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**Datasheet for the decision
of 12 July 2007**

Case Number: T 0047/05 - 3.5.02

Application Number: 01128370.2

Publication Number: 1193870

IPC: H03H 9/64

Language of the proceedings: EN

Title of invention:
Surface-acoustic-wave filter

Applicant:
FUJITSU LIMITED

Opponent:
-

Headword:
-

Relevant legal provisions:
EPC Art. 54, 56, 76(1), 123(2)

Keyword:
"Validity of the divisional application - (yes)"
"Novelty, inventive step - after amendments - (yes)"

Decisions cited:
G 0002/88, G 0006/88, G 0001/05, G 0001/06, T 0528/04

Catchword:
-



Case Number: T 0047/05 - 3.5.02

D E C I S I O N
of the Technical Board of Appeal 3.5.02
of 12 July 2007

Appellant:

FUJITSU LIMITED
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Decision under appeal:

Decision of the Examining Division of the
European Patent Office posted 5 August 2004
refusing European application No. 01128370.2
pursuant to Article 97(1) EPC.

Composition of the Board:

Chairman: M. Ruggiu
Members: J.-M. Cannard
H. Preglau

Summary of Facts and Submissions

I. The appellant contests the decision of the examining division to refuse European patent application No. 01 128 370.2. The reason given for the refusal was that claim 1 of the sole request lacked novelty and was not allowable under Article 54(1) EPC.

II. The following documents of the state of the art have been considered in the first instance proceedings:

D1: EP-A-0 337 703,

D2: Tseng et al, "SAW Planar Network", IEEE Ultrasonics Symposium Proceedings, IEEE, NY, US, 1974, pages 282 to 285, and

D3: US-A-5 059 848.

III. Claim 1 of the current request filed with the letter dated 9 March 2007 reads as follows:

"A band-pass filter having a predetermined pass-band characteristic and comprising a plurality of SAW resonators (R1-R5) connected in a ladder formation in at least two series arms (61; R₂, R₄) and at least two parallel arms (62-64; R₁, R₃, R₅), wherein all the said resonators are formed on a single piezoelectric substrate (82);

characterised in that the parallel arms are connected by respective inductance paths to a ground outside the substrate".

Claims 2 to 6 are dependent on claim 1.

- IV. According to the file, the appellant requests that the decision under appeal be set aside and that a patent be granted on the basis of:

claims 1 to 6 filed with the letter of 9 March 2007; description, pages 1, 4, 9 to 24, 27, 28, 32 to 35, 37, 39 to 41 and 44 to 48 as originally filed; page 2 filed with the letter of 2 October 2006; pages 5, 6, 8, 25, 26, 30, 31, 36, 42 and 49 filed with the letter dated 23 February 2007; and pages 3, 3a, 7, 29, 38 and 43 filed with the letter of 9 March 2007; and drawings, figures 1 to 66, 68 to 71 as originally filed and figure 67 filed with the letter of 30 December 2003.

- V. The written arguments of the appellant can be summarised as follows:

The additional feature "the parallel arms are connected by respective inductance paths to a ground outside the substrate" incorporated in amended claim 1 was clear and based on passages such as page 19, lines 19 to 20 of the application as filed.

In the filter according to the equivalent circuit of figure 4 and the representation of figure 5 of document D1, no inductance paths between the parallel arms and the ground were shown. Rather, figure 4 of D1 disclosed that, ideally, the parallel arms and the ground were connected with zero impedance.

The band-pass filter of the claimed invention had a wide pass-band width, an improved side lobe suppression factor, and a low insertion loss, as shown in figure 14 of the application. There was no teaching in D1 of the "inductance paths" as in the claimed invention, nor was there any indication that any inductance should connect the parallel arms to the ground. For productivity reasons, the skilled person aware of D1 would simply consider minimizing the wiring connection and connect a common ground terminal of the substrate and the ground by a single wire.

Reasons for the Decision

1. The appeal is admissible.

Amendments

2. The present application is a divisional application which derives from the earlier European applications Nos. 92309830.5, 96108331.8 and 99100121.5. It meets the conditions laid down in Article 76(1) EPC. The Board is also satisfied that the amendments made to the claims, description and drawings meet the requirements of Article 84 EPC and do not contravene Article 123(2) EPC.
 - 2.1 The description and drawings of the present application as originally filed are in substance identical to the description and drawings of the earlier applications as originally filed.

- 2.2 According to the decision under appeal (point 6 of the facts and submissions), the position of the examining division was that the claims then on file did not add subject-matter (Article 123(2), Article 76(1) EPC). The Board has no reason to challenge this view of the examining division.
- 2.3 More specifically, a band-pass filter which comprises all the features of the then on file claim 1 is disclosed by the embodiment described with reference to figures 13, 16, 17, 42 and 43 in the present application as filed (and the earlier applications). The features of the then dependent claims 2, 3, 4, 5 and 6 are respectively based on the passages of page 19, lines 10 to 12, page 20, lines 7 to 21 and figure 18, page 21, lines 18 to 30 and figure 21, page 47, lines 20 and 21, and page 19, lines 1 to 9, and in figure 16 of the filed application (and in corresponding passages and figures of the earlier applications as filed). Therefore, in accordance with the decisions of the Enlarged Board of Appeal G 1/05 and G 1/06 of 28 June 2007 (not yet published), the Board judges that the requirements of Article 76(1) EPC are met.
- 2.4 Present claim 1 is based on claim 1 considered in the decision under appeal with the added restriction that "the parallel arms are connected by respective inductance paths to a ground outside the substrate". Such parallel arms are disclosed in the application as filed (see figures 13, 16, 42 and 43; paragraphs [0039], [0044] to [0047], [0082], [0083] and [0084] of the published application) and in the corresponding passages and figures of the earlier applications as filed. Present dependent claims 2 to 6 are identical with

claims 2 to 6 considered in the decision under appeal. The present set of claims thus does not contravene Article 123(2) EPC.

- 2.5 The description and figures of the present application have been correctly adapted to the amended claims.

Novelty - Inventive step

3. Document D1, which is the closest prior art among the documents cited by the examining division, discloses a band-pass filter having a predetermined pass-band characteristic and comprising a plurality of SAW resonators (column 6, line 45 to column 7, line 44; figures 1, 4 and 5) connected in a ladder formation in two series arms (11-1,12-1,13-1; 11-4,12-4,13-4) and two parallel arms (11-2,12-2,13-2; 11-3,12-3,13-3), wherein all the resonators are formed on a single piezoelectric substrate (7). D1 thus discloses a band-pass filter comprising all the features recited in the preamble of present claim 1.
4. The feature recited in the characterising part of claim 1, i.e. "the parallel arms are connected by respective inductance paths to a ground outside the substrate", is not disclosed in D1.
- 4.1 More specifically, neither the filters according to the diagrams of figures 1 and 5, nor the filter according to the electrical equivalent circuit of figure 4 comprise inductance paths connecting the resonators of the parallel arms of the filter to a ground outside the substrate (7). In particular, the equivalent circuit of figure 4, which shows many inductances forming part of

the filter resonators or of the input and output matching circuits (3-1 to 3-4), appears to teach, in contrast, that, ideally, the parallel arms and the ground should be connected by a zero impedance.

4.2 In practice, the resonators disposed in the parallel arms of the filters disclosed in D1 may be connected by wires to the ground. According to the theory, the wires have a small inductance at high frequencies. But D1 does not mention the inductance of the wires or any particular effects resulting from it. Such effects would only be revealed by testing a filter fabricated according to the teaching of D1. According to decision G 2/88 of the Enlarged Board of Appeal (OJ 1990, 93, point 10 of the reasons), the inductance components of such wires and their resulting effects should therefore not be considered as made available to the public by the disclosure of D1.

4.3 According to the description of the application (see published application, paragraph [0043]), the inductance paths connecting the parallel arms to a ground outside the substrate result in the filter of the claimed invention having a larger pass-band width, a larger side lobe suppression factor and a lower insertion loss than filters which do not include such inductance paths. Since claim 1 can be seen as concerned with a new use of inductance paths in the parallel arms of a band-pass filter, the effects disclosed in the application should be construed as features of the claimed invention, following the decision G6/88 of the Enlarged Board of Appeal (OJ 1990, 114, points 7 and 9 of the reasons), which states that the proper interpretation of a claim whose wording clearly defines a new use of a known

compound for a particular purpose, will normally be such that the attaining of the new technical effect described in the patent which underlies the new use is a technical feature of the claimed invention (see T0528/04, not published).

- 4.4 Accordingly, even if the use in a filter of wires for connecting the parallel arms to the ground was known at the filing date of the application in suit, the effects of inductance paths connecting the resonators in the parallel arms of a band-pass filter to a ground outside the substrate (as described in the application) are technical features which are not disclosed in any of the prior art documents cited. The subject-matter of claim 1 is novel.

5. Starting from D1 and having regard to the technical effects achieved by the invention, the technical problem addressed by the invention can be seen as providing a filter with a large band width, a large suppression factor and a small insertion loss. This is in accordance with the technical problem specified in the application as filed (paragraph [0008] of the published application). This problem is solved by the feature specified in the characterising part of claim 1.

6. There is no hint in the cited prior art of the solution provided by the invention and the person skilled in the art would not consider connecting the resonators in the parallel arms of a band-pass filter to a ground outside the filter substrate by means of inductance paths, because none of the cited prior art documents discloses the technical effects provided by such inductance paths.

- 6.1 It is observed that wires connecting resonators of a filter to the ground were used for a long period before the invention was made, but the inductance of the wires was apparently never considered. This in itself indicates that there is no obvious connection in the mind of the skilled person between the use of such wires and the effects of inductance paths as recited in claim 1. Furthermore, as argued by the appellant, for productivity reasons, the skilled person, aware of D1, would probably have considered simply minimizing the wiring connection and connecting a common ground terminal of the substrate to the ground by a single wire.
- 6.2 The other documents of the search report, D2 and D3 are no more relevant than D1. Document D2 concerns SAW resonator arrangements for use in filters, and document D3 relates to a low-cost SAW packaging technique.
7. The Board therefore concludes that the subject-matter of claim 1 and claims 2 to 6, which are dependent on claim 1, is considered to be new and involve an inventive step within the meaning of Articles 54 and 56 EPC. The application as amended meets the requirements of the EPC.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The case is remitted to the department of the first instance with the order to grant a patent in the following version:

claims: 1 to 6 filed with the letter of 9 March 2007;

description: description, pages 1, 4, 9 to 24, 27, 28, 32 to 35, 37, 39 to 41 and 44 to 48 as originally filed; page 2 filed with the letter of 2 October 2006; pages 5, 6, 8, 25, 26, 30, 31, 36, 42 and 49 filed with the letter dated 23 February 2007; and pages 3, 3a, 7, 29, 38 and 43 filed with the letter of 9 March 2007;

drawings: figures 1 to 66, 68 to 71 as originally filed and figure 67 filed with the letter of 30 December 2003.

The Registrar:

The Chairman:

R. Schumacher

M. Ruggiu