

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

AMT PRODUCT STANDARD

Doc No:	AS-02514-00C-1	Doc Rev: 1.0
Title:	SPECIFICATIONS OF ANALOG RESISTIVE TOUCH SCREEN Model Name: 02514-00 Rev: C Size:12.26"	Released: Nov. 06, 2012
		Page. 1 of 6

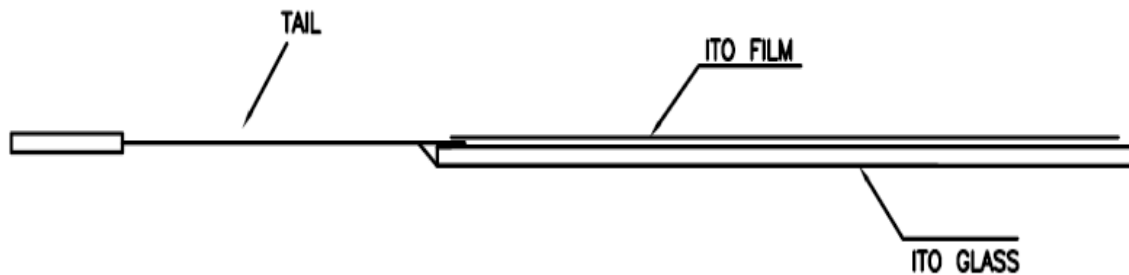
Analog 5wires Touch Screen Specification  
 Manufacturer: Apex Material Technology Corp.  
 Model Name: 02514-00 Rev: C

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: 1.80mm
  - 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
16mm dia. Silicon "finger"	Less than 1.00 N

Touch screen side view:



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

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	Model Name: 02514-00 Rev: C Size:12.26"	Page. 2 of 6

2. Typical Optical Characteristics

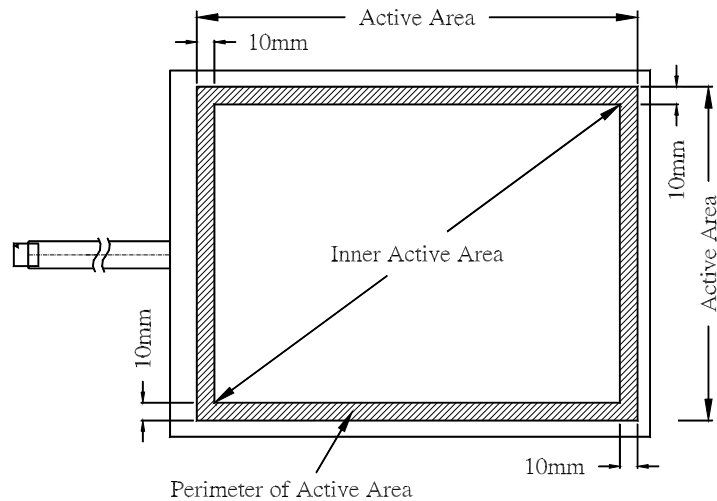
- 2.1 Visible Light Transmission:  $81 \pm 3\%$
- 2.2 Haze:  $9.5 \pm 4\%$

3. Electrical Specifications

- 3.1 Operating Voltage: 5.5V or less
- 3.2 Contact current: 70mA (maximum)
- 3.3 Circuit close resistance: 30~300 $\Omega$
- 3.4 Circuit open resistance: > 10M $\Omega$  at 25VDC
- 3.5 Contact bounce: < 15ms
- 3.6 Linearity Specifications:

The linearity specifications are based on Hampshire or PenMount touch screen controllers and drivers to define.

- 3.6.1 Inner Active Area : 10 mm inside of X and Y active area dimensions.  
Perimeter of Active Area : The area 10 mm inside of X and Y active area dimensions.



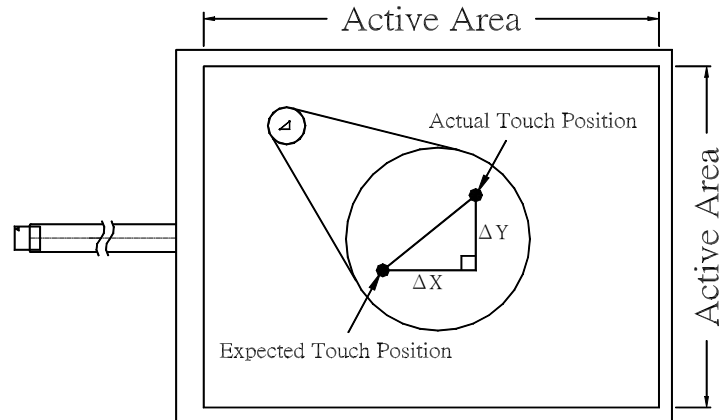
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3.6.2 Calculate Linearity

$$\%Linearity = \frac{\sqrt{\Delta X^2 + \Delta Y^2}}{\text{Active Area Diagonal}} * 100$$



3.6.3 Linearity :

Inner Active Area : <1.0%

Perimeter of Active Area : <1.5%

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

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

4. Environmental Specifications

4.1 Operating Temperature: -20° C ~ + 70° C

4.2 Storage Temperature: -40° C ~ + 80° C

4.3 Humidity: if temp. ≥ 20° C, see Fig.4 below

if temp. < 20° C, humidity less than 90% RH

No dew condensation

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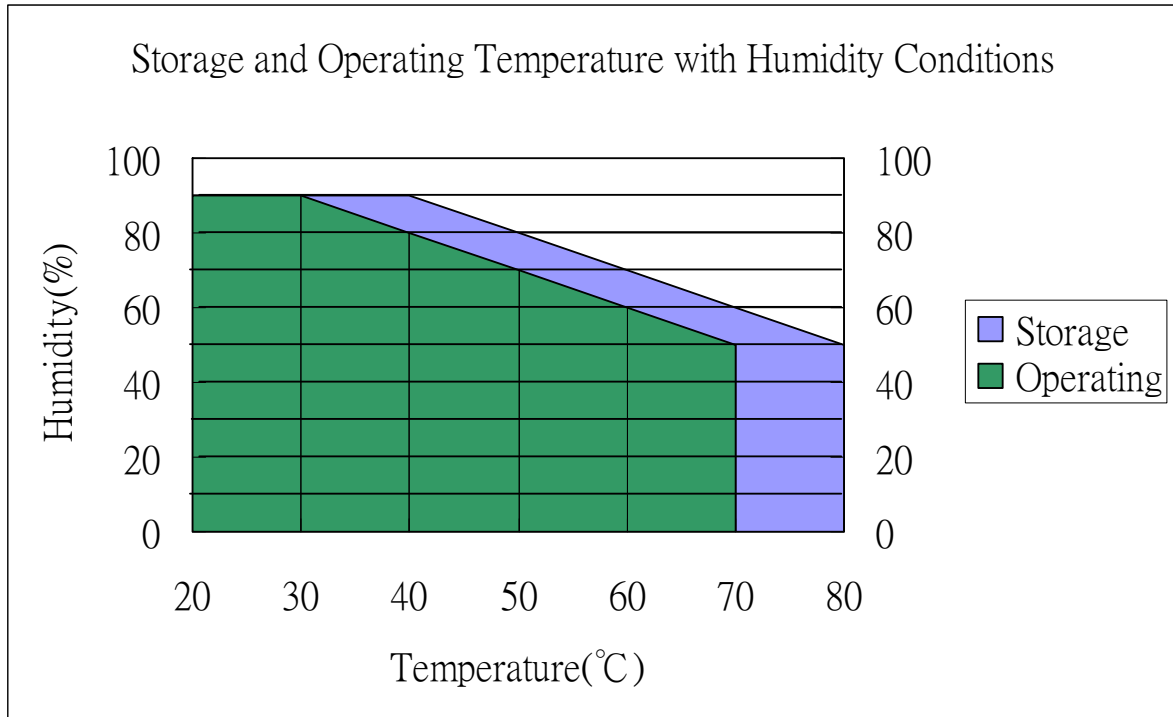


Fig.4 Storage and Operating Temperature with Humidity Conditions

5. Reliability Test

5.1 Exposure to high temperature

Touch panel is put into a test machine at the condition of 80°C for 504 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

5.2 Exposure to low temperature

Touch panel is put into a test machine at the condition of -40°C for 504 hours. Then it is left at the room temperature for 24 hours or more. The measurement must satisfy the following:

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	Model Name: 02514-00 Rev: C Size:12.26"	Page. 5 of 6

- 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

#### 5.3 Exposure to constant temperature and humidity

Touch panel is put into a test machine at the condition of 60°C, 90%RH for 504 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

#### 5.4 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 50 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

#### 6. Durability test:

Touch panel is hit 36 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

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7. Optical Performance

7.1 Optical inspection method and optical defect standards refer to AMT document A001 updated version ; "Touch Screen Optical Quality Standard."

7.2 Outside to Viewing Area: any optical defects in this area need to be ignored if no touch screen function is affected.

8. Others

8.1 Always store the touch screen in its original shipping container under normal conditions (Temperature 20~25°C; Humidity  $\leq$ 65%RH).

8.2 This Model is RoHS compliant.