FEATURES

- Supports bit rates up to 28Gbps
- 0℃ to +70℃ operating case temperature
- SFP28 package with duplex LC receptacle connector
- Hot-pluggable capability
- Single 3.3V power supply
- 1270nm~1370nm CWDM un-cooled DFB transmitter and high performance PIN receiver
- Up to 9.2dB Power Budget
- Low power dissipation
- SFI electrical interface
- Low EMI and excellent ESD protection
- Built- in Digital Diagnostic Monitoring (DDM) function
- Class I laser safety standard IEC-60825 compliant
- RoHS-6 compliance

APPLICATIONS

- 25-Gigabit Ethernet
- CWDM Network

STANDARDS

- Complies with SFP28 MSA (SFF-8402)
- Complies with SFF-8472
- Complies with 802.3cc
- 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 Humidity	OH	0	95	%	
Power Supply Voltage	V_{CC}	-0.3	3.6	V	
Damage receive power threshold		3.5		dBm	

RECOMMENDED OPERATING CONDITION

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Operating Case Temperature	T_c	0		70	°C	
Power Supply Voltage	V_{CC}	3.13	3.3	3.47	V	
Power Supply Consumption	P			1	W	
Data Rate		24.3	25.78	28.05	Gbps	CDR Enable

TRANSMITTER OPTICAL CHARACTERISTICS

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Centre Wavelength	λ_C	λ-6.5	λ	λ+6.5	nm	
Average Output Power	P_{Out}	0		6	dBm	Launched into SMF Fiber
Optical modulation amplitude	OMA	-1.1			dBm	
Launch power in OMA minus TDP		-5			dB	
Average Power of OFF Transmitter	$P_{OUT-OFF}$			-35	dBm	
Extinction Ratio	ER	3.5			dB	
Transmitter and Dispersion Penalty	TDP			2	dB	1271nm/1291nm/1311nm, SMF 10km
				3		1331nm, SMF 10km
				4.5		1351nm/1371nm, SMF 10km
Optical return loss tolerance		20			dB	
Transmitter eye mask definition {X1, X2, X3, Y1, Y2, Y3}		{0.31, 0.4, 0.45, 0.34, 0.38, 0.4}				Hit ratio 5E-5 hits per sample

TRANSMITTER ELECTRICAL CHARACTERISTICS

Parameter		Symbol	Min.	Typ.	Max.	Unit	Notes
Differential input eye height from host			180		900	mV	
Input Differential Impedance			85	100	115	Ω	
TX Disable	Disable		2		VCC+0.3	V	
	Enable		-0.3		0.8	V	
TX Fault	Fault		2.4		VCC_{HOST}	V	
	Normal		-0.3		0.4	V	

RECEIVER OPTICAL CHARACTERISTICS

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Operating Wavelength	λ_C	1260		1620	nm	
Sensitivity(OMA)	SEN(OMA)			-14	dBm	$PRBS2^{31}$-1@25.78Gbps; BER ≤5E-5; Back-to-back connection
Saturation Optical Power	SAT	2.5			dBm	$PRBS2^{31}$-1@25.78Gbps
LOS De-Assert	LOS_D			-17	dBm	
LOS Assert	LOS_A	-30			dBm	
LOS Hysteresis	HYS	0.5		5	dB	

RECEIVER ELECTRIAL CHARACTERISTICS

Parameter	Symbo	Min.	Typ.	Max.	Unit	Notes
Differential data output swing	Vout	300		800	mV	
Rx_LOS Output Voltage - High	High	2.4		VCC_{HOST}	V	
Rx_LOS Output Voltage - Low	Low	-0.3		0.4	V	

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	Rate select 0	
8	RX_LOS	Loss of Signal	Low: signal detected; High: loss of signal
9	RS1	Rate select 1	
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	

PIN OUT DRAWING (TOP VIEW)

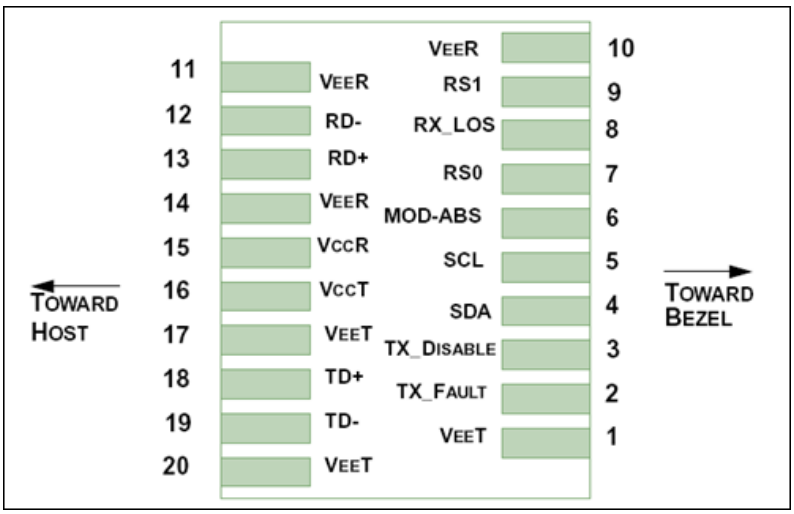

Figure 1 Pin Out Drawing (Top view)

TYPICAL INTERFACE CIRCUIT

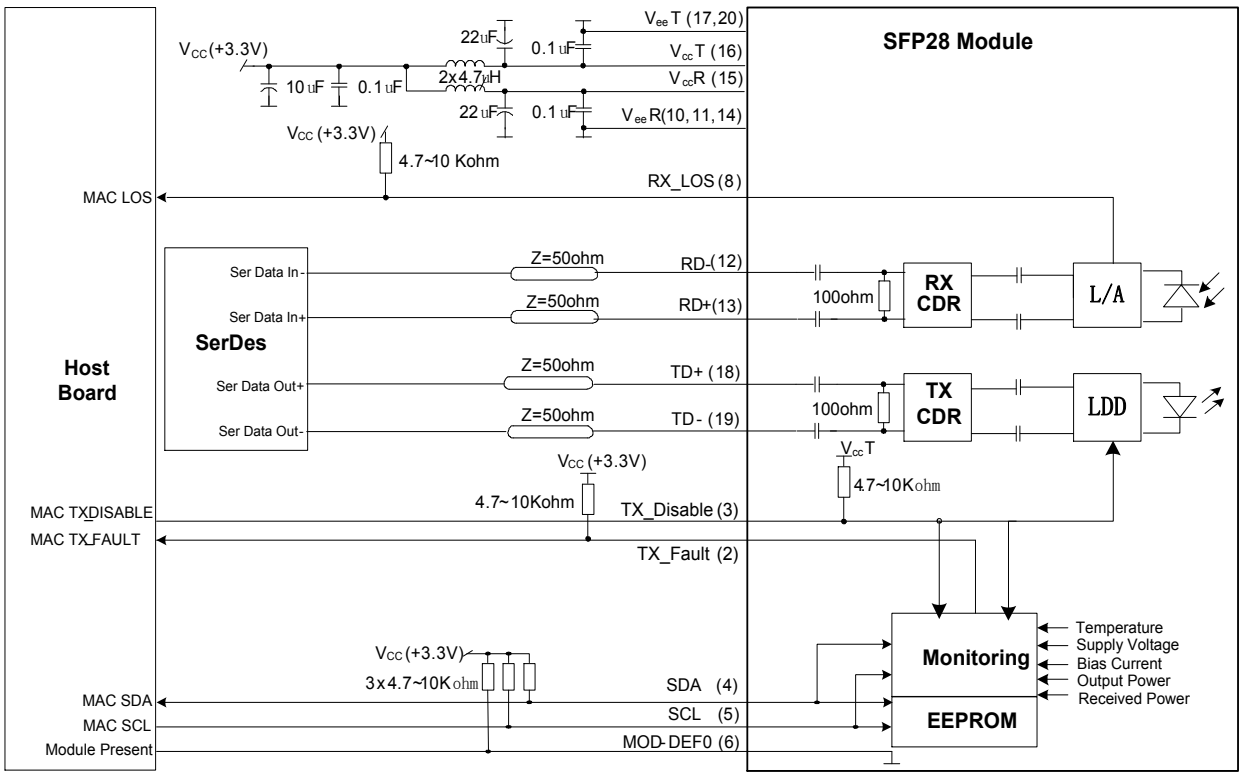

Figure 2 Typical Interface Circuit

PACKAGE OUTLINE

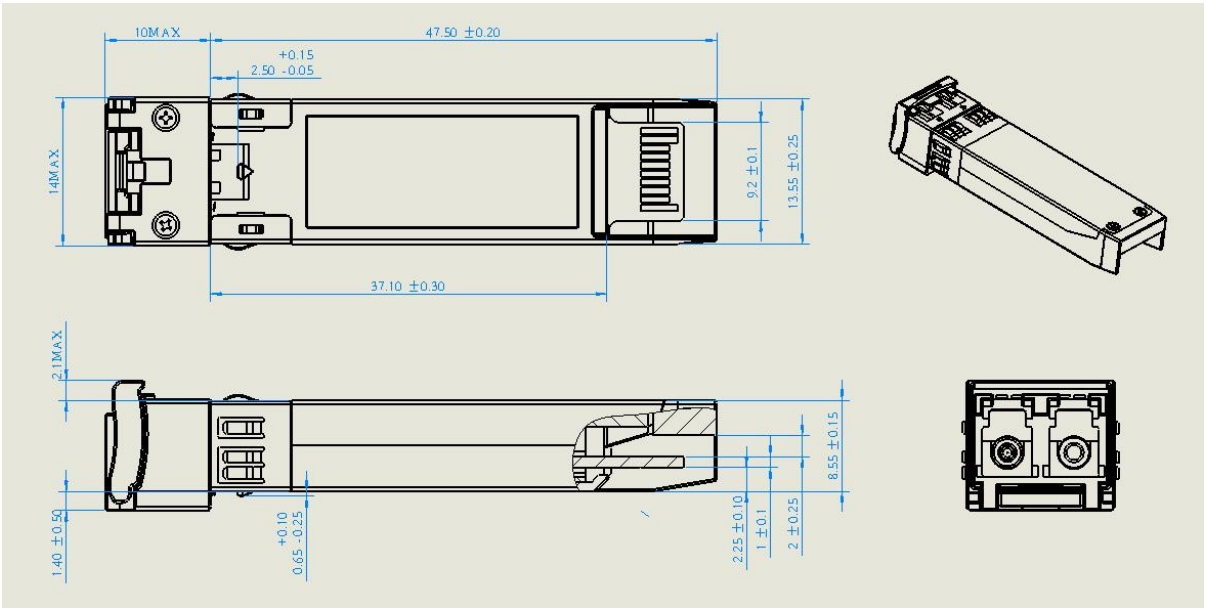

Figure 3 Package Outline

EEPROM INFORMATION

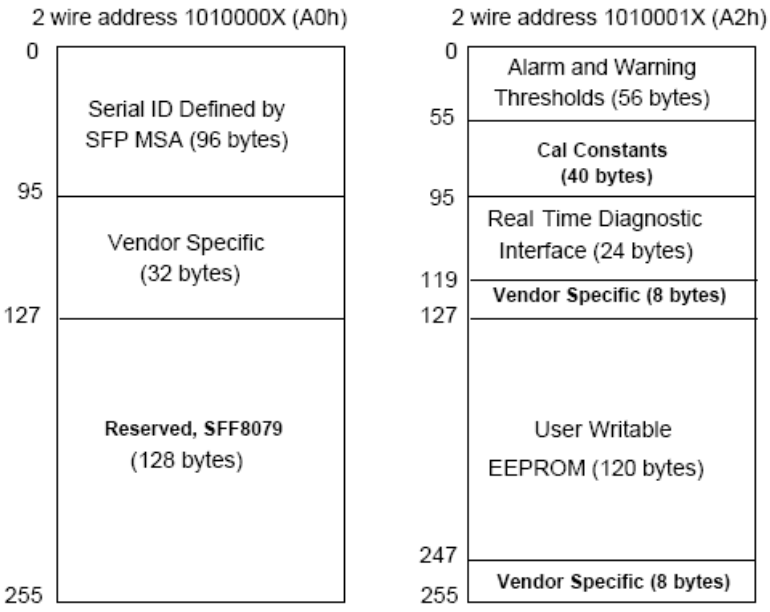

Figure 4 EEPROM Memory Map Specific Data Field Descriptions

DIGITAL DIAGNOSTIC MONITORING INTERFACE

Parameter	Range	Accuracy	Calibration	NOTES
Temperature	0 to 70°C	±3°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	-1 to +7dBm	±3dB	Internal	LSB: 0.1uW
RX Power	-15 to +3.5dBm	±3dB	Internal	LSB: 0.1uW

ORDERING INFORMATION

Wavelength Code	Product Code	Center Wavelength (nm)
27	SO01CWFF-PLGA-27	1271
29	SO01CWFF–PLGA-29	1291
31	SO01CWFF–PLGA-31	1311
33	SO01CWFF–PLGA-33	1331
35	SO01CWFF-PLGA-35	1351
37	SO01CWFF-PLGA-37	1371

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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