

### **SFP-10GB-DW61-80-I-CN2-OPC**

Ciena® Compatible TAA 10GBase-DWDM SFP+ Transceiver C-Band 100GHz (SMF, 1528.77nm, 80km, LC, DOM, -40 to 85C)

#### **Features**

- SFF-8432 and SFF-8472 Compliance
- Duplex LC Connector
- Single-mode Fiber
- Industrial Temperature -40 to 85 Celsius
- Hot Pluggable
- Metal with Lower EMI
- Excellent ESD Protection
- RoHS Compliant and Lead Free



#### **Applications:**

- 10x Gigabit Ethernet over DWDM
- 8x/10x Fibre Channel
- Access and Enterprise

#### **Product Description**

This Ciena® compatible SFP+ transceiver provides 10GBase-DWDM throughput up to 80km over single-mode fiber (SMF) using a wavelength of 1528.77nm via an LC connector. It is capable of withstanding rugged environments and can operate at temperatures between -40 and 85C. Our transceiver is built to meet or exceed OEM specifications and is guaranteed to be 100% compatible with Ciena®. It has been programmed, uniquely serialized, and tested for data-traffic and application to ensure that it will initialize and perform identically. All of our transceivers comply with Multi-Source Agreement (MSA) standards to provide seamless network integration. Additional product features include Digital Optical Monitoring (DOM) support which allows 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.

## 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.

## Wavelength Guide (100GHz ITU-T Channel)

ITU Channel #	Frequency (THZ)	Center Wavelength (nm)
64	196.4	1526.44
63	196.3	1527.22
62	196.2	1527.99
61	196.1	1528.77

## Absolute Maximum Ratings

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Maximum Supply Voltage	Vcc	-0.5		3.6	V	
Storage Temperature	Tstg	-40		85	°C	
Operating Case Temperature	Tc	-40		85	°C	
Operating Humidity	RH	0		95	%	
Bit Rate	BR			11.1	Gbps	1
Bit Error Ratio	BER			10e <sup>-12</sup>		2
Max. Supported Link Length	LMAX			80	km	1

## Notes:

1. 10GBase-ZR, 10GBase-ZW, and 1200-SM-LL-L 10GFC.
2. Tested with a 2<sup>31</sup>-1 PRBS.

Electrical Characteristics

Parameter		Symbol	Min.	Typ.	Max.	Unit	Notes
Power Supply Voltage		Vcc	3.14	3.3	3.46	V	
Module Power		Icc			2000	mW	
Transmitter							
Input Differential Impedance		ZIN	80	100	120	Ω	
Differential Data Input		VIN	180		700	mVp-p	
Tx_Fault	Assert	VFA	2.0		Host_Vcc	V	
	De-Assert	VFDA	Vee		Vee+0.4	V	
Tx_Disable	Transmitter Disable	VIH	2.0		Host_Vcc	V	
	Transmitter Enable	VIL	Vee		Vee+0.8	V	
Receiver							
Differential Data Output		VOUT	350		850	mVp-p	
Output Rise Time		Tr	25			pS	
Output Fall Time		Tf	25			pS	
LOS Fault		LOS	2.0		Host_Vcc	V	
LOS Normal		LOS	Vee		Vee+0.4	V	

## Optical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Transmitter						
Average Launch Optical Power	POUT	0		4	dBm	1
Center Wavelength Range	$\lambda_C$	1526.44		1563.86	nm	
Center Wavelength Spacing			100		GHz	
Center Wavelength Tolerance	$\Delta\lambda_C$	x-100	x	x-100	pm	
Extinction Ratio	ER	8.2			dB	
Side-Mode Suppression Ratio	SMSR	30			dB	
Relative Intensity Noise	RIN			-128	dB/Hz	
Average Launch Power of Off Tx	Poff			-30	dBm	
Receiver						
Optical Center Wavelength	$\lambda_C$	1260		1620	nm	
Receiver Sensitivity	RSENSE			-24	dBm	2
Receiver Sensitivity @80km Fiber	RSENSE			-21	dBm	3
Receiver Overload	POL	-7			dBm	
Optical Return Loss	ORL	27			dB	
LOS De-Assert	LOSD			-27	dBm	
LOS Assert	LOSA	-37			dBm	
LOS Hysteresis		0.5			dB	

### Notes:

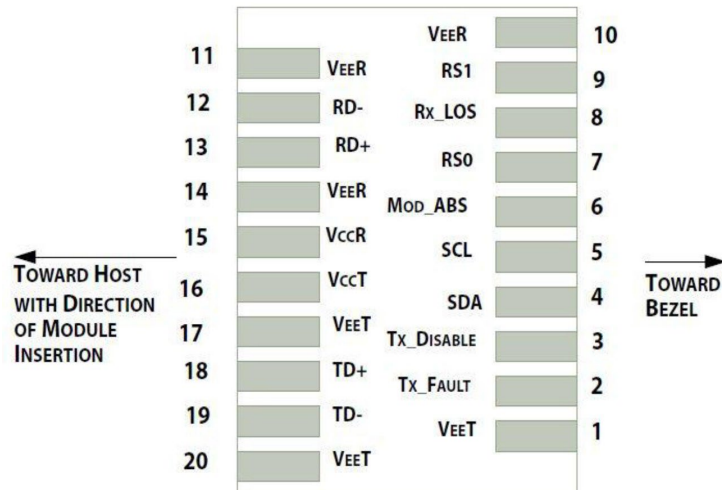
1. The optical power is launched into the SMF.
2. Measured at 1528-1600nm, ER>9dBm, PRBS 2<sup>31</sup>-1, and BER better than or equal to 10E<sup>-12</sup>.
3. Loopback using 80km fiber (SMF-28).

## Pin Descriptions

Pin	Symbol	Name/Description	Note
1	VeeT	Transmitter Ground (Common with Receiver Ground).	1
2	Tx_Fault	Transmitter Fault. LVTTTL-O.	2
3	Tx_Disable	Transmitter Disable. Laser output disabled on “high” or “open.” LVTTTL-I.	3
4	SDA	2-Wire Serial Interface Data (Same as MOD-DEF2 in INF-8074i). LVTTTL-I/O.	
5	SCL	2-Wire Serial Interface Clock (Same as MOD-DEF2 in INF-8074i). LVTTTL-I.	
6	MOD_ABS	Module Absent. Connect to the VeeT or VeeR in the module.	4
7	RS0	Rate Select 0. Not Used.	5
8	LOS	Loss of Signal Indication. “Logic 0” indicates normal operation. LVTTTL-O.	2
9	RS1	Rate Select 1. Not Used.	5
10	VeeR	Receiver Ground (Common with Transmitter Ground).	1
11	VeeR	Receiver Ground (Common with Transmitter Ground).	1
12	RD-	Receiver Inverted Data Out. AC Coupled. CML-O.	
13	RD+	Receiver Non-inverted Data Out. AC Coupled. CML-O.	
14	VeeR	Receiver Ground (Common with Transmitter Ground).	1
15	VccR	Receiver Power Supply.	
16	VccT	Transmitter Power Supply.	
17	VeeT	Transmitter Ground (Common with Receiver Ground).	1
18	TD+	Transmitter Non-Inverted Data In. AC Coupled. CML-I.	
19	TD-	Transmitter Inverted Data In. AC Coupled. CML-O.	
20	VeeT	Transmitter Ground (Common with Receiver Ground).	1

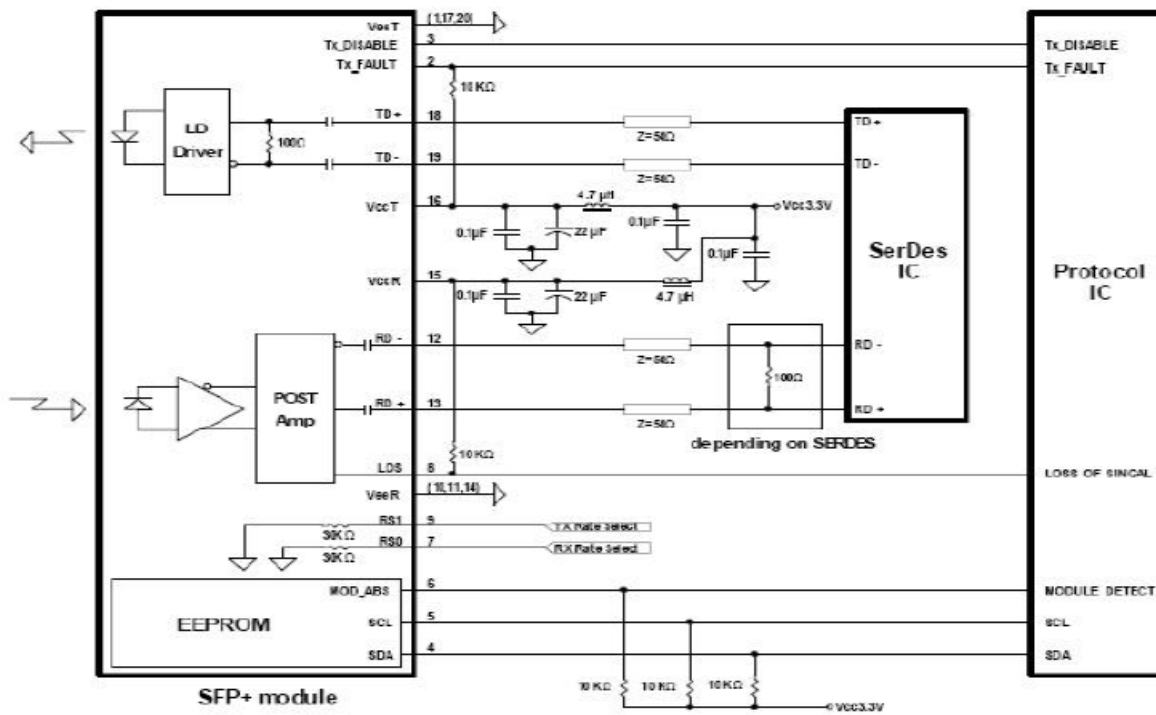
### Notes:

1. The module signal ground contacts, VeeR and VeeT, should be isolated from the module case.
2. This contact is an open collector/drain output and should be pulled up to the Vcc\_Host with resistor in the range 4.7kΩ-10kΩ. Pull-ups can be connected to one or several power supplies; however, the host board design shall ensure that no module contract has voltage exceeding module VccT/R+0.5V.
3. Tx\_Disable is an input contact with a 4.7kΩ-10kΩ pull-up resistor to the VccT inside the module.
4. MOD\_ABS is connected to the VeeT or VeeR in the SFP+ module. The host may pull the contract up to Host\_Vcc with a resistor in the range from 4.7kΩ-10kΩ. MOD\_ABS is asserted “high” when the SFP+ module is physically absent from a host slot.
5. Internally pulled down per SFF-8431.

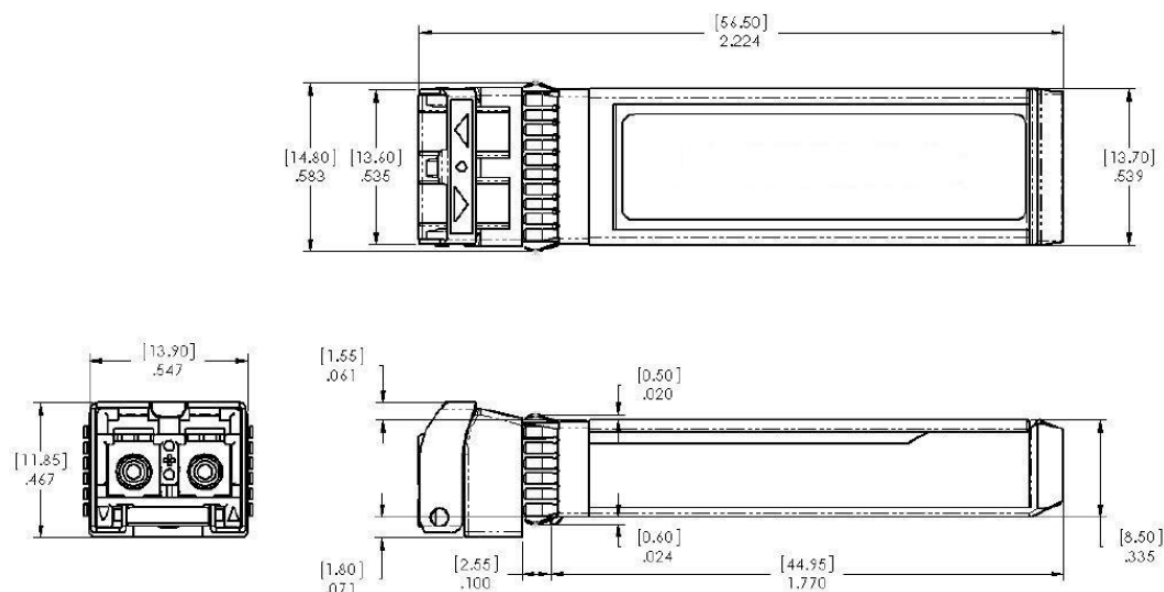


Pin-Out of Connector Block on the Host Board

### Recommended Circuit Schematic



Mechanical Specifications



EEPROM Information

EEPROM memory map-specific data field description is as below:

