

TRANSPORT AND GENERATION OF THE EXCESS CARRIERS IN SEMICONDUCTORS IN THE PRESENCE OF A TEMPERATURE GRADIENT AND A MAGNETIC FIELD

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ABSTRACT

In the Sections 1 and 2 of the paper the theory and a quantitative analysis of ambipolar thermodiffusion are presented. Formulas are derived describing the internal and total current densities and the excess carrier density distribution in a semiconductor in the presence of a temperature gradient perpendicular to the surface of the semiconductor plate. The Sections 3 and 4 describe the interaction of thermodiffusion current and perpendicular magnetic field resulting with *emf* and voltage between sample electrodes. We have called this phenomenon as thermomagnetolectric effect (TME). The theory gives the formula that defines the TME voltage, which depends on the carrier lifetime and the surface recombination velocity of the semiconductor sample.