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**Datasheet for the decision  
of 14 October 2025**

**Case Number:** T 2028/23 - 3.5.05

**Application Number:** 18791267.0

**Publication Number:** 3618530

**IPC:** H04W72/04, H04L5/00

**Language of the proceedings:** EN

**Title of invention:**

Resource mapping method for demodulation reference signal, base station and computer readable storage medium

**Patent Proprietor:**

Vivo Mobile Communication Co., Ltd.

**Opponent:**

Nokia Solutions and Networks GmbH & Co. KG (until 5 February 2024)

**Headword:**

Resource mapping in New Radio systems/VIVO MOBILE

**Relevant legal provisions:**

EPC Art. 54

RPBA 2020 Art. 12(4), 12(6)

**Keywords:**

Novelty - main request (no)

Admittance of claim requests filed on appeal - auxiliary  
requests 1 and 2 (no): should have been submitted earlier +  
"fresh case"



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Case Number: T 2028/23 - 3.5.05

**D E C I S I O N**  
**of Technical Board of Appeal 3.5.05**  
**of 14 October 2025**

**Appellant:** Vivo Mobile Communication Co., Ltd.  
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**Decision under appeal:** **Decision of the Opposition Division of the  
European Patent Office posted on 21 December  
2023 revoking European patent No. 3618530  
pursuant to Article 101(3)(b) EPC.**

**Composition of the Board:**

**Chair** K. Bengi-Akyürek  
**Members:** J. Eraso Helguera  
F. Blumer

## Summary of Facts and Submissions

I. This case concerns the appeal filed by the proprietor against the decision of the opposition division revoking the opposed patent under Article 101(2) and 101(3)(b) EPC for lack of novelty (Article 54 EPC) and added subject-matter (Article 123(2) EPC).

II. The opponent withdrew its opposition before the proprietor filed its statement of grounds of appeal.

III. The decision under appeal mentioned, *inter alia*, the following prior-art document:

**D1:** EP 2 941 072 A1.

In its statement of grounds of appeal, the appellant further referred to the following prior-art document:

**D22:** LTE; Evolved Universal Terrestrial Radio Access (E-UTRA); Physical channels and modulation (3GPP TS 36.211 version 13.5.0 Release 13).

IV. Oral proceedings before the board were held on 14 October 2025. The final requests of the proprietor (appellant) were that the decision under appeal be set aside and that the patent be maintained in amended form on the basis of one of:

- **main request**, corresponding to "main request B" of the appealed decision and re-submitted with the statement of grounds of appeal as "Main request - amended", and

- **auxiliary requests 1 and 2**, filed for the first time with the statement of grounds of appeal.

At the end of those oral proceedings, the board announced its decision.

- V. Claim 1 of **main request** ("Main request - amended") reads as follows:

"A resource mapping method for a demodulation reference signal DMRS, comprising:

determining (101) a target orthogonal frequency division multiplexing OFDM symbol for mapping a physical broadcast channel PBCH-DMRS from OFDM symbols corresponding to a new radio NR synchronization signal SS block;

mapping (102) the PBCH-DMRS in the target OFDM symbol, wherein, the determining (101) the target OFDM symbol for mapping the PBCH-DMRS from the OFDM symbols corresponding to the NR SS block comprises:

using at least one of an OFDM symbol occupied by a primary synchronization signal PSS in the NR SS block and an OFDM symbol occupied by a secondary synchronization signal SSS in the NR SS block as the target OFDM symbol;

characterized in that

the mapping (102) the PBCH-DMRS in the target OFDM symbol comprises selecting one set of subcarriers to which a synchronization signal is not mapped in each of the target OFDM symbol occupied by the synchronization signal to map the PBCH-DMRS, wherein the synchronization signal comprises a PSS and/or an SSS, each set of subcarriers comprises a preset number of subcarriers, and a frequency interval between two adjacent subcarriers of the preset number of subcarriers is a preset frequency threshold."

Claim 1 of **auxiliary request 1** reads as follows:

"A resource mapping method for a demodulation reference signal DMRS, comprising:

determining (101) a target orthogonal frequency division multiplexing OFDM symbol for mapping a physical broadcast channel PBCH-DMRS from OFDM symbols corresponding to a new radio NR synchronization signal SS block,

wherein the NR SS block comprises a primary synchronization signal, PSS, a secondary synchronization signal, SSS, and a PBCH and includes four OFDM symbols which are consecutive in time, wherein the PBCH has a bandwidth and each of the PSS and the SSS has a bandwidth, wherein the bandwidth of the PSS and the SSS is smaller than the bandwidth of the PBCH;

mapping (102) the PBCH-DMRS in the target OFDM symbol, wherein, the determining (101) the target OFDM symbol for mapping the PBCH-DMRS from the OFDM symbols corresponding to the NR SS block comprises:

using one OFDM symbol occupied by the SSS in the NR SS block and one OFDM symbol occupied by the PBCH in the NR SS block as the target OFDM symbol;

wherein

the mapping (102) the PBCH-DMRS in the target OFDM symbol comprises selecting one set of subcarriers to which a synchronization signal is not mapped by selecting the one set of subcarriers from resources in a frequency domain that correspond to the difference between the bandwidth of the PBCH and the bandwidth of the PSS and the SSS in each of the target OFDM symbol occupied by the synchronization signal to map the PBCH-DMRS, wherein the synchronization signal comprises the SSS, each set of subcarriers comprises a preset number of subcarriers, and a frequency interval between two

adjacent subcarriers of the preset number of subcarriers is a preset frequency threshold."

Claim 1 of **auxiliary request 2** differs from claim 1 of auxiliary request 1 in:

- the deletion of the word "four" right before the term "OFDM symbols"
- the insertion of the phrase "wherein the PSS occupies one OFDM symbol, the SSS occupies one OFDM symbol, and the PBCH occupies two OFDM symbols," right before the wording "wherein the PBCH has a bandwidth".

## **Reasons for the Decision**

### 1. MAIN REQUEST

Claim 1 of the **main request** (labelled "Main request - amended") comprises the following limiting features:

1. A resource mapping method for a demodulation reference signal (DMRS), comprising:
  - 1.1 determining a target orthogonal frequency division multiplexing (OFDM) symbol for mapping a physical broadcast channel (PBCH-DMRS) from OFDM symbols corresponding to a new radio (NR) synchronisation signal (SS) block;
    - 1.1.1 the determining the target OFDM symbol for mapping the PBCH-DMRS from the OFDM symbols corresponding to the NR SS block comprises: using at least one of an OFDM symbol occupied by a primary synchronisation signal (PSS) in the NR SS block and an OFDM symbol occupied by a

- secondary synchronisation signal (SSS) in the NR SS block as the target OFDM symbol;
- 1.2 mapping the PBCH-DMRS in the target OFDM symbol, [characterised in that] the mapping the PBCH-DMRS in the target OFDM symbol comprises
- 1.3 selecting one set of subcarriers to which a synchronisation signal (SS) is not mapped in each of the target OFDM symbol occupied by the SS to map the PBCH-DMRS,
  - 1.3.1 the SS comprises a PSS and/or an SSS,
  - 1.3.2 each set of subcarriers comprises a preset number of subcarriers, and
  - 1.3.3 a frequency interval between two adjacent subcarriers of the preset number of subcarriers is a preset frequency threshold.

*1.1 Claim 1 - novelty in view of D1 (Article 54 EPC)*

- 1.1.1 Document **D1** discloses a resource mapping method for a demodulation reference signal (DMRS). Fig. 6 of D1 shows a Physical Resource Block (PRB) which is a part of an "NR SS block" comprising the sixth and seventh OFDM symbols of each subcarrier in the subframe. This "NR SS block" in turn includes Resource Elements (REs) used for SS signals (marked as "SSS" and "PSS" in the first, third to sixth and eighth to eleventh subcarriers) as well as REs to which PBCH-DMRS are mapped (marked as "DMRS" in the second, seventh and twelfth subcarriers). This disclosure corresponds to the preamble of present claim 1 (i.e. **features 1, 1.1, 1.1.1 and 1.2**). Furthermore, in document D1, the PBCH occupies the 72 centre subcarriers (i.e. 6 PRBs) in each subframe #0 (see D1, Fig. 2 and D22, section 6.6.4). But, as known from the LTE standards, the PSS/SSS only occupy 62 centre subcarriers (see e.g. sections 6.11.1.2 and 6.11.2.2 of D22). That means that

the PSS/SSS of the system of D1 never occupy the five outermost subcarriers of PRB#0 and PRB#5. Thus, according to the example of paragraph [0049] and Figure 6 of D1, whenever the DMRSs use either PRB#0 or PRB#5 as one of the two selected PRBs (see Figs. 4(a), 4(b), 5(a) and 5(b) of D1), there will always be at least "one set of subcarriers to which a synchronisation signal is not mapped in each of the target OFDM symbol occupied by the synchronisation signal to map the PBCH-DMRS". This "set of subcarriers comprises a preset number of subcarriers" and "a frequency interval between two adjacent subcarriers of the preset number of subcarriers is a preset frequency threshold", as required by **features 1.3, 1.3.1, 1.3.2 and 1.3.3**.

Hence, the subject-matter of claim 1 is not new in view of document **D1**.

- 1.1.2 In that regard, the appellant submitted that an assignment of the PBCH-DMRS in the resource element unoccupied in PRB#0 (or PRB#5) in Fig. 4(a) to Fig. 5(b) of D1 would in any case still not fulfil the requirement of **feature 1.3** ("selecting one set of subcarriers to which a synchronization signal is not mapped in each of the target OFDM symbol occupied by the synchronization signal to map the PBCH-DMRS"). In any of those configurations, at most one of PRB#0 and PRB#5 (but never both) was selected and therefore there would be always only *one subcarrier* "to which a synchronization signal is not mapped" *in each of the target OFDM symbol occupied by the synchronisation signal in the NR SS block, but not "one set of subcarriers" in each of the target OFDM symbol* as required by **feature 1.3**.

- 1.1.3 This argument does not sway the board. Those "unoccupied subcarriers" (i.e. five in PRB#0 and five more in PRB#5) are sufficient to define "one set of subcarriers" as claimed, even if the PBCH-DMRS only maps into one of them (i.e. the outermost in PRB#0 and the one before the outermost in PRB#5, according to Fig. 6 of D1).
  
- 1.2 Thus, the main request is not allowable under Article 54 EPC.
  
- 1.3 The board adds that, even if feature 1.3 was not disclosed in document D1, the mere abstract mapping scheme according to that feature, does not necessarily imply the use of any technical means and cannot cause any technical effect, let alone contribute to an "optimised use of the mapped resources" (as put forward by the appellant at the oral proceedings before the board).

## 2. AUXILIARY REQUESTS

Claim 1 of **auxiliary request 1** differs from claim 1 of the main request in the following features (board's labelling):

- 1.4 the NR SS block comprises a PSS, an SSS, and a PBCH and includes four OFDM symbols which are consecutive in time,
- 1.5 the PBCH has a bandwidth and each of the PSS and the SSS has a bandwidth, the bandwidth of the PSS and the SSS being smaller than the bandwidth of the PBCH;
- 1.1.1' determining the target OFDM symbol for mapping the PBCH-DMRS from the OFDM symbols corresponding to the NR SS block comprises:

using one OFDM symbol occupied by the SSS in the NR SS block and one OFDM symbol occupied by the PBCH in the NR SS block as the target OFDM symbol;

- 1.6 selecting the one set of subcarriers from resources in a frequency domain that correspond to the difference between the bandwidth of the PBCH and the bandwidth of the PSS and the SSS;
- 1.3.1' the SS comprises the SSS.

Claim 1 of **auxiliary request 2** differs from claim 1 of auxiliary request 1 in that:

- 1.7 the PSS occupies one OFDM symbol, the SSS occupies one OFDM symbol, and the PBCH occupies two OFDM symbols.

2.1 *Admittance into the appeal proceedings (Article 12 RPBA)*

2.1.1 The appellant submitted that:

- (a) **Auxiliary requests 1 and 2** were newly filed in the appeal proceedings because no earlier opportunity had existed to file these claim requests. They were based on auxiliary request 3B, rejected by the opposition division for added subject-matter. Point 13 on page 9 of the minutes of the oral proceedings showed that the opposition division had not given any reasons for the non-admittance of auxiliary request 3B, but merely referred to the conclusions for auxiliary request 2A. The opposition division's objection was unexpected because the "or" option in the wording used in claim 1 of auxiliary request 3B ("*a bandwidth used for the PSS and/or the SSS is smaller*") clearly

referred to the case that the subcarriers were selected in the "target OFDM symbol" occupied by the PSS or by the SSS. Now that the "or" option had been deleted in feature 1.5, the added-matter objection was in any case moot. With the further amendments to claim 1, the remaining objections of the opposition division with respect to Article 84 and Article 123(2) and (3) EPC were also moot and the auxiliary requests were *prima facie* admissible.

- (b) Given that the opposition had been withdrawn, the present proceedings now lacked a contentious nature. They thus concerned the examination of the contested decision which, again, concerned (without the contentious nature) the protection of the public interest in preventing maintenance of a patent - a monopoly right - for a subject-matter which was not an invention. Accordingly, the relevant factors when exercising the discretion in the present case were the patent proprietor's interest to protect its invention and the procedural economy of the appeal proceedings in view of the above-identified purpose of the proceedings. Admitting the auxiliary requests would certainly be in line with the patent proprietor's interest. The procedural economy of the appeal proceedings would not be at risk if the auxiliary requests were admitted, as they had been filed at the very first stage of the appeal proceedings, namely together with the statement of grounds of appeal, taking the decision under appeal into account. Thus, they were an outcome of the patent proprietor's endeavour to *comply* with the decision under appeal.

2.1.2 These claim requests were filed only with the statement of grounds of appeal. Hence, they may be admitted only at the discretion of the board (Article 12(4) RPBA).

2.1.3 The board did not admit them into the appeal proceedings for the following reasons:

(a) Auxiliary request 3B was filed during the oral proceedings before the opposition division, which did however not admit it into the opposition proceedings for being late-filed and *prima facie* not complying with Article 84 EPC and Article 123(2) and (3) EPC. The admittance of auxiliary request 3B was discussed with the parties (see points 11 to 13 of the minutes of the first-instance oral proceedings). In particular, point 12.2 on page 8 of the minutes shows that the opponent had objected to the presence of the wording "and/or" in auxiliary request 3B. After the opposition division announced that auxiliary request 3B (and also auxiliary request 4A) would not be admitted, the discussion moved on in the afternoon to auxiliary requests 4B, 5A and 5B. At the end of the oral proceedings, the appellant submitted that it had no further requests to make (see point 15.1 of the minutes). In view of this, the board cannot recognise any "surprising" development that could have prevented the appellant from submitting present auxiliary requests 1 and 2 already at that stage during the opposition proceedings (Article 12(6), second sentence, RPBA).

(b) Even if, *arguendo*, the auxiliary requests were *prima facie* allowable under Articles 84 EPC, 123(2) and (3) EPC, claim 1 of those auxiliary requests introduces further limitations at least partly

extracted from the description, according to the bases given by the appellant in point 64 of its statement of grounds of appeal. The merits of these limitations were however **never discussed or decided upon** during the opposition proceedings. Thus, this would constitute a "fresh case" requiring the board to examine the matter of novelty and inventive step from the ground up. Alternatively, the board could indeed remit the case to the opposition division for further prosecution. The board would then have to set aside a decision which was correct in the substance only to give the appellant a second opportunity to argue its case before the opposition division or even file more claim requests if necessary. In the board's view, the withdrawal of the opposition in the case at hand cannot justify greater leniency towards the appellant.

3. Since there are no allowable claim requests on file, the appeal must be dismissed.

**Order**

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

The appeal is dismissed.

The Registrar:

The Chair:



B. Brückner

K. Bengi-Akyürek

Decision electronically authenticated