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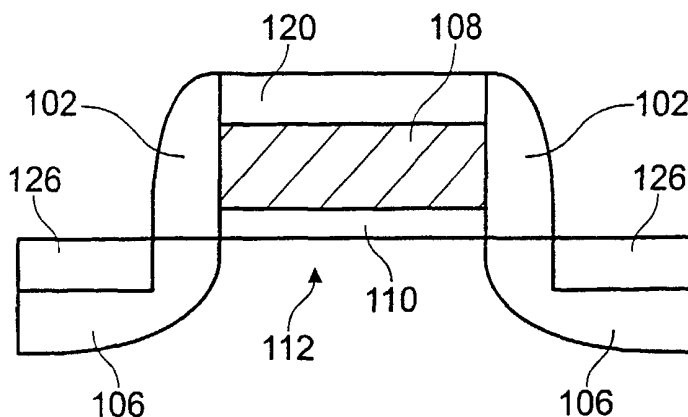
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- (74) Agents: **MILLIKEN, Darren, J.** et al.; Blakely, Sokoloff, Taylor & Zafman LLP, 7th floor, 12400 Wilshire Boulevard, Los Angeles, CA 90025 (US).
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- (71) Applicant (*for all designated States except US*): **INTEL CORPORATION** [US/US]; 2200 Mission College Boulevard, Santa Clara, CA 95052 (US).
- (72) Inventors; and
- (75) Inventors/Applicants (*for US only*): **BAI, Gang** [CN/US]; 1247 Sajak Avenue, San Jose, CA 95131 (US). **JACOB, Pauline, N.** [US/US]; 14648 NW Heathman Lane, Portland, OR 97229 (US). **JAN, Chia-Hong** [—/US]; 3995 N.W. 176th Avenue, Portland, OR 97229 (US). **TSAI, Julie, A.** [US/US]; 15021 S.W. Telluride Terrace, Beaverton, OR 97007 (US).
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(54) Title: AMORPHIZATION OF SUBSTRATE TO PREVENT SILICIDE ENCROACHMENT INTO CHANNEL REGION OF FIELD EFFECT TRANSISTOR



(57) Abstract: A MOSFET includes silicided source/drain terminals (106) and a substantially metal-free channel region (112), wherein the metal is characterized in that it diffuses more easily into the material of the substrate which contains the source/drain terminals (106) than the material of the substrate diffuses into the metal. In a further aspect of the present invention, a portion of the source/drain terminals (106) of a MOSFET are converted to an amorphous material (122) prior to being reacted with a metal.

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INTERNATIONAL SEARCH REPORT

International application No.
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A. CLASSIFICATION OF SUBJECT MATTER		
IPC(6) : HO1L 29/76 US CL : 257/385, 386, 387, 388 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. : 257/385, 386, 387, 388		
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 practicable, search terms used)		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5,807,770 A (MINEJI) 15 September 1998 (15.09.98), col. 5, lines 6-28.	1-6, 10, 11, 15-19
X	US 5,766,997 A (TAKEUCHI) 16 June 1998 (16.06.98), col. 6, lines 44-68.	1-17, 19, 20
X	US 5,899,720 A (MIKAGI) 04 May 1999 (04.05.99), col. 5, lines 2-22.	1-11, 13, 19, 20
X	US 5,691,212 A (TSAI et.al.) 25 November 1997 (25.11.99), col. 5, lines 14-67.	1-11, 13, 15, 18-20
X	US 5,710,450 A (CHAU et.al.) 20 January 1998 (20.01.98), col. 3, lines 4-65.	1-6
X	US 6,010,936 A (SON) 04 January 2000 (04.01.00), col 3, lines 3-58.	1-6, 8
<input checked="" type="checkbox"/> Further documents are listed in the continuation of Box C. <input type="checkbox"/> See patent family annex.		
* Special categories of cited documents:	"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
"A" document defining the general state of the art which is not considered to be of particular relevance	"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
"E" earlier document published on or after the international filing date	"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
"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)	"&"	document member of the same patent family
"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		
Date of the actual completion of the international search 02 FEBRUARY 2000	Date of mailing of the international search report 18 JUL 2000	
Name and mailing address of the ISA/US Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20231 Facsimile No. (703) 305-3230	Authorized officer EDGARDO ORTIZ Telephone No. (703) 308-0956	

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US99/26865

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	JP 405136398 A (HAYASHIDA) 06 June 1993 (06.06.93), abstract	1-6
Y	JP 362122173 A (IMAOKA) 03 June 1987 (03.06.87), abstract	1-6

INTERNATIONAL SEARCH REPORT

International application No.
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Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This international 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:

Please See Extra Sheet.

1. 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.:

4. No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

- Remark on Protest**
- The additional search fees were accompanied by the applicant's protest.
- No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

International application No.
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BOX II. OBSERVATIONS WHERE UNITY OF INVENTION WAS LACKING

This ISA found multiple inventions as follows:

This application contains the following inventions or groups of inventions which are not so linked as to form a single inventive concept under PCT Rule 13.1. In order for all inventions to be searched, the appropriate additional search fees must be paid.

Group I, claim(s)1-18, drawn to a method of forming a transistor.

Group II, claim(s)19-20, drawn to a field effect semiconductor device.

The inventions listed as Groups I and II do not relate to a single inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons: The claims relating to a method of forming a transistor contain the special technical feature consisting of an amorphous portion on the source/drain regions, whereas the claims relating to the field effect semiconductor device do not include the special technical feature described.