Automotive TrueTouch® Multi-Touch All-Points Touchscreen Controller Datasheet

Features

- 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
  - Cypress 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

- 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)
    - 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

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

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Document Number: 002-04310 Rev. *A   Revised April 21, 2017

Ordering Information

Table 1 lists the CYAT81X TrueTouch touchscreen controllers.

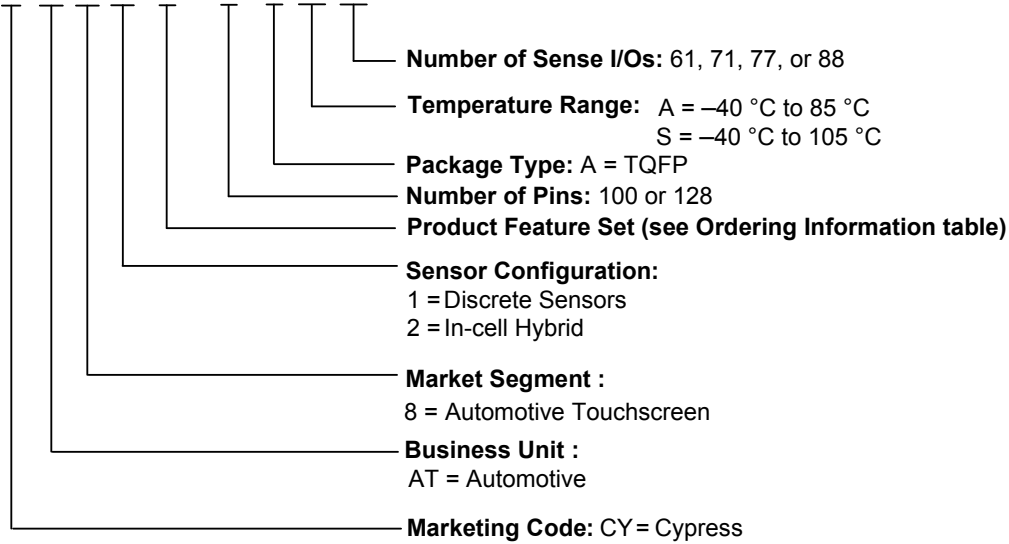**Table 1. Ordering Information[2]**

Family	MPN	Number of Sense Pins	Number of Fingers	CapSense Buttons	Water Rejection	Thin Glove Support	Display Armor	Gestures	Thick Overlay/Thick Glove Support	5-V TX	Package
Low Cost	CYAT81682-100AA61	61	10	✓	✓	✓	✓	–	–	–	100 TQFP
	CYAT81682-100AS61	61	10	✓	✓	✓	✓	–	–	–	100 TQFP
	CYAT81682-100AA71	71	10	✓	✓	✓	✓	–	–	–	100 TQFP
	CYAT81682-100AS71	71	10	✓	✓	✓	✓	–	–	–	100 TQFP
	CYAT81682-100AA77	77	10	✓	✓	✓	✓	–	–	–	100 TQFP
	CYAT81682-100AS77	77	10	✓	✓	✓	✓	–	–	–	100 TQFP
	CYAT81682-128AA88	88	10	✓	✓	✓	✓	–	–	–	128 TQFP
	CYAT81682-128AS88	88	10	✓	✓	✓	✓	–	–	–	128 TQFP
Gestures	CYAT81685-100AA61	61	10	✓	✓	✓	✓	✓	–	–	100 TQFP
	CYAT81685-100AS61	61	10	✓	✓	✓	✓	✓	–	–	100 TQFP
	CYAT81685-100AA71	71	10	✓	✓	✓	✓	✓	–	–	100 TQFP
	CYAT81685-100AS71	71	10	✓	✓	✓	✓	✓	–	–	100 TQFP
	CYAT81685-100AA77	77	10	✓	✓	✓	✓	✓	–	–	100 TQFP
	CYAT81685-100AS77	77	10	✓	✓	✓	✓	✓	–	–	100 TQFP
	CYAT81685-128AA88	88	10	✓	✓	✓	✓	✓	–	–	128 TQFP
	CYAT81685-128AS88	88	10	✓	✓	✓	✓	✓	–	–	128 TQFP
Base	CYAT81688-100AA61	61	10	✓	✓	✓	✓	✓	✓	✓	100 TQFP
	CYAT81688-100AS61	61	10	✓	✓	✓	✓	✓	✓	✓	100 TQFP
	CYAT81688-100AA71	71	10	✓	✓	✓	✓	✓	✓	✓	100 TQFP
	CYAT81688-100AS71	71	10	✓	✓	✓	✓	✓	✓	✓	100 TQFP
	CYAT81688-100AA77	77	10	✓	✓	✓	✓	✓	✓	✓	100 TQFP
	CYAT81688-100AS77	77	10	✓	✓	✓	✓	✓	✓	✓	100 TQFP
	CYAT81688-128AA88	88	10	✓	✓	✓	✓	✓	✓	✓	128 TQFP
	CYAT81688-128AS88	88	10	✓	✓	✓	✓	✓	✓	✓	128 TQFP

Notes
2. All devices have the following base features: Water Rejection, DisplayArmor™, AutoArmor™, DualSense™, CapSense buttons, Large Object Detection and Rejection, and Grip Suppression.

Ordering Code Definitions

CY AT X X XXX - XXX X X XX

Number of Sense I/Os: 61, 71, 77, or 88

Temperature Range: A = –40 °C to 85 °C
S = –40 °C to 105 °C

Package Type: A = TQFP

Number of Pins: 100 or 128

Product Feature Set (see Ordering Information table)

Sensor Configuration:
1 = Discrete Sensors
2 = In-cell Hybrid

Market Segment :
8 = Automotive Touchscreen

Business Unit :
AT = Automotive

Marketing Code: CY = Cypress

Document History Page

Document Title: CYAT81X (61, 71, 77, 88 I/Os) Automotive TrueTouch® Multi-Touch All-Points Touchscreen Controller Datasheet Document Number: 002-04310				
Revision	ECN	Orig. of Change	Submission Date	Description of Change
**	4988927	MANU	10/28/2015	New summary datasheet
*A	5705461	AESATMP7	04/21/2017	Updated Cypress Logo and Copyright.

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