



1.25Gb/s Multi-rate DWDM SFP 80km
Hot Pluggable, Duplex LC, +3.3V, DDMI, ITU-T 100G DWDM
PDSFP-24-1XX12-22F

Features:

- Compliant with Small form Factor Pluggable MSA Specification
- C-Band ITU 100-GHz DWDM grid DFB with built-in Isolator
- Standard and Wide Operating Temperature Range -5~70deg
- Single +3.3 V Power Supply and TTL Logic Interface
- Multi-rates from 100Mbps to 1.25Gbps
- 24dB Power Budget with PIN-TIA Receiver
- Compliant with Industry Standard RFT Electrical Connector and Cage
- High-Performance and Cost-Effective
- Low Power Consumption

- Metal Package for Superior EMI Performance
- EEPROM with Serial ID Functionality
- Enhanced Monitoring Functionality (Digital Diagnostics per SFF-8472 available)
- Safety Designed to Meet Laser Class1, Compliant with IEC60825

Applications:

- Metropolitan and access systems
- IP routers and ATM core switches
- DWDM for Metro Area Networks
- Gigabit Ethernet, Fibre Channel 1 Gbps and 2 Gbps

Ordering Information:

Part No.	Data Rate *1	Laser	Power Budget*2	Connector	Operation Temp
PDSFP-24-1XX12-22F	1.25Gb/s	DFB	24dBm	LC	-5~70deg

Note1: XX refers to DWDM Wavelength range as ITU-T specified, please refer the Appendix A for detailed center wavelength information.

Note2: Over the G.652 SMF, the dispersion tolerance is 1600ps/nm.

Absolute Maximum Ratings:

Parameter	Symbol	Min.	Max.	Unit
Storage Temperature	T_{ST}	-40	85	0C
Input Voltage	T_{CC}	0	5	V
Operating Relative Humidity		-	95	%

Operating Environment:

Parameter	Symbol	Min.	Max.	Unit
Supply Voltage	V_{CC}	+3.15	+3.45	V
Ambient Operating Temperature	T_{OP}	-5	70	°C

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Specification:

Electrical Characteristics: (Condition: $T_a=T_{OP}$)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Ref.
Supply Voltage	V_{CC}	3.1		3.5	V	
Supply Current	I_{CC}			380	mA	
Transmitter						
Input differential impedance	R_{in}		100		Ω	1
PECL/CML Input	V_{TXDIFF}	400		2000	mV	
Input Rise/Fall	T_R/T_F			160	ps	
Transmit Disable Voltage	V_D	2		3.47	V	2
Transmit Enable Voltage	V_{EN}	-0.3		0.8	V	
Receiver						
Differential Output Swing	V_{RXDIFF}	400	800	1200	mV	3
Rise/Fall Time	T_R/T_F			140	ps	5
Loss of Signal (Asserted)	V_{OH}	2		3.47	V	4
Loss of Signal (De-Asserted)	V_{OL}	-0.3		0.8	V	4

Notes:

1. AC coupled.
2. Or open circuit.
3. Into 100 ohm differential termination.
4. LOS is LVTTTL. Logic 0 indicates normal operation; logic 1 indicates no signal detected.
5. 20% - 80%



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Optical Characteristics: (Condition: $T_a=T_{OP}$)

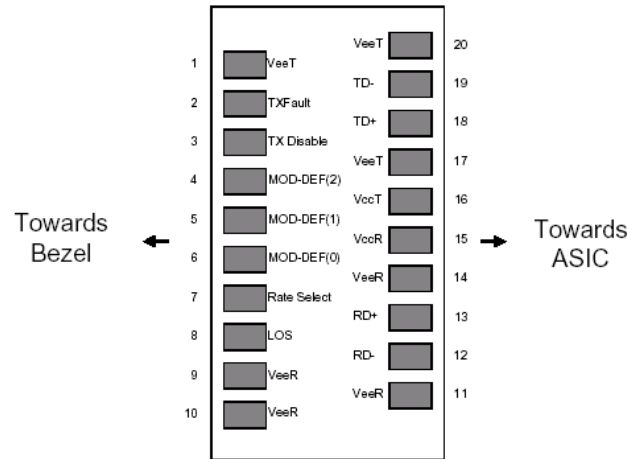
Parameter	Symbol	Min	Typ	Max	Unit	Ref
Transmitter						
Data Rate	BR		1.25		Gb/s	
ITU Central Wavelength	λ_c	1528		1606	nm	1
Optical Wavelength	λ	x-0.1	x	x+0.1	nm	2
Spectral Width	σ			0.2	nm	3
Side-Mode Suppression Ratio	SMSR	30			dB	
Optical Output Power	P_O	0	2	4	dBm	4
Extinction Ratio	ER	8.2			dB	
Dispersion Tolerance	D_T			1600	ps/nm	
Dispersion Penalty	D_p			2	dB	
Optical Return Loss	RL	24			dB	
Jitter Generation	TJ_{p-p}			70	mUI	
Output Optical Eye	Compliant with Bellcore GR-253-CORE and IEEE 802.3ae for Ethernet and Fibre Channel					
Receiver						
Optical Center Wavelength	λ_C	1260		1610	nm	
Receiver Sensitivity@1.25G	RX1			-24	dBm	5
Maximum Input Power	P _{MAX}	-7			dBm	
Return Loss				-27	dB	
LOS De-Assert	LOSD			-33	dBm	
LOS Assert	LOSA	-23			dBm	
LOS Hysteresis		0.5		3	dB	

Notes:

1. Refer to Appendix A for detailed ITU-T wavelength
2. Where λ_c is a defined ITU-T wavelength
3. Full width, -20dB from maximum, with resolution bandwidth (RBW) = 0.01 nm
4. Average power coupled into single-mode fiber and Modulated at 2.488Gb/s
5. ONSR measurements are made using an optical spectrum analyser with a resolution bandwidth of 0.1nm and an optical passband filter with a 3dB bandwidth of 1nm. Average power at 1×10^{-12} BER and data rates of 155Mb/s to 2.667Gb/s using PRBS $2^{23}-1$.

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Pin Assignment:



Pin out of Connector Block on Host Board

Pin	Symbol	Name/Description	Ref.
1	VEET	Transmitter Ground (Common with Receiver Ground)	1
2	TFAULT	Transmitter Fault. Not supported.	
3	TDIS	Transmitter Disable. Laser output disabled on high or open.	2
4	MOD_DEF(2)	Module Definition 2. Data line for Serial ID.	3
5	MOD_DEF(1)	Module Definition 1. Clock line for Serial ID.	3
6	MOD_DEF(0)	Module Definition 0. Grounded within the module.	3
7	Rate Select	No connection	
8	LOS	Loss of Signal indication. Logic 0 indicates normal operation.	4
9	VEET	Transmitter Ground (Common with Transmitter Ground)	1
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	
13	RD+	Receiver Non-inverted DATA out. AC Coupled	
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.	
19	TD-	Transmitter Inverted DATA in. AC Coupled.	
20	VEET	Transmitter Ground (Common with Receiver Ground)	1

Notes:

1. Circuit ground is internally isolated from chassis ground.
2. Laser output disabled on TDIS >2.0V or open, enabled on TDIS <0.8V.
3. Should be pulled up with 4.7k – 10kohms on host board to a voltage between 2.0V and 3.6V. MOD_DEF(0) pulls line low to indicate module is plugged in.
4. LOS is open collector output. Should be pulled up with 4.7k – 10kohms on host board to a voltage between 2.0V and 3.6V. Logic 0 indicates normal operation; logic 1 indicates loss of signal.

EEPROM Information

The SFP MSA defines a 256-byte memory map in EEPROM that is accessible over a 2-wire serial interface at the 8 bit address 1010000X (A0h). The digital diagnostic monitoring interface also defines another 256-byte memory map in EEPROM, which makes use of the 8 bit address 1010001X (A2h). Please see Figure 1. For detail EEPROM information, please refer to the related document of SFF-8472 Rev 9.5. The monitoring specification of this product is described in Table Digital Diagnostic Monitor Characteristics.

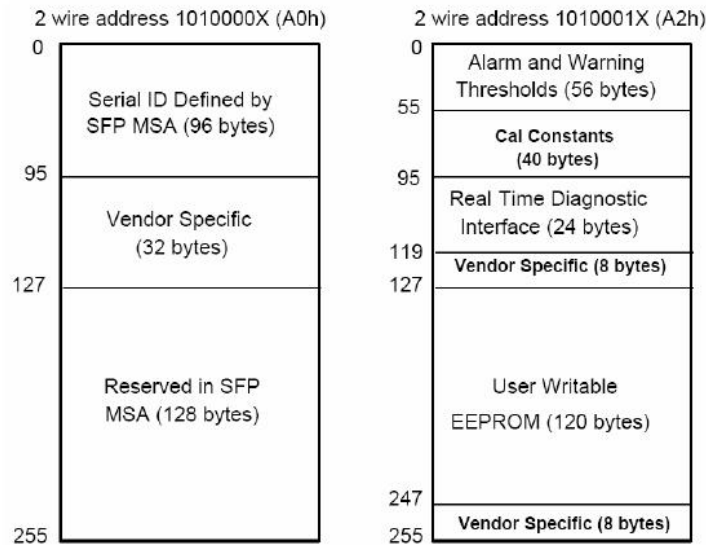


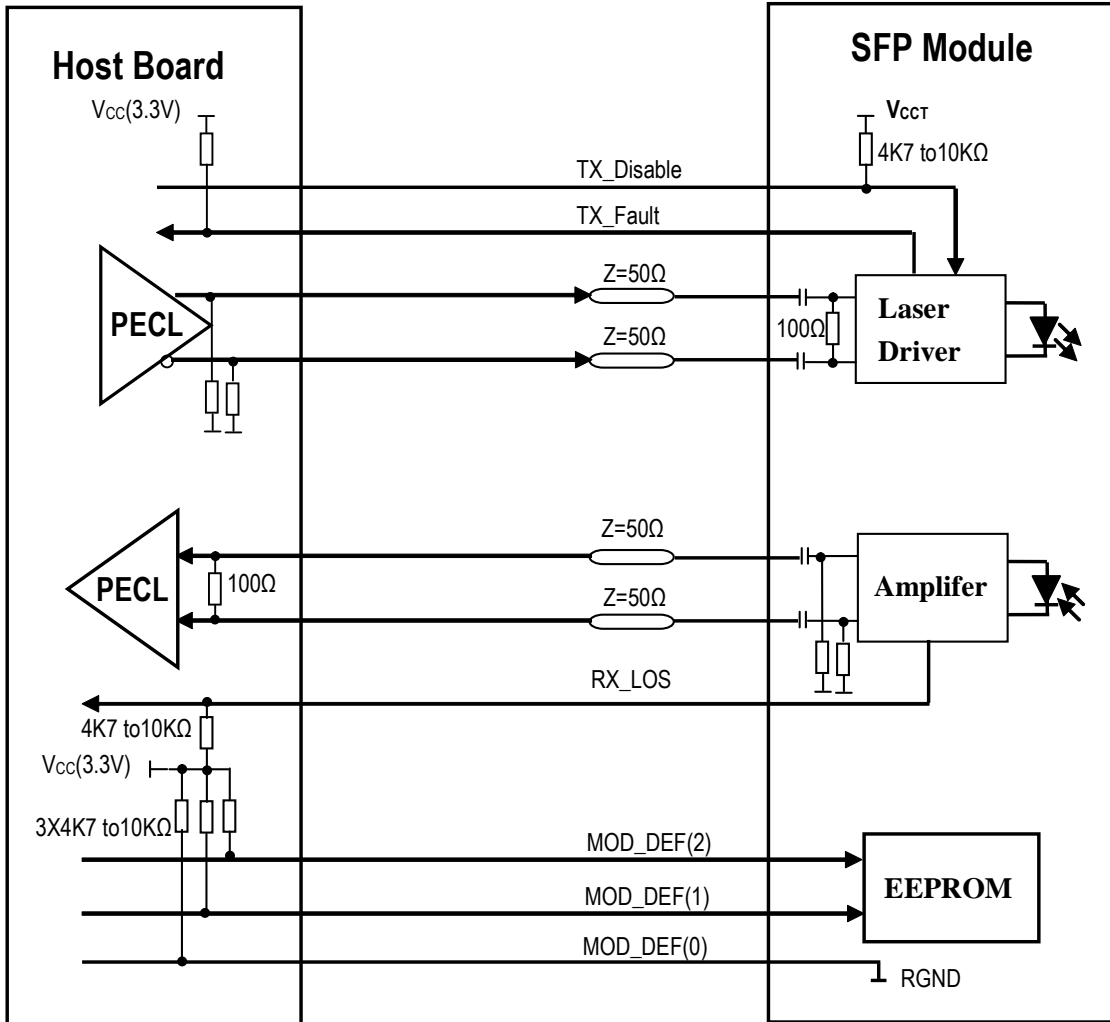
Figure 1: EEPROM Memory Map Specific Data Field Descriptions

Digital Diagnostic Monitor Characteristics:

Parameter	Range	Accuracy	Calibration
Temperature	-5 ~ +70°C	±3°C	Internal
Voltage	3.0 ~ 3.6V	±3%	Internal
Bias Current	0 ~ 120mA	±10%	Internal
TX Power	0 ~ 4dBm	±2dB	Internal
RX Power	-32 ~ -7dBm	±2dB	Internal

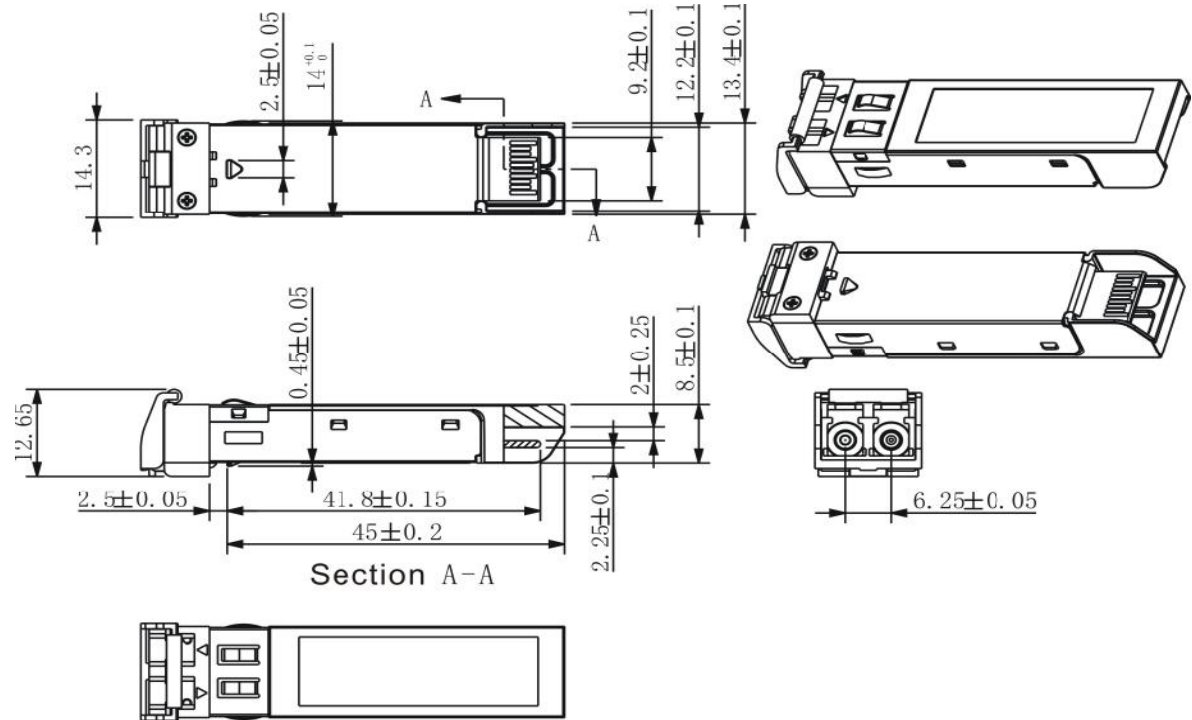
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Recommended Circuit:



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Mechanical Dimensions:



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Appendix A: ITU-T 100GHZ DWDM Central Wavelength Table

Channel	Central Wavelength(nm)	Frequency (THZ)
CH61	1528.77	196.1
CH60	1529.55	196.0
CH59	1530.33	195.9
CH58	1531.12	195.8
CH57	1531.90	195.7
CH56	1532.68	195.6
CH55	1533.47	195.5
CH54	1534.25	195.4
CH53	1535.04	195.3
CH52	1535.82	195.2
CH51	1536.61	195.1
CH50	1537.40	195.0
CH49	1538.19	194.9
CH48	1538.98	194.8
CH47	1539.77	194.7
CH46	1540.56	194.6
CH45	1541.35	194.5
CH44	1542.14	194.4
CH43	1542.94	194.3
CH42	1543.73	194.2
CH41	1544.53	194.1
CH40	1545.32	194.0
CH39	1546.12	193.9
CH38	1546.92	193.8
CH37	1547.72	193.7
CH36	1548.51	193.6
CH35	1549.32	193.5
CH34	1550.12	193.4
CH33	1550.92	193.3
CH32	1551.72	193.2
CH31	1552.52	193.1
CH30	1553.33	193.0
CH29	1554.13	192.9
CH28	1554.94	192.8
CH27	1555.75	192.7
CH26	1556.55	192.6
CH25	1557.36	192.5
CH24	1558.17	192.4
CH23	1558.98	192.3
CH22	1559.79	192.2
CH21	1560.61	192.1
CH20	1561.42	192.0
CH 19	1562.23	191.9
CH 18	1563.05	191.8
CH 17	1563.86	191.7

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