

### CWDM-SFP-47U-HD1-80-AO

Cisco® CWDM-SFP-47U-HD1-80 Compatible TAA Compliant 1000Base-CWDM SFP Transceiver (SMF, 1470nm LTx/HRx, 80km, LC, DOM)

#### Features

- INF-8074 and SFF-8472 Compliance
- 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

- 1x Fibre Channel
- Gigabit Ethernet over CWDM
- Access, Metro and Enterprise

#### Product Description

This Cisco® CWDM-SFP-47U-HD1-80 compatible SFP transceiver provides 1000Base-CWDM throughput up to 80km over single-mode fiber (SMF) at a bidirectional wavelength of 1470nm LTx/HRx via an LC connector. It is guaranteed to be 100% compatible with the equivalent Cisco® 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."



### Regulatory Compliance

- ESD to the Electrical PINs: compatible with MIL-STD-883E Method 3015.4
- ESD to the LC Receptacle: compatible with IEC 61000-4-3
- EMI/EMC compatible with FCC Part 15 Subpart B Rules, EN55022:2010
- Laser Eye Safety compatible with FDA 21CFR, EN60950-1& EN (IEC) 60825-1,2
- RoHS compliant with EU RoHS 2.0 directive 2015/863/EU

### Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Units	Conditions
Storage Temperature	Tstg	-40	+85	°C	Ambient
Power Supply Voltage	VCC		< +4.0	V	
Ambient Humidity	Hop	5	95	%	w/o dew
Operating Temperature	TC	-40	+85	°C	Case, w/airflow

**Electrical Characteristics (TOP=25°C, Vcc=3.3Volts)**

Parameter		Symbol	Min.	Typ.	Max.	Unit	Notes
Power Supply Voltage		Vcc	3.135	3.30	3.465	V	
Power Supply Current		Icc			550	mA	Cooled type
Power Supply Noise Rejection		PSNR			100	mVp-p	from 100Hz to 1MHz
Transmitter							
Data Rate		DRT	1.0625		1.25	Gb/s	
Differential Input Voltage		VINpp	150		1000	mV	
Differential Input Impedance		ZIN	90	100	110	ohm	
TX_Disable	Input Low	VIL	0		0.8	V	LVTTTL,Normal at Low, High is Shutdown(Poff)
	Input high	VIH	2.0		3.465	V	
	Assert Time	tOFF			10	us	High
	Negate Time	tON			1	ms	Low
Tx Disable to reset		treset	10			us	High
Time to Initialize Cooled Including reset of Tx_Fault		tinit_cooled			10	sec	1
TX_Fault	Output Low	VFOL	0		0.8	V	LVTTTL, Low is Normal
	Output High	VFOH	2.0		Vcc+0.3	V	
Receiver							
Data Rate		DRR	1.0625		1.25	Gb/s	
Differential Output Voltage		Vout	480		1080	mV	
Differential Output Impedance		Zout	90	100	110	ohm	
Rx_LOS (Loss of Signal)	Output Low	VLOSL	0		0.8	V	LVTTTL, Low is normal
	Output High	VLOSH	2		Vcc+0.3	V	
	Assert time	tLOS-ON			100	us	Low -> High
	Deassert time	tLOS-OFF			100	us	High -> Low

**Notes:**

1. Cooled version, for wavelength stabilization at worst case (Low & High temperature)

## Optical Characteristics

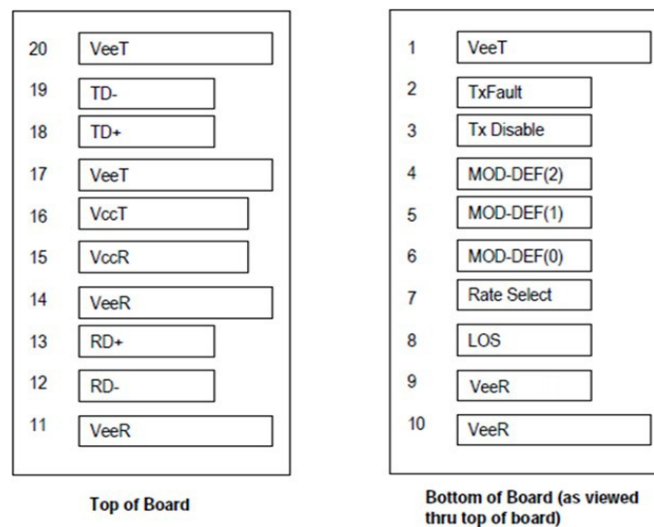
Parameter		Symbol	Min.	Typ.	Max.	Unit	Conditions	
Transmitter								
Optical Transmit Power		P <sub>f</sub>	-2.5		2.0	dBm		
Transmitter Disable (Off) Power		P <sub>off</sub>			-35	dBm	@Tx_Diable is High	
Peak Wavelength	HBD24-AE2MW-IxL	λ <sub>p</sub>	λ <sub>c</sub> - 6.5 ~ λ <sub>c</sub> - 1.5			nm	CWDM, DFB-LD, Note1	
	HBD24-AE2MW-IxH		λ <sub>c</sub> + 2.0 ~ λ <sub>c</sub> + 6.5					
Spectral Width		Δλ			1.0	nm	@-20 dB	
Side Mode Suppression Ratio		SMSR	30			dB		
RIN <sub>12OMA</sub>		RIN			-117	dB/Hz		
Dispersion Penalty		DP			2.0	dB		
Extinction Ratio		ER	8.2			dB	@1.25Gb/s,PRBS 2 <sup>7</sup> -1	
Eye pattern Mask		IEEE802.3/2008						
Receiver								
Optical Sensitivity		S			-29.5	dBm	Note 2	
Optical Overload		OL	-5.0			dBm	Note 2	
Operating wavelength	HBD24-AE2MW-IxL	λ <sub>o</sub>	λ <sub>c</sub> + 2.0 ~ λ <sub>c</sub> + 6.5			nm	Note 1	
	HBD24-AE2MW-IxH		λ <sub>c</sub> - 6.5 ~ λ <sub>c</sub> - 1.5					
Rx_LOS (Loss of signal)	Assert	P <sub>A</sub>	-40.0			dBm	Squelch function enable	
	De-assert	P <sub>D</sub>			-29.5	dBm		
	Hysteresis	P <sub>A</sub> -P <sub>D</sub>	0.5	2.0	5.0	dB		
Receiver Reflectance					-27	dB	@ λ <sub>o</sub>	
RSSI Calibration		RCAL	Internal Calibrated (The host side can be read by an external way)					

## Notes:

- $\lambda_c=1271,1291,1311,1331,1351,1371,1391,1411,1431,1451,1471,1491,1511,1531,1551,1571,1591,1611\text{nm}$
- PRBS2<sup>7</sup>-1, BER1x10<sup>-12</sup>, Source ER=8.2[dB]

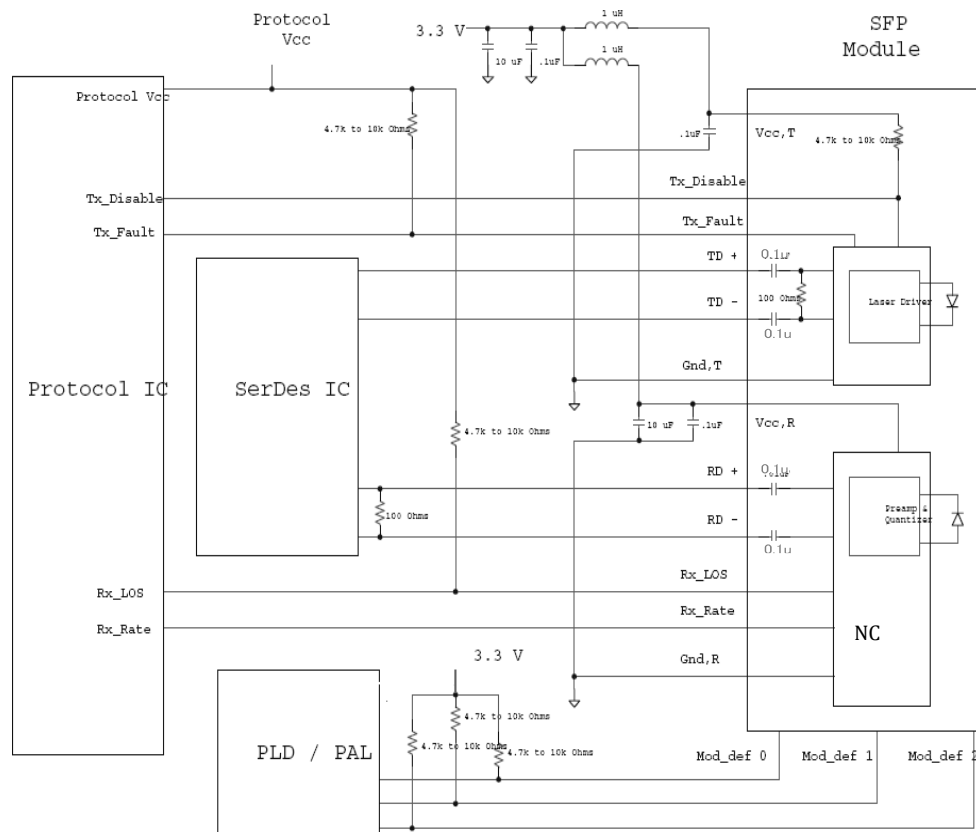
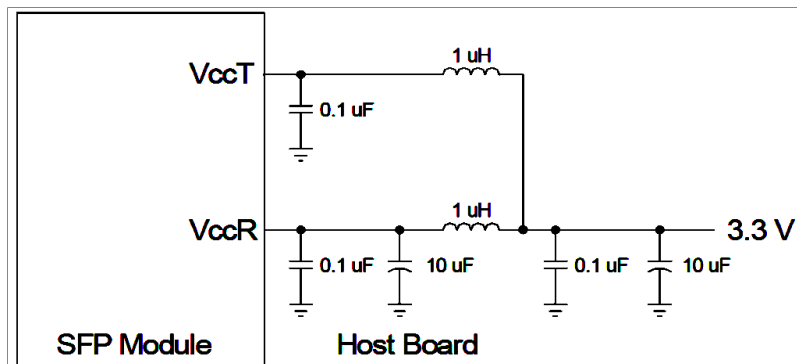
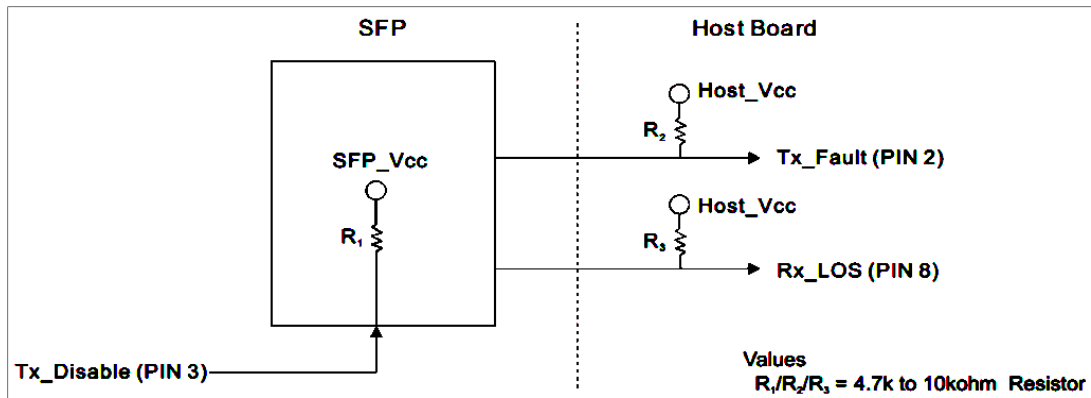
## Pin Descriptions

Pin	Symbol	Name/Descriptions	Ref.
1	TGND(VeeT)	Ground	1
2	Tx_Fault	Status Out	3
3	Tx_Disable	Control In	3
4	MOD_DEF(2)	Input/Output(SDA, I <sup>2</sup> C data)	3
5	MOD_DEF(1)	Input/Output(SCL, I <sup>2</sup> C clock)	3
6	MOD_DEF(0)	Indicates that the module is present,Grounded internally	3
7	Rate Select	Rate Select In(NC)	3
8	RX_LOS	Status Out	3
9	RGND(VeeR)	Ground	3
10	RGND(VeeR)	Ground	1
11	RGND(VeeR)	Ground	1
12	Rx_Data bar	Data Out Negative	3
13	Rx_Data	Data Out Positive	3
14	RGND(VeeR)	Ground	1
15	Rx_Vcc(VccR)	Power	2
16	Tx_Vcc(VccR)	Power	2
17	TGND(VeeT)	Ground	1
18	Tx_Data	Data In Positive	3
19	Tx_Data bar	Data In Negative	3
20	TGND(VeeT)	Ground	1



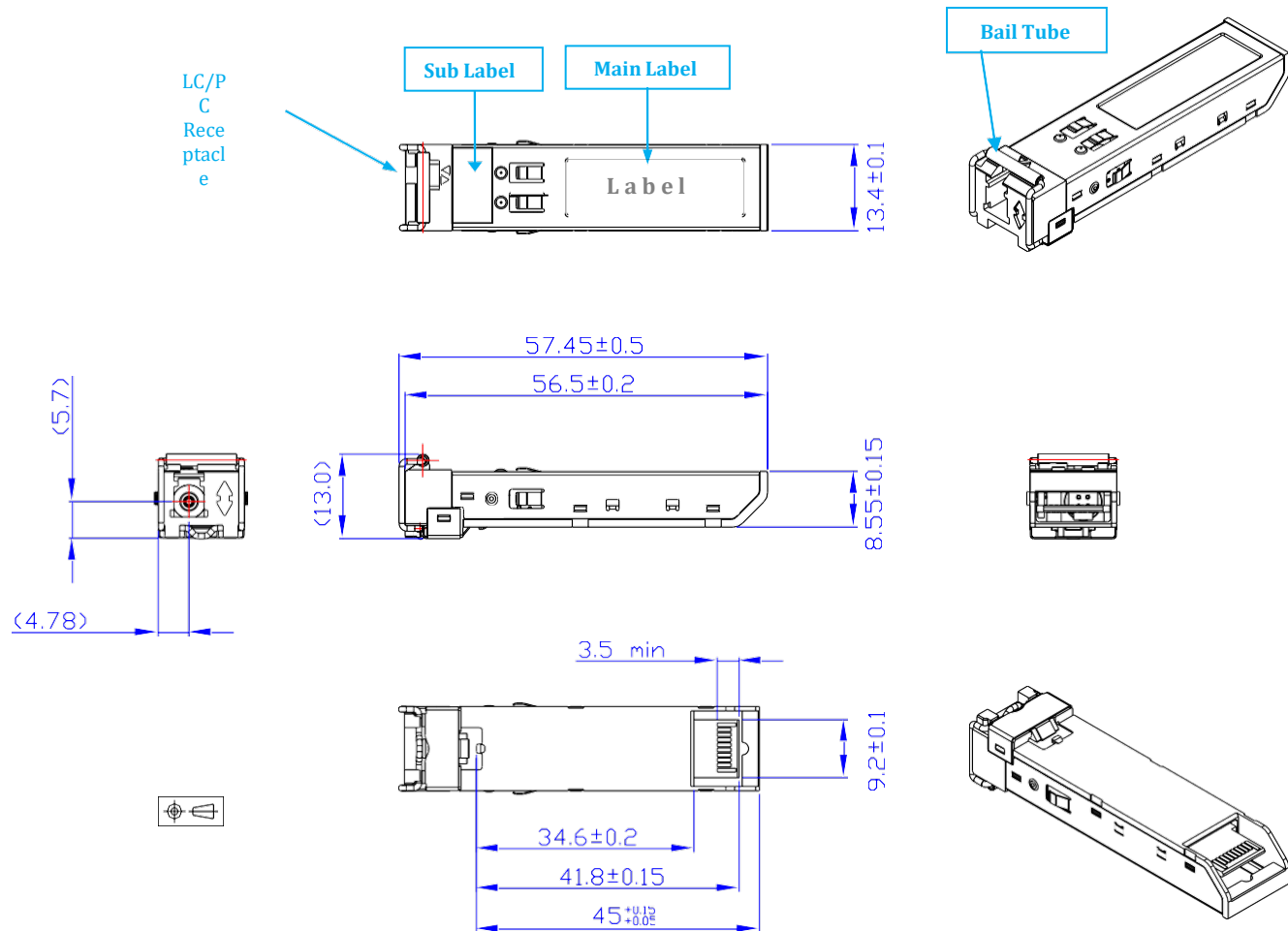
Pin-out of connector Block on Host board

Recommended Circuit Schematic



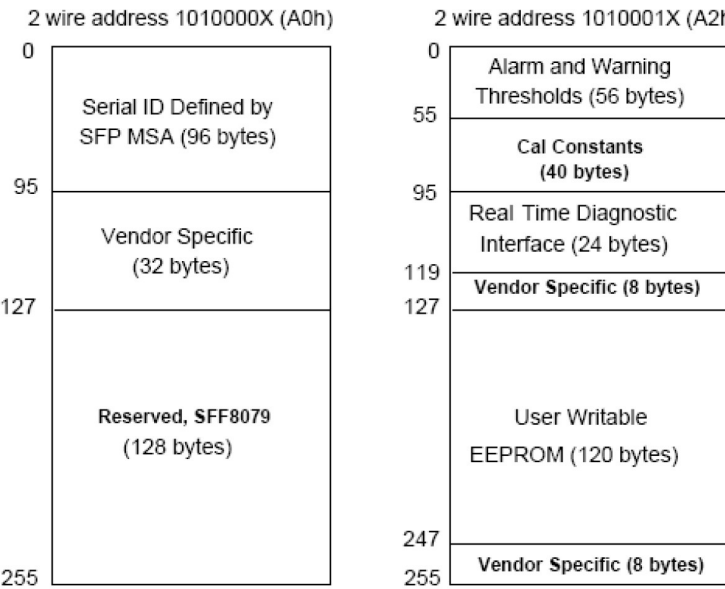
**Mechanical Specifications**

Small Form Factor Pluggable (SFP) transceivers are compatible with the dimensions defined by the SFP Multi-Sourcing Agreement (MSA).

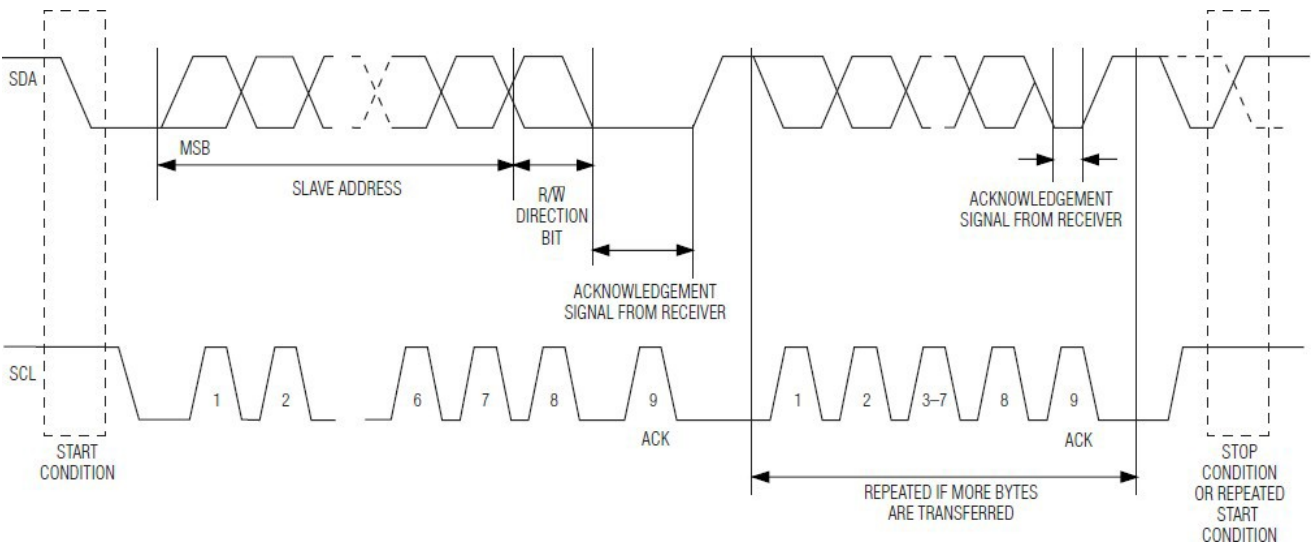


EEPROM Information

EEPROM memory map specific data field description is as below:



2-Wire Data Transfer Protocol





**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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