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 - (71) Applicant (for all designated States except US):
FAIRCHILD SEMICONDUCTOR CORPORATION [US/US]; 82 Running Hill Road, South Portland, Maine 04106-0022 (US).
 - (72) Inventors; and
 - (75) Inventors/Applicants (for US only): **WOOSLEY, Debra, Susan** [US/US]; 11464 S Cranberry Hill Court, Draper, Utah 84020 (US). **SHARP, Joelle** [US/US]; 5775 W. Ophelia Lane, Herriman, Utah 84096 (US). **OLSEN, Tony, Lane** [US/US]; 2875 W. 11980 S., Riverton, Utah 84065 (US). **MADSON, Gordon, K.** [US/US]; 8045 Country View Lane, Herriman, Utah 84096 (US).
 - (74) Agents: **SANI, Barmak** et al.; Two Embarcadero Center, 8th Floor, San Francisco, California 94111-3834 (US).
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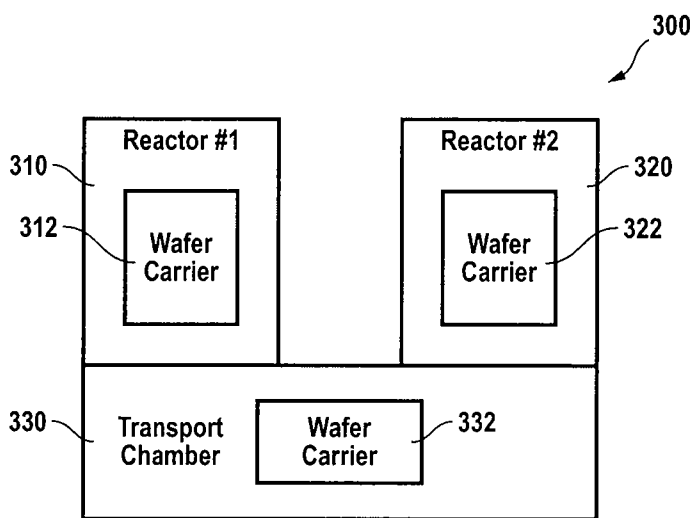


FIG. 3A

(57) Abstract: A method of forming a trench gate field effect transistor includes the following processing steps. Trenches are formed in a semiconductor substrate. The semiconductor substrate is annealed in an ambient including hydrogen gas. A dielectric layer lining at least the sidewalls of the trenches is formed. During the time between annealing and forming the dielectric layer, the semiconductor substrate is maintained in an inert environment to prevent formation of native oxide along sidewalls of the trenches prior to forming the dielectric layer.

WO 2008/100705 A3

INTERNATIONAL SEARCH REPORT

International application No.

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A. CLASSIFICATION OF SUBJECT MATTER
 IPC(8) - H01L 21/335, H01L 21/8242 (2008.04)
 USPC - 438/248, 438/142
 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)
 USPC: 438/248, 142

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
 USPC: 438/248, 142 (see also text search below)

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
 Electronic Databases Searched: PubWEST(USPT,PGPB,EPAB,JPAB); USPTO, Google, Answers.com, Google Patents
 Search Terms Used: trench, gate, field, transistor, semiconductor, substrate, dielectric, layer, inert, environment, native, oxide, silicon, nitride, epitaxial, conductivity, source, drain, well, bottom, reactor, wafe

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 2006/0267088 A1 (SHARPE et al.) 30 November 2006 (30.11.2006), para [0002], [0006], [0012]-[0014], [0019]-[0022], [0024]-[0026], [0028]-[0029], [0031]-[0033], [0036], [0042], [0045]	1-40
Y	US 2002/0167045 A1 (SHORT et al.) 14 November 2002 (14.11.2002), para [0026], [0031]	1-37
Y	US 2004/0055539 A1 (LEE et al.) 25 March 2004 (25.03.2004), para [0014], [0024]-[0027], [0030], [0044], [0056], [0085]	9-11, 24-26
Y	US 2005/0040413 A1 (TAKAHASHI et al.) 24 February 2005 (24.02.2005), para [0039], [0285], [0374]-[0375], [0386], [0388], [0428], [0445], [0489], [0531], [0633], [0738], [0740], [1129]	32-37
Y	US 2004/0255868 A1 (AMRHEIN et al.) 23 December 2004 (23.12.2004), para [0009], [0011], [0013], [0019], [0026]-[0028], [0038], [0050], [0054], [0058]-[0059]	33, 38-40
Y	US 2006/0240680 A1 (YOKOTA et al.) 26 October 2006 (26.10.2006), para [0007]	10-11, 25, 26, 35, 38-40

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