MAX8989 Evaluation Kit

Evaluates: MAX8989

General Description

The MAX8989 evaluation kit (EV kit) is a fully assembled and tested circuit for evaluating the MAX8989 step-down converter with linear bypass regulator. The EV kit operates from a 2.7V to 5.5V power supply or battery. The output regulates to twice the voltage at REFIN (0.2V to 1.7V) and provides up to 2.5A drive capability.

Component List

DESIGNATION	QTY	DESCRIPTION
C1, C2, C4, C5, C6	5	4.7µF 20%, 6.3V X5R ceramic capacitors (0603) TDK C1608X5R0J475M
C3	1	1000pF ±5%, 50V C0G ceramic capacitor (0402) Murata GRM1555C1H102J
C7	0	Not installed, ceramic capacitor (0603)
JU1	1	2-pin header, 0.1in
JU2	1	3-pin header, 0.1in
L1	1	4.7µH ±20%, 252mΩ, 850mA inductor, 1.2mm (max) height (2520) TOKO 1239AS-H-4R7N=P2 (DFE252012C)
U1	1	PWM step-down converter (9 WLP, 0.5mm pitch) Maxim MAX8989EWL+
—	2	Shunts, 2-position
—	1	PCB: MAX8989 EVALUATION KIT+

Features

- **PA Step-Down Converter**
  - **25µs (typ) Settling Time for 0.4V to 3.2V Output-Voltage Change**
  - **Dynamic Output-Voltage Setting from 0.4V to V_{IN}**
  - **85mΩ PFET and 100% Duty Cycle for Low Dropout**
  - **2MHz Switching Frequency**
  - **Low Output-Voltage Ripple**
  - **2% Output-Voltage Accuracy Over Load, Line, and Temperature**
  - **Tiny External Components**
- **2.5A Output-Current Capability**
- **Simple Logic On/Off Control**
- **Low 0.1µA Shutdown Current**
- **2.7V to 5.5V Supply Voltage Range**
- **Thermal-Overload Protection**
- **Proven PCB Layout**
- **Fully Assembled and Tested**

Ordering Information

PART	TYPE
MAX8989EVKIT+	EV Kit

+Denotes lead(Pb)-free and RoHS compliant.

Component Suppliers

SUPPLIER	PHONE	WEBSITE
Murata Electronics North America, Inc.	770-436-1300	www.murata-northamerica.com
TDK Corp.	847-803-6100	www.component.tdk.com
TOKO America, Inc.	847-297-0070	www.tokoam.com

Note: *Indicate that you are using the MAX8989 when contacting these component suppliers.*

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

19-5745; Rev 0; 1/11

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Quick Start

Recommended Equipment

- MAX8989 EV kit
- 2.7V to 5.5V power supply or battery capable of delivering 2.5A
- Voltage reference or power supply capable of providing 0.2V to 1.7V (must be able to sink and source up to 1mA)
- Voltmeter
- Load (resistor or electronic load)

Procedure

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

1) Preset the power supply to 3.7V.
2) Preset the voltage reference between 0.2V and 1.7V.
3) Turn off the power supply and reference. Do not turn on the power supply until all connections are completed.
4) Remove the shunt from jumper JU1.
5) Connect the positive power-supply terminal to the EV kit PCB pad labeled IN.
6) Connect the negative power-supply terminal to the EV kit PCB pad labeled GND1.
7) Connect the positive voltage-reference terminal to the EV kit PCB pad labeled REFIN.
8) Connect the negative voltage-reference terminal to the EV kit PCB pad labeled AGND.
9) Connect the load from OUT to GND2.
10) Turn on the power supply and voltage reference.
11) Install the shunt on jumper JU1.
12) With the voltmeter, verify that the voltage from OUT to PGND2 is approximately twice the reference voltage.

Detailed Description of Hardware

The MAX8989 output regulates to twice the voltage at REFIN and provides up to 2.5A drive capability. REFIN must connect to an external reference supply between 0.2V and 1.7V. Connect the ground of the reference supply to the AGND PCB pad. **Do not use AGND as a power-ground connection.**

Enable

Enable/shutdown control is provided by jumper JU1. For normal operation, place a shunt on the pins of JU1. For low-power shutdown mode, remove the shunt from JU1. In shutdown mode, the step-down regulator and LDO are off, reducing the supply current to 0.1µA (typ).

To drive the enable input from an external logic source, remove the shunt on JU1. Connect the logic signal to pin 2 of JU1. Connect the signal ground to AGND. Refer to the *Electrical Characteristics* section in the MAX8989 IC data sheet for the required logic levels.

Skip Mode

The device has an optional skip mode. To enable skip mode, connect pins 2-3 of jumper JU2. Skip mode provides the highest possible efficiency during light-load conditions, reducing the no-load supply current to 115µA (typ). Skip mode is only active when the output voltage is less than 1V.

To prevent the device from entering skip mode, connect pins 1-2 of JU2.

Table 1. Jumper Settings (JU1, JU2)

JUMPER	SHUNT POSITION		
	OPEN	1-2	2-3
JU1	Shutdown mode	Output enabled	—
JU2	—	Forced-PWM operation	Skip mode enabled for light loads with V_{OUT} < 1V

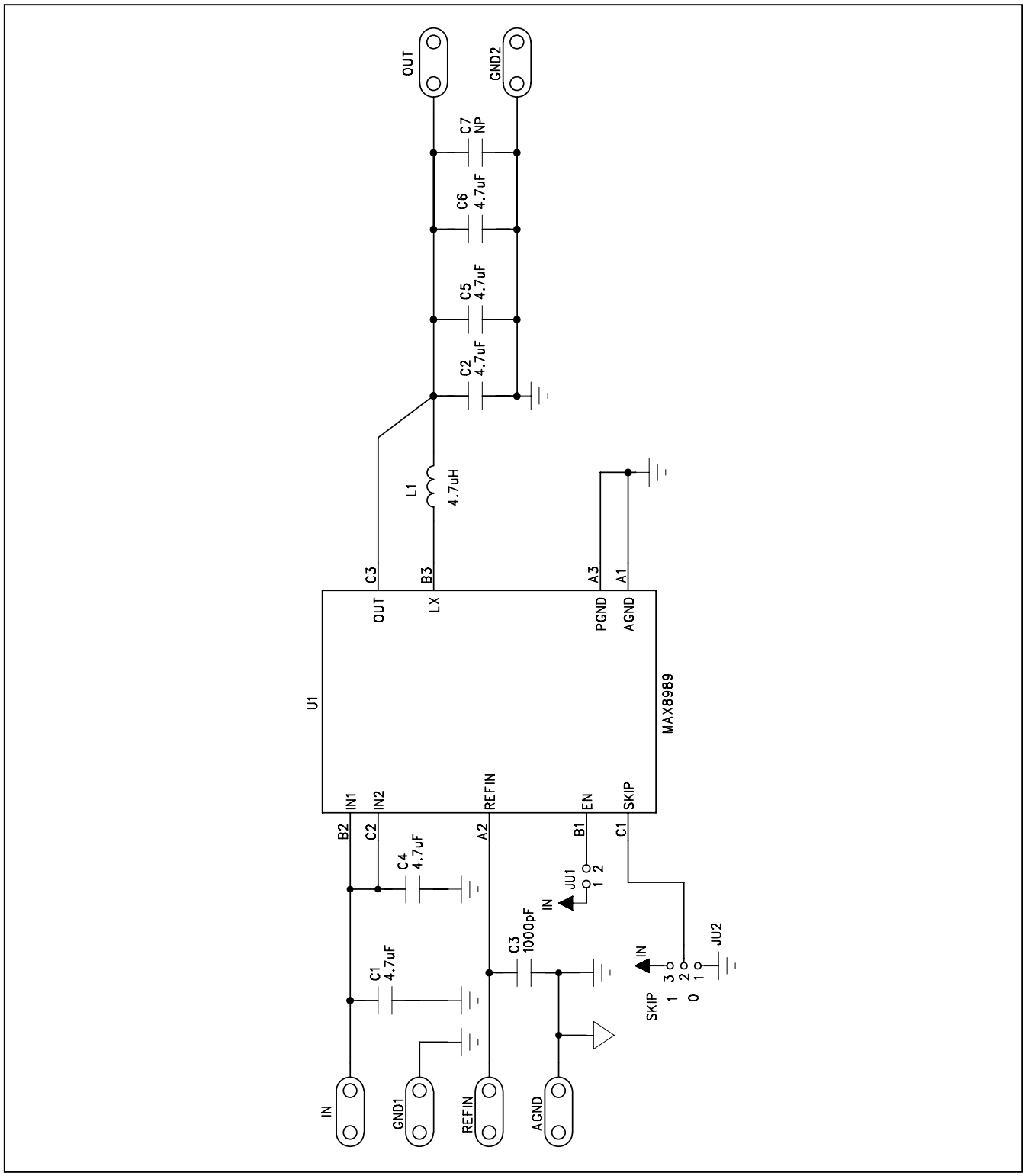

Figure 1. MAX8989 EV Kit Schematic

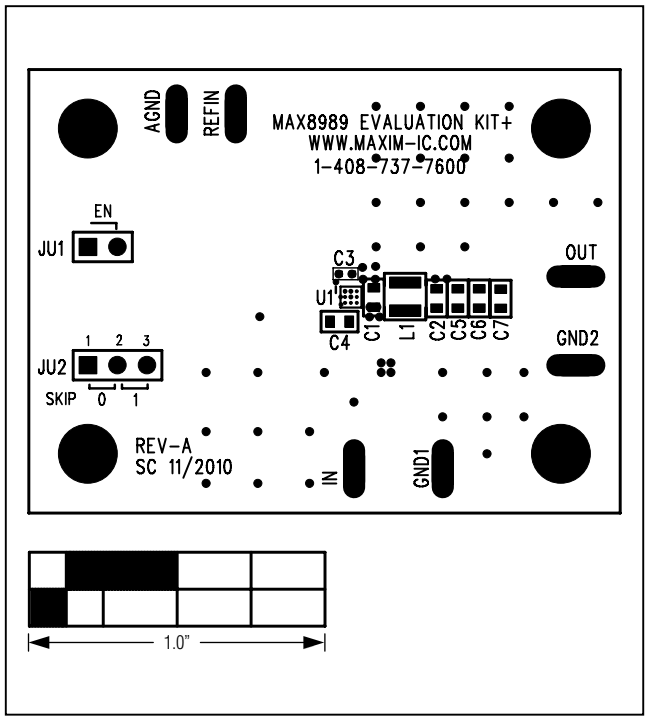

Figure 2. MAX8989 EV Kit Component Placement Guide—Component Side

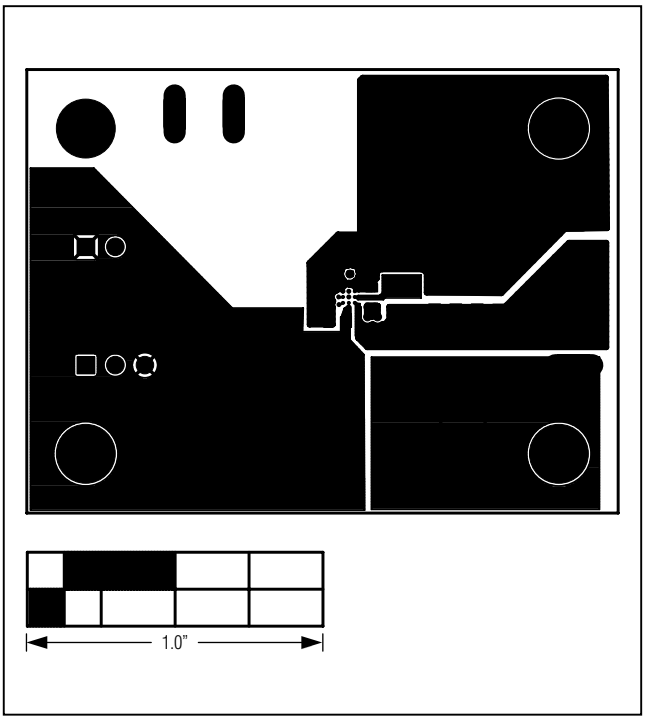

Figure 3. MAX8989 EV Kit PCB Layout—Component Side (Layer 1)

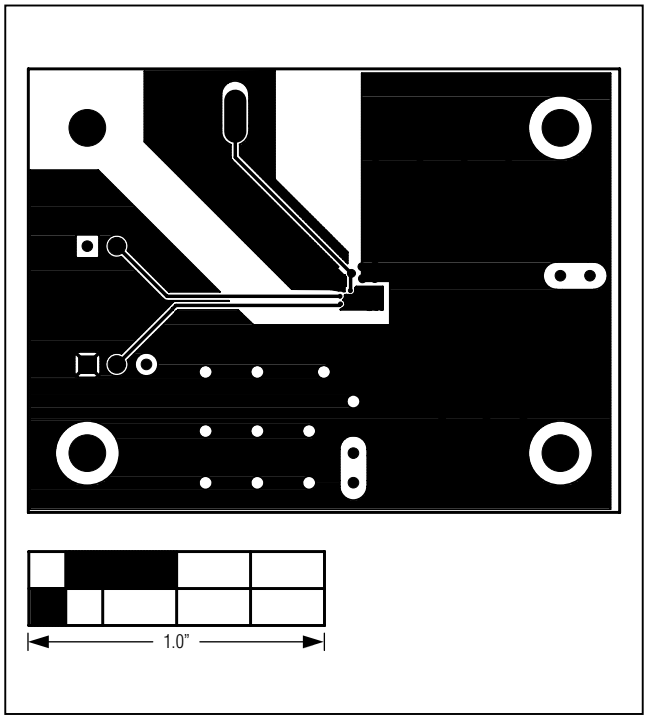

Figure 4. MAX8989 EV Kit PCB Layout—Inner Layer 2

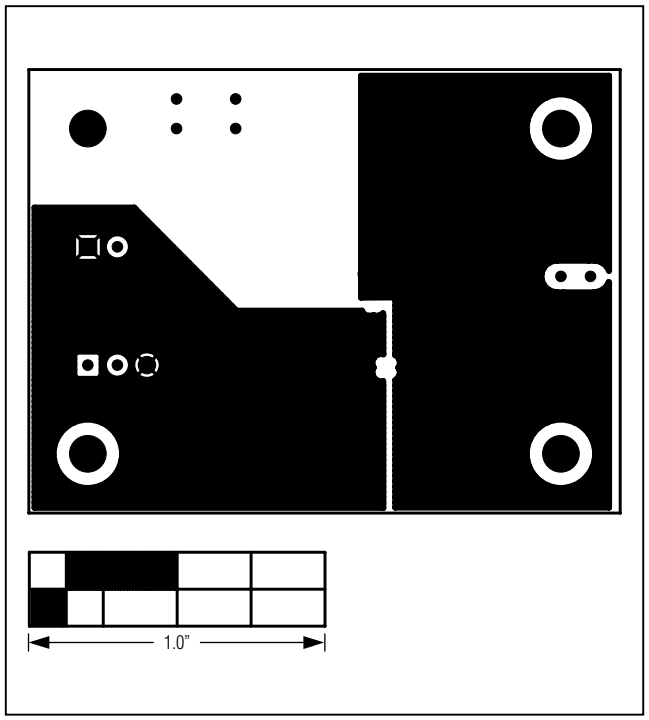

Figure 5. MAX8989 EV Kit PCB Layout—Inner Layer 3

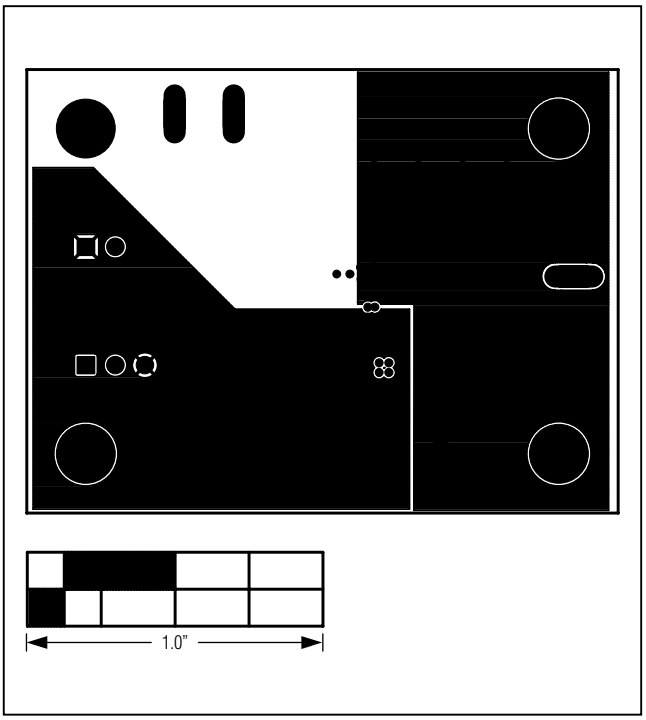

Figure 6. MAX8989 EV Kit PCB Layout—Solder Side (Layer 4)

Revision History

REVISION NUMBER	REVISION DATE	DESCRIPTION	PAGES CHANGED
0	1/11	Initial release	—

Стандарт Электрон Связь

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