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General Description

The MAX44205 evaluation kit (EV kit) provides a proven design to evaluate the MAX44205, low-noise, low-distortion fully differential operational amplifier (op amp), suitable for driving high-resolution SAR ADCs such as the MAX11905 family of devices.

The EV kit PCB comes installed with a MAX44205ATC+ in a 12-pin, 3mm x 3mm TQFN package with an exposed pad.

Benefits and Features

- Fully Differential Amplifier with 130dBc THD
- +2.7V to +13.2V Supply Voltage Range
- Output-Voltage Clamps to Prevent Overranging ADC
- Adjustable Output Common-Mode Voltage
- Evaluate 20-Bit SAR ADC + MAX44205 Amplifier (refer to the MAX11905 EV Kit)
- Proven PCB Layout
- Fully Assembled and Tested

Ordering Information ***appears at end of data sheet.***

Quick Start

Required Equipment

- MAX44205 EV kit
- ±5V, 100mA dual DC power supply
- Low-distortion differential-output signal generator (i.e., Audio Precision 2700, Stanford Research DS360)
- 2-channel oscilloscope
- Two SMA cables of equal length

Procedure

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

1) Verify that all shunts are in their default positions, as shown in Table 1.
2) Connect the ±5V supply to the VS+, VS-, and GND test points, respectively.
3) Use the SMA cables and connect the 10kHz, 6.6Vp-p sine, differential input from the signal generator to the INP and INM SMAs on the EV kit.
4) Turn on the power supplies.
5) Use the oscilloscope and monitor the differential output at jumper JU6.

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Table 1. Jumper Functions (Ju1–Ju5)

JUMPER	SHUNT POSITION	DESCRIPTION
JU1	1-2*	Normal operation
	2-3	$\overline{SHDN}$. MAX44205 is in shutdown mode.
JU2	1-2*	VCLPH is connected to VS+.
	2-3	External VCLPH. Apply a voltage no greater than (VS+) + 0.42V at the EXT_VCLPH test point.
JU3	1-2*	VCLPL is connected to VS-.
	2-3	External VCLPL. Apply a voltage no greater than (VS-) + 0.54V at the EXT_VCLPL test point.
JU4	Not installed	User-supplied VOCM. Apply (VS-) + 1.2V to (VS+) - 1.2V at the VOCM test point.
	Installed*	VOCM is connected to GND.
JU5	Not installed*	Disconnects VS- from GND.
	Installed	Connects VS- to GND.

**Default position.*

***Note:** Jumper JU6 has no shunt; it is used for probing only.*

Detailed Description of Hardware

The MAX44205 EV kit provides a proven design to evaluate the MAX44205, low-noise, low-distortion, fully differential op amp, suitable for driving high-resolution SAR ADCs such as the MAX11905 family of devices. Features of the EV kit include jumpers for $\overline{SHDN}$ control, VCLPH/VCLPL voltage-clamping options, and input for output common-mode voltage (VOCM). The EV kit is meant to work using dual supplies where the voltage between VS+ and VS- is +2.7V to +13.2V.

Shutdown Mode ($\overline{SHDN}$)

Jumper JU1 controls the shutdown mode of the device. The device is in normal operation when the shunt is installed in the 1-2 position on jumper JU1. To place the device in shutdown mode, install a shunt in the 2-3 position on JU1. If the shunt on JU1 is removed, the device is pulled internally to VS+. This option also allows a pulse to be sent through the $\overline{SHDN}$ SMA.

Clamping Voltage (VCLPH and VCLPL)

Jumpers JU2 and JU3 allow the options to connect to the VS+ and VS- supply rails or external supplies (Table 1). When the device is driving an ADC, connect VCLPH to the reference voltage of the ADC and VCLPL to the minimum input voltage (or ground).

Output Common-Mode Voltage (VOCM)

Jumper JU4 sets the output common-mode voltage to 0V. If the shunt is removed, apply the desired output common-mode voltage from (VS-) + 1.2V to (VS+) - 1.2V at the VOCM test point.

Adjusting the Gain

Adjust the gain by replacing R1–R4 on the EV kit with appropriate resistors. The gain (A_V) is as follows:

$$A_V = \frac{R3}{R1} = \frac{R4}{R2}$$

When selecting resistors, use 0.1% tolerance and 10ppm parts when possible.

Input Termination Resistors

The EV kit has 49.9Ω termination resistors populated at the R7 and R8 pads at the IN+ and IN- inputs. These resistors should be removed or replaced appropriately to match the impedance of the signal source.

Input Filter for ADC

Replace R5, R6, and populate C12 appropriately when driving a high-resolution ADC like the MAX11905. Additional capacitance can be installed at the C17 and C18 pads. Refer to *Driving a Fully Differential ADC* section in the MAX44205 IC data sheet.

Component List

Refer to file “evkit_build_bom_max44205_evkit_a.csv” attached to this PDF for component information.

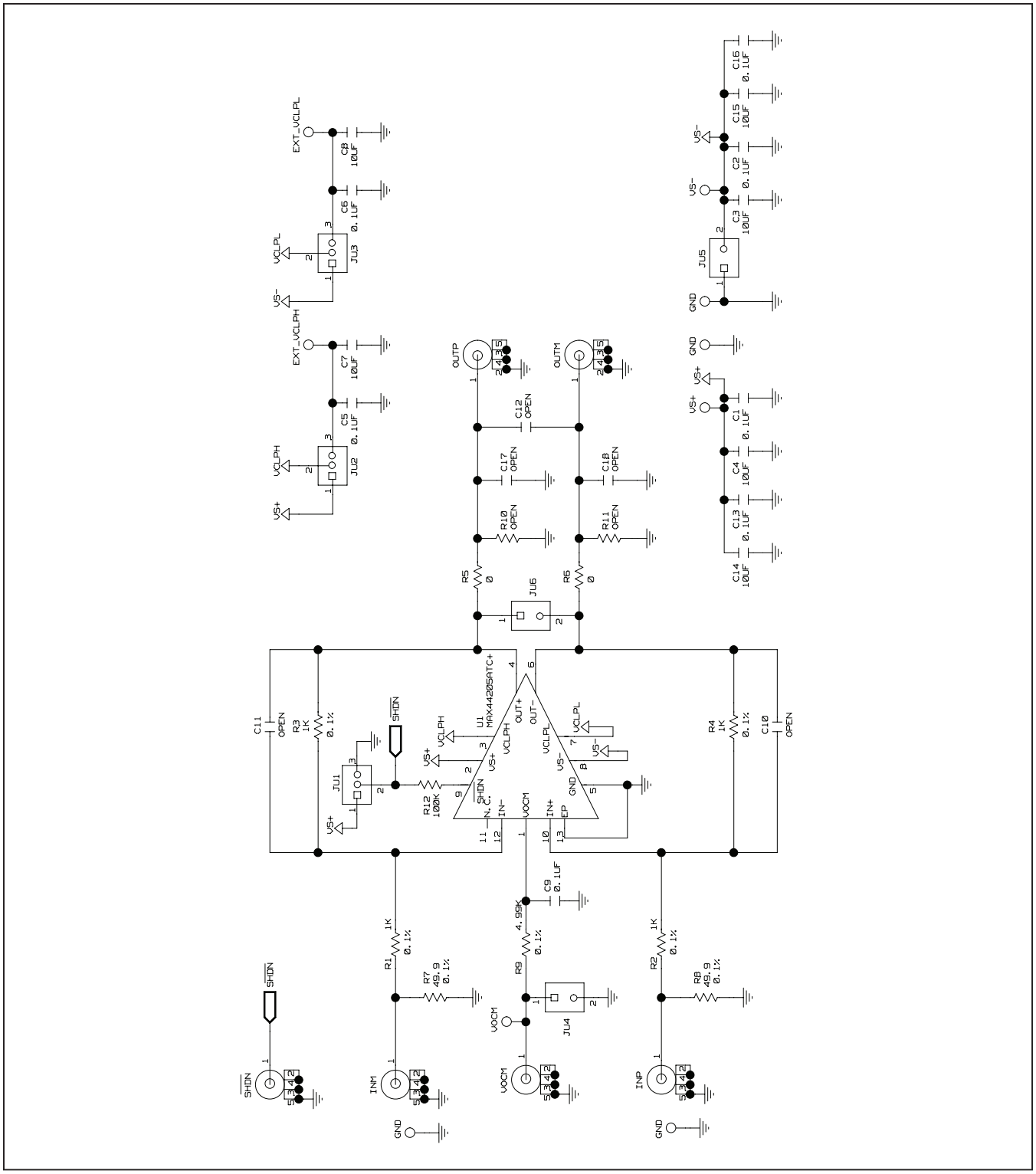

Figure 1. MAX44205 EV Kit Schematic

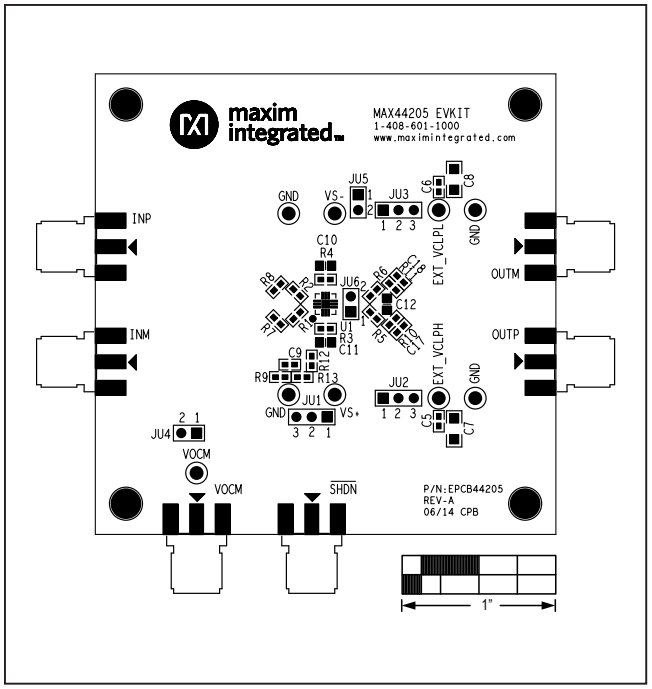

Figure 2. MAX44205 EV Kit Component Placement Guide—Component Side

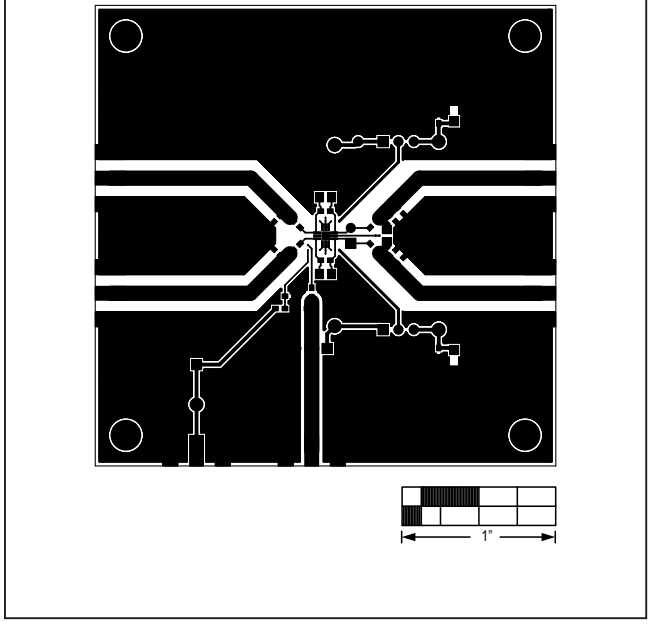

Figure 3. MAX44205 EV Kit PCB Layout—Component Side

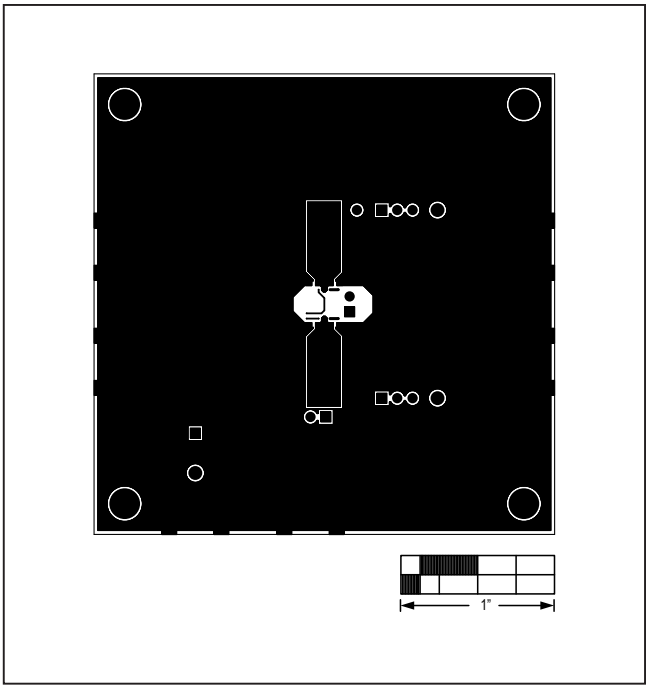

Figure 4. MAX44205 EV Kit PCB Layout—Solder Side

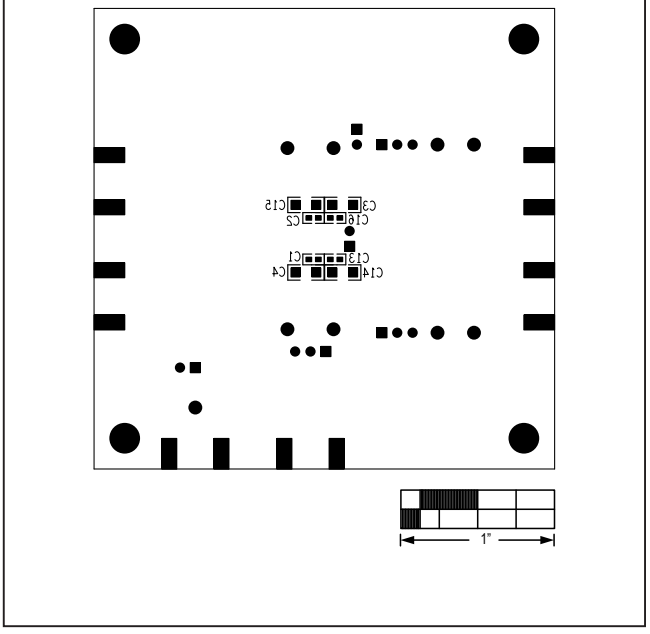

Figure 5. MAX44205 EV Kit Component Placement Guide—Solder Side

Ordering Information

PART	TYPE
MAX44205EVKIT#	EV Kit

Revision History

REVISION NUMBER	REVISION DATE	DESCRIPTION	PAGES CHANGED
0	9/14	Initial release	—

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