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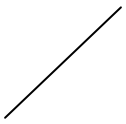
SPECIFICATION

4-wire ANALOG TOUCH PANEL

(MODEL : M070IA-AI)

Customer : 카즈머스

Issued : 2011.08.12 (Ver.03)

	PREPARE (R&D)	CHECK (R&D)	AGREEMENT (QM)	APPROVE (R&D)
Meeredp				
	11.08.12		11.08.12	11.08.12

	CHECK	CHECK	APPROVE
CUSTOMER			

meeredp

Rev NO.	DATE	Detail of revision	Remark
00	2011.08.12	First established	

1. Range of Application

This specification is applied to meeredp Product No. M070IA-AI03

2. Warranty

Touch Panel products manufactured to this specification shall be warranted for a minimum period of 12 months from the date of shipping from meeredp when stored or used as specified under normal conditions within the contents of these sheets.
If Touch Panel products are not stored or used as specified herein,
The 12 month - warranty will be void.

3. Shape

Shape, structure and Dimension are referred to the proper Drawing
No. M070IA-CD-AI03

4. Rating

4.1 Maximum voltage and current

Less than DC7V,1mA at the contact point of top layer and bottom layer

4.2 Operation temperature

From -20℃ to +60℃ (humidity: from 20%RH to 90%RH)

4.3 Storage temperature

From -30℃ to +70℃ (humidity: from 20%RH to 90%RH)

5. Electrical

5.1 Terminal resistance unit of measurement

Between X1 and X2 (top layer) : 100 ~ 1200 Ω
Between Y1 and Y2 (bottom layer): 100 ~ 1200 Ω

5.2 Linearity

X axis : ±1.5% or less
Y axis : ±1.5% or less
* Measurement as per attached Appendix 1.

5.3 Insulation resistance

Minimum 20MΩ at DC25V

6. Mechanical performance

6.1 Input method
R0.8 stylus or finger

6.2 Actuation force
Input with stylus : 100g or less (R0.8 Polyacetal stylus)
Input with finger : 200g or less (R8.0 Hs40 silicon rubber)

6.3 Transparency
80% or more
(Measuring apparatus : Haze meter-made by NIPPON DENSYOKU IND.
according to JIS-K7105)

6.4 Surface hardness
Pencil hardness 3H or more according to JIS-K5400.

7. Reliability

7.1 Exposure to high temperature
Put it in a vessel at the condition of 80℃ for 240 hours, and then leave it at room temperature for 24 hours or more.
The measurement must satisfy the following:
▶ Resistance between terminals: According to Section 5.1
▶ Linearity: According to Section 5.2
▶ Insulation Resistance: According to Section 5.3

7.2 Exposure to low Temperature
Put it in a vessel at the condition of -40℃ for 240 hours, and then leave it at room temperature for 24 hours or more.
The measurement must satisfy the following:
▶ Resistance between terminals: According to Section 5.1
▶ Linearity: According to Section 5.2
▶ Insulation Resistance: According to Section 5.3

7.3 Exposure to constant high temperature and high humidity
Put it in a vessel at the condition of 60℃,90%RH for 240 hours, and then leave it at room temperature for 24 hours or more.
The measurement must satisfy the following:
▶ Resistance between terminals: According to Section 5.1
▶ Linearity: According to Section 5.2
▶ Insulation Resistance: According to Section 5.3

7.4 Repetition of high and low temperature

Put it in a vessel at the condition of -40℃ for 30 minutes and then 80℃ for 30 minutes. This process is repeated 10 cycles.
Then it is left at room temperature for 24 hours or more.
The measurement must satisfy the following:

▶ Resistance between terminals: According to Section 5.1
▶ Linearity: According to Section 5.2
▶ Insulation Resistance: According to Section 5.3

8. Durability

8.1 Writing friction

Write 100,000 capital or small alphabetical characters with a stylus in an area 20㎜×20㎜.
Stylus is used as below on the following conditions:
Pen:0.8R Polyacetal stylus Loads : 250gf
Speed:1,000 characters/hour Measurement Position:Center of Panel
The measurement must satisfy the following:

▶ Resistance between terminals: According to Section 5.1
▶ Linearity: According to Section 5.2
▶ Insulation Resistance: According to Section 5.3

8.2 Finger touches

Punching 1,000,000 times with a silicon rubber R8.0, hardness of 70.
Force : 250g , Speed : 2 Times a second
The measurement must satisfy the following:

▶ Resistance between terminals: According to Section 5.1
▶ Linearity: According to Section 5.2
▶ Insulation Resistance: According to Section 5.3

8.3 Flexible tail peeling strength

400g/㎝ or more
(peeling upward by 90° deg. in the direction of X, speed:50㎜/min)

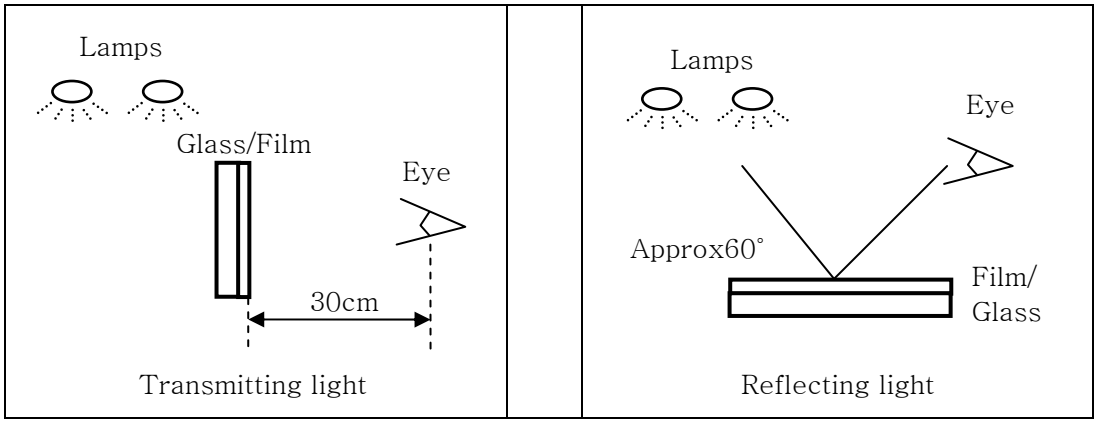
9. Cosmetic inspection criterion

The followings are applied to the viewing area only. Those in the non-viewing area are ignored as long as the electrical performance of the touch panel is normal. W=Width, L=Length, t=Glass thickness. Contamination that can be cleaned using a soft cloth with ethyl alcohol does not apply to these inspection criterion. But if an object is in the viewing area after rubbed by the soft cloth to a direction 3 times longer, it is considered a linear foreign object.

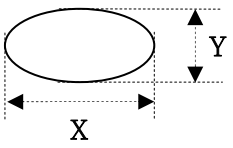
▶ Inspection condition

The Inspection shall be performed by using two 14W fluorescent lamps.

The panel shall be placed at 30㎝ away from eyes as shown below.



9.1 Spots And Dots

Inspection Method	Criteria
D ≤ 0.15㎜	Ignored
0.15㎜ < D ≤0.3㎜	3 or less (distance 5㎜ over)
D > 0.3㎜	NG
 (X+Y)/2=D	

9.2 Liner Foreign Matter

Inspection Method	Criteria
W ≤ 0.03㎜	Ignored
0.03㎜ < W ≤0.05㎜, L ≤ 2.0㎜	3 or less (distance 5㎜ over)
W > 0.05㎜	NG

9.3 Scratch

Inspection Method	Criteria
W ≤0.03㎜	Ignored
0.03㎜ < W ≤0.05㎜, L ≤ 5㎜	3 or less (distance 5㎜ over)
W > 0.05㎜	NG

9.4 Fish Eye

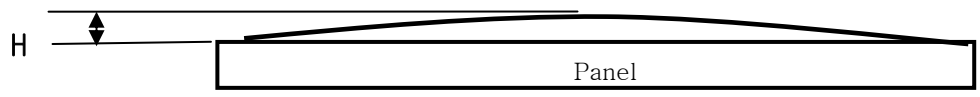
Inspection Method	Criteria
D ≤0.15㎜	Ignored
0.15㎜ < D ≤ 0.5㎜	3 or less♪(di♪tance 5㎜ over)
D > 0.5㎜	NG

9.5 Newton's Ring

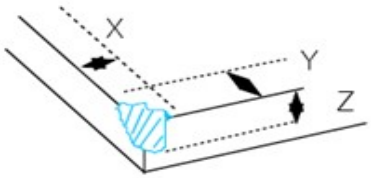
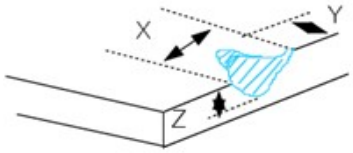
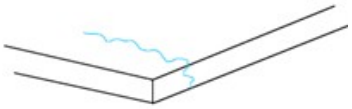
Inspection Method	Criteria
D ≤ 7㎜	1 or less
D > 7㎜	NG

9.6 Film Bagginess

Inspection Method	Criteria
H ≤ 0.3㎜	Acceptable



9.6 Glass breakage

	Criteria
Corner Crack	 X ≤ 2.0mm Y ≤ 2.0mm : Ignored Z ≤ t
General Crack	 X ≤ 3.0mm Y ≤ 2.0mm : Ignored Z ≤ t
Bad Crack	 All shall be rejected. : NG By naked eyes.

10. Inspection

10.1 Resistance between terminals
Criterion : According to Section 5.1.
All the T/Ps are inspected.

10.2 Linearity
Criterion : According to Section 5.2.
All the T/Ps are inspected.

10.3 Insulation resistance
Criterion : According to Section 5.3.
All the T/Ps are inspected in the first production lot.
Sampling inspection from the second lot.

10.4 Appearance
Criterion : According to Section 9.
All the T/Ps are inspected.

11. Handling Remarks

SUBJECT	NOTE
Storage	① Store touch panels in boxes at room temperature. ② Please do not expose touch panels to a direct ray of the sun.
Unpacking	① Open the box after checking the up/down indicator. ② Please do not touch where tails are heat-sealed in order to avoid disconnection.
Handling	① Use gloves and masks when handling touch panels. ② Please do not touch where tails are heat-sealed in order to avoid disconnection. ③ Hold touch panels around outside of viewing area. ④ Please do not pile touch panels onto other touch panels. ⑤ Please do not put heavy objects on touch panels. ⑥ Clean off touch panels with soft clothes with alcohol when surface is dirty. ⑦ Please do not use organic solvents except alcohol.
Assembly	① Please design housing which minimizes stress onto touch panels. ② Please pay attention not to harm touch panels with your tools which may be used for assembling. ③ Please pay attention not to create any stress to the heat-sealed tails.
Housing design	① Keep the gap (over 0.3㎜) between the touch panel and flat-panel display to protect a display device. The reason is to prevent the bezel edge from contacting touch panel surface which may cause a short with the bottom layer. ② Keep the gap (over 0.3㎜) between the bezel edge and touch panel surface. ③ We recommend the use of a cushion material between the touch panel and the bezel. ④ The cushion material should be limited only on the busbar area. If it is out of the busbar area, a short may occur.
Operation	① Please do not operate touch panels by applying excessive force. ② Please do not use a sharp things except finger or R0.8 polyacetal tip pen for input. ③ We recommend calibration after long term use.

12. Others

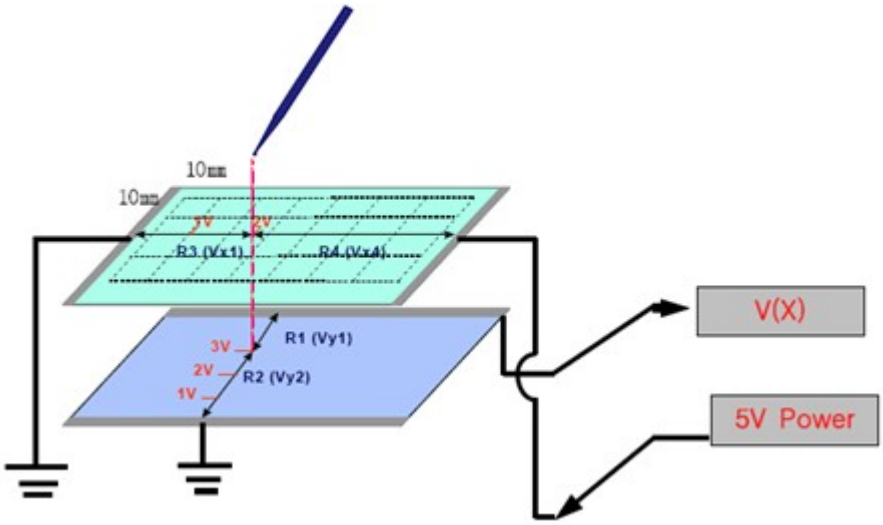
12.1 This specification shall guarantee the quality of the product.
When using the products, be sure to check and evaluate after installing on your equipment.

12.2 After evaluation, please return approval sheet or our specification submitted, with approval stamp on it.

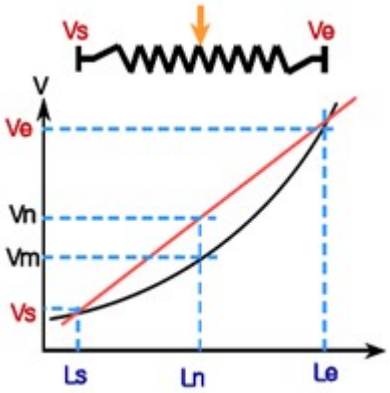
12.3 Any changes of the approved specification are subject to agreement prior to the actual changes.

Appendix 1 ; Linearity

Voltage (DC 5 volt) is applied to the top electrode.
Output Voltage V(X) on the bottom electrode is measured at every crossing point.



Linearity is measured by ;



Vs : Start voltage in the resistance
Ve : End voltage in the resistance
Ls : Starting point of resistance
Le : Ending point of resistance
Ln : Measuring point of resistance
Vm: Measured voltage of Ln
Vn : Expecting voltage of Ln

$$\text{Linearity} = \frac{[Vn - Vm] \times 100}{Ve - Vs}$$

For the Y axis direction, exchange the Voltage Input direction, and measure the voltage in the same way.

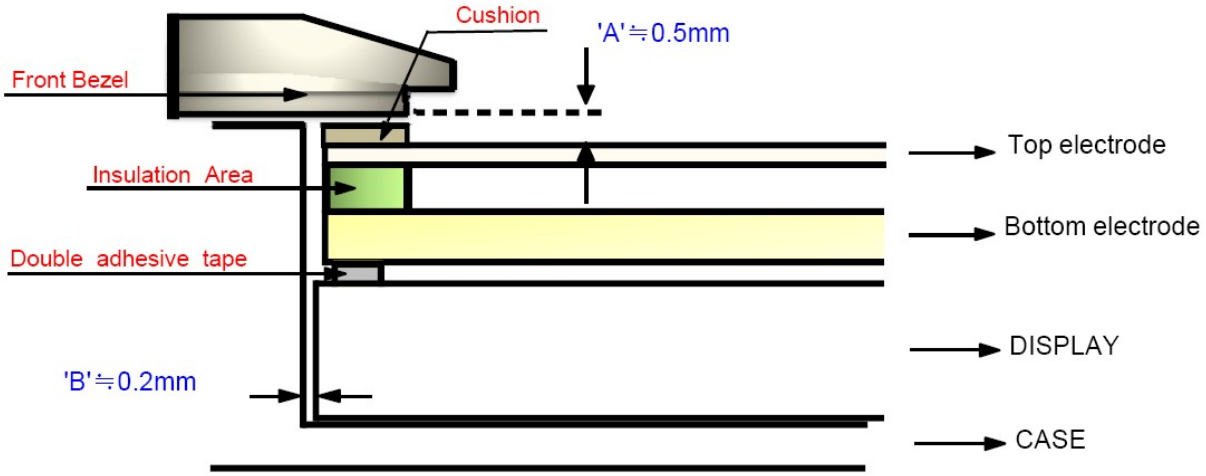
Appendix 2 ; Mounting Notice

Bezel edge should be positioned in the area between the Active Are and the View Area.

The gap 'A' is needed between bezel and top electrode and would be approximately 0.5mm.

Cushion is needed as distortion might be on the top electrode.

The gap 'B' is needed to absorb the tolerance in the case and connector.



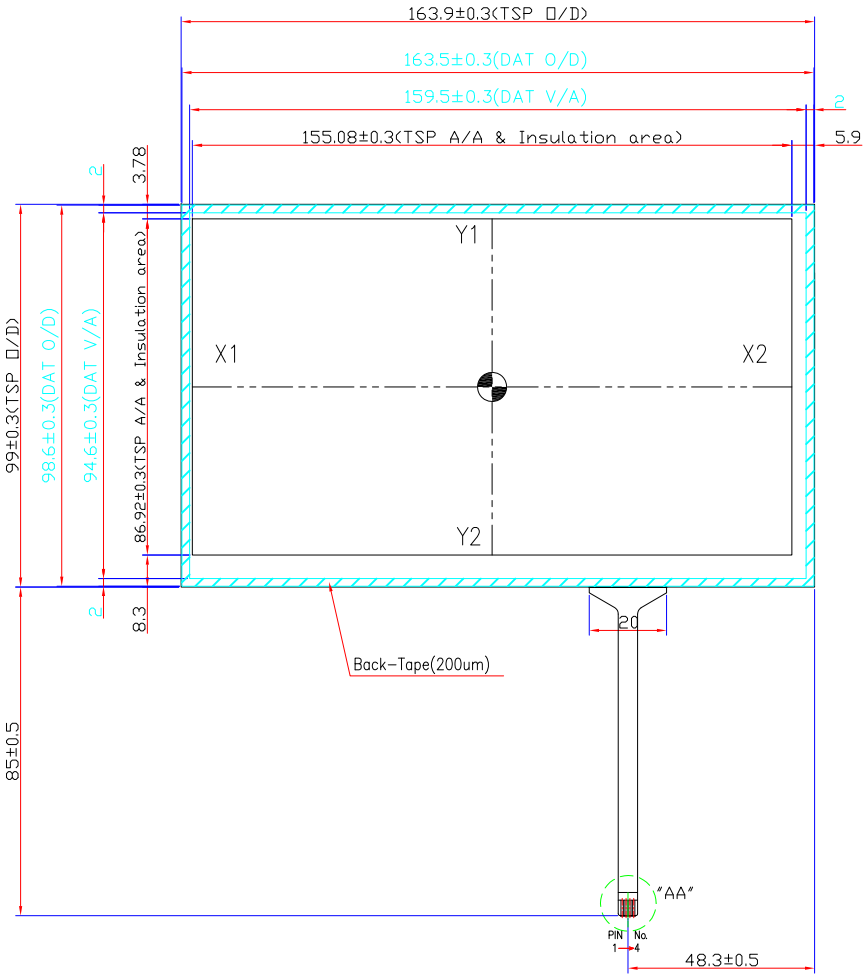
< Scheme of Mounting >

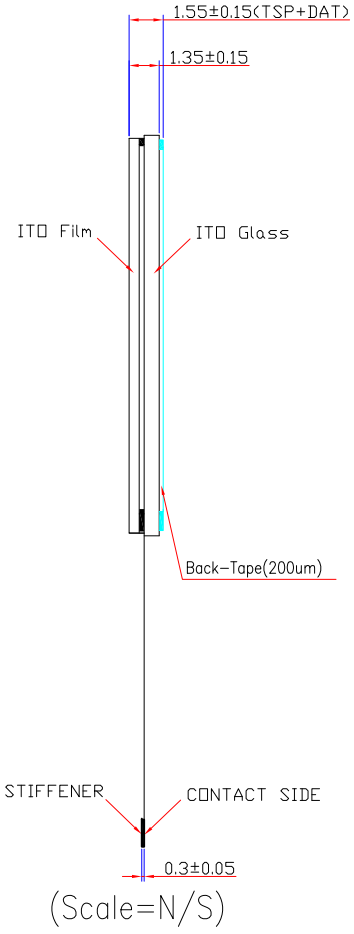
CUSTOMER APPROVAL

DATE : / /

REV.No.	REVISED	DATE	DRAWN	CHECKED	APPROVED
0					

DATE	11.03.08	SCALE	DIM.	STD.TOL	DRAWING NO.	UNIT
DESIGNED	D.Y.HWANG	1 : 1	1 : 1	±0.3	M070IA-CD-AI03	MM
CHECKED	/	meeredp			PRODUT NO.	SIZE
APPROVED	Y.B.SHIM				M070IA-AI03	A4



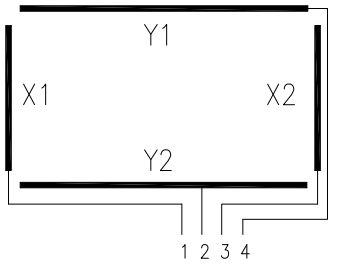


(Scale=N/S)

REMARK

Glass THK.	■ 0.7mm □ 1.1mm
Film type	□ Clear ■ Non-glare
Total THK.	■ 0.95±0.15mm □ 1.35±0.15mm
Linearity	±1.5% or less
Transmittance	80% or more
Resistance	100 < X axis < 1200 ohm
	100 < Y axis < 1200 ohm
Tail	FPC(Ni+Au)
TFT-LCD MAKER	

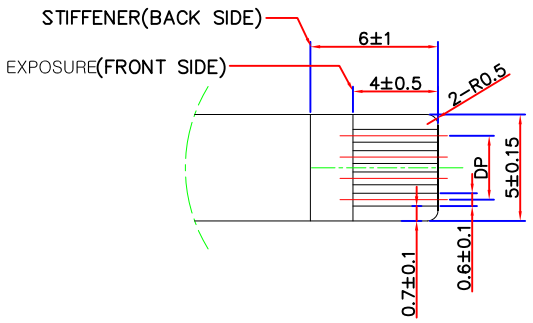
CIRCUIT DIAGRAM



SIGNAL ASSIGNMENT

Pin No	Signal
1	X1
2	Y2
3	X2
4	Y1

Detail "AA"(Scale=5/1)



DP=P1.0*3=3.0±0.15

Notes

* It is absolutely forbidden to draw line along with the edge of the housing because the extreme force will damage the upper layer and cause the failure of the Touch Panel