

General Description

The MAX44285 evaluation kit (EV kit) provides a proven design to evaluate the MAX44285 dual-channel, high-precision, high-voltage, current-sense amplifier. This EV kit demonstrates the MAX44285 in an ultra-small, 1mm x 2mm, 8-bump WLP package.

The EV kit PCB comes with a MAX44285TAWA+ installed, which is the 20V/V gain version. Other gain options are available. Contact the factory for the pin-compatible MAX44285LAWA+ ($G = 12.5\text{V/V}$), MAX44285FAWA+ ($G = 50\text{V/V}$), and MAX44285HAWA+ ($G = 100\text{V/V}$).

EV Kit Contents

- MAX44285 EV Kit Board

Features and Benefits

- Precision Real-Time Current Monitoring
- +2.7V to +76V Input Common-Mode Range
- Proven PCB Layout
- Fully Assembled and Tested

Ordering Information appears at end of data sheet.

Quick Start

Required Equipment

The following items are required for operation:

- MAX44285 EV kit
- +3.3V, 1A DC power supply
- +5V, 3A DC power supply
- An electronic load capable of sinking 3A (i.e., HP6060B)
- Two digital voltmeters

Procedure

The MAX44285 EV kit is fully assembled and tested. Follow the steps below to verify the board operation.

Caution: Do not turn on power supply or the electronic load until all connections are made.

- 1) Connect the positive terminal of the +3.3V supply to the VDD test point and the negative terminal of the supply to the nearest GND test point.
- 2) Connect the positive terminal of the +5V supply to the VSENSE+ test point and the negative terminal of the supply to the nearest GND test point.
- 3) Set the electronic load to sink 2.5A.
- 4) Connect the positive terminal of the electronic load to the VSENSE- test point and the negative terminal of the supply to the nearest GND test point.
- 5) Connect the first voltmeter between test points RS1+ and RS1- to measure V_{SENSE1} .
- 6) Connect the second voltmeter between VOUT1 and the nearest GND test points.
- 7) Turn on the power supplies.
- 8) Enable the electronic load.
- 9) Verify that the first voltmeter displays 125mV and the second voltmeter displays 2.5V.
- 10) Repeat the steps for the second current sense amplifier using the VSENSE2+ and VSENSE2- test points as the inputs and VOUT2 test point as the output.

Detailed Description of Hardware

The MAX44285 EV kit provides a proven design to evaluate the MAX44285 high-side, dual-channel, current-sense amplifier, which offers precision accuracy specifications of input offset voltage (V_{OS}) less than 10 μ V (max) and gain error less than 0.1% (max).

Applying the V_{RS+} Supply and the Load

The EV kit is installed with a MAX44285TAWA+, which has a 20V/V gain. The current-sense resistors (R_{SENSE}) value is 0.05 Ω with $\pm 0.5\%$ tolerance. The V_{OUT} for each channel given by:

$$V_{OUT} = I_{LOAD} \times R_{SENSE} \times A_V$$

where A_V is the gain and I_{LOAD} is the current load applied to the device. Normal operating V_{RS+} and V_{RS-} range is 2.7V to 76V.

Component List

DESIGNATION	QTY	DESCRIPTION
C1	1	0.1 μ F $\pm 10\%$, 16V SMT ceramic capacitor (0603)
C2	1	4.7 μ F $\pm 10\%$, 16V SMT ceramic capacitor (0805)
C3–C8	6	1000pF $\pm 10\%$, 50V SMT ceramic capacitors (1206)
C9, C10	2	180pF $\pm 10\%$, 50V SMT ceramic capacitors (0603)
GND, TP1–TP4	5	Test points
R1, R2	2	0.05 Ω $\pm 0.5\%$, 0.5W resistors (1206)
R3–R8	6	0 Ω 0%, 0.10W resistors (0603)

Measuring the Load Current

The load current is measured as a voltage drop (V_{SENSE}) across an external sense resistor. This voltage is then amplified by the current-sense amplifier and presented at its $V_{OUT_}$ pin. Like all differential amplifiers, the output voltage has two components of error (an offset error and a gain error). The offset error affects accuracy at low currents and a gain error affects accuracy at large currents—both errors affect accuracy at intermediate currents. By minimizing both offset and gain errors, accuracy can be optimized over a wide dynamic range.

DESIGNATION	QTY	DESCRIPTION
RS1+, RS1-, RS2+, RS2-	4	Test points
U1	1	Dual-channel, current-sense amplifier (8 WLP) Maxim MAX44285TAWA+
VDD, VOUT1, VOUT2, VSENSE1+, VSENSE1-, VSENSE2+, VSENSE2-	7	Red test points (1.80mm)
—	—	PCB: MAX44285 EVKIT

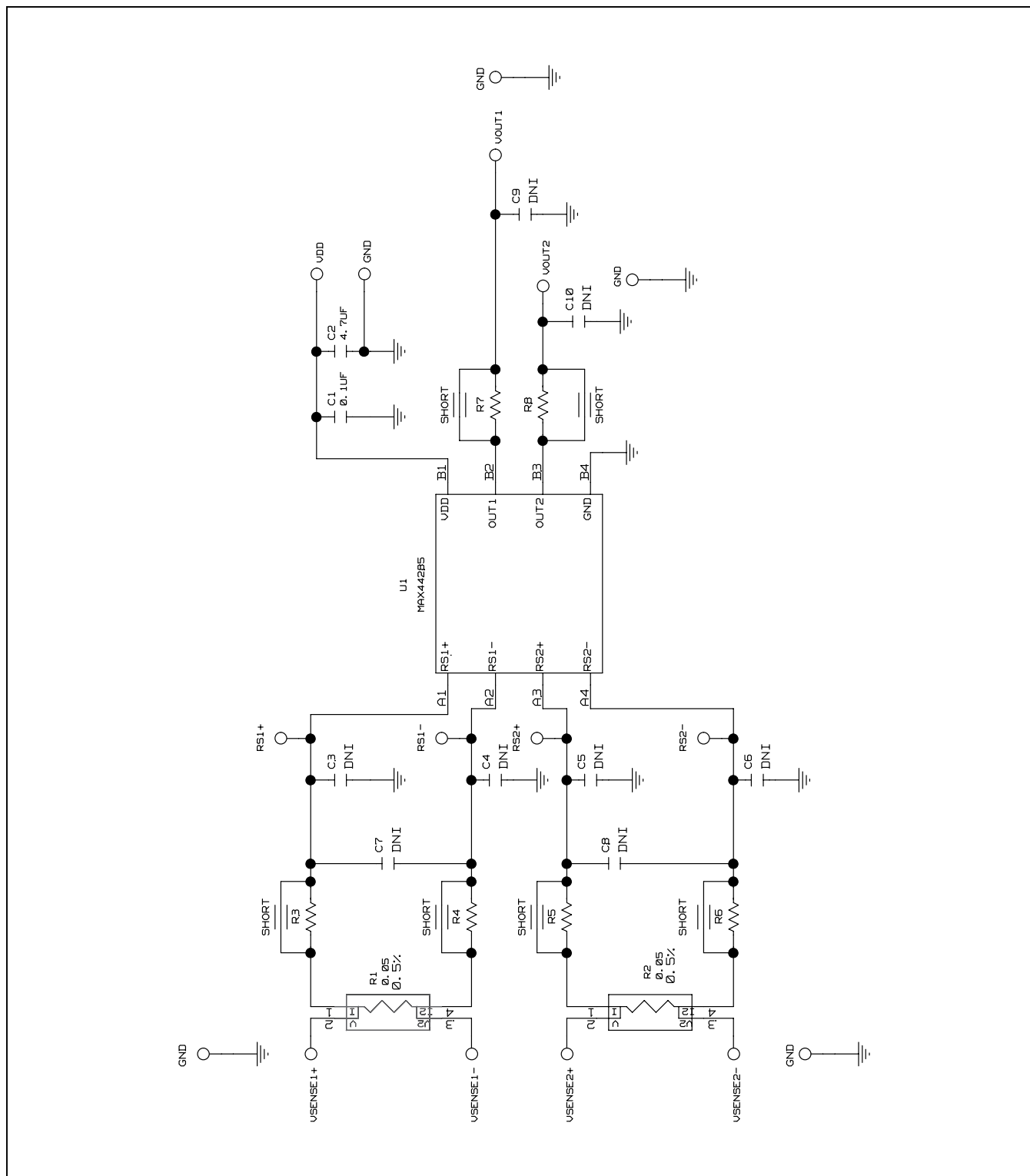


Figure 1. MAX44285 EV Kit Schematic

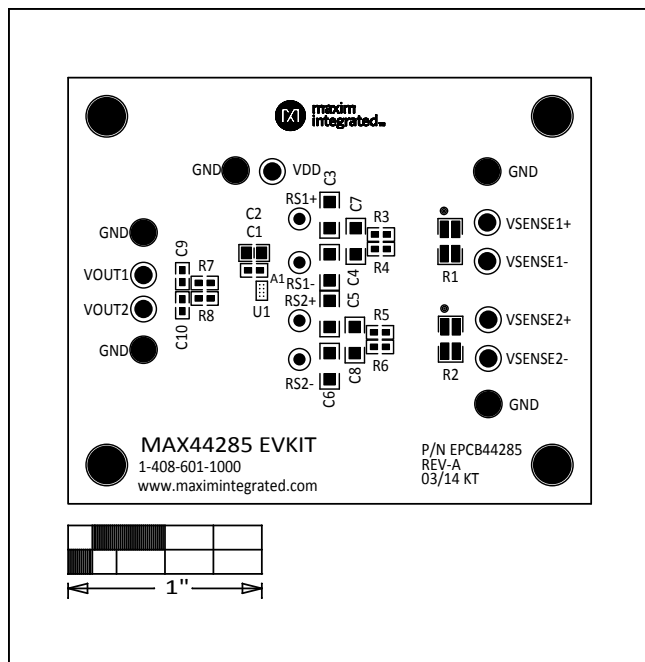


Figure 2. MAX44285 EV Kit Component Placement Guide—Component Side

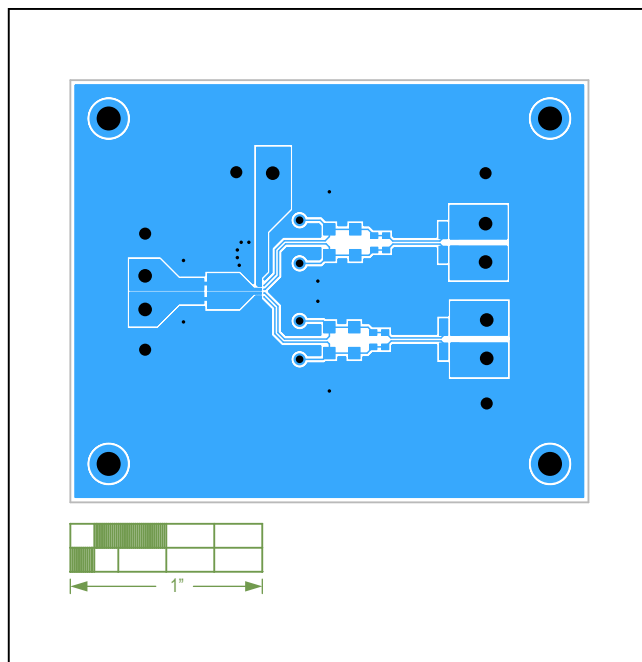


Figure 3. MAX44285 EV Kit PCB Layout—Component Side

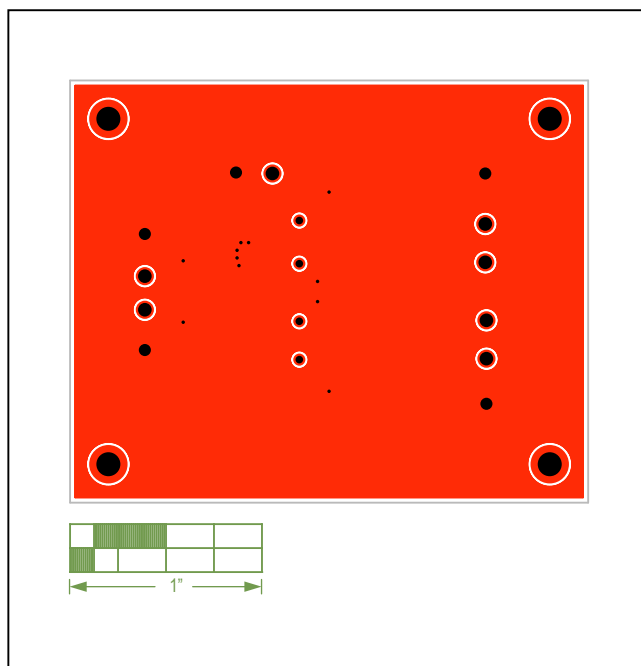


Figure 4. MAX44285 EV Kit PCB Layout—Solder Side

Ordering Information

PART	TYPE
MAX44285EVKIT#	EV Kit

#RoHS-compliant.

Revision History

REVISION NUMBER	REVISION DATE	DESCRIPTION	PAGES CHANGED
0	7/14	Initial release	—

For pricing, delivery, and ordering information, please contact Maxim Direct at 1-888-629-4642, or visit Maxim Integrated's website at www.maximintegrated.com.

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