



RoHS compliant
TX-1270/RX-1310 nm Single-mode Bi-directional, SMF 60km
SFP LC Simplex Connector
25GBASE-BR



Features

- Compliant with SFP+ MSA SFF-8431
- Compliant with SFF8472 diagnostic monitoring interface
- Compliant to optical interface with IEEE802.3cp 25GBASE-BR requirements.
- Single power supply 3.3V
- Hot Pluggable
- EML laser and APD receiver
- Class 1 laser product complies with EN 60825-1
- Link distance up to 50km single mode fiber without FEC
- Link distance up to 60km single mode fiber with FEC
- 23dB link budget

Ordering Information

| PART NUMBER | WAVELENGTH | TEMPERATURE | DISTANCE |
|-----------------|-------------------|----------------|-------------|
| LG38-J3U-TC-N27 | TX1270nm/RX1310nm | 0°C to 70 °C | 50km ~ 60km |
| LG38-J3U-TI-N27 | TX1270nm/RX1310nm | -40°C to 85 °C | 50km ~ 60km |

Transmission distance: Attenuation of 0.35 dB/km @1310nm is used for the link length calculations

Diagnostics

| PARAMETER | RANGE | ACCURACY | UNIT | CALIBRATION |
|------------------|--------------|----------|------|-------------|
| Temperature | -40 to 85 | ± 3 | °C | |
| Voltage | 3.14 to 3.46 | ± 0.1 | V | |
| Bias Current | 0 to 120 | ± 10% | mA | Internal |
| TX Average Power | +2 to +6 | ± 3 | dB | |
| RX Average Power | -5 to -21 | ± 3 | dB | |



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Absolute Maximum Ratings

| PARAMETER | SYMBOL | MIN | MAX | UNITS | NOTE |
|-----------------------------|--------------|------|-----|-------|------|
| Storage Temperature | T_S | -40 | 85 | °C | |
| Supply Voltage | V_{CC} | -0.4 | 3.6 | V | |
| Operating Relative Humidity | RH | 5 | 85 | % | |
| Average receive power (max) | P_{Damage} | --- | -3 | dBm | |

Recommended Operating Conditions

| PARAMETER | SYMBOL | MIN | MAX | UNITS | NOTE |
|----------------------------|-------------------|------|------|-------|--------|
| Case operating Temperature | T_C | 0 | 70 | °C | C-Temp |
| | | -40 | 85 | | I-Temp |
| Supply Voltage | V_{CC} | 3.14 | 3.46 | V | |
| Supply Current@3.3V | $I_{TX} + I_{RX}$ | | 424 | mA | C-Temp |
| | | | 515 | | I-Temp |
| Power Consumption@3.3V | P | --- | 1.4 | W | C-Temp |
| | | | 1.7 | | I-Temp |



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Transmitter Electro-optical Characteristics

$V_{CC} = 3.14 \text{ V to } 3.46 \text{ V}$, $TC = 0^\circ \text{C to } 70^\circ \text{C}$, $TI = -40^\circ \text{C to } 85^\circ \text{C}$

| PARAMETER | SYMBOL | MIN | TYP. | MAX | UNITS | NOTE |
|--|-----------------|------------------------------------|-------|----------|---------|---|
| Bit Rate | B | 24 | 25.78 | 26.5 | Gbps | |
| Average Launch Power | P_{avg} | +2 | --- | +6 | dBm | (1) |
| Optical Modulation Amplitude(OMA) | P_{oma} | +3 | | +6 | dBm | |
| Extinction Ratio | ER | 6.5 | --- | --- | dB | |
| Center Wavelength | λ_c | 1260 | 1270 | 1280 | nm | |
| Spectral Width (-20dB) | $\Delta\lambda$ | --- | --- | 1 | nm | |
| Side Mode Suppression Ratio | $SMSR$ | 30 | | | dB | |
| Transmitter eye mask definition {X1, X2, X3, Y1, Y2, Y3} | | {0.31, 0.4, 0.45, 0.34, 0.38, 0.4} | | | | Hit ratio 5×10^{-5} hits per sample. |
| Max. P_{out} TX-DISABLE Asserted | P_{OFF} | --- | --- | -45 | dBm | |
| Max power and dispersion penalty | TDP | | | 1 | dB | |
| Differential Input Voltage | V_{DIFF} | 200 | | 1000 | mV | |
| Transmit Fault Output-Low | TX_FAULT_L | 0.0 | --- | 0.5 | V | |
| Transmit Fault Output-High | TX_FAULT_H | 2.4 | --- | V_{CC} | V | |
| TX_DISABLE Assert Time | t_{off} | --- | --- | 100 | μs | |
| TX_DISABLE Negate Time | t_{on} | --- | --- | 2 | ms | |
| Time to initialize, include reset of TX_FAULT | t_{init} | --- | --- | 300 | ms | |
| Tx_Fault assert for cooled module | t_{fault} | --- | --- | 50 | ms | |
| TX_DISABLE time to start reset | t_{reset} | 10 | --- | --- | μs | |



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Receiver Electro-optical Characteristics

$V_{CC} = 3.14 \text{ V to } 3.46 \text{ V}$, $TC = 0^\circ\text{C to } 70^\circ\text{C}$, $TI = -40^\circ\text{C to } 85^\circ\text{C}$

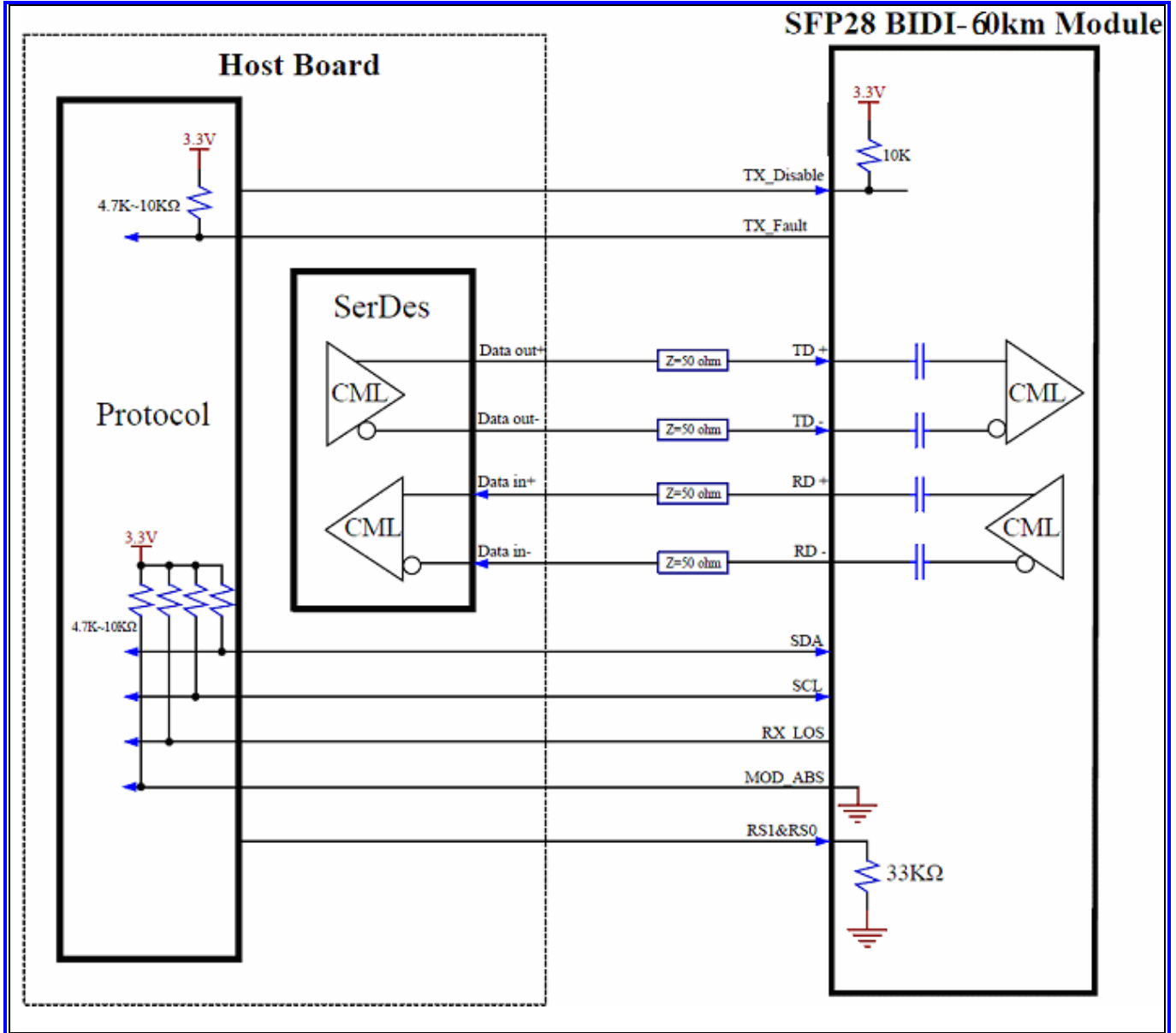
| PARAMETER | SYMBOL | MIN | TYP. | MAX | UNITS | NOTE |
|---|-----------------|------|-------|----------|---------------|-----------|
| Data Rate | B | 24 | 25.78 | 26.5 | Gbps | |
| Average Receive Power | | -21 | | -5 | dBm | (1) |
| Receiver Sensitivity(OMA) | P_{IN} | --- | --- | -20 | dBm | @BER=5E-5 |
| Operating Center Wavelength | λ_C | 1300 | 1310 | 1320 | nm | |
| Optical Return Loss | ORL | 26 | --- | --- | dB | |
| Loss of signal -Deasserted | P_D | --- | --- | -23 | dBm | |
| Loss of signal -Asserted | P_A | -35 | --- | --- | dBm | |
| Differential Output Voltage | V_{DIFF} | 500 | --- | 1000 | mV | |
| Receiver Loss of Signal Output Voltage-Low | RX_LOS_L | 0 | --- | 0.5 | V | |
| Receiver Loss of Signal Output Voltage-High | RX_LOS_H | 2.4 | --- | V_{CC} | V | |
| Receiver Loss of Signal Assert Time (off to on) | t_{A,RX_LOS} | --- | --- | 100 | μs | |
| Receiver Loss of Signal Assert Time (on to off) | t_{D,RX_LOS} | --- | --- | 100 | μs | |

Note1: Average launch power (min) is informative and not the principal indicator of signal strength. A transmitter with launch power below this value cannot be compliant; however, a value above this does not ensure compliance.

Timing Parameters

| PARAMETER | SYMBOL | MIN | TYP. | MAX | UNITS | NOTE |
|--------------------|-----------------|-----|------|-----|-------|------|
| Time to initialize | t_{start_up} | | | 10 | s | |

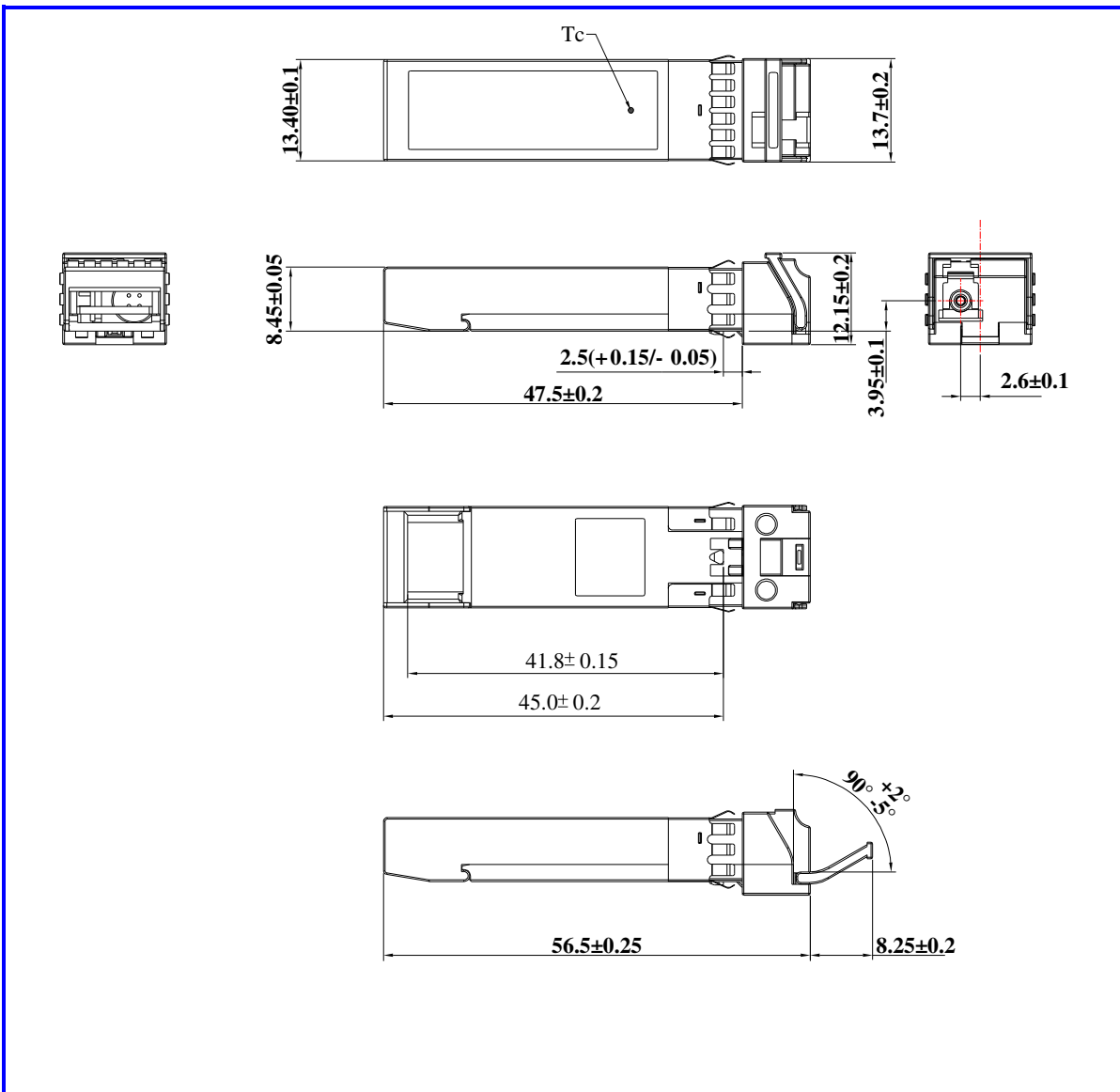
Block Diagram of Transceiver



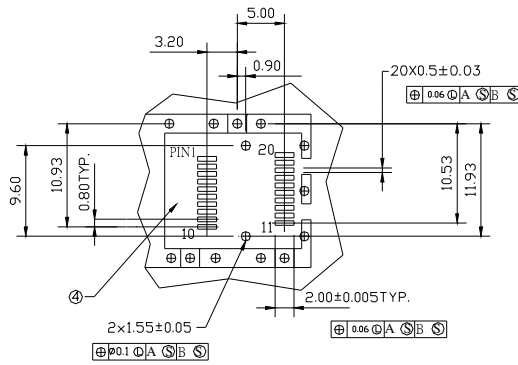
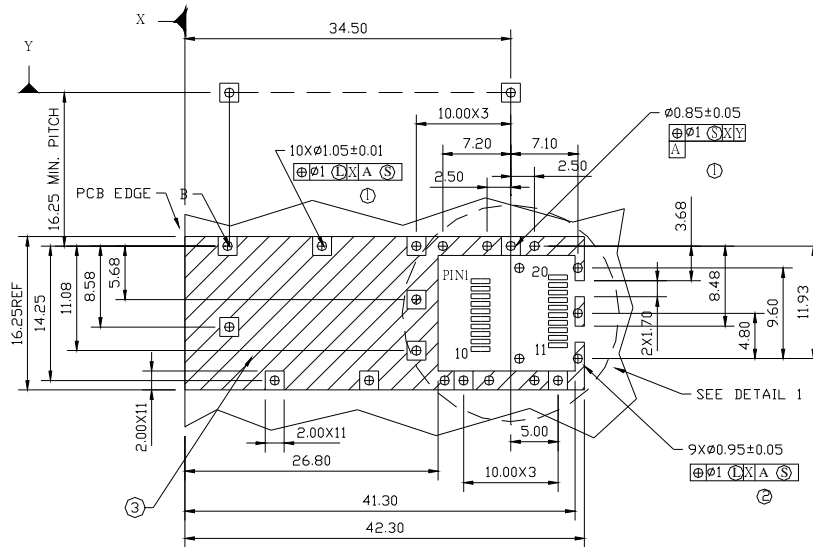


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Dimensions



SFP host board mechanical layout



DETAIL 1

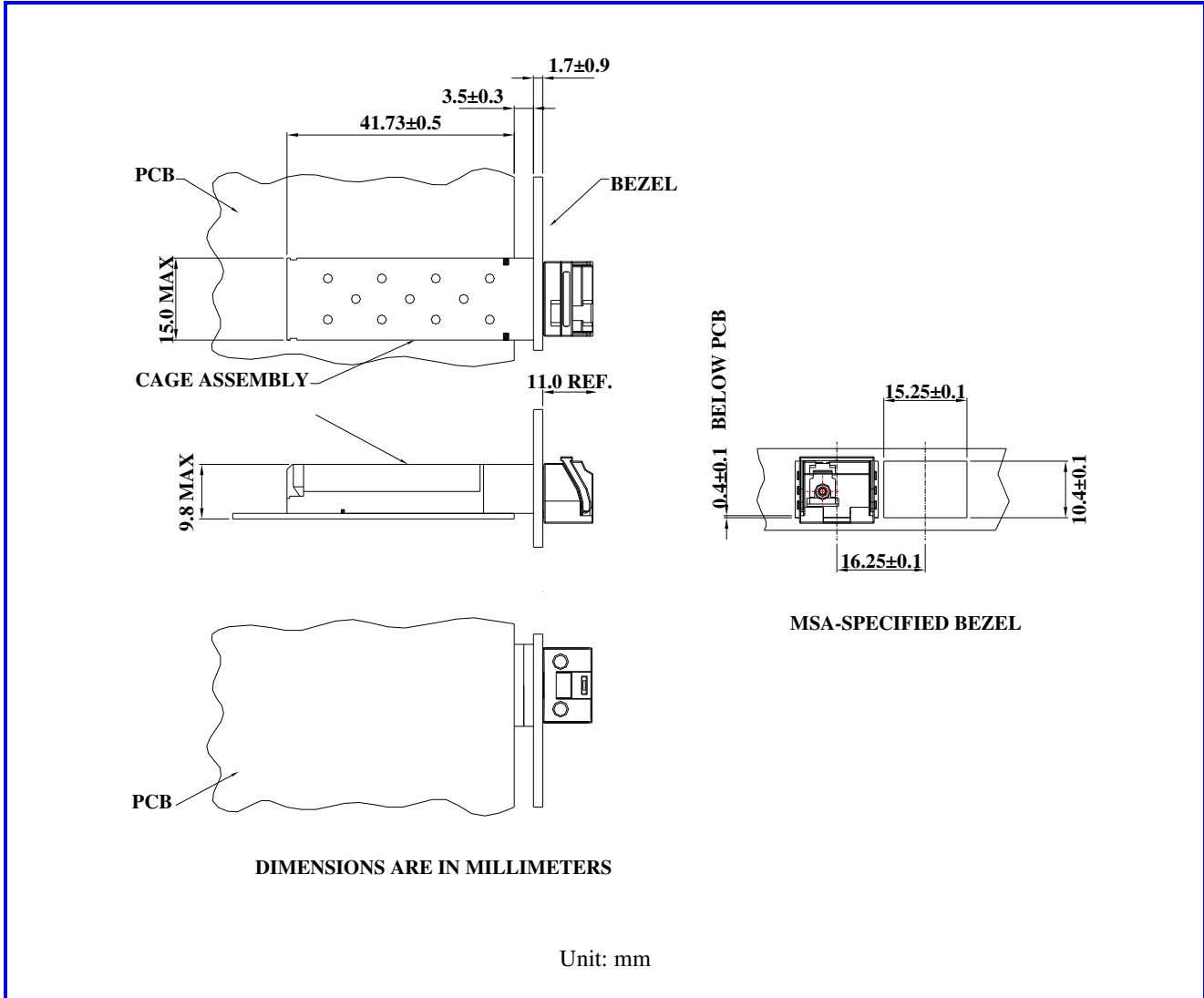
LEGEND

- 1.PADS AND VIAS ARE CHASSIS GROUND
- 2.THROUGH HOLES, PLATING OPTIONAL
- 3.HATCHED AREA DENOTES COMPONENT AND TRACE KEEPOUT(EXCEPT CHASSIS GROUND)
- 4.AREA DENOTES COMPONENT KEEPOUT (TRACES ALLOWED)

DIMENSIONS ARE IN MILLIMETERS

Unit: mm

Assembly drawing

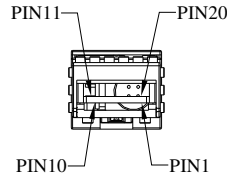




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Pin Assignment

Pin-Out



| Pin | Signal Name | I/O | Logic | Description | Note |
|-----|-------------------|-----|-------|--|------|
| 1 | <i>VeeT</i> | | | Transmit Ground | |
| 2 | <i>TX_FAULT</i> | O | LVTTL | Transmit Fault | |
| 3 | <i>TX_DISABLE</i> | I | LVTTL | Transmit Disable | |
| 4 | <i>SDA</i> | I/O | LVTTL | 2-wire Serial Interface Data Line | |
| 5 | <i>SCL</i> | I/O | LVTTL | 2-wire Serial Interface Clock | |
| 6 | <i>MOD_ABS</i> | | | Module Absent, connected to VeeT or VeeR in the module | |
| 7 | <i>RS0</i> | I | LVTTL | Rate select 0, not used | 1 |
| 8 | <i>RX_LOS</i> | O | LVTTL | Receiver Loss of Signal | |
| 9 | <i>RS1</i> | I | LVTTL | Rate select 1, not used | 1 |
| 10 | <i>VeeR</i> | | | Receiver Ground | |
| 11 | <i>VeeR</i> | | | Receiver Ground | |
| 12 | <i>RD-</i> | O | CML | Receive Data out Bar, AC coupled | |
| 13 | <i>RD+</i> | O | CML | Receive Data out, AC coupled | |
| 14 | <i>VeeR</i> | | | Receiver Ground | |
| 15 | <i>VCCR</i> | | | Receiver Power Supply | |
| 16 | <i>Vcct</i> | | | Transmitter Power Supply | |
| 17 | <i>VeeT</i> | | | Transmitter Ground | |
| 18 | <i>TD+</i> | I | CML | Transmit Data in, AC coupled | |
| 19 | <i>TD-</i> | I | CML | Transmit Data in Bar, AC coupled | |
| 20 | <i>VeeT</i> | | | Transmitter Ground | |

Note 1:RS0 and RS1 are module inputs and are pulled low to VeeT with > 30 kΩ resistors in the module.