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OPTIMUM n-GaN SCHOTTKY DIODE CURRENT-VOLTAGE CHARACTERISTICS BY USING DIFFERENT METAL CONTACT

T. Munir , A. Abdul Aziz, M. J. Abdullah, N. M. Ahmed , A. Y. Hudeish
School of Physics University Sains Malaysia 11800
Minden Penang Malaysia.

ABSTRACT

We focus in this paper on the optimum room temperature (I-V) characteristics obtained by using contacts of various single layer metal (Pt, Ni, Au, Ti, Al, Sc) to form an ntype GaN schottky diode. The simulated current was obtained by increasing forward bias from 0~ 4Volt conducted by using Atlas/Blaze developed by Silvaco. The incomplete ioniz, cvt, Fermi, Bgn, Shockley- Read Hall model was used to get optimum current –voltage (I-V) characteristics. It was found that metals Pt, Ni, Au exhibit strong rectifying behavior while Al and Ti exhibit weak rectifying properties. It was also found that an increase in the metal work function is correlated with an increase in the barrier height. By calculating the values of barrier height (öB), ideality factor (ç), breakdown voltage (V_B) for the different electrodes, we came to a conclusion that Pt metal exhibit optimum (I-V) rectifying characteristics of n-GaN schottky diode [7].

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