

# MAX5110 Evaluation Kit

Evaluates: MAX5110/MAX5111

## General Description

The MAX5110 evaluation kit (EV kit) provides a proven design to evaluate the MAX5110 9-channel, 14-bit current DAC. The EV kit also includes Windows XP®, Windows Vista®, and Windows® 7-compatible software that provides a simple graphical user interface (GUI) for exercising the features of the device.

The EV kit comes with a MAX5110GTJ+ installed. Contact the factory for free samples of the pin-compatible MAX5111GTJ+ to evaluate this device.

## Component List

DESIGNATION	QTY	DESCRIPTION
C10–C18, C100–C104, C111, C121, C122	17	0.1µF ±10%, 25V X7R ceramic capacitors (0603) TDK C1608X7R1E104K
C21, C22, C31, C32, C108, C131, C141	7	1µF ±10%, 16V X7R ceramic capacitors (0603) TDK C1608X7R1C105K
C23, C109, C132, C142	4	10µF ±10%, 6.3V X7R ceramic capacitors (0805) Murata GRM21BR70J106K
C33	0	Not installed, ceramic capacitor (0805)
C105	1	0.01µF ±10%, 16V X7R ceramic capacitor (0402) Murata GRM155R71C103K
C106, C107	2	22pF ±5%, 50V C0G ceramic capacitors (0603) Murata GRM1885C1H220J

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## Features

- On-Board +3.0V Regulator Accepts +5.5V to +3.35V Supply Range
- On-Board -5.2V Regulator Accepts -6.5V to -5.24V Supply Range
- Windows XP-, Windows Vista-, and Windows 7-Compatible Software
- USB-PC Connection (Cable Included)
- On-Board Diode and Resistive Loads
- SPI™ Interface Terminals (MAX5110)
- I<sup>2</sup>C Interface Terminals (MAX5111)
- Proven PCB Layout
- Fully Assembled and Tested

## Ordering Information

PART	TYPE
MAX5110EVKIT+	EV Kit

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

DESIGNATION	QTY	DESCRIPTION
C110	1	33000pF ±10%, 25V X7R ceramic capacitor (0603) Murata GRM188R71E333K
C123, C124	2	10pF ±5%, 50V C0G ceramic capacitors (0603) Murata GRM1885C1H100J
D11A–D14A, D11B–D14B, D11C–D14C, D11D–D14D, D21A–D24A, D21B–D24B, D21C–D24C, D21D–D24D, D31, D32, D34, D35, D36, D41, D42, D43, D51, D52, D61, D62, D71, D72, D73, D81–D85, D91–D95	57	200mA, 25V Schottky diodes (SOT23) Fairchild BAT54
D33	1	1N4001 diode Diodes Inc. 1N4001
D44, D53, D74	3	1N4148 diodes (SOT23) Fairchild MMBD4148 (Top Mark: 5H)



## Component List (continued)

DESIGNATION	QTY	DESCRIPTION
H1	1	36-pin (2 x 18) header
H2	1	8-pin header
H120, H123	0	Not installed, 9-pin headers
HOUT1A–HOUT1D, HOUT2A–HOUT2D, HOUT3–HOUT9	15	2-pin headers
JTAGU120	0	Not installed, 10-pin (2 x 5) header
JU10, JU11, JU16, JU17	4	2-pin headers
JU12, JU13, JUOUT1A– JUOUT1D, JUOUT2A– JUOUT2D, JUOUT4, JUOUT5, JUOUT7, JUOUT8, JUOUT9	15	3-pin headers
JU14, JU15, JUOUT6	3	4-pin headers
JU101–JU108	0	Not installed, headers—shorted with PCB trace
JUOUT3	1	5-pin header
L101	1	Ferrite bead (0603) TDK MMZ1608R301A
LEDPWR	1	Red LED (0805)
Q100	1	p-channel FET (SOT223) Fairchild Semi NDT456P
R11	1	1M $\Omega$ $\pm$ 5% resistor (0603)
R16, R17	2	4.7k $\Omega$ $\pm$ 5% resistors (0603)
R21	1	220k $\Omega$ $\pm$ 1% resistor (0603)
R22	1	80.6k $\Omega$ $\pm$ 1% resistor (0603)
R31	1	316k $\Omega$ $\pm$ 1% resistor (0603)
R32	1	100k $\Omega$ $\pm$ 1% resistor (0603)
R41, R42, R43, R51, R52, R71, R72, R73	8	10 $\Omega$ $\pm$ 5% resistors (0603)
R61, RL61	2	6.8 $\Omega$ $\pm$ 5%, 1W resistors (2512) Vishay/Dale CRCW25126R80JNEG
R62, RL62	2	33 $\Omega$ $\pm$ 5% resistors (0805)
R100, RL32	2	1k $\Omega$ $\pm$ 5% resistors (0603)

DESIGNATION	QTY	DESCRIPTION
R101, R102	2	27 $\Omega$ $\pm$ 5% resistors (0603)
R103	1	1.5k $\Omega$ $\pm$ 5% resistor (0603)
R104	1	470 $\Omega$ $\pm$ 5% resistor (0603)
R111	1	2.2k $\Omega$ $\pm$ 5% resistor (0603)
R112	1	10k $\Omega$ $\pm$ 5% resistor (0603)
RL1A–RL1D, RL2A–RL2D	8	200 $\Omega$ $\pm$ 5% resistors (0603)
RL4, RL7	2	22 $\Omega$ $\pm$ 5% resistors (1206)
RL5	1	11 $\Omega$ $\pm$ 1%, 0.5W resistor (1210) KOA Speer RK73H2ETTD11R0F
RL31	1	100 $\Omega$ $\pm$ 5% resistor (0603)
RL81, RL82, RL91, RL92	4	270 $\Omega$ $\pm$ 5% resistors (0603)
RLEDPWR	1	330 $\Omega$ $\pm$ 5% resistor (0603)
TP0	1	Black multipurpose test point
TP1, TP22	2	Red multipurpose test points
TP2, TP32	2	Yellow multipurpose test points
TP00, TP10, TP100, TP101, TP108, TP132, TP142	0	Not installed, multipurpose test points
U1	1	9-channel, 14-bit current DAC (32 TQFN-EP*) Maxim MAX5110GTJ+
U2	1	3.3V at 1000mA LDO regulator (16 TSSOP-EP*) Maxim MAX8869EUE33+
U3	1	-5V at 200mA LDO regulator (5 SOT23) Maxim MAX1735EUK30+ (Top Mark: ADOY)
U100	1	UART-to-USB converter (32 TQFP)
U110	0	Not installed, 93C46-type 3-wire EEPROM 16-bit architecture (8 SO)

### Component List (continued)

DESIGNATION	QTY	DESCRIPTION
U120	1	Low-power microcontroller (68 QFN-EP*) Maxim MAXQ2000-RAX+
U130	1	2.5V regulator (5 SC70) Maxim MAX8511EXK25+T (Top Mark: ADV)
U140	1	3.3V regulator (5 SC70) Maxim MAX8511EXK33+T (Top Mark: AEI)
USB1	1	USB type-B right-angle female receptacle

DESIGNATION	QTY	DESCRIPTION
Y100	1	6MHz crystal Hong Kong X'tals SSL60000N1HK188F0-0
Y120	1	16MHz crystal Hong Kong X'tals SSM16000N1HK188F0-0
—	1	USB high-speed A-to-B cables, 6ft
—	23	Shunts
—	1	PCB: MAX5110 EVALUATION KIT+

\*EP = Exposed pad.

### Component Suppliers

SUPPLIER	PHONE	WEBSITE
Diodes Incorporated	805-446-4800	www.diodes.com
Fairchild Semiconductor	888-522-5372	www.fairchildsemi.com
Hong Kong X'tals Ltd.	852-35112388	www.hongkongcrystal.com
Murata Electronics North America, Inc.	770-436-1300	www.murata-northamerica.com
TDK Corp.	847-803-6100	www.component.tdk.com
Vishay	402-563-6866	www.vishay.com

**Note:** Indicate that you are using the MAX5110 when contacting these component suppliers.

### MAX5110 EV Kit Files

FILE	DESCRIPTION
INSTALL.EXE	Installs the EV kit files on your computer
MAX5110.EXE	Application program
CDM20600.EXE	Installs the USB device driver
UNINSTALL.EXE	Uninstalls the EV kit software
USB_Driver_Help_200.PDF	Uninstalls the EV kit software

## Quick Start

### Required Equipment

- MAX5110 EV kit (USB cable included)
- Windows XP, Windows Vista, or Windows 7 PC with a spare USB port
- User-supplied +5V DC at 750mA power supply
- User-supplied -5.5V DC at 100mA power supply
- Digital voltmeters (DVMs)

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

- 1) Visit [www.maximintegrated.com/evkitsoftware](http://www.maximintegrated.com/evkitsoftware) to download the latest version of the EV kit software, 5110Rxx.ZIP. Save the EV kit software to a temporary folder and uncompress the ZIP file.
- 2) Install the EV kit software and USB driver on your computer by running the INSTALL.EXE program inside the temporary folder. The program files are copied to your PC and icons are created in the Windows **Start | Programs** menu. During software installation, some versions of Windows may show a warning message indicating that this software is from an unknown publisher. This is not an error condition and it is safe to proceed with installation. Administrator privileges are required to install the USB device driver on Windows.
- 3) Verify that all jumpers (JU10–JU17, JUOUT1A–JUOUT2D, JUOUT3–JUOUT9) are in their default positions, as shown in Tables 1 and 2.
- 4) To measure OP9, connect the DVM between HOUT9 (OP9) and GND (optionally, outputs can be monitored at the labeled test points on header H1).
- 5) Connect the +5V DC power supply between TP1 (+5V) and TP0 (GND).
- 6) Connect the -5.5V DC power supply between TP2 (-5.5V) and TP0 (GND).
- 7) Enable both power supplies.
- 8) Connect the USB cable from the PC to the EV kit board. A Windows message appears when connecting the EV kit board to the PC for the first time. Each version of Windows has a slightly different message. If you see a Windows message stating **ready to use**, then proceed to the next step. Otherwise, open the USB\_Driver\_Help\_200.PDF document in the Windows **Start | Programs** menu to verify that the USB driver was installed successfully.
- 9) Start the EV kit software by opening its icon in the Windows **Start | Programs** menu. The EV kit software main window appears, as shown in Figure 1.

### DAC1 Output MUX Test

- 1) Press **F1** to return to the block diagram. Click on **OP1** to drill down to **IDAC Configuration** for OP1.
- 2) Connect a DVM to HOUT1A.
- 3) Under the **Output pin to drive** drop-down list, select **OP1A**.
- 4) Drag the **Source Mode Code** track bar to the right.
- 5) Verify that the DVM connected to HOUT1A shows approximately +2.0V (10mA output current).
- 6) Connect a DVM to HOUT1B.
- 7) Verify that the DVM connected to HOUT1B shows approximately 0V (0mA output current).
- 8) Under the **Output pin to drive** drop-down list, select **OP1B**.
- 9) Verify that the DVM connected to HOUT1B shows approximately +2.0V (10mA output current).
- 10) Connect a DVM to HOUT1C.
- 11) Verify that the DVM connected to HOUT1C shows approximately 0V (0mA output current).
- 12) Under the **Output pin to drive** drop-down list, select **OP1C**.
- 13) Verify that the DVM connected to HOUT1C shows approximately +2.0V (10mA output current).
- 14) Connect a DVM to HOUT1D.
- 15) Verify that the DVM connected to HOUT1D shows approximately 0V (0mA output current).

- 16) Under the **Output pin to drive** drop-down list, select **OP1D**.
- 17) Verify that the DVM connected to HOUT1D shows approximately +2.0V (10mA output current).

#### DAC2 Output MUX Test

- 1) Under the **IDAC to configure** drop-down list, select **OP2**.
- 2) Connect a DVM to HOUT2A.
- 3) Under the **Output pin to drive** drop-down list, select **OP2A**.
- 4) Drag the **Source Mode Code** track bar to the right.
- 5) Verify that the DVM connected to HOUT2A shows approximately +2.0V (10mA output current).
- 6) Connect a DVM to HOUT2B.
- 7) Verify that the DVM connected to HOUT2B shows approximately 0V (0mA output current).
- 8) Under the **Output pin to drive** drop-down list, select **OP2B**.
- 9) Verify that the DVM connected to HOUT2B shows approximately +2.0V (10mA output current).
- 10) Connect a DVM to HOUT2C.
- 11) Verify that the DVM connected to HOUT2C shows approximately 0V (0mA output current).
- 12) Under the **Output pin to drive** drop-down list, select **OP2C**.
- 13) Verify that the DVM connected to HOUT2C shows approximately +2.0V (10mA output current).
- 14) Connect a DVM to HOUT2D.
- 15) Verify that the DVM connected to HOUT2D shows approximately 0V (0mA output current).
- 16) Under the **Output pin to drive** drop-down list, select **OP2D**.
- 17) Verify that the DVM connected to HOUT2D shows approximately +2.0V (10mA output current).

#### DAC3 Range Test

- 1) Press **F1** to return to the block diagram. Click on **OP3** to drill down to **IDAC Configuration** for OP3.
- 2) Connect a DVM to HOUT3.

- 3) Verify that the DVM connected to HOUT3 shows approximately 0V (0mA output current).
- 4) Click on the **High current range** radio button.
- 5) Drag the **Source Mode Code** track bar to the right.
- 6) Verify that the DVM connected to HOUT3 shows approximately +2.0V (20mA output current).
- 7) Click on the **Low current range** radio button.
- 8) Verify that the DVM connected to HOUT3 shows approximately +0.2V (2mA output current).

#### DAC4 Current-Source Test

- 1) Click on **OP4** to drill down to **IDAC Configuration** for OP4.
- 2) Connect a DVM to HOUT4.
- 3) Drag the **Source Mode Code** track bar to the right.
- 4) Verify that the DVM connected to HOUT4 shows approximately +2.0V (90mA output current).

#### DAC5 Current-Source Test

- 1) Click on **OP5** to drill down to **IDAC Configuration** for OP5.
- 2) Connect a DVM to HOUT5.
- 3) Drag the **Source Mode Code** track bar to the right.
- 4) Verify that the DVM connected to HOUT5 shows approximately +2.0V (180mA output current).

#### DAC6 Source-Mode Test

- 1) Press **F1** to return to the block diagram. Click on **OP6** to drill down to **IDAC Configuration** for OP6.
- 2) Connect a DVM to HOUT6.
- 3) Drag the **Source Mode Code** track bar to the right.
- 4) Verify that the DVM connected to HOUT6 shows approximately +2.0V (300mA output current).

#### DAC6 Sink-Mode Test

- 1) Press **F1** to return to the block diagram. Click on **OP6** to drill down to **IDAC Configuration** for OP6.
- 2) Connect a DVM to HOUT6.
- 3) Drag the **Sink Mode Code** track bar to the right.
- 4) Click on the **Low current range** radio button.
- 5) Verify that the DVM connected to HOUT6 shows approximately -0.4V (-60mA output current).

**DAC6 Shutter-Mode Test**

- 1) Press **F1** to return to the block diagram. Click on **OP6** to drill down to **IDAC Configuration** for OP6.
- 2) Connect a DVM to HOUT6.
- 3) Drag the **Shutter Mode Code** track bar to the center.
- 4) Click on the **High current range** radio button.
- 5) Under **CLR pin action**, click on the **SHUTTER** radio button.
- 6) Set **CLR pin** to **High** to enter shutter mode.
- 7) Verify that the DVM connected to HOUT6 shows approximately -0.2V (-30mA output current).
- 8) Set **CLR pin** to **Low** to exit shutter mode.
- 9) Verify that the DVM connected to HOUT6 shows approximately +2.0V (300mA output current).

**DAC7 Current-Source Test**

- 1) Click on **OP7** to drill down to **IDAC Configuration** for OP7.
- 2) Connect a DVM to HOUT7.
- 3) Drag the **Source Mode Code** track bar to the right.
- 4) Verify that the DVM connected to HOUT7 shows approximately +2.0V (90mA output current).

**DAC8 Current-Source Test**

- 1) Click on **OP8** to drill down to **IDAC Configuration** for OP8.
- 2) Connect a DVM to HOUT8.
- 3) Drag the **Source Mode Code** track bar to the right.
- 4) Verify that the DVM connected to HOUT8 shows approximately +2.0V (15mA output current).

**DAC9 Current-Source Test**

- 1) Click on **OP9** to drill down to **IDAC Configuration** for OP9.
- 2) Connect a DVM to HOUT9.
- 3) Drag the **Source Mode Code** track bar to the right.
- 4) Verify that the DVM connected to HOUT9 shows approximately +2.0V (15mA output current).

**Detailed Description of Software**

The main window of the evaluation software (Figure 1) displays the output code for all DAC outputs. In addition, the main window has four tabs. The **Block Diagram** tab sheet shows the status of all nine DACs. Click on a DAC to drill down to the **IDAC Configuration** tab sheet (Figure 2). The **Registers** tab sheet (Figure 3) provides low-level access to all device registers. The **Interface History** tab sheet (Figure 4) shows the sequence of I<sup>2</sup>C or SPI operations that have been performed.

**Advanced User Interface**

There are two methods for communicating with the device. The first is through the windows shown in Figures 1–4. The second is through the **Advanced User Interface** window shown in Figures 5 and 6. The **Advanced User Interface** window becomes available by selecting the **Option | Interface (Advanced User)** menu item and allows execution of serial commands manually.

The **Advanced User Interface** window can also be used as a debug tool because it is capable of manually reading and writing to every register of the device.

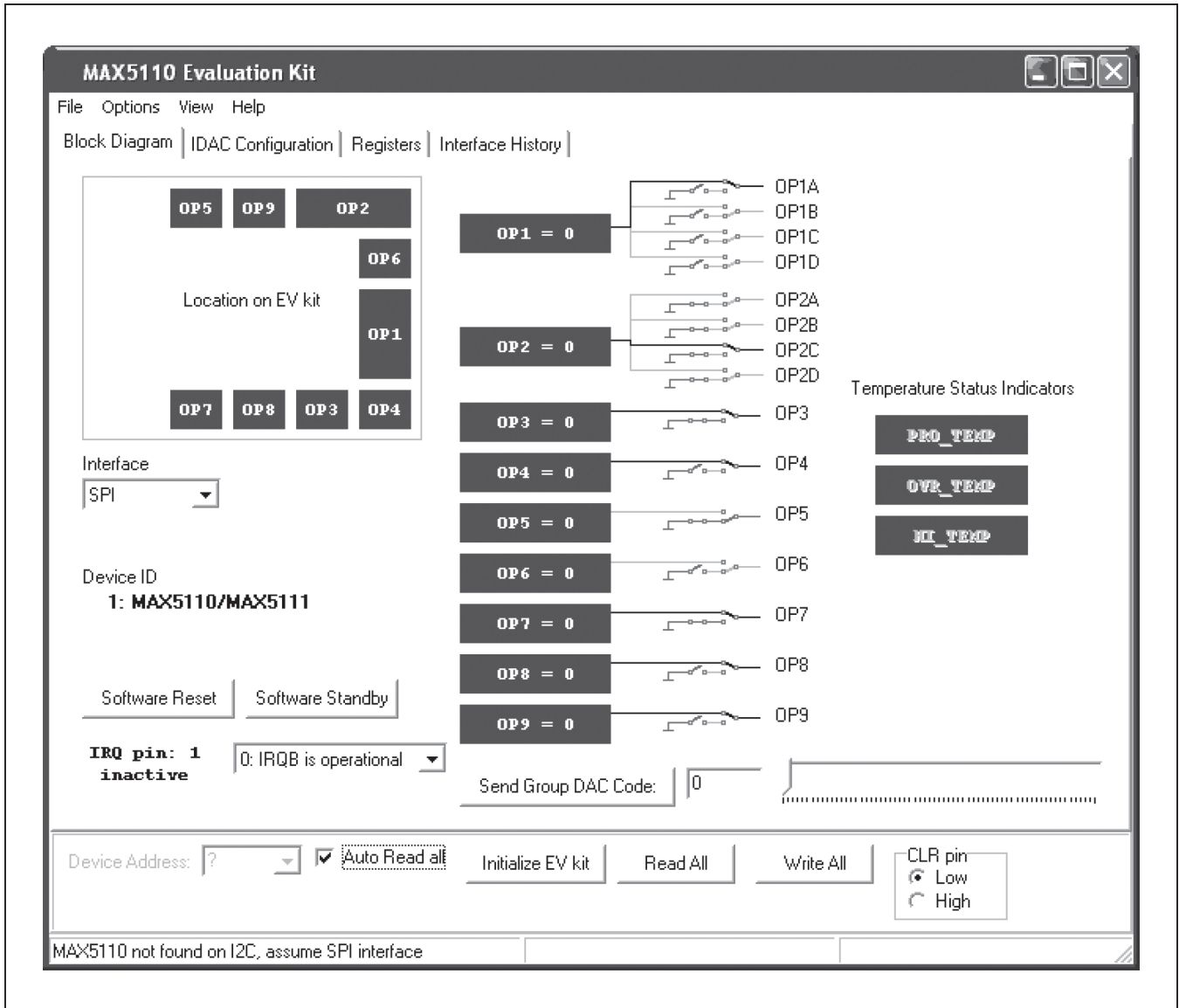


Figure 1. MAX5110 EV Kit Software Main Window (Block Diagram Tab)



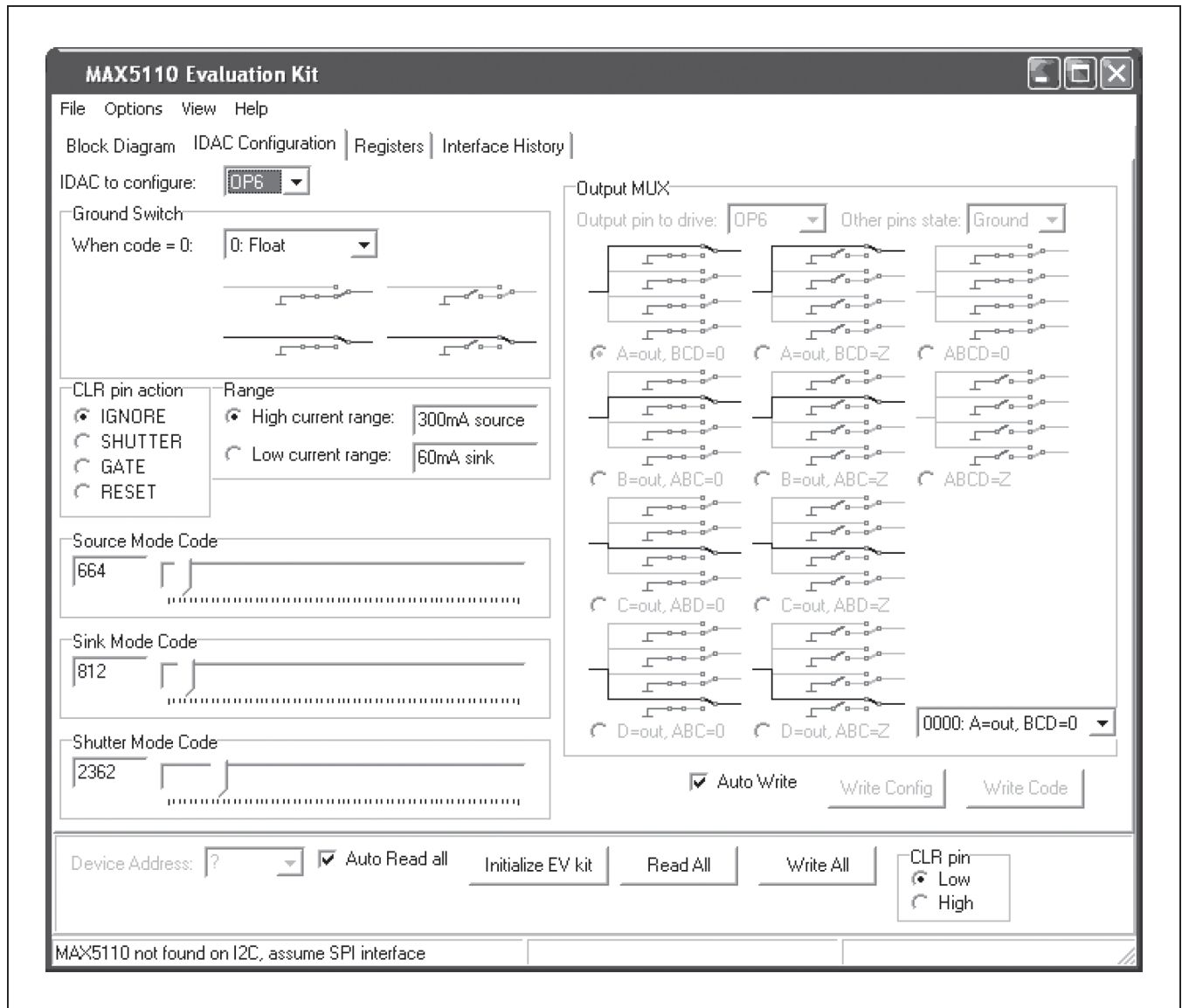


Figure 2. MAX5110 EV Kit Software Main Window (IDAC Configuration Tab)



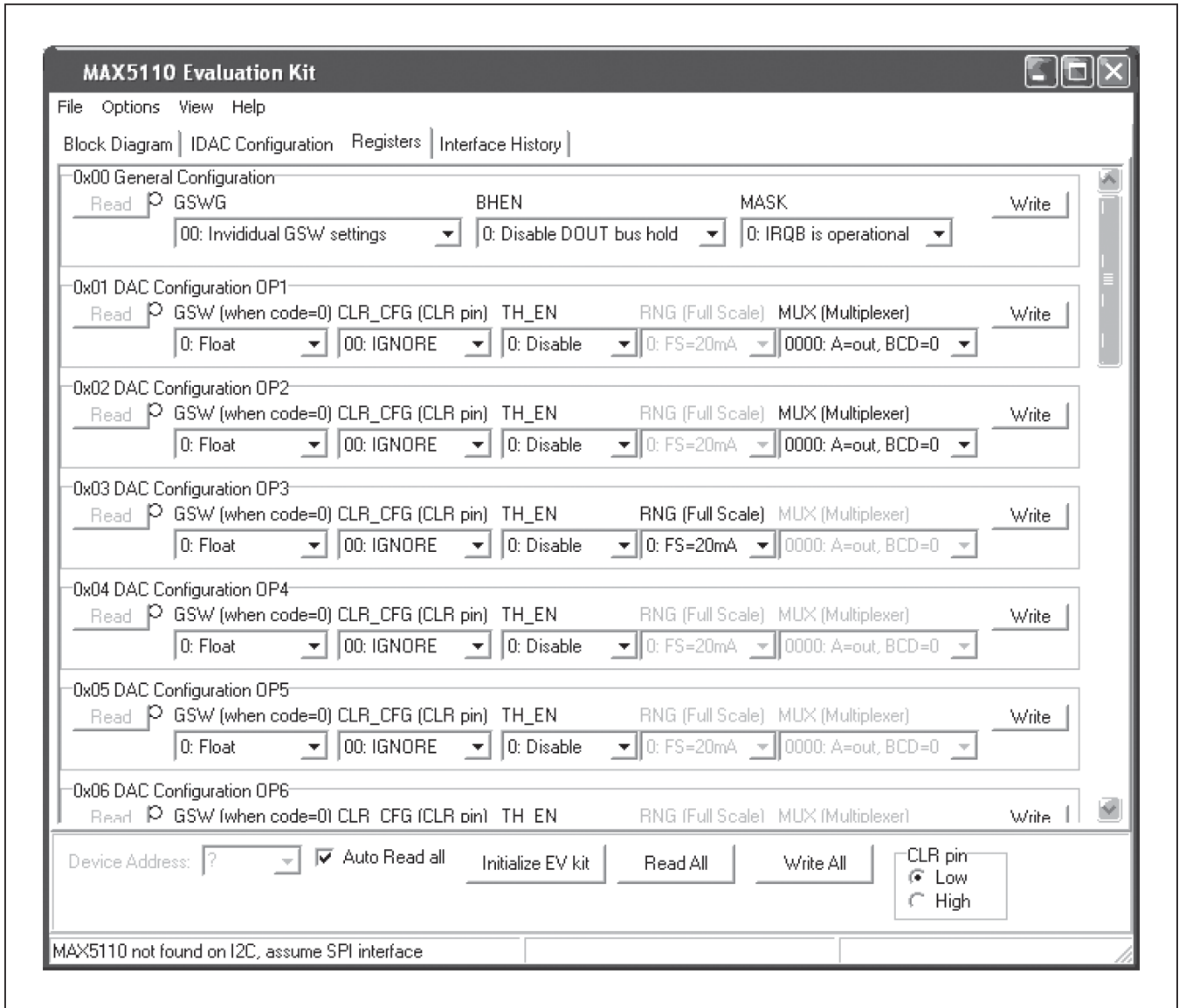


Figure 3. MAX5110 EV Kit Software Main Window (Registers Tab)

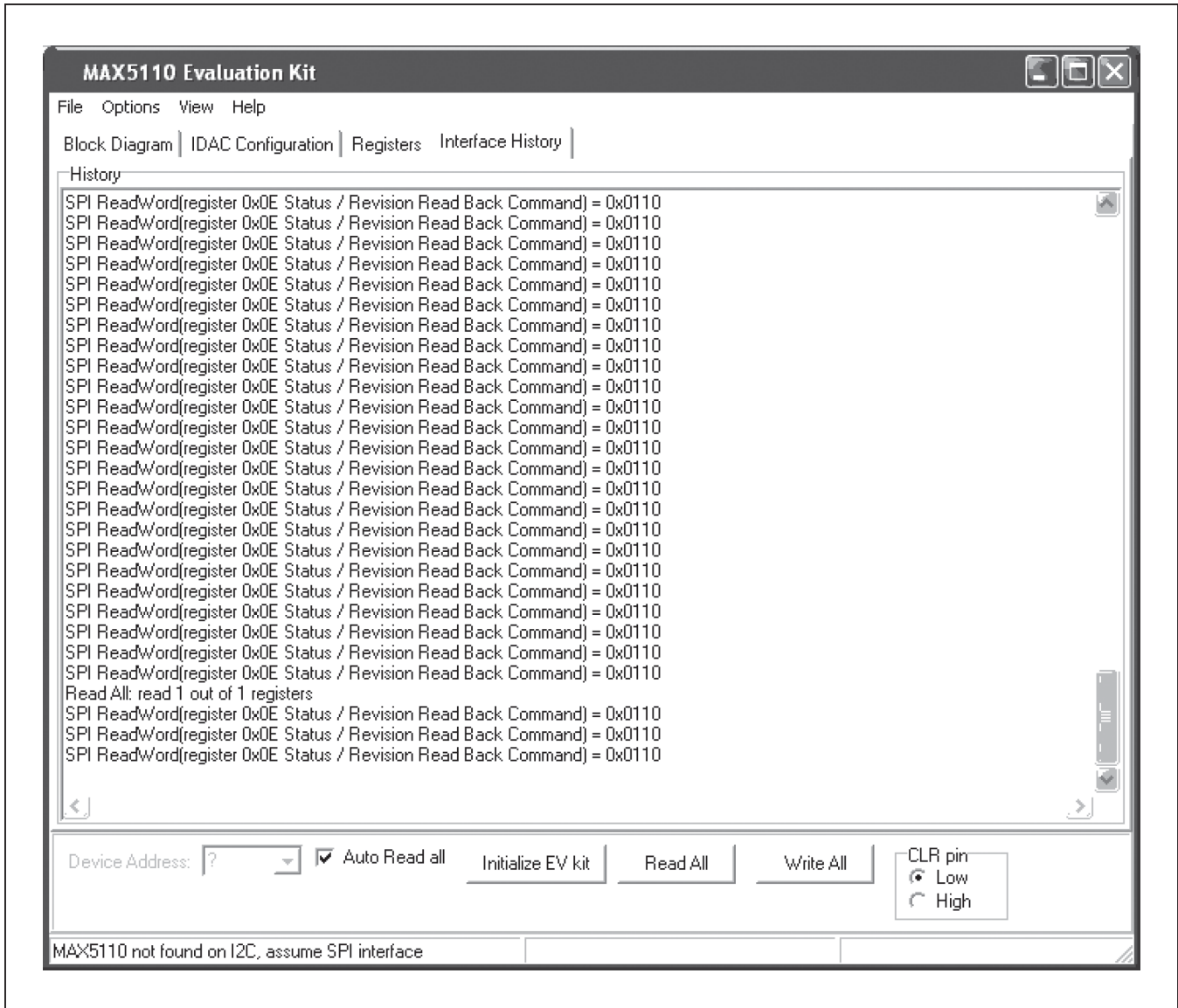


Figure 4. MAX5110 EV Kit Software Main Window (Interface History Tab)

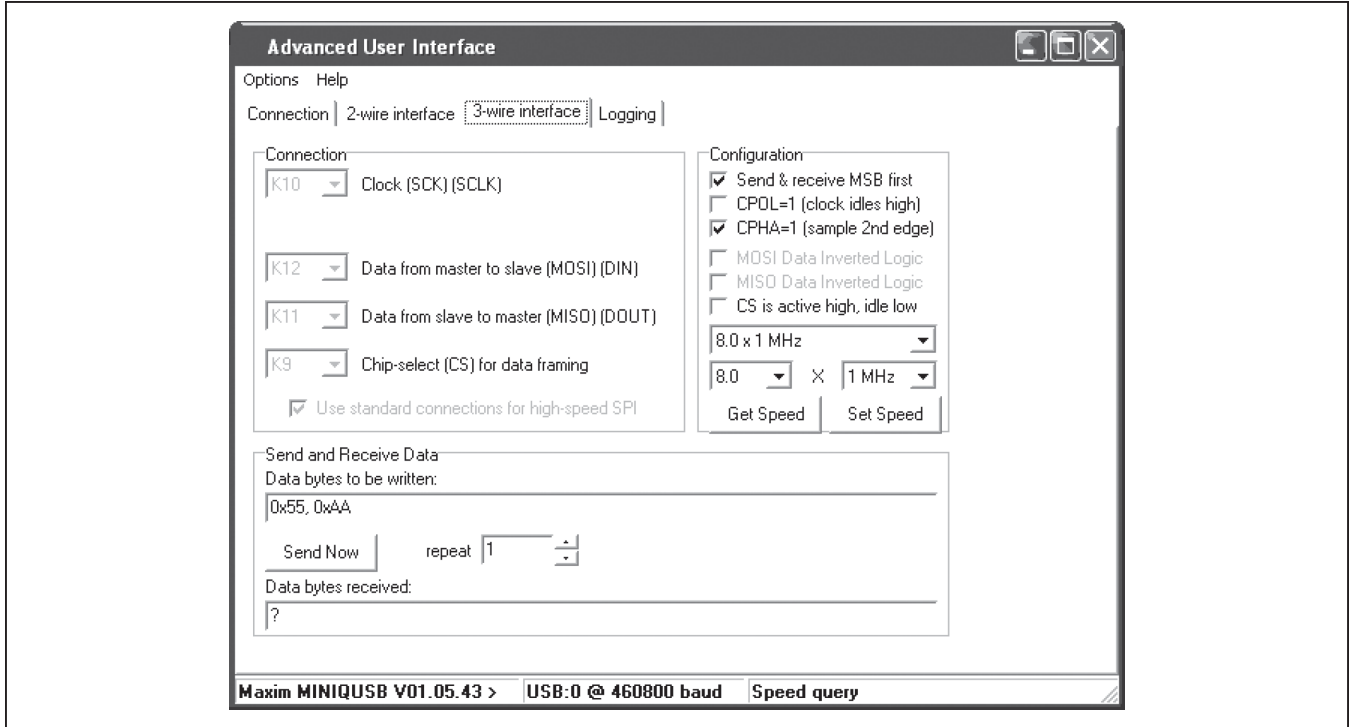


Figure 5. Advanced User Interface Window (3-Wire Interface Tab)

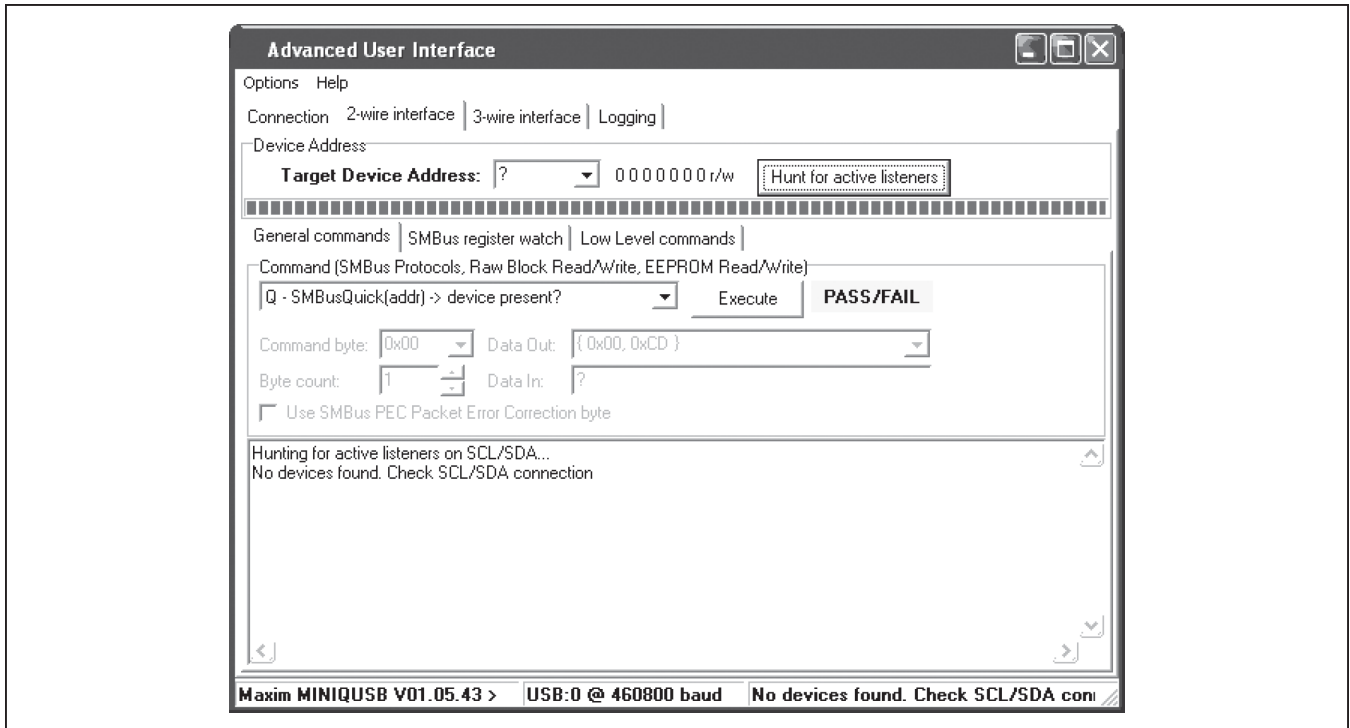


Figure 6. Advanced User Interface Window (2-Wire Interface Tab)

### Detailed Description of Hardware

The MAX5110 EV kit provides a proven layout for the MAX5110 in a 32-pin TQFN package with an exposed pad. I<sup>2</sup>C and SPI interface pads and easy-to-use USBPC connection are included on the EV kit.

Standard MINIUSB-equivalent microcontroller circuits (U100–U140) connect from the USB to the SPI and I<sup>2</sup>C interfaces. The MINIUSB circuit powers its +2.5V and +3.3V supplies from the +5V USB.

External user-supplied power connects to the device through test points TP0, TP1, and TP2. The MAX8869 LDO linear regulator (U2) supplies +3V at 1000mA powered from the external TP1 positive supply. The MAX1735 negative LDO linear regulator (U3) supplies -5.2V at 200mA powered from the external TP2 negative supply. TP0 is the ground return.

Jumpers JU10–JU17 connect the MINIUSB SPI bus, I<sup>2</sup>C bus, and GPIO signal to the CLR pin, as well as the MINIUSB +3.3V VDDIO power supply.

Each of the outputs has its own dedicated 2-pin output header with GND and a jumper-selectable choice of onboard loads, including both resistive loads and diode loads. The resistive loads produce a voltage drop on the order of +2V at full-scale current. The diode loads mimic a typical fiber-optic system. Output 3 has two resistive loads and two diode loads to support both the 2mA and the

20mA ranges. Output 6 has two parallel strings of diodes, one for source load and the other for sink load.

Header H1 connects outputs 1–9 with ground returns and power-supply connections for optional external-user hardware connections. If a standard ribbon cable is connected to H1, ground returns are on alternating wires.

#### User-Supplied SPI Interface

To use the EV kit with a user-supplied SPI interface, remove the shunts on JU10–JU17. Connect the DIN, SCLK,  $\overline{CS}$ , DOUT, VDD, GND, and CLR signals to the corresponding pads on header H2 on the EV kit board.

#### Evaluating the MAX5111

The MAX5111 is the I<sup>2</sup>C version of the MAX5110. To evaluate this device, request a free sample of the MAX5111GTJ+ when ordering the EV kit. With power off, replace U1 with the MAX5111. Move JU12 and JU13 shunts to 2-3. Move JU14 and JU15 shunts to 1-2. Move JU16 and JU17 shunts to 1-2 (see Table 1).

#### User-Supplied I<sup>2</sup>C Interface

To evaluate the MAX5111 using the EV kit with a user-supplied I<sup>2</sup>C interface, remove the shunts from JU10–JU17. Connect the SDA, SCL, A0, A1, VDD, GND, and CLR signals to the corresponding pads on header H2 on the EV kit board.

**Table 1. Jumper Descriptions (JU10–JU17)**

JUMPER	SIGNAL	SHUNT POSITION	DESCRIPTION
JU10	VDDI	1-2*	MINIUSB powers digital interface VDDI with 3.3V from U14.
		Open	User-supplied interface powers VDDI logic supply.
JU11	CLR	1-2*	MINIUSB drives CLR pin under software control.
		Open	User-supplied interface drives CLR, pulled low (inactive) by R11.
JU12	DIN/SDA	1-2*	MINIUSB SPI interface (master-out/slave-in data).
		2-3	MINIUSB I <sup>2</sup> C interface (SDA).
		Open	User-supplied interface connected to header H2.
JU13	SCLK/SCL	1-2*	MINIUSB SPI interface (clock).
		2-3	MINIUSB I <sup>2</sup> C interface (SCL).
		Open	User-supplied interface connected to header H2.
JU14	$\overline{CS}$ /A0	1-2	MINIUSB I <sup>2</sup> C interface address select A0 = 0.
		1-3*	MINIUSB SPI interface (chip select).
		1-4	MINIUSB I <sup>2</sup> C interface address select A0 = 1.
		Open	User-supplied interface connected to header H2.

**Table 1. Jumper Descriptions (JU10–JU17) (continued)**

JUMPER	SIGNAL	SHUNT POSITION	DESCRIPTION
JU15	DOUT/A1	1-2	MINIQU SB I <sup>2</sup> C interface address select A1 = 0.
		1-3*	MINIQU SB SPI interface (master-in/slave-out data).
		1-4	MINIQU SB I <sup>2</sup> C interface address select A1 = 1.
		Open	User-supplied interface connected to header H2.
JU16	SCL	1-2	MINIQU SB I <sup>2</sup> C SCL pullup resistor R16 is enabled.
		Open*	MINIQU SB SPI does not require pullup R16.
JU17	SDA	1-2	MINIQU SB I <sup>2</sup> C SCL pullup resistor R17 is enabled.
		Open*	MINIQU SB SPI does not require pullup R17.

\*Default position.

**Table 2. Load Jumper Descriptions (JUOUT1A–JUOUT9)**

JUMPER	SIGNAL	SHUNT POSITION	DESCRIPTION
JUOUT1A	OUT1A	1-2	Output connects to 10mA diode load.
		2-3*	Output connects to 10mA resistive load.
		Open	Output requires user-supplied current load.
JUOUT1B	OUT1B	1-2	Output connects to 10mA diode load.
		2-3*	Output connects to 10mA resistive load.
		Open	Output requires user-supplied current load.
JUOUT1C	OUT1C	1-2	Output connects to 10mA diode load.
		2-3*	Output connects to 10mA resistive load.
		Open	Output requires user-supplied current load.
JUOUT1D	OUT1D	1-2	Output connects to 10mA diode load.
		2-3*	Output connects to 10mA resistive load.
		Open	Output requires user-supplied current load.
JUOUT2A	OUT2A	1-2	Output connects to 10mA diode load.
		2-3*	Output connects to 10mA resistive load.
		Open	Output requires user-supplied current load.
JUOUT2B	OUT2B	1-2	Output connects to 10mA diode load.
		2-3*	Output connects to 10mA resistive load.
		Open	Output requires user-supplied current load.
JUOUT2C	OUT2C	1-2	Output connects to 10mA diode load.
		2-3*	Output connects to 10mA resistive load.
		Open	Output requires user-supplied current load.
JUOUT2D	OUT2D	1-2	Output connects to 10mA diode load.
		2-3*	Output connects to 10mA resistive load.
		Open	Output requires user-supplied current load.

**Table 2. Load Jumper Descriptions (JUOUT1A–JUOUT9) (continued)**

JUMPER	SIGNAL	SHUNT POSITION	DESCRIPTION
JUOUT3	OUT3	1-2	Output connects to 2mA diode load.
		1-3	Output connects to 20mA diode load.
		1-4	Output connects to 2mA resistive load.
		1-5*	Output connects to 20mA resistive load.
		Open	Output requires user-supplied current load.
JUOUT4	OUT4	1-2	Output connects to 90mA diode load.
		2-3*	Output connects to 90mA resistive load.
		Open	Output requires user-supplied current load.
JUOUT5	OUT5	1-2	Output connects to 180mA diode load.
		2-3*	Output connects to 180mA resistive load.
		Open	Output requires user-supplied current load.
JUOUT6	OUT6	1-2	Output connects to 300mA/-60mA diode load.
		1-3	Output connects to -60mA resistive load.
		1-4*	Output connects to 300mA resistive load.
		Open	Output requires user-supplied current load.
JUOUT7	OUT7	1-2	Output connects to 90mA diode load.
		2-3*	Output connects to 90mA resistive load.
		Open	Output requires user-supplied current load.
JUOUT8	OUT8	1-2	Output connects to 15mA diode load.
		2-3*	Output connects to 15mA resistive load.
		Open	Output requires user-supplied current load.
JUOUT9	OUT9	1-2	Output connects to 15mA diode load.
		2-3*	Output connects to 15mA resistive load.
		Open	Output requires user-supplied current load.

\*Default position.

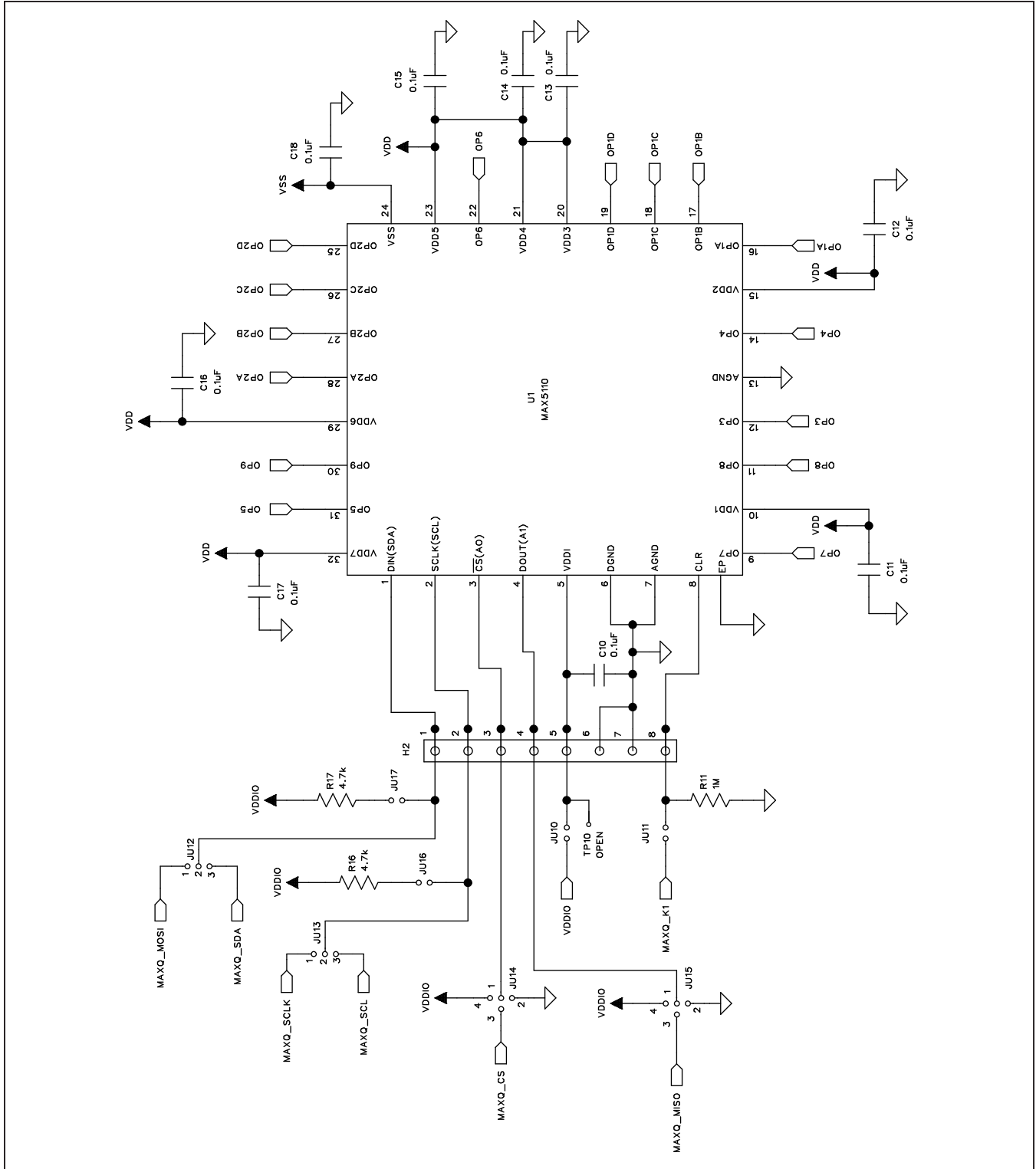


Figure 7a. MAX5110 EV Kit Schematic (Sheet 1 of 6)



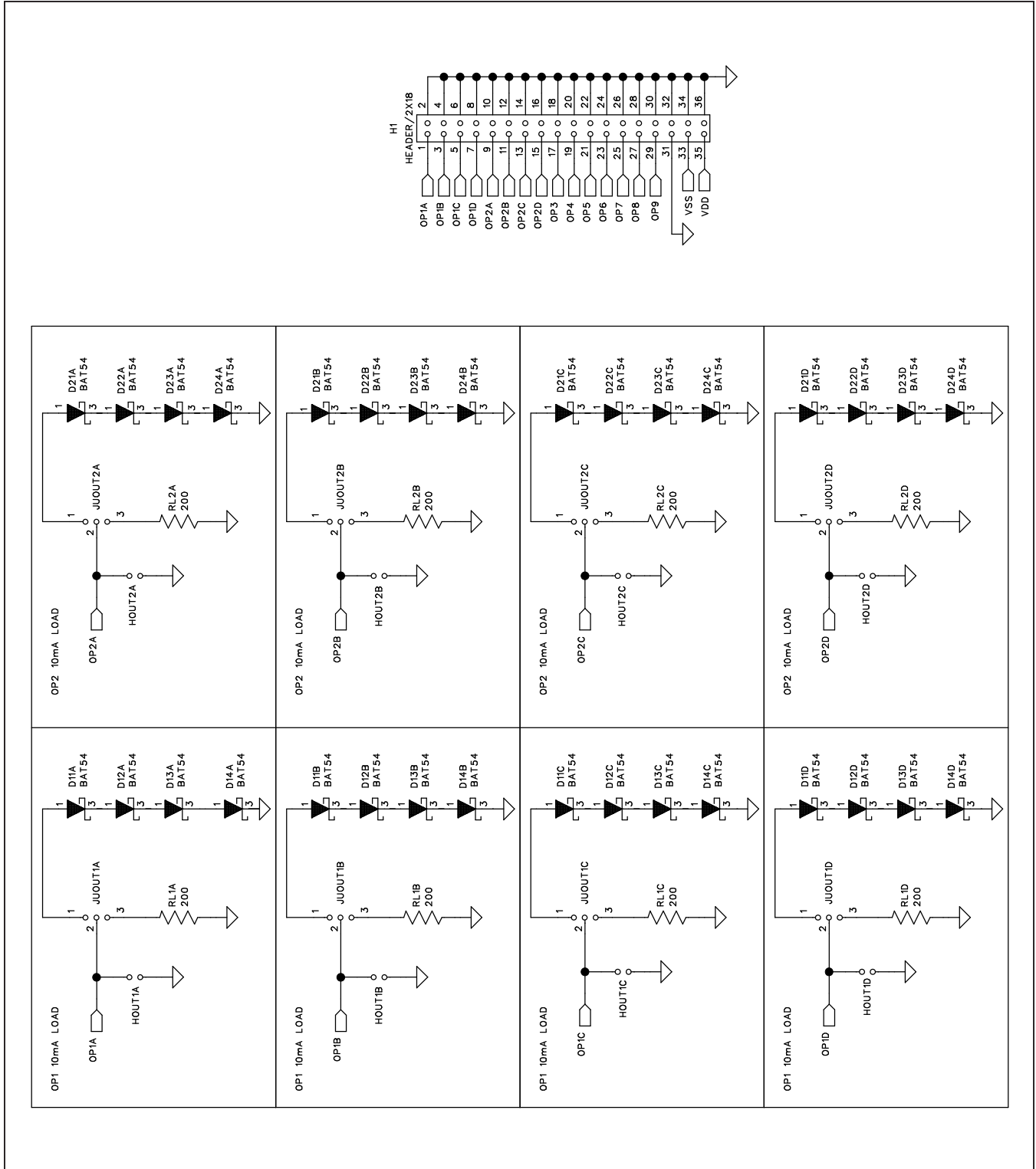


Figure 7b. MAX5110 EV Kit Schematic (Sheet 2 of 6)

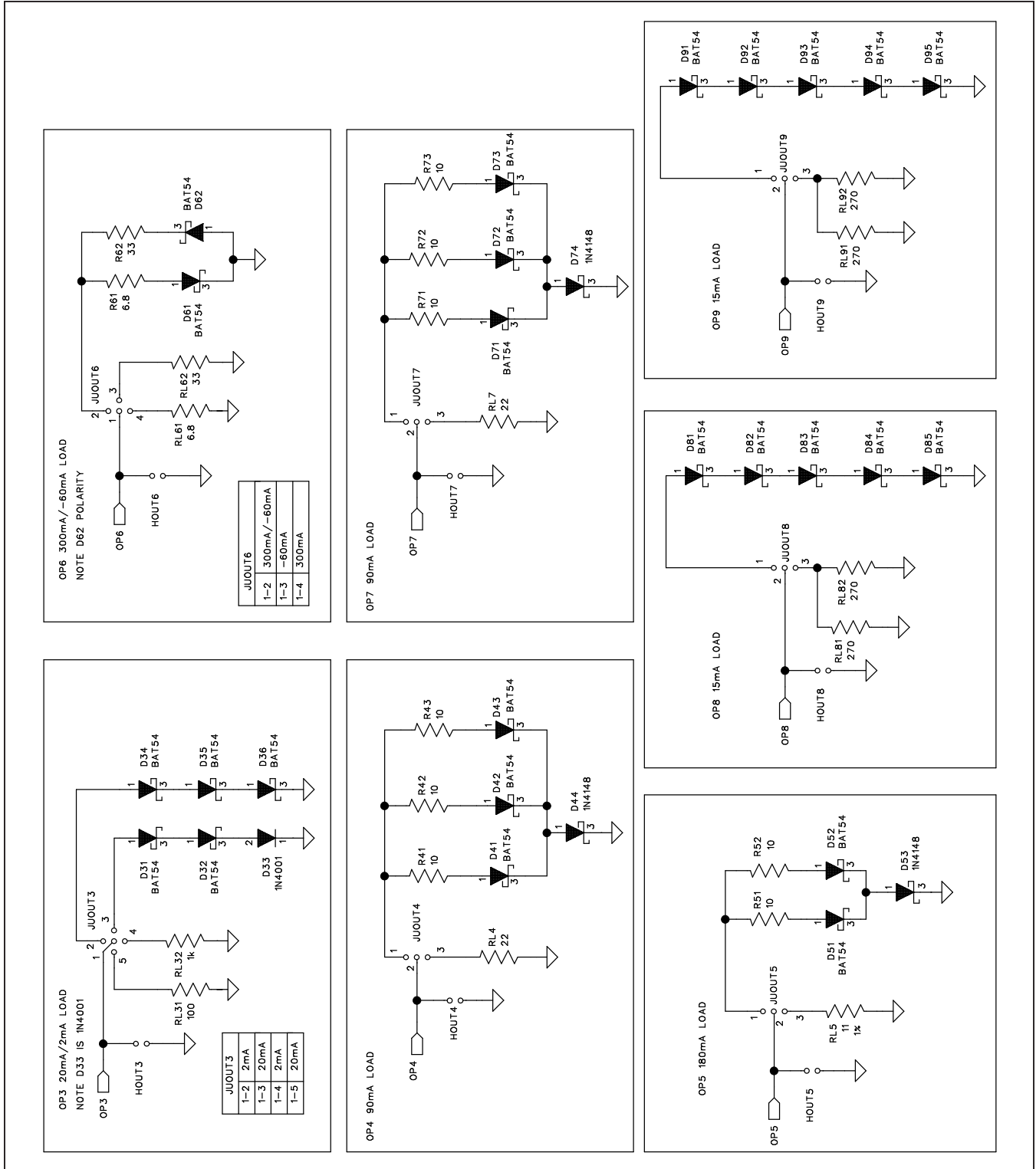


Figure 7c. MAX5110 EV Kit Schematic (Sheet 3 of 6)

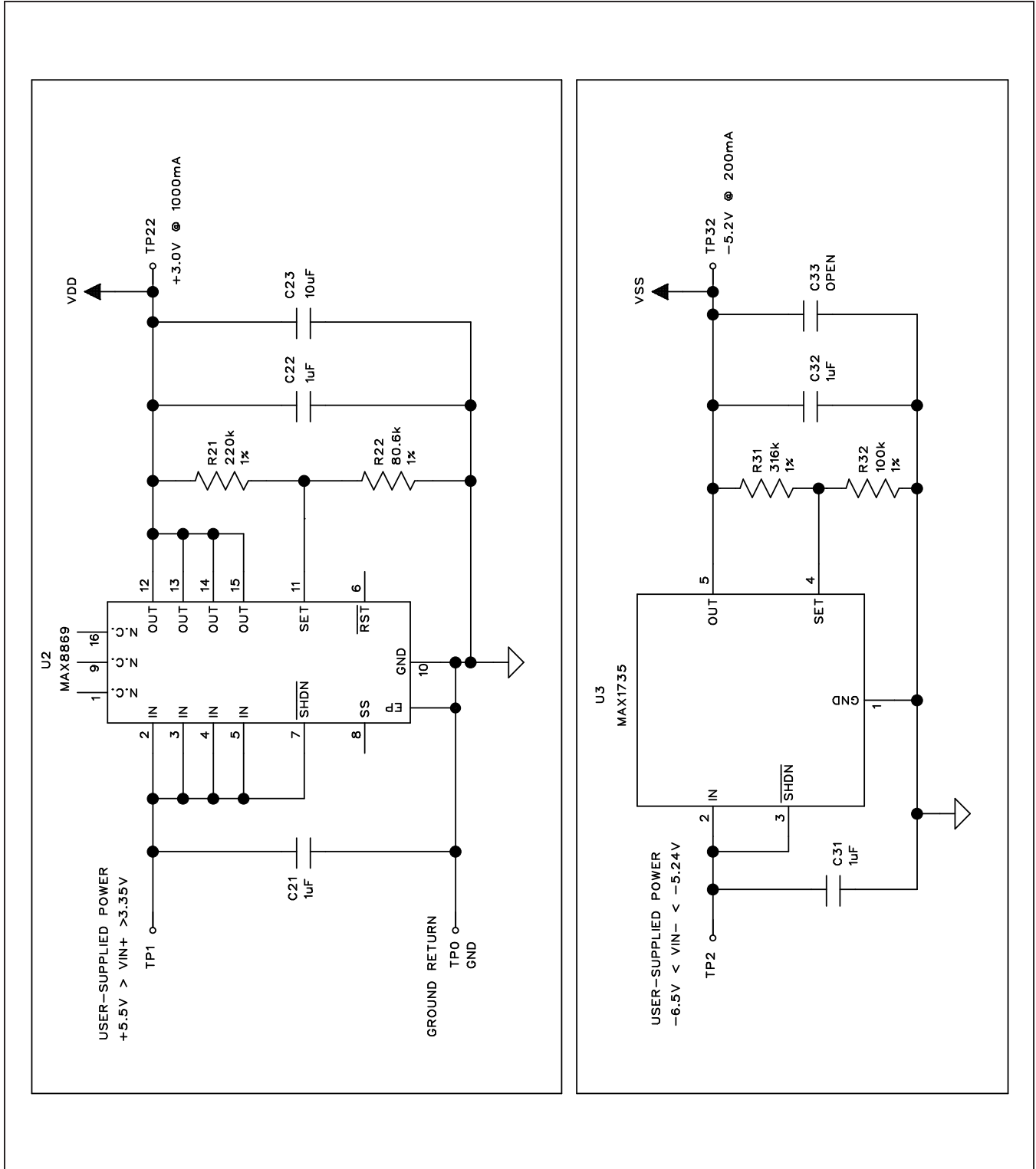


Figure 7d. MAX5110 EV Kit Schematic (Sheet 4 of 6)

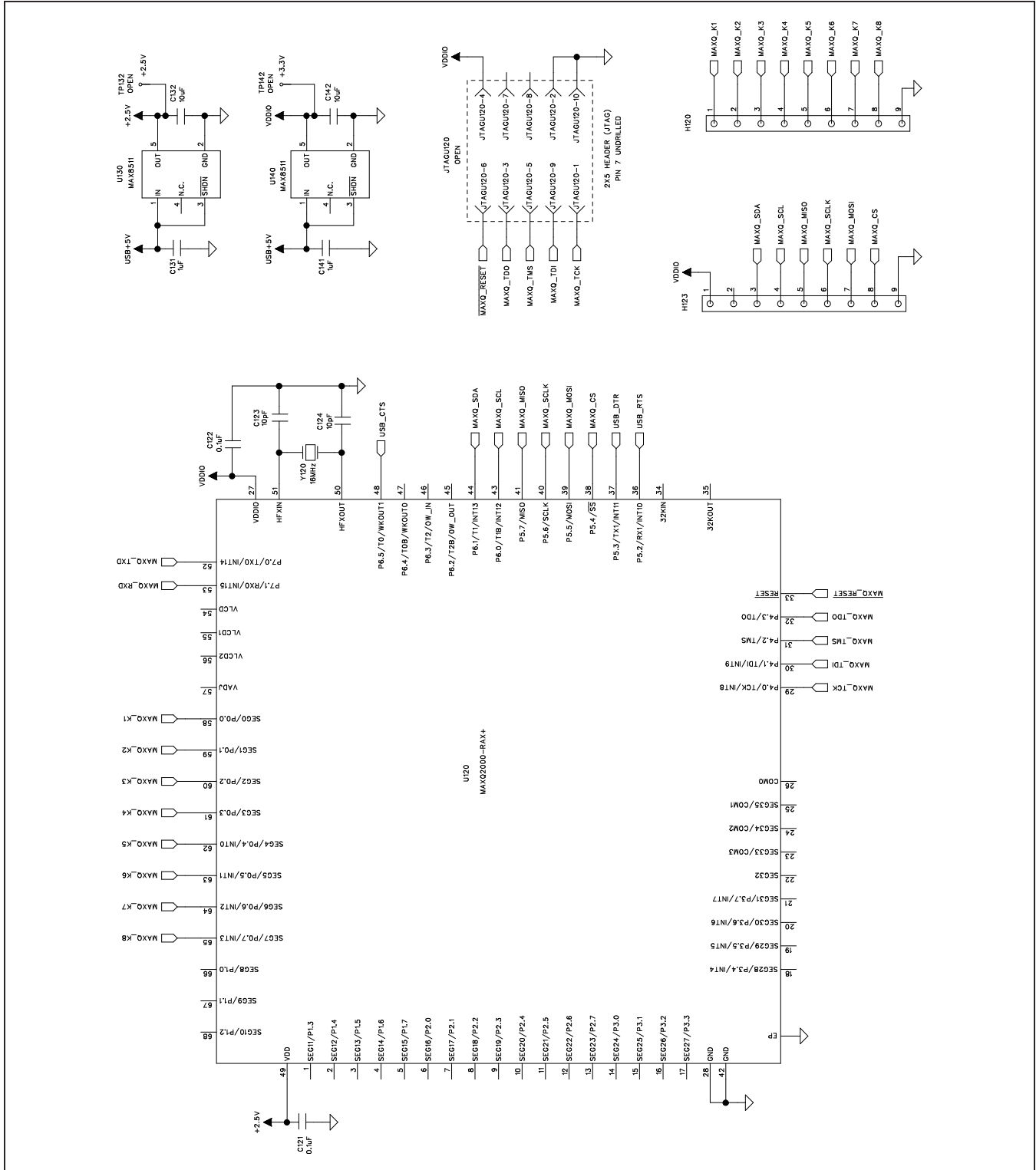


Figure 7e. MAX5110 EV Kit Schematic (Sheet 5 of 6)

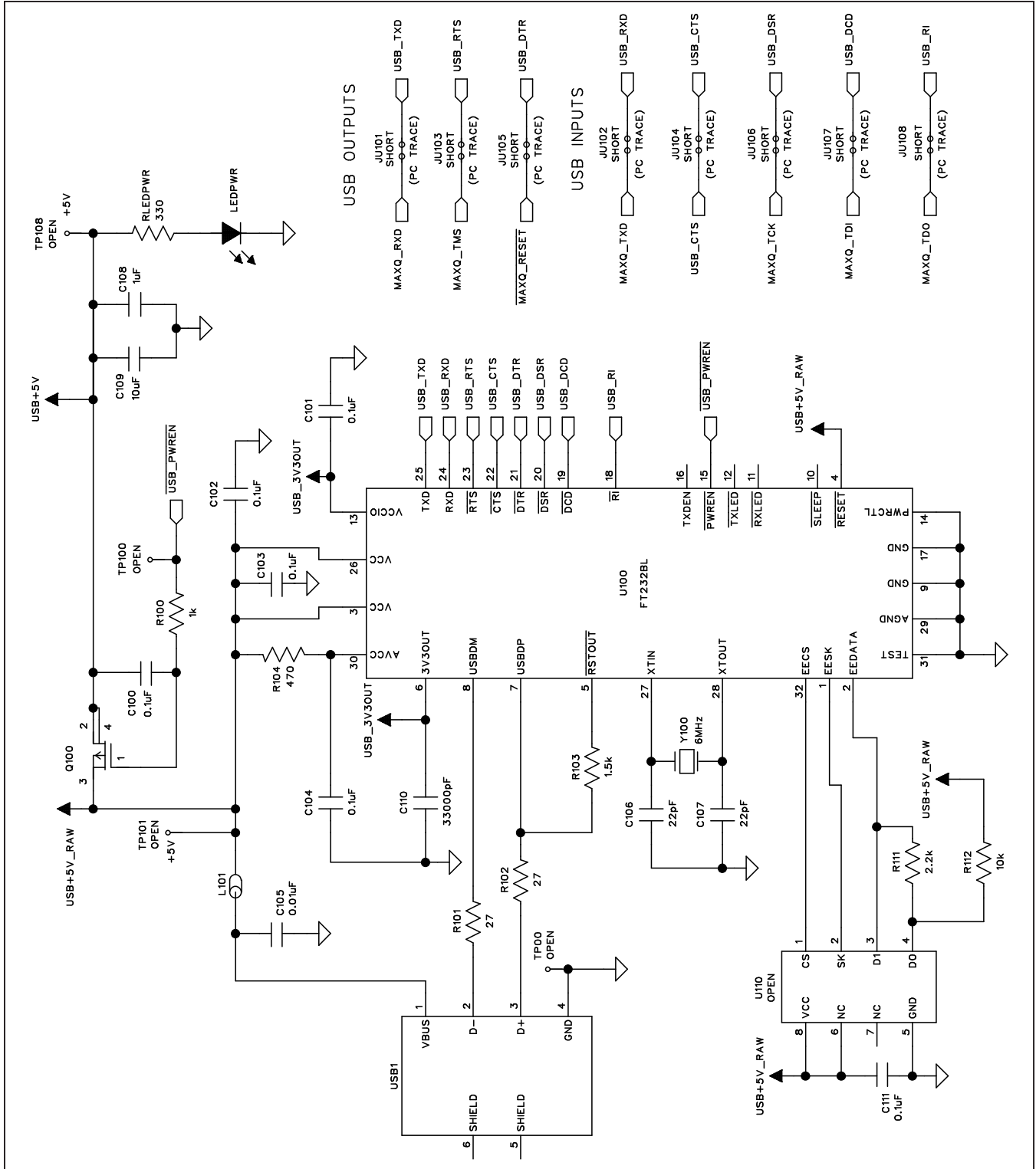


Figure 7f. MAX5110 EV Kit Schematic (Sheet 6 of 6)

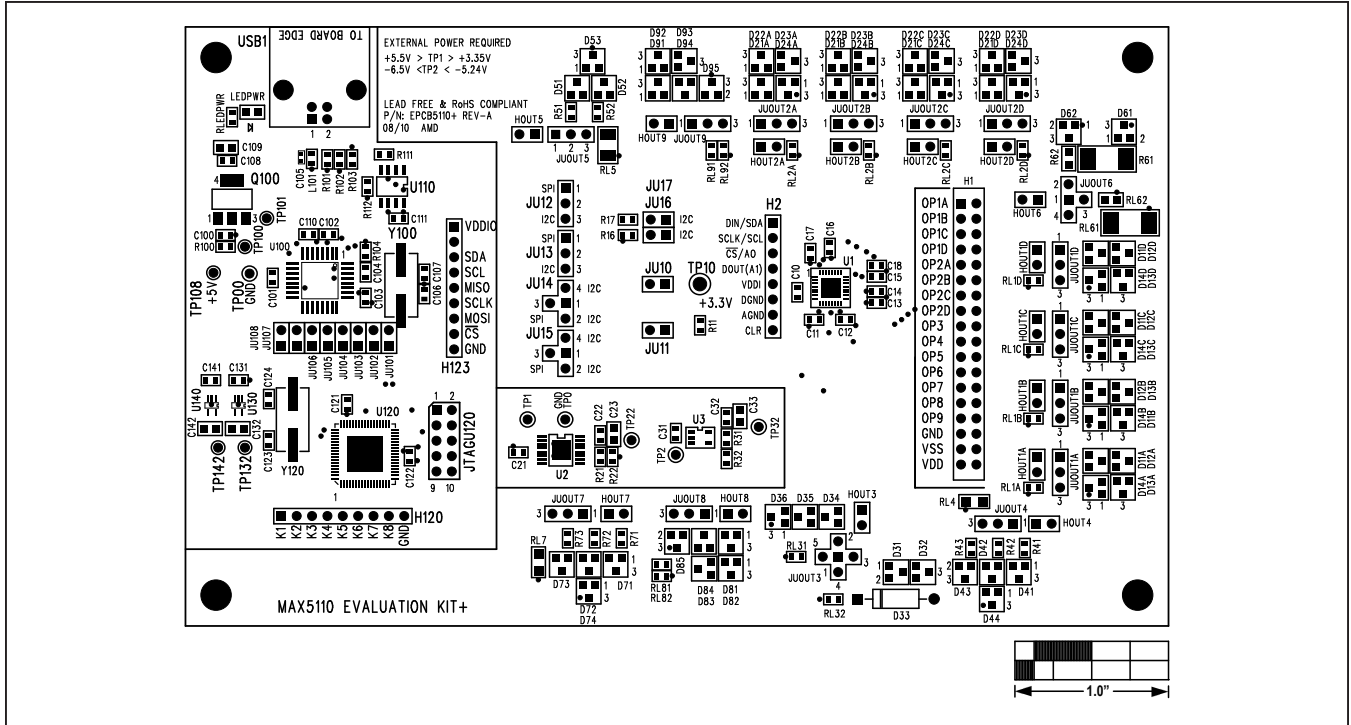


Figure 8. MAX5110 EV Kit Component Placement Guide—Component Side

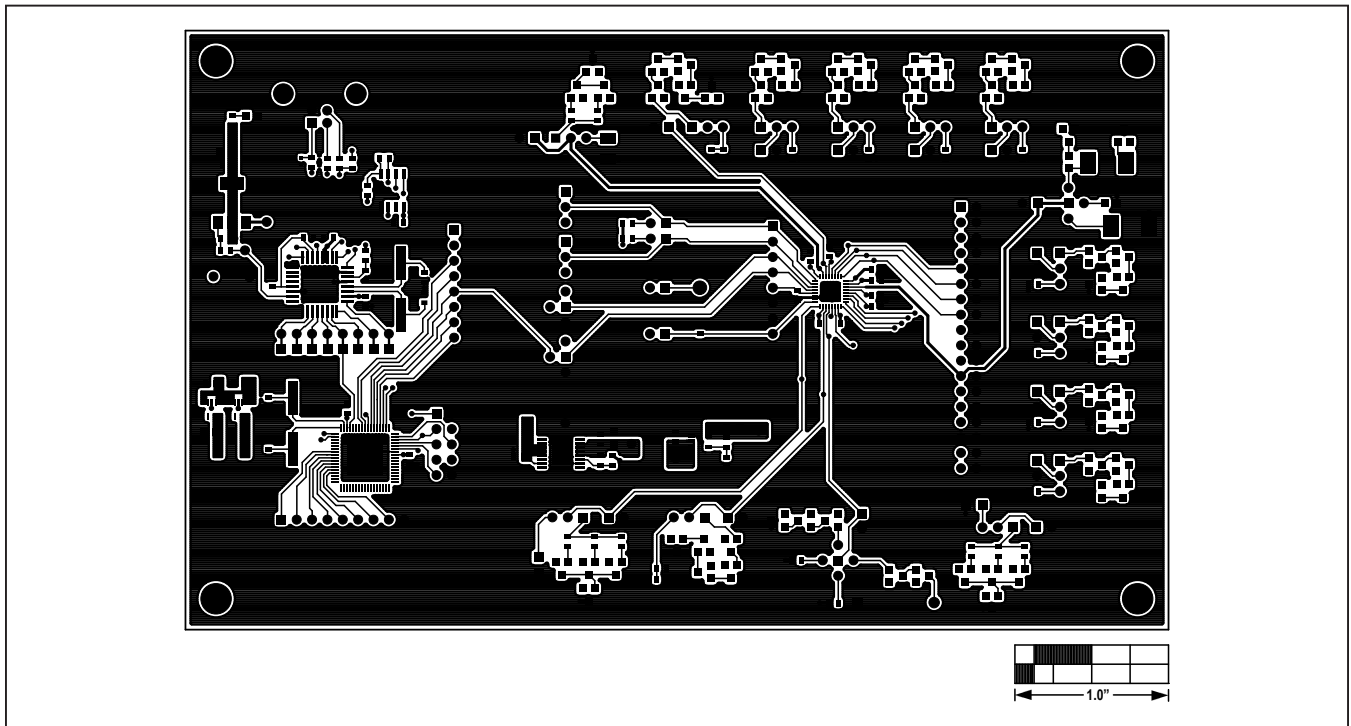


Figure 9. MAX5110 EV Kit PCB Layout—Component Side

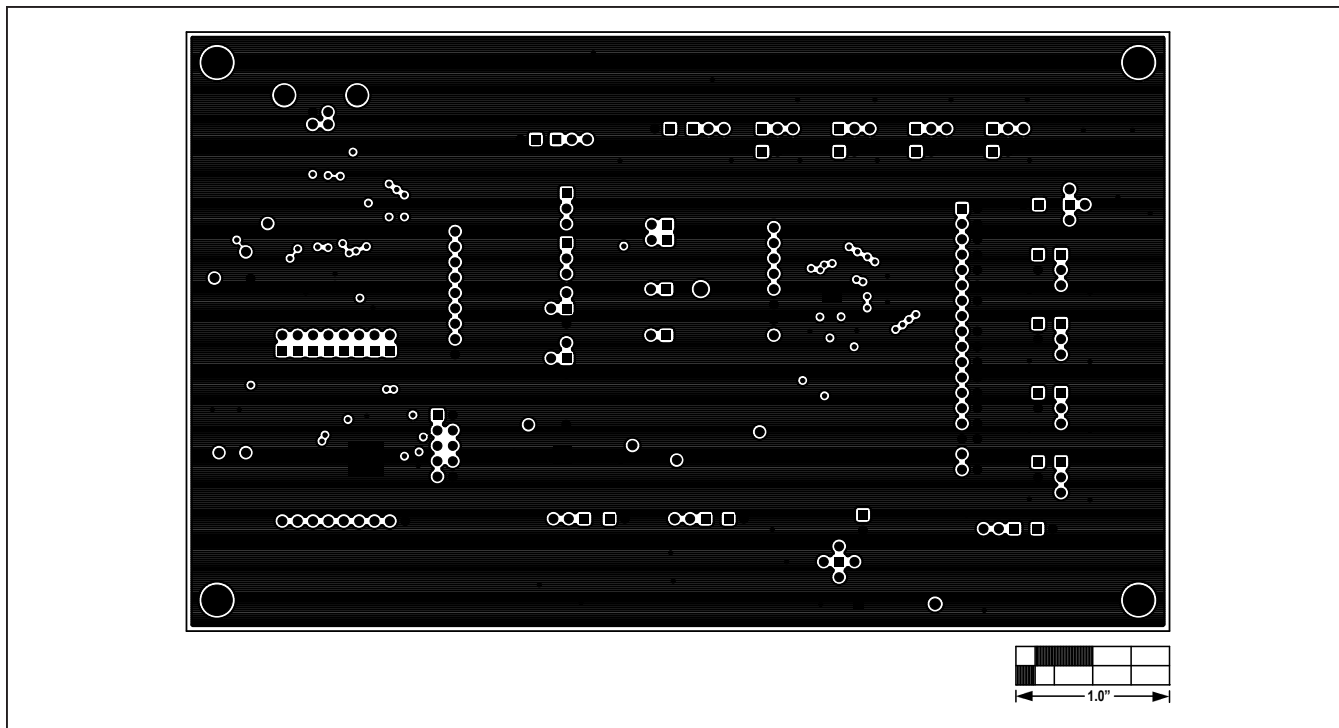


Figure 10. MAX5110 EV Kit PCB Layout—Ground Layer 2

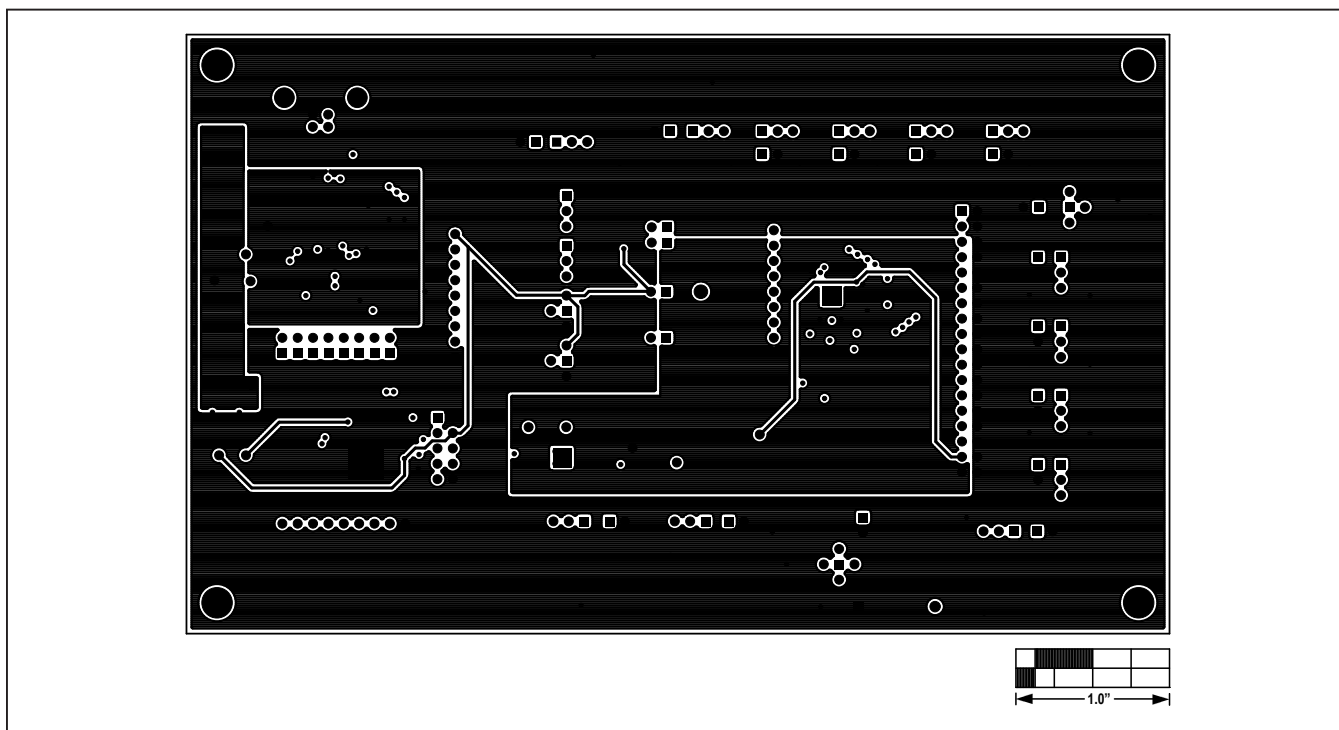


Figure 11. MAX5110 EV Kit PCB Layout—Power Layer 3



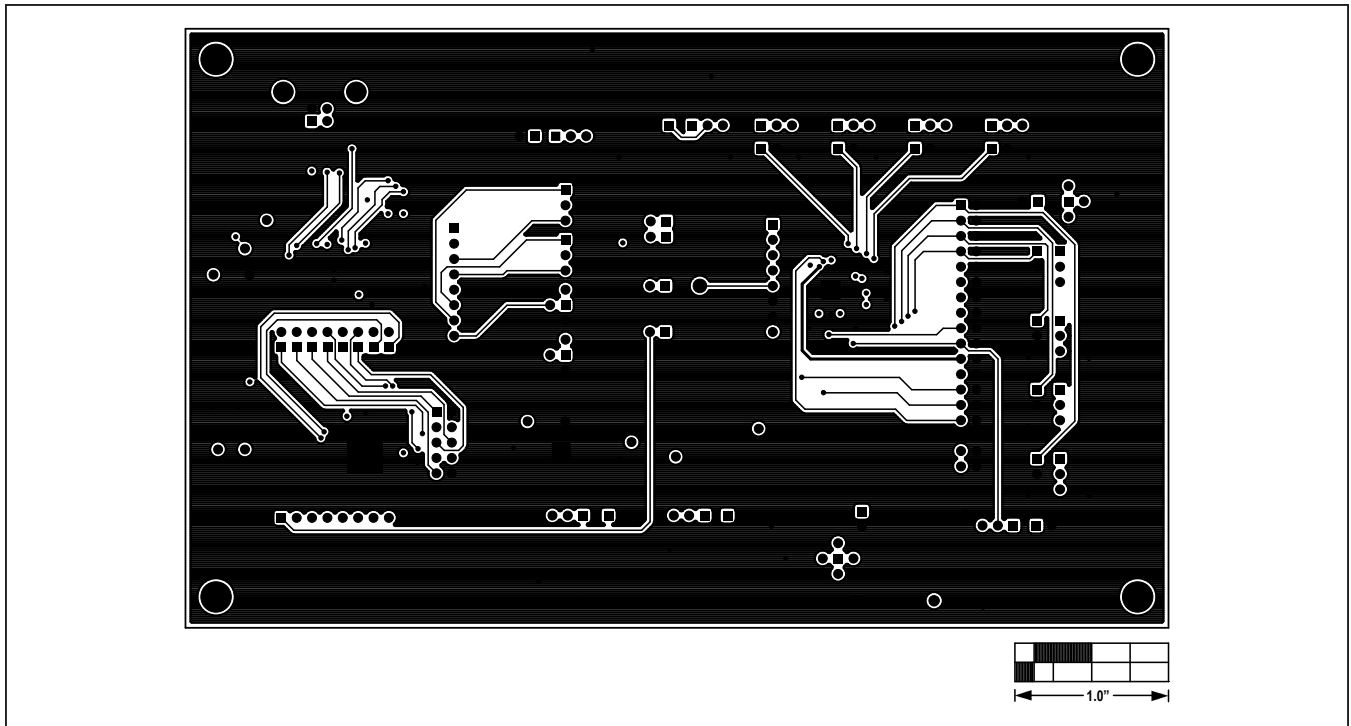


Figure 12. MAX5110 EV Kit PCB Layout—Solder Side

## Revision History

REVISION NUMBER	REVISION DATE	DESCRIPTION	PAGES CHANGED
0	10/10	Initial release	—

For pricing, delivery, and ordering information, please contact Maxim Direct at 1-888-629-4642, or visit Maxim Integrated's website at [www.maximintegrated.com](http://www.maximintegrated.com).

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