10Gb/s SFP+ LR 1310nm10km Optical Transceiver

Features

- Up to 10km transmission distance
- Support Multi Rate 2.5-10.3125Gbps
- 1310nm DFB and PIN receiver
- SFI electrical interface
- 2-wire interface for integrated Digital Diagnostic monitoring
- SFP MSA package with duplex LC connector
- Hot pluggable
- Very low EMI and excellent ESD protection
- +3.3V power supply
- Power consumption less than 1.2W
- Operating case temperature: 0~+70°C

Applications

- High-speed storage area networks
- Computer cluster cross-connect
- Custom high-speed data pipes
- LTE optical repeater application

Compliance

- Compliant with IEEE 802.3ae-2002
- Compliant with MSA SFF-8472
- Compliant with MSA SFF-8431

Description

10Gb/s Enhanced Small Form Factor Pluggable SFP+ transceivers are designed for use in 10-Gigabit Ethernet links up to 10km over Single Mode fiber.They are compliant with SFF-8431,SFF-8432 and IEEE802.3ae 10GBASE-LR/LW,and 10G Fibre Channel 1200-SM-LL-LDigital diagnostics functions are available via a 2-wire serial interface.The transceiver is a"limiting module",i.e. ,item ploys a limiting receiver.Host board designers using an EDCPHYIC should follow the IC manufacturer's recommend settings for inter operating the host-board EDCPHY with a limiting receiver SFP+ module.The optical transceiver is compliant per the ROHS Directive 2011/65/EU.

Absolute Maximum Ratings

Table1-Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Unit
Storage Temperature	Ts	-40	+85	℃
Supply Voltage	Vcc	0	3.6	V
RX Input Average Power	Pmax	0	+3	dBm

Recommended Operating Conditions

Table2-Recommended Operating Conditions

Parameter	Symbol	Min.	Typical	Max.	Unit
Operating Case Temperature	TC	0	25	+70	℃
Power Supply Voltage	VCC	3.14	3.3	3.47	V
Power Supply Current	ICC			300	mA

Transmitter Operating Characteristic-Optical

Table3-Transmitter Operating Characteristic-Optical

Parameter	Symbol	Min.	Typical	Max.	Unit	Note
Side Mode Suppression Ratio	SMSR	30			dBm	
Output Center Wavelength	λ c	1260	1310	1355	nm	
Spectral Width（-20dB）	Pm			1	nm	
Laser Off Power	Poff			-30	dBm	
Relative Intensity Noise	Rin			-128	dB/Hz	
Average Optical Power	Pavg	-8.2		0.5	dBm	
Extinction Ratio	ER	3.5			dB	

Receiver Operating Characteristic-Optical

Table4-Receiver Operating Characteristic-Optical

Parameter	Symbol	Min.	Typical	Max.	Unit	Note
Rx Output Rise and Fall Time	Tr/Tf		34		ps	20% to 80%
Center Wavelength Range	λ r	1260	1310	1355	nm	
Overload	Rovl	0.5			dBm	
Sensitivity	Rsen			-14.4	dBm	
RX_LOS Assert Level	RLOSa	-26			dBm	
RX_LOS De-assert Level	RLOSd			-12	dBm	
RX_LOS Hysteresis	RLOSh	0.5			dB	

Digital Diagnostic Functions

The transceiver can be used in host systems that require either internally or externally calibrated digital diagnostics.

Table5-Digital diagnostic specification table

Parameter	Symbol	Min.	Max	Unit	Notes
Internally measured transceiver temperature	DMI_Temp	-3	3	℃	Over operating temp
Measured RX received average optical power	DMI_TX	-2	2	dB	
Measured TX output power	DMI_RX	-2	2	dB	-1dBm to -16dBm range
Internally measured transceiver supply voltage	DMI_VCC	-100	100	mV	Full operating range
Measured TX bias	DMI_Ibias	-10	10	%	

Pin Description

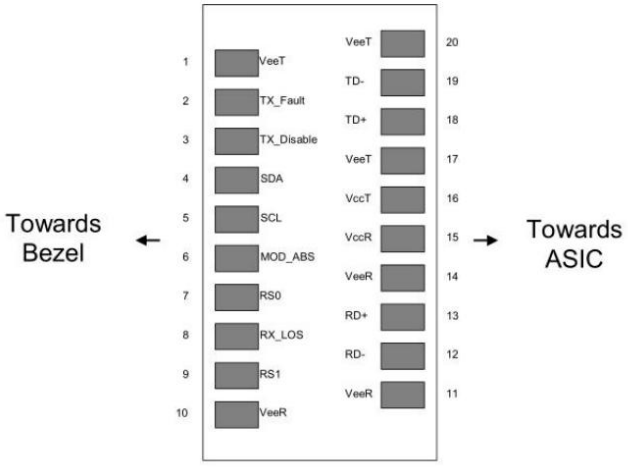

Figure1 Pin view

Pin Function Definitions

Table6-Pin Function Definitions

PIN	Symbol	Name / Description	Power Sequence Order	Note
1	VeeT	Module Transmitter Ground	1st	1
2	TX_Fault	Module Transmitter Fault	3rd	2
3	TX_Dis	Transmitter Disable. Laser output disabled on high or open	3rd	3
4	SDA	2-Wire Serial Interface Data Line	3rd	2
5	SCL	2-Wire Serial Interface Clock	3rd	2
6	MOD_ABS	Module Absent, connected to VeeT or VeeR in the module	3rd	
7	RS0	Not used	3rd	4
8	RX_LOS	Receiver Loss of Signal Indication Active High	3rd	5
9	RS1	Not used	3rd	4
10	VeeR	Module Receiver Ground	1st	1
11	VeeR	Module Receiver Ground	1st	1
12	RD-	Receiver Inverted Data Output	3rd	
13	RD+	Receiver Data Output	3rd	
14	VeeR	Module Receiver Ground	1st	1
15	VccR	Module Receiver 3.3 V Supply	2nd	
16	VccT	Module Receiver 3.3 V Supply	2nd	
17	VeeT	Module Transmitter Ground	1st	1
18	TD+	Transmitter Non-Inverted Data Input	3rd	
19	TD-	Transmitter Inverted Data Input	3rd	
20	VeeT	Module Transmitter Ground	1st	1

[1] Circuit ground is internally isolated from chassis ground..

[2] TFAULT is an open collector/drain output, which should be pulled up with a 4.7k -10k Ohms resistor on the host board if intended for use. Pull up voltage should be between 2.0V to Vcc + 0.3V. A high output indicates a transmitter fault caused by either the TX bias current or the TX output power exceeding the preset alarm thresholds. A low output indicates normal operation. In the low state, the output is pulled to ＜0.8V.

[3] Laser output disabled on TDIS ＞2.0V or open, enabled on TDIS ＜0.8V.

[4] Internally pulled down per SFF-8431 Rev 2.0. See Sec. X for the logic table to use for the internal CDRs locking modes.

[5] LOS is open collector output. Should be pulled up with 4.7kΩ -10kΩ on host board to a voltage between 2.0V and 3.6V. Logic 0 indicates normal operation; logic 1 indicates loss of signal.

Monitoring Specification

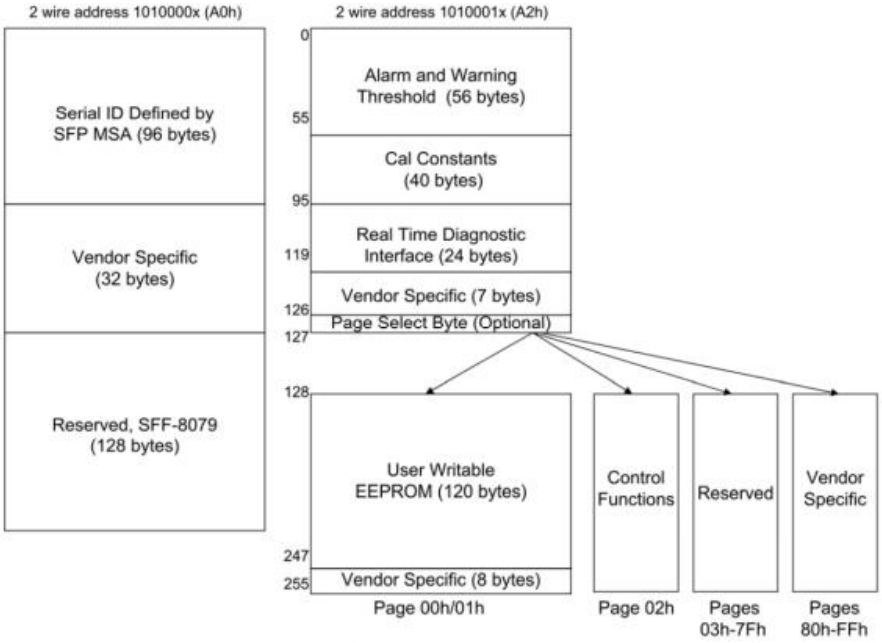

Figure2 Memory map

Mechanical Dimensions

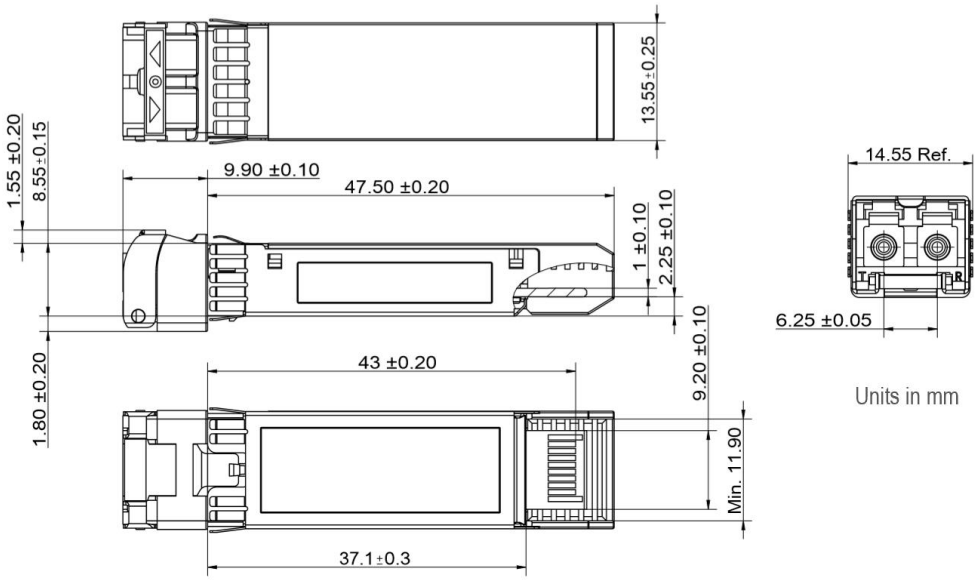

Figure3 Map Mechanical Outline