

Fig. 1. (a) Schematic diagram and (b) top-view SEM image of the RESURF Ga₂O₃ SBD. (c) The N_d-N_a depth profile of the Ga₂O₃ epi layers. (d) C-V and $1/C^2$ -V characteristics of the vertical NiO/Ga₂O₃ diode at 25°C and 200°C.

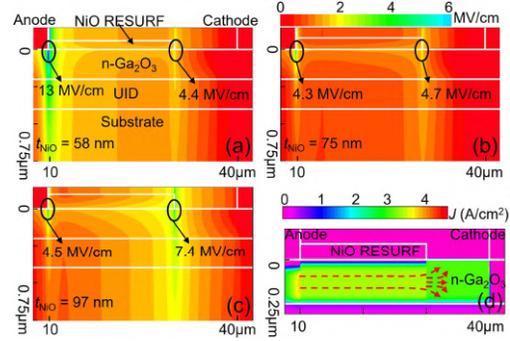


Fig. 2. Simulated E-field contour of Ga₂O₃ RESURF SBDs with t_{NiO} of (a) 58nm, (b) 75nm, and (c) 97nm, at $V_R=4\text{kV}$. (d) Simulated current density contour of the 75-nm-RESURF SBD at 2V.

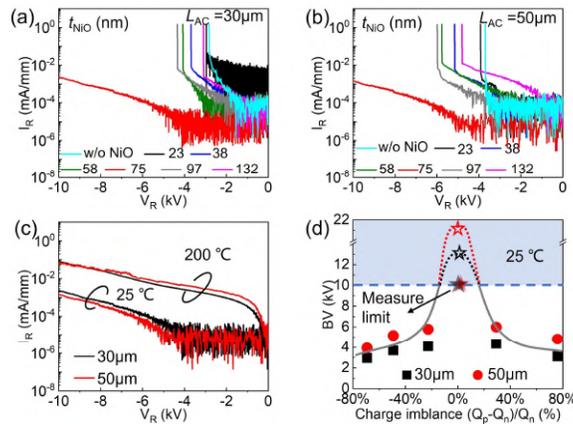


Fig. 3. Reverse I-V characteristics of the SBDs and RESURF SBDs with L_{AC} of (a) 30 and (b) 50 μm , both with various t_{NiO} . (c) Reverse I-V characteristics of the 75-nm-RESURF SBDs with two L_{AC} at 25°C and 200°C. (d) BV as a function of the charge imbalance percentage. The hollow symbols show the projected BV of the 75-nm-RESURF SBDs.

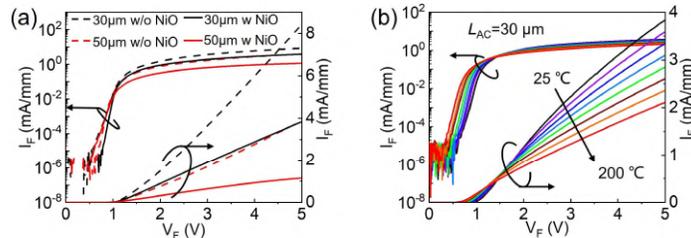


Fig. 4. (a) Forward I-V characteristics of the SBDs and RESURF SBDs, both with $L_{\text{AC}}=30$ and 50 μm . (b) Forward I-V characteristics of the RESURF SBD with $L_{\text{AC}}=30\mu\text{m}$ at temperatures of 25°C to 200°C at a step of 25°C.

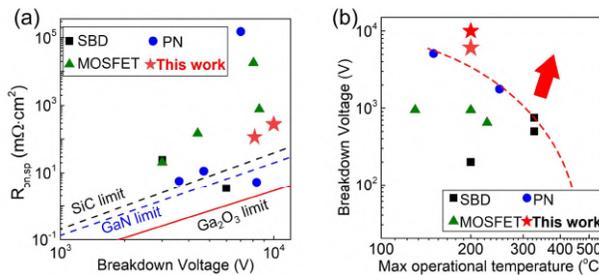


Fig. 5. (a) Benchmark of the differential $R_{\text{on,sp}}$ vs. BV for our device and the reported Ga₂O₃ devices with $BV>3\text{kV}$. (b) The BV vs. max operational temperature benchmark for our device and the reported high-temperature Ga₂O₃ devices with $BV>100\text{V}$.