

# MAX3711 Evaluation Kit

## Evaluates: MAX3711

### General Description

The MAX3711 evaluation kit (EV kit) is a fully assembled and tested demonstration board that provides electrical and optical evaluation of the MAX3711, which is a 125Mbps to 3.125Gbps integrated limiting amplifier with a dual-loop laser driver. The controlling software communicates with the EV kit through the USB port of the included card and provides simplified control of all functions of the device. The EV kit can be fully powered by the USB port or the user can choose to power the device with an external 3.3V supply while the USB port supplies the included HFRD-46-1 USB daughter card. The laser connection on the evaluation board allows attachment of lasers in TOSA packages.

### Features

- ◆ **Software Control of the Device**
- ◆ **Power Supplied through the USB or an External Connection**
- ◆ **Connection for Lasers in TOSA Packages**
- ◆ **Proven PCB Layout**
- ◆ **Fully Assembled and Tested**

*Ordering Information appears at end of data sheet.*

### Component List

DESIGNATION	QTY	DESCRIPTION
C1, C4, C5, C8, C26, C27, C38	7	1000pF ±10% ceramic capacitors (0402)
C2, C3, C6, C7, C12, C13, C16, C17, C28	9	0.01µF ±10% ceramic capacitors (0402)
C9	1	1pF ±0.25pF ceramic capacitor (0402)
C10	1	6.8pF ±5% ceramic capacitor (0402)
C11	1	22pF ±10% ceramic capacitor (0402)
C14	1	8.2pF ±0.25pF ceramic capacitor (0402)
C15	1	100pF ±5% ceramic capacitor (0402)
C18	1	12pF ±10% ceramic capacitor (0402)
C23, C29	2	10µF ±20% ceramic capacitors (0603)
C24, C25, C31, C35, C37	5	0.1µF ±10% ceramic capacitors (0402)
D1, D2	2	Red LEDs
D4, D7	2	Green LEDs
D5	1	Laser (user installed)

DESIGNATION	QTY	DESCRIPTION
J1–J4, J7, J8	6	Edge-mount SMA connectors
J10	1	PC-mount SMB connector
J13, J15, TP1–TP6, TP9–TP13, TP17–TP19, TP21, TP22, TP25	19	Test points
J14	1	Micropitch connector
JU19–JU21	3	2-pin headers, 0.1in centers
JU26	1	3-pin header, 0.1in centers
L1	1	Ferrite bead (0402) Murata BLM15HG102
L2	1	47nH ±20% inductor
L3, L5, L6	3	4.7µH ±20% inductors
Q1, Q2	2	nnp transistors Zetex FMMT491A
R1, R3	2	4.7kΩ ±5% resistors (0402)
R2	0	Not installed, resistor (0402)
R4, R51	2	10.0kΩ ±1% resistors (0402)
R5, R6	2	0Ω resistors (0402)
R8	1	6.04kΩ ±1% resistor (0402)
R9	1	47Ω ±5% resistor (0402)
R10	1	82Ω ±5% resistor (0402)
R11	1	220Ω ±5% resistor (0402)

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### Component List (continued)

DESIGNATION	QTY	DESCRIPTION
R12	1	39Ω ±5% resistor (0402)
R14, R15	2	22Ω ±5% resistors (0402)
R24	1	100Ω ±1% resistor (0402)
R32, R35–R38	0	Not installed, resistors
R50, R52–R54	4	1kΩ ±1% resistors (0402)
S1	1	SP3T switch Alps SSSS211900

DESIGNATION	QTY	DESCRIPTION
U1	1	Limiting amplifier and laser driver (24 TQFN-EP*) Maxim MAX3711ETG+
U2	1	EEPROM
—	1	HFRD-46-1 USB interface card
—	1	PCB: MAX3711 EVALUATION BOARD+

\*EP = Exposed pad.

### Component Suppliers

SUPPLIER	PHONE	WEBSITE
Diodes Incorporated (Zetex)	805-446-4800	www.diodes.com
Murata Electronics North America, Inc.	770-436-1300	www.murata-northamerica.com

**Note:** Indicate that you are using the MAX3711 when contacting these component suppliers.

### Quick Start

#### Required Equipment

- MAX3711 EV kit
- Windows® PC
- Oscilloscope
- Pattern generator

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

#### Procedure for Initial Setup

- 1) Install the EV kit software on a computer by attaching the USB daughter card to the computer using the supplied USB cable. After the USB device has been detected and installed by the operating system, a flash drive becomes available in the **Devices with Removable Storage** section of **My Computer**. Search the flash drive for the **MAX3711 EV kit.zip** file. Copy this file to the desktop or another known folder and unzip the file. Locate the newly created **MAX3711 EV kit** folder and run setup.exe.

- 2) After installation is complete, follow this path to start the program: **Start | All Programs | Maxim Integrated Products | MAX3711 EV Kit GUI**. The software is a graphical user interface (GUI) meant to simplify control of the device.
- 3) Insert the USB daughter card (HFRD-46-1) into connector J14 on the EV kit.
- 4) Set the jumper on JU26 to the desired power-supply option (USB or external supply).
- 5) If an external power supply is used, set the voltage to 3.3V, the current limit to 300mA, and connect the supply to the board.
- 6) Connect the computer to the USB daughter card with a USB cable (A-male to mini-B-male). Several LEDs should illuminate, indicating that the USB source is powered. Press the **Initialize** button in the software to initiate communication to the EV kit. When communication is established, the **STATUS** indicator on the GUI turns green.

#### Procedure for Transmitter Evaluation

- 1) Solder a laser to connection D5. See Figure 1 for more information about the laser connection.
- 2) Connect a 50Ω source to TIN+ and TIN- (J7 and J8). Set the source differential amplitude to 500mVp-p. Set the source common-mode voltage to 2V or use external DC blocks.

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- 3) Connect the output from the TOSA to an optical receiver (either an optical-to-electrical converter or an optical input head on an oscilloscope).
- 4) All controls of the device are available in the software. Fault and warning indicators are displayed on the right side of the GUI window. When a hard fault has occurred, the part goes into latched shutdown. The source of the fault should be removed and the **DISABLE** box should be toggled to reset the part.
- 5) The registers contain a default setting and can be read using the **Block Read All** button. For detailed register functions, refer to the MAX3711 IC data sheet.
- 6) Note that the GUI software automatically sets the device into "setup mode" before writing to a register. If the **Enable Block Write** checkbox is checked,

multiple writes can be buffered by the GUI and written all at once when the **TX Block Write** or **Block Write All** button is clicked.

### **Procedure for Receiver Evaluation**

- 1) Connect a 50 $\Omega$  source to RIN+ and RIN- (J3 and J4).
- 2) Connect outputs ROUT+ and ROUT- (J1 and J2) to 50 $\Omega$  oscilloscope inputs.
- 3) The receiver controls are located in the **RECEIVER** section of the GUI.
- 4) Note that the GUI software automatically sets the device into "setup mode" before writing to a register. If the **Enable Block Write** checkbox is checked, multiple writes can be buffered by the GUI and written all at once when the **RX Block Write** or **Block Write All** button is clicked.

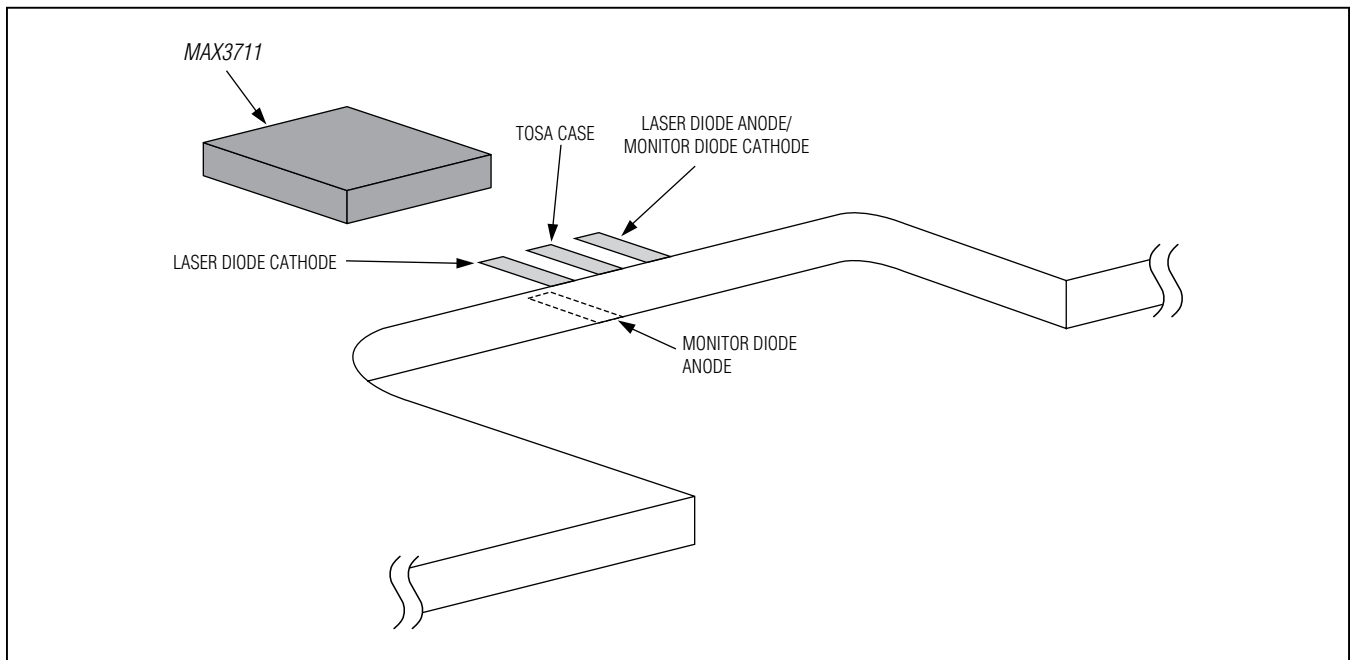


Figure 1. TOSA Connection

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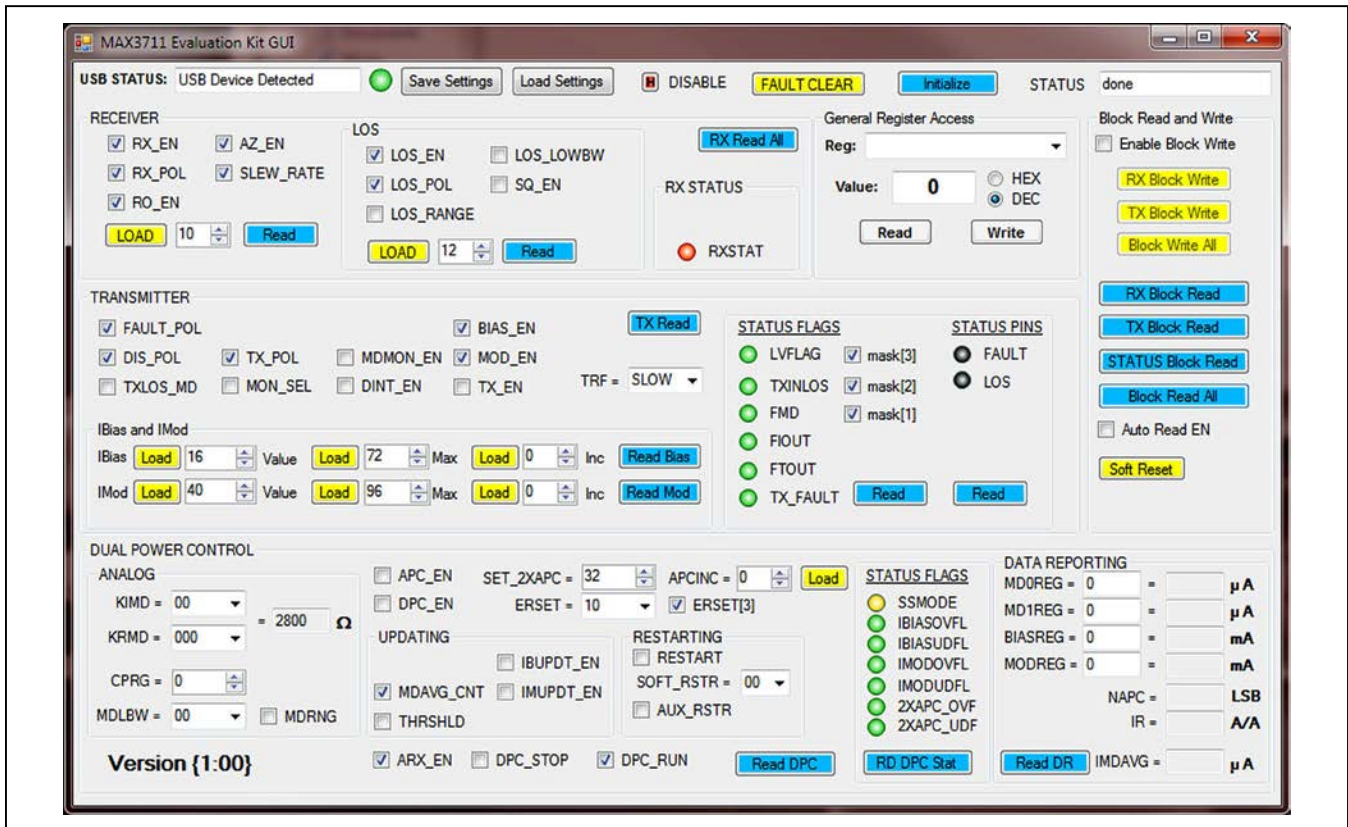


Figure 2. MAX3711 EV Kit Software

## Detailed Description of Software

### Graphical User Interface (GUI)

The GUI consists of four main sections: **RECEIVER**, **TRANSMITTER**, **DUAL POWER CONTROL**, and **Block Read and Write**.

#### Receiver

All the controls for the receiver portion of the device are included in the **RECEIVER** block. The SET\_CML and SET\_LOS registers are written to by inserting the desired decimal value for the register in the appropriate checkbox and pressing the **LOAD** button.

#### Transmitter

The **TRANSMITTER** block allows control of the transmitter's general settings. Pressing the **TX Read** button reads all the registers shown in the transmitter section.

#### Dual Power Control

The **DUAL POWER CONTROL** block allows adjustment and monitoring of the transmitter's dual power-control

loops. A sub-block in this section (**DATA REPORTING**) uses the device's registers to calculate the apparent average power (NAPC), the apparent extinction ratio (IR), and the average MD current (IMDAVG). The MD0REG and MD1REG values shown in the GUI are 16 bit and range from 0 to 255 in steps of 0.0039.

#### Block Read and Write

The **Block Read and Write** section allows the user to read/write to more than one register at a time. Pressing any of the **Block Read** buttons causes the GUI to execute a block read of the appropriate group of registers. By checking the **Enable Block Write** checkbox, the user is able to change multiple registers without a write being executed each time. The GUI buffers the commands and executes them in a single write command once the appropriate **Block Write** button has been pressed. Note that if a **Block Write** button is not pressed, individual bits are written any time a checkbox is checked or unchecked.



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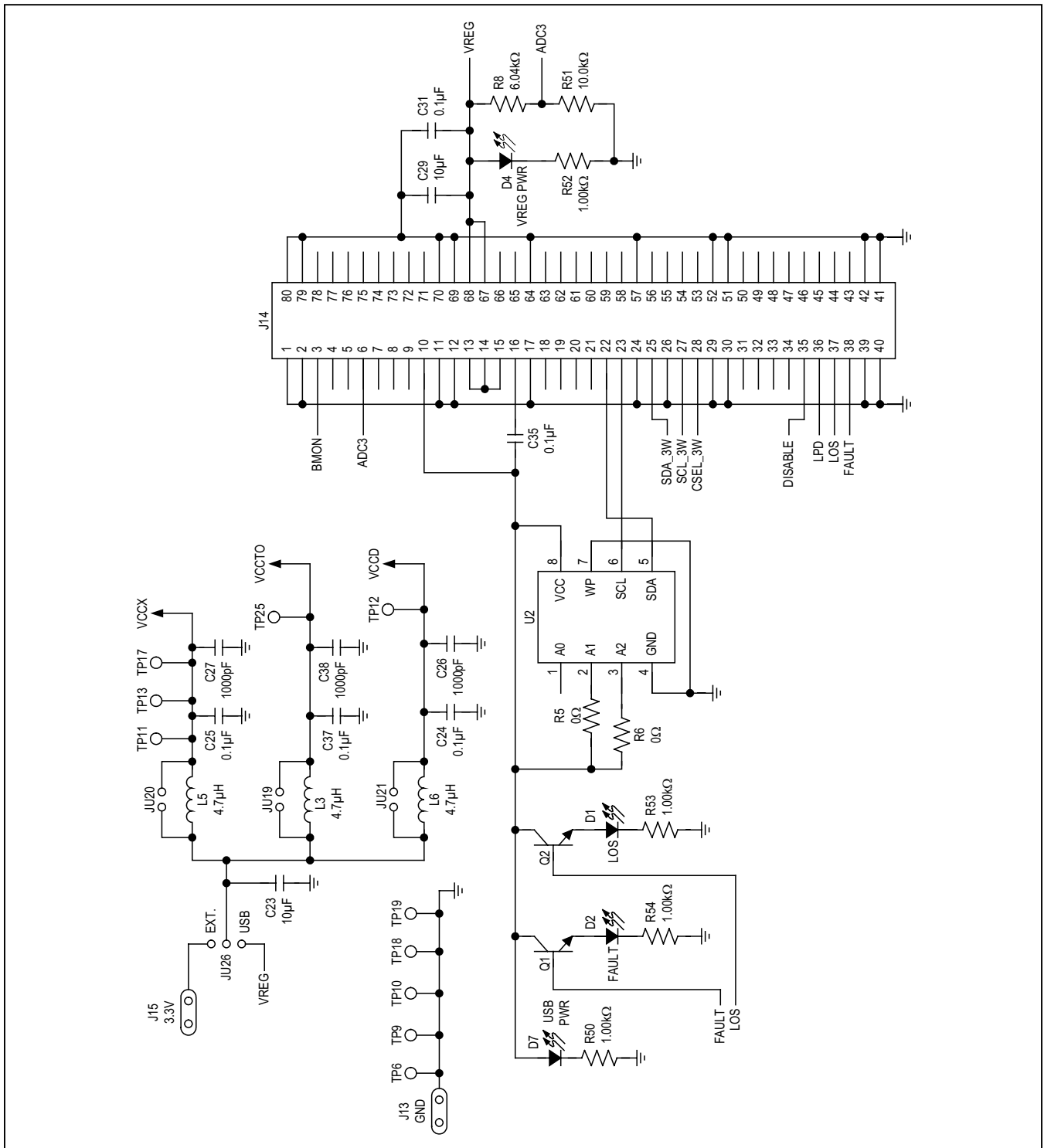
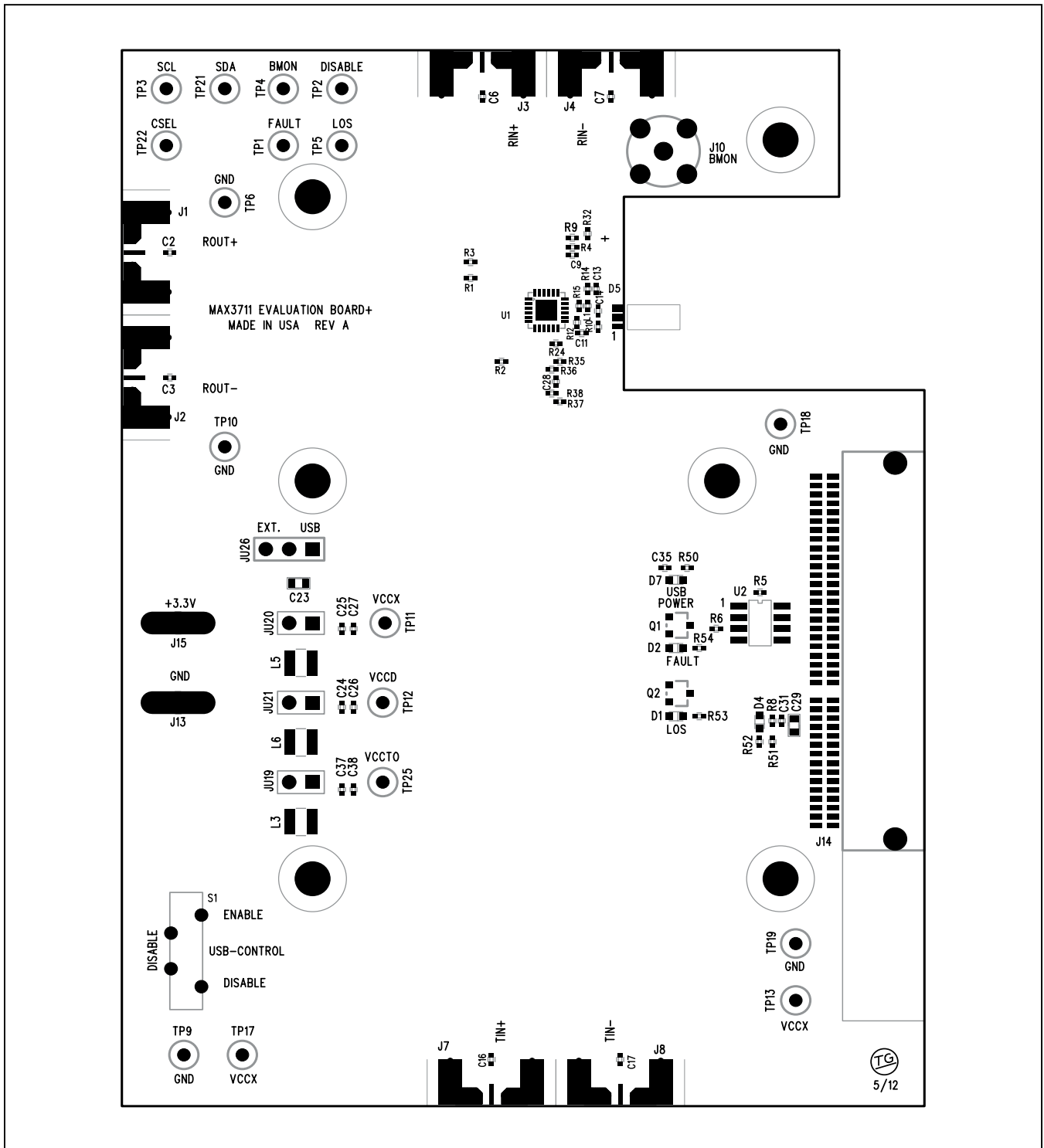


Figure 3b. MAX3711 EV Kit Schematic (Sheet 2 of 2)

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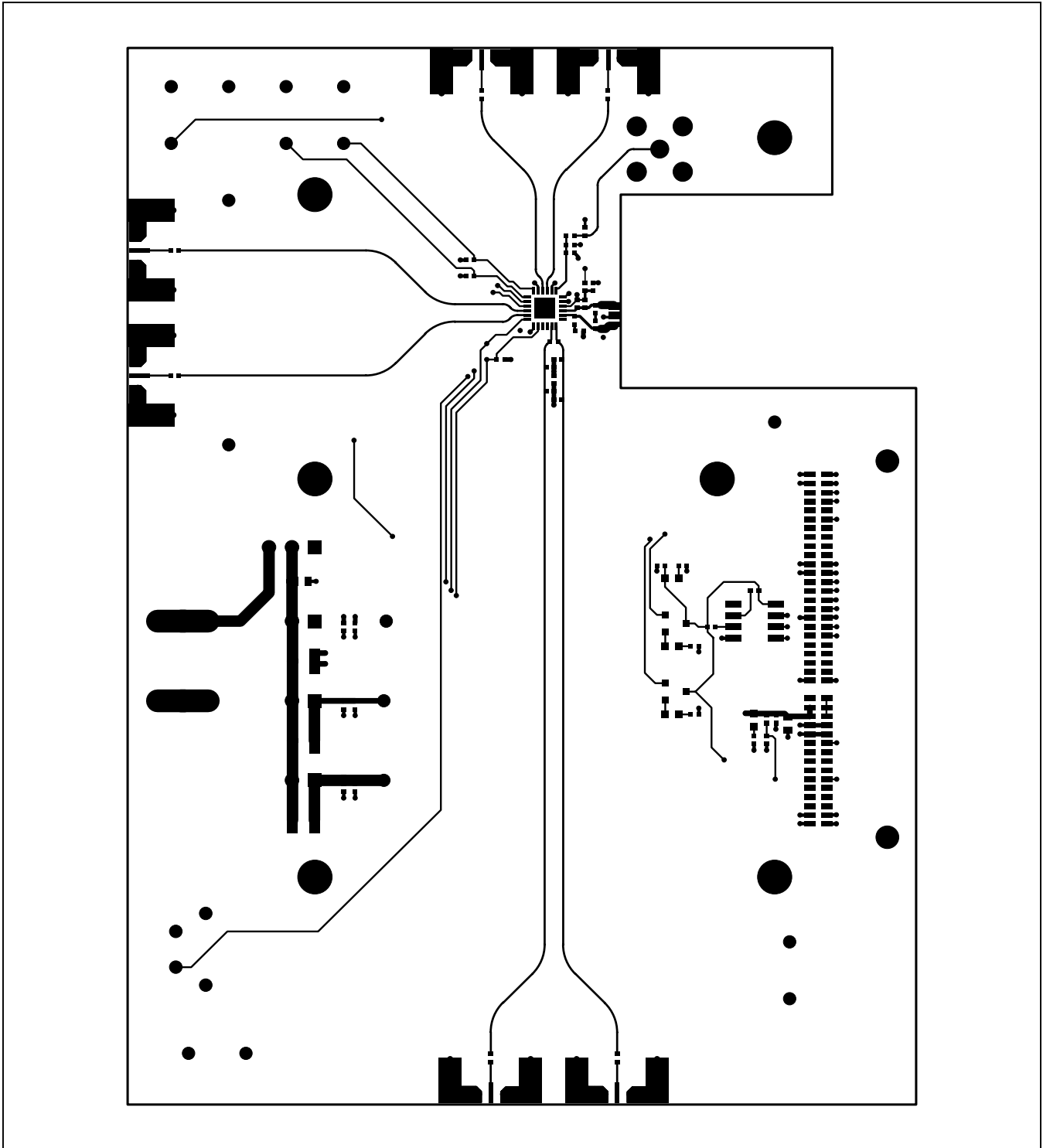


Figure 5. MAX3711 EV Kit PCB Layout—Top Side



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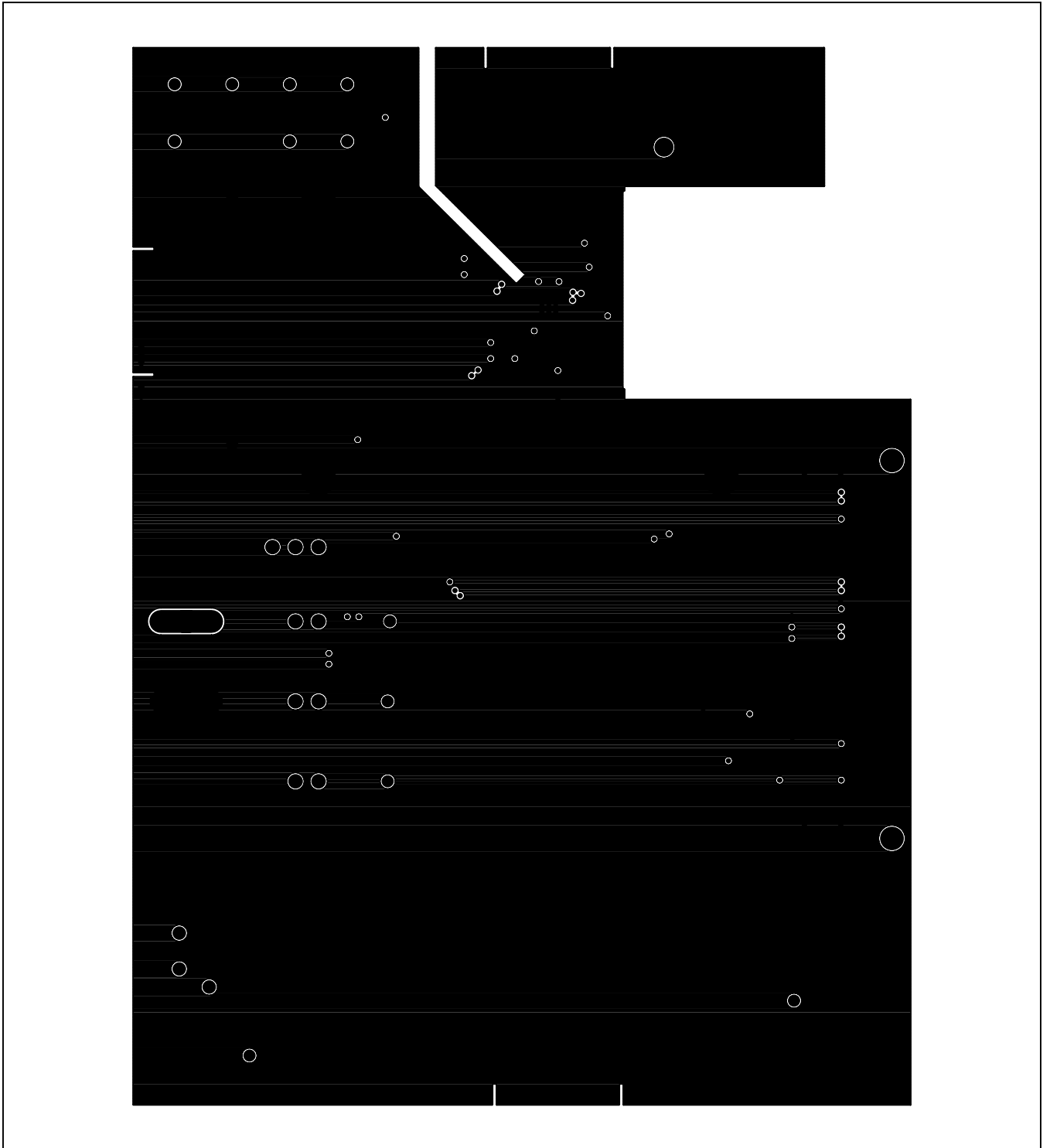


Figure 6. MAX3711 EV Kit PCB Layout—Ground Plane

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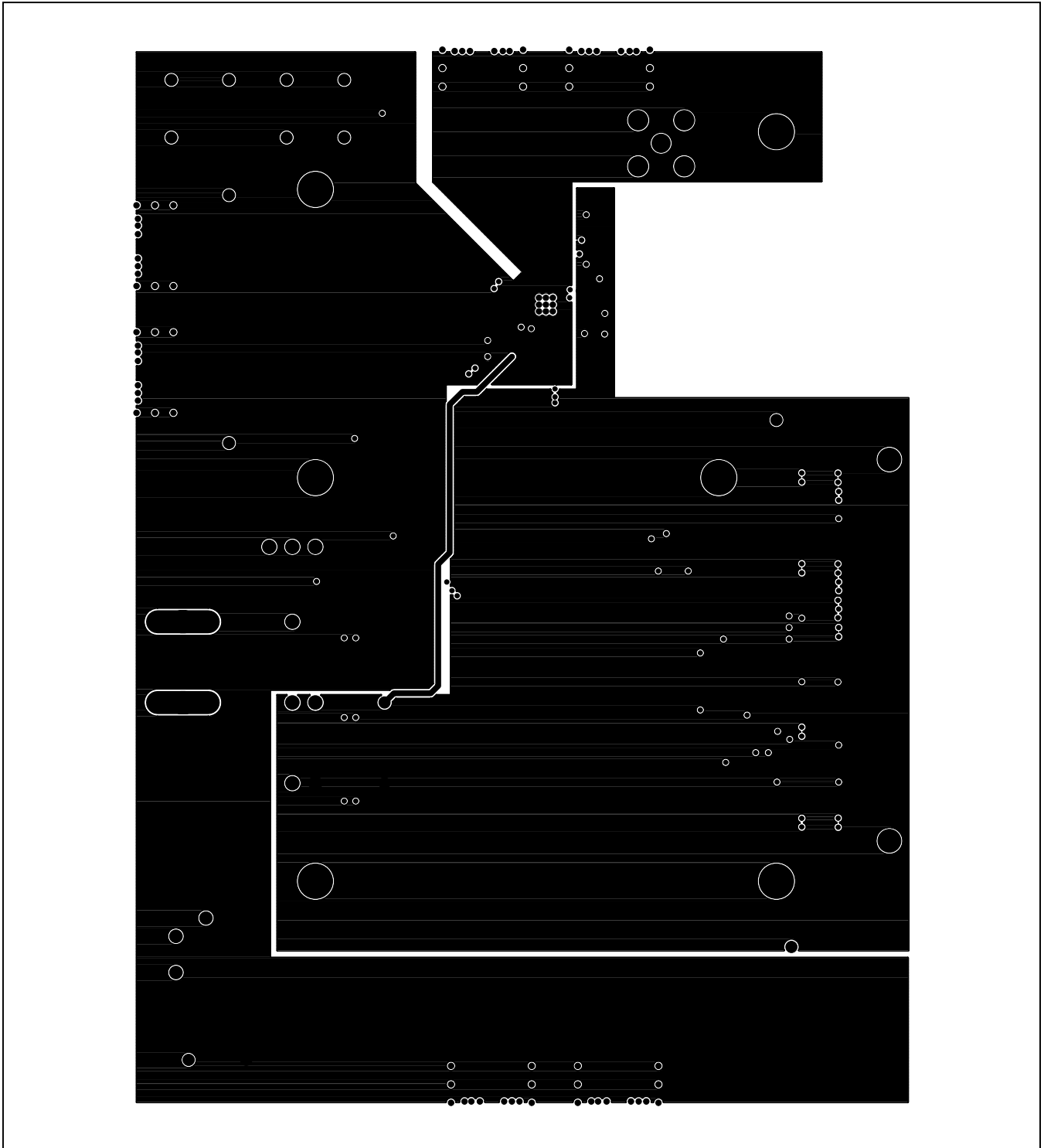


Figure 7. MAX3711 EV Kit PCB Layout—Power Plane

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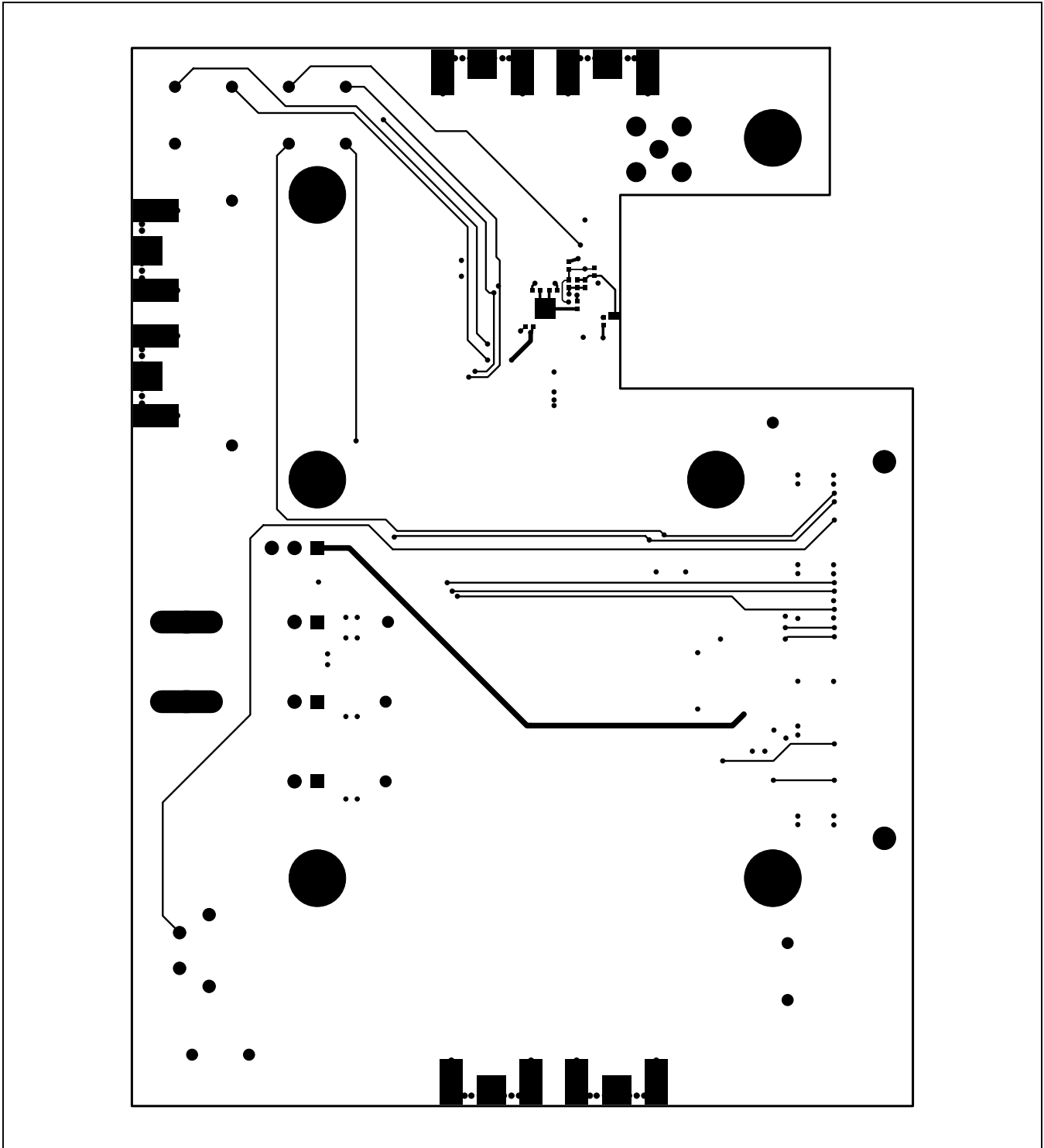


Figure 8. MAX3711 EV Kit PCB Layout—Solder Side

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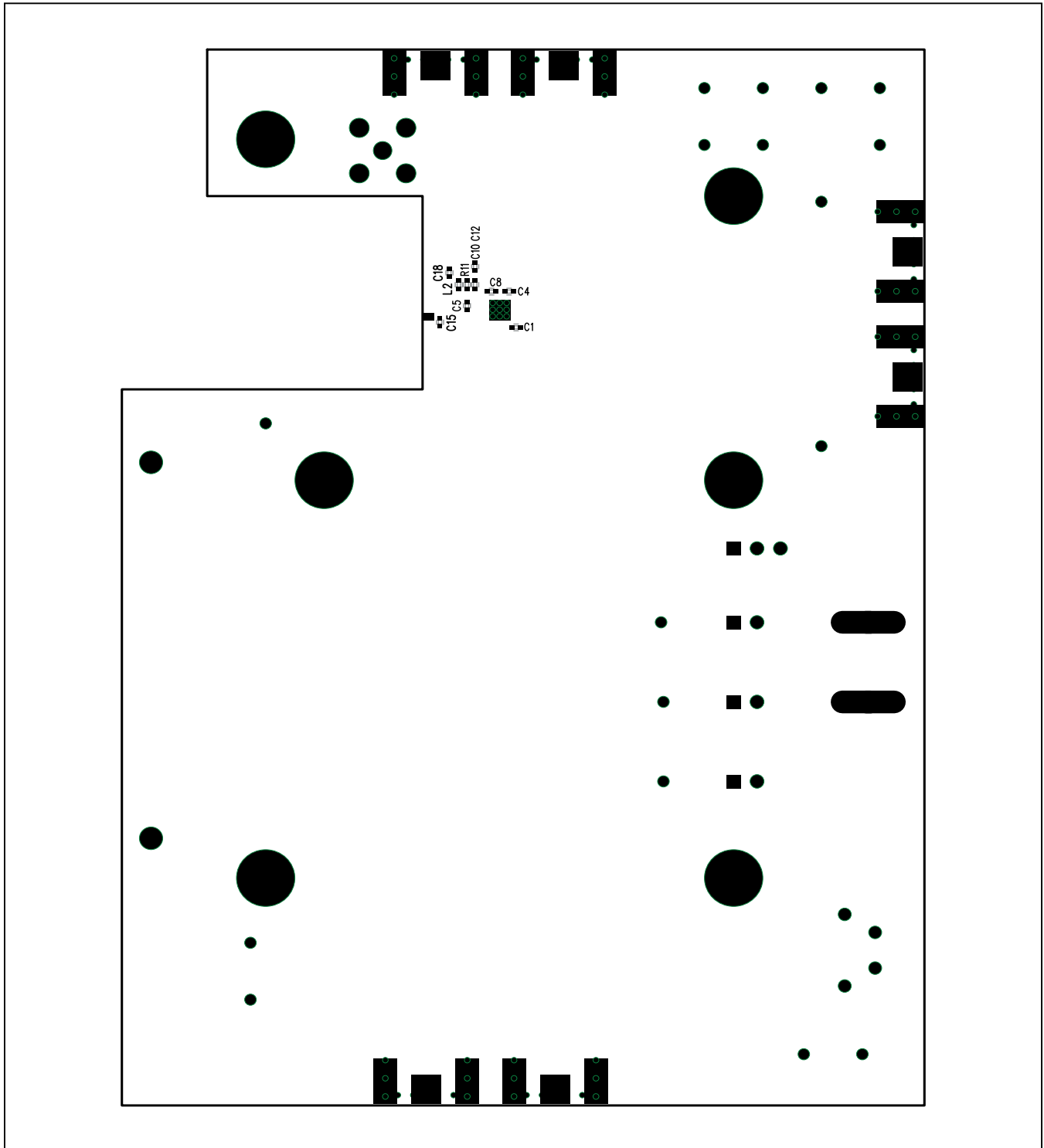


Figure 9. MAX3711 EV Kit Component Placement Guide—Solder Side

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## ***Ordering Information***

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<b>PART</b>	<b>TYPE</b>
MAX3711EVKIT#	EV Kit

*#Denotes RoHS compliant.*

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### *Revision History*

REVISION NUMBER	REVISION DATE	DESCRIPTION	PAGES CHANGED
0	9/12	Initial release	—



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