19-0788; Rev 0; 8/07

MAX7306 Evaluation Kit/Evaluation System

Evaluate: MAX7306/MAX7307

General Description

The MAX7306 evaluation kit (EV kit) is a fully assembled and tested printed circuit board (PCB) that demonstrates the capabilities of the MAX7306 4-port level-translating GPIO with latching transition detection, blink, and pulse-width modulation (PWM). The MAX7306 EV kit also includes Windows® 98SE/2000/XP-compatible software that provides a simple graphical user interface (GUI) for exercising the MAX7306's features.

The MAX7306 evaluation system (EV system) includes a MAX7306 EV kit and a Maxim CMAXQUSB serial-interface board.

The CMAXQUSB board connects to a PC's USB port and allows the transfer of I²C commands to the MAX7306 EV kit.

The EV kit comes with the MAX7306AUB+ installed. The MAX7306 EV kit can also be used to evaluate the MAX7307. Contact factory for free samples of the pin-compatible MAX7307AUB+ to evaluate this part.

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Features

- **400kHz 2-Wire Serial Interface, 5.5V Tolerant**
- **1.62V to 3.6V Operation (VDD)**
- **1.4V to 5.5V I/O Level Translation Port Supply (VLA)**
- **High Output Sink Current—Up to 25mA per Port**
- **Proven PCB Layout**
- **Windows 98SE/2000/XP-Compatible Evaluation Software**
- **Fully Assembled and Tested**
- **EV System Includes USB Connectivity**

Ordering Information

PART	TYPE	INTERFACE
MAX7306EVKIT+	EV kit	User-supplied I²C interface
MAX7306EVCMAXQU+	EV system	CMAXQUSB serial-interface board

+Denotes a lead-free and RoHS-compliant EV kit.

Note: *The MAX7306 EV kit software is designed for use with the complete EV system. The EV system includes both the Maxim CMAXQUSB board and the EV kit. If the Windows software will not be used, the EV kit board can be purchased without the Maxim CMAXQUSB board.*

Component Lists

MAX7306 EV System

PART	QTY	DESCRIPTION
MAX7306EVKIT+	1	MAX7306 EV kit
CMAXQUSB+	1	Serial-interface board

MAX7306 EV Kit

DESIGNATION	QTY	DESCRIPTION
C1	1	1µF ±15%, 16V X7R ceramic capacitor (0603) TDK C1608X7R1C105M
C2	1	10µF ±15%, 10V X5R ceramic capacitor (0805) TDK C2012X5R1A106M
C3	1	0.1µF ±15%, 25V X7R ceramic capacitor (0603) TDK C1608X7R1E104K
C4	0	Not installed, capacitor (0603)
D1	1	White LED (PLCC-2) OPTEK OVS9WBCR9
D2	1	RGB LED (2.7mm x 2.4mm x 0.95mm) OPTEK OVSTRGBAC6
J1	1	2 x 10 right-angle female receptacle
JU1, JU2, JU5	3	3-pin headers
JU3, JU4	2	2-pin headers
JU6	1	5-pin header
R1	1	10kΩ ±5% resistor (0603)
R2	1	150Ω ±5% resistor (0603)
R3	1	160Ω ±5% resistor (0603)
R4	1	270Ω ±5% resistor (0603)
R5	1	68Ω ±5% resistor (0603)
R6	1	100kΩ ±5% resistor (0603)
R7	1	0Ω ±5% resistor (0603)
R8, R9, R10	0	Not installed, resistors (0603)
R11	1	2kΩ ±5% resistor (0603)
S1, S2	2	Pushbutton switches
U1	1	MAX7306AUB+ (10-pin µMAX® with exposed paddle)
—	1	PCB: MAX7306 Evaluation Kit+

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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 Suppliers

SUPPLIER	PHONE	WEBSITE
OPTEK Technologies	800-341-4747	www.optekinc.com
TDK Corp.	847-803-6100	www.component.tdk.com

Note: *Indicate that you are using the MAX7306 when contacting these component suppliers.*

MAX7306 EV Kit Files

FILE	DESCRIPTION
INSTALL.EXE	Installs the EV kit files on your computer
MAX7306.EXE	Application program
FTD2XX.INF	USB device driver file
UNINST.INI	Uninstalls the EV kit software
TROUBLESHOOTING_USB.PDF	USB driver installation help file

Quick Start

Recommended Equipment

- One 5V power supply
- MAX7306 EV system

  MAX7306 EV kit
  Maxim CMAXQUSB interface board (USB cable included)
- A user-supplied Windows 98SE/2000/XP PC with a spare USB port

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 98SE/2000/XP operating system.

Procedure

The MAX7306 is fully assembled and tested. **Caution: Do not turn on the power supply until all connections are made.**

1) Visit www.maxim-ic.com/evkitsoftware to download the latest version of the EV kit software, 7306Rxx.ZIP.
2) Install the MAX7306 evaluation software on your computer by running the INSTALL.EXE program. The program files are copied and icons are created in the Windows **Start** menu.
3) On the CMAXQUSB board, ensure that the shunt of JU1 is in the 3.3V position.
4) Enable the I^2C pullup resistors on the CMAXQUSB board by setting the DIP switches on SW1 to the ON position.
5) For the MAX7306 EV kit, make sure that the shunts of all jumpers are in the following default positions:

   JU1: (2-3) CMAXQUSB provides the V_{DD} supply.

   JU2: (1-2) P1 drives the white LED (D1).

   JU3: (1-2) P2 drives the red LED of D2.

   JU4: (1-2) P3 drives the green LED of D2.

   JU5: (1-2) P4 drives the blue LED of D2.

   JU6: (1-3) I^2C slave address is 1001100x (0x98).
6) Carefully align the MAX7306 EV kit's 20-pin connector with the 20-pin connector of the CMAXQUSB board and press them together.
7) Connect the 5V power supply between the MAX7306 EV kit's VLA and GND pads.
8) Turn on the 5V power supply.

9) Connect the USB cable from the PC to the CMAXQUSB board. A **Building Driver Database** window pops up in addition to a **New Hardware Found** message, if this is the first time program runs on this PC. If you do not see a window that is similar to the one described above after 30s, remove the USB cable from the CMAXQUSB and reconnect it. Administrator privileges are required to install the USB device driver on Windows 2000 and XP. Refer to the TROUBLESHOOTING_USB.PDF document included with the software if you have any problems during this step.

10) 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\MAX7306** (default installation directory) using the **Browse** button.

11) Start the MAX7306 EV kit software by opening its icon in the **Start** menu. The GUI main window will appear, as shown in Figure 1.

12) Switch to **Port Registers** tab, as shown in Figure 2. Check the **Output** radio button in the **Port Index (0x01 - 0x04)** panel and press the **Write** button. Observe the light change of LED on the EV kit board.

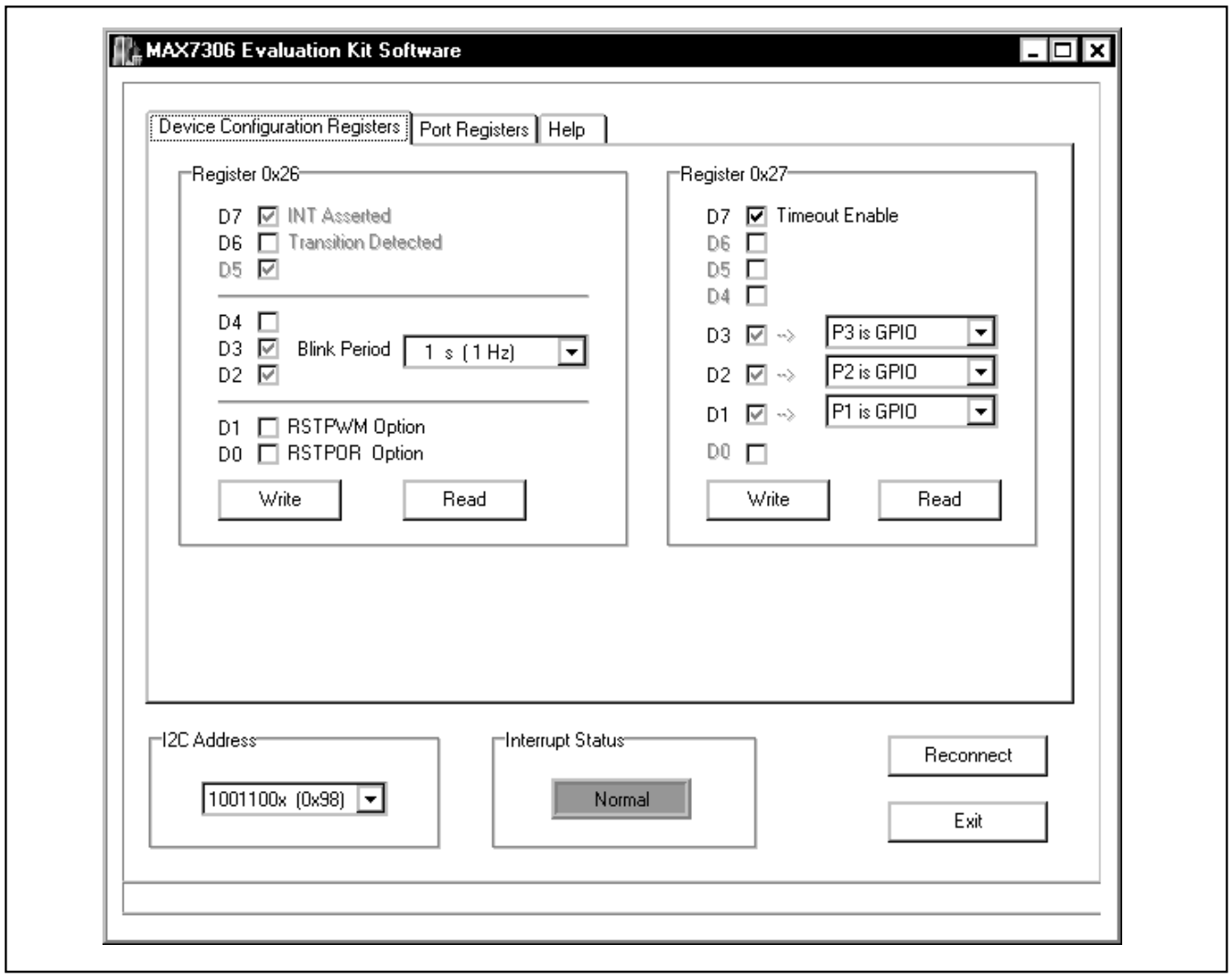


Figure 1. MAX7306 Evaluation Software Main Window (Device Configuration Registers Tab)

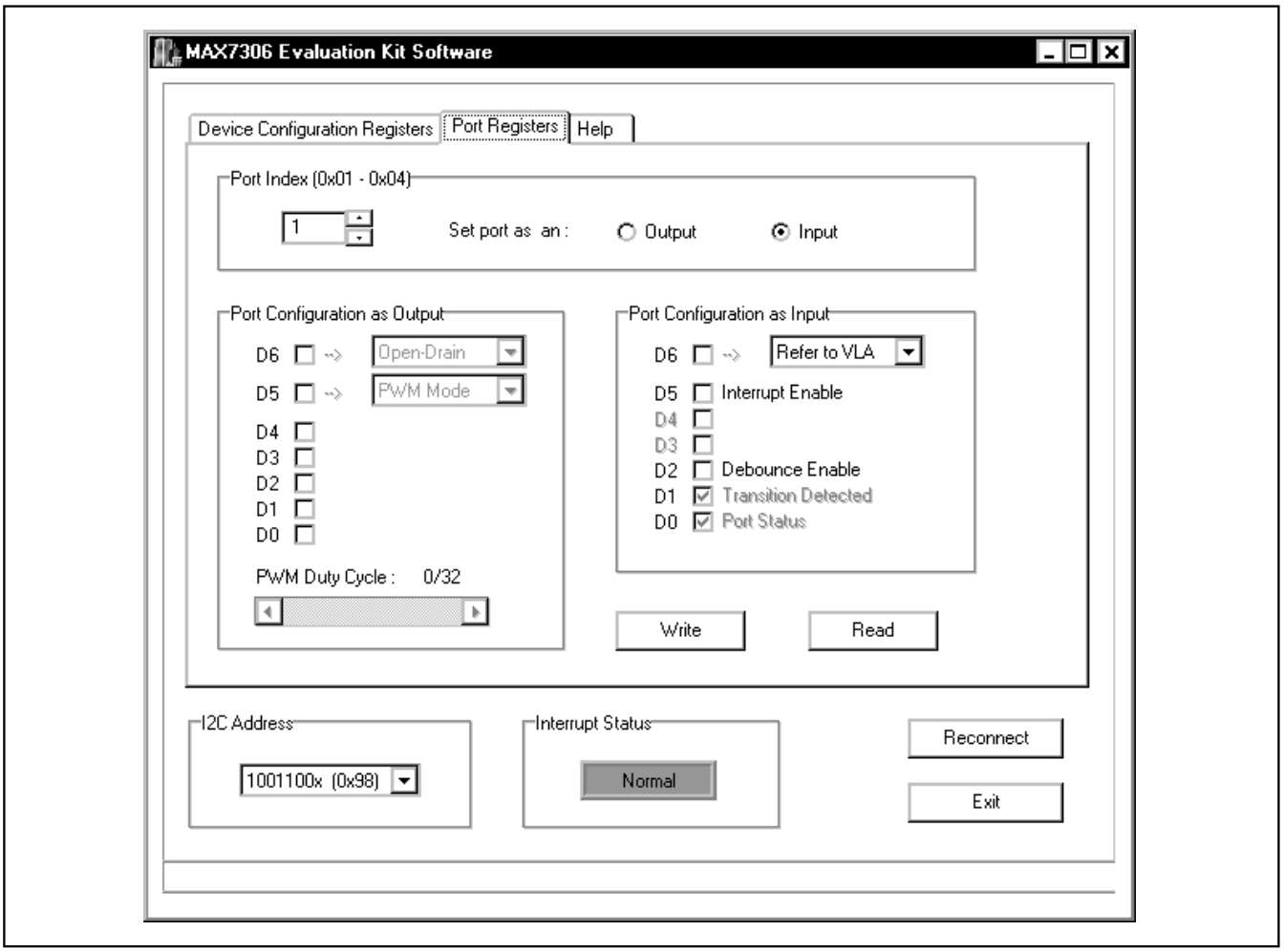


Figure 2. Port Registers Tab

Detailed Description of Software

To start the MAX7306 EV kit software, double-click the MAX7306 EV kit icon that is created during installation. The GUI main window appears as shown in Figure 1. The user will have to wait approximately 2s while the MAX7306 EV kit software connects to the CMAXQUSB board.

There are three tabs on the MAX7306 EV kit GUI window: **Device Configuration Registers**, **Port Registers**, and **Help**.

There are two group boxes on the MAX7306 EV kit GUI window: **I2C Address** and **Interrupt Status**.

There are two buttons on the MAX7306 EV kit GUI window: **Reconnect** and **Exit**.

Device Configuration Registers Tab

The **Device Configuration Registers** tab shown in Figure 1 contains two group boxes: **Register 0x26** and **Register 0x27**.

Press the **Read** button inside those two group boxes to read the current setting of the corresponding register. Select the desired setting and press the **Write** button to set the MAX7306's corresponding registers.

Port Registers Tab

The **Port Registers** tab shown in Figure 2 contains the **Port Index (0x01 - 0x04)** group box, **Port Configuration as Output** group box, **Port Configuration as Input** group box, and the **Read** and **Write** buttons.

The **Port Index (0x01 - 0x04)** group box selects the port to be configured; each port can be set as input or output.

Press the **Read** button to read the current device register setting and press the **Write** button to write the new setting to the port register.

Help Tab

The **Help** tab contains the MAX7306 EV kit software version and Maxim's website information.

I2C Group Box

The pulldown menu inside **I2C Address** group box autodetects the MAX7306's I²C slave address when the GUI software starts. If multiple devices are connected to the I²C bus, the user can use this pulldown menu to manually change the device's I²C slave address according to the shunt position of JU6, as shown in Table 1.

Table 1. I²C Address Configuration

JUMPER	SHUNT POSITION	I²C ADDRESS
JU6	1-2	1001101x (0x9A)
	1-3*	1001100x (0x98)
	1-4	1001110x (0x9C)
	1-5	1001111x (0x9E)

**Default position.*

Interrupt Status Group Box

The **Interrupt Status** group box shows the current status of the MAX7306 $\overline{INT}$ pin. It detects the latched transition of any port, when the port configured as an input and the interrupt enable bit is set.

Reconnect and Exit Buttons

Press the **Reconnect** button to reestablish the connection between the EV kit GUI software and MAX7306 EV kit hardware.

Press the **Exit** button to quit the MAX7306 EV kit GUI software.

_Detailed Description of Hardware

The MAX7306 is a 4-port level-translating GPIO with latching transition detection, blink, and PWM. The MAX7306 EV kit board provides a proven layout for evaluating the MAX7306. The EV kit comes with a MAX7306AUB+ installed.

Hardware Reset

Press pushbutton S2 to void current I²C transaction involving the MAX7306. It has the option of resetting the registers to power-up condition, resetting the PWM, and the blink-timing counter. Refer to the MAX7306 IC data sheet for more details on the Reset function.

I²C Address Configuration

The shunt position of jumper JU6 determines the I²C slave address of the MAX7306 EV kit. See Table 1 for appropriate settings.

Jumper Settings of I/O Ports Configuration

Jumpers JU2–JU5 are used to configure the MAX7306 I/O ports. Table 2 shows the detailed function of each jumper.

Table 2. Jumpers JU2–JU5 Configuration

JUMPER	SHUNT POSITION	DESCRIPTION
JU2	1-2*	P1 drives the white LED (D1).
	2-3	P1 function as $\overline{INT}$.
	Open	Use P1/INT pad to evaluate P1/$\overline{INT}$ pin.
JU3	1-2*	P2 drives the red LED of D2.
	Open	Use P2/OSCIN pad to evaluate P2/OSCIN pin.
JU4	1-2*	P3 drives the green LED of D2.
	Open	Use P3/OSCOUT pad to evaluate P3/OSCOUT pin.
JU5	1-2*	P4 drives the blue LED of D2.
	2-3	Use P4 as an input.
	Open	Use P4 pad to evaluate P4 pin.

**Default position.*

Power Supplies

The power supply for all LEDs must be powered by a user-supplied 1.4V to 5.5V power supply connecting to VLA. The MAX7306 can either be powered from the CMAXQUSB (2.5V or 3.3V) or from a user-supplied 1.62V to 3.6V power supply connecting to VCC, as shown in Table 3. If an external power supply is used, make sure that the supplied voltage is compatible with the CMAXQUSB JU1 setting.

Table 3. VDD Selection Configuration

JUMPER	SHUNT POSITION	DESCRIPTION
JU1	1-2	User-supplied 1.62V to 3.6V power supply (VCC)
	2-3*	Powered by CMAXQUSB

**Default position.*

User-Supplied I²C Interface

To use the MAX7306 EV kit with a user-supplied I²C interface, install the shunt on jumper JU1's 1-2 position and remove the CMAXQUSB board. Connect SDA, SCL, and GND lines from the user-supplied I²C interface to the SDA, SCL, and GND pads on the MAX7306 EV kit. Apply a 1.62V to 3.6V power supply to the VCC pad of the MAX7306 EV kit. Depending on the configuration of the user-supplied I²C interface, it may be necessary to install I²C pullup resistors R9 and R10.

Evaluate the MAX7307

Follow the steps below to evaluate the MAX7307:

1) Remove the MAX7306 IC and replace it with the MAX7307 IC on the board.
2) Ensure that the shunt of JU6 is in the 1-2 position.
3) Remove R7 and install a 0Ω resistor to R8.
4) Install a 0.1µF capacitor to C4.

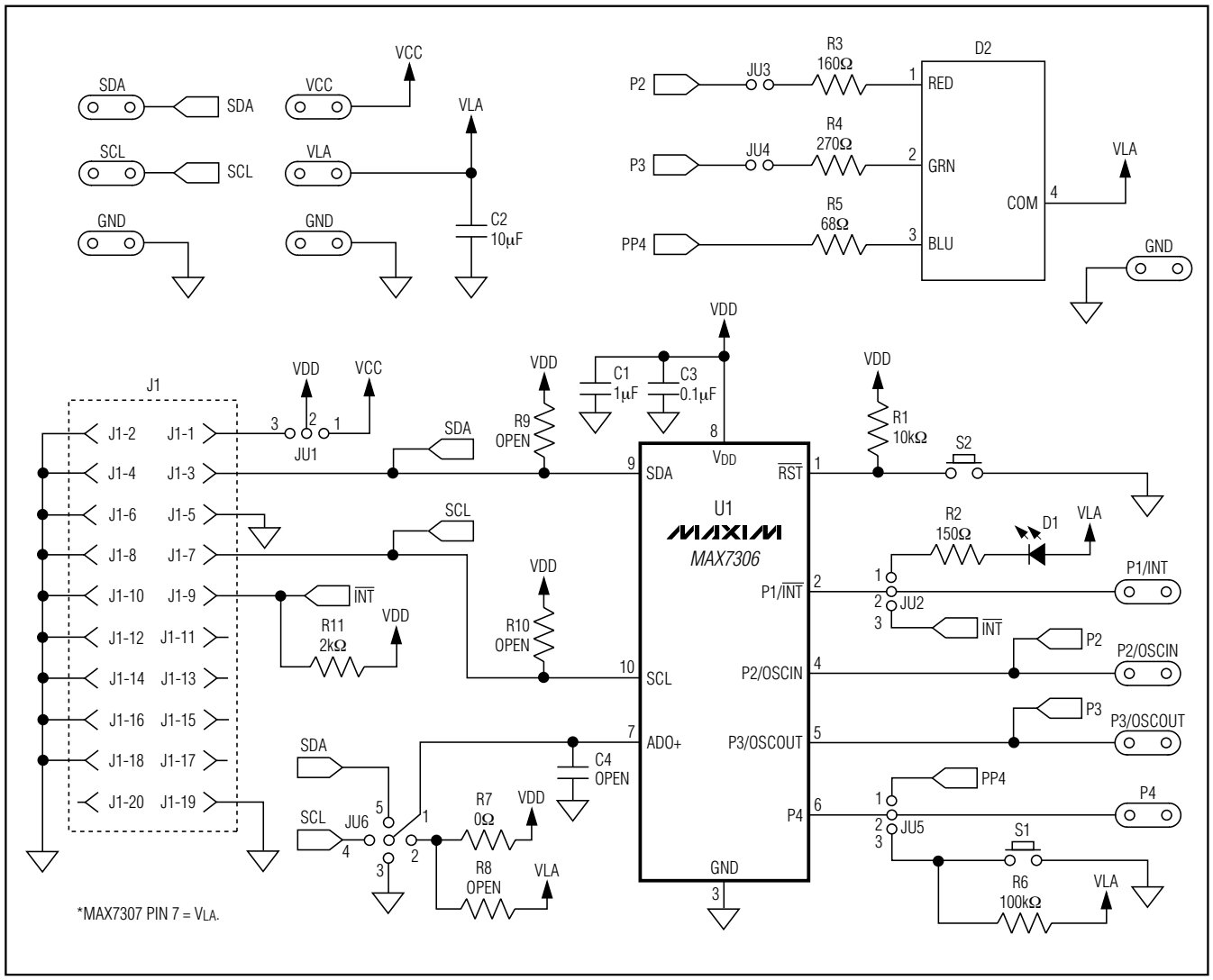


Figure 3. MAX7306 EV Kit Schematic

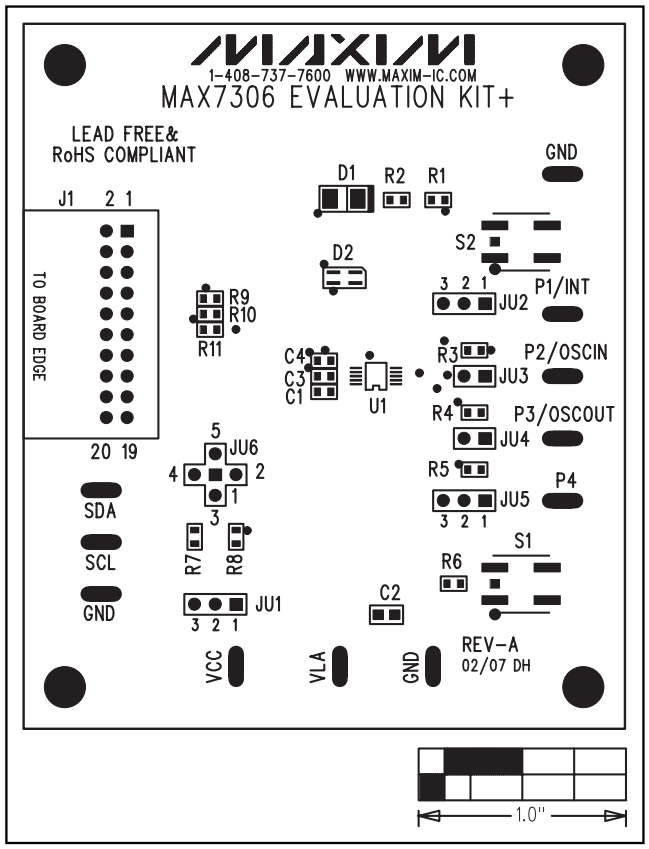


Figure 4. MAX7306 EV Kit Component Placement Guide—Component Side

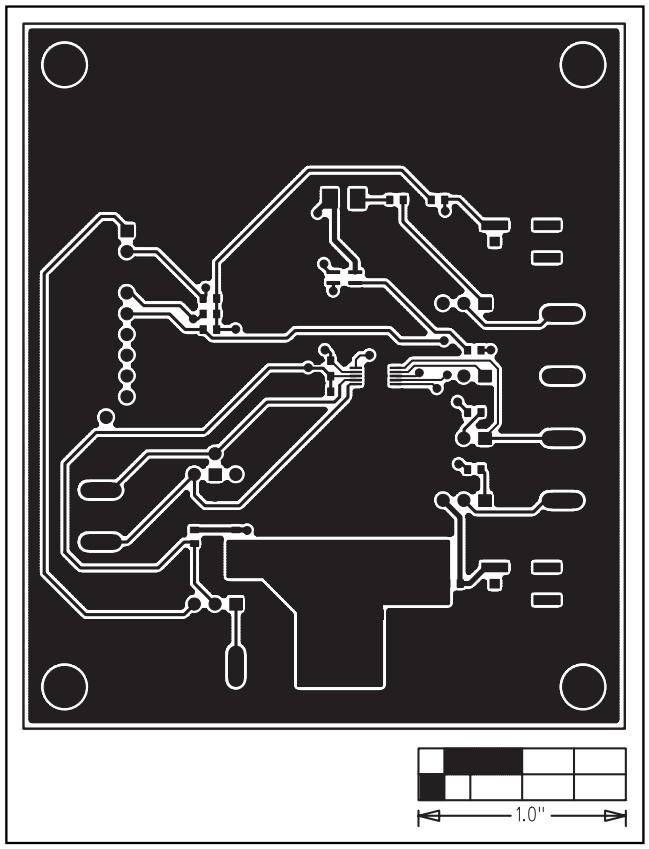


Figure 5. MAX7306 EV Kit PCB Layout—Component Side

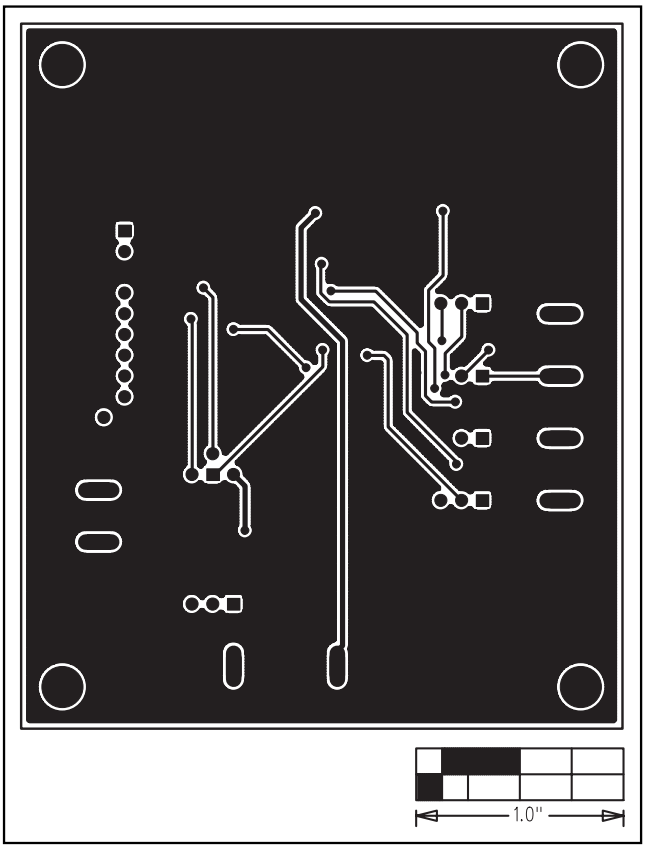


Figure 6. MAX7306 EV Kit PCB Layout—Solder Side

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