

# MAXIM

## MAX6651 Evaluation System

### General Description

The MAX6651 evaluation kit (EV kit) is an assembled and tested circuit board that demonstrates the MAX6651 intelligent fan controller IC. Windows® 95/98 software provides a handy user interface to exercise the MAX6651's features. Order the MAX6651EVSYS for complete evaluation of the MAX6651, including a Maxim SMBus™ Interface Board (MAXSMBUS). Order the MAX6651EVKIT if you already have an SMBus interface.

### MAX6651 EV Kit Files

EV KIT FILES	DESCRIPTION
INSTALL.EXE	Installs the EV kit files on your computer
MAX6651.EXE	Application program
LPTCON.VXD	Required parallel port driver

### Features

- ◆ Proven PC Board Layout
- ◆ Convenient On-Board Test Points
- ◆ Fully Assembled and Tested

### Ordering Information

PART	TEMP. RANGE	INTERFACE TYPE
MAX6651EVKIT	0°C to +70°C	User supplied
MAX6651EVSYS	0°C to +70°C	Windows software

### Component List

MAX6651EVSYS SYSTEM COMPONENT LIST		
PART	QTY	DESCRIPTION
MAX6651EVKIT	1	MAX6651 EV kit
MAXSMBUS	1	PC parallel port to SMBus interface

MAX6651EVKIT COMPONENT LIST		
DESIGNATION	QTY	DESCRIPTION
C1	1	10µF, 25V radial leaded electrolytic capacitor
C2	0	Open
C3	1	0.1µF ceramic capacitor (1206)
LED1	1	Light-emitting diode
P1	1	2 x 10 right-angle socket SamTec SSW-110-02-S-D-RA
RP1	1	SIP resistor network, 10kΩ, 6 pins, common
J1–J5, J7–J12	11	2-pin headers
J1, J5, J8–J12	7	Shunts

MAX6651EVKIT COMPONENT LIST		
DESIGNATION	QTY	DESCRIPTION
Q1	1	TO-220 logic-level N-channel FET International Rectifier IRFZ24N (Rdson < 0.1Ω at 5Vgs, 30Vbdss)
Q1	1	Heatsink, thermalloy 6028
Q1	1	No. 4 nut
Q1	1	4-40 x 1/4in machine screw
R1	1	10kΩ ±1% resistor (1206)
R2	1	100kΩ ±1% resistor (1206)
R3	1	560Ω ±5% resistor (1206)
R4–R8	5	49.9kΩ ±1% resistors (1206)
U1	1	MAX6651EEE
None	1	PC board, MAX6651 EV kit
None	1	3 1/2in software disk, MAX6651 EV kit
None	1	MAX6651 EV kit data sheet (includes MAXSMBUS manual)

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Windows is a registered trademark of Microsoft Corp.

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**For price, delivery, and to place orders, please contact Maxim Distribution at 1-888-629-4642, or visit Maxim's website at [www.maxim-ic.com](http://www.maxim-ic.com).**

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## Recommended Equipment

Before you begin, you will need the following equipment:

- Maxim MAX6651EVKIT and MAXSMBUS interface board
- A 12VDC power supply
- A computer running Windows 95/98
- A spare parallel port
- A 25-pin I/O extension cable

## Quick Start

- 1) With the power off, connect the 12VDC power supply of the MAXSMBUS board between POS9 and GND.
- 2) Also connect the 12VDC supply to the MAX6651 EV kit at the pads labeled FAN SUPPLY ( $\pm$ ). (The MAX6651's +5V supply comes from the MAXSMBUS board.)
- 3) Connect the boards together.
- 4) Connect the 25-pin I/O extension cable from the computer's parallel port to the MAXSMBUS board. The EV kit software uses a loopback connection to confirm that the correct port has been selected.
- 5) Ensure that the jumper settings are in the default position (Table 1).
- 6) Connect a 12V tachometer-output fan to the FAN0+, FAN0-, and FAN0T terminals. Additional fans may be connected at FAN1+/FAN1-, FAN2+/FAN2-, and FAN3+/FAN3-. Optional tachometer inputs FAN1T, FAN2T, and FAN3T may be used to monitor the auxiliary fans' speed.
- 7) Install the MAX6651 EV kit software on your computer by running the INSTALL.EXE program on the floppy disk. The program files are copied and icons are created for them in the Windows Start menu.
- 8) Turn on the power supply. The fan will turn on at full speed.
- 9) Start the MAX6651 program by opening its icon in the Start menu.
- 10) In the Config register, drop down the full-on combo box and choose closed-loop mode.
- 11) In the 1/Speed register, type in the value "100." Adjust this value up or down to choose the target fan speed. Increasing the 1/Speed value makes the closed-loop set point a slower fan speed.
- 12) Observe measured fan speed in the Tach0 tachometer display.

## Description of Software

The main window shows the register values of the MAX6651. Register bit fields are presented as drop-down combo boxes. The 1/Speed and Tach0-3 register values are also translated into the corresponding fan (RPMs).

## Detailed Description of Hardware

U1, the MAX6651, is an intelligent fan controller. MOSFET Q1 regulates the fan voltage (measured by the FB input). In closed-loop mode, adjusting the fan voltage set point regulates the main fan's tachometer output.

### PC Board Layout Tips

For best results, keep the Q1 gate drive trace as short as possible.

See Figure 1, which shows the MAX6651 EV kit schematic, and refer to the MAX6651 data sheet.

### Troubleshooting

#### Problem: Cannot find MAX6651 parallel port connection.

Ensure that the I/O extension cable is connected to a parallel port, and not to a SCSI or other type of port. Verify that the supplied LPTCON.VXD is in the same directory as MAX6651.EXE. If a local printer driver is installed, temporarily disable it. The software will not work if the program icon is dragged onto the Windows desktop; instead, install the software into a subdirectory, such as C:\MAX6651. The software can also be run directly from its floppy disk, as long as both MAX6651.EXE and LPTCON.VXD are in the same directory.

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**Table 1. Jumper Functions**

JUMPER	POSITION	FUNCTION
J1	*Open	See Table 2.
J2	*Open	See Table 2.
J3	*Open	See Table 2.
J4	*Closed	See Table 2.
J5	*Closed	Connect on-board LED to GPIO0 output.
	Open	Disconnect on-board LED from GPIO0 output.
J7	Closed	Connect GPIO0 to GPIO1.
	*Open	GPIO0 is not connected to GPIO1.
J8	*Closed	Fan 3 tachometer connects to FAN3T directly.
	Open	Fan 3 tachometer connects to FAN3T through 49.9kΩ resistor R8.
J9	*Closed	Fan 2 tachometer connects to FAN2T directly.
	Open	Fan 2 tachometer connects to FAN2T through 49.9kΩ resistor R7.
J10	*Closed	Fan 1 tachometer connects to FAN1T directly.
	Open	Fan 1 tachometer connects to FAN1T through 49.9kΩ resistor R6.
J11	*Closed	Fan 0 tachometer connects to FAN0T directly.
	Open	Fan 0 tachometer connects to FAN0T through 49.9kΩ resistor R5.
J12	*Closed	FB feedback input connects to Q1 drain directly.
	Open	FB feedback input connects to Q1 drain through 49.9kΩ resistor R4.

\*Default configuration

**Table 2. Address Selection Jumpers**

J1	J2	J3	J4	ADDRESS
Closed	Open	Open	Open	1001 011R
Open	Closed	Open	Open	0011 111R
Open	Open	Closed	Open	1001 000R
*Open	*Open	*Open	*Closed	0011 011R

\*Default configuration

# MAX6651 Evaluation System

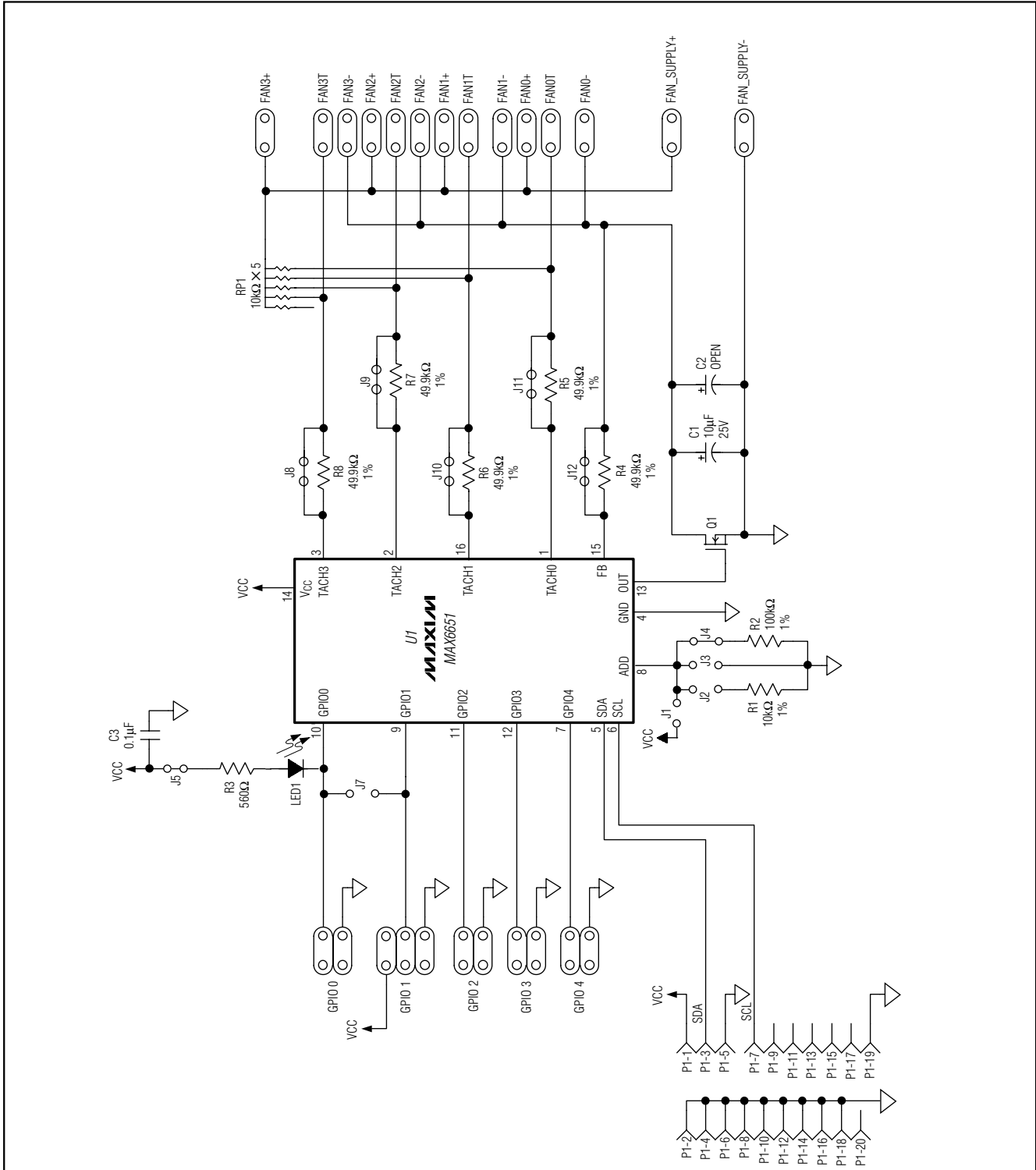


Figure 1. MAX6651 EV Kit Schematic

# MAX6651 Evaluation Kit

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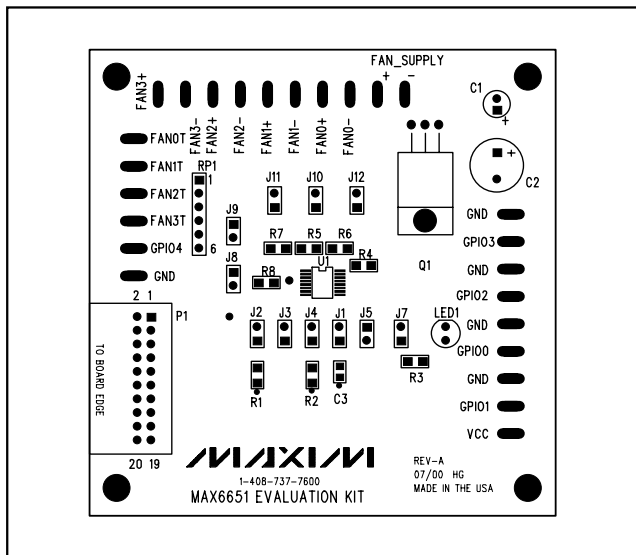


Figure 2. MAX6651 EV Kit Component Placement Guide—Component Side

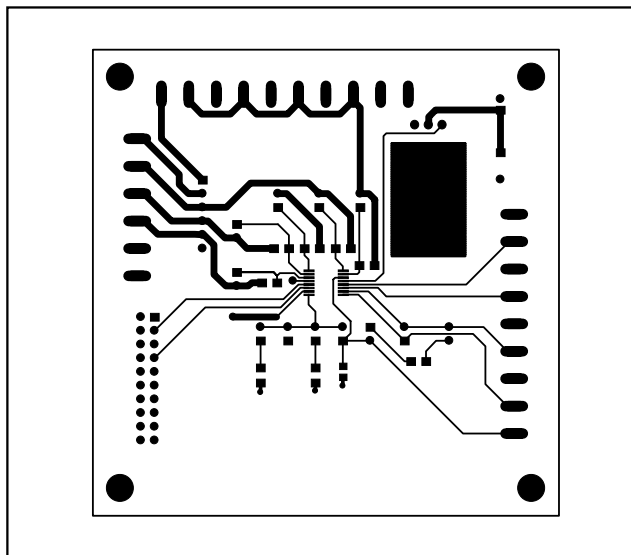


Figure 3. MAX6651 EV Kit PC Board Layout—Component Side

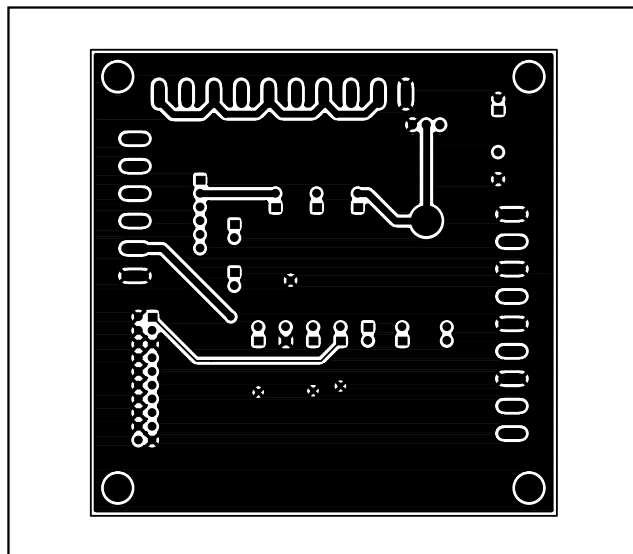


Figure 4. MAX6651 EV Kit PC Board Layout—Solder Side

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