

### **CWDM-SFP-47D-HD1-80-C**

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

#### **Features:**

- INF-8074 and SFF-8472 Compliance
- Simplex LC Connector
- Single-mode Fiber
- Commercial Temperature 0 to 70 Celsius
- Hot Pluggable
- Metal with Lower EMI
- Excellent ESD Protection
- RoHS Compliant and Lead Free



#### **Applications:**

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

#### **Product Description**

This Cisco® CWDM-SFP-47D-HD1-80 compatible SFP transceiver provides 1000Base-CWDM throughput up to 80km over single-mode fiber (SMF) at a bidirectional wavelength of 1470nm HTx/LRx 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.

ProLabs'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	T <sub>stg</sub>	-40	+85	°C	Ambient
Power Supply Voltage	VCC		< +4.0	V	
Ambient Humidity	H <sub>op</sub>	5	95	%	w/o dew
Operating Temperature	TC	0	70	°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			500	mA	Cooled type
Power Supply Noise Rejection	PSNR			100	mVp-p	from 100Hz to 1MHz
<b>Transmitter</b>						
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	
<b>Receiver</b>						
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

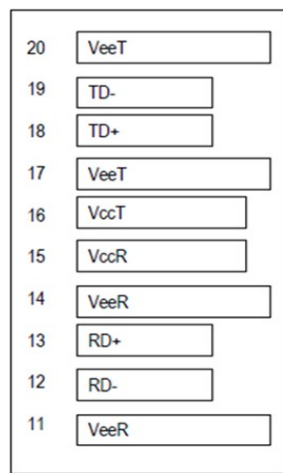
Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions	
<b>Transmitter</b>							
Optical Transmit Power	Pf	-2.5		2.0	dBm		
Transmitter Disable (Off) Power	Poff			-35	dBm	@Tx_Diable is High	
Peak Wavelength	$\lambda_p$	$\lambda_c + 2.0 \sim \lambda_c + 6.5$			nm	CWDM, DFB-LD, Note1	
Spectral Width	$\Delta\lambda$			1.0	nm	@-20 dB	
Side Mode Suppression Ratio	SMSR	30			dB		
RIN <sub>12OMA</sub>	RIN			-117	dB/Hz		
Dispersion Penalty	DP			1.5	dB		
Extinction Ratio	ER	8.2			dB	@1.25Gb/s, PRBS 2 <sup>7</sup> -1	
Eye pattern Mask	IEEE802.3/2008					@1.25Gb/s, PRBS 2 <sup>7</sup> -1	
<b>Receiver</b>							
Optical Sensitivity	S			-26.5	dBm	Note 2	
Optical Overload	OL	2.0			dBm	Note 2	
Operating wavelength	$\lambda_o$	$\lambda_c - 6.5 \sim \lambda_c - 1.5$			nm	Note 1	
Rx_LOS (Loss of signal)	Assert	PA	-38.0			dBm	Squelch function enable
	De-assert	PD			-26.5	dBm	
	Hysteresis	PA-PD	0.5	2.0	5.0	dB	
Receiver Reflectance				-27	dB	@ $\lambda_o$	
RSSI Calibration	RCAL	Internal Calibrated (The host side can be read by an external way)					

### Notes:

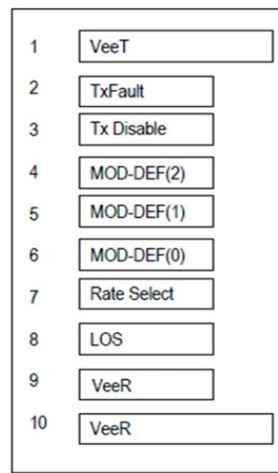
- $\lambda_c=1271,1291,1311,1331,1351,1371,1391,1411,1431,1451,1471,1491,1511,1531,1551,1571,1591,1611\text{nm}$
- PRBS<sup>27</sup>-1, BER $1 \times 10^{-12}$ , Source ER=8.2[dB]

## 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



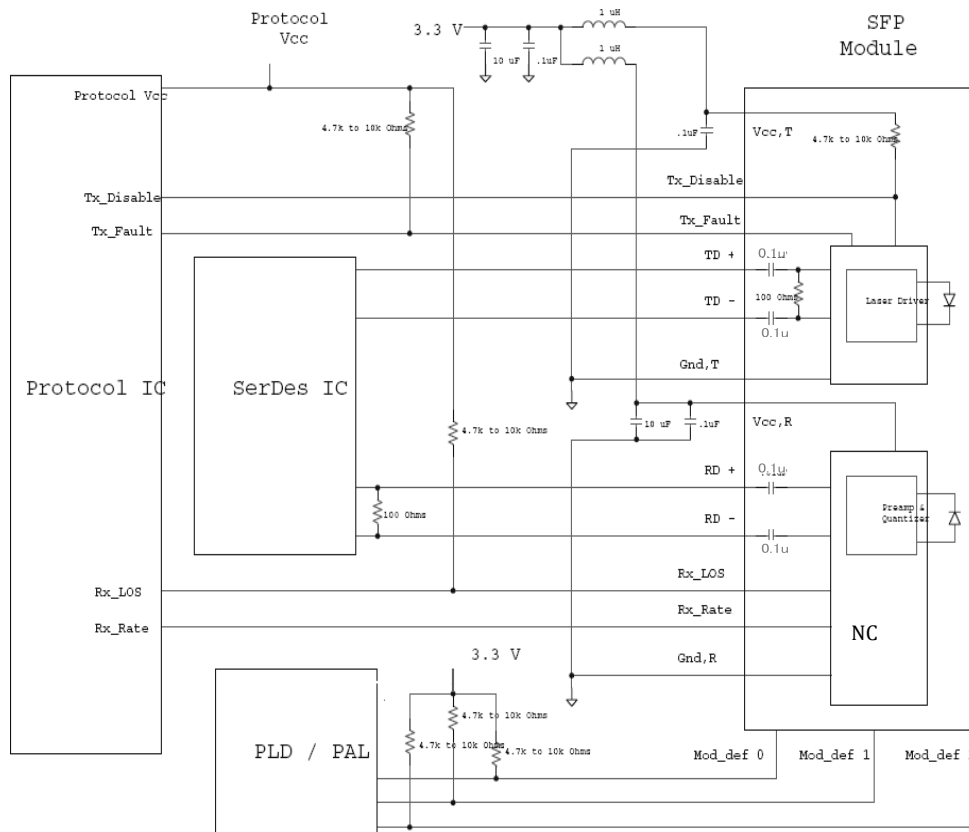
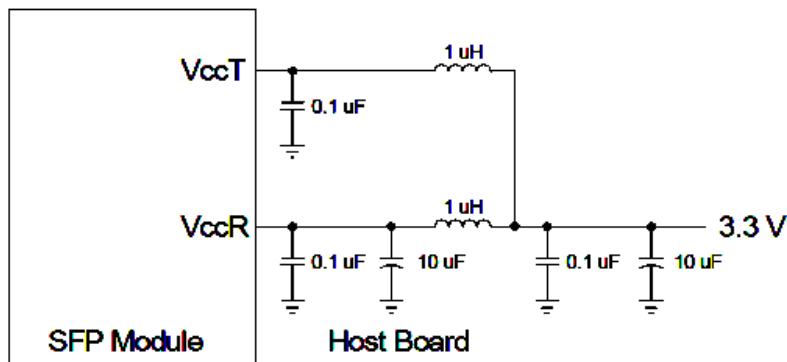
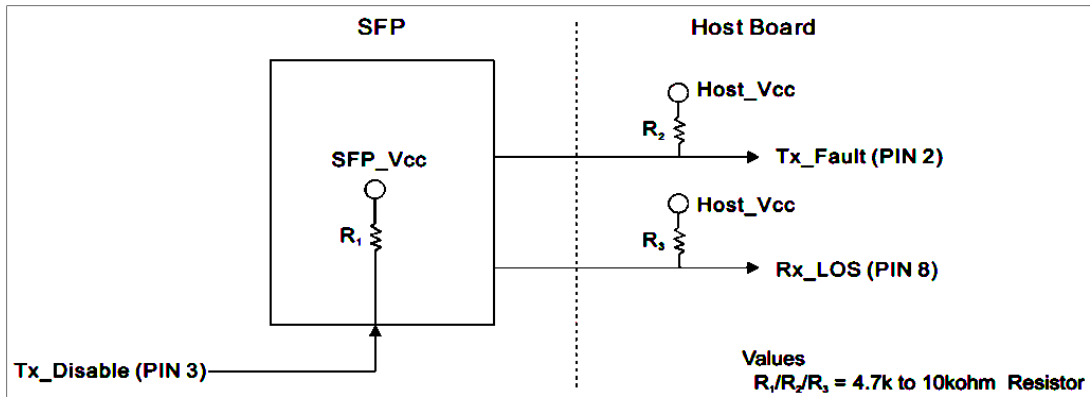
Top of Board



Bottom of Board (as viewed thru top of board)

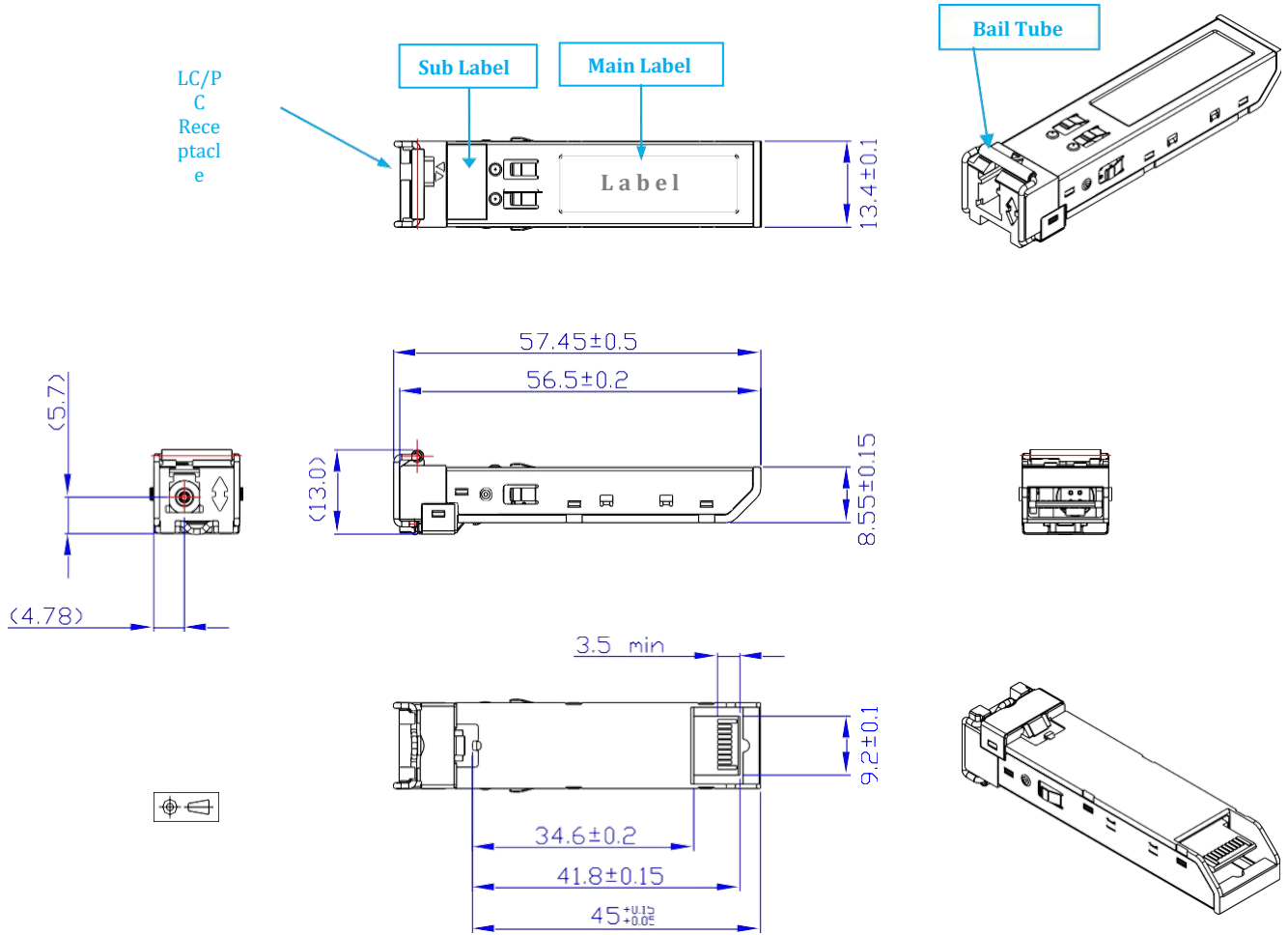
Pin-out of connector Block on Host board

## Recommended Circuit Schematic



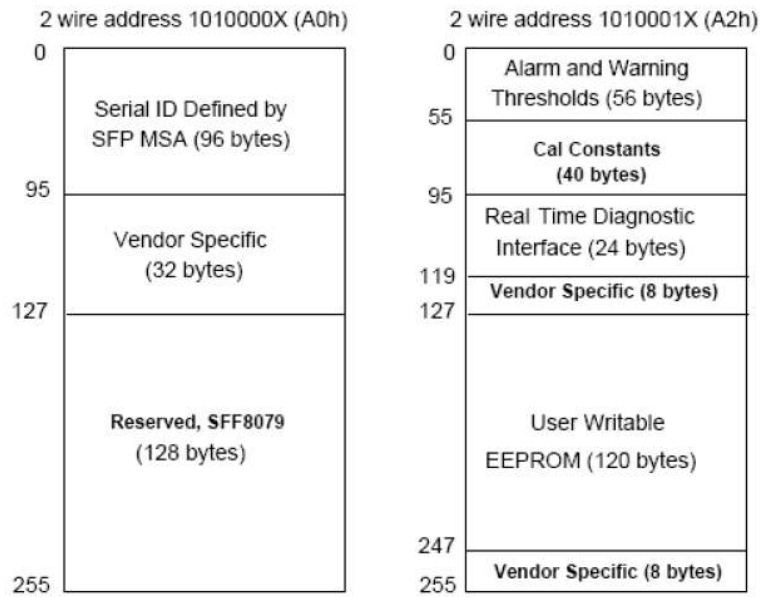
## Mechanical Specifications

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

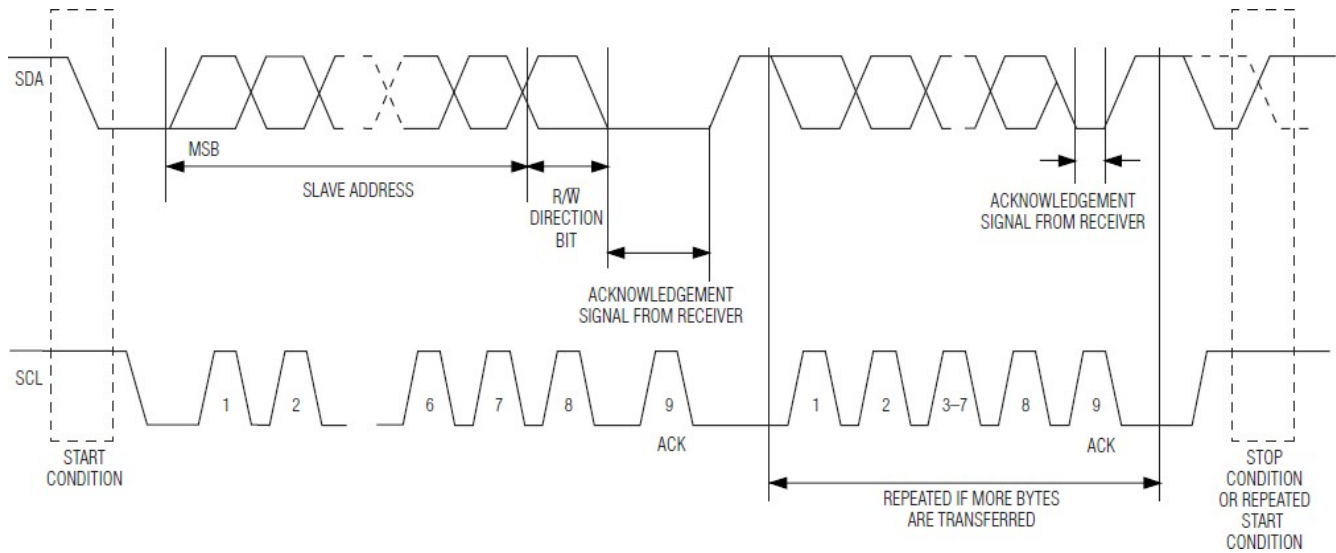


## EEPROM Information

EEPROM memory map specific data field description is as below:



## 2-Wire Data Transfer Protocol





## **About ProLabs**

Our experience comes as standard; for over 15 years ProLabs has delivered optical connectivity solutions that give our customers freedom and choice through our ability to provide seamless interoperability. At the heart of our company is the ability to provide state-of-the-art optical transport and connectivity solutions that are compatible with over 90 optical switching and transport platforms.

## **Complete Portfolio of Network Solutions**

ProLabs is focused on innovations in optical transport and connectivity. The combination of our knowledge of optics and networking equipment enables ProLabs to be your single source for optical transport and connectivity solutions from 100Mb to 400G while providing innovative solutions that increase network efficiency. We provide the optical connectivity expertise that is compatible with and enhances your switching and transport equipment.

## **Trusted Partner**

Customer service is our number one value. ProLabs has invested in people, labs and manufacturing capacity to ensure that you get immediate answers to your questions and compatible product when needed. With Engineering and Manufacturing offices in the U.K. and U.S. augmented by field offices throughout the U.S., U.K. and Asia, ProLabs is able to be our customers best advocate 24 hours a day.

## **Contact Information**

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