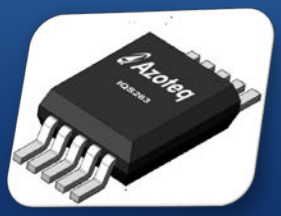
World Leader in Capacitive Proximity Sensing



Azoteq Announces the IQS263, a 3 Channel Capacitive Controller for SAR, Sliders, Scroll Wheels and Buttons

Azoteq's IQS263 is the first device to offer multi functionality in a small, low cost MSOP10 package

Azoteq will release the IQS263 to market in May 2014. The IQS263 is the first proximity controller specifically designed to meet the latest SAR regulations (KDB 616217–D04 and IEC 62209-2 ed1.0).

With 3 input channels, the IQS263 can detect proximity to meet SAR regulations in multiple points and also be used to detect a stylus or smart cover. The IQS263 features a unique movement sensor that prevents stuck conditions.

The IQS263 offers three self or mutual-capacitance channels. Proximity wakeup allows for very low power consumption until the user interacts with the product.

The IQS263 can be configured as a three channel slider or scroll wheel. The device can also be configured as a two channel slider with one key or utilize the third channel for long range proximity detection.

Continued on Page 4

Content

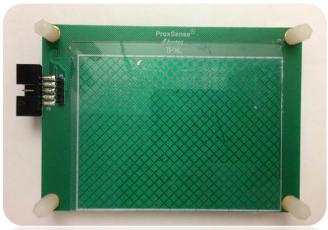
Azoteq enables next generation user interfaces for users to interact naturally with products through capacitive proximity and touch

Azoteq's High Resolution Touchpad

Azoteq has developed a High Resolution Touchpad based on the IQS550, our Projected Capacitive Touch and Proximity Track-Pad/Touchscreen Controller. This high resolution touchpad allows for a thin tip passive stylus to be used. These features help save on costs and complexity of having to use an active stylus.

Features of the High Resolution Touchpad are:

- Touchpad based IQS550
- Utilizes ProxSense's high SNR and sensitivity
- Custom firmware to support thin stylus
- 20 x 15 or 300 channels
- 4608 x 3584 resolution
- Supports a passive stylus with 1mm tip



Azoteq's High Resolution Touchpad

The picture above showcases the High Resolution Touchpad using the IQS550

For more information, please email info@azoteq.com

Azoteq's IQS550

The IQS550 is a projected capacitive touch and proximity track-pad/touchscreen controller. It is available for purchase on Mouser. Full product link to Mouser is located here.

Some Features of the IQS550 are:

- Proximity, touch and snap on each channel
- Multi-touch and multi-hover support
- 3584 x 2304 resolution
- I^2C communications interface
- ATI: automatic tuning for optimum sensitivity
- Supply Voltage 1.65V to 3.6V
- Proximity low power operation (<10uA)

Design and optimize electrodes for projected capacitive sensors, by Cheok Thng

This article is a follow-up to the one on SELF capacitance, and together, they cover the theories and design guides for the two most popular capacitive sensors, the projected and self-capacitive sensors.

The behaviors of the projected and self-capacitive sensors are noticeably different in the following ways:

	Projected capacitive sensor	Self capacitive sensor
1	Mutual capacitance **decreases** as the finger approaches the electrodes. (see Figure 1).	Self-capacitance **increases** as the finger approaches the electrode
2	Mutual capacitance initially decreases as the finger approaches the electrodes, and then increases when the finger is closer than some critical height (see Figure 1)	Self-capacitance (the signal) **increases monotonically** as the finger moves closer to the electrode

Table 1. Major differences in the signal response between the self and projected capacitive sensors.

In a single-channel self-capacitive sensor, the transducer comprises two electrodes, namely the touch electrode and the ground plane. At the touch electrode, the fingertip and the electrode form a parallel-plate capacitor. The increase of the capacitance when the finger approaches the electrode is well understood, because:

$$C \propto 1/h$$

is quite an intuitive concept. The system capacitance can be modeled by lumped capacitors and the sensitivity of the electrode can be adjusted according to the circuit model.

In a single-channel projected capacitive sensor, the transducer comprises three electrodes, namely the transmitter electrode (T_x), the receiver electrode (R_x) and the ground plane. A typical layout for the discrete button is shown in Figure 1, with the R_x surrounded by the T_x and a big ground plane nearby. The ground plane is part of the sensing mechanism, and therefore must be analyzed together with T_x and R_x.

Figure 1 shows the typical response of the mutual capacitance vs. the height h, of the fingertip above the touch electrodes. This response curve is obtained by rigorous numerical simulation using Method of Moment, and the response profile is consistent with the experimental results. As the finger moves towards the electrodes, the mutual capacitance decreases and produces a signal, ΔC_m, which eventually reaches a maximum dip and then turns around. The response curve is not monotonic and, after reaching the maximum dip, the signal can be misinterpreted as a "release".

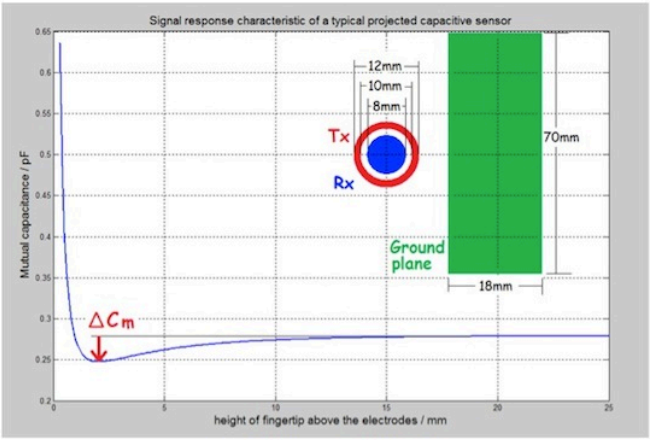


Figure 1: Signal response of a typical projected capacitive sensor.

The working principle behind the projected capacitive sensors:

In a projected capacitive sensor, T_x is excited with a charging voltage while R_x is held at the virtual ground, and the charges induced on R_x are then measured. Since the excitation and sensing take place at two different electrodes, the capacitance measured is regarded as the "mutual" capacitance.

Full Article Located here.

Page 1 Continued

The IQS263 supports gestures when the device is configured as a slider. The device provides tap, left swipe and right swipe gestures. The fast sample rate of 80Hz ensures that fast flicks are recognized. In low power mode, the IQS263 only draws 3uA while sensing making it ideal for battery applications.

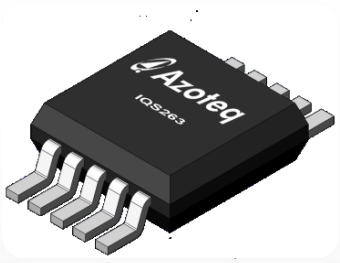
“The IQS263 is the lowest cost capacitive slider and scroll wheel controller available today. In addition, the IQS263 is the first device to meet all the latest SAR regulations,” said Kobus Marneweck, VP of Marketing.

Features:

- 3 Self or Mutual Channel Capacitive Controller
- Configurable 8-bit 2/3 channel slider or 3 channel scroll wheel
- Up to 80Hz report rate
- On chip Movement Detection algorithm
- SAR compliance - IEC 62209-2 ed1.0 and the FCC KDB 616217–D04
- Left, right flick and tap gestures
- Automatic adjustment for optimal performance (ATI)
- User selectable Proximity and Touch thresholds
- Long proximity range
- Automatic drift compensation
- Event mode or streaming modes
- Hibernation mode
- Supply voltage: 1.8V to 3.6V
- 3 μ A Active sensing in LP mode
- 100 μ A at 40Hz report rate

Pricing and Availability

The IQS263 is priced at $0.34 in quantities of 1K and $0.21 for orders greater than 1M. IQS263 samples and production will be available from Mouser.



IQS263 Applications

- SAR detection for tablets and mobile phones
- SAR detection for wireless charging stations
- Sliders/Scroll wheels for remote controls
- Movement detection devices
- Volume Control & Lid closure detection for laptops
- MP3 players
- Portable Electronics
- Wearable Electronics

Full Application Note on here.

Updates to Azoteq's Website

Azoteq is committed to making things easier for our customers. To do that, we've made some updates to our website. Azoteq has added a google search function to help you find datasheets and other information faster. Other updates including the one just listed are:

- Customized Google Search Bar
- Addition of Social Media Links
- RSS feed located on the "What's New" page
- New Application Notes
- Updated GUI Software

Azoteq's Homepage

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