

(43) International Publication Date
22 September 2011 (22.09.2011)(10) International Publication Number
WO 2011/115574 A1(51) International Patent Classification:
G02F 1/025 (2006.01) **G02F 1/17** (2006.01)(21) International Application Number:
PCT/SG2011/000097(22) International Filing Date:
10 March 2011 (10.03.2011)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
201001780-4 15 March 2010 (15.03.2010) SG(71) Applicant (for all designated States except US): **AGENCY FOR SCIENCE, TECHNOLOGY AND RESEARCH** [SG/SG]; 1 Fusionopolis Way #20-10, Connexis, Singapore 138632 (SG).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **LIM, Eu-Jin Andy** [SG/SG]; c/o Institute of Microelectronics, 11 Science Park Road, Singapore Science Park 2, Singapore 117685 (SG). **ANG, Kah Wee** [SG/SG]; c/o Institute of Microelectronics, 11 Science Park Road, Singapore Science Park 2, Singapore 117685 (SG). **FANG, Qing** [CN/SG]; c/o Institute of Microelectronics, 11 Science Park Road, Singapore Science Park 2, Singapore 117685 (SG). **LIOW, Tsung-Yang Jason** [SG/SG]; c/o Institute of Microelectronics, 11 Science Park Road, Singapore Science Park 2, Singapore 117685 (SG). **YU, Mingbin** [CN/SG]; c/o Institute of Microelectronics, 11 Science Park Road, Singapore Science Park 2, Singapore 117685 (SG). **LO,****Guo Qiang Patrick** [US/SG]; c/o Institute of Microelectronics, 11 Science Park Road, Singapore Science Park 2, Singapore 117685 (SG).(74) Agent: **VIERING, JENTSCHURA & PARTNER LLP**; P.O. Box 1088, Rochor Post Office, Rochor Road, Singapore 911833 (SG).

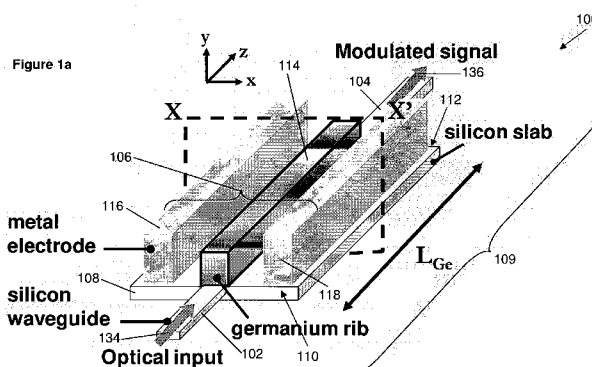
(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, 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, RO, RS, RU, 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, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, 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))

(54) Title: OPTICAL MODULATOR AND METHOD FOR MANUFACTURING THE SAME



(57) **Abstract:** An optical modulator and a method for manufacturing an optical modulator are provided. The optical modulator includes a first waveguide, a second waveguide, a modulating portion connected between the first waveguide and the second waveguide, the modulating portion being configured to receive an input signal from the first waveguide, to modulate the input signal and to supply a corresponding modulated input signal as an output signal to the second waveguide, wherein the modulating portion includes a semiconductor substrate, one end thereof being coupled to the first waveguide, and a corresponding opposite end thereof being coupled to the second waveguide, a Germanium rib provided on the substrate such that the input signal propagates through the Germanium rib along a longitudinal axis thereof, and a first electrode and a second electrode respectively provided on the substrate, wherein the Germanium rib is provided between the first electrode and the second electrode, and wherein the first electrode and the second electrode are configured to apply an electrical field to the Germanium rib in order to modulate the input signal propagating through the Germanium rib.