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File No.: T 0933/91 - 3.5.1
Application No.: 83 105 182.6
Publication No.: 0 095 721
Classification: G06F 11/20
Title of invention: Semiconductor memory device

D E C I S I O N
of 21 June 1993

Applicant: KABUSHIKI KAISHA TOSHIBA

Proprietor of the patent:

Opponent:

Headword:

EPC: Art. 111(1)

Keyword: "Remittal to the first instance"

Headnote
Catchwords



Case Number: T 0933/91 - 3.5.1

D E C I S I O N
of the Technical Board of Appeal 3.5.1
of 21 June 1993

Appellant: KABUSHIKI KAISHA TOSHIBA
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Representative: Lehn, Werner, Dipl.-Ing.
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Decision under appeal: Decision of the Examining Division of the European
Patent Office dated 12 July 1991 refusing European
patent application No. 83 105 182.6 pursuant to
Article 97(1) EPC.

Composition of the Board:

Chairman: P.K.J. van den Berg
Members: A.S. Clelland
W.M. Schar

Summary of Facts and Submissions

- I. European patent application No. 83 105 182.6, published on 7 December 1983 and claiming the priority of a Japanese application filed on 28 May 1982, was refused by decision of the Examining Division dated 12 July 1991.

- II. The reason for the refusal was that the subject-matter of each of the claims lacked an inventive step having regard to the following documents:

D1: US-A-3 758 761
D2: GB-A-2 067 836 and
D3: WO-A1-80/01732.

- III. On 10 September 1991 an appeal was lodged against this decision and the prescribed fee was paid. On 19 November 1991 a Statement setting out the Grounds of Appeal was filed, together with two sets of revised claims constituting the claims of a main request and an auxiliary request. Cancellation of the decision and grant of a patent on the basis of the claims of the main request or, failing that, the claims of the auxiliary request, was requested. In the event that the Board was not in a position to allow the appeal oral proceedings were requested.

- IV. In a communication dated 31 March 1993 the Rapporteur expressed the preliminary view that the subject-matter of each of the claims of both the main and auxiliary requests lacked novelty and/or inventive step having regard to each of the above-mentioned documents. The Rapporteur also considered that Claims 2 and 3 of both requests were inadmissible because they contained an

appreciation of the invention not derivable from the originally filed application so that subject-matter had been added, Article 123(2) EPC, that Claim 1 of the auxiliary request was not wholly clear and supported by the description, and that the application did not contain any manner of detecting a leakage current, a feature of the auxiliary request.

- V. Oral proceedings were appointed for 21 June 1993. On 27 May 1993 the Appellant maintained the main request and filed revised claims to replace those of the auxiliary request. A revised sheet of the drawings, sheet 6, was also filed, in which the use of means to detect leakage current was illustrated. Supporting arguments were also put forward.
- VI. The oral proceedings were held on 21 June 1993. At the commencement of the oral proceedings the Appellant withdrew his main request and filed a new main request, based on claims generally similar to the claims of the auxiliary request but drawn in somewhat different terms: it was stated on behalf of the Appellant that the claims of the auxiliary request inadvertently failed to embrace the embodiment of Figure 13, only the embodiments of Figures 12 and 14 being covered. The claims of the new main request now embraced the embodiments of each of Figures 12 to 14. It was argued that these revised claims met the requirements of the EPC. In particular, it was argued that the revised auxiliary request now met the requirement of Article 84 EPC as regards clarity and that the revised Figure 12 showed the clearly intended purpose of the ammeter, namely to measure leakage current flowing through the power source and the integrated circuit. It was also argued that the provision of switch controlling means 131 for the switch

121 enabled error bit cell detection as individual rows could be addressed in turn. The presence of the means 131 was used to measure leakage current by the incorporation of the ammeter in series with the supply line. In the embodiments of Figures 12 and 14 the circuit 131 caused the switch 121 to turn on when the corresponding row line was addressed, so that leakage in any cell of a particular row could be detected by the ammeter. In the Figure 13 embodiment a decrease in current caused by turning off a row line containing a faulty cell was measured. None of the cited documents disclosed the measurement of leakage current. These documents were concerned with the isolation of unused auxiliary memory and did not suggest the isolation of a defective portion of main memory in order to conserve power consumption.

VII. The Appellant's requests as made at the oral proceedings are as follows:

Main request:

Claims: 1 to 9 as filed at the oral proceedings;

Description: pages 3 to 8, 10, 12 to 29 as originally filed;
pages 1, 2, 9a and 11 as filed on 29 June 1988;
page 9 as filed on 22 January 1990;

Drawings: sheets 1 to 5 and 7 as originally filed;
sheet 6 as filed on 27 May 1993.

Auxiliary request:

Claims: 1 to 8 as filed on 27 May 1993;

Description

and Drawings: as for main request.

The Board notes that the minutes of the oral proceedings contain an error in the date mentioned for the auxiliary request. The correct date is: 27 May 1993, as indicated herein before

VIII. Claim 1 of the main request reads as follows:

"A semiconductor memory device comprising:
memory means of a plurality of memory cells (22₁₁, 22₁₂, ... 28₁₁, 28₁₂, ...), and having a main memory (21) and an auxiliary memory (27) for use in place of a part of said main memory;

a plurality of row lines (R_{M1}, R_{M2}, ... R_{A1}, R_{A2}, ...) connected to said memory cells, for specifying said memory cells; and

a plurality of column lines (C1, C2, ...) connected to said memory cells, for specifying said memory cells, and through which data is read out;

characterized by

fuse means (FD_{M1}, FD_{M2}, ... FD_{A1}, FD_{A2}, ...) for disconnecting, when blown, a portion of said memory cells of said memory means from a power source terminal (V₀); and

means (121, 131) for detecting whether said portion of said memory cells includes a defective memory cell, the detecting means (121, 131) including switch means (121) inserted between said power source terminal and said memory cells portion, an ammeter (161) connected in series with said switch means and said power source

terminal (V_p), means (131) for controlling the switch means in accordance with an address signal to permit an electric current to flow from the power source terminal (V_p) into said memory cell portion through the ammeter (161) and said switch means (121), and means for blowing said fuse means corresponding to said memory cell portion in response to a change in operating state of the switch means, if said ammeter (161) shows a value of electric current indicative of said memory cell portion including a defective memory cell."

IX. Claim 1 of the auxiliary request differs from that of the main request only in the characterising part, which reads as follows:

"fuse means (FD_{M1} , FD_{M2} , ... FD_{A1} , FD_{A2} , ...) for disconnecting, when blown, a portion of said memory cells of said memory means from a power source terminal (V_p); and

means (121, 131) for detecting said portion of said memory cells, the detecting means (121, 131) including switch means (121) inserted between said power source terminal and said memory cells, an ammeter (161) inserted in series between an external power source and said power source terminal (V_p), means (131) for controlling the switch means in accordance with an address signal to permit an electric current to flow from the power source into said memory cells through the ammeter (161) and said switch means (121), and means for blowing said fuse means corresponding to said memory cell portion if an electric current flows through said memory cell portion and said ammeter (161) shows a value of electric current above a predetermined value."

Reasons for the Decision

1. The appeal is admissible.
2. The admissibility to the appeal proceedings of the claims of the main and of the auxiliary request, according to item VII will be addressed first.
3. The original main request had been maintained unamended since the filing of the Statement of Grounds of Appeal but was replaced at the commencement of the oral proceedings by a request generally similar to the auxiliary request but in terms sufficiently broad to embrace the Figure 13 embodiment.

According to the established case law of the Board of Appeal the appeal procedure is not an extension of examination but is intended to consider the correctness of the appealed decision having regard to the requests and grounds as filed in the notice of appeal and Statement of Grounds. The admission to appeal proceedings of amended claims is at the discretion of the Board concerned. The present Board has noted that in the case under consideration here the new main request can be considered as intermediate in scope between the preceding main request and the present auxiliary request, and that it remedies - from the Appellant's point of view - the deficiency in the present auxiliary request, which does not embrace the Figure 13 embodiment. The claims according to the new main request were filed for the first time at the oral proceedings before the Board. Although in such a situation the Board would be entitled to exercise its discretion and refuse to admit the amended claims to the proceedings, for the reasons given below the case will

be remitted to the first instance; the Board therefore considers it expedient to leave the further examination of these claims, and a formal decision on their admissibility, to the first instance.

4. Claim 1 of the auxiliary request was amended in response to an objection of lack of clarity put by the Board in a preliminary communication. There is no objection to its admission into the appeal proceedings.

5. The independent claim of the present main request is as noted above directed to the embodiments shown in Figures 12 to 14 of the drawings and apparently does not embrace the embodiments of Figures 5 to 11. Furthermore, the claim relies on a feature which is only shown clearly for the first time in amended sheet 6 of the drawings, filed in response to a communication from the Board. In Figure 12 of amended sheet 6 an "ammeter" 161 is shown in a series circuit including a voltage source V_s , said to be a ground reference, an unreferenced battery and a fuse FD_{M1} , the supply voltage V_a being shown as being developed at the fuse. In the originally filed Figure 12 the "ammeter" was shown as short-circuiting the power line, which the skilled person would immediately see as erroneous. This issue was not raised in the proceedings before the Examining Division and arises in consequence of the Appellant's reliance on claims directed to those embodiments which make use of the "ammeter".

6. Furthermore, in a discussion of inventive step in the course of the oral proceedings the Appellant argued that the "control circuit" 131 and transistor 121 shown in the embodiment of Figures 12 to 14 were necessarily present in the memory device and gave the added

advantage that the current in a row could easily be measured by the use of the "ammeter" in the row supply in conjunction with the switching voltage P supplied to the "control circuit" 131. This argument is not to be found in the proceedings prior to the response to the Rapporteur's communication and appears to rely on a reading of the invention not to be found in any of the argumentation before either the Examining Division or the Board prior to the oral proceedings. In the originally filed claims only Claim 11 referred to "means for selectively disconnecting said switching means [the CMOS switch 121] from each of said power source lines by controlling said switch means". The Board were in the course of the oral proceedings unable to determine whether the skilled person would understand that the "means for controlling the switch means" were necessarily present in any memory device, as apparently suggested by the Appellant.

7. In view of the above-noted substantial changes in the invention under consideration, in particular the replacement at the commencement of the oral proceedings of the independent claim of the then main request by a considerably more limited claim which had never been considered by the Examining Division, and in view of the new arguments advanced in support of patentability, the Board considers that the Appellant's right to two instances can only be preserved if the Board exercises its power under Article 111(1) EPC to set aside the contested decision and remit the case to the Examining Division for further prosecution.

Order

For these reasons, it is decided that:

1. The contested decision is set aside.
2. The case is remitted to the first instance for further prosecution on the basis of the Appellant's requests.

The Registrar:

The Chairman:

M. Kiehl

P.K.J. van den Berg

BESCHWERDEKAMMERN
DES EUROPÄISCHEN
PATENTAMTS

BOARDS OF APPEAL OF
THE EUROPEAN PATENT
OFFICE

CHAMBRES DE RECOURS
DE L'OFFICE EUROPEEN
DES BREVETS

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Publication No.: 0 095 721
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Applicant:
Proprietor of t
Opponent:

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Headword:

EPC: Art

Keyword: "Ret

**Headnote
Catchwords**

Case Number: T 0933/91 - 3.5.1

D E C I S I O N
of the Technical Board of Appeal 3.5.1
of 21 June 1993

Appellant:

KABUSHIKI KAISHA TOSHIBA
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Kawasaki-shi
Kanagawa-ken 210 (JP)

Representative:

Lehn, Werner, Dipl.-Ing.
Hoffmann, Eitle & Partner
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Postfach 81 04 20
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Decision under appeal:

Decision of the Examining Division of the European
Patent Office dated 12 July 1991 refusing European
patent application No. 83 105 182.6 pursuant to
Article 97(1) EPC.

Composition of the Board:

Chairman: P.K.J. van den Berg
Members: A.S. Clelland
W.M. Schar

Summary of Facts and Submissions

- I. European patent application No. 83 105 182.6, published on 7 December 1983 and claiming the priority of a Japanese application filed on 28 May 1982, was refused by decision of the Examining Division dated 12 July 1991.

- II. The reason for the refusal was that the subject-matter of each of the claims lacked an inventive step having regard to the following documents:

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- III. On 10 September 1991 an appeal was lodged against this decision and the prescribed fee was paid. On 19 November 1991 a Statement setting out the Grounds of Appeal was filed, together with two sets of revised claims constituting the claims of a main request and an auxiliary request. Cancellation of the decision and grant of a patent on the basis of the claims of the main request or, failing that, the claims of the auxiliary request, was requested. In the event that the Board was not in a position to allow the appeal oral proceedings were requested.

- IV. In a communication dated 31 March 1993 the Rapporteur expressed the preliminary view that the subject-matter of each of the claims of both the main and auxiliary requests lacked novelty and/or inventive step having regard to each of the above-mentioned documents. The Rapporteur also considered that Claims 2 and 3 of both requests were inadmissible because they contained an

appreciation of the invention not derivable from the originally filed application so that subject-matter had been added, Article 123(2) EPC, that Claim 1 of the auxiliary request was not wholly clear and supported by the description, and that the application did not contain any manner of detecting a leakage current, a feature of the auxiliary request.

- V. Oral proceedings were appointed for 21 June 1993. On 27 May 1993 the Appellant maintained the main request and filed revised claims to replace those of the auxiliary request. A revised sheet of the drawings, sheet 6, was also filed, in which the use of means to detect leakage current was illustrated. Supporting arguments were also put forward.
- VI. The oral proceedings were held on 21 June 1993. At the commencement of the oral proceedings the Appellant withdrew his main request and filed a new main request, based on claims generally similar to the claims of the auxiliary request but drawn in somewhat different terms: it was stated on behalf of the Appellant that the claims of the auxiliary request inadvertently failed to embrace the embodiment of Figure 13, only the embodiments of Figures 12 and 14 being covered. The claims of the new main request now embraced the embodiments of each of Figures 12 to 14. It was argued that these revised claims met the requirements of the EPC. In particular, it was argued that the revised auxiliary request now met the requirement of Article 84 EPC as regards clarity and that the revised Figure 12 showed the clearly intended purpose of the ammeter, namely to measure leakage current flowing through the power source and the integrated circuit. It was also argued that the provision of switch controlling means 131 for the switch

121 enabled error bit cell detection as individual rows could be addressed in turn. The presence of the means 131 was used to measure leakage current by the incorporation of the ammeter in series with the supply line. In the embodiments of Figures 12 and 14 the circuit 131 caused the switch 121 to turn on when the corresponding row line was addressed, so that leakage in any cell of a particular row could be detected by the ammeter. In the Figure 13 embodiment a decrease in current caused by turning off a row line containing a faulty cell was measured. None of the cited documents disclosed the measurement of leakage current. These documents were concerned with the isolation of unused auxiliary memory and did not suggest the isolation of a defective portion of main memory in order to conserve power consumption.

VII. The Appellant's requests as made at the oral proceedings are as follows:

Main request:

Claims: 1 to 9 as filed at the oral proceedings;

Description: pages 3 to 8, 10, 12 to 29 as originally filed;
pages 1, 2, 9a and 11 as filed on 29 June 1988;
page 9 as filed on 22 January 1990;

Drawings: sheets 1 to 5 and 7 as originally filed;
sheet 6 as filed on 27 May 1993.

Auxiliary request:

Claims: 1 to 8 as filed on 27 May 1993;

Description

and Drawings: as for main request.

The Board notes that the minutes of the oral proceedings contain an error in the date mentioned for the auxiliary request. The correct date is: 27 May 1993, as indicated herein before

VIII. Claim 1 of the main request reads as follows:

"A semiconductor memory device comprising:
memory means of a plurality of memory cells
($22_{11}, 22_{12}, \dots, 28_{11}, 28_{12}, \dots$), and having a main memory
(21) and an auxiliary memory (27) for use in place of a
part of said main memory;
a plurality of row lines ($R_{M1}, R_{M2}, \dots, R_{A1}, R_{A2}, \dots$)
connected to said memory cells, for specifying said
memory cells; and
a plurality of column lines ($C1, C2, \dots$) connected
to said memory cells, for specifying said memory cells,
and through which data is read out;
characterized by
fuse means ($FD_{M1}, FD_{M2}, \dots, FD_{A1}, FD_{A2}, \dots$) for
disconnecting, when blown, a portion of said memory
cells of said memory means from a power source terminal
(V_p); and
means (121, 131) for detecting whether said portion
of said memory cells includes a defective memory cell,
the detecting means (121, 131) including switch means
(121) inserted between said power source terminal and
said memory cells portion, an ammeter (161) connected in
series with said switch means and said power source

terminal (V_D), means (131) for controlling the switch means in accordance with an address signal to permit an electric current to flow from the power source terminal (V_D) into said memory cell portion through the ammeter (161) and said switch means (121), and means for blowing said fuse means corresponding to said memory cell portion in response to a change in operating state of the switch means, if said ammeter (161) shows a value of electric current indicative of said memory cell portion including a defective memory cell."

- IX. Claim 1 of the auxiliary request differs from that of the main request only in the characterising part, which reads as follows:

"fuse means (FD_{M1} , FD_{M2} , ... FD_{A1} , FD_{A2} , ...) for disconnecting, when blown, a portion of said memory cells of said memory means from a power source terminal (V_D); and

means (121, 131) for detecting said portion of said memory cells, the detecting means (121, 131) including switch means (121) inserted between said power source terminal and said memory cells, an ammeter (161) inserted in series between an external power source and said power source terminal (V_D), means (131) for controlling the switch means in accordance with an address signal to permit an electric current to flow from the power source into said memory cells through the ammeter (161) and said switch means (121), and means for blowing said fuse means corresponding to said memory cell portion if an electric current flows through said memory cell portion and said ammeter (161) shows a value of electric current above a predetermined value."

Reasons for the Decision

1. The appeal is admissible.
2. The admissibility to the appeal proceedings of the claims of the main and of the auxiliary request, according to item VII will be addressed first.
3. The original main request had been maintained unamended since the filing of the Statement of Grounds of Appeal but was replaced at the commencement of the oral proceedings by a request generally similar to the auxiliary request but in terms sufficiently broad to embrace the Figure 13 embodiment.

According to the established case law of the Board of Appeal the appeal procedure is not an extension of examination but is intended to consider the correctness of the appealed decision having regard to the requests and grounds as filed in the notice of appeal and Statement of Grounds. The admission to appeal proceedings of amended claims is at the discretion of the Board concerned. The present Board has noted that in the case under consideration here the new main request can be considered as intermediate in scope between the preceding main request and the present auxiliary request, and that it remedies - from the Appellant's point of view - the deficiency in the present auxiliary request, which does not embrace the Figure 13 embodiment. The claims according to the new main request were filed for the first time at the oral proceedings before the Board. Although in such a situation the Board would be entitled to exercise its discretion and refuse to admit the amended claims to the proceedings, for the reasons given below the case will

considers it expedient to leave the further examination of these claims, and a formal decision on their admissibility, to the first instance.

4. Claim 1 of the auxiliary request was amended in response to an objection of lack of clarity put by the Board in a preliminary communication. There is no objection to its admission into the appeal proceedings.
5. The independent claim of the present main request is as noted above directed to the embodiments shown in Figures 12 to 14 of the drawings and apparently does not embrace the embodiments of Figures 5 to 11. Furthermore, the claim relies on a feature which is only shown clearly for the first time in amended sheet 6 of the drawings, filed in response to a communication from the Board. In Figure 12 of amended sheet 6 an "ammeter" 161 is shown in a series circuit including a voltage source V_s , said to be a ground reference, an unreferenced battery and a fuse FD_{M1} , the supply voltage V_d being shown as being developed at the fuse. In the originally filed Figure 12 the "ammeter" was shown as short-circuiting the power line, which the skilled person would immediately see as erroneous. This issue was not raised in the proceedings before the Examining Division and arises in consequence of the Appellant's reliance on claims directed to those embodiments which make use of the "ammeter".
6. Furthermore, in a discussion of inventive step in the course of the oral proceedings the Appellant argued that the "control circuit" 131 and transistor 121 shown in the embodiment of Figures 12 to 14 were necessarily present in the memory device and gave the added advantage that the current in a row could easily be

measured by the use of the "ammeter" in the row supply in conjunction with the switching voltage P supplied to the "control circuit" 131. This argument is not to be found in the proceedings prior to the response to the Rapporteur's communication and appears to rely on a reading of the invention not to be found in any of the argumentation before either the Examining Division or the Board prior to the oral proceedings. In the originally filed claims only Claim 11 referred to "means for selectively disconnecting said switching means [the CMOS switch 121] from each of said power source lines by controlling said switch means". The Board were in the course of the oral proceedings unable to determine whether the skilled person would understand that the "means for controlling the switch means" were necessarily present in any memory device, as apparently suggested by the Appellant.

7. In view of the above-noted substantial changes in the invention under consideration, in particular the replacement at the commencement of the oral proceedings of the independent claim of the then main request by a considerably more limited claim which had never been considered by the Examining Division, and in view of the new arguments advanced in support of patentability, the Board considers that the Appellant's right to two instances can only be preserved if the Board exercises its power under Article 111(1) EPC to set aside the contested decision and remit the case to the Examining Division for further prosecution.

Order

For these reasons, it is decided that:

1. The contested decision is set aside.
2. The case is remitted to the first instance for further prosecution on the basis of the Appellant's requests.

The Registrar:

The Chairman:

M. Kiehl

P.K.J. van den Berg