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MAX5393 Evaluation System

General Description

The MAX5393 evaluation kit (EV kit) is a fully assembled and tested PCB that features the MAX5393M 256-tap, 50kΩ, dual digital potentiometer. The MAX5393 dual volatile potentiometers communicate through an SPI™-compatible serial interface (or through a stand-alone 3-wire interface).

The MAX5393EVMINIQU+ evaluation system (EV system) includes the MAX5393 EV kit and a MINIQUSB+ interface board. The MINIQUSB+ interface board can be used to enable PC communication through the USB interface. Windows® 2000- , Windows XP®-, and Windows Vista®-compatible software provides a professional user interface for exercising the MAX5393 features. The program is menu-driven and offers a graphical user interface (GUI) complete with buttons, track bars, and edit boxes. The EV kit software can also be used to evaluate the MAX5386M, MAX5388, and MAX5391. The EV kit can also be interfaced directly to a user-supplied 3-wire system.

The MAX5393 ICs can be powered from a 1.7V, 2.6V, 3.3V, or 5V source generated from the MINIQUSB+ interface board and EV kit circuitry, or from a user-supplied external 1.7V to 5.25V DC power supply. Order the EV system (MAX5393EVMINIQU+) for a complete PC-based evaluation of the MAX5393.

The EV kit also contains PCB footprints for the MAX5386M, MAX5388, and MAX5391. To evaluate these parts, order samples and install the ICs on U1, U4, and U2, respectively.

Features

♦ **1.7V to 5.25V Single-Supply Operation**
♦ **PC USB to 3-Wire Interface or Stand-Alone 3-Wire Serial-Interface Operation**
♦ **Easy-to-Use Menu-Driven Software**
♦ **Includes Windows 2000-, Windows XP-, and Windows Vista-Compatible Software**
♦ **Fully Assembled and Tested**

Ordering Information

PART	TYPE
MAX5393EVMINIQU+	EV System

+Denotes lead(Pb)-free and RoHS compliant.

Component Lists

MAX5393 EV System (MAX5393EVMINIQU+)

PART	QTY	DESCRIPTION
MAX5393EVKIT+	1	EV kit
MINIQUSB+	1	Maxim command module

MAX5393 EV Kit (MAX5393EVKIT+)

DESIGNATION	QTY	DESCRIPTION
C1, C2, C3, C7, C10, C11, C14, C15, C19, C20, C23, C24, C25	13	1µF ±10%, 16V X5R ceramic capacitors (0603) Murata GRM188R71C105K or TDK C1608X5R1C105K
C4, C8, C12, C16	4	0.1µF ±10%, 50V X7R ceramic capacitors (0603) Murata GRM188R71H104K or TDK C1608X7R1H104K
C5, C6, C9, C13	0	Not installed, ceramic capacitors (0603)
C26	1	10µF ±10%, 6.3V X5R ceramic capacitor (0805) Murata GRM21BR60J106K or TDK C2012X5R0J106K
J1	1	2 x 4-pin header
J2	1	2 x 8-pin header

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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.

Component Lists (continued)

MAX5393 EV Kit (continued)

DESIGNATION	QTY	DESCRIPTION
J3	1	8-pin female receptacle
JU1, JU3–JU6, JU8–JU18	16	2-pin headers
JU2, JU7, JU19	3	3-pin headers
JU20	1	4-pin header
R1	1	40.2kΩ ±1% resistor (0603)
R2	1	100kΩ ±1% resistor (0603)
U1, U2	0	Not installed, dual digital potentiometers (16 TQFN-EP*)
U3	1	256-tap, 50kΩ, dual digital potentiometer (14 TSSOP) Maxim MAX5393MAUD+
U4	0	Not installed, digital potentiometer (10 µMAX®)

DESIGNATION	QTY	DESCRIPTION
U5	1	Adjustable output LDO regulator (5 SC70) Maxim MAX8512EXK+ (Top Mark: ADW)
U6	1	2.6V LDO regulator (5 SC70) Maxim MAX8511EXK26+ (Top Mark: AAW)
U7	1	Single 1.8V to 5V level translator (6 SC70)
U8	1	Dual 1.8V to 5V level translator (8 SSOP)
—	20	Shunts (JU1–JU20)
—	1	PCB: MAX5386/5388/5391/5393 EVALUATION KIT+

*EP = Exposed pad.

Component Suppliers

SUPPLIER	PHONE	WEBSITE
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 MAX5386M, MAX5388, MAX5391, or MAX5393 when contacting these component suppliers.

MAX5393 EV Kit Files

FILE	DESCRIPTION
INSTALL.EXE	Installs the EV kit files on the computer
MAX5393.EXE	Application program
FTD2XX.INF	USB driver file
UNINST.INI	Uninstalls the EV kit software
USB_Driver_Help.PDF	USB driver installation help file

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MAX5393 Evaluation System

Quick Start

Required Equipment

- MAX5393 EV system

    MAX5393 EV kit

    MINQUSB+ command module (USB cable included)

- User-supplied Windows 2000, Windows XP, or Windows Vista PC with a spare USB port

- One or two multimeters

Note: In the following sections, software-related items are identified by bolding. Text in **bold** refers to items directly from the EV kit software. Text in **bold and underlined** refers to items from the Windows operating system.

Procedure

The MAX5393 EV kit is fully assembled and tested. Follow the steps below to verify board operation:

1) Visit **www.maxim-ic.com/evkitsoftware** to download the latest version of the EV kit software, 5393Rxx.ZIP. Save the EV kit software to a temporary folder and uncompress the ZIP file.

2) Install the EV kit software on the computer by running the INSTALL.EXE program inside the temporary folder. The program files are copied and icons are created in the Windows **Start | Programs** menu.

3) Verify that shunts are correctly installed on the jumpers, as listed in Table 1, for proper operation of the EV kit.

4) Connect the multimeters to measure voltage across the MAX5393 (U3) WA and LA PCB pads and WB and LB PCB pads.

5) Connect the MINIQUSB+ interface board to the EV kit J2 and J3 connectors.

6) Connect the included USB cable from the PC to the MINIQUSB+ interface board. A **Building Driver Database** window pops up in addition to a **New Hardware Found** message when installing the USB driver for the first time. If a window is not seen that is similar to the one described above after 30s, remove the USB cable from the board and reconnect it. Administrator privileges are required to install the USB device driver on Windows 2000, Windows XP, and Windows Vista.

7) Follow the directions of the **Add New Hardware Wizard** to install the USB device driver. Choose the **Search for the best driver for your device** option. Specify the location of the device driver to be **C:\Program Files\MAX5393** (default installation directory) using the **Browse** button. During device driver installation, Windows may show a warning message indicating that the device driver Maxim uses does not contain a digital signature. This is not an error condition and it is safe to proceed with installation. Refer to the USB_Driver_Help.PDF document included with the software if you have problems during this step.

8) Start the EV kit software by opening its icon in the **Start | Programs** menu.

9) Observe as the program automatically detects the USB connection and starts the main program.

10) Using the **Device Connected** combo box, select **MAX5393** from the list and then press the **Default** button. The EV kit software main window appears, as shown in Figure 1.

11) The MAX5393 EV kit is now ready for additional testing.

MAX5393 Evaluation System

Table 1. Jumper Configuration

JUMPER	SHUNT POSITION	EV KIT FUNCTION
JU1	Not installed	1.7V LDO output disabled
	Installed*	1.7V LDO output enabled
JU12	Not installed	MAX5393 HA disconnected from U3 VDD voltage source
	Installed*	MAX5393 HA connected to U3 VDD voltage source
JU13	Not installed	MAX5393 LA disconnected from GND
	Installed*	MAX5393 LA connected to GND
JU14	Not installed	MAX5393 HB disconnected from U3 VDD voltage source
	Installed*	MAX5393 HB connected to U3 VDD voltage source
JU15	Not installed	MAX5393 LB disconnected from GND
	Installed*	MAX5393 LB connected to GND
JU19	1-2*	MAX5393 VDD = 1.7V
	2-3	MAX5393 VDD voltage dependent on jumper JU20 configuration
JU20	1-2	VPOWER = 5V
	1-3*	VPOWER = 3.3V
	1-4	VPOWER = 2.6V

*Default position.

__Detailed Description of Software

Graphical User Interface (GUI) Panel

The MAX5393 EV kit software GUI shown in Figure 1 is a Windows program that provides a convenient means to control the MAX5393 dual potentiometer. Use the mouse or press the Tab key to navigate through the GUI controls. The correct SPI write operations are generated to update the MAX5393 internal memory registers when any of these controls are executed.

The software divides the EV kit functions into group boxes. The **Interface** group box indicates the EV kit **Status** and the last write operation **Command Sent** and **Data Sent** indicators. This data confirms proper device operation. The **Device Connected** combo box selects the Maxim part being evaluated and enables the **Update Pot A and B** checkbox function when choosing the **MAX5393** option from the list. The **Default** button programs both potentiometers to their midscale positions. The lower **Potentiometer A** and **Potentiometer B** group boxes provide controls to change the respective wiper positions. The main window's bottom status bar provides the USB interface circuit communication status.

Software Startup

Upon startup, the EV kit software automatically searches for the USB interface board's circuit connection. In the **Interface** group box, the **Device Connected** combo box allows the user to select the proper part being evaluated. Upon selection of the device being evaluated, the **Update Pot A and B** checkbox is enabled/disabled. The EV kit enters the normal operating mode when the USB connection is detected and the part has been selected. Since the MAX5393 does not have read capability, all of the edit boxes are set to question marks (**??**) and the **Potentiometer_** track bars are set to midscale. If the USB connection is not detected, the software prompts the user to retry, exit the program, or enter the demo mode.
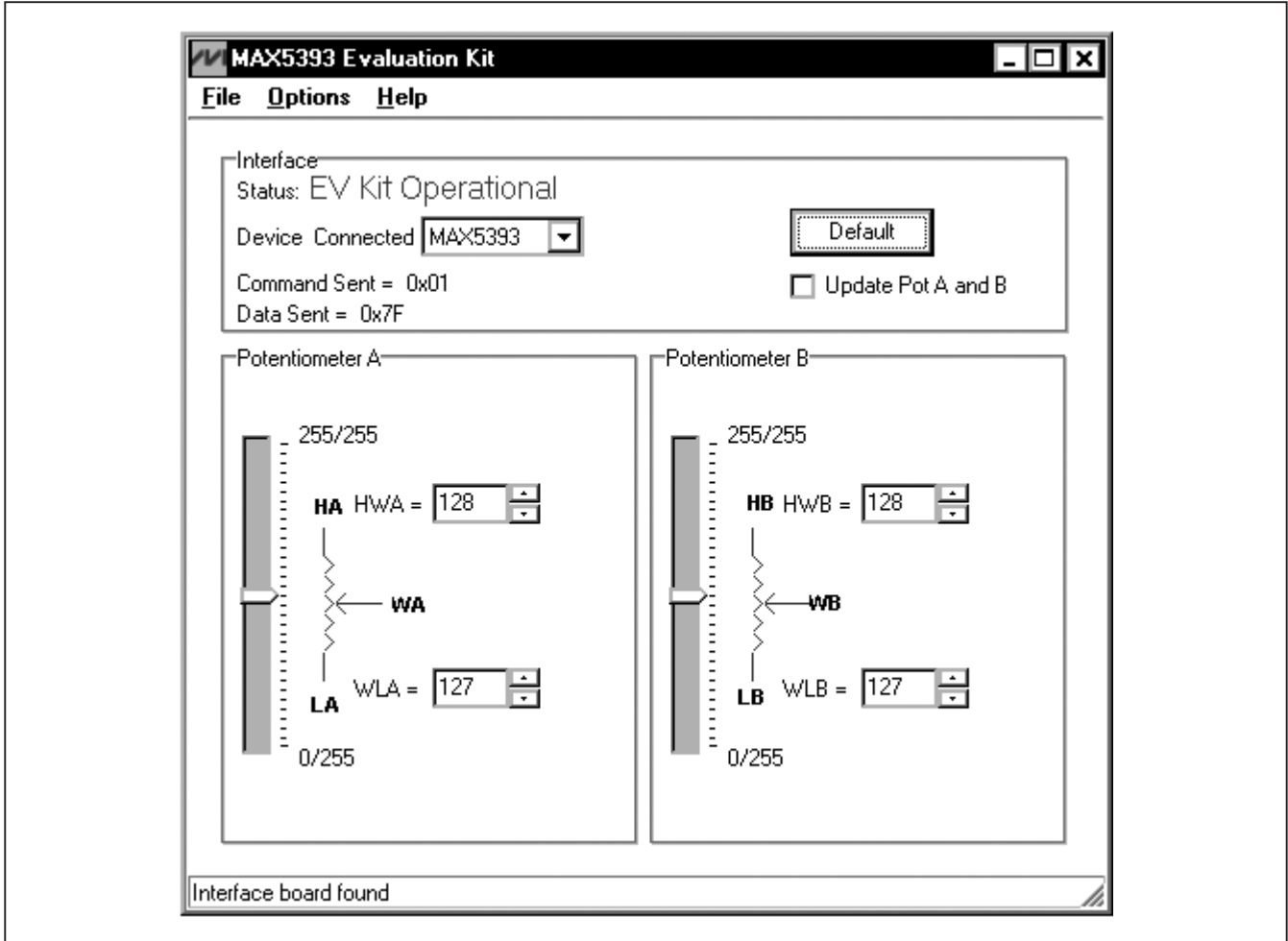
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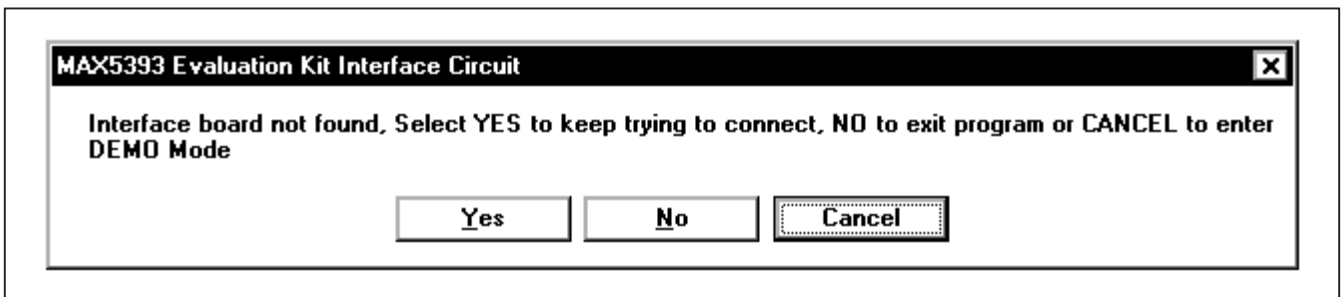Figure 1. MAX5393 Evaluation Kit Software Main Window

Figure 2. MAX5393 Evaluation Kit Interface Circuit Popup Window

MAX5393 Evaluation System

Demo Mode

The EV kit software enters the demo mode, when the USB connection is not detected, by selecting **Cancel** on the **MAX5393 Evaluation Kit Interface Circuit** popup window (Figure 2). The software can also enter demo mode at any time from the main window by selecting the **Options | Demo Mode** menu item. When in demo mode, all software communication to the EV kit circuit is disabled; however, most of the software GUI is functional. Demo mode allows the user to evaluate the software without hardware connectivity. To exit demo mode, deselect the **Options | Demo Mode** menu item.

Potentiometer A and B Wiper Positions

The wiper position track bars (WA, WB) in the **Potentiometer A** and **Potentiometer B** group boxes are used to independently change the wiper position between the H_ and L_ end points. Use the computer mouse or arrow keys to move the wiper position between the 256 position points. The wiper position can also be changed by entering the desired integer value in the edit boxes, or by pressing the up or down arrows in the respective edit box. A change in the **W_** wiper position track bars, or **HW_/WL_** edit boxes writes to the registers and the wiper position is updated with the data sent. The wiper position is shown in the **HW_** and **WL_** edit boxes. The **HW_** edit box shows the wiper position with respect to the potentiometer H end point and the **WL_** edit box shows the wiper position with respect to the potentiometer L_ end point.

Potentiometers A and B can be updated simultaneously by checking the **Update Pot A and B** checkbox. When enabled, the **Potentiometer A** group box sends the same data to both of the digital potentiometers and enables control of both digital potentiometers together.

Factory Default

Pressing the **Default** button resets potentiometer A and B wiper positions in the MAX5393 to the factory-default midscale position.

Status Indicator

The **Status** indicator in the **Interface** group box displays **EV Kit Operational** when the EV kit enters the normal operating mode after the USB connection is detected. If the USB connection is not detected, or when the software enters the demo mode, the **Status** indicator displays **Demo Mode**. Demo mode is used to exercise the software without hardware connectivity.

Command Sent Indicator

The **Command Sent** indicator in the **Interface** group box displays the last command sent from the master (software) to the MAX5393. There are three SPI commands available in the MAX5393 IC, which Table 2 describes.

Data Sent Indicator

The **Data Sent** indicator displays the last data sent for the write to potentiometer A (0x00), potentiometer B (0x01), or both potentiometer A and B (0x03) commands. The MAX5393 IC uses an 8-bit (MSBs, D7:D0) data byte to set the wiper position. Refer to the MAX5391/MAX5393 IC data sheet for additional information.

Keyboard Navigation

Press the Tab key to select each GUI control. The selected control is indicated by a dotted outline. Pressing Shift + Tab moves the selection to the previously selected control. Buttons respond to the keyboard's space bar and some controls respond to the keyboard's up-and-down arrow keys. Activate the program's menu bar by pressing the F10 key and then pressing the letter of the desired menu item. Most menu items have one letter underlined, indicating their shortcut key.

When a number is entered into the edit boxes, it can be sent to the device by pressing the Enter key. It is also sent when Tab or Shift + Tab is pressed.

Simple SPI Commands

There are two methods for communicating with the EV kit, through the normal user-interface panel (Figure 1) or through the SPI commands available by selecting

Table 2. MAX5393 SPI Command

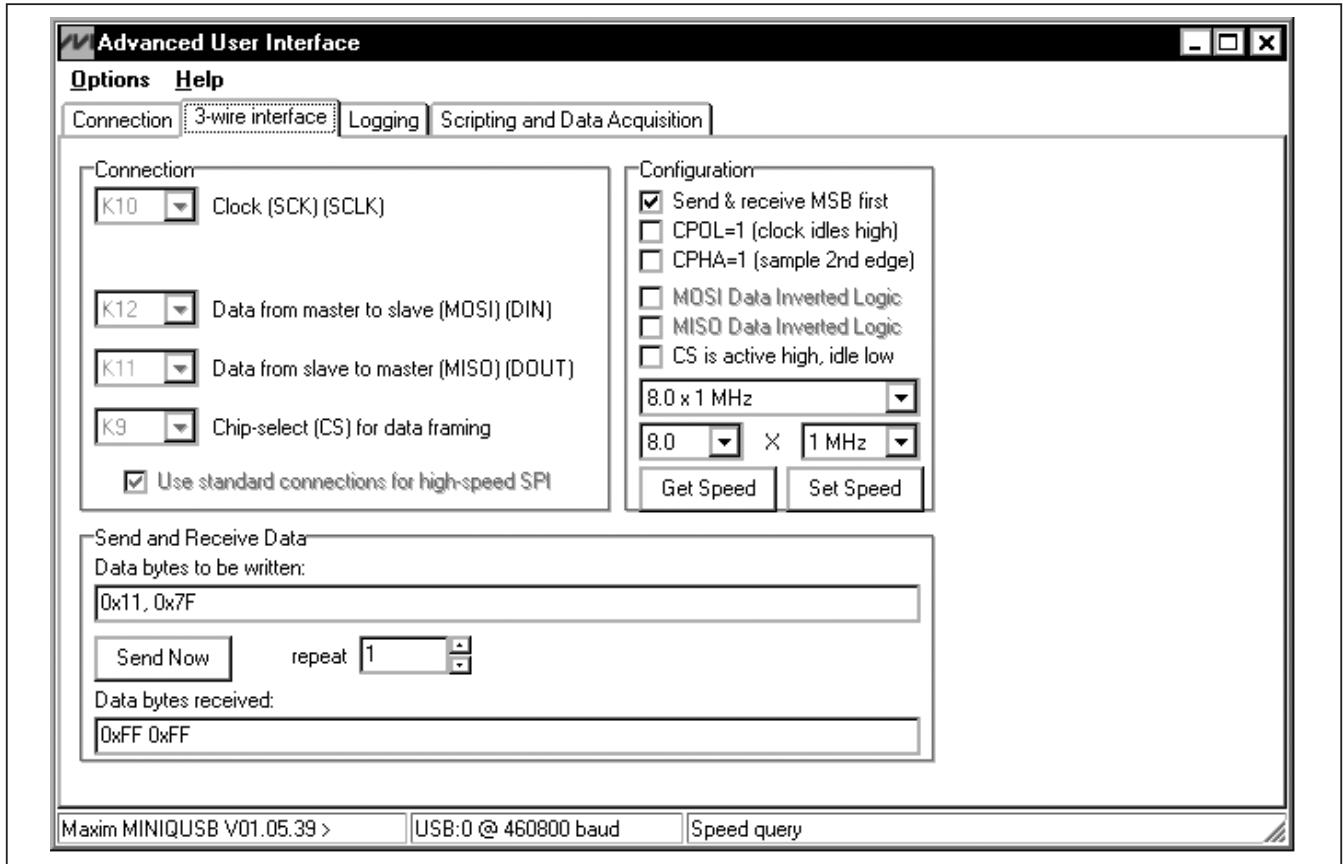| MAX5393 REGISTER	COMMAND		DESCRIPTION
	BINARY	HEX	
VREGA	00000000	0x00	SPI data is written to potentiometer A. Wiper WA position updates with SPI data.
VREGB	00000001	0x01	SPI data is written to potentiometer B. Wiper WB position updates with SPI data.
VREGAB	00000011	0x03	SPI data is written to potentiometers A and B. Wipers WA and WB position updates with SPI data.

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Figure 3. Simple Low-Level 3-Wire Interface

the **3-Wire Interface** (Figure 3) utility from the main program's **Options | Advanced Users Interface** menu bar. A window is displayed that allows SPI send/receive data operations.

On the **3-wire interface** tab, the **Connection** group box defines the hardware connections of the interface. For the EV kit, **K10** is selected from the **Clock (SCK) (SCLK)** drop-down list, **K12** from the **Data from master to slave (MOSI) (DIN)** drop-down list, **K11** from the **Data from slave to master (MISO) (DOUT)** drop-down list, **K9** from the **Chip-select (CS) for data framing** drop-down list, and the **Use standard connections for high-speed SPI** checkbox is checked (see Figure 3).

The **Configuration** group box allows the user to configure the logic level and data rate. For the MAX5393 EV kit, check the **Send & Receive MSB first** checkbox and verify that the **CPOL=1 (clock idle high)** and **CPHA=1 (sample 2nd edge)** checkboxes are unchecked (see Figure 3).

The **Send and Receive Data** group box allows the user to send data to the MAX5393. The **Data bytes to be written** edit box indicates data to be sent from the master (microcontroller) to the device (MAX5393). Eight-bit hexadecimal numbers should be comma delimited. Press the **Send Now** button to transmit the data from the master to the device. Data appearing in the **Data bytes received** edit box is data read from the device. The **Data bytes received** edit box in the EV kit software always shows a default value of **0xFF** since the MAX5393 does not send data back to the master.

Note: The SPI dialog boxes accept numeric data in hexadecimal format. Hexadecimal numbers must be prefixed by $ or 0x. Figure 3 shows a simple SPI write-byte operation using the included 3-wire interface diagnostics tool. In this example, the software is sending command 0x11 (write to potentiometers A and B) and data 0x7F. The data sequence sets potentiometer A and B wiper positions to 127.

General Troubleshooting

Problem: Software reports it cannot find the interface circuit:

• Is the USB cable connected to the MINIQUSB+ board?

• Has Windows plug-and-play detected the board? Bring up **Control Panel->System->Device Manager**, and look at what device nodes are indicated for USB. If there is an **Unknown device node** attached to the USB, uninstall it—this forces plug-and-play to try again.

• If using an off-board SPI interface, is the power ground connected to the EV kit ground (GND) at one of the header J1 pin connections (J1-2, J1-4, J1-6, or J1-8)?

_Detailed Description of Hardware

The MAX5393 EV kit is an assembled and tested PCB that features the MAX5393M 256-tap, 50kΩ, dual digital potentiometer. Each wiper can be programmed independently among 256 tap positions. The EV kit uses a MAX5393M in a 16-pin TSSOP package on a proven two-layer PCB design.

The EV kit provides connector J1 to interface with the MAX5393 $\overline{CS}$, DIN, SCLK, and GND signals directly to a user-supplied 3-wire system. Connector J1 also provides a connection for the EV kit's 1.7V to 5.5V VPOWER power-supply input.

The EV kit is typically used with a MINIQUSB+ interface board for communicating with a PC through the 3-wire serial interface. Logic-level translators U7 and U8 provide proper SPI interface translation when using 1.7V to 5.5V to power the MAX5393 VDD input.

EV Kit VDD Input Source

The VPOWER rail is typically supplied as 3.3V or 5V by the MINIQUSB+ interface board circuitry or 2.6V using LDO regulator U6. LDO regulator U5 output is set to 1.7V and is powered from the VPOWER rail. The VPOWER rail and U5 are used to set the MAX5393 VDD input to 5V, 3.3V, 2.6V, or 1.7V.

Regulator U5 has an adjustable output that can be configured to a different voltage by replacing resistor R1. Use the following equation to set U5 output voltage:

$$R1 = 10^5 \times \left(\frac{VOUT}{1.225} - 1\right)$$

where R1 is in ohms and VOUT is the desired U5 output voltage.

Jumper JU20 selects the source for the MAX5393 EV kit circuit VPOWER rail. See Table 3 for proper jumper configuration for setting VPOWER rail.

Alternatively, the EV kit's VDD PCB pad can be used to supply an external 1.7V to 5.25V to the circuit's VPOWER rail, by removing the shunt at jumper JU20.

Jumper JU1 enables/disables U5 output. Install a shunt across JU1 to enable U5 1.7V output. Remove the shunt at JU1 to disable U5 output. See Table 4 for proper JU1 configuration.

Note: LDO U6 output is disabled when the MINIQUSB+ board is not installed at headers J1 and J2.

Table 3. VPOWER Rail (JU20)

SHUNT POSITION JU20	VPOWER SOURCE
1-2	5V (MINIQUSB+ circuitry)
1-2	5V (MINIQUSB+ circuitry)
1-3	3.3V (MINIQUSB+ circuitry)
1-4	2.6V (LDO U6)
Not installed	External source applied at VDD and GND PCB pads

Table 4. U5 LDO Function (JU1)

SHUNT POSITION	U5 1.7V OUTPUT
Installed*	Enabled
Not installed	Disabled

*Default position.

Table 5. MAX5393 VDD Power Source (JU19, JU1, JU20)

SHUNT POSITION			MAX5393 VDD PIN
JU19	JU1	JU20	
1-2*	Installed*	X	1.7V
1-2	Not installed	X	Not powered
2-3	X	1-2	5V
2-3	X	1-3	3.3V
2-3	X	1-4	2.6V
2-3	X	Not installed	External source applied at the EV kit VDD and GND PCB pads

*Default position.
X = Don't care.

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MAX5393 VDD Input Configuration

Jumper JU19 selects the power source for the MAX5393 VDD input. Install a shunt across pins 1-2 to set the MAX5393 VDD input to 1.7V. Install a shunt across pins 2-3 to set the MAX5393 VDD input to the VPOWER rail. See Table 5 for proper jumper configuration for the MAX5393 VDD power-supply input.

SPI Clock and Data-/Chip-Select Inputs

The MAX5393 features a clock and data-/chip-select input pins for SPI-compatible communication to control the wiper position. The clock and data-/chip-select pins can be driven by the MINIQUSB+ interface circuit or the PCB header (J1), along with a user-supplied external SPI-compatible controller. An external SPI-compatible controller can be connected to $\overline{CS}$ (J1-3), DIN (J1-5), SCLK (J1-7), and GND (J1-2, J1-4, J1-6, J1-8) on header J1 to communicate with the MAX5393 IC. When using an external SPI-compatible controller, verify that the MINIQUSB+ interface board has been disconnected from the EV kit's J2 and J3 headers. See Table 5 for header J1 pin assignment.

Table 6. Header J1 Pin Assignment

PIN	SIGNAL
J1-1	VPOWER
J1-2, J1-4, J1-6, J1-8	GND
J1-3	$\overline{CS}$
J1-5	DIN
J1-7	SCLK

Potentiometer, Voltage-Divider or Variable Resistor, with Ground Reference

The EV kit provides an option to configure the MAX5393 as a potentiometer or voltage-divider, open-ended or with ground reference, respectively. Use jumpers JU12 and JU13 for potentiometer A, and jumpers JU14 and JU15 for potentiometer B configurations. See Tables 7 and 8 for jumper options for configuring potentiometers A and B.

The MAX5393 IC can also be configured as a variable resistor by shorting the H_ and W_ pads together using a wire. When operating as a variable resistor, any power source connected to the H_, W_, or L_ pads must be voltage and current limited to the maximum conditions stated in the MAX5391/MAX5393 IC data sheet.

Note: To test the device in resistor mode, the ohmmeter must be GND referenced to the MAX5393. This can be accomplished by connecting the L_ pin to GND or the H_ pin to VDD. Resistance can then be measured between W_ and L_ or W_ and H_PCB pads.

Evaluating the MAX5386M/MAX5388/MAX5391 ICs

The EV kit is populated with additional PCB footprints (U1, U2, and U4) and various jumpers to evaluate the MAX5386M, MAX5391, and MAX5388, respectively. **Note:** It is recommended that the $\overline{CS}$, DIN, and SCLK signals not drive more than one device at any given time.

Refer to the MAX5386M, MAX5388, or MAX5391L/MAX5391N EV system data sheets for additional information when evaluating the MAX5386M, MAX5388, or MAX5391 digital potentiometers.

Table 7. JU12 and JU13 Jumper Functions (Potentiometer A)

SHUNT POSITION		HA PAD	LA PAD	MAX5393 FUNCTION
JU12	JU13			
Not installed	Not installed	Not connected	Not connected	Potentiometer open ended
	Installed		Connected to GND	Potentiometer with GND reference
Installed*	Not installed	Connected to VDD	Not connected	Voltage-divider open ended
	Installed*		Connected to GND	Voltage-divider with GND reference

*Default position.

Table 8. JU14 and JU15 Jumper Functions (Potentiometer B)

SHUNT POSITION		HB PAD	LB PAD	MAX5393 FUNCTION
JU14	JU15			
Not installed	Not installed	Not connected	Not connected	Potentiometer open ended
	Installed		Connected to GND	Potentiometer with GND reference
Installed*	Not installed	Connected to VDD	Not connected	Voltage-divider open ended
	Installed*		Connected to GND	Voltage-divider with GND reference

*Default position.

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Table 9. Jumper Configuration (JU1–JU20)

JUMPER	SHUNT POSITION	EV KIT FUNCTION
JU1	Not installed	1.7V LDO output disabled
	Installed*	1.7V LDO output enabled
JU2	1-2*	MAX5386M VDD voltage = 1.7V
	2-3	MAX5386M VDD voltage dependent on jumper JU20 configuration
JU3	Not installed	MAX5386M HA disconnected from U1 VDD voltage source
	Installed*	MAX5386M HA connected to U1 VDD voltage source
JU4	Not installed	MAX5386M LA disconnected from GND
	Installed*	MAX5386M LA connected to GND
JU5	Not installed	MAX5386M HB disconnected from U1 VDD voltage source
	Installed*	MAX5386M HB connected from U1 VDD voltage source
JU6	Not installed	MAX5386M LB disconnected from GND
	Installed*	MAX5386M LB connected to GND
JU7	1-2*	MAX5391 VDD voltage = 1.7V
	2-3	MAX5391 VDD voltage dependent on jumper JU20 configuration
JU8	Not installed	MAX5391 HA disconnected from U2 VDD voltage source
	Installed*	MAX5391 HA connected to U2 VDD voltage source
JU9	Not installed	MAX5391 LA disconnected from GND
	Installed*	MAX5391 LA connected to GND
JU10	Not installed	MAX5391 HB disconnected from U2 VDD voltage source
	Installed*	MAX5391 HB connected to U2 VDD voltage source
JU11	Not installed	MAX5391 LB disconnected from GND
	Installed*	MAX5391 LB connected to GND
JU12	Not installed	MAX5393 HA disconnected from U3 VDD voltage source
	Installed*	MAX5393 HA connected to U3 VDD voltage source
JU13	Not installed	MAX5393 LA disconnected from GND
	Installed*	MAX5393 LA connected to GND
JU14	Not installed	MAX5393 HB disconnected from U3 VDD voltage source
	Installed*	MAX5393 HB connected to U3 VDD voltage source
JU15	Not installed	MAX5393 LB disconnected from GND
	Installed*	MAX5393 LB connected to GND
JU16	Not installed	MAX5388 LA disconnected from GND
	Installed*	MAX5388 LA connected to GND
JU17	Not installed	MAX5388 HB disconnected from U4 VDD voltage source
	Installed*	MAX5388 HB connected to U4 VDD
JU18	Not installed	MAX5388 LB disconnected from GND
	Installed*	MAX5388 LB connected to GND
JU19	1-2*	MAX5393 VDD = 1.7V
	2-3	MAX5393 VDD dependent on jumper JU20 configuration
JU20	1-2	VPOWER = 5V
	1-3*	VPOWER = 3.3V
	1-4	VPOWER = 2.6V

*Default position.

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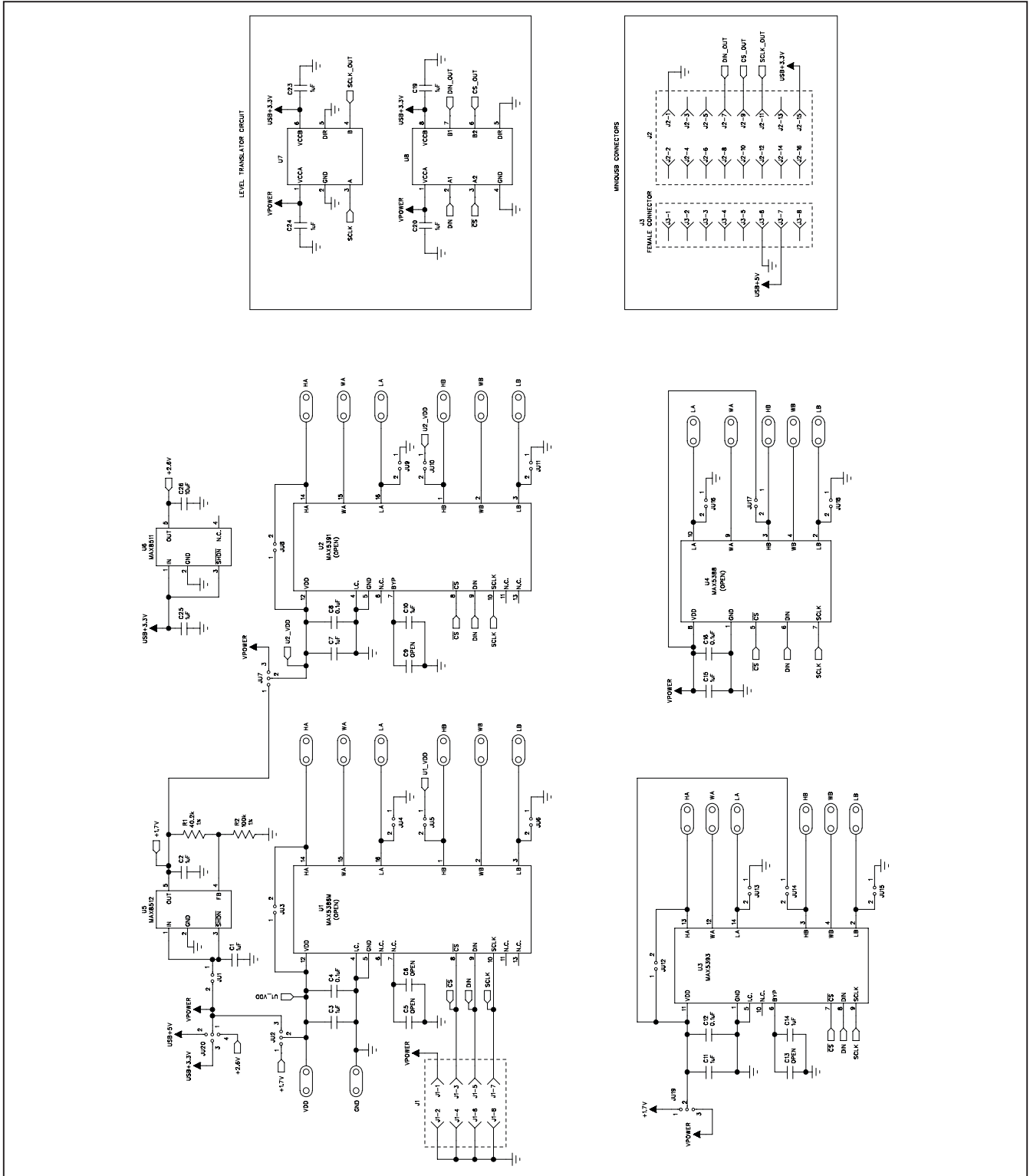
Figure 4. MAX5393 EV Kit Schematic

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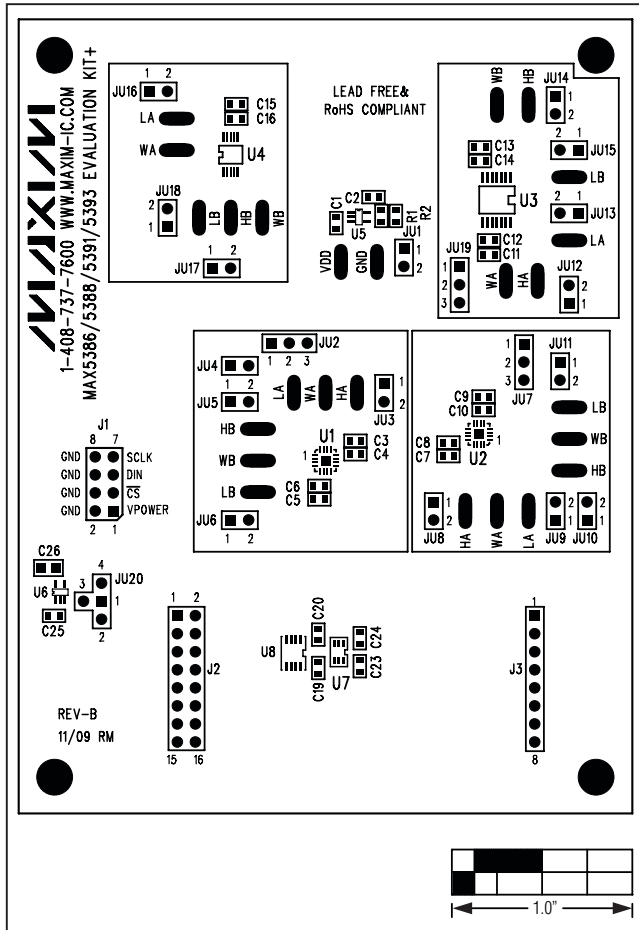
Figure 5. MAX5393 EV Kit Component Placement Guide—Component Side
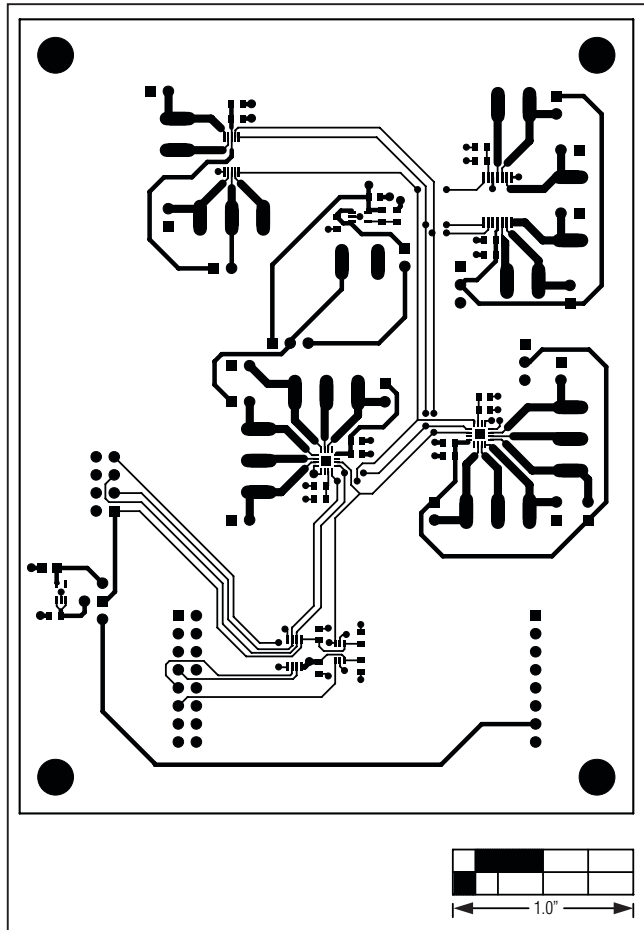
Figure 6. MAX5393 EV Kit PCB Layout—Component Side
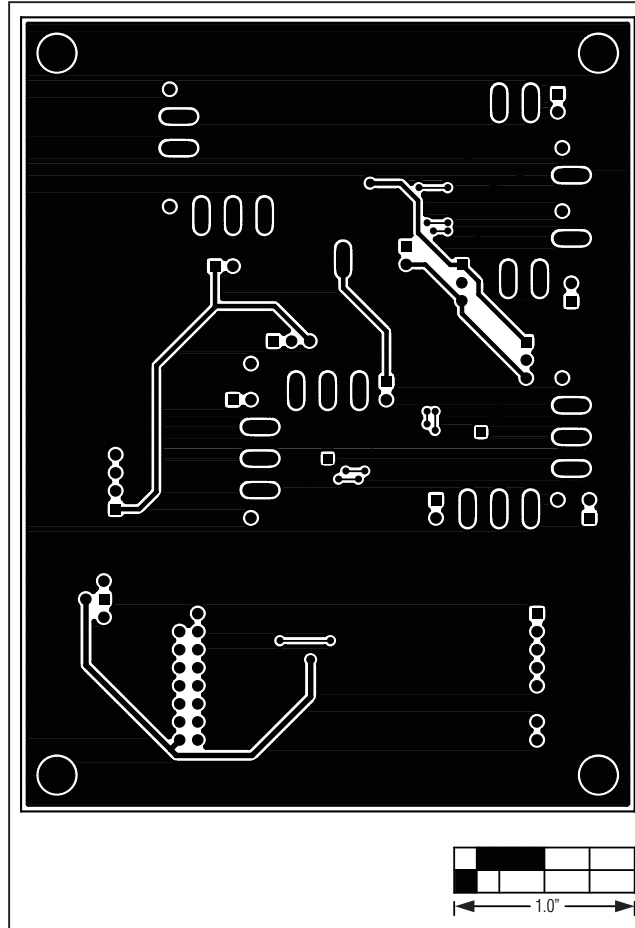
Figure 7. MAX5393 EV Kit PCB Layout—Solder Side

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