

NXS1-C18DM-S20D

SFP 1G LX CWDM 20 km

Features

- SFP Form Factor
- 1,25 Gb/s bitrate
- Up to 20 km over Singlemode
- LC connector
- 1270-1610, DFB laser, PIN photodiode
- Up to 1W power consumption
- +0/+70°C temperature range
- Built in digital diagnostic monitoring



Applications

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

Optical specifications



Optical budget : 24 dB

Transmitter & Receiver optical Specifications

Parameter	Min	Max	Unit
Tx Power	-2.5	2	dBm
Rx Sensitivity	-26.5	2	dBm

CWDM Available Wavelengths

Wavelength	Min.	Typ.	Max.
27	1264.5	1271	1277.5
29	1284.5	1291	1297.5
31	1304.5	1311	1317.5
33	1324.5	1331	1337.5
35	1344.5	1351	1357.5
37	1364.5	1371	1377.5
39	1384.5	1391	1397.5
41	1404.5	1411	1417.5
43	1424.5	1431	1437.5
45	1444.5	1451	1457.5
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.	Typ.	Max.	Unit	Notes
Power Supply Voltage	Vcc	+3.135	+3.30	+3.465	V	
Power Supply Current	Icc			500	mA	1
Power Supply Noise Rejection	PSNR			100	mVp-p	2
Operating Temperature	Tc	-40		+85	°C	3
Storage Temperature	Tstg	-40		+85	°C	4
Power Supply Storage	Vcc		< +4.0		V	
Ambient Humidity	AH	5		95	%	5

Notes:

1. Cooled type.
2. From 100Hz to 1MHz.
3. Case with airflow.
4. Ambient.

- Without dew.

Electrical Characteristics

Parameter		Symbol	Min.	Typ.	Max.	Unit	Notes
Transmitter							
Data Rate		DR	1.0625		1.25	Gbps	
Differential Input Voltage		VIN,pp	150		1000	mV	
Differential Input Impedance		ZIN	90	100	110	Ω	
Tx_Disable	Input_Low	VIL	0		0.8	V	1
	Input_High	VIH	2.0		3.465	V	
	Assert Time	tOFF			10	us	2
	Negate Time	tON			1	ms	3
Tx_Disable to Reset		treset	10			us	4
Time to Initialize_Cooled (Including Reset of Tx_Fault)		tInit_cooled			10	sec	5
Tx_Fault	Output_Low	VFOL	0		0.8	V	6
	Output_High	VFOH	2.0		Vcc+0.3	V	
Receiver							
Data Rate		DR	1.0625		1.25	Gbps	
Differential Output Voltage		VOUT	300		850	mV	-
Differential Output Impedance		ZOUT	90	100	110	Ω	-
Rx_LOS (Loss of Signal)	Output_Low	VLOSL	0		0.8	V	6
	Output_High	VLOSH	2		Vcc+0.3	V	
	Assert Time	tLOS-ON			100	us	7
	De-Assert Time	tLOS-OFF			100	us	8

Notes:

- LVTTTL, normal at low, high is shutdown (Poff).
- Assert time tOFF: high.
- Negate time tON: low.
- Tx_Disable to reset treset: high.
- Cooled version, for wavelength stabilization at worst-case (low & high temperature).
- LVTTTL, low is normal.
- Assert time tLOS-ON: Low → High.
- De-Assert time tLOS-OFF: High → Low.

Optical Characteristics

Parameter		Symbol	Min.	Typ.	Max.	Unit	Notes
Transmitter							
Optical Transmit Power		Pf	-2.5		2.0	dBm	
Transmitter Disable (Off) Power		Poff			-35	dBm	2
Peak Wavelength		λ_P	$\lambda_C+2.0 \sim \lambda_C+6.5$			nm	1
Spectral Width		$\Delta\lambda$			1.0	nm	3
Side-Mode Suppression Ratio		SMSR	30			dB	
RIN ₁₂ OMA		RIN			-117	dB/Hz	
Dispersion Penalty		DP			1.5	dB	
Extinction Ratio		ER	8.2			dB	4
Eye Pattern Mask		IEEE802.3/2008 Section 3 Figure 38-2					4
Receiver							
Optical Sensitivity		S			-26.5	dBm	5
Optical Overload		OL	2.0			dBm	5
Operating Wavelength		λ_O	$\lambda_C-6.5 \sim \lambda_C-1.5$			nm	1
Rx_LOS (Loss of Signal)	Assert	PA	-38.0			dBm	6
	De-Assert	PD			-26.5	dBm	
	Hysteresis	PA-PD	0.5	2.0	5.0	dB	
Receiver Reflectance					-27	dB	7
RSSI Calibration		RCAL	Internally Calibrated				

Notes:

1. CWDM, DFB-LD, $\lambda_C = 1271, 1291, 1311, 1331, 1351, 1371, 1391, 1411, 1431, 1451, 1471, 1491, 1511, 1531, 1551, 1571, 1591, \text{ and } 1611\text{nm}$.
2. At Tx_Disable is high.
3. At -20dB.
4. At 1.25Gbps, PRBS 2⁷-1, Figure 1.
5. PRBS2⁷-1, BER=1x10⁻¹², and ER=8.2dB.
6. Squelch function enabled.
7. At λ_O .

Pin Descriptions

Pin	Symbol	Name/Description	Plug Sequence	Notes
1	VeeT	Module Ground.	1	
2	Tx_Fault	Status Out.	3	
3	Tx_Disable	Control In.	3	
4	MOD_DEF(2)	Input/Output (SDA, I ² C Data).	3	
5	MOD_DEF(1)	Input/Output (SCL, I ² C Clock).	3	
6	MOD_DEF(0)	Indicates that the module is present. Grounded internally.	3	
7	Rate Select	Rate Select In. Not Used.	3	1
8	Rx_LOS	Status Out.	3	
9	VeeR	Module Ground.	3	
10	VeeR	Module Ground.	1	
11	VeeR	Module Ground.	1	
12	Rx_Data-	Data Out Negative.	3	
13	Rx_Data	Data Out Positive.	3	
14	VeeR	Module Ground.	1	
15	VccR	Power.	2	
16	VccR	Power.	2	
17	VeeT	Module Ground.	1	
18	Tx_Data	Data In Positive.	3	
19	Tx_Data-	Data In Negative.	3	
20	VeeT	Module Ground.	1	

Notes:

1. Internally pulled down with a >51kΩ resistor.

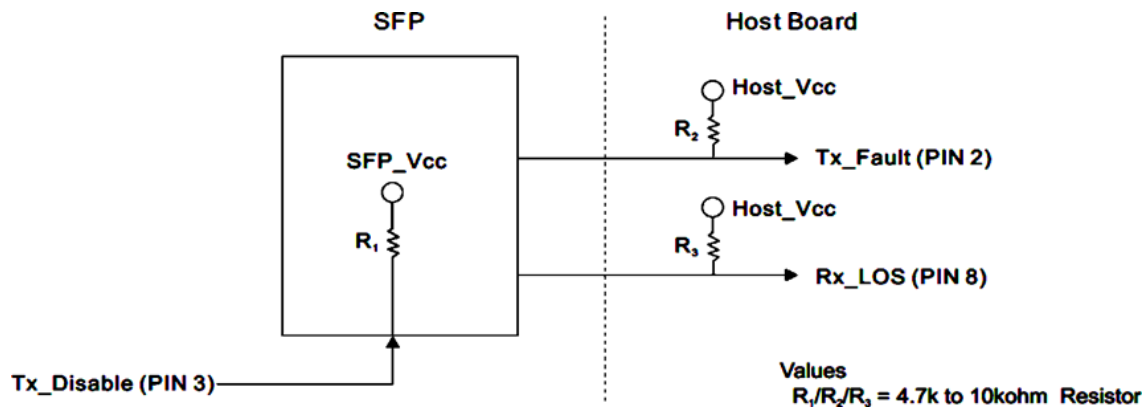
Recommended Circuit Schematic

Tx_Disable: Transmitter Disable, logic high, 4.7kΩ to 10kΩ pull-up to the Vcc on the SFP.

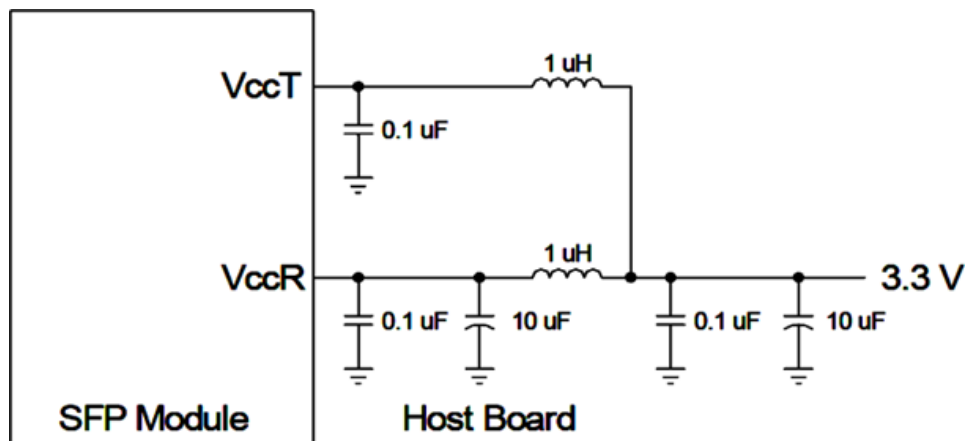
Tx_Fault: Transmitter Fault, logic high, 4.7kΩ to 10kΩ pull-up to the Vcc on the host.

Rx_LOS: Receiver Loss of Signal, logic high, 4.7kΩ to 10kΩ pull-up to the Vcc on the host.

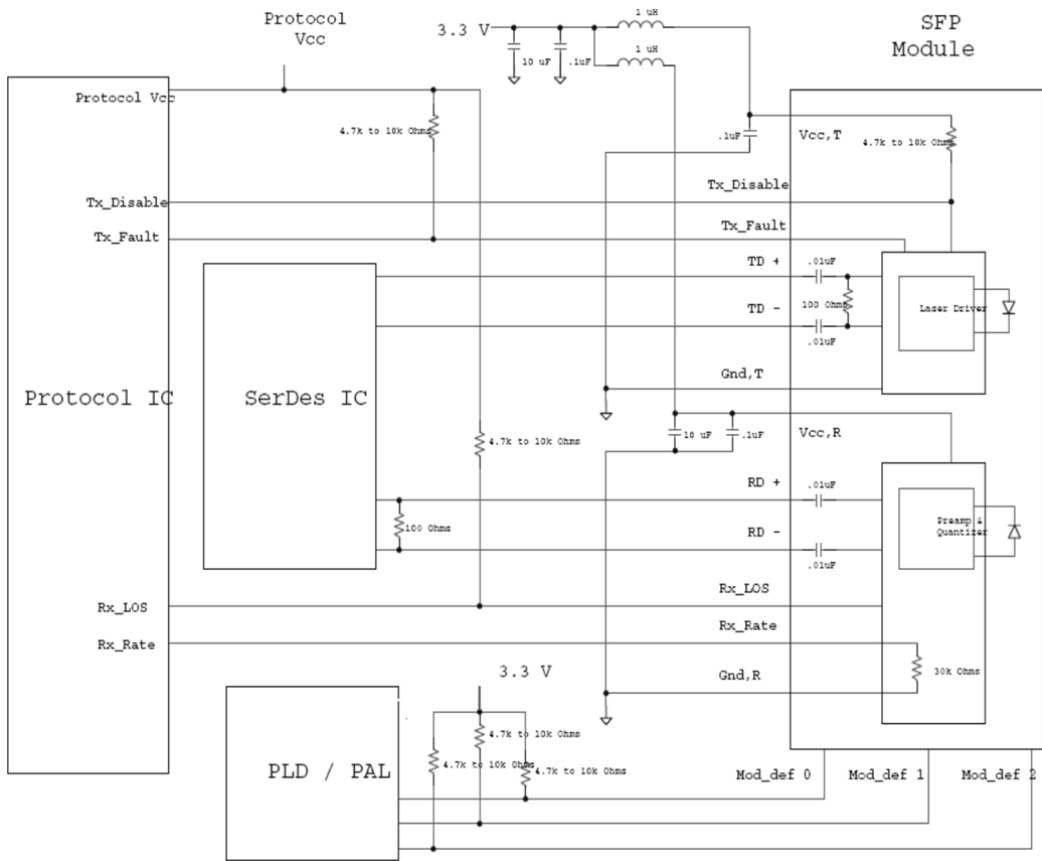
Signal Definitions



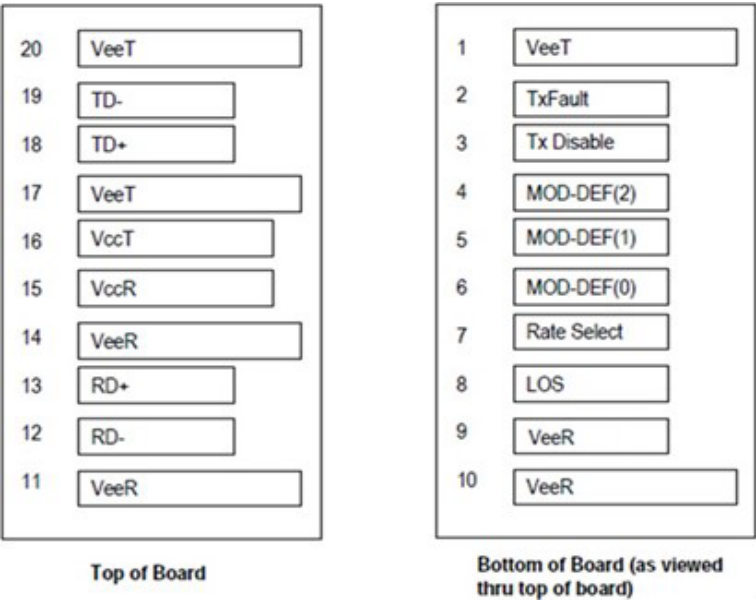
Power Coupling



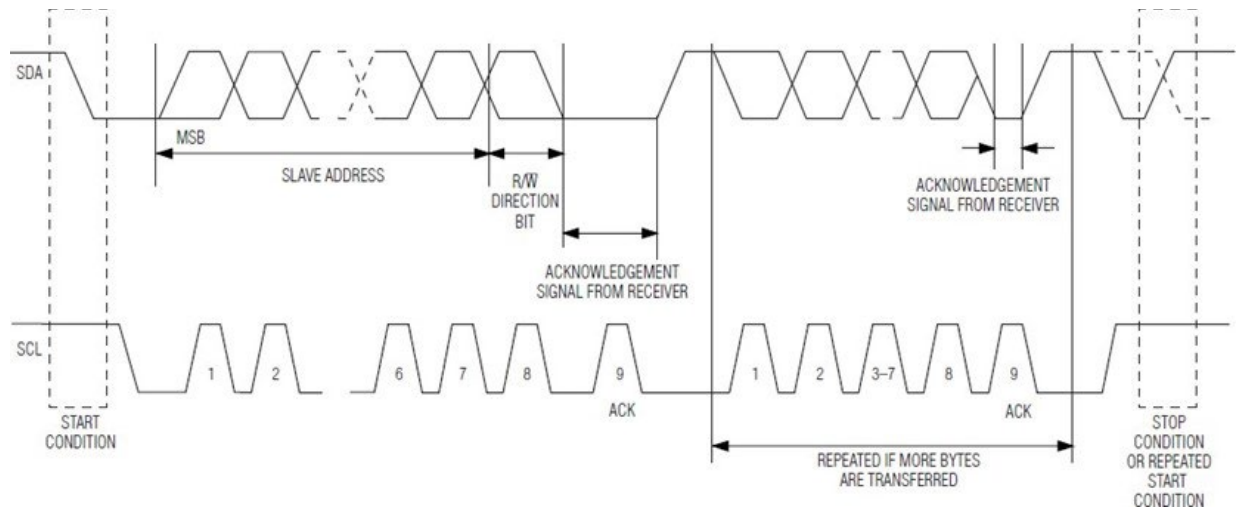
SFP Host Board Schematic



20-Pin Connector



2-Wire Data Transfer Protocol



Mechanical Specifications

