



**ATA121302D1C**  
1.25 Gb/s Transimpedance Amplifier  
Advanced Product Information  
Rev 0

**FEATURES**

- 1.25 Gb/s Differential Output TIA
- Automatic Gain Control

**APPLICATIONS**

- Gigabit Ethernet (1.250 Gb/s)
- Fibre Channel (1.064 Gb/s)

**ELECTRICAL CHARACTERISTICS<sup>(1)</sup>** ( $T_A = 25^\circ\text{C}$ ,  $V_{DD} = +5.0\text{V} \pm 10\%$ )

PARAMETER	MIN	TYP	MAX	UNIT
Small Signal Differential ( $R_L = 100 \Omega$ ) Transresistance <sup>(2)</sup>	-	2.8	-	$\text{k}\Omega$
Bandwidth	1000	1100	-	MHz
Low Frequency Cutoff	-	800	-	kHz
Input Resistance		100		$\Omega$
Output Resistance	-	40	-	$\Omega$
Input Offset Voltage	-	1.4	-	V
Output Offset Voltage	-	2.2	-	V
Photodiode Biasing Voltage ( $V_N$ )		-5	-	V
Optical Overload <sup>(1), (3)</sup>	-3		-	dBm
Optical Sensitivity <sup>(1), (3)</sup>	-	-25		dBm
Differential Output Voltage <sup>(4), (5)</sup>	-	350	-	mV
$T_{RISE}$ & $T_{FALL}$ (20 - 80%) <sup>(5), (6)</sup>	-	280	-	ps
Duty Cycle Distortion <sup>(4), (7)</sup>	-	4	-	%
RMS Jitter <sup>(4), (7), (8)</sup>	-	20	-	ps
Total Jitter (pk-pk) <sup>(4), (7), (9)</sup>	-	100	-	ps
Supply Current	-	35	-	mA
Operating Voltage Range	+4.5	+5.0	+5.5	V
Operating Temperature Range	0	-	85	$^\circ\text{C}$
Input Noise Current	-	TBD	-	nA

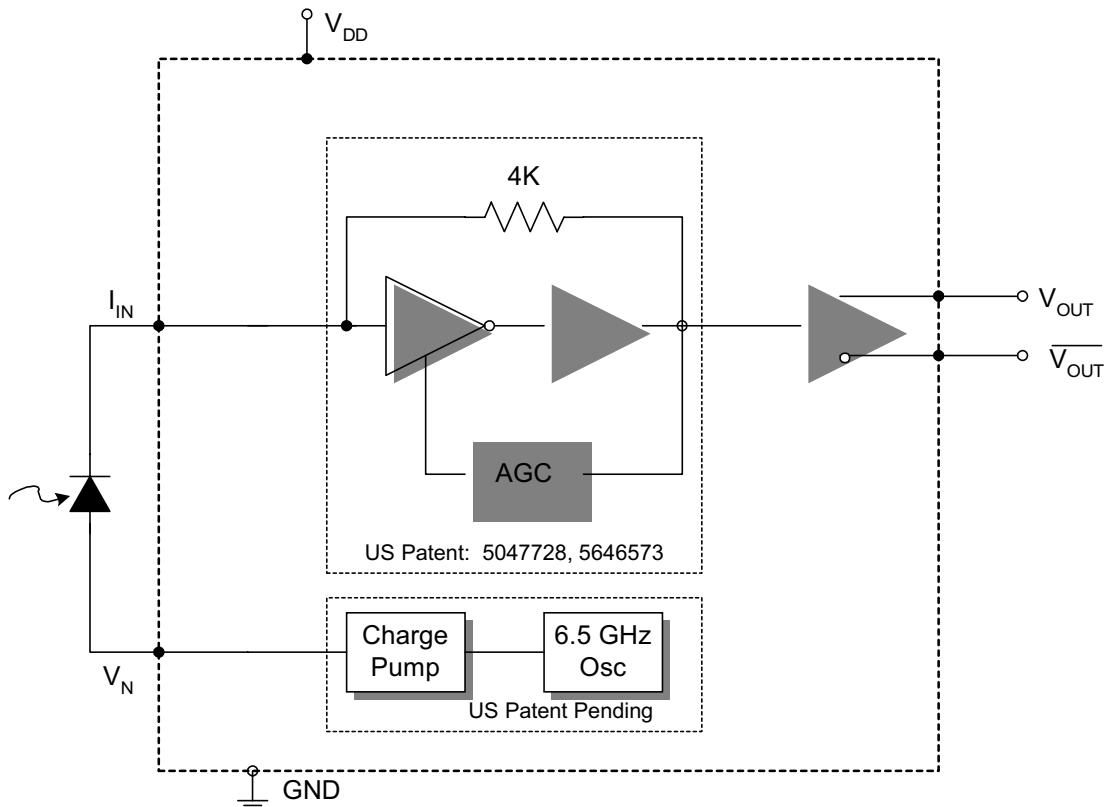
1. Measured with a photodiode having a maximum capacitance of 0.6 pF and a minimum responsivity of 0.8 A/W.
2. f = 50 MHz
3. Measured at  $10^{-10}$  BER with a 2<sup>7</sup>-1 PRBS, 1.25 Gb/s.
4. Input optical power = -3 dBm,  $R_L = 100 \Omega$  (differential)
5. Measured with a 625 MHz, 50% duty cycle square wave.
6. Measured differentially at -14dBm optical input power.
7. Measured with a 2<sup>7</sup>-1 PRBS.
8. 1 $\sigma$  about the center eye crossing.
9. 6 $\sigma$  about the center eye crossing.

**ABSOLUTE MAXIMUM RATINGS**

$V_{DD}$	7.0 V
$I_{IN}$	3.5 mA
$T_S$	Storage Temp. - 65 °C to 125 °C

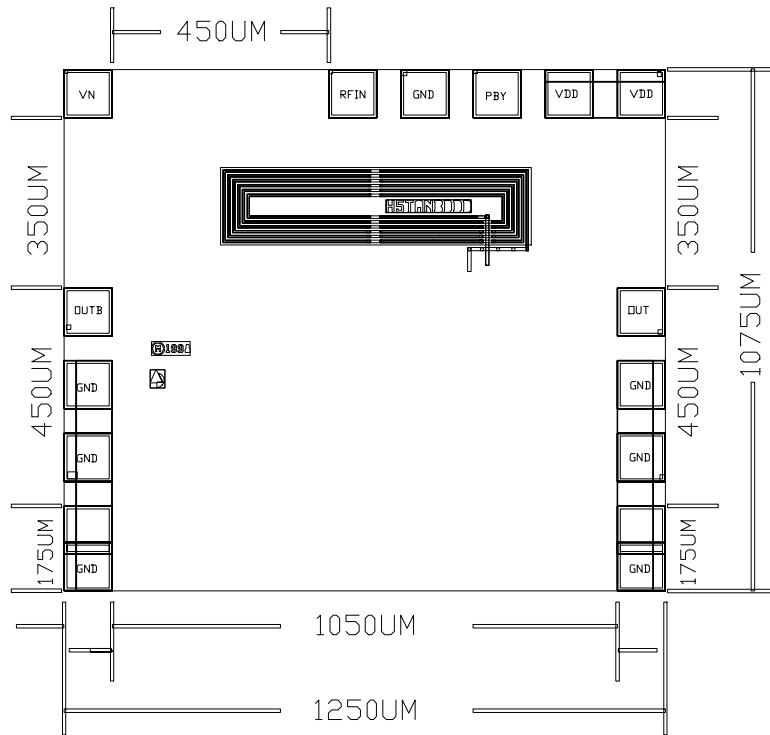
**ATA121302D1C PAD DESCRIPTION**

PAD	Description	Comment
$V_{DD}$	Positive Supply Voltage	+ 5 Volts
$I_{IN}$	TIA Input	Connect to detector cathode for proper operation
$V_N$	Negative Voltage for Photodiode Biasing	Connect to detector anode for optimum performance
$V_{OUT}$	TIA Output Voltage (Non-Inverted)	Logical '1' with optical input
$\overline{V_{OUT}}$	TIA Output Voltage (Inverted)	Logical '0' with optical input

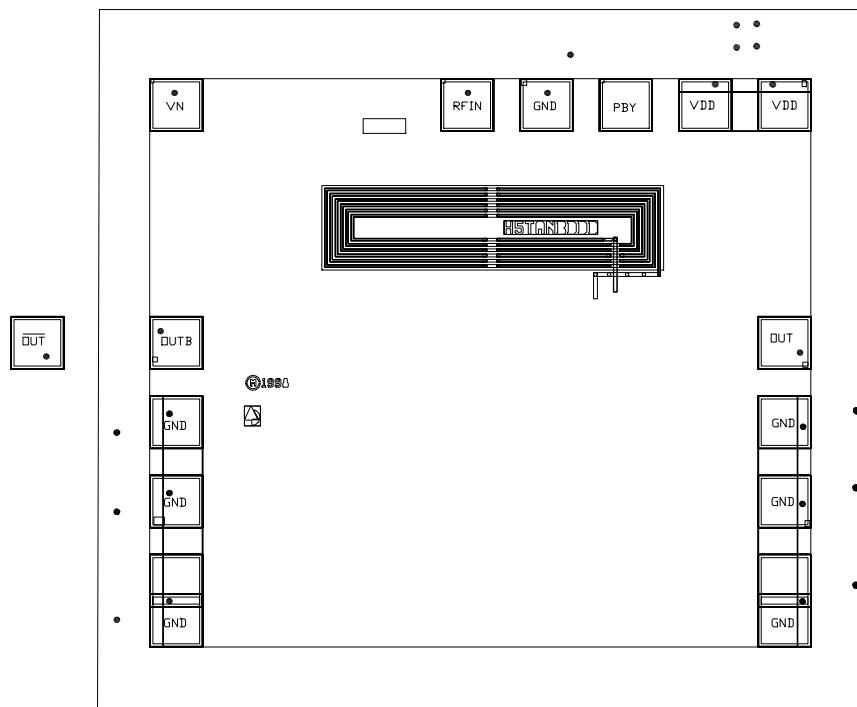
**ATA121302D1C BLOCK DIAGRAM**


The photodetector cathode must be connected to  $I_{IN}$  and the anode can be connected to  $V_N$  or ground for proper AGC operation.

## BONDING PADS



## TYPICAL BONDING DIAGRAM



Scribe streets are  $37.5\mu\text{m}$  wide

## Typical Characteristics (measured with a photodiode)

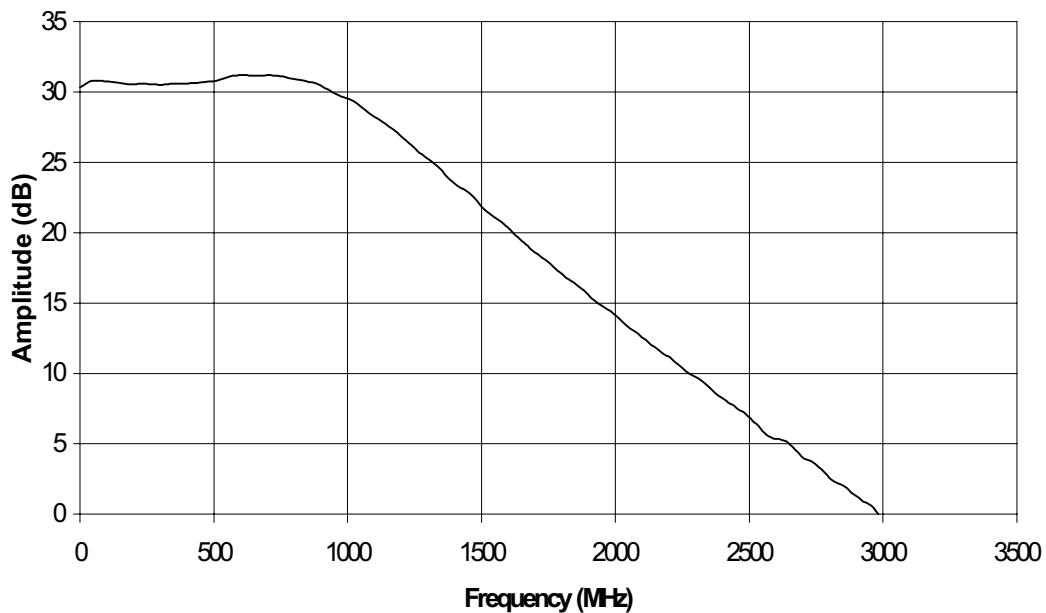


Figure 1. Frequency Response

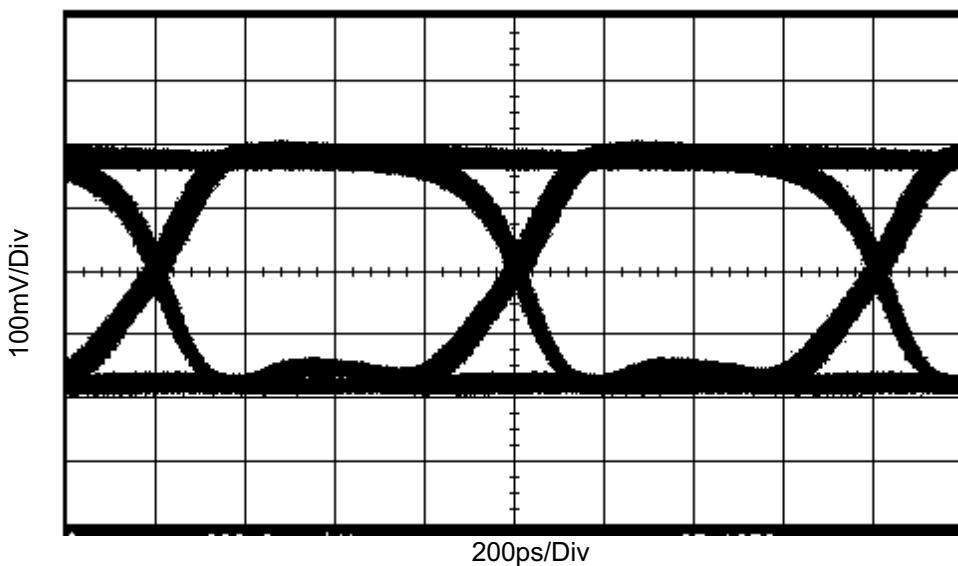


Figure 2. Eye Diagram with an Optical Input Power of -3dB

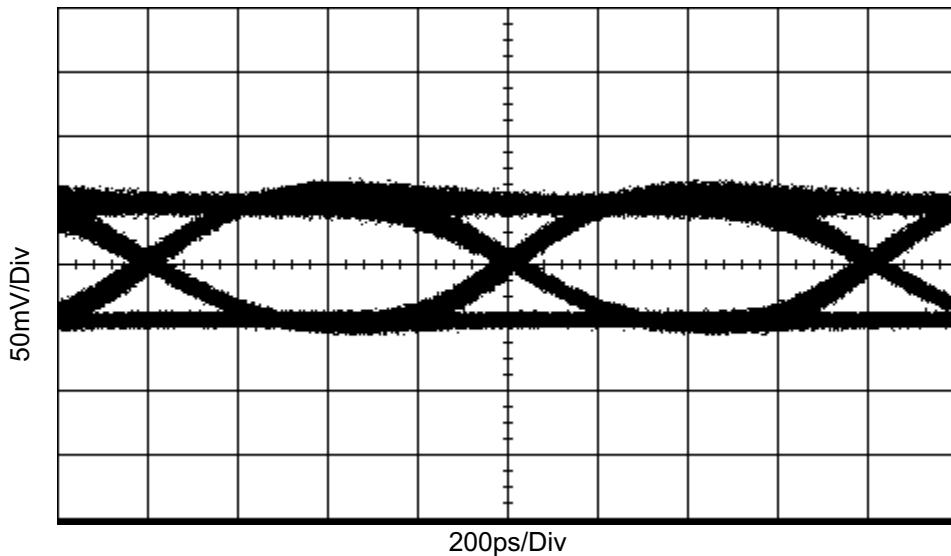


Figure 3. Eye Diagram with an Optical Input Power of  $-17$  dBm

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