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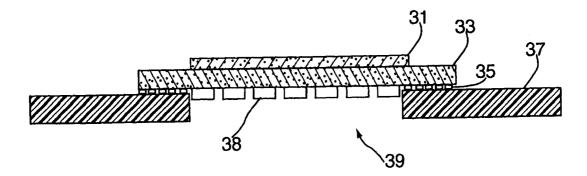
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With international search report.

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(54) Title: LAND-SIDE MOUNTING OF COMPONENTS TO AN INTEGRATED CIRCUIT PACKAGE



(57) Abstract

A method and apparatus is presented to allow one or more electrical components to be coupled to the land-side of an integrated circuit package coupled to a circuit board. In a first embodiment, a void is provided in the circuit board, and a peripheral area of the integrated circuit package is coupled to a peripheral area around the void. This provides space for the insertion of components in the land-side of the integrated circuit package. In a second embodiment, a spacer is provided coupled to the peripheral area of the integrated circuit package to allow the insertion of components into the land-side of the package and above the circuit board. With these embodiments of the present invention, components, such as decoupling capacitors can be coupled closer to the die (e.g. a processor die) of the package thus reducing parasitic inductance.

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A. CLASSIF IPC 7	HO1L23/13 HO1L23/538 HO1L25/19	5 H01L25/16			
	International Patent Classification (IPC) or to both national classificat	ion and IPC			
B. FIELDS	SEARCHED cumentation searched (classification system followed by classification	n symbols)			
IPC 7	H01L		·		
Documentat	on searched other than minimum documentation to the extent that su	ch documents are included in the fields se	arched		
Electronic da	ata base consulted during the international search (name of data base	e and, where practical, search terms used)			
C. DOCUME	ENTS CONSIDERED TO BE RELEVANT				
Category °	Citation of document, with indication, where appropriate, of the rele	vant passages	Relevant to claim No.		
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	figures 9,10,15				
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X Furt	her documents are listed in the continuation of box C.	Patent family members are listed	in annex.		
° Special ca	tegories of cited documents :	"T" later document published after the inte or priority date and not in conflict with	rnational filing date		
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other means ments, such combination being obvious to a person skilled in the art.					
	nan the priority date claimed actual completion of the international search	"&" document member of the same patent Date of mailing of the international sea			
Date of the	actual completion of the international search		2.011100011		
1	1 January 2000	2 6 JAN 2000			
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C (Continue	ation) DOCUMENTS CONSIDERED TO BE RELEVANT	
Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 0 822 595 A (TAIYO YUDEN KK) 4 February 1998 (1998-02-04) column 3, line 35 -column 4, line 49; figure 1	5-15,17, 18
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Inc. ational application No. PCT/US 99/16067

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)
This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:
1. Claims Nos.: because they relate to subject matter not required to be searched by this Authority, namely:
2. Claims Nos.: because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
3. Claims Nos.: because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).
Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)
This International Searching Authority found multiple inventions in this international application, as follows:
see additional sheet
1. X As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
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FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. Claims: 1-4,16

Electronic circuit assembly, and method of manufacturing the same, comprising an integrated circuit package having a land-side, said land-side being adapted to be coupled to an electrical component as well as to a circuit board, characterized in that said circuit board has a void and that said integrated circuit package is adapted to be coupled to said printed circuit board at a peripheral area around said void.

2. Claims: 5-15,17-18

Electronic circuit assembly, and method of manufacturing the same, comprising an integrated circuit package having a land-side, said land-side being adapted to be coupled to an electrical component as well as to a circuit board, characterized in that said land-side has a peripheral area to which a spacer is coupled, said spacer being adapted to be coupled to said circuit board.

information on patent family members

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