

Features:

- 850nm multimode oxide isolated VCSEL
- Operates up to 10.3125 Gbps
- TO-46 tilt window TO-CAN prealigned into LC sleeve
- Packaged with a monitor photodiode
- Packaged with integrated heater for low-temperature operation
- 6dB attenuated receptacle

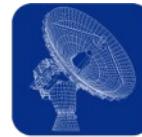


COTSWORKS 850nm 10G VCSEL TOSA is suited to a wide variety of multimode fiber applications.


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**SUBSEA
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Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Unit	Notes
Storage Temperature	T_{sto}	-55	105	°C	
Case Operating Temperature	T_{OP}	-55	100	°C	
Laser Reverse Voltage	V_R	-	5	V	
Laser Forward Current	I_F	-	15	mA	
Hand Lead Soldering Temperature	-	-	260	°C	(1)
ESD Exposure (Human Body Model)	-	-	225	V	(2)

Notes:

- 1) Hand solder for 10 seconds.
- 2) Proper ESD conditions should be employed while attaching to host board.

Opto-Electronic Specifications

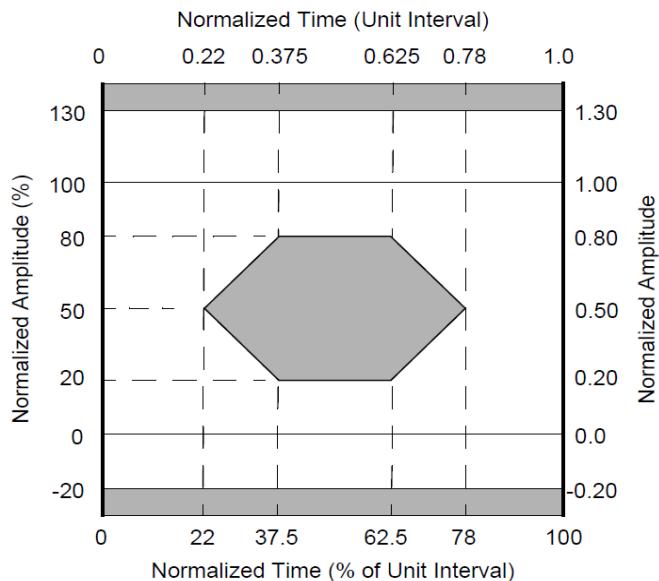
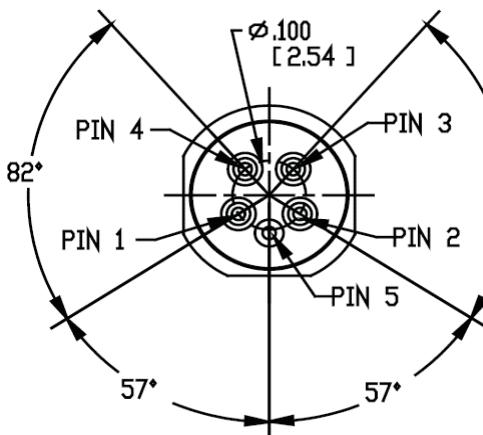
(For $DR \leq 5.0$ Gbps, unless otherwise noted, $-55^\circ C \leq T_C \leq 100^\circ C$. Use of heater is not permitted during operation.)

(For $5.0 < DR \leq 10.3125$ Gbps, unless otherwise noted, $-20^\circ C \leq T_C \leq 95^\circ C$. For $-55^\circ C \leq T_C < -20^\circ C$ operation the heater should be driven so performance mimics $25^\circ C$ specifications.)

Parameter	Test Condition	Symbol	Min.	Typ.	Max.	Unit	Notes
VCSEL							
Data Rate	-	DR	-	-	10.3125	Gbps	(9)
Optical Output Power	$I_F = 7.5\text{mA}$ 50/125 μm MMF 62.5/125 μm MMF $T_C = 25^\circ C$	P_F	0.45	-	0.7	mW	
Coupling Efficiency	$I_F = 7.5\text{mA}$ $T_C = 25^\circ C$	PO_PCT	70	-	-	%	(2)
Threshold Current	$T_C = 25^\circ C$	I_{TH}	-	0.75	1.5	mA	
Threshold Current Temperature Variation	-	ΔI_{TH}	-	-	1.2	mA	(3)
Slope Efficiency	$T_C = 25^\circ C$	η	0.06	0.09	0.1	W / A	
Center Wavelength	-	λ_C	830	850	860	nm	(1)
Center Wavelength Temperature Variation	-	$\Delta\lambda_C / \Delta T$	-	0.06	-	nm / $^\circ C$	
RMS Spectral Width	-	$\Delta\lambda$	-	-	0.65	nm	(1)
Laser Forward Voltage	$I_F = 7.5\text{mA}$ $T_C = 25^\circ C$	V_F	-	2.1	2.4	V	
Laser Reverse Voltage	$I_R = 10\mu\text{A}$	V_R	5	10	-	V	
Relative Intensity Noise	$I_F = 7.5\text{mA}$	RIN12OMA	-	-	-128	dB / Hz	(4)
Series Resistance	-	R	45	70	85	Ω	(1)
Optical Return Loss	-	ORL	12	-	-	dB	
Encircled Flux Diameter	-	EF 4.5 μm EF 19 μm	- 86	-	30 -	%	(5)
Bias Current Range	-	I_F	6	-	12	mA	
High Temperature Power Droop	-	P_{DROOP}	-0.8	-	0	dB	(7)
Transmitter Dispersion Penalty	-	TDP	-	-	3.8	dB	(1)
Monitor Photodiode							
MPD Current	$V_R = 3V$	I_{PD}	135	-	215	μA	(1)
MPD Power Tracking	-	$\Delta P / \Delta T$	0.8	-	1.2	dB	
MPD Dark Current	$P_F = 0\text{mW}$ $V_R = 3V$	I_{DARK}	-	-	20	nA	
MPD Reverse Voltage	$P_F = 0\text{mW}$ $I_R = 10\mu\text{A}$	BVR_{PD}	30	115	-	V	(6)
Monitor Capacitance	$V_R = 0V$ Freq = 1MHz	C_{PD}	-	75	100	pF	
	$V_R = 3V$ Freq = 1MHz		-	40	55		
Heater							
Resistance	$T_C = 25^\circ C$	R_{HEATER}	12	15	18	Ω	
Settling Time	$T_C = -40^\circ$	T_{HEATER}	-	-	90	s	(8)
Heater Thermal Impedance	-	-	-	180	-	$^\circ C / W$	
Heater Maximum Current	$T_C = -40^\circ$	$I_{H,max}$	-	150	-	mA	
	$T_C = 95^\circ C$		-	0	-		

Notes:

- 1) Test condition is over all operating condition temperatures with tracked back monitor current found at 7.5 mA at 25°C with a 12 mA clamp.
- 2) PO_PCT is defined as the ratio of the coupled power into a 50/125 μ m fiber to the total power output from the optical front end as measured on a large area detector.
- 3) Operation outside of the specified range may result in the threshold current exceeding the maximums defined in the electro-optical characteristics table. Δ ITH is the maximum deviation from the 25°C value.
- 4) RIN12 is measured using the OMA technique with 12dB return.
- 5) Encircled flux is measured per TIA-455-203 at 7.5 mA average current.
- 6) To prevent VCSEL damage, short the VCSEL anode and cathode during BVR testing of the photodiode.
- 7) Droop is the fiber coupled power difference in dB from a tracked condition to the clamped condition.
- 8) Settling time is tracked by center wavelength stabilizing to within 5% of the final value.
- 9) For 0.125 to 5.0Gbps operation, the heater shall not be required to achieve compliance with the eye mask detailed in **Figure 1** when measured with a fourth order Bessel-Thomson filter having a 3dB bandwidth of 0.75 times the signaling rate.

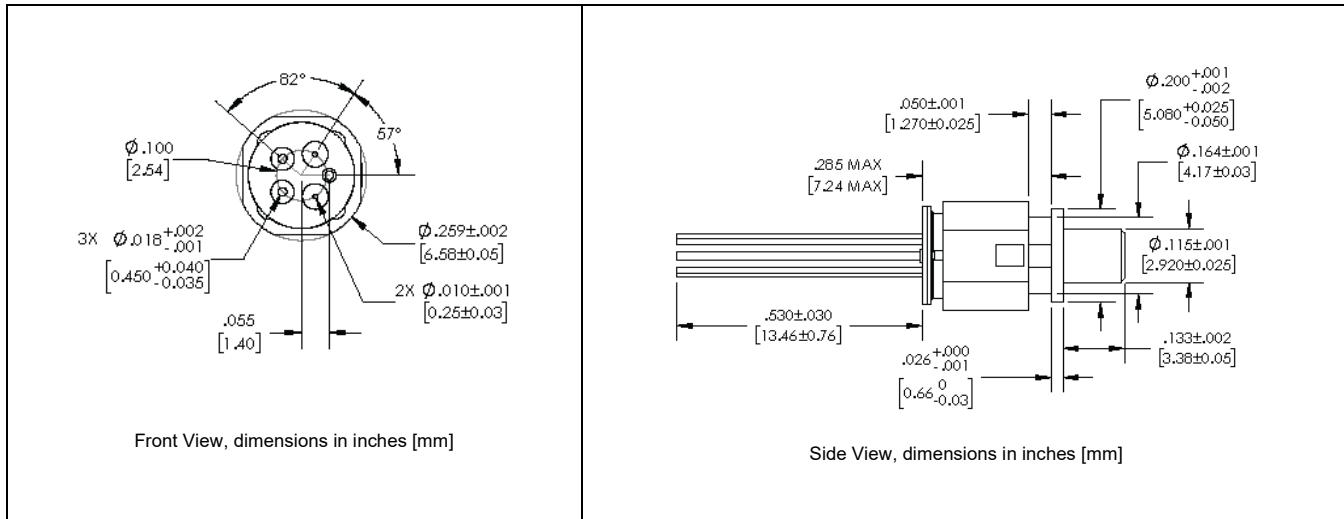
Figure 1: 0.125 to 5.0 Gbps Eye Mask

Pin Identification


PIN #	Description	Pin Diameter
1	VCSEL Anode	9 mil
2	VCSEL Cathode	9 mil
3	Heater Terminal 2	18 mil
4	PD Cathode	18 mil
5	PD Anode, Heater Terminal 1, CASE	18 mil

Notes:

- 1) Mechanical dimensions shown here are in units of mm [inches].

Standard Mechanical Dimensions



Warnings:

Handling Precautions: This device is susceptible to damage as a result of electrostatic discharge (ESD). A static free environment is highly recommended.

Laser Safety: Radiation emitted by laser devices can be dangerous to human eyes. Avoid eye exposure to direct or indirect radiation

Ordering Information

Contact COTSWORKS Sales for information and pricing.

Contact COTSWORKS for mechanical dimensional information, lead times and configuration options.

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