

Appendix B

GaAs Properties

Properties	Value	Unit
Electron affinity	4.07	V
Intrinsic carrier density	2×10^6	cm^{-3}
Diffusion coefficient for electron	207	$cm^2 s^{-1}$
Diffusion coefficient for hole	10	$cm^2 s^{-1}$
Dielectric constant (ϵ_s)	13.9	F/cm
Effective density of the conduction band	4.4×10^{17}	cm^{-3}
Effective density of the valence band	8.2×10^{18}	cm^{-3}
Minority carrier life time (τ_0)	10^{-8}	s
Ionization Energy E_{ion}	4.02	$eV (ehp)^{-1}$
Energy gap	1.42	eV
Intrinsic debey length	2250	μm
Effective masse of electron	$0.063m_0$	Kg
Effective masse of hole	$0.53m_0$	Kg
Electron mobility	7300	$cm^2 V^{-1} s^{-1}$
Hole mobility	425	$cm^2 V^{-1} s^{-1}$
Maximum resistivity	8.43×10^8	Ωcm
Thermal velocity (v_{th})	4.653×10^7	cms^{-1}