(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
13 May 2004 (13.05.2004)

PCT

(10) International Publication Number
WO 2004/040619 A3

(51) International Patent Classification[7]: H01L 21/762, 21/20, 21/762

(21) International Application Number: PCT/US2003/032770

(22) International Filing Date: 14 October 2003 (14.10.2003)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
10/272,979 18 October 2002 (18.10.2002) US

(71) Applicant: ADVANCED MICRO DEVICES, INC. [US/US]; One AMD Place, Mail Stop 68, P.O. Box 3453, Sunnyvale, CA 94088-3453 (US).

(72) Inventors: WRISTERS, Derick, J.; 13710 Overland Pass, Bee Caves, TX 78738 (US). XIANG, Qi; 1119 Thames Drive, San Jose, CA 95129 (US). BULLER, James, F.; 6908 Indica Cove, Austin, TX 78759 (US).

(74) Agent: COLLOPY, Daniel, R.; Advanced Micro Devices, Inc., One AMD Place, Mail Stop 68, Sunnyvale, CA 94088-3453 (US).

(81) Designated States *(national)*: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VC, VN, YU, ZA, ZM, ZW.

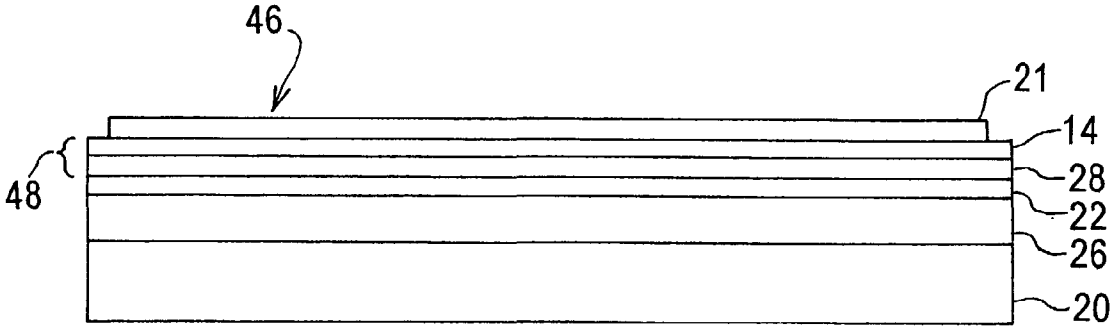
(84) Designated States *(regional)*: ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:
— *with international search report*
— *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments*

(88) Date of publication of the international search report: 4 November 2004

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: SEMICONDUCTOR DEVICE WITH TENSILE STRAIN SILICON INTRODUCED BY COMPRESSIVE MATERIAL IN A BURIED OXIDE LAYER



(57) Abstract: A semiconductor device is provided with the high-speed capabilities of silicon on insulator (SOI) and strained silicon technologies, without requiring the formation of a silicon germanium layer. A layer of compressive material (22) is formed on a SOI semiconductor substrate (20) to induce strain in the overlying silicon layer (21). The compressive materials include silicon oxynitride, phosphorus, silicon nitride, and boron/phosphorus doped silica glass.

WO 2004/040619 A3