

1.25G SFP CWDM 120km Transceiver

PRODUCT FEATURES

- Up to 1.25Gb/s data links
- DFB laser transmitter and APD receiver
- Up to 120KM on 9/125μm SMF
- Hot-pluggable SFP footprint
- Duplex LC/UPC type pluggable optical interface
- Low power dissipation
- Metal enclosure, for lower EMI
- RoHS compliant and lead-free
- Single +3.3V power supply
- Support Digital Diagnostic Monitoring interface
- Compliant with SFF-8472
- Case operating temperature: 0°C to +70°C

APPLICATIONS

- Switch to Switch Interface
- Fast Ethernet
- Switched Backplane Applications
- Router/Server Interface
- Other Optical Links

STANDARD

- SFP+ MSA Compliant
- SFF-8472 reversion 9.5 compliant
- IEEE802.3-2005 compliant
- Telcordia GR-468-CORE compliant
- FCC 47 CFR Part 15, Class B compliant
- FDA 21 CFR 1040.10 and 1040.11, class1 compliant
- RoHS compliant

ORDERING INFORMATION

Product Part Number	Data Rate	Media	Wavelength	Transmission Distance	Temperature Range (Tcase)
ZSCWXX12-LDH3	1.25	SMF	xxxx	120Km	0~70°C
ZSCWXX12-iLDH3	1.25	SMF	xxxx	120Km	-40~+85°C

PRODUCT SELECTION

Wavelength	XX	Clasp Color Code	Wavelength	XX	Clasp Color Code
1270nm	27	Gray	1450nm	45	Brown
1290nm	29	Gray	1470nm	47	Gray
1310nm	31	Gray	1490nm	49	Purple
1330nm	33	Purple	1510nm	51	Blue
1350nm	35	Blue	1530nm	53	Green
1370nm	37	Green	1550nm	55	Yellow
1390nm	39	Yellow	1570nm	57	Orange
1410nm	41	Orange	1590nm	59	Red
1430nm	43	Red	1610nm	61	Brown

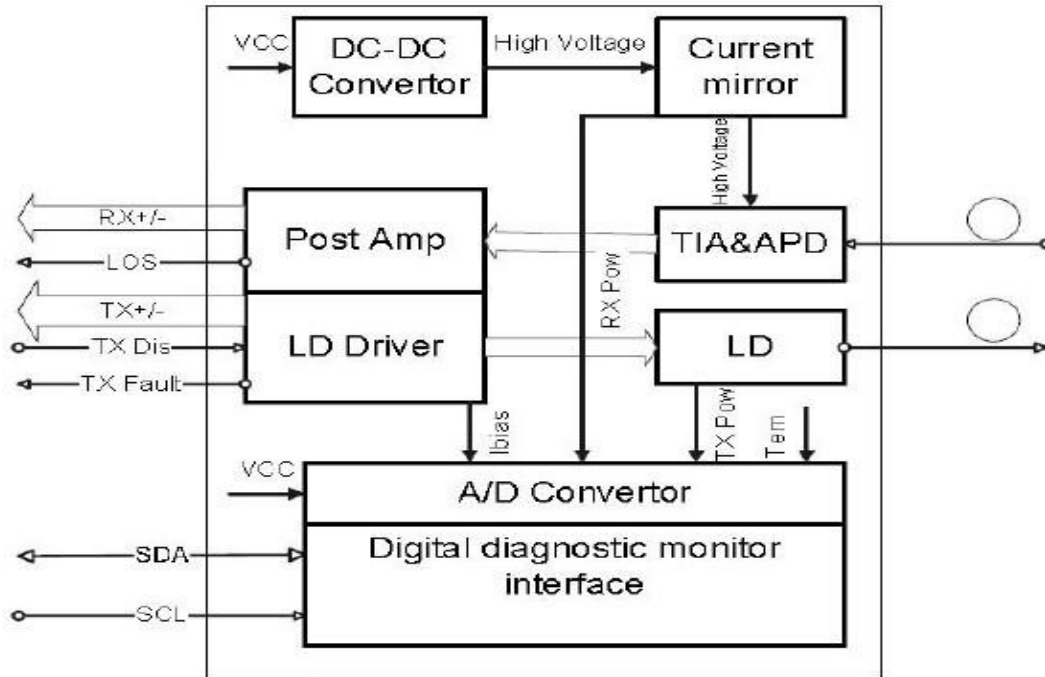
ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Min.	Max	Unit	Notes
Supply Voltage	Vcc	-0.5	4.0	V	
Storage Temperature		-40	85	°C	
Relative Humidity		5	95	%	

Note: Stress in excess of the maximum absolute ratings can cause permanent damage to the module.

GENERAL OPERATING CHARACTERISTICS

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Data Rate Gigabit Ethernet			1.25		Gb/s	
Supply Voltage	Vcc	3.13	3.3	3.47	V	
Supply Current	Icc			300	mA	
Operating Case Temperature	Tc	0		70	°C	
		-10		80		
		-45		85		

FUNCTIONAL DIAGRAM

ELECTRICAL INPUT/OUTPUT CHARACTERISTICS

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Transmitter						
Diff. Input Voltage Swing		120		820	mVpp	1
Tx Disable Input	H	V_{IH}	2.0	$V_{CC}+0.3$	V	
	L	V_{IL}	0	0.8		
Tx Fault Output	H	V_{OH}	2.0	$V_{CC}+0.3$	V	2
	L	V_{OL}	0	0.5		
Input Diff. Impedance	Z_{in}		100		Ω	
Receiver						
Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Diff. Output Voltage Swing		340	650	800	mVpp	3
Rx LOS Output	H	V_{OH}	2.0	$V_{CC}+0.3$	V	2
	L	V_{OL}	0	0.8		

Note 1) TD+/- are internally AC coupled with 100 Ω differential termination inside the module.

Note 2) Tx Fault and Rx LOS are open collector outputs, which should be pulled up with 4.7k to 10k Ω resistors on the host board. Pull up voltage between 2.0V and $V_{CC}+0.3V$.

Note 3) RD+/- outputs are internally AC coupled, and should be terminated with 100 Ω (differential) at the user SERDES.

OPTICAL CHARACTERISTICS

Parameter	Symbol	Min.	Typ	Max.	Unit	Note
Transmitter						
Operating Wavelength	λ_C		xx		nm	
Ave. output power (Enabled)	P_o	0		5	dBm	1
Extinction Ratio	ER	9			dB	1
RMS spectral width	$\Delta\lambda$			4	nm	
Rise/Fall time (20%~80%)	Tr/Tf			0.26	ps	2
Output Eye Mask	Telcordia GR-253-CORE and ITU-T G.957 compatible					

 Note (1): Measure at 2⁷-1 NRZ PRBS pattern

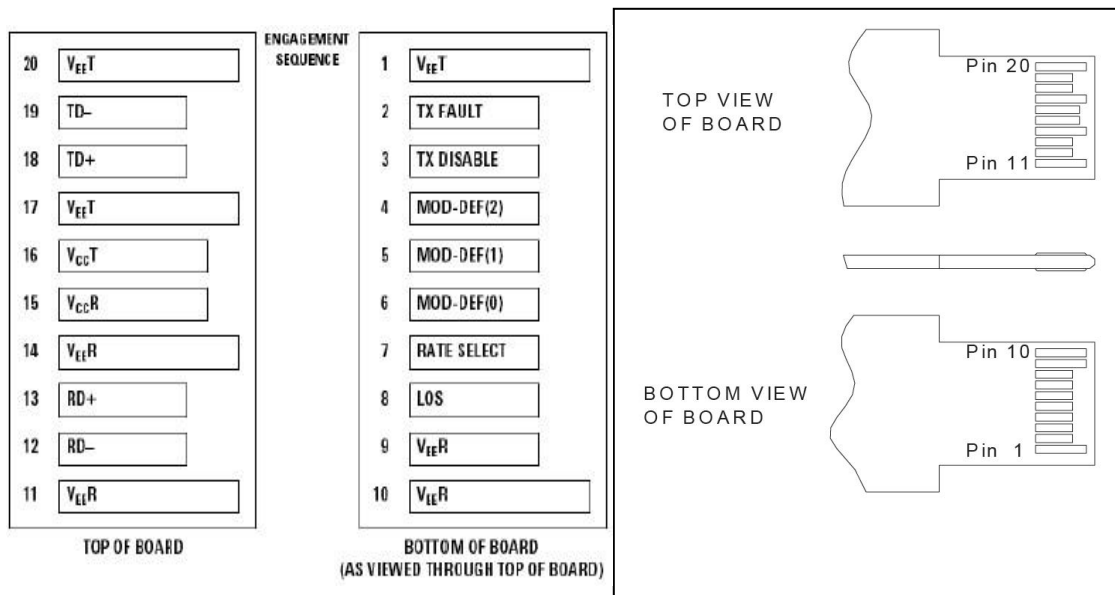
Note (2): Transmitter eye mask definition

 Note (3): “XX” is: 27,29,31,33,35,37,39,41,43,45,47,49,51,53,55,57,59 and 61; “ $\Delta\lambda$ ” is 7.5

Parameter	Symbol	Min.	Typ	Max.	Unit	Note
Receiver						
Operating Wavelength		1270		1610	nm	
Sensitivity	P_{sen}			-32	dBm	3
Min. overload	P_{imax}	-10			dBm	
LOS Assert	P_a	-40			dBm	
LOS De-assert	P_d			-33	dBm	
LOS Hysteresis	P_d-P_a	0.5		6	dB	

 Note (1): Measured with Light source 1XX0 nm, ER=4dB; BER =<10⁻¹² @PRBS=2⁷-1 NRZ

Note (2): When LOS de-asserted, the RX data+/- output is High-level (fixed)

PIN DEFINITIONS AND FUNCTIONS


PIN #	Name	Function	Notes
1	VeeT	Module transmitter ground	Note1
2	Tx Fault	Module transmitter fault	Note 2
3	Tx Disable	Transmitter Disable; Turns off transmitter laser output	Note 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	Note 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	Note4
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	Note 1
11	VeeR	Module receiver ground	Note 1
12	RD-	Receiver inverted data out put	
13	RD+	Receiver non-inverted data out put	
14	VeeR	Module receiver ground	Note 1
15	VccR	Module receiver 3.3V supply	
16	VccT	Module transmitter 3.3V supply	
17	VeeT	Module transmitter ground	Note 1
18	TD+	Transmitter inverted data out put	
19	TD-	Transmitter non-inverted data out put	
20	VeeT	Module transmitter ground	Note1

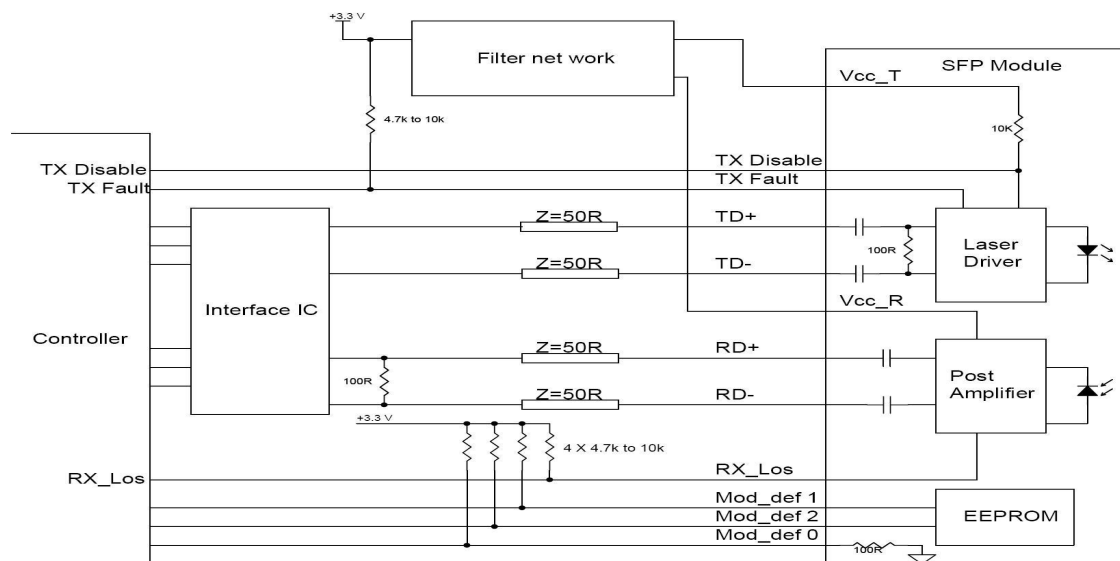
Note 1) The module ground pins shall be isolated from the module case.

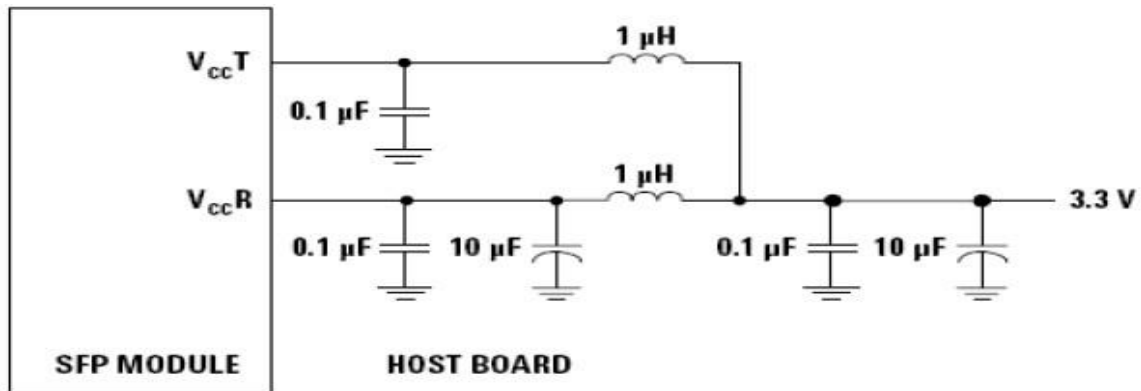
Note 2) This pin is an open collector/drain output pin and shall be pulled up with 4.7K-10Kohms to Host_Vcc on the host board.

Note 3) This pin shall be pulled up with 4.7K-10Kohms to VccT in the module.

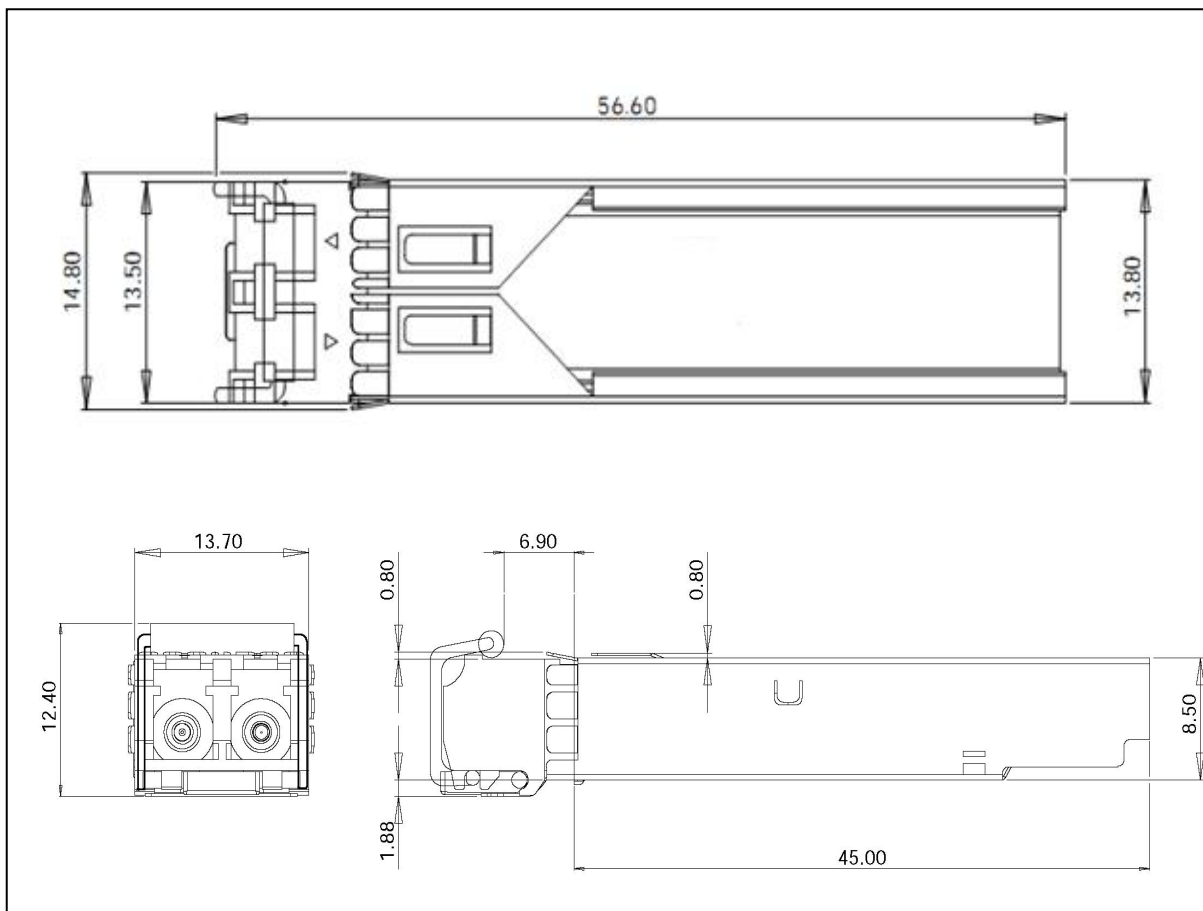
Note 4) This pin is an open collector/drain output pin and shall be pulled up with 4.7K-10Kohms to Host_Vcc on the host board. In FC designated as RX_LOS, inSONET designated as LOS, and in Ethernet designated at Signal Detect.

TYPICAL INTERFACE CIRCUIT



RECOMMENDED POWER SUPPLY FILTER


Note: Inductors with DC resistance of less than 1Ω should be used in order to maintain the required voltage at the SFP input pin with 3.3V supply voltage. When the recommended supply filtering network is used, hot plugging of the SFP transceiver module will result in an inrush current of no more than 30 mA greater than the steady state value.

PACKAGE DIMENSIONS


REGULATORY COMPLIANCE

Feature	Reference	Performance
Electrostatic discharge (ESD)	IEC/EN 61000-4-2	Compatible with standards
Electromagnetic Interference (EMI)	FCC Part 15 Class B EN 55022 Class B (CISPR 22A)	Compatible with standards
Laser Eye Safety	FDA 21CFR 1040.10, 1040.11 IEC/EN 60825-1, 2	Class 1 laser product
Component Recognition	IEC/EN 60950, UL	Compatible with standards
ROHS	2002/95/EC	Compatible with standards
EMC	EN61000-3	Compatible with standards

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