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

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
16 July 2009 (16.07.2009)

PCT

(10) International Publication Number
WO 2009/088660 A1

(51) International Patent Classification:
H01L 21/311 (2006.01)

(21) International Application Number:
PCT/US2008/086921

(22) International Filing Date:
16 December 2008 (16.12.2008)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
11/969,443 4 January 2008 (04.01.2008) US

(71) Applicant *(for all designated States except US)*: **MICRON TECNOLOGY, INC.** [US/US]; 8000 South Federal Way, Mail Stop 525, Boise, ID 83716 (US).

(72) Inventors; and

(75) Inventors/Applicants *(for US only)*: **BENSON, Russell, A.** [US/US]; 7082 Chilacot, Boise, ID 83709 (US). **TAYLOR, Ted** [US/US]; 9894 W. Hillendale Drive, Boise, ID 83709 (US). **KIEHLBAUCH, Mark** [US/US]; 2002 E. Goodman Ct., Boise, ID 83712 (US).

(74) Agent: **STRODTHOFF, Kristine, M.**; Whyte Hirschboeck Dudek S.C., 555 East Wells Street, Suite 1900, Milwaukee, WI 53202 (US).

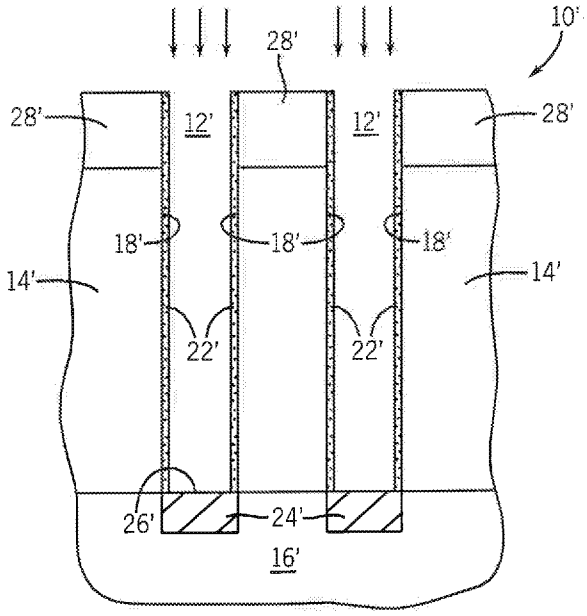
(81) Designated States *(unless otherwise indicated, for every kind of national protection available)*: AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, 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, ST, 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, HR, HU, IE, IS, IT, LT, LU, LV, MC, MT, NL, NO, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:
— *with international search report*

(54) **Title:** METHOD OF ETCHING A HIGH ASPECT RATIO CONTACT

FIG. 4



(57) **Abstract:** Methods and an etch gas composition for etching a contact opening in a dielectric layer are provided. Embodiments of the method use a plasma generated from an etch gas composed of C_4F_8 and/or C_4F_6, an oxygen source, and a carrier gas in combination with tetrafluoroethane (C_2F_4) or a halofluorocarbon analogue of C_2F_4,

WO 2009/088660 A1