



SPB32060102D000

MSA Compliant 10GBase-BX SFP+ Transceiver (SMF, 1330nmTx/1270nmRx, 60km, LC, DOM, -40 to 85C)

Product Description

This MSA compliant SFP+ transceiver provides 10GBase-BX throughput up to 60km over single-mode fiber (SMF) using a wavelength of 1330nmTx/1270nmRx via an LC connector. This bidirectional unit must be used with another transceiver or network appliance of complimenting wavelengths. It is also capable of withstanding rugged environments and can operate at temperatures between -40 to 85C. It is built to MSA standards and is uniquely serialized and data-traffic and application tested to ensure that they will integrate into your network seamlessly. Digital optical monitoring (DOM) support is also present to allow access to real-time operating parameters. We stand behind the quality of our products and proudly offer a limited lifetime warranty.

Skylane's transceivers are RoHS compliant and lead-free.

Features:

- SFF-8432 and SFF-8472 Compliance
- Simplex LC Connector
- Industrial Temperature -40 to 85 Celsius
- Single-mode Fiber
- Hot Pluggable
- Excellent ESD Protection
- Metal with Lower EMI
- RoHS Compliant and Lead Free



Applications:

- 10GBase-BX Ethernet
- Access, Metro and Enterprise
- 8x/10x Fibre Channel

For your product safety, please read the following information carefully before any manipulation of the transceiver:



ESD

This transceiver is specified as ESD threshold 1kV for SFI pins and 2kV for all others electrical input pins, tested per MIL-STD-883G, Method 3015.4 /JESD22-A114-A (HBM). However, normal ESD precautions are still required during the handling of this module.



LASER SAFETY

This is a Class1 Laser Product according to IEC 60825-1:2007. This product complies with 21 CFR 1040.10 and 1040.11 except for deviations pursuant to Laser Notice No. 50, dated (June 24, 2007).

The optical ports of the module need to be terminated with an optical connector or with a dust plug in order to avoid contamination.

Regulatory Compliance

- ESD to the Electrical PINs: compatible with MIL-STD-883E Method 3015.4
- ESD to the LC Receptacle: compatible with IEC 61000-4-3
- EMI/EMC compatible with FCC Part 15 Subpart B Rules, EN55022:2010
- Laser Eye Safety compatible with FDA 21CFR, EN60950-1& EN (IEC) 60825-1,2
- RoHS compliant with EU RoHS 2.0 directive 2015/863/EU

Absolute Maximum Ratings

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Maximum Supply Voltage	V _{CC}	-0.3		4	V	
Storage Temperature	T _S	-40		85	°C	
Operating Case Temperature	T _c	-40		85	°C	1
Operating Humidity	RH	5		95	%	
Receiver Power	R _{MAX}			-6	dBm	
Data Rate	BR		10.3125	11.3	Gbps	
Transmission Distance	TD			60	Km	
Coupled Fiber	Single mode fiber					9/125um SMF

Notes:

1. Without air flow

Electrical Characteristics (TOP=25°C, Vcc=3.3Volts)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Power Supply Voltage	Vcc	3.14	3.3	3.47	V	
Power Supply Current	Icc			450	mA	
Power Consumption	P _{DISS}			1.5	W	
Signal Input Voltage		Vcc-0.3		Vcc+0.3	V	
Transmitter						
Differential Data Input Voltage	VDT	180		700	mVp-p	
Input differential impedance	Zin	85	100	115	Ω	
Transmitter Fault Output-High	VFaultH	2.4		Vcc	V	
Transmitter Fault Output-Low	VFaultL	-0.3		0.8	V	
Transmitter Disable Voltage- High	VDisH	2		Vcc+0.3	V	
Transmitter Disable Voltage- Low	VDisL	-0.3		0.8	V	
Receiver						
Differential Data Output Voltage	VDR	300		850	mVp-p	
Output differential impedance	Zin	80	100	120	Ω	
Receiver LOS Pull up Resistor	RLOS	4.7		10	KOhm	
Data Output Rise/Fall time	tr/tf			38	Ps	
LOS Fault	VLOS fault	Vcc-1.3		VccHOST	V	
LOS Normal	VLOS norm	Vee		Vee+0.8	V	

Optical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Transmitter						
Optical Power (average)	PO	0		5	dBm	
Average Launched Power (Laser Off)	Poff			-30	dBm	1
Optical Extinction Ratio	ER	3.5			dB	2
Center Optical Wavelength	λC	1320	1330	1340	nm	
Side Mode Suppression Ratio	SMSR	30			dB	
Spectrum Bandwidth (-20dB)	σ			1	nm	
Output Eye Mask	Compliant with IEEE 802.3ae					2
Receiver						
Receiver Sensitivity	Psen			-20	dBm	3
Input Saturation Power (Overload)	Psat	-6			dBm	3
Receiver wavelength	Rλ	1260	1270	1280	nm	
LOS Assert	LOSA	-38			dBm	
LOS De-assert	LOSD			-21	dBm	
LOS -Hysteresis	Phys	0.5		5	dB	

Notes:

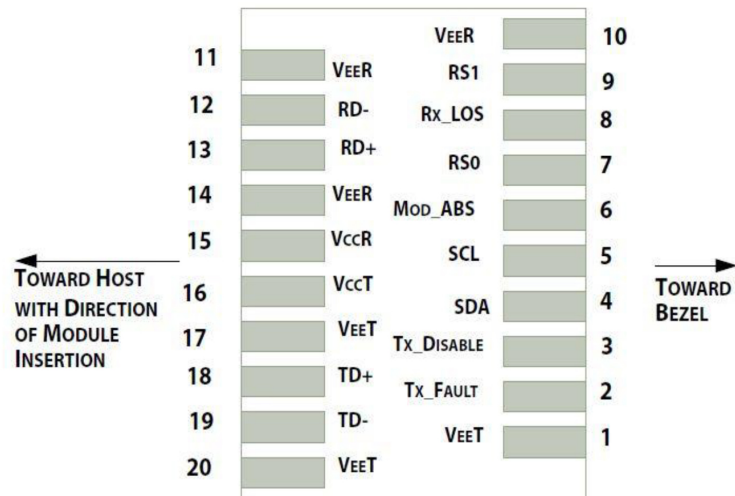
1. The optical power is launched into SMF
2. Measured with RPBS 2³¹-1 test pattern @10.3125Gbs
3. Measured with RPBS 2³¹-1 test pattern @10.3125Gbs BER=<10⁻¹²

Pin Descriptions

Pin	Symbol	Name/Descriptions	Ref.
1	VeeT	Transmitter Ground (Common with Receiver Ground).	1
2	TX Fault	Transmitter Fault. LVTTTL-O	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. Not used	5
8	LOS	Loss of Signal indication. Logic 0 indicates normal operation. LVTTTL-O.	2
9	RS1	Rate Select 1. Not used	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

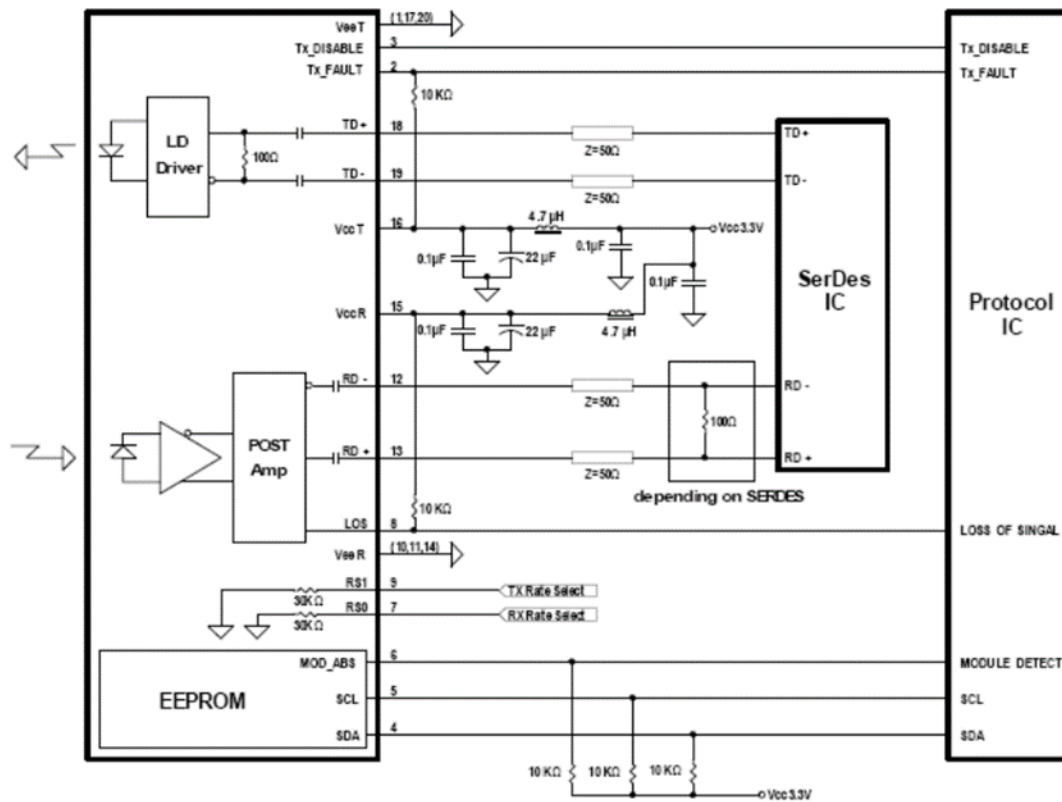
Notes:

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. Internally pulled down per SFF-8431



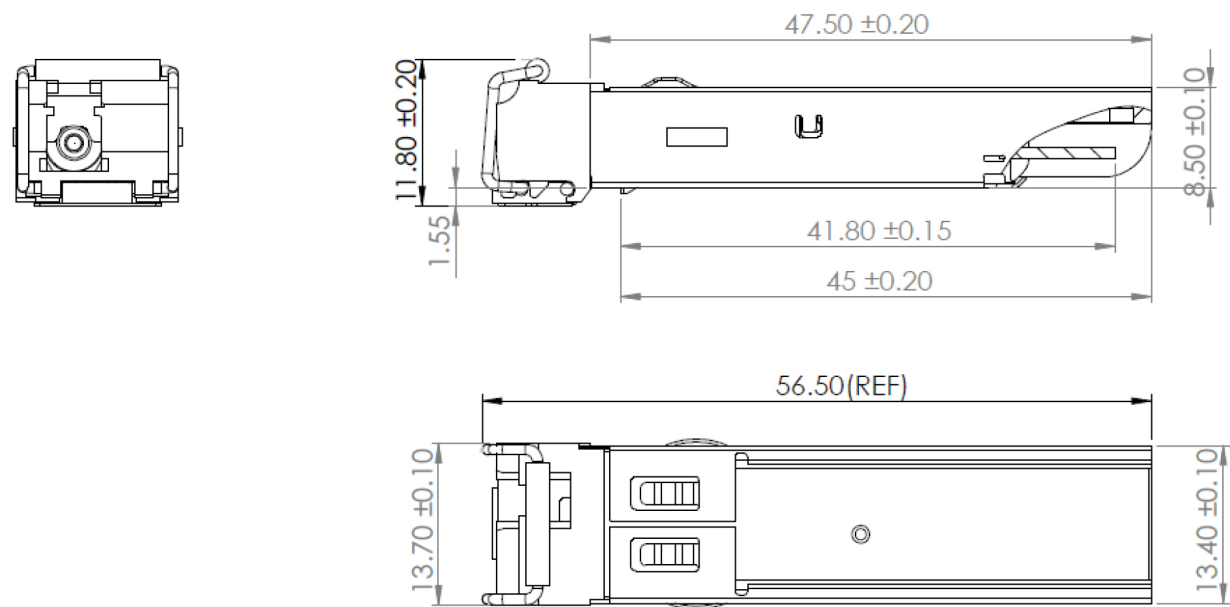
Pin-out of connector Block on Host board

Recommended Circuit Schematic



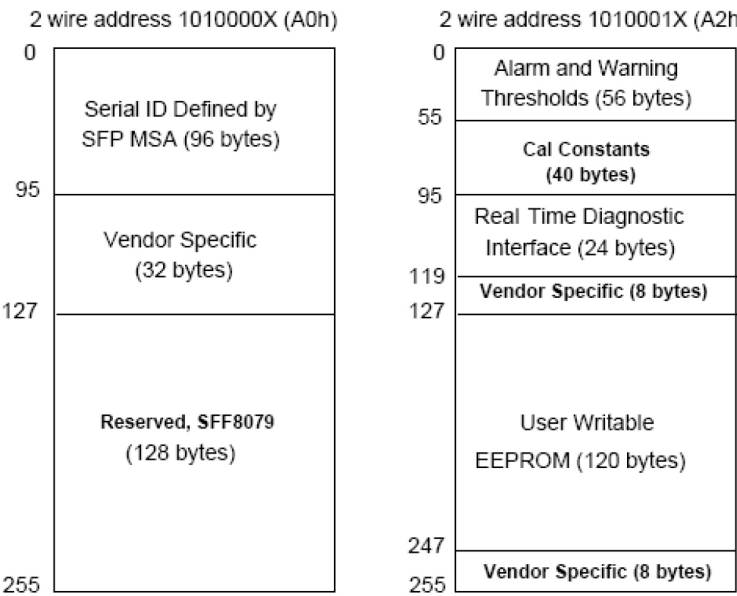
Mechanical Specifications

Small Form Factor Pluggable (SFP) transceivers are compatible with the dimensions defined by the SFP Multi-Sourcing Agreement (MSA).



EEPROM Information

EEPROM memory map specific data field description is as below:



About Skylane Optics

Skylane is a leading provider of transceivers for optical communication.

We offer an extensive portfolio for the enterprise, access, datacenter and metropolitan fiber optical market as well as for smart home applications and home networks.

We cover the European, South American and North American market with a strong partner network and have offices in Belgium, Brazil, Sweden and USA.

Our offerings are characterized by high quality and performance. In combination with our strong technical support, we enable our customers to build cost optimized network solutions.

We offer an extensive range of high-quality products including transceivers (Optical and copper), Active Optical Cable (AOC), Direct Attach Cable (DAC), Mux/Demux, Coding Box.

