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

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
15 November 2007 (15.11.2007)

PCT

(10) International Publication Number
WO 2007/130241 A1

(51) International Patent Classification:
*H01L 21/336* (2006.01) *H01L 21/762* (2006.01)
*H01L 29/10* (2006.01) *H01L 21/84* (2006.01)
*H01L 29/78* (2006.01) *H01L 29/786* (2006.01)

(21) International Application Number:
PCT/US2007/007844

(22) International Filing Date: 29 March 2007 (29.03.2007)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
10 2006 019 937.5 28 April 2006 (28.04.2006) DE
11/563,986 28 November 2006 (28.11.2006) US

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

(72) Inventors; and

(75) Inventors/Applicants *(for US only)*: **WEI, Andy** [US/DE]; Alaunstrasse 23, 01099 Dresden (DE). **KAMMLER, Thorsten** [DE/DE]; Buchenstrasse 12c, 01458 Ottendorf-Okrilla (DE). **HOENTSCHEL, Jan** [DE/DE]; Prellerstrasse 9, 01309 Dresden (DE). **HORSTMANN, Manfred** [DE/DE]; Aeussere Parkstr 25, 01833 Duerroehrsdorf-Dittersbach (DE).

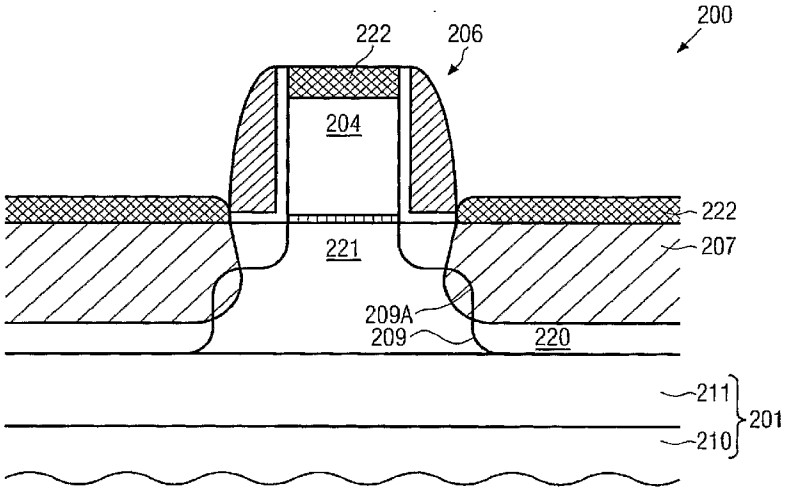
(74) Agent: **DRAKE, Paul, S.**; Advanced Micro Devices, Inc., 5204 East Ben White Boulevard, Mail Stop 562, Austin, TX 78741 (US).

(81) Designated States *(unless otherwise indicated, for every kind of national protection available)*: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, SV, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

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

*[Continued on next page]*

(54) Title: AN SOI TRANSISTOR HAVING AN EMBEDDED STRAIN LAYER AND A REDUCED FLOATING BODY EFFECT AND A METHOD FOR FORMING THE SAME




(57) Abstract: By forming a portion (209A, 309A, 409A) of a PN junction (209, 309, 409) within strained silicon/germanium material (207, 307, 407) in SOI transistors (200, 300, 400) with a floating body (221, 321) architecture, the junction leakage may be significantly increased, thereby reducing floating body effects. The positioning of a portion (209A, 309A, 409A) of the PN junction (209, 309, 409) within the strained silicon/germanium material (207, 307, 407) may be accomplished on the basis of implantation and anneal techniques, contrary to conventional approaches in which *in situ* doped silicon/germanium is epitaxially grown so as to form the deep drain and source regions. Consequently, high drive current capability may be combined with a reduction of floating body effects.

WO 2007/130241 A1

**Published:**
— *with international search report*

*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.*