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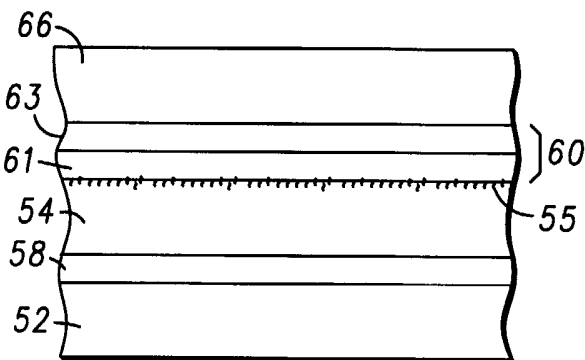
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(54) Title: SEMICONDUCTOR COMPLIANT SUBSTRATE HAVING A GRADED MONOCRYSTALLINE LAYER



(57) Abstract: High quality epitaxial layers of monocrystalline materials can be grown overlying monocrystalline substrates (22) such as large silicon wafers by forming a compliant substrate for growing the monocrystalline layers. One way to achieve the formation of a compliant substrate includes first growing an accommodating buffer layer (24) on a silicon wafer. The accommodating buffer layer is a layer of monocrystalline oxide spaced apart from the silicon wafer by an amorphous interface layer (28) of silicon oxide. The amorphous interface layer dissipates strain and permits the growth of a high quality monocrystalline oxide accommodating buffer layer. The accommodating buffer layer is lattice matched to both the underlying silicon wafer and the overlying monocrystalline material layer. A monocrystalline

graded layer (32), in which the lattice constant varies with the thickness of the layer, is then formed over the accommodating buffer layer, such that a lattice constant of the top of the graded layer substantially matches the lattice constant of a subsequently grown monocrystalline film.

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INTERNATIONAL SEARCH REPORT

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A. CLASSIFICATION OF SUBJECT MATTER
 IPC 7 H01L21/00 C30B25/02 C30B29/32 C30B23/02 H01L21/20
 C30B25/20

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 7 C30B H01L

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 practical, search terms used)
 EPO-Internal, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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A	US 6 107 653 A (FITZGERALD EUGENE A) 22 August 2000 (2000-08-22) the whole document	1, 8, 14-16, 22, 23, 29-31
A	"INTEGRATION OF GAAS ON SI USING A SPINEL BUFFER LAYER" IBM TECHNICAL DISCLOSURE BULLETIN, IBM CORP. NEW YORK, US, vol. 30, no. 6, November 1987 (1987-11), page 365 XP000952091 ISSN: 0018-8689 the whole document	1-3, 23, 31

Further documents are listed in the continuation of box C. Patent family members are listed in annex.

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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
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O document referring to an oral disclosure, use, exhibition or other means	* & * document member of the same patent family
P document published prior to the international filing date but later than the priority date claimed	

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