

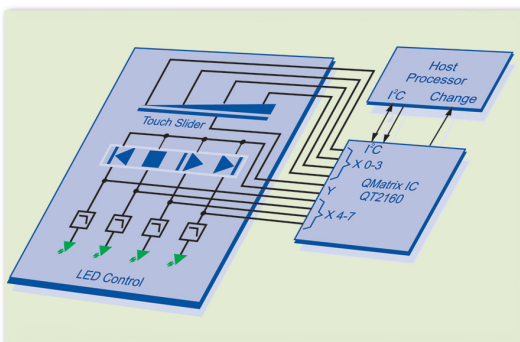
## ➔ AT42QT2160

### Integrated Touch and Slide Control Panel IC

The QT2160 is a low cost touch sense key and slider panel IC with PWM outputs to control up to eleven LEDs. The IC is ideal for use as a small control panel processor on battery driven consumer devices such as personal media players, PDAs, digital pictures frames and other mobile appliances. It is based on Atmel's QMatrix™ and QSlide™ technologies, has very low power requirements and provides a very wide range of host programmable input/output configurations.

#### It Provides:

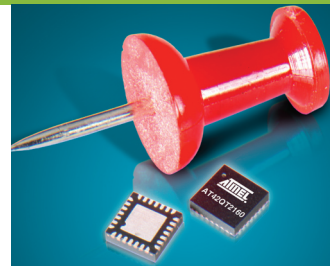
- Up to 16 Independent Touch Channels
- 1 Slider Control with Up to 8 Bit (0 to 255) Resolution
- 11 Programmable Interface Lines – 3 Can Be Configured as Inputs or Outputs, 8 are Outputs Only
- All Output Signals Can Be Pulse Width Modulated (PWM) to Provide Intensity Control of LEDs
- Host Programmability through an I<sup>2</sup>C compatible Interface
- Very Low Power Operation (< 1.0  $\mu$ A @ 1.8V in Sleep Mode)



Control Inputs and Visual Feedback a – Typical QT2160 Application

#### Multiple Applications

This fully integrated device can be used in many different ways and is a good choice if, for example, you need to provide special function keys or a media interface in mobile phones, MP3 players or PDAs.



A tiny 4 mm x 4 mm MLF package makes the QT2160 ideal for use in handheld applications

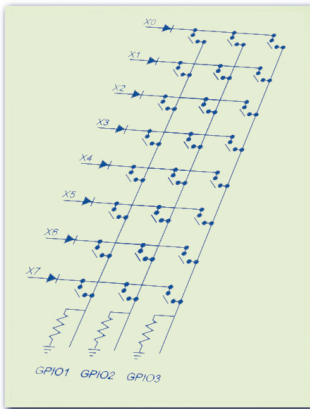
The application shown is typical – an audio control keyboard with built-in LED indicators to provide visual feedback to the user.

#### Long Touch Sliders Made Simple

The QT2160 provides a way of integrating a slider into your product at very low cost. The sensing elements can be made from almost any conductive material and can be integrated into the casing of the product in many novel ways. They can be made much longer than a conventional slider mechanism, can provide a better user experience and, with no moving parts, have the potential for much greater reliability.

#### Easy, Low Cost Implementation

The IC is supplied in a 28-pin 4 mm x 4 mm RoHS compliant package and requires only a small number of additional components for a practical circuit.



## Input/Output Options:

For such a small device, the QT2160 provides you with an exceptional number of options for interfacing with external devices. When configured as inputs, the interface lines can be connected to mechanical switches or logic signals. You can use them to provide control inputs, or to provide a multi-input host wake-up function. Or you can configure them as PWM capable outputs and use them to provide key illumination and visual feedback with touch related PWM control of LED indicators. The 11 I/O pins provide you with many other interesting possibilities when they are used in combination. For instance, as shown here, they can be used in conjunction with up to 24 mechanical switches and suitable host software to provide an input matrix.

### System Parameters

Number of Touch Keys	Up to 16 keys plus 1 slider (constructed from 2 to 8 keys)
Number of I/O lines	11 (3 are configurable for input or output, 8 output only) all outputs with PWM control for LED driving
Key outline sizes	6 mm x 6 mm or larger (depends on panel thickness); different sizes and shapes are possible
Key spacings	8 mm center to center or more (depends on panel thickness)
Host interface	2-wire Serial Interface (I <sup>2</sup> C compatible) – slave mode (100kHz)
Signal processing	Self-calibration, auto drift compensation, noise filtering, Adjacent Key Suppression™

## QT2160 – Electrical and Environmental Specifications

### Recommended Operating Conditions

Power supply	VDD	1.8V to 5.1V
Power supply ripple+noise <1 MHz		±25 mV
Power supply ripple+noise >1 MHz		±50 mV

### Environmental Specifications

Operating temperature	Ta	-40 to +85° C
Storage temperature	Ts	-55 to +125° C

### DC Specifications

Supply current sleep mode	I <sub>dds</sub>	1.5 µA @ 1.8V (typical)
Supply current run mode	I <sub>dds</sub>	476 µA @ 1.8V (typical)

### Package Options

28-pin,	4 mm x 4 mm	MLF RoHS compliant
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EVK2160A Evaluation Board

## More information?

A datasheet for the QT2160 IC is available to download from our website – [www.atmel.com](http://www.atmel.com)

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

Call us to find out more..

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