

SFP-10G-ZR-LEG
CISCO 10GBASE-SR SFP+ SMF
1550NM 80KM REACH LC DOM



SFP-10G-ZR-LEG

10Gbps SFP+ Transceiver

Features

- Duplex LC connector
- Support hot-pluggable
- Metal with lower EMI
- Excellent ESD protection
- RoHS compliant and Lead Free
- Compliant with IEEE 802.3ae
- ITU-T G.959, G.691 compliant
- Temperature-stabilized EML transmitter and APD ROSA
- Up to 80KM for single mode fiber
- GR-253-CORE compliant
- Compliant with SFP+ MSA: SFF-8431 Rev.4.1
- Digital diagnostic compatible with SFF-847 Rev11.0
- Single 3.3V power supply and low power dissipation <2.5W



Applications

- 10GBase-ZR/ZW 10G Ethernet
- 10G Fibre Channel
- SONET OC-192/SDH STM-64
- Other optical link

Product Description

Legrand's SFP-10G-ZR-LEG Small Form Factor Pluggable (SFP) transceiver is compatible with the Small Form Factor Pluggable Multi-Sourcing Agreement (MSA). SFP+ transceivers are high performance, cost effective modules supporting dual data-rate of 10Gbps and support distance up to 80km with SMF.

Legrand's SFP+ transceivers are RoHS compliant and lead-free

Regulatory Compliance

- ESD to the Electrical PINs: compatible with MIL-STD-883E Method 3015.7.
- ESD to the Duplex LC Receptacle: compatible with IEC 61000-4-2
- Immunity compatible with IEC 61000-4-3.
- EMI compatible with FCC Part 15 Class B EN55022 Class B (CISPR 22B) VCCI Class B.
- Laser Eye Safety compatible with FDA 21CFR 1040.10 and 1040.11 EN60950, EN (IEC) 60825-1,2.
- RoHs compliant with 2002/95/EC 4.1&4.2 2005/747/EC.

Pin Descriptions

Pin	Symbol	Name/Descriptions	Ref.
1	VeeT	Transmitter Ground (Common with Receiver Ground).	1
2	TX Fault	Transmitter Fault.	2
3	TX Disable	Transmitter Disable. Laser output disabled on high or open. LVTT-I.	3
4	SDA	2-Wire Serial Interface Data Line (Same as MOD-DEF2 in INF-8074i). LVTTTL-I/O.	
5	SCL	2-Wire Serial Interface Data Line (Same as MOD-DEF2 in INF-8074i). LVTTTL-I.	
6	MOD_ABS	Module Absent, Connect to VeeT or VeeR in Module.	4
7	RS0	Rate Select 0, optionally controls SFP+ module receiver LVTTTL-I.	5
8	LOS	Loss of Signal indication. Logic 0 indicates normal operation. LVTTTL-O.	2
9	RS1	Rate Select 1, optionally controls SFP+ module transmitter. LVTTTL-I.	5
10	VeeR	Receiver Ground (Common with Transmitter Ground).	1
11	VeeR	Receiver Ground (Common with Transmitter Ground).	1
12	RD-	Receiver Inverted DATA out. AC Coupled. CML-O.	
13	RD+	Receiver Non-inverted DATA out. AC Coupled. CML-O.	
14	VeeR	Receiver Ground (Common with Transmitter Ground).	1
15	VccR	Receiver Power Supply.	
16	VccT	Transmitter Power Supply.	
17	VeeT	Transmitter Ground (Common with Receiver Ground).	1
18	TD+	Transmitter Non-Inverted DATA in. AC Coupled. CML-I.	
19	TD-	Transmitter Inverted DATA in. AC Coupled. CML-O.	
20	VeeT	Transmitter Ground (Common with Receiver Ground).	1

Notes:

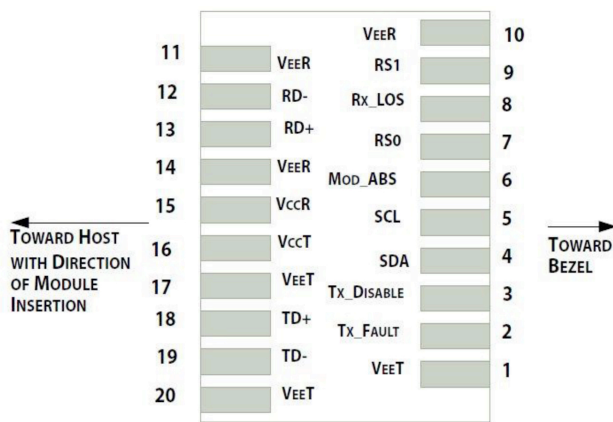
1. The module signal ground contacts, VeeR and VeeT, should be isolated from the module case.
2. This contact is an open collector/drain output and should be pulled up to the Vcc_Host with resistor in the range 4.7KΩ to 10KΩ. Pull ups can be connected to one or several power supplies, however the host board design shall ensure that no module contract has voltage exceeding module VccT/R +0.5.V.
3. Tx_Disable is an input contact with a 4.7KΩ to 10KΩ pull-up resistor to VccT inside module.
4. Mod_ABS is connected to VeeT or VeeR in the SFP+ module. The host may pull the contract up to Vcc_Host with a resistor in the range from 4.7KΩ to 10KΩ. Mod_ABS is asserted "High" when the SFP+ module is physically absent from a host slot.
5. RS0 and RS1 are module inputs and are pulled low to VeeT with >30K resistors in the module. RS0 optionally selects the optical receive signaling rate coverage. RS1 optionally selects the optical transmit signaling rate coverage.

These contacts can also be used for RS0 and RS1 if implementing SFF8079. See SFF8079 for details. RS1 is commonly connected to VeeT or VeeR in the classic SFP modules. The host needs to ensure that it will not be damaged if this contact is connected to VeeT or VeeR in the module.

The SFP+ module provides two inputs RS0 and RS1 that can optionally be used for rate selection. RS0 controls the receive path signaling rate compatibility, and RS1 controls the transmit path signaling rate compatibility. The host and module may choose to use either, both, or none of these functions. Because contact 9 in the classic SFP INF-8074i is connected to VeeR, and SFP+ host utilizing RS1 must provide short circuit protection.

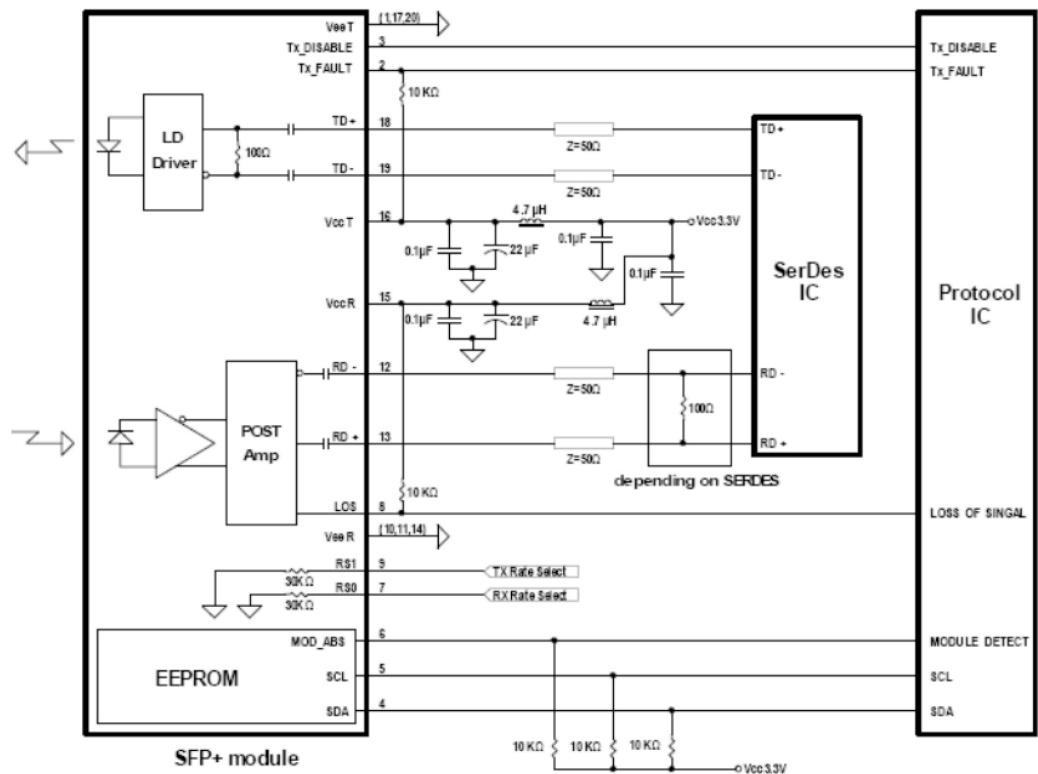
This rate select functionality can also be controlled by software as defined by SFF-8472. Optionally the rate select methods of Part 2 SFF-8079 may be used instead of the method described here by setting the management declaration bit (A0h byte 93 bit 2) to 1, see SFF-8472.

Parameter	State	Conditions
RS0	Low	Rx signally rate less than or equal to 4.25GBd.
	High	Rx signally rate great than 4.25GBd.
RS1	Low	Tx signally rate less than or equal to 4.25GBd.
	High	Tx signally rate great than 4.25GBd.



Pin-out of connector Block on Host board

Recommend Circuit Schematic



Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Unit
Storage Temperature	TS	-40	85	°C
Supply Voltage	Vcc	-0.5	4.0	V
Operating Humidity	RH	5	95	%

Recommended Operating Conditions

Parameter	Symbol	Min.	Typ.	Max.	Unit
Power Supply Voltage	Vcc	3.13	3.30	3.47	V
Power Supply Current	Icc			750	mA
Case Operating Temperature – Commercial	Tc	0		70	°C
Case Operating Temperature – Industrial	Ti	-40		85	°C
9/125μm SMF	Lmax			80	km

Electrical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Transmitter						
Input differential impedance	Rin	85	100	115	Ω	1
Differential data input swing	Vin, pp	120	600	850	mV	
TX Disable-High		2.0		Vcc+0.3	V	
TX Disable-Low		Vee		Vee+0.8	V	
TX Fault-High		2.0		Vcc+0.3	V	
TX Fault-Low		Vee		Vee+0.8	V	
Receiver						
Single ended data output swing	Vout, pp	350	400	700	mV	
LOS-High		2.0		Vcc+0.3	V	
LOS-Low		Vee		Vee+0.8	V	

Notes:

1. AC coupled.

Optical Characteristics

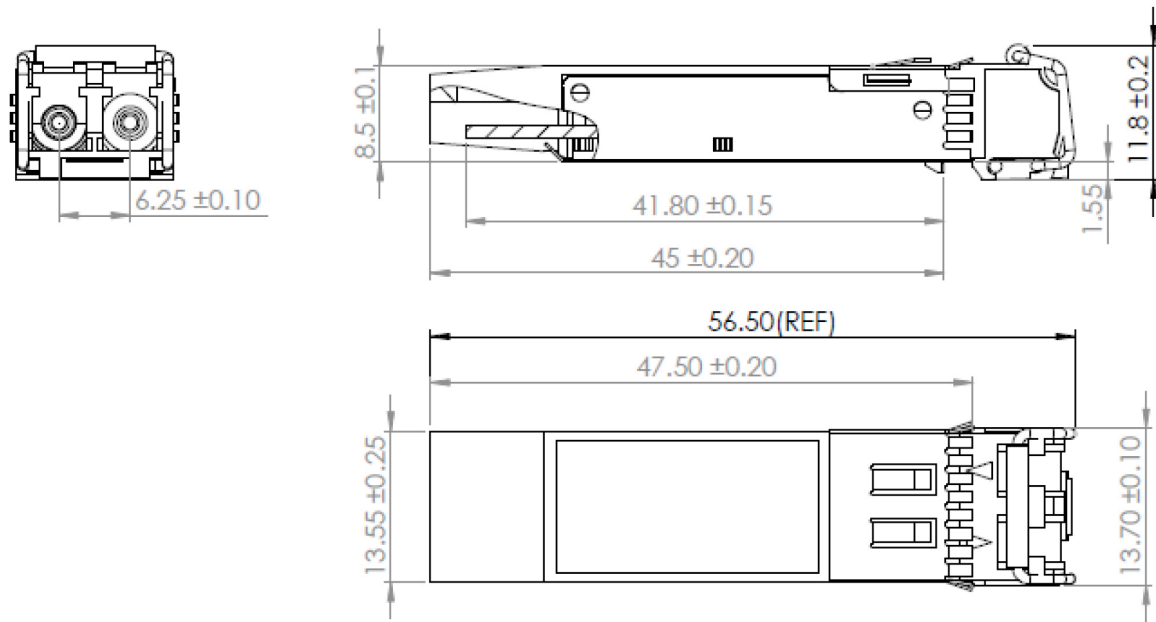
Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Transmitter						
Output Opt. Power	PO	0		4	dBm	
Optical Extinction Ratio	ER	9			dB	
Side Mode Suppression Ratio	SMSR	30			dB	
Center Wavelength Spacing			100		GHZ	
Optical Wavelength	λ	1528	1550	1565	nm	
Generation 1(20KHZ-80MHZ)				0.3	Ulp-p	1
Generation Jitter 2(4MHZ-80MHZ)				0.1	Ulp-p	1
Optical Eye Mask 1		ITU-T G.691				1
Optical Eye Mask 2		IEEE802.3ae				2
Receiver						
Overload	PO	-8			dBm	
Optical Center Wavelength	λC	1270		1600	nm	
LOS De-Assert	LOSD			-28	dBm	

LOS Assert	LOSA	-34			dBm	
LOS Hysteresis		0.5		5	dB	
Receiver Sensitivity @non-FEC rate	Pmin1			-24	dBm	3
Receiver Sensitivity @ FEC rate	Pmin2			-27	dBm	3

Notes:

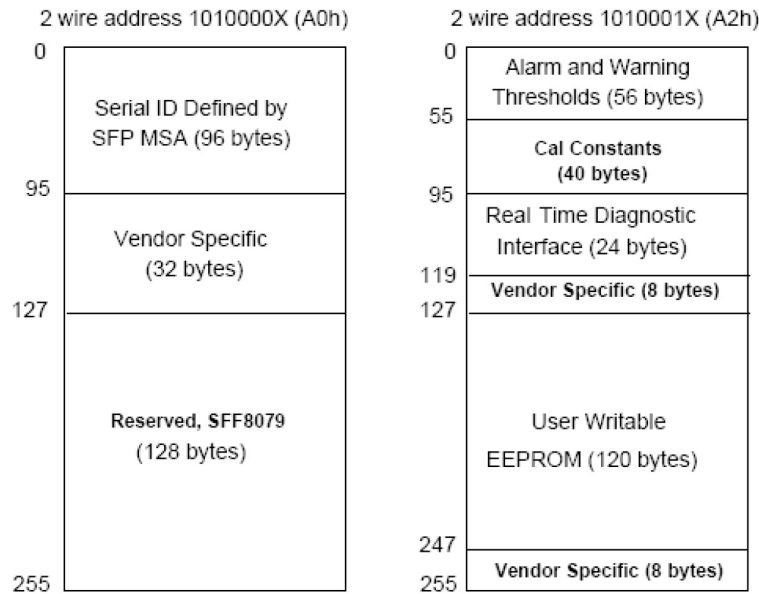
1. Measured at 9.9532GBs, PRBS³¹-1, NRZ.
2. Measured at 10.3125GBs, Non-framed PRBS²³¹-1, NRZ.
3. Non-FEC rate refers 9.9/10.3/10.5 Gbs, and FEC rate refers 10.7/11.1/11.3 Gbs, BER of 1E-12 for non-FEC rate, and 1E-4 for FEC rate.

Mechanical Specifications



EEPROM Information

EEPROM memory map specific data field description is as below:



Digital Diagnostic Monitoring Interface

The digital diagnostic monitoring interface also defines another 256-byte memory map in EEPROM, which makes use of the 8 bi address 1010001X (A2h). The monitoring specification of this product is described in this table.

Parameter	Range	Accuracy	Calibration
Temperature	0°C to 70°C (C)	±3°C	Internal
Voltage	2.97V to 3.63V	±3%	Internal
Bias Current	0mA to 100mA	±10%	Internal
TX Power	0dBm to 4dBm	±2dB	Internal
RX Power	-24dBm to -8dBm	±2dB	Internal



Data Communications

125 Eugene O'Neill Drive
New London, CT 06320
800.934.5432
www.legrand.us

570 Applewood Crescent
Vaughan, Ontario L4K 4B4
905.738.9195
www.legrand.ca