



World Leader in Capacitive Proximity Sensing



## Azoteq Announces 4.3" Low Cost Multi-touch Projected Capacitive Touchscreen with Controller

Azoteq announced the IQS550-TS43 4.3" multi-touch projected capacitive touchscreen, the first capacitive touchscreen solution to cost less than resistive touchscreens. The touchscreen with the IQS550 projected capacitive controller interface board is priced at \$9.10 in 1K quantities.

The IQS550-TS43 combines a 4.3" touch screen with the IQS550 controller to provide 3584 x 2304 touch resolution. The IQS550 supports scan rates up to 80 Hz and multi-touch up to 5 fingers. The IQS550 communicates through an I2C interface to a host controller. Azoteq provides a driver for quick integration into an existing system. In addition Azoteq provides the CT210 I2C to USB adapter and the IQS5xx GUI for debugging on a PC. The IQS550-TS43 features a unique proximity mode, which allows <math><10\mu\text{A}</math> current in standby while still sensing proximity.

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To enable next generation capacitive user interfaces and intelligent switch applications for users to interact naturally with products through capacitive proximity and touch

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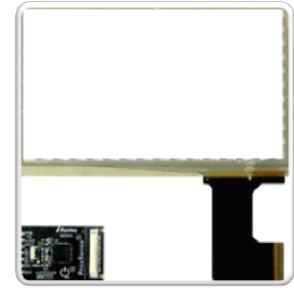
“Azoteq realized that projected capacitive touch is too expensive for low and medium volume customers because there are no of-the-shelf capacitive touchscreen solutions. By offering a complete projected capacitive touchscreen solution, Azoteq will make it easy to add a touchscreen or to replace a resistive touchscreen to any LCD product”, said Kobus Marneweck, CEO VP of Marketing at Azoteq.

### Applications:

- Appliances
- Office equipment
- Medical equipment
- Industrial Instrumentation

### Pricing:

The IQS550-TS43 is priced at \$9.10 in 1K quantities and \$9.95 for single units. The IQS550-TS43 is available from Mouser Electronics for immediate shipment.



Azoteq's IQS550-TS43 comes with a 4.3" touchscreen and control module

## Features of the IQS550-TS43 4.3" multi-touch projected touchscreen

The IQS550-TS43 4.3" multi-touch projected touchscreen offers several features. These features are:

- 4.3" Touchscreen Panel with controller
- IQS550 Controller
- 3584 x 2304 Resolution
- Report rate of 80 Hz (dual-touch)
- Up to 5 simultaneous touch co-ordinates
- I2C Interface
- Event mode and streaming mode
- Excellent panel transparency (>85%)
- Proximity low power operation (<10uA)
- Supply voltage 1.65V to 3.6V



## How to design a \$3.50 educational touch toy

Capacitive touch keys provide robustness and flexibility to a cost-effective educational toy. Touch keys will withstand the 'abuse' inflicted by children when they play. This guide on "How to design a \$3.50 educational touch toy" describes the design and execution of an educational touch toy with the constraint of a \$3.50 BOM cost. The toy will respond with a variety audio clips, depending on the icon touched by the child.

### Proposed solution

The IQS550, coupled with a voice integrated IC, will provide the solution to making a low-cost educational toy. The proposed solution will integrate Azoteq's IQS550 touch controller with the Aplus a MTP32M voice integrated IC. With this particular voice integrated IC, a maximum of 255 sound enabled touch keys are possible.



Figure 1: System Block Diagram

### Design specification

The specifications for the educational toy are the following:

- Complete BOM cost of \$3.50
- Minimum of 80 buttons
- Integrated sound
- Touch keys
- 7" Tablet-type form factor

To comply with the \$3.50 BOM specification cost the following components were selected:

1. Azoteq IQS550 touch sensor
  - Cost effective
  - Sufficient number of touch keys
  - Low power consumption

2. Aplus aMTP32M voice IC
  - 660s integrated voice time
  - 256 voice addresses
3. Speaker
4. Single sided FR1 pc-board
  - Cost effective for large-sized form factor
  - 7" tablet form factor
5. Miscellaneous
6. Plastic (or other) Mold
7. Graphic inserts

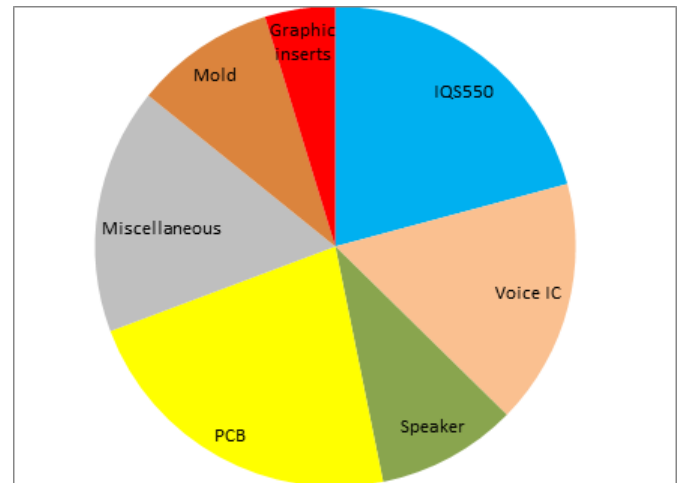


Figure 2: Pie Chart of BOM Cost

Due to the cost of pc-boards, a novel idea had to be found for a design with 160 touch keys. The touch keys had to be big enough for activation by a toddler. The keys had to be spaced far enough apart so that no two keys could be pressed simultaneously.

For eight games to be played with the same HW platform, eight graphic inserts are used. Each insert has a different theme. The different inserts are detected with a capacitive method from the source touch IC. The voice IC responds with the appropriate sound for the particular graphic of the particular insert.

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## Page 3 Continued

The hardware supports 20 keys. With eight graphic inserts, it therefore allows for 160 independent graphics each with a unique sound.

The pc-board for the design is shown Figure 3. Figure 4 shows a typical graphic insert.

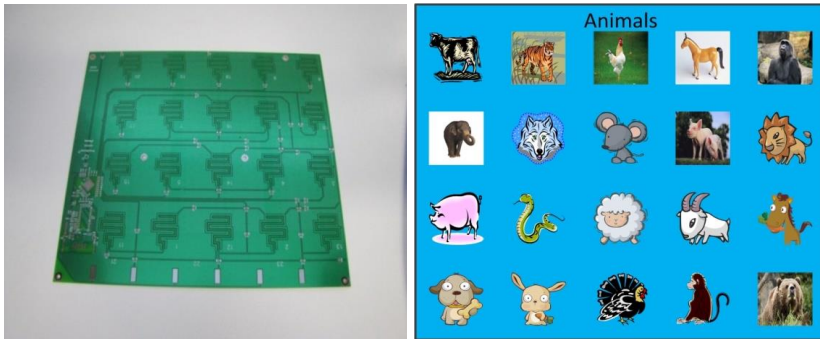


Figure 3: PC-Board for Educational Toy

Figure 4: Typical Graphic Insert

The graphic select sensors are placed on the edge of the pc-board, as in Figure 5. These sensor keys are used to differentiate between the eight different graphic inserts. Each insert is coded with a different binary code. This code is in the form of a conductive strip, as in Figure 6, which is sensed by the main board's hardware.

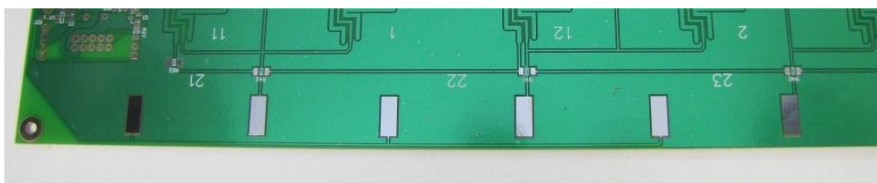


Figure 5 Graphic Select Sensors

The graphic option sensor is a three bit binary number.

### Design considerations

- The hardware must be rigid
- Touch keys must be spaced so that they will not be pressed simultaneously
- Graphic selection sensors must be placed on the edge of the pc-board
- Mounting holes should be placed on the edges of the pc-board



Figure 6

Conductive strips on the graphic insert identify each unique insert

### Applications

- Drum kit
- Electric touch guitar
- Turn table
- Touch toy smart phone
- Smart music carpet
- Music keyboard/ touch piano
- Musical books
- Interactive advertisements

[Full article with design files available here](#)

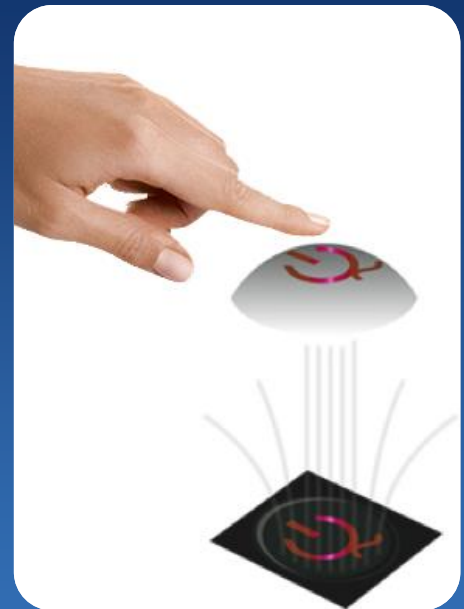
# History of Azoteq's AirButton trademark

In the early days of promoting the proximity functionality, we found that the word "PROXIMITY" was difficult to pronounce in Asian countries and that there was not a good translation for "PROXIMITY" into Mandarin.

The term "AirButton" was created by Terry Chiang, Azoteq's Product Manager for Taiwan. The term is both easy to pronounce and very descriptive of the proximity function as used by Azoteq, namely to active a function while the hand or finger is still in the air.

The AirButton logo was developed by Azoteq to depict a button in the air, with the capacitive lines projecting from the surface of the touch electrode into the air to form an invisible button.

We have created a truly universal word that is easy to pronounce and is very descriptive of the technology.



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