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

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
7 July 2005 (07.07.2005)

PCT

(10) International Publication Number
WO 2005/062387 A1

(51) International Patent Classification[7]: H01L 29/78, 29/417, 21/336

(21) International Application Number: PCT/US2004/035408

(22) International Filing Date: 26 October 2004 (26.10.2004)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
10/727,999 3 December 2003 (03.12.2003) 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) Inventor; and

(75) Inventor/Applicant *(for US only)*: **MASZARA, Witold, P.** [US/US]; 15375 Via De Ninos, Morgan Hill, CA 95037 (US).

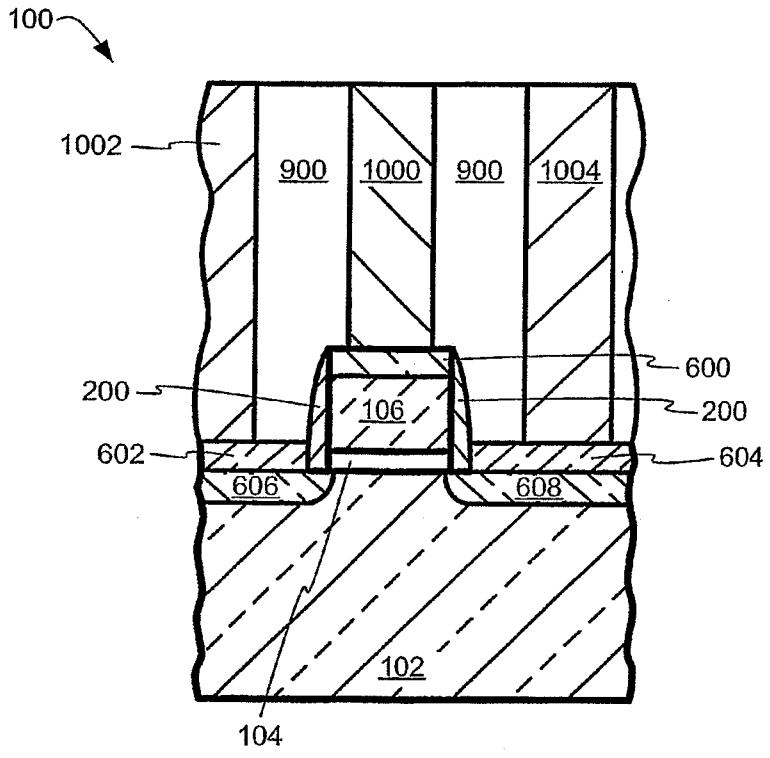
(74) Agent: **DRAKE, Paul, S.**; One AMD Place, Mail Stop 68, P.O. Box 3453, Sunnyvale, CA 94088-3453 (US).

(81) Designated States *(unless otherwise indicated, for every kind of national protection available)*: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, 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, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, 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, IT, LU, MC, 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: FORMATION OF ABRUPT JUNCTIONS IN DEVICES BY USING SILICIDE GROWTH DOPANT SNOWPLOW EFFECT



(57) Abstract: A method (1100) of forming an abrupt junction device (100) with a semiconductor substrate (102) is provided. A gate dielectric (104) is formed (1104) on a semiconductor substrate (102), and a gate (106) is formed (1106) on the gate dielectric (104). A sidewall spacer (200) is formed (1108) on the semiconductor substrate (102) adjacent the gate (106) and the gate dielectric (104). A thickening layer (300) is formed (1110) by selective epitaxial growth on the semiconductor substrate (102) adjacent the sidewall spacer (200). Raised source/drain dopant implanted regions (402, 404) are formed (1112) in at least a portion of the thickening layer (300). Silicide layers (602, 604) are formed (1114) in at least a portion of the raised source/drain dopant implanted regions (402, 404) to form source/drain regions (606, 608), beneath the silicide layers (602, 604), that are enriched with dopant from the silicide layers (602, 604). A dielectric layer (900) is deposited over the silicide layers (602, 604), and contacts (1002, 1004) are then formed in the dielectric layer (900) to the silicide layers (602, 604).

WO 2005/062387 A1

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*

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.