MULTI-INNO TECHNOLOGY CO., LTD.

www.multi-inno.com

TOUCH PANEL SPECIFICATION

Model : MI0500CAP-C

For Customer's Acceptance:

Customer	
Approved	
Comment	

Revision	1.2
Engineering	
Date	2013-03-07
Our Reference	

REVISION RECORD

Date	Rev.No.	Page	Revision Items	Prepared
2011.05.19	**V 1.0**		**The first formal release.**	
2012.10.07	**V 1.1**		**Update power supply current**	
2013.03.07	**V 1.2**		**Change IC as TANGO_C48.** **Change power supply voltage.** **Change Timing Chart**	

CONTENTS

1. General Specifications

The projected capacitive touch technology applied to this product is an ITO-based touch technology. It consists of one glass substrate layers with ITO coating patterned into a grid of rows/columns and cover lens that are laminated together. During a touch, the capacitance of the finger changes the capacitive coupling between the grid elements on the location of the touch. This location is calculated from the change in electrical characteristics of the sensor grid. Mathematical processing, programmed in the Touch Controller chip, is used to recognize this distortion. Capacitive sensors can be touched with a bare finger or a conductive device being held by a bare hand. They are not affected by outside elements and have high clarity.

The purpose of this specification is to define the general provisions and quality requirements that apply to the supply of capacitive touch sensor or capacitive touch panel (CTP) module manufactured by Multi-Inno.This document, together with the Module Drawing, is the highest-level specification for this product. It describes the product and contains specifications.

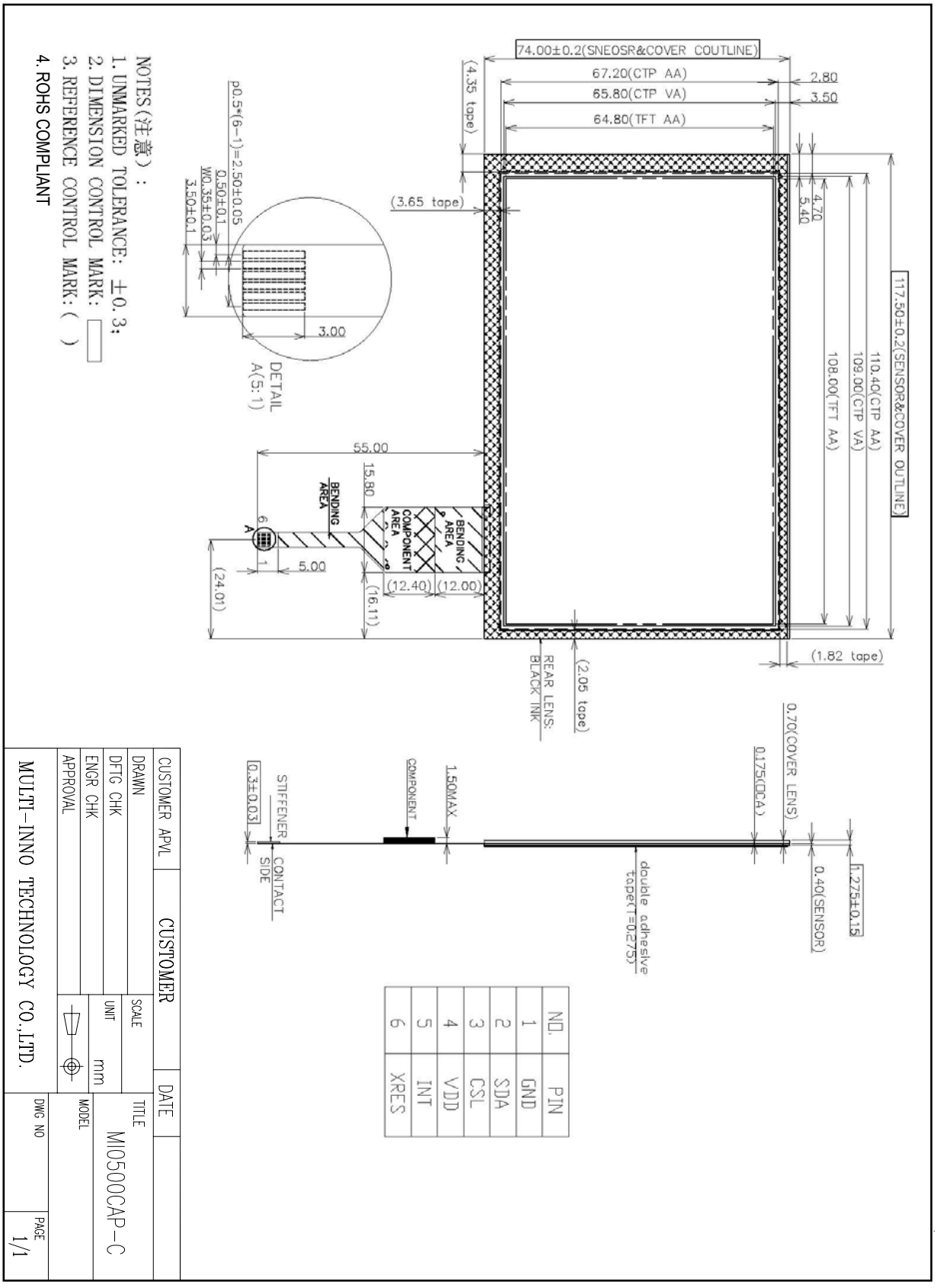
1.1 General overview

Features	Details	Unit	Note
Operation Technology	Projected capacitive	-	1
Product type	Capacitive touch lens	-	-
Product structure	Glass Lens/Glass Sensor	-	2
Input Method	Bare finger or a conductive device being held	-	-
Number of simultaneous touches	2 points multi-touch	-	-
Minimum Touch Area	Φ6	mm	-
Connection Type	FPC connector(0.5mm Pitch)	-	2
Customer Application	✓ Media Player ✓ Game Console	-	-
FG Weight	TBD	g	-

Note 1: Mutual mode.

Note 2: RoHS compatible.

2. Outline Drawing



3. Circuit Block Diagram

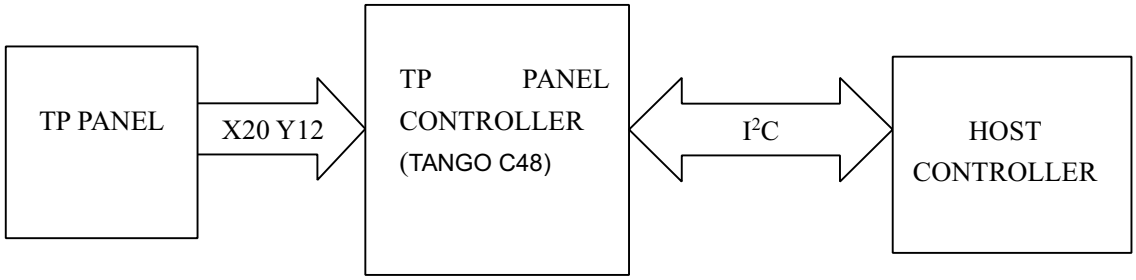


Fig2. System Block Diagram

4. Production Description

4.1 General description

Item	Contents	Unit	Note
Product size	5.0	inch	
TP outline	117.50 (W) x 74.00 (H) x 1.275 (T)	mm	
TP active area	110.40(W) x 67.20 (H)	mm	
Resolution	800*480		
Operation temperature	-20℃~70℃	℃	
Storage temperature	-30℃~80℃	℃	
Control IC	TANGO C48		
Interface	I²C		
Surface Hardness	6	H	
Transmission	88	%	

4.2 Structure description

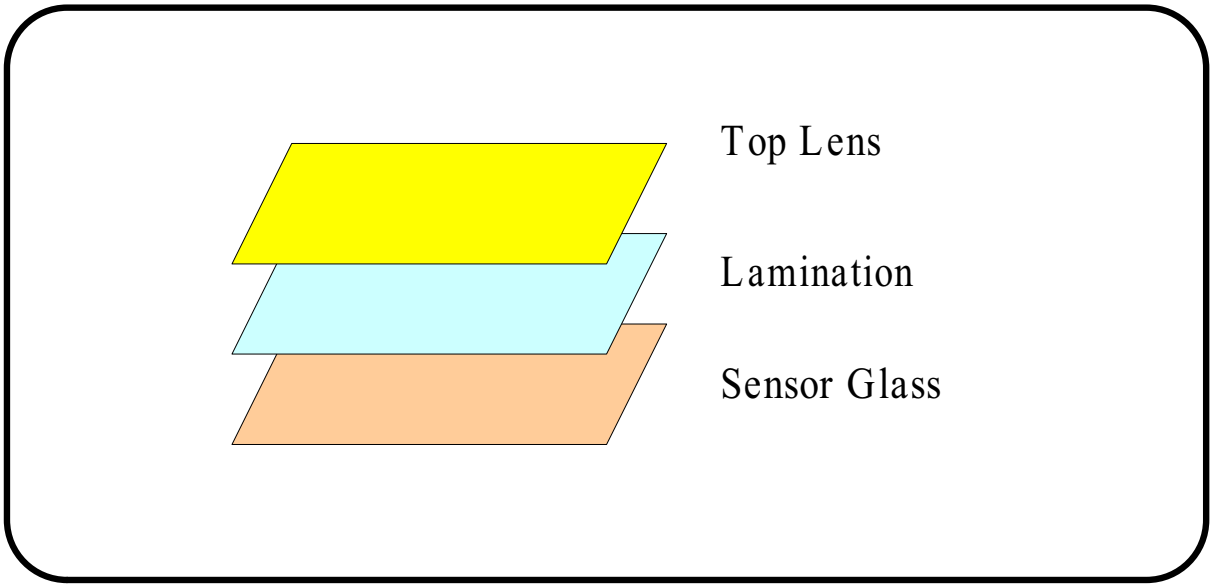


Fig3. Structure of touch lens

4.3 Hardware interface block diagram

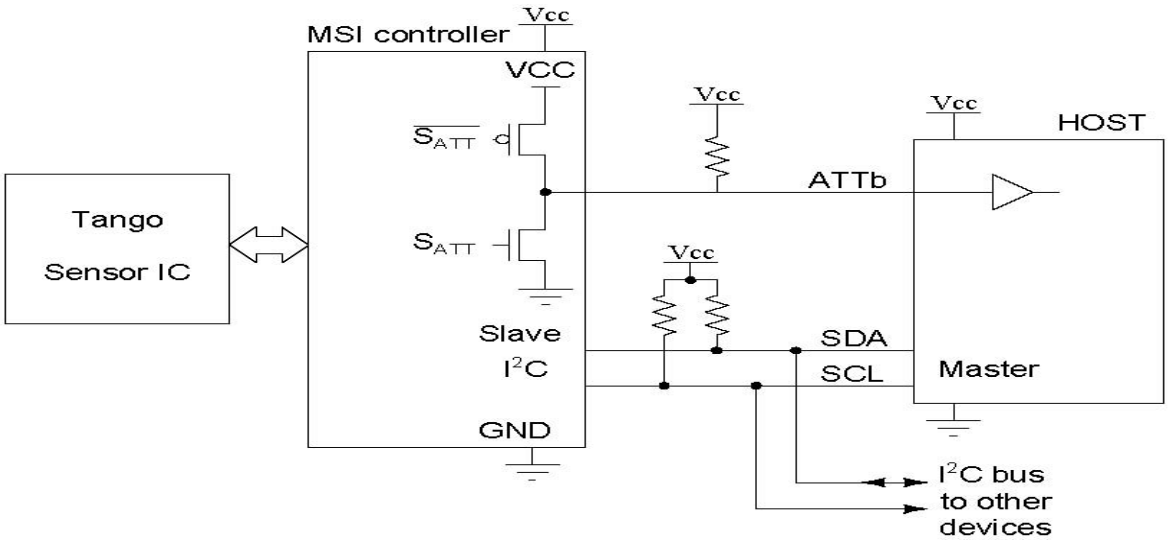


Fig 4 .Reference environment configuration

4.4 Product specification

(T_A= 25℃)

Item	Min	Typ	Max	Unit	Note
Digital power supply voltage	2.8	3.3	3.6	V	DC (noise should be under 100mV)
Power supply current		TBD	4.0	mA	One finger on sensor

Note1: All current measurement is average current.

5. FPC interface pin and Interface Timing Chart

5.1 The FPC Connection of CTP

Pin No.	Symbol	I/O	Description	Remark
1	GND	P	Ground.	-
2	SDA	I/O	I2C data signal.Must be pulled high.	1
3	SCL	I	I2C clock signal.Must be pulled high.	1-
4	VDD	P	CTP power supply.	-
5	INT	O	Interrupt signal.	1
6	XRES	I	Reset pin.Must be pulled high.	1

Note :

1.Please contacts to product supplier for detail define information.

5.2 Interface Timing Chart

Note: Please refer to TANGO C48 data sheet for more details.

MSI device address = 0x5C .

I2C slave can hold off the master in the middle of a transaction using what's called clock stretching (the slave keeps SCL pulled low until it's ready to continue). Refer to figure 5 for a example.

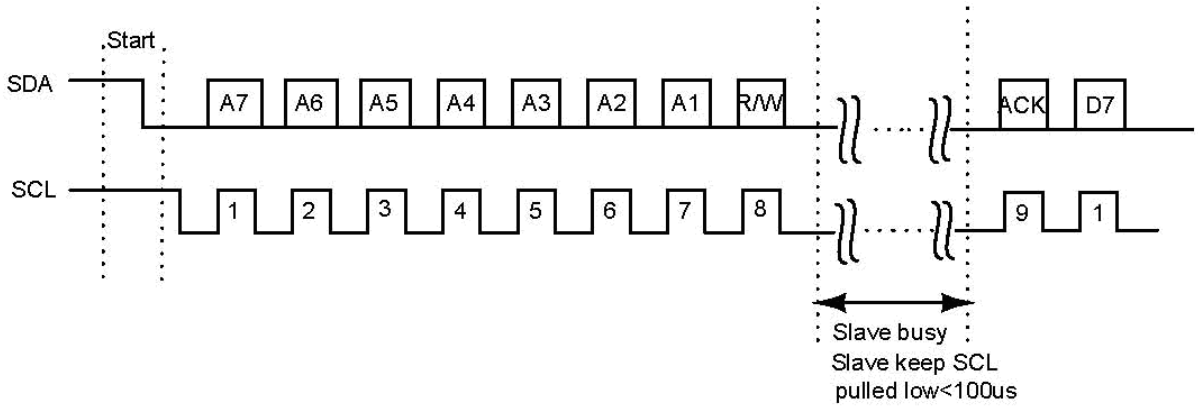


Figure 5 : I²C clock stretching example

Fig 6 .Read operation

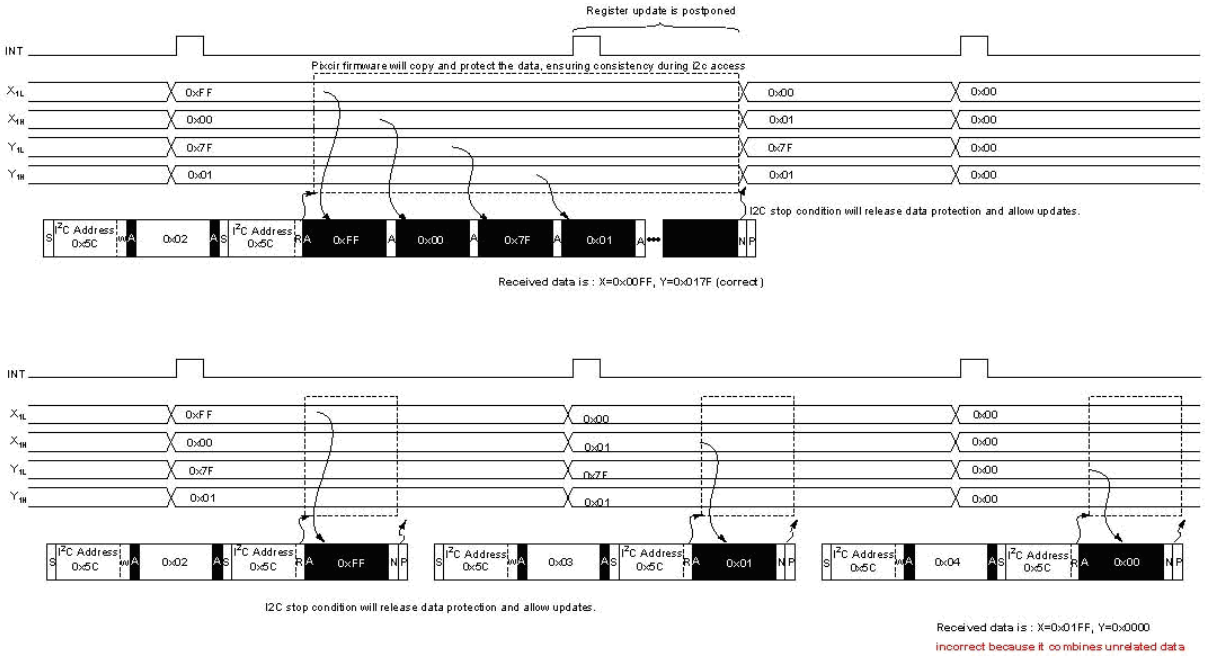


Fig 7 .Coordinates read operation

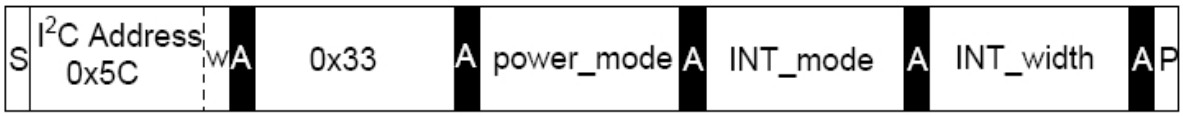


Fig 8 .Coordinates write operation

MSI Registers

The accessible registers are shown in the following table. These registers are technically accessible both for reading or writing direction. However, most registers have only one meaningful direction: finger position registers, for example, are typically used in read direction, and writing to them will have no effect; their content will be overridden after a new sensor scan.

Table 5.1. MSI registers,coordinates

Address	Type	Name	Description	Category
0	char	touching	Bitfield, see table 10	touch
1	char	buttons	Buttons bitfield	
2 (lsb) 3 (msb)	int	posx1	Finger #1 X position	
4 (lsb) 5 (msb)	int	posy1	Finger #1 Y position	
6	char	id1	Finger #1 identificator	
7 (lsb) 8 (msb)	int	posx2	Finger #2 X position	
9 (lsb) 10 (msb)	int	posy2	Finger #2 Y position	
11	char	id2	Finger #2 identificator	
12 (lsb) 13 (msb)	int	posx3	Finger #3 X position	
14 (lsb) 15 (msb)	int	posy3	Finger #3 Y position	
16	char	id3	Finger #3 identificator	
17 (lsb) 18 (msb)	int	posx4	Finger #4 X position	
19 (lsb) 20 (msb)	int	posy4	Finger #4 Y position	
21	char	id4	Finger #4 identificator	
22 (lsb) 23 (msb)	int	posx5	Finger #5 X position	
24 (lsb) 25 (msb)	int	posy5	Finger #5 Y position	
26	char	id5	Finger #5 identificator	
27	char	strength1	Finger #1 strength	
28	char	strength2	Finger #2 strength	
29	char	strength3	Finger #3 strength	
30	char	strength4	Finger #4 strength	
31	char	strength5	Finger #5 strength	

Table 5.2. Touching

Bit 0,1,2	Nb of fingers touching (NBF)
Bit 3	Noise flag (indicates the report is unreliable) (NOI)
Bit 4	message flag (indicates a message string is sent by slave) (MSG)
Bit 5	buffer indicates the master has missed more than 2 reports, which are stored in buffer array (BUF)
Bit 6	palm flag (indicates the algorithm has a palm or similar blocking issue) (PAL)
Bit 7	water flag, indicates the algorithm has a rejected inputs due to water (WAT)

Table 5.3. MSI registers, gestures and monitoring

Address	Type	Name	Description	Category
32 (lsb) 33 (msb)	int	initial_distance	Distance separating fingers on the first time multitouch is detected	gesture
34 (lsb) 35 (msb)	int	distance	Distance separating fingers	
36 (lsb) 37 (msb)	int	ratio	100·distance / initial_distance	
38	char	water_level		
39	char	noise_level		
40	char	palm_level		monitor
41	char	signal_x		
42	char	signal_y		
43 50	char	button1 button8	Signal level of the buttons	buttons
51	char	power_mode	Power management register. See §2.2.3 and table 16	power management
52	char	INT_mode	Control of the ATTb pin, see §2.2.4 and table 17	
53	char	INT_width	ATTb pulse width	
54-57	char		reserved for future use	
58	char	SPECOP	Special operation . See table 13	special operations
59 (lsb) 60 (msb)	int	EEPROM_read_addr	Address used during special operation	
61	char	Engineering_cmd	Allows, with I²c, to send "hyperterminal like commands" for engineering modes	
62 (lsb) 63 (msb)	int	CRC	FLASH CRC value (must be requested by SPECOP), excluding "EEPROM" zone	version
64-95	char	version[0..31]	Customer version control (32bytes) (imap to "eeprom")	

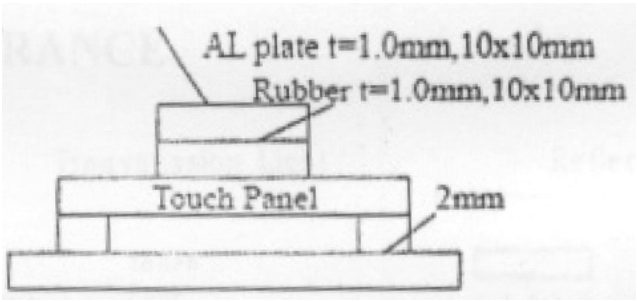
Table 5.4 MSI registers, gestures and monitoring

Address	Type	Name	Description	Category
96-135	char	message[0..39]	Null terminated ASCII message string for engineering and debug purpose	
136 (lsb) 137 (msb)	int	RAW_CTRL	Controls RAW data mode (internal, raw, etc. . .) see table 14	
138	char	cross_x	X coordinate for method 1 crossing node measurement request	method 1
139	char	cross_y	Y coordinate for method 1 crossing node measurement request	
140 (lsb) 142 (msb)	int	cross_node	Measurement result for method 1	
142 (lsb) 143 (msb) 144 (lsb) 145 (msb) etc.	int int int	RAW[0..69] shared with history_buffer	Raw data, content controlled by RAW_CTRL register, or alternatively, history buffer (see below)	RAW data

6 Reliability

6.1 Mechanical test

No.	Item	Requirement	Verification method
1	Impact Resistance test	No crack after test.	Use the 9mm diameter steel ball is dropped on the Glass surface from 30cm height at 1time(Glass side)
2	Static Load Resistance Test	No crack after test.	After 4.5Kg load for 1min is applied to the center area (1.0cm2) of the Touch panel, the requirements in optical characteristic and electrical characteristics shall be satisfied.

			
3	Surface hardness	6H	JIS-K5600

6.2 Electrical test

No.	Item	Specification	Remark
1	Function test	No open and No short for ALL X/Y sensors Linearity is OK	Test condition (Ta=25℃,VDD=3.0V)

6.3 Optical test

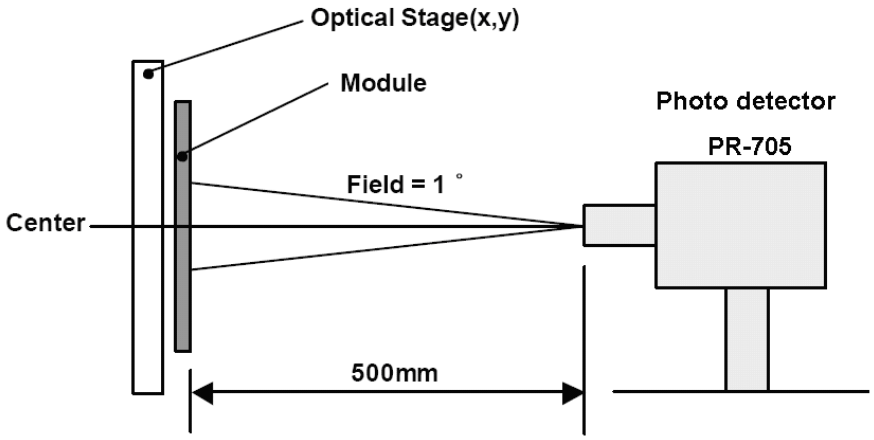
(Ta = 25 °C)

Item	Symbol	Condition	Min.	Typ.	Max.	Unit	Remark
Transmission	%	550nm	86	88	90	%	Note 1

Note 1: Measuring equipments: DMS-501, PR-705. @550nm

Measuring condition:

- After stabilizing and leaving the panel alone at a given temperature for 30 min, the measurement should be executed,
- Measuring surroundings: a stable, windless and dark room,
- Measuring temperature: Ta=25°C,
- 30 min after lighting the back-light.



6.4 Environmental / Reliability Tests

No	Test Item	Test condition	Criterion
1	High Temperature Storage	+80℃±2℃ 120H Power off	After testing, cosmetic and electrical defects should not happen.
2	Low Temperature Storage	-30℃±2℃ 120H Power off	
3	High Temperature Operation	+70℃±2℃ 120H Power on	
4	Low Temperature Operation	-20℃±2℃ 120H Power on	
5	High Temperature & Humidity Operation	+60℃±2℃ 90%RH±2%RH,120H Power off	

Note:Additional test Item proposed by customer shall be determined by mutual agreement between customer and Multi-Inno.

For consumer production uses, we recommended the temperature operation range of 0~60 d egree, beyond this temperature range can still be used, but the performance may be decrease, the difference with the production will be different.

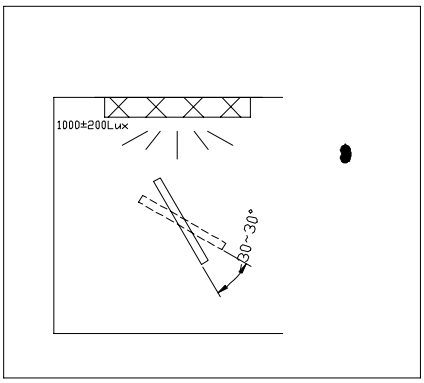
7. Specification of Quality Assurance

7.1 Inspection condition

a. Inspected Temperature：20～25℃,Inspected Distance：30±5cm.

b. Viewing Angle:

When inspecting, keep the eyesight perpendicular to the product surface:90± 30 degree,as below.



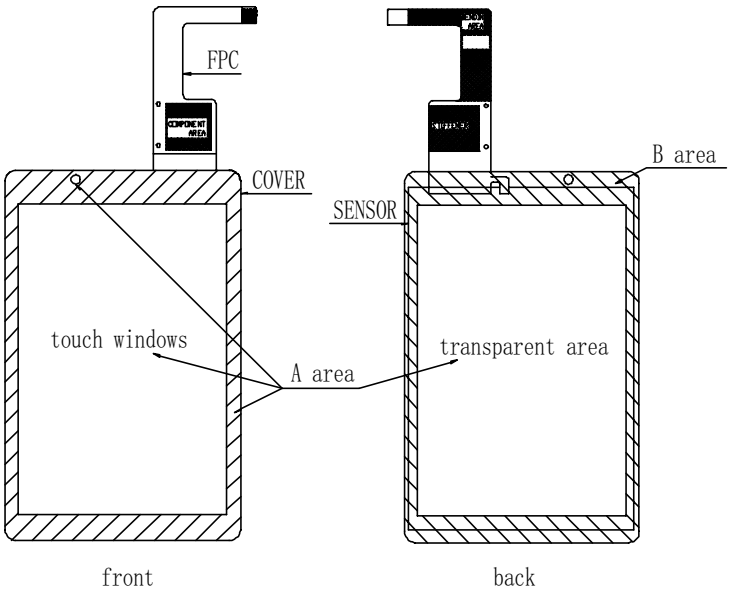
c. Inspected illumination:1000±200Lux.

d. Inspected background：Under black background

7.2 Definiton for the appearance area.

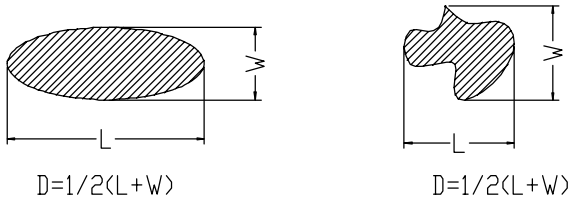
A area: The front area of the sample and the transparent area from the backside; as below;

B area: The backside printing area. As below.



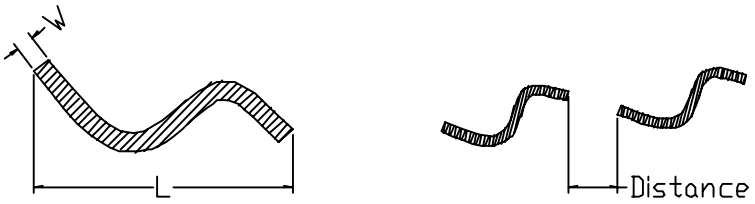
7.3 Definiton for the defects.

a. Circular Defects:

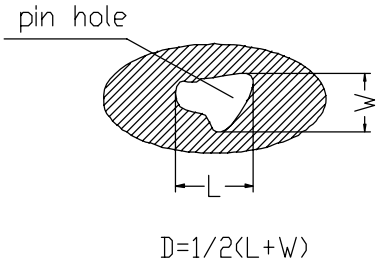


D: diameter W:width L: length (the same as below)

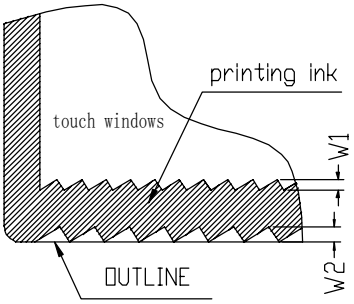
b. Linear Defects:



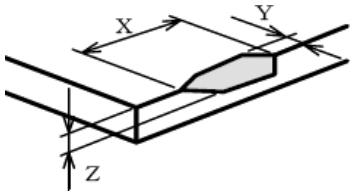
c. Pin hole(Translucidus)



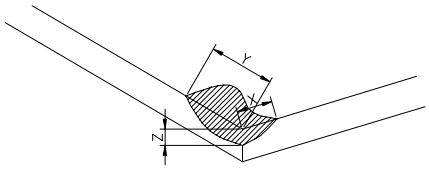
d. Zigzag for the printing ink



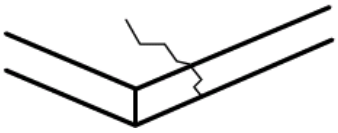
e. Edge Crack Chip



f. Corner Crack Chip



g. Bad Crack



7.4 Foreign object

A-level standard

No.	Inspection items	Judgment standard(Unit：mm）		
1	Circular Defects(Dot、Impurity、Dust、Bubble)	Defect Size	Judgment（A Area）	Judgment（B Area）
		D≤0.10	Neglected(distance≥10)	Neglected

		0.10＜D≤0.15	N≤2，(distance≥10）	
		D＞0.15	NG	
		Notes：1、The circular defects which can be removed is ignored. 2、The circular defects of B area should not affect to assembly,functionality or final look of the product. 3, The circular defects of A area does not include the protective film, TThe circular defects of B area does not include the adhesive tapes.		
2	Linear Defects(Scratch Line\Foreign material)	W(width)/L(length)	Judgment	
		W≤0.05，L≤3.0	Neglected(distance≥10）	
		0．05＜W≤0.1，L≤3.0	N≤2，(distance≥10）	
		W＞0.1，L＞3.0	NG	
		Notes：The foreign meterial which can be removed is ignored.		
3	Dent	Defect Size	Judgment（A Area）	Judgment（B Area）
		D≤0.15	Neglected(distance≥10）	Neglected
		0.15≤D≤0.3	N≤3，(distance≥10）	
		D＞0.3	Not allowed	
		Notes：1、The foreign meterial which can be removed is ignored. 2、The foreign meterial of B area should not affect to assembly,functionality or final look of the product.		
4	Dirt/Fingerprint/ Smokes/Snake/Rainbow effect	A area：not allowed； B area：neglected（Not affect to assembly,functionality or final look of the product.）		
5	Printing ink color	The printing ink color should be consistent with design drawing.(or client standard sample).		
6	Printing ink color difference	1、 The judgement area is the front non-translucent zone of the sample. 2、 Accept the same series ink color printing shift.		

		3、Color difference of IR hole,light sensor hole is not inspected. 4、If there is customer's inspection criteria or sample,determining by customer's inspection criteria or standard sample.
7	Transmittance-rate (IR hole\light sensor hole)	Meet design drawings.
8	Printing pin hole	Not allowed
9	Font / Logo	Font / Logo should be printed smooth, no jagged, shadow, penetration, wear and tear, displacement, disconnection and connection defects
10	Breakage on edge or corner	A area(front side)：not allowed. B area(back side)：X≤0.2,Y≤0.2,Z≤1/5T; N≤2，(distance≥20)，Neglected
11	Crack	Not allowed
12	Printing ink Edges burrs / Printing ink Zigzag	1、the front (back) printing ink edge of the touch window region : W1≤0.2，OK；W1＞0.2，NG。 2、the front (back) printing ink edge of the sample: W2≤0.3，OK；W2＞0.3，NG。
13	Foreign material of printing area	(1).The touch windows + 0～2.0mm：the criteria is same to Circular Defects； (2). The touch windows + 2.0 ～ 5.0mm： D≤0.3，Neglected(distance≥5.0) (3).The other areas:D≤0.5，Neglected(distance≥5.0)
14	Circular Defects for LED hole/ IR hole/sensor hole	Sensor hole、LED hole：D≤0.1mm，N≤1，allowed ； D＞0.1mm, not allowed； IR hole：D≤0.1mm，neglected； D＞0.1mm，not allowed。
15	Bad cutting section for cover/sensor	1.Cutting section allow the wave-like phenomenon, but the cutting edge level of view must be a smooth line; 2, cutting section does not allow any cracks appearance.
16	Surface Dirt	1, the process dirt which can not wipe with alcohol is not allowed; 2, The dirty can be wiped with a clean cloth or with clean cloth &alcohol , and the dirt is less than 10% of the total area of the product, and the dirt is less than two points each piece of product, allowed.
17	FPC	1. The component soldering can not be cold soldering, short, open circuit, burrs, tin ball； 2. The shape of FPC can not been broken, died off;

		3. FPC stiffener of the component area can not drain back paste or damaged; 4. FPC version number should be consistent with the design drawings;
18	Tape (foam / double-sided adhesive, etc.) Judgement	Tape attached should be consistent with the design drawing;, not missing , unbreakable, non-attached side.

B-level standard

<table>
<tr><td>No.</td><td>Inspection items</td><td colspan="3">Judgment standard(Unit：mm）</td></tr>
<tr><td rowspan="5">1</td><td rowspan="5">Circular Defects(Dot、Impurity、Dust、Bubble)</td><td>Defect Size</td><td>Judgment（A Area）</td><td>Judgment（B Area）</td></tr>
<tr><td>D≤0.15</td><td>Neglected(distance≥10)</td><td rowspan="3">Neglected</td></tr>
<tr><td>0.15＜D≤0.2</td><td>N≤3，(distance≥10）</td></tr>
<tr><td>D＞0.2</td><td>NG</td></tr>
<tr><td colspan="3">Notes：1、The circular defects which can be removed is ignored.
2、The circular defects of B area should not affect to assembly,functionality or final look of the product.
3, The circular defects of A area does not include the protective film, TThe circular defects of B area does not include the adhesive tapes.</td></tr>
<tr><td rowspan="5">2</td><td rowspan="5">Linear Defects(Scratch Line\Foreign material)</td><td colspan="2">W(width)/L(length)</td><td>Judgment</td></tr>
<tr><td colspan="2">W≤0.05，L≤3.5</td><td>Neglected(distance≥5）</td></tr>
<tr><td colspan="2">0．05＜W≤0.1，L≤3.5</td><td>N≤3，(distance≥10）</td></tr>
<tr><td colspan="2">W＞0.1，L＞3.5</td><td>NG</td></tr>
<tr><td colspan="3">Notes：The foreign meterial which can be removed is ignored.</td></tr>
<tr><td rowspan="3">3</td><td rowspan="3">Dent</td><td>Defect Size</td><td>Judgment（A Area）</td><td>Judgment（B Area）</td></tr>
<tr><td>D≤0.15</td><td>Neglected(distance≥10)</td><td rowspan="2">Neglected</td></tr>
<tr><td>0.15≤D≤0.3</td><td>N≤3，(distance≥10)</td></tr>
</table>

		D＞0.3	NG	
		Notes：1、The foreign meterial which can be removed is ignored. 2、The foreign meterial of B area should not affect to assembly,functionality or final look of the product.		
4	Dirt/Fingerprint/ Smokes/Snake/Rainbow effect	A area：not allowed； B area：neglected（Not affect to assembly,functionality or final look of the product.）		
5	Printing ink color	The printing ink color should be consistent with design drawing.(or client standard sample).		
6	Printing ink color difference	5、The judgement area is the front non-translucent zone of the sample. 6、Accept the same series ink color printing shift. 7、Color difference of IR hole,light sensor hole is not inspected. 8、If there is customer's inspection criteria or sample,determining by customer's inspection criteria or standard sample.		
7	Transmittance-rate (IR hole\light sensor hole)	Meet design drawing.		
8	Printing pin hole	Not allowed		
9	Font / Logo	Font / Logo should be printed smooth, no jagged, shadow, penetration, wear and tear, displacement, disconnection and connection defects		
10	Breakage on edge or corner	A area(front side)：not allowed. B area(back side)：X≤0.2,Y≤0.2,Z≤1/5T; N≤2，(distance≥20)，Neglected		
11	Crack	Not allowed		
12	Printing ink Edges burrs / Printing ink Zigzag	1、the front (back) printing ink edge of the touch window region : W1≤0.2，OK；W1＞0.2，NG。 2、the front (back) printing ink edge of the sample: W2≤0.3，OK；W2＞0.3，NG。		
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		(3).The other areas:D≤0.5，Neglected(distance≥5.0）
14	Circular Defects for LED hole/ IR hole/sensor hole	Sensor hole、LED hole：D≤0.1mm，N≤1，allowed ； D＞0.1mm, not allowed； IR hole：D≤0.1mm，neglected； D＞0.1mm，not allowed。
15	Bad cutting section for cover/sensor	1.Cutting section allow the wave-like phenomenon, but the cutting edge level of view must be a smooth line; 2, cutting section does not allow any cracks appearance.
16	Surface Dirt	1, the process dirt which can not wipe with alcohol is not allowed; 2, The dirty can be wiped with a clean cloth or with clean cloth &alcohol , and the dirt is less than 10% of the total area of the product, and the dirt is less than two points each piece of product, allowed.
17	FPC	3. The component soldering can not be cold soldering, short, open circuit, burrs, tin ball； 4. The shape of FPC can not been broken, died off; 3. FPC stiffener of the component area can not drain back paste or damaged; 4. FPC version number should be consistent with the design drawing;
18	Tape (foam / double-sided adhesive, etc.) Judgement	Tape attached should be consistent with the design drawing;, not missing , unbreakable, non-attached side.

C-level standard

<table>
<tr><td>No.</td><td>Inspection items</td><td colspan="3">Judgment standard(Unit：mm）</td></tr>
<tr><td rowspan="5">1</td><td rowspan="5">Circular Defects(Dot、Impurity、Dust、Bubble)</td><td>Defect Size</td><td>Judgment（A Area）</td><td>Judgment（B Area）</td></tr>
<tr><td>D≤0.20</td><td>Neglected(distance≥10）</td><td rowspan="3">Neglected</td></tr>
<tr><td>0.20≤D≤0.3</td><td>N≤5，(distance≥10）</td></tr>
<tr><td>D＞0.3</td><td>Not allowed</td></tr>
<tr><td colspan="3">Notes：1、The circular defects which can be removed is ignored.
2、The circular defects of B area should not affect to assembly,functionality or final look of the product.</td></tr>
</table>

<table>
<tr><td></td><td></td><td colspan="3">3, The circular defects of A area does not include the protective film, TThe circular defects of B area does not include the adhesive tapes.</td></tr>
<tr><td rowspan="5">2</td><td rowspan="5">Linear Defects(Scratch Line\Foreign material)</td><td colspan="2">W(width)/L(length)</td><td>Judgment</td></tr>
<tr><td colspan="2">W≤0.10，L≤3.0</td><td>Neglected(distance≥10）</td></tr>
<tr><td colspan="2">0．10＜W≤0.20，L≤3.0</td><td>N≤3，(distance≥10）</td></tr>
<tr><td colspan="2">W＞0.2，L＞3.0</td><td>Not allowed</td></tr>
<tr><td colspan="3">Notes：The foreign meterial which can be removed is ignored.</td></tr>
<tr><td rowspan="5">3</td><td rowspan="5">Dent</td><td>Defect Size</td><td>Judgment（A Area）</td><td>Judgment（B Area）</td></tr>
<tr><td>D≤0.15</td><td>Neglected(distance≥10）</td><td rowspan="3">Neglected</td></tr>
<tr><td>0.15≤D≤0.3</td><td>N≤3，(distance≥10)</td></tr>
<tr><td>D＞0.3</td><td>NG</td></tr>
<tr><td colspan="3">Notes：1、The foreign meterial which can be removed is ignored.
2、The foreign meterial of B area should not affect to assembly,functionality or final look of the product.</td></tr>
<tr><td>4</td><td>Dirt/Fingerprint/ Smokes/Snake/Rainbow effect</td><td colspan="3">A area：not allowed；
B area：neglected（Not affect to assembly,functionality or final look of the product.）</td></tr>
<tr><td>5</td><td>Printing ink color</td><td colspan="3">The printing ink color should be consistent with design drawing. (or client standard sample).</td></tr>
<tr><td>6</td><td>Printing ink color difference</td><td colspan="3">9、 The judgement area is the front non-translucent zone of the sample.
10、 Accept the same series ink color printing shift.
11、 Color difference of IR hole,light sensor hole is not inspected.
12、 If there is customer's inspection criteria or sample,determining by customer's inspection criteria or standard sample.</td></tr>
<tr><td>7</td><td>Transmittance-rate （ IR</td><td colspan="3">Meet design drawing.</td></tr>
</table>

	hole\light sensor hole)	
8	Printing pin hole	Not allowed
9	Font / Logo	Font / Logo should be printed smooth, no jagged, shadow, penetration, wear and tear, displacement, disconnection and connection defects
10	Breakage on edge or corner	A area(front side)：not allowed. B area(back side)：X≤0.2,Y≤0.2,Z≤1/5T; N≤2，(distance≥20)，Neglected
11	Crack	Not allowed
12	Printing ink Edges burrs / Printing ink Zigzag	1、the front (back) printing ink edge of the touch window region : W1≤0.2，OK；W1＞0.2，NG。 2、the front (back) printing ink edge of the sample: W2≤0.3，OK；W2＞0.3，NG。
13	Foreign material of printing area	(1).The touch windows + 0～2.0mm：the criteria is same to Circular Defects； (2). The touch windows + 2.0 ～ 5.0mm ： D≤0.3 ，Neglected(distance≥5.0) (3).The other areas:D≤0.5，Neglected(distance≥5.0)
14	Circular Defects for LED hole/ IR hole/sensor hole	Sensor hole、LED hole：D≤0.1mm，N≤1，allowed ； D＞0.1mm, not allowed； IR hole：D≤0.1mm，neglected； D＞0.1mm，not allowed。
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17	FPC	5. The component soldering can not be cold soldering, short, open circuit, burrs, tin ball； 6. The shape of FPC can not been broken, died off; 3. FPC stiffener of the component area can not drain back paste or damaged; 4. FPC version number should be consistent with the design drawing;
18	Tape (foam / double-sided adhesive, etc.) Judgement	Tape attached should be consistent with the design drawing;, not missing , unbreakable, non-attached side.

8 Precautions for Use of CTP Modules

8.1 Handling Precautions

8.1.1 The product is made of glass. Do not subject it to a mechanical shock by dropping it from a high place, etc.

8.1.2 Do not apply excessive force to the product since this may damage to the performance;

8.1.3 If the display surface is contaminated, breathe on the surface and gently wipe it with a soft dry cloth. If still not completely clear, moisten cloth with one of the following solvents:

— Isopropyl alcohol

— Ethyl alcohol

Solvents other than those mentioned above may damage the product. Especially, do not use the following:

— Water

— Ketone

— Aromatic solvents

8.1.4 Do not attempt to disassemble the CTP Module.

8.1.5 If the logic circuit power is off, do not apply the input signals.

8.1.6 To prevent destruction of the elements by static electricity, be careful to maintain an optimum work environment.

a. Be sure to ground the body when handling theCTP Modules.

b. Tools required for assembly, such as soldering irons, must be properly ground.

c. To reduce the amount of static electricity generated, do not conduct assembly and other work under dry conditions.

d. The CTP Module is coated with a film to protect the display surface. Be care when peeling off this protective film since static electricity may be generated.

8.2 Storage precautions

8.2.1 When storing the CTP modules, avoid exposure to direct sunlight or to the light of fluorescent lamps.

8.2.2 The CTP modules should be stored under the storage temperature range. If the CTP modules will be stored for a long time, the recommend condition is:

Temperature : 0℃ ～ 40℃

Relatively humidity: ≤80%

8.2.3 The LCD modules should be stored in the room without acid, alkali and harmful gas.

8.3 notes

The CTP modules should be no falling and violent shocking during transportation, and also should avoid excessive press, water, damp and sunshine.