

# Asymmetric Bi-Directional Transceiver TDEx360-9IN Series



- T1.3 $\mu$ m/R1.55 $\mu$ m or T1.55 $\mu$ m/R1.3 $\mu$ m  
Bi-Directional transceiver with SMF
- Asymmetric Data Rate  
1.25Gbps/155Mbps
- Single +3.3V Power Supply
- 1X9 package  
with Pigtailed type(SC/FC/ST)

## Family Model

TDE6360-9IN    TDE7360-9IN

## Features

- Compliant with ITU-T SDH STM-1 and IEEE 802.3z 1000BASE-LX specifications
- Industry standard 1X9 package with various pigtailed connectors
- 1.3 $\mu$ m or 1.55 $\mu$ m uncooled InGaAsP SMQW FP-LD or DFB-LD
- High sensitive InGaAs PIN photodiode used at wavelengths from 1.1 $\mu$ m to 1.6 $\mu$ m
- PECL differential data inputs and outputs
- Operating temperature ; -20 to +70 $^{\circ}$ C
- Tested by Teradian's Reliability and Qualification Program
- Distance  
60km with 9/125 $\mu$ m SMF

## Description

The TDE6360/TDE7360 series transceivers are designed to meet the specifications of ITU-T SDH rates of STM-1 and IEEE 802.3z 1000BASE-LX. The transceivers are manufactured in 1x9 pin package with pigtailed SC, FC, or ST connector interface.

The transmitter consists of a long wavelength(1.3 $\mu$ m or 1.55 $\mu$ 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 and an operating temperature range of -20°C to +70°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 <sub>op</sub>	°C	-20	70	Indoor use
Storage Temperature	T <sub>stg</sub>	°C	-40	85	
Supply Voltage	V <sub>CC</sub>	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 <sub>CC</sub> -V <sub>EE</sub>	V	3.1	3.3	3.5	3.3V
DC Power Supply Current	I <sub>CC,TX</sub>	mA			210	
	I <sub>CC,RX</sub>	mA			100	
Input Data Voltage	Low V <sub>IL</sub> - V <sub>CC</sub>	V	-1.810		-1.475	
	High V <sub>IH</sub> - V <sub>CC</sub>		-1.165		-0.880	
Output Data Voltage	Low V <sub>OL</sub> - V <sub>CC</sub>	V	-1.892		-1.548	
	High V <sub>OH</sub> - V <sub>CC</sub>		-1.051		-0.879	
Signal Detect	PECL	Low V <sub>L</sub> - V <sub>CC</sub>	-		-1.48	155M RX
		High V <sub>H</sub> - V <sub>CC</sub>	-1.16		-	
Output Voltage	TTL	Low V <sub>L</sub> - V <sub>CC</sub>	-		-2.50	1.25G RX
		High V <sub>H</sub> - V <sub>CC</sub>	-1.10		-	

## Optical Characteristics

Parameters		Symbol	Condition	Unit	Min.	Typ.	Max.	Remark
Data Bit Rate	1310 Tx		PRBS 2 <sup>23</sup> -1,NRZ	Mbps	10	155.52		TDE6360
	1550 Rx					1250		
	1550 Tx		PRBS 2 <sup>23</sup> -1,NRZ	Mbps		1250		TDE7360
	1310 Rx				10	155.52		
Fiber Length 9μm core SMF			10 <sup>-10</sup> BER, 155M or 1.25Gbps	Km	60			TDE6360 TDE7360
<b>TRANSMITTER</b>								
Average Power Output		P <sub>o</sub>	I <sub>f</sub> =I <sub>BIAS</sub> + I <sub>mod</sub> /2	dBm	-15.0 -2.0	-10.0 -0.5	-8.0 +1.0	TDE6360 TDE7360
Extinction Ratio		ER		dB	10			
Peak Wavelength	1310 Tx	λ <sub>c</sub>	CW, @ P <sub>o</sub>	nm	1290	1310	1330	TDE6360
	1550 Tx				1530	1550	1570	TDE7360
Side Mode Suppression Ratio		SMSR	CW, @ P <sub>o</sub>	dB	30			TDE7360
Spectral Width		Δλ	RMS Width Max. -20dB WD	nm		2.0	4.0	TDE6360
Optical Rise/Fall Time		t <sub>r</sub> /t <sub>f</sub>	20 - 80%	nsec			0.26	
<b>RECEIVER</b>								
Wavelength	1310 Rx	λ		nm	1260	1310	1360	TDE7360
	1550 Rx				1500	1550	1600	TDE6360
Sensitivity (Average Input Power)		P <sub>RL</sub>	PRBS 2 <sup>23</sup> -1, 10 <sup>-10</sup> BER	dBm		-36 -23	-34 -21	155M Rx 1.25G Rx
Receiver Overload		P <sub>IN,MAX</sub>		dBm	-3.0			
Signal Detect Threshold								
Decreasing light input		P <sub>D</sub>		dBm		P <sub>RL</sub> -3		
Increasing light input		P <sub>A</sub>		dBm		P <sub>RL</sub> -2		
Signal Detect Hysteresis		P <sub>A</sub> - P <sub>D</sub>		dB	0.5	1.0		

## Pin Descriptions

No	Symbol	Description	Level/Logic
1	V <sub>EE,RX</sub>	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 <sub>CC,RX</sub>	Rx Power supply	Power supply
6	V <sub>CC,TX</sub>	Tx Power supply	Power supply
7	TD-	Tx Data in(-)	PECL input
8	TD+	Tx Data in(+)	PECL input
9	V <sub>EE,TX</sub>	Tx Ground	Power supply

## Ordering Information

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

# Outline Diagram

( unit ; mm )

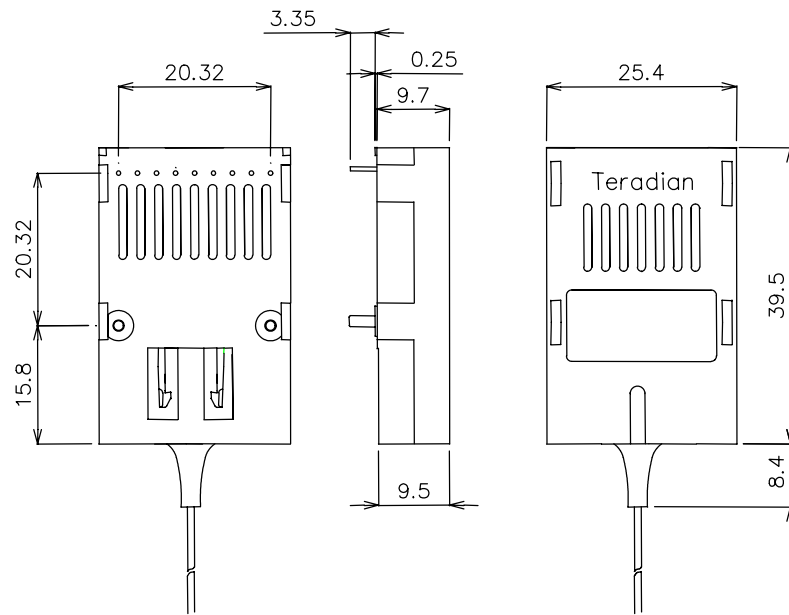


Fig. 1 TDxxxx Series Bi-Directional transceiver module(Pigtailed type)