XBR-000498-PRO

Brocade® XBR-000498 Compatible TAA Compliant 16GBase-LW Fibre Channel SFP+ Transceiver (SMF, 1310nm, 10km, 0 to 70C, LC)

Features

- SFF-8432 and SFF-8472 Compliance
- Duplex 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:

- Fibre Channel
- Access and Enterprise

Product Description

This Brocade® XBR-000498 compatible SFP+ transceiver provides 16GBase-LW Fibre Channel throughput up to 10km over single-mode fiber (SMF) using a wavelength of 1310nm via an LC connector. It is guaranteed to be 100% compatible with the equivalent Brocade® transceiver. This easy to install, hot swappable transceiver has been programmed, uniquely serialized and data-traffic and application tested to ensure that it will initialize and perform identically. It is built to meet or exceed the specifications of Brocade®, as well as to comply with MSA (Multi-Source Agreement) standards to ensure seamless network integration. This transceiver is Trade Agreements Act (TAA) compliant. We stand behind the quality of our products and proudly offer a limited lifetime warranty.

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

TAA refers to the Trade Agreements Act (19 U.S.C. & 2501-2581), which is intended to foster fair and open international trade. TAA requires that the U.S. Government may acquire only "U.S. – made or designated country end products.

Rev. 031924

Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Unit
Maximum Supply Voltage	Vcc	-0.5	4.0	V
Storage Temperature	Tstg	-40	85	°C
Operating Case Temperature	Tc	0	70	°C
Operating Humidity	RH	5	95	%
Receiver Power	Rmax		2	dBm
9/125μm G.652 SMF	Lmax		10	km

Electrical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Power Supply Voltage	Vcc	3.13	3.30	3.47	V	
Power Supply Current	Icc			350	mA	
Power Consumption	P_{DISS}			0.8	W	
Transmitter						
Differential data input swing	Vin, pp	120	600	850	mV	
Input differential impedance	Zin	90	100	110	Ω	
TX Disable-High		2.0		Vcc+0.3	V	
TX Disable-Low		Vee-0.3		0.8	V	
TX Fault-High		2.0		Vcc+0.3	V	
TX Fault-Low		Vee-0.3		0.8	V	
Receiver						
Differential data output swing	Vout, pp	300	600	850	mV	
Output Differential Impedance	Zin	90	100	110	Ω	
LOS-High		2.0		Vcc+0.3	V	
LOS-Low		Vee-0.3		0.8	V	
Unstressed Receiver OMA Sensitivity, 14.025 Gb/s	R_{SENSr}			0.063	mW	
Unstressed Receiver OMA Sensitivity, 8.5 Gb/s	R_{SENSr}			0.042	mW	1
Unstressed Receiver OMA Sensitivity, 4.25 Gb/s	R_{SENSr}			0.029	mW	1

Notes:
1. Measured with PRBS 2^7-1 at 10^{-12} BER.

Optical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Transmitter						
Output Opt. Power @14.025Gbps	$P_{O,RH}$	-5		2	dBm	1, 2
Output Opt. Power @4.25/8.5Gbps	$P_{O,RL}$	-5		-1	dBm	3
Optical Wavelength	λ	1295		1325	nm	4
Spectral Width	σ			1	nm	4, 5
Optical Modulation Amplitude @ 14.025 Gbps	OMA	631			µW	6
Optical Modulation Amplitude @ 4.25/8.5Gbps	OMA	290			µW	4, 6
Transmitter and Dispersion Penalty @14.025Gbps	TDP			4.4	dB	7
Transmitter and Dispersion Penalty @8.5Gbps	TDP			3.2	dB	7
Optical Rise/Fall Time @4.25Gbps	Tr/Tf			90	ps	8
RIN				-130	dB/Hz	
Eye Diagram	Compatible with IEEE 802.3-2005					
Receiver						
Average Received Power	RX_{MAX}			2.0	dBm	
Optical Center Wavelength	λC	1260		1370	nm	
Return Loss		12			dB	
LOS De-Assert	LOSD			-19	dBm	
LOS Assert	LOSA	-30			dBm	
LOS Hysteresis		0.5			dB	

Notes:

2. Class 1 Laser Safety per FDA/CDRH and EN (IEC) 60825 regulations.
3. High Bandwidth Mode. Class 1 Laser Safety per FDA/CDRH and EN (IEC) 60825 regulations.
4. Low Bandwidth Mode. Class 1 Laser Safety per FDA/CDRH and EN (IEC) 60825 regulations.
5. Also specified to meet curves in FC-PI-5 Rev 6.10 Figures 23, 24, and 25, which allow trade-off between wavelength, spectral width and OMA for 4.25/8.5Gbps operation.
6. 20dB spectral width.
7. Equivalent extinction ratio specification for Fiber Channel. Allows smaller ER at higher average power.
8. For 14.025/8.5Gbps operation, Jitter values for gamma T and gamma R are controlled by TDP.
9. Unfiltered, 20-80%. Complies with IEEE 802.3 (Gia. E), FC 4x eye mask when filtered.

Pin Descriptions

Pin	Symbol	Name/Description	Notes
1	VeeT	Transmitter Ground (Common with Receiver Ground).	1
2	Tx_Fault	Transmitter Fault. LVTTL-O.	2
3	Tx_Disable	Transmitter Disable. Laser output disabled on "high" or "open." LVTT-I.	3
4	SDA	2-Wire Serial Interface Data. Same as MOD-DEF2 in INF-8074i. LVTTL-I/O.	
5	SCL	2-Wire Serial Interface Clock. Same as MOD-DEF2 in INF-8074i. LVTTL-I.	
6	MOD_ABS	Module Absent. Connect to VeeT or VeeR in the module.	4
7	RS0	Rate Select 0. Optionally controls the SFP+ module receiver. LVTTL-I.	5
8	LOS	Loss of Signal Indication. "Logic 0" indicates normal operation. LVTTL-O.	2
9	RS1	Rate Select 1. Optionally controls the SFP+ module transmitter. LVTTL-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 Host_Vcc with resister 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+0.5V.
3. Tx_Disable is an input contact with a 4.7kΩ to 10kΩ pull-up resistor to the VccT inside the module.
4. MOD_ABS is connected to the VeeT or VeeR in the SFP+ module. The host may pull the contract up to Host_Vcc 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 SFF-8079. See SFF-8079 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.
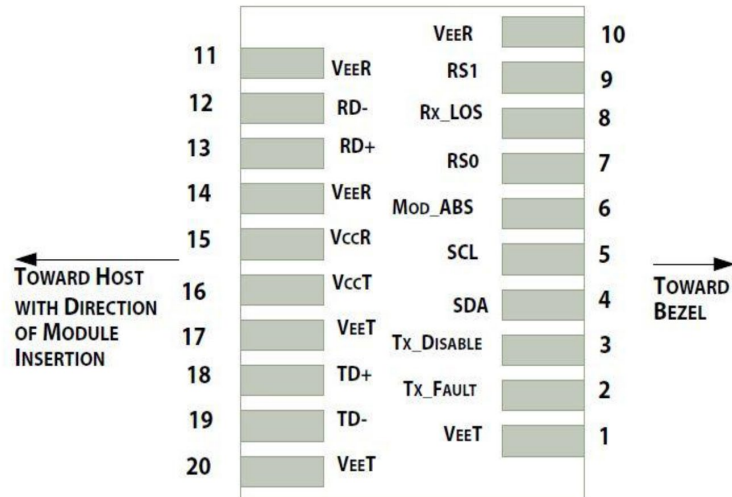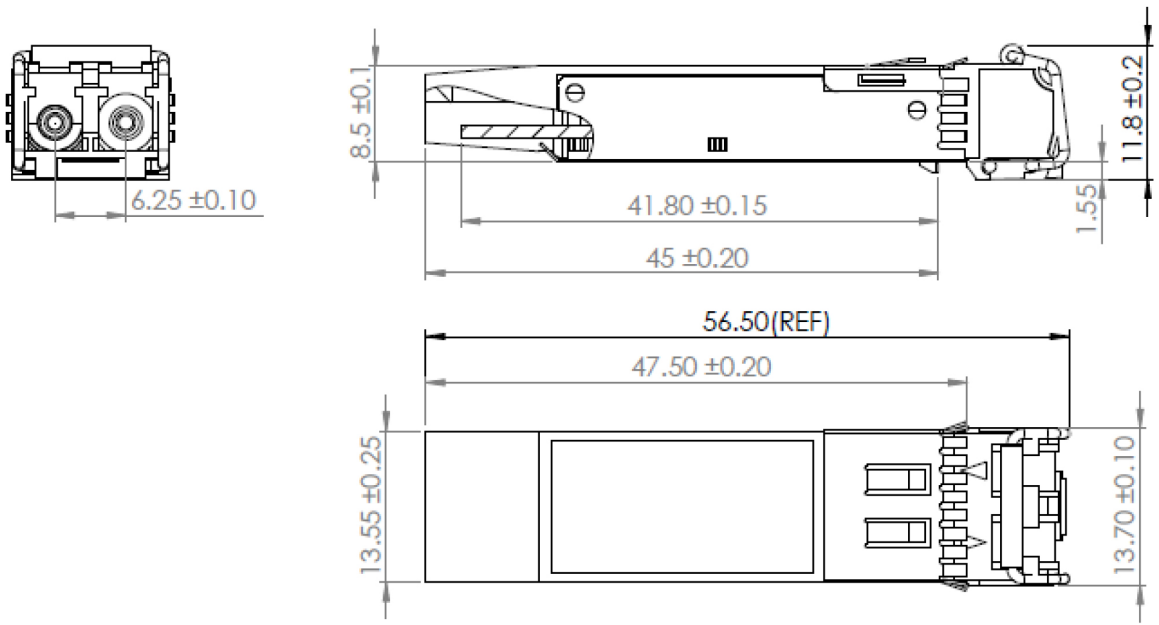

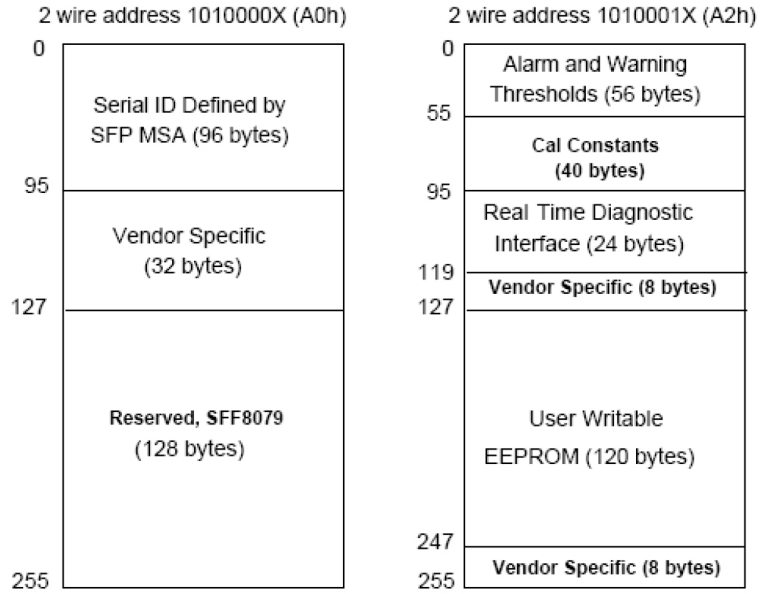Pin-Out of Connector Block on the Host Board

Recommended Circuit Schematic
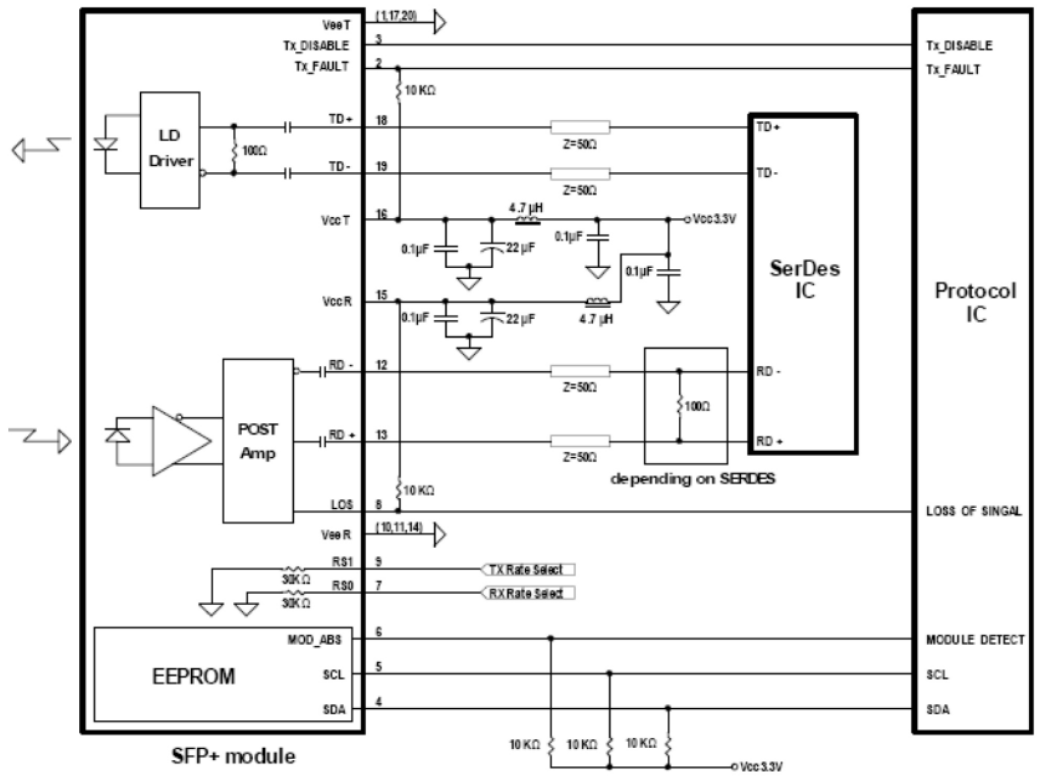
Mechanical Specifications

EEPROM Information

EEPROM memory map-specific data field description is as below:

About Us:

Proline Options is one of North America's leading providers of transceivers and high speed cabling. With a reputation for quality, tested products that cover the connectivity spectrum, Proline Options has a solution for you regardless of the specification.

At Proline Options, every product is tested in its intended application - never batch or spec tested only. We run bandwidth, distance and IOS network tests. We have documented an impressive 0.03% failure rate over the last 10 years. To continue this rate of success we invest millions annually in our own on-site testing lab.

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