

Investigation of Doping Effects on Nonradiative Recombination Parameters in Bulk GaAs

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Abstract : We have used Photothermal deflection spectroscopy PTD to investigate the impact of doping on electronics properties of bulk. Then, the extraction of these parameters is performed by fitting the theoretical curves to the experimental PTD ones. We have remarked that electron mobility in p type C-doped GaAs is about $300 \text{ cm}^2/\text{V}\cdot\text{s}$. Accordingly, the diffusion length of minority carrier lifetime is equal to $5 (\pm 7\%)$, $5 (\pm 4,4\%)$ and $1.42 \mu\text{m} (\pm 7,2 \%)$ for the Cr, C and Si doped GaAs respectively. Surface recombination velocity varies randomly that can be found around of 7942 m/s, 100 m/s and 153 m/s GaAs doped Si, Cr, C, respectively.

Keywords : nonradiative lifetime, mobility of minority carrier, diffusion length, surface and interface recombination in GaAs

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