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**Datasheet for the decision  
of 9 May 2022**

**Case Number:** T 0190/19 - 3.4.03

**Application Number:** 07007924.9

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**IPC:** H01L29/78, H01L29/267,  
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H01L29/24, H01L29/49, H01L29/24

**Language of the proceedings:** EN

**Title of invention:**  
Semiconductor device and manufacturing method thereof

**Applicant:**  
NISSAN MOTOR CO., LTD.

**Headword:**

**Relevant legal provisions:**

EPC 1973 Art. 84  
EPC Art. 123(2)  
EPC R. 99(2)  
RPBA Art. 12(4)  
RPBA 2020 Art. 12(3), 13(2)

**Keyword:**

Main request - admitted (yes)

Main request - amendments - intermediate generalisation - allowable (no)

Late-filed request - submitted shortly before oral proceedings - admitted (no) - submitted during oral proceedings - correction of errors (no) - admitted (no)

Auxiliary request submitted with statement of grounds of appeal - reasons set out clearly and concisely (no) - admitted (no)

Auxiliary requests submitted with statement of grounds of appeal - convergence (no) - admitted (no)

**Decisions cited:**

**Catchword:**



**Beschwerdekammern**  
**Boards of Appeal**  
**Chambres de recours**

Boards of Appeal of the  
European Patent Office  
Richard-Reitzner-Allee 8  
85540 Haar  
GERMANY  
Tel. +49 (0)89 2399-0  
Fax +49 (0)89 2399-4465

Case Number: T 0190/19 - 3.4.03

**D E C I S I O N**  
**of Technical Board of Appeal 3.4.03**  
**of 9 May 2022**

**Appellant:** NISSAN MOTOR CO., LTD.  
(Applicant) 2, Takara-cho, Kanagawa-ku  
Yokohama-shi,  
Kanagawa-ken (JP)

**Representative:** Grünecker Patent- und Rechtsanwälte  
PartG mbB  
Leopoldstraße 4  
80802 München (DE)

**Decision under appeal:** **Decision of the Examining Division of the  
European Patent Office posted on 9 August 2018  
refusing European patent application No.  
07007924.9 pursuant to Article 97(2) EPC.**

**Composition of the Board:**

**Chairman** T. Häusser  
**Members:** J. Thomas  
G. Decker

## **Summary of Facts and Submissions**

- I. The appeal is against the decision of the examining division to refuse European patent application No. 07 007 924 on the grounds that
- the subject-matter of the former main request and former auxiliary requests 1 to 5 did not fulfil the requirements of Article 84 EPC 1973, Article 123(2) EPC, and Article 52(1) EPC in combination with Article 54(1) and (2) EPC 1973, and
  - the subject-matter of former auxiliary request 6 did not fulfil the requirements of Article 84 EPC 1973, Article 123(2) EPC, and Article 52(1) EPC in combination with Article 56 EPC 1973.
- II. Reference is made to the following document:
- D2: US 2004/079989 A1
- III. At the end of the oral proceedings held by video conference before the Board the appellant requested that the decision under appeal be set aside and that a patent be granted on the basis of the new claims 1 to 13 according to the request filed with the letter dated 6 May 2022. Should the Board not admit this request into the proceedings, the appellant requested that the decision under appeal be set aside and that a patent be granted on the basis of the claims according to the main request or according to the first auxiliary request filed with the statement setting out the grounds of appeal dated 19 December 2018, or according to auxiliary request 1b filed during the oral proceedings on 9 May 2022, or according to one of the second to fourth auxiliary requests filed with the

statement setting out the grounds of appeal dated 19 December 2018.

IV. Claim 1 of **the request submitted with the letter dated 6 May 2022** is based on claim 1 of the main request (submitted with the statement setting out the grounds of appeal) and reads as follows with the newly included features being underlined by the Board:

*"A semiconductor device comprising:  
a semiconductor substrate (1,2) of a first electroconduction type;  
a hetero semiconductor region (3) contacted with a first main surface of the semiconductor substrate (1,2) and comprising a semiconductor material having a bandgap different from that of the semiconductor substrate (1,2);  
a gate electrode (5,13) of the first electroconduction type formed through a gate insulator layer (4) at a position adjacent to a junction region between the hetero semiconductor region (3) and the semiconductor substrate (1,2);  
a source electrode (7) connected to the hetero semiconductor region (3);  
a drain electrode (8) connected to the semiconductor substrate (1,2);  
the hetero semiconductor region (3) including a low-resistance region (6) of the first electroconduction type and a gate-electrode facing portion (3a) of the first electroconduction type, the low-resistance region (6) is formed by a contact portion (6a) and an electroconductive portion (6b) and along the first main surface of the hetero semiconductor region (3), from at least a part of the hetero semiconductor region (3) where the low-resistance region (6) contacts at its end*

with the source electrode (7), to a position where the low-resistance region (6) is located just below and adjacent to a peripheral portion of the gate electrode (5) through the gate insulator layer (4), the contact portion (6a) is contacted with the source electrode (7) and has an impurity concentration higher than an impurity concentration of the gate-electrode facing portion (3a) which is positioned to face toward the gate electrode (5,13) through the gate insulator layer (4) and which has an upper surface along a remaining part of the first main surface of the hetero-semiconductor region (3) that is located just below and adjacent to the gate electrode (5) through the gate insulator layer (4),

**characterized in that**

the electroconductive portion (6b) is interposed between the gate-electrode facing portion (3a) and the contact portion (6a) and has an impurity concentration higher than that of the gate-electrode facing portion (3a) in the hetero semiconductor region (3), the gate electrode (5,13), the contact portion (6a) and the electroconductive portion (6b) contain an impurity of the first electroconduction type and the same element, and a concentration of the impurity in the gate-electrode facing portion (3a) is not greater than a concentration of the impurity in the low resistance region (6)."

- V. Claim 1 of the **main request** is amended compared to the combination of claims 1 and 2 as originally filed, and reads as follows, wherein the underlined features were added (underlining by the Board); omitted passages compared to the originally filed claims are not indicated:

"A semiconductor device comprising:  
a semiconductor substrate (1,2) of a first  
electroconduction type;  
a hetero semiconductor region (3) contacted with a  
first main surface of the semiconductor substrate  
(1,2) and comprising a semiconductor material  
having a bandgap different from that of the  
semiconductor substrate (1,2);  
a gate electrode (5,13) formed through a gate  
insulator layer (4) at a position adjacent to a  
junction region between the hetero semiconductor  
region (3) and the semiconductor substrate (1,2);  
a source electrode (7) connected to the hetero  
semiconductor region (3);  
a drain electrode (8) connected to the  
semiconductor substrate (1,2);  
the hetero semiconductor region (3) including a  
low-resistance region (6) of the first  
electroconduction type and a gate-electrode facing  
portion (3a) of the first electroconduction type,  
the low-resistance region (6) is formed by a  
contact portion (6a) and an electroconductive  
portion (6b) and along the first main surface of  
the hetero semiconductor region (3), from at least  
a part of the hetero semiconductor region (3) where  
the low-resistance region (6) contacts at its end  
with the source electrode (7), to a position where  
the low-resistance region (6) is located just below  
and adjacent to a peripheral portion of the gate  
electrode (5) through the gate insulator layer (4),  
the contact portion (6a) is contacted with the  
source electrode (7) and has an impurity  
concentration higher than an impurity concentration  
of the gate-electrode facing portion (3a) which is

positioned to face toward the gate electrode (5,13) through the gate insulator layer (4),

**characterized in that**

the electroconductive portion (6b) is interposed between the gate-electrode facing portion (3a) and the contact portion (6a) and has an impurity concentration higher than that of the gate-electrode facing portion (3a) in the hetero semiconductor region (3).

VI. Claim 1 of the **first auxiliary request** is based on the combination of claims 1 to 3 as originally filed and reads as follows, wherein the further amendments are underlined by the Board; omitted passages compared to the originally filed claims are not indicated:

"A semiconductor device comprising: a semiconductor substrate (1,2) of a first electroconduction type; a hetero semiconductor region (3) contacted with a first main surface of the semiconductor substrate (1,2) and comprising a semiconductor material having a bandgap different from that of the semiconductor substrate (1,2); a gate electrode (5,13) formed through a gate insulator layer (4) at a position adjacent to a junction region between the hetero semiconductor region (3) and the semiconductor substrate (1,2); a source electrode (7) connected to the hetero semiconductor region (3); and a drain electrode (D) connected to the semiconductor substrate (1,2); wherein the hetero semiconductor region (3) includes a contact portion (6a) contacted with the source electrode (7), the contact portion (6a) is of the first electroconduction type and has an impurity concentration higher than an impurity concentration of a gate-electrode facing portion



*(3a) in the hetero semiconductor region (3) which is positioned to face toward the gate electrode (5,13) through the gate insulator layer (4), wherein at least part of that region of the hetero semiconductor region (3) which is interposed between the gate electrode facing portion (3a) and the contact portion (6a), is of the first electroconduction type and forms an electroconductive portion (6b), characterized in that the electroconductive portion (6b) is formed throughout a region positioned to extend from the contact portion (6a) up to just below a peripheral portion of the gate electrode (5,13) and has an impurity concentration higher than that of the gate electrode facing portion (3a)."*

VII. Claim 1 of **auxiliary request 1b** is based on claim 1 of the first auxiliary request, further including the features underlined by the Board:

*"... the contact portion (6a) is of the first electroconduction type and has an impurity concentration higher than an impurity concentration of a gate-electrode facing portion (3a) in the hetero semiconductor region (3) which is of the first electroconductive type and positioned to face toward the gate electrode (5,13) through the gate insulator layer (4)"*

VIII. Claim 1 of the **second auxiliary request** is essentially based on claim 1 of the main request with the following feature added before the characterising portion:

*"[the gate-electrode facing portion (3a) ... through the gate insulator layer (4)] and has a*

*surface extending from just below the peripheral portion of the gate electrode (5,13) to the junction region"*

- IX. Claim 1 of the **third auxiliary request** is based on claim 1 of the first auxiliary request further including the following feature added at the end of the claim:

*"and the gate-electrode facing portion (3a) faces toward the gate electrode (5,13) through the gate insulator layer (4) throughout a region positioned from the junction region up to the position just below the peripheral portion of the gate electrode (5,13)"*

- X. Claim 1 of the **fourth auxiliary request** is based on claim 1 of the third auxiliary request further including the following feature added at the end of the claim:

*"and the gate electrode (5,13) is of the first electroconductive type"*

- XI. The appellant's arguments, insofar as they are relevant for the present decision, are summarised as follows:

Concerning the admission of the request filed with the letter dated 6 May 2022 into the proceedings, the appellant argued that the late reply was due to a confluence of unfavourable circumstances, namely a holiday week in Japan (the appellant's country), a misunderstanding of paragraph 10.3 of the Board's communication (the appellant understood this paragraph in the sense of an indication by the Board of patentable subject-matter) and a complex exchange

between the representative and the appellant. Hence, an earlier response was not possible. Nevertheless, it should be possible to react to the preliminary opinion of the Board. Therefore, the request should be admitted since according to the appellant's opinion the amendments overcame all outstanding objections without giving rise to new ones.

Concerning the main request, the appellant considered that the amendments had sufficient basis in the originally filed application documents as indicated in the statement setting out the grounds of appeal. Nevertheless, the appellant admitted that the wording of claim 1 did not imply that the gate-electrode facing portion 3a and the electroconductive portion 6b joined directly along the first surface. Hence, an additional portion could be present along the first surface between the gate-electrode facing portion 3a and the electroconductive portion 6b.

Concerning the first, third and fourth auxiliary requests, the appellant admitted that, compared to the main request, these requests were not convergent. The definition of the specific electroconduction type of the gate-electrode facing portion 3a being of the first electroconduction type had accidentally been omitted in claim 1 of these requests. However, the accidental omission was evident from the statement setting out the grounds of appeal (page 11, sixth paragraph of the section "III. On the First Auxiliary Request"), where the appellant referred to the omitted feature. Since the error was obvious, these requests should be admitted into the proceedings.

Auxiliary request 1b should be admitted into the proceedings because it corrected the above-mentioned

obvious error in claim 1 of the first, third and fourth auxiliary requests. A correction should be possible also at this late stage of the proceedings.

Concerning the second auxiliary request, the appellant did not argue in detail. No additional arguments with regard to its missing substantiation in the statement setting out the grounds of appeal, as objected to by the Board in point 9.4 of its communication under Article 15(1) RPBA 2020, were brought forward during the oral proceedings.

### **Reasons for the Decision**

1. The appeal is admissible.
2. **Admission into the proceedings of the request submitted with the letter dated 6 May 2022, Article 13(2) RPBA 2020**
  - 2.1 In the late afternoon of the last working day before the oral proceedings, the appellant submitted a new set of claims which, if admitted into the proceedings, should replace all requests on file.

The appellant submitted that it had originally misunderstood paragraph 10.3 of the Board's communication as an indication by the Board of patentable subject-matter. This misunderstanding, together with the fact that there had been holidays in the appellant's country Japan ("the golden week") shortly before the oral proceedings and the rather complex communication between the appellant and its representative, had led to the delayed reply and made an earlier reply impossible.

The appellant claimed that this request should nevertheless be admitted into the proceedings since all remaining objections were overcome without giving rise to new ones.

2.2 This request was filed after the notification of a summons to oral proceedings before the Board. Therefore, Article 13(2) RPBA 2020 applies according to which any *"amendment to a party's appeal case made ... after notification of a summons to oral proceedings shall, in principle, not be taken into account unless there are exceptional circumstances, which have been justified with cogent reasons by the party concerned"*.

2.3 The appellant's arguments concerning the reasons for the very late filing do not convince the Board. Neither holidays, which are well-known beforehand, nor a misunderstanding of clearly presented matter, nor a complex exchange between the appellant and the representative are considered exceptional circumstances justifying a late filing. A timely and accurate exchange between the appellant and the representative and, if necessary, the timely filing of new submissions must be expected from the appellant even under the cited circumstances.

2.4 Furthermore, after discussion with the representative during the oral proceedings, the Board concluded that - *prima facie* - the amendments provided in claim 1

- (i) do not overcome all objections raised in the examining division's decision,
- (ii) give rise to new objections,
- (iii) do not relate exclusively to the objections raised for the first time by the Board in its communication under Article 15(1) RPBA 2020, but

also to further objections which had already been raised in the examining division's decision and which should have been addressed in the requests submitted with the statement setting out the grounds of appeal.

- 2.4.1 Ad (i): The Board's objections under Article 123(2) EPC (see communication under Article 15(1) RPBA 2020, point 4 with subpoints) are not fully addressed in this request since the following objections are still valid:

The meaning of "*along the first main surface of the hetero semiconductor region*" requires some interpretation as there is no explicit definition in the application of the surface which constitutes the "*first main surface of the hetero semiconductor region*".

In the light of Figure 1, the Board's understanding is that the claimed "*first main surface of the hetero semiconductor region*" is the upper surface of the hetero semiconductor region 3 (the hetero region 3 includes the regions 6a and 6b), and the contact portion 6a and the electroconductive portion 6b are "along" this first main surface in the sense that the upper surfaces of regions 6a and 6b form part of this first main surface of the hetero semiconductor region 3.

The appellant did not object to this interpretation of the defined first main surface of the hetero semiconductor region.

The amendment concerning the positioning of the contact portion 6a and the electroconductive portion 6b "*along the first main surface of the hetero semiconductor*

region" has its basis in the original description, page 11, line 23 to page 12, line 12 describing the embodiment shown in Figure 1. In this Figure the electroconductive portion 6b joins directly the gate-electrode facing portion 3a along the first surface in the horizontal direction. In all further figures showing the gate-electrode facing portion 3a and the electroconductive portion 6b, both portions are directly joining each other. However, this is not reflected in the wording of claim 1, which is broader with respect to this feature, because a further portion could be provided between both cited portions. This however has not been originally disclosed. It thus represents an intermediate generalisation which has no basis in the originally filed application documents.

The appellant itself admitted that the present wording does not exclude the possibility of an additional portion between the electroconductive portion 6b and the gate-electrode facing portion 3a along this upper surface.

In addition, Figure 1 further shows that the gate-electrode facing portion 3a extends over the entire thickness of the hetero semiconductor region 3. This characteristic relating to the thickness of the gate-electrode facing portion 3a is not reflected in the wording of claim 1, either. The gate-electrode facing portion could also be of reduced vertical extent compared to the thickness of the hetero semiconductor region 3. Therefore, the present formulation with respect to the gate-electrode facing portion includes a further intermediate generalisation which finds no basis in the originally filed application documents.

2.4.2 Ad (ii): The amendments give rise to new objections under Articles 84 EPC 1973 and 123(2) EPC as will be detailed in the following.

Lack of conciseness and clarity arises from the definitions of the impurity concentration as formulated in claim 1. The impurity concentrations are defined in the introductory portion of claim 1 and in the characterising portion of claim 1. Therefore, the definition of the impurity concentration is either repeated in the wording of claim 1, thereby provoking a lack of conciseness or, if the two definitions refer to different impurity concentrations, this wording provokes a lack of clarity, because the difference between these impurity concentrations remains unclear.

Moreover, the general formulation of a first electroconduction type of the gate electrode, as it is used in claim 1, includes the P-type which is nowhere directly and unambiguously disclosed in the original application documents for the gate electrode. In particular, only a gate electrode having N<sup>+</sup>-type is described in the paragraph bridging pages 18 and 19 of the description pointed out by the appellant. Moreover, the very general wording of the description, page 62, lines 2 to 9, is not considered a sufficient basis for the amended feature, either, which therefore constitutes an undisclosed generalisation (Article 123(2) EPC).

2.4.3 Ad (iii): The appellant based its amendments on the claims submitted on 16 April 2012 which the examining division considered as complying with Article 123(2) EPC. The objections under Article 123(2) EPC in the Board's communication were consequently raised for the first time. Therefore, the appellant's amendments to



overcome the objections under Article 123(2) EPC might be considered as a reaction to the Board's preliminary opinion. However, these were not fully addressed (see point 2.4.1 above).

Furthermore, the amendments effected in relation to the inventive step objection should have been submitted already with the statement setting out the grounds of appeal, as the Board did not deviate from the examining division's opinion in this respect. Therefore, the amendments made to overcome the inventive step objection should and could have been submitted at an earlier stage of the proceedings and are consequently considered late filed.

2.5 Based on all these considerations, the Board concludes that the request submitted on 6 May 2022 is not admitted into the proceedings under Article 13(2) RPBA 2020.

**3. Main request, added subject-matter, Article 123(2) EPC**

3.1 The main request was submitted for the first time with the statement setting out the grounds of appeal. The provided amendments were considered to be a *bona fide* attempt to overcome all outstanding objections set out in the decision (see communication according to Article 15(1) RPBA 2020, point 3.4). According to Article 12(4) RPBA 2007 (which applies here according to Article 25(2) RPBA 2020), this request is considered in the appeal proceedings.

3.2 Compared to the originally filed claims, claim 1 was amended *inter alia* by introducing the feature "*the low-resistance region (6) is formed by a contact portion (6a) and an electroconductive portion (6b) and along*

*the first main surface of the hetero semiconductor region (3)".*

As already indicated above under point 2.4.1, this feature is taken from the passage in the description on page 11, line 23 to page 12, line 12, which describes the embodiment of Figure 1. Therefore, all structural features relevant for the present invention shown in Figure 1 and described above should be entirely taken into account in the wording of claim 1 in order not to extend the subject-matter beyond the content as originally disclosed. Thus, claim 1 misses the features that the gate-electrode facing portion 3a joins directly the electroconductive portion 6b along the first main surface and that the gate-electrode facing portion 3a extends over the entire thickness of the hetero semiconductor region 3.

Consequently, all arguments set out above under point 2.4.1 apply *mutatis mutandis* to claim 1 of the main request, so that this claim does not fulfil the requirements of Article 123(2) EPC.

**4. Admission into the proceedings of the first auxiliary request, Article 12(4) RPBA 2007**

4.1 Claim 1 of the first auxiliary request is essentially based on claims 1 to 3 as originally filed including some additional amendments, *inter alia* the deletion of "at least" and the replacement of "predetermined" by "first" for the electroconduction type.

4.2 Since this request was not equivalent to any of the requests underlying the examining division's decision and it was submitted for the first time before the Board, the Board has a discretion not to admit this

request into the proceedings (Article 12(4) RPBA 2007). When exercising its discretion, it also takes the principle of convergence into account, which is to be understood in the sense that the subject-matter of a lower ranking request should be further limited with respect to the higher ranking requests (see *Case Law of the Boards of Appeal*, 9th Edition, 2019, section V.A. 4.12.4).

- 4.3 According to claim 1 of the main request, the contact portion 6a, the electroconductive portion 6b and the gate-electrode facing portion 3a are all of the first electroconduction type, whereas in claim 1 of the first auxiliary request, the type of the gate-electrode facing portion 3a remains undefined, thereby including both possibilities, N- and P-type, for the gate-electrode facing portion 3a.

Consequently, the subject-matter defined in claim 1 is broadened, contrary to the principle of convergence. This missing feature would in particular reopen the discussion of novelty over the prior art, namely over document D2, which was discussed during the proceedings at first instance, and which motivated the appellant to add the feature that the gate electrode facing portion 3a is of the same electroconduction type as the contact part 6a and the electroconductive part 6b to the claimed subject-matter.

- 4.4 The appellant admitted that claim 1 of the first auxiliary request lacked convergence compared to the main request, but submitted that this was due to an accidental omission of the features at issue. However, the fact that the appellant unintentionally omitted these features does not alter the fact that the

subject-matter of claim 1 is not convergent compared to the higher-ranking requests.

4.5 Hence, exercising its discretion under Article 12(4) RPBA 2007, the Board does not admit the first auxiliary request into the proceedings.

5. **Admission into the proceedings of auxiliary request 1b, Article 13(2) RPBA 2020**

5.1 During the oral proceedings before the Board, the appellant submitted auxiliary request 1b, which is based on the first auxiliary request and further includes the feature that the *"gate-electrode facing portion (3a) in the hetero semiconductor region ... is of the first electroconductive type"*.

5.2 Due to the date of filing (at the oral proceedings before the Board) the admission of auxiliary request 1b into the proceedings is decided under Article 13(2) RPBA 2020 which requires cogent reasons under exceptional circumstances.

5.3 In the appellant's view, this amendment corrected the lack of convergence objected to with respect to the first auxiliary request. According to the appellant's submission in the statement setting out the grounds of appeal, section III, sixth paragraph, it should be obvious that the appellant's intention was not to broaden claim 1. On the contrary, the previous omission of the gate-electrode facing portion 3a being of the first electroconduction type should now be reintroduced to correct the obvious error. In the appellant's view, the correction of an obvious error should be possible.

5.4 Contrary to the appellant's opinion, the Board holds that the amendments of claim 1 of auxiliary request 1b do not concern an obvious error. Even if the statement of grounds of appeal indicated with respect to the first auxiliary request that claim 1 was amended in a certain way (see statement setting out the grounds of appeal, section III, sixth paragraph), the resulting contradiction between this indication and the wording of claim 1 does not automatically render the point in question an obvious error. In fact, it is not uncommon for parties to assert facts in their accompanying letters that are not reflected in the wording of the claims. Thus, a contradiction between the accompanying letter and the wording of the claims alone is not sufficient proof for an obvious error. In addition, it must be assumed that the parties formulate the claims with the greatest possible care. The Board must rely on the wording of the claim and cannot necessarily assume that the lack of convergence is merely an error, let alone an obvious error. Still less can it conclude that the actual intention is based on the information in the accompanying letter.

Irrespective of whether or not the error was obvious, the Board notes that the lack of convergence was already objected to in the Article 15(1) RPBA 2020 communication. Therefore, auxiliary request 1b should have been filed directly in response to this communication as quickly as possible if this error was to be corrected. However, this did not happen.

Nor did the appellant even correct the error by submitting auxiliary request 1b together with the submissions of 6 May 2022.

The Board therefore considers that the filing of auxiliary request 1b during the oral proceedings before the Board cannot be justified on the grounds put forward by the appellant. In the Board's view, no exceptional circumstances justified by cogent reasons are apparent.

5.5 Therefore, auxiliary request 1b is not admitted into the proceedings under Article 13(2) RPBA 2020.

6. **Admission into the proceedings of the second auxiliary request, Article 12(4) RPBA 2007**

6.1 The second auxiliary request is said to be based on auxiliary request 4 as refused, with additional amendments. It is therefore not the same as any request on which the contested decision was based, and hence the Board has a discretion not to admit this request into the proceedings (Article 12(4) RPBA 2007).

6.2 Claim 1 of the second auxiliary request comprises the additional feature that the gate-electrode facing portion 3a *"has a surface extending from just below the peripheral portion of the gate electrode (5,13) to the junction region"*.

6.3 Leaving open the question whether or not this request fulfils the requirements of Article 123(2) EPC, the following is noted in relation to the substantiation of the request. In the statement setting out the grounds of appeal, the appellant merely states that the feature now added in claim 1 *"strengthens the distinguishing features of the invention with respect to the 3<sup>rd</sup> embodiment of D1"* (page 14, fourth paragraph). However, there is neither an explanation as to why such a feature is new over the available prior art, nor how

it contributes to inventive step. Also, no argumentation is presented in the form of the problem-solution-approach, as usually preferred by the EPO. No explanation or substantiation is given in order to identify the problem solved by the newly introduced feature or the advantages resulting therefrom.

6.4 Therefore, the second auxiliary request fails to meet the criterion for admission into the proceedings that adequate substantiation should be provided explaining why any new request is considered to meet the requirements of the EPC (Article 12(3) RPBA 2020, Rule 99(2) EPC; *Case Law of Boards of Appeal*, 9th edition 2019, V.A.4.12.5). It is consequently not admitted into the proceedings under Article 12(4) RPBA 2007.

7. **Admission into the proceedings of the third and fourth auxiliary requests, Article 12(4) RPBA 2007**

7.1 Claim 1 of the third and fourth auxiliary requests, respectively, lacks convergence in the same way as claim 1 of the first auxiliary request (see point 4.3 above), because the type of electroconduction of the gate-electrode facing portion 3a is again not defined. The gate-electrode facing portion 3a can be configured as an electroconduction N-type or P-type, thereby broadening the defined subject-matter in this respect.

7.2 All arguments brought forward against the first auxiliary request under points 4.3 and 4.4 above, apply *mutatis mutandis* for these two requests.

7.3 Consequently, neither the third nor the fourth auxiliary request is admitted into the proceedings (Article 12(4) RPBA 2007).

## 8. Conclusion

Since the only request admitted into the proceedings is the main request, which, however, does not fulfil the requirements of Article 123(2) EPC, the appeal must fail.

## Order

**For these reasons it is decided that:**

The appeal is dismissed.

The Registrar:

The Chairman:



S. Sánchez Chiquero

T. Häusser

Decision electronically authenticated