

## Ar Ion Irradiation Effects on the Characteristics of Ru|Pt|*n*-GaN Schottky Barrier Diodes

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The present study reports the effects of 650-keV Ar<sup>2+</sup> ion irradiation on the structural, optical, and device characteristics of Ru|Pt|*n*-GaN Schottky barrier diodes (SBDs). Ion irradiation induces the broadening of the GaN X-ray diffraction peaks due to induced structural deformities. The photoluminescence spectroscopy intensity decreases with the increase in the fluence of ions. The recombination of charge carriers induced by the geometrical distortions, and the formation of defects states, shifts the peak positions to shorter wavelengths. The electrical characteristics of these devices exhibit significant changes due to modification at the interface and charge transport properties after Ar<sup>2+</sup> ion irradiation. The charge-transport properties are affected by these deformities at higher fluences and attributed to the contributions of various current conduction mechanisms, including defect-assisted tunnelling and generation–recombination (G–R) currents along with thermionic emission.

**Keywords:** GaN SBDs, electrical parameters, ion irradiation, current conduction mechanisms.

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