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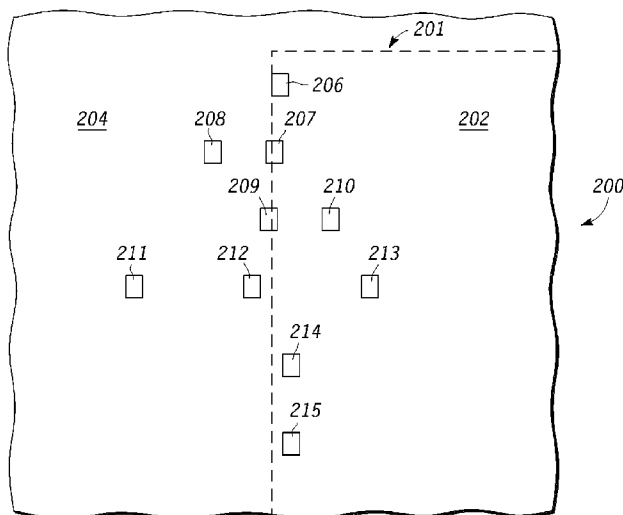
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(54) **Title:** SEMICONDUCTOR DEVICE HAVING STRESSORS AND METHOD FOR FORMING

FIG. 16



(57) **Abstract:** N channel (113, 115) and P channel (111) transistors are enhanced by applying stressor layers of tensile (128) and compressive (126), respectively, over them. A previously unknown problem was discovered concerning the two stressor layers, which both may conveniently be nitride but made somewhat differently. The two stressors have different etch rates which results in deleterious effects when etching a contact hole at the interface between the two stressors. A contact to a gate is often preferably half way between N and P channel transistors which is also the seemingly best location for the border between the two stressor layers. The contact etch at the border can result in pitting of the underlying gate structure or in residual nitride in the contact hole. Therefore, it has been found beneficial to ensure that each contact (154) is at least some predetermined distance from the stressor of the opposite type from the one the contact is passing through.

WO 2007/097814 A3

INTERNATIONAL SEARCH REPORT

International application No.

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A. CLASSIFICATION OF SUBJECT MATTER

IPC: **HOIL 21/335(2006.0 1),27/088(2006.01)**

USPC: 257/368;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)

U.S. : 257/368; 438/142

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

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

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 2004/0029323 A (Shimizu et al) 12 February 2004 (12.02.2004), para. [0074], [0078] and [0024].	1-20
Y	US 5,707,486 A (Collins) 13 January 1998 (13.01.1998), col. 6, lines 50-65.	1-20
Y	US 5,591,494 A (Sato et al) 7 January 1997 (07.01.1997), col. 1, lines 16-36.	1-20

Further documents are listed in the continuation of Box C.

See patent family annex.

* Special categories of cited documents		
"A"	document defining the general state of the art which is not considered to be of particular relevance	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"E"	earlier application or patent published on or after the international filing date	"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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"O"	document referring to an oral disclosure, use, exhibition or other means	
"P"	document published prior to the international filing date but later than the priority date claimed	"&" document member of the same patent family

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