



3.3V SFF 2×5 1.25G Single Mode Transceiver

RTXM177-402

Features

- Duplex LC receptacle optical interface
- SFF 2x5 metallic package with EMI nose shield
- Distance of 30km on 9/125 μ m SMF cables
- CML or PECL logic I/O interfaces
- PECL transmitter disable input
- PECL receiver signal detect output
- Single + 3.3V power supply
- Low power consumption
- RoHS compliant

Application

- Gigabit Ethernet
- Fiber Channel

Standard

- Compliant with SFF MSA July 5,2000
- Compliant with IEEE 802.3z

Absolute Maximum Ratings

| Parameter | Symbol | Unit | Min | Max |
|-------------------------|-----------------|------|-------|-------|
| Storage Temperature | T _s | °C | - 40 | + 85 |
| Relative Humidity | RH | % | 5 | 95 |
| Power Supply Voltage | V _{cc} | V | - 0.5 | + 4.0 |
| Lead Solder Temperature | - | °C | - | 260 |
| Lead Solder Duration | - | sec | - | 10 |

Note: Stresses in excess of absolute maximum ratings may cause damage to the device. Exposure to absolute maximum ratings for extended periods may affect device reliability.

Recommended Operating Conditions

| Parameter | Symbol | Unit | Min | Typ | Max |
|-------------------------------|-----------------|------|------|-----|------|
| Ambient Operating Temperature | T _A | °C | 0 | - | + 70 |
| Power Supply Voltage | V _{cc} | V | 3.14 | 3.3 | 3.47 |

Specifications (tested under recommended operating conditions, unless otherwise noted)

| Parameter | Symbol | Unit | Min | Typ | Max | Note |
|--|------------------|------|----------------------|-----------------------|----------------------|----------------------|
| Electrical Characteristics | | | | | | |
| Supply Current | I _{cc} | mA | - | - | 300 | |
| Transmitter Differential Data Input Swing | V _{IN} | mV | 400 | - | 2000 | 1 |
| Transmitter Disable Voltage | - | V | V _{cc} -1.3 | - | V _{cc} +0.3 | |
| Transmitter Enable Voltage | - | V | 0 | - | 0.8 | |
| Transmitter Disable Assert Time | t _{off} | μs | - | - | 10 | |
| Transmitter Disable Deassert Time | t _{on} | ms | - | - | 1.0 | |
| Receiver Differential Data Output Swing | V _{OUT} | mV | 370 | - | 2000 | 2 |
| Signal Detect | High | - | V | V _{cc} -1.1 | - | V _{cc} -0.7 |
| Output Voltage (PECL) | Low | - | V | V _{cc} -1.95 | - | V _{cc} -1.5 |
| Optical Transmitter Characteristics | | | | | | |
| Launch Optical Power | P ₀ | dBm | - 5 | - | 0 | 3,4 |
| Center Wavelength Range | λ _c | nm | 1260 | 1310 | 1360 | |
| Extinction Ratio | E _x | dB | 9.0 | - | - | |
| Spectral Width (RMS) | Δλ | nm | - | - | 4 | |
| Rise/Fall Time (20% ~ 80%) | tr/tf | ns | - | - | 0.26 | |
| Disabled Transmitter Output Power | - | dBm | - | - | -35 | |
| Eye Diagram | | | IEEE 802.3z | | | 5 |
| Optical Receiver Characteristics | | | | | | |
| Receiver Sensitivity | S | dBm | - | - | - 20 | 6 |
| Overload Input Optical Power | | dBm | - 3 | - | - | |
| Signal Detect | Assert | - | dBm | - | - | - 22 |

| | | | | | | |
|--------------------------|-----------|---|-----|------|---|---|
| | De-assert | - | dBm | - 35 | - | - |
| Signal Detect Hysteresis | | - | dB | 0.5 | - | - |

Note 1: AC coupled internally.

Note 2: AC coupled internally.

Note 3: Minimum output optical level is at end of life (EOL).

Note 4: Coupled into 9/125 μ m SMF.

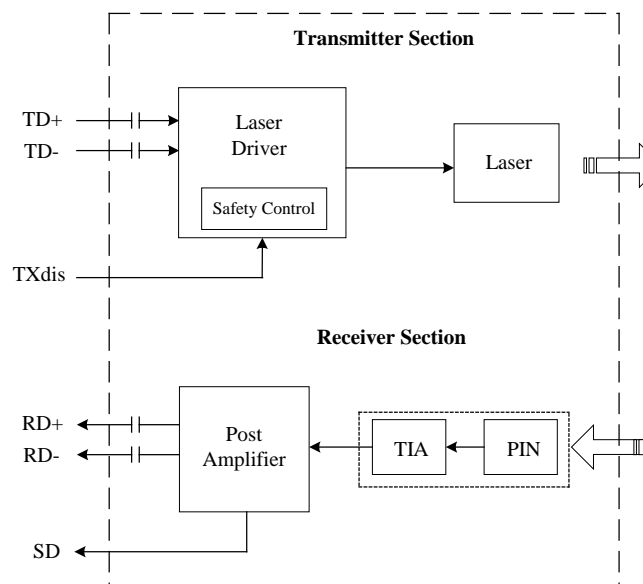
Note 5: Measured with PRBS 2⁷-1 test pattern @1.25Gbps.

Note 6: Measured with PRBS 2⁷-1 test pattern @1.25Gbps, E_x=10dB, BER≤10⁻¹².

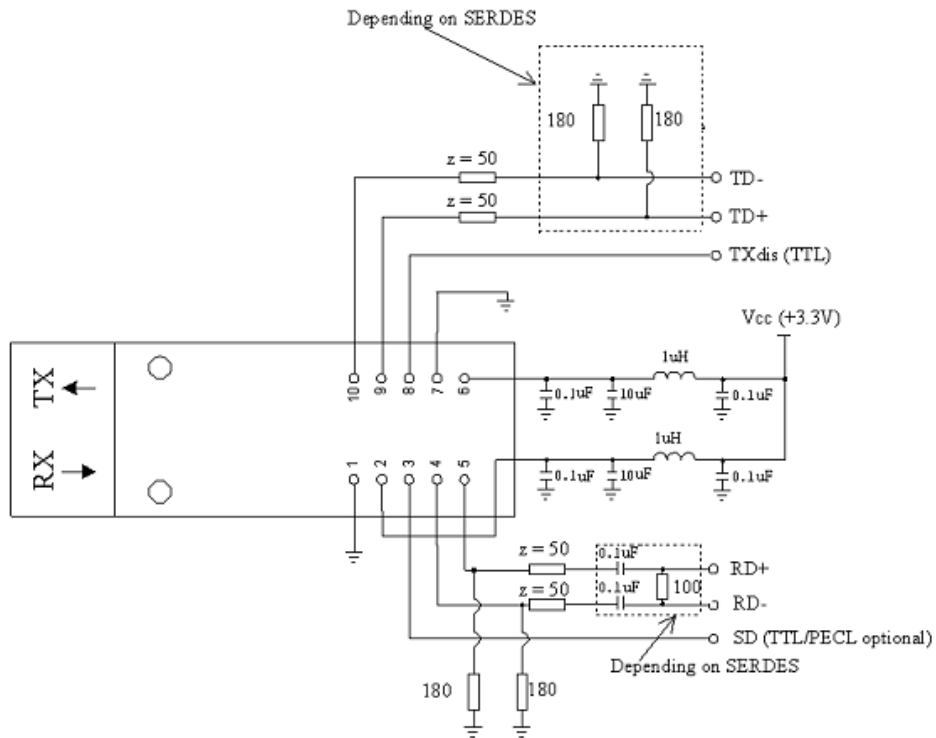
Pin Description

| Pin | Name | Description |
|-----|------------------|--|
| 1 | V _{EER} | Receiver Signal Ground |
| 2 | V _{CCR} | Receiver Power Supply |
| 3 | SD | Signal Detect(PECL) |
| | | Normal Operation: logic "1"output Fault Condition: logic "0"output |
| 4 | RD- | Received Data Output Bar |
| 5 | RD+ | Receiver data output |
| 6 | V _{CCT} | Transmitter Power Supply |
| 7 | V _{EET} | Transmitter Signal Ground |
| 8 | TXdis | Transmitter Disable |
| | | Normal Operation: logic "0" or Open Circuit --Laser On Transmit Disabled: logic "1" --Laser Off |
| 9 | TD+ | Transmitter Data In |
| 10 | TD- | Transmitter data In Bar |

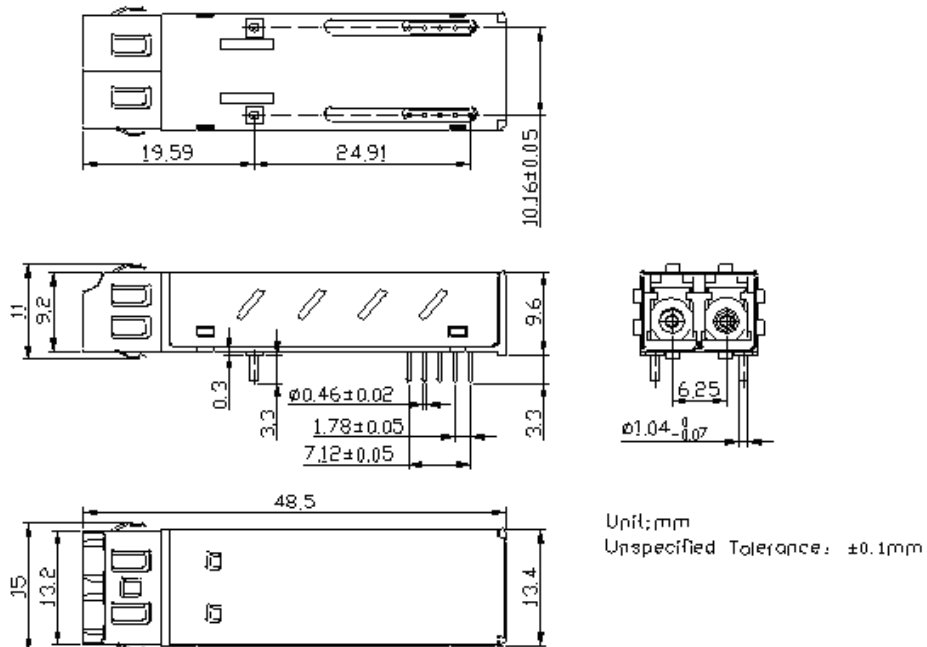
Block Diagram



Typical Application Circuit



Package Outline *(units in mm)*



Regulatory Compliance

| Feature | Test Method | Performance |
|--|--|--|
| Electrostatic Discharge (ESD) to the Electrical Pins | MIL-STD-883E Method 3015.7 | Class 1 (>1.5kV) – Human Body Model |
| Electrostatic Discharge (ESD) Immunity | IEC61000-4-2 | Class 2 (>4.0kV) |
| Electromagnetic Interference (EMI) | CISPR22 ITE Class B EN55022 Class B | Compliant with standards |
| Immunity | IEC61000-4-3 Class 2 EN55024 | Typically show no measurable effect from a 3V/m field swept from 80 to 1000MHz applied to the transceiver without a chassis enclosure. |
| Eye Safety | FDA 21 CFR 1040.10 and 1040.11 UL TUV EN 60825-1 | Compliant with Class I, CDRH/IEC 825 UL file E239070 |

Ordering Information

| Part. No. | Specifications | | | | | | | | | Application |
|-------------|----------------|-------|-----------|-----------|-----|----------|--------|-------|-----------------|-------------|
| | Pack | Rate | Tx | Pout | Rx | S | Temp | Reach | Others | |
| RTXM177-402 | 2x5 SFF | 1.25G | 1310nm FP | -5 ~ 0dBm | PIN | < -20dBm | 0~70°C | 30km | AC,PECL RoHS | 1000BASE-LH |

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