

Introduction

The MAXREFDES1265 is a reference design showcasing the MAX7360 and MAX32625PICO with a low-cost, small-size keypad interface. The MAX7360 I²C-interfaced peripheral allows microprocessors and microcontrollers to manage up to 64 key switches with additional eight LED drivers/GPIOs (general-purpose input/output) featuring constant current, PWM (pulse-width modulation) intensity control, and rotary switch control options. The MAX32625PICO is an Arm®-core-based, low-power microcontroller. It acts as the I²C master for the MAX7360 to read and put these values on the PC terminal through the USB interface.

Hardware Specification

The MAXREFDES1265 has pinout headers for rows and columns to connect the keypad. The microcontroller reads the value through the MAX7360 with the I²C interface every time a key is pressed. The microcontroller simultaneously puts the value on the terminal of the PC.

Designed–Built–Tested

This document describes the hardware in [Figure 1](#). It provides a detailed, systematic technical guide to use the small-size, low-cost, keypad interface design. The design was built and tested. The details follow in this document.

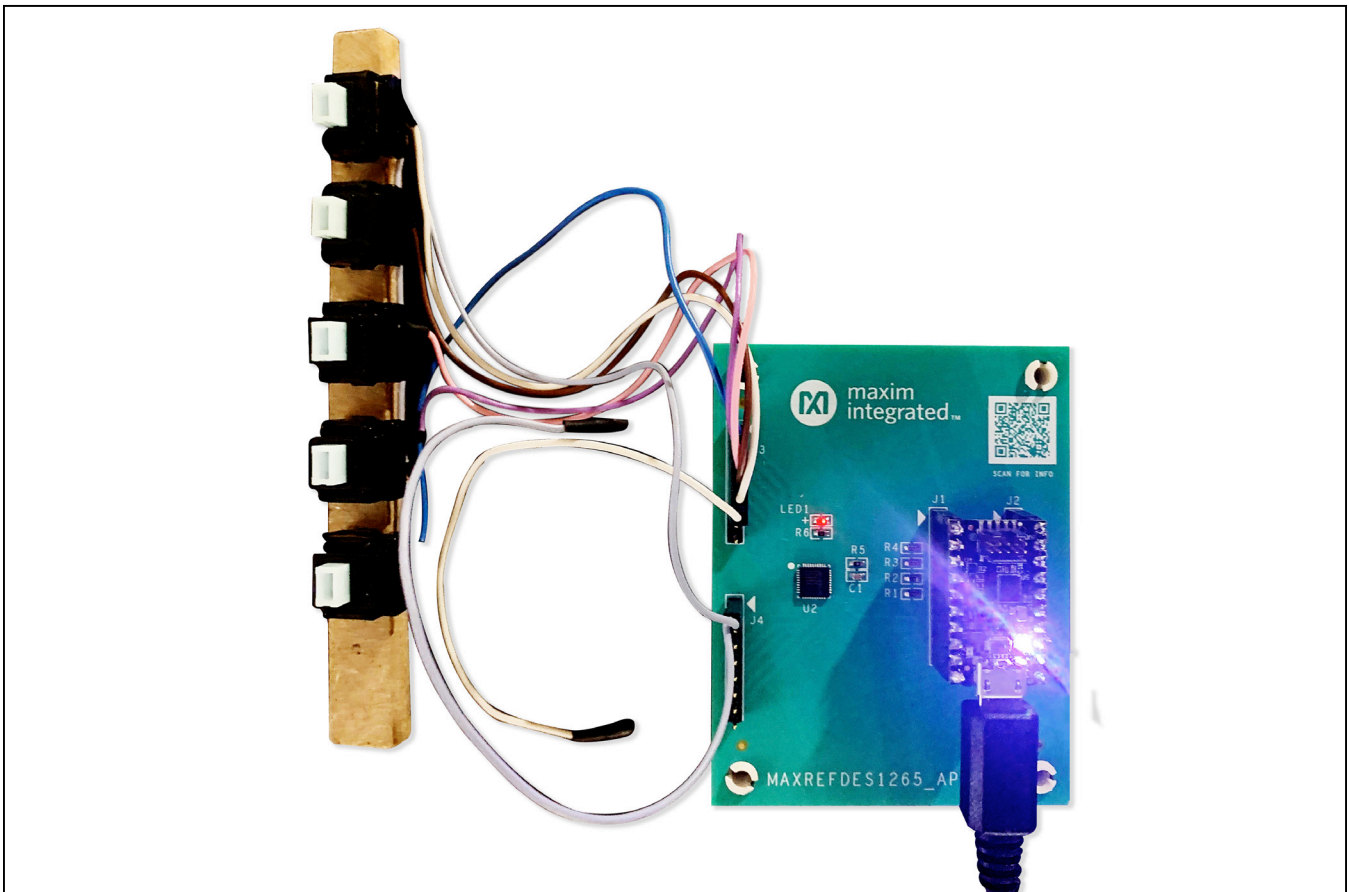


Figure 1. The MAXREFDES1265 connected to the keypad switches.

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Quick Start

Required Equipment

Figure 1 shows the hardware connections of the following components:

- MAXREFDES1265
- Simple keypad
- Laptop and PC with a serial terminal application. This document uses the tera term
- USB cable

Procedure

- Connect the keypad to the row (J3) and column (J4) pinout headers of the MAXREFDES1265 (**Figure 1**).
- Connect a USB cable between the PC and MAX32625 PICO.
- The LED1 is **ON** as soon as the PICO is connected to the PC, indicating the board is powered up.
- The PICO must be programmed with a *.bin file (<https://os.mbed.com/platforms/MAX32625PICO>).
- Open a serial program like the tera term and connect to the USB Serial COM port (**Figure 2**).
- A serial connection is established. The key logs on the tera term (**Figure 3**).

Detailed Description of the Firmware

The firmware is developed using an MBED online compiler. This firmware connects the I²C master of the MAX32625PICO and I²C slave of the MAX7360. It establishes a serial communication between the PICO and PC. The firmware is completely tested. It is found in the **Design Resources** tab.

Conclusion

The MAXREFDES1265 is a portable design that can interface a keypad to a microcontroller through the MAX7360. This design is a 5-switch version and can go up to 64 switches.

Design Resources

For the complete set of design resources, including schematics, bill of materials, and PCB layout, go to www.maximintegrated.com/AN6466 and click on the **Design Resources** tab.

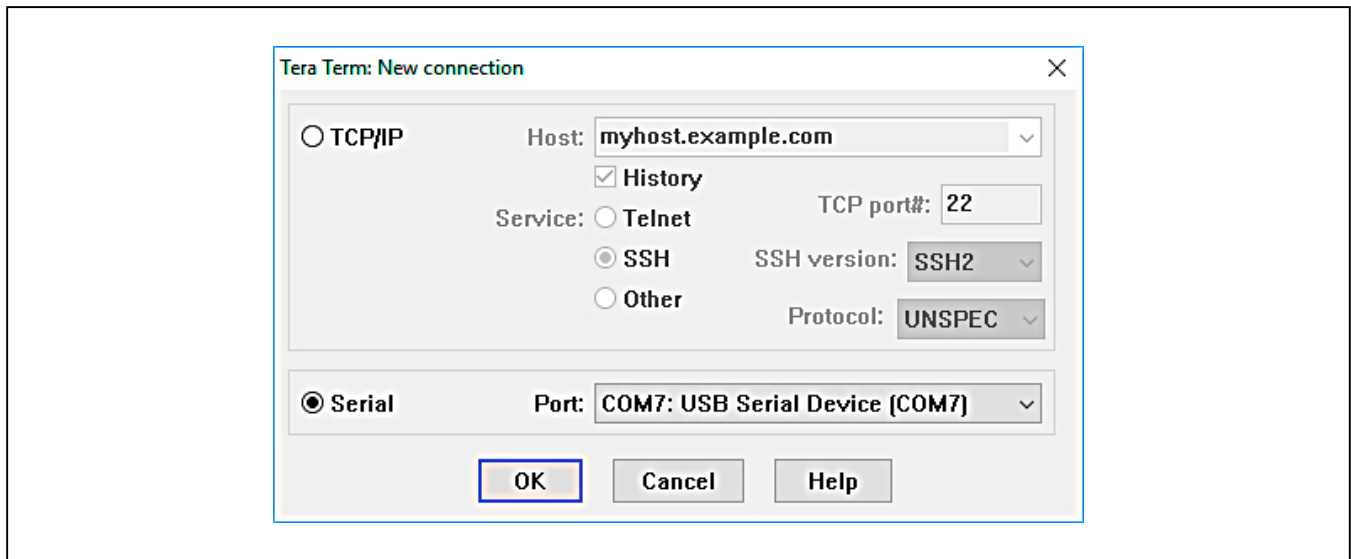


Figure 2. Selecting the COM port (the USB serial device is COM7).

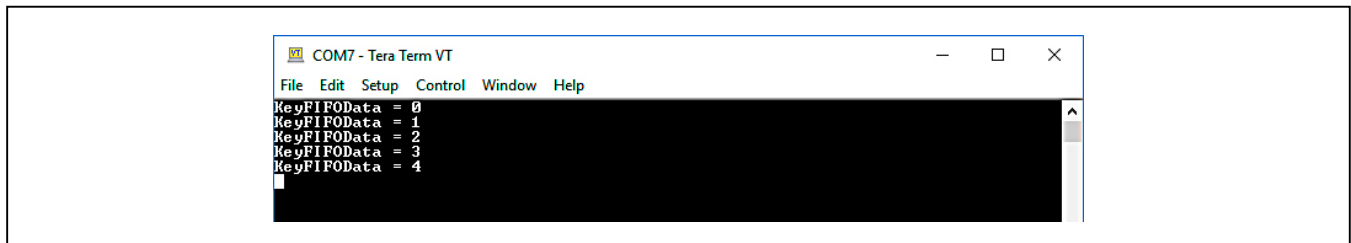
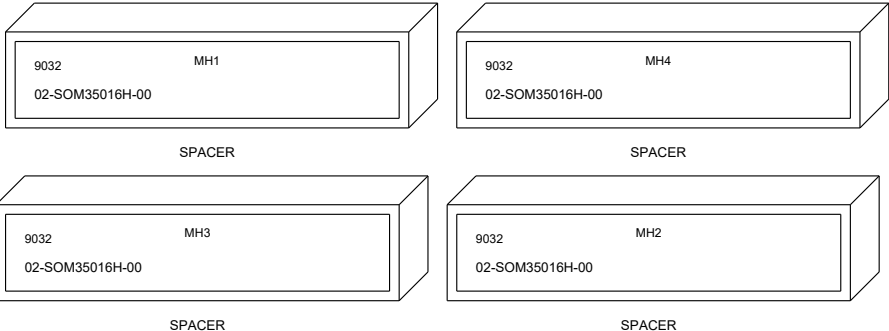


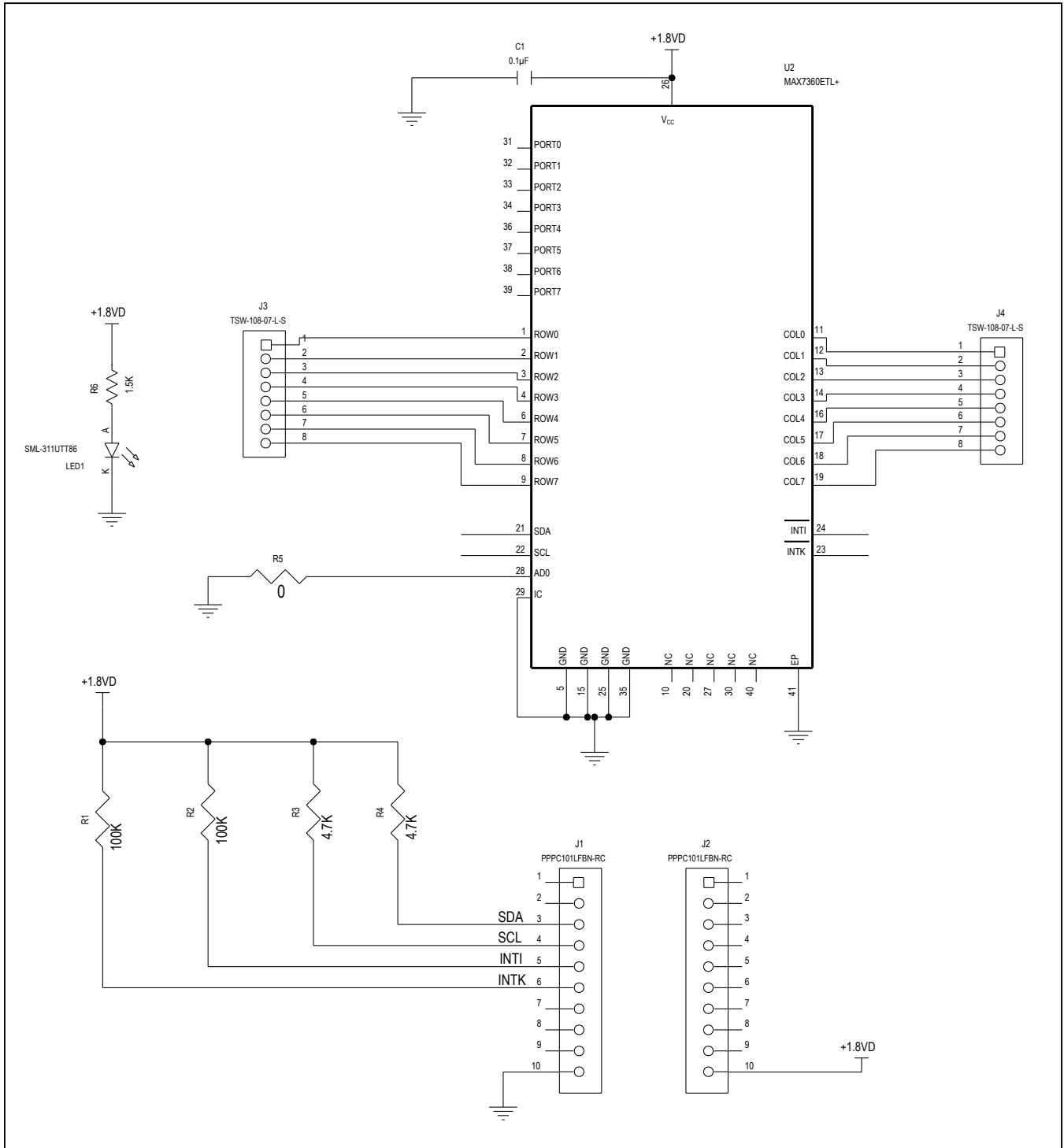
Figure 3. The key logging on the tera term.

MECHANICAL

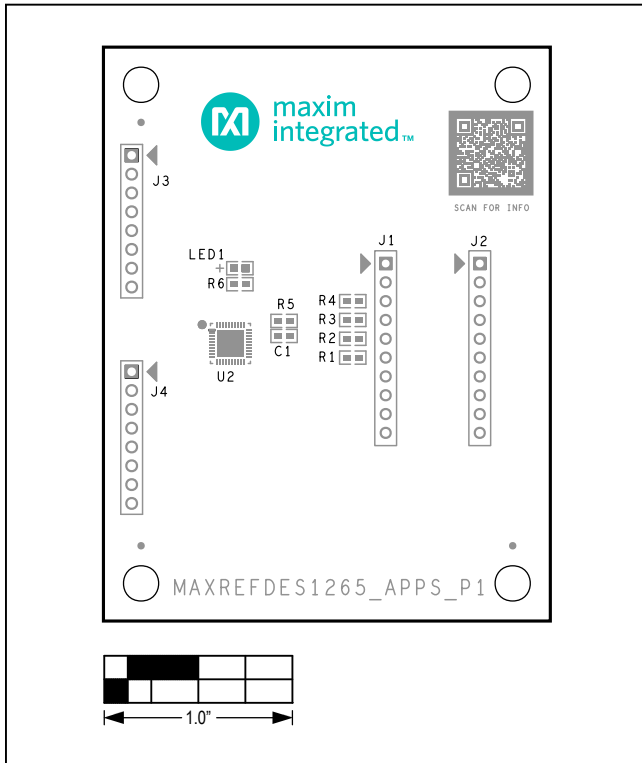
STAND OFF



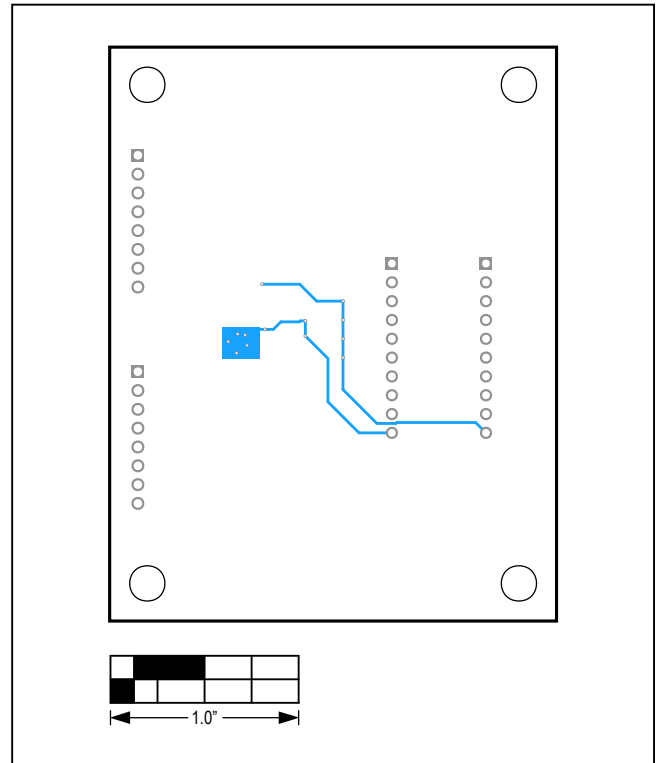
MAXREFDES1265 Schematic Diagrams (Continued)



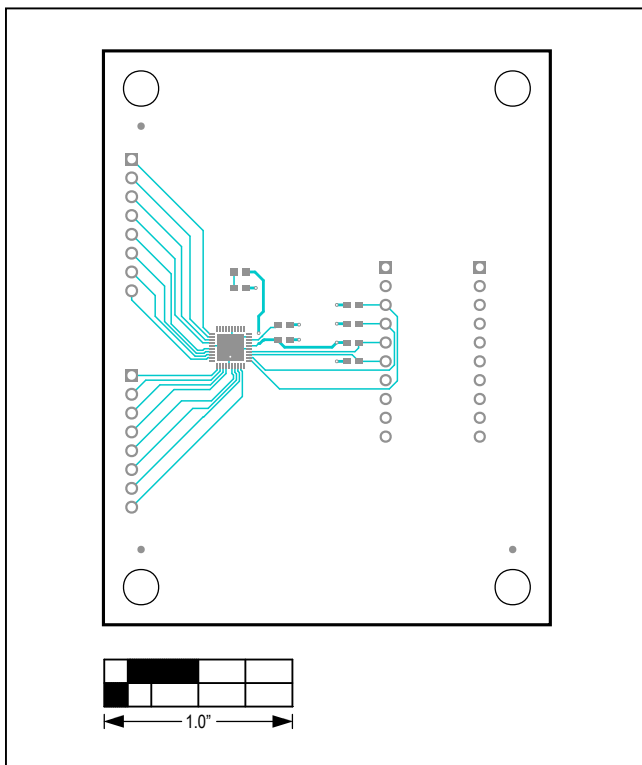
MAXREFDES1265 PCB Layout Diagrams



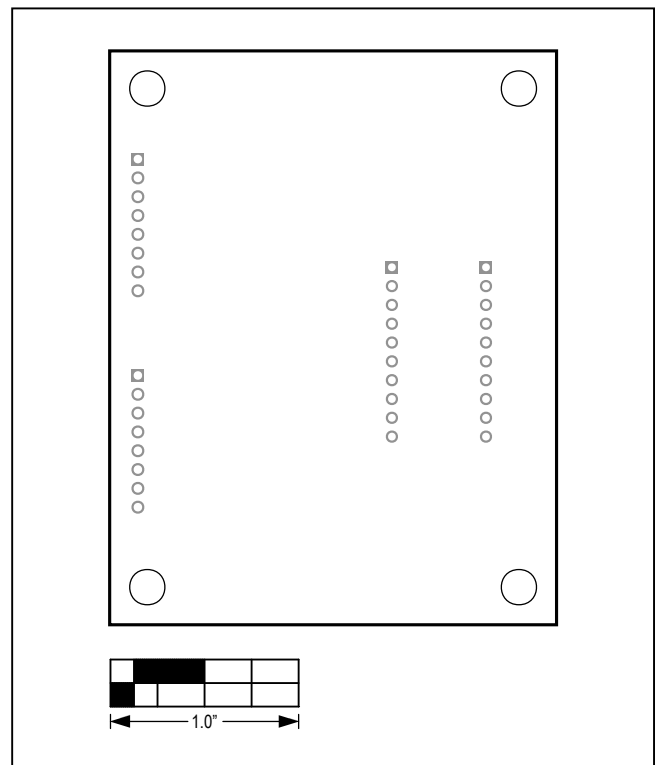
MAXREFDES1265 PCB layout – silkscreen top.



MAXREFDES1265 PCB layout – bottom view.



MAXREFDES1265 PCB layout – top view.



MAXREFDES1265 PCB layout – silkscreen bottom.

Revision History

REVISION NUMBER	REVISION DATE	DESCRIPTION	PAGES CHANGED
0	8/20	Initial release	—

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