19-1786; Rev 0; 3/01

MAX2644 Evaluation Kit

Evaluates: MAX2644

General Description

The MAX2644 evaluation kit (EV kit) simplifies the evaluation of the MAX2644 low-noise amplifier (LNA). The kit enables testing of the device's performance and requires no additional support circuitry. The signal input and output use SMA connectors to facilitate easy connection of RF test equipment.

The MAX2644 EV kit is fully assembled with the MAX2644 and incorporates matching components optimized for a 2450MHz RF frequency operation.

Features

- ♦ **Easy Evaluation of MAX2644**
- ♦ **+2.7V to +5.5V Single-Supply Operation**
- ♦ **Matched to 50Ω at 2450MHz**
- ♦ **Fully Assembled and Tested**

Ordering Information

PART	TEMP RANGE	IC-PACKAGE
MAX2644EVKIT	-40°C to +85°C	8 SC70-6

Component Suppliers

SUPPLIER	PHONE	FAX	WEBSITE
Coilcraft	847-639-6400	847-639-1469	www.coilcraft.com
Kamaya	219-489-1533	219-489-2261	www.kamaya.com
Murata Electronics	800-831-9172	814-238-0490	www.murata.com
Taiyo Yuden	800-348-2496	408-434-0375	www.t-yuden.com

Component List

DESIGNATION	QTY	DESCRIPTION
C1, C2	2	33pF ±5%, 50V ceramic capacitors (0402) Murata GRM36C0G330J050AD or Taiyo Yuden UMK105CH330JW
C3	1	2.2pF ±0.1pF, 50V ceramic capacitor (0402) Murata GRM36C0G2R2B050AD or Taiyo Yuden UMK105CH2R2CW
L1	1	3.3nH ±0.3nH inductor (0402) Murata LQG10A3N3S00 or Coilcraft 0402CS-3N3XKBG
R1	1	1.2kΩ ±5% resistor (0402)
RFIN, RFOUT	2	SMA connectors (PC edge-mount) EFJohnson 142-0701-801 or Digi-Key J502-ND
VCC, GND	2	Test points, Mouser 151-203
U1	1	MAX2644EXT (6-pin SC70)
None	1	MAX2644EVKIT PC board
None	1	MAX2644 EV kit data sheet
None	1	MAX2644 data sheet

Quick Start

The MAX2644 EV kit is fully assembled and factory tested. Follow the instructions in the *Connections and Setup* section for proper device evaluation.

Test Equipment Required

- One RF signal generator capable of delivering 10dBm of output power and a frequency range covering the MAX2644 (2400MHz to 2500MHz, for example)
- An RF spectrum analyzer that covers the operating frequency range (HP8561E, for example)
- DC power supply capable of supplying +2.7V to +5.5V and 20mA of current
- Two 50Ω coaxial cables with SMA connectors
- (Optional) An ammeter to measure supply current
- (Optional) A noise figure meter
- (Optional) Network analyzer to measure gain and return loss

Connections and Setup

Checking Power Gain

1) Connect a DC supply (preset to +3.0V) to the VCC and GND terminals (through an ammeter, if desired) on the EV kit.
2) Set the RF generator for a 2450MHz output frequency at a -30dBm power level. Disable RF generates

For pricing, delivery, and ordering information, please contact Maxim/Dallas Direct! at 1-888-629-4642, or visit Maxim's website at www.maxim-ic.com.

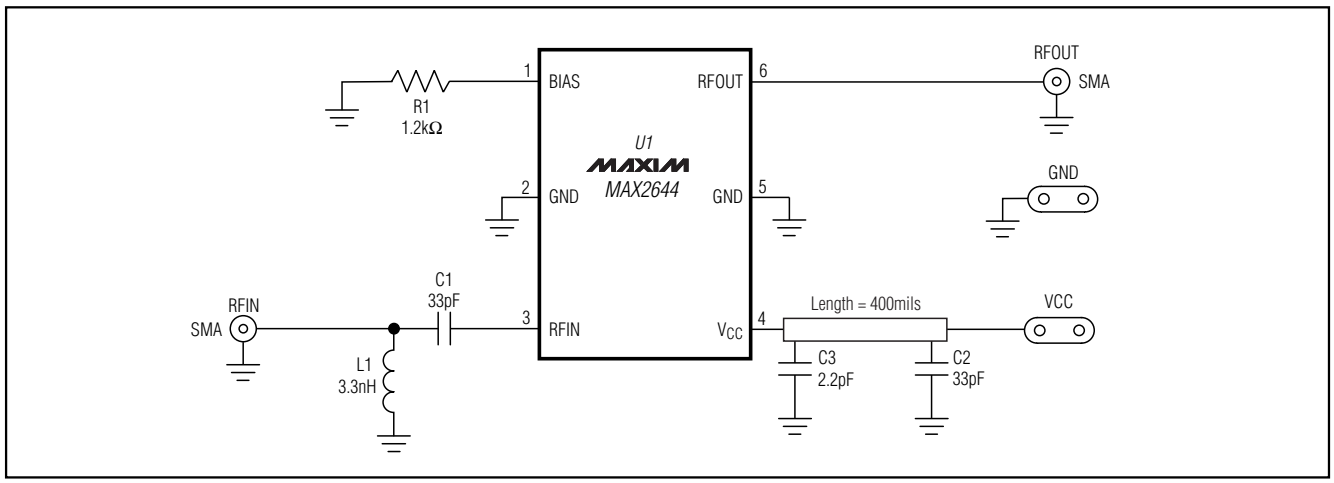


Figure 1. MAX2644 EV Kit Schematic

output. Connect the RF generator output to the RFIN SMA connector with a coaxial cable.

3) Connect the coaxial cable from the RFOUT SMA connector to the spectrum analyzer.
4) Turn on the DC supply. The supply current should read approximately 10mA (if using an ammeter).
5) Activate the RF generator's output. A signal on the spectrum analyzer's display should indicate a typical gain of +17dB after accounting for cable and board losses. Typical board loss is 0.6dB from input to output port.
6) (Optional) Another method for determining gain is using a network analyzer. This has the advantage of displaying gain versus a swept frequency band, in addition to displaying input and output return loss. Refer to the network analyzer manufacturer's user manual for setup details.

Checking Noise Figure

Noise figure measurements on low-noise devices such as the MAX2644 are extremely sensitive to board and lab setup losses and parasitics. There are many techniques and precautions for measuring a low noise figure. Detailed explanation of these items would exceed the scope of this document. Take into account PC-board and external-components loss when performing noise-figure measurements. The typical input losses on this EV kit are 0.3dB. For more information on how to perform this level of noise-figure measurement, refer to the noise-figure meter operating manual as well as the Agilent Technologies (formerly Hewlett Packard) application note #57-2, *"Noise Figure Measurement Accuracy."*

Layout Considerations

A good PC board layout is an essential part of an RF circuit design. The EV kit PC board can serve as a guide for laying out a board using the MAX2644. Generally, the V_{CC} node on the PC board should have a decoupling capacitor located close to the device, and additional capacitors may be needed for long V_{CC} lines. This minimizes supply coupling. Proper grounding of the GND pins is essential. Connect the GND pins to the ground plane either directly or through vias or both.

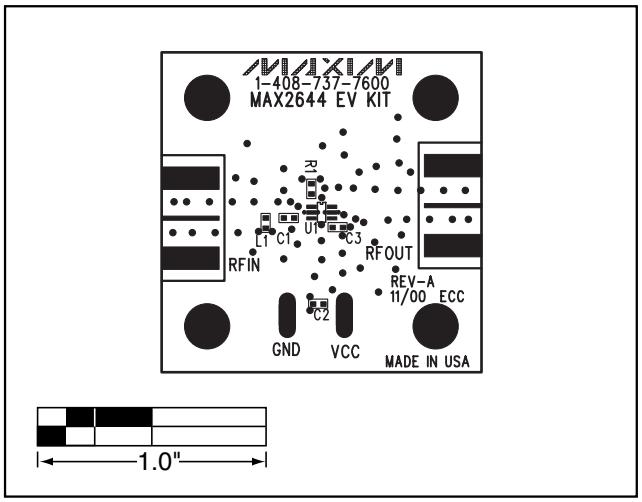


Figure 2. MAX2644 EV Kit Component Placement Guide—Component Side

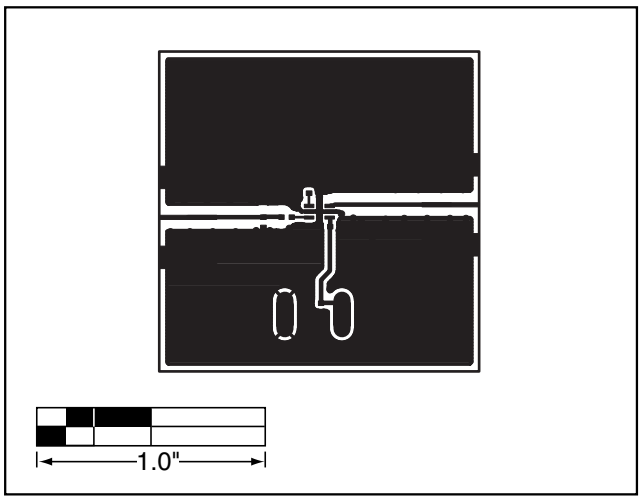


Figure 3. MAX2644 EV Kit PC Board Layout—Component Side

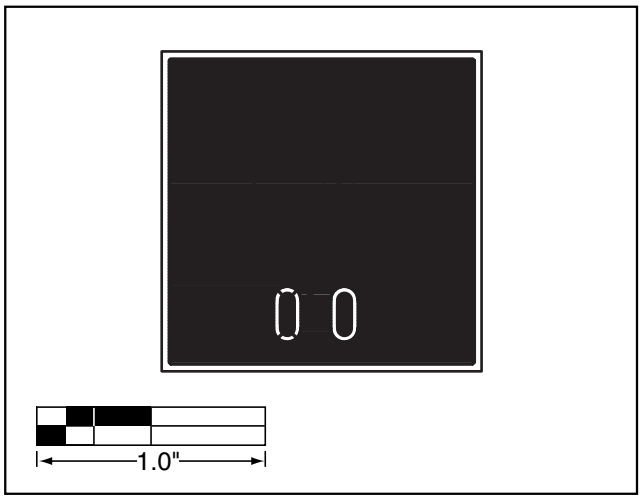


Figure 4. MAX2644 EV Kit PC Board Layout—Solder Side

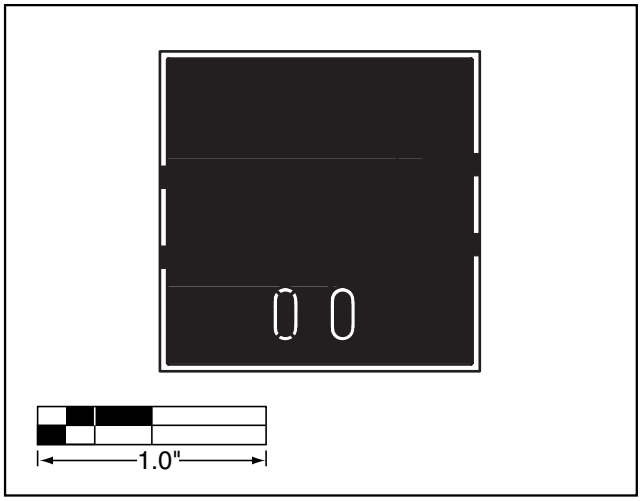


Figure 5. MAX2644 EV Kit PC Board Layout—Ground Plane Layers 2 and 3

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