

## Pigtailed PIN-TIA Receivers TPT48xx series



- PIN-TIA with low-noise transimpedance amplifier 1.25Gbps
- Operation voltage 3.3V or 5V
- Detection wavelength range of 1.1 $\mu$ m to 1.6 $\mu$ m
- SMF or MMF Pigtailed
- SC, FC, LC or ST Connector

### Family Model – x : pin

TPT483x    TPT485x

### Features

- InGaAs long wavelength PIN photodiode with transimpedance amplifier and decoupling capacitor operating at 1.25Gbps
- Operation at 1310nm & 1550nm
- High sensitivity and high overload characteristics
- High transimpedance gain with on-chip AGC(Automatic Gain Control(AGC))
- Differential or single ended output
- Operating temperature ; -40 $^{\circ}$ C to +85 $^{\circ}$ C
- Single-mode fiber or Multi-mode fiber pigtailed with SC, LC, FC or ST connector

### Description

The TPT48XX series is a reliable InGaAs PIN-TIA module pigtailed with transimpedance amplifier and decoupling capacitor operating at 1.25Gbps.

The parts of pigtailed PD module – single-mode fiber, lens and photodiode - are actively aligned by high power YAG laser welding method. This packaging guarantees high sensitivity and low deviation over a wide temperature range(-40 $^{\circ}$ C to +85 $^{\circ}$ C), and provides high optical performance for ITU-T G.651 and G.652 standard optical fiber.

### Applications

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

- Intra-office and Inter-office SONET/ITU-T SDH links

- Fiber in the loop(FTTO, FTTC, FTTH etc.)
- Transport links receiver
- Subscriber loops
- Private optical networks

## Absolute Maximum Ratings

Parameters	Symbol	Unit	Min.	Max.	Remarks
Ambient Operating Temperature	T <sub>op</sub>	°C	-40	85	Outdoor use
Storage Temperature	T <sub>stg</sub>	°C	-40	85	
PD Reverse Voltage	V <sub>RP</sub>	V	-	15	
PD Reverse Current	I <sub>RP</sub>	mA	-	3	
PD Forward Current	I <sub>FL</sub>	mA	-	50	
Supply Voltage	V <sub>cc</sub> - GND	V	-0.5	4.0 6.0	@3.3V @5V
Optical Input Power	P <sub>in</sub>	mW	-4	5 4	@3.3V @5V
Lead Soldering Temp./Time		°C/sec		260/10	

## Electrical & Optical Characteristics

(T<sub>op</sub> = 25°C)

Parameters	Symbol	Condition	Unit	Min.	Typ.	Max.	Remark
Detection range	λ	V <sub>R</sub> =5V, R>0.75	μm	1.1		1.6	
Responsivity	R	V <sub>R</sub> =5V, λ=1.3μm	A/W	0.8			
Transimpedance	R <sub>Ω</sub>	@ Single ended	kΩ	12	15	17.5	@3.3V
		@ Differential		24	30	35	
		, with 30μA <sub>p-p</sub> signal		2.3	2.8	3.4	@5V
Output Impedance	Z <sub>o</sub>	Single ended	Ω	25	40	60	@3.3V
				48	50	52	@5V
Differential Output Offset	ΔV <sub>out</sub>	I <sub>IN</sub> =1.3mA	mV		2		(622)
Maximum Differential Output Voltage	V <sub>diff</sub>	Input = 1mA <sub>p-p</sub> P-P, Single ended Input = 500μA, P-P Differential Signal	mV <sub>p-p</sub>	185	275 250	500 415	@3.3V @5V
Low Cut-off Frequency (-3dB point)	f <sub>c</sub>	High; V <sub>R</sub> =5V Low; I <sub>IN</sub> =1μA Low; I <sub>IN</sub> =20μA	GHz kHz	30	50 44	110	@3.3V @5V
High Cut-off Frequency (-3dB point)	f <sub>-3dB(h)</sub>	Measured @-26dBm relative to the gain	MHz	0.7 0.75	1.1 0.92	1.1	@3.3V @5V

		at 10MHz					
Small-Signal Bandwidth	$B_s$		MHz	115			(155)
Supply Current	$I_s$	AC coupled $R_L=50\Omega$	mA	23	30 26/34	39 50/47	@3.3V @5V
Optical Sensitivity	S	$\lambda=1.3\mu\text{m}$ , $R_L=50\Omega$ NRZ, PRBS= $2^{23}-1$ BER= $10^{-10}$ *1	dBm		-27 -27	-26/5	@3.3V
Input-Referred Noise	$i_{in}$	BW=460MHz	nA <sub>RMS</sub>		210 200	300	@3.3V @5V
Optical Overloads	OL	$\lambda=1.3\mu\text{m}$	dBm	-3p/0		+3	

\* Note 1 : post-amp BW = 1.25GHz, Extinction Ratio of LD is 10dB

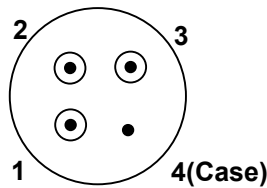
### ! Handling Caution

The Photo-diode can be damaged by overvoltage and current surges. Precautions should be taken for transient power supply.

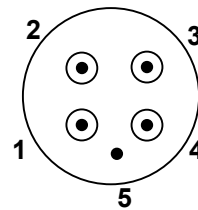
This device is susceptible to damage as a result of electrostatic discharge(ESD). Take proper precautions during both handling and testing

### Pin Description

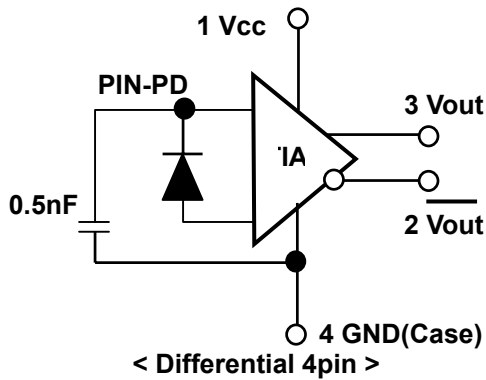
Pin No.	Differential 4pin		Single 4pin		Differential 5pin	
	Sym.	Description	Sym.	Description	Sym.	Description
1	V <sub>CC</sub>	Power Supply	V <sub>PD</sub>	PD bias	V <sub>out</sub>	Non-inverting Data Output
2	V <sub>out</sub>	Inverting Data Output	V <sub>CC</sub>	Power Supply	V <sub>PD</sub>	PD bias
3	V <sub>out</sub>	Non-inverting Data Output	V <sub>out</sub>	Non-inverting Data Output	V <sub>CC</sub>	Power Supply
4	GND	Ground	GND	Ground	V <sub>out</sub>	inverting Data Output
5					GND	Case GND



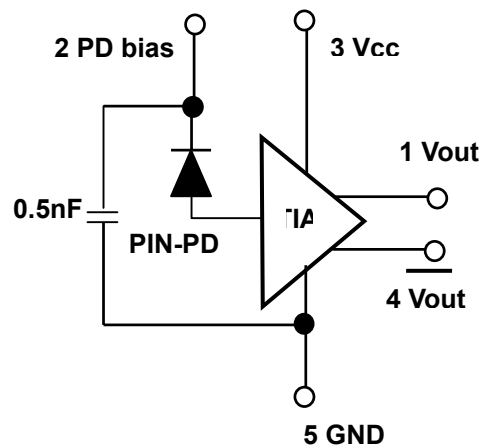
< TO Package bottom view : 4pin >



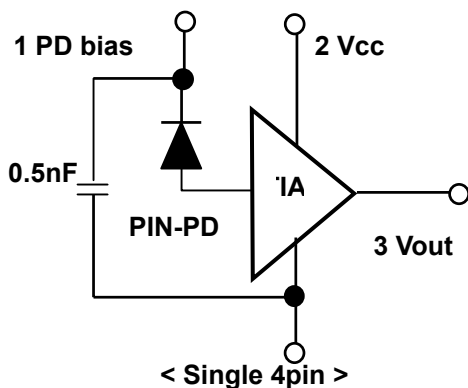
< TO Package bottom view : 5pin >



< Differential 4pin >



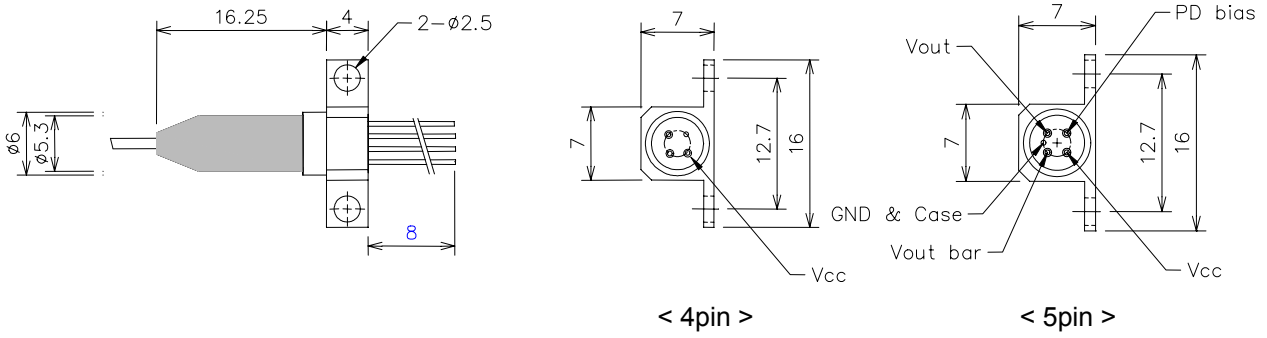
< Differential 5pin >



< Single 4pin >

Outline Diagram

- TPT4xxx-xxxH (pin numbering : clockwise)



- TPT4xxx-xxxV

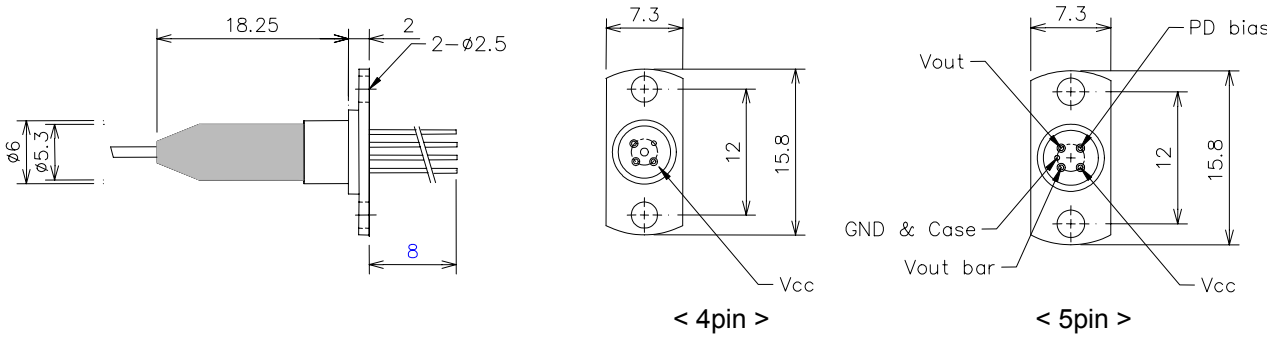
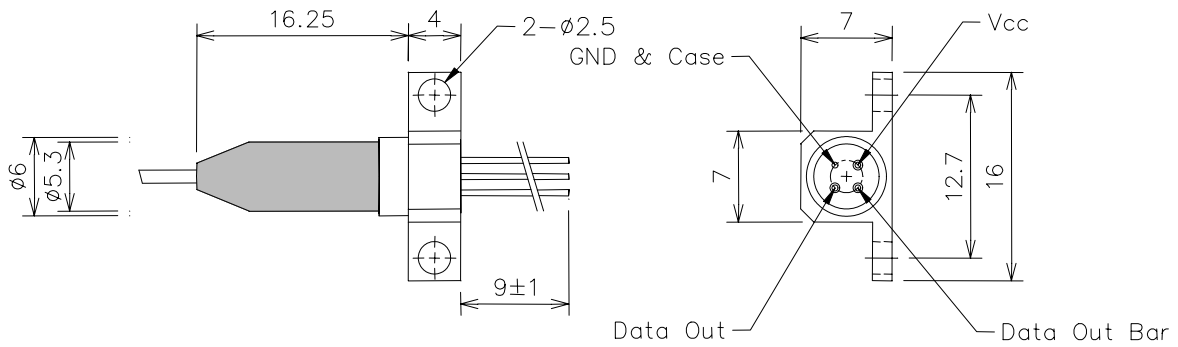


Fig.4 Pigtailed PD-TIA Package Dimensions [unit: mm]

TPT4834-OxxH-PE



## Ordering Information

Company	Device Type		Wave-length	Data rate (PIN-TIA)	Volt. (TIA)	Pin	Temp. Range	Fiber	Connector	Flange
<b>T</b>	<b>P</b>	<b>T</b>	<b>4</b>	<b>1</b>	<b>3</b>	<b>4</b>	<b>O</b>	<b>S</b>	<b>N</b>	<b>H</b>
TERADIAN	<b>P</b> ; PD Pigtail <b>C</b> ; PD Receptacle	<b>P</b> ; PIN <b>T</b> ; PIN-TIA <b>A</b> ; APD	<b>4</b> ; 1.3/1.5 μm <b>8</b> ; 850nm	<b>N</b> ; None <b>0</b> ; 51Mbps <b>1</b> ; 155Mbps <b>4</b> ; 622Mbps <b>8</b> ; 1.25Gbps <b>G</b> ; 2.5Gbps	<b>N</b> ; None <b>3</b> ; 3.3V <b>5</b> ; 5V	<b>3</b> ; 3pin <b>4</b> ; 4pin (differential) <b>5</b> ; 5pin <b>6</b> ; 4pin (single ended)	<b>I</b> ; Indoor Use (0~70℃) <b>O</b> ; Outdoor Use (-40~85℃)	<b>S</b> ; SMF <b>M</b> ; MMF	<b>N</b> ; None <b>S</b> ; SC <b>F</b> ; FC <b>T</b> ; ST <b>L</b> ; LC	<b>N</b> ; None <b>V</b> ; Vertical <b>H</b> ; Horizontal

\*Note 1 ; additional order information

- Connector type default is SC/PC and the default length of fiber is 1m
- In case of ordering pigtailed Bi-Di Transceiver, please specify specs. clearly if not default.

## More Information

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