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

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
25 November 2004 (25.11.2004)

PCT

(10) International Publication Number
WO 2004/102592 A3

(51) International Patent Classification[7]: H01L 21/02, 21/334

(21) International Application Number: PCT/US2004/013963

(22) International Filing Date: 4 May 2004 (04.05.2004)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
10/435,103 9 May 2003 (09.05.2003) US

(71) Applicant: **MICRON TECHNOLOGY, INC.** [US/US]; 8000 S. Federal Way, Boise, ID 83716 (US).

(72) Inventors: **BASCERI, Cem**; 12011 Edgemere Circle, Reston, VA 20190 (US). **GEALY, F., Daniel**; 4300 Junayo Lane, Kuna, ID 83634 (US). **SANDHU, Gurtej, S.**; 2964 E. Parkriver Drive, Boise, ID 83706 (US).

(74) Agents: **LATWESEN, David, G.** et al.; Wells St. John PS, 601 W. First Avenue, Spokane, WA 99201 (US).

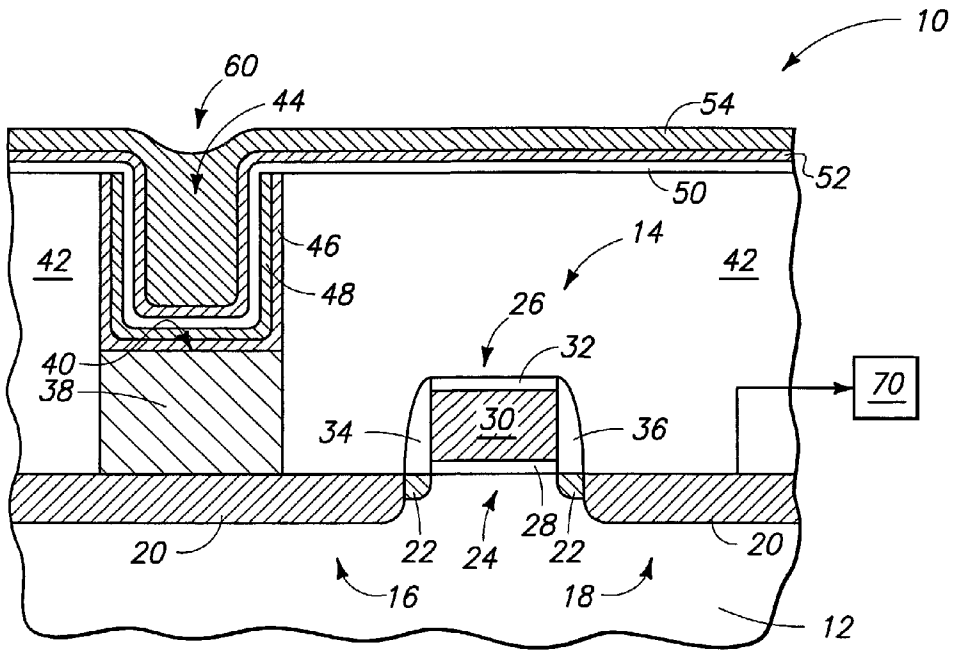
(81) Designated States *(unless otherwise indicated, for every kind of national protection available)*: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, 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).

Published:
— *with international search report*

[Continued on next page]

(54) Title: CAPACITOR CONSTRUCTIONS, AND THEIR METHODS OF FORMING



(57) Abstract: The invention includes methods in which metal oxide dielectric materials (50) are deposited over barrier layers (48). The barrier layers can comprise compositions of metal and one or more of carbon, boron and nitrogen, and the metal oxide of the dielectric material can comprise the same metal as the barrier layer. The dielectric material/barrier layer constructions can be incorporated into capacitors. The capacitors can be used in, for example, DRAM cells, which in turn can be used in electronic systems.

WO 2004/102592 A3

— *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments*

(88) Date of publication of the international search report:
20 January 2005

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.