

# ZAMP003

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## 800-2500MHz MMIC WIDEBAND AMPLIFIER

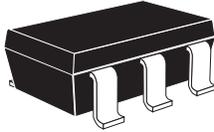
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### LNA, 15dB Gain, Very Low Current

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#### DESCRIPTION

The ZAMP003 is an ultra low current low noise amplifier designed for L band and IF applications. Although the ZAMP003 has been designed primarily for DBS applications the ZAMP003 is capable of extending to frequencies of 2.5GHz so it has a good fit with various applications. An additional benefit of the ZAMP003 is it's rising gain characteristic, this has been designed to counteract the gain losses found at the higher frequencies. The ZAMP003 has been optimized for input and output impedance's of 50 ohms. The ZAMP003 complements the buffer amplifiers in the ZAMP range to give a low current high performance solution. Packaged in a small SC70-6 with the minimum number of external bias components required it is the ideal solution for space and current limited applications.



SC70-6

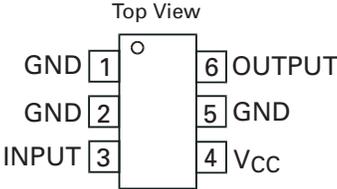
#### FEATURES

- L and IF frequency band
- Low current consumption 6.8mA typical
- Gain 14.8dB typical
- Rising gain
- IP3 5.8dBm @ 1GHz
- 4.5 to 5.5V Supply Voltage
- Unconditionally stable
- SC70-6 SMD package

#### APPLICATIONS

- Satellite LNB receivers
- Set-top boxes
- TV tuners
- SMR (Special Mobile Radio)
- RLAN/WLAN
- General purpose

#### CONNECTION DIAGRAM



#### ORDERING INFORMATION

DEVICE	REEL SIZE (inches)	QUANTITY PER REEL	DEVICE MARKING
ZAMP003H6TA	7	3000 units	ZP03
ZAMP003H6TC	13"	10000 units	ZP03

# ZAMP003

## ABSOLUTE MAXIMUM RATINGS

Supply Voltage	7V
Supply Current	30mA
Operating Temperature	-40 to 85°C
Storage Temperature	-50 to 125°C

## ELECTRICAL CHARACTERISTICS

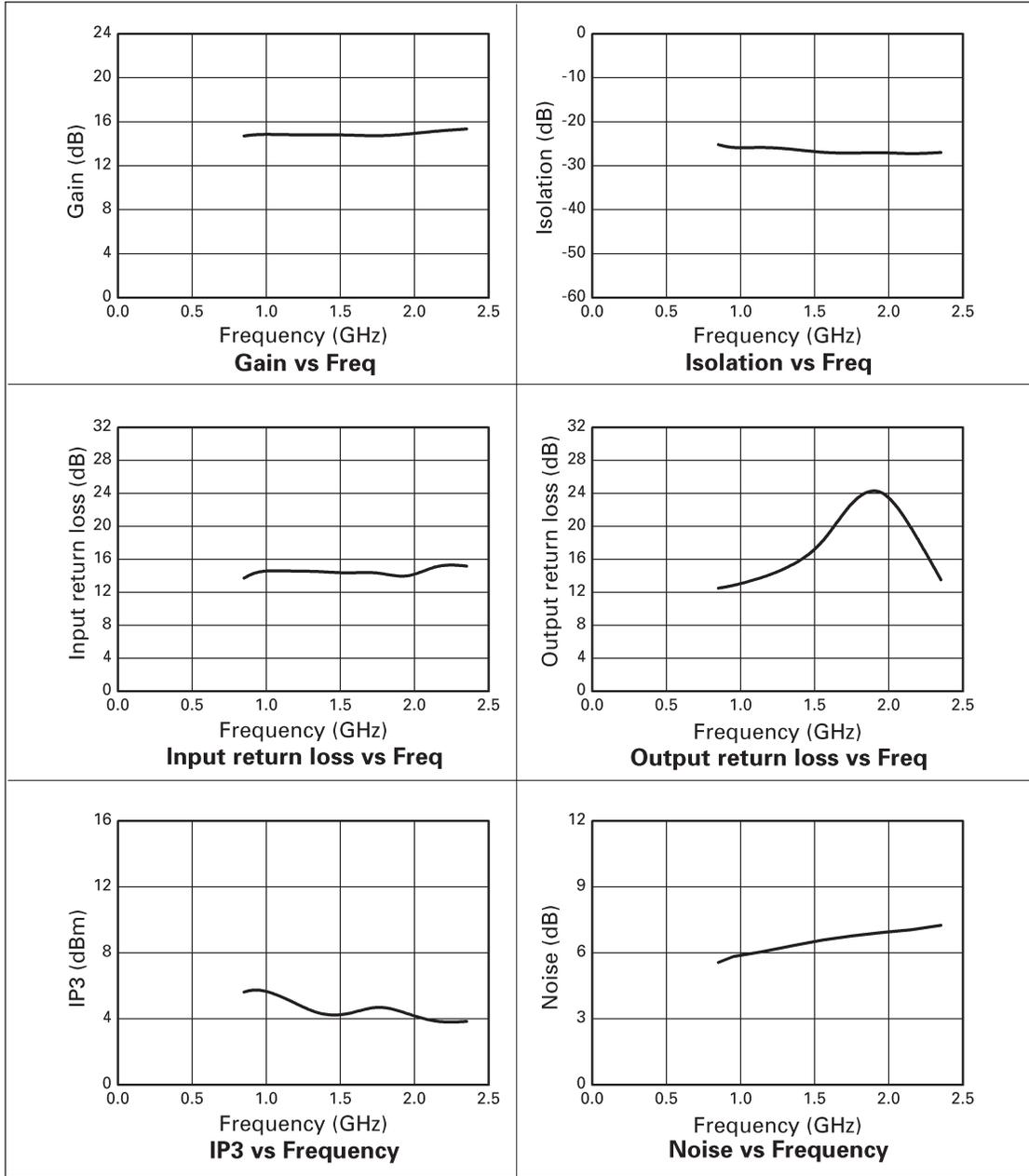
Test Conditions (unless otherwise stated):  $V_{CC} = 5V$ ,  $T_{amb} = 25^{\circ}C$ ,  $Z_o = 50\Omega$ .

SYMBOL	PARAMETER	CONDITIONS	MIN	TYP.	MAX	UNITS
$F_O$	Operating Frequency		800		2500	MHz
$V_{CC}$	Supply Voltage		4.5	5	5.5	V
$I_{CC}$	Supply Current			6.8	8	mA
$G_p$	Power Gain	F = 950	14	14.8		dB
		F = 1550 MHz		14.8		dB
		F = 2150 MHz		15.1	15.8	dB
NF	Noise Figure	F = 950		5.5		dB
		F = 1550 MHz		6.5		dB
		F = 2150 MHz		7.5		dB
IP3	3rd Order Intercept Point	F = 950 MHz	4.5	5.8		dBm
		F = 1550 MHz		4.5		dBm
		F = 2150 MHz		4		dBm
P1dB	1dB Gain Compression	F = 950 to 2150 MHz	-7.5	-6.5		dBm
$RL_{IN}$	Input Return Loss	F = 950		14		dB
		F = 2150 MHz		14		dB
$RL_{OUT}$	Output Return Loss	F = 950		13		dB
		F = 2150 MHz		21		dB
Risol	Reverse Isolation	F = 950 MHz		26		dB
		F = 2150 MHz		27		dB
K	Stability factor	F = 950 MHz		1.8		
		F = 2150 MHz		2.1		

# ZAMP003

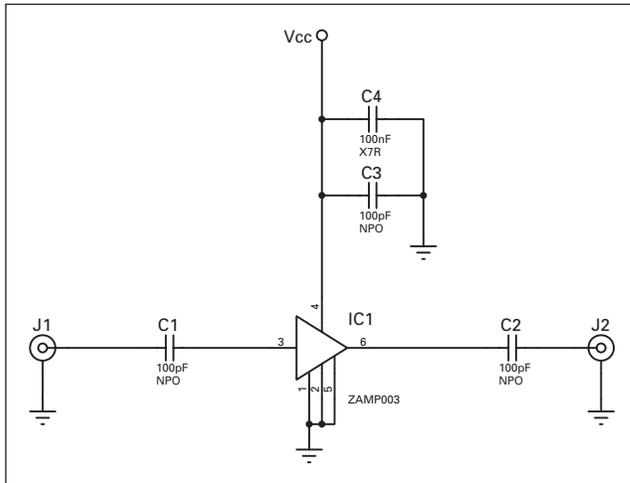
## TYPICAL CHARACTERISTICS

Test Conditions (unless otherwise stated):  $V_{CC} = 5V$ ,  $T_{amb} = 25^{\circ}C$ ,  $Z_o = 50\Omega$ .



# ZAMP003

## TEST CIRCUIT

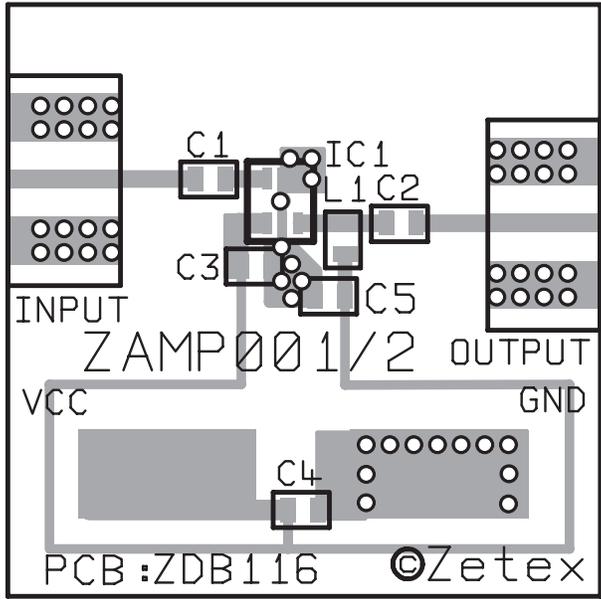


## TEST CIRCUIT COMPONENTS LIST

Circuit Ref.	Description	Value	Type
C1,C2,C3	Chip ceramic capacitor	100 pF	Murata GRH708 series, size 0805
C4	Chip ceramic capacitor	100 nF	X7R, size 0805
IC1	ZAMP003		Wideband Amplifier, SC70-6

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## TEST CIRCUIT LAYOUT



Note: For ZAMP003, L1 and C5 are not fitted.

### APPLICATION NOTES

The ZAMP003 is a medium power wideband amplifier which is designed for low power applications. The ZAMP003 provides both a 50 Ohm input and output impedance and thus requires no additional matching components. The input and output signal connections each require a DC blocking capacitor (C1 and C2). A suitable value for these capacitors is around 100pF for the 950MHz to 2150MHz frequency range. For other frequency ranges the value of the capacitor should be such that its reactance at the lowest operating frequency is small when compared to 50 ohms. Supply de-coupling is also recommended and should take the form of a suitable 100pF capacitor, C3, for the 950MHz to 2150MHz frequency range. The 100pF capacitor should be mounted as close to the Vcc pin of the amplifier as is physically possible. An additional low frequency de-coupling capacitor, C4, with a value around 100nF (for the 950MHz to 2150MHz range) is also advised.

An example layout for a test board for the series can be seen above. This was designed for an FR4 board 1 x 1 inch, 0.016 inch thick with a copper thickness of 35 microns. Edge mounted SMA connectors were used for the RF signals. The inductor is not required for the ZAMP003.

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Notes

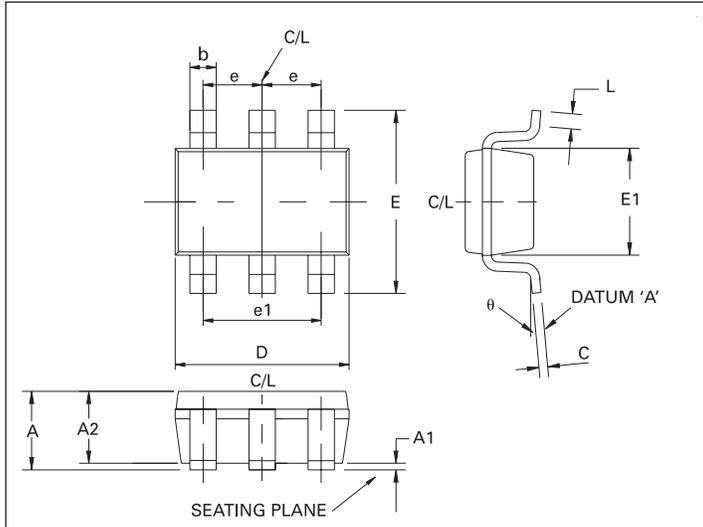
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Notes



# ZAMP003

## PACKAGE DIMENSIONS SC706



## PACKAGE DIMENSIONS

DIM	MILLIMETRES		DIM	MILLIMETRES	
	MIN	MAX		MIN	MAX
A	—	1.00	E	2.10 BSC	
A1	—	0.10	E1	1.25	1.35
A2	0.70	0.90	e	0.65 BSC	
b	0.15	0.30	e1	1.30 BSC	
C	0.08	0.25	L	0.26	0.46
D	2.00 BSC		$\theta$	0°	8°

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