PSoC™ Automotive Multitouch Generation 7XL

Datasheet Summary

Note that this is a Summary Datasheet. To access the full version of this datasheet, register in My Infineon Collaboration Platform (MyICP).

Features

- Automotive Electronics Council (AEC) AEC-Q100 qualified
- Multi-touch capacitive touchscreen controller
  - 32-bit Arm® Cortex® CPU
  - Register-configurable
  - Noise-suppression technologies for display and EMI
    - Hover sensing (up to 35 mm)
    - Force Touch
    - Slider sensing
    - CAPSENSE™ button sensing
    - Wake-up button sensing
    - Low-power wake-up button (< 50 µA)
    - Wake-on-touch screen
    - Runtime diagnostics
    - Support for split screen
    - Support for free form shapes
    - Effective 20-V drive for higher signal-to-noise ratio (SNR)[1]
    - AutoArmor improves both electromagnetic emissions and immunity
    - External display synchronization
  - Water rejection and wet-finger tracking using DualSense
  - Multi-touch glove with automatic mode switching
    - Ten fingers with thin glove (≤ 1-mm thick)
    - Two fingers with thick glove (≤ 5-mm thick)
  - Fingernail tracking
  - Large object rejection
  - Automatic baseline tracking to environmental changes
  - Low-power look-for-touch mode
  - Field upgrades via bootloader
  - Manufacturing test kit (MTK)
  - Android driver support
  - Touchscreen sensor self-test

Note

1. Effective voltage when using 17 multi-phase TX and 5-V V_{CCTX} supply.

Features

- System performance (configuration dependent)
  - Screen sizes up to 15-inch diagonal
    - 5.3-mm electrode pitch; 16:10 aspect ratio
  - Up to 103 sense pins, 2500 intersections
  - Reports up to ten fingers
  - Small finger support down to 5 mm
  - Refresh rate up to 250 Hz; other rates configurable
  - TX frequency up to 300 kHz
  - 5-V TX with high-order multi-phase TX capability for higher signal-to-noise (SNR) ratio
  - High-frequency TX frequency hopping supported for optimal noise filtering
  - Integrated DSP to process and filter data for faster scanning and lower noise
  - 64 RX channels, each with its own ADC, to enable single-pass long-side scanning for faster processing of touch data and better noise filtering
- Force Touch
  - 5 RX channels can be used for parallel touch/force scan
  - Typical Force range: 0.5 N to 10 N
  - Minimum displacement: 100 µm/10 N
  - Resolution (0.1 N)
  - Rigid body mechanic implementation
  - Refresh rate up to 100 Hz
  - Use of simple/cost-efficient FPC sensors
- Power (configuration-dependent)
  - 1.71- to 1.95-V and 3.0- to 5.5-V logic and digital I/Os supply
  - 3.0- to 5.5-V analog supply
  - 30-mW average power
  - 30-µW typical deep-sleep power
- Sensor and system design (configuration-dependent)
  - Supports a variety of touchscreen sensors and stackups
    - Manhattan, diamond
    - Sensor-on-lens (SOL)
    - On-cell touch integrated display modules
    - Hybrid In-Cell
    - Single-Layer Independent Multi-Touch (SLIM)
    - Plastic (PET) and glass-sensor substrates
    - LCD, AMOLED, and IPS displays
    - Metal mesh
- Primary host communication interface
  - I^2C slave at standard bit rates 100 kbps, 400 kbps, and 1 Mbps
  - SPI slave bit rates up to 8 Mbps
  - Optional cryptographic engine for secure communication
- Secondary safety communication interface
  - I^2C/SPI configurable as master/slave[2]
  - CAN interface

Note
2. Secondary slave interface requires custom firmware to enable.

Features

- Interface for external sensors
  - I^2C/SPI for external accelerometer
  - I^2C/SPI for external IR proximity
- Package
  - 100-pin TQFP 14 × 14 × 1.4 mm (0.5-mm pitch)
  - 128-pin TQFP 14 × 20 × 1.4 mm (0.5-mm pitch)
- Ambient temperature range
  - Automotive-A: –40°C to 85°C
  - Automotive-S: –40°C to 105°C

1 Ordering information

Table 1 lists the CYAT817X touchscreen controllers.

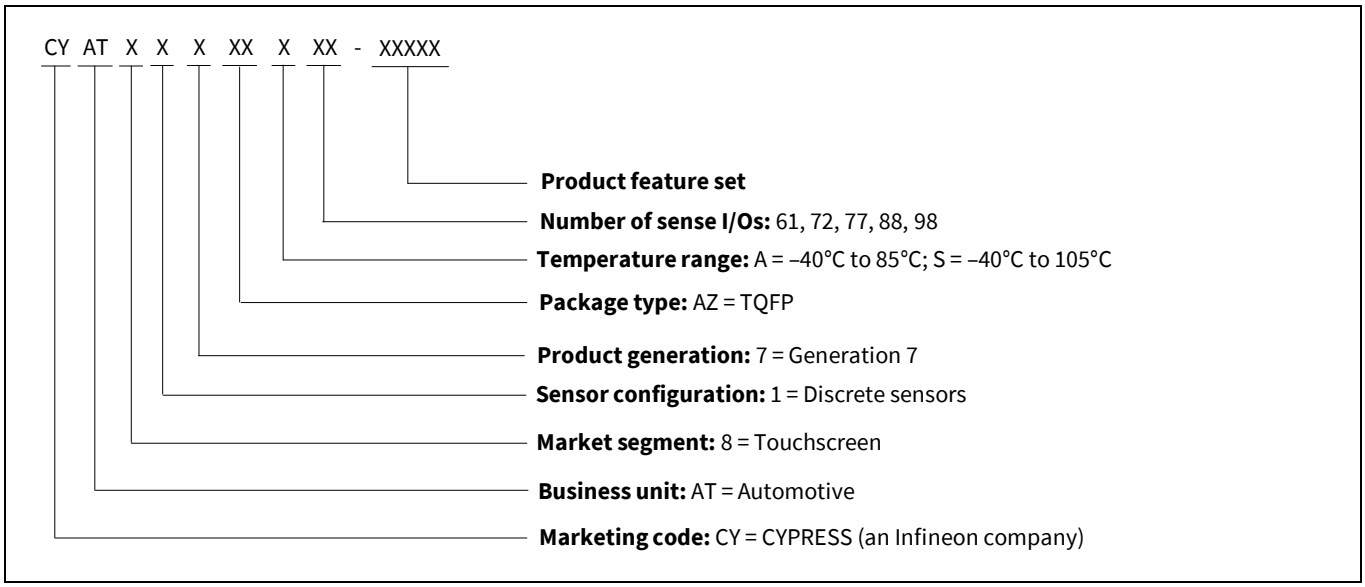
Table 1 Ordering information[3]

MPN	Number of sense pins	Number of fingers	Hover	Force Touch	CAPSENSE™ buttons	Low-power wake-up button / wake-on-touch screen	Slider	Haptic	Acoustic	Secondary SCB (Touch data)	CAN	Proximity	Crypto	Gesture touchscreen	Gesture slider	H2O	Package
CYAT817AZS61-3A202	61	10	✔	✔	–	–	–	✔	–	–	–	–	–	–	–	✔	100-pin TQFP
CYAT817AZS61-3A002	61	10	✔	✔	–	–	–	–	–	–	–	–	–	–	–	✔	
CYAT817AZS61-22002	61	10	–	–	–	–	–	–	–	–	–	–	–	–	–	✔	
CYAT817AZS72-3BFBA	72	10	✔	✔	✔	✔	✔	✔	✔	✔	–	✔	✔	✔	–	✔	
CYAT817AZS72-3B202	72	10	✔	✔	✔	–	–	✔	–	–	–	–	–	–	–	✔	
CYAT817AZS72-3B002	72	10	✔	✔	✔	–	–	–	–	–	–	–	–	–	–	✔	
CYAT817AZS72-33002	72	10	✔	–	✔	–	–	–	–	–	–	–	–	–	–	✔	
CYAT817AZS72-32002	72	10	✔	–	–	–	–	–	–	–	–	–	–	–	–	✔	
CYAT817AZS72-22002	72	10	–	–	–	–	–	–	–	–	–	–	–	–	–	✔	
CYAT817AZA72-3BFBA	72	10	✔	✔	✔	✔	✔	✔	✔	✔	–	✔	✔	✔	–	✔	
CYAT817AZS77-5BFBA	77	10	✔	✔	✔	✔	✔	✔	✔	✔	–	✔	✔	✔	–	✔	128-pin TQFP
CYAT817AZS77-5A202	77	10	✔	✔	–	–	–	✔	–	–	–	–	–	–	–	✔	
CYAT817AZS77-5A002	77	10	✔	✔	–	–	–	–	–	–	–	–	–	–	–	✔	
CYAT817AZS77-53C02	77	10	✔	–	✔	✔	✔	–	–	–	–	–	–	–	–	✔	
CYAT817AZS77-520DA	77	10	✔	–	–	–	–	–	–	✔	✔	–	✔	✔	–	✔	
CYAT817AZA77-5BFBA	77	10	✔	✔	✔	✔	✔	✔	✔	✔	–	✔	✔	✔	–	✔	
CYAT817AZS77-42002	77	10	–	–	–	–	–	–	–	–	–	–	–	–	–	✔	
CYAT817AZS88-5BFBA	88	10	✔	✔	✔	✔	✔	✔	✔	✔	–	✔	✔	✔	–	✔	
CYAT817AZS88-52002	88	10	✔	–	–	–	–	–	–	–	–	–	–	–	–	✔	
CYAT817AZS88-42002	88	10	–	–	–	–	–	–	–	–	–	–	–	–	–	✔	
CYAT817AZA88-5BFBA	88	10	✔	✔	✔	✔	✔	✔	✔	✔	–	✔	✔	✔	–	✔	
CYAT817AZA88-5B202	88	10	✔	✔	✔	–	–	✔	–	–	–	–	–	–	–	✔	
CYAT817AZA88-5B002	88	10	✔	✔	✔	–	–	–	–	–	–	–	–	–	–	✔	
CYAT817AZA88-53002	88	10	✔	–	✔	–	–	–	–	–	–	–	–	–	–	✔	
CYAT817AZA88-42002	88	10	–	–	–	–	–	–	–	–	–	–	–	–	–	✔	
CYAT817AZS98-5BFFE	98	10	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	
CYAT817AZS98-5BFBA	98	10	✔	✔	✔	✔	✔	✔	✔	✔	–	✔	✔	✔	–	✔	
CYAT817AZS98-523DA	98	10	✔	–	–	–	–	✔	✔	✔	✔	–	✔	✔	–	✔	
CYAT817AZS98-42002	98	10	–	–	–	–	–	–	–	–	–	–	–	–	–	✔	
CYAT817AZA98-5BFBA	98	10	✔	✔	✔	✔	✔	✔	✔	✔	-	✔	✔	✔	-	✔	
CYAT817AZA98-5B202	98	10	✔	✔	✔	–	–	✔	–	–	–	–	–	–	–	✔	
CYAT817AZA98-5B002	98	10	✔	✔	✔	–	–	–	–	–	–	–	–	–	–	✔	
CYAT817AZA98-53002	98	10	✔	–	✔	–	–	–	–	–	–	–	–	–	–	✔	
CYAT817AZA98-42002	98	10	–	–	–	–	–	–	–	–	–	–	–	–	–	✔	

Note

3. All devices have the following base features: Water rejection, DisplayArmor, AutoArmor, DualSense, glove support, and large object detection and rejection.

1.1 Ordering code definitions



Revision history

Document revision	Date	Description of changes
**	2022-08-04	Initial release.