Features

- **Number of Keys:**
  - **One**
  - **Configurable as either a single key or a proximity sensor**
- **Technology:**
  - **Patented spread-spectrum charge-transfer (direct mode)**
- **Key outline sizes:**
  - **6 mm x 6 mm or larger (panel thickness dependent); widely different sizes and shapes possible**
- **Electrode design:**
  - **Solid or ring electrode shapes**
- **PCB Layers required:**
  - **One**
- **Electrode materials:**
  - **Etched copper, silver, carbon, Indium Tin Oxide (ITO)**
- **Electrode substrates:**
  - **PCB, FPCB, plastic films, glass**
- **Panel materials:**
  - **Plastic, glass, composites, painted surfaces (low particle density metallic paints possible)**
- **Panel thickness:**
  - **Up to 12 mm glass, 6 mm plastic (electrode size and Cs dependent)**
- **Key sensitivity:**
  - **Settable via capacitor (Cs)**
- **Interface:**
  - **Digital output, active high**
- **Moisture tolerance:**
  - **Good**
- **Power:**
  - **1.8V – 5.5V; 17 μA at 1.8V typical**
- **Package:**
  - **6-pin SOT23-6 RoHS compliant**
- **Signal processing:**
  - **Self-calibration, auto drift compensation, noise filtering**
  - **Infinite max on-duration**
- **Applications:**
  - **Control panels, consumer appliances, proximity sensor applications, toys, lighting controls, mechanical switch or button,**
- **Patents:**
  - **QTouch® (patented charge-transfer method)**
  - **HeartBeat™ (monitors health of device)**
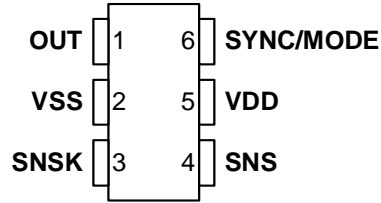
One-channel Touch Sensor IC

AT42QT1011

Summary

1. Pinout and Schematic

1.1 Pinout Configuration

```
OUT  | 1      6 |  SYNC/MODE
VSS  | 2      5 |  VDD
SNSK | 3      4 |  SNS
```

1.2 Pin Descriptions

Table 1-1. Pin Listing

Name	Pin	Type	Comments	If Unused, Connect To...
OUT	1	O	Output state	–
Vss	2	P	Supply ground	–
SNSK	3	I/O	Sense pin	Cs + Key
SNS	4	I/O	Sense pin	Cs
Vdd	5	P	Power	–
SYNC	6	I	SYNC and Mode Input	Pin is either SYNC/Slow/Fast Mode, depending on logic level applied

I	Input only	I/O	Input and output
O	Output only, push-pull	P	Ground or power

1.3   Schematic

Figure 1-1.   Basic Circuit Configuration
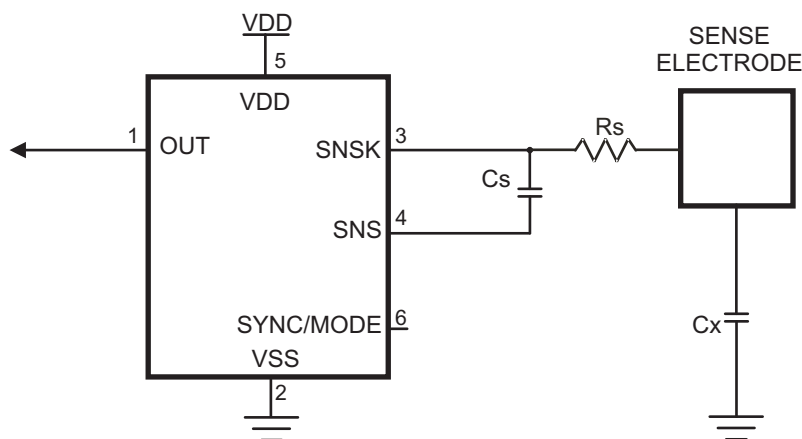
Note: A bypass capacitor should be tightly wired
between Vdd and Vss and kept close to pin 5.

2.   Overview of the AT42QT1011

The AT42QT1011 (QT1011) is a digital burst mode charge-transfer (QT™) sensor that is capable
of detecting near-proximity or touch, making it ideal for implementing touch controls.

With the proper electrode and circuit design, the self-contained digital IC will project a touch or
proximity field to several centimeters through any dielectric like glass, plastic, stone, ceramic,
and even most kinds of wood. It can also turn small metal-bearing objects into intrinsic sensors,
making them responsive to proximity or touch. This capability, coupled with its ability to
self-calibrate, can lead to entirely new product concepts.

The QT1011 is designed specifically for human interfaces, like control panels, appliances, toys,
lighting controls, or anywhere a mechanical switch or button may be found. It includes all
hardware and signal processing functions necessary to provide stable sensing under a wide
variety of changing conditions. Only a single low-cost capacitor is required for operation.

Revision History

Revision No.	History
Revision A – May 2009	• Initial release
Revision B – August 2009	• Updated for chip revision 2.2.2
Revision C – August 2009	• Minor updates for clarity
Revision D – January 2010	• Updated for revision 2.4.1
Revision ES – February 2010	• Minor updates

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