

Pigtailed PIN-TIA Receivers TPT4Gxx series



- PIN-TIA with low-noise transimpedance amplifier 2.5Gbps
- Operation voltage 3.3V to 5V
- Detection wavelength range of 1.1 μ m to 1.6 μ m
- SMF Pigtailed
- SC, FC, LC or ST Connector

Family Model – x : pin

TPT4G3x TPT4G5x

Features

- InGaAs long wavelength PIN photodiode with transimpedance amplifier and decoupling capacitor operating at 2.5Gbps
- Operation at 1310nm & 1550nm
- High sensitivity and high overload characteristics
- High transimpedance gain with **or without** 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 TPT4GXX series is a reliable InGaAs PIN-TIA module pigtailed with transimpedance amplifier and decoupling capacitor operating at 2.5Gbps.

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 _{op}	°C	-40	85	Outdoor use
Storage Temperature	T _{stg}	°C	-40	85	
PD Reverse Voltage	V _{RP}	V	-	15	
PD Reverse Current	I _{RP}	mA	-	3	
PD Forward Current	I _{FL}	mA	-	50	
Supply Voltage	V _{cc} - GND	V	-0.7	3.5/5 6	@3.3V @5V
Optical Input Power	P _{in}	mW		2.5	@3.3V @5V
Lead Soldering Temp./Time		°C/sec		260/10	

Electrical & Optical Characteristics

(T_{op} = 25°C)

Parameters	Symbol	Condition	Unit	Min.	Typ.	Max.	Remark
Detection range		V _R =5V, R>0.75	μm	1.1		1.6	
Responsivity	R	V _R =5V,λ=1.3μm	A/W	0.8			
Transimpedance	R _Ω	50Ω, Differential output f=100MHz, with 40μA _{p-p} signal	kΩ	2.5 1.5	3.5 1.9	4.5 2.3	@3.3V @5V
Output Impedance	Z _o	Single ended	Ω	48	50	52	
Differential Output Offset	ΔV _{out}	I _{IN} =1.3mA	mV		2		(622)
Input Data Rate	D _{ri}		Mb/s	155		2500	(2.5G)
Maximum Differential Output Voltage	V _{diff}	Input = 1mA _{p-p} P to P, Single ended Input = 500μA, P-P Differential Signal	mV _{p-p}	185	250	300 415	@3.3V @5V
Low Cut-off Frequency (-3dB point)	f _c	-3dB,input ≤ 20μA DC	kHz		3 44	4	@3.3V @5V
High Cut-off Frequency (-3dB point)	f _{-3dB(h)}	C _i =0.5pF	GHz	1.7	1.9		@3.3V;M
Small-Signal Bandwidth	B _s	-3dB point	GHz	1.7	2.1	2.6	@3.3V

				1.5	1.9	2.4	@5V
Supply Current	I_s	AC coupled $R_L=50\Omega$	mA		44 26	59 54	@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		-26 -24	-24 -21	@3.3V @5V
Input-Referred Noise	i_{in}	BW=460MHz	nA _{RMS}		45 73	55 93.5	(622)
Optical Overloads	OL	$\lambda=1.3\mu\text{m}$	dBm	0.0			

* Note 1 : post-amp BW = 2.5GHz, Extinction Ratio of LD is 10dB

* AGC option : Total integrated RMS noise current over bandwidth, Automatic gain control loop time, AGC threshold current (peak-to-peak value)

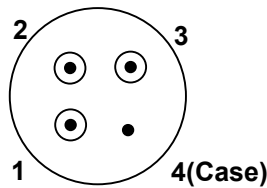
! Handling Caution

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

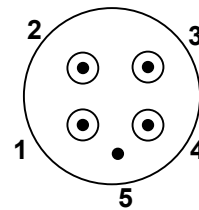
This device is susceptible to damage as a result of electrostatic discharge(ESD). Take proper precautions during both handling and testing

Pin Description

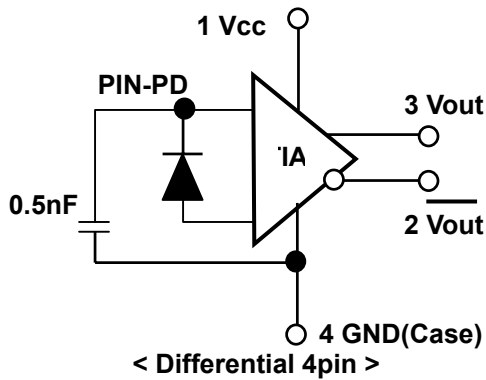
Pin No.	Differential 4pin		Single 4pin		Differential 5pin	
	Sym.	Description	Sym.	Description	Sym.	Description
1	V_{CC}	Power Supply	V_{PD}	PD bias	V_{out}	Non-inverting Data Output
2	V_{out}	Inverting Data Output	V_{CC}	Power Supply	V_{PD}	PD bias
3	V_{out}	Non-inverting Data Output	V_{out}	Non-inverting Data Output	V_{CC}	Power Supply
4	GND	Ground	GND	Ground	V_{out}	inverting Data Output
5					GND	Case GND



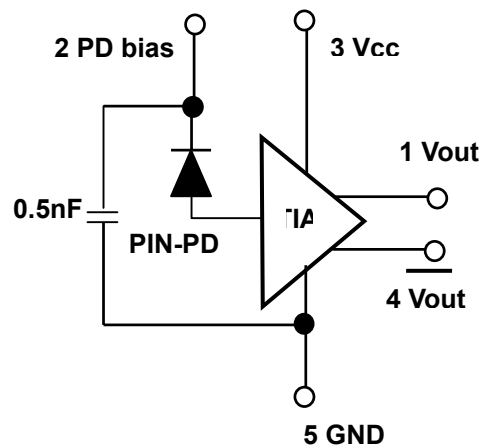
< TO Package bottom view : 4pin >



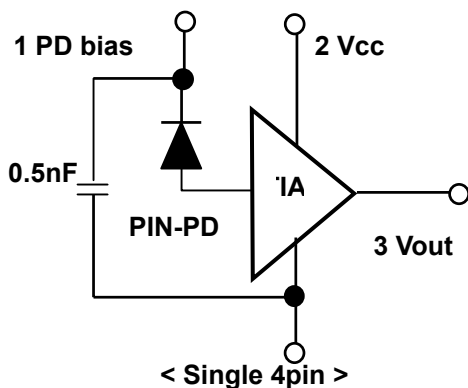
< TO Package bottom view : 5pin >



< Differential 4pin >



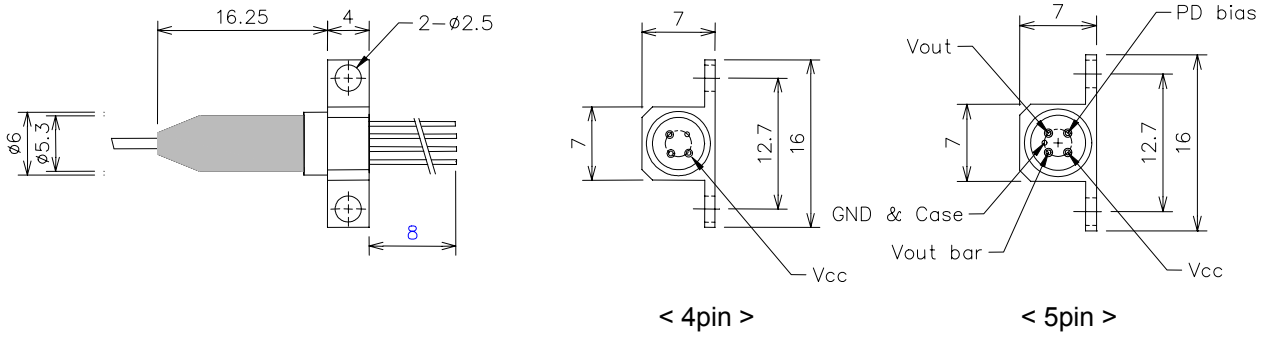
< Differential 5pin >



< Single 4pin >

Outline Diagram

- TPT4xxx-xxxH (pin numbering : clockwise)



- TPT4xxx-xxxV

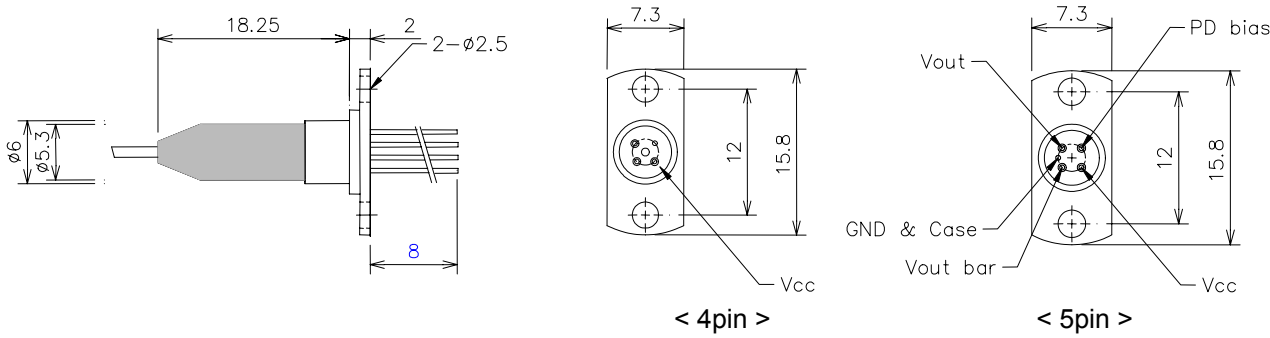


Fig.4 Pigtailed PD-TIA Package Dimensions [unit: mm]

Ordering Information

Company	Device Type		Wave-length	Data rate (PIN-TIA)	Volt. (TIA)	Pin	Temp. Range	Fiber	Connector	Flange
T	P	T	4	1	3	4	O	S	N	H
TERADIAN	P ; PD Pigtail C ; PD Receptacle	P ; PIN T ; PIN-TIA A ; APD	4 ; 1.3/1.5 μm 8 ; 850nm	N ; None 0 ; 51Mbps 1 ; 155Mbps 4 ; 622Mbps 8 ; 1.25Gbps G ; 2.5Gbps	N ; None 3 ; 3.3V 4 : 3.3~5.0V 5 ; 5V	3 ; 3pin 4 ; 4pin (differential) 5 ; 5pin 6 ; 4pin (single ended)	I ; Indoor Use (0~70℃) O ; Outdoor Use (-40~85℃)	S ; SMF M ; MMF	N ; None S ; SC F ; FC T ; ST L ; LC	N ; None V ; Vertical H ; 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.

Voltage : 4 option - 3.3~5V free

More Information

Teradian Inc.

Address 946, Dunsan-dong, Seo-gu, Daejeon, 302-120, Korea
 Tel +82-42-476-4800, 4803(Oversea Sales Team)
 Fax +82-42-476-4805
 Homepage <http://www.teradian.com>
 e-mail sales@teradian.com