

NXS1-D176-S4D

SFP 1G EX DWDM 40 km

Features

- SFP Form Factor
- 1,25 Gb/s bitrate
- Up to 40 km over Singlemode
- LC connector
- C17~C61, DML laser, PIN photodiode
- Up to 1W power consumption
- +0/+70°C temperature range
- Built in digital diagnostic monitoring



Applications

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

Optical specifications



Optical budget : 20 dB

Transmitter & Receiver optical Specifications

Parameter	Min	Max	Unit
Tx Power	0	4	dBm
Rx Sensitivity	-20	-1	dBm

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)
61	196.1	1528.77
60	196.0	1529.55
59	195.9	1530.33
58	195.8	1531.12
57	195.7	1531.90
56	195.6	1532.68
55	195.5	1533.47
54	195.4	1534.25
53	195.3	1535.04
52	195.2	1535.82
51	195.1	1536.61
50	195.0	1537.40
49	194.9	1538.19
48	194.8	1538.98
47	194.7	1539.77
46	194.6	1540.56
45	194.5	1541.35
44	194.4	1542.14
43	194.3	1542.94
42	194.2	1543.73
41	194.1	1544.53
40	194.0	1545.32
39	193.9	1546.12
38	193.8	1546.92
37	193.7	1547.72
36	193.6	1548.51
35	193.5	1549.32
34	193.4	1550.12
33	193.3	1550.92
32	193.2	1551.72
31	193.1	1552.52
30	193.0	1553.33
29	192.9	1554.13
28	192.8	1554.94
27	192.7	1555.75
26	192.6	1556.55

25	192.5	1557.36
24	192.4	1558.17
23	192.3	1558.98
22	192.2	1559.79
21	192.1	1560.61
20	192.0	1561.42
19	191.9	1562.23
18	191.8	1563.05
17	191.7	1563.86

Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Unit
Maximum Supply Voltage	V _{CC}	-0.5	4.0	V
Storage Temperature	T _S	-40	85	°C
Operating Case Temperature	T _C	0	70	°C
Operating Humidity	RH	5	85	%

Electrical Characteristics (TOP=25°C, V_{CC}=3.3Volts)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Power Supply Voltage	V _{CC}	3.14	3.30	3.46	V	
Power Supply Current	I _{CC}			450	mA	
Supply Voltage	V _{MAX}	-0.5		4	V	
Transmitter						
Differential data input voltage (TD +/-)		200		1200	mVp-p	1
Low speed output: Tx Fault/ Loss of Signal (LOS)	VOH	2.0		V _{CC}	V	2
	VOL	0		0.8	V	
Low speed output: Tx Disable / MOD_DEF1, MOD_DEF 2	VOH	2.0		V _{CC}	V	3
	VOL	0		0.8	V	
Receiver						
Differential data output voltage		600		1200	mVp-p	4

Notes

1. Internally AC coupled and terminated to 100Ω differential load.
2. Pulled up externally with a 4.7KΩ-10KΩ resistor on the host board to VCCT,R.
3. Mod_Def1 and Mod_Def2 must be pulled up externally with a 4.7KΩ-10KΩ resistor on the host board to VCCT,R.

- Internally AC coupled, but requires a 100Ω differential termination or internal to Serializer/Deserializer.

Optical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Transmitter						
Wavelength Spacing			100		GHz	
Optical Wavelength	T _λ	x-0.1	x	X+0.1	nm	
Optical Power (average)	P _{AVE}	0		4	dBm	1
Transmitter and Dispersion Penalty	TDP			3	dB	
Optical Extinction Ratio	ER	8.0			dB	
Spectral Width	Δλ			0.3	nm	
Sidemode Suppression Ratio	SMSR	30			dB	
Optical Rise/Fall Time (20%-80%)	t _r /t _f			260	ps	
Eye Diagram		Compatible with IEEE 802.3				
Receiver						
Receiver Wavelength	λ _C	1528		1566	nm	
Receiver Sensitivity (average)	R _{AVE}			-20	dBm	2
Receiver overload	P _{max}	-1			dBm	3
LOS Assert	LOS _A	-35			dBm	
LOS De-Assert	LOS _D			-22	dBm	
LOS Hysteresis	LOS _H	0.5			dBm	

Notes:

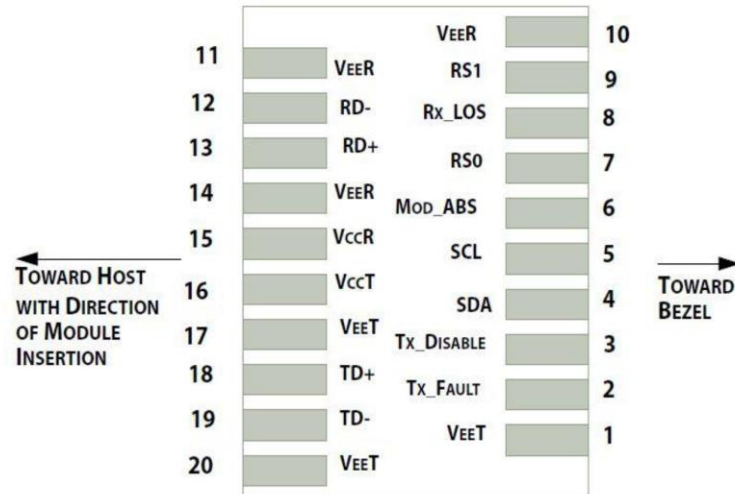
- Coupled into a Single-mode fibre
- Average power, back-to-back, @1.25Gbps, BER $1E^{-12}$, PRBS $2^{31}-1$.
- Exceeding the Receiver overload can physically damage the module. Please use appropriate attenuation.

Pin Descriptions

Pin	Symbol	Name/Descriptions	Ref.
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. LVTT-I.	3
4	SDA	2-Wire Serial Interface Data Line (Same as MOD-DEF2 in INF-8074i). LVTTTL-I/O.	
5	SCL	2-Wire Serial Interface Data Line (Same as MOD-DEF2 in INF-8074i). LVTTTL-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. 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

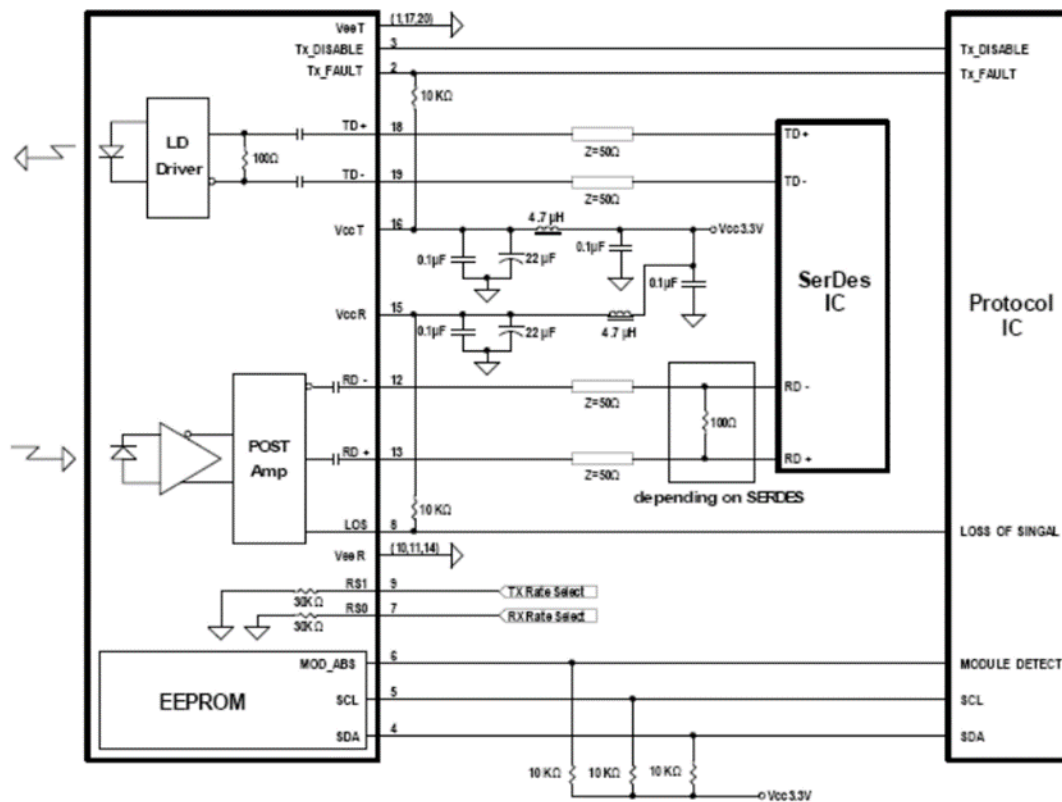
Notes:

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 to 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 +0.5.V.
3. Tx_Disable is an input contact with a 4.7KΩ to 10KΩ 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 4.7KΩ to 10KΩ. Mod_ABS is asserted "High" when the SFP+ module is physically absent from a host slot.
5. Internally pulled down per SFF-8431



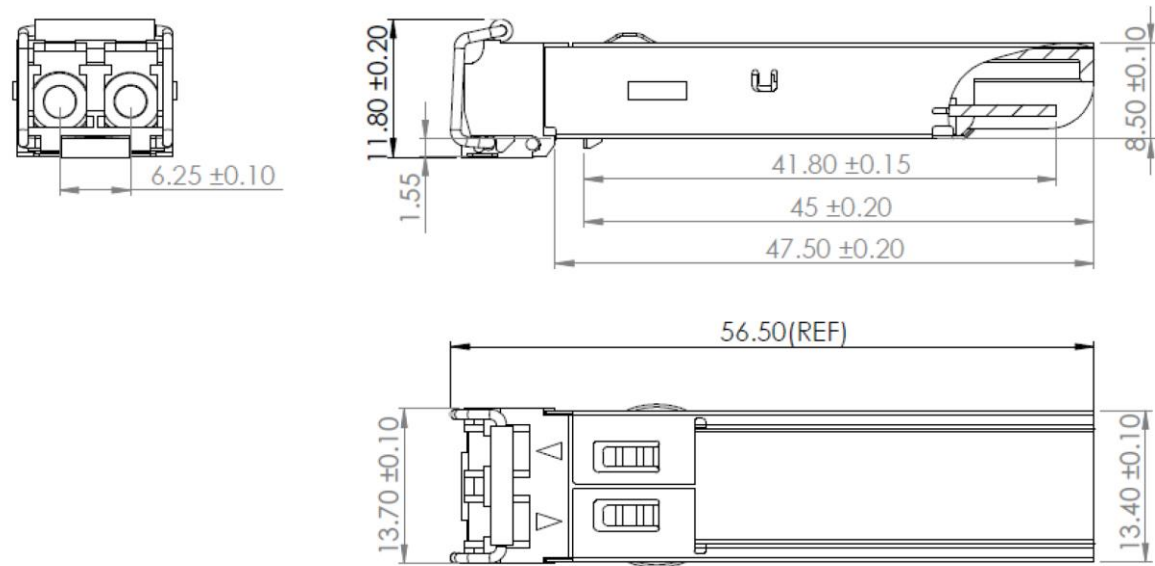
Pin-out of connector Block on Host board

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:

