

**Apex Material Technology Corp.**  
**創為精密材料股份有限公司**

AMT PRODUCT STANDARD

Doc No:	AS-09509-00C-7	Doc Rev: 7.0
Title:	SPECIFICATIONS OF ANALOG RESISTIVE TOUCH SCREEN	Released: Aug. 19, 2011
	Model Name: 09509-00 Rev: C Size: 10.40"	Page. 1 of 7

Analog Touch Screen Specification

Manufacturer: Apex Material Technology Corp.

Model Name: 09509-00 Rev: C

1. Mechanical Dimensions and Construction

1.1 General: Analog Resistive touch screen is laminated by ITO film to ITO glass.

1.2 Mechanical Performance:

1.2.1 Surface hardness: 3H

1.2.2 ITO Glass Thickness: 1.1mm

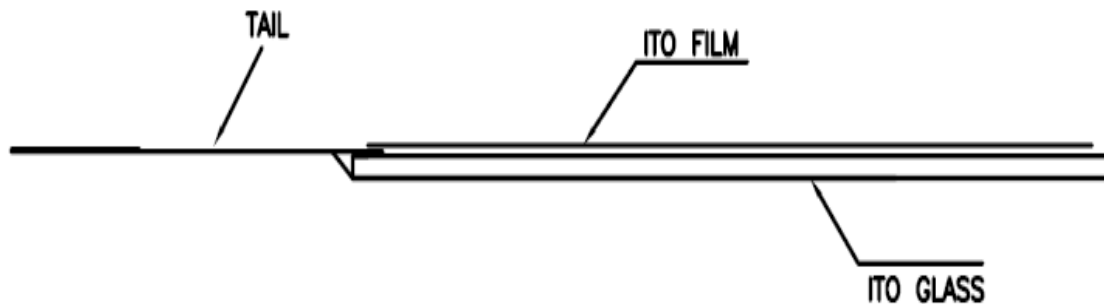
1.2.3 Tail Type: FPC

1.2.4 Surface Finish Type: Anti-glare

1.3 Input Method and Activation Force

Input Method	Average Activation Force
1.6mm dia. Delrin stylus	0.10~0.70N
16mm dia. Silicon "finger"	0.10~0.80N

Touch screen side view:



Remarks: This Model is with Anti-Newton Ring design.

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2. Typical Optical Characteristics

- 2.1 Visible Light Transmission:  $81 \pm 3\%$
- 2.2 Haze:  $9.5 \pm 4\%$

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)
- 3.8 Electrostatic Discharge Protection: (per EN 61000-4-2 )

The touch screen withstands of 15KV air discharge and 8KV contact discharge.

4. Linearity

4.1 Linear Test Specification

- Direction X: <1.5 %
- Direction Y: <1.5 %

4.2 Linearity Test

Apply voltage (DC5V) to upper (or lower ) electrodes, output voltage Vx (see Fig.4-1) or Vy (see Fig.4-2) on the other electrodes is measured at every regular intervals.

Linearity is the value of max. error voltage (see Fig. 4-3).

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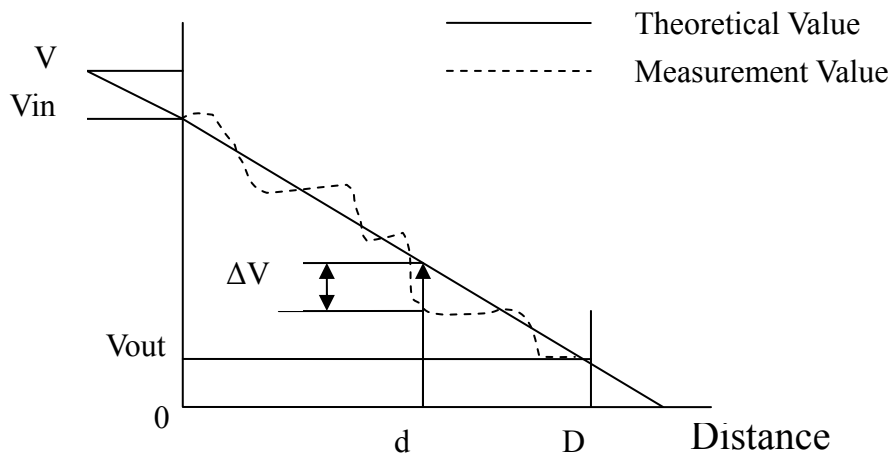
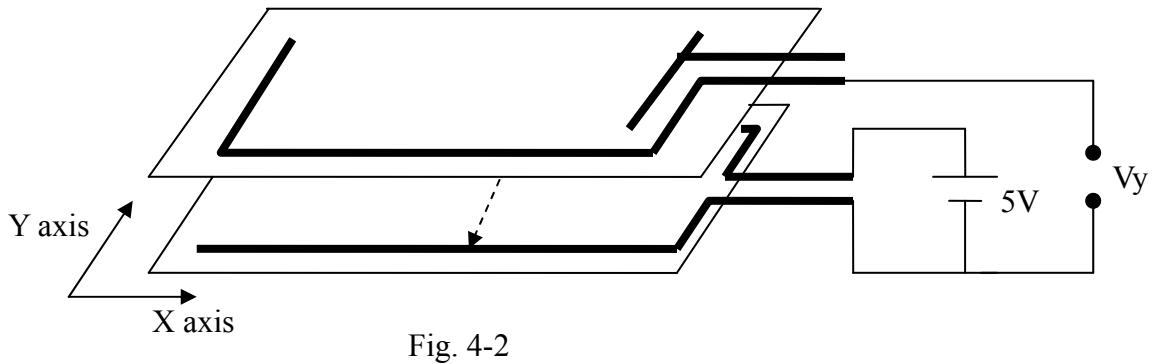
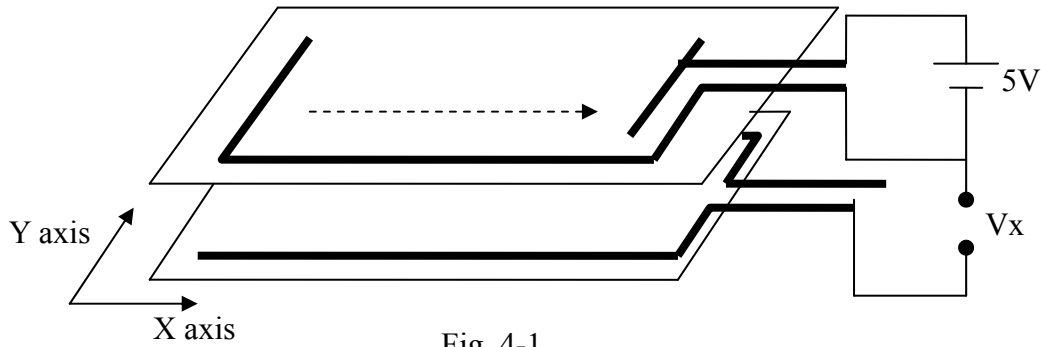


Fig. 4-3

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5. Environmental Specifications

5.1 Operating Temperature:  $-20^{\circ}\text{C} \sim +70^{\circ}\text{C}$

5.2 Storage Temperature:  $-40^{\circ}\text{C} \sim +80^{\circ}\text{C}$

5.3 Humidity: if temp.  $\geq 20^{\circ}\text{C}$ , see Fig.5 below  
 if temp.  $< 20^{\circ}\text{C}$ , humidity less than 90% RH  
 No dew condensation

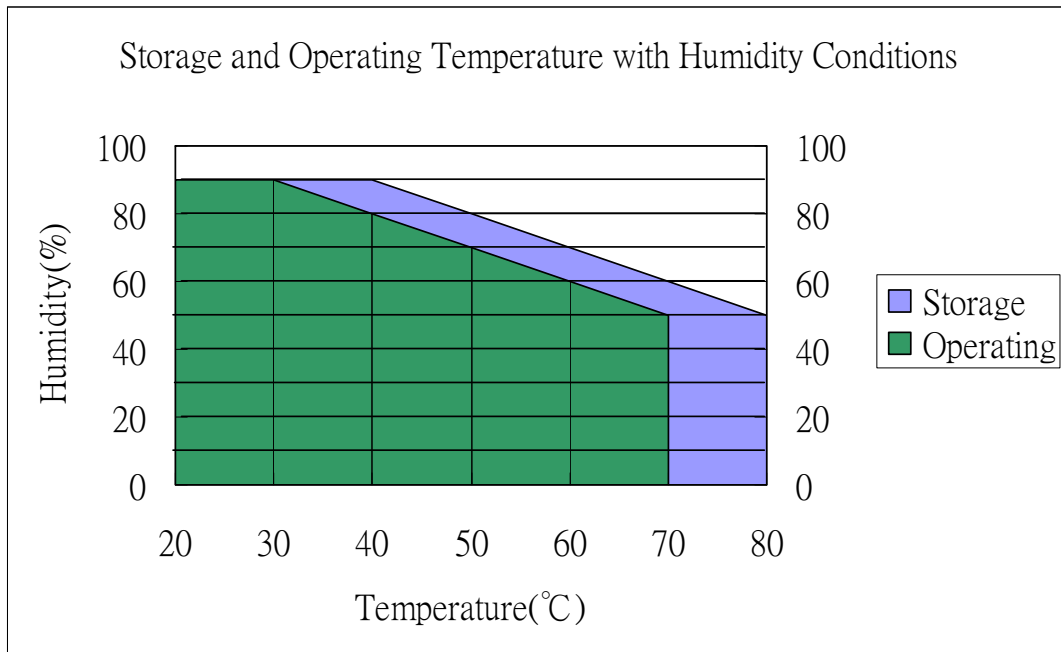


Fig.5 Storage and Operating Temperature with Humidity Conditions

6. Reliability Test

6.1 Exposure to high temperature

Touch panel is put into a test machine at the condition of  $80^{\circ}\text{C}$  for 288 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

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#### 6.2 Exposure to low temperature

Touch panel is put into a test machine at the condition of  $-40^{\circ}\text{C}$  for 288 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  $50^{\circ}\text{C}$ , 80%RH for 288 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  $-40^{\circ}\text{C}$  for 30 minutes, and then  $80^{\circ}\text{C}$  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(see Fig.7-1), hitting rate is by 250g at 2 times per second. The measurement must satisfy the following:

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- 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

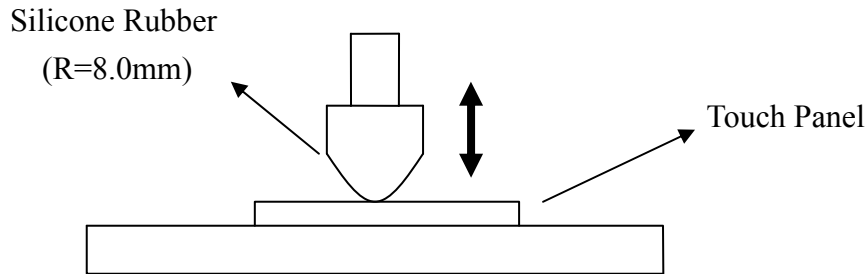


Fig. 7-1

### 7.2 Stylus writing

Touch panel is drawn by R0.8 Derlin stylus pen, at 250g forces, repeat one inch by 200K times (see Fig.7-2). 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

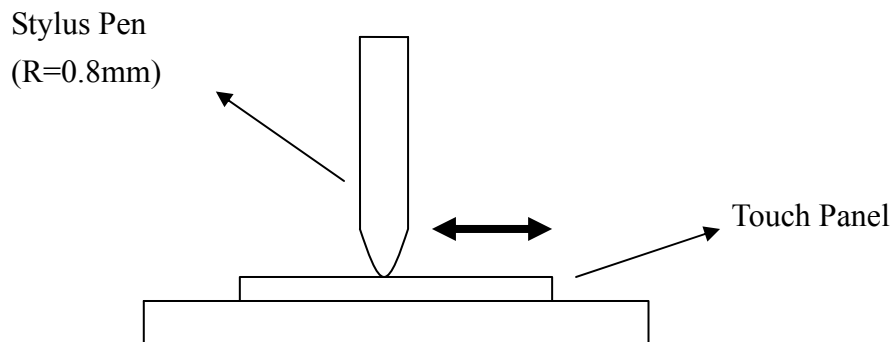


Fig. 7-2

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8. Optical Performance

- 8.1 Optical inspection method and optical defect standards refer to AMT document A001 updated version ; "Touch Screen Optical Quality Standard."
- 8.2 Outside to Viewing Area: any optical defects in this area need to be ignored if no touch screen function is affected.

9. Others

- 9.1 Always store the touch screen in its original shipping container under normal conditions (Temperature 20~25°C ; Humidity  $\leq$  65%RH).
- 9.2 This Model is RoHS compliant.