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

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
19 April 2007 (19.04.2007)

PCT

(10) International Publication Number
WO 2007/044132 A1

(51) International Patent Classification:
G03F 1/14 (2006.01)

(21) International Application Number:
PCT/US2006/032916

(22) International Filing Date: 23 August 2006 (23.08.2006)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
11/245,824 7 October 2005 (07.10.2005) 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)*: **MATTHEW, Itty** [IN/US]; 3500 Granada Avenue #384, Santa Clara, CA 95051 (US). **SINGH, Bhanwar** [US/US]; 17122 Haetherwood Way, Morgan Hill, CA 95037 (US).

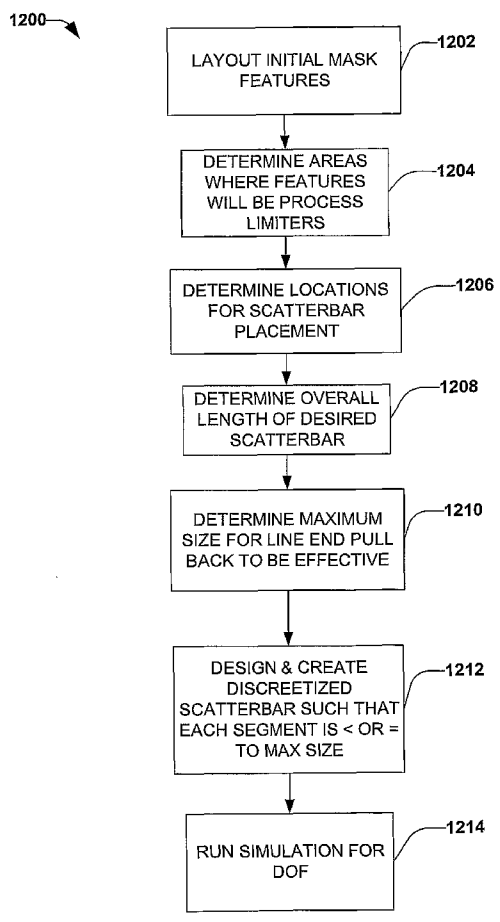
(74) Agent: **DRAKE, Paul, S.**; ADVANCED MICRO DEVICES, INC., 5204 EAST BEN WHITE BOULEVARD, Mail Stop 562, Austin, TX 78741 (US).

(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, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LV, LY, MA, MD, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, SV, SY, 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, 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,

[Continued on next page]

(54) Title: IMPROVED PROCESS MARGIN USING DISCRETE ASSIST FEATURES



(57) Abstract: The subject invention provides a system and method for improving the process margin of a lithographic imaging system. The process margin improvement is achieved through the novel placement of discrete assist features and/or the use of forbidden pitches and specific pitch orientations (1310, 1312). Novel geometries are utilized, which take advantage of line-end pull back and/or a lack of resolution of pitches perpendicular to an axis of a dipole illumination source (822, 824). The strategic placement of a series of discrete scatterbar segments on a mask near positions of critical features, such as, for example, contacts, mitigates resist residue that can result from the use of a contiguous scatterbar (1212, 1312).

WO 2007/044132 A1

FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, 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*

— *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.