

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

(19) World Intellectual Property
Organization
International Bureau

(43) International Publication Date
31 August 2023 (31.08.2023)



(10) International Publication Number
WO 2023/164413 A1

(51) International Patent Classification:

H01L 21/768 (2006.01) C23C 16/02 (2006.01)
H01L 21/285 (2006.01) C23C 16/04 (2006.01)
H01L 21/02 (2006.01) C23C 16/06 (2006.01)

(21) International Application Number:

PCT/US2023/062877

(22) International Filing Date:

17 February 2023 (17.02.2023)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

63/268,484 24 February 2022 (24.02.2022) US
63/381,883 01 November 2022 (01.11.2022) US

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

(72) Inventors: **HSIEH, Yao-Tsung**; 4650 Cushing Pkwy., Fremont, California 94538 (US). **GRIFFITHS, Matthew Bertram Edward**; 4650 Cushing Pkwy., Fremont, California 94538 (US). **NA, Jeong-Seok**; 4650 Cushing Pkwy., Fremont, California 94538 (US). **LAI, Chiukin Steven**; 4650 Cushing Pkwy., Fremont, California 94538 (US).

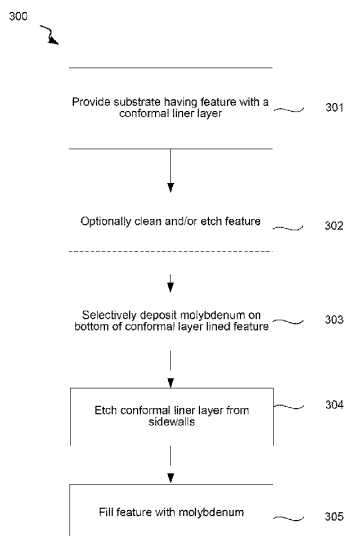
MANDIA, David Joseph; 4650 Cushing Pkwy, Fremont, 94538 (US).

(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, 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, 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,

(54) Title: LOW RESISTANCE MOLYBDENUM DEPOSITION FOR LOGIC SOURCE/DRAIN CONTACTS



(57) Abstract: Provided is an efficient method for filling a semiconductor substrate conformal layer lined feature utilizing a metal precursor to selectively deposit metal at the bottom of the feature and to etch the conformal layer lining from feature sidewalls.

FIG. 3

WO 2023/164413 A1

[Continued on next page]

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))*