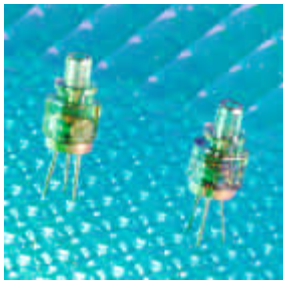
# LC-TOSA

**(preliminary information)**

## *Product Description*

The LC-TOSA is a high-performance optical subassembly with an integrated Emcore TO-56, 850nm VCSEL (Vertical Cavity Surface-Emitting Laser). This device is tailored to meet the needs of high-speed data communications and telecommunications applications. The product is designed for easy integration into a wide variety of Gigabit Ethernet, Fibre Channel, and ATM transceiver modules and systems. The LC-TOSA converts electrical current into optical power and then couples that power via an LC receptacle into a multimode optical fiber. The optical subassembly includes a TO-56 can with an Isolated Case, Common Anode pin configuration.



## *Product Specifications*

### Absolute Maximum Ratings

| Parameter | Rating | Important Notice |
|---|---|---|
| Operating Case Temperature | 0°C to 85°C | Stresses beyond 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 conditions beyond those indicated for extended periods of time may effect device reliability. |
| Storage Temperature | -40°C to 85°C | |
| Lead Solder Temperature | 260°C for 10 seconds | |
| Laser Reverse Voltage | 5V | |
| Laser Forward Current (continuous) | 10mA | |
| Laser Forward Current (instantaneous) | 15 mA | |
| Photodiode Forward Current | 2mA | |

### Electro-Optical Characteristics
### (T= 25°C unless otherwise stated)

| Characteristic | Symbol | Min. | Typ. | Max. | Units |
|---|---|---|---|---|---|
| Peak Emission Wavelength ($I_F$ = 5mA at 25°C, use $\Delta\lambda_p$ for range over 0-85 °C) | $\lambda_p$ | 830 | 850 | 860 | nm |
| RMS Spectral Width (at $I_F$ = 5mA, and over 0-85°C) | $\Delta\lambda$ | | | 0.85 | nm |
| $_p$ Temp Coefficient (at $I_F$ = 5mA) | $\Delta\lambda_p$ | | 0.06 | | nm/°C |
| Optical Rise and Fall Time (20%-80%, @1.25Gb/s) | $t_R$, $t_F$ | | 110 | 150 | ps |
| Threshold Current ($P_o$ = 20 uW) | $I_{TH}$ | | 1.5 | 2.5 | mA |
| $I_{TH}$ Change Over Temperature (0°C to 85°C) | $\Delta I_{TH}$ | -1.0 | | 1.0 | mA |
| Laser Forward Voltage at $I_F$ = 5mA | $V_F$ | 1.6 | 1.8 | 2.2 | V |
| Laser Reverse Voltage ($I_R$=1µA) | $V_{RBLD}$ | 5 | | | V |
| Differential Series Resistance (averaged between 4 - 8mA) | $\delta R_s$ | 25 | 35 | 50 | Ω |

### Photodiode Characteristics
### (T= 25°C unless otherwise stated)

| Characteristic | Symbol | Min. | Typ. | Max. | Units |
|---|---|---|---|---|---|
| Monitor Current ($P_{oc}$=0.40 mW) | $I_{PD}$ | 0.10 | | 0.580 | mA |
| Dark Current (Po =0 mW, $V_R$ =3V, @ 25°C) | $I_D$ | | | 20 | nA |
| Reverse Voltage (Po = 0 mW, $I_R$=10µA) | $V_{RBLD}$ | 10 | | | V |
| Capacitance $V_R$ =0V, @ 1MHz<br>$V_R$ =3V, @ 1MHz | C | | | 100<br>55 | pF<br>pF |

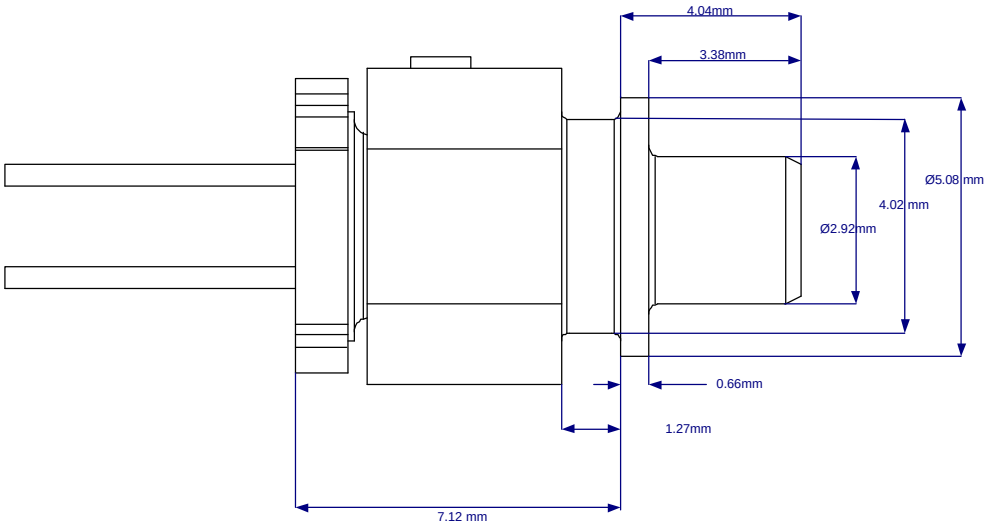
## Optical Functional Characteristics
## (T= 25°C unless otherwise stated)

| Characteristic | Symbol | Min. | Type | Max. | Units |
|---|---|---|---|---|---|
| Coupling Efficiency (50/125µm fiber, @ $I_F$) [2] | $\varepsilon_{fiber}$ | 60 | | | % |
| Rattle Sensitivity [1] | $R_{at}$ | | | 0.5 | dB |
| Fiber Coupled Slope Efficiency (Measured @ $I_F$ = 4 - 8mA, 50 µm fiber) | $\eta$ | 0.030 | 0.08 | 0.15 | mW/mA |
| Fiber Coupled Slope Efficiency over 0-85°C | $\eta t$ | 0.021 | | 0.175 | mW/mA |
| Coupled Power Ratio ($P_{oc}$ =200 µW) [3] | CPR | 9 | | | dB |

1. Rattle Sensitivity is the change in the coupled optical power when the connector is subjected to 25 cN in 4 quadrants, $R_{at=}$ 10log (Pmax/Pmin).
2. Coupling Efficiency is the ratio of the power coupled into a 50/125µm multi-mode fiber to the total power emitted from the open-bore OSA barrel.
3. Coupled Power Ratio, CPR, provides an indication of the mode volume excited in the multi-mode fiber. It is the difference in the optical power coupled into a multi-mode fiber (50/125µm or 62.5/125µm) and the power coupled into a single mode fiber. CPR will be measured according to TIA/EIA 526-14A. CPR(dB) = $P_{OC,MMF}$(dB) - $P_{OC,SMF}$(dB).

## Diagram

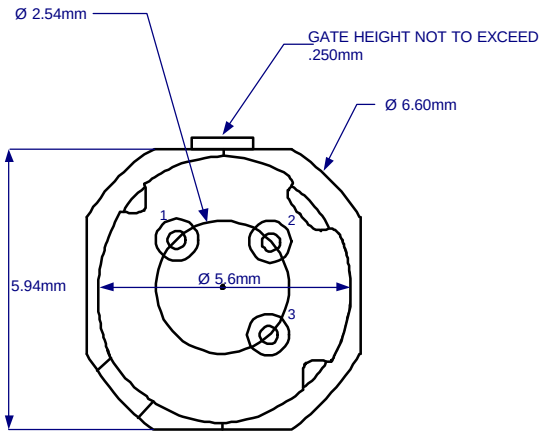
*All dimensions are nominal*




## Diagram

*All dimensions are nominal*

8585-3500: ISOLATED CASE, COMMON ANODE




PIN 1 - VCSEL CATHODE
PIN 2 - VCSEL ANODE/PHOTODIODE CATHODE
PIN 3 - PHOTODIODE ANODE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