List of Symbols

I. Semiconductor Physics

Symbol	Description	Unit
E_g	Band gap energy (in terms of eV, where 1 eV = 1.602 x 10^{-19} J)	eV
q	Electronic charge (q = 1.602 x 10^{-19} C)	C
T	Absolute temperature (room temperature is T = 300K)	K
n_i	Intrinsic carrier concentration (n_i = 1.5 $\times$ 10^{10} cm^{-3} for silicon at T = 300 K)	cm^{-3}
p	Hole concentration	cm^{-3}
n	Electron concentration	cm^{-3}
p_0	Hole concentration at thermal equilibrium	cm^{-3}
n_0	Electron concentration at thermal equilibrium	cm^{-3}
N_A	Acceptor concentration	cm^{-3}
N_D	Donor concentration	cm^{-3}
N_A^-	Ionized acceptor concentration	cm^{-3}
N_D^+	Ionized donor concentration	cm^{-3}
I_{drift}	Drift current	A
$I_{p,drift}$	Hole drift current	A
$I_{n,drift}$	Electron drift current	A
J_{drift}	Drift current density	A/cm^2
$J_{p,drift}$	Hole drift current density	A/cm^2
$J_{n,drift}$	Electron drift current density	A/cm^2
v_d	Drift velocity of charge carriers	cm/s
E	Electric field	V/cm
μ_p	Hole mobility	$cm^2/V.s$
μ_n	Electron mobility	$cm^2/V.s$
σ	Conductivity	Ω^{-1} cm^{-1}
ρ	Resistivity	Ω cm
D_p	Hole diffusion coefficient or diffusivity	cm^2/s
D_n	Electron diffusion coefficient or diffusivity	cm^2/s
k	Boltzmann constant (k = 1.381 $\times 10^{-23}$ J/K = 8.62$\times 10^{-5}$ eV/K)	J/K or eV/K
V_T	Thermal voltage (V_T $\approx$ 0.025 V at T = 300 K)	V
Δp	Excess hole concentration	cm^{-3}
Δn	Excess electron concentration	cm^{-3}