

Features:

- ☞ Up to 2.5Gbps data rate
- ☞ Duplex LC receptacle optical interface compliant
- ☞ Single +3.3V power supply
- ☞ 850nm VCSEL,300m
- ☞ DDM function implemented, External calibration
- ☞ Hot-pluggable
- ☞ Receiver Loss of Signal Output
- ☞ AC coupling of PECL signals
- ☞ Serial ID module on MOD(0-2)
- ☞ International Class 1 laser safety certified
- ☞ Transmitter disable input
- ☞ Operating temperature range: 0°C ~+70°C
- ☞ RoHS Compliant



Applications:

- ☞ SDH STM-16 and SONET OC-48 system
- ☞ 2x Fiber Channel applications
- ☞ Switch to switch interface
- ☞ Switched backplane applications

Standards:

- ☞ Compliant with SFP MSA (INF-8074i)
- ☞ Compliant with SFF-8472 v9.3
- ☞ Compliant with IEEE802.3z Gigabit Ethernet
- ☞ Compliant with ITU-T G.695

Description:

The SFP transceivers are high performance, cost effective modules supporting 2.5Gbps and 300m transmission distance with MMF (62.5/125 μ m) .

The transceiver consists of three sections: a 850nm Vcsel transmitter, a PIN photodiode with a trans-impedance preamplifier (TIA). All modules satisfy class I laser safety requirements.

The transceivers are compatible with SFP Multi-Source Agreement (MSA) and SFF-8472. For further information, please refer to SFP MSA.

Absolute Maximum Ratings

Table 1 - Absolute Maximum Ratings

Parameter	Symbol	Min	Max	Unit
Supply Voltage	V _{cc}	-0.5	4.5	V
Storage Temperature	T _s	-40	85	°C
Operating Humidity	-	5	95	%

Recommended Operating Conditions

Table 2 - Recommended Operating Conditions

Parameter	Symbol	Min	Typical	Max	Unit
Operating Case Temperature	T _c	0		70	°C
Power Supply Voltage	V _{cc}	3.13	3.3	3.47	V
Data Rate			2.48832		Gbps

Optical and Electrical Characteristics

Table 3 - Optical and Electrical Characteristics

Parameter	Symbol	Min	Typical	Max	Unit	Notes
Transmitter						
Centre Wavelength	λ_c	830	850	870	nm	VCSEL-LD
Spectral Width (RMS)	$\Delta\lambda$			0.85	nm	VCSEL-LD
Average Output Power	P _{out}	-10	-5	-3	dBm	550m 850nm VCSEL-LD
Extinction Ratio	EX	8.5			dB	
Contributed Total Jitter added at TP2	TJ		0.1	3	UI	1
Relative Intensity Noise	RIN			-120	dB/Hz	2
Eye Diagram	Complies with STM-16 eye masks when filtered					
Dispersion Penalty				1	dB	
Optical Rise/Fall Time	Trise/Tfall			150	ps	3
Receiver						
Receiver Sensitivity	S			-18	dBm	300m 4
Receiver Overload	P _{in}	-3			dBm	300m
LOS De-Assert	LOSD	S			dBm	

LOS Assert	LOSA	-35			dBm	
LOS Hysteresis		0.5	3	5	dB	5

Note1. For the jitter measurements, the device was driven with SONET OC-48 data pattern with $2^{23}-1$ PRBS payload.

Note2. RIN is the laser noise, integrated over a specified bandwidth, measured relative to average optical power with 12dB return loss. For multimode application, the RIN is better than -117dB/Hz.

Note3. Optical transition time is the time interval required for the rising or falling edge of an optical pulse to transition between the 20% and 80% amplitudes relative to the logical 1 and 0 levels

Note4. Measured with a PRBS $2^{23}-1$ test pattern, @2.488Gb/s, EX=10dB, BER< 10^{-12} .

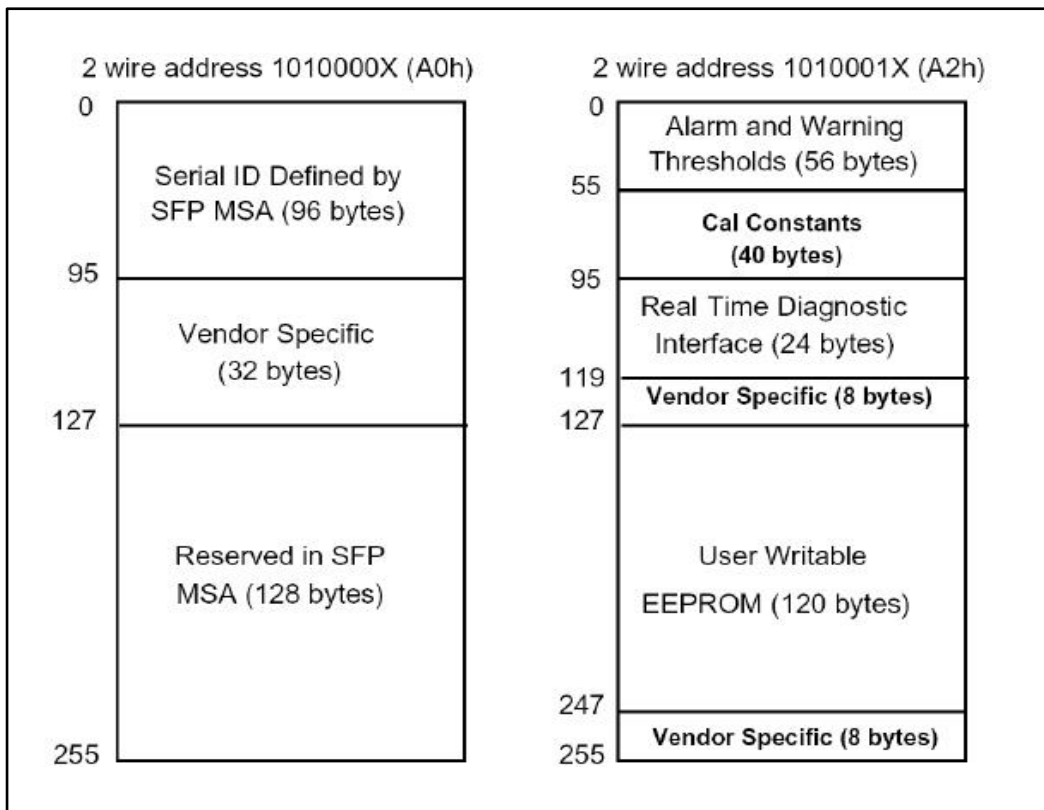
Note5. The LOS Hysteresis to minimize “chatter” on the output line. In principle, Hysteresis alone does not guarantee chatter-free operation.

Digital Diagnostic Memory Map

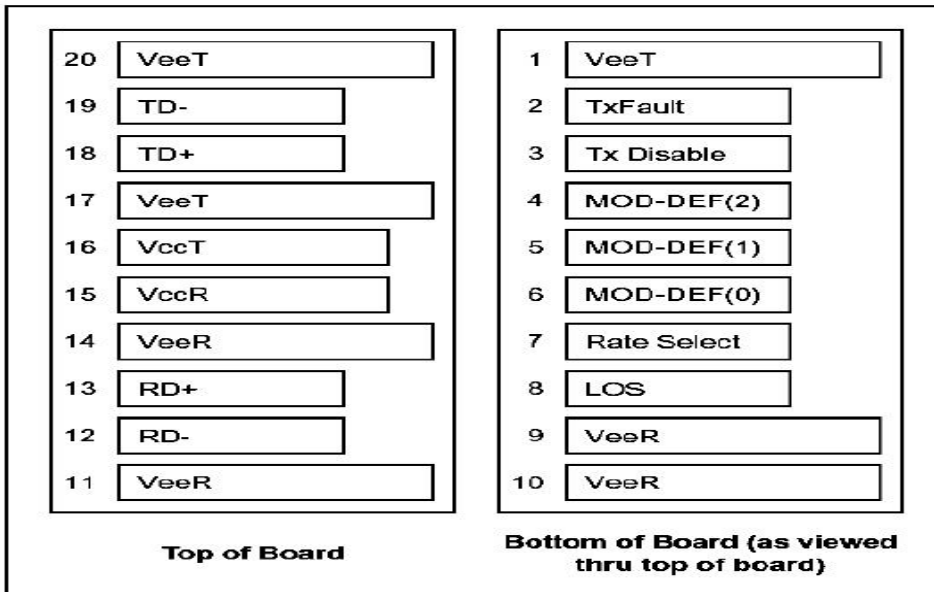
The transceivers provide serial ID memory contents and diagnostic information about the present operating conditions by the 2-wire serial interface (SCL, SDA).

The diagnostic information with internal calibration or external calibration all are implemented, including received power monitoring, transmitted power monitoring, bias current monitoring, supply voltage monitoring and temperature monitoring.

The digital diagnostic memory map specific data field defines as following.



Pin Definitions



Pin Descriptions

Pin	Signal Name	Description	Plug Seq.	Notes
1	VEET	Transmitter Ground	1	
2	TX FAULT	Transmitter Fault Indication	3	Note 1
3	TX DISABLE	Transmitter Disable	3	Note 2
4	MOD_DEF(2)	SDA Serial Data Signal	3	Note 3
5	MOD_DEF(1)	SCL Serial Clock Signal	3	Note 3
6	MOD_DEF(0)	TTL Low	3	Note 3
7	Rate Select	Not Connected	3	
8	LOS	Loss of Signal	3	Note 4
9	VEER	Receiver ground	1	
10	VEER	Receiver ground	1	
11	VEER	Receiver ground	1	
12	RD-	Inv. Received Data Out	3	Note 5
13	RD+	Received Data Out	3	Note 5
14	VEER	Receiver ground	1	
15	VCCR	Receiver Power Supply	2	
16	VCCT	Transmitter Power Supply	2	
17	VEET	Transmitter Ground	1	
18	TD+	Transmit Data In	3	Note 6
19	TD-	Inv. Transmit Data In	3	Note 6
20	VEET	Transmitter Ground	1	

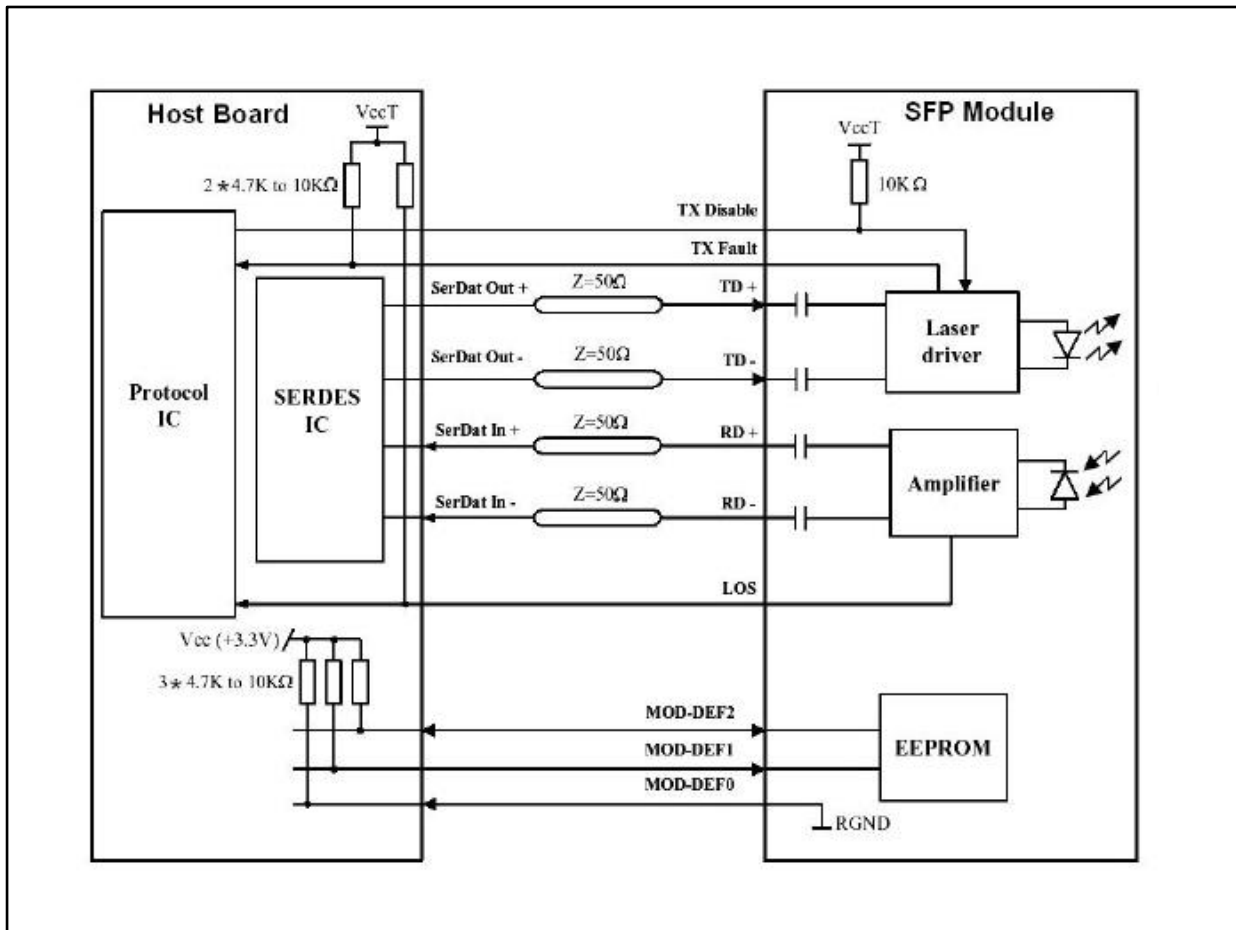
Notes:

Plug Seq.: Pin engagement sequence during hot plugging.

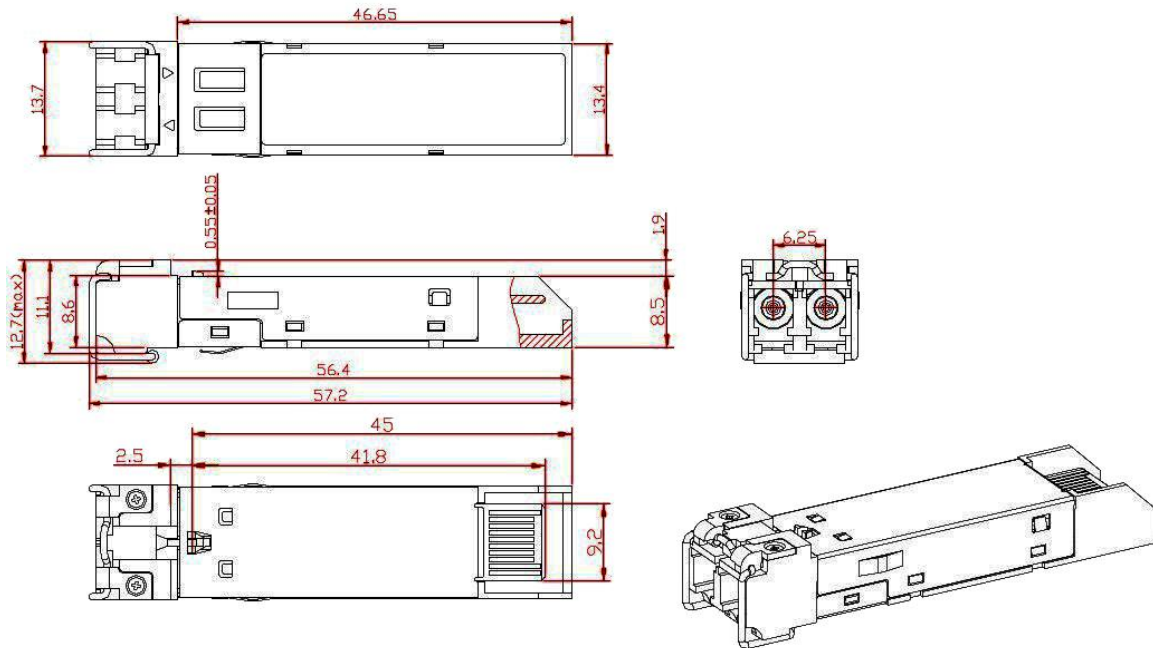
- TX Fault is an open collector output, which should be pulled up with a 4.7k~10kΩ resistor on the host board to a voltage between 2.0V and Vcc+0.3V. Logic 0 indicates normal operation; Logic 1 indicates a laser fault of some kind. In the low state, the output will be pulled to less than 0.8V.

- 2) TX Disable is an input that is used to shut down the transmitter optical output. It is pulled up within the module with a 4.7k~10kΩ resistor. Its states are:
 Low (0 to 0.8V): Transmitter on
 (>0.8V, < 2.0V): Undefined
 High (2.0 to 3.465V): Transmitter Disabled
 Open: Transmitter Disabled
- 3) Mod-Def 0,1,2. These are the module definition pins. They should be pulled up with a 4.7k~10kΩ resistor on the host board.
 The pull-up voltage shall be VccT or VccR.
 Mod-Def 0 is grounded by the module to indicate that the module is present
 Mod-Def 1 is the clock line of two wire serial interface for serial ID
 Mod-Def 2 is the data line of two wire serial interface for serial ID
- 4) LOS is an open collector output, which should be pulled up with a 4.7k~10kΩ resistor. Pull up voltage between 2.0V and Vcc+0.3V. Logic 1 indicates loss of signal; Logic 0 indicates normal operation. In the low state, the output will be pulled to less than 0.8V.
- 5) RD-/+ : These are the differential receiver outputs. They are internally AC-coupled 100 differential lines which should be terminated with 100Ω (differential) at the user SERDES.
- 6) TD-/+ : These are the differential transmitter inputs. They are internally AC-coupled, differential lines with 100Ω differential termination inside the module.

Recommended Interface Circuit



Mechanical Dimensions



Regulatory Compliance

Honlus' SFP transceiver is designed to be Class I Laser safety compliant and is certified per the following standards

Feature	Agency	Standard
	ISO9001	GB/T 19001-2008/ISO 9001:2008
EMC	CE	EN 55022: 1998 + A1: 2000 + A2: 2003
		EN 61000 – 4 – 2: 1995 + A1: 1998 + A2: 2001
		EN 61000 – 4 – 3: 2002 + A1: 2002
	TUV	RoHS Directive 2011/65/EC
EMI	FCC	FCC Rules and Regulations Part 15 Subpart B Class B

Ordering information

Part Number	Product Description
HOLS-P285Z-LD-CV	SFP, 850nm, 2.5Gbps, 300m, 0 °C ~ +70 °C, With DDM