



IQS525-TP43-HID Evaluation Kit User Manual

IQ Switch® - ProxSense® Series

1 Introduction

The IQS525-TP43-HID evaluation kit is a single unit that contains an IQS525-TP43 trackpad module and a HID interface board. A user can directly connect the EV-Kit to a PC, as shown in Figure 1, and then control the mouse pointer and some of the keyboard keys using the evaluation kit. The EV-Kit can be used as a basis for the development of custom trackpad applications. The development

procedure using the evaluation kit is illustrated in Figure 2.

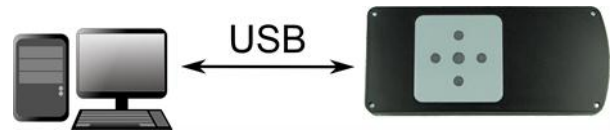
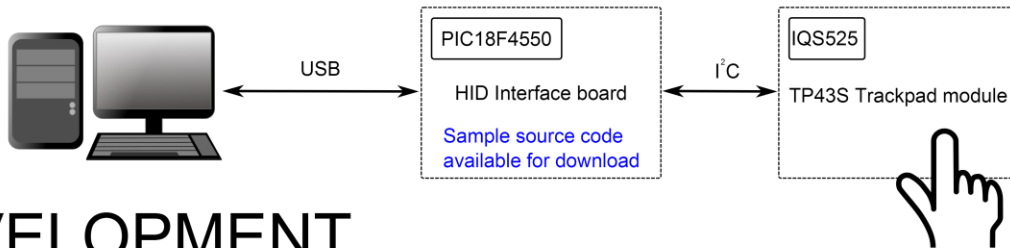
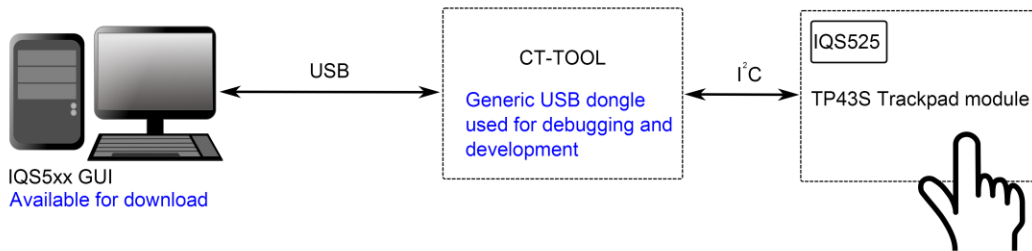


Figure 1: The IQS525-TP43-HID-EVKIT connects to a PC through the USB.

EV-KIT



DEVELOPMENT



APPLICATION

Example: remote control

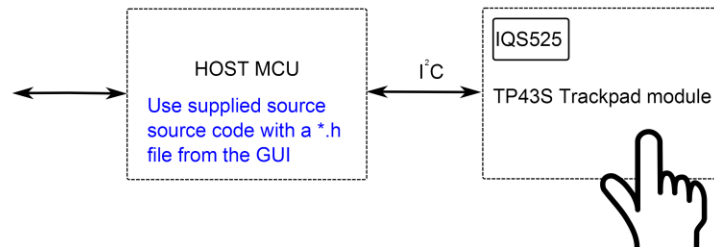


Figure 2: TP43S development stages



The EVKIT can be seen in [Figures 3 and 4](#). The EVKIT contains a trackpad with 5 imbedded buttons.

The EVKIT can be connected to a computer using a USB cable and provides the following functionality:

- The user can slide the tip of his finger on the trackpad to move the mouse pointer.
- Mouse clicks are generated with finger taps.
- The user can press the following keys:
 - Up arrow
 - Down arrow
 - Left arrow
 - Right arrow
 - Enter.

The locations of the keys are illustrated in [Figure 5](#). The purpose of the HID module is to illustrate the capabilities of the IQS525-TP43 module and to serve as a design example of how such a trackpad module can be used in conjunction with a Microchip MCU.

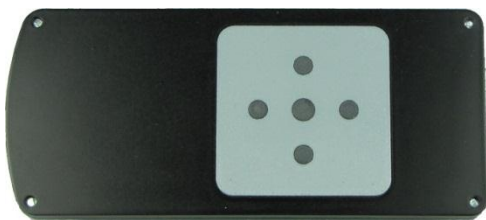


Figure 3: Top view of IQS525-TP43-HID evaluation kit.



Figure 4: Bottom view of IQS525-TP43-HID evaluation kit.

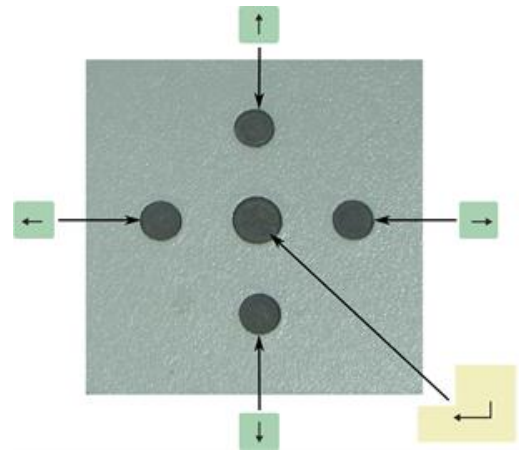


Figure 5: The locations of the keyboard keys on the trackpad are illustrated above.

Users are encouraged to download the following design resources from the Azoteq website:

- [AZD068: Trackpad design guide.](#)
- [AZD070: Trackpad algorithms.](#)
- [PIC18F4550 HID sample code.](#)

2 HID interface board

The HID interface board contains a PIC18F4550 MCU and can interface to a TP43 module using I²C and to a computer using USB. The HID interface board with its connection to the trackpad module is shown in [Figure 7](#). A schematic of the HID interface board is provided for reference in [Figure 11](#).

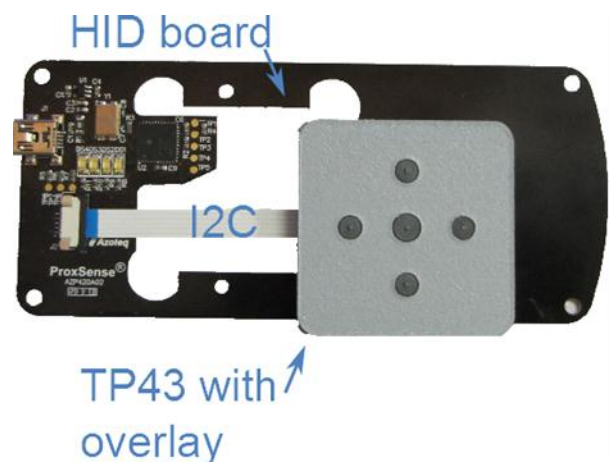


Figure 6: HID interface board connected to the IQS525 TP43 module using the I2C protocol on a flex cable.



3 TP43 Trackpad Module

The TP43 trackpad module boasts a 5x5 sensor array managed by an IQS525 trackpad controller. The trackpad module can be seen in Figure 8. The module is available for purchase as a single unit and is provided with a 2mm flat Perspex overlay. Note that the snap functionality cannot be evaluated using the flat overlay. Users are referred to the IQS525-TP43-HID evaluated kit for this purpose. The IQS525 TP43 module specifications are provided in Table 1. The TP43 module in the IQS525-TP43-HID evaluation kit has a 2mm thick overlay with 5 embedded buttons. Figure 9 shows the TP43 with its snap domes and its overlay. Figure 10 contains a schematic of the IQS525 TP43 trackpad circuit.

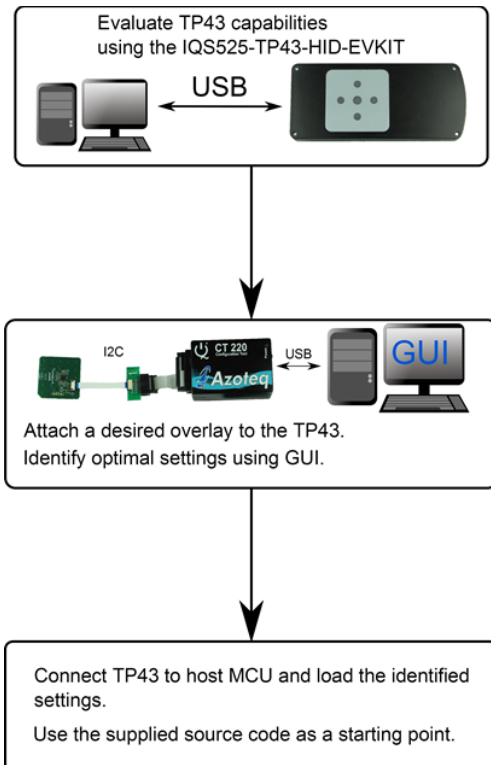


Figure 7: Steps for designing a custom trackpad.

This schematic can serve as a reference design for users who want to design their own custom trackpads. The steps for designing a custom trackpad application are outlined in Figure 6. The basic procedure is as follows:

- Fit the desired overlay on the TP43 trackpad module.
- Connect the trackpad module to a PC using an AZP216D01 interface board and a CT-tool.
- Download Azoteq's IQS5xx GUI (<http://www.azoteq.com/>) and identify the optimal trackpad settings.
- Include the TP43 module in a custom design that has its own host MCU.
- Replicate the trackpad performance on the host MCU. The provided source code can be used as a starting point for this.

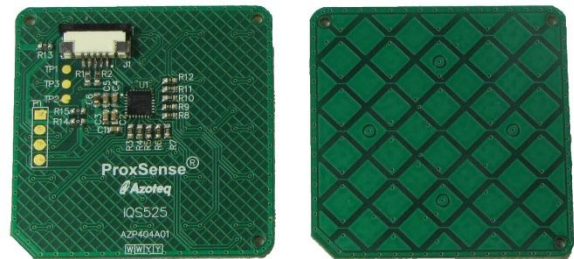


Figure 8: Left: Circuit of TP43 module containing an IQS525 chip. Right: Trackpad sensor pattern with 25 channels.



Figure 9: Left: IQS525 TP43 trackpad module with snap domes. Right: Overlay with embedded buttons for IQS525-TP43-HID evaluation kit.

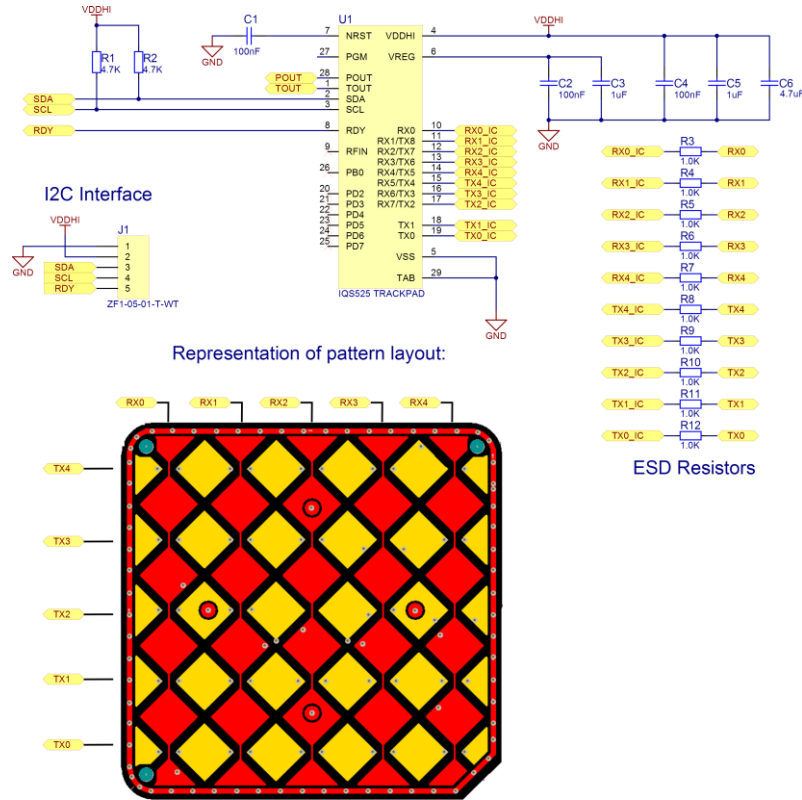


Figure 10: Schematic of the IQS525 TP43S module.

Table 1: IQS525 TP43 module specifications.

Specifications	
Size	43x43 mm
Interface	I ² C
Current	<1μA (Shutdown)
	8μA (Sleep)
	2mA (Active)
Voltage	1.8-3.6V
Electrode	5x5 diamond pattern
Resolution	600 DPI
Connector	ZIF

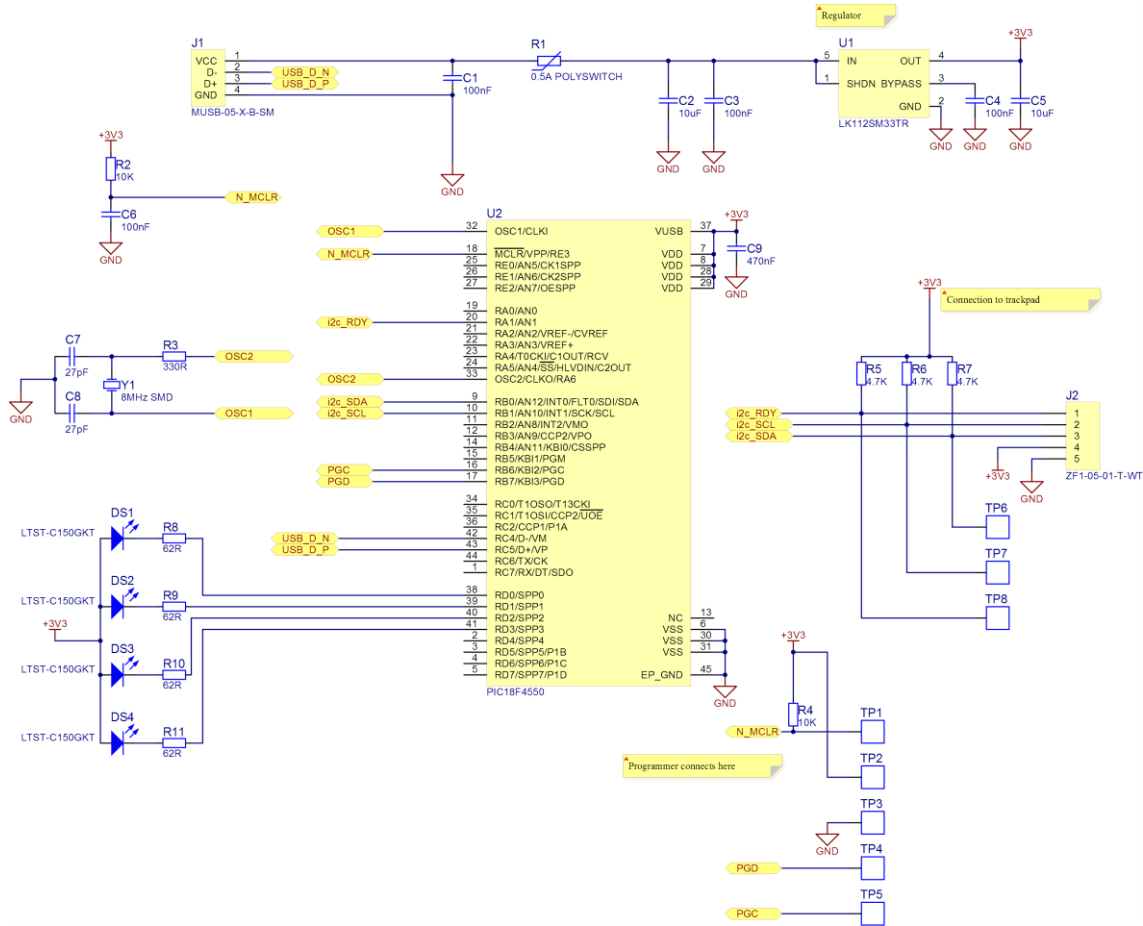


Figure 11: Schematic of the HID interface board.

The following patents relate to the device or usage of the device: US 6,249,089 B1, US 6,952,084 B2, US 6,984,900 B1, US 7,084,526 B2, US 7,084,531 B2, EP 1 120 018 B2, EP 1 206 168 B1, EP 1 308 913 B1, EP 1 530 178 A1, ZL 99 8 14357.X, AUS 761094, HK 104 14100A, US13/644,558, US13/873,418

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