MAXIM

MAX2383 Evaluation Kit

Evaluates: MAX2383

General Description

The MAX2383 evaluation kit (EV kit) simplifies the evaluation of the MAX2383. It includes an LO balun for interfacing with differential LO ports. Similarly, an IF balun is used for interfacing with differential IF ports. SMA connectors are included to facilitate easy connections.

Features

♦ **Baluns are Included for Single-Ended LO and IF Drives**

♦ **All Inputs and Outputs are Matched to 50Ω Systems**

♦ **SMA Connectors for Easy Connections**

Ordering Information

PART	TEMP. RANGE	IC PACKAGE
MAX2383EVKIT	-40°C to +85°C	3 x 4 UCSP

Component Suppliers

SUPPLIERS	PHONE	FAX	WEBSITE
AVX	843-448-9411	843-448-7139	www.avxcorp.com
CoilCraft	800-322-2645	847-639-1469	www.coilcraft.com
Murata Electronics	770-436-1300	770-436-3030	www.murata.com
Taiyo Yuden	800-368-2496	408-573-4159	www.t-yuden.com
Toko	847-297-0070	847-699-7864	www.tokoam.com

Component List

DESIGNATION	QTY	DESCRIPTION
C1, C2	2	22pF ±5%, 50V ceramic capacitors (0402) Murata GRM36C0G220J050
C3, C4, C8, C11, C12, C14	6	330pF ±10%, 50V ceramic capacitors (0402) Murata GRM36X7R331K050
C5, C6	2	100pF ±5%, 50V ceramic capacitors (0402) Murata GRM36C0G101J050
C7	1	10µF ±20%, 10V tantalum capacitor (B case) AVX TAJB106M010R
C9	1	6800pF ±10%, 10V ceramic capacitor (0402) Murata GRM36X7R682K025
C10	1	2.2pF ±0.1pF, 50V ceramic capacitor (0402) Murata GRM36C0G2R2B050

DESIGNATION	QTY	DESCRIPTION
C13, C15, C18, C19	0	Not installed
C16	1	2.0pF ±0.1pF, 50V ceramic capacitor (0402) Murata GRM36C0G020B050
C17	1	150pF ±5%, 50V ceramic capacitor (0402) Murata GRM36C0G151J050
L1	1	3.3nH ±0.3nH inductor (0402) Murata LQG10A3N3S00T1
L2	1	100nH ±5% inductor (0603) Coilcraft 0603CS-R10XJBC
L3, L4	2	1.0nH inductors (0402) Toko LL1005-FH-1N0S
L5	1	4.7nH ±0.3nH inductor (0402) Murata LQG10A4N7S00T1
L6	1	12nH ±5% inductor (0402) Murata LQG10A12NJ00T1

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_____Component List (continued)

DESIGNATION	QTY	DESCRIPTION
L7	1	3.3nH inductor (0402) Toko LL1005-FH-3N3S
R1, R2	2	10kΩ ±1% resistors (0402)
R3	0	Not installed
R4, R5	2	24Ω ±1% resistors (0402)
R6	1	390Ω ±1% resistor (0402)
R7, R8	2	2.4Ω ±1% resistors (0402)
T1	1	Balun transformer (B4F type) Toko 617DB-1018
T2	1	Balun transformer Murata LDB15C201A2400
TL1	1	50Ω coaxial cable (0.047in diameter)
LOIN, LFIN, DROUT	3	SMA connectors (PC edge-mount) EF Johnson 142-0701-801 DIGI-KEY J502-ND
DRIN, RFOUT	0	Not installed
JU1, JU2	2	3-pin headers Digi-Key S1012-36-ND or Equivalent
None	2	Shunts for JU1–JU12
V_{CC}, GND, GC, LO_EN, $\overline{SHDN}$	5	Test points Mouser 151-203 or Equivalent
U1	1	MAX2383EBC (12 UCSP)
None	1	MAX2383 PC board
None	1	MAX2383 data sheet
None	1	MAX2383 EV kit data sheet

_____Quick Start

Test Equipment Required

- A +3V power supply capable of supplying 50mA.

- An adjustable power supply for gain control.

- An RF signal generator for LO covering the frequency range of 2270MHz to 2580MHz and output power range of -15dBm to 0.

- Another RF signal generator for IF with WCDMA modulation, covering the frequency range of 200MHz to 600MHz, and output power range of -35dBm to -5dBm.

- A spectrum analyzer with ACPR markers and covering the frequency range 1900MHz to 2000MHz.

Connections and Setup

1) Set the power supply to +2.85V and turn it off.

2) Set the adjustable power supply to +2.0V and turn it off.

3) Connect the ground terminal to GND.

4) Connect the positive +2.85V terminal to VCC, LO_EN, and $\overline{SHDN}$ two-pin headers.

5) Connect the positive terminal of the adjustable power supply to GC.

6) Set the IF generator to 380MHz and set the power level to -11.5dBm at the board IF input. Set the modulation to WCDMA mode. The IF balun loss and the board loss, including the 3dB resistive matching loss due to the on-board 390Ω shunt resistor, account for about 4.5dB, so the IF power delivered to the device's differential LO port is approximately -16dBm. Keep the RF generator output off.

7) Set the LO generator to 2330MHz and set the power level to -8dBm. The board loss and the LO balun loss account for about 2dB, so the LO power delivered to the device's differential LO port is approximately -10dBm. Keep the RF generator output off.

8) Using an SMA cable, connect the output of the IF generator to the LFIN on the MAX2383 EV kit.

9) Using an SMA cable, connect the output of the LO generator to the LOIN on the MAX2383 EV kit.

10) Using an SMA cable, connect the DROUT to the input of the spectrum analyzer.

11) Set the spectrum analyzer to view the output (ACPR marker, center frequency, etc.).

12) Turn on all power supplies and enable both signal generators.

13) Observe the RF output frequency as displayed on the spectrum analyzer. Measure the RF output power.

_____Layout Issues

A good PC board 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 MAX2383. Keep the traces carrying RF signals as short as possible to minimize radiation and insertion loss. Use impedance control on all RF signal traces. The V_{CC} node on the PC board should have decoupling capacitors to the closest ground. Refer to the _Layout_ section of the MAX2383 data sheet for more information.
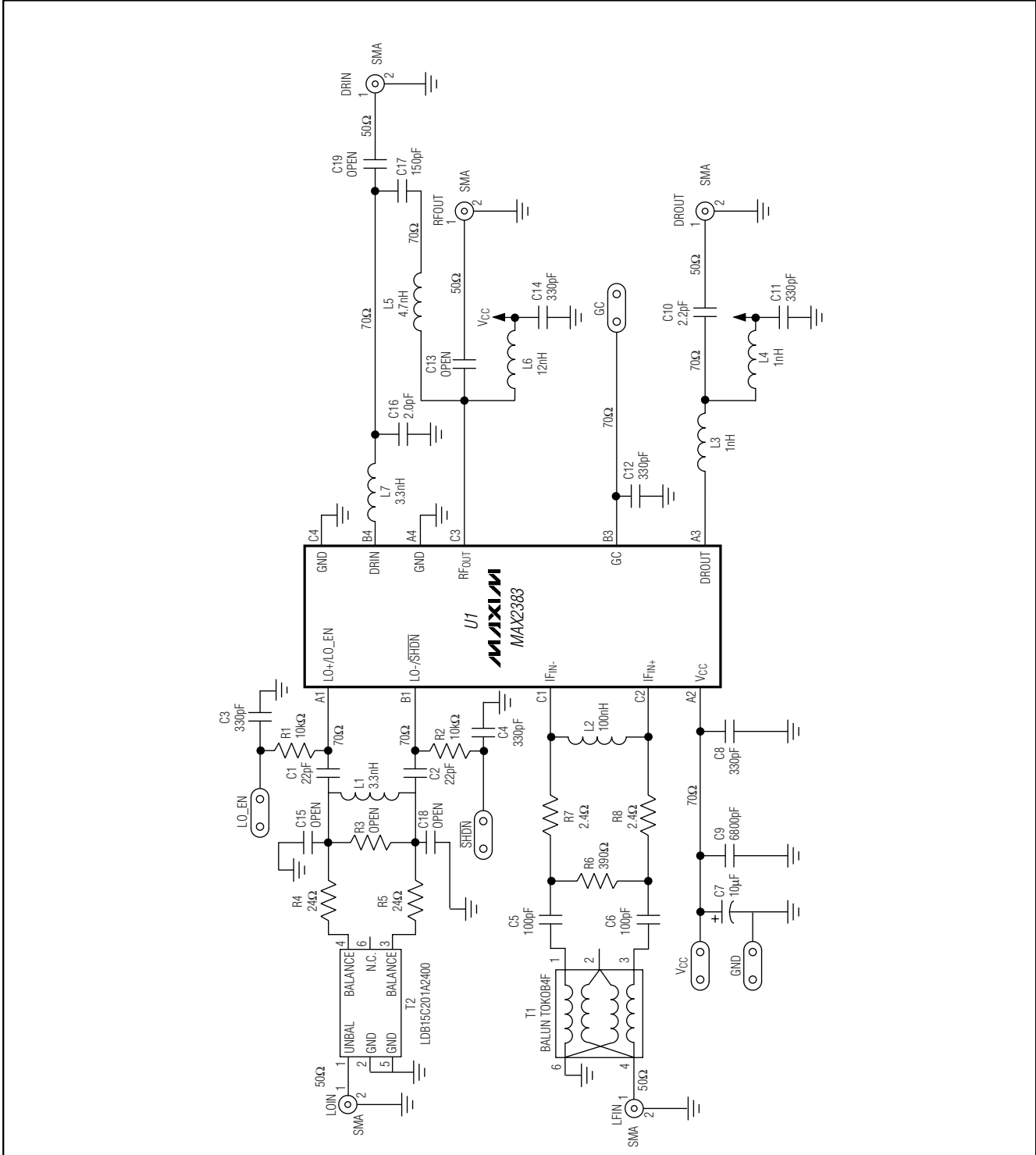
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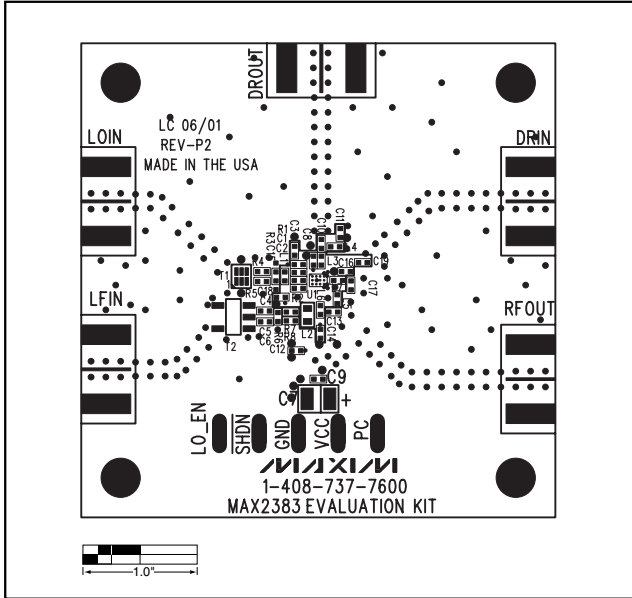*Figure 1. MAX2383EV Kit Schematic*

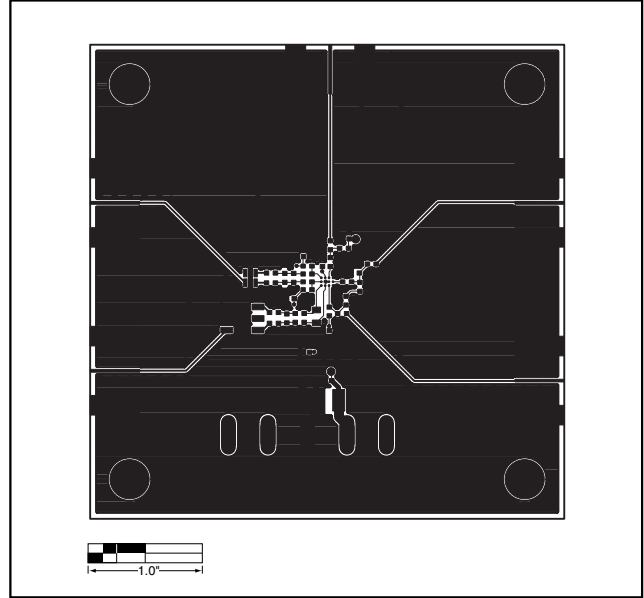# MAX2383 Evaluation Kit

Figure 2. MAX2383 EV Kit PC Board—Top Silkscreen
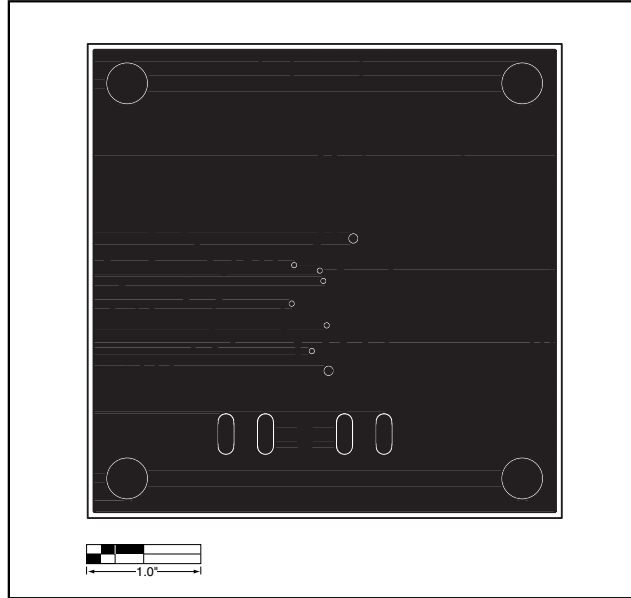

Figure 3. MAX2383 EV Kit PC Board Layout—Component Side

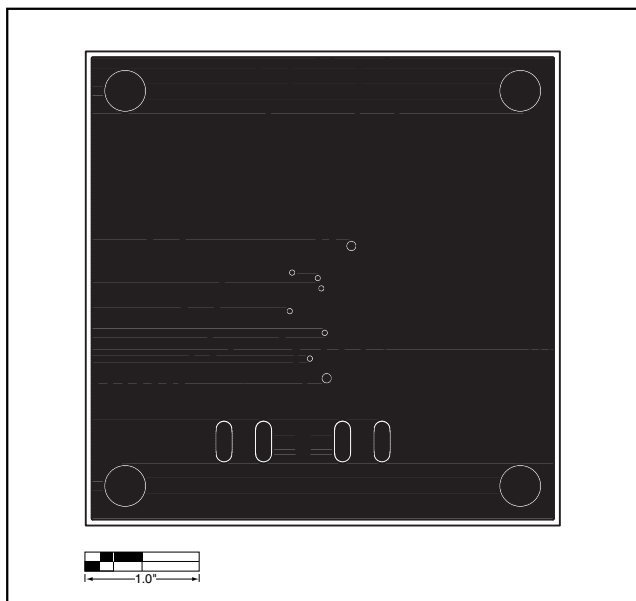Figure 4. MAX2383 EV Kit PC Board Layout—GND Plane 2

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Figure 5. MAX2383 EV Kit PC Board Layout—GND Plane 3
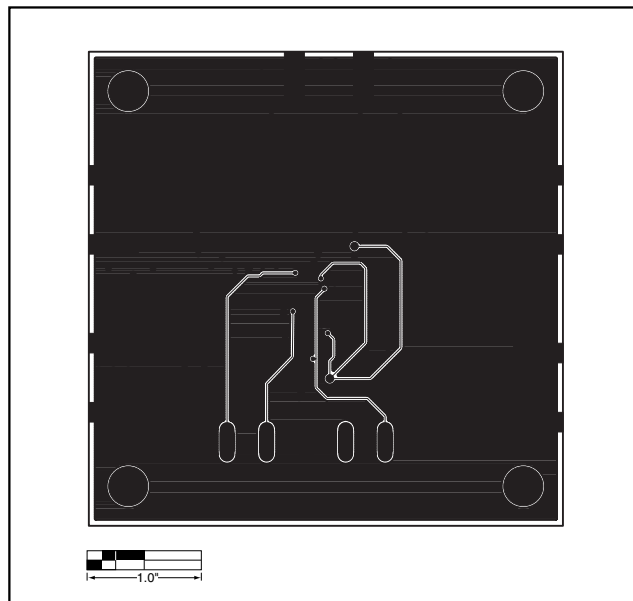
Figure 6. MAX2383 EV Kit PC Board Layout—Back Side