

## SFP-TSOP-2-AO

MSA and TAA OC-48 TSOP Intelligent Transceiver (SMF, 1310nm, 2km, LC, DOM)

### Features

- 2.5Gbps, SR1, 2km, Optical Data Link
- Remote DDM
- Compliant with SFP MSA
- Wide Dynamic Range PIN-PD Receiver
- Protocol Processor for Intelligent Transceiver
- 1310nm FP Laser TDM Application
- Metal Package for Lower EMI
- Supports Transparent SONET Over Packet (TSOP)
- Single Power Supply Voltage: 3.3V
- LC Duplex Connector
- Operating Temperature: 0 to 70 Celsius
- RoHS Compliant and Lead-Free



### Applications

- OC-48 Transmission
- Access and Enterprise

### Product Description

This Industry Standard SFP transceiver provides OC-48 (2488mbps) transmission rates for up to 2km over single-mode fiber (SMF) using a wavelength of 1310nm via an LC connector. It is guaranteed to be 100% compatible with the equivalent Industry Standard 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. Digital optical monitoring (DOM) support is also present to allow access to real-time operating parameters. This transceiver is Trade Agreements Act (TAA) compliant. We stand behind the quality of our products and proudly offer a limited lifetime warranty.

AddOn'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."



## Absolute Maximum Ratings

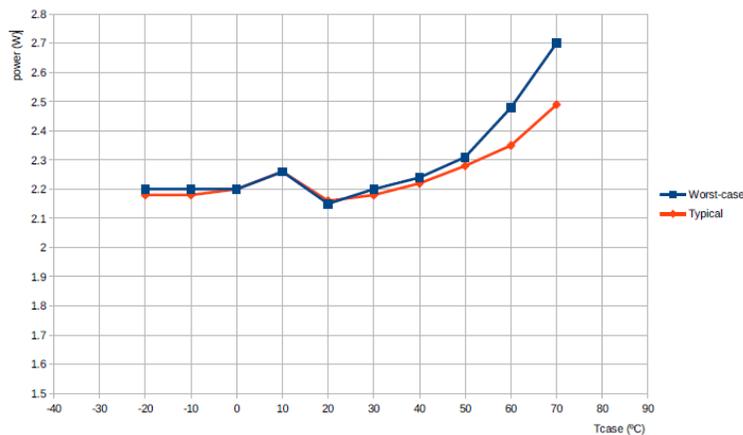
Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Maximum Supply Voltage	Vcc	0		4.0	V	
Storage Temperature	Tstg	-40		85	°C	
Operating Case Temperature	Tc	0		70	°C	
Operating Relative Humidity		5		85	%	
Relative Humidity		5		95	%	
Transmission Distance	Dmax	2			km	
Bit Error Rate	Electrical	BER	10.3		Gbps	
	Optical	BER	2.488		Gbps	

## Electrical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Power Supply Current	Icc			861	mA	
Power Supply Voltage	Vcc	3.135	3.30	3.465	V	
Power Consumption				2.7	W	
ESD (High-Speed Pins)				500	V	1
Voltage Ramp for Dying Gasp				-22	mV/μsec	
<b>Transmitter</b>						
Input Differential Impedance	PIN		100		Ω	
Single-Ended Data Input Swing	VIN,pp	100		625	mV	
Tx_Disable Voltage	VD	2.4			V	
Tx_Enable Voltage	VEN			0.8V		
<b>Receiver</b>						
Differential Data Output Swing	VOUT	200		800	mVp-p	
Data Output Rise/Fall Time	Tr/Tf			260	pm	20-80%

## Notes:

1.



## Optical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
<b>Transmitter</b>						
Optical Power	POUT	-8		-3	dBm	1
Extinction Ratio	ER	8.2			dB	
Optical Wavelength	$\Lambda$	1270	1310	1360	nm	
Spectral Width	$\sigma_{RMS}$			4.0	nm	
Relative Intensity Noise	RIN			-113	dB/Hz	
Jitter Generation (12kHz~20MHz)				0.1	UI	
Jitter Generation (500Hz~20MHz)				0.5	UI	
Jitter Tolerance		0.15			UI	
Dispersion Penalty	DP			1	dB	
<b>Receiver</b>						
Average Sensitivity	Rsens1			-19	dBm	2
Maximum Input Power	Pmax	-3			dBm	
Optical Wavelength	$\lambda$	1260		1620	nm	
LOS Assert	LOSA	-35			dBm	
LOS De-Assert	LOSD			-14	dBm	
LOS Hysteresis		0.5	2	3	dB	

### Notes:

1. Using 9/125 SMF.
2. Measured with PRBS of  $2^{23}-1 \times 10^{-10}$  BER and 8.2dB extinction ratio at 1310nm.

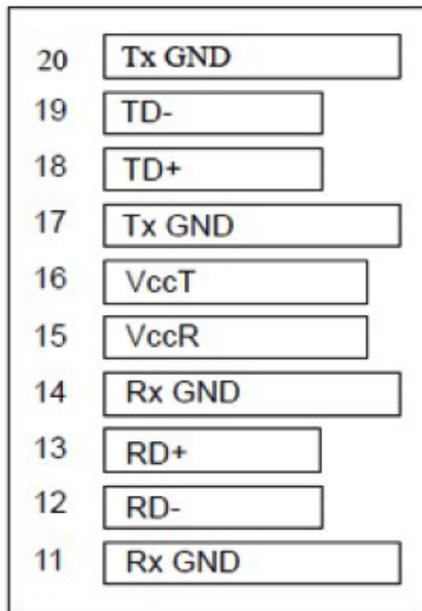
## Pin Descriptions

Pin	Symbol	Name/Description	Plug Seq.	Notes
1	Tx GND	Transmitter Ground.	1	1
2	Tx Fault	Transmitter Fault Indication.	3	2
3	Tx Disable	Transmitter Disable.	3	3
4	Mod-Def2	Module Definition 2.	3	4
5	Mod-Def1	Module Definition 1.	3	4
6	Mod-Def0	Module Definition 0.	3	4
7	Rate Select	No User Connection.	3	
8	LOS	Loss of Signal.	3	5
9	Rx GND	Receiver Ground.	1	1
10	Rx GND	Receiver Ground.	1	1
11	Rx GND	Receiver Ground.	1	1
12	RD-	Receiver Negative Data Out.	3	
13	RD+	Receiver Positive Data Out.	3	
14	Rx GND	Receiver Ground.	1	1
15	VccR	Receiver Power.	2	
16	VccT	Transmitter Power.	2	
17	Tx GND	Transmitter Ground.	1	1
18	TD+	Transmitter Positive Data In.	3	
19	TD-	Transmitter Negative Data In.	3	
20	Tx GND	Transmitter Ground.	1	1

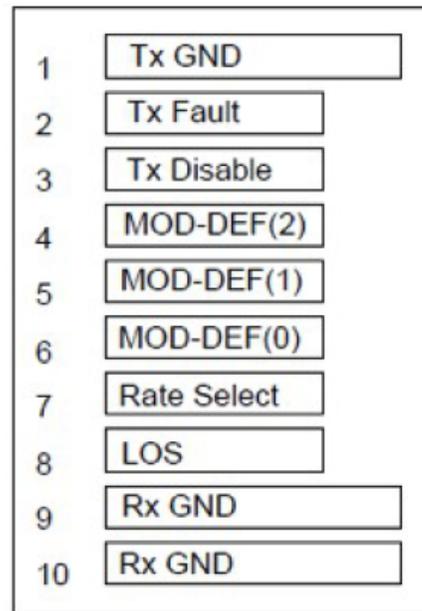
### Notes:

- The circuit ground is internally isolated from the frame ground. Tx GND and Rx GND may be internally isolated within the Trx module.
- Tx Fault is an open collector output that shall be pulled up with a 4.7kΩ to 10kΩ on the host board. Pull-up voltage between 2.0V and VccT+0.3V. When “high,” output indicated a laser fault of some kind. When “low,” output indicates normal operation. The LD output is not turned off in case of Tx Fault.
- Tx Disable is an input that is used to shut down the transmitter optical output. It is pulled within the Trx with a 4.7kΩ to 10kΩ.
- Mod-Def 0, 1, and 2 are the SFP module definition pins. They should be pulled up with a 4.7kΩ to 10kΩ on the host board. The pull-up voltage shall be VccT.
  - Mod-Def0 indicated that the module is present.
  - Mod-Def1 is the clock line of 2-wire serial interface for Serial ID.
  - Mod-Def2 is the data line of 2-wire serial interface for Serial ID.
- LOS is an open collector output. Shall be pulled up with a 4.7kΩ to 10kΩ on the host board. Pull-up voltage between 2.0 and VccR+0.3. “Logic 0” indicates normal operation.

## Electrical Pin-Out Details

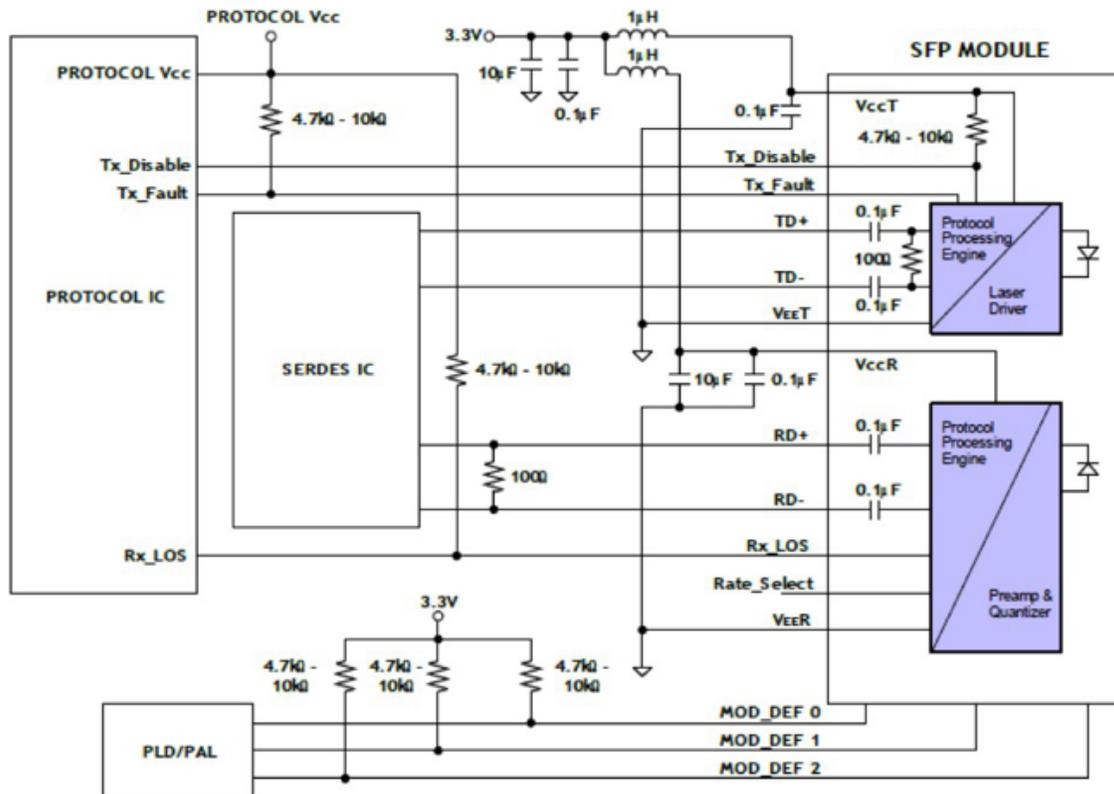


Top of Board

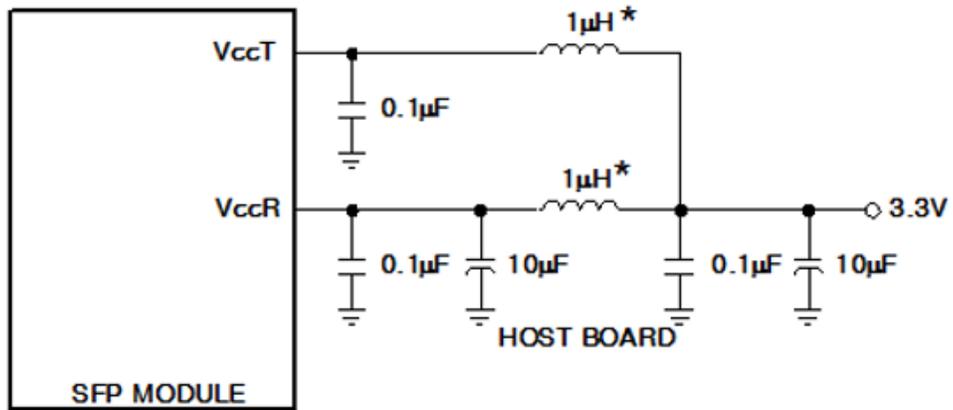


Bottom of Board

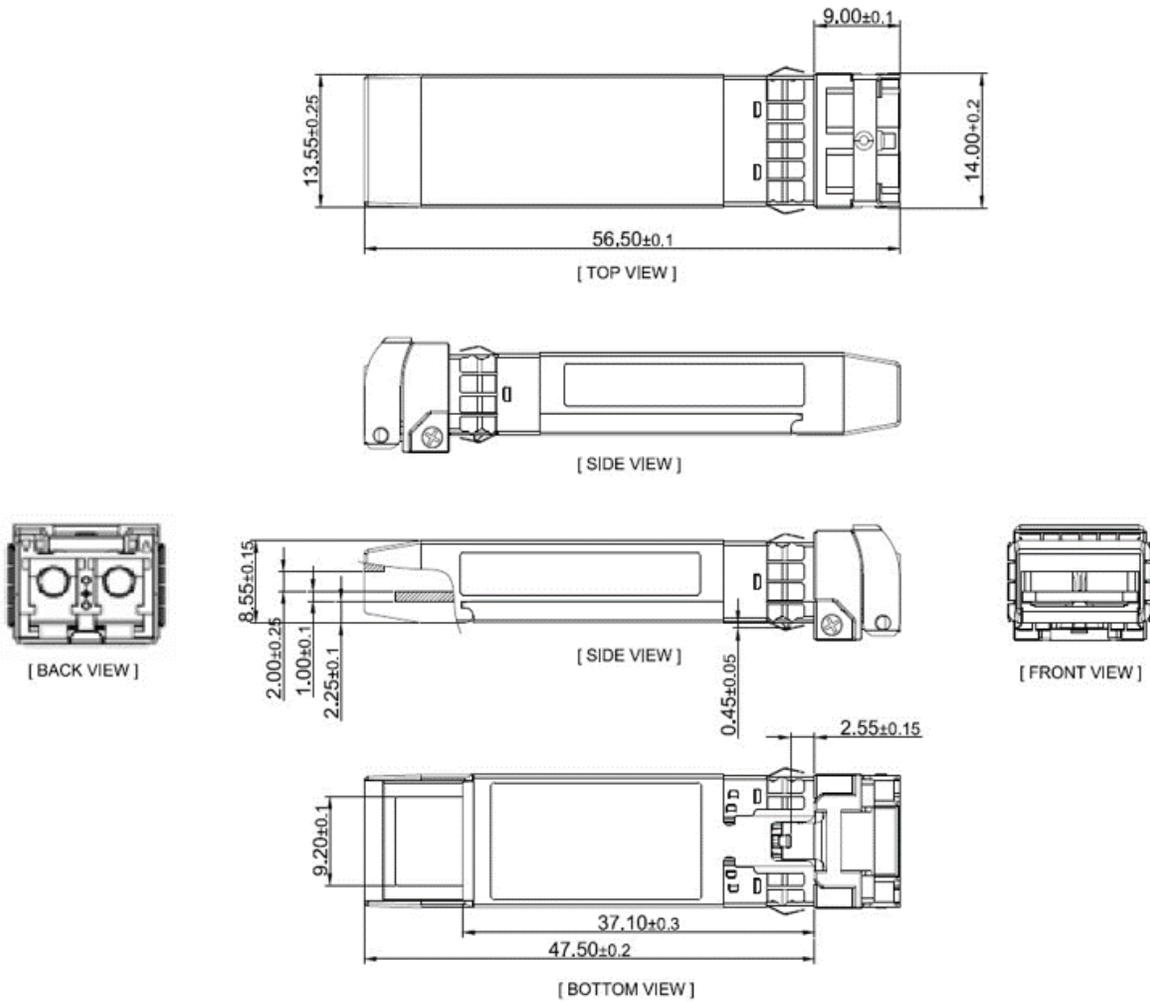
## SFP Host Board



## Recommended Host Board Supply Filtering Network



## Mechanical Specifications



## About AddOn Networks

In 1999, AddOn Networks entered the market with a single product. Our founders fulfilled a severe shortage for compatible, cost-effective optical transceivers that compete at the same performance levels as leading OEM manufacturers. Adhering to the idea of redefining service and product quality not previously had in the fiber optic networking industry, AddOn invested resources in solution design, production, fulfillment, and global support.

Combining one of the most extensive and stringent testing processes in the industry, an exceptional free tech support center, and a consistent roll-out of innovative technologies, AddOn has continually set industry standards of quality and reliability throughout its history.

Reliability is the cornerstone of any optical fiber network and is engrained in AddOn's DNA. It has played a key role in nurturing the long-term relationships developed over the years with customers. AddOn remains committed to exceeding industry standards with certifications from ranging from NEBS Level 3 to ISO 9001:2005 with every new development while maintaining the signature reliability of its products.



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