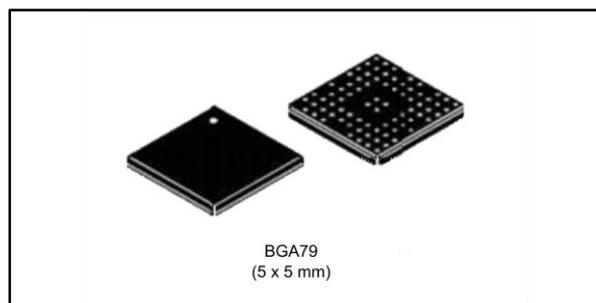


## Ultra low-power capacitive multi-touch screen controller for 2" to 13" screens

Data brief



- I<sup>2</sup>C, SPI and HID over I<sup>2</sup>C
- I<sup>2</sup>C master interface for connecting other peripherals

### Applications

- Wearable devices
- Smartphones
- Phablets
- Tablets
- Notebooks

### Features

- True multi-touch
  - Single chip for 2" to 13" screens with independent XY tracking for 10 simultaneous touches
- Multi-mode sensing support
  - Simultaneous mutual sensing and self-sensing support on all the channels on the same frame
- Advanced features
  - Multi-finger thick gloves, small 1 mm passive stylus, palm rejection, wet touch, water rejection, cover mode support, wakeup gestures
  - Supports on-cell, laminated, curved displays, film-based, touch-on lens, thin ITO-touch display panels
- Digital core
  - Optimized processing to reduce drag latency and increase response times
  - ARM M3 core with Flash to implement all features with space left for further customization
- High SNR and low power
  - Very low intrinsic noise to improve device SNR and provide very high sensitivity
  - ST proprietary hardware and firmware techniques to achieve ultra low power
- Fast report rate
  - >150 Hz under all conditions
- Serial interface

# 1 Description

FingerTip provides an optimal mix of low power, small size, low external part count and versatile features with unmatched true multi-touch performance in a single-chip touchscreen controller.

FingerTip uses a dedicated capacitance-to-voltage acquisition engine to implement the touch sensing. Coupled with the internal processor, the FingerTip touchscreen controller can detect, classify and track 10 finger touches with fast a report rate and response times.

The touch acquisition analog front-end has a wide dynamic range capable of coping with touchscreens of different sizes and configurations. This offers the flexibility to use FingerTip with multiple touchscreens using different ITO designs and overlay materials. One or two layer ITO sensors are supported using glass or PET substrates. FingerTip provides support for curved displays through proprietary node compensation hardware.

FingerTip's low-noise capacitive analog front-end provides enhanced noise suppression capabilities for various noise sources such as display, 3-phase noise and severe common mode noise introduced by battery chargers. The device utilizes ST proprietary hardware and firmware techniques to reduce power significantly in low power active mode and in low power idle mode, and incorporates multiple TX driving methods that can further boost the SNR and report rate.

FingerTip supports advanced features thanks to multi-mode sensing technology. The water rejection algorithm can detect water on the top of the screen and the device can still track one finger moving in the water without false touch or line breaking. The device supports multi-finger glove operation and small passive stylus.

The device also provides all types of SYNC mode (HSYNC and VSYNC) support, which enables touch sampling to be synchronized with the display SYNC signal. This enables it to work even with quad high definition displays.

The main processor implements a powerful 32-bit ARM M3 core with Flash that is capable of providing a high level of overall touch performance in terms of noise rejection, response time and power consumption. It runs concurrently with the analog front end and gives ample scope for implementation of complex touch-sensing tracking algorithms, advanced shape-based filtering and event reporting. The Flash size provides enough free space for further customization, even after implementation of ST firmware for all features.

The device supports I<sup>2</sup>C serial interface, I<sup>2</sup>C master interface, HID over I<sup>2</sup>C interface and SPI interface for greater flexibility.

## 2 Ordering information

**Table 1: Ordering information**

Order code	Package	Packing	Screen size	Remarks
FINGERTIP	BGA	Tape & reel	2" to 13"	Contact STMicroelectronics
	QFN			

### 3 Revision history

Table 2: Document revision history

Date	Version	Changes
13-Aug-2015	1	Initial release.

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