

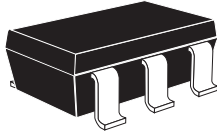
ZAMP003

800-2500MHz MMIC WIDEBAND AMPLIFIER

LNA, 15dB Gain, Very Low Current

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

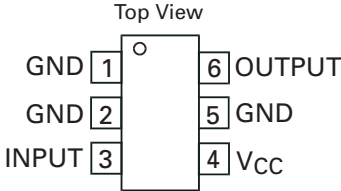
FEATURES

- 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

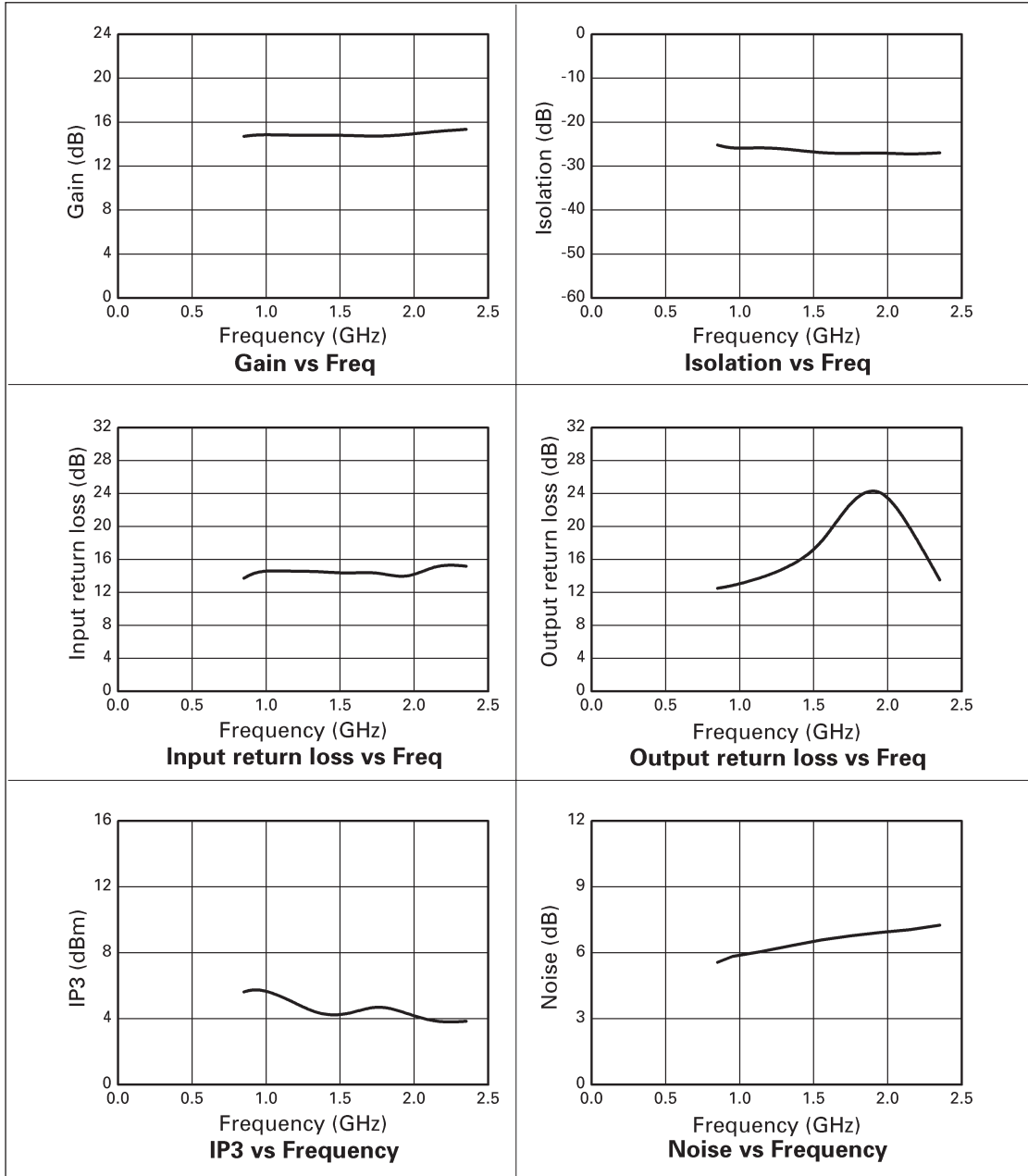
Test Conditions (unless otherwise stated): $V_{CC} = 5V$, $T_{amb} = 25^{\circ}C$, $Z_o = 50\Omega$.

| 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 |
| IP ₃ | 3rd Order Intercept Point | F = 950 MHz | 4.5 | 5.8 | | dBm |
| | | F = 1550 MHz | | 4.5 | | dBm |
| | | F = 2150 MHz | | 4 | | dBm |
| P _{1dB} | 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

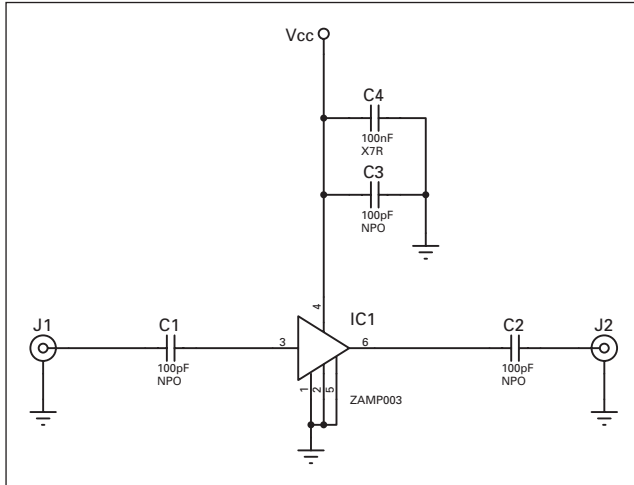
TYPICAL CHARACTERISTICS

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



ZAMP003

TEST CIRCUIT

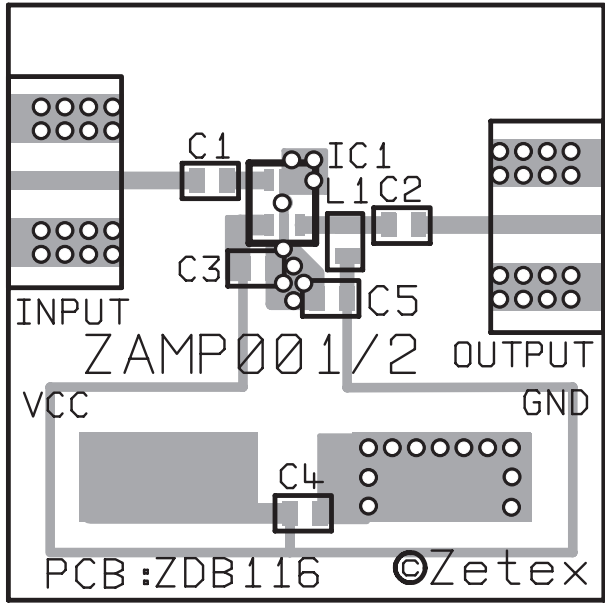


TEST CIRCUIT COMPONENTS LIST

| 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 |

ZAMP003

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.



ZAMP003

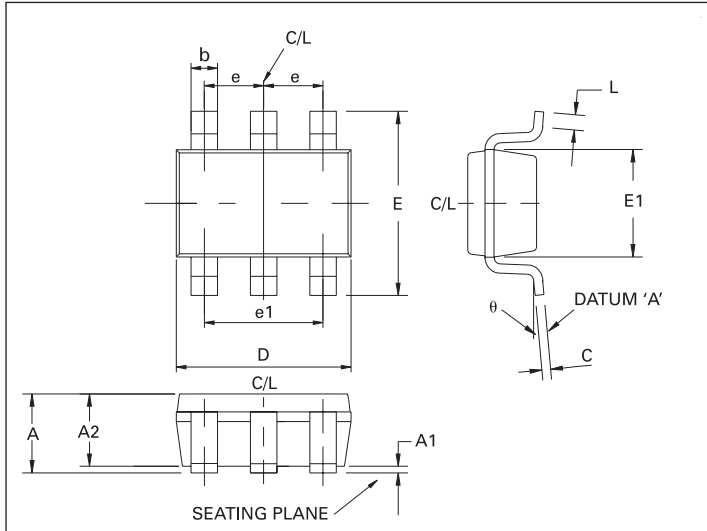
Notes

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 | | θ | 0° | 8° |

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