

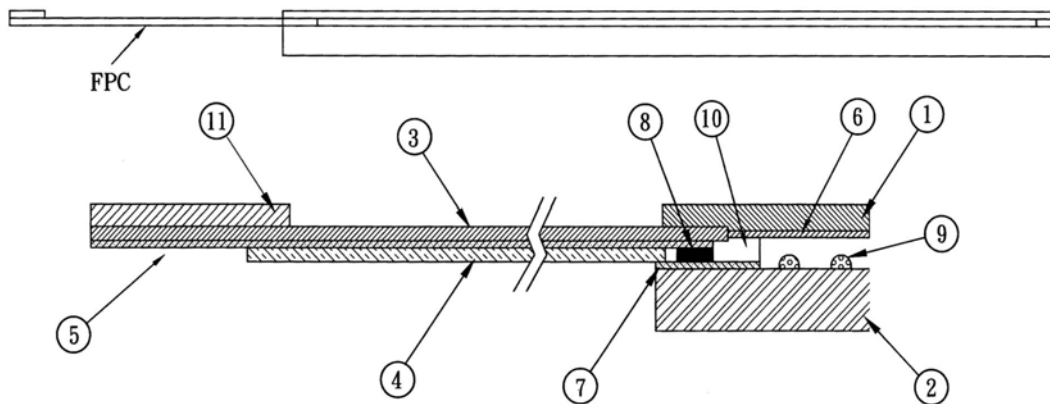
Analog 4-wire PET-On-Glass Touch Screen Specification

1. Mechanical Dimensions and Construction

- 1.1 General: Analog Resistive touch screen is laminated by ITO PET to ITO glass.
 1.2 Construction :

Item	Description	Material	Remarks
1	ITO PET (Top layer)	0.188mm ITO PET Film	Antiglare coating Surface hardness: 3H Resistance:300~600Ω/□
2	ITO Patterned Glass (Bottom layer)	1.10mm ITO Glass	Resistance:300~600Ω/□
3	Tail Base	Kapton	Separated Tail
4	Tail Coverlay	Kapton	
5	Conductor	Copper	
6	Top layer circuit	Silver ink	
7	Bottom layer circuit	Silver ink	
8	Layer to layer contacted	Silver ink	
9	Dot spacer	UV Cure ink	
10	Isolation Layer	Isolation Adhesive	
11	Stiffener	PET Film	

Touch screen side view:



Changes that contribute to technical improvement are subject to alternations

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1.3 Input Method and Activation Force

Input Method	Average Activation Force
1.6mm dia. Delrin stylus	10~70 grams
16mm dia. Silicon "finger"	10~ 80 grams

2. Typical Optical Characteristics

- 2.1 Visible Light Transmission: >80%
- 2.2 Haze: 3~7% (JIS K-7105)


3. Electrical Specifications

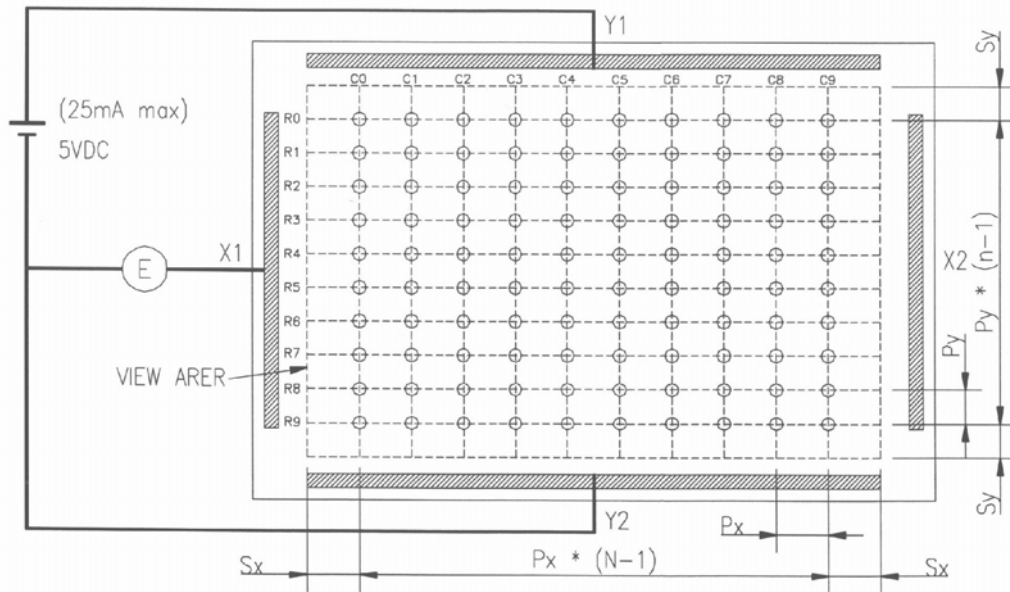
- 3.1 Operating Voltage: 5.5V or less
- 3.2 Contact current: 20mA (maximum)
- 3.3 Circuit close resistance: X : 500~1300Ω Y : 150~550Ω
- 3.4 Circuit open resistance: > 10MΩ at 25VDC
- 3.5 Contact bounce: < 10ms
- 3.6 Linear Test : <1.5 %
- 3.7 Capacitance: 100nF(maximum)

4. Linearity

- 4.1 Linear Test Specification
 - Direction X: <1.5 %
 - Direction Y: <1.5 %
- 4.2 Line Test Circuit for Y Coordinate
Add 5V between Y1 and Y2 touch the point C0R0 to C9R9 separately, and measure the voltage from X1 as the following drawing.

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4.3 Calculate Linearity : For the First Row0

$$R0_{avg} = (VC0 + VC1 + VC2 + \dots + VC9) \div 10$$

R0max = The maximum voltage in Row 0
R0min = The minimum voltage in Row 0
R0 linear1 = $| R0 \text{ max} - R0 \text{ avg.} | \div R0 \text{ avg.} * 100\%$
R0 linear2 = $| R0 \text{ min} - R0 \text{ avg.} | \div R0 \text{ avg.} * 100\%$
R0 linear = max (R0 linear1, R0 linear2)

4.4 For X Coordinate Test

Add 5 voltage between X1 and X2 touch the point C0R0 to C9R9 separately and measure the voltage from Y1 as the above drawing

4.5 Calculate Linearity : For the First Column0

$$C0_{avg} = (VR0 + VR1 + VR2 + \dots + VR9) \div 10$$

C0max = The maximum voltage in Column 0
C0min = The minimum voltage in Column 0
C0 linear1 = $| C0 \text{ max} - C0 \text{ avg.} | \div C0 \text{ avg.} * 100\%$
C0 linear2 = $| C0 \text{ min} - C0 \text{ avg.} | \div C0 \text{ avg.} * 100\%$
C0 linear = max (C0 linear1 ,C0 linear2)

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5. Environment Specification

- 5.1 Operating Temperature - 10° C ~ + 60° C Humidity less than 90% RH
 5.2 Storage Temperature - 20° C ~ + 80° C at Ambient Humidity

6. Reliability Test

- 6.1 Exposure to high temperature
 Touch panel is put into a test machine at the condition of 80° for 120 hours. Then it is left at the room temperature for 24 hours or more. The measurement must satisfy the following:
- Circuit close resistance: as Sec. 3.3
 - Circuit open resistance: as Sec. 3.4
 - Contact bounce: as Sec. 3.5
 - Linearity test: as Sec. 3.6
- 6.2 Exposure to low temperature
 Touch panel is put into a test machine at the condition of -20° for 120 hours. Then it is left at the room temperature for 24 hours or more. The measurement must satisfy the following:
- Circuit close resistance: as Sec. 3.3
 - Circuit open resistance: as Sec. 3.4
 - Contact bounce: as Sec. 3.5
 - Linearity test: as Sec. 3.6
- 6.3 Exposure to constant temperature and humidity
 Touch panel is put into a test machine at the condition of 60°, 90%RH for 120 hours. Then it is left at the room temperature for 24 hours or more. The measurement must satisfy the following:
- Circuit close resistance: as Sec. 3.3
 - Circuit open resistance: as Sec. 3.4
 - Contact bounce: as Sec. 3.5
 - Linearity test: as Sec. 3.6
- 6.4 Thermal Shock
 Touch panel is put into a test machine at the condition of -20° for 30 minutes, and then 80° for 30 minutes. The process is repeated by 10 cycles. Then it is left at the room temperature for 24 hours or more. The measurement must satisfy the following:
- Circuit close resistance: as Sec. 3.3
 - Circuit open resistance: as Sec. 3.4
 - Contact bounce: as Sec. 3.5
 - Linearity test: as Sec. 3.6

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7. Durability test:

7.1 Finger touches

Touch panel is hit 10 millions times with a silicone rubber of R8 finger, hitting rate is by 250g at 2 times per second. The measurement must satisfy the following:

- Circuit close resistance: as Sec. 3.3
- Circuit open resistance: as Sec. 3.4
- Contact bounce: as Sec. 3.5
- Linearity test: as Sec. 3.6

7.2 Stylus writing

Touch panel is drawn by R0.8 Derlin stylus pen, at 250g forces, repeat one inch by 100K times. The measurement must satisfy the following:

- Circuit close resistance: as Sec. 3.3
- Circuit open resistance: as Sec. 3.4
- Contact bounce: as Sec. 3.5
- Linearity test: as Sec. 3.6

8. Optical Performance

8.1 Optical inspection method and optical defect standards refer to document. A001-1 Touch Screen Optical Quality Standard.

8.2 Outside to Viewing Area : any optical defected in this area need to be ignored if no effected to touch screen function.

8.3 Silver Bus Pattern defect : Voids in traces to be less than 50% of the trace width.

8.3.1 Silver Bus Pattern gap: >0.1mm

8.3.2 Silver Bus and Active area gap: No silver ink may project beyond the viewing area.

8.4 Glass defects such as edge chips and scratches refer to A001-1 Touch Screen Optical Quality Standard.


8.5 Others

8.5.1 Folding line should be avoided on the pressure sensitive adhesive.

8.5.2 Refer to document A001-1 Touch Screen Optical Quality Standard.

8.5.3 Always store the touch screen in its original shipping container under normal conditions (20~25°C, 65% RH)

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