

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

(19) World Intellectual Property
Organization
International Bureau

(43) International Publication Date
02 December 2021 (02.12.2021)



(10) International Publication Number
WO 2021/242654 A1

(51) International Patent Classification:

G01B 11/24 (2006.01) H01L 21/68 (2006.01)
G01B 11/02 (2006.01) H01L 21/66 (2006.01)

(21) International Application Number:

PCT/US2021/033805

(22) International Filing Date:

24 May 2021 (24.05.2021)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

63/029,741 26 May 2020 (26.05.2020) US
17/069,177 13 October 2020 (13.10.2020) US

(71) Applicant: **KLA CORPORATION** [US/US]; Legal Department, One Technology Drive, Milpitas, California 95035 (US).

(72) Inventors: **HILL, Andrew, V.**; 2112 Los Angeles Avenue, Berkeley, California 94707 (US). **LAREDO, Gilad**; Hasidey Umot Haolam 18, 3298531 Haifa (IL). **MAN-ASSEN, Amnon**; 10 Golda Meir Street, 34892 Haifa (IL). **SAFRANI, Avner**; P.O. Box 605, Mitzpe Aviv, D.N. Misgav, 20187 Misgav (IL).

(74) Agent: **MCANDREWS, Kevin** et al.; KLA Corporation, Legal Department, One Technology Drive, Milpitas, California 95035 (US).

(81) Designated States (*unless otherwise indicated, for every kind of national protection available*): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DJ, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IR, IS, IT, JO, JP, KE, KG, KH, KN, KP, KR, KW, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC, SD, SE, SG, SK, SL, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, WS, ZA, ZM, ZW.

(84) Designated States (*unless otherwise indicated, for every kind of regional protection available*): ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, ST, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, KM, ML, MR, NE, SN, TD, TG).

(54) Title: IMAGING SYSTEM FOR BURIED METROLOGY TARGETS

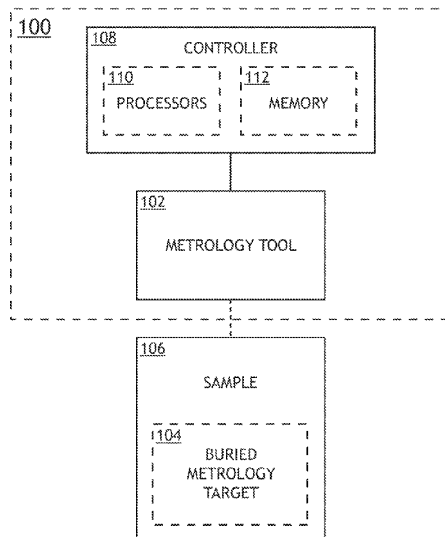


FIG. 1A

(57) Abstract: A metrology system may include an imaging sub-system to image a metrology target buried in a sample, where the sample is formed from bonded first and second substrates with a metrology target at the interface. The metrology system may further include an illumination sub-system with an illumination field stop and an illumination pupil, where the illumination field stop includes an aperture to provide that a projected size of the field-stop aperture on a measurement plane corresponding to the metrology target matches a field of view of the detector at the measurement plane, and where the illumination pupil includes a central obscuration to provide oblique illumination of the metrology target with angles greater than a cutoff angle selected to prevent illumination from the illumination source from reflecting off of the bottom surface of the sample and through the field of view of the detector at the measurement plane.

WO 2021/242654 A1

[Continued on next page]

Published:

— *with international search report (Art. 21(3))*