

Features

- Transceiver unit with independent
 - 1310nm DFB Laser diode transmitter
 - InGaAs PIN photodiode receiver
- Duplex SC receptacle and plastic package
- +3.3V Signal power supply, PECL interface logic level
- Operate data rates from 5Mb/s to 1270Mb/s (NRZ)
- Compliant with specifications for IEEE 802.3z/Gbabit Ethernet and SONET OC-24
- Wave solderable and washable with process plug inserted

Application

- SONET OC-24
- ATM
- IEEE 802.3z/Gibabit Ethernet

General

The optical transceiver is a high performance, cost effective module for serial optical data communication applications. It is designed to provide a SONET/IEEE 802.3z/SONET compliant link for OC-24/Gigabit Ethernet 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 DFB 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.

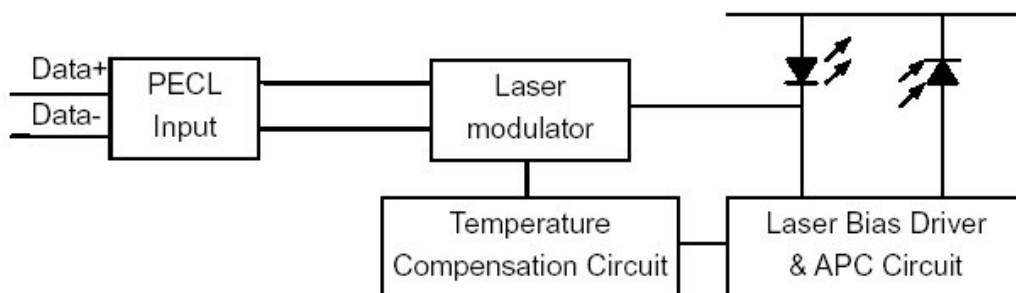


Figure1. Transmitter Block Diagram

Receiver Section

The receiver section uses a hermetic packaged front end 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 1270Mb/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 0.5 dB higher than the de-assert level.

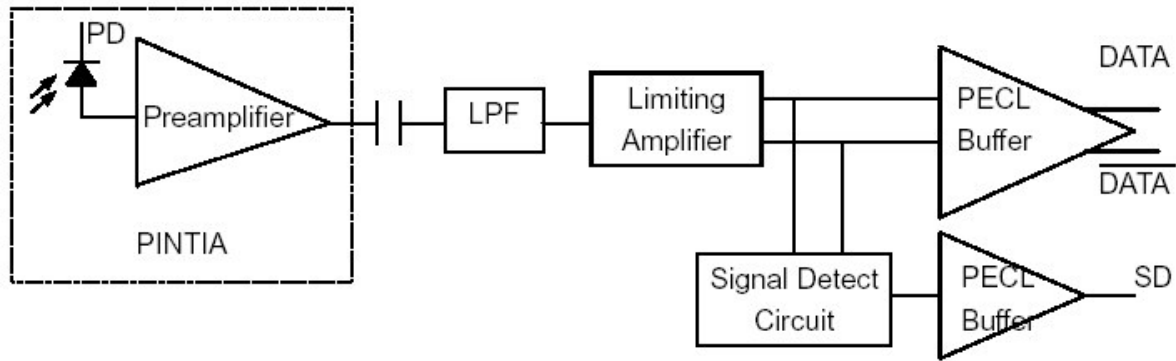


Figure 2. Receiver Block Diagram

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 | +3.6 | V | |
| Lead Soldering Temperature/Time | - | - | 240/10 | °C/S | |
| Operating Temperature | To | SSTR3251-23-113 | 0 | +70 | °C |
| | | SSTR3251-23-213 | -40 | +85 | |

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

Tabel2. Operating Environment

| Parameter | Symbol | Min | Max | Unit | |
|-------------------------------|--------|-----------------|------|------|----|
| Power Supply Voltage | Vcc | +3.1 | +3.5 | V | |
| Ambient Operating Temperature | Tc | SSTR3251-23-113 | 0 | +70 | °C |
| | | SSTR3251-23-213 | -40 | +85 | |

Table 3. Optical and Electrical Characteristics

| Parameter | Symbol | Min | Typ | Max | Unit | Note |
|------------------------------|---|------|------|------|------|------------------|
| Transmitter | | | | | | |
| Center Wavelength | λ_p | 1280 | 1310 | 1335 | nm | - |
| Spectral Width | $\Delta\lambda(-20dB)$ | - | - | 1 | nm | - |
| Average Optical Output Power | P_o | -3 | - | +2 | dBm | - |
| Extinction Ratio | EXT | 10 | - | - | Db | - |
| Power Supply Current | Icc | - | 70 | 180 | mA | 1 |
| Data Inputs | PECL | | | | | |
| Output Eye | Compliant with Bellcore TR-NWT-000253 and ITU Recommendation G957 | | | | | |
| Receiver | | | | | | |
| Parameter | Symbol | Min | Typ | Max | Unit | Note |
| Sensitivity | P_r | - | -25 | -23 | dBm | 2 |
| Maximum input power | P_s | -3 | - | - | dBm | 2 |
| Signal Detect Assert Level | - | -35 | - | - | dBm | Low Level: Alarm |
| Signal Detect Deassert Level | - | - | - | -23 | dBm | |
| Signal Detect Hysteresis | - | - | 3 | - | dB | |
| Power Supply 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 - 1165 | - | VCC - 880 | mV | 3 |
| Input LOW voltage | V_{IL} | VCC - 1810 | - | VCC - 1475 | mV | 3 |

PECL Output Pins SD, RD+ and RD-

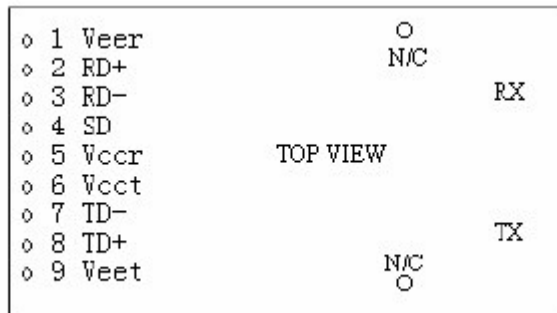
| Parameter | Symbol | Min | Typ | Max | Unit | Note |
|---------------------------|----------|------------|-----|------------|------|------|
| LOW-level output voltage | V_{oL} | VCC - 1840 | - | VCC - 1600 | mV | 3 |
| HIGH-level output voltage | V_{oH} | VCC - 1100 | - | VCC - 900 | mV | 3 |

Note :

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

Pin Definitions

Pin Diagram

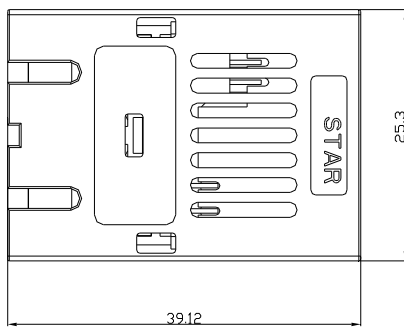
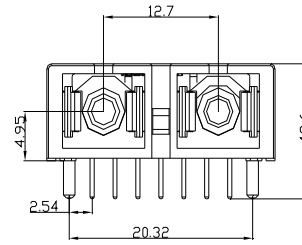
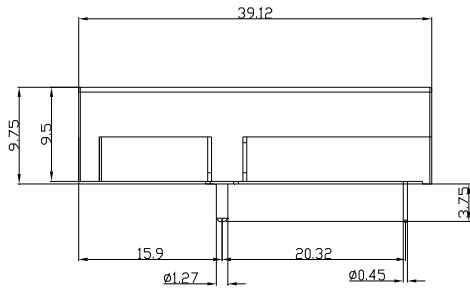


Pin Description

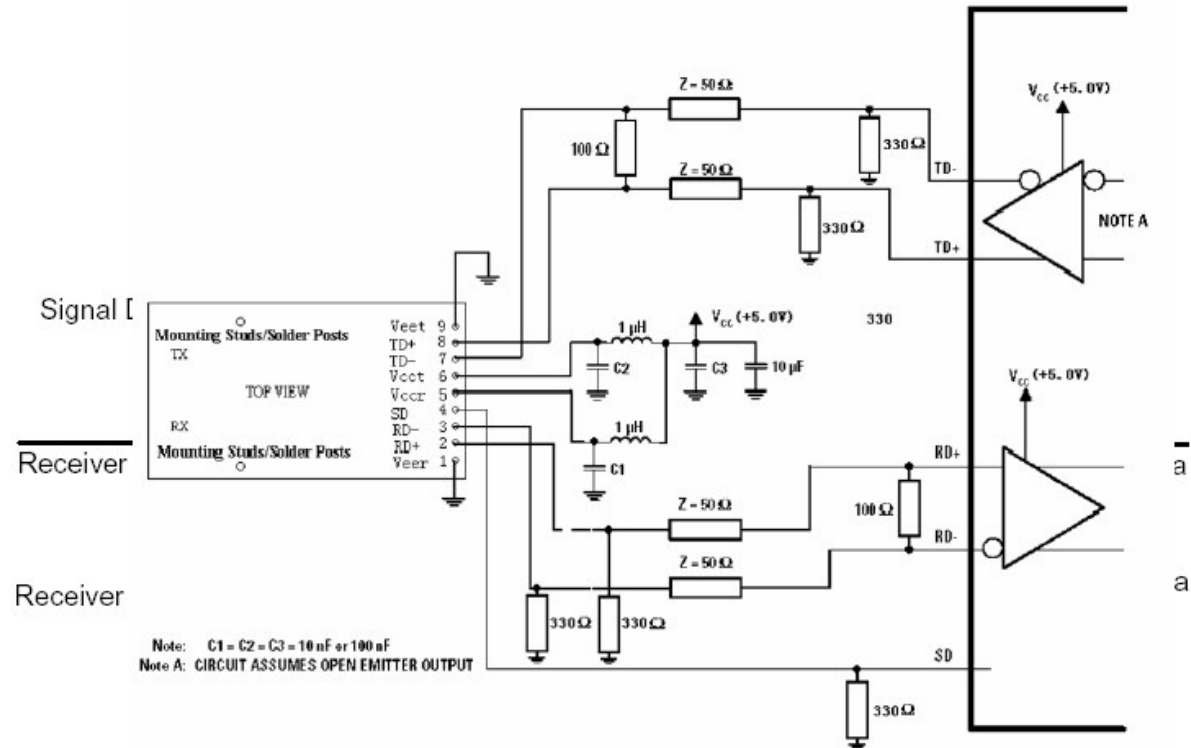
| Pin# | Pin Name | | Logic Level | Description |
|------|----------------|-------------------------|-------------|--|
| N/C | Mounting Studs | | - | The two pins are not connected to the transceiver internal circuit. |
| 1 | VEER | RX Ground | N/C | Directly connect this pin to receiver signal ground plane. |
| 2 | RD+ | RX Output Data | PECL | |
| 3 | RD- | RX Output Inverted Data | PECL | |
| 4 | SD | RX Signal Detect | PECL | Normal Operation: Logic "1" output, 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

Please visit our website:

[Http://www.staropto.com](http://www.staropto.com)

Copyright Star Opto Co., Ltd. 2005

All Rights Reserved.

All information contained in this document is subject to change without notice. The products described in this document are NOT intended for use in implantation or other life support applications where malfunction may result in injury or death to persons.

The information contained in this document dose not affect or change Star’s product specifications or warranties. Nothing in this document shall operate as an express or implied license or indemnity under the intellectual property rights of Star or third parties. All information contained in this document was obtained in the specific environments, and is presented as an illustration. The results obtained in other operating environment may vary.

The information contained in this document is provided on an “as is” basis. In no event will Star be liable for the damages arising directly from any use of the information contained in this document.

