# FTS

FingerTip S multi-touch capacitive touchscreen controller with multi-mode sensing

Data brief

Features

- True multi-touch
  - Independent XY tracking with 10 simultaneous touches in real time
  - Up to 18 force and 30 sense channels
- Single chip solution
  - Supports up to 6 inches screen size
  - Supports multiple touchscreen configurations including touch keys with no external components on touch channels
- Multi-mode sensing support
  - Simultaneous mutual sensing and self sensing support on all the channels on the same frame
  - Robust water rejection, proximity, hovering and gloved hands operation
- High SNR
  - Extremely strong common mode charger noise rejection
  - Advanced filtering techniques for high noise immunity
  - Up to 12 V on YForce using internal charge-pump to further boost SNR
- Fast report rate: >300 Hz
- Power consumption
  - Under 22 mW in active mode (multi-touch)
  - Under 33 µW in sleep mode
- 32-bit ARM M3 processor
  - 64 KB Flash memory
  - Flexibility for customer code implementation
  - Allows customization of proprietary touch pattern and gestures
- Multiple input types: finger and small stylus
  - Simultaneous finger and stylus
  - Stylus recognition with palm rejection

LGA79

QFN56
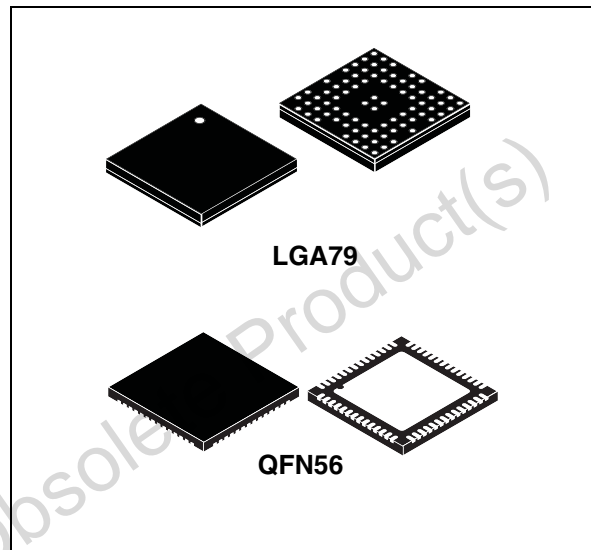
- Touch panels:
  - Works with plastic or glass sensors, with different types of sensor patterns with or without ground shield
  - Supports on-cell, laminated and touch-on-lens touch display
  - Excellent support for 1-layer ITO touch lens
- Power supply scheme:
  - 3.3 V and 1.8 V
- Serial interface:
  - Supports high speed I^2C and SPI
  - I^2C master for sensor hub application
- I/Os: RESETB, INTB hardware pins to host interface and 4 GPIOs with full programmability
- High ESD protection:
  - ±8 KV HBM ESD protection on all the force and sense pins

Applications

- Smartphones
- Tablets

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For further information contact your local STMicroelectronics sales office.

1   Description

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

The FingerTip S uses a dedicated capacitance to voltage acquisition engine to implement the touch sensing. Coupled with the internal processor the Fingertip S touchscreen controller can detect, classify and track 10 fingers touch with fast report rate and response times on an ITO matrix of up to 540 nodes.

The touch acquisition analog front end has a wide dynamic range able to cope with touchscreens of different size and configuration. This offers great flexibility to use FingerTip S with multiple touchscreens using different ITO designs and overlay materials. One or two layer ITO sensors are supported using glass or PET substrates.

The FingerTip S 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.

FingerTip S supports the detection of 1mm stylus for smooth handwriting capability on touchscreens while detecting and rejecting large area such as palm or hand. The device also supports separate touch keys external to the screen area.

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 main processor implements a powerful 32-bit ARM M3 core able to provide a high level of overall touch performance in terms of noise rejection, response time and power consumption. It is running concurrently to the analog front end and gives ample scope for implementation of complex sensing touch tracking algorithm, advanced shape based filtering and event reporting.

The device supports I^2C serial interface and SPI interface for more flexibility. The device also incorporates an I^2C master interface that can be used in sensor hub applications.

Table 1.   Ordering information

Order code	Package	Packing	Screen size	Channels
FTS1A048A01LE	LGA79 (5.0 x 5.0 mm; 0.5 mm pitch; 0.55 mm thickness)	Tape and reel	4.3" to 6.0"	30 sense 18 force 4 GPIO
FTS1A040A01QE	QFN56 (6 x 6 mm; 0.35mm pitch; 0.55 mm thickness)	Tape and reel	3.5" to 4.3"	24 sense 16 force 3 GPIO

2 Revision history

Table 2. Document revision history

Date	Revision	Changes
11-Jan-2013	1	Initial release.

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