
XTE40-D0C-31T1

Features

- ◆ Up to 9.95 Gbps to 11.3Gbps
- ◆ 1310nm DFB Laser and APD photo detector
- ◆ Duplex LC receptacle optical interface compliant
- ◆ 3.3V power supplies required
- ◆ Hot-pluggable
- ◆ AC coupling of CML signals
- ◆ International Class1 laser safety certified
- ◆ Operating temperature range:
Commercial:0℃~+70℃
- ◆ RoHS Compliant
- ◆ DDMI function available with internally calibrated mode

Application

- ◆ SONET OC-192 &SDH STMI-64.1
- ◆ 10Gigabit Ethernet
- ◆ 10Gigabit Fiber Channel

Standard

- ◆ Compliant with IEEE802.3ae
- ◆ Compliant with INF-8077
- ◆ Compliant with ITU-T G.691

Specification:

| Absolute Maximum Ratings | | | | |
|--------------------------|--------|------|-----|------|
| Parameter | Symbol | Min | Max | Unit |
| Storage temperature | TS | -40 | 85 | °C |
| Power Supply Voltage | Vcc3 | -0.5 | +4 | V |
| Relative Humidity | RH | 5 | 95 | % |

| Recommended Operating Conditions | | | | | |
|---|--------|------|---------|------|------|
| Parameter | Symbol | Min | Typical | Max | Unit |
| Operating Case Temperature (Commercial) | Tc | 0 | | 70 | °C |
| Power Supply Voltage | Vcc3 | 3.13 | 3.3 | 3.47 | V |
| Supply Current ¹ | Icc3 | | | 600 | mA |
| Data Rate | | 9.95 | | 11.3 | Gbps |
| Fiber Length 9/125µm core SMF | | - | 40 | - | km |

| Electrical Characteristics | | | | | | |
|--|-----------------|------|---------|---------|------|--------|
| Parameter | Symbol | Min | Typical | Max | Unit | Notes |
| Power dissipation | P | | | 2.5 | W | |
| Transmitter differential input voltage | | 120 | - | 820 | mV | |
| Receiver differential output Voltage | | 300 | 650 | 850 | mV | |
| Transmit disable voltage | V _{IH} | 2.0 | | Vcc+0.3 | V | LVTTTL |
| Transmit enable voltage | V _{IL} | -0.3 | | 0.8 | V | LVTTTL |
| Transmit disable assert time | | | | 10 | us | |
| Loss of Signal (LOS) | V _{OH} | 2.4 | | Vcc+0.3 | V | LVTTTL |
| | V _{OL} | -0.3 | | 0.4 | V | LVTTTL |
| Leakage Current | I _L | -10 | | 10 | µA | |
| I2C Clock Rate | | | | 400 | KHz | |

| Optical transmitter Characteristics | | | | | | |
|-------------------------------------|------------------|-----|---------|-----|------|-------|
| Parameter | Symbol | Min | Typical | Max | Unit | Notes |
| Launched Power (avg.) | P _{out} | 0 | | 5 | dBm | |

| Operating Wavelength Range | λ_c | 1260 | 1310 | 1355 | nm | |
|------------------------------------|--|-------|---------|------|-------|-------|
| Spectral Width(-20dB) | $\Delta\lambda$ | | | 1 | nm | |
| Side Mode Suppression Ratio | SMSR | 30 | | | dB | |
| Extinction Ratio | ER | 8.2 | | | dB | 2 |
| Relative Intensity Noise | RIN | | | -128 | dB/Hz | |
| Transmitter and Dispersion Penalty | TDP | | | 3.2 | dB | |
| Optical Rise/Fall Time | Tris/Tfall | 28 | | | PS | 3 |
| Optical Tx Output disable | P_{dis} | | | -45 | dBm | |
| Output Eye Diagram | Compliant with ITU-T G.691 eye mask and IEEE802.3ae eye mask | | | | | |
| Optical receiver Characteristics | | | | | | |
| Parameter | Symbol | Min | Typical | Max | Unit | Notes |
| Receiver Sensitivity | S | | | -18 | dBm | 4 |
| Wavelength Range | λ_c | 1260 | | 1355 | nm | |
| Receiver Reflectance | | | | -27 | dB | |
| Optical Power Input Overload | P_{in-max} | -1 | | | dBm | 4 |
| LOS | Optical De-assert | P_d | | -19 | dBm | 4 |
| | Optical Assert | P_a | -35 | | | |
| LOS hysteresis | | 0.5 | | 5 | dB | 5 |

Note1. The supply current is XFP module's working current.

Note2: For the measurements, the device was driven with 10.3125Gbps data pattern with $2^{31}-1$ PRBS payload.

Note3. Optical transition time is the time interval required for the rising or falling edge of an optical pulse to transition between the 20% and 80% amplitudes relative to the logical 1 and 0 levels.

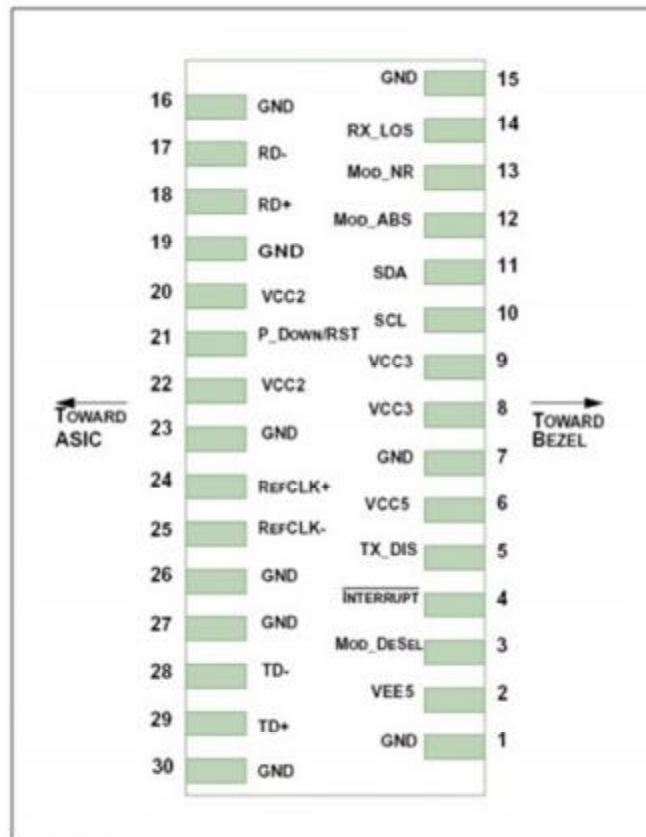
Note4. Measured with a PRBS $2^{31}-1$ test pattern, @10.3125Gbps, ER=8.2dB, BER< 10^{-12} .

Note5. The LOS Hysteresis minimizes 'chatter' on the output line. In principle, Hysteresis alone does not guarantee chatter-free operation.

Digital Diagnostic Monitoring Information

| Parameter | Accuracy | Calibration | Range |
|--------------|-----------------------|-------------|---------------------------|
| Temperature | $\pm 3^\circ\text{C}$ | internal | 0~70°C |
| Voltage | $\pm 3\%$ | internal | 3.1~3.5V |
| Bias Current | $\pm 10\%$ | internal | Specified by normal value |
| TX Power | $\pm 2\text{dB}$ | internal | 0~5dBm |
| RX Power | $\pm 3\text{dB}$ | internal | -18~0dBm |

Pin Description



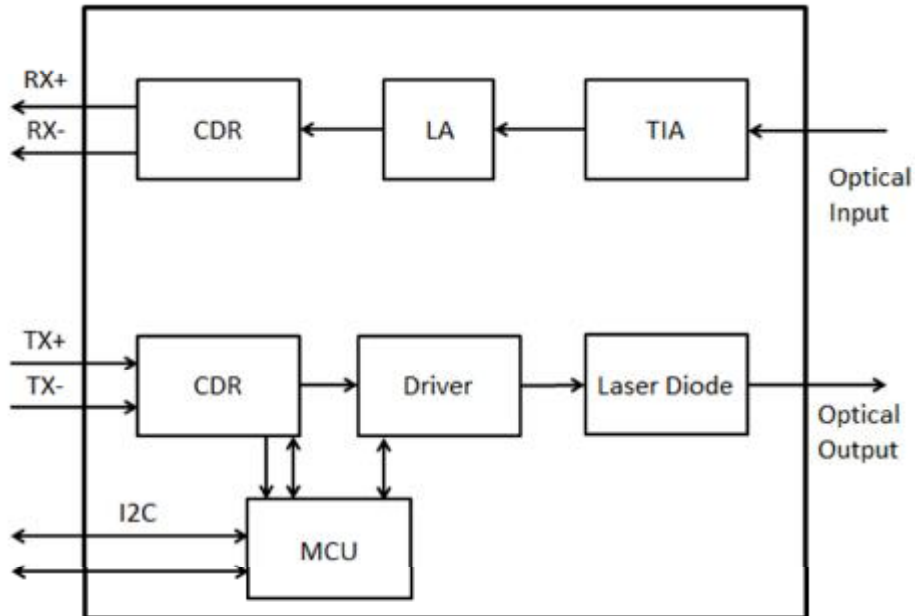
| Pin | Logic | Symbol | Description | Note |
|-----|-----------|-----------|--|------|
| 1 | | GND | Module Ground | 1 |
| 2 | | VEES | Optional -5.2V Power Supply(Not Required) | |
| 3 | LVTTL-I | Mod DeSel | Reverse data output of receiver section | |
| 4 | LVTTL-O | PECL | Optical alarm of receiver section, High level when normal, low level when no light | 2 |
| 5 | LVTTL-I | Interrupt | Interrupt;Indicates presence of an important conditionof an important condition which can be read over the 2-wire serial interface | |
| 6 | | Vcc | +5V Power Supply (Not Required) | |
| 7 | | GND | Module Ground | 1 |
| 8 | | VCC3 | +3V Power Supply | |
| 9 | | VCC3 | +3V Power Supply | |
| 10 | LVTTL-I/O | SCL | 2-Wire Serial Interface Clock | 2 |
| 11 | LVTTL-I/O | SDA | 2-Wire Serial Interface Data Line | 2 |

| | | | | |
|----|----------|----------------|--|---|
| 12 | LVTTTL-O | Mod_Abs | Indicates Module is not present. Grounded in the Module | 2 |
| 13 | LVTTTL-O | Mod_NR | Module Not Ready; Indicating Module Operating Faulty | 2 |
| 14 | LVTTTL-O | RX_LOS | Receiver Loss Of Signal Indicator | 2 |
| 15 | - | GND | Module Ground | 1 |
| 16 | - | GND | Module Ground | 1 |
| 17 | CML-O | RD- | Receiver Inverted Data Output | |
| 18 | CML-O | RD+ | Receiver Non-Inverted Data Output | |
| 19 | | GND | Module Ground | 1 |
| 20 | | VCC2 | +1.8V Power Supply | |
| 21 | LVTTTL-I | P_Down/ RST | Power down; When high, requires the module to limit power consumption to 1.5w or below. 2-Wire serial interface must be functional in the low power mode. Reset;The falling edge initiates a complete reset of the module including the 2-wire serial interface, equivalent to a power cycle. | |
| 22 | | VCC2 | +1.8V Power Supply | |
| 23 | | GND | Module Ground | |
| 24 | PECL-I | RefCLK+ | Reference Clock Non-Inverted Input, AC coupled on the host board (Not Required) | |
| 25 | PECL-I | RefCLK- | Reference Clock Inverted Input, AC coupled on the host board (Not Required) | |
| 26 | | GND | Module Ground | 1 |
| 27 | | GND | Module Ground | 1 |
| 28 | CML-I | TD- | Transmitter Inverted Data Input | |
| 29 | CML-I | TD+ | Transmitter Non-Inverted Data Input | |
| 30 | | GND | Module Ground | 1 |

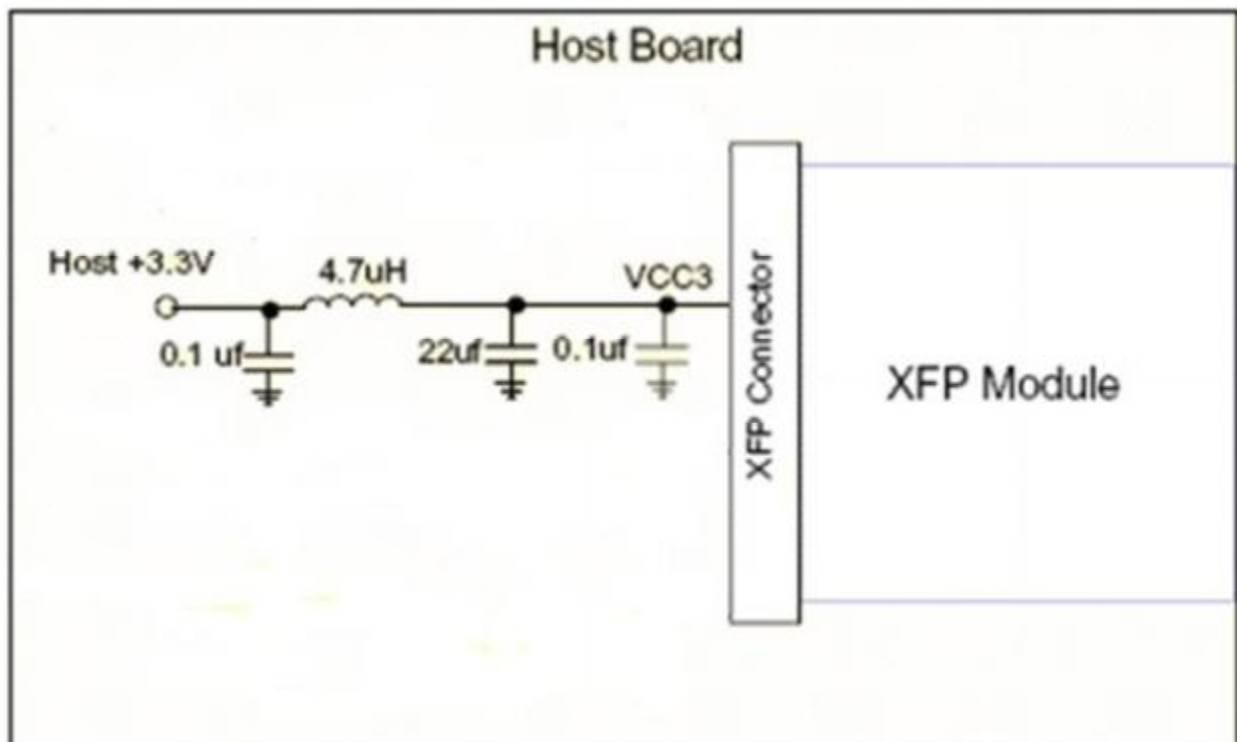
Note1. Module ground pins GND are isolated from the module case and chassis ground within the module.

Note2. It shall be pulled up with 4.7K-10Kohms to a voltage between 3.15V and 3.45V on the host board.

Block Diagram



Typical Application Circuit For Power Supply



Regulatory Compliance

| Feature | Test | Method |
|--|---|---|
| Electrostatic Discharge (ESD) to the Electrical Pins | MIL-STD-883E Method 3015.7 | Class 1(>1000V for SFI pins, >2000Vfor other pins.) |
| Electrostatic Discharge (ESD) Immunity | IEC61000-4-2 | Class 2(>4.0kV) |
| Electromagnetic Interference (EMI) | CISPR22 ITE Class B FCC Class B CENELEC EN55022 VCCI Class 1 | Comply with standard |
| Immunity | IEC61000-4-3 | Comply with standard |
| Eye Safety | FDA 21CFR 1040.10 and 1040.11 EN (IEC) 60825-1,2 | Compatible with Class I laser Product |

Ordering information

| Part. No | Specifications | | | | | | | | |
|----------------|----------------|-------------|---------|----------|-----|-----------|-----------|------------|-----|
| | Pack | Rate (Gbps) | Tx (nm) | Po (dBm) | RX | Sen (dBm) | Temp (°C) | Reach (km) | DDM |
| XTE40-D0C-31T1 | XFP | 9.95~11.3 | 1310 | 0~5 | APD | <-18 | 0~70 | 40 | Y |