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(81) Designated States (unless otherwise indicated, for every
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KW, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, ME, MG,
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TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW,
KM, ML, MR, NE, SN, TD, TG).

(54) Title: AN INTEGRATED METHOD FOR WAFER OUTGASSING REDUCTION

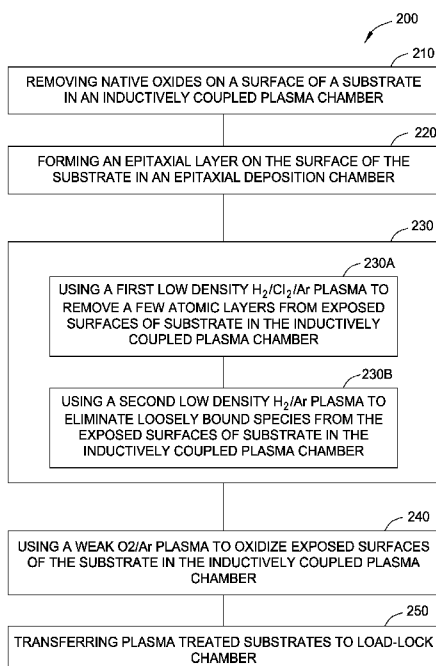


FIG. 2

(57) Abstract: Implementations disclosed herein relate to methods for controlling substrate outgassing. In one implementation, the method includes removing oxides from an exposed surface of a substrate in an inductively coupled plasma chamber, forming an epitaxial layer on the exposed surface of the substrate in an epitaxial deposition chamber, and performing an outgassing control of the substrate by subjecting the substrate to a first plasma formed from a first etch precursor in the inductively coupled plasma chamber at a first chamber pressure, wherein the first etch precursor comprises a hydrogen-containing precursor, a chlorine-containing precursor, and an inert gas, and subjecting the substrate to a second plasma formed from a second etch precursor in the inductively coupled plasma chamber at a second chamber pressure that is higher than the first chamber pressure, wherein the second etch precursor comprises a hydrogen-containing precursor and an inert gas.



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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 21/3065; H01L 21/477; H01L 27/088; H01L 21/306; H01L 21/425; C23C 16/40; H01L 29/66; C23C 16/42; H01L 51/50; H01L 21/20; H01L 21/02; H01L 21/67

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

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

eKOMPASS(KIPO internal) & Keywords: outgassing control, epitaxial layer, plasma, chamber pressure, density, hydrogen-containing precursor, chlorine-containing precursor, inert gas

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 2013-0288480 A1 (ERROL ANTONIO C. SANCHEZ et al.) 31 October 2013 See paragraphs [0019]-[0039] and figures 1, 2.	1-15
A	US 2003-0236003 A1 (KYEONGMO KOO et al.) 25 December 2003 See paragraphs [0043]-[0063] and figures 2-5C.	1-15
A	US 2013-0149462 A1 (JINGMEI LIANG et al.) 13 June 2013 See the whole document.	1-15
A	US 2014-0197493 A1 (TAIWAN SEMICONDUCTOR MANUFACTURING COMPANY, LTD.) 17 July 2014 See paragraphs [0019]-[0021] and figure 1.	1-15
A	JP 2015-206076 A (TOKYO ELECTRON LTD.) 19 November 2015 See paragraphs [0026]-[0034] and figures 1-3.	1-15

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

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"&" document member of the same patent family

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INTERNATIONAL SEARCH REPORT

Information on patent family members

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
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