

# FINGER

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PCAP PRODUCTS CATALOG  
First issue

# Projected Capacitive

The EXC7xxx is a family of MCU based integrated system controller chip for capacitive touchscreen.

EXC7200 works with EX5404, and external amplifiers for projected capacitive touchscreen application. Such EXC7200 & EX5404 self capacitance measurement based combination provides with up to 4 finger touchscreen. EXC7900 works with EX5920 / EX5960 sensing chip and EX5418 / EX5420 driving chip provide with a mutual capacitance based measurement solution. It can support 10 fingers of touch for the touchscreen size under 15.6". EXC7920 has built in more memory size and accelerator to support large format projected capacitive touchscreen. This EXC7920 + EX5960 + EX5418 solution is designed to support up to 32" touchscreen.

## Controller Chip

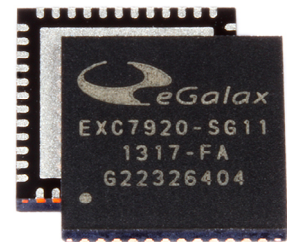
**EXC7200-SG41**



**EXC7900-SG11**



**EXC7920-SG11**



## Features

<b>Operating Power</b>	2.7VDC to 3.3VDC Consumption 50mA maximum
<b>Operating Temperature</b>	-40 to 85°C
<b>Storage Temperature</b>	-40 to 125°C
<b>ESD</b>	2000V (HBM)
<b>Package</b>	( EXC7200-SG41) TQFP48 7mm x 7mm x 1.20mm ( EXC7900-SG11) QFN48 6mm x 6mm x 0.85mm ( EXC7920-SG11) QFN48 7mm x 7mm x 0.85mm RoHS compliant
<b>Peripherals</b>	<b>Analog</b> * Analog signal processing unit * Analog Multiplexer * 12 bits 200KPS SAR ADC
	<b>Digital</b> * UART * I2C * USB 1.1 full speed * GPIO * Enhanced computation for image process ( EXC7900 and EXC7920 ) * I2C win8 protocol stack ( EXC7900 and EXC7920 )
	<b>Memory</b> EXC7200 and EXC7900 *16KB SRAM + 1KB ( USB FIFO ) * 32KB Flash Program Memory EXC7920 *40KB SRAM + 1KB ( USB FIFO ) *128KB Flash Program Memory
<b>Application</b>	Touchscreen Controller



## Controller Chip

### EXC9720-EG32



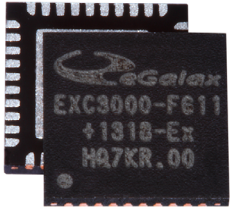
EXC9720 is a MCU based projected capacitive touch screen controller. EXC9720 controller can provide high driving voltage for better wideband interference susceptibility. It also provides different working frequency to avoid narrow band interference to optimize the touch performance. In addition to conventional PWM square wave driving signal, EXC9720 also can provide with sine wave driving signal to minimize harmonic EMI from sensor. With excellent interference susceptibility and algorithm, EXC9720 can support different stack structure of touch sensor like OGS, SITO, DITO, G/F, G/F/F, and G/G structure. EXC9720 also makes it possible to support both air bonding and optical bonding lamination process of LCD with touch sensor without back shielding ITO layer to provide with a cost effective touch solution.

### Features

<b>CPU</b>	<ul style="list-style-type: none"><li>• 8051 MCU core, 1T instruction set</li><li>• Support up to 96MHz</li></ul>
<b>Clocks</b>	<ul style="list-style-type: none"><li>• External 12 MHz crystal</li><li>• Internal PLL</li><li>• Internal 32 bits RTC</li><li>• Clock generator for digital modules</li><li>• Clock generator for analog modules</li></ul>
<b>Power Management</b>	<ul style="list-style-type: none"><li>• Power supply : 2.7V to 3.3VDC</li><li>• Internal regulator for digital core.</li><li>• Idle mode</li><li>• Sleep mode</li><li>• Power consumption - TBD</li></ul>
<b>Memory</b>	<ul style="list-style-type: none"><li>• 64KB embedded flash</li><li>• 32KB SRAM + 1KB USB FIFO</li></ul>
<b>Analog Modules</b>	<ul style="list-style-type: none"><li>• ADC</li><li>• Up to 70 RX channels</li><li>• Up to 44 TX channels</li><li>• Signal generator</li><li>• 1.8V analog core for signal processing.</li></ul>
<b>Communication Interface</b>	<ul style="list-style-type: none"><li>• USB 2.0 compliant full speed with LPM L1 supported.</li><li>• UART @ 57600 baud rate, none parity, 8 data bits and 1 stop bit</li><li>• I<sup>2</sup>C@400Kbps</li></ul>
<b>Digital Modules</b>	<ul style="list-style-type: none"><li>• Timers, watch dog Timer</li><li>• PWM generator</li><li>• Reference clock generator for external sensing device.</li><li>• Hardware algorithm accelerator</li><li>• Hardware scan engine</li><li>• Hardware digital filter</li><li>• SYNC. Module for noise rejection.</li></ul>
<b>Temperature Range</b>	<ul style="list-style-type: none"><li>• -40 to 85°C operation</li><li>• -40 to 90°C storage</li></ul>
<b>Package</b>	<ul style="list-style-type: none"><li>• VFBGA 6mm x 11mm x 1.0mm</li><li>• Ball Pitch : 0.5mm</li><li>• Ball Count : 195</li></ul>

## Controller Chip

### EXC3000-FG11



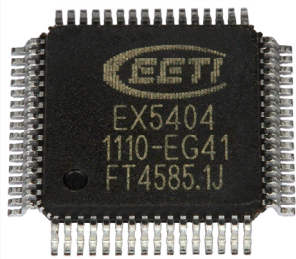
The EXC3000 series Touchscreen controller is the master controller chip for eGalaxTouch Projected capacitive touchscreen controller. It works with eGalaxtouch slave EX5418 driving chips and EX5960 sensing chips to provide a high performance projected capacitive multi touch touchscreen controller solution. With multiple slave chips, it can support up to 32" ( 27" for Windows 8 ) projected capacitive touchscreen application.

### Features

<b>Operating Power</b>	3.0VDC to 3.3VDC
<b>Operating Temperature</b>	-40 to 85°C
<b>Storage Temperature</b>	-40 to 125°C
<b>ESD</b>	>2000V (HBM)
<b>Package</b>	QFN40 5mm × 5mm × 0.65mm RoHS compliant
<b>Peripherals</b>	Analog <ul style="list-style-type: none"><li>• LDO1 3.3V to 1.8V</li><li>• LDO2 3.3V to 3.0V</li><li>• POR/PDR</li><li>• PLL</li></ul>
	Digital <ul style="list-style-type: none"><li>• UART</li><li>• I<sup>2</sup>C</li><li>• USB 1.1 full speed, support LPM L1</li><li>• GPIO</li><li>• capacitive scan engine</li><li>• multi-touch algorithm engine</li><li>• Timing Module</li></ul>
	Memory <ul style="list-style-type: none"><li>• 32KB SRAM + 1KB (USB FIFO)</li><li>• 64KB embedded flash program memory</li></ul>
<b>Application</b>	Touchscreen Controller

## Driving / Sensing Chip

### EX5404-EG41



### Features

Operating Power	2.7V to 3.3V Consumption 10mA maximum
Operating Temperature	-40 to 85 °C
Storage Temperature	-40 to 125 °C
ESD	4000V(HBM)
Packages	TQFP 7mm x 7mm x 1.2mm RoHS compliant
Technology	Slave IC for Projected Capacitive Touchscreen. Up to 54 sensing I/O channels.
Interface	I2C

## Driving Chip

### EX5418-EG11

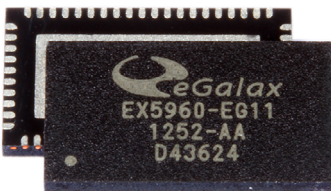


### Features

Operating Power	2.7V to 3.6V Power consumption < 10mA
Operating Temperature	-40 to 85 °C
Storage Temperature	-40 to 125 °C
ESD	2.5KV(HBM)
Packages	QFN60L 5mm x 9mm x 0.75mm RoHS compliant
Application	TX signal for capacitive touchscreen.
Numbers of Channel	44 TX channels
Interface	I2C

## Sensing Chip

### EX5960-EG11



### Features

Operating Power	2.7V to 3.6V Power consumption < 15mA
Operating Temperature	-40 to 85 °C
Storage Temperature	-40 to 125 °C
ESD	4000V(HBM)
Packages	QFN60L 5mm x 9mm x 0.85mm RoHS compliant
Technology	Support up to 44 channels
Interface	I2C

MCU	EXC7200-SG41	EXC7900-SG11	EXC7920-SG11	EXC9720-EG32	EXC3000-FG11
Number of touches	4	10	20	10	15
Package (mm)	TQFP48 7 x 7 x 1.20	QFN48 6 x 6 x 0.85	QFN48 7 x 7 x 0.85	VFBGA 6 x 11 x 1.0	QFN40 5 x 5 x 0.65
Interface	I2C / USB / UART	I2C / USB / UART	I2C / USB / UART	I2C / USB / UART	I2C / USB / UART
Operating Power	2.7VDC to 3.3VDC	2.7VDC to 3.3VDC	2.7VDC to 3.3VDC	2.7VDC to 3.3VDC	3.0 to 3.3VDC
Support Sizes	up to 27"	up to 15.6"	15.6" to 42"	7" to 14.1"	up to 27" for Windows 8
Matching IC	<b>EX5404-EG41</b>	<b>EX5418-EG11</b>	<b>EX5960-EG11</b>		
Max number of IC/module	3	2	4		
Package (mm)	TQFP48 7 x 7 x 1.20	QFN60L 5 x 9 x 0.75	QFN60L 5 x 9 x 0.85		

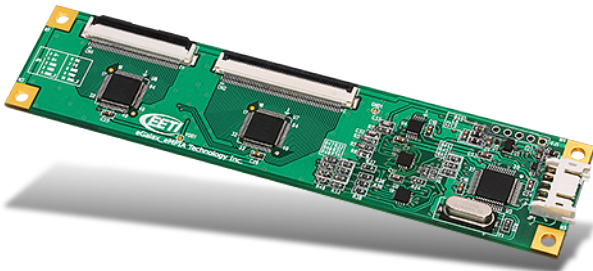
## Order Information

ETP-CP-EXC7200-	S	G	4	1
ETP-CP-EXC7900-	S	G	1	1
ETP-CP-EXC7920-	S	G	1	1
ETP-CP-EXC9720-	E	G	3	2
ETP-CP-EXC3000-	F	G	1	1
ETP-CP-EX5404-	E	G	4	1
ETP-CP-EX5418-	E	G	1	1
ETP-CP-EX5960-	E	G	1	1
CP = Chip EX = Slave ASIC EXC = MCU	Tracking Code 1	Green Part	0 = LQFP 1 = QFN 2 = TSSOP 3 = BGA 4 = TQFP	Tracking Code 2

# PCAP Touch Controller Board

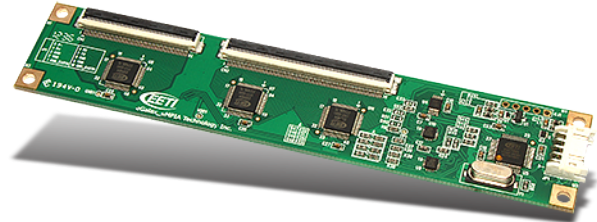
for 2~4 points Touch

## EXC205442TBG



- (mm) 125 × 28 × 8
- 2~4 points multi-touch
- Max. X:52 Y:40 channels

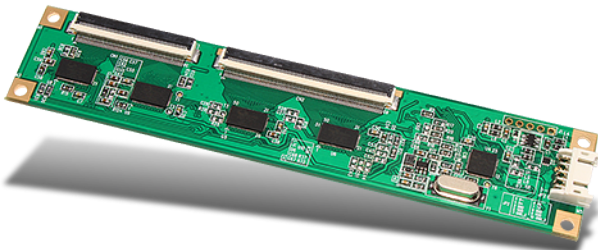
## EXC208056TBG



- (mm) 140 × 28 × 8
- 2~4 points multi-touch
- Max. X:78 Y:44 channels

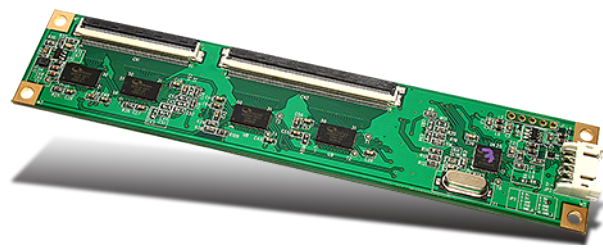
for 10 points Touch

## EXC968056TDG



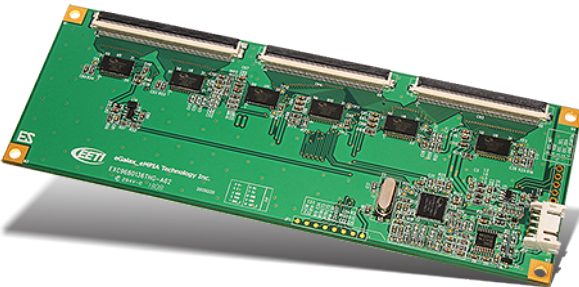
- (mm) 140 × 28 × 8
- 10 points multi-touch
- Suitable Panel Size up to 15.6" for Windows 8 requirement
- Max. Tx:78 Rx:54 channels

## EXC965680TDG



- (mm) 140 × 28 × 8
- 10 points multi-touch
- Suitable Panel Size up to 15.6" for Windows 8 requirement
- Max. Tx:54 Rx:78 channels

## EXC9680136THG



- (mm) 152 × 55 × 8.3
- 10 points multi-touch
- Suitable Panel Size up to 27" for Windows 8 requirement
- Max. Tx:78 Rx:132 channels

	EXC205442	EXC968056
	EXC208056	EXC965680
		EXC9680136
<b>Input Voltage</b>	3.5 to 5.5V Typical 5V	
<b>Operating Temperature</b>	-40 to 85°C	
<b>Storage Temperature</b>	- 40 to 90°C	
<b>Relative Humidity</b>	95% at 60°C, RH Non-condensing	
<b>Interface</b>	USB : 1.1 Full Speed RS232 : No parity, 8 data bits, 1 stop bit, baud rate 115200bps I2C : 100K / 400KHz	
<b>Resolution</b>	4096 x 4096	
<b>Compliance</b>	CE, FCC, RoHS, REACH	
<b>OS Supported</b>	Windows, Linux, Mac, QNX	
<b>Linearity / Accuracy</b>	Line drawing accuracy : 1pt +/- 1mm o set /10mm, 2pt +/- 2mm o set /10mm Touch (point) accuracy : 1pt +/- 2.5mm, 2pt +/- 5.0mm (Refer to Windows 7 Logo regulation)	All area: +/- 1mm
<b>Report rate</b>	Single touch : Typ.200 Hz Dual touch : Typ.120 Hz 4 point touch : Typ. 60 Hz	All points > 100Hz
<b>Response time</b>	Max. 20ms	Max. 20ms

# Surface Capacitive

## Controller Chip

### ESC7700-EG41



EETI provides a full range of controllers designed to optimize the performance of analog resistive touch panels. The controller communicates with the PC system directly through RS232, PS/2 and USB port.

EETI's superior design combines accuracy, sensitivity and speed to reach the outstanding touch performance and ease of use. The drivers emulate the mouse input and right button function, and support a variety of operation systems, including DOS, Windows series: 98 / ME / NT4 / 2000 / XP / VISTA / 7, Windows CE.net, Mac, and Linux kernel 2.4.x / 2.6.x with XFree86 or xorg system.

However, some special designs, our honor customers have to develop their own programs communicating with the touch panel controller firmware directly. In chapter 1 of this application note, firstly the needed protocols are described. Then, the special notices of programming RS232 is expressed. At the end, the sample code of parsing the protocols and the two points calibration conversion formulas are listed.

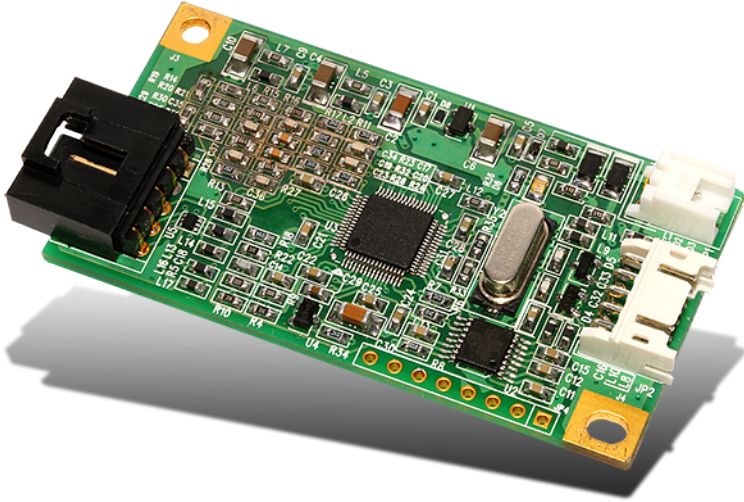
## Hardware Features

Controller	High Speed 8051 micro controller * 1 T instruction set * Up to 96 MIPS @ 96 MHz system clock
Operating Power	3.0VDC to 3.3VDC Consumption 50mA maximum
Operating Temperature	-40 to 85°C
Storage Temperature	-40 to 90°C
Clock	* external crystal 12 MHz * switch system clock on the fly * internal PLL
Package	TQFP64 7mm x 7mm RoHS compliant
Peripherals	Analog * 6 x Analog comparators/Buffer * Multiplexers x 4 * 12 bits ADC
	Digital * Hardware UART interface * Hardware I <sup>2</sup> C interface * 3 x 16bits timers + 1 x 24bits timer * GPIO * PWM module * DSP module * Watch dog timer
	One chip Memory * 24KB internal SRAM + 1KB USB FIFO * 64KB embedded flash
Application	Surface Capacitive Touchscreen Controller
Software Features	* USB 1.1 Full speed (12 Mbps) * UART @ 9600 ~ 57600 baud rate, none parity, 8 data bits and 1 stop bit * Linux kernel 2.6.x driver support * Windows OS Driver Support * Response Time < 35ms * Report Rate up to 170 points/sec



# ESCAP7700

## SCAP Controller Board



This touch panel controller provides the optimistic performance of your capacitive touch panels. It communicates with PC system directly through RS232 or USB connector. You can see how superior the design is in sensitivity, accuracy and friendly operation. The touch panel driver emulates mouse left and right button function and supports operation systems as following.

- (mm) 62 × 33 × 10
- 10 points multi-touch
- Suitable Panel Size up to 27" for Windows 8 requirement
- Max. Tx:78 Rx:132 channels

# Surface Acoustic Wave

## LEO series Touch Panel

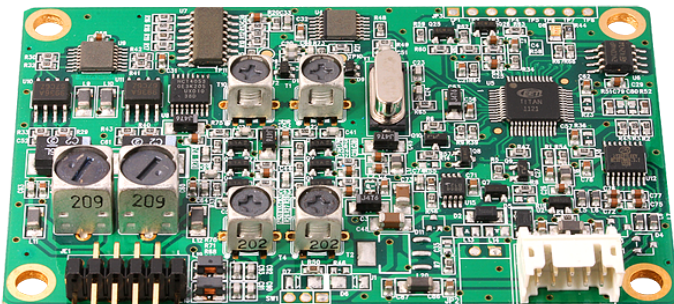
EETI's LEO series Surface Acoustic Wave (SAW) touch panel ranged from size 8.4" to 22". The tempered glass delivering an excellent optical clarity and high quality of touch accuracy. Optional anti-glare (AG) and anti-reflective (AR) optical coatings are available for increasing readability. Selection also includes customized panels that fits vandal-proof or special mechanism requirements.



# TITAN6001

## SAW Controller Board

The Titan6001, EETI's third generation Surface Acoustic Wave (SAW) touch panel controller, is designed with optimization for a fast and accurate touch response. Specialized functionality enable it to support multi-touch gestures and continue to work in a below zero degrees environment.



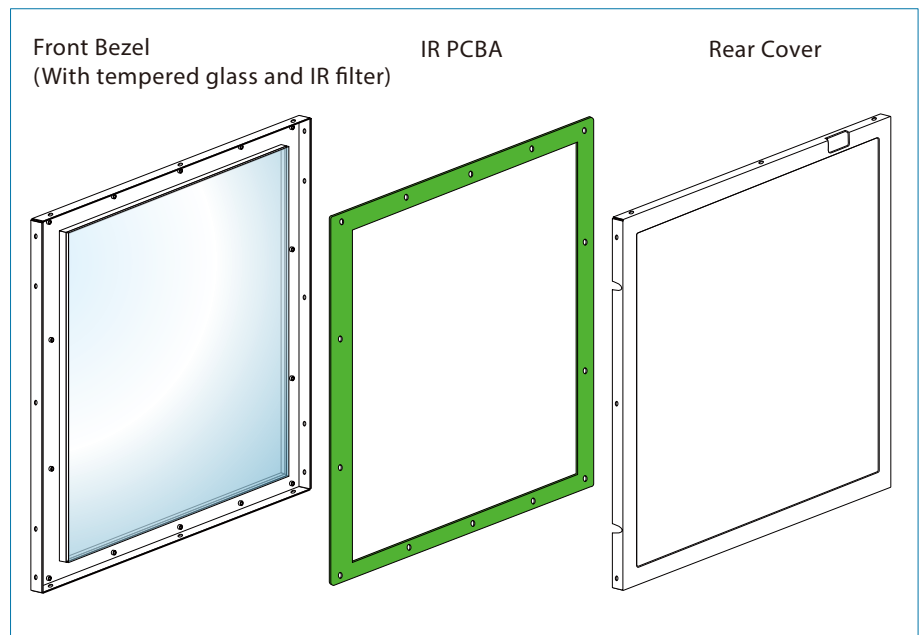


# Infra-Red Touch

## SUN series

The SUN series Infrared (IR) touch panel is one complete unit package integrated with the infrared sensing panel and the controller. By employing steel frame and tempered glass, the SUN touch panel is low-maintenance and able to withstand harsh environments or rugged applications.

The SUN touch panel is calibration-free and driver-free when it goes with USB Human Interface Device (HID) built-in driver in Windows 7, Windows Vista and Windows XP tablet PC operation systems. In addition, it supports multi-touch gestures such as two-finger Zoom/Rotate/Slide, and touch can be easily activated by gloved hand or virtually any finger-sized object. The SUN infrared touch panel is ideally for general users in everyday usage.



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