SO08D199-PLGA-XX

FEATURES

- Supports 9.95Gb/s to 11.1Gb/s bit rates
- Maximum link length of 80km
- 3.3V power supplies required
- SFP+ package with Duplex LC connector
- Temperature-stabilized 1550nm DWDM EML transmitter and High performance APD receiver
- Commercial temperature range:-5°C to 70°C
- Built-in CDR
- Digital diagnostic monitor interface
- RoHS-6 Compliant for SO08D199-PLGA-XX
- SFI electrical interface

APPLICATIONS

- DWDM Network
- 10GBASE-ZR/ZW
- OTN
- 10Gb/s Fiber Channel

STANDARDS

- Complies with IEEE802.3ae
- Complies with SFP+ MSA (SFF-8431)
- Complies with SFF-8472
- Complies with FCC 47 CFR Part 15, Class B
- Complies with 21 CFR 1040.10 and 1040.11 except for deviations pursuant to Laser Notice No. 50, dated June 24, 2007

ABSOLUTE MAXIMUM RATING

Parameter	Symbol	Min.	Max.	Unit	Notes
Storage Ambient Temperature	T_{STG}	-40	85	°C	
Operating Case Temperature	T_c	-5	70	°C	
Operating Humidity	OH	5	95	%	
Power Supply Voltage	V_{CC}	-0.5	3.6	V	

RECOMMENDED OPERATING CONDITION

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Operating Case Temperature	Tc	-5		+70	°C	
Power Supply Voltage	V_{CC}	3.13	3.3	3.47	V	
Power Supply Current	P			2.5	W	
Nominal upstream line rate		9.95		11.1	Gbps	

TRANSMITTER OPTICAL CHARACTERISTICS

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Average Launch Optical Power	P_{OUT}	-1	-	3	dBm	
Extinction Ratio	ER	8.2	-	-	dB	
Centre Wavelength space			100		GHz	
Centre Wavelength (BOL)	λ	X-40	X	X+40	pm	
Centre Wavelength (EOL)	λ	X-100	X	X+100	pm	
Spectral Width (-20dB)	Δλ	-	-	0.3	nm	
Side Mode Suppression Mode	SMSR	35			dB	
Tx Jitter (SONET) 20kHz-80MHz	Txj1			0.3	UI	
Tx Jitter (SONET) 4MHz-80MHz	Txj2			0.1	UI	
Transmitter Dispersion Penalty (@ 1600 ps/nm)	TDP			2	dB	RATE:10.3G BER<1E-12
Eye Diagram	IEEE802.3ae 10GBASE-ZR					
Mask margin		15			%	

TRANSMITTER ELECTRICAL CHARACTERISTICS

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Input Differential Impedance	ZIN	90	100	110	Ω	
Data Input Swing Differential	VIN	120	-	820	mV	
Transmit Disable Voltage	V_D	2		VCC	V	
Transmit Enable Voltage	V_{EN}	-0.3		0.8	V	
Transmit Fault - Normal Voltage		-0.3		0.4	V	
Transmit Fault - Fault Voltage		2.4		VCC_{HOST}	V	

RECEIVER ELECTRICAL CHARACTERISTICS

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Differential data output swing	Vout	340	650	850	mV	
LOS	High	2.4	-	VCC_{HOST}	V	
	Low	-0.3	-	0.4	V	

RECEIVER CHARACTERISTICS

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Optical Center Wavelength	λ_C	1260	-	1620	nm	
Receiver Sensitivity (BOL)				-22	dBm	RATE:10.3G BER<1E-12
Receiver Overload		-7			dBm	
Receiver reflectance				-27	dB	
LOS De-Assert				-30	dBm	
LOS Assert		-35			dBm	
LOS Hysteresis		0.5		5	dB	

PIN DESCRIPTION

PIN	Name	Description	Notes
1	$V_{EE}T$	Transmitter Ground	
2	TX_Fault	Transmitter Fault Indication	Low: normal; High: abnormal
3	TX_Disable	Transmitter Disable	Low: transmitter on; High: transmitter off
4	SDA	SDA	The data line of two wire serial interface
5	SCL	SCL	The clock line of two wire serial interface
6	MOD_ABS	Module Absent	Connected to $V_{EE}T$ or $V_{EE}R$ in the module
7	RS0	Not Connected	
8	RX_LOS	Loss of Signal	Low: signal detected; High: loss of signal
9	RS1	Not Connected	
10	$V_{EE}R$	Receiver Ground	
11	$V_{EE}R$	Receiver Ground	
12	RD-	Inv. Received Data Out	AC-coupled, CML
13	RD+	Received Data Out	AC-coupled, CML
14	$V_{EE}R$	Receiver Ground	
15	$V_{CC}R$	Receiver Power	
16	$V_{CC}T$	Transmitter Power	
17	$V_{EE}T$	Transmitter Ground	
18	TD+	Transmit Data In	AC-coupled, CML
19	TD-	Inv. Transmit Data In	AC-coupled, CML
20	$V_{EE}T$	Transmitter Ground	

1. Module ground pins Gnd are isolated from the module case and chassis ground within the module.
2. Shall be pulled up with 4.7K-10Kohms to a voltage between 3.15V and 3.45V on the host board.

PIN OUT DRAWING

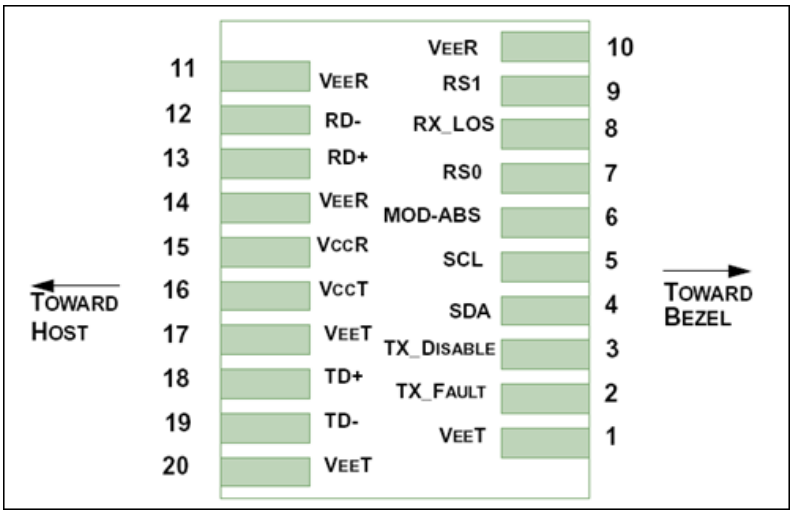

Figure 1 Host PCB SFP Pinout Top View

Host Board Supply Filtering Network

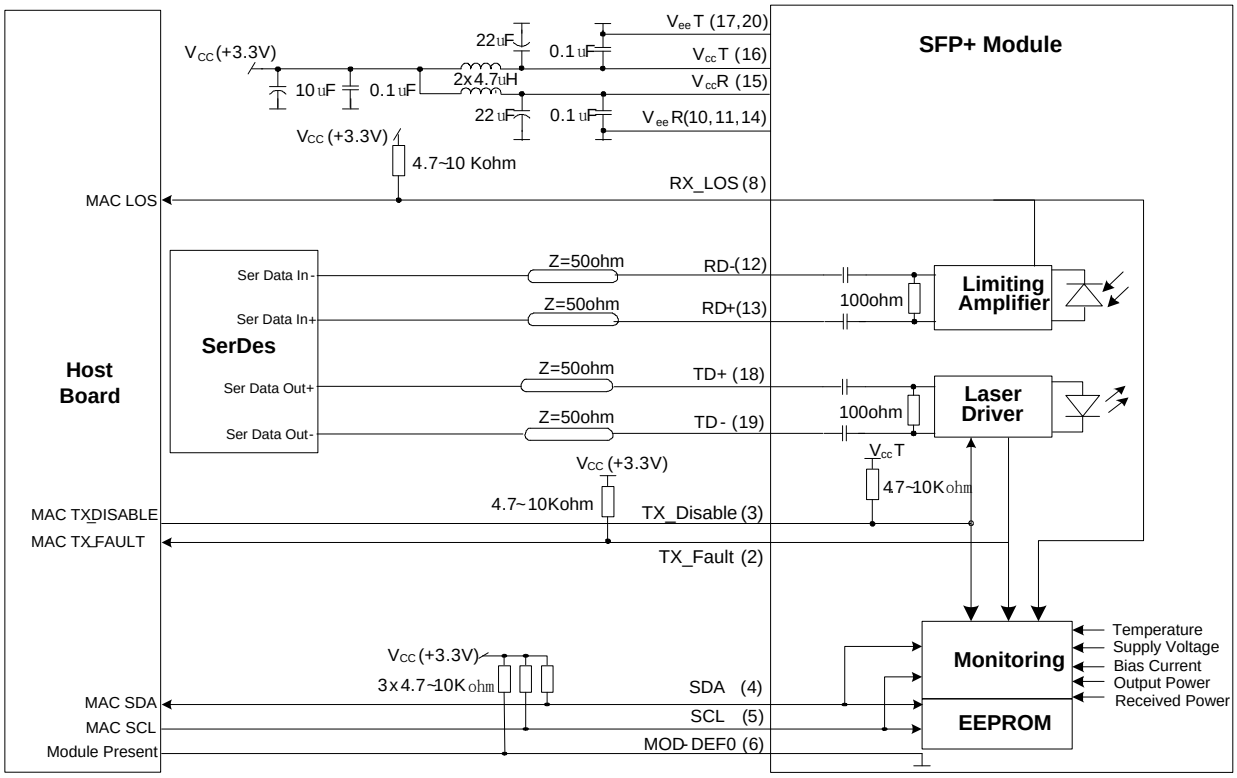

Figure 2 Host Board Supply Filtering Network

PACKAGE OUTLINE

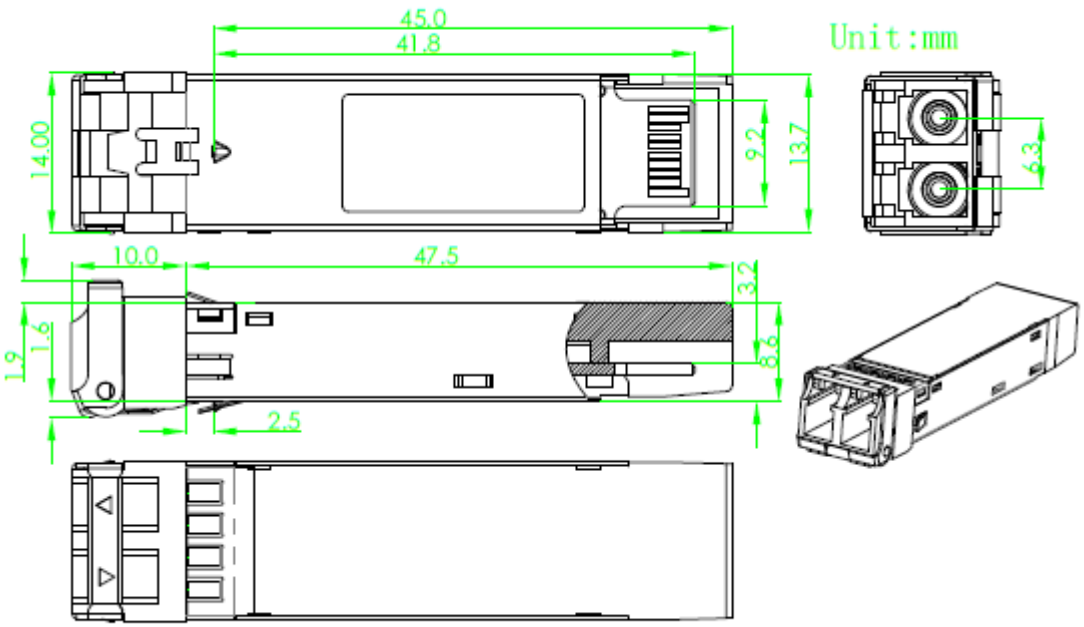

Figure 3 Package Outline

EEPROM INFORMATION

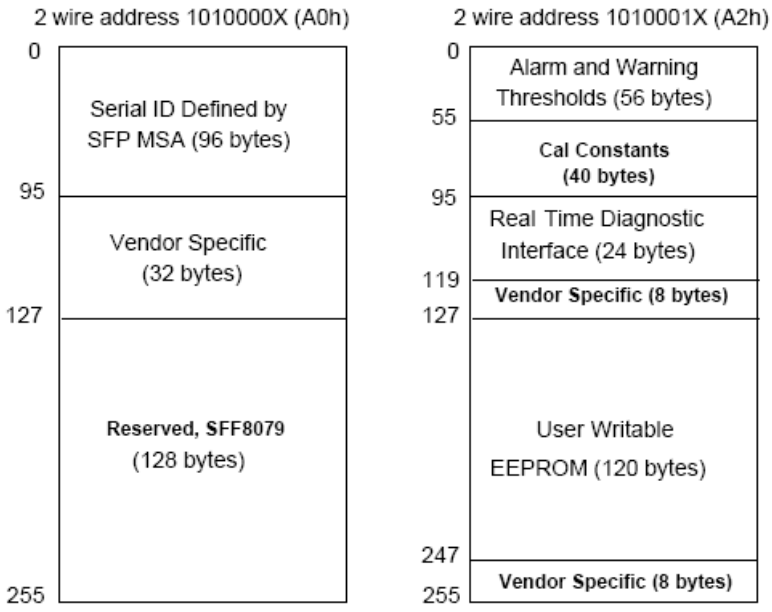

Figure 4 EEPROM Memory Map Specific Data Field Descriptions

DIGITAL DIAGNOSTIC MONITORING INTERFACE

Five transceiver parameter values are monitored. The following table defines the monitored parameter's accuracy.

Parameter	Range	Accuracy	Calibration	NOTES
Temperature	-5 to 70°C	±5°C	Internal	LSB: 1/256C
Voltage	2.97 to 3.63V	±3%	Internal	LSB: 0.1mV
Bias Current	0 to 100mA	±10%	Internal	LSB: 2uA
TX Power	0 to +5dBm	±2dB	Internal	LSB: 0.1uW
RX Power	-23 to -8dBm	±3dB	Internal	LSB: 0.1uW

ORDERING INFORMATION			
Channel	Product Code	Frequency (THz)	Center Wavelength (nm)
1	SO08D199-PLGA-61	196.1	1528.77
3	SO08D199-PLGA-60	196.0	1529.55
5	SO08D199-PLGA-59	195.9	1530.33
7	SO08D199-PLGA-58	195.8	1531.12
9	SO08D199-PLGA-57	195.7	1531.9
11	SO08D199-PLGA-56	195.6	1532.68
13	SO08D199-PLGA-55	195.5	1533.47
15	SO08D199-PLGA-54	195.4	1534.25
17	SO08D199-PLGA-53	195.3	1535.04
19	SO08D199-PLGA-52	195.2	1535.82
21	SO08D199-PLGA-51	195.1	1536.61
23	SO08D199-PLGA-50	195.0	1537.4
25	SO08D199-PLGA-49	194.9	1538.19
27	SO08D199-PLGA-48	194.8	1538.98
29	SO08D199-PLGA-47	194.7	1539.77
31	SO08D199-PLGA-46	194.6	1540.56
33	SO08D199-PLGA-45	194.5	1541.35
35	SO08D199-PLGA-44	194.4	1542.14
37	SO08D199-PLGA-43	194.3	1542.94
39	SO08D199-PLGA-42	194.2	1543.73
41	SO08D199-PLGA-41	194.1	1544.53
43	SO08D199-PLGA-40	194.0	1545.32
45	SO08D199-PLGA-39	193.9	1546.12
47	SO08D199-PLGA-38	193.8	1546.92
49	SO08D199-PLGA-37	193.7	1547.72
51	SO08D199-PLGA-36	193.6	1548.51
53	SO08D199-PLGA-35	193.5	1549.32
55	SO08D199-PLGA-34	193.4	1550.12
57	SO08D199-PLGA-33	193.3	1550.92
59	SO08D199-PLGA-32	193.2	1551.72
61	SO08D199-PLGA-31	193.1	1552.52
63	SO08D199-PLGA-30	193.0	1553.33
65	SO08D199-PLGA-29	192.9	1554.13
67	SO08D199-PLGA-28	192.8	1554.94
69	SO08D199-PLGA-27	192.7	1555.75

71	SO08D199-PLGA-26	192.6	1556.55
73	SO08D199-PLGA-25	192.5	1557.36
75	SO08D199-PLGA-24	192.4	1558.17
77	SO08D199-PLGA-23	192.3	1558.98
79	SO08D199-PLGA-22	192.2	1559.79
81	SO08D199-PLGA-21	192.1	1560.61
83	SO08D199-PLGA-20	192.0	1561.42
85	SO08D199-PLGA-19	191.9	1562.23
87	SO08D199-PLGA-18	191.8	1563.05
89	SO08D199-PLGA-17	191.7	1563.86
91	SO08D199-PLGA-16	191.6	1564.68
93*	SO08D199-PLGA-15	191.5	1565.5
95*	SO08D199-PLGA-14	191.4	1566.31
97*	SO08D199-PLGA-13	191.3	1567.13
99*	SO08D199-PLGA-12	191.2	1567.95

WARNINGS

- Handling Precautions: This device is susceptible to damage as a result of electrostatic discharge (ESD). A static free environment is highly recommended. Follow guidelines according to proper ESD procedures.
- Laser Safety: Radiation emitted by laser devices can be dangerous to human eyes. Avoid eye exposure to direct or indirect

radiation.

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