#### SFP-10GERLC-CW53-OPC

Moxa® SFP-10GERLC-CW53 Compatible TAA 10GBase-CWDM SFP+ Transceiver (SMF, 1530nm, 40km, LC, DOM)

#### **Features**

- SFF-8432 and SFF-8472 Compliance
- Duplex 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:**

- 10x Gigabit Ethernet over CWDM
- 8x/10x Fibre Channel
- Access, Metro and Enterprise
- Mobile Fronthaul CPRI/OBSAI

#### **Product Description**

This Moxa® SFP-10GERLC-CW53 compatible SFP+ transceiver provides 10GBase-CWDM throughput up to 40km over single-mode fiber (SMF) using a wavelength of 1530nm via an LC connector. The listed reach has been determined using a link budget calculation and tested in a standard environment. Actual link distances achieved will be dependent upon the deployed environment. Our transceiver is built to meet or exceed OEM specifications and is guaranteed to be 100% compatible with Moxa®. 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. 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

#### **CWDM Available Wavelengths**

Wavelengths	Min.	Тур.	Max.
47	1464.5	1471	1477.5
49	1484.5	1491	1497.5
51	1504.5	1511	1517.5
53	1524.5	1531	1537.5
55	1544.5	1551	1557.5
57	1564.5	1571	1577.5
59	1584.5	1591	1597.5
61	1604.5	1611	1617.5

## **Absolute Maximum Ratings**

Parameter	Symbol	Min.	Тур.	Max.	Unit	Notes
Maximum Supply Voltage	Vcc	-0.5		4.0	V	1
Storage Temperature	TS	-40		85	°C	2
Operating Case Temperature	Тс	0		70	°C	
Data Rate	DR	1.2		11.3	Gb/s	3
Bit Error Rate	BER			10 <sup>-12</sup>		

## Notes:

- 1. For electrical power interface
- 2. Ambient temperature
- 3. IEEE 802.3ae

# Electrical Characteristics (V $_{CC} = 3.14 V \ to \ 3.46 V, \ T_C)$

Parameter	Symbol	Min.	Тур.	Max.	Unit	Notes	
Power Supply Voltage	Vcc	3.14	3.3	3.46	V		
Power Supply Current	Icc		400	450	mA		
Transmitter							
Input differential impedance	RIN		100		Ω		
Differential data input swing	VIN PP	120		850	mV		
Transmit Disable Voltage	V <sub>D</sub>	2		VCC	V		
Transmit Enable Voltage	VEN	VEE		V <sub>EE</sub> +0.8	V		
Receiver							
Differential data output swing	VOUT PP	300		850	mV		
Data output rise time/fall time (20%-80%)	t <sub>r</sub> /t <sub>f</sub>	28			ps		
LOS Fault	VLOS A	2		VCC HOST	V		
LOS Normal	VLOS D	VEE		V <sub>EE</sub> +0.5	V		

**Optical Characteristics** 

Parameter	Symbol	Min.	Тур.	Max.	Unit	Notes
Transmitter						
Output Optical Power	PTX	-1		4	dBm	1
Optical Center Wavelength	λ <sub>C</sub>	λ-6	λ	λ+6	nm	
Optical Modulation Amplitude	OMA	-5.2				2
Extinction Ratio	ER	8.2			dB	
Spectral Width (-20dB)	Δλ			0.6	nm	
Side Mode Suppression Ratio	SMSR	30			dB	
Relative Intensity Noise	RIN			-128	dB/Hz	
Transmitter Dispersion Penalty	TDP			2	dB	
Launch Power of OFF Transmitter	POUT_OFF			-30	dBm	1
Transmitter Jitter	ransmitter Jitter According to IEEE 802.3ae requirement			'		
Receiver						
Optical Center Wavelength	λ <sub>C</sub>	1260		1620	nm	
Average Receive Power	P <sub>RX</sub>	-16		-1	dBm	
Receiver Sensitivity @10.3Gb/s	RX_SEN			-16	dBm	3
Receiver Reflectance	TR <sub>RX</sub>			-27	dB	
LOS Assert	LOS <sub>A</sub>	-25			dBm	

LOS De-Assert	LOS <sub>D</sub>		-18	dBm	
LOS Hysteresis	LOS <sub>H</sub>	0.5		dB	

#### Notes:

- 1. Average
- 2. Per IEEE 802.3ae
- 3. Measured with worst ER: BER<10<sup>-12</sup>; 2<sup>31</sup>-1 PRBS

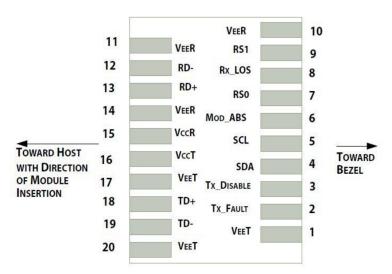
**Pin Descriptions** 

Pin	Symbol	Name/Descriptions	Ref.
1	VeeT	Transmitter Ground (Common with Receiver Ground).	1
2	TX Fault	Transmitter Fault. LVTTL-O	2
3	TX Disable	Transmitter Disable. Laser output disabled on high or open. LVTT-I.	3
4	SDA	2-Wire Serial Interface Data Line (Same as MOD-DEF2 in INF-8074i). LVTTL-I/O.	
5	SCL	2-Wire Serial Interface Data Line (Same as MOD-DEF2 in INF-8074i). LVTTL-I.	
6	MOD_ABS	Module Absent, Connect to VeeT or VeeR in Module.	4
7	RS0	Rate Select 0. Not used	5
8	LOS	Loss of Signal indication. Logic 0 indicates normal operation. LVTTL-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:**

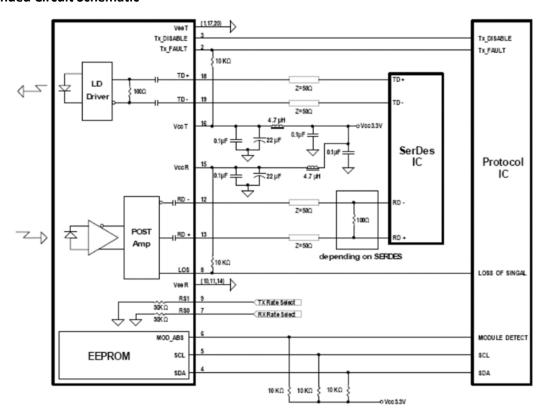
- 1. The module signal ground contacts, VeeR and VeeT, should be isolated from the module case.
- 2. This contact is an open collector/drain output and should be pulled up to the Vcc\_Host with resister in the range  $4.7K\Omega$  to  $10K\Omega$ . Pull ups can be connected to one or several power supplies, however the host board design shall ensure that no module contract has voltage exceeding module VccT/R +0.5.V.
- 3. Tx\_Disable is an input contact with a 4.7K $\Omega$  to 10K $\Omega$  pull-up resistor to VccT inside module.

- 4. Mod\_ABS is connected to VeeT or VeeR in the SFP+ module. The host may pull the contract up to Vcc\_Host with a resistor in the range from  $4.7K\Omega$  to  $10K\Omega$ . Mod\_ABS is asserted "High" when the SFP+ module is physically absent from a host slot.
- 5. Internally pulled down per SFF-8431



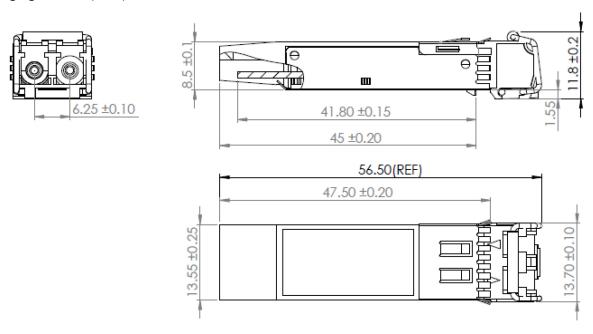
Pin-out of connector Block on Host board

## **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:

