



(51) International Patent Classification:

H10B 53/30 (2023.01) C23C 16/455 (2006.01)
H10N 97/00 (2023.01) C07F 7/00 (2006.01)
C23C 16/40 (2006.01)

(21) International Application Number:

PCT/US2023/070447

(22) International Filing Date:

18 July 2023 (18.07.2023)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

63/368,891 20 July 2022 (20.07.2022) US

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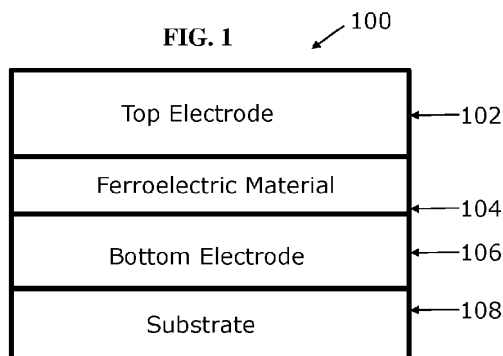
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(81) Designated States (unless otherwise indicated, for every
kind of national protection available): AE, AG, AL, AM,
AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ,
CA, CH, CL, CN, CO, CR, CU, CV, CZ, DE, DJ, DK, DM,
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HN, 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,
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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: OPTIMIZATION OF BOTTOM ELECTRODE FOR THE ENHANCEMENT OF FERROELECTRIC PERFORMANCE
IN HAFNIA-BASED OXIDE WITH BACK-END-OF-LINE (BEOL) COMPATIBLE PROCESS

FIG. 1



(57) Abstract: The disclosed and claimed subject matter relates to a ferroelectric device having a bottom electrode, a film comprising crystalline ferroelectric materials that include a mixture of hafnium oxide and zirconium oxide having a substantial (i.e., approximately 40% or more) or majority portion of the material in a ferroelectric phase as deposited, a top electrode, and methods for preparing and depositing these materials. The bottom electrode is thin and has low roughness. The ferroelectric device is back-end-of-line (BEOL) compatible as all process steps take place at a temperature of 400 degrees Celsius or less.

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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))*