



# RF Solutions.

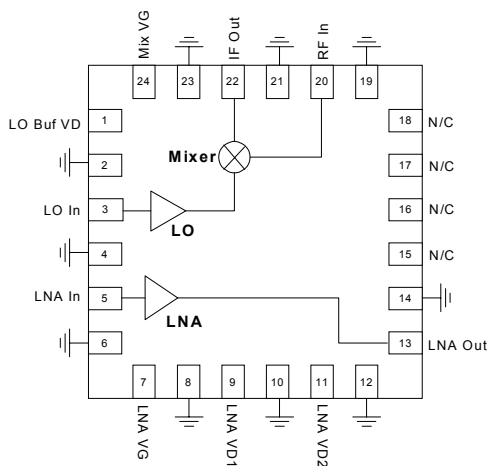
## RFS5000

### 2.4-2.7 GHz Downconverter



#### Applications

- MMDS RF downconverter
- WLAN, ISM RF downconverter



**Functional Block Diagram**



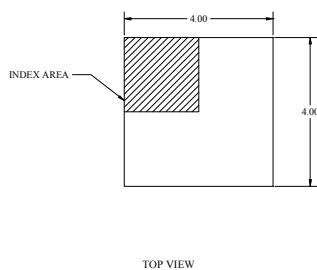
#### Product Description

The RFS5000 downconverter is a high-performance GaAs MESFET IC designed for receiver applications in the 2.4-2.7 GHz MMDS and WLAN frequency bands. With low-noise figure, high gain and high input IP3, the device is ideal for fixed wireless applications requiring high front-end linearity. The RFS5000 combines the low-noise amplifier, LO buffer, and mixer in a single low-cost surface-mount package. The input of the LNA is matched to 50 ohms and the IC operates off a 3V or 5V supply.

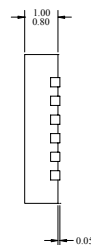


#### Product Features

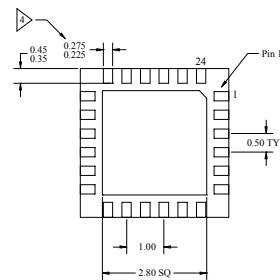
- Single-chip RF downconverter
- RF downconverter gain of 6.3 dB
- Input matched to 50 ohms
- 2 dBm Input IP3



TOP VIEW



SIDE VIEW



BOTTOM VIEW

- 1 ALL DIMENSIONS ARE IN MILLIMETERS, ANGLES IN DEGREES.
  - 2 THE TERMINAL #1 IDENTIFIER AND PAD NUMBERING CONVENTION SHALL CONFORM TO JESD 95-1 SPP-012
  - 3 LEAD COPLANARITY: 0.05 MAX.
- 3 DIMENSION APPLIES TO METALLIZED PAD AND IS MEASURED BETWEEN 0.25 AND 0.30 MM FROM PAD TIP.



#### 4mm Package Outline

| Parameter <sup>1</sup>    | Specification |       |      | Unit | Condition           |
|---------------------------|---------------|-------|------|------|---------------------|
|                           | Min.          | Typ.  | Max. |      |                     |
| <b>Overall</b>            |               |       |      |      |                     |
| RF Frequency Range        | 2400          |       | 2700 | MHz  |                     |
| LO Frequency Range        | 2200          |       | 2400 | MHz  |                     |
| IF Frequency Range        | 200           |       | 500  | MHz  |                     |
| Cascaded Gain             |               | 6.3   |      | dB   |                     |
| Cascaded P <sub>1dB</sub> |               | -8    |      | dBm  |                     |
| Cascaded Gain Var vs Temp |               | ±1.0  |      | dB   | -40 to +85 °C       |
| Cascaded Input IP3        |               | 2     |      | dBm  |                     |
| Cascaded Noise Figure     |               | 3.0   |      | dB   | Single sideband     |
| LO-RF Isolation           |               | 24    |      | dB   |                     |
| LO-IF Isolation           |               | 30    |      | dB   |                     |
| <b>LNA</b>                |               |       |      |      |                     |
| Noise Figure              |               | 2.1   |      | dB   |                     |
| Gain                      |               | 15    |      | dB   |                     |
| Input IP3                 |               | 3     |      | dBm  |                     |
| Gain Flatness             |               | ±0.5  |      | dB   | Over a 200 MHz band |
| Reverse Isolation         |               | 25    |      | dB   |                     |
| Input Return Loss         | 10            |       |      | dB   |                     |
| Output Return Loss        | 10            |       |      | dB   |                     |
| Current Consumption       |               | 11    |      | mA   |                     |
| <b>Mixer</b>              |               |       |      |      |                     |
| Noise Figure              |               | 7.2   |      | dB   | Single sideband     |
| Input 1dB Compression     |               | +10.5 |      | dBm  |                     |
| Input IP3                 |               | +21   |      | dBm  |                     |
| Conversion Gain           |               | -7.2  |      | dB   |                     |
| Gain Flatness             |               | ±0.4  |      | dB   | Over a 200 MHz band |
| IF Return Loss            | 10            |       |      | dB   |                     |
| RF Return Loss            | 10            |       |      | dB   |                     |
| <b>LO Input</b>           |               |       |      |      |                     |
| LO Input Level            |               | 3     |      | dBm  |                     |
| LO Input Return Loss      | 10            |       |      | dB   |                     |
| <b>Power Supply</b>       |               |       |      |      |                     |
| Operating Voltage         | 2.7           |       | 6.0  | V    |                     |
| Current Consumption       |               | 54    |      | mA   |                     |

Note 1: Test Conditions: LO Buf  $V_D=2.7V$ , LNA  $V_{D2}=2.7V$ , LNA  $V_{D1}=2.1V$ , Mix  $V_G=0.3V$  RF=2593MHz, LO=2278MHz, IF=315MHz, LO input=3dBm, T=25°C, unless otherwise specified.

### Absolute Maximum Ratings

| Parameter                     | Rating      | Unit |
|-------------------------------|-------------|------|
| DC Power Supply               | 8.0         | V    |
| Operating Ambient Temperature | -40 to +85  | °C   |
| Storage Temperature           | -55 to +150 | °C   |
| Maximum RF Input Level        | +10         | dBm  |



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