

Description

General

The SC1315-15APO transceiver from SANOC is the industry standard 1×9 package with SC duplex fiber optical connector for serial optical data communications applications specify of SONET OC-3 / SDH STM-1 / IEEE 802.3u. This modules is designed for single mode fiber and operates at a nominal wavelength of 1310nm with cost effective and high performance



Transmitter Section

The transmitter consists of a high-performance 1310 nm Fabry-Perot (FP) laser in the optical subassembly (OSA), which is housed within a metal package. In addition, this component is also class 1 laser compliant with according to International Safety Standard IEC-825

Receiver Section

The receiver contain of an InGaAs PIN photodiode coupled to a high sensitivity transimpedance amplifier (TIA) in an OSA. This OSA combination is mated to a quantized IC that provides the post amplification, signal detection, and PECL logic high state output when a usable input optical signal level is detected.

Features

- Single + 3.3 V power Supply
- PECL Differential Inputs and Output
- Compliant with specification for ITU-T G.957
- Industry Standard 1x 9 Footprint, SC Duplex connector
- 1310 nm Single Mode Transceiver for SONET OC-3 / SDH STM-1 / IEEE 802.3u
- Class 1 Laser International Safety Standard IEC 825 Compliant
- Temperature Ranges: 0°C to +70°C
- RoHS Compliant

Applications

- ATM switch, SONET OC-3 / SDH STM-1 (S1.1)
- Bridges/Routers/intelligent hub and concentrators
- Fast Ethernet

Performance Specifications

Absolute Maximum Ratings					
Parameter	Symbol	Min	Typ	Max	Unit
Supply Voltage	V _{CC}	0	-	5	V
Storage Temperature	T _S	-40	-	85	°C
Operating Temperature	T _{OP}	0	-	70	°C
Lead Soldering Limits	T _{SOLD}	-	-	260/10	°C/sec
General Specifications					
Parameter	Symbol	Min	Typ	Max	Units
Data Rate	B	-	155	-	Mbps
Supported Link Length on 9/125μm SMF	L	-	15	-	Km

Optical and Electrical Characteristics

Transmitter Electrical Characteristics					
Parameter	Symbol	Min	Typ	Max	Unit
Supply Voltage	V_{CC}	3.15	3.3	3.45	V
Supply Current	I_{CC}	-	-	160	mA
Data Differential Input Voltage	$V_{in, pp}$	300	-	1600	mV
Disable Input Voltage	$V_{IL} - V_{CC}$	-1.81	-	-1.48	V
Enable Input Voltage	$V_{IH} - V_{CC}$	-1.16	-	-0.88	V
Transmitter Optical Characteristics					
Parameter	Symbol	Min	Typ	Max	Unit
Output Optical Power	P_O	-15	-	-8	dBm
Center Wavelength	λ_C	1280	1310	1340	nm
Spectral Width (RMS)	$\Delta\lambda$	-	2	-	nm
Optical Rise Time (10%-90%)	t_r	-	-	2	ns
Optical Fall Time (10%-90%)	t_f	-	-	2	ns
Extinction Ratio	ER	8.2	-	-	dB

Receiver Electrical Characteristics					
Parameter	Symbol	Min	Typ	Max	Unit
Supply Voltage	V_{CC}	3.15	3.3	3.45	V
Supply Current	I_{CC}	-	-	100	mA
Data Differential Output Voltage	$V_{out, pp}$	300	-	1000	mV
Data Output Rise Time (10%-90%)	t_r	-	-	2	ns
Data Output Fall Time (10%-90%)	t_f	-	-	2	ns
Receiver Optical Characteristics					
Parameter	Symbol	Min	Typ	Max	Unit
Maximum Receiver Power	P_{in}	-3	-	-	dBm
Receiver Sensitivity	P_S	-	-34	-	dBm
Optical Center Wavelength	λ_C	1100	-	1600	nm
Signal Detect-Asserted	P_A	-	-	-34	dBm avg.
Signal Detect-Deasserted	P_D	-46	-	-	dBm avg.
Signal Detect-Hysteresis	$P_A - P_D$	0.5	-	-	dB

Recommended Circuit Schematic

Data Input/Output :

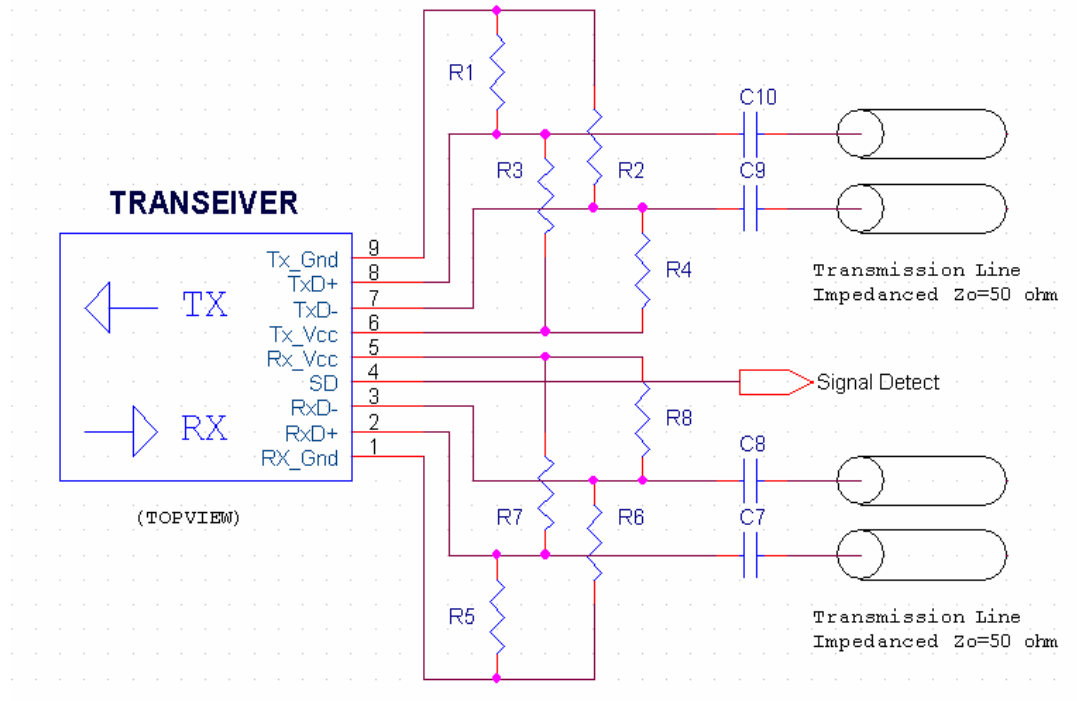


Figure 1

$R3/R4/R7/R8 = 130 \Omega$,

$R1/R2/R5/R6 = 82 \Omega$

$C7/C8/C9/C10 = 0.1\mu F$

Signal Detect:

The PECL output option of the signal line may be terminated a 50 ohm resistor to a Vcc-2 volt source or the Thevenin equivalent in order to generate the correct voltage outputs.

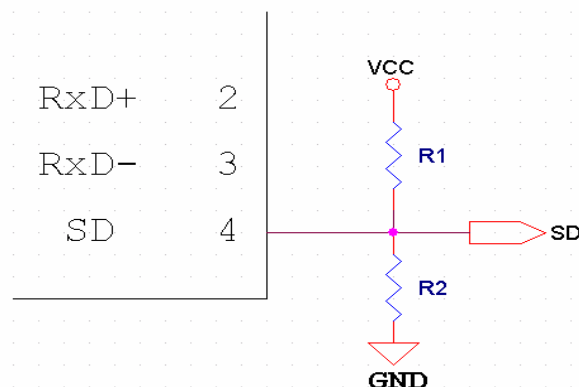


Figure 2

Power Coupling:

The L1 and L2 can use Ferrite Bead (BLM11A102S) or inductor (4.7uH)

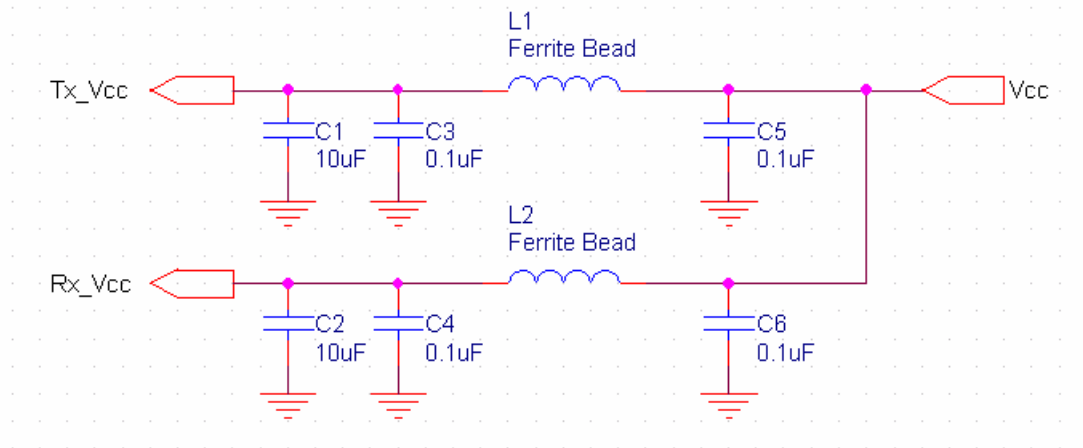
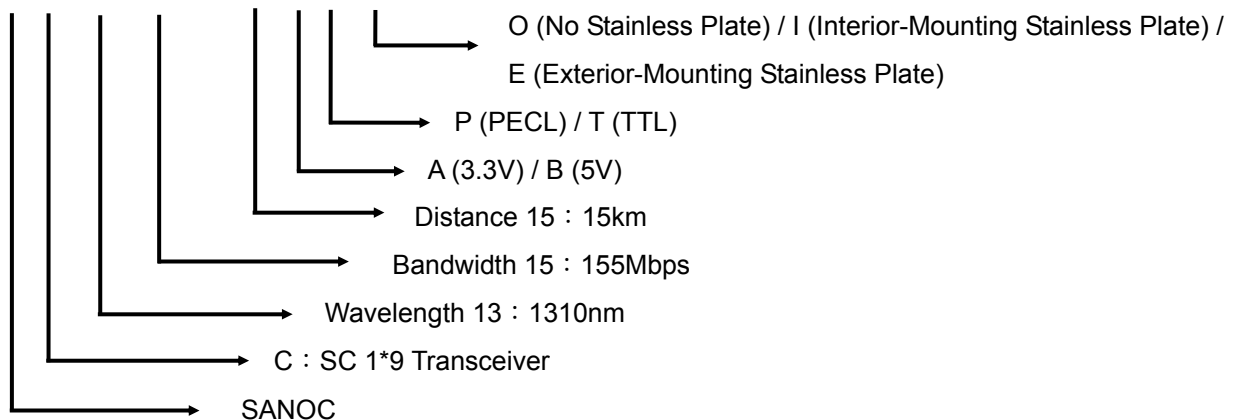
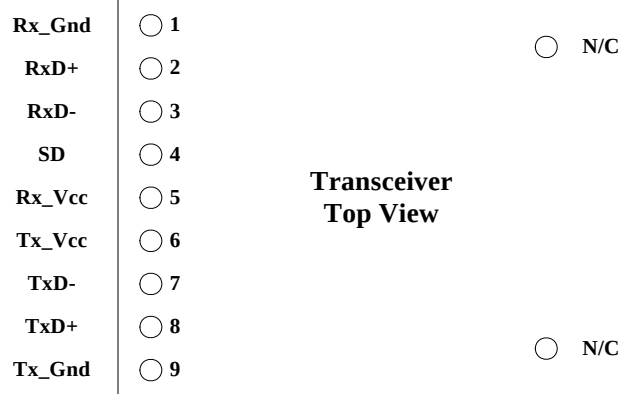


Figure 3

Ordering Information

S C 13 15 – 15 A P O

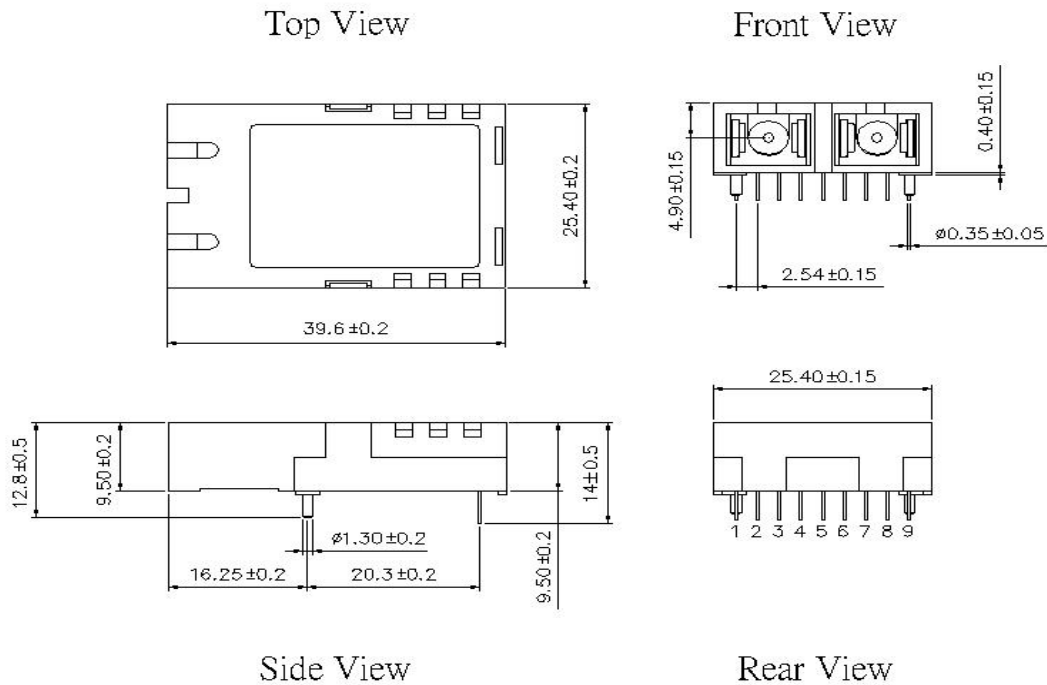

Pin Assignment


Pin Description

Pin	Symbol	Function Description
1	Rx_Gnd	Receiver Signal Ground Directly connect this pin to receiver signal ground plane.
2	RxD+	Receiver Data Out RD+ is used to PECL output. Terminal this high-speed differential PECL output with standard PECL techniques at the follow-on device. Reference Figure 1.
3	RxD-	Receiver Data Out Bar RD- is used to PECL output. Terminal this high-speed differential PECL output with standard PECL techniques at the follow-on device. Reference Figure 1.
4	SD	Signal Detect Normal optical input levels to the receiver result in a logic "1" output, Voh, asserted. Low input optical levels to the receiver result in a fault condition indicated by a logic "0" output Vol, deasserted. There are several types for output interface, PECL, CMOS and TTL. Reference Figure 2.
5	Rx_Vcc	Receiver Power Supply Provide (+5/+3.3V) via the recommended receiver power supply filter. Reference Figure 3.
6	Tx_Vcc	Transmitter Power Supply Provide (+5/+3.3V) via the recommended transmitter power supply filter. Reference Figure 3.
7	TxD-	Transmitter Data In Bar TxD- is used to PECL input. Terminate this high-speed differential PECL input with standard PECL techniques at transmitter input pin. Reference Figure 1.
8	TxD+	Transmitter Data In TxD+ is used to PECL input. Terminate this high-speed differential PECL input with standard PECL techniques at transmitter input pin. Reference Figure 1.
9	Tx_Gnd	Transmitter Signal Ground Directly connect this pin to transmitter signal ground plane.

Package Outline Drawing

Dimension (unit:mm)



RoHS Reference

Material Classify	Substance	Reference	Standard	Analysis	Equipment
Heavy Metals	Lead (Pb)/ Lead Compounds	2002/95/EC	< 1000 ppm	US EPA 3050B	ICP-AES
	Cadmium (Cd)/ Cadmium Compounds	2002/95/EC	< 100 ppm	EN1122-2001 91/338/EEC	ICP-AES
	Mercury (Hg) / Mercury Compounds	2002/95/EC	< 1000 ppm	US EPA 3052	ICP-AES
	Hexavalent-Chromium(Cr6+)Compounds	2002/95/EC	< 1000 ppm	US EPA 3060A & 7196A	UV-VIS
Brominated Organic Compounds	PolyBrominated Biphenyls (PBB)	2002/95/EC	< 1000 ppm	US EPA 3540 & 3550	GC/MS
	PolyBromo Diphenyl Ethers(PBDE)	2002/95/EC	< 1000 ppm	US EPA 3540 & 3550	GC/MS

Qualification Information

Heading	Test	Conditions	Sample Size	Reference
Mechanical & Physical	Mechanical Shock	5 times/axis 500G , 1.0ms	11	MIL-STD-883 Method 2002
	Vibration	20G , 20Hz - 2000HZ 4min/cycle ,4cycles/axis	11	MIL-STD-883 Method 2007
	Thermal Shock	Delta T=100℃	11	MIL-STD-883 Method 2003
	Solderability	-	11	MIL-STD-883 Method 2007
	Fiber Pull	1Kg ; 3times ; 5sec	11	Bellcore 983
Endurance	Accelerated Aging	85℃ , 5000hrs	25	Bellcore 983 Section 5.18
	High Temperature Storage	85℃ , 2000hrs	11	Bellcore 983
	Low Temperature Storage	-40℃ , 2000hrs	11	Bellcore 983
	Temperature Cycling	500 cycles.	11	Bellcore 983 Section 5.20
	Cyclic Moisture Resistance	10 cycles	11	Bellcore 983 Section 5.23
	Damp Heat	40℃ , 95% RH , 1344hrs	11	MIL-STD-202 Method 103
Special Test	Internal Moisture	<5000ppm water vapor	11	MIL-STD-883 Method 1018
	Flammability	-	-	TR357 Sec.4.4.2.5
	ESD Threshold	-	6	Bellcore 983 Section 5.22