



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⁽¹⁾ ($T_A = 25\text{ }^\circ\text{C}$, $V_{DD} = +5.0\text{V} \pm 10\%$)

PARAMETER	MIN	TYP	MAX	UNIT
Small Signal Differential ($R_L = 100\ \Omega$) Transresistance ⁽²⁾	-	2.8	-	$K\Omega$
Bandwidth	1000	1100	-	MHz
Low Frequency Cutoff	-	800	-	kHz
Input Resistance		100		Ω
Output Resistance	-	40	-	Ω
Input Offset Voltage	-	1.4	-	V
Output Offset Voltage	-	2.2	-	V
Photodiode Biasing Voltage (V_N)		-5	-	V
Optical Overload ^{(1), (3)}	-3		-	dBm
Optical Sensitivity ^{(1), (3)}	-	-25		dBm
Differential Output Voltage ^{(4), (5)}	-	350	-	mV
T_{RISE} & T_{FALL} (20 - 80%) ^{(5), (6)}	-	280	-	ps
Duty Cycle Distortion ^{(4), (7)}	-	4	-	%
RMS Jitter ^{(4), (7), (8)}	-	20	-	ps
Total Jitter (pk-pk) ^{(4), (7), (9)}	-	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 AW.
2. $f = 50\text{ MHz}$
3. Measured at 10^{-10} BER with a 2^7-1 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 2^7-1 PRBS.
8. 1σ about the center eye crossing.
9. 6σ about the center eye crossing.

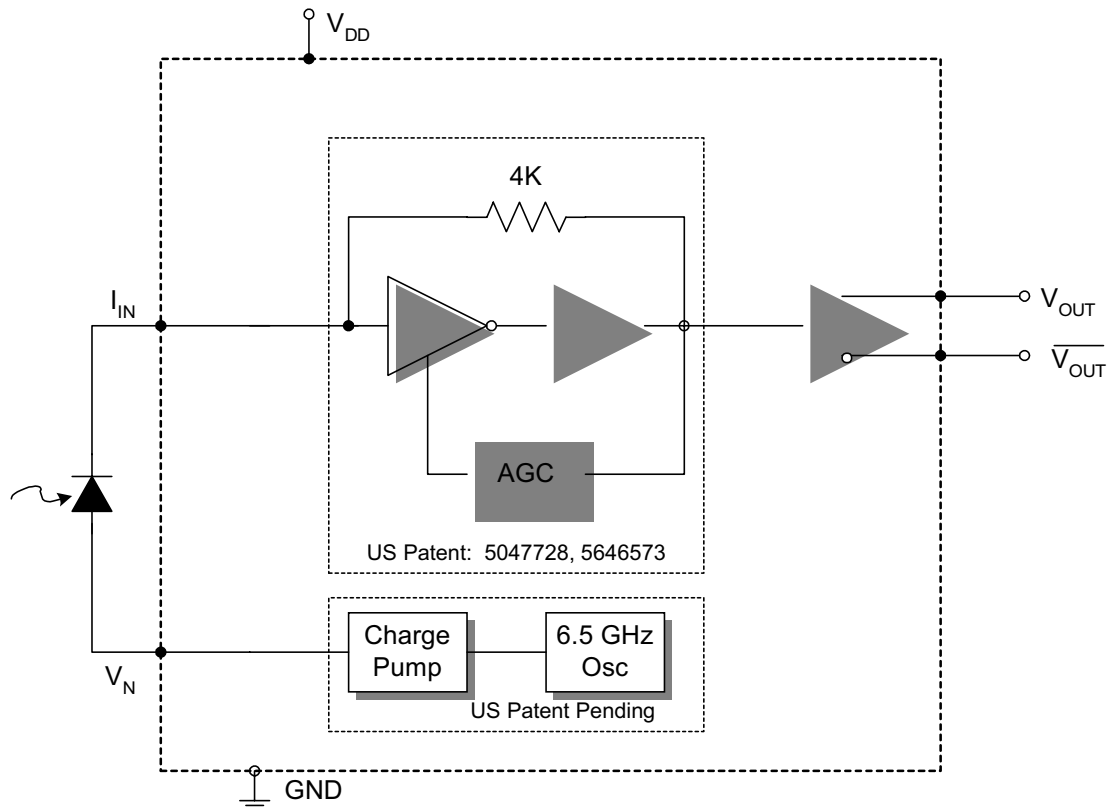
ABSOLUTE MAXIMUM RATINGS

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

ATA121302D1C PAD DESCRIPTION

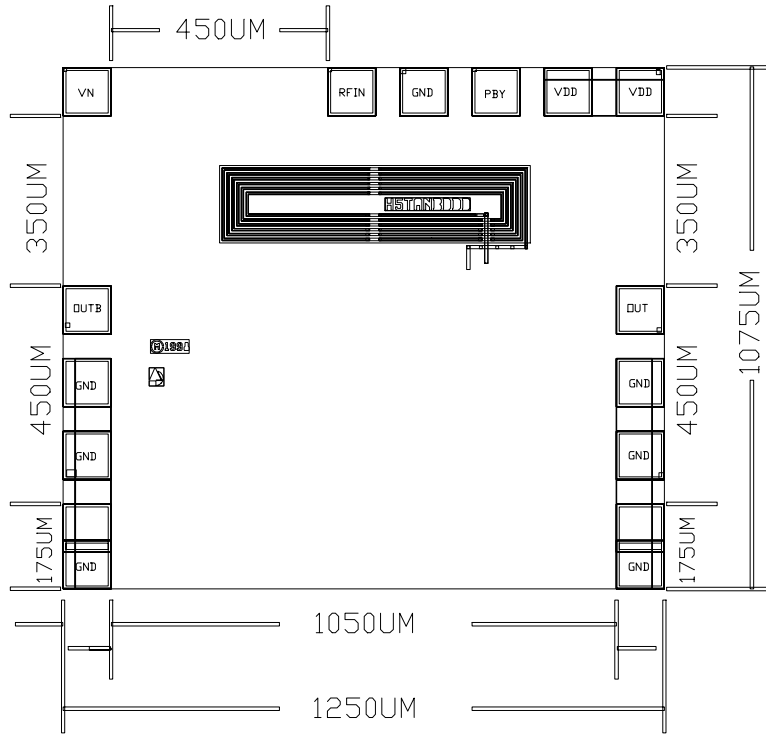
PAD	Description	Comment
V_{DD}	Positive Supply Voltage	+ 5 Volts
I_{IN}	TIA Input	Connect to detector cathode for proper operation
V_N	Negative Voltage for Photodiode Biasing	Connect to detector anode for optimum performance
V_{OUT}	TIA Output Voltage (Non-Inverted)	Logical '1' with optical input
$\overline{V_{OUT}}$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

ATA121302D1C BLOCK DIAGRAM

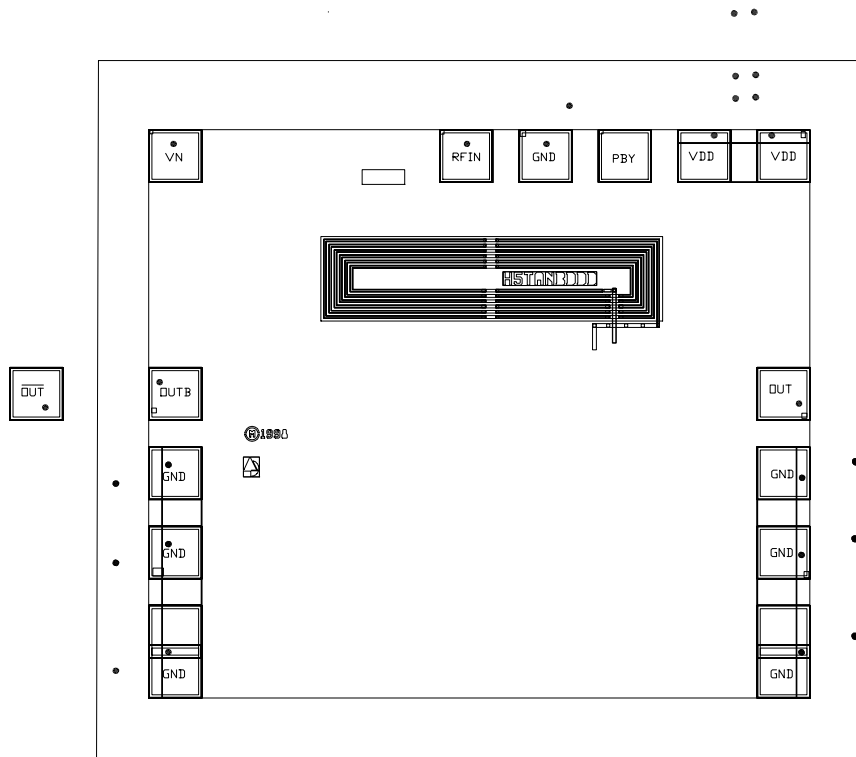


The photodetector cathode must be connected to I_{IN} and the anode can be connected to V_N or ground for proper AGC operation.

BONDING PADS



TYPICAL BONDING DIAGRAM



Scribe streets are 37.5µm wide

Typical Characteristics (measured with a photodiode)

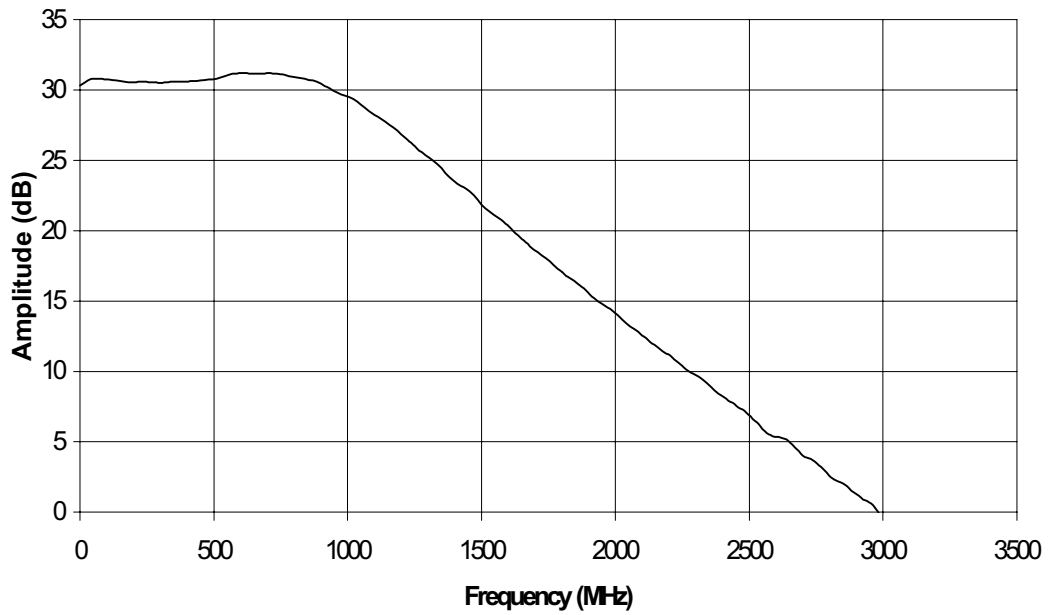


Figure 1. Frequency Response

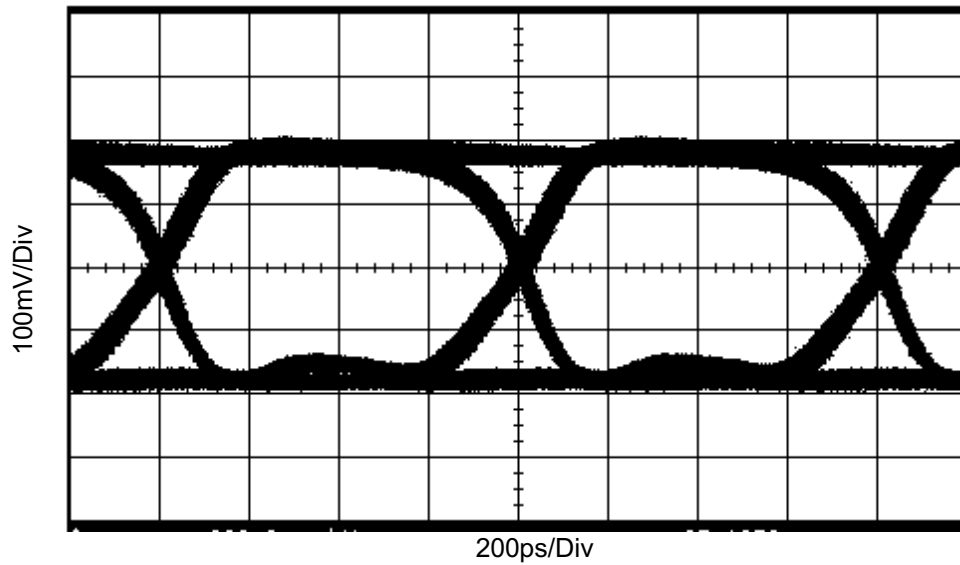


Figure 2. Eye Diagram with an Optical Input Power of -3dB

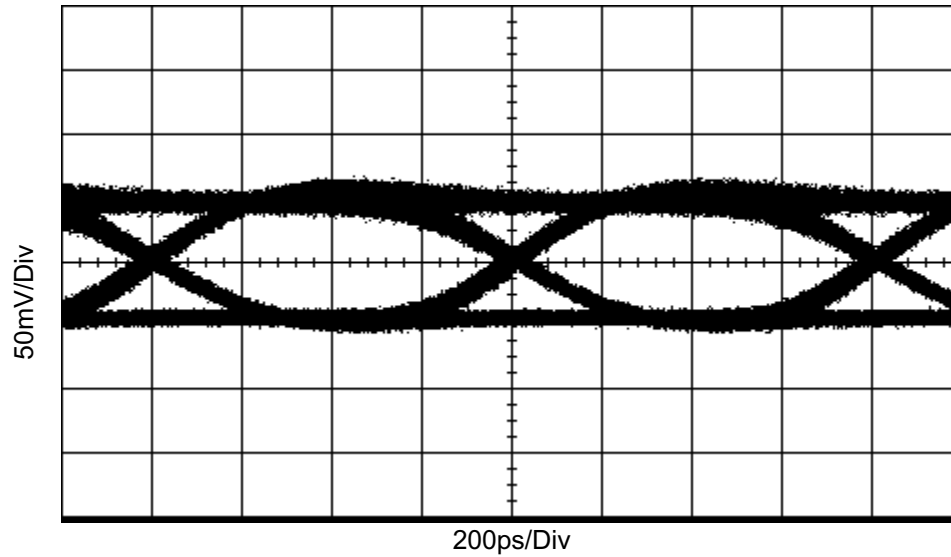


Figure 3. Eye Diagram with an Optical Input Power of -17 dBm

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