



TOPSTAR TECHNOLOGY INDUSTRIAL CO., LIMITED

产 品 规 格 书

Product Specification Sheet

TOP-BIDI-1.25G-40AD/BD

RoHS Compliant 1.25G 1310/1550nm(1550/1310nm) 40KM Transceiver



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PRODUCT FEATURES

- Up to 1.25Gb/s data links
- DFB laser transmitter
- PIN photo-detector
- Up to 40km on 9/125 μ mSMF
- Hot-pluggable SFP footprint
- BIDILC/UPC type pluggable optical interface
- Low power dissipation
- Metal enclosure, for lower EMI
- RoHS compliant and lead-free
- Single+3.3Vpower supply
- Support Digital Diagnostic Monitoring interface
- Compliant withSFF-8472
- Case operating temperature Commercial: 0°C to +70°C Extended:-10°C to +80°C Industrial:-40°C to+85°C

APPLICATIONS

- Switch to Switch Interface
- Fast Ethernet
- Switched Back plane Applications
- Router/Server Interface
- Other Optical Links

STANDARD

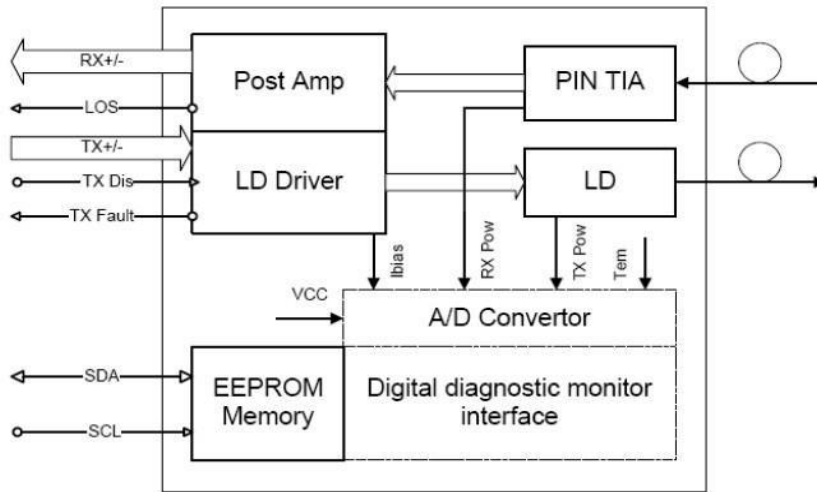
- SFP+MSA Compliant
- SFF-8472 reversion 9.5compliant
- IEEE802.3-2005 compliant
- Telcordia GR-468-CORE compliant
- FCC47CFRPart15,ClassB compliant
- FDA21CFR1040.10and1040.11,class1 compliant
- RoHS compliant



PRODUCT DESCRIPTION

TOP-BIDI-1.25G-40AD/BD optical transceivers are designed for optical interfaces for data communications with single mode fiber(SMF). The transceiver designs are optimized for high performance and cost effective to supply customers the best solutions for telecom applications.

FUNCTIONAL DIAGRAM



Ordering information

Product part Number	Data Rate (Gbps)	Media	Wavelength (nm)	Transmission Distance(km)	Temperature Range (Tcase) (°C)	
TOP-BIDI-1.25G-40AD/BD-c	1.25	Single mode fiber	1310/1550(1550/1310)	40	0~70	commercial
TOP-BIDI-1.25G-40AD/BD-e	1.25	Single mode fiber	1310/1550(1550/1310)	40	-10~80	extended
TOP-BIDI-1.25G-40AD/BD-i	1.25	Single mode fiber	1310/1550(1550/1310)	40	-45~85	industrial

Parameter	Symbol	Min.	Max.	Unit	Note
Supply Voltage	Vcc	-0.5	4.0	V	
Storage Temperature		-40	85	°C	
Relative Humidity		5	95	%	

Note: Stress in excess of the maximum absolute ratings can cause permanent damage to the module



ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Min.	Max.	Unit	Note
Supply Voltage	V _{cc}	-0.5	4.0	V	
Storage Temperature		-40	85	°C	
Relative Humidity		5	95	%	

Note: Stress in excess of the maximum absolute ratings can cause permanent damage to the module

GERERAL OPERATING CHARACTERISTICS

Parameter	Symbol	Min.	Typ	Max.	Unit	Note
Data Rate			1.25		Gb/s	
Supply Voltage	V _{cc}	3.13	3.3	3.47	V	
Supply Current	I _{ccs}			280	mA	
		0		70	°C	TOP-BIDI-1.25G-40AD-c
		-10		80	°C	TOP-BIDI-1.25G-40AD-e
		-40		85	°C	TOP-BIDI-1.25G-40AD-i

ELECTRICAL INPUT/OUTPUT CHARACTERISTICS

Transmitter

Parameter	Symbol	Min.	Typ	Max.	Unit	Note
Diff. input voltage swing		120		820	mVpp	1
Tx Disable input	H	V _{IH}	2.0	V _{cc} +0.3	V	
	L	V _{IL}	0	0.8		
Tx Fault output	H	V _{OH}	2.0	V _{cc} +0.3	V	2
	L	V _{OL}	0	0.8		
Input Diff. Impedance	Z _{in}		100		Ω	

Receiver

Parameter	Symbol	Min.	Typ	Max.	Unit	Note
Diff. output voltage swing		340	650	800	mVpp	3
RxLOS Output	H	V _{OH}	2.0	V _{cc} +0.3	V	2
	L	V _{OL}	0	0.8		

Note1)TD+/-areinternallyACcoupledwith100Ω differential termination inside the module.

Note2)Tx Fault and RxLOS are open collector outputs, which should be pulled up with 4.7k to 10kΩ resistors on the host board. Pull up voltage between2.0VandV_{cc}+0.3V.

Note3)RD+/- outputs are internally AC coupled, and should be terminated with100Ω(differential)at the user SERDES.



OPTICAL CHARACTERISTICS

Transmitter

Parameter	Symbol	Min.	Typ	Max.	Unit	Note
Operating Wavelength	λ_C	1270	1310	1360	nm	
		1500	1550	1570		
Ave. output power(Enabled)	Po	-3		2	dBm	1
Extinction Ratio	ER	9			dB	1
RMS spectralwidth	$\Delta\lambda$			4	nm	
Rise/Falltime(20%~80%)	Tr/Tf			0.26	ps	2
Output Eye Mask	TelcordiaGR-253-COREandITU-TG.957compatible					

Note (1):Measureat2^7-1 NRZPRBS pattern

Note (2): Transmitter eye mask definition

Receiver

Parameter	Symbol	Min.	Typ	Max.	Unit	Note
Operating Wavelength		1530	1550	1570	nm	
		1270	1310	1360		
Sensitivity	Psen			-25	dBm	3
Min. overload	Pimax	-1			dBm	
LOSAssert	Pa	-40			dBm	
LOS De-assert	Pd			-26	dBm	
LOS Hysteresis	Pd-Pa	0.5		6	dB	

Digital Diagnostic Functions

TOP-BIDI-1.25G-40AD transceivers support the 2-wire serial communication protocol as defined in the SFPMSA. It is very closely related to the E2PROM defined in the GBIC standard, with the same electrical specifications.

The standard SFP serial ID provides access to identification information that describes the transceiver’s capabilities, standard interfaces, manufacturer, and other information.

Additionally, TOP-BIDI-1.25G-40AD transceivers provide a unique enhanced digital diagnostic monitoring interface, which allows real-time access to device operating parameters such as transceiver temperature, laser bias current, transmitted optical power, received optical power and transceiver supply voltage. It also defines a sophisticated system of alarm and warning flags, which alerts end-users when



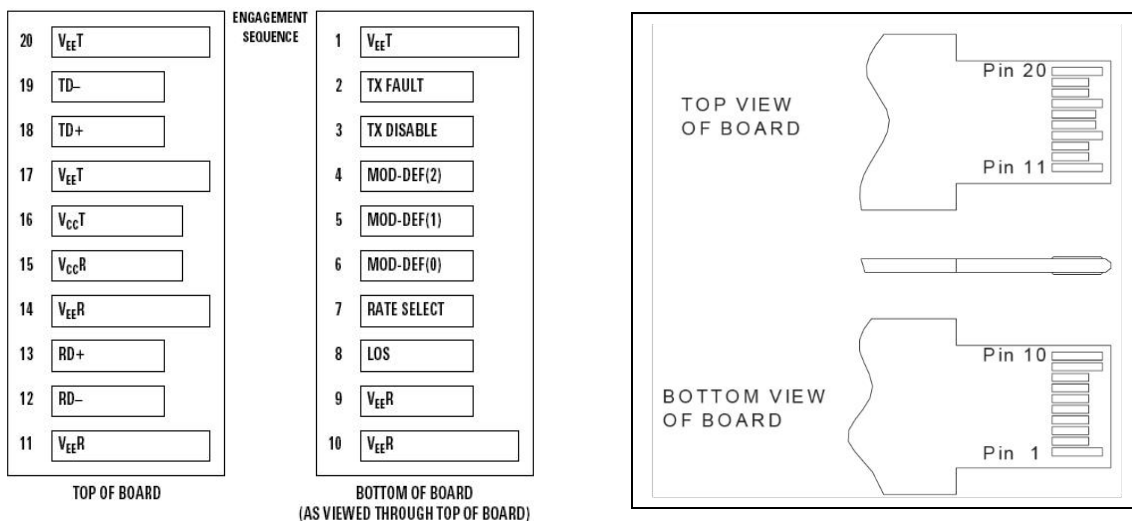
particular operating parameters are outside of a factory set normal range.

The SFPMSA defines a 256-byte memory map in E2PROM that is accessible over a 2-wireserial interface at the 8 bit address1010000X(A0h).The digital diagnostic monitoring interface makes use of the 8 bit address 1010001X(A2h), so the originally defined serial ID memory map remains unchanged. The interface is identical to, and is thus fully backward compatible with both the GBIC Specification and the SFP Multi Source Agreement.

The operating and diagnostics information is monitored and reported by a Digital Diagnostics Transceiver Controller(DDTC)inside the transceiver, which is accessed through a 2-wire serial interface. When the serial protocol is activated, the serial clock signal (SCL,ModDef1)is generated by the host. The positive edge clocks data into the SFP transceiver into those segments of the E2PROM that are not write-protected. The negative edge clocks data from the SFP transceiver. The serial data signal(SDA,ModDef2) is bi-directional for serial data transfer. The host uses SDA in conjunction with SCL to mark the start and end of serial protocol activation. The memories are organized as a series of 8-bit data words that can be addressed individually or sequentially.

Digital diagnostics for the TOP-BIDI-1.25G-40AD/BD are Internally calibrated by default.

Definitions and Functions





PIN #	Name	Function	Notes
1	VeeT	Module transmitter ground	Note1
2	Tx Fault	Module transmitter fault	Note 2
3	Tx Disable	Transmitter Disable; Turns off transmitter laser output	Note 3
4	SDL	2 wire serial interface data input/output (SDA)	
5	SCL	2 wire serial interface clock input (SCL)	
6	MOD-ABS	Module Absent, connect to VeeR or VeeT in the module	Note 2
7	RS0	Rate select0,optionally control SFP+ receiver. When high, input data rate >4.5Gb/s;when low, input data rate <=4.5Gb/s	
8	LOS	Receiver Loss of Signal Indication	Note4
9	RS1	Rate select0,optionally control SFP+ transmitter. When high, input data rate >4.5Gb/s;when low, input data rate <=4.5Gb/s	
10	VeeR	Module receiver ground	Note 1
11	VeeR	Module receiver ground	Note 1
12	RD-	Receiver inverted data out put	
13	RD+	Receiver non-inverted data out put	
14	VeeR	Module receiver ground	Note 1
15	VccR	Module receiver 3.3V supply	
16	VccT	Module transmitter 3.3V supply	
17	VeeT	Module transmitter ground	Note 1
18	TD+	Transmitter inverted data out put	
19	TD-	Transmitter non-inverted data out put	
20	VeeT	Module transmitter ground	Note1

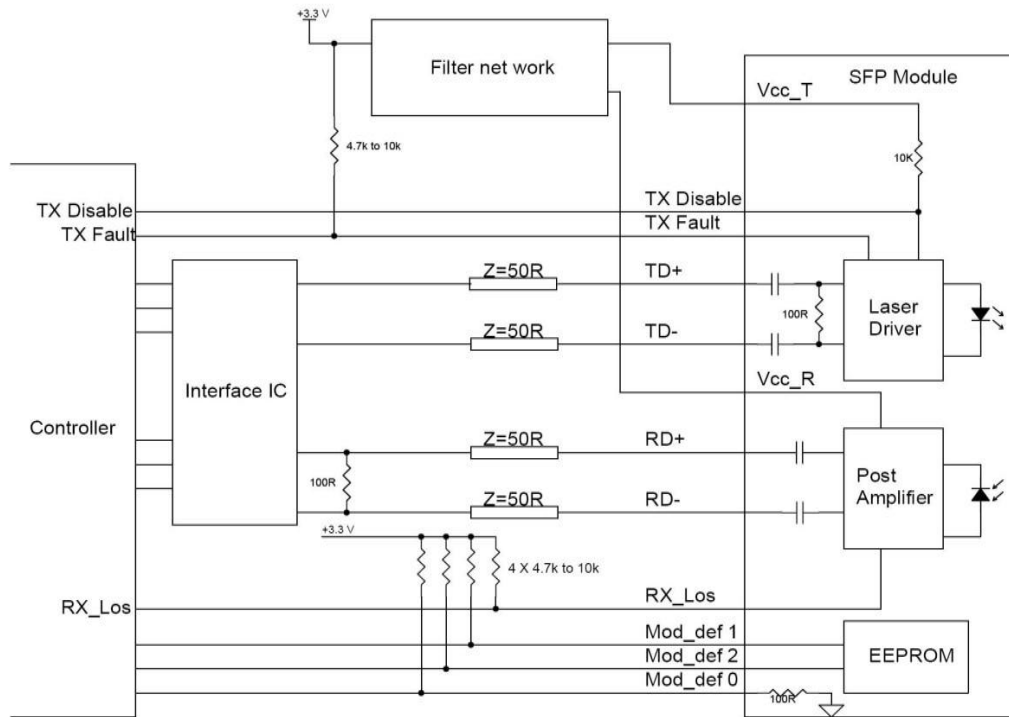
Note1)The module ground pins shall be isolated from the module case.

Note2)This pin is an open collector/drain output pin and shall be pulled up with 4.7K-10Kohmsto Host_Vcc on the host board.

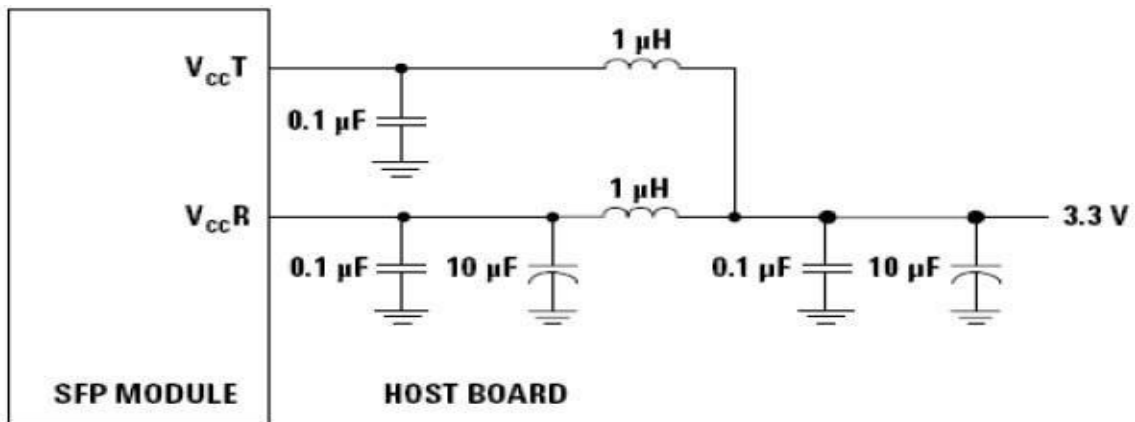
Note3)This pin shall be pulled up with 4.7K-10Kohmsto VccT in the module.

Note4)This pin is an open collector/drain output pin and shall be pulled up with 4.7K-10KohmstoHost_Vcc on the host board. InFC designated as RX_LOS,inSONET designated as LOS, and in Ethernet designated at Signal Detect.

TYPICAL INTERFACE CIRCUIT



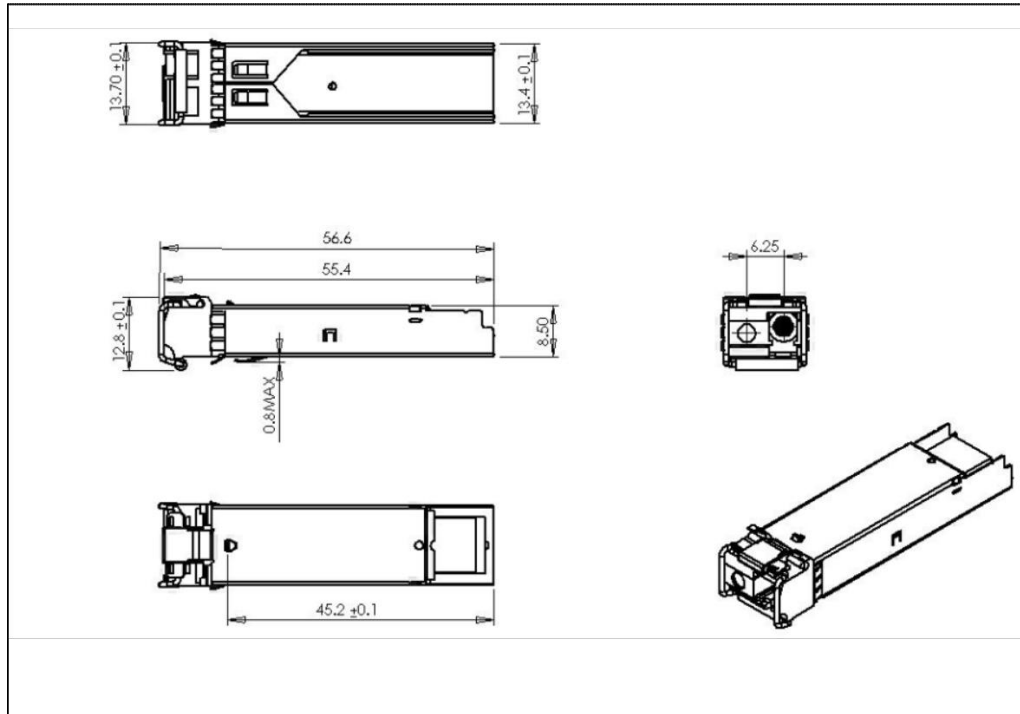
Recommended power supply filter



Note: Inductors with DC resistance of less than 1Ω should be used in order to maintain the required voltage at the SFP input pin with 3.3V supply voltage. When the recommended supply filtering network is used, hot plugging of the SFP transceiver module will result in an inrush current of no more than 30mA greater than the steady state value



PACKAGE DIMENSIONS





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