Au/3C-SiC/Al 쇼터키 다이오드의 전기적 특성

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Electrical characteristics of Au/3C-SiC/Si/Al Schottky diode

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Abstract : High temperature silicon carbide Schottky diode was fabricated with Au deposited on poly 3C–SiC thin film grown on p-type Si(100) using atmospheric pressure chemical vapor deposition. The charge transport mechanism of the diode was studied in the temperature range of 300 K to 550 K. The forward and reverse bias currents of the diode increase strongly with temperature and diode shows a non-ideal behavior due to the series resistance and the interface states associated with 3C-SiC. The charge transport mechanism is a temperature activated process, in which, the electrons passes over of the low barriers and in turn, diode has a large ideality factor. The charge transport mechanism of the diode was analyzed by a Gaussian distribution of the Schottky barrier heights due to the Schottky barrier inhomogeneities at the metal-semiconductor interface and the mean barrier height and zero-bias standard deviation values for the diode was found to be 1.82 eV and s_0 = 0.233 V, respectively. The interface state density of the diode was determined using conductance-frequency and it was of order of 9.18×10^{10} eV^{-1} cm^{-2}.

Key Words : SiC diode, interfacial state density