

Features

- Transceiver unit with independent
 - 1310nm MQW FP Laser diode transmitter
 - InGaAs PIN photodiode receiver
- +5V Signal power supply, PECL interface logic level
- Qualified to meet the intent of Bellcore reliability practices
- Operate data rates from 5Mb/s to 200 Mb/s (NRZ)
- Duplex SC receptacle and plastic package
- Intermediate and long reach SONET/SDH OC-3.STM-1 compliant

Application

- SONET/SDH
- ATM

General

The optical transceiver is a high performance, cost effective module for serial optical data communication application. It is designed to provide a SONET/SDH compliant link for OC-3/STM-1 short, intermediate and long reach links.

Transmitter Section

Transmitter is designed for single mode fiber and operates at a nominal wavelength of 1310nm. The transmitter module uses a MQW FP laser diode and full IEC825 and CDRH class 1 eye safety. It contains APC function, temperature compensation circuit and PECL logic interface, as shown in figure 1.

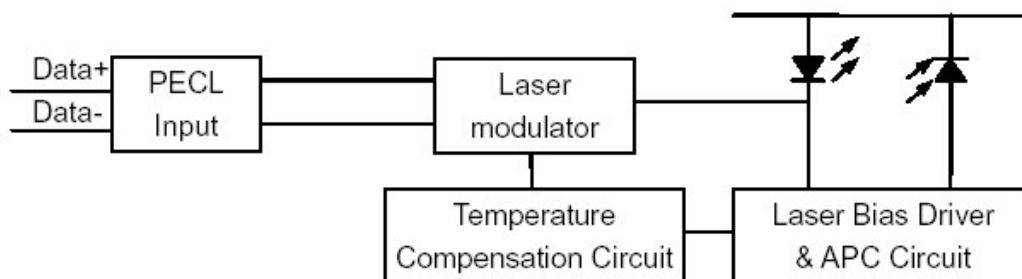


Figure 1. Transmitter Block Diagram

Receiver Section

The receiver section uses a hermetic packaged front and receiver (InGaAs PIN and preamplifier). The postamplifier is ac coupled to preamplifier through a capacitor and a low pass filter, as shown in figure 2. The capacitor and LPF are enough to pass the signal from 5Mb/s to 200Mb/s without significant distortion or performance penalty. The LPF limits the preamplifier bandwidth to improve receiver sensitivity. Figure 2 shows the receiver section, which proves PECL logic differential outputs and a signal detect output.

As the input optical is decreased, Signal Detect will switch from high to low (deassert point). As the input optical power is increased from very low levels, Signal Detect will switch back from low to high (assert point). The assert level will be at least 0.5dB higher than the de-assert level.

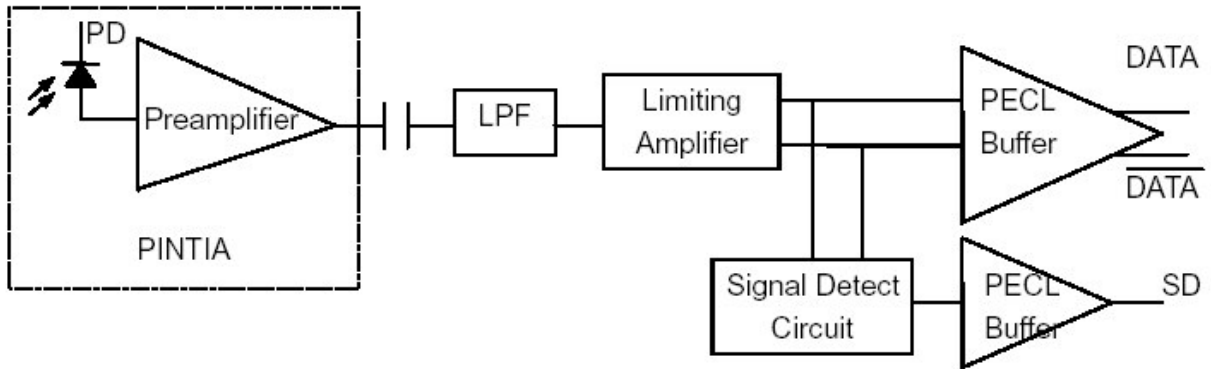


Figure 2. Receiver Block Diagram

Performance Specifications

Table1. Absolute Maximum Ratings

| Parameter | Symbol | Min | Max | Unit |
|---------------------------------|-----------------|-----|--------|------|
| Storage Temperature | Tst | -40 | +85 | °C |
| Input Voltage | - | GND | Vcc | V |
| Power Supply Voltage | Vcc-Vee | 0 | +6 | V |
| Lead Soldering Temperature/Time | - | - | 240/10 | °C/S |
| Operating Temperature | SSTR3131-15-113 | 0 | +70 | °C |
| | SSTR3131-15-213 | -40 | +85 | |

Note: Stress in excess of maximum absolute ratings can cause permanent damage to the module

Table2. Operating Environment

| Parameter | Symbol | Min | Max | Unit |
|-------------------------------|-----------------|-------|-------|------|
| Power Supply Voltage | Vcc | +4.75 | +5.25 | V |
| Ambient Operating Temperature | SSTR3131-15-113 | 0 | +70 | °C |
| | SSTR3131-15-213 | -40 | +85 | |

Table 3. Optical and Electrical Characteristics

| Parameter | Symbol | Min | Typ | Max | Unit | Note | |
|------------------------------|--|-----------------|------|------|------|------|---|
| Transmitter | | | | | | | |
| Center Wavelength | λ_p | SSTR3131-15-113 | 1261 | 1310 | 1360 | nm | |
| | | SSTR3131-15-213 | 1280 | 1310 | 1360 | | |
| Spectral Width | $\Delta\lambda$ (RMS) | SSTR3131-15-113 | - | - | 7.7 | nm | |
| | | SSTR3131-15-213 | | | +3 | | |
| Average Optical Output Power | Po | SSTR3131-15-113 | -15 | - | -8 | dBm | |
| | | SSTR3131-15-213 | -5 | | 0 | | |
| Extinction Ratio | EXT | SSTR3131-15-113 | 8.2 | - | - | dB | |
| | | SSTR3131-15-213 | 10 | | | | |
| Power Supply Current | Icc | - | 70 | 180 | mA | 1 | |
| Output Eye | Compliant with Bellcore TR-NWT-000253 and ITU recommendation G.957 | | | | | | |
| Data Input | PECL | | | | | | |
| Receiver | | | | | | | |
| Parameter | Symbol | Min | Typ | Max | Unit | Note | |
| Sensitivity | Pr | - | -36 | -34 | dBm | 2 | |
| Maximum input power | Ps | SSTR3131-15-113 | -6 | - | - | dBm | 2 |
| | | SSTR3131-15-213 | -3 | 0 | | | |
| Signal Detect Assert Level | Pa(SD L-H) | -50 | - | - | dBm | | |
| Signal Detect Deassert Level | Pd(SD H-L) | - | - | -36 | dBm | | |
| Signal Detect Hysteresis | | - | 3 | - | dB | | |
| Operating Current | Icc | - | 80 | 100 | mA | 1 | |
| Data Outputs | PECL | | | | | | |
| Alarm Output | PECL | | | | | | |

PECL Input Pins SD, TD+ and TD-

| Parameter | Symbol | Min | Typ | Max | Unit | Note |
|--------------------|-----------------|------------|-----|------------|------|------|
| Input HIGH voltage | V _{IH} | VCC - 1100 | - | VCC - 740 | mV | 3 |
| Input LOW voltage | V _{IL} | VCC - 2000 | - | VCC - 1580 | mV | 3 |

PECL Output Pins SD, RD+ and RD-

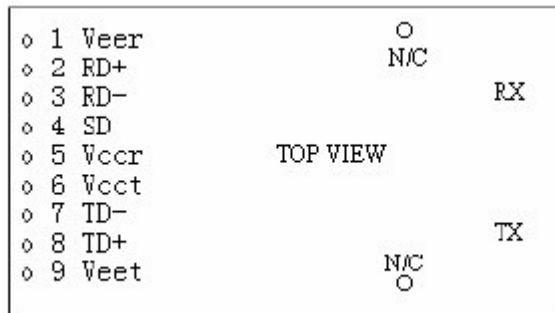
| Parameter | Symbol | Min | Typ | Max | Unit | Note |
|---------------------------|-----------------|------------|-----|------------|------|------|
| LOW-level output voltage | V _{OL} | VCC - 1840 | - | VCC - 1600 | mV | 3 |
| HIGH-level output voltage | V _{OH} | VCC - 1100 | - | VCC - 900 | mV | 3 |

Note :

1. The current excludes the output load current.
2. Minimum Sensitivity and saturation levels for a $2^{23} - 1$ PRBS with 72 ones and 72 zeros inserted (ITU recommendation G958)
3. RL=50R connected to a level of Vcc -2V.

Pin Definitions

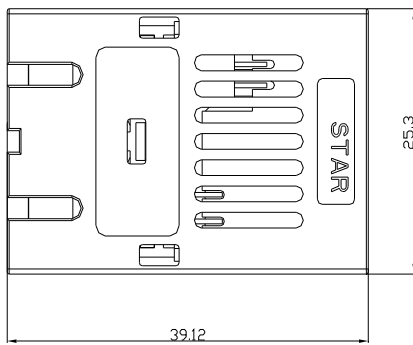
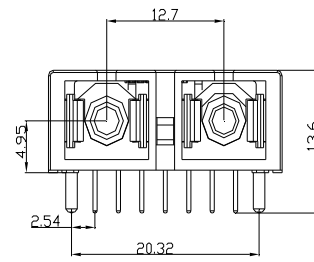
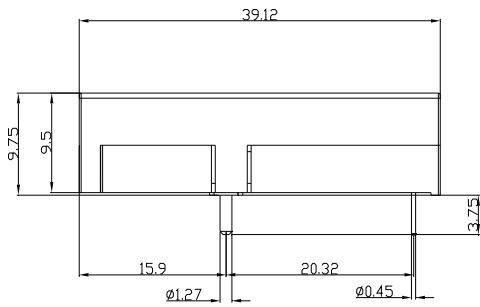
Pin Out Diagram



Pin Description

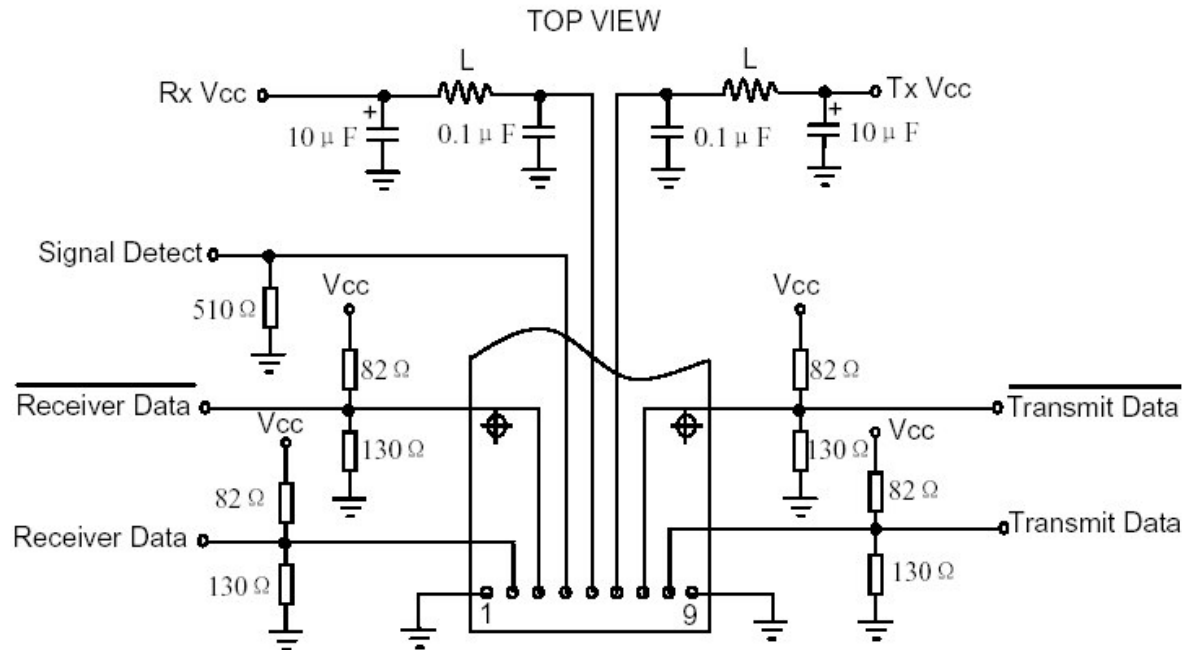
| Pin# | Pin Name | Logic Level | Description | |
|------|----------------|-----------------------|---|--|
| N/C | Mounting Studs | | The two pins are not connected to the transceiver internal circuit. | |
| 1 | VEER | RX Ground | N/C | Directly connect this pin to receiver signal ground plane. |
| 2 | RD+ | RX Output Data | PECL | |
| 3 | RD- | RX Output Invert Data | PECL | |
| 4 | SD | RX Signal Detect | PECL | Normal Operation: Logic "1" Out put , represents that optical is present at receiver input. Fault Condition: Logic "0" output |
| 5 | VCCR | RX Power Supply | N/C | Provide +5V DC through the recommended power supply filter circuit. Place the filter circuit as close as possible to the VCCR pin. |
| 6 | VCCT | TX Power Supply | N/C | Provide +5V DC through the recommended power supply filter circuit. Place the filter circuit as close as possible to the VCCT pin |
| 7 | TD- | TX Invert Data Input | PECL | |
| 8 | TD+ | TX Data Input | PECL | |
| 9 | VEET | TX Ground | N/C | Directly connect this pin to transmitter signal ground plane. |

Package Information



Unit: mm

Recommended Circuit



Obtaining Document

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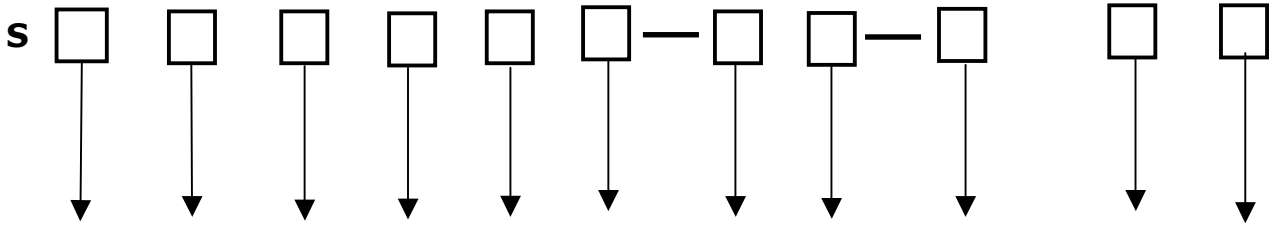
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Ordering Information



| | | | | | | | | | |
|-----------------|-----------------|----------|--------|-----------|-------------|--------------|-----------|---------|---------|
| Classification: | Wavelength: | LD Type: | Data | Pack | Output | Power: | Operate | Signal | 3:SC/PC |
| S: General | Type: 3:1310 nm | 1: FP | rate : | 1:1*9(TR) | Power: 5:5V | Temperature: | 1: 0~70°C | Detect: | |
| Information | TR | | 3:155M | | -15~-8 | 2:-45~+85°C | | 1: PECL | |
| | | | | | (dBm) | | | Signal/ | |
| | | | | | | | | PECL | |
| | | | | | | | | Alarm | |

| Part number | Product Information |
|-----------------|------------------------------|
| SSTR3131-15-113 | 1310nm 155Mb/s 1*9 0~70°C |
| SSTR3131-15-213 | 1310nm 155Mb/s 1*9 -45~+85°C |