

SFPTURKIYESBD(A)SM02010GD 10G SFP Bi-Di 1270nm TX/1330nm RX 20Km SMF LC DDM
SFPTURKIYESBD(B)SM02010GD 10G SFP Bi-Di 1330nm TX/1270nm RX 20Km SMF LC DDM

Features :

- GiSObit Ethernet
- GiSObit Fiber Channel
- SFP MSA package with Simplex LC connector
- Compliant with IEEE 802.3ah,
- Digital diagnostic monitor interface compatible with SFF-8472
- transmission with 9/125 μ m 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	-	+4	V	
Storage Temperature	T _S	-40	-	85	°C	
Operating Relative Humidity	RH	0	-	85	%	

Recommended Operating Conditions

Table 2- Recommended operating Conditions

Parameter	Symbol	Min.	Typ.	Max.	Units	Notes
Operating Case Temperature	T _C	-5	-	70	°C	
Power Supply Voltage	V _{CC}	3.14	3.3	3.46	V	
Power Supply Current	I _{CC}	-	-	450	mA	
Power Dissipation	P _D	-	-	1	W	



Data Rate		-	10.3125	-	Gbps	
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Electrical Characteristics

Table 3- Electrical Characteristics

Parameter		Symbol	Min.	Typ.	Max.	Units	Notes
Differential Data Input Swing		$V_{in\ p-p}$	180	-	700	mV	1
Input Differential Impedance		R_{IN}	80	100	120	Ω	
Tx_Disable	Laser Disable	V_{OH}	2.0	-	$V_{CC}+0.3$	V	
	Normal Operation	V_{OL}	GND	-	$GND+0.8$	V	
TX_ Fault	Transmitter Fault	V_{OH}	2.4	-	$V_{CC}+0.3$	V	
	Normal Operation	V_{OL}	GND	-	$GND+0.8$	V	
Differential Data Output Swing		$V_{out\ p-p}$	300		850	mV	2
Rx_LOS	Los Signal	V_{OH}	2.4	-	$V_{CC}+0.3$	V	
	Normal Operation	V_{OL}	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	Sym bol	Min.	Typ.	Max.	Unit		Note s
Transmitter							
Average Output Power	P _{OUT}	-3		2	dBm	20km	1
Mean Wavelength	λ	1260	1270	1280	nm	SFPTURKIYESBD(A)SM	
		1320	1330	1340		SFPTURKIYESBD(B)SM	
Extinction Ratio	ER	9	-	-	dB		
Spectral Width(RMS)	Δλ	-	-	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 802.3ae Compliant						
Receiver							
Receiver Power	Pin		-	-23	dBm	20km	2
Centre Wavelength	λ _c	1320	1330	1340	nm	SFPTURKIYESBD(B)SM	
		1260	1270	1280		SFPTURKIYESBD(A)SM	
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			-	dB		
		-	-	-15		20km	
LOS Assert	LOS _A	-25	-	-	dB	20km	
LOS Hysteresis		0.5		4			

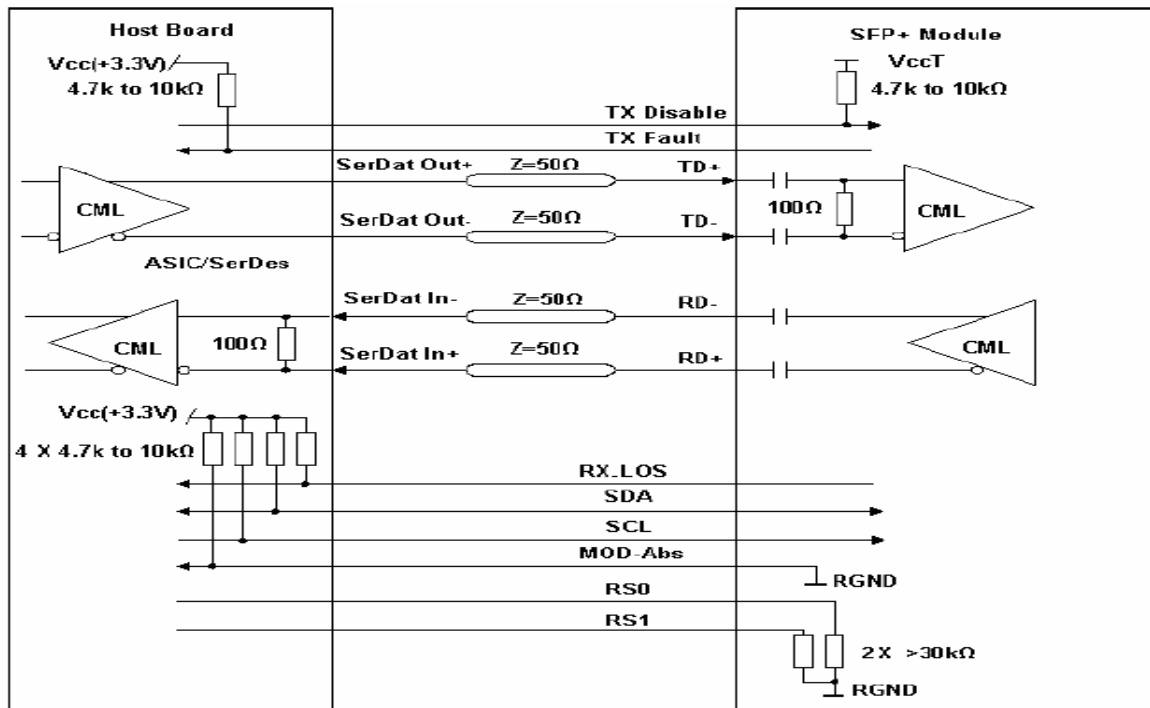
Note:

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

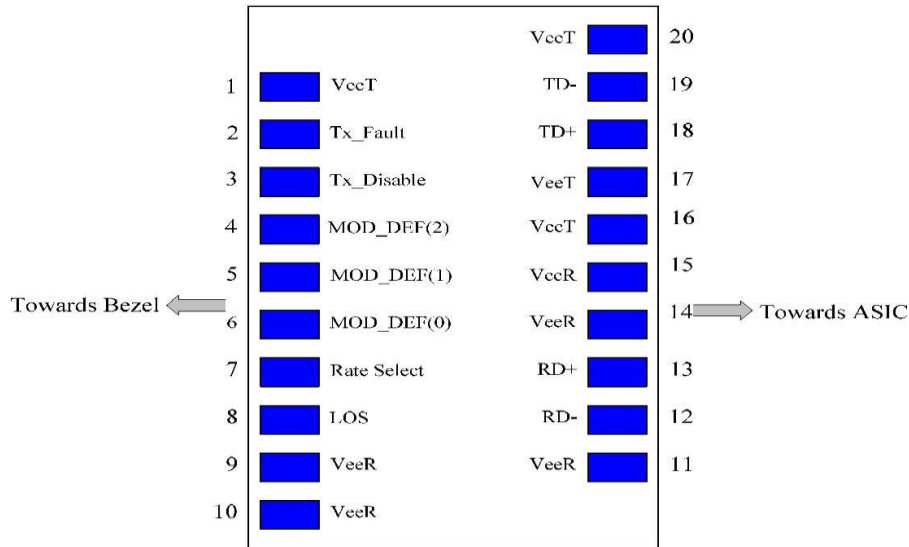


Figure 2, Pin View

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 \pm 5%
16	VccT	Transmitter Power	2	3.3V \pm 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 ~10K Ω 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}):	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 $V_{CC}+0.3V$ or $V_{CCR}+0.3V$.
 - 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~10k Ω 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.

Digital Diagnostic Memory Map

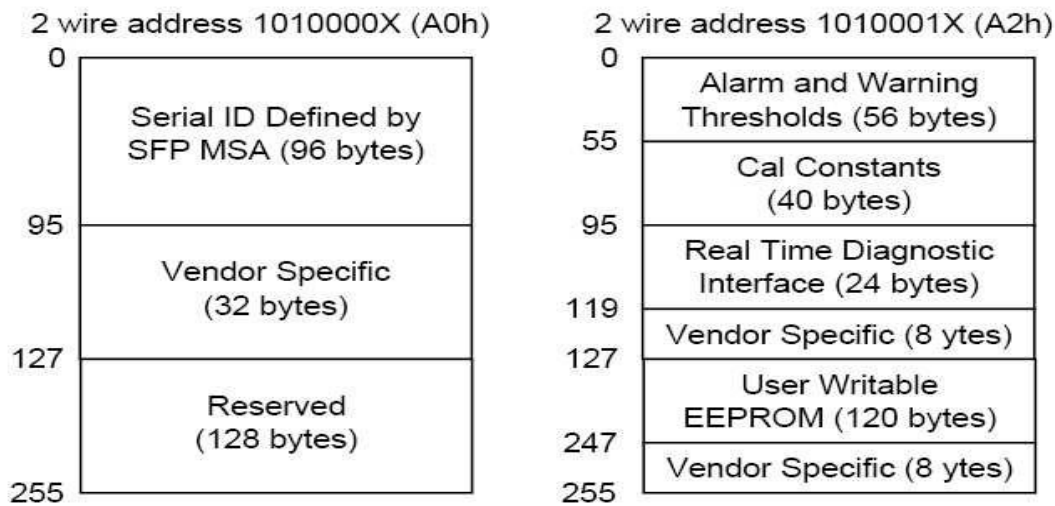


Figure 3, memory map



Mechanical Diagram

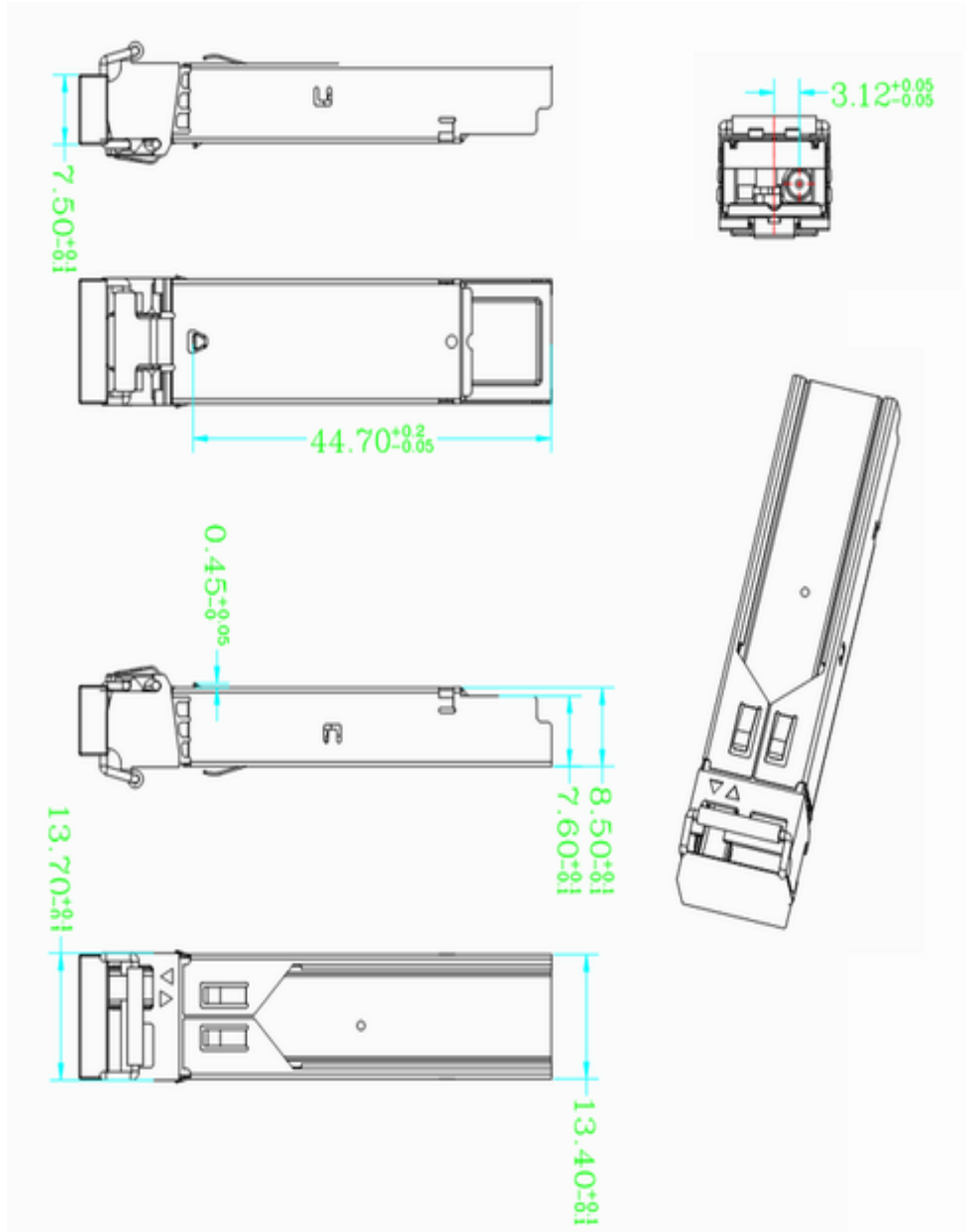


Figure 4, mechanical diagram



Ordering Information

Table 6-ordering information

Part No.	DDM	Tx Wavelength	Rx Wavelength	Fiber Type	Optical Interface	Distance
SFPTURKIYESBD(A)SM02010GD	YES	1270nm	1330nm	SMF	SC/LC	20km
SFPTURKIYESBD(B)SM02010GD	YES	1330nm	1270nm	SMF	SC/LC	20km

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