EUROPEAN COMMISSION
Competition DG

CASE AT.40220
Qualcomm (Exclusivity payments)

(Only the English text is authentic)

ANTITRUST PROCEDURE
Council Regulation (EC) 1/2003

Article 7 Regulation (EC) 1/2003

Date: 24/01/2018

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EUROPEAN
COMMISSION

Brussels, 24.1.2018
C(2018) 240 final

COMMISSION DECISION

of 24.1.2018

relating to proceedings under Article 102 of the Treaty on the Functioning of the European Union and Article 54 of the Agreement on the European Economic Area

AT.40220 – Qualcomm (Exclusivity payments)

(Text with EEA relevance)

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THE EUROPEAN COMMISSION,

Having regard to the Treaty on the Functioning of the European Union[1],

Having regard to the Agreement on the European Economic Area,

Having regard to Council Regulation (EC) No 1/2003, of 16 December 2002 on the implementation of the rules on competition laid down in Articles 81 and 82 of the Treaty,[2] and in particular Articles 7(1) and 23(2) thereof,

Having regard to the Commission Decision of 16 July 2015 to initiate proceedings in this case,

Having given the undertaking concerned the opportunity to make known its views on the objections raised by the Commission pursuant to Article 27(1) of Regulation (EC) No 1/2003 and Article 12 of Commission Regulation (EC) No 773/2004 of 7 April 2004 relating to the conduct of proceedings by the Commission pursuant to Articles 81 and 82 of the Treaty[3],

After consulting the Advisory Committee on Restrictive Practices and Dominant Positions,

Having regard to the final report of the Hearing Officer in this case,

Whereas:

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1 OJ, C 115, 9.5.2008, p.47.

2 OJ L 1, 4.1.2003, p. 1. With effect from 1 December 2009, Articles 81 and 82 of the EC Treaty have become Articles 101 and 102, respectively, of the Treaty on the Functioning of the European Union ("the Treaty"). The two sets of provisions are, in substance, identical. For the purposes of this Decision, references to Articles 101 and 102 of the Treaty should be understood as references to Articles 81 and 82, respectively, of the EC Treaty where appropriate. The Treaty also introduced certain changes in terminology, such as the replacement of "Community" by "Union" and "common market" by "internal market". Where the meaning remains unchanged, the terminology of the Treaty will be used throughout this Decision.

3 OJ L 123, 27.4.2004, p. 18., as amended by Commission Regulation (EU) 2015/1348 of 3 August 2015, OJ L 208, 5.8.2015, p. 3–6.

1. INTRODUCTION

(1) This Decision establishes that Qualcomm Inc. ("Qualcomm") infringed Article 102 of the Treaty and Article 54 of the Agreement on the European Economic Area ("the EEA Agreement") by granting payments to Apple Inc. ("Apple") on condition that Apple obtain from Qualcomm all of Apple's requirements of baseband chipsets compliant with the Long-Term Evolution ("LTE") standard together with the Global System for Mobile Communications ("GSM") and the Universal Mobile Telecommunications System ("UMTS") standards.

2. THE UNDERTAKINGS CONCERNED

2.1. Qualcomm

(2) Qualcomm is a developer of wireless technology products and services which has its headquarters in San Diego, California (United States of America).

(3) Qualcomm holds essential intellectual property rights ("IPR") in a number of cellular communications standards including the third generation ("3G") UMTS and the fourth generation ("4G") LTE standards and is a supplier of chips and chipsets used in mobile handsets and other devices.

(4) Qualcomm conducts business primarily through its business units Qualcomm CDMA Technologies and Qualcomm Technology Licensing, which are operated by Qualcomm and its direct and indirect subsidiaries.[4]

2.2. Interested Third Persons

(5) The Commission has heard Apple and Nvidia Corporation ("Nvidia") as interested third persons pursuant to Regulation (EC) No 773/2004.

(6) Apple is a US-based corporation established in 1977 which designs, manufactures and markets mobile communication and media devices, personal computers and portable digital music players, and sells a variety of related software.

(7) Nvidia is a US-based manufacturer of graphics processing units as well as of system-on-a-chip units for the mobile computing sector.

3. PROCEDURE

(8) In August 2014, the Commission started an *ex officio* investigation into arrangements relating to the purchase and use of Qualcomm's baseband chipsets.

(9) Between 12 August 2014 and 23 July 2015, the Commission sent requests for information pursuant to Articles 18(2) and 18(3) of Regulation (EC) No 1/2003 to Qualcomm, its customers and its competitors.

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[4] At the beginning of fiscal year 2013, Qualcomm completed a corporate reorganisation in which certain of its assets as well as the stock of certain of its direct and indirect subsidiaries were contributed to its wholly-owned subsidiary Qualcomm Technologies, Inc. (QTI). Qualcomm Technology Licensing continues to be operated directly by Qualcomm, which continues to own the vast majority of Qualcomm's patent portfolio. Substantially all of Qualcomm's products and services businesses, including Qualcomm CDMA Technologies, and substantially all of Qualcomm's engineering, research and development functions, are operated by QTI and its subsidiaries. For more information on Qualcomm's corporate structure, see Qualcomm's 2014 10-K Report, available at http://investor.qualcomm.com/secfiling.cfm?filingID=1234452-14-320&CIK=804328

(10) On 16 July 2015, the Commission initiated proceedings against Qualcomm with a view to adopting a decision under Chapter III of Regulation (EC) No 1/2003.

(11) On 3 September 2015, the Commission held a State of Play meeting with Qualcomm. The services of the Directorate General of Competition also met with Qualcomm on 29 September 2015.

(12) On 8 December 2015, the Commission issued a statement of objections to Qualcomm ("Statement of Objections"). The Commission reached the preliminary conclusion that, absent any objective justification or efficiency gains, the payments granted by Qualcomm to Apple on condition that Apple obtain from Qualcomm all of its requirements of baseband chipsets compliant with the UMTS and LTE standards constituted an abuse of a dominant position under Article 102 of the Treaty and Article 54 of the EEA Agreement.

(13) On 21 December 2015, the Commission provided Qualcomm with documents saved on an electronic storage device by means of access to the Commission's file in accordance with Article 27(2) of Regulation (EC) No 1/2003 and Article 15 of Regulation (EC) No 773/2004.

(14) The Commission originally set a time-limit of three months within which Qualcomm could submit a response to the Statement of Objections. At the request of Qualcomm, the Commission extended the time-limit by an additional month. On 15 April 2016, the Hearing Officer, in the light of Qualcomm's various submissions on access to the Commission's file and on the deadline for Qualcomm's response, suspended the running of the time period for responding in writing to the Statement of Objections. On 27 May 2016, the Hearing Officer lifted that suspension and granted an additional period for Qualcomm to submit its response, bringing the deadline for that response to 23 June 2016. After another extension request from Qualcomm, the Hearing Officer revised that deadline to 27 June 2016.

(15) On 27 June 2016, Qualcomm submitted its response to the Statement of Objections ("Response to the Statement of Objections"). Qualcomm did not request the opportunity to express its views at an oral hearing pursuant to Article 12(1) of Regulation (EC) No 773/2004.

(16) On 28 June 2016 and again on 30 June 2016, Qualcomm's lawyers submitted 'confidential substantive submissions' on behalf of Qualcomm in relation to certain documents whose confidential versions they had examined in restricted access procedures ordered by the Hearing Officer.

(17) On 27 July 2016, Qualcomm submitted a note entitled 'The efficiency rationale of the Transition Agreement between Apple and Qualcomm'.

(18) On 15 March 2016 and on 31 March 2016, the Commission informed Apple and Nvidia respectively of the nature and subject matter of the proceedings by providing them with a non-confidential version of the Statement of Objections. Apple made known its views in writing on 2 May 2016. Nvidia made known its views in writing on 31 May 2016.

(19) Between 22 November 2016 and 5 May 2017, the Commission sent requests for information pursuant to Article 18(2) of Regulation (EC) No 1/2003 to Qualcomm, its competitors and Apple.

(20) On 19 October 2016, the Commission provided Apple with a non-confidential version of the Response to the Statement of Objections. Apple made known its views in writing on 21 November 2016.

(21) On 10 February 2017, the Commission sent Qualcomm a letter informing it about pre-existing evidence to which Qualcomm already had access but which was not expressly relied upon in the Statement of Objections but which, on further analysis of the Commission's file, could be relevant to support the preliminary conclusion reached in the Statement of Objections. The Commission also informed Qualcomm about additional evidence obtained by the Commission after the adoption of the Statement of Objections ("Letter of Facts").

(22) On 13 February 2017, the Commission granted Qualcomm further access to its file in relation to all documents that the Commission had obtained after the Statement of Objections up to the date of the Letter of Facts.

(23) The Commission originally set a deadline of 3 March 2017 for Qualcomm to submit a response to the Letter of Facts. At the request of Qualcomm, the Commission extended the response period by an additional ten days. After a further extension request of Qualcomm, the Hearing Officer maintained the deadline of 13 March 2017.

(24) On 13 March 2017, Qualcomm submitted its response to the Letter of Facts ("Response to the Letter of Facts").

(25) On 30 June 2017, the services of the Directorate General of Competition met with Qualcomm.

4. QUALCOMM'S CLAIMS OF PROCEDURAL IRREGULARITIES

(26) Qualcomm claims that the Commission has infringed its rights of defence due to a number of procedural irregularities.[5]

(27) First, Qualcomm claims that the confidentiality redactions applied to certain documents in the Commission's file have been excessive and unwarranted, with the result that Qualcomm has not been granted access to all the documents in the Commission's file that may be relevant for its defence.[6]

(28) Second, Qualcomm claims that it has had insufficient time to prepare its Response to the Statement of Objections and to the Letter of Facts.[7]

(29) Third, Qualcomm claims that the Commission should have requested Apple to provide all internal documents comparing different baseband chipset suppliers and leading to the selection of Qualcomm as Apple's chipset supplier between 2011 and 2015.[8]

(30) For the reasons set out in the following, the Commission considers that Qualcomm's rights of defence have been respected throughout the investigation.

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5 Qualcomm's Response to the Statement of Objections […], paragraph 840.

6 Qualcomm's Response to the Statement of Objections […], paragraphs 843-863.

7 Qualcomm's Response to the Statement of Objections […], paragraph 864.

8 Qualcomm's response of 27 June 2016 to the Statement of Objections […], paragraph 443. See also Qualcomm's response of 13 March 2017 to the Letter of Facts, paragraph 232 and in particular footnote 309 […].

(31) First, the Commission struck an appropriate balance between the proper exercise of Qualcomm's rights of defence and the right of information providers to protect their business secrets and other confidential information.[9]

(32) On the one hand, Qualcomm was granted access to non-confidential versions of the documents in the Commission's file. In addition, Qualcomm's advisors were granted further access to entirely unredacted or less redacted versions of certain documents in the context of data room procedures,[10] and access to certain documents [Procedural issues].[11]

(33) On the other hand, the documents to which further access was granted in the context of the data room procedures and [Procedural issues] contained business secrets and other confidential information within the meaning of Article 339 of the Treaty, Article 27(2) of Council Regulation (EC) No 1/2003, and Articles 15(2) and 16(1) of the Commission Regulation (EC) 773/2004.

(34) Second, the period of six months and six days that Qualcomm had to prepare its Response to the Statement of Objections and the period of one month and three days that Qualcomm had to prepare its Response to the Letter of Facts were, in light of the complexity of the case,[12] sufficient to allow Qualcomm to exercise its rights of defence.

(35) In the first place, the Statement of Objections was only 77 pages long.

(36) In the second place, the Commission's file containing all the documents that the Commission had obtained prior to the Statement of Objections was not particularly voluminous and consisted mainly of agreements between Qualcomm and third parties.

(37) In the third place, on 21 December 2015, Qualcomm was given access to non-confidential versions of all documents in the Commission's file, except for 21 documents from Apple and 106 documents from […].[13]

(38) The Commission's conclusion that the time granted to Qualcomm to prepare its Response to the Statement of Objections and Response to the Letter of Facts was sufficient to allow Qualcomm to exercise its rights of defence is not contradicted by the fact that the Commission provided Qualcomm with access to non-confidential

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9 Case T-30/91 *Solvay v Commission*, EU:T:1995:115, paragraph 88; Case T-36/91 *ICI v Commission*, EU:T:1995:118, paragraph 98; Joined Cases T-305/94 *LVM v Commission*, EU:T:1999:80; Joined Cases T-25/95 etc *Cimenteries and Others v Commission*, paragraph 147; Case T-203/01 *Michelin v Commission*, EU:T:2003:250, paragraph 125; Case T-410/03 *Hoechst v Commission*, EU:T:2008:211, paragraph 153; Case C-450/06 *Varec v Belgian State*, paragraph 52.

10 In particular, on 23 and 24 May 2016, further access to certain Apple internal documents was provided to Qualcomm's external advisers at the Commission's premises. Also, on 1 June 2016, Qualcomm's external advisers were granted further access to certain […] documents at the Commission's premises. In both instances, access was limited to a restricted circle of persons (specified external lawyers and economic advisers of Qualcomm).

11 [Procedural issues]

12 Joined Cases 40/73 etc *Suiker Unie and Others v Commission*, EU:C:1975:174, paragraphs 94 to 99; Case 27/76 *United Brands* v *Commission*, EU:C:1978:22, paragraphs 270 to 273; Joined Cases T-25/95 etc *Cimenteries and Others v Commission*, paragraph 653; Case T-9/99 *HFB and Others v Commission*, EU:T:2002:70, paragraph 344; Case T-16/99 *Lögstör Rör v Commission*, EU:T:2002:72, paragraph 178; Case T-44/00 *Mannesmannröhren-Werke v Commission*, EU:T:2004:218, paragraph 62.

13 Case T-44/00 *Mannesmannröhren-Werke v Commission*, EU:T:2004:218, paragraph 66.

versions of these 21 documents from Apple and 106 documents from […] on 19 February 2016 and on 3 March 2016 respectively. This is because:

(1) In the case of Apple, following a request by Qualcomm on 29 January 2016, the Commission contacted Apple and obtained non-confidential versions of the 21 documents,[14] which were provided to Qualcomm on 19 February 2016;[15] and

(2) In the case of […], following a request by Qualcomm on 29 January 2016, the Commission contacted […] and obtained non-confidential versions of the 106 documents, which were provided to Qualcomm by email of 3 March 2016.[16]

(39) In the fourth place, and in any event, any delay in providing access to certain documents was taken into account by the Hearing Officer when a subsequent extension of the time-limit for Qualcomm to respond to the Statement of Objections was granted.[17]

(40) In the fifth place, the fact that, following Qualcomm's requests, the Commission provided it on an ongoing basis with less redacted non-confidential versions of certain documents is not out of the ordinary in investigations in competition matters.[18]

(41) In the sixth place, the fact that Qualcomm was notified on the same day of two different Statements of Objections relating to two separate investigations[19] was taken into account by the Commission when setting the original time period for Qualcomm to respond to both Statements of Objections.

(42) In the seventh place, it is clear from the Response to the Statement of Objections and the Response to the Letter of Facts that Qualcomm was able to make known its views in an effective manner. In particular, Qualcomm gave a detailed exposition of its views on each essential allegation made by the Commission.[20]

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14 None of these 21 documents was relied on in the Statement of Objections. Furthermore, 3 of the 21 documents were emails with no content (blank pages with documents attached) while the other 18 documents were short (in total 43 pages long). Parts of these documents were also similar to parts of other Apple documents to which Qualcomm was already provided access on 21 December 2015.

15 In addition, on that same date, the Commission services provided Qualcomm with updated non-confidential versions of 9 documents already provided on 21 December 2015, in which a non-confidential description of the redacted information was included. Moreover, further to Qualcomm's requests, the Commission subsequently provided Qualcomm with certain non-confidential versions of other Apple documents (attachments to emails), which had not been not initially provided by Apple to the Commission and were therefore not part of the Commission's file at the time when the access to the Commission's file was granted on 21 December 2015.

16 These 106 documents related to agreements between […] and either Qualcomm or third parties. None of these 106 documents was relied upon in the Statement of Objections.

17 Joined Cases T-489/09, T-490/09 and T-56/10 *Leali SpA and Acciaierie e Ferriere Leali Luigi v Commission*, EU:T:2014:1039, paragraph 294.

18 Commission Notice on the rules for access to the Commission file in cases pursuant to Articles 81 and 82 of the EC Treaty, Articles 53, 54 and 57 of the EEA Agreement and Council Regulation (EC) No 139/2004 of 20 January 2004 on the control of concentrations between undertakings (the EC Merger Regulation) (Council Regulation (EC) No 139/2004 of 20 January 2004 on the control of concentrations between undertakings (the EC Merger Regulation) (Text with EEA relevance) OJ L 24, 29.1.2004, p. 7, paragraph 47.

19 One in this case and the other in Case AT.39711.

20 See, by analogy Case T-62/98 *Volkswagen v Commission*, EU:T:2000:180, paragraph 313.

(43) In the eighth place, the Letter of Facts was only 30 pages long and the Commission's file containing all the documents that the Commission had obtained after the Statement of Objections up to the date of the Letter of Facts was not particularly voluminous. In addition, it consisted mainly of Qualcomm's Response to the Statement of Objections and responses to a Commission request for information regarding production and sales volumes of baseband chipsets.[21]

(44) Third, the Commission was not required to obtain from Apple all internal documents comparing different baseband chipset suppliers leading to the selection of Qualcomm as Apple's chipset supplier between 2011 and 2015. The Commission has already obtained from Apple a significant amount of internal documents, which, together with the Apple's responses to the requests for information, the Commission considers sufficient for the purposes of its investigation.

5. STANDARDS, STANDARD-SETTING ORGANISATIONS AND STANDARD ESSENTIAL PATENTS

5.1. Standards

(45) Standards ensure compatibility and interoperability between related products. This has many benefits.[22] Standards can encourage innovation and lower costs by increasing the volume of manufactured products. Standards can strengthen competition by enabling consumers to switch more easily between products from different manufacturers. Standards may also further the Treaty objective of achieving the integration of national markets through the establishment of an internal market. The European Union has accordingly promoted standardisation as a tool for European competitiveness.[23]

5.2. Standard-setting organisations

(46) Standard-setting organisations are organisations whose primary activity is to develop and maintain standards by bringing together industry participants to evaluate competing technologies for inclusion in standards.

(47) Standard-setting organisations also seek to ensure that industry participants contribute technology that will create valuable standards and that these standards are

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21 Qualcomm was given access to the documents obtained by the Commission after the Statement of Objections and before the Letter of Facts on 13 February 2017.

22 Guidelines on the applicability of Article 101 of the Treaty on the Functioning of the European Union to horizontal co-operation agreements ("the Horizontal Guidelines"), OJ C 11, 14.1.2011, p. 1, paragraph 263.

23 See Communication from the Commission of 11 March 2008 to the Council, the European Parliament and the European Economic and Social Committee, "Towards an increased contribution from standardisation to innovation in Europe", COM(2008) 133 final; and Communication from the Commission of 1 June 2011 to the European Parliament and the European Economic and Social Committee: "A strategic vision for European standards: Moving forward to enhance and accelerate the sustainable growth of the European economy by 2020", COM(2011) 311 final. See also Regulation (EU) No 1025/2012 of the European Parliament and of the Council of 25 October 2012 on European standardisation, amending Council Directives 89/686/EEC and 93/15/EEC and Directives 94/9/EC, 94/25/EC, 95/16/EC, 97/23/EC, 98/34/EC, 2004/22/EC, 2007/23/EC, 2009/23/EC and 2009/105/EC of the European Parliament and of the Council and repealing Council Decision 87/95/EEC and Decision No 1673/2006/EC of the European Parliament and of the Council, OJ L 316, 14.11.2012, p. 12.

widely adopted. The broader the implementation of a standard, the greater the interoperability benefits.

(48) Participants in a standard-setting process can obtain significant benefits if their technology becomes part of a standard. These include potential royalties from licensees, a large base of licensees, increased demand for their products and improved compatibility with other products using the standard.

(49) The European Union and the European Free Trade Association (EFTA) have recognised three standard-setting organisations as official European standardisation bodies:[24]the European Committee for Standardisation (CEN), the European Committee for Electrotechnical Standardisation (CENELEC) and the European Telecommunications Standards Institute (ETSI).[25]

5.3. Standard essential patents

(50) Standards frequently make reference to technologies that are protected by patents, especially in industries such as telecommunications. Hundreds or even thousands of patents may relate to a single standard. Thus, when a user of a standard (also known as an "implementer") manufactures standard-compliant products, it cannot avoid the use by its products of technologies that are covered by such patents.

(51) Patents that are essential to a standard are those that cover technology to which a standard makes reference and that implementers of the standard cannot avoid using in standard-compliant products. These patents are known as standard-essential patents (SEPs). SEPs are different from patents that are not essential to a standard. This is because it is generally technically possible for an implementer to design around a non-essential patent in order to comply with a standard. By contrast, an implementer has to use the technology protected by a SEP when manufacturing a standard-compliant product.

(52) The major standard-setting organisations in the field of wireless communications namely ETSI, the Institute of Electrical and Electronics Engineers ("IEEE") and the International Telecommunications Union ("ITU") require their members to license their SEPs on (fair,) reasonable and non-discriminatory ("(F)RAND") terms.

6. THE TECHNOLOGY AND PRODUCTS CONCERNED BY THE DECISION

(53) This Decision concerns baseband chipsets that implement and comply with the LTE standard of cellular communication technology.

(54) Cellular communication technology allows communication by means of cellular network, which is a radio network distributed over land through cells, where each cell includes a fixed location transceiver known as a base station. These cells together provide radio coverage over larger geographical areas. Cellular user equipment, such as mobile phones, is therefore able to communicate even if the equipment is moving through those cells during transmission.

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[24] See Annex I of Regulation (EU) No 1025/2012, OJ L 316, 14.11.2012, p. 12.

[25] The European Telecommunications Standards Institute produces globally-applicable standards for Information and Communications Technologies (ICT), including fixed, mobile, radio, converged, broadcast and Internet technologies. It includes more than 800 member organizations worldwide, drawn from 64 countries and five continents.

(55) In this Decision, the following definitions apply:

(1) "UMTS-compliant chipsets" means baseband chipsets that implement and comply with the UMTS cellular communications standard;

(2) "LTE-compliant chipsets" means baseband chipsets that implement and comply with the LTE cellular communications standard;

(3) "LTE chipsets" means baseband chipsets that comply with all of the following standards: GSM, UMTS and LTE;

(4) "UMTS chipsets" means baseband chipsets that comply with both the GSM and UMTS standards but not with the LTE standard;

(5) "GSM chipsets" means baseband chipsets that comply with the GSM standard but not with the UMTS and LTE standards; and

(6) "Single-mode LTE chipsets" means baseband chipsets that comply only with the LTE standard but not with the GSM and UMTS standards.

6.1. The evolution of cellular communication standards

6.1.1. GSM

(56) GSM is a standard developed by ETSI to describe technologies for second generation ("2G") digital cellular networks. Developed as a replacement for first generation analogue cellular networks, the GSM standard originally described a network optimised for voice telephony. The standard was expanded over time to include packet data transport via General Packet Radio Services ("GPRS") and Enhanced Data rates for GSM Evolution ("EDGE"). Later technology generations build on the principles established by this standard.

(57) In this Decision, references to GSM include GPRS and EDGE.

6.1.2. UMTS

(58) UMTS is a 3G cellular communications standard capable of supporting multimedia services, beyond the capability of 2G systems such as GSM.

(59) The beginning of the UMTS standard-setting process dates back to the early 1990s when the concept of UMTS emerged from European research programmes. ETSI established a technical working group[26] in 1992 specifically to investigate the UMTS concept. By January 1998, the decision was made to adopt two alternative technologies, Wideband-Code Division Multiple Access ("W-CDMA") and Time Division -(Synchronous) Code Division Multiple Access ("TD-(S)CDMA"),[27] as options for the radio part of the UMTS standard.

(60) In December 1998, following a decision of the ETSI General Assembly, the work on UMTS was moved to a new group which included delegations from the US, South Korea and Japan as full members. It became known as the 3rd Generation Partnership Project or "3GPP". The aim of 3GPP was to create a globally applicable 3G cellular communications standard.

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[26] Technical Committee Special Mobile Group.

[27] The two variants (TD-CDMA and TD-SCDMA) are collectively also known as UMTS Time Division Duplexing ("UMTS-TDD").

(61) In December 1999, 3GPP completed what was known as "Release 99". This marked the first iteration of the UMTS standard. Release 99 was then transposed by ETSI into formal European standards throughout 2000. In line with the requirements of Decision 128/1999/EC,[28] the UMTS standard was implemented in most Member States in the Union during the following years.

(62) 3GPP has further evolved the W-CDMA variant of UMTS in order to provide improved characteristics, including higher data rates. Notable evolutions of W-CDMA include High Speed Packet Access ("HSPA")[29], HSPA+[30] and Dual Carrier HSPA.[31] These evolutions formed part of subsequent 3GPP Releases.

(63) The major breakthroughs in the market evolution of UMTS-compliant baseband chipsets are related to the support of increasingly high data rates of broadband connectivity. Before the development of HSPA technology, UMTS supported data rates up to 0.384Mbps, which was inadequate to support typical broadband applications like full internet browsing and video streaming. HSPA technology (3GPP Release 4 and 3GPP Release 5) enabled data rates up to 3.6Mbps. Subsequent iterations of HSPA+ in 3GPP Releases 7 and 8 increased the data rates even further to 28Mbps and 42Mbps respectively.

(64) In this Decision and for the purposes of convenience, unless otherwise specified,[32] the term UMTS will be used to describe only the W-CDMA variant of the radio interface as well as its evolutions such as HS(D/U)PA, HSPA+ and Dual Carrier HSPA. These technologies are also known as UMTS Frequency Division Duplexing ("UMTS-FDD").[33]

6.1.3. LTE

(65) LTE is an orthogonal frequency-division multiple access ("OFDMA") technology that increases the capacity and speed of GSM and UMTS by using a different radio interface together with core network improvements. This standard was developed by 3GPP.

(66) LTE is commonly referred to as a 4G standard, although strictly speaking the requirements set for 4G are satisfied only by its later iterations (known as LTE-Advanced or LTE-A).

(67) The maximum downlink data rate supported by LTE increased about 260-fold compared to the first iterations of the UMTS standards (from 0.384 Mbps to 100 Mbps). This facilitates faster browsing experience, file downloads, music and video streaming, etc.

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28 Decision No 128/1999/EC of the European Parliament and of the Council of 14 December 1998 on the coordinated introduction of a third-generation mobile and wireless communications system (UMTS) in the Community (OJ L 17, 22.1.1999, p. 1).

29 HSPA is a technology that provides enhanced data rates in UMTS (W-CDMA) networks. It is the combination of High Speed Downlink Packet Access (HSDPA) and High Speed Uplink Packet Access (HSUPA) technologies.

30 HSPA+, formally known as Evolved High Speed Packet Access is an evolution of HSPA that provides data rates up to 28 Mbps (Megabit per second).

31 D(ual)C(arrier)-HSPA is a technology that combines data transmissions from two carriers (cells). The concept is enhanced further in M(ulti)C(arrier)-HSPA.

32 In certain sections where UMTS-TDD is discussed, the designations UMTS-FDD and UMTS-TDD are used explicitly, for reasons of clarity.

33 As opposed to the alternative technology, UMTS-TDD.

(68) In this Decision, the term LTE will be used to refer to LTE, LTE-A, and further iterations of the LTE technology.

6.1.4. Other cellular and wireless communication standards

(69) In addition to GSM, UMTS and LTE, there are other cellular communication standards such as Code Division Multiple Access ("CDMA"). There are also standards for wireless communication which do not make use of cellular technology, such as Worldwide Interoperability for Microwave Access ("WiMAX") and Wireless Local Area Network ("WLAN"), also commonly called WiFi.

(70) These standards are standardised by standard-setting organisations like the Third Generation Partnership Project 2 ("3GPP2")[34] and the IEEE.

6.2. Baseband chipsets

(71) Baseband chipsets are part of the mobile communications industry, which has experienced high growth over the last two decades.[35] An important factor in the growth of the baseband chipset sales has been the steady increase in smartphone adoption.[36]

6.2.1. Functions

(72) Mobile devices such as smartphones, tablets, portable PCs and e-book readers require mobile broadband[37] connectivity to the internet through cellular mobile telecommunication networks ("mobile networks").

(73) The core component providing mobile connectivity in a device is the baseband processor. Its main task is to perform the signal processing functionality according to communication protocols described by cellular communications standards. Baseband processors can be embedded directly in mobile devices, or in external modules such as a USB stick, which is also called a "dongle", and which are in turn plugged into a device.

(74) A baseband processor typically consists of both hardware and software. The hardware consists of an integrated circuit, made of semiconductor material, known as "silicon die", and packaged into a baseband chip using ceramic or plastic material.

(75) In addition to the baseband processor, certain types of mobile devices require an application processor, used for running the operating system and applications (including messaging, internet browsing, imaging and games). This application processor can either be provided as a standalone product, packaged into a separate chip or can be integrated with the baseband processor into the same silicon die and packaged into the same chip.

(76) Based on this distinction, baseband chips can be divided into two categories:

(1) Standalone baseband chips, where no application processor is included; and

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34 3GPP2 is the standardization group for CDMA2000, a CDMA based technology alternative to UMTS for 3G networks. The organisation is unrelated, but similar to 3GPP.

35 Qualcomm's answer to […] of the request for information […].

36 Qualcomm's answer to […] of the request for information […].

37 According to the Commission's Digital Agenda Glossary, mobile broadband is the name used to describe various types of wireless high-speed internet access through a portable modem, telephone or other device. See https://ec.europa.eu/digital-agenda/en/broadband-glossary#S.

(2) Integrated baseband chips, where the baseband processor has been integrated with an application processor, usually onto a single silicon die, and is packaged in the same chip.

(77) Regardless of the presence of an application processor, a baseband processor is typically paired with two additional components to complete its functionality, namely the Radio Frequency (RF) integrated circuit, also known as RF transceiver,[38] and the Power Management (PM) integrated circuit.[39] All three functionalities (baseband processor, RF transceiver and PM circuitry) are necessary for mobile connectivity and their resulting combination is called a "baseband chipset".[40] The three components of baseband chipsets are usually obtained from the same supplier, either as a bundle or separately.[41]

(78) In this Decision, the term "integrated baseband chipset(s)" or simply "integrated chipset(s)" will be used for chipsets that include an integrated baseband chip. The term "standalone baseband chipset(s)" or "slim modem(s)" will be used for chipsets that include a standalone baseband chip without an application processor.

(79) Baseband chipsets, whether standalone or integrated, implement one or multiple cellular and wireless communications standards, from the same or from different technology families and generations. For example, a baseband chipset might implement only the GSM standard or it might implement a combination of the GSM, UMTS and LTE standards (see in more detail Section 8.2.3).

(80) Baseband chipsets of a given generation tend to be backwards compatible with earlier cellular communication technology of the same technology family. For example, UMTS-compliant chipsets generally provide support for GSM.[42] In addition, the vast majority of LTE-compliant chipsets also provide support for UMTS and GSM.[43]

6.2.2. Customers and applications

(81) Baseband chipsets are typically sold to original equipment manufacturers ("OEMs" – also called "device manufacturers"), which incorporate them into devices that make use of mobile connectivity. OEMs include Apple, HTC Corporation ("HTC"), Huawei Technologies Co. Ltd. ("Huawei"), LG Corp ("LG"), Samsung Group ("Samsung") and ZTE Corporation ("ZTE").

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38 RF integrated circuits contain analog circuitry which allows the operation of the device at the frequencies allocated to mobile communications.

39 PM integrated circuits manage the power requirements of the mobile device.

40 Typically the three components (baseband, RF, PM) are implemented on separate pieces of silicon and reside in different chips. In a few cases, either the RF transceiver, or the PM component, or both, may be packaged in the same chip as the baseband processor. The term "baseband chipset" will be used throughout the text in a broader sense that also covers these cases.

41 See for instance Qualcomm's lines of products as described below in Section [7.1].

42 This is particularly the case for smartphones, as for most mobile network operators ("MNOs"), GSM is still important for voice transmission, in terms of coverage and capacity. GSM may also be useful for devices different from phones, although it does not provide broadband connectivity: via its basic connectivity support, it can ensure service continuity in case of gaps in UMTS coverage.

43 This is because, as discussed in Section [6.2.2], in the Period Concerned LTE was primarily used for data transmission and LTE-based smartphones were normally using UMTS and GSM for voice transmission. Moreover, UMTS can also be used for data transmission in areas where there is no LTE network coverage.

(82) OEMs incorporate baseband chipsets in a variety of devices, which can be grouped in two broad categories:

(a) Mobile phones (also called "handsets"), usually further classified into:

(1) Basic phones (phones providing only basic functionality like voice and messaging);

(2) Feature phones (phones providing more advanced functionality, like multimedia applications and internet connectivity); and

(3) Smartphones (phones providing advanced functionality, comparable to the functionality provided by a personal computer).

(b) Mobile broadband devices, which cover devices with mobile connectivity, other than mobile phones, and include in particular:

(1) Tablets with cellular access;[44]

(2) Data cards with cellular access, typically in the form of USB sticks (also called "dongles");

(3) Wireless routers that rely on cellular networks to act as WiFi hotspots, also called "MiFi" devices; and

(4) Other devices (for example, laptops) using embedded modules with cellular access.

(83) While all of these devices incorporate baseband chipsets, they do not all require the exact same functionalities.

(84) Voice telephony is an important requirement for mobile phones. Mobile phones typically use a number of interoperable technologies in order to provide a seamless voice experience to users. For many European mobile networks, in the period from 25 February 2011 to 16 September 2016 ("the Period Concerned"), this would have meant the capability to use both GSM and UMTS technologies for traditional voice telephony.[45]

(85) By contrast, the main purpose of cellular access in mobile broadband devices is broadband data connectivity, based on UMTS or LTE technology.[46] These devices therefore do not provide traditional voice telephony, also called "circuit switched"[47] voice, or do so only exceptionally.

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44 The distinction between smartphones and tablets is not clear-cut. Devices with full voice capabilities and increased screen size are commonly called "phablets", combining the characteristics of both. Smartphones, tablets and phablets are also collectively referred to as "smart devices".

45 LTE technology is primarily used for data transmission; however, since 2014, a gradual uptake of Voice over LTE (VoLTE) has started. See for example Singtel's press release from May 2014 concerning the launch of 4G ClearVoice and claiming it to be world's first commercial full-featured VoLTE service. Available at: https://www.singtel.com/about-us/news-releases/singtel-samsung-and-ericsson-unveil-worlds-first-full-featured-voice-over-lte.

46 GSM can also provide data connectivity; however, the data rates achieved in practice are insufficient for many data intensive applications (for example video streaming). GSM is therefore not considered a mobile broadband technology.

47 Circuit switching is a method of implementing a telecommunication network in which two network nodes establish a dedicated communications channel (circuit) through the network before the nodes may communicate. The circuit guarantees the full bandwidth of the channel and remains connected for the

6.2.3. Production process

(86) Baseband chipset suppliers typically design and develop their products themselves.[48] The majority, however, do not manufacture (or "fabricate") them in their own facilities.[49] Instead, they outsource the "fabrication" to specialised manufacturers called "foundries" which aggregate demand from multiple semiconductor suppliers. The baseband chipset suppliers that outsource the production of chipsets are called "fabless" suppliers.

6.2.4. Main suppliers

(87) Apart from Qualcomm, a number of other suppliers were active in the supply of UMTS- and LTE-compliant baseband chipsets in the Period Concerned.

6.2.4.1. Infineon / Intel

(88) Infineon Technologies AG ("Infineon") is a Germany-based company active in a range of semiconductor solutions.

(89) On 29 August 2010, Intel Corporation ("Intel"), a U.S. multinational, announced the acquisition of the wireless solutions business of Infineon,[50] which included its baseband chipsets. The acquisition was completed on 31 January 2011.[51] Since then, Intel has taken over and developed the business of Infineon in the baseband chipset space.

(90) Apple incorporated Infineon UMTS-compliant baseband chipsets in its iPhone and iPad devices launched before 2011.[52]

(91) Starting from the iPhone 7 devices launched on 16 September 2016, Apple started to incorporate also Intel LTE-compliant baseband chipsets in certain of its devices.[53]

(92) In October 2015, Intel acquired the CDMA business of Via Technologies Inc. ("Via").[54] In February 2017, Intel announced its first baseband processor product that integrated Via's CDMA technology with Intel's own multi-mode processor technologies.[55]

6.2.4.2. ST-Ericsson / Ericsson

(93) ST-Ericsson NV ("ST-Ericsson") was a multinational manufacturer of wireless products and semiconductors which had its headquarters in Geneva, Switzerland and which was established on 3 February 2009 as a 50/50 joint venture between

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duration of the communication session. The circuit functions as if the nodes were physically connected as with an electrical circuit.

48 See non-confidential answers to […] of the request for information […] to baseband chipset suppliers.

49 See non-confidential answers to […] of the request for information […] to baseband chipset suppliers.In particular, […] indicated that they had been using external suppliers (foundries), whereas […] stated that they operated their own production facilities.

50 http://newsroom.intel.com/docs/DOC-1173.

51 http://newsroom.intel.com/community/intel_newsroom/blog/2011/01/31/intel-completes-acquisition-of-infineon-s-wireless-solutions-business.

52 See Apple's answer to […] to the request for information […] to baseband chipset customers […].

53 See Section [8.4]. In this Decision, unless otherwise specified, "iPhone 7" refers to both the iPhone 7 and the iPhone 7 Plus.

54 http://www.viatech.com/en/2015/10/via-telecom-completes-sale-of-part-of-assets-to-intel-corporation/.

55 The XMM 7560 modem, see https://newsroom.intel.com/newsroom/wp-content/uploads/sites/11/2017/02/XMM7560-Fact-Sheet.pdf.

Telefonaktiebolaget L. M. Ericsson ("Ericsson") and ST Microelectronics N.V. ("ST Microelectronics").[56] ST-Ericsson supplied its baseband chipsets to OEMs such as Sony-Ericsson, Nokia[57], LG and Samsung.

(94) The ST-Ericsson Joint Venture was dissolved on 2 August 2013,[58] with its baseband assets being transferred to Ericsson.

(95) On 18 September 2014, Ericsson announced its intention to cease producing baseband chipsets.[59]

6.2.4.3. MediaTek

(96) MediaTek Inc. ("MediaTek") is a fabless semiconductor company for wireless communications and digital multimedia solutions headquartered in Taiwan.

(97) It is mainly focussed on the low- and mid-range segments of baseband chipsets and on sales in China.[60] It started to produce UMTS-compliant chipsets in 2010 and LTE-compliant chipsets in 2014.[61]

(98) As of 2015, MediaTek began to offer CDMA processors on the basis of a CDMA technology licence from Via.[62]

6.2.4.4. Marvell

(99) Marvell Technology Group Ltd. ("Marvell") is a US-based fabless semiconductor supplier. It historically focused on the smartphone market, being the supplier of Blackberry Limited ("Blackberry").[63]

(100) On 24 September 2015, Marvell announced its intention to cease producing baseband chipsets.[64]

6.2.4.5. Huawei / HiSilicon

(101) HiSilicon Technologies Co., Ltd. ("HiSilicon") is a China-based fabless semiconductor supplier.[65]

(102) It is a 100% subsidiary of the Chinese device manufacturer Huawei and produces baseband chipsets […].[66]

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56 https://www.ericsson.com/en/press-releases/2009/2/st-ericsson-born-as-wireless-semiconductor-industry-leader.

57 In April 2014, Microsoft Corp. completed the acquisition of the Nokia Devices and Services business of Nokia. See https://news microsoft.com/2014/04/25/microsoft-officially-welcomes-the-nokia-devices-and-services-business/.

58 http://www.ericsson.com/thecompany/press/releases/2013/08/1721084.

59 http://www.ericsson.com/news/1856711.

60 See for example http://technews.co/2015/03/03/no-showdown-between-qualcomm-and-mediatek-in-2015/. This was confirmed by a number of OEMs. […], for instance, stated that *"MediaTek has traditionally provided chipsets for lower end devices mainly."* (see […] non-confidential answer to […] of the request for information […] to baseband chipset customers […]). […] stated: "*MediaTek's principal focus today appears to be the mid-market and low-end smart mobile segments, where it offers an Integrated Chipset*." (see […] non-confidential answer to […] of the request for information […]).

61 Strategy Analytics, Baseband Market Share Tracker Q1 2015 […].

62 http://www.simmtester.com/page/news/shownews.asp?num=15853.

63 https://origin-www marvell.com/company/news/pressDetail.do?releaseID=2957.

64 http://rethinkresearch.biz/articles/marvell-is-latest-casualty-of-mobile-modem-meltdown/

65 […] non-confidential answer to […] of the request for information […] to baseband chipset suppliers […].

6.2.4.6. Renesas

(103) Renesas Mobile Corporation was a wholly-owned subsidiary of Renesas Electronics Corporation ("Renesas"), headquartered in Japan. It was active in the design and development of platforms for mobile phones and other mobile devices. It mainly supplied Japanese OEMs such as Fujitsu, Sharp, NEC, Sony and Panasonic.[67]

(104) In 2010, Renesas expanded its activities in baseband chipsets by acquiring the baseband assets of Nokia.[68]

(105) In 2013, Renesas sold its baseband assets to Broadcom.[69]

6.2.4.7. Broadcom

(106) Broadcom Corporation ("Broadcom") is a US-based fabless semiconductor company that designs solutions for a broad range of wired and wireless communications markets. The company's customers included smartphone manufacturers like Samsung and Nokia.[70]

(107) In 2013, Broadcom acquired the baseband assets of Renesas.

(108) In July 2014, Broadcom announced its intention to cease producing baseband chipsets.[71] Whilst Broadcom had been active in the supply of UMTS-compliant chipsets, it never supplied any LTE-compliant baseband chipsets.[72]

6.2.4.8. Samsung / LSI

(109) Samsung Systems LSI ("LSI") is a South Korean-based foundry semiconductor company that designs and manufactures baseband chipsets to be incorporated in mobile devices such as smartphones and tablets.

(110) LSI is a fully-owned subsidiary of Samsung and […].[73]

6.2.4.9. Nvidia

(111) Nvidia was active in the supply of baseband chipsets following its acquisition in 2012 of Icera Inc. ("Icera"), which was a UK-based manufacturer of baseband chipsets.

(112) In May 2015, Nvidia announced its intention to cease producing baseband chipsets.[74]

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66 See Section [9.2.9].

67 https://www.strategyanalytics.com/strategy-analytics/blogs/components/handset-components/handset-components/2010/07/06/nokia-partnership-could-help-renesas-expand-outside-japan#.Vbot-f4w9fw.

68 http://www.electronicsweekly.com/news/design/communications/renesas-to-buy-nokias-baseband-chip-business-2010-07/.

69 http://www.renesas.com/press/news/2000/news20130904.jsp.

70 http://articles.latimes.com/2011/apr/27/business/la-fi-broadcom-earns-20110427.

71 http://www.forbes.com/sites/greatspeculations/2014/06/04/rising-competition-forces-broadcom-to-exit-the-baseband-market/.

72 […] non-confidential answer to […] of the request for information […].

73 […] non-confidential answer to […] of the request for information […].

74 http://www.forbes.com/sites/greatspeculations/2015/05/07/nvidia-to-sell-its-icera-business-exit-the-mobile-chip-market/.

6.2.4.10. Sequans

(113) Sequans Communications S.A. ("Sequans") is a fabless semiconductor company based in France and specialising in the development of single-mode LTE chipset solutions.[75] Its customers include Asus, HTC, Huawei and ZTE.[76]

6.2.4.11. Spreadtrum

(114) Spreadtrum Communications, Inc. ("Spreadtrum") is a fabless semiconductor company that develops mobile chipset platforms for smartphones, feature phones and other consumer electronics products, supporting 2G, 3G and 4G cellular communications standards. It was founded in April 2001 and is headquartered in Shanghai, China.[77]

(115) It is mainly focused on the low- and mid-range segments of baseband chipsets and on sales in emerging markets such as India, Southeast Asia, Africa and South America.[78]

7. QUALCOMM'S ACTIVITIES IN RELATION TO BASEBAND CHIPSETS

7.1. Product range

(116) Qualcomm has a broad product portfolio ranging from low- and mid-cost baseband chipsets for the mass market to leading-edge baseband chipsets implementing the latest standards.[79] Being active also in the development of application processors, it offers both standalone and integrated chipsets.

(117) Qualcomm markets, or has marketed, its baseband chips (and by extension chipsets) mainly under the following product family names:[80]

(a) The Mobile Data Modem ("MDM") product family, which includes standalone baseband chips, namely baseband chips that mainly provide baseband processing (connectivity);

(b) The Mobile Station Modem ("MSM") product family, which includes integrated baseband chips, namely chips that provide both application processing and baseband processing (connectivity);

(c) The Qualcomm Single Chip ("QSC") product family, which includes integrated baseband chips. QSC products incorporate the RF and PM functionalities in the same chip, in addition to the baseband and application processors;[81] and

(d) The Qualcomm SnapDragon ("QSD") product family, which includes a specific range of integrated chips, featuring a "Snapdragon" application

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75 […] non-confidential answer to […] of the request for information […].

76 http://www.sequans.com/company/ecosystem/customers/.

77 http://www.spreadtrum.com/en/about html.

78 https://www.counterpointresearch.com/2017-spreadtrum-global-partner-conference-highlights-new-strategy/.

79 See Qualcomm's response to the request for information […].

80 Qualcomm's response to the request for information […].

81 For reasons of convenience, the term "baseband chipset" should be understood to include also the QSC products, even if all functionality is provided in a single chip, rather than in separate chips (together forming a chipset).

processor. The QSD designation was withdrawn in 2010 and replaced by MSM.

7.2. Qualcomm's participation in the standardisation of cellular communications standards

(118) Qualcomm develops, commercialises and actively supports 3G and 4G cellular communication technologies, including CDMA2000, WCDMA, HSDPA, HSUPA, HSPA+, TD-SCDMA and LTE.

(119) Qualcomm invests large amounts in research and development expenditure. In the fiscal years 2011 to 2014, Qualcomm's investments amounted to USD 3.0 billion USD 3.9 billion, USD 5.0 billion and USD 5.5 billion respectively.[82]

(120) As explained in Sections 7.2.1 to 7.2.3, Qualcomm played an important role in the development of cellular communications technology standards, and in particular CDMA**,** UMTS and LTE.

7.2.1. CDMA

(121) In 1986, Qualcomm filed its first patent application in the area of CDMA technology. This patent, together with other patents, would become the basis of CDMA technologies in mobile networks.[83]

(122) According to Qualcomm, "*[o]ther companies had invested vast sums in developing TDMA technologies (including GSM) and argued that CDMA was technically and commercially impossible to develop. Qualcomm developed a complete end-to-end system, including infrastructure and handset equipment, to ensure the early supply of CDMA equipment and to demonstrate that CDMA technology actually worked*".[84]

(123) In 1990, Qualcomm's early funding agreements and licenses with AT&T and Motorola established the framework for subsequent licences. In this way, the CDMA technology was successfully tested. In 1993, one year after Qualcomm's first licence agreement with Nokia, the Telecommunication Industry Association adopted and published the IS-95 CDMA Standard, based on Qualcomm's technology. In the meantime, Qualcomm entered into licence agreements with Matsushita (Panasonic), Samsung, LG, Hyundai and NEC. [85]

(124) To date, Qualcomm leads the development of CDMA-based technologies.[86] Qualcomm owns a large portfolio of IPR applicable to products that implement any version of CDMA, including patents, patent applications and trade secrets.[87] The

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82 See page 10 of Qualcomm's 2014 10-K Report, available at http://investor.qualcomm.com/secfiling.cfm?filingID=1234452-14-320&CIK=804328. See also page 9 of Qualcomm's 2013 10-K report, available at http://investor.qualcomm.com/secfiling.cfm?filingID=1234452-13-483.

83 See page 3 of Qualcomm's presentation of 20 February 2013 "The Qualcomm Technology Licensing Program and the Licensing of Standard-Essential Patents" […].

84 *Ibid.*

85 See page 5 of Qualcomm's presentation of 20 February 2013 "The Qualcomm Technology Licensing Program and the Licensing of Standard-Essential Patents" […].

86 See Page 3 of Qualcomm's 2014 10-K Report, available at http://investor.qualcomm.com/secfiling.cfm?filingID=1234452-14-320&CIK=804328.

87 See Page 1 of Qualcomm's 2014 10-K Report, available at http://investor.qualcomm.com/secfiling.cfm?filingID=1234452-14-320&CIK=804328

mobile communications industry generally recognises that a company seeking to develop manufacture and sell products that use CDMA technology will require a patent licence from Qualcomm.[88]

(125) Until 2015, Qualcomm was one of two suppliers active in the production of CDMA chipsets. The other, Via, did not supply any LTE chipsets during the Period Concerned.[89] In 2015, MediaTek began also supplying CDMA chipsets.

7.2.2. UMTS

(126) Qualcomm also had a strong impact on the development of UMTS technology, namely on the WCDMA standard. UMTS is a 3G CDMA-based technology, and Qualcomm owned an extensive IPR portfolio in relation to CDMA.

(127) According to Qualcomm, *"WCDMA […] is based on [its] underlying CDMA technology"[…].*[90] Qualcomm explained that *"[a]s second-generation (2G) networks make the transition to advanced wireless systems, the WCDMA (UMTS) market [was] gaining impressive momentum, presenting an additional opportunity for [Qualcomm]. As of November 2006, there were more than 90 million WCDMA subscribers worldwide.[…]"*[91] Qualcomm stated that *"[its] expertise and continued innovation in CDMA technology have brought [it] to a leading position in both CDMA2000 and WCDMA next-generation innovations."*[92]

(128) Moreover, "*[l]everaging [its] expertise in CDMA, [Qualcomm has] also developed integrated circuits for manufacturers and wireless operators deploying the WCDMA version of 3G for manufacturers of wireless devices*."[93] As a result, "*[t]he majority of the world's wireless device and infrastructure manufacturers (more than 125 and including all leading suppliers) have licensed [its] technology for use in WCDMA products."*[94]

7.2.3. LTE

(129) Qualcomm had a significant influence on the development of LTE technology.

(130) Already in 2006, Qualcomm announced that *"[a]n optimised OFDMA system* [which includes LTE] *designed to provide high performance in a mobile environment, including advanced techniques such as MIMO"* would have been commercialised as of 2010."[95]

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88 *Ibid.*

89 See recital (92) above.

90 See page 9 of Qualcomm's 2005 10-K Report, available at https://www.qualcomm.com/documents/investor-2005-annual-report.

91 See page 2 of Qualcomm's 2006 10-K Report, available at https://www.qualcomm.com/documents/qualcomm-2006-annual-report.

92 *Ibid.*

93 See page 6 of Qualcomm's 2011 10-K Report, available at http://investor.qualcomm.com/secfiling.cfm?filingID=1234452-11-360.

94 See page 4 of Qualcomm's 2011 10-K Report, available at http://investor.qualcomm.com/secfiling.cfm?filingID=1234452-11-360.

95 See page 8 of Qualcomm's 2006 10-K Report, available at https://www.qualcomm.com/documents/qualcomm-2006-annual-report.

(131) In 2007, Qualcomm stated that "*[it] ha[s] also informed standards bodies that [it] may hold essential intellectual property rights for certain standards that are based on OFDMA technology, e.g. […] LTE.*"[96]

(132) In 2008, Qualcomm outlined that *"[its] considerable expertise with OFDMA technology is now focused on the development of Qualcomm's LTE program and the creation of innovative next generation air interface technologies.*"[97] Still in 2011, Qualcomm declared that *"[it] continue[s] to invest significant resources toward the development of technologies and products for voice and data communications, primarily in the wireless industry, including advancements to […] 4G LTE networks wireless baseband chips.*"[98]

(133) Still in 2014, Qualcomm continued "*to play a significant role in the development of LTE and LTE Advanced, which are the predominant 4G technologies".*[99]

7.3. Qualcomm's patent portfolio

(134) Qualcomm is the largest IPR holder active in the supply of baseband chipsets. As of 6 August 2015, it owned more than 100,000 distinct patents.[100] [Qualcomm's legal and business strategy].[101]

8. QUALCOMM'S AGREEMENTS WITH APPLE

(135) Apple incorporates baseband chipsets into its "iPhone" smartphones and its "iPad" tablets with cellular connection.

(136) Apple has outsourced all manufacturing processes in relation to iPhones and iPads to third party contract manufacturers.[102]

(137) Apple gives instructions to its contract manufacturers as to the components that they have to buy for incorporation into Apple end-products.[103] These contract manufacturers are also referred to as "authorised purchasers".

(138) Apple has direct contracts with the suppliers of components for iPhones and iPads, but these suppliers ship and sell those components directly to the contract manufacturers for assembly into the finished products.[104]

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96 See page 14 of Qualcomm's 2007 10-K Report, available at https://www.qualcomm.com/documents/investor-2007-annual-report.

97 See page 12 of Qualcomm's 2008 10-K Report, available at https://www.qualcomm.com/documents/investor-2008-annual-report.

98 See page 32 of Qualcomm's 2011 10-K Report, available at http://investor.qualcomm.com/secfiling.cfm?filingID=1234452-11-360.

99 See page 4 of Qualcomm's 2014 10-K Report, available at http://investor.qualcomm.com/secfiling.cfm?filingID=1234452-14-320&CIK=804328.

100 https://www.qualcomm.com/invention/licensing/qualcomm-patent-lists.

101 See [Procedural issues].

102 Apple's non-confidential answer to […] of the request for information […]. See also the STA between Apple and Qualcomm, effective as of 16 December 2009, and the Amended and Restated STA between Apple and Qualcomm, effective as of 28 February 2013 […].

103 Apple's non-confidential answer to […] of the request for information […]. See also the STA between Apple and Qualcomm, effective as of 16 December 2009, and the Amended and Restated STA between Apple and Qualcomm, effective as of 28 February 2013 […].

104 Apple's non-confidential answer to […] of the request for information […].

(139) As regards the supply of Qualcomm baseband chipsets, on 16 December 2009, Apple concluded a framework agreement with Qualcomm, the Strategic Terms Agreement ("STA"), which amongst other things, contains certain terms and conditions relating to the sale of Qualcomm chipsets to authorised purchasers.[105]

(140) Pursuant to the STA, Apple and Qualcomm have entered into Statements of Works ("SOWs") setting out the terms and conditions for the supply of Qualcomm baseband chipsets, including the price of those chipsets. Pursuant to the SOWs, Qualcomm ships baseband chipsets directly to Apple's contract manufacturers for assembly into Apple's iPhones and iPads. While contract manufacturers pay Qualcomm for baseband chipsets, Apple is then reimbursed by Qualcomm under the terms of the STA and each SOW for the difference between the price applicable between the contract manufacturer and Qualcomm, and the price agreed between Apple and Qualcomm.[106]

(141) In addition, Apple and Qualcomm entered into an agreement (the "Transition Agreement") on 25 February 2011.[107] The Transition Agreement was amended on 28 February 2013 by means of a subsequent agreement ("the First Amendment to the Transition Agreement").

(142) While the Transition Agreement, as amended by the First Amendment to the Transition Agreement (together, the "Agreements"), were scheduled to expire on 31 December 2016, for the purposes of this Decision it is considered that they terminated on 16 September 2016 pursuant to Clause 1.5A of the First Amendment to the Transition Agreement following Apple's launch of iPhone 7 devices incorporating Intel LTE chipsets. The content of the Agreements is outlined further in Sections 8.1 and 8.2.

8.1. The Transition Agreement

(143) The purpose of the Transition Agreement was to set out certain terms and conditions regarding the payment by Qualcomm to Apple of *"certain funds related to Apple's transition to using Qualcomm Chipsets in Apple products (the "Transition")"*.[108]

(144) The Transition Agreement established three different payment schemes:

(1) the 4-Year Transition Fund;[109]

(2) the Marketing and Development Fund;[110] and

(3) the Variable Incentive Fund.[111]

(145) Under the 4-Year Transition Fund, "*in consideration of Apple's substantial resource investment associated with the Transition*", Qualcomm committed to pay Apple USD

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105 See Transition Agreement […], under "Purpose". For the description of the Transition Agreement, see Section [8.1] below.

106 Apple's non-confidential answer to […] of the request for information […].

107 Transition Agreement, […]. For the description of the Transition Agreement, see Section [8.1] below.

108 *Ibid.*

109 See Clause 1.1 of the Transition Agreement […].

110 See Clause 1.2 of the Transition Agreement […].

111 See Clause 1.3 of the Transition Agreement […].

[200-300] million in two instalments of USD [100-200] million each,[112] the first on 31 March 2012 and the second on 31 March 2013.[113]

(146) If, however, during 2011, the volume of Qualcomm baseband chipsets that implement CDMA, UMTS and/or LTE used in Apple products did not meet a certain threshold, or if, during any quarter of 2012, the volume of UMTS-compliant baseband chipsets did not meet certain thresholds, Qualcomm was entitled to reduce the first or the second instalment of this payment respectively. Further, if during any quarter of 2013 or the first quarter of 2014, the volume of UMTS-compliant baseband chipsets did not meet certain thresholds, Apple would reimburse some of the previously paid 4-Year Transition Fund to Qualcomm.[114]

(147) Under the Marketing and Development Fund, designed "*to contribute to the costs of Apple's marketing efforts*", Qualcomm committed to pay USD [100-200] million in six quarterly instalments of USD [20-30] million dollars each. Each instalment was due before the end of each of six consecutive calendar quarters, beginning with the third quarter of 2011.[115]

(148) If, however, Apple did not launch at least one Apple product with a UMTS carrier that incorporated a Qualcomm baseband chipset by 31 December 2012, Apple would reimburse all payments previously paid pursuant to the Marketing and Development Fund.[116]

(149) Under the Variable Incentive Fund, *"in consideration of Apple's use of Qualcomm Chipsets"*, Qualcomm committed to pay Apple up to USD [500-600] million in yearly payments of up to USD [100-200] million each, over four consecutive years. The exact value of each yearly payment was calculated by reference to a scale starting at USD [100-200] million to USD [100-200] million, depending on the volume of Qualcomm baseband chipsets incorporated in Apple products in the preceding twelve months. The applicable yearly volume requirements gradually increased over time. The lowest threshold that triggered the payment of USD [100-200] million increased from [50-100] million units in 2012 to [100-200] million units in 2015, while the highest threshold that triggered the payment of USD [100-200] million increased from [100-200] million units in 2012 to [100-200] million units in 2015.[117]

(150) For example,[118] the annual volume thresholds for 2014 and 2015[119] were as follows:[120]

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112 See Clause 1.1(a) of the Transition Agreement […].

113 See Clause 1.1(b) of the Transition Agreement […].

114 See Clauses 1.1(c), (d) and (e) of the Transition Agreement […].

115 See Clause 1.2 of the Transition Agreement […].

116 See Clause 1.2(b) of the Transition Agreement […].

117 See Clause 1.3(a) of the Transition Agreement […].

118 The annual volume thresholds set out for 2012 and 2013 follow a similar structure, with the payment amounts being the same and the annual volume thresholds being slightly lower.

119 As the total amount payable under the Variable Incentive Fund is capped at USD [500-600] million for four years, the payment due in the last year of 2015 *"shall be the lesser of (i) the unpaid balance of the Variable Incentive Fund, or (ii) the payment amount set forth […] for the applicable Annual Volume."*

120 See Clauses 1.3(a)(iii) and (iv) of the Transition Agreement […].

Table 1: Variable Incentive Fund annual volume thresholds for 2014 and 2015

Payment Amount	Annual Volume
USD [100,000,000-200,000,000]	≥ [100-200] million units
USD [100,000,000-200,000,000]	≥ [100-200] million and < [100-200] million units
USD [100,000,000-200,000,000]	≥ [100-200] million and < [100-200] million units
USD [0-10,000,000]	< [100-200] million units

(151) Qualcomm's commitment to make the payments envisaged under each the payment schemes referred to in recital (144) was subject to the conditions set out in Clause 1.5 of the Transition Agreement.[121]

(152) Clause 1.5 of the Transition Agreement stated: *"if after October 1, 2011, Apple sells an Apple product commercially that incorporates a non-Qualcomm cellular baseband modem,*[122] *this Agreement shall automatically terminate and Qualcomm shall not be obligated to make any of the payments that are due and payable after the date of such sale."* In addition, if such sales took place in calendar year 2013, Apple would be liable to reimburse within 45 days both of the following:

(1) the second instalment of the Transition Fund; and

(2) the second instalment of the Variable Incentive Fund.[123]

(153) The provisions of Clause 1.5 were stated not to "*apply to continued sales by Apple of any Apple product that incorporates a non-Qualcomm cellular baseband modem which Apple is selling commercially as of October 1, 2011 and minor modifications thereto but not including Major Releases.*[124]"[125] Apple could thus continue to sell any legacy products that incorporated Intel baseband chipsets.

8.2. The First Amendment to the Transition Agreement

(154) The First Amendment to the Transition Agreement took effect as of 1 January 2013.

(155) According to the recitals of the First Amendment to the Transition Agreement, Qualcomm entered into this amendment agreement because it wished *"to provide additional marketing incentives to Apple in order to help drive demand for global sales of Apple Phones and Apple Tablets with advanced cellular technologies."*[126]

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121 See Clauses 1.1(a), 1.2(a) and 1.3(a) of the Transition Agreement […].

122 "Baseband modem" should be read in this context as "baseband chipset".

123 See Clause 1.5 of the Transition Agreement […].

124 Pursuant to Clause 1.5 of the Transition Agreement […], *"A "Major Release" is any Apple product for commercial sale that includes a substantial change in industrial design when compared to the model it replaced or a change in the non-Qualcomm cellular base band modem in such device. The differences in the industrial design in iPhone 4 and its predecessor iPhone 3GS is an example of substantial change in industrial design. Minor modifications, for example, to address regional or carrier requirements, shall not constitute a Major Release."*

125 See Clause 1.5 of the Transition Agreement […].

126 See the recitals of the First Amendment to the Transition Agreement […].

(156) The First Amendment to the Transition Agreement established two different payment schemes, in addition to the three existing payment schemes referred to in recital (144), namely:

(1) the Marketing Fund;[127] and

(2) the Additional Variable Incentive Fund.[128]

(157) Under the Marketing Fund, for the period 1 January 2013 to 31 December 2016 or upon the earlier termination of the Agreements,[129] Qualcomm committed to pay USD [0-5] for each Apple phone sold at a price of at least USD [200-300][130] and USD [0-5] for each Apple tablet sold at a price of at least USD [100-200] that incorporated a Qualcomm baseband chipset.[131] Qualcomm would also pay the same amount for all Apple phones or all Apple tablets if these conditions were not met but if the quarterly average sale price of these devices reached USD [100-200] and USD [100-200] respectively.[132] Payments were accounted on a quarterly basis[133] but due 45 days after the end of each calendar year.[134]

(158) Clause 1.3A(c) of the Transition Agreement, as amended by the First Amendment to the Transition Agreement, provided, however, that *"if* […] *Apple or any of its Affiliates* [sold] *a Non-QC Device* [namely device incorporating a baseband chipset other than produced by Qualcomm] *commercially (i.e., more than 1000 units)"*, Apple would be liable to reimburse either:

(1) All Marketing Fund amounts previously paid by Qualcomm in full, if such sales took place in calendar years 2013 or 2014; or

(2) All Marketing Fund amounts paid in the previous 15-month period, if such sales took place in calendar year 2015.[135]

(159) The provisions of Clause 1.3A(c) did not however apply to any continued sales of the iPhone 4 product that incorporated a non-Qualcomm baseband chipset and its minor modifications.[136]

(160) Under the Additional Variable Incentive Fund, Qualcomm committed to pay to Apple up to USD [300-400] million in yearly payments of up to USD [100-200]

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127 See Clause 2 of the First Amendment to the Transition Agreement [...].

128 See Clause 3 of the First Amendment to the Transition Agreement [...].

129 See Clause 1.3A(a) of the Transition Agreement [...] as added by Clause 2 of the First Amendment to the Transition Agreement [...].

130 See Clause 1.3A(a)(i) of the Transition Agreement [...] as added by Clause 2 of the First Amendment to the Transition Agreement [...].

131 See Clause 1.3A(a)(ii) of the Transition Agreement [...] as added by Clause 2 of the First Amendment to the Transition Agreement [...].

132 See Clause 1.3A(a)(i) and (ii) of the Transition Agreement [...] as added by Clause 2 of the First Amendment to the Transition Agreement [...].

133 See Clause 1.3A(a) of the Transition Agreement [...] as added by Clause 2 of the First Amendment to the Transition Agreement [...].

134 See Clause 1.3A(b) of the Transition Agreement [...] as added by Clause 2 of the First Amendment to the Transition Agreement [...].

135 See Clause 1.3A(c) of the Transition Agreement [...] as added by Clause 2 of the First Amendment to the Transition Agreement [...].

136 *Ibid.*

million each, in 2015 and 2016.[137] The First Amendment to the Transition Agreement specified that these payments were in addition to any amounts due under the Variable Incentive Fund established by the Transition Agreement.[138] The exact value of each yearly payment was calculated by reference to a scale starting at USD [100-200] million to USD [100-200] million, depending on the volume of Qualcomm baseband chipsets incorporated in Apple products in the preceding twelve months.[139]

(161) The annual volume thresholds for 2015 and 2016 were as follows:[140]

Table 2: Additional Variable Incentive Fund annual volume thresholds for 2015 and 2016

Payment Amount	Annual Volume
USD [100,000,000-200,000,000]	≥ [100-200] million units
USD [100,000,000-200,000,000]	≥ [100-200] million and < [100-200] million units
USD [100,000,000-200,000,000]	≥ [100-200] million and < [100-200] million units
USD [0-10,000,000]	< [100-200] million units

(162) Clause 1.3B(b) provided, however, that *"if Apple or any of its Affiliates* [sold] *a non-QC device commercially (i.e. more than 1000 units)"*, Apple would be liable to reimburse either:

(1) The Additional Variable Incentive Fund payment of 2015, if such sales took place in calendar year 2015; or

(2) The Additional Variable Incentive Fund payment of 2016, if such sales took place in calendar year 2016. [141]

(163) The provisions of Clause 1.3B(b) did not apply to any continued sales of the iPhone 4 product that incorporated a non-Qualcomm baseband chipset and its minor modifications.[142]

(164) The First Amendment to the Transition Agreement maintained the provisions regarding Apple's reimbursement of certain funds envisaged in Clause 1.5 of the

137 See Clause 1.3B(a) of the Transition Agreement [...] as added by Clause 3 of the First Amendment to the Transition Agreement [...].

138 *Ibid.*

139 See Clauses 1.3B (a)(i) and (ii) of the Transition Agreement [...] as added by Clause 3 of the First Amendment to the Transition Agreement [...].

140 *Ibid.*

141 See Clause 1.3B(b) of the Transition Agreement as added by Clause 3 of the First Amendment to the Transition Agreement [...].

142 *Ibid.*

Transition Agreement (see Clause 5 of the First Amendment to the Transition Agreement). [143]

(165) In addition, a new Clause 1.5A was added to the Transition Agreement by the First Amendment to the Transition Agreement, pursuant to which: "*if during the Term Apple or any of its Affiliates* [sold] *a Non-QC Device commercially (i.e., more than 1000 units), this Agreement shall automatically terminate"* and Qualcomm would not be required to make any of the payments that were otherwise due and payable after the date of such sale. This would include the payments envisaged by the Transition Agreement and those added by the First Amendment to the Transition Agreement.

(166) The provisions of Clause 1.5A were stated not to *"apply to continued sales by Apple of any Apple product that incorporates a non-Qualcomm cellular baseband modem which Apple was selling commercially as of October 1, 2011 and minor modifications thereto but not including Major Releases."*[144]

8.3. Summary of the Transition Agreement and the First Amendment to the Transition Agreement

(167) In summary, the Agreements provided that:

(a) Qualcomm would grant Apple certain payments, which include lump-sum, volume-based and per-device payments (collectively referred to as the "Incentive Payments");

(b) The Incentive Payments were conditional upon Apple obtaining from Qualcomm all of Apple's requirements of baseband chipsets:

(1) In the event that Apple commercially released a product that incorporated a non-Qualcomm baseband chipset, the Agreements would terminate and Qualcomm would not have to make any of the Incentive Payments that were otherwise due and payable after the date of such release (the "Termination Clause");[145]

(2) In the event that Apple commercially released a product that incorporated a non-Qualcomm baseband chipset between 2013 and 2015, Apple would be obliged to reimburse part of the Incentive Payments previously received from Qualcomm (the "Repayment Mechanism").[146]

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143 See Clause 1.5 of the Transition Agreement [...] as amended by Clause 5 of the First Amendment to the Transition Agreement [...].

144 See Clause 1.5 of the Transition Agreement [...] as amended by Clause 5 of the First Amendment to the Transition Agreement [...] and Clause 1.5A of the Transition Agreement [...] as added by Clause 6 of the First Amendment to the Transition Agreement [...]. For definition of a *"Major Release"* see footnote 124.

145 See Clause 1.5 of the Transition Agreement [...] and Clause 1.5A as added by Clause 6 of the First Amendment to the Transition Agreement [...]. See footnote 146 as regards the applicability to legacy products.

146 See Clause 1.5 of the Transition Agreement [...]; See also Clauses 1.3A(c) of the Transition Agreement [...] as added by Clause 2 of the First Amendment to the Transition Agreement [...] and Clause 1.3B(b) of the Transition Agreement [...] as added by Clause 3 of the First Amendment to the Transition Agreement [...] and Clause 1.5 as amended by Clause 5 of the First Amendment to the Transition Agreement [...]. The Repayment Mechanism is not triggered by "*continued sales by Apple of any Apple product that incorporates a non-Qualcomm cellular baseband modem which Apple was selling commercially as of October 1, 2011 and minor modifications thereto but not including Major Releases*".

8.4. LTE chipsets obtained by Apple during the Period Concerned

(168) During the period 2011 to 2015, Apple obtained LTE chipsets only from Qualcomm.[147] The first Apple device to incorporate a Qualcomm LTE chipset was the third generation iPad which was launched in March 2012.[148]

(169) In 2016, Apple obtained LTE chipsets from both Qualcomm and Intel. The first Apple device to incorporate an Intel LTE chipset was the iPhone 7 launched on 16 September 2016.[149]

(170) The LTE chipsets that Apple obtained from Intel in 2016 accounted for between [10-20] and [20-30]% of Apple's total LTE chipset requirements[150] and for less than [50-60]% of its LTE chipset requirements for the iPhone 7.[151]

(171) Tables 3 and 4 show the LTE chipsets that Apple obtained from Qualcomm during the period 2011 to 2016 in terms of volume of units and value.

Table 3: LTE chipsets obtained by Apple from Qualcomm throughout the period 2011 to 2016 ('000 Units)

Chipset model	Standards supported[152]	2011	2012	2013	2014	2015[153]	2016
MDM9600/ MDM9610	UMTS/CDMA/ LTE	[100-200]	[10,000-20,000]	[10-20]	[10-20]	-	-
MDM9615	UMTS/CDMA/ LTE	-	[50,000-150,000]	[50,000-150,000]	[2,500-3,500]	[100-200]	[10-20]
MDM9615	UMTS/CDMA/ LTE	-	-	[50,000-150,000]	[50,000-150,000]	[30,000-100,000]	[20,000-100,000]
MDM9625	UMTS/CDMA/ LTE	-	-	-	[100,000-200,000][154]	[100,000-200,000]	[10,000-20,000]
MDM9635	UMTS/CDMA/ LTE	-	-	-	-	[50,000-150,000]	[50,000-150,000]
MDM9625	UMTS/CDMA/ LTE	-	-	-	-	[20-30]	[20,000-30,000]
MDM9645	UMTS/CDMA/ LTE	-	-	-	-	-	[50,000-150,000]
Total		[100-200]	[50,000-150,000]	[100,000-200,000]	[200,000-300,000]	[200,000-300,000]	[100,000-200,000]

Source: Apple[155]

147 See non-confidential Annex […], attached to Apple's response to the request for information […].

148 See Apple's non-confidential answer to […] of the request for information […].

149 See http://www.apple.com/iphone-7/specs/ and Apple's comments of 21 November 2016 on Qualcomm's response to the Statement of Objections, paragraph 52, ninth bullet point […]. In September 2016, Apple also launched a CDMA, TD-SCDMA and LTE-compliant version of the iPhone 7 incorporating a Qualcomm LTE chipset.

150 In 2016, Apple obtained [30-50 million] LTE chipsets from Intel […] and [100-200] million LTE chipsets from Qualcomm (see Table 3).

151 See Apple's comments […] on Qualcomm's response to the Statement of Objections, paragraph 52, fifth bullet point […].

152 This is not an exhaustive list as additional standards may be supported.

153 Some figures differ compared to the ones included in the Statement of Objections as the 2015 figures included in the Statement of Objections were estimates.

154 This figure differs slightly compared to the one included in the Statement of Objections because Apple provided an updated figure […]. The difference between the two figures is, however, minimal (less than 0.1%).

Table 4: LTE chipsets obtained by Apple from Qualcomm throughout the period 2011 to 2016 ('000 USD)

Chipset model	Standards supported[156]	2011	2012	2013	2014	2015[157]	2016
MDM9600/ MDM9610	UMTS/CDMA/ LTE	[4,000-5,000]	[300,000-400,000]	[200-300]	[200-300]	-	-
MDM9615	UMTS/CDMA/ LTE	-	[1,000,000 - 2,000,000]	[1,000,000 - 2,000,000]	[30,000-40,000]	[2,000-3,000]	[200-300]
MDM9615	UMTS/CDMA/ LTE	-	-	[1,000,000 - 2,000,000]	[1,000,000-2,000,000]	[500,000-600,000]	[400,000-500,000]
MDM9625	UMTS/CDMA/ LTE	-	-	-	[1,000,000-2,000,000] [158]	[2,000,000 - 3,000,000]	[300,000-400,000]
MDM9635	UMTS/CDMA/ LTE	-	-	-	-	[1,000,000 - 2,000,000]	[1,000,000 - 2,000,000]
MDM9625	UMTS/CDMA/ LTE	-	-	-	-	-	[200,000-300,000]
MDM9645	UMTS/CDMA/ LTE	-	-	-	-	-	[1,000,000 - 2,000,000]
Total		[4,000-5,000]	[2,000,000 - 3,000,000]	[3,000,000 - 4,000,000]	[3,000,000-4,000,000]	[4,000,000 - 5,000,000]	[3,000,000 - 4,000,000]

Source: Apple[159]

8.5. Qualcomm's payments to Apple pursuant to the Agreements

(172) Pursuant to the Agreements, Qualcomm paid Apple a total of USD [2-3] billion between 2011 and 2015.[160]

(173) The Agreements also provided that Qualcomm would make Additional Variable Incentive Fund payments by 15 November 2016 and Additional Marketing Fund payments by 15 February 2017. However, Qualcomm never made such payments because the Agreements terminated on 16 September 2016 pursuant to Clause 1.5A of the First Amendment to the Transition Agreement following Apple's launch of iPhone 7 devices incorporating Intel's LTE chipsets.[161]

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155 Non-confidential Annex attached to Apple's answer to […] of the request for information […].

156 This is not an exhaustive list as additional standards may be supported.

157 Some figures differ compared to the ones included in the Statement of Objections as the 2015 figures included in the Statement of Objections were estimates.

158 This figure differs slightly compared to the one included in the Statement of Objections because Apple provided an updated figure […]. The difference between the two figures is, however, minimal (less than 0.001%).

159 Non-confidential Annex attached to Apple's answer to […] of the request for information […].

160 See Table 11 below: [40,000,000-50,000,000] (2011) + [400,000,000-500,000,000] (2012) + [700,000,000-800,000,000] (2013) + [700,000,000-800,000,000] (2014) + [800,000,000-900,000,000] (2015).

161 See Apple's non-confidential response to the request for information […].

9. MARKET DEFINITION

9.1. Principles

(174) The definition of the relevant market is carried out, in the context of the application of Article 102 of the Treaty and Article 54 of the EEA Agreement, in order to define the boundaries within which it must be assessed whether a given undertaking is able to behave to an appreciable extent independently of its competitors and its customers.[162]

(175) The concept of the relevant market implies that there can be effective competition between the products or services which form part of it and this presupposes that there is a sufficient degree of interchangeability between all the products or services forming part of the same market in so far as a specific use of such products or services is concerned.[163]

(176) An examination to that end cannot be limited solely to the objective characteristics of the relevant products and services, but the competitive conditions and the structure of supply and demand on the market must also be taken into consideration.[164]

(177) The definition of the relevant market does not require the Commission to follow a rigid hierarchy of different sources of information or types of evidence. Rather, the Commission must make an overall assessment and can take account of a range of tools for the purposes of that assessment.[165]

9.2. Relevant product market

9.2.1. Principles relating to product market definition

(178) The identification of the relevant product market by the Commission derives from the existence of competitive constraints. Undertakings are subject to three main sources of competitive constraints, namely demand-side substitution, supply-side substitution and potential competition. From an economic point of view, for the definition of the relevant market, demand-side substitution constitutes the most immediate and effective disciplinary force on the suppliers of a given product.[166]

(179) Supply-side substitution may also be taken into account when defining markets in those situations in which its effects are equivalent to those of demand-side substitution in terms of effectiveness and immediacy. There is supply-side substitution when suppliers are able to switch production to the relevant products and market them in the short term without incurring significant additional costs or risks

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162 Case C-457/10 P *AstraZeneca* v *Commission*, EU:T:2012:770, paragraph 175; Case C-549/10 P *Tomra v Commission*, EU:C:2012:221, paragraph 38.

163 Case 85/76 *Hoffmann-La Roche* v *Commission*, EU:C:1979:36, paragraph 28; Case C-1/12 *Ordem dos Técnicos Oficiais de Contas*, EU:C:2013:127, paragraph 77. See also the Commission's Notice on the definition of relevant market for the purposes of Community competition law ("Notice on market definition"), OJ C 372, 9.12.1997, p. 5.

164 Case 322/81 *Nederlandsche Banden Industrie Michelin v Commission*, EU:C:1983:313, paragraph 37; Case T-556/08 *Slovenská pošta v Commission*, EU:T:2015:189, paragraph 112.

165 Case T-210/01 *General Electric v Commission*, EU:T:2005:456 paragraph 519; Case T-343/06 *Shell Petroleum and Others v Commission*, EU:T:2012:478, paragraph 171; Case T-342/07 *Ryanair v Commission*, EU:T:2010:280, paragraph 136; Case T-175/12 *Deutsche Börse v Commission*, EU:T:2015:148, paragraph 133; Case T-699/14 *Topps Europe v Commission*, EU:T:2017:2, paragraph 82.

166 Notice on market definition, paragraph 13.

in response to small and permanent changes in relative prices. When these conditions are met, the additional production that is put on the market will have a disciplinary effect on the competitive behaviour of the companies involved.[167]

(180) Supply-side substitution is, however, not taken into account for the definition of a relevant market each time it would entail the need to adjust significantly existing tangible and intangible assets, additional investments, strategic decisions or time delays.[168]

9.2.2. Application to this case

(181) The Commission concludes that the relevant product market for the purposes of this Decision (the "LTE chipset market") covers slim and integrated LTE chipsets but not captive production of such chipsets.

(182) The Commission has reached this conclusion based on the following factors:

(a) GSM chipsets are not substitutable for LTE chipsets (Section 9.2.3.1);

(b) UMTS chipsets are not substitutable for LTE chipsets (Section 9.2.3.2);

(c) Single-mode LTE chipsets are not substitutable for LTE chipsets (Section 9.2.3.3);

(d) Baseband chipsets that comply with certain iterations of the LTE standard are substitutable for baseband chipsets compliant with other iterations of the LTE standard (Section 9.2.4);

(e) Non LTE-compliant baseband chipsets that comply with technologies other than LTE, such as CDMA, TD-SCDMA (UMTS-TDD), WiFi and WiMAX, are not substitutable for LTE chipsets (Sections 9.2.5, 9.2.6 and 9.2.7);

(f) Integrated baseband chipsets are substitutable for standalone baseband chipsets, also known as slim modems (Section 9.2.8); and

(g) Captive production of baseband chipsets does not exert a competitive constraint on merchant market sales of baseband chipsets (Section 9.2.9).

(183) Contrary to Qualcomm's arguments, the Commission could reach these conclusions without having to carry out a SSNIP[169] test (Section 9.2.10).

9.2.3. The substitutability of LTE chipsets with GSM chipsets, UMTS chipsets, and single-mode LTE chipsets

(184) This section assesses whether LTE chipsets are substitutable with any of three other types of chipsets, namely:

(1) GSM chipsets (Section 9.2.3.1);

(2) UMTS chipsets (Section 9.2.3.2); and

(3) Single-mode LTE chipsets (Section 9.2.3.3).

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167 Notice on market definition, paragraph 20.

168 Notice on market definition, paragraph 23.

169 Small but significant non-transitory increase in price.

9.2.3.1. The substitutability of GSM chipsets and LTE chipsets

(185) During the Period Concerned, GSM chipsets represented a relatively large proportion of worldwide sales of chipsets. For example, in 2014, GSM chipsets represented [30-40]% of worldwide sales of all chipsets.[170]

(186) The Commission concludes that GSM chipsets are not substitutable for LTE chipsets. This is for the following reasons.

(187) First, data rates achieved by GSM chipsets are inadequate for data-transfer intensive applications like video streaming. For an operator or mobile OEM wishing to enable these services, GSM chipsets, with a data rate limit of approximately 100 kbps, are not a viable alternative. This is confirmed by several of the baseband chipset customers that responded to requests for information, for example:

(1) According to […]: "*[i]n most markets with widespread 3G adoption (including the EEA), neither [mobile network operators, "MNOs"] nor end consumers would be likely to accept devices limited to GSM as alternatives to devices supporting more modern mobile standards. In addition, OEMs (including* […]*) tend to market the smallest number of devices possible which could serve the majority of the markets in which they are present. Since the majority of the markets are 3G/4G, […]UMTS chipsets are usually the bare minimum*."[171]

(2) According to Apple, "*it requires [baseband chipset] suppliers to support multi-mode functionality. (LTE, WCDMA, CDMA, and GSM). Apple would not use a chipset in any of its devices that supports anything less than GSM/UMTS/LTE*."[172]

(188) Second, LTE chipsets are more efficient than GSM chipsets in the use of spectrum for data and voice.[173]

(189) Third, suppliers of GSM chipsets[174] are unable to switch to the supply of LTE or even UMTS chipsets in a short timeframe and without incurring significant additional investments or risks. For example:

(1) According to […]: "*GSM chipsets do not allow easy transition to UMTS. Indeed, a number of [baseband chipset] suppliers have attempted unsuccessfully to make this switch - for example, Texas Instruments*[175]*, a [baseband chipset] supplier who has since exited the market, failed to make the switch from GSM to UMTS despite their strength in GSM chipsets*".[176]

(2) According to […]: "*In order to switch from supplying GSM chipsets to chipsets supporting GSM/UMTS, a supplier must undertake significant additional*

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170 Strategy Analytics, Baseband Market Share Tracker Q1 2015 […].

171 […] non-confidential answer to […] of the request for information […] to baseband chipset customers […].

172 Apple's non-confidential answer to […] of the request for information […] to baseband chipset customers […].

173 See for instance Khandekar, A.; Bhushan, N.; Ji Tingfang; Vanghi, V., "LTE-Advanced: Heterogeneous networks," in EW2010: European Wireless 2010, pp.978-982, 12-15 April 2010, Available at: http://www.engr.uconn.edu/~bing/cse330/papers/heter-net/LTE-Advanced.pdf.

174 See answers to […] of the request for information […] to baseband chipset suppliers.

175 Texas Instruments, a US company, was operating as a foundry for Nokia.

176 […] non-confidential answer to […] of the request for information […] to baseband chipset suppliers […].

investments, because little of the original GSM investment can be leveraged into UMTS development. As much as 80% of the GSM/UMTS chipset is specific to UMTS, including the physical layer of the chipset, as well as the access stratum, which is a functional layer responsible for transporting data over the wireless connection and managing radio resources. Further, the UMTS standard also requires the use of many additional components as compared to GSM hardware. Accordingly, […] *estimates the total time needed for such a switch as approximately between three and five years*."[177]

(190) While Qualcomm claims that GSM and LTE chipsets form part of the same market, which would also include chipsets supporting all other cellular and wireless communications standards,[178] it has submitted no evidence to support this claim.

9.2.3.2. The substitutability of UMTS chipsets and LTE chipsets

(191) During the Period Concerned, UMTS chipsets represented a relatively large proportion of worldwide sales of chipsets. For example, in 2014, UMTS chipsets represented [30-40]% of worldwide sales of all chipsets.[179]

(192) The Commission concludes that UMTS chipsets are not substitutable for LTE chipsets. The Commission also concludes that, contrary to Qualcomm's claim, UMTS and LTE chipsets are not part of an overall market for baseband chipsets supporting each of the competing wireless communication standards.

(193) There are two main reasons why UMTS chipsets are not substitutable for LTE chipsets.

(194) First, a majority of those baseband chipset customers that responded to requests for information indicated that they would not find it commercially feasible to switch from LTE chipsets to UMTS chipsets.[180] For example:

(1) According to Apple: "[…], *consumers expect Apple's devices to include the most recent technologies. For example, it would not be a commercially viable option for Apple to replace GSM/UMTS/LTE chipsets with chipsets that are only enabled with UMTS and earlier generation standards in its most recent devices. LTE is a requirement for most of the world's largest carriers and consumers. There is no alternative standard to LTE for devices designed for sale in markets that demand LTE connectivity, which includes all European markets.*" [181]

(2) According to […]: "*In most markets that* […] *operates, the majority of MNOs support (and require) LTE access. Therefore, LTE has generally become a necessary configuration even for low-end smartphones. Thus, in general* […] *would prefer […]LTE chipsets over […]UMTS. Similarly the MNOs that*

177 […] non-confidential answer to […] of the request for information […] to baseband chipset suppliers […].

178 Qualcomm's response of 27 June 2016 to the Statement of Objections […], Section III.C.

179 Strategy Analytics, Baseband Market Share Tracker Q1 2015 […].

180 See answers to […] of the request for information […] to baseband chipset customers.

181 Apple's non-confidential answer to […] of the request for information […] to baseband chipset customers […].

purchase […] *devices in the EEA and the United States already require, in many cases, that the* […] *devices support LTE*." [182]

(3) According to […]: "[…] *customers require UMTS LTE (LTE is a higher speed and results in a better customer experience.)*"[183]

(195) This conclusion is not affected by Qualcomm's claim regarding the alleged bias or lack of clarity of certain replies by baseband chipset customers to two questions in a request for information.[184] This is because these questions were sent to sophisticated customers that could be expected to carefully read and interpret the questions put to them and not be misled.[185]

(196) Second, suppliers of UMTS chipsets are unable to switch to the supply of LTE chipsets in a short timeframe and without incurring significant additional investment or risk. This is because the addition of LTE functionalities to a UMTS chipset entails substantial costs and time. This is confirmed by all those baseband chipset producers that responded to requests for information.[186] For example:

(1) According to […]: "*There would be new complex software and algorithms, different protocol stack, radio frequencies and reference design. At chip level, switching to a different standard would be a ground-up new chip design to an entirely new block diagram; at least that was the case in the custom segment when we were* […]. *For those suppliers with the requisite 3G + 4G capability switching would in our view be possible but not in a short timeframe. In the* […], *embracing a new 3G standard was a new chip development and not possible without* […] *3G designs and capabilities.* […] *would support* […] *on new standards based chips by adapting to* […] *requirement specification the MCU, DSP and memory integrated circuitry but* […] *would provide the 3G wireless capability in the form of logic gates and algorithms for on-chip integration and execution of* […] *proprietary software for* […] *RF and reference design validation*." [187]

(2) According to […]: "*With the move to GSM/UMTS/LTE, the number of use cases that must be predicted and tested during the design process again increases exponentially. Therefore, just as the switch from GSM to GSM/UMTS requires significant time and investment as a result of increased complexity, so too does the switch to GSM/UMTS/LTE*."[188]

(3) According to […]: "*The development processes for LTE are completely distinct from GSM/UMTS and have to be started from scratch. LTE has entirely different protocols and specifications from those of UMTS and GSM […] b. New testing equipments for the LTE standard will be required. […] c. The*

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182 […] non-confidential answer to […] of the request for information […] to baseband chipset customers […].

183 […] non-confidential answer to […] of the request for information […] to baseband chipset customers […].

184 Qualcomm's response of 27 June 2016 to the Statement of Objections […], paragraphs 89-97.

185 See by analogy Case T-5/02 *Tetra Laval v Commission*, EU:T:2002:264, paragraph 114.

186 See answers to […] of the request for information […] to baseband chipset suppliers.

187 […] non-confidential answer to […] of the request for information […] to baseband chipset suppliers […].

188 […] non-confidential answer to […] of the request for information […] to baseband chipset suppliers […].

semiconductor foundries will need to apply new fabrication technologies and processes […] d. Baseband certification/verification processes need to be conducted […]".[189]

(4) According to […], the cost of switching from UMTS to LTE chipsets amounts to: "*At least a billion dollars or more, which includes R&D expenses from 2011-2014, acquisition of companies, investment in employees/engineers, etc*".[190]

(197) Qualcomm claims[191] that UMTS chipsets and LTE chipsets are part of the same market, which would also include chipsets supporting all other cellular and wireless communications standards,[192] on the basis of the following five main reasons:

(1) LTE is simply an evolution of UMTS, in the same way as UMTS-HSDPA or UMTS-HSUPA, unlike LTE-A which represents the first "true" 4G technology;

(2) The maximum download and upload speeds of UMTS and LTE are similar and indicative of the existence of a chain of substitution between UMTS and LTE chipsets;[193]

(3) The average prices of UMTS and LTE chipsets are similar and indicative of the existence of a chain of substitution between those chipsets;

(4) LTE and UMTS chipsets were substitutable at least until 2013[194] because LTE networks were rolled out slowly in the European Economic Area ("EEA"); and

(5) The Commission has in previous decisions defined a single relevant market for 3G technologies, which according to Qualcomm includes both UMTS and LTE chipsets, as opposed to a market for "true" 4G technologies, which according to Qualcomm includes LTE-A chipsets.

(198) However, none of the five reasons are convincing arguments that UMTS chipsets and LTE chipsets are part of the same market.

(199) First, LTE is not "*simply an evolution*" of UMTS.

(200) In the first place, UMTS and LTE are based on different technologies. While UMTS and its different iterations (such as HSDPA) are based on W-CDMA, LTE and its different iterations (such as LTE-A) are based on OFDMA.[195]

(201) In the second place, a majority of those baseband chipsets customers that responded to requests for information confirmed that they would not find it commercially feasible to switch from LTE chipsets to UMTS chipsets in their devices.[196]

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189 […] non-confidential answer to […] of the request for information […] to baseband chipset suppliers […].

190 […] non-confidential answer to […] of the request for information […] to baseband chipset suppliers […].

191 Qualcomm's response of 27 June 2016 to the Statement of Objections […], paragraphs 133-154.

192 Qualcomm's response of 27 June 2016 to the Statement of Objections […], Section III.C.

193 Qualcomm's response of 27 June 2016 to the Statement of Objections […], paragraphs 136-144.

194 Qualcomm's response of 27 June the Statement of Objections [...], paragraph 139.

195 See Sections [6.1.2] and [6.1.3].

196 See answers to […] of the request for information […] to baseband chipset customers.

(202) Moreover, while two customers, […][197] and […][198], stated that they would find it commercially feasible to switch from LTE chipsets to UMTS chipsets:

(1) […] based its statement on the alleged novelty of LTE technology, even if LTE had been already launched commercially since December 2009; and

(2) […] indicated that switching would only occur with the acceptance of carriers, which is unlikely given that carriers generally favour and require LTE support.[199]

(203) In the third place, suppliers of UMTS chipsets cannot switch to the supply of LTE chipsets in a short timeframe and without incurring significant additional investment or risk. This was confirmed by all those suppliers of baseband chipsets that responded to requests for information.[200]

(204) Second, contrary to Qualcomm's claim, the maximum download and upload speeds of UMTS chipsets and LTE chipsets are not similar and, in any event, do not indicate the existence of a chain of substitution between UMTS and LTE chipsets.

(205) In the first place, a higher maximum download speed is only one of the advantages of LTE. LTE is also a superior technology compared to UMTS in several other respects, including spectrum efficiency, latency and upload speed, as confirmed, for example, by the following companies that responded to requests for information:

(1) […]: "*As compared with 3G, 4G/LTE has focused on improving mobile broadband performance (rather than improving voice communication) and is intended to deliver significant increases in mobile broadband data capacity and performance. 4G networks generally offer faster download/upload speeds, web browsing and reduced latency as compared with 3G networks*".[201]

(2) […]: "*Most carriers are migrating to LTE because, among other reasons, LTE offers higher capacity, higher data rates and many attractive features for carriers/operators, such as reduced network and equipment costs, and the ability to deploy heterogeneous networks (e.g., employing WiFi and LTE in the same network). This makes the requirement for GSM/UMTS/LTE mandatory on modern devices in order to be commercially viable*."[202]

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197 […] non-confidential answer to […] of the request for information of […] to baseband chipset customers […].

198 […] non-confidential answer to […] of the request for information of […] to baseband chipset customers […].

199 See for instance Apple's non-confidential answer to […] of the request for information […] to baseband chipset customers […], "*LTE is a requirement for most of the world's largest carriers and consumers. There is no alternative standard to LTE for devices designed for sale in markets that demand LTE connectivity, which includes all European markets;*" and […] non-confidential answer to […] of the request for information […] to baseband chipset customers […], "*Most carriers are migrating to LTE because, among other reasons, LTE offers higher capacity, higher data rates and many attractive features for carriers/operators, such as reduced network and equipment costs, and the ability to deploy heterogeneous networks (e.g., employing WiFi and LTE in the same network). This makes the requirement for GSM/UMTS/LTE mandatory on modern devices in order to be commercially viable".*

200 See answers to […] of the request for information […] to baseband chipset suppliers.

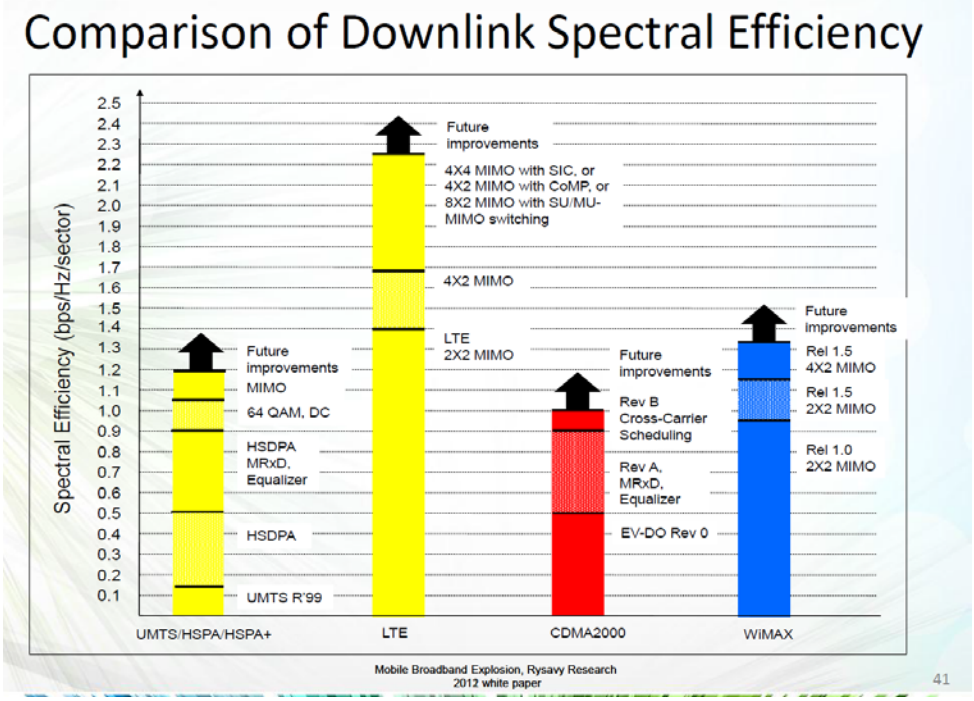
201 […] non-confidential answer to […] of the request for information […] to baseband chipset suppliers […].

202 […] non-confidential answer to […] of the request for information […] to baseband chipset customers […].

(206) Regarding the superiority of LTE over UMTS in terms of spectral efficiency, this is confirmed by the following:

(1) A guide written by cellular technology experts and submitted by Qualcomm, which states that: [Third party confidential information].[203]

(2) The following extract from a presentation by Rysavy Research entitled "Comparison of Downlink Spectral Efficiency", which compares the spectral efficiency of (inter alia) UMTS and LTE[204] and indicates that the downlink spectral efficiency of LTE is significantly superior to UMTS (more than 2.2 bps/Hz/sector compared to 1.2 bps/Hz/sector).



(3) The probative value of this extract is not called into question by Qualcomm's claim that other extracts and quotes in the same presentation[205] indicate that the performance of LTE and UMTS is similar. Those extracts and quotes do not provide information about the performance gap between LTE chipsets on the one hand and GSM and UMTS chipsets on the other hand; rather, they simply refer to the fact that GSM and UMTS are expected to co-exist with LTE for a given time period.

(207) Regarding the superiority of LTE over UMTS in terms of latency, this is confirmed by the graph entitled "LTE latency in ms vs latencies experiences on other

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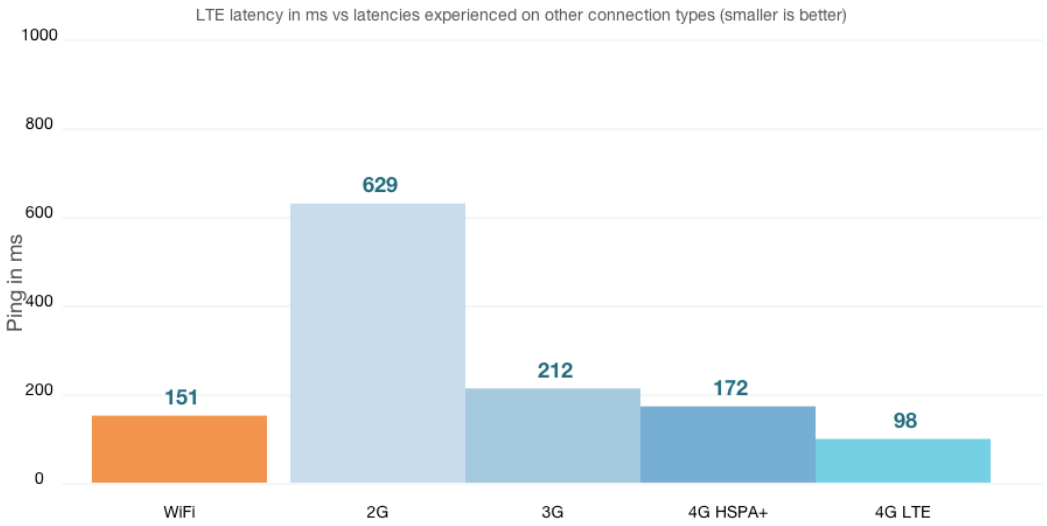
203 "A guide to Wireless Modem Chips – 3G/4G Basebands and Wi-FI Combos" by Gardner, Krewell and Gwennap, […].

204 http://www.4gamericas.org/files/4114/0759/4570/PPT_-_Rysavy_Mobile_Broadband_Explosion_2012.pdf […], page 41.

205 "[…] *expected to co-exist with LTE for the remainder of this decade, HSPA+ provides a strategic performance roadmap advantage for incumbent GSM-HSPA operators*"; and "*GSM-HSPA will comprise the overwhelming majority of subscribers over the next five to ten years, even as LTE becomes globally available*").

connection types (smaller is better)",[206] which compares different cellular and wireless communications standards and indicates that the latency of LTE is approximately half that of UMTS: while the latency of UMTS (3G) and HSPA+ ranges between 172 and 212 ms, the latency of LTE is 98 ms.



(208) The probative value of this graph is not affected by Qualcomm's claim that a study by O'Reilly Media,[207] a provider of technology-related training, indicates that the performance of LTE and UMTS networks is similar for the following reasons:[208]

(1) The substitutability of LTE and UMTS networks is irrelevant to the assessment of the substitutability of LTE and UMTS chipsets. This is because while different networks are needed to support UMTS and LTE technologies, LTE chipsets support both UMTS and LTE technologies;

(2) The study indicates the coexistence of different standards, which is irrelevant for the purposes of substitutability between UMTS and LTE chipsets. This is because, as pointed out in recital (55), LTE chipsets are compliant with both UMTS and LTE technology;

(3) The study makes a clear distinction between LTE (which it refers to as "3.9 G") and previous technologies;[209]

(4) The study confirms that UMTS and LTE are based on different technologies and architectures;[210] and

(5) The study includes the following graph, which confirms the superior performance of LTE compared to HSDPA, at least in terms of upload and download speed.[211]

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206 The chart contains a comparison of latency for different standards by Open Signal (source: https://opensignal.com/blog/wp-content/uploads/2014/03/Latency-comparison-with-other-techs.png […]). Even if HSPA+ is labelled as "4G", Open Signal does not consider HSPA+ as a 4G technology (see for example https://opensignal.com/reports/state-of-lte-q1-2014/ […], where it is stated: "*and we count HSPA+ as a form of 3G technology, even if it is often marketed as 4G in the United States*").

207 In particular, Qualcomm refers to the following quotes: [Third party confidential information].

208 See Qualcomm's response of 13 March 2017 to the Letter of Facts […], paragraphs 42-52.

209 E.g. [Third party confidential information]

210 See […], Figures 7-5, 7-7 and page 20.

[Third party confidential information]

(209) Regarding the superiority of LTE over UMTS in terms of upload speed, this is confirmed by the following:

(1) The theoretical maximum upload speed of LTE (up to 50 Mbps) is more than four times higher than that of UMTS (11.5 Mbps[212]);

(2) The theoretical maximum upload speed of LTE chipsets supplied by Qualcomm (up to 50 Mbps) is more than nine times higher than that of UMTS chipsets supplied by Qualcomm (5.76 Mbps).[213]

(210) In the second place, even if, as Qualcomm appears to claim, the maximum theoretical download speed of UMTS could be up to almost 400 Mbps,[214] [Volumes sold during the Period Concerned].[215] This means that the theoretical maximum download speed of early LTE chipsets (up to 100 Mbps) is more than twice that of UMTS chipsets.

(211) In addition, in 2011 and 2012, the years in which LTE chipsets with theoretical maximum download speed of only 100 Mbps were available, Qualcomm sold only very limited quantities of UMTS chipsets with theoretical maximum download speed of 42 Mbps,[216] whilst the other UMTS chipsets supplied by Qualcomm had a lower speed.

(212) In the third place, as of October 2015, no UMTS networks supported download speeds of up to 400 Mbps. Only two out of a sample of 588 commercial UMTS networks operating worldwide supported a theoretical maximum download speed of 63 Mbps while all the remaining networks supported only 21 Mbps and 42 Mbps at most.[217] By contrast, LTE cat 4 and LTE cat 6 networks, which were widely available, supported a theoretical maximum download speed of up to 150 and 300 Mbps respectively.[218]

(213) In the fourth place, contrary to what Qualcomm claims,[219] the relevant point in time for comparing the performance of UMTS and LTE chipsets should not be the years 2008 and 2009. This is because these years are more than three years before the Period Concerned.

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211 See […]. [Third party confidential information]

212 See http://www.indiantelecomnews.com/mobile-internet-standards-2g-3g-4g-hspa-lte-evdo-gprs-edge-rtt […].

213 Qualcomm's response to […] of the request for information […] of the request for information […] of the request for information […].

214 See Qualcomm's response of 27 June 2016 to the Statement of Objections [...], figure 3.

215 Annexes to Qualcomm's responses to the requests for information […] as well as Tables 2, 3 and 4 of Qualcomm's response of 27 June 2016 to the Statement of Objections [...].

216 These chipsets represented respectively 1% and 2% of Qualcomm's chipset sales in 2011 and 2012, compared to respectively 4% and 31% represented by LTE chipsets in the same years. Qualcomm's response of 27 June 2016 to the Statement of Objections [...], Table 3.

217 See Global mobile Suppliers Association, GSM/3G Market/Technology Update, October 2015, available at http://gsacom.com/wp-content/uploads/2015/10/151011-HSPA_operator_commitments.pdf, […].

218 See Global mobile Suppliers Association, 4G Market and Technology Update, October 2015, available at http://gsacom.com/wp-content/uploads/2015/10/151013-Evolution_to_LTE_report.pdf […].

219 Qualcomm's response of 13 March 2017 to the Letter of Facts […], paragraphs 55 and 56.

(214) In the fifth place, none of the statements relied on by Qualcomm[220] contradict the conclusion that the maximum download speed of LTE is significantly superior to UMTS. In particular:

(1) Regarding the statement by AT&T in 2010 that its 21 Mbps HSPA+ networks would give it an advantage vis-à-vis Verizon's 5-12 Mbps LTE networks,[221] it compares the real-world download speed for LTE with theoretical download speeds for HSPA+. These measures are different and cannot be compared with each other as real-world speed is significantly lower than theoretical speed (see for example point (2) below or compare recitals (215) and (216)). In addition, AT&T itself acknowledged that the "*advantage*" that it would allegedly maintain over Verizon would not consist of higher download speeds, but service continuity.[222]

(2) Regarding the statement by T-Mobile in 2011 that its 42 Mbps HSPA+ network would provide download speeds comparable with Verizon's LTE network,[223] it is contradicted by the fact that, even in 2017, the download speed of T-Mobile's HSPA+ network is lower than 42 Mbps ("*typically between 2-6 Mbps*");[224]

(3) Regarding Telefónica Germany's announcement that it would launch LTE services in 2011,[225] it relates to DSL replacement routers to be launched in Germany's rural areas and not to a LTE cellular network;

(4) Regarding the statement by EE UK in 2012 that it was forecasting download speeds on its LTE networks of between 8 and 12Mbps,[226] such speed is higher than the maximum download speed of even the fastest UMTS network in the UK in 2016, which amounted to 6.10 Mbps (see recital (216) below). Moreover, the download speed reached by the EE UK LTE network is higher in practice (see recital (216) below).

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220 Qualcomm's response of 13 March 2017 to the Letter of Facts [...], paragraph 56.

221 "*Verizon said its LTE network will deliver real-world downlink speeds of 5-12 Mbps and uplink speeds of 2-5 Mbps, which it said is 10 times faster than its 3G network. AT&T, which plans to deploy LTE by mid-2011, is currently upgrading its 3G network to 21 Mbps HSPA+, and has argued that its HSPA+ network will give it a distinct advantage over Verizon.*", see http://www.fiercewireless.com/wireless/clearwire-at-t-take-jabs-at-verizon-s-lte-speeds-pricing.

222 "*Indeed, AT&T hammered the point home in a blog post. "Customers of carriers who chose not to upgrade their current networks will move in and out of LTE coverage areas as well," AT&T CTO John Donovan wrote. "But as they do, they'll experience a jarring speed degradation. If they're online and on the phone when they move to sites that don't support simultaneous voice and data connections, they'll drop one of those connections. And if they're watching video, it's not going to be pretty.""*, see http://www.fiercewireless.com/wireless/clearwire-at-t-take-jabs-at-verizon-s-lte-speeds-pricing.

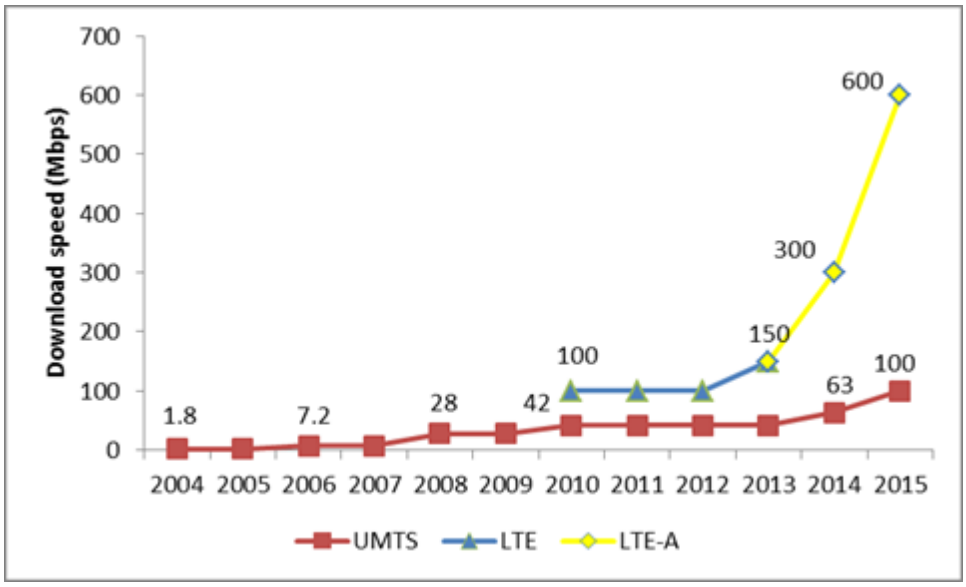
223 "*Ray said T-Mobile's HSPA+ 42 network will provide speeds comparable with Verizon Wireless' (NYSE:VZ) recently launched LTE network. Ray said T-Mobile has been testing T-Mobile's planned HSPA+ 42 upgrade against Verizon's LTE network here, and he said both networks provided average download speeds of around 8 Mbps.*" Qualcomm failed to provide a link to this statement in its Response to the Letter of Facts. The Commission understands that the source for the statement is: http://www.fiercewireless.com/wireless/t-mobile-we-ll-match-verizon-s-lte-speeds-hspa-42..

224 See https://www.t-mobile.com/company/company-info/consumer/internet-services.html.

225 "*Telefónica Germany has announced plans to launch LTE services on July 1, 2011. However the launch will be limited to DSL replacement routers capped at speeds of 7.2Mbps*", see http://telecoms.com/28435/telefonica-germany-to-launch-800mhz-rural-lte-on-1-july/.

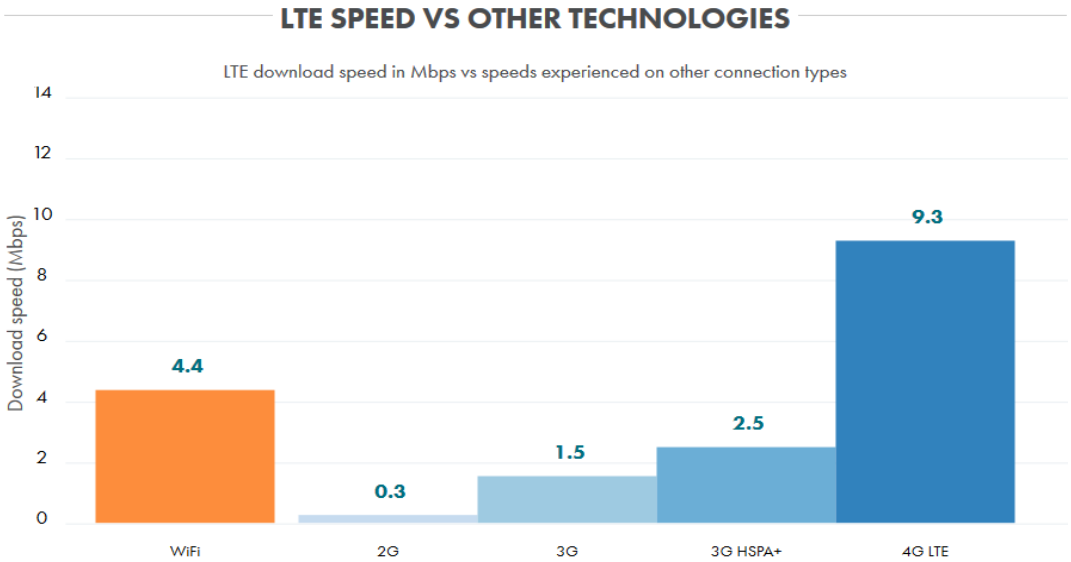
226 See https://www.theguardian.com/technology/2012/oct/29/ee-launches-uk-4g-mobile-network.

(215) In the sixth place, even if at present, UMTS were to achieve maximum download speed comparable to LTE, the following graph, provided by Qualcomm,[227] confirms that only in 2015 did UMTS technology achieve a theoretical maximum download speed comparable to low-end LTE technology launched in 2010.



(216) In the seventh place, contrary to what Qualcomm claims,[228] LTE achieves actual average download speeds at least four times higher than those of UMTS. This is confirmed by the following:

(1) According to the graph entitled "LTE speed vs other technologies",[229] LTE was in 2015 on average almost four times faster than HSPA+ on a worldwide basis;



(2) In Italy, the fastest 4G (LTE) networks, operated by Vodafone, achieved in 2016 an average download speed of 34.36 Mbps, whereas the fastest 3G

227 Qualcomm's response of 27 June 2016 to the Statement of Objections [...], figure 2.
228 Qualcomm's response of 13 March 2017 to the Letter of Facts [...], paragraphs 64-67.
229 See "The State of LTE", March 2015, https://opensignal.com/reports/2015/02/state-of-lte-q1-2015/ […].

(UMTS) networks, operated by Vodafone, achieved in 2016 only an average download speed of 6.77 Mbps.[230]

(3) In the United Kingdom, the fastest 4G (LTE) network, operated by EE, achieved in 2016 an average download speed of 27.98 Mbps, whereas the fastest 3G (UMTS) network, operated by 3, achieved in 2016 only an average download speed of 6.10 Mbps.[231]

(217) Third, contrary to Qualcomm's claim,[232] the average prices of UMTS and LTE chipsets are not similar and, thus, do not indicate the existence of a chain of substitution between these chipsets because of the following reasons.

(218) In the first place, LTE chipsets command a premium price against UMTS chipsets and this is confirmed by the following:

(1) Apple's statement, according to which: "*BCs implementing the latest and more advanced air interfaces and supporting the most legacy standards are often higher priced. For example, an LTE chipset requires more chip area and is developed on an advanced process node resulting in a higher cost structure*.";[233] and

(2) Information from Strategy Analytics[234] indicating that the difference in average selling prices between UMTS chipsets and LTE chipsets was at least [70-80]% in each year between 2012 and 2015 (see Table 5).

Table 5: Average selling prices of UMTS and LTE chipsets, 2011 to 2015[235]

	Average selling price of UMTS chipsets	Average selling price of LTE chipsets	Difference, USD	Difference, %
2011	[10-15]	[10-15]	[0-5]	[10-20]%
2012	[10-15]	[20-25]	[5-10]	[70-80]%
2013	[10-15]	[20-25]	[10-15]	[90-100]%
2014	[5-10]	[15-20]	[5-10]	[100-110]%
2015	[5-10]	[10-15]	[5-10]	[120-130]%

(219) In the second place, this conclusion is not affected by the price data provided by Qualcomm in Table 4 of its Response to the Statement of Objections (which is reproduced below as Table 6 of this Decision) for the following reasons:

230 See https://opensignal.com/reports/2016/11/italy/state-of-the-mobile-network/ […].
231 See https://opensignal.com/reports/2016/10/uk/state-of-the-mobile-network/ […].
232 Qualcomm's response of 27 June 2016 to the Statement of Objections [...], paragraphs 151-154.
233 Apple's non-confidential answer to […] of the request for information […] to baseband chipset customers […].
234 Strategy Analytics Baseband Market Share Tracker Q2 2016 […].
235 Strategy Analytics Baseband Market Share Tracker Q2 2016 […].

Table 6: Weighted average price of Qualcomm UMTS and LTE chipsets, 2009 to 2015[236]

3GPP Standard	Max. Download speed (Mbps)	2009	2010	2011	2012	2013	2014	2015
UMTS	0.384	10.49	7.64	7.90	8.78			
UMTS	1.8	19.09	20.92	5.48				
UMTS	3.6	7.68	6.20	5.48	7.38	[5-10]	[20-25]	[5-10]
UMTS	7.2	18.55	13.19	9.87	7.82	[5-10]	[5-10]	[20-25]
UMTS	14.4		18.52	14.69	12.46	[5-10]	[5-10]	[5-10]
UMTS	21				12.65	[10-15]	[15-20]	[65-70]
UMTS	28	21.39	19.45	7.44	4.84	[0-5]	[0-5]	[0-5]
UMTS	42	53.44	27.87	19.22	22.75	[15-20]	[5-10]	[0-5]
LTE	100	43.72	37.94	30.34	22.34	[15-20]	[10-15]	[10-15]
LTE	150				37.54	[35-40]	[15-20]	[5-10]
LTE-A	300					[15-20]	[30-35]	[10-15]
LTE-A	450							[45-50]

(1) Qualcomm has provided no explanation as to the methodology it used for the collection of the data reproduced in Table 6;

(2) The data within Table 6 contains several inconsistencies, mostly relating to those chipsets which were sold in relatively small volumes, and in particular to those chipsets that, on the basis of figures provided by Qualcomm, accounted for up to 2% of Qualcomm's chipset sales in a given year.[237] In particular, [Pricing information], in 2014, the weighted average price of a UMTS chipset with a theoretical maximum download speed of 3.6 Mbps was USD [20-25], the weighted average price of a UMTS chipset with a theoretical maximum download speed of 21 Mbps in 2014 was USD [15-20] and the weighted average price of a LTE chipset with a theoretical maximum download speed of 150 Mbps was USD [15-20].

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236 Table 4 of Qualcomm's response of 27 June 2016 to the Statement of Objections [...].

237 Percentage of sales for each chipset category assessed on the basis of Table 3 of Qualcomm's response of 27 June 2016 to the Statement of Objections [...]. Qualcomm itself acknowledges inconsistencies related to nine out of 60 entries in Table 4, see footnote 238 of Qualcomm's response of 27 June 2016 to the Statement of Objections [...].

(3) When only chipsets that, on the basis of figures provided by Qualcomm,[238] account for more than 2% of Qualcomm's chipset sales in a given year are taken into account, most of the inconsistencies in the data referred to in point (2) are removed. In this scenario, with most of the inconsistencies of the type acknowledged by Qualcomm[239] thus filtered out, [Pricing information].[240]

Table 7: Weighted average price of Qualcomm UMTS and LTE chipsets, 2009 to 2015, only chipsets accounting for more than 2% of Qualcomm's chipset sales a given year[241]

3GPP Standard	Max. Download speed (Mbps)	2009	2010	2011	2012	2013	2014	2015
UMTS	0.384	10.49						
UMTS	3.6	7.68	6.20	5.48				
UMTS	7.2	18.55	13.19	9.87	7.82	[5-10]	[5-10]	
UMTS	14.4		18.52	14.69	12.46	[5-10]	[5-10]	
UMTS	21					[10-15]		
UMTS	42					[15-20]	[5-10]	[0-5]
LTE	100			30.34	22.34	[15-20]	[10-15]	[10-15]
LTE	150					[35-40]	[15-20]	[5-10]
LTE-A	300							[10-15]
LTE-A	450							[45-50]

(220) Fourth, UMTS and LTE chipsets were not substitutable during the period 2011 to 2013 when LTE networks were being gradually rolled out in the EEA. This is because of the following:

(1) LTE chipsets, unlike LTE-single mode chipsets, were only partially affected by the absence of LTE coverage in certain areas because they are also compliant with GSM and UMTS; and

(2) Users purchasing devices during the period 2011 to 2013 would have taken into account the upcoming expansion of LTE networks, given that the large majority of users keep their purchased devices for two years or more.[242]

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238 Table 4 of Qualcomm's response of 27 June 2016 to the Statement of Objections [...].

239 See footnote 238 of Qualcomm's response of 27 June 2016 to the Statement of Objections [...].

240 [Pricing information]. Sales of 42 Mbps UMTS chipsets accounted for only [0-10]% of Qualcomm's sales in that year, whereas sales of 100 Mbps LTE chipsets accounted for [40-50]% of Qualcomm's sales (see Qualcomm's response of 27 June 2016 to the Statement of Objections [...], Table 3).

241 Based on Tables 3 and 4 Qualcomm's response of 27 June 2016 to the Statement of Objections [...].

242 See https://www.emarketer.com/Article/Smartphone-Owners-Wait-Years-Replace-Handsets/1014149 […].

(221) Fifth, the Commission has not concluded in its analysis of past merger cases that UMTS and LTE chipsets belong to the same relevant product market.[243] Rather, the Commission has either defined markets according to a distinction between 3G and 4G (explicitly including LTE) technologies,[244] or has given no indication that LTE chipsets belong to the same relevant product market as UMTS chipsets.[245]

(222) Sixth, the fact that UMTS and LTE chipsets belong to different markets is supported by Qualcomm's claim that one of the reasons why Apple did not select Intel in 2011 was because Intel's chipsets supported UMTS but not LTE.[246]

9.2.3.3. The substitutability of single-mode LTE chipsets and LTE chipsets

(223) During the Period Concerned, single-mode LTE chipsets represented a small proportion of worldwide sales of baseband chipsets. For example, in 2014, single-mode LTE chipsets accounted for approximately [0-10]% of worldwide sales of all baseband chipsets incorporating LTE technology.[247]

(224) The Commission concludes that single-mode LTE chipsets are not substitutable for LTE chipsets.

(225) First, single-mode LTE chipsets are unable to transmit voice.[248]

(226) Second, because of the gradual roll-out of LTE networks in the EEA during the Period Concerned, single-mode LTE chipsets were unable to ensure service continuity for voice and data services, which had to be provided using networks based on previous generations of technology including GSM and UMTS.

(227) Third, a large majority of customers wish to obtain chipsets that are backwards-compatible (i.e. LTE chipsets) rather than LTE-single mode chipsets.[249]

(228) Fourth, because of the inclusion of additional standards in the baseband chipset, suppliers of single-mode LTE chipsets are unable to switch to the supply of LTE chipsets in a short timeframe and without incurring significant additional investments or risks.[250] For example:

(1) According to […], "*UMTS is a very complex system and adding it (including multimode handling between the systems) to LTE single mode will require significant investments both in R&D and equipment. Processes for both development and certification will have to be adjusted while interactions with foundries most likely can be similar. This would also open up a complete new field related to IPR*".[251]

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243 See Qualcomm's response of 27 June 2016 to the Statement of Objections [...], paragraph 116.

244 See Commission Decision of 24 July 2015 (Case COMP/M.7632 *Nokia/Alcatel-Lucent*), paragraph 13, "*4G systems most typically refer to networks utilizing LTE*".

245 See Commission Decision of 15 December 2010 (Case COMP/M.6007 *Nokia Siemens Networks/ Motorola Network Business*); Commission Decision of 25 November 2008 (Case COMP/M.5332 *Ericsson/STM/JV*).

246 See Qualcomm's response of 27 June 2016 to the Statement of Objections [...], paragraph 358.

247 See Strategy Analytics, Baseband Market Share Tracker Q1 2015 […]. Altair, GCT, and Sequans are the only players supplying single-mode LTE chipsets (see below, footnote 369).

248 This is not the case for LTE-single mode chipsets incorporating VoLTE technology (see footnote 45).

249 See answers to […] of the request for information […] to baseband chipset customers.

250 See answers to […] of the request for information […] to baseband chipset suppliers.

251 […] non-confidential answer […] of the request for information […] to baseband chipset suppliers […].

(2) According to […], […][252]

(229) While Qualcomm claims that single-mode LTE chipsets and LTE chipsets form part of the same market, which would also include chipsets supporting all other cellular and wireless communications standards,[253] it has submitted no evidence to support this claim.

9.2.4. The substitutability of baseband chipsets that comply with different iterations of LTE technology

(230) The Commission concludes that baseband chipsets that comply with certain iterations of LTE technology are substitutable for chipsets compliant with other iterations of that technology.

(231) First, higher speed LTE chipsets can be substituted to a certain extent by chipsets of lower performance. For instance, according to […]: "*It takes time for advanced standards to substitute less advanced standards in the market. Telecom Operators take into account the operation cost and maturity of the standard when choosing a standard. When MAS [Most Advanced Standard] is not mature enough, Telecom Operator would choose the less advanced but mature standard for their wireless network. Thus, products with chipsets supporting less advanced standards, which are mature, could be a good alternative as long as Telecom Operators require (only) the mature standard (which is also less expensive for the Telecom Operators). However, once a standard has matured, and it has been adopted by Telecom Operators, products with [baseband chipsets] supporting the less advanced standard would not be a good alternative. At that point, these [baseband chipsets] would not match customers' requirements*."[254]

(232) Second, barriers to switching between different iterations of LTE technology are lower than barriers to switching between different generations of cellular communications standards. This is because new iterations of standards within a certain technology generation are to a large extent based on previous iterations. For instance, HSPA+ is based on HSPA and, as discussed in recital (234), LTE-A is based on LTE.

(233) Third, the Commission's conclusion is not affected by Qualcomm's claim that a separate market exists comprising only LTE-A baseband chipsets for the following reasons.[255]

(234) In the first place, like LTE, LTE-A is an OFDMA-based technology. LTE-A therefore represents a progression of LTE technology rather than a switch to a new technology and this is supported by the following evidence:

(1) Slides published on Qualcomm's website, which are reproduced here in this Decision and are entitled "*The evolution continues*", "*LTE Advanced: part of a*

252 […] non-confidential answer […] of the request for information […] to baseband chipset suppliers […].

253 Qualcomm's response of 27 June 2016 to the Statement of Objections [...], Section III.C.

254 […] non-confidential answer to […] of the request for information […] to baseband chipset customers […].

255 Qualcomm's response of 27 June 2016 to the Statement of Objections [...], paragraphs 155-169.

rich roadmap of LTE technologies" and "*Leading the way for global adoption of LTE*",[256] in which Qualcomm itself presents LTE-A as an evolution of LTE.

(2) A statement from Qualcomm, *"Along with carrier aggregation, LTE Advanced brings many more enhancements, including advanced antenna techniques and optimization for small cells. LTE Advanced continues to evolve [.][…]. The evolution of LTE will significantly expand the role of LTE Advanced in the future of communications […]".*[257]

(3) A 3GPP report that considers LTE-A as an evolution of LTE. In particular, the 3GPP's documents quoted by Qualcomm in its Response to the Statement of Objections refer to LTE-A as "*an evolution of LTE*" and specify that LTE-A is a "*further evolution of LTE Release 8 and 9*".[258]

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256 See https://www.qualcomm.com/invention/technologies/lte/advanced […], https://www.qualcomm.com/documents/delivering-on-the-lte-advanced-promise […], and https://www.qualcomm.com/invention/technologies/lte/lte […].

257 See page 4 of Qualcomm's 2014 10-K Report, available at http://investor.qualcomm.com/secfiling.cfm?filingID=1234452-14-320&CIK=804328.

258 See Proposal for Candidate Radio Interface Technologies for IMT-Advanced Based on LTE Release 10 and Beyond (LTE-Advanced), available at http://www.3gpp.org/IMG/pdf/2009_10_3gpp_IMT.pdf […].

(4) An academic article which according to Qualcomm has been *"written by highly-respected experts in the field*", stating that: *"Within 3GPP, LTE-Advanced is seen as the next major step in the evolution of LTE. LTE-Advanced is therefore not a new technology; it is an evolutionary step in the continuing development of LTE*"[259];

(5) Another academic article, which states that "*already the first release of LTE includes many of the features originally considered for future fourth generation systems. As the work on this first release of the LTE standard is coming to an end, the focus in 3GPP is now gradually shifting towards the further evolution of LTE, referred to as LTE-Advanced*". According to the same article, "*Although the term LTE-Advanced is used frequently, it is important to stress that this is not a new radio-access scheme but rather the evolution of LTE to further improve the performance. LTE-Advanced is thus a name for a future release of the LTE standard, currently predicted to release-10. […] In fact, many of the IMT-Advanced requirements are close to be fulfilled already with the first release of LTE.*"[260]

(6) Apple's comments on Qualcomm's Response to the Statement of Objections in which it indicated that "*LTE and the LTE-Advanced iteration are OFDMA-based, i.e. they implement an access method which allows several users to share the same frequency band and time by allocating different subcarriers to individual users, and thus belong, along with the other LTE releases, to the same relevant market irrespective of their "marketing name"*."[261]

(235) In the second place, carrier aggregation, which according to Qualcomm represents the main feature of LTE-A,[262] had already been developed on LTE (Cat 3 and Cat 4) devices.[263] Carrier aggregation is therefore not a feature that was introduced exclusively on LTE-A Cat 6 baseband chipsets.[264]

(236) In the third place, because carrier aggregation had already been developed on both LTE Cat 3 and LTE Cat 4 and LTE-A devices, the boundary between the two technologies is blurred. For example, the list of LTE-A devices referred to by Qualcomm in its Response to the Statement of Objections also includes LTE Cat 4 devices with carrier aggregation.[265]

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259 See "4G: LTE/LTE-A for Mobile Broadband" (2nd ed., 2014) (ISBN: 978-0-12-419985-9), quoted at footnote 247 of Qualcomm's response of 27 June 2016 to the Statement of Objections, paragraph 161 [...].

260 See http://www.jocm.us/uploadfile/2013/0423/20130423033506732.pdf […].

261 See Apple's comments […] on Qualcomm's response to the Statement of Objections, paragraph 19 [...].

262 See Qualcomm's response of 27 June 2016 to the Statement of Objections, paragraph 161 [...].

263 "*Commercial LTE networks started with Category 3 and 4 devices supporting 100 to 150 Mbps with continuous 20 MHz spectrum. The first version of carrier aggregation, during 2013, enabled 150 Mbps with 10 + 10 MHz allocation. The next phase with Category 6 devices has been commercially available since 2014, supporting 300 Mbps with 20 + 20 MHz. Category 9 will bring 450 Mbps with 60 MHz during 2015, and the evolution continues, with expected rates of 1 Gbps in the near future*.", see Nokia Networks white paper: LTE-Advanced Carrier Aggregation Optimization, http://resources.alcatel-lucent.com/asset/200172 […].

264 See Qualcomm's response of 27 June 2016 to the Statement of Objections, paragraph 157 [...].

265 https://en.wikipedia.org/wiki/List_of_devices_with_LTE_Advanced#cite_note-AppleLTE-2, this link was provided in footnote 262 of Qualcomm's response of 27 June 2016 to the Statement of Objections [...].

(237) In the fourth place, LTE-A and LTE are mutually compatible, in the sense that any LTE-A network can provide access to an LTE chipset and that any LTE-A baseband chipset can access an LTE network.[266] By contrast, contrary to what Qualcomm claims,[267] there is no such compatibility between LTE and UMTS, in the sense that LTE networks cannot provide access to UMTS chipsets and LTE single-mode chipsets cannot access UMTS networks.

(238) In the fifth place, the theoretical maximum download speed for LTE Cat 5 is 300 Mbps, which is the same theoretical maximum download speed for LTE Cat 6, which was the first release considered as LTE-A by Qualcomm.[268]

(239) In the sixth place, certain Qualcomm chipsets supplied during the Period Concerned, which Qualcomm itself describes as LTE-A,[269] achieved only a maximum theoretical download speed of 150 Mbps. This is the same maximum theoretical download speed as that of other LTE chipsets.[270]

(240) In the seventh place, devices running on LTE networks are capable of achieving similar, if not higher, average download speeds than devices running on LTE-A networks. For example:

(1) In the Netherlands, the LTE network of T-Mobile achieved in 2015 an average download speed of 37 Mbps. This is more than the fastest LTE-A network in the Netherlands, operated by Vodafone, which achieved in 2015 an average download speed of 25 Mbps.[271]

(2) In the United Kingdom, the LTE network of 3 achieved in 2016 an average download speed of 24.46 Mbps. This is comparable with the fastest LTE-A networks, operated by EE, which achieved in 2016 an average download speed of 27.98 Mbps.[272]

(241) In the eighth place, if, as Qualcomm claims,[273] the actual performance of LTE-A chipsets and LTE chipsets should be compared at the time when the LTE-A standard was "frozen", the comparison would have to be carried out in 2011, which is when 3GPP decided to freeze LTE Release 10.[274] However, no LTE-A chipsets were available at that time.[275]

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266 See Proposal for Candidate Radio Interface Technologies for IMT-Advanced Based on LTE Release 10 and Beyond (LTE-Advanced), available at http://www.3gpp.org/IMG/pdf/2009_10_3gpp_IMT.pdf […].

267 Qualcomm's response of 13 March 2017 to the Letter of Facts [...], paragraph 88.

268 See Qualcomm's response of 27 June 2016 to the Statement of Objections, Table 5 [...].

269 See https://www.qualcomm.com/news/releases/2012/02/27/qualcomm-third-generation-lte-chipsets-are-first-support-hspa-release-10.

270 See for instance MDM9225, MDM9225M, MDM9625, MDM9625M and MDM8994 in Qualcomm's answer to […] of the request for information […],[…] of the request for information […],[…] of the request for information […].

271 See Independent Speed test Analysis of 4G Mobile Networks Performed by DIKW Consulting, pages 15 and 16, available at https://www.t-mobile.nl/business/media/pdf/shop/aansluitingen/DIKW-speedtest-analysis-final-1.3.pdf […].

272 See https://opensignal.com/reports/2016/10/uk/state-of-the-mobile-network/ […]

273 See Qualcomm's response of 13 March 2017 to the Letter of Facts [...], paragraph 55.

274 See http://www.3gpp.org/specifications/67-releases.

275 See Qualcomm's response of 27 June 2016 to the Statement of Objections, Table 3 [...].

(242) In the ninth place, regarding the alleged lower latency of LTE-A chipsets compared to other LTE chipsets,[276] Qualcomm itself recognises that latency "*is generally just one indication of performance, and certainly not the most meaningful one*".[277]

(243) In the tenth place, contrary to what Qualcomm argues,[278] VoLTE is available not only on LTE-A chipsets but also on other LTE chipsets.[279]

(244) In the eleventh place, the theoretical maximum upload speed for LTE Cat 4 and Cat 5 is the same or higher than for LTE Cat 6.[280]

(245) In the twelfth place, several of Qualcomm's LTE-A chipsets supplied in the Period Concerned achieved the same maximum theoretical upload speed as other LTE chipsets, namely 50 Mbps.[281]

(246) In the thirteenth place, even if LTE technology did not initially comply with the IMT-Advanced requirements for 4G technology set by ITU,[282] ITU subsequently recognised that the term 4G could be used also to refer to LTE technology.[283]

(247) In the fourteenth place, as acknowledged by Qualcomm,[284] LTE is commonly marketed as a 4G technology. Even Qualcomm itself stated that it continues *"to play a significant role in the development of LTE and LTE Advanced, which are the predominant 4G technologies"*.[285]

(248) In the fifteenth place, if, as has been argued by Qualcomm,[286] compliance with the IMT-Advanced requirements and in particular with the 1 Gpbs download speed requirement were to be considered the relevant criterion for the purposes of defining a possible relevant market, practically none of the (LTE-A) chipsets supplied by Qualcomm in the Period Concerned would have to be considered part of this market. This is because of the following reasons:

(1) None of the LTE-A chipsets sold by Qualcomm until 2016 achieved a theoretical download speed of 1 Gbps (namely 1 000 Mbps);[287]

(2) Even in 2016, Qualcomm sold [Volumes sold] chipsets achieving 1 Gbps theoretical download speed ([Volumes sold]).[288] Furthermore, [Qualcomm's customers]; and

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276 See Qualcomm's response of 13 March 2017 to the Letter of Facts, paragraph 50 [...].

277 See Qualcomm's response of 13 March 2017 to the Letter of Facts, paragraph 50 [...].

278 See Qualcomm's response of 13 March 2017 to the Letter of Facts, paragraph 32 [...].

279 "*SRVCC - Single Radio Voice call Continuity is a level of functionality that is required within VoLTE systems to enable the packet domain calls on LTE to be handed over to legacy circuit switched voice systems like GSM, UMTS and CDMA 1x in a seamless manner. […] The concept for SRVCC was originally included in the 3GPP specification Release 8*", available at: http://www.radio-electronics.com/info/cellulartelecomms/lte-long-term-evolution/srvcc-single-radio-voice-call-continuity.php.

280 See Qualcomm's response of 27 June 2016 to the Statement of Objections, Table 5 [...].

281 See for instance MDM9365, MDM8992 and MDM8994 in Qualcomm's answer to […] of the request for information […] of the request for information […] of the request for information […].

282 See Qualcomm's response of 27 June 2016 to the Statement of Objections, paragraphs 157 and 158 [...].

283 http://www.itu.int/net/pressoffice/press_releases/2010/48.aspx#.V_OZE3pNvKk […].

284 See Qualcomm's response of 13 March 2017 to the Letter of Facts, paragraphs 39(ii) and 49 [...].

285 See page 4 of Qualcomm's 2014 10-K Report, available at http://investor.qualcomm.com/secfiling.cfm?filingID=1234452-14-320&CIK=804328.

286 See Qualcomm's response of 27 June 2016 to the Statement of Objections, footnote 183 [...].

287 See Table 6 of Qualcomm's response of 27 June 2016 to the Statement of Objections [...].

(3) It is only LTE-Advanced Pro, that is the iteration of LTE technology following LTE-A, that has begun to achieve download speeds approaching 1 Gbps.[289]

(249) In the sixteenth place, the Commission has not reached the conclusion in any of its previous merger decisions that equipment incorporating LTE and LTE-A technologies belong to separate markets, even in decisions in which it used the terminology "3G" and "4G" as opposed to "UMTS" and "LTE" (or "LTE-A").

(250) In the seventeenth place, it is inconsistent for Qualcomm to argue, on the one hand that there is a single product market comprising chipsets that support all relevant cellular and wireless communication standards[290] and, on the other hand, that there is a separate market for LTE-A chipsets.

(251) In the eighteenth place, and in any event, if a separate market for LTE-A chipsets were to exist, Qualcomm would enjoy even higher shares in that market than in the overall market for LTE chipsets, even on the basis of data presented by Qualcomm itself.[291]

9.2.5. The substitutability of LTE chipsets and chipsets that support CDMA but not UMTS

(252) The Commission concludes that CDMA chipsets that do not support UMTS are not substitutable for LTE chipsets.

(253) First, a majority of those baseband chipset customers that responded to requests for information would not find it technically or commercially feasible to switch to CDMA chipsets that do not support UMTS.[292] This is because the majority of mobile networks and 3G-enabled devices in the EEA use UMTS technology and CDMA compliant devices are not compatible with UMTS networks. This is confirmed by a large number of those customers that responded to requests for information, for example:

(1) According to […], *"[t]he requirement for which standard is supported by the product is driven by the individual carrier*". Moreover, "*CDMA is only used by a limited number of carriers in the world*."[293]

(2) According to […], it "*does not consider CDMA [baseband chipsets] to be technically and commercially potential substitutes for UMTS/LTE [baseband chipsets]. Technically, CDMA [baseband chipsets] cannot operate on the UMTS/LTE network. […] The cellular networks (operated by the regional telecom operators) define what wireless standard is required and in most*

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288 See the MDM9x50/55 and the MSM8998 in Qualcomm's answer to […] of the request for information […] of the request for information […] of the request for information […].

289 See Qualcomm's observations of 29 May 2017 on the evidence added to the case file since the adoption of the Statement of Objections [...], paragraph 113.

290 See Qualcomm's response of 27 June 2016 to the Statement of Objections, Section III.C [...].

291 According to Qualcomm, its shares by reference to volume in a market for LTE-A chipsets would have been [90-100]% in 2013, [85-95]% in 2014 and [60-70]% in 2015 (see Qualcomm's response of 27 June 2016 to the Statement of Objections, Table 14 [...]). Those market shares also include captive suppliers and therefore largely underestimate Qualcomm's position in the merchant market.

292 See answers to […] of the request for information […] to baseband chipset customers.

293 […] non-confidential answer to […] of the request for information […] to baseband chipset customers […].

regions (except in the US and in China) the CDMA standard is not supported by the networks."[294]

(3) According to […], *"[c]ustomers want products that support UMTS/LTE. If* […] *were to switch to using chipsets supporting only CDMA or other non-3GPP wireless standards (e.g. WiMax, WiFi, etc), its devices would no longer match customers' requirements."* [295]

(254) Second, suppliers of CDMA baseband chipsets that do not support UMTS cannot switch or expand their supply to UMTS chipsets in a short timeframe and without incurring significant additional investments or risks. This is confirmed by a large number of those baseband chipset suppliers that responded to requests for information.[296]

(255) While Qualcomm claims that CDMA chipsets that do not support UMTS and LTE chipsets that support UMTS form part of the same market, which would also include chipsets supporting all other cellular and wireless communications standards,[297] it has submitted no evidence to support this claim.

9.2.6. The substitutability of chipsets supporting UMTS-FDD and chipsets supporting UMTS-TDD but not UMTS-FDD

(256) The Commission concludes that UMTS-TDD chipsets that do not support UMTS-FDD are not substitutable for LTE chipsets that support UMTS-FDD.

(257) First, the majority of mobile networks and 3G-enabled devices in the EEA use UMTS-FDD technology. Only limited frequencies have been assigned in some Member States to UMTS-TDD technology[298] and UMTS-TDD compliant devices are not compatible with UMTS-FDD networks. This is confirmed by a majority of those baseband chipset customers that responded to the requests for information[299], including respondents such as […] and […].

(1) […]: "*UMTS-TDD is only used in China. UMTS-FDD is required by Telecom Operators outside of China. Chipsets supporting only UMTS-TDD, therefore, would not satisfy the requirements of Telecom Operators outside of China, making them commercially unfeasible*."[300]

(2) […]: "*[…] UMTS-TDD is only used in China. […] It is not commercially feasible for* […] *to replace the [baseband chipsets] supporting UMTS-FDD with [baseband chipsets] supporting UMTS-TDD if UMTS-TDD is not supported by local carrier*."[301]

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294 […] non-confidential answer to […] of the request for information […] to baseband chipset customers […].

295 […] non-confidential answer to […] of the request for information […] to baseband chipset customers […].

296 See answers to […] of the request for information […] to baseband chipset suppliers.

297 Qualcomm's response of 27 June 2016 to the Statement of Objections [...], Section III.C.

298 https://web.archive.org/web/20171028061104/http://www.spectrummonitoring.com/frequencies/, (website as of 28 October 2017).

299 See answers to […] of the request for information […] to baseband chipset customers.

300 […] non-confidential answer to […] of the request for information […] to baseband chipset customers […].

301 […] non-confidential answer to […] of the request for information […] to baseband chipset customers […].

(258) Second, suppliers of UMTS-TDD baseband chipsets that do not support UMTS-FDD cannot switch or expand their supply to UMTS-FDD baseband chipsets in a short timeframe and without incurring significant additional investments or risks.[302] This is confirmed by a majority of those baseband chipset customers that responded to requests for information, for example:

(1) According to […]: "*A switch from the supply of UMTS-TDD chipsets to chipsets supporting UMTS-FDD requires the development of technology under the new standard. This requires a very significant investment in R&D, including many 100s if not 1,000s of man-years of R&D work. Such switch will require a multi-year development phase*."[303]

(2) According to […]: "*Although the actual time and expense involved will vary, we believe that it is extremely unlikely that a supplier of a chipset supporting one standard could switch to the supply of a chipset supporting another standard in less than two years (in fact, we believe that two years would be an unusually rapid development timeframe), and for a total expenditure of less than hundreds of millions, if not billions, of dollars*."[304]

(259) While Qualcomm claims that UMTS-TDD chipsets that do not support UMTS-FDD and LTE chipsets that support UMTS-FDD form part of the same market, which would also include chipsets supporting all other cellular and wireless communications standards,[305] it has submitted no evidence to support this claim.

9.2.7. The substitutability of LTE chipsets and baseband chipsets supporting WiFi and WiMAX but not LTE

(260) The Commission concludes that chipsets supporting WLAN (commonly known as WiFi) but not LTE and chipsets supporting WiMAX but not LTE are not substitutable for LTE chipsets.

(261) First, neither WiFi nor WiMAX offers mobile cellular connectivity like LTE. This is because user access is restricted to a limited number of venues, typically including their home, place of work and selected public venues.

(262) This conclusion is not affected by Qualcomm's claim that end users consider WiFi and mobile cellular connectivity as substitutes in certain circumstances because of the following reasons.[306]

(263) In the first place, Wifi access is not comparable to cellular connectivity in terms of availability.

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302 See answers to […] of the request for information […] to baseband chipset suppliers. The Commission notes that in its answer to […] has answered that a switch would be possible. […], however, appears to have interpreted the question as if it were related to a switch from UMTS-FDD to UMTS-TDD, whereas the question was referring to a switch from UMTS-TDD to UMTS-FDD. In any event, […] stated that "*If a supplier has a commercial UMTS-FDD solution on market then the time-frame required to introduce and commercialize a UMT-TDD would require at least 2.5-3 years of development from design start to available on market*". Therefore, the time horizon considered by […] is excessive for the purposes of the assessment of supply side in the context of product market definition.

303 […] non-confidential answer to […] of the request for information […] to baseband chipset suppliers […].

304 […] non-confidential answer to […] of the request for information […] to baseband chipset suppliers […].

305 Qualcomm's response of 27 June 2016 to the Statement of Objections [...], Section III.C.

306 Qualcomm's response of 27 June 2016 to the Statement of Objections [...], paragraphs 127-132.

(264) In the second place, mobile cellular connectivity remains an important requirement for smart mobile devices, regardless of the fact that users may in some cases switch to data connectivity via Wi-Fi.[307]

(265) Second, in contrast to WiFi, the adoption of WiMAX in the EEA has been minimal. By 2014, there were only about 2.5 million WiMAX subscribers in the Union.[308]

(266) Third, a large majority of those customers that responded to the requests for information stated that chipsets incorporating WiMAX and WiFi are not substitutable for LTE chipsets.[309] For example, according to […]: "*Customers want products that support UMTS/LTE. If* […] *were to switch to using chipsets supporting only […] non-3GPP wireless standards (e.g. WiMax, WiFi, etc), its devices would no longer match customers' requirements*."[310]

(267) Fourth, contrary to Qualcomm's claim,[311] Apple's statements from 2006 and 2007 according to which WiMAX was a credible alternative to UMTS are irrelevant because they are from more than four years before the Period Concerned. Moreover, those statements refer to WiMax potentially being an alternative to UMTS and not to LTE.

(268) Fifth, suppliers of baseband chipsets supporting WiFi and WiMAX cannot switch or expand their supply to baseband chipsets compliant with LTE in a short timeframe because the addition of cellular communications standards would entail significant time and costs. This was confirmed by a majority of those baseband chipset suppliers that responded to requests for information.[312]

(269) This conclusion is not affected by the fact that […] switched from WiMAX to LTE and released its first single-mode LTE chipsets in 2012 because of the following reasons.[313]

(270) In the first place […] switched from the supply of WiMAX chips to the supply of single-mode and not multi-mode LTE chipsets.

(271) In the second place, […] itself has acknowledged that a switch to GSM and UMTS technologies, which would be required to enter the worldwide market for LTE chipsets, would be […]. According to […].[314]

(272) In the third place, […] has confirmed that switching from WiMAX to LTE would take a considerable amount of time and resources, […][315] A WiMAX chipset

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307 See answers to […] of the request for information […] to baseband chipset customers.

308 Electronic communications market indicators collected by Commission services, through National Regulatory Authorities, for the Communications Committee (COCOM).

309 See answers to […] of the request for information […] to baseband chipset customers.

310 […] non-confidential answer to […] of the request for information […] to baseband chipset customers […].

311 Qualcomm's observations of 29 May 2017 on the evidence added to the case file since the adoption of the Statement of Objections [...], paragraph 110.

312 See answers to […] of the request for information […] to baseband chipset suppliers.

313 See […] non-confidential answers to […] of the request for information […] to baseband chipset suppliers […].

314 See […] non-confidential answer to […] of the request for information […] to baseband chipset suppliers […].

315 See […] non-confidential answer to […] of the request for information […] to baseband chipset suppliers […].

manufacturer would also have to incur additional costs to ensure backward compatibility of LTE with GSM and UMTS (see recital (271)).

9.2.8. The substitutability of standalone and integrated baseband chipsets

(273) The Commission concludes that integrated chipsets are substitutable for standalone chipsets, also referred to as slim modems.

(274) First, customers often buy both integrated chipsets and slim modems[316] because they consider that an architecture based on an integrated chipset is in many cases an alternative to architecture based on a slim modem combined with an application processor (and vice-versa).[317]

(275) Second, relatively few requirements would need to be met in order for a hypothetical supplier of only integrated baseband chipsets to start supplying slim modems.[318] This conclusion is based on the following:

(1) According to Qualcomm, the requirements would not generally be any greater than for a supplier of integrated chipsets to add another chipset to its portfolio.[319]

(2) According to a number of suppliers, switching from the supply of integrated chipsets to the supply of slim modems would be relatively straightforward. For example, […] stated: *"This seems to us mostly a cut-out exercise. If the more complex product exists, it should be fairly straightforward to design a feature-reduced version. The question is what sort time and low investment means. For sure both is an order of magnitude smaller/shorter than developing a new modem."*[320] Similarly, […] stated: *"This exercise is relatively simple, and would not consume considerable resources or time."*[321]

9.2.9. The competitive constraint exerted by captive production of baseband chipsets on the merchant market sales

(276) The Commission concludes that captive production of baseband chipsets by certain OEMs, namely […], […] and […] does not exert a competitive constraint on merchant market sales of LTE chipsets.

(277) First, the production of LTE chipsets by […],[322] […][323] and […][324] is meant for self-supply and, […].

(278) Second, OEMs with captive production still rely to a significant extent on sales of baseband chipsets by third party suppliers.[325]

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316 See answers to […] of the request for information […] to baseband chipset customers.

317 See answers to […] of the request for information […] to baseband chipset customers.

318 As for the requirements that a hypothetical supplier of slim modems would need to meet in order to start supplying integrated baseband chipsets, this can be left open in the present case. This is because Apple obtained only slim modems during the Period Concerned.

319 Qualcomm's answer to […] of the request for information […].

320 […] non-confidential answer to […] of the request for information […] to baseband chipset suppliers […].

321 […] non-confidential answer […] of the request for information […] to baseband chipset suppliers […].

322 […]

323 […] non-confidential answer to […] of the request for information […].

324 […] non-confidential answer to […] of the request for information […] to baseband chipset suppliers […] and non-confidential version of […] attached to […] response to the request for information […].

(279) Third, the Commission's conclusion is not affected by Qualcomm's claim[326] that captive sales should be included in the relevant market because OEMs with captive production exert a constraint on LTE chipset suppliers for the following three reasons:

(1) OEMs with captive production are unwilling to pay more for third-party LTE chipsets than the cost at which they able to produce those chipsets themselves (other than to reflect the fact that the chipsets from the third party supplier possess qualities that the in-house chipset does not);

(2) OEMs with captive production may enter the merchant market and start supplying LTE chipsets to other OEMs; and

(3) OEMs without captive production will demand lower prices from LTE chipset suppliers because of the downstream competition between OEMs with and without captive production.

(280) In relation to point (1) of recital (279), the direct constraint that OEMs with captive production are able to exert on LTE chipset suppliers is limited for two reasons:

(1) The share of overall LTE chipset demand satisfied by captive supply is limited;[327] and

(2) Even OEMs with captive production rely to a significant extent on sales of baseband chipsets by LTE chipset suppliers.[328]

(281) In relation to point (2) of recital (279), the examples relied on by Qualcomm do not prove that OEMs with captive production may enter the merchant market and start supplying LTE chipsets to other OEMs for the following reasons:

(1) Qualcomm's example of Xiaomi starting to produce baseband chipsets[329] relates to a launch in 2017 and therefore after the Period Concerned. Moreover, the newspaper article to which Qualcomm refers[330] underlines the uncertainty surrounding Xiaomi's project when it states that: "*Mr Lei* [Xiaomi's chief

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325 See for example […].

326 Qualcomm's response of 27 June 2016 to the Statement of Objections [...], paragraphs 118-122 and 261-269; Qualcomm's response of 13 March 2017 to the Letter of Facts […], paragraphs 102 and 108.

327 According to Strategy Analytics […], captive production represents the following share of total LTE chipset production in the Period Concerned: 2011: [40-50]%; 2012: [5-15]%; 2013: [0-10]%; 2014: [0-10]%; 2015: [10-20]%; 2016: [10-20]%. The volumes represented in 2011 are disproportionately high given that only limited amounts of baseband chipsets were sold in that year and therefore even small volumes can amount for a sizeable part of overall production.

328 On the basis of Strategy Analytics ([…], Tab 5), in the period 2014 to 2016 captive production accounted for the following percentage of […] and […] respective needs (only Q1 and Q3 of each year indicated): […]. Strategy Analytics does not report data before 2014 but it is unlikely that those figures would be representative given that, even including captive production, Qualcomm's market shares in the period 2011 to 2013 would be significant.

329 Qualcomm's response of 13 March 2017 to the Letter of Facts [...], paragraph 98.

330 Footnote 111 of Qualcomm's response of 13 March 2017 to the Letter of Facts [...]. For the article see Financial Times, "China smartphone maker Xiaomi designs its first chip," 28 February 2017, available at https://www.ft.com/content/c18e0cf8-fd88-11e6-96f8-3700c5664d30?emailId=58b5faeed4c26e0004a2dca2&segmentId=60a126e8-df3c-b524-c979-f90bde8a67cd.

executive] *admitted that chip design was a high-risk field with "nine ways to die for every one way to survive*""[331];

(2) Qualcomm's example of […] becoming "*serious about selling its chipset solutions to third-party device suppliers*"[332] relates to limited sales of baseband chipsets to […] in 2015. In total, […] sold less than […] chipsets on the merchant market between January 2014 and September 2016;[333]

(3) Qualcomm's example of Apple using an application processor produced captively[334] and […] supplying application processors to OEMs[335] are irrelevant as they relate to application processors and not to LTE chipsets; and

(4) Qualcomm's arguments relating to LG, Sony and ZTE[336] are speculative and based on the possible launch of chipsets after the Period Concerned.

(282) In relation to point (3) of recital (279), any indirect constraint that OEMs with captive production may exert on LTE chipset suppliers because of the downstream competition between OEMs with and without captive production would be limited. End-consumers of devices of OEMs with no captive production are unlikely to switch to OEMs with captive production in the event of a small but significant non-transitory price increase of LTE chipsets for the following reasons:

(1) LTE chipsets represent only approximately [0-10]% of the price of smartphones. In 2015, the average selling price of a smartphone was approximately USD [250-300][337] whereas as average selling price of a LTE chipset was approximately USD [10-15];[338] and

(2) LTE smartphones are differentiated products since their performance, design, brand prestige, functionality or supported applications vary significantly.[339]

(283) In the fourth place, and in any event, even if captive production were part of the relevant market, Qualcomm would have held high shares in that market.[340]

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331 See Financial Times, "China smartphone maker Xiaomi designs its first chip," 28 February 2017, available at https://www.ft.com/content/c18e0cf8-fd88-11e6-96f8-3700c5664d30?emailId=58b5faeed4c26e0004a2dca2&segmentId=60a126e8-df3c-b524-c979-f90bde8a67cd.

332 Qualcomm's response of 27 June 2016 to the Statement of Objections [...], paragraph 122.

333 See non-confidential version of […] attached to […] response to the request for information […].

334 Qualcomm's response of 27 June 2016 to the Statement of Objections [...], paragraph 264.

335 Qualcomm's response of 27 June 2016 to the Statement of Objections [...], paragraph 267.

336 Qualcomm's response of 27 June 2016 to the Statement of Objections [...], paragraph 264.

337 Statista, Average global selling price for smartphones […]. This figure is likely to underestimate the average selling price of an LTE smartphone, as it also includes UMTS devices, which are typically low-end and priced substantially lower than LTE devices.

338 Strategy Analytics Baseband Market Share Tracker Q2 2016 […].

339 Contrary to Qualcomm's claim, there is no need to consider MBB devices because, as Qualcomm itself admits, they accounted for only a small proportion of LTE chipset sales during the Period Concerned (see Qualcomm's observations of 29 May 2017 on the evidence added to the case file since the adoption of the Statement of Objections [...], paragraph 89: "[…] *downstream demand for data-centric devices was short-lived; it declined rapidly, and the so-called "MBB" became largely obsolete due to the emergence of ever more capable smartphones and newer devices such as tablets able to serve as mobile hotspots and provide seamless wireless broadband connectivity to other devices such as PCs*.")

340 According to Strategy Analytics, if captive production were included, Qualcomm's market shares in the Period Concerned would have been: (i) by reference to value, [60-70]% in 2011, [90-100]% in 2012, [90-100]% in 2013, [80-90]% in 2014, [60-70]% in 2015 and [50-60]% in 2016; and (ii) by reference to

9.2.10. The need to carry out a SSNIP test

(284) Contrary to Qualcomm's claim,[341] in order to reach the conclusions set out in Sections 9.2.3 to 9.2.9, the Commission was not required to carry out a SSNIP test.

(285) First, the SSNIP test is not the only method available to the Commission when defining the relevant product market.[342]

(286) Second, the Commission is required to make an overall assessment of all the evidence and there is no hierarchy between the types of evidence that the Commission can rely upon.[343]

(287) Third, the SSNIP test may not have been appropriate because prices of LTE chipsets might have been set at a supra-competitive level due to Qualcomm's position in the worldwide market for LTE chipsets since 2010 (see Section 10.3 below).[344]

9.3. Relevant geographic market

9.3.1. Principles relating to geographic market definition

(288) The relevant geographic market comprises an area in which the undertakings concerned are involved in the supply and demand of the relevant products or services, in which area the conditions of competition are similar or sufficiently homogeneous and which can be distinguished from neighbouring areas in which the prevailing conditions of competition are appreciably different.[345]

(289) The definition of the geographic market does not require the conditions of competition between traders or providers of services to be perfectly homogeneous. It is sufficient that they are similar or sufficiently homogeneous, and accordingly, only those areas in which the conditions of competition are 'heterogeneous' may not be considered to constitute a uniform market.[346]

9.3.2. Application to this case

(290) For the following reasons, the Commission concludes that the market for LTE chipsets is worldwide in scope.

(291) First, with few exceptions, LTE chipset suppliers and OEMs all offer their products throughout the world.

(292) Second, LTE chipset supply agreements are typically global in scope. This is confirmed by Qualcomm's agreements with OEMs.[347]

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volume, [50-60]% in 2011, [90-100]% in 2012, [90-100]% in 2013, [80-90]% in 2014, [60-70]% in 2015 and [50-60]% in 2016. Strategy Analytics Baseband Market Share Tracker Q3 2016 […].

341 Qualcomm's response of 27 June to the Statement of Objections [...], paragraph 85.

342 Case T-699/14 *Topps Europe v Commission*, EU:T:2017:2, paragraph 82.

343 Case T-210/01 *General Electric v Commission*, EU:T:2005:456, paragraph 519; Case T-343/06 *Shell Petroleum and Others v Commission*, EU:T:2012:478, paragraph 171; Case T-342/07 *Ryanair v Commission*, EU:T:2010:280, paragraph 136; Case T-175/12 *Deutsche Börse v Commission*, EU:T:2015:148, paragraph 133.

344 Case T-699/14 *Topps Europe v Commission*, EU:T:2017:2, paragraph 82.

345 Case 27/76 *United Brands vs. Commission*, EU:C:1978:22, paragraph 44; Case 322/81, *Michelin v Commission*, EU:C:1983:313, paragraph 26, Case 247/86, *Alsatel v Novasam*, EU:C:1988:469, paragraph 15.

346 Case 27/76 *United Brands v Commission*, EU:C:1978:22, paragraphs 11 and 53.

347 See Qualcomm's response to the request for information […], and in particular […]

(293) Third, given the physical characteristics of LTE chipsets, transport costs are negligible in comparison to the value of the products.[348]

10. DOMINANCE

10.1. Principles

(294) Dominance is *"a position of economic strength enjoyed by an undertaking, which enables it to prevent effective competition being maintained on the relevant market by affording it the power to behave to an appreciable extent independently of its competitors, its customers and ultimately of consumers."*[349]

(295) The existence of a dominant position derives from a combination of several factors which, taken separately, are not necessarily determinative.[350]

(296) One important factor is the existence of very large market shares, which are in themselves, save in exceptional circumstances, evidence of the existence of a dominant position.[351] An undertaking which has a very large market share and holds it for some time is in a position of economic strength which makes it an unavoidable trading partner and which, because of this alone, secures for it, at the very least during relatively long periods, that freedom of action which is the special feature of a dominant position.[352] A market share of 50% constitutes in itself, save in exceptional circumstances, evidence of the existence of a dominant position.[353] Likewise, a market share of between 70% and 80% is in itself a clear indication of the existence of a dominant position in a relevant market.[354] The ratio between the market share held by the dominant undertakings and that of its nearest rivals is also a highly significant indicator.[355]

(297) A decline in market shares which are still very large cannot in itself constitute proof of the absence of a dominant position, particularly when the market shares are still in fact very high at the end of the infringement period.[356] In the same vein, whilst retention of market share may show the existence of a dominant position, a decline in

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348 The dimensions of baseband chips are typically less than 15mm x 15mm (see for example https://www.anandtech.com/print/6541/the-state-of-qualcomms-modems-wtr1605-and-mdm9x25), while their average selling price is above $10 (See Strategy Analytics, Baseband Market Share Tracker Q1 2015, […]).

349 Case 27/76 *United Brands v Commission*, EU:C:1978:22, paragraph 65.

350 Case 27/76 *United Brands v Commission*, EU:C:1978:22, paragraph 66; and Case 85/76 *Hoffmann-La Roche v Commission*, EU:C:1979:36, paragraph 39.

351 Case 85/76 *Hoffmann-La Roche v Commission*, EU:C:1979:36, paragraphs 39 and 41; and Case T-65/98 *Van den Bergh Foods v Commission*, EU:T:2003:281, paragraph 154.

352 Joined Cases C-395/96 P and C-396/96 P Co*mpagnie maritime belge transports and Others v Commission*, EU:C:2000:132, paragraph 132; Case T-336/07 *Telefónica and Telefónica de España v Commission*, EU:T:2012:172, paragraph 149; Case C-23/14 *Post Danmark A/S v Konkurrencerådet*, EU:C:2015:651, paragraph 40.

353 Case C-62/86 *Akzo v Commission*, EU:C:1991:286, paragraph 60; Case T-340/03 *France Télécom*, EU:T:2007:22, paragraph 100; and Case T-336/07, *Telefónica and Telefónica de España v Commission*, EU:T:2012:172, paragraph 150.

354 Case C-62/86 *Akzo v Commission*, EU:C:1991:286, paragraph 60; and Case T-336/07 *Telefónica and Telefónica de España v Commission*, EU:T:2012:172, paragraph 150.

355 Case T-219/99 *British Airways v Commission*, EU:T:2003:343, paragraph 210.

356 Case T-219/99 *British Airways v Commission*, EU:T:2003:343, paragraphs 223-224; Case T-340/03 *France Télécom v Commission*, EU:T:2007:22, paragraph 104.

market shares that are still very large cannot in itself constitute proof of the absence of a dominant position.[357]

(298) While in recent and fast-growing sectors characterised by short innovation cycles, large market shares may sometimes turn out to be ephemeral and not necessarily indicative of a dominant position,[358] the fact that an undertaking may enjoy high market shares in a fast-growing market cannot preclude application of Article 102 of the Treaty.[359]

(299) Even the existence of lively competition on a particular market does not rule out the possibility that there is a dominant position on that market, since the predominant feature of such a position is the ability of the undertaking concerned to act without being materially constrained by this competition in its market strategy and without for that reason suffering detrimental effects from such behaviour. Thus, the fact that there may be competition on the market is a relevant factor for the purposes of ascertaining whether a dominant position exists, but it is not in itself a decisive factor in that regard.[360]

(300) Another important factor for assessing dominance is the existence of barriers preventing potential competitors from having access to the market and actual competitors from expanding their activities on the market.[361]

(301) Barriers to entry or expansion can take various forms, and can be created by the dominant undertaking's own conduct, for example where it has made significant investments which entrants or competitors would have to match.[362]

(302) Although the mere possession of IPR cannot be considered to confer a dominant position,[363] their possession is nonetheless capable, in certain circumstances, of creating a dominant position, in particular by enabling an undertaking to prevent effective competition on the market.[364]

(303) Where a holder of the IPR is regarded as enjoying a dominant position, the requirement that use of those IPR be non-abusive cannot be regarded as insufficient reward in the light of the incentives for innovation.[365]

(304) Regarding countervailing buyer power, in a situation where a supplier holds a dominant position, the presence of one or more large customers is not capable of affecting the dominant position of the supplier where the demand side is composed of a number of customers that are not equally strong and which cannot be aggregated.[366] It is also possible both for a seller and for a purchaser to hold a

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357 Joined Cases T-24/93 to T-26/93 and T-28/93 *Compagnie maritime belge transports and Others* v *Commission*, EU:T:1996:139, paragraph 77.

358 Case T-79/12 *Cisco Systems, Inc. and Messagenet SpA v Commission*, EU:T:2013:635, paragraph 69.

359 Case T-340/03 *France Télécom v Commission*, EU:T:2007:22, paragraphs 107-109.

360 Case 27/76 *United Brands v Commission*, EU:C:1978:22, paragraphs 108 to 129; Case 85/76 Hoffmann-La Roche *v Commission*, EU:C:1979:36, paragraph 70; Case T-340/03 *France Télécom v Commission*, EU:T:2007:22, paragraph 101.

361 Case 27/76 *United Brands v Commission*, EU:C:1978:22, paragraphs 91 and 122; and Case 85/76 *Hoffmann-La Roche v Commission*, EU:C:1979:36, paragraph 48.

362 Case 27/76 *United Brands v Commission*, EU:C:1978:22, paragraph 91.

363 Joined Cases C-241/91 P and C-242/91 P *RTE and ITP v Commission*, EU:C:1995:98, paragraph 46.

364 Case T-321/05 *AstraZeneca v Commission*, EU:T:2010:266, paragraph 270.

365 Case T-321/05 *AstraZeneca v Commission*, EU:T:2010:266, paragraph 273.

366 Case T-228/97 *Irish Sugar v Commission*, EU:T:1999:246, paragraphs 97-98.

dominant position within the meaning of Article 102 of the Treaty and Article 54 of the EEA Agreement.[367]

10.2. Application to this case

(305) For the reasons set out in Sections 10.3 to 10.5, the Commission concludes that Qualcomm held a dominant position in the worldwide market for LTE chipsets between 1 January 2011 and 31 December 2016 (hereinafter "between 2011 and 2016").

10.3. Market shares

(306) The Commission concludes that Qualcomm has enjoyed large shares in the worldwide market for LTE chipsets since 2010. This provides a good indication of Qualcomm's competitive strength in that market.

(307) For the purpose of calculating market shares in the worldwide market for LTE chipsets, the Commission has used two datasets.

(308) First, the Commission has calculated market shares based on value. The LTE revenues of Qualcomm and the other main suppliers[368] of baseband chipsets in the worldwide market for LTE chipsets for the period 2010 to 2016 were estimated by Strategy Analytics as follows.[369]

Table 8: Revenues in the worldwide market for LTE chipsets, 2010 to 2016[370]

LTE chipset revenues (USD million)	2010	2011	2012	2013	2014	2015	2016
Qualcomm	[0-1,000]	[0-1,000]	[1,000-5,000]	[5,000-10,000]	[10,000-15,000]	[10,000-15,000]	[10,000-15,000]
MediaTek	[0-1,000]	[0-1,000]	[0-1,000]	[0-1,000]	[0-1,000]	[1,000-5,000]	[1,000-5,000]
Spreadtrum	[0-1,000]	[0-1,000]	[0-1,000]	[0-1,000]	[0-1,000]	[0-1,000]	[0-1,000]
Intel	[0-1,000]	[0-1,000]	[0-1,000]	[0-1,000]	[0-1,000]	[0-1,000]	[0-1,000]

367 Case T-219/99 *British Airways v Commission*, EU:T:2003:343, paragraph 102.

368 While the value of certain […] chipsets ought to be excluded for the purpose of these calculations because they do not provide backwards compatibility to UMTS, the Commission has not done so because the data provided by Strategy Analytics is insufficiently granular as it does not provide breakdown by chipset type (of which the […] sales are composed). In any case, taking into account the value of these […] chipsets is favourable to Qualcomm as it reduces its market shares.

369 Strategy Analytics also reports relevant revenues for GCT, Sequans, and Altair. All three of these suppliers produced mostly single-mode LTE chipsets, which are not part of the worldwide market for LTE chipsets (for Altair, see http://altair-semi.com/about/; for GCT, see http://www.gctsemi.com/html/LTE html; for […], see […] non-confidential answer to […] of the request for information […] to baseband chipset suppliers […] and to […] of the request for information […]). In addition, Strategy Analytics also reports relevant revenues for […], […] and […]. However, as discussed above in Section [9.2.9], these sales are not part of worldwide market for LTE chipsets. Therefore, these suppliers have also been excluded for the purposes of market share calculations.

370 Source: Strategy Analytics Baseband Market Share Tracker Q3 2016 […]. Intel includes Infineon. Renesas Mobile includes Renesas and NEC. Data for Q3 2016 and Q4 2016 are provisional.

Marvell	[0-1,000]	[0-1,000]	[0-1,000]	[0-1,000]	[0-1,000]	[0-1,000]	[0-1,000]
Leadcore	[0-1,000]	[0-1,000]	[0-1,000]	[0-1,000]	[0-1,000]	[0-1,000]	[0-1,000]
Renesas Mobile	[0-1,000]	[0-1,000]	[0-1,000]	[0-1,000]	[0-1,000]	[0-1,000]	[0-1,000]
ST-Ericsson	[0-1,000]	[0-1,000]	[0-1,000]	[0-1,000]	[0-1,000]	[0-1,000]	[0-1,000]
Broadcom	[0-1,000]	[0-1,000]	[0-1,000]	[0-1,000]	[0-1,000]	[0-1,000]	[0-1,000]
NVIDIA	[0-1,000]	[0-1,000]	[0-1,000]	[0-1,000]	[0-1,000]	[0-1,000]	[0-1,000]
Others	[0-1,000]	[0-1,000]	[0-1,000]	[0-1,000]	[0-1,000]	[0-1,000]	[0-1,000]
Total Revenues	[0-1,000]	[0-1,000]	[1,000-5,000]	[5,000-10,000]	[10,000-15,000]	[10,000-15,000]	[15,000-20,000]

(309) Based on Table 8, the estimated market shares by reference to value in the worldwide market for LTE chipsets were as follows.

Table 9: Estimated shares in the worldwide market for LTE chipsets by reference to value, 2010 to 2016[371]

LTE chipset market shares (by revenue)	2010	2011	2012	2013	2014	2015	2016
Qualcomm	[90-100]%	[90-100]%	[90-100]%	[90-100]%	[90-100]%	[70-80]%	[60-70]%
MediaTek	[0-10]%	[0-10]%	[0-10]%	[0-10]%	[0-10]%	[10-20]%	[20-30]%
Spreadtrum	[0-10]%	[0-10]%	[0-10]%	[0-10]%	[0-10]%	[0-10]%	[0-10]%
Intel	[0-10]%	[0-10]%	[0-10]%	[0-10]%	[0-10]%	[0-10]%	[0-10]%
Marvell	[0-10]%	[0-10]%	[0-10]%	[0-10]%	[0-10]%	[0-10]%	[0-10]%
Leadcore	[0-10]%	[0-10]%	[0-10]%	[0-10]%	[0-10]%	[0-10]%	[0-10]%
Renesas Mobile	[0-10]%	[0-10]%	[0-10]%	[0-10]%	[0-10]%	[0-10]%	[0-10]%
ST-Ericsson	[0-10]%	[0-10]%	[0-10]%	[0-10]%	[0-10]%	[0-10]%	[0-10]%
Broadcom	[0-10]%	[0-10]%	[0-10]%	[0-10]%	[0-10]%	[0-10]%	[0-10]%
NVIDIA	[0-10]%	[0-10]%	[0-10]%	[0-10]%	[0-10]%	[0-10]%	[0-10]%
Others	[0-10]%	[0-10]%	[0-10]%	[0-10]%	[0-10]%	[0-10]%	[0-10]%
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

(310) Qualcomm's market share by reference to value was above [60-70]% between 2011 and 2016 and above [90-100]% until 2014. Moreover, until 2014, none of Qualcomm's competitors had a market share exceeding [0-10]% and thereafter, only MediaTek's share was above [0-10]%.

(311) Second, the Commission has calculated market shares based on volume. The Commission has obtained the following data from major LTE chipset suppliers on their LTE chipsets shipped for the period 2010 to 2016.

371 Source: Strategy Analytics Baseband Market Share Tracker Q3 2016 […]. Intel includes Infineon. Renesas Mobile includes Renesas and NEC. Data for Q3 2016 and Q4 2016 are provisional.

Table 10: Volumes shipped in the market for LTE chipsets, 2010 to 2016[372]

LTE chipset volumes (millions units)	2010	2011	2012	2013	2014	2015	2016
Qualcomm	2.2	14.7	162.9	[250-350]	[450-550]	[650-750]	[650-750]
MediaTek	[…]	[…]	[…]	[…]	[…]	[…]	[…]
Spreadtrum	[0-5]	[0-5]	[0-5]	[0-5]	[0-5]	[5-25]	[50-100]
Intel	[…]	[…]	[…]	[…]	[…]	[…]	[…]
Marvell	[…]	[…]	[…]	[…]	[…]	[…]	[…]
Leadcore	[0-5]	[0-5]	[0-5]	[0-5]	[0-5]	[5-25]	[0-5]
NVIDIA	[…]	[…]	[…]	[…]	[…]	[…]	[…]
Ericsson	[…]	[…]	[…]	[…]	[…]	[…]	[…]
Renesas	[…]	[…]	[…]	[…]	[…]	[…]	[…]
Total	[0-5]	[5-25]	[150-250]	[250-350]	[550-650]	[850-950]	[1150-1350]

(312) Based on Table 10, the estimated market shares by reference to volume in the worldwide market for LTE chipsets were as set out in Table 11.

372 Commission analysis of data ("Market reconstruction") provided by Qualcomm in response to […] of the request for information […] of the request for information […] of the request for information […] and by […] in response to […] of the request for information […] in response to […] of the request for information […] and […] in response to […] of the request for information […]. As […] did not respond to the request for information […] and […], Strategy Analytics' volume estimates have been used for these companies […]. For 2016, […] has provided actual sales for the period January to October 2016 and sales forecasts, based on expected orders, for the period November to December 2016. These figures also do not include volumes of baseband chipsets that are not UMTS-compliant. The Commission excluded for the period 2014 to 2016 certain sales from […] of chipsets that are not UMTS-compliant. While Table 7 of Annex 1 of the Letter of Facts […] contained clerical errors relating to data from […], those errors do not affect the results of the Market reconstruction (see footnote 373) and the Commission has corrected those errors in this Decision.

Table 11: Estimated shares in the worldwide market for LTE chipsets by reference to volume, 2010 to 2016[373]

LTE market shares	2010	2011	2012	2013	2014	2015	2016
Qualcomm	76.30%	86.30%	95.90%	[90-100]%	[90-100]%	[80-90]%	[60-70]%
MediaTek[374]	[0-10]%	[0-10]%	[0-10]%	[0-10]%	[0-10]%	[10-20]%	[20-30]%
Spreadtrum	-	-	[0-10]%	[0-10]%	[0-10]%	[0-10]%	[0-10]%
Intel	-	-	-	[0-10]%	[0-10]%	[0-10]%	[0-10]%
Marvell	-	[0-10]%	[0-10]%	[0-10]%	[0-10]%	[0-10]%	[0-10]%
Leadcore	-	-	-	-	[0-10]%	[0-10]%	[0-10]%
NVIDIA	-	[0-10]%	[0-10]%	[0-10]%	[0-10]%	[0-10]%	[0-10]%
Ericsson	-	-	-	-	[0-10]%	[0-10]%	
Renesas	[20-30]%	[10-20]%	[0-10]%	[0-10]%	-	-	-
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

(313) Qualcomm's market share by reference to volume was above [60-70]% between 2011 and 2016 and above [80-90]% until 2015.

(314) The Commission's conclusion that Qualcomm's large market shares provide a good indication of its competitive strength in the worldwide market for LTE chipsets is not affected by Qualcomm's claims that:

(1) Qualcomm's initial investments in LTE technology granted it only a temporary advantage in the worldwide market for LTE chipsets, which was characterised by fast growth and innovation during the Period Concerned;[375]

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373 Market reconstruction. As […] did not respond to the request for information […] and […], Strategy Analytics' volume estimates have been used for these companies […]. […] submission is non-confidential vis-a-vis Qualcomm. For 2016, […] has provided actual sales for the period January 2016 to October 2016 and sales forecasts, based on expected orders, for November 2016 and December 2016. While Table 8 of the Annex 1 of the Letter of Facts […] contained a clerical error relating to data from […], that error does not affect the results of the Market reconstruction and the Commission has corrected that error in the Decision (Qualcomm's shares in the Letter of Facts were the following: 2010 – 76.3%; 2011 – 86.3%, 2012 – 95.9%, 2013 – [90-100]%, 2014 – [90-100]%, 2015 – [80-90]%, 2016 – [60-70]%. Even using these (in some years lower) shares would not change the Commission's conclusion reached in Section 10.3 as Qualcomm's market share by reference to volume would still be above [60-70]% throughout the Period Concerned and above [80-90]% until 2015).

374 The Commission has excluded certain volumes of […] chipsets because they do not provide backwards compatibility to UMTS ([…] response to […] of the request for information […]).

375 See Qualcomm's response of 27 June 2016 to the Statement of Objections [...], paragraph 222, second bullet point; Qualcomm's response to the Letter of Facts […], paragraph 107, fourth bullet point, and paragraph 108, fourth bullet point.

(2) The Commission disregarded the competitive constraint exerted on Qualcomm by MediaTek[376] and by Intel;[377]

(3) Qualcomm's volume-based market shares are a more relevant indicator of its economic strength during the Period Concerned than value-based market shares; and

(4) Qualcomm is not an unavoidable trading partner.[378]

(315) First, Qualcomm's influence on the development of LTE technology granted it a lasting advantage throughout the Period Concerned in the worldwide market for LTE chipsets. Qualcomm held a market share more than nine times higher than the combined market shares of other chipset suppliers between 2011 and 2014 and more than twice as high as the next largest chipset supplier (MediaTek) in 2015 and 2016.

(316) Second, any competitive constraint exerted on Qualcomm by MediaTek and Intel during the Period Concerned was not capable of affecting Qualcomm's dominant position on the worldwide market for LTE chipsets.

(317) In the first place, MediaTek was during the Period Concerned mainly focused on the low and mid-range segments of LTE chipsets and on sales in China. This is confirmed by the following:

(1) Strategy Analytics' September 2016 baseband market share tracker, which indicated that [Third party confidential information][379]

(2) The fact that customers of MediaTek tends to use Qualcomm's chipsets in their mid and high-end smartphones. For example, Sony uses MediaTek's Helio P10 in its Xperia XA (with a retail price of around EUR 250),[380] whereas it uses Qualcomm's Snapdragon 650 and Qualcomm's Snapdragon 820 in its Xperia X (with a retail price of around EUR 400) and Xperia X Performance (with a retail price of around EUR 600) respectively.[381]

(3) An article of 27 January 2015 referred to by Qualcomm, which in addition to describing MediaTek as a *"very significant supplier of wireless chipsets*", states that "*Mediatek has gained <u>some</u> market share"* and concludes by *"It's good to see Qualcomm get a <u>little</u> competition. No sector should be a one-horse race. Now it remains to be seen what kinds of wins Mediatek can rack up.*" (emphasis added)[382]

(4) Research by ABI research from 17 February 2016 indicating that Qualcomm is *"well placed to continue its predominance in the baseband market"* whereas *"MediaTek and Spreadtrum remain the weakest links in the LTE CA market,*

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376 See Qualcomm's response of 27 June 2016 to the Statement of Objections [...], paragraph 183 and the following; Qualcomm's response of 13 March 2017 to the Letter of Facts […], paragraph 107, fifth bullet point, and paragraphs 109 to 116.

377 See Qualcomm's response of 27 June 2016 to the Statement of Objections [...], paragraphs 189 to 190.

378 Qualcomm's response of 27 June 2016 to the Statement of Objections, paragraphs 321 to 330.

379 Strategy Analytics Baseband Market Share Tracker Q2 2016 […], Point three, Key points.

380 See http://www.gsmarena.com/sony_xperia_xa-7950.php […].

381 See http://www.gsmarena.com/sony_xperia_x-7948.php […] and http://www.gsmarena.com/sony_xperia_x_performance-7949.php […].

382 See Qualcomm's response of 27 June 2016 to the Statement of Objections, paragraph 184. The article can be found at: https://www.itworld.com/article/2876178/a-challenger-emerges-for-qualcomm-mediatek.html?_sm_au_=iVV7MVWnbnPDrHKN.

and there is no evidence to suggest that this will change in the foreseeable future"[383].

(5) […] statement that "*Qualcomm is a leader in wireless technology in the market. MediaTek has great business potential and frequently supplies to mid and low tier products.*"[384]

(6) […] statement that "*MediaTek has traditionally provided chipsets for lower end devices mainly.*"[385]

(7) […] statement that "*Currently Qualcomm is dominating the market for BCs. Also, Qualcomm is the only chipset supplier that sells LTE chipsets with CDMA compatibility. There appears to be a trend towards Chinese chipset manufacturers, such as MediaTek and Spreadtrum increasing their market presence both in China and worldwide. However, they remain significantly smaller than Qualcomm and do not offer the same range of products. In terms of product offerings, Qualcomm is by far the leading supplier on the high-end segment of BCs* […]."[386]

(8) […] statement that "*Nowadays, mainstream BC providers in the BC market include Qualcomm, MediaTek, Hisilicon, Nvidia, Intel, Spreadtrum, Marvell and VIA, etc. […]. At present, Qualcomm is the industry leader, leading in high-end BC market. […] MediaTek provides BCs supporting all the communication standards […] but mainly middle and low-end BC market. MediaTek has the biggest market share in China with a large influence. […].*"[387]

(9) […] statement that "*Currently, Qualcomm dominates the market particularly at the high end, with Intel maintaining a small share due to a very large investment, and Mediatek and smaller China players having a presence in the China market*."[388]

(10) […] statement that *"[…] Mediatek has historically focused on supplying BCs for use in low-end/ mid-market mobile devices. Although Mediatek currently may have ambitions to enter the premium segment, reports suggest that its technology still lags far behind and it is not a viable competitor to Qualcomm. […]"*[389]

(318) In the second place, Intel's market share during the Period Concerned remained below [0-5]% both in terms of value and volume. This is consistent with […]

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383 See https://www.abiresearch.com/press/abi-research-forecasts-lte-carrier-aggregation-pow/ […]. LTE CA stands for LTE-Advanced chipsets that form part of the (high-end) LTE chipset market.

384 […] non-confidential answer to […] of the request for information […] to baseband chipset customers […].

385 […] non-confidential answer to […] of the request for information […] to baseband chipset customers […].

386 […] non-confidential answer to […] of the request for information […] to baseband chipset customers […].

387 […] non-confidential answer to […] of the request for information […] to baseband chipset customers […].

388 […] non-confidential answer to […] of the request for information […] to baseband chipset suppliers […].

389 […] non-confidential answer to […] of the request for information […] to baseband chipset suppliers […].

statement that "*Qualcomm dominates the market particularly at the high end, with Intel maintaining a small share due to a very large investment*."[390]

(319) Third, market shares calculated by reference to value rather than to volume are a more relevant indicator of Qualcomm's economic strength in the worldwide market for LTE chipsets because of the diversity in performance and quality of the LTE chipset suppliers during the Period Concerned.[391] Moreover, and in any event, Qualcomm's market share by reference to volume was above [60-70]% throughout the Period Concerned and above [80-90]% in each year between 2011 and 2015.

(320) Fourth, Qualcomm has failed to substantiate its claim that it is not an unavoidable trading partner in the worldwide market for LTE chipsets.

(321) In the first place, Qualcomm's shares of the worldwide market for LTE chipsets, were:

(1) By reference to value, above [60-70]% throughout the Period Concerned and above [90-100]% until 2014; and

(2) By reference to volume, above [60-70]% throughout the Period Concerned and above [80-90]% in each year between 2011 and 2015.

(322) In the second place, between 2011 and 2015, Apple had no alternative as regards its requirements of LTE chipsets for its iPhone devices.[392]

(323) In the third place, in an email dated 8 January 2013, [Personal data], at the time [Personal data], indicated that Qualcomm was at least an unavoidable trading partner for its iPhone flagship devices: *"Recall the competitive threat we've viewed is on the iPADs and low tier as our technology would prevail on high sku."*[393]

(324) In the fourth place, this is confirmed by Qualcomm's statement that "*during much of the relevant period, there were no viable alternative suppliers of […] multimode LTE baseband chipsets*."[394]

10.4. Barriers to entry and expansion

(325) The Commission concludes that the worldwide market for LTE chipsets is characterised by the existence of a number of barriers to entry and expansion for the reasons set out in Sections 10.4.1 to 10.4.5.

10.4.1. Research and development (R&D) activities related to the design of LTE chipsets

(326) A new supplier of LTE chipsets needs to undertake significant initial investments in R&D activities related to the design of LTE chipsets before it can launch its first product on the market.

(327) This is confirmed by the following.

(328) First, Qualcomm spent a total of USD [20,000-30,000] million on R&D during the period 2010 to 2015.[395]

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390 […] non-confidential answer to […] of the request for information […] to baseband chipset suppliers […].

391 See for example Table 3 above.

392 See Section [11.4.2]

393 Annex 14 to Qualcomm's response of 27 June 2016 to the Statement of Objections […].

394 See Qualcomm's response of 27 June 2016 to the Statement of Objections [...], paragraph 596.

(329) Second, a number of suppliers of LTE chipsets indicated that they have invested hundreds of millions of dollars in R&D:

(1) According to […]: "*Our company invested billions of dollars in organic R&D since 2007, as well as making several acquisitions, in an effort to develop a cellular baseband business.*"[396]

(2) According to […], "*more than 70% of the company's total [baseband chipset] investment goes to R&D, design and physical infrastructure costs.*"[397]

(3) According to […], "*[t]he current operating cost of the* […] *modem business is approximately $135 million a year. Approximately 85% of that sum is spent on R&D related to UMTS and LTE [baseband chipset] production.*"[398]

(4) According to […], "*Since 2007,* […] *has invested over [several billions] in the development and enablement of its baseband chips*"."[399]

(5) […] outlined that "*It is estimated that between 2010 and 2014,* […] *invested about US$ [700-800] million with respect to research and development activities and design activities associated with UMTS and LTE BCs.*"[400]

(330) Third, this conclusion is not affected by Qualcomm's claim that it had to make similar investments when entering the worldwide market for LTE chipsets.[401] This is because while Qualcomm was already active in that market, potential entrants could have been dissuaded from entering due to the magnitude and nature of the investments required.

10.4.2. The Qualcomm grant-back network

(331) Qualcomm holds a large portfolio of patents.[402] When Qualcomm agrees cross-licences with other holders of IPR in the UMTS and LTE standards, Qualcomm systematically requests and obtains the right of pass-through of the other party's IPR to Qualcomm's chipset customers. [Qualcomm's licensing strategy].

(332) The existence of such a network of contractual clauses, known as the "grant-back network" and its value to Qualcomm's baseband chipset customers was outlined by Qualcomm's President and Vice Chairman Steve Altman in his speech at a conference in 2005: *"over 100 companies have provided us with some set of pass-through rights. That means that when I sell my chips and software to a company, they get access to Qualcomm's IP, and they get access to more than 100 companies'*

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395 See Qualcomm's response of 27 June 2016 to the Statement of Objections [...], Table 7.

396 […] non-confidential answer to […] of the request for information […] to baseband chipset suppliers […].

397 […] non-confidential answer to […] of the request for information […] to baseband chipset suppliers […].

398 […] non-confidential answer to […] of the request for information […] to baseband chipset suppliers […].

399 […] non-confidential answer to […] of the request for information […].

400 […] non-confidential answer to […] of the request for information […] to baseband chipset suppliers […].

401 Qualcomm's response of 27 June 2016 to the Statement of Objections [...], paragraphs 273-276; Qualcomm's response of 13 March 2017 to the Letter of Facts […], paragraphs 117-120.

402 See for example p.10 of Qualcomm's Form-10K report for the fiscal year 2011 (section "Patents, Trademarks and Trade Secrets"). http://investor.qualcomm.com/secfiling.cfm?filingid=1234452-11-360&cik=.

IP as a result of that. That eliminates a great deal of potential royalty stacking, because otherwise, if they were to acquire chips from another company or didn't have these pass-through rights, they would be in a position where they'd have to individually negotiate with each of these other companies and potentially have to pay royalties to each of these other companies".[403]

(333) The grant-back network constitutes a barrier to entry and expansion because competing LTE chipset suppliers are unable to offer a similar level of pass-through rights.

(334) First, the covenants in the grant-back network are effective only for products that incorporate a Qualcomm chipset: if a customer were to buy a baseband chipset from a different supplier, it would have to pay royalties to some or all of these third party IPR holders (to fill the so called "IPR gap").

(335) Second, even if competing LTE chipset suppliers were able to enter into the same amount of cross-licence agreements with holders of IPR in the UMTS and LTE standards as Qualcomm, they would still be unable to replicate Qualcomm's grant-back network as they do not have access to Qualcomm's IPR portfolio. This is because, since 2008, Qualcomm has refused to enter into licence agreements with competing chipset suppliers relating to CDMA, UMTS/W-CDMA and LTE standards that would allow those suppliers to pass-through rights under Qualcomm's patents to their customers.[404]

(336) Third, other LTE chipset suppliers, including […] and […], have sought to conclude licence agreements that would allow them to pass-through rights under Qualcomm's patents to their customers. Qualcomm has, however, consistently refused to enter into such agreements.[405] Instead, Qualcomm agrees either to grant licences limited to the manufacture of chipsets (without pass-through rights), [Qualcomm's licensing strategy].[406]

(337) Fourth, the Commission's conclusion that the grant-back network constitutes a barrier to entry and expansion is confirmed by those competing LTE chipset suppliers and those customers that responded to requests for information:[407]

(1) According to […], the value of the Grant-back network is estimated to be USD [5-10] per baseband chipset by aggregating the royalties claimed by major SEP holders.[408]

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403 Transcript of Qualcomm London Investor Day Presentation, 8 Nov. 2005, p. 15 […].

404 See Page 10 of Qualcomm's 2008 Form 10 –K Report, available at https://www.qualcomm.com/documents/investor-2008-annual-report.

405 See […] non-confidential answer to […], […] non-confidential answer to […] and […] non-confidential answer to […] of the request for information […] to baseband chipset suppliers; […] non-confidential answer to […] the request for information […] to baseband chipset suppliers […]; […] non-confidential answer to […] the request for information […] to baseband chipset suppliers […]; […] non-confidential answer to […] of the request for information […] to baseband chipset suppliers […]; […] non-confidential answer to […] the request for information […] to baseband chipset customers […].

406 See Page 10 of Qualcomm's 2008 Form 10 –K Report, available at https://www.qualcomm.com/documents/investor-2008-annual-report and Qualcomm's presentation of 20 February 2013 "The Qualcomm Technology Licensing Program and the Licensing of Standard-Essential Patents" […].

407 See answers to […] of the request for information […] to baseband chipset suppliers; answers to […] of the request for information […] to baseband chipset customers.

(2) According to […], it *"understands from customers"* that the grant-back value (including patent royalties of a number of licensors) is USD [1-5] per baseband chipset.[409]

(3) According to […], *"[i]f other conditions are similar, customer will surely give up rival [baseband chipset] suppliers' products as it is much safer from IPR perspective to choose Qualcomm [baseband chipsets]*".[410]

(4) According to […], *"[…] Qualcomm does not grant licenses to its competitors. Instead, it requests end device manufacturers to take licenses which, according to Qualcomm, are necessary even when device manufacturers use another supplier's BCs. […] Qualcomm's licensing strategy, therefore, takes away a considerable competitive advantage of other BC suppliers. […]."*[411] *"Qualcomm has created this grant-back network in order to bind its BC customers to it and obtain several competitive advantages vis-à-vis its BC competitors and raise revenue. First, Qualcomm's ability to offer its customers protection from IP attack from most of Qualcomm's roughly 250 licensees constitutes a substantial competitive advantage compared to its BC competitors, as it renders the purchase of BCs from Qualcomm's competitors substantially more expensive for end device manufacturers. It therefore binds the end device manufacturers to the purchase of Qualcomm BCs. Second, it reduces the value of its competitors' IPR which also places them at a competitive disadvantage and limits the customers' choice. […] Qualcomm reserves the right to stop supplying its customers with its own BCs unless they agree to take a license to its IPR portfolio. Because of Qualcomm's dominance in BCs—it accounts for 90%+ share in CDMA and LTE BCs—an interruption in supply would cause grave harm to almost any customer. This threat, which is even more powerful than the threat of a court injunction, acts as a strong incentive to take a license from Qualcomm."*[412] "[The grant-back network] *increases the costs of end device manufacturers purchasing BC's from Qualcomm's competitors. The benefit of Qualcomm's grant-back network only applies to Qualcomm's products. If a customer were to buy BCs from a different supplier, it would be open to any member of Qualcomm's grant-back network to initiate infringement actions against that customer. If the customer wanted to avoid this risk, it would have to take a license from each IPR owner concerned. This is a significant added cost that, in practice, exceeds any price advantage or quality improvement that can be offered by Qualcomm's competitors.* […]"[413]

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408 […] non-confidential answer to […] of the request for information […] to baseband chipset customers […].

409 […] non-confidential answer to […] of the request for information […] to baseband chipset suppliers […].

410 […] non-confidential answer to […] of the request for information […] to baseband chipset customers […].

411 […] non-confidential answer to […] of the request for information […] to baseband chipset suppliers […].

412 […] non-confidential answer to […] of the request for information […] to baseband chipset customers […].

413 […] non-confidential answer to […] of the request for information […] to baseband chipset suppliers […].

(5) According to […], "[…] *Potential purchasers of BCs from alternative suppliers would have to take into account this potential added exposure from using non-Qualcomm BCs.* […]"[414]

(6) According to […], *"[…]* […] *understands that Qualcomm's grant-back network enhances the perceived attractiveness of Qualcomm's BCs to certain customers in markets in which Qualcomm faces competition from alternative BC providers. Arguably, Qualcomm's network of royalty–free grant-back licenses to SEPs and non-SEPs give Qualcomm a competitive advantage in relation to some BC customers because those customers get a better deal in comparison to buyers of non-Qualcomm BCs by getting access to Qualcomm's grant-back network.*"[415]

(7) According to […], "*While it is very difficult to quantify the precise impact, the grantback network would pose a significant barrier to entry. In addition, we would often times be requested by customers to cut prices to compensate for the lack of a grant-back network. Finally, we would lose many designs due to our lack of a grant-back network."* [416]

(8) According to […], "*In some instances, customers including [MAJOR OEM] have cited the greater patent protection that they believe that Qualcomm offers as a basis for demanding a lower price from* […] *to compensate for the perceived disparity in patent protection. […]*[417] *During these negotiations, [MAJOR OEM] sought indemnity from* […] *from claims that* […] *[baseband chipsets], alone or as used in [MAJOR OEM] products, infringed on a third party's IPRs. [MAJOR OEM] claimed that Qualcomm offered significant pass-through rights because of its grant-back network, and indicated that* […] *proposal was at a disadvantage relative to Qualcomm's unless* […] *offered to indemnify [MAJOR OEM] against claims from which [MAJOR OEM] would have been protected by using Qualcomm [baseband chipsets]."* [418]

(9) According to Apple, "*Qualcomm uses its grant-back network as a marketing tool for its [baseband chipsets], and a competitive advantage over other [baseband chipset] suppliers.*[419] *[…] Qualcomm seeks to leverage the existence of this network in its commercial negotiations for chip supply to justify its (higher) component pricing and to differentiate its component offering from other would-be suppliers (such as Intel) who have not been able to secure (and therefore offer) such third party rights as a benefit for choosing*

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414 […] non-confidential answer to […] of the request for information […] to baseband chipset customers […].

415 […] non-confidential answer to […] of the request for information […] to baseband chipset customers […].

416 […] non-confidential answer to […] of the request for information […] to baseband chipset suppliers […].

417 […] non-confidential answer to […] of the request for information […] to baseband chipset suppliers […].

418 […] non-confidential answer to […] of the request for information […] to baseband chipset suppliers […].

419 Apple's non-confidential answer to […] of the request for information […] to baseband chipset customers […].

to engage with Qualcomm in a commercial relationship for its [baseband chipsets]."[420]

(10) According to […], "*Pursuant to Qualcomm's grant-back network, Qualcomm's customers are shielded from patent infringement claims from Qualcomm and other Qualcomm customers at no extra cost but only insofar as they use Qualcomm BCs. This is a feature which no rival chipset manufacturer can replicate. Accordingly, Qualcomm's grant-back network represents an important competitive advantage over its competitors.*"[421]

(338) Fifth, the Commission's conclusion that the grant-back network constitutes a barrier to entry and expansion is not affected by Qualcomm's claims[422] that:

(1) In order to obtain a licence of Qualcomm's patents, other holders of IPR are not required to grant the right of pass-through of their IPR rights to Qualcomm's chipset customers;

(2) Market participants do not view the grant-back network as a barrier to entry and expansion;[423]

(3) The Commission has overlooked Qualcomm's investments in R&D, resulting in a valuable patent portfolio;[424]

(4) The grant-back network is neither an absolute protection nor a one-stop shop;[425]

(5) Qualcomm's ability to charge a higher price for its chipsets reflects its investment in R&D and IPR, including the grant-back network;[426]

(6) Competing chipset suppliers could offer an indemnity to compete with the grant-back network;[427] and

(7) Licensing at the end-device level as opposed to the chipset level is consistent with Qualcomm's FRAND commitments and likely to lead to efficiency enhancements.[428]

(339) In the first place, the evidence in the Commission's file indicates that other holders of IPR are systematically required to grant the right of pass-through of their IPR rights to Qualcomm's chipset customers.[429]

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420 Apple's non-confidential answer to […] of the request for information […] to baseband chipset customers […].

421 […] non-confidential answer to […] of the request for information […] to baseband chipset customers […].

422 See Qualcomm's response of 27 June 2016 to the Statement of Objections [...], paragraphs 292-312; Qualcomm's response of 13 March 2017 to the Letter of Facts […], paragraphs 125-128.

423 See Qualcomm's response of 27 June 2016 to the Statement of Objections [...], paragraphs 308-312.

424 See Qualcomm's response of 27 June 2016 to the Statement of Objections [...], paragraphs 297-298.

425 See Qualcomm's response of 27 June 2016 to the Statement of Objections [...], paragraph 300.

426 See Qualcomm's response of 27 June 2016 to the Statement of Objections [...], paragraph 305.

427 See Qualcomm's response of 27 June 2016 to the Statement of Objections [...], paragraph 306.

428 See Qualcomm's response of 27 June 2016 to the Statement of Objections [...], paragraphs 285-289.

429 See answers to […] of the request for information […] to baseband chipset customers; answers to […] of the request for information […] to baseband chipset suppliers. For example, […] explained that *"In order to obtain a license from Qualcomm, a licensee must accept all the conditions set forth in Qualcomm's licensing agreements, including the participation in the grant-back network"*. Similarly,

(340) In the second place, as noted in recital (337), those competing LTE chipset suppliers and those customers that responded to requests for information view the grant-back network as a barrier to entry and expansion.

(341) In the third place, the fact that Qualcomm invested significantly in R&D is irrelevant for the purposes of establishing whether the grant-back network constitutes a barrier to entry.

(342) In the fourth place, it is irrelevant that the grant-back network may not cover all relevant IPR needed to commercialise a smart mobile device. This is because the evidence in the Commission's file shows that no other competing LTE chipset supplier can offer its customers a similar level of pass-through rights.

(343) In the fifth place, the Commission's conclusion is not affected by Qualcomm's claim that its ability to charge a higher price for its chipsets reflects its investments in R&D and IPR, including the grant-back network. Even this were true, this does not alter the fact that the grant-back network constitutes a barrier to entry.

(344) In the sixth place, Qualcomm's claim that competing chipset suppliers could offer an indemnity to compete with the grant-back network confirms that the latter is a barrier to entry and expansion. […][430] […][431]

(345) In the seventh place, because it is irrelevant for the purposes of this case whether licensing at the end-device level and [Qualcomm's licensing strategy] are consistent with Qualcomm's FRAND commitments or might lead to efficiency enhancements, the Commission does not take any position on these issues in this Decision. The conclusion that the grant-back network constitutes a barrier to entry is independent from whether licensing at the end-device level is consistent with Qualcomm's FRAND commitments or might lead to efficiency enhancements.

10.4.3. OEM and MNO certification

(346) Baseband chipsets need to be certified by MNOs on their networks and by OEMs in their devices. The certification process of a new baseband chipset typically takes between 6 to 12 months.[432]

(347) The process of certification constitutes a barrier to entry and expansion because established suppliers of baseband chipsets benefit from time savings due to: (i) similarities between older and newer chipset models of the same supplier; (ii) supplier-specific investments made by OEMs; and (iii) existing relationships with MNOs.

[…] explained that *"Qualcomm's standard license terms require participation."* […] also stated that: *"it is not possible to obtain a licence without participating in the grant-back network."*

430 See Qualcomm's response of 27 June 2016 to the Statement of Objections [...], paragraph 305.

431 See also quotes referred to in recital (333).

432 […] non-confidential answer to […] of the request for information […] to baseband chipset suppliers […]; […] non-confidential answer to […] of the request for information […] to baseband chipset customers […]; […] non-confidential answer to […] of the request for information […] to baseband chipset customers […]; […] non-confidential answer to […] of the request for information […] to baseband chipset customers […]; […] non-confidential answer to […] of the request for information of […] to baseband chipset customers […].

(348) First, qualifying a new feature on an existing reference design takes a few months, whereas the certification of a genuinely new baseband chipset design takes up to one or two years.[433]

(349) Second, previous supplier-specific investments lead to time savings because of the use of established technical and testing processes, established trust, and accumulated know-how. This has been confirmed by a number of baseband chipset suppliers:

(1) According to […], "*[p]rospective customers have made major investments over the years in designing devices using [baseband chipsets] of established chipset providers, creating an incumbent's advantage, making it difficult to displace*."[434]

(2) According to […], "*A [baseband chipset] customer undertakes significant capital investments when it adopts a given [baseband chipset] supplier's chipset kit, as a result of technical enabling requirements and testing processes that are specific to that [baseband chipset] supplier. Therefore, a [baseband chipset] customer must undertake additional investment and risk if it switches [baseband chipset] suppliers."*[435] *" […] many companies have exited the market because they have not been able to develop the relationships with OEMs and MNOs needed to gain market acceptance and operate profitability—a fact that, in turn, makes it more difficult for new entrants to raise the necessary funds*." [436]

(3) According to […], "*Generally, certification by an OEM is shortened when the OEM has previously bought BCs from the same supplier as there is greater trust and the leverage of past performance and testing*."[437]

(4) According to […], "[…] *BC suppliers must gain customers' trust in order to compete against established players in the market. Switching to a new BC supplier carries significant risks for OEMs; it requires developing new mobile devices compatible with the supplier's platform. If the new BCs prove to be unstable, the OEM's entire product line and reputation would be damaged. As a result, OEMs prefer to place their orders with established players with a track record for producing stable BCs. It can take many years for a new BC supplier to gain customers' trust and, therefore, to be able to compete effectively in the market*." [438]

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433 […] and […] non-confidential answers to […] of the request for information […].

434 […] non-confidential answer to […] of the request for information […] to baseband chipset suppliers […].

435 […] non-confidential answer to […] of the request for information […] to baseband chipset suppliers […].

436 […] non-confidential answer to […] of the request for information […] to baseband chipset suppliers […].

437 […] non-confidential answer to […] of the request for information […] to baseband chipset suppliers […].

438 […] non-confidential answer to […] of the request for information […] to baseband chipset suppliers […].

(5) According to […], "*OEMs can shorten certification process since they can use the same test environment or they can accumulate know-how about [baseband chipsets] of a [baseband chipset] supplier*."[439]

(6) According to […], "[…] *With respect to device certification, however, in principle, because the [baseband chipsets] of a given [baseband chipsets] supplier are likely to exhibit certain similarities to one another, including across technology generations, reusing a vendor is likely to shorten the design process […]. Specifically, the time required for the conformance testing which is required for the certification process could be shortened if the BC supplier was used and certified in a previous design.* […]."[440]

(7) According to […], "*There will be some similarity in [baseband chipsets] solution of the same [baseband chipsets] vender. And some designs and experiences we got in previous [baseband chipsets] can help us to shorten the certification process of a new [baseband chipsets] reference design*."[441]

(350) Third, building a relationship with MNOs provides an advantage to baseband chipset suppliers in commercial relationships with OEMs,[442] in terms of stability and interoperability of suppliers' chips on the MNO's network, past experience, adaptation of development plans, facilitating of testing and certification, etc. This was confirmed by a number of baseband chipset suppliers:

(1) According to […], "*A good relationship with mobile network operators can be very helpful to [baseband chipsets] suppliers in their commercial relationship with OEMs and for the general marketing of their products. OEMs will only place orders from [baseband chipsets] suppliers whose [baseband chipsets] have proven to be interoperable and stable in MNO networks. Similarly, if a MNO were to question the performance of an end device on its networks, it would render marketing the device very difficult. [Baseband chipsets] suppliers must, therefore, test the performance and interoperability of its [baseband chipsets] in real networks, which requires the cooperation of MNOs. A good relationship with MNOs can be very helpful in achieving this*."[443]

(2) According to […], "*A significant portion of OEMs' products are sold through the operator channel as subsidised devices, and this is especially true for the larger OEMs' products. Therefore, OEMs are incentivised to use a BC supplier that already has a strong relationship with a given MNO, because it will provide an easier path of entry into that channel. In addition, in the context of its relationship with a given MNO, a BC supplier may develop and deploy features specific to that MNO, which in turn provides the supplier with*

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439 […] non-confidential answer to […] of the request for information […] to baseband chipset suppliers […].

440 […] non-confidential answer to […] of the request for information […] to baseband chipset customers […].

441 […] non-confidential answer to […] of the request for information […] to baseband chipset customers […].

442 See answers to […] of the request for information […] to baseband chipset suppliers.

443 […] non-confidential answer to […] of the request for information […] to baseband chipset suppliers […].

a technical advantage over other BC suppliers that do not have such a relationship.[…]"[444]

(3) According to […], "*Yes, it is desirable for a BC supplier to build a good relationship with MNOs: (a) to ensure that the technical development plan for its modem meets the long term needs of the carrier; (b) to facilitate testing/validating/certifying of any new modem generation, since an OEM may leverage some of the BC supplier's modem testing and thus avoid re-doing in the final end-product testing phase* […]"[445] "[…] […] *generally understands that Qualcomm makes effort to build relationships with MNOs, helping them drive adoption of new features in their networks […]."*[446]

(4) According to […] "*BC suppliers take advantage of relationships with MNOs to gather information about the functions MNOs want to incorporate in the future or they can get certification from MNOs smoothly by having a good relationship. Such suppliers will advantageous in business talks*."[447]

(5) According to […], "[…] *baseband chipset suppliers will need to get their products accepted by the network operators before any handset maker will consider their use. In this respect* […] *believes that building a collaborative relationship with the network operators provides a substantial advantage to a baseband chipset supplier in its commercial relationship with the handset manufacturers. Indeed, through this relationship the supplier of baseband chipsets can get an early access to the network operators' requirements and tailor the characteristics of its baseband chipsets accordingly to have them accepted by the network operator. The baseband chipset supplier which manages to be the first to be accepted by the network operator gains an important competitive edge*."[448] "*To the best of* […] *knowledge, in light of the fact that Qualcomm is effectively the only supplier of CDMA baseband chipsets and that US network operators Sprint and Verizon request CDMA compatibility, Qualcomm [is well placed]."*[449]

(6) According to […], "*Healthy MNO relationships, and MNO certification experience and favorable results are vital to a BC supplier having credibility with OEMs*."[450] "*Qualcomm's resource scale has allowed it to maintain strong relationships with many operators*.[…]"[451]

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444 […] non-confidential answer to […] of the request for information […] to baseband chipset suppliers […].

445 […] non-confidential answer to […] of the request for information […] to baseband chipset suppliers […].

446 […] non-confidential answer to […] of the request for information […] to baseband chipset suppliers […].

447 […] non-confidential answer to […] of the request for information […] to baseband chipset suppliers […].

448 […] non-confidential answer to […] of the request for information […] to baseband chipset suppliers […].

449 […] non-confidential answer to […] of the request for information […] to baseband chipset suppliers […].

450 […] non-confidential answer to […] of the request for information […] to baseband chipset suppliers […].

451 […] non-confidential answer to […] of the request for information […] to baseband chipset suppliers […].

(351) This conclusion is also not affected by Qualcomm's claim that it incurred costs relating to certification when entering the worldwide market for LTE chipsets.[452] This is because while Qualcomm was already active in that market, potential entrants could have been dissuaded from entering due to the need to obtain OEM and MNO certification.

10.4.4. Qualcomm's brand image and reputation and strong business relationships

(352) Recent entrants or smaller players may find it challenging to enter or expand in the worldwide market for LTE chipsets, due to the brand image, reputation and strong business relationships that Qualcomm enjoys.

(353) Qualcomm's brand image, reputation and strong business relationships constitute a barrier to entry and expansion.

(354) First, recent entrants or smaller players may need to compensate their customers for their less well-known brand, for instance by offering price discounts. This was confirmed by both […] and […]:

(1) According to […], "*[baseband chipset] customers are very hesitant to adopt untested platforms, given both the resources required to adopt a new chipset […] and the attendant risk due the large volume of distribution of many mobile telephony SKUs [Stock Keeping Unit]*.[453] *Accordingly, when negotiating with a [baseband chipset] customer that is comparing* […] *against its incumbent [baseband chipset] supplier,* […] *must provide the customer with a strong incentive, in terms of both price and features, to make the switch to* […]."[454]

(2) According to […], "*Qualcomm has powered Samsung's devices for several years. Because Samsung's mobile devices are perceived as being truly global and innovative products, Qualcomm's reputation as the dominant BC supplier in the industry has undoubtedly been helped by its relationship with Samsung. It has helped Qualcomm to create an extensive customer list, […] Although Apple has tended to favor its own BCs, it typically turns to Qualcomm for wireless modems. Like Samsung's phones, iPhones are considered state-of-the-art smartphones that are sold all around the world. This allows Qualcomm to position itself as a supplier of global BCs, capable of satisfying requirements worldwide*."[455]

(355) Second, the reputation of a baseband chipset supplier is important for its success with customers. This was confirmed by the majority of respondents to requests for information.[456] For example, […] indicated that *"to be considered by larger OEMs, a* [baseband chipset] *supplier needs to have proven records, shipment records, or formal approvals from major carriers worldwide."*[457]

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452 Qualcomm's response of 27 June 2016 to the Statement of Objections [...], paragraph 314; Qualcomm's response of 13 March 2017 to the Letter of Facts […], paragraph 132.

453 Stock Keeping Unit is a separate item in an inventory.

454 […] non-confidential answer to […] of the request for information […] to baseband chipset suppliers […].

455 […] non-confidential answer to […] of the request for information […] to baseband chipset suppliers […].

456 See answers to […] of the request for information […] to baseband chipset suppliers.

457 […] non-confidential answer to […] of the request for information […] to baseband chipset suppliers […].

(356) Third, Qualcomm has built strong business relationships with a number of MNOs globally.[458] This was confirmed by a majority of those competing baseband chipset suppliers that responded to requests for information:

(1) According to […], "*Qualcomm makes effort to build relationships with MNOs, helping them drive adoption of new features in their networks. To the best of* […] *understanding, Qualcomm Engineering Services ("QES"), a former (and possibly current) division of Qualcomm Technology Licensing ("QTL"), may have offered engineering services to MNOs.*"[459]

(2) According to […], it *"has observed that when an operator issues an RFI/RFQ*[460]*, the entire process may be skewed in Qualcomm's favour such that the operators and OEM would not be likely to choose a competitor of Qualcomm."*[461]

(3) According to […], *"Qualcomm often dictates or influences the carriers' choices, and thus Qualcomm has a significant advantage in having its* [baseband chipsets] *certified by the carriers."*[462]

(357) Fourth, the Commission's conclusions are not affected by Qualcomm's claims that it does not have a strong reputation with end-users[463] and that it also had to make investments in order to achieve its reputation.[464]

(358) In the first place, the Commission's conclusions are based on the brand image, reputation and strong business relationships of Qualcomm vis-à-vis OEMs and MNOs, not vis-à-vis end users. Qualcomm's argument is therefore irrelevant.

(359) In the second place, this conclusion is not affected by Qualcomm's claim that Qualcomm had to make investments in order to achieve its reputation. This is because while Qualcomm was already active in that market, potential entrants could have been dissuaded from entering due to the magnitude and nature of the investments required to establish a reputation.

10.4.5. It is important for suppliers to supply chipsets supporting a variety of standards

(360) OEMs often sell the same devices throughout the world and they expect that suppliers are able to provide baseband chipsets that support a variety of standards used across all geographic areas. In particular, two of the largest carriers in the United States of America (Verizon and Sprint) as well as several Chinese carriers

458 See answers to […] of the request for information […] to baseband chipset suppliers.

459 […] non-confidential answer to […] of the request for information […] to baseband chipset suppliers […].

460 Telecommunication operators who sell phones normally issue a RFI (Request for Information) and a RFQ (Request for Quote of devices) to select suppliers.

461 […] non-confidential answer to […] of the request for information […] to baseband chipset suppliers […].

462 […] non-confidential answer to […] of the request for information […] to baseband chipset customers […].

463 Qualcomm's response of 27 June 2016 to the Statement of Objections, [...] paragraph 316.

464 Qualcomm's response of 27 June 2016 to the Statement of Objections [...], paragraph 315; Qualcomm's response of 13 March 2017 to the Letter of Facts […], paragraph 136.

own mobile networks based on the CDMA standard. Accordingly, it is important that a supplier is able to supply LTE chipsets that are also compliant with CDMA.[465]

(361) The need for suppliers to supply chipsets supporting a variety of standards, including CDMA, constitutes a barrier to entry and expansion.

(362) First, while baseband chipset customers multisource, they consider it important, in respect of the Period Concerned, that a baseband chipset supplier be able to supply chipsets that are compliant with CDMA. This was confirmed by a number of those customers that responded to requests for information:[466]

(1) According to […], "*CDMA is used as the prevailing communication technology. […] As a result, there will be great demand for BCs supporting CDMA for several years to come*."[467]

(2) According to […], "*The availability of CDMA BCs in a BC supplier's portfolio is a must*."[468]

(3) According to […], "*Let's take China as an example, […] If CDMA BCs will be provided by different BC suppliers, it will very difficult to support so many networks. Therefore it is very important for a BC supplier to be able to supply including but not limited to CDMA BCs*."[469]

(363) Second, the inability to provide a uniform product globally may deter OEMs from sourcing (large) volumes of baseband chipsets from multiple suppliers. According to […], *"some major OEMs, such as Samsung, have required the same multimode chipset with LTE plus 3G for both CDMA networks and UMTS networks in the same country, so as to maintain the identical LTE performance on the same handset models across different carriers."*[470]

(364) Third, the Commission's conclusion that it is important for suppliers to supply chipsets supporting a variety of standards represents a barrier to entry and expansion is not affected by Qualcomm's claim that the Commission's approach is inconsistent with its definition of a worldwide market for LTE chipsets.[471]

(365) In the first place, there is no inconsistency between the fact that it is important for baseband chipset suppliers to supply chipsets supporting a variety of standards, including CDMA, and the Commission's conclusion that CDMA chipsets that do not support UMTS are not substitutable for LTE chipsets (see Section 9.2.5 above).

(366) In the second place, even if the importance of CDMA were to have diminished over time, the evidence referred to at recitals (360), (361) - (363) indicates that during the

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465 See answers to […] of the request for information […] to baseband chipset customers; answers to […] of the request for information […] to baseband chipset suppliers.

466 See answers to […] of the request for information […] to baseband chipset customers.

467 […] non-confidential answer to […] of the request for information […] to baseband chipset customers […].

468 […] non-confidential answer to […] of the request for information […] to baseband chipset customers […].

469 […] non-confidential answer to […] of the request for information […] to baseband chipset customers […].

470 […] non-confidential answer to […] of the request for information […] to baseband chipset suppliers […].

471 Qualcomm's response of 27 June 2016 to the Statement of Objections [...], paragraphs 317-318: Qualcomm's response of 13 March 2017 to the Letter of Facts [...], paragraphs 138-141.

Period Concerned the addition of CDMA compliance to LTE chipsets was important from the point of view of baseband chipset customers.

(367) In the third place, the fact that the CDMA standard is not widely implemented in the EEA is irrelevant because the geographic scope of the market for LTE chipsets is worldwide.

10.5. Countervailing buyer power

(368) The Commission concludes that the potential commercial strength of Qualcomm's baseband chipset customers is not capable of affecting Qualcomm's dominant position.

(369) First, when negotiating with Qualcomm, customers are unable to exercise significant pressure regarding price and other key elements. This was confirmed by a majority of those baseband chipset customers that responded to requests for information:[472]

(1) According to […], "*The negotiations between* […] *and Qualcomm are heavily influenced by Qualcomm's position in the market as an unavoidable supplier for* […] *handset business*. […]"[473] "[…] *has no significant leverage to negotiate the prices of certain baseband chipsets. For example, LTE Integrated chipsets (e.g. "Snapdragon"') and CDMA chipsets are relatively high-priced since Qualcomm is the sole supplier of LTE baseband chipsets and the de facto sole supplier of CDMA chipsets*."[474]

(2) According to […]: "[…] *has [made] concessions to Qualcomm that it [has not made to] other component suppliers (such as agreeing to pay [very high] royalties, the technology grant-back and the free provision of R&D services, all of which have been described above). […] therefore, […] Qualcomm can exercise more leverage in negotiations than other manufacturers*."[475] "[…] *While Qualcomm might make minor concessions on the price of particular components in certain instances, as a general rule it can still dictate both price and non-price terms and conditions to its customers. This includes the ability to dictate terms down the stream of distribution, such as by imposing restrictions on the sale of devices manufactured by contract manufacturers using Qualcomm BCs*. […]"[476]

(3) According to […], "[…] *Compared to other BC suppliers who provide a lower proportion of* […] *BCs, Qualcomm's negotiating position is correspondingly much stronger*."[477]

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472 See answers to […] of the request for information […] to baseband chipset customers.

473 […] non-confidential answer to […] of the request for information […] to baseband chipset customers […].

474 […] non-confidential answer to […] of the request for information […] to baseband chipset customers […].

475 […] non-confidential answer to […] of the request for information […] to baseband chipset customers […].

476 […] non-confidential answer to […] of the request for information […] to baseband chipset customers […].

477 […] non-confidential answer to […] of the request for information […] to baseband chipset customers […].

(4) According to Apple, "*Qualcomm's dominant market positions in [baseband chipsets] and SEPs make it extremely difficult to exert pressure on the company concerning price and other key elements during negotiations*."[478]

(370) Second, customers typically must accept the standard terms proposed by Qualcomm in its template agreements, [Qualcomm's sales and licensing strategy]. This was confirmed by those baseband chipset customers that responded to requests for information, including, for instance, […] and […].

(1) […] stated that: "[…] *and Qualcomm are currently negotiating an agreement where Qualcomm refuses to utilize the* […] *template that other competitors have utilized without objectio*n."[479]

(2) […] stated that: "*Qualcomm primarily operates using standard terms and only rarely deviates from them, and even then only after extensive negotiation.*"[480]

(371) Third, the Commission's conclusion is not affected by Qualcomm's claims that:

(1) The responses of baseband chipset customers to requests for information on which the Commission relies to reject the existence of countervailing buyer power are "*speculative*";[481]

(2) Several baseband chipset customers, including Apple, Samsung and Huawei, exert considerable countervailing buyer power on Qualcomm;[482]

(3) Apple, in particular, exerted considerable countervailing buyer power on Qualcomm, as demonstrated by its "*cash piles*"[483] and the relationship-specific investments it required Qualcomm to make;[484]

(4) Qualcomm's pricing ability is constrained by captive supplies;[485] and

(5) Apple may seek to produce its own baseband chipsets in the future.[486]

(372) In the first place, the responses of baseband chipset customers to requests for information relied on in recitals (369) - (370) are not "speculative" but precise and consistent regarding the lack of countervailing buyer power vis-a-vis Qualcomm.

(373) In the second place, even if any of Apple, Samsung and Huawei were to have some buyer power vis-à-vis Qualcomm, this would ensure that only a particular or limited segment of customers is shielded from the dominant position of Qualcomm.

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478 Apple's non-confidential answer to […] of the request for information […] to baseband chipset customers […].

479 […] non-confidential answer to […] of the request for information […] to baseband chipset customers […].

480 […] non-confidential answer to […] of the request for information […] to baseband chipset customers […].

481 Qualcomm's response of 27 June 2016 to the Statement of Objections [...], paragraph 238.

482 Qualcomm's response of 27 June 2016 to the Statement of Objections [...], paragraphs 251-254 and 270-272.

483 Qualcomm's response of 27 June 2016 to the Statement of Objections [...], paragraph 251.

484 Qualcomm's response of 27 June 2016 to the Statement of Objections [...], paragraphs 252-253.

485 Qualcomm's response of 27 June 2016 to the Statement of Objections [...], paragraphs 261-269.

486 Qualcomm's response of 27 June 2016 to the Statement of Objections [...], paragraph 264; Qualcomm's observations of 29 May 2017 on the evidence added to the case file since the adoption of the Statement of Objections [...], paragraph 115.

(374) In the third place, Apple's alleged "*cash piles*" are irrelevant because countervailing buyer power does not relate to the amount of money that Apple may have but rather to its ability to exert countervailing power upon Qualcomm.

(375) In the fourth place, even customers that had captive production during the Period Concerned, such as […], did not exert countervailing buyer power as they still relied to a significant extent on sales of baseband chipsets by Qualcomm […](see Section 9.2.9). For example, while Qualcomm claims that in 2015 *"for its […] devices […] used its proprietary chipsets rather than a Qualcomm baseband chipset"*,[487] […] still relied on Qualcomm to supply the LTE baseband chipsets for the CDMA version of the device.[488]

(376) In the fifth place, whether, in the future, Apple might produce its own baseband chipsets is irrelevant to whether it exerted countervailing buyer power during the Period Concerned. In any event, as Apple has indicated, this would be an expensive and time-consuming process as "*it would take about [0-1,000] engineers and [0-5] years*."[489]

11. ABUSE OF A DOMINANT POSITION

11.1. Principles

(377) The concept of abuse is an objective concept relating to the behaviour of an undertaking in a dominant position which is such as to influence the structure of a market where, as a result of the very presence of the undertaking in question, the degree of competition is weakened and which, through recourse to methods different from those which condition normal competition, has the effect of hindering the maintenance of the degree of competition still existing in the market or the growth of that competition.[490]

(378) A dominant undertaking has a special responsibility not to impair, by conduct falling outside the scope of competition on the merits, genuine undistorted competition in the internal market.[491] It follows from the nature of the obligations imposed by Article 102 of the Treaty and Article 54 of the EEA Agreement that, in specific circumstances, an undertaking in a dominant position may be deprived of the right to adopt a course of conduct or take measures which are not in themselves abuses and which would even be unobjectionable if adopted or taken by non-dominant undertakings.[492]

(379) Article 102 of the Treaty and Article 54 of the EEA Agreement prohibit abusive practices which may cause damage to consumers directly, but also those which cause

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487 Qualcomm's response of 27 June 2016 to the Statement of Objections [...], paragraph 263.

488 See for example […]. See also footnote 327.

489 Apple's comments […] on Qualcomm's response to the Statement of Objections [...], paragraph 24.

490 Case C-549/10 P *Tomra v Commission*, EU:C:2012:221, paragraph 17; Case C-457/10 P *AstraZeneca v Commission*, EU:C:2012:770, paragraph 74.

491 Case 322/81 *Nederlandsche Banden Industrie Michelin v Commission*, EU:C:1983:313, paragraph 57; Case C-209/10 *Post Danmark A/S v Konkurrencerådet*, EU:C:2012:172, paragraph 23; Case C-457/10 P *AstraZeneca v Commission*, EU:C:2012:770, paragraph 134.

492 Case 322/81 *Nederlandsche Banden-Industrie Michelin v Commission*, EU:C:1983:313, paragraph 57; Case T-111/96 *ITT Promedia v Commission*, EU:T:1998:183, paragraph 139; Case C-413/14 P *Intel Corp. v Commission*, EU:C:2017:632, paragraph 135.

consumers harm through their impact on competition.[493] Article 102 of the Treaty and Article 54 of the EEA Agreement apply, in particular, to the conduct of a dominant undertaking that, through recourse to methods different from those governing normal competition on the basis of the performance of commercial operators, has the effect, to the detriment of consumers, of hindering the maintenance of the degree of competition existing in the market or the growth of that competition.[494]

(380) Article 102 of the Treaty and Article 54 of the EEA Agreement prohibit a dominant undertaking from, among other things, adopting pricing practices that have an anticompetitive effect on its competitors, actual or potential, considered to be as efficient as that undertaking, thereby strengthening its dominant position by using methods other than those that come within the scope of competition on the merits.[495] Such an anticompetitive effect concerns competitors not less attractive to consumers than the dominant undertaking from the point of view of, among other things, price, choice, quality or innovation.[496] Their foreclosure would be to the detriment of competition and, thereby, of consumers' interests.[497]

(381) While the anticompetitive effect of a particular practice must not be of purely hypothetical nature, the effect does not necessarily have to be concrete.[498] It is sufficient to demonstrate that by making more difficult, or impossible, the entry of competitors considered to be as efficient as the dominant undertaking onto the

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493 Case C-202/07 P *France Télécom v Commission*, EU:C:2009:214, paragraph 105; Joined Cases C-501/06 P, C-513/06 P, C-515/06 P and C-519/06 P *GlaxoSmithKline Services and Others v Commission and Others*, EU:C:2009:610, paragraph 63; Case C-52/09 *Konkurrensverket v TeliaSonera Sverige AB*, EU:C:2011:83, paragraph 24; Case C-209/10 *Post Danmark A/S v Konkurrencerådet*, EU:C:2012:172, paragraph 20; Case C-286/13 P *Dole Food and Dole Fresh Fruit Europe v Commission*, EU:C:2015:184, paragraph 125.

494 Case 85/76 *Hoffmann-La Roche* v *Commission*, EU:C:1979:36, paragraph 91; Case C-62/86 *Akzo v Commission*, EU:C:1991:286, paragraph 69; Case C-552/03 P *Unilever Bestfoods v Commission*, EU:C:2006:607, paragraph 129; Case C-95/04 P *British Airways*, EU:C:2007:166, paragraph 66; Case C-171/05 P *Piau v Commission*, EU:C:2006:149, paragraph 37; Case C-52/07 *Kanal 5 and TV 4*, EU:C:2008:703, paragraph 25; Case C-202/07 P *France Télécom v Commission*, EU:C:2009:214, paragraph 104; Case C-280/08 P *Deutsche Telekom v Commission*, EU:C:2010:603, paragraph 174; Case C-52/09 *TeliaSonera Sverige*, EU:C:2011:83, paragraph 27; Case C-457/10 P *AstraZeneca v Commission*, EU:C:2012:770, paragraph 74; Case C-549/10 P *Tomra Systems and Others v Commission*, EU:C:2012:221, paragraph 17; Case C-209/10 *Post Danmark*, EU:C:2012:172, paragraph 24; Case C-170/13 *Huawei Technologies*, EU:C:2015:477, paragraph 45; Case C-23/14 *Post Danmark A/S v Konkurrencerådet*, EU:C:2015:651, paragraph 26.

495 Case C-62/86 *Akzo v Commission*, EU:C:1991:286, paragraphs 70 and 72; Case C-280/08 P *Deutsche Telekom v Commission*, EU:C:2010:603, paragraphs 177, 178 and 199; Case C-52/09 *TeliaSonera Sverige*, EU:C:2011:83, paragraph 40; Case C-209/10 *Post Danmark*, EU:C:2012:172, paragraph 25; Case T-336/07 *Telefónica and Telefónica de España v Commission*, EU:T:2012:172, paragraph 189; Case C-413/14 P *Intel Corp. v Commission*, EU:C:2017:632, paragraph 136.

496 Case C-209/10 *Post Danmark A/S v Konkurrencerådet*, EU:C:2012:172, paragraph 22; Case C-413/14 P *Intel Corp. v Commission*, EU:C:2017:632, paragraph 134.

497 Case C-209/10 *Post Danmark A/S v Konkurrencerådet*, EU:C:2012:172, paragraphs 20, 22, 24, 25 and 44; Case C-23/14 *Post Danmark A/S v Konkurrencerådet*, EU:C:2015:651, paragraph 69.

498 Case C-52/09 *TeliaSonera Sverige*, EU:C:2011:83, paragraph 64; Case T-336/07 *Telefónica and Telefónica de España v Commission*, EU:T:2012:172, paragraph 268, confirmed on appeal in Case C-295/12 P, EU:C:2014:2062, paragraph 124; Case T-398/07 *Spain v Commission*, EU:T:2012:173, paragraph 90; Case C-457/10 P *AstraZeneca* v *Commission*, EU:T:2012:770, paragraph 112; Case C-23/14 *Post Danmark A/S v Konkurrencerådet*, EU:C:2015:651, paragraph 66.

market concerned, there is an anticompetitive effect that may potentially exclude those competitors.[499]

(382) An undertaking which is in a dominant position on a market and ties purchasers — even if it does so at their request — by an obligation or promise on their part to obtain all or most of their requirements exclusively from that undertaking abuses its dominant position within the meaning of Article 102 of the Treaty and Article 54 of the EEA Agreement, whether the obligation is stipulated without further qualification or whether it is undertaken in consideration of the grant of a rebate or payment. The same applies if the undertaking in question, without tying the purchasers by a formal obligation, applies, either under the terms of agreements concluded with these purchasers or unilaterally, a system of loyalty rebates or payments, that is to say, discounts or payments conditional on the customer's obtaining all or most of its requirements — whether the quantity of its purchases be large or small — from the undertaking in a dominant position ("exclusivity rebates" or "exclusivity payments").[500] Exclusivity rebates or exclusivity payments are therefore presumed to constitute an abuse of a dominant position within the meaning of Article 102 of the Treaty and Article 54 of the EEA Agreement.

(383) Where, however, the dominant undertaking concerned seeks to rebut the presumption of abuse by submitting, during the administrative procedure, on the basis of supporting evidence, that its exclusivity rebates or exclusivity payments were not capable of restricting competition and, in particular, of producing the alleged foreclosure effects,[501] the Commission is not only required to analyse, first, the extent of the undertaking's dominant position on the relevant market and, secondly, the share of the market covered by the exclusivity rebates or exclusivity payments, as well as the conditions and arrangements for granting the rebates or payments in question, their duration and their amount, it is also required to assess the possible existence of a strategy aiming to exclude competitors that are at least as efficient as the dominant undertaking from the market.[502]

(384) The analysis of the capacity to foreclose is also relevant in assessing whether a system of exclusivity rebates or exclusivity payments which, in principle, falls within the scope of the prohibition laid down in Article 102 of the Treaty and Article 54 of the EEA Agreement, may be objectively justified.[503]

(385) The exclusionary effect arising from such exclusivity rebates or exclusivity payments, which is disadvantageous for competition, may be counterbalanced, or

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499 Case C-280/08 P *Deutsche Telekom v Commission*, EU:C:2010:603, paragraphs 177, 178, 253 and 254; Case C-52/09 *TeliaSonera Sverige*, EU:C:2011:83, paragraphs 63 and 64; Case T-336/07 *Telefónica and Telefónica de España v Commission*, EU:T:2012:172, paragraphs 271 and 275, confirmed on appeal in Case C-295/12 P, EU:C:2014:2062, paragraph 124; Case T-398/07 *Spain v Commission*, EU:T:2012:173, paragraph 93; Case C-209/10 *Post Danmark A/S v Konkurrencerådet*, EU:C:2012:172, paragraphs 25, 36, 40 and 44; Case C-23/14 *Post Danmark A/S v Konkurrencerådet*, EU:C:2015:651, paragraphs 31, 65 and 66; Case C-413/14 P *Intel Corp. v Commission*, EU:C:2017:632, paragraph 136.

500 Case 85/76 *Hoffmann-La Roche* v *Commission*, EU:C:1979:36, paragraph 89; Case C-413/14 P *Intel Corp. v Commission*, EU:C:2017:632, paragraph 137.

501 Case C-413/14 P *Intel Corp. v Commission*, EU:C:2017:632, paragraph 138.

502 Case C-413/14 P *Intel Corp. v Commission*, EU:C:2017:632, paragraph 139.

503 Case C-413/14 P *Intel Corp. v Commission*, EU:C:2017:632, paragraph 140.

outweighed, by advantages in terms of efficiency which also benefit the consumer.[504] That balancing of the favourable and unfavourable effects of exclusivity rebates or exclusivity payments on competition can be carried out in the Commission's decision only after an analysis of the intrinsic capacity of those rebates or payments to foreclose competitors which are at least as efficient as the dominant undertaking.[505]

(386) It is for a dominant undertaking to raise any plea of objective justification or efficiency defence and to support it with arguments and evidence.[506]

(387) A dominant undertaking must therefore demonstrate that four cumulative conditions are met:[507]

(1) The efficiency gains likely to result from the exclusivity rebates or exclusivity payments counteract any likely negative effects on competition;

(2) Those gains have been, or are likely to be, brought about as a result of the exclusivity rebates or exclusivity payments;

(3) The exclusivity rebates or exclusivity payments are necessary for the achievement of those gains in efficiency; and

(4) The exclusivity rebates or exclusivity payments do not eliminate effective competition, by removing all or most existing sources of actual or potential competition.

11.2. Application and overview

(388) For the reasons set out in Sections 11.3 to 11.8, the Commission concludes that, from 25 February 2011 to 16 September 2016, Qualcomm abused its dominant position on the worldwide market for LTE chipsets by granting payments to Apple on condition that Apple obtain from Qualcomm all of Apple's requirements of LTE chipsets.

(389) First, the payments granted by Qualcomm to Apple on condition that Apple obtain from Qualcomm all of Apple's requirements of LTE chipsets were exclusivity payments (Section 11.3).

(390) Second, the presumption that the grant of such exclusivity payments constitutes an abuse of a dominant position is borne out in the circumstances of the present case by the Commission's analysis of the capability of Qualcomm's exclusivity payments to have anti-competitive effects (Section 11.4).

(391) Third, the "critical margin analysis" submitted by Qualcomm does not undermine the Commission's conclusion that, in the circumstances of the present case, Qualcomm's exclusivity payments were capable of having anti-competitive effects (Section 11.5).

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504 Case C-95/04 P *British Airways*, EU:C:2007:166, paragraphs 85 and 86; Case C-209/10 *Post Danmark A/S v Konkurrencerådet*, EU:C:2012:172, paragraphs 40 and 41; Case C-23/14 *Post Danmark A/S v Konkurrencerådet*, EU:C:2015:651, paragraphs 47 and 48; Case C-413/14 P *Intel Corp. v Commission*, EU:C:2017:632, paragraph 140.

505 Case C-413/14 P *Intel Corp. v Commission*, EU:C:2017:632, paragraph 140.

506 Case T-201/04 *Microsoft Corporation v Commission*, EU:T:2007:289, paragraph 688; Case C-209/10 *Post Danmark A/S v Konkurrencerådet*, EU:C:2012:172, paragraph 42; Case C-23/14 *Post Danmark A/S v Konkurrencerådet*, EU:C:2015:651, paragraph 49.

507 Case C-209/10 *Post Danmark A/S v Konkurrencerådet*, EU:C:2012:172, paragraph 42; Case C-23/14 *Post Danmark A/S v Konkurrencerådet*, EU:C:2015:651, paragraph 49.

(392) Fourth, in addition, Qualcomm has not demonstrated that its exclusivity payments were counterbalanced or outweighed by advantages in terms of efficiency that also benefit the consumer (Section 11.6).[508]

(393) Fifth, Qualcomm's claims regarding the Guidance on the Commission's enforcement priorities in applying Article 82 of the EC Treaty to abusive exclusionary conduct by dominant undertakings (the "Guidance on Enforcement Priorities")[509] do not contradict the Commission's conclusion that Qualcomm's exclusivity payments constitute an abuse of a dominant position (Section 11.7).

(394) Sixth, Qualcomm's abuse took place between 25 February 2011 and 16 September 2016 (Section 11.8).

11.3. The payments conditional upon Apple obtaining from Qualcomm all of Apple's requirements of LTE chipsets were exclusivity payments

(395) The Commission concludes that the payments granted by Qualcomm to Apple on condition that Apple obtain from Qualcomm all of Apple's requirements of LTE chipsets were exclusivity payments.

(396) First, pursuant to the Agreements, Qualcomm committed from 25 February 2011 until termination of the Agreements to grant Apple payments on condition that Apple obtain from Qualcomm all of Apple's requirements of LTE chipsets.

(397) More specifically, the Agreements provided that Qualcomm would pay Apple the Incentive Payments, subject to a number of exclusivity provisions. Those were:

(1) In the event that Apple released a product commercially that incorporated a non-Qualcomm baseband chipset, the Agreements would terminate and Qualcomm would not make any of the Incentive Payments that were due and payable after the date of such release, due to the inclusion in the Agreements of the Termination Clause;[510] and

(2) In the event that Apple released a product commercially that incorporated a non-Qualcomm baseband chipset in 2013, 2014 or 2015, Apple would reimburse part of the Incentive Payments previously made by Qualcomm, due to the inclusion in the Agreements of the Repayment Mechanism.[511]

(398) Second, Qualcomm granted payments to Apple pursuant to the Agreements with regard to the calendar years from 2011 to 2015 (see recital (413)).

(399) Third, following Apple's launch on 16 September 2016 of iPhone 7 devices incorporating Intel LTE chipsets, Qualcomm retained the payments that would otherwise have been due to Apple under the Agreements for the calendar year 2016.

(400) Fourth, the Commission's conclusion that the payments granted by Qualcomm to Apple constituted exclusivity payments is not affected by the fact that the

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508 Qualcomm has not claimed that its exclusivity payments were objectively justified.

509 OJ 2009/C 45/02.

510 See Clause 1.5 of the Transition Agreement [...] and Clause 1.5A as added to the Transition Agreement by Clause 6 of the First Amendment to the Transition Agreement [...].

511 See Clause 1.5 of the Transition Agreement; See also Clauses 1.3A(c) as added by Clause 2 of the First Amendment to the Transition Agreement [...] and Clause 1.3B(b), as added by Clause 3 of the First Amendment to the Transition Agreement and Clause 1.5, as amended by Clause 5 of the First Amendment to the Transition Agreement [...].

Agreements allowed Apple to continue to procure baseband chipsets for legacy products from existing suppliers without losing the right to receive the payments from Qualcomm envisaged in the Agreements (see Section 8.1)). This is because Apple had never commercialised devices incorporating LTE chipsets from third party suppliers before entering into the Agreements. Thus, there are no LTE-compliant legacy products that could have benefited from this provision.

(401) Fifth, the Commission's conclusion that the payments granted by Qualcomm to Apple constituted exclusivity payments is not affected by Qualcomm's claims[512] that:

(1) Exclusivity payments within the meaning of the case law consist only of payments that are coupled with a formal requirement (as opposed to an option) to obtain all or most of a customer's requirements from a dominant undertaking;[513]

(2) Its conduct differs in several respects to that at issue in the *Intel* case;[514] and

(3) Apple first suggested the alleged exclusivity payments and was actively involved in the wording of the First Amendment to the Transition Agreement.[515]

(402) In relation to point (1) of recital (401), what makes the payments of a dominant undertaking exclusive is that they are designed to deprive customers of sources of supply or restrict their possible choices of sources of supply and to deny competitors access to the market.[516] In order to achieve such a result, it is not necessary that such payments be coupled with a formal obligation on customers to obtain all or most of their requirements from the dominant undertaking. While such a formal requirement may be one method of achieving such a result, it is not the only one. For example, the same result may be achieved, as in this case, by making previous and future payments conditional on the absence of switching.

(403) In relation to point (2) of recital (401), Qualcomm's argument that its exclusivity payments should not be assessed in the same way as the exclusivity rebates in the *Intel* case due to a number of differences between the two cases is unfounded. This is because, in this case, the Commission assessed Qualcomm's conduct on its own merits and on the basis of the principles outlined in Section 11.1.

(404) In relation to point (3) of recital (401), it is irrelevant who first suggested the exclusivity payments and the degree of involvement of Qualcomm and Apple in the wording of the First Amendment to the Transition Agreement. An undertaking that is in a dominant position on a market and ties purchasers — even if it does so at their request — by an obligation or promise on their part to obtain all or most of their requirements exclusively from the said undertaking is presumed to abuse its

512 Qualcomm's response of 27 June 2016 to the Statement of Objections [...], paragraphs 53-81.
513 Qualcomm's response of 27 June 2016 to the Statement of Objections [...], paragraphs 62 and 481.
514 Qualcomm's response of 27 June 2016 to the Statement of Objections [...], paragraph 66.
515 Qualcomm's response of 27 June 2016 to the Statement of Objections [...], paragraph 416.
516 Case C-85/76 *Hoffmann-La Roche*, EU:C:1979:36, paragraph 90; Case T-66/01 *Imperial Chemical Industries v Commission*, EU:T:2010:255, paragraph 315; Case T-155/06 *Tomra v Commission*, EU:T:2010:370, paragraph 209.

dominant position within the meaning of Article 102 of the Treaty and Article 54 of the EEA Agreement.[517]

(405) In any event, the evidence in the Commission's file (see Section 11.4.2.3) indicates that it is unlikely that Apple requested the exclusivity conditions in the Agreements.

11.4. Potential anti-competitive effects of Qualcomm's exclusivity payments

(406) The presumption that the grant of Qualcomm's exclusivity payments constitutes an abuse of a dominant position is borne out in the circumstances of the present case by the Commission's analysis of the capability of Qualcomm's exclusivity payments to have anti-competitive effects.

(407) First, Qualcomm's payments reduced Apple's incentives to switch to competing LTE chipset suppliers (Section 11.4.1).

(408) Second, Apple's internal documents and explanations confirm that Qualcomm's exclusivity payments reduced Apple's incentives to switch to competing LTE chipset suppliers (Section 11.4.2).

(409) Third, Qualcomm's exclusivity payments covered a significant share of the market (Section 11.4.3).

(410) Fourth, Apple is an attractive customer for LTE chipset suppliers because of its importance for entry or expansion in the worldwide market for LTE chipsets (Section 11.4.4).

(411) As part of this analysis, the Commission has assessed and taken into account, in particular: (i) the extent of Qualcomm's dominant position on the worldwide market for LTE chipsets (see Section 10); (ii) the share of the worldwide market for LTE chipsets covered by the exclusivity payments (see Section 11.4.3); (iii) the conditions and arrangements for granting the exclusivity payments (see Section 11.3); (iv) their duration and amount (see Sections 11.4.1 and 11.8); and (v) the importance of Apple as a baseband chipset customer (Section 11.4.4).

11.4.1. Qualcomm's exclusivity payments reduced Apple's incentives to switch to competing LTE chipset suppliers

(412) The Commission concludes that Qualcomm's exclusivity payments reduced Apple's incentives to switch to competing LTE chipset suppliers.

(413) First, as indicated in Table 11 below, between 2011 and 2016, the Incentive Payments represented in total USD [3-4] billion. This constituted between [0-5]% and [10-20]% of Apple's yearly expenditure on baseband chipsets between 2011 and 2016 and is a significant amount both in absolute terms and as a proportion of Apple's baseband chipset expenditure.

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[517] Case C-85/76 *Hoffmann-La Roche v Commission*, EU:C:1979:36, paragraph 89; Case T-65/89 *BPB Industries and British Gypsum v Commission*, EU:T:1993:31, paragraph 68 confirmed on appeal in Case C-310/93 P, EU:C:1995:101, paragraph 11; Case T-128/98 *Aéroports de Paris v Commission*, EU:T:2000:290, paragraph 170; Case T-66/01 *Imperial Chemical Industries v Commission*, EU:T:2010:255, paragraphs 305, 315, 328 and 413; Case C-413/14 P *Intel Corp. v Commission*, EU:C:2017:632, paragraph 137.

(414) Second, Apple would not have obtained these payments had it launched a device incorporating a LTE chipset from any supplier other than Qualcomm during the Period Concerned.

(415) Pursuant to the Agreements, Qualcomm therefore paid Apple a total of USD [2-3] billion between 2011 and 2015 and retained USD [600-700] million originally due for 2016 following Apple's launch on 16 September 2016 of iPhone 7 devices incorporating Intel LTE chipsets (see recital (173)).

Table 12 – Amount of Incentive Payments between 2011 and 2016[518]

Year	Amount of Incentive Payment (USD)	Incentive Payments as % of yearly Apple expenditure on baseband chipsets	Incentive Payments as % of yearly Apple expenditure on Qualcomm baseband chipsets[519]
2011	[40,000,000-50,000,000]	[0-5]%	[5-10]%
2012	[400,000,000-500,000,000]	[10-20]%	[10-20]%
2013	[700,000,000-800,000,000]	[10-20]%	[10-20]%
2014	[700,000,000-800,000,000]	[10-20]%	[10-20]%
2015	[800,000,000-900,000,000]	[10-20]%	[10-20]%
2016*	[600,000,000-700,000,000]	[10-20]%	[10-20]%

* Estimates[520]

(416) Third, as indicated in the Table 13, the amounts affected by the Repayment Mechanism represented in total USD [700-800] million. Apple would have had to make such repayments had it obtained LTE chipsets from any supplier other than Qualcomm in 2013, 2014 and 2015.[521]

518 See non-confidential Annexes to Apple's responses to […] of the request for information […]. While table 11 of the Statement of Objections contained different percentage values because […], Apple submitted an updated version of its original submission […], those differences do not contradict the conclusion that Qualcomm's exclusivity payments reduced Apple's incentives to switch to competing LTE chipset suppliers and the Commission has used those updated percentages in this Decision.

519 The difference in some years between the percentage values in the 3rd and 4th columns is because even though the Transition Agreement was effective as of February 2011, Apple continued to obtain baseband chipsets from Intel necessary for the manufacture of legacy products until 2014. In addition, on 16 September 2016, Apple launched iPhone 7 devices incorporating Intel LTE chipsets.

520 For 2016, Apple provided only estimates for the Marketing Fund; see non-confidential Annexes to Apple's responses to […] of the request for information […].

521 As stated in Section [8.2], no repayment was due in case of breach in the years 2011, 2012 and 2016 because the Repayment Mechanism was established only as of 1 January 2013 and there was no Repayment Mechanism for 2016.

Table 13 – Amounts to be reimbursed by Apple under the Repayment Mechanism if Apple had obtained LTE chipsets from any supplier other than Qualcomm in 2013, 2014 and 2015[522]

Year of breach for exclusivity requirement	Amount to be reimbursed by Apple to Qualcomm pursuant to the Repayment Mechanism (USD)	Reimbursement as % of yearly Apple expenditure on Qualcomm baseband chipsets
2013	[100,000,000-200,000,000]	[0-5]%
2014	[300,000,000-400,000,000]	[5-10]%
2015*	[200,000,000-300,000,000]	[5-10]%

* Estimates[523]

(417) Fourth, the cumulative impact of the Termination Clause and the Repayment Mechanism if Apple had ceased obtaining from Qualcomm all of Apple's requirements of LTE chipsets between 2011 and 2016 is significant, as shown in Table 14.

522 See non-confidential Annexes to Apple's response to […] of the request for information […].

523 For 2015, Apple provided only estimates; see non-confidential Annexes to Apple's responses to […] of the request for information […].

Table 14 – Cumulative amounts foregone if Apple had obtained LTE chipsets from a supplier other than Qualcomm[524] in a given year between 2011 and 2016[525]

Year	Incentive Payments that Apple would have foregone due to the Termination Clause (USD)[526]	Amount that Apple would have had to reimburse pursuant to the Repayment Mechanism (USD)	Total loss in a given year due to Termination Clause and Repayment Mechanism (USD)
2011	[500,000,000-1,000,000,000][527]	-	[500,000,000-1,000,000,000]
2012	[500,000,000-1,000,000,000][528]	-	[500,000,000-1,000,000,000]
2013*	[2,500,000,000-3,000,000,000][529]	[100,000,000-200,000,000]	[2,500,000,000-3,000,000,000]
2014*	[2,000,000,000-2,500,000,000][530]	[300,000,000-400,000,000]	[2,500,000,000-3,000,000,000]

524 With the exception of legacy devices, see Sections [8.1] and [8.2].

525 See non-confidential Annex to Apple's response to […] of the request for information […]. The figures in the table are different from the figures included in Table 11 because they reflect Apple's estimates as to the expected loss due to the switch as of a given year; see footnotes 527 - 532.

526 While Table 13 of the Statement of Objections contained a clerical error relating to data from Apple, that error does not contradict the conclusion that Qualcomm's exclusivity payments reduced Apple's incentives to switch to competing LTE chipset suppliers and the Commission has corrected that error in this Decision.

527 Because of the multi-annual character of the Agreements, the total loss of USD [500,000,000-1,000,000,000] had Apple switched in 2011 would have included payments relating to several years: (i) Marketing Development Fund for 2011 and 2012 (USD [20,000,000-30,000,000] x [5-10]); (ii) Variable Incentive Fund for 2012, 2013 and 2014 (USD [100,000,000-200,000,000] x [0-5]); and (iii) Transition Fund for 2012 and 2013 (USD [100,000,000-200,000,000] x [0-5]).

528 Because of the multi-annual character of the Agreements, the total loss of USD [500,000,000-1,000,000,000] had Apple switched at the time of the launch of the new iPhone model in September 2012 would have included payments relating to several years: (i) Marketing Development Fund for 2012 (USD [20,000,000-30,000,000] x [0-5]); (ii) Variable Incentive Fund for 2012, 2013 and 2014 (USD [100,000,000-200,000,000] x [0-5]); and (iii) Transition Fund for 2013 (USD [100,000,000-200,000,000]). Had Apple switched at the time of the launch of the new iPad 3rd generation model in March 2012, the total loss would have been USD [500,000,000-1,000,000,000] as Apple would have foregone, in addition to USD [500,000,000-1,000,000,000], a further USD [100,000,000-200,000,000] in Incentive Payments.

529 Because of the multi-annual character of the Agreements, the total loss of USD [2,500,000,000-3,000,000,000] had Apple switched in 2013 would have included payments relating to several years: (i) Marketing Fund for 2013, 2014, 2015 and 2016 (USD [300,000,000-400,000,000] + USD [500,000,000-600,000,000] + USD [600,000,000-700,000,000] + USD [400,000,000-500,000,000]); (ii) Variable Incentive Fund for 2013 and 2014 (USD [100,000,000-200,000,000] x [0-5]); and (iii) Additional Variable Incentive Fund for 2015 and 2016 (USD [100,000,000-200,000,000] + USD [100,000,000-200,000,000]).

530 Because of the multi-annual character of the Agreements, the total loss of USD [2,000,000,000-2,500,000,000] had Apple switched in 2014 would have included payments relating to several years: (i) Marketing Fund for 2014, 2015 and 2016 (USD [500,000,000-600,000,000] + USD [600,000,000-700,000,000] + USD [400,000,000-500,000,000]); (ii) Variable Incentive Fund for 2014 (USD

2015*	[1,000,000,000-1,500,000,000][531]	[200,000,000-300,000,000]	[1,500,000,000-2,000,000,000]
2016*	[600,000,000-700,000,000][532]	-	[600,000,000-700,000,000]

* Estimates[533]

(418) Fifth, the Commission's conclusion is not affected by Qualcomm's claim that *"[the Commission] commits the fundamental conceptual error of treating as part of the alleged "cost" of "switching" any and all incentives that may be generated in respect of future sales of baseband chipsets for use in Apple devices during the term of the Transition Agreement (as amended)."*[534] Qualcomm considers that "*any competing baseband chipset supplier is equally well placed to offer an identical incentive [for future sales of not-yet released models of Apple devices]*".[535]

(419) In the first place, contrary to what Qualcomm claims, Table 14 accurately quantifies the magnitude of the incentives for Apple created by the Agreements on Apple. Qualcomm does not contest that Apple was entitled to obtain the entire amount of the Incentive Payments, provided it fulfilled the requirements of the Agreements. Qualcomm also does not contest that had Apple obtained LTE chipsets from any supplier other than Qualcomm, it would no longer have been entitled to any future Incentive Payments and would have had to repay some of the Incentive Payments already made.

(420) In the second place, the fact that competing baseband chipset suppliers would have had to offer Apple similar incentives to compensate for the loss of the Incentive Payments confirms that those payments reduced Apple's incentives to switch to competing LTE chipset suppliers.

(421) In the third place, as explained in Section 11.4.2, until 2016 Apple would only have switched LTE chipset supplier for its iPad requirements. iPad sales represent only approximately 10% of Apple's sales of LTE devices, the rest being accounted for by iPhones.[536] Competing LTE chipset suppliers would therefore have had to offer Apple incentives to compensate for the loss of the Incentive Payments over the entire portfolio of existing and future generations of iPhones and iPads while it could

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[100,000,000-200,000,000]); and (iii) Additional Variable Incentive Fund for 2015 and 2016 (USD [100,000,000-200,000,000] + USD [100,000,000-200,000,000]).

531 Because of the multi-annual character of the Agreements, the total loss of USD [1,000,000,000-1,500,000,000] had Apple switched in 2015 would have included payments relating to several years: (i) Marketing Fund for 2015 and 2016 (USD [600,000,000-700,000,000] + USD [400,000,000-500,000,000]); and (ii) Additional Variable Incentive Fund for 2015 and 2016 (USD [100,000,000-200,000,000] + USD [100,000,000-200,000,000]).

532 The total loss of USD [600,000,000-700,000,000] had Apple switched in 2016 would have included payments relating to: (i) Marketing Fund for 2016 (USD [400,000,000-500,000,000]); and (ii) Additional Variable Incentive Fund for 2016 (USD [100,000,000-200,000,000]).

533 For the 2015 and 2016 Marketing Fund values, Apple provided only estimates. As these values are also part of the calculations of the cumulative amounts for 2013 and 2014 (see footnotes 529 and 530), the cumulative amounts in 2013 and 2014 are also indicated as estimates.

534 Qualcomm's response of 27 June 2016 to the Statement of Objections [...], paragraph 544.

535 Qualcomm's response of 27 June 2016 to the Statement of Objections [...], paragraph 544.

536 Apple's comments […] on Qualcomm's response to the Statement of Objections [...], paragraph 82.

recover those Incentive Payments over revenues from only the future generation(s) of iPads.

(422) Sixth, the Commission's conclusion is not affected by Qualcomm's claim[537] that it would not have made sense for Qualcomm to offer additional funds to Apple under the First Amendment to the Transition Agreement if the Transition Agreement had already foreclosed competition. [Qualcomm's commercial relationships with Apple / Qualcomm's business decisions and strategy], notwithstanding the Transition Agreement, it entered into the First Amendment to the Transition Agreement [Qualcomm's commercial relationships with Apple / Qualcomm's business decisions and strategy].[538]

11.4.2. Apple's internal documents and explanations confirm that Qualcomm's exclusivity payments reduced Apple's incentives to switch to competing LTE chipset suppliers

(423) The Commission concludes that Apple's internal documents and explanations confirm that Qualcomm's exclusivity payments reduced Apple's incentives to switch to competing LTE chipset suppliers (Section 11.4.2.1). This conclusion is not affected by Qualcomm's claims that: (i) Apple's internal documents are unreliable and contradict its explanations (Section 11.4.2.2); (ii) Qualcomm did not insist on the alleged exclusivity contained in the Agreements (Section 11.4.2.3); and (iii) Apple would have selected Qualcomm in any event because of the superior quality of its LTE chipsets (Section 11.4.2.4).

11.4.2.1. Apple's internal documents and explanations

(424) Apple's internal documents and explanations confirm that Qualcomm's exclusivity payments reduced Apple's incentives to switch to competing LTE chipset suppliers, in particular Intel, whose chipsets had been evaluated seriously by Apple for use in devices launched in 2014 and 2015.

(425) After entering into the Transition Agreement in 2011, Apple sought to try an alternative supplier in one of its non-CDMA iPad models, due to the smaller volumes and commercial risk.[539] As […] explained in an internal email dated 20 February 2014: *" From vendor bring up perspective, it's much better to bring up the alternate vendor on iPad before we do an iPhone with them"*.[540]

(426) The first time that Apple sought to try an alternative supplier in one of its non-CDMA iPad models was in summer 2011, relating to the launch in 2014 of the non-CDMA versions of iPads. On 9 August 2011, Apple drew up a technical shortlist of the three baseband chipset suppliers it considered to be the most competitive alternatives to Qualcomm, namely ST-Ericsson, Broadcom and Intel.[541] Apple then engaged in a series of discussions with at least Intel and Broadcom for over a year.[542]

(427) Apple considered Intel's June 2012 proposal to be particularly competitive as *"the overall contract is more favourable with IMC [Intel]"*, including the per-device

537 Qualcomm's response of 27 June 2016 to the Statement of Objections [...], paragraph 570.

538 Annex 22 of Qualcomm's response of 27 June 2016 to the Statement of Objections, […], p. 22.

539 Apple's non-confidential answer to […] of the request for information […].

540 Non-confidential version of Apple's internal document submitted in response to the request for information […], AAPL00056 […].

541 Non-confidential version of Apple's internal document submitted in response to the request for information […], AAPL00001 […].

542 Apple's non-confidential answer to […] of the request for information […].

chipset price. Moreover, *"there is no apparent technical KPI [Key Performance Indicator] and feature advantage of a […] [Qualcomm] solution except C2K availability".*[543] Apple therefore *"began serious consideration of using an Intel baseband chipset for Apple's 2014 mobile devices".*[544]

(428) After further assessment, however, Apple's procurement team calculated on 29 June 2012 that Intel's June 2012 financial proposal would be insufficient to compensate Apple for the loss of Qualcomm's last payment under the Variable Incentive Fund: *"If we assume [20m-40m] cellular based iPads, we'd need a $[0-5] cheaper solution just to break even on the last payment of the transition agreement ($[100- 200]) which would likely be lost. We'll need $[5-10]-$[5-10] additional reduction as break even."*[545] As a result, Apple's procurement team […][546]

(429) In July 2012, Intel came back with an improved price offer. Following assessment of that proposal, Apple's procurement team concluded on 26 July 2012 that *"[w]e are at a point where we have an interesting commercial proposal […] These are measurable savings."*[547] Apple's procurement team also considered that the *"[o]verall contract is more favourable with IMC. […] IMC MDSA is better than Qualcomm STA [Strategic Terms Agreement]."*[548]

(430) A number of internal strategy documents prepared by Apple's procurement team in September 2012 discussed the costs and benefits of using Intel baseband chipsets in iPads.[549] Apple's procurement team analysed the cost savings that it could achieve by using Intel's baseband chipsets in some of its iPads in 2014 and the entirety of its cellular iPad portfolio in 2015. The presentation indicated that while *"IMC7160 is on par with […] [Qualcomm] 9x15"* in terms of technology, *"The IMC7160 savings vs. […] chipset would be [$6.5-$10.00]".* The presentation therefore concludes that *"[…] […] 2014 Transition Agreement payment at risk but long term savings opportunity outweighs the TA [Transition Agreement] payment."*[550]

(431) Similarly, in Apple's Modem Roadmap, circulated internally by Apple's procurement team on 4 September 2012, Intel's baseband chipsets were indicated as alternative options to Qualcomm's for the 2014 and 2015 iPad models as well as the 2015 iPhone model.[551] Apple has subsequently stated that *"[…]."*[552]

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543 Non-confidential version of Apple's internal document submitted in response to the request for information […], AAPL00012 […].

544 Apple's non-confidential answer to […] of the request for information […].

545 Non-confidential version of Apple's internal document submitted in response to the request for information […], AAPL00036 […].

546 Non-confidential version of Apple's internal document submitted in response to the request for information […], AAPL00036 […].

547 Non-confidential version of Apple's internal document submitted in response to the request for information […], AAPL00040 […].

548 Non-confidential version of Apple's internal document submitted in response to the request for information […], AAPL00084 […].

549 Non-confidential versions of Apple's internal documents submitted in response to the request for information […], AAPL00082; AAPL00099; and AAPL00111 […].

550 Non-confidential version of Apple's internal document submitted in response to the request for information […], AAPL00045 […].

551 Non-confidential version of Apple's internal document submitted in response to the request for information […], AAPL00079 […].

552 Apple's non-confidential answer to […] of the request for information […].

(432) Equally, a presentation of 11 September 2012 circulated by Apple's procurement team concluded that the transition of iPads to Intel baseband chipsets could be achieved by […] and would yield to Apple cumulative savings of [USD 400-550 million] over a 2-year period.[553]

(433) On 2 October 2012, following a meeting dedicated to a review of baseband chipset suppliers, […], circulated an email of the minutes of the meeting.[554] The minutes indicated that Apple was considering an Intel product for the iPad. The email notes in particular that: "*[…]*".[555] The email further clarified that *"[…]"*.[556] The same email also clarified that Intel was the most credible alternative to Qualcomm: "*[…]*".[557] Eventually, *"all agreed in the meeting that IMC for […]* [[Apple product] originally planned for launch in spring 2014][558] *was a good plan"*.[559]

(434) At the beginning of 2013, however, *"Qualcomm offered Apple significant incentives to use its chipsets exclusively in Apple devices."*[560] This eventually led to the First Amendment to the Transition Agreement on 28 February 2013.

(435) As a result of the First Amendment to the Transition Agreement, Apple "*cease*[d] *all consideration of alternative baseband chipset vendors to Qualcomm for 2014 and 2015 mobile devices."*[561] Apple also "*began requiring certain executives to review a "clawback checklist" at the end of each quarter and certify that no triggering events (i.e., use of non-Qualcomm chipsets) had taken place that would have required reimbursements to Qualcomm."*[562]

(436) Unaware of the terms of the Agreements, engineers within Apple continued, however to advocate for the use of Intel as an alternative chipset supplier in iPads.[563] For example, an internal email exchange from 18 February 2014 indicated that an Apple engineer suggested using Intel's baseband chipset in the Autumn 2015 iPad model, as it *"has feature parity"* with Qualcomm's chipset.[564]

(437) This suggestion was, however, rejected by Apple's procurement team because, as explained by […] in an email of 20 February 2014, […] had some *"commercial penalty concerns"* about using non-Qualcomm baseband chipsets.[565] According to

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553 Non-confidential version of Apple's internal document submitted in response to the request for information […], AAPL00084 […].

554 Non-confidential version of Apple's internal documents submitted in response to the request for information […], AAPL00107 [...].

555 Non-confidential version of Apple's internal documents submitted in response to the request for information […], AAPL00107 [...].

556 Non-confidential version of Apple's internal documents submitted in response to the request for information […], AAPL00107 [...].

557 Non-confidential version of Apple's internal documents submitted in response to the request for information […], AAPL00107 [...].

558 Finally launched in Autumn 2013.

559 Non-confidential version of Apple's internal documents submitted in response to the request for information […], AAPL00107 [...].

560 Apple's non-confidential answer to […] of the request for information of 12 March 2015 [...].

561 Apple's non-confidential answer to […] of the request for information of 12 March 2015 [...].

562 Apple's non-confidential answer to […] of the request for information of 12 March 2015 [...].

563 Apple's non-confidential answer to […] of the request for information of 12 March 2015 [...].

564 Non-confidential version of Apple's internal document submitted in response to the request for information […], AAPL00056 […].

565 Non-confidential version of Apple's internal document submitted in response to the request for information […], AAPL00056 […].

[…] email of the same day, the commercial launch of an iPad with a competing baseband chipset supplier in 2015 would be *"commercially untenable"*.[566]

(438) Indeed, on 29 January 2014, Apple's procurement team had put together a document aimed at illustrating the costs and benefits for Apple of a breach of its exclusivity requirement with Qualcomm by shifting [70-90%] of Apple's demand for non-CDMA baseband chipsets[567] to an alternative supplier in 2015.[568] The procurement team's analysis indicated that the potential costs of Apple breaching the Agreements would outweigh the potential benefits even in the "*unrealistically aggressive*"[569] scenario of shifting [70-90%] of Apple's non-CDMA baseband chipset needs to Intel.

(439) When considering alternative baseband chipset suppliers for 2015 device models, Apple thus estimated[570] that it "stood to lose over $*[0-2]* billion in payments and reimbursements to Qualcomm if it used a non-Qualcomm chipset in its fall 2015 lineup of mobile devices. These financial penalties ensured Apple would be exclusive to Qualcomm through at least 2015, despite the attractiveness of competitive alternatives."[571]

11.4.2.2. The reliability of Apple's internal documents and explanations

(440) Contrary to what Qualcomm claims,[572] Apple's internal documents and explanations are reliable as a whole and confirm that Qualcomm's exclusivity payments reduced Apple's incentives to switch to competing LTE chipset suppliers.

(441) First, Apple submitted the internal documents and explanations in response to requests for information pursuant to Article 18(2) of Regulation (EC) No 1/2003. Providing incorrect or misleading information in response to such requests is punishable by a fine.[573]

(442) Second, there is no inconsistency between Apple's internal documents and explanations regarding why it chose to use Qualcomm LTE chipsets in devices launched in 2014 and 2015.

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566 Non-confidential version of Apple's internal document submitted in response to the request for information […], AAPL00056 […].

567 And not, as Apple indicated in its response to […] of the request for information […], the costs and benefits for Apple of a breach of its exclusivity requirement with Qualcomm by shifting [70-90%] of Apple's total demand for baseband chipsets. Such an inaccuracy does not, however, contradict the conclusion that Qualcomm's exclusivity payments reduced Apple's incentives to switch. This is because Apple's inaccurate premise indicates that Apple considered that switching to Intel would have been unprofitable even for a higher number of units ([70-90]% of all needs as opposed to [70-90]% of non-CDMA needs).

568 Non-confidential versions of Apple's internal documents submitted in response to the request for information[…], AAPL00050; and AAPL00129 […].

569 Apple's non-confidential answer to […] of the request for information [...].

570 While Apple therefore overestimated the amount of the Incentive Payments it would have lost had it switched in 2015 (which, as indicated in Table 13, was USD [0-2] billion), such an overestimation does not contradict the conclusion that Qualcomm's exclusivity payments reduced Apple's incentives to switch. This is because the Commission in any event took into account in its assessment the lower amount.

571 Apple's non-confidential answer to […] of the request for information [...].

572 See Section V of Qualcomm's response of 27 June 2016 to the Statement of Objections [...].

573 In addition, as a Qualcomm customer, Apple risks exposing itself to retaliatory measures by Qualcomm if it were wrongly to accuse Qualcomm of anti-competitive conduct in a Commission investigation.

(443) In the first place, Apple's explanations indicate that its choice not to use Intel's chipsets was motivated by several considerations and that Qualcomm's exclusivity payments were one reason for that choice:

(1) *"Apple would likely have selected Intel baseband chipsets for its 2014 iPad models but for Qualcomm's rebates conditioned on exclusivity. It is also likely to have selected Intel baseband chipsets for the 2015 iPad models, and, if Intel had demonstrated its capabilities in the 2014 iPad models, the non-CDMA iPhone models in 2015*".[574]

(2) *"The internal documents cited in SO 268-281 provide for an abundance of evidence that the exclusivity obligations in the TA and FATA had, at the very minimum, a "material impact" on Apple's decision making since the TA entered into force in 2011."* [575]

(444) In the second place, internal Apple documents confirm that Apple seriously evaluated using Intel LTE chipsets.[576]

(445) In the third place, concerning Apple devices to be launched in 2014, contrary to Qualcomm's claim,[577] internal Apple documents[578] do not prove that Apple would have financially benefited from switching to Intel. This is because these documents date from 2012 and thus disregard the Marketing Fund and the Additional Variable Incentive Funds introduced by the First Amendment and their impact on Apple's incentives to switch (see recitals (156) to (163)).

(446) In the fourth place, concerning Apple devices to be launched in 2015, the single internal Apple document quoted by Qualcomm, which dates from […],[579] does not support its claim that Apple would have financially benefited had it chosen to use Intel LTE chipsets in devices launched in 2015:

(1) The internal document, put together by Apple's procurement team, illustrates that the costs of Apple breaching the Agreements would have outweighed the benefits in 2015:[580]

(2) Concerning Qualcomm's claim[581] that Apple would have benefited from a switch as of 2015 once losses and benefits for 2016 were also taken into account, the Commission notes that the document assumes that Apple would have been able to switch as of 2015 for a substantial share of the 2015 iPhone generation which was unrealistic as in 2015, Apple would only have switched LTE chipset supplier for its iPad requirements (see recitals (436), (437) and footnote 586); and

(3) Apple did not double-count the Variable Incentive Funds for legacy devices. Rather, in the event Apple had chosen to use Intel LTE chipsets in devices

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574 Apple's non-confidential answer to […] of the request for information [...].

575 Apple observations […] on the Commission's Statement of Objections […], paragraph 51.

576 See for example non-confidential version of Apple's internal document submitted in response to the request for information […], AAPL00111, AAPL00050, AAPL00036 […].

577 Qualcomm's response of 27 June 2016 to the Statement of Objections [...], paragraphs 389-393.

578 AAPL12 […], AAPL45 […], AAPL84 […], APL99 […], AAPL36 […].

579 AAPL00050, […]. Qualcomm's response of 27 June 2016 to the Statement of Objections [...], paragraphs 395-397.

580 Qualcomm's response of 27 June 2016 to the Statement of Objections [...], paragraph 401.

581 Qualcomm's response of 27 June 2016 to the Statement of Objections [...], paragraph 401.

launched in 2015, it (i) could have lost in relation to legacy devices, up to USD [100-200] million in 2015 from the Variable Incentive Funds provided for in the Transition Agreement[582] (ii) would have lost another USD [100-200] million in 2015 from the additional Variable Incentive Funds provided for in the First Amendment to the Transition Agreement, and (iii) would have lost in relation to future devices, USD [100-200] million[583] in 2016 from the Additional Variable Incentive Funds provided for in the First Amendment to the Transition Agreement.[584]

(447) Fourth, contrary to what Qualcomm claims[585], it is unsurprising that there are internal Apple documents indicating that a switch to Intel in 2016 would be profitable for Apple as:

(1) The financial consequences of switching were lower than in previous years because (i) there was no Repayment Mechanism in that year; and (ii) Apple would not have foregone payments for future years/device since 2016 was the last year of the validity of the Agreements;[586] and

(2) Apple would be able to switch sourcing for a higher number of units than in previous years due to Intel's improvement in key technologies[587] that allowed Intel to be considered for the iPhone (and not only the iPad) which means that the foregone payments could be spread over a higher number of units and would be significantly lower on a per device basis.

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582 The Variable Incentive Fund represented USD [500-600] million over 2012, 2013, 2014 and 2015 with a maximum of USD [100-200] million for each year (based on the number of Qualcomm chipsets bought by Apple in a given year). As a result, at the time of the preparation of the internal document of […], Apple would have been uncertain as to the amount left to be paid out from the Variable Incentive Fund in November 2015.

583 That is approximately USD [0-5] per device (USD [100-200] million / [250-350] million devices).

584 But not, as Apple indicated in its response to […] of the request for information […], USD [0-5] per device […]. Such an inaccuracy does not, however, contradict the conclusion that Qualcomm's exclusivity payments reduced Apple's incentives to switch. This is because Apple's incentives to switch as of 2015 would be reduced in both these scenarios (as the amount of [0-5] USD per device would be present in either of them).

585 Qualcomm's response of 27 June 2016 to the Statement of Objections [...], paragraph 505.

586 See Apple's comments […] on Qualcomm's response to the Statement of Objections [...], paragraphs 81-82: *"For its 2016 devices, Apple was in a similar situation as it was at the end of 2012, when it considered BC suppliers for its 2014 iPad. With the exclusivity payments coming to an end, in both instances, Apple faced a lower contractual penalty and thus had increased incentives to engage with Intel. The main difference is that, at the end of 2012, Qualcomm engaged in discussions that would lead to the FATA, in order to prevent Apple from effectively engaging with Intel. These factors, combined with the improvements of the Intel chipsets with regards to key technologies, including VoLTE, contributed to Apple's decision in 2014 to introduce Intel as a second BC supplier for the non-CDMA portion of its 2016 iPhones. As mentioned in Apple's Reply to Question 1 the RFI of 12 March 2015, and evidenced by the calculations in AAPL 54, by this time, a decision to use Intel only in iPad SKUs would not have made economic sense, as iPads represent only approximately 10% of Apple's BC purchases, and the loss of the payments under the FATA's Marketing Funds and AVIF would not have been compensated by unit savings on only 10% of Apple's new cellular device sales. Apple therefore had no choice but to "go big" and take the risk of using a new BC supplier in its flagship product, the iPhone 7."*

587 See footnote 586 above.

11.4.2.3. Contrary to Qualcomm's claims, it is unlikely that Apple requested the exclusivity conditions in the Agreements

(448) Even if it were legally relevant which party requested the inclusion of the exclusivity provisions in the Agreements, which it is not,[588] the evidence on file suggests that, contrary to what Qualcomm claims,[589] it is unlikely that Apple requested the exclusivity conditions in the Agreements.

(449) First, it is improbable that Apple would have requested the inclusion of such a mechanism because it required it to forego future Incentive Payments and even to reimburse part of the Incentive Payments previously made by Qualcomm in the event that Apple launched a product incorporating a non-Qualcomm baseband chipset.

(450) Second, concerning specifically the Repayment Mechanism, contrary to what Qualcomm claims,[590] there is no inconsistency between the proposition that Qualcomm requested the inclusion of the Repayment Mechanism in the First Amendment to the Transition Agreement and the possibility that Apple might have prepared a first draft of the wording of the Repayment Mechanism. On the contrary, the process of drafting of the wording of the Repayment Mechanism confirms that Qualcomm's payments were conditional on Apple obtaining from Qualcomm all of Apple's requirements of LTE chipsets, and that when Apple attempted to relax that condition via the wording of the Repayment Mechanism, Qualcomm refused:

(1) In an email exchange dated 9 January 2013 Qualcomm asked Apple to "*send […] the language on the clawback*" namely the Repayment Mechanism;[591]

(2) In an email dated 10 January 2013, Apple sent Qualcomm a draft of such language. According to the draft language, Apple would be entitled to obtain up to [20-30]% of its LTE chipset requirements from another supplier in 2015 without any financial penalty linked to the Marketing Fund;[592] and

(3) On 20 January 2013, Qualcomm sent Apple revised language in which it replaced Apple's proposal with an obligation whereby Apple would have to reimburse all Marketing Fund amounts paid by Qualcomm during the preceding 15 months if Apple were to launch in 2015 any device with a non-Qualcomm baseband chipset.[593]

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588 Case C-85/76 *Hoffmann-La Roche v Commission*, EU:C:1979:36, paragraph 89; Case T-65/89 *BPB Industries and British Gypsum v Commission*, EU:T:1993:31, paragraph 68.

589 Qualcomm's response of 27 June 2016 to the Statement of Objections [...], paragraph 416.

590 Qualcomm's response of 27 June 2016 to the Statement of Objections [...], paragraphs 416-422.

591 Qualcomm's response of 27 June 2016 to the Statement of Objections [...], paragraph 418.

592 Annex 9 of Qualcomm's response of 27 June 2016 to the Statement of Objections […].

593 Annex AAPL191 […] and AAPL194 […] to Apple's comments […] on Qualcomm's response to the Statement of Objections [...]. Contrary to what Qualcomm claims in paragraph 225 of its response of 13 March 2017 to the Letter of Facts [...], it was not therefore that Qualcomm "*simplified the workings of the provision by proposing a mechanism whereby the use of non-Qualcomm chipsets in Apple's devices (except for legacy devices) would trigger an obligation on Apple's part to reimburse the marketing fund that would have already been paid by Qualcomm without interest (which provided for USD [0-5] per iPhone and USD [0-5] per iPad).*" Rather, Qualcomm's wording ensured that the payments to Apple would continue to be conditional on Apple obtaining from Qualcomm all of Apple's requirements of LTE chipsets.

11.4.2.4. Qualcomm's exclusivity payments had an impact on Apple's LTE chipset sourcing strategy for devices to be launched in 2014 and 2015

(451) The Commission concludes that Qualcomm's exclusivity payments had an impact on Apple's LTE chipset sourcing strategy for devices to be launched in 2014 and 2015.

(452) First, contrary to what Qualcomm claims,[594] Apple does not pursue a single-sourcing strategy for baseband chipsets as a matter of company policy. Rather, the fact that Apple obtained from Qualcomm all of Apple's requirements of LTE chipsets under the terms of the Agreements was an exception to Apple's general policy to multi-source.[595] This is confirmed by the fact that:

(1) In 2011, Apple obtained baseband chipsets for iPhone 4 devices from Intel and Qualcomm; and

(2) As of 2016, Apple obtained baseband chipsets for iPhone 7 devices from Qualcomm and Intel.

(453) Moreover, if Apple were to pursue a single-sourcing strategy as a matter of company policy, it would have been unnecessary for Qualcomm to offer Apple the Incentive Payments as it would have been sufficient for Qualcomm to supply only a limited amount of Apple's requirements of LTE chipsets in order to ensure exclusivity.

(454) Second, contrary to what Qualcomm claims,[596] Apple did not pursue a strategy of having one phone for all carriers as a matter of company policy, requiring that all chipsets in its devices be multimode and support the CDMA standard. This is confirmed by the fact that as of 2016, Apple obtained part of its baseband chipsets from Intel (with no CDMA functionality).

(455) Third, contrary to what Qualcomm claims,[597] it is irrelevant whether Apple may have decided to use Qualcomm chipsets in the devices launched during the period 2011 to 2013 before the signature of the Transition Agreement. As of the signature of the Transition Agreement on 25 February 2011, Qualcomm's exclusivity payments were capable of having anti-competitive effects in relation to LTE chipsets for devices that

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594 Qualcomm's response of 27 June 2016 to the Statement of Objections [...], paragraphs 352, 458-459 and 485. See also Qualcomm's response of 13 March 2017 to the Letter of Facts, paragraphs 247 and 249 [...] and Qualcomm's observations of 29 May 2017 on the evidence added to the case file since the adoption of the Statement of Objections [...], paragraph 22.

595 *"Sole or exclusive sourcing is contrary to Apple's procurement strategy. Apple has over [1,000-2000] supply agreements for various components of its products. For the overwhelming majority of these components, Apple has multiple suppliers. The reason is simply to maintain feature and price competition among suppliers, and to ensure security of supply by reducing dependency on any given supplier (which is critical given the short sales cycles and enormous volumes of Apple products, in particular the iPhone). De facto sole sourcing is very rare in Apple's supply chain. Other than with Qualcomm, Apple has never agreed to contractual exclusivity with any supplier."* Apple's comments […] on Qualcomm's response to the Statement of Objections [...], paragraph 47. As regards this Apple statement, Qualcomm re-iterates in its response to the Letter of Facts (paragraph 249 [...]) that Apple had a single SKU and single supplier strategy for baseband chipsets. This claim is addressed in recitals (452) - (453).

596 Qualcomm's response of 27 June 2016 to the Statement of Objections [...], paragraph 352 and 458-459. See also Qualcomm's observations of 29 May 2017 on the evidence added to the case file since the adoption of the Statement of Objections [...], paragraph 22.

597 Qualcomm's observations of 29 May 2017 on the evidence added to the case file since the adoption of the Statement of Objections [...], paragraphs 32-33.

were to be launched in 2014 and 2015, for which negotiations between Apple and its potential suppliers were ongoing.[598]

(456) Fourth, contrary to what Qualcomm claims,[599] the Agreements influenced Apple's decision to use Qualcomm chipsets in its devices launched in 2014 and 2015.

(457) In the first place, negotiations relating to Apple devices launched in 2014 and 2015 were ongoing between summer 2011 and January 2013,[600] namely following entry into force of the Transition Agreement and about one month before the signature of the First Amendment to the Transition Agreement.

(458) In the second place, on 10 January 2013, Qualcomm sent Apple an updated wording of the First Amendment to the Transition Agreement that already included the exclusivity payment provisions.[601] Thus, even if Apple's procurement decision in relation to its devices launched in 2014 and 2015 took place in or around January 2013,[602] it is implausible that such decision was not influenced by the First Amendment to the Transition Agreement that was formally signed in February 2013.

(459) Fifth, contrary to what Qualcomm claims,[603] Intel did not offer Apple a better level of intellectual property protection than Qualcomm […].[604]

(460) Sixth, contrary to what Qualcomm claims,[605] it does not appear that Apple decided to use Qualcomm's chipsets in the CDMA version of the iPhone 4 that was launched in February 2011 because of problems that it experienced with Intel's UMTS chipsets used in the iPhone 4. The articles quoted by Qualcomm mainly concern problems with Intel's chipsets used in the 2nd and 3rd generations of iPhones. While one article mentions a signal attenuation issue of the iPhone 4 with an Intel chipset,[606] it is unclear whether the iPhone 4 with Qualcomm chipset resolved this issue.[607]

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598 Apple issues a request for quotations to potential suppliers typically three years before launch of a device on the market, after holding technical workshops to determine the product roadmap. Apple typically takes a decision on the identity of its baseband chipset supplier(s) several months or even years before the launch (see non-confidential version of Apple's response to […] of the request for information […]). For example, already in summer 2011, Apple drew up a technical shortlist of the three alternative baseband chipset suppliers to Qualcomm it considered to be the most competitive relating to the launch in 2014 of the non-CDMA versions of iPad and then engaged in a series of discussions with at least Intel and Broadcom for over a year (see recital (426) and Apple's comments […] on Qualcomm's response to the Statement of Objections, paragraph 52 [...]).

599 Qualcomm's observations of 29 May 2017 on the evidence added to the case file since the adoption of the Statement of Objections [...], paragraphs 32-33.

600 See recitals (426), (434), (435) and (465).

601 Annex 9 of Qualcomm's response of 27 June 2016 to the Statement of Objections […]. Annex AAPL191-193 […] and AAPL194-200 […] to Apple's comments […] on Qualcomm response to the Statement of Objections [...].

602 Qualcomm's observations of 29 May 2017 on the evidence added to the case file since the adoption of the Statement of Objections [...], paragraph 32.

603 Qualcomm's response of 27 June 2016 to the Statement of Objections [...], paragraph 405. See also Qualcomm's response of 13 March 2017 to the Letter of Facts, paragraph 193 [...].

604 Non-confidential version of Apple's internal document submitted in response to the request for information […], AAPL00120 […].

605 Qualcomm's response of 27 June 2016 to the Statement of Objections [...], paragraphs 379 and 383. See also Qualcomm's observations of 29 May 2017 on the evidence added to the case file since the adoption of the Statement of Objections [...], paragraphs 24-27.

606 Non-CDMA iPhone 4 sold by AT&T.

607 While the article referenced by Qualcomm indicates that iPhone 4 with Qualcomm chipset (CDMA iPhone 4 sold by Verizon) resolved this issue, an article by Consumer Reports concludes that iPhone 4

(461) In addition, other documents relating to a common project of Qualcomm and AT&T aimed at solving the issues of dropping calls on the AT&T network also do not prove that Apple decided to switch to Qualcomm because of problems that it experienced with Intel's UMTS chipsets used in the iPhone 4. This is because, while it appears that Qualcomm may have contacted AT&T based on a request from Apple,[608] iPhone 4 is nowhere mentioned in the documents and the submitted AT&T and Qualcomm presentations are of general nature and do not specifically mention Apple.[609] In this context, Apple indicated that it decided to use Qualcomm chipsets in iPhone 4 due to their CDMA compatibility.[610]

(462) Seventh, the evidence on file does not support Qualcomm's claim[611] that Apple decided to use Qualcomm's LTE chipsets in devices launched in 2014 and 2015 because of certain technical shortcomings of Intel's LTE chipsets and because Intel could not supply the required chipsets on time.

(463) In the first place, as explained in recitals (442) - (444), there is no inconsistency between Apple's internal documents and explanations regarding why it chose Qualcomm LTE chipsets for use in devices launched in 2014 and 2015.

(464) In the second place, and in any event, Apple considered using Intel LTE chipsets in iPads to be launched in 2014 and 2015 taking into account all parameters, not just technical superiority,[612] and including the specific requirements for those devices.[613] Apple therefore considered that Intel was not less attractive than Qualcomm at least for the iPads to be launched in 2014 and 2015.

(465) In the third place, […][614]

11.4.3. Qualcomm's exclusivity payments covered a significant share of the LTE chipset market during the Period Concerned

(466) The Commission concludes that Qualcomm's exclusivity payments covered a significant share of the LTE chipset market during the Period Concerned.

(467) First, Qualcomm's exclusivity payments covered:

(1) Up to [40-50]% of the worldwide market for LTE chipsets during the Period Concerned; and

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with Qualcomm chipset (CDMA iPhone 4 sold by Verizon) suffered from similar signal attenuation problems as the iPhone 4 with Intel chipset (non-CDMA iPhone 4 sold by AT&T).
For AnandTech (article referenced by Qualcomm) see http://www.anandtech.com/print/4163/verizon-iphone-4-review.
For Consumer Reports, see http://www.consumerreports.org/cro/news/2011/02/verizon-iphone-4-mind-the-gap-our-tests-show/index.htm#.

608 Annex 4 of Qualcomm's response of 27 June 2016 to the Statement of Objections […].

609 Annexes 5.1, 5.3 and 5.4 of Qualcomm's response of 27 June 2016 to the Statement of Objections […]

610 Apple's comments […] on Qualcomm's response to the Statement of Objections paragraph 27 [...].

611 Qualcomm's response of 27 June 2016 to the Statement of Objections [...], paragraphs 352-354, 358, 360, 363, 367, 369, 374, 375, 377, 459, 510, 517, 524. See also Qualcomm's response of 13 March 2017 to the Letter of Facts, paragraphs 169, 174, 176-188 [...] and Qualcomm's observations of 29 May 2017 on the evidence added to the case file since the adoption of the Statement of Objections [...], paragraphs 30 and 34.

612 See for example AAPL12, AAPL107 and AAPL36 […].

613 In particular iPads would not require cellular voice support (see Qualcomm's response of 27 June 2016 to the Statement of Objections [...], paragraph 377).

614 Apple's comments […] on Qualcomm's response to the Statement of Objections [...], paragraph 52.

(2) Approximately [25-35]% on average of the worldwide market for LTE chipsets during the Period Concerned.

(468) This is illustrated in the Table 15 which sets out the volume of LTE chipsets that Apple obtained from Qualcomm, both in absolute terms and relative to overall demand.

Table 15 - LTE chipsets obtained by Apple from Qualcomm, 2011 to 2016[615]

	2011	2012	2013	2014	2015	2016
Units	[100,000-200,000][616]	[75,000,000-85,000,000]	[100,000,000-200,000,000]	[200,000,000-300,000,000]	[200,000,000-300,000,000]	[100,000,000-200,000,000]
As % of total LTE chipsets	[0-10]%[617]	[40-50]%	[40-50]%	[30-40]%	[20-30]%	[10-20]%

(469) Second, the Commission's conclusion is not affected by Qualcomm's claims[618] that:

(1) LTE chipsets obtained by Apple from Qualcomm represented only a small portion of demand by reference to value; and

(2) Apple's share by reference to volume of LTE chipset demand was declining rapidly during the Period Concerned while the volume of LTE chipsets obtained by other customers increased year-on-year.

(470) In the first place, the LTE chipsets obtained by Apple's represented, by reference to value, [60-70]%, [40-50]%, [30-40]%, [30-40]% and [20-30]% of demand in the worldwide market for LTE chipsets in the years 2012, 2013, 2014, 2015 and 2016 respectively.[619] Contrary to Qualcomm's claim, this is not a small portion of demand.

(471) In the second place, Qualcomm's exclusivity payments were granted during a strategic time period. While LTE chipset sales amounted in 2011 to only USD [100-200] million, they reached USD [10,000-20,000] million in 2016 after years of constant growth[620] representing a total increase of approximately [9,500-10,500]% over the period 2011 to 2016 and an average yearly increase of approximately [125-175]%.

(472) In the third place, while Apple's share by reference to volume might have declined, the volumes (in absolute terms) of LTE chipsets obtained by Apple during Period Concerned increased substantially.

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615 Data on the LTE chipsets Apple obtained from Qualcomm was provided by Apple in non-confidential answer to […] of the RFI […]. Data on the size of the worldwide market for LTE chipsets is based on the Market reconstruction for the period 2011 to 2016. While Table 12 of the Annex 1 of the Letter of Facts […] contained a clerical error relating to data for the period 2014 to 2016, that error does not contradict the conclusion that Qualcomm's exclusivity payments covered up to [40-50]% of the worldwide market for LTE chipsets during the Period Concerned and the Commission has corrected that error in the Decision.

616 As Apple did not launch any LTE device in 2011, the number corresponds to chipsets supplied to Apple in 2011 for iPad 3 which was commercially available in March 2012.

617 While this percentage slightly differs from the one included in Table 14 of the Statement of Objections as Apple has provided an updated version of the data […], it does not contradict the conclusion that Qualcomm's exclusivity payments covered a significant share of the LTE chipset market during the Period Concerned.

618 Qualcomm's response of 27 June 2016 to the Statement of Objections [...], paragraphs 580, 586-592.

619 Data on the LTE chipsets Apple obtained from Qualcomm was provided by Apple in the Annex to the non-confidential answer to […] of the request for information […]. Data on the size of the worldwide market for LTE chipsets is based on Strategy Analytics Baseband Market Share Tracker Q3 2016 […].

620 Strategy Analytics Baseband Market Share Tracker Q3 2016 […].

(473) In the fourth place, the fact that Apple's share by reference to volume of LTE chipset demand declined during the Period Concerned while the volume of LTE chipsets obtained by other customers increased every year is irrelevant because:

(1) The LTE chipsets obtained by Apple by volume remained significant throughout the Period Concerned (see Table 15); and

(2) Apple remained an attractive customer because of its importance for entry or expansion in the worldwide market for LTE chipsets throughout the Period Concerned (see Section 11.4.4).

11.4.4. Apple is an attractive customer for LTE chipset suppliers because of its importance for entry or expansion in the worldwide market for LTE chipsets

(474) The Commission concludes that Apple is an attractive customer for LTE chipset suppliers because of its importance for entry or expansion in the worldwide market for LTE chipsets.

(475) First, supplying Apple with LTE chipsets would have helped competing suppliers achieve scale. This was confirmed by […] and […]:

(a) According to […], "*the adoption of a* [baseband chipset] *supplier's technology by a trend setter* [such as Apple] *significantly increases that supplier's volume and, as a result, market share. Likewise, this increase in volume leads the supplier to use more wafers starts in producing* [baseband chipset] *chips, which improves the supplier's bargaining position with its external foundry. As foundry costs improve, the* [baseband chipset] *supplier is then able to offer lower costs to additional customers, feeding a virtuous cycle."*[621]

(b) According to […], "[...] [baseband chipset] *development requires an extremely large R&D investment with thousands of highly skilled engineers. […] In order to support the required investment (which requires scale), and with the consolidation of the mobile device market meaning that there are very few successful device manufacturers, a [baseband chipset] manufacturer needs to either have a significant share of high-end designs at Apple and Samsung or a significant share in China, or both."*[622]

(476) Second, supplying Apple with LTE chipsets would have reduced the R&D expenditure that a supplier must incur in relation to each device design of an OEM. Because Apple typically releases only one or two iPhone and one or two iPad models each year, its purchases of baseband chipsets are spread across a limited number of designs. This was confirmed by […] and Apple:

(a) According to […], "*To supply to Apple has significant scale advantages as they have so limited number of models in portfolio and with premium reputation also an important quality confirmation*." [623]

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621 […] non-confidential answer to […] of the request for information […] to baseband chipset suppliers […].

622 […] non-confidential answer to […] of the request for information […] to baseband chipset suppliers […].

623 […] non-confidential answer to […] of the request for information […] to baseband chipset suppliers […].

(b) According to Apple, *"Apple […] represents a unique opportunity for a* [baseband chipset] *supplier to demonstrate that it has the ability to produce quality* [baseband chipsets] *in volume. Apple's global SKU strategy and the fact that it introduces only a handful of models each year make it a particularly attractive reference customer."*[624]

(477) Third, supplying Apple with LTE chipsets would have allowed competing suppliers to increase their ability to compete as Apple seeks to obtain high-end components that are more profitable. This was confirmed by […], […], […] and Apple:

(a) According to […], *"[m]arket participants who can offer chipsets at both the very high end and the medium to low end tend in our experience to cut price aggressively for the latter; at the high end there may be only one or two [baseband chipsets] that support all the requirements, so pricing there remains high."*[625]

(b) According to […], *"[c]hipsets enabling new leading edge features are typically more expensive than more mature technologies. Overall, competition has an impact on the pricing."*[626]

(c) According to […], *"[p]roducts with cutting edge technology are to our experience more expensive than others."*[627]

(d) According to Apple, *"[t]he prices within each segment are primarily a function of competition (or a lack thereof). For non-LTE enabled [baseband chipsets], there are more suppliers and as a result pricing is lower. For LTE-enabled [baseband chipsets], there is less competition and as a result Qualcomm has more pricing power."*[628]

(478) Fourth, because of its reputation and role in the development of innovative products,[629] supplying Apple with LTE chipsets would have allowed competing suppliers to improve their credibility and reputation.[630] This was confirmed by […], […] and […], […] and […]:

(a) According to […], "*Apple and Samsung are widely perceived as market leaders and trend setters in the production of end devices*." [631]

(b) According to […], "*the launch of Apple's newest models is always observed by the industry*."[632]

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624 Apple's non-confidential answer to […] of the request for information […].

625 […] non-confidential answer to […] of the request for information […] to baseband chipset suppliers […].

626 […] non-confidential answer to […] of the request for information […] to baseband chipset customers […].

627 […] non-confidential answer to […] of the request for information […] to baseband chipset customers […].

628 Apple's non-confidential answer to […] of the request for information […].

629 See answers to […] of the request for information […] to baseband chipset customers, and answers to […] of the request for information […] to baseband chipset suppliers.

630 See answers to […] of the request for information […] to baseband chipset customers, and answers to […] of the request for information […] to baseband chipset suppliers.

631 […] non-confidential answer to […] of the request for information […] to baseband chipset suppliers […].

(c) According to […], *"if a market leader or trend setter is supplied […], especially in their flagship and premium product, this means that the OEM confirms the quality of the chipset and trust its supplier and definitely help the [baseband chipset] suppliers to increase its reputation."*[633]

(d) According to […], *"the adoption of a [baseband chipset] supplier's technology by a trend setter boosts that supplier's credibility with other OEMs, suggesting to them that the supplier's technology is up to the task of functioning in a market-leading device. Adoption by a market leader signals to other OEMs that the [baseband chipset] supplier's chip is able to provide the kind of performance, power consumption, and price point demanded by the leading OEMs (and therefore, by MNOs and end users)".* [634]

(e) According to […], "*Success with a leading OEM can have a 'halo' effect with other OEMs of similar devices*."[635]

(479) Fifth, the importance of Apple as a customer is supported by the fact that Broadcom ceased to supply baseband chipsets after losing the 2014 Apple tender for LTE chipsets:

(1) According to Apple, "*Broadcom, for example, exited the baseband chipset market shortly after being informed that they did not win Apple's chipset business in 2014*."[636]

(2) […][637]

(480) Sixth, the Commission's conclusion that Qualcomm's exclusivity payments were capable of foreclosing competing suppliers of LTE chipsets is not affected by Qualcomm's claims[638] that:

(1) It is not possible to conclude that Qualcomm's exclusivity payments foreclosed competing suppliers of LTE chipsets purely from the fact that Apple is an "attractive" customer; and

(2) Other baseband chipset suppliers could have achieved scale by supplying customers other than Apple such as MediaTek and Spreadtrum which allegedly thrived during the Period Concerned.

(481) In the first place, the Commission does not conclude that Qualcomm's exclusivity payments were capable of foreclosing competing suppliers of LTE chipsets purely from the fact that Apple is an "attractive" customer. Rather, as can be seen in particular from Sections 11.2, 11.3 and 11.4, the Commission's conclusion is based on a range of other factors in addition to the attractiveness of Apple as a customer.

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632 […] non-confidential answer to […] of the request for information […] to baseband chipset suppliers […].

633 […] non-confidential answer to […] of the request for information […] to baseband chipset customers […].

634 […] non-confidential answer to […] of the request for information […] to baseband chipset suppliers […].

635 […]' non-confidential answer to […] of the request for information […] to baseband chipset suppliers […].

636 Apple's non-confidential answer to […] of the request for information […].

637 […] non-confidential answer to […] of the request for information […].

638 Qualcomm's response of 27 June 2016 to the Statement of Objections [...], paragraph 580, 586-592 and 601-602.

(482) In the second place, Qualcomm's exclusivity payments were capable of foreclosing competing LTE chipset suppliers even if they were only granted to Apple. This is because supplying Apple would have helped competing LTE chipset suppliers to, among other things, achieve scale and improve their credibility and reputation (see recitals (475) and (478)). Qualcomm's exclusivity payments made it less likely that competing LTE chipset suppliers could achieve such scale, credibility and reputational enhancement. Qualcomm could therefore protect its dominant position otherwise than through competition on the merits.

(483) In the third place, not supplying Apple, defined by Qualcomm as "*the world's most significant customer of baseband chipsets*",[639] deprived competing LTE chipset suppliers of the opportunity to achieve scale. For example, Apple's requirements for one generation of iPads were equal to approximately [7-8] times Intel's sales of LTE chipsets in 2013, [1-2] times Intel's sales of LTE chipsets in 2014 and [1-2] times Intel's sales of LTE chipsets in 2015.[640]

(484) In the fourth place, MediaTek and Spreadtrum, on whose performance during the Period Concerned Qualcomm places particular reliance,[641] were mainly focused on the low- and mid-range LTE chipset segments and on sales in China and emerging markets respectively (see recitals (97) and (115)) whereas Qualcomm is focussed on the high-range, more profitable, LTE chipset segment. This is confirmed by ABI research from 17 February 2016 indicating that Qualcomm is *"well placed to continue its predominance in the baseband market"* whereas *"MediaTek and Spreadtrum remain the weakest links in the LTE CA market, and there is no evidence to suggest that this will change in the foreseeable future"*.[642]

(485) In the fifth place, Qualcomm's claim that competing suppliers of LTE chipsets could have achieved scale by supplying customers other than Apple is inconsistent with market developments during the Period Concerned. For example:

(1) Ericsson announced its intention to cease producing baseband chipsets on 18 September 2014;[643]

(2) Renesas sold its baseband assets to Broadcom in 2013,[644] which announced its intention to cease producing baseband chipsets in July 2014;[645] and

(3) Nvidia announced its intention to cease producing baseband chipsets in May 2015.[646]

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639 Qualcomm's observations of 29 May 2017 on the evidence added to the case file since the adoption of the Statement of Objections [...], paragraph 3.

640 See footnote 664 with regard to iPad sales and Strategy Analytics […] with regard to Intel sales. These figures are only provided for the period 2013 to 2015 as Intel did not sell any LTE chipset volumes in 2011 and 2012.

641 See Qualcomm's response of 27 June 2016 to the Statement of Objections [...], paragraph 592.

642 See https://www.abiresearch.com/press/abi-research-forecasts-lte-carrier-aggregation-pow/ […].

643 http://www.ericsson.com/news/1856711.

644 http://www.renesas.com/press/news/2000/news20130904.jsp.

645 http://www.forbes.com/sites/greatspeculations/2014/06/04/rising-competition-forces-broadcom-to-exit-the-baseband-market/.

646 http://www.forbes.com/sites/greatspeculations/2015/05/07/nvidia-to-sell-its-icera-business-exit-the-mobile-chip-market/.

11.4.5. Conclusion

(486) On the basis of the foregoing, from which a coherent story of harm to competition emerges, the Commission concludes that Qualcomm's exclusivity payments were capable of having anti-competitive effects.

11.5. Qualcomm's critical margin analysis

(487) As part of its line of argument that its exclusivity payments did not have and were incapable of having anti-competitive effects, Qualcomm has submitted what it terms a "critical margin analysis" to claim that "*an 'as-efficient competitor' could profitably compete to supply Apple with baseband chipsets*". Qualcomm's analysis is claimed in substance to demonstrate that, had Apple taken the decision to switch as of a given year between 2012 and 2015, a hypothetical competitor, assumed to have the same average variable costs ("AVC") as Qualcomm, would have been able to cover those costs when supplying LTE chipsets over one, two or three annual[647] generations of iPhones.[648] Table 16 presents the essence of the analysis submitted by Qualcomm.

Table 16 – Critical margin[649] associated with the termination of the Agreements as calculated by Qualcomm[650]

Year of Apple switch	Total switching costs (USD, million)	Critical margin per device/number of contestable devices (1 iPhone generation)	Critical margin per device /number of contestable devices (2 iPhone generations)	Critical margin per device/number of contestable devices (3 iPhone generations)	Qualcomm per device margin after covering its AVC (USD)	Critical margin lower than Qualcomm per device margin?[651]
2012	0	[0-5]/[150,000,000-250,000,000]	[0-5]/[350,000,000-450,000,000]	[0-5]/[550,000,000-650,000,000]	[10-15]	Yes[652] ([10-15]/[10-15]/[10-15])
2013	[200-300]	[0-5]/[150,000,000-250,000,000]	[0-5]/[350,000,000-450,000,000]	[0-5]/[550,000,000-650,000,000]	[10-15]	Yes[653] ([5-10]/[5-10]/[5-10])
2014	[500-750]	[0-5]/[150,000,000-250,000,000]	[0-5]/[350,000,000-450,000,000]	[0-5]/[550,000,000-650,000,000]	[5-10]	Yes ([0-5]/[0-5]/[0-

647 Apple typically launches new iPhone models in September of a given year. See for example Qualcomm's response of 27 June 2016 to the Statement of Objections [...], Table 28.

648 iPhone 5 for 2012, iPhone 5c/5s for 2013, iPhone 6/6Plus for 2014, iPhone 6s/6sPlus for 2015**.**

649 Qualcomm describes "*margin*" as "*price less variable cost of production*" and the "critical margin" as "*the critical per chipset margin associated with the hypothetical termination of the* [Agreements] *that would be triggered if Apple were to use the* [hypothetical] *rival supplier's baseband chipsets for one or more generations of Apple's devices*", noting in substance that the greater the number of units the hypothetical rival is assumed to supply to Apple, the lower 'the 'critical margin'. The critical margin is thus the amount of payments that Apple would have foregone if it used the baseband chipsets of a hypothetical competitor assumed to have the same AVC as Qualcomm divided by the number of devices over which that hypothetical competitor is assumed to be able to compensate Apple for this loss of exclusivity payments otherwise available under the Agreements.

650 Based on Tables 18 and 19 of Qualcomm's response to the Statement of Objections [...].

651 When the critical margin is lower than the Qualcomm per device margin, this means that a hypothetical competitor with the same AVC as Qualcomm would have been able to cover its AVC when supplying LTE chipsets. If, on the other hand, the critical margin is higher than the Qualcomm per device margin, this means that such a hypothetical competitor would not have been able to cover its AVC when supplying LTE chipsets.

652 [Calculations pertaining to critical margin analysis]

653 [Calculations pertaining to critical margin analysis]

						5])
2015	[750-1,000]	[0-5]/[150,000,000-250,000,000]	[0-5]/[350,000,000-450,000,000]	[0-5]/[550,000,000-650,000,000]	[5-10]	Yes ([0-5]/[5-10]/[5-10])

(488) The Commission concludes that Qualcomm's analysis does not support the claim that its exclusivity payments were incapable of having anti-competitive effects.

(489) In particular, Qualcomm's analysis is based on three unrealistic or incorrect assumptions.

(490) In the first place, Qualcomm's analysis assumes that the capability to have anti-competitive effects can be rebutted by showing that a hypothetical competitor with the same AVC as Qualcomm would only have had to cover these AVC. This assumption is, however, incorrect because, in a market such as the worldwide market for LTE chipsets characterised by high R&D expenses,[654] such a competitor would need to cover not only its AVC, but also a share of fixed costs, including at least some part of R&D expenses.

(491) In the second place, Qualcomm's analysis assumes that all Apple's requirements of LTE chipsets for iPhone generations to be launched in 2012, 2013, 2014, 2015 and 2016 were contestable.[655] This assumption is, however, incorrect because: (i) none of Apple's requirements of LTE chipsets for iPhone generations to be launched in 2012, 2013, 2014 and 2015 were contestable; and (ii) only approximately [50-60]% of Apple's requirements of LTE chipsets for the iPhone generation to be launched in 2016 was contestable.

(492) Regarding the absence of contestability of Apple's requirements of LTE chipsets for iPhone generations to be launched in 2012, 2013, 2014 and 2015, this is confirmed by the following contemporaneous evidence, and statements by Qualcomm during the administrative procedure:

(1) The contemporaneous internal Apple documents and responses to requests for information described in Section 11.4.2.1, in particular Apple's statement that it sought to try an alternative supplier in one of its non-CDMA iPad models, due to the smaller volumes and commercial risk involved (see recital (425)), and the email circulating the minutes of an internal Apple meeting on 2 October 2012 dedicated to a review of baseband chipset suppliers. The latter minutes state that "[…]" (see recital (433) above);

(2) An internal Qualcomm email sent on 8 January 2013, [Personal data], at the time [Personal data], to *inter alia* [Personal data], at the time [Personal data],[656] regarding payments to Apple pursuant to the First Amendment of the Transition Agreement. In his email, [Personal data] stated as follows: *"Recall the competitive threat we've viewed is on the iPADs and low tier as our technology would prevail on high sku* [i.e. on the flagship iPhone devices]";[657]

654 See Qualcomm R&D expenses in Section [10.4.1].

655 Qualcomm's analysis was silent regarding whether Apple's requirements of LTE chipsets for iPads to be launched in 2012, 2013, 2014 and 2015 were contestable.

656 On 28 February 2013, these two Qualcomm employees signed the First Amendment to the Transition Agreement with Apple on behalf of Qualcomm.

657 Annex 14 to Qualcomm's response of 27 June 2016 to the Statement of Objections […].

(3) Qualcomm's Response to the Statement of Objections: "*Intel's chipset solutions could only potentially have been viable for use in iPads because (i) voice connectivity was not required in the iPad; and (ii) and global support was considered to be less important*";[658]

(4) Qualcomm's Response to the Letter of Facts: "*Intel's chipsets were not considered as viable alternatives to Qualcomm chipsets for use in an iPhone (as they did not support voice functionality until some point in 2014), and that the first iPhone model in which Intel's chipsets could have been used was the iPhone 7 launched in fall 2016*";[659] and

(5) Qualcomm's Observations on the evidence added to the case file since the adoption of the Statement of Objections: "*There is no evidence on file supporting the assertion that, at the time* [i.e. Fall 2013 / Spring 2014 device or later device], *Apple was seriously considering Intel chipsets for use in an iPhone."* [660]

(493) Regarding the contestability of approximately [50-60]% of Apple's requirements of LTE chipsets for iPhone generations to be launched in 2016, this is confirmed by Apple in its comments on Qualcomm's Response to the Statement of Objections in which it stated that *"in 2016, Apple was able to shift less than* [50-60]*% of its volume to Intel for the iPhone 7"*.[661]

(494) In the third place, Qualcomm's analysis assumes that, had Apple taken the decision to switch as of a given year between 2012 and 2015, Apple would have foregone only payments pursuant to the Repayment Mechanism and future payments on iPhone and iPad generations that had been already launched.[662] This assumption is, however, incorrect since it treats future payments on upcoming iPhone and iPad generations as not being conditional on Apple obtaining from Qualcomm all of Apple's requirements of LTE chipsets.[663]

(495) Qualcomm's analysis thus fails to take into account the following elements:

(1) A measure of costs that would take into account a share of fixed costs, including, at least some part of R&D expenses;

(2) The fact that only Apple's requirements of LTE chipsets for iPads yet to be launched were contestable in 2012, 2013, 2014, 2015 and 2016[664] and for

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658 Qualcomm's response of 27 June 2016 to the Statement of Objections [...], paragraph 518.

659 Qualcomm's observations of 29 May 2017 on the evidence added to the case file since the adoption of the Statement of Objections [...], paragraph 219.

660 Qualcomm's observations of 29 May 2017 on the evidence added to the case file since the adoption of the Statement of Objections [...], paragraph 55.

661 Apple's comments […] on Qualcomm's response to the Statement of Objections [...], paragraph 52.

662 Annex 18 of Qualcomm's response of 27 June 2016 to the Statement of Objections, paragraph 2.2. […].

663 See Qualcomm's response of 27 June 2016 to the Statement of Objections [...], footnote 833.

664 Qualcomm's analysis does not contain an estimate of Apple's sales of a given generation of iPads. The analysis does, however, provide an estimate of Apple's sales of a given generation of iPhones ([150,000,000-250,000,000]). Consequently, Apple's sales of a given generation of iPads ([15,000,000-30,000,000]) can be estimated by multiplying: (i) Qualcomm's estimate that Apple would have sold approximately([150,000,000-250,000,000]) devices of a given generation of iPhones; (ii) by 11.43% (80/700), which is a favourable estimate to Qualcomm of the percentage of iPads [60-80 million] sold by Apple compared to iPhones [700-800 million] throughout the period 2011 to 2016 (see Apple non-confidential answer to […] of the request for information […]).

iPhones, the only part of Apple's requirements for LTE chipsets for iPhones that was contestable was [50-60]% of its 2016 requirements; and

(3) The fact that had Apple taken the decision to switch as of a given year between 2012 and 2015, Apple would have also foregone payments in relation to upcoming iPhone and iPad generations.

(496) Qualcomm's analysis thus assesses only whether, had Apple switched in a given year between 2012 and 2015, a hypothetical competitor with the same AVC as Qualcomm could have compensated Apple for the loss of the payments over one, two or three generations of iPhones. That assumption is, however, incorrect because, depending on the year between 2012 and 2015 in which Apple would have taken the decision to switch, the number of generations of iPads (and not of iPhones since only approximately [50-60]% of the 2016 iPhone generation was contestable – see recital (492)) over which such a hypothetical competitor could have compensated Apple for the loss of the payments would have varied. This is due to the structure of the payments foreseen by the Transition Agreement in 2012, 2013, 2014, 2015 and 2016 and by the First Amendment to the Transition Agreement in 2013, 2014, 2015 and 2016:

(1) In 2012, a hypothetical competitor with the same AVC as Qualcomm would have had to compensate Apple for the loss of the payments over a maximum of four annual generations of iPads (2012, 2013, 2014 and 2015). This is because the Transition Agreement foresaw payments until 2015.[665] (see Section 8.1);

(2) In 2013, a hypothetical competitor with the same AVC as Qualcomm would have had to compensate Apple for the loss of the payments over a maximum of four annual generations of iPads (2013, 2014, 2015 and 2016) and [50-60]% of the 2016 generation iPhone[666]. This is because the First Amendment to the Transition Agreement foresaw payments for devices launched in 2013, 2014, 2015 and 2016 (see Section 8.2);

(3) In 2014, a hypothetical competitor with the same AVC as Qualcomm would have had to compensate Apple for the loss of the payments over a maximum of three annual generations of iPads (2014, 2015 and 2016) and [50-60]% of the 2016 generation iPhone. This because the First Amendment to the Transition Agreement foresaw payments for devices launched in 2014, 2015 and 2016 (see Section 8.2); and

(4) In 2015, a hypothetical competitor with the same AVC as Qualcomm would have had to compensate Apple for the loss of the payments over a maximum of two annual generations of iPads (2015 and 2016) and [50-60]% of the 2016 iPhone generation. This is because the First Amendment to the Transition

665 This assumption is favourable to Qualcomm because the Variable Incentive Fund represented USD [500-600] million over 2012, 2013, 2014 and 2015 with a maximum of USD [100-200] million for each year (based on the number of Qualcomm chipsets bought by Apple in a given year). As a result, in 2012, Apple would have been uncertain as to the amount (if any) left to be paid out from the Variable Incentive Fund in November 2015.

666 This assumption is favourable to Qualcomm because Apple decided at the earliest in 2014 to switch to Intel LTE chipsets for iPhones launched in 2016. See Apple's comments […] on Qualcomm's response to the Statement of Objections [...].

Agreement foresaw payments for devices launched in 2015 and 2016 (see Section 8.2).

(497) Qualcomm's analysis fails to reflect these more accurate assumptions.

(498) To illustrate this point, Tables 16 and 17 below show the critical margin associated with the termination of the Agreements based on:

(1) The modified assumptions set out in recitals (495)(2) and (495)(3); and

(2) The more accurate assumptions set out in recital (496).

Table 17 illustrates that had Qualcomm's analysis been based on these modified assumptions, it would have indicated that a hypothetical competitor with the same AVC as Qualcomm would have been unable to cover its AVC when supplying LTE chipsets as of 2013, 2014 and 2015.

Table 17 – Critical margin associated with the termination of the Agreements based on: (i) all 2012 to 2016 iPad generations and (ii) [50-60]% of 2016 iPhone generation foreseen by Apple as of 2013

Year of Apple switch	Total switching costs (USD, million)	Critical margin per device/number of contestable Apple devices: *(i) all 2012 to 2016 iPad generations and (ii) 50% of 2016 iPhone generation foreseen as of 2013*	Qualcomm per device gross margin after covering its AVC and excluding the payments (USD)	Critical margin lower than Qualcomm per device margin?
2012	[750-1,000]	[5-10]/[50,000,000-150,000,000][667]	[10-15]	Yes ([0-5])[668]
2013	[2,500-3,000]	[15-20]/[150,000,000-250,000,000][669]	[10-15]	No (-[0-5])[670]
2014	[2,500-3,000]	[15-20]/[150,000,000-250,000,000][671]	[5-10]	No (-[5-10])[672]
2015	[1,500-2,000]	[10-15]/[50,000,000-150,000,000][673]	[10-15]	No (-[0-5])[674]

(499) A hypothetical competitor with the same AVC as Qualcomm would have been even less able to cover its AVC when supplying LTE chipsets as of 2013 if the analysis were based on the more realistic assumption that Apple decided at the earliest in 2014 to switch to Intel LTE chipsets for [50-60]% of the iPhones launched in 2016, as Table 18 below shows.

667 [Calculations pertaining to critical margin analysis]
668 [Calculations pertaining to critical margin analysis]
669 [Calculations pertaining to critical margin analysis]
670 [Calculations pertaining to critical margin analysis]
671 [Calculations pertaining to critical margin analysis]
672 [Calculations pertaining to critical margin analysis]
673 [Calculations pertaining to critical margin analysis]
674 [Calculations pertaining to critical margin analysis]

Table 18 – Critical margin associated with the termination of the Agreements based on: (i) all 2012 to 2016 iPad generations and (ii) [50-60]% of 2016 iPhone generation foreseen as of 2014

Year of Apple switch	Total switching costs (USD, million)	Critical margin per device/number of contestable Apple devices: *(i) all 2012 to 2016 iPad generations and (ii) 50% of 2016 iPhone generation foreseen as of 2014*	Qualcomm per device gross margin after covering its AVC and excluding the payments (USD)	Critical margin lower than Qualcomm per device margin?
2012	[750-1,000]	[5-10]/[50,000,000-150,000,000][675]	[10-15]	Yes ([0-5])[676]
2013	[2,500-3,000]	[30-35]/[50,000,000-150,000,000[677]	[10-15]	No (-[15-20])[678]
2014	[2,500-3,000]	[15-20]/[150,000,000-250,000,000][679]	[5-10]	No (-[5-10])[680]
2015	[1,500-2,000]	[10-15]/[50,000,000-150,000,000][681]	[10-15]	No (-[0-5])[682]

(500) Even if, had it been based on the assumptions set out in recital (498), Qualcomm's critical margin analysis could suggest that a hypothetical competitor with the same AVC as Qualcomm may have been able to cover its AVC when supplying LTE chipsets as of 2012, this would still not support Qualcomm's claim that its exclusivity payments were incapable of having anti-competitive effects.[683]

(501) In the first place, such an analysis would still be based on Qualcomm's incorrect assumption that a hypothetical competitor with the same AVC as Qualcomm would have to cover only its AVC and not AVC plus a share of fixed costs including at least some part of R&D expenses (see recital (490)).

(502) In the second place, that analysis would still be based on the assumptions favourable to Qualcomm that: (i) Apple sold [15,000,000-30,000,000] devices of the 2012 generation of iPads (see footnote 664) and that (ii) a hypothetical competitor with the same AVC as Qualcomm would have had to compensate Apple for the loss of the payments over a maximum of four annual generations of iPads. (see footnote 665).

(503) In the third place, as Qualcomm itself claims (see recital (455)), Apple's requirements of LTE chipsets in 2012 might not have been contestable as Apple might have decided to use Qualcomm LTE chipsets in the devices launched in 2012 before the signature of the Transition Agreement.

675 [Calculations pertaining to critical margin analysis]
676 [Calculations pertaining to critical margin analysis]
677 [Calculations pertaining to critical margin analysis]
678 [Calculations pertaining to critical margin analysis]
679 [Calculations pertaining to critical margin analysis]
680 [Calculations pertaining to critical margin analysis]
681 [Calculations pertaining to critical margin analysis]
682 [Calculations pertaining to critical margin analysis]
683 These same reasons would also apply had an a hypothetical competitor with the same AVC as Qualcomm been able to make a positive per iPad margin after covering its AVC when supplying LTE chipsets for all iPads launched as of 2013, 2014 or 2015.

11.6. Objective justification or efficiencies

(504) The Commission concludes that notwithstanding Qualcomm's claims (Section 11.6.1), Qualcomm has not demonstrated that the capability to have anti-competitive effects of the exclusivity payments is counterbalanced or outweighed by advantages in terms of efficiencies that also benefit the consumer (Section 11.6.2).[684] This is because Qualcomm has not demonstrated that the exclusivity payments were necessary for the achievement of any gains in efficiency.

11.6.1. Qualcomm's claims

(505) Qualcomm claims that any exclusionary effect of the exclusivity payments it granted to Apple is counterbalanced or outweighed by advantages in terms of efficiencies that also benefit the consumer.

(506) In particular, Qualcomm relies on the following arguments.

(507) First, Qualcomm claims that it had to make significant relationship-specific investments in order to develop customised MDM chipsets for Apple. It would not, however, have made such investments but for the exclusivity payments because:

(1) Apple refused to commit to the use of Qualcomm chipsets in its future devices;[685]

(2) Apple would not have committed to a minimum purchasing requirement[686]; and

(3) Quantity rebates would not have provided Qualcomm with sufficient certainty as to the recoupment of its relationship-specific investments.[687]

(508) In support of this argument, Qualcomm has submitted an economic model[688] that interprets the exclusivity payments as a contractual safeguard for Qualcomm intended to enhance Qualcomm's investment incentives, by preventing Apple from not sufficiently compensating Qualcomm for its relationship-specific investments. The model describes a theoretical framework for when a potential seller of an input has to decide whether to make a significant investment before being able to enter into a binding agreement with the only potential buyer of the input on the terms of supply of this input. According to that framework, it is necessary for the seller to protect such an investment through an exclusivity agreement when the investment is (i) sunk (i.e. irreversible), (ii) relationship-specific; and (iii) non-contractible, meaning that the exact nature of the investment is not verifiable to a third party, so that it is impossible to write (and enforce) a contract in which the buyer directly compensates the seller for undertaking the investment.

(509) Second, the exclusivity payments were also necessary more generally [Qualcomm's investment decisions].[689] [Qualcomm's investment decisions].[690] [Qualcomm's investment decisions].

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684 Qualcomm has not claimed that its exclusivity payments were objectively justified.

685 Qualcomm's response of 27 June 2016 to the Statement of Objections [...], paragraphs 633-634.

686 Qualcomm's response of 27 June 2016 to the Statement of Objections [...], paragraph 712.

687 Qualcomm's response of 27 June 2016 to the Statement of Objections [...], paragraph 712.

688 Qualcomm's response of 27 June 2016 to the Statement of Objections, Annex 22 […].

689 Qualcomm's response of 27 June 2016 to the Statement of Objections [...], paragraphs 681-684.

690 Qualcomm's response of 27 June 2016 to the Statement of Objections [...], paragraph 668.

(510) Third, the necessity of the exclusivity payments is confirmed by the fact that other LTE chipset suppliers […][691] and required financial mechanisms to recoup such investments.[692]

11.6.2. The Commission's assessment

(511) The Commission concludes that Qualcomm has not demonstrated that the exclusivity payments were necessary for the achievement of any gains in efficiency and that, therefore, the exclusionary effect of its exclusivity payments were counterbalanced or outweighed by advantages in terms of efficiencies that also benefit the consumer.

(512) First, Qualcomm has not demonstrated that its exclusivity payments were a risk-sharing mechanism without which it would not have made significant relationship-specific investments in order to develop customised MDM chipsets for Apple.

(513) In the first place, Qualcomm has submitted no contemporaneous evidence supporting this claim.

(514) In the second place, Qualcomm itself states that it made in total Apple specific investments in chipsets of, at least, approximately USD 200 million in 2009 and 2010[693] i.e. without any need for exclusivity payments.

(515) In the third place, Qualcomm also states[694] [Qualcomm's investment decisions][695] [Qualcomm's investment decisions][696] i.e. again without any need for exclusivity payments.

(516) In the fourth place, Qualcomm could have recouped any Apple-specific investments in less restrictive ways, such as via a minimum purchase commitment or reimbursement of R&D expenses. For example, […][697] and […].[698]

(517) In the fifth place, any exclusivity payments, if required, could have been limited to the single model or MDM chipset to which the investments would have related.

(518) In the sixth place, Qualcomm itself recognises that [Qualcomm's investment decisions].[699]

(1) [Qualcomm's investment decisions][700]

(2) [Qualcomm's investment decisions][701]

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691 Qualcomm's response of 27 June 2016 to the Statement of Objections [...], paragraph 696; Qualcomm's observations of 29 May 2017 on the evidence added to the case file since the adoption of the Statement of Objections [...], paragraphs 80-81.

692 Qualcomm's response of 27 June 2016 to the Statement of Objections [...], paragraph 638.

693 Qualcomm's response of 27 June 2016 to the Statement of Objections [...], Table 36 and paragraphs 693-694.

694 Qualcomm's response of 27 June 2016 to the Statement of Objections [...], paragraph 677. See also response to additional questions from the CET regarding the efficiency justification in Case AT.40220 – Qualcomm (exclusivity payments), paragraph 3.13 […].

695 In the end, there were two iPhone devices launched in 2017: iPhone 8 and iPhone X.

696 Response to additional questions from the CET regarding the efficiency justification in Case AT.40220 – Qualcomm (exclusivity payments), paragraph 3.13 […].

697 See Apple's non-confidential answer to […] of the request for information […].

698 See non-confidential version of Annex 6 to AAPL00042 […].

699 Qualcomm's answer to […] of the request for information […].

700 Qualcomm's answer to […] of the request for information […], footnotes omitted.

701 Qualcomm's answer to […] of the request for information […], footnotes omitted.

(3) [Qualcomm's investment decisions][702]

(519) In the seventh place, the economic model submitted by Qualcomm is not applicable to the facts of this case.

(520) First of all, at least a significant proportion of the investment by Qualcomm was not specific to its relationship with Apple because there were several other buyers of MDM baseband chipsets (see recital (524)).

(521) Next, since September 2016, both Intel and Qualcomm are able to supply LTE chipsets to Apple for its iPhone 7, iPhone 8 and iPhone X devices without any need for exclusivity.

(522) In addition, Qualcomm has subsequently patented the technology developed for Apple i.e. such technology continues to have a positive value even after the termination of the Agreements.

(523) Finally, at least a significant proportion of the investment by Qualcomm was contractible i.e. it was possible to write (and enforce) a contract in which Apple would have directly compensated Qualcomm for any relationship-specific investments in LTE technologies because Apple's RFQs describe in detail the technologies that Apple requires its suppliers to develop. […].[703] […] (see recital (516)).

(524) Second, Qualcomm has not demonstrated that [Qualcomm's investment decisions], there were several other buyers of MDM baseband chipsets, which accounted for between [20-30]% and [75-85]% of Qualcomm's revenue from the sale of MDM chipsets throughout the duration of the Transition Agreement.[704]

(525) Third, while competing LTE chipset suppliers […], they have not required exclusivity payments […]. For example, Intel was the sole supplier of baseband chipsets to Apple before 2011[705] and also […][706] [707] without any exclusivity conditions attached to its supplies to Apple.[708]

11.7. The Guidance on Enforcement Priorities

(526) The Commission's conclusion that Qualcomm has abused its dominant position on the worldwide market for LTE chipsets by granting payments to Apple on condition that Apple obtain from Qualcomm all of Apple's requirements of LTE chipsets is not affected by Qualcomm's claims[709] that the Commission has breached the principles of legal certainty and legitimate expectations by failing to:

(1) Assess the legality of Qualcomm's exclusivity payments in accordance with the Guidance on Enforcement Priorities; and

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702 Qualcomm's answer to […] of the request for information […], footnotes omitted.

703 See Apple's non-confidential response to […] of the request for information […].

704 See paragraphs 682 and 683.

705 See Apple's non-confidential answer to […] of the request for information […] and […] non-confidential answer to […] of the request for information […].

706 […]

707 […]

708 See Apple's non-confidential answer to […] of the request for information […] and […] non-confidential answer to […] of the request for information […].

709 Qualcomm's response of 27 June 2016 to the Statement of Objections [...], paragraphs 42-52.

(2) Demonstrate that Qualcomm's exclusivity payments satisfy the criteria of the Guidance on Enforcement Priorities for being dealt with as a priority. In particular, according to Qualcomm, the Commission has failed to conduct a price-cost test assessing whether the payments could foreclose an "as-efficient competitor".

(527) In relation to point (1) of recital (526), the Commission is not required to assess the legality of Qualcomm's exclusivity payments in accordance with the Guidance on Enforcement Priorities.

(528) In the first place, the Guidance on Enforcement Priorities merely sets out the Commission's approach as to the choice of cases that it intends to pursue as a matter of priority.[710] The Commission did not thereby impose on itself any limitations or requirements regarding the range of tools at its disposal for the purposes of assessing the legality of Qualcomm's exclusivity payments and the types of evidence on which the Commission can rely on as part of that assessment.[711]

(529) In the second place, Qualcomm has presented no contemporaneous evidence from the time of the negotiation and conclusion of the Agreements showing that it believed in good faith that the Commission would assess the legality of Qualcomm's exclusivity payments in accordance with the Guidance on Enforcement Priorities. On the contrary, the critical margin analysis submitted by Qualcomm (see Section 11.4.5) was prepared specifically for the purposes of Qualcomm's Response to the Statement of Objections, and not before, or at the time of, the negotiation and conclusion of the Agreements.

(530) In relation to point (2) of recital (526), Qualcomm's exclusivity payments satisfy the criteria set out in the Guidance on Enforcement Priorities for being dealt with by the Commission as a priority.

(531) In the first place, when identifying cases to be dealt with as a matter of priority, the Commission can rely on "*qualitative and, where possible and appropriate, quantitative evidence*" (paragraph 19 of the Guidance on Enforcement Priorities).

(532) In the second place, it is clear from this Decision why, in light of the evidence in the Commission's possession, Qualcomm's exclusivity payments satisfied the criteria for being dealt with as a priority (paragraph 20 of the Guidance on Enforcement Priorities):

(1) Qualcomm's position on the worldwide market for LTE chipsets. Qualcomm's market share by reference to value was above [60-70]% between 2011 and 2016 and above [90-100]% until 2014. Moreover, until 2014, none of Qualcomm's competitors had a market share exceeding [0-10]% and thereafter, only MediaTek's share was above [0-10]% (see recital (310));

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710 Case C-23/14 *Post Danmark A/S v Konkurrencerådet* EU:C:2015:651, paragraph 52; Case T-712/14 *CEAHR v Commission*, EU:T:2017:748, paragraph 115.

711 Case T-210/01 *General Electric v Commission*, EU:T:2005:456 paragraph 519; Case T-343/06 *Shell Petroleum and Others v Commission*, EU:T:2012:478, paragraph 171; Case T-342/07 *Ryanair v Commission*, EU:T:2010:280, paragraph 136; Case T-175/12 *Deutsche Börse v Commission*, EU:T:2015:148, paragraph 133; Case T-699/14 *Topps Europe v Commission*, EU:T:2017:2, paragraph 82.

(2) The conditions of entry and expansion on the worldwide market for LTE chipsets. In particular, the market is characterised by the existence of barriers to entry and expansion (see Section 10.4);

(3) The position of Qualcomm's competitors. Intel played a significant competitive role despite only holding a small market share as Apple seriously evaluated the possibility of using Intel LTE chipsets in devices to be launched in 2014 and 2015 (see recitals (424)-(439));

(4) The position of Apple as a customer. Qualcomm offered exclusivity to Apple, a customer of particular importance for the entry or expansion of competitors (see recitals (475) - (479)); and

(5) The extent of Qualcomm's exclusivity payments. During the Period Concerned, the payments covered up to [40-50]% of the worldwide market for LTE chipsets and approximately [25-35]% on average (see recitals (467) - (468)).

(533) In the third place, given among other things that Qualcomm's exclusivity payments satisfied the criteria for being dealt with as a priority in light of the evidence in the Commission's possession, the Commission was not required to conduct a price-cost test assessing whether the payments could foreclose an "as-efficient competitor". Such a test is only one factor, among others, in the Commission's general assessment of whether a particular form of exclusionary conduct should be dealt with as a priority.[712]

11.8. Duration of the infringement

(534) The Commission concludes that the infringement lasted 5 years, 6 months and 23 days.

(535) The infringement started on 25 February 2011, the date of the signature of the Transition Agreement (see recital (455)).

(536) The infringement ended on 16 September 2016, the date when the Agreements terminated following Apple's launch of iPhone 7 devices incorporating Intel LTE chipsets.

(537) None of Qualcomm's claims affects this conclusion.

(538) First, contrary to what Qualcomm claims,[713] an undertaking can abuse a dominant position in the same year that its dominant position is first established.[714]

(539) Second, Qualcomm's exclusivity payments were capable of having anti-competitive effects as of 25 February 2011. This is because, as of that date, the payments affected Apple's choice of LTE chipset suppliers in relation to devices that were to be launched in 2014 and 2015 (see recital (455) above).

(540) Third, since as of 25 February 2011, Qualcomm's exclusivity payments affected Apple's choice of LTE chipset suppliers in relation to devices to be launched in 2014 and 2015, it is irrelevant that

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712 See paragraphs 27, 38 and 45 of the Guidance on Enforcement Priorities.

713 Qualcomm's response of 27 June 2016 to the Statement of Objections [...], paragraphs 335-336.

714 Case T-321/05 *AstraZeneca v Commission*, EU:T:2010:266, upheld on appeal in Case C-457/10 P *AstraZeneca* v *Commission*, EU:T:2012:770.

(1) Qualcomm did not supply any LTE chipsets for use in Apple devices in 2011[715];

(2) Apple might have taken the decision to obtain from Qualcomm all its requirements of LTE chipsets for devices launched in 2012 and 2013 before entering into the Transition Agreement;[716] and

(3) Apple only started obtaining from Qualcomm significant amounts of LTE chipsets from Qualcomm in 2012.[717]

(541) Fourth, the Letter of Facts did not impermissibly extend the duration of Qualcomm's infringement beyond 8 December 2015, the date of adoption of the Statement of Objections.[718] The Statement of Objections stated unequivocally that, on the basis of information available to the Commission at the time of the adoption of that document, Qualcomm's infringement was "*still ongoing*"[719]. In such circumstances, the Commission is entitled to establish that Qualcomm's infringement extended beyond 8 December 2015.[720]

12. JURISDICTION

12.1. Principles

(542) Article 102 of the Treaty is intended to prevent unilateral conduct of undertakings limiting competition within the internal market. In particular, Article 102 of the Treaty prohibits the abuse of a dominant position '*within the internal market or in a substantial part of it*'.[721]

(543) In order to justify the Commission's jurisdiction, it is sufficient that a conduct is either implemented in the EEA ("implementation test") or is liable to have immediate, substantial and foreseeable effects in the EEA ("qualified effects test").[722] These two approaches for establishing the Commission's jurisdiction are alternative.[723]

(544) The implementation test is satisfied by mere sale within the EEA, irrespective of the location of sources of supply or of production plants.[724]

(545) The qualified effects test allows the application of Article 102 of the Treaty to be justified under public international law when it is foreseeable that the conduct in question will have an immediate and substantial effect in the European Union.[725] In

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715 Qualcomm's response of 27 June 2016 to the Statement of Objections [...], paragraph 739.

716 Qualcomm's observations of 29 May 2017 on the evidence added to the case file since the adoption of the Statement of Objections [...], paragraphs 29-39.

717 Qualcomm's response of 27 June 2016 to the Statement of Objections [...], paragraph 743.

718 Qualcomm's response of 13 March 2017 to the Letter of Facts [...], paragraph 108, first bullet point.

719 Statement of Objections, paragraph 306.

720 Case T-340/03 *France Télécom v Commission*, EU:T:2007:22, paragraphs 49-50.

721 Case C-413/14 P *Intel Corp. v Commission*, EU:C:2017:632, paragraph 42.

722 Joined Cases 89/85, 104/85, 114/85, 116/85, 117/85 and 125/85 to 129/85 *Ahlström Osakeyhtiö and Others* v *Commission*, EU:C:1988:447, paragraphs 11 to 18; Case T-102/96 *Gencor* v *Commission* EU:T:1999:65, paragraphs 89 to 101.

723 Case C-413/14 P *Intel Corp. v Commission*, EU:C:2017:632, paragraphs 40-46.

724 Joined Cases 89/85, 104/85, 114/85, 116/85, 117/85 and 125/85 to 129/85 *Ahlström Osakeyhtiö and Others (Wood Pulp)* v *Commission*, EU:C:1988:447, paragraph 17; Case T-102/96 *Gencor* v *Commission* EU:T:1999:65, paragraph 87.

725 Case C-413/14 P *Intel Corp. v Commission*, EU:C:2017:632, paragraph 42.

this regard, it is sufficient to take account of the probable effects of conduct on competition in order for the foreseeability criterion to be satisfied.[726]

12.2. Application to this case

(546) The Commission concludes that it has jurisdiction to apply Article 102 of the Treaty and Article 54 of the EEA Agreement to Qualcomm's abusive conduct described in Section 11, since that conduct was both implemented and capable of having substantial, immediate and foreseeable effects in the EEA.

12.2.1. The implementation of Qualcomm's exclusivity payments in the EEA

(547) Qualcomm's exclusivity payments were implemented in the EEA because, during the Period Concerned, Apple had direct or indirect sales, including within the EEA, of products incorporating Qualcomm's LTE chipsets.

(548) The payments granted by Qualcomm to Apple thus ensured that when Apple sold its products in the EEA, irrespective of the actual location of sources of supply or of production plants, those sales necessarily included devices that incorporated Qualcomm's LTE chipsets.

(549) This conclusion is not affected by the fact that Apple's products were manufactured by third parties, which were in a direct contact with Qualcomm, as Apple instructed those third parties which components to be used in the manufacturing of Apple's devices.[727]

12.2.2. The substantial, immediate and foreseeable effects of Qualcomm's exclusivity payments in the EEA

(550) For the reasons set out below, Qualcomm's exclusivity payments were capable of having substantial, immediate and foreseeable effects in the EEA.

(551) First, Qualcomm's exclusivity payments were capable of having substantial effects in the EEA for two main reasons.

(552) In the first place, in the period August 2011 to December 2016, Apple's total EEA sales of LTE-enabled iPads amounted to [20-30]% of its global sales, and Apple's total EEA sales of LTE enabled iPhones amounted to [10-20]% of its global sales.[728]

(553) In the second place, Apple necessarily incorporated a substantial portion of the LTE chipsets it obtained from Qualcomm into devices destined for consumers in the EEA.[729]

(554) Second, Qualcomm's exclusivity payments were capable of producing, and intended to produce, an immediate effect in the EEA. Qualcomm's exclusivity payments were intended to ensure, and were capable of having, the immediate effect that, during the duration of the Agreements, no new Apple model available on the market anywhere in the world, including in the EEA, would incorporate a LTE chipset of a competitor of Qualcomm. The fact that under the terms of the Agreements Apple obtained all its LTE chipset requirements from Qualcomm meant directly and necessarily that Apple could not sell any product incorporating a LTE chipset of a competitor. Qualcomm's

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726 Case C-413/14 P *Intel Corp. v Commission*, EU:C:2017:632, paragraph 51.

727 See Section [8].

728 Apple non-confidential response to […] of the request for information […].

729 See Apple's comments […] on Qualcomm's response to the Statement of Objections [...].

exclusivity payments were, therefore, liable to affect the competitive structure in the EEA.[730]

(555) Third, Qualcomm knew, or could reasonably have foreseen, that the probable effect of its conduct would be that:

(1) No Apple model incorporating LTE chipsets anywhere in the world, including in the EEA, would incorporate a LTE chipset other than Qualcomm's; and

(2) As a result, Qualcomm's competitors would be foreclosed from the worldwide LTE chipset market.

(556) Fourth, it was Qualcomm's exclusivity payments, and not Apple's alleged self-imposed single sourcing strategy[731] that was capable of having substantial, immediate and foreseeable effects in the EEA. This is confirmed by the evidence in Section 11.4.2.4, indicating that during the Period Concerned, Apple was looking for alternative sources of supply of LTE chipsets.

(557) Fifth, it is irrelevant whether Qualcomm may have believed that Apple could at all times switch to alternative suppliers.[732]

(558) In the first place, what matters is that Qualcomm could have foreseen that the probable effect of its conduct would be that described at recital (554) above.

(559) In the second place, the Commission's jurisdiction is not confined to pursuing and punishing abuse that achieved an intended result. The Commission must strive to safeguard competition within the internal market from threats to the effective functioning thereof, regardless of the subjective intention of the dominant undertaking.

(560) In the third place, and in any event, Qualcomm's exclusivity payments were intended to produce effects within the internal market (see recital (554)).

13. EFFECT ON TRADE BETWEEN MEMBER STATES

13.1. Principles

(561) Article 102 of the Treaty prohibits as incompatible with the internal market an abuse of a dominant position "*in so far as it may affect trade between Member States*". Article 54 of the EEA Agreement contains a similar prohibition with respect to trade between Contracting Parties to the EEA Agreement.

(562) The effect on trade criterion consists of three elements.

(563) First, "*trade*" must be potentially affected. The concept of trade is not limited to traditional exchanges of goods and services across borders, but covers all cross-border economic activity. It also encompasses practices affecting the competitive

730 Changes to the structure of the market must be taken into consideration when it comes to determining whether there are substantial effects within the EEA. See for example Joined Cases 6/73 and 7/73, *Instituto Chemioterapico Italiano and Commercial Solvents v Commission*, EU:C:1974:18, paragraph 33; and Case T-102/96 *Gencor* v *Commission* EU:T:1999:65, paragraphs 94 to 96.

731 Qualcomm's response of 27 June 2016 to the Statement of Objections [...], paragraphs 801-821.

732 Qualcomm's response of 27 June 2016 to the Statement of Objections [...], paragraphs 424-431.

structure of the internal market by eliminating or threatening to eliminate a competitor operating within the territory of the Union.[733]

(564) Second, the practice does not necessarily need to reduce trade;[734] it is sufficient to show that the abuse "*may affect trade between Member States*". In other words, it must be foreseeable with a sufficient degree of probability on the basis of a set of objective factors of law or fact that the practice in question has an influence, direct or indirect, actual or potential, on the pattern of trade between Member States.[735] Where a dominant undertaking engages in exclusionary conduct in more than one Member State, such conduct is presumed, by its very nature, to be capable of affecting trade between Member States.[736]

(565) Third, the effect on trade between Member States must be "*appreciable*". This element requires that effect on trade between Member States must not be insignificant and is assessed primarily with reference to the position of the undertaking(s) on the relevant product market(s).[737] The stronger the position of an undertaking, the more likely it is that the effect of a practice on trade between Member States will be appreciable.[738]

13.2. Application to this case

(566) The Commission concludes that the conduct covered by this Decision has an appreciable effect on trade between Member States within the meaning of Article 102 of the Treaty and on trade between the Contracting Parties to the EEA Agreement within the meaning of Article 54 of the EEA Agreement. The Agreements applied to the worldwide procurement of baseband chipsets by Apple. Those Agreements, therefore, also applied to baseband chipsets incorporated in products sold by Apple in the EEA. The conduct affected the competitive structure of the internal market (see Section 12.2). Because of the size of the market concerned and of Qualcomm's position on that market, the effect on trade was appreciable.

(567) Qualcomm claims that its conduct had no effect on trade, using essentially the same arguments as those presented in Section 12. For the same reasons as those set out in that Section, Qualcomm’s claim cannot be accepted.

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733 Joined Cases 6/73 and 7/73, *Istituto Chemioterapico Italiano S.p.A. and Commercial Solvents Corporation v Commission*, EU:C:1974:18, paragraphs 32-33; Joined Cases T-24/93, T-25/93, T-26/93 and T-28/93, *Compagnie Maritime Belge v Commission*, EU:T:1996:139, paragraph 203.

734 Case T-141/89, *Tréfileurope v Commission*, EU:T:1995:62, paragraphs 57 and 122.

735 Case 5/69, *Franz Völk v Établissement J. Vervaecke*, EU:C:1969:35, paragraph 5/7; Case 322/81, *NV Nederlandsche Banden Industrie Michelin v Commission*, EU:C:1983:313, paragraph 104; Case C-41/90, *Höfner and Elsner v Macrotron*, EU:C:1991:161, paragraph 32; Case T-228/97, *Irish Sugar v Commission*, EU:T:1999:246, paragraph 170.

736 Guidelines on the effect on trade concept contained in Articles 81 and 82 of the Treaty, OJ C 101, 27.4.2004, p. 81, paragraph 75; Joined Cases 6/73 and 7/73, *Istituto Chemioterapico Italiano S.p.A. and Commercial Solvents Corporation v Commission*, EU:C:1974:18, paragraph 35.

737 Case 5/69, *Franz Völk v Établissement J. Vervaecke*, EU:C:1969:35, paragraph 5/7.

738 Case T-65/89, *BPB Industries and British Gypsum v Commission*, EU:T:1993:31, paragraph 138.

14. REMEDIES AND FINES

14.1. Remedies

(568) Article 7(1) of Regulation (EC) No 1/2003 provides that where the Commission finds that there is an infringement of Article 102 of the Treaty and Article 54 of the EEA Agreement, it may require by decision that the undertaking concerned brings such an infringement to an end in accordance with Article 3 of that Regulation. For this purpose, it may also impose on the undertaking concerned any behavioural or structural remedies which are proportionate to the infringement committed and necessary to bring the infringement effectively to an end.

(569) At the time of the adoption of this Decision, Qualcomm's abuse has come to an end as the Agreements terminated on 16 September 2016 pursuant to Clause 1.5A of the First Amendment to the Transition Agreement following Apple's launch of iPhone 7 devices incorporating Intel LTE chipsets (see Section 11.8).

(570) Qualcomm should, however, be required to refrain from repeating the conduct described in this Decision and from any act or conduct that would have the same or an equivalent object or effect as the conduct described in this Decision. This includes payments, rebates or any type of consideration, conditional on Apple obtaining from Qualcomm all or most of its requirements of LTE chipsets.

14.2. Fines

(571) Pursuant to Article 23(2)(a) of Regulation (EC) No 1/2003 and Article 5 of Council Regulation (EC) No 2894/94[739] the Commission may by decision impose fines on undertakings, where, either intentionally or negligently, they infringe Article 102 of the Treaty and Article 54 of the EEA Agreement.

(572) In the present case, the Commission concludes that the payments to Apple on condition that Apple obtain from Qualcomm all of Apple's requirements of LTE chipsets constituted an abuse of dominant position within the meaning of Article 102 of the Treaty and of Article 54 of the EEA Agreement.

(573) The Commission concludes that, contrary to what Qualcomm claims,[740] a fine is warranted as:

(1) Qualcomm acted intentionally or at least negligently; and

(2) The case does not raise complex and novel legal, economic and factual issues.

(574) Regarding Qualcomm's alleged good faith reliance on the Guidance on Enforcement Priorities, see Section 11.7.

(575) Regarding the legal, economic and factual issues raised by the case, exclusivity payments by undertakings in a dominant position have already been repeatedly condemned by the Commission and the Court of Justice of the European Union.

14.3. Calculation of the fines

(576) Pursuant to Article 23(3) of Regulation (EC) No 1/2003, in fixing the amount of the fine, the Commission must have regard to all relevant circumstances and particularly to the gravity and to the duration of the infringement. In doing so, the Commission

739 OJ L 305, 30.11.1994, p. 6.

740 See Section XI of Qualcomm's response of 27 June 2016 to the Statement of Objections [...].

will set the fine at a level sufficient to ensure deterrence. The Commission will reflect any aggravating or mitigating circumstances in the fine imposed.

(577) In setting the fine, the Commission refers to the principles laid down in its Guidelines on the method of setting fines imposed pursuant to Article 23(2)(a) of Regulation (EC) No 1/2003 ("the Fining Guidelines").[741]

(578) The Commission first defines the basic amount of the fine (see Section 14.3.1).[742] Second, where applicable, the Commission adjusts the basic amount upwards or downwards (see Section 14.3.6).[743]

(579) The basic amount of the fine is to be set by reference to the value of sales,[744] that is, the value of the undertaking's sales of goods or services to which the infringement directly or indirectly relates in the relevant geographic area in the EEA (see Section 14.3.1.1).

(580) The Commission will normally take into account the sales made by the undertaking during the last full business year of the occurrence of the infringement.[745] If the last year is not sufficiently representative because the value of sales in that year differs significantly from the yearly value achieved over the first years of the infringement, the Commission may take into account another year and/or other years for the determination of the value of sales. The value of sales is assessed before VAT and other taxes directly related to the sales.[746]

(581) The amount of the value of sales taken into account will correspond to a percentage which is set at a level of up to 30% of the value of sales.[747] The choice of a given percentage will depend on the degree of gravity of the infringement (see Section 14.3.3). The proportion of the value of sales resulting from that percentage will then be multiplied by the duration of the infringement (see Section 14.3.4).[748] The Commission may also include in the basic amount an additional amount corresponding to a percentage value of sales which may be set at a level between 15% and 25% of the value of sales (see Section 14.3.5).[749] The Commission may then adjust the basic amount up or down to take into account aggravating or mitigating circumstances (see Section 14.3.6).[750] Those circumstances are listed in a non-exhaustive way in points 28 and 29 of the Fining Guidelines.

(582) The Commission may depart from the methodology set out in the Fining Guidelines where it is justified by the particularities of a given case or the need to achieve deterrence in a particular case.[751]

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741 OJ C 210, 1.9.2006, p. 2.
742 Paragraph 10 of the Fining Guidelines.
743 Paragraph 11 of the Fining Guidelines.
744 Paragraph 13 of the Fining Guidelines.
745 Paragraph 13 of the Fining Guidelines.
746 Paragraph 17 of the Fining Guidelines.
747 Paragraph 21 of the Fining Guidelines.
748 Paragraph 19 of the Fining Guidelines.
749 Paragraph 25 of the Fining Guidelines.
750 Paragraph 27 of the Fining Guidelines.
751 Paragraph 37 of the Fining Guidelines.

(583) Pursuant to Article 23(2) of Regulation No 1/2003, the fine for an infringement shall not exceed 10% of the undertaking's total turnover in the preceding business year (see Section 14.3.7).

14.3.1. Basic amount of the fine

14.3.1.1. The value of sales

(584) The Commission concludes that Qualcomm's direct and indirect sales of all LTE chipsets to third parties in the EEA should be taken into account. Qualcomm had limited direct sales in 2015 and therefore taking into account only those sales would not result in a fine that was sufficiently deterrent.[752] Indirect sales[753] can also be taken into account in this case as there is a sufficiently close link between Qualcomm's exclusivity payments, these sales and the EEA.[754]

14.3.2. The last year of the infringement

(585) In this case, there are no exceptional reasons to deviate from the basic principle that the fine should be based on the last full year's revenues.

(586) The value of sales should therefore be based on Qualcomm's direct and indirect sales of all LTE chipsets to third parties in the EEA in 2015.

14.3.3. Gravity

(587) The Commission concludes that the proportion of the value of sales to be used to establish the basic amount of the fine should be 11%.

(588) In reaching this conclusion, the Commission takes into account the following factors.

(589) First, the worldwide LTE chipset market is of significant economic importance. This means that the anticompetitive conduct on this market is likely to have had a considerable impact.

(590) Second, exclusivity payments by undertakings in a dominant position have already been repeatedly condemned by the Commission and the Court of Justice of the European Union.[755]

(591) Third, Qualcomm not only held a dominant position in the worldwide LTE chipset market during the Period Concerned but its market share was above [90-100]% by reference to value and above [80-90]% by reference to volume for most of that

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752 Qualcomm's direct EEA sales in 2015 were only about EUR [10-20] million. See […] to Qualcomm's response to the request for information […].

753 In the present case, indirect sales in the EEA are the value of Qualcomm's average sales price per unit of the LTE chipsets sold/delivered by Qualcomm to independent third companies, multiplied by the total volume of LTE-compliant devices, which incorporate Qualcomm's LTE chipsets, delivered into the EEA by an independent third company (see […] of the request for information […]). The value of indirect sales in the EEA was provided by Qualcomm in the […] to its response to the request for information […]. Given that such value had not been reduced by the value of Qualcomm's direct sales into the EEA, the Commission did not add to these figures the amount of Qualcomm's direct sales for the purposes of calculating the total value of sales (see […] of Qualcomm's response to the request for information […]).

754 Cases T-56/09 and T-73/09 *Saint-Gobain Glass France and Others v Commission*, EU:T:2014:160, paragraph 476; Case T-128/11 *LG Display and LG Display Taiwan v Commission*, EU:T:2014:88, paragraph 141. See also Section (541) above.

755 See for example Case 85/76 *Hoffmann-La Roche v Commission*, EU:C:1979:36; Case T-66/01 *Imperial Chemical Industries v Commission*, EU:T:2010:255, paragraph 315.

period. Even in 2016, when Qualcomm's share was the lowest compared to other years of the infringement, it remained above [60-70]% both in terms of value and volume.

(592) Fourth, Qualcomm's exclusivity payments were worldwide in scope. This means that the whole EEA was covered by Qualcomm's exclusivity payments.

14.3.4. Duration

(593) In its assessment of the duration of the infringement, the Commission will multiply the amount determined on the basis of the value of sales by the number of years of the duration of the infringement.[756]

(594) In the present case, the Commission considers that the duration of the infringement is 5 years, 6 months and 23 days (see recital (534)).

14.3.5. Additional amount

(595) The Commission concludes that the basic amount should include an additional amount in order to deter undertakings of a similar size and with similar resources from entering into the same type of infringement as Qualcomm.[757]

(596) In light of the factors set out in recitals (587) - (592), the additional amount should be 11% of Qualcomm's value of sales in 2015.

14.3.6. Aggravating and mitigating circumstances

(597) In the present case, the Commission considers that there are no aggravating or mitigating circumstances that should result in an increase or decrease in the basic amount of the fine.

14.3.7. Conclusion: final amount of the fine

(598) The final amount of the fine to be imposed on Qualcomm should be EUR 997 439 000.

(599) Qualcomm's turnover in the business year ending 24 September 2017 was EUR 20 189 million.[758] As the amount of the fine set above is below this legal maximum no adaptation is necessary.

HAS ADOPTED THIS DECISION:

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[756] Paragraph 24 of the Fining Guidelines.

[757] Paragraph 25 of the Fining Guidelines.

[758] USD 22 291 million, consolidated turnover of Qualcomm Inc., see 2017 10-K Report, page F-35, available at: http://investor.qualcomm.com/common/download/download.cfm?companyid=QCOM&fileid=964717&filekey=EF216DA8-07D0-434C-911F-12C99C753606&filename=SEC-QCOM-1234452-17-190.pdf
Converted at the EUR/USD average exchange rate of the ECB for the period 26 September 2016 to 24 September 2017 of EUR 1 = USD 1.1014, this rate can be obtained at the ECB website at the following address:
https://www.ecb.europa.eu/stats/policy_and_exchange_rates/euro_reference_exchange_rates/html/eurofxref-graph-usd.en.html

Article 1

Qualcomm Inc. has committed an infringement of Article 102 of the Treaty and Article 54 of the Agreement on the European Economic Area by granting payments to Apple Inc. on condition that Apple Inc. obtain from Qualcomm Inc. all of Apple Inc.'s requirements of baseband chipsets compliant with the Long-Term Evolution standard together with the Global System for Mobile Communications and the Universal Mobile Telecommunications System standards.

The infringement lasted from 25 February 2011 to 16 September 2016.

Article 2

For the infringement referred to in Article 1, a fine of EUR 997 439 000 is imposed on Qualcomm Inc.

The fine shall be credited in euros, within a period of three months of the date of notification of this Decision, to the following bank account held in the name of the European Commission:

BANQUE ET CAISSE D'EPARGNE DE L'ETAT
1-2, Place de Metz
L-1930 Luxembourg

IBAN: LU02 0019 3155 9887 1000
BIC: BCEELULL
Ref.: European Commission – BUFI/COMP/AT.40220

After the expiry of that period, interest shall automatically be payable at the interest rate applied by the European Central Bank to its main refinancing operations on the first day of the month in which this Decision is adopted, plus 3.5 percentage points.

Where Qualcomm Inc. lodges an action for annulment, it must cover the fine by the due date, either by providing an acceptable financial guarantee or making a provisional payment of the fine in accordance with Article 90 of Commission Delegated Regulation (EU) No 1268/2012[759].

Article 3

Qualcomm Inc. shall refrain from repeating any act or conduct described in Article 1, and from any act or conduct having the same or an equivalent object or effect.

Article 4

This Decision is addressed to Qualcomm Inc., 5775 Morehouse Drive, San Diego, 92121 California, United States of America.

[759] OJ L 362, 31.12.2012, p. 1.

This Decision shall be enforceable pursuant to Article 299 of the Treaty and Article 110 of the Agreement on the European Economic Area.

Done at Brussels, 24.1.2018

For the Commission
Margrethe VESTAGER
Member of the Commission