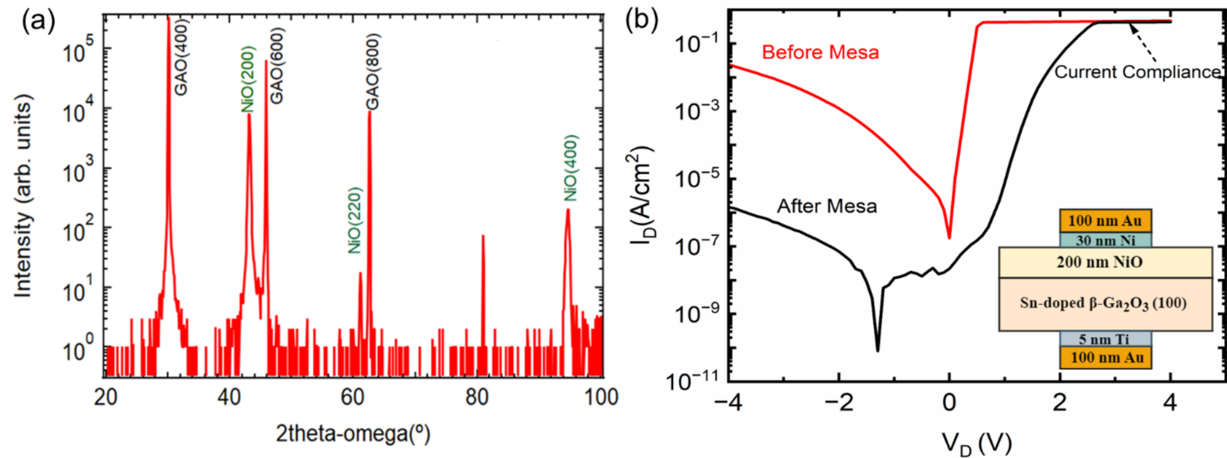

Figure 1: (a) Wide angle x-ray diffraction scan of ~200nm thick NiO thin film grown by pulsed laser deposition on Sn-doped Ga_2O_3(100) substrate, showing a polycrystalline layer with a preferential (100) orientation. (b) Room temperature I-V characteristics of NiO/β-Ga_2O_3 *p-n* diode on a 100 µm pad before(red) and after (black) NiO mesa isolation. The mesa etch is effective at reducing current spreading leading to improved leakage current. Inset shows a schematic of the device structure.

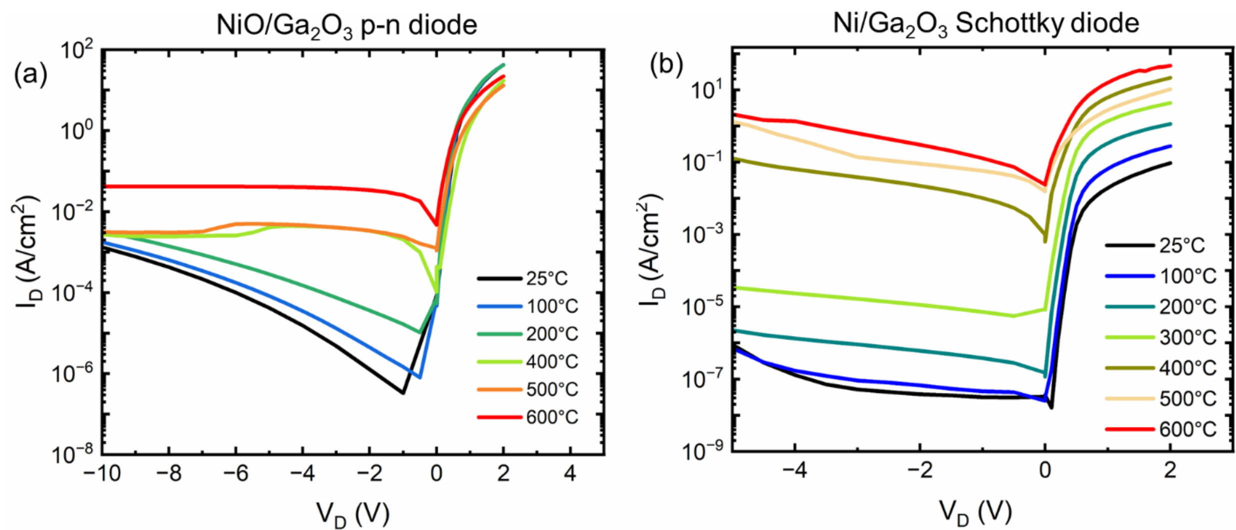

Figure 2: High temperature rectification characteristics of (a) NiO/β-Ga_2O_3 *p-n* diode and (b) Ni/β-Ga_2O_3 Schottky diode. The reverse leakage current of the *p-n* diode increases approximately 2 orders of magnitude from 300 °C to 600 °C, compared to about 5 orders of magnitude for the Schottky diode over the same temperature range.