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Characterization of Temperature Dependence of the Electron Capture Cross Section of E-Center in Sb-Doped Germanium

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Abstract :

The temperature dependent capture cross section of the E-center in Ge after intentionally irradiating the sample by alpha particle has been investigated. Ohmic contact and Schottky diodes were deposited on n-type Sb-doped Ge by resistive evaporation. DLTS measurements were made by high resolution Laplace DLTS. From an Arrhenius plot, we found that the thermal emission of the E-center had activation energy of (0.370 ± 0.001) eV and an apparent capture cross section of 2.22×10^{-15} cm². For a constant filling pulse width, the height of the DLTS peak due to the E-center increased with increasing temperature. This is the evidence that the E-center has a temperature activated capture cross section. The capture barrier energy and true capture cross section of Ge E-center have been determined to be (0.052 ± 0.003) eV and $(2.25 \pm 0.05) \times 10^{-17}$ cm² respectively

Award :

Yes

Level :

PhD

Supervisor :

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Paper :

No

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