



(12) **EUROPEAN PATENT APPLICATION**

(88) Date of publication A3:
17.10.2001 Bulletin 2001/42

(51) Int Cl.7: **H05K 1/18**, H01L 23/498,
H05K 3/34

(43) Date of publication A2:
24.01.2001 Bulletin 2001/04

(21) Application number: **00306001.9**

(22) Date of filing: **14.07.2000**

(84) Designated Contracting States:
**AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU
MC NL PT SE**
Designated Extension States:
AL LT LV MK RO SI

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(30) Priority: **22.07.1999 JP 20742999**

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(54) **Multilayer circuit board**

(57) The present invention provides a multilayer circuit board for mounting thereon a semiconductor chip or other electronic elements having electrode terminals or other connection terminals which are arranged in a grid, staggered, or close-packed manner in an improved form to enable reduction in the number of the wiring layers for lead wiring lines, thereby facilitating the production of multilayer circuit boards and providing an improved product reliability. The multilayer circuit board comprises: a base board having a mounting surface for mounting thereon a semiconductor chip and/or other electronic elements having lattice-arranged connection terminals; connection terminal pads (8) arranged on the mounting surface to form a plane lattice corresponding to the lattice arrangement of the connection terminals and having lattice sites each occupied by one of the connection terminal pads (8); lead wiring lines (7) lying on the mounting surface and having one end connected to the connection terminal pads (8) and the other end extending outwardly from the plane lattice; and the said plane lattice having a peripheral zone including periodic vacant lattice areas (A) formed by vacant lattice sites (10) occupied by no connection terminal pads (8).

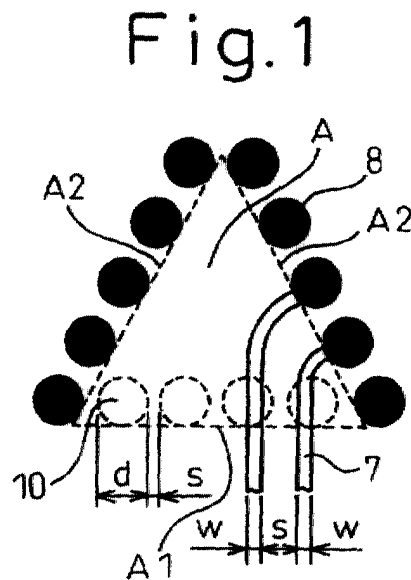
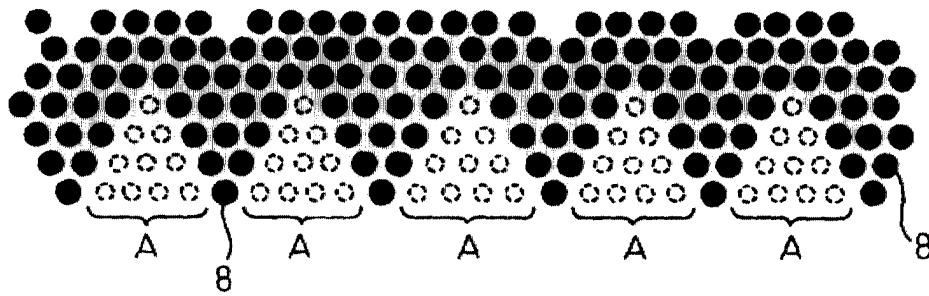


Fig.2





European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 00 30 6001

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
A	US 5 784 262 A (SHERMAN JOHN V) 21 July 1998 (1998-07-21) * the whole document * ---	1-6	H05K1/18 H01L23/498 H05K3/34
A	EP 0 898 311 A (NIPPON ELECTRIC CO) 24 February 1999 (1999-02-24) * the whole document * -----	1-6	
			TECHNICAL FIELDS SEARCHED (Int.Cl.7)
			H01L H05K
The present search report has been drawn up for all claims			
Place of search MUNICH		Date of completion of the search 24 August 2001	Examiner Van Reeth, K
<p>CATEGORY OF CITED DOCUMENTS</p> <p>X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document</p> <p>T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons</p> <p>& : member of the same patent family, corresponding document</p>			

EPO FORM 1503 03 82 (Pct/C01)

ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.

EP 00 30 6001

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24-08-2001

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 5784262 A	21-07-1998	KR 258263 B	01-06-2000
EP 0898311 A	24-02-1999	JP 11067960 A	09-03-1999
		CN 1208961 A	24-02-1999
		TW 401731 B	11-08-2000