

PSoC™ Automotive Multitouch Generation 6XL

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
 - 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)
 - Large object rejection
 - Automatic baseline tracking to environmental changes
 - Low-power look-for-touch mode
 - Field upgrades via bootloader
 - Manufacturing test kit (MTK)
 - Touchscreen sensor self-test
- System performance (configuration dependent)
 - Screen sizes up to 15-inch diagonal
 - 6.0-mm electrode pitch; 16:10 aspect ratio
 - Up to 88 sense pins, 1836 intersections; 16:10 aspect ratio (34 TX × 54 RX)
 - Reports up to ten fingers
 - Small finger support down to 4 mm

Note

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

Features

- 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- μ W typical deep-sleep power
- Sensor and system design (configuration-dependent)
 - Supports a variety of touchscreen sensors and stackups
 - Manhattan, diamond
 - Sensor-on-lens (SOL)
 - Plastic (PET) and glass-sensor substrates
 - LCD, AMOLED, and IPS displays
 - Metal mesh
- Communication interface
 - I²C slave at 100 and 400 kbps
 - SPI slave bit rates up to 8 Mbps
- 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

Ordering information

1 Ordering information

Table 1 lists the CYAT8168X touchscreen controllers.

Table 1 Ordering information^[2]

MPN	Number of sense pins	Number of fingers	Low-power wake-up button	CAPSENSE™ buttons	Water rejection	Thin glove support	Display Armor	Gestures	Thick overlay/thick glove support	5-V Tx	Package
CYAT81682-100AA61Z	61	10	-	✓	✓	✓	✓	-	-	-	100-pin TQFP
CYAT81682-100AS61Z	61	10	-	✓	✓	✓	✓	-	-	-	100-pin TQFP
CYAT81682-100AA71Z	71	10	-	✓	✓	✓	✓	-	-	-	100-pin TQFP
CYAT81682-100AS71Z	71	10	-	✓	✓	✓	✓	-	-	-	100-pin TQFP
CYAT81682-100AA77Z	77	10	-	✓	✓	✓	✓	-	-	-	100-pin TQFP
CYAT81682-100AS77Z	77	10	-	✓	✓	✓	✓	-	-	-	100-pin TQFP
CYAT81682-128AA88Z	88	10	-	✓	✓	✓	✓	-	-	-	128-pin TQFP
CYAT81682-128AS88Z	88	10	-	✓	✓	✓	✓	-	-	-	128-pin TQFP
CYAT81685-100AA61Z	61	10	-	✓	✓	✓	✓	✓	-	-	100-pin TQFP
CYAT81685-100AS61Z	61	10	-	✓	✓	✓	✓	✓	-	-	100-pin TQFP
CYAT81685-100AA71Z	71	10	-	✓	✓	✓	✓	✓	-	-	100-pin TQFP
CYAT81685-100AS71Z	71	10	-	✓	✓	✓	✓	✓	-	-	100-pin TQFP
CYAT81685-100AA77Z	77	10	-	✓	✓	✓	✓	✓	-	-	100-pin TQFP
CYAT81685-100AS77Z	77	10	-	✓	✓	✓	✓	✓	-	-	100-pin TQFP
CYAT81685-128AA88Z	88	10	-	✓	✓	✓	✓	✓	-	-	128-pin TQFP
CYAT81685-128AS88Z	88	10	-	✓	✓	✓	✓	✓	-	-	128-pin TQFP
CYAT81688-100AA61Z	61	10	-	✓	✓	✓	✓	✓	✓	✓	100-pin TQFP
CYAT81688-100AS61Z	61	10	-	✓	✓	✓	✓	✓	✓	✓	100-pin TQFP
CYAT81688-100AA71Z	71	10	-	✓	✓	✓	✓	✓	✓	✓	100-pin TQFP
CYAT81688-100AS71Z	71	10	-	✓	✓	✓	✓	✓	✓	✓	100-pin TQFP
CYAT81688-100AA77Z	77	10	-	✓	✓	✓	✓	✓	✓	✓	100-pin TQFP
CYAT81688-100AS77Z	77	10	-	✓	✓	✓	✓	✓	✓	✓	100-pin TQFP

Note

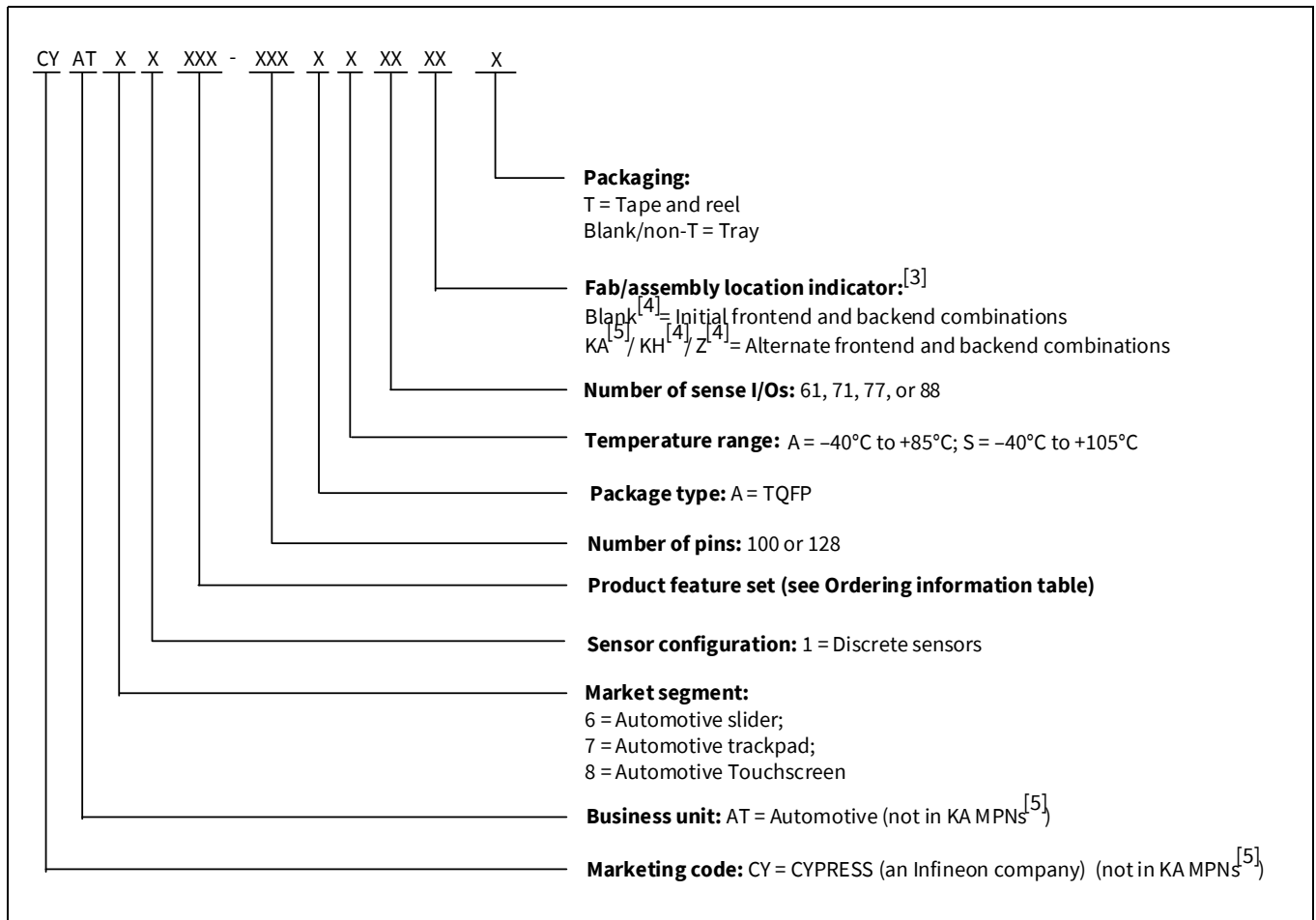
- All devices have the following base features: Water Rejection, DisplayArmor, AutoArmor, DualSense, CAPSENSE™ buttons, and large object detection and rejection.

Ordering information

Table 1 **Ordering information**^[2] (continued)

MPN	Number of sense pins	Number of fingers	Low-power wake-up button	CAPSENSE™ buttons	Water rejection	Thin glove support	Display Armor	Gestures	Thick overlay/thick glove support	5-V Tx	Package
CYAT81688-128AA88Z	88	10	-	✓	✓	✓	✓	✓	✓	✓	128-pin TQFP
CYAT81688-128AS88Z	88	10	-	✓	✓	✓	✓	✓	✓	✓	128-pin TQFP
CYAT81689-100AA61Z	61	10	✓	✓	✓	✓	✓	✓	✓	✓	100-pin TQFP
CYAT81689-100AS61Z	61	10	✓	✓	✓	✓	✓	✓	✓	✓	100-pin TQFP
CYAT81689-100AS71Z	71	10	✓	✓	✓	✓	✓	✓	✓	✓	100-pin TQFP
CYAT81689-100AA77Z	77	10	✓	✓	✓	✓	✓	✓	✓	✓	100-pin TQFP
CYAT81689-100AS77Z	77	10	✓	✓	✓	✓	✓	✓	✓	✓	100-pin TQFP
CYAT81689-128AA88Z	88	10	✓	✓	✓	✓	✓	✓	✓	✓	128-pin TQFP
CYAT81689-128AS88Z	88	10	✓	✓	✓	✓	✓	✓	✓	✓	128-pin TQFP

1.1 Ordering code definitions



Notes

3. All manufacturing locations (Blank / KA / KH / Z) have the same silicon ID.
4. Example Blank/KH/Z MPNs: CYAT81688-100AS61, CYAT81688-100AS61KH, and CYAT81688-100AS61Z.
5. Example KA MPN: 81688-100AS61KAT.

Revision history

Revision history

Document revision	Date	Description of changes
**	2015-10-28	New datasheet.
*A	2017-04-21	Updated Cypress Logo and Copyright.
*B	2017-11-13	Updated Ordering information : Removed column “Family”. Added column “Wake-up Button Support”. Updated part numbers. Updated Ordering code definitions : Added more details to reflect the updates of part numbers.
*C	2019-12-23	Updated Ordering information : Updated part numbers. Updated to new template.
*D	2020-11-26	Replaced CYAT81X with CYAT8168X in Document Title. Updated Features : Added “Automotive Electronics Council (AEC) AEC-Q100 qualified”. Updated Ordering information : No change in part numbers. Updated Ordering code definitions : Updated all details to reflect the updates of part numbers.
*E	2022-05-19	Updated to PSoC™ Automotive Multitouch branding guidelines. Updated Ordering information : Removed CYAT81689-100AA71Z and its details. Updated Ordering code definitions : Added Note 3, 4, and 5 and referred the notes in appropriate places.
*F	2022-06-13	Updated Ordering code definitions under Ordering information : Replaced KG with KH in all instances.
*G	2022-07-26	Updated Document Title. Added MyICP link. Migrated to Infineon template.

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