Features

- **Number of Keys:**
  - One toggle mode (touch-on/touch-off), plus programmable auto-off delay and external cancel
  - 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 external capacitor (Cs)
- **Interface:**
  - Digital output, active high or active low (hardware configurable)
- **Moisture tolerance:**
  - Good
- **Power:**
  - 1.8V ~ 5.5V; 32.5 µA at 1.8V
- **Package:**
  - 6-pin SOT23-6 (3 x 3 mm) RoHS compliant
- **Signal processing:**
  - Self-calibration, auto drift compensation, noise filtering
- **Applications:**
  - Power switch replacement in countertop appliances, irons, battery powered toys, heaters, lighting controls, automotive interior lighting, commercial and industrial equipment such as soldering stations and cooking equipment
- **Patents:**
  - QTouch® (patented charge-transfer method)

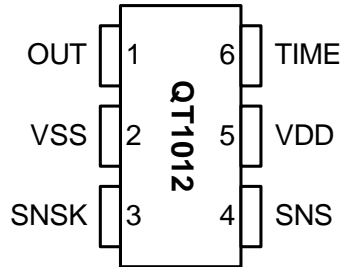# One-channel Toggle-mode Touch Sensor IC with Power Management Functions

AT42QT1012

Summary

Note: This is a summary document. A complete document is available. For more information contact www.atmel.com/touch.

1. Pinout and Schematic

1.1 Pinout Configuration

```
OUT  ⌷1      6⌷  TIME

VSS  ⌷2  QT1012  5⌷  VDD

SNSK ⌷3      4⌷  SNS
```

1.2 Pin Descriptions

Table 1-1. Pin Listing

Pin	Name	Type	Comments
1	OUT	O	Output state. To switched circuit and output polarity selection resistor (Rop)
2	Vss	P	Supply ground
3	SNSK	I/O	Sense pin. To Cs capacitor and to sense electrode
4	SNS	I/O	Sense pin. To Cs capacitor and multiplier configuration resistor (Rm). Rm must be fitted and connected to either VSS or VDD.
5	Vdd	P	Power
6	TIME	I	Timeout configuration pin. Must be connected to either VSS, VDD, OUT or an RC network.

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
(active high output, toggle on/off, no auto switch off)

Note: bypass capacitor to be tightly wired between VDD and VSS and kept close to pin 5.
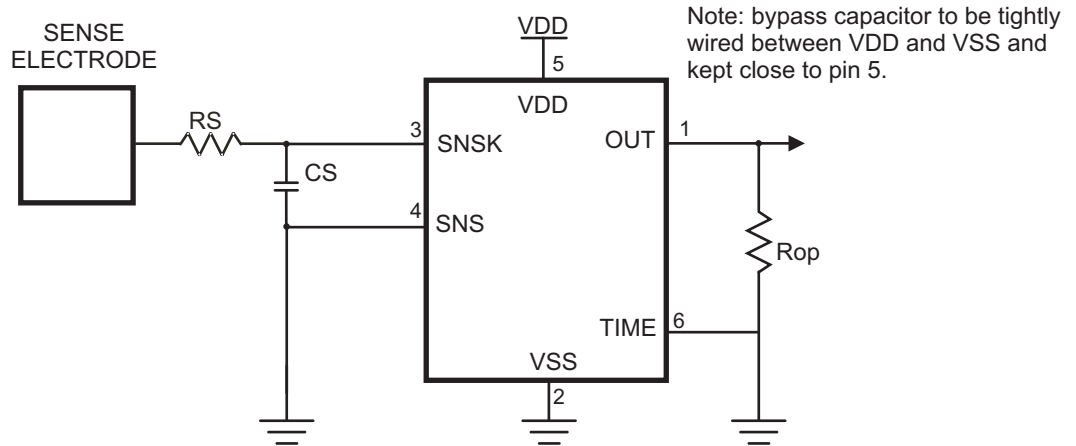
2.   Overview of the AT42QT1012

2.1   Introduction

The AT42QT1012 (QT1012) is a single key device featuring a touch on/touch off (toggle) output with a programmable auto switch-off capability.

The QT1012 is a digital burst mode charge-transfer (QT™) sensor designed specifically for touch controls. It includes all hardware and signal processing functions necessary to provide stable sensing under a wide variety of changing conditions; only low cost, noncritical components are required for operation. With its tiny low-cost SOT-23 package, this device can suit almost any product needing a power switch or other toggle-mode controlled function, especially power control of small appliances and battery-operated products.

A unique "green" feature of the QT1012 is the timeout function, which can turn off power after a specified time delay ranging from minutes to an hour.

Like all QTouch® devices, the QT1012 features automatic self-calibration, drift compensation, and spread-spectrum burst modulation in order to provide for the most reliable touch sensing possible.

Revision History

Revision No.	History
Revision A – August 2009	• Initial release for chip revision 2.4
Revision B – September 2009	• Changes to Cs value.
Revision CS – February 2010	• Updated for chip revision 3.1

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