OC48 SFP 2km SMF Optical Transceiver

Product Features

- Supports up to 2.67Gbps bit rates
- Hot-pluggable SFP footprint
- 1310nm FP Laser and Pin-Tia detector, Up to 2km for SMF transmission
- Compliant with SFP MSA and SFF-8472 with duplex LC receptacle
- Compatible with RoHS
- Single +3.3V power supply
- Real Time Digital Diagnostic Monitoring
- Operating case temperature: -5 to +85° C

Applications

- 2.5Gbps Optical systems
- Fiber Channel
- Other Optical links

The Axiom AC-F-SFPO48-ESR-xx is a high performance, cost effective modules supporting data rate of 2.67 Gbps and 2km transmission distance with SMF.

The transceiver consists of three sections: a DFB laser transmitter, a PIN photodiode integrated with a trans-impedance preamplifier (TIA) and MCU control unit. All modules satisfy class I laser safety requirements.

The transceivers are compatible with SFP Multi-Source Agreement and SFF-8472 digital diagnostics functions.

Ordering Information

Part Number	Description
AC-F-SFPO48-ESR-xx	SFP OC48 1310nm 2km SMF optical transceiver Extended Temperature

Regulatory Compliance

Feature	Standard	Performance
Electromagnetic Interference (EMI)	FCC Part 15 Class B EN 55022:2010, Class B	Compatible with standards
Electromagnetic susceptibility (EMS)	EN 55024:2010	Compatible with standards
Laser Eye Safety	FDA 21CFR 1040.10 and 1040.11 EN60950, EN (IEC) 60825-1,2	Compatible with Class I laser product

Absolute Maximum Ratings

The operation in excess of any absolute maximum ratings might cause permanent damage to this module.

Parameter	Symbol	Min	Max	Unit	Notes
Storage Temperature	TS	-40	85	℃	
Power Supply Voltage	V_{CC}	-0.5	4.5	V	
Relative Humidity (non-condensation)	RH	0	85	%	
Input Voltage	Vin	-0.3	Vcc+0.3	V	

Recommended Operating Conditions and Power Supply Requirements

Parameter	Symbol	Min	Typical	Max	Unit	Notes
Operating Case Temperature	TOP	-5		85	℃	
Power Supply Voltage	V_{CC}	3.135	3.3	3.465	V	
Power Supply Current				300	mA	
Data Rate	DR			2.67	Gbps	

Optical Characteristics

All parameters are specified under the recommended operating conditions unless otherwise specified..

Parameter	Symbol	Min	Typical	Max	Unit	Notes
Transmitter						
Center Wavelength	λ	1270	1310	1350	nm	
Spectral Width (RMS)	Δλ			4	nm	
Average Optical Output Power	Po	-10		-3	dBm	
Extinction Ratio	Er	8.5			dB	
Transmitter Enable Voltage	VEN	0		0.8	V	
Transmitter Disable Voltage	VD	2.0		Vcc	V	

Single Ended Data Input Swing	$V_{IN}pp$	250		1200	mV	
Output Eye Diagram	Compliant with ITU recommendation G957					
Receiver						
Operate Wavelength		1270		1610	nm	
Sensitivity	Sen			-22	dBm	1
Saturation	Psat	-3			dBm	1
LOS Asserted		-35			dBm	High level: Alarm
LOS De-Asserted				-23	dBm	
LOS Hysteresis		0.5		5	dB	
Single Ended Data Output Swing	VOUTPP	185		1000	mV	
LOS Low Voltage	VLout			0.8	V	
LOS High Voltage	VHout	2.0			V	

Notes:

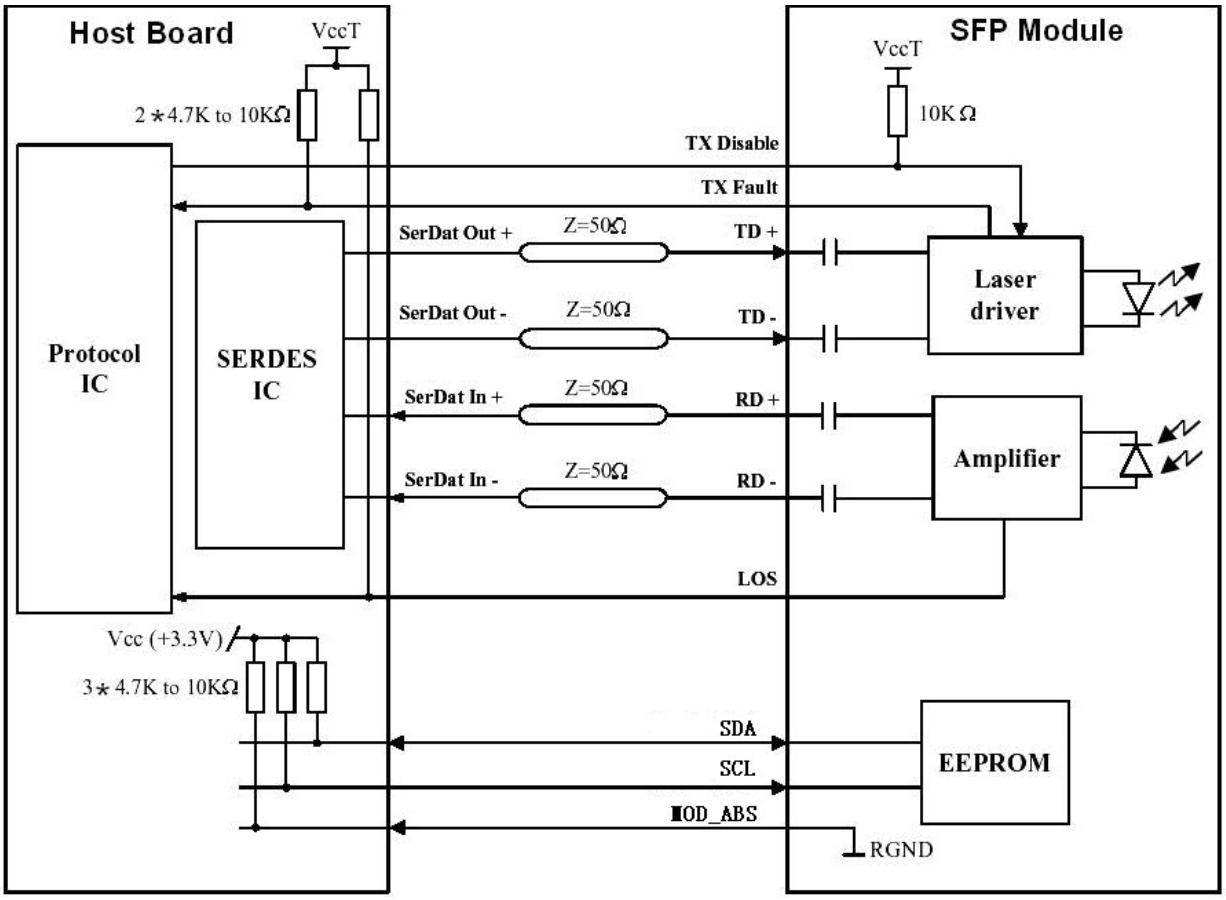
1. Minimum Sensitivity and saturation levels for a 2^{23}-1 PRBS with 72 ones and 72 zeros inserted (ITU recommendation G958).

   Internally AC-coupled.

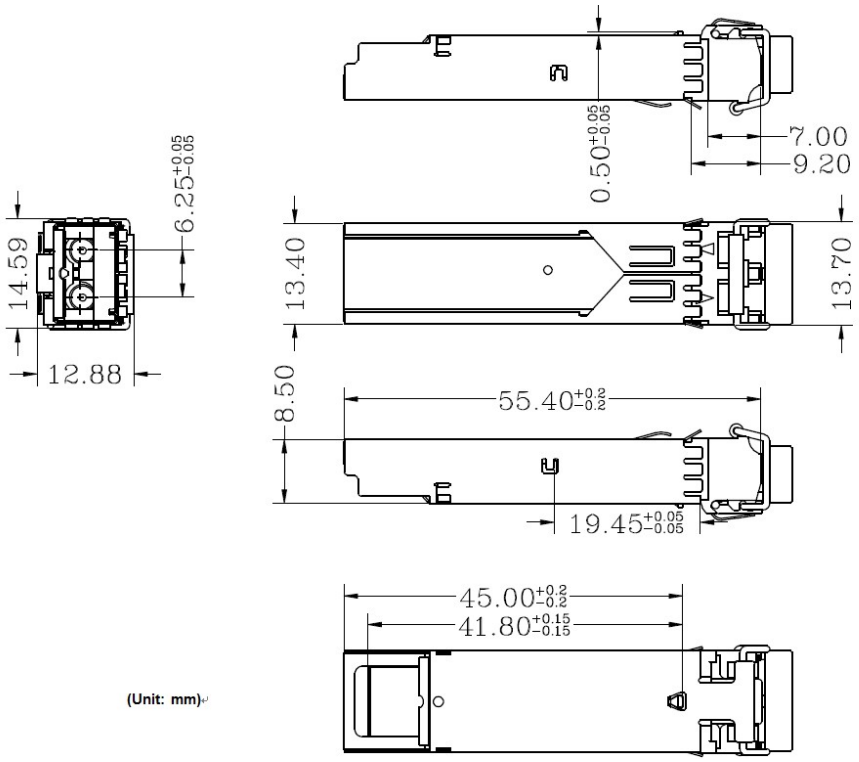
Digital Diagnostic Functions

Parameter	Symbol	Min	Max	Unit	Notes
Temperature monitor absolute error	DMI_Temp	-3	+3	℃	
Supply voltage monitor absolute error	DMI_VCC	-3%	+3%	V	
TX power monitor absolute error	DMI_RX	-3	+3	dB	
RX power monitor absolute error	DMI_RX	-3	+3	dB	
Bias current monitor	DMI_Ibias	-10%	+10%	mA	

Recommended Circuit

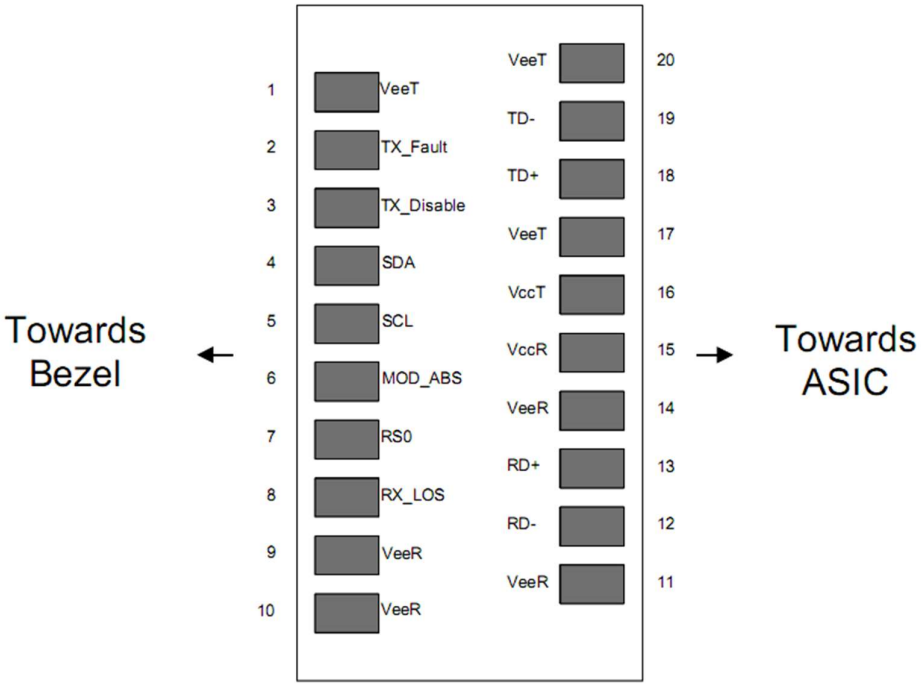


Mechanical Dimensions



(Unit: mm)

Pin Assignment and Description



Pin Assignment

Pin	Signal Name	Description	Plug Seq.	Notes
1	V_{EET}	Transmitter Ground	1	
2	TX FAULT	Transmitter Fault Indication	3	Note 1
3	TX DISABLE	Transmitter Disable	3	Note 2
4	SDA	SDA Serial Data Signal	3	
5	SCL	SCL Serial Clock Signal	3	
6	MOD_ABS	Module Absent. Grounded within the module	3	
7	RS0	Not Connected	3	
8	LOS	Loss of Signal	3	Note 3
9	V_{EER}	Receiver ground	1	

10	V_{EER}	Receiver ground	1	
11	V_{EER}	Receiver ground	1	
12	RD-	Inv. Received Data Out	3	Note 4
13	RD+	Received Data Out	3	Note 4
14	V_{EER}	Receiver ground	1	
15	V_{CCR}	Receiver Power Supply	2	
16	V_{CCT}	Transmitter Power Supply	2	
17	V_{EET}	Transmitter Ground	1	
18	TD+	Transmit Data In	3	Note 5
19	TD-	Inv. Transmit Data In	3	Note 5
20	V_{EET}	Transmitter Ground	1	

Notes:

Plug Seq.: Pin engagement sequence during hot plugging.

1. TX Fault is an open collector output, which should be pulled up with a 4.7k~10k Ω resistor on the host board to a voltage between 2.0V and Vcc+0.3V. Logic 0 indicates normal operation; Logic 1 indicates a laser fault of some kind. In the low state, the output will be pulled to less than 0.8V.

2. Laser output disabled on TDIS >2.0V or open, enabled on TDIS <0.8V.

3. LOS is open collector output. Should be pulled up with 4.7k~10k Ω on host board to a voltage between 2.0V and 3.6V. Logic 0 indicates normal operation; logic 1 indicates loss of signal.

4. RD-/+: These are the differential receiver outputs. They are internally AC-coupled 100 differential lines which should be terminated with 100 Ω (differential) at the user SERDES.

5. TD-/+: These are the differential transmitter inputs. They are internally AC-coupled, differential lines with 100 Ω differential termination inside the module.