

# MAXIM

## MAX1708 Evaluation Kit

Evaluates: MAX1708

### General Description

The MAX1708 evaluation kit (EV kit) is a step-up DC-DC switching regulator for 1- to 3-cell battery inputs as well as +2.5V or +3.3V regulated supply inputs. The EV kit accepts a positive input between 0.7V and  $V_{OUT}$ , and converts it to a higher, pin-selectable output voltage.

Efficiency is up to 90% with output load currents to 2A. This EV kit operates at fixed 600kHz PWM frequency, allowing the use of a small inductor.

A movable jumper on the EV kit selects either a +3.3V or +5V output voltage. Additional pads on the board accommodate the resistors for output adjustment. This EV kit uses surface-mount components and is fully assembled and tested for quick evaluation.

### Features

- ◆ 0.7V to  $V_{OUT}$  Input Voltage Range
- ◆ Pin-Selectable +3.3V or +5V Output Voltage (+5V as Shipped)
- ◆ Adjustable Output Voltage (+2.5V to +5.5V, External Divider)
- ◆ Up to 2A Output Current
- ◆ 600kHz PWM Operation
- ◆ Internal 5A MOSFET Switch
- ◆ 1 $\mu$ A IC Shutdown Current
- ◆ Surface-Mount Components
- ◆ Fully Assembled and Tested

### Ordering Information

PART	TEMP RANGE	IC PACKAGE
MAX1708EVKIT	0°C to +70°C	16 QSOP

### Component List

DESIGNATION	QTY	DESCRIPTION
C1, C4	0	Not installed (D case)
C2	1	150 $\mu$ F, 6.3V low-ESR capacitor (D case) Sanyo 6TPB150M or Panasonic EEFUE0J151R
C3	1	150 $\mu$ F, 6.3V 15m $\Omega$ low-ESR capacitor (D case) Panasonic EEFUE0J151R
C5, C6, C10	3	0.1 $\mu$ F ceramic capacitors (1206)
C7	1	0.22 $\mu$ F ceramic capacitor (1206)
C8	1	1 $\mu$ F, 16V ceramic capacitor (1206) Taiyo Yuden EMK316BJ105KL or TDK C3216X7R1C105M
D1	1	5A Schottky diode (SMC case) Central Semiconductor CMSH5-20 or CMSH5-40

DESIGNATION	QTY	DESCRIPTION
L1	1	2.2 $\mu$ H power inductor Coilcraft DO3316P-222HC (unshielded) or Coiltronics UP2B-2R2 (unshielded) or Sumida CDRH104R-2R5 (2.5 $\mu$ H, shielded)
R1, R3	0	Not installed (1206)
R2	0	Not installed, (short PC trace) (1206)
R4	1	2 $\Omega$ $\pm$ 5% resistor (1206)
R5–R8	4	1M $\Omega$ $\pm$ 5% resistors (1206)
U1	1	MAX1708EEE (16-pin QSOP)
JU1, JU2, JU3	3	2-pin headers
None	3	Shunts
None	1	MAX1708 PC board
None	1	MAX1708 EV kit data sheet
None	1	MAX1708 data sheet

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## Component Suppliers

SUPPLIER	PHONE	FAX
Central Semiconductor	631-435-1110	631-435-1824
Coilcraft	847-639-6400	847-639-1469
Coiltronics	561-752-5000	561-742-0134
Panasonic	714-373-7334	714-373-7323
Sanyo	619-661-6835	619-661-1055
Sumida	847-545-6700	847-545-6720
Taiyo Yuden	408-573-4150	408-573-4159
TDK	847-803-6100	847-390-4405

**Note:** Please indicate that you are using the MAX1708 when contacting these component suppliers.

## Quick Start

The MAX1708 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) Connect a +3V supply to the VIN pad. Connect ground to the GND pad.
- 2) Connect a voltmeter to the V<sub>OUT</sub> pad.
- 3) Remove all the shunts from JU1, JU2, JU3.

- 4) Turn on the power supply and verify that the output voltage is 5V. Refer to the MAX1708 data sheet for output load during start up.
- 5) For other output voltages, refer to *Setting the Output Voltage* in the MAX1708 data sheet for instructions on selecting the feedback resistors R1 and R2.

## Detailed Description

The MAX1708 EV kit provides a pin-selectable +3.3V or +5V output from a +0.7V to V<sub>OUT</sub> input voltage. The output voltage can also be adjusted with external resistors for voltages between +2.5V to +5.5V.

The MAX1708 includes an internal MOSFET switch with a typical peak current limit of 5A, and which can deliver loads up to 2A. Connecting an external resistor from SS/ILIM to GND (R3) can also reduce the current limit. Connecting a capacitor from SS/ILIM to GND (C6) sets the soft-start rate.

The EV kit operates at 600kHz switching frequency and allows the use of a small inductor value. The switching frequency can also be synchronized to an external clock ranging from 350kHz to 1MHz.

## Jumper Selection

Three jumpers on the PC board allow the user to select several configurations. Table 1 lists the jumpers and their functions.

**Table 1. Jumper Functions**

JUMPER	SHUNT LOCATION	PIN CONNECTION	MAX1708 OPERATION
JU1	Not Installed	$\overline{\text{ONB}}$ connected to GND	MAX1708 is enabled if $\text{ONA} = \text{V}_{\text{OUT}}$
	Installed	$\overline{\text{ONB}}$ connected to V <sub>OUT</sub>	MAX1708 is disabled if $\text{ONA} = \text{GND}$
JU2	Not Installed	ONA connected to GND	MAX1708 is disabled if $\overline{\text{ONB}} = \text{V}_{\text{OUT}}$
	Installed	ONA connected to V <sub>OUT</sub>	MAX1708 is enabled if $\overline{\text{ONB}} = \text{GND}$
JU3	Not Installed	$\overline{3.3}/5$ connected to V <sub>OUT</sub>	V <sub>OUT</sub> is set to 5V. FB pin must be connected to ground (R2 = short)
	Installed	$\overline{3.3}/5$ connected to GND	V <sub>OUT</sub> is set to 3.3V. FB pin must be connected to ground (R2 = short)
	Installed	$\overline{3.3}/5$ connected to GND and resistor R1 and R2 are installed	V <sub>OUT</sub> = adjustable between +2.5V to +5.5V range. Refer to <i>Setting the Output Voltage</i> in the MAX1708 data sheet for instructions on selecting the feedback resistors R1 and R2. Also cut the PC trace, shorting R2

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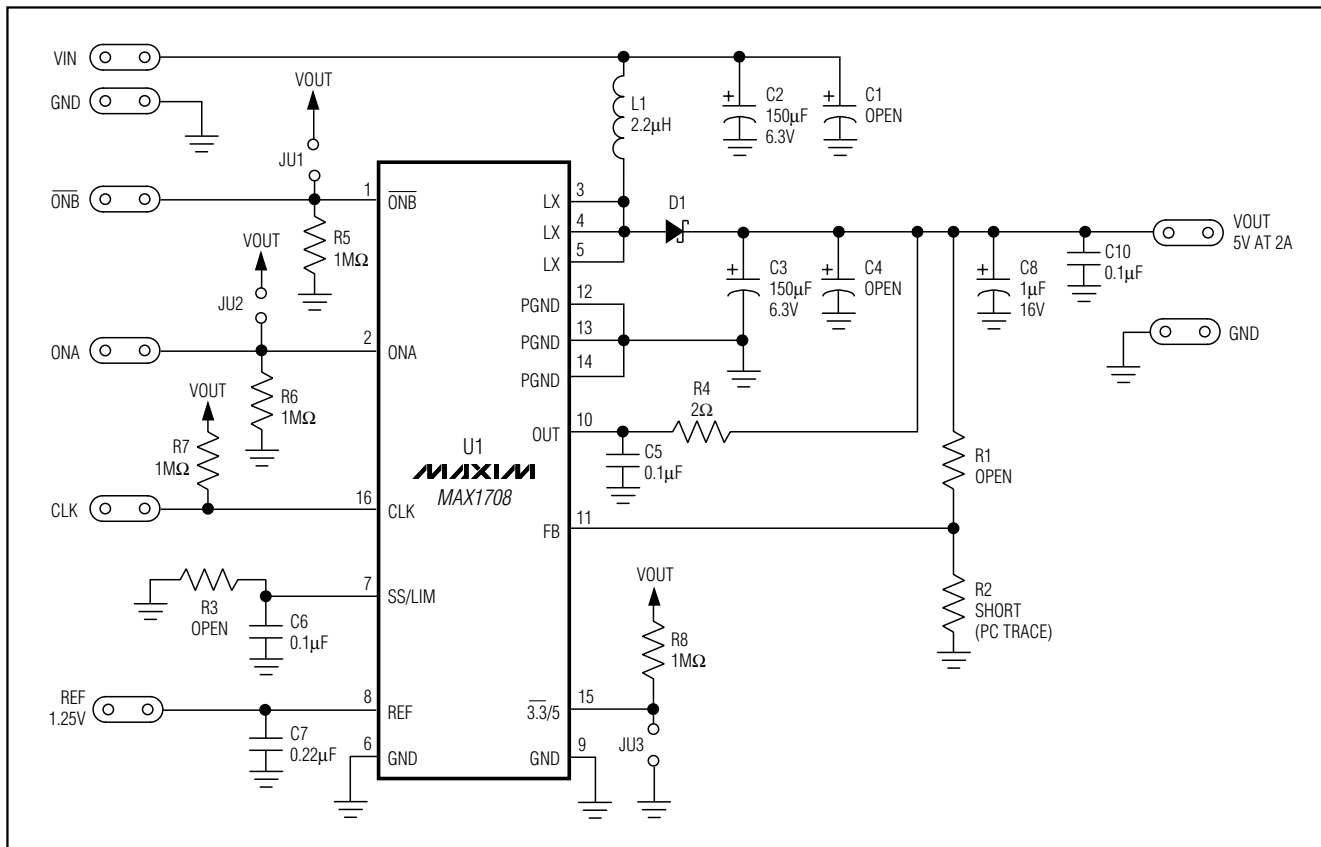


Figure 1. MAX1708 EV Kit Schematic

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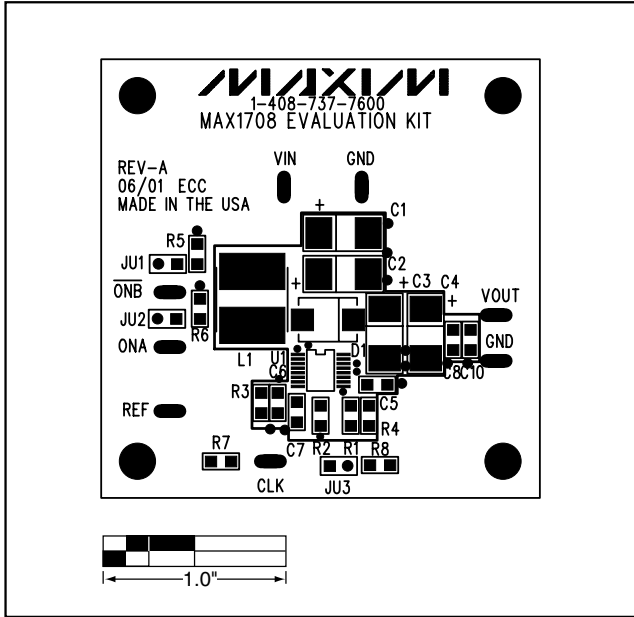


Figure 2. MAX1708 EV Kit Component Placement Guide—Component Side

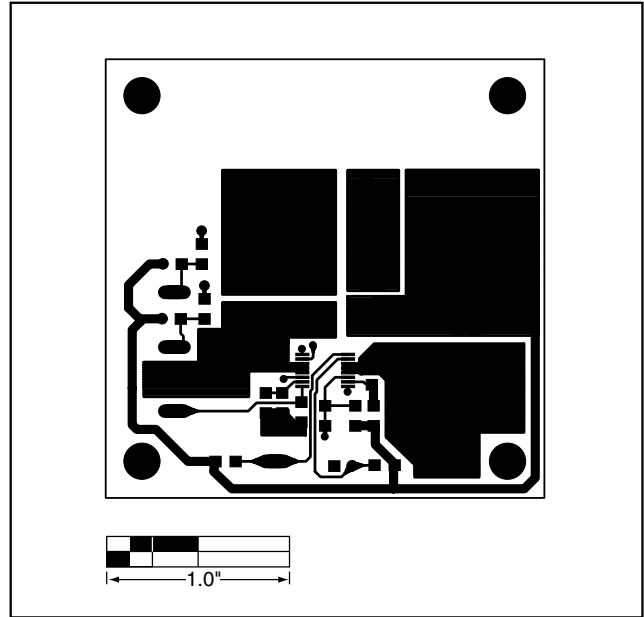


Figure 3. MAX1708 EV Kit PC Board Layout—Component Side

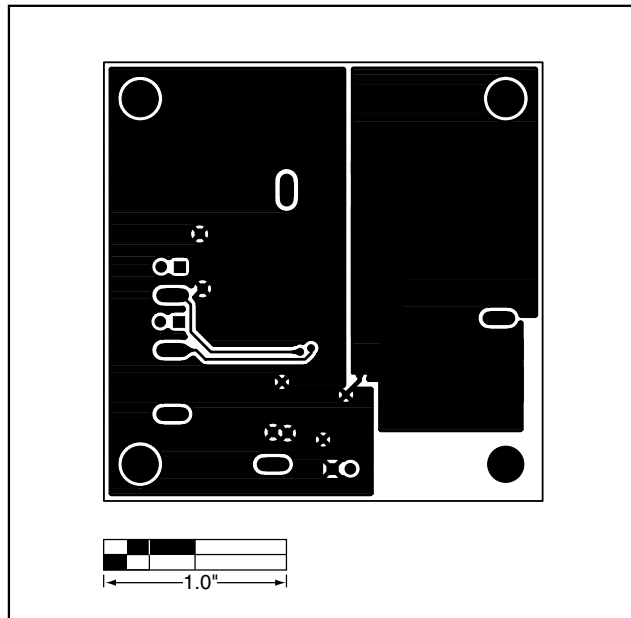


Figure 4. MAX1708 EV Kit PC Board Layout—Solder Side

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