SPECIFICATION
FOR
LCD MODULE

MODULE NO: AFD800600A1T-10.4N6NTH-R
VERSION NO.: V1.0

Customer's Approval:

	SIGNATURE	DATE
PREPARED BY		
CHECKED BY		
APPROVED BY		

RECORD OF REVISION

Version	Revised Date	Page	Content
V1.0	2013/12/17	--	Preliminary specification

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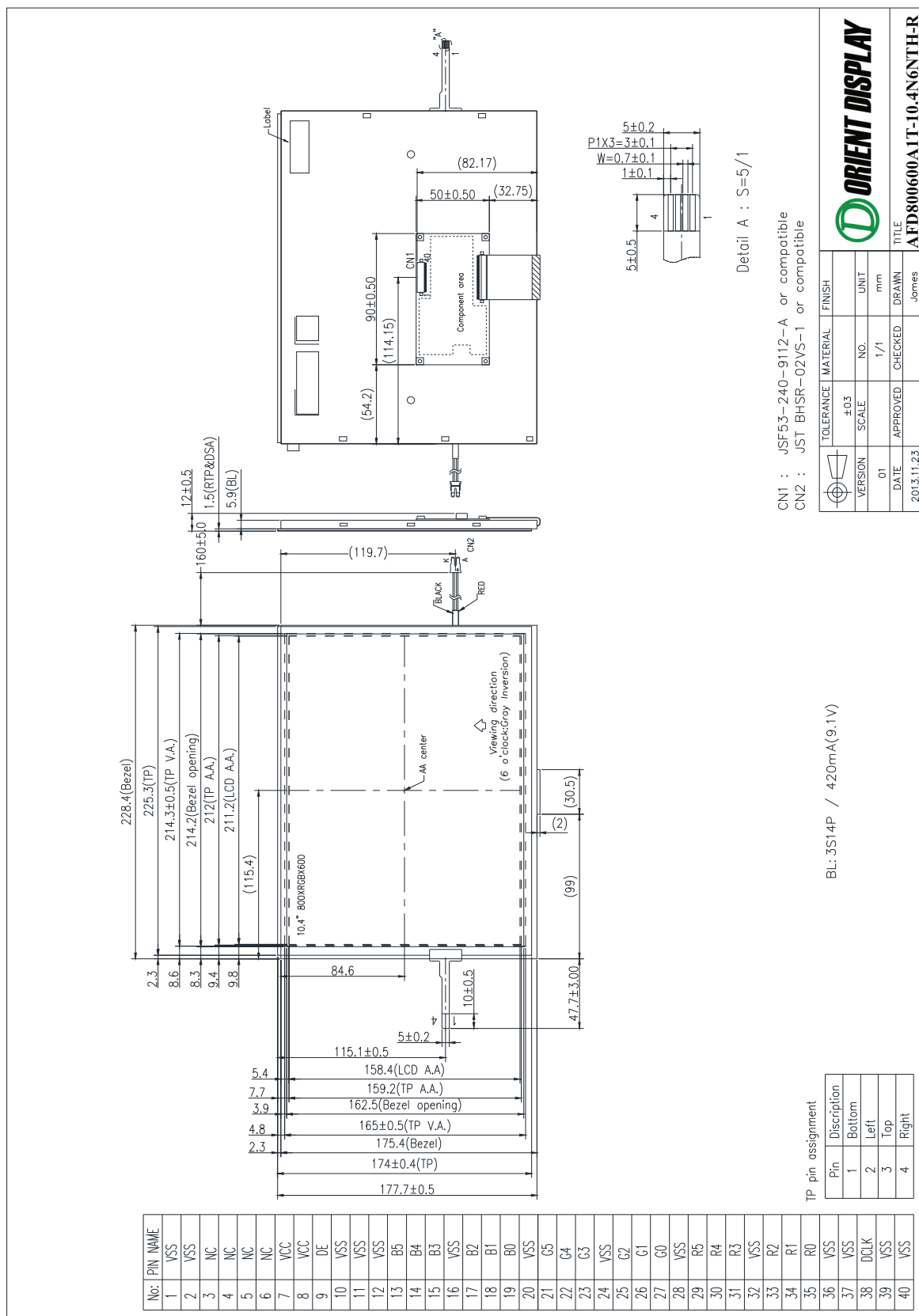
1. GENERAL DESCRIPTION

1.1 Description

The specifications is model AFD800600A1T-10.4N6NTH-R is a color active matrix thin film transistor (TFT) liquid crystal display (LCD) that uses amorphous silicon TFT as a switching device. This model is composed of a TFT LCD panel, a driving circuit, a back light system and 4wire touch panel. This TFT LCD has a 10.4 (4:3) inch diagonally measured active display area with SVGA (800 horizontal by 600 vertical pixels) resolution.

1.2 Features:

No.	Item	Specification	Unit
1	Panel Size	10.4"	Inch
2	Number of Pixels	800 (W) x RGB x 600 (H)	Pixels
3	Active Area	211.2 (W) × 158.4 (H)	mm
4	Pixel Pitch	0.264 (W) x 0.264 (H)	mm
5	Outline Dimension	228.4 (W) × 177.7 (H) × 12 (T)	mm
6	Number of Colors	262K	- -
7	Display Mode	TN / Normally White / Transmissive	- -
8	View Direction	6 o'clock(Gray Inversion)	
9	Display Format	RGB vertical stripe	- -
10	Surface Treatment	Anti-Glare	- -
11	Contrast Ratio	500 (Typ.)	- -
12	Luminance (cd/m^2)	480 (Typ.)	cd/m2
13	Interface	RGB 18 bit Interface	- -
14	Backlight	White LED	- -
15	Operation Temperature	-10 ~ 50	°C
16	Storage Temperature	-20 ~ 60	°C
17	Weight	(420)	g

2. MECHANICAL SPECIFICATION

CN1 : JSF53-240-9112-A or compatible
CN2 : JST BHSR-02VS-1 or compatible

Detail A : S=5/1

BL: 3S14P / 420mA(9.1V)

Title block

TOLERANCE	MATERIAL	FINISH	
±03	NO.	UNIT	ORIENT DISPLAY
SCALE	1/1	mm	TITLE
VERSION	APPROVED	CHECKED	DRAWN
01			James
DATE	2013.11.23		AFD800600A1T-10.4N6NTH-R

PIN NAME

No:	PIN NAME
1	VSS
2	VSS
3	NC
4	NC
5	NC
6	NC
7	VCC
8	VCC
9	DE
10	VSS
11	VSS
12	VSS
13	B5
14	B4
15	B3
16	VSS
17	B2
18	B1
19	B0
20	VSS
21	G5
22	G4
23	G3
24	VSS
25	G2
26	G1
27	G0
28	VSS
29	R5
30	R4
31	R3
32	VSS
33	R2
34	R1
35	R0
36	VSS
37	VSS
38	DCLK
39	VSS
40	VSS

TP pin assignment

Pin	Discription
1	Bottom
2	Left
3	Top
4	Right

3. PIN DESCRIPTION

3.1 TFT LCD Module

Pin No	Symbol	I/O	Function	Remark
1	GND	P	Ground	
2	GND	P	Ground	
3	NC	-	No connection	
4	NC	-	No connection	
5	NC	-	No connection	
6	NC	-	No connection	
7	VCC	P	Power Supply Logic voltage	
8	VCC	P	Power Supply Logic voltage	
9	DE	I	Data Enable Timing Signal	
10	GND	P	Ground	
11	GND	P	Ground	
12	GND	P	Ground	
13	B5	I	Blue data signal (MSB)	
14	B4	I	Blue data signal	
15	B3	I	Blue data signal	
16	GND	P	Ground	
17	B2	I	Blue data signal	
18	B1	I	Blue data signal	
19	B0	I	Blue data signal (LSB)	
20	GND	P	Ground	
21	G5	I	Green data signal (MSB)	
22	G4	I	Green data signal	
23	G3	I	Green data signal	
24	GND	P	Ground	
25	G2	I	Green data signal	
26	G1	I	Green data signal	
27	G0	I	Green data signal (LSB)	
28	GND	P	Ground	
29	R5	I	Red data signal (MSB)	
30	R4	I	Red data signal	
31	R3	I	Red data signal	
32	GND	P	Ground	
33	R2	I	Red data signal	
34	R1	I	Red data signal	
35	R0	I	Red data signal (LSB)	
36	GND	P	Ground	
37	GND	P	Ground	

38	DCLK	I	Data Clock	
39	GND	P	Ground	
40	GND	P	Ground	

NOTE:

1. VSS=GND

3.2 Backlight Unit

Pin No.	Symbol	Function	Remark
1	LEDA	Power Supply for LED backlight	RED
2	LEDK	GND for LED backlight	BLACK

4. ABSOLUTE MAXIMUM RATINGS
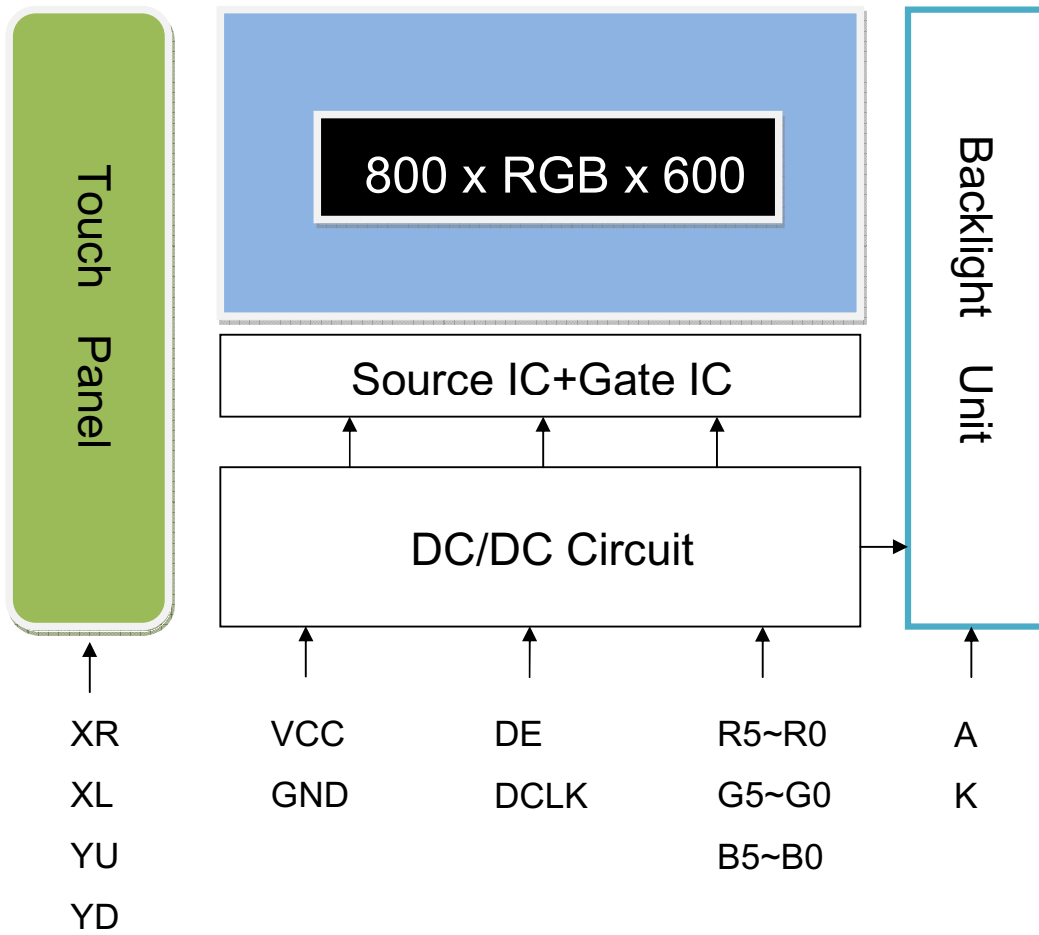
4.1 Electrical Absolute Rating

4.1.1 TFT LCD Module

Item	Symbol	Values		Unit	Note
		Min.	Max.		
Power supply voltage	VCC	-0.3	5.0	V	

4.1.2 Environment Absolute Rating

Item	Symbol	Values			Unit	Note
		Min.	Typ.	Max.		
Operating Temperature	Topa	-10		50	°C	Ambient temperature
Storage Temperature	Tstg	-20		60	°C	

5. BLOCK DIAGRAM

5.1 TFT LCD Module

Touch Panel

800 x RGB x 600

Backlight Unit

Source IC+Gate IC

DC/DC Circuit

XR	VCC	DE	R5~R0	A
XL	GND	DCLK	G5~G0	K
YU			B5~B0	
YD				

6. Relationship Between Displayed Color and Input

6.1 6 bit

| | | Color & Gray Scale | Data Signal | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | R5 | R4 | R3 | R2 | R1 | R0 | G5 | G4 | G3 | G2 | G1 | G0 | B5 | B4 | B3 | B2 | B1 | B0 |
| Basic Color | | Black | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | Red | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | Green | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | Blue | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 |
| | | Cyan | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| | | Magenta | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 |
| | | Yellow | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | White | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Red | | Black | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | Red(1) | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | Red(2) | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : |
| | | Red(31) | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : |
| | | Red(62) | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | Red(63) | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Green | | Black | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | Green(1) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | Green(2) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : |
| | | Green(31) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : |
| | | Green(62) | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | Green(63) | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| Blue | | Black | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | Blue(1) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| | | Blue(2) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| | | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : |
| | | Blue(31) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 |
| | | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : |
| | | Blue(62) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 0 |
| | | Blue(63) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 |

0 : Low level voltage, 1 :High level voltage

Each basic color can be displayed in 64 gray scales from 6 bit data signals. With the combination of total 18 bit data signals, the 262K-color display can be achieved on the screen.

7. ELECTRICAL CHARACTERISTICS

7.1 TFT LCD Module

Item		Symbol	Value			Unit	Note
			Min.	Typ.	Max.		
Power supply voltage		VCC	3.0	3.3	3.6	V	
		VDD	4.5	5	5.5	V	
Input Voltage for logic	H Level	VIH	0.7xVCC	-	VCC	V	
	L Level	VIL	0	-	0.3xVCC	V	
Digital Current		ICC	-	(200)	(220)	mA	Note1

Note 1: frame =60Hz , Ta=25°C , Display pattern : Black pattern
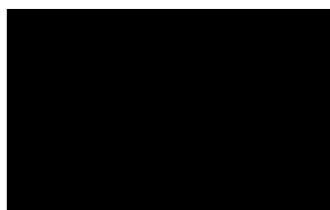
7.2 Backlight Unit

Item	Symbol	Value			Unit	Condition
		Min.	Typ.	Max.		
LED Voltage	VL	-	(9.1)	-	V	
LED Current	IF	-	420	-	mA	3S14P
Power Consumption	PBL	-	3.822	-	W	
LED Life Time (25℃)	-	(30000)	-	-	hr	(1)

Note 1: The "LED life time" is defined as the module brightness decrease to 50% original brightness that the ambient temperature is 25℃ 60% RH.

7.3 INTERFACE SPECIFICATIONS

7.3.1 AC Timing characteristics

Signal	Parameter	Symbol	Min.	Typ.	Max.	Unit.	Remark
HSYNC	HS setup time	Thst	8	-	-	ns	
	HS hold time	Thhd	8	-	-	ns	
VSYNC	VS setup time	Tvst	8	-	-	ns	
	VS hold time	Tvhd	8	-	-	ns	
Data	Data setup time	Tdsu	8	-	-	ns	
	Data hold time	Tdhd	8	-	-	ns	
DE	DEN setup time	Tvpw	8	-	-	ns	
	DEN hold time	Tvb	8	-	-	ns	
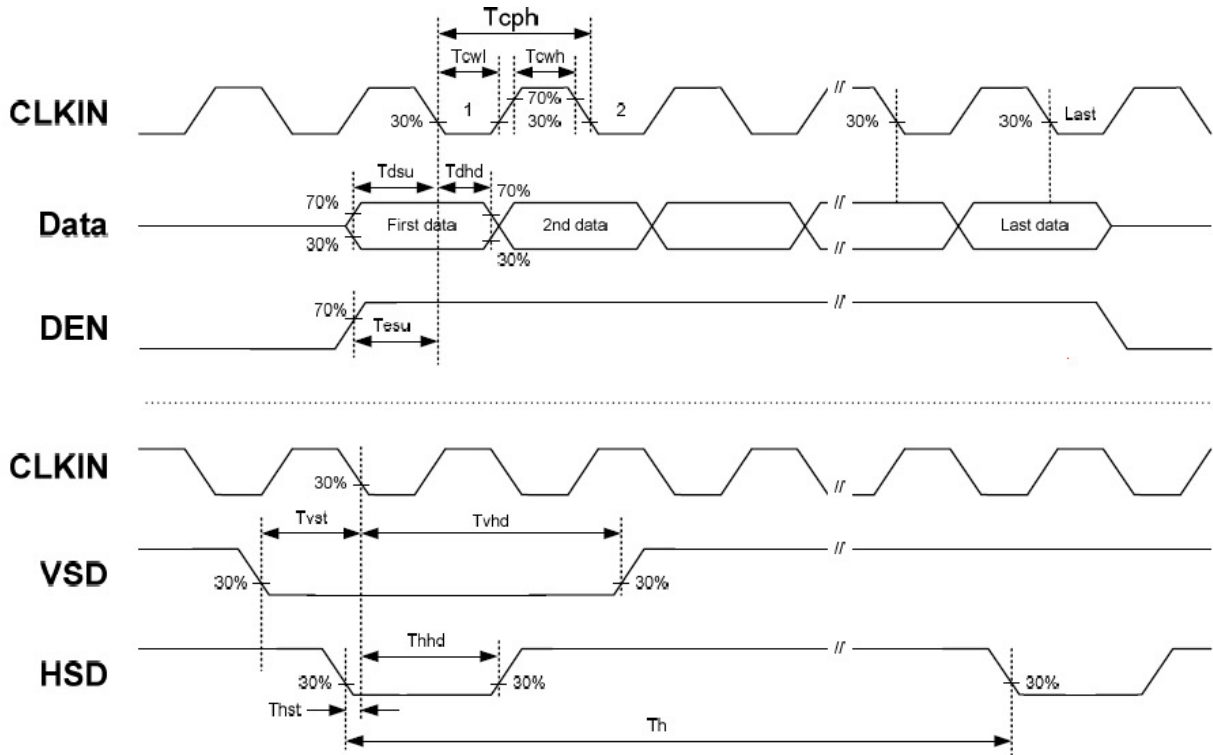
7.3.2 DE Mode Input Timing Table

Signal	Parameter	Symbol	Min.	Typ.	Max.	Unit.	Remark
DCLK	CLK frequency	Fclk	-	40	50	MHz	
	CLK period	Tcph	20	-	-	ns	
	CLK pulse duty	Tcwh	40	50	60	%	
HSYNC	Horizontal Line	Th	862	1056	1200	CLK	
	HS Display Area	Thd	-	800	-	CLK	
	HS Pulse Width	Thpw	1	-	40	CLK	
	HS Back Porch	Thb	-	46	-	CLK	
	HS Front Porch	Thfp	16	210	354	CLK	
VSYNC	VS Display Area	Tvd	-	600	-	th	
	VS Period Time	Tv	624	635	700	th	
	VS Pulse Width	Tvpw	1	-	20	th	
	VS Back Porch	Tvb	-	23	-	th	
	VS Front Porch	Tvfp	1	12	77	th	

Horizontal input timing
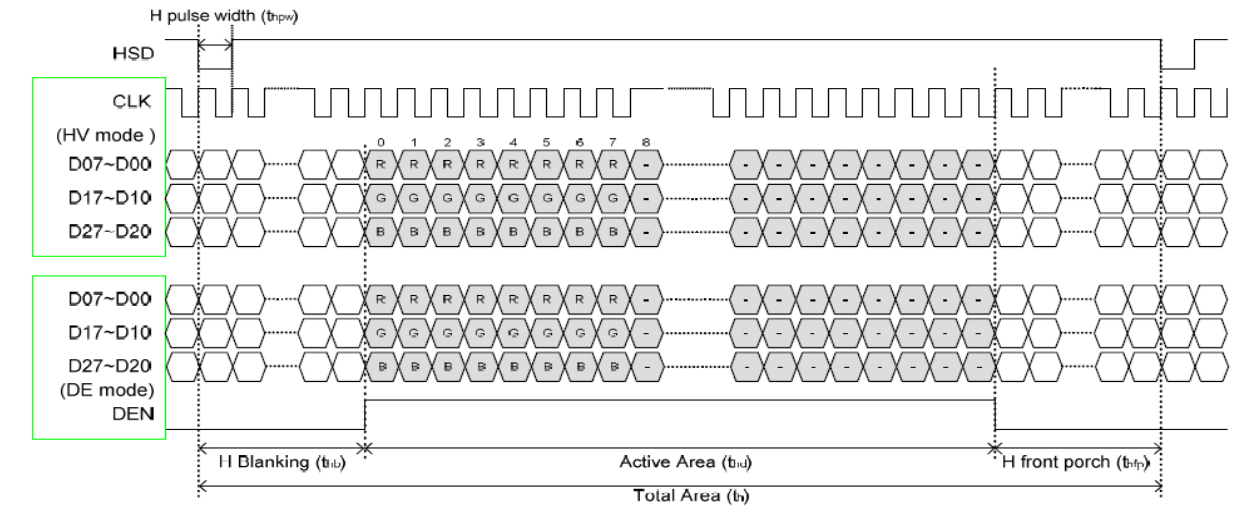
Vertical input timing
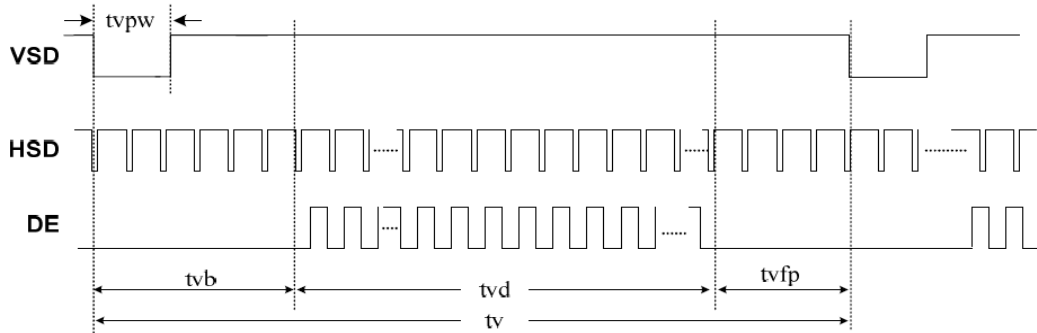
7.4 Power On / Off Sequence

Data: RGB DATA, DCLK, DE
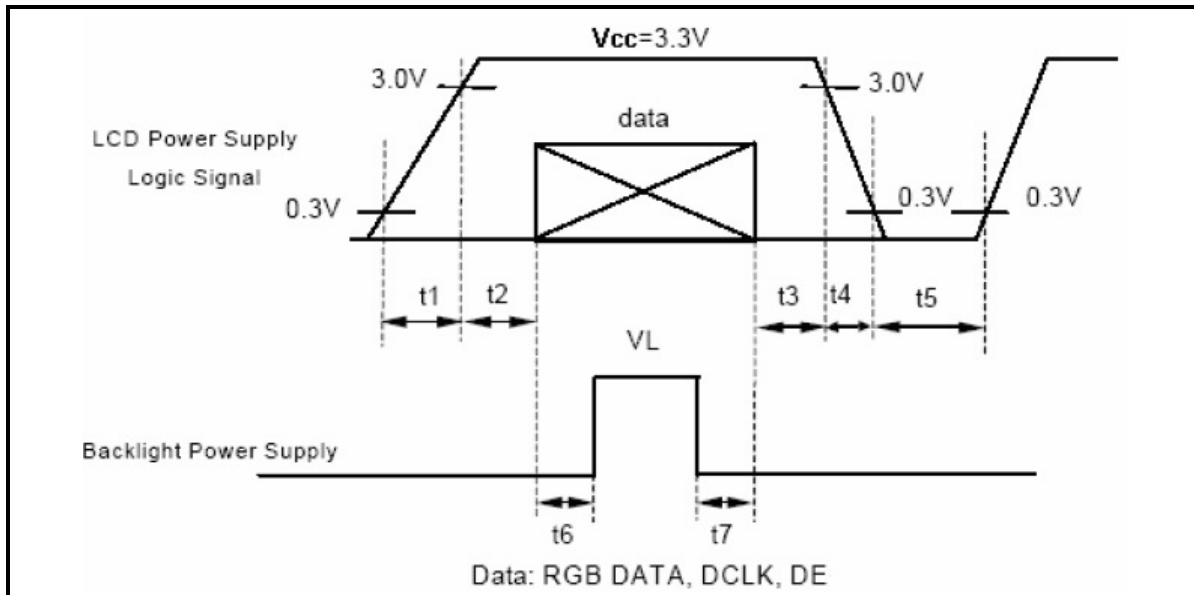
t1 ≤10ms : 1 sec≤ t5

50ms≤ t2 : 200ms ≤t6

0<t3 ≤50ms: 200ms≤ t7

0<t4 ≤10ms

8. TOUCH SCREEN PANEL SPECIFICATIONS

8.1 Main Feature

Item	Min.	Typ.	Max.	Unit	Note
Linearity	-2.0	-	+2.0	%	Initial data
	-3.5	-	+3.5	%	After environmental &life test ,Refer Note2
Terminal resistance	200	-	1000	Ω	X (glass)
	100	-	800	Ω	Y (film)
Insulation resistance	10	-	-	MΩ	DC 25V
Voltage	-	-	7	V	DC
Response time	-	-	20	ms	
Haze	4	8	12	%	JIS K-7105
Minimum Input force	-	-	80	gf	Test Area is 2mm inside of active area, but not on Dot-Spacer. Refer Note1
Notes life	100000			words	Refer Note3
Input life	1000000			times	Refer Note3

Note1: Measurement condition of minimum input force Resistance between X & Y axis must be equal or lower than 2kΩ (Ron ≤ 2kΩ)

Note2: Measurement condition of Linearity
Difference between actual voltage &
Theoretical voltage is an error at any points.
Linearity is the value max. Error voltage
divided by voltage difference on active area
inside 1mm.

Note3:

Fig.1 筆輸入 by pen
Fig.2 指輸入 by finger
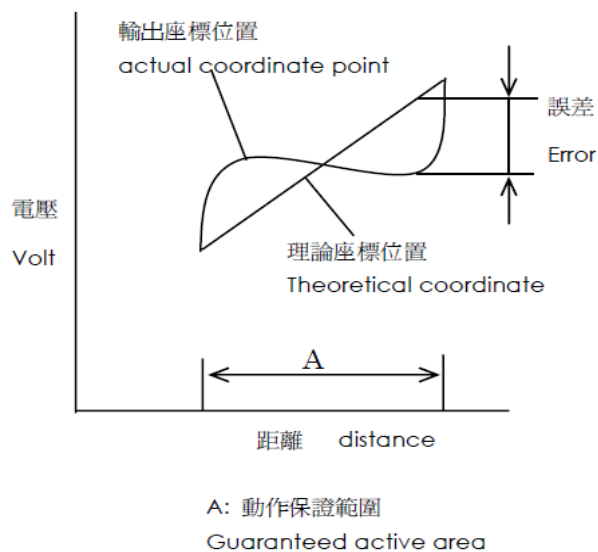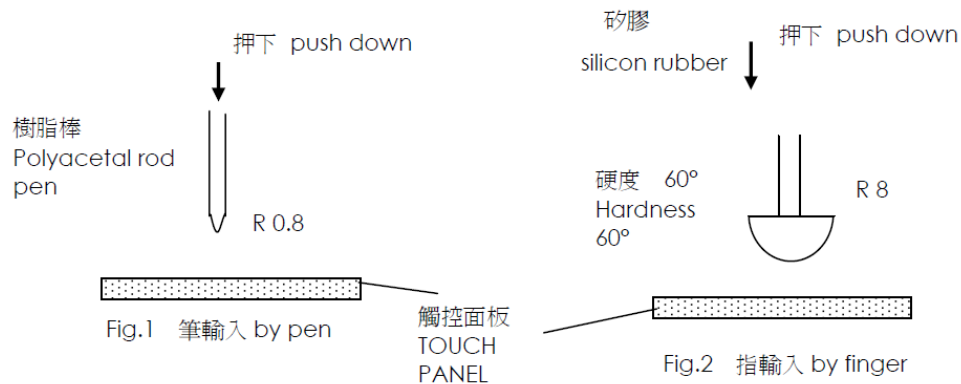
Notes area for pen notes life test is 10×9mm. Size of word is 7.5×6.75mm. Word is any A.B.C….. Word. Center of each word is changed at random on active area inside 5mm.

Sharp of pen end: R 0.8 (Refer Fig.1)

Materials of pen: Polyacetal

Load: 250g

Speed: 60mm/s
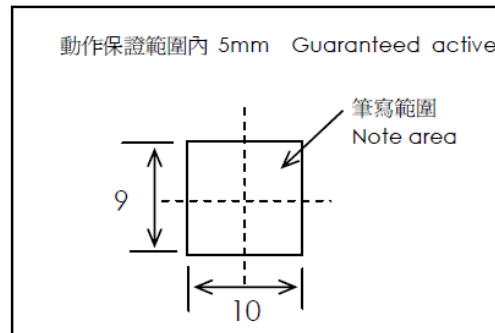
Input life test condition (by finger)

By silicone rubber tapping at same point.

Sharp of rubber end: R8 Hardness 60° (Refer fig.2)

Load: 200g

Frequency: 5Hz

8.2 Pin Assignments and Definitions

Item	Name	I/O	Unit
1	YD	O	Touch Panel Down
2	XL	O	Touch Panel Left
3	YU	O	Touch Panel Up
4	XR	O	Touch Panel Right

9. OPTICAL CHARACTERISTICS

Item		Symbol	Condition	Min.	Typ.	Max.	Unit
Brightness		--	Note1, Note 3, ($\theta = 0°$, Normal Viewing Angle)	380	480	--	cd/m2
Uniformity		B-uni		70	80	-	%
Contrast Ratio		CR		300	500	--	--
Response Time		Tr		--	10	10	ms
		Tf		--	15	20	ms
Color Chromaticity	White	Wx		0.260	0.310	0.360	--
		Wy		0.280	0.330	0.380	--
View angle	Horizontal	θx+	Center CR≥10	60	70	--	
		θx-		60	70	--	
	Vertical	θY+		40	50	--	
		θY-		50	60	--	
Image sticking		tis	2 hours	--	--	2	Sec

Note：The following optical specifications shall be measured in a darkroom or equivalent state(ambient luminance ≤1 lux, and at room temperature). The operation temperature is 25℃±2℃. The measurement method is shown in Note1.

Note1: The method of optical measurement:
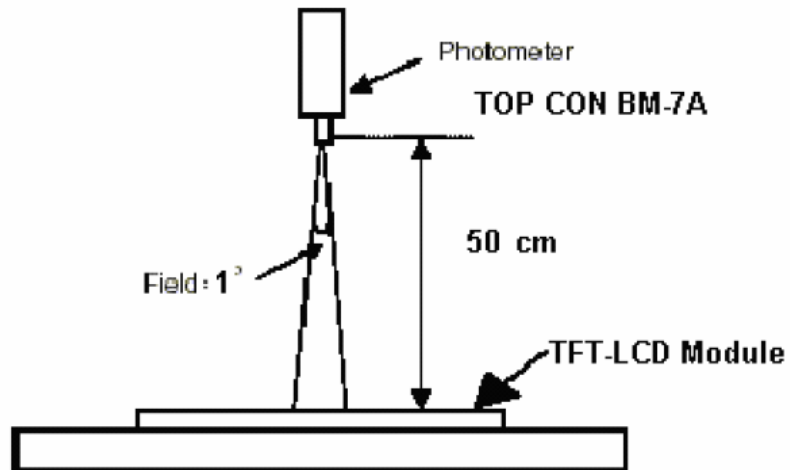
Note2: Measured at the center area of the panel and at the viewing angle of the θx=θy =0°

Note3: Definition of Contrast Ratio (CR):

CR = Luminance with all pixels in white state ÷ Luminance with all pixels in Black state

Note4: Definition of Viewing Angle:
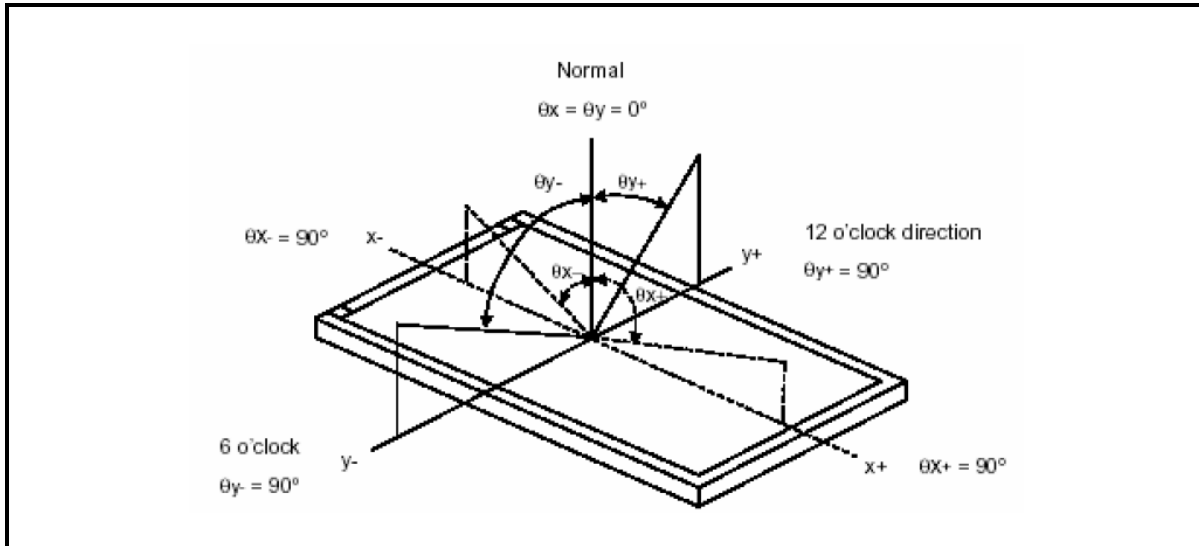
Note 5: Definition of Brightness Uniformity (B-uni):
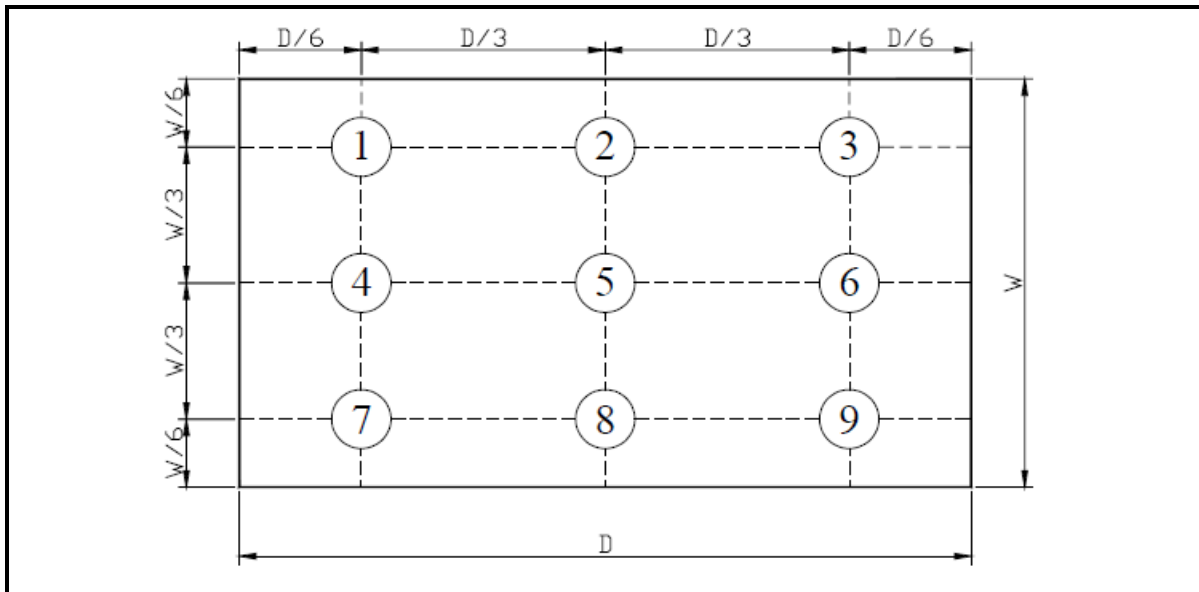
B-uni ＝(Minimum luminance of 9 points÷Maximum luminance of 9points)X100%

Note 6: Definition of Response Time:

The Response Time is set initially by defining the "Rising Time (Tr)" and the "Falling Time (Tf)" respectively. Tr and Tf are defined as following figure
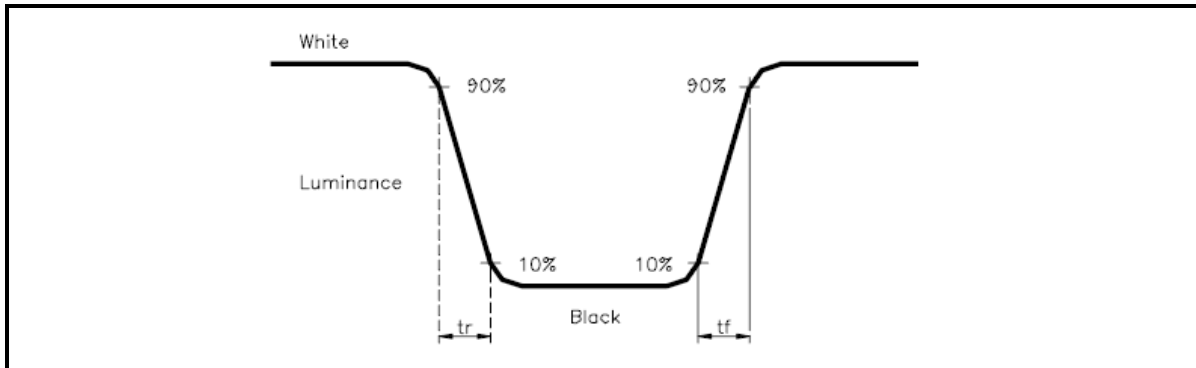
Note 7: Definition of Chromaticity:

The color coordinates (Wx,Wy),(Rx,Ry),(Gx,Gy),and (Bx,By) are obtained with all pixels in the viewing field at white, red, green, and blue states, respectively.

Note 8: Definition of Image sticking (tis):

Continuously display the test pattern shown in the figure below for 2 hours. Then display a completely white screen. The previous image shall not persist more than 2 sec at 25 ℃

Image sticking pattern
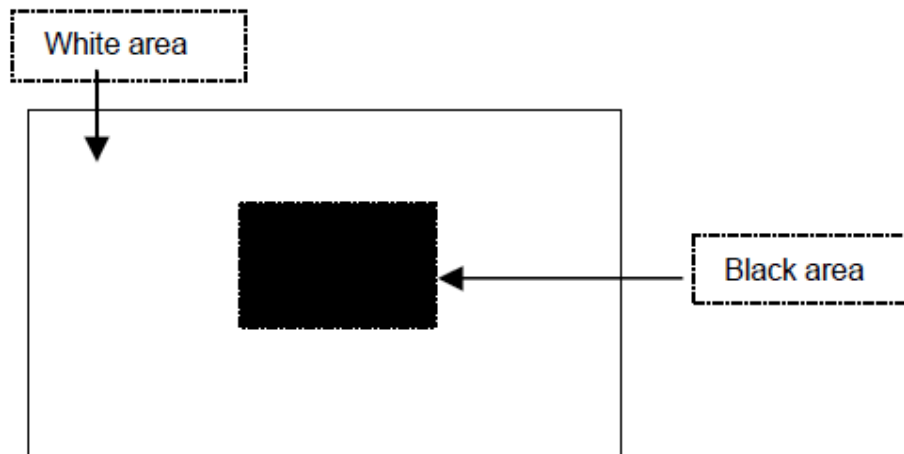
10. RELIABILITY

10.1 Test Condition

10.1.1 Temperature and Humidity(Ambient Temperature)

Temperature : 25 ± 5℃

Humidity : 65 ± 5%

10.1.2 Operation

Unless specified otherwise, test will be conducted under function state.

10.1.3 Container

Unless specified otherwise, vibration test will be conducted to the product itself without putting it in a container.

10.1.4 Test Frequency

In case of related to deterioration such as shock test. It will be conducted only once.

10.2 TESTS

No.	ITEM	CONDITION CRITERION
1	High Temperature Storage	60℃, 240 hrs
2	Low Temperature Storage	-20℃, 240 hrs
3	High Temperature Operating	50℃, 240 hrs
4	Low Temperature Operating	-10℃, 240 hrs
5	High Temperature/Humidity Non-Operating	40℃, 90%RH, 240 hrs
6	Temperature Shock Non-Operating	-20℃ ←→60℃ (0.5hr each), 25 cycles
7	Vibration Test Non-Operating	Frequency:0 ~ 55 Hz Amplitude:1.5 mm Sweep Time:11min Test Period:6 Cycles for each Direction of X,Y,Z
8	Electro-static Discharge Non-Operating	150pF,330Ω Panel surface / top case Air:± 8KV;Contact: ±6KV

Note1: The test sample have recovery time for 24 hours at room temperature before the function check. In the standard conditions, there is no any touch panel function NG issue occurred.

10.3 JUDGMENT STANDARD

The judgment of the above test should be made as follow:

Pass: Normal display image with no obvious non-uniformity and no line defect. Partial transformation of the module parts should be ignored.

Fail: No display image, obvious non-uniformity, or line defects.

10.4 INCOMING INSPECTION STANDARDS

No.	Parameter	Criteria
1	Operating	Display function: No Display malfunction (Major)
		Contrast ratio (Black, White): Does not meet specified range in the spec. (Major) (Note:3)
		Line Defect: No obvious Vertical and Horizontal line defect in bright, dark and colored. (Major) (Note:1)
		Point Defect : Active area ≤ 5 dots (Minor) (Note:1)
		Non-uniformity: Visible through 5%ND filter. (Minor)
		Foreign material in Black or White spots shape (W>1/4L)
		Foreign Material in Line or spiral shape (W≤1/4L) (Note: 4)
2	External Inspection (non-operating)	Dimension: Outline (Major)
		Bezel appearance: uneven (Minor)
		Scratch on the polarize: (Note:2)
		Dent or bubble on the polarize (Note:2)

Point Defect table:

Item	Acceptable number — Active Area	Total
Bright	2	5
Dark	4	

Foreign material in Black or White spots shape (W>1/4L):

Zone / Dimension	Acceptable number	Class Of Defects	AQL Level
D> 0.5	0	Minor	1.5
0.3 < D ≤ 0.5	5		
D ≤ 0.3	*		

D = (Long + Short) / 2   ∗ : Disregard

Foreign Material in Line or spiral shape (W≤1/4L) (Note: 4):

Zone / L (mm)	W(mm)	Acceptable number	Class Of Defects	AQL Level
L >5	W>0.1	0	Minor	1.5
0.5 < L ≤ 5	0.03 < W≤0.1	5		
L ≤0.5	W≤0.03	*		

L : Length   W : Width   ∗ : Disregard

Scratch on the polarize: (Note:2)

Zone / L (mm)	W(mm)	Acceptable number	Class Of Defects	AQL Level
--	W>0.1	0	Minor	1.5
L ≤ 3	W≤0.1	3		

L : Length   W : Width   ∗ : Disregard

Dent or bubble on the polarize (Note:2)

Zone / Dimension	Acceptable number	Class Of Defects	AQL Level
D≤0.3	*	Minor	1.5
D≤0.5	3		

D = (Long + Short) / 2   ∗ : Disregard

| Class of defects | Major | AQL 0.65% | **Definition** It is a defect that is likely to result in failure or to reduce materially the usability of the product for the intended function. |
| | Minor | AQL 1.5% | It is a defect that will not result in functioning problem with deviation classified. |

Note1:

(a)Bright point defect is defined as point defect of R,G,B with area >1/2 pixel respectively

(b)Dark point defect is defined as visible in full white pattern.

(c)Definition of distribution of point defect is as follows:

  -minimum separation between dark point defects should be larger than 5mm.

 -minimum separation between bright point defects should be larger than 5mm.

(d)Definition of joined bright point defect and joined dark point defect are as follows:

  -Two or more joined bright point defects must be nil.

  -Three joined dark point defects must be nil.

  -Coupling of one dark and one bright point in junction is counted as one dark and bright

   spot with 1 pair maximum.

  -Two Joined dark point is counted as two dark points with 2 pair maximum.

Note2: The external inspection should be conducted at the distance 30± 5cm between the eyes of inspector and the panel.

Note3: Luminance measurement for contrast ratio is at the distance 50± 5cm between the detective head and the panel with ambient luminance less than 1 lux. Contrast ratio is obtained at optimum view angle.

Note4: W-Width in mm , L-length of Max.(L1,L2) in mm.
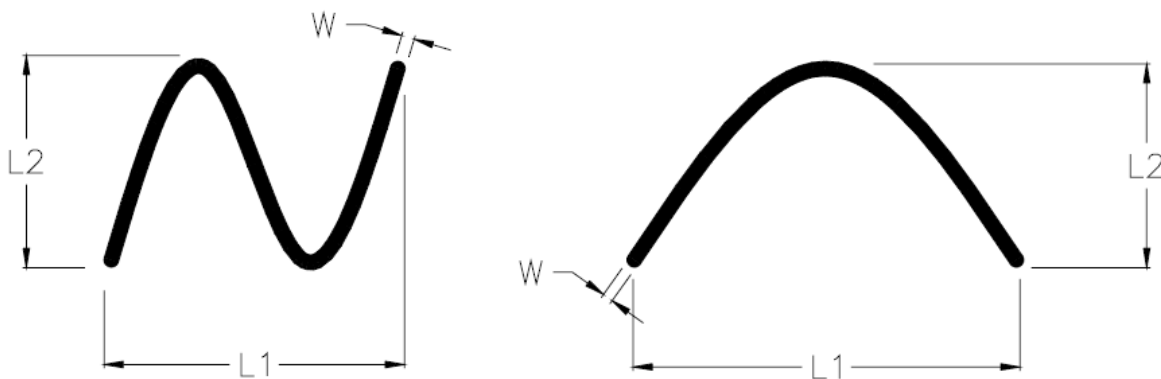
10.5 Sampling Condition

Unless otherwise agree in written, the sampling inspection shall be applied to the incoming inspection of customer.

Lot size: Quantity of shipment lot per model.

Sampling type: normal inspection, single sampling
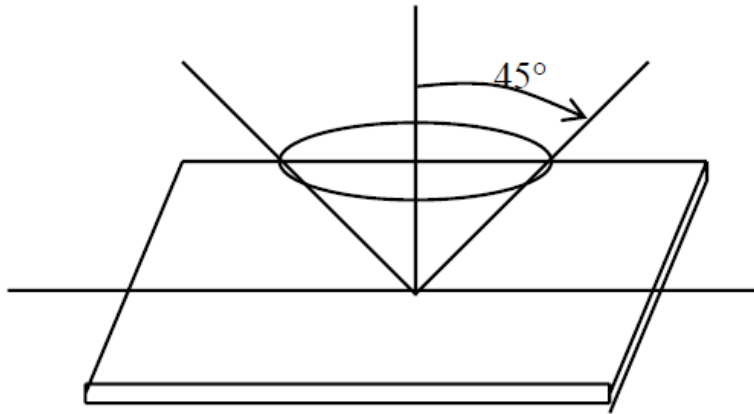
Sampling table: MIL-STD-105E

Inspection level: Level II
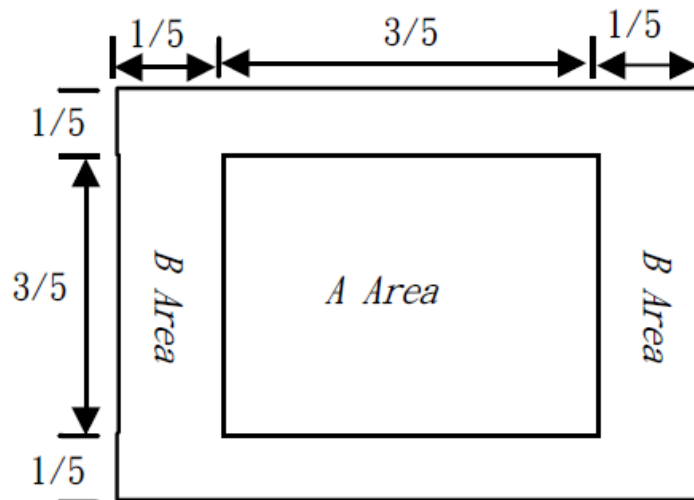
10.6 Inspection conditions

The LCD shall be inspected under 40W white fluorescent light.

$\theta \le 45°$ inspection under non-operating condition.

$\theta \le 5°$ inspection under operating condition

Definition of applicable Zones

11. PRECAUTION RELATING PRODUCT HANDLING

11.1 SAFETY

11.1.1 If the LCD panel breaks , be careful not to get the liquid crystal to touch your skin.

11.1.2 If the liquid crystal touches your skin or clothes , please wash it off immediately by using soap and water.

11.2 HANDLING

11.2.1 Avoid any strong mechanical shock which can break the glass.

11.2.2 Avoid static electricity which can damage the CMOS LSI—When working with the module, be sure to ground your body and any electrical equipment you may be using.

11.2.3 Do not remove the panel or frame from the module.

11.2.4 The polarizing plate of the display is very fragile. So , please handle it very carefully, Do not touch, push or rub the exposed polarizing with anything harder than an HB pencil lead (glass , tweezers , etc.)

11.2.5 Do not wipe the polarizing plate with a dry cloth, as it may easily scratch the surface of plate.

11.2.6 Do not touch the display area with bare hands , this will stain the display area.

11.2.7 Do not use ketonics solvent & aromatic solvent. Use with a soft cloth soaked with a cleaning naphtha solvent.

11.2.8 To control temperature and time of soldering is 280 ± 10˚C and 3-5 sec.

11.2.9 To avoid liquid (include organic solvent) stained on LCM.

11.3 STORAGE

11.3.1 Store the panel or module in a dark place where the temperature is 25˚C ± 5˚C and the humidity is below 65% RH.

11.3.2 Do not place the module near organics solvents or corrosive gases.

11.3.3 Do not crush, shake, or jolt the module.