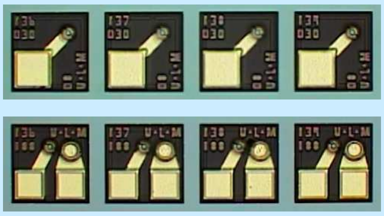
10 Gbps VCSEL 850 nm

1x1/4/12 chip



- Vertical Cavity Surface-Emitting Laser
- Cathode on top or substrate side
- Unsealed 85% r.H./85℃ certified
- 1x1, 1x4, 1x12 chips

INVISIBLE LASER RADIATION
AVOID BEAM EXPOSURE
CLASS 3B LASER PRODUCT

Preliminary

ELECTRO-OPTICAL CHARACTERISTICS

Chip Temperature = 0...85℃ unless otherwise stated.

PARAMETER	SYMBOL	UNITS	MIN	TYP	MAX	TEST CONDITIONS
Emission wavelength	λ_R	nm	840	850	860	Iop = 6 mA
Threshold current	I_{th}	mA	0.4	0.5	0.8	Tchip = 25℃
		mA	0.3		1.5	
Threshold voltage	U_{th}	V	1.4		1.8	
Slope Efficiency	η_s	W/A	0.3	0.4	0.5	Tchip = 25℃
Variation of η_s over temp.	$\Delta\eta_s/\eta_s/\Delta T$	%/℃	-0.4	-0.55	-0.70	
Laser forward current	Iop	mA	3.0	3.7	4.5	Popt = 1.2 mW, Tchip = 25℃
		mA	2.8		10.0	Popt = 1.2 mW
Differential series resistance	R_{S_25}	Ω	40	50	65	Tchip = 25℃, Popt = 1.2mW
	Rs	Ω	30		75	Popt. = 1.2mW
3dB modulation bandwidth	ν_{3dB}	GHz	7.5			Popt. = 1.2mW
Rise and fall time	$t_R/t_{F\ 20/80}$	ps		45	55	Popt. = 1.2mW
Relative intensity noise	RIN	dB/Hz			-128	
Wavelength tuning over current		nm/mA		0.3		
Wavelength tuning over temp.		nm/K		0.07		
Thermal resistance	$R_{Thermal}$	K/mW		2.0		
Beam divergence	θ	°	20		30	1/exp², Popt. = 1.2mW
Spectral bandwidth	$\Delta\lambda_1$	nm			0.65	Tchip = 25℃, Iop = 6 mA

ABSOLUTE MAXIMUM RATINGS

Storage temperature	- 40 .. 125℃
Operating temperature	0 .. 85℃
Electrical power dissipation	30 mW
Continous forward current	12 mA
Reverse voltage	8V
Optical output power	6mW

NOTICE: Stresses greater than those listed under „Absolute Maximum Ratings“ may cause permanent damage to the device. These are stress ratings only and functional operation of the device at these or any other condition beyond those indicated for extended periods of time may effect device reliability.

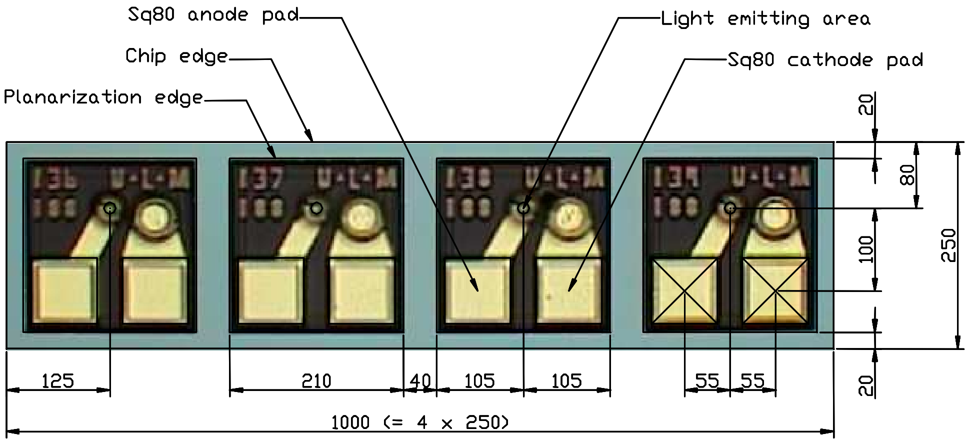
ATTENTION: Electrostatic Sensitive Devices
Observe Precautions for Handling

UNIFORMITY OF ARRAY PRODUCTS

Chip Temperature = 25℃; Variation from mean value within each array

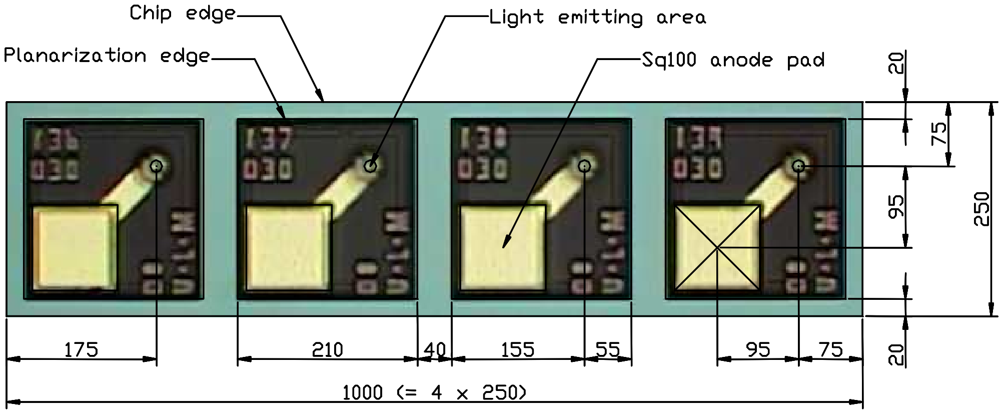
PARAMETER	SYMBOL	UNITS	MIN	TYP	MAX
Threshold current	ΔI_{th}	mA			0.1
Slope Efficiency	$\Delta\eta_s$	%			10.0
Series resistance	R_s	%			5.0

ULM850-10-TT-N0101U (10 Gbps, anode and cathode bond pad, single channel) Size 250x250x150
ULM850-10-TT-N0104U (10 Gbps, anode and cathode bond pad, 1x4 array) Size 1000x250x150
ULM850-10-TT-N0112U (10 Gbps, anode and cathode bond pad, 1x12 array) Size 3000x250x150



unit: µm

ULM850-10-TN-N0101U (10 Gbps, backside cathode contact, single channel) Size 250x250x150
ULM850-10-TN-N0104U (10 Gbps, backside cathode contact, 1x4 array) Size 1000x250x150
ULM850-10-TN-N0112U (10 Gbps, backside cathode contact, 1x12 array) Size 3000x250x150



unit: µm