



PRODUCT SPECIFICATION



7.0" IPS TFT LCD MODULE MODEL: PV07071H0550Y

< ◇ > Preliminary Specification

< ◆ > Finally Specification

CUSTOMER'S APPROVAL	
CUSTOMER :	
SIGNATURE:	DATE:

APPROVED BY	PM REVIEWED	PD REVIEWED	PREPARED BY



Revision History

Revision	Date	Originator	Detail	Remarks
Ver 1.0	20230512		Initial Release	
Ver 1.1	20230513		Change BL current	

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1. General Description

The specification is a transmissive type color active matrix liquid crystal display (LCD) which uses amorphous thin film transistor (TFT) as switching devices. This product is composed of a TFT-LCD panel, driver ICs and a backlight unit.

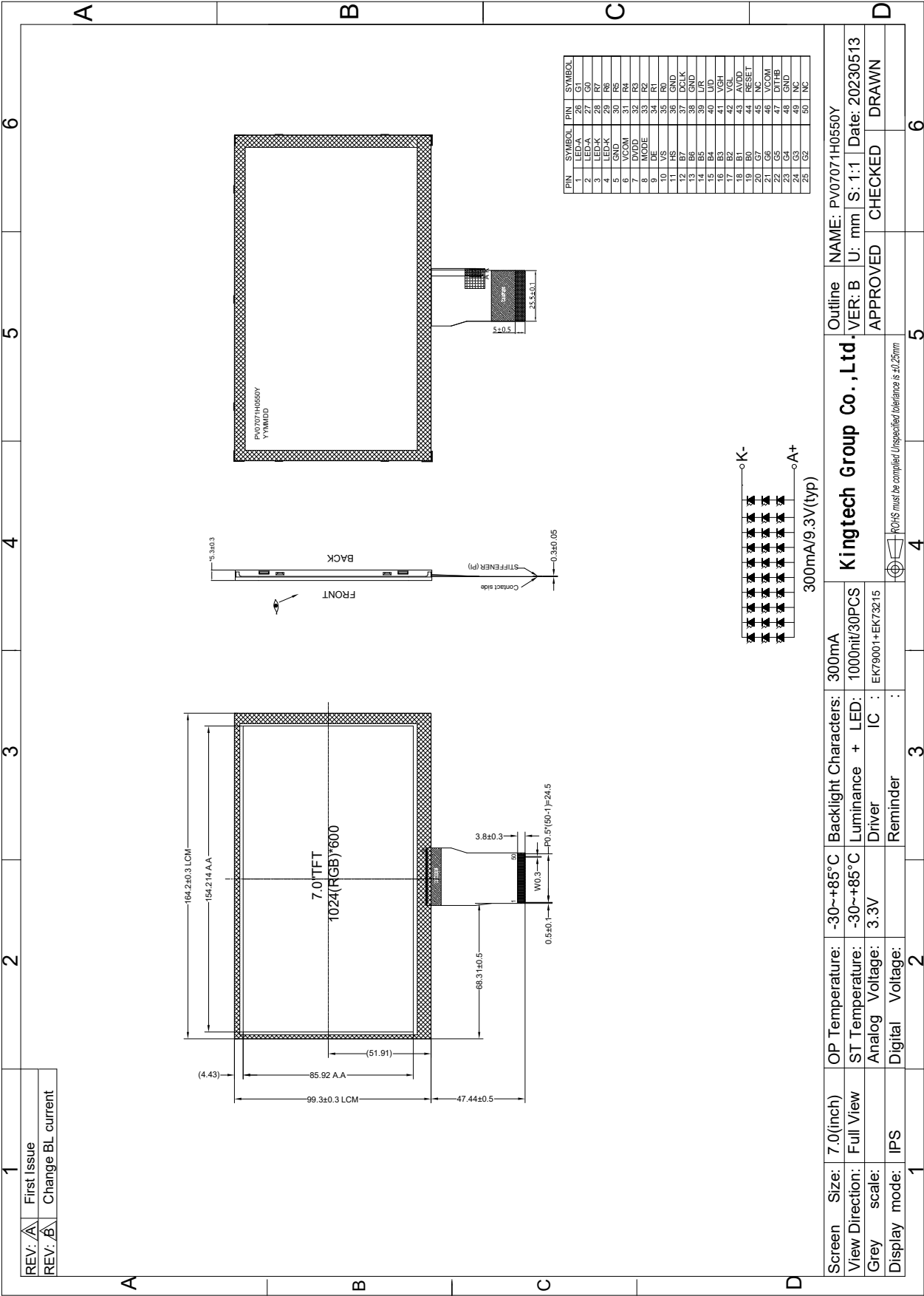
2. Module Parameter

Features	Details	Unit
Display Size(Diagonal)	7.0"	
LCD type	IPS TFT	
Display Mode	Transmissive /Normally Black	
Resolution	1024 RGB x 600	Pixels
View Direction	Full View	Best Image
Module Outline	164.2(H) x 99.3(V) x5.3(T) (Note1)	mm
Active Area	154.214(H) x 85.92(V)	mm
Pixel Pitch	50.2*3(H) x 143.2(V)	s
Pixel Arrangement	RGB Vertical stripe	
Polarizer Surface Treatment	Anti-glare	
Display Colors	16.7M	
Interface	24BIT RGB interface	
Driver IC	EK79001 & EK73215	
With or without the touch panel	Without	
Operating Temperature	-30~85	°C
Storage Temperature	-30~85	°C
Weight	-	g

Note 1: Inclusive hooks, posts, FFC/FPC tail etc.



2.1. Outline Drawing





3. Absolute Maximum Ratings

 $V_{SS}=0V, T_a=25^{\circ}C$

Item	Symbol	Min.	Max.	Unit
Supply Voltage	DVDD	-0.5	+3.96	V
	AVDD	-0.5	+14.85	V
	VGH	-0.3	+42.0	V
	VGL	VGH-42	+0.3	V
Storage temperature	T _{stg}	-30	+85	°C
Operating temperature	T _{op}	-30	+85	°C

Note 1: If T_a below $50^{\circ}C$, the maximal humidity is 90%RH, if T_a over $50^{\circ}C$, absolute humidity should be less than 60%RH.

Note 2: The response time will be extremely slow when the operating temperature is around $-10^{\circ}C$, and the back ground will become darker at high temperature operating.

4. DC Characteristics

Item		Symbol	Min.	Typ.	Max.	Unit
Supply Voltage		DVDD	3.0	3.3	3.6	V
		AVDD	-	9.6	-	V
		VGH	-	17	-	V
		VGL	-	-7	-	V
		VCOM	-	4.2	-	V
Logic Low input voltage		V _{IL}	0	-	0.3*DVDD	V
Logic High input voltage		V _{IH}	0.7*DVDD	-	DVDD	V
Logic Low output voltage		V _{OL}	-	-	GND+0.4	
Logic High output voltage		V _{OH}	DVDD-0.4	-	-	
Current Consumption All Black	Logic	I _{CC} + I _{IN}	-	-	-	mA
	Analog					

Note 1: All of the voltage listed above are with respect to GND = 0v

Note 2: Device is subject to be damaged permanently if stresses beyond those absolute maximum rating listed above

5. Backlight Characteristic

5.1. Backlight Characteristic

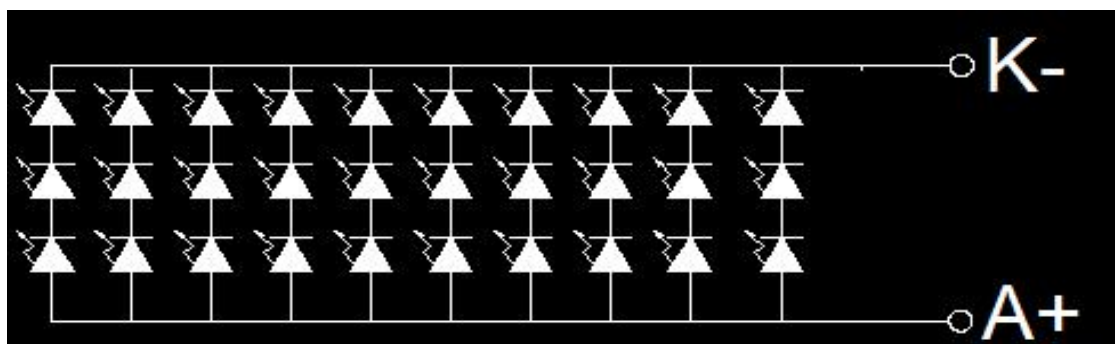
Item	Symbol	Condition	Min.	Typ.	Max.	Unit
Forward Voltage	V _F	T _a =25 °C, I _F =30mA/LED	8.4	9.3	10.2	V
Forward Current	I _F	T _a =25 °C, V _F =3.1V/LED	-	300	-	mA
Power dissipation	P _d	-	-	279	-	mW
Uniformity	Avg	-	-	80	-	%
LED working life(25°C)	-	-	-	20000	-	Hrs
Drive method	Constant current					
LED Configuration	30 White LEDs (3 LEDs in one string and 10 groups in parallel)					

Note1: LED life time defined as follows: The final brightness is at 50% of original brightness.

The environmental conducted under ambient air flow, at $T_a=25 \pm 2^{\circ}C$, 60%RH $\pm 5\%$, I_F=30mA/LED.



5.2. Backlighting circuit



6. Optical Characteristics

6.1. Optical Characteristics

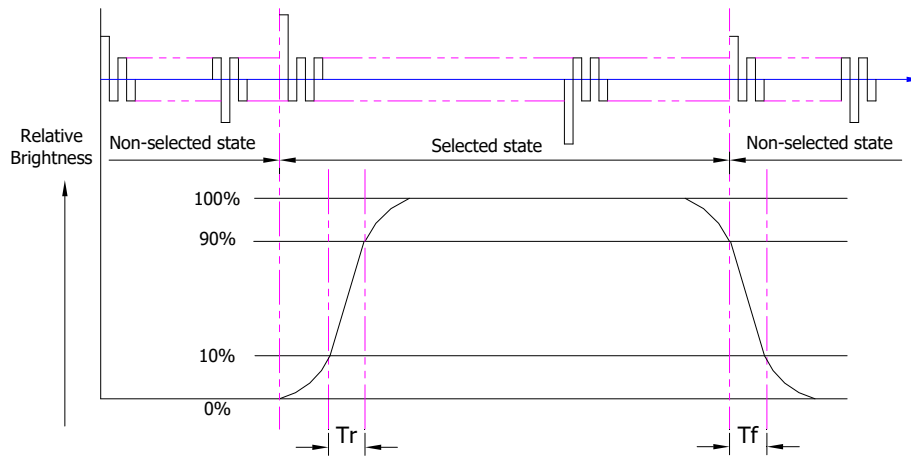
Ta=25°C, DVDD=3.3V

Backlight On (Transmissive Mode)	Item		Symbol	Condition	Specification			Unit
					Min.	Typ.	Max.	
	Luminance on TFT(I_f =20mA/LED)		Lv		850	1000	-	cd/m²
	Contrast ratio(See 6.3)		CR		800	1000	-	
	Response time (See 6.2)		TR+TF		-	25	35	ms
	Chromaticity Transmissive (See 6.5)	Red	XR			TBD		
			YR			TBD		
		Green	XG			TBD		
			YG			TBD		
		Blue	XB			TBD		
YB					TBD			
White		XW			TBD			
		YW			TBD			
Viewing Angle (See 6.4)	Horizontal	θ_{X+}	Center CR≥10	80	85	-	Deg.	
		θ_{X-}		80	85	-		
	Vertical	φ_{Y+}		80	85	-		
		φ_{Y-}		80	85	-		
	NTSC ratio (Color gamut)				-	50	-	%



6.2. Definition of Response Time

6.2.1. Normally Black Type (Negative)

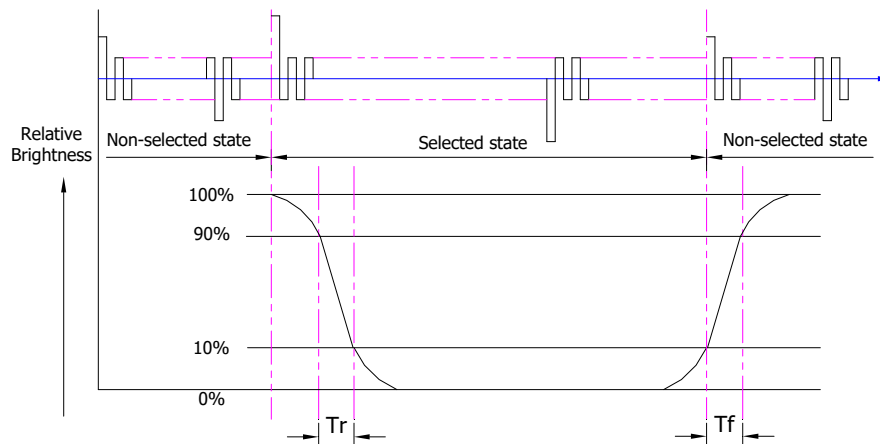


T_r is the time it takes to change from non-selected stage with relative luminance 10% to selected state with relative luminance 90%;

T_f is the time it takes to change from selected state with relative luminance 90% to non-selected state with relative luminance 10%.

Note: Measuring machine: LCD-5100

6.2.2. Normally White Type (Positive)



T_r is the time it takes to change from non-selected stage with relative luminance 90% to selected state with relative luminance 10%;

T_f is the time it takes to change from selected state with relative luminance 10% to non-selected state with relative luminance 90%;

Note: Measuring machine: LCD-5100 or EQUI

6.3. Definition of Contrast Ratio

Contrast is measured perpendicular to display surface in reflective and transmissive mode.

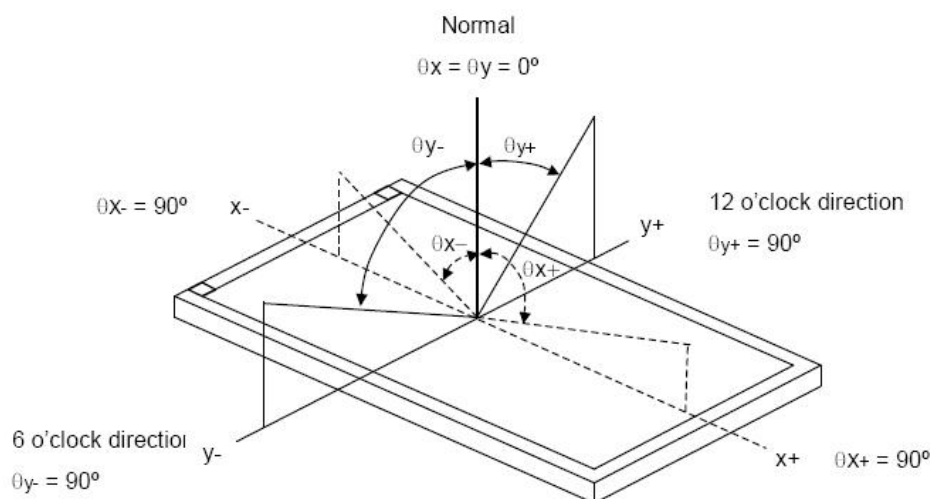


The measurement condition is:

Measuring Equipment	Eldim or Equivalent
Measuring Point Diameter	3mm//1mm
Measuring Point Location	Active Area centre point
Test pattern	A: All Pixels white
	B: All Pixel black
Contrast setting	Maximum

Definitions: CR (Contrast) = Luminance of White Pixel / Luminance of Black Pixel

6.4. Definition of Viewing Angles



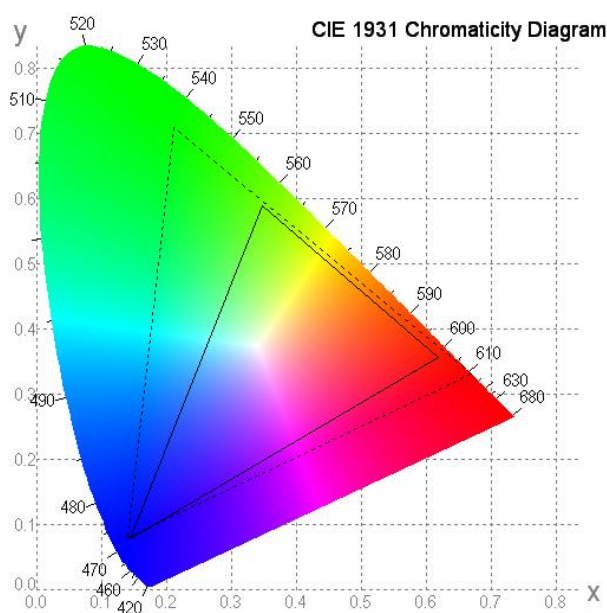
Measuring machine: LCD-5100 or EQUI

6.5. Definition of Color Appearance

R,G,B and W are defined by (x, y) on the IE chromaticity diagram

NTSC=area of RGB triangle/area of NTSC triangleX100%

Measuring picture: Red, Green, Blue and White (Measuring machine: BM-7)



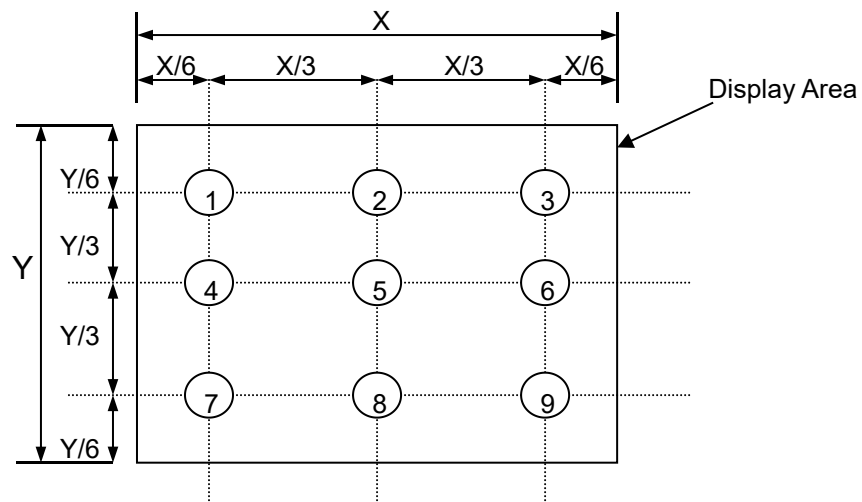
6.6. Definition of Surface Luminance, Uniformity and Transmittance

Using the transmissive mode measurement approach, measure the white screen luminance of the display panel and backlight.

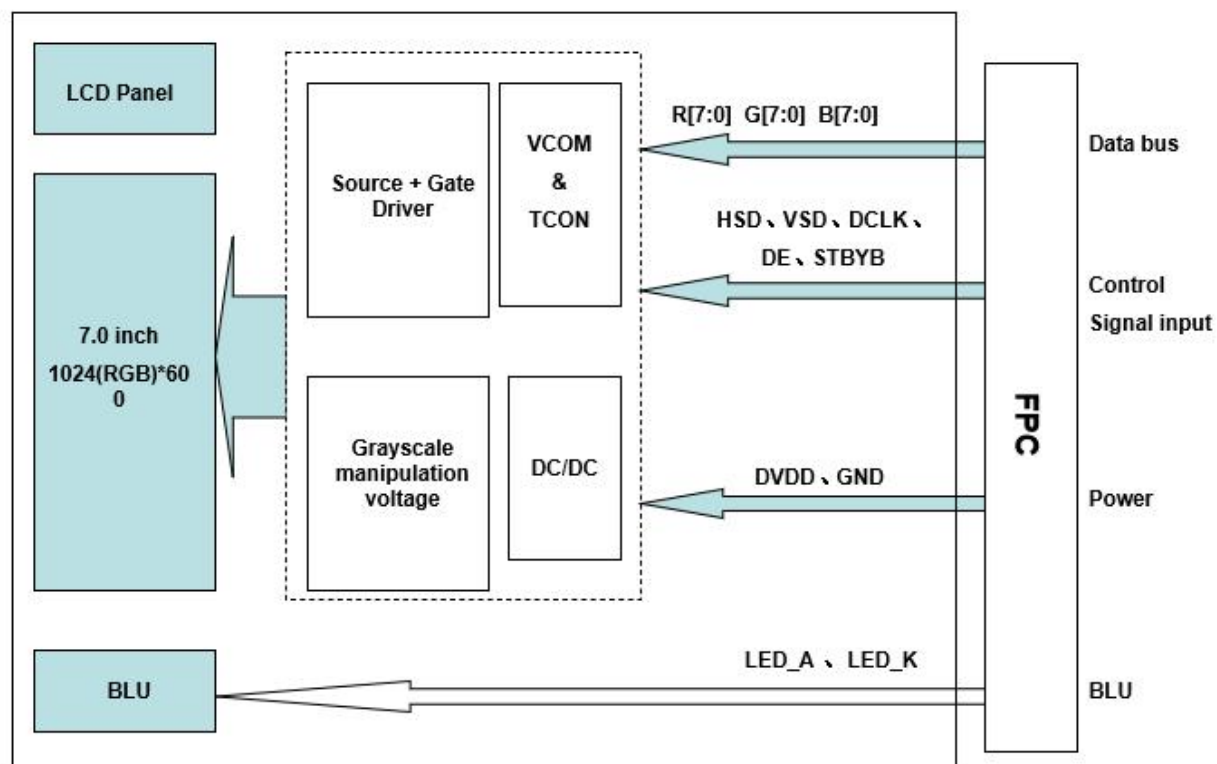


- 6.6.1. Surface Luminance: $L_V = \text{average} (L_{P1}:L_{P9})$
- 6.6.2. Uniformity = $\text{Minimal} (L_{P1}:L_{P9}) / \text{Maximal} (L_{P1}:L_{P9}) * 100\%$
- 6.6.3. Transmittance = $L_V \text{ on LCD} / L_V \text{ on Backlight} * 100\%$

Note: Measuring machine: BM-7



7. Block Diagram and Power Supply





8. Interface Pins Definition

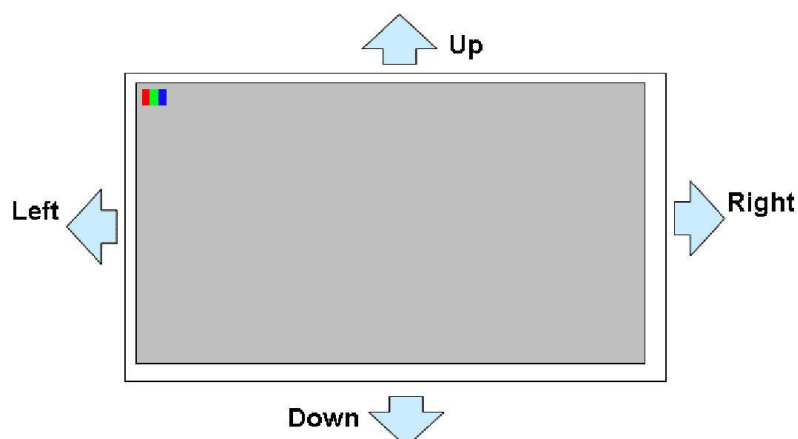
No.	Symbol	Function	Remark
1	VLED+	LED Input Terminal I(Anode).	
2	VLED+	LED Input Terminal I(Anode).	
3	VLED-	Ground (Cathode).	
4	VLED-	Ground (Cathode).	
5	GND	Ground.	
6	VCOM	Common voltage.	
7	DVDD	Power for Digital Circuit.	
8	MODE	DE/SYNC mode select.	Note 1
9	DE	Data Input Enable.	
10	VS	Vertical Sync Input.	
11	HS	Horizontal Sync Input.	
12	B7	Blue data(MSB)	
13	B6	Blue data	
14	B5	Blue data	
15	B4	Blue data	
16	B3	Blue data	
17	B2	Blue data	
18	B1	Blue data	Note 2
19	B0	Blue data(LSB)	Note 2
20	G7	Green data(MSB)	
21	G6	Green data	
22	G5	Green data	
23	G4	Green data	
24	G3	Green data	
25	G2	Green data	
26	G1	Green data	Note 2
27	G0	Green data(LSB)	Note 2
28	R7	Red data(MSB)	
29	R6	Red data	
30	R5	Red data	
31	R4	Red data	
32	R3	Red data	
33	R2	Red data	
34	R1	Red data	Note 2
35	R0	Red data(LSB)	Note 2
36	GND	Ground.	
37	DCLK	Sample clock.	Note 3
38	GND	Ground.	
39	L/R	Left / right selection.	Note 4,5
40	U/D	Up / Down selection.	Note 4,5
41	VGH	Gate ON Voltage.	



42	VGL	Gate OFF Voltage.	
43	AVDD	Power for Analog Circuit.	
44	RESET	Global reset pin.	Note 6
45	NC	No connection.	
46	VCOM	Common voltage.	Note 7
47	DITHB	Dithering function.	
48	GND	Ground.	
49	NC	No connection.	
50	NC	No connection.	

Note 1:

SHLR	UPDN	Data shifting
DVDD	GND	Left→Right , Up→Down(default)
GND	GND	Right→Left , Up→Down
DVDD	DVDD	Left→Right , Down→Up
GND	DVDD	Right→Left , Down→Up



9. AC characteristics

9.1. Timing



DE mode

DE mode					
Parameter	Symbol	Value			Unit
		Min.	Typ.	Max.	
DCLK frequency @Frame rate=60hz	fclk	40.8	51.2	67.2	Mhz
Horizontal display area	thd	1024			DCLK
HSYNC period time	th	1114	1344	1400	DCLK
HSYNC blanking	thb+thfp	90	320	376	DCLK
Vertical display area	tvd	600			H
VSYNC period time	tv	610	635	800	H
VSYNC blanking	tvb+tvfp	10	35	200	H

HV mode(1)

HV mode

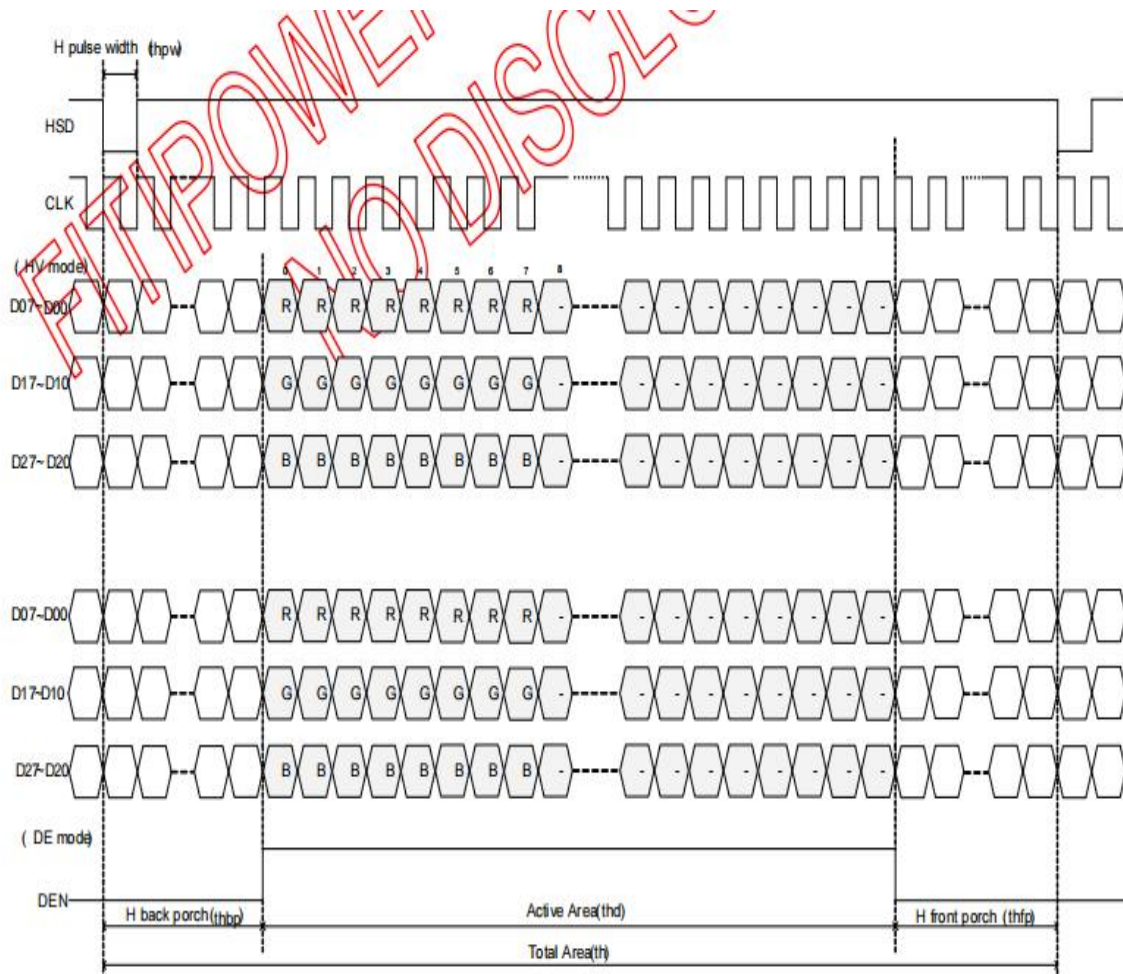
Horizontal input timing

Parameter		Symbol	Value			Unit
Horizontal display area		thd	1024			DCLK
DCLK frequency@ Frame rate=60hz		fclk	Min.	Typ.	Max.	
			44.9	51.2	63	Mhz
1 Horizontal Line		th	1200	1344	1400	DCLK
HSYNC pulse width	Min.	thpw	1			
	Typ.		—			
	Max.		140			
HSYNC back porch		thbp	160	160	160	
HSYNC front porch		thfp	16	160	216	

HV mode(2)

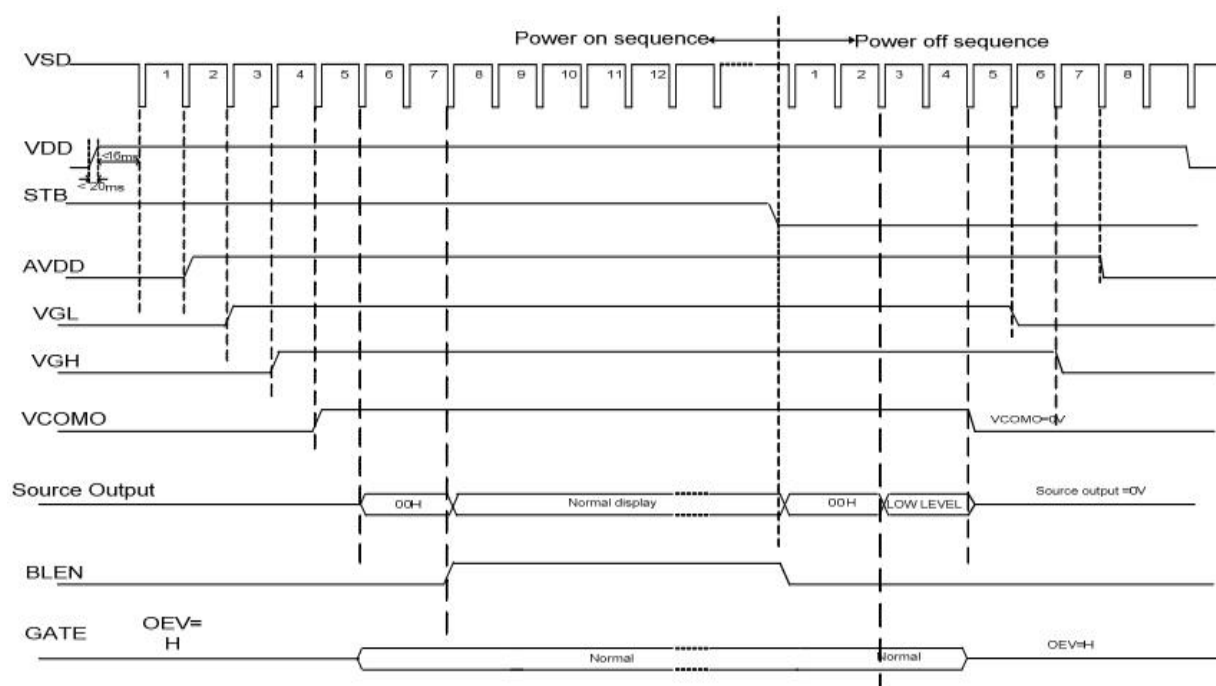
Vertical input timing					
Parameter	Symbol	Value			Unit
		Min.	Typ.	Max.	
Vertical display area	tvd	600			H
VSYNC period time	tv	624	635	750	H
VSYNC pulse width	tpw	1	—	20	H
VSYNC back porch	tvb	23	23	23	H
VSYNC front porch	tvfp	1	12	127	H

9.2. Data Input Format for RGB

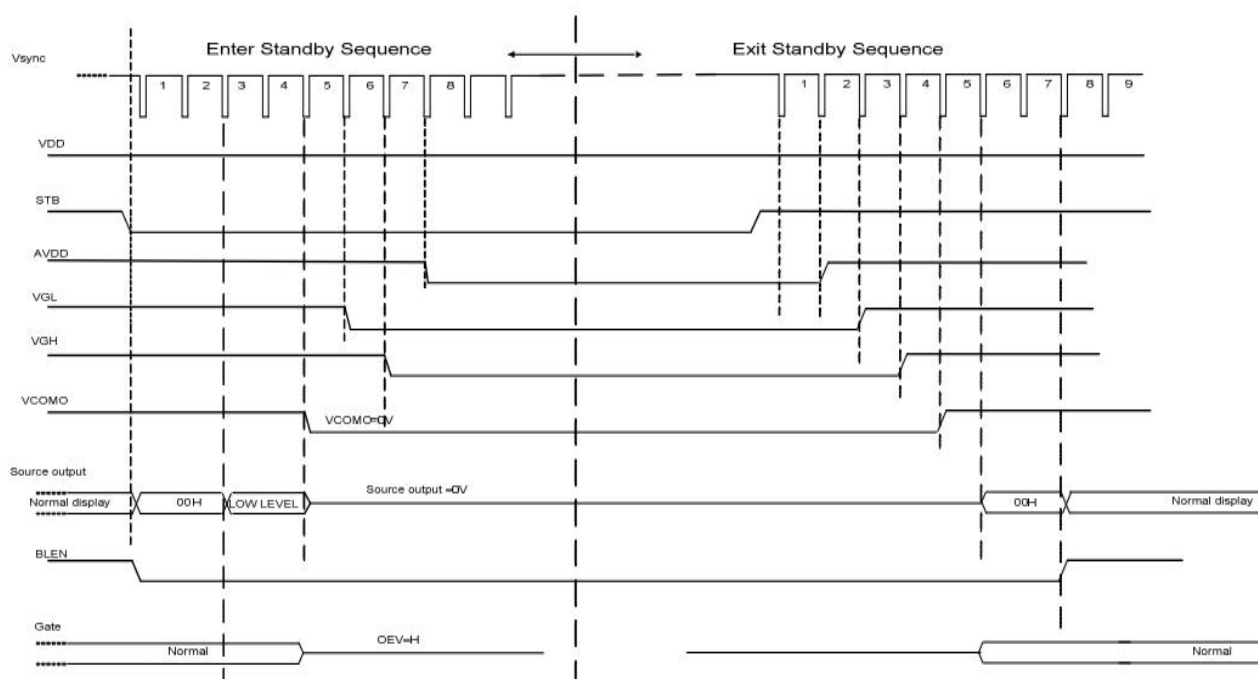




10. Power On/Off Sequence



Power On/Off timing chart



Enter and Exit Standby Mode timing chart



11. Quality Assurance

11.1.Purpose

This standard for Quality Assurance assures the quality of LCD module products supplied to customer.

11.2.Standard for Quality Test

11.2.1. Sampling Plan:

GB2828.1-2012

Single sampling, general inspection level II

11.2.2. Sampling Criteria:

Visual inspection: AQL 1.5

Electrical functional: AQL 0.65.

11.2.3. Reliability Test:

Detailed requirement refer to Reliability Test Specification.

11.3.Nonconforming Analysis & Disposition

11.3.1. Nonconforming analysis:

11.3.1.1. Customer should provide overall information of non-conforming sample for their complaints.

11.3.1.2. After receipt of detailed information from customer, the analysis of nonconforming parts usually should be finished in one week.

11.3.1.3. If cannot finish the analysis on time, customer will be notified with the progress status.

11.3.2. Disposition of nonconforming:

11.3.2.1. Non-conforming product over PPM level will be replaced.

11.3.2.2. The cause of non-conformance will be analyzed. Corrective action will be discussed and implemented.

11.4.Agreement Items

Shall negotiate with customer if the following situation occurs:

11.4.1. There is any discrepancy in standard of quality assurance.

11.4.2. Additional requirement to be added in product specification.

11.4.3. Any other special problem.

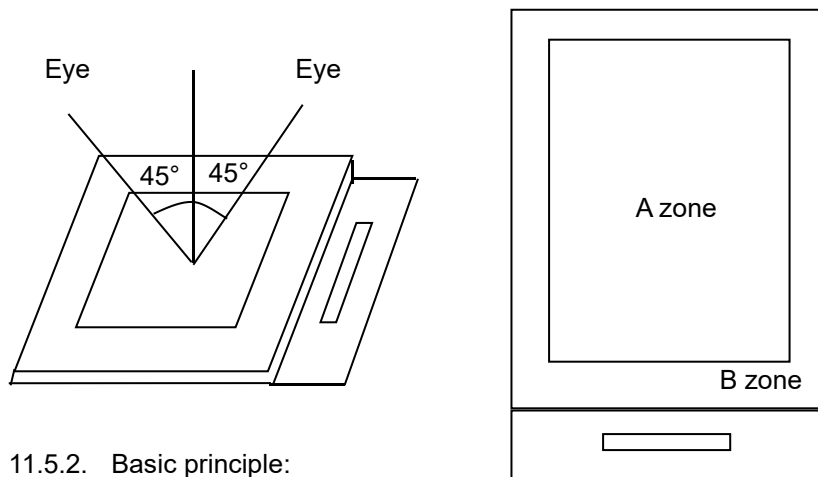
11.5.Standard of the Product Visual Inspection

11.5.1. Appearance inspection:

11.5.1.1. The inspection must be under illumination about 1000 – 1500 lx, and the distance of view must be at 30cm ± 2cm.

11.5.1.2. The viewing angle should be 45° from the vertical line without reflection light or follows customer's viewing angle specifications.

11.5.1.3. Definition of area: A Zone: Active Area, B Zone: Viewing Area,

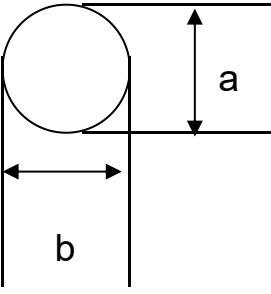


11.5.2. Basic principle:

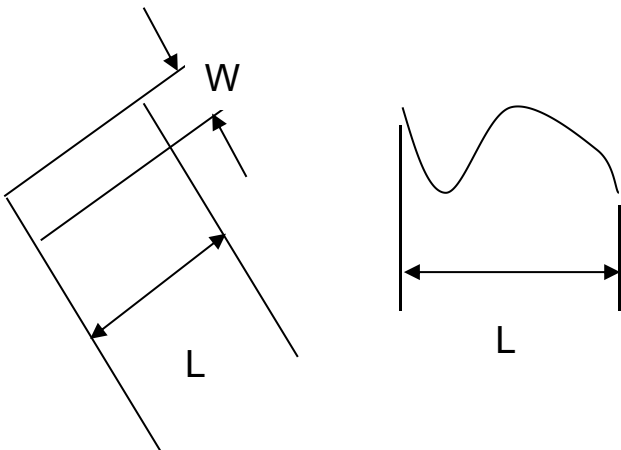
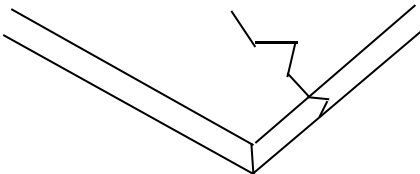
11.5.2.1. A set of sample to indicate the limit of acceptable quality level must be discussed by both us and customer when there is any dispute happened.

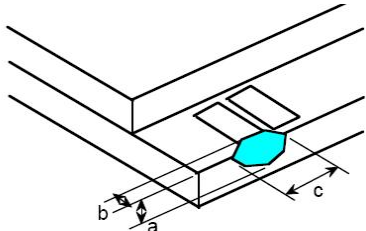
11.5.2.2. New item must be added on time when it is necessary.

11.6. Inspection Specification for the TFT module

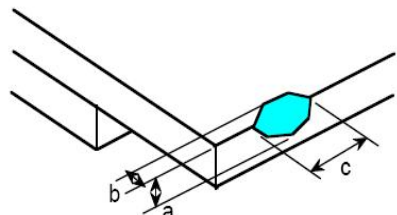
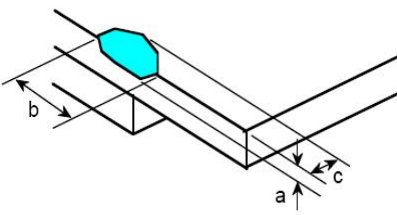
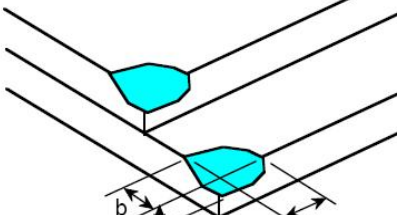
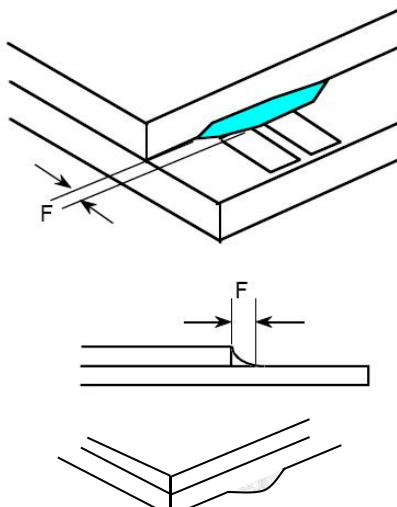
No.	Item	Criteria (Unit: mm)																		
01	Black / White spot Foreign material (Round type) Pinholes Stain Particles inside cell. (Minor defect)	 $\varphi = (a + b) / 2$	<table><tr><th>Size \ Area</th><th colspan="2">Acc. Qty</th></tr><tr><td>$\varphi \leq 0.20$</td><td colspan="2">Ignore</td></tr><tr><td>$0.20 < \varphi \leq 0.50$</td><td colspan="2">N≤3</td></tr><tr><td>$0.50 < \varphi$</td><td colspan="2">0</td></tr></table>			Size \ Area	Acc. Qty		$\varphi \leq 0.20$	Ignore		$0.20 < \varphi \leq 0.50$	N≤3		$0.50 < \varphi$	0				
			Size \ Area	Acc. Qty																
$\varphi \leq 0.20$	Ignore																			
$0.20 < \varphi \leq 0.50$	N≤3																			
$0.50 < \varphi$	0																			
		Distance between 2 defects should more than 5mm apart.																		
02	Electrical Defect (Minor defect)	<table><tr><td rowspan="2">Bright dot</td><td>Display Area</td><td>Total</td><td rowspan="4">Note 1</td></tr><tr><td>N≤2</td><td>N≤2</td></tr><tr><td>Dark dot</td><td>N≤4</td><td>N≤4</td></tr><tr><td>Total dot</td><td>N≤4</td><td>N≤4</td></tr><tr><td>Mura</td><td colspan="2">Not visible through 5% ND filters.</td><td>Note 2</td></tr></table>			Bright dot	Display Area	Total	Note 1	N≤2	N≤2	Dark dot	N≤4	N≤4	Total dot	N≤4	N≤4	Mura	Not visible through 5% ND filters.		Note 2
		Bright dot	Display Area	Total		Note 1														
N≤2	N≤2																			
Dark dot	N≤4	N≤4																		
Total dot	N≤4	N≤4																		
Mura	Not visible through 5% ND filters.		Note 2																	
		Remark: 1. Bright dot caused by scratch and foreign object accords to item 1.																		



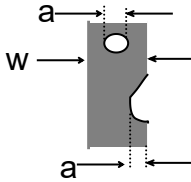
03	Black and White line Scratch Foreign material (Line type) (Minor defect)	 <table border="1" data-bbox="577 719 1203 983"> <thead> <tr> <th>Length</th><th>Width</th><th>Acc. Qty</th></tr> </thead> <tbody> <tr> <td>/</td><td>$W \leq 0.1$</td><td>Ignore</td></tr> <tr> <td>$L \leq 2.5$</td><td>$0.1 < W \leq 0.2$</td><td>3</td></tr> <tr> <td>$L > 2.5$</td><td>$0.2 < W$</td><td>0</td></tr> <tr> <td colspan="2">Total</td><td>3</td></tr> </tbody> </table> Distance between 2 defects should more than 3mm apart. Scratches not viewable through the back of the display are acceptable.	Length	Width	Acc. Qty	/	$W \leq 0.1$	Ignore	$L \leq 2.5$	$0.1 < W \leq 0.2$	3	$L > 2.5$	$0.2 < W$	0	Total		3
Length	Width	Acc. Qty															
/	$W \leq 0.1$	Ignore															
$L \leq 2.5$	$0.1 < W \leq 0.2$	3															
$L > 2.5$	$0.2 < W$	0															
Total		3															
04	Glass Crack (Minor defect)	 Crack is potential to enlarge, any type is not allowed.															

05	Glass Chipping Pad Area: (Minor defect)								
		<table border="1"><thead><tr><th>Length and Width</th><th>Acc. Qty</th></tr></thead><tbody><tr><td>$c > 3.0, b < 1.0$</td><td>1</td></tr><tr><td>$c < 3.0, b < 1.0$</td><td>3</td></tr><tr><td colspan="2">$a < \text{Glass Thickness}$</td></tr></tbody></table>	Length and Width	Acc. Qty	$c > 3.0, b < 1.0$	1	$c < 3.0, b < 1.0$	3	$a < \text{Glass Thickness}$
Length and Width	Acc. Qty								
$c > 3.0, b < 1.0$	1								
$c < 3.0, b < 1.0$	3								
$a < \text{Glass Thickness}$									



06	Glass Chipping Rear of Pad Area: (Minor defect) 	<table><tr><th>Length and Width</th><th>Acc. Qty</th></tr><tr><td>$c > 3.0, b < 1.0$</td><td>1</td></tr><tr><td>$c < 3.0, b < 1.0$</td><td>2</td></tr><tr><td>$c < 3.0, b < 0.5$</td><td>4</td></tr><tr><td colspan="2">$a < \text{Glass Thickness}$</td></tr></table>	Length and Width	Acc. Qty	$c > 3.0, b < 1.0$	1	$c < 3.0, b < 1.0$	2	$c < 3.0, b < 0.5$	4	$a < \text{Glass Thickness}$	
Length and Width	Acc. Qty											
$c > 3.0, b < 1.0$	1											
$c < 3.0, b < 1.0$	2											
$c < 3.0, b < 0.5$	4											
$a < \text{Glass Thickness}$												
07	Glass Chipping Except Pad Area: (Minor defect) 	<table><tr><th>Length and Width</th><th>Acc. Qty</th></tr><tr><td>$c > 3.0, b < 1.0$</td><td>1</td></tr><tr><td>$c < 3.0, b < 1.0$</td><td>2</td></tr><tr><td>$c < 3.0, b < 0.5$</td><td>4</td></tr><tr><td colspan="2">$a < \text{Glass Thickness}$</td></tr></table>	Length and Width	Acc. Qty	$c > 3.0, b < 1.0$	1	$c < 3.0, b < 1.0$	2	$c < 3.0, b < 0.5$	4	$a < \text{Glass Thickness}$	
Length and Width	Acc. Qty											
$c > 3.0, b < 1.0$	1											
$c < 3.0, b < 1.0$	2											
$c < 3.0, b < 0.5$	4											
$a < \text{Glass Thickness}$												
08	Glass Corner Chipping: (Minor defect) 	<table><tr><th>Length and Width</th><th>Acc. Qty</th></tr><tr><td>$c < 3.0, b < 3.0$</td><td>Ignore</td></tr><tr><td colspan="2">$a < \text{Glass Thickness}$</td></tr></table>	Length and Width	Acc. Qty	$c < 3.0, b < 3.0$	Ignore	$a < \text{Glass Thickness}$					
Length and Width	Acc. Qty											
$c < 3.0, b < 3.0$	Ignore											
$a < \text{Glass Thickness}$												
09	Glass Burr: (Minor defect) 	<table><tr><th>Length</th><th>Acc. Qty</th></tr><tr><td>$F < 1.0$</td><td>Ignore</td></tr></table> Glass burr don't affect assemble and module dimension.	Length	Acc. Qty	$F < 1.0$	Ignore						
Length	Acc. Qty											
$F < 1.0$	Ignore											



10	FPC Defect: (Minor defect) 	10.1 Dent, pinhole width $a < w/3$. (w: circuitry width.) 10.2 Open circuit is unacceptable. 10.3 No oxidation, contamination and distortion.								
11	Bubble on Polarizer (Minor defect)	<table><tr><th>Diameter</th><th>Acc. Qty</th></tr><tr><td>$\varphi \leq 0.30$</td><td>Ignore</td></tr><tr><td>$0.30 < \varphi \leq 0.50$</td><td>$N \leq 2$</td></tr><tr><td>$0.50 < \varphi$</td><td>$N = 0$</td></tr></table>	Diameter	Acc. Qty	$\varphi \leq 0.30$	Ignore	$0.30 < \varphi \leq 0.50$	$N \leq 2$	$0.50 < \varphi$	$N = 0$
Diameter	Acc. Qty									
$\varphi \leq 0.30$	Ignore									
$0.30 < \varphi \leq 0.50$	$N \leq 2$									
$0.50 < \varphi$	$N = 0$									
12	Dent on Polarizer (Minor defect)	<table><tr><th>Diameter</th><th>Acc. Qty</th></tr><tr><td>$\varphi \leq 0.25$</td><td>Ignore</td></tr><tr><td>$0.25 < \varphi \leq 0.50$</td><td>$N \leq 4$</td></tr><tr><td>$0.50 < \varphi$</td><td>None</td></tr></table>	Diameter	Acc. Qty	$\varphi \leq 0.25$	Ignore	$0.25 < \varphi \leq 0.50$	$N \leq 4$	$0.50 < \varphi$	None
Diameter	Acc. Qty									
$\varphi \leq 0.25$	Ignore									
$0.25 < \varphi \leq 0.50$	$N \leq 4$									
$0.50 < \varphi$	None									
13	Bezel	13.1 No rust, distortion on the Bezel. 13.2 No visible fingerprints, stains or other contamination.								
14	Touch Panel	D: Diameter W: width L: length 14.1 Spot: $D < 0.25$ is acceptable $0.25 \leq D \leq 0.4$ 2dots are acceptable and the distance between defects should more than 10 mm. $D > 0.4$ is unacceptable 14.2 Dent: $D > 0.40$ is unacceptable 14.3 Scratch: $W \leq 0.03$, $L \leq 10$ is acceptable, $0.03 < W \leq 0.10$, $L \leq 10$ is acceptable Distance between 2 defects should more than 10 mm. $W > 0.10$ is unacceptable.								
15	PCB	15.1 No distortion or contamination on PCB terminals. 15.2 All components on PCB must same as documented on the BOM/component layout. 15.3 Follow IPC-A-600F.								
16	Soldering	Follow IPC-A-610C standard								
17	Electrical Defect	The below defects must be rejected.								



	(Major defect)	17.1 Missing vertical / horizontal segment, 17.2 Abnormal Display. 17.3 No function or no display. 17.4 Current exceeds product specifications. 17.5 LCD viewing angle defect. 17.6 No Backlight. 17.7 Dark Backlight. 17.8 Touch Panel no function.
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Remark: LCD Panel Broken shall be rejected. Defect out of LCD viewing area is acceptable.

11.7. Classification of Defects

11.7.1. Visual defects (Except no / wrong label) are treated as minor defect and electrical defect is major.

11.7.2. Two minor defects are equal to one major in lot sampling inspection.

11.8. Identification/marketing criteria

Any unit with illegible / wrong /double or no marking/ label shall be rejected.

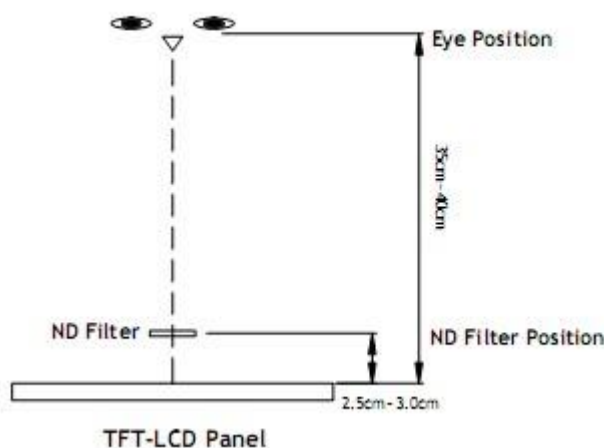
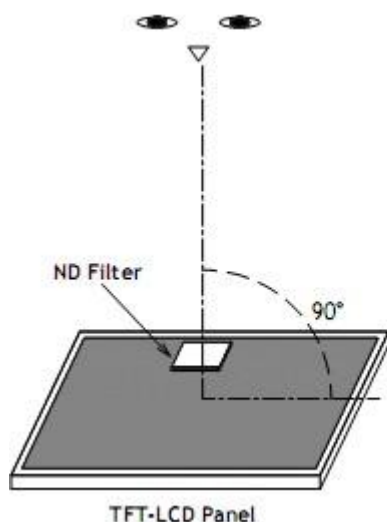
11.9. Packing

11.9.1. There should be no damage of the outside carton box, each packaging box should have one identical label.

11.9.2. Modules inside package box should have compliant mark.

11.9.3. All direct package materials shall offer ESD protection.

Note1: Bright dot is defined as the defective area of the dot is larger than 50% of one sub-pixel area.



Bright dot: The bright dot size defect at black display pattern. It can be recognized by 2% transparency of filter when the distance between eyes and panel is $350\text{mm} \pm 50\text{mm}$.

Dark dot: Cyan, Magenta or Yellow dot size defect at white display pattern. It can be recognized by 5% transparency of filter when the distance between eyes and panel is $350\text{mm} \pm 50\text{mm}$.

Note2: Mura on display which appears darker / brighter against background brightness on parts of display area.



12. Reliability Specification

No	Item	Condition	Quantity	Criteria
1	High Temperature Operating	85°C, 96Hrs	2	GB/T2423.2-2008
2	Low Temperature Operating	-30°C, 96Hrs	2	GB/T2423.1-2008
3	High Humidity	60°C, 90%RH, 96Hrs	2	GB/T2423.3-2016
4	High Temperature Storage	85°C, 96Hrs	2	GB/T2423.2-2008
5	Low Temperature Storage	-30°C, 96Hrs	2	GB/T2423.1-2008
6	Thermal Cycling Test	-30°C, 60min ~ 80°C, 60min, 20 cycles.	2	GB/T2423.22-2012
7	Packing vibration	Frequency range:10Hz~50Hz Acceleration of gravity:5G X, Y, Z 30 min for each direction.	2	GB/T5170.14-2009
8	Electrical Static Discharge	Air: $\pm 8KV$ 150pF/330 Ω Contact: $\pm 4KV$ 150pF/330 Ω	2	GB/T17626.2-2018
9	Drop Test (Packaged)	Height:72cm(weight $\leq 10kg$),60cm (weight $> 10kg$) 1 corner, 3 edges, 6 surfaces.	2	GB/T2423.8-1995

Note1. No defection cosmetic and operational function allowable.

Note2. Total current Consumption should be below double of initial value



13. Precautions and Warranty

13.1. Safety

- 13.1.1. The liquid crystal in the LCD is poisonous. Do not put it in your mouth. If the liquid crystal touches your skin or clothes, wash it off immediately using soap and water.
- 13.1.2. Since the liquid crystal cells are made of glass, do not apply strong impact on them. Handle with care.

13.2. Handling

- 13.2.1. Reverse and use within ratings in order to keep performance and prevent damage.
- 13.2.2. Do not wipe the polarizer with dry cloth, as it might cause scratch. If the surface of the LCD needs to be cleaned, wipe it swiftly with cotton or other soft cloth soaked with petroleum IPA, do not use other chemicals.

13.3. Storage

- 13.3.1. Do not store the LCD module beyond the specified temperature ranges.
- 13.3.2. Strong light exposure causes degradation of polarizer and color filter

13.4. Metal Pin (Apply to Products with Metal Pins)

13.4.1. Pins of LCD and Backlight

- 13.4.1.1. Solder tip can touch and press on the tip of Pin LEAD during the soldering

13.4.1.2. Recommended Soldering Conditions

Solder Type: Sn96.3~94-Ag3.3~4.3-Cu0.4~1.1

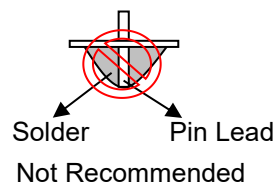
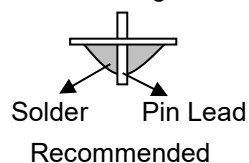
Maximum Solder Temperature: 370°C

Maximum Solder Time: 3s at the maximum temperature

Recommended Soldering Temp: 350±20°C

Typical Soldering Time: ≤3s

13.4.1.3. Solder Wetting



13.4.2. Pins of EL

- 13.4.2.1. Solder tip can touch and press on the tip of EL leads during soldering.

- 13.4.2.2. No Solder Paste on the soldering pad on the motherboard is recommended.

13.4.2.3. Recommended Soldering Conditions

Solder type: Nippon Alimit Leadfree SR-34, size 0.5mm

Recommended Solder Temperature: 270~290°C

Typical Soldering Time: ≤2s

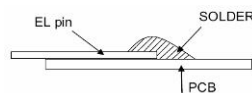
Minimum solder distance from EL lamp (body): 2.0mm

- 13.4.2.4. No horizontal press on the EL leads during soldering.

- 13.4.2.5. 180° bend EL leads three times is not allowed.



13.4.2.6. Solder Wetting

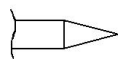


Recommended

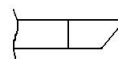


Not Recommended

13.4.2.7. The type of the solder iron:



Recommended



Not Recommended

13.4.2.8. Solder Pad



13.5. Operation

- 13.5.1. Do not drive LCD with DC voltage
- 13.5.2. Response time will increase below lower temperature
- 13.5.3. Display may change color with different temperature
- 13.5.4. Mechanical disturbance during operation, such as pressing on the display area, may cause the segments to appear "fractured".
- 13.5.5. Do not connect or disconnect the LCM to or from the system when power is on.
- 13.5.6. Never use the LCM under abnormal condition of high temperature and high humidity.
- 13.5.7. Module has high frequency circuits. Sufficient suppression to the electromagnetic interface shall be done by system manufacturers. Grounding and shielding methods may be important to minimize the interference.
- 13.5.8. Do not display the fixed pattern for long time (we suggest the time not longer than one hour) because it may develop image sticking due to the TFT structure.

13.6. Static Electricity

- 13.6.1. CMOS LSIs are equipped in this unit, so care must be taken to avoid the electro-static charge, by ground human body, etc.
- 13.6.2. The normal static prevention measures should be observed for work clothes and benches.
- 13.6.3. The module should be kept into anti-static bags or other containers resistant to static for storage.

13.7. Limited Warranty

- 13.7.1. Our warranty liability is limited to repair and/or replacement. We will not be responsible for any consequential loss.
- 13.7.2. If possible, we suggest customer to use up all modules in six months. If the module storage time over twelve months, we suggest that recheck it before the module be used
- 13.7.3. After the product shipped, any product quality issues must be feedback within three months, otherwise, we will not be responsible for the subsequent or consequential events.



14. Packaging

TBD