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## Analysis of temperature-dependent current-voltage characteristics and extraction of series resistance in Pd/ZnO Schottky diode

*Tuesday, 5 May 2015 15:15 (1h 45m)*

We report on the analysis of current voltage (I-V) measurements performed on Pd/ZnO Schottky barrier diodes in the 30-350 K temperature range. Assuming thermionic emission (TE) theory, the forward bias I-V characteristics were analysed to extract Pd/ZnO Schottky diode parameters. Comparing Cheung's method in the extraction of the series resistance with Ohm's law, it was observed that at lower temperatures ( $T < 180$  K) the series resistance decreased with increasing temperature, the absolute minimum was reached near 180 K and increases linearly with temperature at high temperatures ( $T > 200$  K). The barrier height and the ideality factor decreased and increased, respectively, with decrease in temperature, attributed to the existence of barrier height inhomogeneity. Such inhomogeneity was explained based on TE with the assumption of Gaussian distribution of barrier heights with a mean barrier height of 0.986 eV and a standard deviation of 0.015 eV. A mean barrier height of 0.994 eV and Richardson constant value of  $37.48 \text{ A cm}^{-2} \text{ K}^{-2}$  were determined from the modified Richardson plot that considers the Gaussian distribution of barrier heights.

**Are you currently a postgraduate student? (Yes/No)**

yes

**At what level of studies are you currently? (Hons/MSc/PhD)**

MSc

**Please provide the name and email address of your supervisor.**

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