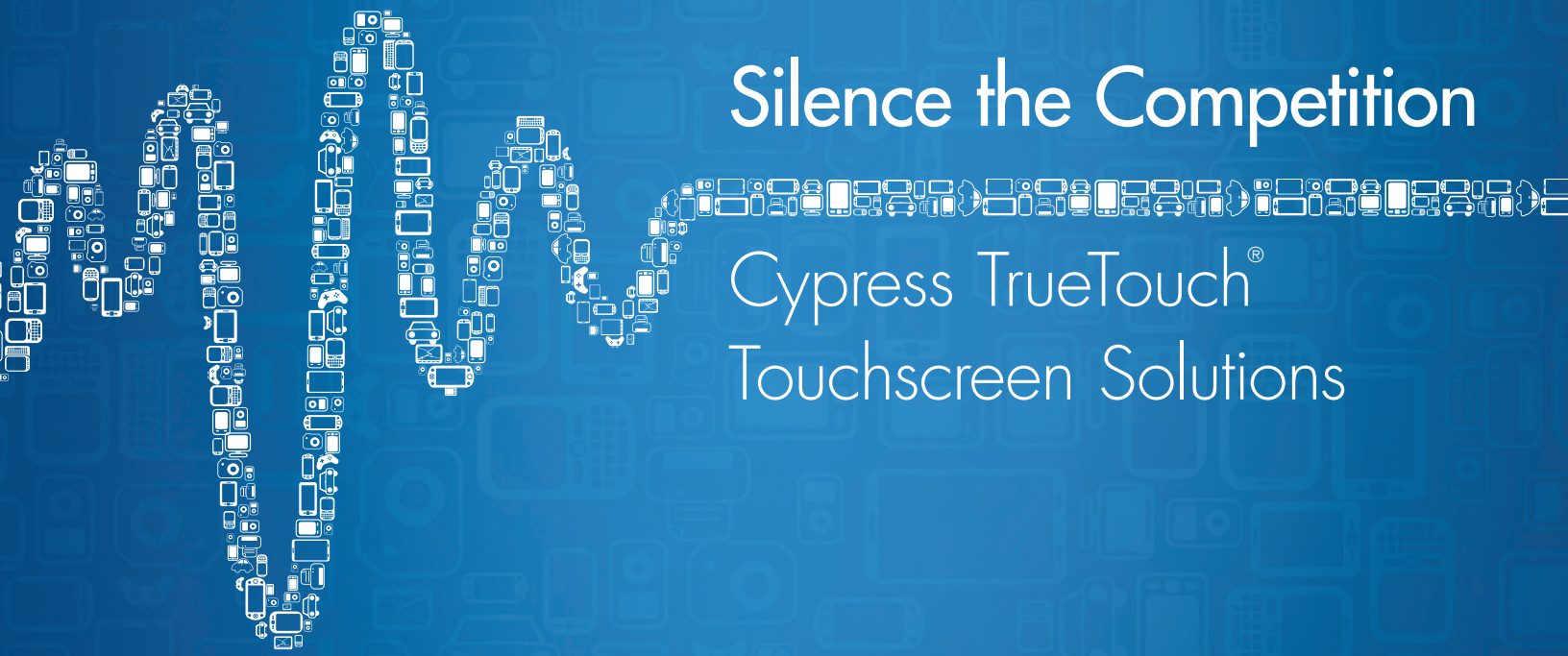
Welcome to E-XFL.COM

What is "Embedded - Microcontrollers"?

"Embedded - Microcontrollers" refer to small, integrated circuits designed to perform specific tasks within larger systems. These microcontrollers are essentially compact computers on a single chip, containing a processor core, memory, and programmable input/output peripherals. They are called "embedded" because they are embedded within electronic devices to control various functions, rather than serving as standalone computers. Microcontrollers are crucial in modern electronics, providing the intelligence and control needed for a wide range of applications.

Applications of "Embedded - Microcontrollers"

Details	
Product Status	Obsolete
Core Processor	-
Core Size	-
Speed	-
Connectivity	-
Peripherals	-
Number of I/O	-
Program Memory Size	-
Program Memory Type	-
EEPROM Size	-
RAM Size	-
Voltage - Supply (Vcc/Vdd)	-
Data Converters	-
Oscillator Type	-
Operating Temperature	-
Mounting Type	-
Package / Case	-
Supplier Device Package	-
Purchase URL	https://www.e-xfl.com/product-detail/infineon-technologies/tma545-48lqi36zzat



Silence the Competition

Cypress TrueTouch® Touchscreen Solutions

CYPRESS®
PERFORM

WE TOOK NOISE OUT OF THE EQUATION.

SO YOUR DESIGNS CAN BE HEARD CLEARLY IN THE MARKET.

REVOLUTIONARY TRUETOUCH TOUCHSCREEN CONTROLLERS DELIVER GAME-CHANGING NOISE IMMUNITY, PERFORMANCE, AND INNOVATION

The world is a noisy place. Battery chargers, radio transmitters, LCDs, and other sources can generate enough noise to wreak havoc with capacitive touchscreen designs.

The touchscreen world is demanding larger, thinner, more sophisticated designs, making noise a bigger challenge moving forward.

Fortunately, Cypress TrueTouch® touchscreen solutions get noise out of your way so nothing interferes with your imagination. With the industry's highest signal-to-noise ratio (SNR), best waterproofing, excellent touch performance, quickest time-to-market, and largest portfolio of proprietary noise-immunity solutions, TrueTouch-powered devices enable a new era of touch interaction and creativity.

With Cypress, you can develop thinner products with more innovative interfaces that work under more challenging conditions than ever before. With over one billion touch solutions shipped, this proven, market-leading technology is changing the whole electronics industry.

The Huawei X1 tablet expands the user experience with a 7.0" HD display, hover, and real glove functionality.

The elegant and curved Samsung Gear S integrates your wristwatch and Android smartphone, providing enhanced functionality as an all-in-one communicator watch, notifier, app interface, and personal fitness monitor.

OVER ONE BILLION TOUCH SOLUTIONS SHIPPED.

TrueTouch powers some of the world's most innovative products, enabling design engineers to bring devices to market faster, thanks to revolutionary noise immunity and performance. What will you do with TrueTouch?

The TrueTouch-powered Nubia X6 from ZTE is a high-performance, multi-function touch screen smartphone with dual 13-MP cameras and a 6.44" HD display.

HIGH-PERFOMANCE SOLUTION FOR PREMIUM SMARTPHONES

SURPASSING EXPECTATIONS WITH SUPERIOR FEATURES

In addition to innovative, proprietary noise immunity technologies (see next page), the TMA5XX chip family includes these features:

- **All-New Analog Front End** combines narrow-band response with high-frequency sampling and advanced hardware DSP filtering to deliver revolutionary charger and display noise immunity
- **Eliminates Charger Noise** up to 40 Vpp at 1-500 kHz
- **The Best Gets Better:** With multi-phase TX and single-pass correlated scanning, the industry's highest SNR gets even higher
- **Best Waterproofing in the World** due to improved self-capacitance sensing and patented self- plus mutual-capacitance architecture
- **Display Integrated Design Support** for both in-cell and on-cell stackups for thin, sleek form factors
- **2-mm Passive Stylus Support** plus palm rejection for the ultimate input versatility with TMA568
- **Large Screen Support** for superphones (5.3" at a 3.2-mm pitch) and tablets (8.3" at a 5-mm pitch) with TMA568

NOISE IS HISTORY. NEXT COMES YOUR COMPETITION.

FIND OUT HOW TRUETOUCH SILENCES NOISE TO TAKE SIGNAL-TO-NOISE RATIOS HIGHER THAN EVER.

Touchscreen designers and engineers have to overcome three main types of noise: common mode, display, and environmental. Left unchecked, noise can cause panels to register false touches, reduce input accuracy, and even cause touchscreens to stop functioning completely.

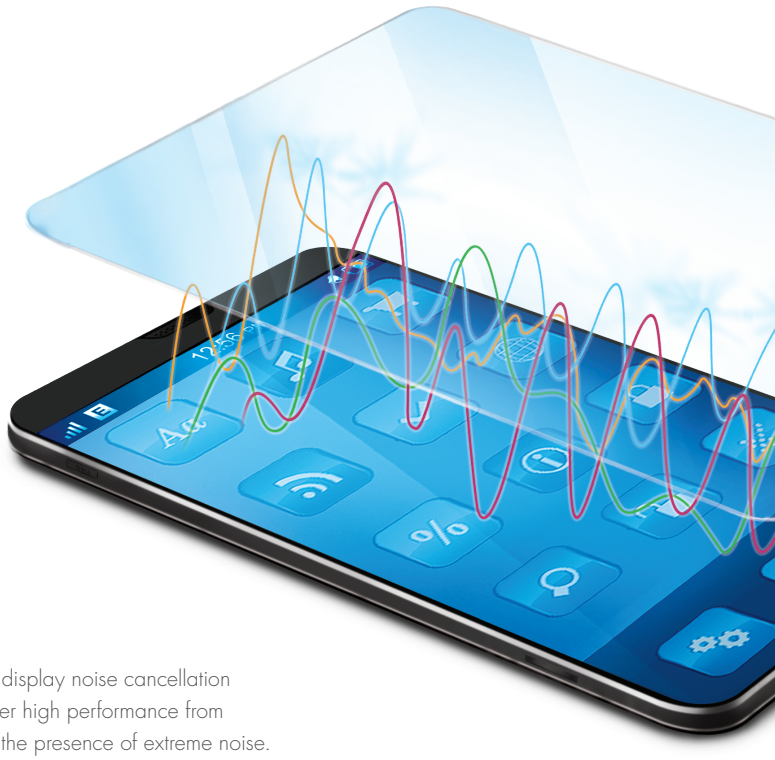
Cypress's TrueTouch solutions leverage innovative technologies to address these noise challenges.

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, in the presence of touch. The mobile device industry has established EN standards for maximum charger noise and TrueTouch easily exceeds them. However, because many chargers can emit noise up to 40 V peak-to-peak, we have Charger Armor. It is an adaptive technology that listens for charger noise and activates proprietary noise-elimination technologies to effectively deal with both periodic and broadband noise. The result is revolutionary charger noise immunity to the market.

DISPLAY NOISE CANCELLATION TECHNOLOGY NEUTRALIZES DISPLAY NOISE.

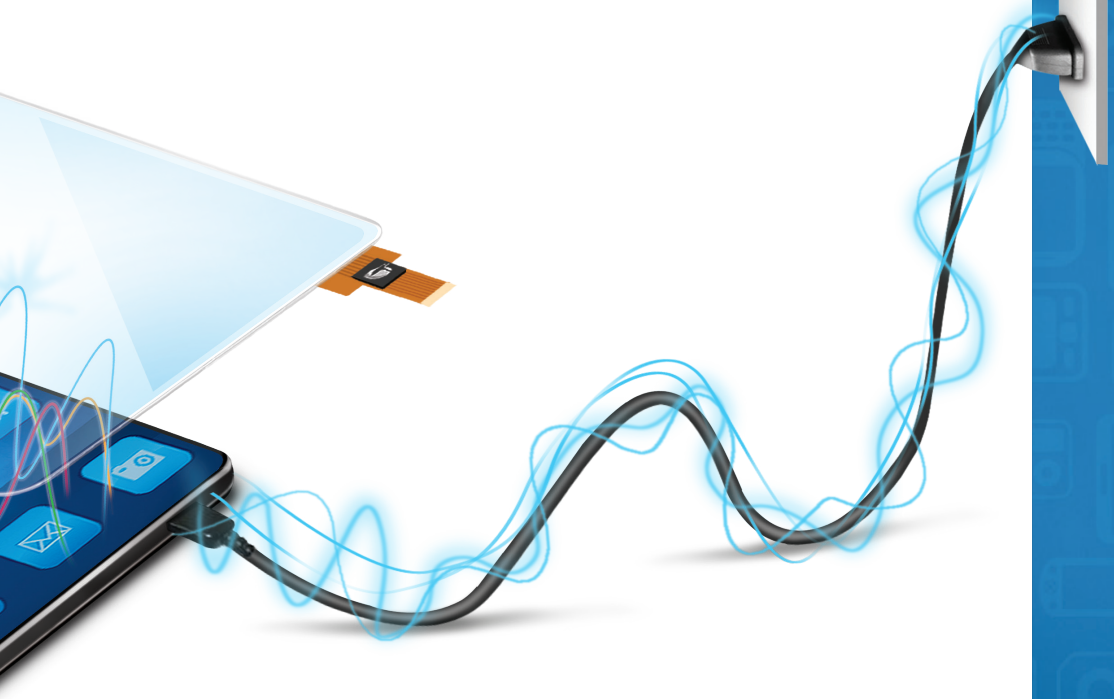
LCD displays are inherently noisy. This makes it difficult for touchscreen sensors to accurately read and interpret touch input. TrueTouch controllers have external display synchronization, eliminating the need for air gaps or shield layers to protect against noise. This makes TrueTouch the ideal solution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



Charger Armor™ and display noise cancellation technologies help deliver high performance from touchscreen devices in the presence of extreme noise.

SIGNAL-TO-NOISE RATIOS HAVE NEVER BEEN HIGHER.

Cypress is the only company to deliver on-chip 10-V Tx and our proprietary Tx-Boost™ multi-phase Tx drives SNR to unmatched heights. The flagship TMA5XX product family builds on this with two unique tools. First, a new touchscreen subsystem architecture combines narrow-band response with high-frequency sampling and advanced hardware DSP filtering. Next, an increased ADC channel count allows TMA5XX to scan all Rx lines simultaneously for robust correlated noise immunity. With this array of tools, Cypress delivers unparalleled performance in the presence of noise.



SLIMMING DOWN YOUR BUDGET AND YOUR DESIGNS.

TrueTouch® SLIM® Stackup

As touchscreen-enabled devices become ubiquitous, it is important to make touchscreens more affordable to manufacture and to purchase. Cypress is here to help designers with an unmatched portfolio of single-layer touchscreen solutions to bring multitouch to the masses. From our Single-Layer Independent Multitouch (SLIM) sensor for unbelievably thin designs, with full multitouch functionality, to our patented Backgammon single-layer sensor (US Patent No. 8,121,283) for lower-cost touchscreen systems, there is a Cypress solution for every application.

Eliminating the second sensor layer can save manufacturers 40 percent on sensor costs. It also allows the creation of a new wave of exceptionally thin devices.

THE MOST INNOVATIVE TOUCHSCREEN DESIGNS

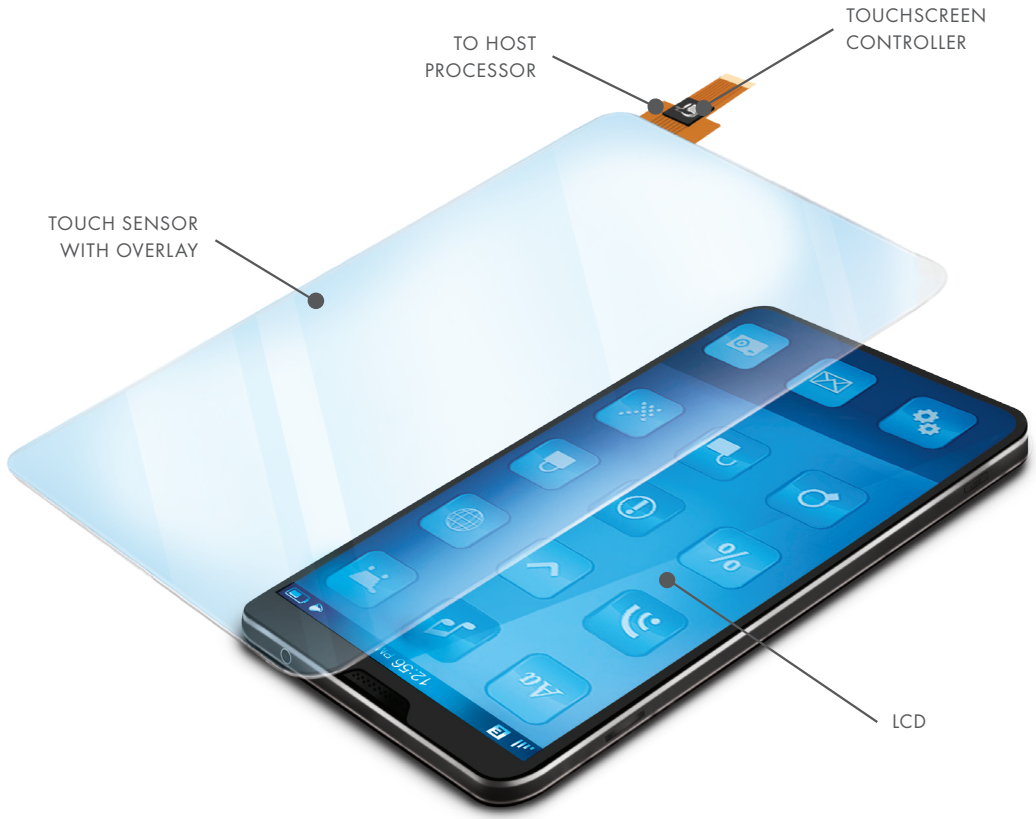
START WITH THE MOST INNOVATIVE TOUCHSCREEN SOLUTIONS.

MORE WAYS TO UNLEASH YOUR DESIGN CREATIVITY.

Charger Armor, the industry's highest SNR, and display-integrated design support give designers and engineers greater freedom to experiment. But there is even more in TrueTouch to inspire your innovation.

SWITCH BETWEEN SELF- AND MUTUAL-CAPACITANCE MEASUREMENTS—DYNAMICALLY.

This unique capability gives TrueTouch the best of both technologies: robust signal acquisition and the ability to sense the position of simultaneous touches with the sophisticated accuracy required by high-performance touchscreens. By combining differential signal analysis with advanced algorithms, Cypress's patented DualSense™ self- plus mutual-capacitance sensing (US Patent Nos. 8,358,142; 8,319,505; and 8,067,948) enables best-in-class waterproofing, hover and glove capability, and 2-mm passive stylus support.



ELEVATE YOUR USER INTERFACE WITH HOVER.

Now you can develop touchscreen interfaces that do not require touch. TrueTouch accurately tracks a user's finger up to 10 mm above the surface and senses it up to an inch above the surface. This unique feature allows UI designers to enable mouseover and preview capabilities, creating exciting new possibilities for handheld displays.

TOUCHSCREEN OPERATION WITH GLOVES IS A REALITY WITH CYPRESS.

TrueTouch delivers full 10-finger functionality for thin gloves and two-finger touch with gestures for thick gloves. Users can rely on 1-mm accuracy and linearity for accurate input even in heavy gloves. TrueTouch's automatic mode-switching capability transitions seamlessly between glove and finger input modes for a smooth user experience.

2-MM STYLUS SUPPORT.

TrueTouch supports passive stylus capability with a 2-mm tip, allowing users to easily write, draw, and navigate with their mobile device. You can capture characters as small as 7 mm^2, with 1-mm accuracy and linearity and a 120-Hz refresh rate. TrueTouch also delivers built-in palm rejection, preventing unintentional input when a user's hand rests on the screen.

WATERPROOFING MAKES TOUCHSCREENS MORE FOOLPROOF.

Moisture on the surface of a touchscreen device can confuse an ordinary capacitive touchscreen controller, causing it to inaccurately track input or even become totally unresponsive. But because TrueTouch uses DualSense's combined self- and mutual-capacitance sensing to overcome these performance challenges, engineers can design truly waterproof products that meet IP-67 standards.

Unmatched Touch Leadership

Cypress continues to develop ground-breaking touchscreen technology. Our continued leadership in the evolving touchscreen space means that we respond to new challenges and market trends with cutting-edge solutions.

Cypress has the world's broadest and most widely adopted portfolio of touchscreen solutions. We have been granted dozens of touchscreen patents, with hundreds more pending. Cypress engineers are constantly creating new technological advancements, and we continue to lead the market through innovation.

WE RAISED THE BAR FOR TOUCHSCREEN PERFORMANCE.

NOW YOU CAN RAISE THE BAR FOR APPLICATION INNOVATION.

TRUETOUCH UNLOCKS YOUR DESIGN'S POTENTIAL.

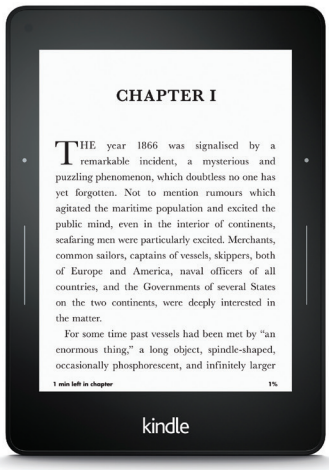
TrueTouch touchscreens are changing the way we interact with a wide range of products. They simplify and streamline application interfaces and provide a cleaner, more sophisticated look, giving your products a significant competitive advantage in the marketplace.

Cypress's capacitive touch technologies provide a sleek user interface for many of the world's leading products.

KEY APPLICATIONS

Cypress touch technology enhances the features and functionality in these key applications:

- Mobile Phones
- Tablets & Notebooks
- Digital Cameras
- Portable Media Players
- GPS Navigation Devices
- E-readers
- Wearables
- Printers
- Automotive Infotainment Displays
- White Goods



> The Cypress TrueTouch solution provided the design flexibility and multi-finger tracking performance we required to make the Vega R3 touchscreen a differentiating feature of the phone.
>
> — **Yeonsu Lee,**
> *Senior MTS, R&D Center, Pantech*

> We selected Cypress for its technical leadership in providing advanced features such as gloved finger tracking.
>
> — **Ni Fei,**
> *CEO of Nubia brand at ZTE*

> Cypress's single-layer SLIM sensor delivers excellent multi-touch touchscreen for the high-volume smartphone market in China.
>
> — **Liu Junming,**
> *General Manager, Vanzo*

A COMPLETE RANGE OF SOLUTIONS.

SO YOU CAN COMPLETELY DOMINATE YOUR MARKET.

HIGH PERFORMANCE SOLUTION FOR PREMIUM SMARTPHONES

TRUETOUCH: EVOLVING TO MEET YOUR NEEDS AS QUICKLY AS THEY CHANGE.

Whether you need simple single-touch gestures to navigate your applications, or want sophisticated multitouch gesture and all-points interfaces, TrueTouch supports a wide range of applications. This family of single-chip solutions works with screen sizes from 1.5 to 10.1 inches and delivers the industry's highest SNR, best waterproofing, lowest power consumption, and fast refresh rates. TrueTouch also supports single-layer sensors and multiple stackup options for the most flexible and cost-reduced designs, including PET, glass, sensor-on-lens, direct lamination, on-cell, and in-cell.

TMA5XX FAMILY—THE NEXT LEVEL OF PERFORMANCE SILENCES THE COMPETITION.

The TrueTouch TMA5XX series has an all-new analog front end that combines narrow-band response with high-frequency sampling and advanced hardware DSP filtering to deliver improved charger and display noise immunity. TMA568, TMA545, and TMA525 provide premium advanced features such as hover, stylus, and glove. The TMA5XX family can reject charger noise of up to 40 Vpp from 1 to 500 kHz (22-mm finger) to silence external noise. TMA525 and TMA525A are new additions to the TMA5XX fmaily and are an excellent option for small, high-performance, power-conscious wearable devices. TMA568 expands the platform with 58 sense I/Os to support larger screen sizes. This allows it to deliver an ultra-tight pitch for 5-6" super phones, enabling 2-mm passive stylus support with built-in palm rejection. TMA568 can also be extended to support tablets and e-readers up to 8.3". Add in the industry's best waterproofing, glove, hover, and support for in-cell and on-cell stackups and you have an unbeatable solution for touchscreen system designs.

TMA448 AND CYTT21X/31X—HIGH-END MULTITOUCH PERFORMANCE.

TMA448 and the new CYTT21X/31X controllers leverage up to 10-V TX and proprietary Tx-Boost multi-phase Tx for high SNR in the presence of noisy chargers and displays. TMA448 and CYTT21X/31X controllers also support advanced features such as glove functionality, 2.5-mm passive stylus, and built-in capacitive face detection. TMA448 and CYTT21X/31X controllers provide improved charger noise immunity and customizable advanced features at a compelling price point. This chip family also delivers very low power consumption and is compatible with Cypress's SLIM sensor for thin stackups and reduced materials cost. CYTT21X/31X support screen sizes up to 7.0" and TMA448 further extends screen sizes up to 8.3".

TST2X/TMG240—SINGLE AND TWO-TOUCH FUNCTIONALITY THAT REPLACES RESISTIVE TOUCHSCREENS.

TrueTouch TST24X/TMG240 solutions deliver the enhanced functionality of two-finger gestures such as pinch and zoom, providing high-end performance at lower costs. TST24X supports diamond patterns (TST241) and also supports Cypress's Backgammon pattern (TST242). This patented design (US Patent No. 8,121,283) cuts costs and stackup height in half by eliminating the need for a second ITO layer while providing capacitive two-finger and single touch. TMG240 provides the added flexibility of on-chip gesture decode.

CYPRESS TrueTouch SOLUTIONS

SOLUTION	Max Sensor Inputs	Max Screen Size (in)	Max Fingers Supported	True Single Layer Sensor	Waterproof	Packages
TMA525	25	3.0	4	SLIM	Y	48 BGA, 49 CSP
TMA525A	24	3.0	4	SLIM	Y	28 QFN AND 34 CSP
TST241/242	32	3.6	2 (TST242)	BACKGAMMON	N	32, 48 QFN
TMG240	32	4.3	2	N	N	32, 48 QFN
TMA545	36	5.0	10	SLIM	Y	44, 48 QFN
TMA448	58	8.3	10	SLIM	Y	56 QFN, 70 BGA
CYTT21X/31X	48	7	10	SLIM	Y	56 QFN, 44 QFN AND 48 QFN
TMA568	58	8.3	10	SLIM	Y	56 QFN, 70 BGA

DESIGN ASSISTANCE GETS YOU TO MARKET FASTER.

Cypress provides an easy design platform to accelerate your time to market. We also have in-house sensor and touch experts to help in the design and tuning of your system, making implementation a snap.

OTHER TrueTouch FEATURES THAT ACCELERATE TIME-TO-MARKET INCLUDE:

- Configurable tools for simpler, faster design implementations
- An entire platform of single-chip solutions that support a wide variety of screen sizes, from mobile phones to tablets
- Controllers that are operating system and manufacturing ready
- Multiple stackup and topology options – traditional on-stack, sensor on lens, and display integration – for the most flexible designs with the lowest cost

CONTACT US

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