



**ATA01501D1C**

**ATA01501S2C**

AGC Transimpedance Amplifier

SONET OC-3

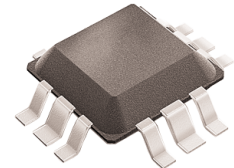
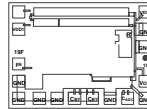
Preliminary Data Sheet - Rev 5

**FEATURES**

- Single +5 Volt Supply
- Automatic Gain Control
- Excellent Sensitivity
- 0 dBm Optical Overload

**APPLICATIONS**

- SONET OC-3 Receiver
- FDDIk Ethernet Fiber LAN
- Low Noise RF Amplifier



**D1**

**S2**  
**12 Pin 4 Sided**  
**SQFP Package**

**Electrical Characteristics** <sup>(1)</sup> ( $T_A = 25^\circ\text{C}$ ,  $V_{DD} = +5.0\text{V} \pm 10\%$ ,  $C_{DIODE} + C_{STRAY} = 0.5\text{pF}$ , Det. Cathode to  $I_{IN}$ )

PARAMETER	MIN	TYP	MAX	UNIT
Transresistance ( $R_L = \infty, I_{dc} < 500\text{nA}$ )		17		$\text{K}\Omega$
Transresistance ( $R_L = 50\Omega$ ) <sup>(1)</sup>	5.5	8	10	$\text{K}\Omega$
Bandwidth -3dB (D1C)	150	175		MHz
Bandwidth -3dB (S2C)	130	75		MHz
Input Resistance <sup>(2)</sup>		500		$\Omega$
Output Resistance	30	50	60	$\Omega$
Supply Current		30	45	mA
Input Offset Voltage	1.4	1.6	1.9	Volts
Output Offset Voltage		1.8		Volts
AGC Threshold ( $I_{IN}$ ) <sup>(3)</sup>	15	30		$\mu\text{A}$
Optical Overload <sup>(4)</sup>	-3	0		dBm
Input Noise Current <sup>(5)</sup>		14	20	nA
AGC Time Constant <sup>(6)</sup>		16		$\mu\text{sec}$
Offset Voltage Drift		1		$\text{mV}/^\circ\text{C}$
Optical Sensitivity -(D1C) <sup>(7)</sup>		-38		dBm
Optical Sensitivity - (S2C) <sup>(7)</sup>		-37		dBm
Operating Voltage Range	+ 4.5	+ 5.0	+ 6.0	Volts
Operating Temperature Range	- 40		85	$^\circ\text{C}$

1.  $f = 50\text{MHz}$
2. Measured with  $I_{IN}$  below AGC Threshold. During AGC, input impedance will decrease proportionally to  $I_{IN}$
3. Defined as the  $I_{IN}$  where Transresistance has decreased by 50%.
4. See note on "Indirect Measurement of Optical Overload".
5. See note on "Measurement of Input Referred Noise Current".
6.  $C_{AGC} = 220\text{pF}$
7. Parameter is guaranteed (not tested) by design and characterization data @155Mb assuming detector responsivity of 0.9

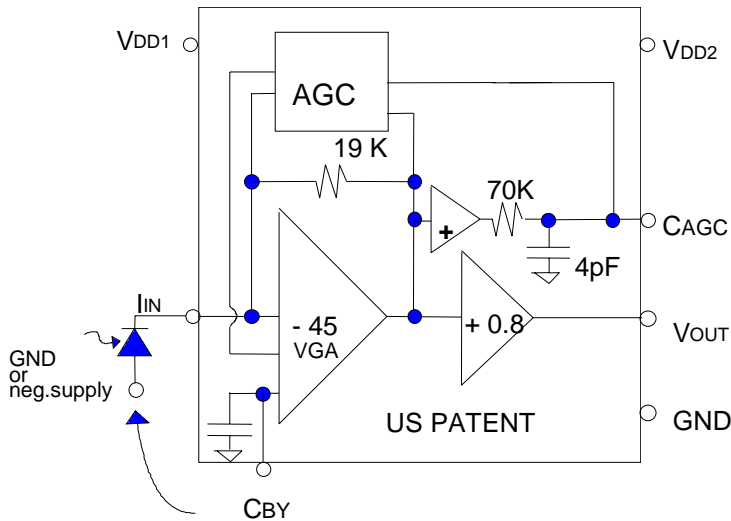
**Absolute Maximum Ratings**

$V_{DD1}$	7.0 V
$V_{DD2}$	7.0 V
$I_{IN}$	5 mA
$T_A$	Operating Temp. - 40 C to 125 C
$T_S$	Storage Temp. - 65 C to 150 C

**Pad Description**

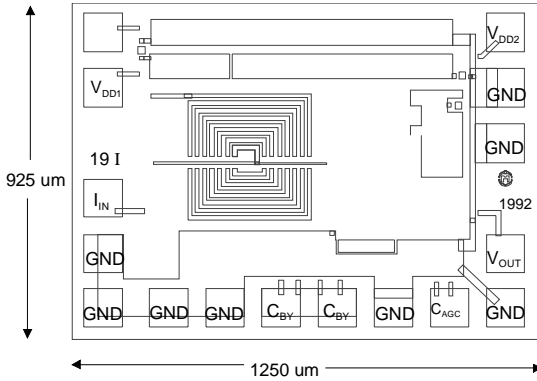
PAD	Description	Comment
$V_{DD1}$	$V_{DD1}$	Positive supply for input gain stage
$V_{DD2}$	$V_{DD2}$	Positive supply for second gain stage
$I_{IN}$	TIA Input Current	Connect detector cathode for proper operation
$V_{OUT}$	TIA Output Voltage	Requires external DC block
$C_{AGC}$	External AGC Capacitor	$70K * C_{AGC} = AGC \text{ time constant}$
$C_{BY}$	Input gain stage bypass capacitor	$>56 \text{ pF}$

**Equivalent Circuit**

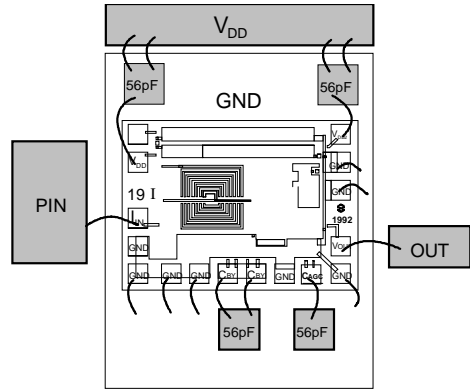


Photodiode cathode must be connected to lin for proper AGC operation

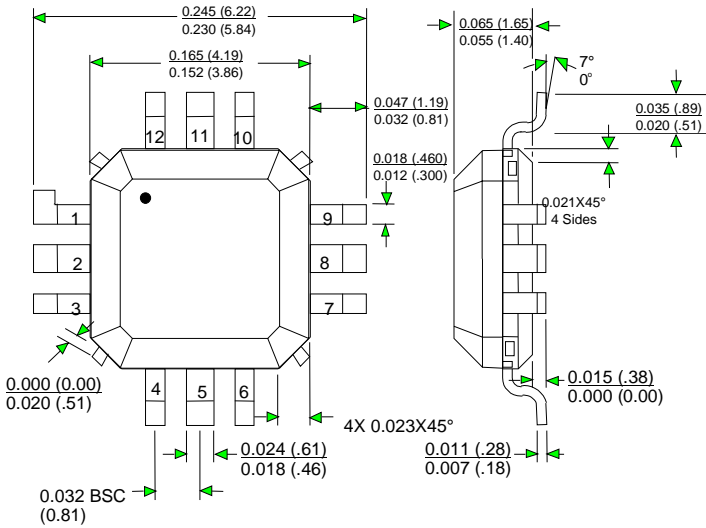
ATA01501D1C Die Bonding Pads



ATA01501D1C Die Typical Bonding

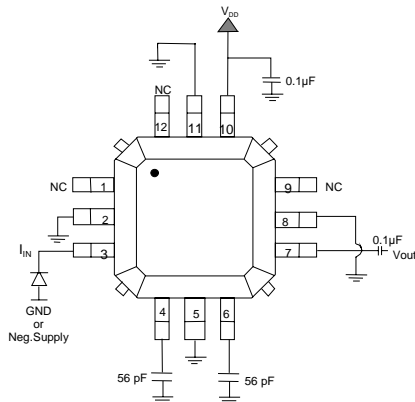


ATA01501DS2C SQFP Package Outline



PIN NO.	FUNCTION
1	NC
2	GND
3	I <sub>IN</sub>
4	C <sub>BY</sub>
5	GND
6	C <sub>AGC</sub>
7	V <sub>OUT</sub>
8	GND
9	NC
10	V <sub>DD</sub>
11	GND
12	NC

ATA01501DS2C Typical SQFP Connection Package





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