



# MAX6683 Evaluation System/Evaluation Kit

## General Description

The MAX6683 evaluation system (EV system) consists of a MAX6683 evaluation kit (EV kit) and a companion Maxim system management bus (SMBus)<sup>™</sup> interface board (MAXSMBUS).

The MAX6683 EV kit is an assembled and tested PC board that demonstrates the MAX6683 temperature sensor and system monitor. The MAX6683 monitors temperature, supply voltage, and the voltage of three external supplies. Temperature is converted to 11-bit serial data and voltage to 8-bit data.

The MAXSMBUS allows an IBM-compatible PC to use its parallel port to emulate an Intel (SMBus). Windows<sup>®</sup> 95/98/2000-compatible software provides a user-friendly interface to exercise the features of the MAX6683. The program is menu driven and offers a graphic interface with control buttons and status display.

**Note:** Windows 2000 requires the installation of a driver; refer to Win2000.pdf or Win2000.txt located on the diskette.

Order the MAX6683EVSYS for a complete IBM PC-based evaluation of the MAX6683. Order the MAX6683EVKIT if you already have an SMBus interface.

To evaluate the MAX6652, order a free sample of the MAX6652AUB.

## MAX6683EVSYS Component List

PART	QTY	DESCRIPTION
MAX6683EVKIT	1	MAX6683 evaluation kit
MAXSMBUS	1	SMBus interface board

SMBus is a trademark of Intel Corp.

Windows is a registered trademark of Microsoft Corp.

I<sup>2</sup>C is a trademark of Philips Corp.

## Features

- ◆ Measure and Display the MAX6683 Temperature
- ◆ Monitor Four Voltage Channels
  - Three External (1.8V, 2.5V, and 5V Nominal)
  - Vcc Pin (3.3V Nominal)
- ◆ Programmable Alarms and Configuration
- ◆ SMBus/I<sup>2</sup>C<sup>™</sup> Compatible
- ◆ Easy-to-Use Menu-Driven Software
- ◆ Assembled and Tested
- ◆ Include Windows 95/98/2000-Compatible Software and Demo PC Board

## Ordering Information

PART	TEMP RANGE	INTERFACE TYPE
MAX6683EVKIT	0°C to +70°C	Not included
MAX6683EVSYS	0°C to +70°C	MAXSMBUS

**Note:** The MAX6683 EV kit software is provided with the MAX6683EVKIT. However, the MAXSMBUS board is required to interface the EV kit to the computer when using the software.

## MAX6683EVKIT Component List

PART	QTY	DESCRIPTION
C1, C2	2	0.1μF, 16V X7R ceramic capacitors Taiyo Yuden EMK107BJ104KA Murata GRM188R71C104KA01 TDK C1608X7R1C104K
C3	1	2.2μF, 16V X7R ceramic capacitor Taiyo Yuden EMK316BJ225ML Murata GRM42-6X7R225K016 TDK C3216X7R1C225M
J1	1	2 × 10 right-angle female receptacle
JU1	1	2 × 4 straight header
JU2	0	Not installed
R1, R2, R3	3	10kΩ ±5% resistors
R4	1	470kΩ ±5% resistor
SW1	1	Slide switch
U1	1	MAX6683AUB
U2	1	MAX1615EUK
None	1	Shunt for JU1



# MAX6683 Evaluation System/Evaluation Kit

## Component Suppliers

SUPPLIER	PHONE	FAX	WEBSITE
Murata	770-436-1300	770-436-3030	www.murata.com
Taiyo Yuden	800-348-2496	847-925-0899	www.t-yuden.com
TDK	847-803-6100	847-390-4405	www.component.tdk.com

**Note:** Please indicate you are using the MAX6683 when contacting these manufacturers.

## Quick Start

### Required Equipment

Before you begin, the following equipment is needed:

- A computer running Windows 95, 98, or 2000  
**Note:** Windows 2000 requires the installation of a driver; refer to Win2000.pdf or Win2000.txt located on the diskette.
- 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 (printer extension cable) to connect the computer's parallel port to the Maxim SMBus interface board
- DC power supply capable of supplying any voltage between 7V and 20V at 100mA
- 3.3V power supply for VCC
- 1.8V power supply\*
- 2.5V power supply\*
- 5V power supply\*

### Procedure

- 1) Carefully connect the boards by aligning the 20-pin connector of the MAX6683 EV kit with the 20-pin header of the MAXSMBUS interface board. Gently press them together.
- 2) Make sure switch SW1 on the MAX6683 EV kit is in the OFF position.
- 3) Make sure JU3 is set to the 1-2 position.
- 4) Connect a straight-through 25-pin female-to-male cable from the computer's parallel port to the SMBus interface board. 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 MAX6683.EXE software program can be run

\*These supplies are optional; however, if different nominal supplies are used, appropriate threshold values should be programmed.

from the floppy or hard drive. Use the Windows program manager to run the program. You may use the INSTALL.EXE program to copy the files and create icons for them in the Windows 95/98/2000 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.  
**Do not turn on the power until all connections are made.**

- 6) Connect the 3.3V power supply to the VCC and GND pads.
- 7) Connect the 1.8V nominal power supply to the 1.8V and GND pads.
- 8) Connect the 2.5V nominal power supply to the 2.5 and GND pads.
- 9) Connect the 5V nominal power supply to the 5 and GND pads.
- 10) Connect the 7V to 20V power supply to the pads labeled POS9 and GND1 on the SMBus interface board.
- 11) Turn on the power supplies.
- 12) Turn on the EV kit by moving SW1 to the ON position.
- 13) Start the MAX6683 program by opening its icon in the Start menu.
- 14) Wait until the program automatically detects the address of the MAX6683 and displays the user-interface panel (Figure 1).
- 15) Select the Configuration tab on the panel.
- 16) Uncheck the Interrupt Clear checkbox.
- 17) Check the START checkbox.
- 18) Verify that the temperature displayed on the user-interface panel is not 0.000°C.

## Detailed Description

### User-Interface Panel

The user interface is easy to operate using the mouse, or by using the Tab key to navigate with the arrow keys. The checkboxes, edit fields, and radio buttons correspond to bits in the internal registers. By clicking on

# MAX6683 Evaluation System/Evaluation Kit

Evaluate: MAX6652/MAX6683

them, the correct SMBus write operation is generated to update the registers.

**Note:** Words in boldface are user-selectable features in the software.

The program monitors for an alert interrupt and continually polls the device for new temperature, voltage, and status data. To disable the continuous polling of data, uncheck the **Automatic Read** checkbox. To change the temperature or voltage threshold comparison registers, select the appropriate data field and type in the new value. Pressing Enter, after typing in the new values, updates the internal registers.

The message ALERT appears whenever an interrupt condition occurs. To clear the interrupt, first eliminate the condition that caused it and then click on **Read Status**.

## Simple SMBus Commands

There are two methods for communicating with the MAX6683: through the normal user-interface panel or through the SMBus commands available from pressing the **MAXSMBUS** button. A display appears that allows the SMBus protocols, such as Read Byte and Write Byte, to be executed. 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 unchecking the **Automatic Read** checkbox.

The SMBus dialog boxes accept numeric data in binary, decimal, or hexadecimal. Hexadecimal numbers should be prefixed 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 MAX6683 as determined by the address pin (ADD) with the last bit set to 1 for a read operation and 0 for a write.

## Data Logging

Check the **Data Logging** checkbox to activate data logging. Data logging saves temperature, voltage, and status data to a text file that includes a time/date stamp next to each data point. If Automatic Read is enabled, data is sampled at 2Hz; however, the data is logged to the file only if the temperature, voltage, or status change. This slows the growth of the data-logging file. When Automatic Read is disabled, the data is logged each time the **Read All** button is clicked. To stop data logging, uncheck the **Data Logging** checkbox.

## Jumper and Switch Settings

Jumper 1 (JU1) sets the MAX6683 slave address. The default address is 0010 101 (ADD = VCC); see Table 1 for a complete list of addresses. The slide switch, SW1, provides a means to force a reset. This switch disables power to the device.

**Table 1. JU1 Shunt Settings for SMBus Address**

SHUNT LOCATION	ADD CONNECTION	MAX6683 ADDRESS
0x28	To GND	0010 100Y
0x2A	To VCC	0010 101Y
0x2C	To SDA	0010 110Y
0x2E	To SCL	0010 111Y

**Note:** The first 7 bits shown are the address. Y (bit 0) is the SMBus read/write bit. This bit is a 1 for a read operation and zero for a write.

## Evaluating the MAX6652

The MAX6683 EV kit can also evaluate the MAX6652. Remove the MAX6683 from the board and install the MAX6652.

The MAX6652 and MAX6683 monitor different voltages. See Table 2.

When evaluating the MAX6652 with the MAX6683 software, the voltages displayed for the supply voltage (VCC), the 1.8V nominal voltage, and the 5V nominal voltage are incorrect. However, the ADC output code, shown in parentheses next to the voltage, is correct. Use the equations shown below to calculate the actual voltages:

$$V_{CC} = \frac{5V \times \text{ADC output code}}{192}$$

$$\text{Voltage on pin 1} = \frac{12V \times \text{ADC output code}}{192}$$

$$\text{Voltage on pin 3} = \frac{3.3V \times \text{ADC output code}}{192}$$

**Table 2. Voltage Monitor Differences Between MAX6652 and MAX6683**

PIN	MAX6652 (V)	MAX6683 (V)
10 (VCC)	5	3.3
1	12	1.8
3	3.3	5

# MAX6683 Evaluation System/Evaluation Kit

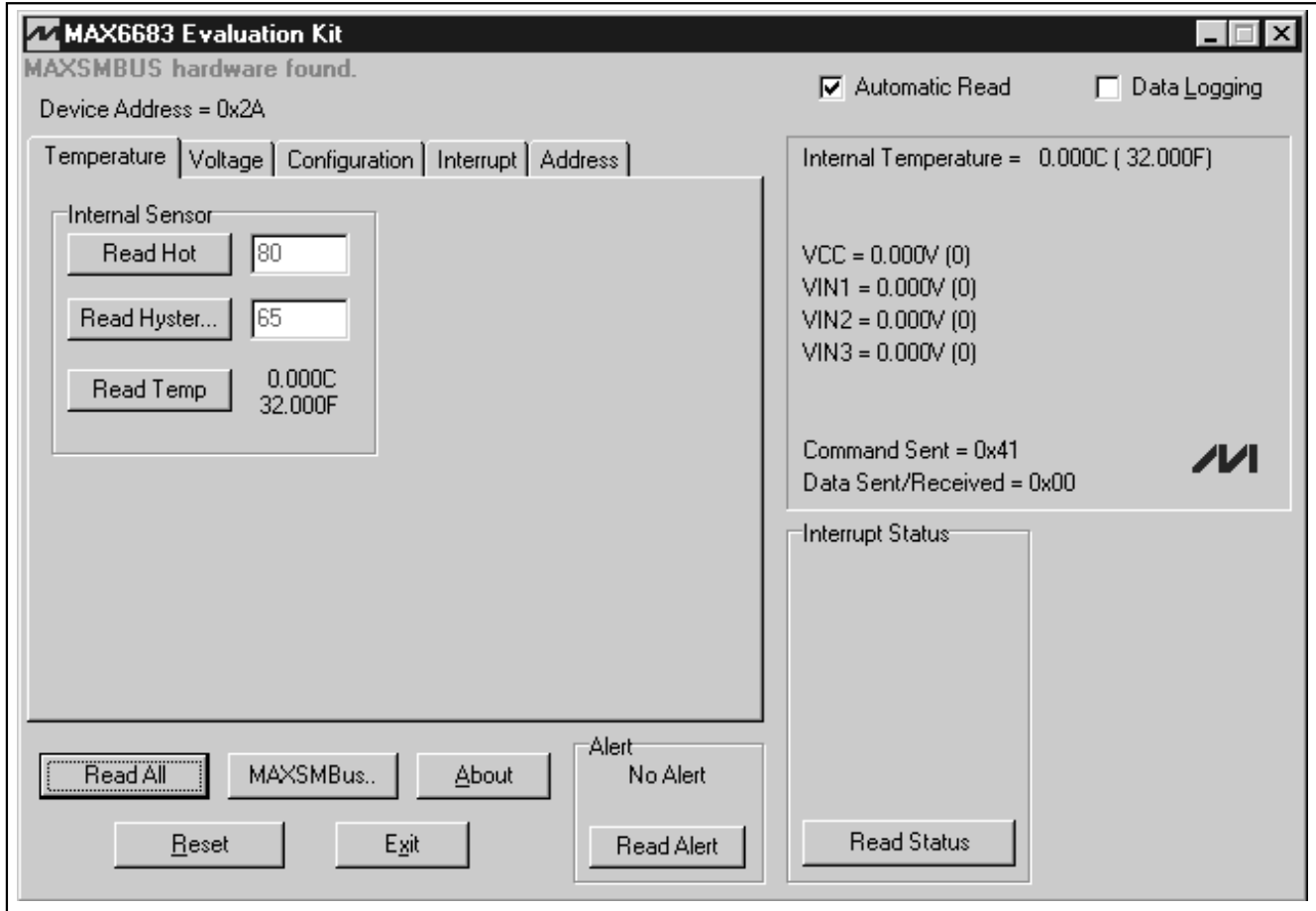


Figure 1. User-Interface Panel for MAX6683EVKIT

# MAX6683 Evaluation System/Evaluation Kit

Evaluate: MAX6652/MAX6683

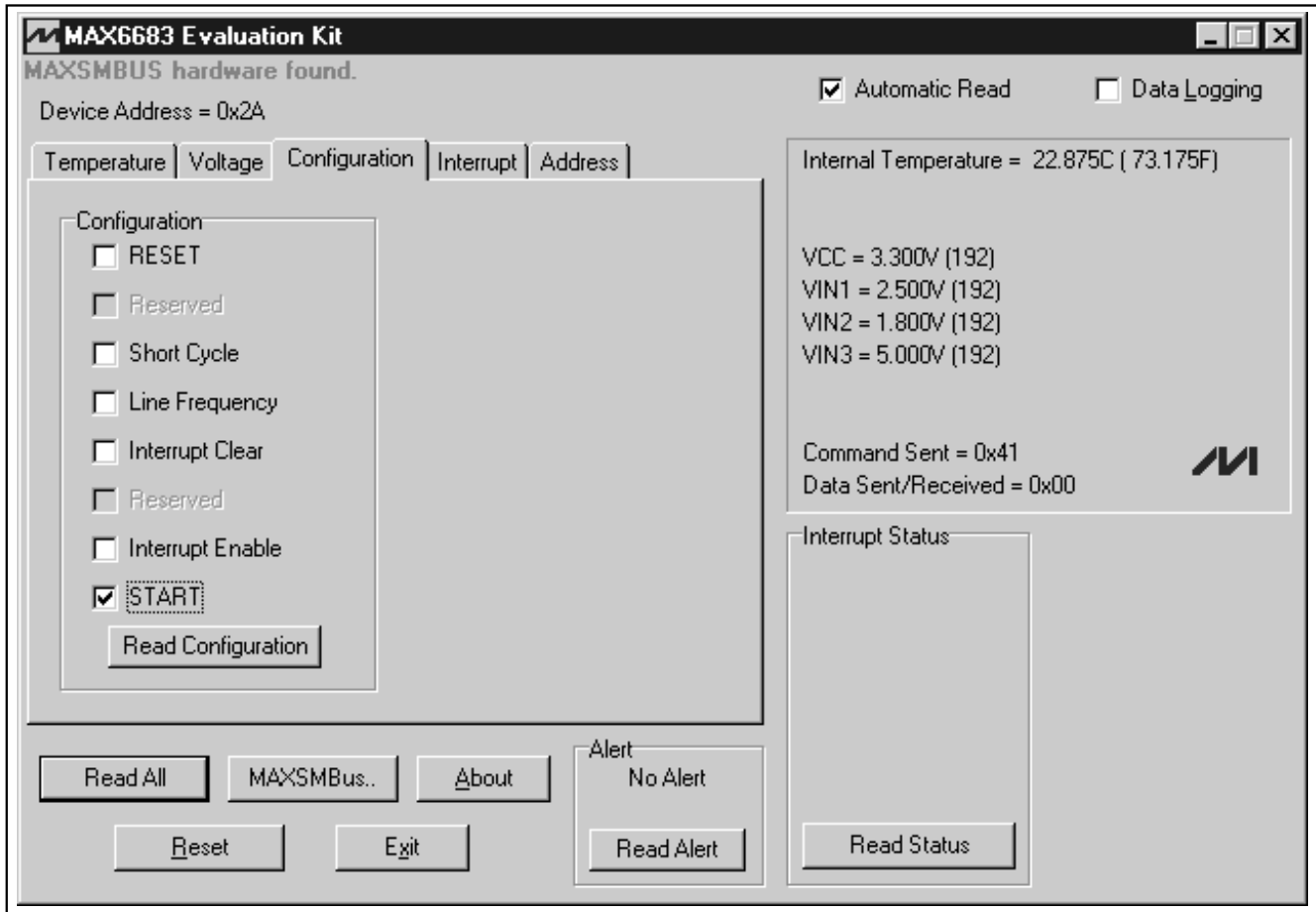


Figure 2. Configuration Display



# MAX6683 Evaluation System/Evaluation Kit

Evaluate: MAX6652/MAX6683

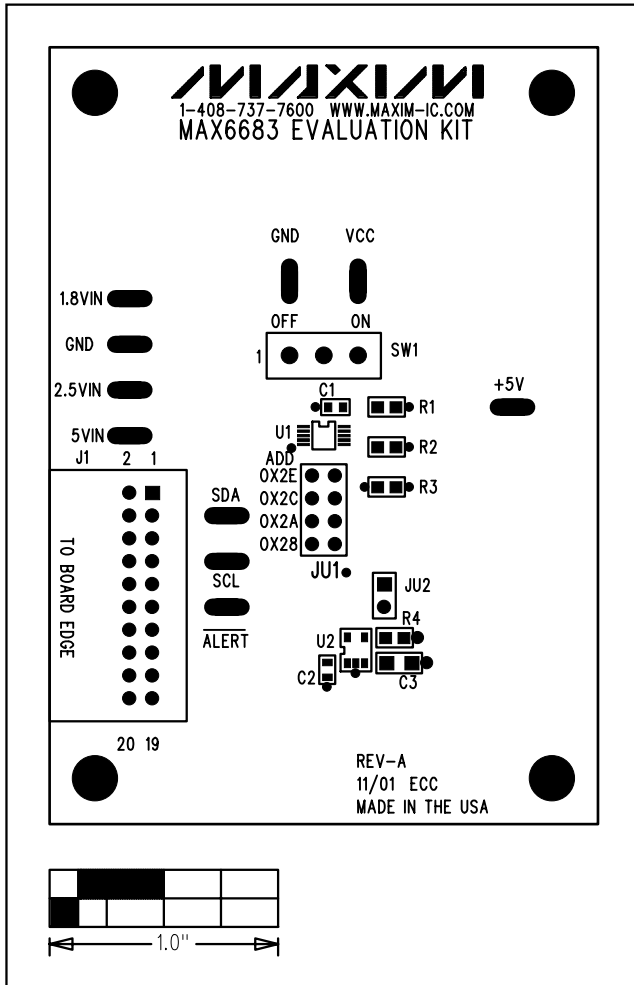


Figure 4. MAX6683 EV Kit Component Placement Guide—Component Side

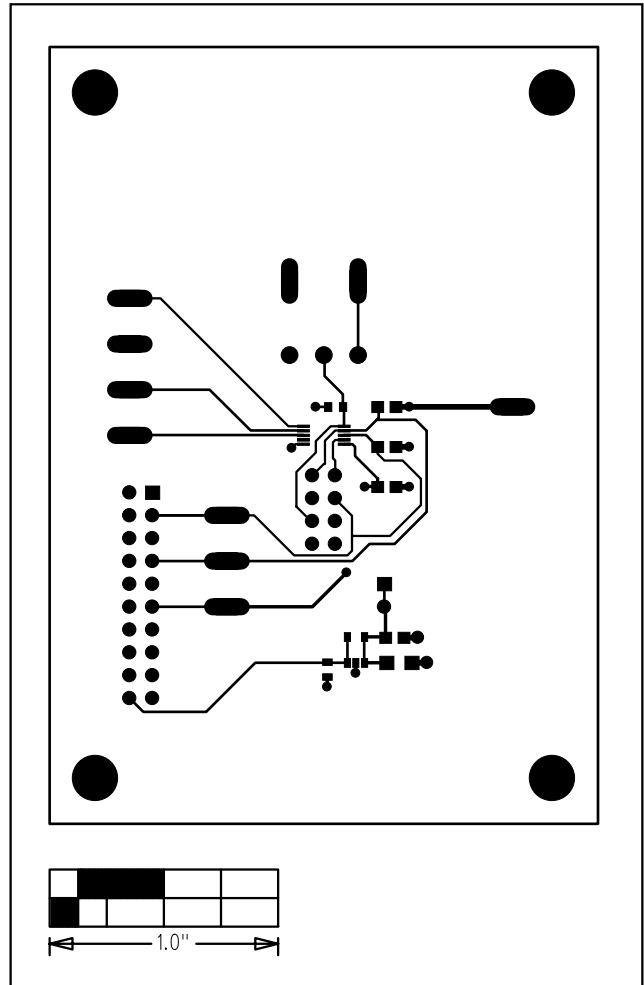


Figure 5. MAX6683 EV Kit PC Board Layout—Component Side

# MAX6683 Evaluation System/Evaluation Kit

Evaluate: MAX6652/MAX6683

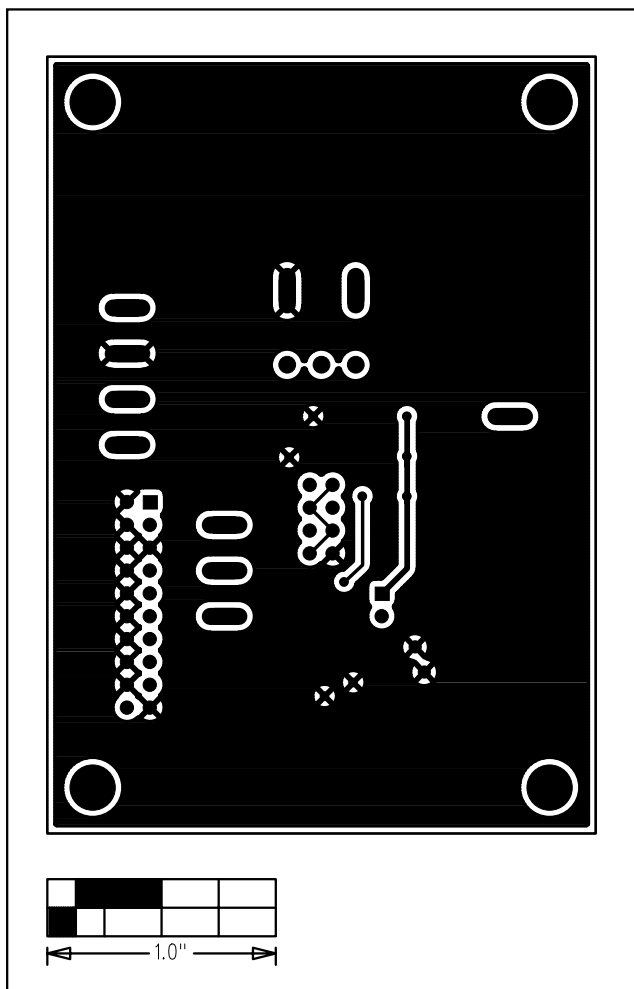


Figure 6. MAX6683 EV Kit PC Board Layout—Solder Side

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