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(54) **Title:** DEFECT-FREE JUNCTION FORMATION USING OCTADECABORANE SELF-AMORPHIZING IMPLANTS

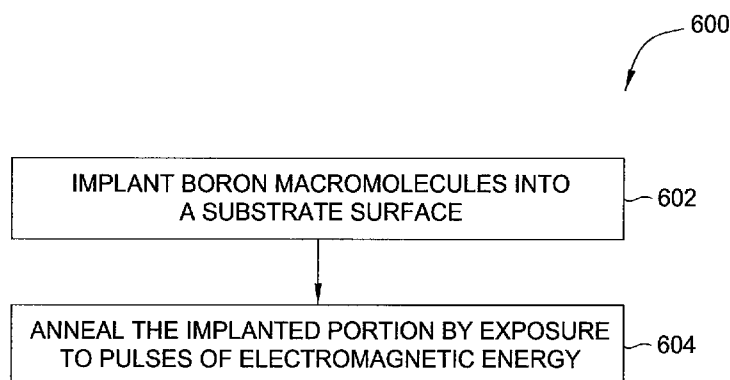


FIG. 6

(57) **Abstract:** A method and apparatus for implanting a semiconductor substrate with boron clusters. A substrate is implanted with octadecaborane by plasma immersion or ion beam implantation. The substrate surface is then annealed to completely dissociate and activate the boron clusters. The annealing may take place by melting the implanted regions or by a sub-melt annealing process.



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**A. CLASSIFICATION OF SUBJECT MATTER*****H01L 21/265(2006.01)i***

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)

H01L 21/265; A61N 5/00; C23C 16/00; H01L 21/425

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Korean utility models and applications for utility models  
Japanese utility models and applications for utility models  
(Chinese Patents and application for patent)

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

eKOMPASS(KIPO internal) &amp; Keywords: implant, boron, and molecule

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 2008-0122005 A1 (HORSKY, THOMAS N. et al.) 29 May 2008 See abstract; paragraphs [0079] - [0086]; claims 24-30 and figures 15-16.	1-15
Y	US 7148131 B1 (SUVKHANOV, AGAJAN et al.) 12 December 2006 See abstract; column 2, line 23 - column 4, line 39; claims 1-16 and figures 1-4.	1-15
A	US 6531367 B2 (CHEN, WEI-WEN) 11 March 2003 See abstract; column 2, line 39 - column 3, line 28; claims 1-5 and figures 1-2.	1-15

 Further documents are listed in the continuation of Box C. See patent family annex.

\* Special categories of cited documents:

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"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

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Information on patent family members

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**PCT/US2009/057708**

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2008-0122005 A1	29.05.2008	None	
US 7148131 B1	12.12.2006	None	
US 6531367 B2	11.03.2003	US 2002-137314 A1	26.09.2002