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

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
16 December 2004 (16.12.2004)

PCT

(10) International Publication Number
WO 2004/109803 A1

(51) International Patent Classification[7]: H01L 27/00

(21) International Application Number: PCT/US2004/014696

(22) International Filing Date: 11 May 2004 (11.05.2004)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
10/452,877 2 June 2003 (02.06.2003) US

(71) Applicant *(for all designated States except US)*: **ADVANCED MICRO DEVICES, INC.** [US/US]; One AMD Place, Mail Stop 68, P.O. Box 3453, Sunnyvale, CA 94088-3453 (US).

(72) Inventors; and

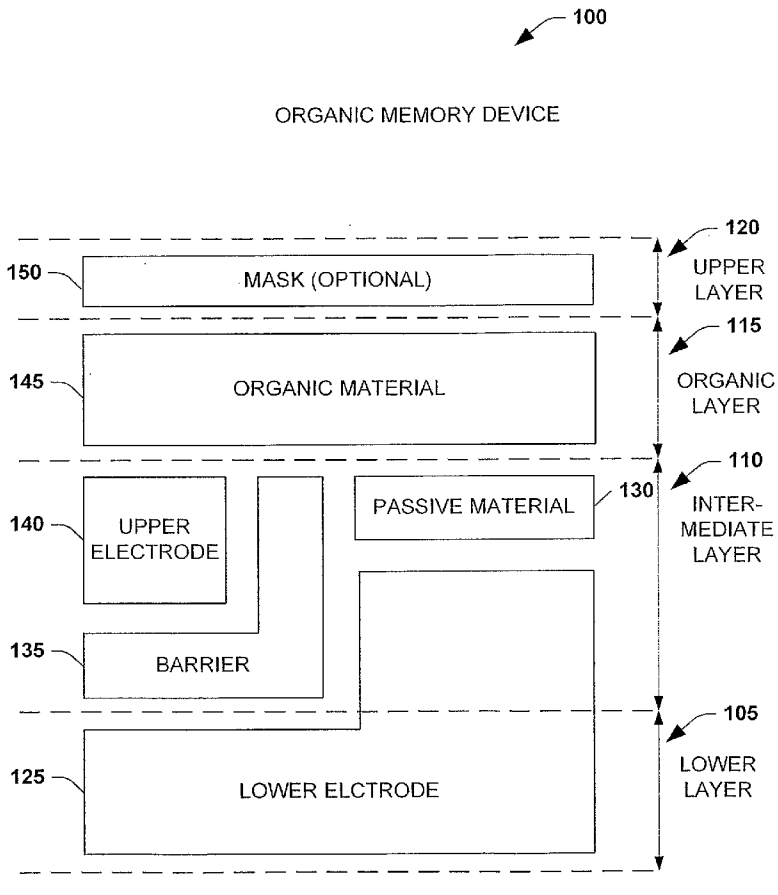
(75) Inventors/Applicants *(for US only)*: **TRIPSAS, Nicholas, H.** [US/US]; 6017 Crossmont Court, San Jose, CA 95120 (US). **BUYNOSKI, Matthew**; 2607 Emerson Street, Palo Alto, CA 94306 (US). **OKOROANYANWU, Uzodinma**; 1958 Rock Street #8, Mountain View, CA 94088 (US). **PANGRLE, Suzette, K.**; 21849 Lindy Lane, Cupertino, CA 95014 (US).

(74) Agent: **COLLOPY, Daniel, R.**; One AMD Place, Mail Stop 68, P.O. Box 3453, Sunnyvale, CA 94088-3453 (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.

[Continued on next page]

(54) Title: PLANAR POLYMER MEMORY DEVICE



(57) Abstract: The present invention provides a planar polymer memory device (100) that can operate as a non-volatile memory device. A planar polymer memory device (100) can be formed with two or more electrodes and an electrode extension associated with one electrode, wherein a selectively conductive medium and dielectric separate the electrodes. The method for forming a planar polymer memory device (100) comprises at least one of forming a first electrode (125) with an associated plug, forming a second electrode (140), forming a passive layer (130) over the extension, depositing an organic polymer and patterning the organic polymer (115). The method affords integration of a planar polymer memory device into a semiconductor fabrication process. A thin film diode (TFD) can further be employed with a planar polymer memory device (100) to facilitate programming. The TFD can be formed between the first electrode (125) and the selectively conductive medium or the second electrode (140) and the selectively conductive medium.

WO 2004/109803 A1

(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*

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.