

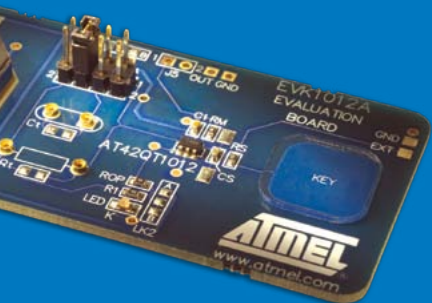
Application Specific QTouch Solutions

Buttons, Sliders and Wheels



Lead with Atmel Touch Solutions

Atmel® offers market-proven technology for implementing nonmechanical buttons, sliders, and wheels on any touch-sensitive device. These integrated circuits (ICs) enhance the user experience with excellent precision and reliability. They also deliver superb low-power characteristics, a critical requirement for today's battery-powered handheld and mobile devices. The technology supports simple 1–10 button configurations (self capacitance) as well as more complex scanned-matrix configurations (mutual capacitance) of up to 48 buttons at very low cost per button. In addition to the application specific chips, Atmel offers the QTouch® Library for embedding buttons, sliders, and wheels into the industry-leading AVR® microcontrollers and Atmel AT91SAM.



Atmel EVK1012A Evaluation board for the Atmel AT42QT1012 controller

Capacitive Touch Controllers for Buttons, Sliders and Wheels

| Family Names | Part Number | Description | QTouch/QMatrix | Functionality | Vdd Low | Vdd High | #of I/O | Pins | Interface | Package | Temp Range |
|------------------|-----------------|---|----------------|---------------------|---------|----------|---------|------|---------------------------|-----------|--------------|
| SINGLE TOUCH | AT42QT1010-TSHR | 1-button, proximity capable, w/ timer to reset "stuck key" | QTouch | Buttons | 1.8V | 5.5V | 2 | 6 | Digital Output | SOT23 | -40 to 85 C |
| | AT42QT1010-MAH | 1-button, proximity capable, w/ timer to reset "stuck key" | QTouch | Buttons | 1.8V | 5.5V | 2 | 8 | Digital Output | UDFN/USON | -40 to 85 C |
| | AT42QT1011-TSHR | 1-button, proximity capable, no reset timer | QTouch | Buttons | 1.8V | 5.5V | 2 | 6 | Digital Output | SOT23 | -40 to 85 C |
| | AT42QT1011-MAH | 1-button, proximity capable, no reset timer | QTouch | Buttons | 1.8V | 5.5V | 2 | 8 | Digital Output | UDFN/USON | -40 to 85 C |
| | AT42QT1012-TSHR | 1-button, proximity capable, toggle output w/ power down timer | QTouch | Buttons | 1.8V | 5.5V | 2 | 6 | Digital Output | SOT23 | -40 to 85 C |
| | AT42QT1012-MAH | 1-button, proximity capable, toggle output w/ power down timer | QTouch | Buttons | 1.8V | 5.5V | 2 | 8 | Digital Output | UDFN/USON | -40 to 85 C |
| BUTTONS ≤10 | AT42QT1040-MMH | 4-channels, AKS | QTouch | Buttons | 1.8V | 5.5V | 8 | 20 | Pin-per-key | VQFN | -40 to 85 C |
| | AT42QT1060-MMU | 6-channels, AKS, w/ PWM control for LED | QTouch | Buttons | 1.8V | 5.5V | 7 | 28 | I2C & Discrete | MLF | -40 to 85 C |
| | AT42QT1070-SSU | 7-channels, Guard Channel, AKS, Optimized (no external components needed and 1-sensor per pin) | QTouch | Buttons | 1.8V | 5.5V | 2 | 14 | I2C | SOIC | -40 to 85 C |
| | AT42QT1070-MMH | 7-channels, Guard Channel, AKS, Optimized (no external components needed and 1-sensor per pin) | QTouch | Buttons | 1.8V | 5.5V | 2 | 20 | I2C | VQFN | -40 to 85 C |
| BUTTONS > 10 | AT42QT1110-MU | 11-channels, AKS | QTouch | Buttons | 3V | 5.5V | 22 | 32 | SPI | MLF | -40 to 85 C |
| | AT42QT1110-AU | 11-channels, AKS | QTouch | Buttons | 3V | 5.5V | 22 | 32 | SPI | TQFP | -40 to 85 C |
| | AT42QT1111-MU | 11-channels, AKS | QTouch | Buttons | 1.8V | 5.5V | 22 | 32 | SPI | MLF | -40 to 85 C |
| | AT42QT1111-AU | 11-channels, AKS | QTouch | Buttons | 1.8V | 5.5V | 22 | 32 | SPI | TQFP | -40 to 85 C |
| WHEELS & SLIDERS | AT42QT2100-MU | 7 channels & 1-slider or 1-wheel, proximity capable, AKS, Conducted Immunity EN61000-4-6 Level 2 B | QTouch | 1-slider or 1-Wheel | 2.0V | 5.5V | 20 | 32 | SPI | QFN | -40 to 85 C |
| | AT42QT2100-AU | 7 channels & 1-slider or 1-wheel, proximity capable, AKS, Conducted Immunity EN61000-4-6 Level 2 B | QTouch | 1-slider or 1-Wheel | 2.0V | 5.5V | 20 | 32 | SPI | TQFP | -40 to 85 C |
| AUTOMOTIVE | AT42QT1110-MZ | 11-channels, AKS | QTouch | Buttons | 3V | 5.5V | 22 | 32 | SPI, Change Pin, Discrete | QFN | -40 to 125 C |
| | AT42QT1110-AZ | 11-channels, AKS | QTouch | Buttons | 3V | 5.5V | 22 | 32 | SPI, Change Pin, Discrete | TQFP | -40 to 125 C |
| HAPTICS | AT42QT1085-AU | 8-channels, proximity, 14-haptic effects, AKS | QTouch | Buttons | 2.0V | 5.5V | 20 | 32 | SPI | MLF | -40 to 85 C |
| | AT42QT1085-MMU | 8-channels, proximity, 14-haptic effects, AKS | QTouch | Buttons | 2.0V | 5.5V | 20 | 32 | SPI | TQFP | -40 to 85 C |
| BUTTONS > 10 | AT42QT60160-ISG | 16-channels, AKS | QMatrix | Buttons | 1.8V | 5.5V | 2 | 32 | I2C & Shift registers | MLF | -40 to 85 C |
| | AT42QT60168-ASG | 16-channels, AKS | QMatrix | Buttons | 3.0V | 5.5V | 0 | 32 | SPI | TQFP | -40 to 105 C |
| | AT42QT60240-ISG | 24-channels, AKS | QMatrix | Buttons | 1.8V | 5.5V | 2 | 32 | I2C & Shift registers | MLF | -40 to 85 C |
| | AT42QT60248-ASG | 24-channels, AKS | QMatrix | Buttons | 3.0V | 5.5V | 0 | 32 | SPI | TQFP | -40 to 105 C |
| | AT42QT60326-ASG | 32-channels, AKS | QMatrix | Buttons | 4.8V | 5.3V | 3 | 44 | SPI & UART | TQFP | -40 to 105 C |
| | AT42QT60486-ASG | 48-channels, AKS | QMatrix | Buttons | 4.8V | 5.3V | 3 | 44 | SPI & UART | TQFP | -40 to 105 C |
| SLIDER | AT42QT2160-MMU | 8X by 2Y either 16-key or 1-slider (2-8 channels) + keys (2-8 channels), w/ PWM control for LED, AKS | QMatrix | 1-Slider | 1.8V | 5.5V | 11 | 28 | I2C | MLF | -40 to 85 C |
| | AT42QT2161-MMU | 8X by 2Y either 16-key or 1-slider (2-8 channels) + keys (2-8 channels), w/ smooth PWM control for LED, AKS | QMatrix | 1-Slider | 1.8V | 5.5V | 11 | 28 | I2C | MLF | -40 to 85 C |
| HOME APPLIANCE | AT42QT1481-AU | 48-channels, FMEA / EN60730, AKS, Conducted Immunity EN61000-4-6 Level 2 B | QMatrix | Buttons | 4.75V | 5.25V | 15 | 44 | UART, SPI | TQFP | -40 to 85 C |



Evaluation/ Development Kits

| Part Number | Description | QTouch/QMatrix |
|-------------------------|---|----------------|
| E6240 | Eval for ATQT60160/ATQT60240 | QMatrix |
| E6248 | Eval for ATQT60168/ATQT60248 | QMatrix |
| E6486 | Eval for ATQT60326/ATQT60486 | QMatrix |
| EVK1010A | Eval for AT42QT1010 | QTouch |
| EVK1012A | Eval for AT42QT1012 | QTouch |
| EVK1040A | Eval for AT42QT1040 | QTouch |
| EVK1060A | Eval for AT42QT1060, 5-sensors and guard channel | QTouch |
| ATEVK1070A | Eval for AT42QT1070, Stand alone: eval board w/ coin cell battery - 4-sensors and guard channel | QTouch |
| ATEVK1070B | Eval for AT42QT1070, Comms: eval board USB powered, w/ 6-sensors and guard channel | QTouch |
| EVK1085A | Eval kit for AT42QT1085, Comms: eval board USB powered, with 7-sensors and a guard channel, 14-haptic effects | QTouch |
| EVK2160A | Eval for AT42QT2160 8-sensors and slider | QMatrix |
| AT9206 USB Plug-In Card | Interface board to PC for EVK1060A & EVK2160A | NA |
| TS2080A | ATAVRTS2080A - QTouch Library w/ATmega88 QTouch | QTouch |
| TS2080B | ATAVRTS2080B - QTouch Library w/ATtiny88 QMatrix | QMatrix |
| ATQT600 | QTouch Library capacitive sensing modular development board | Both |

Atmel uses their patented charge transfer sensing technology that enables robust capacitive sensing, even in harsh environments. This is further improved with the post acquisition processing that occurs. With over 15-years of capacitive sensing experience, this technology is a market leader today!

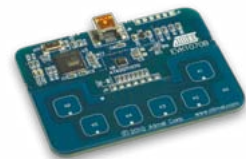
For more information see our Sensor Design Guide: http://www.atmel.com/dyn/resources/prod_documents/doc10620.pdf
 QTouch Library Selection Guide: http://www.atmel.com/dyn/products/tools_docs.asp?category_id=170&family_id=702&subfamily_id=2259&tool_id=4627



Atmel EVK1070A



Atmel EVK1012A



Atmel EVK1070B

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