

1.25Gb/s SFP DWDM 40km Industrial Type

PRODUCT FEATURES

- Up to 1.25Gbps Data Links
- Up to 40km transmission on SMF
- Compliant with SFP MSA
- SFP MSA package with duplex LC connector
- Digital Diagnostic Monitor Interface
- Very low EMI and excellent ESD protection
- High transmission margin
- +3.3V single power supply
- Below <1.8W power consumption
- SFP mechanical interface
- Wide data-rate range

APPLICATIONS

- Switch/Router
- SAN/Server
- Fiber Channel
- Other optical transmission systems

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, class I compliant
- RoHS compliant

ORDERING INFORMATION

Product Part Number	Data Rate	Media	Wavelength	Transmission Distance	Temperature Range (Tcase)
ZSDWXX12-LD40	1.25	SMF	DWDM	40Km	0~70°C
ZSDWXX12-iLD40	1.25	SMF	DWDM	40Km	-40~+85°C

PRODUCT SELECTION

 C-band λ_c Wavelength Guide Pin Descriptions

Channl#	Product Code	Frequency (THz)	Cent Wavelength (nm)
17	ZSDW1712-iLD 40	191.7	1563.86
18	ZSDW1812-iLD 40	191.8	1563.05
19	ZSDW1912-iLD 40	191.9	1562.23
20	ZSDW2012-iLD 40	192.0	1561.42
21	ZSDW2112-iLD 40	192.1	1560.61
22	ZSDW2212-iLD 40	192.2	1559.79
23	ZSDW2312-iLD 40	192.3	1558.98
24	ZSDW2412-iLD 40	192.4	1558.17
25	ZSDW2512-iLD 40	192.5	1557.36
26	ZSDW2612-iLD 40	192.6	1556.55
27	ZSDW2712-iLD 40	192.7	1555.75
28	ZSDW2812-iLD 40	192.8	1554.94
29	ZSDW2912-iLD 40	192.9	1554.13
30	ZSDW3012-iLD 40	193.0	1553.33
31	ZSDW3112-iLD 40	193.1	1552.52
32	ZSDW3212-iLD 40	193.2	1551.72
33	ZSDW3312-iLD 40	193.3	1550.92
34	ZSDW3412-iLD 40	193.4	1550.12
35	ZSDW3512-iLD 40	193.5	1549.32
36	ZSDW3612-iLD 40	193.6	1548.51
37	ZSDW3712-iLD 40	193.7	1547.72

38	ZSDW3812-iLD 40	193.8	1546.92
39	ZSDW3912-iLD 40	193.9	1546.12
40	ZSDW4012-iLD 40	194.0	1545.32
41	ZSDW4112-iLD 40	194.1	1544.53
42	ZSDW4212-iLD 40	194.2	1543.73
43	ZSDW4312-iLD 40	194.3	1542.94
44	ZSDW4412-iLD 40	194.4	1542.14
45	ZSDW4512-iLD 40	194.5	1541.35
46	ZSDW4612-iLD 40	194.6	1540.56
47	ZSDW4712-iLD 40	194.7	1539.77
48	ZSDW4812-iLD 40	194.8	1538.98
49	ZSDW4912-iLD 40	194.9	1538.19
50	ZSDW5012-iLD 40	195.0	1537.40
51	ZSDW5112-iLD 40	195.1	1536.61
52	ZSDW5212-iLD 40	195.2	1535.82
53	ZSDW5312-iLD 40	195.3	1535.04
54	ZSDW5412-iLD 40	195.4	1534.25
55	ZSDW5512-iLD 40	195.5	1533.47
56	ZSDW5612-iLD 40	195.6	1532.68
57	ZSDW5712-iLD 40	195.7	1531.90
58	ZSDW5812-iLD 40	195.8	1531.12
59	ZSDW5912-iLD 40	195.9	1530.33
60	ZSDW6012-iLD 40	196.0	1529.55
61	ZSDW6112-iLD 40	196.1	1528.77

ABSOLUTE MAXIMUM RATINGS

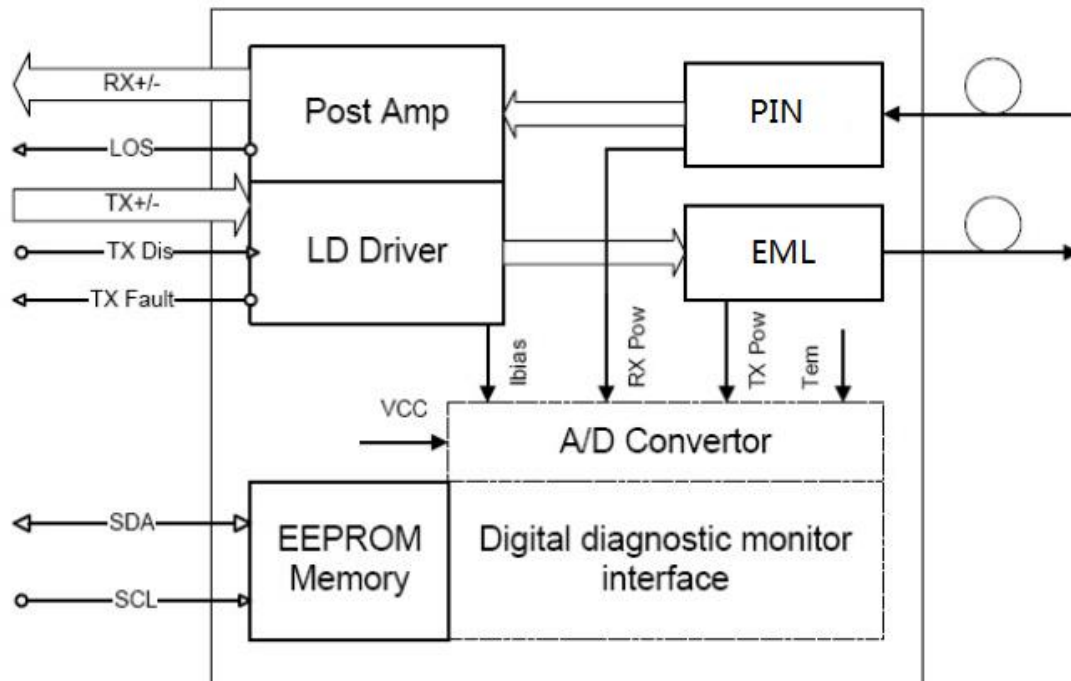
Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Supply Voltage	Vcc	-0.5	-	4.0	V	
Storage Temperature	Ts	-40	-	85	°C	
Relative Humidity	RH		-	85	%	

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	Note
Data Rate			1.25		Gb/s	
Supply Voltage	Vcc	3.13	3.3	3.47	V	
Supply Current	Icc5			500	mA	
Operating Case Temp.	Tc	0		70	°C	

FUNCTIONAL DIAGRAM



ELECTRICAL INPUT/OUTPUT CHARACTERISTICS

Parameter	Symbol	Min.	Typ	Max.	Unit	Note
Diff. input voltage swing		120		820	mVpp	1
Tx Disable input	H	VIH	2.0	Vcc+0.3	V	
	L	VIL	0	0.8		
Tx Fault output	H	VOH	2.0	Vcc+0.3	V	2
	L	VOL	0	0.8		
Input Diff. Impedance	Zin		100		Ω	

Note 1) TD+/- are internally AC coupled with 100Ω 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 10kΩ resistors on the host board. Pull up voltage between 2.0V and Vcc+0.3V.

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

OPTICAL CHARACTERISTICS

Parameter	Symbol	Min.	Typ	Max.	Unit	Note
Transmitter (0~70°C@1250Mb/s)						
Operating Wavelength			xx		nm	
Ave. output power (Enabled)	Po	-3		+3	dBm	1
Extinction Ratio	ER	9			dB	1
RMS spectral width	Δλ			1	nm	
Rise/Fall time (20%~80%)	Tr/Tf			260	ps	2
Optical modulation amplitude	OMA	2			dBm	
Dispersion penalty				3	dB	
Output Optical Eye	IEEE 802.3-2005 Compliant					

Note 1) Measured at 1250Mb/s with PRBS 2³¹ - 1 NRZ test pattern.

Note 2) 20%~80%

Note 3) Under the ER worst case, measured at 1250 Mb/s with PRBS 2³¹ - 1 NRZ test pattern for BER < 1x10⁻¹²

SERIAL INTERFACE FOR ID AND DDM

The SFP modules implement the 2-wire serial communication protocol as defined in the SFP MSA.

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. For more details of the memory map and byte definitions, please refer to the SFF-8472 (Rev 9.3, Aug. 2002), "Digital Diagnostic Monitoring Interface for Optical Transceivers".

The DDM parameters have been internally calibrated.

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

2 wire address 1010000X (A0h)		2 wire address 1010001X (A2h)	
Address	Information	Address	Information
0~95	Serial ID Defined by SFP MSA (96 bytes)	0~55	Alarm and Warning Thresholds (56 bytes)
96~127	Vendor Specific (32 bytes)	56~95	Calibration Constants (40 bytes)
		96~119	Real Time Diagnostic Interface (24 bytes)
128~255	Reserved, SFF8079 (128 bytes)	120~127	Vender Specific (8 bytes)
		128~247	User Writable EEPROM (120 bytes)
		248~255	Vender Specific (8 bytes)

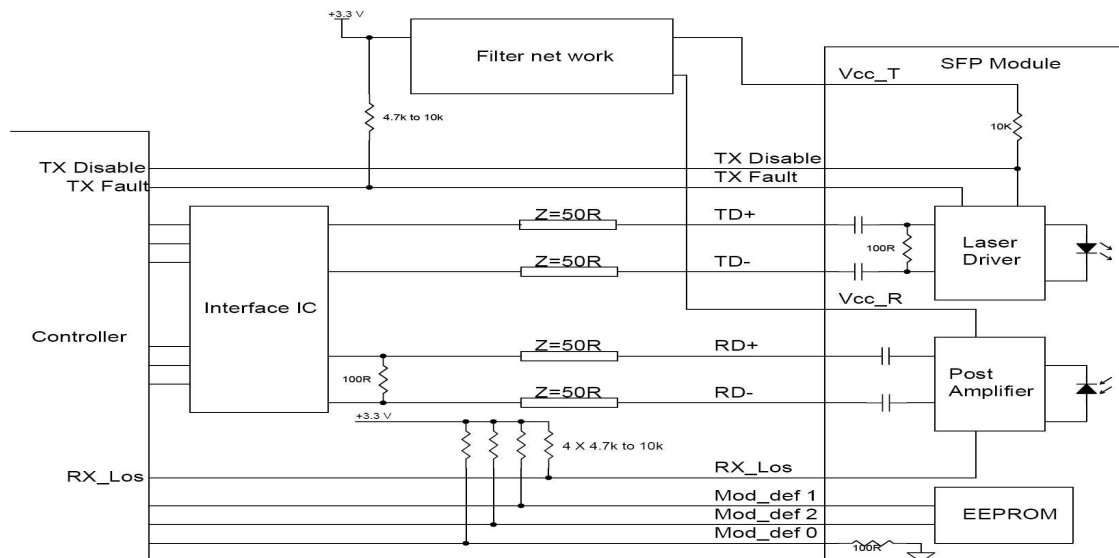
Note 3) Mod-Def 0,1,2. These are the module definition pins. They should be pulled up with a 4.7K – 10KΩ resistor on the host board. The pull-up voltage shall be between 2.0V~V_{cc}+0.3V.
 Mod-Def 0 has been grounded by the module to indicate that the module is present
 Mod-Def 1 is the clock line of two wire serial interface for serial ID
 Mod-Def 2 is the data line of two wire serial interface for serial ID

Note 4) When high, this output indicates loss of signal (LOS). Low indicates normal operation.

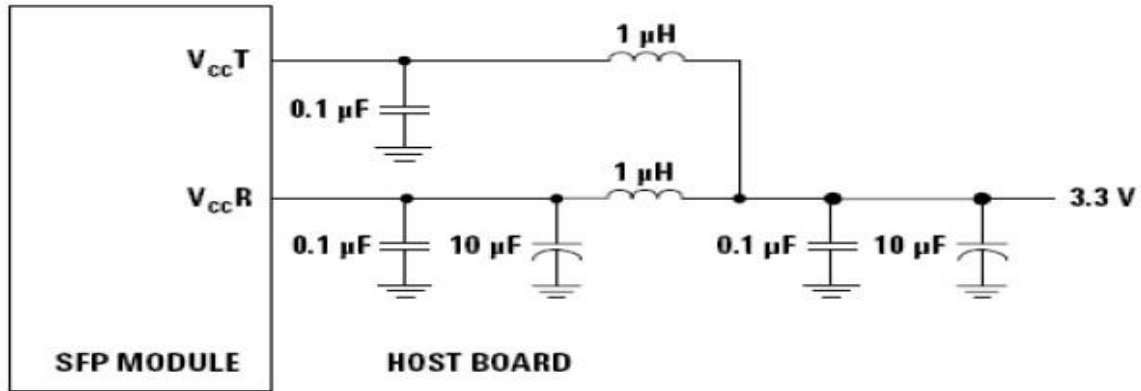
Note 5) RD+/-: These are the differential receiver outputs. They are AC coupled 100Ω differential lines which should be terminated with 100Ω (differential) at the user SERDES. The AC coupling is done inside the module and is thus not required on the host board.

Note 6) TD+/-: These are the differential transmitter inputs. They are AC-coupled, differential lines with 100Ω differential termination inside the module. The AC coupling is done inside the module and is thus not required on the host board.

TYPICAL INTERFACE CIRCUIT

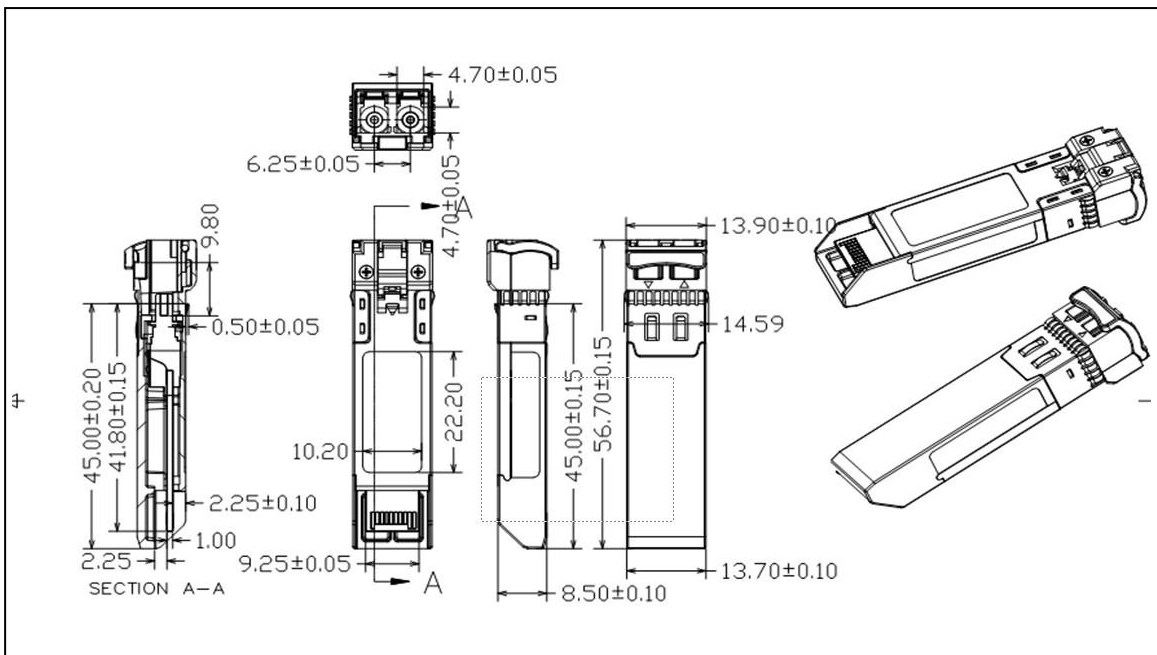


RECOMMENDED POWER SUPPLY FILTER



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

FOR MORE INFORMATION

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