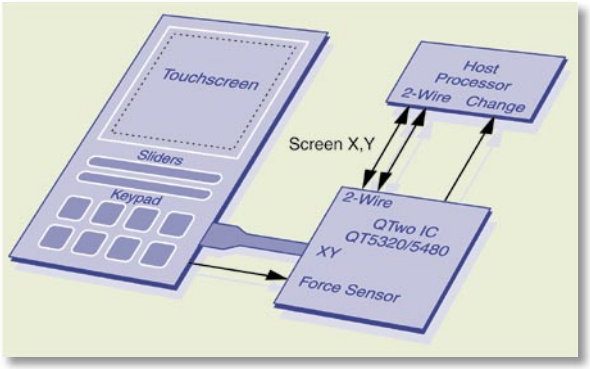
AT42QT5320/AT42QT5480

Versatile QTwo™ Based Two Touch™ Touchscreen Solutions

The AT42QT5320 and AT42QT5480 ICs are high-performance, state-of-the-art touch interface controllers that provide single- and dual-finger touch gestures for intuitive user interfaces. They are highly adaptable and allow users to choose between:

- A Dual Two Touch Touchscreen Providing Two, Fully Independent and Trackable Touch Coordinates
- A Touch Keypad with up to Forty Eight Individually Configurable Keys
- Up to Six Independent Touch Slider or Wheel Controls
- A Hybrid Panel Featuring a Mixture of all Three of These Control Elements



Versatile, Flexible and Easy to Use

The QT5320 and QT5480 are both single chip solutions and combine Atmel's QTwo™, QMatrix™, QSlide™, QWheel™, and QField™ technologies in a single package.

Demonstrated on screens of up to 8-inch diagonal, and with a wide variety of configuration options, these chips are ideal for a huge range of applications:

- Small Scale Handheld Devices
- Media Players
- Navigation Systems
- E-Book Readers
- Fixed Control Panel Applications (Kitchen Appliances, Vending Machines, etc.)

Both ICs are supplied in surface mount packages and require only a few additional components to produce a working circuit.

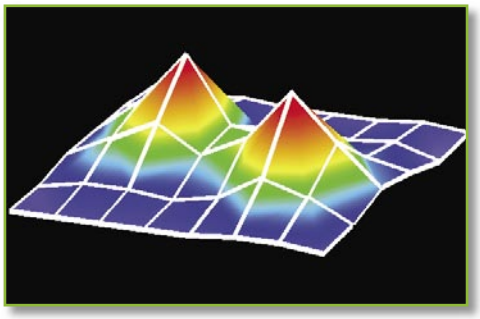
The touch screen and the touch controller IC are interconnected by a 14 or 16 line passive tail and can be separated by up to 60 mm.

Only three lines (a two wire I^2C-compatible and a single CHANGE event line) are required to connect the touch controller to the host processor.

ATMEL QTouch

Advanced Technology that is Flexible, Adaptable and Easy to Use

Atmel's patented scanning technique provides many configuration possibilities, including the creation of true dual-touch touchscreens.



Precision Touch Sensing with QTwo

Atmel's QTwo ICs make use of timed multiplex sensing to read a matrix array of sense electrode nodes arranged on the touch panel. Each node is scanned sequentially at high speed to provide precise identification of the position and degree of the user's touch.

Different configurations of X and Y lines provide custom performance levels that can be configured for the specific application. The raw output data from the scan can be used in many different ways.

Genuine Two Touch Touchscreens

When the touchscreen is touched with a dual-finger gesture, the ICs generate precise X-Y coordinates for two, fully independent touch positions. These positions can be identified and tracked anywhere across the screen surface on screens of up to 8" diagonal (QT5480 only – the maximum screen size for the QT5320 IC is 4.3").

Both ICs have a full palette of Two Touch interface gestures built in:

- Pinch (zoom in)
- Stretch (zoom out)
- Rotate
- Press and Tap
- Press and Double Tap
- Press and Flick
- Press and Drag
- Two-finger drag

Multikey Keypads

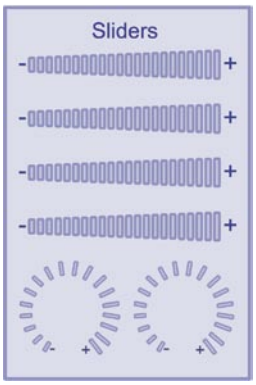
In QMatrix mode, the QT5480 can also control up to 48 (or 32 for the QT5320) discrete touch keys in a 8x6 (8x4) X-Y input matrix.

The chips can control a wide range of different sizes and shapes of keys, and the sensitivity of each key is individually configurable. Atmel's patented Adjacent Key Suppression™ (AKS™) ensures that tightly spaced keys can be discriminated and a guard channel feature provides reliable rejection of false inputs.

Multiple Slide Controls

In QSlide/QWheel mode the QT5320 can provide up to 4 sliders and QT5480 can control up to 8 (or 6 for the QT5320) touch sliders or wheels.

Each slider or wheel requires a single Y line of the keypad input matrix, but the resolution is selectable and each slider can be from 2 to 8 keys long. Using 8 keys in a slider/wheel will allow a resolution of up to 8 bits to be achieved.



Hybrid Panels

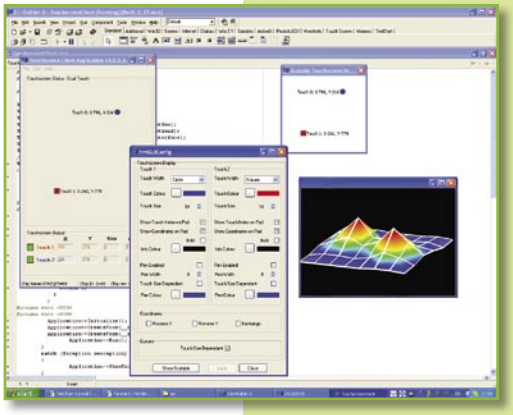
Both ICs can be configured to allow the creation of hybrid panels containing a mix of touchscreen, sliders, wheels and discrete keys. A very wide range of object combinations can be configured – see each IC's datasheet for full details.

Advanced Signal Processing

The QT5320 and QT5480 ICs are packed with features that provide reliable and fast operation even in electrically noisy environments.

Atmel's patented charge-transfer acquisition method provides best in class EMC performance and will allow effective operation with both double and single layer sensor designs.

Adjacent Key Suppression (AKS), the force sensor input, and a guard channel feature provide multiple layers of touch event discrimination and ensure reliable keying.



PC Software is Available from Atmel to Support Development with the Touchscreen Evaluation Boards.

Evaluation and Demonstration Boards

Atmel offers a range of evaluation and demonstration kits available for both ICs. The kits allow you to quickly assess the performance of the ICs without the need to develop an application specific sensor. The range includes two different sizes of touchscreen sensors, with and without ground shielding, and an extreme landscape format a PCB-based touchscreen evaluation kit.

The boards are supplied together with PC host software, gesture algorithms, USB cables and a full range of documentation. See the table below for more details.

QT5320/5480 Evaluation Kits include Boards, Software, Cables and Documentation.

Part No	Description	Screen Size/Ratio	Integral Groundshield
EVK5480A	Two Touch – touchscreen evaluation kit demonstrating the AT42QT5480	3.3"/3:2	No
EVK5480B	Two Touch – touchscreen evaluation kit demonstrating the AT42QT5480	3.3"/3:2	Yes
EVK5480C	Two Touch – touchscreen evaluation kit demonstrating the AT42QT5480	4.3"/16:9	No
EVK5480D	Two Touch – touchscreen evaluation kit demonstrating the AT42QT5480	4.3"/16:9	Yes
EVK5480E	PCB based Two Touch – touchscreen evaluation board for AT42QT5480 (QT5320)	3.1"/18:10	No

ATMEL®
QTouch™

Technical Support

Atmel's touch technology is backed up by comprehensive technical documentation and support based on Atmel's unparalleled experience in the touch sense industry.

We have strong relationships with both materials and service suppliers and we can help you locate all of the resources you require to get your product to market. Once a design is in place, Atmel will work with you and its partners to quickly move the product right through from early prototype to full production.

To help you get the result you want Atmel provides:

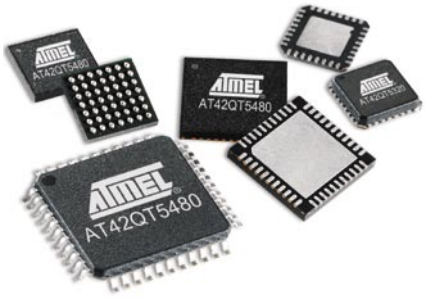
- Guaranteed reliability
- Easy customisation
- The supply chain flexibility required for large projects.

Call us to find out more.

System Parameters	
Technology	Patented spread spectrum charge transfer (transverse mode)
Sensor layers	One layer (Single Touch) or two layers (Two Touch)
Screen minimum edge wiring	4.5 mm not including bonding area (depends on screen construction technology)
Panel Materials	Plastic, Glass, Composites, Painted Surfaces (low particle density metallic paints possible)
Panel thickness	1.0 to 2 mm glass - 0.5 to 1.5 mm plastic
QT5320 touchscreen size	Up to 4.3 inches diagonal
QT5480 touchscreen size	Up to 8 inches diagonal
Resolution	10-bit (1024 x 1024)
Screen material	ITO (Indium Tin Oxide)
Host interface	I^2C-compatible slave mode (100 kHz or 400 kHz)
Touch response time	60 msec initially, 15 to 20 msec for updates
Signal processing	Self calibration, auto drift compensation, LCD noise filtering and Adjacent Key Suppression™ (AKS™)

QT5320/5480 ICs – Electrical and Environmental Specifications

Recommended Operating Conditions		
Power supply	+1.8V to +5.5V (2.5V to 5.5V in high speed mode)	
Environmental Specifications		
Operating temperature	-40° to +85°C	
Storage temperature	-55° to +125°C	
DC Specifications		
Supply current (sleep mode)	<2 µA @ 3.3V	
Supply current (active/touched)	<4900 µA @ 3.3V (high speed mode)	
Supply current (idle/not touched)	<2740 µA @ 3.3V (high speed mode)	
Package Options		
QT5320 32 pins,	5 mm x 5 mm	QFN RoHS compliant
QT5480 49 balls,	5 mm x 5 mm	BGA RoHS compliant
QT5480 44 pins,	7 mm x 7 mm	QFN RoHS compliant
QT5480 44 pins,	10 mm x 10 mm	TQFP RoHS compliant



The QT5320 and QT5480 are available in small packages, required for the use in handheld applications

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