

#### **FEATURES**

- Supports up to 6.144Gb/s bit rates
- -20 to 85°C operating case temperature
- SFP+ package with duplex LC Receptacle connectors
- CWDM uncooled DFB laser transmitter and high performance PIN-TIA receiver
- Hot-pluggable capability
- Single 3.3V power supply
- Low power dissipation
- Up to 26dB power budget over SMF
- SFI electrical interface
- Low EMI and excellent ESD protection
- Built- in Digital Diagnostic monitoring (DDM) function
- Class I laser product
- RoHS-6 compliance

#### **APPLICATIONS**

- CPRI rates 2.4576Gb/s, 4.9152Gb/s, 6.144Gb/s
- CWDM Network

#### **STANDARDS**

- Complies with SFP+ MSA (SFF-8431)
- Complies with SFF-8472
- Complies with SFF-8432
- 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	$T_c$	-40	85	°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	$T_c$	-40		+85	°C	
Power Supply Voltage	$V_{CC}$	3.13	3.3	3.47	V	
Power Supply Current	$I_{CC}$			360	mA	
Data Rate				6.144	Gbps	
Data Rate Drift		-100		+100	PPM	

**TRANSMITTER OPTICAL CHARACTERISTICS**

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Centre Wavelength	$\lambda_c$	$\lambda-7.5$	$\lambda$	$\lambda+7.5$	nm	
Spectral Width (-20dB)	$\Delta\lambda$			1	nm	
Average Output Power	$P_{OUT}$	0		5	dBm	Launched into SMF Fiber
Average Power of OFF Transmitter	$P_{OFF}$			-30	dBm	
Extinction Ratio	ER	3.5			dB	
Side Mode Suppression Ratio	SMSR	30			dB	

#### TRANSMITTER ELECTRICAL CHARACTERISTICS

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Data Input Differential Swing		180		700	mV	
Input Differential Impedance		85	100	115	$\Omega$	
TX Disable	Disable	2		VCC+0.3	V	
	Enable	-0.3		0.8	V	
TX Fault	Fault	2.4		VCC <sub>HOST</sub>	V	
	Normal	-0.3		0.4	V	

#### RECEIVER OPTICAL CHARACTERISTICS

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Operating Wavelength	$\lambda_c$	1260		1620	nm	
Sensitivity	SEN			-26	dBm	BER<1E-12, 6.144Gb/s, PRBS31
Saturation Optical Power	SAT	-8			dBm	
LOS De-Assert	LOS <sub>D</sub>			-30	dBm	
LOS Assert	LOS <sub>A</sub>	-40			dBm	
LOS Hysteresis	HYS	0.5		5	dB	

#### RECEIVER ELECTRICAL CHARACTERISTICS

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Differential data output swing	Vout	350		850	mV	
Rx_LOS Output Voltage - High	High	2.4		VCC <sub>HOST</sub>	V	
Rx_LOS Output Voltage - Low	Low	-0.3		0.4	V	

PIN DESCRIPTION			
PIN	Name	Description	Notes
1	V <sub>EE</sub> 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 <sub>EE</sub> T or V <sub>EE</sub> 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 <sub>EE</sub> R	Receiver Ground	
11	V <sub>EE</sub> R	Receiver Ground	
12	RD-	Inv. Received Data Out	AC-coupled, CML
13	RD+	Received Data Out	AC-coupled, CML
14	V <sub>EE</sub> R	Receiver Ground	
15	V <sub>CC</sub> R	Receiver Power	
16	V <sub>CC</sub> T	Transmitter Power	
17	V <sub>EE</sub> T	Transmitter Ground	
18	TD+	Transmit Data In	AC-coupled, CML
19	TD-	Inv. Transmit Data In	AC-coupled, CML
20	V <sub>EE</sub> T	Transmitter Ground	

PIN OUT DRAWING (TOP VIEW)

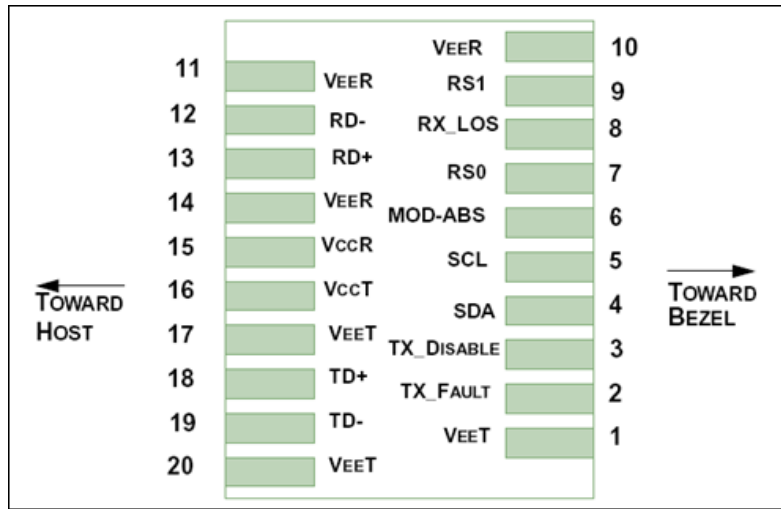


Figure 1 Pin Out Drawing (Top view)

TYPICAL INTERFACE CIRCUIT

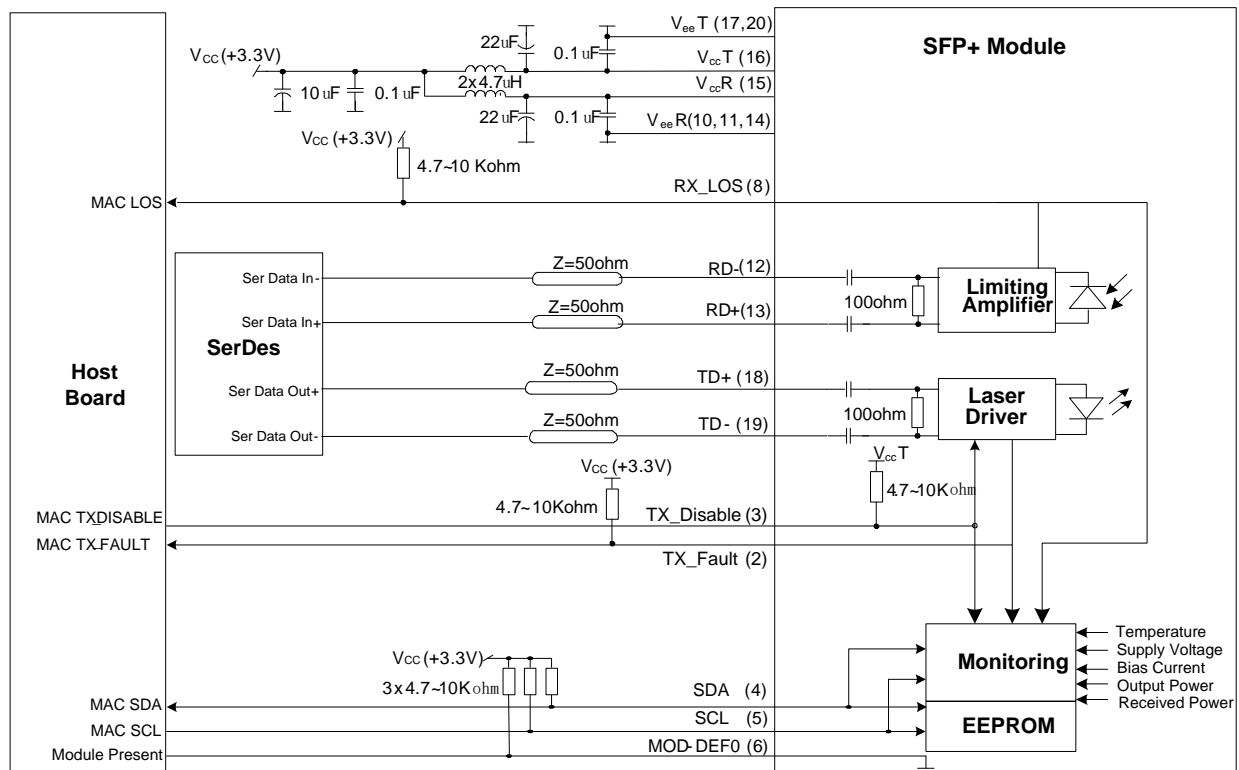
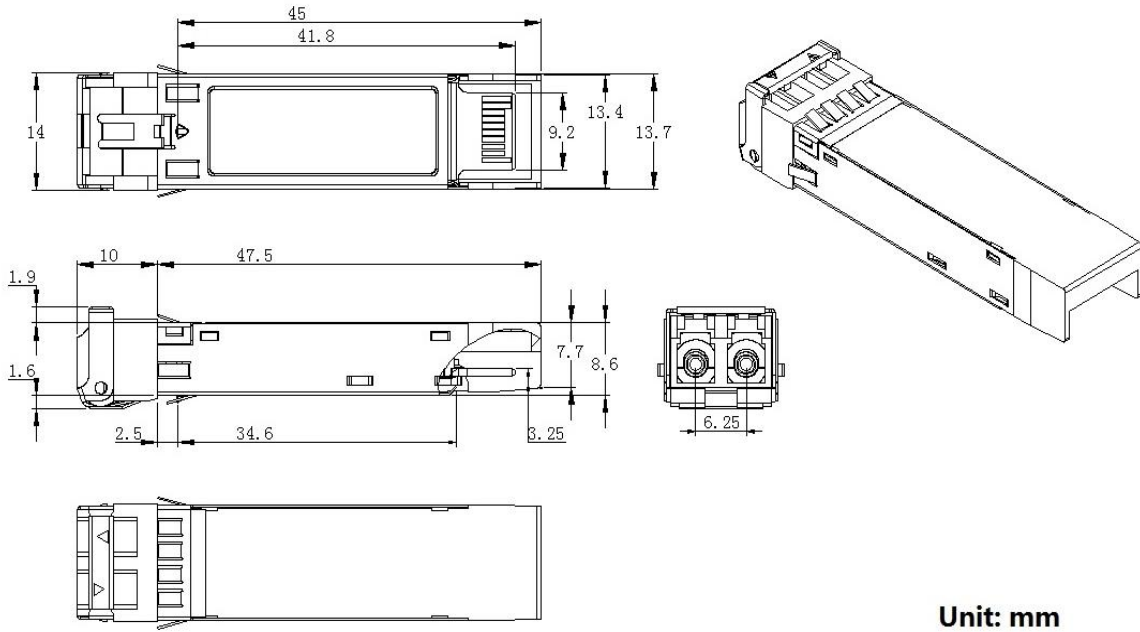


Figure 2 Typical Interface Circuit

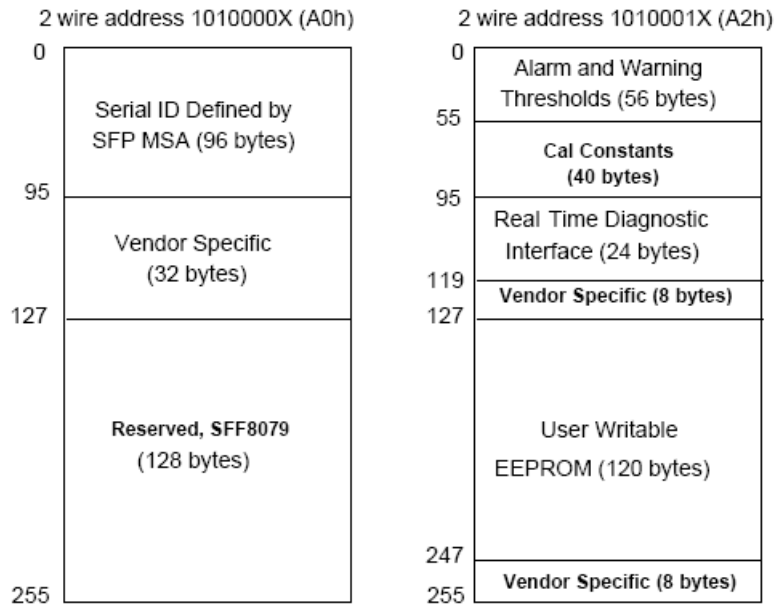
**PACKAGE OUTLINE**



**Unit: mm**

**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	-40 to 85°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	-3 to +3dBm	±3dB	Internal	LSB: 0.1uW
RX Power monitor	-15 to +1dBm	±3dB	Internal	LSB: 0.1uW

ORDERING INFORMATION

Part No.	Tx/Rx	Data Rate	Operating Temp	Distance
HOLS-PPCxx3066-LD-CD	DFB/APD	6.144G	0 to +70°C	30km
HOLS-PPCxx3066-LD-ID	DFB/APD	6.144G	-40 to +85°C	30km

Note:

XX is CWDM wavelength code as in the table below:

Center Wavelength(nm)	Code	Center Wavelength(nm)	Code
1271	27	1471	47
1291	29	1491	49
1311	31	1511	51
1331	33	1531	53
1351	35	1551	55
1371	37	1571	57
1391	39	1591	59
1411	41	1611	61

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.