

Description

General

The SD1315-20CPFI transceiver from SANOC is the industry standard 1x9 package with FC duplex fiber optical connector for serial optical data communications applications specify of ATM, Fast Ethernet and FDDI. This module 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

- Power Supply with +3.3V or +5V
- PECL Differential Input and Output
- Industry Standard 1x9 Footprint
- For Single Mode Applications
- FC Duplex Connector
- Class 1 Laser International Safety Standard IEC 825 Compliant
- Temperature Ranges: 0°C to +70°C
- Linking Distance Up to 20 km.
- RoHS Compliant

Applications

- ATM switch, multimode fiber media converters, multimode fiber backbone links
- Bridges/Routers/intelligent hub and concentrators
- Fast Ethernet

Performance Specifications

Absolute Maximum Ratings					
Parameter	Symbol	Min	Typ	Max	Unit
Supply Voltage	V _{CC}	0	-	6	V
Storage Temperature	T _S	-40	-	85	°C
Operating Temperature(Case)	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	-	20	-	Km

Optical and Electrical Characteristics

Transmitter Electrical Characteristics					
Parameter	Symbol	Min	Typ	Max	Unit
Supply Voltage	V_{CC}	3.15	-	5.25	V
Supply Current	I_{CC}	-	-	200	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	-	-5	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	8.5	-	-	dB

Receiver Electrical Characteristics					
Parameter	Symbol	Min	Typ	Max	Unit
Supply Voltage	V_{CC}	3.15	-	5.25	V
Supply Current	I_{CC}	-	-	120	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 :

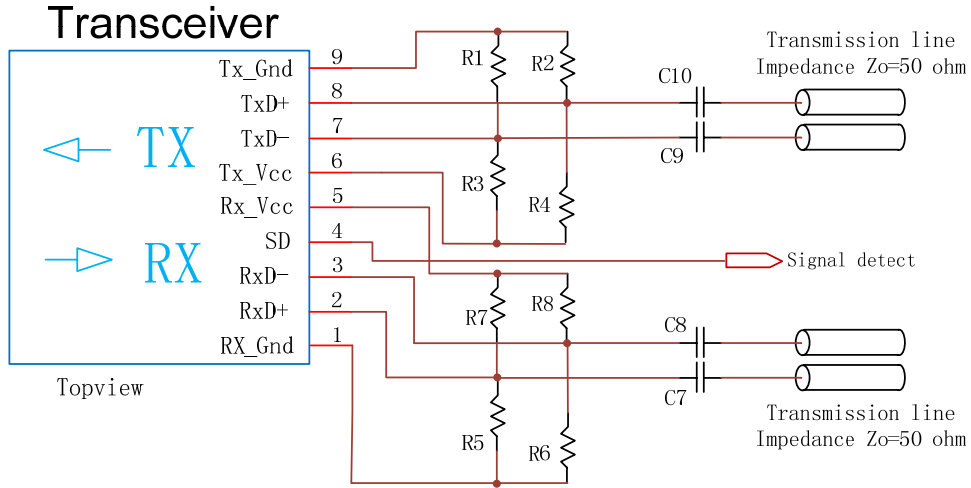


Figure 1

For 3.3V : R3/R4/R7/R8 = 130 Ω, R1/R2/R5/R6 = 82 Ω

For 5V : R3/R4/R7/R8 = 82 Ω, R1/R2/R5/R6 = 130 Ω

C7/C8/C9/C10 = 0.1uF

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.

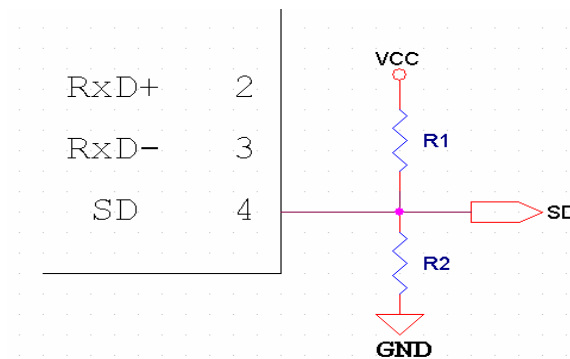


Figure 2

Power Coupling:

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

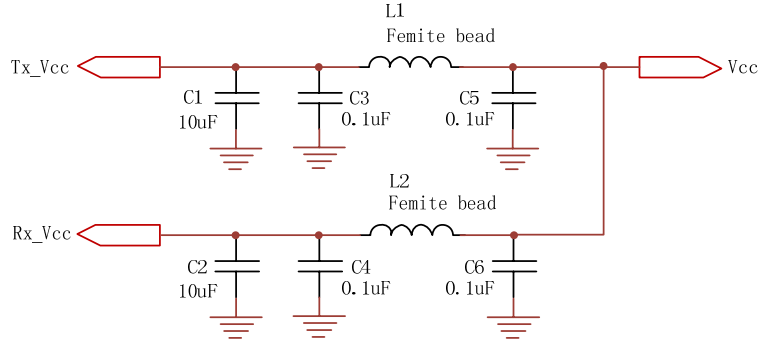
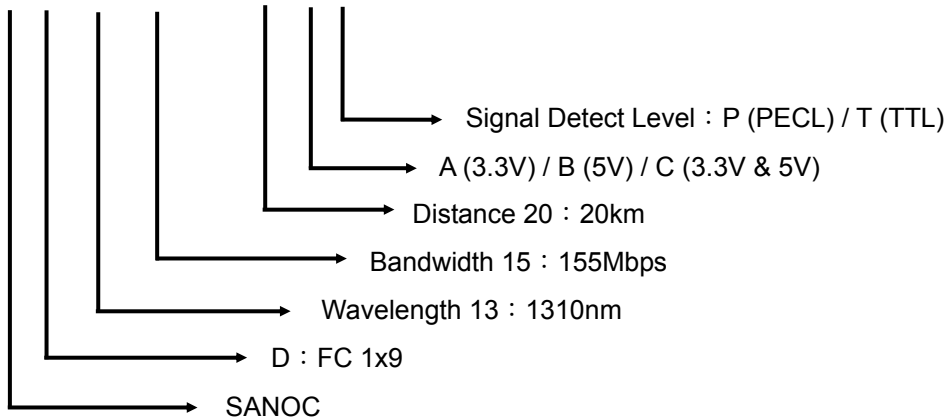


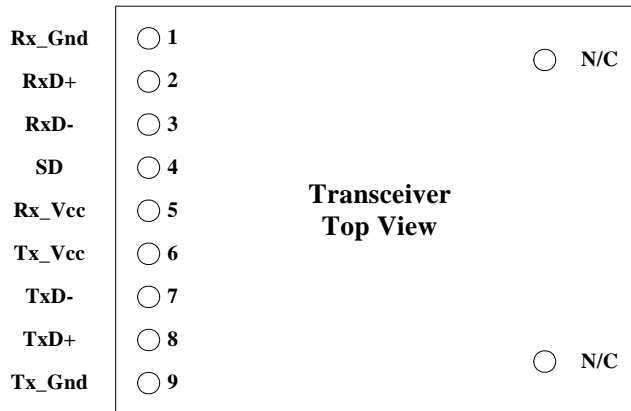
Figure 3

Ordering Information

S D 13 15 – 20 C P F I



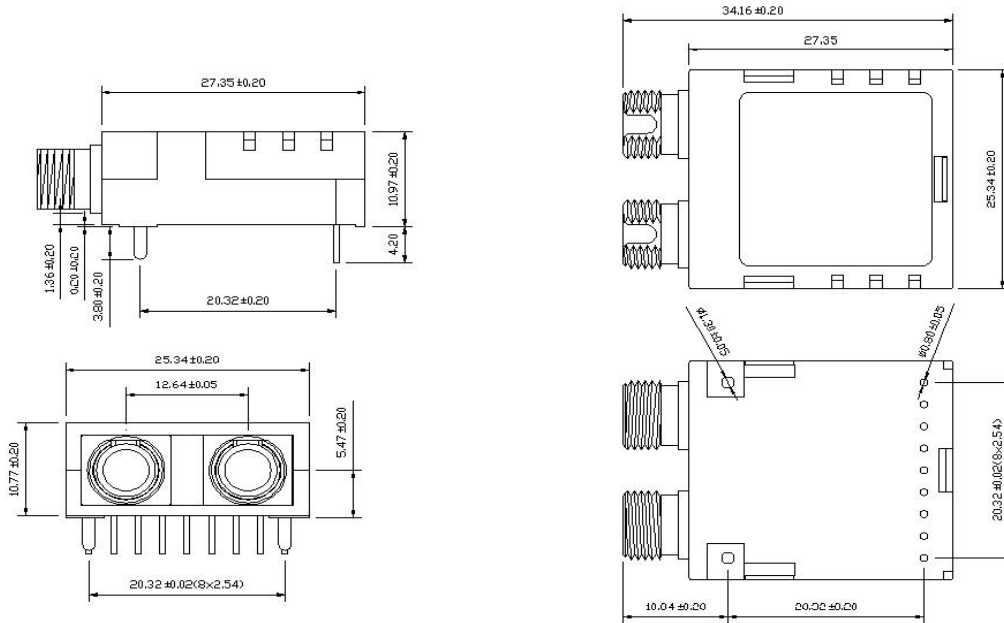
Pin Assignment



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. Terminate 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. Terminate 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°C	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°C , 5000hrs	25	Bellcore 983 Section 5.18
	High Temperature Storage	85°C , 2000hrs	11	Bellcore 983
	Low Temperature Storage	-40°C , 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°C , 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