



**ADA10001S3C**  
 Linear Amplifier MMIC  
 Data Sheet - Rev. 1

**FEATURES**

- High Linearity ( $IIP_3 + 18 \text{ dBm}$ )
- Low Noise Figure (2.0 dB)
- Single Supply (+8Vdc)
- Wide Bandwidth (50MHz - 1 GHz)

**APPLICATIONS**

- Driver Amplifier
- CATV - Distribution / Drop Amplifiers



**S3C**  
**16 Pin SOIC Package**

**DESCRIPTION:**

The ADA10001 is a monolithic IC intended for use in applications requiring high linearity such as: Cellular Telephone Base Station Driver Amplifiers, CATV Fiber Receiver/Distribution Amplifiers and CATV Drop Amplifiers. Supplied in a surface mount, 16 lead-SOIC package, it is well suited for use in amplifiers where small size, reduced component count, and high reliability are important.

**ABSOLUTE MAXIMUM RATINGS**

PARAMETER	MIN.	MAX.	UNITS
$V_{DD}/V_{RFOUT}$	0	12	$V_{DC}$
$V_{RFIN}$		0	$V_{DC}$
$RF_{IN}$		+ 10	dBm
Storage Temperature	- 65	+150	°C
Soldering Temperature		260	°C
Soldering Time		5.0	Sec.
Thermal Resistance		35	°C/W

**ELECTRICAL SPECIFICATIONS**(T<sub>A</sub> = +25 °C, R<sub>F</sub> = 50 to 1000 MHz, Test System = 75Ω, V<sub>DD</sub> = + 8V<sub>DC</sub>)

PARAMETER	MIN.	TYP.	MAX.	UNITS
CSO <sup>2</sup>	60			dBc
CTB <sup>2</sup>	65			dBc
Gain	14	15		dB
Noise Figure		2.0	3.5	dB
2nd Order Input Intercept Point (IIP2) <sup>3</sup>	+35	+38		dBm
3rd Order Input Intercept Point (IIP3) <sup>3</sup>	+15	+18		dBm

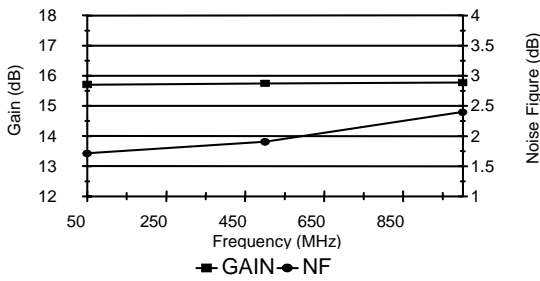
1. The device can be operated at + 6 V<sub>DC</sub> for lower power dissipation; Refer to the figures on page 3 for performance variation with supply voltage.
2. 160 channels, + 23 dBmV per channel, (measured at the output) 6 MHz channel spacing.
3. Two tones, - 10 dBm per tone at input.

**OPERATING RANGES**

PARAMETER	MIN.	TYP.	MAX.	UNITS
V <sub>DD</sub>	4	8 <sup>1</sup>	9	Volts
I <sub>DD</sub>	50	-	150	mA
Case Temperature	-40	-	70 <sup>*</sup>	°C

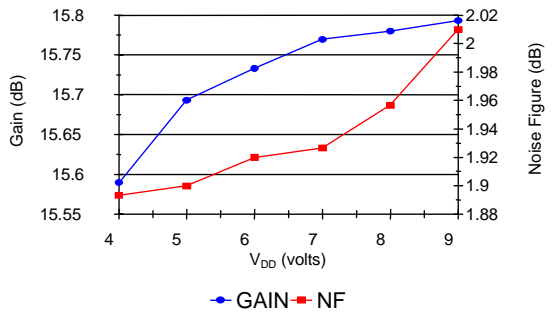
Gain and Noise Figure vs Frequency

T<sub>c</sub> = 25 deg C, V<sub>DD</sub> = +8V



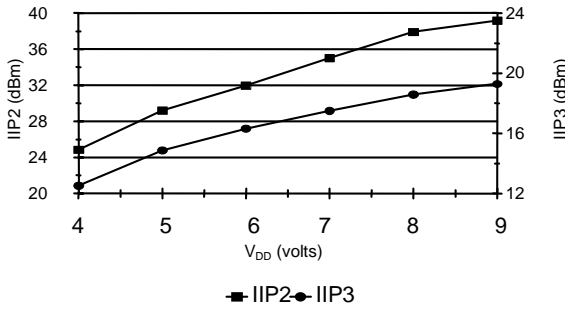
Gain and Noise Figure vs. V<sub>DD</sub>

T<sub>c</sub> = 25 deg C, RF = 500 MHz



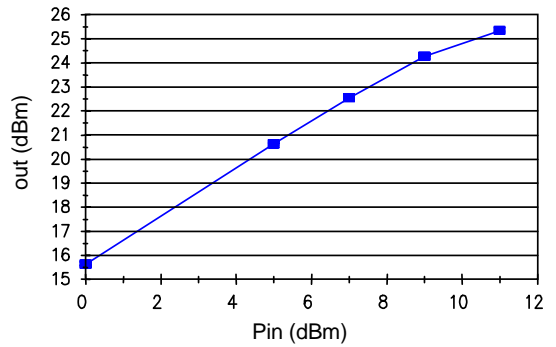
IIP2, IIP3 vs. V<sub>DD</sub>

T<sub>c</sub> = 25 deg C



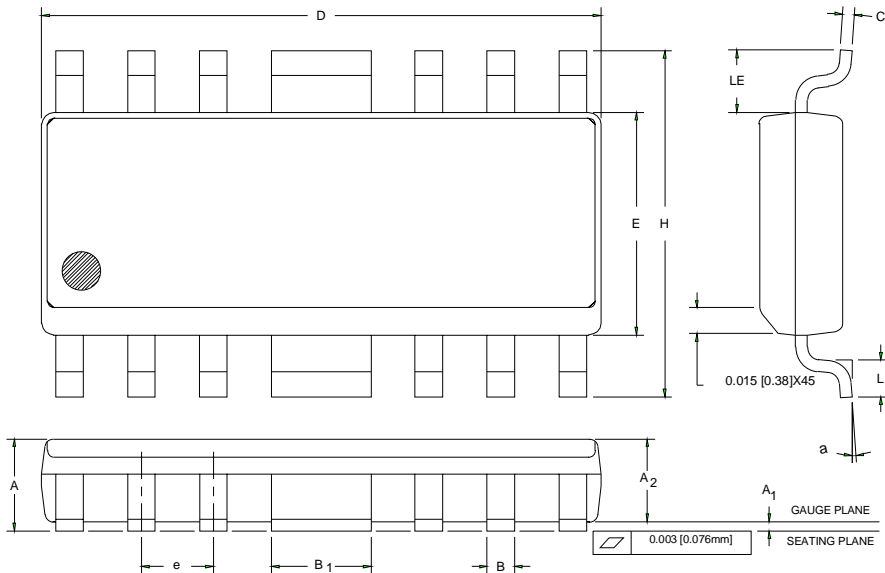
Pin vs. Pout

T<sub>c</sub> = 25 deg C, V<sub>DD</sub> = +8V, RF = 500 MHz



\* Notes:

- IIP2 Measured at 986.5 MHz, Input = two tones (55.25 MHz and 931.25 MHz) at - 10 dBm.
- IIP3 Measured at 986.5 MHz, Input = two tones (986.5 MHz and 992.5 MHz) at - 10 dBm.



S <sub>W</sub> /D <sub>L</sub>	INCHES		MILLIMETERS		NOTE
	MIN.	MAX.	MIN.	MAX.	
A	0.058	0.068	1.47	1.73	
A <sub>1</sub>	0.004	0.010	0.10	0.25	
A <sub>2</sub>	0.055	0.065	1.40	1.65	
B	0.013	0.020	0.33	0.50	
B <sub>1</sub>	0.062	0.070	1.58	1.78	
C	0.008	0.010	0.20	0.25	4
D	0.380	0.400	9.66	10.16	2
E	0.150	0.160	3.81	4.06	3
e	0.050 BSC		1.27 BSC		
H	0.226	0.244	5.74	6.20	
L	0.016	0.040	0.41	1.02	
LE	0.030	—	0.76	—	
a	0	8	0	8	

NOTES:

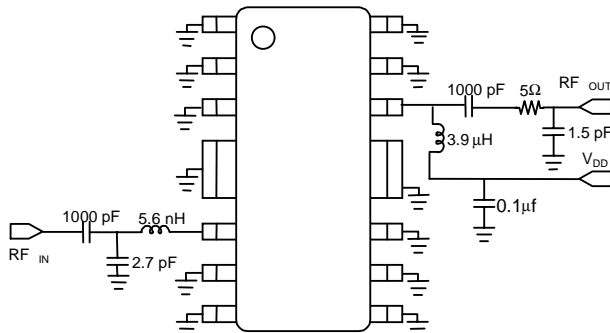
1. CONTROLLING DIMENSION: INCHES
2. DIMENSION "D" DOES NOT INCLUDE MOLD FLASH, PROTRUSIONS OR GATE BURRS. MOLD FLASH, PROTRUSIONS AND GATE BURRS SHALL NOT EXCEED 0.006 [0.15mm] PER SIDE.
3. DIMENSION "E" DOES NOT INCLUDE INTER-LEAD FLASH OR PROTRUSIONS. INTER-LEAD FLASH AND PROTRUSIONS SHALL NOT EXCEED 0.010 [0.25mm] PER SIDE.
4. LEAD THICKNESS AFTER PLATING TO BE 0.013 [0.33mm] MAXIMUM.

SPECIFICATION: 98000-006

SUBJECT: PUBLISHED OUTLINE,  
16 LEAD BATWING SOIC PKG.

EXTERNAL TEST CIRCUIT

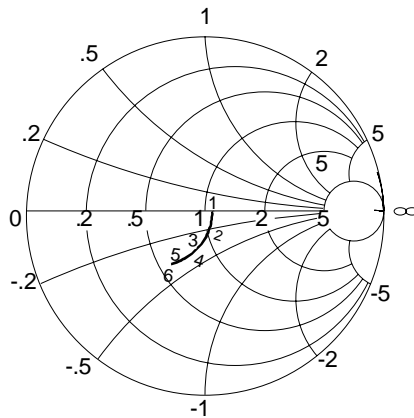
PINFUNCTION	
1	GND
2	GND
3	NC
4	GND
5	GND
6	RF IN
7	NC
8	GND
9	GND
10	NC
11	NC
12	GND
13	GND
14	RF OUT
15	NC
16	GND



### INPUT IMPEDANCE

START: 0.050 GHz

STOP: 1.00 GHz



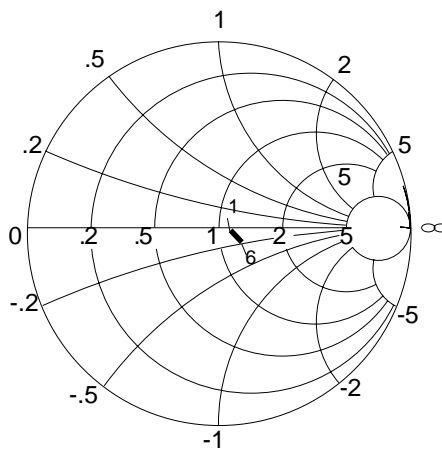
1:	0.050 GHz 79.76 Ω - 4.79 jΩ
2:	0.20 GHz 77.88 Ω - 13.21 jΩ
3:	0.40 GHz 70.02 Ω - 21.83 jΩ
4:	0.6 GHz 59.63 Ω - 26.56 jΩ
5:	0.8 GHz 49.91 Ω - 26.56 jΩ
6:	1.0 GHz 41.77 Ω - 25.15 jΩ

Measured in 75 Ω System

### OUTPUT IMPEDANCE

START: 0.050 GHz

STOP: 1.00 GHz



1:	0.050 GHz 83.9 Ω - 8.1 jΩ
2:	0.20 GHz 84.17 Ω - 1.19 jΩ
3:	0.40 GHz 85.38 Ω - 2.27 jΩ
4:	0.6 GHz 87.64 Ω - 3.82 jΩ
5:	0.8 GHz 90.20 Ω - 6.60 jΩ
6:	1.0 GHz 93.57 Ω - 11.76 jΩ

Measured in 75 Ω System

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