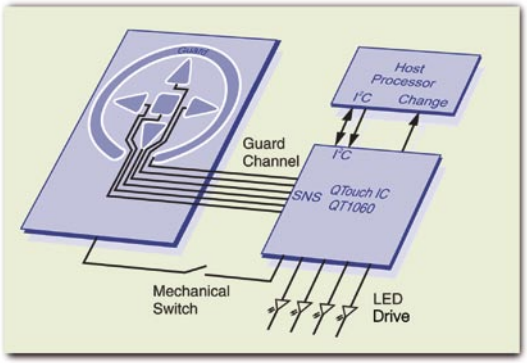
AT42QT1060

Touch Interface IC for Mobile Applications

The QT1060 IC provides all of the functions needed to create a fully functional touch interface for a mobile phone or other handheld device. The QT1060 is a touch sensor IC designed to make the development of mobile and other applications as fast and simple as possible. It is based on Atmel's QTouch™ technology and provides all of the signal processing and input/output functions required in a tiny 28-pin, 4 mm x 4 mm RoHS compliant package:

- 6 Independent Touch Sensor Channels
- An Integrated Guard Channel Function to Prevent False Detections
- A 7-line I/O Expander Port
- Direct LED Drive (low current LEDs) Through Seven Programmable PWM Outputs
- Very Low Power Operation (1.8V minimum, 1.1 µA in sleep mode)



Control inputs and visual feedback – a typical QT1060 application

Multiple Interface Opportunities

Six touch sensor channels provide dozens of possibilities for inventive user interface designs.

In the example diagram, five discrete touchkeys are used to provide a joystick quadrant, with a selection touch pad in the centre.

The sixth channel is used to provide a guard band channel which will prevent false detections on the other keys when the device is in a pocket or held to the user's ear.

Dynamic Programming by Host

Configuration and adjustment of the operating parameters is carried out by the host processor via the I^2C compatible interface.

This can be done dynamically if necessary – the interface can respond instantly to changing conditions.

I/O Expansion Possibilities

The IC's seven I/O pins can be independently controlled by the host MCU. It can be used to provide a multi-input host wake up, extended user switch inputs, or visual feedback and key illumination using touch related PWM control of LEDs.

Low Component Count, Easy Circuit Design

Each sensor channel used requires only two external components — an operational circuit can be built on a few square centimeters of PCB.

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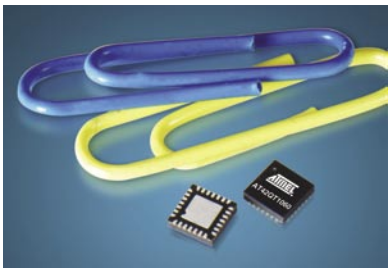


A tiny 4 mm x 4 mm QFN package makes the QT1060 ideal for use in handheld applications

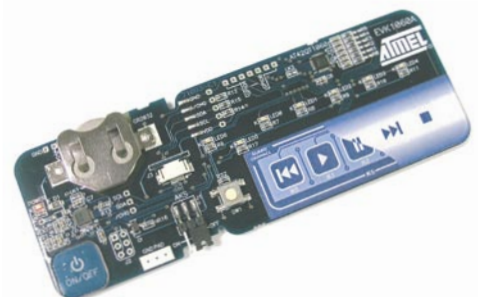
Built-in Reliability

Designing a handheld device with touch sensors that resist false detections can be challenging. The capacitance changes that indicate the user's touch inputs can also be produced by normal handling. The device must have a reliable way of discriminating between the two. The QT1060 achieves this by using Quantum's patented Adjacent Key Suppression™ (AKS™) technology and the ability to adjust individual key sensitivity to provide a guard channel feature. The guard channel is connected to an additional sensor region surrounding the entire sensor key region. AKS is used to prevent other keys from operating when the guard channel key is touched. This means that only, intentional key presses will be accepted. All touches that include the guard channel (if the user holds the device to their ear for example) will be ignored. Guard channel operation combined with Quantum's inherently reliable spread spectrum detection technology provides a very rich user interface that effectively eliminates false detections – no matter how roughly the device product is handled.

System	
Number of Keys	2 to 6
Number of I/O lines	7, configurable for input or output, with PWM control for direct LED drive capability (low current LEDs) through programmable PWM outputs
Key outline sizes	6 mm x 6 mm or larger (depends on panel thickness); widely different sizes and shapes are possible
Key spacings	7 mm center to center or more (depends on panel thickness)
Host interface	2-wire Serial Interface (I²C compatible) in slave mode (100 kHz)
Signal processing	Self-calibration, auto drift compensation, noise filtering, Adjacent Key Suppression AKS™

QT1060 – Electrical and Environmental Specifications

Recommended Operating Conditions		
Power supply	VDD	1.8V to 5.5V
Power supply ripple+noise		±5 mV
Environmental Specifications		
Operating temperature	Ta	-45° to +85°C
Storage temperature	Ts	-55° to +125°C
DC Specifications		
Supply current sleep mode	Idds	1.1 µA @ 1.8V
Supply current run mode	Idds	<403 µA @ 1.8V
Package Options		
28 - pin, 4 mm x 4 mm		QFN RoHS compliant



AT42EVK1060 Evaluation Board

More Information?

A datasheet for the QT1060 IC is available to download from our website – www.atmel.com

There is also an evaluation and demonstration board available that will allow you to experiment with different configurations and setting. It is ready to use, supplied with a USB cable and supplied with a full range of documentation.

Call us to find out more.

Headquarters
Atmel Corporation
2325 Orchard Parway
San Jose, CA 95131
USA
Tel +1-408-441-0311
Fax +1-408-487-2600

International
Atmel Europe
Le Krebs
8, rue Jean-Pierre Timbaud
BP 309,78054
Saint-Quentin-en-Yvelines
Cedex
FRANCE
Tel +33-1-3060-7000
Fax +33-1-3060-7111

Atmel Asia
Room 1219
Chinachen Golden Plaza
77 Mody Road Tsimshatsui
East Kowloon
HONG KONG
Tel +852-2721-9778
Fax +852-2722-1369

Atmel Japan
9F, Tonetsu Shinkawa Bldg.
1-24-8 Shinkawa
Chuo-ku, Tokyo 104-0033
JAPAN
Tel +81-3-3523-3551
Fax +81-3-3523-7581

Atmel Touch Technology Division
Headquarters
1 Mitchell Point, Ensign Way
Hamble, Southampton
Hampshire SO31 4RF
UNITED KINDGOM
Tel +44-23-8056-5600
Fax +44-23-8045-3939

Literature Requests
www.atmel.com/literature

Website
www.atmel.com

E-mail
qprox.sales@atmel.com

Rev.: 10603A-AT42-07/08/0M