19-1509; Rev 0; 7/99

MAXIM

MAX1618 Evaluation System/Evaluation Kit

Evaluates: MAX1618

General Description

The MAX1618 evaluation system (EV system) consists of a MAX1618 evaluation kit (EV kit) and a companion Maxim SMBus™ Interface Board.

The MAX1618 EV kit is an assembled and tested PC board that demonstrates the MAX1618 temperature sensor. It monitors the temperature of an external diode-connected transistor and converts the temperature to 8-bit, 2-wire serial data. A 2N3904 temperature-sensor transistor comes soldered to the board in a SOT23 package, but it can be removed. The board can then be connected through a twisted pair to a remote diode closer to your system.

The Maxim SMBus Interface Board (MAXSMBUS) allows an IBM-compatible PC to use its parallel port to emulate an Intel System Management Bus (SMBus) 2-wire interface. Windows® 3.1/95/98 software provides a user-friendly interface to exercise the features of the MAX1618. The program is menu driven and offers a graphic interface with control buttons and status display.

Order the MAX1618EVSYS for complete IBM PC-based evaluation of the MAX1618. Order the MAX1618EVKIT if you already have an SMBus interface.

Features

- **Measures and Displays Remote Sensor Temperature**
- **Programmable Alarms and Configuration**
- **-55°C to +125°C Operating Temperature Range**
- **I²C™/SMBus Compatible**
- **Easy-to-Use Menu-Driven Software**
- **Assembled and Tested**

Ordering Information

PART	INTERFACE TYPE	BOARD TYPE
MAX1618EVKIT	User-Supplied	10 µMAX
MAX1618EVSYS	Windows Software	10 µMAX

Note: *The MAX1618 software can only be used with the complete evaluation system MAX1618EVSYS, which includes the MAXSMBUS interface board and the MAX1618EVKIT.*

MAX1618EVKIT Component List

DESIGNATION	QTY	DESCRIPTION
C1	1	0.1µF, 16V, X7R ceramic capacitor Taiyo Yuden EMK107BJ104KA
C2	1	2200pF, 50V, X7R ceramic capacitor
J1	1	2 x 10 right-angle female receptacle
JU1, JU2, JU3	3	3-pin headers
JU4	0	Not installed
Q1	1	NPN transistor Central Semiconductor CMPT3904, Fairchild MMBT3904, or Motorola MMBT3904
SW1	1	Slide switch
U1	1	Maxim MAX1618EUB
None	3	Shunts

SMBus is a trademark of Intel Corp.
Windows is a registered trademark of Microsoft Corp.
I²C is a trademark of Philips Corp.

MAX1618EVSYS Component List

PART	QTY	DESCRIPTION
MAX1618EVKIT	1	MAX1618 evaluation kit
MAXSMBUS	1	SMBus interface board

Component Suppliers

SUPPLIER	PHONE	FAX
Central Semiconductor	515-435-1110	515-435-1824
Fairchild	408-822-2000	408-822-2102
Motorola	303-675-2140	303-675-2150
Taiyo Yuden	408-573-4150	408-573-4159

Note: *Please indicate you are using the MAX1618 when contacting these component suppliers.*

MAX1618 Evaluation System/Evaluation Kit

Quick Start

Equipment Required

Before you begin, you will need the following equipment:

- An IBM PC-compatible computer capable of running Windows 3.1/95/98
- A parallel printer port (this is a 25-pin socket on the back of the computer)
- A standard 25-pin, straight-through male-to-female cable to connect the computer's parallel port to the Maxim SMBus Interface Board
- A DC power supply capable of supplying +7V to +20V at 100mA

Procedure

1) Carefully connect the boards by aligning the 20-pin connector of the MAX1618 EV kit with the 20-pin header of the MAXSMBUS interface board. Gently press them together. The two boards should be flush against each other.

   Make sure switch SW1 on the MAX1618 EV kit is in the OFF position. **Do not turn on the power until all connections are made.**

2) Connect a +7V to +20V DC power supply to the pads labeled POS9 and GND1 of the SMBus interface board.

3) Make sure JU3 is set to the 2–3 position.

4) Connect a cable from the computer's parallel port to the SMBus interface board. Use a 25-pin straight-through, female-to-male cable. To avoid damaging the EV kit or your computer, do not use a 25-pin SCSI port or any other connector that is physically similar to the 25-pin parallel printer port.

5) The *MAX1618.EXE* software program can be run from the floppy or hard drive. Use the Windows Program Manager to run the program. If desired, you may use the *INSTALL.EXE* program to copy the files and create icons for them in the Windows 3.1 Program Manager (or the Windows 95/98 Start Menu). An uninstall program is included with the software. Click on the UNINSTALL icon to remove the EV kit software from the hard drive.

6) Turn on the power supply.

7) Turn the EV kit on by moving SW1 to the ON position.

8) Start the MAX1618 program by opening its icon in the Program Manager (or Start Menu).

9) When the program prompts you, select the correct parallel port. An autodetect routine identifies the port to which the EV kit is connected and selects it as the default choice by highlighting it. Verify that the correct port is highlighted, then select "OK."

10) Observe as the program automatically detects the address of the MAX1618 and starts the main program.

Note: *The MAX1618 reads the address select pins at device power-up only.*

Detailed Description

User-Interface Panel

The user interface is easy to operate; use the mouse, or press the Tab key to navigate with the arrow keys (Figure 1). Each of the buttons corresponds to bits in the command and configuration bytes. Click on them to generate the correct SMBus write operation to update the internal registers. The program continually polls the device for new temperature data and status, and monitors for alert conditions. To change the T_{HIGH} and T_{LOW} alarm-threshold comparison registers, select the appropriate data field and type in the new value. Press Enter after typing in the new values to update the internal registers.

To make single-shot conversions, click in the Stop check box under Configuration, then click on the Measure Now button. Single-shot conversions can also be performed while the device is autoconverting. The single-shot command overrides the automatic conversion. After the single shot is complete, the device returns to automatic operation.

If an interrupt condition is generated by the temperature crossing one of the alarm threshold levels, a message appears in the alert box: "ALERT! INT = LOW." To clear the interrupt, first eliminate the condition that caused it, then click on Read Alert. This action reads the Alert Response address, returns the value of the current MAX1618 slave address, and clears the interrupt.

Note: *The 7 most significant bits (MSBs) are the address. The least significant bit (LSB) is the read/write status.*

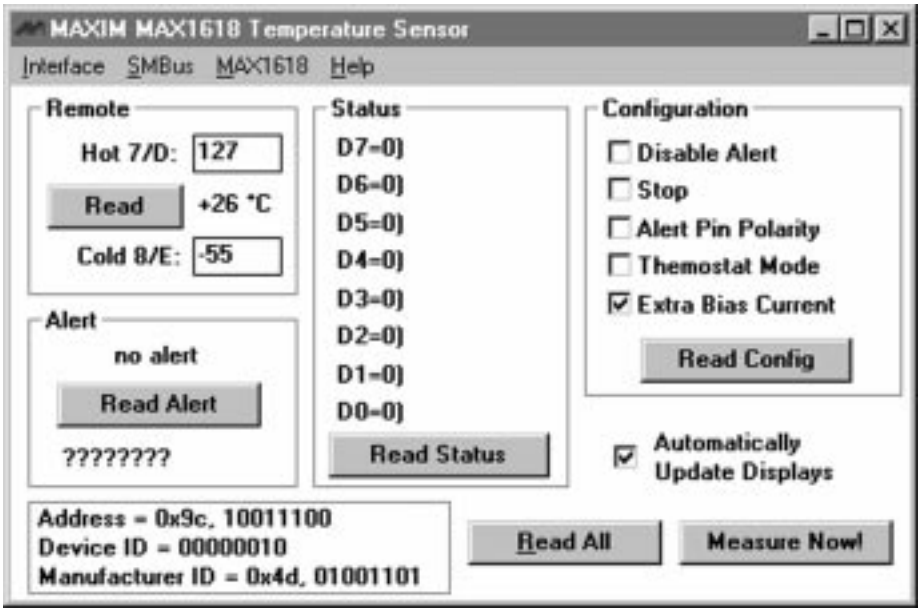

Figure 1. Main Display for MAX1618 EV Kit

Simple SMBus Commands

There are two methods for communicating with the MAX1618: through the normal user-interface panel, or through the simple SMBus commands available from the SMBus pull-down menu. The menu lists simple SMBus protocols, such as Read Byte and Write Byte. To stop normal user-interface execution so that it does not override the manually set values, turn off the update timer that slaves the program to the conversion rate by clicking in the Automatically Update Displays check box.

The SMBus dialog boxes accept numeric data in binary, decimal, or hexadecimal. Prefix hexadecimal numbers by $ or 0x. Binary numbers must be exactly eight digits.

Note: *In places where the slave address asks for an 8-bit value, it must be the 7-bit slave address of the MAX1618 as determined by ADD0 and ADD1, with the last LSB bit always set to 1.*

Data Logging

Data-logging commands are accessed through the pull-down menu labeled MAX1618. Data logging saves temperature data to a text file that includes a time/date stamp next to each data point. Due to the high conversion rate of the MAX1618, not every data point is logged, depending on the speed of the disk drive where the file is being written. To stop data logging, deselect Logging from the pull-down menu.

Table 1. JU1 and JU2 Shunt Settings for SMBus Address

SHUNT LOCATION		MAX1618 ADDRESS
JU1	JU2	
2–3	2–3	0011 000
2–3	Open	0011 001
2–3	1–2	0011 010
Open	2–3	0101 001
Open	Open	0101 010
Open	1–2	0101 011
1–2	2–3	1001 100
1–2	Open	1001 101
1–2	1–2	1001 110

Table 2. JU3 Shunt Settings for $\overline{STBY}$

SHUNT LOCATION	$\overline{STBY}$ PIN	FUNCTION
1–2	Connected to GND	In standby mode
Open	Connect an external signal to $\overline{STBY}$	—
2–3	Connected to VCC	In operating mode

Jumper and Switch Settings

Two jumpers set the MAX1618 slave address. The default address is 1001 110 (ADD0 = ADD1 = V_{CC}). JU1 corresponds to ADD0 and JU2 corresponds to ADD1; see Table 1 for a complete list of addresses. The MAX1618 must undergo a power-on reset for the new address to become effective.

The +5V supply voltage for the MAX1618 comes from the SMBus interface board. To evaluate the MAX1618 with a different voltage, cut the trace shorting the two pins of JU4 and apply a voltage to the pad labeled VCC.

The MAX1618 can be placed in standby mode using jumper JU3. See Table 2 for jumper settings.

A slide switch, SW1, is provided as a means to force a power-on reset of the MAX1618. This switch disables power to the device.

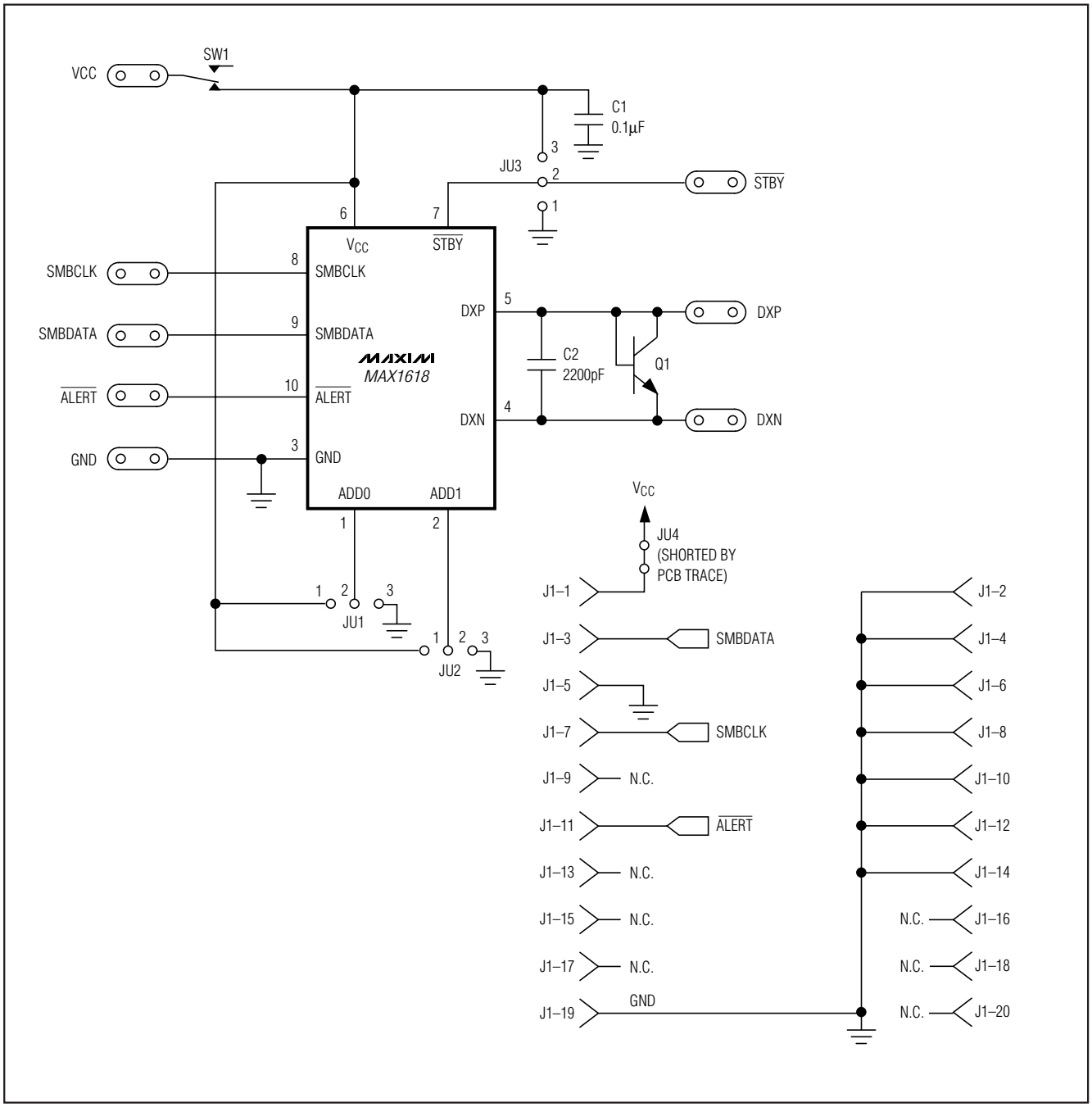

Figure 2. MAX1618 EV Kit Schematic

MAX1618 Evaluation System/Evaluation Kit

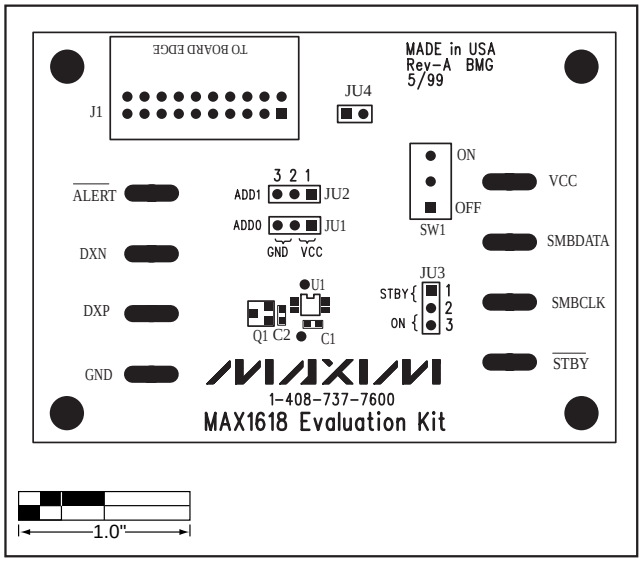

Figure 3. MAX1618 EV Kit Component Placement Guide—Component Side

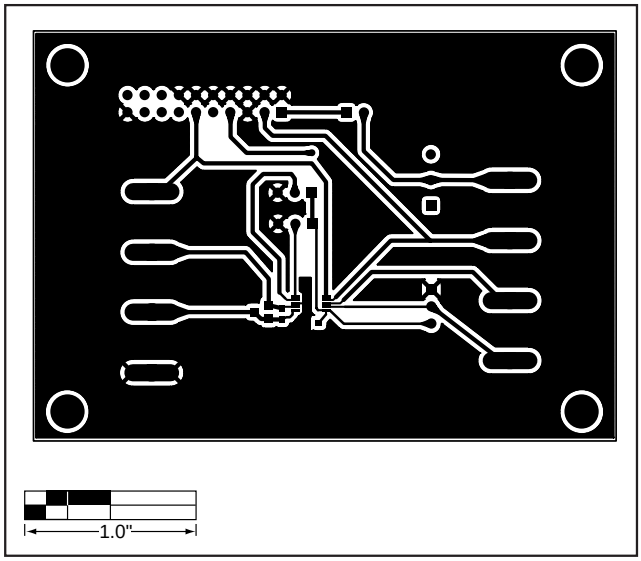

Figure 4. MAX1618 EV Kit PC Board Layout—Component Side

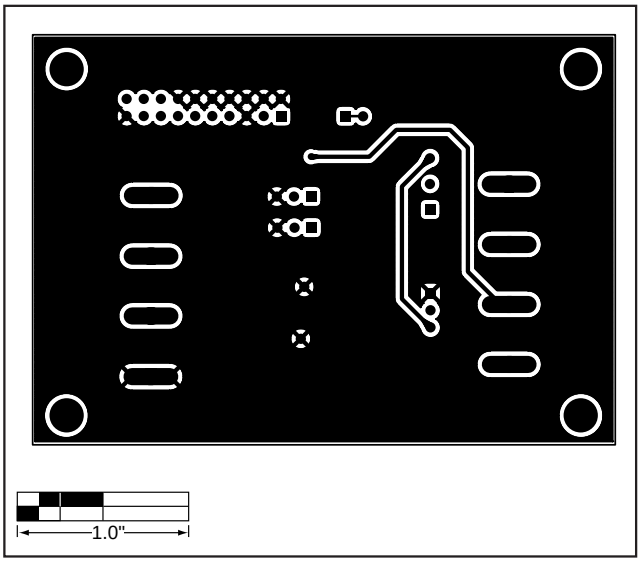

Figure 5. MAX1618 EV Kit PC Board Layout—Solder Side