

Capacitive Multi-Touch screen controller for OLED touch panels



Features

- **True multi-touch**
 - Independent XY tracking with 10 simultaneous touches in real time
 - Supports 22TX, 34RX channels
- **Single chip solution**
 - Supports 5.5inch to 7 inch inches screen size with 4mm to 5mm sensor pitch
 - Supports high-end touch-display projected capacitive technology panel types
- **Advanced Analog Front End (AFE)**
 - Simultaneous mutual sensing and self-sensing support on all the channels
 - Proprietary node compensation hardware
 - Multiple scanning methods with multi-TX drive to boost the SNR and provide high noise immunity
 - High drive capability charge-pump
- **High SNR**
 - Very low intrinsic noise to improve the device SNR and provide very high sensitivity
 - Extremely strong common mode charger noise rejection
 - Advanced filtering techniques for high noise immunity
- **Digital Core**
 - ARM M3 core with 128KB Flash memory to implement all features with free space for customer use
 - Advanced data processing for common mode noise immunity
- **Advanced Features**
 - Multi finger thick gloves, 2.5mm passive stylus, wet finger touch, water rejection, cover mode support
 - Finger separation $\leq 10\text{mm}$
- **Fast report rate**
 - Report rate of $>150\text{Hz}$ in Active Mode
- **Low Power**
 - ST proprietary Hardware and Firmware techniques to achieve low power
- **Touch panels**
 - Works with flat or curved panels with touch embedded into high resolution displays
- **Power supply scheme**
 - Dual supply operation 3.3 V and 1.8 V
 - Single 3.3V operation is also supported
- **Serial interface**
 - I2C compatible slave mode (100Kbps, 400Kbps, 1Mbps)
 - 3-wire and 4-wire Mode 0 SPI interface 12MHz (typ).
 - I3C interface
 - 3.3V tolerant interface for I2C and SPI

Product status	
Custom data	
Product summary	
Order code	FTM5CU56AA1BE
Package	XFBGA84 (5x5x0.5mm pitchx0.47mm max thickness)
Packing	Tape and Reel
Channels	34 Rx and 22 Tx

- I/Os: RESETB, INTB hardware pins to host interface, 3 Digital inputs and 2 GPIOs with full programmability
- **ESD**
 - High ESD on RX and TX pins ($\pm 8\text{KV}$ HBM) and $>\pm 3\text{KV}$ HBM on all other pins
 - High ESD on RX and TX pins ($\pm 1\text{KV}$ CDM) and $\pm 500\text{V}$ CDM on all other pins

Application

- Smartphones
- Trackpads
- Game consoles
- Phablets

Description

FingerTip FTM5CU56A 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 for thin flexible embedded display-touch panels.

FingerTip FTM5CU56A uses a dedicated front end architecture with capacitance to current acquisition engine to implement the touch sensing. Coupled with the internal processor the Fingertip touchscreen controller can detect, classify and track 10 fingers touch with fast report rate and response times with a configurable channel matrix consisting of total 22 TX and 34 RX channels.

The touch acquisition analog front end has a wide dynamic range able to cope with panels of different size and configuration. This offers great flexibility to use FingerTip with new technology of embedded display-touch panels that are flat or curved types. FingerTip FTM5CU56A provides support for flat or curved displays through proprietary node compensation hardware coupled with data processing techniques in firmware.

FingerTip FTM5CU56A low-noise capacitive analog front-end provides enhanced noise suppression capabilities for various noise sources such as high resolution display, 3-phase noise and severe common mode noise introduced by battery chargers.

FingerTip FTM5CU56A uses hardware and firmware ST proprietary techniques to reduce power in active and idle modes.

FingerTip FTM5CU56A device incorporates multiple TX driving methods that can further boost the SNR and report rate.

FingerTip FTM5CU56A supports advanced features thanks to the 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 2.5mm passive stylus.

The main processor implements a powerful 32-bit ARM M3 core with 128KB Flash that is 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 128KB flash size provides enough free space in the Flash for further customization even after implementation of ST firmware for all the features.

The device supports I2C serial interface, I3C interface and SPI slave interface for more flexibility.

Revision history

Table 1. Document revision history

Date	Version	Changes
09-Apr-2019	1	Initial release.

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