

10G SFP+ ZR 1550nm 80KM LC SMF Fiber Optic Transceiver



Applications

- 10G Base-ZR/ZW
- 10G SONET/SDH, OTU2/2e

Features

- 1550nm cooled EML, APD Receiver
- Up to 80km on 9/125um SMF
- SFP+ MSA package with duplex LC connector
- SFI High Speed Electrical Interface
- Very low EMI and excellent ESD protection
- +3.3V single power supply
- 2-wire interface for management and diagnostic monitor
- Power dissipation < 1.5W
- Case temperature range: Commercial: 0°C to +70°C
Industrial: -40°C to +85°C

STANDARD

- Compliant to SFP+ SFF-8431
- Compliant with SFF-8427
- Compliant with IEEE 802.3ae 10GBASE-ZR and 10GBASE-ZW
- Compliant with IEC 60825-1 Class 1 laser eye safe
- RoHS Compliant.

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Description

10G SFP+ ZR compatible SFP+ transceiver supports up to 80Km link lengths over SMF via an LC duplex connector. Digital diagnostics monitoring is available via a 2-wire serial interface, as specified in SFF-8472. Each SFP+ transceiver module is individually tested to be used on a series of Cisco switches, routers, servers, network interface card (NICs) etc. Featuring low power consumption, high speed, this 10G SFP+ transceiver is ideal for data center, enterprise wiring closet, service provider transport application, Radio & Baseband Unit, etc

Main product parameters

		Vendor Name	superlink
Wavelength	1550nm	Max Data Rate	11.3 Gbps
Max Cable Distance	80km	Connector type	Duplex LC
Fiber cable Type	SMF		
Transmitter Type	EML	Receiver Type	APD
Transmit Power	0~4 dBm	Receiver sensitivity	-23 ~-6 dBm
DDM	Supported	Operating Temp.	0°C to 70°C (32°F to 158°F)

Detailed product specifications

1 Absolute Maximum Ratings

Parameter	Symbol	Min.	Typical	Max.	Unit	Ref.
Maximum Supply Voltage	Vcc3	-0.5		4	V	
Storage Temperature	Ts	-40		85	°C	
Operating Relative Humidity	RH			88	%	
Case Operating Temperature	Tcase	-5		70	°C	
Receiver Damage Threshold		6			dBm	

2 Electrical Characteristics (Tcase= -5 to 70 °C, VCC3 = 3.13 to 3.47 Volts)

Parameter	Symbol	Min.	Typical	Max.	Unit	Ref.
Supply Voltage	Vcc3	3.13		3.47	V	
Supply Current	Icc			450	mA	
Module total power	P			1.5	W	1
Transmitter						
Input differential impedance	Rin		100		Ω	1
Differential data input swing	Vin,pp	360		1400	mV	
Transmit Disable Voltage	VD	2		Vcc3	V	
Transmit Enable Voltage	VEN	GND		GND+ 0.8	V	
Transmit Disable Assert Time				10	us	
Transmit Disable De-assert Time				2	ms	
Receiver						
Differential data output swing	Vout-pp	400	650	800	mV	2
Data output rise and fall time	Tr,Tf	30			ps	3
LOS Fault	Vlos-fault	2		Vcc-host	V	4
LOS Normal	Vlos-nor	GND		GND+0.8	V	4

Notes:

- 1.Connected directly to TX data input pins.
- 2.Input 100Ω differential termination.
- 3.These are unfiltered 20-80% values
- 4.LOS is an open collector output. Should be pulled-up with 4.7k Ω-10 k Ω on the host board.
Normal operation is logic 0, loss of signal is 1

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3 Optical Characteristics (Tcase = -5 to 70 °C, VCC3 = 3.13 to 3.45 Volts)

Parameter	Symbol	Min.	Typical	Max.	Unit	Ref.
Transmitter						
Average Optical Power	PAVE	-1		5		1
Optical Wavelength	λ	1530	1550	1565	nm	
Side-Mode Suppression ratio	SMSR	30			dB	
SMSR		30			dB	
Optical Extinction Ratio	ER	8.2			dB	
Transmitter and Dispersion Penalty	TDP			3	dB	
Average Launch power of OFF transmitter	POFF			-30	dBm	
Output Eye Mask	Compliant with IEEE 0802.3ae					
Receiver						
Receiver Sensitivity	RSSENS			-23	dBm	2
Input Saturation Power (Overload)	Psat	-6			dBm	
Wavelength Range	λ_C	1270		1610	nm	
LOS De-Assert	LOSD			-26	dBm	
LOS Assert	LOSA	-35			dBm	
LOS Hysteresis		0.5		5	dB	

- Notes:**
1.Average power figures are informative only, per IEEE 802.3ae.
2.Measured with conformance test signal for BER = 10^{-12} .@10.3125Gbps, PRBS=2³¹-1,NRZ

4 Pin Descriptions

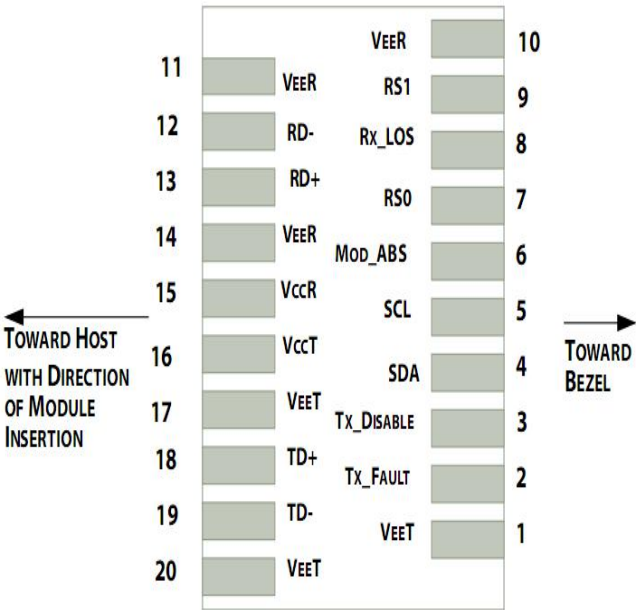


Diagram of Host Board Connector Block Pin Numbers and Name

10G SFP+ ZR 80KM Transceiver

5 Transceiver Block Diagram

Pin	Symbol	Name/Description	NOTE
1	V _{EET}	Transmitter Ground	1
2	Tx_FAULT	Transmitter Fault.	2
3	Tx_DISABLE	Transmitter Disable. Laser output disabled on high or open.	3
4	SDA	2-wire Serial Interface Data Line	2
5	SCL	2-wire Serial Interface Clock Line	2
6	MOD_ABS	Module Absent. Grounded within the module	4
7	RS0	No connection required	
8	RX_LOS	Loss of Signal indication. Logic 0 indicates normal operation.	2
9	RS1	No connection required	
10	V _{EER}	Receiver Ground	1
11	V _{EER}	Receiver Ground	1
12	RD-	Receiver Inverted DATA out. AC Coupled	
13	RD+	Receiver DATA out. AC Coupled	
14	V _{EER}	Receiver Ground	1
15	V _{CCR}	Receiver Power Supply	
16	V _{CCT}	Transmitter Power Supply	
17	V _{EET}	Transmitter Ground	1
18	TD+	Transmitter DATA in. AC Coupled	
19	TD-	Transmitter Inverted DATA in. AC Coupled.	
20	V _{EET}	Transmitter Ground	1

Note:

1. Module circuit ground is isolated from module chassis ground within the module.
2. Should be pulled up with 4.7k – 10k ohms on host board to a voltage between 3.13V and 3.6V.
3. Tx_Disable is an input contact with a 4.7 kΩ to 10 kΩ pull-up to VccT inside the module
4. Mod_ABS is connected to VeeT or VeeR in the SFP+ module. The host may pull this contact up to Vcc_Host with a resistor in the range 4.7 kΩ to 10 kΩ. Mod_ABS is asserted "High" when the SFP+ module is physically absent from a host slot.

6 Digital Diagnostic Functions

As defined by the SFP MSA, Fibrate's SFP+ transceivers provide digital diagnostic functions via a 2-wire serial interface, which allows real-time access to the following operating parameters:

- Transceiver temperature
- Laser bias current
- Transmitted optical power
- Received optical power
- Transceiver supply voltage

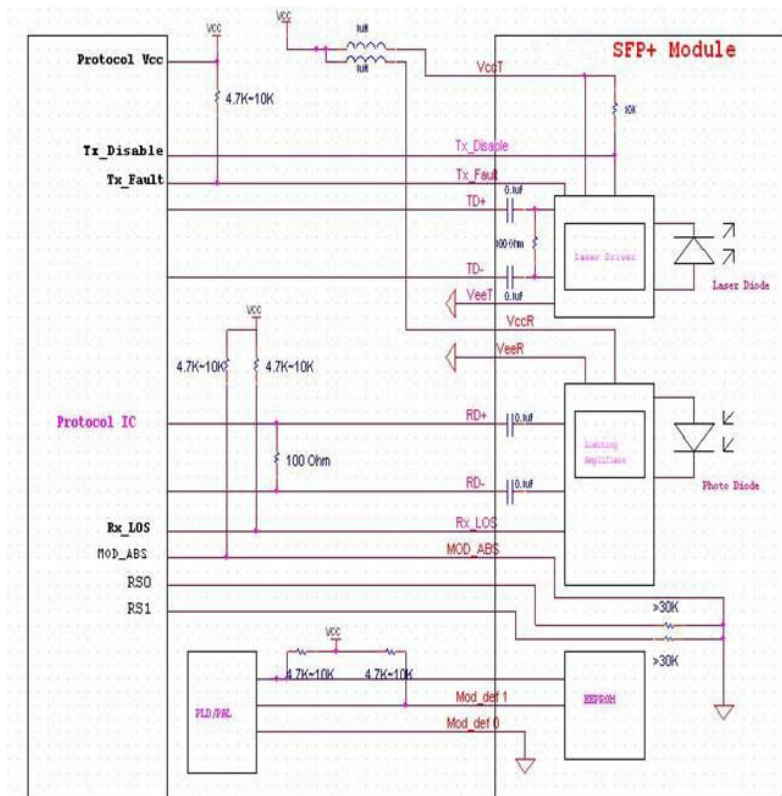
It also provides a sophisticated system of alarm and warning flags, which may be used to alert end-users when particular operating parameters are outside of a factory-set normal range.

The SFP MSA defines a 256-byte memory map in EEPROM that is accessible over a 2-wire serial interface at the 8 bit address 1010000X (A0h). The digital diagnostic monitoring interface makes use of the 8 bit address 1010001X (A2h), so the originally defined serial ID memory map remains unchanged.

The operating and diagnostics information is monitored and reported by a Digital Diagnostics Transceiver Controller (DDTC) inside the transceiver, which is accessed through a 2-wire serial interface. The memories are organized as a series of 8-bit data words that can be addressed individually or sequentially.

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7 Host - Transceiver Interface Block Diagram



8 Outline Dimensions

