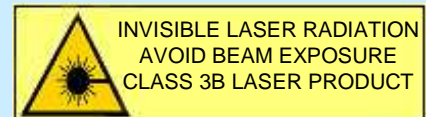
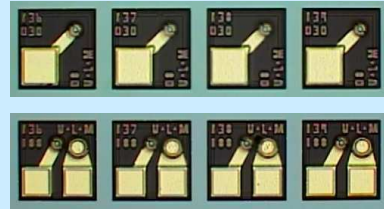


10 Gbps VCSEL 850 nm 1x1, 1x4/12 chip

- ◆ Vertical Cavity Surface-Emitting Laser
- ◆ High speed up to 10 Gbps
- ◆ Unsealed 85% r.H./85°C certified
- ◆ 1x1, 1x4, 1x12 chips



ELECTRO-OPTICAL CHARACTERISTICS (chip)

PRELIMINARY

PARAMETER	SYMBOL	UNITS	MIN	TYP	MAX	TEST CONDITIONS
Emission wavelength	λ_R	nm	840	850	860	$I_{op}=6mA$; $T=0..70^\circ C$
Threshold current	I_{th}	mA			1.0	$T=0..70^\circ C$
Threshold voltage	U_{th}	V	1.5		1.8	$T=0..70^\circ C$
Slope Efficiency	η_s	W/A	0.3	0.4	0.5	$T=20^\circ C$
Variation of η_s over temp.	$\Delta\eta_s(T)$	W/A			0.12	$T=0..70^\circ C$
Optical output power	P_{opt}	mW	1.0		2.5	$I_{op}=6mA$; $T=0..70^\circ C$
Variation of P_{opt} over temp.	$\Delta P_{opt}(T)$	mW			0.8	$I_{op}=6mA$; $T=0..70^\circ C$
Laser voltage	U_{op}	V		2.0		$I_{op}=6mA$; $T=20^\circ C$
Differential series resistance	R_S	Ω	50	70	90	$I_{op}=6mA$; $T=20^\circ C$
3dB modulation bandwidth	V_{3dB}	GHz	8			$I_{op}=6mA$; $T=20^\circ C$
Rise and fall time	t_R/t_F 20/80	ps		30/45	55	$I_{op}=6mA$; ER=8dB; $T=20^\circ C$
Relative intensity noise	RIN	dB/Hz		-130	-120	$I_{op}=6mA$; 0.1..10GHz; $T=20^\circ C$
Wavelength tuning over current		nm/mA		0.3		
Wavelength tuning over temp.		nm/K		0.07		
Thermal resistance	$R_{Thermal}$	K/mW		1.8	2.5	$T=20^\circ C$
Beam divergence	θ	$^\circ$	20		30	$I_{op}=6mA$; full-width $1/e^2$; $T=20^\circ C$
Spectral bandwidth	$\Delta\lambda$	nm			0.45	$I_{op}=6mA$; rms; $T=20^\circ C$

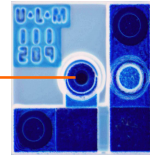
ABSOLUTE MAXIMUM RATINGS

Storage temperature	- 40 .. 125°C
Operating temperature	-20 .. 85°C
Electrical power dissipation	20 mW
Continuous forward current	8 mA
Reverse voltage	8V
Soldering temperature	330°C

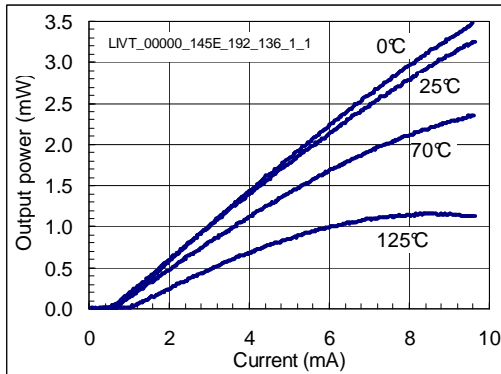
NOTICE: Stresses greater than those listed under „Absolute Maximum Ratings“ may cause permanent damage to the device. These are stress ratings only and functional operation of the device at these or any other condition beyond those indicated for extended periods of time may effect device reliability.



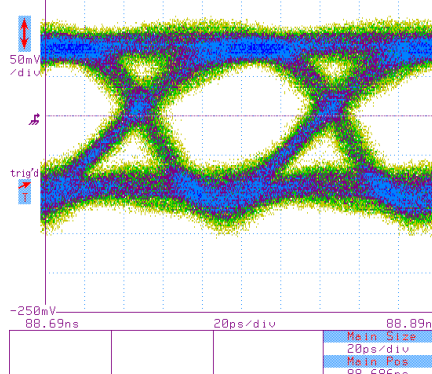
ATTENTION: Electrostatic Sensitive Devices
Observe Precautions for Handling



Output power over temp.

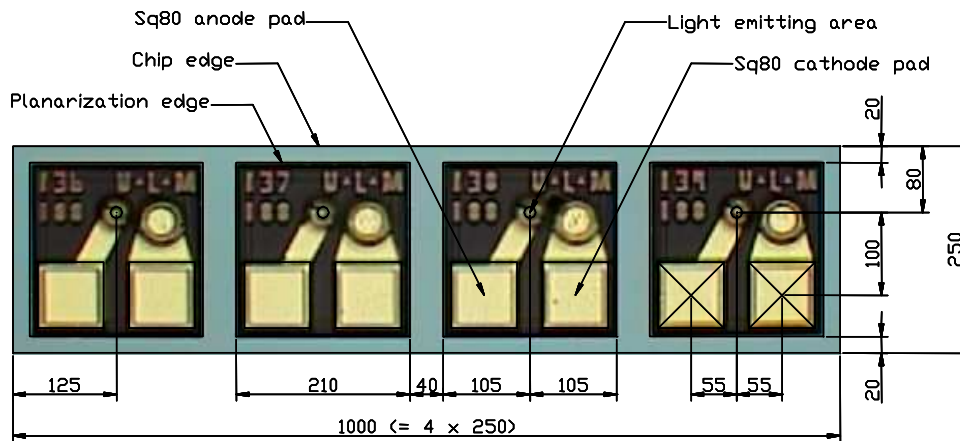


10 Gbps eye diagram



Driver signal:
 10.3125 GHz PRBS31
 Ioff/ Ion = 2/ 10 mA
 Iavg = 6 mA
 Umod (50 Ohm) = 0.7 V
Optical signal:
 E.R. = 8 dB
 Poff/ Pon = 0.6/ 3.8 mW
 Pavg = 2.2 mW
 Rise/ fall time
 20/80 = 30/45 ps
 10/90 = 40/60 ps

- 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



isolated cell available

- 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

