Gaussian distribution of inhomogeneous barrier height in Al/p-GaAs Schottky Barrier Diodes (SBDs) SAHAR ALIALY, SEMSETTIN AL-TINDAL, Physics Department, Faculty of Sciences, Gazi University, 06500, Ankara, Turkey — The forward bias current-voltage (I-V) characteristics of Al/p-GaAs SBDs have been investigated in the temperature range of 240-360 K. The main electrical parameters such as zero-bias barrier height (Φ_{Bo}), ideality factor (n) and series resistance (R_s) determined from the forward bias I-V data. These values are strong function of temperature and voltage. The analysis of I-V data based on the thermionic emission (TE) mechanism show that while the n decreases, the Φ_{Bo} and R_s increases with increasing temperature. Φ_{Bo} and n versus q/2kT plots were drown to obtain an evidence of GD of BH. The mean value of BH and standard deviation (σ_o) values were found from the intercept and slope of Φ_{Bo} vs q/2kT plot, respectively. Furthermore, the mean value of BH and the effective Richardson constant A* were obtained from the intercept and slope of the modified $\ln(I_o/T^2)$-$q^2\sigma_0^2/2(kT)^2$ versus q/kT plot. The obtained value of A* is closed to theoretical value of p-GaAs. As a result, the I-V characteristics in Al/p-GaAs successfully have been explained based on TE theory with GD of BHs.

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