

MAXIM

MAX1776 Evaluation Kit

General Description

The MAX1776 evaluation kit (EV kit) provides a +5.0V output voltage from a +5.5V to +24V input source. It delivers 500mA output current and operates up to 100% duty cycle at dropout. The MAX1776 is a step-down switching regulator with an internal power switch.

The EV kit is a fully assembled and tested surface-mount PC board. It can also be used to evaluate other output voltages in the +1.25V to +23.5V range by adding the feedback resistors and changing a jumper setting.

Features

- ◆ +5.5V to +24V Input Voltage Range (for Fixed +5V Output)
- ◆ +4.5V to +24V Input Voltage Range (for +3.3V Output)
- ◆ Output Voltage
 - Fixed +5V
 - Adjustable Output (+1.25V to +23.5V)
- ◆ 500mA Output Current
- ◆ 3µA IC Shutdown Mode
- ◆ 8-Pin µMAX Package
- ◆ Surface-Mount Construction
- ◆ Fully Assembled and Tested

Component List

DESIGNATION	QTY	DESCRIPTION
C1	1	10µF ±10%, 25V, X5R ceramic capacitor (1812) Taiyo Yuden TMK432BJ106KM or TDK C4532X5R1E106M
C2	1	100µF, 6.3V, 45mΩ low-ESR electrolytic capacitor (POSCAP) (D2) Sanyo 6TPC100M
D1	1	1A, 30V Schottky diode Nihon EP10QY03
L1	1	10µH inductor Sumida CDRH6D28-100NC
R1	0	Not installed (0603)
R2	0	Not installed, pads shorted with PC
JU1, JU4	2	3-pin headers
JU2, JU3	0	Not installed, pins 1 and 2 shorted with PC trace
U1	1	MAX1776EUA (8-pin µMAX)
None	2	Shunts
None	1	MAX1776 PC board
None	1	MAX1776 EV kit data sheet
None	1	MAX1776 data sheet

Ordering Information

PART	TEMP. RANGE	IC PACKAGE
MAX1776EVKIT	-40°C to +85°C	8 µMAX

Component Suppliers

SUPPLIER	PHONE	FAX
Nihon	847-843-7500	847-843-2798
Sanyo	619-661-6835	619-661-1055
Sumida	847-956-0666	847-956-0702
Taiyo Yuden	408-573-4150	408-573-4159
TDK	847-390-4373	847-390-4428

Note: Please indicate that you are using the MAX1776 when contacting these component suppliers.

Evaluates: MAX1776



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Quick Start

The MAX1776 EV kit is a fully assembled and tested surface-mount board. Follow the steps below to verify board operation. **Do not turn on the power supply until all connections are completed.**

- 1) Verify that shunts are across pins 1 and 2 of jumper JU1 (SHDN) and pins 1 and 2 of jumper JU4.
- 2) Connect a voltmeter and load (if any) to the VOUT pad. Connect the ground to the GND pad closest to VOUT.
- 3) Connect a +5.5V to +24V power supply to the VIN pad. Connect the power-supply ground to the GND pad closest to VIN.
- 4) Turn on the power supply, and verify that the output voltage is +5.0V.

To evaluate other output voltages, refer to *Evaluating Other Output Voltages*

Detailed Description

Shutdown Jumper Selection

The MAX1776 EV kit features a shutdown mode that reduces quiescent current to 3 μ A (typ) to preserve battery life. Jumper (JU1) options select the circuit operating modes: shutdown or normal mode (Table 1).

Adjustable Current Limit

The MAX1776 EV kit can operate at different current limits after modification. Jumper (JU2 and JU3) options select the MAX1776 internal switch current limit. The EV

kit's default setting provides the maximum 1.2A switch current limit. To change the switch current limit, cut open the PC board traces, shorting pins 1 and 2 of JU2 and JU3, and short the appropriate pins for the desired current limit (Table 2). Changing the current limit requires inductor L1 and output capacitor C2 to be replaced. Refer to the *Recommended Components Table* (Table 3) of the MAX1776 data sheet.

Evaluating Other Output Voltages

The default output for the MAX1776 EV kit is +5.0V. To generate output voltages other than +5.0V, set the JU4 shunt to pins 2 and 3 (Table 3), cut the PC board trace shorting the pads of R2, and install feedback resistors R1 and R2. Select feedback resistor R2 in the 10k Ω to 100k Ω range.

$$R1 = R2 [(V_{OUT} / 1.25V) - 1]$$

Table 2. Jumper JU2 and JU3 Functions

JU2 SHUNT LOCATION	JU3 SHUNT LOCATION	MAX1776 SWITCH CURRENT LIMIT (A)
2 and 3	2 and 3	0.15
1 and 2	2 and 3	0.30
2 and 3	1 and 2	0.60
1 and 2*	1 and 2*	1.20

*Default configuration: JU2 (1-2), JU3 (1-2) shorted by PC board trace.

Table 1. Jumper JU1 Functions

SHUNT LOCATION	SHDN PIN	MAX1776 OUTPUT
1 and 2	Connected to VIN	MAX1776 enabled, V _{OUT} = +5.0V
2 and 3	Connected to GND	Shutdown mode, V _{OUT} = 0V
None	Connect external source to SHDN pad	MAX1776 output depends on external SHDN signal

Table 3. Jumper JU4 Functions

SHUNT LOCATION	JUMPER CONNECTION	MAX1776 OUTPUT
1 and 2	Connected to OUT	Fixed output, V _{OUT} = +5.0V
2 and 3	Connected to a voltage-divider	Adjustable output

Note: Do not switch JU4 shunt location or leave JU4 floating (no shunt across JU4) when power is on.

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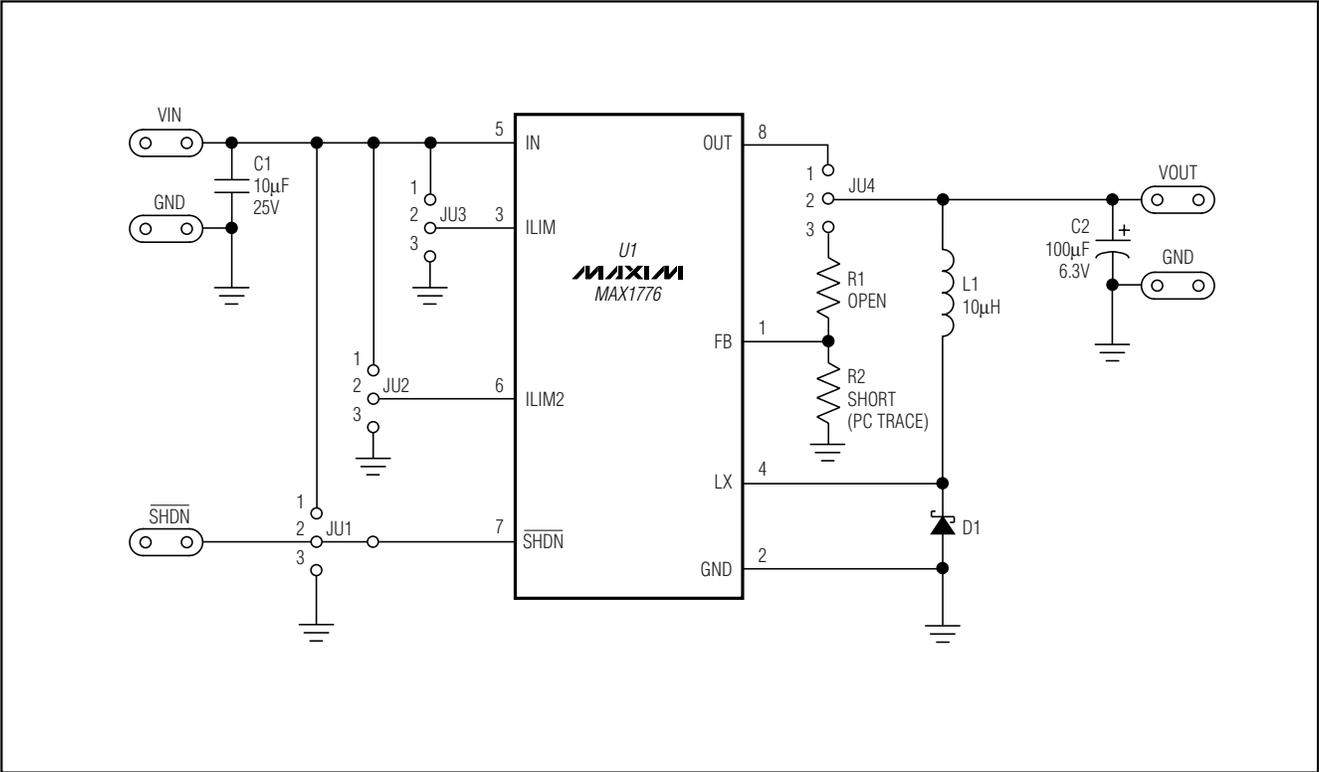


Figure 1. MAX1776 EV Kit Schematic

MAX1776 Evaluation Kit

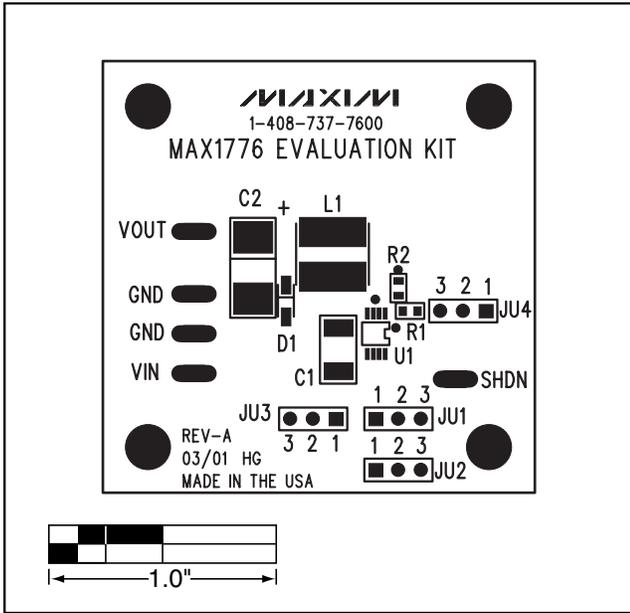


Figure 2. MAX1776 EV Kit Component Placement Guide—Component Side

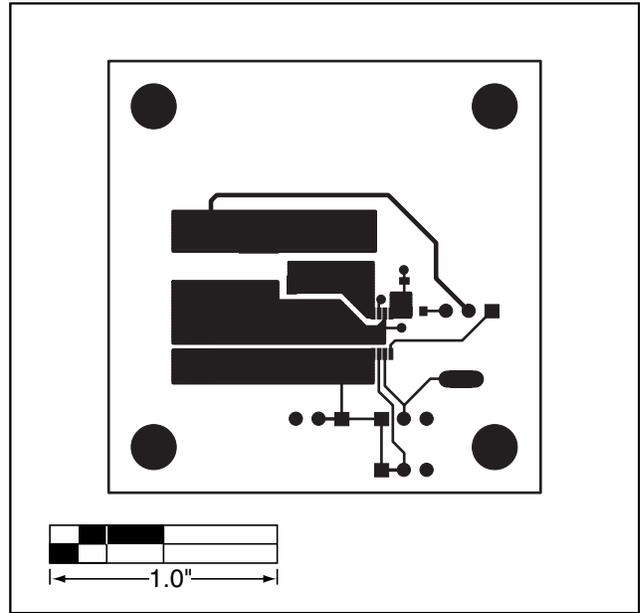


Figure 3. MAX1776 EV Kit PC Board Layout—Component Side

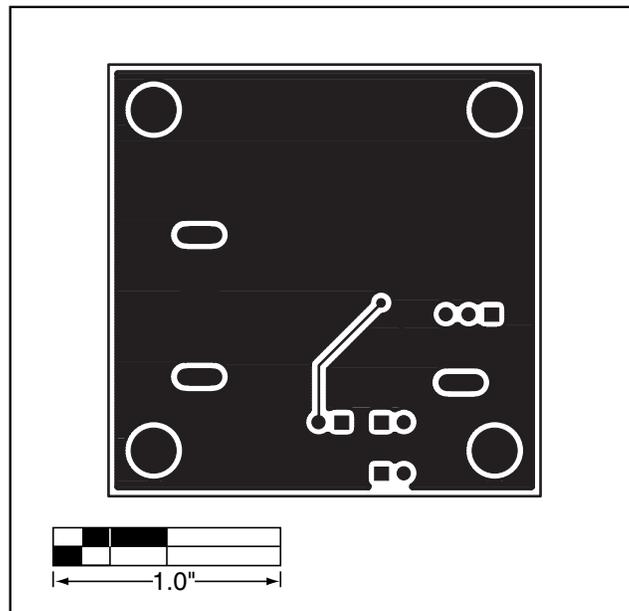


Figure 4. MAX1776 EV Kit PC Board Layout—Solder Side

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