IQS253EV02 Evaluation Kit User Manual

IQ Switch® - ProxSense® Series

Table of Contents

1   Introduction

This user manual describes the operation of the IQS253EV02 Evaluation Kit. The EV-Kit is manufactured in three parts, consisting of a mainboard, and two separate plug-in module boards. To adjust IC OTP settings, the main board can be interfaced to any personal computer with the Azoteq Configuration Tool (CT220), and making the adjustments by means of theUSBProg software. The purpose of the IQS253EV02 EV-Kit is to help application and development engineers in evaluating the IQS253 proximity and touch sensor.

2   EV-Kit Mainboard

Figure 2.1 illustrates the evaluation kit mainboard and the two supplied controller modules. The mainboard supplies power and other functions to the controller module boards and is easily operated. Simply plug in the desired module board into the mainboard and interface with the IQS253 GUI Software by means of the Azoteq Configuration Tool (CT220). Features included in the EV-Kit mainboard:

> Modular design: Connect one of the supplied IC modules into the mainboard, or wire into a prototype for rapid prototyping
>
> Reference designs for IQS253 with user proximity & touch detection ability
>
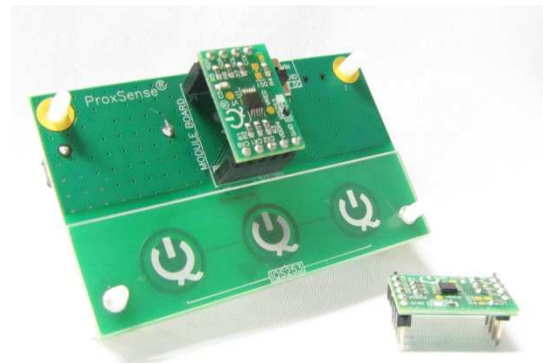> Two separate module boards, one for projected mode, and one for self-capacitance mode

Figure 2.1   IQS253EV02 Mainboard and controller modules

> Usedin Data Streaming Mode:
> EV-KIT requires Azoteq Configuration Tool CTxxx or DS for streaming.
> OTP bits can be programmed on the kit (requires CT220)

Figure 2.2 illustrates the bottom view of the EV-Kit mainboard.The EV-Kit can optionally be powered by two 3V coin cell batteries in series, which are regulated to 3.3V and supplied to the module board. The EV-Kit mainboard can also draw power from a USB source by means of the mini-USB connector provided on the mainboard (optional).
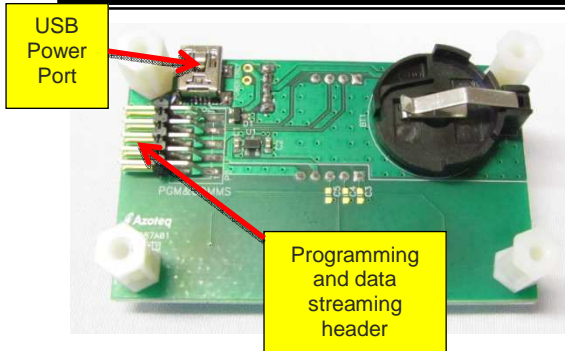
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Figure 2.2   Bottom view of EV-Kit mainboard

The mainboard includes a programming and data streaming header as also illustrated in the Figure 2.2.

The EV-Kit is interfaced to a personal computer for data streaming and programming OTP options, by means of the Azoteq Configuration Tool (CT220).For IC programming and visual data streaming please utilizethe USBProg and IQS253 GUI software, provided on the Azoteq website. (http://www.azoteq.com).

3 Module Boards

3.1 IQS253 Module Board – Self Capacitance Mode

Figure 3.1 illustrates the self-capacitance mode IQS253 Module board. Its features include:

> 3 x Touch and proximity sensing channels in self-capacitance mode

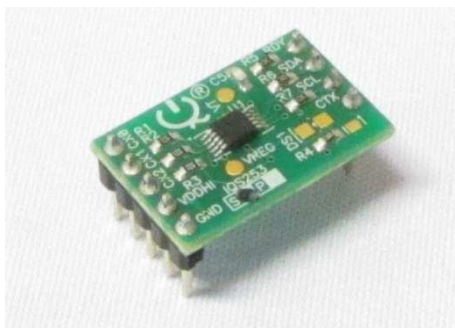> Small and compact PCB layout, which is easily wired to prototype applications

Figure 3.1   IQS253   Module   board marked "S"

Descriptions of the components are given in Table 3.1.

Table 3.1   IQS253 S-ModeModule board component description

Component	Purpose	Typical value
C1, C2	Power supply decoupling capacitors	1µF, 100pF
C3, C4	Internal regulator decoupling capacitors	1µF, 100pF
R4	Boolean Output	100Ω
R1, R2, R3	Sense electrode (Cx) series resistors (Added ESD Protection)	470Ω
R5, R6, R7	Streaming pull-up resistors	10kΩ

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3.2 IQS253 Module Board – Projected Capacitance Mode

Figure 3.2 illustrates the projected mode IQS253 Module board. Its features include:

3 x Touch and Proximity sensing channels in projected capacitance mode

Small and compact PCB layout, which iseasily wired to prototype applications

Figure 3.2   IQS253 module board marked "P"

Descriptions of the IQS253 self-capacitance mode module board components are given in Table 3.2.

Table 3.2   IQS253 P-Mode Module board component description

Component	Purpose	Typical value
C1, C2	Power supply decoupling capacitors	1µF, 100pF
C3, C4	Internal regulator decoupling capacitors	1µF, 100pF
R4	Sense electrode (CTX) series resistor (Added ESD Protection)	470Ω
R1, R2, R3	Sense electrode (CRX) series resistors (Added ESD Protection)	470Ω
R7, R8, R9	Debug Mode pull-up resistors	10kΩ

3.3 IQS253 GUI Interface

For operation and data visualization, it is necessary to interface the IQS243 module to a personal computer by means of the Azoteq

CT200 Configuration Tool. The IQS243 GUI is used to stream and visualize data in real-time.
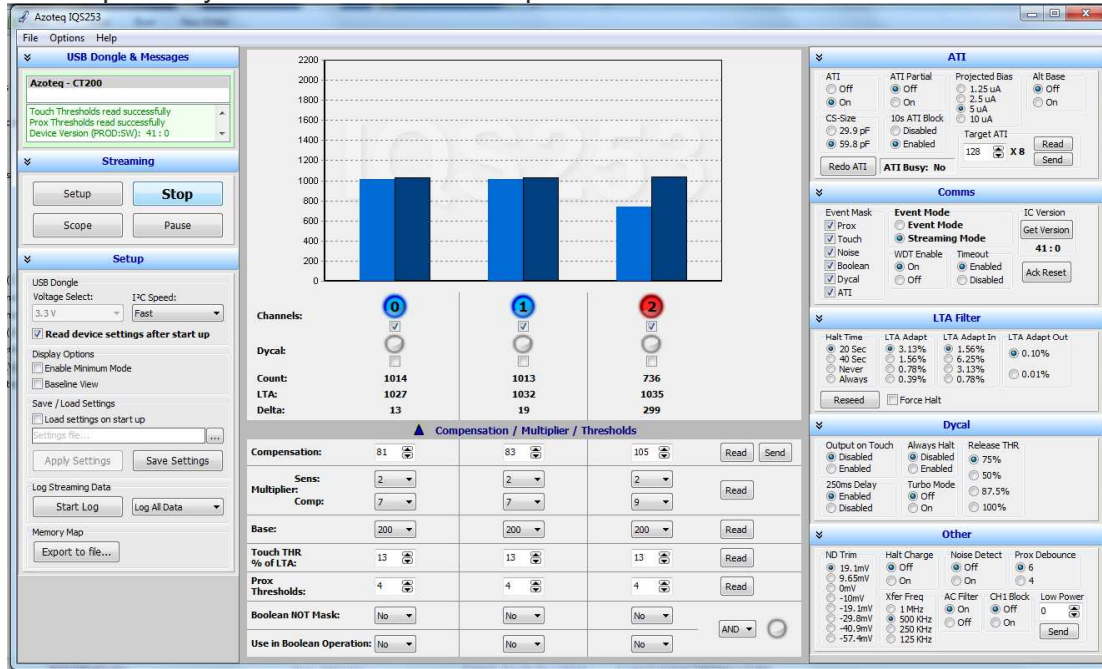

Figure 3.3   IQS253 Graphical User Interface

The IQS253 Software GUI can be downloaded from the following link:

http://www.azoteq.com/images/stories/software/azoteq_iqs253_setup.zip

Plug in the IQS253 module into the Mainboard
Connect the Mainboard to the Azoteq CT
Run the IQS253 Software GUI and Click on "Start".

The GUI display is illustrated in Figure 3.3 where channel 3 shows a valid touch, and proximity is detected on all other channels.

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4 Reference Designs

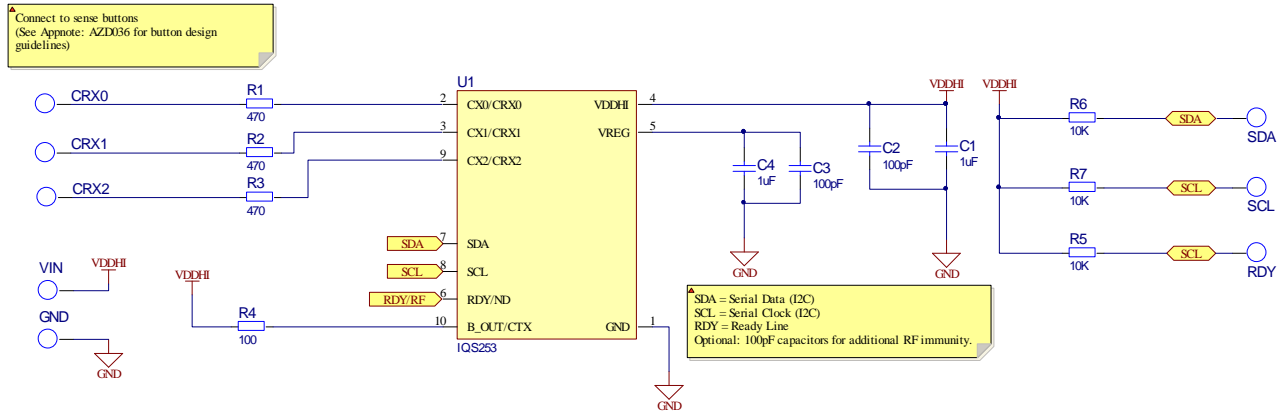## 4.1 IQS253 Self-Capacitance Reference Design

Figure 4.1   IQS253 Self Capacitance Mode Reference design
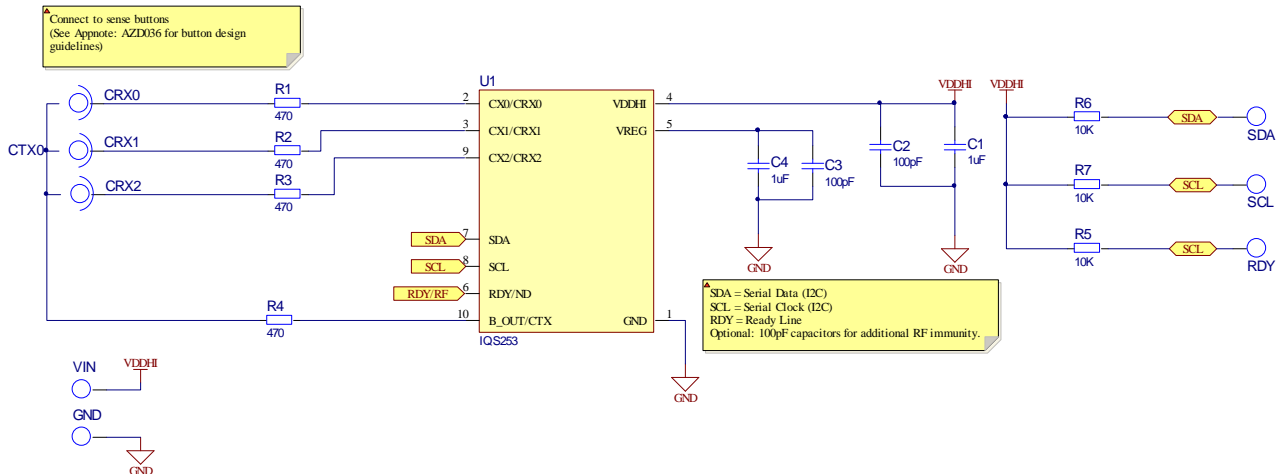
4.2 IQS253 Projected Capacitance Reference Design

Figure 4.2   IQS253 Projected Mode Reference design

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The following patents relate to the device or usage of the device: US 6,249,089 B1, US 6,621,225 B2, US 6,650,066 B2, US 6,952,084 B2, US 6,984,900 B1, US 7,084,526 B2, US 7,084,531 B2, US 7,119,459 B2, US 7,265,494 B2, US 7,291,940 B2, US 7,329,970 B2, US 7,336,037 B2, US 7,443,101 B2, US 7,466,040 B2, US 7,498,749 B2, US 7,528,508 B2, US 7,755,219 B2, US 7,772,781, US 7,781,980 B2, US 7,915,765 B2, EP 1 120 018 B1, EP 1 206 168 B1, EP 1 308 913 B1, EP 1 530 178 B1, ZL 99 8 14357.X, AUS 761094

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