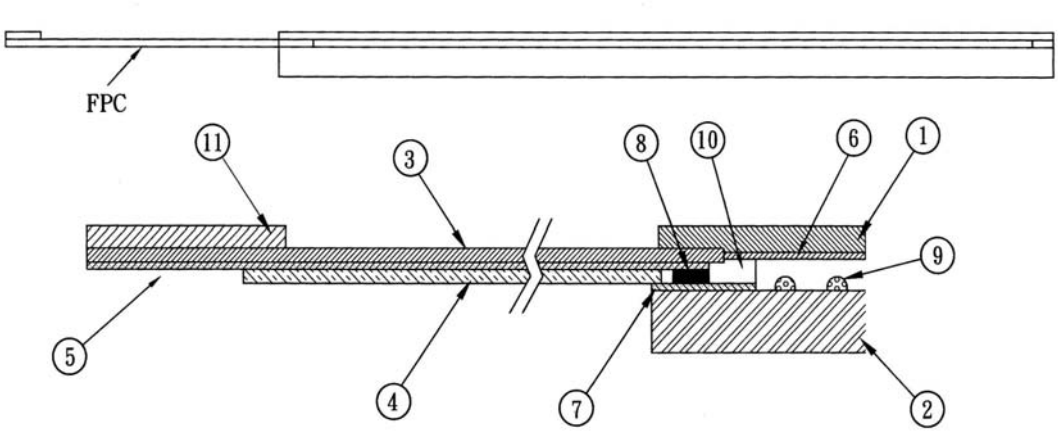
Analog 4-wire PET-On-Glass Touch Screen Specification

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)	1.80mm 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:



1.3 Input Method and Activation Force

Input Method	Average Activation Force
1.6mm dia. Delrin stylus	0,1 ~ 0,7N
16mm dia. Silicon "finger"	0,1 ~ 0,8 N

2. Typical Optical Characteristics

2.1 Visible Light Transmission: > 80%
2.2 Haze: < 13%

3. Electrical Specifications

3.1 Operating Voltage: 5.5V or less
3.2 Contact current: 20mA (maximum)
3.3 Circuit close resistance: X : 400~1000Ω; Y : 200~650Ω
3.4 Circuit open resistance: > 10MΩ at 25VDC
3.5 Contact bounce: < 10ms
3.6 Linear Test : <1.5 %
3.7 Capacitance: 100nF(maximum)

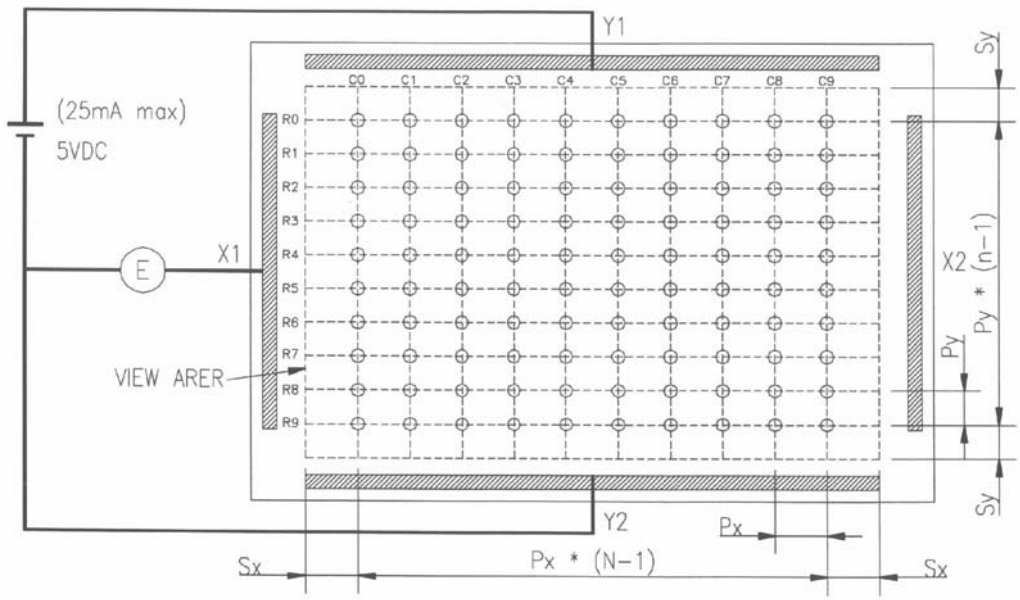
4. Linearity

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.



4.3 Calculate Linearity : For the First Row0

R0avg = (VC0 + VC1 + VC2 +- - - - - - - + VC9) ÷ 10
R0max = The maximum voltage in Row 0
R0min = The minimum voltage in Row 0
R0 linear1 = | R0 max – R0 avg. | ÷ R0 avg. * 100%
R0 linear2 = | R0 min – R0 avg. | ÷ R0 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

C0avg = (VR0 + VR1 + VR2 +- - - - - - - + VR9) ÷ 10
C0max = The maximum voltage in Column 0
C0min = The minimum voltage in Column 0
C0 linear1 = | C0 max – C0 avg. | ÷ C0 avg. * 100%
C0 linear2 = | C0 min – C0 avg. | ÷ C0 avg. * 100%
C0 linear = max (C0 linear1 ,C0 linear2)

5. Environment Specification

5.1	Operating Temperature	- 10° C ~ + 60° C	Humidity less than 90% RH
5.2	Storage Temperature	- 40° 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°C 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 –40°C 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°C, 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 –40°C for 30 minutes, and then 80°C 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

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. A001-2. 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 A001-2, 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 A001-2, 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)