Supplementary Information (SI) for Journal of Materials Chemistry C.

Supplementary Information

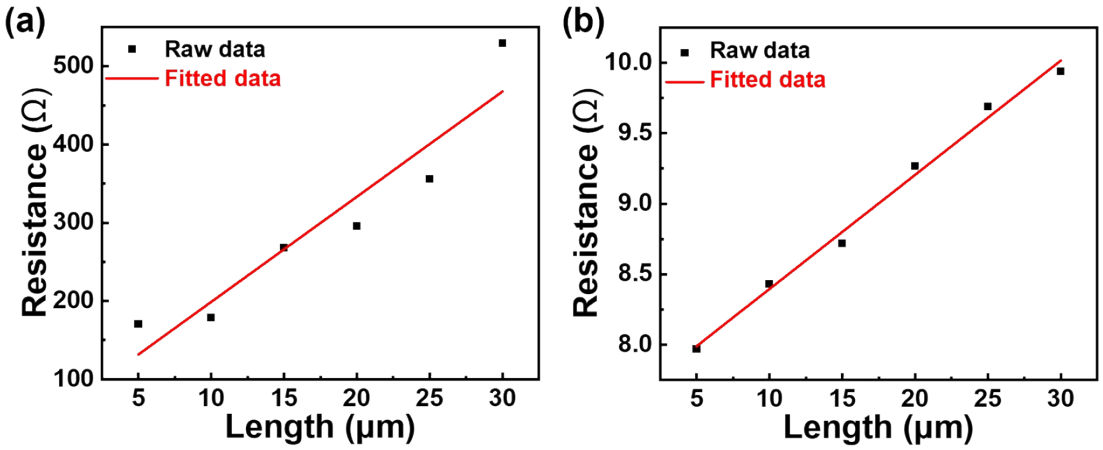

Fig. S1. Fitted data for calculating contact resistance (a) without and (b) with N_2 plasma treatment.

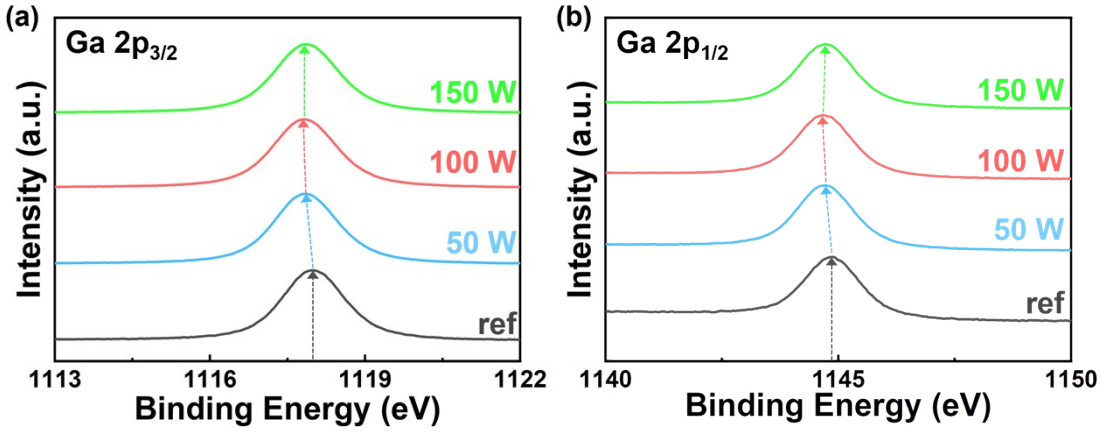

Fig. S2. X-ray photoelectron spectroscopy (XPS) spectra of (a) Ga $2p_{3/2}$ peak and (b) Ga $2p_{1/2}$ for β-Ga_2O_3 substrates treated with N_2 plasma at varying bias powers of 0, 50, 100, and 150 W.

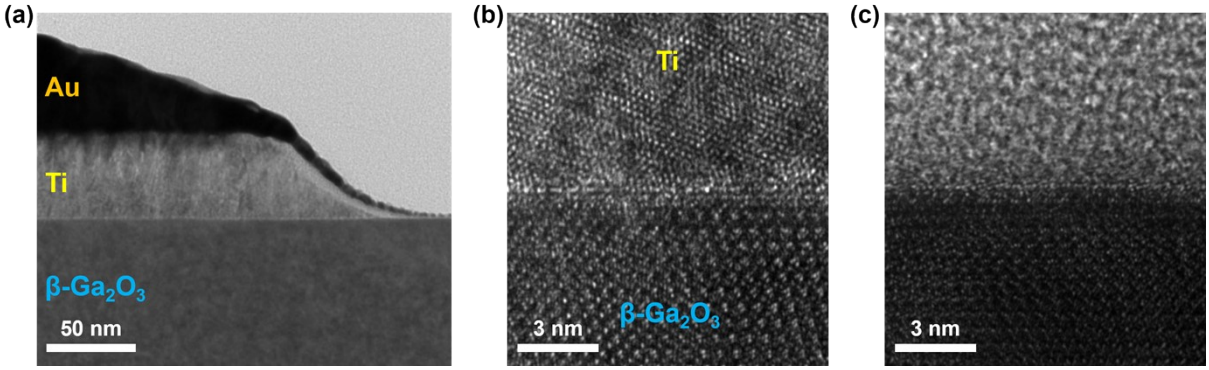

Fig. S3. Cross-sectional transmission electron microscope (TEM) images of (a) β-Ga_2O_3 without plasma treatment, (b) Ti/β-Ga_2O_3 interface, and (c) carbon-coated β-Ga_2O_3.

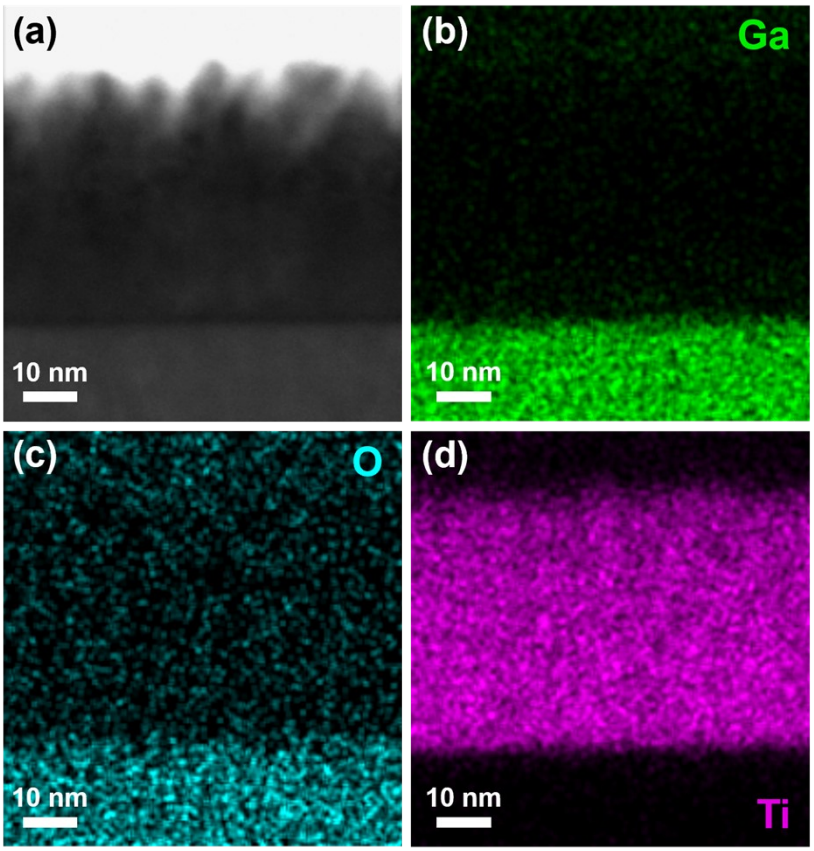

Fig. S4. (a) High magnification scanning tunnelling electron microscope (STEM) image of the metal electrode/β-Ga_2O_3 interface. (b)-(d) Energy dispersive spectroscopy (EDS) mapping of gallium, oxygen, and titanium corresponding to the region shown in (a), respectively.

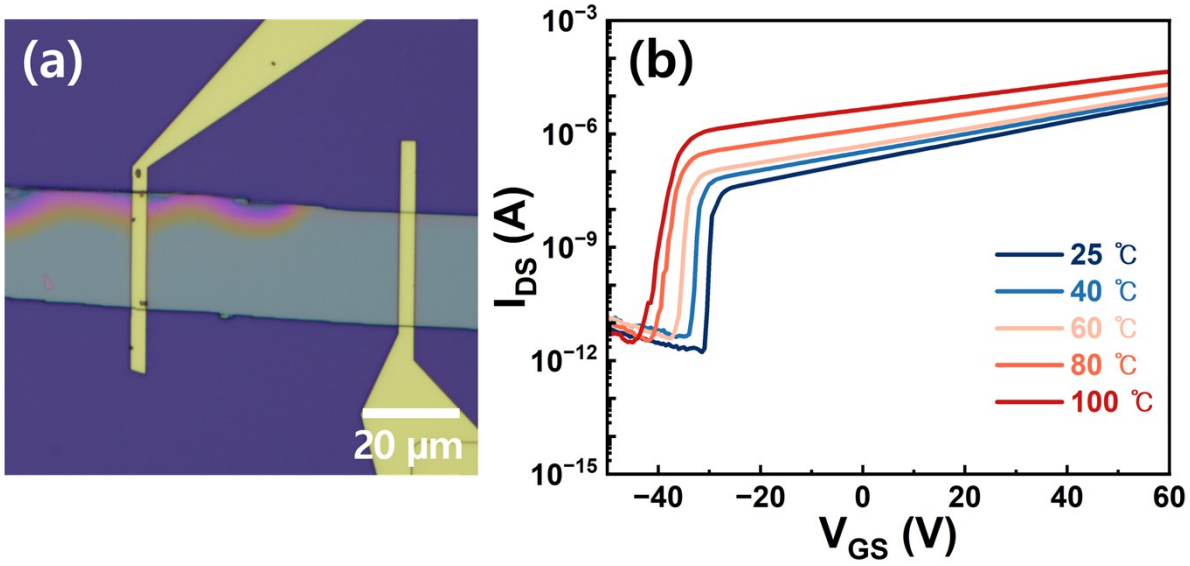

Fig. S5. (a) Optical microscope image of the plasma-treated β-Ga_2O_3 FET. (b) V_{GS}-I_{DS} transfer curve of the β-Ga_2O_3 FET measured at elevated temperatures ranging from 25 °C to 100 °C.

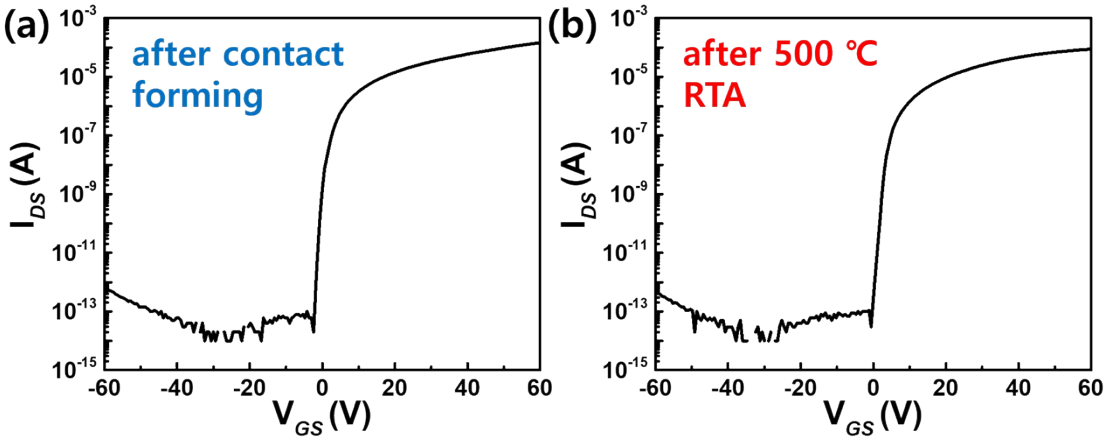

Fig. S6. V_{GS}-I_{DS} transfer curve of the β-Ga_2O_3 FET of (a) after contact formation by N_2 plasma treatment and (b) after additional 500 °C rapid thermal annealing.

Temperature (℃)	threshold voltage (V)
25	41.43
40	40.47
60	39.98
80	37.00
100	30.18

Table S1. Threshold voltage calculation data from transfer curve of the β-Ga_2O_3 FET measured at elevated temperatures ranging from 25 °C to 100 °C.