

PHOTOACOUSTIC INVESTIGATIONS OF THERMAL AND TRANSPORT PROPERTIES OF GALLIUM ARSENIDE AND SILICON

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ABSTRACT

Photoacoustic (PA) technique using Open Photoacoustic Cell was tested by employing two widely used semiconductors, Gallium Arsenide (GaAs) and Silicon. Measurements were done in two cases, that is, the low-frequency and the high-frequency range. At low-frequency regime, thermal diffusivities were determined from the PA amplitude and phase signal. However, at high-frequency regime, non-radiative recombination processes of photo-excited carriers already occurred. In this case, thermal diffusivity and carrier transport properties were also determined. The value of thermal diffusivities obtained show that the PA instrumentation is successful in measuring thermal properties of semiconductors.

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