19-4555; Rev 0; 4/09

MAX9875 Evaluation Kit

Evaluates: MAX9875

General Description

The MAX9875 evaluation kit (EV kit) is an assembled and tested PCB that evaluates the MAX9875 IC. The MAX9875 is a Class D audio power amplifier and stereo DirectDrive® headphone amplifier communicating over a 2-wire I²C interface. The MAX9875 features user-defined input configuration, input gain, input source, output enable, volume control, and oscillator frequency-modulation modes. The user-defined features are programmed through the I²C-compatible serial interface, communicating at data rates up to 400kbps. The I²C data is sent through an on-board USB interface circuit using a computer or a user-supplied I²C bus.

The EV kit also features Windows® 2000/XP®- and Windows Vista®-compatible software that provides a user interface for exercising the MAX9875's features. The program is menu driven and offers a graphical user interface (GUI) complete with buttons, checkboxes, and track bars.

Features

- **2.7V to 5.25V Single-Supply Operation**
- **Proven Audio PCB Layout**
- **On-Board USB Interface Circuit Generates I²C-Compatible Signals**
- **USB-PC Connection (Cable Included)**
- **PCB Pads for User-Supplied I²C-Compatible Signals**
- **PCB Pads for Audio Input and Output Signals**
- **Evaluates the MAX9875ERP+ in a 2mm x 2.5mm, 20-Bump, (5 x 4) UCSP™ Package**
- **Windows 2000/XP- and Windows Vista (32-Bit)-Compatible Software**
- **Lead(Pb)-Free and RoHS Compliant**
- **Fully Assembled and Tested**

Ordering Information

PART	TYPE
MAX9875EVKIT+	EV Kit

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

Component List

DESIGNATION	QTY	DESCRIPTION
C1, C3–C10, C17	10	0.1µF ±10%, 16V X7R ceramic capacitors (0603) Murata GRM188R71C104K
C2, C13, C15	3	10µF ±20%, 6.3V X5R ceramic capacitors (0805) Murata GRM21BR60J106M
C11, C12	2	10pF ±5%, 50V C0G ceramic capacitors (0603) Murata GRM1885C1H100J
C14, C16, C21–C24	6	1µF ±10%, 10V X5R ceramic capacitors (0603) Murata GRM188R61A105K
C18, C19	2	22pF ±5%, 50V C0G ceramic capacitors (0603) Murata GRM1885C1H220J
C20	1	3300pF ±10%, 50V X7R ceramic capacitor (0603) Murata GRM188R71H332K
C25, C26, C27, C46	4	10pF ±5%, 50V C0G ceramic capacitors (0402) Murata GRM1555C1H100J
C28–C31, C39, C40, C41	7	1µF ±10%, 10V X5R ceramic capacitors (0402) Murata GRM155R61A105K
C32, C33	0	Not installed, capacitors (0603)
C34–C38	5	0.22µF ±10%, 10V X5R ceramic capacitors (0402) Murata GRM155R61A224K
C42, C43, C45	3	0.1µF ±10%, 10V X5R ceramic capacitors (0402) Murata GRM155R61A104K

DirectDrive is a registered trademark of Maxim Integrated Products, Inc.

Windows, Windows XP, and Windows Vista are registered trademarks of Microsoft Corp.

UCSP is a trademark of Maxim Integrated Products, Inc.

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.

MAX9875 Evaluation Kit

Component List (continued)

DESIGNATION	QTY	DESCRIPTION
C44	1	33µF ±10%, 10V tantalum capacitor (C case) AVX TAJC336K010R
D1	1	Green LED (0603)
FB1, FB6, FB7	0	Not installed, ferrite beads—short (PC trace) (0603)
FB2–FB5, FB8	5	250mA ferrite beads—short (PC trace) (0402) Murata BLM15HD102SN1
FB9	1	2A ferrite bead (0805) Murata BLM21PG221SN1
HPJK	1	3.5mm stereo headphone jack, SMT, 4 positions, switched
HPL, HPR, TP1–TP4	0	Not installed, test points
JU1–JU5	5	2-pin headers
JU6	1	3-pin header
L1, L2	0	Not installed, inductors TOKO A916CY-220M (provided with EV kit)
OUT-	1	Test point, black
OUT+	1	Test point, red
P1	1	USB type-B right-angle male receptacle
R1	1	0Ω ±5% resistor (0603)
R2	1	220Ω ±5% resistor (0603)
R3	1	10kΩ ±5% resistor (0603)
R4	1	2.2kΩ ±5% resistor (0603)
R5	1	1.5kΩ ±5% resistor (0603)
R6, R7	2	27Ω ±5% resistors (0603)
R8–R11	4	2kΩ ±5% resistors (0603)
R12, R13	2	22Ω ±5% resistors (0603)
R14	1	0Ω ±5% resistor (0402)
U1	1	Speaker and headphone amplifier (20 UCSP) Maxim MAX9875ERP+
U2	1	32-bit microcontroller (68 QFN-EP*) Maxim MAXQ2000-RAX+
U3	1	93C46 type 3-wire EEPROM (8 SO)
U4	1	UART-to-USB converter (32 TQFP)
U5	1	3.3V regulator (5 SC70) Maxim MAX8511EXK33+T (Top Mark: AEI)
U6	1	2.5V regulator (5 SC70) Maxim MAX8511EXK25+T (Top Mark: ADV)
U7, U8	2	Low-voltage level translators (10 µMAX®) Maxim MAX1840EUB+
Y1	1	16MHz crystal (HCM49) Hong Kong X'tals SSM1600000E18FAF
Y2	1	6MHz crystal (HCM49) Hong Kong X'tals SSL6000000E18FAF
—	6	Shunts
—	1	USB high-speed A-to-B cable, 6ft
—	1	PCB: MAX9875 EVALUATION KIT+

**EP = Exposed pad.*

Component Suppliers

SUPPLIER	PHONE	WEBSITE
AVX Corporation	8430-946-0238	www.avxcorp.com
Hong Kong X'tals Ltd.	+852-35112388	www.hongkongcrystal.com
Murata Electronics North America, Inc	770-436-1300	www.murata-northamerica.com
TOKO America, Inc.	800-745-8656	www.tokoam.com

Note: *Indicate that you are using the MAX9875 when contacting these component suppliers.*

µMAX is a registered trademark of Maxim Integrated Products, Inc.

MAX9875 EV Kit Software Files

FILE	DESCRIPTION
INSTALL.EXE	Installs the EV kit files on the computer
MAX9875.EXE	Application program
FTD2XX.INF	USB driver file
UNINST.INI	Uninstalls the EV kit software
USB_Driver_Help.PDF	USB driver installation help file

Quick Start

Required Equipment

- MAX9875 EV kit (USB cable included)
- User-supplied Windows 2000/XP or Windows Vista PC with a spare USB port
- 2.7V to 5.25V, 1.25A DC power supply
- One stereo audio source
- One speaker
- One pair of headphones

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 MAX9875 EV kit is fully assembled and tested. Follow the steps below to verify board operation. **Caution: Do not turn on the power supply until all connections are completed.**

1) Visit **www.maxim-ic.com/evkitsoftware** to download the latest version of the EV kit software, 9875Rxx.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 no shunt is installed on jumpers JU1 and JU2. This enables the INA2 and INB2 inputs to the MAX9875.
4) Verify that a shunt is installed on jumpers JU3 and JU4. This configures the I^2C input pins to receive signals from the USB interface circuit.
5) Verify that no shunt is installed on jumper JU5 (MAX9875 enabled).
6) Verify that a shunt is installed on pins 1-2 of jumper JU6. This configures the I^2C logic level to match the MAX9875 power supply.
7) Connect the audio source outputs to the INA1 and INA2 PCB pads.
8) Connect the audio source ground to a GND PCB pad.
9) Connect the speaker across the OUT+ and OUT- test points.
10) Connect the headphone to the HPJK stereo headphone jack.
11) Connect the power supply across the VDD and GND PCB pads.
12) Turn on the power supply and set the supply voltage to 3.7V.
13) Connect the USB cable from the PC to the EV kit board. A **New Hardware Found** window pops up when installing the USB driver for the first time. If you do not see a window 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.
14) 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\MAX9875** (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 for additional information.
15) Start the MAX9875 EV kit software by opening its icon in the **Start | Programs** menu.

MAX9875 Evaluation Kit

16) Observe as the program automatically detects the address of the MAX9875 and starts the main program. After successful connection, the EV kit software main window appears in the upper-left corner of the window, as shown in Figure 1.

17) The MAX9875 EV kit is ready for additional testing.

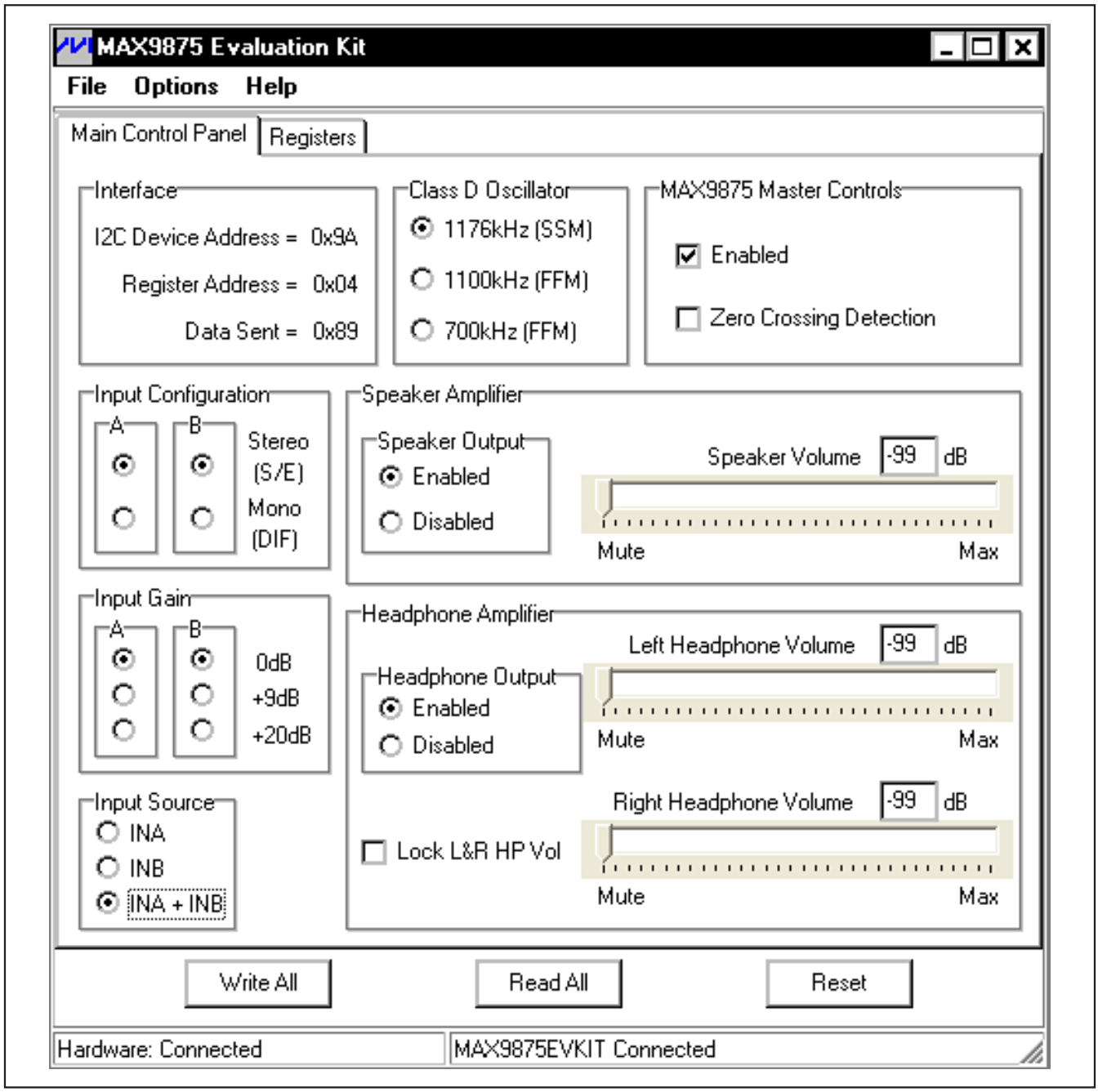


Figure 1. MAX9875 Evaluation Kit Software Main Control Panel

Detailed Description of Software

Graphical User Interface (GUI)

The MAX9875 EV kit software GUI screenshots (Figures 1 and 2) are windows that provide a convenient means to control the MAX9875. Figure 1 is the MAX9875 EV kit software's main control panel, while Figure 2 is the registers read-only panel. Use the mouse or press the tab key to navigate through the GUI controls. The correct I^2C write operation is generated to update the MAX9875 internal memory registers when any of these controls are executed.

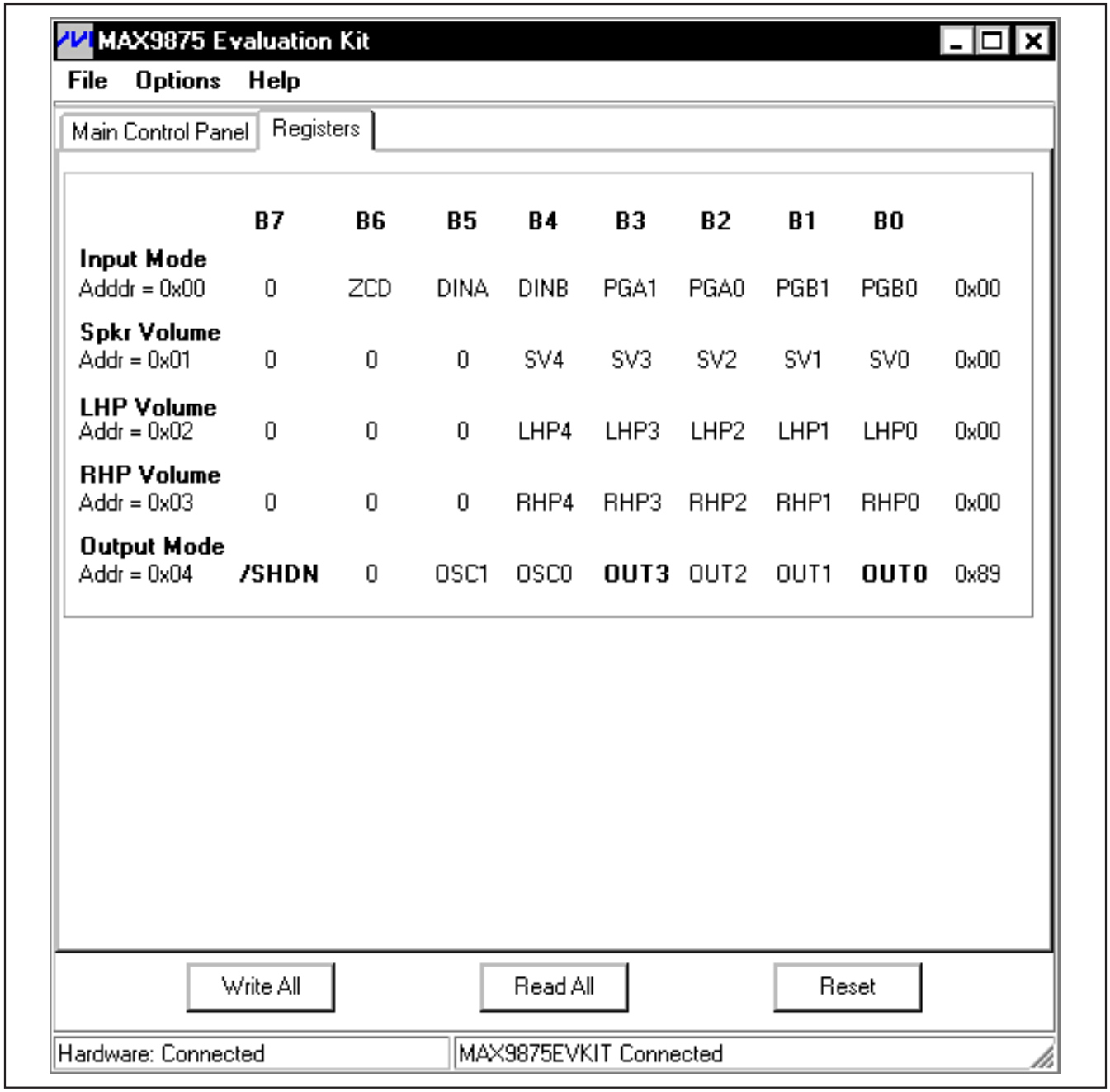


Figure 2. MAX9875 Evaluation Kit Software Read-Only Registers

MAX9875 Evaluation Kit

The MAX9875 EV kit software **Main Control Panel** tab sheet (Figure 1) divides the EV kit functions into logical blocks. The **Interface** group box displays U1 **I2C Device Address**, **Register Address**, and **Data Sent** indicators. This data is used to confirm proper device operation. The **Class D Oscillator** group box controls and displays the oscillator frequency. The **MAX9875 Master Controls** group box provides the main controls for the MAX9875 IC. The **Input Configuration**, **Input Gain**, and **Input Source** group boxes configure the input configurations for the MAX9875 EV kit inputs. The **Speaker Amplifier** and **Headphone Amplifier** group boxes configure the output and control the volume of the speaker and headphone connected to the MAX9875 EV kit. The blank space above the status bar displays error messages, warnings, and/or suggestions for proper operation. The bottom-left status bar of the main window provides the USB interface circuit communication status. The bottom-right status bar indicates the presence or absence of the MAX9875 device.

The MAX9875 EV kit software **Registers** tab sheet (Figure 2) displays the logic-level status for each individual register's data bits. A data bit shown in **bold** indicates a logic-high, while nonbold data bits indicate a logic-low. Refer to the MAX9875 IC data sheet for detailed information on registers and data bits.

Software Startup

Upon software startup, the MAX9875 EV kit software automatically searches for the USB interface circuit connection and then for the MAX9875 device address. The MAX9875 EV kit enters the normal operating mode when the USB connection is detected and has found the device address. The **Class D Oscillator** is set to **1176kHz (SSM)**. The **MAX9875 Master Controls** enable the EV kit. By default, the **Input Configuration** is set to **Stereo (S/E)**. The **Input Gain** is set to **0dB** and the **Input Source** is set to **INA + INB**. The **Speaker Amplifier** and **Headphone Amplifier** are enabled, with volume controls set to **-99dB** (**Mute**). If the USB connection is not detected, the software prompts the user to retry, exit the program, or enter the demo mode.

Demo Mode

The MAX9875 EV kit software enters the demo mode when the USB connection is not detected or by selecting the **Options | Demo Mode** menu item in the main window. 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. If the USB cable is connected to the EV kit, but power is not applied to VDD, the EV kit GUI acts like it is in demo mode. In such a case, the EV kit is connected to the PC through USB and I^2C commands can be sent to the on-board MAX9875, but without power, the MAX9875 does not acknowledge the I^2C commands. When power is applied, press the **Reset** button to detect the presence of the MAX9875.

Write All/Read All/Reset

The **Write All** button writes to all registers the current settings on the GUI. The EV kit software GUI performs I^2C write commands as changes occur in the GUI. The **Read All** button changes the GUI settings to match the MAX9875 register settings. To change settings one time, enter demo mode by selecting the **Options | Demo Mode** menu item, change the GUI to the required settings, exit demo mode by selecting **Options | Demo Mode**, and then press the **Write All** button. If further changes are not required, enter demo mode to disable communication to the MAX9875. The EV kit software GUI can change its settings and nothing will be programmed to the MAX9875. To obtain the MAX9875 settings, exit demo mode and press the **Read All** button. The **Reset** button clears the EV kit software GUI and reprograms the MAX9875 to the default values.

Class D Oscillator

The software's **Class D Oscillator** group box (Figure 1) selects the frequency modulation scheme for the MAX9875 EV kit. The MAX9875's Class D oscillator can operate in one of three frequency modulation modes, **1176kHz (SSM)** spread-spectrum modulation, **1100kHz (FFM)** fixed-frequency modulation, or **700kHz (FFM)**.

MAX9875 Master Controls

The software's **MAX9875 Master Controls** group box contains functions that control the MAX9875 EV kit. The **Enabled** checkbox enables or disables the MAX9875 EV kit. The **Zero Crossing Detection** checkbox enables or disables the zero-crossing detection (ZCD) during a volume-change operation. When enabled, the ZCD forces all volume adjustments to be made when the output signal is crossing zero, thus reducing audio clicks during volume changes.

The **Reset** button resets the software to the following conditions: **Class D Oscillator** set to **1176kHz (SSM)**, **MAX9875 Master Controls** set to **Enabled**, **Input Configuration** channels **A** and **B** set to **Stereo (S/E)**, **Input Gain** channels **A** and **B** set to **0dB**, **Input Source** set to **INA + INB**, **Speaker Output** set to **Enabled**, **Speaker Volume** set to **-99dB** (**Mute**), **Headphone Output** set to **Enabled**, and **Left Headphone Volume** and **Right Headphone Volume** set to **-99dB** (**Mute**).

Input Configuration

The MAX9875 EV kit software's **Input Configuration** group box configures the input channels for the MAX9875 EV kit. The MAX9875 EV kit accepts a pair of single-ended audio inputs for stereo-mode operation, or a pair of differential audio inputs for mono-mode operation. The MAX9875 single-ended input signals for the headphone are defined as IN_1 = left and IN_2 = right. The single-ended input signal for the speaker is defined as IN_1 + IN_2. The differential input signal is defined as IN_diff = IN_2 - IN_1 for both headphone and speaker. Select the **Stereo (S/E)** radio button for single-ended stereo mode, or the **Mono (DIF)** radio button for differential mono mode.

Input Gain and Input Source

The MAX9875 EV kit software's **Input Gain** group box selects the input channel preamplifier gain for the MAX9875. The MAX9875 input channel preamplifier gain is selectable between **0dB**, **+9dB**, or **+20dB**. Select the respective radio button for the desired input channel preamplifier gain setting.

The MAX9875 EV kit software's **Input Source** group box selects the audio source for the MAX9875. The MAX9875 accepts input from channels **INA**, **INB**, or **INA + INB**. Select the respective radio button for the desired input channel.

Speaker Amplifier

The MAX9875 EV kit software's **Speaker Amplifier** group box contains the **Speaker Output** group box, and the **Speaker Volume** track bar and edit box. The **Speaker Output** group box enables or disables the speaker output. The **Speaker Volume** track bar and edit box set the speaker volume.

Select the **Enabled** or **Disabled** radio buttons to enable or disable the speaker amplifier on the MAX9875 EV kit.

The **Speaker Volume** track bar sets the speaker amplifier volume between **-99dB** (**Mute**) to **0dB** (**Max**). Similarly, the **Speaker Volume** edit box accepts a numerical value from **-99** (**Mute**) to **0** (**Max**) to control the speaker amplifier volume.

Headphone Amplifier

The MAX9875 EV kit software's **Headphone Amplifier** group box contains the **Headphone Output** group box, the **Left Headphone Volume** and **Right Headphone Volume** track bars and edit boxes, and the **Lock L&R HP Vol** checkbox. The **Headphone Output** group box enables or disables headphone outputs. The **Left Headphone Volume** and **Right Headphone Volume** track bars and edit boxes set the headphone volume.

Select the **Enabled** or **Disabled** radio buttons to enable or disable the headphone amplifier on the MAX9875 EV kit.

The **Left Headphone Volume** and **Right Headphone Volume** track bars set the left and right headphone volume, respectively, between **-99dB** (**Mute**) to **0dB** (**Max**). Similarly, the **Left Headphone Volume** and **Right Headphone Volume** edit boxes accept numerical values from **-99** (**Mute**) to **0** (**Max**) to control the left and right headphone volume, respectively.

Select the **Lock L&R HP Vol** checkbox to lock the **Left Headphone Volume** and **Right Headphone Volume** track bars. When the **Lock L&R HP Vol** checkbox is selected, both **Left Headphone Volume** and **Right Headphone Volume** track bars move simultaneously when either track-bar position is changed.

Interface and I²C Bus Speed Indicator

The MAX9875 EV kit software's **Interface** group box displays the MAX9875's **I2C Device Address**, **Register Address**, and the last **Data Sent**.

The **I2C Device Address** indicator in the MAX9875 EV kit software **Interface** group box displays the MAX9875 I²C device address. The MAX9875 I²C device address is internally set to **0x9A**.

The **Register Address** indicator in the MAX9875 EV kit software **Interface** group box displays the last command sent from the master (software) to the MAX9875. Refer to the MAX9875 IC data sheet for additional information.

The **Data Sent** indicator in the MAX9875 EV kit software **Interface** group box displays the last data sent from the master (software) to the MAX9875. Refer to the MAX9875 IC data sheet for additional information.

The MAX9875's I²C bus speed defaults to 400kbps at software startup. The MAX9875 I²C bus speed is selectable between 400kbps or 100kbps. The MAX9875 I²C bus speed can be changed at any time by selecting the **Options | I2C Bus Speed** pulldown menu item in the main window.

Keyboard Navigation

Press the Tab key to select each GUI control. Most of the selected controls are indicated by a dotted outline. Using Shift+Tab moves the selection to the previously selected control. Buttons respond to the keyboard's Space bar. Some controls respond to the keyboard 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. When the Alt key is pressed and released, most menu items show one letter underlined, indicating their shortcut key.

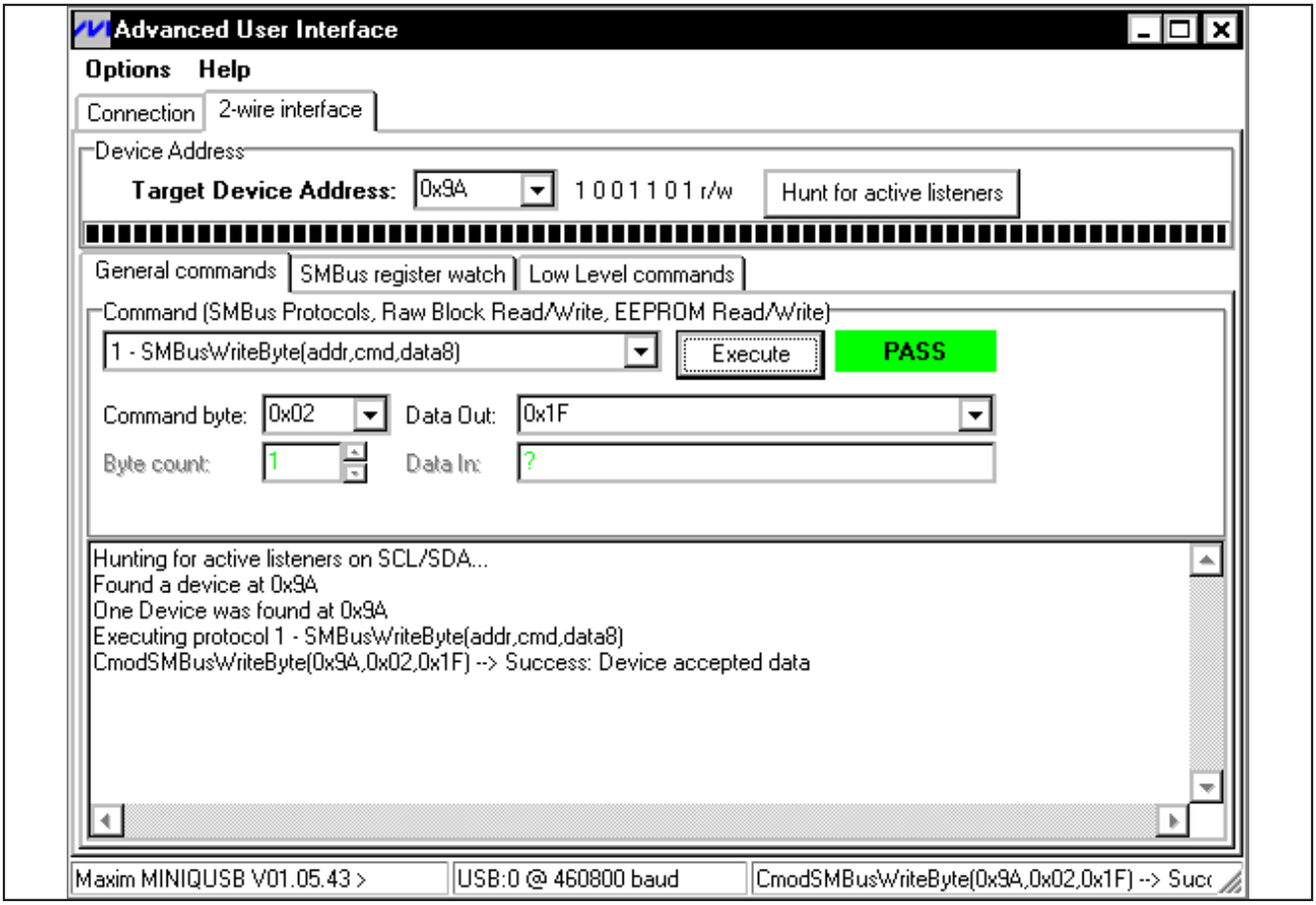


Figure 3. Simple Low-Level 2-Wire Interface

Simple I²C Commands

There are two methods for communicating with the MAX9875 EV kit, through the **Main Control Panel** (Figure 1) or by using low-level SMBus™ commands available through the **2-wire interface** (Figure 3) utility from the main program's **Options | Interface (Advanced Users)** main menu. A window is displayed that allows I²C operations, such as **SMBusReadByte** and **SMBusWriteByte**. Do not use the **SMBusReadByte** operation because the MAX9875 does not send data to the master.

Note: The I²C dialog boxes accept numeric data in binary, decimal, or hexadecimal. Hexadecimal numbers must be prefixed by 0x. Binary numbers must be exactly eight binary digits. See Figure 3 for an example of this tool. Figure 3 shows a simple SMBus write-byte operation using the included **2-wire interface** diagnostics tool. In this example, the software is writing data **0x1F** to the register address **0x01** (speaker volume) to the device with the **Target Device Address 0x9A**. The data sequence sets the MAX9875 speaker volume to 0dB (max).

Refer to Application Note 476: *Comparing the I²C Bus to the SMBus*, available on the Maxim website, for information and a comparison of the I²C bus and SMBus protocols.

General Troubleshooting

Problem: Software reports it cannot find the interface circuit.

- Is the interface circuit power LED lit?
- Is the USB cable connected?

SMBus is a trademark of Intel Corporation.

- 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, delete it—this forces plug-and-play to try again.
- Are jumpers JU3–JU6 properly configured?

Detailed Description of Hardware

The MAX9875 EV kit evaluates the MAX9875 IC, a Class D audio power amplifier and stereo DirectDrive headphone amplifier that communicates over I²C. The Class D audio power amplifier is capable of driving 725mW into an 8Ω speaker. The stereo headphone amplifier is capable of driving 53mW per channel into a pair of 16Ω stereo headphones. The EV kit demonstrates the MAX9875 features, such as user-defined input configuration, input gain, input source, output enable, volume control, and oscillator frequency-modulation schemes. The EV kit's on-board I²C-compatible serial interface communicates at data rates up to 400kbps to program the MAX9875.

The EV kit uses a MAX9875 IC in a 20-bump (5 x 4) UCSP package on a proven four-layer PCB design. The MAX9875 EV kit operates from a 2.7V to 5.25V DC power supply that provides at least 1.25A. The MAX1840 logic-level translators (U7, U8) provide proper I²C interface operation for the EV kit to operate in the 2.7V to 5.25V power-supply range.

Filterless Output

The MAX9875 EV kit's filterless outputs (OUT+, OUT-) can be connected directly to a speaker load without any filtering. Use the OUT+ and OUT- test points to connect a speaker directly to the MAX9875 outputs using twisted-pair cable. For maximum efficiency, do not install inductors L1 and L2.

Filtered Output

Audio analyzers typically cannot accept PWM signals at their inputs. Therefore, the MAX9875 EV kit features a pair of lowpass filters at the output to ease evaluation. To use the filtering output pads (FOUT+, FOUT-), install inductors L1 and L2 (provided separately with the EV kit), connect the load between FOUT+ and FOUT-, and connect the filtered output to the audio analyzer. The default lowpass filters at the EV kit output are optimized for an 8Ω speaker.

Output Filtering Requirements

- To ease evaluation, MAX9875 EV kits are shipped with inductor-based output filters, with inductors L1 and L2 provided separately with the EV kit. However, ferrite-bead filters (FB6, FB7, C32, and C33) should be used when EMC testing.
- The ferrite-bead filter component selections are dependent on speaker-wire length and are determined during EMC testing.
- To install the ferrite-bead filters, first cut open the PCB traces between FB6 and FB7. Then install the ferrite-bead filtering components FB6, FB7, C32, and C33. The speaker wires should be connected to the OUT+ and OUT- test points using twisted-pair cables.

Jumper Selection

Single-Ended/Differential Audio Inputs

The MAX9875 EV kit features an option to select between stereo single-ended, mono single-ended, or mono differential mode for the audio inputs. The MAX9875 EV kit software allows the selection between stereo single-ended and mono differential inputs. Jumpers JU1 and JU2 are used to select mono single-ended mode. Table 1 lists the selectable jumper options.

Table 1. JU1, JU2 Jumper Selection (INA1, INA2, INB1, INB2)

AUDIO INPUT MODE	JUMPER	SHUNT POSITION	AUDIO INPUTS	SOFTWARE SETTING
Stereo Single-Ended	JU1	Not installed*	INA1/INB1 (Left) INA2/INB2 (Right)	Single-Ended
	JU2			
Mono Differential	JU1	Not installed*	INA1/INB1 (Negative) INA2/INB2 (Positive)	Differential
	JU2			
Mono Single-Ended	JU1	Installed	INA1/INB1 (Signal) INA2/INB2 (AC GND)	Differential
	JU2			

**Default position.*

MAX9875 Evaluation Kit

I²C Clock and Data Inputs

The MAX9875 features clock and data input pins for I²C-compatible communication to control the MAX9875 features. The clock and data pins can be driven by the on-board USB interface circuit or by the PCB pads, along with the user-supplied external I²C-compatible controller. An external I²C-compatible controller can be connected to the SCL, SDA, and GND pads to communicate with the MAX9875 IC.

Jumpers JU3 and JU4 select the I²C serial interface signal-control sources for the MAX9875 IC. Table 2 lists the various options for configuring I²C input signal controls.

Table 2. JU3, JU4 Jumper Functions (SCL, SDA)

SHUNT POSITION	I²C INTERFACE CONTROL SIGNALS CONNECTED TO	I²C INTERFACE SIGNALS CONTROLLED BY
Installed*	USB interface circuit	USB interface circuit and EV kit software
Not installed	PCB pads	User-supplied external I²C interface signals

**Default position.*

Bias

The MAX9875 EV kit circuit features a jumper (JU5) that pulls the MAX9875 BIAS pin to ground to initiate shutdown for the MAX9875 IC. Table 3 shows the jumper options for jumper JU5 on the MAX9875 EV kit. Refer to the *Shutdown Mode* section in the MAX9875 IC data sheet for additional information on the BIAS pin.

Table 3. JU5 Jumper Function (SHDN)

SHUNT POSITION	MAX9875 BIAS PIN CONNECTED TO	EV KIT FUNCTION
Not installed*	1.2V (internally pulled up to common-mode bias)	EV kit enabled
Installed	GND (through resistor R14)	Shutdown initiated

**Default position.*

MAX9875 I²C Signal Pullup Voltage Level

The MAX9875 EV kit circuit features an option to select the pullup voltage level for the I²C signals for the MAX9875 IC. Jumper JU6 selects the I²C signal's pullup voltage level of the MAX9875 IC. The MAX9875 I²C signals can be pulled up to the EV kit's input power VDD or to a user-supplied external DC power supply connected across the VDDIO and GND PCB pads. The external VDDIO power supply can range from 1.7V to 3.6V. Table 4 shows the selectable jumper options for jumper JU6 on the MAX9875 EV kit.

Table 4. JU6 Jumper Function (VDDIO)

SHUNT POSITION	I²C SIGNALS PULLED UP TO	VOLTAGE RANGE
1-2*	VDD	2.7V to 5.25V
2-3	VDDIO (external DC power supply)	1.7V to 3.6V

**Default position.*

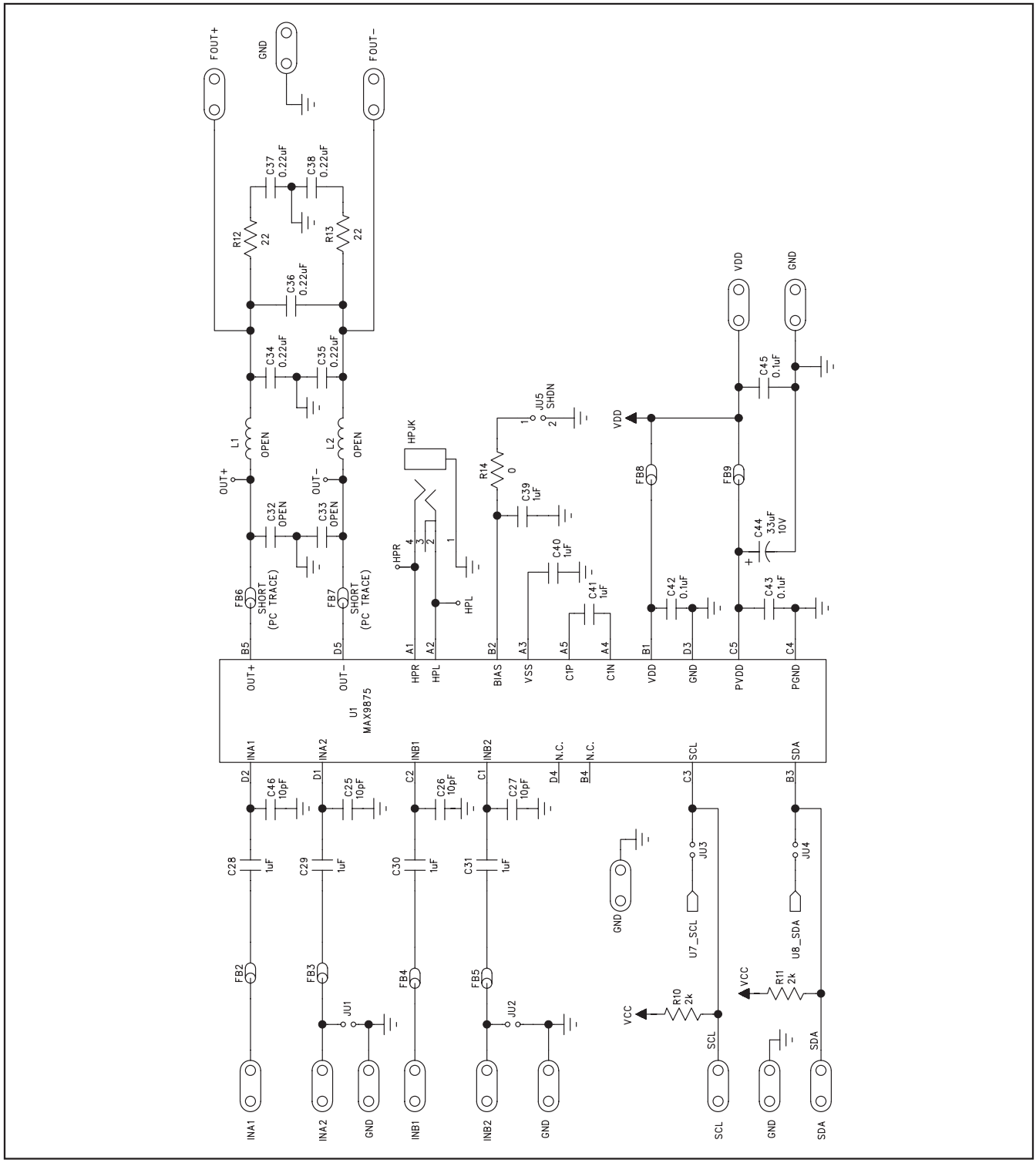


Figure 4a. MAX9875 EV Kit Schematic (Sheet 1 of 2)

MAX9875 Evaluation Kit

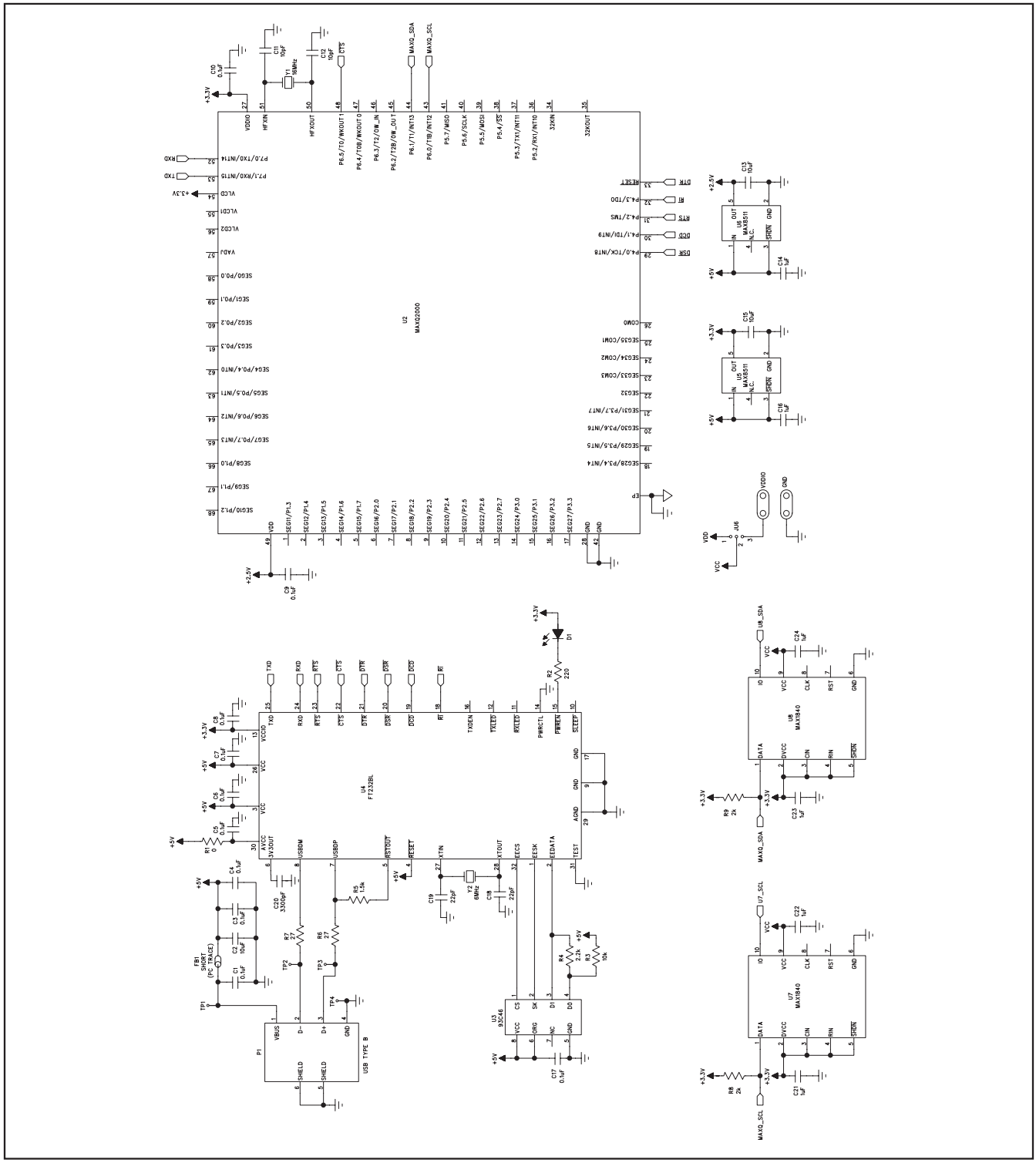


Figure 4b. MAX9875 EV Kit Schematic (Sheet 2 of 2)

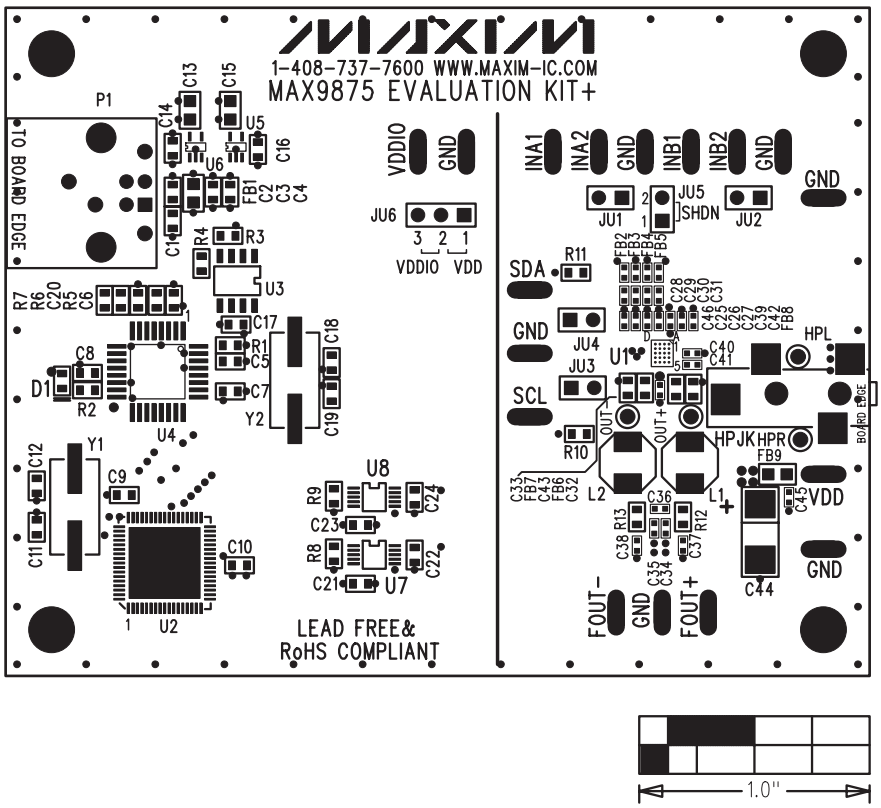


Figure 5. MAX9875 EV Kit Component Placement Guide—Component Side

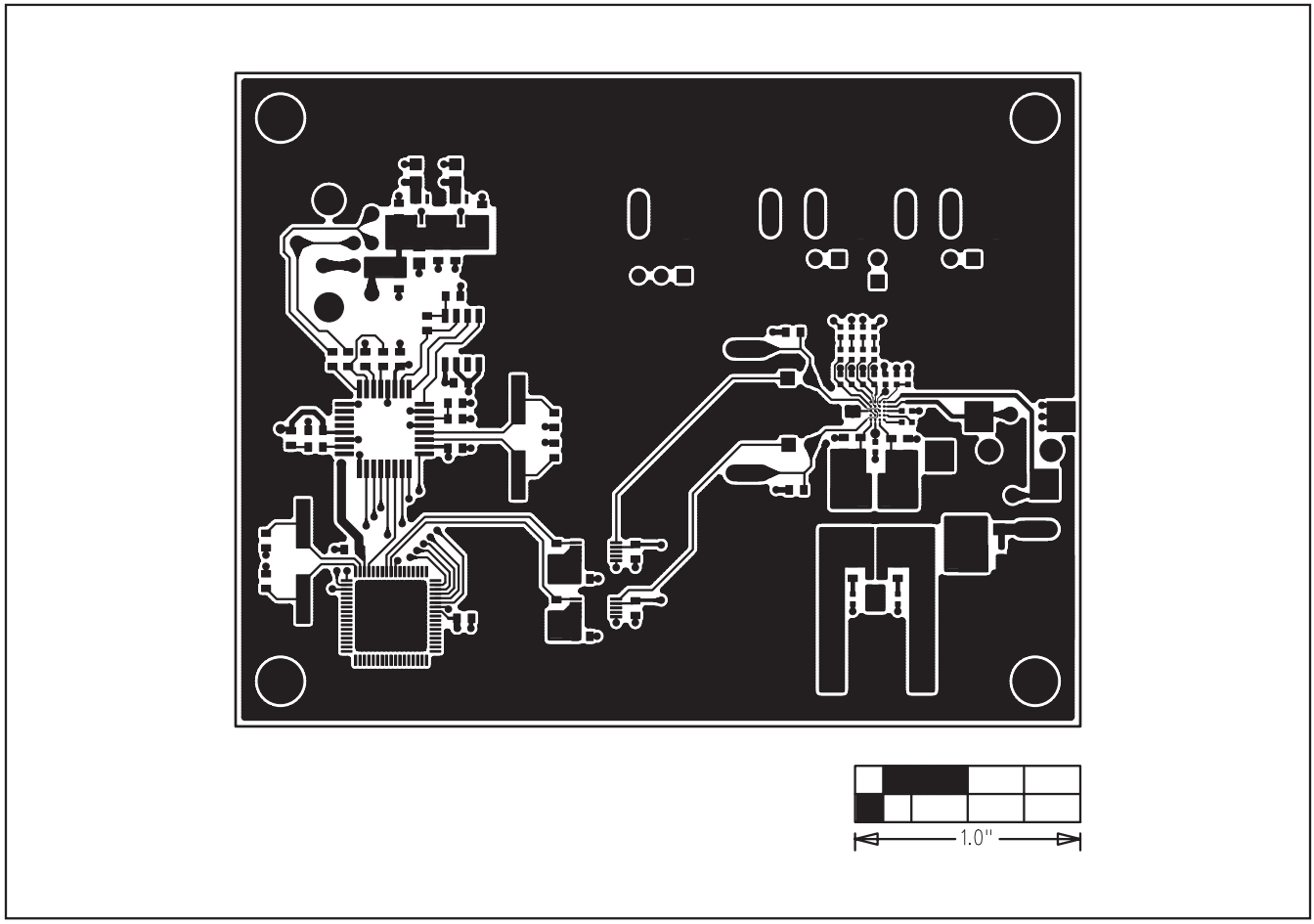


Figure 6. MAX9875 EV Kit PCB Layout—Component Side

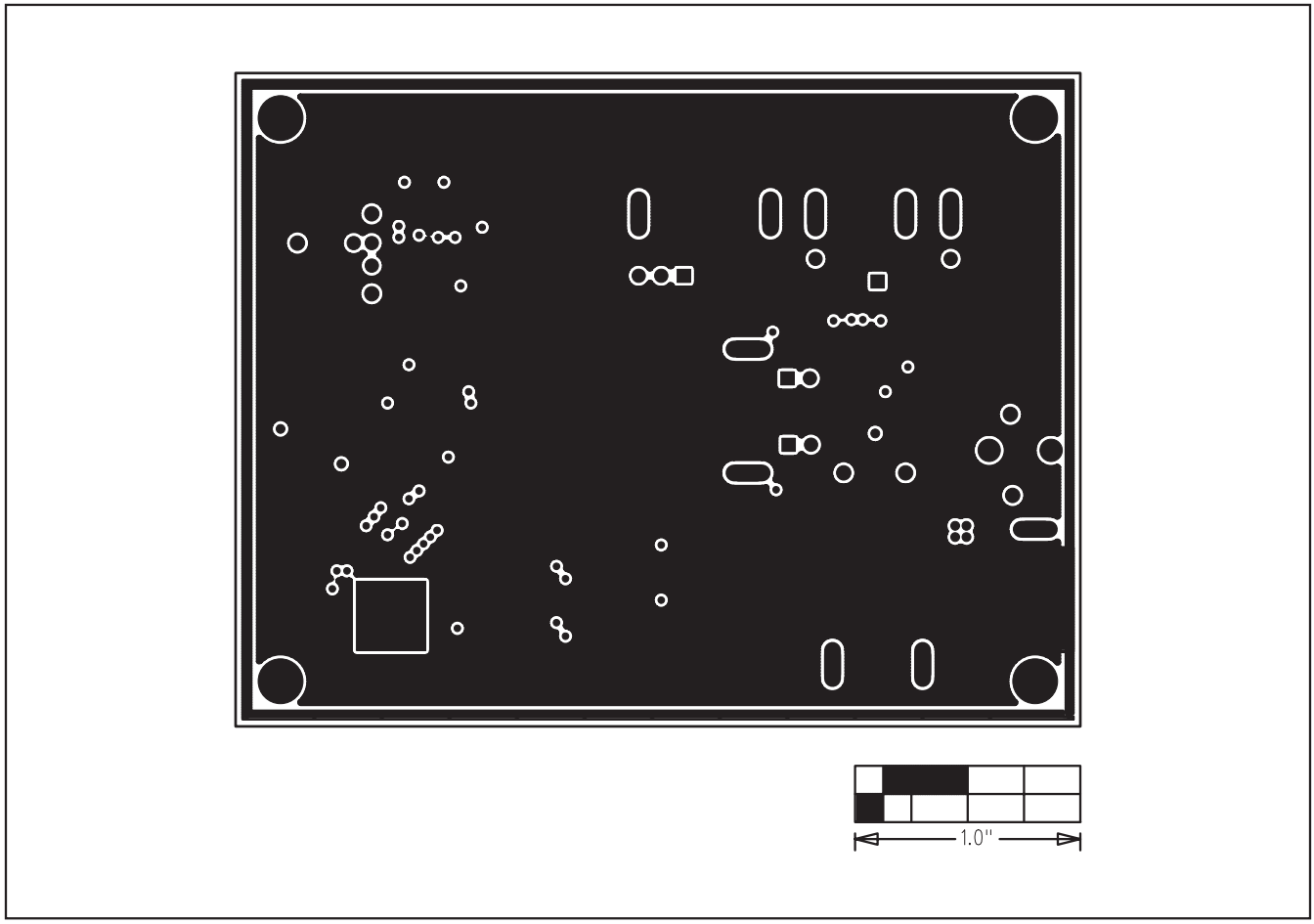


Figure 7. MAX9875 EV Kit PCB Layout—GND Layer 2

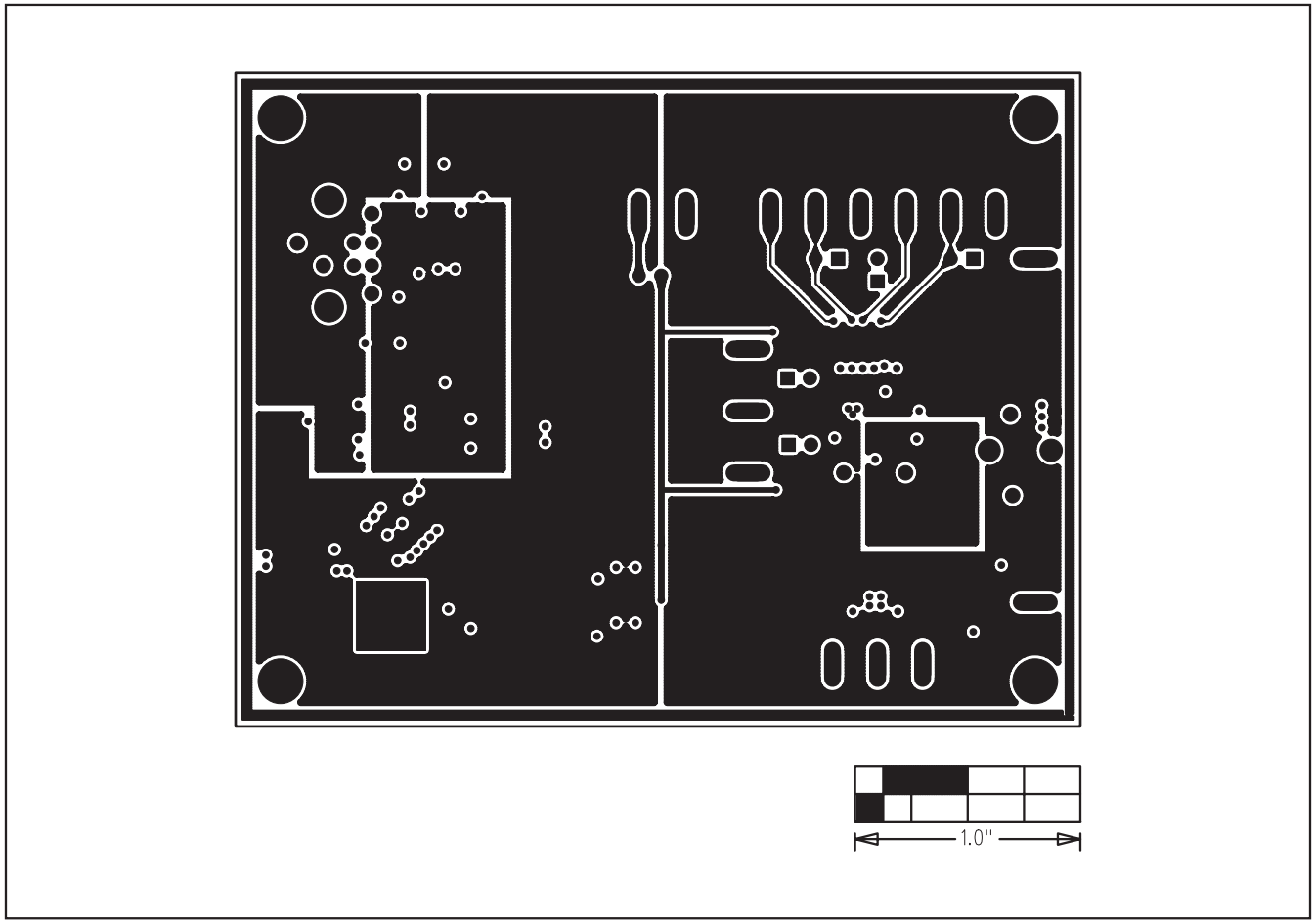


Figure 8. MAX9875 EV Kit PCB Layout—PWR Layer 3

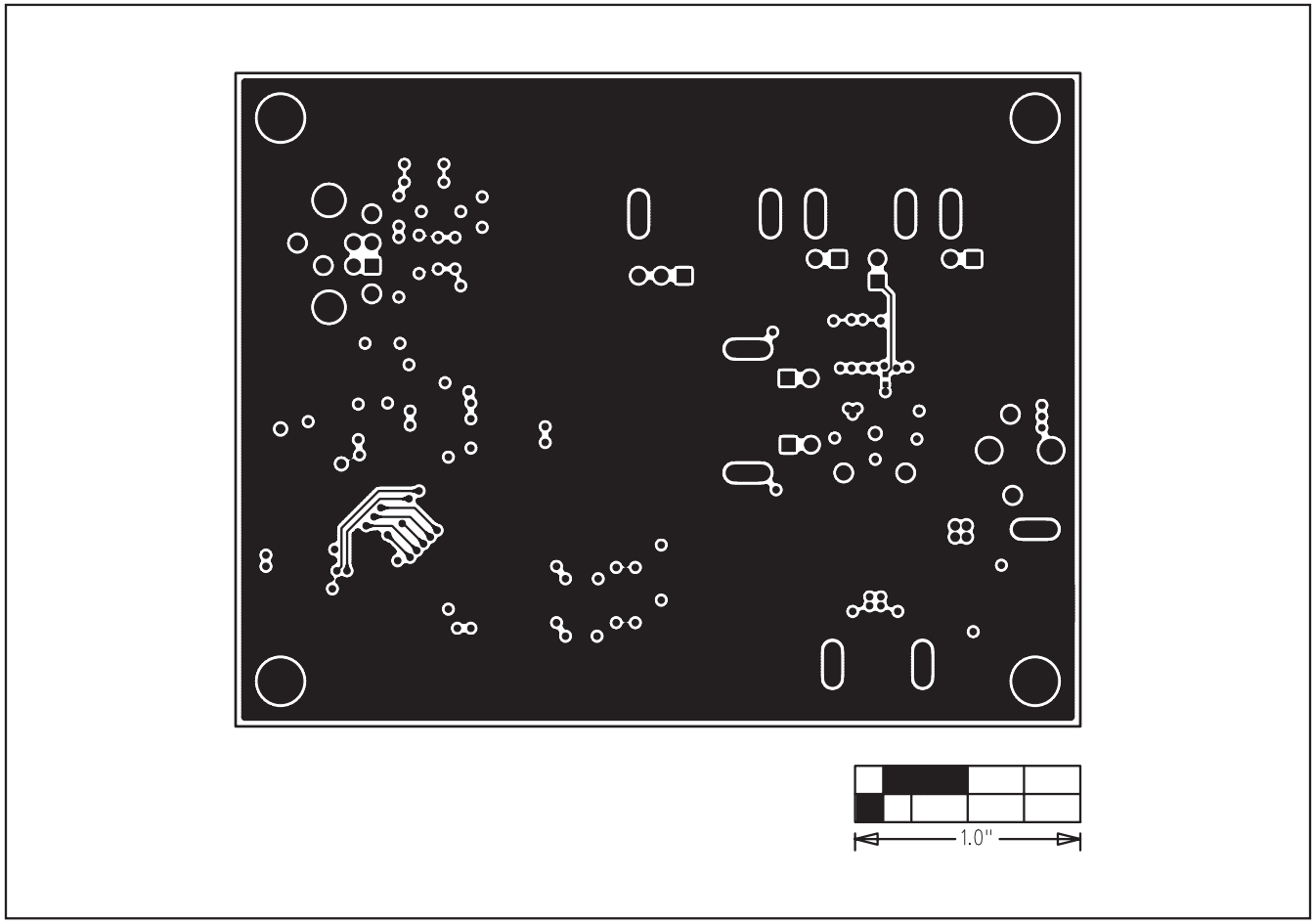


Figure 9. MAX9875 EV Kit PCB Layout—Solder Side

MAX9875 Evaluation Kit

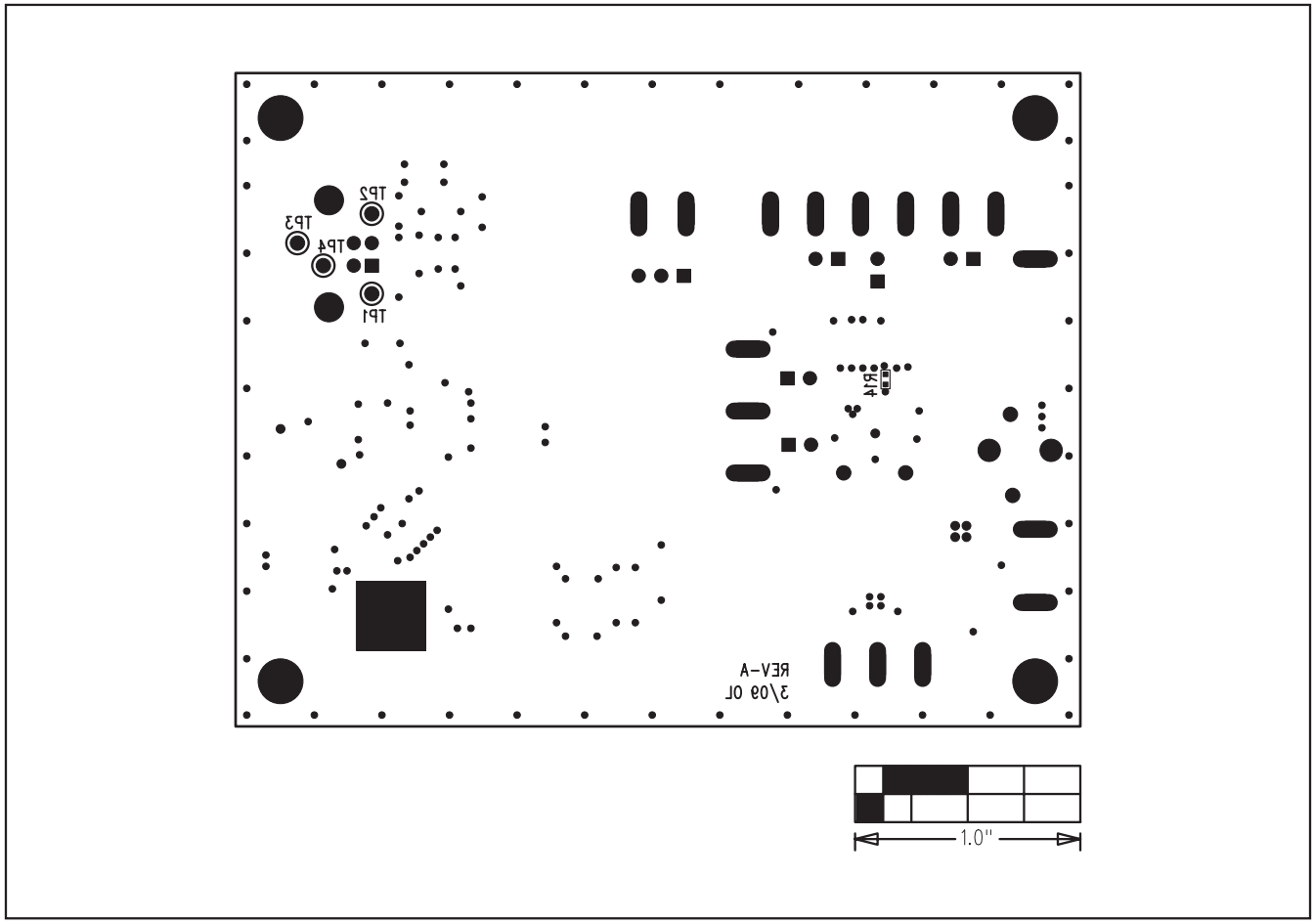


Figure 10. MAX9875 EV Kit Component Placement Guide—Solder Side

Maxim cannot assume responsibility for use of any circuitry other than circuitry entirely embodied in a Maxim product. No circuit patent licenses are implied. Maxim reserves the right to change the circuitry and specifications without notice at any time.

© 2009 Maxim Integrated Products Maxim is a registered trademark of Maxim Integrated Products, Inc.