

(19) World Intellectual Property
Organization
International Bureau



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

PCT

(10) International Publication Number
WO 2004/006014 A2

(51) International Patent Classification⁷: **G03F 1/08**

(21) International Application Number:
PCT/US2003/020113

(22) International Filing Date: 25 June 2003 (25.06.2003)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
10/190,138 3 July 2002 (03.07.2002) US

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

(72) Inventors: **TABERY, Cyrus, E.**; 1220 North Fair Oaks,
#4102, Sunnyvale, CA 94089 (US). **LYONS, Christopher,**
F.; 42681 Lerwick Street, Fremont, CA 94539 (US).

(74) Agent: **COLLOPY, Daniel, R.**; Advanced Micro Devices,
Inc., One AMD Place, Mail Stop 68, Sunnyvale, CA 94088-
3453 (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, 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.

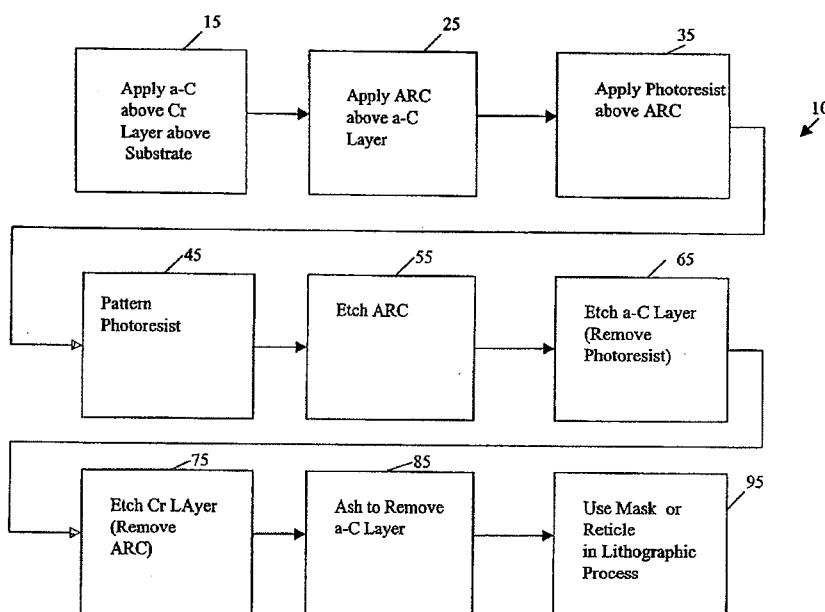
(84) Designated States (*regional*): ARIPO patent (GH, GM,
KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW),
Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),
European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE,
ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO,
SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM,
GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

— without international search report and to be republished
upon receipt of that report

For two-letter codes and other abbreviations, refer to the "Guid-
ance Notes on Codes and Abbreviations" appearing at the begin-
ning of each regular issue of the PCT Gazette.

(54) Title: METHOD OF USING AN AMORPHOUS CARBON LAYER FOR IMPROVED RETICLE FABRICATION



(57) Abstract: A method of using an amorphous carbon layer (130) for improved reticle fabrication includes depositing a stack of layers including a substrate (110), an absorber (120), a transfer layer (130), an antireflective coating (ARC) layer (140), and a photoresist layer (150), patterning (45) the photoresist layer (150), and etching (55, 65) the ARC layer (140) and the transfer layer (130). The method also includes etching (75) the absorber layer (120) and removing (85) the transfer layer (130). The transfer layer (130) including amorphous carbon.

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

(19) World Intellectual Property
Organization
International Bureau



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

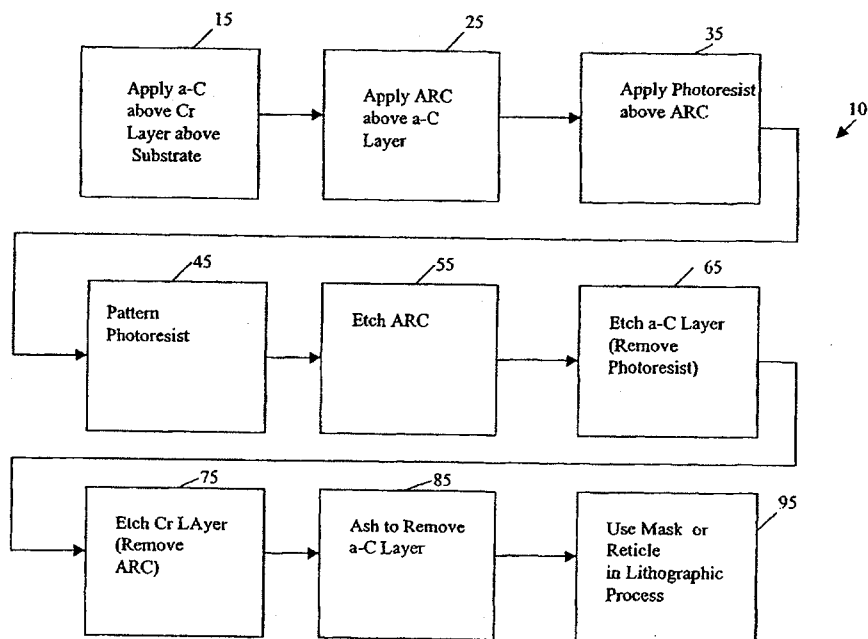
PCT

(10) International Publication Number
WO 2004/006014 A3

- (51) International Patent Classification⁷: G03F 1/08, 7/09 (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, UZ, VC, VN, YU, ZA, ZM, ZW.
- (21) International Application Number: PCT/US2003/020113
- (22) International Filing Date: 25 June 2003 (25.06.2003)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data: 10/190,138 3 July 2002 (03.07.2002) US
- (71) Applicant: ADVANCED MICRO DEVICES, INC. [US/US]; One AMD Place, Mail Stop 68, P.O. Box 3453, Sunnyvale, CA 94088-3453 (US).
- (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).
- (72) Inventors: TABERY, Cyrus, E.; 1220 North Fair Oaks, #4102, Sunnyvale, CA 94089 (US). LYONS, Christopher, E.; 42681 Lerwick Street, Fremont, CA 94539 (US).
- (74) Agent: COLLOPY, Daniel, R.; Advanced Micro Devices, Inc., One AMD Place, Mail Stop 68, Sunnyvale, CA 94088-3453 (US).
- Published:
— with international search report
— before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments
- (88) Date of publication of the international search report: 10 June 2004

[Continued on next page]

(54) Title: METHOD OF USING AN AMORPHOUS CARBON LAYER FOR IMPROVED RETICLE FABRICATION



(57) Abstract: A method of using an amorphous carbon layer (130) for improved reticle fabrication includes depositing a stack of layers including a substrate (110), an absorber (120), a transfer layer (130), an antireflective coating (ARC) layer (140), and a photoresist layer (150), patterning (45) the photoresist layer (150), and etching (55, 65) the ARC layer (140) and the transfer layer (130). The method also includes etching (75) the absorber layer (120) and removing (85) the transfer layer (130). The transfer layer (130) including amorphous carbon.

WO 2004/006014 A3



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.