

MAXIM

MAX1761 Evaluation Kit

Evaluates: MAX1761

General Description

The MAX1761 evaluation kit (EV kit) demonstrates a standard 2A application circuit. This DC-DC converter steps down high-voltage batteries and/or AC adapters, generating a precision, low-voltage rail for use as chipset, I/O, and other low-voltage supplies in notebook computers and PDAs.

The MAX1761 EV kit provides dual 1.8V and 2.5V output voltages from a +5V to +20V battery input range. It delivers up to a 2A output current for each output with greater than 90% efficiency. The EV kit operates at 300kHz switching frequency and has superior line- and load-transient response.

This EV kit is a fully assembled and tested circuit board. It also allows the evaluation of other output voltages in the 1.0V to 5.5V range by changing feedback resistors R1–R4.

Features

- ◆ +5V to +20V Input Voltage Range
- ◆ Preset 1.8V and 2.5V Output Voltages
- ◆ Adjustable Output Voltages (1V to 5.5V, external divider)
- ◆ 2A Output Current
- ◆ 300kHz Switching Frequency
- ◆ No Current-Sense Resistor
- ◆ 4 μ A V+ Shutdown Supply Current
- ◆ 5 μ A V_L Shutdown Supply Current
- ◆ 16-Pin QSOP Package
- ◆ Low-Profile Components
- ◆ Fully Assembled and Tested

Ordering Information

PART	TEMP. RANGE	IC PACKAGE
MAX1761EVKIT	0°C to +70°C	16 QSOP

Component List

DESIGNATION	QTY	DESCRIPTION
C1	1	10 μ F, 25V ceramic capacitor (1812) Taiyo Yuden TMK432BJ106KM or TDK C4532X5R1E106M
C2, C7–C11	0	Not installed (0805)
C3, C4	2	220 μ F, 10V low-ESR 40m Ω capacitors Sanyo 10TPB220M or 330 μ F, 10V low-ESR 30m Ω capacitors Kemet T510X337M010AS
C5	1	0.1 μ F ceramic capacitor (0805)
C6	1	4.7 μ F, 10V X5R ceramic capacitor (1206) Taiyo Yuden LMK316BJ475ML
C12	1	1 μ F, 25V X5R ceramic capacitor Taiyo Yuden TMK316BJ105ML
D1, D2	0	Not installed Nihon EP10QY03

DESIGNATION	QTY	DESCRIPTION
L1, L2	2	7 μ H power inductors Sumida CDRH104R-7R0NC
N1, P1, N2, P2	2	Dual N- and P-channel MOSFETs International Rectifier IRF7319 or Fairchild FDS8958A
R1–R6	0	Not installed (0805)
R7, R8	2	1M Ω \pm 5% resistors (0805)
R9	1	10 Ω \pm 5% resistor (0805)
R10–R13	0	Not installed
U1	1	MAX1761EEE (16-pin QSOP)
SW1	1	DIP-3 dip switch
None	4	Rubber bumpers 3M SJ-5007 Mouser 517-SJ-5007BK or equivalent
None	1	MAX1761 PC board
None	1	MAX1761 data sheet
None	1	MAX1761 EV kit data sheet

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Component Suppliers

SUPPLIER	PHONE	FAX
Fairchild	408-721-2181	408-721-1635
International Rectifier	310-322-3331	310-322-3332
Sanyo	619-661-6835	619-661-1055
Sumida	708-956-0666	708-956-0702
Taiyo Yuden	408-573-4150	408-573-4159
TDK	847-390-4373	847-390-4428

Note: Please indicate that you are using the MAX1761 when contacting these suppliers.

Quick Start

The MAX1761 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) Connect voltmeters and loads (if any) to the VOUT pads.
- 2) Verify that switches ON1 and ON2 (SW1) are in the on position.
- 3) Connect a +5V to +20V supply to the pads marked VBATT and GND.

Table 1. Switch SW1 Functions

SW1 LOCATION	ON1 PIN	ON2 PIN	OPERATION MODE
ON1 = low, ON2 = X	Connected to GND, VOUT1 = 0, VOUT2 = 0	—	MAX1761 is in shutdown mode.
ON1 = high, ON2 = low	Connected to VBATT, VOUT1 = 2.5V, VOUT2 = depends on ON2	Connected to GND, VOUT2 = 0	VOUT1 is in normal mode. VOUT2 is in shutdown mode.
ON1 = high, ON2 = floating	Connected to VBATT, VOUT1 = 2.5V	ON2 = float VOUT2 = 1.8V	Low-noise mode, forced fixed-frequency PWM operation.
ON1 = high, ON2 = high	Connected to VBATT, VOUT1 = 2.5V	Connected to VL, VOUT2 = 1.8V	Both outputs are enabled in normal mode. Normal operation allows automatic PWM/PFM switchover for pulse skipping at light load, resulting in highest efficiency.

- 4) Turn on the power and verify that the output voltages are 1.8V and 2.5V.
- 5) Refer to the *Output Voltage Selection* section in the MAX1761 data sheet to modify the board for different output voltages.
- 6) Refer to the *Setting the Current Limit* section in the MAX1761 data sheet to modify the board for a higher output current.

Detailed Description

Switch Settings

Table 1 lists switch settings.

Evaluating Other Output Voltages

The EV kit outputs are preset to +1.8V and +2.5V. However, the output voltages can also be adjusted between 1.0V and 5.5V by selecting R1/R2 and R3/R4 values. R1 and R3 are given by:

$$R1 \text{ or } R3 = (R2 \text{ or } R4) \left(\frac{V_{OUT}}{V_{FB}} - 1 \right)$$

where $V_{FB} = 1.0V$.

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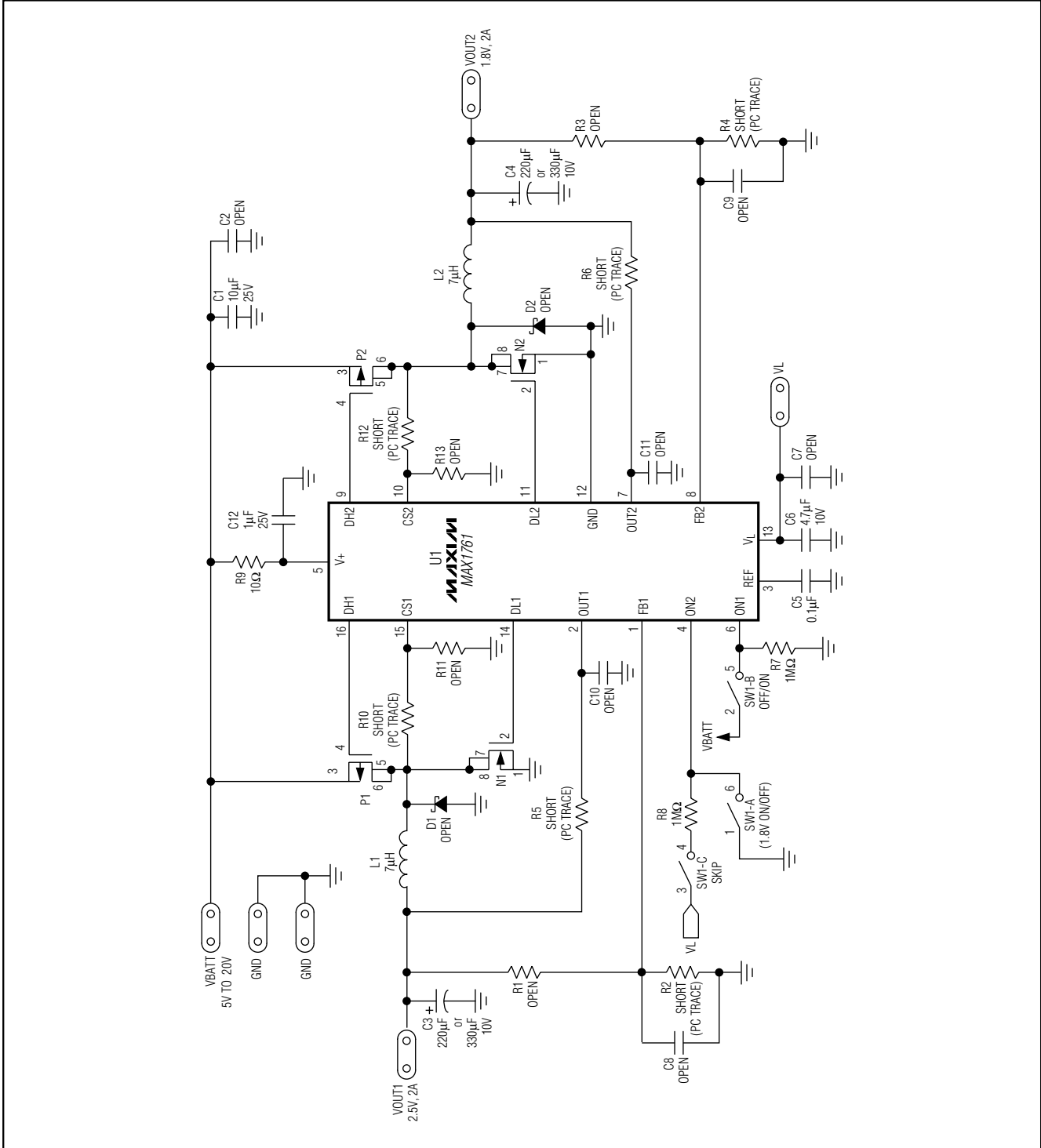


Figure 1. MAX1761 EV Kit Schematic

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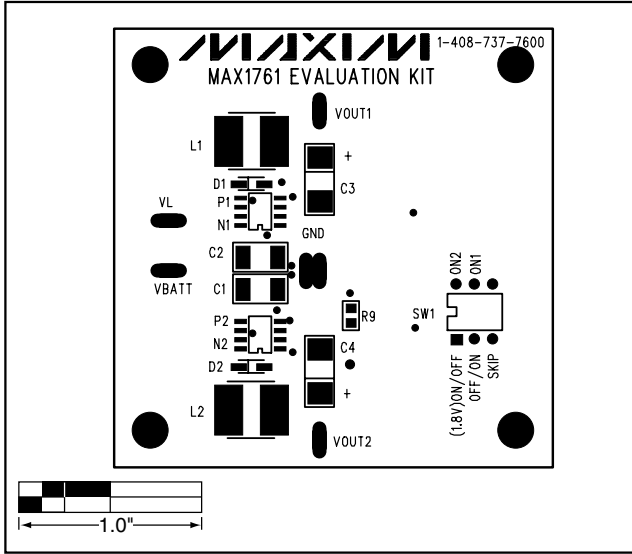


Figure 2. MAX1761 EV Kit Component Placement Guide—Component Side

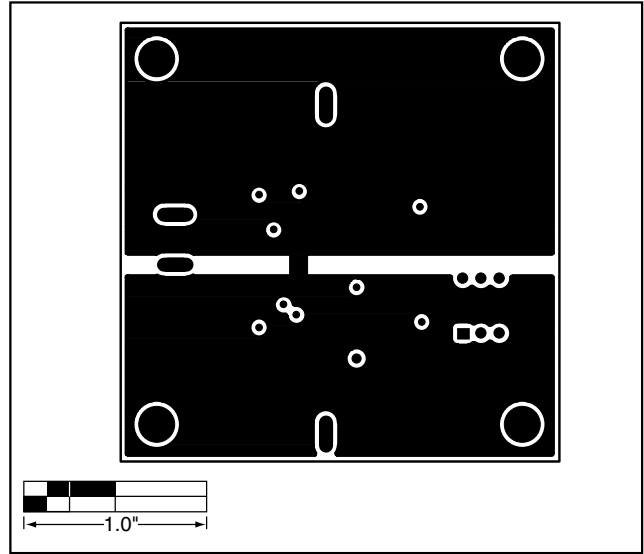


Figure 3. MAX1761 EV Kit PC Board Layout—Ground Plane (Layer 2)

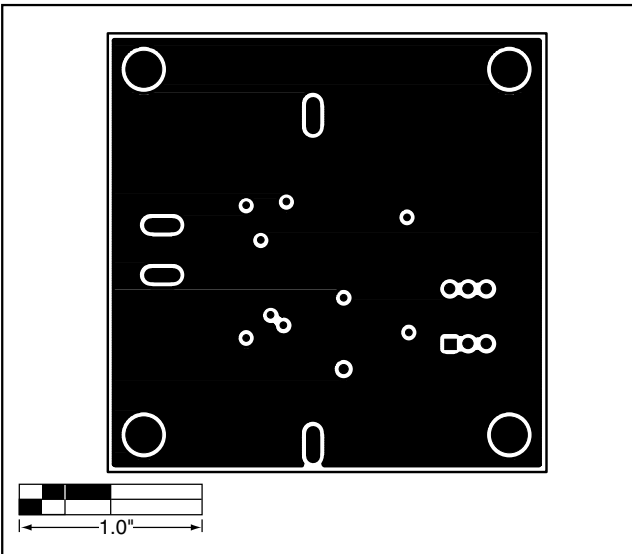


Figure 4. MAX1761 EV Kit PC Board Layout—Ground Plane (Layer 3)

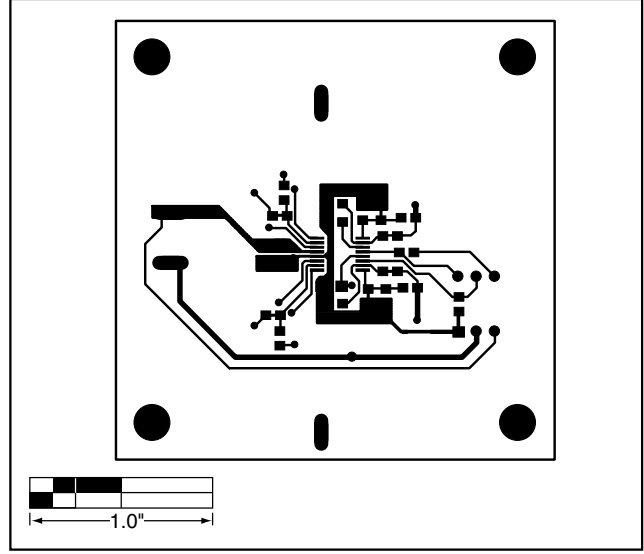


Figure 5. MAX1761 EV Kit PC Board Layout—Solder Side

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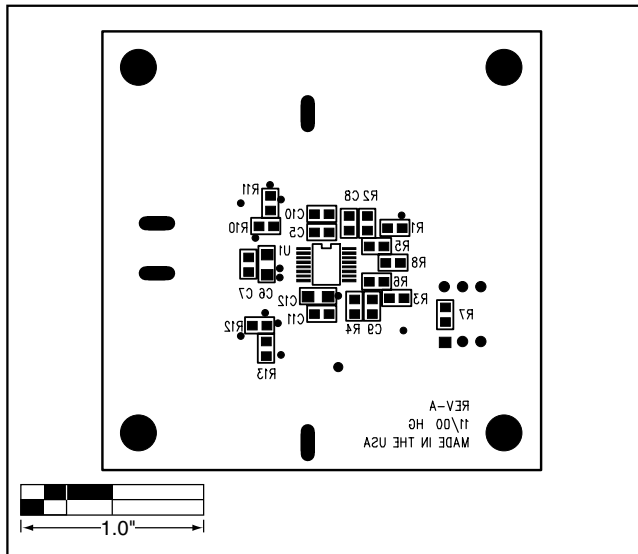


Figure 6. MAX1761 EV Kit Component Placement Guide—Solder Side

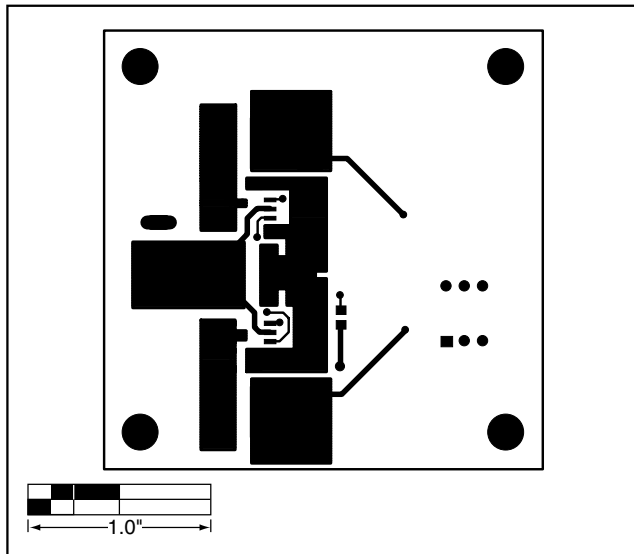


Figure 7. MAX1761 EV Kit PC Board Layout—Component Side

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