

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

(19) World Intellectual Property
Organization
International Bureau

(43) International Publication Date
26 August 2021 (26.08.2021)



(10) International Publication Number
WO 2021/168134 A1

(51) International Patent Classification:
H01L 21/768 (2006.01) *H01L 21/285* (2006.01)

(21) International Application Number:
PCT/US2021/018606

(22) International Filing Date:
18 February 2021 (18.02.2021)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
62/978,765 19 February 2020 (19.02.2020) US

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(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: GRAPHENE INTEGRATION

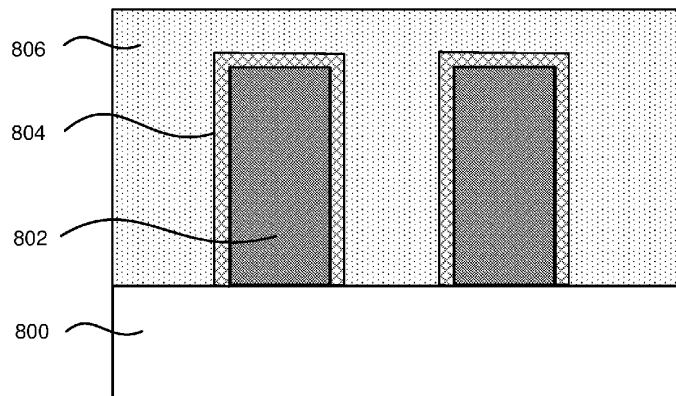


FIG. 8

(57) Abstract: Graphene is deposited on a metal surface of a semiconductor substrate at a deposition temperature compatible with back-end-of-line semiconductor processing. The graphene may be annealed at a temperature between the deposition temperature and a temperature sensitive limit of materials in the semiconductor substrate to improve film quality. Alternatively, the graphene may be treated by exposure to plasma with one or more oxidant species. The graphene may be encapsulated with an etch stop layer and hermetic barrier, where the etch stop layer includes a metal oxide deposited under conditions that do not change or that improve the film quality of the graphene. The graphene may be encapsulated with a hermetic barrier, where the hermetic barrier is deposited under conditions that do not damage the graphene.

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Published:

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