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

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
20 October 2005 (20.10.2005)

PCT

(10) International Publication Number
WO 2005/098923 A1

(51) International Patent Classification[7]: H01L 21/308, 21/762

(21) International Application Number: PCT/US2005/010197

(22) International Filing Date: 25 March 2005 (25.03.2005)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
10/817,029 1 April 2004 (01.04.2004) US

(71) Applicant and
(72) Inventor: MICRON TECHNOLOGY, INC.? [US/US]; 8000 South Federal Way, Boise, ID 83716 (US).

(72) Inventors: DERDERIAN, Garo, J.; 6184 South Schooner Place, Boise, ID 83716 (US). MANNING, Montgomery, H.; 3695 West Houseland Court, Eagle, ID 83616 (US).

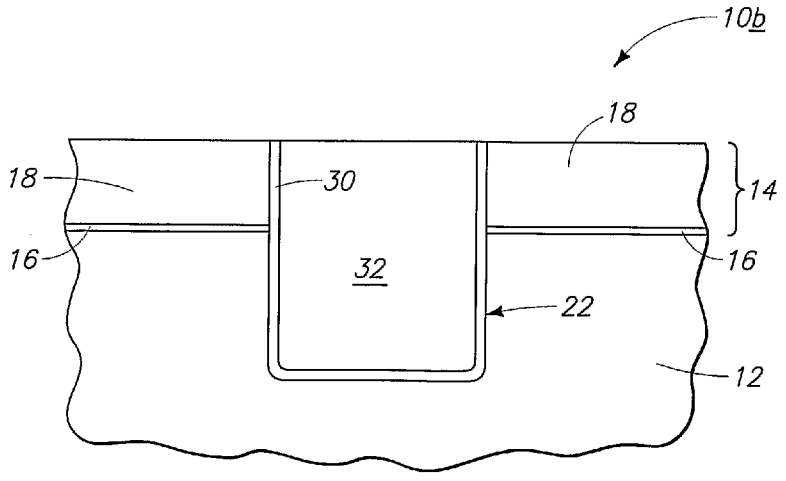
(74) Agents: MATKIN, Mark, S. et al.; 601 West First Avenue, Suite 1300, Spokane, WA 99201-3828 (US).

(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, SM, 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, IS, IT, LT, 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: METHODS OF FORMING TRENCH ISOLATION REGIONS



(57) Abstract: The invention includes methods of forming trench isolation regions. In one implementation, a masking material is formed over a semiconductor substrate. The masking material comprises at least one of tungsten, titanium nitride and amorphous carbon. An opening is formed through the masking material and into the semiconductor substrate effective to form an isolation trench within semiconductive material of the semiconductor substrate. A trench isolation material is formed within the isolation trench and over the masking material outside of the trench effective to overfill the isolation trench. The trench isolation material is polished at least to an outermost surface of the at least one of tungsten, titanium nitride and amorphous carbon of the masking material. The at least one of tungsten, titanium nitride and amorphous carbon is/are etched from the substrate. Other implementations and aspects are contemplated.

WO 2005/098923 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.