MAXIM

MAX4948 Evaluation Kit

Evaluates: MAX4948

General Description

The MAX4948 evaluation kit (EV kit) evaluates the MAX4948 hex single-pole/double-throw (SPDT) data switch. The EV kit utilizes the MAX4948 in a Secure Digital (SD) card application. The EV kit provides two SD card sockets and a single SD card printed-circuit board (PCB) plug. The supply voltage provided by the host interface powers the MAX4948 IC and any connected SD memory cards.

The MAX4948 EV kit is a customized PCB with an SD plug designed into the board. The PCB plug is designed to resemble an SD memory card's mechanical dimensions. The PCB plug measures 50.8mm x 24mm x 1.4mm. The mechanical specifications of an actual SD memory card can be obtained from the SD Card Association.

Features

♦ **Powered by Host Interface**

♦ **Customized PCB**

♦ **SD PCB Plug (1.4mm Thickness)**

♦ **On-Board SD Card Sockets (P1, P2)**

♦ **On-Board Power Indicator (LED1)**

Ordering Information

PART	TYPE
MAX4948EVKIT+	EV Kit

+Denotes lead-free and RoHS-compliant.

Component List

DESIGNATION	QTY	DESCRIPTION
C1	1	1µF ±10%, 10V X5R ceramic capacitor (0603) Murata GRM188R61A105K TDK C1608X5R1A105K
C2	0	Not installed, ceramic capacitor (0603)
C3, C4	2	0.1µF ±10%, 50V X5R ceramic capacitors (0603) Murata GRM188R71H104K TDK C1608X7R1H104K
J1	1	24-pin, dual-row (2 x 12) vertical header (0.1in centers)

DESIGNATION	QTY	DESCRIPTION
J2	1	16-pin, dual-row (2 x 8) vertical header (0.1in centers)
JU1, JU2	2	3-pin headers (0.1in centers)
LED1	1	Green surface-mount LED (0603)
P1, P2	2	SD memory card socket (SMD)
R1–R18	0	Not installed, resistors—short (PC trace) (0402)
R19	1	430Ω ±5% resistor (0603)
TP1, TP2	2	Multipurpose test points
U1	1	Maxim Hex SPDT data switch MAX4948ETG+ (24-pin TQFN-EP)
—	22	Shunts
—	1	PCB: MAX4948 Evaluation Kit+

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

MAX4948 Evaluation Kit

Component Suppliers

SUPPLIER	PHONE	WEBSITE
Murata Mfg. Co., Ltd.	770-436-1300	www.murata.com
TDK Corp.	847-803-6100	www.component.tdk.com

Note: *Indicate that you are using the MAX4948 when contacting these component suppliers.*

Quick Start

Recommended Equipment

Before beginning, the following equipment is needed:

- SD card reader/SD card slot
- Computer with Windows® 98SE/2000/XP/Vista operating system

Note: *The MAX4948 EV kit does not require a driver or software. The EV kit acts only as an SPDT switch, connecting one of two SD memory cards to the host's SD bus.*

Procedure

The MAX4948 EV kit is fully assembled and tested. Follow the steps below to verify board operation:

1) Verify that shunts are installed between each odd-and-even pin of header J1 (i.e., between pins 1 and 2, pins 3 and 4, etc.).

2) Verify that shunts are installed between each odd-and-even pin of header J2 (i.e., between pins 1 and 2, pins 3 and 4, etc.).

3) Verify that a shunt is installed across pins 1-2 of header JU1. This connects the NO_ inputs (from socket P1) to the COM outputs.

4) Verify that a shunt is installed across pins 1-2 of header JU2. This powers on the analog switches.

5) Insert the SD PCB plug (P3) into the SD card reader/SD card slot.

6) Verify that LED1 is illuminated.

Detailed Description

The MAX4948 evaluation kit (EV kit) evaluates the MAX4948 hex SPDT data switch. The EV kit is designed for an SD application, providing two SD sockets and a single SD plug. Standard and thin SD memory cards can be inserted into the P1 and P2 sockets. The MAX4948 is then used to switch between the two SD memory cards, connecting one of the cards to the SD plug. The SD plug can be inserted into any standard SD memory card slot. The SD plug is designed

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into the PCB and conforms to the dimensional standards of a thin SD memory card. The net effect is the ability to switch between two SD memory cards on a single SD bus.

Enable and Configuration

The EV kit is configured through jumpers JU1 and JU2. Jumper JU2 is used to enable/disable the MAX4948 analog switches and jumper JU1 is used to switch between the two SD card sockets, P1 and P2.

Enable (JU2)

The MAX4948 analog switch is enabled and disabled through jumper JU2. See Table 1 for jumper JU2 functions.

Table 1. Jumper JU2 Functions

SHUNT POSITION	$\overline{EN}$ PIN	DESCRIPTION
1-2	Connected to VDD	All switches are in a high-impedance state.
2-3*	Connected to GND	All switches are on.

*Default position.

Configuration (JU1)

Based on jumper JU1's configuration, the signal lines from one of the SD card sockets (P1 or P2) are connected to the common (COM) terminals of the analog switches (COM1–COM6). The COM1–COM6 terminals are then routed through header J2 to the SD PCB plug (P3). See Table 2 for configuration options and Figure 1 for an illustration of the MAX4948 analog switch connections.

Table 2. MAX4948 Configuration

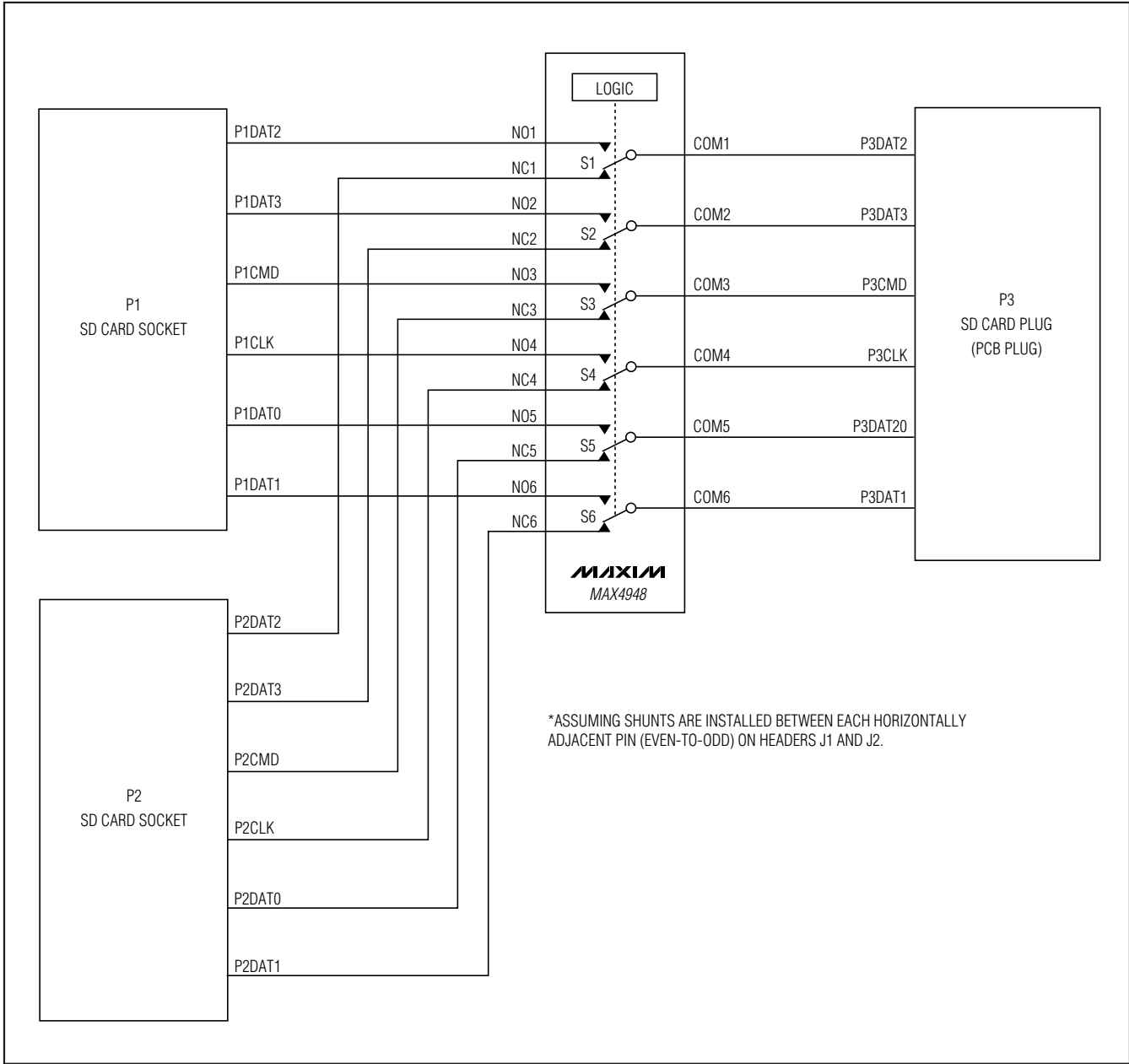| CB PIN (JU1)	COM_ TERMINAL	CONFIGURATION
VDD (1-2)*	Connected to NO_ terminal	SD card socket (P1) connected to the SD card plug (P3)
GND (2-3)	Connected to NC_ terminal	SD card socket (P2) connected to the SD card plug (P3)

*Default position.

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Evaluates: MAX4948

Figure 1. MAX4948 Switch Connections

*ASSUMING SHUNTS ARE INSTALLED BETWEEN EACH HORIZONTALLY ADJACENT PIN (EVEN-TO-ODD) ON HEADERS J1 AND J2.

MAX4948 Evaluation Kit

SD Sockets

The two on-board SD card sockets accommodate both a standard SD memory card and a thin SD memory card. The pinout for each SD socket is listed in Table 3.

Table 3. P1 and P2 Pinout

SD	P1 PIN	P2 PIN
DAT1	8	8
DAT0	7	7
GND	6	6
CLK	5	5
VCC	4*	4**
GND	3	3
CMD	2	2
DAT3	1	1
DAT2	9	9

*Shunted to VDD at header J2 (J2-7 to J2-8).

**Shunted to VDD at header J2 (J2-9 to J2-10).

Header J1

The 24-pin, dual-row header (J1) connects the P1 and P2 SD sockets to the normally open (NO) and normally closed (NC) terminals. The P1 socket is connected through header J1 to the switches' NO terminals (NO1–NO6). The P2 socket is connected through header J1 to the switches' NC terminals (NC1–NC6). See Table 4 for a pinout of header J1.

Table 4. J1 Pinout

NET	J1 PIN (ODD)	J1 PIN (EVEN)	MAX4948 (U1) PIN
P1DAT1	1	2	NO6
P2DAT1	3	4	NC6
P1DAT0	5	6	NO5
P2DAT0	7	8	NC5
P1CLK	9	10	NO4
P2CLK	11	12	NC4
P1CMD	13	14	NO3
P2CMD	15	16	NC3
P2DAT3	17	18	NC2
P1DAT3	19	20	NO2
P2DAT2	21	22	NC1
P1DAT2	23	24	NO1

Header J2

The 16-pin, dual-row header (J2) connects the COM1–COM6 terminals to the PCB plug (P3). In addition, the VDD supply voltage from the SD card reader/SD card port is routed through J2 to each VCC pin of socket P1 and P2. See Table 5 for a pin-to-pin association between J2, the PCB plug, and the switches' COM terminals.

Table 5. J2 Pinout

PIN ASSOCIATION	J2 PIN (ODD)	J2 PIN (EVEN)	P3 PLUG PIN
COM6	1	2	P3-8
COM5	3	4	P3-7
COM4	5	6	P3-5
P1-4	7*	8**	P3-4
P2-4	9*	10**	P3-4
COM3	11	12	P3-2
COM2	13	14	P3-1
COM1	15	16	P3-9

*VCC: SD memory card supply voltage.

**VDD: Host-interface supply voltage.

SD PCB Plug

The MAX4948 EV kit was designed on a customized PCB to allow for actual application evaluation. The SD plug (P3) is an extension of the PCB and can be inserted into a standard SD card socket. This design allows two SD memory cards to be switched into a single SD card socket. See Table 6 for the SD plug's net associations. The pinout and dimensions of the SD plug are shown in Figures 2 and 3.

Table 6. SD Plug Pinout

NET NAME	P3 PIN	SD
SD8	8	DAT1
SD7	7	DAT0
GND	6	GND
SD5	5	CLK
VDD	4	VDD
GND	3	GND
SD2	2	CMD
SD1	1	DAT3
SD9	9	DAT2

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MAX4948 Evaluation Kit

DAT1 — 8
DAT0 — 7
GND — 6
CLK — 5
VDD — 4
GND — 3
CMD — 2
DAT3 — 1
DAT2 — 9
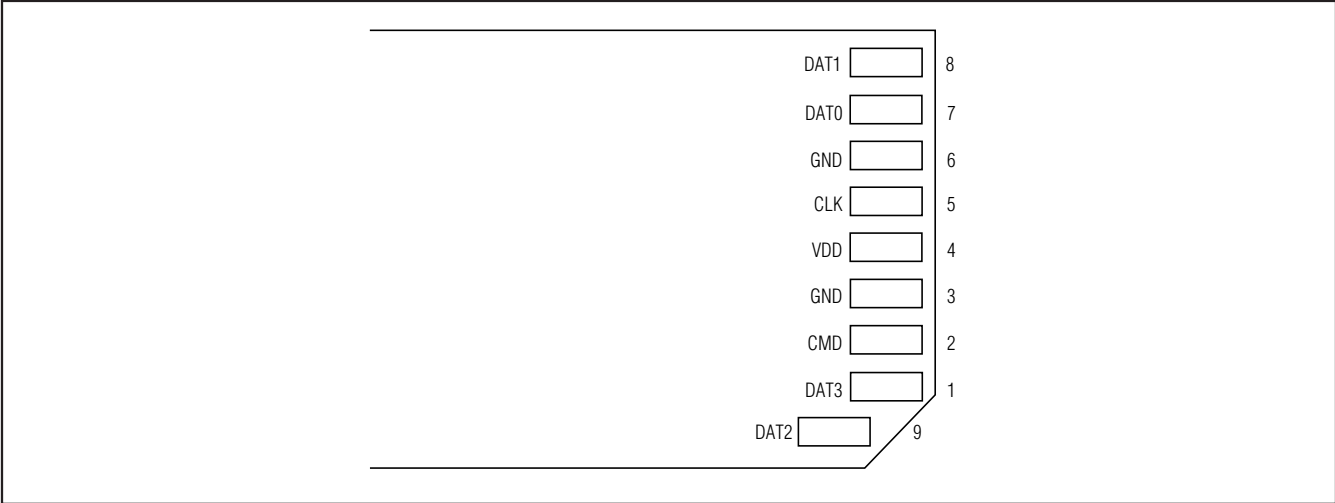
Figure 2. PCB Plug (P3) Pinout

86.4mm

50.8mm

31.2mm

86.4mm

24mm

CHAMFER 5.7mm

BOARD THICKNESS: 1.4mm

31.2mm

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MAX4948 EVALUATION KIT+

1.0"
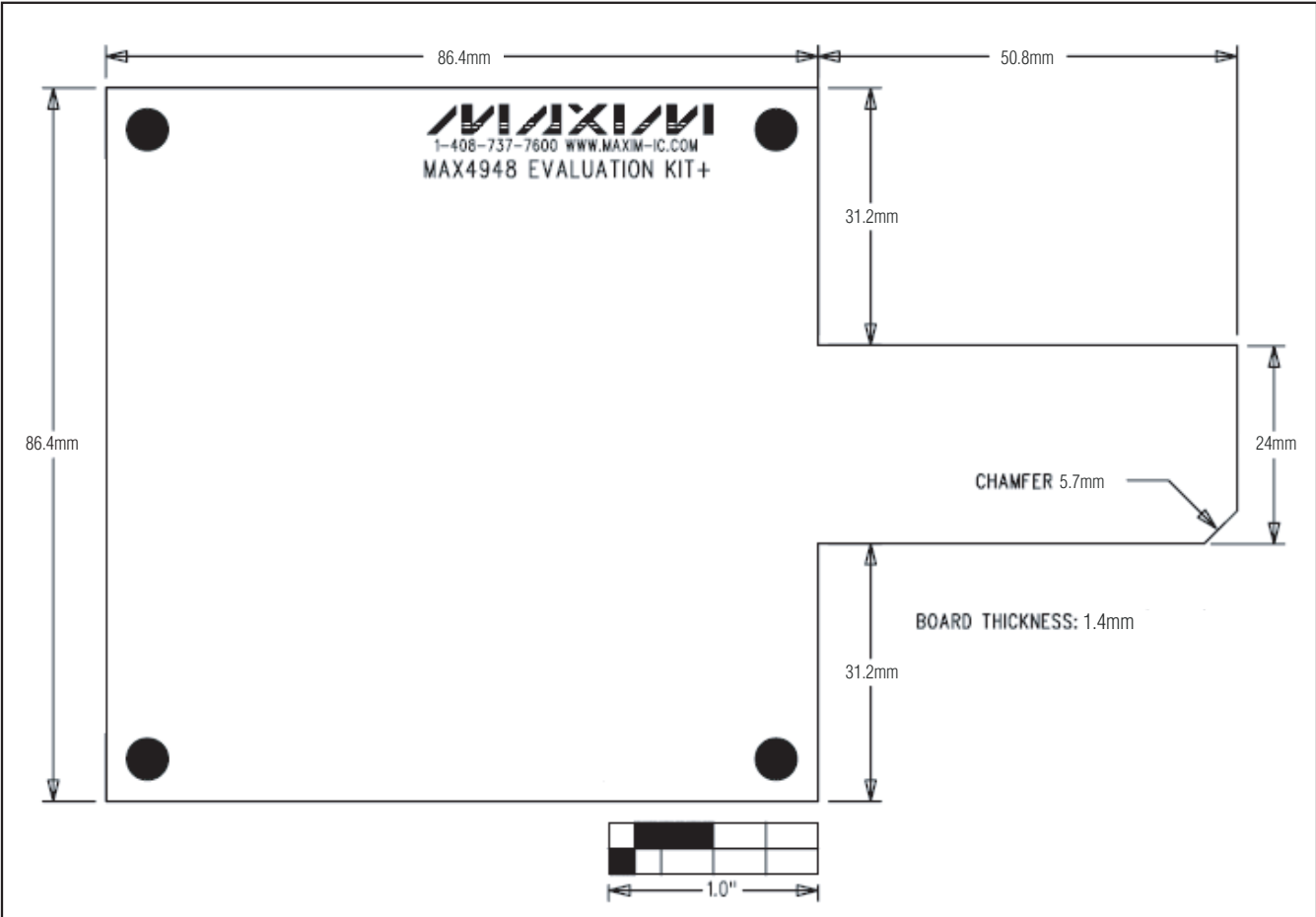
Figure 3. PCB Plug (P3) Dimensions
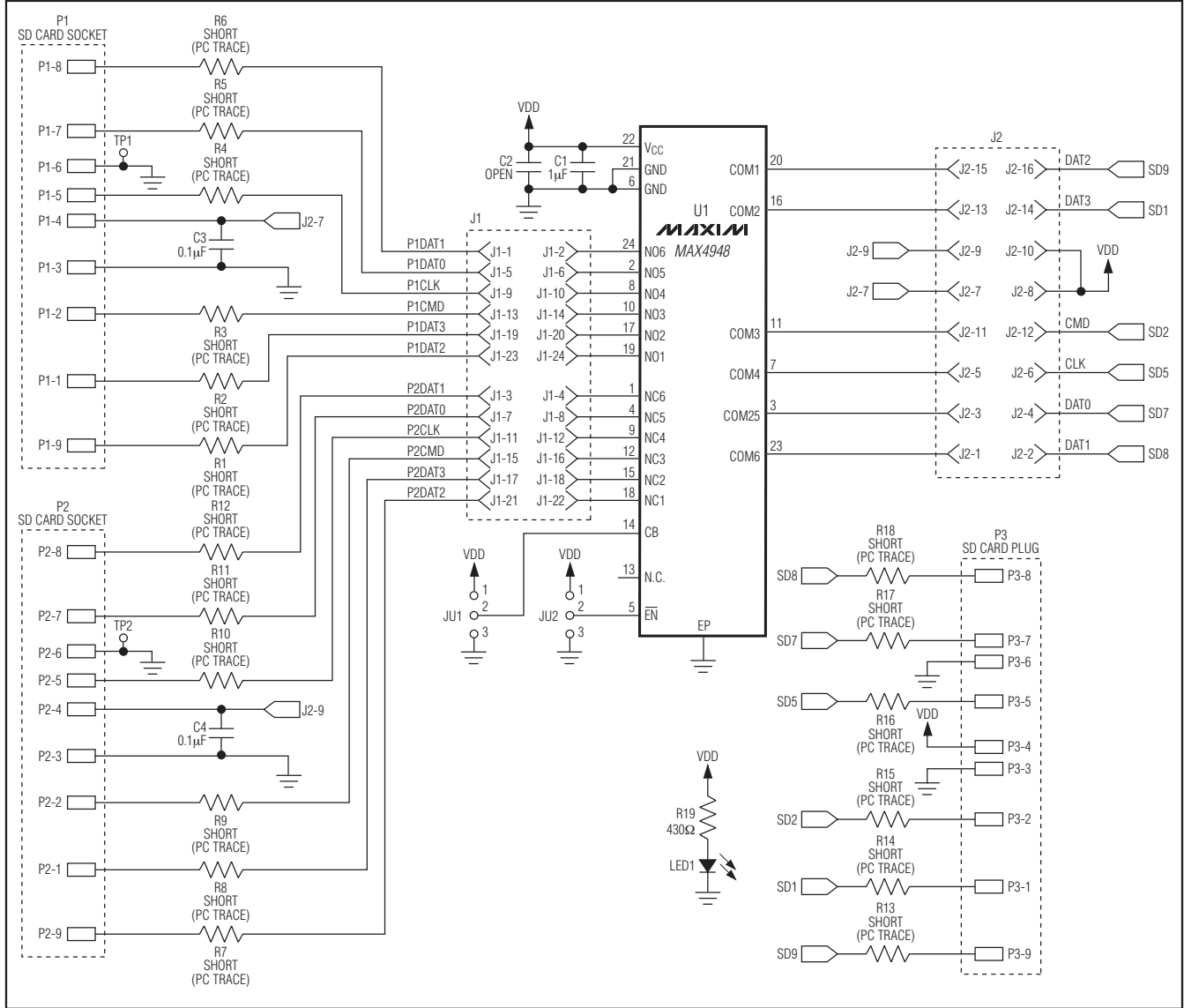
Figure 4. MAX4948 EV Kit Schematic
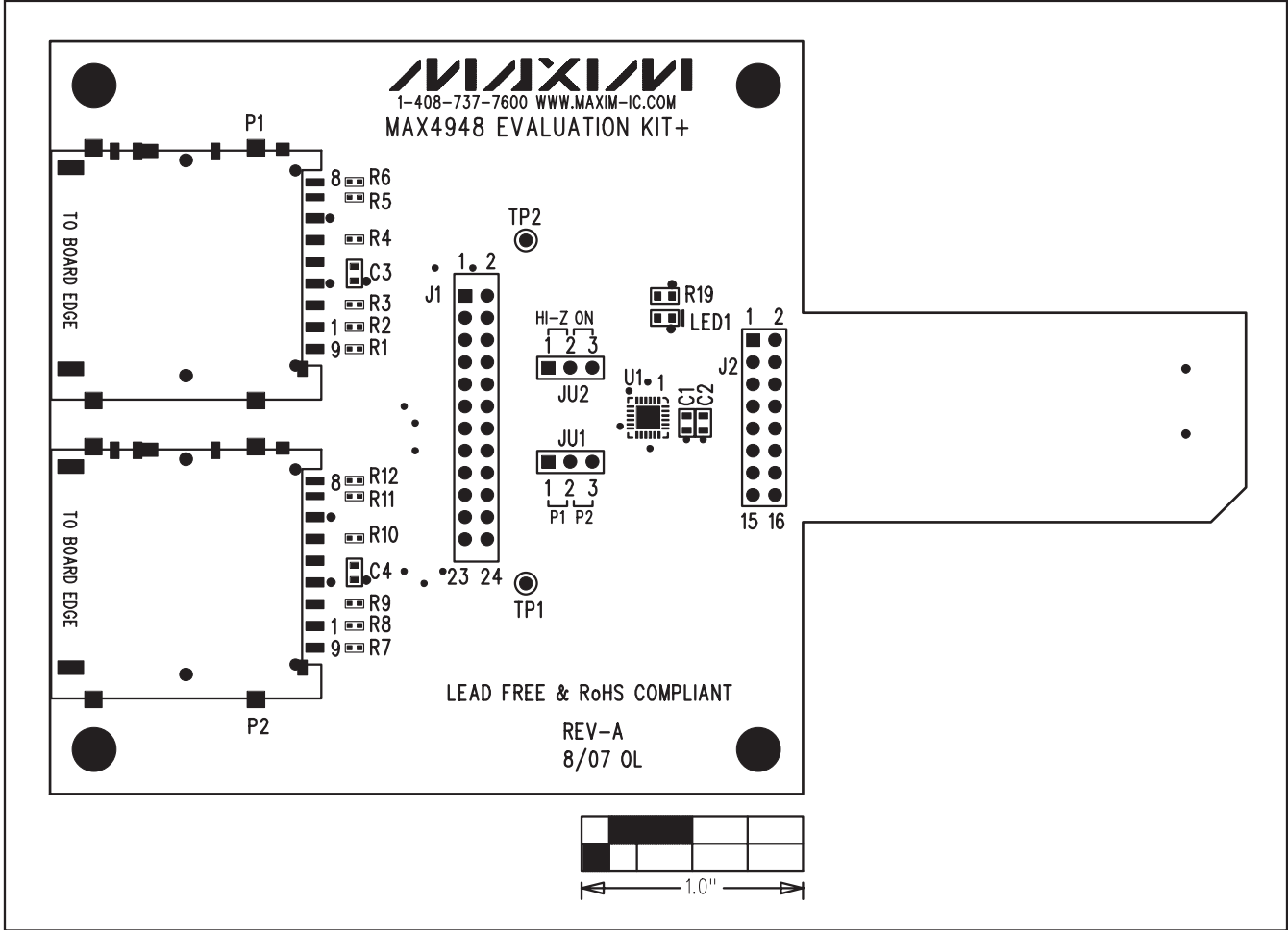
Figure 5. MAX4948 EV Kit Component Placement Guide—Component Side

Evaluates: MAX4948

Figure 6. MAX4948 EV Kit PCB Layout—Component Side

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MAX4948 Evaluation Kit
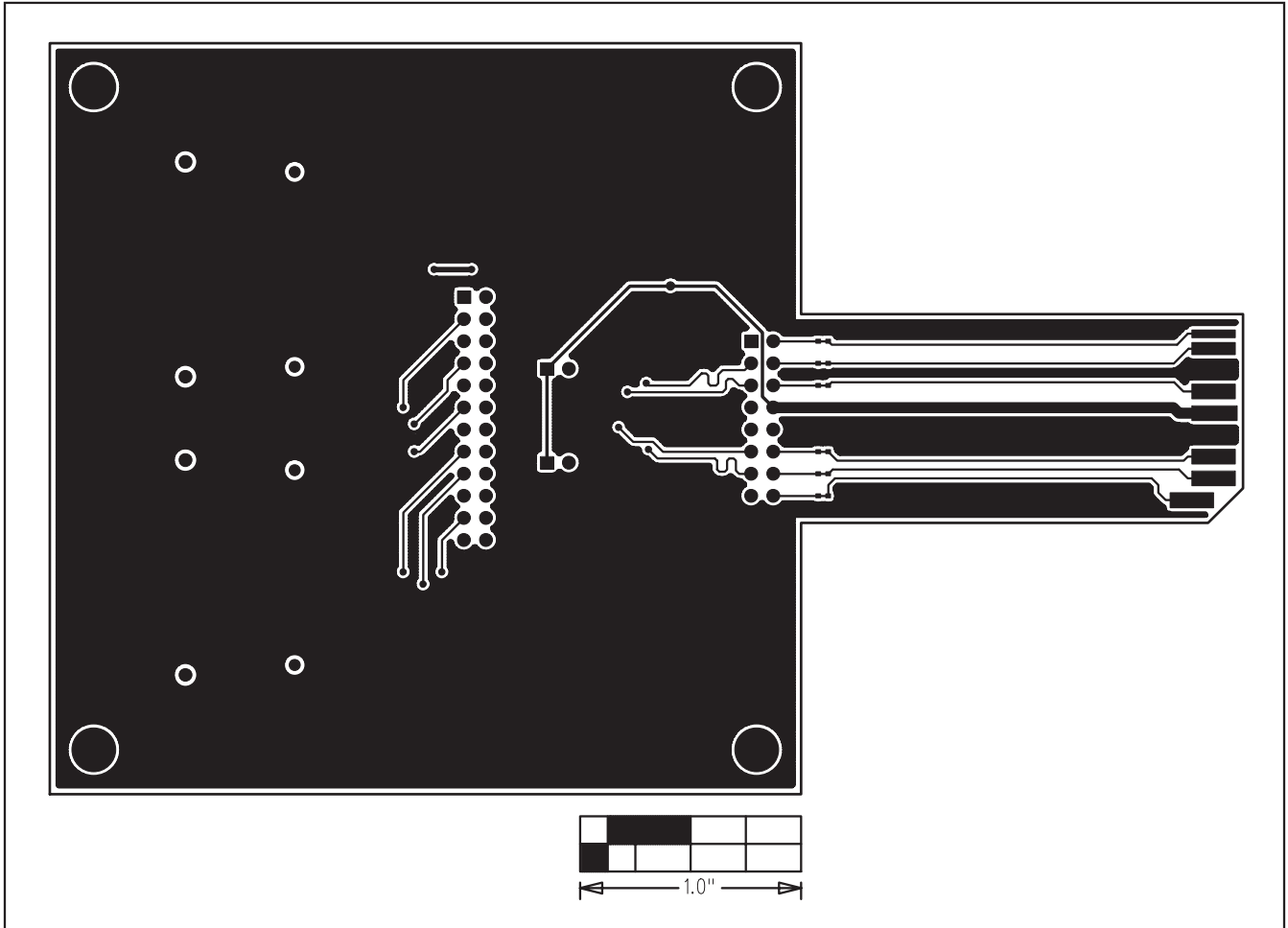
Figure 7. MAX4948 EV Kit PCB Layout—Solder Side

Evaluates: MAX4948

9

MAX4948 Evaluation Kit
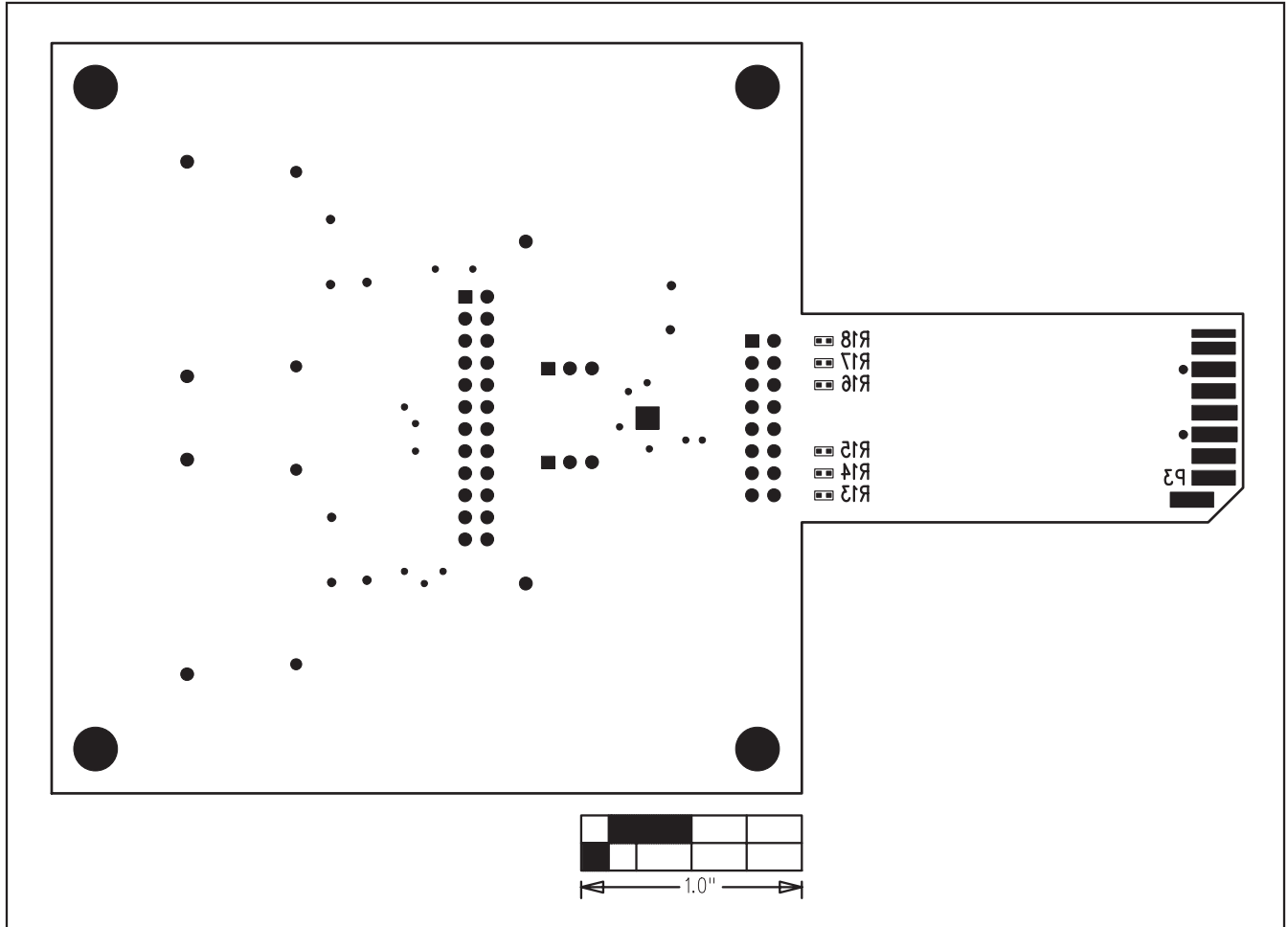
Figure 8. MAX4948 EV Kit Component Placement Guide—Solder Side

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