



SBD53080DR0D000

MSA Compliant 1000Base-BX SFP Transceiver (SMF, 1550nmTx/1310nmRx, 80km, LC, DOM)

Product Description

This MSA compliant SFP transceiver provides 1000Base-BX throughput up to 80km over single-mode fiber (SMF) using a wavelength of 1550nmTx/1310nmRx via an LC connector. This bidirectional unit must be used with another transceiver or network appliance of complementing wavelengths. It can operate at temperatures between 0 and 70C. All of our transceivers are built to comply with Multi-Source Agreement (MSA) standards and are uniquely serialized and tested for data-traffic and application to ensure seamless network integration. Additional product features include Digital Optical Monitoring (DOM) support which allows 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:

- INF-8074 and SFF-8472 Compliance
- Uncooled DFB transmitter and PIN receiver
- Simplex LC Connector
- Commercial Temperature 0 to 70 Celsius
- Single-mode Fiber
- Hot Pluggable
- Excellent ESD Protection
- Metal with Lower EMI
- RoHS Compliant and Lead Free



Applications:

- 1000Base-BX Ethernet
- Access (FTTx) and Enterprise
- 1x 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.

Absolute Maximum Ratings

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Maximum Supply Voltage	V _{cc}	-0.5		4.0	V	
Storage Temperature	T _{stg}	-40		85	°C	
Operating Case Temperature	T _c	-10	25	70	°C	
Operating Relative Humidity	RH	5		95	%	
Power Supply Current	I _{cc}			300	mA	
Data Rate		0.1		1.25	Gbps	

Electrical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Supply Voltage	V _{cc}	3.135	3.3	3.465	V	
Module Supply Current	I _{cc}			300	mA	
Power Dissipation	PD			1000	mW	
Transmitter Differential Input Voltage (TD+/-)		300		2200	mVp-p	1
Receiver Differential Output Voltage (RD+/-)		600		1200	mVp-p	2
Low-Speed Output: Transmitter Fault (Tx_Fault)/Loss of Signal (LOS)	VOH	2.0		V _{cc}	V	3
	VOL	0		0.8	V	
Low-Speed Input: Transmitter Fault (Tx_Fault), MOD_DEF1, MOD_DEF2	VIH	2.0		V _{cc}	V	4
	VIL	0		0.8	V	
Timing Characteristics						
Tx_Disable Assert Time	T _{off}			10	us	
Tx_Disable Negate Time	T _{on}			1	ms	
Time to Initialize, Includes Reset of Tx_Fault	T _{init}			300	ms	
Tx_Fault from Fault to Assertion	T _{fault}			100	us	
Tx_Disable Time to Start Reset	T _{reset}	10			us	
Receiver LOS Assert Timer (On to Off)	T _D , Rx_LOS			80	us	
Receiver LOS Assert Timer (Off to On)	T _A , Rx_LOS			80	us	
Serial I2C Clock Rate	I2C_Clock			100	kHz	

Notes:

1. Internally AC coupled and terminated to 100Ω differential load.
2. Internally AC coupled but requires a 100Ω differential termination or internal to serializer/deserializer.
3. Pulled up externally with a 4.7kΩ to 10kΩ resistor on the host board to V_{cc}T/R.
4. MOD_DEF1 and MOD_DEF2 must be pulled up externally with a 4.7kΩ to 10kΩ resistor on the host board to V_{cc}T/R.

Optical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Transmitter						
Launch Optical Power	Po	0		5	dBm	
Center Wavelength	λ_C	1530	1550	1570	nm	
Extinction Ratio	ER	9			dB	
Spectral Width (-20dB)	$\Delta\lambda$			1	nm	
Side-Mode Suppression Ratio	SMSR	30			dB	
Optical Rise/Fall Time	Tr/Tf			260	ps	
POUT @ Tx_Disable Asserted	Poff			-45	dBm	
Eye Diagram	IEEE Std 802.3-2005 1000Base-BX-D Compatible					
Receiver						
Wavelength Range		1260	1310	1360	nm	
Receiver Sensitivity	S			-26	dBm	1
Receiver Overload	Pol	-3			dBm	1
Optical Return Loss	ORL	12			dB	
LOS De-Assert	LOSD			-27	dBm	
LOS Assert	LOSA	-35			dBm	
LOS Hysteresis		0.5	3	5	dB	

Notes:

1. Measured with a PRBS 2^7-1 test pattern @1.25Gbps with BER< 10^{-12} .

Pin Descriptions

Pin	Symbol	Name/Description	Plug Seq.	Notes
1	VeeT	Transmitter Ground.	1	
2	Tx_Fault	Transmitter Fault Indication.	3	1
3	Tx_Disable	Transmitter Disable. Module disables on “high” or “open.”	3	2
4	MOD_DEF2	Module Definition 2. 2-Wire Serial ID Interface.	3	3
5	MOD_DEF1	Module Definition 1. 2-Wire Serial ID Interface.	3	3
6	MOD_DEF0	Module Definition 0. Grounded within the module.	3	3
7	Rate Select	Not Connected. Function Not Available.	3	
8	LOS	Loss of Signal.	3	4
9	VeeR	Receiver Ground.	1	
10	VeeR	Receiver Ground.	1	
11	VeeR	Receiver Ground.	1	
12	RD-	Inverse Received Data Out.	3	5
13	RD+	Received Data Out.	3	5
14	VeeR	Receiver Ground.	1	
15	VccR	3.3 ± 5% Receiver Power.	2	6
16	VccT	3.3 ± 5% Transmitter Power.	2	6
17	VeeT	Transmitter Ground.	1	
18	TD+	Transmitter Data In.	3	7
19	TD-	Inverse Transmitter Data In.	3	7
20	VeeT	Transmitter Ground.	1	

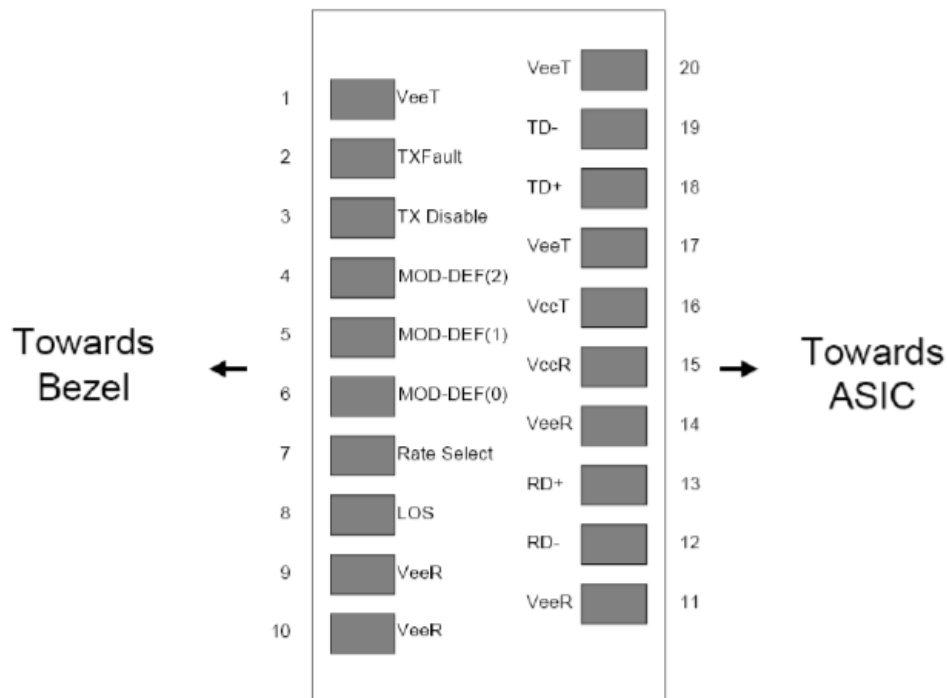
Notes:

1. Tx_Fault is an open collector/drain output that should be pulled up with a 4.7kΩ to 10kΩ resistor on the host board. Pull-up voltage between 2.0V and VccT/R+0.3V. When “high,” output indicates a laser fault of some kind. “Low” indicates normal operation. In the low state, the output will be pulled to <0.8V.
2. Tx_Disable is an input that is used to shut down the transmitter optical output. It is pulled up within the module with a 4.7kΩ to 10kΩ resistor. Its states are:
 - Low (0V – 0.8V): Transmitter On.
 - Between (0.8V and 2.0V): Undefined.
 - High (2.0V – VccT): Transmitter Disabled.
 - Open: Transmitter Disabled.
3. MOD_DEF0, 1, & 2. These are the module definition pins. They should be pulled up with a 4.7kΩ to 10kΩ resistor on the host board. The pull-up voltage shall be VccT or VccR.
 - MOD_DEF0 is grounded by the module to indicate that the module is present.
 - MOD_DEF1 is the clock line of the 2-wire serial interface for optional serial ID.
 - MOD_DEF2 is the data line of the 2-wire serial interface for optional serial ID.
4. LOS (Loss of Signal) is an open collector/drain output that should be pulled up with a 4.7kΩ to 10kΩ

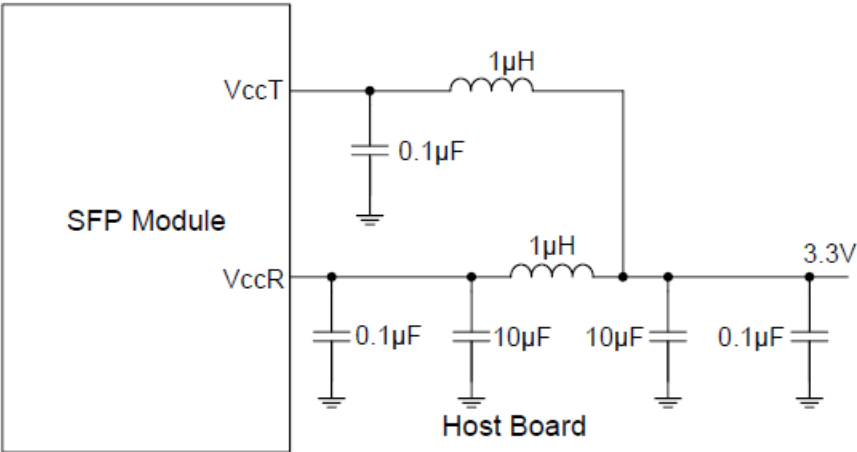
resistor on the host board to supply $<V_{ccT}+0.3V$ or $V_{ccR}+0.3V$. When "high," this output indicates the received optical power is below the worst-case receiver sensitivity (as defined by the standard in use). "Low" indicates normal operation. In the low state, the output will be pulled to $<0.8V$.

5. RD-/+. These are the differential receiver outputs. They are AC-coupled, 100Ω differential lines which should be terminated with 100Ω (differential) at the user SERDES. The AC coupling is done inside the module and is thus not required on the host board.
6. VccR and VccT are the receiver and transmitter power supplies. They are defined as $3.3V \pm 5\%$ at the SFP connector pin. The in-rush current will typically be more than 30mA above the steady state supply current after 500ns.
7. TD-/+. These are the differential transmitter inputs. They are AC-coupled, differential lines with 100Ω differential terminations inside the module. The AC coupling is done inside the module and is thus not required on the host board.

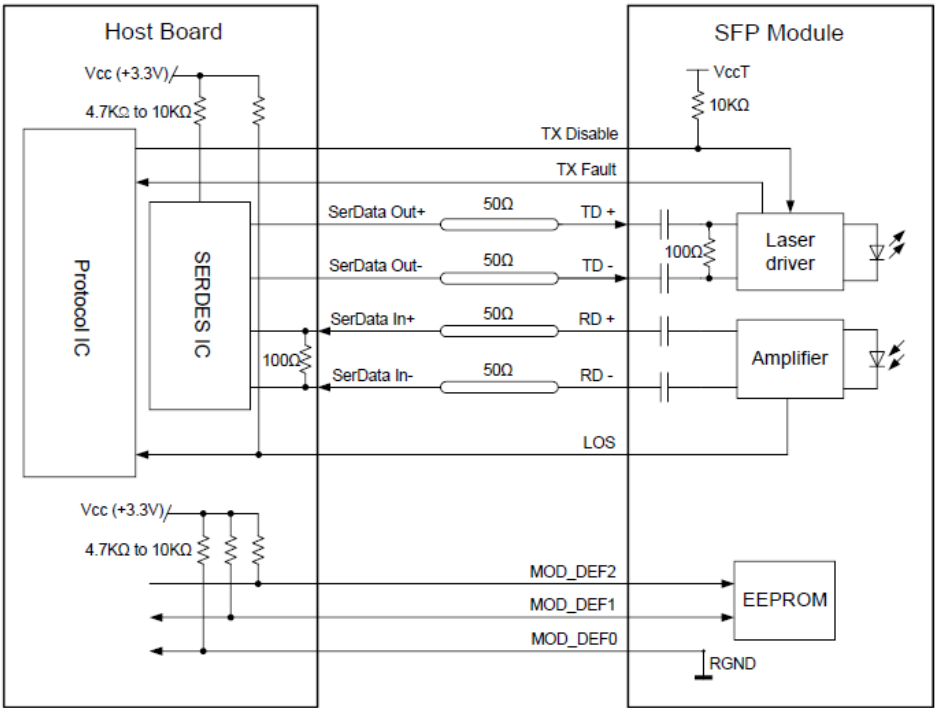
Pin Connectors



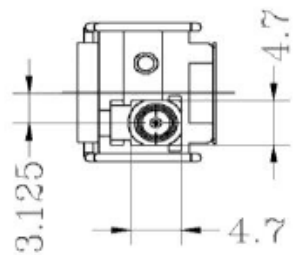
Recommended Host Board Power Supply Circuit



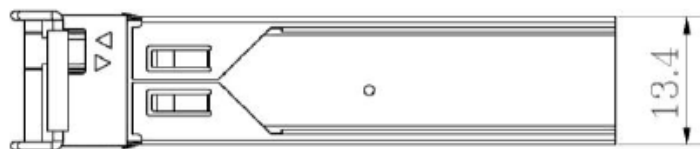
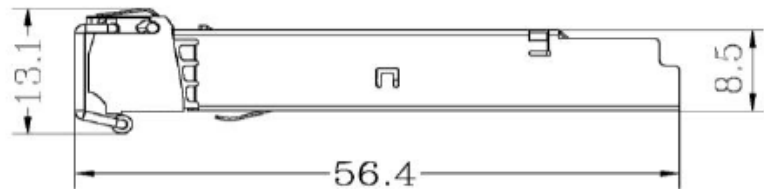
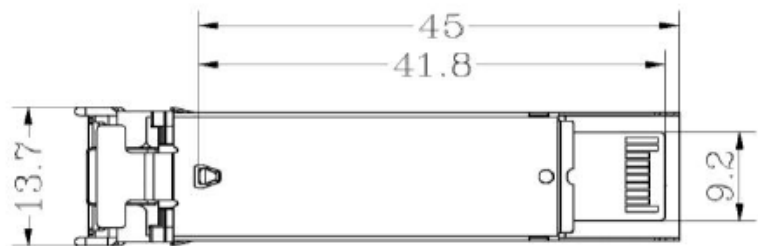
Recommended Application Interface Circuit



Mechanical Specifications



Unit:mm



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.

