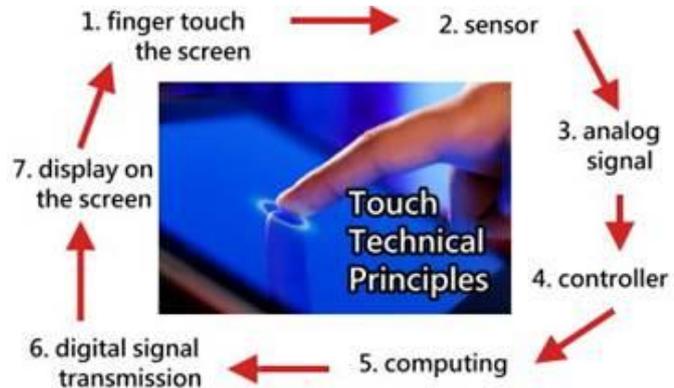


## The Comparison of Gtouch Touch Panels

Technology comes from humanity. The touch technology makes our lives easier than before. The computer screen can have the touch function when the traditional computer monitor combines with the touch modules

So far, there are a lot of touch technologies have been published, such as resistive touch, capacitive touch, electromagnetic touch, infrared ray touch, optical touch, acoustic signal touch, and image recognition touch, etc.



analog signal	electric signal	- resistive touch → general matrix
		- capacitive touch → surface / projected
digital signal	optical signal	- electromagnetic touch
	acoustic signal	- infrared ray touch - optical touch
		- surface acoustic wave touch - acoustic waveguide touch - acoustic pulse touch - dispersive signal touch

Given the trend of the current market, the resistive touch is commonly applied to small sizes for applications (such as cell phone and car navigation etc.). Projective capacitive is also put to use likewise. (ex.iPhone).

For large-size panel applications, infrared type and acoustic wave type basically account the majority, such as game machines, digital signage, multimedia machine, Kiosk, POS, ATM and so on. The optical touch is pretty new technology for applications of large-size panel, and has big potential in future development.

The below comparison table of the product features are 5W/4W (resistive touch), SCAP(surface capacitive touch), PCT(projected capacitive touch), SAW(surface acoustic wave touch), IR(infrared ray touch) and CCD(image recognition touch).

Touch	Panel size	Touch media	Multi Touch	Reaction time	Operating temperature	Warranty
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technology						
IR	8.4" ~ 100"	Opaque Light-blocking medium	1-6 points	100rps	-30°C ~70°C	3 years
PCT	3.5" ~ 24"	Hand or capacitive stylus	2-10 points	Max. 20ms	-30°C ~70°C	1 year
5W	5.7" ~ 24"	Hand or stylus	1 point	Max. 20ms	-30°C ~70°C	2 years
4W	3.5" ~ 17"	Hand or stylus	1 point	Max. 20ms	-30°C ~70°C	1 year
SCAP	5.8" ~ 32"	Hand	1 point	Max. 25ms	-30°C ~70°C	1 year
SAW	10.4" ~ 32"	Hand or any soft media	1 point	10ms	-30°C ~70°C	5 years
CCD	21.5" ~ 65"	Opaque Light-blocking medium	2-6 points	$\geq$ 100frame/sec	-30°C ~70°C	1 year

The below strength table of the product features are IR(infrared ray touch) , PCT(projected capacitive touch), 5W/4W (resistive touch), SCAP(surface capacitive touch), SAW(surface acoustic wave touch), IR(infrared ray touch) and CCD(image recognition touch).

Touch technology	Strength
IR	<ol style="list-style-type: none"> <li>1. High transmittance</li> <li>2. Long life</li> <li>3. Anti-scratch(7H)</li> <li>4. Operating force is lighter</li> </ol>
PCT	<ol style="list-style-type: none"> <li>1. Multi-touch operation</li> <li>2. High sensitivity</li> <li>3. The top surface of the glass is anti-scratch &amp; explosion-proof</li> <li>4. The panel is entire plane &amp; beautiful</li> </ol>
5W	<ol style="list-style-type: none"> <li>1. Waterproof and dustproof (mechanism design is easier)</li> <li>2. Technology is mature, lower unit price</li> <li>3. The life of the product is higher than 4W resistance</li> </ol>
4W	<ol style="list-style-type: none"> <li>1. Waterproof and dustproof (mechanism design is easier)</li> <li>2. Technology is mature, lower unit price</li> </ol>

<b>SCAP</b>	<ol style="list-style-type: none"> <li>1. Operating force is lighter</li> <li>2. High transparency</li> <li>3. Scratch-resistant(7H)</li> </ol>
<b>SAW</b>	<ol style="list-style-type: none"> <li>1. Transparency up to 98%</li> <li>2. Chemically enhanced glass scratch-resistant and vandal-proof.</li> <li>3. Long product life</li> <li>4. Capable to be operated with gloved hands under low temperature environment.</li> <li>5. Reaction time is faster</li> </ol>
<b>CCD</b>	<ol style="list-style-type: none"> <li>1. High transparency</li> <li>2. Long life</li> <li>3. Anti-scratch(7H)</li> <li>4. Operating force is lighter</li> </ol>

The below table of the product innate shortcomings are IR(infrared ray touch) , PCT(projected capacitive touch), 5W/4W (resistive touch), SCAP(surface capacitive touch), SAW(surface acoustic wave touch), IR(infrared ray touch) and CCD(image recognition touch).

<b>Touch technology</b>	<b>Product innate shortcomings</b>
<b>IR</b>	<ol style="list-style-type: none"> <li>1. The frame size is wider than other types' of touch panel.</li> <li>2. Higher price</li> <li>3. No waterproof</li> </ol>
<b>PCT</b>	<ol style="list-style-type: none"> <li>1. Development costs are extremely high</li> <li>2. The after-sales services (firmware .. etc.) need to be individually adjusted for different models</li> <li>3. Rely on the human body's static electricity. The panel will not operate unless the user is wearing a particular gloves</li> </ol>
<b>5W</b>	<ol style="list-style-type: none"> <li>1. The film on the surface is easily damaged, making the product life shorter than others (only better than 4W)</li> <li>2. Poor transparency</li> <li>3. Operating force is heavier</li> <li>4. Not suitable for drawing lines but suitable for clicking</li> </ol>
<b>4W</b>	<ol style="list-style-type: none"> <li>1. The film on the surface is easily damaged, the weakest product in all types</li> <li>2. Poor transparency</li> <li>3. Operating force is heavier</li> <li>4. Not suitable for drawing lines but suitable for clicking</li> </ol>
<b>SCAP</b>	<ol style="list-style-type: none"> <li>1. Greatly interfered by the outside environment and it's more difficult to trouble shoot</li> </ol>

	<ol style="list-style-type: none"> <li>2. Rely on the human body's static electricity. The panel will not operate unless the user is wearing a particular gloves</li> </ol>
<b>SAW</b>	<ol style="list-style-type: none"> <li>1. The surface is not waterproof. A coin size of water drip on the surface of panel would lead to malfunction. The function will be back to normal after wiping it dry.</li> <li>2. Single touch only, it will take time to R&amp;D for multi-touch</li> <li>3. Because of the characteristics of the product, it only responses to soft material. Nail is not able to function it, only palm of finger can function it</li> </ol>
<b>CCD</b>	<ol style="list-style-type: none"> <li>1. Due to the size of the optical camera, the volume of the sensor is big. Therefore, it is not suitable for small size of the product</li> <li>2. No waterproof</li> <li>3. There are dead spaces for CCD touch panel.</li> </ol>

For more product information about Gtouch Touch Screen, please email to [sky@gtouch.com.tw](mailto:sky@gtouch.com.tw).

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### About Gtouch

Groovy Technology, established in 1995, is an organization of professionals dedicated solely to the touch screen industry. With the brand of "Gtouch," Groovy Technology manufactures and markets **4W/5W resistive touch screen, Capacitive touch screen, surface acoustic wave touch screen, infrared ray touch screen, optical touch screen, add on single touch screen, touch monitor and touch controller** all over the world.

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