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

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
31 January 2013 (31.01.2013)

WIPO | PCT

(10) International Publication Number
WO 2013/015935 A3

(51) International Patent Classification:
H01L 27/02 (2006.01)

(21) International Application Number:
PCT/US2012/044484

(22) International Filing Date:
27 June 2012 (27.06.2012)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
13/191,192 26 July 2011 (26.07.2011) US

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

(72) Inventor; and
(75) Inventor/Applicant *(for US only)*: **SANDHU, Gurtej, S.** [US/US]; 2964 E. Parkriver Drive, Boise, ID 83706 (US).

(74) Agents: **MATKIN, Mark, S.** et al.; Wells St. John P.S., 601 West First Avenue, Suite 1300, Spokane, WA 99201 (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, CL, 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, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, 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, LR, LS, MW, MZ, NA, RW, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

— *with international search report (Art. 21(3))*

(88) Date of publication of the international search report:
18 April 2013

(54) Title: METHODS OF FORMING GRAPHENE-CONTAINING SWITCHES

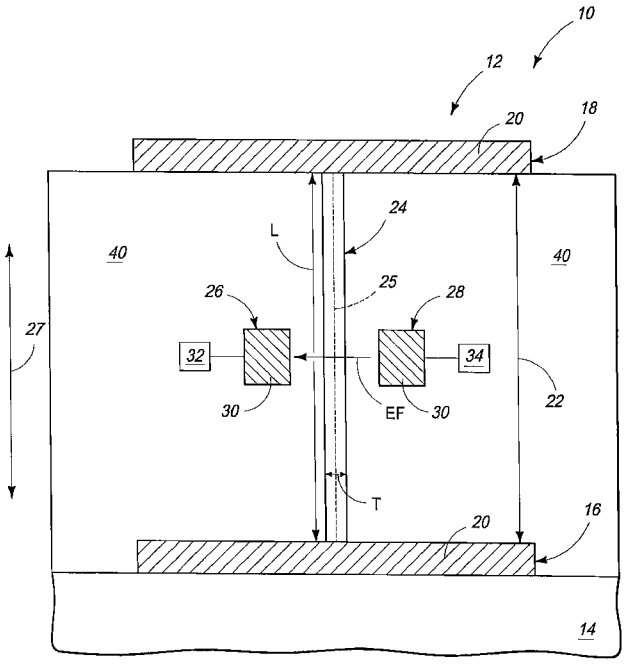


FIG. 1

(57) Abstract: Some embodiments include methods of forming graphene-containing switches. A bottom electrode may be formed over a base, and a first electrically conductive structure may be formed to extend upwardly from the bottom electrode. Dielectric material may be formed along a sidewall of the first electrically conductive structure, while leaving a portion of the bottom electrode exposed. A graphene structure may be formed to be electrically coupled with the exposed portion of the bottom electrode. A second electrically conductive structure may be formed on an opposing side of the graphene structure from the first electrically conductive structure. A top electrode may be formed over the graphene structure and electrically coupled with the second electrically conductive structure. The first and second electrically conductive structures may be configured to provide an electric field across the graphene structure.

WO 2013/015935 A3