



SFP Bi-Di 155Mbps Transceiver

SOSPB-3501-20D 80D
SOSPB-5301-20D 80D

● Features :

- Fast Ethernet
- SDH/STM-1, SONET/OC-3
- SFP MSA package with Simplex SC connector
- Compliant with IEEE 802.3ah
- Compliant with ITU -T G.957
- Digital diagnostic monitor interface compatible with SFF-8472
- transmission with 9/125 μm SMF
- Single 3.3V Power Supply and LVTTTL 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	V _{cc}	-0.5	-	+3.6	V	
Storage Temperature	T _s	-40	-	85	°C	
Operating Relative Humidity	RH	+5	-	+95	%	

● Recommended Operating Conditions

Table 2- Recommended operating Conditions

Parameter	Symbol	Min.	Typ.	Max.	Units	Notes
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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			155	-	Mbps	

● Electrical Characteristics

Table 3- Electrical Characteristics

Parameter		Symbol	Min.	Typ.	Max.	Units	Notes
Differential Data Input Swing		$V_{in\ p-p}$	200	-	2400	mV	1
Input Differential Impedance		R _{IN}	80	100	120	Ω	
Tx_Disable	Laser Disable	V _D	2.0	-	VCC+0.5	V	
	Normal Operation	V _{EN}	GND	-	GND+0.8	V	
Tx_Fault	Transmitter Fault	V _{OH}	2.0	-	VCC+0.5	V	
	Normal Operation	V _{OL}	GND	-	GND+0.8	V	
Differential Data Output Swing		$V_{out\ p-p}$	1450	1600	1750	mV	2
Rx_LOS	Los Signal	V _{OH}	2.0	-	VCC+0.5	V	
	Normal Operation	V _{OL}	GND	-	GND+0.8	V	

Notes:

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



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● Optical Characteristics

Table 4-Optical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit		Notes
Transmitter							
Average Output Power	P_{OUT}	-15	-	-8	dBm	5km/20km	1
		-5	-	0		40km/80km	
Mean Wavelength	λ	1290	1310	1330	nm	SOBS-3503-xxx	
		1480	1490	1500		SOBS-4503-80x	
		1540	1550	1560		SOBS-5303-xxx SOBS-5403-80x	
Extinction Ratio	ER	9	-	-	dB		
Spectral Width(RMS)	$\Delta\lambda$	-	-	1	nm		
$P_{out@TX}$ Disable Asserted	P_{OUT}	-	-	-45	dB		
Rise/Fall Time (20%~80%)	T_r/T_f			260	ps		
Optical Eye Mask	IEEE 802.3ah Compliant						
Receiver							
Receiver Power	P_{in}		-	-28	dBm	5km	2
				-34		20km/40km/80km	
Centre Wavelength	λ_c	1290	1310	1330	nm	SOBS-5303-xxx	
		1480	1490	1500		SOBS-5403-80x	
		1530	1550	1570		SOBS-3503-xxx SOBS-4503-80x	
Receiver Overload	$R_{sens,high}$	-3	-	-	dBm		
Damage Threshold For Receive	$P_{in, damage}$	0					
Receiver Reflectance	RX_r	-	-	-12	dB		
LOS De-Assert	LOS_D	-	-	-29	dB	5km	
				-35		20km/40km/80km	



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LOS Assert	LOS _A	-39	-	-	dB	5km	
		-45				20km/40km/80km	
LOS Hysteresis		0.5		-	dB		

Note:

1. Coupled into 9/125 SMF.
2. Measured with PRBS 2⁷-1 test pattern @155Mbps.BER=10E-12

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● **Recommended Interface Circuit**

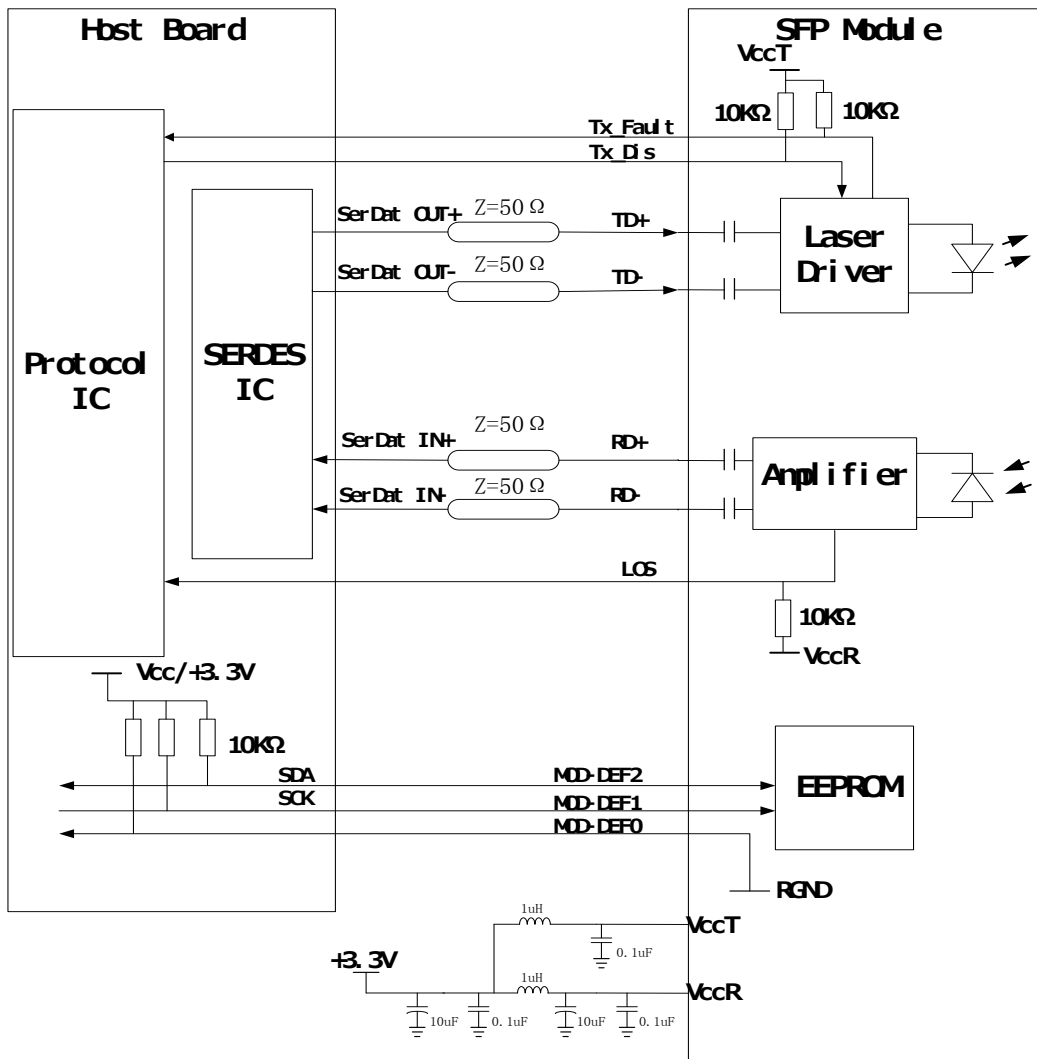


Figure 1, Recommended Interface Circuit

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● **Pin arrangement**

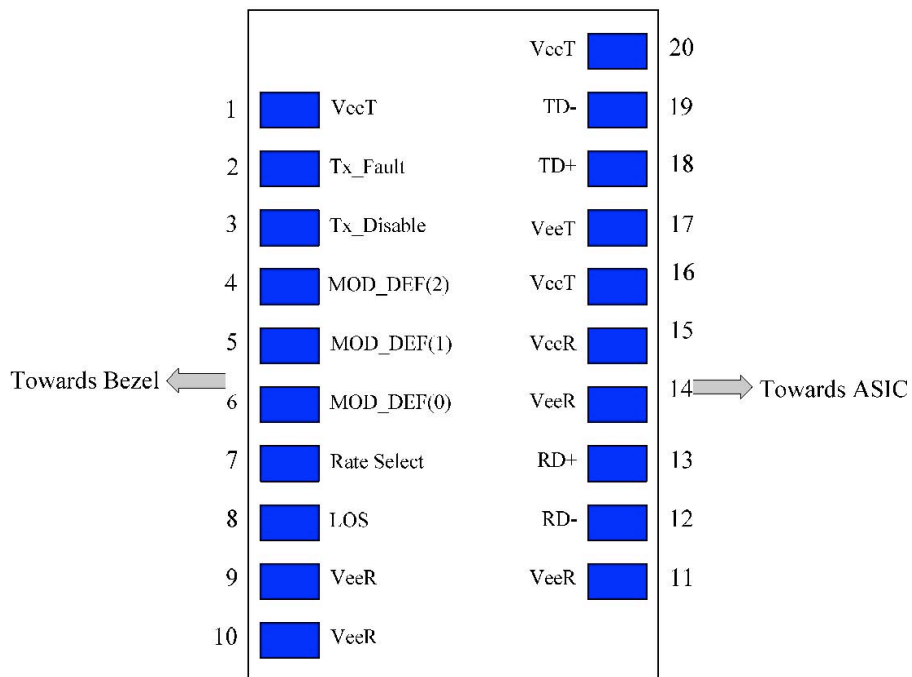


Figure 2, Pin View

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



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9	VeeR	Receiver Ground	1	5
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	5
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 V_{CC}+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 – V_{CC}T): 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 V_{CC}T+0.3V or V_{CC}R+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 V_{CC}+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.



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● Digital Diagnostic Memory Map

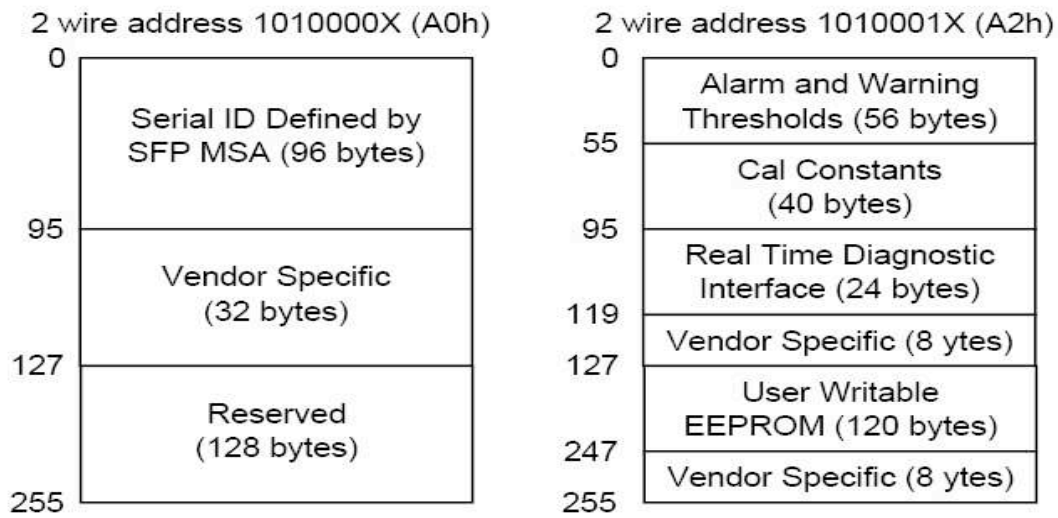
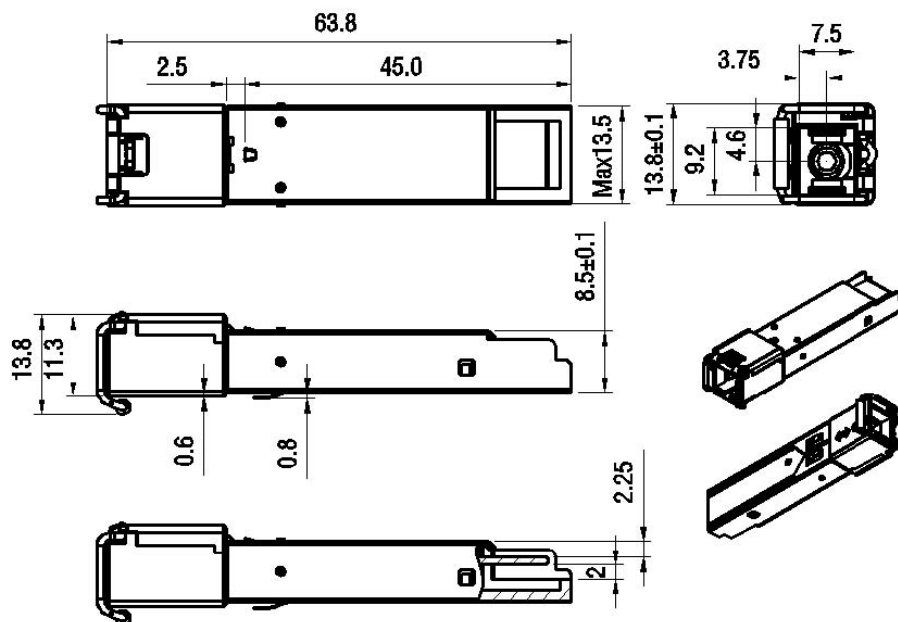


Figure 3, memory map

● Mechanical Diagram





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Figure 4, mechanical diagram

● **Ordering information**

Table 6-Pin Function Definitions

Part No.	DDM	Tx Wavelength	Rx Wavelength	Fiber Type	Optical Interface	Distance
SOSPB-3503-05D	YES	1310nm	1550nm	SMF	SC	5km
SOSPB-3503-05	NO					
SOSPB-5303-05D	YES	1550nm	1310nm	SMF	SC	5km
SOSPB-5303-05	NO					
SOSPB -3503-20D	YES	1310nm	1550nm	SMF	SC	20km
SOSPB -3503-20	NO					
SOSPB -5303-20D	YES	1550nm	1310nm	SMF	SC	20km
SOSPB -5303-20	NO					
SOSPB -3503-40D	YES	1310nm	1550nm	SMF	SC	40km
SOSPB -3503-40	NO					
SOSPB 5303-40D	YES	1550nm	1310nm	SMF	SC	40km
SOSPB 5303-40	NO					
SOSPB 4503-80D	YES	1490nm	1550nm	SMF	SC	80km
SOSPB -4503-80	NO					
SOSPB -5403-80D	YES	1550nm	1490nm	SMF	SC	80km
SOSPB -5403-80	NO					



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● **Contact**

Shenzhen Sinovo Telecom Co.,Ltd
Tel:+86(0)0755-32959919 Fax:+86(0)755 32959918
Email: sales@sinovocorp.com
Web:www.sinovocorp.com