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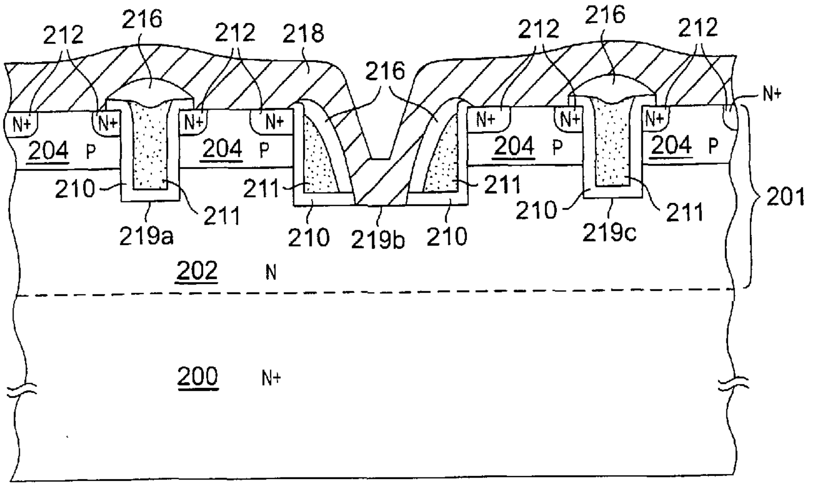
(54) Title: TRENCH DMOS TRANSISTOR WITH EMBEDDED TRENCH SCHOTTKY RECTIFIER



(57) Abstract: A merged device is that comprises a plurality of MOSFET cells (219) and a plurality of Schottky rectifier cells (S), as well as a method of designing and making the same. According to an embodiment of the invention, the MOSFET cells comprise: (a) a source region (212) of first conductivity type formed within an upper portion of a semiconductor region (201), (b) a body region (204) of second conductivity type formed within a middle portion of the semiconductor region (201), (c) a drain region (202) of first conductivity type formed within a lower portion of the semidonductor region (201), and (d) a gate region (211) provided adjacent the source region (212), the body region (204), and the drain region (202). The Schottky diode cells (S) in this embodiment are disposed within a trench network (219a, 219b, 219c) and comprise a conductor portion (218) in Schottky rectifying contact with the lower portion of the semiconductor region (201). At least one MOSFET cell gate region (211) is positioned along a sidewall of the trench network (219a, 219b, 219c) and adjacent at least one Schottky diode cell (S) in this embodiment.

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INTERNATIONAL SEARCH REPORT

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A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : H01L 21/336, 29/76, 29/94
US CL : 438/268,270,272; 257/328,329,331
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. : 438/268,270,272; 257/328,329,331

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)
EAST

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 6,049,108 A (Williams et al.) 11 April 2000 (11.04.2000), column 7, line 20 through column 8,line 11.	1-8, 10-15, 24-27
X, P	US 6,351,018 B1 (Sapp) 26 February 2002 (26.02.2002), column 3, line 45 through column 5, line 63.	1-8, 10-15, 24-27

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