World Leader in Capacitive Proximity Sensing

Azoteq Announces Pricing Breakthrough for Capacitive Switches

Azoteq announced on May 16th, 2013, a breakthrough pricing for selected capacitive proximity and touch controllers.

With pricing of less than $0.025 per switch or channel capacitive switches can now replace mechanical switches in many applications. In addition designers get proximity detection of over 300 mm using practical electrodes.

Azoteq combined breakthrough levels of sensitivity, Signal to Noise Ratio (1000:1) and RF immunity into cost-effective capacitive controllers. These benefits relax the common design constraints normally imposed on designers, and the automatic tuning algorithm ensures that no calibration is required in manufacturing.

This allows designers to use thick overlay materials of up to 50 mm or more and touch keys in extremely small spaces. With ProxSense® a touch key is easily realized with a pad on a PCB.

Content

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

IQS127 Automatic soap dispenser application - IR replacement

In an application such as an automatic soap dispenser using an IR sensor, a capacitive solution can also be used. This article describes the IR sensor replacement with an IQS127 ProxSense™ capacitive sensor.

The IQS127 is a cost effective single channel touch and proximity sensor offered in a TSOT23-6 package.

IQS127 ProxSense™ Sensor Integration

The IQS127 is extremely easy to set up and integrate into new and existing applications by following a few simple steps:

- Set up the IQS127 for active high or active low operation on detection (default active low).

- Design and integrate an appropriate sense antenna. (See section 3.1)

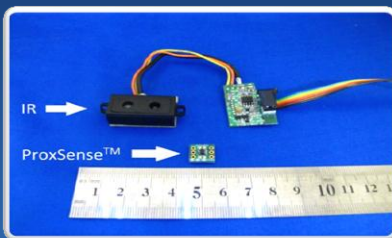- Interface the IQS127 to a microcontroller or other control circuit.

The IQS127 requires very few external components.
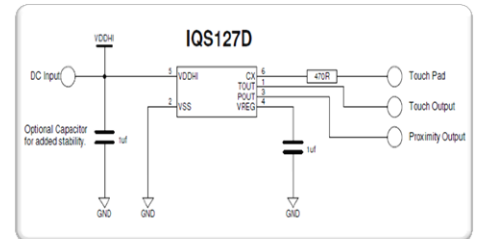
IQS127D Reference Design

IR Sensor Replacement

Two types of IR proximity detection are commonly employed, low range "always ON" infrared detection and long range pulsed infrared detection. Both infrared sensor types usually interface with a microcontroller, and can easily be replaced by a single ProxSense™ capacitive sensor in the majority of applications.

As seen in the picture to the left, the IR detection circuitry is compared to the ProxSense™ circuit board. The IR circuitry is easily removed at the interface to the microcontroller, as the detection circuitry simply outputs a LOW or HIGH signal in the event of a positive detection.

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Proximity detection is natively offered on all touch key controllers, opening up possibilities for more intuitive user interfaces. This includes such as wake-up from standby, pre-emptive menu selection and automatic backlight illumination.

ProxSense® was developed and patented from the ground up using novel analog design techniques for ultra-sensitive capacitive measurements. The result is a proximity and touch controller that can sense changes of 20 atto farads in projected capacitance mode and 200 atto farads in self-capacitance mode.

In contrast to common perception, Azoteq has proven that long range can reliably be achieved with projected capacitance. R&D in novel micro-electronic designs allows for this groundbreaking sensitivity whilst maintaining industry-leading ESD immunity and low current consumption.

"Azoteq's industry-leading sensitivity and robustness enable many new applications for proximity and touch. Azoteq now offers the lowest cost capacitive solutions to replace mechanical switches", said Frederick Bruwer, CEO of Azoteq.

Pricing:

Device	Channels	Price @ 1M
IQS127	1	$0.11
IQS232	2	$0.16
IQS213	3	$0.19
IQS243	3	$0.21
IQS259	9	$0.23
IQS312	12	$0.29
IQS316	16	$0.39

Price applies to firm orders of 1M+

Azoteq High Volume Terms and Conditions Apply.

Features:

- 1, 2, 3, 9, 12 and 16 channels
- Self- and projected capacitance modes
- Proximity and touch on each channel
- Distributed proximity channel formed by multiple keys
- On-chip hardware compensation for sensitivity-reducing objects
- I2C interface
- Automatic tuning to optimum sensitivity
- Supply voltage of 1.8V to 5.5V
- Multiple low-power modes
- Internal voltage regulator and reference capacitor
- Large proximity-detection range
- Automatic drift compensation
- Industrial temperature range
- TSOT6, MSOP10, QFN16, QFN20, QFN32 packages

Applications:

- Consumer electronics: televisions, Blu-Ray players, set-top boxes
- Computers and tablets
- White goods and appliances
- Office equipment

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Integration of IQS127 and sense antenna

Due to its small size the IQS127 is easily and rapidly integrated into the automatic soap dispenser. Figure 1 illustrates the integrated sense antenna inside the automatic soap dispenser, as well as the IQS127.

A passive ground plane can be used to shield areas where no proximity should be detected, in this case the lower sides or back of the soap dispenser, as can also be seen in figure 1.
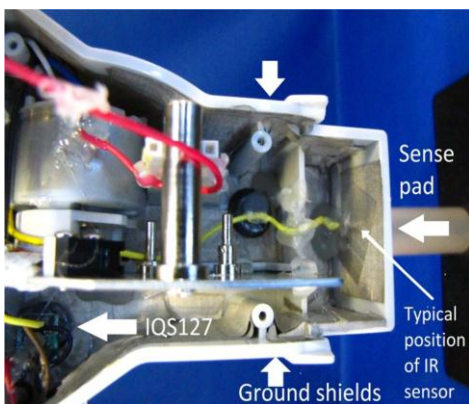

Figure 1: Soap dispenser sense antenna and ground shield

Ground planes can be effectively used to achieve directionality and prevent unwanted detections at specific positions. From the figure, the lower left, right and rear sides of the soap dispenser are shielded with a ground plane to prevent proximity detection in these directions.

For more effective shielding ensure that the antenna sensing wire (CX) is not resting directly against these planes, but at least 5mm away.

Interfacing the IQS127 to a microcontroller

The IQS127 can be operated in active high or low modes depending on the desired application.

- Connect pin POUT of the IQS127 to any microcontroller input pin as usual, to signal proximity detection.

Completed Automatic Soap Dispenser Unit

Information from this application note can help you create your own proximity activated product using capacitive sensing

Unparalleled Support

Azoteq is committed to help your project succeed. We can help you through any part of your design. Through helping you pick out the right IC to providing a look over on your design.

Contact us for more information.

Our highly knowledgeable engineers are here to help you.

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