UNITED STATES DISTRICT COURT

NORTHERN DISTRICT OF CALIFORNIA

SAN JOSE DIVISION

FEDERAL TRADE COMMISSION,

Plaintiff,

v.

QUALCOMM INCORPORATED,

Defendant.

Case No. 17-CV-00220-LHK

FINDINGS OF FACT AND CONCLUSIONS OF LAW

Plaintiff Federal Trade Commission ("FTC") brings suit against Defendant Qualcomm Incorporated ("Qualcomm") for allegedly violating Section 5(a) of the FTC Act, 15 U.S.C. § 45(a), and seeks permanent injunctive relief. Specifically, the FTC claims that Qualcomm has harmed competition in two markets for baseband processors, also called modem chips, through a set of interrelated Qualcomm practices. The FTC Act prohibits "[u]nfair methods of competition," which include violations of the Sherman Act. The FTC asserts that Qualcomm's conduct violates (1) Section 1 of the Sherman Act, 15 U.S.C. § 1; (2) Section 2 of the Sherman Act, 15 U.S.C. § 2; and (3) Section 5 of the FTC Act, 15 U.S.C. § 45(a). ECF No. 966.

On April 3, 2017, Qualcomm moved to dismiss the FTC's Complaint. ECF No. 69. On June 26, 2017, the Court denied Qualcomm's motion to dismiss. ECF No. 134.

On August 30, 2018, the FTC moved for partial summary judgment on the question of whether Qualcomm's commitments to two standard setting organizations ("SSOs"), the Alliance for Telecommunications Industry Solutions ("ATIS") and the Telecommunications Industry Association ("TIA"), require Qualcomm to license to other modem chip suppliers on fair, reasonable, and nondiscriminatory terms Qualcomm's patents that are essential to practicing the ATIS and TIA standards. ECF No. 792. On November 6, 2018, the Court granted the FTC's motion for partial summary judgment. ECF No. 931.

The Court held a 10-day bench trial in this matter beginning on January 4, 2019. The parties gave closing arguments on January 29, 2019. Having considered the evidence and arguments of counsel, the relevant law, and the record in this case, the Court hereby enters the following findings of fact and conclusions of law.

I. STIPULATED FACTS

The parties stipulated to the following facts:

1. Qualcomm is headquartered in San Diego, California. ECF No. 1326 at 1.

2. Since at least 1989, Qualcomm has been, and is now, a corporation. *Id.*

3. Since at least 1989, Qualcomm has been, and is now, engaged in interstate and international commerce. *Id.*

4. Qualcomm's operating segment relating to its chip and software business is called Qualcomm CDMA Technologies ("QCT"). Qualcomm's operating segment relating to the licensing of its patents is called Qualcomm Technology Licensing ("QTL"). *Id.*

5. In 2012, Qualcomm created Qualcomm Technologies, Inc. ("QTI"), a wholly owned subsidiary of Qualcomm. QTI operates substantially all of Qualcomm's products and services business, including QCT, as well as substantially all of Qualcomm's engineering, research, and development functions. Qualcomm continues to operate QTL. *Id.*

6. Qualcomm CDMA Technologies Asia-Pacific Pte. Ltd. ("QCTAP"), a Singapore company, is a wholly owned indirect subsidiary of Qualcomm. *Id.*

7. Cellular communications depend on widely distributed networks that implement

cellular communications standards. *Id.*

8. Some original equipment manufacturers ("OEMs") have purchased multimode modem chips for use in Cellular Handsets intended for operation on the major U.S. wireless networks. *Id.* at 2.

9. Cellular Handsets are designed, marketed, and sold by OEMs such as Samsung, Huawei, Apple, Xiaomi, OPPO, VIVO, Google, Lenovo/Motorola Mobility, and LGE. *Id.*

10. Consumers purchase Cellular Handsets for a variety of reasons, including for (a) their ability to transmit and receive data at high speeds over cellular networks, such as those implementing Long Term Evolution ("LTE"), the highest-speed cellular standard which has widely commercialized to date, and (b) their ability to perform voice calls. *Id.*

11. The Third Generation Partnership Project ("3GPP") and the Third Generation Partnership Project 2 ("3GPP2") are global collaborative partnerships of standards development/standards-setting organizations ("SDOs" or "SSOs")[1] and other industry participants that develop technical specifications for cellular standards. *Id.*

12. The current "organizational partners" of 3GPP are seven regional SSOs, specifically: the European Telecommunications Standards Institute ("ETSI"), the Alliance for Telecommunications Industry Solutions ("ATIS"), the Association of Radio Industries and Businesses, Japan ("ARIB"), the Telecommunication Technology Committee, Japan ("TTC"), the China Communications Standards Association ("CCSA"), the Telecommunications Standards Development Society, India ("TSDSI"), and the Telecommunications Technology Association, Korea ("TTA"). *Id.*

13. The current organizational partners of 3GPP2 are five regional SSOs, specifically: the Telecommunications Industry Association ("TIA"), ARIB, TTC, CCSA, and TTA. *Id.*

14. Cellular communications standards have evolved over "generations," including second-generation ("2G"), third-generation ("3G"), and fourth-generation ("4G") standards. *Id.*

[1] Consistent with the Court's prior orders, *see* ECF No. 931 at 3 n.2, the Court refers to these standards organizations as SSOs.

15. 2G cellular standards include the Global System for Mobile ("GSM") and cdmaOne (also sometimes called "TIA/EIA/IS-95" or "IS-95"). *Id.*

16. ETSI adopted GSM as a cellular standard. ETSI also adopted General Packet Radio Service ("GPRS") and Enhanced Data Global Evolution ("EDGE") as improvements to GSM. These are considered 2G standards. *Id.* at 2–3.

17. GSM uses time division multiple access ("TDMA") technology. *Id.* at 3.

18. TIA adopted cdmaOne as a cellular standard. TIA also adopted IS-95A and IS-95B as improvements to cdmaOne. These are considered 2G standards. *Id.*

19. cdmaOne uses code division multiple access ("CDMA") technology. *Id.*

20. 3G cellular standards include the Universal Mobile Telecommunications System ("UMTS") and CDMA2000. *Id.*

21. UMTS is an umbrella term for three 3G cellular air interfaces standardized within 3GPP: UTRA-FDD, commonly called Wideband CDMA ("WCDMA"), used worldwide; UTRA-TDD High Chip Rate, having little deployment; and UTRA-TDD Low Chip Rate, commonly called Time Division-Synchronous CDMA ("TD-SCDMA"), used primarily in China. *Id.*

22. Included within the CDMA2000 family of standards are CDMA2000 1x, often called 1xRTT, and High Rate Packet Data, often called 1xEV-DO or EV-DO. *Id.*

23. CDMA2000 was standardized by 3GPP2. *Id.*

24. In the United States, AT&T and T-Mobile have operated WCDMA networks. Verizon and Sprint have operated CDMA2000 networks. *Id.*

25. All four major U.S. carriers (Verizon, AT&T, T-Mobile, and Sprint) have deployed LTE, which also encompasses the LTE Advanced, or "LTE-A" standard, as their 4G standard. *Id.*

26. LTE uses orthogonal frequency division multiple access ("OFDMA") technology for downlink transmissions and single-carrier frequency division multiple access ("SC-FDMA") technology for uplink transmissions. *Id.*

27. LTE was standardized by 3GPP. *Id.* at 4.

II. BACKGROUND

The Court discusses cellular standard setting organizations ("SSOs"), Qualcomm's license agreements, Qualcomm's modem chip business, antitrust investigations into Qualcomm's licensing practices, and the credibility of many Qualcomm witnesses.

A. SSOs and FRAND

Standing setting organizations ("SSOs") are global collaborations of industry participants that develop technical specifications for cellular standards. ECF No. 1326 at 2. These specifications ensure that cellular industry participants—including modem chip suppliers, handset original equipment manufacturers ("OEMs"), infrastructure companies, and carriers—develop standard-compatible devices that can communicate with each other. CX6786-R at 19:6-22. Cellular standards evolve over time. Therefore, although the first generation of LTE was standardized in 2008, there have been several new LTE releases as standards contributors develop new features. Tr. at 1320:19-1321:2.

Cellular standards may incorporate patented technology. Patents that are essential to a standard are called standard essential patents ("SEPs"). Tr. at 1396:3-7. Because a SEP holder could prevent other industry participants from implementing a cellular standard, SSOs require patent holders to commit to license their SEPs on fair, reasonable, and nondiscriminatory ("FRAND") terms before SSOs will incorporate the patent into the cellular standard. QX2776-001. For example, under the intellectual property policy of the Telecommunications Industry Association ("TIA"), a SSO, a SEP holder must commit to TIA that: "A license under any Essential Patent(s), the license rights which are held by the undersigned Patent Holder, will be made available to all applicants under terms and conditions that are reasonable and non-discriminatory." *Fed. Trade Comm'n v. Qualcomm*, 2018 WL 5848999, at *3.

This promise to license SEPs on FRAND terms is generally referred to as a SEP holder's FRAND commitment. Tr. at 1423:23-25. At summary judgment, the Court held that Qualcomm's FRAND commitments to SSOs, TIA and ATIS, require Qualcomm to license its modem chip SEPs to rival modem chip suppliers. *Fed. Trade Comm'n v. Qualcomm Inc.*, 2018 WL 5848999, at *1.

B. Qualcomm License Agreements

Qualcomm Technology Licensing ("QTL") is the division of Qualcomm that grants licenses to Qualcomm's patent portfolio. CX7257-007. QTL holds and licenses three broad categories of patents: (1) cellular standard essential patents ("SEPs"); (2) non-cellular SEPs; and (3) non-SEPs, which also are known as implementation patents. Tr. at 1537:20-1538:4; CX7257-007. Cellular SEPs are patents necessary to practice a particular cellular standard. QX2776-042 to -043.[2] By contrast, non-cellular SEPs are necessary to the practice of a non-cellular standard. Tr. at 1537:24-1538:1. Non-SEPs are patents not necessary to the practice of any standard. *Id.* at 1538:2-4. Liren Chen (QTL Senior Vice President of Engineering and Legal Counsel) estimated at trial that Qualcomm held approximately 140,000 granted patents and pending patent applications as of March 2018. Tr. at 1540:14-17.

Qualcomm primarily licenses its patents on a "portfolio basis," which means that a licensee pays for and receives rights to all three categories of Qualcomm patents—cellular SEPs, non-cellular SEPs, and non-SEPs. Tr. at 1972:19-24. Qualcomm occasionally offers separate licenses to its SEPs. Tr. at 1991:13-18; CX7257-014. Qualcomm stated in its 2017 10-K filed with the Securities and Exchange Commission ("SEC") that SEP-only licenses "negatively impact" Qualcomm's licensing revenues because Qualcomm receives higher royalty rates for portfolio licenses than for SEP-only licenses. CX7257-027.

In 1990, Qualcomm began licensing its CDMA patents. According to Dr. Irwin Jacobs (Qualcomm Co-Founder and former CEO)[3], Qualcomm first licensed its patents to generate funds

[2] Exhibits beginning with the letters "CX" are exhibits that the FTC introduced at trial. Exhibits beginning with the letters "QX" are exhibits that Qualcomm introduced at trial. Exhibits beginning with the letters "JX" are exhibits that the parties jointly introduced at trial. The first four numbers after those letters are the exhibit number. The numbers following the dash are the page number. Where the Court cites a page range in an exhibit, the Court uses the word "to" to denote that the Court is citing a range (e.g., QX2776-042 to -043). Where the Court cites multiple pages in an exhibit that are not within a page range, the Court uses a comma to indicate that the Court is citing multiple pages (e.g., QX2776-042, -044).

[3] All the Qualcomm witnesses have or had multiple titles and roles during their time at Qualcomm. Where the Court knows a witness's title at the time of a document or event, the witness is so identified. Where the Court does not know a witness's contemporaneous title, the Court identifies the witness by their current or last title at Qualcomm.

for continued research and development. Tr. at 1265:24-1266:22. On July 24, 1990, Qualcomm entered a patent license agreement with AT&T, in which Qualcomm charged a 4% running royalty rate on handset sales and no royalties on chipset sales. JX0002-006; ECF No. 1326 at 4. Qualcomm entered a similar patent license agreement with Motorola in July 1990, in which Qualcomm charged a 4% running royalty rate on handset sales and no royalties on chipset sales. Tr. at 216:20-217:3; JX0003-005.

In a 1999 email, Steve Altman (later Qualcomm President) told Marv Blecker (QTL Senior Vice President) that Qualcomm licensed rival modem chip suppliers in exchange for a 3% running royalty rate on chipset sales. CX8177-001. Specifically, Altman's email stated: "Other ASIC licensees pay royalties to Qualcomm at 3% with no minimum dollar amount." *Id.*

At some point, Qualcomm stopped licensing rival modem chip suppliers and instead started licensing only OEMs at a 5% running royalty on the price of each handset sold. These licenses are called Subscriber Unit License Agreements ("SULA"). *See* JX0030 (SULA between Qualcomm and BenQ). With a SULA, an OEM may sell handsets that practice Qualcomm's patents without fear of an infringement suit from Qualcomm. Tr. at 1426:2-10. The parties stipulated that in a typical SULA, Qualcomm receives consideration in the form of a running royalty rate calculated as a percentage of the licensee's wholesale net selling price of the end-user device (minus applicable deductions), subject to royalty caps. ECF No. 1326 at 10. An end-user device is a cellular handset, which the parties have stipulated is defined as a mobile phone. ECF No. 1326 at 2.

Specifically, Qualcomm charges a 5% running royalty on handset sales for a license to Qualcomm's CDMA patent portfolio, which includes CDMA SEPs and non-SEPs. Tr. at 1399:21-24. For Qualcomm's LTE portfolio, Qualcomm has historically charged a 4% running royalty rate. *Id.* at 1400:11-16. Qualcomm SULAs grant rights both to the relevant Qualcomm patents existing at the time of the SULA and additional relevant Qualcomm patents issued during the license term. Tr. at 1397:5-8.

Qualcomm has capped the maximum royalty base or net selling price of the handset at

$400. Tr. at 1979:19-23; *see also* JX0122-010 (royalty base cap in SULA between Samsung and Qualcomm). In some SULAs, Qualcomm charges an upfront fee in addition to the running royalty rate on handset sales. *See* JX0042-011 (upfront license fee in SULA between Wistron and Qualcomm). SULAs also require OEMs to grant cross licenses to their patents to Qualcomm, sometimes on a royalty-free basis. Tr. at 1398:11-13; CX7257-015.

Qualcomm has been forced to alter certain royalty rates and licensing practices after a 2014 investigation of Qualcomm's business practices by China's National Development and Reform Commission ("NDRC"), the government entity responsible for antitrust. Tr. at 1981:9-16. The NDRC issued a "rectification plan," which requires Qualcomm to offer SEP-only licenses to Qualcomm's China patents at specified rates. *Id.* at 1400:17-25; CX7257-014. The resulting agreements are Chinese Patent License Agreements ("CPLA"). Tr. at 1457:14-1458:3.

In a CPLA, which is a SEP-only license, Qualcomm charges a 5% running royalty rate on sales of handsets that support multiple cellular standards and a 3.5% running royalty rate on sales of LTE-only handsets, although the CPLA charges those rates against 65% of the handset price and the rates apply only to handsets made and sold for use in China. *Id.* at 1400:17-25; *see* QX9266-365 (CPLA between Lenovo and Qualcomm). As will be discussed further below, a presentation to a committee of the Qualcomm Board of Directors in 2015 explained that Qualcomm was able to avoid more aggressive rate cuts by making a $150 million contribution to the Chinese government. CX3755-004.

Qualcomm now charges the same royalty rates in other SEP-only licenses regardless of whether the handsets are made and sold only for use in China. Tr. at 1401:1-4.

Licensing is very profitable for Qualcomm. In 2015, David Wise (Qualcomm Senior Vice President and Treasurer) stated in a presentation shared with Alex Rogers (QTL President) that "QTL represents the vast majority of our value at $50-$70B" and that "1 point of royalty is $16-$20B." CX5953-004. At trial, Wise agreed that QTL has historically "represented at least two thirds of the value of Qualcomm." Tr. at 91:14-17. Qualcomm's 2017 strategic plan indicates that QTL earned $7.7 billion in 2016. CX7122-026. That figure exceeded the combined 2016

licensing revenue of twelve other patent licensors, including Ericsson, Nokia, and Interdigital. *Id.* A 2012 Bain Consulting presentation that Qualcomm introduced into evidence concluded that in 2011, "Qualcomm has 25% of global patent licensing revenue" in the cellular handset space and that Qualcomm earned more than 50% of all modem chip patent licensing revenue. QX0121A-009.

C. Qualcomm Sales of Modem Chips

Next, the Court provides a general overview of Qualcomm CDMA Technologies ("QCT"), Qualcomm's modem chip supply division. Qualcomm is a "fabless" modem chip supplier, which means that QCT outsources the actual fabrication of QCT modem chips to third parties. CX7257-013. Modem chips[4] enable handsets to communicate with each other across cellular networks. Tr. at 553:25-554:2. Any OEM manufacturing a cellular handset must purchase and install a modem chip. CX0507-001. Because the OEM must integrate the modem chip into the OEM's handset design process, OEMs may engage with potential modem chip suppliers as many as two years before the OEM plans to commercialize the handset. Tr. at 674:16-21; CX0507-001.

Modem chips are either "single-mode" or "multimode." Whereas a single-mode modem chip supports only one cellular standard (like CDMA), a multimode modem chip supports multiple standards in one chip. Tr. at 1352:21-25. For example, Qualcomm's MSM 7600 modem chip supports six different cellular standards. *Id.* at 1372:8-25. A multimode modem enables global roaming, as carriers in different parts of the world may support different cellular standards. *Id.* at 1352:24-1353:2.

Modem chips also contain varying features. "Thin modems" are standalone modem chips that provide only the core cellular functionality. Tr. at 1378:7-14. Apple, a major OEM, buys thin modems from external modem chip suppliers and internally develops application processors, which include the multimedia capability necessary for smartphones. *Id.* Other OEMs have also

[4] Other terms for modem chips are baseband processors, application specific integrated circuits ("ASICs"), and chipsets. *See, e.g.*, JX0051-004. For ease of reference, and in accordance with the parties' usage, the Court uses the term "modem chip."

purchased thin modems and paired them with application processors. Tr. at 457:5-9. By contrast, a "system on a chip" ("SoC") is an integrated chip that includes both a modem's cellular functionality and the application processor. *Id.* at 1361:6-17; QX9204-015. Qualcomm produces SoCs (its MSM line of chips) and thin modems (its MDM line). CX5551-024; Tr. at 1375:5-21.

Qualcomm first sold commercial quantities of modem chips in 1996. CX1771-022. From fiscal years 2015 to 2017, Qualcomm shipped between 804 million and 932 million modem chips each year. CX7257-012. Although such sales are not relevant to this case, Qualcomm also sells modem chips to OEMs that manufacture items like smart cars. CX7257-012.

As of March 2018, several other companies were selling modem chips. These companies include MediaTek; HiSilicon, a division of the OEM Huawei; Samsung LSI (also referred to as Exynos), a division of the OEM Samsung; Intel; and Unisoc (formerly known as Spreadtrum). Tr. at 323:25-324:4; CX7257-014. Other modem chip suppliers exited the market between 2006 and 2016, including Freescale, Marvell, Texas Instruments, ST-Ericsson, Broadcom, and Nvidia. CX8292-006, -024; Tr. at 324:5-12. The Court will discuss these rivals and how Qualcomm's practices affected them in more detail below.

D. Government Investigations, Findings, and Fines

The following descriptions of various government investigations and findings are from Qualcomm's 2017 10-K filed with the SEC on November 1, 2017:

The FTC first notified Qualcomm of its investigation related to the instant case in September 2014 and filed its complaint in the instant case in January 2017. CX7257-099.

In September 2009, the Japan Fair Trade Commission ("JFTC") issued a cease and desist order regarding certain of Qualcomm's licenses with Japanese licensees. CX7257-097. The JFTC order concluded that the Japanese licensees "were forced to cross-license patents to [Qualcomm] on a royalty-free basis and were forced to accept a provision under which they agreed not to assert their essential patents against [Qualcomm's] other licensees who made a similar commitment." *Id.* Qualcomm invoked its right to administrative hearings before the JFTC and the Tokyo High Court stayed the cease and desist order while the JFTC held administrative hearings. *Id.* As of

2017, the JFTC had held hearings on 37 different dates. *Id.*

In January 2010, the Korea Fair Trade Commission ("KFTC") found that Qualcomm had violated Korean law "by offering certain discounts and rebates for purchases of its CDMA chipsets and for including in certain agreements language requiring the continued payment of royalties after all licensed patents have expired." CX7257-097. The KFTC imposed a fine, which Qualcomm paid, although Qualcomm has appealed the KFTC's order to the Korea Supreme Court. CX7257-097 to -098.

In March 2015, the KFTC notified Qualcomm that the KFTC was investigating whether Qualcomm's licensing practices violate the Korean monopoly laws. CX7257-098. In January 2017, the KFTC issued a written order that the following practices violate Korean law: "(i) refusing to license, or imposing restrictions on licenses for, cellular communications standard-essential patents with competing modem chipset makers; (ii) conditioning the supply of modem chipsets to handset suppliers on their execution and performance of license agreements with the Company; and (iii) coercing agreement terms." *Id.* The KFTC also fined Qualcomm $927 million. *Id.* Qualcomm has appealed the order to the Korea Supreme Court. *Id.*

In 2015, the European Commission began formal proceedings into a 2010 complaint that Qualcomm had engaged in anticompetitive activity. CX7257-098. The Commission issued a decision in 2015 "expressing its preliminary view that between 2009 and 2011, the Company engaged in predatory pricing by selling certain baseband chipsets to two customers at prices below cost, with the intention of hindering competition." *Id.* As of 2017, the matter remained ongoing. *Id.*

In 2015, the Taiwan Fair Trade Commission ("TFTC") began investigating whether Qualcomm's patent licensing practices violate Taiwan's fair trade laws. CX7257-099. In 2017, the TFTC issued a formal decision that Qualcomm violated Taiwan law by refusing to license modem chip rivals, refusing to supply modem chips to OEMs who are unlicensed, and providing discounts to Apple in exchange for Apple's exclusive purchase of Qualcomm modem chips. *Id.* The TFTC imposed a $778 million fine. *Id.*

In addition, China's National Development and Reform Commission ("NDRC") investigated Qualcomm's licensing practices and in 2015 imposed a rectification plan that altered some of Qualcomm's licensing practices in China, as set forth in the licensing background section above. CX7257-027. Presentation notes from a slide deck that Boston Consulting Group ("BCG") presented to the Qualcomm Board of Directors in 2015 explain that Qualcomm was able to avoid caps on non-SEP royalty rates, more aggressive rate cuts, and forced sales to non-licensees due to a $150 million payment to the Chinese government:

> NDRC settlement- Worst penalties were avoided – e.g. caps on non-SEP royalties, more aggressive rate cuts, forced selling of chips to non-licensees, etc. – primarily because of what CalTech[5] [code name for QCT] offered NDRC (agreement with SMIC (Semiconductor Manufacturing International Corporation) to collaborate on production technology + voluntarily contributing ~$150M to Chinese R&D investment fund.

CX3755-004.

Accordingly, Qualcomm's licensing practices have been the subject of government investigations in the United States since at least 2014 and in Asia and Europe since at least 2009.

E. Credibility Determinations

Before discussing the trial evidence in more detail, the Court observes that Qualcomm's trial presentation relied almost exclusively on trial testimony and ignored Qualcomm's own contemporaneous documents. Qualcomm introduced only 16 of its own documents at trial, as compared to the more than 125 Qualcomm documents that the FTC introduced—not counting license and supply agreements. ECF No. 1458-1. At closing argument Qualcomm relied primarily on expert testimony and demonstratives, and largely ignored Qualcomm's own documents. Most of Qualcomm's experts did not even review Qualcomm's own documents.

The Court finds Qualcomm's internal, contemporaneous documents more persuasive than Qualcomm's trial testimony prepared specifically for this antitrust litigation. *See In re High-Tech Employee Antitrust Litig.*, 289 F.R.D. 555, 576 (N.D. Cal. 2013) (finding contemporaneous

[5] Project Phoenix was a 2015 Qualcomm analysis of whether to split QTL and QCT, and CalTech was the Project Phoenix code name for QCT. Tr. at 96:20-21.

documents more persuasive than the defendants' "litigation driven" declarations).

Specifically, many Qualcomm executives' trial testimony was contradicted by these witnesses' own contemporaneous emails, handwritten notes, and recorded statements to the Internal Revenue Service ("IRS"). For example, at trial and at his deposition, Cristiano Amon (Qualcomm President) testified that he had never been informed of Qualcomm threatening to cut off chip supply:

> **Q**: You were asked, 'You have never been informed that QTL threatened to cease supplying chipsets to a customer because of a licensing dispute; is that right?' You answered 'That is correct.' That was a true statement when you said it?
> **A**: That is correct.

Tr. at 548:3-17 (citing Amon Depo. 50:24-51:2). However, Amon's own handwritten notes from 2015 license negotiations with Motorola's President Rick Osterloh, entitled "12-9-15-Rick & Team-Motorola," state: "(1) Licensing > Eric [Reifschneider, QTL Senior Vice President and General Manager] constantly threatening to cut off chip supply." CX7024-001. Thus, despite Amon's own handwriting acknowledging 2015 chip supply threats, Amon testified under oath at his deposition and trial that he was unaware of QTL threats to cutoff chip supply.

Furthermore, Cristiano Amon himself approved joint QTL and QCT plans to cut off chip supply during patent licensing disputes. For example, in November 2012, Eric Reifschneider (QTL Senior Vice President and General Manager) wrote to Amon (then QCT Co-President), Steve Mollenkopf (Qualcomm President), Derek Aberle (QTL President), and Marv Blecker (QTL Senior Vice President) regarding Chinese OEMs: "Cristiano, This summarizes the conclusions we reached regarding sales of TD-SCDMA [TD-SCDMA is a 3G standard used primarily in China] chipsets to customers that we anticipate will use them in TD-SCDMA/GSM products… 3. If any of these customers refuses or fails to pay royalties on any other (i.e., C2K [CDMA], UMTS, LTE) devices, we will discontinue supply to such customers as necessary." CX5053-002. Amon replied: "This summarizes well the discussion between QMC [Qualcomm Mobile Computing, a division of QCT]/QTL and the agreed plan forward. We will start communicating the plan to the customer base." CX5053-001. Thus, Amon not only approved the plan for QCT to cut off chip

supply to Chinese OEMs who refuse to pay patent royalties to QTL, but Amon agreed to start communicating this plan to customers. Amon's trial testimony was not consistent with his contemporaneous emails and handwritten notes.

Likewise, at trial, Steve Mollenkopf (Qualcomm CEO) testified that he was not aware that Qualcomm had ever cut off an OEM's chip supply:

> **Q**: "[H]as Qualcomm ever exercised the right to cut off chip supply to a customer that was in dispute about licensing with Qualcomm?
> **A**: Not that I'm aware of.

Tr. at 809:16-22. Mollenkopf's testimony also was not consistent with his contemporaneous emails.

On February 23, 2012, Sony CEO Bob Ishida (Sony CEO) sent an email with the subject line "urgent" to Steve Mollenkopf (then Qualcomm President). CX7824-002. Ishida wrote that Qualcomm had held all chip shipments to Sony and asked Mollenkopf to intervene:

> QC legal team ordered to your sales to hold any shipment to SOMC due to non existence of QTL license agreement with SOMC after we became 100% subsidiary of Sony. Are you aware of that? We have an individual talking to your legal team diligently to agree on the licensing terms so it was a surprise that your legal team stopped the shipment. Please let me know what you can do on this.

CX7824-002. After the Sony shipment hold, Steve Mollenkopf wrote an email to Derek Aberle (QTL President) and Cristiano Amon (QCT Co-President) stating not that Qualcomm should never cut off chip supply, but only that Mollenkopf wished to have "visibility" on any future shipment holds: "Let's make sure we have a process to make sure Jim L [Jim Lederer, QCT Executive Vice President] or I have visibility before a stop-ship goes out." CX6522-002.

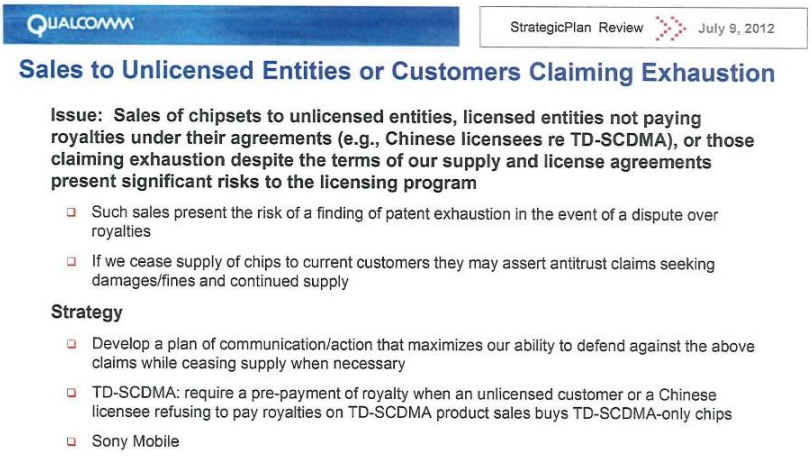
At trial, Steve Mollenkopf (Qualcomm CEO) testified that the Sony chip supply cutoff was a mistake: "[O]ur team had mistakenly put in a stop ship for [Sony]." Tr. at 811:23-24. However, two months after Qualcomm cut off Sony's chip supply, Qualcomm hired Eric Reifschneider, the outside counsel who threatened to cut off Sony's chip supply, as QTL Senior Vice President and General Manager. ECF No. 1326 at 15. Then, in an October 27, 2012 email to Jonathan Pearl (Sony General Counsel), Eric Reifschneider again threatened Sony's chip supply and told Pearl

that QTL would report to QCT that Sony was not licensed: "[A]t this point I must report to QCT that SMC [Sony Mobile Corp.] appears unwilling to enter into a license agreement with Qualcomm." CX5185-005.

Mollenkopf also participated in the November 2012 emails summarizing the QTL and QCT plan for QCT to cut off chip supply to Chinese OEMs who refuse to pay patent royalties to QTL. CX5053-001 to -002. Moreover, on May 20, 2013, Derek Aberle (QTL President) told Steve Mollenkopf (then Qualcomm President) in an email that "I suggest you make the following points to Huawei's CEO." CX5231-001. Among those points was threatening to cut off Huawei's chip supply: "[I]f they don't extend we will have issues re continued chip supply on C2K. Note that Huawei has been claiming patent exhaustion based on their purchase of chips from QC despite the terms of our supply agreement." CX5231-001. Steve Mollenkopf replied, "I got it. Thanks." *Id.*

At both his deposition and at trial, Derek Aberle (QTL President in 2012) was asked about a July 2012 Qualcomm presentation to the Qualcomm Board of Directors that stated "If we cease supply of chips to current customers they may assert antitrust claims seeking damages/fines and continued supply" and listed the following strategy: "Develop a plan of communication/action that maximizes our ability to defend against the above claims while ceasing supply when necessary." CX6974-070.

On July 2, 2012, Derek Aberle (QTL President) sent a slide from the presentation to Dr. Paul Jacobs (Qualcomm CEO), Steve Mollenkopf (Qualcomm President), and Steve Altman (Qualcomm Vice Chairman). CX6998-001, -011. On July 9, 2012, Qualcomm presented the same slide—reproduced below—to the Qualcomm Board of Directors, including Dr. Irwin Jacobs (Qualcomm Co-Founder and former CEO). CX6974-001.



At his March 2018 deposition, Derek Aberle (former Qualcomm President), who left Qualcomm in January 2018, could not answer any questions about Qualcomm's July 2012 communication plan to defend against antitrust claims: "Actually, as I read that, I don't recall it. I don't actually know what it means." Aberle Depo. 217:25-218:12.

However, at the January 2019 trial, Derek Aberle testified that the July 2012 slide reflected Qualcomm's intent to "come up with a proactive plan to make sure we could get out ahead of situations where there may be a dispute or a license renewal that needed to happen and somebody was buying chips from us." Tr. at 261:7-19. It is odd that Aberle had better recall during the January 2019 trial than nearly a year earlier at his March 2018 deposition. The Court does not find Aberle's prepared for trial testimony credible.

Similarly, Alex Rogers (QTL President), who has worked at Qualcomm since 2001, testified that Qualcomm has "never threatened to cut off chip supply to get a licensee to accept license terms." Tr. at 1994:1-16. However, Rogers received the October 27, 2012 email that Eric Reifschneider (QTL Senior Vice President and General Manager) sent to Sony threatening Sony's chip supply because Sony was not licensed. *See* CX5185-002. Rogers' testimony was not consistent with his own emails.

Fabian Gonell (QTL Legal Counsel and Senior Vice President, Licensing Strategy) also testified that Qualcomm does not cut off chip supply during license disputes:

> **Q**: What is Qualcomm's practice with respect to supplying chips to a licensee who is disputing the terms of its license?
> **A**: If there's a licensee that is disputing the terms of its license, then we continue to supply chips if they want them.

Tr. at 1428:2-5. However, like Rogers, Gonell received the October 27, 2012 Sony email in which Eric Reifschneider (QTL Senior Vice President and General Manager) threatened Sony's chip supply. *See* CX5185-003. Gonell also received the November 2012 email in which Eric Reifschneider summarized the QTL and QCT plan for QCT to "discontinue supply" to Chinese OEMs who refuse to pay patent royalties to QTL. CX5053-001. Gonell also did not testify credibly when confronted by a recording of a Qualcomm meeting with the IRS, as the Court will discuss later in this order. Gonell's testimony was not consistent with his own emails and his own recorded statements to the IRS.

In addition to giving testimony under oath at trial that contradicted their contemporaneous emails, handwritten notes, and recorded statements to the IRS, some Qualcomm witnesses also lacked credibility in other ways. For example, Dr. Irwin Jacobs (Qualcomm Co-Founder), Steve Mollenkopf (Qualcomm CEO), and Dr. James Thompson (Qualcomm CTO) gave such long, fast, and practiced narratives on direct examination that Qualcomm's counsel had to tell the witnesses to slow down. For example, Qualcomm's counsel told Steve Mollenkopf (Qualcomm CEO): "Slow down just a little bit, Mr. Mollenkopf, if you will, please." Tr. at 803:22-23. Qualcomm's counsel also had to tell Irwin Jacobs to slow down: "I'm going to ask you, Dr. Jacobs, to slow down just a little bit. We're trying to take down every word." Tr. at 1259:25-1260:2. By contrast, when cross-examined by the FTC, each witness was very reluctant and slow to answer, and at times cagey.

Similarly, as CTO, James Thompson oversees engineering at Qualcomm. On direct examination, Thompson readily testified about several of Qualcomm's modem chips, identified them by their marketing codes, and discussed the standards each chip practiced:

> **Q**: Moving over to the next one, the 7600, what was that chip the first of?
> **A**: Okay. So that's – so I mentioned before that we had made a decision to support all modes in the world so our modems could go anywhere in the world, and that was the first chip that supported that.

Tr. at 1372:8-13. However, on cross-examination, Dr. Thompson was suddenly unable to answer even basic questions about a modem chip:

> **Q**: Dr. Thompson, Qualcomm's MSM 8655 modem chip is a CDMA capable modem chip?
> **A**: That – the MSM 8655, I'm trying to remember. I – you know, off the top of my head, I'm trying to remember which one that is. We use internal code names, and so –
> **Q**: Does the second digit being a 6 tell you that this has CDMA?
> **A**: Honestly, I don't – I don't know the marketing codes that are used. I have kind of – I think 9 means it has LTE. But – but I'm not sure. I'm not 100 percent sure.

Tr. at 1384:22-1385:6. Similar examples exist for Dr. Irwin Jacobs (Qualcomm Co-Founder) and Steve Mollenkopf (Qualcomm CEO).

Therefore, the Court largely discounts Qualcomm's trial testimony prepared specifically for this litigation and instead relies on these witnesses' own contemporaneous emails, handwritten notes, and recorded statements to the IRS.

III. THE FTC ACT AND THE SHERMAN ACT

The FTC brings its complaint against Qualcomm under § 5 of the FTCA, which prohibits "[u]nfair methods of competition in or affecting commerce." 15 U.S.C. § 45(a).

"[U]nfair methods of competition" under the FTCA includes "violations of the Sherman Act." *Fed. Trade Comm'n v. Cement Inst.*, 333 U.S. 683, 693–94 (1948). In addition, the FTC under § 5 may "bar incipient violations of [the Sherman Act], and conduct which, although not a violation of the letter of the antitrust laws, is close to a violation or is contrary to their spirit." *E.I. du Pont de Nemours & Co. v. Fed. Trade Comm'n*, 729 F.2d 128, 136–37 (2d Cir. 1984) (internal citations omitted); *see also Fed. Trade Comm'n v. Brown Shoe Co.*, 384 U.S. 316, 321 ("This broad power of the [FTC] is particularly well established with regard to trade practices which conflict with the basic policies of the Sherman and Clayton Acts even though such practices may not actually violate these laws."). "The standard of 'unfairness' under the FTCA is, by necessity, an elusive one," and the precise contours of the FTC's authority under § 5 are not clearly defined. *Fed. Trade Comm'n v. Indiana Fed. of Dentists*, 476 U.S. 447, 454 (1986). However, the FTC's authority to proscribe "unfair methods of competition" under § 5 is not unbounded. *See E.I. du*

Pont de Nemours & Co., 729 F.2d at 137 ("When a business practice is challenged by the [FTC], even though, as here, it does not violate the antitrust or other laws and is not collusive, coercive, predatory or exclusionary in character, standards for determining whether it is 'unfair' within the meaning of § 5 must be formulated to discriminate between normally acceptable business behavior and conduct that is unreasonable or unacceptable.").

Here, FTC alleges that Qualcomm's conduct violates § 5 of the FTCA because Qualcomm's conduct violates both § 1 and § 2 of the Sherman Act. Compl. ¶ 147; *see also* ECF No. 1083 ("FTC Pretrial Brief"), at 3 (arguing that Qualcomm violated § 1 and § 2 of the Sherman Act). FTC also alleges that, even if Qualcomm's conduct does not violate either § 1 or § 2 of the Sherman Act, Qualcomm's conduct nonetheless "constitute[s] unfair methods of competition in violation of [§ 5] of the FTCA." Compl. ¶ 147.

A. Section 1 and Section 2 of the Sherman Act

"Section 1 of the Sherman Act, 15 U.S.C. § 1, prohibits [e]very contract, combination ... or conspiracy, in restraint of trade or commerce among the several States." *Allied Orthopedic Appliances, Inc. v. Tyco Health Care Grp. LP*, 592 F.3d 991, 996 (9th Cir. 2010). "Unlike Section 2 claims, Section 1 restraint of trade claims need not establish the threshold showing of monopoly control over a relevant market." *Amarel v. Connell*, 102 F.3d 1494, 1552 (9th Cir. 1996). "To establish liability under § 1, a plaintiff must prove (1) the existence of an agreement, and (2) that the agreement was an unreasonable restraint of trade." *Aerotec Int'l, Inc. v. Honeywell Int'l, Inc.*, 836 F.3d 1171, 1178 (9th Cir. 2016). An agreement is an unreasonable restraint of trade if defendant "plays enough of a role in [the relevant] market to impair competition significantly" and the challenged agreement "is the type that restrains trade." *Bhan v. NME Hosps., Inc.*, 929 F.2d 1404, 1413 (9th Cir. 1991).

"Section 2 of the Sherman Act makes it unlawful for a firm to 'monopolize.'" *United States v. Microsoft Corp.*, 253 F.3d 34, 50 (D.C. Cir. 2001). "The offense of monopolization has two elements: '(1) the possession of monopoly power in the relevant market"; and (2) "the willful acquisition or maintenance of that power" through exclusionary conduct "as distinguished from

growth or development as a consequence of a superior product, business acumen, or historic accident.'" *Id.* (quoting *United States v. Grinnell Corp.*, 384 U.S. 563, 570–71 (1966)); *see also McWane v. Fed. Trade Comm'n*, 783 F.3d 814, 828 (11th Cir. 2015) (applying these two elements in a case brought under § 5 of the FTCA). As the D.C. Circuit has explained, "to be condemned as exclusionary, a monopolist's act must have an 'anticompetitive effect,'" which means that the conduct "must harm the competitive *process* and thereby harm consumers." *Microsoft*, 253 F.3d at 58 (emphasis in original). "The [Sherman Act] directs itself not against conduct which is competitive, even severely so, but against conduct which unfairly tends to destroy competition itself." *Spectrum Sports, Inc. v. McQuillan*, 506 U.S. 447, 458 (1993).

Thus, the Sherman Act "contains a 'basic distinction between concerted and independent action.'" *Copperweld Corp. v. Independence Tube Corp.*, 467 U.S. 752, 767 (1984) (quoting *Monsanto Co. v. Spray-Rite Serv. Corp.*, 465 U.S. 752, 761 (1984)). Whereas § 1 prohibits certain concerted activity between separate entities, § 2 is addressed to the anticompetitive conduct of a single firm. *Id.* at 767–68. In addition, the showing of monopoly power required under § 2 is "more stringent" than the showing of market power required under § 1. *Eastman Kodak Co. v. Image Technical Servs., Inc.*, 504 U.S. 451, 481 (1992).

Nonetheless, once a plaintiff has shown the existence of an agreement under § 1 or shown that a defendant possess monopoly power under § 2, courts apply substantially identical analytical frameworks to determine whether the defendant's conduct actually violated § 1 or § 2. *See Microsoft*, 253 F.3d at 59 (describing the "similar balancing approach" under both § 1 and § 2, and citing cases).

For example, under § 1, unless a restraint is unreasonable *per se*, courts apply the "rule of reason" and its three-step, burden-shifting framework. *Ohio v. Am. Express Co.*, 138 S. Ct. 2274, 2284 (2018). The FTC does not argue that Qualcomm entered any agreements that are *per se* unreasonable. FTC Pretrial Brief at 9. Under the § 1 rule of reason, the plaintiff has the initial burden to show that "the challenged restraint has a substantial anticompetitive effect that harms consumers in the relevant market." *Id.* If the plaintiff makes that showing of anticompetitive

effect, "then the burden shifts to the defendant to show a procompetitive rationale for the restraint." *Id.* If the defendant shows a procompetitive rationale, "the burden shifts back to the plaintiff to demonstrate that the procompetitive efficiencies could be reasonably achieved through less anticompetitive means." *Id.*

Under § 2, a court asks whether the defendant possessed monopoly power in a relevant antitrust market. *Microsoft*, 253 F.3d at 51. Monopoly power is "the power to control prices or exclude competition." *Grinnell*, 384 U.S. at 571. If the court finds that a defendant possessed monopoly power, the court then asks whether the defendant has acquired or maintained its monopoly "by engaging in exclusionary conduct 'as distinguished from growth or development as a consequence of a superior product, business acumen, or historic accident." *Microsoft*, 253 F.3d at 58 (quoting *Grinnell*, 384 U.S. at 571). The monopolist's conduct "must have an anticompetitive effect." *Eastman v. Quest Diagnostics Inc.*, 108 F. Supp. 3d 827, 834 (N.D. Cal. 2015) (quoting *Microsoft*, 253 F.3d at 58).

If the plaintiff makes a prima facie case under § 2 by showing that the monopolist's conduct has anticompetitive effect, the burden shifts to the monopolist to "proffer a 'procompetitive justification' for its conduct." *Microsoft*, 253 F.3d at 59 (quoting *Eastman Kodak*, 504 U.S. at 483). If the monopolist shows a procompetitive justification, "the burden shifts back to the plaintiff to rebut that claim." *Id.* If the plaintiff cannot rebut the monopolist's procompetitive justification, the plaintiff "must demonstrate that the anticompetitive harm of the conduct outweighs the procompetitive benefit." *Id.*

Therefore, the inquiry as to whether an agreement is an "unreasonable restraint of trade" in violation of § 1 and the inquiry as to whether conduct is exclusionary under § 2 substantially overlap. *See Williams v. I.B. Fischer Nev.*, 999 F.2d 445, 448 (9th Cir. 1993) (concluding that because conduct underlying both § 1 and § 2 claims was not anticompetitive under § 1, the court need not separately analyze § 2); *see also United States v. Socony-Vacuum Oil Co.*, 310 U.S. 150, 224 n.59 (1940) (holding that "the two sections overlap in the sense that a monopoly under § 2 is a species of restraint of trade under § 1"). The United States Supreme Court has held that under

both § 1 and § 2 of the Sherman Act, "the criteria to be resorted to in any given case for the purpose of ascertaining whether violations of the section have been committed is the rule of reason guided by the established law." *Standard Oil Co. of N.J. v. United States*, 221 U.S. 1, 61–62 (1911).

As a result, in denying Qualcomm's motion to dismiss the FTC's Complaint, this Court concluded that the analyses of anticompetitive conduct under § 1 and § 2 "are substantially identical." *Fed. Trade Comm'n v. Qualcomm*, 2017 WL 2774406, at *9. Similarly, in *Microsoft*, the D.C. Circuit applied the same three-part burden-shifting analysis to the government's § 1 and § 2 claims. *See* 253 F.3d at 58, 95–97. Indeed, the FTC relies on the same theories under both § 1 and § 2 of the Sherman Act. *See* Compl. ¶ 147; FTC Pretrial Brief at 3 ("The legal analysis of Qualcomm's conduct under Sections 1 and 2 of the Sherman Act is similar."). Both Qualcomm and the FTC acknowledge that each of the FTC's claims should be judged under this balancing approach. ECF No. 1322 ("QC Pretrial Brief") at 11; ECF No. 1472, FTC Proposed Findings of Fact and Conclusions of Fact ("FTC FOFCOL") at 65.

Accordingly, the Court's analysis proceeds as follows. First, the Court discusses whether the FTC has shown that Qualcomm possessed monopoly power in relevant antitrust markets, and thus satisfied the first element of § 2. Then, the Court discusses whether the FTC has shown that Qualcomm's conduct is an unreasonable restraint of trade under § 1 or exclusionary conduct under § 2. Because the Court concludes that Qualcomm's conduct violates the Sherman Act and thereby violates the FTC Act, the Court does not address the separate argument that Qualcomm's conduct is a standalone violation of the FTC Act.

IV. MARKET SHARE AND MARKET POWER

The Court first addresses Qualcomm's market share and market power in the relevant antitrust markets, the market for CDMA modem chips and the market for premium LTE modem chips.

A. Legal Standard

A relevant antitrust market is bounded both by geography and product. *Brown Shoe Co. v.*

United States, 370 U.S. 294, 324 (1962). An antitrust market is geographically bounded by "where sellers operate and where purchasers can predictably turn for supplies." *E.I. du Pont de Nemours & Co. v. Kolon Indus., Inc.*, 637 F.3d 435, 439 (4th Cir. 2011) (citing *Tampa Elec Co. v. Nashville Coal Co.*, 365 U.S. 320, 332–33 (1961)).

The boundaries of an antitrust product market "are determined by the reasonable interchangeability of use or the cross-elasticity of demand between the product itself and substitutes for it." *Brown Shoe*, 370 U.S. at 1524–25. "The test of reasonable interchangeability . . . require[s] the District Court to consider only substitutes that constrain pricing in the reasonably foreseeable future, and only products that can enter the market in a relatively short time can perform this function." *Microsoft*, 253 F.3d at 53–54. "[T]he definition of the relevant market rests on a determination of available substitutes." *Id.* at 54 (citation omitted). Other practical indicia of an antitrust product market include "industry or public recognition" of the market and "the product's peculiar characteristics and uses." *Brown Shoe Co.*, 370 U.S. at 325 (internal citation omitted).

One method that courts have used to apply the above principles and define an antitrust product market is the hypothetical monopolist test. *See Theme Promotions, Inc. v. News Am. Mktg. FSI*, 546 F.3d 991, 1002 (9th Cir. 2008). Under the hypothetical monopolist test, the court asks "whether a monopolist in the proposed market could profitably impose a small but significant and nontransitory price increase" or "SSNIP." *Id.* If after the monopolist imposed a SSNIP, customers would purchase products outside the proposed market, the proposed antitrust market definition is too narrow. *Saint Alphonsus Med. Center-Nampa Inc. v. St. Luke's Health Sys., Ltd.*, 778 F.3d 775, 784 (9th Cir. 2015). If customers would not change their behavior even if the monopolist imposed a SSNIP, the market definition is proper. *See id.* ("Market definition thus perforce focuses on the anticipated behavior of buyers and sellers."); *see also Hynix Semiconductor Inc. v. Rambus Inc.*, 2008 WL 73689, at *3 (N.D. Cal. Jan. 5, 2008) (applying the hypothetical monopolist test).

Once the relevant antitrust market is defined, the court must then address whether the

defendant held monopoly power during the period alleged. Because there is rarely direct proof of a firm's ability to "profitably raise prices substantially above the competitive level," a court may also rely on circumstantial evidence of monopoly power. *Microsoft*, 253 F.3d at 51. "The existence of such power ordinarily may be inferred from the predominant share of the market." *Grinnell*, 384 U.S. at 571. The United States Supreme Court held in *Kodak* that evidence that a defendant holds more than 80% share of the product market "with no readily available substitutes" is sufficient to support a finding of monopoly power. 504 U.S. at 481. *Kodak* also cited other United States Supreme Court precedent for the proposition that "over two-thirds of the market is a monopoly." *Id.* (citing *Am. Tobacco Co. v. United States*, 328 U.S. 781, 797 (1946)). A lesser showing of a "roughly 40% or 50% share" is required to show a § 1 violation. *Microsoft*, 253 F.3d at 70.

However, market share alone is not dispositive. *Id.* at 54. Rather, "no single factor has been held determinative as to the existence of [monopoly] power," and courts also consider whether "barriers to entry" protect the dominant firm's ability to control prices. *Oahu Gas Serv., Inc. v. Pac. Res. Inc.*, 838 F.2d 360, 366 (9th Cir. 1988). Entry barriers are market characteristics "that prevent new rivals from timely responding to an increase in price above the competitive level." *Microsoft*, 253 F.3d at 51. An industry that "requires onerous front-end investments that might deter competition from all but the hardiest and most financially secure investors" is one with significant entry barriers. *United States v. Syufy Enters.*, 903 F.2d 659, 667 (9th Cir. 1990). Moreover, a declining market share does not preclude a finding of monopoly power. *Oahu Gas Serv.*, 838 F.2d at 366.

Thus, the Ninth Circuit has held that to show monopoly power using circumstantial evidence, a plaintiff must: "(1) define the relevant market; (2) show that the defendant owns a dominant share of that market; and (3) show that there are significant barriers to entry and show that existing competitors lack the capacity to increase their output in the short run." *Image Tech. Servs., Inc. v. Eastman Kodak Co.*, 125 F.3d 1195, 1202 (9th Cir. 1997) (citation omitted).

B. CDMA Modem Chip Market

First, the FTC contends that from 2006 to 2016, Qualcomm possessed monopoly power in the global market for CDMA modem chips. FTC Pretrial Brief at 4. In around 1996, Qualcomm sold its first CDMA modem chip, defined as a modem chip that supports the CDMA standard. Tr. at 327:21-25. A "CDMA multimode" modem chip is a modem chip that supports CDMA and additional standards. CX7606-028. The Court first defines the CDMA modem chip market and then explains how Qualcomm possessed monopoly power in the CDMA modem chip market.

1. CDMA Modem Chip Market Definition

As an initial matter, the geographic boundaries of the CDMA modem chip market are worldwide, a conclusion that Qualcomm does not contest. An antitrust market is geographically bounded by "where sellers operate and where purchasers can predictably turn for supplies." *Kolon Indus.*, 637 F.3d at 439. A slide in a 2011 strategic plan for QCT, Qualcomm's modem chip division, shows that Qualcomm sells CDMA modem chips in every region of the globe. CX7606-037. In the same 2011 strategic plan, Qualcomm calculates QCT's CDMA modem chip market share on a global basis. CX7606-029.

Defining the relevant product market "rests on a determination of available substitutes." *Microsoft*, 253 F.3d at 54. Industry practice also informs whether a product market is distinct. *See Brown Shoe Co.*, 370 U.S. at 325 (explaining that practical indicia of an antitrust product market include "industry or public recognition" of the market).

Qualcomm conclusorily disputes that the CDMA modem chip market is a relevant market, but does not cite any evidence. ECF No. 1473, Qualcomm Proposed Findings of Fact and Conclusions of Law ("QC FOFCOL") at 107 (arguing only that the FTC failed to show that Qualcomm held monopoly power in the CDMA modem chip market).

Because non-CDMA modem chips are not "available substitutes" for CDMA modem chips, and because Qualcomm's own documents show that the CDMA modem chip market is a distinct product market, the Court concludes that the FTC has adequately defined the antitrust market.

First, modem chips that do not comply with CDMA standards are not available substitutes

for CDMA modem chips. Under the hypothetical monopolist test, the court asks "whether a monopolist in the proposed market could profitably impose a small but significant and nontransitory price increase" or "SSNIP." *Theme Promotions*, 546 F.3d at 1002. If after the monopolist imposed a SSNIP, customers would purchase products outside the proposed market, the proposed antitrust market definition is too narrow. *Saint Alphonsus*, 778 F.3d at 784. If customers would not change their behavior even if the monopolist imposed a SSNIP, the market definition is proper. *See id.*

Application of the hypothetical monopolist test shows that the CDMA modem chip market is properly defined. Due to Qualcomm's large market share, Qualcomm has been able to charge a premium on CDMA modem chips, which is a paradigmatic SSNIP. Per Qualcomm's 2012 QCT strategic plan, Qualcomm planned to charge what the strategic plan called a "CDMA Adder" of $4 on CDMA modem chips relative to comparable modem chips without CDMA capability. CX7607-061. At trial, Cristiano Amon (Qualcomm President) agreed that the slide shows that "Qualcomm associates a $4 CDMA adder" with chips sold for premium handsets. Tr. at 503:25-504:5. Two years later, Qualcomm's 2014 QCT strategic plan shows that Qualcomm anticipated charging a $4 "CDMA Adder" on premium handsets through 2018. CX7644-054.

Qualcomm's CDMA adder has been as high as 30% over comparable UMTS chips, as Qualcomm's expert Tasneem Chipty conceded at trial. Tr. at 1747:4-10. For example, a 2015 modem chip pricing agreement between Qualcomm and Apple indicates that Qualcomm charged Apple $3 more—equivalent to a 30% premium—on "CDMA-enabled" modem chips as compared to "non-CDMA" modem chips. JX0107-013. In 2013, Cristiano Amon stated in an email to Derek Aberle (QTL President), Steve Mollenkopf (Qualcomm President), Paul Jacobs (Qualcomm CEO), and other Qualcomm executives that Qualcomm's CDMA adder had been as high as $7: "[T]here is an overall $4.50-7.00 delta between the chipset price of CDMA and its equivalent UMTS." CX5294-002.

Despite the adder, OEMs cannot substitute a non-CDMA modem chip for a CDMA modem chip. Certain carriers, including Verizon in the United States and China Telecom in

China, deploy CDMA networks, which means that an OEM who wishes to sell a handset for use with that carrier needs to purchase a CDMA modem chip. Tr. at 581:9-12. Finbarr Moynihan (MediaTek General Manager of Corporate Sales and Business Development) testified, "[I]f somebody needs to support CDMA for a specific network, like Verizon or Sprint or the Chinese operators, there isn't an alternative to that. It's a standard technology." Tr. at 329:23-25.

John Grubbs (BlackBerry Senior Director of Intellectual Property Transactions) also testified that non-CDMA modem chips are not viable substitutes for CDMA modem chips:

> **Q**: So in order for BlackBerry to sell a phone in to one of these CDMA carriers, the phone had to have a CDMA chipset; is that right?
> **A**: That's right.

Grubbs Depo. 208:1-4. As a result, there is no evidence that any OEM substituted a non-CDMA modem chip for a CDMA modem chip, "making the SSNIP unprofitable." *Saint Alphonsus*, 778 F.3d at 784.

Second, Qualcomm documents reflect "industry or public recognition" of the CDMA modem chip market as a distinct product market. *See Brown Shoe Co.*, 370 U.S. at 325. For example, a slide in a 2011 QCT strategic plan includes charts identifying "QCT Market Share by Technology," including one that tracks Qualcomm's share in CDMA modem chips. CX7606-029. A July 2016 internal Qualcomm presentation titled Qualcomm Technology Licensing: Market Trends includes updated CDMA market share information, and shows that from 2014 to 2016, Qualcomm held at least a 96% share of the worldwide CDMA modem chip market. CX7618-025. Steve Mollenkopf (Qualcomm CEO), Derek Aberle (Qualcomm President), and Alex Rogers (QTL President) all received the Market Trends presentation. CX7618-001. Those Qualcomm documents confirm that there is a distinct, identified market for CDMA modem chips.

Therefore, the Court concludes that because non-CDMA modem chips are not "available substitutes" for CDMA modem chips, the CDMA modem chip market is a relevant antitrust product market. *Microsoft*, 253 F.3d at 54.

2. Qualcomm CDMA Modem Chip Market Share and Market Power

To show monopoly power, the FTC must demonstrate that Qualcomm owned a dominant

share of the market and "show that there are significant barriers to entry and show that existing competitors lack the capacity to increase their output in the short run." *Image Tech. Servs.*, 125 F.3d at 1202. The evidence shows that Qualcomm has maintained a large share of the CDMA modem chip market, that existing competitors have been unable to quickly increase their output to discipline Qualcomm's CDMA adder, and that there are structural barriers to entering the CDMA modem chip market.

Qualcomm's own documents show that Qualcomm has maintained a dominant share of the market. For example, a slide in a 2011 QCT strategic plan includes charts identifying "QCT Market Share by Technology," and indicates that Qualcomm maintained a 95% share of the CDMA modem chip market in 2010. *Id.* A July 2016 internal Qualcomm presentation titled Qualcomm Technology Licensing: Market Trends includes updated CDMA market share information, and shows that from 2014 to 2016, Qualcomm held at least a 96% share of the worldwide CDMA modem chip market. CX7618-025. The July 2017 version of the Market Trends presentation shows that Qualcomm's CDMA market share remained at least 92% through the end of 2016. CX7629-026.

In addition, that Qualcomm could charge its CDMA adder without price discipline is evidence of Qualcomm's market power. *See Rebel Oil Co., Inc. v. Atl. Richfield Co.*, 51 F.3d 1421, 1434 (9th Cir. 1995) (defining market power as the ability "to increase prices above competitive levels, and sustain them for an extended period").

Qualcomm has directly attributed the CDMA adder to Qualcomm's market power. For example, Cristiano Amon (now Qualcomm President) told Sanjay Mehta (now Qualcomm Senior Vice President for Compute Products) and Jim Lederer (later QCT Executive Vice President and General Manager) in a 2008 email that "UMTS prices are now lower than CDMA not to cost or volume but due to competition." CX8257-001.

In another 2008 email, Cristiano Amon proposed to Steve Mollenkopf (now Qualcomm CEO) that Qualcomm charge a 10% price premium on CDMA modem chips as compared to UMTS modem chips simply because Qualcomm could: "There is no justification for the 10

percent, but we think that it resides within the OEM threshold of tolerances." CX5279-003. In the email, Cristiano Amon was explicit that Qualcomm had the market power to charge an even higher premium, but recommended that "Qualcomm will not exercise its CDMA market share dominance to practice uncompetitive prices." CX5279-003.

In 2013, Cristiano Amon again emphasized that Qualcomm prices its CDMA modem chips based on market power, in an email to Derek Aberle (QTL President), Steve Mollenkopf (Qualcomm President), and other Qualcomm executives: "Our price is not based on cost but on value – in reality, cost will allow modest addition in ASP to cover for CDMA RF. This is not a cost discussion. Present strategy is based on monetizing full value of CDMA." CX5393-001. At trial, Cristiano Amon agreed that Qualcomm has "historically priced CDMA based on value rather than cost." Tr. at 482:21-483:15.

Other evidence at trial also shows that Qualcomm's competitors have lacked the ability "to increase their output in the short run" and discipline Qualcomm's prices. *Image Tech. Servs.*, 125 F.3d at 1202. Although a rival modem chip supplier, VIA Telecom ("VIA"), also sold CDMA modem chips, OEMs did not view VIA's chips as competitive. Todd Madderom (Motorola Director of Procurement) testified, "So there was VIA Technologies in the market. They had CDMA IP. We didn't feel it was capable or competitive, and so we were sole sourced to Qualcomm." Madderom Depo. 157:21-23. John Grubbs (BlackBerry Senior Director of Intellectual Property Transactions) testified that there were "[n]ot viable alternatives" to Qualcomm for CDMA modem chips. Grubbs Depo. 214:4-8.

Although VIA lagged in the market, when VIA introduced a CDMA modem chip in a segment where Qualcomm had already introduced a CDMA modem chip, Qualcomm's prices would fall. An April 2009 presentation created by Mark Davis (former VIA Vice President and Chief Technical Officer) stated, "Q and V prices are similar, where comparable products exist," but that "Q's margins are vastly higher in segments where V provides no similar product." CX1770-002. The presentation gave a specific example of how Qualcomm only reduced its prices once VIA introduced a chip: "When first introduced CBP6 to US market, the price of QSC6055 [a

Qualcomm chip] was $18." CX1770-004. Within weeks, "the QSC6055 price was reduced to $10." *Id.*

Qualcomm, too, has viewed itself as the sole viable option for CDMA modem chips. For example, during 2009 internal Qualcomm discussions regarding how to price CDMA modem chips for Apple, Eric Koliander (QCT Vice President, Sales) wrote to Cristiano Amon (now-Qualcomm President): "Truthfully, we should take a harder line with these issues for CDMA since their options are limited." CX6839-002. Cristiano Amon replied: "Can't imagine Via would be an option." CX6839-002. Five years later, James Thompson (Qualcomm CTO) noted to Steve Mollenkopf (Qualcomm President) in a 2014 email that without Qualcomm's CDMA chips, Apple "would lose big parts of North America, Japan and China. That would really hurt them." CX5402-003.

Thus, the evidence shows that Qualcomm's rivals lacked the ability to increase their output in the short term and discipline Qualcomm's CDMA adder. *Rebel Oil Co.*, 51 F.3d at 1434.

The CDMA modem chip market is also characterized by significant barriers to entry. In *Syufy Enterprises*, 903 F.2d 659, the Ninth Circuit held that industries that require "onerous front-end investments that might deter competition from all but the hardiest and most financially secure investors" are characterized by structural entry barriers. *Id.* at 667. Modem chips are such a market. Scott McGregor (former Broadcom CEO) testified at trial that "the economics of being in the cellular baseband business are very sensitive to volume of customers" because of the front-end investments necessary to fund research and development. McGregor Depo. 174:19-21.

As a result, rivals have very slowly entered the CDMA modem chip market. In 2013, MediaTek licensed VIA's CDMA patents. Finbarr Moynihan (MediaTek General Manager of Customer Sales and Business Development) testified that MediaTek was not able to launch a CDMA modem chip until 2015 because of the time necessary to "integrate that into a chipset and produce it." Tr. at 327:13-328:6. Finbarr Moynihan testified that MediaTek did not launch a CDMA modem chip in the United States until "late 2016." *Id.* at 327:17-22.

In 2015, Intel purchased VIA for [redacted][6], according to an Intel presentation. CX1598-004. Aicha Evans (Intel Chief Strategy Officer) testified that because of the significant investment required to develop modem chips, acquiring VIA was the most expedient way to enter the market:

> **Q**: Why did Intel decide to acquire VIA Technologies instead of developing CDMA in-house?
> **A**: Because there was – I mean, you need experience, you need talent, expertise, and at this point basically building it from scratch was never – we were not going to make it.

Id. at 585:24-586:1. MediaTek's and Intel's delayed entry into the CDMA modem chip market show that the "onerous front-end investments" required to develop modem chips pose structural entry barriers. *Syufy Enters.*, 903 F.2d at 667.

The inquiry into entry barriers focuses on "external factors at work precluding entry into the market," rather than the defendant's conduct. *Oahu Gas.*, 828 F.2d at 367. Therefore, although Qualcomm's anticompetitive conduct has imposed additional entry barriers, the Court reserves that discussion for later in this order.

MediaTek's 2015 entry into the CDMA modem chip market exerted downward pressure on Qualcomm's CDMA adder. A 2015 Qualcomm pricing proposal sent to Will Wyatt (QTI [Qualcomm Technologies, Inc., the Qualcomm subsidiary that operates QCT] Vice President, Finance) demonstrates how Qualcomm shifted its prices to respond to MediaTek's entry. Will Wyatt testified that Cristiano Amon (QCT President) also reviewed the pricing proposal. Tr. at 431:10-15. One slide is titled, "Budget Pricing vs Proposed Pricing Moves," and charts Qualcomm's price responses to two MediaTek modem chips. CX7591-011. Will Wyatt agreed at trial that the slide "shows that Qualcomm was proposing to reduce the price of its MSM 8939 chip by $2.21 following MediaTek's introduction of the 6752 chip." Tr. at 433:2-5.

Despite MediaTek's entry, Qualcomm still retains a dominant share of the CDMA modem

[6] To avoid unnecessary redactions, the Court will refer to sealed information once and then not refer to it again unless necessary.

chip market. In a 2018 Qualcomm strategic plan that Steve Mollenkopf (Qualcomm CEO) received, Qualcomm forecast that QCT would maintain a 79% share of CDMA modem chips sold to handset OEMs. CX8190-067.

Against that evidence of market share, barriers to entry, and rivals' inability to increase output, Qualcomm argues that Qualcomm lacked market power because large OEMs "could easily retaliate in the much larger non-CDMA segments against any effort by Qualcomm to exercise monopoly power in the far smaller CDMA segment." QC FOFCOL at 105–06. In *United States v. Archer-Daniels-Midland Co.*, 781 F. Supp. 1400 (S.D. Iowa 1991), the district court made the factual finding that a concentration of powerful buyers of high fructose corn syrup exerted downward pressure on syrup prices. *Id.* at 1416–18. These powerful buyers used various tactics to obtain lower prices from syrup producers, including "[s]winging large volume back and forth among suppliers to show each supplier that it better quote a lower price to obtain and keep large volume sales," and refusing to purchase syrup until producers acceded to the buyers' demands. *Id.* at 1418.

Archer-Daniels-Midland is inapposite. Qualcomm identifies no evidence that OEMs organized to attempt to force down Qualcomm's prices, nor any evidence that any powerful OEMs in fact disciplined Qualcomm's prices. In addition, Qualcomm was able to leverage its CDMA modem chip dominance against the most powerful OEMs. For example, during 2009 internal Qualcomm discussions regarding how to price CDMA modem chips for Apple, Cristiano Amon (now-President of Qualcomm) wrote that Apple had no other CDMA modem chip options: "Can't imagine Via would be an option." CX6839-002.

Even for powerful OEMs, Qualcomm's CDMA modem chip dominance meant that OEMs needed to accede to Qualcomm's royalty demands, or risk the critical harm of being unable to sell handsets. Injung Lee (Licensing Lead at Samsung Intellectual Property Center) testified that Samsung's business could not afford any disruption in CDMA modem chip supply because Samsung purchased 100% of its CDMA modem chips from Qualcomm, and could not sell handsets without those modem chips:

> [G]iven the fact that we were being supplied with 100 percent of our chipsets from Qualcomm, were it such that we were not getting provided with those chipsets as per the normal manner and fashion, then Samsung would not have been able to manufacture mobile phones nor sell the same. And as such, it would have had an untold impact on our business.

Lee Depo. 166:14-20. Todd Madderom (Motorola Director of Procurement) testified, "If we are unable to source the modem, we are unable to ship the handset. It's a direct correlation. No modem supply, no phone supply to our customer." Madderom Depo. 147:25-148:3. Unlike in *Archer-Daniels-Midland*, therefore, an OEM could not refuse to purchase modem chips as leverage against Qualcomm. Nor could an OEM swing large volume back and forth without a viable alternative modem chip supplier.

Qualcomm also argues that the CDMA modem chip market has been characterized by "increasingly competitive conditions." QC FOFCOL at 106. In *Syufy Enterprises*, the Ninth Circuit concluded that because a competitor had "steadily been eating away" at the dominant corporation's market share and because the government *conceded* the lack of entry barriers, a defendant's large market share alone did not prove monopoly power. 903 F.2d at 666–67. By contrast, modem chip rivals—as will be discussed later—must fund expensive research and development or acquire other companies to gain a foothold in the CDMA modem chip market, and Qualcomm's practices impose further entry barriers. Further, no rival has "steadily been eating away" at Qualcomm's market share, as Qualcomm enjoyed ten years of almost 100% market share before MediaTek finally commercialized a CDMA multimode chip in 2015. As stated above, despite MediaTek's entry, Qualcomm still retains a dominant share of the CDMA modem chip market. In a 2018 Qualcomm strategic plan that Steve Mollenkopf (Qualcomm CEO) received, Qualcomm forecast that QCT would maintain a 79% share of CDMA modem chips sold to handset OEMs. CX8190-067.

Therefore, because Qualcomm has owned a dominant share of the CDMA modem chip market, there are significant barriers to entry, and competitors have lacked the ability to discipline Qualcomm's prices, the Court concludes that Qualcomm has possessed monopoly power in the

CDMA modem chip market. *Image Tech. Servs.*, 125 F.3d at 1202.

C. Premium LTE Modem Chip Market

The FTC contends that from 2011 to 2016, Qualcomm possessed monopoly power in the global market for premium LTE modem chips, which the FTC defines as "LTE-compliant handsets used in premium handsets." *Id.* at 7. Cristiano Amon (Qualcomm President) testified that LTE modem chips are those modem chips compatible with LTE, a 4G cellular standard. Tr. at 479:3-5. The Court first defines the premium LTE modem chip market and then explains how Qualcomm possessed monopoly power in the premium LTE modem chip market.

1. Premium LTE Modem Chip Market Definition

As an initial matter, the geographic boundaries of the premium LTE modem chip market are worldwide, a conclusion that Qualcomm does not contest. An antitrust market is geographically bounded by "where sellers operate and where purchasers can predictably turn for supplies." *Kolon Indus.*, 637 F.3d at 439.

Defining the relevant product market "rests on a determination of available substitutes." *Microsoft*, 253 F.3d at 54. Industry practice also informs whether a product submarket is distinct. *See Brown Shoe Co.*, 370 U.S. at 325 (explaining that practical indicia of an antitrust product market include "industry or public recognition" of the market).

The evidence shows that Qualcomm and other cellular industry participants view the premium LTE modem chip market as a distinct submarket.

Qualcomm categorizes modem chips into different "tiers" of the market. James Thompson (Qualcomm CTO), who leads Qualcomm's modem chip engineering, testified, "So we have a tier of products, so we do what we would call premium tier, and then we do a number of tiers all the way down to what we call the entry level." Tr. at 1363:16-18. Thus, in a 2018 Qualcomm strategic plan slide deck that Steve Mollenkopf (Qualcomm CEO) and Cristiano Amon (Qualcomm President) received, Qualcomm organized modem chips into tiers, including "discrete modem" (a thin modem chip), "premium," "high," and "mid/low." CX8190-261. The same strategic plan identifies Qualcomm strategies and market shares specific to all tiers, including the

"mobile premium tier." CX8190-260. Cristiano Amon (Qualcomm President) testified that the Snapdragon 800 is "our premium tier" modem chip series. Tr. at 505:16-18.

OEMs concurred that premium LTE modem chips are a distinct segment. Tony Blevins (Apple Vice President of Procurement) testified that premium modem chips are distinct from lower tier modem chips in terms of features like speed, uplink and downlink performance, quality, miniaturization, and power consumption. Tr. at 673:3-17. Blevins testified that because LTE is the latest cellular standard, any premium modem chip must support LTE. *Id.* at 672:23-24.

Will Wyatt (QTI Vice President, Finance) agreed that "premium tier chipsets typically have a higher product cost and more functionality." Tr. at 434:5-7. QCT's 2016 strategic plan, which Cristiano Amon (QCT President) and Derek Aberle (Qualcomm President) received, shows that Qualcomm proposed to charge, on average, twice as much for a premium LTE modem chip ([redacted]) as a modem chip released the same quarter in the "low-high" tiers ([redacted]). CX5551-045. That same strategic plan also shows that Qualcomm earns its highest margins—ranging from 47-49%—on premium LTE modem chips. CX5551-013.

Qualcomm documents also show that OEMs sell cellular handsets in tiers that correspond to the modem chip tier. In a 2016 QCT strategic plan sent to Cristiano Amon (QCT President), Qualcomm defined handsets priced at $400 or more as premium tier, between $250 and $400 as high tier, between $110 and $250 as mid tier, and below $100 as low or entry tier. CX8256-112. Cristiano Amon testified that those handset definitions correspond to the modem chip tier:

> **Q**: It's accurate, sir, that in 2016 Qualcomm continued to view premium tier chips as associated with handset prices of $400 and up; is that right?
> **A**: In – that's what this slide is saying, that is correct.

Tr. at 506:20-23. The relevant slide in the 2016 QCT strategic plan that Cristiano Amon received shows that Qualcomm plans specific modem chip features for handsets in the premium tier, as distinct from those features planned for modem chips in lower tiers. CX8256-112.

Product plans in Qualcomm documents also identify specific Qualcomm modem chip models as designed for premium handsets. For example, one slide in the 2016 QCT strategic plan that Cristiano Amon (QCT President) and Derek Aberle (Qualcomm President) received includes

a chart with a column for "Handset ASP." CX5551-007. "ASP" means average selling price. That column includes rows for "MDM" (thin modem), and the handset prices $400+, $250-$400, $125-$250, and <$100. *Id.* In the fields to the right of the $400+ row, Qualcomm lists planned modem chip releases for each year. *Id.* Qualcomm released the MSM 8996 modem chip in 2015 and planned to release the MSM 8998 in 2016. *Id.* For 2018, Qualcomm lists no model number, but simply "Premium 18" and planned release dates. *Id.* At trial, Dr. James Thompson (Qualcomm CTO) also referred to a Qualcomm premium modem chip designed for Samsung's line of "premium tier products." Tr. at 1375:15-1376:21. Therefore, Qualcomm's own documents consistently identify a distinct market for LTE-compliant modem chips sold for premium handsets.

Despite Qualcomm's own documents to the contrary, Will Wyatt (QTI Vice President, Finance) testified that some OEMs purchase premium LTE modem chips for use in non-premium handsets: "Xiaomi [an OEM] uses our Snapdragon 800 tier chip in a device that they'll price as low as 2,000 RMB, so that's roughly $300 U.S." Tr. at 451:22-452:2. Will Wyatt also testified that the OEM VIVO "will use our Snapdragon 600 series, and they will sell that in a device that is . . . in the neighborhood of 4- to 500 U.S. dollars." *Id.* at 452:6-12. However, Qualcomm offered no documents to support Will Wyatt's testimony, not even Qualcomm's sales documents to Xiaomi and VIVO. Wyatt's unsupported testimony is contradicted by Qualcomm's own documents, which clearly demonstrate that as a general matter, premium LTE modem chips are those modem chips sold for use in premium tier handsets.

In addition, courts have concluded that "premium" products may constitute distinct antitrust product markets. In *F.T.C. v. Whole Foods Market, Inc.*, 548 F.3d 1029 (D.C. Cir. 2008), the FTC sought a preliminary injunction and contended that two merging grocery store chains, Whole Foods and Wild Oats, were part of a submarket of "premium, natural, and organic supermarkets." *Id.* at 1032. The FTC proffered undisputed evidence that Whole Foods and Wild Oats "provide higher levels of customer service than conventional supermarkets, a 'unique environment,' and a particular focus on the 'core values'" that certain customers espoused. *Id.* at

1039. Whole Foods and Wild Oats also sold more natural and organic products than conventional supermarkets as a proportion of inventory. *Id.* Finally, when a conventional grocery store opened near a Wild Oats, Wild Oats prices stayed static, but Wild Oats dropped its prices when a Whole Foods opened near a Wild Oats. *Id.* at 1040.

On that evidence, the D.C. Circuit concluded that the FTC could likely show that premium, natural, and organic supermarkets constitute a relevant antitrust submarket. *Id.* The D.C. Circuit concluded that premium, natural, and organic supermarkets "serve a core consumer base." *Id.* Whole Foods' own documents "suggested that if a Wild Oats near a Whole Foods were to close, the majority (in some cases nearly all) of its customers would switch to the Whole Foods rather than to conventional submarkets." *Id.* Therefore, the D.C. Circuit concluded that as a matter of law, "in some situations core consumers, demanding exclusively a particular product or package of products, distinguish a submarket." *Id.* at 1041.

The district court's decision in *United States v. Gillette Co.*, 828 F. Supp. 78 (D.D.C. 1993), is also on point. In *Gillette*, the plaintiff argued that there was a separate antitrust product market for "premium" fountain pens priced from $50 to $400. *Id.* The court concluded that premium fountain pens contained unique features, such that premium fountain pens "afford their users (as well as those who merely put them in their breast pockets) image, prestige, and status." *Id.* at 82. The court also identified industry recognition of a distinct premium fountain pen submarket, as well as evidence that if a retailer increased the price of a premium fountain pen, "consumers will nonetheless purchase the now-costlier pen rather than substitute a less expensive, less prestigious model." *Id.* Above $400, pens "become mere collectors items or 'jewelry' pieces," such that a consumer would not substitute a $400-and-up pen for a premium fountain pen. *Id.* Therefore, the *Gillette* court concluded that premium fountain pens priced between $50 and $400 were not reasonably interchangeable with pens priced below or above that range, and held that premium fountain pens constituted an appropriate antitrust product market. *Id.* at 83.

Here, the premium LTE modem chip market is an appropriate antitrust submarket because OEMs producing premium handsets—the core consumers, as in *Whole Foods*—require premium

LTE modem chips. Tony Blevins (Apple Vice President of Procurement) testified that because Apple produces only premium handsets, Apple buys only premium LTE modem chips: "We focus exclusively on premium chips. Our perception is that the iPhone is a premium smartphone, so therefore all of its components need to be the best that we can possibly design or acquire." Tr. at 674:24-675:2.

As in *Gillette*, even if the price of premium LTE modem chips goes up, a non-premium substitute is not a reasonable substitute. Todd Madderom (Motorola Director of Procurement) testified that Motorola requires a premium LTE modem chip for its premium handsets:

> **Q**: And how would it impact Motorola's business if it used a nonpremium-tier cellular modem in a premium-tier handset?
> **A**: We've never considered that because I don't think that's a viable approach. I think that equates to not being able to sell in a product.

Madderom Depo. 140:13-18.

Finbarr Moynihan (MediaTek General Manager of Customer Sales and Business Development) made the same points when asked whether an OEM could substitute a non-premium modem chip for a premium modem chip: "So generally those things are not negotiable. They're looking for certain feature sets in those price points at those tiers. So generally not substitutable." Tr. at 325:12-23.

Therefore, because a non-premium LTE modem chip is not an "available substitute" for a premium LTE modem chip, the Court concludes that the premium LTE modem chip market is a relevant antitrust market.

2. Qualcomm Premium LTE Modem Chip Market Share and Market Power

To show monopoly power, the FTC must demonstrate that Qualcomm owned a dominant share of the market and "show that there are significant barriers to entry and show that existing competitors lack the capacity to increase their output in the short run." *Image Tech. Servs.*, 125 F.3d at 1202. The evidence shows that Qualcomm has maintained a large share of the premium LTE modem chip market, that existing competitors have been unable to quickly increase their output, and that there are structural barriers to entering the premium LTE modem chip market.

At trial, Cristiano Amon (Qualcomm President) testified that Qualcomm was the first to supply premium LTE modem chips and that Qualcomm has been "first to market with every transition of LTE." Tr. at 479:3-14. Since then, Qualcomm has maintained a large share of the premium LTE modem chip market. For example, a 2016 QCT strategic plan that Cristiano Amon and Derek Aberle (then Qualcomm President) received states that Qualcomm held an 89% share of the premium LTE modem chip market in 2014 and an 85% share of the market in 2015. CX5551-010. In the same 2016 QCT strategic plan, Qualcomm projected that it would retain a 77% share in 2016 and a 64% share in 2017. CX5551-010.

Qualcomm documents also show that Qualcomm has faced little competition in the premium LTE modem chip market. A presentation for Qualcomm's Board of Directors in July 2017, which Steve Mollenkopf (Qualcomm CEO) received, includes a slide on the "Mobile competitive environment" that compares Qualcomm's position to those of other rival modem chip suppliers. CX8191-089. In the rows that indicate suppliers' offerings in the premium LTE modem chip tier, Qualcomm is the only external supplier of premium LTE SoC modem chips. *Id.* Intel supplies only premium LTE thin modems. *Id.* MediaTek and Spreadtrum have no premium tier offerings, and Spreadtrum has only low tier offerings. *Id.* Although Exynos, Samsung's modem chip division (also known as Samsung LSI), has a premium LTE modem chip, Finbarr Moynihan (MediaTek General Manager of Customer Sales and Business Development) testified that MediaTek does not "tend to see Samsung LSI as a supplier much outside of Samsung's own phones." Tr. at 327:14-15. Similarly, Alex Rogers (QTL President) testified that Exynos primarily supplies modem chips to its parent Samsung. Tr. at 1989:5-6.

OEM testimony confirmed that Qualcomm held market power in LTE. John Grubbs (BlackBerry Senior Director of Intellectual Property Transactions) testified that in 2011, "the other chipset manufacturers were at least two years behind on LTE . . . there would not have been any other viable sources for LTE targeting the early 2013 time frame for release." Grubbs Depo. 215:12-216:1. Similarly, Ira Blumberg (Lenovo Vice President of Intellectual Property) testified that without Qualcomm's premium LTE modem chips, Lenovo's phones would not be viable "at

least with respect to the high end of the market." Blumberg Depo. 71:19-72:8.

Qualcomm's ability to charge monopoly prices on premium LTE modem chips over an extended period also shows that competitors were not quickly able to increase output. *See Rebel Oil*, 51 F.3d at 1434 (defining market power as the ability "to increase prices above competitive levels, and sustain them for an extended period"). For example, in November 2013, Cristiano Amon (QCT Co-President) informed Apple that "LTE was not a commodity and would therefore have to be priced 'upon value – not cost.'" CX0597-001. Amon similarly alluded to value over cost as to CDMA prices, and specifically identified competition rather than cost or volume as the difference in CDMA over UMTS prices: "UMTS prices are now lower than CDMA not to cost or volume but due to competition." CX8257-001. Therefore, the inference is that Qualcomm could also price its LTE modem chips higher due to a lack of competition.

Like the market for CDMA modem chips, the market for premium LTE modem chips is characterized by significant structural barriers to entry. *See Syufy Enters.*, 903 F.2d at 667 (holding that industries that require "onerous front-end investments that might deter competition from all but the hardiest and most financially secure investors" are characterized by structural entry barriers).

Developing premium LTE modem chips requires even more investment in research and development because premium modem chips contain the most advanced features, according to Finbarr Moynihan (MediaTek General Manager of Corporate Sales and Business Development): "You'd certainly like to see that the higher tiers generate higher profit, higher margins, yeah. It takes more R&D to develop those products." Tr. at 378:18-20. Likewise, Aicha Evans (Intel Chief Strategy Officer) testified that when Intel purchased Infineon in 2011 and aimed to develop a premium LTE modem chip from scratch, Intel had to invest heavily: "Lots of money, billions of dollars, and an army of engineers worldwide." Tr. at 565:4-5.

As such, Finbarr Moynihan testified that MediaTek has not been able to develop into a competitor in premium LTE modem chips: "We haven't really penetrated ever what I would call the premium tiers in the market, the high tiers, the highest tiers of the market." Tr. at 324:25-

325:2. In fact, Moynihan testified that because research and development for premium LTE modem chips is so expensive, MediaTek has [redacted] and "decided to focus our limited R&D in other places." *Id.* at 378:2-3.

Therefore, because Qualcomm has owned a dominant share of the premium LTE modem chip market, there are significant barriers to entry, and competitors have lacked the ability to discipline Qualcomm's prices, the Court concludes that Qualcomm has possessed monopoly power in the premium LTE modem chip market. *Image Tech. Servs.*, 125 F.3d at 1202. The Court next discusses Qualcomm's anticompetitive conduct and harm.

V. ANTICOMPETITIVE CONDUCT AND HARM

Under the rule of reason, the court "weighs legitimate justifications for a restraint against any anticompetitive effects." *Paladin Assocs., Inc. v. Mont. Power Co.*, 328 F.3d 1145, 1156 (9th Cir. 2003). In this three-part, burden-shifting analysis, the FTC has the initial burden to show that Qualcomm's conduct "has a substantial anticompetitive effect that harms consumers in the relevant market." *Am. Express*, 138 S. Ct. at 2284. A plaintiff may prove anticompetitive effects either "directly or indirectly." *Am. Express*, 138 S. Ct. at 2284. Direct evidence includes "proof of actual detrimental effects" on competition, including "reduced output, increased prices, or decreased quality in the relevant market." *Id.* (quoting *F.T.C. v. Indiana Fed'n of Dentists*, 476 U.S. 447, 460 (1986)). By contrast, indirect evidence includes "proof of market power plus some evidence that the challenged restraint harms competition." *Id.* The FTC has satisfied its burden to prove market power, as discussed above, and thus the question is whether Qualcomm's actions harmed competition in the relevant markets.

A. Legal Standard

As the D.C. Circuit observed in *Microsoft*, "[w]hether any particular act of a monopolist is exclusionary, rather than merely a form of vigorous competition, can be difficult to discern: the means of illicit exclusion, like the means of legitimate competition, are myriad." 253 F.3d at 58. It is not enough for conduct to harm a competitor. *Id.* Nor is maintenance of monopoly power alone sufficient, if that advantage is "a consequence of a superior product, business acumen, or

historic accident." *Grinnell*, 384 U.S. at 571. As the United States Supreme Court has explained, "[t]he opportunity to charge monopoly prices—at least for a short period—is what attracts 'business acumen' in the first place; it induces risk taking that produces innovation and economic growth." *Verizon Commc'ns Inc. v. Law Offices of Curtis V. Trinko, LLP*, 540 U.S. 398, 407 (2004).

Rather, anticompetitive conduct is conduct that "harm[s] the competitive *process* and thereby harm[s] consumers." *Microsoft*, 253 F.3d at 58 (emphasis in original). Put another way, "[a]nticompetitive conduct is behavior that tends to impair the opportunities of rivals and either does not further competition on the merits or does so in an unnecessarily restrictive way." *Cascade Health Sols. v. PeaceHealth*, 515 F.3d 883, 894 (9th Cir. 2008); *see also Spectrum Sports*, 506 U.S. at 458 (holding that the Sherman Act "directs itself . . . against conduct which unfairly tends to destroy competition itself").

"Although output reductions are one common kind of anticompetitive effect in antitrust cases, a 'reduction in output is not the *only* measure of anticompetitive effect." *O'Bannon v. Nat'l Collegiate Athletic Ass'n*, 802 F.3d 1049, 1070 (9th Cir. 2015) (quoting Areeda & Hovenkamp ¶ 1503b(1) (emphasis in original). "Anticompetitive conduct may take a variety of forms." *Broadcom Corp. v. Qualcomm Inc.*, 501 F.3d 297, 308 (3d Cir. 2007). Further, a court should consider the combined anticompetitive effects of a defendant's challenged actions. *City of Anaheim v. S. Cal. Edison Co.*, 955 F.2d 1373, 1378 (9th Cir. 1992) (holding that "it would not be proper to focus on specific individual acts of an accused monopolist while refusing to consider their overall combined effect"). Finally, "[t]he test is not total foreclosure, but whether the challenged practices bar a substantial number of rivals or severely restrict the market's ambit." *United States v. Dentsply Int'l, Inc.*, 399 F.3d 181, 191 (3d Cir. 2005).

Qualcomm argues that the FTC must also show "a causal link between the challenged conduct and the actual, significant competitive harm." QC Pretrial Brief at 13. However, the D.C. Circuit in *Microsoft* rejected a similar contention that "plaintiffs must present direct proof that a defendant's continued monopoly power is precisely attributable to its anticompetitive conduct."

253 F.3d at 79. A plaintiff need not "reconstruct the hypothetical marketplace absent a defendant's anticompetitive conduct." *Id.* Instead, where a government agency seeks injunctive relief—as here—courts should "infer 'causation' from the fact that a defendant has engaged in anticompetitive conduct that 'reasonably appear[s] capable of making a significant contribution to . . . maintaining monopoly power." *Id.* (alteration in original) (quoting 3 Phillip E. Areeda & Herbert Hovenkamp, Antitrust Law ¶ 651c, at 78 (1996 ed.)). A court "may infer causation when exclusionary conduct is aimed at producers of nascent competitive [products] as well as when it is aimed at producers of established substitutes." *Id.* Therefore, the Court may infer causation where a defendant has maintained monopoly power and the defendant's anticompetitive conduct "reasonably appears capable" of maintaining monopoly power.

Although the Court's focus is "upon the effect of [the defendant's] conduct, not upon the intent behind it," a monopolist's intent *is* relevant to "the likely effect of the monopolist's conduct." *Id.*; *see also Aspen Skiing Co. v. Aspen Highland Skiing Corp.*, 472 U.S. 585, 602 (1985) (holding that intent is relevant to the question of anticompetitive effect because "no monopolist monopolizes unconscious of what he is doing"); *Chicago Bd. of Trade v. United States*, 246 U.S. 231, 238 (1918) ("[K]nowledge of intent may help the court to interpret facts and to predict consequences.").

If the FTC meets its burden to show that Qualcomm's conduct has anticompetitive effects, the burden then shifts to Qualcomm to show that its conduct has "procompetitive justifications." *Microsoft*, 253 F.3d at 58. Courts have defined a procompetitive justification as "a nonpretextual claim that [the defendant's] conduct is indeed a form of competition on the merits because it involves, for example, greater efficiency or enhanced consumer appeal." *Id.*; *see also Kodak*, 504 U.S. at 483 (holding that a defendant must show "valid business reasons" for its actions). A defendant does not meet its burden with a purported procompetitive justification that is merely pretextual. *Kodak*, 504 U.S. at 484; *see also Bhan*, 929 F.2d at 1413 (holding that the defendant "must offer evidence of pro-competitive *effects*") (emphasis added). Further, "[i]ntellectual property rights do not confer a privilege to violate the antitrust laws." *Microsoft*, 253 F.3d at 63

(quoting *In re Indep. Serv. Orgs. Antitrust Litig.*, 203 F.3d 1322, 1325 (Fed. Cir. 2000)).

If Qualcomm meets its burden to show procompetitive justifications for its conduct and the FTC fails to rebut the justification, the burden returns to the FTC to "show that the anticompetitive harm of the conduct outweighs the procompetitive benefit." *Microsoft*, 253 F.3d at 59.

Below, the Court describes in detail Qualcomm's anticompetitive conduct and the resulting harm to competition.

B. Anticompetitive Conduct Against OEMs and Resulting Harm

First, Qualcomm has used its monopoly power in the CDMA and premium LTE modem chip markets to engage in a wide variety of anticompetitive acts against OEMs.

In a practice that Qualcomm concedes is unique within Qualcomm and unique in the industry, Qualcomm refuses to sell modem chips to an OEM until the OEM signs a separate patent license agreement. Thus, Qualcomm refuses to sell an OEM modem chips exhaustively. Under the doctrine of patent exhaustion, "the initial authorized sale of a patented item terminates all patent rights to that item." *Quanta Comp., Inc. v. LG Elecs., Inc.*, 553 U.S. 617, 625 (2008). Thus, patent exhaustion provides that when a consumer purchases a television, the consumer does not have to separately sign a license and pay royalties for any patents practiced by the television.

To avoid exhaustion and to enforce Qualcomm's practice of requiring a separate patent license before selling modem chips, Qualcomm wields its chip monopoly power to coerce OEMs to sign patent license agreements. Specifically, Qualcomm threatens to withhold OEMs' chip supply until OEMs sign patent license agreements on Qualcomm's preferred terms. In some cases, Qualcomm has even cut off OEMs' chip supply, although the threat of cutting off chip supply has been more than sufficient to coerce OEMs into signing Qualcomm's patent license agreements and avoiding the devastating loss of chip supply. Qualcomm has also used the "carrot" of chip incentive funds, which reduce the price of Qualcomm's chips and induce OEMs to agree to Qualcomm's licensing terms. QTL—Qualcomm's licensing division—funds these agreements even though the incentives accrue on OEMs' purchases of QCT chips. These chip incentive funds often function as de facto exclusive deals that foreclose OEMs from purchasing

modem chips from Qualcomm's rivals.

In addition, Qualcomm has refused to even provide samples of Qualcomm modem chips, withheld technical support, and delayed delivery of software or threatened to require the return of software until OEMs sign Qualcomm's patent license agreements. In 2018, Qualcomm paid to extinguish Samsung's antitrust claims and to silence Samsung. Qualcomm patent license agreements also include unusual provisions that require OEMs to cross-license their patents—often royalty-free—to QCT, Qualcomm's modem chip division, in exchange for the rights to QTL's patents. Despite this host of unique arrangements, Qualcomm refuses to provide OEMs lists of Qualcomm's patents or patent claim charts during license negotiations.

Qualcomm's practice of refusing to sell modem chips until an OEM signs a patent license agreement, and Qualcomm's associated threats, generate and sustain Qualcomm's unreasonably high royalty rates. Because Qualcomm receives royalties on any handset sale, even when that handset contains a rival's modem chip, Qualcomm's unreasonably high royalty rates impose an artificial and anticompetitive surcharge on the price of rivals' modem chips. At times, Qualcomm has even charged OEMs higher royalty rates when OEMs purchase rivals' chips than when OEMs purchase Qualcomm's chips, which further harms rivals.

To provide a coherent narrative, the Court organizes its discussion of Qualcomm's anticompetitive practices in patent license negotiations around Qualcomm's conduct toward the following OEMs: (1) LGE, (2) Sony, (3) Samsung, (4) Huawei, (5) Motorola, (6) Lenovo, (7) BlackBerry, (8) Curitel, (9) BenQ, (10) Apple, (11) VIVO, (12) Wistron, (13) Pegatron, (14) ZTE, (15) Nokia, and (16) smaller Chinese OEMs.

1. LG Electronics ("LGE")

Qualcomm engaged in anticompetitive conduct by cutting off LGE's chip supply, threatening to withdraw technical support, threatening to require the return of software, charging higher patent royalty rates when LGE used a rival's instead of Qualcomm's chip, giving LGE chip incentive funds if LGE purchased at least 85% of its chips from Qualcomm, and giving rebates on the price of Qualcomm's chips.

Hwi-Jae Cho (Director of LGE Intellectual Property Center) testified that Qualcomm's requirement that an OEM sign a separate patent license agreement before the OEM can purchase a component is unique in the industry:

> **Q**: Have other suppliers of components to LGE required LGE to execute a separate license agreement in order to obtain access to their components?
> **A**: No.

Cho Depo. ¶ 15.

On August 31, 1993, Qualcomm entered an Infrastructure and Subscriber Unit License and Technical Assistance Agreement ("1993 CDMA SULA") with Goldstar Information & Communications Ltd., an LGE corporate predecessor. ECF No. 1326 at 6. According to Hwi-Jae Cho (Director of LGE Intellectual Property Center), LGE paid Qualcomm a 5.75% running royalty on any LGE handsets that LGE sold outside of Korea under the CDMA SULA. Cho Depo ¶ 38h. Qualcomm and LG Information & Communications, Ltd., an LGE corporate predecessor, entered into an Amendment to Subscriber Unit License and Technical Assistance Agreement, with an effective date of March 17, 1998. *Id.* Qualcomm and LGE entered into an Amendment to Infrastructure and Subscriber Unit License and Technical Assistance Agreement, with an effective date of March 15, 2000. *Id.*

On September 1, 2000, QCTAP (QCT's Asia Pacific division) and LGE entered the ASICS Supply Agreement, which governs LGE's purchase of CDMA modem chips. CX6803-001. Hwi-Jae Cho (Director of LGE Intellectual Property Center) agreed that the Supply Agreement "prohibit[s] LGE from using Qualcomm baseband processors in unlicensed handsets." Cho Depo. ¶ 14d. The Supply Agreement also provides that Qualcomm can terminate the Supply Agreement if LGE defaults on its royalty obligations: "QUALCOMM may terminate this Agreement if Buyer is in Default under the License and such default is not cured within the cure period specified therein." CX6803-007.

a. <u>2004 Chip Supply Threats and Cutoff</u>

In December 2003, Qualcomm initiated arbitration against LGE and alleged that LGE had breached LGE's 1993 CDMA SULA by "[f]ailing to report sales of WCDMA products for the

purpose of paying royalties to QUALCOMM as required by Section 5." CX8117-007. According to Hwi-Jae Cho (Director of LGE Intellectual Property Center), LGE argued in opposition that "WCDMA arose from a different technology, GSM, which is different technology from CDMA," and that "in contrast to CDMA that was developed mainly by Qualcomm, many companies like Nokia, Ericsson, and NTT Docomo, among others, participated to develop WCDMA." Cho Depo. ¶ 38b-d.

Hwi-Jae Cho testified that LGE also argued in the arbitration that Qualcomm's 5.75% royalty rate for its small share of WCDMA technology would make the aggregate royalty for the entire WCDMA patent portfolio 25% of the phone price, which would make it difficult to make any profit on phones. Companies in the industry thought that approximately 5% of the phone price was the proper cumulative royalty rate for all WCDMA SEPs, not just Qualcomm's share of SEPs. Specifically, Hwi-Jae Cho testified:

> If Qualcomm attempted to assert a 5.75% royalty for its small share of WCDMA technology alone, the aggregate royalty for the entire WCDMA patent portfolio would be more than 25% of handset price, which was far more than what LGE or the industry thought at that time. If the royalty for WCDMA alone was more than 25% of the phone price, it would be impossible to make any profit by selling handsets. Companies in the industry thought that approximately 5% of the phone price was the proper cumulative royalty rate for the entire WCDMA standard essential patents.

Cho Depo. ¶ 38h.

To resolve the patent license dispute, Qualcomm threatened to terminate the Supply Agreement and cut off QCT's supply of modem chips to LGE. On May 6, 2004, Louis Lupin (Qualcomm General Counsel) asserted to Mun-hwa Park (LGE CEO) that "even under LGE's purported interpretation of its license agreements with QUALCOMM, LGE would be in breach of the Supply Agreement" because LGE had not paid any royalties on sales of WCDMA handsets. CX6774-008.

Hwi-Jae Cho (Director of LGE Intellectual Property Center) testified that LGE interpreted Qualcomm's actions as a threat to LGE's modem chip supply: "We thought Qualcomm would use whatever leverage it had because Qualcomm often mentioned termination of the Supply

Agreement." Cho Depo. ¶ 61.

On May 26, 2004, Louis Lupin (Qualcomm General Counsel) threatened to cut off chip supply in a letter to Mun-hwa Park (LGE CEO): "[P]lease be advised that QUALCOMM, at this time, has terminated only the MOU but reserves the right to terminate the Supply Agreement as well." CX6774-017. Hwi-Jae Cho testified that any loss of chip supply would be devasting to LGE's handset business: "All of LGE's CDMA products used Qualcomm's baseband chipsets and LGE also started to use Qualcomm's WCDMA baseband chips. Therefore, there would be significant negative impact to LGE's business if Qualcomm had terminated the Supply Agreement." Cho Depo. ¶ 67.

Dr. Irwin Jacobs (Qualcomm Co-Founder and CEO) then became involved in the chip supply threats. On June 16, 2004, Irwin Jacobs wrote a letter to Ssang Su Kim (LGE Vice Chairman) in which he stated that unless LGE withdrew its arbitration claims and paid past WCDMA royalties, Qualcomm would stop accepting LGE purchase orders for chips, cease all shipments of chips, withdraw all technical support, and require LGE to return all chip software. Specifically, Irwin Jacobs stated:

1) QUALCOMM will stop accepting LGE purchase orders for WCDMA ASICs;
2) QUALCOMM will cease all shipments of WCDMA ASICs to LGE, beginning with the next-scheduled shipment of 500 units of the MSM 6250 for June 30, and 6000 units of the MSM 6200 scheduled to ship during the first week in July;
3) QUALCOMM will withdraw all of its substantial WCDMA engineering resources currently providing technical support to LGE and reassign those resources to our strategic ASIC customers, all of whom are honoring their supply contracts and licensing obligation; and
4) QUALCOMM will require that LGE return to QUALCOMM all versions and derivations of our WCDMA ASIC software.

CX6814-022. At trial, Irwin Jacobs testified that Qualcomm then cut off LGE's chip supply: "We did not ship to them the chips that were specified here, the 500 and then 6,000 chips as far as I know at this time." Tr. at 1293:25-1294:2.

In early July, shortly after the CDMA chip supply threats and WCDMA chip supply cutoff, LGE and Qualcomm reached a set of agreements to resolve their dispute. On July 11, 2004,

Qualcomm and LGE entered into (1) a Settlement and Release with Qualcomm, JX0025; (2) an Amendment to Infrastructure and Subscriber Unit License and Technical Assistance Agreement, JX0026 ("2004 SULA Amendment); and (3) a Chipset Purchase and Incentive Agreement ("Chipset Agreement"). CX6809. Hwi-Jae Cho (Director of LGE Intellectual Property Center) testified that "[w]hen Qualcomm threatened to terminate the Supply Agreement, LGE had no option but to agree to whatever Qualcomm demanded. LGE's top management did not want to take the risk of endangering LGE's mobile business." Cho Depo. ¶ 91.

Under the 2004 SULA Amendment, LGE paid Qualcomm a 5% running royalty on handsets containing Qualcomm modem chips and a 5.75% running royalty on handsets containing non-Qualcomm modem chips. JX0026-005. Although Hwi-Jae Cho testified that LGE's "assessment of the fairness and reasonability" of Qualcomm's royalty rates had not changed, "LGE accepted such terms because LGE had little chance to evaluate Qualcomm's WCDMA patent portfolio and, most importantly, LGE had to consider the business risks" of a chip supply cutoff. Cho Depo. ¶ 91. Hwi-Jae Cho testified, "During that time period, almost all of the profits of LGE's mobile business were from its CDMA handsets and Qualcomm was the only CDMA chipset supplier. Therefore, if Qualcomm were to suspend the supply of baseband processors, LGE would not have been able to develop or manufacture any CDMA handset products." *Id.* at ¶ 105.

In the July 2004 Chipset Agreement, Qualcomm offered LGE chip incentive funds as another carrot to purchase Qualcomm chips. Qualcomm rebated LGE 3-5% of the purchase price on each Qualcomm modem chip that LGE purchased, provided that LGE purchased at least 85% of its CDMA modem chips from Qualcomm. CX6809-004. This agreement effectively resulted in exclusivity.

LGE has argued that the handset is an unfair royalty base for Qualcomm's royalty rates. Hwi-Jae Cho (Director of LGE Intellectual Property Center) testified that during the 2004 negotiations LGE argued that Qualcomm should deduct the cost of camera modules and mobile television from the royalty base because those features are independent of Qualcomm's SEPs:

"LGE argued to deduct the cost of camera modules and DMB (which is the Korean version of mobile TV) modules because, at a minimum, those two features were functionally independent from Qualcomm's standard essential patents at that time." Cho Depo. ¶ 101. Qualcomm rejected LGE's argument. *Id.*

b. 2007 Chip Incentive Funds

Qualcomm and LGE entered another set of patent license and chip incentive agreements in 2007. On May 14, 2007, Qualcomm and LGE signed an Amendment to the Infrastructure and Subscriber Unit License and Technical Assistance Agreement ("2007 CDMA SULA"), effective January 1, 2007. ECF No. 1326 at 7. On May 14, 2007, Qualcomm and LGE signed a contract titled "Agreement," effective January 1, 2007. ECF No. 1326 at 7.

The two agreements lowered LGE's royalty rate on non-Qualcomm chips, according to a January 2007 email that Steve Altman (Qualcomm President) sent to Irwin Jacobs (Qualcomm Co-Founder and former CEO): "They currently pay 5% when they use our chip and 5.75% when they don't. We have agreed to take their rate to 5% regardless of whose chip they use." CX6722-001. Thus, from 2004 to 2007, LGE was paying a higher royalty rate on handsets containing rivals' modem chips than on those containing Qualcomm modem chips.

Qualcomm also offered LGE additional chip incentives. According to a May 2007 Qualcomm accounting memo, Qualcomm offered LGE a "Strategic Fund," under which Qualcomm rebated LGE 3-4% of the purchase price on each Qualcomm CDMA or WCDMA modem chip that LGE purchased from 2007 to 2014. CX7556-002.

Importantly, the May 2007 Qualcomm accounting memo concluded that although the chip incentives were calculated on LGE's purchase of QCT modem chips, QTL (Qualcomm's licensing division) received the primary benefit because LGE signed a favorable patent license agreement, and QTL would thus provide the rebate funds: "QTL is deemed to be the primary beneficiary of the elements of these agreements, including the expected royalty streams resulting from QC's first OFDM subscriber device license with a major handset manufacturer. Therefore, the amounts under these agreements will be recorded in the QTL business unit." CX7556-005. OFDMA

("orthogonal frequency division multiple access") is a technology used in the LTE standard. ECF No. 1326 at 3.

c. 2016 Chip Incentive Funds

In 2016, Qualcomm again used chip incentive funds to lower LGE's effective royalty rates on Qualcomm chips only. On or about December 11, 2015, LGE filed a Request for Arbitration with the International Chamber of Commerce in a matter captioned *LG Electronics Inc. v. Qualcomm Inc.* ECF No. 1326 at 8. According to Hwi-Jae Cho (Director of LGE Intellectual Property Center), LGE argued in the arbitration that Qualcomm had not reduced its royalty rate even though Qualcomm's patents had become fully paid up under LGE's existing SULA: "[T]here was no royalty rate adjustment even after the fully paid up rights matured." Cho Depo. ¶ 195. Under a fully paid up agreement, the licensee's royalty obligations may expire after a certain term. On or about February 18, 2016, Qualcomm filed a response to LGE's Request for Arbitration. ECF No. 1326 at 8.

Then, the parties quickly reached three agreements to resolve the royalty dispute before arbitration. On April 16, 2016, Qualcomm and LGE entered (1) a Settlement Agreement and Release, ECF No. 1326 at 8; (2) an Amendment to License Agreements, ECF No. 1326 at 8; and (3) a Strategic Fund and Indemnity Agreement. JX0110-001.

The Strategic Fund and Indemnity Agreement provided that Qualcomm would pay LGE a **7.5**% rebate on the price of any Qualcomm modem chips that LGE purchased. JX0110-009. When asked why LGE entered the 2016 agreements, Hwi-Jae Cho testified that although the Amendment to License Agreements did not alter LGE's contractual royalty rates, the chip rebates reduced LGE's effective royalty rate on Qualcomm modem chips: "Although there were many factors, overall, it would reduce LGE's effective royalty rate through the strategic fund and indemnification." Cho Depo. ¶ 206.

In sum, Qualcomm has engaged in anticompetitive conduct toward LGE by cutting off LGE's chip supply, threatening to withdraw technical support, threatening to require the return of software, charging higher patent royalty rates when LGE used a rival's instead of Qualcomm's

chip, giving LGE chip incentive funds if LGE purchased at least 85% of its chips from Qualcomm, and giving rebates on the price of Qualcomm's chips.

2. Sony

Qualcomm engaged in anticompetitive conduct toward Sony at least twice in 2012 by threatening and delaying Sony's chip supply.

a. February 2012 Chip Supply Threats and Cutoff

In early 2012, Qualcomm concluded that Sony had become unlicensed after a Sony Ericsson joint venture dissolved. CX6522-004.

On February 20, 2012, Eric Reifschneider (then-outside counsel, later QTL Senior Vice President and General Manager) wrote in an email to Jonathan Pearl (Sony General Counsel) and Derek Aberle (QTL President), "As we discussed in New York, we need to get a new license agreement in place quickly so that we can avoid any disruption in supply. . . . I understand that there are several chipset orders scheduled to ship this week, so we need to move quickly on this." CX7650-002 to -003.

Jonathan Pearl took immediate offense at Qualcomm's threat to Sony's chip supply:

> I am sure that in raising the imminent delivery of Q chipsets that you are not threatening to withdraw or delay chip supplies. Sony Mobile is Qualcomm's 3rd largest customer for chipsets and such action would bring this company to a virtual standstill. In the present circumstances this would seem to be a highly questionable tactic and would unlikely be considered as fair, or reasonable.

CX7650-002.

At trial, Derek Aberle (then QTL President) recalled that Eric Reifschneider had threatened Sony's chip supply:

> **Q**: And at several points through the course of the negotiations, Eric Reifschneider and others reminded Sony that if they did not reach an agreement, that they would be unable to purchase chips; is that correct?
> **A**: I remember you showing me passages from emails where that was communicated.
> **Q**: Do you call that – those things being communicated at the time?
> **A**: Yes.

Tr. at 314:21-315:4.

Internally, Qualcomm continued to view chip supply as leverage against Sony. Derek Aberle (QTL President) wrote in a February 22, 2012 email to Qualcomm executives including Cristiano Amon (QCT Co-President), Steve Mollenkopf (Qualcomm President), and Fabian Gonell (QTL Division Counsel) that Qualcomm needed to maintain its no license, no chips practice: "To my knowledge, we have never shipped commercial quantities of chips to a company without a license. We can't do that here either." CX6522-005. Carol Blubaugh (QCT) stated in an email the same day that QTL had "request[ed] to have us looking at holding chip shipments" to Sony. CX6522-005. On February 23, 2012, Blubaugh stated in another email that "our operations team has been advised to hold all component shipments to SEMC/Sony Mobile." CX6522-003.

At trial, Fabian Gonell testified that QCT only stopped chip shipments because someone at QCT misunderstood a Gonell email: "[I] turns out that they misunderstood my e-mail and did it because of my e-mail and not because somebody else at QTL said that they should do it." The February 16, 2012 Gonell email in question stated only: "SEMC [Sony] is not a licensee w/r/t WCDMA." CX6522-006. Gonell's testimony is contradicted by the record. Carol Blubaugh's (QCT) February 22, 2012 email refers to specific QTL directions regarding the stop shipment: "QTL is working the issue but wanted to bring you up to speed on QTL's request to have us look at holding chip shipments" and "QTL will advise by tomorrow if we need to hold off on pending shipments." CX6522-005. Thus, the Court finds not credible Gonell's testimony.

Sony responded immediately after learning of the shipment hold. On February 23, 2012, Bob Ishida (Sony CEO) sent an email with the subject line "urgent" to Steve Mollenkopf (Qualcomm President). CX7824-002. Ishida wrote that Qualcomm had held all chip shipments to Sony and asked Mollenkopf to intervene:

> QC legal team ordered to your sales to hold any shipment to SOMC due to non existence of QTL license agreement with SOMC after we became 100% subsidiary of Sony. Are you aware of that? We have an individual talking to your legal team diligently to agree on the licensing terms so it was a surprise that your legal team stopped the shipment. Please let me know what you can do on this.

CX7824-002. Steve Mollenkopf replied, "They mistakenly sent the wrong signal and will

immediately work to make right today." CX7824-001. However, Ishida replied, "As of now, your legal team does not seems [sic] to be following your instructions. Could you please confirm? Sorry to bother you but this is really urgent and important." *Id.* At trial, Steve Mollenkopf testified that Qualcomm then reinstituted chip supply to Sony. Tr. at 813:13-22. After the reinstitution of chip supply, Steve Mollenkopf (Qualcomm President) wrote a February 23, 2012 email to Derek Aberle (QTL President) and Cristiano Amon (QCT Co-President) stating not that Qualcomm should never cut off chip supply, but only that Mollenkopf wished to have "visibility" on such threats: "Let's make sure we have a process to make sure Jim L [Jim Lederer, QCT Executive Vice President] or I have visibility before a stop-ship goes out." CX6522-002.

A week after the chip supply threats, Sony and Qualcomm reached an interim patent license agreement while negotiations continued. On March 1, 2012, Sony and Qualcomm entered into a Temporary Agreement, effective February 29, 2012. ECF No. 1326 at 8. Two months after Qualcomm cut off Sony's chip supply, Qualcomm hired Eric Reifschneider, the outside counsel who threatened to cut off Sony's chip supply, as QTL Senior Vice President and General Manager. ECF No. 1326 at 15.

Then, on May 3, 2012, Sony and Qualcomm entered into a Subscriber Unit Patent License Agreement, effective February 16, 2012 through September 30, 2012 ("May 2012 Sony Interim License"). ECF No. 1326 at 9. Under the May 2012 Sony Interim License, Sony agreed to provisionally pay Qualcomm a 5% royalty on CDMA handsets. JX0063-015. In contemporaneous notes from the interim negotiations with Sony, Eric Reifschneider (QTL Senior Vice President and General Manager) observed that Sony remained concerned about chip supply: "Sony concerned about QC applying pressure thru chip supply." CX8297-041.

b. October 2012 Chip Supply Threats

Sony and Qualcomm did not reach a long-term agreement before the September 30, 2012 expiration of the May 2012 Sony Mobile Interim License. Thus, on October 1, 2012, Sony Mobile and Qualcomm entered into a brief amendment to the May 2012 Sony Mobile Interim License. ECF No. 1326 at 9.

In late October 2012, after the October amendment to the interim license expired, Qualcomm again threatened Sony's chip supply. In an October 20, 2012, email to Derek Aberle (QTL President), Fabian Gonell (QTL Division Counsel), and Eric Reifschneider (QTL Senior Vice President and General Manager), Marv Blecker (QTL Senior Vice President) recommended that Qualcomm "delay final approval of chip shipment until Tuesday to let them know that we are serious about this." CX5186-001. Reifschneider replied in agreement: "At a minimum, we need to be prepared to stop all chip shipments after Tuesday if [Sony doesn't] sign on Tuesday." CX5186-001. In another email in the same thread, Reifschneider wrote that Qualcomm's primary concern was whether a chip supply threat would get Sony to sign the patent license agreement, and that the most relevant question was "are they more or less likely to sign on Tuesday if we hold the shipment." CX6534-001.

On October 25, 2012, in an email to Derek Aberle (QTL President), Fabian Gonell (QTL Division Counsel), and Marv Blecker (QTL Senior Vice President), Eric Reifschneider (QTL Senior Vice President and General Manager) included a spreadsheet with specific Sony modem chip shipments that Qualcomm could hold: "If I am reading this spreadsheet correctly, it looks like there are shipments scheduled to go out on 10/24 and 10/25, correct? . . . If so, and if they still have not signed the license agreement, I think we need to seriously consider holding those shipments until they do." CX7961-001.

In an October 27, 2012 email, Eric Reifschneider told Jonathan Pearl (Sony General Counsel) that "I must report to QCT that SMC [Sony Mobile Corp.] appears unwilling to enter into a license agreement with Qualcomm," CX5185-005, to which Reifschneider referred at his deposition as "the next step in the escalation process." Reifschneider Depo. 207:6-16. Thus, as in February 2012, QTL again dictated whether QCT would stop Sony's modem chip supply shipments. Fabian Gonell (QTL Division Counsel) and Alex Rogers (current QTL President) each received the email chain including the threats to cut off Sony's chip supply. CX5185-003.

Two weeks after that threat, on November 12, 2012, Sony Mobile and Qualcomm entered into a Subscriber Unit Patent License Agreement, effective beginning October 1, 2012. ECF No.

1326 at 9; JX0072. Under that agreement, Sony paid Qualcomm a 5% royalty on CDMA handsets. JX0072-023.

On September 29, 2015, Qualcomm and Sony Corporation entered into a CDMA Complete Terminal Patent License Agreement, with an effective date of October 1, 2015. ECF No. 1326 at 9; *see* JX0105. Under the 2015 patent license agreement, Sony pays Qualcomm a 3.5% running royalty on handset sales. JX0105-031. At trial, Fabian Gonell (QTL Legal Counsel and Senior Vice President, Licensing Strategy) testified that Qualcomm granted Sony "a discount from our standard royalty terms" because "Sony granted Qualcomm a very robust cross-license to what we considered a commercially valuable portfolio of patents." Tr. at 1407:12-17.

In sum, Qualcomm engaged in anticompetitive conduct toward Sony by repeatedly delaying and threatening Sony's chip supply.

3. Samsung

Qualcomm has engaged in anticompetitive conduct toward Samsung by threatening Samsung's chip supply, reducing the royalty rate if Samsung purchased at least 85% of its chipsets from Qualcomm, delaying the delivery of software, threatening to withhold technical support, offering Samsung chip incentive funds if Samsung purchased 100% of its premium chips from Qualcomm, and paying to extinguish Samsung's antitrust claims and to silence Samsung.

Moreover, when asked whether any other component supplier requires execution of a patent license agreement before selling components, Andrew Hong (Samsung Legal Counsel) also testified that Qualcomm's practice of requiring Samsung to sign a patent license agreement before Samsung can purchase modem chips is unique in the industry:

> **Q**: In any of those negotiations, did Samsung's prospective supplier require that Samsung execute a patent license agreement prior to agreeing to sell their product to Samsung?
> **A**: No.

Hong Depo. 197:25-198:4. Injung Lee (Licensing Lead at Samsung Intellectual Property Center) agreed. Lee Depo. 132:23-133:12.

On September 3, 1993, Samsung and Qualcomm entered into an Infrastructure and

Subscriber Unit License and Technical Assistance Agreement ("1993 CDMA SULA"). ECF No. 1326 at 8. Under the 1993 CDMA SULA, Samsung paid Qualcomm an $8.5 million upfront fee and a running royalty rate of 5.75% on handsets sold outside of Korea and 5.25% on handsets sold in Korea. JX0006-012. Later, Samsung and Qualcomm entered into an Amendment to Infrastructure and Subscriber Unit License and Technical Assistance Agreement, effective November 17, 1997. ECF No. 1326 at 8.

a. 2001 Chip Supply Threats

Qualcomm threatened Samsung's chip supply in 2001. At trial, Steve Altman (former Qualcomm President) agreed that in 2001, Samsung argued "that its existing CDMA license agreement did not apply to its sales of 3G infrastructure and subscriber equipment." Tr. at 186:25-187:3. On August 24, 2001, Irwin Jacobs (Qualcomm Co-Founder and CEO) wrote a letter to Ki Tae Lee (Samsung President) threatening to terminate Qualcomm's chip supply to Samsung:

> [I]f Samsung persists in taking the position that its license agreement does not cover 1X and does not pay QUALCOMM the 1X royalties due under the agreement, we will have no choice but to take all action necessary to enforce the terms of our license agreement, including possible termination. Under our agreements, we do not ship ASICs to non-licensees or to licensees who are not performing their obligations.

CX6729-002. A week later, Samsung caved to Qualcomm's royalty demands, as Ki Tae Lee responded to Irwin Jacobs: "I will remit the 1X royalty payment immediately upon completion of the necessary calculations." JX0014-001.

b. 2003 Chip Volume Commitments

In 2003, during patent license renegotiations with Samsung, Irwin Jacobs (Qualcomm Co-Founder and CEO) told Ki Tae Lee (Samsung President) that Qualcomm would only lower Samsung's royalty rate if Samsung committed to purchase 85% of its chips from Qualcomm: "[I]f Samsung maintained our existing partnership agreement and did purchase at least 85% of its ASICs from QUALCOMM (as it is currently doing), then Samsung will receive the benefits of our proposed royalty reduction." CX6719-002. Irwin Jacobs also told Samsung that Qualcomm was offering similar provisions to other OEMs to suppress rivals' market share: "I am compelled to

offer this proposal to others as it is important that we maintain good relationships with our other ASIC partners. We are also counting on them to take market share from manufacturers that do not use our ASICs." *Id.*

Shortly thereafter, Samsung and Qualcomm entered into an Amendment to Infrastructure and Subscriber Unit License and Technical Assistance Agreement, with an effective date of March 29, 2004. ECF No. 1326 at 8; *see* JX0024. Under the 2004 SULA amendment, Samsung paid a 5% running royalty rate on CDMA handsets containing Qualcomm chips, subject to a $20 royalty cap. JX0024-002 to -003. Given that Samsung's royalty rate was reduced as Irwin Jacobs had promised if Samsung bought at least 85% of its modem chips from Qualcomm, presumably Samsung agreed to Jacobs' offer.

c. 2008-2009 Chip Sample Software Delay

In 2008, Samsung entered patent license renegotiations with Qualcomm. Injung Lee (Licensing Lead at Samsung Intellectual Property Center), who co-led Samsung's negotiating team, testified that Samsung wanted a lower royalty rate: "[W]e believed that the existing royalty rate was excessively high, which warranted a reduction in it, in our estimation." Lee Depo. 144:6-8. Injung Lee testified that Qualcomm's royalty rates were "rather high in comparison to other patentees," and that Samsung paid Ericsson a lump sum that equated to a ■% effective royalty rate and paid Nokia a lump sum that equated to a ■% effective royalty rate. Lee Depo. 145:8-17. According to Injung Lee, Samsung proposed a royalty rate under 1%, but Qualcomm refused. CX2568A-001.

Injung Lee testified that during negotiations, Samsung was concerned about any disruption in chip supply because Samsung depended entirely on Qualcomm CDMA modem chips:

> [G]iven the fact that we were being supplied with 100 percent of our chipsets from Qualcomm, were it such that we were not getting provided with those chipsets as per the normal manner and fashion, then Samsung would not have been able to manufacture mobile phones nor sell the same. And as such, it would have had an untold impact on our business.

Lee Depo. 166:14-20. Although Samsung's March 2008 notes from negotiations with Qualcomm

state that "Samsung demanded that Qualcomm's chipset supply and technical support should not be affected by this negotiation, and Qualcomm agreed to this," that only confirms that Samsung was concerned about Qualcomm cutting off chip supply and technical support. QX0551B-161.

Injung Lee (Licensing Lead at Samsung Intellectual Property Center) testified that in 2008, "when the negotiations got prolonged, I was told that at the end of the negotiation process to the effect that there would be some difficulties with the technical support being provided to Samsung." Lee Depo. 72:13-18. Specifically, Injung Lee testified that although Samsung "would receive chip samples and also software to drive the samples of the chipsets . . . I was told that the – receiving the software in that context was getting delayed from Qualcomm." *Id.* at 74:18-25.

Samsung then capitulated to Qualcomm's patent license demands. Injung Lee testified that after those delays, "Vice President Park said that we would expedite thing and to wrap up the negotiations. So that was the course of action we took as a result." *Id.* at 75:5-9. Thus, on November 4, 2009, Samsung and Qualcomm entered into an Amendment to Infrastructure and Subscriber Unit License and Technical Assistance Agreement, with an effective date of January 1, 2009 ("Samsung 2009 SULA Amendment"). ECF No. 1326 at 8; *see* JX0047.

d. 2013 Samsung Views of Qualcomm Royalty Rates

In 2013, Samsung continued to view Qualcomm's royalty rates as unreasonably high. Contemporaneous notes from June 2013 patent license negotiations reflect Samsung's view that "[i]f each holder of communication [SEPs] were to collect royalties on the price of handsets at Qualcomm's rate, this would result in [cumulative] royalty rates of at least 10% being levied on handset manufacturers." CX2642A-002. According to the Samsung notes, Samsung argued that a handset is an outdated royalty base: "The value of smart phones lies in various computer functions, the operating system, software, applications, and design, etc., which have nothing to do with Qualcomm's chipset IP. Therefore it is unfair for Qualcomm to levy royalties on the basis of the entire phone." CX2642A-003. However, Samsung attributed Qualcomm's maintenance of high royalty rates to Qualcomm's chip monopoly: "The structure of high royalties is only possible because Qualcomm has a monopoly position in the chipset market and does not supply chips to

manufacturers without licenses to Qualcomm standard essential patents, giving manufacturers no choice but to accept." *Id.*

According to Samsung's notes, Qualcomm was not interested in negotiation: "Qualcomm is confident about defending against Samsung's royalty terms, and there is no additional room for negotiation with regard to royalty reductions." *Id.* Samsung notes from later in the negotiation indicate that Samsung felt unable to challenge Qualcomm's patent license terms: "Samsung has been practically unable to purchase chips from other chipset suppliers, and had no choice but to enter into a license agreement with Qualcomm despite the unreasonable terms in order to engage in its mobile phone business." CX2643A-002.

Samsung also argued to Qualcomm that because "all Qualcomm [SEPs] are implemented within a chip, royalties should be assessed on a chipset basis." CX2643A-002. However, Injung Lee testified that "Qualcomm does not – has not granted licenses to chipset manufacturers." Lee Depo. 136:3-5. Qualcomm's refusal to license its SEPs to rivals is discussed in more detail later in this order.

e. 2018 Qualcomm Monetary Payment to Extinguish Samsung's Antitrust Claims and Silence Samsung, and Chip Incentive Funds

Alex Rogers (QTL President) testified that in 2016, Samsung and Qualcomm entered another patent license renegotiation, which resolved on January 30, 2018 in several agreements. Tr. at 1988:16-18. Among the agreements are: (1) the 2018 Amendment to Infrastructure and Subscriber Unit License and Technical Assistance Agreement, a patent license agreement, JX0122-003; (2) the Amended and Restated Strategic Relationship Agreement, which provides Samsung chip incentives on QCT chips, JX0122-035; (3) the Amendment to Component Supply Agreement, which amends the 2004 CSA, JX0122-043; (4) the 2018 Settlement Agreement, in which both Samsung and Qualcomm release legal claims, JX0122-049; and (5) a foundry agreement, the terms of which are not in evidence. Tr. at 2007:2-2008:6.

The 2018 patent license amendment does not alter Samsung's contractual running royalty rate. JX0122-028 to -029. However, Qualcomm provides Samsung a quarterly credit in exchange for Samsung's cross-license of patents. JX0122-008. Under the Strategic Relationship

Agreement, Qualcomm promises to pay Samsung—through December 31, 2023—chip incentive funds that accrue on Samsung's purchases of QCT chips, provided that Samsung purchases specific volumes of Qualcomm chips. JX0122-036 to -037. Specifically, Samsung's receipt of incentive funds is conditioned on Samsung's purchase from Qualcomm of 100% of Samsung's premium modem chips and at least [redacted] medium and high tier chips. JX0122-036 to -037. This agreement further ensures that rivals cannot sell modem chips to Samsung.

Under the 2018 Settlement Agreement, Qualcomm paid Samsung $100 million to extinguish all of Samsung's antitrust claims and to silence Samsung. JX0122-054. In the Settlement Agreement, Samsung specifically releases claims based on the following:

> any claim of coercion or other similar claims regarding the negotiation, execution, or terms of this Settlement Agreement, the 2018 Amendment, the CMCPCA, and/or the Collaboration Agreement . . .
>
> any patent licensing conduct of Qualcomm or any of its Affiliates or (b) any conduct of Qualcomm or any of its Affiliates in the Private and Regulatory Actions . . . [and]
>
> any claim that Qualcomm's Existing Practices violate any antitrust, competition, or similar laws of any state or territory of the United States (including federal law), Korea, or any other country or any jurisdiction, or any principle of common or civil law to similar effect including any claim based on or arising from findings or conclusions articulated in . . . (4) the ultimate decisions, settlement agreements or other dispositions of any of the cases brought against Qualcomm (or that contain counterclaims against Qualcomm) by the U.S. Federal Trade Commission ("U.S. F.T.C.") (*FTC v. Qualcomm Incorporated*, Case No. 5:17-CV-00220-LHK (N.D. Cal.)) . . .

JX0122-050 to -052.

Further, in the Settlement Agreement, Samsung agreed to withdraw from participation in this action and others:

> Samsung will promptly take all actions reasonably required to withdraw all pending or accepted applications for intervention, or any other forms of substantive participation (except for any participation, including discovery or deposition, to the extent required by law), in any of the Private or Regulatory Actions and any other proceedings involving claims that Qualcomm's Existing Practices violate antitrust, competition, or similar laws. . . . [and]

> Samsung will withdraw from all existing Common Interest Agreements and all other similar agreements in which the general purpose is to share information and communications under some form of protection against disclosure (collectively, the "CIAs") between Samsung or any of its Affiliates and any third party that pertains to any of the Private and Regulatory Actions or any other proceedings or collaboration by third parties involving claims or potential claims that Qualcomm's Existing Practices violate antitrust, competition, contract, or similar laws or undertakings.

JX0122-056. Moreover, Samsung promised to make the following statement to the KFTC: "[I]n any statement Samsung provides to the KFTC regarding Qualcomm's compliance with the KFTC 2017 Orders, Samsung agrees that it shall confirm that it has resolved its disputes with Qualcomm and the resolution of such dispute satisfies Samsung's demands made under the KFTC 2017 Orders." JX0122-055.

In sum, Qualcomm has engaged in anticompetitive conduct toward Samsung by threatening Samsung's chip supply, reducing the royalty rate if Samsung purchased at least 85% of its chipsets from Qualcomm, delaying the delivery of software, threatening to withhold technical support, offering Samsung chip incentive funds if Samsung purchased 100% of its premium chips from Qualcomm, and paying to extinguish Samsung's antitrust claims and to silence Samsung.

4. Huawei

Qualcomm engaged in anticompetitive conduct toward Huawei by giving a drastically reduced royalty rate if Huawei purchased 100% of its chips from Qualcomm, requiring Huawei to grant Qualcomm a royalty-free cross-license to Huawei's patents, threatening to cut off Huawei's chip supply on multiple occasions, and demanding unreasonably high royalty rates but refusing to provide patent claim charts.

Moreover, Nanfen Yu (Huawei Senior Legal Counsel) testified that Qualcomm's requirement of a separate patent license when selling chips is unique in the industry:

> **Q**: Are there other suppliers that have that practice [of requiring a separate license when selling modem chips]?
> **A**: Not that I'm aware.

Yu Depo. 121:6-22.

a. 2001 Component Supply Agreement

Qualcomm and Huawei entered into a Contract for the License of Certain Technology for the Manufacturing and Sale of Certain CDMA Infrastructure Equipment on September 22, 2001. ECF No. 1326 at 5. Qualcomm and Huawei then entered into a component supply agreement effective November 13, 2001. CX1006-002.

The 2001 component supply agreement provides that Qualcomm's sale of modem chips to Huawei does not exhaust Qualcomm's intellectual property rights: "The sale of Products to Manufacturer does not convey to Manufacturer or Trade Corporation title to any embedded software or any intellectual property rights in such Products." CX1006-006. As with other Qualcomm supply agreements, Qualcomm's component supply agreement with Huawei provides that Qualcomm can terminate the supply agreement if Huawei becomes unlicensed: "QCTAP [QCT's Asia Pacific division] may terminate this Contract if Manufacturer is in default under the License Agreement." CX1006-007. Nanfen Yu (Huawei Senior Legal Counsel) testified that although Huawei asked to modify that termination provision, "Qualcomm refused Huawei's request." Yu Depo. 160:24-162:1.

b. 2003 and 2004 Chip Supply Leverage

Qualcomm also used its chip supply leverage to obtain substantial modem chip purchase commitments from Huawei. On May 29, 2003, Huawei and Qualcomm entered into a Contract between Qualcomm Incorporated and Huawei Technologies Co. Ltd. for the License of Certain Technology for the Manufacturing and Sale of Certain CDMA Subscriber Units, with an effective date of May 29, 2003 ("2003 CDMA SULA"). ECF No. 1326 at 5; JX0022. In the 2003 CDMA SULA, Huawei agreed to purchase 100% of its CDMA chips for handsets sold in China from Qualcomm in exchange for a reduced royalty rate of 2.65%. JX0022-010, -012. However, if Huawei purchased chips from another supplier, or if Huawei sold handsets outside of China, Huawei owed a 5-7% royalty rate on those handsets. JX0022-010.

Qualcomm also required Huawei to provide Qualcomm royalty-free licenses to Huawei's patents. Nanfen Yu (Huawei Senior Legal Counsel) testified that QTL's patent licenses with

Huawei all require Huawei to grant QCT royalty-free cross-licenses to all of Huawei's SEPs, which Yu testified "could be of great value if we license out by ourselves. But through the royalty free grant back license, we're just giving it out to Qualcomm and other handset manufacturers for free." Yu Depo. 195:23-196:13. For example, in the 2003 CDMA SULA, Huawei granted "QUALCOMM a worldwide, nontransferable, non-exclusive, irrevocable and royalty free license . . . to use LICENSEE's Intellectual Property" to make modem chips. JX0022-016.

Qualcomm and Huawei entered into a Memorandum of Understanding ("Huawei MOU"), dated July 21, 2004. ECF No. 1326 at 5. The MOU agreement required Huawei to pay the royalty rates in the 2003 CDMA SULA on Huawei's sales of WCDMA handsets. JX0027-005.

Internally, Qualcomm understood that Qualcomm's chip supply leverage led Huawei to sign the MOU on Qualcomm's standard patent license terms. In a September 2004 email thread forwarded to Steve Altman (later Qualcomm President), Qualcomm employee Jing Wang wrote: "[I]f we could not resolve these issues timely, Huawei could be lured to use EMP's UMTS chip and we could lose a *huge leverage* (ie, MSM 6250 chip supply) in pushing Huawei to sign the definitive agreement with us." CX7886-001 (emphasis added). In a later email in the thread, Jing Wang wrote, "[t]he reason Huawei signed interim agreement on WCDMA IPR with QC two months ago on standard terms was . . . because of their hope to quickly develop UMTS terminals based on our MSM 6250 in order to sell to VF, H3G, Sunday and later China Mobile [all mobile carriers]." CX7886-001. Steve Altman (later Qualcomm President) forwarded the email to another Qualcomm employee and wrote, "Jing is exactly right." *Id.* At trial, Steve Altman conceded that he was the "architect" of Qualcomm's licensing program and practices. Tr. at 177:21-25.

c. 2013 Chip Supply Threats

In 2013, Qualcomm and Huawei engaged in negotiations over renewing Huawei's 2003 CDMA SULA, which was slated to expire May 29, 2013. JX0022-007.

Eric Reifschneider (QTL Senior Vice President and General Manager) threatened Huawei's chip supply from the outset of the negotiations. In a May 1, 2013 email, Reifschneider

informed Xuxin Cheng (Huawei) that "if the C2K SULA expires and has not been replaced by a new patent license agreement covering C2K products, there will be issues with Huawei's ability to continue to use C2K chipsets or QMCi's software, issues which I am sure both our companies would like to avoid." CX1000-004.

On May 1, 2013, Cheng replied that Huawei wished to reduce the royalty rate it paid Qualcomm "because the current situation is significantly different from ten years ago, such as the fact that many essential patents for C2K [CDMA] have expired or will expire in the coming 3-5 years." CX1000-002.

Eric Reifschneider (QTL Senior Vice President and General Manager) continued to threaten Huawei's chip supply. In a May 8, 2013 email to Cheng and other Huawei negotiators, Reifschneider listed chip supply among the "topics that Qualcomm would like to discuss at our meeting this week." CX1000-001. Reifschneider wrote that if Huawei renewed the patent license, Huawei would not face any chip supply issues: "Ways to avoid any disruption in chipset supply at the end of this month without creating undue risk for either party (the simplest being for Huawei to exercise its right to renew the C2K license agreement under which it has been operating successfully for the last ten years)." *Id.*

Nanfen Yu (Huawei Senior Legal Counsel) testified that at the May 10, 2013 meeting between Huawei and Qualcomm, at which she was present, Reifschneider made oral threats to cut off Huawei's chip supply:

> **Q**: And subsequent to this, did you hear him say it again orally?
> **A**: Yes.
> . . .
> **Q**: Did you believe it was just posturing?
> **A**: No.

Yu Depo. 140:23-141:12. Yu testified that specifically, "Eric make it very clear that we have to sign a license agreement in some form. And we didn't see that there's any other possible ways to avoid the disruption of the chipset supply." *Id.* at 69:12-15.

Qualcomm's notes from the May 10, 2013 meeting with Huawei also reflect

Reifschneider's threats to Huawei: "Not to mention the chip supply problem. Letting the agreement expire takes flexibility away from both of us. It puts us both in a worse spot. Renewing does not put you in a worse negotiating position; it puts you in a better one." CX6528-002.

In his own notes from the 2013 Huawei negotiations, Eric Reifschneider observed that Qualcomm could not negotiate on the contractual royalty rates, but could negotiate on other points: "We explained why we have little flexibility with the royalty rates given the established value of our patent portfolio and indicated our willingness to consider other ways to have a mutual exchange of value such as a patent transfer" or a chip incentive fund. CX5211-002 to -003.

Other Qualcomm executives discussed using chip supply threats to get Huawei to renew its patent license. These discussions show that QTL, Qualcomm's licensing division, drove the chip supply threats. On May 20, 2013, Derek Aberle (QTL President) told Steve Mollenkopf (Qualcomm President) in an email that "I suggest you make the following points to Huawei's CEO." CX5231-001. Among those points was threatening to cut off chip supply: "[I]f they don't extend we will have issues re continued chip supply on C2K. Note that Huawei has been claiming patent exhaustion based on their purchase of chips from QC despite the terms of our supply agreement." CX5231-001. Steve Mollenkopf replied, "I got it. Thanks." *Id.*

Only a week later, on May 27, 2013, Qualcomm and Huawei entered into an Amendment to Subscriber Unit License Agreement. ECF No. 1326 at 5. Nanfen Yu (Huawei Senior Legal Counsel) testified that although Huawei viewed Qualcomm's royalty rates as high, Huawei signed the license agreement because Huawei had "[n]o choice for the CDMA chipset supply." Yu Depo. 143:9-21. Yu testified that "Qualcomm was essentially the only supplier for CDMA chips in the market," such that "Qualcomm's royalty rate is nonnegotiable." *Id.* at 143:5-6, 149:19-21.

d. 2014 Chip Supply Leverage

On December 15, 2014, Huawei and Qualcomm entered an Amendment to Subscriber Unit License Agreement, with an effective date of July 1, 2014, amending the Contract for the License of Certain Technology for the Manufacturing and Sale of Certain CDMA Subscriber Units, dated

May 29, 2003. ECF No. 1326 at 5. On December 15, 2014, Huawei and Qualcomm entered a Subscriber Unit License Agreement ("2014 SULA"), with an effective date of July 1, 2014. ECF No. 1326 at 5; JX0098. The 2014 SULA requires Huawei to pay a 5% running royalty rate on devices containing WCDMA technology and a 3.5% running royalty rate on devices containing LTE technology, and includes a royalty cap of [redacted]. JX0098-011, -016.

Nanfen Yu (Huawei Senior Legal Counsel) testified that the need for chip supply left Huawei with little room to negotiate those royalty rates:

> **Q**: Why do you say 'we had no choice'?
> **A**: Firstly, there were dependency and need from the business unit for us to sign to maintain license agreement for them to be able to obtain chipsets from Qualcomm. . . . Qualcomm wouldn't agree to sign any agreement if we don't include LTE license here.

Yu Depo. 98:4-14.

e. 2016 Huawei Royalty Complaints

In June 2016, Huawei sent Qualcomm a proposal to renegotiate the royalty rates due under the Huawei SULA, which Fabian Gonell (QTL Legal Counsel and Senior Vice President, Licensing Strategy) received. CX1101-001. In the proposal, Huawei argued that Qualcomm's royalty rates are unreasonably high because (1) Qualcomm ties its high 3G royalty rates to 4G products in contradiction of industry practice; (2) Qualcomm receives more than 50% of the accumulated royalty rate in the industry even though it contributed only 10% of WCDMA and LTE patents; (3) many of Qualcomm's CDMA patents have expired; and (4) Qualcomm charges its royalty rates on the price of a whole handset when Qualcomm's patents do not contribute to the whole handset's value. Specifically, Huawei stated:

> **Qualcomm unreasonably ties its high 3G rates on 4G multimode products**
> - Despite the fact that 3G is becoming a backup technology with a significant number of 3G patents being expired, Qualcomm is charging 4G multimode products on 3G rates. This is not consistent with industry practice where patent holders charge royalty at the rate of the latest technology and Qualcomm is trying to extend the benefits gained in 3G era based on its dominant position in chipset market and unique business model bundling chipset supply and patent license.
>
> **Qualcomm's royalty rates are not consistent with its contribution to standards**

- Qualcomm's proportion of declared essential patents in both WCDMA and LTE are only around 10%, but its royalty rate is more than 50% of the accumulated royalty rate in the industry
- Huawei has entered into license agreements with major patent holders in the industry, but the royalty Huawei paid to Qualcomm each year consists of 80-90% of the total royalty we paid for terminal products, which well demonstrates that Qualcomm's royalty rate is excessively higher than other major patent holders in the industry

The value of Qualcomm's WCDMA SEP portfolio has declined significantly but Qualcomm hasn't adjusted its WCDMA royalty rate accordingly

- A significant number of Qualcomm's WCDMA patents are expired or expiring, particularly those early fundamental patents.

Qualcomm's royalty model does not reflect the real value contributed by patent technology to handset

- It is not reasonable to collect royalty on the selling price of the whole handset as Qualcomm's essential patents are mostly implemented by chipset.

CX1101-002 to -003 (emphases in original).

Nanfen Yu (Huawei Senior Legal Counsel) testified that despite Qualcomm's high rates, Qualcomm has never provided patent claim charts to Huawei, but that Nokia, Ericsson, and Siemens all have. Yu Depo. 216:4-217:2. Specifically, as to Qualcomm, Yu testified:

> **Q**: [I]n all of your negotiations with Qualcomm throughout the course of your career, has Qualcomm ever provided claim charts for its patents?
> **A**: No.

Id. at 216:4-8. Yu testified that Huawei has not sued Qualcomm to determine a FRAND royalty rate because Qualcomm could cut off Huawei's chip supply: "[O]ne concern would be the chipset supply, and the other is that we have the existing licensing agreements in place." *Id.* at 158:7-9.

Yu testified that although Huawei recently has withheld royalty payments from Qualcomm during license renegotiations, Qualcomm has continued to supply chips to Huawei because, according to Yu, "the NDRC [Chinese antitrust agency] decision and KFTC [Korean Fair Trade Commission] decision requires that Qualcomm does not bundle the chipset into the international [sic] property rights license." Yu Depo. 47:17-21; 70:20-71:8.

In sum, Qualcomm engaged in anticompetitive conduct toward Huawei by giving a drastically reduced royalty rate if Huawei purchased 100% of its chips from Qualcomm, requiring

Huawei to grant Qualcomm a royalty-free cross-license to Huawei's patents, threatening to cut off Huawei's chip supply on multiple occasions, and demanding unreasonably high royalty rates but refusing to provide patent claim charts.

5. Motorola

Qualcomm engaged in anticompetitive conduct toward Motorola by offering a significantly reduced effective royalty rate if Motorola purchased 100% of its chips from Qualcomm and threatening to cut off Motorola's chip supply.

Moreover, Todd Madderom (Motorola Director of Procurement) testified that in his 15 years in procurement, no other company has asked him to take a separate patent license to buy components:

> **Q**: And in your experience aside from your experience with Qualcomm, have you ever been required to separately take a license from a component supplier in order to procure commercial quantities from that component supplier?
> **A**: No, this is a unique situation. I've never run across this prior.

Madderom Depo. 162:24-163:10. Madderom also testified that Qualcomm's royalty rates are vastly higher than those Motorola pays other patent licensors: "In our experience we've never seen such a significant licensing fee tied to any other IP we license." Madderom Depo. 217:24-218:2.

a. 2005 Chip Incentive Funds

On September 26, 1990, Qualcomm entered a license agreement with Motorola, which had an effective date of September 26, 1990. ECF No. 1326 at 6. Under that patent license agreement, Qualcomm charged a 4% running royalty rate on handset sales and no royalties on chipset sales. Tr. at 216:20-217:3; JX0003-005. As relevant here, Qualcomm and Motorola executed a Second Amendment to the Agreement to Amend the Patent License Agreement and Technology License Agreement and Software License Agreement, with an effective date of April 11, 2003. ECF No. 1326 at 6.

In May 2005, as Motorola and Qualcomm were negotiating a WCDMA patent license, Paul Jacobs (Qualcomm CEO) wrote to Edward Zander (Motorola CEO) that Qualcomm could not budge on its contractual royalty rates, but could offer other consideration: "[I]t is difficult for

us to reduce Motorola's royalties given the impact that it could have on other license agreements. We are prepared, however, to offer Motorola a marketing incentive payment to help defray a portion of Motorola's expenses incurred in selling WCDMA handsets in Europe." CX7041-002. Motorola and Qualcomm then reached a patent license amendment. An October 2006 presentation to the Qualcomm Board of Directors offered an "Executive Summary" of the amendment's benefits, including "Reduced likelihood of litigation with Motorola." CX7042-005.

b. 2015 Chip Supply Threats

At trial and at his March 12, 2018 deposition, Cristiano Amon (Qualcomm President) testified that he had never been informed of Qualcomm threatening to cut off chip supply:

> **Q**: You were asked, 'You have never been informed that QTL threatened to cease supplying chipsets to a customer because of a licensing dispute; is that right?' You answered 'That is correct.' That was a true statement when you said it?
> **A**: That is correct.

Tr. at 548:3-17 (citing Amon Depo. 50:24-51:2).

However, Amon's own handwritten notes from 2015 license negotiations with Motorola's President Rick Osterloh, entitled "12-9-15-Rick & Team-Motorola," state: "(1) Licensing > Eric [Reifschneider, QTL Senior Vice President and General Manager] constantly threatening to cut off chip supply." CX7024-001. Thus, despite Amon's own handwriting acknowledging 2015 chip supply threats, Amon testified under oath at his deposition and trial that he was unaware of QTL threats to cut off chip supply.

c. 2016 Chip Incentive Fund and Chip Supply Leverage

In 2016, Motorola and Qualcomm again entered patent license negotiations. An October 2016 internal Motorola presentation states that Qualcomm offered Motorola a ■ chip rebate on purchases of Qualcomm modem chips. CX2060-020. Motorola analyzed Qualcomm's proposal on another slide, and concluded that only if Motorola purchased 100% of its modem chips from Qualcomm would Motorola be able to achieve a 3.8% effective royalty rate. CX2060-021.

Todd Madderom (Motorola Director of Procurement) testified that Qualcomm's royalty rates are vastly higher than those Motorola pays other licensors: "In our experience we've never

seen such a significant licensing fee tied to any other IP we license." Madderom Depo. 217:24-218:2. A 2015 internal Motorola presentation titled "Motorola Qualcomm Briefing" includes Motorola's talking points for a meeting with Qualcomm, and reflects the same concern. CX2123-003. Under the header "Relationship Struggles," the slide states "Licensing fees are inflated and cost prohibitive to technological advances." *Id.* Todd Madderom testified that the slide reflects that Qualcomm's royalty rates are disproportionate: "I think it's perhaps a relative assessment of the millions of dollars we spend in licensing with Qualcomm is disproportionate to anyone else in the world that we would pay licensing fees to." Madderom Depo. 218:2-5.

Todd Madderom testified that if Motorola did not have to pay Qualcomm's inflated patent license fees, Motorola could invest those funds in better features for consumers: "[W]e believe that the millions of dollars that we pay to royalty could be better – could be invested to perhaps develop our own technological advances." *Id.* at 218:24-219:3.

Madderom testified that Motorola has felt constrained from challenging Qualcomm's royalty rates because Qualcomm has provided the only CDMA and premium LTE modem chip solutions: "For 2013 the only company that offered an LTE solution that was viable was Qualcomm." Madderom Depo. 134:18-19. Madderom also testified that Qualcomm was Motorola's only CDMA modem chip option: "So there was a VIA Technologies in the market. They had CDMA IP. We didn't feel it was capable or competitive, and so we were sole sourced to Qualcomm." *Id.* at 157:21-23.

Any chip supply disruption would be catastrophic for an OEM, Madderom testified: "If we are unable to source the modem, we are unable to ship the handset. It's a direct correlation. No modem supply, no phone supply to our customer." Madderom Depo. 147:25-148:3. Further, "[i]t takes many months of engineering work to design in a replacement solution, if there is even a viable one on the market that supports the need." *Id.* at 147:25-148:11.

Madderom testified that without a chip supply alternative, Motorola is effectively powerless to contest Qualcomm's royalty rates:

Q: How, if at all, would moving away from Qualcomm chipsets better position

> Motorola to have a fight with Qualcomm about Qualcomm's royalties?
> **A**: Qualcomm would not be able to cut off our supply in that fight. It's as simple as that. We could create a fight, and we feel like our supply wouldn't be threatened.

Id. at 223:25-224:7.

In sum, Qualcomm engaged in anticompetitive conduct toward Motorola by offering a significantly reduced effective royalty rate if Motorola purchased 100% of its chips from Qualcomm and threatening to cut off Motorola's chip supply.

6. Lenovo

Qualcomm has engaged in anticompetitive conduct toward Lenovo by threatening to cut off Lenovo's chip supply; threatening that even Qualcomm's rival MediaTek cannot sell chips to Lenovo if Lenovo becomes unlicensed with Qualcomm; demanding unreasonably high royalty rates without providing technical or legal information about Qualcomm's patents; and offering chip incentive funds if Lenovo committed to purchasing 30-50 million Qualcomm chips.

On June 30, 2003, Qualcomm and Legend Mobile Communication Technology Ltd. ("Legend") executed a Contract between Qualcomm Incorporated and Legend Mobile Communication Technology Ltd. for the License of Certain Technology for the Manufacturing and Sale of Certain CDMA Subscriber Units. ECF No. 1326 at 5–6. Lenovo is a successor in interest to Legend. *Id.* at 6. On March 28, 2007, Qualcomm and Lenovo executed an Amendment to Contract between Qualcomm Incorporated and Lenovo Mobile Communication Technology Ltd. for the License of Certain Technology for the Manufacturing and Sale of Certain CDMA Subscriber Units. ECF No. 1326 at 6.

a. 2013 Qualcomm "Carrots and Sticks" Strategy

Ira Blumberg (Lenovo Vice President of Intellectual Property) testified that during 2013 renegotiations of the Lenovo patent license agreement, Eric Reifschneider (QTL Senior Vice President and General Manager) first threatened to cut off Lenovo's chip supply: "At that initial meeting, we explained that we were contemplating terminating the license through whatever mechanism we thought was applicable. And Mr. Reifschneider was very calm about it, and said that we should feel free to do that, but if we did, we would no longer be able to purchase

Qualcomm chips." Blumberg Depo. 157:7-14. Blumberg heard from a negotiating colleague that "that same assertion was repeated numerous times during the negotiation of these amendments by the licensing staff at Qualcomm." *Id.* at 158:1-4.

Reifschneider's threats were consistent with tactics articulated in a March 24, 2013 QTL slide deck titled "Lenovo 4G Strategy." CX5210-001. One slide in the presentation was headlined "Carrots and Sticks," with a table below including one column for "Carrots" and one column for "Sticks." CX5210-011. Under "Carrots," Qualcomm listed chip incentives, like "Offer Strategic Fund" and "Offer Chip Rebate." *Id.* Under "Sticks," Qualcomm listed cutting off Lenovo's chip supply: "Product hold on Chip shipments. QMC has 478.5K MSMs on backlog scheduled to ship by 4/9/13." *Id.*

Going into those 2013 patent license negotiations, Lenovo viewed Qualcomm's royalty rates as unreasonably high in comparison to the rates of other SEP licensors. Ira Blumberg testified that Qualcomm's royalty rates "don't take into account changes in the size of their portfolio but fix the royalty rates, and fix those royalty rates at a level higher than most of the other licensors." Blumberg Depo. 30:22-21:2. Blumberg testified that although "I don't know what all other licensors in the field charge, . . . the ones that I do know of are – are lower," including Nokia, Ericsson, and Interdigital. *Id.* at 31:3-12.

Blumberg also testified that he viewed it as a FRAND violation for a modem chip supplier to refuse to license other modem chip suppliers: "My interpretation of FRAND obligations does suggest that the licensor has an obligation to license any company that requests a license, whether it is a chip company, a device company, or anything in between." *Id.* at 132:19-24.

Despite Lenovo's disagreement with Qualcomm's royalty rates, Ira Blumberg (Lenovo Vice President of Intellectual Property) testified that Lenovo was hamstrung by Qualcomm's chip supply leverage:

> My understanding from our business colleagues was that least with respect to high-end phones, at the time that we're talking about, Qualcomm had the best chipset available and that it would be difficult to convince consumers and carriers to spend for a high-end phone if it did not have the – the features, functions, and – and

performance that the Qualcomm chip provided.

Blumberg Depo. 71:19-72:1. Further, "[i]n the absence of the ability to terminate the license, we don't feel we have much negotiating power to set new terms with Qualcomm." *Id.* at 156:8-11. A contemporaneous internal Lenovo presentation titled "Qualcomm Update" reflects the same concern, with text on one slide stating: "QC says they want to be partners but we see no sign of reducing royalties without a fight due to QC monopoly power." CX2121-005.

Blumberg also testified that litigation to challenge Qualcomm's royalty rate was not an option due to Qualcomm's chip supply leverage: "[T]he quickest legal resolution to that – at least in the US – you're looking at months and months, if not a year or more, without supply, which would be, if not fatal, then nearly fatal to almost any company in this business." Blumberg Depo. 189:13-18. As such, Blumberg testified that Qualcomm did not share any technical information about its patents: "[I]n the absence of the ability to cut off supply, we might have gone through that same kind of arrangement where Qualcomm would have been incented to give us technical and legal presentations to explain why it would be a bad idea to terminate . . . [b]ut we never got to those discussions because Qualcomm didn't feel they needed to." *Id.* at 190:24-191:7.

Thus, shortly after Eric Reifschneider's (QTL Senior Vice President and General Manager) chip supply threats, Lenovo and Qualcomm agreed to a new patent license agreement. On June 27, 2013, Qualcomm and Lenovo executed an Amendment to Subscriber Unit License Agreement, with an effective date of June 28, 2013. ECF No. 1326 at 6. The 2013 CDMA SULA amendment preserved the royalty rate Lenovo pays to Qualcomm. JX0087-001.

b. 2013 Chip Incentive Fund Offer

Later in 2013, during LTE patent license negotiations, Qualcomm offered Lenovo substantial chip incentive funds, although Lenovo remained concerned about Qualcomm's ability to cut off chip supply.

In a November 19, 2013 email, Eric Reifschneider (QTL Senior Vice President and General Manager) proposed that Qualcomm would rebate Lenovo $5 for every Qualcomm modem chip Lenovo purchased, up to a total of $180 million. CX6491-002. The chip incentive fund

carried two conditions, according to Reifschneider's email. Lenovo would have to "[e]nter into a 4G SULA . . . with Qualcomm that is generally on Qualcomm's standard terms including royalties of 4% of the net selling price" and "[c]ommit to purchase at least 30M Snapdragon chips from QTI during the first 18 months . . . and at least 50M Snapdragon chips from QTI during the last 12 months." CX6491-003 (emphases removed). QTI ("Qualcomm Technologies, Inc.") is the Qualcomm subsidiary that operates QCT.

Ira Blumberg (Lenovo Vice President of Intellectual Property) testified that the chip incentive fund would lower Lenovo's total cost of doing business with Qualcomm, but not reduce the royalty rate Lenovo paid whenever Lenovo purchased Qualcomm's rivals' chips:

> [I]n general, the way that Christian, who is typically the negotiator on the financial terms, would discuss it with Qualcomm was effectively a total cost of using Qualcomm: Cost of chips, cost of royalties, and so on. And so Qualcomm was basically saying, 'Well, we can address the total cost by doing things that will make it effectively less expensive.'

Blumberg Depo. 218:1-10.

During the negotiations, Lenovo worried about chip supply. On November 22, 2013, Ira Blumberg (Lenovo Vice President of Intellectual Property) wrote to other Lenovo executives that even though Lenovo's strongest leverage in negotiations was to terminate the patent license, doing so could threaten Lenovo's chip supply from both Qualcomm and MediaTek: "Qualcomm has threatened to stop selling its chips to Lenovo if Lenovo terminates its license. Further, Qualcomm has threatened to force its chip licensees (including MediaTek) to stop selling mobile phone chips to Lenovo if Lenovo terminates its license." CX2079-004. As discussed below in the section on Qualcomm's refusal to license rivals, Qualcomm and MediaTek had entered an agreement that restricted MediaTek to selling modem chips only to Qualcomm licensees.

In later emails, Blumberg doubled down on the existential threat posed by a loss of chip supply: "[W]hat would Lenovo do if Qualcomm and/or Mediatek experienced a natural disaster that prevented it from delivering chips for 3+ months? The legal situation Lenovo is facing is quite similar as there is risk that Lenovo could lose its supply of chips for a substantial period of

time." CX2079-002. However, in December 20, 2013, Yang Chu (Lenovo) confirmed in an email to Blumberg that MediaTek "committed to ensure the supply for Lenovo even if we did not sign off the contract with Qualcomm." CX2079-001. Ultimately, Lenovo did not accept Qualcomm's chip incentive offer. Blumberg Depo. 180:9-14.

c. 2015 Chip Supply Threats

China's National Development and Reform Commission ("NDRC"), the government antitrust agency, investigated Qualcomm's patent licensing practices and instituted a rectification plan that altered the terms for Qualcomm's China patent licenses. After the NDRC rectification plan, Qualcomm and Lenovo entered a negotiation regarding Lenovo's China patent license. In a December 16, 2015 email forwarded by Sanjay Vanjani (Lenovo Chief Financial Officer), Scott Offer (Lenovo) reported that Eric Reifschneider (QTL Senior Vice President and General Manager) had again threatened Lenovo's chip supply: "Ira [Blumberg] made a proposal which Eric did not reject out of hand. On that call, Eric once more made another threat about continued chip supply if we do not have a license. Action: David/Heather to research what the NDRC rectification plan says about continued supply." CX2093-002. Two months after Reifschneider's threat, on February 17, 2016, Qualcomm and Lenovo entered a Chinese Patent License Agreement. QX9266-391.

In sum, Qualcomm has engaged in anticompetitive conduct toward Lenovo by threatening to cut off Lenovo's chip supply; threatening that even Qualcomm's rival MediaTek cannot sell chips to Lenovo if Lenovo becomes unlicensed with Qualcomm; demanding unreasonably high royalty rates without providing technical or legal information about Qualcomm's patents; and offering chip incentive funds if Lenovo committed to purchasing 30-50 million Qualcomm chips.

7. BlackBerry

Qualcomm engaged in anticompetitive conduct toward BlackBerry by requiring BlackBerry to sign a patent license agreement before assuring BlackBerry's supply of modem chips and by providing BlackBerry chip incentive funds that effectively required BlackBerry to purchase Qualcomm modem chips exclusively.

John Grubbs (BlackBerry Senior Director of Intellectual Property Transactions) testified that Qualcomm's requirement of a license in order to buy chips is unique in the industry:

> **Q**: Do any other suppliers of BlackBerry require BlackBerry to acquire a patent license in order to purchase components from that supplier?
> **A**: No, not to my knowledge.
> **Q**: Do any of BlackBerry's suppliers own standard essential patents that breed [sic] on the products that they are selling to BlackBerry?
> **A**: Historically when we were producing devices, yes, there were some of our suppliers that owned standard essential patents and – and we did not have a patent license agreement in place with those suppliers.

Grubbs Depo. 268:15-269:5.

On March 22, 2000, Qualcomm entered a patent license agreement with Research In Motion Limited ("RIM"), a corporate predecessor of BlackBerry, effective March 22, 2000. ECF No. 1326 at 4–5. On March 21, 2001, Qualcomm entered a patent license agreement amendment with RIM, effective March 21, 2001 ("2001 SULA"). ECF No. 1326 at 5.

a. 2010-2011 Chip Supply Leverage

BlackBerry and Qualcomm further amended the March 22, 2000 SULA in an agreement entered on January 26, 2011, with a retroactive effective date of October 1, 2010 ("2010 SULA"). ECF No. 1326 at 5; JX0094-002.

John Grubbs (BlackBerry Senior Director of Intellectual Property Transactions), who was involved in negotiations with Qualcomm, testified that Qualcomm required BlackBerry to sign a patent license before Qualcomm would sell BlackBerry premium LTE modem chips: "[A]t that point we had no license for LTE, and from what – from what I recall, we were told that we had to get a license before they would supply us with LTE chipsets." Grubbs Depo. 225:9-13.

Grubbs testified that in 2010, BlackBerry and Qualcomm were engaged in a dispute over the existing 2001 SULA: "[T]here was a dispute between BlackBerry and Qualcomm over . . . the scope of whether the [2001] license agreement covered UMTS-only devices." *Id.* at 231:14-16. UMTS is a 3G standard. ECF No. 1326 at 3. As a result, Grubbs testified that BlackBerry was very concerned that Qualcomm could withhold BlackBerry's chips during the dispute:

> BlackBerry was very concerned that Qualcomm – if BlackBerry pushed that issue too far, that Qualcomm could just shut down supply and walk off, and BlackBerry had no contractual provisions or contractual agreements that would allow them to stop – to not do that or – or to where we could go sue for damages.

Grubbs Depo. 231:17-25. BlackBerry sought a component supply agreement to ensure supply, which Qualcomm conditioned on resolving the SULA, per a June 2010 email Derek Aberle (QTL President) wrote to Larry Conlee (BlackBerry): "As part of this overall deal, we will need to resolve our current disagreement regarding the SULA." CX3264-001.

The supply agreement bolstered Qualcomm's no license, no chips practice, though. Qualcomm could terminate the supply agreement if BlackBerry defaulted on its patent license agreement: "QUALCOMM shall have the right to terminate this Agreement and/or to cancel or hold any and/or all orders placed by Buyer . . . if . . . Buyer is in default under the License Agreement." JX0093-121.

Under the 2010 SULA, BlackBerry paid Qualcomm a [redacted] advance fee and a [redacted] per handset royalty payment on each CDMA or WCDMA handset BlackBerry sold. JX0094-019, -027.

John Grubbs (BlackBerry Senior Director of Intellectual Property Transactions) testified that the royalty rates BlackBerry paid Qualcomm were "significantly higher than any other SEP rate [BlackBerry] paid to anybody else in the industry." Grubbs Depo. 236:5-7. However, Grubbs testified that BlackBerry felt unable to challenge Qualcomm's royalty rate without an assurance of chip supply: "I mean, at that point we had no license for LTE, and from what – from what I recall, we were told that we had to get a license before they would supply us with LTE chipsets." Grubbs Depo. 225:9-13.

Grubbs testified that he did not believe Qualcomm's 5% royalty rate was FRAND because many of Qualcomm's CDMA patents had expired: "So at some point you get to the point where an entity is paying 5 percent for the CDMA patents when there may not be but just a handful of CDMA patents left. So that – in that respect, it – it becomes a not – it violates FRAND." Grubbs Depo. 235:10-15.

Grubbs also testified that BlackBerry considers the value of any patent cross-license from

the licensee when setting royalty rates: "All I can say is based on what BlackBerry has done, and I know that we would take into account the value of any cross-license coming back – if there was any significant value there – before we would price our license." Grubbs Depo. 94:23-95:2.

However, because BlackBerry needed Qualcomm's CDMA and premium LTE modem chips, BlackBerry was unable to challenge Qualcomm's royalty rates, according to Grubbs: "[I]f BlackBerry tried to assert that the license terms were not FRAND, then that – I mean, that's been our concern, that we can't do that because of the supply issue." *Id.* at 240:25-241:3. When asked if BlackBerry had alternative suppliers for CDMA modem chips, Grubbs testified that there were "[n]ot viable alternatives, no." *Id.* at 213:23-214:8. Thus, if Qualcomm shut off BlackBerry's CDMA chip supply, Grubbs testified that "30 percent of our device sales would have gone away overnight if we couldn't have supplied CDMA devices." *Id.* at 239:11-14.

BlackBerry was also concerned that Qualcomm could cut off engineering support, which would functionally cut off chip supply: "[I]f we were getting aggressive in terms of the license side, [then] Qualcomm could alter their engineering support services to us, which would have the net effect, or very close to it, of stopping our supply of chipsets." *Id.* at 240:7-20.

b. 2010-2011 Chip Incentive Funds

Qualcomm also gave BlackBerry [redacted] million in chip incentive funds to induce BlackBerry to sign the 2010 SULA. John Grubbs (BlackBerry Senior Director of Intellectual Property Transactions) agreed that the "strategic incentive[s] . . . were contingent on BlackBerry resolving its royalty dispute with Qualcomm." Grubbs Depo. 248:9-15.

The chip incentives effectively required BlackBerry to buy modem chips exclusively from Qualcomm. Derek Aberle's (QTL President) June 2010 proposal stated that BlackBerry could receive the chip incentives only if BlackBerry purchased a majority of its modem chips from Qualcomm: "Savings predicated on achieving 50% of RIM UMTS volume by Q4'11." CX3264-005. BlackBerry received the incentives as rebates on Qualcomm modem chips, according to Grubbs' contemporaneous notes: "Incentive amount is: $1.75 per chip for the 7500A and 7600 chips [and] $2.75 per chip for the 7630 and 8655 chips." CX3255-002.

Thus, John Grubbs testified that because the chip incentives accrued only on purchases of Qualcomm chips and did not reduce BlackBerry's actual royalty burden, the chip incentives reduced the total cost of Qualcomm chips but not of Qualcomm's rivals' chips:

> BlackBerry is going to pay the royalty, regardless of whether it buys the chip from Qualcomm or Marvell. If – if Qualcomm agreed to reduce the royalty, then BlackBerry could buy the chips from Qualcomm or Marvell and still get the benefit of that reduced price. If Qualcomm reduces the chip cost, then we can only go to one person in order to take advantage of that and that's Qualcomm. So we can't go to Marvell and take advantage of a reduction in chip price unless they're going to get this reduction too.

Grubbs Depo. 259:13-25. Grubbs testified that the chip incentives reduced BlackBerry's effective royalty rate on Qualcomm chips to 4.37%. *Id.* at 259:6-11.

Grubbs testified that these chip incentives contributed to BlackBerry shifting its modem chip purchases from Marvell to Qualcomm:

> [Marvell] apparently – or from what I – what I understand were about two years behind on LTE development. And in addition, we – we also switched to Qualcomm because of a – or at least one of them – the factors that didn't – didn't hurt was the fact that we had a large incentive to divert our UMTS business to Qualcomm.

Id. at 111:1-7.

In sum, Qualcomm engaged in anticompetitive conduct toward BlackBerry by conditioning chip supply assurances on BlackBerry signing a Qualcomm patent license agreement and by paying BlackBerry chip incentive funds that functionally required BlackBerry to buy Qualcomm modem chips, to the exclusion of rivals' modem chips.

8. Curitel

Qualcomm engaged in anticompetitive conduct toward the OEM Curitel by cutting off Curitel's chip supply.

In 2001, during patent license negotiations with Curitel, Marv Blecker (QTL Senior Vice President) recommended in an email to Steve Altman (Qualcomm lawyer and later Qualcomm President) and Derek Aberle (Qualcomm lawyer and later Qualcomm President) that Qualcomm threaten Curitel's chip supply to end license negotiations: "I think we need to explicitly threaten to

(and actually) cut off ASIC shipments if they do not accept our final proposal (this is our final proposal); after all, they are not licensed and we have moved considerably from our initial position." CX8286-001. Twenty minutes later, Jim Lederer (later QCT Executive Vice President and General Manager) replied that QCT had cut off supply: "We have stopped shipments until resolution of these terms . . . ." CX8286-001.

In January 2002, Marv Blecker told Curitel officials in an email, on which Derek Aberle (Qualcomm lawyer and later Qualcomm President) was copied, that QTL was cutting off Curitel's chip supply:

> I am asking our QCT Division to hold all sales and shipments of CDMA ASICs to Curitel until this agreement is executed because QUALCOMM does not sell CDMA ASICs to non-licensees. We have been working on this agreement for many months and it seems to me that it is well past time to bring this matter to conclusion.

CX6469-001.

9. BenQ

Qualcomm engaged in anticompetitive conduct by threatening to cut off the OEM BenQ's chip supply after BenQ challenged Qualcomm's use of the handset as a royalty base.

In an October 5, 2004 email, Kim Huang (BenQ) stated in an email to Marv Blecker (QTL Senior Vice President) and Derek Aberle (Qualcomm lawyer and later Qualcomm President) that Qualcomm's use of the handset as the royalty base was "an out-of-date concept." CX8281-002. Huang argued that Qualcomm's intellectual property is for communication, and Qualcomm does not own intellectual property on color TFT LCD panel, mega-pixel DSC module, user storage memory, decoration, and mechanical parts. The costs of these non-communication-related components have become more expensive and now contribute 60-70% of the phone value. The phone is not just for communication, but also for computing, movie-playing, video-taking, and data storage. Huang stated specifically:

> Qualcomm owns IPR [intellectual property rights] on 'Communication' related components of a mobile phone; we appreciate and respect that. But you don't own IPR on most of the other key components. For example, color TFT LCD panel,

> mega-pixel DSC module, user storage memory, decoration mechanical parts and etc. These non-communications-related components have become more and more important and the cost of them became higher and higher-probably contribute more than 60%-70% of a whole phoneset. Please note that, a phone in the future is not for communication only, but may be used for computing, movie playing, video taking, mega-picture taking, data storage and etc. Just like a notebook computer. Do you charge the whole notebook computer when a manufacturer build-in a CDMA modem in their notebooks?

CX8281-002. Huang's email provoked a backlash from Qualcomm.

Jeff Jacobs (Qualcomm)[7] forwarded Huang's email on October 6, 2004 and wrote: "Certainly send waves around the industry if they lose their license as they have made a visible commitment to CDMA and WCDMA." CX8281-001. Tony Thornley (Qualcomm) replied that Qualcomm may need to threaten BenQ's chip supply: "A situation we should work hard to fix rather than terminate. However, the threat may be what is needed." *Id.* The same day, only one day after Huang's email, Steve Altman (Qualcomm lawyer and later Qualcomm President) affirmed in an email sent to Paul Jacobs (later Qualcomm CEO) that Qualcomm had already threatened BenQ's chip supply: "We have made the threat. Hopefully, they will respond positively." *Id.*

Two months later, on January 6, 2005, BenQ and Qualcomm signed a new patent license agreement. JX0030. Under the license agreement, BenQ owed Qualcomm's standard 5% running royalty rate, with the handset as royalty base. *See* JX0030-007 (defining the royalty base as "the Selling Price charged by LICENSEE for Subscriber Units Sold to such Purchaser." JX0030-007 to -008. Thus, BenQ responded "positively" to Qualcomm's chip supply threat. Accordingly, Qualcomm engaged in anticompetitive conduct by threatening to cut off BenQ's chip supply after BenQ challenged Qualcomm's use of the handset as a royalty base.

10. Apple

Qualcomm engaged in anticompetitive conduct with respect to Apple by (1) refusing to sell Apple modem chips or even share sample chips until Apple signed a patent license; (2)

[7] Where the Court is not aware of a Qualcomm employee's job title, the Court identifies the individual's role solely as "Qualcomm."

eliminating a competing cellular standard that Intel was supporting; (3) attempting to require Apple to cross-license its entire patent portfolio to Qualcomm; and (4) using Qualcomm's monopoly power to enter exclusive deals with Apple that foreclosed Qualcomm's rivals from selling modem chips to Apple from 2011 to September 2016.

a. Qualcomm Refused to Sell Apple Modem Chips Until Apple Signed a Patent License

Tony Blevins (Apple Vice President of Procurement) testified that Apple shipped its first handset, the iPhone, in January 2007. Tr. at 669:19-21. Blevins testified that two years before that launch, in 2005, Apple reached out to potential modem chip suppliers, including Qualcomm. *Id.* at 674:16-20. Blevins testified that Qualcomm informed Apple of Qualcomm's practices of not selling modem chips exhaustively and requiring OEMs to sign a license before purchasing modem chips: "[I]nstead of offering us samples and specifications, we got a letter indicating that they had a licensing agreement that had to be completed prior to them shipping us any samples or having any engagement." *Id.* at 675:14-17. That letter, which Jeff Altman (QTL Business Development) sent to Apple's Barry Corlett, stated, "Once this patent license has been completed, licensee would then have the rights to purchase chips, software, reference designs from our ASIC group (called QCT) or one of our other ASIC licensed suppliers." JX0032-001.

Tony Blevins (Apple Vice President of Procurement) testified that Qualcomm's practices were unique in multiple respects. First, that Apple could not even obtain samples without a Qualcomm patent license: "I'd spent 20 years in the industry, I had never seen a letter like this. It was going to take me some time to evaluate, but it looked like there was a requirement for an agreement before we got samples." Tr. at 676:4-7.

Second, that Qualcomm required Apple to cross-license its patents to Qualcomm: "[W]e later learned that license also required Apple to cross-license its IP back to Qualcomm, which we found unsettling. . . . This is the only one that I've ever personally seen." *Id.* at 676:25-677:2, 678:7-10. As a result, Tony Blevins testified, Apple elected not to buy chips from Qualcomm that year: "But we knew that we weren't going to cross-license all of our IP back to Qualcomm. We

were simply trying to buy a chip. So at this point we essentially eliminated Qualcomm from further consideration." *Id.* at 677:6-10.

Tony Blevins (Apple Vice President of Procurement) testified that as a procurement executive, he was not usually involved in intellectual property discussions, but that negotiations with Qualcomm always entangled patent licensing and chip supply: "I'm generally not involved in separate and distinct intellectual property licensing discussions. We have a separate team at Apple that does that. However, in this case, these two issues, they were just hopelessly entangled." *Id.* at 704:3-7.

In 2006, Qualcomm reiterated its practice of requiring an OEM to sign a patent license before purchasing modem chips when Qualcomm responded to Apple's request for quotation to supply modem chips for a future Apple handset. In Qualcomm's response, which Tony Blevins (Apple Vice President of Procurement) received, Mark Savoy (QCT Director of Sales) attached a draft patent license agreement: "Attached are documents referenced in the RFQ regarding QUALCOMM's Subscriber User License Agreement (SULA) as well as a letter discussing our position on third party IPR rights." CX0507-001. According to Blevins, Apple viewed the response as a reiteration of Qualcomm's earlier approach: "So once again, they were reiterating that you have to sign this license agreement if you want to buy chips." Tr. at 679:18-20.

b. 2007 Marketing Incentive Agreement

Apple and Qualcomm eventually reached an indirect patent license agreement, which they memorialized in the Marketing Incentive Agreement, effective as of January 8, 2007 ("MIA"). ECF No. 1326 at 4. Of special note, Qualcomm used its monopoly power against Apple to eliminate WiMax, a competing cellular standard supported by Intel.

The MIA lowered Apple's royalty payments to Qualcomm through a rebate structure. Apple does not manufacture handsets itself but instead uses contract manufacturers, including Pegatron and Wistron, to manufacture handsets. ECF No. 1326 at 4. These contract manufacturers pay Qualcomm a 5% running royalty rate on the manufacturers' handset selling price. JX0042-014 to -015 (Wistron SULA). Then, according to Jeff Williams (Apple COO),

Apple reimburses the contract manufacturers: "Qualcomm had a standard agreement with contract manufacturers and the contract manufacturers paid Qualcomm, and we reimburse the contract manufacturers." Tr. at 868:5-7. In the MIA, Qualcomm agreed to provide Apple royalty rebates on each handset to reduce Apple's royalty payments: "For each Apple Phone purchased by Apple or an Apple Authorized Purchaser during the Term, Qualcomm agrees to pay a Marketing Incentive (defined below) to Apple." JX0040-002. According to Jeff Williams, the MIA rebated Apple's royalty payments to a total of $7.50 per handset. Tr. at 870:17-18.

Apple had contested Qualcomm's royalty terms during the negotiations leading to the MIA. According to Jeff Williams (Apple COO), Apple did not view a handset as an appropriate royalty base for Qualcomm's cellular patents because Apple added handset value that had little to do with Qualcomm's patents. For example, Apple was the first to embed NAND memory, a type of flash memory. If Apple spent $100 on cost for NAND memory, Apple had to pay $5 to Qualcomm even though Qualcomm's intellectual property had nothing to do with NAND memory:

> We were bringing some innovation. And, for example, we were one of the first and led the charge to embed a lot of NAND memory. We did this on our iPods, and we were going to do it on our iPhones, and if we put another $100 of cost in NAND memory, per the Qualcomm agreement, they would get $5 of that even though their IP had nothing to do with that.

Tr. at 869:18-24. Accordingly, Williams testified that Apple had originally proposed a 5% royalty rate on the modem chip price, which amounted to $1.50 per modem chip: "[W]e originally proposed $1.50. We flew down to San Diego and proposed that. That was rejected." *Id.* at 870:22-24. Although Jeff Williams (Apple COO) testified that Apple viewed the $7.50 per handset royalty payment the companies settled on as excessive, Apple had no alternative: "If we didn't agree, then we would be paying the contract manufacturer rate, which was in the high teens; or if we somehow challenged it, we stood the risk of our brand new iPhone we were working on getting enjoined." *Id.* at 871:8-12.

From Qualcomm's perspective, giving Apple royalty rate rebates was justified because

Qualcomm used the MIA to eliminate WiMax, a competing cellular standard supported by Intel. In the MIA, Apple committed to "publicly announce that Apple has chosen GSM technology for its phone and that GSM provides the best global solution for its customers today and into the future with 3G and beyond." JX0040-001. Qualcomm enforced the WiMax provision with a clause that provided the MIA (and thus Apple's rebates) would terminate if (1) Apple sold 1,000 or more WiMax iPhones; or (2) Apple licensed a third party to sell WiMax phones. JX0040-003.

According to Jeff Williams (Apple COO), Apple's MIA with Qualcomm ended Apple's engagement with Intel's WiMax standard:

> **Q**: And following the execution of that agreement, did Apple pursue WiMax further?
> **A**: No. In essence, it was killed in the cradle for us. We did not.

Tr. at 873:21-23.

Internally and in discussions with Apple, Qualcomm viewed Apple's commitment to GSM over WiMax as a crucial strategic win. In December 2006, Marv Blecker (QTL President) sent an email regarding the MIA negotiations, and Steve Altman (Qualcomm President) added his notes in a follow-up email. CX8260-001. Paul Jacobs (Qualcomm CEO) and Derek Aberle (Qualcomm General Manager of Licensing) received the email. *Id.* Blecker's email listed "key aspects" of the Apple deal, including "Apple Public commitment to WCDMA vs. WiMax for their next gen products." CX8260-002. Steve Altman responded, "We are most interested in their making it clear that they have no plans for supporting WiMax." *Id.*

Later, in January 2007, prior to the execution of the MIA, Marv Blecker (QTL President) emailed Jeff Williams (Apple COO) and told Williams that Qualcomm's first priority was eliminating WiMax: "However, we believe that the entire basis of this deal is that Apple is going to select either WCDMA [a GSM technology] or WiMax, not both. Motivating Apple to select WCDMA to the exclusion of WiMax is our primary motivation for entering into this agreement." CX0617-001.

Irwin Jacobs (Qualcomm Co-Founder and former Qualcomm CEO) testified that Qualcomm would have been behind in supplying WiMax chips had WiMax become the 3G

standard:

> **Q**: It's accurate to state, sir, that if WiMax had ended up as the standard, Qualcomm would have been far behind; is that right?
> **A**: That's fine.

Tr. at 1284:10-13.

Thus, via the MIA, Qualcomm used the threat of chip supply and its high royalty rate to eliminate WiMax not because WCDMA was a superior technology, but because Qualcomm's rival was supporting WiMax and Qualcomm was not.

In other contexts, too, Qualcomm has recognized that its chip supply leverage enhances Qualcomm's position in standards bodies. In an April 2015 email, David Wise (now Qualcomm Senior Vice President and Treasurer) told Steve Mollenkopf (Qualcomm CEO) that QCT gives Qualcomm a strong berth in SSOs, but "[i]f separate, QTL may be isolated and ineffective at getting tech into the std. No QCT distribution." CX5913-001. The MIA is one specific example of Qualcomm using chip leverage to have its standard adopted in the first place.

c. 2009 Strategic Terms Agreement

Qualcomm later exercised its CDMA monopoly power to charge Apple a CDMA price premium. Tony Blevins (Apple Vice President of Procurement) testified that in 2009, Apple was planning to launch a 2011 CDMA iPhone worldwide. Tr. at 672:9-16. According to Jeff Williams (Apple COO), Qualcomm was Apple's only viable option to supply modem chips for the 2011 CDMA iPhone: "We also looked – there was also a small company in Taiwan, VIA, that we looked at, but concluded they weren't technically ready or capable. So just Qualcomm." Tr. at 874:21-23. On December 18, 2009, QCTAP (QCT's Asia Pacific arm) and Apple entered the Strategic Terms Agreement ("STA"), a CDMA chip supply agreement. JX0052-001.

Tony Blevins testified that the STA terms differed significantly from Apple's other component supply agreements, in that Qualcomm refused to sell modem chips exhaustively and refused to provide indemnification: "They're not what we typically want. Examples I can give you is we want to buy parts exhaustively; the agreement doesn't provide for that. We want indemnification; the agreement doesn't provide for that." Tr. at 686:21-24.

Qualcomm made it clear to Apple that Qualcomm's practice of refusing to sell modem chips exhaustively was unique within Qualcomm, and is limited to the modem chip markets where Qualcomm has monopoly power. A Qualcomm slide deck presented to Tony Blevins (Apple Vice President of Procurement) includes a slide titled "Authorized Purchaser," which sets forth Qualcomm's licensing requirements. CX8261-004. Under "WAN," which means cellular modem chips, the slide states: "Must be a licensee in good standing." *Id.* However, under non WAN, which Blevins testified means all other components, like Wi-Fi, the slide states: "No separate license" and "Sold on an exhaustive basis." *Id.* Thus, Qualcomm does not require OEMs to sign a separate license before purchasing other products and sells products exhaustively in markets where Qualcomm lacks monopoly power, as Tony Blevins testified: "And so they were essentially saying that for these types of products where there was [sic] competitive alternatives, they would match what other competitors would provide." Tr. at 688:2-5.

Similarly, when asked at trial whether "device manufacturers purchasing Wi-Fi components from Qualcomm have to first take a license to Qualcomm's Wi-Fi standard essential patents," Fabian Gonell (QTL Legal Counsel and Senior Vice President, Licensing Strategy) testified "No." Tr. at 1483:18-21. Thus, Qualcomm's practice of only selling modem chips to an OEM after the OEM signs a separate license agreement is unique even within Qualcomm.

During STA negotiations, Qualcomm knew that Qualcomm's monopoly position in CDMA modem chips gave Qualcomm leverage over Apple. For example, during 2009 internal Qualcomm discussions regarding how to price CDMA modem chips for Apple, Eric Koliander (QCT Vice President, Sales) wrote to Cristiano Amon (now Qualcomm President): "Truthfully, we should take a harder line with these issues for CDMA since their options are limited." CX6839-002. Cristiano Amon replied, "Can't imagine Via would be an option." CX6839-002.

Qualcomm proposed to charge Apple a $5 price premium on CDMA modem chips, according to an August 2009 email Koliander sent to Amon and other QCT officials recapping a Qualcomm meeting: "[A]ll are in agreement that we would like to see a CDMA price premium over UMTS quoted price." CX6840-001. Koliander observed later in the email that although

Apple may respond negatively to the CDMA adder, Apple did not have other short-term supply options: "May motivate Maverick to light up a CDMA competitor (unlikely given time constraints)." CX6840-002. Maverick is Qualcomm's internal code name for Apple. ECF No. 1326 at 10.

d. 2011 Transition Agreement

Qualcomm entered its first exclusive deal with Apple in 2011. In February 2011, Apple, Qualcomm, and QCTAP entered into a Transition Agreement ("TA"), effective as of February 11, 2011, under which Qualcomm paid Apple funds for Apple to transition its chip business to Qualcomm. ECF No. 1326 at 4.

The TA came about in part because Apple wanted to use Qualcomm modem chips as Apple began developing premium LTE handsets and because Apple wanted additional royalty rate rebates from Qualcomm. Jeff Williams (Apple COO) testified that Qualcomm would not apply the MIA rebate to Apple's CDMA handsets: "[W]e discovered that the $7.50 royalty agreement that we had reached was not going to apply to CDMA phones or iPads, and this really upset us." Tr. at 875:2-4. In addition, Williams testified that Apple needed Qualcomm's CDMA and premium LTE modem chips: "We needed their CDMA and LTE technology. We were interested in working with them. They had good engineering leadership in that space, and we asked for transition funds associated with moving business to them." *Id.* at 875:17-19.

According to an August 2010 email from Paul Jacobs (Qualcomm CEO) to Tim Cook (now Apple CEO), Qualcomm would only provide Apple additional royalty rate rebates if Apple committed to purchasing Qualcomm's chips: "We did discuss potentially providing Apple with a rebate on larger screen devices like the iPad, but as part of a larger business relationship between the companies, including Apple's use of Qualcomm chips in its iPhones and devices like the iPad." CX0599-001.

Later in the TA negotiations, Steve Mollenkopf (QCT President) emphasized to Jeff Williams (Apple COO) that Qualcomm would only provide Apple royalty rate rebates if Apple agreed to use Qualcomm chips exclusively: "[W]e are unwilling to have the marketing agreement

apply to CDMA iPhones as part of this deal but we are willing to provide a separate, significant sum of money as part of the chip deal. The structure and $1B (a huge number from our perspective) below is the entirety of our proposal." CX5363-017.

Internal Qualcomm documents from 2010, during the TA negotiations, show that Qualcomm was focused on using Apple's desire for royalty rate rebates to secure exclusivity.

A June 2010 Qualcomm modem strategic plan, which Steve Mollenkopf (QCT President) received, listed "Competition is laser focused on thin modem with significant cost advantage based on scalable architectures" among threats to Qualcomm's modem business. CX6381-008. Mollenkopf agreed at trial that Apple purchases only thin modems. Tr. at 773:13-15.

Thus, in an August 2010 email, Steve Mollenkopf (QCT President) told Paul Jacobs (Qualcomm CEO), Derek Aberle (QTL President), and Steve Altman (Qualcomm President) that if Qualcomm secured Apple exclusivity in the TA, Qualcomm could prevent those thin modem competitors from becoming threats: "[T]here are significant strategic benefits as it is unlikely that there will be enough standalone modem volume to sustain a viable competitor without that slot." CX5348-001. Slot and socket are terms for a modem chip design win for a handset. Tr. at 775:8-10.

Later in the TA negotiations, in November 2010, Steve Mollenkopf (QCT President) received an email from Marc McCloskey (Qualcomm) that highlighted the competitive downside of Apple choosing a different modem chip supplier: "[I]f Maverick went to a competitor and made them more competitive in the market like IFX & Samsung, then what is the impact of losing share going forward?" CX5357-001. Maverick is Qualcomm's code name for Apple, and IFX refers to Infineon. ECF No. 1326 at 9. In December 2010, as TA negotiations neared their end, Steve Mollenkopf (QCT President) again emphasized in an email to Derek Aberle (QTL President) and Steve Altman (Qualcomm President) that Qualcomm was focused on exclusivity: "Need payment and earn-out mechanism that aligns with goal of design-ins and exclusivity." CX5360-003.

Steve Mollenkopf (QCT President) elaborated in another December 2010 email to Cristiano Amon (now Qualcomm President) and other Qualcomm executives that Qualcomm

needed to secure exclusivity in future Apple handset models: "The conclusion is that we want this account but the deal needs to tie any incentives to Mav3 and Mav5 as these are the key units with Mav5 being the more important one." JX0055-006.

The TA provided Qualcomm that exclusivity. Qualcomm committed to pay Apple up to $1 billion via a Transition Fund, Marketing and Development Fund ("MDF"), and Variable Incentive Fund ("VIF") from 2011 to 2015. JX0057-001 to -002.

Qualcomm's payments to Apple were subject to some conditions and volume requirements. If Apple did not launch a handset with a Qualcomm UMTS modem chip by March 2012, Apple would forfeit all Transition Fund payments. JX0057-002. UMTS is an umbrella term for the 3G WCDMA standard, which is distinct from CDMA. ECF No. 1326 at 3. If Apple did not launch a UMTS handset by the end of 2012, Apple would have to pay back more than one hundred million in MDF payments. JX0057-002.

Apple's receipt of the hundreds of millions of VIF funds also depended on the volume of chips Apple purchased from Qualcomm. JX0057-002. If Apple purchased more than 115 million Qualcomm modem chips from October 1, 2011 to September 30, 2012, Apple received the full amount of VIF funds for that year. JX0057-002. If Apple purchased fewer than 80 million Qualcomm modem chips in that period, Apple received no money. JX0057-003. In future years, Apple needed to increase purchase volumes to 125 million annual units and then to 150 million units to receive the full amount of VIF funds for that year. JX0057-003.

Further, Tony Blevins (Apple Vice President of Procurement) testified that these payments, which effectively reduced Apple's royalty obligations, were contingent on modem chip exclusivity: "However, and importantly, there would be large rebates associated with the nominal royalty payments if we were to use Qualcomm chips exclusively." Tr. at 689:7-9.

Of particular import in the TA are its termination and clawback provisions, which ensure exclusivity. The TA would automatically terminate if Apple sold any "Apple product commercially that incorporates a non-Qualcomm cellular baseband modem." JX0057-004. Thus, if Apple used any non-Qualcomm modem chip in an Apple handset, Apple would forfeit future

TA payments. The clawback provision imposed even greater penalties. Under that provision, "if during calendar year 2013 Apple [sold] an Apple product commercially that incorporates a non-Qualcomm cellular baseband modem," Apple would have to pay back Qualcomm hundreds of millions in funds already received under the TA. JX0057-004.

According to Tony Blevins (Apple Vice President of Procurement), the TA's termination and clawback provisions were effectively exclusivity provisions: "They made it very unattractive for us to choose a different chipset supplier. . . . So when we factor in the rebates that we would forfeit by using a different chip supplier, it served as a very strong disincentive for us to do so." Tr. at 689:18-23.

Qualcomm ensured that those exclusivity provisions remained in the TA. In a January 24, 2011 email attaching a proposed agreement, just weeks before the TA was executed, Steve Mollenkopf (QCT President) informed Jeff Williams (Apple COO) that Qualcomm had reinserted certain provisions: "Lastly, we added back in the language on general design commitments (see our page7) that fell out of this draft. They were in the earlier ones and are important to us." CX0526-002 to -003. Page 7 of the Qualcomm proposal includes the termination and clawback provisions in redline, which shows that Qualcomm reinserted those provisions:

- If Maverick launches any device, with a non QC modem (regardless of technology), Maverick shall notify QC, and QC will no longer be obligated to make any future payments that otherwise would be required
- Maverick will reimburse Qualcomm all amounts paid, without interest, if before December 31, 2013 Maverick has commercially sold a single or multimode LTE product that incorporates a non QC modem

CX0526-014.

A March 1, 2011 Qualcomm accounting memo discussing the TA shows that Qualcomm viewed the TA as securing exclusivity: "The primary benefits of the Transition Fund to Qualcomm are the volume requirements as well as the exclusivity provision described above." CX5425-004. In sum, the TA ensured that Apple would source its modem chips exclusively from Qualcomm through at least 2013, and prevented rivals from selling any modem chips to Apple during that time period.

e. 2013 First Amendment to Transition Agreement

In 2013, Qualcomm again gave Apple royalty rate rebates in exchange for Apple's effective commitment to purchase modem chips exclusively from Qualcomm. Although Apple had planned to purchase modem chips from Qualcomm's rival Intel, Qualcomm's 2013 exclusive deal foreclosed Intel (and Qualcomm's other rivals) from working with Apple until September 2016. The Court discusses below the genesis of the 2013 agreement, its exclusivity provisions, and how Qualcomm used exclusivity to end Apple's engagement with Intel.

According to Jeff Williams (Apple COO), the MIA—which rebated Apple's royalty payments to $7.50 per handset—was set to expire at the end of 2012, and Apple wanted to secure continued royalty rate rebates to avoid hundreds of millions in additional royalty payments:

> [W]hat we were starting at is at the end of 2012, our $7.50 arrangement with Qualcomm was coming to an end and the default was that our royalty rate was going to go up to the high teens because it was just going to flow through this, this crazy contract manufacturing arrangement. And so on top of the chips we're buying, on top of the $7.50 we're already paying, there was going to be another $8 or $10, we were selling a hundred million phones, it would be another billion dollars a year in royalty for, for no extra value from Qualcomm.

Tr. at 885:23-886:7.

Qualcomm documents make clear that with the MIA set to expire, Qualcomm's goal was to secure continued modem chip exclusivity from Apple. Cristiano Amon (QCT Co-President) recommended in a December 2012 email to Steve Mollenkopf (Qualcomm President) that QCT reduce its modem chip prices to secure exclusivity: "The above means that we reduce our ASP [average selling price] premium to buy exclusivity as done in the original deal." CX8276-001.

Specifically, Qualcomm sought continued exclusivity to prevent Apple from working with Intel, a rival modem chip supplier. Apple was in contact with multiple modem chip suppliers in 2011 and 2012, but only Intel proved to be a viable Qualcomm alternative.

At trial, Matthias Sauer (Apple Engineer) said that Apple discontinued working with ST Ericsson in March 2012 because ST Ericsson could not meet Apple's schedules: "As it turned out in the course of the project, it turned out that they were slipping in their execution." Tr. at 1505:9-

10. In a March 2012 email to Matthias Sauer, Steve Schell (Apple) offered a more vivid description of ST Ericsson's problems: "They can neither execute nor manage their way out of a paper bag." QX1353-223. Sauer testified that Apple also disengaged with Broadcom in 2012 in part because Broadcom was behind schedule in developing an LTE modem for Apple's 2014 handsets. Tr. at 1510:18-24.

However, Intel proved viable. In October 2012, Apple internally stated its intent to buy modem chips from Intel for a 2014 iPad. An email with the subject line "IMC Status/Next Steps Alignment – Notes" memorializes an Apple modem chip supply meeting. JX0074-001. IMC refers to Intel. Tr. at 691:18-20. The email stated, "Discussed other chipset options including ST Ericsson, Broadcom, Renesas, Mediatek and Marvell, but IMC is the only other Tier 1 option. . . . All agreed in the meeting that IMC for J86 was a good plan." JX0074-002.

At trial, Tony Blevins (Apple Vice President of Procurement), who received the Apple email and attended the meeting, testified that Apple planned to use an Intel modem chip for an iPad as a test run before using Intel in an iPhone:

> At one point in time we had an official plan of record that we would implement Intel on an iPad product launch, and that would give us confidence to extend their presence into an iPhone. We felt that iPad was a simpler transition because it was data only, and then we would add voice as we moved to phone.

Tr. at 690:5-10. J86 was Apple's code name for the iPad Mini 2. *Id.* at 692:9-10.

Aicha Evans (Intel Chief Strategy Officer) testified that Intel's early exposure to Apple provided technical benefits to Intel: "First of all, you just execute, but you start gaining experience and exposure. You also get what I call the halo effect of better presence in the standards." *Tr.* at 569:8-10.

Around that time, Qualcomm knew that Intel was a threat to win Apple's business. Eric Koliander (QCT Vice President, Sales) sent a December 2012 email about Apple's sourcing plans to Steve Mollenkopf (Qualcomm President). CX5378-002. Koliander reported in the email, "Maverick [Qualcomm's code name for Apple] does appear to be working with Intel and we believe, Mav has assigned software and hardware engineering resources to the development of an

Intel based platform." *Id.* Koliander continued, "It is unlikely that Mav would launch an Intel based product until late 2013 earliest (believed to be data only for iPad)." *Id.* Mollenkopf testified at trial that Apple told Qualcomm directly that Apple was considering alternative suppliers, like Intel:

> **Q**: And during negotiation of the 2013 agreements, including the First Amendment to the Transition Agreement, Apple told Qualcomm that it was considering using alternative suppliers; correct?
> **A**: They did.

Tr. at 787:7-14.

Qualcomm recognizes that Apple is a particularly important OEM for modem chip suppliers in terms of scale, engineering support, and prestige. In a July 2012 slide deck presented to the Qualcomm Board of Directors and sent to Dr. Paul Jacobs (Qualcomm CEO) and Dr. Irwin Jacobs (Qualcomm Co-Founder and former CEO), Qualcomm highlighted Apple's significance to modem chip suppliers. CX6974-001. On a slide titled, "OEM Strategy: Win the Designs that Matter Most," Qualcomm listed as its primary goal "Hold position as Apple's primary modem supplier." CX6974-027. On the following slide, under the subtitle "Apple is Important," Qualcomm highlighted the following benefits of Apple's business:

- The largest consumer of high-tier modems, with binary design awards
- Apple challenges suppliers to provide best-in-class products
- Apple modem supplier is enabled to fund R&D to maintain leadership

CX6974-028. Qualcomm projected that Apple's purchase of Qualcomm modem chips could represent approximately 25% of QCT's total modem chip revenue in 2013. *Id.*

Thus, Qualcomm structured two 2013 agreements to ensure that Apple would continue to purchase modem chips exclusively from Qualcomm, and not from Intel (or any other rival). In January 2013, Steve Mollenkopf (Qualcomm President) explained in an email to Derek Aberle (QTL President) and Paul Jacobs (Qualcomm CEO) that the FATA would sacrifice short-term profits for long-term exclusivity: "Economically, our best outcome is that they second SKU and we maintain the high-end via collection of features. *Strategically*, we are better off keeping them on our stuff." CX5381-001 (emphasis added). "Second SKU" refers to Apple using a second

modem chip source.

On February 28, 2013, Apple, Qualcomm, and QCTAP entered into a First Amendment to Transition Agreement, effective as of January 1, 2013 ("FATA"). ECF No. 1326 at 4. On February 28, 2013, Apple and Qualcomm entered into a Business Cooperation and Patent Agreement, effective as of January 1, 2013 ("BCPA"). ECF No. 1326 at 4. According to a 2013 Qualcomm accounting memo, Apple and Qualcomm negotiated the FATA and BCPA in tandem: "[T]he Agreements were negotiated at the same time and there is not sufficient evidence to show that they are separable." CX5391-002.

The BCPA extended and modified the MIA rebate, which lowered Apple's royalty payment per handset. Qualcomm paid Apple rebates to lower Apple's royalty payments to $10 per iPhone and $9 per iPad. JX0078-006. In exchange, Apple promised that "all the Apple Phones it markets, offers to sell and sells will implement one or more CDMA standards." JX0078-001. Apple would forfeit the BCPA rebates if Apple took any of three actions adverse to Qualcomm's licensing business: (1) initiating FRAND litigation against Qualcomm; (2) inducing a third party to initiate FRAND litigation against Qualcomm; or (3) arguing that any Qualcomm modem chip sale exhausted Qualcomm's patents. JX0078-006. Jim Lederer (QCT General Manager) told Steve Mollenkopf (Qualcomm President) in a March 2013 email that the BCPA payments were beneficial to QTL because Qualcomm granted Apple smaller royalty rate rebates than in the MIA: "The large benefit that QTL accrues in the new deal ($10 vs $7.50) is not represented." CX7910-002.

The FATA extended and modified the TA's incentive fund payments. Qualcomm paid Apple a Marketing Fund of $2.50 per iPhone sold with a Qualcomm chip and $1.50 per iPad sold with a Qualcomm chip. JX0057-006 to -007. Qualcomm also paid Apple hundreds of millions in VIF funds conditioned on Apple's purchase of at least 100 million Qualcomm modem chips in both 2015 and 2016. JX0057-008.

Like the TA, the FATA included a clawback provision: "[I]f, during calendar years 2013 or 2014, Apple or any of its Affiliates sells a Non-QC Device commercially (i.e., more than 1000

units), Apple shall (i) promptly notify Qualcomm, and (ii) reimburse QCTAP any Marketing Fund amounts paid by Qualcomm and/or QCTAP in accordance with this Section 1.3A." JX0057-007. If Apple launched a handset with a non-Qualcomm modem chip in 2015, Apple would have to pay back any Marketing Fund amounts earned in the previous 15 months. JX0057-007 to -008. In addition, if Apple launched a handset with a non-Qualcomm modem chip in 2015 or 2016, Apple would have to pay back hundreds of millions in VIF funds. JX0057-009.

As with the TA, the FATA's clawback and termination provisions effectively precluded Apple from working with any of Qualcomm's rivals, as Tony Blevins (Apple Vice President of Procurement) testified: "[I]t was very apparent to us that the very, very large rebates that I mentioned earlier would make it a complete nonstarter to work with someone else." Similarly, Jeff Williams (Apple COO) testified that using a second supplier became financially untenable under the FATA: "In the long term, it made it prohibitively expensive to work with someone else. For example, when we signed – or when we were – we knew we were going to close the 2013 agreement, we cut off the work we were doing with Intel on an iPad." Tr. at 889:9-18.

Contemporaneous Apple documents also reflect that the FATA forced Apple to disengage from Intel. In January 2013, shortly before the FATA was executed, Jeff Williams (Apple Chief Operating Officer) wrote in an email to Tony Blevins (Apple Vice President of Procurement) that Apple, even though it wanted to use a second supplier, would have to stop working with Intel: "Assuming we close QC, we need to communicate to IMC that we will not use their chip in 2014. I think it's also true that given all of our product plan activities, that we don't want to do this." CX0531-001.

Tony Blevins replied that because Blevins made the deal with Intel to use an Intel modem chip, Blevins would tell Intel that the "new QC strategy"—i.e., the FATA—had changed Apple's product plan and prevented Apple from working with Intel:

> Jeff, I feel responsible for communicating this since I made the deal with him. Will do so when I return. We may have accidentally misled him based on the new QC strategy that was not known 6 mos ago. I think we should carefully consider what time window we communicate also ('15 ?).

Id.

The Court finds credible the testimony of Aicha Evans (Intel Chief Strategy Officer), who testified—consistently with the contemporaneous Apple emails—that it was the FATA, not Intel's technical execution, that forced Apple to stop working with Intel: "The reason was that they had, the company, Apple, had some type of business agreement with Qualcomm and that we would get a chance back for the 2016 launch, which means an engagement in 2015." Tr. at 572:1-7.

Evans testified that losing the Apple iPad Mini 2 meant that Intel lost Apple's engineering support, in addition to the iPhone business that could have followed: "We went back to the kid's table in the sense that we didn't have now that deep engagement with their engineers and so on and so forth." *Id.* at 572:21-23. Evans also testified that losing the Apple business harmed Intel's standing in the industry: "It also sort of slowed us down in terms of getting to a more credible position with the operators, as well as with, with standards and TEMS. So, yeah, it set us back two years, and, frankly, it was a near-death experience." *Id.* at 573:19-23. TEMS are network testing companies. *Id.* at 578:19-20. Thus, the FATA had cascading negative effects on Intel.

Other evidence also shows that Apple would have worked with Intel absent the FATA. Although Apple had technical concerns about Intel's execution, Tony Blevins (Apple Vice President of Procurement) testified that Apple *always* has technical concerns about its modem chip suppliers, including Qualcomm:

> I should probably describe to you that Apple's engineering team are some of the most detail obsessed, insanely passionate people on this planet. They hold themselves to high standards. They hold their suppliers to high standards. . . . So in every supplier engagement I've ever been involved in, no one ever meets all of their requirements. I'm not sure it's possible. So I do have some sympathy for our suppliers. But clearly Intel wasn't meeting all of our requirements. I'm not certain they've ever met all of our requirements on any product, and I'm not certain Qualcomm has either or even ever will. That's the nature of the game for us.

Tr. at 696:6-19. Thus, Matthias Sauer (Apple Engineer) testified that in 2016, Apple decided any technical risks were manageable and decided to proceed with purchasing Intel chips: "[T]he general engineering view was that, if we select a second supplier, we have a high chance of success. We had a cross-functional evaluation of different aspects of the engineering work. And

we concluded that the identified risks are manageable." Tr. at 1528:2-6.

During the earlier engagement in 2012, the fact that Intel's modem chip did not support carrier aggregation was irrelevant to its suitability for the iPad Mini 2, which Apple launched in 2013. Tony Blevins (Apple Vice President of Procurement) testified: "The iPad Mini 2 architecture itself didn't support carrier aggregation. So whether the chip was capable or not was irrelevant." Tr. at 697:11-13. Moreover, the Qualcomm chip for the next generation of the iPad Mini did not support carrier aggregation. Specifically, Blevins testified as follows:

> **Q**: Were any iPad Mini models released in 2014?
> **A**: Yes, we released a new model in 2014.
> **Q**: Who was the modem supplier for that device?
> **A**: That was also Qualcomm.
> **Q**: Do you if the modem in that device supported carrier aggregation?
> **A**: I know for a fact the system did not. The system architecture was not designed to enable carrier aggregation.

Tr. at 698:10-17.

Although Aicha Evans (Intel Chief Strategy Officer) conceded at trial that other OEMs, including Samsung and Motorola, decided not to purchase Intel's chip in 2013, those decisions post-date the FATA and Apple's disengagement from Intel and do not shed light on whether Apple thought Intel's modem chip was a viable product when Qualcomm entered the FATA with Apple. Tr. at 597:8-18.

Qualcomm's post-deal evaluations of the FATA highlighted its exclusivity provisions. Steve Mollenkopf (Qualcomm President) explained in a March 2013 internal email to Cristiano Amon (QCT Co-President) and other Qualcomm executives that the FATA eliminated the Intel threat: "I understand it but the scenario is really that there would have been a license fight as well and a push for alternative source." CX7910-001. A slide deck on the FATA, sent to both Steve Mollenkopf and Paul Jacobs (Qualcomm Executive Chairman), touted that Qualcomm had won "100% share in wireless phone and tablet markets through 2016" with Apple. CX5389-011.

Another 2013 slide deck with an overview of the FATA, which the Qualcomm Board of Directors received, explained that the Apple exclusivity provisions had strategic benefits for

Qualcomm despite a negative near-term financial impact on QCT. CX5527-027. A slide titled "Apple Deal Summary" included the header "QCT well-positioned until 2016," with this bullet underneath: "Strategic importance of Apple modem design-win." *Id.* However, in the next header, Qualcomm recognized that buying longer-term exclusivity through the FATA incentives would negatively impact Qualcomm's margins in the short term: "Near term financial impact QCT margin/growth rate." *Id.*

Specifically, a slide later in the slide deck titled "QCT Apple Financial Summary" compares Qualcomm's direct margins on modem chip sales to Apple under the "Apple Deal" scenario and a "No Deal" scenario. CX5527-029. Qualcomm projected that because of the incentives Qualcomm paid Apple, Qualcomm's direct margins under the "Apple Deal" scenario would be 20% lower in both 2015 and 2016 than under the "No Deal" scenario. *Id.* This too shows that Qualcomm sacrificed profits for exclusivity.

Steve Mollenkopf (Qualcomm President) emphasized in a March 2013 email to Paul Jacobs (Qualcomm CEO) that exclusivity bore longer-term strategic benefits because Qualcomm could avoid both a licensing fight and secure future Apple business:

> The most relevant comparisons however should have been made to the case where they fight on IP and spin up a second source in 2014 and 2015. In this case, we would have lost Mav 10 low, Mav 13 and a bunch of the Mav7/8 volume in 2014 and 2015. You can size the impact on page 6. It is huge and has a large strategic downside.

CX5389-001.

f. FATA Prevents Apple from Purchasing Intel Modem Chips in 2014

In 2014, the FATA again prevented Qualcomm's rival Intel from selling modem chips to Apple, despite Apple's interest in Intel. Ina February 2014 email, Isabel Mahe (Apple Vice President of Software Engineering) told Tony Blevins (Apple Vice President of Procurement) that Intel seemed capable of supplying modem chips for a 2015 iPad and 2016 iPhone: "I have some good news on Intel chipset roadmap. They are open to our proposal of a new chipset that is much lower risk from SW perspective than their current 7460. We may be able to do an iPhone in 2016

once we confirm that they can indeed deliver it." CX0853-001. In a later email, Mahe asked Blevins whether using Intel would lead to FATA penalties: "[C]an we absorb it knowing that this is paving the way so that we can have a phone in 2016?? Assuming iPads are launched in October – not sure how big is this penalty?" *Id.* Blevins replied that Apple could not work with Intel in 2015 given the FATA's clawback provisions: "In net, there is no way that we would forego otherwise earned incentives in favor of launching iPad only in '15." *Id.*

Qualcomm documents show that Qualcomm also knew the FATA precluded Apple from purchasing modem chips from Intel until spring 2016. Will Wyatt (QTI [Qualcomm Technologies, Inc., the Qualcomm subsidiary that operates QCT] Vice President, Finance) wrote in a June 2015 email to Sanjay Mehta (now Qualcomm Senior Vice President for Compute Products) that Apple would have to pay back $645 million in FATA incentives if Apple launched a non-Qualcomm handset before February 2016:

> If Mav were to launch in Sept of 2015 we would get back $200M in VIF and $445M in MDF for a total of $645M in FYQ415. I would also argue that if we knew that Mav would be launching in Oct/Nov/Dec (i.e. they announce it) then we would be able to release the MDF of $445M. Mav also will know how the math will work and likely won't launch until after Feb 15th of 2016 when they have their money for the MDF.

CX5767-001.

Apple felt hamstrung by the inability to buy modem chips from a second supplier. Tony Blevins (Apple Vice President of Procurement) wrote to Isabel Mahe (Apple Vice President of Software Engineering) in a February 2014 email: "In an ideal world, we'd like to have the freedom to either choose QCOM chips or not on the basis of their overall value (specs, sch, terms, price, etc.) and not entangle the licensing issues." CX0578-001. Blevins testified at trial that his email referred to how the FATA prevented Apple from choosing the most competitive modem chip: "[W]e'd entered into agreements that offered Apple very significant sums of money for using their chipsets exclusively. So it wasn't the kind of free market that would give us freedom to choose whomever we might want based on a level playing field." Tr. at 701:21-25.

Both Apple and Qualcomm were also aware that if Apple sourced modem chips from a

rival supplier, Apple could have the leverage to challenge Qualcomm's royalty rates. Tony Blevins (Apple Vice President of Procurement) testified that a second supplier could provide competition on Apple's modem chip prices and reduce Apple's royalty burden:

> [O]ur view was that if we could establish a supplemental chip source, we would not only give some leverage on chipset pricing, but we would reduce the stranglehold that Qualcomm has on us relative to royalty leverage, that the point in time they knew we had to buy their chip, we felt it put us in a very unfavorable position on licensing.

Tr. at 711:9-15.

Qualcomm, too, viewed the union of QCT and QTL as important leverage against any Apple attack on Qualcomm's royalty rates. In a June 2014 email to Steve Mollenkopf (Qualcomm CEO), under the header "On QCT/QTL dis-synergy and QTL strategy in general," James Thompson (Qualcomm CTO) wrote that Qualcomm should use its CDMA modem chip market power in response to Apple's desire to develop a second supplier:

> If Apple's ultimate goal is to take down our licensing business or at least chip away at it with a negotiation every few years we should fight back while we are strong. . . . We are the only supplier today that can give them a global launch. In fact, without us they would lose big parts of North America, Japan and China. That would really hurt them. Apple has already said they are going to second us with Intel based on the licensing issue and Intel's willingness to buy the business, so QCT has already lost 40-50% of their business. It can't go down any further. QCT has nothing to lose.

CX5402-003.

g. Apple Launches a Handset with an Intel Modem Chip in 2016

Finally, in late 2016, Apple launched a handset with an Intel modem chip. Qualcomm's rival Intel reaped significant benefits after Apple selected Intel to supply modem chips for a 2016 iPhone. Because an OEM must purchase modem chips well in advance of launching a handset, Apple made the decision to work with Intel in 2014, two years before the 2016 handset's commercial launch, as Matthias Sauer (Apple Engineer) testified at trial:

> **Q**: And in 2014, the Apple engineering team made a unanimous recommendation to select Intel over Broadcom for engagement as a potential second source supplier of baseband modem chips; correct?

A: That is correct.

Tr. at 1511:9-13.

Aicha Evans (Intel Chief Strategy Officer) testified that after Intel won Apple's business, other OEMs reached out about Intel's modem chips: "Lenovo is an example, LG is an example, Motorola is an example, Tesla is an example." Tr. at 576:20-577:4. Intel viewed the Apple win as a boon to Intel's business outside of the Apple volumes. Stefan Wolff (Intel Engineer) highlighted many such benefits in an internal Intel email after Intel won the Apple business:

> We will attract operators and network vendors to do early prototyping / field testing with our latest LTE platforms given Apples [sic] huge volumes in the field. This will speed up the development, hardening, and TTM of our modem technology and help us to providing leading [sic] LTE IP for emerging markets like China. The Apple business will boost our modem revenue and will support the funding of our next generation LTE 7460 on IA and 14nm Intel process.

CX1599-001.

As Intel and Apple continued to work together, Apple pushed Intel to accelerate its engineering, Aicha Evans testified: "[O]n the 2017 launch, initially I had to run for a plan of record of 450 megabits per second, and [Apple] gently explained to me that that wasn't going to cut it, it needs to be 600. So eventually I'm sure we would have done it, but not in that timeframe." Tr. at 579:19-24.

Aicha Evans (Intel Chief Strategy Officer) also testified that when working with Apple, a modem chip supplier gains increased standing in SSOs and with operators (also referred to as carriers, like Verizon): "You also get what I call the halo effect of better presence in the standards, not just presence, but better weight in terms of your contributions, in terms of starting to get leadership positions. Same thing with the operators, because these devices eventually end up on their network." Tr. at 569:9-15.

Winning the Apple business for the 2016 launch enabled Intel to acquire VIA Telecom, a CDMA technology company. Intel acquired VIA in 2015, after Intel had won Apple's business but before the Apple handset had launched commercially. CX1598-001. Aicha Evans (Intel Chief Strategy Officer) testified that to win Apple's business worldwide, including with carriers who use

CDMA, Intel required CDMA technology: "So it was sort of getting the last piece of the puzzle that would allow us to have the privilege and opportunity to supply worldwide, including on Verizon." Tr. at 584:8-10. Internal Intel projections indicated that acquiring VIA would only be profitable if Intel could supply modem chips to Apple; else Intel would not recoup its investment. CX1598-009. In addition, Aicha Evans (Intel Chief Strategy Officer) testified that Intel's modem chip division was only able to pitch the VIA acquisition after Intel won initial Apple business:

> **Q**: So ultimately did the fact that Intel acquired, or won Apple's business affect its decision to acquire VIA?
> **A**: Oh, yeah. There wouldn't have been a – I wouldn't have been – yeah, there wouldn't have been a discussion.

Tr. at 581:17-20.

Thus, Qualcomm's exclusive deals, which delayed Intel's ability to sell modem chips to Apple until September 2016, foreclosed Intel and other rivals from benefits including: (1) a revenue boost critical to funding research and development and acquiring technology (as Intel did with VIA); (2) exposure to Apple's "best-in-class" engineering resources; (3) a foothold at Apple for future handsets; (4) business opportunities with other OEMs; (5) enhanced standing in SSOs; and (6) opportunities to conduct early field testing and prototyping with network vendors and operators.

h. Qualcomm Again Refuses to Sell Modem Chips to Apple

Once Apple started purchasing modem chips from Intel, Apple challenged Qualcomm's royalty rates, as Tony Blevins (Apple Vice President of Procurement) testified at trial: "There are court proceedings where we're trying to establish what is a FRAND rate for royalty." Tr. at 712:2-3. In response, according to Blevins, Qualcomm sought patent injunctions around the world against Apple's handsets: "[T]hey had filed injunctions against Apple and lawsuits on non-SEPs, again, to improve their position . . . on the SEPs." *Id.* at 712:18-20.

Aicha Evans (Intel Chief Strategy Officer) also testified at trial that Qualcomm attempted to ban Apple from importing its handset with Intel chips in proceedings before the International Trade Commission ("ITC"):

> **Q**: [D]o you understand what Qualcomm was seeking in those ITC proceedings?
> **A**: Yeah, cut us off at the knees before we're born and ask for a ban of Intel-based iPhones from the United States.

Tr. at 663:14-17.

Later, Qualcomm also cut off Apple's supply of new chips. In spring 2017, Steve Mollenkopf (Qualcomm CEO) testified, Apple's contract manufacturers stopped paying royalties to Qualcomm for Apple handset sales. Tr. at 836:16-25. According to Jeff Williams (Apple COO), Qualcomm then refused to provide Apple with any chips for new devices, although Qualcomm continued to ship Apple modem chips for older iPhones. As a result, Williams testified at trial, none of Apple's 2018 handset models contain Qualcomm modem chips and Apple has purchased modem chips for 2018 handsets solely from Intel:

> Qualcomm has continued to ship us product on the design wins that they have and had at the time. And so they have continued to sell us chips. We have been unable to get them to support us on new design wins past that time, and this has been a challenge. . . . We – I contacted Qualcomm, I contacted Steve, I sent him e-mails, I called. We tried to get them to sell us chips, and they would not.

Tr. at 890:13-24. Tony Blevins (Apple Vice President of Procurement) similarly testified that Apple's lawsuit spurred Qualcomm to use chip leverage: "At the time we made those challenges, Qualcomm was no longer willing to sell us chips. That was very obvious, very apparent to us. And so we went right back to the no license, no chips, that we were facing back in 2005." Tr. at 711:12-16.

In sum, Qualcomm engaged in anticompetitive conduct with respect to Apple by (1) refusing to sell Apple modem chips or even share sample chips until Apple signed a license; (2) eliminating a competing standard supported by Intel; (3) attempting to require Apple to cross-license its entire patent portfolio to Qualcomm; and (4) and using Qualcomm's monopoly power to enter exclusive deals with Apple that foreclosed Qualcomm's rivals from selling modem chips to Apple from 2011 to September 2016.

11. VIVO

Qualcomm engaged in anticompetitive conduct toward VIVO by using the threat of cutting

off VIVO's chip supply to enter an exclusive agreement with VIVO that prevented VIVO from using MediaTek modem chips even though the MediaTek chips had competitive advantages and were more compatible with VIVO's handset.

On December 24, 2015, Sanjay Mehta (QCT China Senior Vice President) emailed Derek Aberle (Qualcomm President), Cristiano Amon (QCT President), and Eric Reifschneider (QTL Senior Vice President and General Manager) and stated that QCT could secure modem chip exclusivity with VIVO, if QTL would permit QCT to continue shipping modem chips to VIVO while VIVO negotiated a patent license with QTL. Sanjay Mehta explained that MediaTek, Qualcomm's rival, had a modem chip model that was more compatible with VIVO's handset, and that Qualcomm could eliminate the threat of VIVO using MediaTek with an exclusive agreement:

> The objective of this email is to request confirmation from you such that if VIVO negotiates it's [sic] QTL license in good faith that QCT will continue shipping chipsets. There is a summary deal below which makes sense for QCT to drive for various reasons (essentially we can achieve 100% of VIVO's roadmap in the face of 1) MTK has pin for pin and software compatibility and 2) other OEMs utilizing an inferior chipset with larger memory) and moving the market towards a QCT solution.

CX5321-001.

Under the "summary deal" with VIVO, Qualcomm would secure exclusivity if Qualcomm did not cut off Qualcomm's chip supply. Mehta's email summarizing the deal stated: "What VIVO will commit to (pending QTL confirmation that if VIVO continues to negotiate with QTL in good faith, QCT will continue shipping chipsets) . . . will not launch 6755/6750 based handsets (which means QCT will win significant upside in 2016)." CX5321-002. Cristiano Amon (Qualcomm President) testified that the 6755 and 6750 modem chips were MediaTek modem chips that had "competition advantages . . . and software compatibility with whatever the incumbent chipset in VIVO was." Tr. at 509:13-510:7.

Even without an explicit threat from Qualcomm, the implicit threat that Qualcomm could cut off VIVO's chip supply was significant enough to convince VIVO to permanently stop working with MediaTek as soon as Qualcomm promised to ensure VIVO's chip supply, according

to Sanjay Mehta's email: "VIVO CTO Mr. Shi has informed MTK that R&D on 6755/50 will be paused till Feb'16; between now and Feb, if QTL provides confirmation that if VIVO continues to negotiate with QTL in good faith, QCT will continue shipping chipsets, then VIVO will make that official & permanent." CX5321-002.

In sum, Qualcomm engaged in anticompetitive conduct by using the threat of cutting off VIVO's chip supply to enter an exclusive agreement with VIVO that prevented VIVO from using MediaTek modem chips even though the MediaTek chips had competitive advantages and were more compatible with VIVO's handset.

12. Wistron

Qualcomm engaged in anticompetitive conduct toward Wistron by using Qualcomm's royalty rate to impose a surcharge on a MediaTek modem chip that Wistron otherwise thought was the most competitive for Wistron's devices and by refusing to give Wistron a list of Qualcomm's patents during patent license negotiations.

Apple does not manufacture iPhones and iPads itself but instead uses third-party manufacturers ("contract manufacturers") to manufacture those products. ECF No. 1326 at 3. The contract manufacturers that currently manufacture iPhones and/or iPads for Apple include: (i) FIH Mobile Ltd., Hon Hai Precision Industry Co., Ltd., and Foxconn International Holdings Limited (collectively, "Foxconn"); (ii) Pegatron; (iii) Wistron; and (iv) Compal Electronics, Inc. *Id.* at 4. Qualcomm and Wistron entered a CDMA SULA effective May 23, 2007. *Id.*

Under the Wistron SULA, which is perpetual, Wistron paid Qualcomm a [redacted] upfront fee and pays a 5% running royalty on handsets. JX0042-011, -014 to -015. Brian Chong (Wistron Chief of New Technology Development and Product Planning) testified that Wistron could not afford to use MediaTek's modem chips because Qualcomm imposes onerous royalty payments on MediaTek's chips. This is true even when MediaTek's chips' price and specification are best suitable for Wistron's products. Specifically, Chong testified as follows:

> [T]here was a case that I remember in particular when we were considering introducing lower cost phones. And MTK was the chip supplier that we think best suitable for that product position in terms of price position and the spec

> corresponding that it offers. However, in the end we decided to stay Qualcomm for the simple reason that because Qualcomm responded that, even if we're using non-Qualcomm chips, we would still have to pay the onerous royalty that Qualcom dictated in the SULA.

Chong Depo. 256:9-20. Chong also testified that the upfront fee Wistron had paid Qualcomm incentivized Wistron to buy Qualcomm chips rather than rivals' chips: "So by staying with Qualcomm we would be able to recoup that investment faster." *Id.* at 256:21-257:1.

Qualcomm also limited Wistron's ability to evaluate Qualcomm's patents, as Brian Chong testified: "I know for a fact that we asked for a list of patents and never got that" and "I'm sure we asked for the possibility of only licensing a portion of Qualcomm patents" *Id.* at 312:6-8, 23-24. When Qualcomm denied Wistron's requests, Chong testified that Wistron felt it had little option but to enter the patent license to obtain business from OEMs: "In a way, we're forced into the situation that we need to sign. Otherwise we will lose the Dell business that opened up as an opportunity for us to get into the smart phone business with a major player." *Id.* at 361:3-7.

13. Pegatron

Qualcomm engaged in anticompetitive conduct toward Pegatron by withholding chip samples until Pegatron would sign Qualcomm's patent license agreement, which requires Pegatron to grant Qualcomm a royalty-free cross-license to Pegatron's patents.

Qualcomm and Pegatron entered into a CDMA SULA effective April 29, 2010. Under the Pegatron SULA, which is perpetual, Pegatron paid Qualcomm a [redacted] upfront fee and pays a running 5% royalty charged on handsets. JX0053-015, -020. Pegatron also granted QCT a royalty-free cross-license to Pegatron's patents for QCT to produce CDMA modem chips. JX0053-028.

Monica Yang (Pegatron) testified that Qualcomm made clear throughout negotiations that Qualcomm would not sell Pegatron chips until Pegatron signed the patent license: "So even if you sign the CSA [component supply agreement], you cannot get a chip, right. So you have to have the SULA at place. And when I negotiate, I know, okay, you really have to sign the SULA to get the chipset." *Id.* at 184:21-25.

Monica Yang testified that Qualcomm even refused to provide Pegatron any chip samples

until Pegatron signed a patent license:

> **Q**: And, in fact, Qualcomm did not even allow Pegatron to obtain any engineering samples or test chips if Pegatron did not first enter into a license with Qualcomm; right?
> **A**: Yes.

Id. at 244:23-245:5.

Monica Yang also knew that Qualcomm's consistent practice was to threaten chip supply: "[I]t's my impression, like, since beginning, you – if you challenge something against Qualcomm, you might lose the chip supply." *Id.* at 184:9-16. Yang testified that chip supply was essential for Pegatron to retain its contract manufacturing opportunities, such that Pegatron did not challenge royalty rate or license terms: "[F]or us the important thing is to get business from customer. So if we don't have chip, we cannot finish any business opportunity then. That's a big damage to us. So we were under pressure at that time, and we don't have the bargaining power to negotiate with Qualcomm." *Id.* at 247:1-7.

In sum, Qualcomm engaged in anticompetitive conduct toward Pegatron by withholding chip samples until Pegatron would sign Qualcomm's patent license agreement, which requires Pegatron to grant Qualcomm a royalty-free cross-license to Pegatron's patents.

14. ZTE

Qualcomm engaged in anticompetitive conduct toward ZTE by threatening ZTE's chip supply. Qualcomm also internally discussed withholding engineering support from ZTE.

Derek Aberle (QTL President) recommended in an April 14, 2011 email to Jing Wang (Qualcomm), Mike Hartogs (QTL Division Counsel), and other Qualcomm employees that Qualcomm threaten litigation and emphasize its practice of not selling chips to unlicensed OEMs in negotiations with ZTE: "They should also consider the impact on their business in the US (e.g., with VZW) if we are forced to sue them for patent infringement. Finally, they should be reminded that we do not supply chips to companies that are not licensed." CX6658-006. Aberle testified that "VZW" is Verizon, a CDMA carrier. Tr. at 275:11-12. On April 16, 2011, after a negotiation with ZTE, Aberle recommended that Qualcomm consider pulling resources from ZTE: "I think we

should consider stopping support in several areas until we conclude the agreements, but let me speak to Jing before we make any decisions." CX6658-001.

Qualcomm also used chip incentive funds to convince ZTE to sign a patent license agreement. Derek Aberle (QTL President) stated in the April 14, 2011 email to Jing Wang (Qualcomm), Mike Hartogs (QTL Division Counsel), and other Qualcomm employees that QTL proposed to offer ZTE rebates that accrued on ZTE's purchase of QCT chips: "Starting in the quarter in which we sign we have proposed 1.5% of QCT chipset purchases for 2011, 1.75% for 2012, 2% for 2013, 2.25% for 2014, and 2.5% for 2015 and thereafter. To close the deal, I would be willing to increase the 2011 percentage to 1.75%." CX6658-005. At trial, Aberle testified that by "the deal," he meant ZTE's patent license agreement: "Yeah, the license agreement was part of the overall package we were discussing." Tr. at 275:2-6. A few months later, on July 19, 2011, ZTE and Qualcomm signed CDMA and OFDMA patent licenses. ECF No. 1326 at 9–10.

In sum, Qualcomm engaged in anticompetitive conduct toward ZTE by threatening ZTE's chip supply. Qualcomm also internally discussed withholding engineering support from ZTE.

15. Nokia

Qualcomm planned internally to cut off Nokia's chip supply to ensure that Nokia renewed its patent license agreement with Qualcomm.

Derek Aberle (Qualcomm Legal Counsel in 2004) testified at trial that although Nokia and Qualcomm had a patent license agreement that would expire in 2007, "[Nokia] had an option to keep the agreement going if they wanted to." Tr. at 193:1-6. On December 16, 2004, Derek Aberle (Qualcomm lawyer and later Qualcomm President) wrote to Steve Altman (Qualcomm lawyer and also later Qualcomm President) that Qualcomm should threaten Nokia's chip supply to ensure that Nokia renewed the patent license agreement: "If Nokia refuses to exercise the option in 2007, we would have the right to cut-off their DO chips. This may be enough to keep them from stringing us out until 2008 when the option expires. Just a thought." CX7141-001. Steve Altman (Qualcomm lawyer and later Qualcomm President) concurred: "It is the exact thought that I have had." *Id.*

In March 2005, Matti Kauppi (Nokia) expressed concern in an email to Steve Altman (Qualcomm lawyer and later Qualcomm President) that Qualcomm could cut off Nokia's chip supply: "As you certainly understand, once Nokia proceeds with Qualcomm as its chipset provider, any interruption in supply would bring serious consequences for Nokia. . . . The availability of components is a necessity for doing business." CX6979-001.

However, in May 2005, Steve Altman wrote to Irwin Jacobs (Qualcomm Co-Founder and former CEO) and Paul Jacobs (Qualcomm CEO beginning in June 2005 and son of Irwin Jacobs) that Qualcomm should still plan to threaten Nokia's chip supply: "I would stay firm on a position that we will ship them or an ODM [original device manufacturer] the chips and the latest versions we have only as long as they pay us the current royalties with no recourse, and as soon as they stop paying royalties, we stop shipping." CX6987-001.

Thus, Qualcomm planned internally to cut off Nokia's chip supply to ensure that Nokia renewed its patent license agreement with Qualcomm.

16. Threats and Chip Incentive Funds to Smaller Chinese OEMs

With respect to smaller OEMs in China, QTL has planned to cut off the OEMs' chip supply if the OEMs did not pay royalties and has offered chip incentive funds that induce OEMs to agree to Qualcomm's patent license terms.

In November 2012, Eric Reifschneider (QTL Senior Vice President and General Manager) wrote to Cristiano Amon (QCT Co-President), Steve Mollenkopf (Qualcomm President), Derek Aberle (QTL President), and Marv Blecker (QTL Senior Vice President) regarding Chinese OEMs: "Cristiano, This summarizes the conclusions we reached regarding sales of TD-SCDMA chipsets to customers that we anticipate will use them in TD-SCDMA/GSM products." CX5053-002. TD-SCDMA is a 3G standard used primarily in China. ECF No. 1326 at 3. In the email, Reifschneider stated that Qualcomm would cut off OEMs' chip supply if an OEM stopped paying royalties under any Qualcomm patent license agreement: "3. If any of these customers refuses or fails to pay royalties on any other (i.e., C2L [CDMA], UMTS, LTE) devices, we will discontinue supply to such customers as necessary." CX5053-002.

Cristiano Amon (QCT Co-President) replied-all to Eric Reifschneider's (QTL Senior Vice President and General Manager) email. Amon wrote that QTL and QCT had agreed on that plan of action: "This summarizes well the discussion between QMC [Qualcomm Mobile Computing, a division of QCT]/QTL and the agreed plan forward. We will start communicating the plan to the customer base." CX5053-001.

Three years later, QTL and QCT had a similar plan. In a July 2015, Eric Reifschneider (QTL General Manager and Senior Vice President) recommended to Cristiano Amon (QCT President) and Derek Aberle (Qualcomm President) that Qualcomm threaten the chip supply of a few Chinese OEMs that were not paying royalties: "[W]e discontinue chip supply for the small handful of customers/licensees who have stopped reporting and paying royalties altogether (BBK, Gionee, OPPO, perhaps one or two other small customers) – and make sure they understand why." CX6530-001.

In addition, Qualcomm has paired chip incentive funds with negotiation deadlines to induce OEMs to sign Qualcomm's patent licenses. QTL funds and proposes these chip incentive funds, even though the funds accrue as rebates on QCT modem chips. In 2013, QTL proposed to offer the OEM Yulong $15 million in modem chip rebates. Eric Reifschneider (QTL Senior Vice President and General Manager) wrote that Qualcomm should condition the chip rebates on Yulong signing Qualcomm's patent license agreement: "If we make this offer to Yulong it needs to have a firm deadline on it (e.g., a 4G SULA signed by Sept. 30). CX6500-002. In red text, Jeff Altman (QTL Business Development) wrote: "Agree." *Id.*

Similarly, in 2013, Eric Reifschneider (QTL Senior Vice President and General Manager) wrote to Derek Aberle (QTL President) and Marv Blecker (QTL Senior Vice President) during patent license negotiations with the OEM OPPO that Qualcomm could exchange chip incentive funds for a patent license commitment: "Think we have a good chance of getting them to take a 4G license now, if we are willing to give them (in addition to the $5M strat fund) a capped deduction for marketing expenses." CX6516-001.

At trial, Will Wyatt (QTI Vice President, Finance) testified that QTL created and funded

similar Qualcomm chip incentive funds developed in 2016:

> **Q**: And these new incentive deals were funded by QTL even though they were offered by QCT; correct?
> **A**: Yes. These deals were, were created by QTL.

Tr. at 438:9-18.

Thus, according to a Qualcomm accounting memorandum, in April 2016 Qualcomm and Yulong reached two simultaneous agreements: Yulong agreed to a Chinese Patent License Agreement ("CPLA") on Qualcomm's standard 5% royalty terms, and Qualcomm offered Yulong chip incentives through a Strategic Funding Agreement ("SFA"). CX7571-002. Under the SFA, QCTAP (QCT's Asia Pacific division) paid Yulong rebates of $.30 to $.60 per Qualcomm chip Yulong purchased, up to a total of [redacted]. CX7571-003. The Qualcomm accounting team concluded that QTL obtained the primary benefit from the two agreements: "The SFA was entered into by QCTAP but was negotiated primarily by QTL in connection with the execution of the CPLA and transactions will therefore ultimately be reflected in the QTL segment." CX7571-006.

In sum, with respect to smaller OEMs in China, QTL has planned to cut off the OEMs' chip supply if the OEMs did not pay royalties and has offered chip incentive funds that induce OEMs to agree to Qualcomm's patent license terms.

17. Summary of Anticompetitive Conduct Against OEMs and Resulting Harm

In sum, Qualcomm has engaged in extensive anticompetitive conduct against OEMs. In practices that are unique within Qualcomm and unique in the industry, Qualcomm refuses to sell its modem chips exhaustively and to sell modem chips to an OEM until the OEM signs a separate patent license agreement. To enforce those licensing practices, Qualcomm has cut off OEMs' chip supply, threatened OEMs' chip supply, withheld sample chips, delayed software and threatened to require the return of software, withheld technical support, and refused to share patent claim charts or patent lists. In addition, Qualcomm has required OEMs to grant QCT cross-licenses (often royalty-free) to OEMs' patent portfolios and charged OEMs higher royalty rates on rivals' chips. All of these tactics ensure that OEMs will sign Qualcomm's license agreements and generally result in exclusivity.

In addition to these "sticks," Qualcomm has offered OEMs the carrot of chip incentive funds to induce OEMs to sign patent license agreements. Those chip incentive funds result in exclusivity and near-exclusivity and, by preserving Qualcomm's royalty rates, enable Qualcomm to continue to collect its unreasonably high royalty rates on rivals' chips. Lastly, in 2018, Qualcomm paid to extinguish Samsung's antitrust claims and to silence Samsung.

C. Qualcomm's Refusal to License SEPs to Rivals and Resulting Harm

Next, the Court discusses another element of Qualcomm's anticompetitive conduct, Qualcomm's practice of refusing to license its cellular SEPs to rival modem chip suppliers. This practice has promoted rivals' exit from the market, prevented rivals' entry, and delayed or hampered the entry and success of other rivals. Without a license to Qualcomm's SEPs, a rival cannot sell modem chips with any assurance that Qualcomm will not sue the rival and its customers for patent infringement. Qualcomm's refusal to license its SEPs to rivals also enables Qualcomm to demand unreasonably high royalty rates. Below, the Court discusses Qualcomm's refusal to license rivals, and how Qualcomm's practice has prevented entry, promoted rivals' entry, and hampered rivals in the market.

1. 2008 Refusal to License MediaTek

Qualcomm refused its rival MediaTek's 2008 request for a patent license, and would only enter an agreement that restricted MediaTek's customer base. Qualcomm's refusal suppressed MediaTek's revenues and prevented MediaTek from being able to fund research and development for future generations of modem chips.

Finbarr Moynihan (MediaTek General Manager of Corporate Sales and Business Development) testified that when MediaTek was soliciting customers for its first 3G modem chip, OEMs uniformly told MediaTek that OEMs would not purchase the modem chips until MediaTek had a license from Qualcomm: "[T]he kind of prevailing message from all of the customers I engaged with was that they expected us to have a license agreement with Qualcomm before they would consider purchasing 3G chipsets from MediaTek." Tr. at 336:13-16. Thus, Moynihan testified that the license requirement "sort of stalled the progress" of MediaTek's modem chip. *Id.*

at 336:18-20. Moynihan testified that "somebody in the company reached out at some point to seek a license agreement from Qualcomm." *Id.* at 336:23-25. However, the negotiations went slowly, Moynihan testified: "We would have liked if they had gone faster. We felt like they were sort of maybe being slow." *Id.* at 337:8-10.

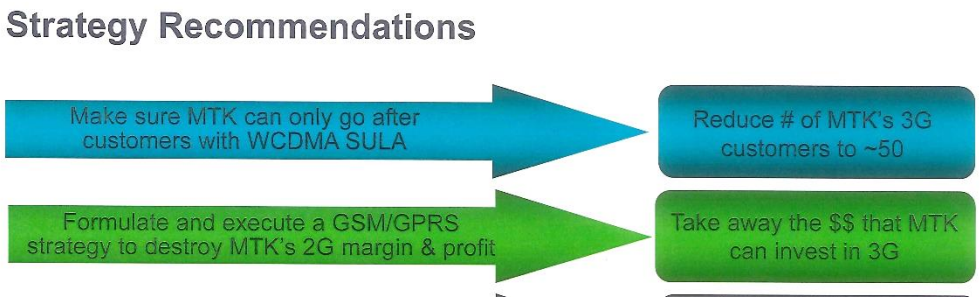
Ultimately, Qualcomm refused to enter a license, and would only offer an agreement called the CDMA ASIC Agreement. *Id.* at 337:11-17; *see* JX0050-001 (CDMA ASIC Agreement). The CDMA ASIC Agreement restricted MediaTek to selling modem chips only to "Authorized Purchasers," defined as "only those entities which have been granted a license by Qualcomm under at least Qualcomm's CDMA Technically Necessary Patents . . . but for only so long as such entities remain so licensed by Qualcomm," and included lists of Authorized Purchasers. JX0050-006, -067. Thus, the CDMA ASIC Agreement gave Qualcomm the power to control to whom MediaTek, Qualcomm's rival, sold modem chips.

In addition, the CDMA ASIC Agreement imposed onerous reporting requirements. The agreement required MediaTek to report to Qualcomm "specific quantities" of modem chips that MediaTek sold to each Authorized Purchaser. JX0050-055 to -056. Thus, MediaTek was forced to give its rival Qualcomm sensitive business information about MediaTek's customers and the quantity of chips MediaTek sold to each customer.

In part due to the delay caused by the need for a license and Qualcomm's refusal, Finbarr Moynihan (MediaTek General Manager of Customers Sales and Business Development) testified that MediaTek's modem chip was outdated by the time it entered the market: "By the time we were really pushing it [in] the market, the requirements had moved on from what features the 6268 could deliver." Tr. at 338:10-12. Moynihan testified that Qualcomm's refusal to license also hampered MediaTek's ability to generate the customer base necessary to invest in future generations: "So not being able to generate profit revenue on 3G I think impacted our ability to invest in 4G." *Id.* at 338:18-339:3.

Qualcomm had articulated such a strategy. A 2009 internal Qualcomm pricing presentation prepared within days of Qualcomm's CDMA ASIC Agreement with MediaTek

includes a slide titled "Strategy Recommendations," which is reproduced below. CX5809-041.



The slide includes the strategy "make sure MTK can only go after customers with WCDMA SULA," with an arrow leading to "Reduce # of MTK's 3G customers to ~50." CX5809-041. The next strategy is "Formulate and execute a GSM/GPRS strategy to destroy MTK's 2G margin & profit," with an arrow to "Take away the $$ that MTK can invest in 3G." CX5809-041. Thus, Qualcomm's refusal to license MediaTek was designed to (and in fact did) limit MediaTek's customer pool and reduce MediaTek's revenue base to invest in future cellular generations.

2. 2011 Refusal to License Project Dragonfly

In 2011, Qualcomm refused the Project Dragonfly modem chip venture's request for a SEP license, which prevented Project Dragonfly from ever entering the modem chip market.

In 2011, the carrier NTT DoCoMo, several Japanese OEMs, and Samsung formed a joint venture called Project Dragonfly to design, develop, and sell modem chips. CX2628-001 to -002, -004. Per the Project Dragonfly Joint Venture Agreement, NTT DoCoMo was to "provide the Company with reasonable support in negotiating with Qualcomm Incorporated in the U.S.A. a certain agreement necessary for the Company to implementing the Company's Business (the 'Q License Agreement')." CX2628-004.

Andrew Hong (Samsung Legal Counsel) testified that Project Dragonfly "wanted a license to be able to manufacture our own chips. And so we were trying to have NTT DoCoMo negotiate those rights, as well." Hong Depo. 176:3-11. However, Qualcomm refused a license, and Project Dragonfly failed to become a rival:

> **Q**: And I believe you testified earlier that NTT DoCoMo was unable to obtain such a license; is that correct?
> **A**: Yes.
> **Q**: And as you mentioned, that that [sic] failure to obtain a license was one of the reasons the joint venture did not proceed; is that correct as well?
> **A**: Yes.

Hong Depo. 173:3-10. Thus, Qualcomm's refusal to license Project Dragonfly contributed to Project Dragonfly's inability to enter the market.

3. 2011 Refusal to License Samsung

Around the same time that Qualcomm refused to license Project Dragonfly, Qualcomm also refused to license Samsung—a Project Dragonfly member—out of fear that Samsung could enable Project Dragonfly to become a competitor.

Andrew Hong (Samsung Legal Counsel) testified that in 2011, Samsung requested a patent license, but "Qualcomm refused to provide license to manufacture chips, modem chips." Hong Depo. 81:19-21. Hong testified that Eric Reifschneider (then QTL outside counsel, later QTL Senior Vice President and General Manager) refused to license Samsung because Qualcomm did not want to enable Project Dragonfly to become a rival:

> He was also aware that we were trying to enter into either joint ventures or license – licensing opportunities with third parties, and I believe he also aware of our, our attempts to form the, the Dragonfly JV that was discussed yesterday. So he was very adamant that we – that whatever modem chip of Samsung's was going to be covered under this agreement would not be that Dragonfly product. And he was aware that if we tried to develop our own chip, it would take several years. And Dragonfly was expected to be up and running within a year.
>
> So he was, he was very adamant that any such advantage in bringing in third-party technology to develop our modem chip product would not be permitted. And he was very clear that he was not going to enable that through that – through this agreement and – give me a moment to think back and recall what he was talking about. I do recall he was very, very angry about this, and he said pretty much under no circumstances was he – was Qualcomm going to permit Samsung to, to have the advantage of, of bringing in third-party technology.

Hong Depo. 215:15-216:14. Hong testified that Reifschneider was aware that Project Dragonfly, given its joint resources, could quickly enter the market with a license: "He said to us pretty much, 'I know if you try to develop this on your own, it will take several years. And I'm not going to let

you enter the market in a, in a year." *Id.* at 216:21-24.

Injung Lee (Licensing Lead at Samsung Intellectual Property Center) testified that Qualcomm's 2011 refusal to license Samsung prevented Samsung from selling modem chips to external OEMs: "In the end, Samsung was not able to obtain a license under which it would get to sell modem chipsets externally." Lee Depo. 227:7-9. Thus, in refusing to license Samsung, Qualcomm further ensured that Project Dragonfly could not enter the modem chip market and prevented Samsung from selling modem chips to external OEMs.

4. Refusal to License VIA

As with MediaTek, Qualcomm refused to license VIA Telecom, a CDMA modem chip supplier, and entered an agreement that permitted VIA to sell modem chips only to Qualcomm licensees. VIA never cut into Qualcomm's CDMA market share and was eventually purchased by Intel in 2015, according to an Intel presentation. CX1598-004.

Qualcomm and VIA entered an ASIC Patent License Agreement that permitted VIA to sell ASICs "only to Authorized Purchasers for incorporation by such Authorized Purchasers in Subscriber Units." JX0007-007. The ASIC Patent License Agreement defined "Authorized Purchasers" as "only those companies which have been granted a license by QUALCOMM." JX0007-001. Thus, the CDMA ASIC Agreement gave Qualcomm the power to control to whom VIA sold modem chips.

In addition, the ASIC Patent License Agreement imposed onerous reporting requirements. The agreement required VIA to report to Qualcomm all of its sales of modem chips to each Authorized Purchaser. JX0007-017. Thus, VIA was forced to give its rival Qualcomm sensitive business information about VIA's customers and the quantity of chips VIA sold to each customer.

Qualcomm's Authorized Purchaser requirement—in both the VIA agreement and the MediaTek agreement—came with serious ramifications. In November 2012, John Sun (VIA) sent an email to Luis Guerra (Qualcomm Contracts Specialist) to apologize for mistakenly selling chips to an unlicensed OEM and to state that VIA had immediately stopped shipments to that OEM:

We would like to inform Qualcomm that our team only realized earlier this month

> that Hangzhou Asiafone Technology Co. Ltd. ("Asiafone") is no longer on the list of Sublicensed Affiliates, and that 236,050 units of CDMA ASICs was shipped by VIA Telecom in the months of September and October, with the last shipment taking place on October 29, 2012. We understand that Asiafone was removed from the August list of Sublicensed Affiliate, which was sent to VIA on August 25, 2012, but it appears that our team did not become aware of the fact until recently. As soon as we realized that Asiafone was no longer a Sublicensed Affiliate, we have taken steps to stop all further shipments. We are notifying Qualcomm of this incident at our earliest opportunity.

CX6552-001. Thus, through the Authorized Purchaser agreement, Qualcomm was able to employ VIA to enforce Qualcomm's practices of not selling modem chips to OEMs without a patent license agreement and of cutting off chip supply.

With no license from Qualcomm, VIA was not able to generate a large share of the CDMA modem chip market. Todd Madderom (Motorola Director of Procurement) testified, "In my opinion, Qualcomm has not really had significant competition in CDMA. I think the VIA Technologies alternative IP that was out there in the world really wasn't a competitive threat." Madderom Depo. 206:6-9.

5. 2004 and 2009 Refusals to License Intel

Qualcomm has twice refused to license Intel, a rival modem chip supplier, which delayed Intel's entry into the CDMA and premium LTE modem chip markets.

In 2004, Sean Maloney (Intel) emailed Dr. Irwin Jacobs (Qualcomm CEO and co-founder) to propose that Intel receive a "license to Qualcomm patents in a completed cross-license agreement." CX7580-002. Steve Altman (then a Qualcomm lawyer, later Qualcomm President) responded to Maloney and Irwin Jacobs and rejected Intel's request:

> [A]re you suggesting that we change our existing licensing program such that a third party purchasing a CDMA ASIC from Intel would receive rights under QUALCOMM's patents? If the later, given the negative impact that it could have on QUALCOMM's licensing program (which comprises a very substantial portion of the company's revenue and profit), we cannot agree to this proposal.

CX7580-001. Thus, Altman acknowledged that Qualcomm could not agree to patent exhaustion because doing so would reduce QTL's licensing revenues, which comprised "a very substantial portion of the company's revenue and profit." *Id.*

In 2009, Qualcomm again refused an Intel license request. Mike Hartogs (QTL Senior Vice President and Division Counsel) reported in an email to Steve Altman (Qualcomm President), Derek Aberle (QTL President), Marv Blecker (QTL Senior Vice President), and Fabian Gonell (QTL Division Counsel): "It was quickly made clear that Intel is not interested in a 'simple' mutual non-assert agreement. Just as in every past discussion, they claim their practise [sic] of indemnifying their customers renders meaningless to them receiving a covenant not to assert." CX6663-001. Derek Aberle confirmed at trial that Qualcomm had rejected Intel's request: "[T]here's no agreement in place granting any rights to Intel." Tr. at 311:22-23.

As a result, Intel did not generate a competitive premium LTE modem chip until 2012, after Intel purchased Infineon and, according to Aicha Evans (Intel Chief Strategy Officer) invested "billions of dollars" to develop LTE. Tr. at 565:3-6. Intel did not begin to develop CDMA modem chips until 2015, when Intel was able to purchase VIA. CX1598-004. Aicha Evans testified that Intel did not release its first CDMA and LTE multimode modem chip until 2018. Tr. at 615:18-21. Thus, Qualcomm's refusals to license Intel delayed Intel's entry into the market.

6. 2009 Refusal to License HiSilicon

Qualcomm also refused to license HiSilicon, a modem chip supplier that is a subsidiary of the OEM Huawei. As a result, HiSilicon generally only sells modem chips to Huawei, and not to third-party OEMs.

According to Nanfen Yu (Huawei Senior Legal Counsel), Huawei asked Qualcomm for a license so that HiSilicon could sell modem chips to third parties: "We were seeking exhaustive license from Qualcomm." Yu Depo. 133:14-15. However, Yu testified that Qualcomm refused, and instead sent Huawei a draft ASIC Patent Agreement—similar to the MediaTek and VIA agreements—which was "only a covenant not to – which does not extend to HiSilicon's customer." *Id.* at 133:20-21. Under the draft agreement, Huawei could only sell modem chips to Authorized Purchasers, defined as "only those persons or entities which have been granted a license by QUALCOMM." CX1009-003. Thus, Qualcomm controlled to whom Huawei could

sell modem chips.

Nanfen Yu (Huawei Senior Legal Counsel) testified that Huawei refused to enter the draft agreement because of the onerous reporting requirements, and the requirement that Huawei promise not to assert its patents against Qualcomm:

> It requires a very broad nonassertion covenant from HiSilicon to Qualcomm. And it also requires that HiSilicon provide sensitive business information, including the customer and the quantity that we're selling to each customer. So those are the very sensitive business information as we're competitors – HiSilicon is a competitor of Qualcomm.

Yu Depo. 132:13-20.

Today, according to Finbarr Moynihan (MediaTek General Manager of Customer Sales and Business Development), HiSilicon is not a competitor for business from non-Huawei OEMs:

> **Q**: And have you ever changed MediaTek pricing in response to competition from HiSilicon at an OEM other than Huawei?
> **A**: No, not that I'm aware of.
> **Q**: And why is that?
> **A**: Same reason. I think even more so we only see HiSilicon in Huawei phones.

Tr. at 327:16-21. Thus, Qualcomm's refusal to license HiSilicon has prevented HiSilicon from becoming a competitor for business from OEMs other than Huawei.

7. Refusal to License Broadcom

Qualcomm's refusal to license has also promoted rivals' exit from the modem chip business. Scott McGregor (former Broadcom CEO) testified that when Broadcom entered the modem chip business and asked Qualcomm for a license, Paul Jacobs (Qualcomm CEO) refused to license Broadcom:

> And I drove down to visit them in San Diego and I met with Paul and Sanjay[8] was in the office as well. . . . And I was surprised by the tone that Sanjay took and just was very aggressive and said, 'No, we can never work with you.' And, you know, 'We don't want you in the business.' And it was kind of alarming to me, and so I was sort of came to the conclusion that Qualcomm was going to be difficult to work with. And we subsequently tried to work out licensing terms with them and

[8] There are two current or former Qualcomm executives named Sanjay (Sanjay Jha and Sanjay Mehta), ECF No. 1326, and it is not clear with which McGregor met.

> we didn't feel we could get reasonable licensing terms with working on that and we felt that may be blocking us in the space.

McGregor Depo. 151:3-14.

Qualcomm's failure to license Broadcom promoted Broadcom's exit from the market. According to a 2016 internal Qualcomm pricing presentation, Broadcom exited the modem chip market in July 2014. CX8292-006.

8. Refusal to License Texas Instruments

Qualcomm also refused to license its SEPs to rival modem chip supplier Texas Instruments ("TI"), which promoted TI's exit from the market.

According to a June 2012 email from Marv Blecker (QTL Senior Vice President) to Derek Aberle (QTL Group President) and Fabian Gonell (QTL Division Counsel), Qualcomm had previously refused to license TI: "[W]e were also asked for licenses by Intel and TI at a minimum, probably others (e.g., Samsung, Mediatek) as well, and we refused to enter into anything other than a non-exhaustive covenant (or covenant to sue last in the case of SS and MT)." CX8285-001.

According to a 2016 internal Qualcomm pricing presentation, TI exited the modem chip market in November 2012. CX8292-006.

9. 2015 Refusal to License LGE

Qualcomm also refused to license LGE, and LGE has not entered the market. According to an October 2015 email regarding LGE negotiations that Eric Reifschneider (QTL Senior Vice President and General Manager) sent to Derek Aberle (Qualcomm President) and Fabian Gonell (QTL Division Counsel), LGE had requested a SEP license from Qualcomm for LGE's potential modem chip, a request Qualcomm planned to refuse:

> Willing to have broad product coverage (as we already do in the existing agreements) but not willing to grant exhaustive license to LGE for chipsets (they don't even have a chipset business – they said they wanted a license just in case, and then they also said they wanted us to license other chip suppliers exhaustively so they could buy chips from them and not pay us royalties on that portion of our patent portfolio).

CX5179-001. Since Qualcomm's refusal to grant LGE a license, LGE has not entered the market as a modem chip supplier.

10. 2009 and 2018 Refusals to License Samsung

Qualcomm has also refused to license Samsung on multiple occasions—in addition to the 2011 refusal discussed above—which has prevented Samsung from selling its modem chips to external OEMs.

According to Andrew Hong (Legal Counsel at Samsung Intellectual Property Center), during license negotiations, Qualcomm made it clear to Samsung that "Qualcomm's standard business practice was not to provide licenses to chip manufacturers." Hong Depo. 161:16-19. Instead, Qualcomm had an "unwritten policy of not going after chip manufacturers." *Id.* at 161:24-25. Samsung's internal notes from another Qualcomm negotiation demonstrate that Qualcomm's refusal to license restricted rivals from selling to third parties: "Qualcomm's business structure does not grant licenses to chipset suppliers, and grants non-assertion covenants to set manufacturers who are not Qualcomm licensees on the ground that they do not sell chipsets, restricting them from selling chipsets." CX2643A-001.

Hong testified that from Samsung's perspective, a promise not to assert patents against Samsung only did not provide sufficient security for Samsung's OEM customers:

> So as part of any chip manufacturing business, a lot of what we do is provide assurances to our customers that we have the rights to manufacture and sell chips. If there's any risk of being sued, meaning that the customer could not use the chip or would have to pay additional amounts, then those become problems for us that we have to address.

Hong Depo. 162:4-11.

In 2017, after the Korea Fair Trade Commission ("KFTC") found that Qualcomm had violated Korean law by "refusing to license, or imposing restrictions on licenses for, cellular communications standard-essential patents with competing modem chipset makers," CX7257-099, Samsung again sought a license from Qualcomm for Samsung to sell modem chips. However, according to Seungho Ahn (Head of Samsung Intellectual Property Center), Qualcomm refused: "They have yet to give us a license." Ahn Depo. 105:9-11.

Qualcomm has also altered the agreements it offers modem chip suppliers in lieu of

licenses. Alex Rogers (QTL President) testified at trial that as part of the 2018 Settlement Agreement between Samsung and Qualcomm, Qualcomm did not license Samsung, but instead promised only that Qualcomm would offer Samsung a FRAND license before suing Samsung: "Qualcomm gave Samsung an assurance that should Qualcomm ever seek to assert its cellular SEPs against that component business, against those components, we would first make Samsung an offer on fair, reasonable, and non-discriminatory terms." Tr. at 1989:5-10. Thus, Qualcomm has never licensed Samsung to sell modem chips.

As a result, Samsung is not a competitor to sell modem chips to external OEMs. Alex Rogers (QTL President) testified that Samsung's modem chip division, Exynos (also known as Samsung LSI), is not an external competitor: "Samsung has a cellular baseband business that they make primarily for their own use." Tr. at 1989:5-6. Finbarr Moynihan (MediaTek General Manager of Customer Sales and Business Development) agreed: "We don't tend to see Samsung LSI as a supplier much outside of Samsung's own phones." Tr. at 327:14-15.

In sum, Qualcomm's refusal to license has prevented rivals' entry, impeded rivals' ability to sell modem chips externally or at all, promoted rivals' exit, and delayed rivals' entry. Qualcomm's refusal to license rivals has further limited OEMs' chip supply options, which has enabled Qualcomm's anticompetitive conduct toward OEMs, sustained Qualcomm's unreasonably high royalty rates, and required OEMs to spend more money on royalty payments to Qualcomm rather than on new technology and product development for consumers.

D. Qualcomm's FRAND Commitments Require Qualcomm to License its Modem Chip SEPs to Rivals

Next, the Court explains how Qualcomm's refusal to license rivals violates Qualcomm's FRAND commitments. The Court held on summary judgment that Qualcomm's FRAND commitments to two SSOs require Qualcomm to license its SEPs to rivals. Outside the context of this litigation, Qualcomm and other SEP holders have advanced the same understanding of FRAND. In addition, Qualcomm's own recorded statements to the Internal Revenue Service ("IRS") show that Qualcomm previously licensed its SEPs to rivals, but stopped doing so because

Qualcomm concluded that instead licensing its SEPs to only OEMs is "humongously more lucrative." Therefore, the Court rejects as pretextual Qualcomm's justifications for refusing to license its rivals. The Court discusses these conclusions in more detail below.

1. The Court's Summary Judgment Order

On summary judgment, the Court held that under Qualcomm's FRAND commitments to two cellular SSOs, the Telecommunications Industry Association ("TIA") and Alliance for Telecommunications Industry Solutions ("ATIS"), Qualcomm is required to license its SEPs to rival modem chip suppliers. *Fed. Trade Comm'n v. Qualcomm*, 2018 WL 5848999, at *7.

Although standards promote interoperability, standards also "threaten to endow holders of standard-essential patents with disproportionate market power." *Microsoft Corp. v. Motorola Inc.*, 696 F.3d 872, 876 (9th Cir. 2012). As a result, the Ninth Circuit held in *Microsoft v. Motorola* that "SSOs requir[e] members who hold IP rights in standard-essential patents to agree to license those patents *to all comers* on [FRAND] terms." *Id.* (emphasis added). These SSO intellectual property policies "admit[] of no limitations as to who or how many applicants could receive a license." *Id.* at 884. Three years later, the Ninth Circuit repeated the same principle: a "SEP holder *cannot* refuse a license to a manufacturer who commits to paying the RAND rate." *Microsoft Corp. v. Motorola Inc.*, 795 F.3d 1024, 1031 (9th Cir. 2015) (emphasis added).

For example, under the intellectual property policy of TIA, a SEP holder like Qualcomm must commit to TIA that "A license under any Essential Patent(s), the license rights which are held by the undersigned Patent Holder, will be made available to all applicants under terms and conditions that are reasonable and non-discriminatory." *Fed. Trade Comm'n v. Qualcomm*, 2018 WL 5848999, at *3.

Consistent with the Ninth Circuit's precedents, the Court held at summary judgment that Qualcomm's commitments to ATIS and TIA to license its SEPs on terms "free of any unfair discrimination" prohibit Qualcomm from discriminating against rival modem chip suppliers by refusing to grant them licenses. *Id.* at *11. In addition, consistent with California contract law, the Court examined extrinsic evidence of the meaning of Qualcomm's FRAND commitments.

The Court observed that guidelines to TIA's intellectual property policy specifically identify "a willingness to license all applicants except for competitors of the licensor" as discriminatory conduct. *Id.* at *12. The Court further concluded that Qualcomm's contractual commitments to ATIS and TIA to license rivals are consistent with the purposes of SSO intellectual property policies, which require the licensing of SEPs to prevent a SEP holder from securing a monopoly based on the standardization of its technology. *Id.*

2. Qualcomm Had the Same Understanding of FRAND Outside This Litigation

Outside the context of this litigation, Qualcomm expressed the same understanding of FRAND as the Court's summary judgment ruling.

In a 1999 Qualcomm email regarding an Intel request for a license, Steve Altman (then a Qualcomm lawyer, and later Qualcomm President), wrote to Lou Lupin (a Qualcomm lawyer who became Qualcomm General Counsel in 2000) and Marv Blecker (QTL Senior Vice President) that Qualcomm's "commitment to the industry to license on fair and reasonable terms free from unfair discrimination would make it difficult to argue that we have the right to refuse to license [Intel]." CX8177-001 to -002.

Then, in 2000, Steve Altman (then a Qualcomm lawyer, and later Qualcomm President) complained in a letter to Motorola that Motorola was not licensing its modem chip SEPs *to Qualcomm* despite "Motorola's commitment to the industry to license its essential patents." CX7799-001.

More recently, Qualcomm has repeated that understanding of FRAND. During a 2012 meeting with the IRS, Eric Reifschneider (QTL Senior Vice President and General Manager) explained to the IRS that when SEP holders participate in SSOs, "as part of that you often have to make commitments that you will, you know, make that technology available to people who want to make products that practice the standard." CX6786-R at 33:1-7. Eric Reifschneider explained that refusing to license a rival modem chip supplier is "not a great, you know, position to be in in terms of defending yourself against, you know, claims that you've broken those promises to make the technology available." *Id.* at 33:11-17.

Similarly, Ira Blumberg (Lenovo Vice President of Intellectual Property) testified at trial that FRAND requires Qualcomm to license its SEPs to modem chip suppliers: "My interpretation of FRAND obligations does suggest that the licensor has an obligation to license any company that requests a license, whether it is a chip company, a device company, or anything in between." Blumberg Depo. at 132:19-24.

3. Qualcomm Previously Licensed Rivals and Has Received Licenses at the Modem Chip Level

Consistent with its statements about FRAND outside litigation, Qualcomm has previously licensed its modem chip SEPs to rivals and received modem chip-level (as opposed to handset-level) licenses to other patent holders' SEPs.

Qualcomm told the IRS in 2012 that Qualcomm previously licensed its modem chips to rival modem chip suppliers. For example, Fabian Gonell (now QTL Legal Counsel and Senior Vice President, Licensing Strategy) told the IRS that Qualcomm had licensed rival modem chip suppliers: "The standard form for ASICs was a license, and royalties were charged. That was a limited license, but royalties were charged, and that changed some years ago so that it is now no longer a license and there are no royalties charged." CX6786-R at 22:18-22. ASIC is another term for modem chip. Similarly, Eric Reifschneider (QTL Senior Vice President and General Manager) told the IRS that Qualcomm had previously licensed its rivals: "We don't collect license fees or royalties at – for chip sets, and we haven't done so for some time now." *Id.* at 15:9-11.

Moreover, in a 1999 email, Steve Altman (then a Qualcomm lawyer, later Qualcomm President) stated to Marv Blecker (QTL Senior Vice President) that Qualcomm had licensed modem chip suppliers: "ASIC licensees pay royalties to QUALCOMM at 3% with no minimum dollar amount." CX8177-001. As the Court will explain below, Qualcomm later stopped licensing rivals because Qualcomm decided that it was more lucrative to license only OEMs.

Qualcomm has also received chip-level licenses to others' modem chip SEPs. At trial, Fabian Gonell (QTL Legal Counsel and Senior Vice President, Licensing Strategy) conceded that Qualcomm has received modem chip licenses from other companies:

Q: Qualcomm has had exhaustive chip-level licenses covering cellular standard essential patents from other companies; right?
A: Inbound licenses?
Q: Correct.
A: Yes.

Tr. at 1494:4-9. Specifically, Gonell conceded that Qualcomm has an existing license from Ericsson, *id.* at 1494:10-13, which Christina Petersson (Ericsson Vice President of Intellectual Property) confirmed. Petersson Depo. 26:5-10.

4. Other SEP Holders Have Granted and Received Modem Chip-Level Licenses

Other modem chip suppliers grant chip-level licenses to their modem chip SEPs. Yooseok Kim (Samsung Intellectual Property Center Official) testified that Samsung has granted Google and Intel licenses to Samsung's cellular SEPs. When asked "[A]re you aware of any instances where Samsung gave a license to its cellular patents to a modem chip maker for the manufacture and sale of modem chipsets?", Kim answered "Yes, I am." Kim Depo. 29:24-30:3. Specifically, Kim identified Samsung licenses to Intel and Google. *Id.* at 30:4-12. As noted above, Ericsson also granted Qualcomm a chip-level license.

5. Qualcomm Now Refuses to License Rivals Because it is More Lucrative to License Only OEMs

Qualcomm stopped licensing rival modem chip suppliers not because Qualcomm's view of FRAND changed, but rather because Qualcomm determined that it was far more lucrative to license only OEMs.

For example, at the 2012 IRS meeting, Marv Blecker (QTL Senior Vice President) told the IRS that when Qualcomm licensed rival modem chip suppliers, revenue from those licenses amounted to only a tiny fraction of Qualcomm's handset royalty revenues: "[W]hen ninety-five percent of the royalties come from manufacturers of these things, and I don't know what the percentage was when we were collecting royalties, but it had to be well less than one percent came from component suppliers." CX6786-R at 32:6-10.

According to a 1999 email Steve Altman (then a Qualcomm lawyer, and later Qualcomm President) sent to Marv Blecker (QTL Senior Vice President), Qualcomm received as little as $.30

in royalty payments per modem chip from modem chip licensees: "Other ASIC licensees pay royalties to QUALCOMM at 3% with no minimum dollar amount. Therefore, on a $10 ASIC, other licensees will pay us 30 cents." CX8177-001.

Qualcomm stopped licensing rivals because doing so could jeopardize Qualcomm's ability to charge unreasonably high royalty rates to OEMs. Eric Reifschneider (QTL Senior Vice President and General Manager) told the IRS that if Qualcomm continued to license rival modem chip suppliers, a rival's modem chip sale to an OEM could prevent Qualcomm from collecting royalties from the OEM: "[W]hen [the rival] sell[s] that chip to somebody who's going to put the chip in a cell phone, okay, the licensee's sale of that chip will exhaust our rights and then we won't be able to collect a royalty on a cell phone that's based on the price of the cellphone." CX6786-R at 26:6-12.

Similarly, in 2004, Steve Altman (Qualcomm President beginning in 2005) told Sean Maloney (Intel) in an email that Qualcomm could not grant Intel a license to sell modem chips to OEMs "given the negative impact that it could have on Qualcomm's licensing program (which comprises a very substantial portion of the company's revenue and profit)." CX7580-001.

Given the choice, collecting handset royalties is far more lucrative than collecting modem chip royalties. Eric Reifschneider (QTL Senior Vice President and General Manager) so told the IRS: "[W]e collect a royalty on a cell phone that's based on the price of the cell phone, and that's a lot higher than the price of the chip. So given a choice, you're always going to want to collect a royalty on the cell phone, not on the chip." CX6786-R at 26:6-18. More simply, Reifschneider told the IRS that Qualcomm decided to "concentrate our licensing program and our licensing negotiations on the guys who make the cell phones and the base stations and the test equipment, *because that's where the real money is*." *Id.* at 27:1-16, 32:14-22 (emphasis added).

Thus, when the IRS asked whether Qualcomm's decision to stop licensing its SEPs to rivals was a "business decision," Marv Blecker (QTL Senior Vice President) agreed: "Oh it's more than that, it's more than that. That's an understatement." *Id.* at 70:22-71:3. Blecker told the IRS that to license rivals would have "the potential of threatening our entire revenue stream at the

handset level." *Id.* at 71:5-6.

Fabian Gonell (now QTL Legal Counsel and Senior Vice President, Licensing Strategy) agreed that Qualcomm stopped licensing rival modem chip suppliers because Qualcomm had to choose between licensing rivals and OEMs, and licensing OEMs is far more lucrative: "But having – having to choose between one or the other then you're right, obviously the handset is humongously more . . . lucrative for a bunch of – a bunch of reasons." *Id.* at 71:18-23. At trial, Fabian Gonell again conceded that it is "absolutely correct" that licensing OEMs rather than rivals is more lucrative. Tr. at 1492:7-11. Thus, Qualcomm stopped licensing its SEPs to rivals because licensing rivals could jeopardize Qualcomm's ability to charge unreasonably high royalty rates to OEMs.

6. Other SEP Licensors Have Imitated Qualcomm's Practice Because it is Lucrative

Following Qualcomm's lead, other SEP licensors like Nokia and Ericsson have concluded that licensing only OEMs is more lucrative, and structured their practices accordingly.

At the 2012 IRS meeting, Eric Reifschneider (QTL Senior Vice President and General Manager) told the IRS that Nokia and Ericsson have similar patent portfolios to Qualcomm: "[I]f you have a licensing program like ours – and to some extent Nokia and Ericsson do – they were also companies who participated in the development of wireless technology in the '90s and in the – 2000 decade, and they have large patent portfolios." CX6786-R at 42:11-15.

Eric Reifschneider (QTL Senior Vice President and General Manager) told the IRS that Nokia and Ericsson have imitated Qualcomm's practice and license only OEMs in order to make more money: "[S]o they also – following our lead I might say – you know, decided hey, we can license these patents and make money by doing and we can make more money licensing this than licensing the chip. So like they licensed the cell phone, not the chip." *Id.* at 42:17-21.

A 2014 internal MediaTek memo, another contemporaneous document, confirms that Qualcomm and other SEP holders, like Nokia and Ericsson, refuse to license modem chip suppliers because licensing only OEMs is more lucrative. In the memo, Finbarr Moynihan (MediaTek General Manager of Customer Sales and Business Development) wrote that evolutions

in patent exhaustion law "caused many of the IPR holders to rework their licensing agreements and policies and in my experience they now go out of their way to make it absolutely clear that they are NOT licensing to the chipset company." QX0219-002. Previously, most SEP holders—including Qualcomm—would "license *everyone* [in] the supply chain," including modem chip suppliers. QX0219-002 (emphasis added).

Nokia and Ericsson's contemporaneous documents and statements contradict Nokia's and Ericsson's self-serving and made-for-litigation justifications for refusing to license modem chip suppliers. For example, in 2006, Nokia argued before the European Commission that Qualcomm's FRAND commitment to license its SEPs to a modem chip supplier was "unequivocal." *FTC v. Qualcomm*, 2018 WL 5848999, at *13. Specifically, Nokia "alleged that Qualcomm's termination of a modem chip license agreement 'after having induced SSOs to base . . . standards on Qualcomm's technology' breached 'Qualcomm's duty to license on FRAND terms' based on multiple IPR policies." *FTC v. Qualcomm*, 2018 WL 5848999, at *13.

However, to preserve its lucrative OEM licensing business modeled after Qualcomm, Dirk Weiler (Nokia Head of Standards Policy) testified at the instant trial that Nokia follows FRAND "by licensing its patents on the device level." Tr. at 1672:4-6. To license at the "device level" means to license the OEM, not the modem chip supplier. *Id.* at 1674:14-17. This is diametrically opposed to what Nokia represented to the European Commission in 2006.

Despite opining about how the entire industry licenses modem chip SEPs, Weiler conveniently claimed complete ignorance about the specific licenses and licensing discussions of Weiler's employer, Nokia. Thus, Weiler was unable to answer any questions about whether Nokia had licensed its SEPs to modem chip suppliers: "I'm not aware of specific licenses from – inside of Nokia, no." *Id.* at 1688:17-18; *see also id.* at 1688:9-11 (**Q**: And you testified that you've never been involved in any licensing discussions at Nokia; right? **A**: This is correct, yes.). Thus, the FTC could not cross-examine Weiler about Nokia's 2006 statements to the European Commission. The Court finds that Weiler was not credible.

Thus, other SEP holders like Nokia and Ericsson have followed Qualcomm's lead and

refuse to license modem chip suppliers because it is more lucrative to license only OEMs.

7. Qualcomm's Justifications for its Refusal to License Rivals Are Pretextual

Qualcomm offers self-serving and pretextual justifications for Qualcomm's refusal to license modem chip suppliers. Qualcomm argues that refusing to license its SEPs to rivals and instead licensing only OEMs is procompetitive because the practice "reduces transaction costs, aligns royalties with the value of the licensed patents, and is much more efficient than the multi-level licensing that would be required if Qualcomm and other innovators licensed other than at the device level." QC FOFCOL at 128.

However, Qualcomm's own recorded statements to the IRS show that Qualcomm used to license rival modem chip suppliers, and that Qualcomm stopped licensing rivals because it is more lucrative to license only OEMs. Nowhere in QTL's long discussion with the IRS did any QTL executive raise concerns about multi-level licensing.

In addition, the unsupported trial testimony that Qualcomm offered to support its justification was not credible. Fabian Gonell (QTL Legal Counsel and Senior Vice President, Licensing Strategy) testified that if Qualcomm had to license modem chip suppliers, Qualcomm would have to engage in multi-level licensing because some of Qualcomm's cellular SEPs read on a handset but not on modem chips. Tr. at 1433:12-14. Thus, Gonell testified, "Once you're in a world where you have to license a device anyway, it's just much more efficient to do one negotiation rather than two." *Id.* at 1434:5-7.

Gonell was not credible in multiple respects. First, Gonell pretended not to recall Qualcomm's 2012 IRS meeting until the FTC played a recording from the meeting with which Gonell disagreed. Second, Gonell's own recorded statements to the IRS, a U.S. government agency, contradict Gonell's prepared for trial testimony.

At trial, Fabian Gonell (QTL Legal Counsel and Senior Vice President, Licensing Strategy) initially claimed to have no memory of the IRS meeting:

> **Q**: In July 2012, you had a conversation with the Internal Revenue Service discussing Qualcomm's licensing practices. Do you recall that?
> **A**: No, but I've seen something that purports to be a transcript of that conversation.

> But I don't have a distinct recollection of that. . . . I really, at this point, don't have a, a memory of the meeting. But I have no reason to doubt that it happened.

Tr. at 1484:17-1485:5. After the FTC played a clip of Marv Blecker (then QTL Senior Vice President) speaking to the IRS, Gonell continued to claim no memory of the meeting:

> **Q**: So do you agree with Mr. Blecker that the ASIC patent agreements that he was describing that you've just testified about were not licenses?
> **A**: . . . That is absolutely 100 percent Marv Blecker's voice. There is no question in my mind. I don't know who the woman on the tape is, but that is absolutely Marv Blecker's voice. So he said those things, absolutely. I just don't know what he means by those things so I can't tell you whether I agree with it or not.
> **Q**: Okay. But you agree that that is something he said?
> **A**: That is absolutely Marv Blecker's voice. I don't know what else is said on the tape. But that is 1,000 percent, to my ears, Marv Blecker's voice.
> **Q**: Okay. And I'd like to play another statement from Mr. Reifschneider. Actually, excuse me. Is it a true statement that Qualcomm told the IRS that its ASIC patent agreements are not license agreements in reality?
> **A**: Well, I don't know. No, I don't know. I mean, Marv Blecker said that. I don't know what the context was, and I don't know what else was said. So I don't know the entirety of what was communicated to the IRS. But those words, whatever those words just, we just heard, Marv Blecker said for sure. But what was communicated and what was intended to be communicated, you know, I'd have to listen to the whole thing or read the transcript to try to understand.

Id. at 1487:23-1489:4. Then, the FTC played a clip of Eric Reifschneider (then QTL Senior Vice President and General Manager) at the meeting, and Gonell continued to profess ignorance:

> **Q**: Okay. And so that was a statement that Mr. Reifschneider made to the Internal Revenue Service on this phone – in this meeting; correct?
> **A**: If this is – if this is a meeting of something with the Internal Revenue Service, I – and he's saying that to – that's who he's talking to, then, yes. It was clearly him talking.

Id. at 1489:17-23.

Finally, the FTC played another clip of Marv Blecker (then QTL Senior Vice President) at the IRS meeting, in which Blecker said that Qualcomm could not charge unreasonably high royalty rates if Qualcomm licensed rival modem chip suppliers. Specifically, Blecker told the IRS:

> Yeah, but if I would average royalty on all the handsets that we collect royalties on – I don't remember what it is anymore, I used to know the number – but if – if it were ten dollars, for example, you couldn't charge a ten-dollar royalty on a chipset

that cost five dollars, or six dollars, or seven dollars.

CX786R at 73:10-15. Blecker (then QTL Senior Vice President) continued: "Yeah, and it would be hard to convince a court that that was a fair royalty also." *Id.* at 73:20-21.

In court, Fabian Gonell's (QTL Legal Counsel and Senior Vice President, Licensing Strategy) memory of the call suddenly returned:

> **Q**: Are those statements made by Mr. Blecker and yourself on this conversation, in this conversation with the IRS?
> **A**: Yes, although the conversation continued, and I expressed my disagreement with Mr. Blecker's statement.
> **Q**: So you recall this meeting now?
> **A**: No. I remember – I remember reading that.

Id. at 1490:24-1491:6.

Gonell's sudden recall once the FTC played a clip with which Gonell disagreed is not credible given Gonell's prior failure to recall the IRS meeting. Previously, Gonell would only agree that he recognized Reifschneider's or Blecker's voice. Gonell's demeanor in court when feigning ignorance was also not credible.

Most importantly, Fabian Gonell's (QTL Legal Counsel and Senior Vice President, Licensing Strategy) own recorded statements to the IRS, a U.S. government agency, contradict Gonell's trial claim that Qualcomm refuses to license rivals to avoid multi-level licensing. Rather, Gonell told the IRS in 2012 that Qualcomm stopped licensing its rivals because licensing only OEMs is more lucrative: "But having – having to choose between one or the other then you're right, obviously the handset is humongously more . . . lucrative for a bunch of – a bunch of reasons." CX6786R at 71:18-23. Thus, Gonell's trial testimony was not credible, and the Court rejects Qualcomm's self-serving justifications as pretextual.

Accordingly, the Court concludes that Qualcomm's FRAND commitments—consistent with Qualcomm's prior actions and statements—require Qualcomm to license its SEPs to rival modem chip suppliers.

E. Qualcomm Has an Antitrust Duty to License its SEPs to Rivals

The Court now addresses whether Qualcomm has a duty under the Sherman Act to license

its SEPs to rival modem chip suppliers. The United States Supreme Court has explained that, in general, "there is no duty to aid competitors." *Trinko*, 540 U.S. at 411. Nonetheless, "[u]nder certain circumstances, a refusal to cooperate with rivals can constitute anticompetitive conduct and violate § 2." *Id.* For the reasons explained below, the Court concludes that Qualcomm has an antitrust duty to license its SEPs to rival modem chip suppliers.

One circumstance where a monopolist has a duty to deal with rivals is explained in *Aspen Skiing*, 472 U.S. 585. In *Aspen Skiing*, the defendant owned three of the four ski resorts in Aspen, Colorado, and the plaintiff owned the fourth resort. *Id.* at 585. The defendant and the plaintiff had, for many years, offered skiers a joint "all-Aspen ticket" that gave skiers admission to all four resorts. *Id.* at 589–90. Revenues from the joint ticket were divided according to the relative percentage of skiers that visited each mountain with the joint ticket. *Id.* at 589.

Believing that it could get greater revenues without the joint ski pass, the defendant offered the plaintiff "an offer that [the plaintiff] could not accept." *Id.* at 592. Essentially, the defendant would only agree to continue the joint ticket if the plaintiff agreed to a fixed percentage of revenue that was below the revenue that the plaintiff had historically received under the joint ticket. *Id.* Significantly, after the plaintiff refused the defendant's offer and the joint ticket was discontinued, the defendant also refused to sell the plaintiff any lift tickets to the defendant's ski resorts, even though the plaintiff offered to pay the defendant retail price for the tickets. *Id.* at 593.

The United States Supreme Court found that the defendant in *Aspen Skiing* violated an antitrust duty to deal with its competitor. The United States Supreme Court explained the general rule that, "[i]n the absence of any purpose to create or maintain a monopoly, the [Sherman] [A]ct does not restrict the long recognized right of a" business to "exercise [its] own independent discretion as to the parties with whom [it] will deal." *Id.* at 602. However, in *Aspen Skiing*, there was sufficient evidence to show that the defendant had refused to deal with the plaintiff only because of the defendant's anticompetitive intent to maintain its monopoly. Specifically, as the United States Supreme Court later explained in *Trinko*, the *Aspen Skiing* Court "found significance in the defendant's decision to cease participation in a cooperative venture." *Trinko*,

540 U.S. at 409. The *Aspen Skiing* defendant's "unilateral termination of a voluntary (and thus presumably profitable) course of dealing suggested a willingness to forsake short-term profits to achieve an anticompetitive end." *Id.* Moreover, "the defendant's unwillingness to renew the [joint] ticket even if compensated at retail price revealed a distinctly anticompetitive bent." *Id.* In those circumstances, the defendant's refusal to deal with the plaintiff violated the Sherman Act.

By contrast, the United States Supreme Court in *Trinko* held that Verizon did not have an antitrust duty to deal with its competitors. There, the Telecommunications Act of 1996 for the first time imposed on Verizon an obligation to share its telephone network with its rivals. *Id.* at 402. However, Verizon did not process its rivals' requests "in a timely manner, or not at all." *Id.* at 404–05. Among other provisions, the Telecommunications Act required Verizon to allow rivals to actually enter Verizon's property and "locate and install [the rival's] equipment on the incumbent's [Verizon's] premises." *Id.* at 406.

Verizon's rivals sued Verizon and alleged that Verizon's refusal to deal was part of an anticompetitive scheme to harm its rivals and maintain Verizon's monopoly. *Id.* However, the United States Supreme Court in *Trinko* held that the plaintiffs had failed to show that Verizon's conduct fell within *Aspen Skiing*'s exception to the general no-duty-to-deal rule. *Id.* at 408–09. Specifically, the *Trinko* Court stated that the plaintiff's complaint "d[id] not allege that Verizon voluntarily engaged in a course of dealing with its rivals," or that Verizon would have ever have dealt with its rivals absent the Telecommunications Act's requirements. *Id.* at 409.

Moreover, the *Trinko* Court found further significance in the fact that, unlike the lift tickets at issue in *Aspen Skiing*, the sharing of Verizon's telephone network was "not otherwise marketed or available to the public." *Id.* at 410. Furthermore, elements of Verizon's telephone network "exist[ed] only deep within the bowels of Verizon" on Verizon's property and could only be shared "at considerable expense and effort" from Verizon. *Id.* Thus, the *Trinko* Court "conclude[d] that Verizon's alleged insufficient assistance to the provision of service to rivals is not a recognized antitrust claim under this Court's existing refusal-to-deal precedents." *Id.*

In *MetroNet Services Corp. v. Qwest Corp.*, 383 F.3d 1124, 1131 (9th Cir. 2004), the Ninth

Circuit discussed *Trinko* and *Aspen Skiing* and determined that the United States Supreme Court considered three factors "significant for creating antitrust liability" in *Aspen Skiing* that were not present in *Trinko*. First, the *Aspen Skiing* defendant's "unilateral termination of a voluntary and profitable course of dealing." *Id.* at 1132. Second, the *Aspen Skiing* defendant's refusal to deal even if compensated at retail price, which suggested that the defendant's conduct was anticompetitive. *Id.* at 1132. Third, the fact that the *Aspen Skiing* defendant refused to provide its competitor a product that was "already sold in a retail market to other customers." *Id.* at 1133.

Therefore, *MetroNet*'s three factors "significant for creating antitrust liability" guide the Court's analysis. *See also SmithKlineBeecham Corp. v. Abbott Labs.*, 2014 WL 6664226, at *4 (N.D. Cal. Nov. 24, 2014) (holding that an antitrust duty to deal exists where a defendant decided "to alter a voluntary course of dealing together with evidence of anticompetitive malice"). The Court discusses below how Qualcomm's refusal to license rivals satisfies all three factors relevant to the antitrust duty to deal.

1. Qualcomm Terminated a Voluntary and Profitable Course of Dealing

The first factor relevant to the antitrust duty to deal is whether Qualcomm terminated a "voluntary and profitable course of dealing." *MetroNe*t, 383 F.3d at 1131. For example, in *Aspen Skiing*, the defendant discontinued offering a joint lift ticket after many years of doing so. 472 U.S. at 604. Here, because Qualcomm previously licensed its rivals, but voluntarily stopped licensing rivals even though doing so was profitable, Qualcomm terminated a voluntary and profitable course of dealing.

As the Court explained at length in Section V.D., Qualcomm previously licensed its rivals, as its FRAND commitments require. For example, Fabian Gonell (now QTL Legal Counsel and Senior Vice President, Licensing Strategy) told the IRS that Qualcomm had licensed rival modem chip suppliers: "The standard form for ASICs was a license, and royalties were charged." CX6786R at 22:18-22. ASIC is another term for modem chip.

Licensing rivals was also profitable for Qualcomm, as Qualcomm received royalties on patent licenses to modem chip suppliers. In a 1999 email, Steve Altman (then a Qualcomm

lawyer, later Qualcomm President) stated to Marv Blecker (QTL Senior Vice President) that Qualcomm had licensed modem chip suppliers: "ASIC licensees pay royalties to QUALCOMM at 3% with no minimum dollar amount." CX8177-001.

However, Qualcomm voluntarily stopped licensing its rivals. Eric Reifschneider (QTL Senior Vice President and General Manager) told the IRS that Qualcomm no longer licensed its rivals: "We don't collect license fees or royalties at – for chip sets, and we haven't done so for some time now." CX6786R at 15:9-11. Later in the IRS meeting, Reifschneider again emphasized that Qualcomm voluntarily stopped licensing its rivals: "So we'd gotten to the point where we decided you know what? We're not even going to try to collect license fees and royalties from guys who make chips." *Id.* at 32:14-16.

Thus, because Qualcomm previously licensed its rivals but voluntarily terminated that practice even though it was profitable, the Court concludes that Qualcomm voluntarily terminated a profitable course of dealing, and that the first factor relevant to the antitrust duty to deal is present in this case.

2. Qualcomm's Refusal to License Rivals is Motivated by Anticompetitive Malice

The second factor relevant to the antitrust duty to deal is whether Qualcomm's refusal to deal with its rivals is motivated by "anticompetitive malice." *SmithKline Beecham Corp.*, 2014 WL 6664226, at *4. In *Trinko*, the United States Supreme Court observed that the defendant's refusal to deal in *Aspen Skiing* "revealed a distinctly anticompetitive bent" because the defendant would not renew the joint lift ticket even if compensated at retail price. 540 U.S. at 880 (citing *Aspen Skiing*, 472 U.S. at 608). Here, Qualcomm's refusal to deal with its rivals reveals similar anticompetitive malice.

Qualcomm's own statements indicate that Qualcomm refuses to license rivals out of anticompetitive malice. For example, in 2012, Eric Reifschneider (QTL Senior Vice President and General Manager) told the IRS that QTL refuses to license rivals explicitly to avoid enabling competition to QCT, Qualcomm's chip business: "You know, we also have a big chipset business, you know, of our own, and we're also interested in protecting that, right?" CX6786R at 33:15-20.

In addition, refusing to license rivals preserves Qualcomm's unreasonably high royalty rates because if Qualcomm licensed its rivals, a rival's sale to an OEM could prevent Qualcomm from collecting royalties from the OEM, as Eric Reifschneider (QTL Senior Vice President and General Manager) told the IRS: "[T]he licensee's sale of that chip will exhaust our rights and then we won't be able to collect a royalty on a cell phone that's based on the price of the cellphone." CX6786-R at 26:6-12.

Marv Blecker (QTL Senior Vice President) also told the IRS that Qualcomm refuses to license rivals to preserve its unreasonably high royalty rates, and that to license rivals has "the potential of threatening our entire revenue stream at the handset level." CX6786R at 71:5-6.

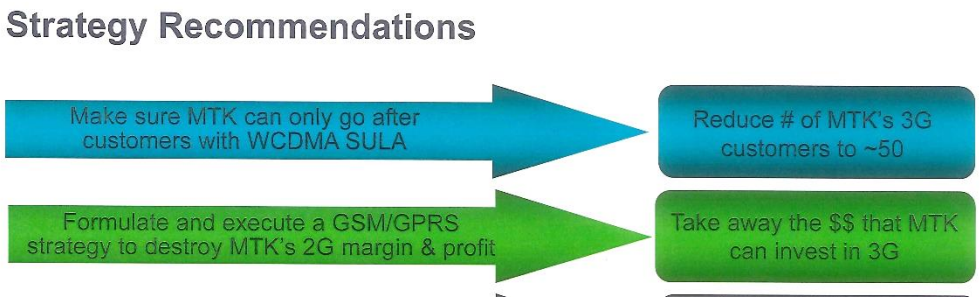
Similarly, when Qualcomm refused Intel's 2004 request for a license, Steve Altman (Qualcomm lawyer, and later Qualcomm President) told Sean Maloney (Intel) in an email that Qualcomm could not license Intel because doing so would exhaust Qualcomm's patents and destroy Qualcomm's licensing program:

> [A]re you suggesting that we change our existing licensing program such that a third party purchasing a CDMA ASIC from Intel would receive rights under QUALCOMM's patents? If the later, given the negative impact that it could have on QUALCOMM's licensing program (which comprises a very substantial portion of the company's revenue and profit), we cannot agree to this proposal.

CX7580-001. Thus, Qualcomm's refusal to license rivals bolsters Qualcomm's unique practice of only selling modem chips to an OEM after the OEM signs a separate license agreement and helps Qualcomm avoid patent exhaustion.

In addition, Qualcomm admits that refusing to license rivals harms its rivals in the marketplace and that Qualcomm does so intentionally. In 2009, Qualcomm refused to license MediaTek and instead entered a CDMA ASIC Agreement that permitted MediaTek to sell modem chips only to Qualcomm licensees. JX0050-006. A Qualcomm presentation shared with Will Wyatt (QTI [Qualcomm Technologies, Inc., the Qualcomm subsidiary that operates QCT] Vice President, Finance) within days of the CDMA ASIC Agreement reveals Qualcomm's intent to reduce MediaTek's customer base and ability to invest in future products. Specifically, the

presentation includes the strategy "make sure MTK can only go after customers with WCDMA SULA," with the goals to "Reduce # of MTK's 3G customers to ~50" and "Take away the $$ that



MTK can invest in 3G." CX5809-041.

Thus, Qualcomm's contemporaneous documents and recorded statements to the IRS indicate that Qualcomm's refusal to license rivals is characterized by a "willingness to sacrifice short-term benefits"—like profitable licenses from modem chip rivals—"in order to obtain higher profits in the long run from the exclusion of competition" to QCT, Qualcomm's modem chip business. *See MetroNet*, 383 F.3d at 1132. Accordingly, with Qualcomm's anticompetitive malice evident, the Court concludes that the second antitrust duty to deal factor is present in this case.

3. There is an Existing Retail Market for Licensing Modem Chip SEPs

The third factor relevant to the antitrust duty to deal is whether Qualcomm refuses to sell products "already sold at retail," such that the Court will not need to set the terms of dealing in a new market. *Trinko*, 540 U.S. at 410. For example, in *Trinko*, the "services allegedly withheld [were] not otherwise marketed or available to the public." 540 U.S. at 410. Here, by contrast, because Qualcomm and other SEP holders have licensed modem chip SEPs at the chip level—as the Court explained in detail in Section V.E.—there is an existing market for modem chip SEP licenses.

For example, in the 2012 IRS meeting, Qualcomm admitted that Qualcomm has licensed its SEPs to modem chip suppliers for royalties. Fabian Gonell (now QTL Legal Counsel and Senior Vice President, Licensing Strategy) told the IRS that Qualcomm had licensed modem chip

rivals and "royalties were charged." CX6786R at 22:18-22. Similarly, in a 1999 email, Steve Altman (then a Qualcomm lawyer, later Qualcomm President) told Marv Blecker (QTL Senior Vice President) that Qualcomm licensed its SEPs to modem chip suppliers "at 3% with no minimum dollar amount." CX8177-001.

Furthermore, Qualcomm has received chip-level licenses to modem chip SEPs, as Fabian Gonell (QTL Legal Counsel and Senior Vice President, Licensing Strategy) conceded at trial. Tr. at 1494:4-9. For example, Qualcomm has an existing license from Ericsson, according to both Gonell and Christina Petersson (Ericsson Vice President of Intellectual Property). *Id.* at 1494:10-13; Petersson Depo. 26:5-10. Yooseok Kim (Samsung Intellectual Property Center Official) testified that Samsung has entered chip-level cross-license agreements with both Intel and Google. Kim Depo. 30:5-12.

Thus, with an existing market for modem chip SEPs, this case is in stark contrast to *Trinko*, in which the "services allegedly withheld [were] not otherwise marketed or available to the public." 540 U.S. at 410. Therefore, the Court concludes that the third factor relevant to the antitrust duty to deal is present in this case. Accordingly, with all three factors from *Aspen Skiing* met, the Court concludes that Qualcomm has an antitrust duty to license its SEPs to rival modem chip suppliers.

Next, the Court discusses Qualcomm's exclusive dealing agreements with Apple.

F. Qualcomm's Exclusive Deals with Apple and Resulting Harm

The Court now explains how Qualcomm's exclusive deals with Apple, the 2011 Transition Agreement ("TA") and the 2013 First Amendment to Transition Agreement ("FATA"), violate the Sherman Act. Through the TA and FATA, Qualcomm shrunk rivals' sales and foreclosed its rivals from the positive network effects of working with Apple, which the Court discusses below. In so doing, Qualcomm maintained the monopoly power in the CDMA and premium LTE modem chip markets that Qualcomm has used to sustain QTL's unreasonably high royalty rates.

The United States Supreme Court has held that agreements that condition benefits to the buyer on exclusivity may be *de facto* exclusive dealing contracts if the "practical effect" is "to

prevent . . . a buyer from using the products of the competitor of the . . . seller." *Tampa Elec. Co. v. Nashville Coal Co.*, 365 U.S. 320, 326 (1961). The Ninth Circuit has held that an unlawful exclusive dealing arrangement "is an 'agreement between a vendor and a buyer that prevents the buyer from purchasing a given good from any other vendor,' and forecloses competition." *Aerotec Int'l*, 836 F.3d at 1180 (quoting *Allied Ortho.*, 592 F.3d at 996 & n.1). "This inquiry requires that we look at the actual terms of the agreements; indeed, 'a prerequisite to any exclusive dealing claim is an agreement to deal exclusively.'" *Id.* at 1181 (quoting *ZF Meritor, LLC v. Eaton Corp.*, 696 F.3d 254, 270 (3d Cir. 2012)).

1. De Facto Exclusive Dealing

The Court first addresses whether the TA and FATA were de facto exclusive deals. "In certain limited situations, discounts and rebates conditioned on a promise of exclusivity or on purchase of a specified quantity or market share of the seller's goods or services may be understood as 'de facto' exclusive dealing contracts because they coerce buyers into purchasing a substantial amount of their needs from the seller." *Aerotec Int'l*, 836 F.3d at 1182; *see also Pro Search Plus, LLC v. VFM Leonardo, Inc.*, 2013 WL 6229141, at *5 (C.D. Cal. Dec. 2, 2013) ("[D]e facto exclusive dealing claims are cognizable under the antitrust laws." (quoting *ZF Meritor*, 695 F.3d at 270)).

Here, the Court easily concludes that both the TA and FATA were de facto exclusive deals because both coerced "[Apple] into purchasing a substantial amount of their needs from [Qualcomm]." *Aerotec Int'l*, 836 F.3d at 1182. Under both the TA and FATA, Apple received hundreds of millions in incentives from Qualcomm only if Apple purchased substantial volumes of Qualcomm modem chips. For example, under the TA, Apple would only receive transition funds if Apple purchased at least 80 million Qualcomm modem chips each year. JX0057-003.

Even more so, the TA and FATA functioned as exclusive deals by imposing substantial penalties if Apple purchased *any* modem chips from a Qualcomm rival. The TA would automatically terminate if Apple sold any "Apple product commercially that incorporates a non-Qualcomm cellular baseband modem," and Apple would forfeit all future TA payments. JX0057-

004. Under the clawback provision of the TA, Apple would have to pay back hundreds of millions in earned incentives if Apple sold a handset containing a Qualcomm rival's modem chip. *Id.* Thus, Tony Blevins (Apple Vice President of Procurement) testified that the TA's termination and clawback provisions effectively prevented Apple from buying modem chips from any supplier other than Qualcomm: "They made it very unattractive for us to choose a different chipset supplier. . . . So when we factor in the rebates that we would forfeit by using a different chip supplier, it served as a very strong disincentive for us to do so." Tr. at 689:18-23.

The FATA also included similar de facto exclusivity provisions. According to a June 2015 email from Will Wyatt (QTI Vice President, Finance) to Sanjay Mehta (QCT), Apple (whom Qualcomm code named "Maverick" or "Mav") would have to return $645 million in FATA incentives if Apple launched a handset containing a Qualcomm rival's chip before February 2016: "If Mav were to launch in Sept of 2015 we would get back $200M in VIF and $445M in MDF for a total of $645M in FYQ415." CX5767-001. The FATA would also terminate and Apple would forfeit future FATA payments if during the term of the agreement Apple sold "a Non-QC Device commercially (i.e., more than 1000 units)." JX0057-010. Accordingly, Tony Blevins (Apple Vice President of Procurement) testified that the FATA, like the TA, effectively precluded Apple from buying modem chips from any of Qualcomm's rivals: "[I]t was very apparent to us that the very, very large rebates that that I mentioned earlier would make it a complete nonstarter to work with someone else." Tr. at 698:21-24.

Therefore, the Court concludes that the TA and FATA were exclusive deals that both coerced "[Apple] into purchasing a substantial amount of [its] needs from [Qualcomm]." *Aerotec Int'l*, 836 F.3d at 1182.

2. Anticompetitive Exclusive Dealing

Although exclusive dealing is a theory under both sections of the Sherman Act, exclusive dealing is not always anticompetitive. *Feitelson v. Google Inc.*, 80 F. Supp. 3d 1019, 1029–30 (N.D. Cal. 2015). The Ninth Circuit has explained that there are "well-recognized economic benefits to exclusive dealing arrangements, including the enhancement of interbrand competition."

Omega, 127 F.3d at 1162. For a buyer, an exclusive dealing agreement "may assure supply, afford protection against rises in price, enable long-term planning on the basis of known costs, and obviate the expense and risk of storage in the quantity necessary for a commodity having a fluctuating demand." *Std. Oil Co. v. United States*, 337 U.S. 293, 306 (1949).

The exclusive dealing arena is one where § 1 and § 2 of the Sherman Act diverge to some degree, at least in terms of the showing required to demonstrate anticompetitive effect. The Ninth Circuit has held that "an exclusive dealing arrangement violates Section 1 only if its effect is to 'foreclose competition in a substantial share of the line of commerce affected." *Allied Orthopedic Appliances Inc. v. Tyco Health Care Grp. LP*, 592 F.3d 991, 996 (9th Cir. 2010) (quoting *Omega*, 127 F.3d at 1162). The "substantial share" standard has typically "been quantified as foreclosure of 40% to 50% of the relevant market." *Feitelson*, 80 F. Supp. 3d at 1030.

By contrast, "a monopolist's use of exclusive contracts, in certain circumstances, may give rise to a § 2 violation even though the contracts foreclose less than the roughly 40% or 50% share usually required in order to establish a § 1 violation." *Microsoft*, 253 F.3d at 70. Courts have also held that exclusion from market share is not the sole means to show substantial foreclosure. An exclusive agreement may substantially lessen competition if the agreement "severely limit[s] . . . competition for the most important customers." *Kolon Indus.*, 637 F.3d at 452. For example, in *Microsoft*, the D.C. Circuit concluded that Microsoft's exclusive dealing harmed competition by keeping "usage of [the rival's product] below the critical level necessary for Navigator or any other rival to pose a real threat to Microsoft's monopoly." 253 F.3d at 71. Beyond market share, other indicia of anticompetitive exclusive dealing contracts include "requirements terms, steep market-share requirements, [and] contract duration." *Aerotec Int'l*, 836 F. 3d at 1182.

The Third Circuit in *ZF Meritor*, 696 F.3d 254, addressed the anticompetitive effects of de facto exclusive dealing agreements between a monopolist transmission supplier and truck manufacturers (referred to as OEMs). In *ZF Meritor*, Eaton, the transmission supplier, conditioned rebates to OEMs on the OEMs agreeing to purchase high percentages of transmissions from Eaton. *Id.* at 265. OEMs maintained "data books," which listed the product specifications

(including transmission options) that end consumers could request when purchasing an OEM's truck. *Id.* at 264.

Although the specific arrangements varied, the OEMs all received rebates only if they purchased between 70% to 97.5% of their transmissions from Eaton. *Id.* at 265. As in Qualcomm's exclusive deals with Apple, Eaton retained the option to "require repayment of all contractual savings" or to terminate agreements if an OEM did not meet the required purchase threshold. *Id.* Eaton also required the OEMs "to publish Eaton as the standard offering" in their data books, and in two cases the agreements required OEMs to remove competing products from the data books altogether. *Id.* at 265–66. Eaton required the OEMs to price Eaton products preferentially as compared to those of its rival, ZF Meritor. *Id.* at 266.

The Third Circuit explained that "[e]xclusive dealing arrangements are of special concern when imposed by a monopolist," *id.* at 271, and gave the following example:

> [S]uppose an established manufacturer has long held a dominant position but is starting to lose market share to an aggressive young rival. A set of strategically planned exclusive-dealing contracts may slow the rival's expansion by requiring it to develop alternative outlets for its product, or rely at least temporarily on inferior or more expensive outlets. Consumer injury results from the delay that the dominant firm imposes on the smaller rival's growth.

Id. (quoting Phillip Areeda & Herbert Hovenkamp, *Antitrust Law* ¶ 1802c, at 64 (2d ed. 2002)).

In evaluating whether Eaton's exclusive dealing agreements were anticompetitive, the Third Circuit looked at three principal factors. First, the Third Circuit concluded that Eaton's exclusive deals with OEMs reduced the share of the market available to Eaton's competitors to approximately 15%. *Id.* at 286. Second, the exclusive deals were all at least five years in duration, and although the OEMs could technically terminate the agreements, the evidence showed that the termination clause was "essentially meaningless" in light of commercial realities. *Id.* at 287. Third, the Third Circuit observed that the exclusive deals included additional anticompetitive provisions, including the requirements to remove competitors from OEMs' data books and to offer preferential pricing on Eaton's transmissions. *Id.* at 287–88. Those provisions increased transaction costs on any sales of competitors' transmissions and "limited the ability of truck

buyers to choose from a full menu of available transmissions." *Id.* Therefore, the Third Circuit held that Eaton's exclusive dealing agreements violated the Sherman Act.

As a point of contrast, the Ninth Circuit's decision in *Allied Orthopedic* provides an example of lawful exclusive dealing agreements. 592 F.3d 991. The defendant, Tyco, sold sensors to health care providers. *Id.* at 993. When Tyco launched a new product in 2003, Tyco offered health care providers discounts if the providers committed to purchase a minimum percentage of sensors from Tyco. *Id.* at 995. Tyco also entered sole-source agreements with purchasing groups of health care providers, which gave the purchasing groups deeper discounts if the purchasing groups agreed to buy exclusively Tyco sensors. *Id.* The health care providers sued Tyco and argued that Tyco's agreements unlawfully restrained sellers of generic sensors. *Id.*

The Ninth Circuit found it significant that the Tyco agreements "did not contractually obligate Tyco's customers to purchase anything from Tyco," and instead provided discounts only if customers in fact purchased high volumes of sensors from Tyco or did so exclusively. *Id.* at 996. Therefore, health care providers were free to forgo the discounts and purchase lower-cost generic sensors at any time, such that a "competing manufacturer need only offer a better product or a better deal to acquire their [business]." *Id.* at 997 (quoting *Omega*, 127 F.3d at 1164) (alterations in original). The Ninth Circuit thus held that Tyco's agreements did not foreclose a substantial share of the market and did not unlawfully restrain trade. *Id.* at 998.

3. Qualcomm's Exclusive Deals with Apple Foreclosed a Substantial Share of the Market

As set forth above, an exclusive deal is unlawful under the Sherman Act if the agreement "substantially foreclosed competition" in the market. *Tampa Elec.*, 365 U.S. at 334. Here, Qualcomm's own documents recognize that exclusivity with Apple could in fact eliminate competition in modem chip markets because the remaining sales to other OEMs could not sustain a rival. Qualcomm's exclusive deals with Apple foreclosed rivals not only from Apple's market share, but also from the other benefits of selling modem chips to Apple that increase a modem chip supplier's standing in the industry. Qualcomm's exclusive deals with Apple also contain

other anticompetitive indicia, including Qualcomm's intent to prevent Intel from selling modem chips to Apple. Lastly, Qualcomm's exclusive deals with Apple cannot be viewed in isolation, as Qualcomm has given several other OEMs chip incentive funds that further foreclose the market available to Qualcomm's rivals. The Court addresses each point in turn.

a. Qualcomm Recognizes That Without Sales to Apple, Competitors Could Not Survive

Exclusive dealing agreements are particularly fraught in markets, like the modem chip market, that are "highly concentrated" with few market participants. *ZF Meritor*, 696 F.3d at 284. Here, Qualcomm recognized that given that concentration in the market, exclusive deals with Apple could eliminate competition.

For example, in an August 2010 email, Steve Mollenkopf (QCT President) told Paul Jacobs (Qualcomm CEO), Derek Aberle (QTL President), and Steve Altman (Qualcomm President) that if Qualcomm secured Apple exclusivity in the TA, Qualcomm could eliminate any competition from modem chip markets: "[T]here are significant strategic benefits as it is unlikely that there will be enough standalone modem volume to sustain a viable competitor without that slot." CX5348-001. Slot and socket are terms for a modem chip design win for a handset. Tr. at 775:8-10. Thus, by Qualcomm's own accounting, the TA could foreclose Qualcomm's rivals not only from a substantial share of the market, but from remaining in the market altogether.

b. Qualcomm's Exclusive Deals with Apple Foreclosed Rivals from Gaining a Foothold in the Market

In addition, Qualcomm's exclusive deals with Apple deprived rivals of all benefits of selling modem chips to Apple and thus from gaining a foothold in the market. Specifically, Qualcomm's exclusive deals with Apple foreclosed Qualcomm's rivals from: (1) a revenue boost critical to funding research and development and acquisitions; (2) exposure to Apple's "best-in-class" engineering resources; (3) a foothold at Apple for future handsets; (4) opportunities to field test new products with Apple; (5) business opportunities from other OEMs; (6) enhanced standing in SSOs; and (7) opportunities to conduct early field testing and prototyping with network vendors

and operators. Even though Qualcomm's own documents recognize that Apple's business generates such benefits for modem chip suppliers, Qualcomm attempts to define the foreclosed market by reference only to the five iPads that Intel lost in 2013 after Qualcomm entered the FATA. QC FOFCOL at 128. Alternatively, Qualcomm claims that Apple's own share of LTE handsets was never more than 41% in any single year. *Id.*

However, the Fourth Circuit and D.C. Circuit have both recognized that pure market share can be an inadequate measure of market foreclosure. In *Kolon Industries*, the Fourth Circuit held that it was sufficient at the pleading stage for the plaintiff to allege that the exclusive dealing agreements "severely limited [the plaintiff] from competition for the most important customers in categories needed to gain a foothold for effective competition." 637 F.3d at 452. Similarly, in *Microsoft*, the D.C. Circuit found it dispositive that the monopolist's exclusive deals kept the rival's share "below the critical level necessary for Navigator or any other rival to pose a real threat to Microsoft's monopoly." 253 F.3d at 59.

Qualcomm recognizes that winning business from an OEM in one year can lead to repeat business with that OEM. Will Wyatt (QTI Vice President, Finance) testified that winning an OEM's business strengthens a modem chip supplier's ability to supply modem chips to that OEM in future years:

> **Q**: In general, winning one design with an OEM can improve that chip supplier's chances of winning business with the OEM in the future; correct?
> **A**: It depends if they do a good job.
> **Q**: But in general, that's a true statement; correct?
> **A**: If they perform, yes.

Tr. at 443:11-16.

Moreover, Qualcomm's own documents recognize that selling modem chips to Apple helps modem chip suppliers become more competitive. A 2012 Qualcomm presentation shared with the Qualcomm Board of Directors identifies Apple as the OEM that "matters most." CX6974-027. In that presentation, Qualcomm stated that Apple's business is strategically beneficial for a modem chip supplier because Apple is the largest consumer of premium modems;

Apple "challenges suppliers to provide best-in-class products" and thereby improves suppliers' products in the broader marketplace; and Apple's supplier receives the sales volumes necessary to fund research and development and produce continually advanced products. CX6974-028.

However, by striving to eliminate competition, Qualcomm's exclusive deals with Apple deprived rival modem chip suppliers of these benefits. As the 2012 Qualcomm presentation recognizes, sales are critical to investment in research and development. Similarly, Scott McGregor (former Broadcom CEO) testified that "the economics of being in the cellular baseband business are very sensitive to volume of customers" because of the investments necessary to fund research and development. McGregor Depo. 174:19-21.

In addition, sales help fund acquisitions to develop new technology. Intel acquired VIA in 2015, after Intel had won Apple's business but before the Apple handset had launched commercially. CX1598-001. Internal Intel projections indicated that acquiring VIA would only be profitable if Intel could supply modem chips to Apple; else Intel would not recoup its investment. CX1598-009. Aicha Evans (Intel Chief Strategy Officer) testified that Intel's modem chip division was only able to pitch the VIA acquisition to Intel management after Intel won initial Apple business:

> **Q**: So ultimately did the fact that Intel acquired, or won Apple's business affect its decision to acquire VIA?
> **A**: Oh, yeah. There wouldn't have been a – I wouldn't have been – yeah, there wouldn't have been a discussion.

Tr. at 581:17-20.

Apple's engineering expertise also benefited Intel. As Intel and Apple continued to work together, Apple pushed Intel to accelerate its engineering, Aicha Evans (Intel Chief Strategy Officer) testified: "[O]n the 2017 launch, initially I had to run for a plan of record of 450 megabits per second, and [Apple] gently explained to me that that wasn't going to cut it, it needs to be 600. So eventually I'm sure we would have done it, but not in that timeframe." Tr. at 579:19-24. Similarly, Christopher Johnson (Bain & Co. Partner), who consulted for Intel, testified that engineering engagement with an OEM like Apple sharpens a modem chip supplier's products and

leads to opportunities to customize products for that OEM: "[B]y working with a customer and having access to their products and their engineering teams, you can customize your products and basically improve your pace of innovation in the features you're bringing out." Tr. at 1854:16-23.

Working with Apple may also generate business opportunities with other OEMs. Aicha Evans (Intel Chief Strategy Officer) testified that after Intel won Apple's business, other OEMs reached out about Intel's modem chips: "Lenovo is an example, LG is an example, Motorola is an example, Tesla is an example." Tr. at 576:20-577:4.

In addition, sales to OEMs also provide modem chip suppliers with opportunities to field test modem chips in real-world conditions. Finbarr Moynihan (MediaTek General Manager of Customer Sales and Business Development) testified that field testing sharpens a supplier's product and helps a supplier spot technical issues: "[I]f you're launching a new modem generation into the market, it takes certainly some time to get it into production, launch it with multiple OEMs into multiple operator networks and operators, network operators, and iron out any of the issues, the bugs that it might find in the field." Tr. at 365:20-25. During generational transitions especially, Moynihan testified, OEMs can "help us as a supplier and navigate some of those transitions without falling down." *Id.* at 339:19-340:4.

Furthermore, Aicha Evans (Intel Chief Strategy Officer) testified that when working with Apple, a modem chip supplier gains increased standing in SSOs and with operators (also referred to as carriers, like Verizon): "You also get what I call the halo effect of better presence in the standards, not just presence, but better weight in terms of your contributions, in terms of starting to get leadership positions. Same thing with the operators, because these devices eventually end up on their network." Tr. at 569:9-15.

Sales to OEMs like Apple also attract interest from operators and network vendors, who engage successful modem chip suppliers for field testing and early prototyping. For example, Stefan Wolff (Intel Engineer) explained in an internal Intel email that winning Apple's business improved Intel's standing with operators and network vendors, and gave Intel opportunities to conduct early field-testing of its newest products. Those early testing opportunities and the

revenue from the Apple business would accelerate Intel's development of new products:

> We will attract operators and network vendors to do early prototyping / field testing with our latest LTE platforms given Apples [sic] huge volumes in the field. This will speed up the development, hardening, and TTM of our modem technology and help us to providing leading [sic] LTE IP for emerging markets like China. The Apple business will boost our modem revenue and will support the funding of our next generation LTE 7460 on IA and 14nm Intel process.

CX1599-001.

Here, however, Qualcomm's exclusive deals with Apple deprived rival modem chip suppliers of the foregoing benefits of selling modem chips to Apple. *See Kolon Indus.*, 637 F.3d at 452 (holding that exclusive dealing agreements are unlawful where they "severely limit[] . . . competition for the most important customers in categories needed to gain a foothold for effective competition"). Specifically, Qualcomm's exclusive deals foreclosed rivals from: (1) a revenue boost critical to funding research and development and acquisitions; (2) exposure to Apple's "best-in-class" engineering resources; (3) a foothold at Apple for future handsets; (4) opportunities to field test new products with Apple; (5) business opportunities from other OEMs; (6) enhanced standing in SSOs; and (7) opportunities to conduct early field testing and prototyping with network vendors and operators.

c. Anticompetitive Indicia

Moreover, Qualcomm's exclusive deals with Apple contain other indicia that Qualcomm's exclusive deals with Apple were anticompetitive. *See ZF Meritor*, 696 F.3d at 289 (noting, in addition to exclusivity requirements, that the exclusive deals "included numerous provisions raising anticompetitive concerns"). Specifically, Qualcomm intended to foreclose rivals from selling modem chips to Apple and prevented Apple from initiating patent litigation against Qualcomm, which could jeopardize Qualcomm's licensing business.

Qualcomm sought exclusivity in the FATA *after* learning that Apple planned to buy modem chips from Qualcomm's rival Intel. At trial, Tony Blevins (Apple Vice President of Procurement) testified that in 2012, prior to the execution of the FATA, Apple planned to use an Intel modem chip for a 2013 iPad as a test run before using Intel in an iPhone:

> At one point in time we had an official plan of record that we would implement Intel on an iPad product launch, and that would give us confidence to extend their presence into an iPhone. We felt that iPad was a simpler transition because it was data only, and then we would add voice as we moved to phone.

Tr. at 690:5-10. J86 was Apple's code name for the iPad Mini 2. *Id.* at 692:9-10.

Qualcomm knew that Apple wanted to source from Intel. Eric Koliander (QCT Vice President, Sales) sent a December 2012 email about Apple's sourcing plans, which Steve Mollenkopf (Qualcomm President) received. CX5378-002. Koliander reported in the email, "Maverick [Qualcomm's code name for Apple] does appear to be working with Intel and we believe, Mav has assigned software and hardware engineering resources to the development of an Intel based platform." *Id.*

Qualcomm's post-deal evaluations of the FATA highlighted that the FATA prevented Apple from working with a second source. Steve Mollenkopf (Qualcomm President) explained in a March 2013 internal email to Cristiano Amon (QCT Co-President) and other Qualcomm executives that the FATA eliminated the Intel threat: "I understand it but the scenario is really that there would have been a license fight as well and a push for alternative source." CX7910-001.

The TA and FATA also included other anticompetitive provisions, as each would automatically terminate "[i]f Apple or any of its Affiliates initiates any action or litigation against Qualcomm, its Affiliates, or the foundries which includes any claim for intellectual property infringement." JX0057-004. By preventing Apple—a particularly important OEM—from engaging in litigation over Qualcomm's patents, these provisions further impaired "the health of the competitive process." *Roland Mach. Co. v. Dresser Indus., Inc.*, 749 F.2d 380, 394 (7th Cir. 1984).

d. The Duration of Qualcomm's Exclusive Agreements with Apple Compounds their Anticompetitive Effect

The five-year duration of Qualcomm's exclusive deals with Apple also makes them unlawful. The Ninth Circuit has upheld exclusive dealing agreements of "short duration." *Christofferson Dairy, Inc. v. MMM Sales, Inc.*, 849 F.2d 1168, 1173 (9th Cir. 1988); *see also*

Omega Envtl., 127 F.3d at 1163 (noting that the "easy terminability" of an exclusive deal renders it less likely to foreclose competition).

Although there is no set duration past which an exclusive dealing agreement is no longer "short," the United States Supreme Court upheld the FTC's determination that in an industry characterized by significant entry barriers, exclusive dealing agreements stretching beyond one year were unlawful. *Fed. Trade Comm'n v. Mot. Picture Adv. Serv. Co.*, 344 U.S. 392, 396 (1953). Similarly, the Third Circuit in *ZF Meritor* found unlawful exclusive dealing agreements that stretched "for at least five years." 696 F.3d at 287. Such long-term agreements were "unprecedented" in the transmissions industry. *Id.*

Here, the TA and the FATA together secured Qualcomm exclusivity with Apple for over five years, and Qualcomm identifies no other exclusive deals in the industry of comparable duration. The clawback provisions, which imperiled $645 million in earned incentives if Apple purchased modem chips from a Qualcomm rival, meant that neither agreement was at all "easily terminable." Thus, the five-year duration of Qualcomm's exclusive deals with Apple further renders the agreements anticompetitive.

e. Qualcomm's Other Exclusive Deals Compounded the Effect of Qualcomm's Exclusive Deals with Apple

Qualcomm's exclusive deals with Apple cannot be viewed in isolation. Qualcomm has a pattern of seeking this type of exclusivity with other OEMs, which further restricts the market available to rivals.

For example, in 2010, Qualcomm gave BlackBerry [redacted] million in chip incentives, which BlackBerry received as rebates on QCT modem chips, according to the contemporaneous notes of John Grubbs (BlackBerry Senior Director of Intellectual Property Transactions). CX3255-002. Grubbs testified that because Qualcomm did not reduce BlackBerry's overall royalty burden, the chip incentive fund reduced the effective price of only Qualcomm modem chips, and resulted in exclusivity:

BlackBerry is going to pay the royalty, regardless of whether it buys the chip from

> Qualcomm or Marvell. If – if Qualcomm agreed to reduce the royalty, then BlackBerry could buy the chips from Qualcomm or Marvell and still get the benefit of that reduced price. If Qualcomm reduces the chip cost, then we can only go to one person in order to take advantage of that and that's Qualcomm. So we can't go to Marvell and take advantage of a reduction in chip price unless they're going to get this reduction too.

Grubbs Depo. 259:13-25.

Similarly, a 2004 QTL chip incentive fund required LGE to purchase at least 85% of its modem chips from QCT to be eligible for the chip incentives. CX6809-004.

In 2003, Qualcomm's chip incentive fund required Samsung to purchase at least 85% of its modem chips from QCT in 2003 to "take market share from manufacturers that do not use our ASICs," according to Irwin Jacobs (Qualcomm Co-Founder). CX6719-002. As recently as 2018, Qualcomm's chip incentive fund required Samsung to purchase from Qualcomm 100% of Samsung's premium modem chips and at least a certain number of medium and high tier modem chips. JX0122-036.

In 2013, QTL offered Lenovo $180 million in chip incentives that were contingent on Lenovo purchasing at least 80 million modem chips from QCT over two years. CX6491-003.

In 2016, QTL offered Motorola a chip incentive fund that Motorola concluded would reduce Motorola's effective royalty rate to 3.8% only if Motorola purchased 100% of its modem chips from Qualcomm. CX2060-021.

In addition, Qualcomm used the threat of chip supply to preclude MediaTek from selling modem chips to VIVO, even though MediaTek's modem chips were more compatible with VIVO's handset. In a December 24, 2015 email, Sanjay Mehta told Derek Aberle (Qualcomm President), Cristiano Amon (QCT President), and Eric Reifschneider (QTL Senior Vice President and General Manager) that if Qualcomm committed to ensuring VIVO's chip supply, VIVO would stop working with MediaTek: "What VIVO will commit to (pending QTL confirmation that if VIVO continues to negotiate with QTL in good faith, QCT will continue shipping chipsets) . . . will not launch 6755/6750 based handsets (which means QCT will win significant upside in 2016)." CX5321-002. Cristiano Amon (Qualcomm President) testified that the 6755 and 6750

modem chips were MediaTek modem chips that had "competition advantages . . . and software compatibility with whatever the incumbent chipset in VIVO was." Tr. at 509:13-510:7.

Similarly, Brian Chong (Wistron Chief of New Technology Development and Product Planning) testified that Wistron could not afford to use MediaTek's modem chips because Qualcomm imposes onerous royalty payments on MediaTek's chips. This is true even when MediaTek's chips' price and specification are best suitable for Wistron's products. Specifically, Chong testified as follows:

> [T]here was a case that I remember in particular when we were considering introducing lower cost phones. And MTK was the chip supplier that we think best suitable for that product position in terms of price position and the spec corresponding that it offers. However, in the end we decided to stay Qualcomm for the simple reason that because Qualcomm responded that, even if we're using non-Qualcomm chips, we would still have to pay the onerous royalty that Qualcom dictated in the SULA.

Chong Depo. 256:9-20. Chong also testified that the upfront fee Wistron had paid Qualcomm incentivized Wistron to buy Qualcomm chips rather than rivals' chips: "So by staying with Qualcomm we would be able to recoup that investment faster." *Id.* at 256:21-257:1.

All of these agreements either resulted in or would have resulted in exclusivity, and further restricted the market available to rival modem chip suppliers. The cumulative impact of Qualcomm's pattern of exclusive deals is to suppress the OEM sales available to rival modem chip suppliers and to substantially foreclose the market available to rivals.

Accordingly, the Court concludes that because Qualcomm's exclusive deals with Apple foreclosed a "substantial share" of the modem chip market, Qualcomm's exclusive deals violate the Sherman Act. *Tampa Elec.*, 365 U.S. at 327.

4. Qualcomm's Sales of Modem Chips to Apple Were Profitable Without Exclusivity

Qualcomm's own documents and testimony show that selling modem chips to Apple was profitable for Qualcomm *without* exclusivity. A 2011 Qualcomm slide deck, which James Thompson (Qualcomm CTO) and Steve Mollenkopf (Qualcomm President) received, represents final approval of the "Elan" chipset. CX6334-001. One slide shows that although Qualcomm

anticipated primarily selling Elan chips to Apple in 2013, Qualcomm anticipated selling much higher volumes of Elan chips to *other* OEMs in future years. CX6334-024. Similarly, Aicha Evans (Intel Chief Strategy Officer) testified that Intel's investments in products for Apple benefit Intel's other products: "Even if we do something that's custom for them, it usually finds itself in the broader, in the broader market. So I would say the majority of the development, the R&D, it eventually will apply to scale." Tr. at 586:17-19.

In addition, Qualcomm's own expert, Dr. Tasneem Chipty, conceded that Qualcomm's exclusive deals with Apple were not necessary for Qualcomm to realize its target profits on thin modems. Dr. Chipty testified that when deciding whether to make a research and development investment for a product, Qualcomm compares the product's anticipated gross margin to the upfront research and development investment necessary to develop the product. Tr. at 1752:5-8. Dr. Chipty testified that Qualcomm calls this a "payback ratio" and that Qualcomm generally targets a payback ratio of three, such that a product's gross margin should triple the upfront research and development investment. *Id.* at 1752:10-13.

Dr. Chipty conceded that to realize that target payback ratio for certain thin modems, Qualcomm did not need to sell any thin modems to Apple. On the MDM 9X15, future sales to other OEMs would enable Qualcomm to realize a payback ratio of 8.2 without counting *a single sale* to Apple. *Id.* at 1753:2-5. In addition, for the Elan thin modem, Dr. Chipty conceded that exclusivity was not necessary to reach Qualcomm's profit goal: "Qualcomm needed to sell some 9X25 chipsets to Apple to meet its target payback ratio of 3, but Qualcomm didn't need to sell all of the chips it actually sold to Apple in order to recognize that payback ratio." *Id.* at 1753:13-16.

Thus, these Qualcomm documents contradict Qualcomm's claim that its exclusive deals with Apple were necessary to defray "relationship-specific" costs of working with Apple. QC FOFCOL at 130. Like Qualcomm's other supposed justifications for its unlawful conduct, this alleged justification is pretextual and contradicted by Qualcomm's own documents.

Rather, the evidence above shows that Qualcomm's sales to Apple already exceeded Qualcomm's target profit ratios. In fact, because of Qualcomm's billion dollar incentive payments

to Apple, Qualcomm *sacrificed* short-term profit margins—by 20% in both 2015 and 2016—for the "[s]trategic importance of Apple modem design-win," according to a Qualcomm slide deck presented to the Qualcomm Board of Directors in 2013. CX5527-029. Steve Mollenkopf (Qualcomm CEO) acknowledged those financial implications in a March 2013 email, but said they were worth it for exclusivity: "I understand it but the scenario is really that there would have been a license fight as well and a push for alternative source." CX7910-001. Thus, Qualcomm's litigation justification is pretextual and contradicted by Qualcomm's own documents.

G. Qualcomm's Royalty Rates Are Unreasonably High

Next, the Court explains how Qualcomm's royalty rates are unreasonably high. Qualcomm's own documents repeatedly recognize that Qualcomm's unreasonably high royalty rates are set by its monopoly chip market share rather than the value of its patents. In fact, Qualcomm refuses to provide patent lists and patent claim charts during license negotiations, unlike other patent holders, and Qualcomm's own documents state that Qualcomm is not the top standards contributor. Moreover, like OEMs, Qualcomm admits that the modem chip no longer drives the value of cellular handsets. Yet Qualcomm continues to charge unreasonably high royalty rates on the sale of the whole handset.

Further, Qualcomm's royalty rate stays constant even though Qualcomm's share of SEPs is declining, Qualcomm's patents expire with successive standards, and Qualcomm receives cross-licenses to OEMs' patent portfolios. OEMs uniformly testified that Qualcomm's royalty rates are higher than any other cellular patent holder. Because of Qualcomm's chip monopoly power, Qualcomm's royalty rates are untested by litigation. For these reasons, and as explained in more detail below, Qualcomm's royalty rates are unreasonably high.

1. Qualcomm Has Admitted That its Chip Market Share Rather Than the Value of its Patents Sustains Qualcomm's Unreasonably High Royalty Rates

In Qualcomm's own documents, Qualcomm has repeatedly admitted that Qualcomm's monopoly chip market share—not the value of Qualcomm's patents—sustains Qualcomm's royalty rates. Qualcomm explicitly considered how QCT chip market share sustains QTL's

royalty rates during two internal analyses of whether to split QCT and QTL, as discussed below.

Qualcomm first analyzed whether to split QCT and QTL beginning in 2007, in an analysis called Project Berlin. David Wise (Qualcomm Senior Vice President and Treasurer) led Project Berlin. Tr. at 103:16-18. Qualcomm's Project Berlin documents show that Qualcomm consistently recognized that QCT's modem share sustains QTL's royalty rates.

For example, in May 2007, Marv Blecker (QTL President) emailed Paul Jacobs (Qualcomm CEO) with a list of pros and cons for separation, in which Blecker observed that QCT protects QTL's royalty rates: "Without chip business, more licensees/potential licensees might fight QTL license demands." CX6605-001.

Specifically, OEMs cannot fight QTL's license demands because OEMs need QCT's modem chips. For example, in a February 2008 email, Steve Altman (Qualcomm President) told Paul Jacobs (Qualcomm CEO and son of Qualcomm Co-Founder Irwin Jacobs) that the only companies that had attacked Qualcomm bought little or no chips from Qualcomm, so the combination of QCT and QTL greatly enhances QTL's success. Steve Altman wrote in that email that it was essential for QCT to maintain market share and keep OEMs "reliant on us for continued supply" to protect QTL from royalty attacks:

> If you consider the fact that the only companies that have attacked us today are companies that essentially purchase little or no ASICs from us, you can understand how the combination of QCT with QTL greatly enhances QTL's success. As CDMA2000 grows and OEMs desire to participate in it to grow their market share, OEMs will remain reliant on us for continued supply and will need to maintain positive relationships with us . . . [if split] they would rely entirely on QCT, but would have no incentive NOT to attack QTL.

CX7035-001. At trial, Steve Altman (Qualcomm President during Project Berlin) claimed that he had "always been an advocate" of splitting QCT and QTL. Tr. at 238:21-25. However, the contemporaneous document Altman prepared eleven years earlier when he was Qualcomm President and Qualcomm was considering whether to split QCT and QTL is more persuasive than Altman's trial testimony given to avoid antitrust liability.

In other Project Berlin documents, Qualcomm admitted that without QCT's chip share,

QTL might lack "leverage" to negotiate patent license agreements, and thus to continue to receive its unreasonably high royalty rates. A July 2007 Project Berlin presentation that Paul Jacobs (Qualcomm CEO) sent to Sanjay Jha (Qualcomm CEO and QCT President) discussed arguments for and against separation. CX7279-003. The presentation identified the following risk of separation: "Can hurt QTL's leverage to negotiate 3G renewals and 4G (OFDMA) licensing deals (ie. LG)." CX72979-008.

In 2015, Qualcomm again recognized in contemporaneous documents that QCT's monopoly chip power sustains QTL's unreasonably high royalty rates.

In 2015, Qualcomm initiated Project Phoenix, a second analysis of whether to split QCT and QTL, due to "concerns over [the] long-term sustainability of QTL royalty stream," according to a Qualcomm Project Phoenix presentation. CX6837-004. By 2015, several government antitrust investigations into Qualcomm's licensing practices were underway, including this action. According to Qualcomm's 2017 10-K filing with the SEC, the FTC first notified Qualcomm of its investigation related to the instant case in September 2014. CX7257-099. According to the 10-K, the Japan Fair Trade Commission ("JFTC"), Korea Fair Trade Commission ("KFTC"), and China's National Development and Reform Commission ("NDRC") had all investigated Qualcomm's licensing practices by the time Qualcomm initiated Project Phoenix, and the KFTC and JFTC had each concluded that certain Qualcomm practices violated those countries' laws. CX7257-097 to -098.

David Wise (Qualcomm Senior Vice President and Treasurer), who led Project Berlin in 2007-2008, also helped lead Project Phoenix and acknowledged that a special committee of Qualcomm's Board of Directors was responsible for Project Phoenix. Tr. at 88:2-4; 88:24-89:1.

Throughout Project Phoenix, Qualcomm executives explained in contemporaneous documents that QCT's monopoly power sustains QTL's unreasonably high royalty rates. David Wise (Qualcomm Senior Vice President and Treasurer) wrote in an October 2015 email to himself and Neil Martin (Qualcomm) that separating QCT and QTL could jeopardize QTL's licensing revenue, which would harm Qualcomm's overall valuation:

> I believe the QTL business model risk is our BIGGEST issue . . . because QTL represents the vast majority of our value at $50-$70B. Note that 1 point of royalty is $16-$20B in value. Also, a slow erosion of the model vs. sustaining the business would reduce valuation by $30B+. QCT risks are important, but less binary and less impactful to overall QC valuation.

CX8299-001.

Then, David Wise (Qualcomm Senior Vice President and Treasurer) explained that because there is a high correlation between Qualcomm's chip market share and the sustainability of Qualcomm's royalty rate, it is critical for Qualcomm to maintain a high modem chip share to sustain its licensing revenues:

> Notably, we are seeing in the market today that there is a high correlation between our modem (chip) share and licensing compliance and royalty rate sustainability. Where we have low chip share we are seeing challenges with compliance and maintaining the royalty rate. So in a sense, QCT has provided the 'give/get' relationship highlighted in the last point. If it's [sic] share falls, however, we lose that important element to sustaining our royalties. SO IT'S CRITICAL THAT WE MAINTAIN HIGH MODEM SHARE TO SUSTAIN LICENSING.

Id. (emphasis in original). In short, Wise admitted that without QCT's chip market share, QTL was "seeing challenges with compliance and maintaining the royalty rate."

David Wise (Qualcomm Senior Vice President and Treasurer) included the same points in a November 2015 Project Phoenix slide deck, which Alex Rogers (now QTL President) and other Qualcomm executives received. CX5953-001. On one slide, under the header "High modem share drives compliance and royalty rate," Wise again explained that there is a high correlation between QCT's modem chip market share and sustaining QTL's unreasonably high royalty rates:

- Addresses QTL compliance challenges and sustainability of long term royalty rate; without risky litigation
- High correlation between modem share and QTL compliance and royalty rate sustainability
- Adds value to our licensees beyond our patent licenses; improving the 'give/get' equation where QTL can't
- Reduces dependence on legal and regulatory structures to sustain royalty rates

CX5953-011.

Like the Qualcomm executives, consultants for Qualcomm during Project Phoenix also

concluded that QCT's market power sustains QTL's unreasonably high royalty rates. In slides prepared for the Project Phoenix committee of the Qualcomm Board of Directors, BCG concluded that separating QCT and QTL could reduce QTL's royalty leverage: "Separation could weaken Tulane [the Project Phoenix code name for QTL] in rate negotiations with major customers – similar to other commercial precedents." CX3755-001. Thus, the Qualcomm Board's Project Phoenix committee knew that without QCT's monopoly chip power, QTL would lose leverage in license negotiations.

David Wise (Qualcomm Senior Vice President and Treasurer) again emphasized in an October 2015 Project Phoenix email to Derek Aberle (Qualcomm President) that maintaining high modem chip market shares was critical to QTL's licensing revenue, and admitted that without "broad modem scale," QTL could not sustain its royalty rates:

> I agree with the viewpoint that as long as QCT has a very high share, they are beneficial to QTL. But if their share drops meaningfully (ie, in China at 30%'ish) then they are less beneficial. That's the logic behind the whole modem licensing concept. We need broad modem scale to support the licensing business.

CX5417-001. Thus, Qualcomm has consistently admitted that without QCT's monopoly chip power, QTL cannot sustain its royalty rates.

As set forth extensively in Section V.B., Qualcomm wields that monopoly chip power against OEMs by cutting off chip supply, threatening to cut off chip supply, refusing to provide chip samples, withholding technical support, and delaying delivery of software or threatening to require the return of software—all to coerce OEMs to sign patent license agreements that sustain Qualcomm's unreasonably high royalty rates.

2. Unlike Other SEP Holders, Qualcomm Refuses to Give Patent Lists or Patent Claim Charts During Patent License Negotiations

Consistent with Qualcomm's admissions that its royalty rates are sustained by QCT's chip monopoly power rather than by Qualcomm's patent portfolio, Qualcomm also refuses to provide patent lists and patent claim charts to OEMs during patent license negotiations, unlike other patent holders.

For example, Ira Blumberg (Lenovo Vice President of Intellectual Property) testified that patent license negotiations typically include technical discussions of the licensor's patents:

> Typically, you'll see technical engagement in a licensing scenario before there is a license, as part of the licensor's practice to convince the licensee why they need a license. So in circumstances like that, you typically have lots of claim charts outlining the licensor's best patents, how they cover the licensee's products, arguments, or at least presentations about how there's no alternative, and so on.

Blumberg Depo. 190:10-19. However, Blumberg testified, Qualcomm never engaged in such a technical discussion with Lenovo during patent license negotiations "because Qualcomm didn't feel they needed to" with its ability to threaten chip supply. Blumberg Depo. 191:6-12.

Similarly, Nanfen Yu (Huawei Senior Legal Counsel) testified that despite Qualcomm's high rates, Qualcomm has never provided patent claim charts to Huawei, but that Nokia, Ericsson, and Siemens all have. Yu Depo. 216:4-217:2. Specifically, as to Qualcomm, Yu testified:

> **Q**: [I]n all of your negotiations with Qualcomm throughout the course of your career, has Qualcomm ever provided claim charts for its patents?
> **A**: No.

Id. at 216:4-8.

Brian Chong (Wistron Chief of New Technology Development and Product Planning) testified that Qualcomm would not even provide Wistron a list of any Qualcomm patents: "I know for a fact that we asked for a list of patents and never got that." Chong Depo. 312:6-8, 23-24.

3. Qualcomm's Anticompetitive Licensing Practices are Unique to Modem Chip Markets Where Qualcomm Has Monopoly Power

Furthermore, even within Qualcomm, Qualcomm's anticompetitive practices are unique to the modem chip market where Qualcomm has monopoly power, which further indicates that QCT's monopoly power sustains Qualcomm's unreasonably high royalty rates.

When asked at trial whether "device manufacturers purchasing Wi-Fi components from Qualcomm have to first take a license to Qualcomm's Wi-Fi standard essential patents," Fabian Gonell (QTL Legal Counsel and Senior Vice President, Licensing Strategy) testified "No." Tr. at 1483:18-21.

Qualcomm made the distinction explicit in a Qualcomm slide deck presented to Tony Blevins (Apple Vice President of Procurement). CX8261-004. To purchase modem chips, an OEM "[m]ust be a licensee in good standing." *Id.* For *all other* components, however, an OEM needs "[n]o separate license," and Qualcomm will sell the component on an exhaustive basis. *Id.* Thus, Qualcomm only refuses to sell modem chips exhaustively and requires OEMs to sign patent license agreements before purchasing modem chips where Qualcomm has monopoly power.

Qualcomm's practice is also unique in the industry. Cellular company after cellular company testified that no other modem chip supplier or component supplier refuses to sell components until the OEM signs a license agreement.

Tony Blevins (Apple Vice President of Procurement) testified: "I'd spent 20 years in the industry, I had never seen a letter like this [requiring Apple to sign a license agreement before purchasing chips]." Tr. at 676:4-7.

Similarly, Todd Madderom (Motorola Director of Procurement) testified of Qualcomm's practice: "[T]his is a unique situation. I've never run across this prior." Madderom Depo. 162:24-163:10.

John Grubbs (BlackBerry Senior Director of Intellectual Property Transactions) testified that no other component supplier required BlackBerry to sign a separate patent license agreement: "[T]here were some of our suppliers that owned standard essential patents and – and we did not have a patent license agreement in place with those suppliers." Grubbs Depo. 268:15-269:25.

Hwi-Jae Cho (Director of LGE Intellectual Property Center), when asked whether "other suppliers of components to LGE required LGE to execute a separate license agreement in order to obtain access to their components," testified "No." Cho Depo. ¶ 15.

Likewise, when asked whether "Samsung's prospective supplier require[d] that Samsung execute a patent license agreement prior to agreeing to sell their product to Samsung," Andrew Hong (Samsung Legal Counsel) testified "No."

When asked whether other component suppliers require Huawei "to obtain a separate license and enter into a separate license agreement," Nanfen Yu (Huawei Senior Legal Counsel)

testified that she was not aware of any suppliers. Yu Depo. 121:6-22.

Aicha Evans (Intel Chief Strategy Officer) testified that no component supplier—"except for one, Qualcomm"—requires OEMs to sign a license before purchasing components. Tr. at 555:2-4.

Even though Qualcomm sells other components exhaustively and does not require OEMs to sign a separate license before purchasing other components, and even though no other component supplier with patents follows Qualcomm's practices, Qualcomm contends that its practices are procompetitive "because Qualcomm has never priced its intellectual property into its chip prices; [thus] OEMs that bought Qualcomm chips without a license would be using Qualcomm's intellectual property for free." ECF No. 1322 at 6. If Qualcomm's practices were truly procompetitive and "involve[], for example, greater efficiency or enhanced consumer appeal," Qualcomm would not implement the practice only where Qualcomm has monopoly power, and not on sales of any other Qualcomm chips. *See Microsoft*, 253 F.3d at 59.

Qualcomm offers no documents to explain its inconsistent licensing practices. In fact, Qualcomm's own documents discussed above reveal that Qualcomm's practices are designed to leverage Qualcomm's "high modem share to sustain licensing." CX8299-001. Specifically, as Eric Reifschneider (QTL Senior Vice President and General Manager) admitted at his deposition, Qualcomm can only sustain that licensing business aimed at OEMs by refusing to sell modem chips to unlicensed OEMs and avoiding exhaustion of its patents: "[T]he concern for the risk to the licensing business of selling – selling chips to unlicensed customers, the – the risk of a customer making an argument of patent exhaustion and sort of undercutting the ability to license the patent portfolio." Reifschneider Depo. 30:15-20.

Thus, Qualcomm leverages its monopoly chip supply and engages in a host of anticompetitive practices to avoid exhaustion and ensure that OEMs acquiesce to Qualcomm's license demands. For example, Qualcomm cuts off chip supply, threatens to cut off chip supply, threatens to withhold engineering support, and delays and threatens to take back software, among other tactics—all to coerce an OEM into signing a Qualcomm license agreement before

purchasing modem chips, unlike any other component supplier in the industry. Thus, the Court rejects Qualcomm's justification as pretextual.

4. Qualcomm's Contributions to Standards Do Not Justify its Unreasonably High Royalty Rates

Moreover, Qualcomm's own documents also show that Qualcomm is not the top standards contributor, which confirms Qualcomm's own statements that QCT's monopoly chip market share rather than the value of QTL's patents sustain QTL's unreasonably high royalty rates. According to internal Qualcomm documents not created for antitrust investigations, other patent holders like Nokia and Ericsson have made comparable or even greater contributions to cellular standards than Qualcomm.

Lorenzo Casaccia (Qualcomm Vice President of Technical Standards) leads Qualcomm's participation in 3GPP, the SSO that standardized LTE. ECF No. 1326 at 11. In 2009, Casaccia sent a slide deck to Edward Tiedemann (Qualcomm Senior Vice President, Engineering) that discussed Qualcomm's 3GPP contributions relative to other licensors. CX6336-001. On one slide, Casaccia posed the question: "To which level is Qualcomm a player in 3GPP?" CX6336-009. Casaccia gave the answer: "Another metric is the number of rapporteurships," defined "rapporteur of a work area" as "has opened/created the work area." *Id.* On the following slide, Casaccia displayed a pie chart and table listing Qualcomm's relative rapporteurships in 3GPP. CX6336-010. According to Casaccia, Qualcomm was responsible for 7% of all rapporteurships, whereas Ericsson was responsible for 17%, more than twice Qualcomm's contribution. *Id.* Casaccia stated that Qualcomm's 7% share of rapporteurships rendered it a "major player" in 3GPP. *Id.*

Similarly, in 2015, Lorenzo Casaccia (Qualcomm Vice President of Technical Standards) prepared and sent a slide deck to Fabian Gonell (QTL Division Counsel) and David Wise (now Qualcomm Senior Vice President and Treasurer). CX6138-001. On one slide, Casaccia referred to the top five "technical contributors" to 3GPP as Ericsson, Huawei, Qualcomm, Samsung, and Nokia, in that order, and referred to those five companies as the "big boys" in 3GPP. CX6138-

032. Thus, even if approved contributions are an imperfect means of measuring a company's contributions to cellular standards, as the Court notes below, Qualcomm *itself* internally charts the major players in standards by reference to technical contributions.

Moreover, Eric Reifschneider (QTL Senior Vice President and General Manager) conceded to the IRS in 2012 that Nokia and Ericsson contributed to the development of cellular standards, have large patent portfolios, and claim to have many SEPs: "[I]f you have a licensing program like ours – and to some extent Nokia and Ericsson do – they were also companies who participated in the development of wireless technology in the '90s and in the – 2000 decade, and they have large patent portfolios, and they also claim to have many patents that are – that are essential to those technical standards." CX6786-R at 42:11-15.

Even in documents Qualcomm created expressly for antitrust investigations into Qualcomm's licensing practices, Qualcomm has represented that Ericsson and Nokia possess significant SEP portfolios. In a September 2016 Qualcomm SEPs and standards presentation to the European Commission during the Commission's investigation into Qualcomm's licensing practices, Qualcomm included a slide titled "The Handful of Active Contributors are the Major SEP Owners." CX8262-035. In a table of the "Top 10 Patent Holders," Qualcomm listed itself as the top patent holder, with Nokia second, InterDigital third, and Ericsson fourth. *Id.* Thus, only in a document created to avoid antitrust liability has Qualcomm identified itself as the top SEP holder, and even in that presentation Qualcomm acknowledged that other patent holders have comparable SEP portfolios and made comparable contributions to standards. The Court finds most persuasive Qualcomm's internal documents not prepared to avoid antitrust liability, which acknowledge that by multiple metrics Qualcomm is not the leading contributor to standards.

Despite Qualcomm's representations about Nokia and Ericsson's comparable contributions, Nokia and Ericsson's royalty rates and licensing revenues are a fraction of Qualcomm's, as the Court discusses in more detail below.

Qualcomm tried to refute its own documents and statements with trial testimony and expert opinion prepared for litigation, but none of Qualcomm's witnesses assessed the relative value of

Qualcomm's patent portfolio or testified about Qualcomm's royalty rates. Liren Chen (QTL Senior Vice President of Engineering and Legal Counsel) testified about the aggregate number of Qualcomm's patents and patent applications, Tr. at 1540:14-17, and Dr. Irwin Jacobs (Qualcomm Co-Founder and former Qualcomm CEO) testified that Qualcomm was instrumental in developing CDMA technology in the early 1990s, Tr. at 1264:7-1265:16. Neither witness's testimony is probative of the relative value of Qualcomm's patents from 2006 to 2016—particularly when many of Qualcomm's early CDMA patents have expired.

Similarly, Durga Malladi (Qualcomm Senior Vice President of Engineering and General Manager of 4G/5G) testified that Qualcomm played a "pioneering role" in unlicensed spectrum technology, which "unleashed gigabit LTE data rates in North America." Tr. at 1326:3-1329:6. However, Malladi conceded that he has no perspective on the relative value of Qualcomm's contributions: "I don't actually look at what others are doing. I only look at what we are doing." *Id.* at 1336:25-1337:9. Moreover, Malladi conceded that he could not offer insight into the value of 5G technology "from a royalty rate standpoint." *Id.* at 1335:16-19.

Qualcomm's expert testimony on this point was equally inapposite. Dr. Jeffrey Andrews opined that 34 of Qualcomm's cellular SEPs "made very fundamental contributions to cellular standards." Tr. 1592:22-23. However, Dr. Andrews analyzed only 34 cellular SEPs, and Dr. Andrews offered no opinion on whether other patent holders have developed *more* or *equally* fundamental contributions to cellular communications. In addition, Dr. Andrews admitted at trial that he offered no opinion on:

> (1) the royalty value of those 34 Qualcomm patents, *id.* at 1615:2-24;
> (2) the value of any of Qualcomm's non-essential patents, which Qualcomm also licenses, *id.* at 1616:23-1617:1;
> (3) the value of any Qualcomm patents outside cellular standards, *id.* at 1617:2-8;
> (4) whether any other company owns any valuable patents related to the technologies Dr. Andrews discussed, *id.* at 1617:9-12; or
> (5) the relative strength of Qualcomm's patent portfolio or of Qualcomm's patents essential to any standard, *id.* at 1617:16-1618:3.

Neither Dr. Andrews's qualitative opinions on 34 Qualcomm cellular patents nor any of Qualcomm's witnesses rebut or even respond to the evidence in Qualcomm's own documents that

Qualcomm's royalty rates are unreasonably high and are sustained by Qualcomm's chip market share.

Furthermore, Qualcomm helped design the patent portfolio scoring system of the patent pool Avanci, which scores Qualcomm's portfolio comparably to Ericsson's even though Ericsson's licensing revenue is a small fraction of Qualcomm's.

Fabian Gonell (QTL Legal Counsel and Senior Vice President, Licensing Strategy) testified at trial that Qualcomm, Ericsson, Nokia, and InterDigital are participants in Avanci, "an effort at joint licensing of cellular essential patents for certain products," including vehicles and smart meters. Tr. at 1467:6-10. A smart meter is a utility meter with cellular connectivity. *Id.* at 1467:12-15. As a participant in Avanci, Qualcomm has agreed to grant licenses to its 3G and 4G SEPs to any vehicle or smart meter OEM that wishes to license Avanci's patents. *Id.* at 1467:18-21. Avanci then distributes those royalty revenues to the individual SEP licensors according to Avanci's distribution method. *Id.* at 1467:23-24.

Avanci's royalty distribution method apportions royalty revenues to Qualcomm and other SEP licensors based on a point-scoring system, according to the Avanci Master License Management Agreement. JX0116-133. Fabian Gonell (QTL Legal Counsel and Senior Vice President, Licensing Strategy) testified that Qualcomm negotiated the point-scoring system with Ericsson, another founding Avanci participant: "[S]o it was basically a three-way negotiation between Qualcomm and Ericsson and the founders of Avanci." Tr. at 1474:14-15.

Michael Lasinski, an FTC patent expert, testified that Avanci awards SEP licensors a maximum of [redacted] points for deemed SEPs, a maximum of [redacted] points for approved contributions, and a maximum of [redacted] points for historical licensing revenue. Tr. at 1025:21-1026:1. According to Lasinski, "deemed SEPs" are SEPs that studies have concluded are in fact essential to a standard. *Id.* at 1016:23-1017:2. According to Lasinski, Qualcomm and Ericsson have comparable SEP portfolios under Avanci's point-scoring system. *Id.* at 1027:2-13. That is so even though one of the Avanci methods—historical licensing revenue—clearly favors Qualcomm because Qualcomm charges vastly higher royalty rates to OEMs than Ericsson does, as the Court

will explain in more detail below. Despite having comparable SEP portfolios, Ericsson's royalty rate is a fraction of Qualcomm's, according to Injung Lee (Samsung Intellectual Property Center). Lee Depo. 145:8-17. Accordingly, Qualcomm's contributions to standards do not justify Qualcomm's unreasonably high royalty rate.

5. Qualcomm's Documents Recognize That Modem Chips Do Not Drive Handset Value

In addition, it is unreasonable for Qualcomm to charge its unreasonably high royalty rates on the sale price of an entire handset, as even Qualcomm's own document recognizes that a modem chip does not drive a cellular handset's value.

In a 2008 QCT strategic plan shared with Steve Mollenkopf (now Qualcomm CEO) and Cristiano Amon (now Qualcomm President), Qualcomm stated that the user experience rather than the modem chip drive a handset's value:

> Past: Modem Leadership Drove Value
> **Now: Best User Experience Drives Value**

CX7559-018 (emphasis in original).

OEMs also recognize that the modem chip does not drive handset value. For example, in 2004, Kim Huang (BenQ) emailed Marv Blecker (QTL Senior Vice President) and Derek Aberle (Qualcomm lawyer, and later Qualcomm President). Huang argued that Qualcomm's intellectual property is for communication, and Qualcomm does not own intellectual property on color TFT LCD panel, mega-pixel DSC module, user storage memory, decoration, and mechanical parts. The costs of these non-communication-related components have become more expensive and now contribute 60-70% of the phone value. The phone is not just for communication, but also for computing, movie-playing, video-taking, and data storage. Huang stated in full:

> Qualcomm owns IPR [intellectual property rights] on 'Communication' related components of a mobile phone; we appreciate and respect that. But you don't own IPR on most of the other key components. For example, color TFT LCD panel, mega-pixel DSC module, user storage memory, decoration mechanical parts and etc. These non-communications-related components have become more and more important the cost them became higher and higher-probably contribute more than 60%-70% of a whole phoneset. Please note that, a phone in the future not for

> communication only, but may be used for computing, movie playing, video taking, mega-picture taking, data storage and etc.

CX8281-002.

Similarly, Jeff Williams (Apple COO) testified that because Apple invests heavily in the handset's physical design and enclosures to add value, and those physical handset features clearly have nothing to do with Qualcomm's cellular patents, it is unfair for Qualcomm to receive royalty revenue on that added value:

> Apple spends a lot of time making its products really beautiful, so we'll spend an extra $60 on the stainless steel and aluminum enclosures and things like that. And per the agreement, if we spent cost on that, say that extra $60, it has nothing to do with their IP, the Qualcomm arrangement would have them collect $3. So that, that didn't make sense to us, and still doesn't today.

Tr. at 869:25-870:5.

Samsung's contemporaneous notes from June 2013 license negotiations reflect Samsung's concurring view that Qualcomm's royalty rates have nothing to do with Qualcomm's patents: "The value of smart phones lies in various computer functions, the operating system, software, applications, and design, etc., which have nothing to do with Qualcomm's chipset IP. Therefore it is unfair for Qualcomm to levy royalties on the basis of the entire phone." CX2642A-003.

Qualcomm's own document recognizes that decorative parts, design, user interface, and mechanical features—the "user experience"—now drive the handset's value rather than the modem chip. *See* CX7559-018. Thus, it makes little sense for Qualcomm to receive royalty revenue on the added value to which Qualcomm did not contribute.

OEMs add other value to handsets unrelated to modem chips. For example, Hwi-Jae Cho (Director of LGE Intellectual Property Center) testified that during 2004 license negotiations LGE argued that Qualcomm should deduct the cost of camera modules and mobile television from the royalty base because those features are independent of Qualcomm's modem chip SEPs: "LGE argued to deduct the cost of camera modules and DMB (which is the Korean version of mobile TV) modules because, at a minimum, those two features were functionally independent from Qualcomm's standard essential patents at that time." Cho Depo. ¶ 101.

Jeff Williams (Apple COO) also testified that Apple invests in other innovations beyond its handset enclosures that add value to a handset. For example, Apple was the first to embed NAND memory, a type of flash memory. If Apple spent $100 on cost for NAND memory, Apple had to then pay Qualcomm $5 even though Qualcomm's intellectual property had nothing to do with NAND memory:

> We were bringing some innovation. And, for example, we were one of the first and led the charge to embed a lot of NAND memory. We did this on our iPods, and we were going to do it on our iPhones, and if we put another $100 of cost in NAND memory, per the Qualcomm agreement, they would get $5 of that even though their IP had nothing to do with that.

Tr. at 869:18-24.

Thus, in 2016, Huawei argued in a letter to Fabian Gonell (QTL Division Counsel) that Qualcomm's royalty rates do not reflect the proportional contribution of Qualcomm's patents to handset value: "It is not reasonable to collect royalty on the selling price of the whole handset as Qualcomm's essential patents are mostly implemented by chipset." CX1101-003.

Expert testimony was consistent with the documentary evidence and OEM testimony. Richard Donaldson, the FTC's licensing expert, explained that Qualcomm's royalty rates should decline over time because handsets are now essentially computers:

> [I]n the case of Qualcomm when rates were first established back when CDMA was used in telephones were our cell phones were – it was just a cell phone. No other capabilities. And those products have changed dramatically over the life since then and we now have smartphones with many, many features that do not infringe the cellular patents, the SEPs. So I would expect that to drive a lower royalty rate.

Tr. at 971:7-14. Likewise, Qualcomm expert Dr. Aviv Nevo testified that handsets have changed dramatically since Qualcomm entered its first license agreements:

> **Q**: The product in which the IP was going to be used changed dramatically over that time; correct?
> **A**: Cell phones did, yeah, they clearly changed.

Tr. at 1944:14-16.

The modem chip also does not drive handset value because handset users can now more

easily use Wi-Fi to transmit data. Michael Lasinski, an FTC expert, testified that the use of Wi-Fi to transmit data has increased: "[I]t turns out that significantly more data is being offloaded to Wi-Fi networks." Tr. at 1016:2-3. Qualcomm expert Dr. Jeffrey Andrews agreed that handset users can use Wi-Fi rather than a modem chip to access data "[a]ssuming they're connected to a Wi-Fi access point that works." Tr. at 1615:7-8.

Qualcomm's constant royalty rate does not reflect the decline in the importance of modem chips in handsets.

6. Qualcomm's Use of the Handset as the Royalty Base is Inconsistent with Federal Circuit Law

Further, Qualcomm's use of the handset device as the royalty base is inconsistent with Federal Circuit law on the patent rule of apportionment. Under the rule of apportionment, "[a] patentee is only entitled to a reasonable royalty attributable to the infringing features." *Power Integrations, Inc. v. Fairchild Semiconductor Int'l, Inc.*, 904 F.3d 965, 977 (Fed. Cir. 2018). In line with that principle, the Federal Circuit held in *LaserDynamics, Inc. v. Quanta Computer, Inc.* that "it is generally required that royalties be based not on the entire product, but instead on the smallest salable patent-practicing unit." 694 F.3d 51, 67 (Fed. Cir. 2012). Thus, Qualcomm is not entitled to a royalty on the entire handset.

Subsequent to *Quanta*, the Federal Circuit has clarified that "[w]here the smallest salable unit is, in fact, a multi-component product containing several non-infringing features with no relation to the patented features . . . , the patentee must do more to estimate what portion of the value of that product is attributable to the patented technology." *Virnetx, Inc. v. Cisco Sys., Inc.*, 767 F.3d 1308, 1327 (Fed. Cir. 2014). This Court has held, in a different case, that "the baseband processor"—the modem chip—"is the proper smallest salable patent-practicing unit" in a cellular handset. *GPNE v. Apple, Inc.*, 2014 WL 1494247, at *10 (N.D. Cal. Apr. 16, 2014), *aff'd*, 830 F.3d 1365 (Fed. Cir. 2016). Because Qualcomm's own document states that a handset's value is now attributable primarily to the "user experience" and not "modem leadership," Qualcomm's collection of a royalty on the entire handset is inconsistent with *VirnetX* and Federal Circuit law

on the smallest salable patent practicing unit.

7. Qualcomm Acknowledges That its SEP Share Has Declined with Successive Standards Yet its Royalty Rate Has Remained Constant for 30 Years

Moreover, even though Qualcomm's share of SEPs is declining and Qualcomm's SEPs expire with successive standards, Qualcomm still maintains a constant royalty rate. A summary exhibit collecting Qualcomm's patent license agreements over the past 30 years shows that Qualcomm has consistently charged OEMs a 5% running royalty for licenses to Qualcomm's patent portfolio. QX9148. Qualcomm charged Siemens a 5% running royalty in 1996 and charged VIVO a 5% running royalty in 2015. QX9148-003, -004.

At trial, Alex Rogers (QTL President) testified that as of 2018, Qualcomm's royalty rate for a portfolio license remains 5%. Tr. at 1972:23-24. Yet according to a March 2016 Qualcomm slide deck that Alex Rogers (QTL President) himself received, Qualcomm's "SEP share has declined with successive standards." CX6594-067.

Consistent with that Qualcomm document, Huawei argued in a 2016 letter to Qualcomm that it is unreasonable for Qualcomm to charge 4G royalty rates predicated on the value of Qualcomm's 3G patent portfolio when Qualcomm's 4G patent portfolio is lower in value:

> Despite the fact that 3G is becoming a backup technology with a significant number of 3G patents being expired, Qualcomm is charging 4G multimode products on 3G rates. This is not consistent with industry practice where patent holders charge royalty at the rate of the latest technology and Qualcomm is trying to extend the benefits gained in 3G era based on its dominant position in chipset market and unique business model bundling chipset supply and patent license.

CX1101-002. Qualcomm's royalty rate should not stay constant across standards when its patent portfolio has declined with successive standards.

As Qualcomm's March 2016 slide deck and Huawei's 2016 letter pointed out, Qualcomm's patent contributions are declining with successive standards. Under the Patent Act, a patent expires twenty years from the date of patent application. 35 U.S.C. § 154(a)(2). Thus, many of Qualcomm's patents—especially those patents covered in early CDMA license agreements—have doubtless expired, as OEMs have asserted.

For example, John Grubbs (BlackBerry Senior Director of Intellectual Property Transactions) testified that Qualcomm's 5% running royalty violates FRAND because many of Qualcomm's CDMA patents have expired: "So at some point you get to the point where an entity is paying 5 percent for the CDMA patents when there may not be but just a handful of CDMA patents left. So that – in that respect, it . . . it violates FRAND." Grubbs Depo. 235:10-15.

Similarly, according to Eric Reifschneider's (QTL Senior Vice President and General Manager) contemporaneous notes, Huawei asserted in 2013 license negotiations that Qualcomm's royalty rate should decline with the expiration of Qualcomm's patents: "As to term, it makes sense to keep it short for c2k [CDMA2000] since half of your patents have expired or will expire in 3-5 years." CX6528-009.

Richard Donaldson, the FTC's expert, testified consistently: "Many of Qualcomm's early patents are expiring which, in my experience in license negotiations, when your portfolio is weakened by expiring significant patents, the royalty rate would typically decrease." Tr. at 971:22-25. Yet Qualcomm's rates have not decreased, which further indicates that Qualcomm's royalty rates are unreasonably high.

Qualcomm's royalty rate stays constant even though Qualcomm receives cross-licenses to OEMs' patent portfolios, which differ in value. John Grubbs (BlackBerry Senior Director of Intellectual Property Transactions) testified that BlackBerry considers the value of cross-licenses when setting a royalty rate: "All I can say is based on what BlackBerry has done, and I know that we would take into account the value of any cross-license coming back – if there was any significant value there – before we would price our license." Grubbs Depo. 94:23-95:2.

In addition, OEMs uniformly testified that Qualcomm's royalty rates are disproportionately higher than the royalty rates OEMs owe other licensors. Jeff Williams (Apple Chief Operating Officer) testified that "Qualcomm charges us more than everybody else put together." Tr. at 871:2-6.

Similarly, Todd Madderom (Motorola Director of Procurement) testified that Qualcomm's royalty rates are the highest Motorola has ever had to pay: "In our experience we've never seen

such a significant licensing fee tied to any other IP we license." Madderom Depo. 217:24-218:2.

Ira Blumberg (Lenovo Vice President of Intellectual Property) concurred: "Based on the negotiations I've had with companies like Nokia, Ericsson, InterDigital, and other significant patent holders, Qualcomm's rates are substantially higher." Blumberg Depo. 149:9-13.

Likewise, John Grubbs (BlackBerry Senior Director of Intellectual Property Transactions) testified that Qualcomm's royalty rate was the highest in the industry: "[T]he 5 percent royalty rate was significantly higher than any other SEP rate we paid to anybody else in the industry." Grubbs Depo. 236:5-7.

Hwi-Jae Cho (Director of LGE Intellectual Property Center) testified that Qualcomm's royalty rate was so high that it could lead to an aggregate royalty that would make it impossible to generate profit on handsets:

> If Qualcomm attempted to assert a 5.75% royalty for its small share of WCDMA technology alone, the aggregate royalty for the entire WCDMA patent portfolio would be more than 25% of handset price, which was far more than what LGE or the industry thought at that time. If the royalty for WCDMA alone was more than 25% of the phone price, it would be impossible to make any profit by selling handsets.

Cho Depo. ¶ 38h.

Similarly, in a June 2016 proposal to Fabian Gonell (QTL Division Counsel) to renegotiate the royalty rate Huawei paid to Qualcomm, Huawei stated that Huawei's royalty payments to Qualcomm comprised 80-90% of the total royalty payments Huawei paid for terminal products:

> Huawei has entered into license agreements with major patent holders in the industry, but the royalty Huawei paid to Qualcomm each year consists of 80-90% of the total royalty we paid for terminal products, which well demonstrates that Qualcomm's royalty rate is excessively higher than other major patent holders in the industry.

CX1101-001.

Qualcomm has sustained by far the highest royalty rates of any cellular patent holder despite its declining SEP share with successive standards and the expiration of its patents. The degree to which Qualcomm's royalty rates and revenues outstrip the rates and revenues of SEP

holders that Qualcomm's own documents state are the top contributors to standards is staggering. For example, QTL's 2017 strategic plan, which Derek Aberle (Qualcomm President) and Alex Rogers (QTL President) reviewed, states that QTL earned $7.7 billion in licensing revenue for Qualcomm in 2016, which exceeded the combined licensing revenue of twelve other licensors, including Ericsson, Nokia, and Interdigital. CX7122-026.

Similarly, a slide deck that Bain prepared for Intel, and which Qualcomm introduced into evidence, shows that in 2011, Qualcomm earned over 25% of global cellular patent licensing revenue and over 50% of global patent licensing revenue related to modem chips. QX0121A-009.

Qualcomm generates that revenue with unreasonably high royalty rates, even though Qualcomm's own documents recognize that Qualcomm is not the top contributor to standards. Injung Lee (Licensing Lead at Samsung Intellectual Property Center) testified that in comparison to Qualcomm's 5% running royalty rate, Samsung paid Ericsson a lump sum royalty payment that worked out to a [redacted]% effective royalty rate and Nokia a lump sum royalty payment that worked out to a [redacted]% effective royalty rate. Lee Depo. 145:8-17. According to Nokia's discovery responses to the FTC, Nokia[9] licenses its SEPs at rates between [redacted]%, but caps its royalty charges at [redacted] Euros] per handset. QX2778-008.

Other patent licensors like Nokia and Ericsson have announced publicly that the aggregate royalty an OEM pays to *all* SEP licensors should not exceed 5%. In 2002 (at the launch of WCDMA), Ericsson, Siemens, Nokia, and other SEP licensors stated in a press release their mutual understanding to "enable the cumulative royalty rate for W-CDMA to be a modest single digit level"—specifically under a 5% cumulative royalty rate paid to all SEP licensors. CX4103-001. In 2008 (at the launch of LTE), those same SEP holders similarly stated in a press release that an OEM's aggregate LTE royalty rate paid to all SEP licensors should be a single digit rate: "[T]he companies support that a reasonable maximum aggregate royalty level for LTE essential

[9] As the Court explained in Section V.E., Nokia followed Qualcomm's lead in licensing at the handset instead of the chipset level and thus to protect its licensing revenue supported Qualcomm at summary judgment and testified for Qualcomm at trial.

IPR in handsets is a single-digit percentage of the sales price." CX4104-001.

Against this wave of evidence that Qualcomm's unreasonably high royalty rate should not stay constant and Qualcomm's admissions that only its monopoly modem chip share sustains Qualcomm's royalty rate, Qualcomm economic expert Dr. Aviv Nevo opined that Qualcomm's royalty rates are reasonable *because* the rates are constant. However, Dr. Nevo was contradicted by Qualcomm's own documents, and the Court does not find his testimony reliable.

Dr. Nevo explained that economists generally believe that to determine a FRAND rate, one should look at rates negotiated before the standard was adopted: "[O]ne thing that's in pretty consensus agreement is the fact that we should be looking at, at negotiations that happened ex ante. Ex ante means before the standard was adopted." Tr. at 1872:13-16. Dr. Nevo observed that Qualcomm entered five CDMA license agreements before 1993, when the CDMA standard was adopted, and that Qualcomm's royalty rates varied from 4% to 6.5%. *Id.* at 1873:1-2.

However, Dr. Nevo made the faulty assumption that Qualcomm's royalty rates in later patent licenses are only unreasonably high if Qualcomm's royalty rates *increased* over time. Tr. at 1865:12-15. Dr. Nevo's assumption ignores the foregoing evidence that Qualcomm's royalty rate should instead decline over time. Dr. Nevo himself admitted that handsets have changed since Qualcomm first licensed its patents: "Cell phones did, yeah, they clearly changed." *Id.* at 1944:16.

Most important, Qualcomm's own admissions contradict Dr. Nevo's claim. For example, in a 2015 Project Phoenix email, David Wise (Qualcomm Senior Vice President and Treasurer) explained that "there is a high correlation between our modem (chip) share and licensing compliance and royalty rate sustainability." CX8299-001. Where QCT had low chip share, Wise stated, "we are seeing challenges with compliance and maintaining the royalty rate." *Id.* Thus, Qualcomm has recognized that QCT's monopoly power helps Qualcomm *sustain* its unreasonably high royalty rates, and that QTL's unreasonably high royalty rates are not attributable to the value of QTL's patents.

8. Qualcomm's Unreasonably High Royalty Rates Have Not Been Tested by Litigation

Moreover, Qualcomm's unreasonably high royalty rates have not been tested by litigation because Qualcomm's chip supply leverage insulates Qualcomm from legal challenges. Qualcomm's own documents recognize how Qualcomm's monopoly modem chip share prevents litigation, which sustains Qualcomm's unreasonably high royalty rates.

For example, Steve Altman (Qualcomm President) prepared portions of a January 2008 Project Berlin presentation shared with Steve Mollenkopf (QCT President). CX6992-001. On one slide, Altman wrote that if Qualcomm separated, Qualcomm's licensing business may be in jeopardy: "Post spin, many current QCT customers may more aggressively seek to challenge certain aspects of our licensing business and/or their agreements with Qualcomm." CX6992-035. Altman testified that "spin" refers to separating QTL and QCT. Tr. at 201:15-18. Among those challenges might be FRAND litigation to challenge Qualcomm's royalty rates, Altman testified:

> **Q**: One argument that's available to companies trying not to pay royalties that they agreed to pay would be to bring a claim that Qualcomm's royalties did not comport with Qualcomm's FRAND commitments; isn't that right?
> **A**: They would try that.

Tr. at 202:11-15.

Seven years later, during Project Phoenix, David Wise (Qualcomm Senior Vice President and Treasurer) included the same points in a slide deck sent to Alex Rogers (now QTL President) and other Qualcomm executives. CX5953-001. On one slide, under the header "High modem share drives compliance and royalty rate," Wise wrote that QTL could avoid "risky litigation" thanks to QCT's modem share: "Addresses QTL compliance challenges and sustainability of long term royalty rate; without risky litigation." CX5953-011. At trial, David Wise (Qualcomm Senior Vice President and Treasurer) conceded that avoiding risky litigation helps avoid any reduction in QTL's royalty rates:

> **Q**: But one component of risky litigation is the risk that Qualcomm doesn't get the royalty rate it seeks? Isn't that fair?
> **A**: You could end up with not getting the royalty rate you think you deserve, sure.

Tr. at 109:25-110:4.

Consistent with Qualcomm's contemporaneous documents, OEMs testified at trial that

QCT's monopoly power and QTL's use of chip supply threats precluded litigation over Qualcomm's royalty rates, or over whether Qualcomm's patents are valid or infringed. For example, Ira Blumberg (Lenovo Vice President of Intellectual Property) testified that ordinarily, litigation provides a tool for both parties to a license negotiation if one thinks the other is being unreasonable:

> [T]hat's the number one thing I use to assess whether I want to sign a license, is a careful analysis of whether litigation and the likely outcome of litigation, plus the expense, taking into account the time value of money and so on, is ultimately greater than or less than the negotiated alternative. And I'm very pragmatic; when the negotiated alternative is clearly less expensive, I'm happy to take a license. When the negotiated alternative is equal to or greater than the likely litigation outcome, I'm not ready to sign, and I'm ready to keep negotiating and/or litigating as necessary.

Blumberg Depo. 188:2-15. However, Blumberg testified that Qualcomm's chip supply leverage took litigation off the table: "But [w]hen you're facing, as we've discussed, a dispute resolution that says either you agree or can't get any more key supplies, it certainly changes the balance of negotiating capabilities." *Id.* at 189:6-9.

Similarly, John Grubbs (BlackBerry Senior Director of Intellectual Property Transactions) testified that Qualcomm rejected BlackBerry's request to arbitrate Qualcomm's royalty rate:

> **Q**: And is this email requesting an arbitration on the royalty cap and on a FRAND determination for Qualcomm's royalty rate?
> **A**: Yes.
> **Q**: Was Qualcomm willing to arbitrate the claim . . . that royalties were not FRAND?
> **A**: No, it was not.

Grubbs Depo. 295:6-14.

Nanfen Yu (Huawei Senior Legal Counsel) also testified that Huawei could not litigate Qualcomm's royalty rates because Huawei was concerned about chip supply:

> **Q**: Would there be practical problems with suing Qualcomm for determination of the FRAND royalty rate while you are obtaining product from Qualcomm?
> **A**: So one concern would be the chipset supply, and the other is that we have the existing license agreements in place. And we have contractual obligations under the agreement, too.

Yu Depo. 158:3-10.

Specifically, Todd Madderom (Motorola Director of Procurement) testified that if an OEM challenged Qualcomm's royalty rate and lost chip supply, an OEM would lose all of its related handset business: "If we are unable to source the modem, we are unable to ship the handset. It's a direct correlation. No modem supply, no phone supply to our customer." Madderom Depo. 147:25-148:3.

Richard Donaldson, the FTC's licensing expert, offered expert testimony consistent with Qualcomm's documents and OEM testimony. Donaldson testified that in a typical negotiation, a licensee always has FRAND litigation as a recourse: "[I]f he is of the opinion that what is being proposed, the rates being proposed are unreasonably high, he would have an expectation that a reasonable court would lower what a reasonable – his determination of a reasonable royalty." Tr. at 966:2-5. However, Qualcomm's licensing practices removed that option: "[I]t would put the licensee at a severe disadvantage. He's basically – and as the testimony reflects – he's basically in the position, I agree to the license or basically go out of business." *Id.* at 967:-18-21. Consistent with the trial evidence, Donaldson opined that this dynamic "results in a disproportionately high royalty rate." *Id.* at 967:24-25.

In addition, Donaldson testified that from 2006 to 2016, Qualcomm was involved in only two patent litigation lawsuits "unrelated to enforcing the SEP patents." Tr. at 973:23-24. By contrast, other SEP holders like Ericsson, Nokia, and InterDigital each were involved in more than twice as many patent litigations over the same period. *Id.* at 973:19-22; *see* CX0101-001 (chart comparing litigation by company). According to Donaldson, those figures undersell the effect of Qualcomm's licensing practices:

> Ericsson, Nokia, and InterDigital did not have a no license, no chip policy, so their negotiations would have always included, or been negotiated in the shadow of what possible legal remedies might exist, which would have – which would suggest that they would have been more reasonable in setting what their royalty demands were and avoiding litigation in a number of cases that aren't reflected here.

Tr. at 973:25-974:7. Because Donaldson's testimony was consistent with Qualcomm's documents

and the trial evidence, the Court finds reliable his opinion that Qualcomm's monopoly chip power both sustains Qualcomm's unreasonably high royalty rates and prevents litigation to challenge those royalty rates.

Although Qualcomm's license agreements offer OEMs binding arbitration, Qualcomm has threatened to cut off chip supply and technical support, and to require the return of software when OEMs attempt to arbitrate royalty rates. This renders arbitration a functional nonstarter. For example, after LGE and Qualcomm exchanged arbitration demands in 2004 relating to LGE's WCDMA royalty obligations, Dr. Irwin Jacobs (Qualcomm Co-Founder and former CEO) stated that unless LGE withdrew its arbitration claims and paid past WCDMA royalties, Qualcomm would stop accepting LGE purchase orders for chips, cease all shipments of chips, withdraw all technical support, and require LGE to return all chip software. Specifically, Irwin Jacobs stated:

> I therefore request that LGE promptly (i) retract and waive Mr. Ham's claim that QUALCOMM has waived its rights under our existing Supply Agreement or that LGE has received or somehow receives any implied royalty free license to use our WCDMA ASICs and (ii) without prejudice to either party's position in the present arbitration, agree to report and pay royalties on all of its sales of past and future WCDMA subscriber units and infrastructure equipment in accordance with the terms of the license agreement. Otherwise, QUALCOMM is left with no choice but to take the following steps:
>
> 1) QUALCOMM will stop accepting LGE purchase orders for WCDMA ASICs;
> 2) QUALCOMM will cease all shipments of WCDMA ASICs to LG, beginning with the next-scheduled shipments of 500 units of the MSM 6250 for June 30, and 6000 units of the MSM 6200 scheduled to ship during the first week in July;
> 3)QUALCOMM will withdraw all of its substantial WCDMA engineering resources currently providing technical support to LGE and reassign those resources to our strategic ASIC customers, all of whom are honoring their supply contracts and licensing obligation; and
> 4) QUALCOMM will require that LGE return to QUALCOMM all versions and derivations of our WCDMA ASIC software.

CX6814-022. At trial, Irwin Jacobs testified that Qualcomm then cut off LGE's chip supply: "We did not ship to them the chips that were specified here, the 500 and then 6,000 chips as far as I know at this time." Tr. at 1293:25-1294:2.

Hwi-Jae Cho (Director of LGE Intellectual Property Center) testified that "[w]hen

Qualcomm threatened to terminate the Supply Agreement, LGE had no option but to agree to whatever Qualcomm demanded. LGE's top management did not want to take the risk of endangering LGE's mobile business." Cho Depo. ¶ 91.

Thus, because Qualcomm threatened to cut off and actually did cut off OEMs' chip supply and threatened to revoke technical support and software from OEMs, arbitration—even if technically available—was not a realistic path for an OEM. Accordingly, Qualcomm's monopoly chip power leads to unreasonably high royalty rates by eliminating the prospect of FRAND litigation or arbitration.

Lastly, Michael Lasinski, the FTC's patent valuation expert, also concluded that Qualcomm's royalty rates are unreasonably high. Lasinski's methodologies are not reliable, as he evaluated SEP holders' relative portfolio strength in part by counting SEP holders' approved contributions to standards. At trial, Lasinski admitted that a company can receive credit for an approved contribution based on a mere cosmetic change to an existing standards document. *Id.* at 1067:17-1068:9. For example, one approved contribution to 3GPP states that the contribution provides "editorial corrections" to a standards document and "has no impact on the implementations" of the standard. QX6457-001. Accordingly, the district court in *TCL Communication Technology Holdings, Ltd. v. Telefonaktiebolaget LM Ericsson*, 2018 WL 4488286 (C.D. Cal. Sept. 14, 2018), concluded that using contribution counting to value a patent portfolio suffers from two flaws: "the absence of any evidence that it corresponds to actual intellectual property rights, and its inability to account for transferred or expired patents." *Id.* at *41. Thus, the Court does not rely on Lasinski's testimony.

However, Lasinski's ultimate conclusions are in line with the documentary evidence that Qualcomm's royalty rates are unreasonably high. Specifically, Lasinski determined that for any OEM, Qualcomm's FRAND royalty rate should be below 1%: "So my highest indicator here is 0.58%, which is significantly below what Qualcomm has actually charged historically to these licensees." Tr. at 1034:25-1035:2. The Court notes that Lasinski's calculations are consistent with [redacted]'s and [redacted]'s rates.

Thus, based on all the foregoing evidence—primarily Qualcomm's own documents—the Court concludes that Qualcomm's royalty rates are unreasonably high. These unreasonably high royalty rates raise costs to OEMs, and harm consumers because OEMs pass those costs along to consumers. Qualcomm's unreasonably high royalty rates also prevent OEMs from investing in new handset features, which further harms consumers. Todd Madderom (Motorola Director of Procurement) testified that if Motorola did not have to pay Qualcomm's inflated license fees, Motorola could invest those funds in better features for consumers: "[W]e believe that the millions of dollars that we pay to royalty could be better – could be invested to perhaps develop our own technological advances." Madderom Depo. 218:24-219:3.

Moreover, Qualcomm's unreasonably high royalty rates may dissuade OEMs from investing in new features that would benefit consumers because an OEM will have to pay Qualcomm additional royalties if the new features add to the handset's price. For example, Jeff Williams (Apple COO) testified that if Apple added $60 of value to its handset enclosure, Qualcomm would receive $3 in royalty payments on each Apple handset even though Qualcomm's cellular patents had nothing to do with Apple's addition. Tr. at 869:21-24.

H. Qualcomm's Surcharge on Rivals Bolsters Qualcomm's Monopoly Chip Market Share, Unreasonably High Royalty Rates, and Exclusivity with OEMs

Next, the Court discusses how Qualcomm's unreasonably high royalty rates impose a surcharge on rivals' modem chips. Under Qualcomm's patent license agreements with OEMs, Qualcomm charges its unreasonably high royalty rates anytime an OEM sells a handset, even when that handset contains a rival's modem chip. Thus, Qualcomm imposes an artificial surcharge on all sales of its rivals' modem chips. The surcharge increases the effective price of rivals' modem chips, reduces rivals' margins, and results in exclusivity.

For example, Brian Chong (Wistron Chief of New Technology Development and Product Planning) testified that Qualcomm's patent license restricts Wistron's ability to use rivals' modem chips because the royalty rate imposes a surcharge on rivals' chips:

[T]here was a case that I remember in particular when we were considering

> introducing lower cost phones. And MTK was the chip supplier that we think best suitable for that product position in terms of price position and the spec corresponding that it offers. However, in the end we decided to stay Qualcomm for the simple reason that because Qualcomm responded that, even if we're using non-Qualcomm chips, we would still have to pay the onerous royalty that Qualcom dictated in the SULA.

Chong Depo. 256:9-20. Chong also testified that the upfront fee Wistron had paid Qualcomm incentivized Wistron to buy Qualcomm chips rather than rivals' chips: "So by staying with Qualcomm we would be able to recoup that investment faster." *Id.* at 256:21-257:1.

Practices that unfairly suppress sales of competing products "below the critical level necessary for any rival to pose a real threat" cause anticompetitive harm because they exclude competitors from the marketplace and thereby harm competition in general. *Dentsply*, 399 F.3d at 191; *see also Spectrum Sports*, 506 U.S. at 458 (holding that the Sherman Act "directs itself . . . against conduct which unfairly tends to destroy competition itself").

The Seventh Circuit's decision in *Premier Electrical Construction Company v. National Electrical Contractors Association*, 814 F.2d 358 (7th Cir. 1987), demonstrates how a monopolist can use an across-the-board price increase to impose artificial constraints that disproportionately harm the monopolist's competitors, as Qualcomm has done.

In *Premier*, an association of electrical employers known as the National Electrical Contractors Association ("the Association") established a fund with an electrical workers' union ("the Union"). *Id.* at 359. Association members contributed 1% of their gross payroll into the fund to offset the cost of collective bargaining and administrative services. *Id.* at 359–60. However, because electrical employers who were not Association members were "free of the 1% contribution," these electrical employers "had lower costs of doing business" and could charge lower prices. *Id.* at 368. Electrical employers who were not Association members thus began to underbid the Association's members for electrical contracting work. *Id.*

To prevent being underbid, the Association enlisted the Union to collect the 1% fee from non-Association electrical employers as well. *Id.* at 368. In this way, the Association "leveled" the playing field because all employers had to pay into the fund, but in so doing the Association

gave itself an advantage. "The result was higher prices to purchasers of electrical work and higher profits for members of the Association—both because there is more in the fund, for the Association's use, and because the reduction in competition enabled the members to capture more of the market." *Id.* Although the Association in *Premier* charged the 1% fee directly to its rivals—whereas Qualcomm's surcharge raises the price an OEM must pay for rivals' modem chips—the result is substantially the same. Like the Association, Qualcomm has "raised its rivals' costs, and thereby raised the market price to its own advantage." *Id.*

Qualcomm's unreasonably high royalty rates enable Qualcomm to control rivals' prices because Qualcomm receives the royalty even when an OEM uses one of Qualcomm's rival's chips. Thus, the "all-in" price of any modem chip sold by one of Qualcomm's rivals effectively includes two components: (1) the nominal chip price; and (2) Qualcomm's royalty surcharge.

To Qualcomm, the surcharge represents "higher profits," both because the surcharge brings additional revenue to Qualcomm, and "because the reduction in competition enable[s]" Qualcomm "to capture more of the [modem chip] market." *Premier*, 814 F.2d at 368; *see United Shoe Mach. Corp. v. United States*, 258 U.S. 451, 457 (1922) (holding that agreements with "the practical effect" to exclude purchases of a competitor's products are anticompetitive).

Because the surcharge also raises the market price of rivals' chips, Qualcomm prevents rivals from underbidding Qualcomm, so that Qualcomm can maintain its modem chip market power. The surcharge affects demand for rivals' chips because as a matter of basic economics, regardless of whether a surcharge is imposed on OEMs or directly on Qualcomm's rivals, "the price paid by buyers rises, and the price received by sellers falls." N. Gregory Mankiw, Principles of Microeconomics, Vol. 1 156 (7th ed. 2014). Thus, the surcharge "places a wedge between the price that buyers pay and the price that sellers receive," and demand for such transactions decreases. *Id.* Rivals see lower sales volumes and lower margins, and consumers see less advanced features as competition decreases.

The district court in *Caldera, Inc. v. Microsoft Corp.*, 87 F. Supp. 2d 1244 (D. Utah 1999), addressed how a similar royalty surcharge increased rivals' prices and promoted exclusivity.

Caldera alleged that Microsoft had unlawfully maintained its monopoly in operating systems used for personal computers through several practices. *Id.* at 1246. In one practice, Microsoft entered multiyear licenses with OEMs that required OEMs to pay Microsoft "a royalty on every machine the OEM shipped regardless of whether the machine contained [Microsoft's operating system] or another operating system." *Id.* at 1249–50. This raised the all-in price of Caldera's operating system. *Id.* at 1250.

Further, Microsoft offered discounts on Microsoft's operating system if OEMs entered the license agreements, which induced OEMs to enter agreements that raised the effective price of Caldera's operating system. *Id.* At summary judgment, the district court concluded that a reasonable jury could conclude that Microsoft's license agreements and discounts "resulted in an agreement with the practical effect of exclusivity" because Microsoft's surcharge increased the effective price of Caldera's operating systems. *Id.* Here, too, Qualcomm's surcharge increased the effective price of rivals' modem chips and Qualcomm's agreements with OEMs result in exclusivity.

I. Qualcomm's Chip Incentive Funds Bolster Qualcomm's Monopoly Chip Market Share, Unreasonably High Royalty Rates, and Exclusivity with OEMs

QTL's chip incentive funds lower the effective price of Qualcomm's modem chips, which exacerbates the effect of Qualcomm's surcharge on rivals' chips. Qualcomm's exclusive deals with Apple are the most prominent single example of such funds, but Qualcomm regularly gave OEMs chip incentives that result in exclusivity and in combination "severely restrict the market's ambit." *Dentsply*, 399 F.3d at 191. In turn, QTL's unreasonably high royalty rates generate the revenue that enables QTL to offer OEMs hundreds of millions (or in the case of Qualcomm's exclusive deals with Apple, billions) in chip incentives.

In 2010, Derek Aberle (QTL President) offered BlackBerry [redacted] million in chip incentives, which BlackBerry received as rebates on QCT modem chips, according to the contemporaneous notes of John Grubbs (BlackBerry Senior Director of Intellectual Property Transactions). CX3255-002. Grubbs testified that because Qualcomm did not reduce

BlackBerry's overall royalty burden, the chip incentive fund reduced the effective price of only Qualcomm modem chips, and resulted in exclusivity:

> BlackBerry is going to pay the royalty, regardless of whether it buys the chip from Qualcomm or Marvell. If – if Qualcomm agreed to reduce the royalty, then BlackBerry could buy the chips from Qualcomm or Marvell and still get the benefit of that reduced price. If Qualcomm reduces the chip cost, then we can only go to one person in order to take advantage of that and that's Qualcomm. So we can't go to Marvell and take advantage of a reduction in chip price unless they're going to get this reduction too.

Grubbs Depo. 259:13-25.

Similarly, a 2004 QTL chip incentive fund required LGE to purchase at least 85% of its modem chips from QCT to be eligible for the chip incentives. CX6809-004.

In 2003, Qualcomm's chip incentive fund required Samsung to purchase at least 85% of its modem chips from QCT in 2003 to "take market share from manufacturers that do not use our ASICs," according to Irwin Jacobs (Qualcomm Co-Founder). CX6719-002. As recently as 2018, Qualcomm's chip incentive fund required Samsung to purchase from Qualcomm 100% of Samsung's premium modem chips and at least a certain number of medium and high tier modem chips. JX0122-036.

In 2013, QTL offered Lenovo $180 million in chip incentives that were contingent on Lenovo purchasing at least 80 million modem chips from QCT over two years. CX6491-003.

In 2016, QTL offered Motorola a chip incentive fund that Motorola concluded would reduce Motorola's effective royalty rate to 3.8% only if Motorola purchased 100% of its modem chips from Qualcomm. CX2060-021.

In 2003, Qualcomm charged Huawei a reduced royalty rate of 2.65% if Huawei purchased 100% of its CDMA modem chips for use in China from Qualcomm, but a 5-7% royalty rate if Huawei purchased CDMA modem chips from a Qualcomm rival. JX0022-010.

Similarly, for years Qualcomm charged LGE a 5.75% running royalty rate on handsets containing Qualcomm's rival's chips and a 5% running royalty rate on handsets containing Qualcomm's chips. JX0026-005. Thus, all of these chip incentives and license provisions tend to

result in exclusivity.

In internal documents, Qualcomm has recognized that reducing its chip price rather than reducing its royalty rate—as Qualcomm does via chip incentive funds—prevents Qualcomm from having to compete with rival modem chip suppliers on price, and results in exclusivity. Thus, in a 1998 email to Steve Altman (later Qualcomm President), Marv Blecker (QTL Senior Vice President) recommended that Qualcomm reduce prices on modem chips, rather than reducing Qualcomm's royalty rates:

> Basically, by reducing royalties we are doing nothing more than competing on price with our asic competitors; that is if the reduced or zero royalty is the incentive to buy Q ASICs, then the same effect can be achieved by simply reducing price on our ASICs by that same amount. The advantage of doing it the latter way is that we have preserved the integrity of our royalty rate; ie we have not started down the 'slippery slope' of reducing royalty rates.

CX8206-001.

Qualcomm's billion-dollar exclusive deals with Apple are the most prominent single example of Qualcomm eliminating chip price competition for OEM business. As the Court discussed at length in Section V.G., Qualcomm's exclusive deals with Apple foreclosed rivals from the many direct and indirect benefits of selling modem chips to Apple. Per a 2012 presentation to the Qualcomm Board of Directors, Apple is the OEM that "matters most" because Apple is the largest consumer of premium modem chips—thus providing its suppliers with high sales volumes—and Apple "challenges suppliers to provide best-in-class products," which improves suppliers' products in the broader marketplace. CX6974-029.

Qualcomm has recognized that Apple's purchase volumes are significant enough that without selling thin modem chips to Apple, a rival supplier of thin modem chips cannot survive in the market. In August 2010, Steve Mollenkopf (QCT President) told Paul Jacobs (Qualcomm CEO), Derek Aberle (QTL President), and Steve Altman (Qualcomm President) in an email that if Qualcomm secured Apple exclusivity in the TA, Qualcomm could prevent rivals from becoming threats: "[T]here are significant strategic benefits as it is unlikely that there will be enough standalone modem volume to sustain a viable competitor without that slot." CX5348-001.

Furthermore, Aicha Evans (Intel Chief Strategy Officer) testified that after Intel won Apple's business, other OEMs, including Lenovo, LGE, Motorola, and Tesla, reached out about Intel's modem chips. Tr. at 576:20-577:4. Evans testified that Apple enhances a modem chip supplier's presence in SSOs. *Id.* at 569:9-10. Similarly, Stefan Wolff (Intel Engineer) explained in a contemporaneous email that winning Apple's business would enable Intel to attract operators and network vendors for early prototyping of Intel's newest LTE modem chips. CX1599-001. Thus, Qualcomm's exclusive deals with Apple both restricted rivals' sales and deprived rivals of the positive network effects of supplying modem chips to Apple.

Qualcomm's chip incentive funds also help maintain Qualcomm's unreasonably high royalty rates and surcharge on rivals' chips by inducing OEMs to sign license agreements. In 2013, Eric Reifschneider (QTL Senior Vice President and General Manager) told Derek Aberle (QTL President) and Marv Blecker (QTL Senior Vice President) that Qualcomm could convince OPPO to sign a QTL license if QTL offered chip incentives: "Think we have a good chance of getting them to take a 4G license now, if we are willing to give them (in addition to the $5M strat fund) a capped deduction for marketing expenses." CX6516-001.

Similarly, John Grubbs (BlackBerry Senior Director of Intellectual Property Transactions) testified that BlackBerry's receipt of chip incentive funds was "contingent on BlackBerry resolving its royalty dispute with Qualcomm." Grubbs Depo. 248:9-15. By using chip incentive funds to close the gap on license agreements, Qualcomm ensures that QTL can continue to charge unreasonably high royalty rates on rivals' modem chips.

Finally, QTL's unreasonably high royalty rates continue the cycle of anticompetitive harm because royalty revenues fund QTL's enormous chip incentive funds.

A May 2007 Qualcomm accounting memo concluded that even though a chip incentive fund accrued on LGE's purchase of QCT modem chips, QTL would fund the chip incentive fund because QTL received the primary benefit: "QTL is deemed to be the primary beneficiary of the elements of these agreements, including the expected royalty streams resulting from QC's first OFDM [an LTE technology] subscriber device license with a major handset manufacturer.

Therefore, the amounts under these agreements will be recorded in the QTL business unit." CX7556-005. Because Qualcomm's unreasonably high royalty rates are not based on the value of Qualcomm's patents but rather on Qualcomm's chip monopoly power, using those unfairly obtained royalty revenues to impair rivals "does not further competition on the merits." *PeaceHealth*, 515 F.3d at 894.

Thus, QTL's unreasonably high royalty rates enable QTL to offer OEMs enormous chip incentive funds, which lower the relative price of Qualcomm's modem chips, result in exclusivity, and maintain Qualcomm's ability to impose a surcharge on rivals' modem chips.

Qualcomm argues that its chip incentive funds are procompetitive as "legitimate marketing funds rather than exclusionary conduct." ECF No. 1470-2 ¶ 697. However, Qualcomm's own documents discussed at length above show that QTL's chip incentive funds preserve QTL's "royalty stream" and enable Qualcomm to avoid competing on chip price with its rivals. Qualcomm offers no evidence that Qualcomm or OEMs viewed Qualcomm's chip incentive funds as anything other than rebates designed to lower Qualcomm's chip prices relative to Qualcomm's rivals and to preserve Qualcomm's unreasonably high royalty rates. Therefore, the Court rejects Qualcomm's procompetitive justification as pretextual.

J. Qualcomm's Refusal to License Rivals Bolsters Qualcomm's Monopoly Chip Share, Unreasonably High Royalty Rates, and Exclusivity with OEMs

Qualcomm also refuses to license rivals in violation of its FRAND commitments and its antitrust duty to deal with rivals. As the Court explained in Section V.C., Qualcomm's refusal to license its modem chip SEPs to rival modem chip suppliers prevents rivals' entry, promotes rivals' exit, and hampers Qualcomm's rivals in the marketplace. Instead of licensing rivals, Qualcomm will only enter CDMA ASIC Agreements, which enable Qualcomm to control to whom its rivals sell modem chips and to require that rivals report to Qualcomm the identities of specific quantities sold to each customer.

In so doing, Qualcomm reduces its rivals' customer base and sales, which results in exclusivity. By preventing rivals from entering the market and restricting the sales of those rivals

that do enter, Qualcomm entrenches its monopoly power, maintains its chip leverage over OEMs, and sustains its unreasonably high royalty rates. *See Dentsply*, 399 F.3d at 191 (holding that anticompetitive harm results when anticompetitive practices "bar a substantial number of rivals" from the market).

Qualcomm's refusal to license rivals boxes out rivals. Scott McGregor (former Broadcom CEO) testified that Qualcomm refused to license Broadcom to prevent Broadcom from becoming a competitor: "[W]e subsequently tried to work out licensing terms with them and we didn't feel we could get reasonable licensing terms with them working on that and we felt they may be blocking us in the space." McGregor Depo. 151:10-14.

Instead of licenses, Qualcomm enters CDMA ASIC Agreements that permit rivals to sell modem chips to only "Authorized Purchasers"—Qualcomm licensees. JX0050-001. Qualcomm's CDMA ASIC Agreements also require rivals to report to Qualcomm "specific quantities" of modem chips sold to each Authorized Purchaser, and thus give Qualcomm sensitive business information about rivals' sales and customers. JX0050-055 to -056. Thus, Qualcomm controls and monitors to whom its rivals sell modem chips.

Qualcomm has emphasized to OEMs that Qualcomm controls to whom its rivals sell modem chips, which bolsters Qualcomm's chip supply leverage and ability to extract unreasonably high royalty payments from OEMs. In November 2013, Ira Blumberg (Lenovo Vice President of Intellectual Property) wrote to other Lenovo executives that Qualcomm had threatened to withhold Lenovo's chip supply *and* to force MediaTek to withhold Lenovo's chip supply: "Qualcomm has threatened to stop selling its chips to Lenovo if Lenovo terminates its license. Further, Qualcomm has threatened to force its chip licensees (including MediaTek) to stop selling mobile phone chips to Lenovo if Lenovo terminates its license." CX2079-004.

Qualcomm even boxes out its rivals through chip supply threats to OEMs. For example, in 2015, Qualcomm used the threat of chip supply cutoff to prevent VIVO from purchasing a more competitive modem chip from Qualcomm's rival MediaTek. Sanjay Mehta (QCT China Senior Vice President) told Derek Aberle (Qualcomm President) and Cristiano Amon (QCT President) in

an email that QCT could secure exclusivity with VIVO if QTL permitted QCT to continue supplying chips: "What VIVO will commit to (pending QTL confirmation that if VIVO continues to negotiate with QTL in good faith, QCT will continue shipping chipsets) . . . will not launch 6755/6750 [MediaTek modem chips] based handsets (which means QCT will win significant upside in 2016)." CX5321-002. When asked about the email, Cristiano Amon (now Qualcomm President) testified that the 6755 and 6750 modem chips were MediaTek modem chips that had "competition advantages . . . and software compatibility with whatever the incumbent chipset in VIVO was." Tr. at 509:13-510:7. Thus, Qualcomm used VIVO's fear of losing chip supply to secure exclusivity with VIVO and eliminate a competitive threat from MediaTek.

Similarly, Brian Chong (Wistron Chief of New Technology Development and Product Planning) testified that Qualcomm's refusal to license rivals, and the resulting surcharge on rivals' chips, limited Wistron's ability to use a MediaTek modem chip that Wistron preferred:

> [T]here was a case that I remember in particular when we were considering introducing lower cost phones. And MTK was the chip supplier that we think best suitable for that product position in terms of price position and the spec corresponding that it offers. However, in the end we decided to stay Qualcomm for the simple reason that because Qualcomm responded that, even if we're using non-Qualcomm chips, we would still have to pay the onerous royalty that Qualcom dictated in the SULA.

Chong Depo. 256:9-20.

Refusing to license rivals not only blocks rivals, but also preserves Qualcomm's ability to demand unreasonably high royalty rates from OEMs. Eric Reifschneider (QTL Senior Vice President and General Manager) told the IRS in 2012 that if Qualcomm licensed a rival, and that rival sold a modem chip to an OEM, Qualcomm could not then collect additional royalty revenues from that OEM: "[W]hen [the rival] sell[s] that chip to somebody who's going to put the chip in a cell phone, okay, the licensee's sale of that chip will exhaust our rights and then we won't be able to collect a royalty on a cell phone that's based on the price of the cellphone." CX6786-R at 26:6-12. Instead, Qualcomm would only charge its royalty rate against the price of a modem chip. According to an email Steve Altman (former Qualcomm President) sent in 1999, the total royalty

payment per chip has been as low as $.30. CX8177-001. That revenue pales in comparison to the $20 royalty payment per chip Qualcomm can receive when demanding a 5% royalty rate on a $400 handset.

Accordingly, when the IRS asked whether Qualcomm's decision to stop licensing its SEPs to rivals was a "business decision," Marv Blecker (QTL Senior Vice President) agreed: "Oh it's more than that, it's more than that. That's an understatement." CX6786R at 70:22-71:3. Blecker told the IRS that to license rivals would have "the potential of threatening our entire revenue stream at the handset level." *Id.* at 71:5-6.

Fabian Gonell (now QTL Legal Counsel and Senior Vice President, Licensing Strategy) also conceded to the IRS that Qualcomm stopped licensing rivals because Qualcomm had to choose between licensing rivals and OEMs, and licensing OEMs is far more lucrative: "But having – having to choose between one or the other then you're right, obviously the handset is humongously more . . . lucrative for a bunch of – a bunch of reasons." *Id.* at 71:18-23.

Thus, Qualcomm's refusal to license rivals prevents entry, promotes exit, and hampers rivals in the marketplace by reducing rivals' customer base and sales. This results in exclusivity, like Qualcomm's other practices. By reducing the sales available to rivals and avoiding exhaustion claims, Qualcomm's refusal to license rivals also helps Qualcomm maintain the chip supply leverage against OEMs that sustains Qualcomm's unreasonably high royalty rates.

K. Qualcomm's Monopoly Chip Market Share, Unreasonably High Royalty Rates, and Exclusivity with OEMs Create Insurmountable Barriers for Rivals

Collectively, the harms caused by Qualcomm's anticompetitive practices take repeated aim at the elements necessary for a rival modem chip supplier to compete in the market. The Ninth Circuit has held that "[a]nticompetitive conduct is behavior that tends to impair the opportunities of rivals and either does not further competition on the merits or does so in an unnecessarily restrictive way." *PeaceHealth*, 515 F.3d at 894.

Here, Qualcomm's interrelated practices create insurmountable and artificial barriers for Qualcomm's rivals, and thus do not further competition on the merits. Qualcomm's practices all

reduce rivals' sales. Qualcomm's chip incentive funds for OEMs lower the effective price of Qualcomm's modem chips, result in exclusivity, and restrict the OEM customer base available to Qualcomm's rivals. Through CDMA ASIC Agreements, Qualcomm limits its rivals' customers and further reduces sales. The surcharge on rivals' modem chips imposed by Qualcomm's unreasonably high royalty rates increases the cost of rivals' chips, which reduces demand for rivals' chips and reduces rivals' margins. By attacking all facets of rivals' businesses and preventing competition on the merits, these practices "harm the competitive process and thereby harm consumers." *See Microsoft*, 253 F.3d at 59.

Qualcomm's licensing practices have enabled Qualcomm to eliminate a cellular standard supported by a rival. Qualcomm's suppression of rivals' sales also forecloses rivals from the revenue necessary to invest in research and development and acquisitions to develop new technology. Without sales to OEMs, rivals lack opportunities to engage with OEMs' engineering teams, customize products for an OEM, and win year-after-year business from an OEM. Finally, Qualcomm's practices harm rivals' standing with SSOs and network vendors. As a result, rivals lack the resources and industry standing to bring the most advanced modem chips to market, which further reduces rivals' sales, and increases Qualcomm's sales. Then, the cycle begins again. The Court discusses these compounding anticompetitive harms in more detail below.

1. Qualcomm Strives to Eliminate Rivals and Eliminated a Competing Standard

Qualcomm's licensing practices, which result in exclusivity, can make it impossible for rivals to survive—as Qualcomm's own documents recognize. For example, as Qualcomm sought exclusivity from Apple in 2010, Steve Mollenkopf (QCT President) told Paul Jacobs (Qualcomm CEO), Derek Aberle (QTL President), and Steve Altman (Qualcomm President) that exclusivity would so restrict the market that no rival supplier of premium thin modems could survive: "[T]here are significant strategic benefits as it is unlikely that there will be enough standalone modem volume to sustain a viable competitor without that slot." CX5348-001.

Not only did Qualcomm strive to eliminate thin modem competitors, but also Qualcomm attempted to and succeeded at eliminating a competing cellular standard. Qualcomm wielded chip

supply leverage and the specter of its unreasonably high royalty rates to eliminate WiMax, a competing cellular standard supported by Intel. In the 2007 Marketing Incentive Agreement ("MIA"), Qualcomm offered Apple royalty rate rebates conditioned on (1) Apple publicly announcing that Apple had "chosen GSM technology for its phone . . . into the future with 3G and beyond"; (2) Apple not selling more than 1,000 WiMax handsets; and (3) Apple not licensing a third party to sell WiMax handsets. JX0040-003. During MIA negotiations, Marv Blecker (QTL President) emailed Jeff Williams (Apple COO) to state that Qualcomm's first priority was eliminating WiMax: "Motivating Apple to select WCDMA to the exclusion of WiMax is our primary motivation for entering into this agreement." CX0617-001.

Irwin Jacobs (Qualcomm Co-Founder and former Qualcomm CEO) testified at trial that Qualcomm would have been behind in supplying WiMax chips had WiMax become the standard:

> **Q**: It's accurate to state, sir, that if WiMax had ended up as the standard, Qualcomm would have been far behind; is that right?
> **A**: That's fine.

Tr. at 1284:10-13.

As a result of the MIA, WiMax was eliminated. Jeff Williams (Apple COO) testified that the Qualcomm agreement ended Apple's engagement with Intel's WiMax standard:

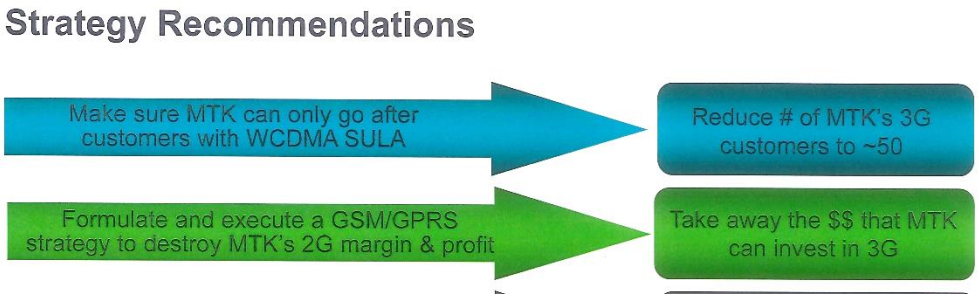
> **Q**: And following the execution of that agreement, did Apple pursue WiMax further?
> **A**: No. In essence, it was killed in the cradle for us. We did not.

Tr. at 873:21-23. Thus, Qualcomm eliminated a competing cellular standard supported by Intel not because WiMax was inferior, but to eliminate competition.

2. Qualcomm's Licensing Practices Prevent Rivals from Investing in New Technology Through Research and Development and Acquisitions

Even when Qualcomm's licensing practices do not outright eliminate competition, Qualcomm can suppress rivals' sales such that rivals lack revenue to invest in research and development, as Qualcomm's own documents recognize. For example, in a 2009 presentation that Qualcomm prepared within days of its CDMA ASIC Agreement with MediaTek—which

restricted MediaTek's sales to Qualcomm licensees only—Qualcomm stated that by reducing MediaTek's customer base, Qualcomm could "[t]ake away the $$ that MTK can invest in 3G." CX5809-041. The slide is reproduced below. Thus, Qualcomm aimed to reduce MediaTek's customer base to destroy MediaTek's margin, and thereby impede MediaTek's ability to invest in 3G.



Reducing rivals' revenue to invest in research and development gravely harms rivals because producing modem chips requires very high fixed research and development costs. For example, after Intel purchased Infineon, Intel had to spend "billions of dollars" to develop LTE technology from scratch, according to Aicha Evans (Intel Chief Strategy Officer). Tr. at 565:3-6.

Accordingly, to cover the costs of research and development, a modem chip supplier must generate a larger customer base. Will Wyatt (QTI [Qualcomm Technologies, Inc., the Qualcomm subsidiary that operates QCT] Vice President, Finance) testified at trial that a large customer base provides the revenue necessary "to make R&D investments to support customers and develop technology." Tr. at 443:6-10. Thus, after Intel won Apple's high-volume business, Stefan Wolff (Intel Engineer) emphasized in an internal Intel email that revenue from sales to Apple would "support the funding of our next generation LTE 7460" modem chip. CX1599-001.

Similarly, Scott McGregor (former Broadcom CEO) testified that because modem chip research and development is so expensive, the economics of supplying modem chips are very sensitive to customer volume:

I mean, the cellular baseband business is extremely R&D intensive. More so than

> probably any other semiconductor business by a lot. And it's a lot of software people, a lot of engineers to do the hardware, a lot of testing, a lot of other things. And the more volume you have, the more you can amortize the fixed costs of doing the development on chips. And so the economics of being in the cellular baseband business are very sensitive to volume of customers.

McGregor Depo. 174:12-21.

Producing premium LTE modem chips is especially sensitive to customer volume because research and development for premium modem chips is more expensive. Finbarr Moynihan (MediaTek General Manager of Corporate Sales and Business Development) testified that premium LTE modem chips require more upfront investment and require higher margin to support that investment: "You'd certainly like to see that the higher tiers generate higher profit, higher margins, yeah. It takes more R&D to develop those products." Tr. at 378:18-20.

Qualcomm's own documents and testimony recognize that research and development is necessary to win the race to market. For example, a 2016 Qualcomm pricing strategy plan received by Will Wyatt (QTI Vice President, Finance) twice makes the point that being first to market has compounding advantages for a modem chip supplier: "Winner Take All in the Mobile Silicon Space" and "It's very simple: If you are first > you win / If you are late > you lose." CX8262-003. At trial, Will Wyatt also testified that it is essential for a modem chip supplier to be first to market:

> **Q**: And you would agree that in the semiconductor space, being early in terms of new technology is very helpful in terms of being successful; correct?
> **A**: Yes. You need to win each of the specific modem socket designs, and they turn over very quickly.

Tr. at 445:2-6.

Thus, by suppressing rivals' sales and revenue to invest in research and development for new technology, Qualcomm ensures that its rivals will lose repeatedly. Those losses further suppress rivals' sales, and further suppress rivals' ability to fund research and development.

In contrast, by winning repeatedly, Qualcomm maintains the scale and margin to have "large teams" that "work around the world" on research and development, as James Thompson (Qualcomm CTO) testified at trial. Tr. at 1382:10-18.

Qualcomm also has two monopoly-generated revenue streams to invest in research and development, unlike its rivals. Qualcomm's monopoly chip power sustains Qualcomm's unreasonably high royalty rates and billions in licensing revenue. Qualcomm's monopoly chip power also enables Qualcomm to charge monopoly prices on modem chips. For example, according to an April 2009 VIA presentation, Qualcomm reduced its prices whenever VIA introduced a comparable chip—which shows that Qualcomm was previously receiving monopoly prices on its modem chips: "When [VIA] first introduced CBP6 to US market, the price of QSC6055 [a Qualcomm chip] was $18," but within weeks "the QSC6055 price was reduced to $10." CX1770-004. Similarly, Will Wyatt (QTI Vice President, Finance) conceded at trial that a 2015 Qualcomm pricing proposal, CX7591-011, shows that Qualcomm reduced its modem chip prices by more than $2 following MediaTek's introduction of a competitive modem chip. Tr. at 433:2-5. Thus, Qualcomm's monopoly chip power has enabled Qualcomm to charge monopoly chip prices.

With those two revenue streams, and with rivals' revenues suppressed, Qualcomm can "take risk and invest in new areas before our competition, so we often have a green field to create new intellectual property," as Paul Jacobs (Qualcomm CEO) stated in a July 2012 letter to the Qualcomm Board of Directors. CX6974-017.

Similarly, suppressing rivals' sales also prevents rivals from developing new technology by acquisition, an alternative to research and development. For example, according to Intel's internal projections, spending [redacted] million to acquire VIA (and its CDMA technology) was only profitable for Intel once Intel secured business from Apple. CX1598-009. Similarly, Aicha Evans (Intel Chief Strategy Officer) testified that without proof of Intel's capability in the market, "there wouldn't have been a discussion" at Intel about acquiring VIA. Tr. at 581:17-20.

Accordingly, Qualcomm's suppression of rivals' sales deprives rivals of revenue to invest in research and development and acquisitions to develop new technology, which prevents the emergence of new rivals, hampers rivals already in the market, and hinders the development of new technologies available to consumers. *See Microsoft*, 253 F.3d at 79 (holding the court may

infer that conduct caused anticompetitive harm "when exclusionary conduct is aimed at producers of nascent competitive [products] as well as when it is aimed at producers of established substitutes").

3. Qualcomm's Licensing Practices Foreclose Rivals from New and Repeat Business, Engineering Engagement, and Field Testing with OEMs

By restricting rivals' sales, Qualcomm's licensing practices also prevent rivals from developing new and maintaining ongoing business relationships with OEMs.

Sales to one OEM can lead to sales to other OEMs, who, impressed that the modem chip supplier can execute, may then reach out to the supplier. For example, Aicha Evans (Intel Chief Strategy Officer) testified that several OEMs reached out to Intel after Intel won Apple's business: "Lenovo is an example, LG is an example, Motorola is an example, Tesla is an example." Tr. at 576:20-577:4.

In addition, winning business from an OEM in one year can lead to repeat business with that OEM. Will Wyatt (QTI Vice President, Finance) testified that winning an OEM's business strengthens a modem chip supplier's ability to supply modem chips to that OEM in future years:

> **Q**: In general, winning one design with an OEM can improve that chip supplier's chances of winning business with the OEM in the future; correct?
> **A**: It depends if they do a good job.
> **Q**: But in general, that's a true statement; correct?
> **A**: If they perform, yes.

Tr. at 443:11-16.

Winning business with an OEM generates deep engagement with that OEM's engineering teams. That engagement both sharpens a modem chip supplier's products and leads to opportunities to customize modem chips for that OEM, as Christopher Johnson (Bain & Co. Partner), who consulted for Intel, testified: "[B]y working with a customer and having access to their products and their engineering teams, you can customize your products and basically improve your pace of innovation in the features you're bringing out." Tr. at 1854:16-23. Specifically, a July 2012 Qualcomm presentation to the Qualcomm Board of Directors states that Apple's engineering team challenges modem chip suppliers to produce "best-in-class" products.

CX6974-029.

Sales relationships with OEMs also provide modem chip suppliers with opportunities to field test modem chips in real-world conditions. Finbarr Moynihan (MediaTek General Manager of Customer Sales and Business Development) testified field testing sharpens a supplier's product and helps a supplier spot technical issues: "[I]f you're launching a new modem generation into the market, it takes certainly some time to get it into production, launch it with multiple OEMs into multiple operator networks and operators, network operators, and iron out any of the issues, the bugs that it might find in the field." Tr. at 365:20-25. During generational transitions especially, Moynihan testified, OEMs can "help us as a supplier and navigate some of those transitions without falling down." *Id.* at 339:19-340:4.

Qualcomm's licensing practices suppress rivals' sales and thus foreclose rivals from new or repeat OEM business, engineering engagement with OEMs, and field testing with OEMs. Missing out on those opportunities further weakens rivals, reduces rivals' ability to produce competitive modem chips, and bolsters Qualcomm's monopoly chip power.

4. Qualcomm's Licensing Practices Harm Rivals' Standing with Other Industry Participants Like SSOs, Network Vendors, and Operators

As discussed above, Qualcomm used its monopoly chip power to eliminate a competing standard, WiMax. However, Qualcomm's licensing practices also harm rivals' standing with SSOs, network vendors, and operators (also referred to as carriers, like Verizon), which further suppresses rivals' sales and further entrenches Qualcomm's monopoly power.

Sales to OEMs are correlated with a supplier's standing in SSOs. For example, Qualcomm's own documents recognize that without QCT's monopoly chip power, QTL would be isolated in SSOs. In April 2015, Steve Mollenkopf (Qualcomm CEO) and David Wise (Qualcomm Senior Vice President and Treasurer) exchanged views over email on how the coming 5G transition may affect QTL and QCT. CX5913-001. Steve Mollenkopf wrote to David Wise and the "exc@qualcomm.com" distribution list: "One of the arguments for not splitting is that we need to be positioned for 5G." CX5913-001. David Wise replied that without QCT's monopoly

power, QTL may become isolated and ineffective at embedding its technology into standards:

> The main point on 5G is that we are in a stronger position to extend QTL licensing model together than separate. Less about level of spend. Much more about our strength in the standards process and regulatory. If separate, QTL may be isolated and ineffective at getting tech into the std. No QCT distribution.

CX5913-001. With QCT's monopoly power, though, QTL retains a strong presence in the standards.

In turn, QTL's influence in SSOs bolsters QCT's chip monopoly power because QTL can embed Qualcomm's technology into cellular standards and enable QCT to win the race to market. For example, a BCG presentation prepared during Project Phoenix states that QCT's share of modem chip sales is "~30% higher in first years of technology standard." CX3755-014. Speaker's notes for the slide explain that Qualcomm's influence in standards enables QCT to get a head start on product development: "Standards are set in ways favorable to [QCT] due to research capabilities and strong influence on SSOs . . . Influence enables head start in product development even before standard is fully set." *Id.*

Similarly, Aicha Evans (Intel Chief Strategy Officer) testified that working with Apple in particular enhances a modem chip supplier's position in the standards: "You also get what I call the halo effect of better presence in the standards, not just presence, but better weight in terms of your contributions, in terms of starting to get leadership positions." Tr. at 569:9-13. Evans testified that winning Apple's business "really got us to the table in terms of standards . . . meaning 3GPP and IEEE [two SSOs]." *Id.* at 574:20-22.

However, by limiting rivals' sales to OEMs like Apple, Qualcomm prevented its rivals from obtaining more influence in standards, and thus ensured that Qualcomm could maintain a time-to-market advantage.

Sales also attract interest from operators and network vendors, who engage successful modem chip suppliers for field testing and early prototyping. Those opportunities help accelerate a modem chip supplier's development of new products.

For example, after Intel won Apple's business, Stefan Wolff (Intel Engineer) wrote in a

contemporaneous email that operators and network vendors reached out to Intel for field testing of Intel's latest LTE modem chips because of Intel's increased sales volumes: "We will attract operators and network vendors to do early prototyping / field testing with our latest LTE platforms given Apples [sic] huge volumes in the field." CX1599-001. As a result, Wolff wrote, Intel could bring its modem chips to market more quickly: "This will speed up the development, hardening, and TTM [time-to-market] of our modem technology." *Id.* Likewise, Aicha Evans (Intel Chief Strategy Officer) testified that operators are not interested in working with a modem chip supplier with low sales: "[F]or the operators, too, to give you that credibility, they're not going to give you that credibility because you have one phone in the corner of the third shelf that nobody buys." Tr. at 576:17-19.

By harming rivals' standing with industry participants, Qualcomm suppresses rivals' ability to generate additional business, develop new products, and win the race to market. Instead, Qualcomm wins these opportunities, which further entrenches Qualcomm's monopoly chip power.

5. Qualcomm's Rivals Have Exited the Market, and Those That Remain are Hobbled

In sum, with practices that result in exclusivity and eliminate opportunities to compete for OEM business, Qualcomm undermines rivals in every facet. Qualcomm attempts to eliminate competition in certain markets; eliminates competing standards; deprives rivals of revenues to invest in research and development and acquisitions; forecloses rivals from establishing technical and business relationships with OEMs; prevents rivals from field testing with OEMs, network vendors, and operators; and ensures that Qualcomm retains influence in SSOs, so that Qualcomm can maintain its time-to-market advantage and its unlawful monopoly. By so hobbling rivals, Qualcomm's practices "unfairly tend[] to destroy competition itself." *Spectrum Sports*, 506 U.S. at 458.

Foreclosed from sales to OEMs and the resulting benefits, rivals are unable to produce competitive modem chips, which further suppresses rivals' sales. Because Qualcomm's practices all reduce rivals' ability to become and remain viable competitors, the Court concludes that the

practices "reasonably appear[] capable" of maintaining Qualcomm's monopoly power. *See Microsoft*, 253 F.3d at 59; *see also id.* at 79 ("We may infer causation when exclusionary conduct is aimed at producers of nascent competitive technologies as well as when it is aimed at producers of established substitutes.").

The modem chip market reflects the cumulative anticompetitive harm of Qualcomm's practices. Many of Qualcomm's rivals have exited, and those rivals that remain are hobbled by Qualcomm's anticompetitive harms.

On this causation question, Qualcomm overstates the FTC's burden. For example, Qualcomm presents evidence that Apple viewed both Broadcom and ST Ericsson—rivals that have exited the market—as technically not capable to supply modem chips for a 2013 Apple handset. QX1353-223; Tr. at 1510:18-24.

In addition, Qualcomm cites a Bain & Company presentation that concluded that although Intel invested only 32% less than Qualcomm in research and development into SoC modem chips in 2015, Qualcomm was more efficient and produced two or three times the product output as Intel. QX0123A-002. However, Intel had to build its modem chip research and development infrastructure from scratch, whereas Qualcomm had two decades head start on Intel. For example, Aicha Evans (Intel Chief Strategy Officer) testified that Intel had to invest "lots of money, billions of dollars, and an army of engineers" to generate a premium LTE modem chip business from scratch. Tr. at 565:3-6. Moreover, Qualcomm ignores how Qualcomm's set of anticompetitive licensing practices undermine its rivals' ability to execute and compete in the market.

Furthermore, Qualcomm's licensing practices blocked Project Dragonfly, a potentially powerful rival, from ever entering the market. Project Dragonfly was a joint venture to sell modem chips comprised of Samsung, one of the largest global OEMs selling cellular handsets; NTT DoCoMo, the largest carrier in Japan; and several Japanese OEMs. CX2628-001. Qualcomm's own document recognizes that Samsung is one of the top five contributors to SSOs. CX6138-032. Thus, Project Dragonfly had access to engineering expertise, the combined capital to fund research and development and acquisitions, the benefit of Samsung's standing in SSOs,

and Samsung's existing relationships with operators and network vendors, all of which would have primed Project Dragonfly for success.

According to Andrew Hong (Samsung Legal Counsel), Qualcomm knew that Project Dragonfly could enter the market in a year because of its joint resources. Hong Depo. 215:15-216:14. However, aware of that threat, Eric Reifschneider (QTL Senior Vice President and General Manager) rejected Project Dragonfly's request for a license and Samsung's request for a license, which would have covered Project Dragonfly and its customers. Andrew Hong (Samsung Legal Counsel) testified that Reifschneider explicitly rejected Samsung's request for a license to avoid enabling Project Dragonfly to come to market: "He said to us pretty much, 'I know if you try to develop this on your own, it will take several years. And I'm not going to let you enter the market in a, in a year." Hong Depo. at 216:21-24. After Qualcomm rejected Project Dragonfly's and Samsung's requests for licenses, Project Dragonfly did not proceed. *Id.* at 173:3-10. Thus, Qualcomm's licensing practices also bar potentially strong rivals from ever entering the market, which stifles competition and harms consumers.

Moreover, even if Qualcomm's rivals have contributed to their own failings, the Court need not conclude that Qualcomm's conduct is the sole reason for its rivals' exits or impaired status to conclude that Qualcomm's practices harmed competition and consumers. Where a government agency seeks injunctive relief, the Court need only conclude that Qualcomm's conduct made a "significant contribution" to Qualcomm's maintenance of monopoly power. *Microsoft*, 253 F.3d at 79 (citation omitted). The plaintiff is not required to "present direct proof that a defendant's continued monopoly power is precisely attributable to its anticompetitive conduct." *Id.*

Qualcomm ignores that standard and argues that the FTC must present evidence that "tends to exclude the possibility" that Qualcomm's rivals exited the industry or are hobbled for reasons independent of Qualcomm's conduct. QC FOFCOL at 127. However, in *Monsanto Co. v. Spray-Rite Serv. Corp.*, 465 U.S. 752, 764 (1984), the United States Supreme Court held in the context of a conspiracy to restrain trade that the evidence must "tend[] to exclude the possibility" that the

alleged *conspirators* were acting independently. The instant case does not allege a conspiracy. Qualcomm's authorities say little about the causation standard for the FTC's Sherman Act claims.

Rather, the United States Supreme Court has held that indirect evidence of anticompetitive conduct includes "proof of market power plus some evidence that the challenged restraint harms competition." *Am. Express*, 138 S. Ct. at 2284. Where the government is a plaintiff, the Court may "infer 'causation' from the fact that a defendant has engaged in anticompetitive conduct that 'reasonably appear[s] capable of making a significant contribution to . . . maintaining monopoly power." *Microsoft*, 253 F.3d at 79 (citation omitted). The FTC is not required "to reconstruct the hypothetical marketplace absent a defendant's conduct." *Id.* Thus, the Court need not conclude that Qualcomm's anticompetitive licensing practices are the sole reason for any particular rival's exit or any particular rival's reduced performance to conclude that Qualcomm's anticompetitive practices harmed competition in the CDMA and premium LTE modem chip markets.

Rather than address that causation question, Qualcomm's experts all simply ignored the effects of Qualcomm's own anticompetitive conduct. It makes little sense to evaluate whether conduct "reasonably appears capable" of causing anticompetitive harm, *see Microsoft*, 253 F.3d at 79, by ignoring evidence of that conduct altogether. Without considering Qualcomm's anticompetitive conduct, one cannot answer whether that conduct has sustained Qualcomm's monopoly power. *Grinnell*, 384 U.S. at 571. But that is how Qualcomm's experts proceeded.

For example, Dr. Edward Snyder, a Qualcomm economic expert, never even considered how Qualcomm's anticompetitive practices affect Qualcomm's rivals. Dr. Snyder testified that only had he found evidence to contradict his own theory that "independent" factors harmed Qualcomm's rivals "would [he] have gone to the next step to evaluate . . . the FTC's claims about Qualcomm's conduct." Tr. at 1788:6-8. Dr. Snyder ignored Qualcomm's conduct even though Dr. Snyder conceded that his "independent" factors are not mutually exclusive with Qualcomm's conduct, and that "anticompetitive conduct by a dominant firm can affect its rivals' investment decisions." *Id.* at 1808:24-1809:1. Because Dr. Snyder did not even evaluate Qualcomm's conduct, the Court finds that Dr. Snyder's opinions are not reliable.

Similarly, Dr. Aviv Nevo also ignored Qualcomm's anticompetitive practices. Dr. Nevo opined that the modem chip industry is "thriving," but made no claim about how Qualcomm's practices might have affected the industry:

> **Q**: Well, can you rule out the possibility that things would have been better were it not for conduct that's been alleged?
> **A**: No, I can't rule that out, and that's not what I'm claiming here.

Id. at 1905:5-8. Thus, the Court finds that Dr. Nevo's opinions are not reliable.

Finally, Dr. Tasneem Chipty also acknowledged that her analysis ignored Qualcomm's anticompetitive practices. For example, Dr. Chipty conceded that she conducted no analysis of how Qualcomm's refusal to license rivals, refusal to sell modem chips exhaustively, requirement that an OEM sign a license before purchasing modem chips, and threats to cut off chip supply and other support affected modem chip markets. Tr. at 1738:3-1739:3. Therefore, because Dr. Chipty failed to consider whether Qualcomm's actual anticompetitive practices harmed rivals, the Court finds that Dr. Chipty's opinions are not reliable.

Here, the modem chip market reflects the expected outcomes of Qualcomm's anticompetitive practices, which "impair the opportunities of rivals" and "do[] not further competition on the merits." *PeaceHealth*, 515 F.3d at 894.

Many of Qualcomm's rivals have exited the market. Scott McGregor (former Broadcom CEO) testified that remaining in the modem chip market was not "economically viable" for Broadcom because Broadcom did not generate the scale "sufficient to cover the R&D and other costs required to create those chips." McGregor Depo. 12:14-17. According to a 2014 Qualcomm presentation shared with Will Wyatt (QTI Vice President, Finance), the former modem chip supplier Freescale exited the market in 2008 due to "customer concentration and the need for significant investment in scale to supply customers." CX8292-006. According to the same 2014 Qualcomm presentation, ST-Ericsson left the market in 2013 due to reduced purchase volumes from two OEM customers, and Texas Instruments also left the market in 2012 due to a reduced customer base. *Id.*

Qualcomm's rivals that remain in the market are hobbled by Qualcomm's practices. For

example, Qualcomm's rival MediaTek had to discontinue its [redacted]. CX3551-004. Finbarr Moynihan (MediaTek General Manager of Customer Sales and Business Development) testified at trial that MediaTek has not "penetrated ever what I would call the premier tiers in the market." Tr. at 324:25-325:2. According to Moynihan, MediaTek has not "been able to invest enough I think in the modem technology and deploy it fast enough to market." *Id.* at 365:10-13. Although MediaTek licensed VIA's CDMA technology in 2013, MediaTek only sold its first CDMA modem chip in 2015. *Id.* at 328:13-16. According to a 2017 presentation to Qualcomm's Board of Directors, which Steve Mollenkopf (Qualcomm CEO) received, MediaTek has no premium LTE modem chip offering. CX8191-089.

In addition, even though Intel is supplying modem chips to Apple, Aicha Evans (Intel Chief Strategy Officer) testified that Intel has never met its target margins and that Intel's sales of modem chips to Apple have not yet been profitable. Tr. at 587:12-22. When asked about the probable effect of losing Apple's business in any given year, Evans testified that losing Apple's business "would not be near death, that would be death." *Id.* at 589:18-19. Specifically, Evans testified: "Once you're in the cycle and you've shipped millions of units, it's – I call it it's Christmas, there's Christmas every year and you can't miss it essentially." *Id.* at 589:11-14.

Furthermore, Samsung's and Huawei's modem chip supply divisions do not compete with Qualcomm for third-party OEM business. At trial, Alex Rogers (QTL President) testified that Exynos is not an external competitor: "Samsung has a cellular baseband business that they make primarily for their own use." Tr. at 1989:5-6. Finbarr Moynihan (MediaTek General Manager of Corporate Sales and Business Development) agreed: "We don't tend to see Samsung LSI as a supplier much outside of Samsung's own phones." Tr. at 327:10-15. The same is true of HiSilicon, Huawei's modem chip division, according to Finbarr Moynihan (MediaTek General Manager of Corporate Sales and Business Development): "I think even more so we only see HiSilicon in Huawei phones." *Id.* at 327:20-21.

Given the fragile state of Qualcomm's rivals, the exits of several other rivals, and

Qualcomm's continued dominance, the Court concludes that there is plentiful "evidence that the challenged restraint harms competition." *See Am. Express*, 138 S. Ct. at 2284.

The Court has already rejected all of Qualcomm's litigation justifications for its conduct as pretextual. *See* Section V.C. (refusal to license rivals); Section V.E. (Apple exclusive agreements); Section V.F. (refusal to sell modem chips without a license agreement); Section V.I. (chip incentive funds). Even if Qualcomm had shown non-pretextual procompetitive justifications for its conduct, the foregoing anticompetitive harm is so severe that the "anticompetitive harm outweighs [any] procompetitive benefit" of Qualcomm's conduct. *Microsoft*, 253 F.3d at 59.

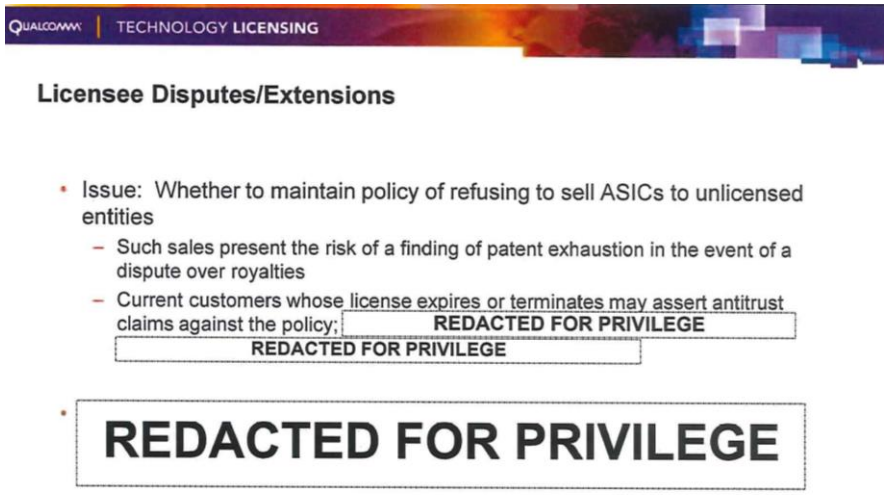
Finally, the Court turns to evidence of Qualcomm's intent to harm competition, as found in Qualcomm's own documents.

L. Qualcomm's Intent to Harm Competition Confirms That Qualcomm's Practices Cause Anticompetitive Harm

Qualcomm's own documents show that Qualcomm knew its licensing practices could lead to antitrust liability, knew its licensing practices violate FRAND, and knew its licensing practices harm competition, yet continued anyway—even in the face of government investigations in Japan, Korea, Taiwan, China, the European Union, and the United States. This evidence of Qualcomm's intent confirms the Court's conclusion that Qualcomm's practices cause anticompetitive harm because "no monopolist monopolizes unconscious of what he is doing." *Aspen Skiing*, 472 U.S. at 602; *see also Chicago Bd. of Trade*, 246 U.S. at 238 ("[K]knowledge of intent may help the court to interpret facts and to predict consequences.").

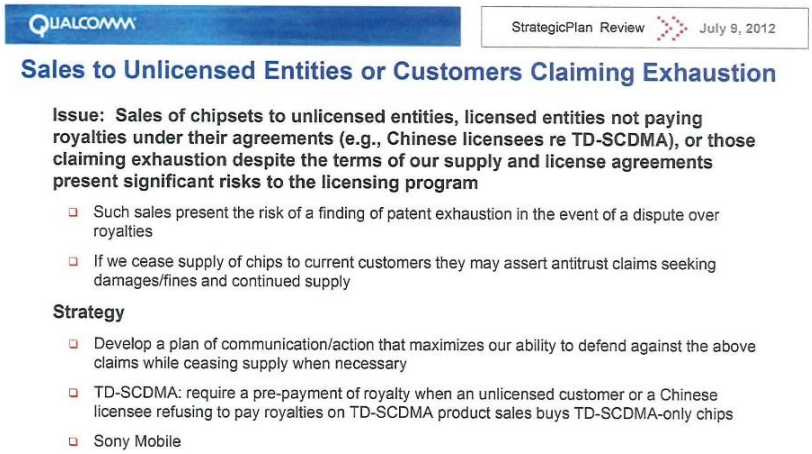
First, Qualcomm admitted in contemporaneous documents that its practices of avoiding patent exhaustion, requiring OEMs to sign a separate license before purchasing modem chips, and threatening to cut off OEMs' chip supply may cause antitrust liability.

For example, in a May 2012 slide deck prepared by Fabian Gonell (now QTL Legal Counsel and Senior Vice President, Licensing Strategy) and reproduced below, Qualcomm admitted that its licensing practices could lead to antitrust claims.



Gonell's slide was shared with Eric Reifschneider (QTL Senior Vice President and General Manager), Derek Aberle (QTL President), Marv Blecker (QTL Senior Vice President), and Lou Lupin (Qualcomm Legal Consultant). Gonell stated that selling modem chips to an unlicensed OEM could "present the risk of a finding of patent exhaustion in the event of a dispute over royalties." CX6548-002. As a result, Qualcomm "refus[es] to sell ASICs to unlicensed entities." *Id.* However, Gonell expressed the concern that "[c]urrent customers whose license expires may assert antitrust claims against the policy." *Id.*

Qualcomm's internal contemporaneous documents repeatedly acknowledge that its licensing practices expose Qualcomm to antitrust claims. The following slide is contained in: (1) a July 2, 2012 QTL strategic plan presentation that Derek Aberle (QTL President) created and sent to Dr. Paul Jacobs (Qualcomm CEO), Steve Mollenkopf (Qualcomm President), and Steve Altman (Qualcomm Vice Chairman), CX6998-001; and (2) a July 9, 2012 presentation to the Qualcomm Board of Directors, which Dr. Irwin Jacobs (Qualcomm Co-Founder) also received. CX6974-001. Yet despite a concern about antitrust claims, Qualcomm planned to continue the anticompetitive practices and to develop a plan of communication against antitrust claims.


QUALCOMM

StrategicPlan Review July 9, 2012

Sales to Unlicensed Entities or Customers Claiming Exhaustion

Issue: Sales of chipsets to unlicensed entities, licensed entities not paying royalties under their agreements (e.g., Chinese licensees re TD-SCDMA), or those claiming exhaustion despite the terms of our supply and license agreements present significant risks to the licensing program

- Such sales present the risk of a finding of patent exhaustion in the event of a dispute over royalties
- If we cease supply of chips to current customers they may assert antitrust claims seeking damages/fines and continued supply

Strategy

- Develop a plan of communication/action that maximizes our ability to defend against the above claims while ceasing supply when necessary
- TD-SCDMA: require a pre-payment of royalty when an unlicensed customer or a Chinese licensee refusing to pay royalties on TD-SCDMA product sales buys TD-SCDMA-only chips
- Sony Mobile

The slide states that Qualcomm's licensing practices may expose Qualcomm to antitrust liability: "If we cease supply of chips to current customers they may assert antitrust claims seeking damages/fines and continued supply." CX6974-070. In response, Qualcomm planned to continue its anticompetitive practices: "Develop a plan of communication/action that maximizes our ability to defend against the above claims while ceasing supply when necessary." *Id.* Thus, Qualcomm repeatedly acknowledged that its licensing practices raise antitrust claims, yet continued the licensing practices anyway.

In fact, Qualcomm's threats to OEMs' chip supply are an ongoing company practice that began with Qualcomm's co-founder, Dr. Irwin Jacobs. For example, in June 2004, Irwin Jacobs (then Qualcomm CEO) threatened LGE that unless LGE withdrew arbitration claims and paid past due royalties, Qualcomm would "stop accepting LGE purchase orders for WCDMA ASICs," "cease all shipments of WCDMA ASICs to LGE," "withdraw all of its substantial WCDMA engineering resources currently providing technical support to LGE," and require LGE to return software to Qualcomm. CX6814-022. At trial, Irwin Jacobs testified that Qualcomm in fact did cut off LGE's chip supply: "We did not ship to them the chips that were specified here, the 500 and then 6,000 chips as far as I know at this time." Tr. at 1293:25-1294:2.

Similarly, after Qualcomm presented the above July 2012 slide to the Board of Directors, Qualcomm continued to threaten OEMs' chip supply. For example, only three months after the July 2012 Board of Directors meeting, Eric Reifschneider (QTL Senior Vice President and

General Manager) threatened to cut off Sony's chip supply. In an October 27, 2012 email, Eric Reifschneider told Jonathan Pearl (Sony General Counsel) that "I must report to QCT that SMC [Sony Mobile Corp.] appears unwilling to enter into a license agreement with Qualcomm," CX5185-005, to which Reifschneider referred as "the next step in the escalation process." Reifschneider Depo. 207:6-16.

In 2013, Reifschneider threatened Huawei's chip supply. In a May 1, 2013 email, Reifschneider informed Xuxin Cheng (Huawei) that "if the C2K SULA expires and has not been replaced by a new patent license agreement covering C2K products, there will be issues with Huawei's ability to continue to use C2K chipsets or QMCi's software, issues which I am sure both our companies would like to avoid." CX1000-004.

In 2013, according to contemporaneous Lenovo documents, Qualcomm threatened to cut off chip supply to Lenovo and to force MediaTek to cut off chip supply to Lenovo: "Qualcomm has threatened to stop selling its chips to Lenovo if Lenovo terminates its license. Further, Qualcomm has threatened to force its chip licensees (including MediaTek) to stop selling mobile phone chips to Lenovo if Lenovo terminates its license." CX2079-004.

In 2015, Cristiano Amon's (QCT President) own handwritten notes from 2015 license negotiations with Motorola's President Rick Osterloh, entitled "12-9-15-Rick & Team-Motorola," state: "(1) Licensing > Eric [Reifschneider, QTL Senior Vice President and General Manager] constantly threatening to cut off chip supply." CX7024-001.

These chip supply threats are critical for maintaining Qualcomm's unreasonably high royalty rate. If Qualcomm sells a modem chip to an unlicensed OEM, that OEM can claim that Qualcomm's sale of the modem chip exhausted Qualcomm's patent rights, according to a 2012 QTL slide presented to the Qualcomm Board of Dirctors: "Such sales present the risk of a finding of patent exhaustion." CX6974-070. If a modem chip sale exhausts Qualcomm's patent rights, Qualcomm cannot then collect its unreasonably high royalty rate from the OEM, as Eric Reifschneider (former QTL Senior Vice President and General Manager) testified: "[T]he concern for the risk to the licensing business of selling – selling chips to unlicensed customers, the – the

risk of a customer making an argument of patent exhaustion and sort of undercutting the ability to license the patent portfolio." Reifschneider Depo. 30:15-20.

Yet Qualcomm has recognized that Qualcomm's licensing practices and its unreasonably high royalty rates—the royalty rates that its practices are designed to sustain—violate FRAND. Marv Blecker (QTL Senior Vice President) told the IRS in 2012 that Qualcomm could not obtain the same royalty revenue through patent licenses to rival modem chip suppliers because doing so would violate FRAND. Specifically, Blecker told the IRS:

> Yeah, but if I would average royalty on all the handsets that we collect royalties on – I don't remember what it is anymore, I used to know the number – but if – if it were ten dollars, for example, you couldn't charge a ten-dollar royalty on a chipset that cost five dollars, or six dollars, or seven dollars.

CX786-R at 73:10-15. Blecker (then QTL Senior Vice President) continued: "Yeah, and it would be hard to convince a court that that was a fair royalty also." *Id.* at 73:20-21.

Similarly, Eric Reifschneider (QTL Senior Vice President and General Manager) told the IRS that Qualcomm's refusal to license rivals violates FRAND. CX6786-R at 33:1-7. Specifically, Reifschneider explained to the IRS that when Qualcomm participates in SSOs, "as part of that you often have to make commitments that you will, you know, make that technology available to people who want to make products that practice the standard." *Id.* Reifschneider explained that refusing to license a rival modem chip supplier is "not a great, you know, position to be in in terms of defending yourself against, you know, claims that you've broken those promises to make the technology available." *Id.* at 33:11-17. Thus, Qualcomm recognizes that its licensing practices and royalty rates violate FRAND.

Moreover, Qualcomm has admitted that its monopoly chip share sustains Qualcomm's ability to receive that unreasonably high royalty rate. During Project Phoenix, David Wise (Qualcomm Senior Vice President and Treasurer) explained in an email that because there is a high correlation between Qualcomm's chip market share and the sustainability of Qualcomm's royalty rate, it is critical for Qualcomm to maintain a high modem chip share to sustain its licensing revenues:

> Notably, we are seeing in the market today that there is a high correlation between our modem (chip) share and licensing compliance and royalty rate sustainability. Where we have low chip share we are seeing challenges with compliance and maintaining the royalty rate. So in a sense, QCT has provided the 'give/get' relationship highlighted in the last point. If it's [sic] share falls, however, we lose that important element to sustaining our royalties. SO IT'S CRITICAL THAT WE MAINTAIN HIGH MODEM SHARE TO SUSTAIN LICENSING.

Id. (emphasis in original). In short, Wise admitted that without QCT's chip market share, QTL was "seeing challenges with compliance and maintaining the royalty rate."

Because Qualcomm acknowledges that chip market share and not the value of its patents determines Qualcomm's royalty rate, Qualcomm refuses to give OEMs information about Qualcomm's patents, including even patent lists, when negotiating patent licenses with OEMs.

Nanfen Yu (Huawei Senior Legal Counsel) testified that Qualcomm has never provided patent claim charts to Huawei, but that Nokia, Ericsson, and Siemens all have. Yu Depo. 216:4-217:2. Specifically, as to Qualcomm, Yu testified:

> **Q**: [I]n all of your negotiations with Qualcomm throughout the course of your career, has Qualcomm ever provided claim charts for its patents?
> **A**: No.

Id. at 216:4-8.

Brian Chong (Wistron Chief of New Technology Development and Product Planning) testified that Qualcomm would not even provide Wistron a list of any Qualcomm patents: "I know for a fact that we asked for a list of patents and never got that." Chong Depo. 312:6-8, 23-24.

Qualcomm not only knows that its royalty rates violate FRAND and are sustained by Qualcomm's modem chip share, but Qualcomm has also intended to harm competition via its practices.

For example, Qualcomm wielded chip supply leverage and the specter of its unreasonably high royalty rates to eliminate WiMax, a competing cellular standard supported by Intel. In the 2007 Marketing Incentive Agreement ("MIA"), Qualcomm offered Apple royalty rate rebates conditioned on (1) Apple publicly announcing that Apple had "chosen GSM technology for its phone . . . into the future with 3G and beyond"; (2) Apple not selling more than 1,000 WiMax

handsets; and (3) Apple not licensing a third party to sell WiMax handsets. JX0040-003. During MIA negotiations, Marv Blecker (QTL President) emailed Jeff Williams (Apple COO) to state that Qualcomm's first priority was eliminating WiMax: "Motivating Apple to select WCDMA to the exclusion of WiMax is our primary motivation for entering into this agreement." CX0617-001.

Irwin Jacobs (Qualcomm Co-Founder and former Qualcomm CEO) testified at trial that Qualcomm would have been behind in supplying WiMax chips had WiMax become the standard:

> **Q**: It's accurate to state, sir, that if WiMax had ended up as the standard, Qualcomm would have been far behind; is that right?
> **A**: That's fine.

Tr. at 1284:10-13.

As a result of the MIA, WiMax was eliminated. Jeff Williams (Apple COO) testified that the Qualcomm agreement ended Apple's engagement with Intel's WiMax standard:

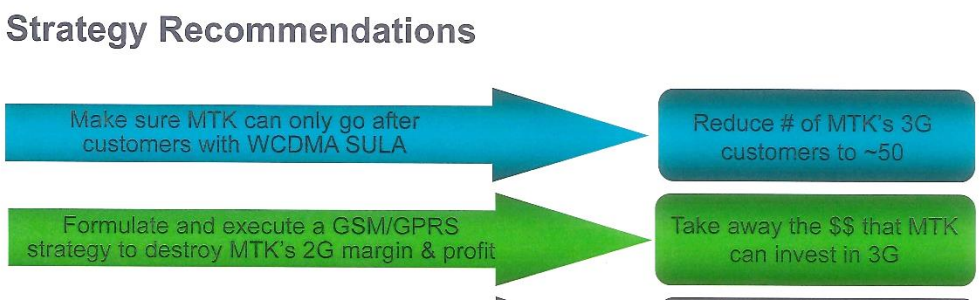
> **Q**: And following the execution of that agreement, did Apple pursue WiMax further?
> **A**: No. In essence, it was killed in the cradle for us. We did not.

Tr. at 873:21-23.

Similarly, Qualcomm entered an exclusive deal with Apple because doing so would eliminate competition. In an August 2010 email, Steve Mollenkopf (QCT President) told Paul Jacobs (Qualcomm CEO), Derek Aberle (QTL President), and Steve Altman (Qualcomm President) that if Qualcomm secured Apple exclusivity in the TA, Qualcomm would eliminate thin modem competitors: "[T]here are significant strategic benefits as it is unlikely that there will be enough standalone modem volume to sustain a viable competitor without that slot." CX5348-001.

In addition, Qualcomm refused to license its rivals and restricted rivals' customer base with the intent to prevent rivals from investing in research and development, and to weaken them in the market. For example, in a 2009 pricing presentation that Qualcomm prepared within days of its CDMA ASIC Agreement with MediaTek—which limited MediaTek's sales to Qualcomm licensees only—Qualcomm stated that by reducing MediaTek's customer base, Qualcomm could

"[t]ake away the $$ that MTK can invest in 3G." CX5809-041. The slide is reproduced below:



Lastly, lawyers—including Derek Aberle, Steve Altman, Eric Reifschneider, Fabian Gonell, and Lou Lupin—were the architect, implementers, and enforcers of Qualcomm's licensing practices. Lawyers explicitly stated that Qualcomm's licensing practices raised concerns about antitrust liability, but chose to continue those practices anyway, with full knowledge that Qualcomm's unreasonably high royalty rates violate FRAND and that Qualcomm's licensing practices harm rivals. That willful, conscious decision to continue Qualcomm's licensing practices is further evidence of intent to harm competition. Although intent is not dispositive, evidence of Qualcomm's intent confirms the Court's conclusion that Qualcomm's licensing practices cause antitrust harm because "no monopolist monopolizes unconscious of what he is doing." *Aspen Skiing*, 472 U.S. at 602.

In combination, Qualcomm's licensing practices have strangled competition in the CDMA and premium LTE modem chip markets for years, and harmed rivals, OEMs, and end consumers in the process. Qualcomm's conduct "unfairly tends to destroy competition itself." *Spectrum Sports*, 506 U.S. at 458. Thus, the Court concludes that Qualcomm's licensing practices are an unreasonable restraint of trade under § 1 of the Sherman Act and exclusionary conduct under § 2 of the Sherman Act. *Microsoft*, 253 F.3d at 58–59 (holding that where conduct causes anticompetitive harm not justified by procompetitive business reasons, the monopolist violates both § 1 and § 2). Therefore, Qualcomm's practices violate § 1 and § 2 of the Sherman Act, and that Qualcomm is liable under the FTC Act, as "unfair methods of competition" under the FTC

Act include "violations of the Sherman Act." *Cement Inst.*, 333 U.S. at 693–94.

VI. INJUNCTIVE RELIEF

The FTC Act authorizes the FTC to seek, and the Court to order, a permanent injunction "after proper proof" of an FTC Act violation. 15 U.S.C. § 53(b). The FTC has shown that Qualcomm is liable under the FTC Act for violating the Sherman Act. Therefore, the Court must consider whether to permanently enjoin Qualcomm and, if so, in what fashion.

A. Legal Standard

Injunctive relief should be granted if "there exists some cognizable danger of recurrent violation." *United States v. W.T. Grant Co.*, 345 U.S. 629, 633 (1953). In a case governed by the FTC Act, "an injunction will issue only if the wrongs are ongoing or likely to recur." *Fed. Trade Comm'n v. Evans Prods. Co.*, 775 F.2d 1084, 1087 (9th Cir. 1985). The Court has already rejected Qualcomm's pre-trial argument that a court must consider "post-discovery evidence of current market power" before issuing an injunction. ECF No. 997.

Injunctive relief may be appropriate under this standard even when the unlawful conduct has ceased. *Evans Prods.*, 775 F.2d at 1088 ("Even though Evans' alleged violations have completely ceased, we must review whether those violations are likely to recur."); *see also Fed. Trade Comm'n v. Accusearch Inc.*, 570 F.3d 1187, 1201–02 (10th Cir. 2009) (concluding that the district court properly issued an injunction under the FTC Act despite cessation of the unlawful conduct because of the possibility of recurrence); *Fed. Trade Comm'n v. Affordable Media*, LLC, 179 F.3d 1228, 1237 (9th Cir. 1999) (same). Past unlawful conduct is "highly suggestive of the likelihood of future violations." *CFTC v. Yu*, 2012 WL 3283430, at *4 (N.D. Cal. Aug. 10, 2012) (quoting *CFTC v. Hunt*, 591 F.2d 1211, 1220 (7th Cir. 1979)).

In terms of the scope of any injunction, the United States Supreme Court instructs "that a remedies decree in an antitrust case must seek to 'unfetter a market from anticompetitive conduct,' to 'terminate the illegal monopoly, deny to the defendant the fruits of its statutory violation, and ensure that there remain no practices likely to result in monopolization in the future.'" *Microsoft*, 253 F.3d at 103 (quoting *Ford Motor Co. v. United States*, 405 U.S. 562, 577 (1972), and *United*

States v. United Shoe Mach. Corp., 391 U.S. 244, 250 (1968)). "[A]dequate relief in a monopolization case should put an end to the combination and deprive the defendants of any of the benefits of the illegal conduct, and break up or render impotent the monopoly power found to be in violation of the Act." *Grinnell*, 384 U.S. at 577.

Thus, it is "entirely appropriate" for a court to order an injunction "beyond a simple proscription against the precise conduct previously pursued." *Nat'l Soc'y of Prof'l Eng'rs v. United States*, 435 U.S. 679, 698 (1978). The relevant question is "whether the relief represents a reasonable method of eliminating the consequences of the illegal conduct." *Id.*; *accord Fed. Trade Comm'n v. Grant Connect, LLC*, 763 F.3d 1094, 1105 (9th Cir. 2014). Where the government has established a violation of law, "all doubts as to the remedy are to be resolved in [the government's] favor." *United States v. E.I. du Pont de Nemours & Co.*, 366 U.S. 316, 334 (1961). Further, a district court in an antitrust case has "'large discretion' to fit the decree to the special needs of the individual case." *Ford Motor Co.*, 405 U.S. at 573.

Qualcomm also argues that the Court must consider traditional equitable factors, including whether the public interest would be disserved by a permanent injunction. QC FOFCOL at 141. Although Qualcomm cites the FTC Act for the proposition that the Court may issue an FTC Act injunction only after "weighing the equities," that provision refers only to the issuance of a preliminary injunction: "Upon a proper showing that, weighing the equities and considering the Commission's likelihood of ultimate success, such action would be in the public interest, and after notice to the defendant, a temporary restraining order or a *preliminary injunction* may be granted without bond." 15 U.S.C. § 53(b) (emphasis added). Qualcomm cites no FTC Act case in which a court considered those equitable factors at the permanent injunction stage.

Regardless, by its very nature, the determination that a monopolist has violated the Sherman Act and that "the wrongs are ongoing or likely to recur" is a finding that an injunction is in the public interest because it will restrain the defendant from further anticompetitive conduct. *Evans Prods.*, 775 F.2d at 1087.

Thus, the Court first considers whether "there exists some cognizable danger of recurrent

violation," *W.T. Grant Co.*, 345 U.S. at 633, and then whether the FTC's requested relief will "unfetter [the] market from anticompetitive conduct." *Ford Motor Co.*, 405 U.S. at 577.

B. Qualcomm's Practices Are Ongoing

The evidence demonstrates that Qualcomm's anticompetitive conduct is ongoing and that an injunction is thus warranted. *See Evans Prods*, 775 F.2d at 1087 (holding that an injunction may issue where unlawful conduct is "ongoing").

Qualcomm continues to refuse to provide patent exhaustion, refuse to sell modem chips to an OEM until the OEM signs a license, and engage in chip supply threats and cutoffs. Steve Mollenkopf (Qualcomm CEO) conceded at trial that Qualcomm does not sell chips to unlicensed OEMs:

> **Q**: And you would agree, sir, that it is Qualcomm's policy not to sell chips to companies that are unlicensed or not complying with their licenses; right?
> **A**: We have that policy, yes.

Tr. at 842:25-843:3.

In addition, Qualcomm continues to withhold chip supply as leverage against OEMs. After Apple challenged Qualcomm's royalty rates in 2016, Qualcomm refused to provide Apple with any chips for new devices, and none of Apple's 2018 handset models contain Qualcomm chips, per Jeff Williams (Apple Chief Operating Officer):

> Qualcomm has continued to ship us product on the design wins that they have and had at the time. And so they have continued to sell us chips. We have been unable to get them to support us on new design wins past that time, and this has been a challenge. . . . We – I contacted Qualcomm, I contacted Steve, I sent him e-mails, I called. We tried to get them to sell us chips, and they would not.

Tr. at 890:13-24. Tony Blevins (Apple Vice President of Procurement) similarly testified that Apple's lawsuit spurred Qualcomm to use chip leverage: "At the time we made those challenges, Qualcomm was no longer willing to sell us chips. That was very obvious, very apparent to us. And so we went right back to the no license, no chips, that we were facing back in 2005." Tr. at 711:12-16.

Qualcomm has also continued to use chip incentive funds and other payments to silence

OEMs. For example, Qualcomm and Samsung entered a series of agreements in early 2018, including the Amended and Restated Strategic Relationship Agreement and the Settlement Agreement. JX-0122-001. The Amended and Restated Strategic Relationship Agreement continues Qualcomm's practice of incentivizing OEMs to buy Qualcomm modem chips to the exclusion of rivals' chips, as Qualcomm promises to pay Samsung rebates only when Samsung purchases Qualcomm modem chips. JX0122-036 to -037. To receive the rebates, Samsung must purchase from Qualcomm 100% of Samsung's premium modem chips and at least a certain number of mid and higher tier chips. *Id.*

The Settlement Agreement represents a new Qualcomm tactic in license negotiations. Qualcomm paid Samsung $100 million to extinguish Samsung's antitrust claims and to silence Samsung. JX0122-054. Samsung specifically releases claims based on the following:

> any claim of coercion or other similar claims regarding the negotiation, execution, or terms of this Settlement Agreement, the 2018 Amendment, the CMCPCA, and/or the Collaboration Agreement . . .
>
> any patent licensing conduct of Qualcomm or any of its Affiliates or (b) any conduct of Qualcomm or any of its Affiliates in the Private and Regulatory Actions . . . [and]
>
> any claim that Qualcomm's Existing Practices violate any antitrust, competition, or similar laws of any state or territory of the United States (including federal law), Korea, or any other country or any jurisdiction, or any principle of common or civil law to similar effect including any claim based on or arising from findings or conclusions articulated in . . . (4) the ultimate decisions, settlement agreements or other dispositions of any of the cases brought against Qualcomm (or that contain counterclaims against Qualcomm) by the U.S. Federal Trade Commission ("U.S. F.T.C.") (*FTC v. Qualcomm Incorporated*, Case No. 5:17-CV-00220-LHK (N.D. Cal.)) . . .

JX0122-050 to -052. Samsung also agreed to withdraw from participation in the instant action and others:

> Samsung will promptly take all actions reasonably required to withdraw all pending or accepted applications for intervention, or any other forms of substantive participation (except for any participation, including discovery or deposition, to the extent required by law), in any of the Private or Regulatory Actions and any other proceedings involving claims that Qualcomm's Existing Practices violate antitrust,

> competition, or similar laws. . . . [and]
>
> Samsung will withdraw from all existing Common Interest Agreements and all other similar agreements in which the general purpose is to share information and communications under some form of protection against disclosure (collectively, the "CIAs") between Samsung or any of its Affiliates and any third party that pertains to any of the Private and Regulatory Actions or any other proceedings or collaboration by third parties involving claims or potential claims that Qualcomm's Existing Practices violate antitrust, competition, contract, or similar laws or undertakings.

JX0122-056.

Further, in the Settlement Agreement, Samsung agreed to make the following statement to the KFTC: "[I]n any statement Samsung provides to the KFTC regarding Qualcomm's compliance with the KFTC 2017 Orders, Samsung agrees that it shall confirm that it has resolved its disputes with Qualcomm and the resolution of such dispute satisfies Samsung's demands made under the KFTC 2017 Orders." JX0122-055.

Qualcomm also continues to refuse to license rival modem chip suppliers. Alex Rogers (QTL President) testified, "So we don't license at the component level." *Id.* at 1978:7. Licensing at the component level refers to licensing to modem chip suppliers. *Id.* at 1978:5-6.

Therefore, all of Qualcomm's unlawful practices continue unabated. This is so even though government agencies in Japan, Korea, Taiwan, China, the European Union, and the United States began investigating Qualcomm's licensing practices as early as 2009, as Qualcomm reported in its own 2017 10-K filed with the SEC. CX7257-097. Qualcomm has fought against attempts in those investigations to change its licensing practices. For example, presentation notes from slides that BCG presented in 2015 to the Project Phoenix committee of the Qualcomm Board of Directors explained that Qualcomm evaded more serious penalties—including a ban on its refusal to sell modem chips to unlicensed OEMs or more aggressive royalty rate cuts—by making a $150 million contribution to the Chinese government. CX3755-004.

That Qualcomm's unlawful practices continue is consistent with its own longstanding strategy. In a 2012 QTL strategic plan presentation that Derek Aberle (QTL President) created and sent to Dr. Paul Jacobs (Qualcomm CEO), Steve Mollenkopf (Qualcomm President), and

Steve Altman (Qualcomm Vice Chairman), Aberle included a slide titled, "Sales to Unlicensed Entities or Customers Claiming Exhaustion." CX6998-011. Aberle wrote, "If we cease supply of chips to current customers they may assert antitrust claims seeking damages/fines and continued supply." *Id.* In a section titled "Strategy," Aberle identified the following strategy: "Develop a plan of communication/action that maximizes our ability to defend against the above claims while ceasing supply when necessary." *Id.* In July 2012, Qualcomm presented to the Qualcomm Board of Directors an identical slide, with the identical strategy: "Develop a plan of communication/action that maximizes our ability to defend against the above claims while ceasing supply when necessary." CX6974-070.

Therefore, the Court concludes that Qualcomm's unlawful practices are "ongoing" or likely to recur.

Qualcomm argues that although Qualcomm's practices are ongoing, an injunction may only issue if Qualcomm continues to maintain monopoly power in the CDMA and premium LTE modem chip markets. QC FOFCOL at 142. However, Qualcomm identifies no legal requirement that a plaintiff show future market power. The Court has already concluded that "evidence of Qualcomm's past conduct is sufficient to show whether any violations are 'likely to recur.'" ECF No. 997 at 7 (quoting *Evans Prods. Co.*, 775 F.2d at 1087).

Regardless, Qualcomm's internal documents and public statements show that Qualcomm is likely to replicate its market dominance during the transition to 5G, the next generation of modem chips. Here, in both internal documents and public statements, Qualcomm has consistently stated that it is ahead of rival modem chip suppliers in developing 5G modem chips.

For example, in a January 2018 letter to Qualcomm shareholders, Steve Mollenkopf (Qualcomm CEO), stated, "Qualcomm is 12-24 months ahead of our merchant competitors in the transition to 5G – a result of our innovation and technological advancements." CX8198-004. At trial, Mollenkopf agreed that his January 2018 statement was true when made. Tr. at 765:17-19. Similarly, a Qualcomm script for a January 2018 earnings call includes the following talking point: "Another important area is 5G and we estimate that we have a 12 to 24 month lead ahead of

our key competitors in the transition to 5G." CX8195-083. The script further highlights carriers and OEMs with whom Qualcomm has "already partnered . . . across the globe as we work to bring 5G to market." *Id.*

Internally, Qualcomm maintains similar messaging about its leadership position. For example, in a presentation prepared for a December 2017 Qualcomm Board of Directors meeting, Qualcomm included a slide, "Global 5G Momentum," which highlighted Qualcomm's existing 5G design engagements with several OEMs. CX8196-129. In addition, in a QTL slide deck titled "FY17 Strategic Plan Review" and sent to Derek Aberle (Qualcomm President) and Alex Rogers (QTL President), a slide highlights that 12 of Qualcomm's top 20 licensees by revenue have entered license agreements with no fixed expiration date and which may already cover some 5G patents. CX7122-016. In another slide deck shared in December 2017 with the Qualcomm Board of Directors, Qualcomm acknowledged that it may face some competition in 5G, as a "5G Leadership Summary" slide stated that, "Samsung & HiSilicon expected to compete with QCT," but "Intel & MTK lagging on time to market." CX8191-121.

However, since then, Qualcomm has remained optimistic about its 5G positioning because of Qualcomm's previous experience at cellular standards transitions. In January 2018, Qualcomm presented to shareholders a slide deck titled, "A Clear Roadmap for Value Creation." CX8197-001. One slide states that "Technology transitions create significant returns for Qualcomm." CX8197-020. Specifically, "During 3G to 4G transition, Qualcomm revenues more than doubled." *Id.* In addition, Qualcomm "[c]aptured 80% share of units during first 3 years of technology transition from 3G to 4G." *Id.* Thus, with 5G imminent, "Qualcomm stockholders [are] poised to achieve substantial returns on 5G investment." *Id.* At trial, Steve Mollenkopf (Qualcomm CEO) conceded that each of the foregoing statements are true. Tr. at 766:6-18.

Further, Qualcomm explicitly considered its potential advantages in 5G during its 2015 Project Phoenix analysis of whether to split QTL and QCT. In a series of emails from April 2015 before a Qualcomm executive committee meeting, Steve Mollenkopf (Qualcomm CEO) and David Wise (Qualcomm Senior Vice President and Treasurer) exchanged their views on how the

coming 5G transition should play into the decision whether to split QTL and QCT. CX5913-001. Steve Mollenkopf wrote to David Wise and the "exc@qualcomm.com" email distribution list, "One of the arguments for not splitting is that we need to be positioned for 5G." CX5913-001. David Wise, who was then working on the Project Phoenix analysis, replied to all on the email thread and explained a Qualcomm lead in 5G modem chips could continue to prop up Qualcomm's royalty rates:

> The main point on 5G is that we are in a stronger position to extend QTL licensing model together than separate. Less about level of spend. Much more about our strength in the standards process and regulatory. If separate, QTL may be isolated and ineffective at getting tech into the std. No QCT distribution. Longer term an independent QTL may not be seen as much as an enabler and more pressure could come on its model risking erosion or worse. Made worse by the fact the dollars are small and could be replicated by an independent QCT who would also probably be in favor of curtailing the QTL model, although you could keep the two contractually connected for a few years.

CX5913-001.

OEMs and rival modem chip suppliers have also recognized that Qualcomm is likely to have a 5G chip lead. In a May 2016 email to a colleague, Todd Madderom (Motorola Director of Procurement) wrote, "Procurement is actively seeking 5G chipset alternatives from MTK and Intel. Neither supplier is responding with the urgency we seek. This is very concerning and suggests a new technology gap is forming which will, once again, put Qualcomm in a position of dominance and monopoly." CX2125-001. Madderom testified consistently at trial, "[W]hat I wrote was that we may be doing a reset in the market where Qualcomm resets and maybe they become several years ahead of the competitor, the competitive alternatives where it took several years for MediaTek or Intel to catch up." Madderom Depo. 234:17-23.

Finbarr Moynihan (MediaTek General Manager of Corporate Sales and Business Development) testified, "I think on the flavor of 5G that will be required for markets like the U.S., I believe there's still a substantial gap," with MediaTek behind Qualcomm. Tr. at 380:1-5. Aicha Evans (Intel Chief Strategy Officer) testified that Intel plans to release a 5G modem chip in late 2019. Tr. at 619:7-16.

Therefore, although rivals anticipate commercializing 5G chips, Qualcomm's own documents and statements show that Qualcomm is already engaged with a significant number of prominent OEMs on 5G designs and that Qualcomm projects the 5G transition may enable Qualcomm to achieve a dominant position in the 5G modem chip market. CX8196-129 (Qualcomm list of its 5G engagements with OEMs); CX8197-020 (Qualcomm projection that 5G transition can provide Qualcomm a dominant share of 5G market). This disposes of Qualcomm's argument that its 5G license agreement with Samsung, for example, is free of anticompetitive conduct because Qualcomm is not yet selling 5G modem chips. QC Pretrial Brief at 17. If Qualcomm has a lead on 5G chips, as Qualcomm states it does, then Samsung had little option but to sign Qualcomm's 5G license agreement to ensure access to Qualcomm's chip supply.

Moreover, the Ninth Circuit has held that an injunction is appropriate when there is a "possibility of recurrence" of illegal conduct. *Affordable Media*, 179 F.3d at 1237 (holding that the district court properly entered an injunction under the FTC Act against future conduct despite the defendant's cessation of illegal conduct due to the "possibility of recurrence"). Furthermore, the United States Supreme Court has held that where the government has established a violation of law, all doubts as to the remedy are to be resolved in the government's favor. *E.I. du Pont de Nemours & Co.*, 366 U.S. at 334 (holding that where the government has established a violation of law, "all doubts as to the remedy are to be resolved in [the government's] favor").

Therefore, because Qualcomm's unlawful practices continue and there is a significant risk that Qualcomm will be dominant in 5G, the Court concludes that the unlawful conduct is likely to recur and that a permanent injunction is warranted. *See W.T. Grant Co.*, 345 U.S. at 633 (holding that an injunction is warranted under the FTC Act where "there exists some cognizable danger of recurrent violation").

C. The Injunction

The Court now turns to the appropriate remedies. The FTC's Complaint does not specify the relief it seeks, other than to ask "[t]hat Qualcomm is permanently enjoined from engaging in its lawful conduct" and "[t]hat Qualcomm is permanently enjoined from engaging in similar and

related conduct in the future." Compl. at 32. In the parties' joint pretrial statement, the FTC specifies the relief it seeks and requests that the Court:

> (1) Prohibit Qualcomm from conditioning the supply of modem chips on a customer's patent-license status;
> (2) Require Qualcomm to negotiate or renegotiate, as applicable, license terms with customers in good faith under conditions free from the threat of lack of access to or discriminatory provision of modem chip supply or associated technical, software, or other support;
> (3) Require Qualcomm to submit, as necessary, to arbitral or judicial dispute resolution to determine reasonable royalties and other license terms should a customer choose to pursue such resolution;
> (4) Require Qualcomm to make exhaustive SEP licenses available to modem-chip suppliers on fair, reasonable, and non-discriminatory terms and to submit, as necessary, to arbitral or judicial dispute resolution to determine such terms;
> (5) Prohibit Qualcomm from discriminating or retaliating in any way against any modem-chip customer or modem-chip supplier because of a dispute with Qualcomm over license terms or because of a customer's license status;
> (6) Prohibit Qualcomm from making payments or providing other value contingent on a customer's agreement to license terms;
> (7) Prohibit Qualcomm from entering express or de facto exclusive-dealing agreements for the supply of modem chips;
> (8) Prohibit Qualcomm from interfering with the ability of any customer to communicate with a government agency about a potential law enforcement or regulatory matter;
> (9) Require Qualcomm to adhere to compliance and monitoring procedures and appropriate 'fencing in' provisions, including but not limited to a potential firewall between patent licensing and chip personnel; and
> (10) Impose any other relief that the Court finds necessary and appropriate to redress and prevent recurrence of Qualcomm's conduct.

ECF No. 1314-3 at 3–4.

Under United States Supreme Court precedent, "a remedies decree in an antitrust case must seek to 'unfetter a market from anticompetitive conduct,' to 'terminate the illegal monopoly, deny to the defendant the fruits of its statutory violation, and ensure that there remain no practices likely to result in monopolization in the future.'" *Microsoft*, 253 F.3d at 103 (quoting *Ford Motor Co.*, 405 U.S. at 577, and *United Shoe Mach. Corp.*, 391 U.S. at 250). "[A]dequate relief in a monopolization case should put an end to the combination and deprive the defendants of any of the benefits of the illegal conduct, and break up or render impotent the monopoly power found to be in violation of the Act." *Grinnell*, 384 U.S. at 577. Thus, it is "entirely appropriate" for a court

to order an injunction "beyond a simple proscription against the precise conduct previously pursued." *Nat'l Soc'y of Prof'l Eng'rs*, 435 U.S. at 698.

Qualcomm raises the overarching argument that all of the FTC's proposed relief is overbroad because the FTC seeks to enjoin Qualcomm's conduct in all modem chip markets, not merely those in which the FTC alleged and showed that Qualcomm held monopoly power. QC FOFCOL at 144. Qualcomm contends that such a remedy is not "tailored to remedy the specific harm alleged." *Id.* (citing *Lamb-Weston, Inc. v. McCain Foods, Ltd.*, 941 F.2d 970, 974 (9th Cir. 1991)). However, this argument is simplistic and factually faulty.

Although Qualcomm argues that Qualcomm could not have used CDMA market power to obtain unreasonably high royalty rates in WCDMA license agreements, Qualcomm's own expert Dr. Aviv Nevo admitted at trial that Qualcomm's WCDMA license agreements often covered sales of CDMA handsets. Tr. at 1646:9-13. Therefore, Qualcomm's CDMA modem chip leverage could have come to bear on WCDMA license negotiations. Further, Qualcomm primarily sells multimode modem chips that support multiple cellular standards. Tr. at 1355:2-6. Accordingly, Qualcomm's monopolies in premium LTE and CDMA modem chip markets could have come to bear on Qualcomm's other license negotiations, if the OEM needed access to Qualcomm's multimode LTE or CDMA modem chips. *See also E.I. du Pont de Nemours & Co.*, 366 U.S. at 334 (holding that where the government has established a violation of law, "all doubts as to the remedy are to be resolved in its favor").

The Court, however, agrees that certain of the FTC's proposed remedies are either vague or not necessary to "'unfetter a market from anticompetitive conduct,' to 'terminate the illegal monopoly, deny to the defendant the fruits of its statutory violation, and ensure that there remain no practices likely to result in monopolization in the future.'" *Microsoft*, 253 F.3d at 103 (citations omitted).

Lastly, the Court notes that more than three months after this trial concluded, the United States filed a statement of interest. ECF No. 1487. The United States argues that if the Court finds a violation of the FTC Act, the Court "should permit additional briefing and schedule an

evidentiary hearing to resolve any disputes regarding the scope and impact of injunctive relief." *Id.* at 3. However, an evidentiary hearing is not necessary where "the matter of relief was part of the trial on liability." *Microsoft*, 253 F.3d at 101.

Here, for example, the parties presented considerable testimony, evidence, and argument on the feasibility of requiring Qualcomm to license its SEPs to rival modem chip suppliers, and on other issues related to the scope or nature of the remedy. *See, e.g.*, QX2778C-012 (Nokia response to FTC civil investigative demand regarding licensing to modem chip suppliers); Tr. at 1913:3-16 (Qualcomm's expert Dr. Aviv Nevo testifying about the implications of enjoining Qualcomm's practice of requiring OEMs to sign a separate license before buying modem chips); Tr. at 1432:25-1434:21 (Fabian Gonell, QTL Legal Counsel and Senior Vice President, Licensing Strategy, testifying about implications of requiring Qualcomm to license its SEPs to rival modem chip suppliers); Tr. at 2169:12-2173:3 (Qualcomm closing argument on remedies, including on implications of requiring Qualcomm to renegotiate existing patent licenses with OEMs).

In addition, the circumstances in *Microsoft*, on which the United States chiefly relies, are distinguishable. In *Microsoft*, the district court instituted the extraordinary remedy of requiring divestiture, even though "[i]n two separate offers of proof, Microsoft identified 23 witnesses who . . . would have challenged a wide range of plaintiffs' factual representations." *Id.* at 101. The district court acknowledged the "acute factual disagreements," but declined to hold an evidentiary hearing. *Id.* The United States identifies no such disagreements or circumstances in this case. Therefore, the Court declines to hold an evidentiary hearing on the question of remedy.

In accordance with the principles above and consistent with the Court's findings of fact and conclusions of law, the Court orders the following injunctive relief:

(1) Qualcomm must not condition the supply of modem chips on a customer's patent license status and Qualcomm must negotiate or renegotiate license terms with customers in good faith under conditions free from the threat of lack of access to or discriminatory provision of modem chip supply or associated technical support or access to software.

This remedy addresses Qualcomm's practices of not selling modem chips exhaustively,

requiring OEMs to sign a separate license before buying modem chips, and Qualcomm's associated threats to cut off OEMs' chip supply and technical support and to delay or revoke access to software, which the Court held constitute anticompetitive conduct under the Sherman Act. Prohibiting Qualcomm from cutting off OEMs' chip supply, technical support, and access to software ensures that Qualcomm and OEMs can negotiate patent license terms that reflect the fair value of Qualcomm's patents, rather than terms that reflect Qualcomm's monopoly power in modem chips. The evidence showed a sufficient risk that Qualcomm will have market power in 5G modem chips and could exercise its dominance to extract unreasonably high royalties. Therefore, prohibiting Qualcomm from cutting off OEMs' chip supply, technical support, and access to software helps "ensure that there are no practices likely to result in monopolization in the future." *Microsoft*, 253 F.3d at 103.

Requiring Qualcomm to renegotiate its existing patent license agreements also addresses the "fruits of [Qualcomm's] statutory violation." *United Shoe Mach. Corp.*, 391 U.S. at 250. Many of Qualcomm's existing patent licenses negotiated under the threat of lack of access to chip supply, technical support, or software are long-term or perpetual in duration. For example, a 2017 Qualcomm slide deck states that 12 of Qualcomm's top 20 licensees by licensing revenue have entered patent license agreements that have no fixed expiration date and that may already cover 5G technology. CX7122-016.

It makes little sense for the Court, having found that Qualcomm's patent licenses are the product of anticompetitive conduct, to leave those licenses in place. To permit Qualcomm to continue to charge unreasonably high royalty rates would perpetuate its artificial surcharge on rivals' chips, which harms rivals, OEMs, and consumers, and would enable Qualcomm to continue to reap the fruits of its Sherman Act violation. Thus, the Court finds it necessary to require Qualcomm to renegotiate those license agreements. *See Grinnell*, 384 U.S. at 577 (holding "that adequate relief in a monopolization case should put an end to the combination and *deprive the defendants of any of the benefits of the illegal conduct*") (emphasis added).

Requiring negotiations and renegotiations of license agreements to occur without the threat

of chip supply, technical support, and software cutoff will enable Qualcomm and OEMs to negotiate license terms that reflect the fair value of Qualcomm's patents. Although this remedy does not merely proscribe future Qualcomm conduct, and will require Qualcomm to renegotiate many licenses, it is "entirely appropriate" for a court to order an injunction "beyond a simple proscription against the precise conduct previously pursued." *Nat'l Soc'y of Prof'l Eng'rs*, 435 U.S. at 698.

(2) Qualcomm must make exhaustive SEP licenses available to modem-chip suppliers on fair, reasonable, and non-discriminatory ("FRAND") terms and to submit, as necessary, to arbitral or judicial dispute resolution to determine such terms.

This remedy addresses Qualcomm's refusal to license rival modem chip suppliers on FRAND terms, which the Court held is anticompetitive conduct under the Sherman Act. Thus, requiring Qualcomm to license its SEPs to rival modem chip suppliers on FRAND terms "unfetter[s] [the] market from anticompetitive conduct." *Ford Motor Co.*, 405 U.S. at 577. Although Qualcomm claims such a remedy is inconsistent with industry practice, Qualcomm conceded to the IRS in 2012 that Qualcomm licensed modem chip suppliers only until Qualcomm decided that licensing OEMs at the handset level instead was "humongously more lucrative." CX6786-R at 71:18-23. Thus, Qualcomm itself has licensed its SEPs to rival modem chip suppliers.

Licensing SEPs to rival modem chip suppliers is also consistent with Qualcomm's existing voluntary FRAND commitments. Requiring Qualcomm to license its SEPs to rival modem chip suppliers will eliminate the anticompetitive conduct in this case because Qualcomm's rivals may enter modem chip markets without fear of an infringement action. Further, requiring Qualcomm to license its SEPs to rival modem chip suppliers on FRAND terms will enable a fair valuation of Qualcomm's modem chip SEPs because modem chip suppliers are unaffected by chip supply leverage. Finally, arbitral and judicial dispute resolution procedures are already in place for FRAND disputes.

(3) Qualcomm may not enter express or de facto exclusive dealing agreements for the

supply of modem chips.

This remedy addresses Qualcomm's exclusive dealing agreements with Apple; de facto exclusive dealing agreements with LGE, BlackBerry, Samsung, and VIVO; and offers of de facto exclusive dealing agreements to Motorola and Lenovo. Qualcomm's exclusive dealing agreements have foreclosed Qualcomm's rivals from a substantial share of the CDMA and premium LTE modem chip markets. Exclusive dealing agreements are particularly fraught in markets, like the modem chip market, that are "highly concentrated" with few market participants and where there are significant barriers to entry. *ZF Meritor*, 696 F.3d at 284. Exclusive dealing by a monopolist in particular "raise[s] legitimate concerns about harm to competition." *Microsoft*, 253 F.3d at 70.

In 2018, Qualcomm agreed to give Samsung chip incentive funds only if Samsung purchases 100% of its premium modem chips from Qualcomm in a given year. JX0122-036 to -037. The Court notes that Qualcomm entered into this de facto exclusive agreement with Samsung a year after the KFTC made adverse findings against Qualcomm for Qualcomm's licensing practices and a year after the FTC filed the instant action.

Thus, Qualcomm continues to enter exclusive deals that could foreclose rivals from the market. In addition, Qualcomm entered its exclusive dealing agreements with Apple during the transition to LTE, when Qualcomm maintained a 100% share of the premium LTE modem chip market. The cellular industry is preparing to transition to 5G, a new generation, and Qualcomm's own internal and public statements represent that Qualcomm "has a 12 to 24 month lead ahead of [its] key competitors in the transition to 5G." CX8195-083. Thus, there is a sufficient likelihood that Qualcomm will hold monopoly power in the 5G modem chip market such that exclusive dealing agreements for the supply of modem chips could foreclose competition in that emerging market.

Moreover, the Court notes that the Ninth Circuit has held that an injunction is appropriate when there is a "possibility of recurrence" of illegal conduct. *Affordable Media*, 179 F.3d at 1237 (holding that the district court properly entered an injunction under the FTC Act against future

conduct despite the defendant's cessation of illegal conduct due to the "possibility of recurrence"). Furthermore, the United States Supreme Court has held that where the government has established a violation of law, all doubts as to the remedy are to be resolved in the government's favor. *E.I. du Pont de Nemours & Co.*, 366 U.S. at 334 (holding that where the government has established a violation of law, "all doubts as to the remedy are to be resolved in [the government's] favor").

(4) Qualcomm may not interfere with the ability of any customer to communicate with a government agency about a potential law enforcement or regulatory matter.

This remedy protects against Qualcomm's continued violation of the Sherman Act. *See W.T. Grant Co.*, 345 U.S. at 633 (holding that an injunction is warranted under the FTC Act where "there exists some cognizable danger of recurrent violation"). Without the aid of market participants, a government agency may be hamstrung in pursuing a potential law enforcement or regulatory matter. Many of Qualcomm's OEM customers testified at trial in both the FTC's and Qualcomm's cases in chief. Thus, this remedy is designed to unfetter the market from anticompetitive conduct. *See Microsoft*, 253 F.3d at 103. This remedy also addresses Qualcomm's conduct in this case because Qualcomm has, even with this action in progress, interfered with the ability of its OEM customers to assist government agencies.

In January 2018, a year after the KFTC made a finding against Qualcomm in January 2017 and fined Qualcomm $927 million, and a year after the FTC filed its complaint in this case, Qualcomm entered a Settlement Agreement in which Qualcomm paid Samsung $100 million to extinguish Samsung's antitrust complaints and to silence Samsung as to any anticompetitive conduct by Qualcomm. For example, in the Settlement Agreement, Samsung specifically releases claims based on the following:

> any claim of coercion or other similar claims regarding the negotiation, execution, or terms of this Settlement Agreement, the 2018 Amendment, the CMCPCA, and/or the Collaboration Agreement . . .
>
> any patent licensing conduct of Qualcomm or any of its Affiliates or (b) any conduct of Qualcomm or any of its Affiliates in the Private and Regulatory Actions . . . [and]

> any claim that Qualcomm's Existing Practices violate any antitrust, competition, or similar laws of any state or territory of the United States (including federal law), Korea, or any other country or any jurisdiction, or any principle of common or civil law to similar effect including any claim based on or arising from findings or conclusions articulated in . . . (4) the ultimate decisions, settlement agreements or other dispositions of any of the cases brought against Qualcomm (or that contain counterclaims against Qualcomm) by the U.S. Federal Trade Commission ("U.S. F.T.C.") (*FTC v. Qualcomm Incorporated*, Case No. 5:17-CV-00220-LHK (N.D. Cal.)) . . .

JX0122-050 to -052. In addition, in the 2018 Settlement Agreement, Samsung promised to withdraw from participation in the instant action and other antitrust actions, outside of that participation required by law:

> Samsung will promptly take all actions reasonably required to withdraw all pending or accepted applications for intervention, or any other forms of substantive participation (except for any participation, including discovery or deposition, to the extent required by law), in any of the Private or Regulatory Actions and any other proceedings involving claims that Qualcomm's Existing Practices violate antitrust, competition, or similar laws.

JX0122-056.

Moreover, Samsung promised to make the following statement to the KFTC: "[I]n any statement Samsung provides to the KFTC regarding Qualcomm's compliance with the KFTC 2017 Orders, Samsung agrees that it shall confirm that it has resolved its disputes with Qualcomm and the resolution of such dispute satisfies Samsung's demands made under the KFTC 2017 Orders." JX0122-055. Qualcomm's pursuit of this and similar releases to extinguish antitrust claims threatens to impede the government's ability to enforce the antitrust laws, and could enable future unlawful Qualcomm conduct to go unreported.

This remedy is particularly relevant given the Court's order below that Qualcomm submit to compliance and monitoring procedures. In the course of such monitoring, the FTC may seek information from OEM customers and other market participants to confirm Qualcomm's compliance with the Court's order enjoining Qualcomm's license practices. Qualcomm could frustrate such inquiries by interfering with OEM's communications to the FTC.

(5) In order to ensure Qualcomm's compliance with the above remedies, the Court orders Qualcomm to submit to compliance and monitoring procedures for a period of seven

(7) years. Specifically, Qualcomm shall report to the FTC on an annual basis Qualcomm's compliance with the above remedies ordered by the Court.

It is well established that in FTC enforcement actions, a court may require a defendant to submit to compliance reporting or monitoring by the FTC. *See United States Dep't of Justice v. Daniel Chapter One*, 89 F. Supp. 3d 132, 144 (D.D.C. 2015) (citing cases and holding that "courts may order record-keeping and monitoring to ensure compliance with a permanent injunction"). For example, in *F.T.C. v. Direct Marketing Concepts, Inc.*, 648 F. Supp. 2d 202 (D. Mass. 2009), the district court concluded that monitoring provisions were appropriate because the defendants had "violated a preliminary injunction" and otherwise "demonstrated a history of poor diligence." *Id.* at 216.

Similarly, Qualcomm's failure to alter its unlawful licensing practices despite years of foreign government investigations, findings, and fines suggests an obstinance that a monitoring provision may address. Other courts in FTC enforcement actions have held that compliance reporting requirements are not "unduly burdensome," even when the provisions require reporting for a period of twenty years. *See Fed. Trade Comm'n v. John Beck Amazing Profits LLC*, 888 F. Supp. 2d 1006, 1016 (C.D. Cal. 2012). Accordingly, the Court finds that requiring Qualcomm to submit annual compliance reports and submit to FTC monitoring is appropriate in this case.

IT IS SO ORDERED.

Dated: May 21, 2019

Lucy H. Koh

LUCY H. KOH
United States District Judge

United States District Court
Northern District of California