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Thermally Stable Schottky Contacts on n-type GaN using ZrB₂
TOM ODER, PAMELA MARTIN, Youngstown State University — Zirconium boride Schottky diodes were successfully fabricated on n-type GaN grown by metalorganic chemical vapor deposition. Nickel gallide was used as the ohmic contact and the metal films were deposited by DC magnetron sputtering. The diodes were characterized using current-voltage measurements, optical microscopy and Rutherford backscattering spectroscopy. Barrier height of 0.8 eV was obtained on as-deposited Schottky contacts. The ideality factor was obtained to be 2.2. High temperature stability of these diodes was also investigated using rapid thermal annealing in nitrogen gas for 20 minutes. Our results showed a decrease in barrier height to 0.7 eV after annealing at 300°C and a further decrease to 0.6 eV after further anneal at 400°C. However, the barrier height remained at around 0.6 eV even when the diodes were annealed at 600°C.

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