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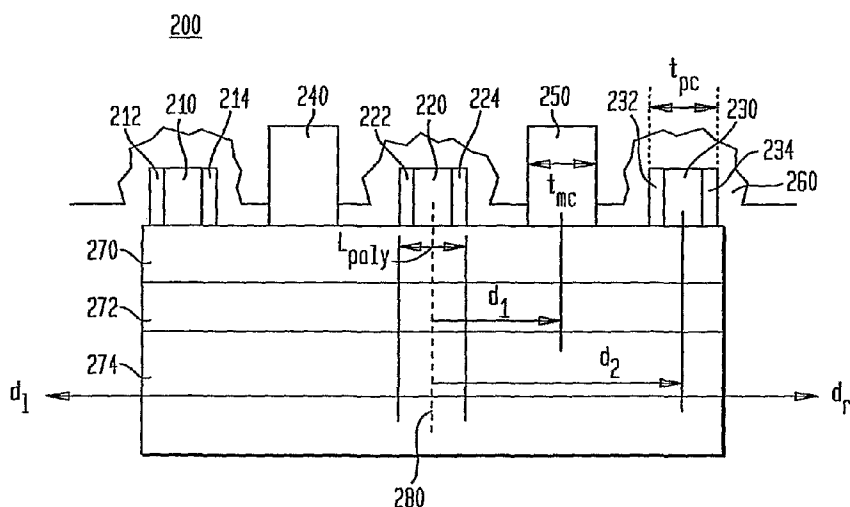
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[Continued on next page]

(54) Title: METHODOLOGY FOR LAYOUT-BASED MODULATION AND OPTIMIZATION OF NITRIDE LINER STRESS EFFECT IN COMPACT MODELS



(57) Abstract: System and method for compact model algorithms (310-350) to accurately account for effects of layout-induced changes in nitride liner (260) stress in semiconductor devices (200). The layout- sensitive compact model algorithms (310-350) account for the impact of large layout variation on circuits by implementing algorithms for obtaining the correct stress response approximations and layout extraction algorithms for obtaining the correct geometric parameters that drive the stress response. In particular, these algorithms include specific information from search "buckets" that are directionally-oriented and include directionally-specific distance measurements for analyzing in detail the specific shape neighborhood of the semiconductor device. The algorithms are additionally adapted to enable the modeling and stress impact determination of a device having single stress liner film and dual-stress liners (260) (two different liner films that abut at an interface).



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INTERNATIONAL SEARCH REPORT

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A. CLASSIFICATION OF SUBJECT MATTER

IPC(8) - G06G 7/48 (2008.04)

USPC - 703/4

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) - G06G 7/48 (2008.04)

USPC - 703/4

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
USPC - 703/2, 13; 706/908, 920, 921; 716/2, 8

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

PubWEST (USPT, PGPB, EPAB, JPAB); DialogPRO (Engineering); Google Scholar

Search Terms: semiconductor, transistor, FET or field effect transistor, simulate, model, netlist, stress, bucket, gate, polysilicon or polycrystalline silicon or poly-si, metal, contact, longitudinal, transverse, isolated

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X --- Y	US 2004/0044511 A1 (SEKIDO et al.) 04 March 2004 (04.03.2004); entire document, especially para [0022]-[0027], [0051], [0057]-[0058], [0061], [0065], [0068]-[0070], [0136]	1-2, 17, 20-23, 30-31, 35-38 3-16, 18-19, 24-29, 32-34
Y	US 2004/0034517 A1 (ADLER et al.) 19 February 2004 (19.02.2004); entire document, especially para [0023]-[0030]	3-16, 24-29, 32-34
Y	US 2005/0158937 A1 (YANG et al.) 21 July 2005 (21.07.2005); entire document, especially para [0018], [0020]-[0021], [0025], [0028]	18-19
Y	US 6,826,517 B2 (OKADA) 30 November 2004 (30.11.2004); entire document, especially Abstract; col 1, ln 11-16; col 3, ln 19-42; col 7, ln 6-18; col 10, ln 55-59; col 12, ln 13-19; col 12, ln 55 to col 13, ln 29; col 14, ln 14-17	6-7, 13-14, 26-27

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"P" document published prior to the international filing date but later than the priority date claimed

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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

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