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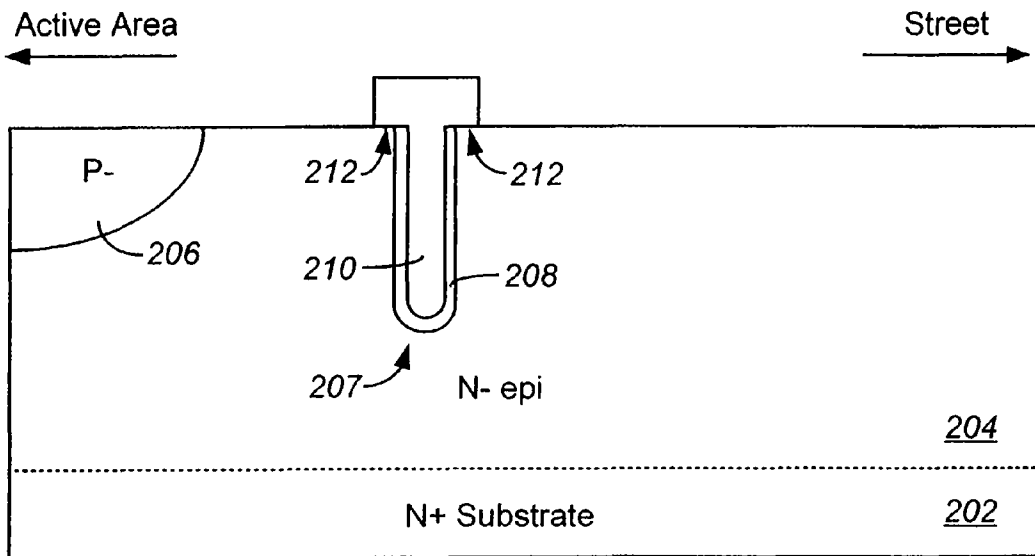
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- Declaration under Rule 4.17:**
— as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))
- Published:**
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[Continued on next page]

(54) Title: TRENCH FIELD PLATE TERMINATION FOR POWER DEVICES



(57) Abstract: In accordance with an embodiment of the invention, a semiconductor power device includes an active region configured to conduct current when the semiconductor device is biased in a conducting state, and a termination region along a periphery of the active region. A first silicon region of a first conductivity type extends to a first depth within a second silicon region of a second conductivity type, the first and second silicon regions forming a PN junction therebetween. At least one termination trench is formed in the termination. The termination trench extends into the second silicon region, and is laterally spaced from the first silicon region. An insulating layer lines the sidewalls and bottom of the termination trench. A conductive electrode at least partially fills the termination trench.

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International application No.

PCT/US 06/61217

A. CLASSIFICATION OF SUBJECT MATTER

IPC(8) - H01L 29/00 (2008.04)

USPC - 257/488

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)
257/488; 12 August 2008 (12.08.2008)Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
257/487; 257/488; 257/490; 257/495; 257/E29.009; 12 August 2008 (12.08.2008)

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

PubWEST(USPT,PGPB,EPAB,JPAB); DialogPRO(Engineering); Google Scholar

Search Terms: termination plate, termination trench, multiple trench isolation, active area, floating pn junction, second isolation trench, semiconductor trench electrode, trench electrode, trench filled plate termination. 12 August 2008 (12.08.2008)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2005/0270869 A1 (Krischke et al.) 08 December 2005 (08.12.2005), entire document especially para. [0010], [0044], [0054], [0059], [0061].	1-4, 6, 8, 11, 14-17, 20-22, 25, 28-29, 32, 34-41

Y		5, 7, 9-10, 12-13, 18-19, 23-24, 26-27, 30-31, 33, 42-44
Y	US 5,414,292 A (Williams) 09 May 1995 (09.05.1995), entire document especially abstract; fig. 1, col. 1, ln 1-10	5, 7, 9-10, 13, 18-19, 23-24, 26-27, 31
Y	US 6,486,039 B2 (Yoo et al.) 26 November 2002 (26.11.2002), entire document especially col.4, ln 14-21; col. 5, ln 20-30	12, 30, 33, 42-44
A	US 5,998,278 A (Yu) 7 December 1999 (07.12.1999), entire document	1-44

 Further documents are listed in the continuation of Box C.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

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"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

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