

CONDUCTIVITY MEASUREMENTS DUE TO THERMAL HEATING OF GERMANIUM JUNCTION DIODE IN REVERSE BIAS PLACED IN DIFFERENT FLUID ENVIRONMENT

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Abstract

Germanium diode in reverse bias kept within fluid environment viz. Transformer oil, Mobil oil, Mustard oil and kerosene is heated to 340°K. Variation in reverse bias current biased at -2.0 volts is studied by increasing the fluid temperature. Study of plot $\log_{10} I_0$ versus $10^3/T$ for all fluids reveals that below 328° K the band gap is steady and hence diode can be used as a temperature sensor in this range. The study of I_0 versus T and T^2 reveal that above 328° K contribution to reverse bias current I_0 is due to the minority carriers developed by thermal agitation and valence bond breakage and not due to carrier supplied by donor levels. addition study reveals that heating fluids do supply some extra carriers making a small variation in reverse bias current with fluids.