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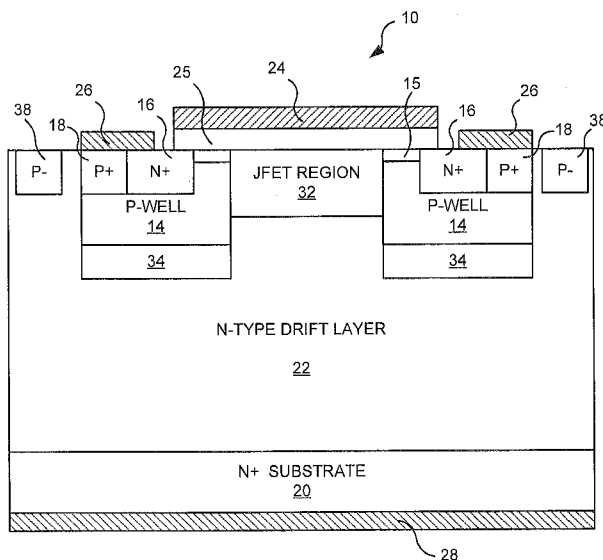
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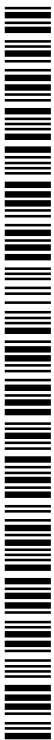
[Continued on next page]

(54) Title: METHODS OF FORMING BURIED JUNCTION DEVICES IN SILICON CARBIDE USING ION IMPLANT CHANNELING AND SILICON CARBIDE DEVICES INCLUDING BURIED JUNCTIONS



(57) Abstract: A semiconductor device structure according to some embodiments includes a silicon carbide substrate having a first conductivity type, a silicon carbide drift layer having the first conductivity type on the silicon carbide substrate and having an upper surface opposite the silicon carbide substrate, and a buried junction structure in the silicon carbide drift layer. The buried junction structure has a second conductivity type opposite the first conductivity type and has a junction depth that is greater than about one micron.

FIGURE 1



EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU,  
LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK,  
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<b>A. CLASSIFICATION OF SUBJECT MATTER</b> IPC(8) - H01L 29/15 (2014.01) CPC - H01L 29/1608 (2014.09) According to International Patent Classification (IPC) or to both national classification and IPC				
<b>B. FIELDS SEARCHED</b>  Minimum documentation searched (classification system followed by classification symbols) IPC(8) - H01L 29/15, 31/0312, 29/66 (2014.01) USPC - 257/77, 266, 409, 483, 484; 438/138  Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched CPC - H01L 29/1608, 29/66068, 29/1602 (2014.09)  Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) Orbit, Google Patents, ProQuest				
<b>C. DOCUMENTS CONSIDERED TO BE RELEVANT</b>				
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.		
X	US 2009/0072241 A1 (HARRIS et al) 19 March 2009 (19.03.2009) entire document	1, 3-8		
Y		2, 9-20		
Y	US 5,895,939 A (UENO) 20 April 1999 (20.04.1999) entire document	2		
Y	US 2008/0001159 A1 (OTA et al) 03 January 2008 (03.01.2008) entire document	9-12, 20		
Y	US 5,681,762 A (BALIGA) 28 October 1997 (28.10.1997) entire document	13-20		
Y	US 2011/0254016 A1 (RYU) 20 October 2011 (20.10.2011) entire document	17		
A	US 2010/0032685 A1 (ZHANG et al) 11 February 2010 (11.02.2010) entire document	1-20		
A	US 6,600,192 B1 (SUGAWARA et al) 29 July 2003 (29.07.2003) entire document	1-20		
A	US 6,091,108 A (HARRIS et al) 18 July 2000 (18.07.2000) entire document	1-20		
<input type="checkbox"/> Further documents are listed in the continuation of Box C. <input type="checkbox"/>				
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