PRODUCT BRIEF

PSoC™ Automotive Multitouch Gen6XL for touchscreens

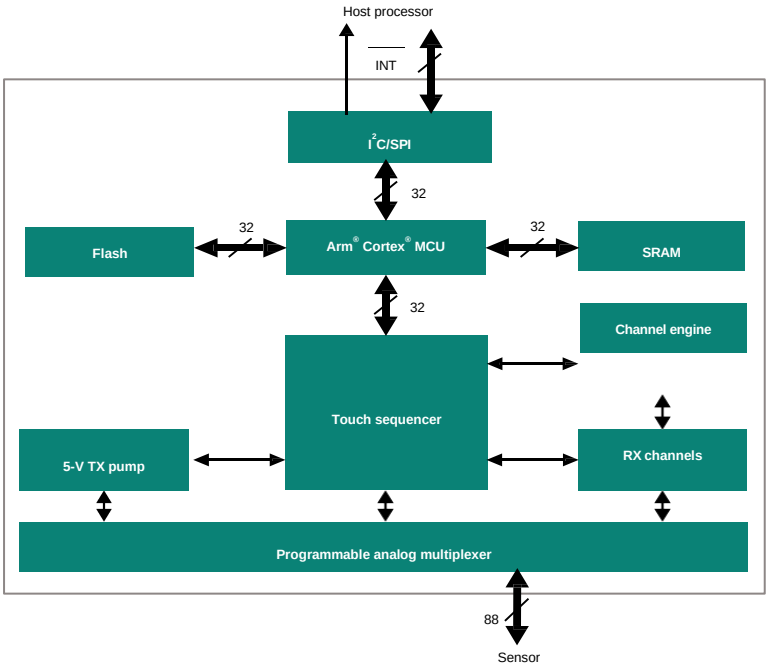
Shorter time-to-market with superior touch performance and user experience

PSoC™ Automotive Multitouch Gen6XL is a touch controller family leveraging Infineon Technologies AG's 10 years of experience in the touch controller sector. The register-configurable methodology provides tried and tested algorithms developed over > 200 man years of Automotive firmware development.

A capacitive touchscreen detects changes in capacitance to determine the location of one or more fingers on the surface of the touchscreen. A typical touchscreen system consists of a capacitive touchscreen sensor, an FPC bonded to the sensor, and the touch controller mounted on the FPC or PCB. The touch controller then connects to a host processor. Users can interact with the displayed user interface through finger movements and gestures on the surface of the touchscreen.

CYAT8168X is a capacitive touch controller with the sensing and processing technology to resolve the locations and report the positions of up to ten fingers on the touchscreen. The touch controller converts an array of sensor capacitances into an array of digital values, which are processed by touch-detection and position-resolution algorithms in the controller. These algorithms determine the location and signal magnitude of each finger on the touchscreen.

Block diagram



Key features

Automotive Electronics Council (AEC) Q100 qualified
MISRA-C / IATF 16949 compliant
Touch controller:
- 32-bit Arm® Cortex® CPU
- Register-configurable
- Noise-suppression technologies for display and EMI:
  - Auto armor technology
  - Spread-spectrum scanning
  - Effective 20 V drive
  - Display synchronization
- Non-rectangular touchscreens
- Water rejection and wet-finger tracking using dual sense capability
- Automatic glove mode switching
- Low-power wake-up options
- Field upgrades via bootloader
- Touchscreen sensor self-test
- Manufacturing Test Kit (MTK)

Performance (config dependent):
- Screen sizes up to 15 inch
- Ten touches at up to 250 Hz
- Gloves (or overlay) up to 5 mm
- TX frequency up to 350 kHz
- 30 mW average power
- 30 µW typical Deep Sleep power

Communication:
- I2C up to 400 kbps
- SPI up to 8 Mbps

Packages:
- 100LD TQFP 14 × 14 × 1.4 mm
- 128LD TQFP 14 × 20 × 1.4 mm

Ambient temperature range:
- Automotive-A: –40°C to 85°C
- Automotive-S: –40°C to 105°C

Infineon provides:
– Application firmware
– Design guidance for the sensor and FPC
– Touchscreen sensor MTK

The Automotive Multitouch solutions are fully tested in an automated way (robot tests) against all specified performance parameters as well as EMI/EMC-compliance, ESD, and environment change tests. The validation reports are available to shorten development cycles.

Infineon Technologies AG's auto armor technology meets the Automotive Electromagnetic Compatibility (EMC) requirements by preventing false touches caused by EMI from other electronic systems using advanced algorithms, including TX frequency spreading (also reducing electromagnetic emissions up to 30%) and Automatic Frequency Hopping (AFH).

Gen6XL provides a seamless integration of a capacitive wake-up button, which is capable of operating at <50 µA, allowing an increased power budget for other system components. Gen6XL enables the implementation of both touchscreen and wake-up button functionality using a single integrated device, reducing board space and costs.

PSoC™ Automotive Gen6XL delivers a perfect user experience on touchscreens, trackpads, and sliders with a shorter development cycle. Gen6XL meets the Automotive EMC requirements and supports low-power wake-up buttons, force touch, cut outs, and non-rectangular shapes for touchscreens.

Product	Product status	Sense pins	Buttons	Low-power wake	Thick glove / overlay	Gestures	Package
CYAT81688-100AS61(Z/KH)	Active and preferred	61	Yes	No	Yes	Yes	100LD TQFP
CYAT81688-100AS71KH	Active and preferred	71	Yes	No	Yes	Yes	100LD TQFP
CYAT81688-100AS77(Z/KH)	Active and preferred	77	Yes	No	Yes	Yes	100LD TQFP
CYAT81688-128AS88(Z)	Active and preferred	88	Yes	No	Yes	Yes	128LD TQFP
See the datasheet for more options							

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