Azoteq

World Leader in Capacitive Proximity Sensing

Design Guidelines for a Slider Application

By A. Patil and S. Anderson

Capacitive sliders provide a fine input control for instrumentation controls, temperature controls, volume controls, and many other applications.

With other touch controlers, up to six channels are required to implement a good slider. With Azoteq's technology, a designer can implement a slider using two to three channels.

Azoteq does offer ICs that can implement the slider interpolation for you, the IQS222 and soon the IQS333. These ICs are made for slider applications. For a lower cost solution that will require the designer to create code to interpolate the data, the IQS213 is a great IC to work with.

A slider using only three channels can be implemented by taking advantage of the high Signal-to-Noise Ratio offered by Azoteq's devices. A capacitive slider can be designed using a 2 or 3 channel self-capacitance or projected capacitance electrodes.

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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

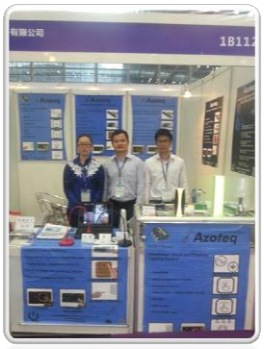
Azoteq exhibits at China Electronics Fair in Shenzhen

Azoteq exhibited at the Shenzhen China Electronics Fair in April of 2013. The focus of the conference was on new advance technology and Azoteq demonstrated Capacitive Proximity and Touch solutions.

Azoteq presented a wide range of capacitive proximity and touch solutions at our booth. Azoteq had demos that featured LED lighting solutions, scroll wheel touch, and proximity activation.

One such demo that was demonstrated was the Air Slider Lamp. The Air Slider lamp uses the IQS550 to implement two sliders, one on each side of the lamp. One side adjusts the intensity of the LEDs while the other side changes the color of the LEDs inside of the lamp.

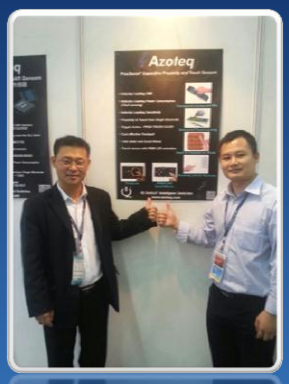
We enjoyed meeting everyone and are excited to help you with all of your Capacitive Proximity and Touch Sensor Needs. Contact us today so that we can help you with any questions that you may have!



Azoteq's booth at China Electronics Fair

Lina Yu, Anson Huang, and Steve Chen before attendees started arriving

Azoteq's Planned Booth Exhibits



Azoteq is planning on attending a few exhibitions and fairs this year to showcase our technology. If you have the chance, we invite you all to come out to see our booth. The planned appearances are as follows:

Guangzhou International Lighting Exhibition	June 9-12
Shanghai International Lighting Fair	July 10 - 13
Guzhen International Lighting Fair	Oct 18-21
Hong Kong International Lighting Fair	Oct 27 - 30

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A self-capacitance 3 channel slider will offer a better resolution than a 2-channel slider. The self-capacitance slider can be designed on a single sided ITO film whereas projected capacitance sliders typically requires two layers of ITO or a double sided PCB.

This application note focuses on a 3-channel self-capacitance slider because it offers a better performance and for ease of design/manufacturing.

The designer has to be familiar with Azoteq's technology before going through this application note. Please follow the application note AZD004 "Azoteq Capacitive Sensing" to learn Azoteq's technology

Design and implementation

In order to create an ideal slider design, keep the following criteria in mind:

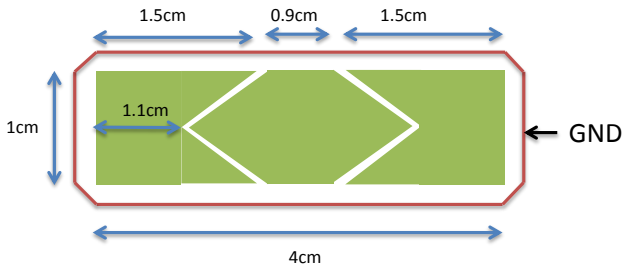
- A fast Sample rate
- Low power consumption
- Good Signal-to-Noise Ratio
- Minimum external components

For this application note, we will focus on using the IQS213.

IQS213 characteristics:

- Low Power: 5 µA considered as a "no current"
- Speed: Normal operation charge cycle is at 3.9mS
- SNR (Signal-to-Noise Ratio): 1000:1

All of these features make the IQS213 an ideal choice for a slider application. The performance of the slider mainly depends on the PCB layout. In order to get a good resolution, it is very important to get a strong signal from the neighbouring channels. Figure 1 below shows how to interleave channels for a slider layout. More interleaving can give a better linearity. In addition, it is important to make the width of the slider equal to or smaller than the tip of a finger. The layout shown in Figure 1 shows the ideal layout for a slider with a smaller width.



It is recommended to put a ground trace around the slider to shield the electrodes from external noise. For a ground shield around the slider, a 2mm of gap should be maintained between the ground trace and the outside edge of the slider.

It is also recommended to design a ground shield at the bottom side of PCB. The ground shield should be slightly bigger than the slider area with a hatched pattern of about 50%. This will block parasitic capacitance from interfering from the bottom side. This is very important in the case of hand held devices. The ProxSense device should be placed as close as possible to the slider with the shortest routing traces possible. A long trace increases the touch area and therefore the noise.

The IQS213 offers two modes for communication, event mode (default) and streaming mode.

Full Application Note Available Soon!

Azoteq Adds Horizon Technical Sales as Representatives

Azoteq, the world leader in capacitive proximity solutions, today announced that Horizon Technical Sales have been appointed to represent Azoteq in Illinois and Wisconsin. Azoteq is represented in all the major US markets, central Europe and has an extensive Asian coverage.

Azoteq's ProxSense® offers the most sensitive capacitive sensing solutions with the highest signal to noise ratio (>1000:1) in the market today. The high sensitivity enables proximity sensing up to 300mm and the ability to implement touch solutions that can work through 20mm cover materials.

"Azoteq partnered with Horizon Technical Sales because they have an experience with introducing smaller semiconductor products to larger companies", said Kobus Marneweck, Azoteq's VP of Marketing.

About Horizon Technical Sales:

"Horizon Technical Sales was formed in 1987 as an electronic components manufacturers' representative. We pride ourselves as a leading and innovative manufacturers' representative serving Northern Illinois and Wisconsin.

We represent high quality manufacturers and we are positioned to satisfy the market needs of these manufacturers and the customers we serve. Our selling team is experienced, well trained, and our most valuable asset.

We have earned a strategic leadership position in the market we serve by doing the basics of our business correctly the first time."

Azoteq's ProxSense® offers the next generation of capacitive proximity and touch solutions. Proximity sensing enables new applications such as detecting when a user's hand approaches the product. Features that can be implemented with proximity sensing include find-in-the-dark (enables backlight when hand approaches) and air gestures (wave hand to turn on/off, page and scroll). The combination of proximity and touch presents the next evolution in user interfaces.

HORIZON Technical Sales, Inc.

Azoteq's Representative in Wisconsin and Illinois

For more information about Horizon Technical Sales, contact Larry Ward at lward@horizontechsales.com

Helpful App Notes for your Design

There are many useful application notes that can be used to help products. Some examples of helpful application notes are:

Mutual Capacitance Button Layout Guideline

Wear&Play™: Auto ON/OFF for portable devices

IQS127 Automatic soap dispenser application - IR replacement

Implementing a Capacitive Swipe-Switch

Trackpad Design Guide

Our Application Notes are located under the design tab of Azoteq's website here.

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