



(51) International Patent Classification:

G03F 7/36 (2006.01) G03F 7/004 (2006.01)
G03F 7/40 (2006.01) H01L 21/67 (2006.01)

(21) International Application Number:

PCT/US2024/039915

(22) International Filing Date:

26 July 2024 (26.07.2024)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

63/516,040 27 July 2023 (27.07.2023) US

(71) Applicant: **LAM RESEARCH CORPORATION**
[US/US]; 4650 Cushing Pkwy., Fremont, California 94538 (US).

(72) Inventors: **LI, Da**; 4650 Cushing Pkwy., Fremont, California 94538 (US). **KIM, Ji Yeon**; 4650 Cushing Pkwy., Fremont, California 94538 (US). **LEE, Younghee**; 4650 Cushing Pkwy., Fremont, California 94538 (US). **ZHAO, Hongxiang**; 4650 Cushing Pkwy., Fremont, California 94538 (US). **ZHU, Yisi**; 4650 Cushing Pkwy., Fremont, California 94538 (US). **TAN, Samantha S.H.**; 4650 Cushing Pkwy., Fremont, California 94538 (US). **ZOU, Meng-**

nan; 4650 Cushing Pkwy., Fremont, California 94538 (US). **SUN, Zhiwei**; 4650 Cushing Pkwy., Fremont, California 94538 (US). **XUE, Jun**; 4650 Cushing Pkwy., Fremont, California 94538 (US).

(74) Agent: **RAMESH, Elaine M.** et al.; Weaver Austin Villeneuve & Sampson LLP, P.O. Box 70250, Oakland, California 94612-0250 (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, CV, CZ, DE, DJ, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IQ, IR, IS, IT, JM, JO, JP, KE, KG, KH, KN, KP, KR, KW, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, MG, MK, MN, MU, 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, CV, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SC, 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,

(54) Title: ALL-IN-ONE DRY DEVELOPMENT FOR METAL-CONTAINING PHOTORESIST

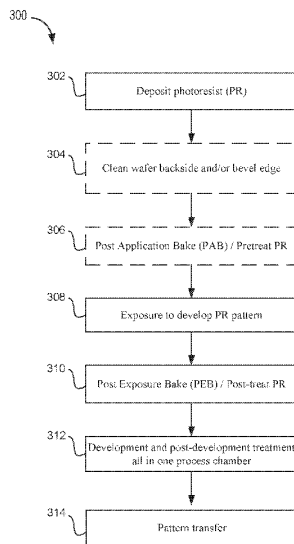


FIG. 3

(57) Abstract: Process condition management facilitates the combination of dry development and post-development treatment into a single process chamber; eliminating the necessity for a post-dry development bake step in a separate chamber during semiconductor manufacturing. Thermal dry development and plasma dry development may be performed in the same chamber. Thermal dry development, plasma dry development and passivation such as an O₂ flash treatment; or thermal dry development, plasma dry development, passivation and hardening operations are enabled without wafer transfer.

DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT,
LU, LV, MC, ME, 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).

Published:

- *with international search report (Art. 21(3))*
- *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))*