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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 (Nss) at frequency range 100 kHz to 1 MHz. From the I–V characteristics of the Schottky diode, ideality factor (n) and barrier height (Φb) 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 (Ess − Ev) was extracted from the forward bias I–V measurements by taking into account the bias dependence of the effective barrier height (Φe) 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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