

# A list of common symbols and abbreviations

## Symbols

$\Gamma$	Confinement factor
$\lambda$	Wavelength
$\mu_e$	Electron mobility
$\mu_h$	Hole mobility
$\Psi$	Wavefunction
$\tau_{e-h}$	Confined carrier electron/hole scattering time
$\tau_{LO}^0$	Confined carrier/LO-phonon scattering time at 0K
$\tau_{AC-e}$	Confined carrier electron/acoustic phonon scattering time
$\tau_{AC-h}$	Confined carrier hole/acoustic phonon scattering time
$\rho_{red}$	Reduced density of states
$\Phi_{PH}$	Photon density
$c$	Speed of light
$e$	Charge on an electron
$F_n$	Quasi-Fermi level of electrons
$F_p$	Quasi-Fermi level of holes
$\hbar$	The reduced Planck's constant
$h$	Planck's constant
$E_g$	Band gap

$J$	Current density
$k_B$	Boltzmann's constant
$L_w$	Quantum well width
$n_g$	Effective group index
$n$	Electron concentration ( $m^{-3}$ )
$n_i$	Intrinsic carrier concentration
$p$	Hole concentration ( $m^{-3}$ )
$S_L$	Lattice heat flux
$S_e$	Electron heat flux
$S_h$	Hole heat flux
$T_L$	Lattice temperature
$T_e$	Electron temperature
$T_h$	Hole temperature
$T_0$	Characteristic temperature

## Abbreviations

ASE	Amplified Spontaneous Emission
BTE	Boltzmann transport equation
COD	Catastrophic Optical Damage
DD	Drift Diffusion
EB	Energy Balance
EEL	Edge Emitting Laser
FD	Fermi-Dirac
DMM	Diffuse Mismatch Model
FCA	Free Carrier Absorption
FP	Fabry-Perot
HD	Hydrodynamic
OSA	Optical Spectrum Analyser
RW	Ridge Waveguide
SRH	Shockley-Read-Hall
SP-ASE	Single Pass Amplified Spontaneous Emission
TBR	Thermal Boundary Resistance
QWIP	Quantum Well Infrared Photodetector