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

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
11 November 2004 (11.11.2004)

PCT

(10) International Publication Number
WO 2004/097932 A3

(51) International Patent Classification[7]: H01L 21/768, 21/288

(21) International Application Number: PCT/US2003/041181

(22) International Filing Date: 22 December 2003 (22.12.2003)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
103 19 135.6 28 April 2003 (28.04.2003) DE
10/666,195 19 September 2003 (19.09.2003) 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: MARXSEN, Gerd, Franz; Wettinstr. 10, 01445 Radebeul (DE). PREUSSE, Axel; Humboldtstr. 3, 01445 Radebeul (DE). NOPPER, Markus; Virchowstrasse 31, 01129 Dresden (DE). MAUERSBERGER, Frank; HoflossnitzStr. 2e, 01445 Radebeul (DE).

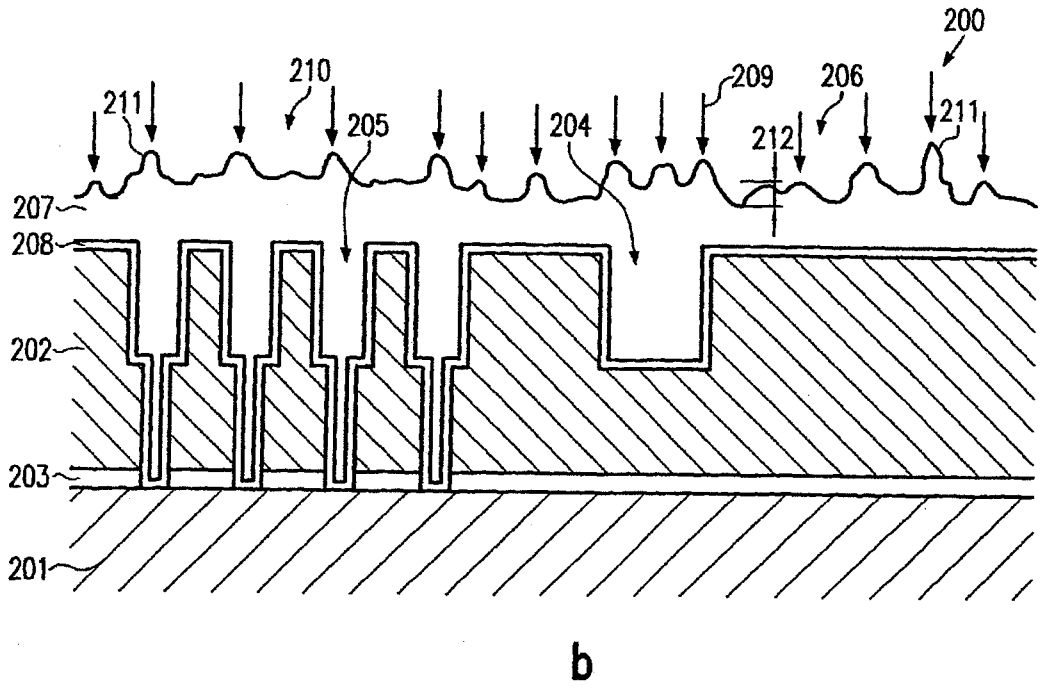
(74) Agent: DRAKE, Paul, E.; Advanced Micro Devices, Inc., 5204 East Ben White Boulevard, Mail Stop 562, Austin, TX 78741 (US).

(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),

[Continued on next page]

(54) Title: METHOD OF ELECTROPLATING COPPER OVER A PATTERNED DIELECTRIC LAYER TO ENHANCE PROCESS UNIFORMITY OF A SUBSEQUENT CMP PROCESS



b

(57) Abstract: In a new method of plating metal onto dielectric layers including small diameter vias and large diameter trenches (205), a surface roughness is created by e.g. reducing the amount of leveler in the plating bath at least on non-patterned regions (206) of the dielectric layer (203) to enhance the uniformity of material removal in a subsequent chemical mechanical polishing (CMP) process.

WO 2004/097932 A3

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*

(88) Date of publication of the international search report:
16 December 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.