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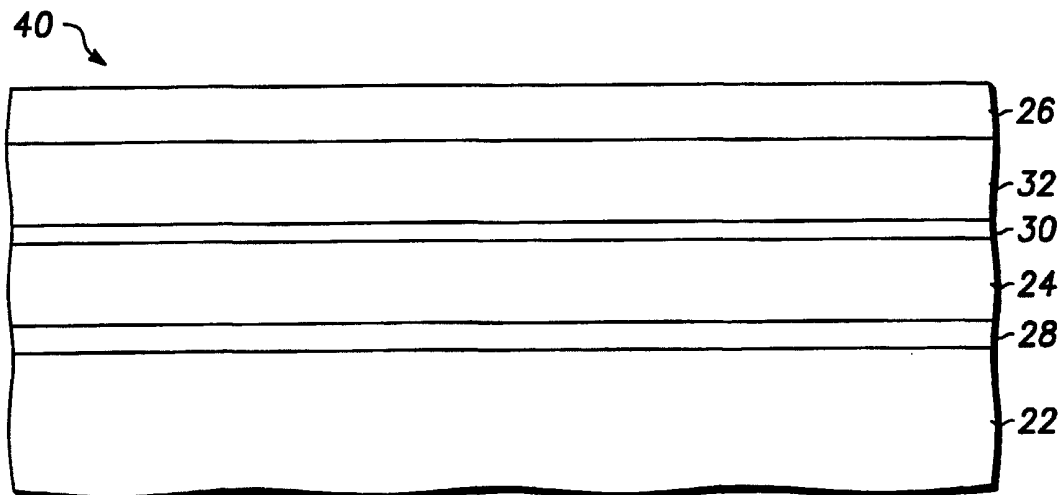
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(54) Title: SEMICONDUCTOR STRUCTURE



(57) Abstract: High quality epitaxial layers of compound semiconductor materials can be grown overlying large silicon wafers by first growing an accommodating buffer layer (24) on a silicon wafer (22). The accommodating buffer layer is a layer of monocrystalline oxide preferably a perovskite 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 (24). The accommodating buffer layer (24) preferably is lattice matched to both the underlying silicon wafer (22) and the overlying monocrystalline compound semiconductor layer (26). Any lattice mismatch between the accommodating buffer layer and the underlying substrate is taken care of by the amorphous interface layer. Additional semiconductor buffer (32) and template layers (28, 30) can be found on or below the oxide buffer layer (24).



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INTERNATIONAL SEARCH REPORT

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**A. CLASSIFICATION OF SUBJECT MATTER**  
IPC 7 H01L21/20 H01L21/36 H01L21/8258

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 H01L C30B

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, WPI Data, PAJ, INSPEC, COMPENDEX, IBM-TDB

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5 159 413 A (CALVIELLO JOSEPH A ET AL) 27 October 1992 (1992-10-27) column 2, line 35 -column 7, line 60; figures 1-3,8-11	1-14
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Further documents are listed in the continuation of box C.  Patent family members are listed in annex.

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Date of the actual completion of the international search  20 July 2001	Date of mailing of the international search report  01/08/2001
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Name and mailing address of the ISA European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Authorized officer  Köpf, C
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INTERNATIONAL SEARCH REPORT

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PCT/US 01/04207

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
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X	US 5 990 495 A (OHBA YASUO) 23 November 1999 (1999-11-23) column 1, line 42 -column 3, line 29 column 6, line 25 -column 8, line 40 ---	1,3,9, 11,16,17
X	VISPUTE R D ET AL: "High quality optoelectronic grade epitaxial AlN films on alpha-Al2O3, Si and 6H-SiC by pulsed laser deposition" THIN SOLID FILMS, vol. 299, no. 1-2, 15 May 1997 (1997-05-15), pages 94-103, XP004115477 ISSN: 0040-6090 page 99, right-hand column -page 102, right-hand column ---	1,2,9,11
X	US 4 846 926 A (KAY ROBERT E ET AL) 11 July 1989 (1989-07-11) column 2, line 38 -column 3, line 57 ---	1,2,9,10
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PCT/US 01/04207

C.(Continuation) 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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