

MAXIM

MAX1612 Evaluation Kit

General Description

The MAX1612 evaluation kit (EV kit) is a complete bridge-battery management circuit. A small 2.4V, 50mAh NiCd battery, similar to the type commonly used in bridge circuits of notebook computers, is mounted on the board. When the main power source is disconnected, the MAX1612 boosts the 2-cell bridge battery voltage to 6V to power the load. The MAX1612 also controls the battery's trickle charge cycle.

The MAX1612 evaluation board can also be used to evaluate the MAX1613. Simply order a free sample of the MAX1613EEE and replace the MAX1612 with the MAX1613.

Features

- ◆ Bridge-Battery Charger
- ◆ 6V, 50mA Bridge Output
- ◆ 5V Linear Regulator
- ◆ Input Voltage Disconnect Detection
- ◆ Fully Assembled and Tested Surface-Mount Board

Ordering Information

PART	TEMP. RANGE	IC PACKAGE
MAX1612EVKIT	0°C to +70°C	16 QSOP

Component List

DESIGNATION	QTY	DESCRIPTION
BATT1	1	2.4V, 50mAh NiCd battery pack TNR Technical N50AAAF2SMT (2 x Sanyo N50AAA)
C1	1	0.33 μ F ceramic capacitor
C2	1	4.7nF ceramic capacitor
C3	1	68nF ceramic capacitor
C4	1	1 μ F ceramic capacitor
C5	1	100 μ F, 10V low-ESR tantalum cap AVX TPSD107M010R0100 or Sprague 593D107X0010D2W
C6	1	22 μ F, 35V low-ESR tantalum cap AVX TPSE226M035R0300 or Sprague 593D226X0035E2W
C7	0	Not installed
D1	1	30V, 500mA Schottky diode Motorola MBR0530
D2	1	Not installed

DESIGNATION	QTY	DESCRIPTION
L1	1	22 μ H, 800mA power inductor Coilcraft DS1608C-223, Sumida CD43-220, or equivalent
J1-J5	5	2-pin jumpers
R1	1	Not installed
R2	1	2.2k Ω , 5% resistor
R3	1	442k Ω , 1% resistor
R4	1	20k Ω , 1% resistor
R5	1	200k Ω , 1% resistor
R6	1	160k Ω , 5% resistor
R7, R8	2	470k Ω , 5% resistors
SW1	1	Momentary switch
U1	1	MAX1612EEE
None	5	Shunts
None	1	MAX1612 printed circuit board
None	1	MAX1612/MAX1613 data sheet

Component Suppliers

SUPPLIER	PHONE	FAX
Coilcraft	847-639-6400	847-639-1469
Coiltronics	561-241-7876	561-241-9339
Sprague	603-224-1961	603-224-1430
Sumida	847-956-0666	847-956-0702
TNR Technical	714-253-9944	714-253-9949

Quick Start

The MAX1612 EV kit is shipped with the on-board battery disconnected. The battery must be charged before use. Follow these steps to charge the battery and verify board operation. **Do not turn on the power supply until all connections are completed.**

- 1) Install a shunt across all jumpers to set the board for operation without external signals. Note: Be sure to *reinstall* the shunt across J2; prior to shipment, this shunt was removed to disconnect the battery.

MAX1612 Evaluation Kit

- 2) Connect a 15V power supply to the VCHARGE pad and voltmeters to the FULL and VMAIN pads.
- 3) Turn on the power supply and momentarily press Switch SW1 to reset the internal counter. Then verify that the voltmeter attached to the FULL pad indicates a logic-low level ($< 0.4V$). Jumper J3 connects the FULL pin to the \overline{CCMD} pin, placing the MAX1612 in the battery-charge mode. The voltmeter attached to the VMAIN pad will read the input voltage.
- 4) The battery will take up to 16 hours to charge. Full charge is indicated when the FULL pin goes high ($> 2.4V$).
- 5) Physically disconnect the input supply, and the VMAIN voltage will be held above 6V by the MAX1612.

Note: The board may be operated using an external 2.4V power supply instead of the on-board battery by removing the shunt across jumper J2 and attaching the supply to the BBATT pin.

Detailed Description

The MAX1612 evaluation board can be operated with or without external control. With shunts across J1–J5, the board will drive VMAIN to 6V when VCHARGE is removed and will control the charging of the bridge battery whenever VCHARGE is greater than 7V. Alternatively, the shunts across J3–J5 can be removed and external signals used to control the board.

Jumper Selection

The jumpers on the board may be removed to allow alternate batteries or to control the MAX1612 with external signals. Table 1 lists the jumpers and their functions.

Component Selection

The capacitor values controlling the charge and discharge timers will need to be adjusted for each application. The ideal charge time depends on the charge current set by R2 and the actual battery being used. The discharge time depends on the load during the discharge cycle. Refer to the MAX1612 data sheet for instructions on selecting values for your application.

Resistor R1 and diode D2 may be installed to provide a low-level current to compensate for the bridge battery's self-discharge.

Table 1. Jumper Functions

JUMPER	SHUNT POSITION	PIN CONNECTION	MAX1612 OPERATION
-J1	Shorted	VCHARGE connected to VMAIN	Normal connection
	Open	VCHARGE disconnected	
-J2	Shorted	On-board battery connected	Normal connection
	Open	On-board battery disconnected	An external battery or power supply may be connected to the BBATT pad.
J3	Shorted	\overline{CCMD} pin connected to the FULL pin	Charges the battery whenever the FULL pin goes low.
	Open	\overline{CCMD} pin open	Charge cycle controlled by an external signal connected to the \overline{CCMD} pad.
J4	Shorted	\overline{BBON} pin connected to the LBO pin	Turns on the DC-DC converter whenever the LBO pin goes low.
	Open	\overline{BBON} pin open	DC-DC converter controlled by an external signal connected to the \overline{BBON} pad. See Figure 2 in the MAX1612 data sheet.
J5	Shorted	\overline{DCMD} pin connected to the LBO pin	The internal timer counts down whenever the LBO pin is low.
	Open	\overline{DCMD} pin open	The countdown function is controlled by an external signal connected to the \overline{DCMD} pad.

MAX1612 Evaluation Kit

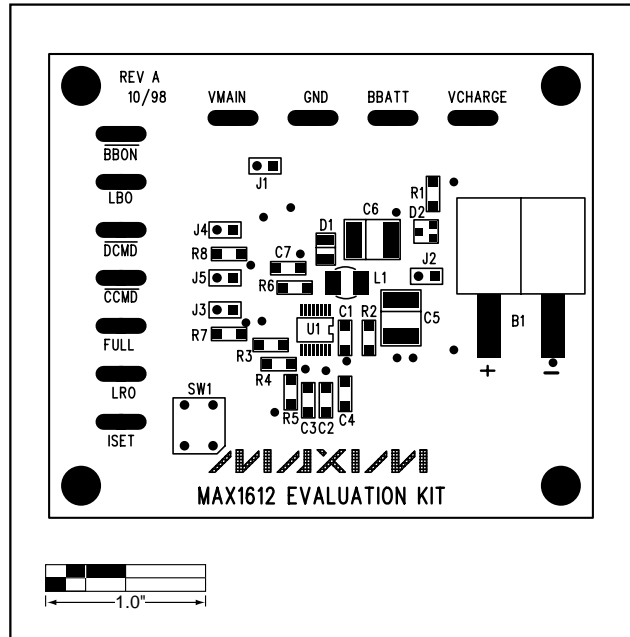


Figure 2. MAX1612 EV Kit Component Placement Guide—Component Side

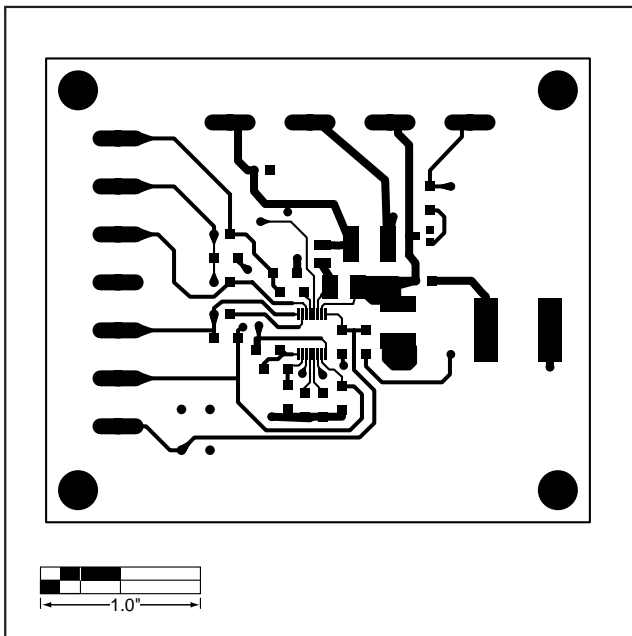


Figure 3. MAX1612 EV Kit PC Board Layout—Component Side

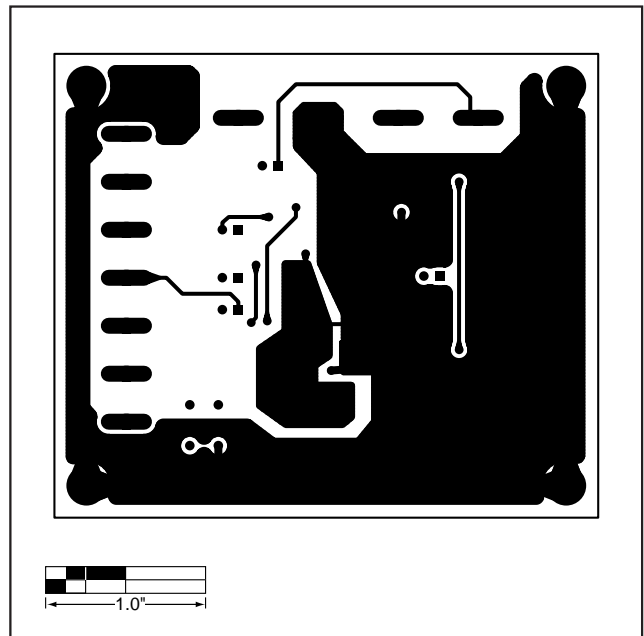


Figure 4. MAX1612 EV Kit PC Board Layout—Solder Side

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4 _____ Maxim Integrated Products, 120 San Gabriel Drive, Sunnyvale, CA 94086 408-737-7600