Federal Trade Commission v. Qualcomm Incorporated

United States District Court Northern District of California,

San Jose Division

No. 17-cv-220

Qualcomm

"[T]he plaintiff has the initial burden to prove that the challenged restraint *has a substantial anticompetitive effect* …

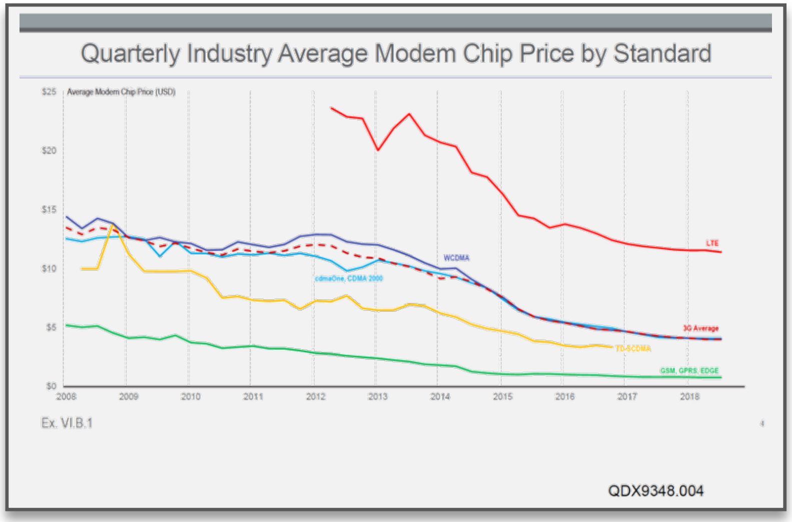
Ohio v. Am. Express Co., 138 S. Ct. 2274, 2284 (2018)(emphasis added);
see also Tanaka v. Univ. of S. Cal., 252 F.3d 1059, 1063 (9th Cir. 2001).

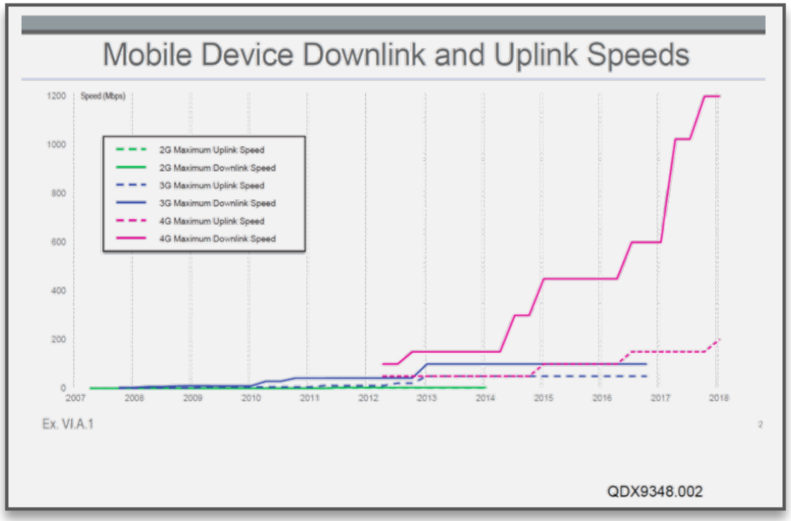
Edward Snyder

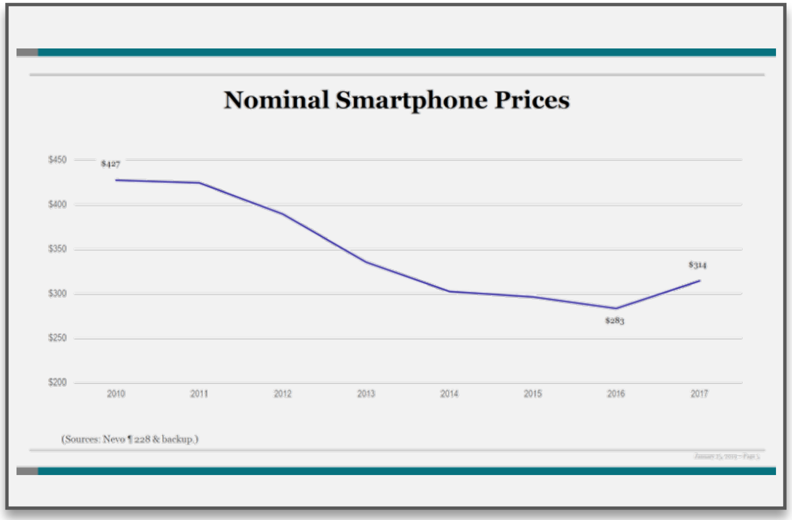
Professor of Economics and Management, Yale

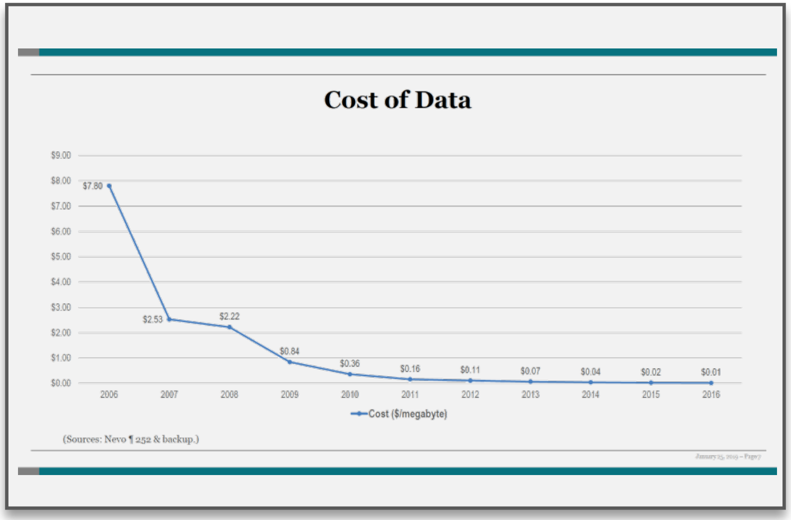
Aviv Nevo

Professor at the Wharton School of Business









Trial Tr. 1/22/19 at 1797:6-25, 1799:1-25, 1800:7-23, 1801:22-24, 1812:8-19 (Snyder);
Trial Tr. 1/25/19 at 1903:8-1904:25 (Nevo); QDX9348.002; QDX9348.004; QDX9351 at 11, 13

Shapiro

Q. …[Y]ou called this industry dynamic; correct?

A. Yes, that -- I believe that. I think of it that way.

Trial Tr. 1/15/19 at 1180:1-2; *see also id.* at 1179:21-1180:6, 1204:21 (Shapiro)

Moynihan

Q. Would you say it's fair to say that competition was very high at that point?

A. I think so, yes.

Trial Tr. 1/7/19 at 343:13-15; *see also id.* at 343:10-15, 343:22-24 (Moynihan)

Chipty

"In my view, the modem chip industry is characterized by dynamic competition in a rapidly changing marketplace."

Trial Tr. 1/22/19 at 1695:22-23 (Chipty)

Nevo

"What I found is that, at a high level, this is a thriving industry. Prices are declining, quantities are skyrocketing."

Trial Tr. 1/25/19 at 1903:8-9 (Nevo)

Carl Shapiro

FTC Expert

Q. In fact, as you noted in your report, Qualcomm's share of what you call premium LTE chips fell in 2015 and 2016 as Samsung, Intel, and MediaTek came into the market; right?

A. That is correct.

Trial Tr. 1/15/19 at 1176:21-24

Will Wyatt
VP Finance, Qualcomm

Tasneem Chipty
Managing Principal,
Matrix Economics

Q. As of early 2018, who were the three largest smartphone makers?
A. So the largest smartphone makers in the world are Apple, Samsung, and Huawei.
Q. And of the premium handset tier, what portion did these three OEM's represent?
A. So between the three of them, they represent over 90 percent of the premium tier handset tier.

Trial Tr. 1/8/19 at 458:10-17

- Samsung: Qualcomm share of premium tier chips is 35%
- Huawei: Qualcomm has 0% share of premium devices
- Apple: Qualcomm has 0% share for 2018 design

Trial Tr. 1/8/19 at 458:18-460:7 (Wyatt); *see also* Trial Tr. 1/22/19 at 1714:15-1716:13 (Chipty); QDX9349

Edward Snyder

Professor of Economics and Management at the Yale School of Management

Q. In any of these case studies, did you find that industry factors failed to explain the outcomes that you observed?

A. No. To the contrary. When you look over time across firms, independent industry factors explain what happened at the firm level.

Q. And what does that result tell you as an IO economist?

A. It's very important. It's simply that independent factors explain the real world, they explain what happened in the industry.

Trial Tr. 1/22/19 at 1796:15-23

Moynihan

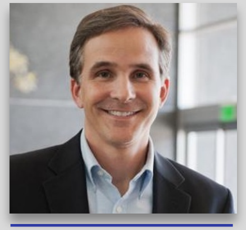
Q. But your understanding is that it was a business decision?
A. It was a decision not to license it at the time, yes.
Q. And MediaTek made that business decision because it wanted to focus on other 3G technology first; right?
A. Yeah, I think that's fair. We were certainly putting priority on wide band CDMA at the time.

Trial Tr. 1/7/19 at 348:1-6 (Moynihan)

Evans

Q. And Intel made a business decision, didn't it, not to acquire CDMA capability from Via Telecom at this time?
A. Yeah. You're an executive. You've got to learn to win some and lose some. At that point in time, I did not convince him to. But eventually, as you know, since we acquired Via, it took me three years, four years, yes, we did. But frankly, the timing worked out because we needed to ship first.

Trial Tr. 1/8/19 at 611:22-612:3 (Evans)



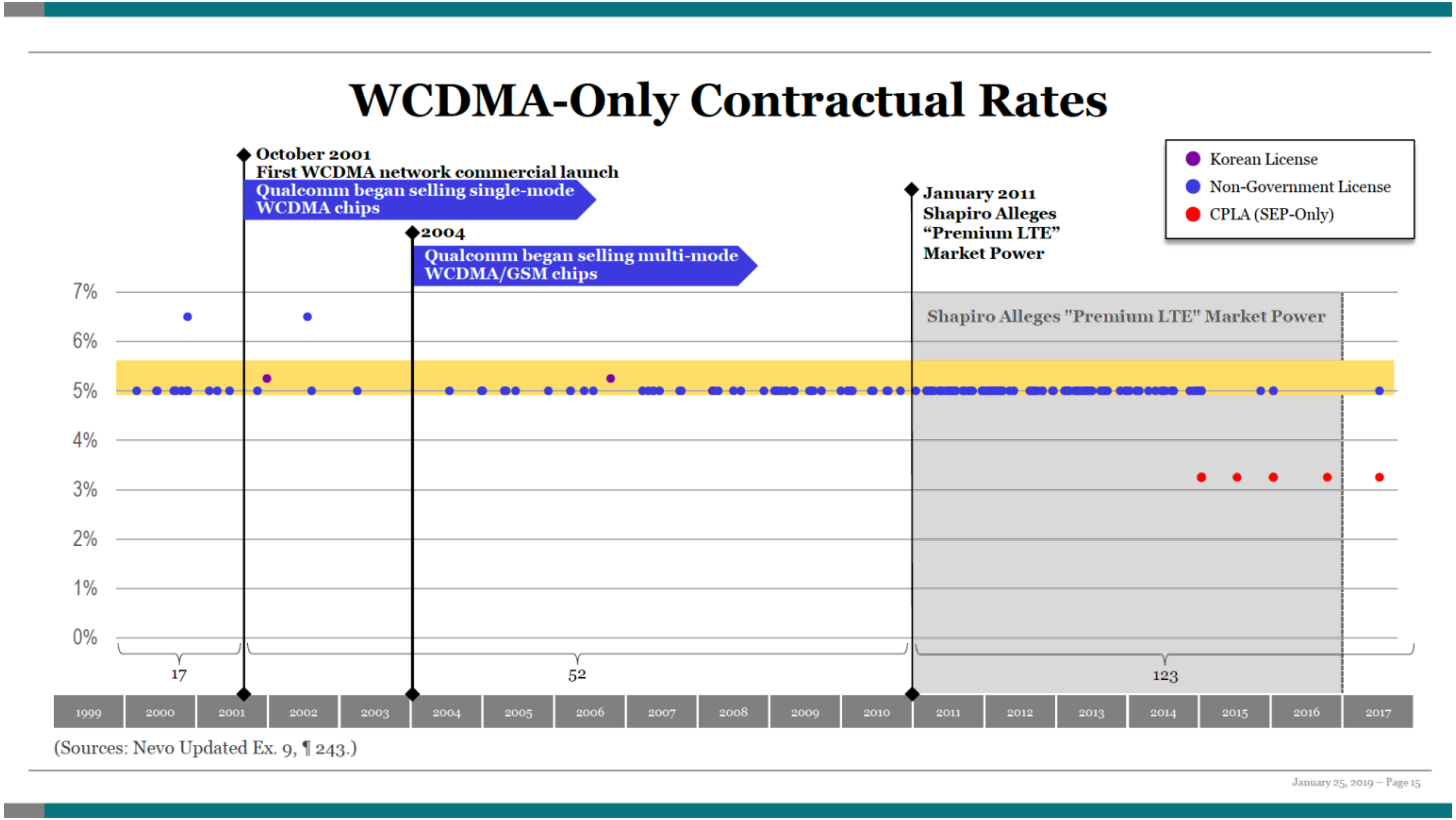
Thompson

"…[A]nd we made this bet in, say, the mid 2000s -- is that multimode was going to be important and multimode was not going to go away."

Trial Tr. 1/18/19 at 1354:11-13; *see also id.* at 1353:22-1354:13 (Thompson)

Aviv Nevo

Professor at the Wharton School of Business and Department of Economics at the University of Pennsylvania



QDX9351; Trial Tr. 1/25/19 at 1874:6-1877:3; *see also id.* at 1865:16-1868:18, 1871:23-1875:4, 1881:4-1888:18

Michael Lasinski

FTC Expert

Q. And you're not aware of anybody, other than yourself, who has applied this kind of standard deviation analysis to blend approved contributions and deemed SEPs; right?

A. That is accurate. . . .

Q. Blending approved contributions and deemed SEPs to derive a portfolio strength metric in this way is something that you and your team developed yourselves; correct?

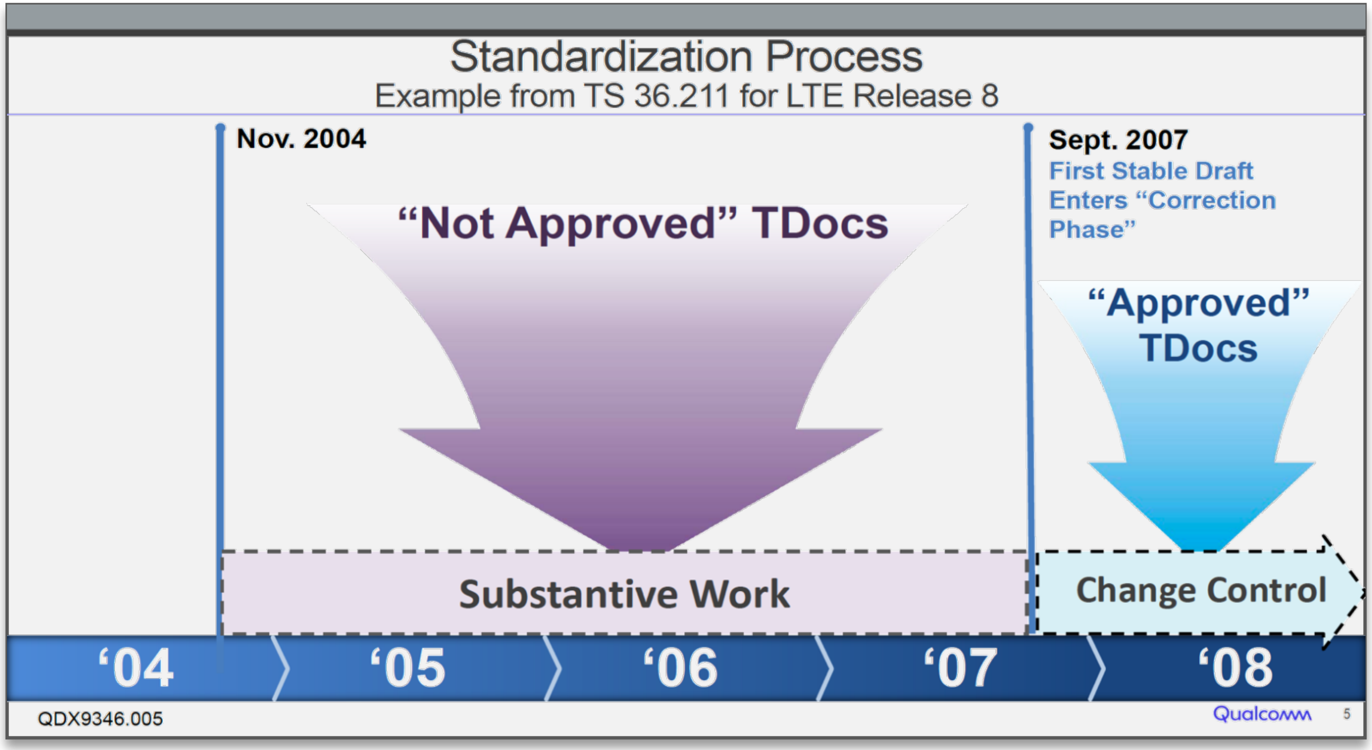
A. We, yes.

Trial Tr. 1/14/19 at 1091:1-4, 1091:15-18

Lorenzo Casaccia
Vice President of
Technical Standards,
Qualcomm

"There is a substantive work phase, and there is a change control phase.

It also shows that the vast majority of formally approved docs takes place in the change control phase."



QDX9346.005; Trial Tr. 1/22/19 at 1630:11-14; *see also id.* at 1632:18-1633:5

Richard Donaldson
FTC Expert

Michael Lasinski
FTC Expert

Q. So you would agree that not all patents are created equal? Some patents are more valuable than others; right?

A. We are talking about patents in general, and I would agree with that.

Q. Okay. In fact, you've testified that a single patent can dominate an entire industry; right?

A. …Yes, this is with reference to the Kilby basic integrated circuit for which he received a Nobel Prize, and that was a very important patent.

Trial Tr. 1/14/19, 988:2-14 (Donaldson)

Q. All right. So there's a wide dispersion among the value of individual cellular SEPs; right?

A. That would be my expectation.

Trial Tr. 1/14/19, 1063:5-7 (Lasinski)

Carl Shapiro

FTC Expert

Q. …[Y]ou have not quantified the effects of Qualcomm's business practices on any other chip maker during this relevant period; correct?

A. I have not quantified that, that is correct. . . .

Q. …[Y]ou did nothing whatsoever to analyze whether rivals' R&D spending, research and development, went up, down, or remained the same; right? …

A. … I'm not offering an opinion about their financial circumstances.

Trial Tr. 1/15/19 at 1210:9-13, 1205:18-1206:9; *see also id.* at 1207:14-1208:5

Carl Shapiro

FTC Expert

Q. …[Y]ou haven't done any quantitative analysis to determine how much of the surcharge you're opining about, if any, was caused by chip leverage as opposed to the threat of litigation, the fear of litigation, the fear of injunctions and other factors; right? You haven't done that?

A. I have not quantified the royalty surcharge.

Q. You have not quantified the effects of Qualcomm's conduct on handset prices in any market; right?

A. That is correct.

Trial Tr. 1/15/19 at 1202:13-18, 1218:15-17

Edward Snyder

Professor of Economics and Management at the Yale School of Management

Q. Professor Snyder, how do you characterize the differences between the approach that you took and the approach that Professor Shapiro took?

A. The approaches are very different. My approach is to conduct an empirical analysis informed by industrial organization principles, informed by an understanding of what factors influence firm level success, or failure, in these kinds of industries, and in this industry in particular, and also grounded in social science principles where the objective is to determine causality, to establish causality.

Professor Shapiro's approach is purely theoretical.

Trial Tr. 1/22/19 at 1801:25-1802:11

Carl Shapiro

FTC Expert

Q. So using Intel as an example, you actually predicted in your rebuttal report that Qualcomm will gain market share at the expense of Intel; right?

A. Again, everything else equal, that is the natural and inevitable economic consequence of the raising rivals' costs. I stand by that.

Q. But, in fact, as you acknowledged two weeks ago here in this courtroom, Qualcomm's market share in what you call the LTE premium market has been declining since 2014; right?

A. It has.

Trial Tr. 1/28/19 at 2063:21-2064:5; *see also id.* at 2064:6-21, 2065:22-2066:6, 2075:7-25

Todd Madderom
Director of Procurement at Motorola

Aviv Nevo
Professor at the Wharton School of Business

Q. When you're making the determination of whose chipset to use in a device, then, does the royalty paid to Qualcomm factor into that decision at all?

A. Today it does not, it does not. It is not part of the analysis we make on performance, pricing, schedules.

Madderom 3/16/18 Dep at 42:3-8 (1/18/19; DKT. 1372-3)

"So the choice of chip by the OEM should be based on the price of the chip and quality, which includes all the various characteristics and attributes…

And from the OEM's perspective, they're saying either way, they are going to pay the royalty, and that doesn't affect the choice between the two."

Trial Tr. 1/25/19 at 1892:11-17 (Nevo)

Finbarr Moynihan

MediaTek

Q. Mr. Moynihan, both the 2009 agreement and the 2013 agreement have now expired; right?

A. That's my understanding, yes.

Q. And as of March 2018 when you were deposed, you couldn't point to any effect that the expiration of those agreements had had on MediaTek's business; correct?

A. I don't think so.

Trial Tr. 1/7/19 at 353:7-13

Martin Zander

Vice President and Head of Strategic Initiatives and Eco-Systems, Ericsson

Q. Would you agree that in ST-Ericsson's case the time to market issues that it experienced could have been reduced or improved by increased research and development investments?

A. For ST-Ericsson specific there was several reasons for them falling behind, you know, it was lack of processes, organizational structure, the management team, the decision-making. Several factors playing into why they were delayed. On paper they had the resources, they had the capabilities to deal with it, they failed on the execution.

Zander 4/19/18 Dep. at 171:18-172:2 (1/18/19; DKT. 1372-7)

BAIN & COMPANY

intel

July 2015

Executive Summary

- Historically, Intel and QCOM investment in mobile SOC has been on par but QCOM product output 2-3X Intel
- In 2015, QCOM mobile SOC HC expected to be 10-20% greater than Intel driven by:
  - QCOM aggressive hiring to maintain mobile leadership & CSR acquisition
  - Intel re-org of MCG and de-scoping of BXT leading to migration of HC to Core products
- This difference is particularly pronounced within iCDG (modem, CNV & SoFIA)
  - iCDG and QCOM comparable HC at ~8k and ~10k, respectively (BB only)
- However, Intel overall mobile productivity still lags QCOM by ~50%, largely driven by Intel supporting multiple architectures (e.g. SoFIA, BXT, CHV)
- To address HC gap, Intel should address the capabilities gap while exploring options of converging arch. and driving engineering efficiencies throughout PEG

intel | 2

QX0092 at Intel-QCOM007957508 Trial Tr. 1/8/19 at 601:22-602:7 (Evans); *see also* QX0123A at 2, Trial Tr. 1/25/19 at 1846:7-17 (Johnson)

John Grubbs

Senior Director of IP Transactions,
Blackberry

Q. And you're not aware of any instance of Qualcomm actually cutting off supply of chips, right? . . .

A. I think that's accurate. . . .

Q. You're not aware of any instance of Qualcomm threatening to cut off the supply of chips to BlackBerry, correct? . . .

A. I think that's accurate. . . .

Q. Are you aware of any statement by Qualcomm suggesting that it would cut off chip supply to BlackBerry?

A. No.

Grubbs 3/01/18 Dep. at 68:11-25, 316:21-24 (1/18/19; DKT. 1372-2)

Todd Madderom

Director of Procurement at Motorola

Q. Do you recall Lenovo being concerned in the 2015 time frame with any form of threat that QTL makes with cellular modem supply?

A. I do not recall.

When I witnessed Rick Osterloh's comment, I think my own personal interpretation was a little bit of confusion like I don't think that's a real concern we need to talk through. But it was discussed.

Madderom 3/16/18 Dep. at 160:9-11, 160:13-17 (1/18/19; DKT. 1372-3)

HUAWEI

Yu

Q. But the fact is that Qualcomm hasn't stopped supplying chips to Huawei for whatever reason; right?

A. Yes.

Yu 3/14/18 Dep. at 71:11-13; *see also id.* at 49:8-10 (1/18/19; DKT. 1372-6)

SAMSUNG

Lee

Q. And sitting here today, you are not aware if Qualcomm communicated any threat concerning chip supply to anyone else at Samsung. Is that right?

A. Correct. There is no such thing that I am aware of.

Lee 3/14/18 Dep. at 14:21-23, 15:2-3 (1/25/19; DKT. 1447-5); *see also id.* at 41:5-8, 41:21-23, 42:2-3

PEGATRON

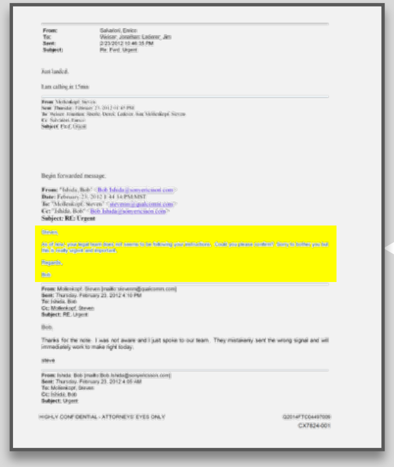
Yang

Q. And do you know whether Qualcomm has ever threatened to cut off chip supply to Pegatron?

A. I -- my understanding is that I don't – I don't recall a specific incident that Qualcomm threatened me -- threatened us to cut the supply.

Yang 3/15/18 Dep. at 184:6-7, 184:9-11; *see also id.* at 184:12-184:16 (1/15/19; DKT. 1324-3)

Steven Mollenkopf
Chief Executive Officer,
Qualcomm



From: Ishida, Bob [mailto:Bob.Ishida@sonyericsson.com]
Sent: Thursday, February 23, 2012 4:05 AM
To: Mollenkopf, Steven

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?

From: Mollenkopf, Steven [mailto:stevenm@qualcomm.com]
Sent: Thursday, February 23, 2012 4:10 PM
To: Ishida, Bob

Thanks for the note. I was not aware and I just spoke to our team. They mistakenly sent the wrong signal and will immediately work to make right today.

CX7824

Madderom

Q. Do you recall Mr. Amon telling Motorola Qualcomm is not going to cut your chip supplies as a result of any licensing negotiations?

A. Yes, I do.

Madderom 3/16/18 Dep. at 117:9-21 (1/18/19; DKT. 1372-3); *see also* Trial Tr. 1/8/19 at 519:19-520:15 (Amon)

Williams

Q. And despite the fact that Apple stopped reimbursing the contract manufacturers for Qualcomm royalties, Qualcomm has continued to ship chips for Apple products; hasn't it?

A. Yes, per the agreement we struck with Qualcomm.

Trial Tr. 1/14/19 at 897:25-898:3 (Williams)

Lee

Q. Is it fair to say that…Samsung demanded that Qualcomm's chipset supply and technical support should not be affected by this negotiation, and Qualcomm agreed?

A. Yes. That is correct.

Lee 3/14/18 Dep. at 64:24-65:3 (1/25/19; DKT. 1447-5); *see also* QX0551; QX9210 at 2017MDL1_01106151; Trial Tr. 1/7/2019 at 291:14-293:11 (Aberle)

SONY

- 2012: 10 month negotiation; interim agreement included true-up clause; agreement expired – no supply disruption; agreed on rates & 3 year term

Trial Tr. 1/18/19 at 1453:4-1455:9 (Gonell); 1407:1-1408:11; CX7650; JX0072-001,-018; JX0063 at 015-016, 025-026

HUAWEI

- 2013-2014: CDMA: Renegotiation of earlier Framework Agreement, negotiated right to terminate in 2013 & 2014 amendments
- 2014: LTE / WCDMA: negotiated almost 2 years, arbitration clause allows for new agreement if parties do not agree on renewal
- 2014: Began producing its own chips

CX5231, JX0097-001,-007; JX0098-039; Trial Tr. 1/18/19 at 1460:1-1461:25, 1415:11-1416:25 (Gonell); Trial Tr. 1178:24-1179:20 (Shapiro);

SAMSUNG

- 2009: Negotiated for 2 years and received lower royalty rate

Lee Dep. at 62:6-8, 62:15-18 (1/25/19; DKT. 1447-5); Trial Tr. 1/18/19 at 1404:6-9 (Gonell)

Lenovo

- 2013: Granted termination rights, could have exercised with 30 day notice
- 2016: Entered into CPLA under NDRC

Trial Tr. 1/18/19 at 1456:17-1459:25 (Gonell); Blumberg Dep. at 81:22-82:6 (1/18/19; DKT. 1372-1); QX9266-001; JX0087-002

Jeff Williams

Chief Operating Officer, Apple

"The other piece is we were going to move our business from Infineon to Qualcomm. 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."

Trial Tr. 1/14/19 at 875:15-19, *see also id.* at 913:11-914:22, CX0861

Jeff Williams

Chief Operating Officer, Apple

Q. In other words, the transition agreement allowed Qualcomm to protect itself from having to make large incentive payments to Apple if Apple didn't buy a lot of chips; right?

A. That's correct. What we actually put in place, the vast majority of the funds in the transition agreement were a price volume rebate, meaning if we did a lot of business with Qualcomm, they gave us funds. If we didn't do a lot of business with Qualcomm, they didn't. No risk to Qualcomm. Upside to Qualcomm. That's a standard practice we do with lots of suppliers. It added up to a lot of money, but it was for billions and billions of dollars of business. That's standard.

Trial Tr. 1/14/19 at 915:15-916:1

Matthias Sauer

Director of Cellular Systems, Apple

Q. And you would agree that it was a reasonable assessment to say that in 2015, Intel was struggling even to match Qualcomm; right?

A. Yes.

Trial Tr. 1/18/19 at 1520:19-22; *see also* QX0113 at Intel-QCOM001360858; Lindner 3/23/18 Dep. at 153:9-154:17, 174:6-7, 174:10-13 (1/22/19; DKT.1386-2)

Aichatou Evans

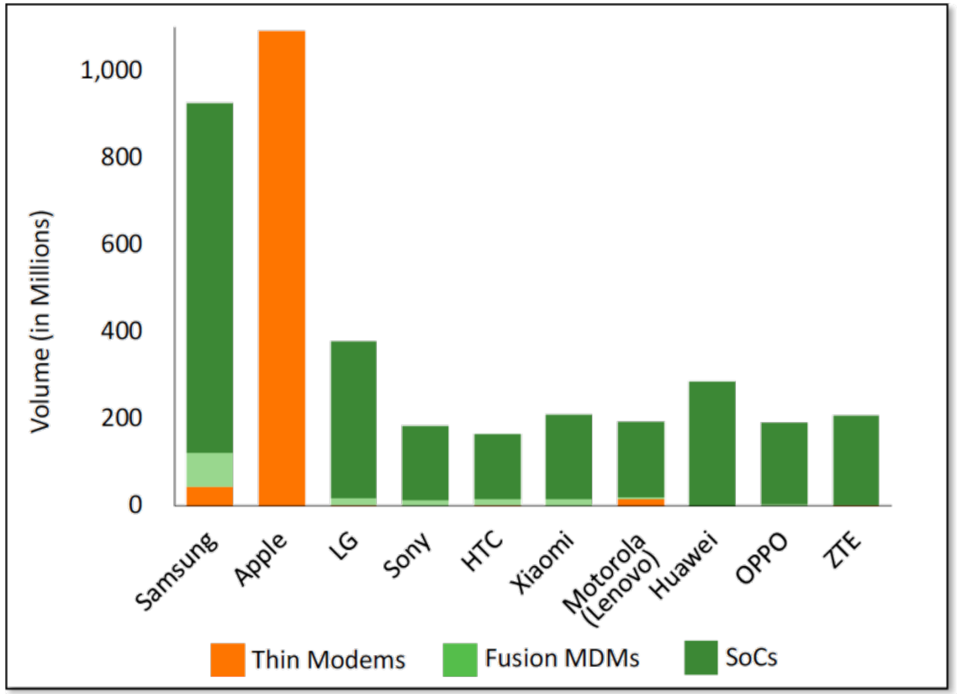
Senior Vice President and Chief Strategy Officer, Intel

Q. And Intel does not currently have a mobile SOC development program, does it?

A. No. That is not something we're currently interested in.

Aside from Apple, OEMs Predominantly Purchase SoCs for Handsets

Units of Modem Chipsets Purchased from Qualcomm for Handsets 2010 – 2017



Source: Chipty Report, Exhibit 43.

Trial Tr. 1/8/19 at 605:11-24 (Evans), QDX9349.007; *see also* Trial Tr. 1/22/19 at 1730:14-23 (Chipty)

“All essential IPR is typically licensed by IPR holders to the end device manufacturer.”

Richard Donaldson
FTC Expert
Trial Tr. 1/14/19 at 992:15-19

J. Finbarr Moynihan
General Manager of Corporate Sales, MediaTek
Trial Tr. 1/7/19 at 355: 15-22, 356:10-22, 357:6-16, 361:23-362:4

Dirk Weiler
ETSI Board Chairman, Head of Standards Policy, Nokia
Trial Tr. 1/22/19 at 1670:14-17, 1672:1-15, 1673:25-1674:17

Christina Petersson
VP of Intellectual Property Rights, Ericsson
4/20/18 Dep. at 26:24-27:9, 37:5-20 (1/25/19; DKT. 1447-1)

Ranae McElvaine
VP and Deputy General Counsel of IP, InterDigital
4/3/18 Dep. at 30:19-31:15 (1/25/19; DKT. 1447-2)

Ilkka Rahnasto
Vice President of Patent Licensing, Nokia
4/17/18 Dep. Tr. at 10:24-11:25, 13:15-21, 13:23-24 (1/25/19; DKT. 1447-3)

MEDIATEK

Moynihan

"I believe these rulings caused many of the IPR holders to rework their license 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; Trial Tr. 1/7/19 at 360:22-361:19 (Moynihan)

INTERDIGITAL

McElvaine

Q. "…InterDigital does not, as a practical matter, enter into stand-alone patent license agreements with chip manufacturers. Rather, InterDigital follows industry practice and conducts its licensing business at the handset or other terminal unit level, and that has been InterDigital's practice for more than 20 years." …[D]oes what I just read accurately reflect InterDigital's understanding and business practices?

A. Yes

McElvaine 4/3/18 Dep. at 30:22-31:15 (1/25/19; DKT. 1447-5)

ERICSSON

Petersson

Q. Were [ST-Ericsson] to take licenses, it "would have been cumbersome and costly ... and would in fact have driven up the price of the STE chipset."

Do you see that?

A. Yes. …

Q. This paragraph further states that: "... STE could rely on the industry practice and was in fact never approached by major patent holders like Samsung, Nokia, Alcatel, Lucent, Panasonic, NEC, Qualcomm etc."

Does this confirm or comport with your knowledge regarding STE's operations?

A. Yes, it does.

Petersson 4/20/18 Dep. at 42:25-44:2 (1/25/19; DKT. 1447-1)

Dirk Weiler

ETSI Board Chairman, Head of Standards Policy, Nokia

Trial Tr. 1/22/19 at 1679:12-18, 1679:25-1680:18

Christina Petersson

VP of Intellectual Property Rights, Ericsson

4/20/18 Dep. at 37:5-38:12 (1/25/19; DKT. 1447-1)

Aviv Nevo

Professor at the Wharton School of Business

Trial Tr. 1/25/19 at 1908:21-1912:17

Dirk Weiler

ETSI Board Chairman, Head of Standards Policy, Nokia

"…[E]verybody can implement a standard and contribute components of the standard into a device and you then license the device level only, and, therefore, all the implementation going into this device is licensed.

And this is why this is fully in line with the policy objectives of ETSI."

Trial Tr. 1/22/19 at 1680:9-18

Fabian Gonell

Senior Vice President of Licensing Strategy & Legal Counsel, Qualcomm

Q. Has Qualcomm ever granted an exhaustive license for cellular SEPs to a modem chip supplier?

A. We've never entered into an agreement, to my knowledge, for cellular SEPs that was intended to be exhaustive.

Trial Tr. 1/18/19 at 1432:12-15

Fabian Gonell
SVP Licensing Strategy

Dirk Weiler
ETSI Board Chairman

Q. Why does Qualcomm request cross grants from licensees?

A. Qualcomm typically requests cross grants from licensees when it is granting licensing to all of Qualcomm's patents, what I'll call the portfolio license. In that situation, it's a matter, you know, of common practice and, frankly, prudence for a company that is granting all of its rights to seek some set of cross rights from the licensee in order to not leave itself exposed to the licensee's patents at a time when it has granted rights to all of its patents.

Q. Is this unique to Qualcomm?

A. No. That's – that's very common in patent licensing.

Trial Tr. 1/18/19 at 1398:10-21 (Gonell)

Q. Now, Clause 6.1 also states that the FRAND undertaking, quote, "may be subject to the condition that those who seek licenses agree to reciprocate."

. . . What does that mean?

A. This means when you are licensing your patents, you can require the licensor in that case to also license their patents back to you. And this is typically implemented by cross-licensing.

Trial Tr. 1/22/19 at 1681:12-21 (Weiler)

Steven Mollenkopf

Chief Executive Officer, Qualcomm

Trial Tr. 1/11/19 at 803:1-807:14

Fabian Gonell

Senior Vice President of Licensing Strategy & Legal Counsel, Qualcomm

Trial Tr. 1/18/19 at 1418:12-1426:11

Aviv Nevo

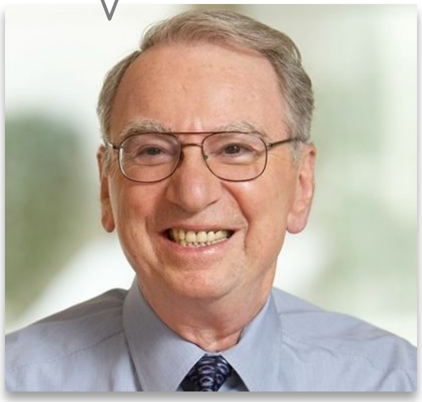
Professor at the Wharton School of Business

Trial Tr. 1/25/19 at 1908:21-1909:17, 1912:18-1913:16

9. A monopolization offense has two elements: (1) the possession of monopoly power in the relevant market and (2) anticompetitive conduct—"the willful acquisition or maintenance of that power *as distinguished from growth or development as a consequence of a superior product, business acumen, or historic accident*." *Eastman Kodak Co. v. Image Tech. Servs., Inc.*, 504 U.S. 451, 481 (1992); *Microsoft*, 253 F.3d at 50; MTD Order, at 18.

FTC's Proposed Findings of Fact and Conclusions of Law (DKT. 966) at 58 (emphasis added)

“[W]e always had the idea that we don’t want to do something just a little better than things that existed. We were always looking for a major step, take a systems approach . . . take a risk, and if successful, have something that could be useful.”



Irwin Jacobs

Co-founder and former Chairman, Qualcomm

Trial Tr. 1/15/19 at 1254:1-6

Durga Malladi

Senior Vice President of Engineering, Qualcomm

Trial Tr. 1/15/19 at 1305:2-20

James Thompson

EVP and Chief Technology Officer, Qualcomm

Trial Tr. 1/18/19 at 1349:16-1351:25

Jeff Andrews

Professor, University of Texas

Portfolio has Grown and Expanded

- **Continuing innovation in established areas**
  - Uplink Waveform (SC-FDMA)
  - Uplink Control Channel
  - Base Station Acquisition
- **Broad patent coverage in new areas**
  - Carrier Aggregation
  - Cellular in Unlicensed Spectrum
  - Heterogeneous Networks

QDX9347.04

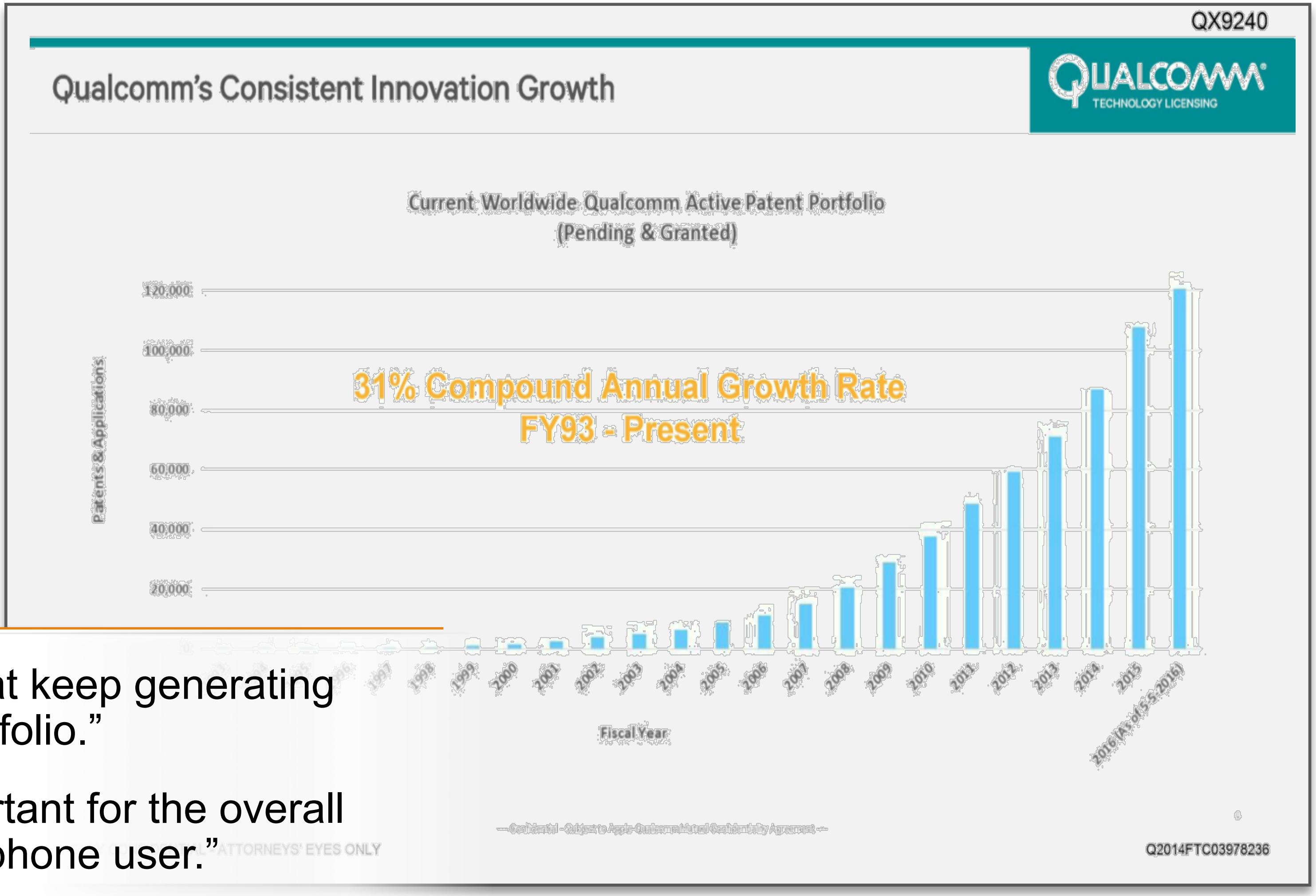
Qualcomm 4

"The patents I analyzed show that the patent portfolio is continually growing and expanding and making fundamental contributions to cellular communication."

Trial Tr. 1/22/19 at 1594:6-1611:12 (Andrews); QDX9347.04; *see also* Trial Tr. 1/18/19 at 1546:2-1549:1 (Chen); Trial Tr. 1/15/19 at 1321:6-1324:6, 1324:18-1332:19 (Malladi)

Liren Chen

Senior Vice President of Engineering, QTL



"…Qualcomm has a lot of ongoing R&D that keep generating new I.P. that keep getting added to our portfolio."

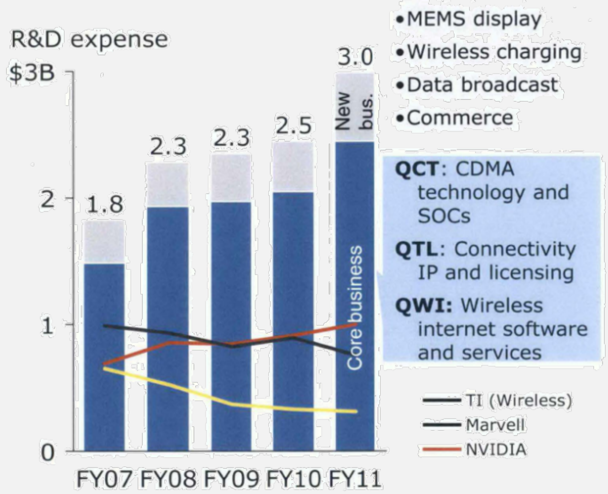
"And all those technology are … very important for the overall working together of the system for a smartphone user."

QX9240 at Q2014FTC03978236, Trial Tr. 1/18/19 at 1539:6-1541:2; *see also id.* at 1537:12-1539:5; 1549:14-1554:22

August 7, 2012

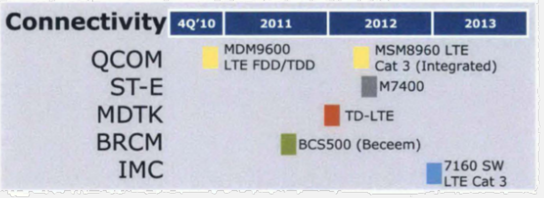
QX0121A

Qualcomm R&D investment drives the pace of innovation

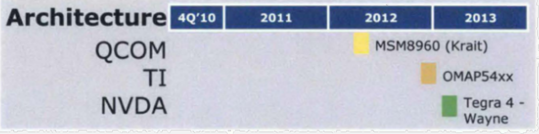


Time to market leadership

First to discrete LTE and integrated BB



First to 28nm and A15 equivalent



"Between ***Motorola's decision to consider using QCOM for its 4G baseband****...and* ***RIM's decision to move*** *its entire family of next gen devices* ***onto Qualcomm*** *Snapdragon chips,* ***we believe Qualcomm's high R&D budget is paying off****"*

Analyst, Morgan Stanley

Note: NVIDIA and Marvell R&D represents the company total R&D. TI wireless R&D assumed to be proportional to revenue
Source: Qualcomm 10Ks; Lit search

Intel Confidential 3

Blumberg

Grubbs

Madderom

Blevins

"Qualcomm had the best chipset available."

Blumberg 4/20/18 Dep. at 71:19-72:01 (1/4/19; DKT. 1161-2)

Q. Were other baseband chipset suppliers also behind Qualcomm and LTE?

A. It was my understanding that everybody else was.

Grubbs 3/1/18 Dep. at 111:22-112:05 (1/7/19; DKT. 1185-2)

Q. So there is a lot of jargon in there, but what's the point that you're making, in general terms?

A. Generally speaking, Qualcomm's performance was one year ahead of Intel's as it related to these modem technologies.

Madderom 3/16/18 Dep. at 55:16-20 (1/18/19; DKT. 1372-3) *see also id.* at 137:24-138:3, 206:14-18, 236:22-23 (1/11/19; DKT. 1272-3)

Q. …[W]hich companies were capable of supplying chips that met Apple's needs?

A. My recollection is our assessment was that Qualcomm had a superior offering, and so therefore, we narrowed our choice to Qualcomm for that first offering.

Trial Tr. 1/11/19 at 674:3-8 (Blevins)

Carl Shapiro

FTC Expert

Qualcomm

Most Advanced LTE Category Shipped by Supplier

<table>
<tr><th>Calendar quarter</th><th>Qualcomm</th><th>Samsung</th><th>Intel</th><th>MediaTek</th></tr>
<tr><td>2010 Q4</td><td rowspan="10">Cat. 3 (DL/UL)</td><td></td><td></td><td></td></tr>
<tr><td>2011 Q1</td><td></td><td></td><td></td></tr>
<tr><td>2011 Q2</td><td></td><td></td><td></td></tr>
<tr><td>2011 Q3</td><td></td><td></td><td></td></tr>
<tr><td>2011 Q4</td><td></td><td></td><td></td></tr>
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<tr><td>2012 Q4</td><td>Cat. 3 (DL/UL)</td><td></td><td></td></tr>
<tr><td>2013 Q1</td><td rowspan="5">Cat. 4 (DL/UL) (W/O CA)</td><td></td><td></td></tr>
<tr><td>2013 Q2</td><td rowspan="4">Cat. 4 (DL/UL) (W. CA)</td><td></td><td></td></tr>
<tr><td>2013 Q3</td><td rowspan="4">Cat. 4 (DL/UL) (W/O CA)</td><td></td></tr>
<tr><td>2013 Q4</td><td></td></tr>
<tr><td>2014 Q1</td><td></td></tr>
<tr><td>2014 Q2</td><td rowspan="2">Cat. 6 (DL/UL)</td><td>Cat. 4 (DL/UL) (W. CA)</td><td rowspan="7">Cat. 4 (DL/UL) (W/O CA)</td></tr>
<tr><td>2014 Q3</td><td rowspan="2">Cat. 6 (DL/UL)</td><td rowspan="7">Cat. 6 (DL/UL)</td></tr>
<tr><td>2014 Q4</td><td rowspan="4">Cat. 9 (DL/UL)</td></tr>
<tr><td>2015 Q1</td><td rowspan="4">Cat. 10 (DL/UL)</td></tr>
<tr><td>2015 Q2</td></tr>
<tr><td>2015 Q3</td></tr>
<tr><td>2015 Q4</td><td rowspan="4">Cat. 12 (DL) Cat. 13 (UL)</td></tr>
<tr><td>2016 Q1</td><td rowspan="4">Cat. 12 (DL) Cat. 13 (UL)</td><td rowspan="4">Cat. 6 (DL/UL)</td></tr>
<tr><td>2016 Q2</td><td rowspan="3">Cat. 10 (DL/UL)</td></tr>
<tr><td>2016 Q3</td></tr>
<tr><td>2016 Q4</td><td>Cat. 16 (DL) Cat. 13 (UL)</td></tr>
</table>

Source: Shapiro Report, Figure 15.

Shapiro demonstrative (DKT. 1286-7); Trial Tr. 1/15/19 at 1189:12-22, 1190:1-1192:4

Carl Shapiro

FTC Expert

"If the cost to an OEM of losing access to Qualcomm's chips were nil, then the no license, no chips policy would have no bite, and, therefore, it would not be able -- Qualcomm would not be able to elevate royalties above reasonable levels using that policy alone."

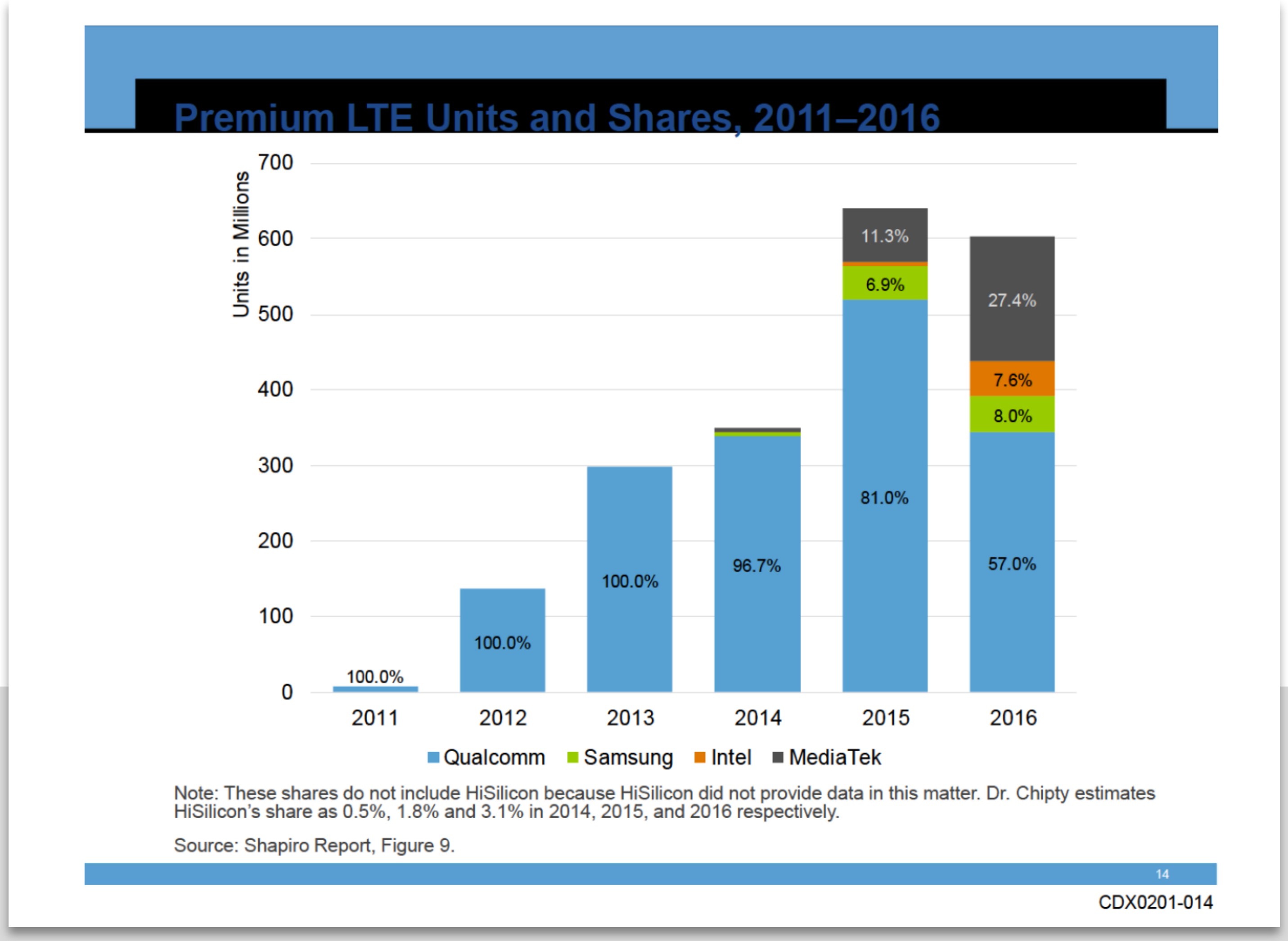
Trial Tr. 1/15/19 at 1241:10-14

Q. But you're not offering any opinion that Qualcomm has monopoly power in any chip market in 2017; isn't that right?

A. That is correct.

Q. And similarly, you're not offering any opinion that Qualcomm has monopoly power in any chip market in 2018, either?

A. That is correct.



Carl Shapiro

FTC Expert

Trial Tr. 1/15/19 at 1176:15-20; CDX0201-014; *see also* Trial Tr. 1/15/19 at 1160:12-1161:2

Moynihan

Evans

Rogers

Q. As of March 2018, MediaTek was working to develop 5G modem chips; right?
A. By March 2018 you said?
Q. Yes, sir.
A. Yes, that's correct.

Trial Tr. 1/7/19 at 348:15-19 (Moynihan)

Q. Okay. And as of that time Intel planned the release of its first 5G modem in late 2019; right?
A. Yes.
Q. And as of that time Intel hoped to sell 5G modems to Apple for use in 2020 iPhones, didn’t it?
A. Yes. Assuming we make it, yes, um-hum.

Trial Tr. 1/8/19 at 619:14-19 (Evans)

Q. What companies did Qualcomm believe would be competing for 5G?
A. Huawei had already announced a 5G chip I think in the prior month at Mobile World Congress; Samsung had announced a 5G chip; Intel had a 5G project; MediaTek had a 5G chip project as well.

Trial Tr. 1/25/19 at 2015:24-2016:4 (Rogers)

- No claim of market power in WCDMA
- No claim of market power in LTE before 2011
- No claim of market power in CDMA before 2006
- No claim of market power after 2016
- CPLA licenses under NDRC Rectification Plan in China
- Samsung 2018 agreement

JX0122; Trial Tr. 1/25/19 at 1980:10-1984:17, 1988:7-1989:24 (Rogers);
QDX9351 at 6-7; Trial Tr. 1/25/19 at 1873:16-1875:10, 1868:2-18 (Nevo);
Trial Tr. 1/18/19 at 1457:1-1459:25 (Gonell);
Ahn 3/28/18 Dep. at 36:12-14, 36:18-19, 37:20-21; 37:25-38:2, 38:4-5; 38:10-11 (1/25/19; DKT. 1447-4)
Lee 3/14/18 Dep. at 11:12-18, 11:21-22, 13:10-13, 14:14-23, 15:2-3 (1/25/19; DKT. 1447-5)

Michael Lasinski

FTC Expert

Q. So you cannot express a view one way or the other on whether the rates in any Qualcomm license agreement before 2011 were or were not above a FRAND rate at the time those agreements were signed; right?

A. I guess it doesn't seem reasonable that they would be. But I don't have a -- I didn't do the analysis to have an opinion on it.

Trial Tr. 1/14/19 at 1059:17-23

Injung Lee
Head of License Team at IP Center

Seungho Ahn
Head of IP Center

Q. And sitting here today, Mr. Lee, you have no reason to believe that Qualcomm did not negotiate in good faith. Is that right?

A. I do not. . . .

Q. And sitting here today, you are not aware if Qualcomm communicated any threat concerning chip supply to anyone else at Samsung. Is that right?

A. Correct. There is no such thing that I am aware of.

Lee 3/14/18 Dep. at 13:10-13, 14:21-23, 15:2-3 (1/25/19; DKT. 1447-5)

Q. Was Samsung coerced into entering the amendments in any way?

A. I don't think there was anything in particular that I can say where Samsung was coerced.

Ahn 3/28/18 Dep. at 37:20-21; 37:5-38:2 (1/25/19; DKT. 1447-4)

Thank you