1.25Gb/s SFP DWDM 120km Industrial Type

PRODUCT FEATURES

- Wavelength selectable to C-band and L-band ITU-T grid wavelengths
- Suitable for use in 100GHz channel spacing DWDM systems
- DWDM SFP MSA Compliant
- Up to 1.25Gb/s data rate
- Cold Start up Wavelength Compliance
- Low Power Dissipation <1.3W Maximum
- -5ºC to 70ºC Operating Case Temperature
- Diagnostic Performance Monitoring of module temperature, supply Voltages, laser bias current, transmit optical power, receive optical power, Laser temperature and TEC current
- Extended link budget with APD receiver technology
- RoHS compliant and lead free

APPLICATIONS

- SFP Transceivers for DWDM SONET/ SDH
- Ethernet IEEE 802.3ae
- Fiber Channel

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）
ZSDWXX12-LDH3	1.25	SMF	DWDM	120Km	0~70℃
ZSDWXX12-LDH3	1.25	SMF	DWDM	120Km	-40~+85℃

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PRODUCT SELECTION

C-band λc Wavelength Guide Pin Descriptions

Channl#	Product Code	Frequency (THz)	Cent Wavelength (nm)
17	ZSDW1712-LDH3	191.7	1563.86
18	ZSDW1812-LDH3	191.8	1563.05
19	ZSDW1912-LDH3	191.9	1562.23
20	ZSDW2012-LDH3	192.0	1561.42
21	ZSDW2112-LDH3	192.1	1560.61
22	ZSDW2212-LDH3	192.2	1559.79
23	ZSDW2312-LDH3	192.3	1558.98
24	ZSDW2412-LDH3	192.4	1558.17
25	ZSDW2512-LDH3	192.5	1557.36
26	ZSDW2612-LDH3	192.6	1556.55
27	ZSDW2712-LDH3	192.7	1555.75
28	ZSDW2812-LDH3	192.8	1554.94
29	ZSDW2912-LDH3	192.9	1554.13
30	ZSDW3012-LDH3	193.0	1553.33
31	ZSDW3112-LDH3	193.1	1552.52
32	ZSDW3212-LDH3	193.2	1551.72
33	ZSDW3312-LDH3	193.3	1550.92
34	ZSDW3412-LDH3	193.4	1550.12
35	ZSDW3512-LDH3	193.5	1549.32
36	ZSDW3612-LDH3	193.6	1548.51
37	ZSDW3712-LDH3	193.7	1547.72
38	ZSDW3812-LDH3	193.8	1546.92
39	ZSDW3912-LDH3	193.9	1546.12
40	ZSDW4012-LDH3	194.0	1545.32
41	ZSDW4112-LDH3	194.1	1544.53
42	ZSDW4212-LDH3	194.2	1543.73
43	ZSDW4312-LDH3	194.3	1542.94
44	ZSDW4412-LDH3	194.4	1542.14

45	ZSDW4512-LDH3	194.5	1541.35
46	ZSDW4612-LDH3	194.6	1540.56
47	ZSDW4712-LDH3	194.7	1539.77
48	ZSDW4812-LDH3	194.8	1538.98
49	ZSDW4912-LDH3	194.9	1538.19
50	ZSDW5012-LDH3	195.0	1537.40
51	ZSDW5112-LDH3	195.1	1536.61
52	ZSDW5212-LDH3	195.2	1535.82
53	ZSDW5312-LDH3	195.3	1535.04
54	ZSDW5412-LDH3	195.4	1534.25
55	ZSDW5512-LDH3	195.5	1533.47
56	ZSDW5612-LDH3	195.6	1532.68
57	ZSDW5712-LDH3	195.7	1531.90
58	ZSDW5812-LDH3	195.8	1531.12
59	ZSDW5912-LDH3	195.9	1530.33
60	ZSDW6012-LDH3	196.0	1529.55
61	ZSDW6112-LDH3	196.1	1528.77

ABSOLUTE MAXIMUM RATINGS

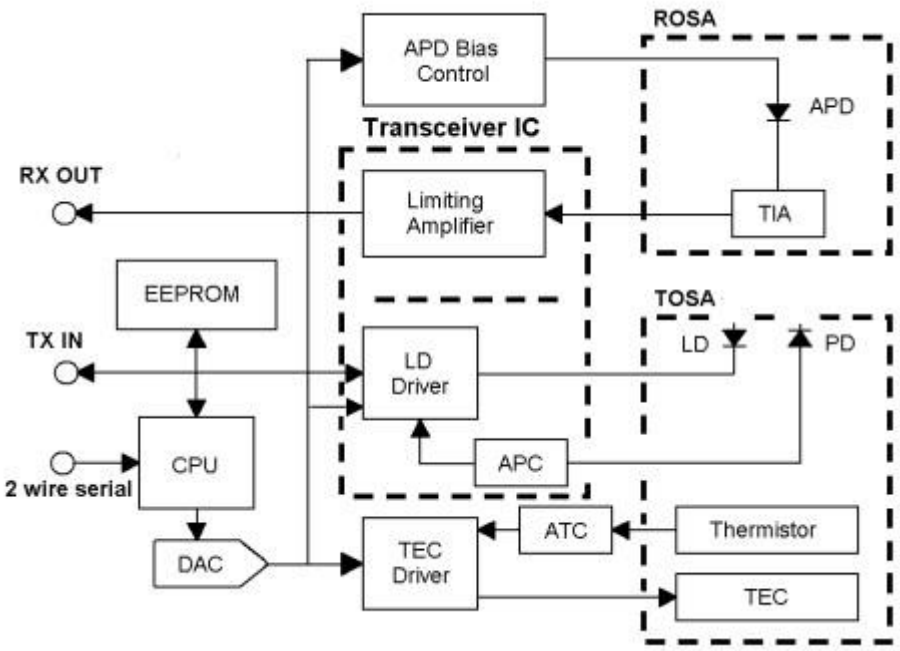
Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Supply Voltage	Vcc	-0.5	-	4.0	V	
Storage Temperature	Ts	-40	-	85	℃	
Relative Humidity	RH		-	85	%	

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	Ethernet			1.25		Gb/s	
	SDH/Sonet						
Supply Voltage		Vcc	3.13	3.3	3.47	V	
		Vcc				V	
Supply Current		Icc_5				mA	
		Icc_3			380	mA	
Operating Case Temp.		Tc	0		70	℃	

FUNCTIONAL DIAGRAM



ELECTRICAL INPUT/OUTPUT CHARACTERISTICS

Parameter		Symbol	Min.	Typ.	Max.	Unit	Note
Transmitter							
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	
Receiver							
Diff. output voltage swing			340	650	800	mVpp	3
Rx LOS Output	H	VOH	2.0		Vcc+0.3	V	2
	L	VOL	0		0.8		

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
Operating Wavelength			xx		nm	
Ave. output power (Enabled)	Po	0		+4	dBm	1
Extinction Ratio	ER	8.2			dB	1
RMS spectral width	Δλ			1	nm	
Rise/Fall time (20%~80%)	Tr/Tf			50	ps	2
Optical modulation amplitude	OMA	2			dBm	
Dispersion penalty				2	dB	
Output Optical Eye	Compliant with Bell core GR-253-CORE & ITU G.957 for SONET/SDH and with IEEE 802.3ae for Ethernet and Fibre Channel					
Receiver						
Parameter	**Symbol**	**Min.**	**Typ**	**Max.**	**Unit**	**Note**
Operating Wavelength		1480	xx	1580	nm	
Sensitivity	Psen			-28	dBm	3
Min. overload	Pimax	-7			dBm	
LOS Assert	Pa	-40			dBm	
LOS De-assert	Pd			-30	dBm	
LOS Hysteresis	Pd-Pa	0.5		4	dB	

Note 1) Measured at 10.3125b/s with PRBS 2^{31} – 1 NRZ test pattern.
Note 2) 20%~80%
Note 3) Under the ER worst case, measured at 10.3125 Gb/s with PRBS 2^{31} - 1 NRZ test pattern for BER < $1x10^{-12}$

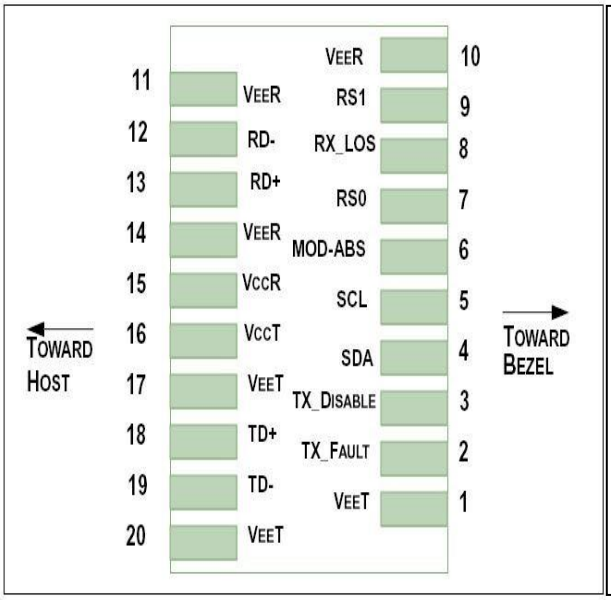
SERIAL INTERFACE FOR ID AND DDM

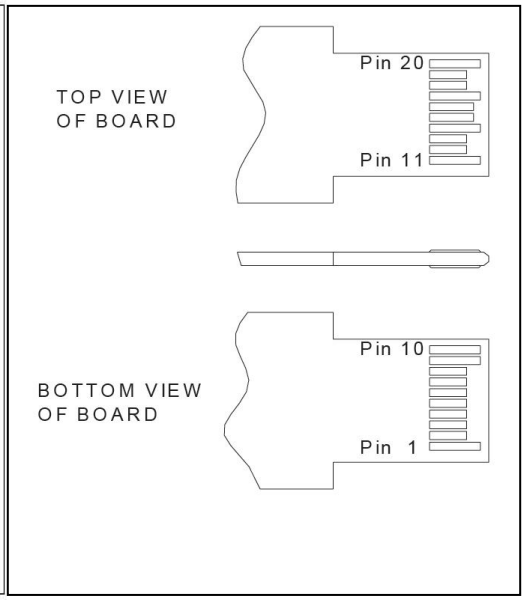
The SFP modules implement the 2-wire serial communication protocol as defined in the SFP MSA. The serial ID information of the SFP modules and Digital Diagnostic Monitor parameters can be accessed through the I2C interface at address A0h and A2h. The memory is mapped in Table 1. For more details of the memory map and byte definitions, please refer to the SFF-8472 (Rev 9.3, Aug. 2002), “Digital Diagnostic Monitoring Interface for Optica
l 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)
			56~95	Calibration Constants (40 bytes)
96~127	Vendor Specific (32 bytes)		96~119	Real Time Diagnostic Interface (24 bytes)
			120~127	Vender Specific (8 bytes)
128~255	Reserved,SFF8079 (128 bytes)		128~247	User Writable EEPROM (120 bytes)
			248~255	Vender Specific (8 bytes)

PIN DEFINITIONS AND FUNCTIONS

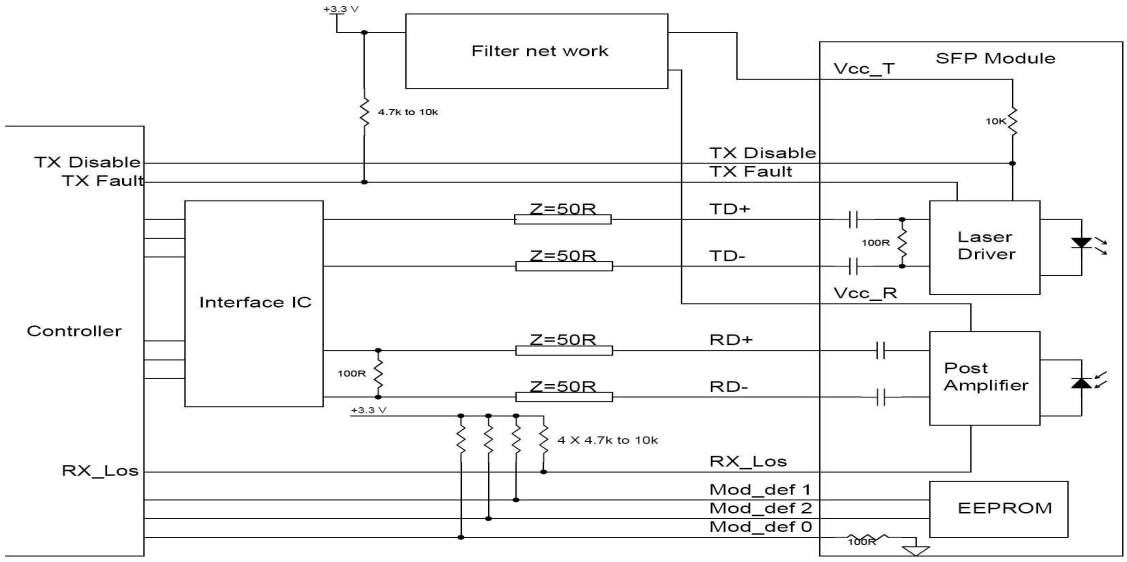




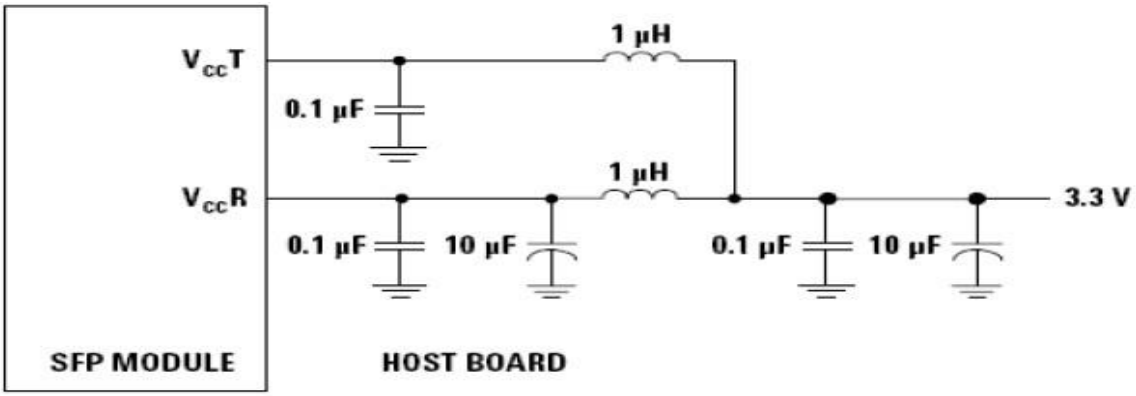
PIN #	Name	Function	Notes
1	VeeT	Module transmitter ground	Note1
2	Tx Fault	Module transmitter fault	Note 2
3	Tx Disable	Transmitter Disable; Turns off transmitter laser output	Note 3
4	SDL	2 wire serial interface data input/output (SDA)	
5	SCL	2 wire serial interface clock input (SCL)	
6	MOD-ABS	Module 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, in SONET designated as LOS, and in Ethernet designated at Signal Detect.

TYPICAL INTERFACE CIRCUIT

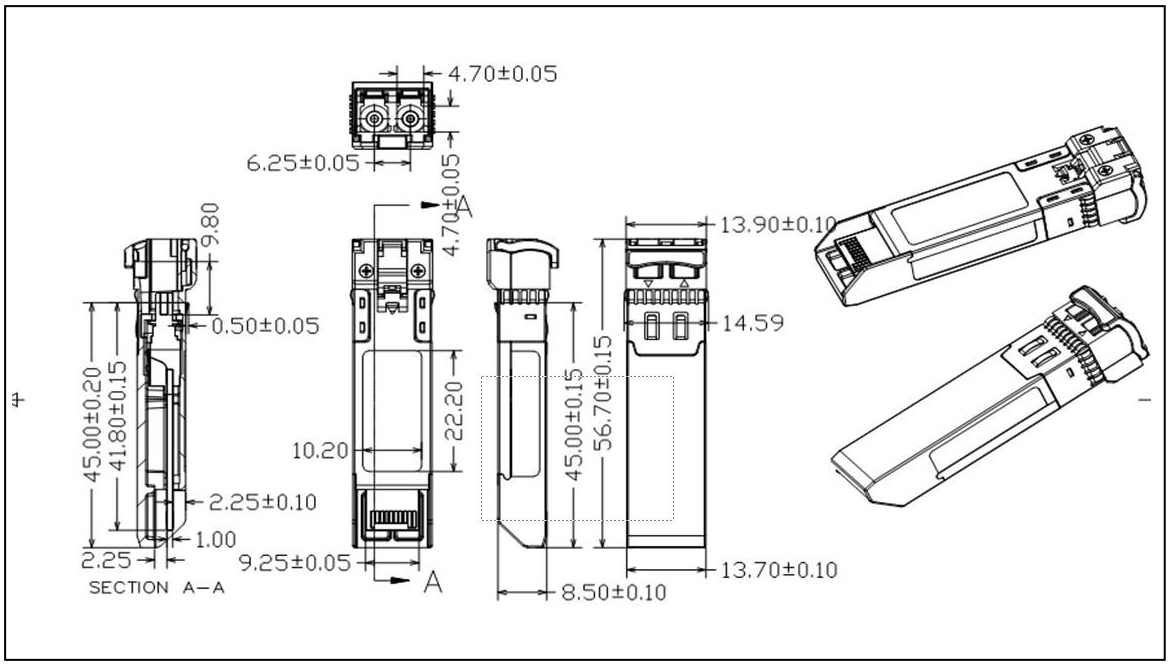


RECOMMENDED POWER SUPPLY FILTER



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

FOR MORE INFORMATION

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