

## Features

- Transceiver unit with independent
  - 1310nm MQW FP Laser diode transmitter
  - InGaAs PIN photodiode receiver
- Operates data rates from 5Mb/s to 1300Mb/s(NRZ)
- Qualified to meet the intent of Bellcore reliability practices
- Duplex SC receptacle and plastic package
- +5V Signal power supply, PECL interface logic level
- Compliant with specification for IEEE 802.3z/Gigabit Ethernet and SONET OC-24
- Short, intermediate and long reach compliant
- SONET OC-24 and IEEE 802.3z Gigabit Ethernet applications.
- ISO9001 Certified

## Application

- SONET
- ATM
- 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 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 LVPECL logic interface, as shown in figure 1.

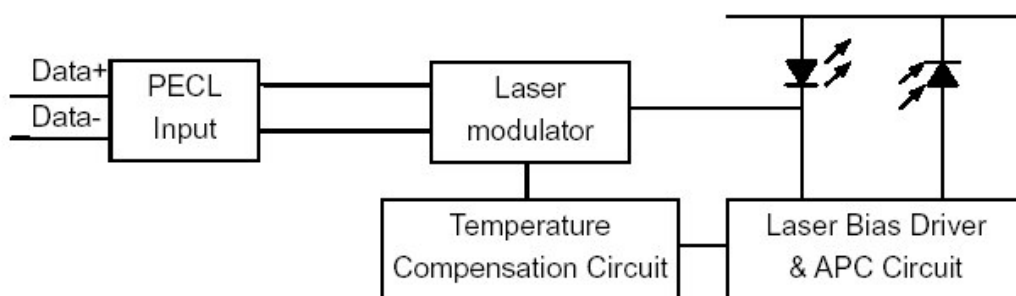
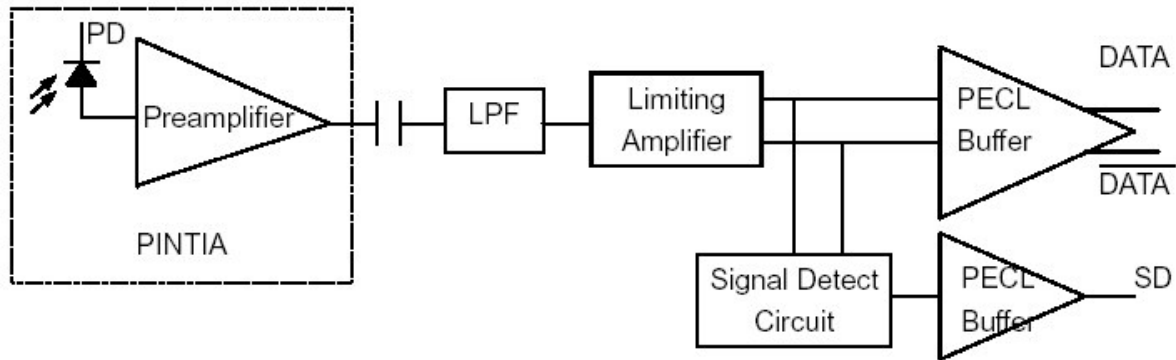


Figure1. Transmitter Block Diagram

## 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 1300Mb/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 LVPECL 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	SSTR3151-15-113	0	+70	°C
		SSTR3151-15-213	-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	Tc	SSTR3151-15-113	0	+70	°C
		SSTR3151-15-213	-40	+85	

**Table 3. Optical and Electrical Characteristics**

Parameter	Symbol	Min	Typ	Max	Unit	Note	
<b>Transmitter</b>							
Center Wavelength	$\lambda_p$	SSTR3151-15-113	1270	1310	1355	nm	-
		SSTR3151-15-213	1280	1310	1335		
Spectral Width	$\Delta\lambda$ (R M S)	SSTR3151-15-113	-	-	4	nm	-
		SSTR3151-15-213	-	-	2.5		
Average Optical Output Power	$P_o$	SSTR3151-15-113	-10	-	-3	dBm	-
		SSTR3151-15-213	-3		+2		
Extinction Ratio	EXT	8.2	-	-	Db	-	
Power Supply Current	Icc	-	70	180	mA	1	
Output Eye	Compliant with Bellcore TR-NWT-000253 and ITU recommendation G957						
Data Inputs	PECL						
<b>Receiver</b>							
Parameter	Symbol	Min	Typ	Max	Unit	Note	
Sensitivity	Pr	-	-25	-23	dBm	2	
Maximum input power	Ps	-3	-	-	dBm	2	
Signal Detect Assert Level	-	-35	-	-	dBm	Low Level: Alarm	
Signal Detect Deassert Level	-	-	-	-23	dBm		
Signal Detect Hysteresis	-	-	1.5	-	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-**

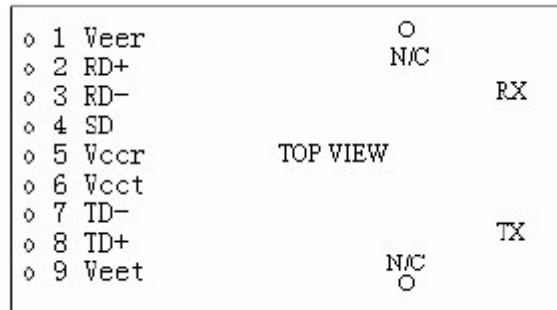
Parameter	Symbol	Min	Typ	Max	Unit	Note
LOW-level output voltage	$V_{OL}$	VCC - 1840	-	VCC - 1600	mV	3
HIGH-level output voltage	$V_{OH}$	VCC - 1100	-	VCC - 900	mV	3

**Note :**

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.  $R_L=50$  R (Ohms) connected to a level of VCC-2V

## Pin Definitions

### Pin Diagram

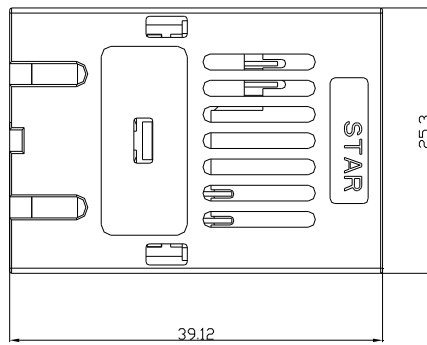
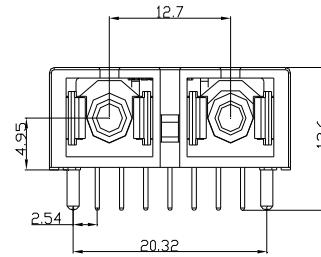
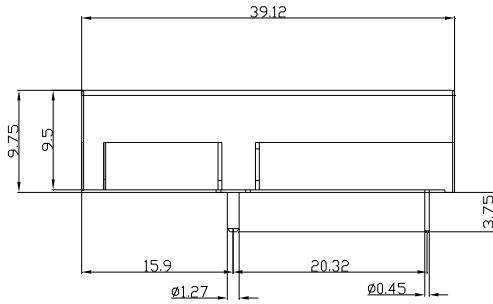


### Pin Description

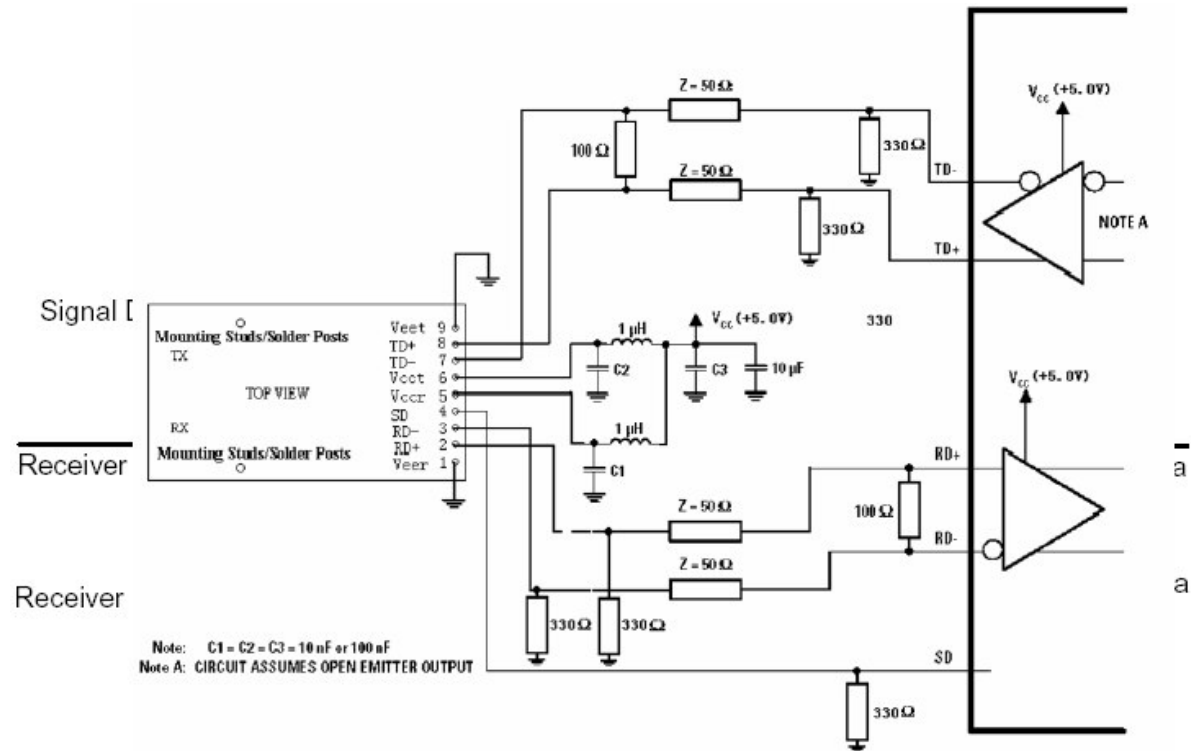
Pin#	Pin Name		Logic Level	Description
N/C	Mounting Studs		-	The two pins are not connected to the transceiver internal circuit.
1	VEER	RX Ground	N/C	Directly connect this pin to receiver signal ground plane.
2	RD+	RX Output Data	PECL	
3	RD-	RX Output Inverted Data	PECL	
4	SD	RX Signal Detect	PECL	Normal 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 +3.3V 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 +3.3V 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**

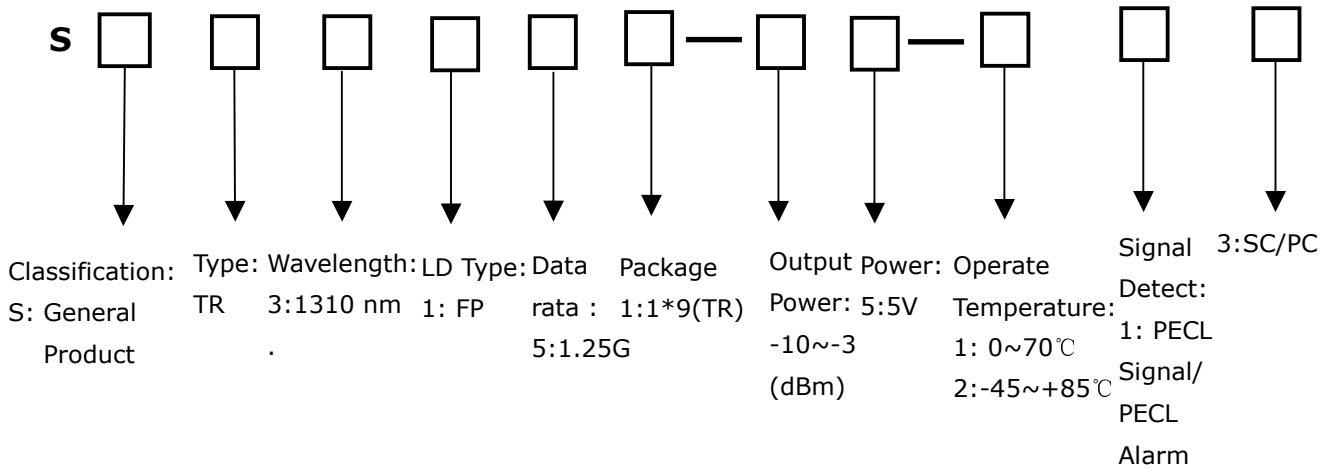
All Rights Reserved.

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.

**Ordering Information**



Part number	Product Information
SSTR3151-15-113	1310nm 1.25Gb/s 1×9 0~70°C
SSTR3151-15-213	1310nm 1.25Gb/s 1×9 -45~+85°C