19-1883; Rev 0; 12/00

MAXIM

MAX1799 Evaluation System

Evaluates: MAX1799

General Description

The MAX1799 evaluation system (EV system) consists of a MAX1799 evaluation kit (EV kit) and a companion Maxim system management bus (SMBus™) interface board.

The MAX1799 EV kit is an assembled and tested PC board that demonstrates the MAX1799 system power supply. The IC contains five programmable LDO linear regulators and two undedicated open-drain outputs. Each regulator can be individually adjusted from +1.8V to +3.3V. The two open-drain outputs can sink up to 150mA.

The Maxim SMBus interface board (MAXSMBUS) allows an IBM-compatible PC to use its parallel port to emulate an Intel SMBus 2-wire interface. The 2-wire serial interface of the MAX1799 is I²C™ compatible. Windows® 95/98/2000-compatible software provides a user-friendly interface to exercise the features of the MAX1799. The program is menu driven and offers a graphics interface with control buttons.

Order the MAX1799EVSYS for complete PC-based evaluation of the MAX1799. Order the MAX1799EVKIT, if you already have an SMBus interface.

EV Kit Component List

DESIGNATION	QTY	DESCRIPTION
C1–C4	4	4.7µF, 10V X5R ceramic capacitors Taiyo Yuden LMK316BJ475ML or Murata GRM42-6X5R475K10
C5–C8	4	2.2µF, 16V X5R ceramic capacitors Taiyo Yuden EMK316BJ225ML or Murata GRM42-6X7R225K16
C9	1	0.01µF, 16V X7R ceramic capacitor
J1	1	2x10 right-angle female receptacle
JU1	1	3-pin header
JU2, JU3	2	2-pin headers
JU4, JU5	0	Not installed
LED1, LED2	2	Light-emitting diodes (green)
R1	1	100kΩ ±5% resistor
R2	1	10kΩ ±5% resistor
R3, R4	2	470Ω ±5% resistors
SW1, SW2	2	Momentary switches (normally open)
U1	1	MAX1799EUP

Features

- **Five Low-Noise LDO Linear Regulators**
  One 300mA Regulator
  Four 150mA Regulators
- **Very Low Dropout**
  100mV (max) at 2/3 Rated Current
- **Programmable +1.8V to +3.3V (in 32 Steps) Output Voltages**
- **I²C/SMBus Compatible**
- **Easy-to-Use Menu-Driven Software**
- **Assembled and Tested**
- **Includes Windows 95/98/2000-Compatible Software and Demo PC Board**

Ordering Information

PART	SMBus INTERFACE TYPE	IC PACKAGE
MAX1799EVKIT	Not Included	20 TSSOP-EP*
MAX1799EVSYS	MAXSMBUS	20 TSSOP-EP

*Exposed pad

The MAX1799 EV kit software is provided with MAX1799EVKIT. However, the MAXSMBUS board is required to interface the EV kit to the computer when using the software.

MAX1799EVSYS Component List

PART	QTY	DESCRIPTION
MAX1799EVKIT	1	MAX1799 evaluation kit
MAXSMBUS	1	SMBus interface board

Component Suppliers

SUPPLIER	PHONE	FAX
Murata	814-237-1431	814-238-0490
Taiyo Yuden	408-573-4150	408-573-4159

Note: *Please indicate that you are using the MAX1799 when contacting these manufacturers.*

SMBus is a trademark of Intel Corp.
I²C is a trademark of Philips Corp.
Windows is a registered trademark of Microsoft Corp.

MAX1799 Evaluation System

Quick Start

Required Equipment

Before you begin, you will need the following equipment:

- IBM PC-compatible computer running Windows 95/98/2000
- Parallel printer port (this is a 25-pin socket on the back of the computer)
- Standard 25-pin straight-through male-to-female cable (printer extension cable) to connect the computer's parallel port to the Maxim SMBus interface board
- DC power supply capable of supplying any voltage between +7V and +20V at 100mA to power the SMBus board
- DC power supply capable of supplying +2.5V to +5.5V at 1A to power the MAX1799 board

Procedure

Do not turn on the power until all connections are made:

1) Carefully connect the boards by aligning the 20-pin connector of the MAX1799 EV kit with the 20-pin header of the MAXSMBUS interface board. Gently press them together. The two boards should be flush against each other.
2) Make sure JU1 (AS) is set to the 1-2 position.
3) Connect a cable from the computer's parallel port to the SMBus interface board. Use a straight-through 25-pin female-to-male cable. To avoid damaging the EV system or your computer, do not use a 25-pin SCSI port or any other connector that is physically similar to the 25-pin parallel printer port.
4) The *MAX1799.EXE* software program can be run from the floppy or hard drive. Use the Windows program manager to run the program. If desired, you may use the *INSTALL.EXE* program to copy the files and create icons for them in the Windows 95/98/2000 start menu. An uninstall program is included with the software. Click on the UNINSTALL icon to remove the EV kit software from the hard drive.
5) Connect a +7VDC to +20VDC power supply to the pads labeled POS9 and GND1 of the SMBus interface board.
6) Connect a +2.5VDC to +5.5VDC power supply to the pads labeled VIN1 and GND on the MAX1799 board.
7) Turn on both power supplies.
8) Turn the EV kit on by pressing SW1.
9) Start the MAX1799 program by opening its icon in the start menu.
10) Observe as the program automatically detects the address of the MAX1799 and starts the main program.

Detailed Software Description

The software provides an easy-to-use, point-and-click method to exercise all the MAX1799 features. The voltages of the regulators can easily be adjusted, as well as toggled on or off. The driver outputs can also be toggled on or off.

Note: At startup, the program forces the MAX1799 into the power-on reset (POR) state.

Main Display

The voltages for each regulator are contained in list boxes. To make changes to the voltages, use the mouse or the tab and arrow keys to navigate until the selection is highlighted. The highlighted voltage is automatically loaded into the buffer on the MAX1799. Click on the **Update All DACs** button to send the buffer contents to the DACs. All five regulators are updated simultaneously when this button is selected.

Each regulator can be enabled or disabled by checking or unchecking the appropriate checkbox.

Note: Disabling regulator 1 shuts down the MAX1799. Once disabled, press SW1 to turn the MAX1799 back on.

The two MAX1799 driver outputs (DR1 and DR2) are controlled by checkboxes **(DR1 Low and DR2 Low).** Checking the checkbox pulls the pin low. Unchecking it places the pin in a high-impedance state.

The device-present checking feature checks for the presence of the IC two times per second. If the device is not detected, a warning message will appear at the top of the main display, and most of the buttons and checkboxes will be disabled. The buttons and checkboxes are disabled to prevent the sending of SMBus commands that will result in the main display showing the wrong contents of the MAX1799's registers. The device-present checking feature can be disabled by unchecking the **Device-Present Checking** checkbox.

The **RESET** button will set the MAX1799 and software to the POR state. If in doubt, click the **RESET** button.

Simple SMBus Commands

There are two methods for communicating with the MAX1799: through either the main display or the simple SMBus commands available by pressing the **MAXSMBUS** button. A display will pop up that allows SMBus protocols, such as Read Byte and Write Byte to be individually executed. When using the simple SMBus commands, uncheck **Device-Present Checking** to prevent any errors from occurring.

The SMBus dialog boxes accept numeric data in binary, decimal, or hexadecimal. Hexadecimal numbers should be prefixed by $ or 0x. Binary numbers must be exactly 8 digits.

Note: In places where the slave address asks for an 8-bit value, it must be the 7-bit slave address of the MAX1799 as determined by AS with the last bit (LSB) always set to zero as shown in Table 1.

Table 1. JU1 Shunt Settings for SMBus Address

JU1 SHUNT LOCATION	MAX1799 ADDRESS	
	BINARY	HEXADECIMAL
1 - 2*	0111 1110	7E
2 - 3	1001 1110	9E

**Default*

Detailed Hardware Description

Jumper and Switch Settings

Jumper JU1 sets the MAX1799 slave address (Table 1).

Jumpers JU2 and JU3 connect LED1 and LED2 to driver outputs DR1 and DR2. The LEDs are also connected to VIN through pullup resistors. Pulling the driver output pins low, by checking the appropriate checkboxes on the main display, turns the LEDs on.

Jumpers JU4 and JU5 connect VIN4/5 and VIN2/3, respectively, to VIN1. This allows all three inputs to be powered from a single power supply. VIN2/3 and VIN4/5 can be connected to different power supplies by cutting two PC board traces. For VIN4/5, cut the trace that shorts the two pins of JU4. For VIN2/3, cut the trace that shorts the two pins of JU5. Connect the power supply for VIN2/3 to the pad labeled VIN2/3. Connect the power supply for VIN4/5 to the pad labeled VIN4/5.

Press switch SW1 to turn the MAX1799 EV kit on. Press SW2 or uncheck the **OUT1 Enabled** checkbox to turn the EV kit off.

MAX1799 Evaluation System

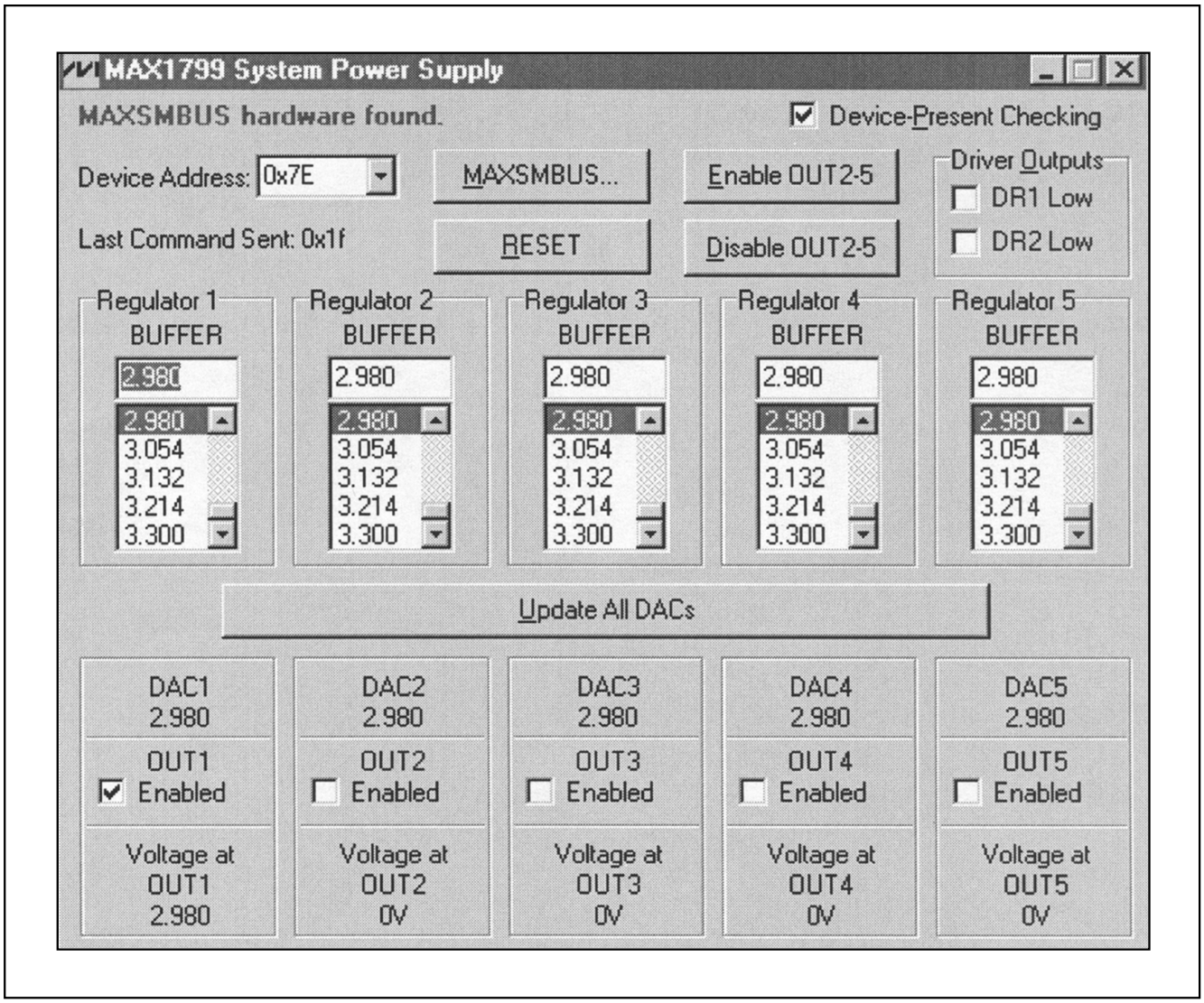

Figure 1. Main Display for MAX1799 EV Kit

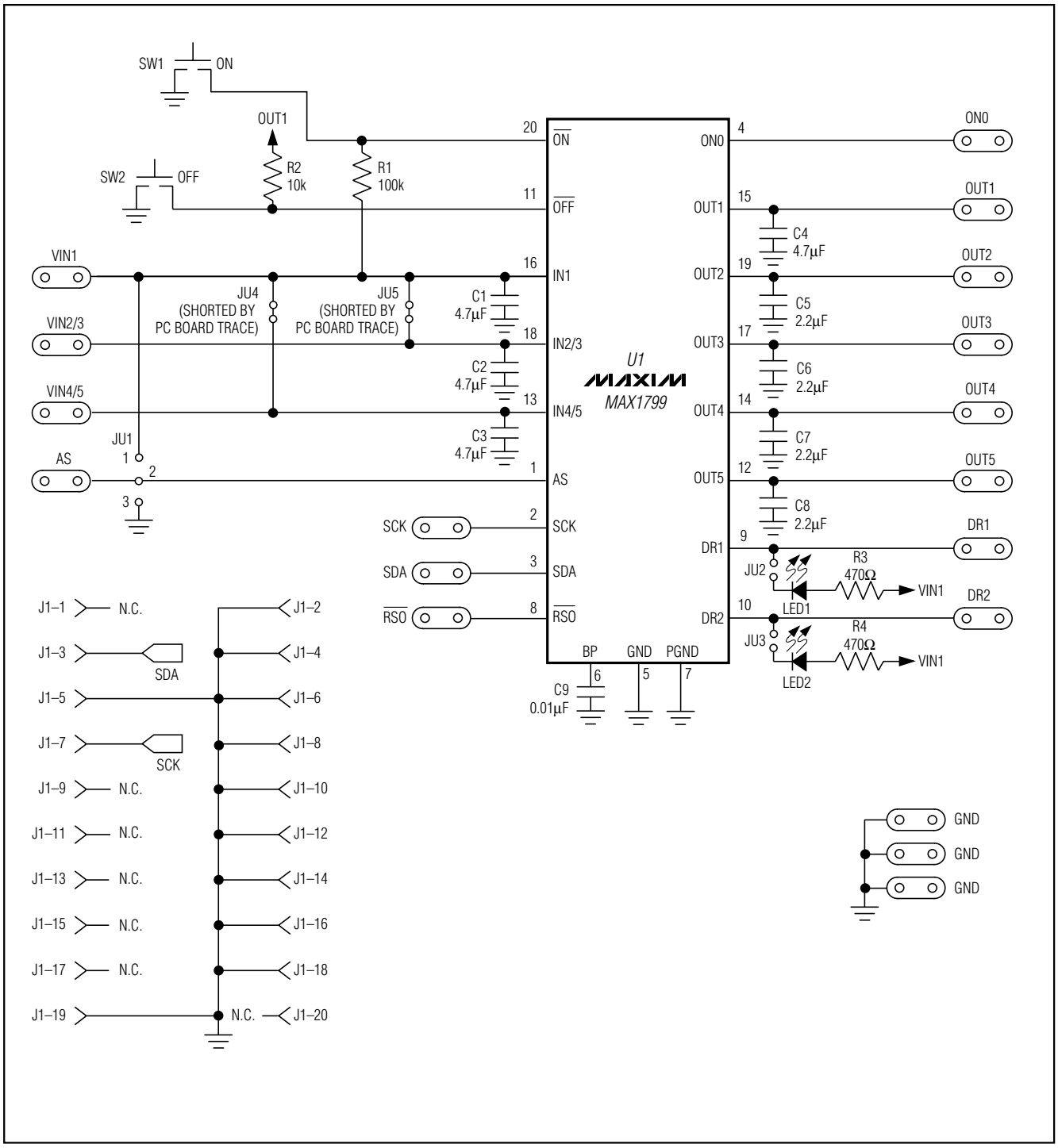

Figure 2. MAX1799 EV Kit Schematic

MAX1799 Evaluation System

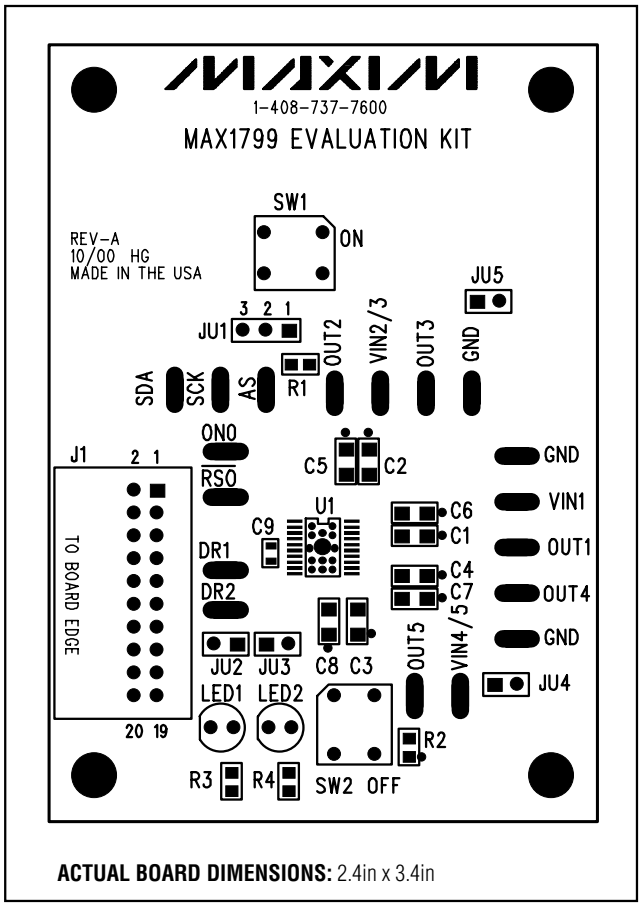

Figure 3. MAX1799 EV Kit Component Placement Guide—Component Side

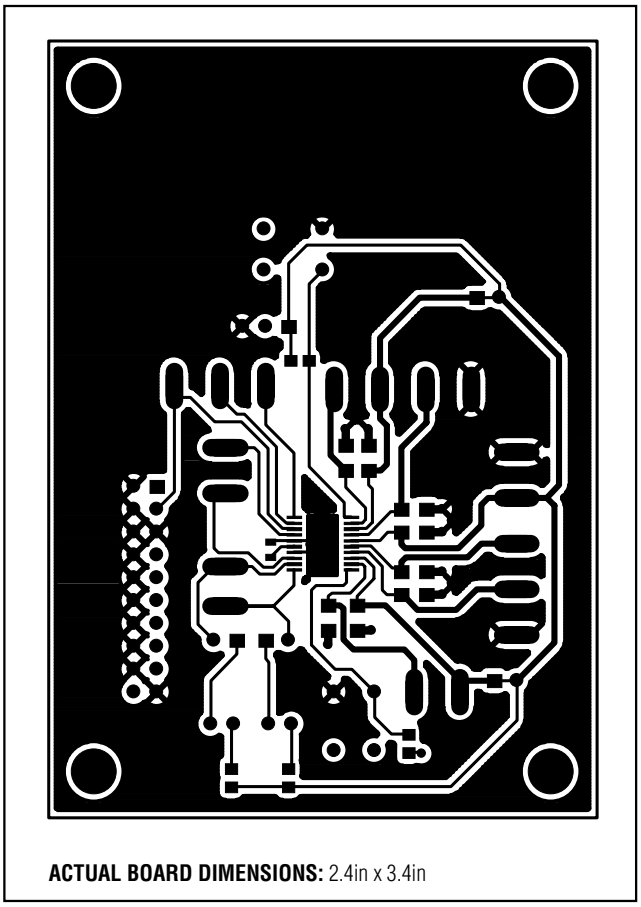

Figure 4. MAX1799 EV Kit PC Board Layout—Component Side

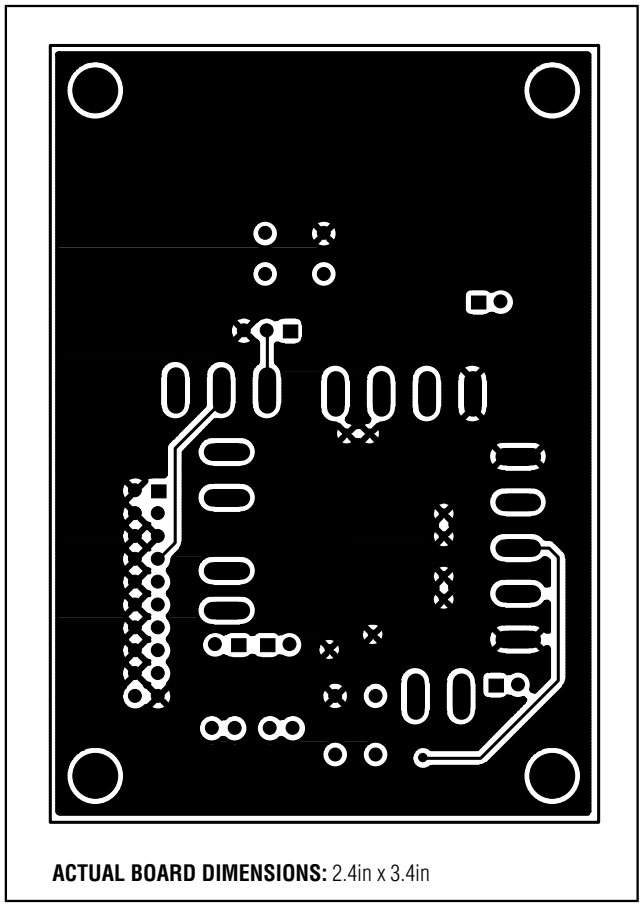

Figure 5. MAX1799 EV Kit PC Board Layout—Solder Side