CYPRESS PRODUCT SELECTOR GUIDE
TRUETOUCH® TOUCHSCREEN SOLUTIONS

JULY 2013

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• PSOC® PROGRAMMABLE SYSTEM-ON-CHIP • TRUETOUCH® TOUCHSCREEN SOLUTIONS
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TRUETOUCH® TOUCHSCREEN SOLUTIONS

INTRODUCTION

With more than four billion buttons replaced, over one billion touch solutions shipped, and over 300 patents granted or pending, Cypress is a worldwide leader in capacitive touch technology. Touchscreens are the predominant user interface for smartphones, tablets, e-readers, and other portable devices. Cypress offers the expertise you need at every stage of building a projected capacitive touchscreen, from concept to mass production. We also provide the silicon, software, tools, design, and system-level experience required to get to market quickly.

A COMPLETE RANGE OF SOLUTIONS

Whether you need simple single-touch functionality or want true multitouch with gestures, TrueTouch supports a wide range of applications. This family of single-chip solutions works with screen sizes from 1.5 to 10.1 inches with the best charger noise immunity in the industry; highest in-application signal-to-noise ratio (SNR); fast refresh rates; and low active power consumption. We are the world leader in small touchscreen packages, with chips available at 3 x 3 mm. Cypress offers single layer sensors with multitouch and two-touch capabilities for thin, cost-effective devices. TrueTouch also supports multiple materials and stackup options for flexibility in design, including PET, glass, and metal mesh. Supported stackup types include sensor-on-lens, direct lamination, and display integrated solutions like in-cell and on-cell.

RISE ABOVE THE NOISE - SILENCE THE COMPETITION

Today's touchscreen devices face tough environments. With form factors becoming thinner, chargers and displays becoming noisier, and consumers using their devices in harsher conditions, providing high touch performance demands a tougher touchscreen controller.

Cypress is the worldwide leader in touchscreen performance in the presence of noise. Gen5, the newest touchscreen controller solution from TrueTouch, leverages the industry's broadest IP portfolio to deliver a user experience unmatched by anything on the market today:

- 40 Vpp charger noise immunity from 1 - 500 kHz
- Highest SNR in the presence of noise with 10V and multi-phase Tx
- World's best waterproofing with patented self plus mutual capacitive sensing
- Supports in-cell and on-cell stackups
- Register configurable for easy tuning
- Intuitive PIP (Packet Interface Protocol) interface
- 32-bit ARM® Cortex™ processor

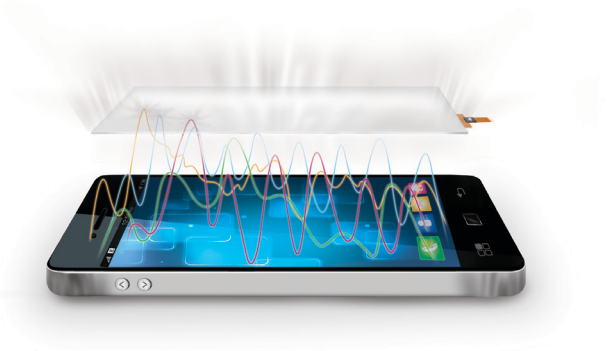
TrueTouch ONE-OF-A-KIND NOISE SOLUTIONS

Charger Armor™

Charger Armor™ pulls the plug on charger noise. Noise enters the touchscreen system through a power supply, such as a mobile handset's battery charger, during the presence of touch. The mobile device industry has established EN standards for maximum charger noise. TrueTouch easily exceeds these standards. However, for chargers that can emit noise at 20 times the spec and beyond, we have Charger Armor. It's an adaptive technology that listens for charger noise and activates when it surpasses a preset threshold to effectively deal with both periodic and broadband noise. The result is truly revolutionary charger noise immunity to the market.

Display Noise Cancellation

LCD displays are inherently noisy. This makes it difficult for touchscreen sensors to accurately read and interpret touch input. TrueTouch controllers can deliver external display synchronization, eliminating the need for air gaps or shield layers to protect against noise. This makes TrueTouch the ideal solution for all types of stackups, including in-cell, on-cell, and direct lamination.



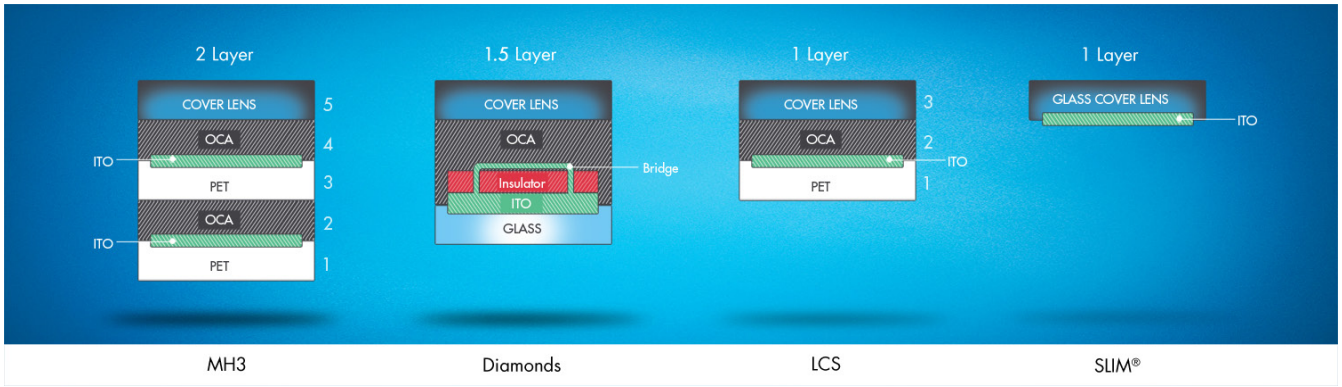
SOLUTIONS FOR EVERY DEVICE

TrueTouch features support many different designs. From support for a wide range of screen sizes to true single-layer touchscreen sensors and advanced features like waterproofing, hover, and 1 mm passive stylus, Cypress has the right technology for your needs.

In addition to offering touchscreen solutions that provide industry-leading performance and features, Cypress is here to help designers bring multitouch to the masses with an unmatched portfolio of low-cost solutions. Whether your design calls for the high-performance Gen4 family, a low-cost Gen2 device, or something in between, Cypress has the right solution for your needs. TrueTouch also delivers the premier single-layer sensor solution with our SLIM® sensor, which enables unbelievably thin multifinger designs with TrueTouch.

SLIM® - For The Thinnest Devices Yet

Our SLIM (Single-Layer Independent Multitouch) sensor takes Cypress's ground-breaking touchscreen innovation to a new level. The world's first true single-layer multitouch sensor is a unique solution that delivers full multitouch functionality at half the thickness and cost, allowing designers to create innovative new products. SLIM does something truly revolutionary – it enables the lowest manufacturing cost, thinnest bezel, and thinnest stackup of any multitouch all-points touchscreen sensor module. Even with only one sensor layer, SLIM delivers excellent accuracy and signal-to-noise ratio, and best-in-class active power.



Screen Size Support

We have expanded our position as a leader in the small-screen market as the first company to deliver a single-chip controller exclusively for large screens. TrueTouch controllers can support everything from the tiny 1.5" screen on an MP3 player all the way up to a 10.1" notebook display, with the same high performance you've come to expect from Cypress.

Advanced Features

TrueTouch supports the most advanced touchscreen functionality. A state-of-the-art touchscreen system with a flawless user interface experience involves much more than just being able to reliably detect a finger touch. Thanks to our unique use of self and mutual capacitance sensing on the same chip, TrueTouch provides an unmatched feature set, that includes true waterproofing, hover, 1 mm passive stylus support, proximity detection, and glove functionality.

TrueTouch controllers enable real waterproofing, with end-customer products that meet stringent IP-67 standards in production today. Water on a touchscreen typically causes false touches and poor accuracy. Cypress delivers both water rejection and wet finger tracking to ensure normal operation in the presence of rain, mist, or sweat.

DualSense's self plus mutual capacitance sensing also enables the touchscreen controller to sense very small touches. Hover allows TrueTouch to accurately track a user's finger while hovering up to 10 mm above the surface. This unique technology allows UI designers to enable useful features like mouse-over capability, and screen magnification, and create exciting new possibilities for gaming and 3D displays.

Mobile device owners are no longer forced to use a bulky, inconvenient capacitive stylus; TrueTouch supports a 1 mm passive stylus for accurate handwriting and character capture and precise navigation. TrueTouch also delivers simultaneous palm and finger rejection capability, so you can use the stylus naturally without discomfort or false touches. And it uses Cypress's industry-leading, proprietary 10 V Tx and multi-phase Tx technology to accurately sense signal input from a small passive stylus.

Capacitive proximity sensing from TrueTouch eliminates the need for separate, expensive infrared proximity sensors, delivering better performance while drastically lowering system cost. Built-in capacitive proximity sensing allows the touchscreen to detect your face as you bring the phone to your ear, from up to 25 mm away. Once the touchscreen controller senses your cheek. it disables touch detection to prevent accidental touches. It also turns off the display to save power while you're on the call, saving battery life.

TrueTouch can deliver real performance with gloves – even thick leather or ski gloves. Cypress's patented DualSense self plus mutual capacitance sensing technology, combined with the industry's highest signal-to-noise ratio (SNR), combine to deliver the robust signal acquisition needed for true glove support. With 1 mm accuracy and linearity, you can still rely on accurate touch input even in a bulky glove. TrueTouch supports full 10-finger touch functionality with thinner nylon or cotton gloves, and enables two-finger touch with gestures for thick gloves.

KEY APPLICATIONS

Mobile phones, tablet and notebook PCs, GPS navigation devices, digital still and video cameras, portable media players, e-readers, automotive infotainment displays, printers, white goods

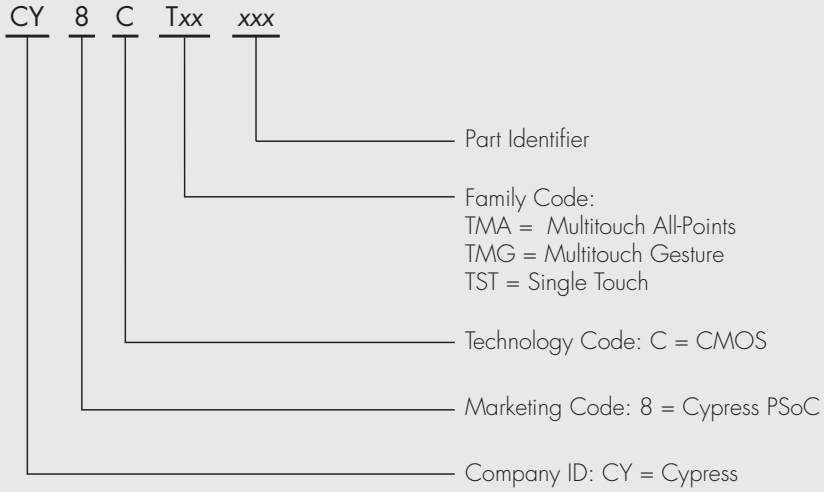
FIND YOUR SOLUTION

Cypress has the world's broadest portfolio of touchscreen solutions to meet your needs. TrueTouch provides a platform of single-chip solutions to support everything from mobile handsets to tablets. Cypress can also accelerate your time to market with an easy design platform that includes assisted tuning support, a platform of single-chip solutions, and multiple stackup options for the most flexible and cost-effective designs. TrueTouch can support your designs with proven performance.

Part Number	Max. Sensor Inputs	Max. Screen Size (inches)	Max. Fingers Supported	True Single Layer Sensor	Waterproofing	Communication Interface	Packages
CY8CTMA140	32	4.5	4	SLIM	N	I²C, SPI	QFN
CY8CTST241	32	3.6	1	LCS*	N	I²C, SPI	QFN, CSP
CY8CTST242	32	3.6	2	LCS*	N	I²C, SPI	OFN, CSP
CY8CTMG240	32	4.3	2	N	N	I²C, SPI	QFN, CSP
CY8CTMA340	32	4.5	4	SLIM	Y	I²C, SPI	QFN, CSP
CY8CTMA445	36	5.0	10	SLIM	Y	I²C, SPI	QFN
CY8CTMA46X	45	6.1	10	SLIM	Y	I²C, SPI	QFN, CSP, BGA
CY8CTMA545	36	6.0	10	SLIM	Y	I²C, SPI	QFN
CY8CTMA768	56	9	10	N	Y	I²C	BGA
CY8CTMA1036	65	10.1	10	N	Y	I²C	BGA

**LCS = Low-cost sensor*

TRUETOUCH PART NUMBER DECODER



For more information on TrueTouch, visit touch.cypress.com.

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ABOUT CYPRESS

Cypress delivers high-performance, mixed-signal, programmable solutions that provide customers with rapid time-to-market and exceptional system value. Cypress offerings include the flagship PSoC® 1, PSoC 3, and PSoC 5 programmable system-on-chip families and derivatives, CapSense® touch sensing and TrueTouch® solutions for touchscreens. Cypress is the world leader in USB controllers, including the high-performance West Bridge® solution that enhances connectivity and performance in multimedia handsets, PCs and tablets. Cypress is also the world leader in SRAM memories. Cypress serves numerous markets including consumer, mobile handsets, computation, data communications, automotive, industrial and military. Cypress trades on the NASDAQ Global Select Market under the ticker symbol CY. Visit Cypress online at www.cypress.com.

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