



MAX8727 Evaluation Kit

Evaluates: MAX8727

General Description

The MAX8727 evaluation kit (EV kit) is a fully assembled and tested surface-mount circuit board that contains a pulse-width-modulated (PWM) step-up DC-DC converter. The EV kit is configured to operate with a 1.2MHz switching frequency. It operates from a 2.6V to 5.5V DC supply voltage, is configured for a 15V output, and can provide 600mA with a 4.5V input.

The MAX8727 EV kit features low quiescent current and high conversion efficiency (90%). The high switching frequency allows for the use of small surface-mount components.

Features

- ◆ 90% Efficiency
- ◆ 2.6V to 5.5V Input Range
- ◆ 15V Output Voltage (Adjustable from V_{IN} to 24V)
- ◆ 600mA Output Current (4.5V Input)
- ◆ 1.2MHz Switching Frequency (Selectable: 640kHz or 1.2MHz)
- ◆ Programmable Soft-Start
- ◆ 0.1 μ A IC Shutdown Current (typ)
- ◆ Fully Assembled and Tested

Ordering Information

PART	TEMP RANGE	IC PACKAGE
MAX8727EVKIT	0°C to +70°C	10 TDFN (3mm x 3mm)

Component List

DESIGNATION	QTY	DESCRIPTION
C1	0	Not installed, ceramic capacitor (0805)
C2	1	10 μ F \pm 10%, 6.3V X5R ceramic capacitor (0805) Murata GRM21BR60J106K Taiyo Yuden JMK212BJ106K
C3	1	1 μ F \pm 10%, 6.3V X5R ceramic capacitor (0603) Murata GRM188R60J105K
C4	1	0.033 μ F \pm 10%, 25V X7R ceramic capacitor (0603) Murata GRM188R71E333K
C5	1	330pF \pm 10%, 50V X7R ceramic capacitor (0603) Murata GRM188R71H331K
C6	1	39pF \pm 5%, 50V C0G ceramic capacitor (0603) Murata GRM1885C1H390J Taiyo Yuden UMK107CG390JZ
C7, C8, C9	3	4.7 μ F \pm 20%, 25V X7R ceramic capacitors (1206) Murata GRM31CR71E475M Taiyo Yuden TMK316BJ475KL

DESIGNATION	QTY	DESCRIPTION
C10	1	100 μ F \pm 20%, 6.3V aluminum electrolytic capacitor (SMT: 6.3mm x 6.0mm) Sanyo 6CV100AX
D1	1	3A, 30V Schottky diode (M-flat) Toshiba CMS02
L1	1	3.6 μ H \pm 30%, 2.5A power inductor Sumida CDRH6D26-3R6NC
R1	1	309k Ω \pm 1% resistor (0603)
R2	1	28.0k Ω \pm 1% resistor (0603)
R3, R4	2	100k Ω \pm 5% resistors (0603)
R5	0	Not installed; short by PC trace (0603)
JU1	1	2-pin header
JU2	0	Not installed, 3-pin header
U1	1	MAX8727ETB (10-pin TDFN 3mm x 3mm) (top mark AMV)
None	1	Shunts
None	1	MAX8727 EV kit PC board

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Recommended Equipment

- 2.6V to 5.5V, 5A DC power supply (VIN)
- Voltmeter

Quick Start

The MAX8727 EV kit is fully assembled and tested. Follow these steps to verify board operation. **Do not turn on the power supply until all connections are completed.**

- 1) Verify that there is no shunt placed across jumper JU1 to enable the MAX8727.
- 2) Connect the positive terminal of the DC power supply to the VIN pad. Connect the negative terminal of the DC power supply to the GND pad above the VIN pad.
- 3) Connect the voltmeter across the VOUT and GND pads.
- 4) Turn on the 2.6V to 5.5V DC power supply and verify that the output is 15V.

Detailed Description

The MAX8727 EV kit contains a high-efficiency, PWM step-up DC-DC converter. The MAX8727 features a programmable soft-start, loop compensation pin, and an internal MOSFET switch. The EV kit operates from a 2.6V to 5.5V DC power supply, provides a regulated 15V output, and is capable of providing a 600mA load current with a 4.5V input. The EV kit is configured for a 5V input, a 15V output, and a 1.2MHz switching frequency. **Operation at a different input voltage, output voltage, or switching frequency may require a different inductor, output capacitor, and compensation components.** Refer to the MAX8727 data sheet for detailed information on loop compensation and component selection.

Jumper Selection

Shutdown Mode (*SHDN*)

The EV kit features a shutdown mode that reduces the MAX8727 quiescent current. JU1 selects the shutdown mode. See Table 1 for jumper JU1 functions.

Switching-Frequency Selection (*FREQ*)

The MAX8727 EV kit provides the option to configure the switching frequency of the step-up DC-DC converter. Table 2 lists jumper JU2 settings for configuring the switching frequency. The EV kit is configured and shipped to operate at 1.2MHz. For operation at 640kHz, cut the trace between pins 1 and 2 of jumper JU2 and short pins 2 and 3. Refer to the MAX8727 data sheet for selecting the proper components.

Table 1. Jumper JU1 Functions

SHUNT LOCATION	<i>SHDN</i> PIN	MAX8727 OUTPUT
Installed	Connected to GND	Shutdown mode, $V_{OUT} = V_{IN} - V_{DIODE}$
Not installed (default)	Connected to VIN through R4	MAX8727 enabled, $V_{OUT} = 15V$

Table 2. Jumper JU2 Functions

SHUNT LOCATION	FREQ PIN	SWITCHING FREQUENCY
1-2 (default)	Connected to VIN with a PC trace	1.2MHz
2-3	Connected to GND (cut the trace between pins 1-2 before shorting pins 2-3)	640kHz

Evaluating Other Output Voltages

The EV kit is configured to provide a 15V output voltage. However, the output voltage can be adjusted from V_{IN} to 24V by selecting appropriate R1 and R2 values. Select R2 in the 10k Ω to 50k Ω range. R1 is then given by:

$$R1 = R2 \times \left[\left(\frac{V_{OUT}}{V_{FB}} \right) - 1 \right]$$

where $V_{FB} = 1.24V$. For significantly different operation points, the EV kit may require a different inductor and component changes. Refer to the MAX8727 data sheet for proper component selection.

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Component Suppliers

SUPPLIER	PHONE	FAX	WEBSITE
Murata	770-436-1300	770-436-3030	www.murata.com
Sanyo	619-661-4134	619-661-1055	www.sanyovideo.com
Sumida	847-545-6700	847-545-6720	www.sumida.com
Taiyo Yuden	408-573-4150	408-573-4159	www.t-yuden.com
Toshiba	949-455-2000	949-859-3963	www.toshiba.com/taec

Note: Indicate that you are using the MAX8727 when contacting these suppliers.

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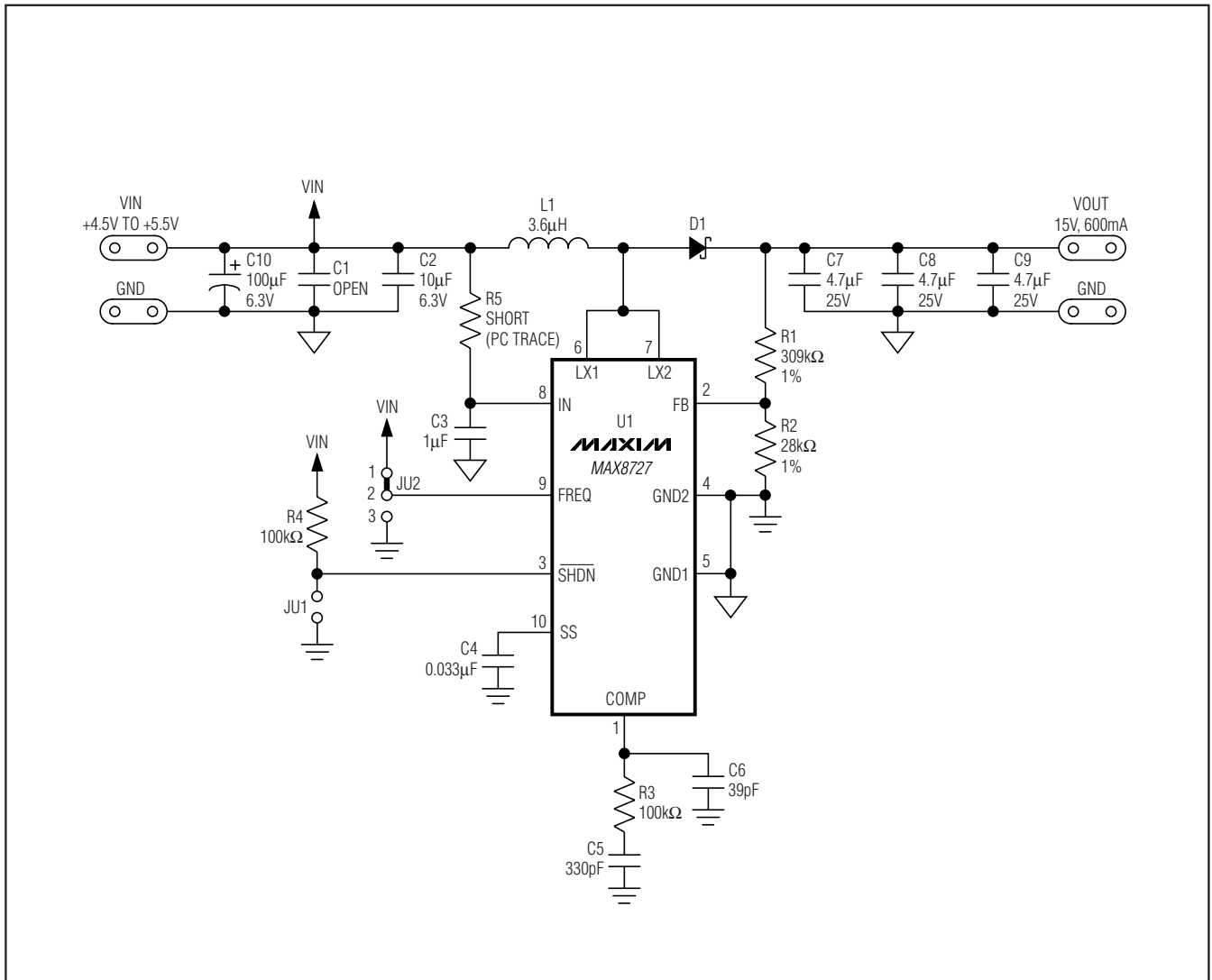


Figure 1. MAX8727 EV Kit Schematic

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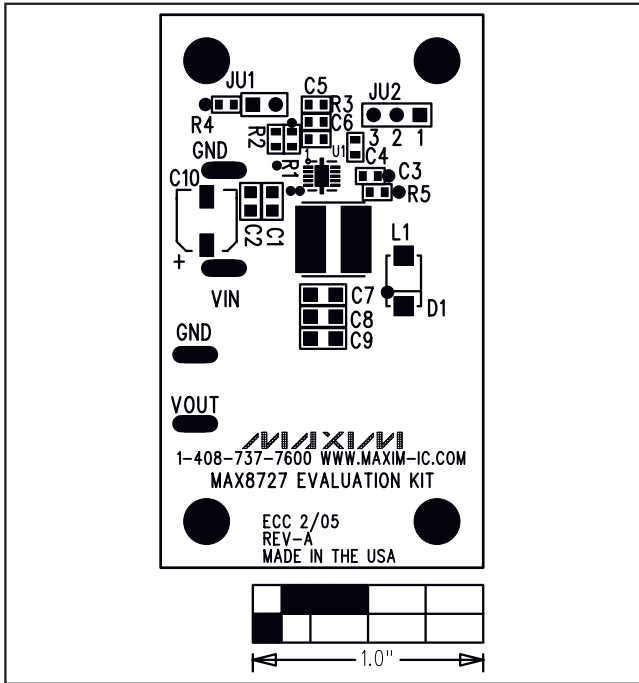


Figure 2. MAX8727 EV Kit Component Placement Guide—Component Side

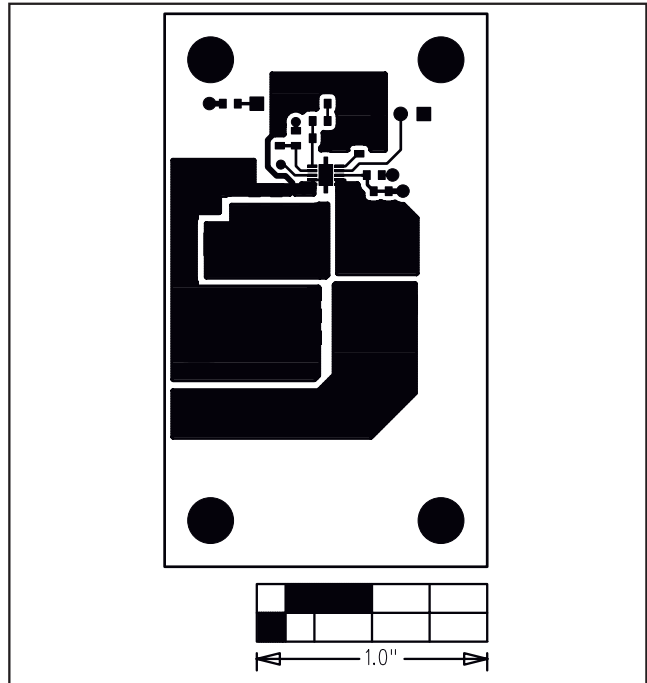


Figure 3. MAX8727 EV Kit PC Board Layout—Component Side

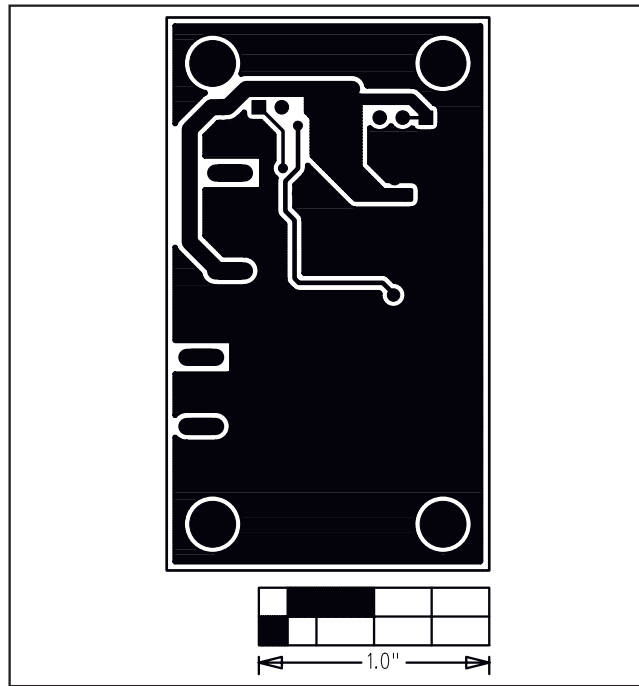


Figure 4. MAX8727 EV Kit PC Board Layout—Solder Side

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