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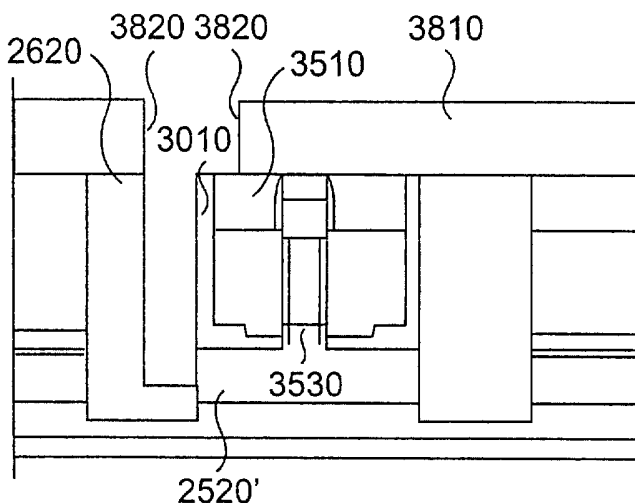
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(54) Title: VERTICAL DUAL GATE FIELD EFFECT TRANSISTOR



(57) Abstract: A vertical transistor particularly suitable for high density integration includes potentially independent gate structures (3230) on opposite sides of a semiconductor pillar (2910) formed by etching in a trench. The gate structure is surrounded by insulating material (2620) which is selectively etchable to isolation material surrounding the transistor. A contact (3820) is made to the lower end of the pillar by selectively etching the isolation material selective to the insulating material. The upper end of the pillar is covered by a cap (2730) and sidewalls of selectively etchable materials so that gate and source connection openings (3720, 3620) can also be made by selective etching with good registration tolerance.



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For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US02/28265

A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) :Please See Extra Sheet.

US CL :257/328-331; 438/212, 259, 268, 270, 271, 587-589

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. : 257/328-331; 438/212, 259, 268, 270, 271, 587-589

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
NONE

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

USPTO APS EAST

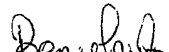
C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X,P --- Y,P	US 6,392,271 B1 (ALAVI et al) 21 May 2002 (21.05.2002), column 3, line 56 - column 6, line 56.	1-10 ----- 25-28,35
X --- Y --- A	US 5,529,303 A (MALHI et al) 08 March 1994 (08.03.1994), column 8, line 36 - column 9, line 2.	18,19,32,38-40 ----- 25-28,35 ----- 11-17,20-24,29-31,33,34,36,37,41-44

Further documents are listed in the continuation of Box C.

See patent family annex.

"A"	document defining the general state of the art which is not considered to be of particular relevance	"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
"E"	earlier document published on or after the international filing date	"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
"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)	"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
"O"	document referring to an oral disclosure, use, exhibition or other means	"&"	document member of the same patent family
"P"	document published prior to the international filing date but later than the priority date claimed		

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