

(19) World Intellectual Property
Organization
International Bureau



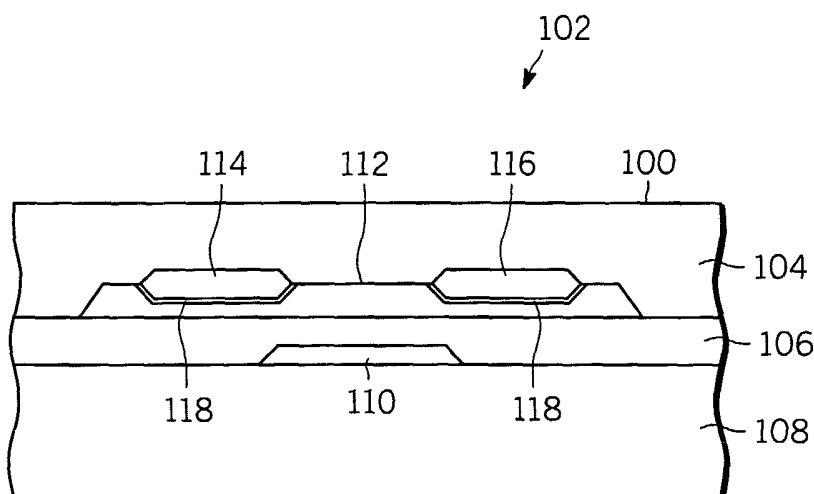
(43) International Publication Date
15 January 2004 (15.01.2004)

PCT

(10) International Publication Number
WO 2004/006633 A3

- (51) International Patent Classification⁷: **H01L 29/06**, 51/40
- (21) International Application Number: PCT/US2003/020650
- (22) International Filing Date: 3 June 2003 (03.06.2003)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:
10/187,737 2 July 2002 (02.07.2002) US
- (71) Applicant: **MOTOROLA, INC.** [US/US]; 1303 East Algonquin Road, Schaumburg, IL 60196 (US).
- (72) Inventors: **ZHANG, Jie**; 2481 Apple Hill Lane, Buffalo Grove, IL 60089 (US). **BRAZIS, Paul**; 11 West Ellington Court, South Elgin, IL 60177 (US). **GAMOTA, Daniel**; 1137 Parkside Drive, Palatin, IL 60067 (US). **KALANA-SUNDARAM, Krishna**; 575 West Madison Street, Apt 4508, Chicago, IL 60661 (US). **SCHEIFERS, Steven**; 4400 Capstan Drive, Hoffman Estates, IL 60195 (US). **WIELGUS, Jerzy**; 112 East Wilma Place, Park Ridge, IL 60068 (US). **CHOWDHURI, Abhijit, Roy**; 210 North Austin Blvd. #2A, Oak Park, IL 60302 (US).
- (74) Agents: **NICHOLS, Daniel, K.** et al.; Motorola, Inc., Intellectual Property Department, 1303 East Algonquin Road, Schaumburg, IL 60196 (US).
- (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, NI, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, 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
- (88) Date of publication of the international search report:
17 June 2004
- 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.

(54) Title: INTEGRATED CIRCUIT INCLUDING FIELD EFFECT TRANSISTOR AND METHOD OF MANUFACTURE



(57) Abstract: An integrated circuit (100, 200, 300, 400) that includes a field effect transistor (102, 202, 302, 402) is fabricated by forming an organic semiconductor channel (112, 216, 308, 418) on one substrate (106, 204), forming device electrodes (114, 116, 110, 208, 210, 212) on one or more other substrates (104, 108, 206), and subsequently laminating the substrates together. In one embodiment, a dielectric patch (214) that functions as a gate dielectric is formed on one of the substrates (204, 206) prior to performing the lamination. Lamination provides a low cost route to device assembly, allows for separate fabrication of different device structures on different substrates, and thins various device layers resulting in improved performance.

WO 2004/006633 A3

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US03/20650

A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : H01L 29/06, 51/40

US CL : 257/40; 438/99

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 257/40; 438/99

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
NONE

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
NONE

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A,P	US 6,518,949 B2 (DRZAIC) 11 February 2003 (11.02.2003), column 12, lines 16-19.	1-15
A	US 5,796,121 (GATES) 18 August 1998 (18.08.1998), column 1, lines 61-64.	7, 14

☐ Further documents are listed in the continuation of Box C.

☐ See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search

28 February 2004 (28.02.2004)

Date of mailing of the international search report

04 MAR 2004

Name and mailing address of the ISA/US

Mail Stop PCT, Attn: ISA/US
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

Facsimile No. (703) 305-3230

Authorized officer

Mark V. Prenty

Telephone No. 703-308-0956