INTELTRONIC

7.0 inch TFT LCD
With Touch Panel
SPECIFICATION

MODEL NAME: LMTAA070YV12-4RA1

Date: 2013 / 09/ 11

Customer Signature		
Customer		
Approved Date	Approved By	Reviewed By

Contents

1. General Specifications

No.	Item	Specification	Remark
1	LCD size	7.0 inch(Diagonal)	
2	Driver element	a-Si TFT active matrix	
3	Resolution	800 × 3(RGB) × 480	
4	Display mode	Normally White, Transmissive	
5	Dot pitch	0.0642(W) × 0.1790(H) mm	
6	Active area	154.08(W) × 85.92(H) mm	
7	Module size	164.9(W) × 100.0(H) × 5.7(D) mm	Note 1
8	Surface treatment	Anti-Glare	
9	Color arrangement	RGB-stripe	
10	Interface	Digital	
11	Backlight power consumption	3.6W @ 1000 nits	
12	Panel power consumption	0.226W (Typ.)	
13	Weight	150 g (Typ.)	

Note 1: Refer to Mechanical Drawing.

2. Pin Assignment

2.1. TFT LCD Panel Driving Section

1. FPC Connector is used for the module electronics interface. The recommended model is FH12A-50S-0.5SH manufactured by Hirose.
2. LED Light Bar Connector is used for the integral backlight system. The recommended model is BHSR-02VS-1 manufactured by JST.

Pin No	Symbol	I/O	Function	Remark
1	NC	-	No connection	
2	NC	-	No connection	
3	NC	-	No connection	
4	NC	-	No connection	
5	GND	P	Power ground	
6	V_{COM}	I	Common voltage	
7	DV_{DD}	P	Power for Digital Circuit	
8	MODE	I	DE/SYNC mode select	Note 1
9	DE	I	Data Input Enable	
10	VS	I	Vertical Sync Input	
11	HS	I	Horizontal Sync Input	
12	B7	I	Blue data(MSB)	
13	B6	I	Blue data	
14	B5	I	Blue data	
15	B4	I	Blue data	
16	B3	I	Blue data	
17	B2	I	Blue data	
18	B1	I	Blue data	Note 2
19	B0	I	Blue data(LSB)	Note 2
20	G7	I	Green data(MSB)	
21	G6	I	Green data	
22	G5	I	Green data	
23	G4	I	Green data	
24	G3	I	Green data	
25	G2	I	Green data	
26	G1	I	Green data	Note 2
27	G0	I	Green data(LSB)	Note 2

28	R7	I	Red data(MSB)	
29	R6	I	Red data	
30	R5	I	Red data	
31	R4	I	Red data	
32	R3	I	Red data	
33	R2	I	Red data	
34	R1	I	Red data	Note 2
35	R0	I	Red data(LSB)	Note 2
36	GND	P	Power Ground	
37	DCLK	I	Sample clock	Note 3
38	GND	P	Power Ground	
39	L/R	I	Left / right selection	Note 4,5
40	U/D	I	Up/down selection	Note 4,5
41	V_{GH}	P	Gate ON Voltage	
42	V_{GL}	P	Gate OFF Voltage	
43	AV_{DD}	P	Power for Analog Circuit	
44	RESET	I	Global reset pin.	Note 6
45	NC	-	No connection	
46	V_{COM}	I	Common Voltage	
47	DITHB	I	Dithering function	Note 7
48	GND	P	Power Ground	
49	NC	-	No connection	
50	NC	-	No connection	

I: input, O: output, P: Power

Note 1: Global reset pin. Active Low to enter Reset State. Suggest to connecting with an RC reset circuit for stability. Normally pull high.

Note 2: Selection of scanning mode

Setting of scan control input		Scanning direction
U/D	R/L	
GND	DV_{DD}	Up to down, left to right
DV_{DD}	GND	Down to up, right to left
GND	GND	Up to down, right to left
DV_{DD}	DV_{DD}	Down to up, left to right

Note 3: DE/SYNC mode select, Normally pull high.
       H: DE mode.
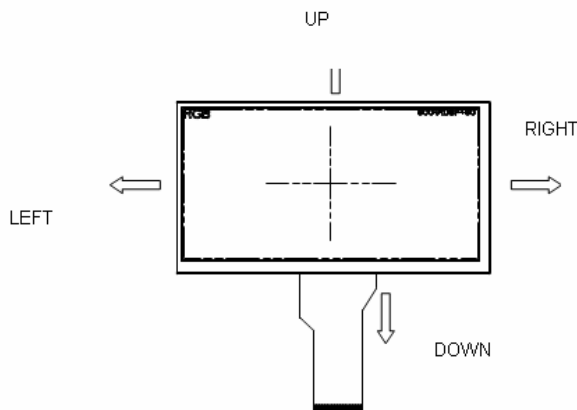   L: HS/VS mode.
Note4: Dithering function enable control. Normally pull high.
       DITHB="1",Disable internal dithering function. For 18bit RGB
           interface, connect two LSB bits of all the R/G/B data
           buses to GND.
       DITHB="0",Enable internal dithering function, For TTL 24bit
           parallel RGB image data input.
Note 5: Definition of scanning direction.
       Refer to the figure as below:

Note 6: Global reset pin. Active low to enter reset state. Suggest to connect
       with an RC reset circuit for stability. Normally pull high.

Note 7: Dithering function enable control, normally pull high.
       When DITHB="1",Disable
       internal dithering function, When
       DITHB="0",Enable internal
       dithering function,

2.2. Backlight Unit Section

Pin No.	Symbol	I/O	Function	Remark
1	V_{LED+}	P	Power for LED backlight anode	Red
2	V_{LED-}	P	Power for LED backlight cathode	Black

3. Operation Specifications

3.1. Absolute Maximum Rating

(GND=AV$_{SS}$=0V, Note 1)

Item	*Symbol*	*Values*		*Unit*	*Remark*
		Min.	*Max.*		
Power voltage	DV$_{DD}$	-0.3	5.0	V	
	AV$_{DD}$	6.5	13.5	V	
	V$_{GH}$	-0.3	40.0	V	
	V$_{GL}$	-20.0	-0.3	V	
	V$_{GH}$-V$_{GL}$	-	40.0	V	
Operation temp.	T$_{OP}$	-20	70	℃	
Storage temp.	T$_{ST}$	-30	80	℃	
LED Reverse Voltage	V$_{R}$	-	1.2	V	each LED (Note 2)
LED Forward Current	I$_{F}$	-	80	mA	each LED

Note 1: The absolute maximum rating values of this product are not allowed to be exceeded at any times. Should a module be used with any of the absolute maximum ratings exceeded, the characteristics of the module may not be recovered, or in an extreme case, the module may be permanently destroyed.
Note 2: V$_{R}$ Conditions: Zener Diode 20mA

3.1.1 Typical Operation Condition

(GND=AV_{SS}=0V, Note 1)

Item	Symbol	Values			Unit	Remark
		Min.	Typ.	Max.		
Power voltage	DV_{DD}	3.0	3.3	3.6	V	Note 2
	AV_{DD}	10.2	10.4	10.6	V	
	V_{GH}	15.3	16.0	16.7	V	
	V_{GL}	-7.7	-7.0	-6.3	V	
Input signal voltage	V_{COM}	3.8	4.0	4.2	V	
Input logic high voltage	V_{IH}	0.7 DV_{DD}	-	DV_{DD}	V	Note 3
Input logic low voltage	V_{IL}	0	-	0.3 DV_{DD}	V	

Note 1: Be sure to apply DV_{DD} and V_{GL} to the LCD first, and then apply V_{GH}.
Note 2: DV_{DD} setting should match the signals output voltage (refer to Note
    3) of customer's system board .
Note 3: DCLK,HS,VS,RSTB,UPDN,STLR,MODE,DITHB.

3.1.2 Current Consumption

(GND=AV_{SS}=0V)

Item	Symbol	Values			Unit	Remark
		Min.	Typ.	Max.		
Current for Driver	I_{GH}	-	0.2	1.0	mA	V_{GH} =16.0V
	I_{GL}	-	0.2	1.0	mA	V_{GL} = -7.0V
	I DV_{DD}	-	4.0	10.0	mA	DV_{DD} =3.3V
	IAV_{DD}	-	20.0	50.0	mA	AV_{DD} =10.4V

3.1.3. Backlight Driving Conditions

Item	Symbol	Values			Unit	Remark
		Min.	Typ.	Max.		
Voltage for LED backlight	V_L		9.9	10.5	V	Note 1
Current for LED backlight	I_L		360	560	mA	
LED life time	-	30K	40K	-	Hr	Note 2

Note 1: The LED Supply Voltage is defined by the number of LED at
Ta=25℃ and I_L =360mA.

Note 2: The "LED life time" is defined as the module brightness decrease to
50% original brightness at Ta=25℃ and I_L =360mA. The LED
lifetime could be decreased if operating I_L is lager than 360 mA.
The LED lifetime could be increased if operating I_L is smaller than
360 mA.

3.2 Power Sequence

3.2.1. Power on:

$$DV_{DD} \rightarrow V_{GL} \rightarrow V_{GH} \rightarrow Data \rightarrow B/L$$

3.2.2. Power off:

$$B/L \rightarrow Data \rightarrow V_{GH} \rightarrow V_{GL} \rightarrow DV_{DD}$$
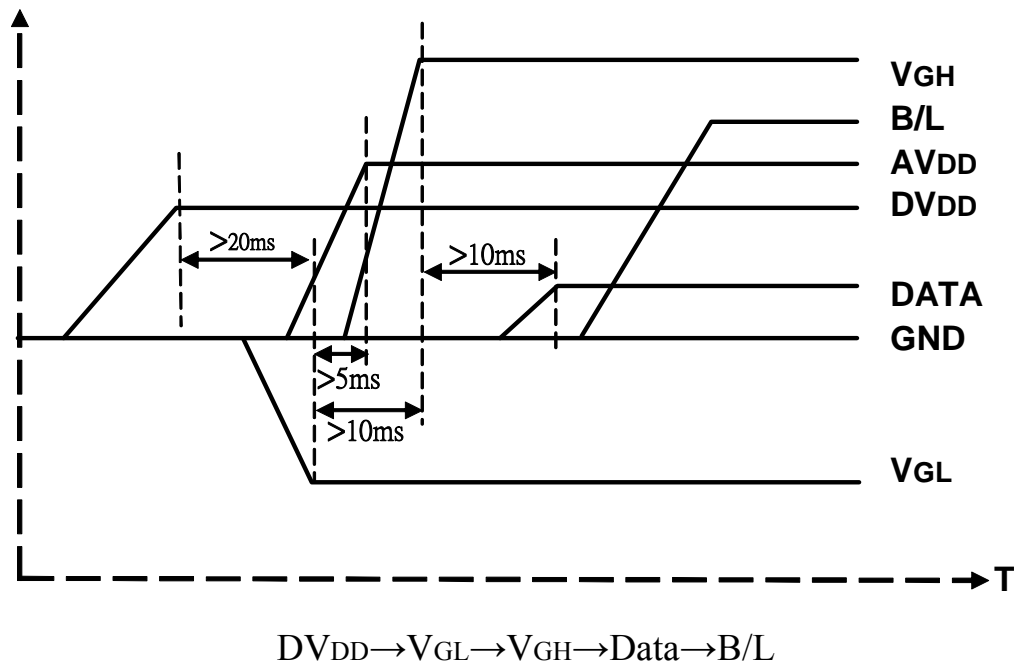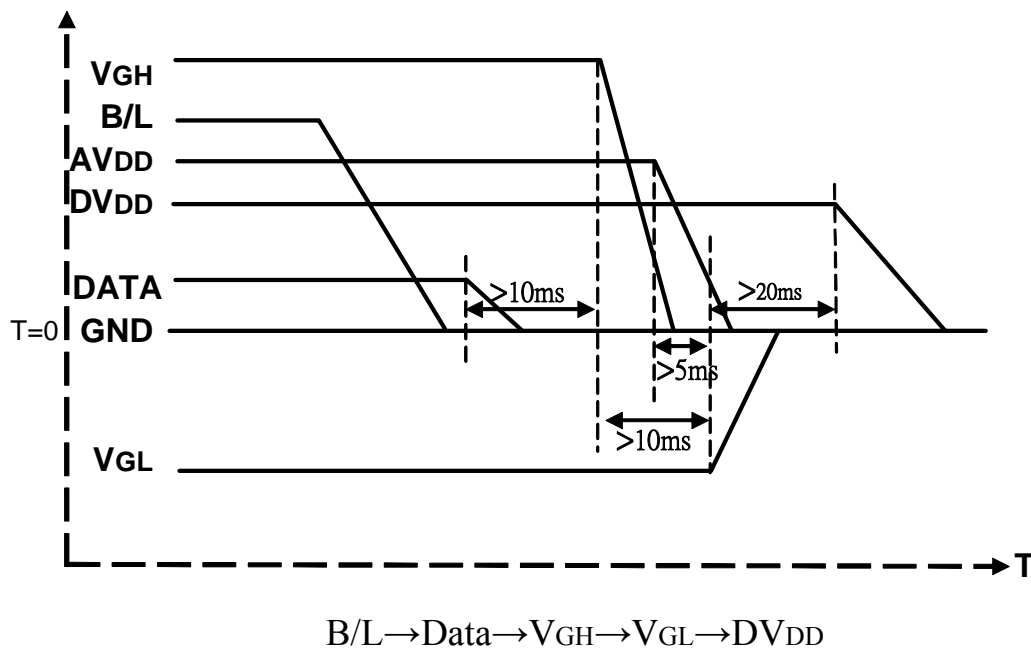
Note: Data include R0~R5, B0~B5, GO~G5, STLR,UPDN, DCLK, HS,VS,DE.

3.3 Timing Characteristics

3.3.1 AC Electrical Characteristics

Item	*Symbol*	*Values*			*Unit*	*Remark*
		Min.	*Typ.*	*Max.*		
HS setup time	T_{hst}	8	-	-	Ns	
HS hold time	T_{hhd}	8	-	-	Ns	
VS setup time	T_{vst}	8	-	-	Ns	
VS hold time	T_{vhd}	8	-	-	Ns	
Data setup time	T_{dsu}	8	-	-	Ns	
Data hole time	T_{dhd}	8	-	-	Ns	
DE setup time	T_{esu}	8	-	-	Ns	
DE hole time	T_{ehd}	8	-	-	Ns	
VDD Power On Slew rate	T_{POR}	-	-	20	ms	
RSTB pulse width	T_{Rst}	1	-	-	us	
CLKIN cycle time	T_{coh}	20	-	-	Ns	
CLKIN pulse duty	T_{cwh}	40	50	60	%	
Output stable time	T_{sst}	-	-	6	us	

3.3.2 Timing

Item	Symbol	Values			Unit	Remark
		Min	*Typ*	*Max*		
Horizontal Display Area	Thd	-	800	-	DCLK	
DCLK Frequency	Fclk	26.4	33.3	46.8	MHz	
One Horizontal Line	Th	862	1056	1200	DCLK	
HS pulse width	Thpw	1	-	40	DCLK	
HS Back Porch(Blanking)	Thb	46	46	46	DCLK	
HS Front Porch	thfp	16	210	354	DCLK	

Item	Symbol	Values			Unit	Remark
		Min	*Typ*	*Max*		
Vertical Display Area	tvd	-	480	-	TH	
VS period time	tv	510	525	650	TH	
VS pulse width	tvpw	1	-	20	TH	
VS Back Porch(Blanking)	tvb	23	23	23	TH	
VS Front Porch	tvfp	7	22	147	TH	

3.3.3. Timing Diagram

Figure 3. 1 Horizontal input timing diagram.
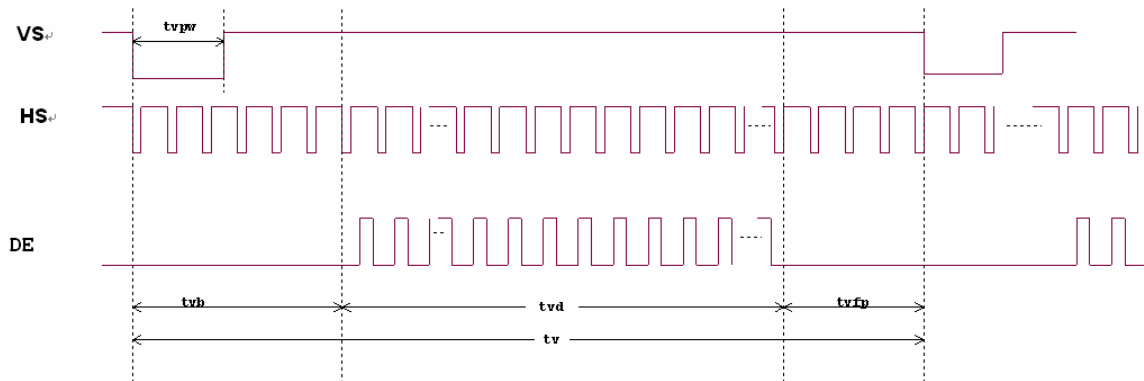
Figure 3. 2 Vertical input timing diagram.

4. Optical Specifications

Item	*Symbol*	*Condition*	*Values*			*Unit*	*Remark*
			Min.	*Typ.*	*Max.*		
View angle (CR$\geq$10)	θ_L	$\Phi=180^o$(9 o'clock)	60	70	-	degree	Note 1
	θ_R	$\Phi=0^o$(3 o'clock)	60	70	-		
	θ_T	$\Phi=90^o$(12 o'clock)	40	50	-		
	θ_B	$\Phi=270^o$(6 o'clock)	60	70	-		
Response time	T_{ON}	Normal $\theta=\Phi=0^o$	-	10	20	msec	Note 3
	T_{OFF}		-	15	30	msec	Note 3
Contrast ratio	CR		400	500	-	-	Note 4
Color chromaticity	W_X		0.26	0.31	0.36	-	Note 2 Note 5 Note 6
	W_Y		0.28	0.33	0.38	-	
Luminance			800	1000	-	Cd/m^2	Note 6
Uniformity			-	75	-	%	Note 7

Test Conditions:
1. DV_{DD}=3.3V, I_L=360mA (Backlight current), the ambient temperature is 25℃.
2. The test systems refer to Note 2.

Note 1 : Definition of viewing angle range
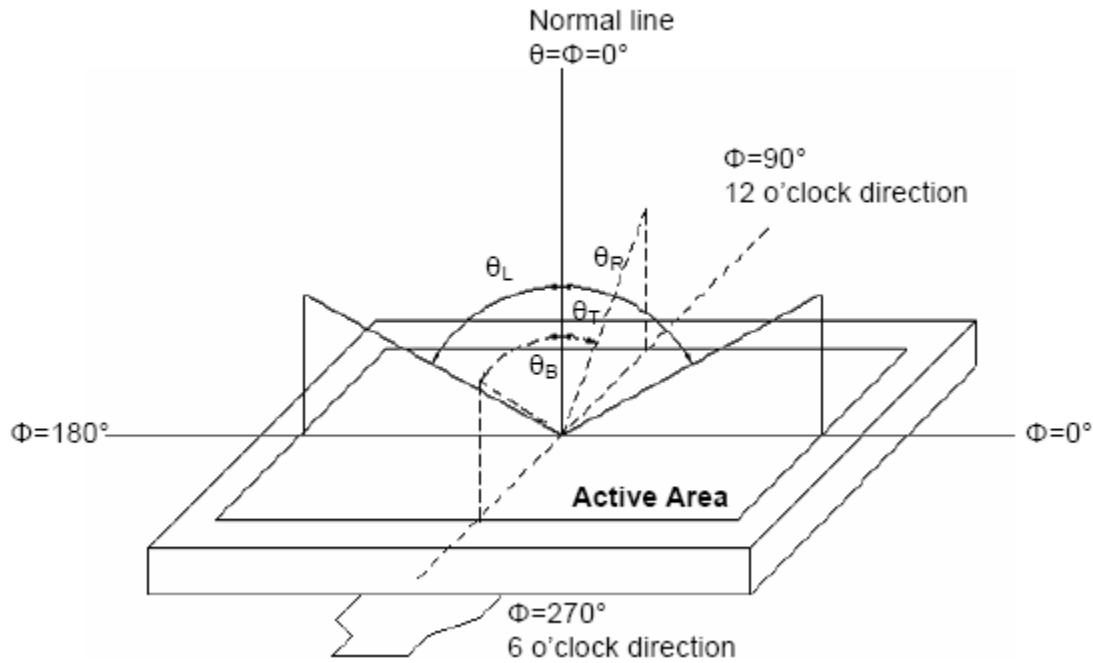
Fig. 4.1 Definition of viewing angle

Note 2: Definition of optical measurement system.

     The optical characteristics should be measured in dark room. After 30 minutes operation, the optical properties are measured at the center point of the LCD screen. (Response time is measured by Photo detector TOPCON BM-7, other items are measured by BM-5A/Field of view: 1° /Height: 500mm.)
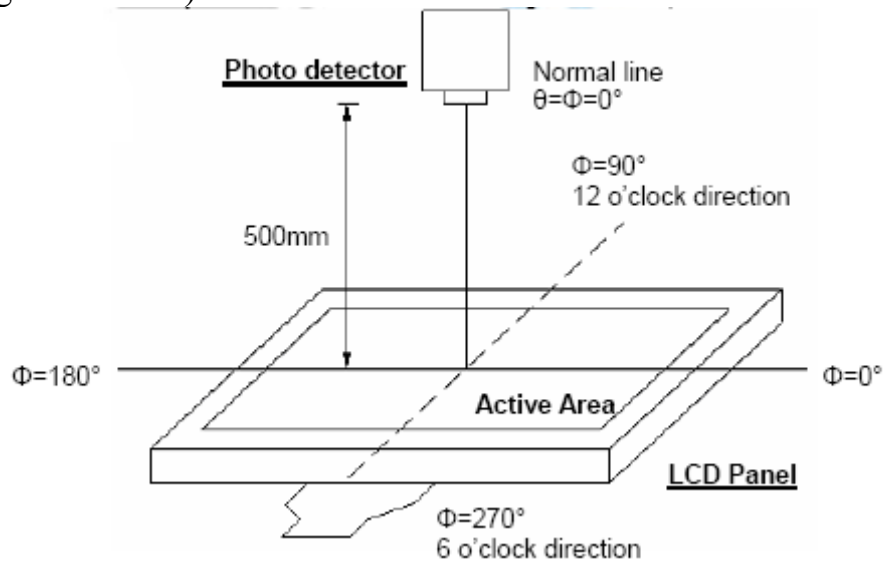

Fig. 4.2 Optical measurement system setup

Note 3: Definition of Response time

The response time is defined as the LCD optical switching time interval between "White" state and "Black" state. Rise time (T_{ON}) is the time between photo detector output intensity changed from 90% to 10%. And fall time (T_{OFF}) is the time between photo detector output intensity changed from 10% to 90%.
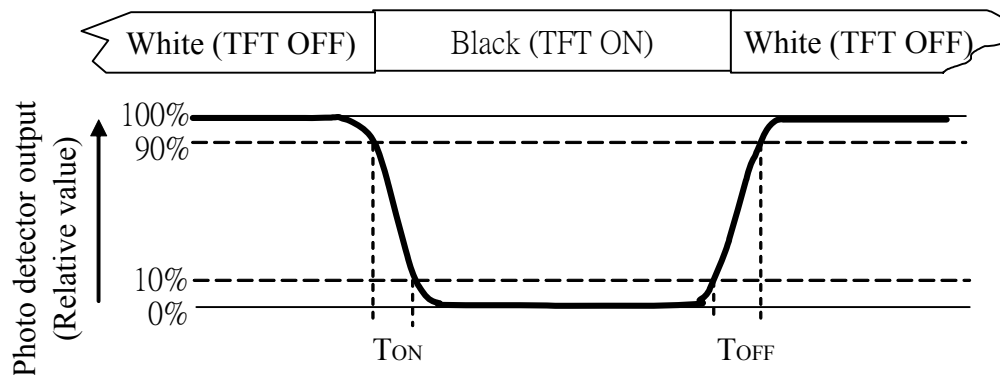
Note 4: Definition of Contrast ratio

$$\text{Contrast ratio (CR)} = \frac{\text{Luminance measured when LCD on the "White" state}}{\text{Luminance measured when LCD on the "Black" state}}$$

Note 5: Definition of color chromaticity (CIE1931)

Color coordinates measured at center point of LCD.

Note 6: All input terminals LCD panel must be ground while measuring the center area of the panel. The LED driving condition is I_L=180mA .

Note 7: Definition of Luminance Uniformity
  Active area is divided into 9 measuring areas (Refer to Fig. 4.4).
  Every measuring point is placed at the center of each measuring area.

$$\text{Luminance Uniformity (Yu)} = \frac{B_{min}}{B_{max}}$$

L ----- Active area length W ----- Active area width
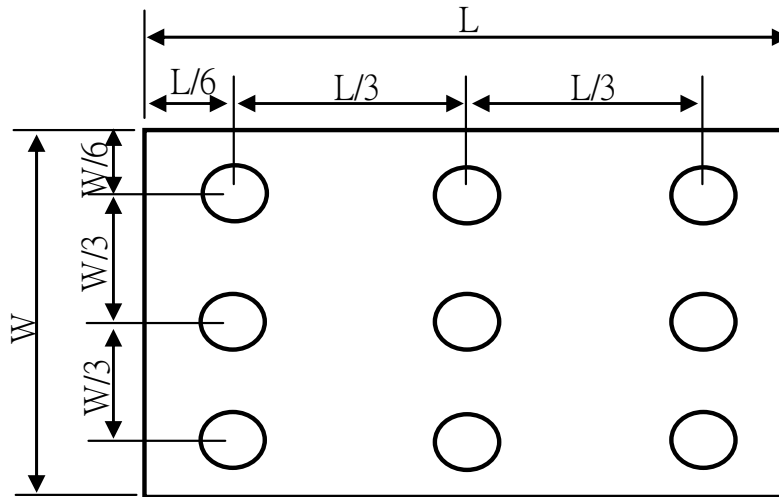
Fig. 4.4 Definition of measuring points

B_{max}: The measured maximum luminance of all measurement position.
B_{min}: The measured minimum luminance of all measurement position.

5. Reliability Test Items

Item	Test Conditions	Remark
High Temperature Storage	Ta = 80℃ 240hrs	Note 1, 4
Low Temperature Storage	Ta = -30℃ 240hrs	Note 1, 4
High Temperature Operation	Ts = 70℃ 240hrs	Note 2, 4
Low Temperature Operation	Ta = -20℃ 240hrs	Note 1, 4
Operate at High Temperature and Humidity	+60℃, 90%RH 240hrs	Note 4
Thermal Shock	-30℃/30 min ~ +80℃/30 min for a total 100 cycles, Start with cold temperature and end with high temperature.	Note 4
Vibration Test	Frequency range:10~55Hz Stroke:1.5mm Sweep:10Hz~55Hz~10Hz 2 hours for each direction of X. Y. Z. (6 hours for total)	
Mechanical Shock	100G 6ms,±X, ±Y, ±Z 3 times for each direction	
Electro Static Discharge	± 2KV, Human Body Mode, 100pF/1500Ω	

Note 1: Ta is the ambient temperature of samples.
Note 2: Ts is the temperature of panel's surface.
Note 3: In the standard condition, there shall be no practical problem that
　　　　may affect the display function. After the reliability test, the product
　　　　only guarantees operation, but don't guarantee all of the cosmetic
　　　　specification.
Note 4: Before cosmetic and function test, the product must have enough
　　　　recovery time, at least 2 hours at room temperature.

6. General Precautions

6.1. Safety
Liquid crystal is poisonous. Do not put it in your mouth. If liquid crystal touches your skin or clothes, wash it off immediately by using soap and water.

6.2. Handling
1. The LCD panel is plate glass. Do not subject the panel to mechanical shock or to excessive force on its surface.
2. The polarizer attached to the display is easily damaged. Please handle it carefully to avoid scratch or other damages.
3. To avoid contamination on the display surface, do not touch the module surface with bare hands.
4. Keep a space so that the LCD panels do not touch other components.
5. Put cover board such as acrylic board on the surface of LCD panel to protect panel from damages.
6. Transparent electrodes may be disconnected if you use the LCD panel under environmental conditions where the condensation of dew occurs.
7. Do not leave module in direct sunlight to avoid malfunction of the ICs.

6.3. Static Electricity
1. Be sure to ground module before turning on power or operating module.
2. Do not apply voltage which exceeds the absolute maximum rating value.

6.4. Storage
1. Store the module in a dark room where must keep at 25±10℃ and 65%RH or less.
2. Do not store the module in surroundings containing organic solvent or corrosive gas.
3. Store the module in an anti-electrostatic container or bag.

6.5. Cleaning
1. Do not wipe the polarizer with dry cloth. It might cause scratch.
2. Only use a soft sloth with IPA to wipe the polarizer, other chemicals might permanent damage to the polarizer.

7．*TOUCH PANEL GENERAL DESCRPTION*

7.1 *General Specification*

No.	Item	Specifications	Unit
1	Screen Size	7.0 inch(Diagonal)	inch
2	Type	Analog resistive 4wires type	-
3	Input Mode	Stylus or Finger	-
4	Active Area	86.92(W) x 155.08 (H)	mm
5	Visual Area	89.5(W) x 156.7(H)	mm
6	Module size	99.2(W) x 164.1(H) x 1.4(D)	mm
7	Surface Hardness	3H	-
8	Transparency Rate (Typical)	80%	-
9	Haze	8%	-
10	FPC Length	80.1	mm
11	FPC Pitch	1.0	mm

7.2 Electronic Characteristics

No.	Item	Specifications	Value	Remark
1	Rated Voltage	Maximum input voltage	7V	
2	Resistance	X Axis	$510\Omega \sim 1100\Omega$	Measure at Connector
		Y Axis	$150\Omega \sim 380\Omega$	
3	Linearity	Initial Value	＜1.5%	Note 1
		After reliability test	＜3.0%	
4	Chattering	Voltage Charge Time	＜10ms	Measure at Connector
5	Insulation Resistance	25V	＞ 20MΩ	-

Note 1:
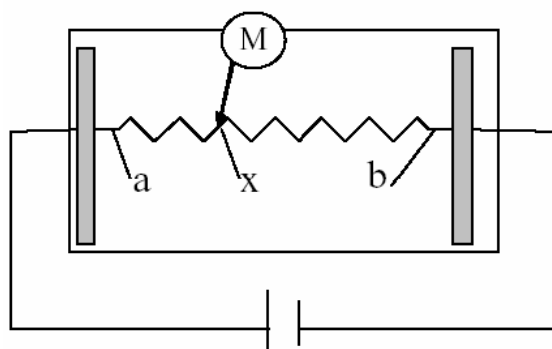
Va: maximum voltage in the active area of touch panel
Vb: minimum voltage in the active area of touch panel
X: random measuring point
Vxm: actual voltage of Lx point

Vxi: theoretical voltage of Lx point
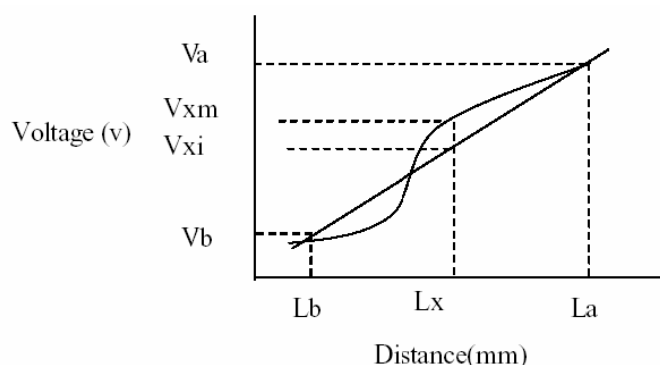
Linearity = [|Vxi-Vxm |/(Va-Vb)]*100%
Test area is as follows and operation force is 200g

7.3 *Material Characteristics*

No.	Item	Specifications	Unit
1	Structure	Film to Glass	-
2	Glass Thickness	1.1	mm
3	Film Thickness	0.188	mm
4	Film Type	Glare hard coating and Anti Newton Ring	-

7.4 *Mechanical Characteristics*

No.	Item	Specifications	Value	Remark
1	Surface Hardness	Pencil hardness	3H	JIS K-5400
2	FPC Peeling Strength	Peeling upward by 90°	＜5N	
3	Operation Force	Stylus or Finger	＞150g	-

7.5 *Reliability*

No.	Item	Specifications	Value	Remark
1	Notes life	Within Active Area	＞100,000 words	Note 1, Note 2, Note 3
2	Input life	Within Active Area	＞1000,000 times	

Note 1: Activation force test condition
    (1) Input DC 5V on X direction, Drop off Polyacetal Stylus (R0.8), until output voltage stabilize ,then get the activation force.
    (2) R8.0mm Silicon rubber for finger Activation force test
    (3) Test point: 9 points
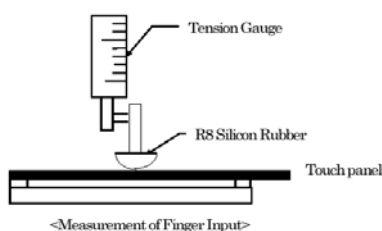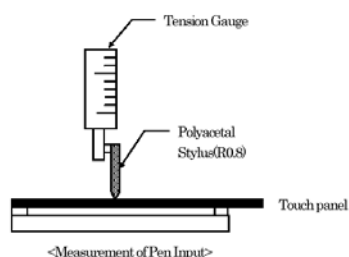
Note 2: Measurement for surface area.
    -Scratch 100,000 times straight line on the film with a stylus change every 20,000 times.
    -Force: 250gf.

-Speed: 60mm/sec.
-Stylus: R0.8 polyacetal tip.
Note 3: Pit 1,000,000 times on the film with a R0.8 silicon rubber.
-Force: 250gf.
-Speed: 2times/sec.

7.6 *Environment Characteristics*

No.	*Item*	*Specifications*	*Unit*
1	Operation Temperature	-20ºC ~ 70ºC	-
2	Storage Temperature	-30ºC ~ 80ºC	-
3	Operation Humidity	20% ~ 90%RH	-
4	Storage Humidity	10% ~ 90%RH	-
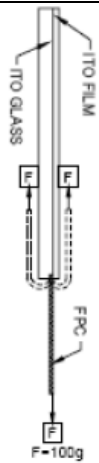
TEST CONDITION
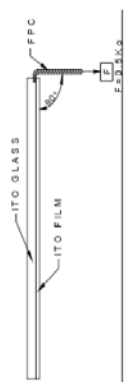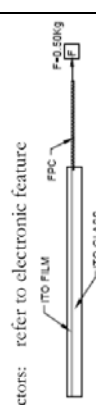
7.7 Environment Duration Test Condition

No.	Item	Description	Value	Remark
1	High temperature storage	After 1 hr room temp.	80ºC, 240 hr	
2	Low temperature storage	After 1 hr room temp.	-30ºC, 240 hr	
3	High temperature high humidity storage	After 24 hr room temp.	40ºC, 95%RH, 240 hr	
4	Temperature Cycling	-	-30ºC ~ +70ºC (0.5hr each),50cycles	

7.8 Mechanical and Function Duration Test Condition
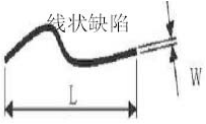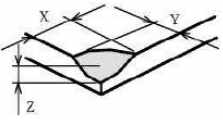
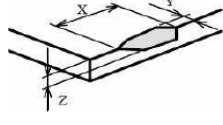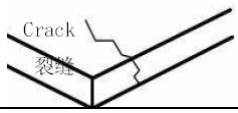| No.	Item	Description	Remark
1	Strike Endurance	Strike 1 million times by POM (R0.8) and test on following item: a. Impedance between connectors b. Linearity c. Insulated impedance	Weight: 250g Speed: twice/second
2	Scratch Resistance	Scratch 100,000 times by POM (R0.8) within 3mm inside AA area outline and test on following item: a. Impedance between connectors b. Linearity c. Insulated impedance	Weight: 250g Speed: 100mm/second
3	FPC Bending	Exert 100g force at the end of FPC and then bending 180 degree for 5 times centering on force exertion point and test on following item: a. Impedance between connectors b. Linearity c. Insulated impedance	

| 4	FPC Force 1	Vertical 90 degree, 0.6kg for 3 minutes, non- stop and test on following item: a. Insulated impedance	
5	FPC Force 2	Horizontal 180 degree, 0.6kg for 10 minutes, non-stop and test on following item: a. Insulated impedance	
5	FPC Bending Resistance	Bend radius is 7mm, length=25mm, Speed:1000 rpm Bending times: 100,000 and test on following item: a. Insulated impedance	
6	Golden Figure Welding	Temperature: 235+/-5 ºC Duration: 3-5 seconds, welding point shall be fine enough.	

7.9 INSPECTION STANDARD

| No	Defect	Standard Length	Standard Width	Acceptable Quantity	Remark
1	Line Defect 线状缺陷	`	W≦0.03mm	Accept	
		L≦5mm	0.03mm≦W≦0.03mm	≦3	Line To Line ≦ 10mm
		NA	W＞0.06mm	Reject	
2	Spot Defect	D≦0.15mm		Accept	
		0.15mm≦D≦0.15mm		≦3	Spot To Spot ≦ 10mm
		D＞0.3mm		Reject	
3	Fish Eyes	D≦0.3mm		Accept	
		0.3mm≦D≦0.5mm		≦3	Spot To Spot ≦ 10mm
		D＞0.5mm		Reject	
4	Newton Ring	NA		Reject	Anti-Newton ring material(Distance 20~30cm from eyes to Touch Panel))
5	Chips on corner	X	≦2mm	Accept	Reject if it is greater than the standard allowable size
		Y	≦2mm	Accept	
		Z	≦T	Accept	
6	Usual Surface Crack	X	≦3mm	Accept	Reject if it is greater than the standard allowable size
		Y	≦2mm	Accept	
		Z	≦T	Accept	
7	Crack Crack 裂缝	≦0mm		Reject	
8	Polygonal	Reject			
9	Background	No light penetration is allowed, not to visible area			
10	Front	The stroke is not allowed to be thinner or thicker than 0.2mm		≦5	
11	Insulated material/Ag	Not exceed to visible area			

7.10 *HOUSING DESIGN GUIDE*

Housing design follow as below
1) Avoid the design that housing overlap and press on the active area of the LCM
2) Give enough gap(over 0.5mm at compressed) between the housing and TSP
   to protect wrong operating.
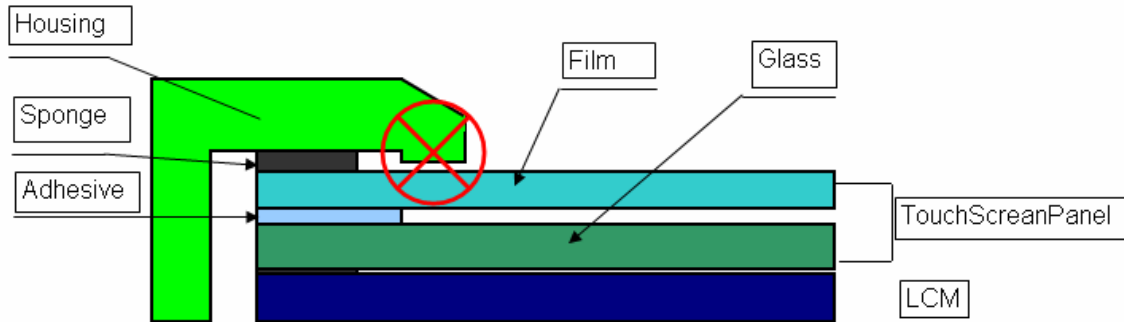
3) Use a buffer material(Gasket) between the TSP and housing to protect
   damage and wrong operating
4) Avoid the design that buffer material overlap and press on the inside of TSP

   view area.
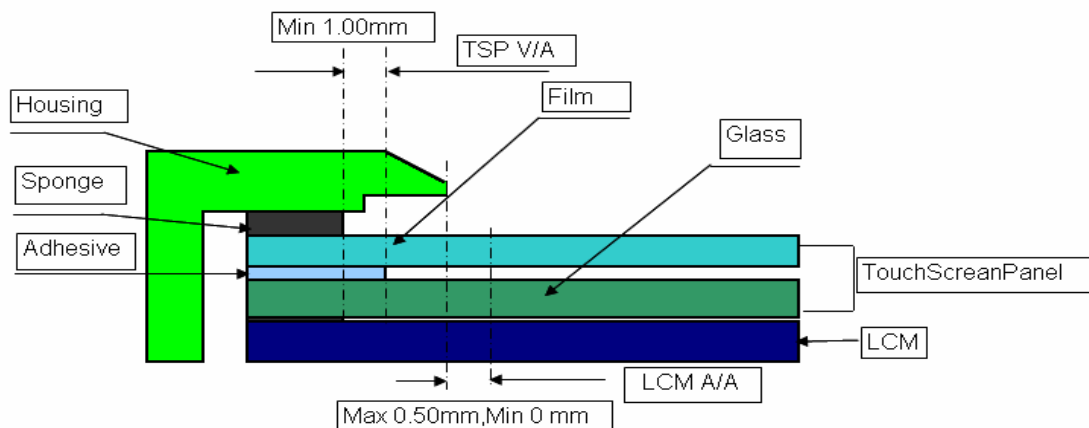
RECAUTIONS

7.11 *Handling*

i. When the module is assembled, it should be attached to the system firmly. Be careful not to twist and bend the module.
ii. Since touch panel is consist of Glass, pls. be careful your hand and other part from injury at handling. You must wear gloves at handling.
iii. Since touch panel is consist of Glass, pls. be careful your hand and other part from injury at handling. You must wear gloves at handling.
iv. Do not put a heavy shock or stress on touch panel.
v. Do not lift Touch Panel by cable (FPC).
vi. Do not add any stress only film face.(Ex. Don't transfer the panel by film face with vacuum)
vii. Do not pile Touch Panel. Do not put heavy goods on Touch Panel.
viii. Do not bend a cable of Touch Panel for prevent happen to line cut failure.
ix. Please don't use following method for insert the cable to connector.
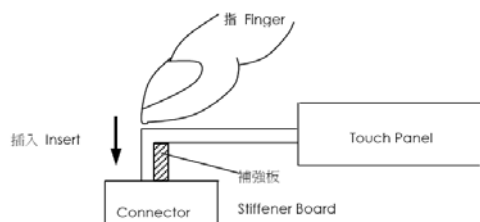
x. Do not disassemble the module.
xi. Please pay attention for the matter as stated below at mounting design of touch panel & enclosure
  a. Enclosure support to fix touch panel must be out of view (transparent)area.(Do not design enclosure presses the view area to protect from miss input)
  b. Enclosure edge must be between view area & Guaranteed active area.(Enclosure edge must not touch with view area)
  c. We recommend the material of support to fix touch panel is elastic material.
  d. Do not bond top surface (film) of touch panel with enclosure.
  e. The corner parts (fig.*) has conductivity. Do not touch any metal part after mounting.
  f. Special design is required for water resistance use.
  g. Cleaning Touch panel by Air gun, pressure $2kg/cm_2$ below is suggested. This is preventing FPC to peel off when air is blowing to FPC from glass side.
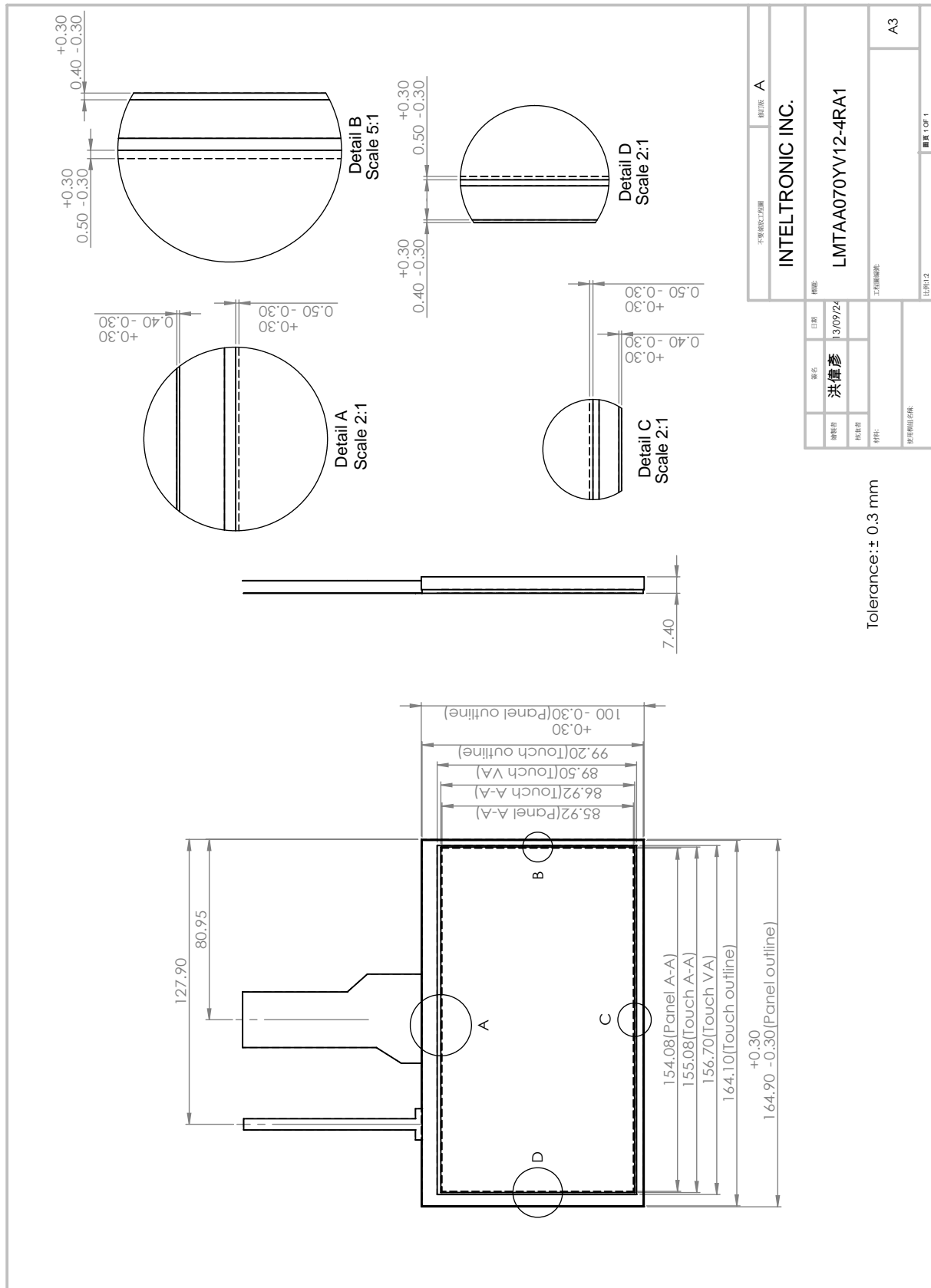
7.12 *Storage*

i. Do not leave the panel in high temperature, and high humidity for a long time. It is highly recommended to store the module with temperature from 0 to 35 ºC and relative humidity of less than 70%.
ii. Do not store the touch panel module in direct sunlight.The module shall be stored in a dark place. It is prohibited to apply sunlight or fluorescent light during the store.

7.13 *Others*

i. Avoid condensation of water. It may result in improper operation or disconnection of electrode.
ii. Do not exceed the absolute maximum rating value. (the supply voltage variation, input voltage variation in part contents and environmental temperature and so on). Otherwise the panel may be damaged.

8. *OUTLINE DRAWING*

Detail B
Scale 5:1

Detail D
Scale 2:1

Detail A
Scale 2:1

Detail C
Scale 2:1

Tolerance:± 0.3 mm

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LMTAA070YV12-4RA1

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9. Inspection Specifications

The buyer (customer) shall inspect the modules within twenty calendar days since the delivery date (the "inspection period") at its own cost. The results of the inspection (acceptance or rejection) shall be recorded in writing, and a copy of this writing will be promptly sent to the seller.

The buyer may, under commercially reasonable reject procedures, reject an entire lot in the delivery involved if, within the inspection period, such samples of modules within such lot show an unacceptable number of defects in accordance with this incoming inspection standards, provided however that the buyer must notify the seller in writing of any such rejection promptly, and not later than within three business days of the end of the inspection period.

Should the buyer fail to notify the seller within the inspection period, the buyer's right to reject the modules shall be lapsed and the modules shall be deemed to have been accepted by the buyer.

10. Warranty

Inteltronic Inc. warrants to you, the original purchaser, that each of its products will be free from defects in materials and workmanship for one year from the date of purchase.

Inteltronic Inc. will be limited to replace or repair any of its module which is found and confirmed defective electrically or visually when inspected in accordance with Inteltronic Inc. general module inspection standard.

This warranty does not apply to any products which have been on customer's production line, repaired or altered by persons other than repair personnel authorized by Inteltronic Inc., or which have been subject to misuse, abuse, accident or improper installation. Inteltronic Inc. assumes no liability under the terms of this warranty as a consequence of such events.

If an Inteltronic Inc. product is defective, it will be repaired or replaced at no charge during the warranty period. For out-of-warranty repairs, you will be billed according to the cost of replacement materials, service time and freight. In returning the modules, they must be properly packaged with original package; there should be detailed description of the failures or defect.

11. RMA

Products purchased through Inteltronic Inc. and under warranty may be returned for replacement. Contact support@inteltronicinc.com for RMA number and procedures

Office Locations

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