



## MAX2371/MAX2373 Evaluation Kits

### General Description

The MAX2371/MAX2373 evaluation kits (EV kits) simplify evaluation of the MAX2371/MAX2373 low-noise amplifiers (LNAs). They enable testing of the devices' radio frequency (RF) performance and require no additional support circuitry. The EV kits' signal inputs and outputs use SMA connectors to facilitate the connection of RF test equipment.

### Features

- ◆ Easy Evaluation of the MAX2371/MAX2373
- ◆ 2.65V to 3.3V Single-Supply Operation
- ◆ Jumpers for Analog/Digital Control
- ◆ All Critical Peripheral Components Included
- ◆ Fully Assembled and Tested

### Ordering Information

| PART         | TEMP RANGE     | IC PACKAGE |
|--------------|----------------|------------|
| MAX2371EVKIT | -40°C to +85°C | 12 QFN     |
| MAX2373EVKIT | -40°C to +85°C | 12 QFN     |

### MAX2371 Component List

| DESIGNATION | QTY | DESCRIPTION  |
|-------------|-----|--|
| C1, C3, C7  | 3   | Open   |
| C2          | 1   | 15pF ±5% capacitor<br>Taiyo Yuden<br>0402_UMK105CH150JW-B    |
| C4, C5      | 2   | 1500pF ±10% capacitors<br>Murata 0402_GRP155R71H152K         |
| C6          | 1   | 6.8pF ± 0.5pF capacitor<br>Murata<br>0402_GRP1555C1H6R8DZ01E |
| C8          | 1   | 1.0µF ±20% capacitor<br>Taiyo Yuden<br>0805_LMK212BJ105MG-B  |
| C9          | 1   | 10nF ±10% capacitor<br>Murata 0402_GRP155R71C103K            |
| C10         | 1   | 0.015µF ±10% capacitor<br>Taiyo Yuden<br>0402_EMK105B153KW-B |
| C19         | 1   | 100nF ±10% capacitor<br>Murata 0402_GRP155R61A104K           |

| DESIGNATION | QTY | DESCRIPTION   |
|-------------|-----|---|
| R1          | 1   | 1.10kΩ ±1% resistor CC0402                          |
| R2          | 1   | 750Ω ±1% resistor CC0402                            |
| R3          | 1   | 0Ω resistor CC0402                                  |
| L1          | 1   | Open  |
| L2          | 1   | 56nH inductor<br>Coilcraft 1008CS-560XJBC           |
| L4          | 1   | 33nH ±5% inductor<br>Murata 0603_LQG18HN33NJ00      |
| L5          | 1   | 120nH ±5% inductor<br>Coilcraft 1008CS-121XJBB      |
| U1          | 1   | MAX2371EGC Maxim MAX2371EGC                         |
| J1, J2, J3  | 3   | 1 × 3-pin headers<br>Digi-Key S1012-36-ND           |
| J4          | 1   | 1 × 6-pin header<br>Digi-Key S1012-36-ND            |
| J5, J6      | 2   | 1 × 2-pin headers<br>Digi-Key S1012-36-ND           |
| P1, P2      | 2   | SMA connectors (edge mount)<br>Johnson 142-0701-801 |

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## MAX2373 Component List

| DESIGNATION | QTY | DESCRIPTION  |
|-------------|-----|--|
| C11         | 1   | 100nF $\pm 10\%$ capacitor<br>Murata 0402_GRP155R61A104K                 |
| C12         | 1   | 0.015 $\mu$ F $\pm 10\%$ capacitor<br>Taiyo Yuden<br>0402_EMK105B153KW-B |
| C13, C14    | 2   | 100pF $\pm 5\%$ capacitors<br>Murata 0402_GRP1555C1H101J                 |
| C15         | 1   | 1.3pF $\pm 0.1$ pF capacitor<br>Murata 0402_GRP1555C1H1R3B               |
| C16         | 1   | 1.0 $\mu$ F $\pm 20\%$ capacitor<br>Taiyo Yuden<br>0805_LMK212BJ105MG-B  |
| C17         | 1   | Open   |
| C18         | 1   | 10nF $\pm 10\%$ capacitor<br>Murata 0402_GRP155R71C103K                  |
| R4          | 1   | 1.10k $\Omega$ $\pm 1\%$ resistor CC0402                                 |
| R5          | 1   | 1.5k $\Omega$ $\pm 1\%$ resistor CC0402                                  |
| R6          | 1   | 0 $\Omega$ resistor CC0402   |
| L6          | 1   | 15nH $\pm 5\%$ inductor<br>Coilcraft 0402CS-15NXJBW                      |
| L8          | 1   | 4.7nH $\pm 0.2$ nH inductor<br>Murata 0402_LQP15MN4N7C00                 |
| L9          | 1   | 1.8nH $\pm 0.3$ nH inductor<br>Murata 0402_LQG15HN1N8S00                 |
| L10         | 1   | 12nH $\pm 5\%$ inductor<br>Murata 0402_LQG15HN12NJ00                     |
| U2          | 1   | MAX2373EGC Maxim MAX2373EGC  |
| J7, J8, J9  | 3   | 1 $\times$ 3-pin headers<br>Digi-Key S1012-36-ND                         |
| J10         | 1   | 1 $\times$ 6-pin header<br>Digi-Key S1012-36-ND                          |
| J11, J12    | 2   | 1 $\times$ 2-pin headers<br>Digi-Key S1012-36-ND                         |
| P3, P4      | 2   | SMA connectors (edge mount)<br>Johnson 142-0701-801                      |

## Component Suppliers

| SUPPLIER    | PHONE        | FAX          |
|-------------|--------------|--------------|
| CoilCraft   | 847-639-6400 | 847-639-1469 |
| Digi-Key    | 800-344-4539 | 218-681-3380 |
| Murata      | 770-436-1300 | 770-436-3030 |
| Taiyo Yuden | 800-348-2496 | 847-925-0899 |

**Note:** Please indicate that you are using the MAX2371/MAX2373 when contacting these component suppliers.

## Quick Start

The MAX2371/MAX2373 EV kits are fully assembled and factory tested. Follow the instructions in the *Connections and Setup* section for proper device evaluation.

## Test Equipment Required

This section lists the recommended test equipment to verify operation of the MAX2371/MAX2373. It is intended as a guide only, and some substitutions are possible.

- Two RF signal generators capable of delivering at least 5dBm of output power at the operating frequency (HPE4433B or equivalent)
- One RF power sensor capable of handling at least 20dBm of output power at the operating frequency (HP8482A or equivalent)
- One RF power meter capable of measuring up to 20dBm of output power at the operating frequency (HP437B or equivalent)
- An RF spectrum analyzer that covers the MAX2371/MAX2373 operating frequency range, as well as a few harmonics (FSEB20, for example)
- A network analyzer (HP8753D, for example) to measure small-signal return loss and gain (optional)
- Two power supplies capable of up to 1A at 2.65V to 3.3V
- An optional ammeter for measuring the supply current
- SMA cables

## Connections and Setup

This section provides a step-by-step guide to operating the EV kits and testing the devices' function. **Do not turn on the DC power or RF signal generators until all connections are made:**

- 1) Connect a DC supply set to 2.775V (through an ammeter if desired) to the VCC and GND on the EV kit. Do not turn on the supply.
- 2) Connect one RF signal generator to the LNA\_IN

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SMA connector. Do not turn on the generator's output. Set the generator for proper output frequency and power level.

- 3) Connect the spectrum analyzer to LNA\_OUT. Set the spectrum analyzer to a center frequency of 150MHz (MAX2371) or 900MHz (MAX2373).
- 4) Connect the jumpers to set the desired mode of operation (RX Enable/Disable, High/Low Attenuation, High/Low Current).
- 5) Connect a DC supply set to 1.3875V ( $V_{CC}/2$  for maximum gain) to AGC. Do not turn on the supply.
- 6) Turn on the DC supplies.
- 7) Activate the RF generator's output. Refer to the *Electrical Characteristics Table* in the data sheet for specifications in different operation modes.
- 8) Another method for determining gain is by using a network analyzer (optional). This has the advantage of displaying gain versus a swept-frequency band, in addition to displaying input return loss. Refer to the network analyzer manufacturer's user manual for setup details.

## **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 MAX2371/MAX2373. Keep traces carrying RF signals as short as possible to minimize radiation and insertion loss. Use impedance control on all RF signal traces. VCC nodes on the PC board should have decoupling capacitors to the closest ground. Refer to the *Layout* section of the MAX2371/MAX2373 data sheet for more information.

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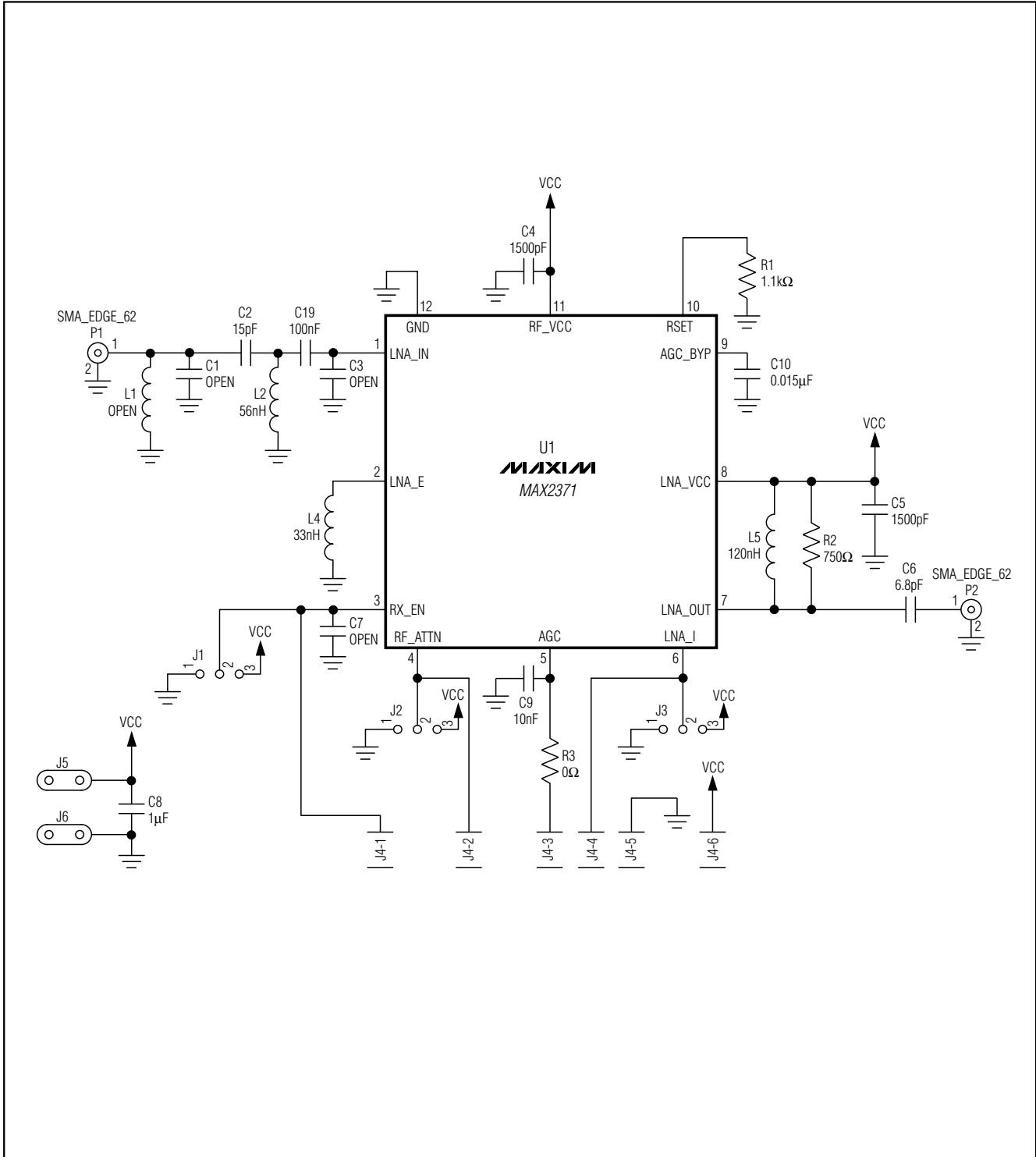


Figure 1. MAX2371 EV Kit Schematic

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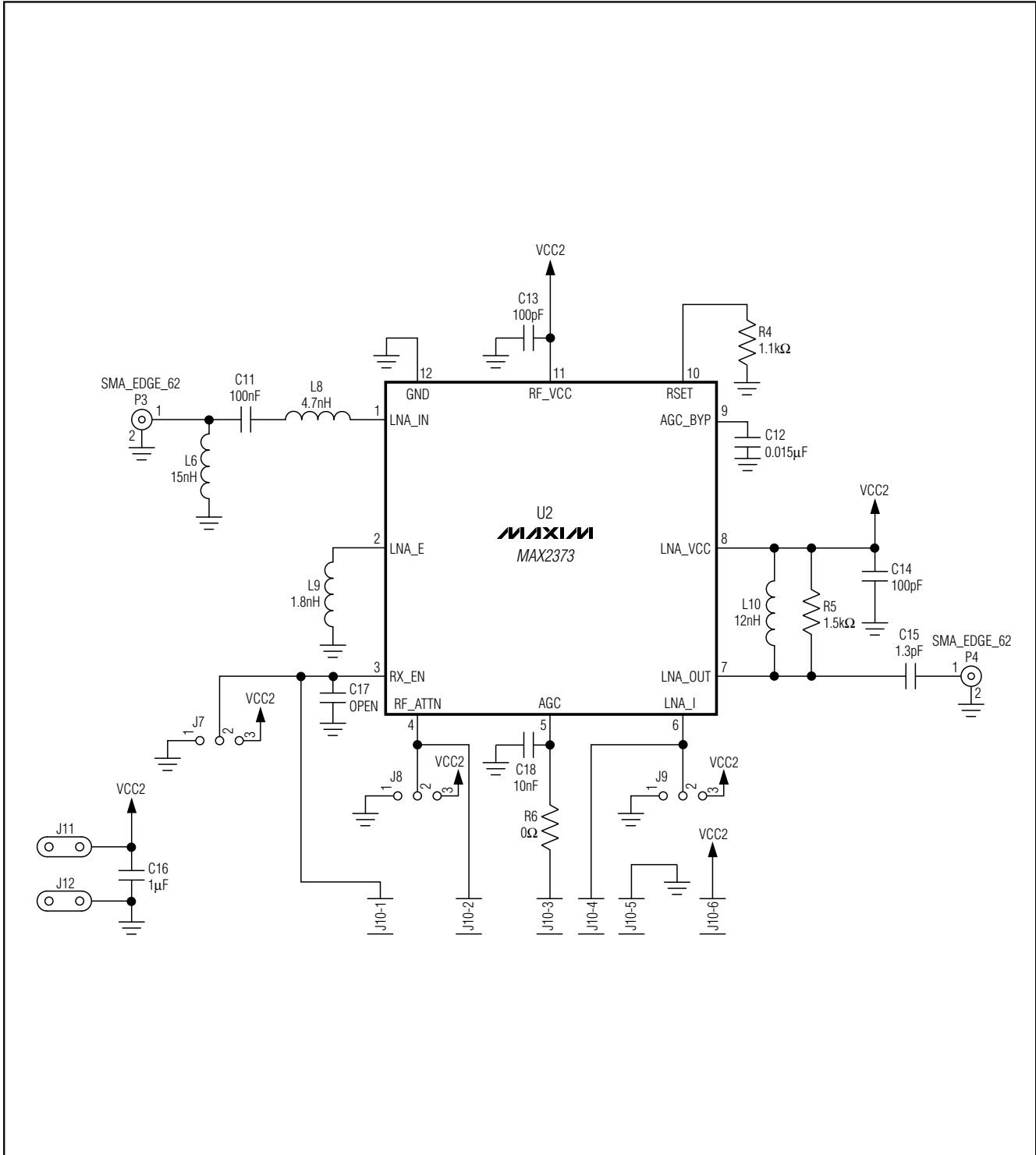


Figure 2. MAX2373 EV Kit Schematic

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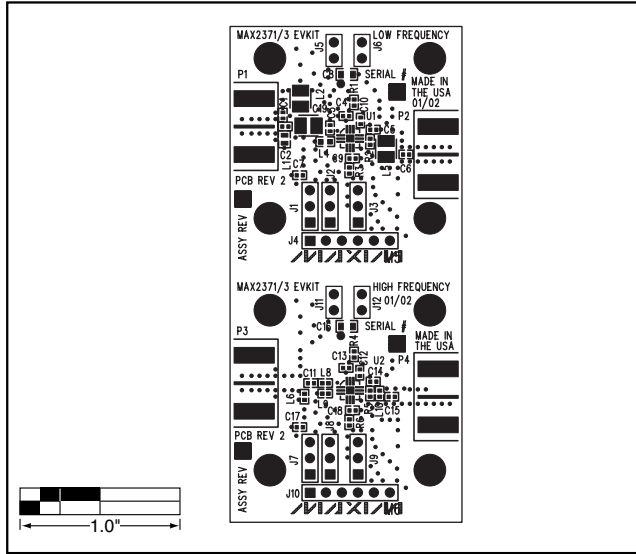


Figure 3. MAX2371/MAX2373 EV Kit Component Placement Guide—Component Side

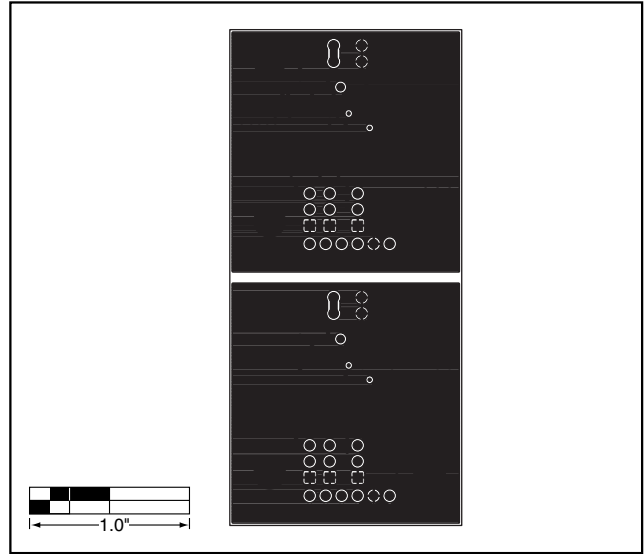


Figure 4. MAX2371/MAX2373 EV Kit PC Board Layout—Layer 2

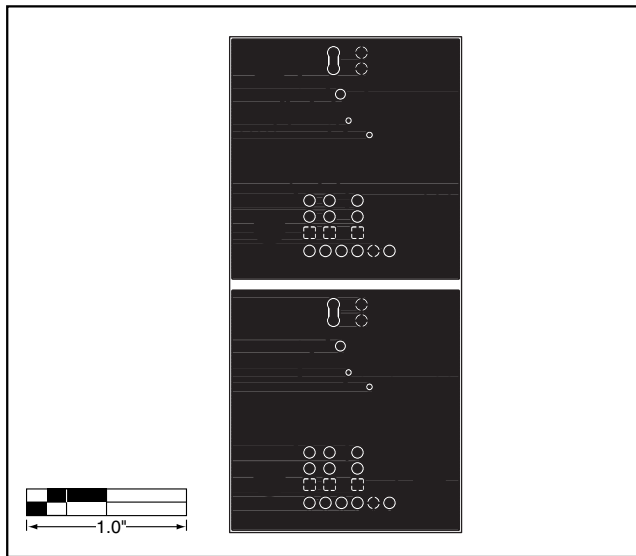


Figure 5. MAX2371/MAX2373 EV Kit PC Board Layout—Layer 3

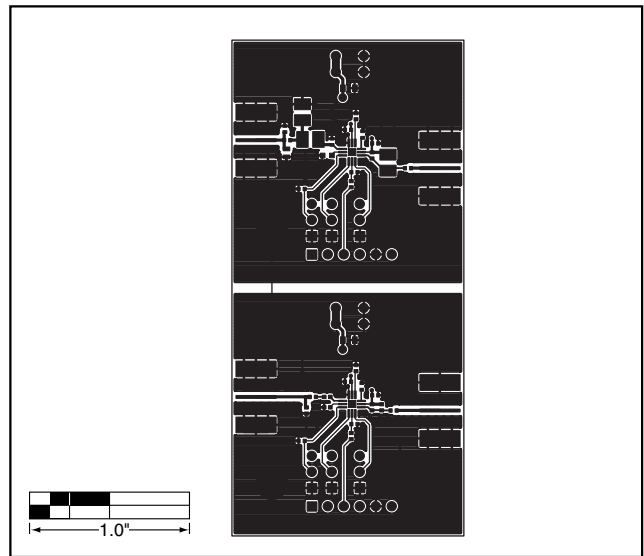


Figure 6. MAX2371/MAX2373 EV Kit PC Board Layout—Primary Component Side

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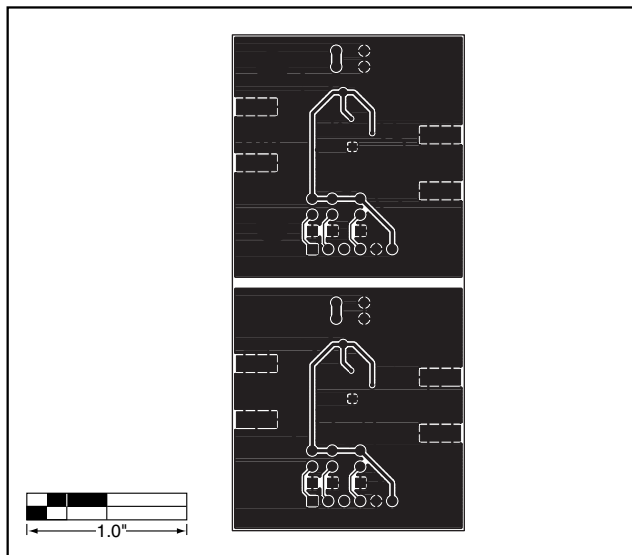


Figure 7. MAX2371/MAX2373 EV Kit PC Board Layout—  
Secondary Side

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**Maxim Integrated Products, 120 San Gabriel Drive, Sunnyvale, CA 94086 408-737-7600** \_\_\_\_\_ 7