

USING THE MAX2682 WITH AN RF INPUT OF 300MHZ

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Abstract:

The MAX2682 miniature, low-cost, low-noise downconverter mixer is designed for low-voltage operations. It is ideal for use in portable communications equipment. This application note demonstrates its adaptation for use at 300MHz.

Introduction

The MAX2682 miniature, low-cost, low-noise downconverter mixer is designed for low-voltage operations. It is ideal for use in portable communications equipment.

The MAX2682 downconverter has a wide frequency range of 0.4GHz to 2.5GHz. However, this range can be extended by changing the external matching components. This application note describes the external matching components and performance of the circuit.

Why Use the MAX2682?

Communication standards change over time and frequency spectrums get reallocated. However, many existing ICs like the MAX2682 can be adapted to evolve with these changes. The advantages of such adaptations are less time to production, reduced costs, and improved quality.

- The time to production reduces because the use of existing components requires no supplier development time.
- The costs are lower because of the use of existing mass-produced items.
- Quality improves because of the use of proven products with a long track record.

Results

Table 1. Typical Performance at 300MHz RF (Radio Frequency) and 70MHz IF (Intermediate Frequency) of MAX2682 (Measured with -5dBm LO at 370MHz, and -25dBm RF Input at 300 MHz, V_{CC} = SHDN (Shutdown) = +3.0V)

| Parameter | Value |
|--|--------|
| Conversion gain | 19.2dB |
| Input IP3 (third-order intercept point) (Note 1) | -7dBm |
| Local Oscillator (LO) leakage at the RFIN port | -43dBm |
| LO leakage at the IF port | -40dBm |
| RF input return loss | 24dB |
| Voltage(V) for conversion gain | 3V |
| Voltage(V) for input IP3 | 3V |

Note 1. Measured with -5dBm LO at 370MHz, -30dBm at 300MHz, and 301MHz

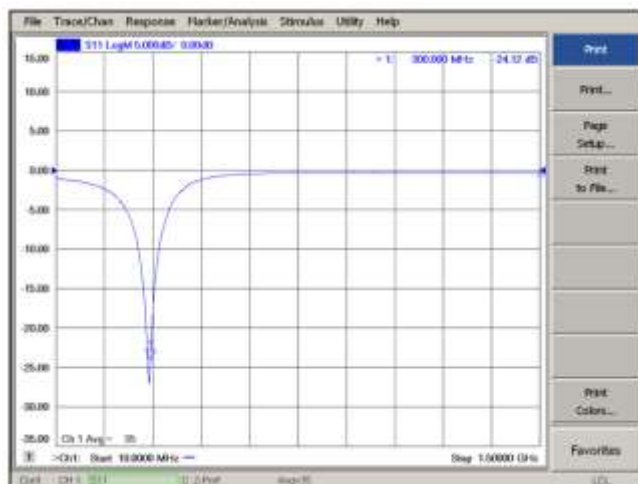


Figure 1. RF port return loss data for MAX2682 tuned to 300MHz.

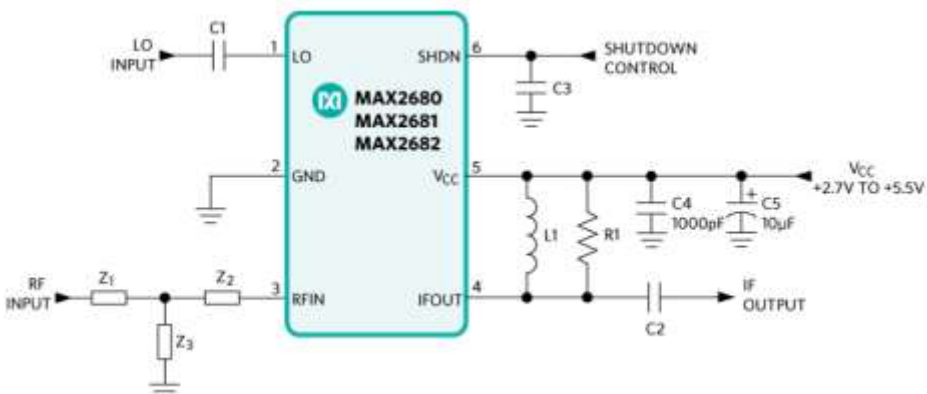


Figure 2. Typical application circuit for MAX2682.

Table 2. External Matching Components to Extend the MAX2682 Frequency Range to 300MHz

| Reference Designator | Recommended Component |
|----------------------|---------------------------------------|
| Z1 | Coilcraft 0603CS-82NXJB 82nH inductor |
| Z2 | 270pF capacitor |
| Z3 | 1.5pF capacitor |

Other components as per the MAX2682 data sheet.

Related Parts

[MAX2682](#) 400MHz to 2.5GHz, Low-Noise, SiGe Downconverter Mixers