

# 10Gb/s 70Km CWDM SFP+ Transceivers

## RTXM228-39X

The CWDM-rated cooled EML laser based 10Gigabit SFP+ Transceiver is designed to transmit and receive serial optical data over single mode optical fiber with 70Km.

They are compliant with SFF-8431,SFF-8432, 10GFC Rev 4.0, and 10GBASE-ZR/ZW. The transmitter converts serial CML electrical data into serial optical data compliant with the IEEE 802.3ae standard. The receiver converts serial optical data into serial CML electrical data.Digital diagnostics functions are available via a 2-wire serial interface, as specified in SFF-8472.

### Specifications

(Tc=-5 to 70 and Vcc= 3.14 to 3.46V)

| Parameter | Symbol | Unit |  |
|-----------|--------|------|--|
|-----------|--------|------|--|

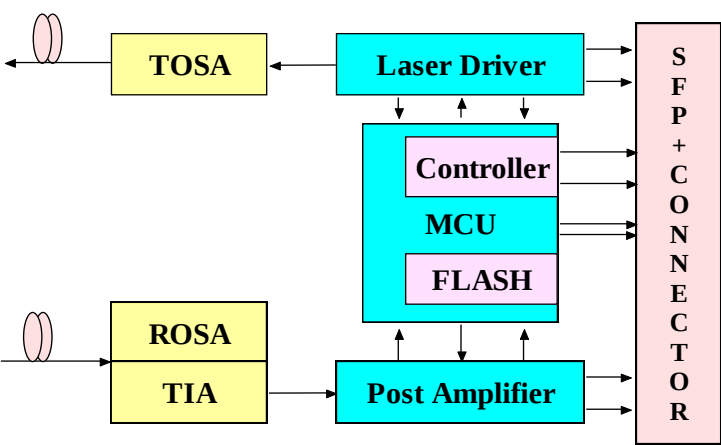
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### Ordering Information

|  |
|--|
|  |
|  |
|  |

### Block diagram



### Absolute Maximum Ratings

| Parameter | Symbol | Unit | Min | Max |
|-----------|--------|------|-----|-----|
|           |        |      | %   |     |

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### Pin function definitions

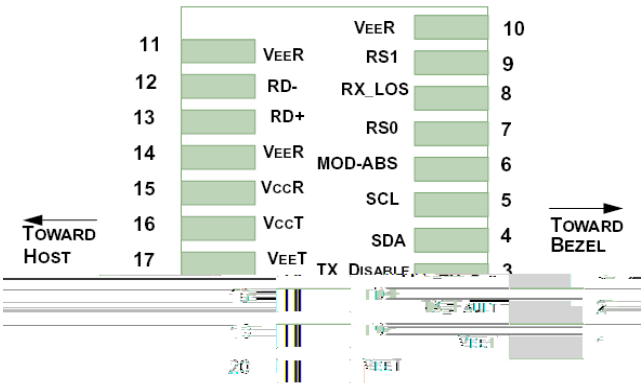


Figure 2.Pin function definitions

| Pin Number | Symbol     | Name                           | Description                                                                    |
|------------|------------|--------------------------------|--------------------------------------------------------------------------------|
| 1,17,20    | VeeT       | Transmitter Signal Ground      | These pins should be connected to signal ground on the host board.             |
| 2          | TX Fault   | Transmitter Fault Out (OC)     | This pin is open collector compatible, and should be pulled up before t_fault) |
| 3          | TX Disable | Transmitter Disable In (LVTTL) |                                                                                |

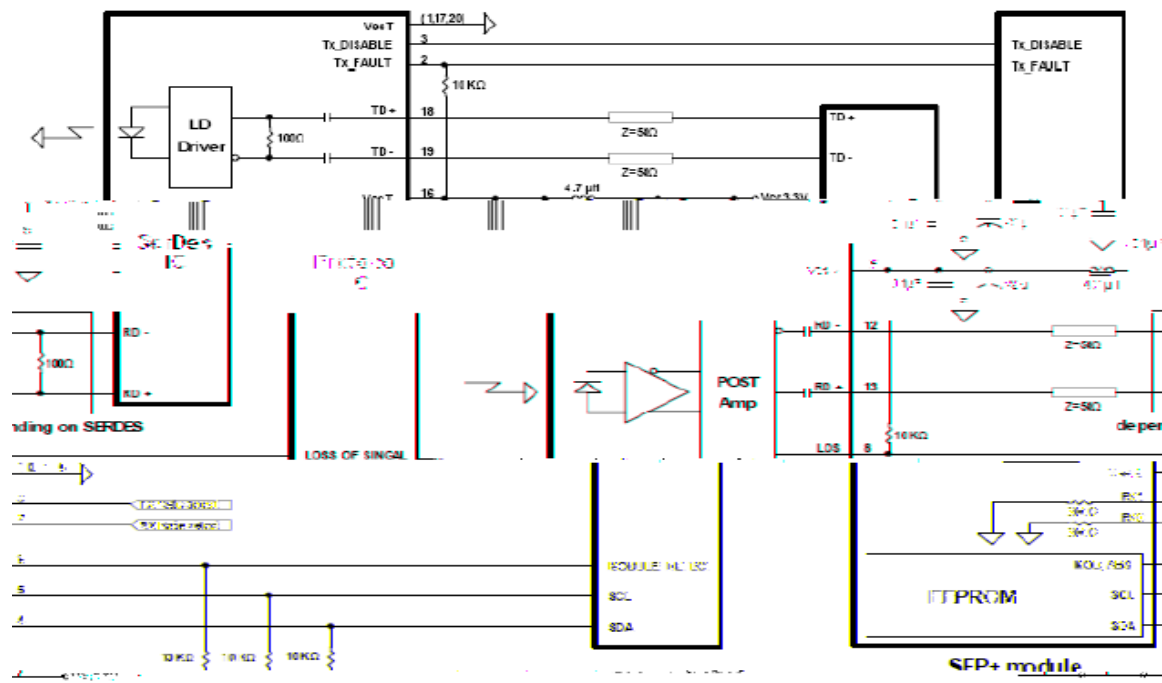
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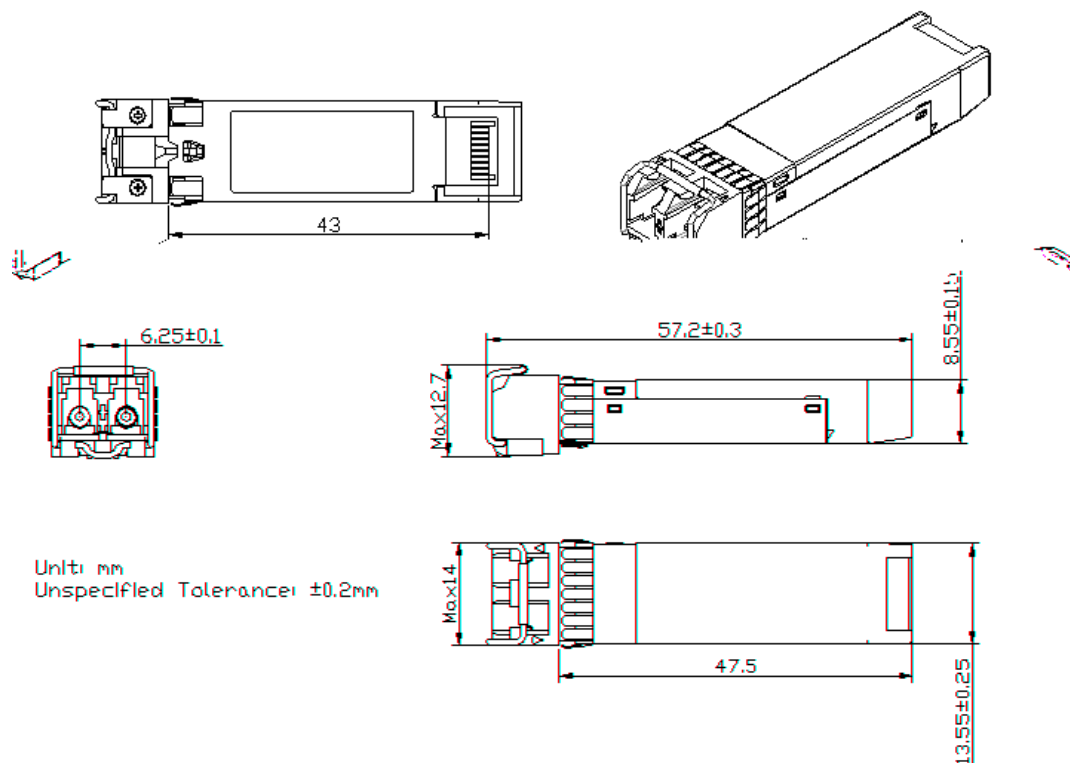
|          |         |                                     |                                                                                                                                                                                                             |
|----------|---------|-------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|          |         |                                     | resistor.                                                                                                                                                                                                   |
| 4        | SDA     | Serial ID with SFF 8472 Diagnostics |                                                                                                                                                                                                             |
| 5        | SCL     | Module Definition Identifiers       | Module Definition pins should be pulled up to Host Vcc                                                                                                                                                      |
| 6        | MOD-ABS |                                     | )                                                                                                                                                                                                           |
| 7        | RS0     | Receiver Rate Select (LVTTTL)       | , ) -down to ground. A                                                                                                                                                                                      |
| 9        | RS1     | Transmitter Rate Select (LVTTTL)    | signal on either of these pins will not affect module performance.                                                                                                                                          |
| 8        | LOS     | Loss of Signal Out (OC)             | Sufficient optical signal for potential $BER < 1 \times 10^{-12}$ )<br>Insufficient optical signal for potential $BER < 1 \times 10^{-12}$<br>This pin is open collector compatible, and should be pulled ) |
| 10,11,14 | VeeR    | Receiver Signal Ground              | These pins should be connected to signal ground on the host board.                                                                                                                                          |
| 12       | RD-     | Receiver Negative DATA Out (CML)    | )<br>. )<br>resistor.                                                                                                                                                                                       |
| 13       | RD+     | Receiver Positive DATA Out (CML)    | Light<br>. )<br>resistor.                                                                                                                                                                                   |
| 15       | VccR    | Receiver Power Supply               | This pin should be connected to a filtered +3.3V power supply on the host board. See Figure 3.Recommended power supply filter                                                                               |
| 16       | VccT    | Transmitter Power Supply            | This pin should be connected to a filtered +3.3V power supply on the host board. See Figure 3.Recommended power supply filter                                                                               |
| 18       | TD+     | Transmitter Positive DATA In (CML)  | ATA inputs are internally AC coupled and terminated with a differential ))                                                                                                                                  |
| 19       | TD-     | Transmitter Negative DATA In (CML)  | )<br>internally AC coupled and terminated with a differential ))                                                                                                                                            |

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## Typical Application Circuit



## Package Outline



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## Regulatory Compliance

| Feature                                                   | Test Method                                           | Performance                                                                                                                            |
|-----------------------------------------------------------|-------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|
| Electrostatic Discharge (ESD) to the Electrical Pins      | MIL-STD-883C Method 3015.7                            | Class 1 (> 1500 Volts)                                                                                                                 |
| Electrostatic Discharge (ESD) to the Duplex LC Receptacle | Variation of IEC 61000-4-2                            | Typically, no damage occurs with 15 kV when the duplex LC connector receptacle is contacted by a Human Body Model probe.               |
| Electrostatic Interference (EMI)                          | CISPR22 ITE Class B<br>EN55022 Class B<br>FCC Class B | Compliant with standards                                                                                                               |
| Immunity                                                  | IEC61000-4-3 Class 2<br>EN55024                       | Typically show no measurable effect from a 3V/m field swept from 80 to 1000MHz applied to the transceiver without a chassis enclosure. |
| RoHS Compliance                                           |                                                       | Less than 1000 ppm of cadmium, lead, mercury, hexavalent chromium, polybrominated biphenyls, and polybrominated biphenyl ethers.       |

| Product Code | Center Wavelength(nm) |
|--------------|-----------------------|
| RTXM228-391  | 1471                  |
| RTXM228-392  | 1491                  |
| RTXM228-393  | 1511                  |
| RTXM228-394  | 1531                  |
| RTXM228-395  | 1551                  |
| RTXM228-396  | 1571                  |
| RTXM228-397  | 1591                  |
| RTXM228-398  | 1611                  |