

Asymmetric Bi-Directional Transceiver TBAXX80/TDAXX80 Series



- T1.3 μ m/R1.55 μ m or T1.55 μ m/R1.3 μ m
Bi-Directional transceiver with SMF
- Asymmetric Data Rate
622Mbps/155Mbps
- Single +5V or +3.3V Power Supply
- 1X9 package with SC Simplex
or Pigtailed type(SC/FC/ST/LC)

Family Model

TBA6380 TBA7380 TBA6580 TBA7580

Features

- Compliant with SONET OC-12/OC-3 and ITU-T SDH STM-4/STM-1 specifications
- Industry standard 1X9 package with SC connector or pigtailed module with various connectors
- 1.3 μ m or 1.55 μ m uncooled InGaAsP SMQW DFB-LD and APC for constant output power
- High sensitive InGaAs PIN photodiode used at wavelengths from 1.1 μ m to 1.6 μ m
- PECL differential data inputs and outputs
- Operating temperature ; 0 to +70 $^{\circ}$ C/-40 to +85 $^{\circ}$ C
- Tested by Teradian's Reliability and Qualification Program
- Distance
80km with 9/125 μ m SMF

Description

The TBAXX80/TDAXX80 series transceivers are designed to meet the specifications of SONET OC-3/OC-12 and ITU-T SDH rates of STM-1/STM-4. The transceivers are manufactured in 1x9 pin package with SC connector or pigtailed module with SC, FC, ST or LC connector interface. The transmitter consists of a long wavelength(1.3 μ m or 1.55 μ m) InGaAsP SMQW laser diode in an optical subassembly (OSA).

The OSA is driven by a custom IC which converts differential PECL logic signals into a laser diode

drive current. The receiver includes a planar InGaAs PIN photodiode mounted with a transimpedance preamplifier IC in an OSA. The OSA is mated to a custom limiting-amplifier which provides post-amplification and signal detect function(active high).

The transceivers are designed to used in a single power supply(+5V or +3.3V) and an operating temperature range of 0°C to +70°C or -40°C to +85°C.

Applications

Used in telecommunication and data communication systems, from medium to high speed for intra-office, short-haul inter-office applications.

- Intra-office and Inter-office SONET/ITU-T SDH
- Fiber in the loop(FTTO, FTTC, FTTH etc.)
- High-speed data links, Single-mode FDDI
- Private optical networks
- ATM

Absolute Maximum Ratings

Parameters	Symbol	Unit	Min.	Max.	Remarks
Ambient Operating Temperature	T_{op}	°C	0 -40	70 85	Indoor use Outdoor use
Storage Temperature	T_{stg}	°C	-40	85	
Supply Voltage	V_{CC}	V	-	6.0	
Lead Soldering Temperature/Time		°C/sec		260/10	
Relative Humidity	RH	%	-	95	

Electrical Characteristics

Parameters	Symbol	Unit	Min.	Typ.	Max.	Remarks	
DC Power Supply Voltage	$V_{CC}-V_{EE}$	V	3.1 4.75	3.3 5.0	3.5 5.25	3.3V 5V	
DC Power Supply Current	$I_{CC,TX}$ $I_{CC,RX}$	mA mA			190 120	5V option	
Input Data Voltage	Low High	$V_{IL}-V_{CC}$ $V_{IH}-V_{CC}$	V	-1.810 -1.165	-1.475 -0.880		
Output Data Voltage	Low High	$V_{OL}-V_{CC}$ $V_{OH}-V_{CC}$	V	-1.892 -1.051	-1.548 -0.879		
Signal Detect	PECL	Low High	V_L-V_{CC} V_H-V_{CC}	V	- -1.16	-1.48 -	155M RX
Output Voltage	TTL	Low High	V_L-V_{CC} V_H-V_{CC}	V	- -1.10	-2.50 -	622M RX

Optical Characteristics

Parameters		Symbol	Condition	Unit	Min.	Typ.	Max.	Remark
Data Bit Rate	1310 Tx		PRBS $2^{23}-1$, NRZ	Mbps	10	155.52		TBA6x80
	1550 Rx					622.08		
	1550 Tx		PRBS $2^{23}-1$, NRZ	Mbps		622.08		TBA7x80
	1310 Rx				10	155.52		
Fiber Length 9 μ m core SMF			10^{-10} BER, 155 or 622Mbps	Km	80			TBAxx80 TBAxx80
TRANSMITTER								
Average Power Output		P _o	I _f =I _{BIAS} + I _{mod} /2	dBm	-1.0 -3.0	+1.0 -1.0	+3.0 +2.0	TBA6x80 TBA7x80
Extinction Ratio		ER		dB	10			
Peak Wavelength	1310 Tx	λ_c	CW, @ P _o	nm	1290	1310	1330	TBA6x80
	1550 Tx				1530	1550	1570	TBA7x80
Side Mode Suppression Ratio		SMSR	CW, @ P _o	dB	30			
Spectral Width		$\Delta\lambda$	RMS Width Max. -20dB WD	nm			1.0	
Optical Rise/Fall Time		t _r /t _f	10 - 90%	nsec			0.5	
RECEIVER								
Wavelength	1310 Rx	λ		nm	1260	1310	1360	TBA7x80
	1550 Rx				1500	1550	1600	TBA6x80
Sensitivity (Average Input Power)		P _{RL}	PRBS $2^{23}-1$, 10^{-10} BER	dBm			-36 -28	155M Rx 622M Rx
Receiver Overload		P _{IN,MAX}		dBm	-3.0			
Signal Detect Threshold Decreasing light input		P _D		dBm		P _{RL} -3		
Increasing light input		P _A		dBm		P _{RL} -2		
Signal Detect Hysteresis		P _A - P _D		dB	0.5	1.0		

Pin Descriptions

No	Symbol	Description	Level/Logic
1	V _{EE,RX}	Rx Ground	Power supply
2	RD+	Rx Data out(+)	PECL output
3	RD-	Rx Data out(-)	PECL output
4	SD	Rx Signal detect	PECL/TTL output
5	V _{CC,RX}	Rx Power supply	Power supply
6	V _{CC,TX}	Tx Power supply	Power supply
7	TD-	Tx Data in(-)	PECL input
8	TD+	Tx Data in(+)	PECL input
9	V _{EE,TX}	Tx Ground	Power supply

Ordering Information

Com-pany	Func-tion	Data Rate	Wavelength	Supply Voltage	Distance	Pin	Temp. Range	Shielding
T	B	A	6	5	80	- 9	I	N
TERA-dian	B ; Bi-di (Recep-tacle) D ; Bi-di (Pig-tailed)	0 ; 51Mbps 1 ; 155Mbps 4 ; 622Mbps F ; 1.06Gbps 8 ; 1.25Gbps S ; 2.12Gbps G ; 2.5Gbps T ; 10Gbps O ; Order-Made A ; Asymmetric 155M/622M	6 ; T1.3/R1.5 7 ; T1.5/R1.3	3 ; 3.3V 5 ; 5V	SX ; Note 02 ; 2km LX ; 5km 10 ; 10km 15 ; 15km 20 ; 20km 30 ; 30km 40 ; 40km 60 ; 60km 80 ; 80km A0 ; 100km C0 ; 120km	9 ; 1X9 (9 pin)	I ; Indoor Use (0~70℃) O ; Outdoor Use (-40~ 85℃)	N ; No Shield

*Note;

- 220m with 62.5/125μm MMF @ 1.25Gbps
- 500m with 50/125μm MMF @ 1.25Gbps
- 200m with 62.5/125μm MMF @ 2.125Gbps

Outline Diagram

(unit ; mm)

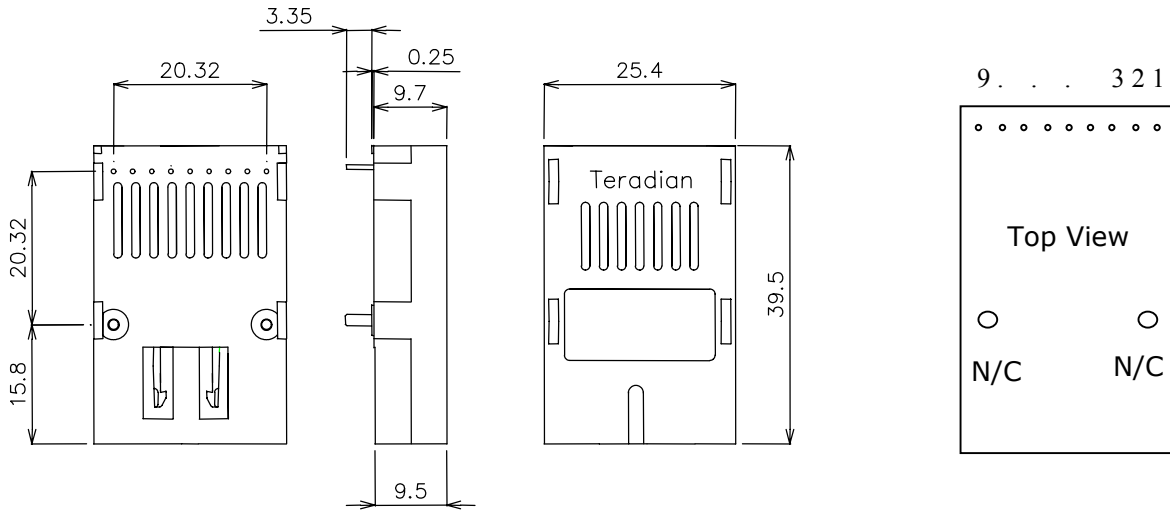


Fig. 1 TBxxxx Series Bi-Directional transceiver module(receptacle type)

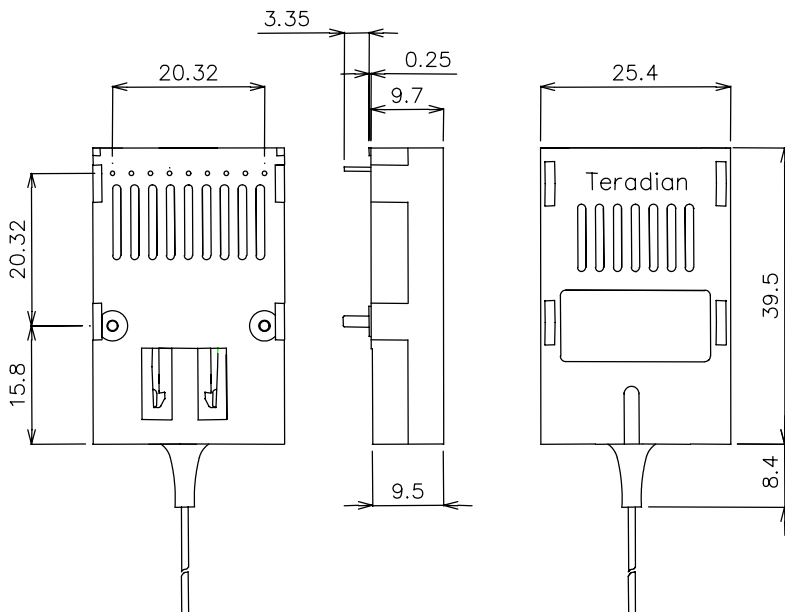


Fig. 2 TDxxxx Series Bi-Directional transceiver module(Pigtailed type)