

Characterization of current-voltage (I-V) and capacitance-voltage-frequency (C-V-f) features of Au/GaN Schottky diodes

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Abstract : The current-voltage (I-V) characteristics of Au/GaN Schottky diodes were measured at room temperature. In addition, capacitance-voltage-frequency (C-V-f) characteristics are investigated by considering the interface states (N_{ss}) at frequency range 100 kHz to 1 MHz. From the I-V characteristics of the Schottky diode, ideality factor (n) and barrier height (Φ_b) values of 1.22 and 0.56 eV, respectively, were obtained from a forward bias I-V plot. In addition, the interface states distribution profile as a function of ($E_{ss} - E_v$) was extracted from the forward bias I-V measurements by taking into account the bias dependence of the effective barrier height (Φ_e) for the Schottky diode. The C-V curves gave a barrier height value higher than those obtained from I-V measurements. This discrepancy is due to the different nature of the I-V and C-V measurement techniques.

Keywords : Schottky diodes, frequency dependence, barrier height, interface states

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