

OC48 SFP 80km Optical Transceiver

Product Features

- Supports up to 2.67Gbps bit rates
- Hot-pluggable SFP footprint
- 1550nm DFB laser and APD photo detector, Up to 80km 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

- 2.67Gbps Optical systems
- Fiber Channel
- Other Optical links

The AC-B-SFPO48-ELR2-xx is a high performance, cost effective modules supporting data rate of 2.67Gbps and 80km transmission distance with SMF.

The transceiver consists of three sections: a DFB laser transmitter, a APD 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-B-SFPO48-ELR2-xx	SFP OC48 1550nm 80km optical transceiver with full real-time digital diagnostic monitoring, Extended Temperature range

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	°C	
Power Supply Voltage	V _{cc}	-0.5	4.5	V	
Relative Humidity (non-condensation)	RH	0	85	%	
Input Voltage	V _{in}	-0.3	V _{cc} +0.3	V	

Recommended Operating Conditions and Power Supply Requirements

Parameter	Symbol	Min	Typical	Max	Unit	Notes
Operating Case Temperature	TOP	-5		85	°C	
Power Supply Voltage	V _{cc}	3.135	3.3	3.465	V	
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						
Centre Wavelength	λ_c	1530	1550	1570	nm	
Spectral Width (-20dB)	$\Delta\lambda$			1	nm	
Side-Mode Suppression Ratio	SMSR	30	-	-	dB	
Average Output Power	P _{out}	-2		+3	dBm	1
Extinction Ratio	ER	9.0			dB	
Data Input Swing Differential	V _{IN}	180		1200	mV	2

Input Differential Impedance		Z _{IN}	90	100	110	Ω	
TX Disable	Disable		2.0		V _{cc}	V	
	Enable		0		0.8	V	
TX Fault	Fault		2.0		V _{cc}	V	
	Normal		0		0.8	V	
Receiver							
Centre Wavelength		λ _c	1260		1610	nm	
Receiver Sensitivity					-28	dBm	3
Receiver Overload			-8			dBm	3
LOS De-Assert		LOS _D			-29	dBm	
LOS Assert		LOS _A	-32			dBm	
LOS Hysteresis			0.5		3	dB	
Data Output Swing Differential		V _{out}	600	800	1000	mV	4
LOS	High		2.0		V _{cc}	V	
	Low				0.8	V	

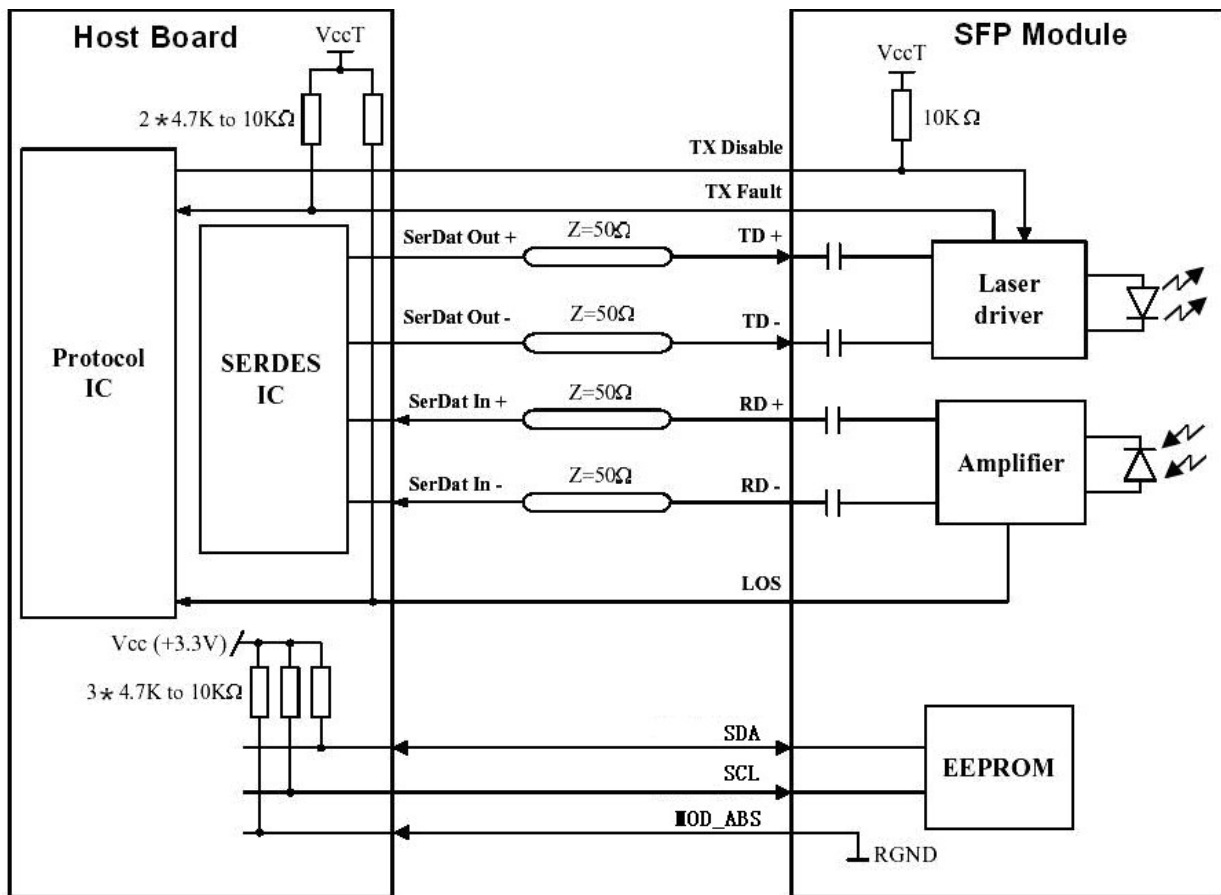
Notes:

1. The optical power is launched into SMF.
2. PECL input, internally AC-coupled and terminated.
3. Measured with a PRBS 223-1 test pattern @2500Mbps, BER ≤ 1 × 10⁻¹².
4. Internally AC-coupled.

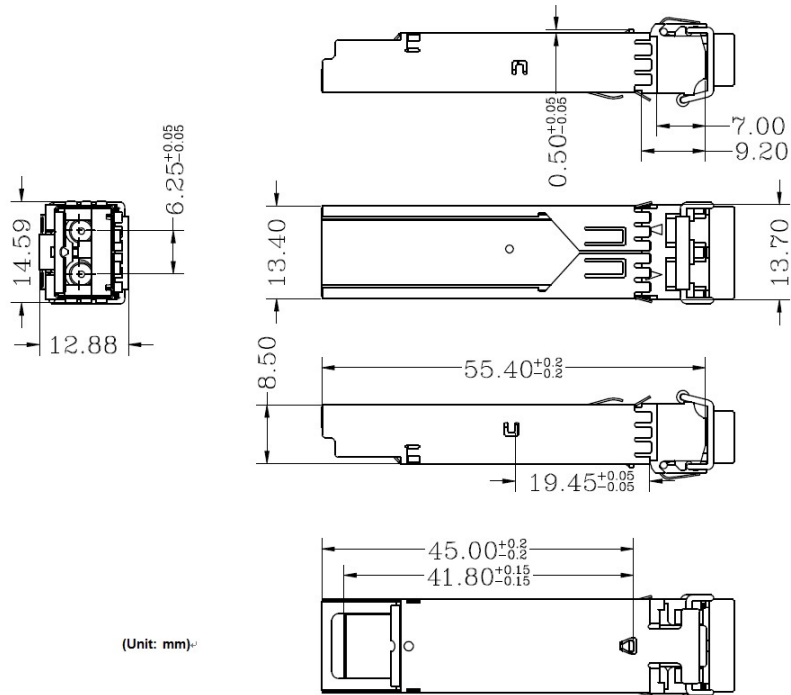
Digital Diagnostic Functions

Parameter	Symbol	Min	Max	Unit	Notes
Temperature monitor absolute error	DMI_Temp	-3	+3	°C	
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	

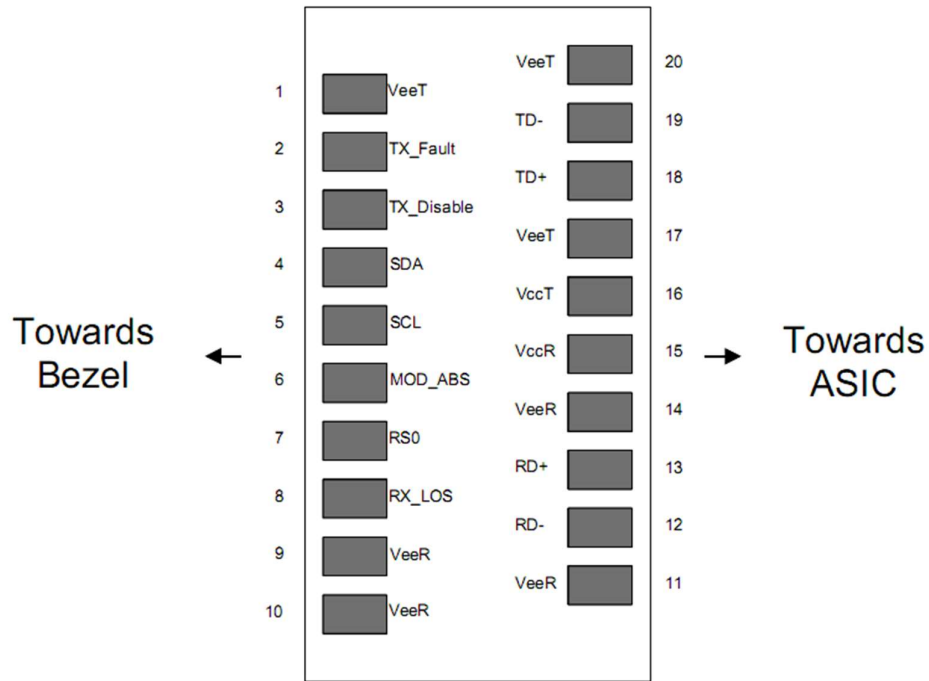
Recommended Circuit



Mechanical Dimensions



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 _{EEER}	Receiver ground	1	
12	RD-	Inv. Received Data Out	3	Note 4
13	RD+	Received Data Out	3	Note 4
14	V _{EEER}	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 V_{cc}+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.