

**050-313**  
**Opto-Electronic Transceiver**  
**MIL-DTL-38999 Type 2.5mm ELIO® Compatible**  
**100Mbps – 4.25Gbps**



***Opto-electronic transceiver with MIL-DTL-38999 type connector interface***



Glenair 050-313 is a D38999 Type 11-02 receptacle connector that incorporates an opto-electronic transceiver that operates from 100Mbps-4.25Gbps that converts electrical signals to multimode fiber. The transmitter section incorporates an 850nm Laser and laser driver with APC functionality to maintain output power and extinction ratio over the operating temperature range. The transmitter has a disable function as well as a transmitter fault detect function. The receiver section incorporates PIN/TIA and limiting amplifier to quantize electrical output signals. The receiver also offers a CMOS compatible Loss of Signal indicator. The electrical interface for the transceiver are PC tail pins that intended to mount to a PCB or interface flex circuit; the high speed lines of the Transmitter and Receiver sections are CML compatible.

The Glenair optical transceiver is ideal for harsh-environment, extreme shock, vibration and temperature avionics and military applications where copper cable link distance, bandwidth, weight or bulk make the use of twisted pair, twinax or quadrx copper conductors unacceptable

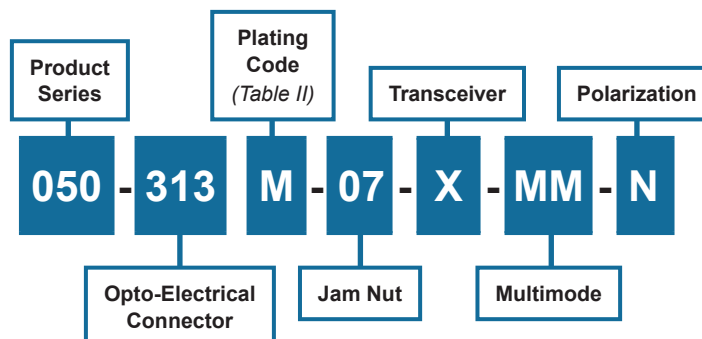
**KEY FEATURES**

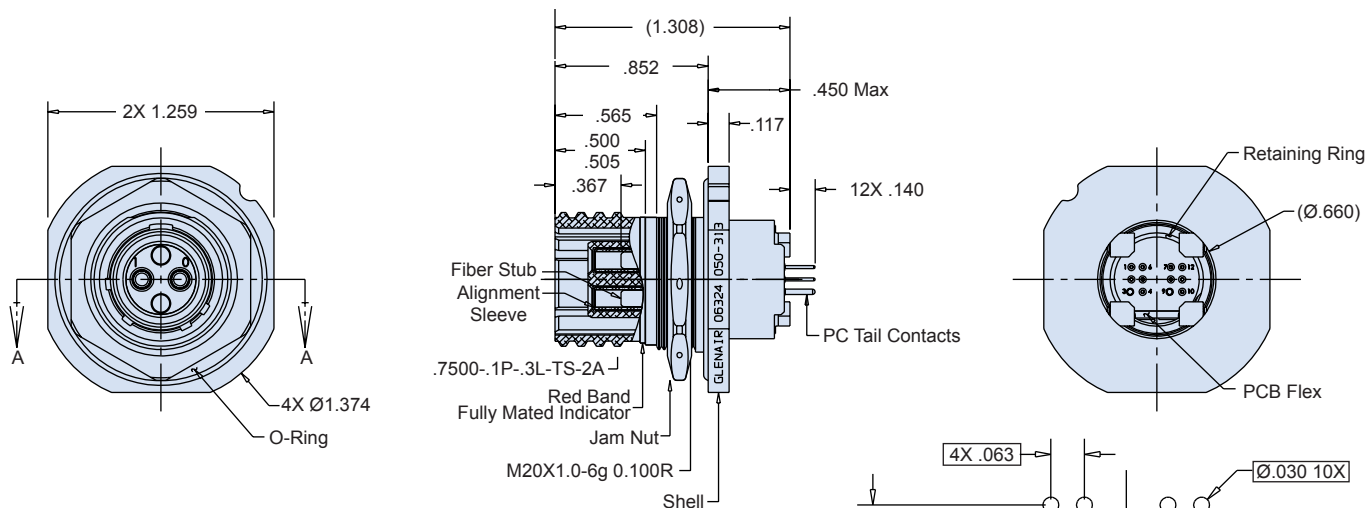
- -40°C to +85°C operating temperature range
- Ideal for military and other harsh environment applications.
- MIL-STD-810 mechanical shock and vibration compliance
- MIL-STD-1344 immersion resistance compliance
- Up to 550 Meters for VCSEL 850nm version with Multimode fiber
- Power supply operation from 3.3V

**APPLICATIONS**

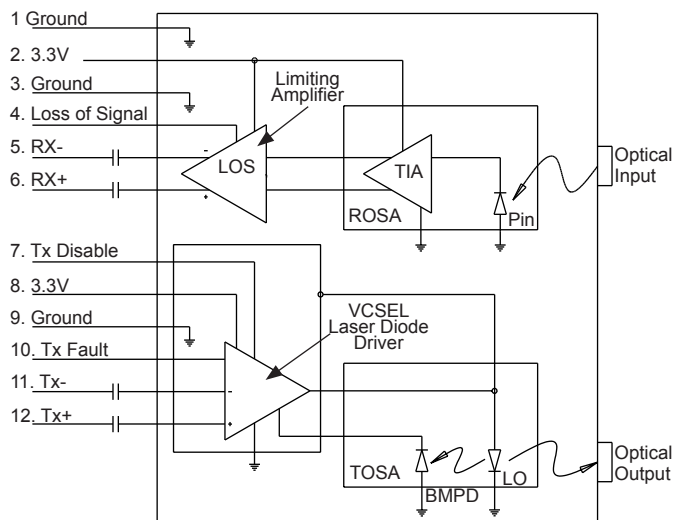
- Military tactical communication Systems
- Harsh environment telemetry or communications
- Satcom systems
- Avionics communication and telemetry systems

**How To Order**





### Simplified I/O Transceiver Schematic



### Recommended PCB Footprint (Viewed from Top)

| Table II: Material And Finish |                                                                                                       |
|-------------------------------|-------------------------------------------------------------------------------------------------------|
| Shell & Jam Nut               | Aluminum/Cad over Nickel                                                                              |
| Retaining Ring                | 300CRES/Passivation                                                                                   |
| Seal & O-Ring                 | Silicone Elastomer                                                                                    |
| Fiber Ferrule & Sleeve        | Zirconia Ceramic                                                                                      |
| PC Tail contacts              | Copper Alloy/Gold Plated                                                                              |
| PCB Flex                      | FR4 & Polyimide                                                                                       |
| Solder Type                   | RoHS Compliant Sn96.5/Ag3.0/Cu0.5 (217° C melting) and RoHS Compliant Sn95/Sb5 (232° C Melting Point) |
| Encapsulant                   | Epoxy                                                                                                 |

### Material and Finish

See Table II

### Assembly Notes

For mating connector, see Souriau plug connector P/N 8D5E11X02AN

This connector meets applicable mechanical requirements of MIL-DTL-38999/24 Size 11

PCB installation contacts (part of PCB flex) can float approximately .010" – .030" radially and axially for ease of installation

Laser safety information: class 1 21CFR1040.10

Product is RoHS compliant

Recommended PCB installation soldering: Contacts can withstand locally applied soldering heating of pins typical RoHS compliant solder temperature of 260° for 10 seconds

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**Ratings and specifications—Transmitter**

| Absolute Maximum Rating  |           |      |     |                 |      |
|--------------------------|-----------|------|-----|-----------------|------|
| Parameter                | Symbol    | Min  | Typ | Max             | Unit |
| Storage Temperature      | Ts        | -55  |     | +100            | °C   |
| Supply Voltage           | Vcc       | -0.4 |     | +4              | V    |
| Tx Disable Input Voltage | V Disable | -0.4 |     | V <sub>cc</sub> | V    |

| Operating Conditions       |           |      |     |      |       |
|----------------------------|-----------|------|-----|------|-------|
| Parameter                  | Symbol    | Min  | Typ | Max  | Unit  |
| Operating Temperature      | Top       | -40  |     | +85  | °C    |
| Supply Voltages            | Vcc       | 3.14 | 3.3 | 3.46 | V     |
| Differential Input Voltage | Vid       | 250  |     | 2200 | mVp-p |
| Power Supply Noise         | VccRipple |      |     | 0.1  | Vp-p  |

| Optical Transmitter  |        |         |     |         |      |
|----------------------|--------|---------|-----|---------|------|
| Parameter            | Symbol | Minimum | Typ | Maximum | Unit |
| Optical Output Power | Pout   | -6.5    |     | -1.5    | dBm  |
| Optical Wavelength   | λout   | 830     | 850 | 860     | nm   |
| Spectral Width       | Δλrms  |         |     | 0.85    | nm   |
| Extinction Ratio     | Er     | 6.0     | 10  |         | dB   |
| Total Jitter         | TJ     |         |     | 55      | ps   |

| Power Supply Current Vcc = 3.14 to 3.46V |        |     |     |     |      |
|------------------------------------------|--------|-----|-----|-----|------|
| Parameter                                | Symbol | Min | Typ | Max | Unit |
| Supply Current                           | Icc    |     |     | 90  | mA   |

| Example Optical Link Distances |                        |            |
|--------------------------------|------------------------|------------|
| Protocol                       | Cable Type             | Distance   |
| Gigabit Ethernet               | 62.5/125μm, 200 MHz*Km | 275 meters |
|                                | 50/125μm, 500 MHz*Km   | 550 meters |

| Electrical Pin Arrangement |            |                                                                                       |                                 |
|----------------------------|------------|---------------------------------------------------------------------------------------|---------------------------------|
| Pin #                      | Symbol     | Description                                                                           | Logic                           |
| 7                          | Tx Disable | Transmit Disable (Input)<br>Logic "1" Input->Disable Transmitter Output               | CMOS<br>Internal 5 – 10K Pullup |
| 8                          | Vcc        | Power Supply                                                                          |                                 |
| 9                          | GND        | Signal Ground                                                                         |                                 |
| 10                         | Tx Fault   | Transmitter Fault Indicator (Output)<br>Logic "1" Output->Transmitter Fault Condition | CMOS<br>Open Drain              |
| 11                         | Tx-        | Transmitter Inverted Data (Input)                                                     | CML (Current Mode Logic)        |
| 12                         | Tx+        | Transmitter Non-Inverted Data (Input)                                                 | CML (Current Mode Logic)        |

## Ratings and specifications—Receiver

| Absolute Maximum Rating |        |      |     |      |      |
|-------------------------|--------|------|-----|------|------|
| Parameter               | Symbol | Min  | Typ | Max  | Unit |
| Storage Temperature     | Ts     | -55  |     | +100 | °C   |
| Operating Voltage       | Vcc    | -0.4 |     | +4   | V    |

| Operating Conditions  |           |      |     |      |      |
|-----------------------|-----------|------|-----|------|------|
| Parameter             | Symbol    | Min  | Typ | Max  | Unit |
| Operating Temperature | Top       | -40  |     | +85  | °C   |
| Supply Voltages       | Vcc       | 3.14 | 3.3 | 3.46 | V    |
| Power Supply Noise    | VccRipple |      |     | 0.1  | V    |

| Optical Receiver                                                                                            |         |         |     |         |      |
|-------------------------------------------------------------------------------------------------------------|---------|---------|-----|---------|------|
| Parameter                                                                                                   | Symbol  | Minimum | Typ | Maximum | Unit |
| Optical Sensitivity<br>125Mbps – 1.25 Gbps,<br>ER = 9dB, PRBS 2 <sup>7</sup> -1,<br>BER = 10 <sup>-12</sup> |         | -17     |     |         | dBm  |
| Optical Overload                                                                                            |         |         |     | 0       | dBm  |
| Optical Wavelength                                                                                          | λout    | 830     |     | 860     | nm   |
| Differential Output<br>Swing (P-P)                                                                          | Vdiff   | 600     |     | 1200    | mV   |
| LOS Assert Level                                                                                            | LOSh    |         | -24 | -22     | dBm  |
| LOS Hysteresis                                                                                              | LOS HYS | 1.5     | 2.3 |         | dB   |

| Power Supply Current Vcc = 3.14 to 3.46V |        |     |     |     |      |
|------------------------------------------|--------|-----|-----|-----|------|
| Parameter                                | Symbol | Min | Typ | Max | Unit |
| Supply Current                           | Icc    | 50  |     | 90  | mA   |

| Electrical Pin Arrangement |        |                                                                           |                          |
|----------------------------|--------|---------------------------------------------------------------------------|--------------------------|
| Pin #                      | Symbol | Description                                                               | Logic                    |
| 1                          | GND    | Signal Ground                                                             |                          |
| 2                          | Vcc    | Power Supply                                                              |                          |
| 3                          | GND    | Signal Ground                                                             |                          |
| 4                          | LOS    | Loss of Signal (Output)<br>Loss of Valid Optical Signal->Logic "1" Output | CMOS<br>Open Drain       |
| 5                          | RX-    | Receiver Inverted Data (Output)                                           | CML (Current Mode Logic) |
| 6                          | RX+    | Receiver Non-Inverted Data (Output)                                       | CML (Current Mode Logic) |