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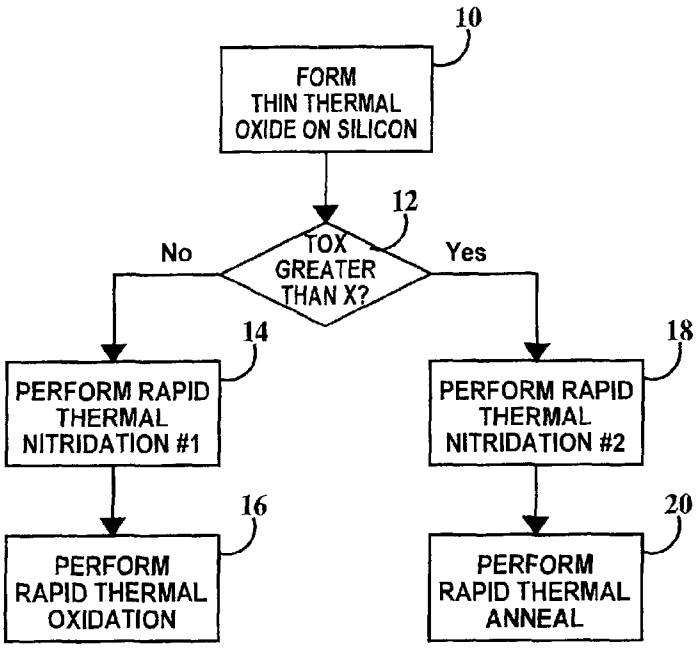
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[Continued on next page]

(54) Title: METHOD OF FABRICATING A NITRIDED SILICON OXIDE GATE DIELECTRIC LAYER



(57) Abstract: A method of forming a nitrided silicon oxide layer. The method includes: forming a silicon dioxide layer on a surface (32) of a silicon substrate (30); performing a rapid thermal nitridation of the silicon dioxide layer at a temperature of less than or equal to about 900 °C and a pressure greater than about 500 Torr to form an initial nitrided silicon oxide layer; and performing a rapid thermal oxidation or anneal of the initial nitrided silicon oxide layer at a temperature of less than or equal to about 900 °C and a pressure greater than about 500 Torr to form a nitrided silicon oxide layer (34). Also a method of forming a MOSFET with a nitrided silicon oxide dielectric layer (34).

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INTERNATIONAL SEARCH REPORT

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A. CLASSIFICATION OF SUBJECT MATTER
IPC(8) - H01L 21/31 (2008.01)
USPC - 438/769, 786; 257/E21.324
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)
IPC(8) - H01L 21/31 (2008.01)
USPC - 438/769, 786; 257/E21.324

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
USPC - 438/775, 770

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
USPTO - WEST: @pd < 20061030 and ((silicon adj1 oxynitride) or (nitrided adj1 silicon adj1 (oxide or dioxide)))[bi] and (nitridation and oxidation and ammonia and nitrogen and thickness)[bi] and (rapid adj3 thermal adj1 (oxidation or nitridation))[bi]
Google Scholar: anneal oxygen OR oxidizing "silicon oxynitride"

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 2004/0248392 A1 (NARWANKAR et al.) 09 December 2004 (09.12.2004) Para. [0010], [0012], [0015], [0016], [0017], [0031] and [0043].	1-46
Y	US 2004/0002226 A1 (BURNHAM et al.) 01 January 2004 (01.01.2004) Figures 5 and 6; para. [0017], [0018], [0019], [0020], [0023], [0025] and [0033].	1-40
Y	US 6,380,056 B1 (SHUE et al.) 30 April 2002 (30.04.2002) Col 7, ln 34-48.	41-46
Y	US 2002/0155708 A1 (LO et al.) 24 October 2002 (24.10.2002) Para. [0025].	4 and 24
Y	US 2005/0048705 A1 (BURNHAM et al.) 03 March 2005 (03.03.2005) Figure 9; para. [0036].	14, 16, 34 and 36

☐ 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

Date of the actual completion of the international search	Date of mailing of the international search report
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