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(54) **Title:** LATERAL DRIFT VERTICAL METAL-INSULATOR SEMICONDUCTORS

(57) **Abstract:** A lateral drift vertical metal-insulated field effect transistor (LDVMISFET) with an optimum conducting channel formed in Silicon Carbide, is provided as a power transistor with a voltage rating of greater than 200V. The lateral drift region achieves a better on-resistance/breakdown voltage trade-off than the conventional vertical drift region design of power MOSFETs. This is achieved by using an optimal doping and thickness for the voltage blocking and current conduction. The drain and backside terminal is able to support at least the rated blocking voltage of the device. A vertical MIS channel may be formed on the favorable 11-20 plane to achieve a higher MIS channel mobility as compared to the conventional 0001 or 000-1 planes resulting in a much lower on-resistance for the same blocking voltage as compared to conventional vertical MOSFET with similar blocking voltage.

INTERNATIONAL SEARCH REPORT

International application No.

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A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : H01L 29/80, 31/0288, 31/112
 US CL : 257/336

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. : 257/336, 263, 302, 3, 28, 329

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.
A	US 2003/0168919 A1 (FRIEDRICHS et al.) 11 September 2003(11.09.2003).	1-22
A	US 6,660,375 B1 (MILLER et al) 09 December 2003(12.09.2003).	1-22

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See patent family annex.

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