MAX14579E Evaluation Kit
Evaluates: MAX14579E/MAX14579AE

General Description

The MAX14579E evaluation kit (EV kit) provides a proven design to evaluate the MAX14579E headset detection IC. The EV kit is designed to demonstrate the IC's headset insertion detection, SEND/END detection, and microphone low-power features. The EV kit requires a single power source using an active USB port.

The EV kit PCB comes with a MAX14579EETA in an 8-pin TDFN package with an exposed pad installed and can also be used to evaluate the MAX14579AE.

Features

♦ **USB Powered or External Power Supplies**
♦ **Low-Power Microphone Mode**
♦ **Low-Noise Microphone Bias Generator**
♦ **Configurable for Headsets with Normally Open Detection Switches**
♦ **Headset SEND/END Detection**
♦ **Proven PCB Layout**
♦ **Fully Assembled and Tested**

Ordering Information appears at end of data sheet.

Component List

DESIGNATION	QTY	DESCRIPTION
C1	1	1µF ±10%, 16V X5R ceramic capacitor (0603) Murata GRM188R61C105k
C2	0	Not installed, ceramic capacitor (0603)
C3	1	0.22µF ±10%, 25V X7R ceramic capacitor (0603) TDK C1608X7R1E224K
C4, C5	2	0.1µF ±10%, 50V X5R ceramic capacitors (0603) Murata GRM188R61H104K
GND	2	Black test points
J1	1	3.5mm audio jack
J2	1	3.5mm, 4-pole jack KSD Co. KJA-PH-00176
J3	1	3.5mm, 4-pole jack INCHANG Electronics IJAN-97

DESIGNATION	QTY	DESCRIPTION
J4	0	Not installed, jack
JU1, JU2	2	3-pin headers
JU3	1	2-pin header
L1	1	Ferrite bead (0603) Murata BLM18SG700TN1
MIC	1	Red test point
P1	1	USB type-B right-angle PC-mount receptacle
R1, R2	2	1MΩ ±5% resistors (0603)
R3	1	2.2kΩ ±5% resistor (0603)
R4	1	10kΩ ±5% resistor (0603)
U1	1	Headset jack detection IC (8 TDFN-EP) Maxim MAX14579EETA+
—	3	Shunts
—	1	PCB: MAX14579E EVALUATION KIT

Component Suppliers

SUPPLIER	PHONE	WEBSITE
INCHANG Electronics	82-31-4688181	www.inchange.en.ec21.com
KSD Co.	82-31-3719955	www.ksdigital.en.ec21.com
Murata Electronics North America, Inc.	770-436-1300	www.murata-northamerica.com
TDK Corp.	847-803-6100	www.component.tdk.com

Note: Indicate that you are using the MAX14579E when contacting these component suppliers.

_____ *Maxim Integrated Products* 1

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.

Quick Start

Required Equipment

- MAX14579E EV kit
- User-supplied PC with a spare USB port
- 3-channel oscilloscope
- Audio input source (optional)
- USB cable
- 3.5mm headset or microphone input source

Procedure

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

1) Verify that shunts are installed on pins 1-2 on jumpers JU1 and JU2.

2) Verify that a shunt is installed on jumper JU3.

3) Connect the USB cable to the USB connector (P1) on the EV kit.

4) Connect the other end of the USB cable to an active USB port.

5) Connect the oscilloscope to the DETIN, DET, and SWD PCB pads.

6) Verify that DETIN, DET, and SWD amplitudes are approximately 5V.

7) Insert a headset with a normally open detection switch to the audio line at J2.

8) Verify that DETIN and DET are low.

9) Press and hold the headset microphone pushbutton. Verify that SWD is low.

10) Release the headset microphone pushbutton and verify that SWD goes high.

Detailed Description of Hardware

The MAX14579E EV kit provides a proven design to evaluate the MAX14579E insertion jack detection, microphone bias generator, and SEND/END button-press detection IC. The EV kit requires an active USB port or an external 2.5V to 5.5V supply for operation

The MAX14579E/MAX14579AE devices manage headsets by integrating a jack insertion detection circuit, microphone bias generation, and SEND/END button-press detection. The devices feature a low-power microphone mode to reduce the high bias current required for microphone operation when the microphone is not in use.

The EV kit circuit provides two 3.5mm headset jacks (J2 and J3) for quick evaluation of the devices. The EV kit also provides a 3.5mm audio jack (J1) for routing audio signals to J2 and J3. The audio signals can also be applied at the AUDIO_L and AUDIO_R PCB pads.

The MAX14579E and MAX14579AE have 350ms (typ) and 1s (typ) DETIN to DET debounce delays, respectively. The EV kit provides PCB pads for monitoring the SWD, DET, DETIN, and MIC_OUT signals in addition to a test point for monitoring the MIC voltage.

The EV kit can also be used to evaluate the MAX14579AE with IC replacement of U1.

External Power Supply

The EV kit derives it power from the USB port (P1) or an external voltage applied at the VCC and GND PCB pads. A 2.5V to 5.5V external supply can be applied at the VCC and GND PCB pads. **When operating the EV kit using an external supply, verify that P1 is not connected to an active USB port.**

Power-Mode Selection (JU1)

Jumper JU1 configures the IC power mode. Install a shunt on pins 1-2 to enter call mode. In call mode, the internal 2.2V (typ) LDO turns on immediately and generates the microphone bias voltage (V_{BIAS}) when a plug is inserted at J2 or J3. The LDO is connected to the MIC through bias resistor R3. The bias voltage can be monitored at the MIC test point.

Install a shunt on pins 2-3 on JU1 to place the IC in standby mode. The microphone bias connection either turns off permanently if a headset is inserted at J2, or J3 enters microphone low-power mode (MPLP). In MPLP mode, the MIC output is pulsed high every 8ms (typ) with a peak amplitude equivalent to V_{BIAS}. See Table 1 for JU1 configuration.

The MODE input is compatible with 1.8V logic and can be set using VCC or a 1.8V to 5.5V external supply at the VLOGIC and GND PCB pads

Refer to the *MODE Control Input* section in the MAX14579E/MAX14579AE IC data sheet for a detailed description of the IC power-mode states.

Table 1. Power-Mode Selection (JU1)

SHUNT POSITION	MODE PIN	POWER MODE
1-2	Connected to VLOGIC	Call
2-3	Connected to ground	Standby

Headset Detection/Insertion

The EV kit circuit detects a headset insertion/removal event by monitoring the DETIN input on the IC.

Jumper JU2 configures the EV kit for headsets with normally open insertion detection switches. Insert a shunt on pins 1-2 for evaluating a headset with a normally open detection switch to the audio line connected at J2. Install a shunt on pins 2-3 to evaluate a headset with a normally open detection switch to ground at J3. When a valid headset is inserted at the connectors, DETIN is pulled low and DET is low after the IC DETIN-to-DET debounce period.

The EV kit provides DETIN and DET PCB pads for monitoring the input and output signals, respectively. See Table 2 for proper JU2 configuration when operating the EV kit using a headset at J2 or J3.

Headset SEND/END Detection

The IC SEND/END detection circuitry is active when DETIN is low. The EV kit circuit detects a SEND/END button-press event by monitoring the MIC input. When pressing the headset MIC pushbutton, the SEND/END open-drain logic output (SWD) goes low after the 30ms (typ) debounce period. The SWD output can be monitored using the SWD PCB pad.

Digital Supply Selection (JU3)

Jumper JU3 selects the EV kit digital supply voltage. Install a shunt on jumper JU3 to select VCC as the digital supply voltage. Remove the shunt on JU3 and apply a user-supplied 1.8V to 5.5V DC power supply at the VLOGIC and GND PCB pads. See Table 3 for proper jumper configuration for setting the EV kit digital supply voltage.

Table 2. Headset Configuration (JU2)

SHUNT POSITION	HEADSET CONNECTED AT	HEADSET SWITCH CONFIGURATION
1-2	J2	Normally open to audio line
2-3	J3	Normally open to GND

Table 3. Digital Voltage Configuration (JU3)

SHUNT POSITION	DIGITAL VOLTAGE SUPPLY
Installed	VCC
Not installed	User-supplied 1.8V to 5.5V power source applied at VLOGIC and GND PCB pads
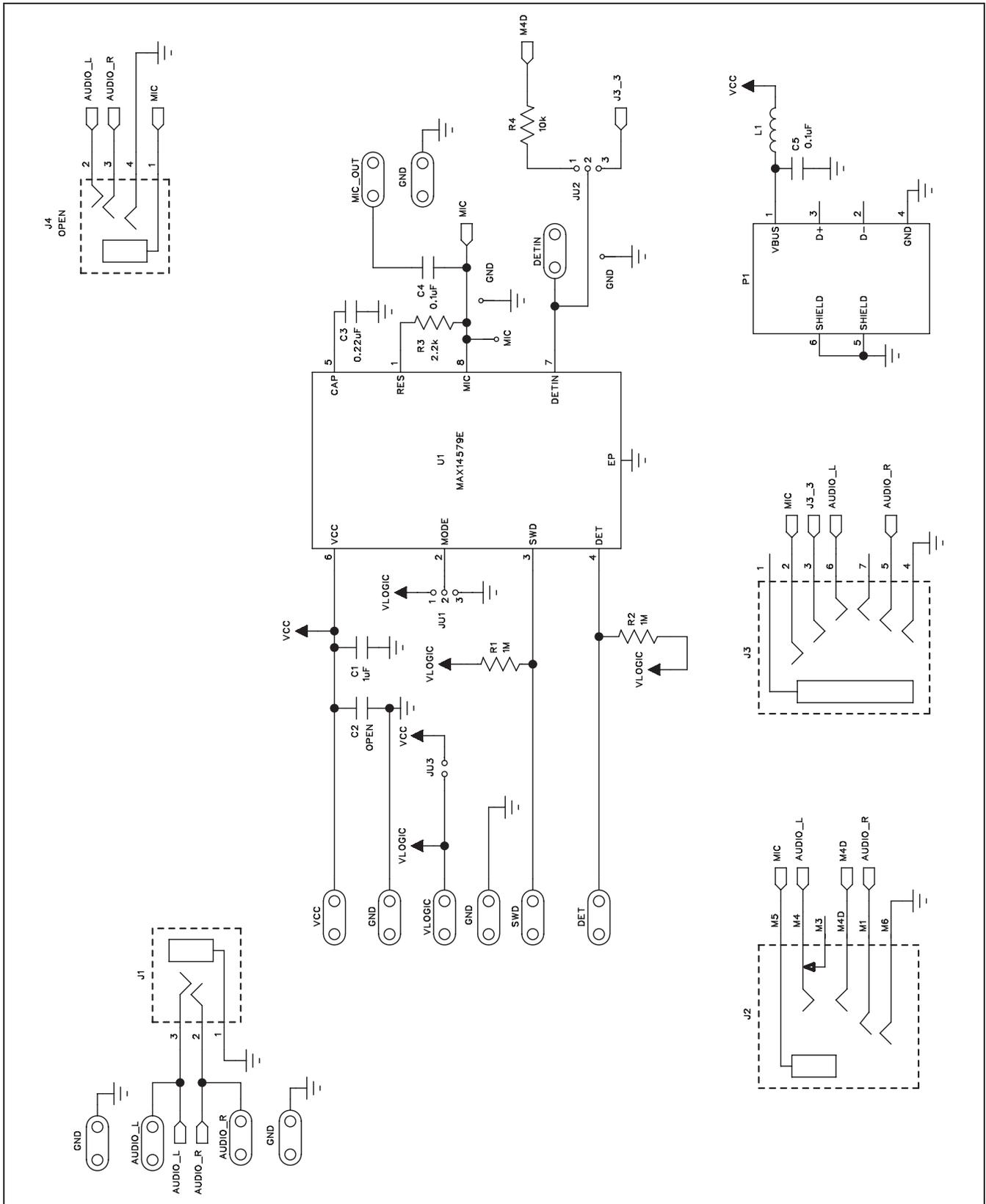
Figure 1. MAX14579E EV Kit Schematic
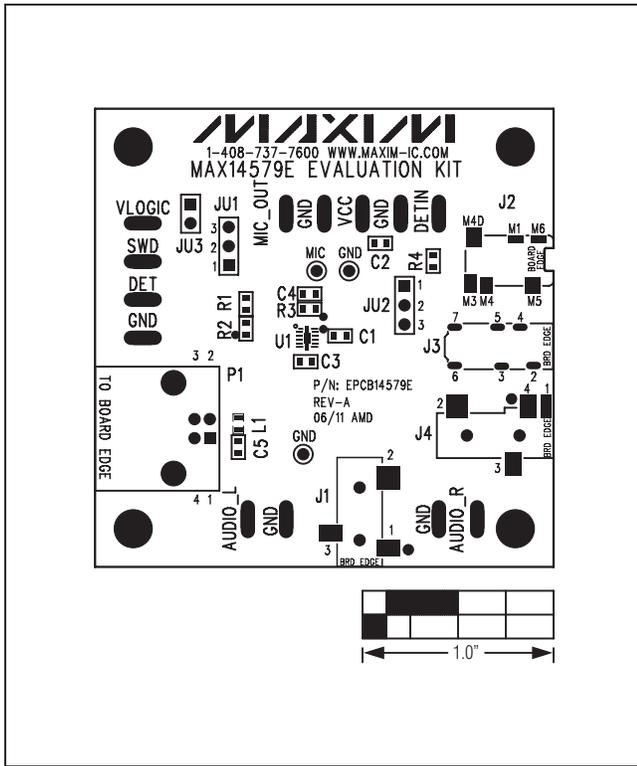
Figure 2. MAX14579E EV Kit Component Placement Guide—Component Side
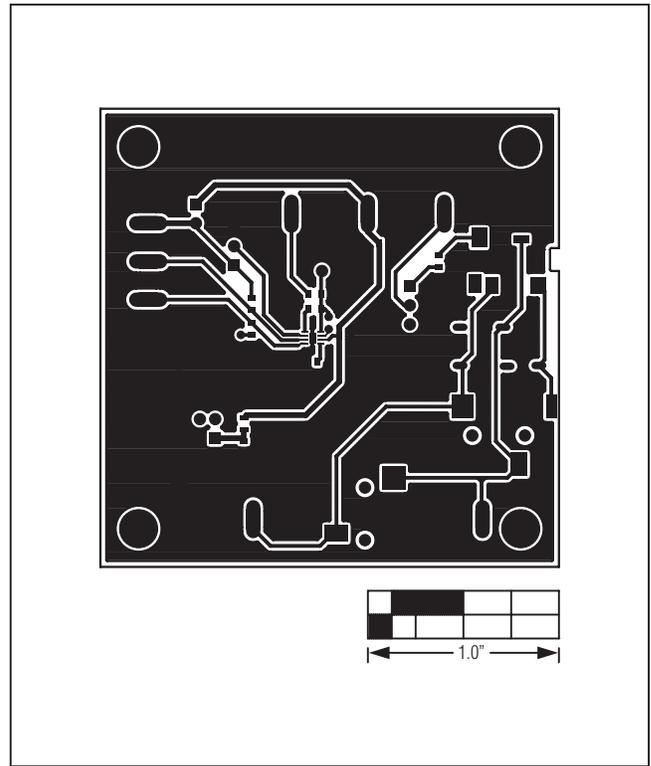
Figure 3. MAX14579E EV Kit PCB Layout—Component Side
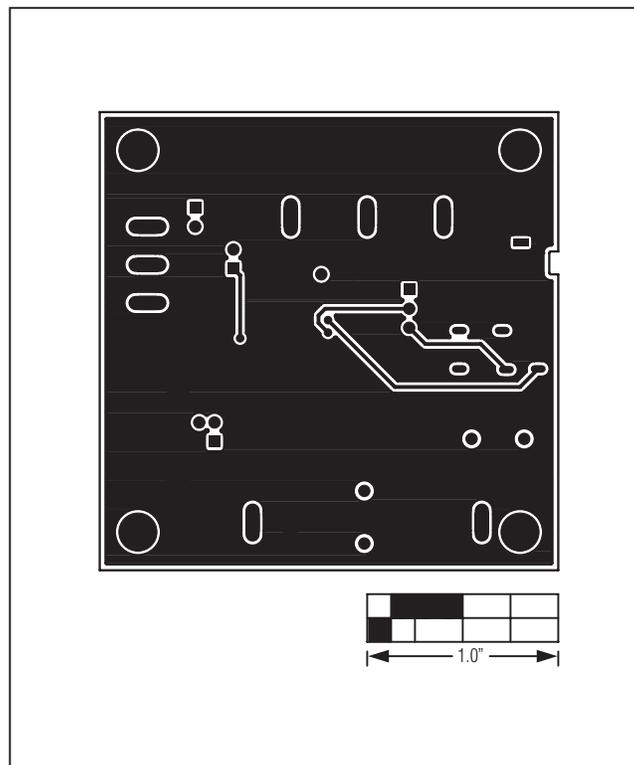
Figure 4. MAX14579E EV Kit PCB Layout—Solder Side

Ordering Information

PART	TYPE
MAX14579EEVKIT#	EV Kit

#Denotes RoHS compliant.

REVISION NUMBER	REVISION DATE	DESCRIPTION	PAGES CHANGED
0	8/11	Initial release	—