CYTMA445

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 battery charger and display
  - • Effective 28-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
  - • 10 fingers with thin glove (≤1-mm thick)
  - • 2 fingers with thick glove (≤5-mm thick)
- ❏ Fingernail tracking
- ❏ Large object rejection
- ❏ Automatic baseline tracking to environmental changes
- ❏ Low-power look-for-touch mode
- ❏ Field upgrades via bootloader
- ❏ Android™ 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
  - • 299 intersections (23 × 13)
- ❏ Reports up to 10 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
- ❏ Fast first-touch response (≤13 ms)
- ❏ Charger noise immunity
  - • Immunity up to 35 peak-to-peak voltage (V_{PP})
  - • Immunity to AT&T Zero charger

■ Power (configuration dependent)
- ❏ 1.71- to 5.5-V digital and I/O supply
- ❏ 2.65- to 5.5-V analog supply
- ❏ 6.75-mW average power
- ❏ 4.5-µW typical deep-sleep power

■ Sensor and system design (configuration dependent)
- ❏ Supports a variety of touchscreen sensors and stackups
  - • Manhattan, diamond, and Single Layer Independent Multi-touch (SLIM®) patterns
  - • Sensor-on-lens (SOL)
  - • On-cell touch integrated display modules
  - • Plastic (PET) and glass sensor substrates
  - • LCD and AMOLED displays
- ❏ Single-layer flexible printed circuit (FPC) routing enabled by flexible TX/RX configurations

■ Communication Interface
- ❏ I²C slave at all standard bit rates
  - • 100 kbps, 400 kbps, 1 Mbps, and 3.4 Mbps
- ❏ SPI slave bit rate up to 10 Mbps

■ Package options
- ❏ 44-pin 5 × 5 × 0.6-mm QFN (0.35-mm lead pitch)
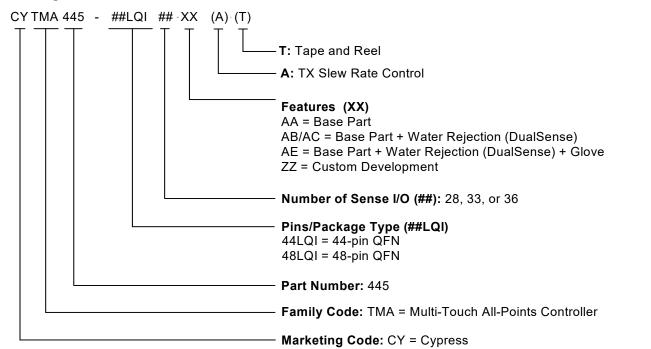- ❏ 48-pin 6 × 6 × 0.6-mm QFN (0.4-mm lead pitch)

Ordering Information

Table 1 lists the CYTMA445 TrueTouch touchscreen controllers. For information on other TrueTouch® families, visit http://www.cypress.com/truetouch.

Table 1. Device Ordering Information [1]

Device Part Number		Base Features					Glove	Package
Family	Part Number	Sense Pins	Typ Screen Size (inches)[2]	Max Fingers	TX Slew Rate Control	Improved ESD Performance		
Water Rejection (DualSense)	CYTMA445-48LQI36AE(T)	36	5.0	10	–	–	✔	48-Pin QFN
Custom Reserved for Kits	CYTMA445-44LQI33ZZ(T)	33	4.5	10	–	–	✔	44-Pin QFN
Base	CYTMA445-44LQI28AAA(T)	28	3.9	10	✔	✔	–	44-Pin QFN
	CYTMA445-44LQI33AAA(T)	33	4.5	10	✔	✔	–	44-Pin QFN
	CYTMA445-48LQI36AAA(T)	36	5.0	10	✔	✔	–	48-Pin QFN
Water Rejection (DualSense)	CYTMA445-44LQI33ABA(T)	33	4.5	10	✔	✔	–	44-Pin QFN
	CYTMA445-48LQI36ABA(T)	36	5.0	10	✔	✔	–	48-Pin QFN
	CYTMA445-44LQI33ACA(T)	33	4.5	10	✔	✔	–	44-Pin QFN
	CYTMA445-48LQI36ACA(T)	36	5.0	10	✔	✔	–	48-Pin QFN
	CYTMA445-44LQI33AEA(T)	33	4.5	10	✔	✔	✔	44-Pin QFN
	CYTMA445-48LQI36AEA(T)	36	5.0	10	✔	✔	✔	48-Pin QFN
Custom Reserved for Kits	CYTMA445-44LQI33ZZA(T)	33	4.5	10	✔	✔	✔	44-Pin QFN
	CYTMA445-48LQI36ZZA(T)	36	5.0	10	✔	✔	✔	48-Pin QFN

Ordering Code Definitions

CY TMA 445 - ##LQI ## · XX (A) · (T)

T: Tape and Reel

A: TX Slew Rate Control

Features (XX)
AA = Base Part
AB/AC = Base Part + Water Rejection (DualSense)
AE = Base Part + Water Rejection (DualSense) + Glove
ZZ = Custom Development

Number of Sense I/O (##): 28, 33, or 36

Pins/Package Type (##LQI)
44LQI = 44-pin QFN
48LQI = 48-pin QFN

Part Number: 445

Family Code: TMA = Multi-Touch All-Points Controller

Marketing Code: CY = Cypress

Notes
1. All devices have the following base features: 10-V TX, ChargerArmor, CapSense buttons, Large Object Detection and Rejection, and Grip Suppression.
2. 4.7-mm pitch for screen sizes up to 4.9-inch diagonal, 4.8-mm pitch for 5.0-inch diagonal screen size, 16:9 aspect ratio. Larger screen sizes can be supported with a larger pitch.

Document History Page

Document Title: CYTMA445, TrueTouch® Multi-Touch All-Points Touchscreen Controller Datasheet Document Number: 001-90907				
Revision	**ECN**	**Orig. of Change**	**Submission Date**	**Description of Change**
**	4267426	SWU	02/19/2014	New data sheet.
*A	4379995	SWU	05/14/2014	Updated Features: Replaced "Refresh rate up to 250 Hz" with "Refresh rate up to 300 Hz". Updated Ordering Information: Updated part numbers. Updated Ordering Code Definitions (Removed 24 under "Number of Sense I/O").
*B	4392605	SWU	05/28/2014	Updated Features: Removed "Face detection with grip suppression" under "Multi-touch capacitive touchscreen controller". Replaced "6.1-mW average power" with "6.75-mW average power" under "Power (configuration dependent)". Updated Ordering Information: Updated part numbers.
*C	4466944	SWU	08/08/2014	Updated Document Title to read as "CYTMA445, TrueTouch® Multi-Touch All-Points Touchscreen Controller Datasheet". Completing Sunset Review.
*D	5139587	ELG	02/18/2016	Updated Ordering Information: Updated part numbers. Updated copyright information. Completing Sunset Review.
*E	6434214	ELG	01/08/2019	Updated to new template. Completing Sunset Review.

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