



## IQS229EV01 module user guide

Single Channel Capacitive Proximity/Touch Controller for SAR Applications

### Operation Characteristics

The IQS229 will work in standalone mode (STD – LED outputs) or streaming mode (STRM), depending on a resistor placement. By default the module will be configured in standalone mode.

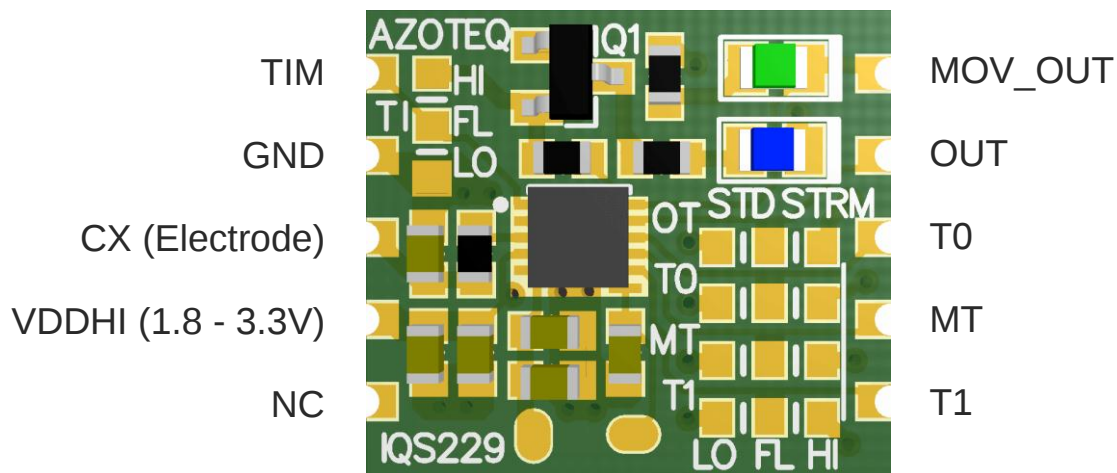
- “OUT” (BLUE) LED will indicate an activation (crossing of the threshold)
- “MOV\_OUT” (GREEN) LED will indicate movement in small detectable amounts.

### Integration

Start the integration of the IQS229 by wiring the following into the intended application:

1. GND
2. CX (Electrode – wire or copper pad)
3. VDDHI

On-board LEDs may be used for feedback, or the OUT and MOV\_OUT pins may be taken to a microcontroller.



### User Configurable Options

Four pins on the IQS229 are used for external configuration. Floating pins are the default configuration. The configuration is read at power-on or reset. To see how resistor straps are applied, see the next page.

Start off by choosing a threshold. T0 is used to set a large jump in threshold and T1 is used to set smaller offsets.

Next choose the preferred movement sensitivity by strapping MT.

Then choose a no movement time-out. If no movement is detected in this time, the sensor will clear the activation. With each movement the IQS229 will reset the timer.

#### Threshold Level Selection

L = LOGIC LOW, H = LOGIC HIGH, F = FLOAT

#### T0, THR0 (pin 8)

|   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|
| L | L | L | F | F | F | H | H | H |
|---|---|---|---|---|---|---|---|---|

#### T1, THR1 (pin 6)

|   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|
| L | F | H | L | F | H | L | F | H |
|---|---|---|---|---|---|---|---|---|

#### Corresponding Threshold Level

|   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|

◀ More sensitive

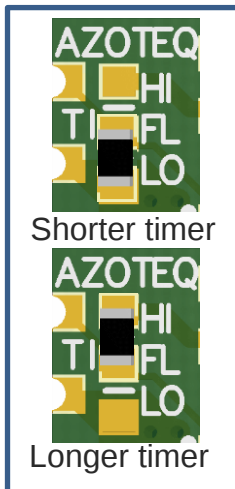
Less sensitive ▶



## Using resistor strap options

Resistor straps are used to configure the device as shown below. It is recommended to use a 1MΩ resistor for this purpose. After power-up or reset the values will be read and each pin is written with the values that was read. This eliminates potential leakage current.

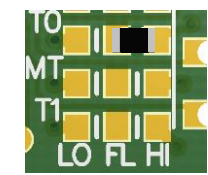
### TIM: Timer Adjustment



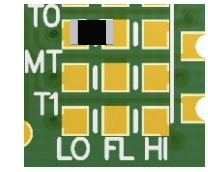
| TIM (pin 1) | No Movement Time-out |
|-------------|----------------------|
| Low         | 60sec                |
| Float       | 3min                 |
| High        | 10min                |

### Threshold Adjustment

T0:  
Large  
steps

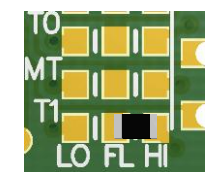


Less sensitive

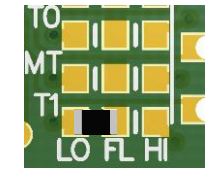


More sensitive

T1:  
Small  
steps



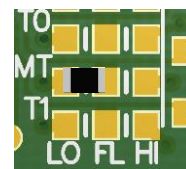
Less sensitive



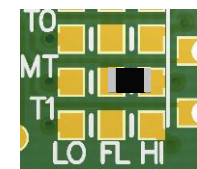
More sensitive

### MT: Movement

#### sensitivity adjustment



More sensitive



Less Sensitive

### OT/OUT Function



Standalone (default)  
1MegΩ pull-down



1-Wire Streaming  
(debugging) 4.7kΩ

| MT<br>MOV_THR (pin 7) | Movement<br>Threshold |
|-----------------------|-----------------------|
| Low                   | More sensitive        |
| Float                 | Default               |
| High                  | Less sensitive        |



## Schematic and assembly

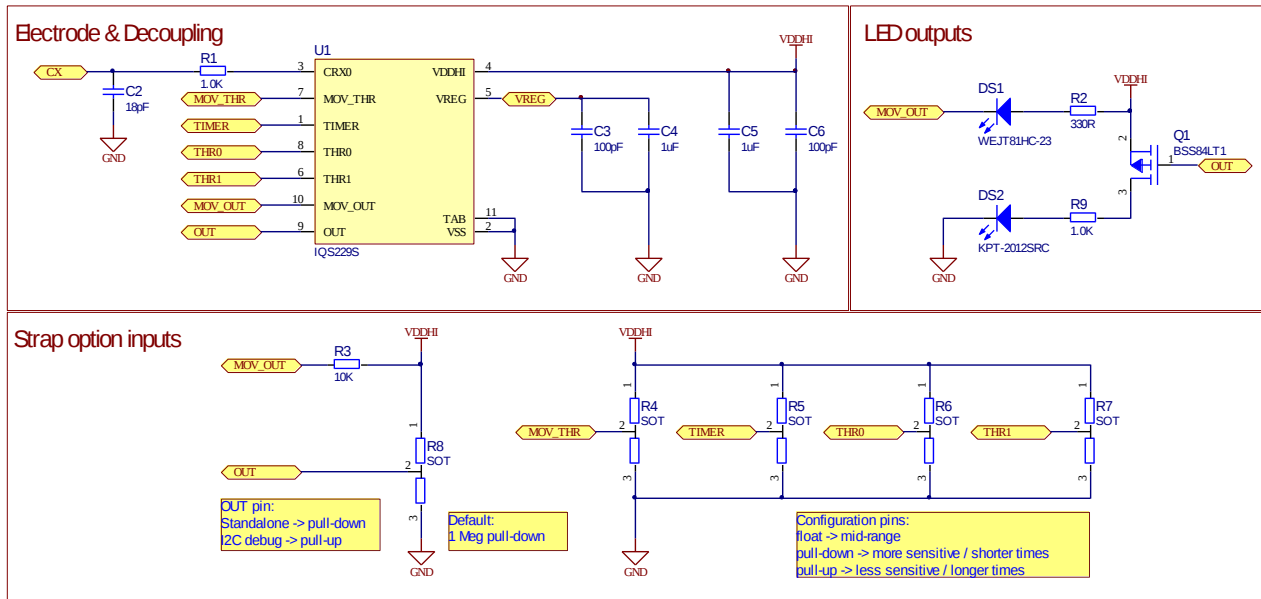


Figure 1 AZP408A05 Schematic

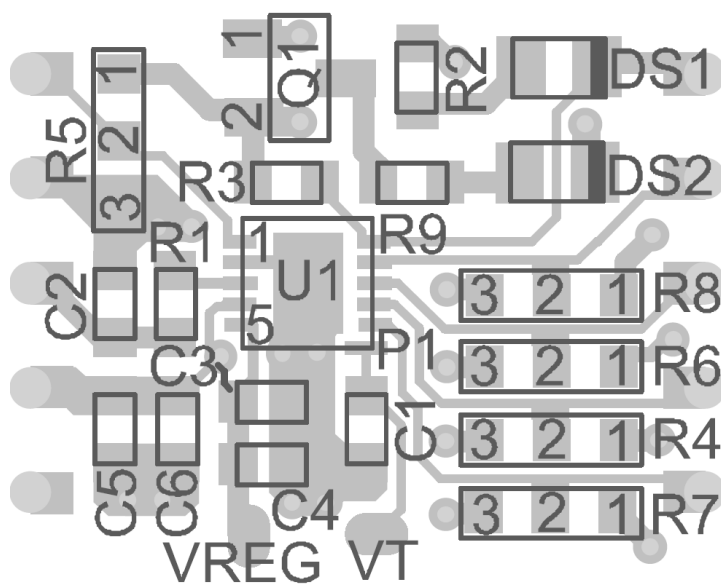


Figure 2 AZP408A05 assembly



## Recommended landing pad

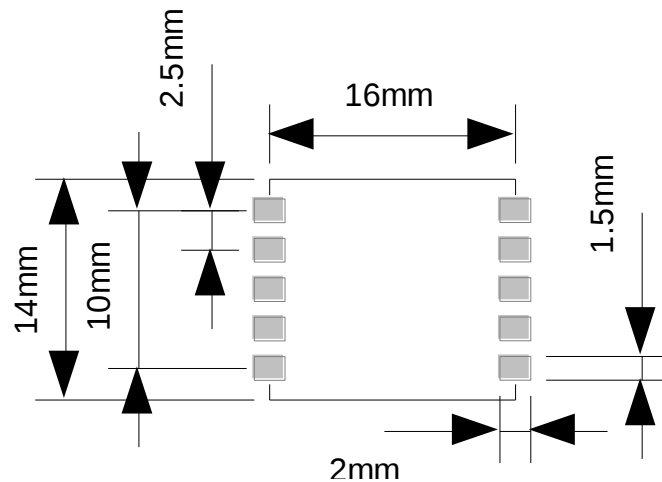


Figure 3 Recommended AZP408A05 landing pad

## Programming

The IQS229 has various one-time-programmable (OTP) fuse options. Information about these options are available on request and are only recommended for larger orders (>50k) or when in-circuit programming is an option after the SMT process.

Connect the AZP408A05 to the CT210 as shown in Figure 4.

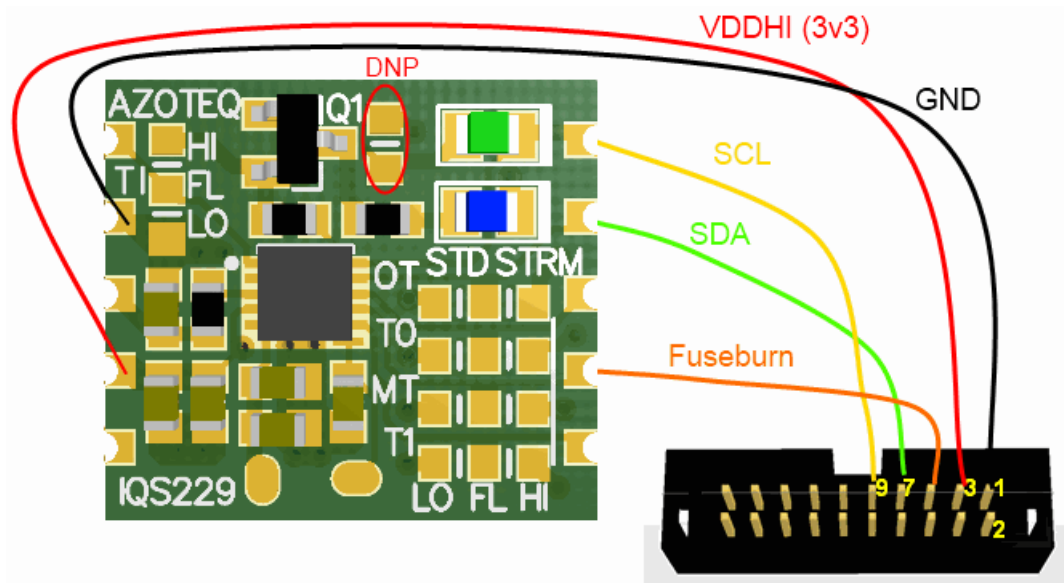


Figure 4 AZP408A05 connection to CT210 for IQS229 fuse burn

It is important to remove R2 when configuring the IQS229 OTP bits. The CT210 will configure the programming via I<sup>2</sup>C and the R2 / DS1 combination will cause the CLK line to become sluggish. Place R2 again after programming.

Program the IQS229 using the Azoteq [USBProg](#) utility.

**Appendix A      Contact Information**

|                         | <b>USA</b>                                                          | <b>Asia</b>                                                                         | <b>South Africa</b>                              |
|-------------------------|---------------------------------------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------|
| <b>Physical Address</b> | 6507 Jester Blvd<br>Bldg 5, suite 510G<br>Austin<br>TX 78750<br>USA | Rm1725, Glittery City<br>Shennan Rd<br>Futian District<br>Shenzhen, 518033<br>China | 109 Main Street<br>Paarl<br>7646<br>South Africa |
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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 6,952,084 B2, US 6,984,900 B1, US 7,084,526 B2, US 7,084,531 B2, EP 1 120 018 B2, EP 1 206 168 B1, EP 1 308 913 B1, EP 1 530 178 A1, ZL 99 8 14357.X, AUS 761094, HK 104 14100A, US13/644,558, US13/873,418

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