



MAX9223/4 Evaluation Kit

General Description

The MAX9223/4 evaluation kit (EV kit) is a fully assembled and tested PCB that simplifies the evaluation of the MAX9223 22-bit, 5MHz to 10MHz serializer and the MAX9224 22-bit, 5MHz to 10MHz deserializer. The MAX9223 IC transfers 22-bit parallel 1.8V to 3.3V logic to an LCDS 2-wire serial interface. The MAX9224 IC accepts an LCDS data and converts it back to a 22-bit parallel 1.8V to 3.3V logic signal.

The MAX9223 serializer operates from a single +2.375V to +3.465V supply and accepts +1.71V to +3.465V inputs. The MAX9224 deserializer operates from a +2.375V to +3.465V core supply and has a separate output buffer supply, allowing +1.71V to +3.465V output high levels.

Component Suppliers

SUPPLIER	PHONE	WEBSITE
Taiyo Yuden	800-348-2496	www.t-yuden.com
TDK Corp.	847-803-6100	www.component.tdk.com

Note: Indicate that you are using the MAX9223/MAX9224 when contacting these component suppliers.

Features

- ◆ 22-Bit Parallel I/O Interface Directly to 1.8V to 3.3V Logic
- ◆ 2-Wire Serial Interface
- ◆ Independent Evaluation of Serializer (MAX9223) and Deserializer (MAX9224)
- ◆ Low-Voltage, Low-Power Operation
- ◆ Including Flat-Flex Cable for 2-Wire Interface
- ◆ Fully Assembled and Tested

Ordering Information

PART	TEMP RANGE	IC PACKAGE
MAX9223/4EVKIT	0°C to +70°C	28 TQFN-EP*

*EP = Exposed paddle.

Component List

DESIGNATION	QTY	DESCRIPTION
C1, C2, C3	3	10 μ F $\pm$ 20%, 6.3V X5R ceramic capacitors (0805) Taiyo Yuden JMK212BJ106MG TDK C2012X5R0J106M
C4, C5, C6	3	0.1 μ F $\pm$ 10%, 16V X7R ceramic capacitors (0603) TDK C1608X7R1C104K
C7, C8, C9	3	0.01 μ F $\pm$ 10%, 25V X7R ceramic capacitors (0402) TDK C1005X7R1E103K
EX_PCLKIN, POWER-DOWN	2	50 Ω BNC PCB-mount connectors

DESIGNATION	QTY	DESCRIPTION
J1, J2, J3	3	2 x 10-pin headers
J4	1	2 x 24-pin header
JU1, JU4, JU5	3	2-pin headers
JU2, JU3	2	3-pin headers
R1, R2	2	249 Ω $\pm$ 1% resistors (0402)
R3	0	Not installed, short by PC trace (0402)
R4	1	10k Ω $\pm$ 5% resistor (0603)
R5, R6	2	49.9 Ω $\pm$ 1% resistors (1206)
U1	1	MAX9223ETI (4mm x 4mm, 28-pin TQFN)
U2	1	MAX9224ETI (4mm x 4mm, 28-pin TQFN)
—	2	Shunts
—	1	PCB: MAX9223/4 Evaluation Kit



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Quick Start

Recommended Equipment

- Three separate 3.0V, 50mA power supplies
- Data generator
- Logic analyzer

Procedure

The MAX9223/4 EV kit is fully assembled and tested.

Caution: Do not turn on the power supplies until all connections are completed.

- 1) Connect JU1 to JU4 with a two-connection, flat-flex cable included in the EV kit.
- 2) Verify that there is a shunt across JU3 (pins 2-3) (power-down).
- 3) Connect the clock signal from the data generator to pin 2 of JU2 and connect the ground to pin 1 of JU2.
- 4) Connect the desired data to the 22-bit parallel inputs (see Table 3 for input bit location).
- 5) Connect the 22-bit parallel outputs to the input of the logic analyzer (see Table 3 for output bits location).
- 6) Connect the output clock signal to the logic analyzer, pin 2 of JU5.
- 7) Connect the positive of a 3.0V power supply to the VDD1 pad, and then connect the negative of the power supply to GND1.
- 8) Connect the positive of a 3.0V power supply to the VDD2 pad, and then connect the negative of the power supply to GND2.
- 9) Connect the positive of a 3.0V power supply to the VDDO pad, and then connect the negative of the power supply to GND3.
- 10) Turn on all three power supplies, and then enable the data generator and logic analyzer.
- 11) Move the shunt on JU3 to pins 1-2 (power-up).
- 12) Compare the input signals of the serializer and the output signals of the deserializer with the logic analyzer.

Detailed Description

The MAX9223/4 EV kit is a fully assembled and tested PCB that simplifies the evaluation of the MAX9223 22-bit, 5MHz to 10MHz serializer and the MAX9224 22-bit, 5MHz to 10MHz deserializer. The MAX9223/MAX9224 serializer/deserializer chipset reduces wiring by serializing 22 bits onto a single differential pair. The 2-wire serial interface uses LCDS for low-EMI, high common-mode noise immunity, and ground-shift tolerance.

The MAX9223 serializer operates from a single +2.375V to +3.465V supply and accepts +1.71V to +3.465V inputs. The MAX9224 deserializer operates from a +2.375V to +3.465V core supply and has a separate output buffer supply, allowing +1.71V to +3.465V output-high levels, $V_{DDO} \leq V_{DD}$.

Transferring Data from Serializer to Deserializer

The EV kit provides two 2-pin headers, JU1 and JU4, for transferring data from the serializer to the deserializer with a flat-flex cable. JU1 is the output of the serializer, and JU4 is the input of the deserializer. The 2-pin header, JU1, provides easy connection for either using a differential probe to monitor the output or connecting a flat-flex cable to the deserializer. Pads SDO+/SDO- and SDI+/SDI- are provided for extra connections.

Parallel Clock Input

The MAX9223/4 EV kit allows the MAX9223 to accept a clock from either a data generator/logic analyzer or a clock from an individual function generator, which is 50 Ω terminated, by changing jumper JU2. See Table 1 for JU2 functions. The clock and the data inputs to the MAX9223 need to be synchronized.

Table 1. JU2 Functions

SHUNT LOCATION	PCLKIN PIN	PARALLEL CLOCK INPUT
Open	Clock externally connected to pin 2 of JU2	Using a clock from a data generator/logic analyzer
Pins 2-3	Connected to EX_PCLKIN connector, 50 Ω terminated	Using a clock from a function generator

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Power-Down Input

The MAX9223/4 EV kit incorporates jumper JU3 to control the PWRDN pin. See Table 2 for JU3 functions. For normal operation, PCLKIN must be running before driving PWRDN high.

Table 2. JU3 Functions

SHUNT LOCATION	PWRDN PIN	MAX9223 OPERATING MODE
Pins 1-2	Connect to VDD1 through a 10k Ω resistor	Power-up mode
Pins 2-3	Connect to SGND1 through R6	Power-down mode
	Connect to POWER-DOWN BNC with an external signal	The external signal levels determine the operating mode

Table 3. Input/Output Bit Location

DATA BIT	INPUT LOCATION	OUTPUT LOCATION
Bit 0	J1-1	J4-43
Bit 1	J1-3	J4-41
Bit 2	J1-5	J4-39
Bit 3	J1-7	J4-37
Bit 4	J1-9	J4-35
Bit 5	J1-11	J4-33
Bit 6	J1-13	J4-31
Bit 7	J1-15	J4-29
Bit 8	J2-1	J4-27
Bit 9	J2-3	J4-25
Bit 10	J2-5	J4-23
Bit 11	J2-7	J4-21
Bit 12	J2-9	J4-19
Bit 13	J2-11	J4-17
Bit 14	J2-13	J4-15
Bit 15	J2-15	J4-13
Bit 16	J3-1	J4-11
Bit 17	J3-3	J4-9
Bit 18	J3-5	J4-7
Bit 19	J3-7	J4-5
Bit 20	J3-9	J4-3
Bit 21	J3-11	J4-1
Clock	Pin 2 of JU2	Pin 2 of JU5

Evaluates: MAX9223/MAX9224

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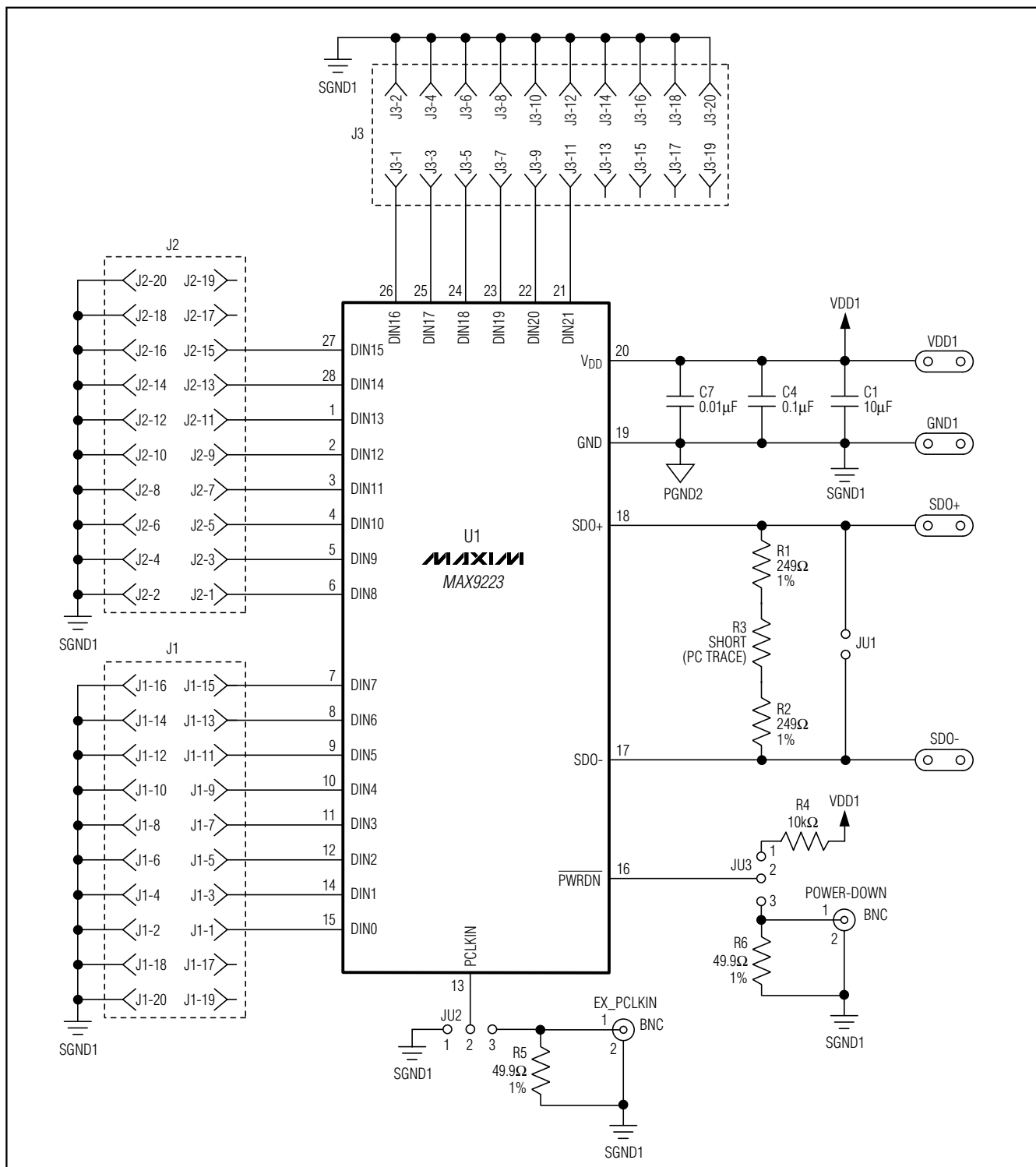


Figure 1a. MAX9223/4 EV Kit Schematic (Sheet 1 of 2)

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Evaluates: MAX9223/MAX9224

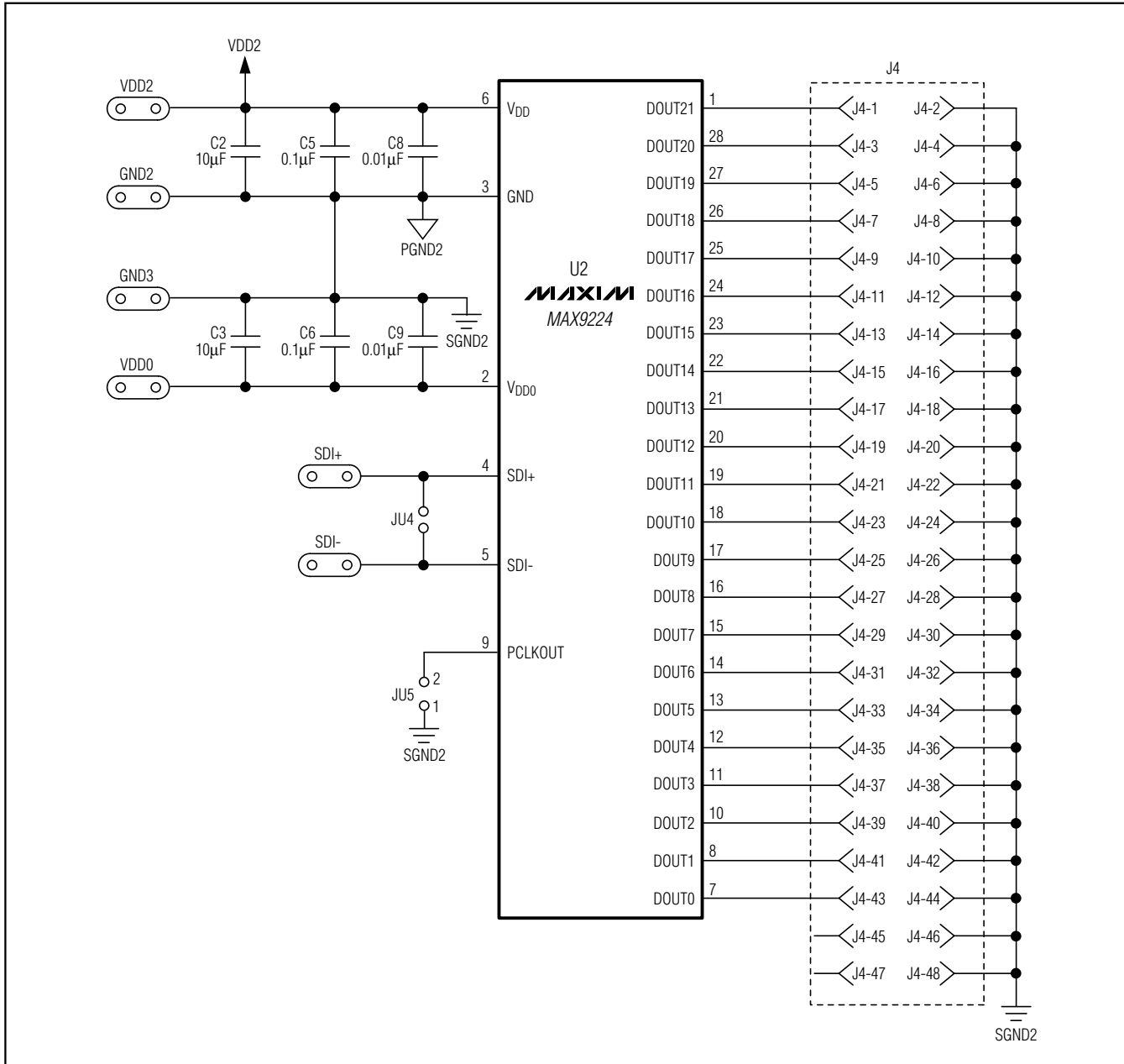


Figure 1b. MAX9223/4 EV Kit Schematic (Sheet 2 of 2)

MAX9223/4 Evaluation Kit

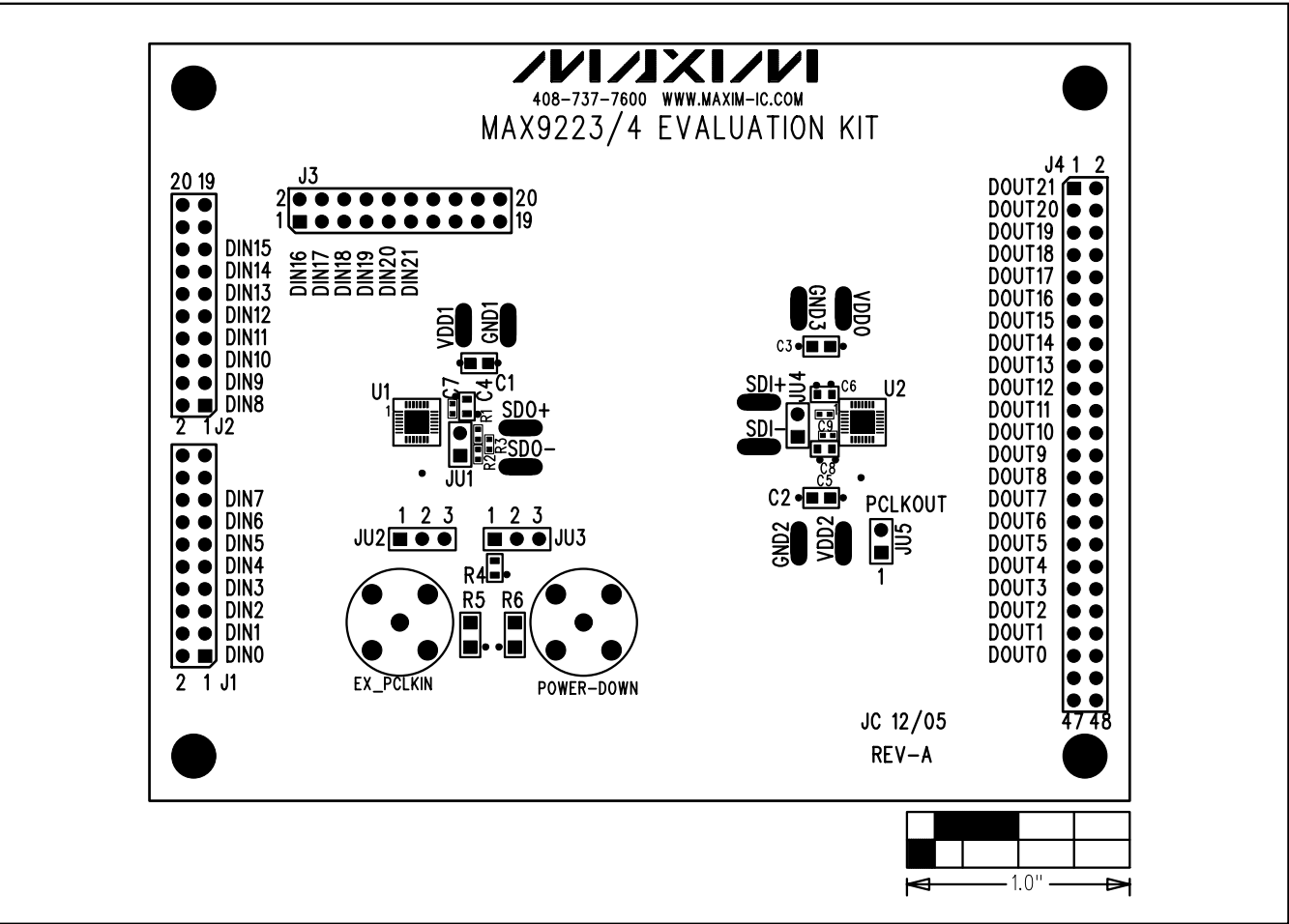


Figure 2. MAX9223/4 EV Kit Component Placement Guide—Component Side

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Evaluates: MAX9223/MAX9224

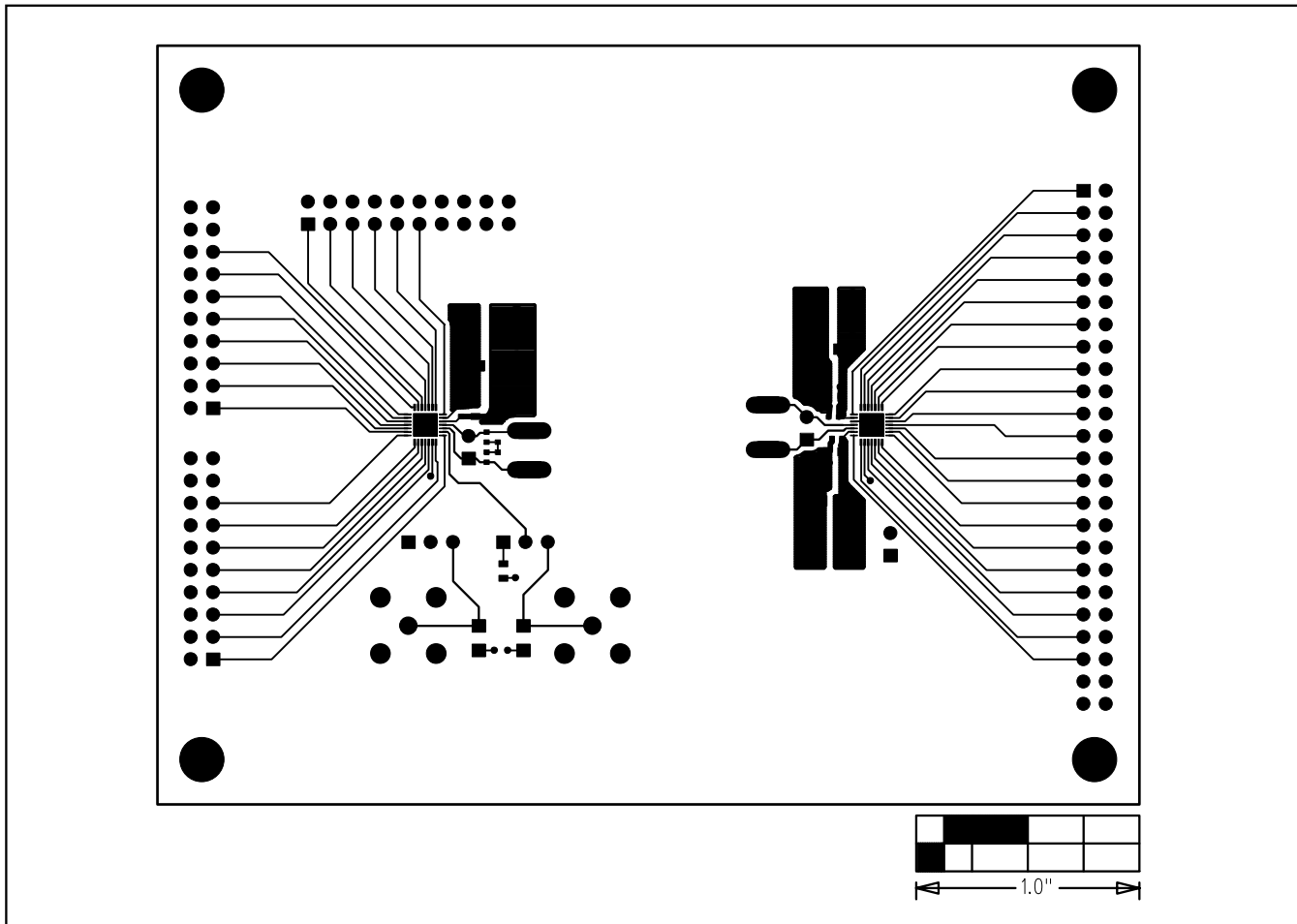


Figure 3. MAX9223/4 EV Kit PCB Layout—Component Side

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Evaluates: MAX9223/MAX9224

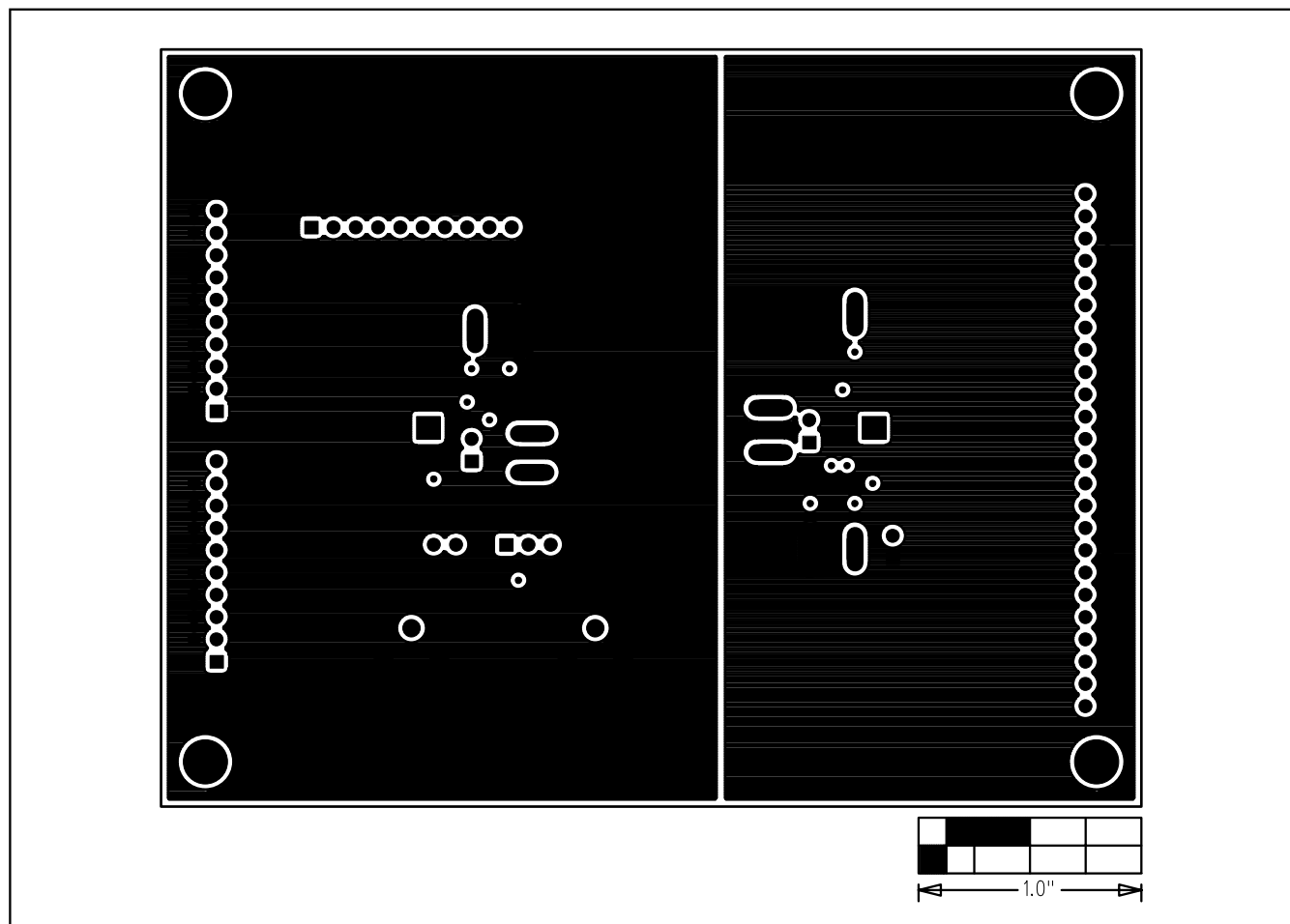


Figure 4. MAX9223/4 EV Kit PCB Layout—Inner Layer 2 (SGND1 and SGND2)

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Evaluates: MAX9223/MAX9224

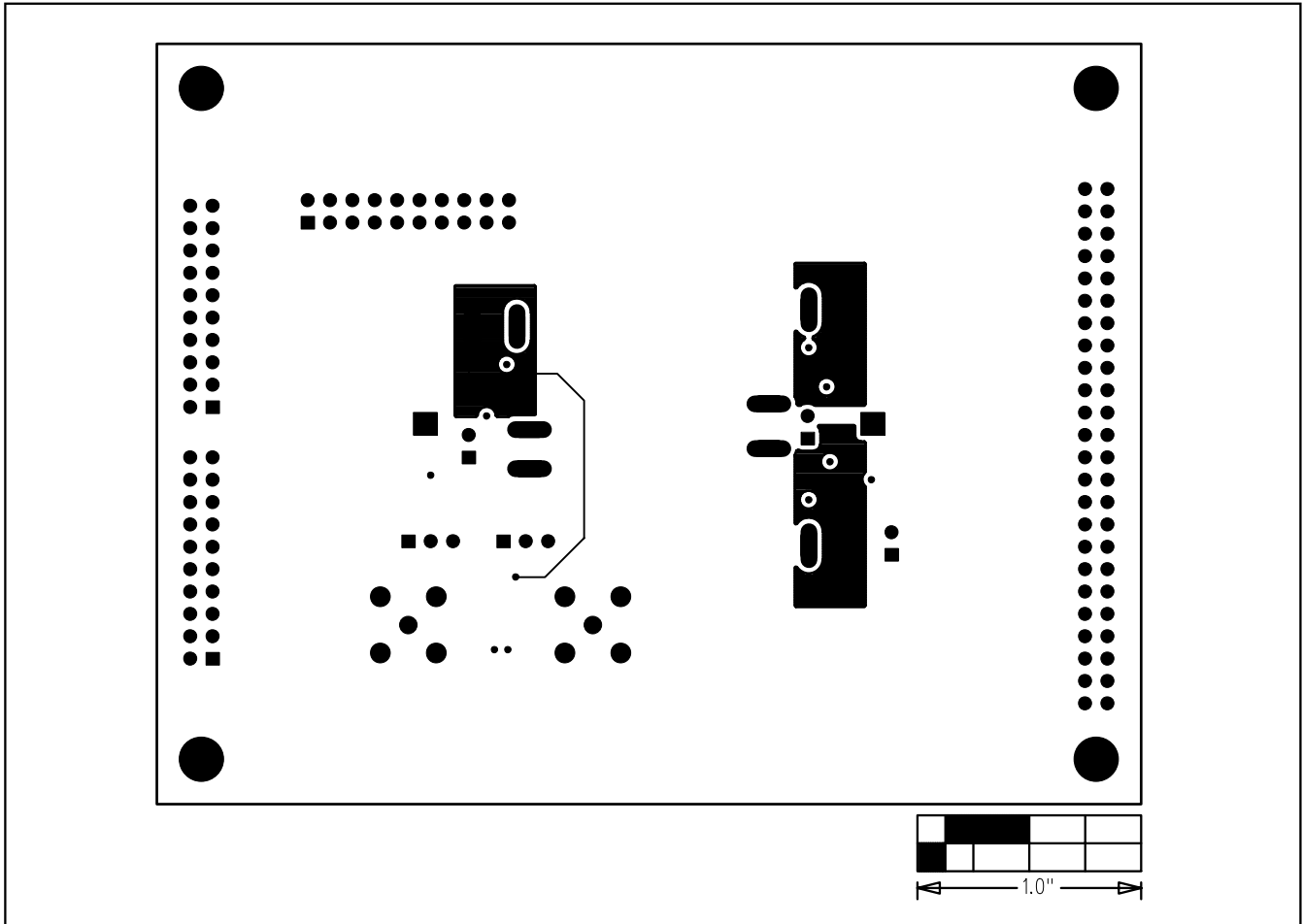


Figure 5. MAX9223/4 EV Kit PCB Layout—Inner Layer 3

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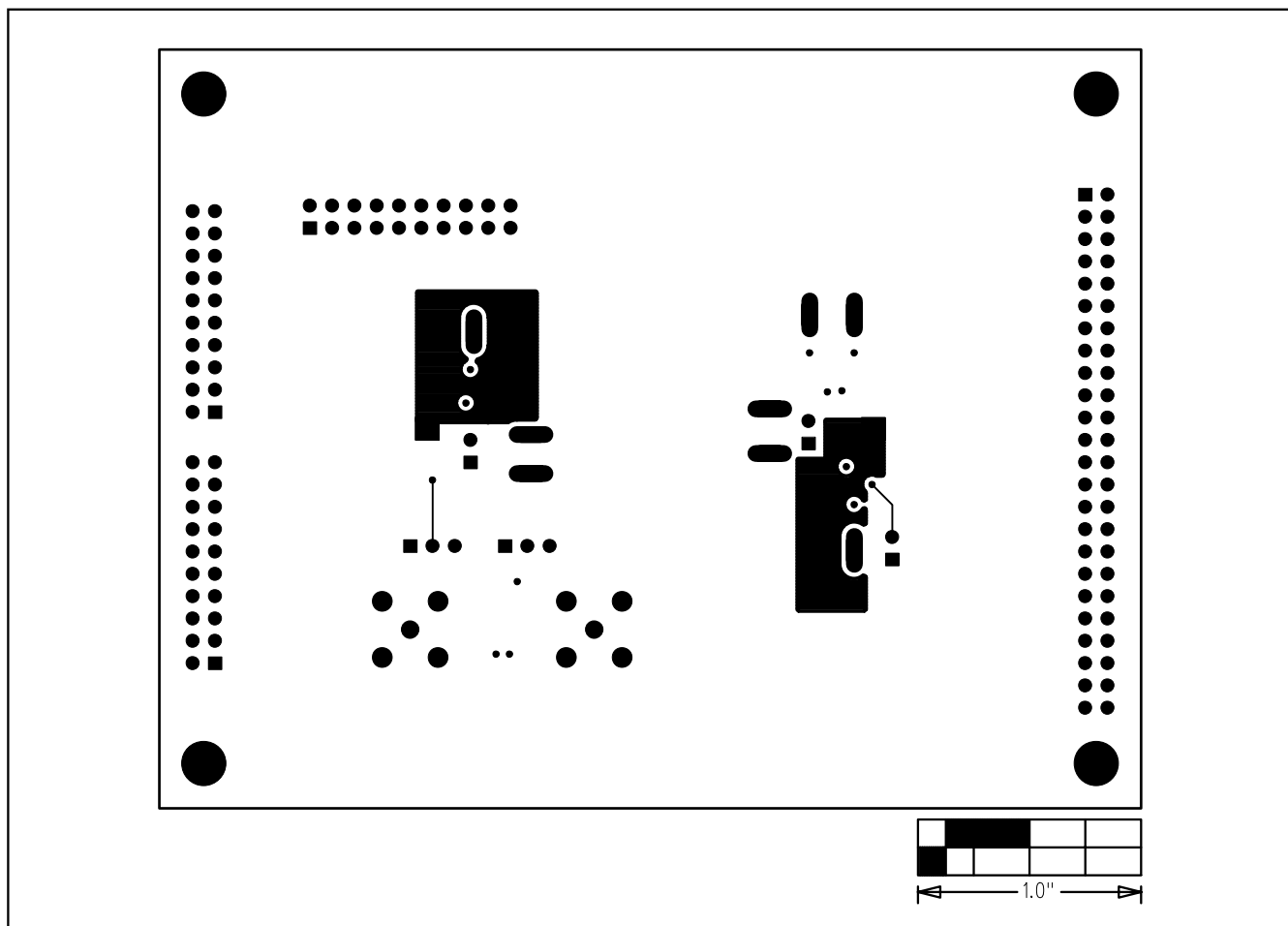


Figure 6. MAX9223/4 EV Kit PCB Layout—Solder Side

Revision History

Pages changed at Rev 1: 1–10

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