## **SUMMARY**

CYAT8165X (48 I/Os)

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

### **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)<sup>[1]</sup>
    - 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 8.5-inch diagonal
    - 6.2-mm electrode pitch; 16:9 aspect ratio
  - □ Up to 48 sense pins, 527 intersections; 16:9 aspect ratio (17 RX and 31 TX)
  - □ Reports up to ten fingers
  - ☐ Small finger support down to 4 mm
  - □ Refresh rate up to 250 Hz; other rates configurable
  - □ TX frequency up to 350 kHz

- 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
  - □ 9-mW average power
- □ 11-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
    - · Plastic (PET) and glass-sensor substrates
    - · LCD, AMOLED, and IPS displays
    - · Metal mesh
- Communication interface
  - □ I<sup>2</sup>C 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)
- 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<sub>CCTX</sub> supply.



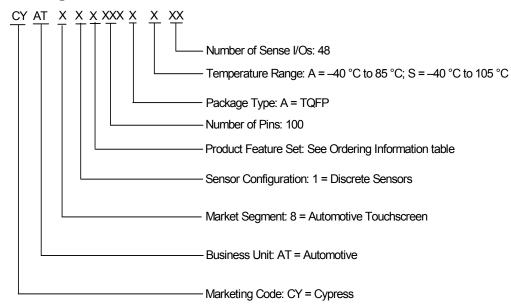
## **Ordering Information**

Table 1 lists the CYAT8165X TrueTouch touchscreen controllers.

Table 1. Ordering Information<sup>[2]</sup>

Marketing Part Number	Number of Sense Pins	Number of Fingers	5-V Tx	Display Armor	Capsense Buttons	Water Rejection	Thin Glove Support	Gestures	Thick Overlay/Thick Glove Support	Package
CYAT81650-100AA48	48	10	~	/	_	_	_	_	_	100-pin TQFP
CYAT81650-100ASA48	48	10	~	~	_	_	_	_	_	100-pin TQFP
CYAT81652-100AA48	48	10	~	~	~	~	~	_	_	100-pin TQFP
CYAT81652-100AS48	48	10	~	~	~	~	~	_	_	100-pin TQFP
CYAT81655-100AA48	48	10	~	~	~	~	~	~	_	100-pin TQFP
CYAT81655-100AS48	48	10	~	~	~	~	~	~	_	100-pin TQFP
CYAT81658-100AA48	48	10	~	~	~	~	~	~	~	100-pin TQFP

## **Ordering Code Definitions**



#### Note

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



## **Document History Page**

Document Title: CYAT8165X (48 I/Os), Automotive TrueTouch <sup>®</sup> Multi-Touch All-Points Touchscreen Controller Document Number: 002-16617									
Revision	ECN	Orig. of Change	Submission Date	Description of Change					
**	5437893	GACH	09/16/2016	Initial release					



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