

Thermal Study of Gallium Nitride - Metal Contact

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Abstract. GaN films are prepared by MOCVD method on a sapphire substrate. The sample is n-type an semiconductor of 0.5 μm thickness and carriers concentration $2.2 \times 10^{19} \text{cm}^{-3}$. Metal contacts are prepared by evaporation of metals on GaN films. I-V characteristics are carried out under vacuum in the temperature rang from 90 to 300 K. There is a departure from the nonlinear behavior of the current to a linear one as temperature increases due to the sample series resistance. The saturation current is found to be 8.3×10^{-7} A at room temperature; then, it increases with temperature. At room temperature, the barrier height at zero- bias and the flat band barrier height are calculated at different temperature and they are found to be 0.66 eV and 0.86 eV, respectively. Moreover, the ideality factor has been calculated at different temperature; it increases with decreasing temperature and it is equal to 1.26 at room temperature. The serial resistant is found to be to 64 Ω at room temperature.

Keywords: Ideality factor, barrier height, I-V_T measurements.