19-2089; Rev 0; 7/01

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**
- **1µA 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	150µF, 6.3V low-ESR capacitor (D case) Sanyo 6TPB150M or Panasonic EEFUE0J151R
C3	1	150µF, 6.3V 15mΩ low-ESR capacitor (D case) Panasonic EEFUE0J151R
C5, C6, C10	3	0.1µF ceramic capacitors (1206)
C7	1	0.22µF ceramic capacitor (1206)
C8	1	1µF, 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	2.2µH power inductor Coilcraft DO3316P-222HC (unshielded) or Coiltronics UP2B-2R2 (unshielded) or Sumida CDRH104R-2R5 (2.5µH, shielded)
R1, R3	0	Not installed (1206)
R2	0	Not installed, (short PC trace) (1206)
R4	1	2Ω ±5% resistor (1206)
R5–R8	4	1MΩ ±5% resistors (1206)
U1	1	MAX1708EEE (16-pinQSOP)
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

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_{OUT} 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_{OUT} 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	$\overline{ONB}$ connected to GND	MAX1708 is enabled if ONA = V_{OUT}
	Installed	$\overline{ONB}$ connected to V_{OUT}	MAX1708 is disabled if ONA = GND
JU2	Not Installed	ONA connected to GND	MAX1708 is disabled if $\overline{ONB}$ = V_{OUT}
	Installed	ONA connected to V_{OUT}	MAX1708 is enabled if $\overline{ONB}$ = GND
JU3	Not Installed	$\overline{3.3}$ /5 connected to V_{OUT}	V_{OUT} is set to 5V. FB pin must be connected to ground (R2 = short)
	Installed	$\overline{3.3}$ /5 connected to GND	V_{OUT} 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_{OUT} = adjustable between +2.5V to +5.5V range. Refer to *Setting the Output Voltage* in the MAX1708 data sheet for instructions on selecting the feedback resistors R1 and R2. Also cut the PC trace, shorting R2

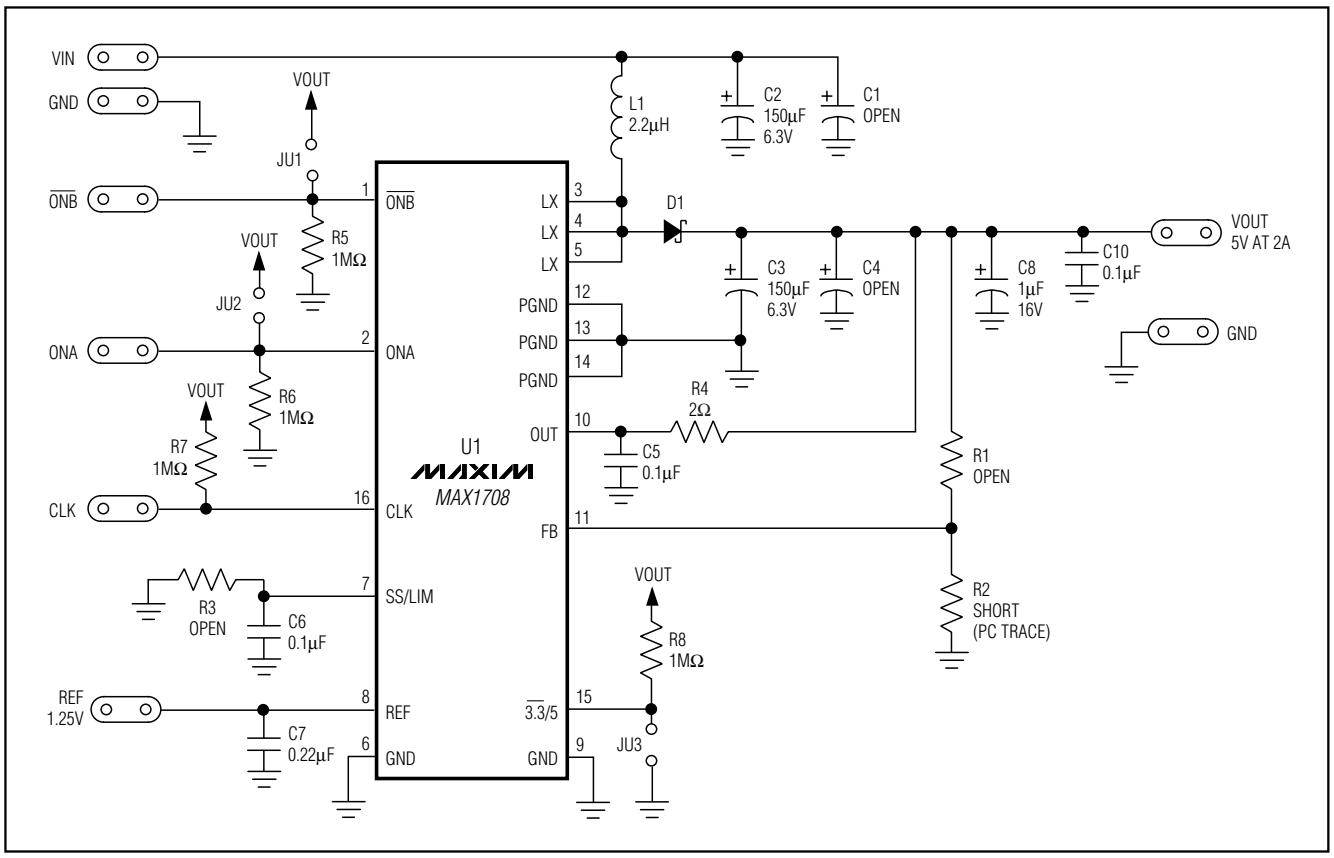

Figure 1. MAX1708 EV Kit Schematic