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**Datasheet for the decision
of 3 April 2019**

Case Number: T 0323/14 - 3.5.02

Application Number: 03254772.1

Publication Number: 1388988

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H01F38/14, H01L23/522,
H01L23/60, H03H7/52, H04B5/00,
H04L25/02

Language of the proceedings: EN

Title of invention:
Chip-scale Coils and Isolators Based Thereon

Patent Proprietor:
Analog Devices

Opponent:
Infineon Technologies AG

Relevant legal provisions:
EPC Art. 123(2)
RPBA Art. 13(1)

Keyword:
Amendments - allowable (no)
Late-filed auxiliary request - justification for late filing
(no)



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Case Number: T 0323/14 - 3.5.02

D E C I S I O N
of Technical Board of Appeal 3.5.02
of 3 April 2019

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Decision under appeal: **Interlocutory decision of the Opposition
Division of the European Patent Office posted on
8 January 2014 concerning maintenance of the
European Patent No. 1388988 in amended form.**

Composition of the Board:

Chairman R. Lord
Members: F. Giesen
W. Ungler

Summary of Facts and Submissions

I. This appeal by the opponent lies from the decision of the Opposition Division concerning maintenance of the European Patent No. 1388988 in amended form.

II. The appellant (opponent) requested that the decision under appeal be set aside and the patent be revoked.

The respondent (patent proprietor) requested that the appeal be dismissed (main request), auxiliarily that the decision under appeal be set aside and the patent be maintained in amended form on the basis of the first auxiliary request filed with letter dated 27 February 2019.

III. Claim 1 according to the **main request** (i.e. as maintained in opposition) reads as follows:

*"A signal isolator comprising:
a first substrate and a second substrate separate from the first substrate;
a transformer including a first winding and a second winding;
an input circuit (245) connected to the first winding of the transformer to drive the transformer;
an output circuit (246) connected to the second winding of the transformer to generate an output signal in response to a signal from the transformer,
characterised by further comprising a third substrate separate from the first substrate and the second substrate, and wherein the transformer (242) is formed on the first substrate (244), the input circuit is on*

the second substrate (252) and the output circuit (246) is on the third substrate, and further characterised in that the first winding of the transformer is disposed in or on the first substrate and the second winding is disposed above the first winding and electrically insulated from the first winding, and the transformer is in an integrated circuit package."

Claim 1 according to the **first auxiliary request** reads as follows:

*"A three-chip signal isolator comprising:
a first chip having a first substrate and a second chip having a second substrate, the first substrate separate from the second substrate;
a transformer including a first winding and a second winding; an input circuit (245) connected to the first winding of the transformer to drive the transformer;
an output circuit (246) connected to the second winding of the transformer to generate an output signal in response to a signal from the transformer,
characterised by further comprising a third chip having a third substrate separate from the first substrate and the second substrate, and wherein the transformer (242) is formed on the first substrate (244), the input circuit is on the second substrate (252) and the output circuit (246) is on the third substrate, and further characterised in that:
the first winding of the transformer is disposed in or on the first substrate and the second winding is disposed above the first winding and electrically insulated from the first winding;
the first substrate is a non-semiconductor substrate made of an insulating material having a resistivity higher than silicon;*

the second and third substrates are semiconductor substrates."

- IV. The appellant's arguments in as far as they are relevant for this decision can be summarised as follows:

Claim 1 according to the main request was amended such that new subject-matter was added. The application as filed did not disclose an integrated circuit package. In Table 1 of the original application only packaging costs were mentioned, from which no information followed about the package itself. It was not disclosed which of the chips or which subset was packaged in what type of package and the amended claim allowed for a number of alternative packaging arrangements, e.g. only the transformer in the package, or all three chips in a single package, which lacked a basis in the original application.

The first auxiliary request should not be admitted into the proceedings. It was late-filed. All objections against the maintained claim had already been raised during the first instance proceedings and repeated in the statement of grounds of appeal. The respondent did not even file an appeal of their own, which would have been necessary to preserve their freedom of action in appeal.

- V. The respondent's arguments in as far as they are relevant for this decision can be summarised as follows:

Claim 1 according to the main request did not represent added subject-matter. From the embodiments A to C in Table 1 one could deduce that all substrates were in a

single package. If one assumed the package costs per isolator were P and the interconnection costs per chip were K, then it followed from embodiments A and B with two chips, that $P + 2K = 12$ cents, and from embodiment C, that $P + 3K = 15$ cents. It followed that $P = 6$ cents and $K = 3$ cents. If in embodiment C three separate packages had been envisaged, then the package costs would have had to be at least 3 times 6 cents = 18 cents, which is more than the 15 cents disclosed in Table 1. It followed that a single integrated circuit package was disclosed. This was also consistent with Figures 5, 8 and 17 which showed side-by-side substrates formed by integrated circuit manufacturing techniques. The figures thus implied a single integrated circuit package. While the passage on page 19, lines 1 to 4 of the original application is strictly about the size of the package, a skilled person would not read this passage so narrowly, but would instead understand the packages to be integrated circuit packages. It would be bizarre to think that devices like the present isolator would not be packaged. There was therefore a basis for the amendments.

The first auxiliary request should be admitted as it was a reaction to the preliminary opinion of the Board. There had been no need to file such a request during the opposition proceedings or with the reply to the grounds of appeal. The respondent had been confident that the decision of the Opposition Division would stand. A change of representative had taken place. It should be appreciated that only a single auxiliary request was filed about a month before the oral proceedings which was an attempt to deal with all outstanding issues.

Reasons for the Decision

1. The appeal is admissible.

2. *Main request - added subject-matter (Article 123(2) EPC)*
 - 2.1 Claim 1 has been amended in such a way that new subject-matter was added.

 - 2.2 Claim 1 according to the main request (i.e. as maintained in opposition proceedings), was amended by adding the feature that the transformer is in an integrated circuit package. It is important to realise that the amendment is directed
 - (a) to a certain type of package, namely an integrated circuit package and
 - (b) to a certain sub-component of the isolator, namely the transformer, being packaged.

 - The respondent never clearly defined what they understood by the term integrated circuit package. This term normally designates a specific type of package where a chip containing an integrated circuit is typically mounted to a lead frame and the ensemble is then potted in plastic, rather than just referring to any package containing an integrated circuit.

- 2.3 There is no literal basis for the amendment. Therefore it has to be considered what can otherwise directly and unambiguously be derived from the disclosure as filed.

2.4 Concerning point (a), the Board is not convinced that Table 1 or any other passage of the application as filed provides a basis for the specific type of package that is an integrated circuit package. What is disclosed in the application as filed is that two sub-components of the isolator contain semiconductor substrates with circuitry on them and could therefore arguably be considered integrated circuits. As pointed out above, however, the term integrated circuit package has a more specific meaning than just a package housing an integrated circuit chip. Therefore none of the references in the application as filed to parts of the isolator being integrated circuits or being fabricated by integrated circuit techniques allows a direct and unambiguous conclusion about the kind of package used.

Page 9, lines 39 to 40 of the A2-publication discloses that if the isolators of Figures 11 to 18 are packaged in appropriate combinations they can form multi-channel isolators. This is not a disclosure of what the package type would be, i.e. that it is an integrated circuit type package, or which chips or sub-components would be packaged.

Page 9, lines 50 to 51 of the A2-publication discloses that the isolators being chip-scale products can be packaged in integrated circuit-sized packages. This is merely a statement about the size rather than about the type of the package. The Board is not convinced by the respondent's argument that in the general context of the application, this passage would be understood to also refer to the type of integrated circuit package. The isolators contain transformer chips which due to their size and interconnect requirements are quite different from conventional integrated circuits. It may for example very well be possible that the input and

output circuit substrates are mounted on the printed circuit board containing the transformer windings. Whether a package for such an isolator would be a conventional integrated circuit package can simply not be directly and unambiguously derived from such a short passage.

The figures are schematic drawings of the substrates and do not show any package. They therefore do not offer any disclosure, let alone a direct and unambiguous one, about the package type or about which components of the isolator are packaged.

The Board cannot see any other passage that dealt with the type of package of the isolator.

There is therefore no disclosure of an integrated circuit package.

- 2.5 Concerning point (b) above, the respondent's own conclusion from the estimate of the packaging costs of Table 1 as filed is that all three substrates are packaged in a single integrated circuit package. It can be seen that the actual claim amendment is a generalisation from this conclusion, in that only the transformer package is addressed by the amendment, leaving it open whether and how other sub-components are packaged. Therefore, even if the respondent's conclusions were correct, they would fall short of providing a direct and unambiguous basis for the actual claim amendment.

It is to be noted, however, that the reasoning by the respondent leading to these conclusions rests itself on assumptions, such as for example that the total packaging costs were composed solely of package costs

and interconnection costs, that the package costs were the same for one, two or three chips in one package and that the interconnection costs for the transformer chip were the same as for the input and output circuits. These assumptions may be reasonable, but reasonable assumptions about details of the cost estimates cannot replace a direct and unambiguous disclosure of them. It follows that not even the conclusion that all chips are in a single package can be considered directly and unambiguously derivable from Table 1 as filed.

- 2.6 Since there is no direct and unambiguous disclosure of a signal isolator with its transformer being in an integrated circuit package, new subject-matter was added by the amendments, contrary to the requirements of Article 123(2) EPC.

3. *First auxiliary request - Admissibility*

- 3.1 According to Article 12(2) of the Rules of Procedure of the Boards of Appeal (RPBA) the reply to the statement of grounds shall contain a party's complete case. According to Articles 13(1) RPBA admittance of amendments to a party's case filed after the reply to the grounds of appeal is at the discretion of the Board.

- 3.2 The Board does appreciate that the submission filed about a month before the oral proceedings contained only a single auxiliary request. Nevertheless, any party has to take into consideration the fact that a Board of Appeal might not agree with the judgement of the decision under appeal. In the case at hand, the Board did not raise any new objection or even new arguments in their preliminary opinion but merely

agreed with the appellant and disagreed with the arguments of the Opposition Division on an issue that had been discussed already during the first instance proceedings. Therefore, even if the respondent might not have perceived a need to file an auxiliary request at the time of filing the reply to the grounds of appeal, that is not a legitimate reason to wait until after the summons to oral proceedings before filing the first auxiliary request. If the respondent had wanted to pursue a fallback position such as the first auxiliary request then, in accordance with Article 12(2) RPBA, this should have been filed with the reply to the statement of grounds of appeal. This applies in particular since the amendments made in this request involve not only the deletion of the previously added feature which had been the subject of the sole issue in the decision under appeal, but also the addition of features taken only from the description. Moreover, a change of representative normally does not justify late filing. A new representative is expected to pick up the case as it stands.

- 3.3 Since there is no satisfactory justification for the late-filing, the Board exercised its discretion under Article 13(1) RPBA not to admit the first auxiliary request into the proceedings.

4. Since the only request of the respondent which has been admitted into the proceedings is not allowable, the Board had to accede to the request of the appellant.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.
2. The patent is revoked.

The Registrar:

The Chairman:



U. Bultmann

R. Lord

Decision electronically authenticated