EUROPEAN COMMISSION
Competition DG

CASE COMP/38511 DRAMs

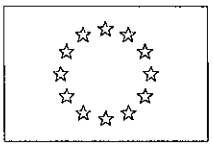
(Only the English text is authentic)

CARTEL PROCEDURE

Council Regulation (EC) 1/2003 and Commission Regulation (EC) 773/2004

Article 7 Regulation (EC) 1/2003

Date: 19/05/2010



EUROPEAN COMMISSION

Brussels,

NON CONFIDENTIAL VERSION OF THE

COMMISSION DECISION

of 19 May 2010

relating to a proceeding under Article 101 of the Treaty on the Functioning of the European Union and Article 53 of the EEA Agreement

(COMP/38511 – DRAMs)

(Only the English text is authentic)

(Text with EEA relevance)

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COMMISSION DECISION

of 19 May 2010

relating to a proceeding under Article 101 of the Treaty on the Functioning of the European Union and Article 53 of the EEA Agreement

(COMP/38511 – DRAMs)

THE EUROPEAN COMMISSION,

Having regard to the Treaty on the Functioning of the European Union (hereinafter "TFEU"),

Having regard to the Agreement on the European Economic Area (hereinafter "the EEA Agreement"),

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[1], and in particular Article 7 and Article 23(2) thereof,

Having regard to Commission Regulation (EC) No 622/2008 of 30 June 2008 amending Regulation (EC) No 773/2004, as regards the conduct of settlement procedures in cartel cases[2], and in particular Article 10a thereof,

Having regard to the Commission decisions of 10 February 2009 and of 8 April 2009 to initiate proceedings in this case,

Having given the undertakings concerned the opportunity to make known their views on the objections raised by the Commission pursuant to Article 27(1) of Regulation (EC) No 1/2003 and Article 11(1) 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 EC Treaty[3],

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

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

2 OJ L 171, 1.7.2008, p. 3.

3 OJ L 123, 27.4.2004, p. 18.

Having regard to the final report of the Hearing Officer in this case[4],

Whereas:

1. INTRODUCTION

1. The present Decision relates to a single and continuous infringement of Article 101 of the TFEU and Article 53 of the EEA Agreement. Parties to the infringement entered into a scheme and/or network of contacts and secret information sharing by which they coordinated their conduct on general pricing levels and quotations to major personal computer ("PC")/server Original Equipment Manufacturers ("OEMs"), ultimately amounting to price coordination to such clients. This was done with the aim of restricting competition in respect of major PC/server OEMs with regard to the sale of Dynamic Random Access Memory ('DRAMs') and, in the case of Toshiba, Samsung and Elpida, also for the sale of Rambus DRAMs, [] in the EEA, from 1 July 1998 until 15 June 2002 in respect of DRAMs, and from 9 April 2001 until 15 June 2002 in respect of Rambus DRAMs.

2. This Decision is addressed to the following companies:

   a) Micron Technology Inc., Micron Europe Limited, Micron Semiconductor (Deutschland) GmbH (hereinafter collectively referred to as "Micron");

   b) Samsung Electronics Co Ltd., Samsung Semiconductor Europe GmbH, Samsung Semiconductor Europe Ltd., Samsung Semiconductor France Sarl (hereinafter referred collectively as "Samsung");

   c) Hynix Semiconductor Inc., Hynix Semiconductor Europe Holding Ltd., Hynix Semiconductor Deutschland GmbH, Hynix Semiconductor United Kingdom Ltd (hereinafter collectively referred to as "Hynix");

   d) Infineon Technologies AG (hereinafter referred to as "Infineon");

   e) NEC Corporation, Renesas Electronics Europe GmbH (formerly NEC Electronics (Europe) GmbH until 1 April 2010), NEC Electronics (UK) Ltd (hereinafter collectively referred to as "NEC");

   f) Hitachi Ltd., Hitachi Europe Ltd (hereinafter collectively referred to as "Hitachi");

   g) Toshiba Corp., Toshiba Electronics Europe GmbH (hereinafter collectively referred to as "Toshiba");

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[4] Final report of the Hearing Officer of 10 May 2010 (not yet published in OJ)

h) Mitsubishi Electric Corp., Mitsubishi Electric Europe BV (hereinafter collectively referred to as "Mitsubishi");

i) Nanya Technology Corp. (hereinafter referred to as "Nanya");

j) Elpida Memory Inc., Elpida Memory (Europe) GmbH (hereinafter collectively referred to as "Elpida").

2. PROCEDURE

3. This case was triggered by an immunity application submitted on [...] by Micron. Conditional immunity was granted to Micron in December 2002. Between [...] 2003 and [...] 2006, Infineon, Hynix, Samsung, Elpida and NEC applied for leniency to the Commission. Infineon's leniency application of [...] was supplemented in [...]. Hynix submitted its leniency application in [...] and made further submissions throughout [...]. Samsung submitted its leniency application in [...] and made further submissions in [...]. Finally, Elpida and NEC submitted their respective leniency applications in [...] and supplemented them respectively in [...]. The first request for information was sent in March 2003 and a series of requests for information were sent at later stages.

4. The Commission initiated proceedings pursuant to Article 11(6) of Regulation (EC) No 1/2003 on 10 February 2009 and, by letter of 13 February 2009, formally requested the parties in the present case to express in writing whether they envisaged engaging in settlement discussions in view of possibly introducing settlement submissions at a later stage. On 8 April 2009, the proceedings were initiated for the relevant subsidiaries of the undertakings concerned.

5. After all the parties had requested settlement discussions through written declarations, these discussions started on 31 March 2009. A number of meetings took place between 31 March 2009 and 25 November 2009. During these meetings, the Commission informed the parties of the objections it had against them and disclosed the evidence in the Commission file used to establish these objections. The parties asserted their views on the objections raised against them. They had access to the relevant file including the oral statements. Upon request, and in so far as it was justified for the purpose of enabling the parties to ascertain their respective positions regarding a time period or any other aspect of the cartel, parties were granted access to non-confidential versions of any specified accessible document [...] in the case-file. The estimation of the range of likely fines to be imposed by the Commission was also given to the parties. At the end of the settlement discussions, all parties considered that there was a sufficient common understanding as regards the scope of the potential objections and the estimation of the range of likely fines to be imposed by the Commission and introduced formal requests to settle in the form of settlement submissions.

6. In their settlement submissions, Infineon, Micron, Samsung, Hynix, Mitsubishi, Elpida, NEC, Hitachi, Toshiba and Nanya clearly and unequivocally acknowledged their respective liability for the infringement of Article 101 of the TFEU, describing its object, its possible implementation, the main facts, their legal qualification, including the party's role and the duration of their participation in the infringement in accordance with the results of the settlement discussions as further explained and

described in the remainder of the decision. The parent companies heading the group clearly and unequivocally acknowledged that they are responsible for their own behaviour as well as for the behaviour of their relevant subsidiaries. In their respective settlement submissions, the parties confirmed having had access to the evidence supporting the objections and having been granted sufficient opportunity to have access to other documents in the Commission's file.

7. In their settlement submissions, according to point 20 of the Notice on the conduct of settlement procedures[5], the parties also confirmed:

   a) Having been sufficiently informed of the objections the Commission envisaged raising against them and having been given sufficient opportunity to make their views known;

   b) Not envisaging requesting access to the file or requesting to be heard again in an oral hearing, unless the Commission did not reflect their settlement submissions in the statement of objections and its decision;

   c) Having agreed to receive the Statement of Objections and the final decision in a given language, in this case in English;

   d) The parties also indicated the maximum amount of the fine that they foresaw being imposed by the Commission and which the parties would accept in the framework of a settlement procedure.

8. The Statement of Objections was adopted by the Commission on 4 February 2010. All the parties confirmed that the Statement of Objections corresponded to the contents of their settlement submissions and that they therefore remained committed to follow the settlement procedure. Having regard to the clear and unequivocal acknowledgments of all the parties to this proceeding described in their settlement submissions and to their clear and unequivocal confirmation that the Statement of Objections reflected their settlement submissions, it should be concluded that the addressees of the present Decision took part in the cartel as described in Section 4 (recitals 25 to 49).

3. THE INDUSTRY SUBJECT TO THE PROCEEDINGS

3.1. The product concerned by the cartel

9. The product at stake is defined as DRAM. DRAM is mainly used as the main memory for loading, displaying and manipulating applications and data. It is the common model for semiconductor memories for personal computers, servers and

[5] Commission Notice on the conduct of settlement procedures in view of the adoption of Decisions pursuant to Article 7 and Article 23 of Council Regulation (EC) No 1/2003 in cartel cases, Official Journal C 167, 2.7.2008, p. 1–6.

workstations. For the purposes of the present proceedings, DRAM comprises both DRAM chips and modules in all configurations and speed.

10. As for the different product generations of DRAM chips/modules, the present proceedings cover: Extended Data Output RAM ('EDO') and Fast Page Mode RAM ('FPM RAM') both defined also as 'Legacy DRAM' or 'Async'; Synchronous DRAM ('SDRAM') and Double Data Rate DRAM ('DDR') (hereinafter collectively referred to as 'DRAM'), as well as a specific DRAM memory type, denominated Rambus DRAM (hereinafter referred to as 'Rambus DRAM').

3.2. The companies subject to the proceedings

3.2.1. Micron

11. The relevant companies are Micron Technology, Inc. and its relevant subsidiaries Micron Europe Limited and Micron Semiconductor (Deutschland) GmbH.

3.2.2. Infineon

12. The relevant company is Infineon Technologies AG, a European semiconductors manufacturer founded in April 1999 in the course of the spin-off of the entire semiconductor business of Siemens AG. Infineon is the economic successor of [...].

3.2.3. Hynix

13. The relevant companies are Hynix Semiconductor Inc. and its relevant subsidiaries Hynix Semiconductor Europe Holding Ltd., Hynix Semiconductor Deutschland GmbH and Hynix Semiconductor United Kingdom, Ltd.

14. On July 9, 1999, Hyundai Electronics Industries acquired LG Electronics Inc.'s interest in LG Semicon Co. Ltd. Thereafter LG Semicon Co. Ltd was merged into Hyundai Electronics Industries, which became Hynix Semiconductor Inc. in March 2001.

3.2.4. Samsung

15. The relevant companies are Samsung Electronics Co Ltd. and its relevant subsidiaries Samsung Semiconductor Europe GmbH, Samsung Semiconductor Europe Ltd. and Samsung Semiconductor France Sarl.

3.2.5. NEC

16. The relevant companies are NEC Corporation and its relevant subsidiaries Renesas Electronics Europe GmbH (formerly NEC Electronics (Europe) GmbH until 1 April 2010) and NEC Electronics (UK) Ltd.

17. From 1 July 1998 to 28 February 2001, NEC was a supplier of DRAMs. As from 1 March 2001 until 15 June 2002, the sale and marketing of DRAMs and Rambus DRAMs was done by a newly established, at the time 50/50, joint venture with Hitachi Ltd., namely Elpida Memory Inc., while NEC continued only the production activity.

3.2.6. Hitachi

18. The relevant companies are Hitachi Ltd. and its relevant subsidiary Hitachi Europe Ltd.

19. Hitachi was a producer of DRAMs which it marketed through its subsidiaries until 28 February 2001. As from 1 March 2001 until 15 June 2002, the sale and marketing of DRAMs and Rambus DRAMs was done by a newly established, at the time 50/50, joint venture with NEC Corporation, namely Elpida Memory Inc., while Hitachi continued the production activity.

3.2.7. Mitsubishi

20. The relevant companies are Mitsubishi Electric Corp. and its relevant subsidiary Mitsubishi Electric Europe BV.

3.2.8. Toshiba

21. The relevant companies are Toshiba Corp. and its relevant subsidiary Toshiba Electronics Europe GmbH. Toshiba exited the DRAM market on 22 April 2002.

3.2.9. Elpida

22. The relevant companies are Elpida Memory Inc. and its relevant subsidiary Elpida Memory (Europe) GmbH.

23. Elpida Memory Inc. was established on 20 December 1999 as a joint venture between NEC Corporation and Hitachi Ltd., in which NEC and Hitachi each held 50% of the shares until its flotation on the Tokyo Stock Exchange in November 2004. Elpida Memory (Europe) GmbH was established on 20 June 2000 as, and remains today, a subsidiary of Elpida Memory Inc. Elpida began marketing and selling DRAMs and Rambus DRAMs in the EEA on 1 March 2001.

3.2.10. Nanya

24. The relevant company is Nanya Technology Corp. which became a relevant player in the DRAM market as of 2001.

4. DESCRIPTION OF THE EVENTS

4.1. Overview of the cartel

25. The cartel aimed to coordinate and monitor prices for DRAMs (all companies) – as well as for Rambus DRAMs (only Toshiba, Samsung and Elpida) – to contract customers which are the major PC/server OEMs, although these major PC/server OEMs did not necessarily purchase these products from every participant in the infringement.

26. By means of regular and repeated contacts, cartel participants secretly exchanged information on pricing intentions and general pricing strategy, as well as on other commercially sensitive data with the anti-competitive purpose of coordinating general pricing levels and quotations to identified contract customers over the whole duration

of the cartel, with a varying degree of intensity, frequency and effectiveness. The contacts consisted in sharing, verifying, monitoring and ultimately coordinating forthcoming or current price quotations to the individual major PC/server OEMs. The participating undertakings relied on the other companies' pricing intentions and/or took into account the information exchanged with competitors in determining their own conduct on the market when negotiating prices with major PC/server OEMs. The information exchanged removed, to some extent, the price uncertainty in the market, enabling the suppliers to make decisions based on more specific and reliable data.

27. This occurred by means of a network of contacts both at a local level of the undertaking with the awareness of the head office and/or also at a senior level of the undertaking. Contacts took mostly place by telephone, but some meetings also took place between certain suppliers. Although the majority of these contacts took place at a bilateral level, these contacts were held with the awareness on both sides that similar contacts also took place with other companies and/or taking the risk that information would be circulated to other companies. As a result, the suppliers –with different degrees of intensity and involvement, depending on the undertakings– operated this network of contacts in order to achieve their anti-competitive aims.

28. Changes in intensity and conducts were made in reaction to new situations happening in the market. For example, cartel members adapted themselves quickly to evolutions in the market, such as the launching of Dynamic Bidding Events (auctions) by some specific major PC/server OEMs towards the end of the cartel period. In such instances, as part of the pricing coordination vis-à-vis major PC/server OEMs, contacts - among suppliers that were "qualified" to supply such customers – in relation to online auctions organized by such major PC/server OEMs on specific dates mainly in Autumn 2001 and Spring 2002 took place. In another example, on specific instances/periods, contacts among certain suppliers took place relating to output/capacity strategy as well as to spot pricing, exclusively in order to support and/or favour price coordination regarding major PC/server OEMs.

29. Overall, the purpose of contacts among competitors was, in a rising market, to maximize the supplier profit, and, in a falling market, to keep prices from falling too quickly.

4.2. Companies' specific behaviour

30. As for the individual involvement of each company in the cartel, the entire body of evidence referred to in recital 5 above shows the involvement of the various suppliers in the cartel. This individual participation is hereunder described in alphabetical order.

4.2.1. Elpida

31. Elpida's involvement in the cartel started from the initiation of Elpida's sales activities in Europe, namely on 1 March 2001, and continued until 15 June 2002. Its involvement in the cartel is shown by [...] according to which Elpida's employees had contacts with employees of competing manufacturers concerning pricing and future pricing intentions regarding major PC/server OEMs. Contacts took place mostly by phone and sometimes in person. The competing manufacturers with whom Elpida's

employees had contacts include Samsung, Toshiba, Infineon, Hynix, Micron, Mitsubishi and Nanya[6].

32. The evidence in the Commission's file shows that Elpida shared and discussed pricing and pricing intentions with competitors with the purpose of coordinating the pricing behaviour. It also shows that Elpida shared and discussed with competitors other commercially sensitive data in order to support the coordination of DRAMs pricing to major PC/server OEMs[7]. Over the period of involvement, although varying in intensity and frequency, the contacts by Elpida's employees occurred on a repeated and regular basis. In relation to a number of Dynamic Bidding Events organised by some major PC/server OEMs in the late 2001/early 2002 period, Elpida's employees had contacts with competitors on pricing strategies[8].

33. [...] demonstrate that Elpida's employees also shared and discussed with competitors (Samsung and Toshiba) pricing and pricing intentions with respect to Rambus DRAMs in the period from 9 April 2001 to 15 June 2002[9]. The evidence also shows that sometimes information was exchanged simultaneously on both products, Rambus DRAMs and DRAMs[10].

4.2.2. Hitachi

34. Hitachi's direct involvement in the cartel can be shown from 9 November 1998 until 28 February 2001. [...] confirm that during that period, although varying in intensity and frequency, Hitachi's employees were involved in regular and repeated DRAM pricing contacts – by phone and sometimes in person – with counterparts at competitors. The evidence in the Commission's file shows contacts by Hitachi's employees at both senior and sales management level with counterparts at Samsung, Hynix, Toshiba, Infineon, Micron, Mitsubishi and NEC. During these contacts, pricing intentions were shared, discussed and verified when negotiating with major PC/server OEMs, with the purpose of coordinating pricing and limiting competition among suppliers[11]. The evidence also shows that Hitachi employees used information checked with competitors in order to determine their own pricing strategy[12]. Other commercially sensitive information was also shared with competitors with the view to support the coordination of DRAMs pricing to major PC/server OEMs[13]. Hitachi employees were involved in the cartel directly until 28 February 2001, when assets

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6 See for example[..].

7 See for example[..].

8 See for example[..].

9 See for example[..] .

10 See for example [..].

11 See for example[..] .

12 See for example [..].

13 See for example[..] .

and personnel were transferred to Elpida. However, its indirect involvement (through the joint venture Elpida) lasted from 1 March 2001 until 15 June 2002.

4.2.3. Hynix

35. Hynix's participation in the cartel is documented by [...] . [...] refer to pricing-related contacts concerning DRAMs between their respective employees at both senior and/or sales management levels during the period beginning on 1 July 1998 and ending on 15 June 2002[14]. The evidence in the Commission's file corroborates that, throughout the whole duration of its participation in the cartel, Hynix shared and discussed DRAM pricing intentions and quotations, as well as other commercially sensitive information, with Samsung, Micron, Infineon, NEC, Hitachi, Elpida, Toshiba and Mitsubishi, with the aim of coordinating prices and limiting competition among DRAM suppliers vis-à-vis major PC/server OEMs[15]. The evidence shows that, between 1998 and 2002, although varying in intensity and frequency, Hynix employees had regular and repeated price-related discussions with their counterparts at competitors, mainly by phone and sometimes in person, and that Hynix would use the information gathered from competitors in determining its own conduct on the market when negotiating prices with its major PC/server OEM customers[16]. In relation to a number of Dynamic Bidding Events organised by some major PC/server OEMs in the late 2001/early 2002 period, Hynix's employees had contacts with competitors on pricing strategies[17].

36. However, as far as Hynix is concerned, the following facts should be noted for 2001. Hynix was subject to the Commission proceedings on the imposition of countervailing duties in the EU with regard to DRAM prices in 2001. The Commission found that Hynix "*contributed significantly to the fall in prices of the Community producers*" due to its low pricing for DRAM products –the same at stake in this case– during the period from 1 January 2001 to 31 December 2001, also "*undercutting the prices of the Community industry on a substantial proportion of its transactions.*"[18] The evidence on file confirms that during this period Hynix was perceived by other suppliers as being a particularly "aggressive" competitor, who undercut other suppliers' pricing, allegedly because of perceived subsidies[19], leading to the submission by some suppliers of complaints also before the US and Japan Trade Authorities with regard to 2001.

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[14] See for example [..].

[15] See for example .[..]

[16] See for example [..] .

[17] See for example [..].

[18] Commission Regulation (EC) No 708/2003 of 23/04/2003, para 148 and ff., confirmed by Commission Regulation (EC) No 1408/2003 of 11/08/2003.

[19] See 1983, 6086-87, 4710. See also U.S. International Trade Commission, *DRAMs and DRAM Modules from Korea*, U.S.I.T.C. Inv. No. 701-TA-431 (Final), Transcript of Public Hearing held on 24 June 2003, page 47, available at http://www.usitc.gov/trade_remedy/731_ad_701_cvd/investigations/2002/drams_and_dram_modules_from_korea/final/PDF/Hearing_06-24-03%20.pdf.

4.2.4. *Infineon*

37. Infineon's involvement in the cartel from 14 November 1998 to 15 June 2002 is shown by several [...]. In particular, [...]confirm that, although varying in intensity and frequency, their own employees were involved in regular and repeated pricing contacts at different levels with Infineon's counterparts during that period.

38. The evidence in the Commission's file shows that Infineon's employees discussed and shared DRAM prices and price intentions for DRAMs during major PC/server OEMs negotiations with Micron, Hynix, Elpida, NEC, Toshiba, Hitachi, Samsung and Nanya with a view to coordinating pricing and limiting competition among suppliers[20]. The evidence also shows that Infineon's employees took into account the information obtained from competitors in order to determine their own pricing strategy[21]. Documents also show that on occasion other commercially sensitive information[22] was shared in order to support coordination for DRAM pricing at major PC/server OEMs. In the late 2001/early 2002 period, contacts between Infineon's employees and competitors on pricing intentions at some major PC/server OEMs where Dynamic Bidding Events were organised are documented in the Commission's file[23].

4.2.5. *Micron*

39. Micron's involvement in the cartel started on 1 July 1998 and ended on 15 June 2002. Over this period, Micron's employees had contacts mainly by phone and sometimes in person with counterparts from competitors on prices and price levels, as well as on other commercially sensitive data in order to support the coordination of DRAMs pricing to major PC/server OEMs[24].

40. [...]confirm contacts by their respective employees with Micron's representatives. [...]also confirm competitor contacts. The evidence in the Commission's file corroborates contacts by Micron's employees with competitors such as Hynix, NEC, Toshiba, Infineon, Samsung, Elpida, Hitachi and Nanya, on pricing and pricing intentions with the purpose of coordinating their pricing strategy towards major PC/server OEMs. The information obtained from competitors was used by Micron as data points in determining prices. Although varying in intensity and frequency, the contacts took place on a repeated and regular basis by employees at various levels of the undertaking[25]. According to the evidence in the Commission's file, Micron's employees also had contacts with competitors on pricing strategies in the framework of the method of negotiations introduced by some major PC/server OEMs in the late 2001/early 2002 period, namely the Dynamic Bidding Events[26].

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[20] See for example [..].

[21] See for example [..].

[22] See for example [..].

[23] See for example [..] .

[24] See for example [..].

[25] See for example [..].

[26] See for example [..].

4.2.6. Mitsubishi

41. [...]establish Mitsubishi's participation in the cartel from 24 November 1998 to 15 June 2002. The evidence in the Commission's file shows that, during this period, Mitsubishi's employees had contact with counterparts at competitors and exchanged commercially sensitive data, including pricing-related information with the aim of coordinating their market behaviour and pricing strategies vis-à-vis major PC/server OEMs[27]. This evidence in the Commission's file includes [...], which refer to pricing-related contacts concerning DRAMs between their respective employees and Mitsubishi's employees[28]. The evidence also shows that, in the late 2001/early 2002 period, contacts between Mitsubishi's employees and its competitors also concerned a limited number of Dynamic Bidding Events organised by one major PC/server OEM[29].

42. However, the evidence shows more sporadic indicia/contacts in the collusive activities by Mitsubishi compared to other suppliers. The overall evidence shows that the number of both senior and lower level personnel involved in anti-competitive contacts for this company is much lower than that of other suppliers. Contact between Mitsubishi and other participants was less frequent, compared to the overall network of contacts, considering the four-year duration of the cartel and Mitsubishi's participation as set out in Section 8.3.2.2 below. As already stated above in recital 26, this cartel is based upon regular and repeated contacts between the cartel participants. Mitsubishi, given its more sporadic contacts, contributed to maintaining the cartel to a lesser extent, without exerting an intense role throughout the duration of the whole cartel. Therefore, as a consequence of its lesser involvement in the network of contacts among competitors, Mitsubishi was not involved in all aspects of the infringement.

4.2.7. Nanya

43. Nanya's participation in the cartel is documented by various [...]. [...]refer to pricing-related contacts over the period 12 October 2001 – 15 June 2002 between their respective employees and Nanya's employees. During the short period of Nanya's involvement, contacts by Nanya's employees were regular and repeated although they varied in intensity and frequency. Contacts on prices were established at different levels of the undertaking[30]. The evidence in the Commission's file demonstrates that, although varying in intensity and frequency, Nanya shared and discussed DRAM prices and price intentions with Samsung, Micron, Elpida and Infineon from 12 October 2001 to 15 June 2002 with the aim of coordinating pricing and limiting competition among suppliers vis-à-vis major PC/server OEMs. In particular, the evidence shows that competitors were checking Nanya's price intentions in order to determine their price strategy[31] and that Nanya also shared and discussed other

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[27] See for example [..] .

[28] See for example [..] .

[29] See for example [..].

[30] See for example [..].

[31] See for example[..] .

commercially sensitive information with competitors in order to support the coordination of DRAM pricing to major PC/server OEMs[32].

4.2.8. NEC

44. NEC's direct participation in the cartel from 1 July 1998 until it exited the market at the end of February 2001 is documented by various [...]. [...] refers to regular pricing-related contacts concerning DRAMs between its employees and its competitors during the relevant period[33]. The involvement of NEC in the cartel is also confirmed by the [...][34]. For the most part, NEC's mid-level employees had contacts with their counterparts at DRAM competitors, mainly by phone, and sometimes in person, but senior level employees also carried out such anti-competitive conversations[35]. NEC took into account the information discussed with competitors in determining its own pricing strategy[36]. The evidence in the Commission's file corroborates that NEC exchanged sensitive DRAM pricing information, such as anticipated prices to major PC/server OEMs, with competitors such as Hynix, Samsung, Micron, Infineon, Hitachi and Toshiba[37], with a view to coordinating pricing and limiting competition among themselves. To support the coordination of DRAM pricing to major PC/server OEMs, NEC also had discussions with the cartel participants regarding other commercially sensitive information[38]. Although the intensity and frequency of these contacts varied during the relevant period, NEC's contacts were of a regular and repeated nature. NEC employees were involved in the cartel directly until 28 February 2001, when assets and personnel were transferred to Elpida. However, its indirect involvement (through the joint venture Elpida) lasted from 1 March 2001 until 15 June 2002.

4.2.9. Samsung

45. Samsung's participation in the cartel in the period 1 July 1998 to 15 June 2002 is documented by [...]. [...]refer to pricing-related contacts between their respective employees as well as other companies' and Samsung's employees. [...]also confirm competitor contacts. The evidence in the Commission's file shows that, although varying in intensity and frequency, regular and repeated contacts with competitors took place at different levels of the undertaking during that period[39]. The evidence in the Commission's file demonstrates that Samsung shared and discussed prices and price intentions for DRAMs with Micron, Hynix, Infineon, Elpida, NEC, Toshiba, Hitachi, Mitsubishi and Nanya with the aim of coordinating pricing and limiting competition among suppliers vis-à-vis major PC/server OEMs[40]. In particular, the

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32 See for example [..].

33 See for example [..].

34 See for example [..].

35 See for example [..].

36 See for example[..] .

37 See for example[..] .

38 See for example [..].

39 See for example [..] .

40 See for example[..] .

evidence shows that Samsung employees shared mutual price intentions with competitors in order to determine their own and influence their competitors' price strategy[41] and that other competitors' employees shared and discussed with Samsung pricing intentions as well as other commercially sensitive information[42], in order to support coordination for pricing at major PC/server OEMs. In the late 2001/early 2002 period, contacts between Samsung's employees and competitors on pricing intentions at some major PC/server OEMs where Dynamic Bidding Events were organised are documented in the Commission's file[43].

46. The evidence in the Commission's file shows that Samsung exchanged pricing intentions with Elpida and Toshiba to coordinate pricing at major PC/server OEMs with regard to Rambus DRAMs, from 9 April 2001 until 15 June 2002[44]. The evidence also shows that information was sometimes exchanged simultaneously on both products, Rambus DRAMs and DRAMs[45].

- *4.2.10. Toshiba*

47. Toshiba participated in the cartel as from 1 July 1998 until 22 April 2002. Toshiba's involvement is shown by several [...]. [...] refer to Toshiba as a participant of the cartel and/or show contacts by their employees on pricing and pricing intentions with Toshiba's employees[46]. The evidence in the Commission's file shows that Toshiba discussed and shared information on future pricing, as well as other commercially sensitive data, with competitors, with the purpose of coordinating pricing behaviour at major PC/server OEMs[47]. The evidence also demonstrates that Toshiba's employees had contact with competitors on pricing intentions with respect to Rambus DRAMs, from 9 April 2001 until 22 April 2002[48].

48. However, the evidence in the file shows more sporadic indicia/contacts in the collusive activities by Toshiba compared to other suppliers. The overall evidence shows that the number of both senior and lower level personnel involved in anti-competitive contacts for this company was much lower than that of other suppliers. Contacts between Toshiba and other participants were of a lesser frequency, compared to the overall network of contacts, considering the four-year duration of the cartel and Toshiba's participation as set out in Section 8.3.2.2 below. As already stated above in recital 26, this cartel is based upon regular and repeated contacts between the cartel participants. Toshiba, given its more sporadic contacts, contributed to maintaining the cartel to a lesser extent, without exerting an intense role throughout the whole cartel. Therefore, as a consequence of its lesser involvement in

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41 See for example [..].

42 See for example [..] .

43 See for example [..] .

44 See for example [..]

45 See for example [..] .

46 See for example [..].

47 See for example [..].

48 See for example [..].

the network of contacts among competitors, Toshiba was not involved in all aspects of the infringement.

4.3. Geographic scope of the infringement

49. According to the entire body of evidence referred to in recital 5, shipments within and to the whole EU/EEA geographic area were affected by the behaviour. As a result, the geographic scope of the infringement covers [...] the EEA.

5. APPLICATION OF ARTICLE 101 OF THE TFEU AND ARTICLE 53 OF THE EEA AGREEMENT

50. Having regard to the body of evidence referred to in recital 5, the facts as described in Section 4 (recitals 25 to 49), the parties' clear and unequivocal acknowledgements of the facts and the legal qualification thereof contained in their settlement submissions, and their replies to the Statement of Objections, the legal assessment is set as follows.

5.1. The nature of the infringement

5.1.1. Agreements and concerted practices

Principles

51. Article 101(1) of the Treaty and Article 53(1) of the EEA Agreement prohibit anti-competitive *agreements* between undertakings, *decisions of associations of undertakings* and *concerted practices*.[49]

52. An 'agreement' may be considered to exist when the parties adhere to a common plan which limits or is likely to limit their individual commercial conduct by determining the lines of their mutual action or abstention from action in the market. Although Article 101(1) of the Treaty and Article 53 of the EEA Agreement draw a distinction between the concept of *"concerted practices"* and *"agreements between undertakings"*, the object is to bring within the prohibition of these Articles a form of co-ordination between undertakings by which, without having reached the stage where an agreement properly so-called has been concluded, they knowingly substitute practical co-operation between them for the risks of competition.[50]

53. In the case of a *complex infringement* of long duration, it is not necessary for the Commission to characterise the conduct as exclusively one or other of those forms of illegal behaviour. The concepts of agreement and concerted practice are fluid and may overlap. It would be artificial analytically to sub-divide what is clearly a

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[49] The case-law of the Court of Justice and the General Court in relation to the interpretation of Article 101 of the Treaty applies equally to Article 53 of the EEA Agreement. See recitals 4 and 15 as well as Article 6 of the EEA Agreement and Article 3(2) of the EEA Surveillance and Court Agreement. Accordingly, in this Decision reference is only made to Article 101 of the Treaty on the understanding that the same considerations apply to Article 53 of the EEA Agreement.

[50] See Case 48/69, *Imperial Chemical Industries ltd v Commission* [1972] ECR 619, paragraph 64.

continuing common enterprise having one and the same overall objective into several different forms of infringement.[51]

Application to this case

54. As described above, parties to the infringement entered into a scheme and/or network of contacts and secret information sharing by which they coordinated their conduct on general pricing levels and quotations made to major PC/server OEMs, ultimately amounting to price coordination with the aim of restricting competition vis-à-vis such clients with regard to the sale of DRAMs and, in the case of Toshiba, Samsung and Elpida, also for the sale of Rambus DRAMs. This behaviour amounts at least to a concerted practice.

55. The repeated contacts, often of a bilateral nature but also including some multilateral meetings, over a significant period of time and covering the aspects described above under Section 4 (recitals 25 to 49) bear the hallmark elements of a complex infringement. The contacts consisted in sharing, verifying, monitoring and ultimately coordinating forthcoming or current price quotations to the individual major PC/server OEMs. The participating undertakings relied on the other companies' pricing intentions and/or took into account the information exchanged with competitors in determining their own conduct on the market when negotiating prices with major PC/server OEMs. The information exchanged removed, to some extent, the price uncertainty in the market, enabling the suppliers to make decisions based on more specific and reliable data. Competitors therefore knowingly replaced competition between themselves by cooperation. As a result, the Commission considers that this behaviour covering [...] the EEA qualifies as an agreement and/or concerted practice between undertakings within the meaning of Article 101 of the TFEU and Article 53 of the EEA Agreement.

5.1.2. Single and continuous infringement

Principles

56. A complex cartel may properly be viewed as a *single and continuous infringement* for the time frame in which it existed. The General Court points out, inter alia, in *Cement* that the concept of 'single agreement' or 'single infringement' presupposes a complex of practices adopted by various parties in pursuit of a single anti-competitive economic aim.[52] The agreement may well be varied from time to time, or its mechanisms adapted or strengthened to take account of new developments. It would be artificial to split up such continuous conduct, characterised by a single purpose, by treating it as consisting of several separate infringements, when what was involved was a single infringement which progressively would manifest itself in both agreements and concerted practices.

57. The mere fact that each participant in a cartel may play a role to this extent which is appropriate to its own specific circumstances does not exclude its responsibility for

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[51] See to that effect Case T-7/89 *Hercules Chemicals NV v Commission*, [1991] ECR II-1711, paragraph 264.

[52] Joined Cases T-25/95 and others, *Cement*, ECR [2000] II-491, paragraph 369.

the infringement as a whole, including acts committed by other participants but which share the same unlawful purpose. An undertaking which takes part in the common unlawful enterprise by actions which contribute to the realisation of the shared objective is equally responsible, for the whole period of its adherence to the common scheme, for the acts of the other participants pursuant to the same infringement. This is for example the case where it is established that the undertaking in question was aware of the unlawful behaviour of the other participants or could have reasonably foreseen or been aware of them and was prepared to take the risk[53].

Application to this case

58. In the present case, the Commission considers that the collusion in question constitutes a single and continuous infringement of Article 101 of the TFEU and Article 53 of the EEA Agreement.

59. Although the collusive arrangements related to several types of DRAMs products, they constituted elements of a single and continuous complex infringement with the anti-competitive aim of coordinating pricing behaviours for all types of DRAMs products sold to major PC/server OEMs as described in Section 3.1 (recitals 9 and 10). Also, whilst certain meetings, contacts or exchanges between competitors could be regarded as infringements in themselves, they are relied upon to establish the existence of a single overall infringement. Indeed, although the majority of contacts took place at a bilateral level, these contacts were held with the awareness on both sides that similar contacts also took place with other companies and/or taking the risk that information would be circulated to other companies. These mostly bilateral contacts resulted in practice in a network of contacts between the companies (cf. recital 27). The information exchanged primarily on a bilateral basis removed, to some extent, the price uncertainty in the whole market, enabling suppliers, when negotiating with major PC/server OEMs, to make decisions based on more specific and reliable data. Contacts between some DRAM products' suppliers related to their behaviour for Dynamic Bidding Events (auctions) organised by certain major PC/server OEMs at specific dates mainly in Autumn 2001 and Spring 2002 served only the overall aim of coordinating prices vis-à-vis major PC/server OEMs.

60. As described in recitals 25 *et seq.*, the conduct relating to DRAM products, and the conduct relating to Rambus DRAM products, aimed to ensure stability of prices on each segment of the market between these types of substitutable products.[54] Moreover, numerous overlaps existed between the conduct in respect of DRAM products and the conduct in respect of Rambus DRAM products, notably in the collusive contacts, in the timing of such contacts – although with a later starting date for Rambus DRAMs – and in the undertakings and individuals involved in such contacts. As a result, all the cartel participants should have reasonably been aware of

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[53] See Case C-49/92P *European Commission* v *Anic Partecipazioni* [1999] ECR I-4125 at paragraph 83.

[54] The substitutability between DRAMs and Rambus DRAMs products is demonstrated by the existence of a price relationship between these two products for certain producers of both the DRAM and Rambus DRAM technologies. However, the conduct in relation to DRAM products and the conduct in relation to Rambus DRAM products which are the subject of this Decision did not concern coordination of the relative price between DRAMs products and Rambus DRAMs products with a view to disadvantage or advantage the sale of one product vis-à-vis the other.

the existence of the conduct relating to DRAM products and the conduct relating to Rambus DRAM products.

5.1.3. Restriction of competition

Principles

61. It is settled case-law that, for the purpose of the application of Article 101 of the TFEU, there is no need to take into account the actual effects of an agreement when it has as its object the prevention, restriction or distortion of competition within the internal market. Consequently, it is not necessary to show actual anti-competitive effects where the anti-competitive object of the conduct in question is proved.[55] The same applies to concerted practices.[56]

Application to this case

62. The cartel members coordinated their behaviour to remove uncertainty between themselves in relation to pricing to major PC/server OEMs regarding DRAMs and Rambus DRAMs products where relevant. By engaging in these courses of conduct, the undertakings aimed to eliminate or at least reduce the risk involved in competing freely on the market. Therefore, the object of their behaviour was the restriction of competition within the meaning of Article 101 of the TFEU and Article 53 of the EEA Agreement. As a result, it is not necessary to show anti-competitive effects on the market.

5.1.4. Effect upon trade between Member States and between EEA Contracting Parties

Principles

63. The Court of Justice and General Court have consistently held that: *"In order that an agreement between undertakings may affect trade between Member States, it must be possible to foresee with a sufficient degree of probability on the basis of a set of objective factors of law or fact that it may have an influence, direct or indirect, actual or potential, on the pattern of trade between Member States".*[57] In any event, whilst Article 101 of the Treaty *"does not require that agreements referred to in that provision have actually affected trade between Member States, it does require that it be established that the agreements are capable of having that effect".*[58]

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55 See, for example, Case T-62/98 Volkswagen AG v Commission [2000] ECR II-2707, paragraph 178 and case-law cited therein

56 See Case C-199/92 *P Hüls* v *Commission,* [1999] ECR I-4287, at paragraphs 158-166.

57 See Case 56/65 *Société Technique Minière (L.T.M.) v Maschinenbau Ulm GmbH (M.B.U.).* [1966] ECR 282, recital7; Case 42/84 *Remia and Others v Commission* [1985] ECR 2545, paragraph 22 and Joined Cases T-25/95 and others, *Cimenteries* CBR v Commission [2002] ECR II-491.

58 Joined Cases C-215/96 and C-216/96 *Bagnasco and others [*1999] ECR I-135, paragraph 48; see also Case T-374/94, *European Night Services (ENS), Eurostar (UK) Ltd, formerly European Passenger Services Ltd (EPS), Union internationale des chemins de fer (UIC), NV Nederlandse Spoorwegen (NS) and Société nationale des chemins de fer français (SNCF) v Commission,* [1998] ECR II-3141, paragraph 136.

Application to this case

64. The market for DRAMs and Rambus DRAMs products is characterised by a substantial volume of trade between Member States. There is also trade between the European Union and EFTA countries belonging to the EEA. Furthermore, there is a substantial volume of trade in the market between non-Member States and the European Union which is capable of affecting trade between member states.

65. The cartel arrangements covered [...] the whole EEA area. Pricing coordination with regard to the major PC/server OEMs must have resulted, or was likely to result, in the automatic diversion of trade patterns from the course they would otherwise have followed.

66. It should therefore be concluded that the continuing agreement and/or concerted practice between the producers had an appreciable effect upon trade between EU Member States and between contracting parties of the EEA Agreement.

5.1.5. Non-applicability of Article 101(3) of the TFEU

67. On the basis of the facts before the Commission, there are no indications that suggest that the conditions of Article 101(3) of the TFEU could be fulfilled with regard to the present cartel.

6. ADDRESSEES OF THIS DECISION

68. Having regard to the body of evidence referred to in recital 5, the facts as described in Section 4 (recitals 25 to 49), the parties' clear and unequivocal acknowledgements of the facts and the legal qualification thereof contained in their settlement submissions, as well as their replies to the Statement of Objections, the present Decision should be addressed to the following legal entities and undertakings.

6.1. Micron

69. Micron Technology Inc. is responsible for its own behaviour as well as for the behaviour of its relevant subsidiaries. In the present case, its relevant subsidiaries Micron Europe Limited and Micron Semiconductor (Deutschland) GmbH also engaged in infringing activity. Liability for the single and continuous infringement is thus imputed jointly and severally to Micron Technology, Inc., Micron Europe Limited and Micron Semiconductor (Deutschland) GmbH (collectively "Micron").

6.2. Infineon

70. Infineon Technologies AG (Infineon) is liable for the infringement from 14 November 1998 until 15 June 2002. Infineon itself directly participated in the infringement from the establishment of Infineon on 1 April 1999 until 15 June 2002. Infineon is held liable as the economic successor of [...] , which participated in the infringement from 14 November 1998 until 31 March 1999, when it was absorbed by Infineon group.

6.3. Hynix

71. Hynix Semiconductor Inc. is responsible for its own behaviour as well as for the behaviour of its relevant subsidiaries. In the present case, its relevant subsidiaries Hynix Semiconductor Europe Holding Ltd., Hynix Semiconductor Deutschland GmbH and Hynix Semiconductor United Kingdom, Ltd also engaged in infringing activity. Liability for the single and continuous infringement is thus imputed jointly and severally to Hynix Semiconductor Inc., Hynix Semiconductor Europe Holding Ltd., Hynix Semiconductor Deutschland GmbH and Hynix Semiconductor United Kingdom, Ltd. (collectively "Hynix").

72. Hynix Semiconductor Inc. is also held liable for the conduct of the company LG Semicon Co. Ltd. ("LG Semicon") as from 1 July 1998 until 9 July 1999, when LG Electronics Inc. transferred its interest in LG Semicon to Hyundai Electronics Industries, which in March 2001 became Hynix Semiconductor Inc.

6.4. Samsung

73. Samsung Electronics Co. Ltd. is responsible for its own behaviour as well as for the behaviour of its relevant subsidiaries. Its subsidiaries Samsung Semiconductor Europe GmbH, Samsung Semiconductor Europe Ltd. and Samsung Semiconductor France Sarl also engaged in infringing activity. Liability for the single and continuous infringement is thus imputed jointly and severally to Samsung Electronics Co. Ltd., Samsung Semiconductor Europe GmbH, Samsung Semiconductor Europe Ltd. and Samsung Semiconductor France Sarl (collectively "Samsung") including liability for the conduct in relation to DRAMs and the conduct in relation to Rambus DRAMs.

6.5. NEC

74. NEC Corporation is responsible for its own behaviour as well as for the behaviour of its relevant subsidiaries. Two periods must be distinguished in the attribution of liability to the relevant legal entities within NEC Group, namely before and after the NEC Group transferred its DRAM sales and marketing activities to the 50/50 Elpida joint venture with Hitachi.

75. NEC Corporation (as well as its subsidiaries Renesas Electronics Europe GmbH (formerly NEC Electronics (Europe) GmbH until 1 April 2010) and NEC Electronics (UK) Ltd.), (collectively "NEC") participated directly in the relevant conduct until the end of February 2001 when the joint venture started its market activities (in Japan at least as of 1 February 2001 and outside Japan at least as of 1 March 2001).

76. As from 1 March 2001, NEC Corporation pursued its participation indirectly in the infringement through the Elpida joint venture.

77. Therefore NEC Corporation, Renesas Electronics Europe GmbH (formerly NEC Electronics (Europe) GmbH until 1 April 2010) and NEC Electronics (UK) Ltd. should be held jointly and severally liable for NEC's direct participation in the relevant conduct from 1 July 1998 until the end of February 2001. NEC Corporation should be held jointly and severally liable with Elpida and Hitachi Ltd. for the involvement of Elpida in the relevant conduct from 1 March 2001 until 15 June 2002.

6.6. Hitachi

78. Hitachi Ltd. is responsible for its own behaviour as well as for the behaviour of its relevant subsidiary. Two periods must be distinguished in the attribution of liability to the relevant legal entities within Hitachi Group, namely before and after Hitachi Group transferred its DRAM sales and marketing activities to the 50/50 Elpida joint venture with NEC.

79. Hitachi Ltd. as well as its subsidiary Hitachi Europe Ltd. (collectively 'Hitachi') participated directly in the relevant conduct from 9 November 1998 until the end of February 2001 when the joint venture started its market activities (in Japan at least as of 1 February 2001 and overseas at least as of 1 March 2001).

80. As from 1 March 2001, Hitachi Ltd. pursued its participation indirectly in the infringement through the Elpida Joint Venture.

81. Therefore Hitachi Ltd. and Hitachi Europe Ltd. should be held jointly and severally liable for Hitachi's direct participation in the relevant conduct until the end of February 2001. Hitachi Ltd. should be held jointly and severally liable with Elpida and NEC Corporation for the involvement of Elpida in the relevant conduct from 1 March 2001 until 15 June 2002.

6.7. Mitsubishi

82. Mitsubishi Electric Corp. is responsible for its own behaviour as well as for the behaviour of its relevant subsidiary. [....]. Liability for the single and continuous infringement is thus imputed jointly and severally to Mitsubishi Electric Corp. and Mitsubishi Electric Europe BV (collectively "Mitsubishi").

6.8. Toshiba

83. Toshiba Corp. is responsible for its own behaviour as well as for the behaviour of its relevant subsidiary. [...]. Liability for the single and continuous infringement is thus imputed jointly and severally to Toshiba Corp. and Toshiba Electronics Europe GmbH (collectively "Toshiba"), including liability for the conduct in relation to DRAMs and the conduct in relation to Rambus DRAMs.

6.9. Elpida

84. Elpida Memory Inc. is responsible for its own behaviour as well as for the behaviour of its relevant subsidiary. Elpida Memory Inc., as well as its subsidiary Elpida Memory (Europe) GmbH (collectively "Elpida"), participated in the infringement as from 1 March 2001, when the DRAM sales and marketing activities of Hitachi and NEC were transferred to it. Liability for the single and continuous infringement should be imputed jointly and severally to Elpida Memory, Inc. and Elpida Memory (Europe) GmbH, including liability for the conduct in relation to DRAMs and the conduct in relation to Rambus DRAMs. As mentioned above in recitals 77 and 81, Hitachi Ltd. and NEC Corporation should be held jointly and severally liable with Elpida for the involvement of Elpida in the infringement from 1 March 2001 until 15 June 2002.

6.10. Nanya

85. Nanya Technology Corp. is liable for its own behaviour.

7. DURATION OF THE INFRINGEMENT

86. Having regard to the body of evidence referred to in recital 5 above, the facts as described in Section 4 (recitals 25 to 49), the parties' clear and unequivocal acknowledgements of the facts and the legal qualification thereof contained in their settlement submissions, as well as their replies to the Statement of Objections, the starting and ending dates of the cartel for each participant are set as follows.

87. The starting date of the cartel was 1 July 1998 for NEC, Samsung, Hynix, Micron and Toshiba. Hitachi, Infineon, Mitsubishi, Elpida and Nanya's participation in the infringement started at a later date. Hitachi started on 9 November 1998, Infineon on 14 November 1998, Mitsubishi on 24 November 1998, Elpida on 1st March 2001 and Nanya on 12 October 2001. The starting date with respect to the Rambus DRAMs conduct was 9 April 2001. The infringement in respect of both the conduct relating to DRAMs and the conduct relating to Rambus DRAMs ended, for the majority of suppliers, on 15 June 2002 . The end date for Hitachi's and NEC's direct participation in the cartel is 28 February 2001- while participation continued indirectly through Elpida until 15 June 2002- and Toshiba's participation ended on 22 April 2002 when it exited the DRAMs and Rambus DRAMs market.

8. REMEDIES

8.1. Article 7 of Regulation (EC) No 1/2003

88. Where the Commission finds that there is an infringement of Article 101 of the TFEU and Article 53 of the EEA Agreement, it may by decision require the undertakings concerned to bring such infringement to an end in accordance with Article 7 of Regulation (EC) No 1/2003.

89. Given the secrecy in which the cartel arrangements were carried out, it is not possible to determine with absolute certainty that the infringement has ceased. It is therefore necessary for the Commission to require the undertakings to which this Decision is addressed to bring the infringement to an end (if they have not already done so) and henceforth to refrain from any agreement and/or concerted practice which might have the same or a similar object or effect.

8.2. Article 23(2) of Regulation (EC) No 1/2003

90. Under Article 23(2) of Regulation (EC) No 1/2003, the Commission may by decision impose upon undertakings fines where, either intentionally or negligently, they have infringed Article 101 of the TFEU and/or Article 53 of the EEA Agreement. [59] Under

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[59] Under Article 5 of Council Regulation (EC) No 2894/94 of 28 November 1994 concerning arrangements of implementing the Agreement on the European Economic Area "the Community rules giving effect to the principles set out in Articles 85 and 86 of the EC Treaty [now Articles 101 and 102 TFEU] [...] shall apply *mutatis mutandis*". (OJ L 305, 30.11.1994, p. 6).

Article 15(2) of Regulation No 17, which was applicable during the infringement period, the fine for each undertaking participating in the infringement could not exceed 10% of its total turnover in the preceding business year. The same limitation results from Article 23(2) of Regulation (EC) No 1/2003.

91. Pursuant to Article 23(3) of Regulation (EC) No 1/2003, the Commission must, in fixing the amount of the fine, have regard to all relevant circumstances and particularly the gravity and duration of the infringement, which are the two criteria explicitly referred to in that Regulation. In doing so, the Commission will set the fines at a level sufficient to ensure deterrence. Moreover, the role played by each undertaking party to the infringement will be assessed on an individual basis. In particular, the Commission will reflect in the fines imposed any aggravating or mitigating circumstances pertaining to each undertaking.

92. In setting the fines to be imposed, the Commission will refer 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[60] (hereafter, "*the Guidelines on fines*"). Finally, the Commission will apply, as appropriate, the provisions of its Notice on immunity from fines and reduction of fines in cartel cases[61] (hereafter, "*the 2002 Leniency Notice*") and its Notice on the conduct of settlement procedures in view of the adoption of Decisions pursuant to Article 7 and Article 23 of Council Regulation (EC) No 1/2003 in cartel cases[62] (hereafter, "*the Settlement Notice*").

8.3. The basic amount of the fine

93. In applying the Guidelines on fines, the basic amounts for each party result from the addition of a variable amount and an additional amount. The variable amount results from a percentage between 0% to 30% of the value of sales and is multiplied by the number of years of the undertakings' participation in the infringement. The additional amount is calculated as a percentage between 15% and 25% of the value of sales of goods or services to which the infringement relates in a given year (normally the last year of the infringement).

8.3.1. Calculation of the value of sales

94. The basic amount of the fine to be imposed on the undertakings concerned is to be set by reference to the value of sales[63], that is, the value of the undertakings' sales of goods or services to which the infringement directly or indirectly related in the relevant geographic area within the EEA. The relevant sales are the undertakings' sales of DRAMs (including Rambus DRAMs where applicable) to major PC/server OEMs within the EEA. Therefore, for the calculation of the fine to be imposed on Hynix, Infineon, Micron, Mitsubishi, and Nanya account will be taken only of the value of sales of DRAMs products to the exclusion of sales of Rambus DRAMs products if any.

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60 OJ C 210, 1.9.2006, p. 2.
61 OJ C 45, 19.02.2002, p.3.
62 OJ C 167, 2.7.2008, p. 1.
63 Point 12 of the Guidelines on fines.

95. The value of sales is based on sales made by the undertaking during the last full business year of its participation in the infringement. In the present case, the 2001 business year is used for the majority of undertakings to calculate the basic amount.[64] The 2001 turnover of Elpida divided between Hitachi and NEC (according to the ratio of their relevant sales to major PC/server OEMs in the EEA in the last business year before the joint venture period) is used as the starting basis for calculating the fine for NEC and Hitachi for the pre-joint venture period. Since Nanya did not participate in the infringement for a full business year, its actual sales during the infringement period are used. The value of sales for every undertaking involved is presented in Table 1:

Table 1

Entity	Value of sales
Micron	[325 000 000- 375 000 000]
Infineon	[150 000 000- 200 000 000]
Hynix	[75 000 000- 125 000 000]
Samsung	[a] [300 000 000 – 350 000 000]
Elpida	[b] [50 000 000 – 100 000 000]
NEC (pre-joint venture)	[20 000 000 – 40 000 000]
Hitachi (pre-joint venture)	[25 000 000 – 50 000 000]
Toshiba	[c] [25 000 000- 50 000 000]
Mitsubishi	[20 000 000 – 40 000 000]
Nanya	[5 000 000- 10 000 000]

[a] [200 000 000- 250 000 000] DRAMs and [75 000 000 – 125 000 000] Rambus DRAMs

[b] [25 000 000 – 50 000 000] DRAMs and [15 000 000 – 25 000 000] Rambus DRAMs

[c] [15 000 000- 25 000 000] DRAMs and [10 000 000- 20 000 000] Rambus DRAMs

8.3.2. Determination of the basic amount of the fine

96. The variable amount consists of an amount between 0% and 30% of a company's relevant sales, depending on the degree of gravity of the infringement and multiplied

[64] It has to be borne in mind that the 2001 business year covers sometimes a different period over the year depending on the cartel member at stake (e.g. from September 2000 to August 2001 or from January 2001 to December 2001).

by the number of years of the company's participation in the infringement.[65] For cartels the percentage is set at the higher end of the scale.

8.3.2.1. Gravity

97. In order to determine the specific percentage of the basic amount of the fine, the Commission may have regard to a number of factors, such as the nature of the infringement, the combined market share of all the undertakings concerned, the geographic scope of the infringement and whether or not the infringement has been implemented.[66] The elements relevant in this case are assessed in recitals 98 to 101.

(a) Nature

98. The addressees of this Decision participated in a single, complex and continuous infringement of Article 101 of the TFEU and Article 53 of the EEA Agreement with the common objective of coordinating pricing for DRAMs (all addressees) and Rambus DRAMs (some addressees) sold to major PC/server OEMs.

99. Such a price coordination cartel is by its very nature a very serious violation of Article 101 of the TFEU and Article 53 of the EEA Agreement.

(b) Geographic scope

100. The geographic scope of the infringement covers [...] the EEA.

(c) Conclusion on gravity

101. Given the specific circumstances of this case, taking into account the above criteria relating to the nature of the infringement and the geographic scope of the infringement, the proportion of the value of sales to be taken into account should be 16%.

8.3.2.2. Duration

102. According to point 24 of the Guidelines on fines, the amount determined on the basis of the value of sales made by the undertaking during the last full business year of its participation in the infringement (value of sales) is multiplied by the number of years of participation in the infringement in order to take fully into account the duration of the participation for each undertaking in the infringement individually[67].

103. For the application of point 24 of the Guidelines on fines, the starting and ending dates for the participation in the infringement by each addressee are as follows:

a) Micron: from 1 July 1998 to 15 June 2002

b) Infineon: from 14 November 1998 to 15 June 2002

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[65] See Points 19 – 24 of the Guidelines on fines.
[66] Points 21-22 of the Guidelines on fines.
[67] Point 24 of the Guidelines on fines.

c) Hynix: from 1 July 1998 to 15 June 2002

d) Samsung: from 1 July 1998 to 15 June 2002 for DRAMs and from 9 April 2001 to 15 June 2002 for Rambus DRAMs

e) NEC: from 1 July 1998 to 28 February 2001 and indirectly[68] through Elpida as from 1 March 2001 to 15 June 2002

f) Hitachi: from 9 November 1998 to 28 February 2001 and indirectly[69] through Elpida as from 1 March 2001 to 15 June 2002

g) Mitsubishi: from 24 November 1998 to 15 June 2002

h) Toshiba: from 1 July 1998 to 22 April 2002 for DRAMs and from 9 April 2001 to 22 April 2002 for Rambus DRAMs

i) Elpida: from 1 March 2001 to 15 June 2002 for DRAMs and from 9 April 2001 to 15 June 2002 for Rambus DRAMs

j) Nanya: from 12 October 2001 to 15 June 2002

104. In this case, account will be taken of the actual duration of participation in the infringement of the undertakings concerned, rounding down to the month. In the circumstances of the present case, it is considered appropriate to apply a proportional increase of the multiplier on a monthly and pro rata basis. For example, the duration of 2 years, 3 months and 2 weeks will not lead to an increase of 250% (point 24 of the Guidelines on fines) but to an increase of 225% (rounding down to the month, 2 years corresponding to 200% and three months to a quarter of a year, i.e. 25%, amounting altogether to 225%).The period of two weeks is not counted. This leads to the following multipliers for duration:

[68] NEC Corporation is held jointly and severally liable with Elpida and Hitachi Ltd. for the involvement of Elpida in the relevant conduct from 1 March 2001 until 15 June 2002

[69] Hitachi Ltd. is held jointly and severally liable with Elpida and NEC Corporation for the involvement of Elpida in the relevant conduct from 1 March 2001 until 15 June 2002

Table 2

Entity	Actual Duration (years, months)	Multiplier
Micron	3 y 11 m	3.92
Infineon	3y 7 m	3.58
Hynix	3 y 11 m	3.92
Samsung DRAMs	3 y 11 m	3.92
Samsung Rambus	1 y 2 m	1.17
Elpida DRAMs*	1 y 3m	1.25
Elpida Rambus*	1 y 2 m	1.17
NEC (pre-joint venture)	2 y 8 m	2.67
Hitachi (pre-joint venture)	2 y 3 m	2.25
Toshiba DRAMs	3 y 9 m	3.75
Toshiba Rambus	1 y	1
Mitsubishi	3y 6m	3.5
Nanya	8 m	0.67

* Elpida's duration covers NEC Corporation's and Hitachi Ltd.'s indirect participation in the infringement

8.3.3. Determination of the additional amount

105. Point 25 of the Guidelines on fines provides that, irrespective of the duration of the undertaking's participation in the infringement, the Commission will include in the basic amount a sum of between 15% and 25% of the value of sales (as defined in recital 95) in order to deter undertakings from even entering into horizontal price-fixing collusion.

106. Given the specific circumstances of this case, taking into account the criteria discussed above relating to the nature of the infringement and the geographic scope of the infringement, the percentage to be applied for the purposes of calculating the additional amount to be imposed pursuant to point 25 of the Guidelines on fines should be 16%. NEC and Hitachi participated directly in the infringement until end of February 2001 and NEC Corporation and Hitachi Ltd. participated indirectly through Elpida until 15 June 2002. Consequently, separate additional amounts are imposed on NEC and Hitachi, while no additional amount is imposed on Elpida.

8.3.4. Calculation and conclusions on basic amounts

107. Based on the criteria explained above, the basic amount of the fine for each undertaking is presented in Table 3:

Table 3

Entity	Basic Amount
Micron	[250 000 000- 300 000 000]
Infineon	[100 000 000- 150 000 000]
Hynix	[75 000 000- 125 000 000]
Samsung	[d] [200 000 000- 250 000 000]
Elpida	[e] [5 000 000- 15 000 000]
NEC (pre-joint venture)	[10 000 000 – 20 000 000] -
Hitachi (pre-joint venture)	[10 000 000 – 20 000 000]
Toshiba	[f] [10 000 000 – 20 000 000]
Mitsubishi	[10 000 000 – 20 000 000]
Nanya	[0 – 5 000 000]

[d] [150 000 000 – 200 000 000] DRAMs and [25 000 000- 50 000 000] Rambus DRAMs

[e] [5 000 000 – 15 000 000] DRAMs and [0 – 5 000 000] Rambus DRAMs

[f] [10 000 000- 20 000 000] DRAMs and [2 500 000- 7 500 000] Rambus DRAMs

8.4. Adjustments to the basic amount of the fine

8.4.1. Aggravating circumstances

108. There are no aggravating circumstances in this case.

8.4.2. Mitigating circumstances

(a) Hynix

109. As described in section 4.2.3 (recitals 35 and 36), Hynix actually avoided, during part of the period in which it was party to the offending agreement and/or concerted practice (namely during 2001), applying it, at least partially, by adopting competitive conduct in the market. This is reflected inter alia by the fact that the Commission imposed countervailing duties in the EU with regard to Hynix's DRAM prices for the period in question. Hynix went beyond a mere opportunistic behaviour and showed during 2001 a competitive conduct. In accordance with point 29, third indent of the Guidelines on fines, the fine to be imposed on Hynix is reduced by 5%.

(b) Toshiba and Mitsubishi

110. As indicated above in recitals 42 and 48, the involvement of both Toshiba and Mitsubishi was much lower than that of other suppliers. Their contacts were of a lesser frequency compared to the overall network of contacts. As a result of their more sporadic contacts, they contributed to maintaining the cartel to a lesser extent, without exerting an intense role throughout the duration of the whole cartel. Toshiba and Mitsubishi were not involved in all aspects of the infringement. In light of the above circumstances, the fine to be imposed on these two companies is reduced by 10%.

8.4.3. Specific increase for deterrence

111. Particular attention should be paid to the need to ensure that fines have a sufficiently deterrent effect; to that end, the fine to be imposed on undertakings which have a particularly large turnover beyond the sales of goods or services to which the infringement relates may be increased.[70]

112. In this case, the amount of the fine is set at a level which ensures sufficient deterrence and it is appropriate to apply a multiplier factor to the fines imposed, based on the size of the undertakings concerned. On that basis, the fine for Hitachi (worldwide turnover ca. 69 754 million EUR) is multiplied by 1.2 while the fine for Samsung (worldwide turnover ca. EUR 45 420 million) and Toshiba (worldwide turnover ca. EUR 47 300 million EUR) is multiplied by 1.1.

8.5. Application of the 10% turnover limit

113. Article 23(2) of Regulation No 1/2003 provides that the fine imposed on each undertaking shall not exceed 10% of its total turnover in the preceding business

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[70] Point 30 of the 2006 Guidelines on Fines.

year. In this particular case, the adjusted basic amounts do not exceed 10% of the total turnover of any of the undertakings concerned. Therefore, it is not required to adjust the amounts in the light of the undertakings' turnover.

8.6. Application of the 2002 Leniency Notice[71]

8.6.1. Immunity from fines

114. Micron submitted an immunity application on 29 August 2002. Micron was the first undertaking to inform the Commission about the secret cartel concerning DRAMs. Micron was granted conditional immunity from fines on 16 December 2002. The cooperation of Micron fulfilled the requirements under the Leniency Notice. Micron is therefore granted immunity from fines in this case.

8.6.2. Reduction of fines

115. Given the particularity of the case, in the absence of any overarching cartel agreement, every single submission has provided important additional elements for proving contacts among suppliers and, ultimately, an overall scheme of contacts by means of which the participants of the cartel operated. It is only thanks to each and every submission from the leniency applicants that the Commission is able to demonstrate the existence of the general scheme/pattern of mostly bilateral contacts comparable to an overall multilateral concerted practice/agreement. Also, explanations submitted by all leniency applicants on those documents (mostly relating to bilateral phone conversations) were crucial for the Commission to establish the overall cartel picture. However, the timing of the cooperation (for all companies which applied for leniency) is also an important factor which needs to be taken into account under point 23 of the Leniency Notice to determine the amount of the reduction. Considering the delay in cooperation after the request for information pursuant to Article 18 of Regulation (EC) No 1/2003, and notwithstanding the quality of the applications, the maximum amount of the respective leniency bands can therefore not be granted and a 10% deduction from the maximum percentage within each band for all applicants is applied (e.g. 45% reduction instead of 50% for the first leniency applicant, 27% reduction instead of 30% for the second leniency applicant, etc.).

116. Since at the time of Elpida's leniency application, Elpida, Hitachi and NEC did not form part of the same undertaking, the latter two companies cannot benefit from Elpida's leniency reduction. Therefore, NEC Corporation and Hitachi Ltd. are held jointly and severally liable for the amount of fine corresponding to the reduction of fine granted to Elpida.

117. In light of the above, Infineon is granted 45% reduction of fine, Hynix is granted 27% reduction of fine and Samsung, Elpida and NEC are granted 18% reduction of fine.

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[71] Commission notice on immunity from fines and reduction of fines in cartel cases Official Journal C 45, 19.02.2002, p.3.

118. In addition, Samsung was the first undertaking to provide the Commission with evidence concerning the price coordination between Samsung, Elpida and Toshiba with regard to Rambus DRAMs. The information provided by Samsung related to facts previously unknown to the Commission and had a direct bearing on the gravity of the cartel as it allowed the Commission to extend the DRAMs cartel to another product, namely Rambus DRAMs. Therefore, as foreseen in point 23 (last paragraph) of the 2002 Leniency Notice, the Commission does not take into account Samsung's Rambus DRAMs sales when setting the fine to be imposed on Samsung. Samsung is therefore granted a 'de facto' immunity in relation to Rambus DRAMs, on top of the reduction within its leniency band.

8.7. Application of the Settlement Notice[72]

119. As foreseen in point 32 of the Settlement Notice, the reward for settlement results in reducing by 10 % the amount of the fine to be imposed after the 10 % cap has been applied having regard to the Guidelines on fines. When settled cases involve also leniency applicants, the reduction of the fine granted to them for settlement will be added to their leniency reward pursuant to point 33 of the Settlement Notice.

120. As a result of the application of the Settlement Notice, the amount of the fine to be imposed on Micron, Infineon, Hynix, Samsung, Elpida, NEC, Hitachi, Toshiba, Mitsubishi and Nanya is reduced by 10%.

8.8. Conclusion: final amount of individual fines to be imposed in this Decision

121. The fines to be imposed pursuant to Article 23(2) of Regulation (EC) No 1/2003 should therefore be as set out in Table 4:

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[72] Commission Notice on the conduct of settlement procedures in view of the adoption of Decisions pursuant to Article 7 and Article 23 of Council Regulation (EC) No 1/2003 in cartel cases, Official Journal C 167, 2.7.2008, p. 1–6

Table 4

Entity	Fines
Micron	0
Infineon	56 700 000
Hynix	51 471 000
Samsung	145 728 000
Elpida jointly and severally liable with NEC Corporation/Hitachi Ltd.	8 496 000
NEC Corporation and Hitachi Ltd. (for the joint venture period)* - NEC Corporation/ Hitachi Ltd. jointly and severally liable with Elpida - NEC Corporation/ Hitachi Ltd. jointly and severally liable for Elpida's reduction	10 620 000 8 496 000 + 2 124 000
NEC (pre-joint venture)	10 296 000
Hitachi (pre-joint venture)	20 412 000
Toshiba	17 641 800
Mitsubishi	16 605 000
Nanya	1 800 000

* Elpida, NEC Corporation and Hitachi Ltd. are jointly and severally liable for 8 496 000, while NEC Corporation and Hitachi Ltd. are liable for the part of Elpida's reduction (2 124 000).

9. CONCLUSION

HAS ADOPTED THIS DECISION:

Article 1

The following undertakings infringed Article 101 of the TFEU and Article 53 of the EEA Agreement by participating, during the periods indicated below, in anti-competitive courses of conduct amounting to price coordination in respect of major PC/server OEMs respectively for DRAM and Rambus DRAM products:

(a) Micron Technology, Inc. from 1 July 1998 until 15 June 2002;

(b) Micron Europe Limited from 1 July 1998 until 15 June 2002;

(c) Micron Semiconductor (Deutschland) GmbH from 1 July 1998 until 15 June 2002;

(d) Infineon Technologies AG from 14 November 1998 until 15 June 2002;

(e) Hynix Semiconductor Inc. from 1 July 1998 until 15 June 2002;

(f) Hynix Semiconductor Europe Holding Ltd. from 1 July 1998 until 15 June 2002;

(g) Hynix Semiconductor Deutschland GmbH from 1 July 1998 until 15 June 2002;

(h) Hynix Semiconductor United Kingdom, Ltd. from 1 July 1998 until 15 June 2002;

(i) Samsung Electronics Co. Ltd. from 1 July 1998 until 15 June 2002 for DRAMs (and from 9 April 2001 until 15 June 2002 for Rambus DRAMs);

(j) Samsung Semiconductor Europe GmbH from 1 July 1998 until 15 June 2002 for DRAMs (and from 9 April 2001 until 15 June 2002 for Rambus DRAMs);

(k) Samsung Semiconductor Europe Ltd. from 1 July 1998 until 15 June 2002 for DRAMs (and from 9 April 2001 until 15 June 2002 for Rambus DRAMs);

(l) Samsung Semiconductor France Sarl from 1 July 1998 until 15 June 2002 for DRAMs (and from 9 April 2001 until 15 June 2002 for Rambus DRAMs);

(m) NEC Corporation from 1 July 1998 until 28 February 2001 and indirectly through Elpida as from 1 March 2001 until 15 June 2002;

(n) Renesas Electronics Europe GmbH (formerly NEC Electronics (Europe) GmbH until 1 April 2010) from 1 July 1998 until 28 February 2001;

(o) NEC Electronics (UK) Ltd. from 1 July 1998 until 28 February 2001;

(p) Hitachi Ltd. from 9 November 1998 until 28 February 2001 and indirectly through Elpida as from 1 March 2001 until 15 June 2002;

(q) Hitachi Europe Ltd. from 9 November 1998 until 28 February 2001;

(r) Mitsubishi Electric Corp. from 24 November 1998 until 15 June 2002;

(s) Mitsubishi Electric Europe BV from 24 November 1998 until 15 June 2002;

(t) Toshiba Corp. from 1 July 1998 until 22 April 2002 for DRAMs (and from 9 April 2001 until 22 April 2002 for Rambus DRAMs);

(u) Toshiba Electronics Europe GmbH from 1 July 1998 until 22 April 2002 for DRAMs (and from 9 April 2001 until 22 April 2002 for Rambus DRAMs);

(v) Elpida Memory Inc. from 1 March 2001 until 15 June 2002 for DRAMs (and from 9 April 2001 until 15 June 2002 for Rambus DRAMs);

(w) Elpida Memory (Europe) GmbH from 1 March 2001 until 15 June 2002 for DRAMs (and from 9 April 2001 until 15 June 2002 for Rambus DRAMs);

(x) Nanya Technology Corp. from 12 October 2001 until 15 June 2002.

Article 2

For the infringement referred to in Article 1, the following fines are imposed:

(a) Jointly and severally on Micron Technology Inc., Micron Europe Limited and Micron Semiconductor (Deutschland) GmbH: 0 EUR;

(b) On Infineon Technology AG: 56 700 000 EUR;

(c) Jointly and severally on Hynix Semiconductor Inc., Hynix Semiconductor Europe Holding Ltd., Hynix Semiconductor Deutschland GmbH and Hynix Semiconductor United Kingdom, Ltd: 51 471 000 EUR;

(d) Jointly and severally on Samsung Electronics Co. Ltd., Samsung Semiconductor Europe GmbH, Samsung Semiconductor Europe Ltd. and Samsung Semiconductor France Sarl: 145 728 000 EUR;

(e) Jointly and severally on NEC Corporation, Renesas Electronics Europe GmbH (formerly NEC Electronics (Europe) GmbH until 1 April 2010) and NEC Electronics (UK) Ltd.: 10 296 000 EUR;

(f) Jointly and severally on Hitachi Ltd. and Hitachi Europe Ltd: 20 412 000 EUR;

(g) Jointly and severally on Mitsubishi Electric Corp. and Mitsubishi Electric Europe BV: 16 605 000 EUR;

(h) Jointly and severally on Toshiba Corp. and Toshiba Electronics Europe GmbH: 17 641 800 EUR;

(i) Jointly and severally on Elpida Memory, Inc. and Elpida Memory (Europe) GmbH, NEC Corporation and Hitachi Ltd : 8 496 000 EUR;

(j) On Nanya Technology Corp.: 1 800 000 EUR;

(k) Jointly and severally on NEC Corporation and Hitachi Ltd.: 2 124 000 EUR.

The fines shall be paid in EURO to the following 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/38511

Fines shall be paid within three months of the date of notification of this Decision, except as provided for in Article 3.

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.

Article 3

1. The fine imposed on the undertakings as listed in Article 2 (c) may be paid in instalments provided that 1/5 of the fine amount is paid within three months of the date of notification of this Decision. The remaining amount, including interest calculated for the whole payment period in accordance with paragraph 3 of this Article, shall be paid in four equal annual instalments, on the anniversary of the first payment.

2. The fine imposed on the undertakings as listed in Article 2 (d) may be paid in instalments provided that 1/3 of the fine amount is paid within three months of the date of notification of this Decision. The remaining amount, including interest calculated for the whole payment period in accordance with paragraph 3 of this Article, shall be paid in two equal annual instalments, on the anniversary of the first payment.

3. Outstanding amounts of the fines imposed on the undertakings referred to in paragraphs 1 and 2 shall bear interest. The interest shall be calculated 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 1.5 percentage points.

4. The outstanding amounts, interest included, shall be covered by bank guarantee, issued by a bank with an AA-rating and situated within the European Union.

   The undertakings listed in Article 2 (c) and (d) may, at any time, replace the bank guarantee, in whole or in part, by a payment for some or all of the amount outstanding.

Article 4

The undertakings listed in Article 1 shall immediately bring to an end the infringement referred to in Article 1 insofar as they have not already done so.

They shall refrain from repeating any act or conduct described in Article 1, and from any act or conduct having the same or similar object or effect.

Article 5

This Decision is addressed to:

a) Micron Technology Inc., 8000 S. Federal Way, P.O.Box 6, Boise, ID 83707-0006, USA

b) Micron Europe Limited, Century Court, Millennium Way, Bracknell, Berkshire RG12 2XJ, United Kingdom

c) Micron Semiconductor (Deutschland) GmbH, Carl-Zeiss-Ring 21, 85737 Ismaning, Germany

d) Samsung Electronics Co. Ltd., 416, Maetan-3 dong, Paldal-Gu, Suwon City, Kyungki-Do, Korea 442-742

e) Samsung Semiconductor Europe GmbH, Kölner Straβe 12, 65760 Eschborn, Germany

f) Samsung Semiconductor Europe Ltd., No 5, The Heights Brooklands Weybridge, Surrey KT13 0NY, United Kingdom

g) Samsung Semiconductor France Sarl, C.A. La Boursidière, RN 186, Bat. Jura, BP202, 92357 Le Plessis Robinson, France

h) Hynix Semiconductor Inc., Hynix Yound-dong Bldg, 891 Daechi-Dong Kangnam-Gu, Seoul 135-738, Korea

i) Hynix Semiconductor Europe Holding Ltd., 241 Brooklands Road, Weybridge, Surrey KT13 0RH, United Kingdom

j) Hynix Semiconductor Deutschland GmbH, Am Prime Parc 13 Kelsterbacher Straße 16, 65479 Raunheim, Germany

k) Hynix Semiconductor United Kingdom Ltd., 241 Brooklands Road, Weybridge, Surrey KT13 0RH, United Kingdom

l) Infineon Technologies AG, Am Campeon 1-12, D-85579 Neubiberg, Germany

m) NEC Corporation, 7-1, Shiba 5-chome, Minato-ku, Tokyo 108-8001, Japan

n) Renesas Electronics Europe GmbH (formerly NEC Electronics (Europe) GmbH until 1 April 2010), Arcadia Straße 10, 40472 Düsseldorf, Germany

o) NEC Electronics (UK) Ltd., Cygnus House Linford Wood Business Centre Sunrise Parkway, Linford Wood, Milton Keynes MK14 6NP, United Kingdom

p) Hitachi Ltd., 6-6, Marunouchi 1-chome, Chiyoda-ku, Tokyo, 100-8280 Japan

q) Hitachi Europe Ltd., Whitebrook Park, Lower Cookham Road Maidenhead, Berkshire SL6 8YA, United Kingdom

r) Toshiba Corp., 1-1, Shibaura 1-Chome, Minato-ku, Tokyo 105-8001, Japan

s) Toshiba Electronics Europe GmbH, Hansaallee 181, 40549 Düsseldorf, Germany

t) Mitsubishi Electric Corp., 7-3 Marunouchi 2-chome Chiyoda-ku, Tokyo 100-8310, Japan

u) Mitsubishi Electric Europe BV, Harman House, 1 George Street Uxbridge, Middlesex UB8 1QQ, United Kingdom

v) Elpida Memory Inc., 2-1, Yaesu 2 - chome, Chuo-ku, 104-0028 Tokyo, Japan

w) Elpida Memory (Europe) GmbH, Grafenberger Allee 99, 40237 Düsseldorf, Germany

x) Nanya Technology Corp., Hwa Ya Technology Park 669 Fuhsing 3 Rd, Kueishan Taoyuan 33383, Taiwan R.O.C

This Decision shall be enforceable pursuant to Article 299 of the TFEU and Article 110 of the EEA Agreement.

Done at Brussels, [SG fills in the date]

For the Commission

[COMMISSIONER]

Member of the Commission