

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.

Ordering Information

Table 1 lists the CYAT81X TrueTouch 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 TQFP
CYAT81682-100AS61Z	61	10	–	✓	✓	✓	✓	–	–	–	100 TQFP
CYAT81682-100AA71Z	71	10	–	✓	✓	✓	✓	–	–	–	100 TQFP
CYAT81682-100AS71Z	71	10	–	✓	✓	✓	✓	–	–	–	100 TQFP
CYAT81682-100AA77Z	77	10	–	✓	✓	✓	✓	–	–	–	100 TQFP
CYAT81682-100AS77Z	77	10	–	✓	✓	✓	✓	–	–	–	100 TQFP
CYAT81682-128AA88Z	88	10	–	✓	✓	✓	✓	–	–	–	128 TQFP
CYAT81682-128AS88Z	88	10	–	✓	✓	✓	✓	–	–	–	128 TQFP
CYAT81685-100AA61Z	61	10	–	✓	✓	✓	✓	✓	–	–	100 TQFP
CYAT81685-100AS61Z	61	10	–	✓	✓	✓	✓	✓	–	–	100 TQFP
CYAT81685-100AA71Z	71	10	–	✓	✓	✓	✓	✓	–	–	100 TQFP
CYAT81685-100AS71Z	71	10	–	✓	✓	✓	✓	✓	–	–	100 TQFP
CYAT81685-100AA77Z	77	10	–	✓	✓	✓	✓	✓	–	–	100 TQFP
CYAT81685-100AS77Z	77	10	–	✓	✓	✓	✓	✓	–	–	100 TQFP
CYAT81685-128AA88Z	88	10	–	✓	✓	✓	✓	✓	–	–	128 TQFP
CYAT81685-128AS88Z	88	10	–	✓	✓	✓	✓	✓	–	–	128 TQFP
CYAT81688-100AA61Z	61	10	–	✓	✓	✓	✓	✓	✓	✓	100 TQFP
CYAT81688-100AS61Z	61	10	–	✓	✓	✓	✓	✓	✓	✓	100 TQFP
CYAT81688-100AA71Z	71	10	–	✓	✓	✓	✓	✓	✓	✓	100 TQFP
CYAT81688-100AS71Z	71	10	–	✓	✓	✓	✓	✓	✓	✓	100 TQFP
CYAT81688-100AA77Z	77	10	–	✓	✓	✓	✓	✓	✓	✓	100 TQFP
CYAT81688-100AS77Z	77	10	–	✓	✓	✓	✓	✓	✓	✓	100 TQFP
CYAT81688-128AA88Z	88	10	–	✓	✓	✓	✓	✓	✓	✓	128 TQFP
CYAT81688-128AS88Z	88	10	–	✓	✓	✓	✓	✓	✓	✓	128 TQFP
CYAT81689-100AA61Z	61	10	✓	✓	✓	✓	✓	✓	✓	✓	100 TQFP

Note

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

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
CYAT81689-100AS61Z	61	10	✓	✓	✓	✓	✓	✓	✓	✓	100 TQFP
CYAT81689-100AA71Z	71	10	✓	✓	✓	✓	✓	✓	✓	✓	100 TQFP
CYAT81689-100AS71Z	71	10	✓	✓	✓	✓	✓	✓	✓	✓	100 TQFP
CYAT81689-100AA77Z	77	10	✓	✓	✓	✓	✓	✓	✓	✓	100 TQFP
CYAT81689-100AS77Z	77	10	✓	✓	✓	✓	✓	✓	✓	✓	100 TQFP
CYAT81689-128AA88Z	88	10	✓	✓	✓	✓	✓	✓	✓	✓	128 TQFP
CYAT81689-128AS88Z	88	10	✓	✓	✓	✓	✓	✓	✓	✓	128 TQFP

Ordering Code Definitions

CY AT X X XXX – XXX X X XX X T

T = Tape and Reel

Fab Location Indicator

Z = New Fab Location

Blank/Non-Z = Initial Fab Location

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

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	Submission Date	Description of Change
**	4988927	10/28/2015	New summary datasheet
*A	5705461	04/21/2017	Updated Cypress Logo and Copyright.
*B	5962384	11/13/2017	Updated Ordering Information and Ordering Code Definition
*C	6759712	12/23/2019	Updated Ordering Information. Updated Sales links and copyright information.

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