

❖ List of Symbols

ν	laser frequency	E_l	excited state energy level
λ	laser wavelength	E_a	activation energy
φ	incident angle	E_c	energy of the conduction band edge
τ	lifetime	E_F	Fermi level
Ω	ohm	E_{F_c, F_v}	quasi Fermi levels
σ	conductivity	E_g	band-gap energy
ρ	density	$E_{g,cl}$	energy difference of cladding layers
λ_0	center wavelength of the laser	E_v	energy of the valance band edge
θ_0	angles of incidence in the incident medium	eV	electron volt
η_d	differential efficiency	g	optical gain
ΔE	energy separation between quasi fermi levels	gm	gram
Γg	modal gain	g_{th}	threshold gain
α_i	absorption coefficient	h	Plank's constant
η_i	internal efficiency	$h\nu$	energy of photon
ΔI	change in operating current	hr	hour
ΔP	change in output power	I_0	initial intensity
Γ -point	center of the brillouin zone	I_{op}	operating current
θ_s	angles of incidence in the substrate	I_{rt}	intensity after a round trip
η_{slope} or dP/dI	slope efficiency	I_{th}	threshold current
μ	mobility	J_{th}	threshold current density
μm	micrometer	k_b	Boltzmann's constant
μ_n	mobility of electron	k	momentum
μ_p	mobility of hole	K	kelvin
A	group III constituent species	kT	kinetic energy of an atom
c	velocity of light in vacuum	L	laser cavity length
D	group V constituent species	M	characteristic matrix
d	thickness	m	meter
E_0	ground state energy level	N_0	number of atoms in ground state
		n_0'	effective refractive indices of the incident medium
		N_l	number of atoms in excited state

n_a	refractive index of the air	$R_{1,2}$	facet mirror reflectivity
n_{cl}	refractive index of cladding layer	r_g	growth rate
n_{eff}	effective refractive index	R_n	lower order organic radical
n_f	refractive index of core layer	R_{nr}	non-radiative recombination rate
n_H	high refractive index	R_{rr}	radiative recombination rate
n_L	low refractive index	R_s	dynamic series resistance
nm	nanometer	R_{SP}	spontaneous emission rate
n_s	refractive index of semiconductor	R_{th}	thermal resistance
n_s'	effective refractive indices of the substrate	s	second
P	reactor pressure	T	temperature
P_0	initial power	t	time
P_{COMD}	power level at COMD	T_0	characteristic temperature
P_{max}	maximum power	T_j	junction temperature
P_{out}	optical output power	V	gas velocity
q	electronic charge	V_0	turn-on voltage
R	reflectivity at normal incident	V_b	bias voltage
r	molecular diameter	V_f	forward voltage
		W	watt

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