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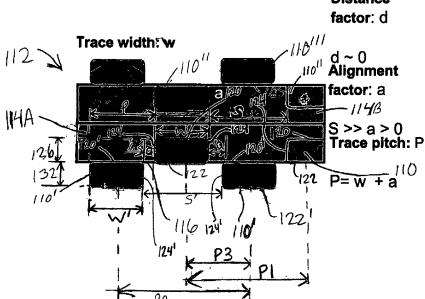
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[Continued on next page]

(54) Title: MICROELECTRONIC INTERCONNECT ELEMENT WITH DECREASED CONDUCTOR SPACING

F16,3A

Distance factor: d



(57) Abstract: A microelectronic interconnect element can include a plurality of first metal lines (110) and plurality of second metal lines (110') interleaved with the first metal lines (110). Each of the first and second metal lines has a surface (122), (120') extending within the same reference plane. The first metal lines (110) have surfaces (120) above the reference plane and remote therefrom and the second metal lines (110') have surfaces (122') below the reference plane and remote therefrom. A dielectric layer (114A) can separate a metal line of the first metal lines from an adjacent metal line of the second metal lines.

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A. CLASSI INV. ADD.	FICATION OF SUBJECT MATTER H01L23/498 H01L21/48		
According to	o International Patent Classification (IPC) or to both national classific	ation and IPC	
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Minimum do H01L	ocumentation searched (classification system followed by classificati	ion symbols)	·
Documentat	tion searched other than minimum documentation to the extent that s	such documents are include	ed in the fields searched
EPO-In	ata base consulted during the international search (name of data ba	se and, where practical, so	earch terms used)
C. DOCUME	ENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the rel	evant passages	Relevant to claim No.
X	EP 0 560 077 A2 (ROGERS CORP [US] CORP [DE]) 15 September 1993 (199 figure 34		1-13
X	US 2008/020132 A1 (HUEMOELLER ROMEUS) ET AL HUEMOELLER ROMALD PATE ET AL) 24 January 2008 (2008-01-2 figure 1N	RICK [US]	1-13
X	US 6 150 721 A (BANDYOPADHYAY BAS ET AL) 21 November 2000 (2000-11- figure 2		1-13
X	US 2001/028112 A1 (MA KIN F [US] 11 October 2001 (2001-10-11) figure 4	ET AL)	1-13
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X Furth	ner documents are listed in the continuation of Box C.	X See patent family	annex.
* Special ca	ategories of cited documents :	"T" later document publish	ned after the international filing date
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PCT/US2009/004033

·/C	DOCUMENTO CONCIDENTE TO DE SELEVA	PCT/US2009/004033
	tion). DOCUMENTS CONSIDERED TO BE RELEVANT	
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2002/105088 A1 (YANG WON-SUK [KR] ET AL) 8 August 2002 (2002-08-08) figure 2	1-13
(US 2005/082674 A1 (SETA SHOJI [JP] ET AL) 21 April 2005 (2005-04-21) figure 25	1-13
X	EP 0 966 035 A1 (SIEMENS AG [DE] INFINEON TECHNOLOGIES AG [DE]) 22 December 1999 (1999-12-22) figure 4	1-13

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No PCT/US2009/004033

Patent document cited in search report		Publication date	Patent family Publication date
EP 0560077	A2	15-09-1993	US 5440805 A 15-08-199 US 5287619 A 22-02-199
US 2008020132	A1	24-01-2008	NONE
US 6150721	Α	21-11-2000	WO 9747036 A1 11-12-199 US 5846876 A 08-12-199
US 2001028112	A1	11-10-2001	NONE
US 2002105088	A1	08-08-2002	JP 4283470 B2 24-06-200 JP 2002246466 A 30-08-200 KR 20020065983 A 14-08-200
US 2005082674	A1	21-04-2005	NONE
EP 0966035	A1	22-12-1999	CN 1254949 A 31-05-200 DE 69930027 T2 14-09-200 JP 2000031280 A 28-01-200 KR 2000006238 A 25-01-200 TW 417204 B 01-01-200 US 6137178 A 24-10-200