MAX2870/MAX2871 Evaluation Kits

Evaluate: MAX2870/MAX2871

General Description

The MAX2870/MAX2871 evaluation kits (EV kits) simplify the testing and evaluation of the MAX2870 and MAX2871 ultra-wideband phase-locked loop (PLL) with integrated voltage-control oscillators (VCOs). Each EV kit is fully assembled and tested at the factory. Standard 50Ω SMA connectors are included on the EV kits for the inputs and outputs to enable quick and easy evaluation on the test bench.

This document provides a *Quick Start* guide, a description of the EV kit circuit, a *Troubleshooting Guide*, the circuit schematic, a list of components for the EV kit, and diagrams for each layer of the PCB.

Note: This EV kit data sheet supports the MAX2870 (Rev B) and MAX2871 EV kits. Customers using MAX2870 (Rev A) EV kit can access the schematic, PCB layout, and user guide under the Help menu of the EV kit software.

Features

- Easy Evaluation of the MAX2870 and MAX2871
- 50Ω SMA Connectors
- All Critical Peripheral Components Included
- PC Control Software
- Proven PCB Layout
- Fully Assembled and Tested

***Ordering Information* appears at end of data sheet.**

Quick Start

Required Equipment

- MAX2870/MAX2871 EV kit board
- Mini-USB type A-to-type B cable (included)
- User-supplied Windows PC
- User-supplied spectrum analyzer or signal analyzer

Note: In the following sections, software-related items are identified by bolding. Text in **bold** refers to items from the EV kit software. Text in **bold and underlined** refers to items from the Windows operating system.

Procedure

Hardware Connection Guide

Each EV kit is fully assembled and tested. Follow the steps below to verify board operation:

1) Verify that all jumpers are in their default positions, as shown in Figure 1.
2) Connect the USB cable from the PC to the EV kit.
3) Connect one of the RFOUT SMA connectors to a signal analyzer or spectrum analyzer.

Software Installation and Evaluation Guide

1) Visit www.maximintegrated.com/evkitsoftware to download the latest version of the EV kit software, Max287X_Setup_1-1-x.zip.
2) Extract the zip file and run the installation file. Restart the PC after installation.
3) Run the MAX287x.exe file. Choose the correct IC type (MAX2870 or MAX2871) at the front page and click the **Continue** button. The EV kit GUI appears and looks similar to Figure 2.
4) Verify that **USB Connected** is displayed in green in the lower right-hand corner of the GUI.
5) Verify that the EV kit **TCXO (U2)** frequency matches the EV kit software **REF. FREQ**. If not, enter the correct value in MHz (default is 50) and press the Enter key.
6) In the GUI, click on the **Defaults** button and then the **Send All** button located at the top of the GUI.
7) Enter the desired output frequency in MHz in the **RF_OUTA** or **RF_OUTB** edit box and press the Enter key.
8) Verify that the **PLL Lock** indicator in the lower right-hand corner of the GUI is displayed in green.
9) Use the signal analyzer to verify the performance of the MAX2870 or MAX2871.

19-6805; Rev 1; 10/14

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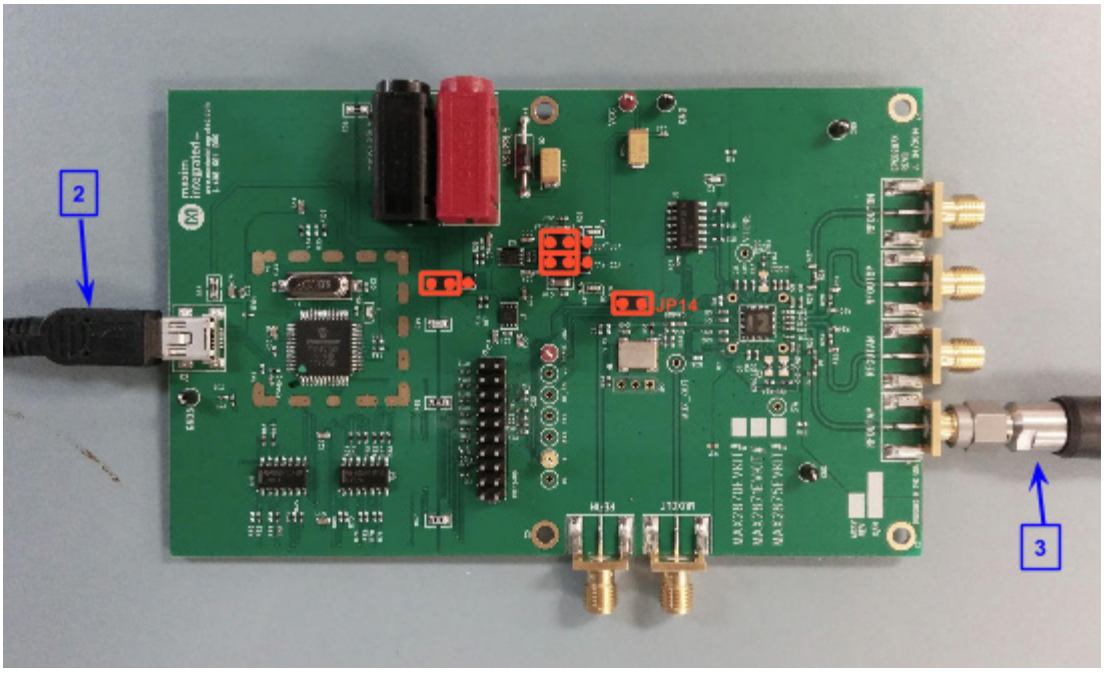

Figure 1. MAX2870/MAX2871 EV Kit Hardware Connection

Troubleshooting Guide

External Reference Source

The default on-board crystal oscillator frequency is 50MHz. To use a different reference frequency, perform the following steps:

1) Remove jumper JP14 (disables on-board XTAL oscillator).
2) Apply a reference signal to the REFIN SMA port, (power > 0 dBm).
3) Update the **REF. FREQ**. value in the EV kit GUI .
4) Program the IC to the desired frequency.
5) Optional: It is recommended to measure the reference-source phase noise and check the MAX2870 simulated phase noise (using the Maxim EE-Sim® PLL tool). **Note:** If the reference-source phase noise is poor, it could impact the ICs' output phase noise.

RF Output Level

There is a 3dB pad at each RFOUT port. The purpose of these 3dB pads is to provide reasonable matched load to the ICs' outputs when unused. Therefore, direct power measurement at the EV kit's RF OUT SMA ports is 3dB lower than the actual output level. To measure the true output level, remove the 3dB pads and terminate all active unused ports with a 50Ω load.

EE-Sim is a registered trademark of Maxim Integrated Products, Inc.

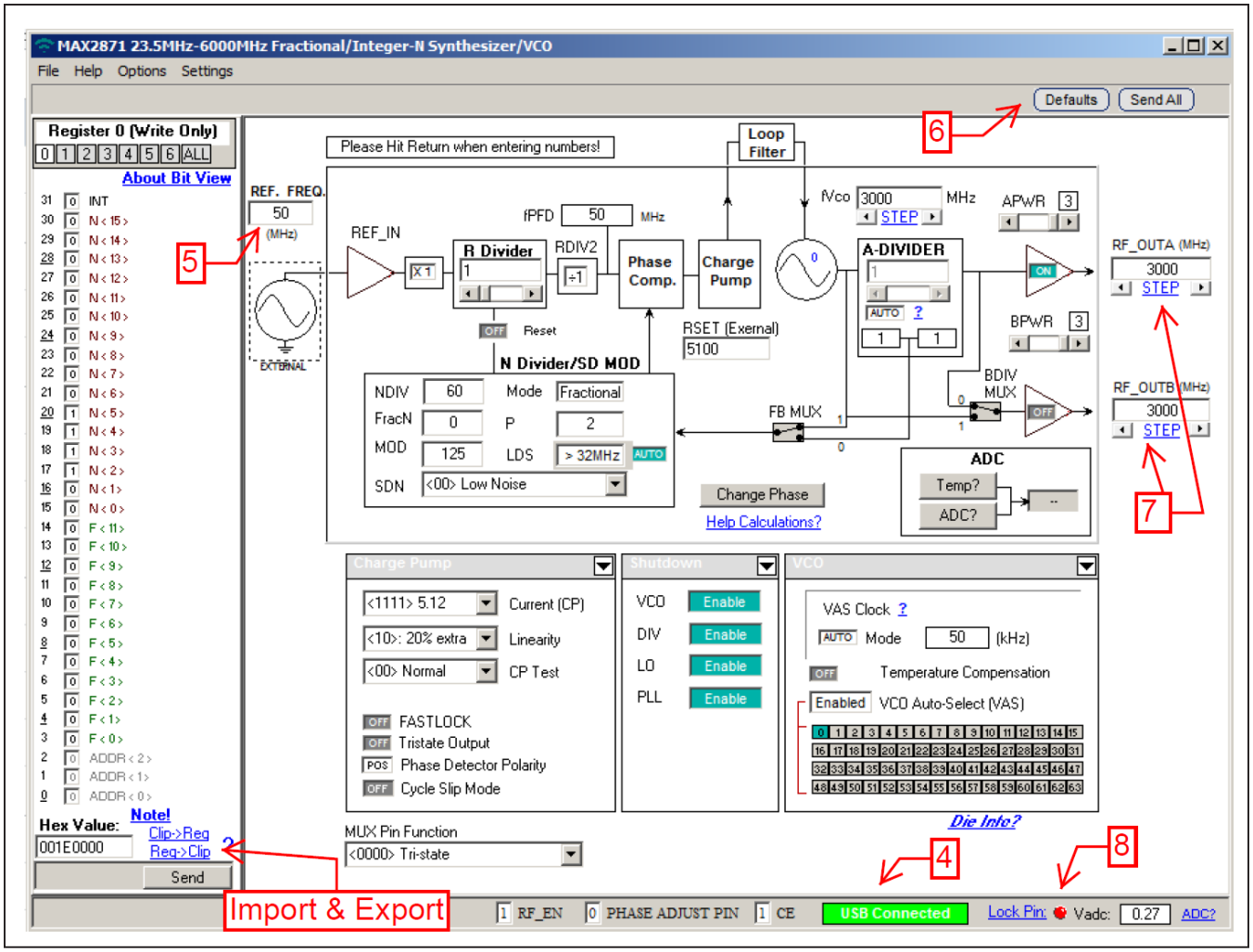

Figure 2. MAX2870/MAX2871 EV Kit Software GUI

Export/Import Full Register Settings

To export the full register settings from the MAX2870/MAX2871, perform the following steps:

- Click on **Reg → Clip** in the lower left-hand corner of the GUI. The registers are then saved to the clipboard.
- Paste the clipboard to any text editor.

To import full register settings to the MAX2870/MAX2871, perform the following steps:

- Copy the register settings (comma delimited) from a text editor to the clipboard.
- Click on **Clip → Reg** in the lower left-hand corner of the GUI.
- Click the **Send All** button in the top right-hand corner of the GUI.

Component List

Refer to file “MAX2870_MAX2871_EVKIT_BOM.xlsx” attached to this PDF for component information.

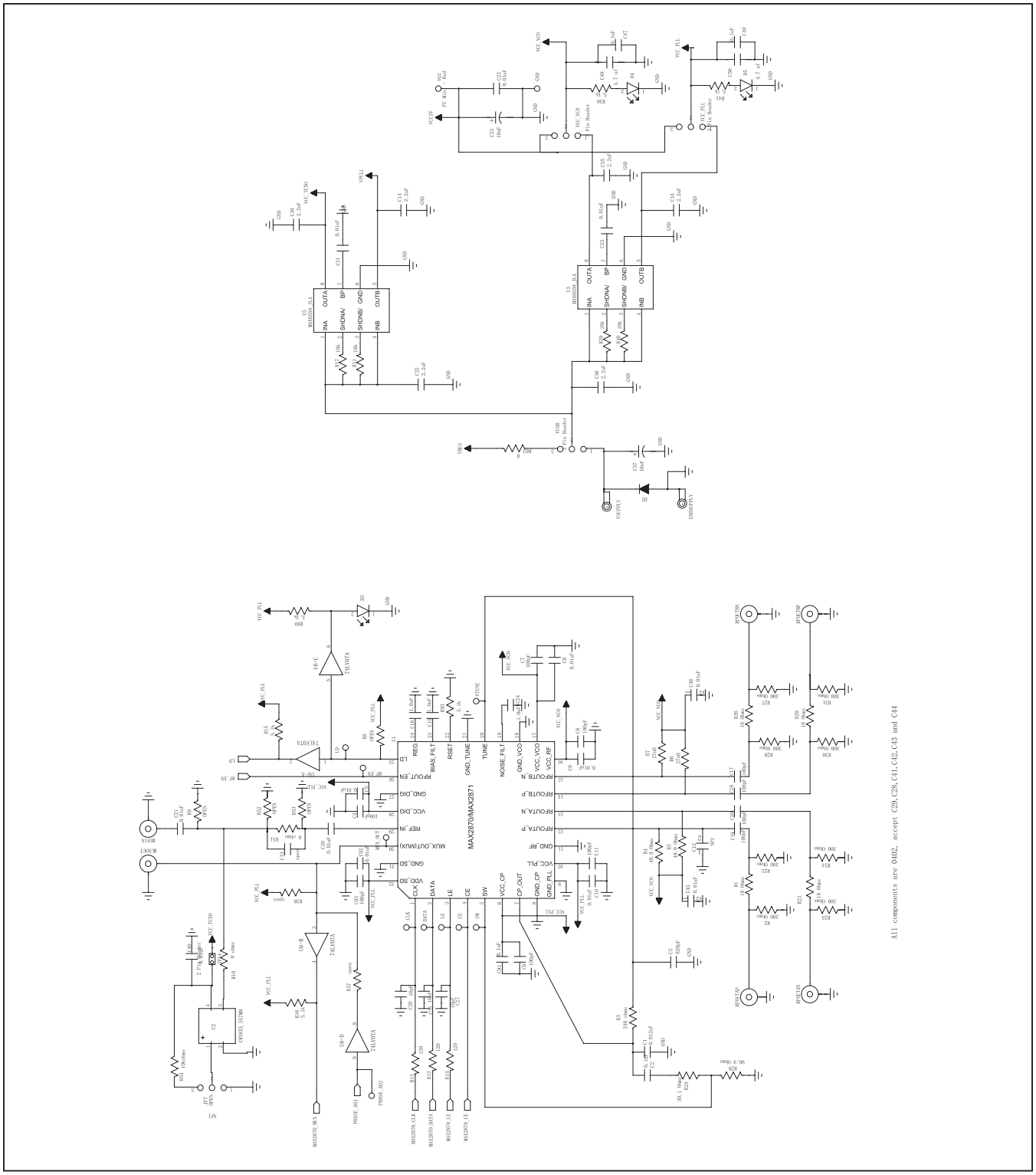

Figure 3a. MAX2870/MAX2871 EV Kit Schematic (sheet 1 of 2)

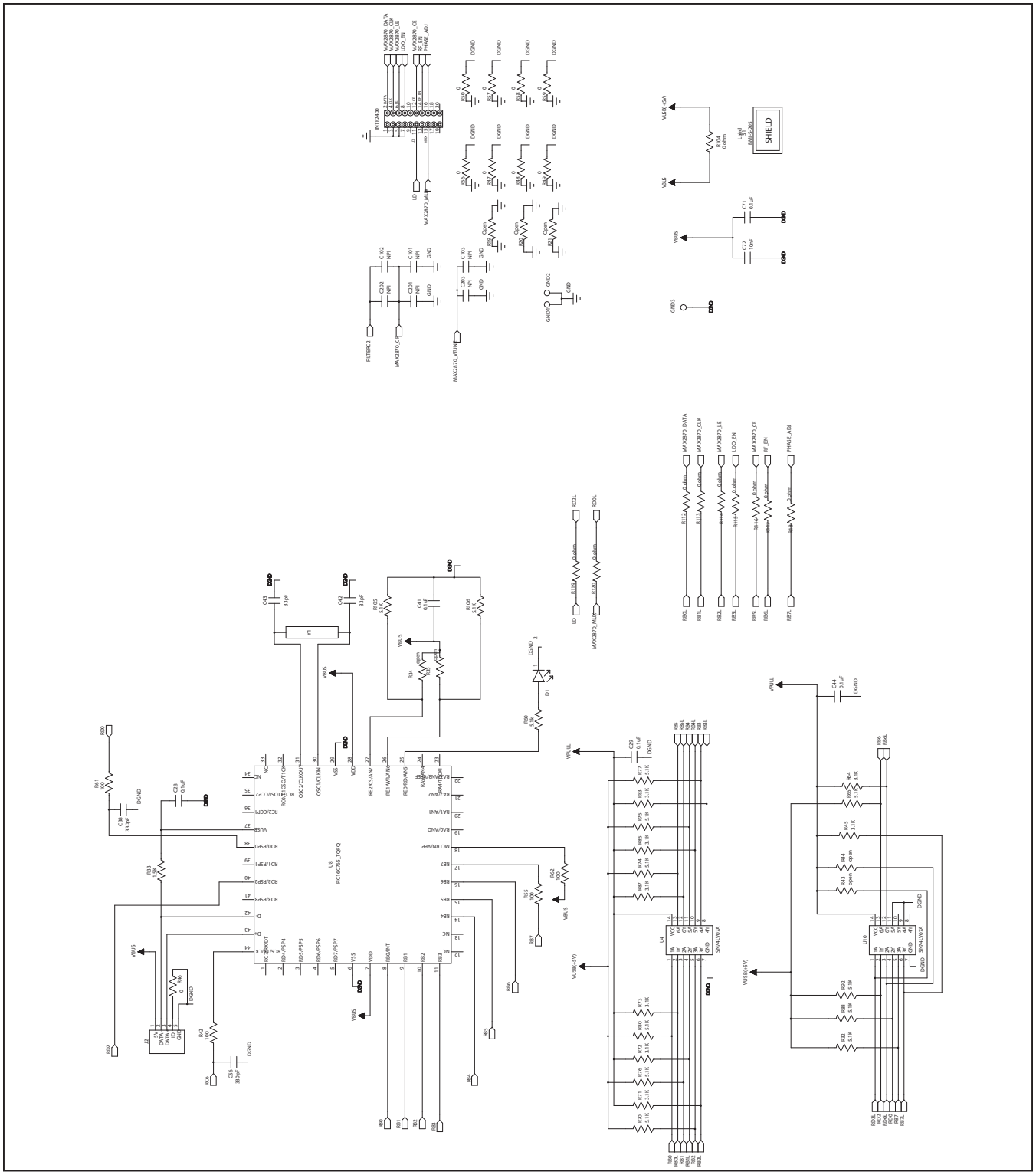

Figure 3b. MAX2870/MAX2871 EV Kit Schematic (sheet 2 of 2)

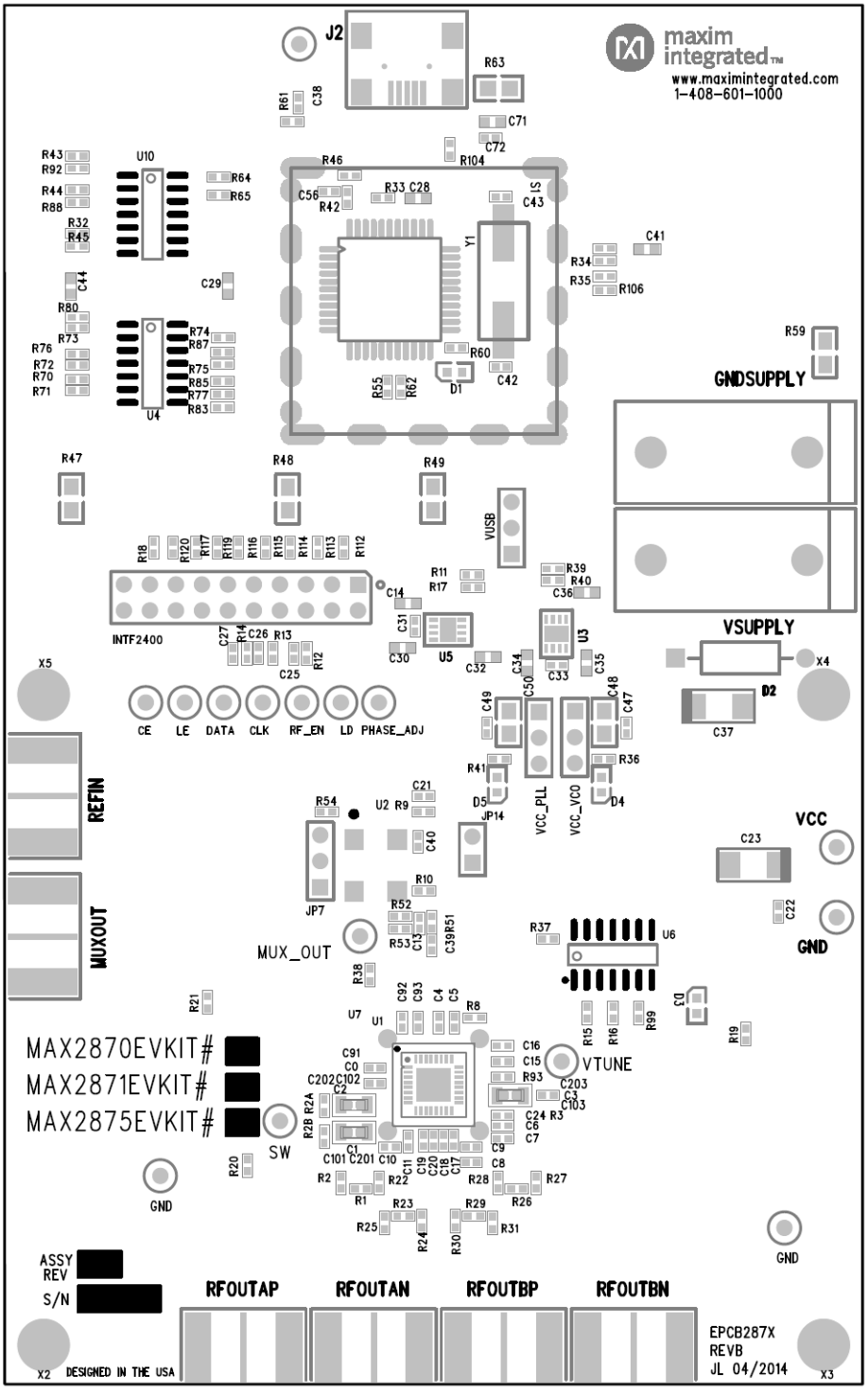

Figure 4. MAX2870/MAX2871 EV Kit Component Placement—Component Side

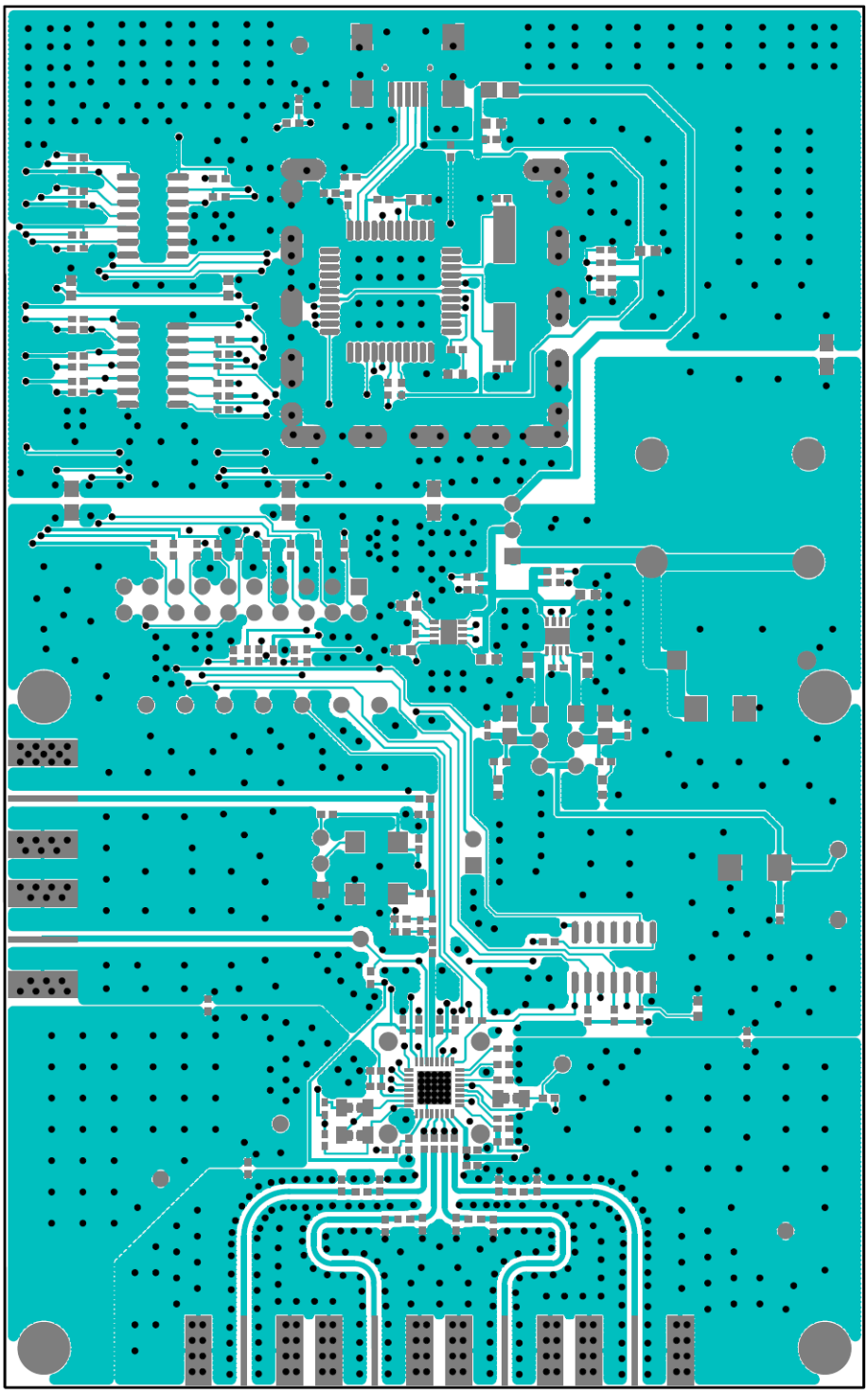

Figure 5. MAX2870/MAX2871 EV Kit PCB Layout—Top Layer

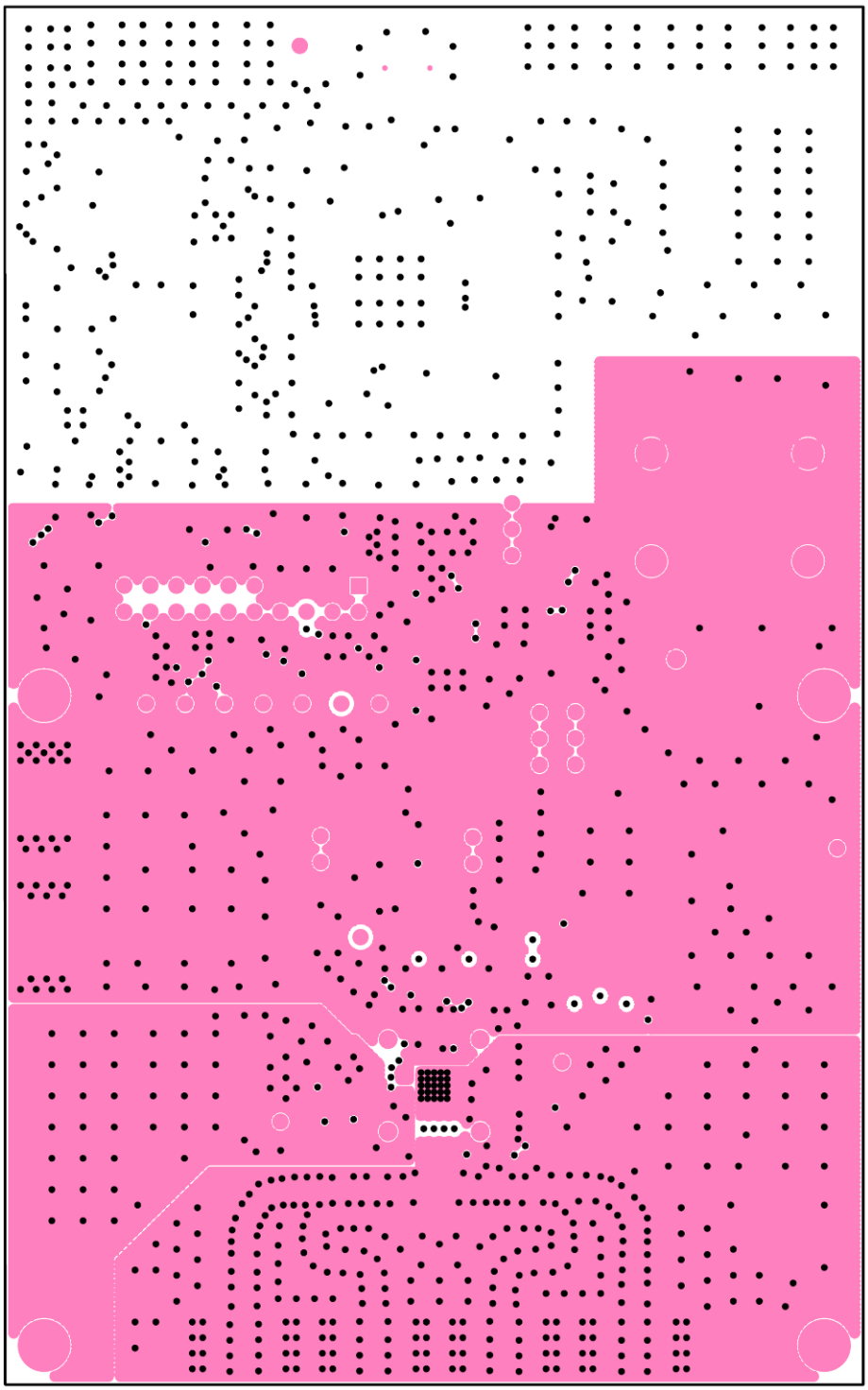

Figure 6. MAX2870/MAX2871 EV Kit PCB Layout—2nd Layer

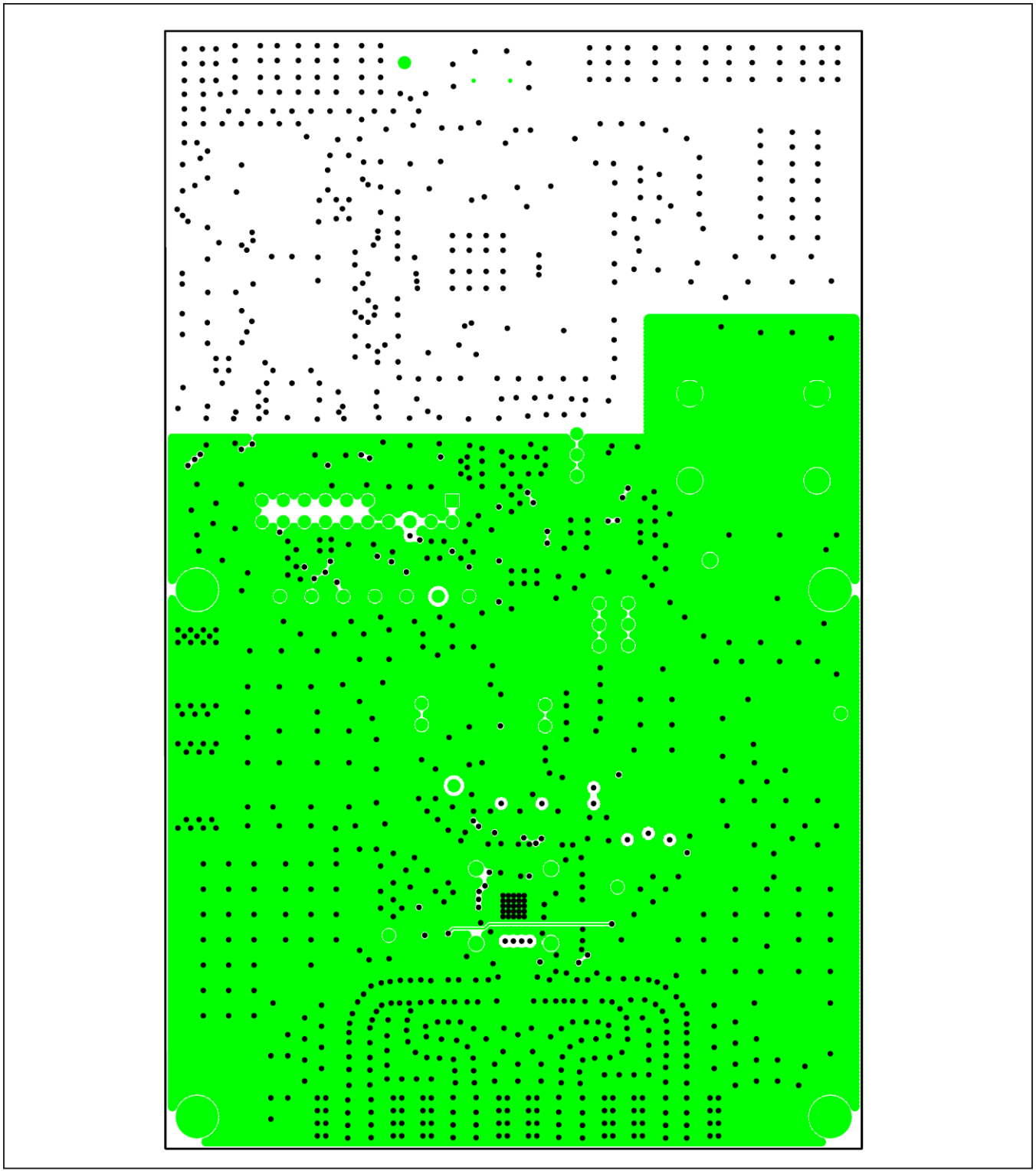

Figure 7. MAX2870/MAX2871 EV Kit PCB Layout—3rd Layer

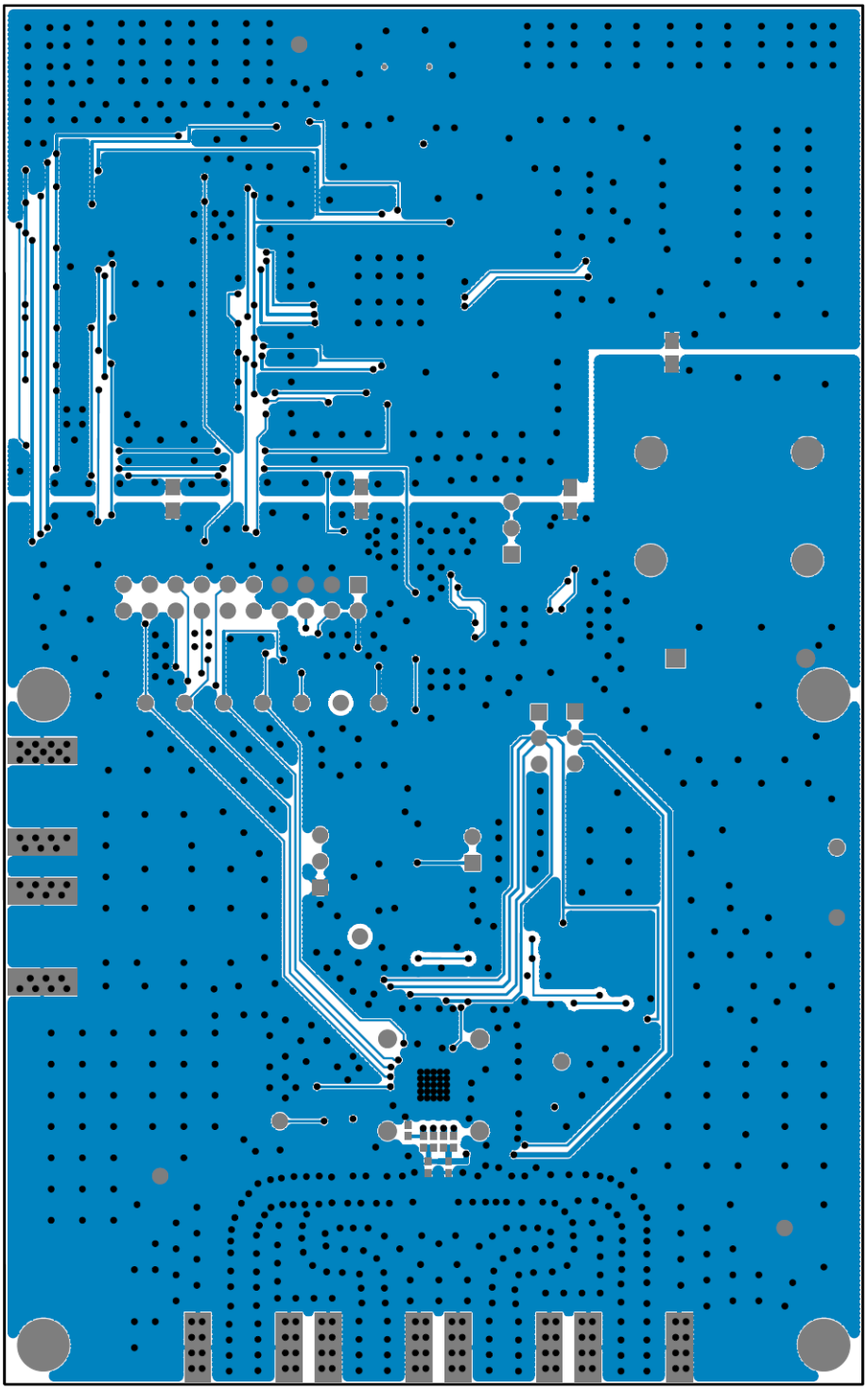

Figure 8. MAX2870/MAX2871 EV Kit PCB Layout—Bottom Layer

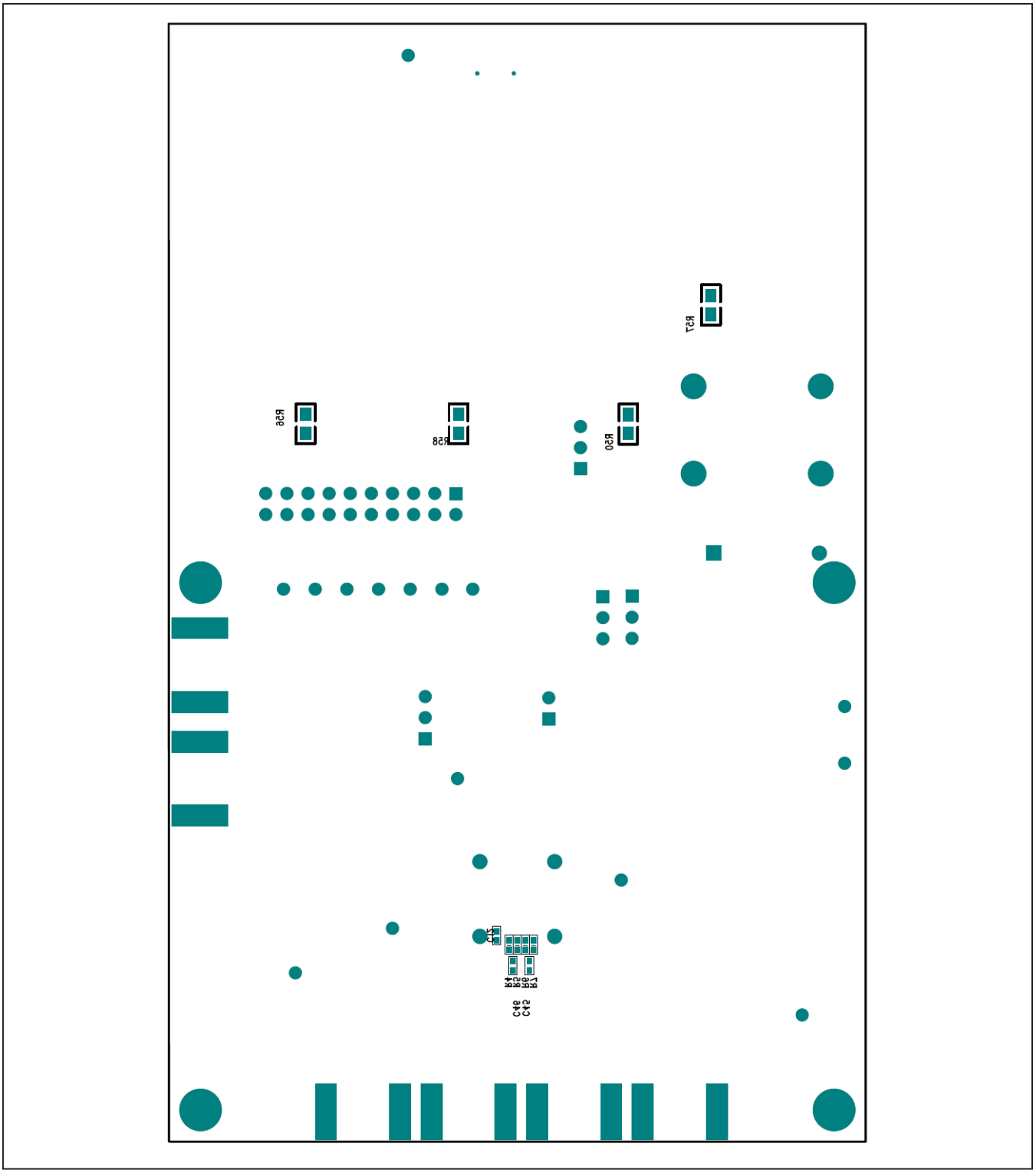

Figure 9. MAX2870/MAX2871 EV Kit Component Placement Guide—Solder Side

Ordering Information

PART	TYPE
MAX2870VKIT#	EV Kit
MAX2871VKIT#	EV Kit

#Denotes RoHS compliant.

Note: *Customers using older versions of the MAX2870 EV kit can access the EV kit data sheet from the Help menu in the software GUI.*

Revision History

REVISION NUMBER	REVISION DATE	DESCRIPTION	PAGES CHANGED
0	9/13	Initial release	—
1	10/14	Added MAX2871 to data sheet	1–15

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