



Features:

- Support CPRI wireless and 25G Ethernet application
- Support data rate up to 25.78125Gbps
- Up to 10km transmission on SMF
- LAN WDM laser and PIN receiver
- SFI high speed electrical interface
- 2-wire interface with integrated Digital Diagnostic monitoring
- SFP+ MSA package with duplex LC connector
- Single +3.3V power supply
- Power consumption lower than 2W
- Operating case temperature: -40~+85°C

Regulatory Compliance

Table 1 – Regulatory Compliance

Feature	Standard	Performance
Electrostatic Discharge (ESD) to the Electrical Pins	MIL-STD-883E Method 3015.7	Class 1(>1000V for SFI pins, >2000V for other pins.)
Electrostatic Discharge (ESD) to the Duplex LC Receptacle	IEC 61000-4-2 GR-1089-CORE	Compatible with standards
Electromagnetic Interference (EMI)	FCC Part 15 Class B EN55022 Class B (CISPR 22B)	Compatible with standards
Immunity	IEC 61000-4-3	Compatible with standards
Laser Eye Safety	FDA 21CFR 1040.10 and 1040.11 EN60950, EN (IEC) 60825-1,2	Compatible with Class I laser product.
RoHS	2011/65/EU	Compliant with standards

Absolute Maximum Ratings

Table 2 – Absolute Maximum Ratings

Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
Storage Temperature	TS	-40	-	+85	°C	
Operating Relative Humidity	RH	0	-	+95	%	

Recommended Operating Conditions

Table 3 – Recommended Operating Conditions

Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
Operating Case Temperature	T _{OPR}	-40	-	85	°C	
Power Supply Voltage	V _{CC}	3.135	3.3	3.465	V	
Power Supply Current	I _{CC}	-	-	520	mA	1
Power Dissipation	P	-	-	1.8	W	
Data rate	BR1	-	25.78125	-	Gbps	
	BR2					
Transmission Distance	TD	-	-	10	km	2

Note:

1. Max. current at 3.3V;
2. Measured with SMF.

Optical and Electrical Characteristics

Table 4 – Transmitter Optical Specifications

Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
Center Wavelength Range	λ _{C1}	1268.24	1269.23	1270.22	nm	XX:69
	λ _{C2}	1272.55	1273.54	1274.54	nm	XX:73
	λ _{C3}	1276.89	1277.89	1278.89	nm	XX:77
	λ _{C4}	1281.25	1282.26	1283.27	nm	XX:82
	λ _{C5}	1285.65	1286.66	1287.68	nm	XX:86
	λ _{C6}	1290.07	1291.1	1292.12	nm	XX:91
	λ _{C7}	1294.53	1295.56	1296.59	nm	XX:95
	λ _{C8}	1299.02	1300.05	1301.09	nm	XX:00
	λ _{C9}	1303.54	1304.58	1305.63	nm	XX:04
	λ _{C10}	1308.09	1309.14	1310.19	nm	XX:09
	λ _{C11}	1312.67	1313.73	1314.79	nm	XX:13
	λ _{C12}	1331.32	1332.41	1333.5	nm	XX:32
Average Output Power	P _{OUT}	-3	-	2.5	dBm	1
OMA		-2	-	-	dBm	
OMA-TDP		-3			dBm	
Average Output Power (Laser Off)	P _{OUT-OFF}	-	-	-30	dBm	1
Extinction Ratio	ER	4	-	-	dB	2
Spectral width(-20dB)	DI	-	-	1	nm	
Side Mode Suppression Ratio	SMS	30	-	-	dB	

	R					
TDP				2.7	dB	
Transmitter eye mask definition {X1, X2, X3, Y1, Y2, Y3} Hit ratio 5×10^{-5} hits per sample.	-	{0.31, 0.4, 0.45, 0.34, 0.38, 0.4}				2
RIN _{20OMA}	-	-	-	-130	dB/H z	
Optical return loss tolerance	-	-	-	20	dB	

Note:

1. The optical power is launched into SMF.
2. Measured with a PRBS 2³¹-1 test pattern @25.78125Gbps.

Table 5 – Receiver Optical Specifications

Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
Center Wavelength Range	λ	1260		1360	nm	
Average receive power		-14		2	dBm	Note
Receiver sensitivity (OMA)	Sen	-	-	-14	dBm	Note
Receiver Overload	P _{IN-OL}	3	-	-	dBm	Note
LOS Assert	LOS _A	-30	-		dBm	
LOS De-assert	LOS _D	-	-	-19	dBm	
LOS Hysteresis	LOS _H	0.5	-	-	dB	
Receiver reflectance	RF	-	-	-26	dB	

Note: Measured with a PRBS 2³¹-1 test pattern @25.78125Gbps, BER≤5x10⁻⁵.

Table 6 – Electrical Specifications

Transmitter (Module Input)						
Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
Differential Data Input Amplitude	V _{IN,P-P}	180	-	900	mVpp	
Input Differential Impedance	Z _{IN}	90	100	110	Ω	
Tx_Fault	Normal Operation	V _{OL}	-0.3	0.4	V	
	Transmitter Fault	V _{OH}	2.4	V _{CC} +0.3	V	
Tx_Disable	Normal Operation	V _{IL}	-0.3	0.8	V	
	Laser Disable	V _{IH}	2.0	V _{CC} +0.3	V	
Receiver (Module Output)						
Differential Data Output Amplitude	V _{OUT,P-P}	300	-	900	mVpp	
Output Differential Impedance	Z _O	90	100	110	Ω	
Rx_LOS	Normal Operation	V _{OL}	-0.3	0.4	V	
	Lose Signal	V _{OH}	2.4	V _{CC} +0.3	V	

Recommended Host Board Power Supply Circuit

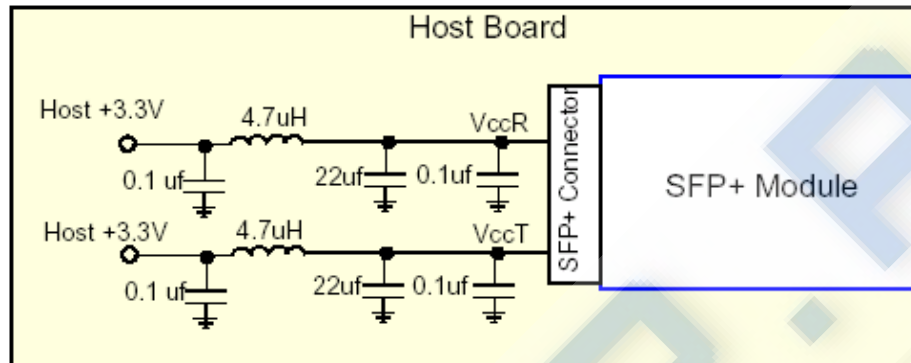


Figure 1, Recommended Host Board Power Supply Circuit

Recommended Interface Circuit

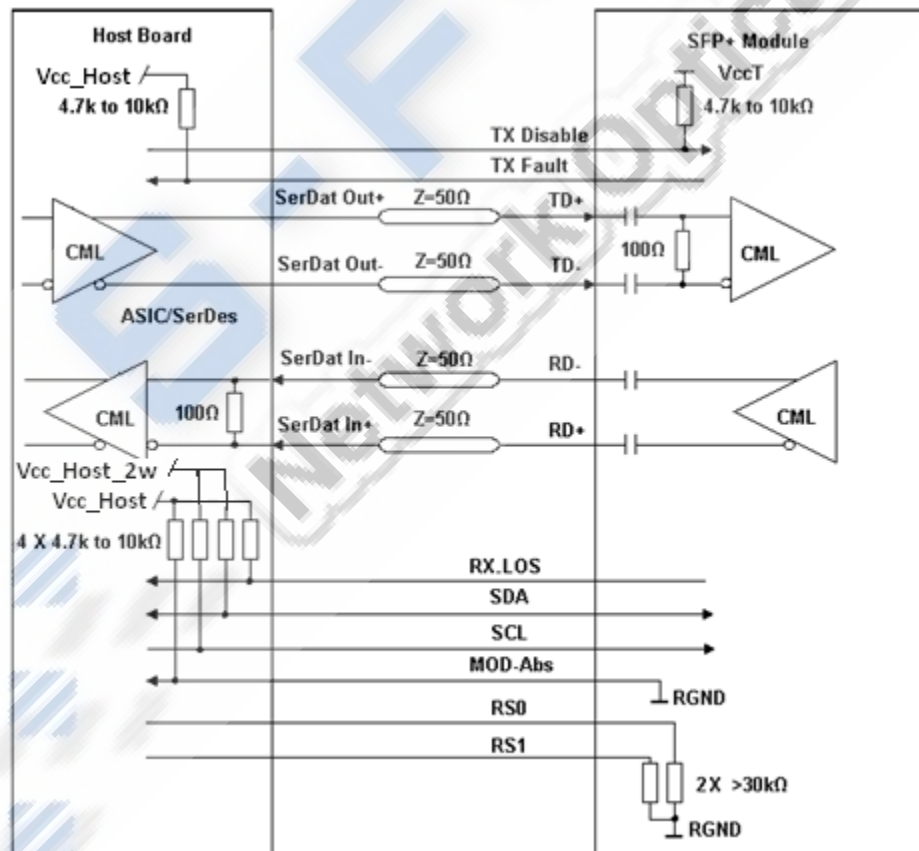


Figure 2, Recommended Interface Circuit

Pin Definitions

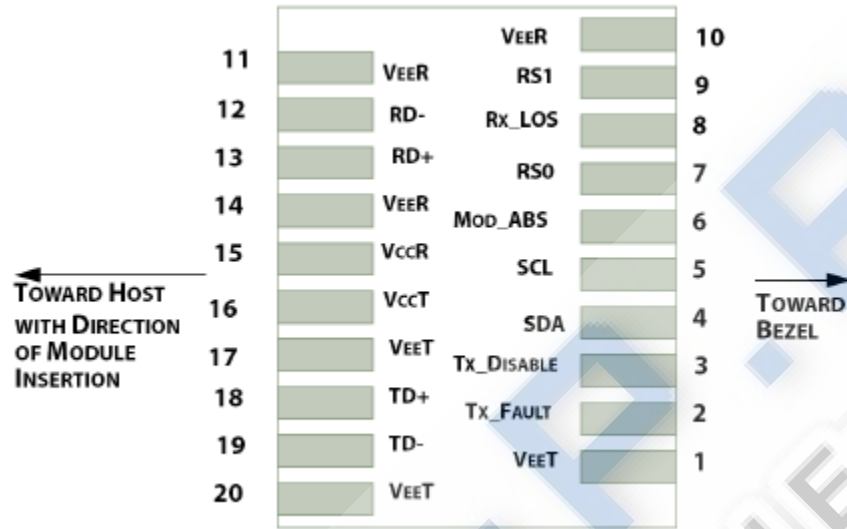


Figure 3, Pin View

Table 7 – Pin Definitions

Contacts	Logic	Symbol	Description	Notes
case		case	Module case	2
1		VEET	Module Transmitter Ground	3
2	LVTTL-O	TX_FAULT	Module Transmitter Fault	4
3	LVTTL-I	TX_DISABLE	Transmitter Disable; Turns off transmitter laser output	5
4	LVTTL-I/O	SDA	2-wire Serial Interface Data Line(Same as MOD-DEF2 in INF-8074i)	6
5	LVTTL-I/O	SCL	2-wire Serial Interface Clock (Same as MOD-DEF1 in INF-8074i)	6
6		MOD_ABS	Module Absent, connected to VEE T or VEE R in the module	7
7	LVTTL-I	RS0	Rate Select 0, optionally controls SFP+ module receiver.	8
8	LVTTL-O	RX_LOS	Receiver Loss of Signal Indication(In FC designated as Rx_LOS and in Ethernet designated as Signal Detect)	4
9	LVTTL-I	RS1	Rate Select 1, optionally controls SFP+ module transmitter	8
10		VEE R	Module Receiver Ground	3
11		VEE R	Module Receiver Ground	3
12	CML-O	RD-	Receiver Inverted Data Output	
13	CML-O	RD+	Receiver Non-Inverted Data Output	
14		VEE R	Module Receiver Ground	3

15		V _{CC} R	Module Receiver 3.3 V Supply	
16		V _{CC} T	Module Transmitter 3.3 V Supply	
17		V _{EE} T	Module Transmitter Ground	3
18	CML-I	TD+	Transmitter Non-Inverted Data Input	
19	CML-I	TD-	Transmitter Inverted Data Input	
20		V _{EE} T	Module Transmitter Ground	3

Notes:

1. Labeling as inputs (I) and outputs (O) are from the perspective of the module.
2. The case makes electrical contact to the cage before any of the board edge contacts are made.
3. The module signal ground contacts, V_{ee}R and V_{ee}T, should be isolated from the module case.
4. This contact is an open collector/drain output contact and shall be pulled up on the host. Pull ups can be connected to one of several power supplies, however the host board design shall ensure that no module contact has voltage exceeding module V_{cc}T/R + 0.5 V.
5. Tx_Disable is an input contact with a 4.7 kOhms to 10 kOhms pullup to V_{cc}T inside the module.
6. 2-wire interface.
7. The pins shall be pulled up with 4.7K-10Kohms to a voltage between 3.14V and 3.46V on host board.
8. The pins are pulled low to V_{ee}T with a >30kΩ resistor in the module.

Mechanics Drawing

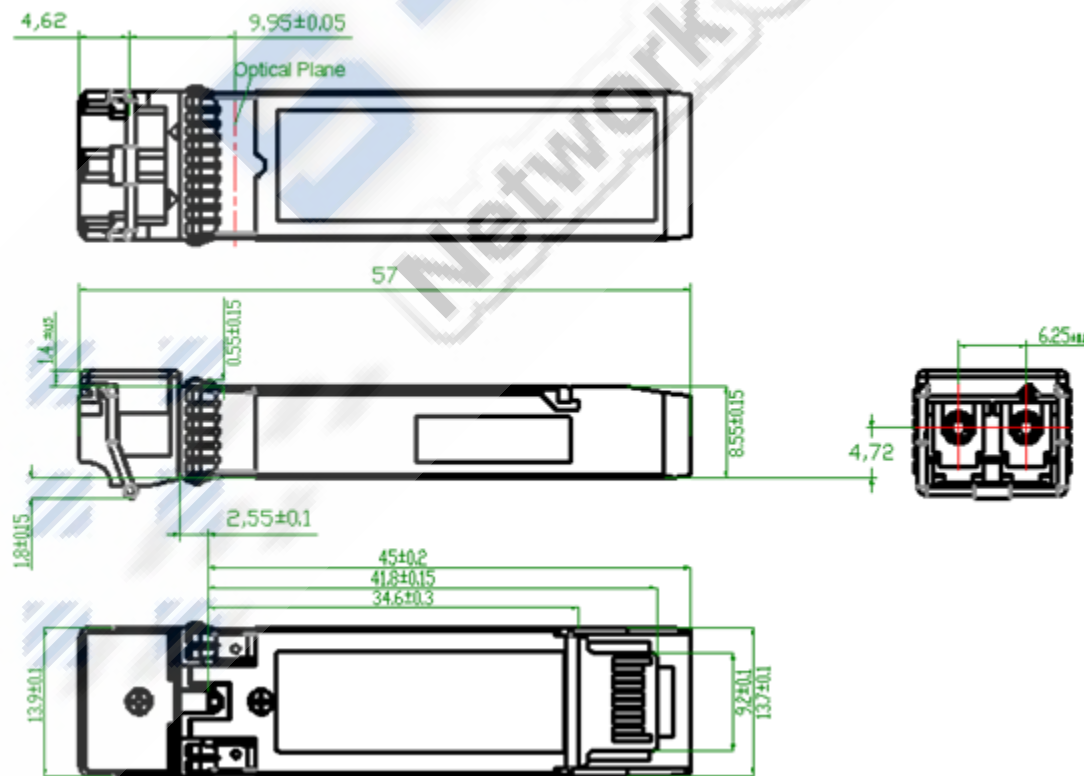


Figure 4 Mechanics drawing

Order Information

Table 8 – Order Information

Part No.	Application	Data Rate	Fiber Type
SP-25E-LR-XXIDFB	CPRI /25GBASE-LR application	25.78125Gb/s	SMF

XX	Center Wavelength	Min	Type	Max	Unit
69	λ_{C1}	1268.24	1269.23	1270.22	nm
73	λ_{C2}	1272.55	1273.54	1274.54	nm
77	λ_{C3}	1276.89	1277.89	1278.89	nm
82	λ_{C4}	1281.25	1282.26	1283.27	nm
86	λ_{C5}	1285.65	1286.66	1287.68	nm
91	λ_{C6}	1290.07	1291.1	1292.12	nm
95	λ_{C7}	1294.53	1295.56	1296.59	nm
00	λ_{C8}	1299.02	1300.05	1301.09	nm
04	λ_{C9}	1303.54	1304.58	1305.63	nm
09	λ_{C10}	1308.09	1309.14	1310.19	nm
13	λ_{C11}	1312.67	1313.73	1314.79	nm
32	λ_{C12}	1331.32	1332.41	1333.5	nm

Warnings

Handling Precautions: This device is susceptible to damage as a result of electrostatic discharge (ESD). A static free environment is highly recommended. Follow guidelines according to proper ESD procedures.

Laser Safety: Radiation emitted by laser devices can be dangerous to human eyes. Avoid eye exposure to direct or indirect radiation.

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