



# ProxSense® IQS550-TS43

## Projected Capacitive Touchscreen

Multi-touch Sensor and Controller for 4.3" LCD displays

The IQS550-TS43 combines a touchscreen sensor and controller to provide a complete touchscreen solution. The IQS550-TS43 allows cost-effective integration of a multi-touch sensor and controller with a 4.3" LCD screen.

### Main Features

- 4.3" Touchscreen Panel with controller
- IQS550 Controller
- 3584 x 2304 Resolution
- Minimum report rate of 80Hz (dual-touch)
- Up to 5 simultaneous touch co-ordinates
- I<sup>2</sup>C Interface
- Event mode and streaming modes
- Excellent panel transparency (>85%)
- Proximity low power operation (<10uA)
- Supply voltage 1.65V to 3.6V

### Applications

- Appliances
- Office equipment
- Kiosks
- POS Terminals
- Medical equipment
- Industrial Instrumentation

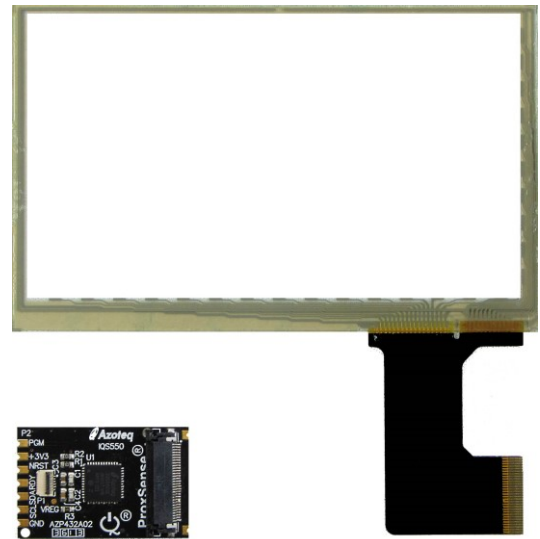


Figure 1.1 IQS550-TS43



## 1 Introduction

The IQS550-TS43 is an integrated projected capacitive touch sensor and controller based on the IQS550. The module is optimized for direct mounting on a 4.3" LCD display with a 16:9 aspect ratio. The product comes with adhesive for quick assembly. The IQS550 is automatically calibrated for optimal performance at power-on. The IQS550-TS43 must be connected to a host controller via I<sup>2</sup>C.

## 2 General Specifications

Item	Specification	Unit
Panel diagonal size	4.3	Inch
Panel size	105	mm
	65.5	mm
Tail length	40	mm
Tail width	30.5	mm
Tail offset (from right)	3.5	mm
Transparency	>85 (TBD)	%
PCB size	33	mm
	22	mm
PCB connection	6w ZIF connector (0.5mm pitch)	-
	7w castellated pads for surface mount, +2 stabilization pads (2.54mm pitch)	-
Interface type	I <sup>2</sup> C (400kHz maximum)	-
Firmware upgrades	Direct 4w flash programming (requires Azoteq CT210)	-
	Boot loader (I <sup>2</sup> C)	-
IQS550	Standard firmware, pre-programmed, boot loader option included	-



### 3 Mechanical Specifications

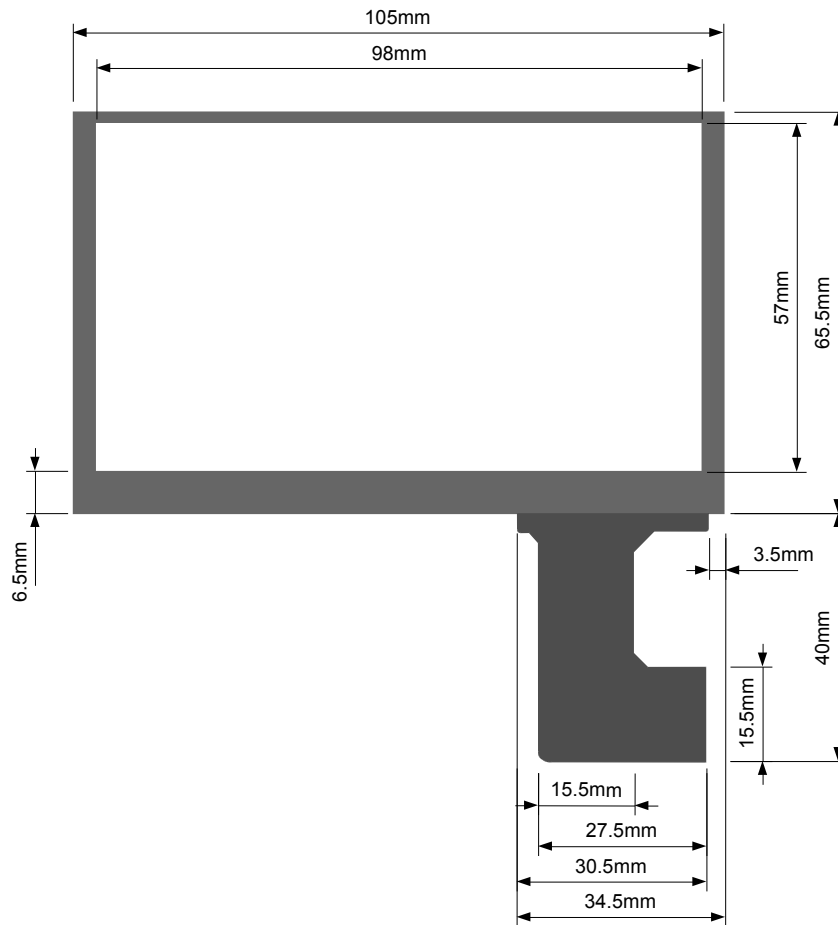


Figure 3.1 Touch Panel Dimensions

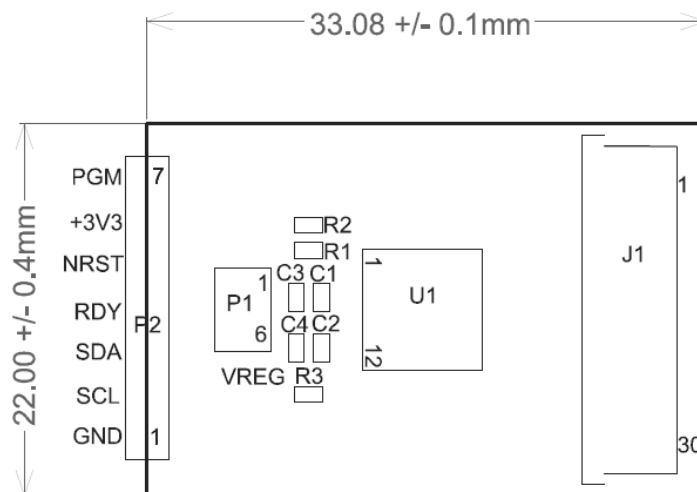


Figure 3.2 PCB Mechanical outline

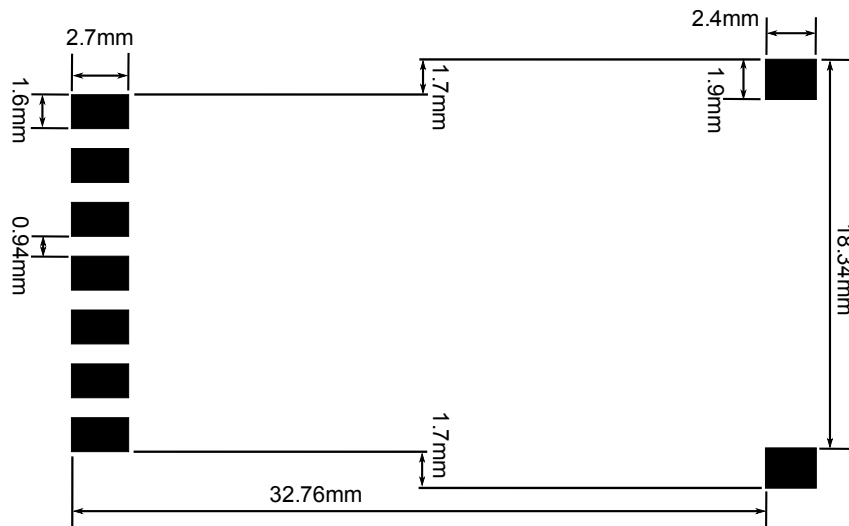


Figure 3.3 Recommended footprint for the AZP432

## 4 Interface description

Connector - pin number	Pin name	Pin Description
P1-1 / P2-6	VDDHI	Input voltage (1.65V to 3.6V)
P1-2 / P2-5	NRST	Hard reset input
P1-3 / P2-4	RDY	Ready line (interrupt request line)
P1-4 / P2-3	SDA	I2C bus data line
P1-5 / P2-2	SCL	I2C bus clock line
P1-6 / P2-1	GND	Signal ground
P2-7	PGM	Data line for flash programming
J1-1	GND	Signal ground
J1-2 → J1-16	Tx14 → Tx0	Transmit signals
J1-17 → J1-19	GND	Signal ground
J1-20 → J1-29	Rx9 → Rx0	Receiver lines
J1-30	GND	Signal ground



## 5 Electrical Specifications

The [IQS5xx-A000](#) datasheet specifies the electrical characteristics for the IQS550 controller. All components on the PCB are chosen for optimal performance.

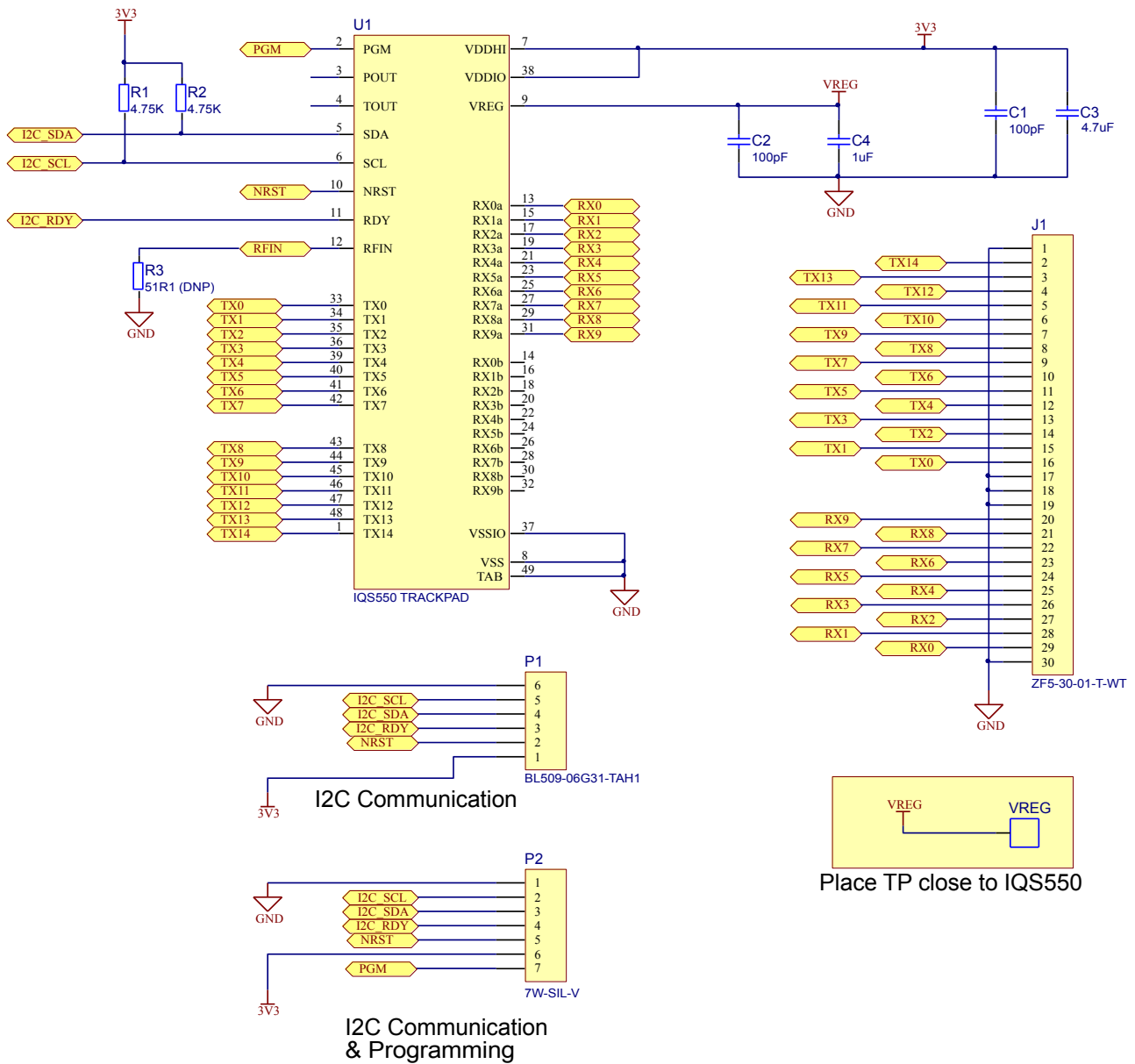


Figure 5.1 AZP432 Schematic



## 6 Communications Interface

The IQS550-TS43 is designed for easy integration. The default values are optimized for typical LCD displays but can be modified through the I<sup>2</sup>C interface for specific display configurations. If the default values are used, no setup is required and only read commands are required. The [IQS5xx-A000](#) datasheet describes the I<sup>2</sup>C communication interface. Example code can be found on the website at [Example Code](#). This code follows the program flow diagram as shown in Figure 6.1

The X-Y data is available for the 5 strongest touches.

The application note [AZD067](#) (IQS5xx Communication Interface) describes the general implementation of an I<sup>2</sup>C master interface in detail.

Azoteq provides an easy to use debugging environment via a USB streaming tool (see application note [AZD070](#) for more information)

### 6.1 Interface instructions

- Optional: Test the panel through the IQS5xx GUI.
- Obtain the available resources from [www.azoteq.com](http://www.azoteq.com) under the Resources Available for Download section.
- Implement the master code according to the example code and program flow shown in Figure 6.1 and consult the [AZD067](#) application note for more detail.
- Initialization procedures can be omitted for the IQS550-TS43. The defaults of the general IQS5xx code have been adapted in firmware to ensure auto-calibration and optimal defaults for the placement of the screen onto a typical 4.3" LCD display. In other words XY-data can be read directly after power-up and auto-calibration.
- If the device is powered on with a hand on the panel, then re-calibration techniques will ensure correct calibration as soon as all “touches” on the panel are released.
- “XY data” is the main output of the IQS550-TS43
- All strongest touch points may be read in each communication window.
- Each XY point is accompanied with an ID for tracking and touch strength indication for organizing data
- When the ID byte has the MSB set, the ID given is for a proximity point. With the MSB cleared, the ID is given for a touch point. Therefore IDs equal to 1 to 5, are touch points.

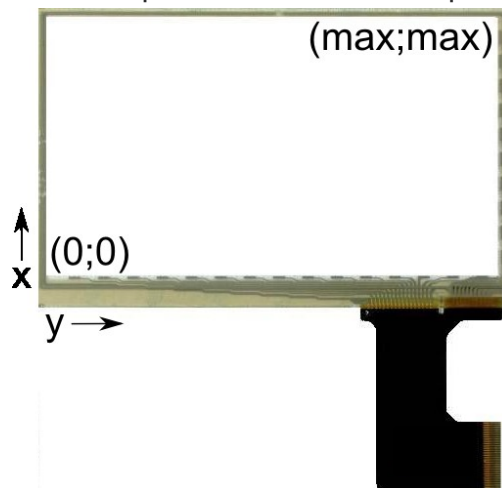


Figure 6.1 Position of XY-data on the screen



## 6.2 Communications program flow

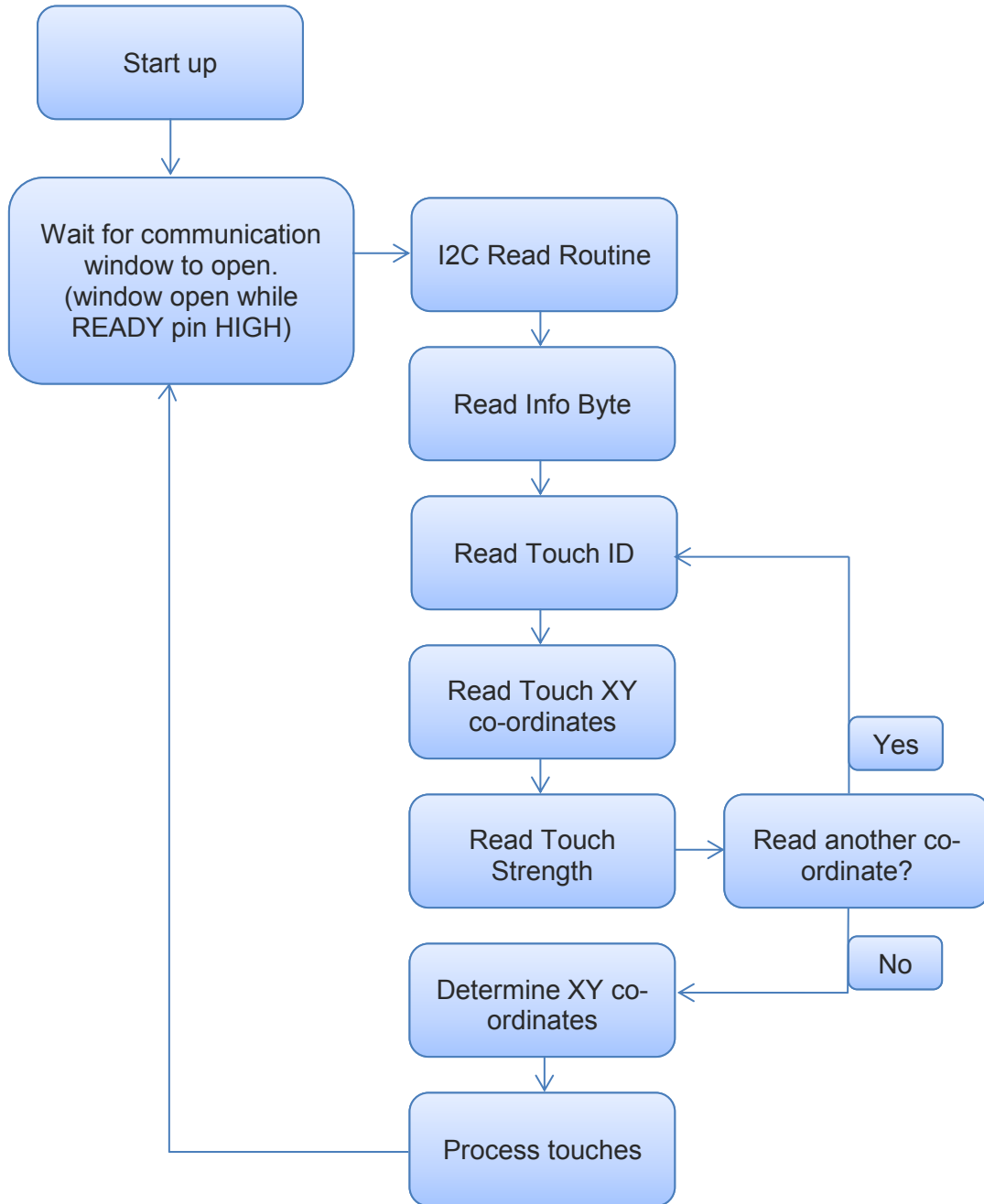


Figure 6.1 Program flow diagram




## Appendix A. Contact Information

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Please visit [www.azoteq.com](http://www.azoteq.com) for a list of distributors and worldwide representation.

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 7,265,494 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 B2; US 7,781,980 B2; US 7,915,765 B2; US 7,994,726 B2; US 8,035,623 B2; US RE43,606 E; US 8,288,952 B2; US 8,395,395 B2; US 8,531,120 B2; US 8,659,306 B2; US 8,823,273 B2 B2; EP 1 120 018 B2; EP 1 206 168 B1; EP 1 308 913 B1; EP 1 530 178 A1; EP 2 351 220 B1; EP 2 559 164 B1; CN 1330853; CN 1783573; AUS 761094; HK 104 1401

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