Abstract

A heat conductive metal layer (200) is formed over a backside of an integrated circuit chip (102), attached via an epoxy or other die attachment material (106) to a substrate (104). The metal layer (200) improves heat dissipation by conducting heat from the chip (102) around voids (109) present in the die attach material. Metal layer (200) may be of composite construction, having a primary metal layer, one or more barrier metal layers, an adhesive metal layer to improve metal adherence to the chip, and a solder layer to enable optional direct solder attachment to a substrate.
For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.
INTERNATIONAL SEARCH REPORT

PCT/US06/19850

A. CLASSIFICATION OF SUBJECT MATTER
USPC: 257/276, 625, 706, 707, 712-722, 796, E33.075, E31.131, E23.051, E23.08-E23.113
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED
Minimum documentation searched (classification system followed by classification symbols)
U.S.: 257/276, 625, 706, 707, 712-722, 796, E33.075, E31.131, E23.051, E23.08-E23.113

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
Electronic Packaging & Interconnection Handbook, Charles A. Harper

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
EAST

C. DOCUMENTS CONSIDERED TO BE RELEVANT

<table>
<thead>
<tr>
<th>Category</th>
<th>Citation of document, with indication, where appropriate, of the relevant passages</th>
<th>Relevant to claim No.</th>
</tr>
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<tbody>
<tr>
<td>X</td>
<td>US 6,756,668 A (Baek et al.) 29 June 2004 (29.06.2004), Columns 1-6, and Figs. 5-6.</td>
<td>1-10</td>
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</table>

Further documents are listed in the continuation of Box C. See patent family annex.

Date of the actual completion of the international search
28 November 2006 (28.11.2006)

Date of mailing of the international search report
09 FEB 2007

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