19-4155; Rev 0; 5/08

MAX4983E Evaluation Kit

General Description

The MAX4983E evaluation kit (EV kit) provides a proven design to evaluate the MAX4983E high ESD-protected double-pole/double-throw (DPDT) switch. The EV kit is designed to demonstrate the MAX4983E ICs used in USB 2.0 high-speed (480Mbps) switching applications. The EV kit routes a single USB signal between one of two type-A USB ports.

The MAX4983E EV kit PCB comes with a MAX4983EEVB+ installed.

Features

- **USB Powered (Cable Included)**
- **Complete USB 2.0 (480Mbps) Switching Circuit**
- **On-Board VBUS Power-Switching Circuit**
- **Lead-Free and RoHS Compliant**
- **Proven PCB Layout**
- **Fully Assembled and Tested**

Ordering Information

PART	TYPE
MAX4983EEVKIT+	EV Kit

+Denotes lead-free and RoHS compliant.

Component List

DESIGNATION	QTY	DESCRIPTION
C1, C3, C5, C6	4	0.1µF ±10%, 16V X7R ceramic capacitors (0603) Murata GRM188R71C104K TDK C1608X7R1C104K
C2, C4	2	10µF ±10%, 16V X5R ceramic capacitors (0805) Murata GRM21BR61C106K
C7	1	1µF ±10%, 16V X5R ceramic capacitor (0603) Murata GRM188R61C105K TDK C1608X5R1C105K
D1	1	Green LED (0603)
FB1	1	Ferrite bead (0603) TDK MMZ1608R301A
JU1, JU2, JU3	3	3 pin headers, 0.1in centers
L1, L2	0	Not installed, chip inductors—short (PCB trace) (0603)
P1	1	USB series-B right-angle PC-mount receptacle
P2, P3	2	USB series-A right-angle PC-mount receptacles
Q1	1	Dual n-channel MOSFET (6 SSOT) Fairchild Semi FDC6305N
Q2	1	Dual p-channel MOSFET (6 SSOT) Fairchild Semi FDC6312P
R1	1	270Ω ±5% resistor (0603)
R2, R3	2	10kΩ ±5% resistors (0603)
U1	1	High-speed USB 2.0 switches (10 UTQFN) Maxim MAX4983EEVB+ (Top Mark: AAA)
U2	1	3.3V linear regulator (5 SC70) Maxim MAX8511EXK33+T (Top Mark: AEI)
—	3	Shunts
—	1	PCB: MAX4983E Evaluation Kit+

Component Suppliers

SUPPLIER	PHONE	WEBSITE
Fairchild Semiconductor	888-522-5372	www.fairchildsemi.com
Murata Electronics North America, Inc.	770-436-1300	www.murata-northamerica.com
TDK Corp.	847-803-6100	www.component.tdk.com

Note: *Indicate that you are using the MAX4983E or MAX4984E when contacting these component suppliers.*

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Quick Start

Recommended Equipment

Before beginning, the following equipment is needed:

- MAX4983E EV kit (USB cable included)
- A user-supplied Windows® 2000/XP/Vista®-compatible PC with a spare high-speed USB port
- One USB 2.0 high-speed/full-speed device (i.e., USB 2.0 flash drive)

Procedure

The MAX4983E EV kit is fully assembled and tested. Follow the steps below to verify board operation:

1) Verify that all jumpers (JU1, JU2, and JU3) are in their default position, as shown in Table 1.
2) Connect the USB cable from the PC to the type-B USB port (P1) on the EV kit.
3) Connect the USB 2.0 device source to P2, type-A USB port.
4) Verify that the USB 2.0 device is detected by the PC.

Table 1. Default Shunt Positions

JUMPER	SHUNT POSITION
JU1	1-2
JU2	1-2
JU3	1-2

Detailed Description

The MAX4983E EV kit provides a proven layout for the MAX4983E and demonstrates the devices used in USB 2.0 high-speed switching applications. The EV kit provides one type-B (P1) and two type-A (P2, P3) USB ports. The MAX4983E routes the USB signals between P1 and one of the two type-A USB ports, depending on the configuration of jumper JU1.

Jumper JU1 is used to switch between the USB channels and JU2 is used to enable/disable the internal switches. The user can switch to one of the two USB inputs by configuring jumper JU1, as shown in Table. 2. The EV kit is powered from the type-B USB port (P1) and provides an on-board regulated 3.3V supply to power the MAX4983E IC. All USB signal traces are 90Ω differential controlled-impedance traces.

The EV kit also includes an on-board VBUS power-switching circuit that routes the USB power from port P1 to either the P2 or P3 type-A USB ports. See the *On-Board VBUS Power Switching* section.

USB Switch Control (CB)

The USB signals are routed between P1 and P2 or between P1 and P3, depending on the state of the MAX4983E DPDT switch. The DPDT switch is controlled through jumper JU1 (Table 2).

Table 2. Jumper JU1 Function

SHUNT POSITION	CB PIN	DESCRIPTION
1-2*	Connected to GND	COM1 and COM2 connected to NC1 and NC2 (P1 ⇔ P2)
2-3	Connected to VCC	COM1 and COM2 connected to NO1 and NO2 (P1 ⇔ P3)

**Default position.*

Device Enable ($\overline{EN}$)

The MAX4983E is enabled/disabled by configuring jumper JU2 (Table 3). When disabled, the MAX4983E switches are placed in a high-impedance state.

Table 3. Jumper JU2 Function

SHUNT POSITION	$\overline{EN}$ PIN	DESCRIPTION
1-2*	Connected to GND	Switches enabled for normal operation
2-3	Connected to VCC	Switches are off and in high-impedance state

**Default position.*

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Power Supply (VCC)

The MAX4983E EV kit can be powered by the P1 USB port (through the 3.3V LDO) or by an external power supply (VIN). The on-board MAX8511 linear regulator (U2) provides the regulated 3.3V from the USB bus voltage (5V) provided at P1. To evaluate the board with an external supply, configure jumper JU3 according to Table 4.

On-Board VBUS Power Switching

The EV kit includes a power-switching circuit, designed with n-channel and p-channel MOSFETs, that routes the P1 USB bus voltage (V1) to the P2 or P3 USB ports. The power-switching circuit is controlled by the state of the CB control pin, which is set through jumper JU1. See Table 5 for operation.

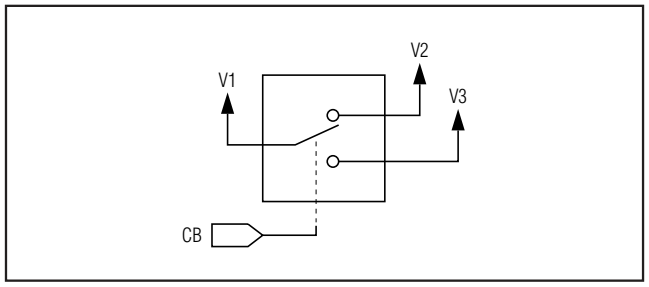

Figure 1. VBUS Power Switching

Table 4. Jumper JU3 Function

SHUNT POSITION	VCC SUPPLY	DESCRIPTION
1-2*	On-board supply	Device powered by on-board linear regulator (3.3V)
2-3	External supply	Device powered by user-supplied 2.8V to 5.5V power supply connected to VIN and GND pads

**Default position.*

Table 5. Relay Operation (Jumper JU1)

SHUNT POSITION	CB PIN	DESCRIPTION
1-2*	Connected to GND	P1 USB bus voltage (V1) routed to USB port P2 (V2 = V1)
2-3	Connected to VCC	P1 USB bus voltage (V1) routed to USB port P3 (V3 = V1)

**Default position.*

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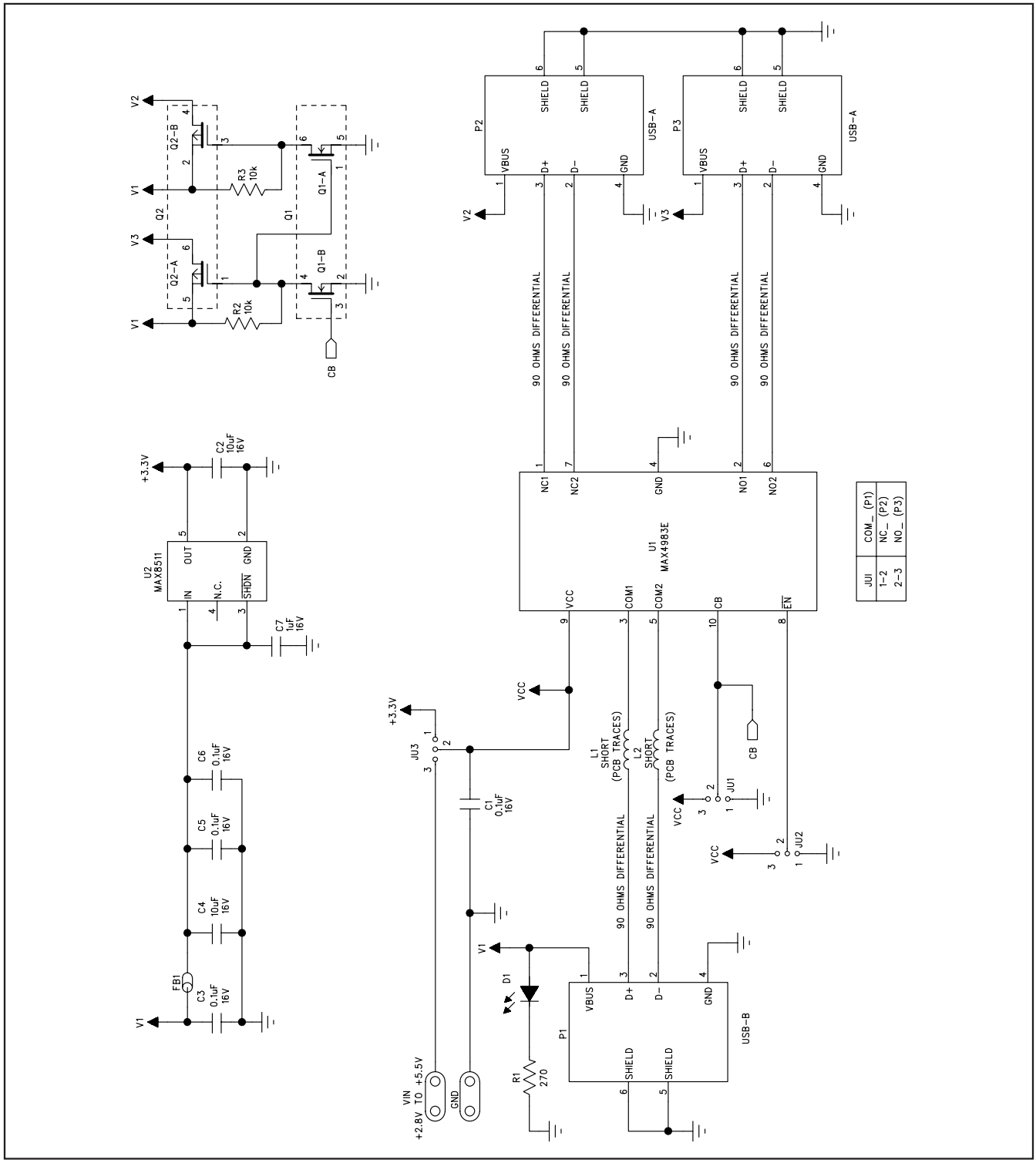

Figure 2. MAX4983E EV Kit Schematic

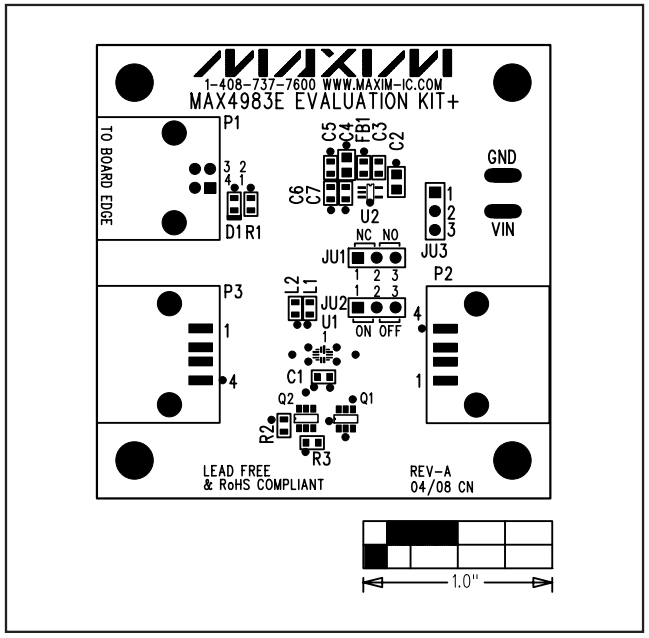

Figure 3. MAX4983E EV Kit Component Placement Guide—Component Side

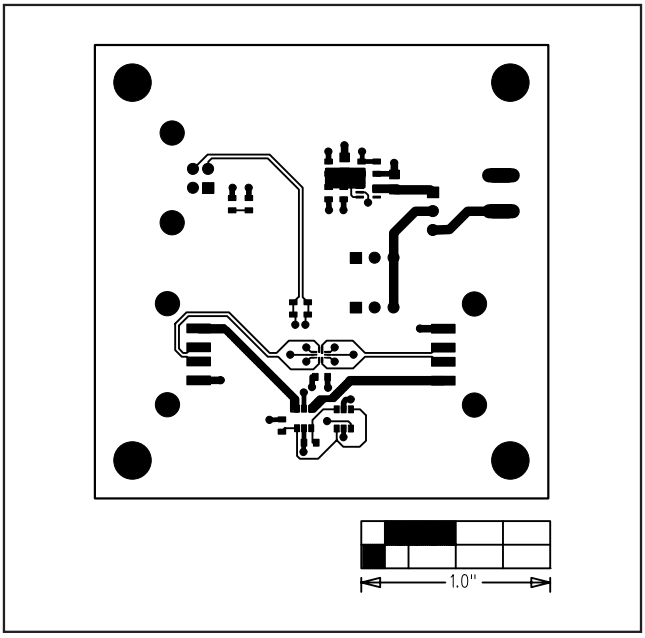

Figure 4. MAX4983E EV Kit PCB Layout—Component Side

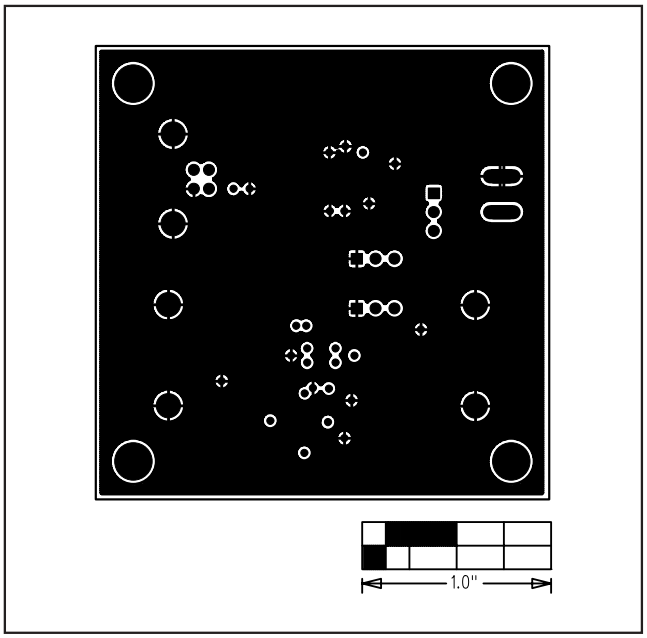

Figure 5. MAX4983E EV Kit PCB Layout—Inner Layer 2

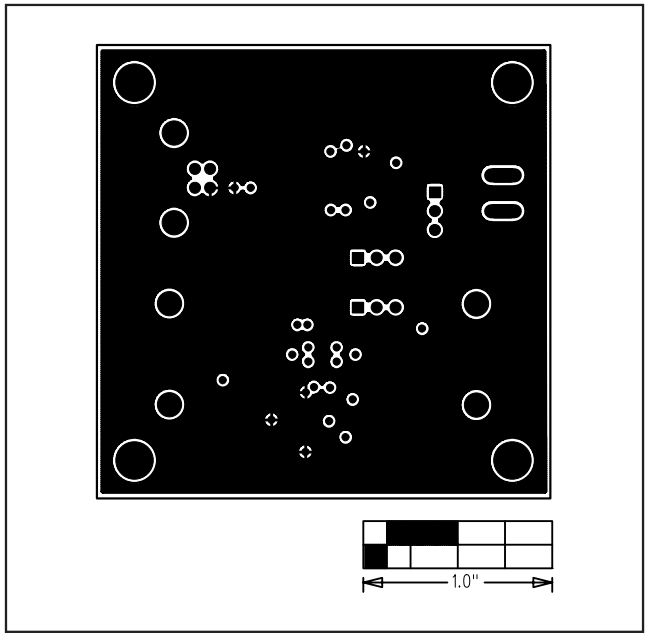

Figure 6. MAX4983E EV Kit PCB Layout—Inner Layer 3

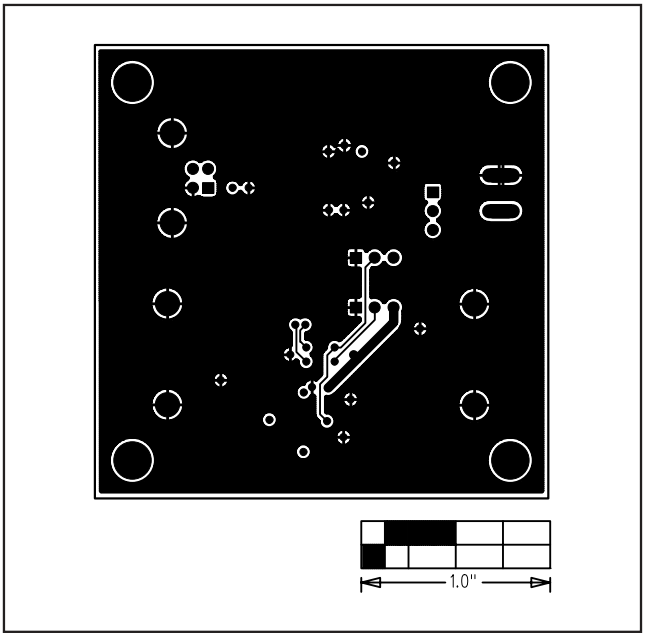

Figure 7. MAX4983E EV Kit PCB Layout—Solder Side