

850 nm multimode 1 x n, 10 Gbps VCSEL for high speed data transmission

- High speed up to 10 Gb/s
- Low current and voltage
- Lowest power consumption
- Single devices and linear arrays

Preliminary

Warning:
Laser radiation, avoid
exposure to beam.
Class 3B laser product,
potential eye hazard.

ELECTRO-OPTICAL-CHARACTERISTICS, (VCSEL CHIP)

PARAMETER	SYMBOL	UNITS	MIN	TYP	MAX	TEST CONDITIONS
Emission wavelength	λ_R	nm	835	850	860	T = 20°C
Threshold current	I_{TH}	mA		1.5	2.5	T = 20°C
Threshold current variation	ΔI_{TH}	mA			1.0	T = 0 .. 70°C
Threshold voltage	U_{TH}	V	1.5	1.8	2.0	
Laser current	I_{OP}	mA	6	8.0		$P_{opt} = 3 \text{ mW}^1$
Laser voltage	U_{OP}	V		2.0		$P_{opt} = 3 \text{ mW}^1$
Wallplug efficiency	η_{WP}	%		20		$P_{opt} = 3 \text{ mW}^1$
Slope efficiency		W/A	0.2	0.5	0.7	T = 0 .. 70°C
Variation of slope efficiency		W/A			0.2	T = 0 .. 70°C
Differential series resistance	R_S	Ω	25	50	100	$P_{opt} = 3 \text{ mW}^1$
3dB modulation bandwidth	ν_{3dB}	GHz		8		$P_{opt} = 3 \text{ mW}^1$
Rise and fall time	t_R/t_F	ps			40/60	10%..90%; $P_{off}=0.5\text{mW}, P_{on}=3.0\text{mW}$ ₁
Relative intensity noise	RIN	dB/Hz ^{-0.5}		-130	-120	$P_{opt} = 3 \text{ mW} @ 1 \text{ GHz}$
Wavelength tuning over current		nm/mA	0.15	0.20		
Wavelength tuning over temp.		nm/K		0.07		
Thermal resistance	$R_{THERMAL}$	K/mW			2	
Beam divergence	θ	°	15	25	35	$P_{opt} = 3 \text{ mW}^1$, full width 1/e ²
Spectral bandwidth	$\Delta\lambda$	nm			2	rms

¹ for chip only

ABSOLUTE MAXIMUM RATINGS

Storage temperature	-40 .. 85°C
Operating temperature	0 .. 70°C
Electrical power dissipation	30 mW
Continuous forward current	12 mA
Reverse voltage	8V @ I = 10 μ A
Soldering temperature	330°C

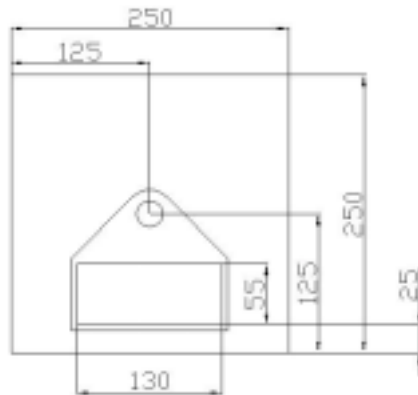


GEOMETRICAL SPECIFICATIONS

Chip area	250x250 μm^2
Chip thickness	150 +/- 20 μm
Emission area centered on chip	$\Phi < 15 \mu\text{m}$
Substrate side metallization	VCSEL cathode
Top side metallization	VCSEL anode

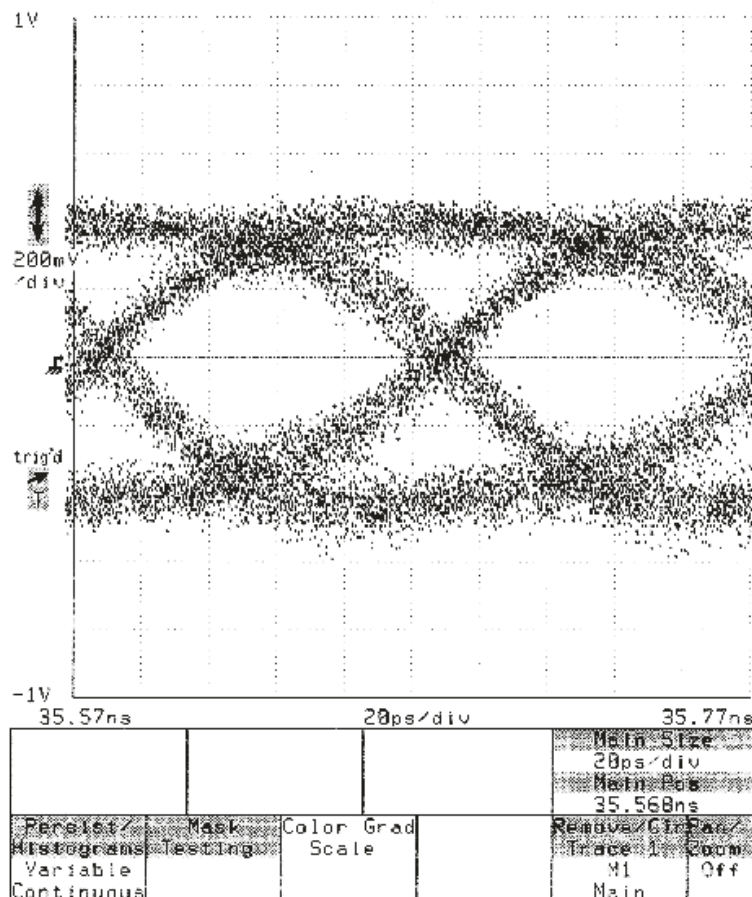
Available on chip level,
array formats
or in TO18/46 can

Chip layout after dice (μm)



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Hardware absent or off line



Transmission
Experiment
with U-L-M photonics
10 Gbps VCSEL:
Eye at 10 Gbps, 2⁷-1
PRBS
Ibias=8mA,
Umod=0.4V
Transmission over
100m, 50 μm GI fiber