

# SUMMARY

## CYTMA445A

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

### Features

- Multi-touch capacitive touchscreen controller
  - □ 32-bit ARM<sup>®</sup> Cortex™ CPU
  - Register-configurable
  - Noise-suppression technologies for battery charger and display
    - Effective 24-V drive for higher signal-to-noise ratio (SNR)
    - ChargerArmor™ for charger noise 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)
  - Fingernail tracking
  - □ Grip suppression
  - □ 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 Panel ID reporting
- System performance (configuration dependent)
  - □ Screen sizes up to 5.0-inch diagonal
  - 4.8-mm sensor pitch; 16:9 aspect ratio
  - □ Up to 36 sense pins
  - 308 intersections (22 × 14)
  - Reports up to ten fingers
  - Small finger support down to 4 mm
  - □ Large finger support up to 30 mm
  - □ Refresh rate up to 300 Hz; other rates configurable
  - TX frequency up to 500 kHz
  - Best-in-class charger noise immunity
    - Immunity up to 35-V peak-to-peak (VPP)
    - Immunity to AT&T<sup>®</sup> Zero charger noise

- Power (configuration-dependent)
- □ 1.71- to 1.95-V or 2.0- to 5.5-V digital and I/O supply
- □ 2.65- to 4.7-V analog supply
- 4-mW average power
- □ 5.7-µW typical deep-sleep power
- Sensor and system design (configuration-dependent)
  - □ Supports a variety of touchscreen sensors and stackups
    - Manhattan, diamond, Single-Layer Independent Multi-touch (SLIM<sup>®</sup>), and Totem-pole patterns
    - Sensor-on-Lens (SOL)
    - · Plastic (PET) and glass-sensor substrates
    - · LCD, AMOLED, and IPS displays
    - Metal mesh
  - Single-layer flexible printed circuit (FPC) routing enabled by flexible TX/RX configurations
- Communication interface
  - □ I<sup>2</sup>C slave at 100 and 400 kbps
  - SPI slave bit rates up to 8 Mbps<sup>[1]</sup>
- Package options
  - □ 44-pin 5 × 5 × 0.6-mm QFN (0.35-mm lead pitch) □ 48-pin 6 × 6 × 0.6-mm QFN (0.4-mm lead pitch)

Note

1. SPI support is only available in 48-pin QFN package.

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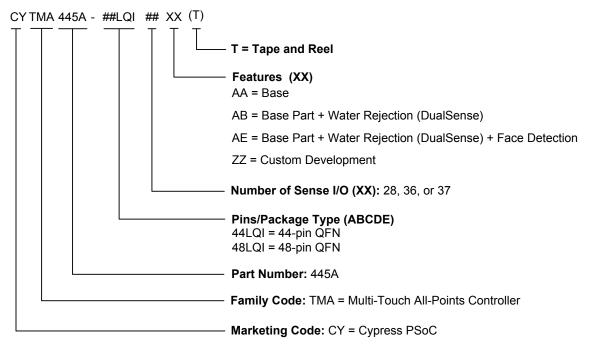
## **Ordering Information**

Table 1 lists the CYTMA445A TrueTouch touchscreen controllers. For information on other TrueTouch families, visit http://www.cypress.com/truetouch.

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

Device	TrueTouch				Package	
Segmentation	Part Number	Sense I/O	35-V <sub>PP</sub> Charger Armor	DualSense	Glove	Туре
	CYTMA445A-44LQI28AA(T)	28	~	-	-	44-Pin QFN
Base Part	CYTMA445A-44LQI33AA(T)	33	~	-	-	44-Pin QFN
Base Part	CYTMA445A-44LQI35AA(T)	35	~	-	-	44-Pin QFN
	CYTMA445A-48LQI36AA(T)	36	~	-	-	48-Pin QFN
	CYTMA445A-44LQI28AB(T)	28	~	~	-	44-Pin QFN
DualSense	CYTMA445A-44LQI33AB(T)	33	~	~	-	44-Pin QFN
DuaiSerise	CYTMA445A-44LQI35AB(T)	35	~	~	-	44-Pin QFN
	CYTMA445A-48LQI36AB(T)	36	~	~	-	48-Pin QFN
Advanced	CYTMA445A-44LQI35AE(T)	35	~	~	~	44-Pin QFN
Feature	CYTMA445A-48LQI36AE(T)	36	~	~	~	48-Pin QFN
Custom	CYTMA445A-44LQI35ZZ(T)	35	~	~	✓	44-Pin QFN
(Reserved for Kits)	CYTMA445A-48LQI36ZZ(T)	36	~	~	~	48-Pin QFN

### **Ordering Code Definitions**



Notes

2. All devices have the following base features: ChargerArmor, CapSense buttons, Large Object Detection and Rejection, and Grip Suppression.



## **Document History Page**

Document Title: CYTMA445A, TrueTouch <sup>®</sup> Multi-Touch All-Points Touchscreen Controller Document Number: 001-90901					
Revision	ECN	Orig. of Change	Submission Date	Description of Change	
**	4379892	SWU	05/14/2014	New datasheet.	
*A	4427766	SWU	07/02/2014	Changed maximum V <sub>DDA</sub> supply from 5.5 V to 4.7 V. Changed Deep Sleep power from 5.674 $\mu$ W to 6.3 $\mu$ W. Changed charger noise (ChargerArmor) immunity from 15Vpp to 35 Vpp. Fixed typo for supported Charger Armor voltage in Ordering Information table. Fixed MPN sense I/O typo in Ordering Information table.	
*В	4484730	SWU	08/27/2014	Added "Datasheet" to document title.	
*C	4670224	SWU	02/25/2015	Fixed typo: Removed footnote link from External display synchronization on the front page. Removed support for On-cell/hybrid in-cell touch-integrated display modules.	
*D	5316805	ELG	06/21/2016	Updated Features. Updated Ordering Information. Updated CY Logo and Sales Disclaimer.	



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