

ATouch Technologies Co., Ltd.



Specification of 5 Wire Analog Resistive Touch Panel



A. Application

This specification applies to the **5 Wire Analog Resistive Touch Panel**.

B. Environmental Conditions

1. Operating Temperature Range

-20°C ~ 70°C

2. Operating Humidity Range

5% ~ 96% RH (no dew falls)

3. Storage Temperature Range

-25°C ~ 80°C

4. Storage Humidity Range

5% ~ 96% RH (no dew falls)

5. Water Spray

Not damaged by running water applied to the active area.

6. Vibration

Withstand 0.01 inches peak to peak excursion, at a frequency of 5 to 455 Hz, for a period of 15 minutes in each of three axes.

7. Chemical Resistance

The touch panel active area of the touchscreen is resistant to the following chemicals when exposed for a period of one hour at a temperature of 21°C:

- Acetone
- Ammonia-based glass cleaners
- Common foods and beverages
- Hexane
- Isopropyl alcohol
- Methylene chloride
- Methyl ethyl ketone
- Mineral spirits
- Turpentine



C. Electrical Characteristics

1. Supply Voltage

+5VDC, nominal.

2. Lead to Lead Resistance

50Ω ~ 200Ω (between X – H)

70Ω ~ 300Ω (between X – Y)

70Ω ~ 300Ω (between L – H)

50Ω ~ 200Ω (between L – Y)

3. Contact Bounce

Less than 10 ms (input by finger).

4. Electrostatic Discharge Protection

Withstands 20 discharges of 15kV, distributed randomly across the active area with proper transient protection.

(per EN 61000-4-2, 1995)

D. Mechanical Characteristics

1. Activation force

Less than 40gr.

Using by the silicone finger, hardness = 60°of diameter 16mm.

2. Input Methods

Finger, glove hand, pen or stylus.

3. Surface Hardness

Meets pencil hardness 3H (per ASTM D3363).

4. Position Accuracy (Linearity)

Less than 1%.

5. Resolution

Based on controller resolution of 4096 x 4096.

6. Cable

• Type: F.C.C. (flat conductor cable)

• Standard length: 300mm



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- Connecting area with touch panel
 - The tensile force: vertical to touch panel — 2.0 kg
 - straight to touch panel — 1.0 kg
 - Connecting type: 5 points soldering adding UV glue
 - Cable fold : 10 times in 1R, 180 degrees
 - Detail specification: ETC test, No.: ET-88T-12-102-C00

7. Connector

Five-position, 0.025 inch (0.635mm) square post receptacle with 2.54mm centers.

The times of insertions and withdrawals : at least 100 times.

E. Reliability

The following characteristics are generated by evaluating test samples after 2 hours leaving in the room condition when each of the reliability tests finishes.

Test Item	Result	Remark
Storage Temperature-high	80°C for 240hours	At ambient humidity
Storage Temperature-low	-25°C for 240hours	
Thermal Shock	-20°C (1hr.) ~ 70°C (1hr.) 10cycles	
High Temp./Humidity Test	60°C/90%RH : 240hours	
Operating Life 1 : Hitting Key Test (*1)	250g , 2 activations / sec. More than 35,000,000 times	By using Silicone finger (*2)
Operating Life 2 : Writing Test (*1)	250g , 4.5mm / sec. More than 1,000,000 times	By using polyester finger (*3)

*1 Without supplying Volts.

*2 Positions of hitting key are between the dots by Silicon finger (hardness 60° silicon rubber) of diameter 16mm.

*3 Writing test is made by polyester stylus pen with tip radius.



F. Optical Performance

Light Transmission 75~ 85% (typical value) (per ASTM D1003)

G. Cosmetic Performance

G.1 Surface Quality

Surface quality criteria recognize cosmetic irregularities appearing on or between the glass and plastic surfaces of the touchscreen. Cosmetic irregularities are normally classified into two parts, circular criteria and linear criteria.

G.1.1 Circular Criteria

Circular criteria recognize surface irregularities that are circular in nature, including dirt, hard coat flaws , particles, glass bubbles, etc.

Circular defect size will be measured across its diameter. Irregularly shaped circular defect diameters will be designated by the smallest diameter into which the defects could be completely covered, i.e. the length at the widest point of the defect.

Area	Diameter of Circular Defect	Comment	Accept or Fail
Active Area	$D > 0.51$ (0.02")		Fail
	0.51 (0.02") $\geq D \geq 0.38$ (0.015")	No more than two defects contained within 50.8 (2") \varnothing	Accept
	The sum of the diameters of all circular defects ≤ 1.27 (0.05")	Within 50.8 (2") \varnothing	Accept
	Black-colored specks or dirt, $D \leq 0.13$ (0.005")		Accept
View Area	$D > 1.02$ (0.04")		Fail
Outside View Area	$D > 1.91$ (0.075")		Fail

Unit : mm



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G.1.2 Linear Criteria

Linear criteria recognize surface irregularities that are linear in nature. Linear defect size will be measured across the width of the defect at its widest point.

Linear defects smaller than 0.025 mm (0.001") will not be considered in the evaluation of surface quality.

Area	Width Range	Maximum Length	Minimum Separation	Comment	Accept or Fail
Active Area	$W > 0.102$ (0.004")				Fail
	0.076 (0.003") ~ 0.102 (0.004")	12.7 (0.500")		A single defect	Accept
	1. The combined length of multiple linear defects within a 50.8 mm (2") diameter area shall not exceed the criteria listed below. 2. The distance between two linear defects shall not be less than the separation defined below. 3. When two linear defects are in different width ranges, the largest width range shall be used to decide minimum separation.				
	0.079 (0.0031") ~ 0.102 (0.0040")	12.7 (0.500")	6.35 (0.250")	Within 50.8 (2") \varnothing	Accept
	0.053 (0.0021") ~ 0.076 (0.0030")	25.4 (1.000")	3.81 (0.150")	Within 50.8 (2") \varnothing	Accept
	0.025 (0.0010") ~ 0.051 (0.0020")	38.1 (1.500")	1.27 (0.050")	Within 50.8 (2") \varnothing	Accept
	$W \leq 0.025$ (0.0010")				Accept
	Outside Active Area	$W > 0.305$ (0.012")			

Unit : mm

G.2 Coversheet Fit Criteria

Coversheet fit criteria relate to the degree of tightness of the coversheet to the touchscreen glass.

G.2.1 Proper Fit

Definition:

- Proper fit is characterized by a tight fitting coversheet.

Method:

- Put a plastic straight edge diagonally across the entire coversheet surface.
- Apply pressure in one corner in the area over the adhesive.

Criteria of determination:

- If the straight edge rests on the opposite corner, this is an acceptable fit (Figure 1).
- If the coversheet in the active area not to touch the straight edge when the straight edge is extended across the sensor on top of the adhesive, this is an acceptable fit (Figure 2).

Figure 1. Proper Coversheet Fit

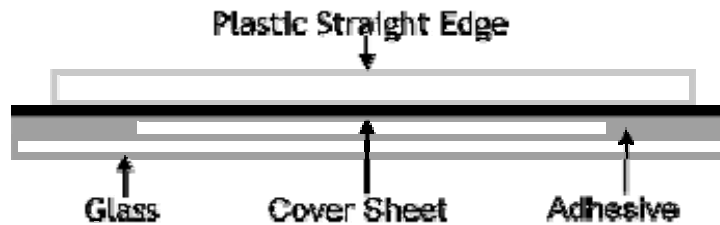
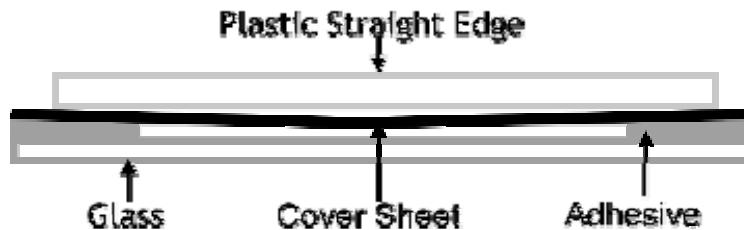


Figure 2. Proper Coversheet Fit





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G.2.2 Ripple Criteria

Definition:

- Ripple criteria are characterized by a wave or ridge in the coversheet which usually stretches from a high point on the screen, for example the cable contact area.

Method :

- Place a plastic straight edge diagonally across the entire coversheet surface.
- Apply pressure in one corner in the area over the adhesive.

Criteria of determination:

- If the straight edge rests on the opposite corner, this is an acceptable fit.
- If the coversheet drops below the straight edge and then rises and falls three times, the touchscreen should fail for improper fit (Figure 3).

Figure 3. Improper Coversheet Fit—Ripple

