

10Gbps SFP+ CWDM 1271nm-1451nm 40km Transceiver

Product Features:

- Support multi protocol from 8.5Gb/s to 11.3Gb/s
- Hot pluggable SFP+ footprint
- Compliant with SFF 8472 and IEE802.3ae
- 1271~1451nm CWDM DFB transmitter
- PIN Receiver
- Duplex LC connector
- 2-wire interface for management and diagnostic monitor
- Single Power 3.3V supply voltages
- Temperature range 0°C to 70°C
- Power dissipation: <1.5W
- RoHS Compliant Part

Applications:

- 10GBASE-ER/EW Ethernet
- 10G Fiber channel
- SONET OC-192/SDH STM-64
- CWDM Networks

Description:

The 10Gbps SFP+ CWDM transceivers are compliant with the current SFP+ Multi-Source Agreement (MSA) Specification. The high performance cooled 1271~1451nm CWDM DFB transmitter and high sensitivity PIN receiver provide superior performance for Ethernet applications up to 40km optical links. The SFP+ Module compliants with SFF-8431, SFF-8432 and IEEE 802.3ae 10GBASE-ER. Digital diagnostics functions are available via a 2-wire serial interface, as specified in SFF-8472.

Specification:

● Absolute Maximum Ratings

Parameter	Symbol	Min.	Typical	Max.	Unit
Storage Temperature	T_s	-40		+85	°C
Case Operating Temperature	T_c	0		70	°C
Maximum Supply Voltage	Vcc	-0.5		4	V
Relative Humidity	RH	0		85	%

● Electrical Characteristics (TOP = T_c , VCC = 3.135 to 3.465 Volts)

Parameter	Symbol	Min.	Typical	Max.	Unit	Note
Supply Voltage	Vcc	3.135		3.465	V	
Supply Current	Icc			400	mA	
Power Consumption	P			1.5	W	
Transmitter Section:						
Input differential impedance	Rin		100		Ω	1
Tx Input Single Ended DC Voltage Tolerance (Ref VeeT)	V	-0.3		4	V	
Differential input voltage swing	Vin,pp	180		700	mV	2
Transmit Disable Voltage	V _D	2		Vcc	V	3
Transmit Enable Voltage	V _{EN}	Vee		Vee+0.8	V	
Receiver Section:						
Single Ended Output Voltage Tolerance	V	-0.3		4	V	
Rx Output Diff Voltage	Vo	300		850	mV	
Rx Output Rise and Fall Time	Tr/Tf	30			ps	4
LOS Fault	V _{LOS} fault	2		VccHOST	V	5
LOS Normal	V _{LOS} norm	Vee		Vee+0.8	V	5

Note:

1. Connected directly to TX data input pins. AC coupling from pins into laser driver IC.
2. Per SFF-8431 Rev 3.0
3. Into 100 ohms differential termination.
4. 20%~80%
5. LOS is an open collector output. Should be pulled up with 4.7k – 10k Ω on the host board. Normal operation is logic 0; loss of signal is logic 1. Maximum pull-up voltage is 5.5V.

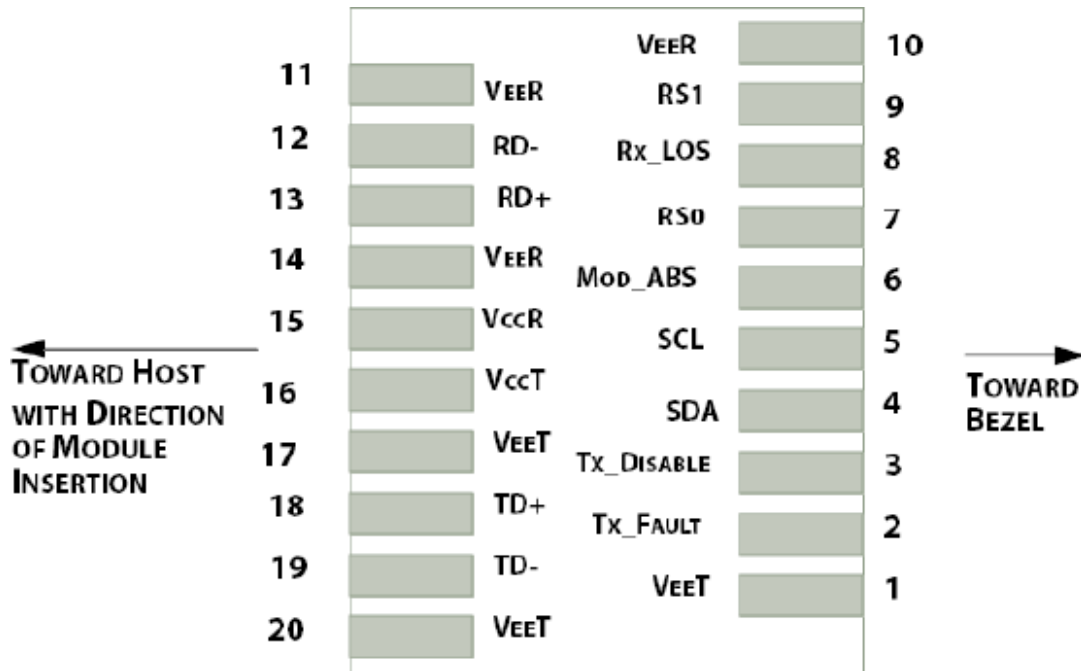
● **Optical Characteristics (TOP =Tc, VCC = 3.135 to 3.465 Volts)**

Parameter	Symbol	Min.	Typical	Max.	Unit	Note
Transmitter Section:						
Center Wavelength	λ_c	$\lambda-6.5$		$\lambda+6.5$	nm	
spectral width	$\Delta\lambda$			1	nm	
Average Optical Power	Pavg	1		+5.5	dBm	1
Laser Off Power	Poff			-30	dBm	
Extinction Ratio	ER	3.5			dB	
Transmitter Dispersion Penalty	TDP			3.2	dB	2
Relative Intensity Noise	Rin			-128	dB/Hz	3
Optical Return Loss Tolerance		20			dB	
Receiver Section:						
Center Wavelength	λ_r	1260		1460	nm	
Receiver Sensitivity	Sen			-15	dBm	4
Stressed Sensitivity (OMA)	Sen _{ST}			-13	dBm	4
Los Assert	LOS _A	-30		-	dBm	
Los De-assert	LOS _D			-17	dBm	
Los Hysteresis	LOS _H	0.5			dB	
Overload	Sat	0			dBm	5
Receiver Reflectance	Rrx			-12	dB	

Note:

1. Average power figures are informative only, per IEEE802.3ae.
2. TWDP figure requires the host board to be SFF-8431compliant. TWDP is calculated using the Matlab code provided in clause 68.6.6.2 of IEEE802.3ae.
3. 12dB reflection.
4. Conditions of stressed receiver tests per IEEE802.3ae. CSRS testing requires the host board to be SFF-8431 compliant.
5. Receiver overload specified in OMA and under the worst comprehensive stressed condition.

Pin Assignment:



● Pin Function Definitions

PIN #	Name	Function	Notes
1	VeeT	Module transmitter ground	1
2	Tx Fault	Module transmitter fault	2
3	Tx Disable	Transmitter Disable; Turns off transmitter laser output	3
4	SDL	2 wire serial interface data input/output (SDA)	
5	SCL	2 wire serial interface clock input (SCL)	
6	MOD-ABS	Module Absent, connect to VeeR or VeeT in the module	2
7	RS0	Rate select0, optionally control SFP+ receiver. When high, input data rate >4.5Gb/ s; when low, input data rate <=4.5Gb/s	
8	LOS	Receiver Loss of Signal Indication	4
9	RS1	Rate select0, optionally control SFP+ transmitter. When high, input data rate >4.5Gb/s; when low, input data rate <=4.5Gb/s	
10	VeeR	Module receiver ground	1
11	VeeR	Module receiver ground	1
12	RD-	Receiver inverted data out put	
13	RD+	Receiver non-inverted data out put	
14	VeeR	Module receiver ground	1
15	VccR	Module receiver 3.3V supply	

16	VccT	Module transmitter 3.3V supply	
17	VeeT	Module transmitter ground	1
18	TD+	Transmitter inverted data out put	
19	TD-	Transmitter non-inverted data out put	
20	VeeT	Module transmitter ground	1

Note:

1. The module ground pins shall be isolated from the module case.
2. This pin is an open collector/drain output pin and shall be pulled up with 4.7K-10Kohms to Host_Vcc on the host board.
3. This pin shall be pulled up with 4.7K-10Kohms to VccT in the module.
4. This pin is an open collector/drain output pin and shall be pulled up with 4.7K-10Kohms to Host_Vcc on the host board.

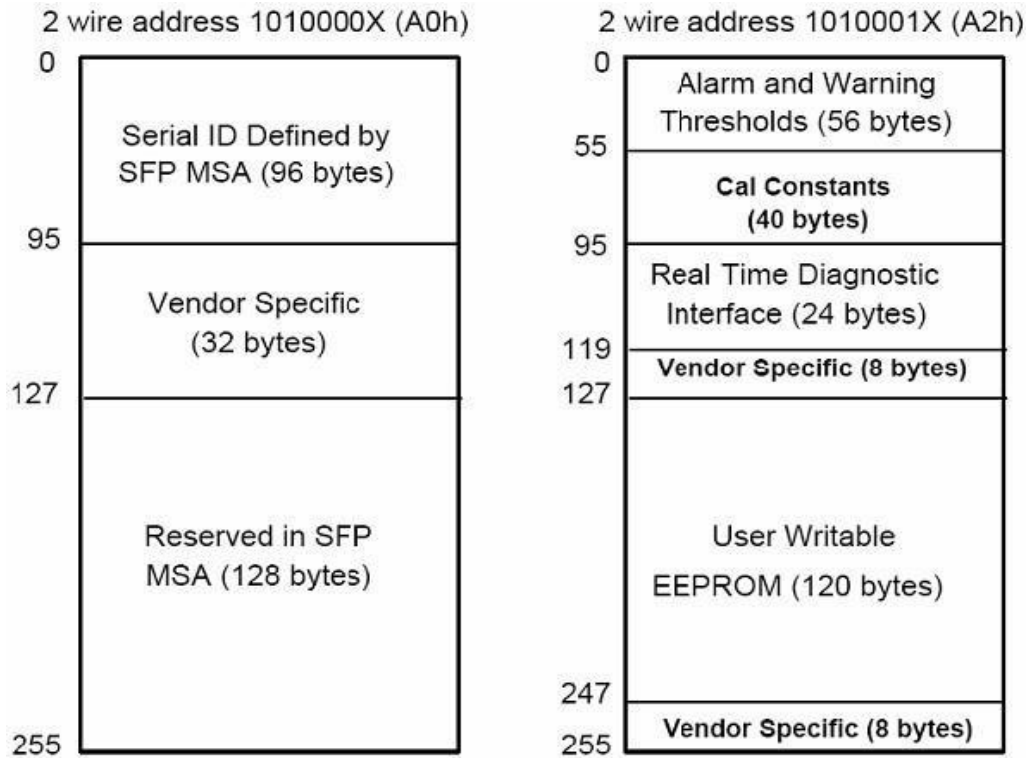
SFP Module EEPROM Information and Management

The SFP modules implement the 2-wire serial communication protocol as defined in the SFP-8472. The serial ID information of the SFP modules and Digital Diagnostic Monitor parameters can be accessed through the I2C interface at address A0h and A2h.

The memory is mapped in Table 1.

Detailed ID information (A0h) is listed in Table 2. And the DDM specification at address A2h.

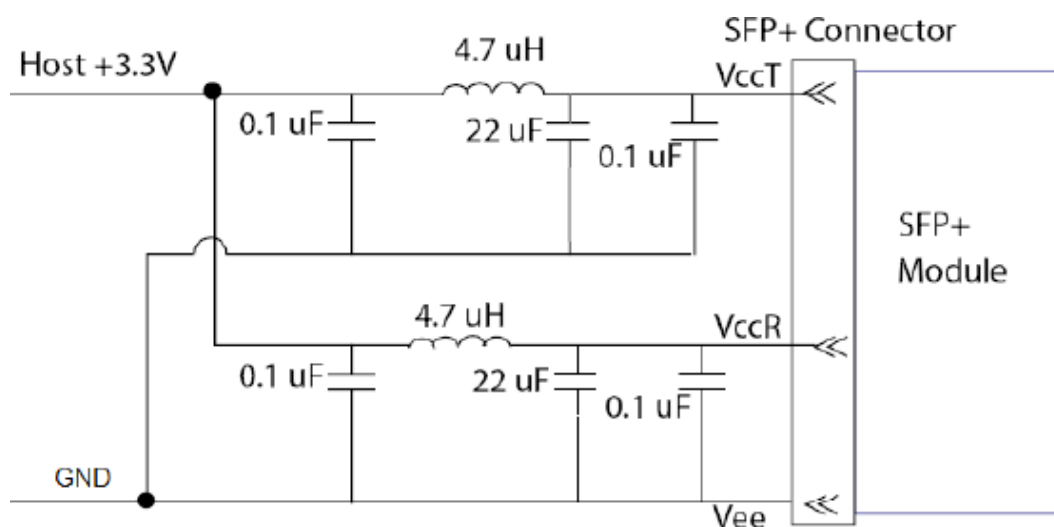
For more details of the memory map and byte definitions, please refer to the SFF-8472, "Digital Diagnostic Monitoring Interface for Optical Transceivers". The DDM parameters have been internally calibrated.

Table 1. Digital Diagnostic Memory Map (Specific Data Field Descriptions)

Table 2. EEPROM Serial ID Memory Contents (A0h)

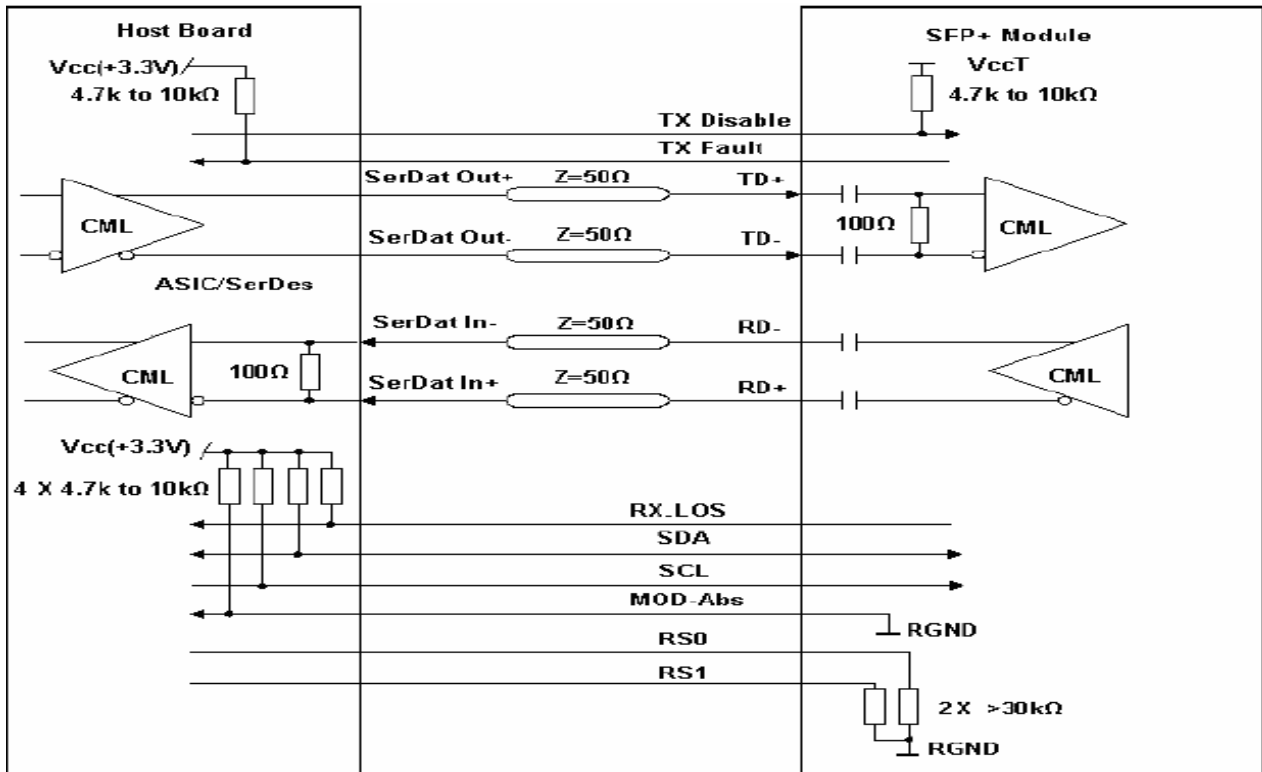
Data Address	Length (Byte)	Name of Length	Description and Contents
Base ID Fields			
0	1	Identifier	Type of Serial transceiver (03h=SFP)
1	1	Reserved	Extended identifier of type serial transceiver (04h)
2	1	Connector	Code of optical connector type (07=LC)
3-10	8	Transceiver	10G Base-ER
11	1	Encoding	64B/66B
12	1	BR, Nominal	Nominal baud rate, unit of 100Mbps
13-14	2	Reserved	(0000h)
15	1	Length(9um)	Link length supported for 9/125um fiber, units of 100m
16	1	Length(50um)	Link length supported for 50/125um fiber, units of 10m
17	1	Length(62.5um)	Link length supported for 62.5/125um fiber, units of 10m
18	1	Length(Copper)	Link length supported for copper, units of meters
19	1	Reserved	
20-35	16	Vendor Name	SFP vendor name
36	1	Reserved	

37-39	3	Vendor OUI	SFP transceiver vendor OUI ID
40-55	16	Vendor PN	Part Number
56-59	4	Vendor rev	Revision level for part number
60-62	3	Reserved	
63	1	CCID	Least significant byte of sum of data in address 0-62
Extended ID Fields			
64-65	2	Option	Indicates which optical SFP signals are implemented (001Ah = LOS, TX_FAULT, TX_DISABLE all supported)
66	1	BR, max	Upper bit rate margin, units of %
67	1	BR, min	Lower bit rate margin, units of %
68-83	16	Vendor SN	Serial number (ASCII)
84-91	8	Date code	Manufacturing date code
92-94	3	Reserved	
95	1	CCEX	Check code for the extended ID Fields (addresses 64 to 94)
Vendor Specific ID Fields			
96-127	32	Readable	Specific date, read only
128-255	128	Reserved	Reserved for SFF-8079

Recommended Circuit:

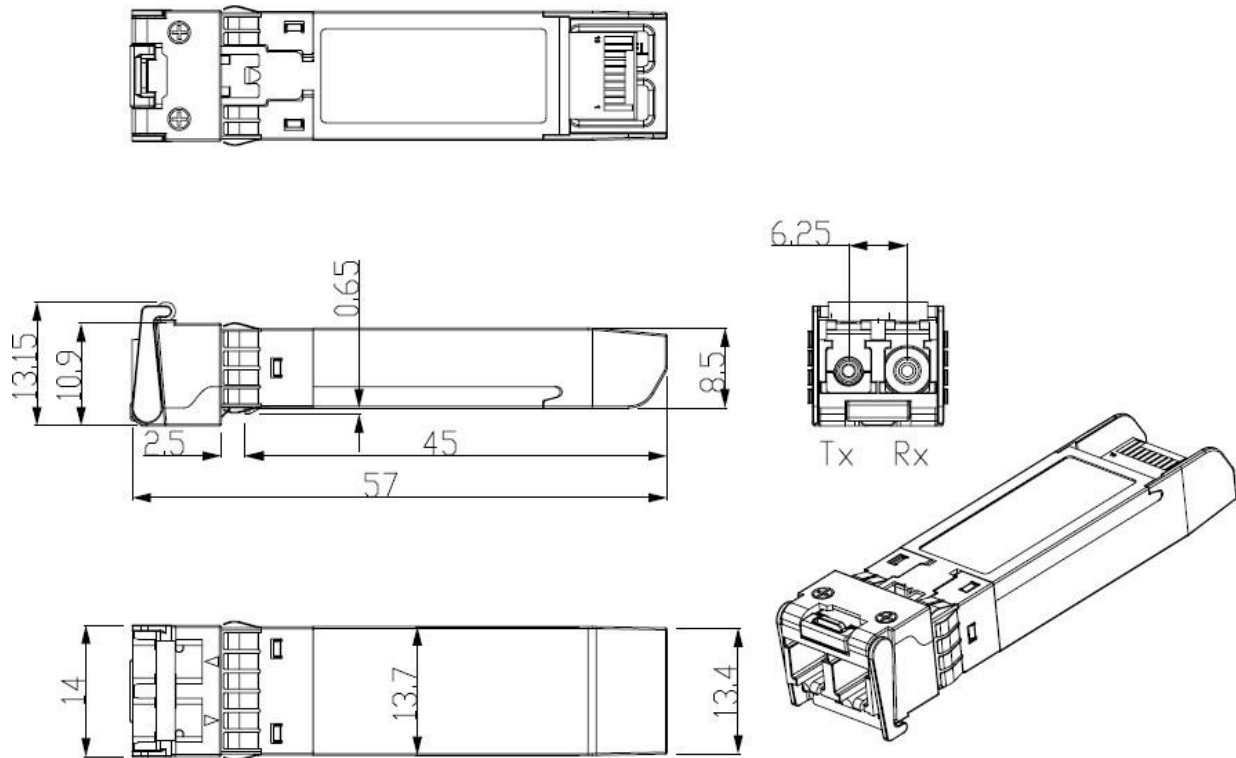


Recommended Host Board Power Supply Circuit



Recommended High-speed Interface Circuit

Mechanical Dimensions:



Ordering Information

Part No.	Data Rate	Wavelength	Optical Link budget	Recommend Distance
CWDM-SFP10G-27-80	10Gbps	1271nm	16dB	40km
CWDM-SFP10G-29-80	10Gbps	1291nm	16dB	40km
CWDM-SFP10G-31-80	10Gbps	1311nm	16dB	40km
CWDM-SFP10G-33-80	10Gbps	1331nm	16dB	40km
CWDM-SFP10G-35-80	10Gbps	1351nm	16dB	40km
CWDM-SFP10G-37-80	10Gbps	1371nm	16dB	40km
CWDM-SFP10G-39-80	10Gbps	1391nm	16dB	40km
CWDM-SFP10G-41-80	10Gbps	1411nm	16dB	40km
CWDM-SFP10G-43-80	10Gbps	1431nm	16dB	40km
CWDM-SFP10G-45-80	10Gbps	1451nm	16dB	40km

NOTICE:

Connlight reserves the right to make changes to this product in this specification without notice, in order to improve product performance.