



#### Features:

- 850nm multimode oxide isolated VCSEL
- Operates from 125 Mbps to 5.0 Gbps
- TO-46 tilt window metal can component prealigned into LC sleeve
- Packaged with a back monitor
- Attenuated window can



**COTSWORKS 850nm 5G VCSEL TOSA is suited to a wide variety of multimode fiber applications.**



COMMERCIAL AEROSPACE



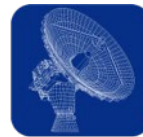
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MILITARY TACTICAL



SUBSEA NETWORKING



RADAR & SENSING



OIL & EXPLORATION

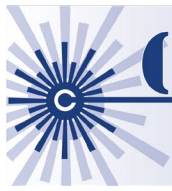
#### Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Unit	Notes
Storage Temperature	T <sub>sto</sub>	-55	105	°C	
Case Operating Temperature	T <sub>OP</sub>	-55	100	°C	
Laser Reverse Voltage	V <sub>R</sub>	-	5	V	
Laser Forward Current	I <sub>F</sub>	-	12	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

(Unless otherwise noted,  $-55^{\circ}\text{C} \leq T_c \leq 100^{\circ}\text{C}$ .)

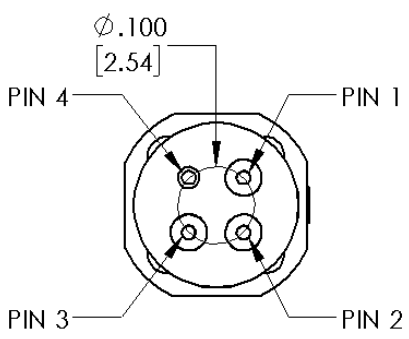
Parameter	Test Condition	Symbol	Min.	Typ.	Max.	Unit	Notes
<b>VCSEL</b>							
Data Rate	-	DR	0.125	-	5.0	Gbps	
Optical Output Power	$I_F = 7.5\text{mA}$ 50/125 $\mu\text{m}$ MMF 62.5/125 $\mu\text{m}$ MMF $T_C = 25^{\circ}\text{C}$	$P_F$	-4.5	-	-1.5	dBm	
Coupling Efficiency	$I_F = 7.5\text{mA}$ $T_C = 25^{\circ}\text{C}$	PO_PCT	55	-	-	%	(2)
Threshold Current	$T_C = 25^{\circ}\text{C}$	$I_{TH}$	0.5	1.5	2	mA	
Threshold Current Temperature Variation	-	$\Delta I_{TH}$	-	-	1.7	mA	(3)
Slope Efficiency Temperature Variation	$I_F = 7.5\text{mA}$	$\Delta \eta / \Delta T$	-	-0.5	-	% / $^{\circ}\text{C}$	
Center Wavelength	-	$\lambda_C$	830	850	860	nm	(1)
Center Wavelength Temperature Variation	-	$\Delta \lambda_C / \Delta T$	-	0.06	-	nm / $^{\circ}\text{C}$	
RMS Spectral Width	-	$\Delta \lambda$	-	-	0.65	nm	(1)
Laser Forward Voltage	$I_F = 7.5\text{mA}$ $T_C = 25^{\circ}\text{C}$	$V_F$	-	1.8	2	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	-	-130	-122	dB / Hz	(4)
Series Resistance	-	R	25	35	50	$\Omega$	(1)
Series Resistance Temperature Variation	$I_F = 7.5\text{mA}$	$\Delta R / \Delta T$	-	-0.2	-	% / $^{\circ}\text{C}$	
Optical Return Loss	-	ORL	12	-	-	dB	
Encircled Flux Diameter	-	EF 4.5 $\mu\text{m}$	-	-	30	%	(5)
		EF 19 $\mu\text{m}$	86	-	-		
Bias Current Range	-	$I_F$	6	-	15	mA	
Open Bore Rollover Current	-	$I_{MAX}$	13	-	-	mA	
High Temperature Power Droop	-	$P_{DROOP}$	-0.8	-	0	dB	(7)
Transmitter Dispersion Penalty	-	TDP	-	-	3.8	dB	(1)
<b>Monitor Photodiode</b>							
MPD Current	$V_R = 3\text{V}$	$I_{PD}$	175	-	600	$\mu\text{A}$	(1)
MPD Power Tracking	-	$\Delta P / \Delta T$	0.8	-	1.2	dB	
MPD Dark Current	$P_F = 0\text{mW}$ $V_R = 3\text{V}$	$I_{DARK}$	-	-	20	nA	
MPD Reverse Voltage	$P_F = 0\text{mW}$ $I_R = 10\mu\text{A}$	$BVR_{PD}$	30	115	-	V	(6)
Monitor Capacitance	$V_R = 0\text{V}$ Freq = 1MHz	$C_{PD}$	-	75	100	pF	
	$V_R = 3\text{V}$ Freq = 1MHz		-	40	55		

### Notes:

- 1) Test condition is over all operating condition temperatures with tracked back monitor current found at 7.5 mA at 25C with a 15 mA clamp.
- 2) PO\_PCT is defined as the ratio of the coupled power into a 62.5/125 $\mu\text{m}$  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.  $\Delta I_{TH}$  is the maximum deviation from the 25 $^{\circ}\text{C}$  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.

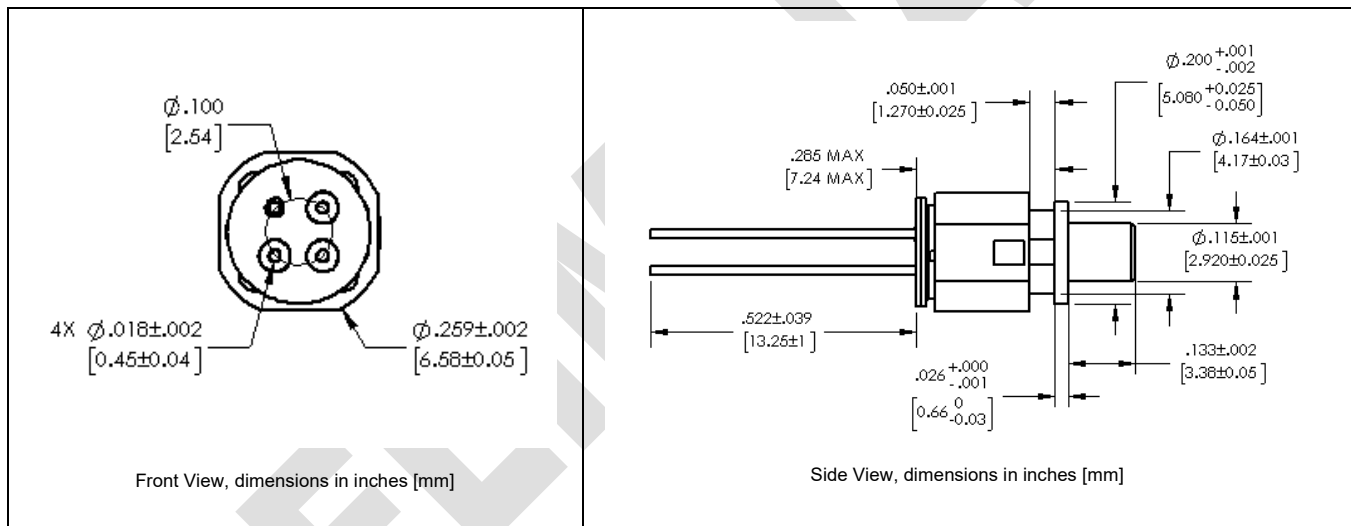


## Pin Identification

	PIN #	Description	Pin Diameter
		1	VCSEL Cathode
	2	VCSEL Anode	18 mil
	3	Monitor Diode Cathode	18 mil
	4	Monitor Diode Anode (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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