

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

(19) World Intellectual Property
Organization
International Bureau

(43) International Publication Date
06 March 2025 (06.03.2025)



(10) International Publication Number
WO 2025/049505 A1

(51) International Patent Classification:

H01L 21/8238 (2006.01) H01L 21/285 (2006.01)
H01L 21/768 (2006.01) H01L 21/02 (2006.01)

(21) International Application Number:

PCT/US2024/044086

(22) International Filing Date:

28 August 2024 (28.08.2024)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

63/536,294 01 September 2023 (01.09.2023) US

(71) Applicant: **APPLIED MATERIALS, INC.** [US/US];
3050 Bowers Avenue, Santa Clara, California 95054 (US).

(72) Inventors: **BREIL, Nicolas Louis**; c/o Applied Materials,
Inc., Law Dept., M/S 1269, 3050 Bowers Avenue, Santa
Clara, California 95054 (US). **GELATOS, Avgerinos V.**; c/
o Applied Materials, Inc., Law Dept., M/S 1269, 3050 Bow-
ers Avenue, Santa Clara, California 95054 (US).

(74) Agent: **HAMMACK, Marcus W.** et al.; Patterson + Sheri-
dan LLP, 24 Greenway Plaza, Suite 1600, Houston, Texas
77046 (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,
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))

(54) Title: METAL TREATMENT ON METAL SILICIDE FOR CMOS DEVICES

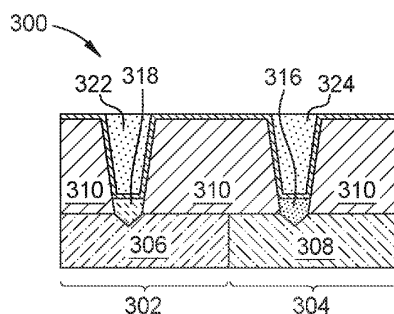


FIG. 3F

(57) Abstract: A method of forming an electrical contact in a semicon-
ductor structure includes performing a cavity shaping process on a semi-
conductor structure having a p-type semiconductor region for a p-type
metal oxide semiconductor (p-MOS) device, the cavity shaping process
comprising forming a first cavity in an exposed surface of the p-type semi-
conductor region, performing a first selective deposition process to form
a first cavity contact, selectively in the first cavity, and performing a metal
treatment process on the formed first cavity contact, to remove oxides at
interfaces of the first cavity contact with the first cavity.

WO 2025/049505 A1