



MAX8640 Evaluation Kit

General Description

The MAX8640 evaluation kit (EV kit) is a fully assembled and tested circuit for evaluating the MAX8640 step-down DC-DC converter. The MAX8640 EV kit operates from a 2.7V to 4.9V supply and provides a 500mA output. The 1.8V/2MHz version of the MAX8640 comes installed in the EV kit, but the same board can be used to evaluate the other versions. The MAX8640 is available with factory preset output voltages ranging from 0.8V to 2.5V.

Component List

DESIGNATION	QTY	DESCRIPTION
C1	1	2.2 μ F \pm 20%, 6.3V X5R ceramic capacitor (0603) Taiyo Yuden JMK107BJ225KA TDK C1608X5R0J225K
C2	1	4.7 μ F \pm 20%, 6.3V X5R ceramic capacitor (0603) TDK C1608X5R0J475M
JU1	1	3-pin header
L1	1	2.2 μ H, 1.3A, 80m Ω inductor (2.5mm x 2.0mm) FDK MIPF2520D2R2
L2	1	2.2 μ H inductor (0603) Taiyo Yuden CBMF1608T2R2M (not connected in circuit)
U1	1	MAX8640YEXT18+ (6-pin SC70-6)
—	1	Shunt, 2-position

Features

- ◆ Tiny 6-Pin SC70 IC Package
- ◆ 500mA Guaranteed Output Current
- ◆ Tiny External Components: (1 μ H/2.2 μ F or 2.2 μ H/4.7 μ F)
- ◆ 24 μ A Quiescent Current
- ◆ \pm 1% Initial Accuracy
- ◆ Ultra-Fast Line and Load Transient Response
- ◆ Low Output Ripple at All Loads
- ◆ Fully Assembled and Tested

Ordering Information

PART	TEMP RANGE	IC PACKAGE
MAX8640EVKIT	0°C to +70°C	6 SC70-6

+Denotes a lead-free and RoHS-compliant EV kit.

Quick Start

Recommended Equipment

- 2.7V to 4.9V power supply capable of delivering 500mA
- Voltmeter
- Load (up to 500mA)

Procedure

The MAX8640 EV kit is fully assembled and tested. Follow the steps below to verify board operation.

Caution: Do not turn on the power supply until all connections are completed.

- 1) Place the shunt across pins 2-3 of JU1 of the EV kit to enable the converter.
- 2) Set the power-supply voltage between 2.7V and 4.9V. Turn the power supply off.
- 3) Connect the positive power-supply lead to the EV kit pad labeled IN. Connect the power-supply ground to the EV kit pad labeled GND.
- 4) Connect the load between the EV kit pads labeled OUT and GND.
- 5) Turn on the power supply.
- 6) Connect a voltmeter across the EV kit terminals OUT and GND to verify that the output voltage is 1.8V.

Evaluates: MAX8640Y/MAX8640Z

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Detailed Description

Safe Operating Region and Power Dissipation

The MAX8640 delivers up to 0.5A and operates with input voltages up to 4.9V, but not simultaneously. The power dissipated in the MAX8640 must not exceed the maximum power dissipation of 245mW (derate 3.1mW/°C above $T_A = +70^\circ\text{C}$) for the SC70 package that is installed on the EV kit by default, or 167mW (derate 2.1mW/°C above $T_A = +70^\circ\text{C}$) for the μDFN package. The operating power dissipation of the MAX8640 depends on the output current and the duty cycle (output to input voltage ratio). Figures 1 and 2 show the safe operating area of the MAX8640 in the SC70 and μDFN packages. To ensure the maximum power dissipation is not exceeded, operate the MAX8640 at or below the levels shown in these figures.

Evaluating Other Versions of the MAX8640

The MAX8640 EV kit comes with the MAX8640YEXT18+ (1.8V output, 2MHz) version installed, but any version of the MAX8640 can be used. The footprint provided on the EV kit supports both SC70 and μDFN packages. To evaluate other versions, carefully remove the MAX8640 from the EV kit and replace with the desired part. The input and output capacitors and inductor may also need to be changed for optimum performance. A tiny 1 μH inductor can also be used with the MAX8640Z (4MHz). Refer to the MAX8640Y/MAX8640Z data sheet for information on component selection.

Table 1. JU1 Functions

SHUNT POSITION	FUNCTION
1-2	Shutdown
2-3	Enable

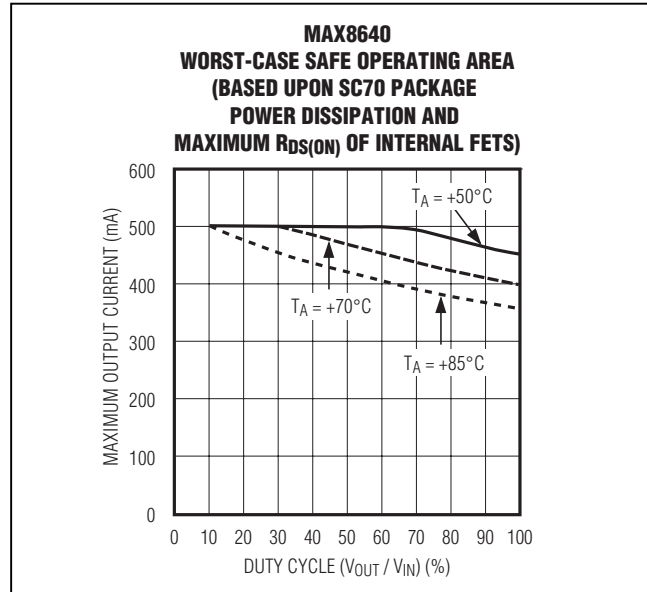


Figure 1. SC70 Safe Operating Area

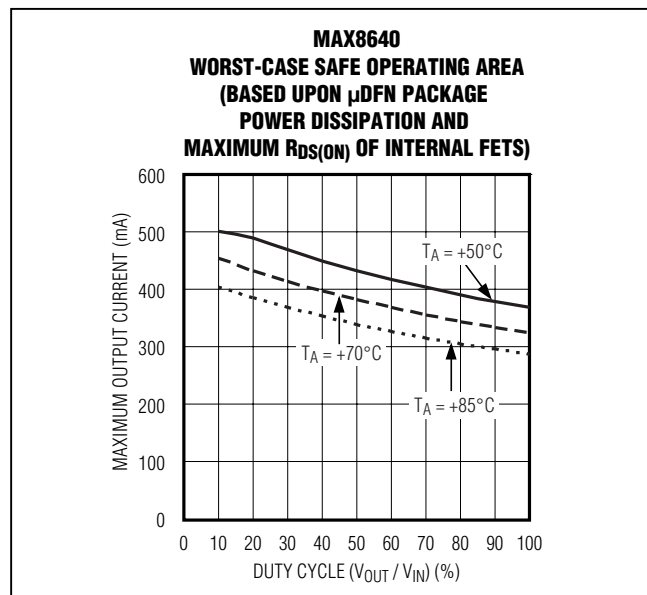


Figure 2. μDFN Safe Operating Area

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Evaluates: MAX8640Y/MAX8640Z

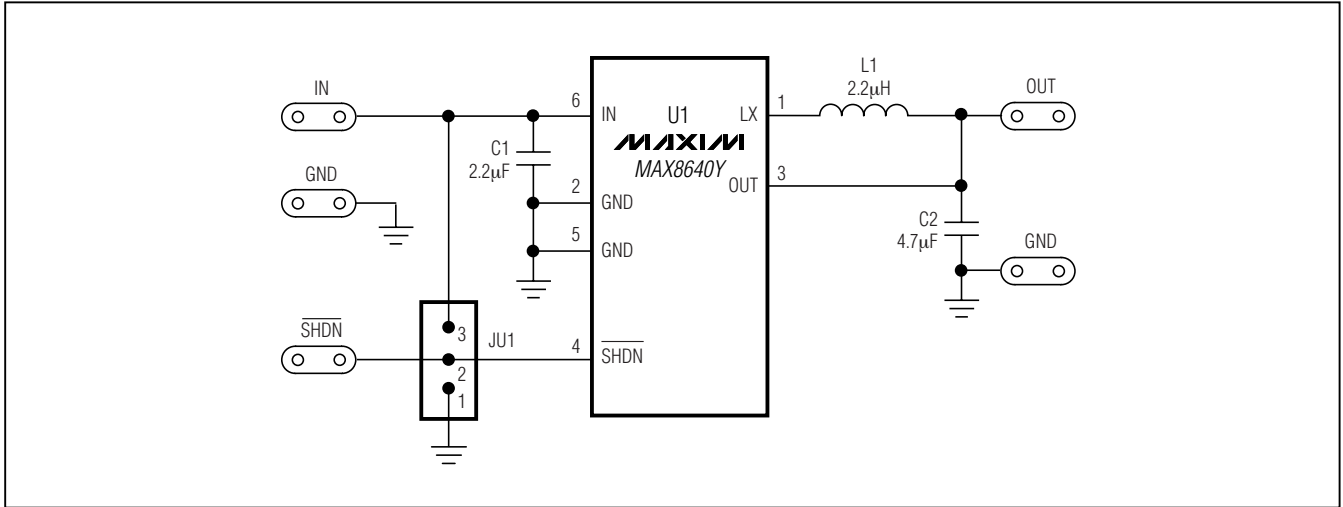


Figure 3. MAX8640 EV Kit Schematic

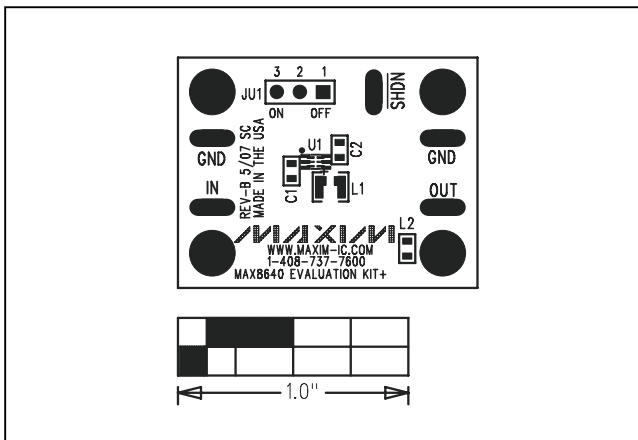


Figure 4. MAX8640 EV Kit Component Placement Guide—Component Side

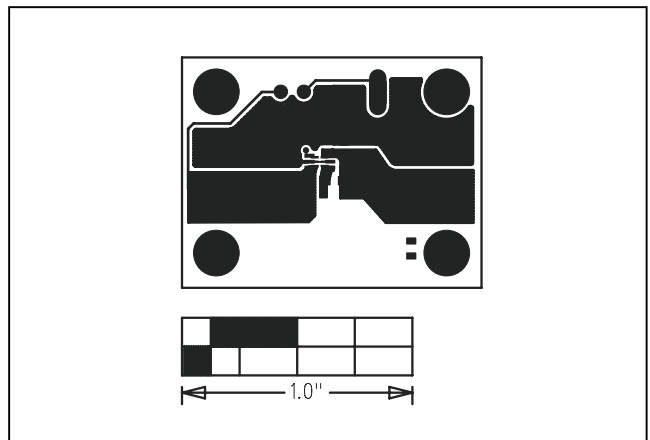


Figure 5. MAX8640 EV Kit PCB Layout—Component Side

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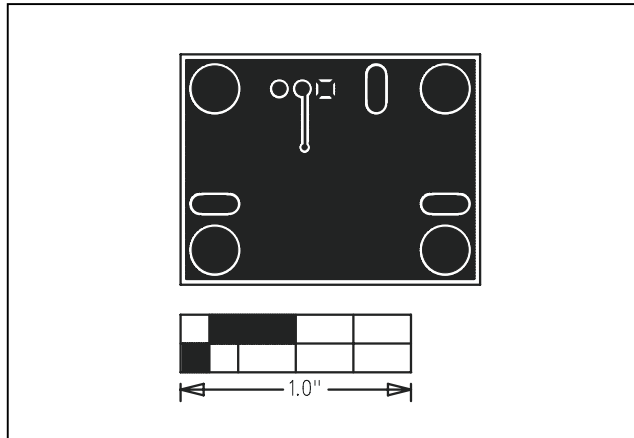


Figure 6. MAX8640 EV Kit PCB Layout—Solder Side

Revision History

Pages changed at Rev 1: 1, 2, 3

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