

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
- 3dB attenuated receptacle



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



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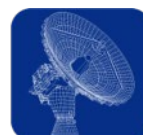
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MILITARY
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SUBSEA
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RADAR &
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Absolute Maximum Ratings

| 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.





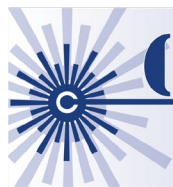
Opto-Electronic Specifications

(For DR ≤ 5.0 Gbps, unless otherwise noted, -55°C ≤ T_C ≤ 100°C. Use of heater is not permitted during operation.)

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

| Parameter | Test Condition | Symbol | Min. | Typ. | Max. | Unit | Notes |
|---|---|----------------------|------|-------|---------|---------|-------|
| VCSEL | | | | | | | |
| Data Rate | - | DR | - | - | 10.3125 | Gbps | (9) |
| Optical Output Power | I _F = 7.5mA 50/125μm MMF 62.5/125μm MMF T _C = 25°C | P _F | 0.9 | - | 1.5 | mW | |
| Coupling Efficiency | I _F = 7.5mA T _C = 25°C | PO_PCT | 70 | - | - | % | (2) |
| Threshold Current | T _C = 25°C | I _{TH} | - | 0.75 | 1.5 | mA | |
| Threshold Current Temperature Variation | - | ΔI _{TH} | - | - | 1.2 | mA | (3) |
| Slope Efficiency | T _C = 25°C | η | 0.12 | 0.175 | 0.2 | W / A | |
| Center Wavelength | - | λ _C | 830 | 850 | 860 | nm | (1) |
| Center Wavelength Temperature Variation | - | Δλ _C / ΔT | - | 0.06 | - | nm / °C | |
| RMS Spectral Width | - | Δλ | - | - | 0.65 | nm | (1) |
| Laser Forward Voltage | I _F = 7.5mA T _C = 25°C | V _F | - | 2.1 | 2.4 | V | |
| Laser Reverse Voltage | I _R = 10μA | V _R | 5 | 10 | - | V | |
| Relative Intensity Noise | I _F = 7.5mA | RIN120MA | - | - | -128 | dB / Hz | (4) |
| Series Resistance | - | R | 45 | 70 | 85 | Ω | (1) |
| Optical Return Loss | - | ORL | 12 | - | - | dB | |
| Encircled Flux Diameter | - | EF 4.5μm | - | - | 30 | % | (5) |
| | | EF 19μm | 86 | - | - | | |
| 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 | - | ΔP / ΔT | 0.8 | - | 1.2 | dB | |
| MPD Dark Current | P _F = 0mW V _R = 3V | I _{DARK} | - | - | 20 | nA | |
| MPD Reverse Voltage | P _F = 0mW I _R = 10μA | 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°C | R _{HEATER} | 12 | 15 | 18 | Ω | |
| Settling Time | T _C = -40° | T _{HEATER} | - | - | 90 | s | (8) |
| Heater Thermal Impedance | - | - | - | 180 | - | °C / W | |
| Heater Maximum Current | T _C = -40° | I _{H,max} | - | 150 | - | mA | |
| | T _C = 95°C | | - | 0 | - | | |

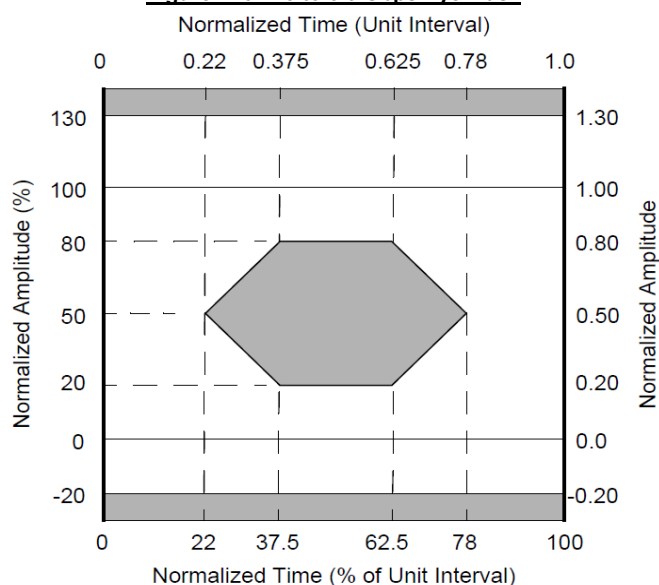




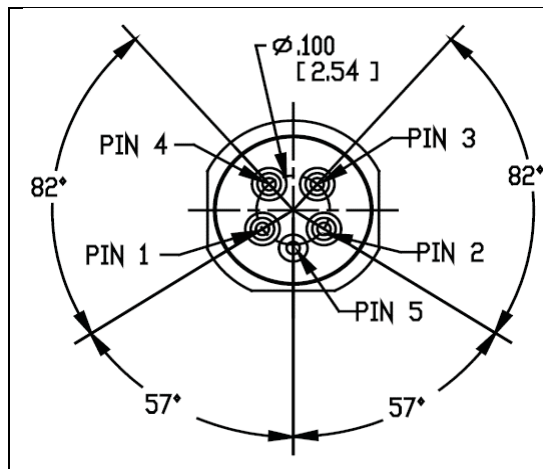
Notes:

- 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 50/125µm 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. ΔITH 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

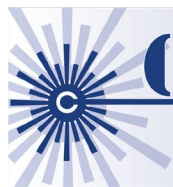


| PIN # | Description | Pin Diameter |
|-------|-----------------------------------|--------------|
| 1 | VCSEL Anode | 9 mil |
| 2 | VCSEL Cathode | 9 mil |
| 3 | Heater Terminal 2 | 18 mil |
| 4 | PD Cathode | 18 mil |
| 5 | PD Anode, Heater Terminal 1, CASE | 18 mil |

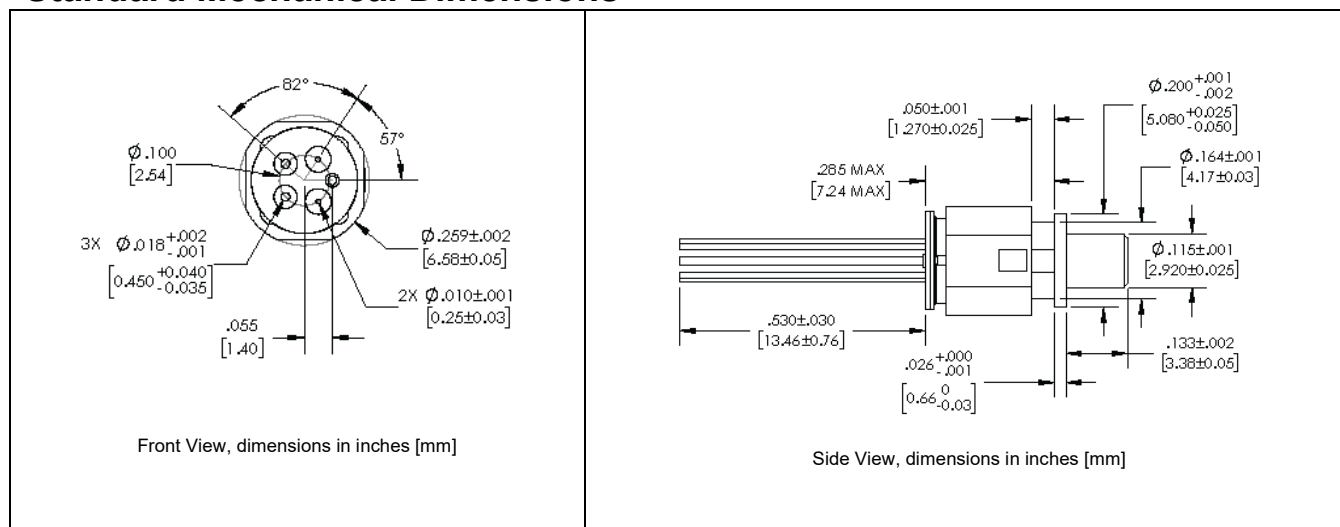
Notes:

- 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.

