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**D E C I S I O N**  
**of 19 July 2001**

**Case Number:** T 0671/97 - 3.4.3

**Application Number:** 91308391.1

**Publication Number:** 0478188

**IPC:** H01L 25/11

**Language of the proceedings:** EN

**Title of invention:**

Integrated circuit package and compact assemblies thereof

**Applicant:**

AT&T Corp.

**Opponent:**

-

**Headword:**

Prismatic structure/AT&T

**Relevant legal provisions:**

EPC Art. 84, 54

**Keyword:**

"Clarity (no)"

"Novelty (no)"

**Decisions cited:**

-

**Catchword:**

-



Case Number: T 0671/97 - 3.4.3

**D E C I S I O N**  
**of the Technical Board of Appeal 3.4.3**  
**of 19 July 2001**

**Appellant:** AT&T Corp.  
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New York, NY 10013-2412 (US)

**Representative:** Williams, David John  
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**Decision under appeal:** Decision of the Examining Division of the  
European Patent Office posted 5 November 1996  
refusing European patent application  
No. 91 308 391.1 pursuant to Article 97(1) EPC.

**Composition of the Board:**

**Chairman:** R. K. Shukla  
**Members:** G. L. Eliasson  
M. J. Vogel

## Summary of Facts and Submissions

I. European patent application No. 91 308 391.1 was refused in a decision of the examining division dated 5 November 1996. The ground for the refusal was that the requirements of Articles 84, 52(1), and 54 EPC were not met, since claim 1 filed with the letter dated 27 April 1995 was not clear, and furthermore, as far as it could be understood, the subject matter of claim 1 was not new with respect to the prior art document

D1: WO-A-84 01 470.

II. Claim 1 as refused by the examining division reads as follows:

"1. An integrated circuit package (10 of FIGS), comprising:

a thermally conductive plate (11) for supporting an integrated circuit,

a rectangular prismatic structure (20) with a central opening, exterior transverse surfaces and interior peripheral surfaces with respect to said opening and parallel lateral surfaces, said rectangular structure mounted on said conductive plate (11) with said interior peripheral surfaces positioned for extending around the periphery of an integrated circuit;

at least one interior peripheral surface presenting at least one linear array of contact means (e. g. B11, B12) for interconnection with contacts on said integrated circuit;

each of said contact means provided with electrical connection extending laterally through said rectangular structure to a respective exterior transverse surface (e.g. B14 of Figure 3 extending to L14); and

each of said contact means provided with electrical connection transversely through said rectangular structure to the overlying lateral surface (e.g. T14)."

III. The reasoning in the decision for the finding of lack of clarity and lack of novelty can be summarized as follows:

(a) Claim 1 is not clear, contrary to the requirements of Article 84 EPC, since it does not define the meaning of "exterior transverse surfaces" and "parallel lateral surfaces". Therefore, it is impossible to determine, according to the wording of claim 1, which of the six exterior surfaces of the rectangular structure are transverse and which are lateral.

(b) Insofar as claim 1 can be understood, it appears that the subject matter of claim 1 is not new with respect to document D1: In the device shown in Figures 1 to 3, each of the contact means for interconnecting with contacts on the integrated circuit chip 51 is provided with a connection 48 extending to an outer transverse surface of the rectangular structure where it terminates in a recessed region 60 in the surface. A metallization in each recessed region provides an electrical connection extending to a contact pad 62 on the top surface of the circuit package. The subject matter of claim 1 does not exclude electrical

connections running through the structure in recessed regions like the ones in document D1.

- (c) Furthermore, the subject matter of claim 1 is also not new with respect to the embodiments of Figures 31 to 33, and 26 of document D1.

IV. The appellant (applicant) lodged an appeal on 19 December 1996, paying the appeal fee on 23 December 1996. A statement of the grounds of appeal was filed on 4 March 1997.

The appellant requests that the decision under appeal be set aside and a patent be granted based on claims 1 to 4 filed with the letter dated 27 April 1995, and claims 5 to 13 as filed.

V. The appellant presented essentially the following arguments in support of his requests:

- (a) The initial element of claim 1 is the thermally conductive plate and is thus the point of reference to which "transverse" and "parallel" refer. Furthermore, "interior" and "exterior" are with respect to the opening of the rectangular prismatic structure. Therefore, there is no ambiguity regarding transverse and parallel surfaces of the prismatic structure.
- (b) Contrary to the reasons given in the decision under appeal, the subject matter of claim 1 is new, since document D1 does not disclose a vertical electrical connection through the body to both a transverse exterior surface and an overlying lateral surface, as defined in claim 1:

Figure 1 of document D1 shows the vertical electrical connection on the outside of the body in recessed regions and not through the body.

## **Reasons for the Decision**

1. The appeal complies with Articles 106 to 108 and Rule 64 EPC and is therefore admissible.
  
2. *Clarity*

According to the decision under appeal, claim 1 does not clearly define the transverse and lateral surfaces of the rectangular prismatic structure. The appellant has on the other hand submitted that these surfaces are defined with respect to the thermally conductive plate on which the rectangular prismatic structure is mounted, and are accordingly clearly defined. The Board however cannot follow this submission, since it is not derivable from the wording of the claim that the rectangular prismatic structure comprises transverse (or parallel) surfaces with respect to the thermally conductive plate. Claim 1 therefore does not comply with Article 84 EPC.

3. *Novelty*

Notwithstanding the above and interpreting claim 1 in the light of the arguments presented by the appellant, i.e. that "lateral" and "transverse" are to be interpreted with respect to the thermal conductive plate (cf. item V(a) above), claim 1 does not meet the requirements of novelty according to Article 54 EPC for the following reasons:

3.1 Document D1 discloses several embodiments of an integrated circuit package. The integrated circuit package depicted in Figures 1 to 3 comprises a thermally conductive plate 42 for supporting an integrated circuit chip 51. A rectangular prismatic structure with a central opening is put together by the layers 46, 52, and 58 on the plate 42 and surrounds the integrated circuit chip. At the interior peripheral surfaces of the rectangular structure facing the integrated circuit chip, linear arrays of contact means are provided for interconnecting with contacts on the integrated circuit chip 51. Each of the contact means is provided with an electrical connection 48 extending to an exterior transverse surface of the rectangular structure where it terminates in a recessed region 60 in the surface. The recessed regions 60 are metallized providing electrical connections to contact pads 62 on the overlying lateral surface of the circuit package.

3.2 The appellant argued that the term "through the rectangular structure" in claim 1 requires that the electrical connection extends inside the body of the rectangular structure to the overlying lateral surface. In the device shown in Figures 1 to 3 of document D1, on the other hand, the electrical connections extend along recessed regions 60 formed in the exterior transverse surfaces and are thus exposed at the outer transverse surface of the rectangular structure.

3.2.1 The Board agrees however with the view held in the decision under appeal that the electrical connection in form of a metallized layer extending along the rectangular structure in a recessed region, as shown in Figures 1 to 3 of document D1, also falls within the term "through the rectangular structure", since the

electrical connection extends transversely from the contact means to the overlying surface along a *recess which extends into the body of the rectangular prismatic structure*. In the Board's view, the term "through" does not necessarily mean that the electrical connection is *within* the rectangular structure. Therefore, a metallized layer in a recessed region 60 as in Figures 1 to 3 is thus considered to be extending through the structure.

Thus, all the features of claim 1 are disclosed in the embodiment of Figures 1 to 3 of document D1.

3.3 Moreover, the embodiment of Figures 31 to 33 of document D1 differs from the embodiment of Figures 1 to 3 in that the electrical connection to the contact pads 202 on the overlying lateral surface is in form of vertical via connections 204 extending through the interior of the rectangular structure (cf. in particular Figure 33). The lateral electrical connections 210 extending from the interior peripheral surfaces may terminate in recessed regions at the exterior transverse surfaces, as for the device of Figures 1 to 3, in order to provide for additional interconnects (cf. page 39, lines 8 to 11).

3.4 Thus, the embodiment of Figures 31 to 33 of document D1 discloses via connections 204 extending through the interior of the rectangular structure, as in the embodiments of the application in suit, whereby the term "through" is interpreted narrowly as submitted by the appellant. The appellant has not presented any other arguments which would be relevant to this embodiment. Therefore, the embodiment of Figures 31 to 33 also discloses all the features of claim 1.



3.5 For the above reasons, in the Board's judgment, the subject matter of claim 1 is not new within the meaning of Article 54(1) and (2) EPC. The patent application therefore does not meet the requirements of Article 52(1) EPC.

## **Order**

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

The appeal is dismissed.

The Registrar:

The Chairman:

M. Beer

R. K. Shukla