162162

2004074688 16 Dec 04

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

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
24 December 2003 (24.12.2003)

PCT

(10) International Publication Number
WO 03/107351 A1

(51) International Patent Classification[7]: G11C 11/22, C23C 14/24, H01L 21/285

(21) International Application Number: PCT/NO03/00198

(22) International Filing Date: 16 June 2003 (16.06.2003)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
20022910 18 June 2002 (18.06.2002) NO

(71) Applicant *(for all designated States except US)*: **THIN FILM ELECTRONICS ASA** [NO/NO]; P.O. Box 1872 Vika, N-0124 Oslo (NO).

(72) Inventors; and

(75) Inventors/Applicants *(for US only)*: **LJUNGCRANTZ, Henrik** [SE/SE]; Kobergsgränd 4, S-587 21 Linköping (SE). **EDVARDSSON, Niclas** [SE/SE]; Hjortronvägen 50, S-59054 Sturefors (SE). **CARLSSON, Johan** [SE/SE]; Ekholmsvägen 219, S-589 29 Linköping (SE). **GUSTAFSSON, Göran** [SE/SE]; Trumslagaragatan 33, S-582 16 Linköping (SE).

(74) Common Representative: **LEISTAD, Geirr, I.**; Thin Film Electronics ASA, P.O. Box 1872 Vika, N-0124 Oslo (NO).

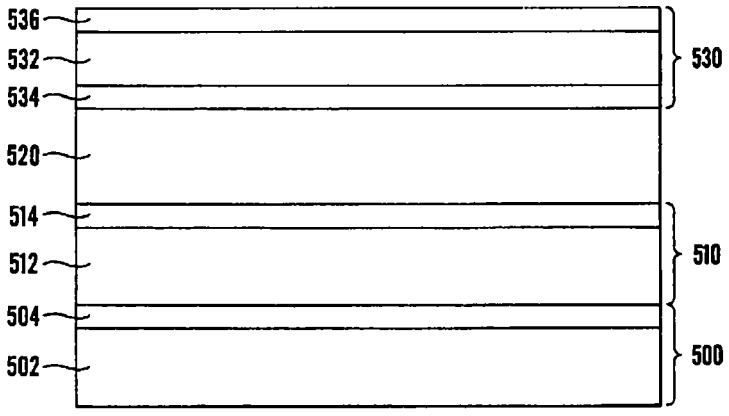
(81) Designated States *(national)*: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States *(regional)*: ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (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: A METHOD FOR MAKING A FERROELECTRIC MEMORY CELL IN A FERROELECTRIC MEMORY DEVICE, AND A FERROELECTRIC MEMORY DEVICE



(57) Abstract: In a method for making ferroelectric memory cells in a ferroelectric memory device a first electrode comprising at least one metal layer and optionally at least one metal oxide layer is formed on a silicon substrate which has an optional insulating layer of silicon dioxide. A ferroelectric layer consisting of a thin film of ferroelectric polymer is formed on the top of the first electrode layer and at least a second electrode comprising at least one metal layer and at least one metal oxide layer is formed on the ferroelectric layer. The second electrode is deposited by thermal evaporation of a high-purity evaporation source from an effusion cell onto the ferroelectric layer in a vacuum chamber filled with a gas or a gas mixture. A ferroelectric memory device wherein the memory cell has been made with the above method, comprises at least a first and a second set of respectively parallel electrodes (510; 530), wherein the electrodes (510; 530) in a set are provided orthogonally to the electrodes (530; 510) of a nearest following set and with memory cells formed in a ferroelectric layer (520) provided between successive electrode sets, such that memory cells are defined in the crossings between the electrodes (510; 530) which contact the ferroelectric layer (520) on each side thereof.

WO 03/107351 A1

ACTION

— *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.