19-3851; Rev 0; 10/05

MAX6960 Evaluation Kit/Evaluation System

Evaluate: MAX6960

General Description

The MAX6960 evaluation kit (EV kit) provides a proven design to evaluate the MAX6960 8 x 8 graphic LED tile display driver. The EV kit board contains four MAX6960 LED display drivers, four 2.4in 8 x 8 bicolor LED tiles, a 4MHz oscillator, and logic buffers. Each MAX6960 EV kit can be cascaded to support up to a total of 20 MAX6960 devices. The EV kit also includes Windows® 98SE/2000/XP-compatible software, which provides a simple graphical user interface (GUI) for exercising the MAX6960's features.

The MAX6960 evaluation system (EV system) consists of a MAX6960 EV kit and a companion Maxim CMODUSB serial interface board. The Maxim CMODUSB serial interface board allows an IBM-compatible PC to use its USB port to emulate a serial interface that is compatible with the MAX6960. Order the MAX6960EVCMODU for a complete PC-based evaluation of the MAX6960. Order the MAX6960EVKIT if you already have a MAX6960 compatible serial interface.

The EV kit includes a preinstalled MAX6960ATH.

Windows is a registered trademark of Microsoft Corp.

Features

- ♦ **Four On-Board MAX6960 Devices**
- ♦ **Four 2.4in 8 x 8 Bicolor (Red/Green) LED Tiles**
- ♦ **4MHz Oscillator**
- ♦ **Cascading EV Kits (Up to 5 EV Kit Boards)**
- ♦ **Buffered Serial Interface**
- ♦ **Windows 98SE/2000/XP-Compatible Evaluation Software**
- ♦ **Proven PC Board Layout**
- ♦ **Fully Assembled and Tested**
- ♦ **EV System Includes USB Connectivity**

Ordering Information

PART	TYPE	INTERFACE
MAX6960EVKIT	EV kit	User-supplied MAX6960 serial interface
MAX6960EVCMODU	EV system	CMODUSB board

Note: *The MAX6960 software is included with the MAX6960 EV kit, but is designed for use with the complete EV system. The EV system (MAX6960EVCMODU) includes both the CMODUSB board and the EV kit. If the Windows software will not be used, the EV kit board can be purchased without the CMODUSB board.*

Component List

MAX6960 EV System

PART	QTY	DESCRIPTION
MAX6960EVKIT	1	MAX6960 EV kit
CMODUSB	1	CMODUSB board

MAX6960 EV Kit

DESIGNATION	QTY	DESCRIPTION
C1–C4, C6–C9, C11–C14, C16, C17, C18, C32	16	10µF ±20%, 6.3V X5R ceramic capacitors (0805) TDK C2012X5R0J106M
C20–C26, C30, C33	9	1µF ±10%, 10V X5R ceramic capacitors (0603) TDK C1608X5R1A105K
C27	1	22µF ±20%, 6.3V X5R ceramic capacitor (1210) TDK C3225X5R0J226M
C28	1	2.2µF ±20%, 10V X5R ceramic capacitor (0805) TDK C2012X5R1A225M
C29	1	470pF ±10%, 50V X7R ceramic capacitor (0603) TDK C1608X7R1H471K
C31	1	120µF, 4V SP capacitor Panasonic EEFUD0G121R
D1–D4	4	2.4in 8 x 8 cathode-row bicolor LED displays Lumex LDM-244288MI
J1	1	2 x 20 right-angle female connector
J2	1	2 x 20 right-angle male connector

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

Component List (continued)

MAX6960 EV Kit

DESIGNATION	QTY	DESCRIPTION	
JU1–JU5, JU7–JU11, JU13	11	3-pin headers	
JU6, JU14–JU17	5	2-pin headers	
JU12	0	PC board trace power jumper, not installed (open)	
L1	1	1.5µH inductor (I_{SAT} = 4A) Sumida CDRH6D28 4762T064	
R1, R2, R3, R6, R7	5	1kΩ ±5% resistors (0603)	
R4	1	10Ω ±5% resistor (0603)	
R5	1	84.5kΩ ±1% resistor (0603)	
RP1–RP8	0	20kΩ potentiometers, top adjust, not installed	
U1–U4	4	MAX6960ATH (44-pin TQFN, 7mm x 7mm x 0.8mm)	
U5–U9, U13	6	Three-state logic buffers (5-pin SOT23) Fairchild Semiconductor NC7SZ126M5X	Top mark 7Z26
U10	1	4MHz silicon oscillator (3-pin SC70) Maxim MAX7375AXR405-T	Top mark AOR
U11	1	8-channel multiplexer (16-pin TSSOP) Maxim MAX4617EUE	
U12	1	3A step-down switching regulator (16-pin QSOP) Maxim MAX1831EEE	
—	16	Shunts	
—	1	MAX6960EVKIT blank PC board	
—	1	MAX6960EVKIT SW CD-ROM	

Component Suppliers

SUPPLIER	PHONE	WEBSITE
Lumex, Inc.	800-278-5666	www.lumex.com
Panasonic	714-373-7366	www.panasonic.com
Sumida USA	847-545-6700	www.sumida.com
TDK	847-803-6100	www.component.tdk.com

Note: *Indicate you are using the MAX6960 when contacting these component suppliers.*

MAX6960 EV Kit Files

FILE	DESCRIPTION
INSTALL.EXE	Installs the EV kit files on your computer.
MAX6960.EXE	Runs application program.
HELPFILE.HTM	Opens the MAX6960 EV kit Helpfile.
TROUBLESHOOTING USB.PDF	Opens the USB driver installation help file.
FTD2XX.INF	USB device driver file.
UNINST.INI	Uninstalls the EV kit software.
*.CM2	MAX6960 8-bit write script files.

Quick Start

This quick start includes directions for using only one MAX6960 EV kit board. See the *Cascading MAX6960 EV Kit Boards* section when using more than one MAX6960 EV kit.

Recommended Equipment

- The MAX6960 EV system
  MAX6960EVKIT
  CMODUSB serial interface board (USB cable included)
- Power supply: +5V at 2.5A per MAX6960 EV kit
- A user-supplied Windows 98SE/2000/XP PC with USB

Proceedure

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

1) Verify jumper J1 on the CMODUSB board is connected to pins 2-3. This process sets the logic supply to 3.3V.
2) Verify the following MAX6960 EV kit jumpers are in the default positions:

JU1: (2-3)	JU10: (2-3)
JU2: (2-3)	JU11: (2-3)
JU3: (1-2)	JU12: (Open)
JU4: (2-3)	JU13: (1-2)
JU5: (2-3)	JU14: (1 only)
JU6: (1-2)	JU15: (1-2)
JU7: (2-3)	JU16: (1-2)
JU8: (2-3)	JU15: (1 only)
JU9: (1-2)	

3) Connect the MAX6960 EV kit's 40-pin female connector (J1) to the CMODUSB board's 40-pin male connector (P4).

4) Install the MAX6960 evaluation software on your computer by running the INSTALL.EXE program on the installation CD-ROM. It is highly recommended to use the default installation path. If you desire to modify the default path, do not use a depth of more than two subdirectories. The program files are copied and icons are created for them in the Windows **Start** menu | **Programs** | **Maxim MAX6960 Evaluation Kit**.

5) Connect the 5V power supply between the MAX6960 EV kit's +5V and GND pads.Turn on the 5V power supply. Do not connect the USB cable before this step.

6) Connect the included USB cable from the PC to the CMODUSB board. A **Building Driver Database** window pops up in addition to a **New Hardware Found** message. If you do not see any window that is similar to the one described above after 30 seconds, remove the USB cable from the CMODUSB board and reconnect it again. Administrator privileges are required to install the USB device driver on Windows 2000 and XP. Refer to the document Troubleshooting USB.PDF included with the software for more information.

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\MAX6960** using the **Browse** button.

8) Start the MAX6960 EV kit software by opening its icon in the Windows **Start** menu | **Programs** | **Maxim MAX6960 Evaluation Kit**. If the 16-color demo mode is visible, then quick start is complete.

Loading Scripts (Optional)

1) Press the **Load 8-bit Write Script** button on the **8 and 16-bit addr modes tab**.

2) Load the script file **1bit_step1_box.cm2** located in the **C:\Program Files\MAX6960** directory.

3) Press the **Run 8-bit Write Script (16bytes)** button in the **8-bit Write Script** window.

4) Press the **Load Next Script** button and load the script file **1bit_step2_box.cm2** located in the **C:\Program Files\MAX6960** directory.

5) Press the Run **8-bit Write Script (16bytes)** button in the **8-bit Write Script** window.

___Detailed Description of Software

The evaluation software's main window shown in Figure 1 displays tabs for 8-bit, 16-bit, and 24-bit addressing modes as well as individual tabs for each register in the MAX6960's register address map (0x00 through 0x0F). Table 1 describes the controls that are always present on the evaluation software's main window.

The **8 and 16-bit addr modes tab**, shown in Figure 1, allows the user to execute 8-bit and 16-bit address mode operations. The 8-bit address mode is the quickest method of updating a plane of display memory in the MAX6960 and is write only. During the 8-bit address

Table 1. MAX6960 EV Kit Software Main Window Control Descriptions

CONTROL	DESCRIPTION
Action	Allows the user to select the active register tab.
Debug	Shows the CMODUSB debugging tools.
Help	Gives access to the Helpfile and the About box.
Cascaded Boards: 1	Automatically sets the global driver devices and the global driver rows registers of the master MAX6960 to the correct values when cascading boards.
SW Reset	Resets all the registers to the software reset settings. For example: • 2-bits/pixel bicolor mode → Register 0x0D = 0xC1 • 4 driver devices (N-1) → Register 0x0E = 0x03 • 2 driver rows (N-1) → Register 0x0F = 0x01
POR Reset	Resets all the registers to the IC power-on reset (POR) settings shown in the MAX6960 data sheet.
CMOD___ HW: Connected	Displays the CMODUSB connection status. CMOD___ means that it supports both the CMODUSB or CMOD232 boards.
Close	Exits the program.

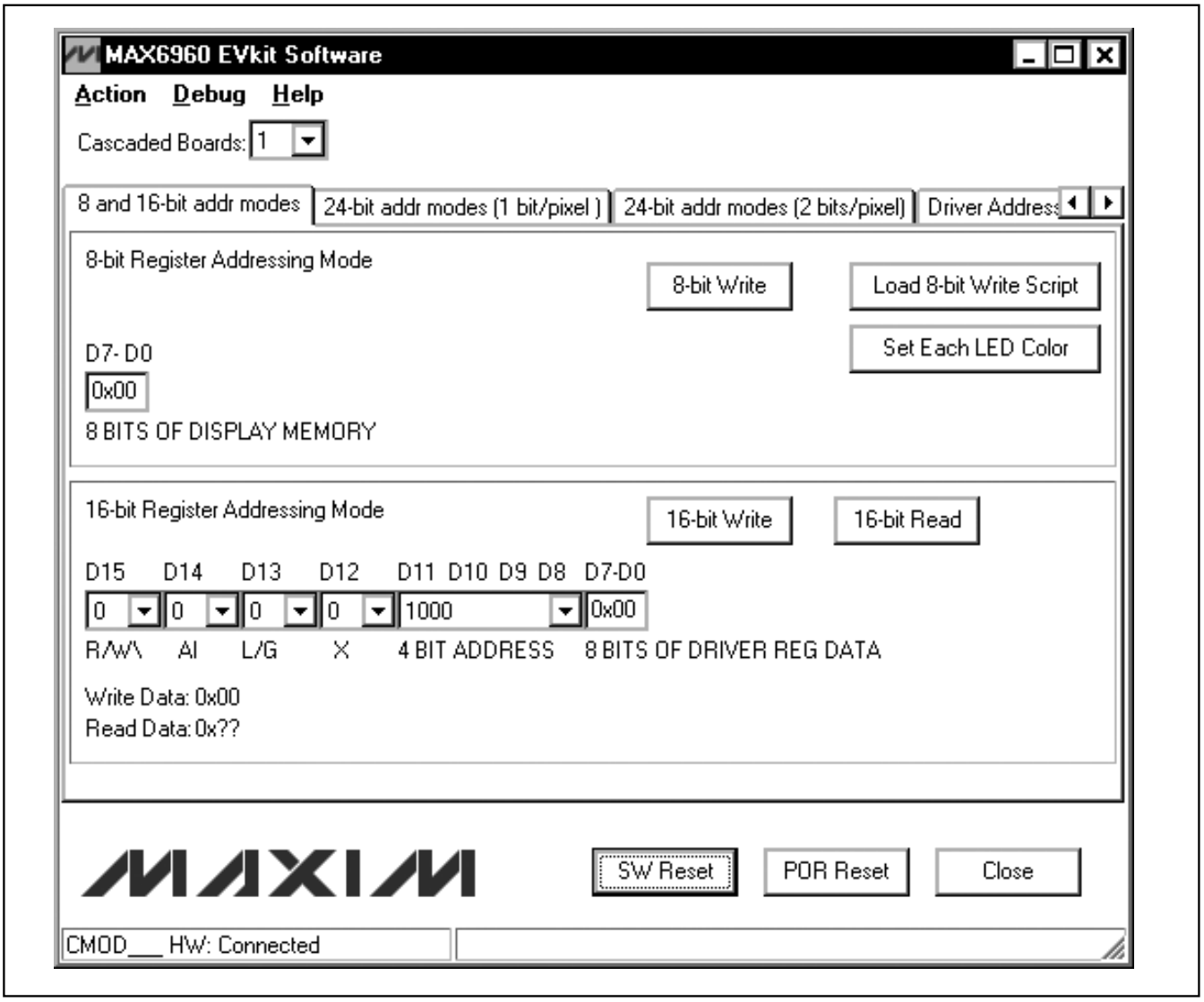

Figure 1. MAX6960 Evaluation Software Main Window

mode, data is written to the display memory using indirection through the global display indirect address register. This display indirect address is autoincremented after each 8-bit write to allow continuous image data dumps into the plane of display memory in the MAX6960.

The 16-bit address mode is capable of reading or writing command/data bytes to the MAX6960's registers. A 16-bit write can be global (updates all MAX6960s with the same data) or local (only one MAX6960). A 16-bit read always uses indirection through the global driver indirect address register to select only one MAX6960. Refer to the *Register Addressing Modes* section of the MAX6960 data sheet for additional information.

The **24-bit addr modes (1 bit/pixel)** tab shown in Figure 2, and the **24-bit addr modes (2 bit/pixel)** tab shown in Figure 3, allow the user to execute 24-bit address mode operations. A 24-bit operation is always a direct read or write of address/data to the MAX6960's display memory because the memory address is included in the 24-bit operation. Refer to the *Register Addressing Modes* section of the MAX6960 data sheet for additional information.

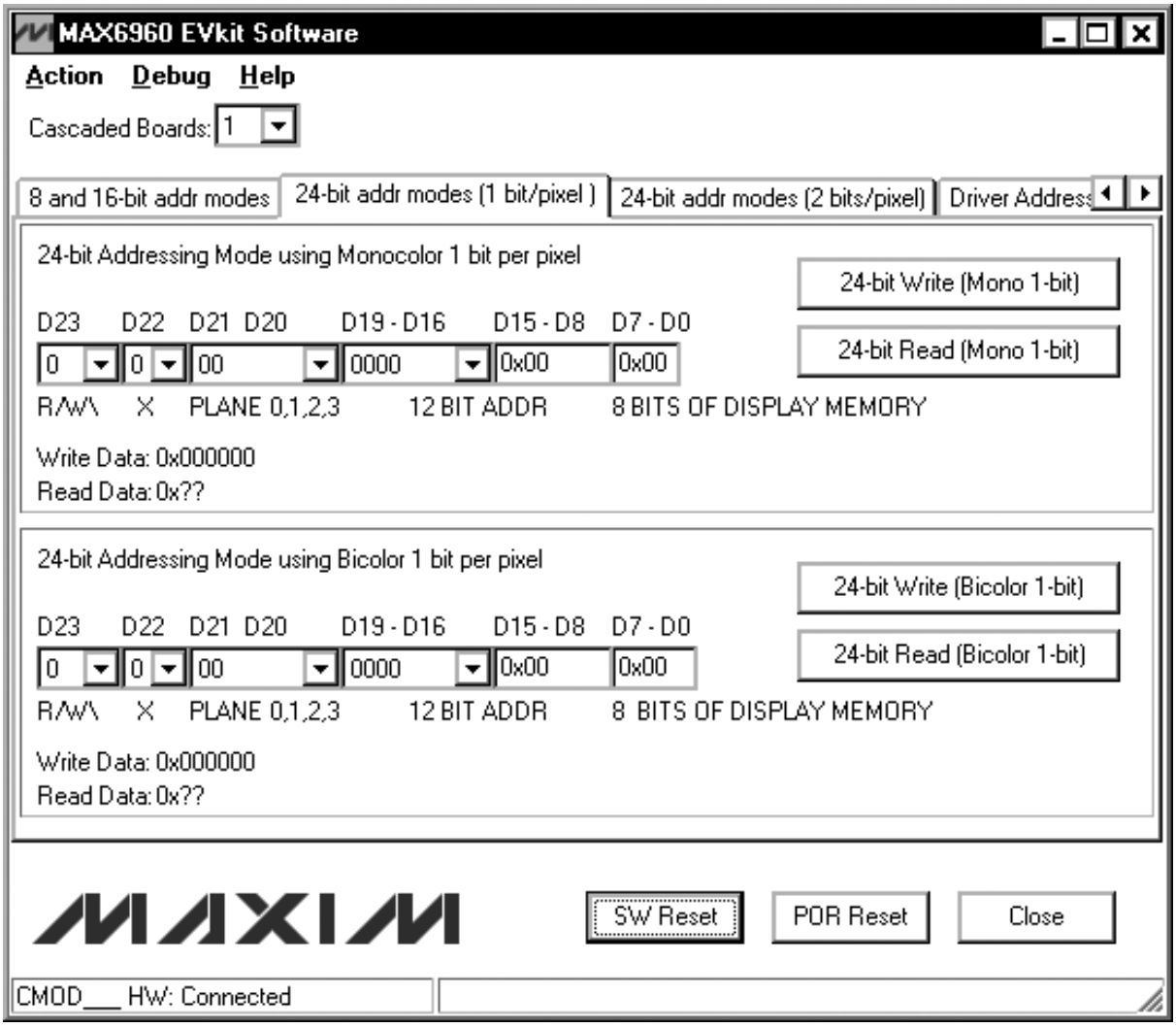

Figure 2. 24-Bit Addressing Modes (1 Bit/Pixel) Tab

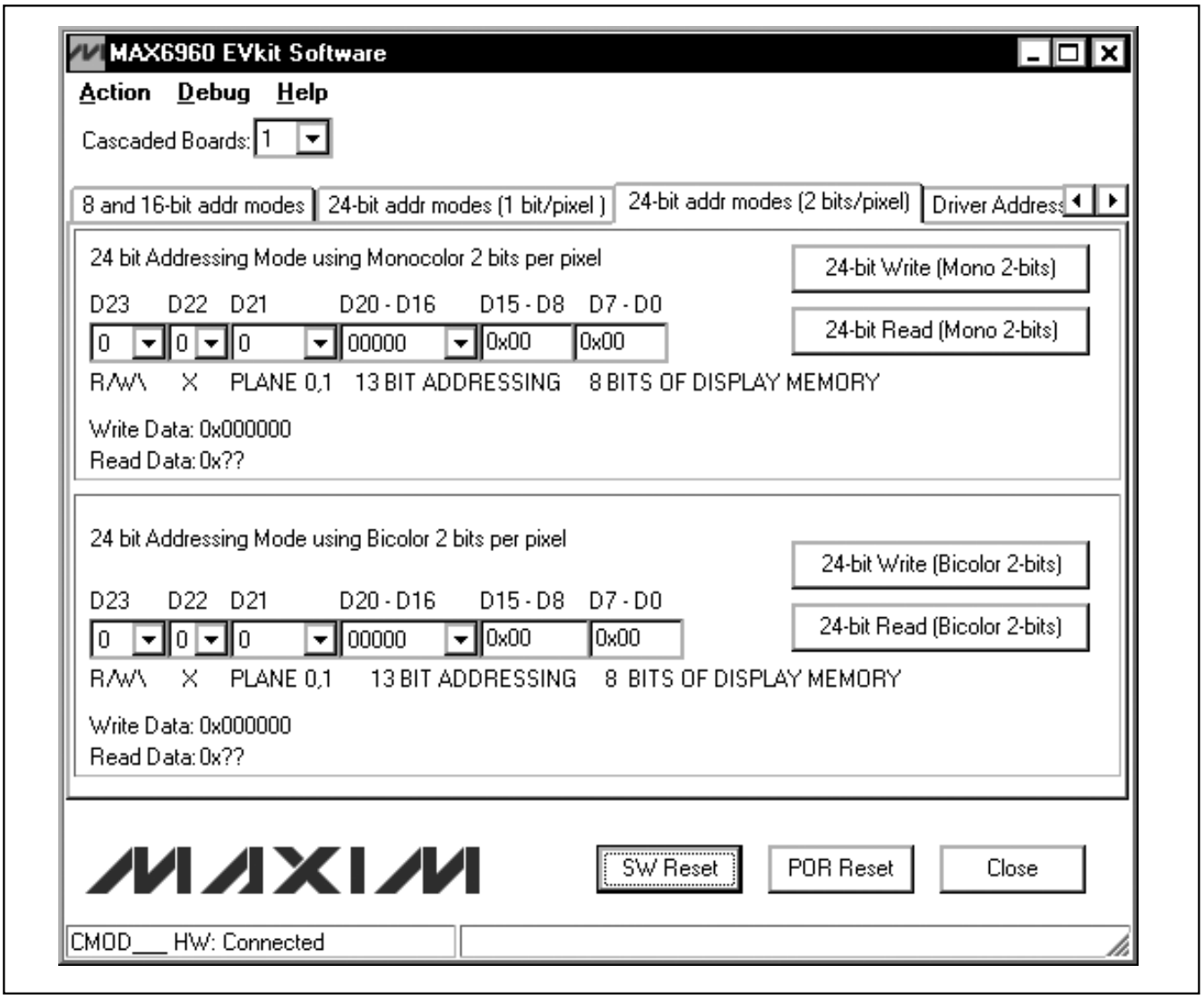

Figure 3. 24-Bit Addressing Modes (2 Bits/Pixel) Tab

_Detailed Description of Hardware

MAX6960 EV System

The MAX6960 EV system is a PC-controlled LED display system consisting of a MAX6960 EV kit and the Maxim CMODUSB serial interface board.

CMODUSB Serial Interface Board

The CMODUSB serial interface board uses a proprietary design to provide SPI™- and I²C-compatible interfaces to demonstrate various Maxim devices. Maxim reserves the right to change the implementation of this module at any time with no advance notice.

CMODUSB Power Supply

The CMODUSB board uses a MAX1658 linear regulator. Jumper J1 selects between a 5V or 3.3V system supply voltage. Do not plug a wall cube into the P1 power jack because power is provided from the USB port.

Table 2. CMODUSB Jumper J1 (System Supply Voltage)

JUMPER	SHUNT POSITION	SYSTEM SUPPLY VOLTAGE (DV_{DD})
J1	1-2	5V
	2-3*	3.3V

**Make sure the J1 jumper on the CMODUSB board is in the 2-3 position when using the MAX6960 EV kit.*

MAX6960 EV Kit

The MAX6960 EV kit contains four MAX6960 devices (U1–U4), a 16 x 16 dot-matrix display (D1–D4), a step-down voltage regulator (U12), a 4MHz oscillator (U10), and logic buffers (U5–U9, U13). The MAX6960 EV kit requires a +5V supply (rated for 2.5A per EV kit) and up to five MAX6960 EV kits can be cascaded allowing the user to evaluate up to 20 MAX6960 devices.

Tables 3 through 19 explain the functionality of each jumper when using only one MAX6960 EV kit.

Table 3. Digit 0 Current Setting (RISET0—U1)

JUMPER	SHUNT POSITION	DESCRIPTION
JU1	1-2	All U1 digit 0 segment currents adjustable from 20mA to 40mA.
	2-3*	All U1 digit 0 segment currents set to 40mA.
	Open	All U1 digit 0 segment currents set to 20mA.

**Default configuration.*

Table 4. Digit 1 Current Setting (RISET1—U1)

JUMPER	SHUNT POSITION	DESCRIPTION
JU2	1-2	All U1 digit 1 segment currents adjustable from 20mA to 40mA.
	2-3*	All U1 digit 1 segment currents set to 40mA.
	Open	All U1 digit 1 segment currents set to 20mA.

**Default configuration.*

Table 5. Address Data Input (ADDIN—U1)

JUMPER	SHUNT POSITION	DESCRIPTION
JU3	1-2*	ADDIN of U1 is connected to +3.3V to indicate the first MAX6960 device.
	2-3	See the *Cascading MAX6960 EV Kit Boards* section for details.

**Default configuration.*

Table 6. Digit 0 Current Setting (RISET0—U2)

JUMPER	SHUNT POSITION	DESCRIPTION
JU4	1-2	All U2 digit 0 segment currents adjustable from 20mA to 40mA.
	2-3*	All U2 digit 0 segment currents set to 40mA.
	Open	All U2 digit 0 segment currents set to 20mA.

**Default configuration.*

SPI is a trademark of Motorola, Inc.

Table 7. Digit 1 Current Setting (RISET1—U2)

JUMPER	SHUNT POSITION	DESCRIPTION
JU5	1-2	All U2 digit 1 segment currents adjustable from 20mA to 40mA.
	2-3*	All U2 digit 1 segment currents set to 40mA.
	Open	All U2 digit 1 segment currents set to 20mA.

**Default configuration.*

Table 8. U2 New Row Selection (NEWROWBUS—U2)

JUMPER	SHUNT POSITION	DESCRIPTION
JU6	Short*	ADDOUTU2 is connected to NEWROWBUS to start the second row of 8 x 8 LED displays.
	Open	See the *Cascading MAX6960 EV Kit Boards* section for details.

**Default configuration.*

Table 9. Digit 0 Current Setting (RISET0—U3)

JUMPER	SHUNT POSITION	DESCRIPTION
JU7	1-2	All U3 digit 0 segment currents adjustable from 20mA to 40mA.
	2-3*	All U3 digit 0 segment currents set to 40mA.
	Open	All U3 digit 0 segment currents set to 20mA.

**Default configuration.*

Table 10. Digit 1 Current Setting (RISET1—U3)

JUMPER	SHUNT POSITION	DESCRIPTION
JU8	1-2	All U3 digit 1 segment currents adjustable from 20mA to 40mA.
	2-3*	All U3 digit 1 segment currents set to 40mA.
	Open	All U3 digit 1 segment currents set to 20mA.

**Default configuration.*

Table 11. Address Data Input (ADDIN—U3)

JUMPER	SHUNT POSITION	DESCRIPTION
JU9	1-2*	ADDIN of U3 is connected to NEWROWBUS to start the second row of 8 x 8 LED displays.
	2-3	See the *Cascading MAX6960 EV Kit Boards* section for details.

**Default configuration.*

Table 12. Digit 0 Current Setting (RISET0—U4)

JUMPER	SHUNT POSITION	DESCRIPTION
JU10	1-2	All U4 digit 0 segment currents adjustable from 20mA to 40mA.
	2-3*	All U4 digit 0 segment currents set to 40mA.
	Open	All U4 digit 0 segment currents set to 20mA.

**Default configuration.*

Table 13. Digit 1 Current Setting (RISET1—U4)

JUMPER	SHUNT POSITION	DESCRIPTION
JU11	1-2	All U4 digit 1 segment currents adjustable from 20mA to 40mA.
	2-3*	All U4 digit 1 segment currents set to 40mA.
	Open	All U4 digit 1 segment currents set to 20mA.

**Default configuration.*

Table 14. +5V Power-Line Pass Through

JUMPER	SHUNT POSITION	DESCRIPTION
JU12	Short	See the *Cascading MAX6960 EV Kit Boards* section for details.
	Open*	User applies +5V between the +5V and GND pads for the first MAX6960 EV kit.

**Default configuration.*

Table 15. Oscillator Buffer Output (OSC)

JUMPER	SHUNT POSITION	DESCRIPTION
JU13	1-2*	The MAX7375 silicon oscillator is routed to U1, U2, U3, and U4.
	2-3	See the *Cascading MAX6960 EV Kit Boards* section for details.

**Default configuration.*

Table 16. NEWROWBUS Pass Through

JUMPER	SHUNT POSITION	DESCRIPTION
JU14	Short	See the *Cascading MAX6960 EV Kit Boards* section for details.
	Open*	Do not short this jumper when using only one MAX6960 EV kit.

**Default configuration.*

Table 17. Put U8 in a Known State

JUMPER	SHUNT POSITION	DESCRIPTION
JU15	Short*	Put U8 in a known state when using only one MAX6960 EV kit.
	Open	See the *Cascading MAX6960 EV Kit Boards* section for details.

**Default configuration.*

Table 18. LED Open Circuit Test (U1COL1)

JUMPER	SHUNT POSITION	DESCRIPTION
JU16	Short*	Normal operation.
	Open	Creates an open circuit on the U1COL1 line of D1 and is used for an LED open circuit test.

**Default configuration.*

Table 19. ADDCLK Pass Through (ADDCLK)

JUMPER	SHUNT POSITION	DESCRIPTION
JU17	Short	See the *Cascading MAX6960 EV Kit Boards* section for details.
	Open*	Do not short this jumper when using only one MAX6960 EV kit.

**Default configuration.*

Cascading MAX6960 EV Kit Boards

The MAX6960 EV kit board was carefully designed to cascade up to five MAX6960 EV kits. Tables 3 through 19 explain the functionality of each jumper when using only one MAX6960 EV kit and Table 20 shows a summary of all the default settings. **The 5V supply requires a current capability of 2.5A per MAX6960 EV kit.** For example, five cascaded MAX6960 EV kits require a 5V supply capable of supplying 12.5A. If the digit 0 and digit 1 segment current settings are changed from 40mA to 20mA on all MAX6960 devices, then the current requirement is cut in half. For example, one MAX6960 EV kit would require 1.25A and five MAX6960 EV kits would require 6.25A.

Table 20. Using One MAX6960 EV Kit Board

MAX6960 EV KIT 1
JU1: (2-3)
JU2: (2-3)
JU3: (1-2)
JU4: (2-3)
JU5: (2-3)
JU6: (1-2)
JU7: (2-3)
JU8: (2-3)
JU9: (1-2)
JU10: (2-3)
JU11: (2-3)
JU12: (Open)
JU13: (1-2)
JU14: (1 only)
JU15: (1-2)
JU16: (1-2)
JU17: (1 only)

The sections below show the jumper settings for cascading two, three, four, and five MAX6960 EV kit boards.

Cascading Two MAX6960 EV Kit Boards

Table 21 shows the jumper settings when cascading two MAX6960 EV kits. The 5V supply requires a current capability of 5A when cascading two MAX6960 EV kits. If the digit 0 and digit 1 segment current settings are changed from 40mA to 20mA on all MAX6960 devices for both MAX6960 EV kits, then the current requirement is 2.5A.

Table 21. Cascading Two MAX6960 EV Kit Boards

MAX6960 EV KIT 1	MAX6960 EV KIT 2
JU1: (2-3)	JU1: (2-3)
JU2: (2-3)	JU2: (2-3)
JU3: (1-2)	**JU3: (2-3)**
JU4: (2-3)	JU4: (2-3)
JU5: (2-3)	JU5: (2-3)
JU6: (1 only)	JU6: (1-2)
JU7: (2-3)	JU7: (2-3)
JU8: (2-3)	JU8: (2-3)
JU9: (1-2)	**JU9: (2-3)**
JU10: (2-3)	JU10: (2-3)
JU11: (2-3)	JU11: (2-3)
JU12: (Open)	**JU12: (Short)**
JU13: (1-2)	**JU13: (2-3)**
JU14: (1 only)	**JU14: (1-2)**
JU15: (1-2)	**JU15: (1 only)**
JU16: (1-2)	JU16: (1-2)
JU17: (1 only)	**JU17: (1-2)**

Note: *Bolded text indicates changes from the default settings.*

Cascading Three MAX6960 EV Kit Boards

Table 22 shows the jumper settings when cascading three MAX6960 EV kits. The 5V supply requires a current capability of 7.5A when cascading three MAX6960 EV kits. If the digit 0 and digit 1 segment current settings are changed from 40mA to 20mA on all MAX6960 devices for all three MAX6960 EV kits, then the current requirement is 3.75A.

Table 22. Cascading Three MAX6960 EV Kit Boards

MAX6960 EV KIT 1	MAX6960 EV KIT 2	MAX6960 EV KIT 3
JU1: (2-3)	JU1: (2-3)	JU1: (2-3)
JU2: (2-3)	JU2: (2-3)	JU2: (2-3)
JU3: (1-2)	**JU3: (2-3)**	**JU3: (2-3)**
JU4: (2-3)	JU4: (2-3)	JU4: (2-3)
JU5: (2-3)	JU5: (2-3)	JU5: (2-3)
JU6: (1 only)	**JU6: (1 only)**	JU6: (1-2)
JU7: (2-3)	JU7: (2-3)	JU7: (2-3)
JU8: (2-3)	JU8: (2-3)	JU8: (2-3)
JU9: (1-2)	**JU9: (2-3)**	**JU9: (2-3)**
JU10: (2-3)	JU10: (2-3)	JU10: (2-3)
JU11: (2-3)	JU11: (2-3)	JU11: (2-3)
JU12: (Open)	**JU12: (Short)**	**JU12: (Short)**
JU13: (1-2)	**JU13: (2-3)**	**JU13: (2-3)**
JU14: (1 only)	**JU14: (1-2)**	**JU14: (1-2)**
JU15: (1-2)	**JU15: (1 only)**	**JU15: (1 only)**
JU16: (1-2)	JU16: (1-2)	JU16: (1-2)
JU17: (1 only)	**JU17: (1-2)**	**JU17: (1-2)**

Note: *Bolded text indicates changes from the default settings.*

Cascading Four MAX6960 EV Kit Boards

Table 23 shows the jumper settings when cascading four MAX6960 EV kits. The 5V supply requires a 10A current capability when cascading four MAX6960 EV kits. If the digit 0 and digit 1 segment current settings are changed from 40mA to 20mA on all MAX6960 devices for all four MAX6960 EV kits, then the current requirement is 5A.

Table 23. Cascading Four MAX6960 EV Kit Boards

MAX6960 EV KIT 1	MAX6960 EV KIT 2	MAX6960 EV KIT 3	MAX6960 EV KIT 4
JU1: (2-3)	JU1: (2-3)	JU1: (2-3)	JU1: (2-3)
JU2: (2-3)	JU2: (2-3)	JU2: (2-3)	JU2: (2-3)
JU3: (1-2)	**JU3: (2-3)**	**JU3: (2-3)**	**JU3: (2-3)**
JU4: (2-3)	JU4: (2-3)	JU4: (2-3)	JU4: (2-3)
JU5: (2-3)	JU5: (2-3)	JU5: (2-3)	JU5: (2-3)
JU6: (1 only)	**JU6: (1 only)**	**JU6: (1 only)**	JU6: (1-2)
JU7: (2-3)	JU7: (2-3)	JU7: (2-3)	JU7: (2-3)
JU8: (2-3)	JU8: (2-3)	JU8: (2-3)	JU8: (2-3)
JU9: (1-2)	**JU9: (2-3)**	**JU9: (2-3)**	**JU9: (2-3)**
JU10: (2-3)	JU10: (2-3)	JU10: (2-3)	JU10: (2-3)
JU11: (2-3)	JU11: (2-3)	JU11: (2-3)	JU11: (2-3)
JU12: (Open)	**JU12: (Short)**	**JU12: (Short)**	**JU12: (Short)**
JU13: (1-2)	**JU13: (2-3)**	**JU13: (2-3)**	**JU13: (2-3)**
JU14: (1 only)	**JU14: (1-2)**	**JU14: (1-2)**	**JU14: (1-2)**
JU15: (1-2)	**JU15: (1 only)**	**JU15: (1 only)**	**JU15: (1 only)**
JU16: (1-2)	JU16: (1-2)	JU16: (1-2)	JU16: (1-2)
JU17: (1 only)	**JU17: (1-2)**	**JU17: (1-2)**	**JU17: (1-2)**

Note: *Bolded text indicates changes from the default settings.*

Cascading Five MAX6960 EV Kit Boards

Table 24 shows the jumper settings when cascading five MAX6960 EV kits. The 5V supply requires a current capability of 12.5A when cascading five MAX6960 EV kits. If the digit 0 and digit 1 segment current settings are changed from 40mA to 20mA on all MAX6960 devices for all five MAX6960 EV kits, then the current requirement is 6.25A.

Table 24. Cascading Five MAX6960 EV Kit Boards

MAX6960 EV KIT 1	MAX6960 EV KIT 2	MAX6960 EV KIT 3	MAX6960 EV KIT 4	MAX6960 EV KIT 5
JU1: (2-3)	JU1: (2-3)	JU1: (2-3)	JU1: (2-3)	JU1: (2-3)
JU2: (2-3)	JU2: (2-3)	JU2: (2-3)	JU2: (2-3)	JU2: (2-3)
JU3: (1-2)	**JU3: (2-3)**	**JU3: (2-3)**	**JU3: (2-3)**	**JU3: (2-3)**
JU4: (2-3)	JU4: (2-3)	JU4: (2-3)	JU4: (2-3)	JU4: (2-3)
JU5: (2-3)	JU5: (2-3)	JU5: (2-3)	JU5: (2-3)	JU5: (2-3)
JU6: (1 only)	**JU6: (1 only)**	**JU6: (1 only)**	**JU6: (1 only)**	JU6: (1-2)
JU7: (2-3)	JU7: (2-3)	JU7: (2-3)	JU7: (2-3)	JU7: (2-3)
JU8: (2-3)	JU8: (2-3)	JU8: (2-3)	JU8: (2-3)	JU8: (2-3)
JU9: (1-2)	**JU9: (2-3)**	**JU9: (2-3)**	**JU9: (2-3)**	**JU9: (2-3)**
JU10: (2-3)	JU10: (2-3)	JU10: (2-3)	JU10: (2-3)	JU10: (2-3)
JU11: (2-3)	JU11: (2-3)	JU11: (2-3)	JU11: (2-3)	JU11: (2-3)
JU12: (Open)	**JU12: (Short)**	**JU12: (Short)**	**JU12: (Short)**	**JU12: (Short)**
JU13: (1-2)	**JU13: (2-3)**	**JU13: (2-3)**	**JU13: (2-3)**	**JU13: (2-3)**
JU14: (1 only)	**JU14: (1-2)**	**JU14: (1-2)**	**JU14: (1-2)**	**JU14: (1-2)**
JU15: (1-2)	**JU15: (1 only)**	**JU15: (1 only)**	**JU15: (1 only)**	**JU15: (1 only)**
JU16: (1-2)	JU16: (1-2)	JU16: (1-2)	JU16: (1-2)	JU16: (1-2)
JU17: (1 only)	**JU17: (1-2)**	**JU17: (1-2)**	**JU17: (1-2)**	**JU17: (1-2)**

Note: *Bolded text indicates changes from the default settings.*

MAX6960 EV System Troubleshooting

Problem 1: CMOD___ Module Hardware Not Found. See Figure 4.

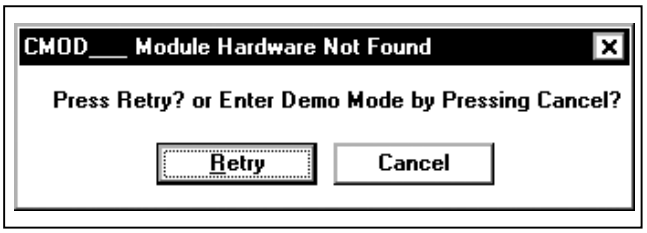

Figure 4. EV Kit Software Warning Message

Solution 1:

- Is the red power LED lit on the CMODUSB? If not, unplug and plug in the USB cable.
- Is the USB cable connected? If not, plug in the USB cable.
- Has the USB driver been installed? If not, refer to step 6 in the *Quick Start* section or the Troubleshooting USB.PDF included with the software.

Problem 2: Not all the LEDs light up.

Solution 2:

- Are the jumpers in the correct settings? If not, see the *Cascading MAX6960 EV Kit Boards* section for correct jumper settings.
- Are the global driver devices and global driver rows registers configured correctly? If not, select the number of MAX6960 EV kits being used in the **Cascaded Boards:** drop-down menu.

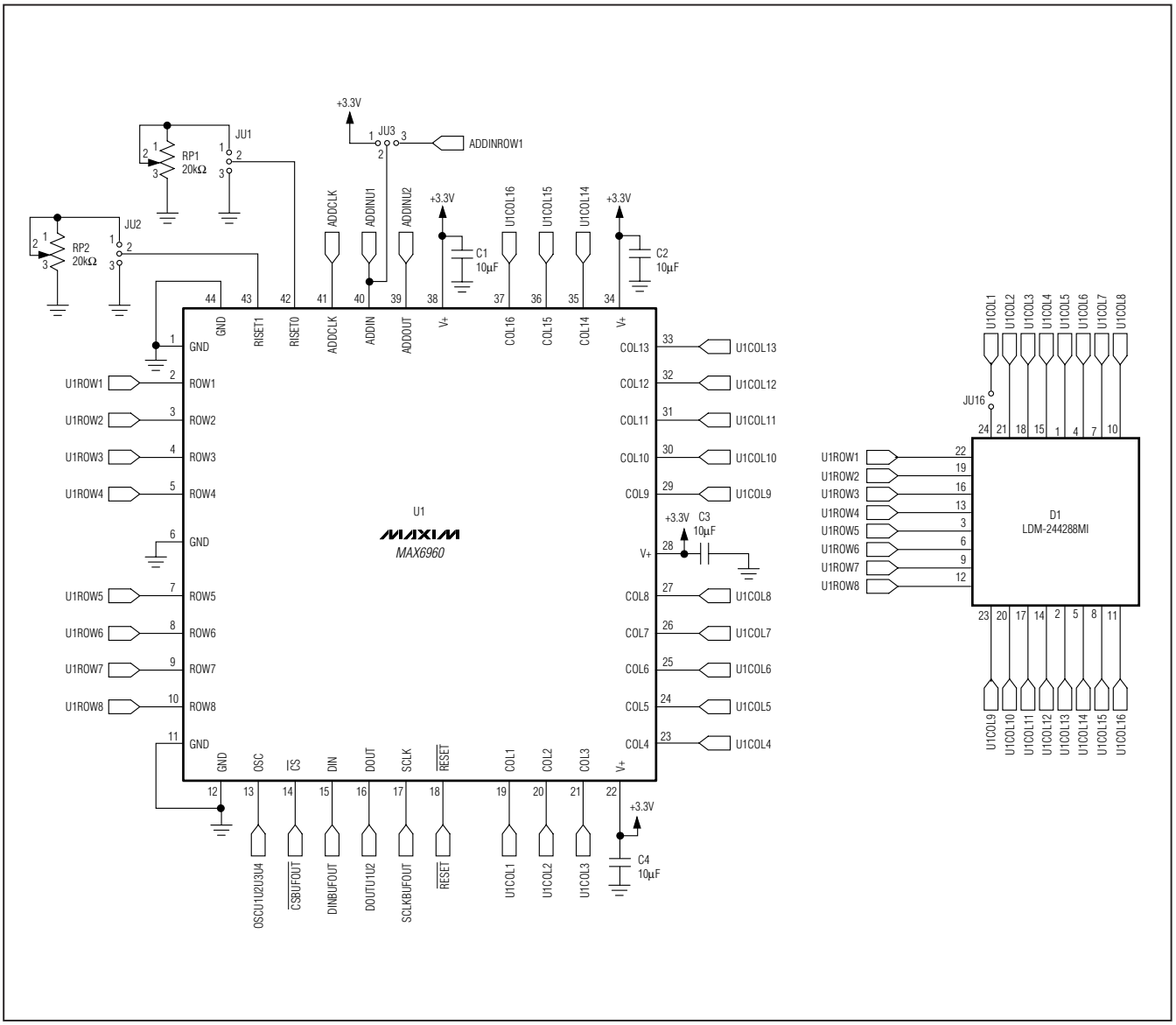

Figure 5. MAX6960 EV Kit Schematic (Sheet 1 of 6)

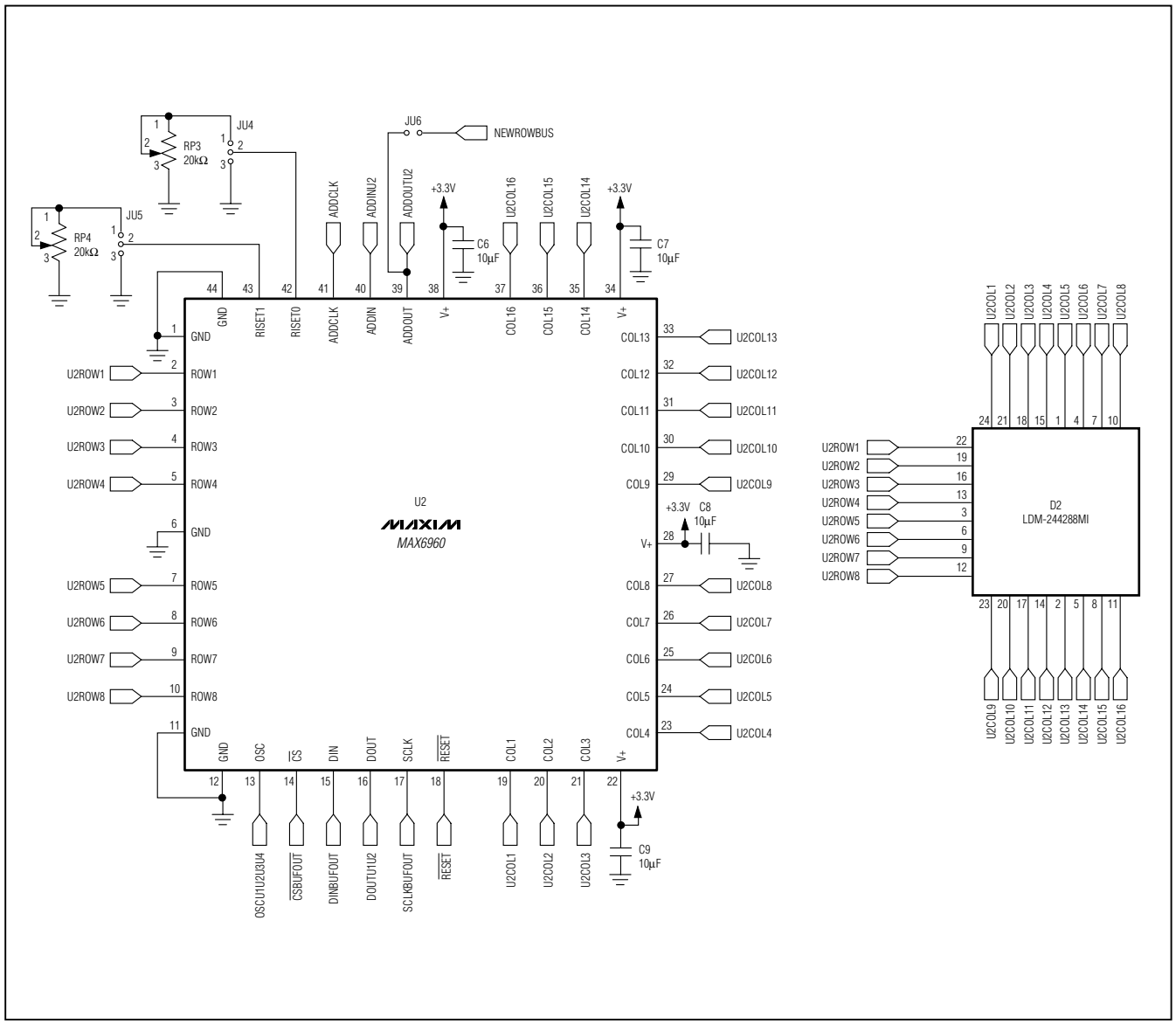

Figure 5. MAX6960 EV Kit Schematic (Sheet 2 of 6)

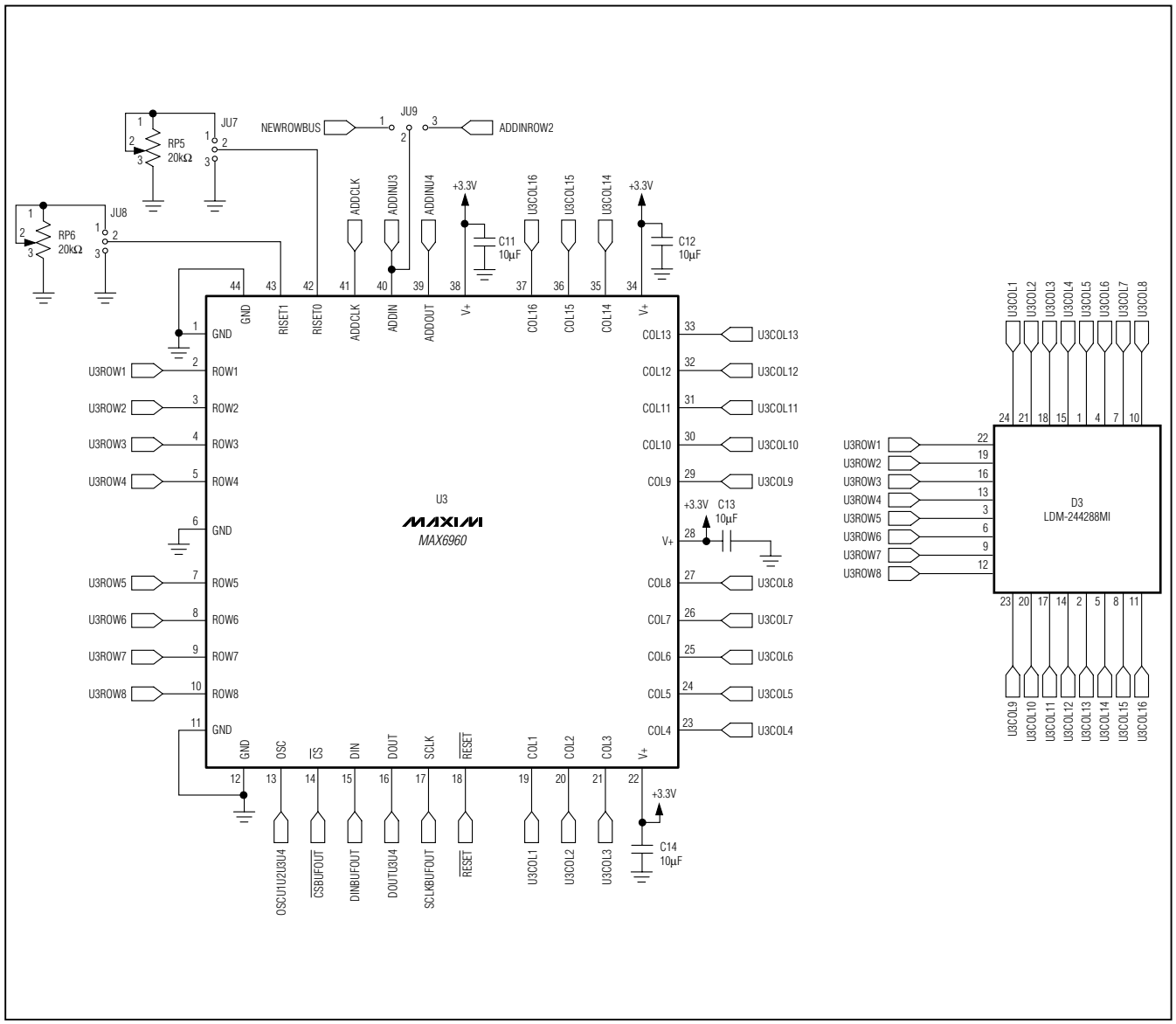

Figure 5. MAX6960 EV Kit Schematic (Sheet 3 of 6)

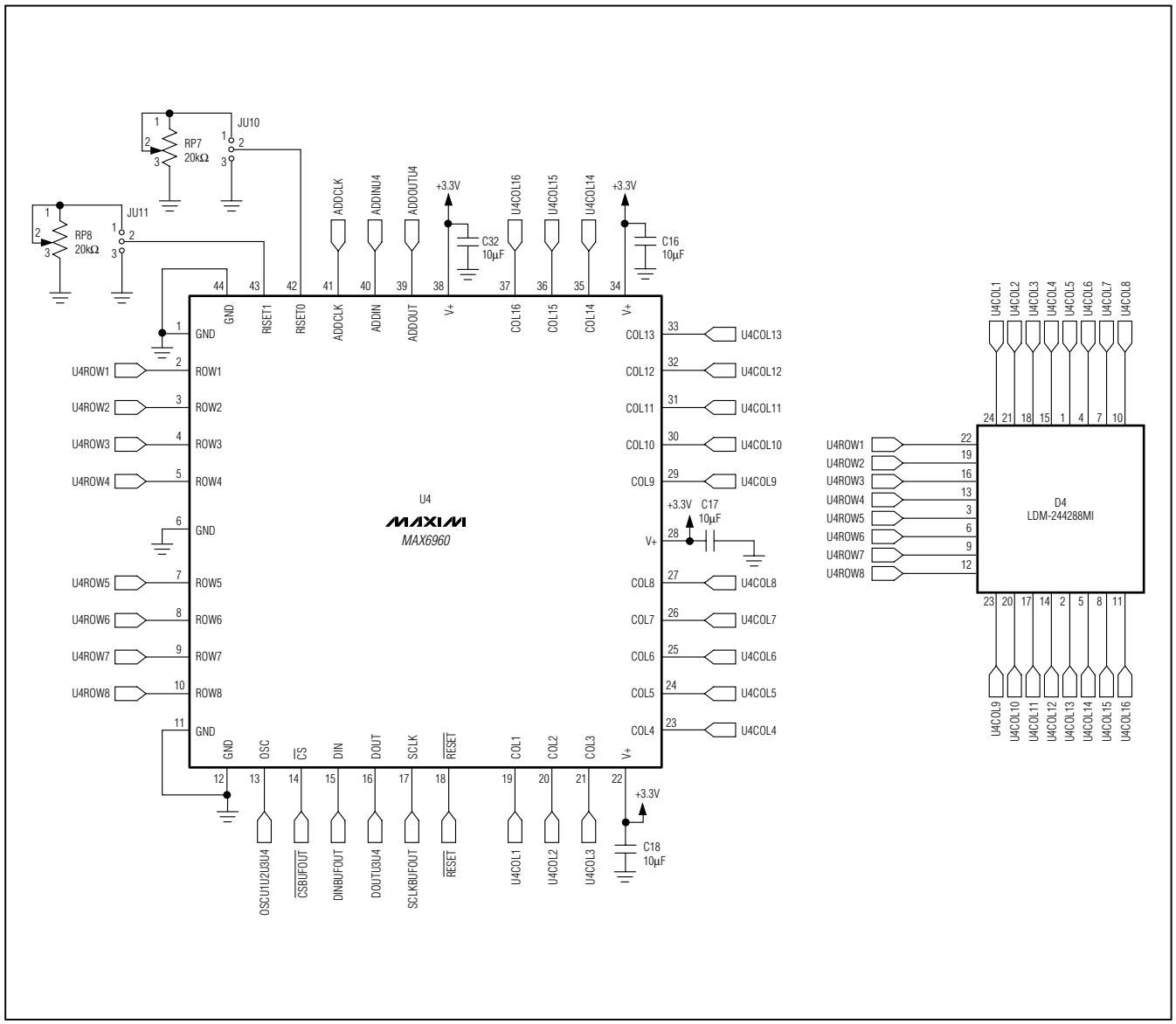

Figure 5. MAX6960 EV Kit Schematic (Sheet 4 of 6)

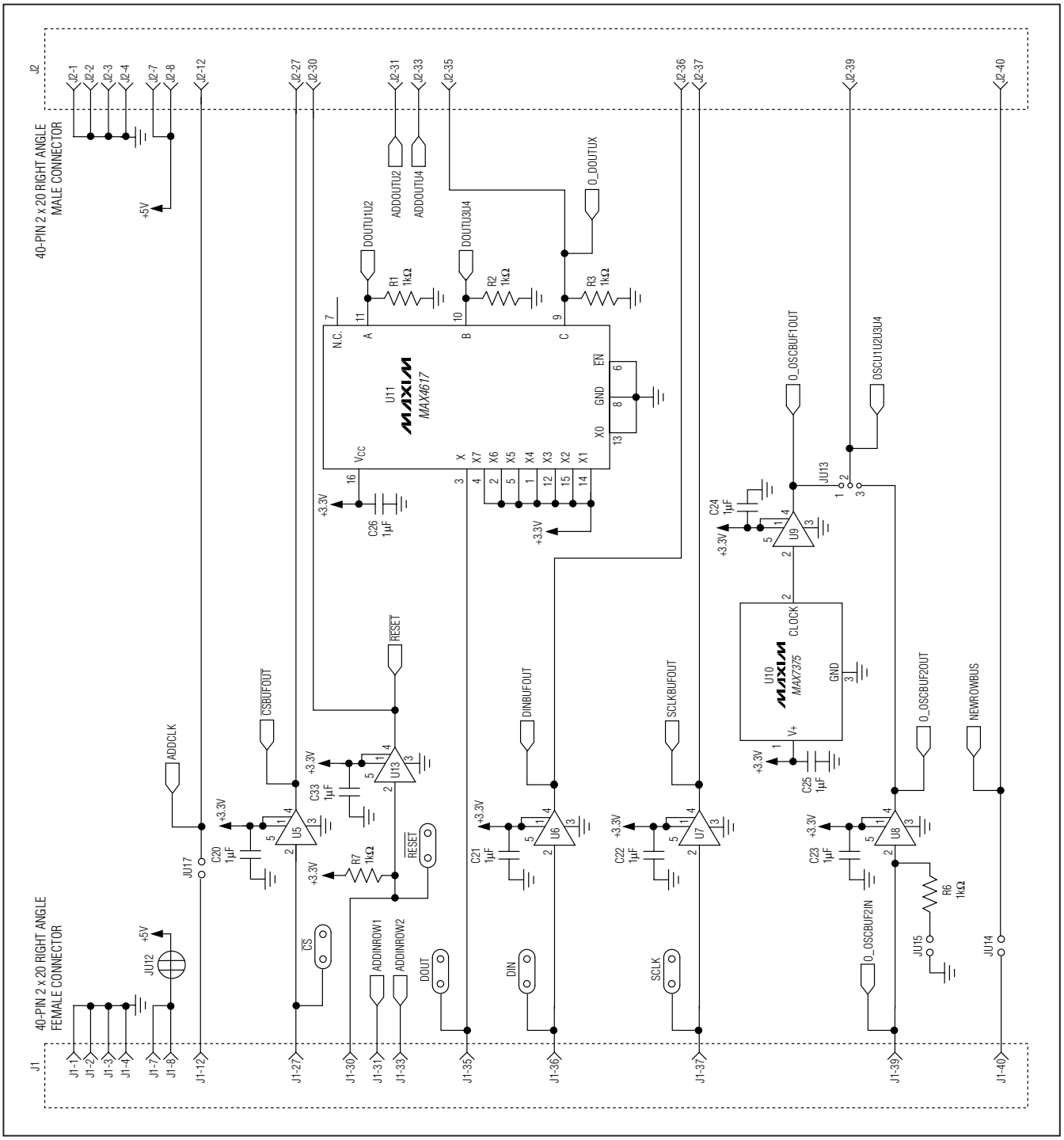

Figure 5. MAX6960 EV Kit Schematic (Sheet 5 of 6)

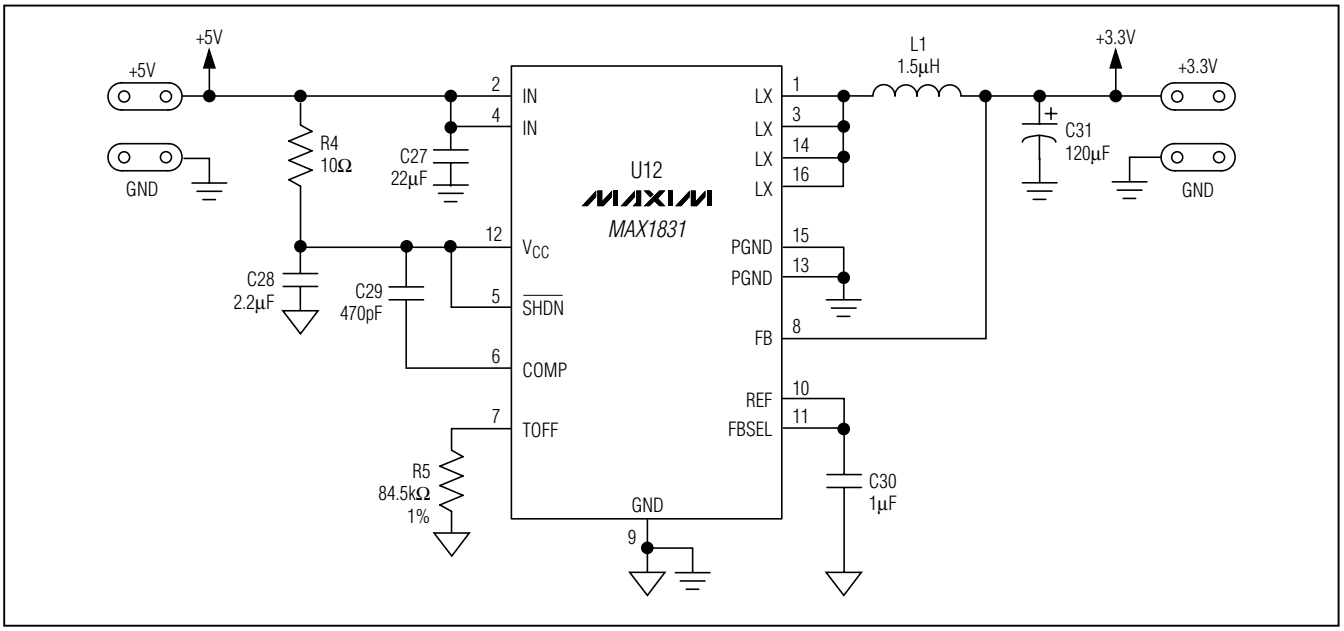

Figure 5. MAX6960 EV Kit Schematic (Sheet 6 of 6)

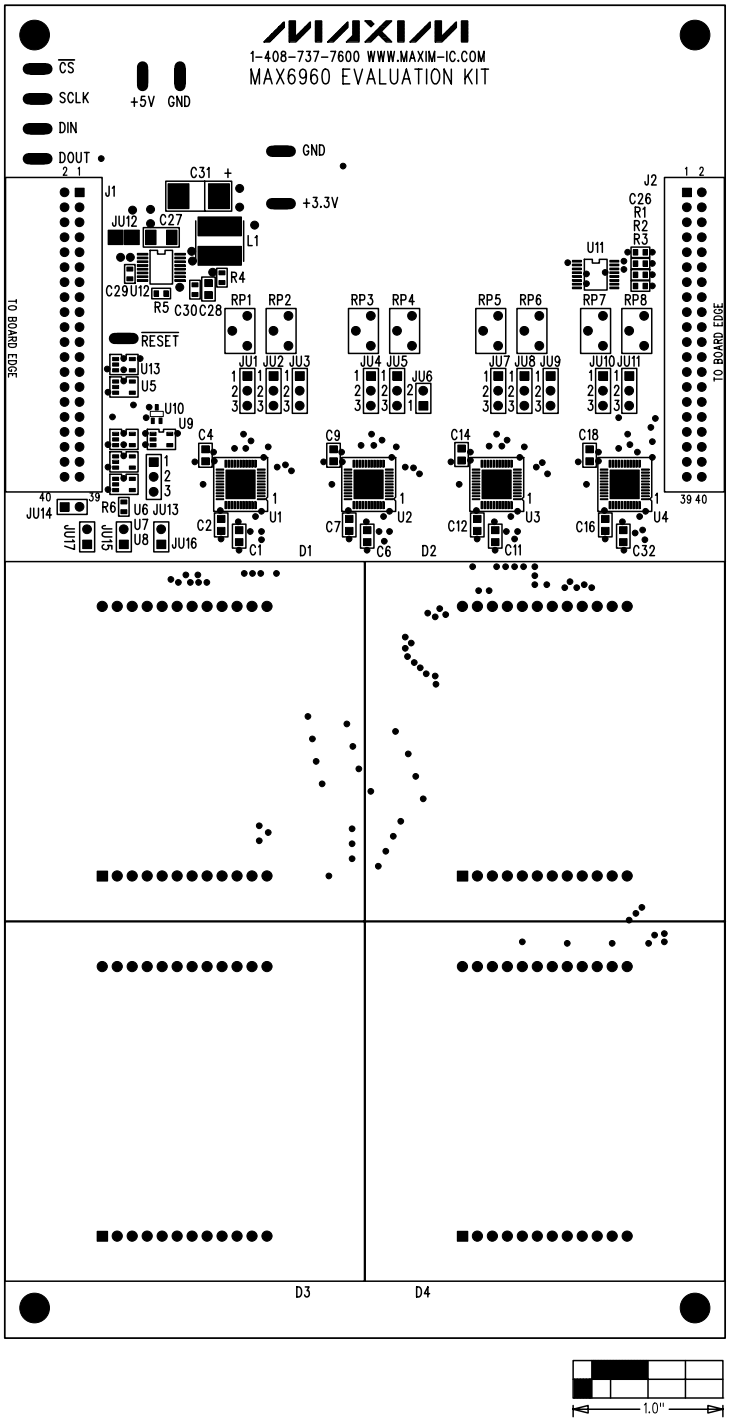

Figure 6. MAX6960 EV Kit Component Placement Guide—Component Side

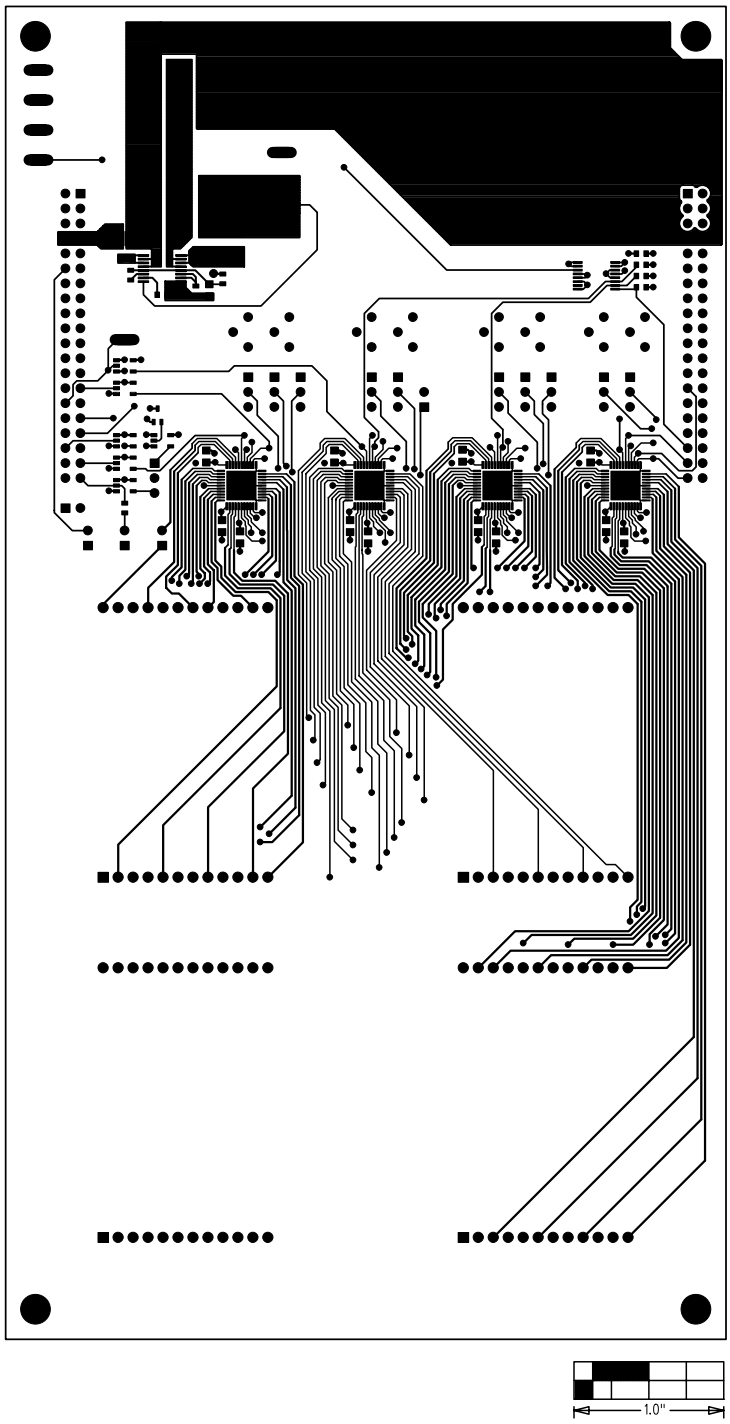

Figure 7. MAX6960 EV Kit PC Board Layout—Component Side

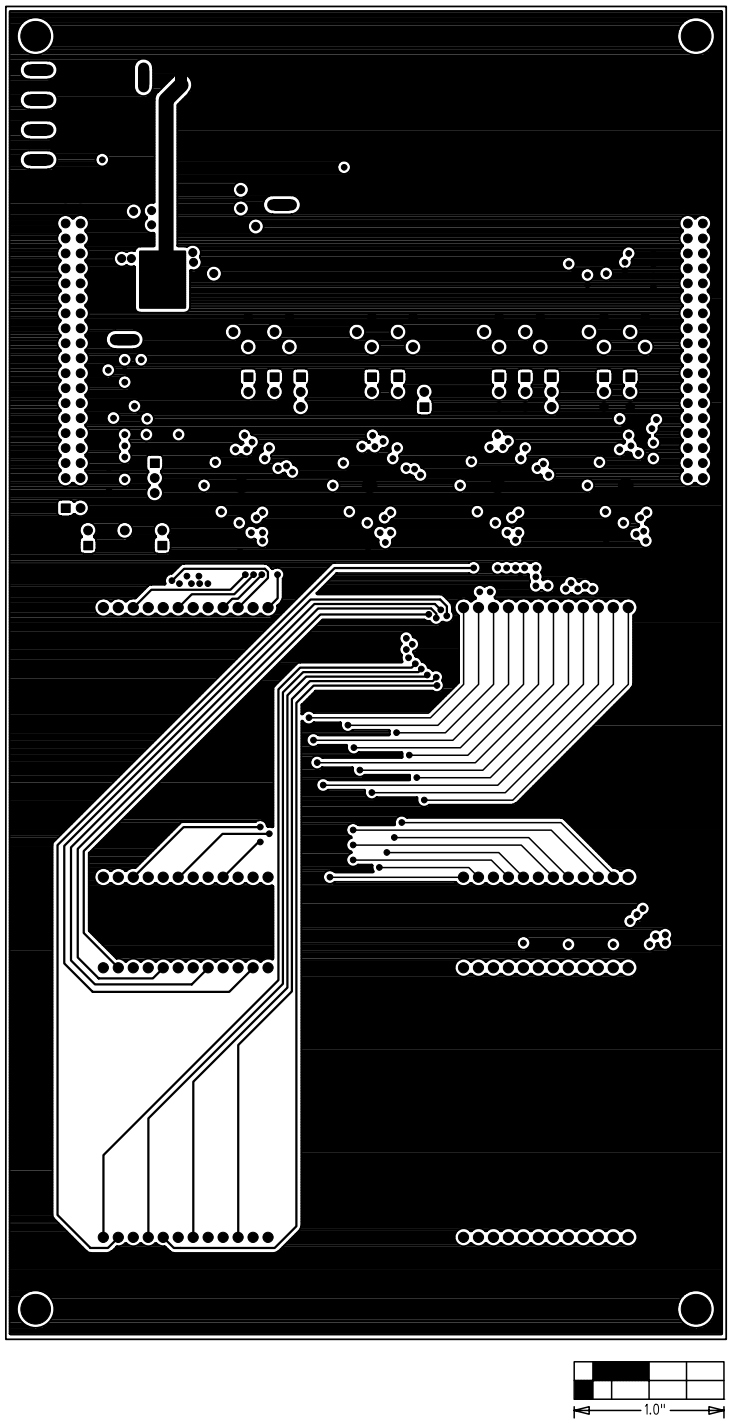

Figure 8. MAX6960 EV Kit PC Board Layout—Inner Layer 2 (GND)

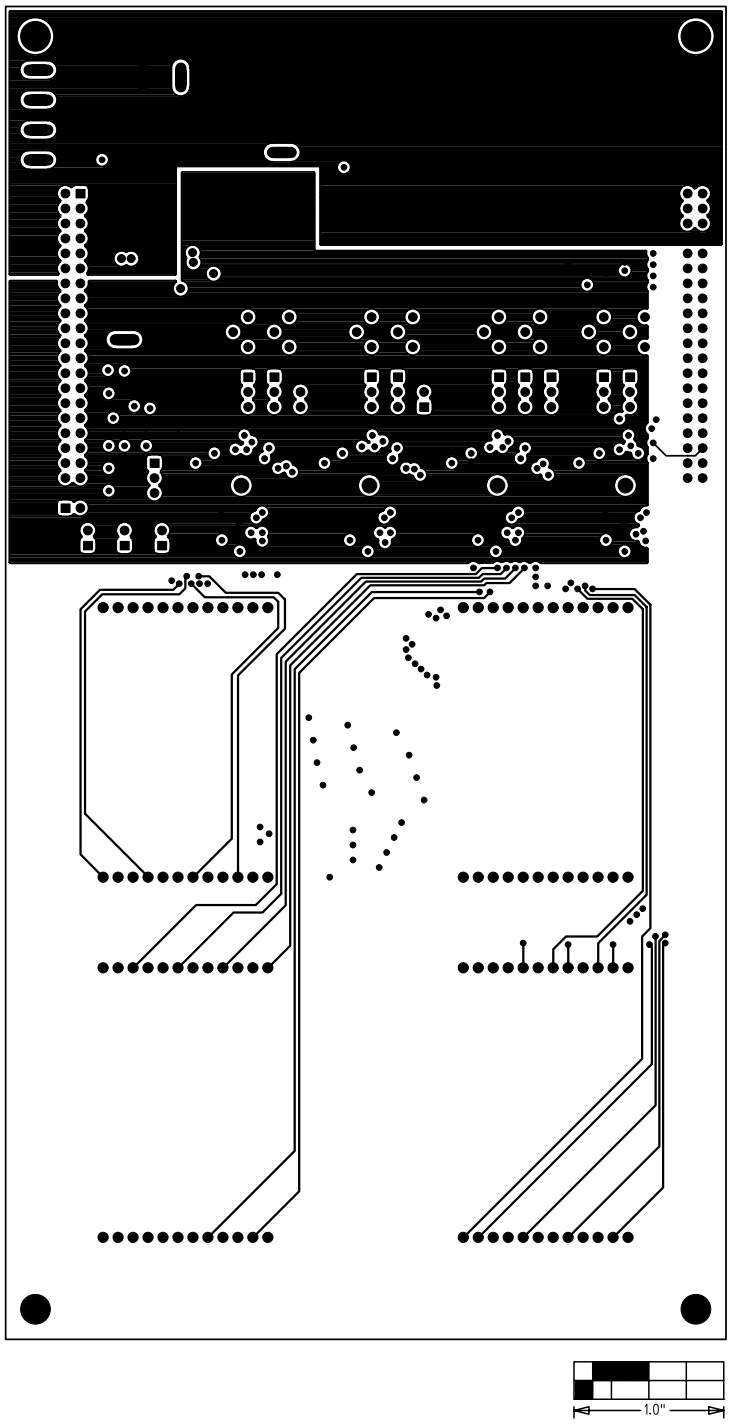

Figure 9. MAX6960 EV Kit PC Board Layout—Inner Layer 3 (VCC)

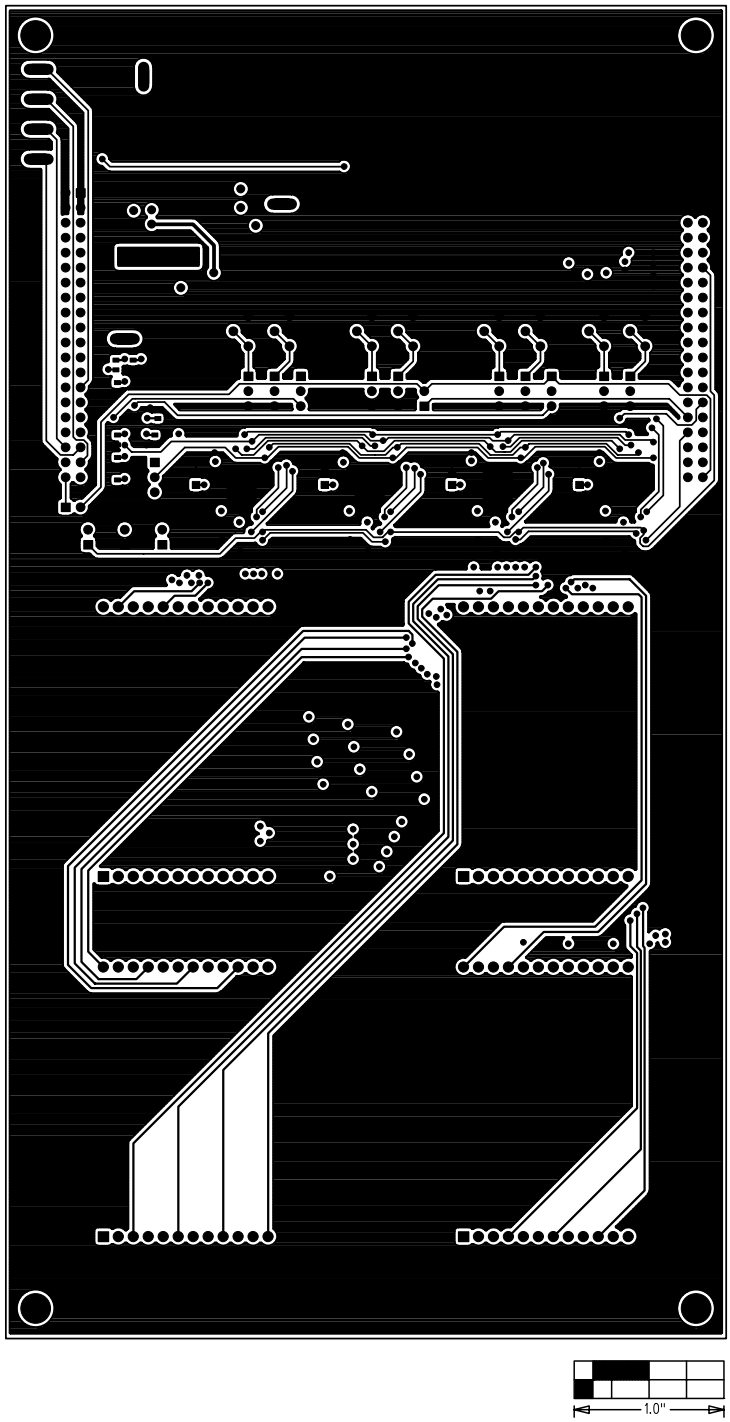

Figure 10. MAX6960 EV Kit PC Board Layout—Solder Side

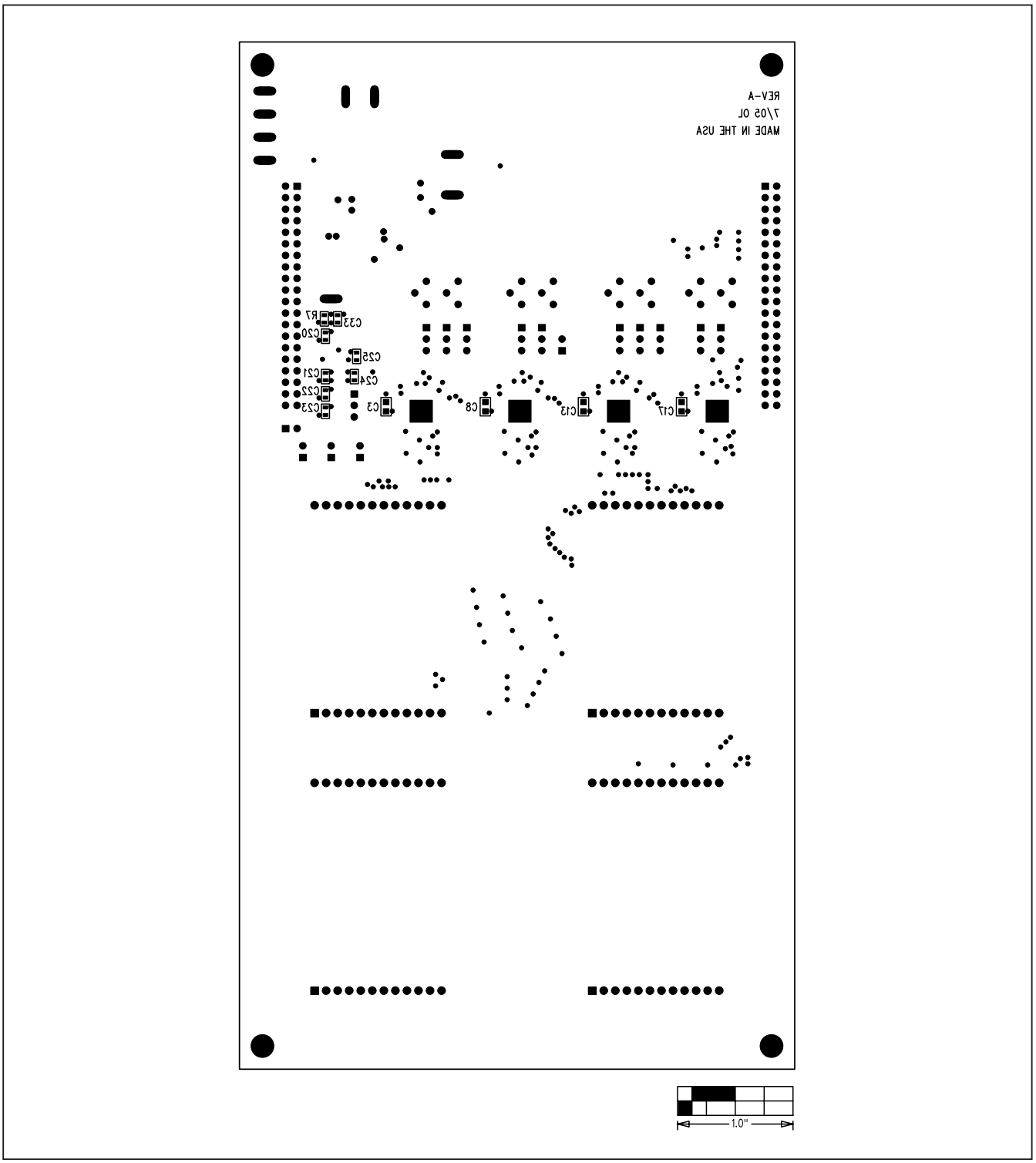

Figure 11. MAX6960 EV Kit Component Placement Guide—Solder Side

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