SFP Bi-Di 1.25Gbps Transceiver
Model: SFP-BIDI-280

Features:

- Gigabit Ethernet
- Gigabit Fiber Channel
- SFP MSA package with Simplex SC connector
- Compliant with IEEE 802.3ah,
- Digital diagnostic monitor interface compatible with SFF-8472
- transmission with 9/125 µm SMF
- Single 3.3V Power Supply and LVTTL Logic
- Very low EMI and excellent ESD protection
- Operating Case Temperature: 0°C ~+70°C
- RoHS compliant
- Class 1 laser safety certified

Absolute Maximum Ratings

Table 1- Absolute Maximum Ratings

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Supply Voltage	Vcc	-0.5	-	+3.6	V	
Storage Temperature	TS	-40	-	85	°C	
Operating Relative Humidity	RH	+5	-	+95	%	

Recommended Operating Conditions

Table 2- Recommended operating Conditions

Parameter	Symbol	Min.	Typ.	Max.	Units	Notes
Operating Case Temperature	TC	0	-	70	°C	
Power Supply Voltage	VCC	3.14	3.3	3.46	V	
Power Supply Current	ICC	-	-	300	mA	
Power Dissipation	PD	-	-	1	W	
Data Rate		-	1250	-	Mbps	

Electrical Characteristics

Table 3- Electrical Characteristics

Parameter		Symbol	Min.	Typ.	Max.	Units	Notes
Differential Data Input Swing		Vin p-p	200	-	2400	mV	1
Input Differential Impedance		RIN	80	100	120	Ω	
Tx_Disable	Laser Disable	VOH	2.0	-	VCC+0.5	V	

	Normal Operation	VOL	GND	-	GND+0.8	V	
TX_ Fault	Transmitter Fault	VOH	2.0	-	VCC+0.5	V	
	Normal Operation	VOL	GND	-	GND+0.8	V	
Differential Date Output Swing		Vout p-p	750	900	1050	mV	2
Rx_ LOS	Los Signal	VOH	2.0	-	VCC+0.5	V	
	Normal Operation	VOL	GND	-	GND+0.8	V	

Note:
1. Internally AC coupled, input termination may be required for CML or LVPECL applications.
2. Internally AC coupled CML differential output stage.

Optical Characteristics
Table 4-Optical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit		Notes
			Transmitter				
Average Output Power	P0UT	-9		-3	dBm	20km	1
		-5		0		40km	
		0		5		80km	
Mean Wavelength	λ	1290	1310	1550	nm	SFP-BIDI-xxx	
Extinction Ratio	ER	9	-	-	dB		
Spectral Width(RMS)	Δλ	-	-	1	nm		
P0ut@TX Disable Asserted	P0UT	-	-	-45	dB		
Rise/Fall Time (20%~80%)	Tr/Tf			260	ps		
Optical Eye Mask		IEEE 802.3ah Compliant					
			Receiver				
Receiver Power	Pin		-	-23	dBm	20km/40km/80km	2
Centre Wavelength	λC	1290	1310	1550	nm	SFP-BIDI-xxx	
Receiver Overload	Rsens, high	-3	-	-	dBm		
Damage Threshold For Receive	Pin, damage	0					
Receiver Reflectance	RX_r	-	-	-12	dB		
LOS De-Assert	LOSD	-	-	-25	dB	20km/40km/80km	
LOS Assert	LOSA	-35	-	-	dB	20km/40km/80km	
LOS Hysteresis		0.5		-	dB		

Note:
1. Coupled into 9/125 SMF.
2. Measured with PRBS 27-1 test pattern @1.25Gbps.BER=10E-12
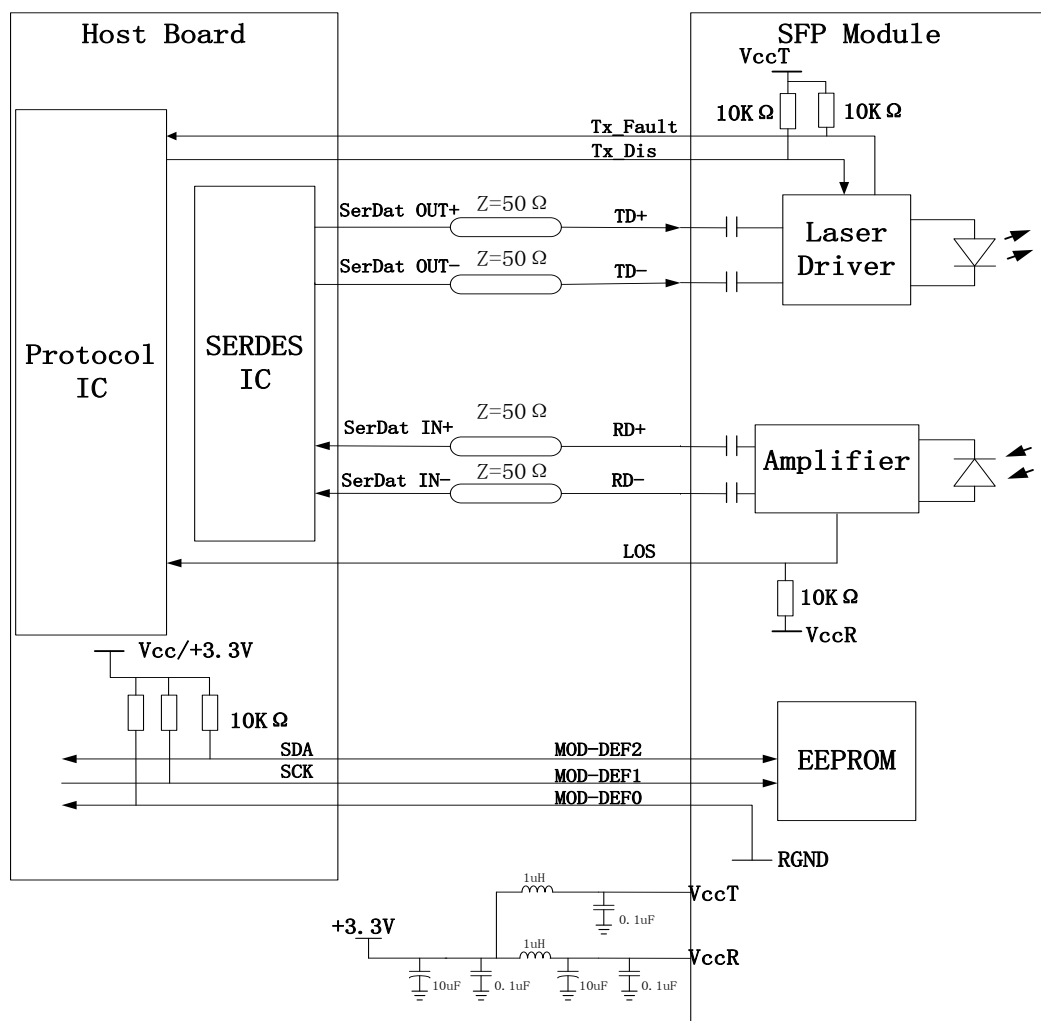
Recommended Interface Circuit

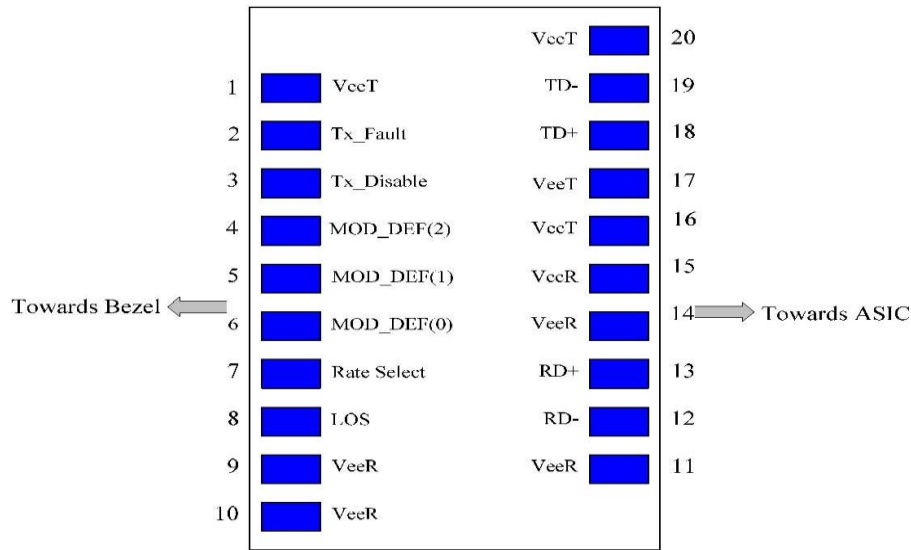Figure 1, Recommended Interface Circuit

Pin arrangement

Figure 2, Pin View

Table 5-Pin Function Definitions

Pin	Name	FUNCTION	Plug Seq.	Notes
1	VeeT	Transmitter Ground	1	
2	TX Fault	Transmitter Fault Indication	3	1
3	TX Disable	Transmitter Disable	3	2
4	MOD-DEF2	Module Definition 2	3	3
5	MOD-DEF1	Module Definition 1	3	3
6	MOD-DEF0	Module Definition 0	3	3
7	Rate Select	Not Connect	3	
8	LOS	Loss of Signal	3	4
9	VeeR	Receiver Ground	1	
10	VeeR	Receiver Ground	1	
11	VeeR	Receiver Ground	1	
12	RD-	Inv. Received Data Out	3	
13	RD+	Received Data Out	3	
14	VeeR	Receiver Ground	1	
15	VccR	Receiver Power	2	3.3V ± 5%
16	VccT	Transmitter Power	2	3.3V ± 5%
17	VeeT	Transmitter Ground	1	
18	TD+	Transmit Data In	3	
19	TD-	Inv. Transmit Data In	3	
20	VeeT	Transmitter Ground	1	

Note:

1. TX Fault is open collector output which should be pulled up externally with a 4.7K ~10KΩ resistor on the host board to 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 input is used to shut down the laser output per the state table below. It is pulled up within the module with a 4.7~ 10K resistor.
    Low (0- 0.8V):   Transmitter on
    Between (0.8V and 2V):   Undefined

      High (2.0 – VccT):   Transmitter Disabled

      Open: Transmitter Disabled

3. MOD-DEF 0, 1, 2. These are the module definition pins. They should be pulled up with a 4.7~10K resistor on the host board to supply less than VccT+0.3V or VccR+0.3V.

    MOD-DEF 0 is grounded by the module to indicate that the module is present.

    MOD-DEF 1 is clock line of two wire serial interface for optional serial ID.

    MOD-DEF 2 is data line of two wire serial interface for optional serial ID.

4. LOS (Loss of signal) 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 loss of signal. In the low state, the output will be pulled to less than 0.8V.
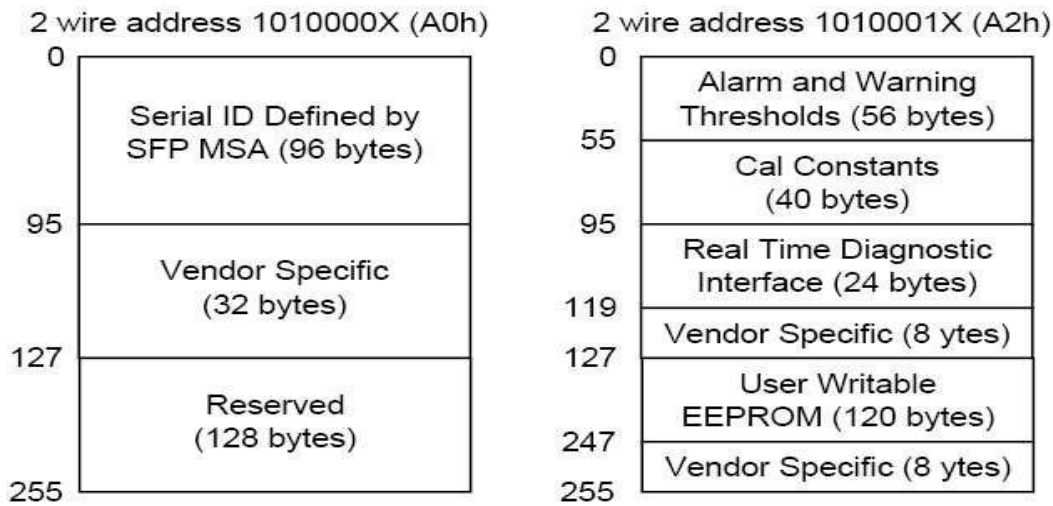
Digital Diagnostic Memory Map
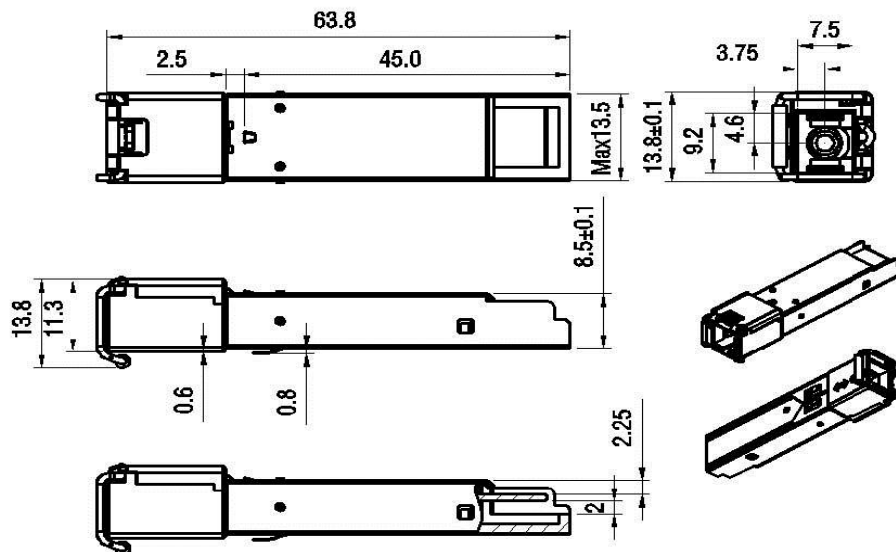

Figure 3, memory map

Mechanical Diagram

Figure 4, mechanical diagram

Order Information
Table 6-order information

Part No.	DDM	Tx Wavelength	Rx Wavelength	Fiber Type	Optical Interface	Distance
SFP-BIDI-220D	YES	1310nm	1550nm	SMF	SC	20km
SFP-BIDI-220	NO					
SFP-BIDI-240D	YES	1310nm	1550nm	SMF	SC	40km
SFP-BIDI-240	NO					
SFP-BIDI-260D	YES	1310nm	1550nm	SMF	SC	60km
SFP-BIDI-260	NO					
SFP-BIDI-280D	YES	1490nm	1550nm	SMF	SC	80km
SFP-BIDI-280	NO					

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