

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)-Q100 qualified
- Multitouch 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]
 - Auto armor technology improves both electromagnetic emissions and immunity
 - External display synchronization
 - Water rejection and wet-finger tracking using dual sense capability
 - Multitouch 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
 - Five 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 or cost-efficient FPC sensors
- Power (configuration-dependent)
 - 1.71 V to 1.95 V and 3.0 V to 5.5 V logic and digital I/Os supply
 - 3.0 V 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 multitouch (SLIM)
 - Plastic (PET) and glass-sensor substrates
 - LCD, AMOLED, and IPS displays
 - Metal mesh
- Primary host communication interface
 - I²C 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
 - I²C/SPI configurable as master/slave^[2]
 - CAN interface

Note

2. Secondary slave interface requires custom firmware to enable.

Features

- Interface for external sensors
 - I²C/SPI for external accelerometer
 - I²C/SPI for external IR proximity
- Package
 - 100LD TQFP 14 × 14 × 1.4 mm (0.5 mm pitch)
 - 128LD 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

Ordering information

1 Ordering information

Table 1 lists the CYAT817X touchscreen controllers.

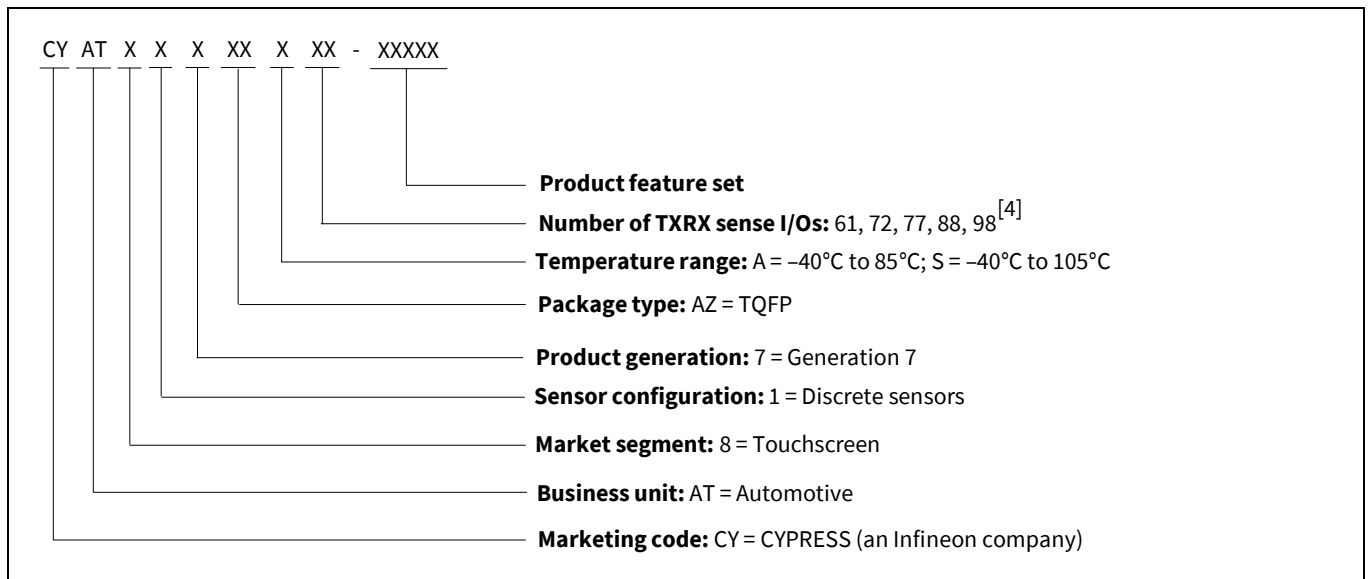
Table 1 Ordering information^[3]

Product	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	✓	✓	-	-	-	✓	-	-	-	-	-	-	-	✓	100LD 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	✓	✓	✓	✓	✓	✓	✓	✓	-	✓	✓	✓	-	✓	128LD 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	103	10	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
CYAT817AZS98-5BFBA	103	10	✓	✓	✓	✓	✓	✓	✓	✓	-	✓	✓	✓	-	✓	
CYAT817AZS98-523DA	103	10	✓	-	-	-	-	✓	✓	✓	✓	-	✓	✓	-	✓	
CYAT817AZS98-42002	103	10	-	-	-	-	-	-	-	-	-	-	-	-	-	✓	
CYAT817AZA98-5BFBA	103	10	✓	✓	✓	✓	✓	✓	✓	✓	-	✓	✓	✓	-	✓	
CYAT817AZA98-5B202	103	10	✓	✓	✓	-	-	✓	-	-	-	-	-	-	-	✓	
CYAT817AZA98-5B002	103	10	✓	✓	✓	-	-	-	-	-	-	-	-	-	-	✓	
CYAT817AZA98-53002	103	10	✓	-	✓	-	-	-	-	-	-	-	-	-	-	✓	
CYAT817AZA98-42002	103	10	-	-	-	-	-	-	-	-	-	-	-	-	-	✓	

Note

3. All devices have the following base features: Water rejection, display armor noise protection technology, auto armor, dual sense, glove support, and large object detection and rejection.

1.1 Ordering code definitions



Note

4. 103 total sensor pins consist of 98 fully configurable TX or RX sensors, and 5 TX only sensors.

Revision history

Revision history

Document revision	Date	Description of changes
**	2022-08-04	Initial release.
*A	2024-05-16	Updated Package information in Features . Updated Number of sense pins and Package information in Table 1 . Updated Ordering code definitions . Updated template. Updated to reflect correct metadata.
*B	2024-08-02	No content updates. Only ECN metadata updates.

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Edition 2024-08-02

Published by

Infineon Technologies AG
81726 Munich, Germany

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Document reference

002-35928 Rev. *B

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