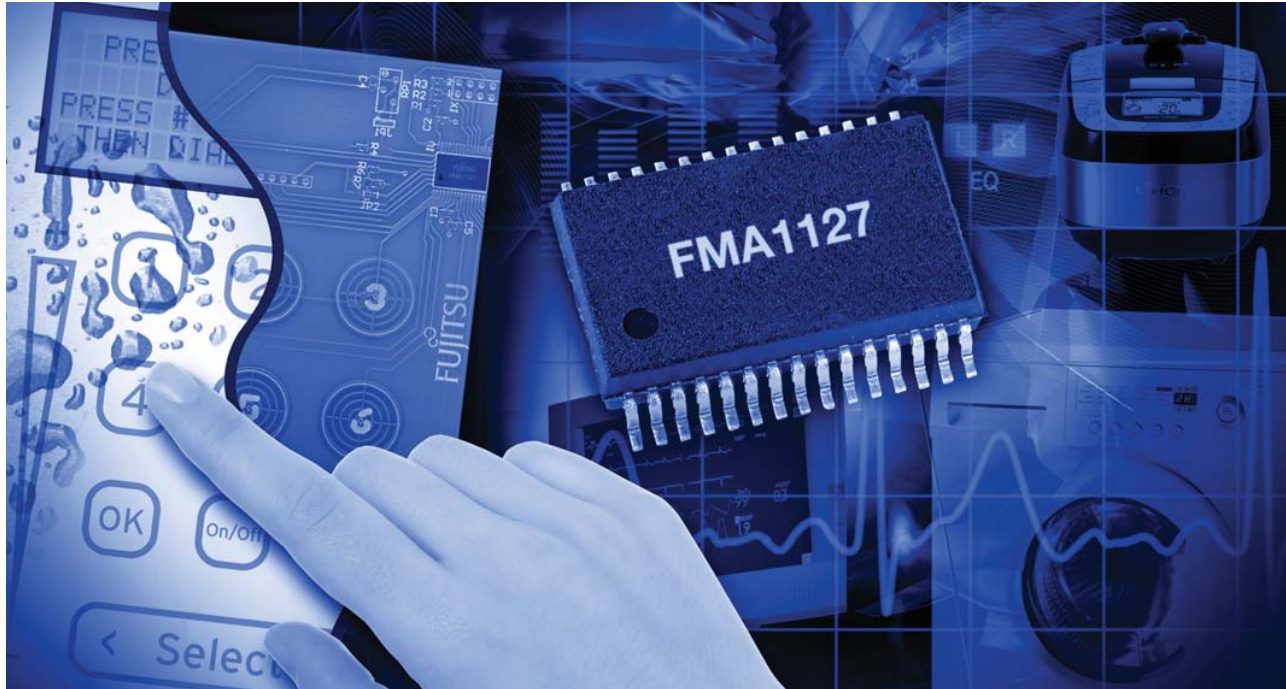# FMA1127
Touch Sensor Controller series

Description

Fujitsu is offering the Touch Sensor Controller (TSC) series FMA1127 from ATLab, Inc. of South Korea. This device represents a simple, reliable and aesthetic replacement for virtually all mechanical buttons and sliders across many markets, such as industrial, home appliance, mobile, consumer electronics and office equipment. The touch sensor controller converts the capacitance generated between a human body and a conductive touch pad into digital data, without any analogue signal processing. It detects a touch completely in the digital domain, by comparing the sensor input impedances with a built-in reference impedance. The device features small package size, fast response time and lowest power consumption.

With the built-in reference capacitors, the sensor eliminates the need for any external components for the touch channels in a wide range of applications. A single electrode is sufficient for each touch channel. Minimum software effort is required to implement the touch functionality. An additional filtering function called APIS™ further reduces software overhead by eliminating adjacent key or pattern interference.

The differential signal format enables the sensor to be resistant against outer signal disturbances and assures reliable operation. Furthermore, the AIC™ (Automatic Impedance Calibration) of FMA1127 allows the sensor to maintain a consistent sensitivity even during environment changes (temperature, humidity).

The FMA1127 TSC offers a high level of design flexibility through the host interface (I^2C) as well as up to 12 programmable general-purpose digital I/Os, which can also be used as external interrupt pins. Moreover, the flexibility of touch pad designs is enhanced through individual channel sensitivity.

1

Features

- Patented fully digital architecture
- 12 / 9 / 6 input channels in both QFN and SSOP packages available
- Programmable registers for easy configuration
  - Sensitivity, AIC interval, clock speed, etc.
- Configurable AIC™ (Automatic Impedance Calibration)
- Individual channel sensitivity
- Host interface via I²C
- Configurable DIO pins as direct touch outputs, extended GPIOs, or external interrupt inputs
- Two types of interrupts can be signaled to host MCU
  - TINT for touch detection
  - GINT for various other events, including I/O pins
- 8-bit resolution of touch strength data
- APIS™ (Adjacent Pattern Interference Suppression)
- Power management – idle and sleep modes
- No external components required for touch pads
- Built-in clock generation and voltage regulator
- Single supply voltage: 2.4V – 5V
- Beep generation for tactile feedback
- De-bounced touch outputs

Applications

- Home appliances and consumer electronics products
- Industrial equipment
- Portable devices such as PDAs, cellular phones, MP3 players, remote controllers and other integrated input devices
- Computer input devices such as mice and keyboards

Specifications

- Recommended operating voltage: 2.4V - 5V (2.3V - 5.5V max)
- Supply Current (typical)
  - Active mode 140µA
  - Idle mode 100µA
  - Sleep mode 0.1µA
- Response time: 0.2msec
- Recommended operating temperature: -40 to +90°C
- ESD protection: 8kV for chip/contact; 15kV for system/air
- RoHS compliant

Design Tool

In order to ensure a fast time-to-market for customers, a starter kit with a software tuning program is available for easy implementation start.
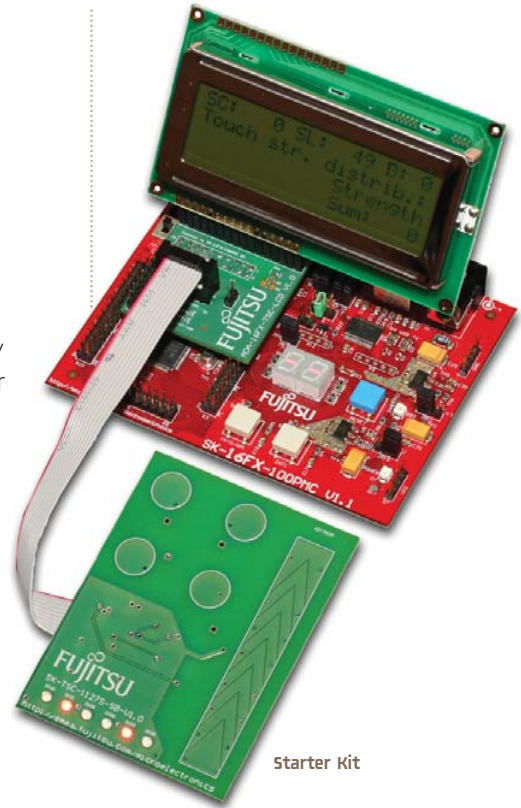
Starter Kit
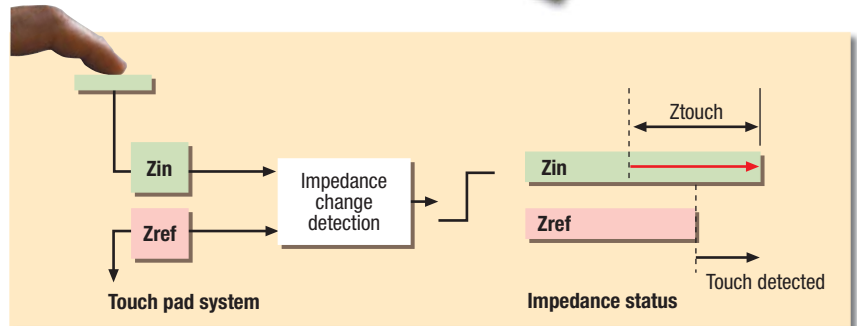
Principle of touch detection

Ordering information

Product Code	Package Type	Package Dimensions	Pin Pitch	Number of Sensor Inputs	Number of Digital I/Os
FMA1127DC-40N	40QFN	5mm x 5mm x 0.85mm	0.4mm	12	12
FMA1127DC-32N	32QFN	4mm x 4mm x 0.85mm	0.4mm	9	8
FMA1127DC-24N	24QFN	4mm x 4mm x 0.85mm	0.5mm	6	3
FMA1127DC-30S	30SSOP	12.7mm x 10.3mm x 2.5mm	0.8mm	12	6
FMA1127DC-24S	24SSOP	8.2mm x 7.8mm x 2.0mm	0.65mm	9	3
FMA1127DC-20S	20SSOP	6.5mm x 6.4mm x 1.85mm	0.65mm	6	2
SK-TSC-1127-SB	Starter Kit TSC				

The Touch Sensor Controller is developed and owned by ATLab, Inc. South Korea

ASK FUJITSU MICROELECTRONICS EUROPE

Contact us on +49(0) 61 03 69 00 or visit
http://emea.fujitsu.com/microelectronics