

ATA01501D1C
ATA01501S2C

AGC Transimpedance Amplifier
SONET OC-3

Preliminary Data Sheet - Rev 5

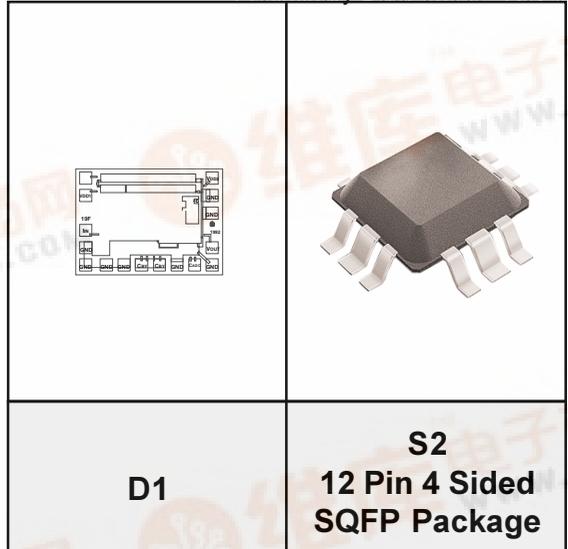


FEATURES

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

APPLICATIONS

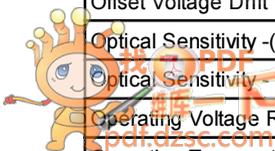
- SONET OC-3 Receiver
- FDDIK Ethernet Fiber LAN
- Low Noise RF Amplifier



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

PARAMETER	MIN	TYP	MAX	UNIT
Transresistance ($R_L = \infty, I_{dc} < 500\text{ nA}$)		17		$\text{K}\Omega$
Transresistance ($R_L = 50\Omega$) ⁽¹⁾	5.5	8	10	$\text{K}\Omega$
Bandwidth -3dB (D1C)	150	175		MHz
Bandwidth -3dB (S2C)	130	75		MHz
Input Resistance ⁽²⁾		500		Ω
Output Resistance	30	50	60	Ω
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}) ⁽³⁾	15	30		μA
Optical Overload ⁽⁴⁾	-3	0		dBm
Input Noise Current ⁽⁵⁾		14	20	nA
AGC Time Constant ⁽⁶⁾		16		μsec
Offset Voltage Drift		1		$\text{mV}/^\circ\text{C}$
Optical Sensitivity -(D1C) ⁽⁷⁾		-38		dBm
Optical Sensitivity -(S2C) ⁽⁷⁾		-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



ATA01501D1C/ATA01501S2C

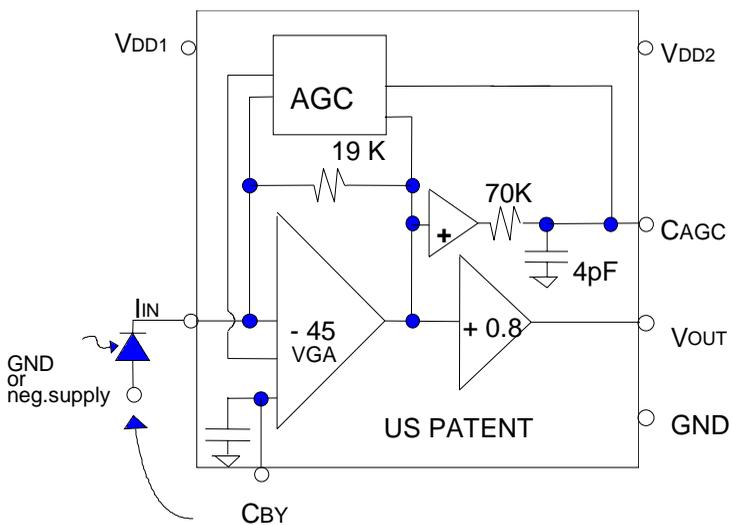
Absolute Maximum Ratings

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 pF

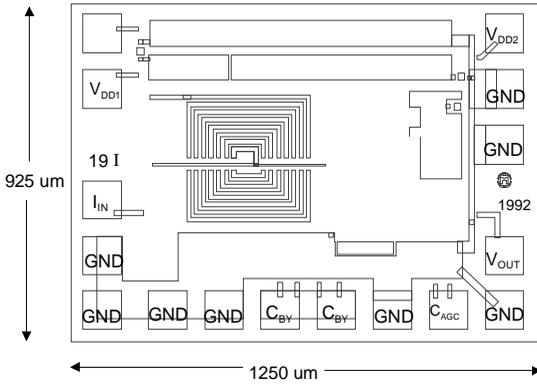
Equivalent Circuit



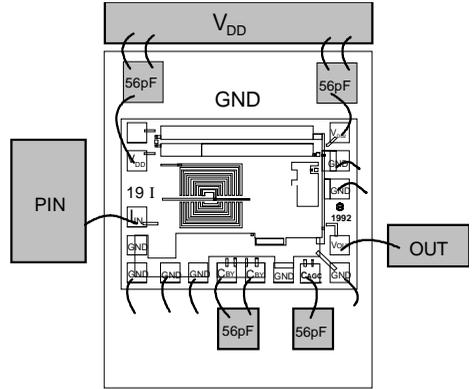
Photodiode cathode must be connected to lin for proper AGC operation

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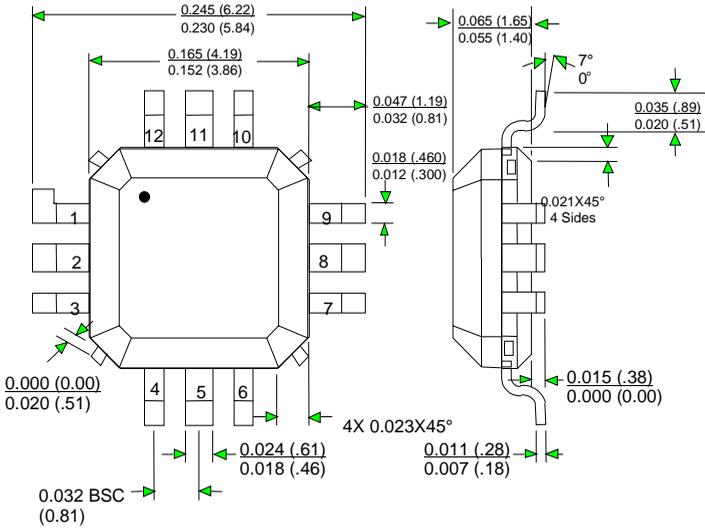
ATA01501D1C Die Bonding Pads



ATA01501D1C Die Typical Bonding

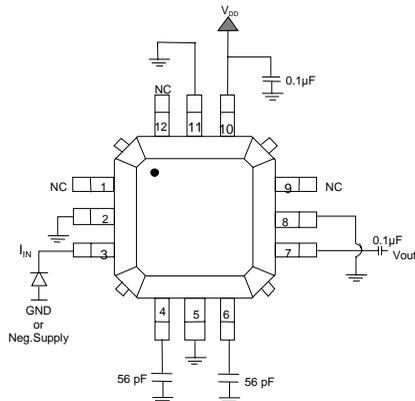


ATA01501DS2C SQFP Package Outline



PIN NO.	FUNCTION
1	NC
2	GND
3	I _{IN}
4	C _{BY}
5	GND
6	C _{AGC}
7	V _{OUT}
8	GND
9	NC
10	V _{DD}
11	GND
12	NC

ATA01501DS2C Typical SQFP Connection Package





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