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# MAX1200/MAX1201/MAX1205 Evaluation Kits

## General Description

The MAX1200/MAX1201/MAX1205 evaluation kits (EV kits) are assembled and tested PC boards that include the basic components necessary to drive either the 16-bit MAX1200 or 14-bit MAX1201/MAX1205 analog-to-digital converters (ADCs). Connectors for power supplies, analog inputs, and digital outputs simplify connections to the device. The PC board layouts are optimized for best dynamic performance. Each EV kit is fully assembled and tested, and includes a MAX1200, MAX1201, or MAX1205 (as requested) that is soldered and ready to test.

## Features

- ◆ Accepts Single-Ended or Differential Inputs
- ◆ Accepts Sine or Square Clock Input
- ◆ Proven PC Board Layout
- ◆ Convenient Test Points Provided On-Board
- ◆ Fully Assembled and Tested Surface-Mount Board

## Ordering Information

PART	TEMP. RANGE	IC PACKAGE
MAX1200EVKIT-MQFP	0°C to +70°C	44 MQFP
MAX1201EVKIT-MQFP	0°C to +70°C	44 MQFP
MAX1205EVKIT-MQFP	0°C to +70°C	44 MQFP

## Component List

DESIGNATION	QTY	DESCRIPTION
C1, C3, C5, C7, C11	5	22 $\mu$ F, 16V tantalum capacitors AVX TAJD226K016
C2, C4, C6, C8, C9, C10, C12, C14–C17, C20, C21, C22, C25, C26, C30, C31, C35, C36, C37, C40, C41, C42, C44, C45, C48, C49, C50, C57, C58	31	0.1 $\mu$ F, 25V ceramic capacitors
C13, C18	2	10 $\mu$ F, 16V tantalum capacitors AVX TAJB106K006
C19, C24	2	0.47 $\mu$ F, 25V ceramic capacitors
C38, C39	2	100pF, 25V ceramic capacitors
C51	1	390pF, 25V ceramic capacitor
FB1–FB5	7	Ferrite beads Panasonic ECE-CL3216U
FB6, FB7	2	Panasonic AEM-MLB-805 G601 P
R1	1	10k $\Omega$ potentiometer
R2, R3, R16	3	5k $\Omega$ , 5% resistors
R4	1	100 $\Omega$ , 5% resistor
R5, R6, R43	3	10 $\Omega$ , 5% resistors
R7, R30, R35, R42	4	33 $\Omega$ , 5% resistors

DESIGNATION	QTY	DESCRIPTION
R17, R19, R21	3	10k $\Omega$ , 5% resistors
R14, R15, R23–R26	6	1k $\Omega$ , 5% resistors
R27	1	1.21k $\Omega$ , 1% resistor
R28, R29, R31–R34, R36, R37	8	976 $\Omega$ , 1% resistors
R39	1	200 $\Omega$ , 1% resistor
R38	1	54.9 $\Omega$ , 1% resistor
CLK_SINE, CLK_SQ, IN, IN+AP, IN-AP, IN_XFR, REF+, REF-	8	SMA connectors
JU1, JU2	2	3-pin headers
J1, J2, J5, J7, J10, JU3, JU4	7	2-pin headers
J3	1	2 x 20 header
None	7	Shunts
+5V_A, +5V_D, +5V_DR, +7V, -3V, AGND, DGND	7	Test points
SW1	1	Momentary pushbutton switch
U1, U2, U3	3	74HC541 three-state buffers

Component List continued on next page.

Evaluate: MAX1200/MAX1201/MAX1205





# MAX1200/MAX1201/MAX1205 Evaluation Kits

## Component List (continued)

DESIGNATION	QTY	DESCRIPTION
U6	1	Maxim MAX961EUA comparator
U7, U8, U9	3	Maxim MAX410CSA op amps
U10, U11	2	Maxim MAX4108ESA op amps
U12	1	Maxim MAX1200CMH, MAX1201CMH, or MAX1205CMH
None	1	PC board
T1	0	Balun transformer Coiltronics CTX03-13675-X330FL97 Rev A (not supplied)

## Quick Start

### Recommended Equipment

You will need the following equipment before you begin:

- A triple-output power supply (-3V, +5V, and +7V)
- A signal source, such as an HP8662A RF signal generator
- Two stable precision voltage references
- A low-phase-noise clock source, such as an HP8662A pulse generator, filtered by a 10MHz low-pass filter (Mini Circuits SLP-10.7).
- A logic analyzer, such as an HP16500B, to collect the data

The EV kit is shipped 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 the power supplies to the -3V, +7V, +5V, AGND, and DGND pads. For best results, use separate analog and digital leads, connecting AGND to DGND close to the power supply's common terminal.
- 2) Connect a signal source to the IN or IN+AP/IN-AP inputs. If using differential inputs, common-mode voltage should be halfway between REF+ and REF-.
- 3) Connect the voltage references to the REF+ and REF- inputs.
- 4) Connect a sine-wave clock source to the CLK\_SINE input. If using a square wave instead of a sine wave, connect it to the CLK\_SQ input instead.
- 5) Turn on the logic analyzer and connect it to header J3. Configure it to receive data on the rising edge of the DAV strobe signal.

- 6) Turn on the EV kit's power supplies.
- 7) Press momentary switch SW1 to trigger self-calibration.
- 8) Turn on the input signal source.
- 9) Collect data using the logic analyzer.

### Hardware Description

The MAX120x EV kit accepts a differential input signal between IN+AP and IN-AP, or it can accept a single-ended (i.e., ground-referenced) input signal at IN. The PC board can also accommodate a Balun transformer at T1; however, transformer-coupling the input may degrade signal performance.

U12, the MAX1200, is a 16-bit, 1Msps ADC with parallel two's complement data outputs. The MAX1201/MAX1205 are 14-bit versions of the MAX1200.

Data output signals are buffered by U1, U2, and U3 and provided at header J3 for evaluation.

### Reference Input

The MAX410 op amps designated as U8 and U9 on the EV board buffer the REF+ and REF- inputs.

The MAX410 op amp designated as U7 on the EV board buffers resistor-dividers R2/R1/R3, providing a common-mode voltage level halfway between REF+ and REF-. Trim pot R1 adjusts the common-mode voltage.

The op amps have a maximum total supply-voltage rating of 10V. The supply rails have been set to  $V_{SS} = -3V$  and  $V_{CC} = +7V$  to keep the signals well within the common-mode range of these op amps.

# MAX1200/MAX1201/MAX1205 Evaluation Kits

Evaluate: MAX1200/MAX1201/MAX1205

**Table 1. Jumper Functions**

JUMPER	STATE	FUNCTION
JU1	1–2	Apply a single-ended input at the “IN” SMA connector.
	2–3*	Apply a differential input between the “IN+ AP” and “IN-AP” SMA connectors.
JU2	1–2	Apply a single-ended input at the “IN” SMA connector.
	2–3*	Apply a differential input between the “IN+ AP” and “IN-AP” SMA connectors.
JU3	Open*	Normal operation with no balun transformer.
	Closed	Install balun transformer T1 and apply an input signal at the “IN_XFR” connector. <i>Not supported as shipped from the factory.</i>
JU4	Open*	Normal operation with no balun transformer.
	Closed	Install balun transformer T1 and apply an input signal at the “IN_XFR” connector. <i>Not supported as shipped from the factory.</i>
J1	Open	14-bit MAX1201/MAX1205
	Closed	16-bit MAX1200
J2	Open	14-bit MAX1201/MAX1205
	Closed	16-bit MAX1200
J5	Open	Enable remote REF+ force/sense.
	Closed	Disable REF+ force/sense.
J7	Open	Enable remote REF- force/sense.
	Closed	Disable REF- force/sense.
J10	Open	Apply a square-wave clock at the “CLK_SQ” SMA connector.
	Closed*	Apply a sinusoidal clock at the “CLK_SINE” SMA connector.

\* Indicates default jumper state.

**Table 2. I/O Connectors**

LABEL	TYPE	DIRECTION	DESCRIPTION
REF+	SMA	Input	Reference voltage input, positive connection
REF-	SMA	Input	Reference voltage input, negative connection
IN+ AP	SMA	Input	Differential signal input, positive connection
IN-AP	SMA	Input	Differential signal input, negative connection
IN	SMA	Input	Single-ended signal input
IN_XFR	SMA	Input	Signal input to optional balun transformer T1. <i>Not supported as shipped from the factory.</i>
CLK_SINE	SMA	Input	Clock input, sine wave
CLK_SQ	SMA	Input	Clock input, square wave
J3	2 x 20 Header	Output	Two’s complement data outputs: MAX1200: D0–D15, D15 = MSB; MAX1201/MAX1205: D0–D13, D13 = MSB.
-3V	Solder Pad	Power Input	Negative power-supply rail for op amps
+7V	Solder Pad	Power Input	Positive power-supply rail for op amps
+5V_A	Solder Pad	Power Input	Positive power supply for analog circuitry
AGND	Solder Pad	Power Input	Analog ground return
DGND	Solder Pad	Power Input	Digital ground return
+5V_DR	Solder Pad	Power Input	Positive power supply for digital outputs DOR, D0–D15. The +5V_DR voltage must not exceed +5V_D.
+5V_D	Solder Pad	Power Input	Positive power supply for digital circuitry

# MAX1200/MAX1201/MAX1205 Evaluation Kits

Evaluate: MAX1200/MAX1201/MAX1205

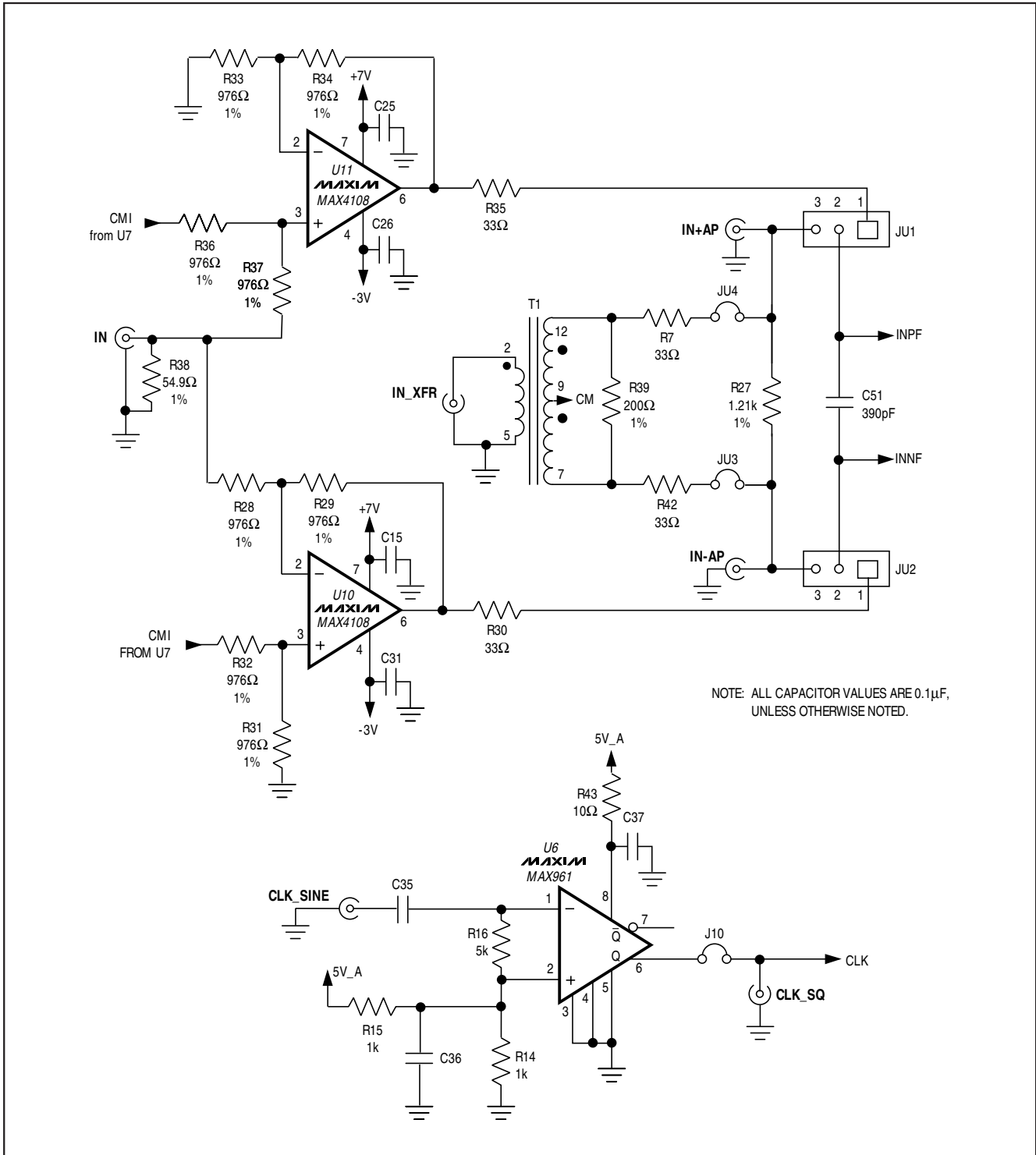


Figure 1. MAX1200/MAX1201/MAX1205 EV Kits Schematic

# MAX1200/MAX1201/MAX1205 Evaluation Kits

Evaluate: MAX1200/MAX1201/MAX1205

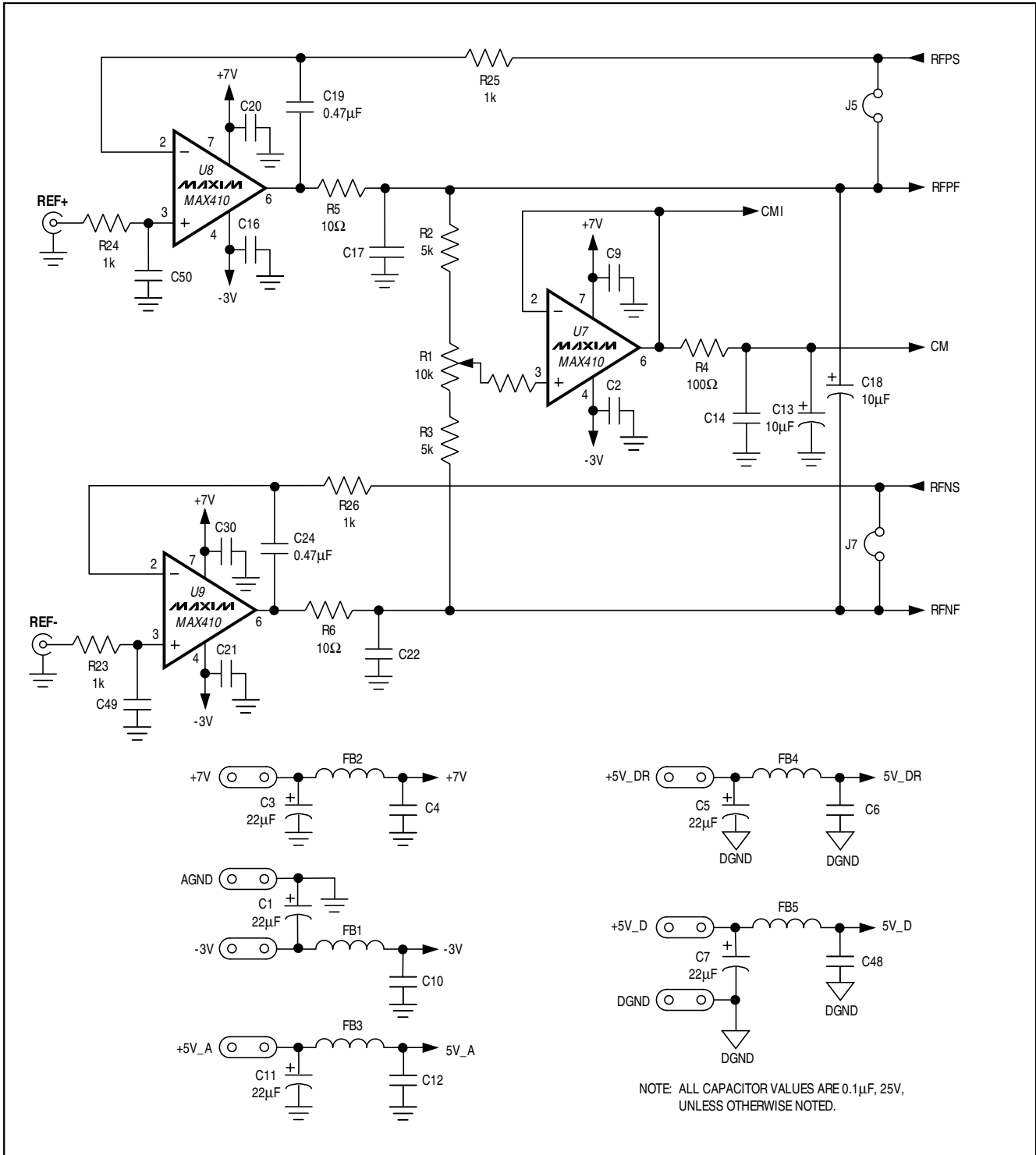


Figure 1. MAX1200/MAX1201/MAX1205 EV Kits Schematic (continued)

# MAX1200/MAX1201/MAX1205 Evaluation Kits

Evaluate: MAX1200/MAX1201/MAX1205

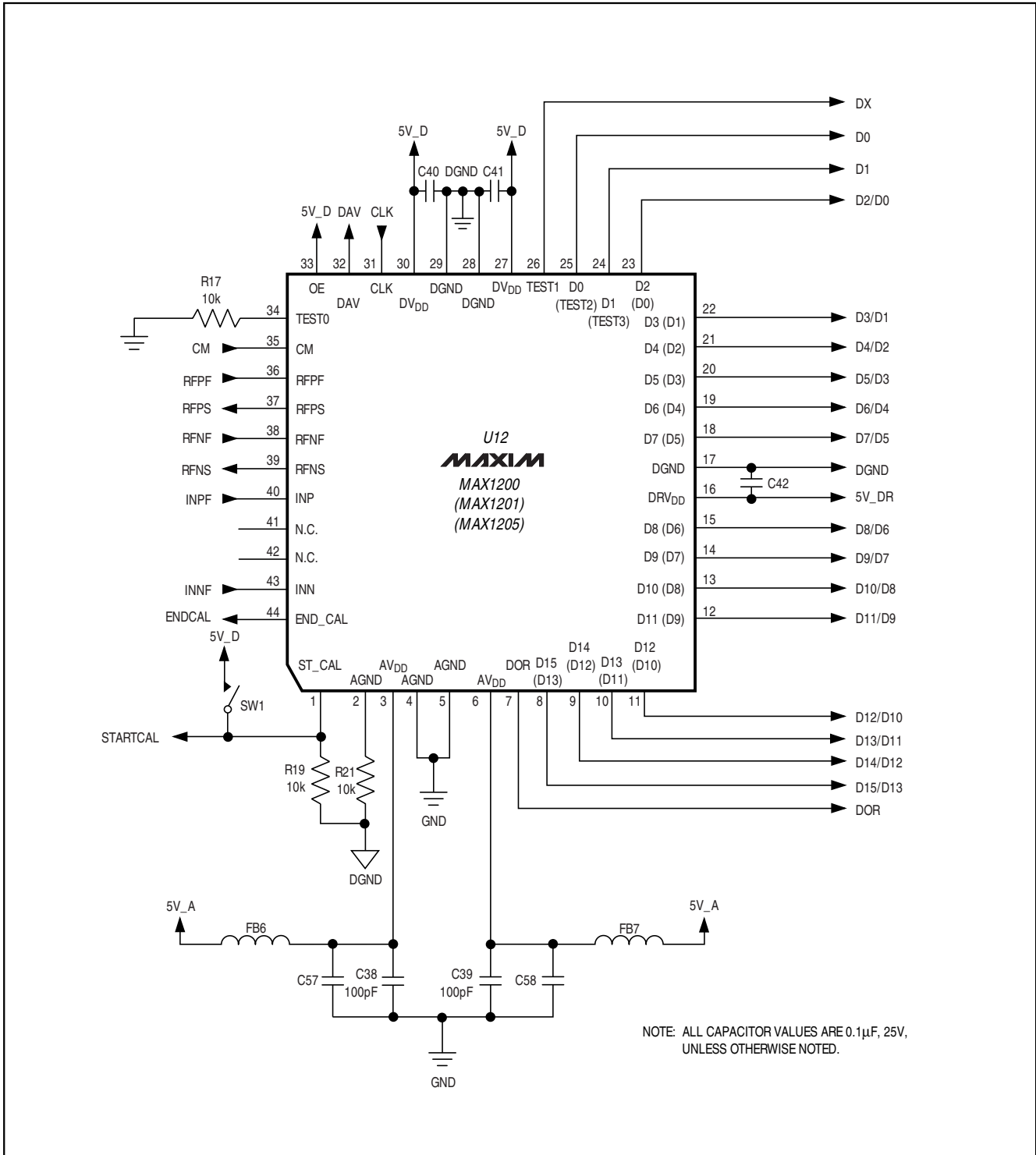


Figure 1. MAX1200/MAX1201/MAX1205 EV Kits Schematic (continued)

# MAX1200/MAX1201/MAX1205 Evaluation Kits

Evaluate: MAX1200/MAX1201/MAX1205

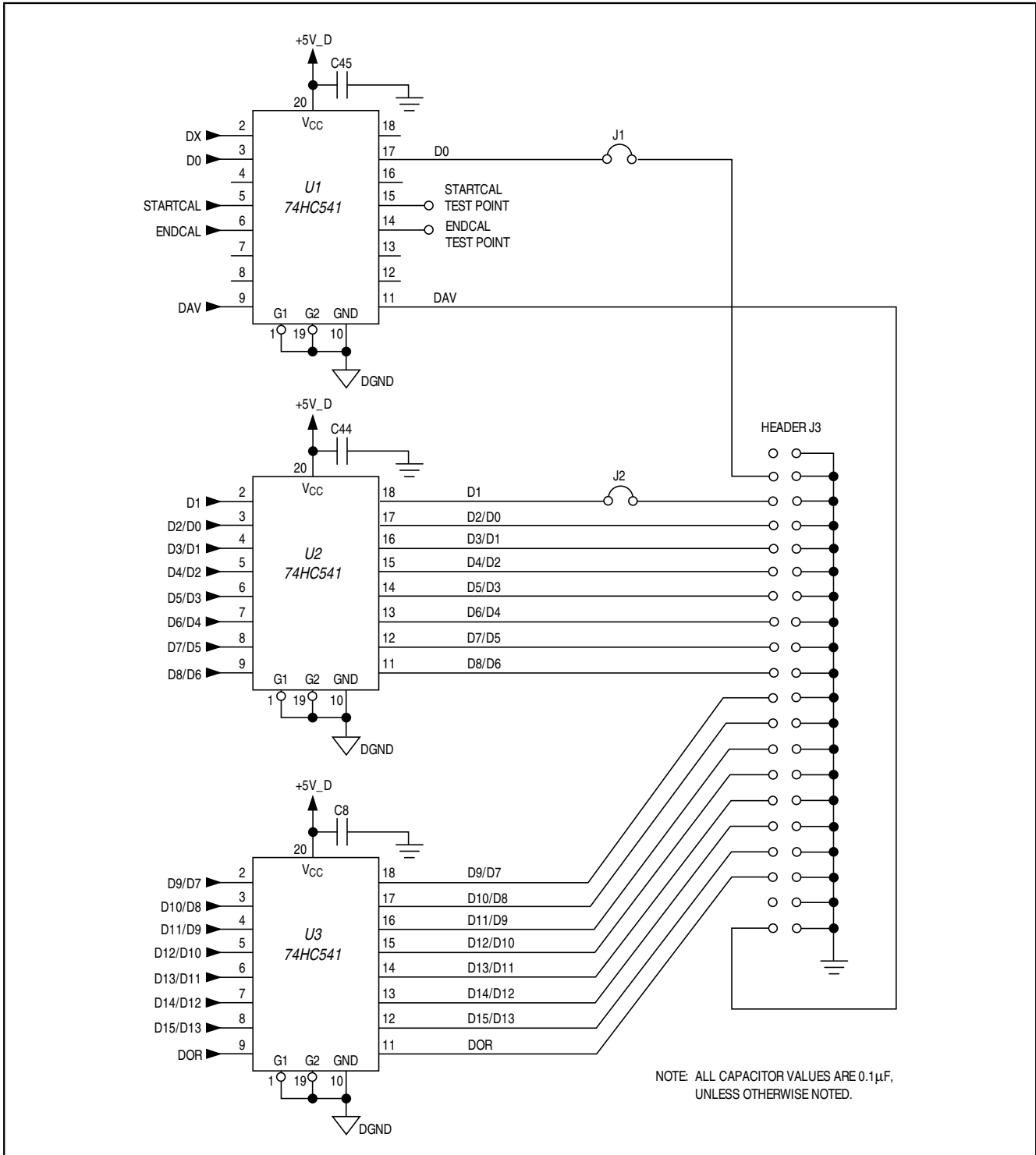


Figure 1. MAX1200/MAX1201/MAX1205 EV Kits Schematic (continued)



# MAX1200/MAX1201/MAX1205 Evaluation Kits

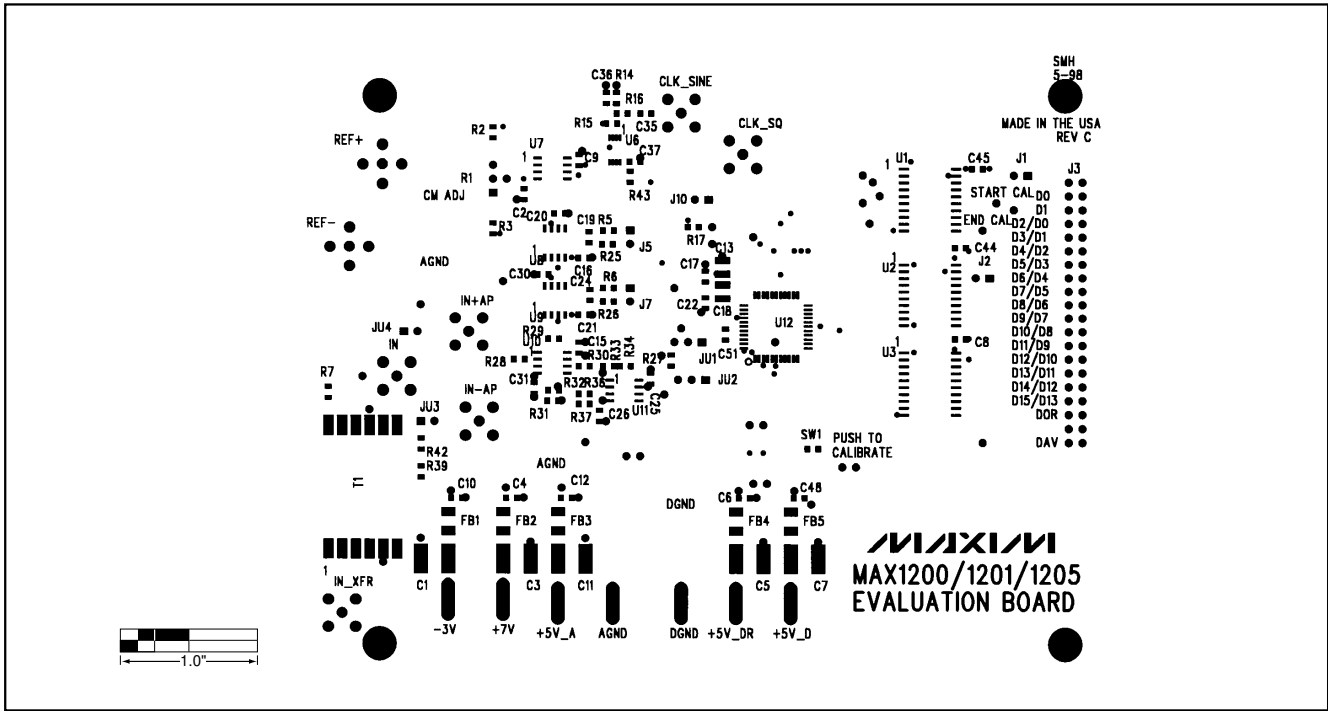


Figure 2. MAX1200/MAX1201/MAX1205 EV Kits Component Placement Guide—Component Side

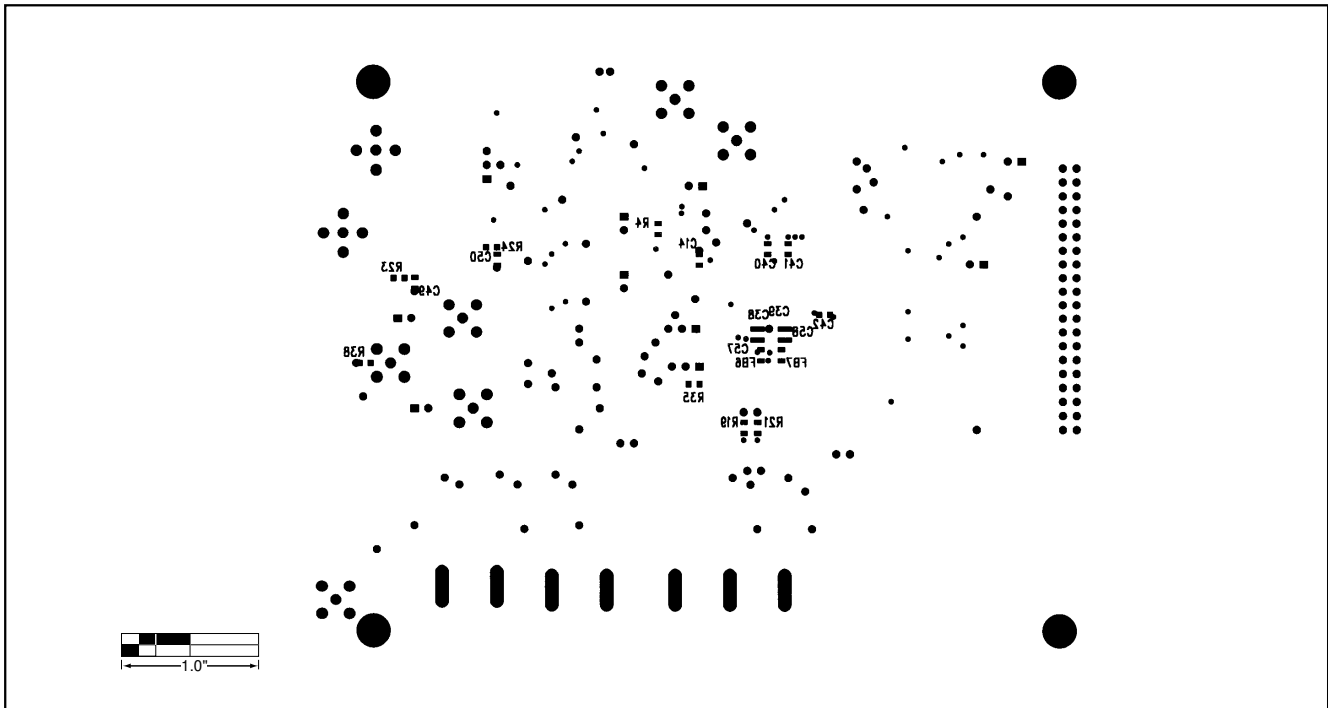


Figure 3. MAX1200/MAX1201/MAX1205 EV Kits Component Placement Guide—Solder Side

# MAX1200/MAX1201/MAX1205 Evaluation Kits

Evaluate: MAX1200/MAX1201/MAX1205

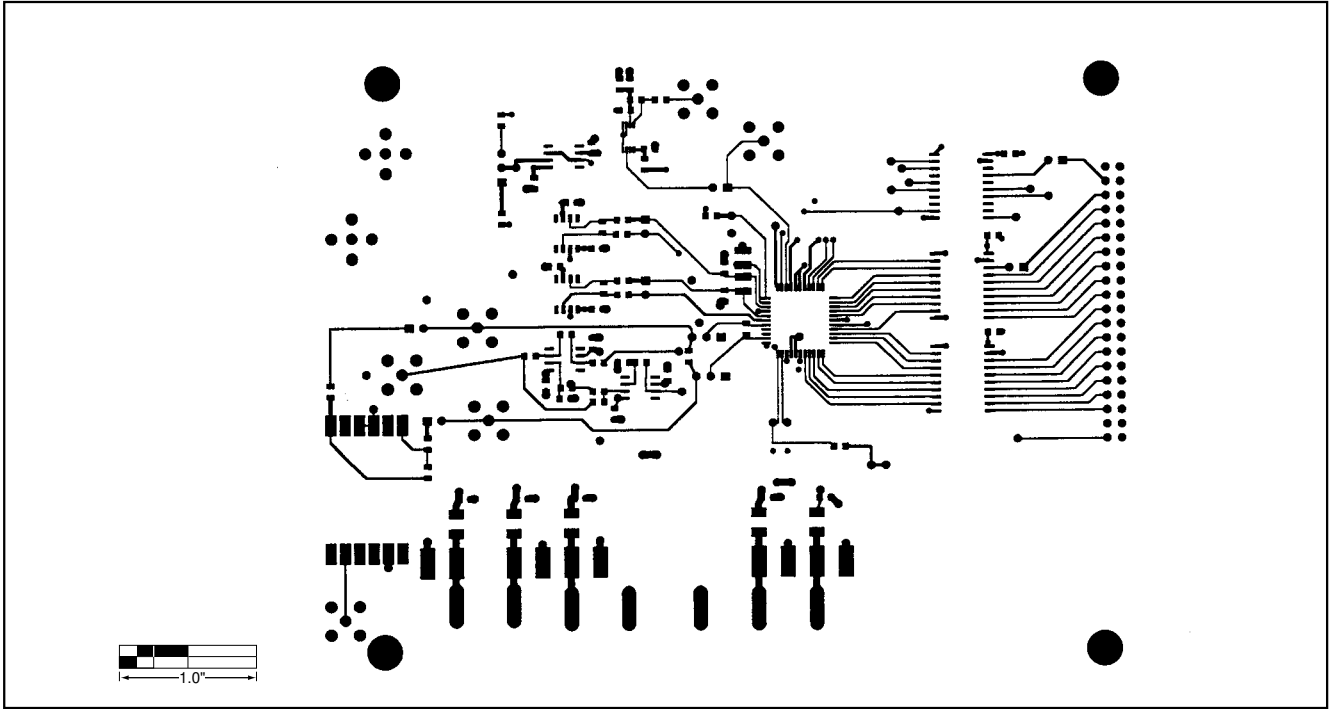


Figure 4. MAX1200/MAX1201/MAX1205 EV Kits PC Board Layout—Component Side

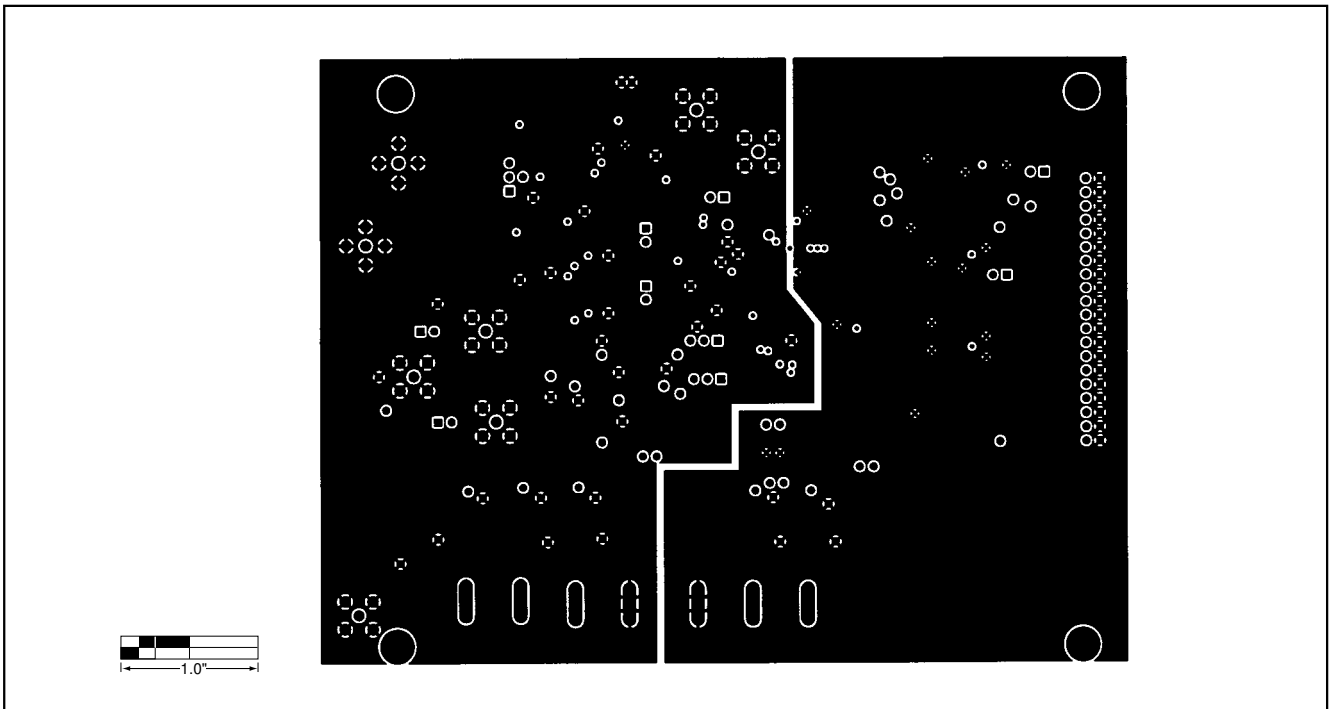


Figure 5. MAX1200/MAX1201/MAX1205 EV Kits PC Board Layout—Ground Plane

# MAX1200/MAX1201/MAX1205 Evaluation Kits

Evaluate: MAX1200/MAX1201/MAX1205

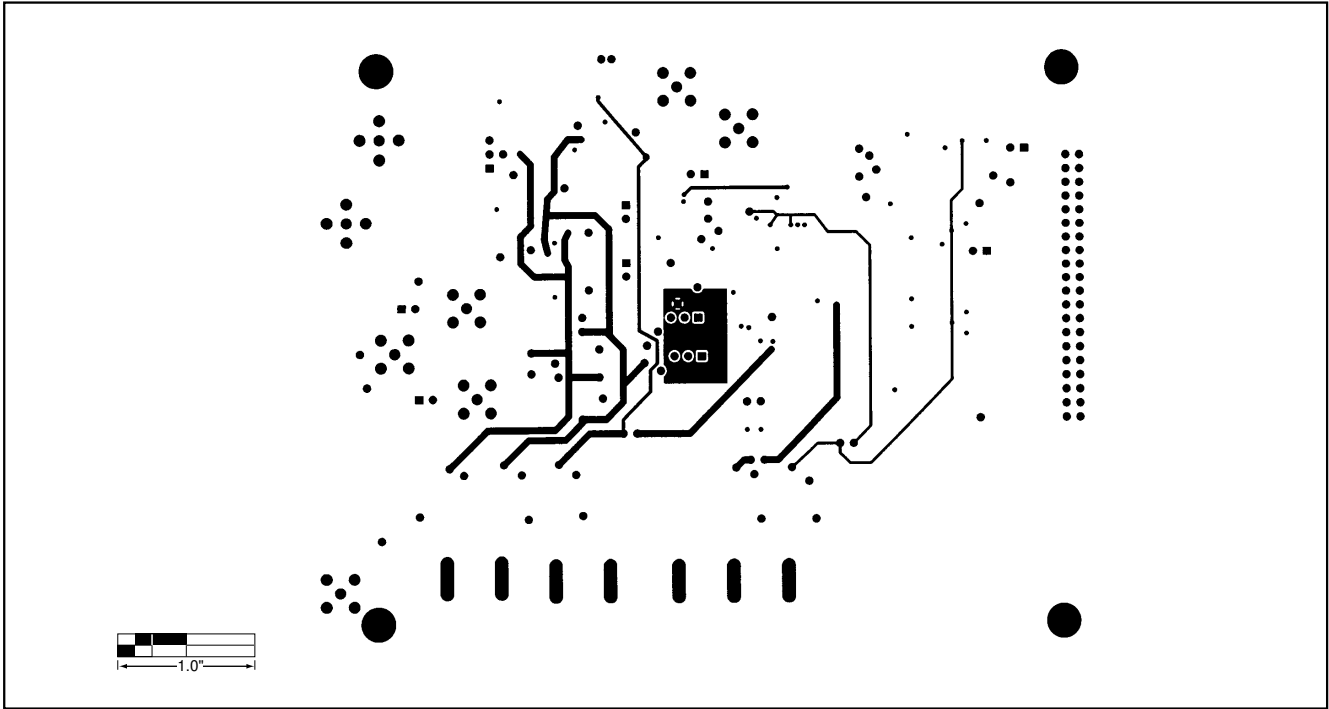


Figure 6. MAX1200/MAX1201/MAX1205 EV Kits PC Board Layout—Power Layer

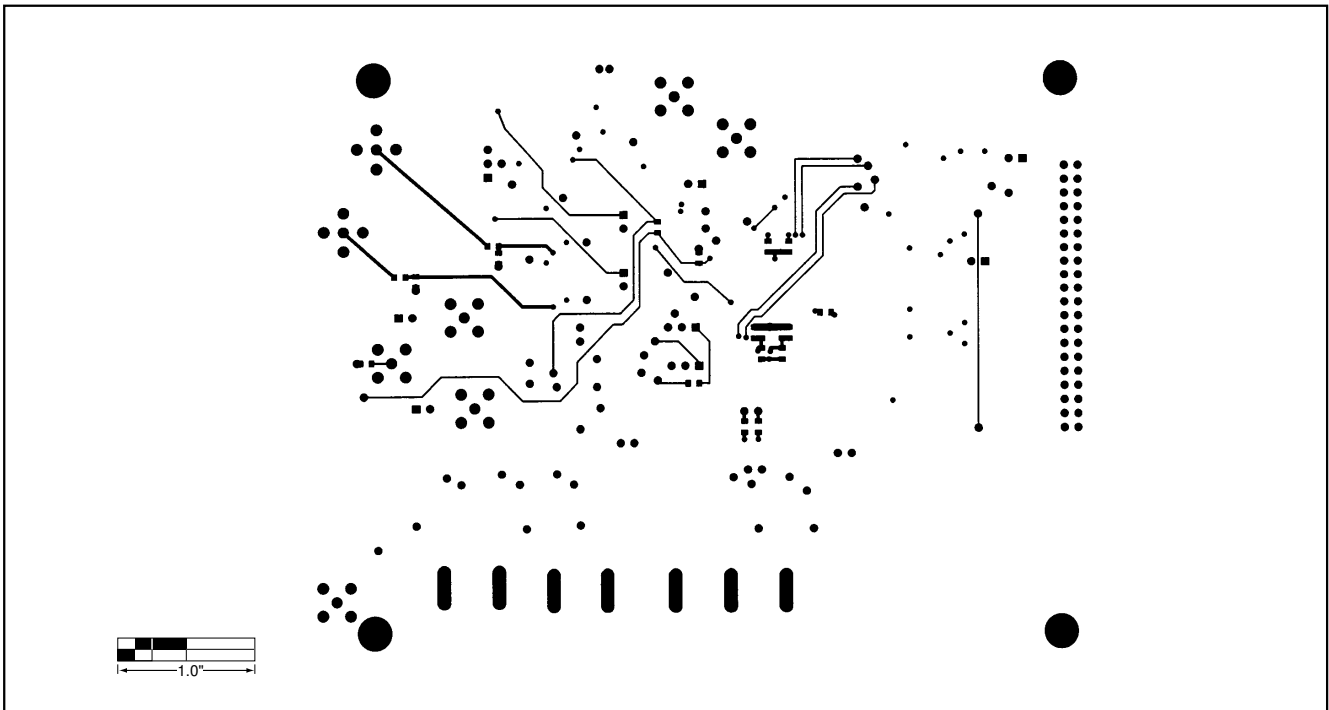


Figure 7. MAX1200/MAX1201/MAX1205 EV Kits PC Board Layout—Solder Side

# **MAX1200/MAX1201/MAX1205 Evaluation Kits**

NOTES

**Evaluate: MAX1200/MAX1201/MAX1205**

# MAX1200/MAX1201/MAX1205 Evaluation Kits

## NOTES

**Evaluate: MAX1200/MAX1201/MAX1205**

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