

# CY8CTMA1036/768/460

# Automotive TrueTouch<sup>®</sup> Multi-Touch All-Points Touchscreen Controller

# Features

■ Automotive Electronics Council (AEC) Q100 qualified

SUMMARY

- Multi-touch capacitive touchscreen and touchpad controller
  - 32-bit ARM Cortex CPU
  - Register configurable
  - Noise suppression technologies for display and EMI
  - On-chip 10-V TX supply for higher signal-to-noise ratio (SNR)
  - External display synchronization
  - Water rejection and wet finger tracking
  - Large object rejection
  - □ Automatic baseline tracking to environmental changes
  - Low-power look-for-touch mode
  - Field upgrades via bootloader
  - ☐ Android<sup>™</sup> driver support
  - Cypress manufacturing test kit (MTK)
  - Touchscreen sensor self-test and ID reporting

#### System performance

- □ Screen sizes up to 10.1-inch diagonal
- 5.5-mm sensor pitch, 4:3 aspect ratio
- □ Up to 65 sense pins
- 1036 intersections, 4:3 aspect ratio (37 × 28)
- Reports up to 10 fingers
- □ Small finger support down to 5 mm
- □ Large finger support up to 22 mm
- □ Refresh rate up to 80 Hz; other rates configurable
- $\Box$  Fast first-touch response ( $\leq$  37.5 ms for a 10.1-inch panel)

## Power (configuration dependent)

- □ 1.71-V to 5.5-V digital and I/O supply
- □ 2.60-V to 5.5-V analog supply
- □ 71-mW average power while sensing
- □ 45-µW typical deep-sleep power

#### Sensor and system design (configuration dependent)

- Supports a variety of touchscreen sensors and stackups
  - · Manhattan and diamond patterns
- · Sensor-on-lens (SOL)
- · Plastic (PET) and glass sensor substrates
- LCD and AMOLED displays
- Single on cell flexible printed circuit (FPC) routing enabled by flexible TX/RX configurations

## I<sup>2</sup>C and SPI interface options

- I<sup>2</sup>C slave at all standard bit rates
  - 100 kbps, 400 kbps, 1 Mbps, and 3.4 Mbps
- SPI slave bit rates up to 8 Mbps

#### Package options

- □ 100-pin TQFP, 14 × 14 × 1.4 mm, 0.5-mm pin-pitch
- Temperature ranges
  - □ Automotive-A: -40 °C to 85 °C
  - □ Automotive-S: -40 °C to 105 °C



# **Ordering Information**

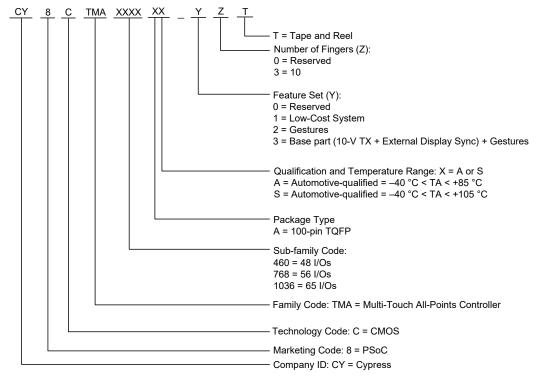
Table 1 lists the CY8CTMA1036/768/460 TrueTouch touchscreen controllers. For information on other TrueTouch families, visit http://www.cypress.com/truetouch.

## Table 1. Device Ordering Information

Family	Marketing Part Number	Number of Sense Pins	Number of fingers	Capsense Buttons	Water Rejection	Object Detect and Reject	Glove Support	Gestures	10-V TX	External Display Sync	Package	Package Size	Silicon ID
Low cost	CY8CTMA460AA-13	48	10	~	~	~	~	-	-	-	100 TQFP	14 × 14 ×1.4 mm	0x01832390
	CY8CTMA460AS-13	48	10	~	~	~	~	-	-	-	100 TQFP	14 × 14 ×1.4 mm	
	CY8CTMA768AA-13	56	10	~	~	~	~	-	-	-	100 TQFP	14 × 14 ×1.4 mm	
	CY8CTMA768AS-13	56	10	~	~	~	~	-	-	-	100 TQFP	14 × 14 ×1.4 mm	
	CY8CTMA1036AA-13	65	10	~	~	~	~	-	-	-	100 TQFP	14 × 14 ×1.4 mm	0x01772390
	CY8CTMA1036AS-13	65	10	~	~	~	~	-	-	-	100 TQFP	14 × 14 ×1.4 mm	0x01782390
	CY8CTMA460AA-23	48	10	~	~	~	~	~	-	-	100 TQFP	14 × 14 ×1.4 mm	0x01852390
	CY8CTMA460AS-23	48	10	~	~	~	~	~	-	-	100 TQFP	14 × 14 ×1.4 mm	0x01862390
Gestures	CY8CTMA768AA-23	56	10	~	~	~	~	~	-	-	100 TQFP	14 × 14 ×1.4 mm	0x01792390
	CY8CTMA768AS-23	56	10	~	~	5	5	~	-	-	100 TQFP	14 × 14 ×1.4 mm	0x017A2390
	CY8CTMA1036AA-23	65	10	>	~	>	>	~	-	-	100 TQFP	14 × 14 ×1.4 mm	0x017B2390
	CY8CTMA1036AS-23	65	10	~	~	5	5	~	-	-	100 TQFP	14 × 14 ×1.4 mm	0x017C2390
Base	CY8CTMA460AA-33	48	10	2	~	2	2	~	2	2	100 TQFP	14 × 14 ×1.4 mm	0x01872390
	CY8CTMA460AS-33	48	10	2	~	2	2	~	2	2	100 TQFP	14 × 14 ×1.4 mm	0x01882390
	CY8CTMA768AA-33	56	10	~	~	~	~	~	2	~	100 TQFP	14 × 14 ×1.4 mm	0x017D2390
	CY8CTMA768AS-33	56	10	~	~	~	~	~	~	~	100 TQFP	14 × 14 ×1.4 mm	0x017E2390
	CY8CTMA1036AA-33	65	10	~	~	~	~	~	~	~	100 TQFP	14 × 14 ×1.4 mm	0x017F2390
	CY8CTMA1036AS-33	65	10	~	~	~	~	~	~	~	100 TQFP	14 × 14 ×1.4 mm	0x01802390
Custom	CY8CTMA1036AA-00	65	10	~	~	~	~	~	~	~	100 TQFP	14 × 14 ×1.4 mm	0x01812390
	CY8CTMA1036AS-00	65	10	~	~	~	~	~	~	~	100 TQFP	14 × 14 ×1.4 mm	0x01822390



## **Ordering Code Definitions**





# **Document History Page**

Document Title: CY8CTMA1036/768/460 Automotive TrueTouch <sup>®</sup> Multi-Touch All-Points Touchscreen Controller Document Number: 001-94115								
Revision	ECN	Orig. of Change	Submission Date	Description of Change				
**	4495966	KAUL	09/09/2014	New summary datasheet.				
*A	5718187	AESATMP7	04/28/2017	Updated Cypress Logo and Copyright.				
*В	5861817	ANEE	08/30/2017	Updated Ordering Code Definitions. Updated Sales page and Copyright information.				



# Sales, Solutions, and Legal Information

#### Worldwide Sales and Design Support

Cypress maintains a worldwide network of offices, solution centers, manufacturer's representatives, and distributors. To find the office closest to you, visit us at Cypress Locations.

#### Products

ARM <sup>®</sup> Cortex <sup>®</sup> Microcontrollers	cypress.com/arm
Automotive	cypress.com/automotive
Clocks & Buffers	cypress.com/clocks
Interface	cypress.com/interface
Internet of Things	cypress.com/iot
Memory	cypress.com/memory
Microcontrollers	cypress.com/mcu
PSoC	cypress.com/psoc
Power Management ICs	cypress.com/pmic
Touch Sensing	cypress.com/touch
USB Controllers	cypress.com/usb
Wireless Connectivity	cypress.com/wireless

## **PSoC<sup>®</sup> Solutions**

PSoC 1 | PSoC 3 | PSoC 4 | PSoC 5LP | PSoC 6

#### **Cypress Developer Community**

Forums | WICED IOT Forums | Projects | Video | Blogs | Training | Components

#### **Technical Support**

cypress.com/support

© Cypress Semiconductor Corporation, 2014-2017. This document is the property of Cypress Semiconductor Corporation and its subsidiaries, including Spansion LLC ("Cypress"). This document, including any software or firmware included or referenced in this document ("Software"), is owned by Cypress under the intellectual property laws and treaties of the United States and other countries worldwide. Cypress reserves all rights under such laws and treaties and does not, except as specifically stated in this paragraph, grant any license under its patents, copyrights, trademarks, or other intellectual property rights. If the Software is not accompanied by a license agreement and you do not otherwise have a written agreement with Cypress governing the use of the Software, hen Cypress hereby grants you a personal, non-exclusive, nontransferable license (without the right to sublicense) (1) under its copyright rights in the Software (a) for Software provided in source code form, to modify and reproduce the Software solely for use with Cypress hardware products, only internally within your organization, and (b) to distribute the Software in binary code form externally to end users (either directly or indirectly through resellers and distributors), solely for use on Cypress hardware product units, and (2) under those claims of Cypress's patents that are infringed by the Software (as provided by Cypress, unmodified) to make, use, distribute, and import the Software solely for use with Cypress hardware products. Any other use, reproduction, modification, translation, or compilation of the Software is prohibited.

TO THE EXTENT PERMITTED BY APPLICABLE LAW, CYPRESS MAKES NO WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, WITH REGARD TO THIS DOCUMENT OR ANY SOFTWARE OR ACCOMPANYING HARDWARE, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. To the extent permitted by applicable law, Cypress reserves the right to make changes to this document without further notice. Cypress does not assume any liability arising out of the application or use of any product or circuit described in this document. Any information provided in this document, including any sample design information or programming code, is provided only for reference purposes. It is the responsibility of the user of this document to properly design, program, and test the functionality and safety of any application made of this information and any resulting product. Cypress products are not designed, intended, or authorized for use as critical components in systems designed or intended for the operation of weapons, weapons systems, nuclear installations, life-support devices or systems, other medical devices or systems (including resuscitation equipment and surgical implants), pollution control or hazardous substances management, or other uses where the failure of the device or system could cause personal injury, death, or property damage ("Unintended Uses"). A critical component is any component of a device or system whose failure to perform can be reasonably expected to cause the failure of the device or systems, or to affect its safety or effectiveness. Cypress is not liable, in whole or in part, and you shall and hereby do release Cypress from any claim, damage, or other liability arising from or related to all Unintended Uses of Cypress products.

Cypress, the Cypress logo, Spansion, the Spansion logo, and combinations thereof, WICED, PSoC, CapSense, EZ-USB, F-RAM, and Traveo are trademarks or registered trademarks of Cypress in the United States and other countries. For a more complete list of Cypress trademarks, visit cypress.com. Other names and brands may be claimed as property of their respective owners.