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

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
17 June 2004 (17.06.2004)

PCT

(10) International Publication Number
WO 2004/051728 A1

(51) International Patent Classification[7]: H01L 21/336, 29/78, 21/225

(21) International Application Number:
PCT/US2003/035355

(22) International Filing Date:
6 November 2003 (06.11.2003)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
10255849.3 29 November 2002 (29.11.2002) DE
10/442,745 21 May 2003 (21.05.2003) 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: FEUDEL, Thomas; Zillestr. 13A, 01445 Radebeul (DE). HORSTMANN, Manfred; Bautzner Str. 18, 01099 Dresden (DE). WIECZOREK, Karsten; Am Schulfeld 24, 01109 Dresden (DE). KRUEGEL, Stephan; An der Otteritz 4, 01468 Boxdorf (DE).

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

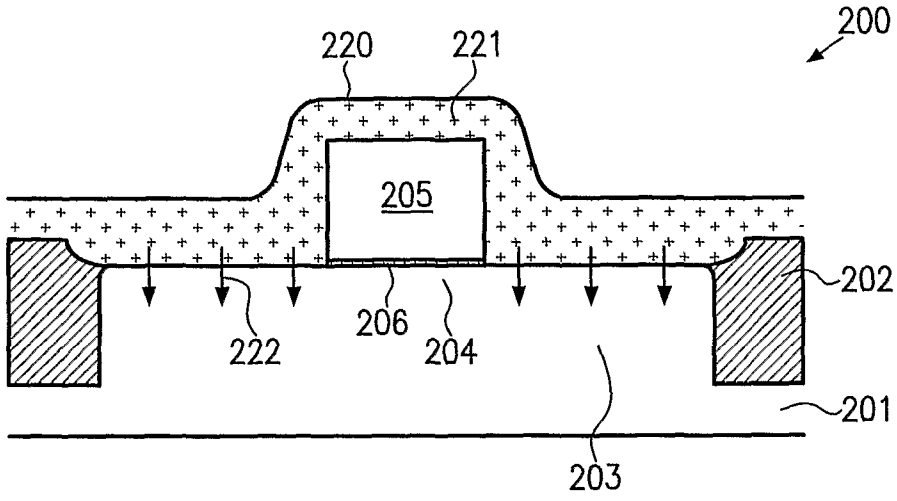
(81) Designated States *(national)*: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, 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 (BW, 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*

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: DRAIN/SOURCE EXTENSION STRUCTURE OF A FIELD EFFECT TRANSISTOR INCLUDING DOPED HIGH-K SIDEWALL SPACERS



(57) Abstract: High-k dielectric spacer elements on the gate electrode of a field effects transistor in combination with an extension region that is formed by dopant diffusion from the high-k spacer elements into the underlying semiconductor region provides for an increased charge carrier density in the extension region. In this way, the limitation of the charge carrier density to approximately the solid solubility of dopants in the extension region may be overcome, thereby allowing extremely shallow extension regions without unduly compromising the transistor performance.

WO 2004/051728 A1