## Product Features

- ✓ Single LC connector
- ✓ Hot-pluggable SFP footprint
- ✓ Uncooled DFB laser
- ✓ RoHS compliant and Lead Free
- ✓ Distance up to 10 km on 9/125um SMF
- ✓ Metal enclosure for lower EMI
- ✓ Power dissipation <1.0W (0~70℃)
  <1.5W(-40~85℃)
- ✓ Commercial and industrial operating temperature optional
- ✓ SFP MSA SFF-8472 SFF-8431 SFF-8432 Compliant

## Applications

- ✓ 10G BASE-ER
- ✓ 10G Fibre Channel

## Product Selection

| Part Number | Wavelength | Operating Case temperature |
|---|---|---|
| APSPB23B33CDL10 | Tx-1270 / Rx-1330 | Commercial |
| APSPB32B33CDL10 | Tx-1330 / Rx-1270 | Commercial |
| APSPB23B33IDL10 | Tx-1270 / Rx-1330 | Industrial |
| APSPB32B33IDL10 | Tx-1330 / Rx-1270 | Industrial |

## Regulatory Compliance

- ESD to the Electrical PINs: compatible with MIL-STD-883 Method 3015
- ESD to the Single LC Receptacle: compatible with EN 61000-4-2
- Immunity compatible with EN 61000-4-3
- EMI compatible with FCC Part 15 Class B
- Laser Eye Safety compatible with FDA 21CFR 1040.10 and 1040.11 IEC 60950, IEC 60825-1,2
- RoHS compliant with RoHS 2.0 (2015/863/EU)-amending

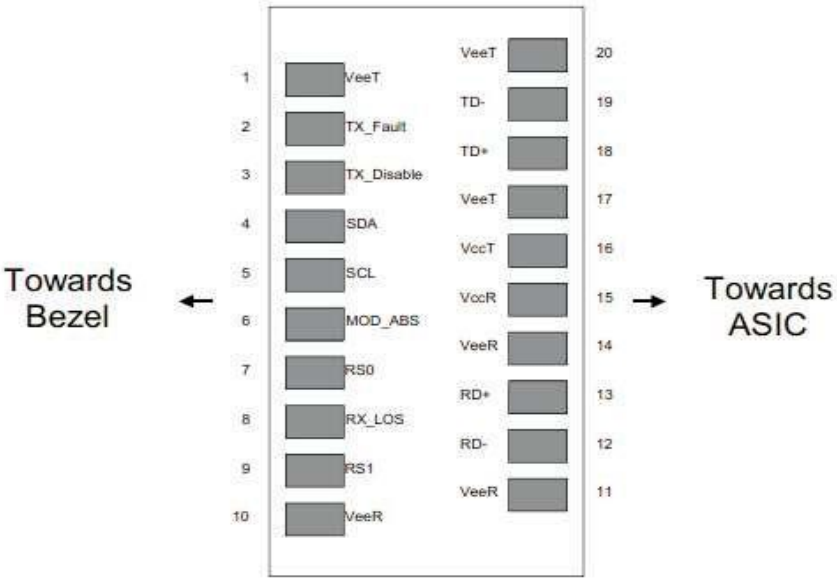
## Pin Descriptions

| P`n | Symbo | Name | Ref. |
|---|---|---|---|
| 1 | VeeT | Transmitter Ground (Common with Receiver Ground) | 1 |
| 2 | TX Fault | Transmitter Fault. LVTTL-O | 2 |
| 3 | TX Dis ble | Transmitter Disable. Laser output disabled on high or open. LVTTL-I | 3 |
| 4 | SDA | 2-Wire Serial Interface Data Line (Same as MOD-DEF2 in INF-8074i). LVTTL-I/O | 2 |
| 5 | SCL | 2-Wire Serial Interface Data Line (Same as MOD-DEF2 in INF-8074i). LVTTL-I | 2 |
| 6 | Mod_ ABS | Module Absent, Connect to VeeT or VeeR in Module. | 2 |
| 7 | RS0 | Rate Select 0, optionally controls SFP+ module receiver LVTTL-I | 4 |
| 8 | LOS | Loss of Signal indication. Logic 0 indicates normal operation. LVTTL-O | 5 |
| 9 | RS1 | Rate Select 1, optionally controls SFP+ module transmitter. LVTTL-I | 4 |
| 10 | VeeR | Receiver Ground (Common with Transmitter Ground) | 1 |
| 11 | VeeR | Receiver Ground (Common with Transmitter Ground) | 1 |
| 12 | RD- | Receiver Inverted DATA out. AC Coupled. CML-O | |
| 13 | RD+ | Receiver Non-inverted DATA out. AC Coupled. CML-O | |
| 14 | VeeR | Receiver Ground (Common with Transmitter Ground) | 1 |
| 15 | VccR | Receiver Power Supply | 6 |
| 16 | VccT | Transmitter Power Supply | 6 |
| 17 | VeeT | Transmitter Ground (Common with Receiver Ground) | 1 |
| 18 | TD+ | Transmitter Non-Inverted DATA in. AC Coupled. CML- I | |
| 19 | TD- | Transmitter Inverted DATA in. AC Coupled. CML- I | |
| 20 | VeeT | Transmitter Ground (Common with Receiver Ground) | 1 |

## Note

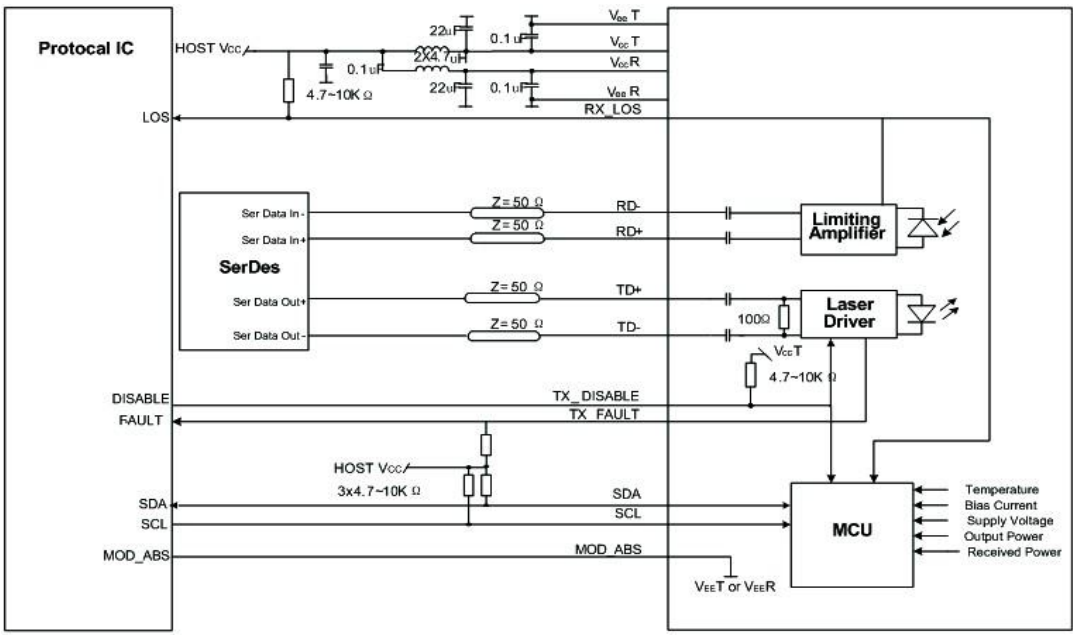
1. Circuit ground is internally isolated from chassis ground.
2. TX Fault is an open collector/drain output .Which should be pulled up with a 4.7K – 10K Ohms resistor on the host board if intended for use. Pull up voltage should be between 2.0V to Vcc+0.3V.A high output indicates a transmitter fault caused by either the tx bias current or the tx output power exceeding the preset alarm thresholds. A low output indicates normal operation .In the low state, the output is pulled to <0.8V.
3. Laser output disabled on TX Disable >2.0V or open, enabled on TX Disable<0.8V.
4. Internally pulled down per SFF-8431 Rev4.1.
5. LOS is open collector output. Should be pulled up with 4.7k – 10kohms on host board to a voltage between 2.0V and 3.6V. Logic 0 indicates normal operation; logic 1 indicates loss of signal.

6. Internally connected




Pin-out of Connector Block on Host Board

## Recommend Circuit Schematic



## Absolute Maximum Ratings

| Parameter | Symbol | Min | Typ | Max | Unit | Ref. |
|---|---|---|---|---|---|---|
| Maximum Supply Voltage | Vcc | -0.5 | | +4.0 | V | |
| Storage Temperature | TS | -40 | | +85 | °C | |
| Operating Humidity | RH | 0 | | 85 | % | |

## Recommended Operating Conditions

| Parameter | Symbol | Min | Typ | Max | Unit | Ref. |
|---|---|---|---|---|---|---|
| Power Supply Voltage | Vcc | 3.13 | 3.30 | 3.47 | V | |
| Power Supply Current | Icc | | | 300 | mA | Commercial |
| | Icc | | | 430 | mA | Industrial |
| Case Operating Temperature | Tc | 0 - 40 | | +70 | °C | Commercial |
| | TI | | | +85 | °C | Industrial |
| Data Rate | BR | | 10.3 | | Gbps | |
| 9/125um G.652 SMF | Lmax | | | 40 | km | |

## Electrical Characteristics

| Parameter | Symbo | M'n | yp | Max | Un't | Ref. |
|---|---|---|---|---|---|---|
| Transmitter | | | | | | |
| Input differential impedance | Rin | 8) | 100 | 120 | Ω | 1 |
| Differential data input swing | Vin, pp | 1 0 | | 850 | mV | |
| TX Disable-High | | Vcc - 0.8 | | Vcc | V | |
| TX Disable-Low | | V e | | Vee+ 0.8 | V | |
| TX Fault-High | | Vcc - 0.8 | | Vcc | V | |
| TX Fault-Low | | V e | | Vee+ 0.8 | V | |
| Receiver | | | | | | |
| Differential data output swing | Vout, pp | 3 0 | | 850 | mV | 2 |
| Data output rise time | Tr | 2 3 | | | ps | 3 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Data output fall time | Tf | 23 | | | ps | 3 |
| LOS-High | | Vcc - 0.8 | | Vcc | V | |
| LOS-Low | | Vee | | Vee+0.8 | V | |

Notes:

1. AC coupled.
2. Into 100 ohm differential termination.
3. 20 – 80 %

## Optical Characteristics

| Parameter | Symbo | M'n | yp | Max | Un't | Ref. |
|---|---|---|---|---|---|---|
| Transmitter | | | | | | |
| Output Opt. Power | PO | +1 | | +6 | dBm | |
| Optical Wavelength | λ | 1260<br>1320 | l270<br>l330 | 1280<br>1340 | nm<br>nm | |
| Side-Mode Suppression Ratio | SMSR | 30 | | | dB | |
| Spectral Width(-20dB) | Δλ | | | 1 | nm | |
| Optical Extinction Ratio | ER | 4 | | | dB | |
| Receiver | | | | | | |
| RX Sensitivity @10.3Gb/s | SENS1 | | | -13 | | 1,2 |
| Receiver Overload | | 1 | | | dBm | |
| Optical Center Wavelength | λC | 1320<br><br>1260 | 1330<br><br>1270 | 1340<br><br>1280 | nm<br><br>nm | dBm |
| LOS De-Assert | LOSD | | | -15 | dBm | |
| LOS Assert | LOSA | -30 | | | dBm | |
| LOS Hysteresis | | 0.5 | | 5 | dB | |

Notes:

1.Measured with conformance signals defined in FC-PI-2 Rev. 10.0 specifications.

2.Measured with PRBS $2^{31}$-1 at $10^{-12}$ BER.

## Mechanical Specifications

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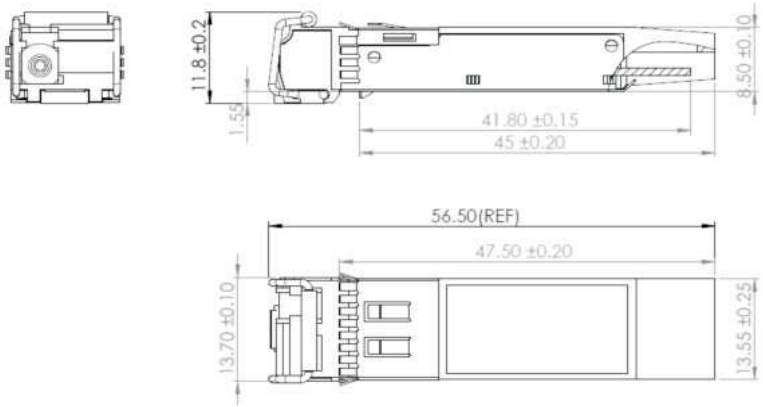
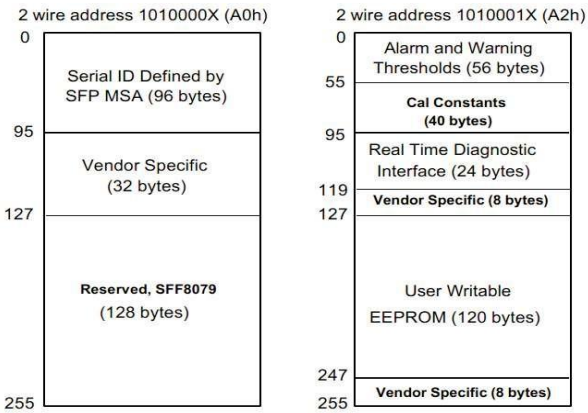



## EEPROM Information

. EEPROM memory map specific data field description is as below:



## Digital Diagnostic Monitoring Interface

Five transceiver parameter values are monitored. The following table defines the monitored parameter's accuracy.

| Parameter | Range | Accuracy | Calibration |
|---|---|---|---|
| Temperature | 0 to +70°C (C)<br>-40 to +85°C (I) | ±3°C | Internal |
| Voltage | 2.97 to 3.63V | ±3% | Internal |
| Bias Current | 0 to 100mA | ±10% | Internal |
| TX Power | +1 to +6dBm | ±3dB | Internal |
| RX Power | -13 to 0.5dBm | ±3dB | Internal |