

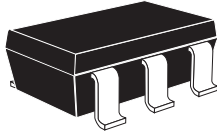
ZAMP001

800-2500MHz MMIC WIDEBAND AMPLIFIER

LNA, 18dB Gain, Low Current

DESCRIPTION

The ZAMP001 is a low current low noise amplifier designed for L band and IF applications. Although the ZAMP001 has been designed primarily for DBS applications the ZAMP001 is capable of extending to frequencies of 2.5GHz so it has a good fit with various applications. An additional benefit of the ZAMP001 is its rising gain characteristic, this has been designed to counteract the gain losses found at the higher frequencies. The ZAMP001 has been optimized for input and output impedances of 50 ohms. The ZAMP001 complements the buffer amplifiers in the ZAMP series to give a low current high performance optimum 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

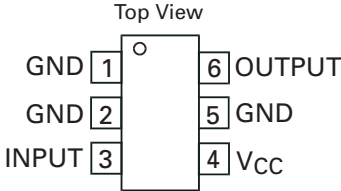
FEATURES

- L and IF frequency band
- Low noise 5dB @ 1GHz
- Low current consumption 12mA typical
- Gain 18dB typical
- Rising gain
- IP3 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 |
|-------------|--------------------|-------------------|----------------|
| ZAMP001H6TA | 7 | 3000 units | ZP01 |
| ZAMP001H6TC | 13" | 10000 units | ZP01 |

ZAMP001

ABSOLUTE MAXIMUM RATINGS

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

ELECTRICAL CHARACTERISTICS

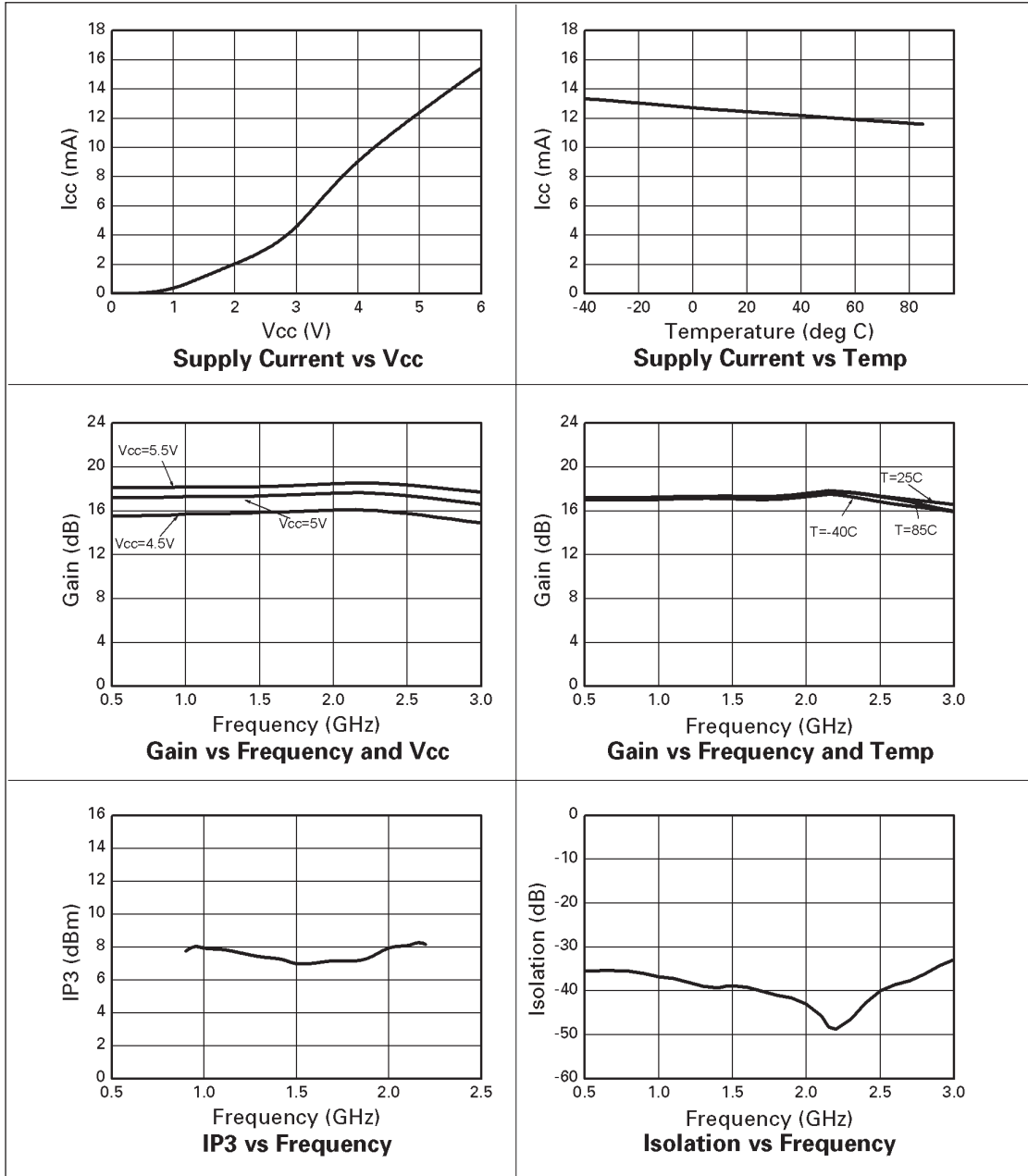
Test Conditions (unless otherwise stated): $V_{CC} = 5V$, $T_{amb} = 25^{\circ}C$, $Z_o = 50\Omega$.

| 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 | | | 12.2 | 14.4 | mA |
| G _p | Power Gain | F = 950 MHz | 17 | 18 | | dB |
| | | F = 1550 MHz | | 18.2 | | dB |
| | | F = 2150 MHz | | 18.5 | 20 | dB |
| NF | Noise Figure | F = 950 MHz | | 5 | | dB |
| | | F = 1550 MHz | | | | dB |
| | | F = 2150 MHz | | 6.5 | | dB |
| IP3 | 3rd Order Intercept Point | F = 950 MHz | 5 | 8 | | dBm |
| | | F = 1550 MHz | | 7 | | dBm |
| | | F = 2150 MHz | | 8 | | dBm |
| P1dB | 1dB Gain Compression | F = 950 to 2150 MHz | -6 | -2 | | dBm |
| RL _{IN} | Input Return Loss | F = 950 MHz | | 9 | | dB |
| | | F = 2150 MHz | | 10 | | dB |
| RL _{OUT} | Output Return Loss | F = 950 MHz | | 17 | | dB |
| | | F = 2150 MHz | | 12 | | dB |
| Risol | Reverse Isolation | F = 950 MHz | | 38 | | dB |
| | | F = 2150 MHz | | 48 | | dB |

ZAMP001

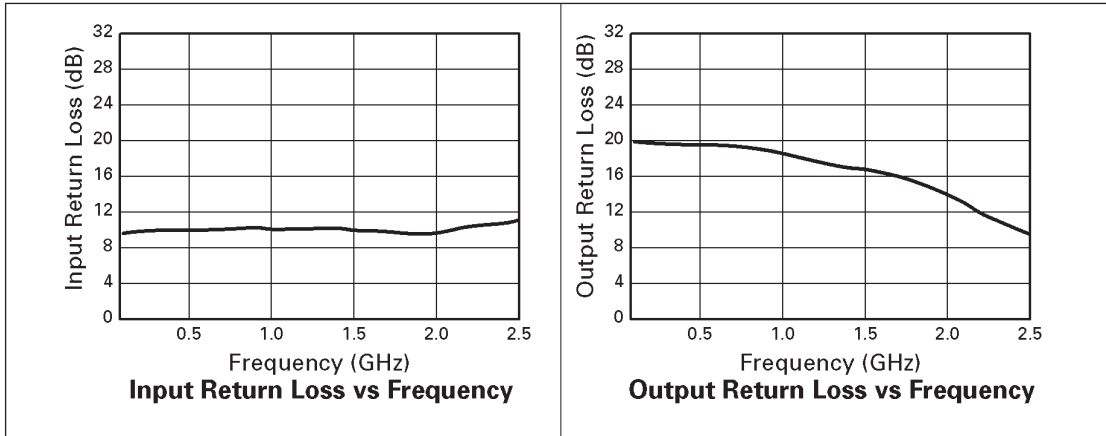
TYPICAL CHARACTERISTICS

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



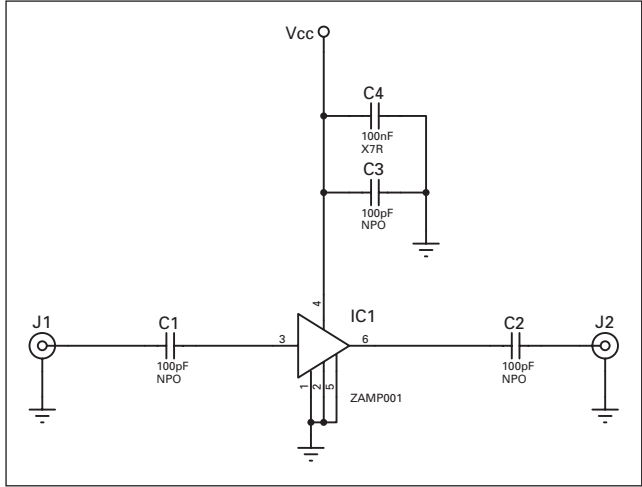
ZAMP001

TYPICAL CHARACTERISTICS



ZAMP001

TEST CIRCUIT

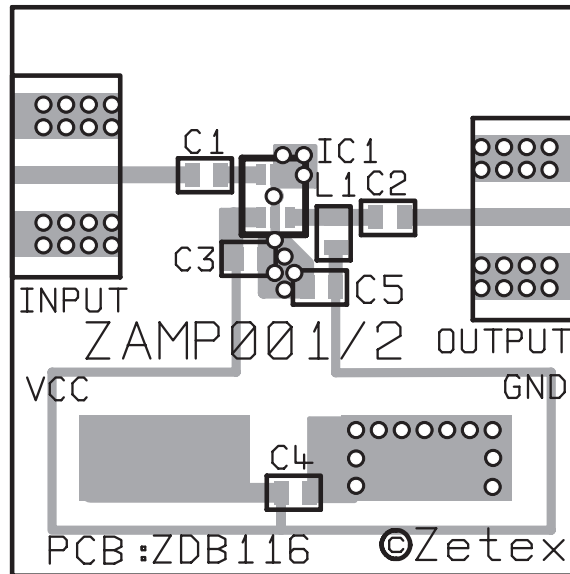


TEST CIRCUIT COMPONENTS LIST

| 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 | ZAMP001 | | Wideband Amplifier, SC70-6 |

ZAMP001

TEST CIRCUIT LAYOUT



Note: For ZAMP001, L1 and C5 are not fitted.

APPLICATION NOTES

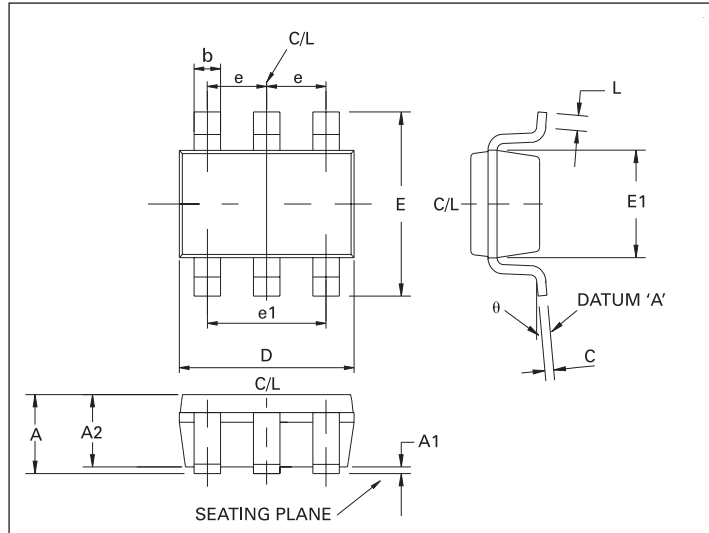
The ZAMP001 is a wideband RFIC amplifier designed for use primarily in DBS applications. The amplifier is designed to provide both a 50 Ohm input and output impedance and thus requires no additional matching components. The input and output signal connections each require a DC blocking capacitor (C1 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 is also advised.

An example layout for a test board for the ZAMP 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 ZAMP001.

Notes

ZAMP001

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 | | θ | 0° | 8° |

© Zetex plc 2003

Europe

Zetex plc
Fields New Road
Chadderton
Oldham, OL9 8NP
United Kingdom
Telephone (44) 161 622 4444
Fax: (44) 161 622 4446
hq@zetex.com

Zetex GmbH
Streitfeldstraße 19
D-81673 München
Germany
Telefon: (49) 89 45 49 49 0
Fax: (49) 89 45 49 49 49
europe.sales@zetex.com

Americas

Zetex Inc
700 Veterans Memorial Hwy
Hauppauge, NY 11788
USA
Telephone: (1) 631 360 2222
Fax: (1) 631 360 8222
usa.sales@zetex.com

Asia Pacific

Zetex (Asia) Ltd
3701-04 Metroplaza Tower 1
Hing Fong Road
Kwai Fong
Hong Kong
Telephone: (852) 26100 611
Fax: (852) 24250 494
asia.sales@zetex.com

These offices are supported by agents and distributors in major countries world-wide.

This publication is issued to provide outline information only which (unless agreed by the Company in writing) may not be used, applied or reproduced for any purpose or form part of any order or contract or be regarded as a representation relating to the products or services concerned. The Company reserves the right to alter without notice the specification, design, price or conditions of supply of any product or service.

For the latest product information, log on to www.zetex.com



ISSUE 2 - MARCH 2003