19-6150; Rev 0; 12/11

MAX16948 Evaluation Kit
Evaluates: MAX16948

General Description

The MAX16948 evaluation kit (EV kit) is an assembled and tested PCB used to evaluate the MAX16948 dual high-voltage, current-sensing LDO regulator/switch. The EV kit demonstrates the device's features: open-drain fault indicator outputs, current-limiting threshold-setting inputs, current-sense outputs, LDO/switch operation, and shutdown function.

Ordering Information appears at end of data sheet.

Features

- **4.5V to 28V Wide Input Voltage Range (45V Load Dump Tolerant)**
- **2-Channel LDO/Switch**
- **Resistor-Adjustable Current-Limit Threshold**
- **Current-Sensing Outputs**
- **Open-Drain, Fault Indicator Outputs ($\overline{ERR1}$ and $\overline{ERR2}$)**
- **Shutdown Control Inputs ($\overline{SHDN1}$ and $\overline{SHDN2}$)**
- **Proven PCB Layout**
- **Fully Assembled and Tested**

Component List

DESIGNATION	QTY	DESCRIPTION
C1	1	22µF ±50V aluminum electrolytic capacitor (8.0mm x 6.2mm) Panasonic EEETG1H220P
C2, C10–C13	5	0.1µF ±10%, 50V X7R ceramic capacitors (0603) TDK C1608X7R1H104K
C3	1	1µF ±10%, 25V X7R ceramic capacitor (0603) Murata GRM188R71E105K
C4, C5	2	2.2µF ±10%, 25V X7R ceramic capacitors (1206) TDK C3216X7R1E225K
C8, C9	0	Not installed, ceramic capacitors (1206)
D1	1	50V, 1A Schottky diode (SMA) Diodes Inc. B150-13-F
D2	1	Red LED (0805)
D3	1	Yellow LED (0805)
D4, D5	2	20V, 1A Schottky diodes (MicroSMP) Vishay MSS1P2U
IN, LIM1, LIM2	3	Red test points
JU1, JU2	2	4-pin headers

DESIGNATION	QTY	DESCRIPTION
JU3, JU4	2	3-pin headers
JU5	1	2-pin header
L1, L3	2	1mH, 480mA inductors (10.5mm x 10.3mm) Sumida CDRH105RNP-102NC
L2, L4	0	Not installed, inductors (1206)
P1, P3	2	50Ω BNC connectors
P2, P4	0	Not installed, BNC connectors
R1, R3	2	3.01kΩ ±1% resistors (0603)
R2, R4	2	750Ω ±1% resistors (0603)
R5, R6	2	0Ω ±5% resistors (0603)
R7,R8	2	2.49kΩ ±1% resistors (0603)
R9, R13	2	4.02kΩ ±1% resistors (0603)
R10, R11	2	2.71kΩ ±5% resistors (0603)
R14, R15	2	10kΩ ±5% resistors (0603)
R16, R17	2	100Ω ±5% resistors (0603)
SW1, SW2	2	Momentary pushbutton switches
U1	1	Dual current-sensing LDO (16 TQFN-EP) Maxim MAX16948AGTE/V+
—	5	Shunts
—	1	PCB: MAX16948 EVALUATION KIT

Component Suppliers

SUPPLIER	PHONE	WEBSITE
Diodes Incorporated	805-446-4800	www.diodes.com
Murata Electronics North America, Inc.	770-436-1300	www.murata-northamerica.com
Panasonic Corp.	800-344-2112	www.panasonic.com
Sumida Corp.	847-545-6700	www.sumida.com
TDK Corp.	847-803-6100	www.component.tdk.com
Vishay	402-563-6866	www.vishay.com

Note: *Indicate you are using the MAX16948 when contacting these component suppliers.*

Quick Start

Required Equipment

- MAX16948 EV kit
- 14V, 1A DC power supply
- Two electronic loads
- Two voltmeters

Procedure

The EV kit is fully assembled and tested. Follow the steps below to verify board operation. **Caution: Do not turn on power supplies until all connections are completed.**

1) Verify that all jumpers are in their default position, as shown in Table 1.
2) Adjust the power supply to 14V.
3) Adjust both loads to 100mA.
4) Connect the power supply between the VIN and GND PCB pads on the EV kit.
5) Connect the first load between the REG_OUT1 and GND PCB pads on the EV kit.
6) Connect the second load between the REG_OUT2 and GND PCB pads on the EV kit.
7) Connect the first voltmeter between the REG_OUT1 and GND PCB pads on the EV kit.
8) Connect the second voltmeter between the REG_OUT2 and GND PCB pads on the EV kit.
9) Enable the power supply and both loads.
10) Verify that the first voltmeter displays 5V.
11) Verify that the second voltmeter also displays 5V.

Table 1. Jumper Descriptions (JU1–JU5)

JUMPER	SHUNT POSITION	DESCRIPTION
JU1	1-2*	Connects the FB1 pin to the resistor-divider (R1 and R2), which sets VOUT1 to 5V.
	1-3	Connects the FB1 pin to the REG pin, which sets VOUT1 to 8.5V.
	1-4	Connects the FB1 pin to GND, which sets channel 1 as a switch.
JU2	1-2*	Connects the FB2 pin to the resistor-divider (R3 and R4), which sets VOUT2 to 5V.
	1-3	Connects the FB2 pin to the REG pin, which sets VOUT2 to 8.5V.
	1-4	Connects the FB2 pin to GND, which sets channel 2 as a switch.
JU3	1-2	Connects the $\overline{SHDN1}$ pin to GND for shutdown mode.
	2-3*	Connects the $\overline{SHDN1}$ pin to the input voltage for normal operation.
JU4	1-2	Connects the $\overline{SHDN2}$ pin to GND for shutdown mode.
	2-3*	Connects the $\overline{SHDN2}$ pin to the input voltage for normal operation.
JU5	Installed*	D2 and D3 LEDs are used as fault indicators for $\overline{ERR1}$ and $\overline{ERR2}$.
	Open	LEDs D2 and D3 are not used. The $\overline{ERR1}$ and $\overline{ERR2}$ test pads on the EV kit are used to monitor fault signals.

**Default position.*

Detailed Description of Hardware

The MAX16948 EV kit is an assembled and tested PCB used to evaluate the MAX16948 dual high-voltage, current-sensing LDO/switch. The EV kit operates from a 4.5V to 28V DC supply voltage. The EV kit demonstrates the device's features: open-drain fault indicator outputs, current-limiting threshold-setting inputs, current-sensing outputs, LDO/switch operation, and shutdown function.

Open-Drain Fault Indicator Outputs ($\overline{ERR1}$, $\overline{ERR2}$)

The EV kit provides D2 and D3 to monitor the fault indicator outputs, $\overline{ERR1}$ and $\overline{ERR2}$, respectively. The LED lights up when a fault is detected.

FB Inputs (FB1, FB2)

The feedback input pins (FB1 and FB2) control the output voltage on VOUT1 and VOUT2. Connect FB_ to GND (shunts on pins 1-4 on jumpers JU1 and JU2) to select current-limited switch operation. The voltage applied at the input is approximately the voltage at the output.

Connect an external resistive divider for adjustable LDO operation (shunts on pins 1-2 of JU1 and JU2). With this configuration, the output voltage $V_{OUT\_}$ (VOUT1 or VOUT2) is approximately 5V. The output can be adjusted between 1V and 12V according to the following equation:

$$V_{OUT\_} = V_{FB} \times \left(1 + \frac{R_{TOP}}{R_{BOTTOM}}\right)$$

where V_{FB} is 1V (typ), R_{TOP} is the resistor from the output to the feedback node, and R_{BOTTOM} is the resistor from the feedback node to ground.

Connect FB_ to REG (shunts on pins 1-3 on JU1 and JU2) to choose the internal resistive divider for the 8.5V regulator option.

Shutdown ($\overline{SHDN1}$, $\overline{SHDN2}$)

The EV kit provides jumpers JU3 and JU4 to control the active-low shutdown inputs, $\overline{SHDN1}$ and $\overline{SHDN2}$, respectively. For normal operation, place a shunt on pins 2-3 on JU3 (enables LDO/switch 1) and a shunt on pins 2-3 on JU4 (enables LDO/switch 2). For low-power shutdown mode, place a shunt on pins 1-2 on JU3 (disables LDO/switch 1) and a shunt on pins 1-2 on JU4 (disables LDO/switch 2).

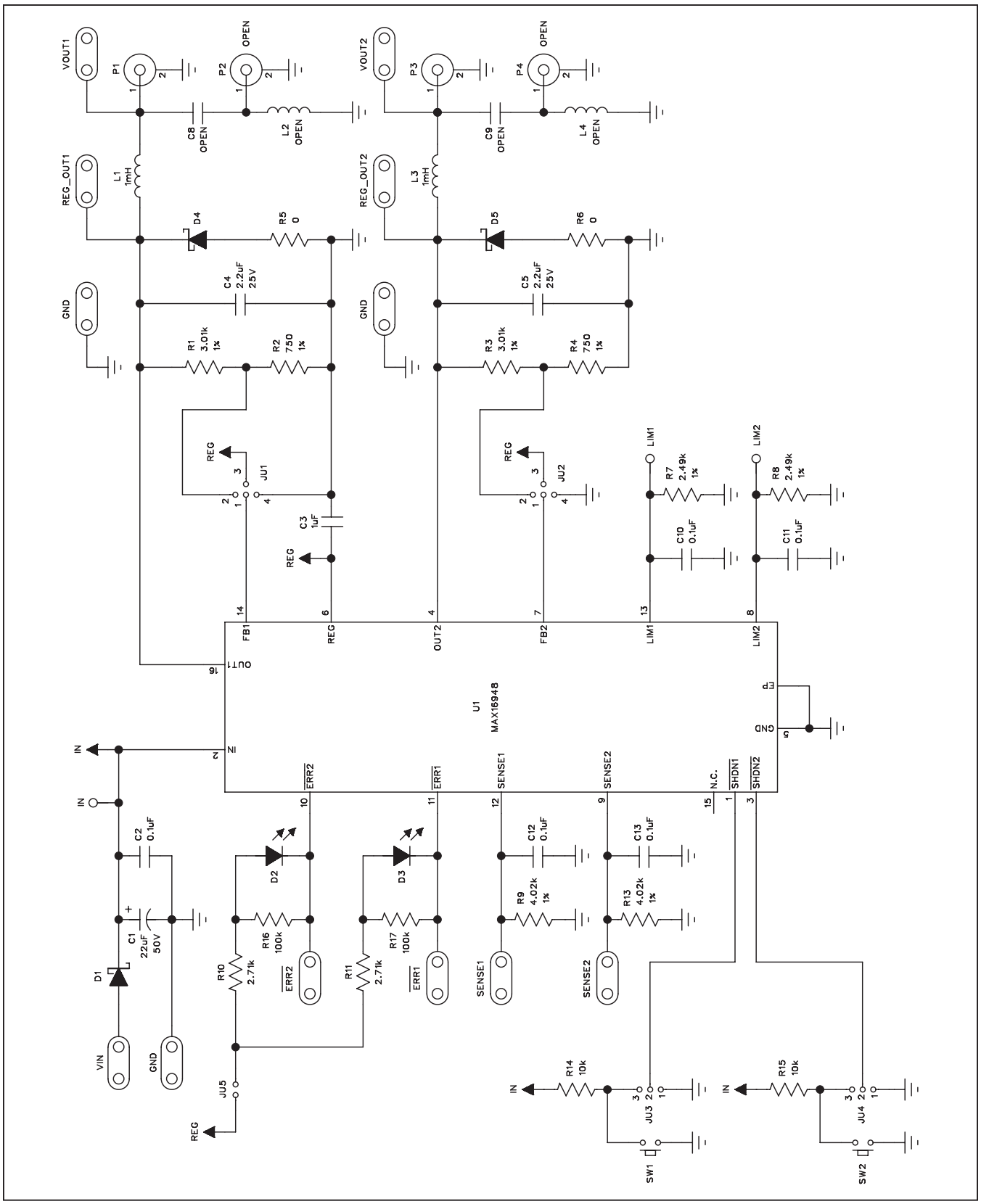

Figure 1. MAX16948 EV Kit Schematic

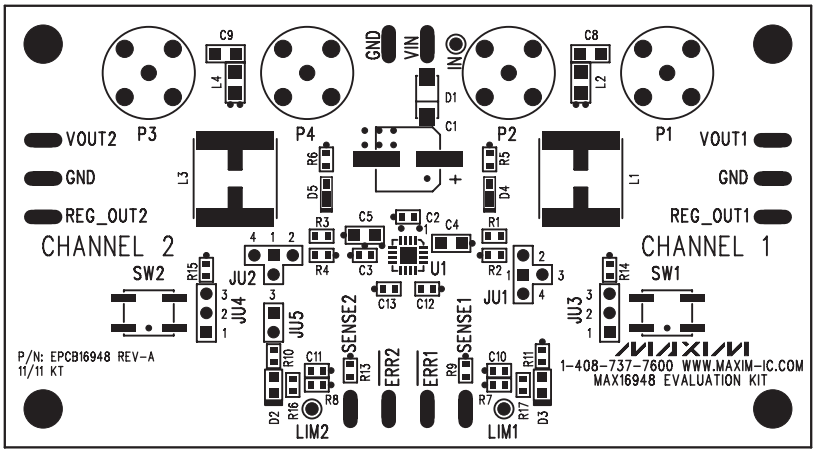

Figure 2. MAX16948 EV Kit Component Placement Guide—Component Side

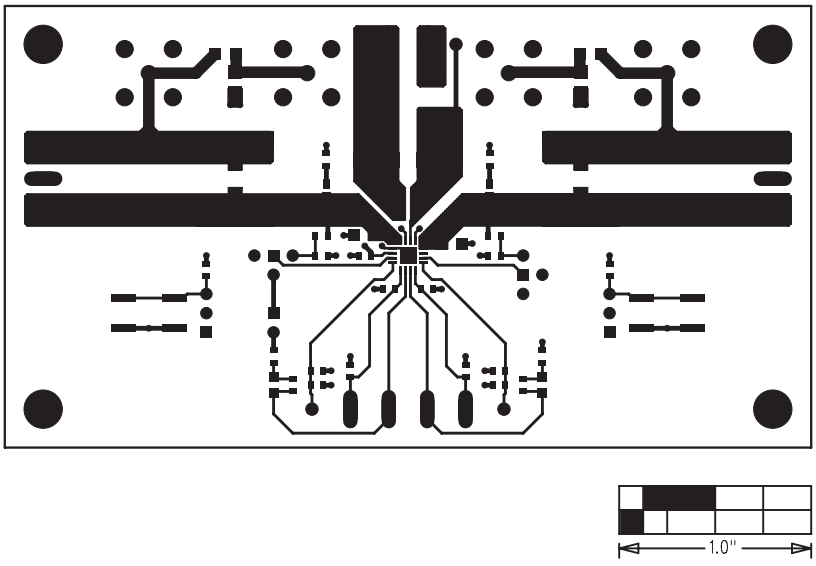

Figure 3. MAX16948 EV Kit PCB Layout—Component Side

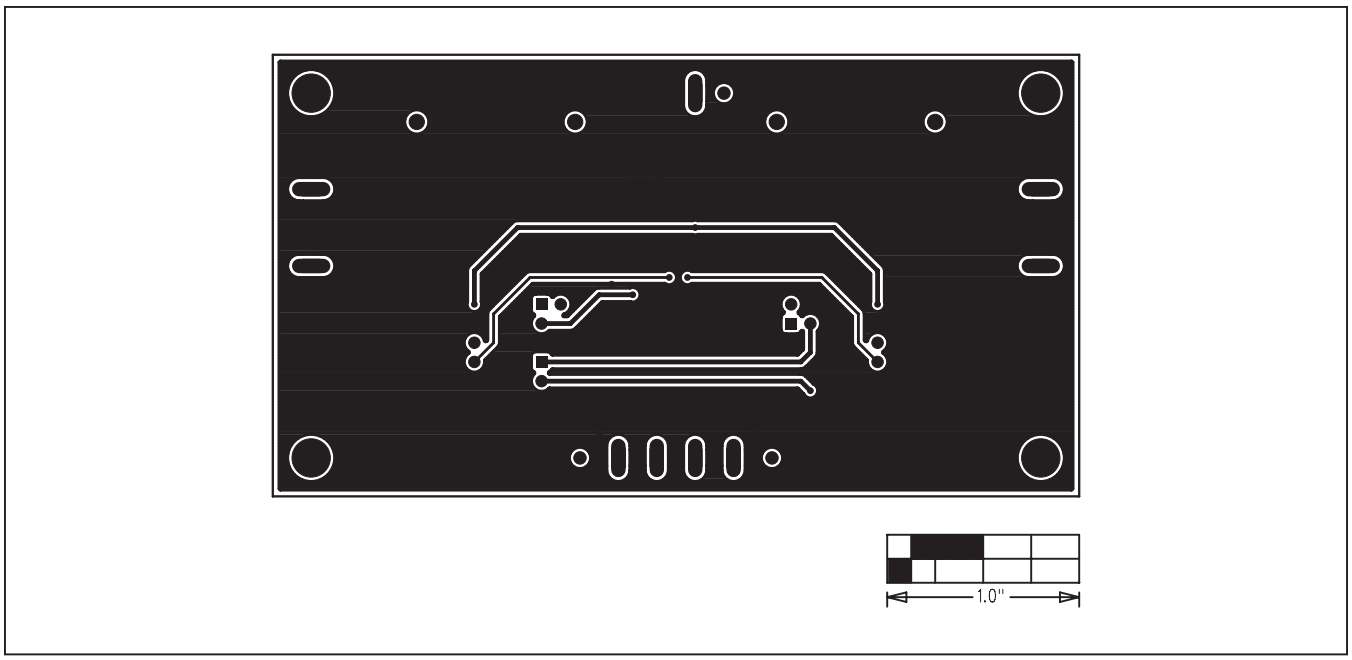

Figure 4. MAX16948 EV Kit PCB Layout—Solder Side

Ordering Information

PART	TYPE
MAX16948EVKIT#	EV Kit

#Denotes RoHS compliant.

Revision History

REVISION NUMBER	REVISION DATE	DESCRIPTION	PAGES CHANGED
0	12/11	Initial release	—