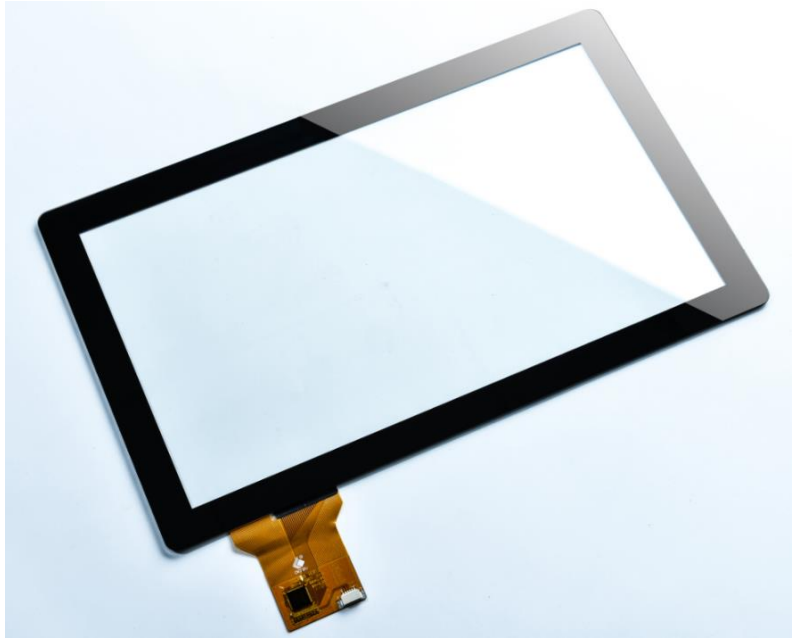
Touch Panels

Touch Panels – Projected Capacitive Touch



Size: 4.3” – 85”
Structures: GG / PG / G1F / GFF
Cover Lens: 0.5mm – 6mm
Touch IC: Silicon Works, EETI, Ilitek, etc.
Customization: Shape, silk screening, coloration, cutouts, touch points, screen enhancements, etc.

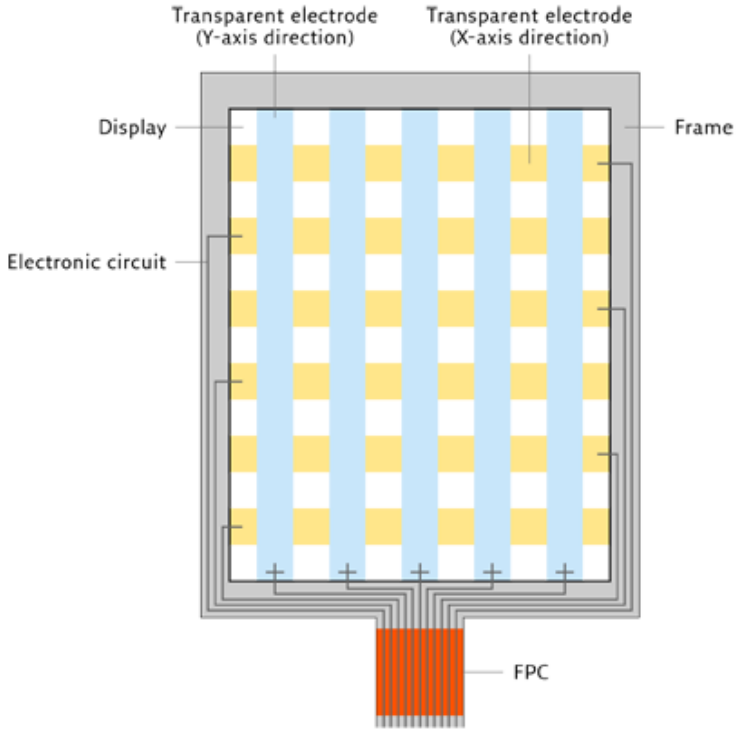
Dignity offers a wide range of Projected Capacitive (PCAP) touch screens (also known as PCT), with a variety of enhancements, sizes and others options. We offer in-house design, engineering services, firmware tuning and other options to optimize the final touch solution for your end use.

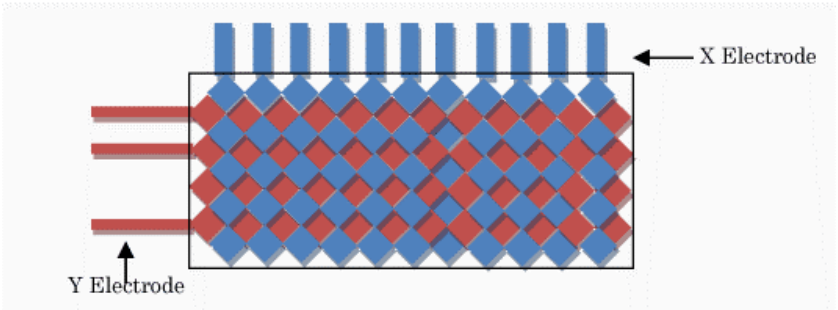
Advantages: Projected capacitive touch screens offer superior touch performance, optical quality, lifespan, resistance to damage and other considerations. They can support multiple gestures and up to 50 simultaneous touch points.

Application: They are commonly used in appliances, POS and retail, legal and amusement gaming, in-vehicle, industrial terminals, etc.

- High accuracy, sensitivity and linearity without periodic calibration
- Available in both Chip on Flex (COF) or Chip on Board (COB)
- Wide variety of screen enhancements and optical filters available
- Wide range of customization options for cover lens materials, decoration and other aspects
- Wide range of supported ICs and hardware
- Firmware tuning support provided by in-house dedicated software engineers

Touch Panels – PCAP Structure

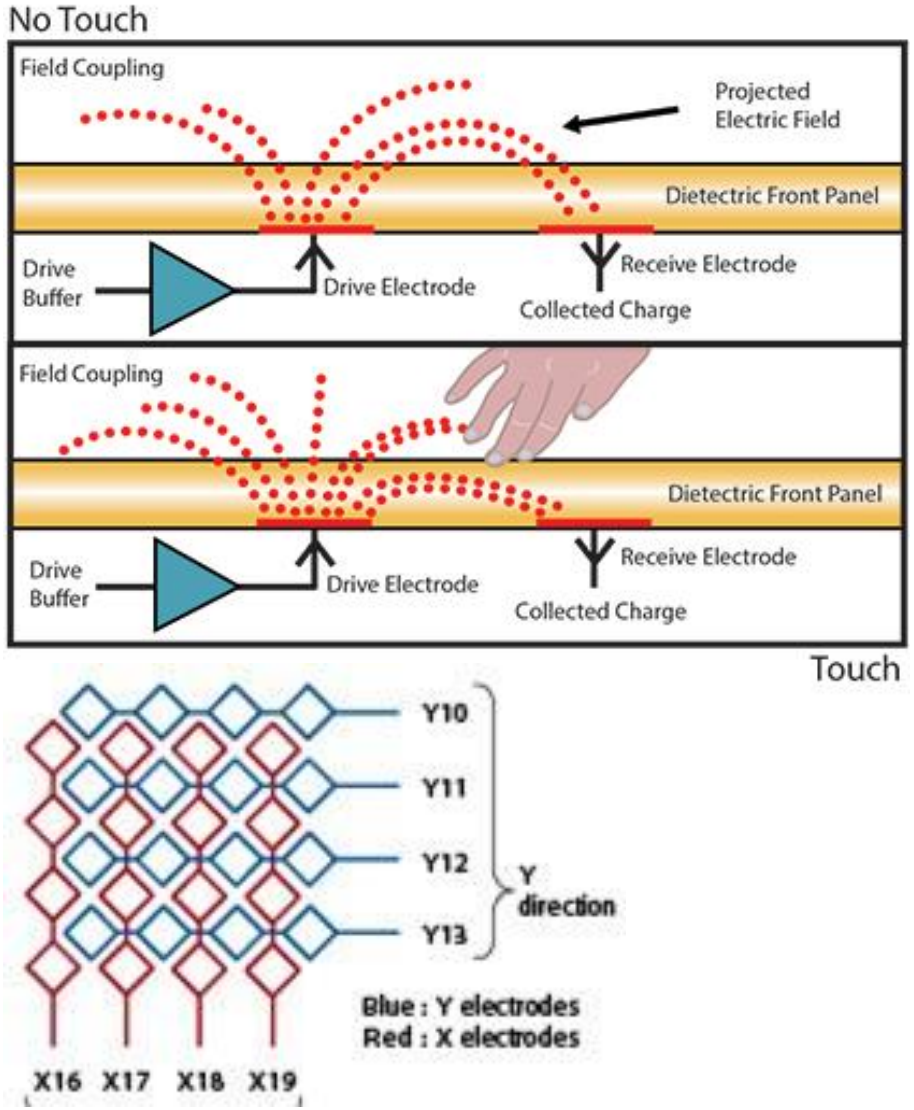




Product Structure

- Projected capacitive touch screens (PCAP or PCT) consist of a double layer of X/Y sensors that can detect a change in an electric field
- The sensors are composed of a conductive material called ITO (Indium Tin Oxide) which is formed into lines via etching or printing processes onto PET film or glass. The lines of sensors are laid out in a grid, in order to determine touch location.
- The sensor layers can be placed on two separate layers of material that are then overlaid to create the sensory grid (SITO), or they can be placed on either side of one layer of material (DITO).
- These layers of material are usually then bonded together using a clear adhesive (OCA/OCR) in order to create a PCAP touch panel.
- A flexible printed circuit (FPC) is attached as part of the bonding process to connect the touch sensor and its grid to the touch controller and mother board.

Touch Panels – PCAP Operating Principles



- Projected capacitive touch is composed of one or two parallel conductive ITO layers; these form an X and Y array of lines. These lines create a matrix of electrodes in the form of a grid.
- A small amount of current is run through the panels electrodes and it causes the electrodes to project a weak electric field outward through the glass – a portion of which is collected by a neighboring “receive” electrode.
- When the finger touches the PCAP panel, the touch “steals” electrical charge from the field generated by the nearest electrodes.
- The panel is constantly scanning and monitoring the current of the capacitive field – if there is a change in current the controller then registers a touch.
- The controller (IC) embedded in the panel calculates the touch location coordinates and sends them on to the mother board for processing.

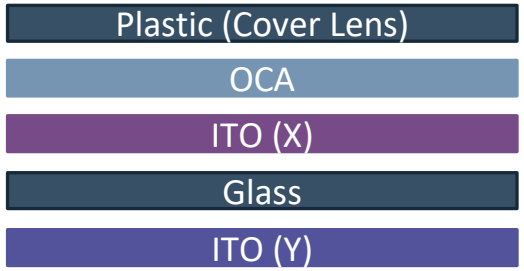
Touch Panels – PCAP Offerings

GG

Closeup of GG Product Structure

- High hardness (≥7), high strength, high yield rate, excellent transmittance and optical clarity; cover lens can be up to 6mm in thickness.
- Higher stack up thickness than GF or GFF; heavier final product, glass sensor is less shatter resistant than GF or GFF.
- Sizes from 4.3" up to 85" available.

PG



Closeup of PG Product Structure

- Mature production process with the lowest cost – competitive in low and mid market products. Often used as a low cost solution for products under 9".
- Poor surface hardness means it is very scratch prone which can reduce display clarity. Optical qualities are poorer than a comparable thickness glass cover lens.
- Sizes from 4.3" up to 9" available.

Touch Panels – PCAP Specifications & Advantages

Electrical Characteristics	
Working Voltage: ≤5V DC (30V max)	Touch Points: 10-50
Insulation Res: ≥20MΩ@25V	Reporting Freq: 80-120Hz
Touch Accuracy: +/- 1mm/2mm	Latency: ≤20ms
Optical Characteristics	
Transmittance: ≥85%	Haze: < 1%
Mechanical Characteristics	
Lifespan (touch): ≥1000k	Surface Hardness: ≥7H
Lifespan (stylus): ≥100k	Activation Force: ≤10g
Input Methods: Finger, active stylus, gloved, etc.	
Environmental Characteristics	
Working Temp:—10℃ - +60℃	Storage Temp—20℃～+70℃
	Humidity: <90% RH

Capacitive Advantages

- Durable and scratch resistant for more demanding applications
- Lifespan is the longest of any touch panel type
- Faster reporting rate for less lag
- Excellent transmittance and optics
- Very light touch activation
- Smooth and fast-scrolling
- Supports “true” multi-touch and gestural recognition
- High accuracy, sensitivity and linearity
- No recalibration needed

Disadvantages

- More expensive than resistive and most other technologies
- Integration is relatively difficult
- Systems must be tuned initially before use
- Even with tuning, can have difficulty operating with significant water on screen

Touch Panels – PCAP Product Enhancements

Supported OS	Screen Enhancements	Cover Lens Material	Connection Options	Decorative Options
Windows 10	Anti-Fingerprint (AF)	PET / Composite	IIC	Silk Screening
Windows XP, 7, 8	Anti-Glare (AG)	Chemically Strengthened	USB	Company Logos
Linux	Anti-Reflective (AR)	Heat Strengthened	RS232	Laser Engraving
Android	Dead Front	Soda-lime Glass	–	Colored Glass
iOS	Mirroring	Gorilla Glass / Dragontrail	–	CNC Shaping or Cutouts
–	Anti-Shatter Film	Borosilicate Glass	–	–

Touch Panels – Key Partners

Dignity Electronics ships HMI components and touch solutions to a range of partners worldwide, including some of the largest appliance, POS and consumer electric manufacturers in the world. We also cooperate with many of the most advanced Chinese and foreign display companies in the Pearl River Delta region.