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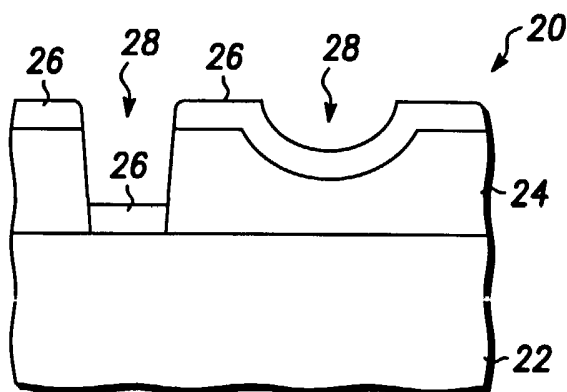
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(54) Title: REMOVING AN AMORPHOUS OXIDE FROM A MONOCRYSTALLINE SURFACE



(57) Abstract: A method of removing an amorphous oxide (24) from a surface of a monocrystalline substrate (22) is provided. The method includes depositing a passivation material (26) overlying the amorphous oxide. The monocrystalline substrate is then heated so that the amorphous oxide layer decomposes into at least one volatile species that is liberated from the surface.

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## INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 02/32344

<b>A. CLASSIFICATION OF SUBJECT MATTER</b> IPC 7 H01L21/00 C30B33/00 C30B23/02		
According to International Patent Classification (IPC) or to both national classification and IPC		
<b>B. FIELDS SEARCHED</b> Minimum documentation searched (classification system followed by classification symbols) IPC 7 H01L C30B		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched		
Electronic data base consulted during the international search (name of data base and, where practical, search terms used) EPO-Internal, PAJ		
<b>C. DOCUMENTS CONSIDERED TO BE RELEVANT</b>		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 1 043 427 A (MOTOROLA INC) 11 October 2000 (2000-10-11) column 3, line 21 - line 53 ---	1-15
X	US 6 113 690 A (ABROKWAH JONATHAN K ET AL) 5 September 2000 (2000-09-05) the whole document ---	1-15
X	EP 1 069 605 A (MOTOROLA INC) 17 January 2001 (2001-01-17) paragraph '0009! - paragraph '0016! ---	1-15
A	US 6 291 866 B1 (WILK GLEN D ET AL) 18 September 2001 (2001-09-18) --- -/--	
<input checked="" type="checkbox"/> Further documents are listed in the continuation of box C. <input checked="" type="checkbox"/> Patent family members are listed in annex.		
* Special categories of cited documents : *A* document defining the general state of the art which is not considered to be of particular relevance *E* earlier document but published on or after the international filing date *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) *O* document referring to an oral disclosure, use, exhibition or other means *P* document published prior to the international filing date but later than the priority date claimed *T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention *X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone *Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art. *&* document member of the same patent family		
Date of the actual completion of the international search		Date of mailing of the international search report
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Name and mailing address of the ISA European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016		Authorized officer  Cook, S

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
P,X	<p>DROOPAD R ET AL: "Development of high dielectric constant epitaxial oxides on silicon by molecular beam epitaxy" MATERIALS SCIENCE AND ENGINEERING B, ELSEVIER SEQUOIA, LAUSANNE, CH, vol. 87, no. 3, 19 December 2001 (2001-12-19), pages 292-296, XP004310489 ISSN: 0921-5107 the whole document -----</p>	1,3-13

# INTERNATIONAL SEARCH REPORT

Information on patent family members

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Patent document cited in search report		Publication date	Patent family member(s)	Publication date
EP 1043427	A	11-10-2000	US 6248459 B1	19-06-2001
			EP 1043427 A1	11-10-2000
			JP 2000294553 A	20-10-2000
US 6113690	A	05-09-2000	NONE	
EP 1069605	A	17-01-2001	US 6319730 B1	20-11-2001
			CN 1281245 A	24-01-2001
			EP 1069605 A2	17-01-2001
			JP 2001068467 A	16-03-2001
			SG 85710 A1	15-01-2002
			TW 468211 B	11-12-2001
US 6291866	B1	18-09-2001	US 6013553 A	11-01-2000
			JP 2000058832 A	25-02-2000
			TW 402779 B	21-08-2000
			US 6020243 A	01-02-2000
			US 6291867 B1	18-09-2001
			US 2001024853 A1	27-09-2001