

PRODUCT SPECIFICATION

10.25” TFT LCD MODULE
MODEL: YDP LCD I 1025 R



- < ◇ > Preliminary Specification
- < ◆ > Finally Specification

CUSTOMER’S APPROVAL	
CUSTOMER :	
SIGNATURE:	DATE:

APPROVED BY	PM REVIEWED	PD REVIEWED	PREPARED BY
-	TFT S. G. H 20240918	TFT 周福云 20240918	TFT L. L 20240918

knitter-switch

Revision History

Revision	Date	Originator	Detail	Remarks
Ver 1.0	2024.09.18	LL	Initial Release	

Table of Contents

No.	Item	Page
1.	General Description	4
2.	Module Parameter	4
3.	Absolute Maximum Ratings	4
4.	DC Characteristics	5
5.	Backlight Characteristic	5
6.	Optical Characteristics	6
6.1.	Optical Characteristics	6
6.2.	Definition of Response Time	6
6.3.	Definition of Contrast Ratio	7
6.4.	Definition of Viewing Angles	7
6.5.	Definition of Color Appearance	7
6.6.	Definition of Surface Luminance, Uniformity and Transmittance	8
7.	Block Diagram and Power Supply	9
8.	Interface Pins Definition	10
9.	AC characteristic	12
9.1.	Parallel RGB with Sync mode	12
9.2.	Parallel RGB with DE only mode	13
9.3.	TTL mode AC electrical characteristics	14
10.	Quality Assurance	15
10.1.	Purpose	15
10.2.	Standard for Quality Test	15
10.3.	Nonconforming Analysis & Disposition	15
10.4.	Agreement Items	15
10.5.	Standard of the Product Visual Inspection	15
10.6.	Inspection Specification	16
10.7.	Classification of Defects	20
10.8.	Identification/marketing criteria	20
10.9.	Packing	20
11.	Reliability Specification	21
12.	Precautions and Warranty	22
12.1.	Safety	22
12.2.	Handling	22
12.3.	Storage	22
12.4.	Metal Pin (Apply to Products with Metal Pins)	22
12.5.	Operation	23
12.6.	Static Electricity	23
12.7.	Limited Warranty	23
13.	Packaging	24
14.	Outline Drawing	25

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)	10.25"	
LCD type	IPS TFT	
Display Mode	Transmissive / Normally Black	
Resolution	1280 RGB x 480	Pixels
View Direction	FULL VIEW	Best Image
Module Outline	258.6(H) x 107.55(V) x 5.85(T) (Note1)	mm
Active Area	(243.84)(H) x (91.44)(V)	mm
Pixel Size	190.5 x 190.5	um
Pixel Arrangement	RGB Vertical Stripe	
Display Colors	16.7M	
Interface	RGB	
Driver IC	HX82102-A00	
With or Without Touch Panel	Without	-
Operating Temperature	-20~70	°C
Storage Temperature	-30~80	°C
Weight	TBD	g

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

3. Absolute Maximum Ratings

GND=0V, Ta=25°C

Item	Symbol	Min.	Max.	Unit
Supply Voltage	VDD	-0.3	4.0	V
Storage temperature	T _{STG}	-30	+80	°C
Operating temperature	T _{OP}	-20	+70	°C

Note 1: If Ta below 50°C, the maximal humidity is 90%RH, if Ta over 50°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°C, and the back ground will become darker at high temperature operating.

4. DC Characteristics

Item	Symbol	Min.	Typ.	Max.	Unit
Digital Interface Supply Voltage	VDD	3.0	3.3	3.6	V
Logic Low input voltage	V _{IL}	GND-0.3	-	0.3*VDD	V
Logic High input voltage	V _{IH}	0.7*VDD	-	VDD+0.3	V
Logic Low output voltage	V _{OL}	GND	-	GND+0.4	V
Logic High output voltage	V _{OH}	VDD-0.4	-	-	V
Current Consumption All White	I _{DD}	-	TBD	-	mA

5. Backlight Characteristic

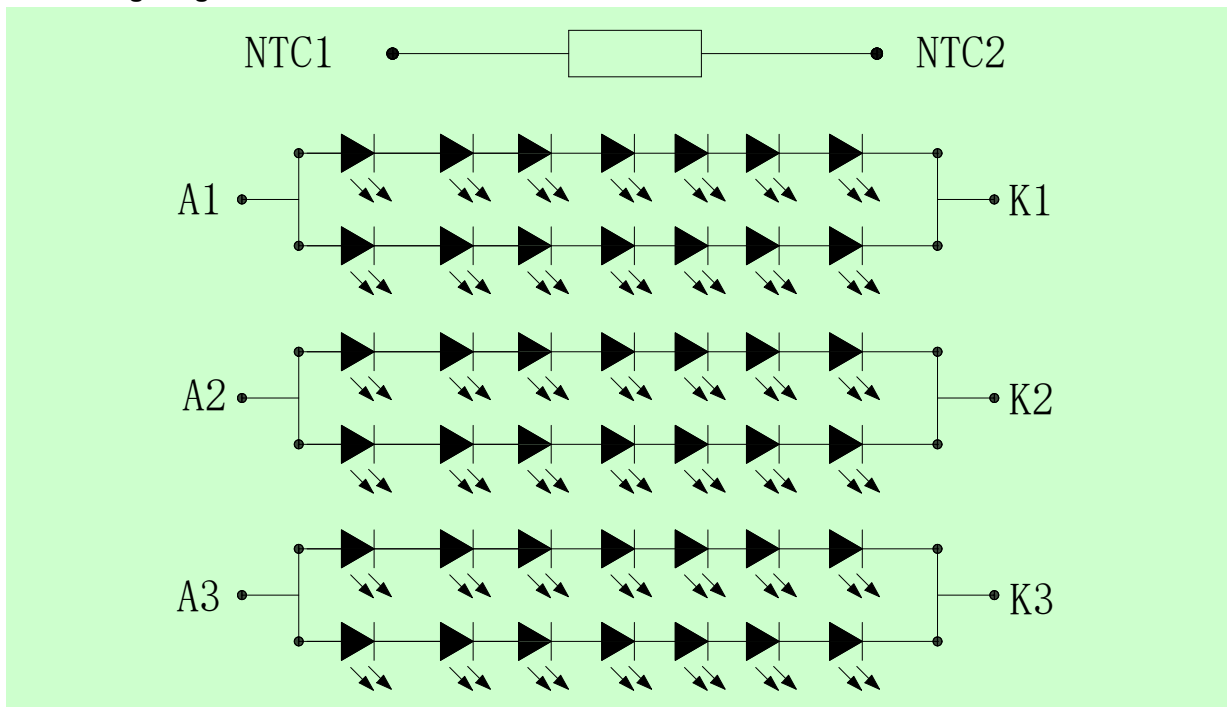
5.1 Backlight Characteristic

Item	Symbol	Condition	Min.	Typ.	Max.	Unit
Backlight Voltage	V _{LED}	Ta=25 °C, I _F =30mA/ LED	18.2	20.3	22.4	V
Backlight Current	I _{LED}	Ta=25 °C, V _F =2.9V/LED	-	180	-	mA
Power dissipation	P _D	-	-	3654	-	mW
Uniformity	Avg	-	-	80	-	%
LED working life(25°C)	-	-	-	30,000	-	Hrs
Drive method	Constant current					
LED Configuration	42 White LEDs (7 LEDs in string and 2 groups in parallel) × 3					

Note 1 : LED life time defined as follows: The final brightness is at 50% of original brightness.

The environmental conducted under ambient air flow, at Ta=25±2 °C,60%RH±5%, I_F=30mA/LED.

5.2 Backlighting circuit



6. Optical Characteristics

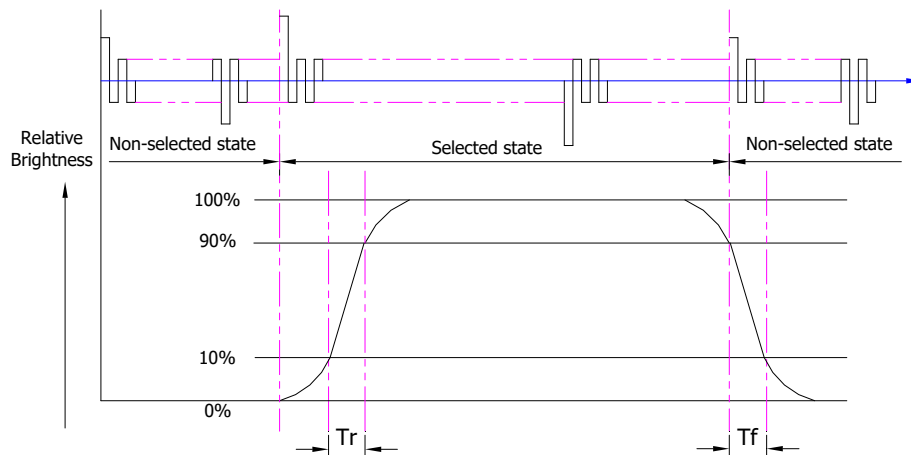
6.1. Optical Characteristics

Ta=25°C, VDD=3.3V

Backlight On (Transmissive Mode)	Item		Symbol	Condition	Specification			Unit
					Min.	Typ.	Max.	
	Luminance on TFT (I_f =30mA/LED)		Lv	Normally viewing angle $\theta_x = \phi_Y =0^\circ$	280	350	-	cd/m ²
	Contrast ratio(See 6.3)		CR		(1100)	(1300)	-	
	Response time (See 6.2)		T _R		-	25	30	ms
			T _F					
	Chromaticity Transmissive (See 6.5)	Red	X _R		-	TBD	-	
			Y _R		-	TBD	-	
		Green	X _G		-	TBD	-	
			Y _G		-	TBD	-	
		Blue	X _B		-	TBD	-	
			Y _B		-	TBD	-	
		White	X _W		-	TBD	-	
			Y _W		-	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(Gamut)					65	70	-	%

6.2. Definition of Response Time

6.2.1. Normally Black Type (Negative)

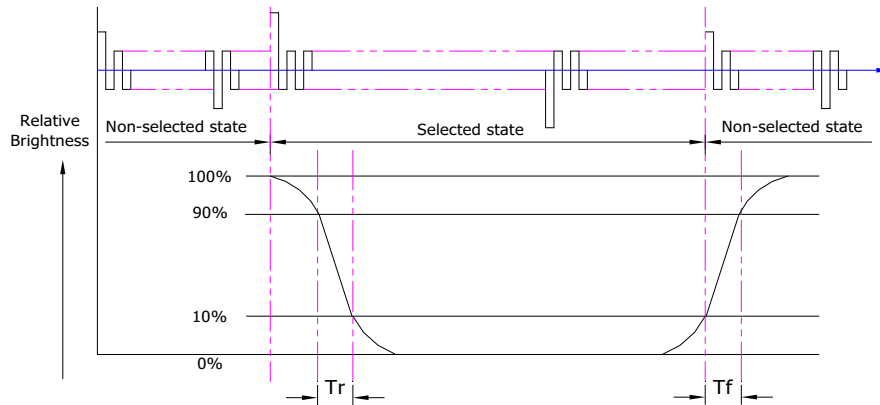


Tr is the time it takes to change from non-selected state with relative luminance 10% to selected state with relative luminance 90%;

Tf 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)



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

Tf 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

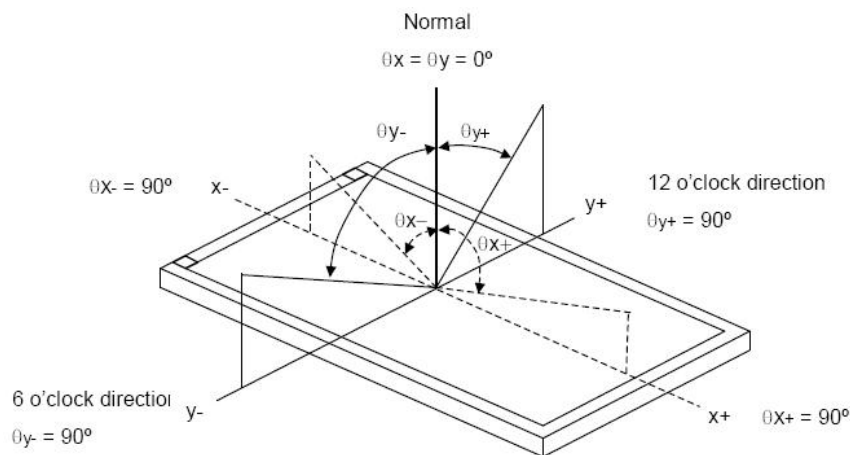
Contrast is measured perpendicular to display surface in reflective and transmissive mode.

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



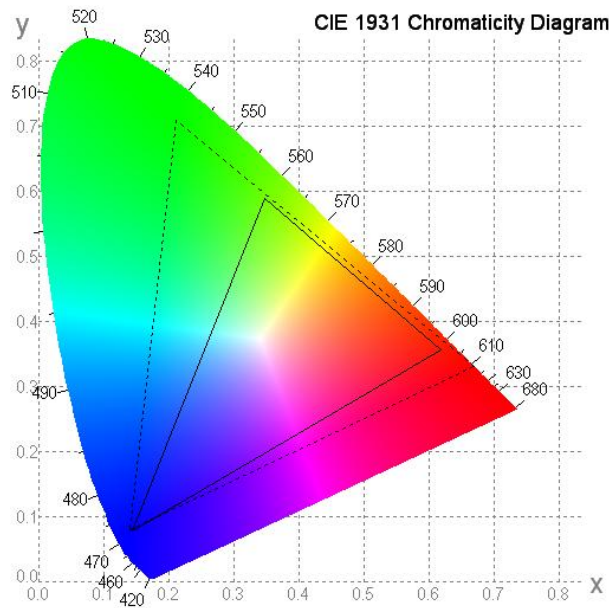
Measuring machine: LCD-5100 or EQUI

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

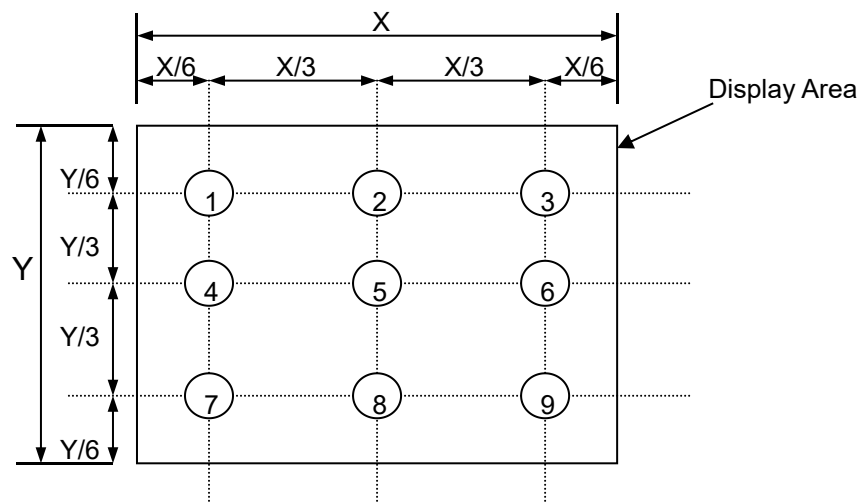
Using the transmissive mode measurement approach, measure the white screen luminance of the display panel and backlight.

6.6.1. Surface Luminance: $L_V = \text{average } (L_{P1}:L_{P9})$

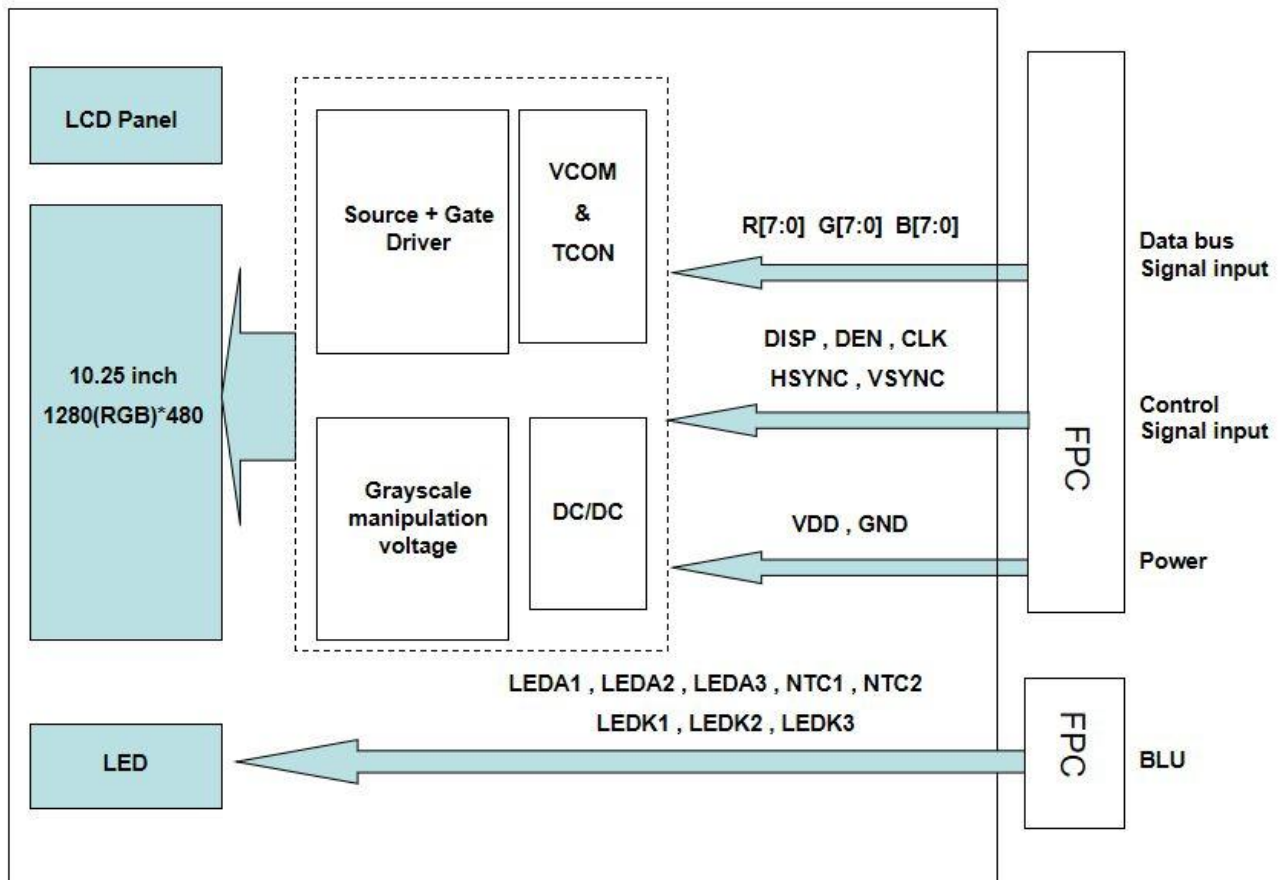
6.6.2. Uniformity = Minimal ($L_{P1}:L_{P9}$) / Maximal ($L_{P1}:L_{P9}$) * 100%

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	GND	Ground	
2	VDD	Power source	
3	R0	Red data signal	
4	R1	Red data signal	
5	R2	Red data signal	
6	R3	Red data signal	
7	R4	Red data signal	
8	R5	Red data signal	
9	R6	Red data signal	
10	R7	Red data signal	
11	G0	Green data signal	
12	G1	Green data signal	
13	G2	Green data signal	
14	G3	Green data signal	
15	G4	Green data signal	
16	G5	Green data signal	
17	G6	Green data signal	
18	G7	Green data signal	
19	B0	Blue data signal	
20	B1	Blue data signal	
21	B2	Blue data signal	
22	B3	Blue data signal	
23	B4	Blue data signal	
24	B5	Blue data signal	
25	B6	Blue data signal	
26	B7	Blue data signal	
27	GND	Ground	
28	DISP	Display on/off signal. DISP="H" Display on; DISP="L" Display off	
29	DEN	Input data enable control	
30	GND	Ground	
31	CLK	Clock signal to sample each data	
32	GND	Ground	
33	HSYNC	Horizontal sync signal	
34	VSYNC	Vertical sync signal	
35	VDD	Power source	

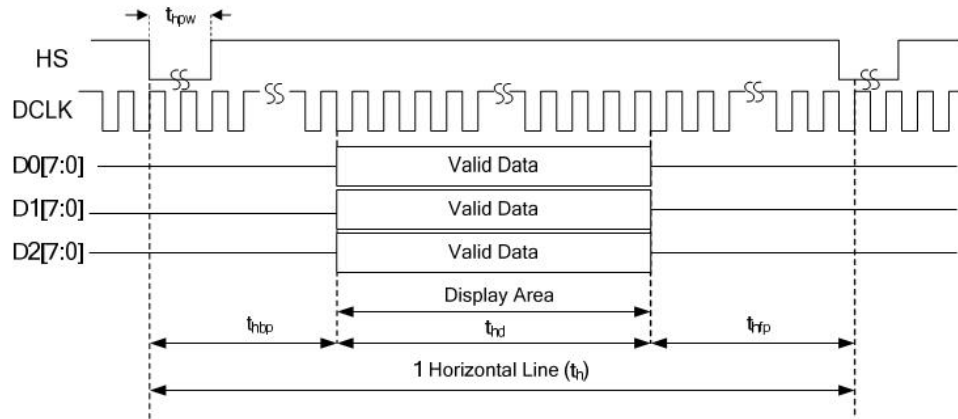
BLU:

No.	Symbol	Function	Remark
1	LEDA1	Backlight Anode	
2	LEDA2	Backlight Anode	
3	LEDA3	Backlight Anode	
4	NC	No connection	
5	NTC1	NTC Thermistor	
6	NTC2	NTC Thermistor	
7	NC	No connection	
8	LEDK1	Backlight Cathode	
9	LEDK2	Backlight Cathode	
10	LEDK3	Backlight Cathode	

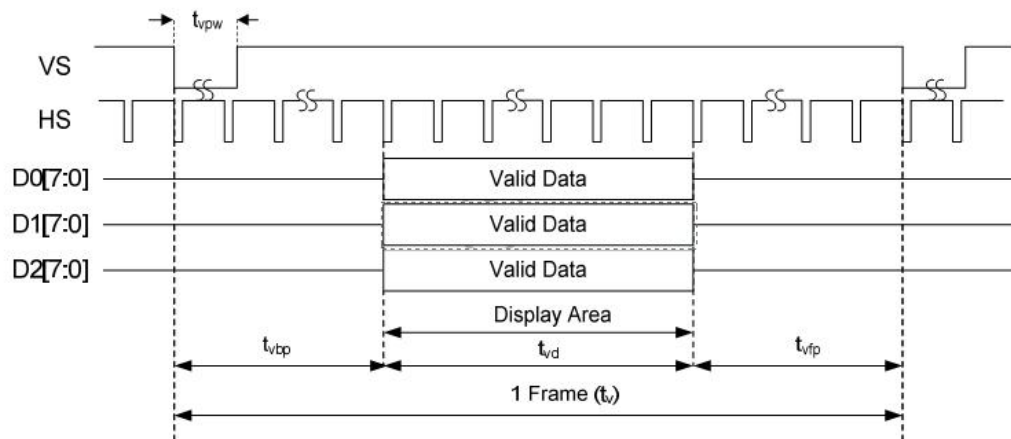
9. AC characteristic

9.1. Parallel RGB with Sync mode

• Horizontal

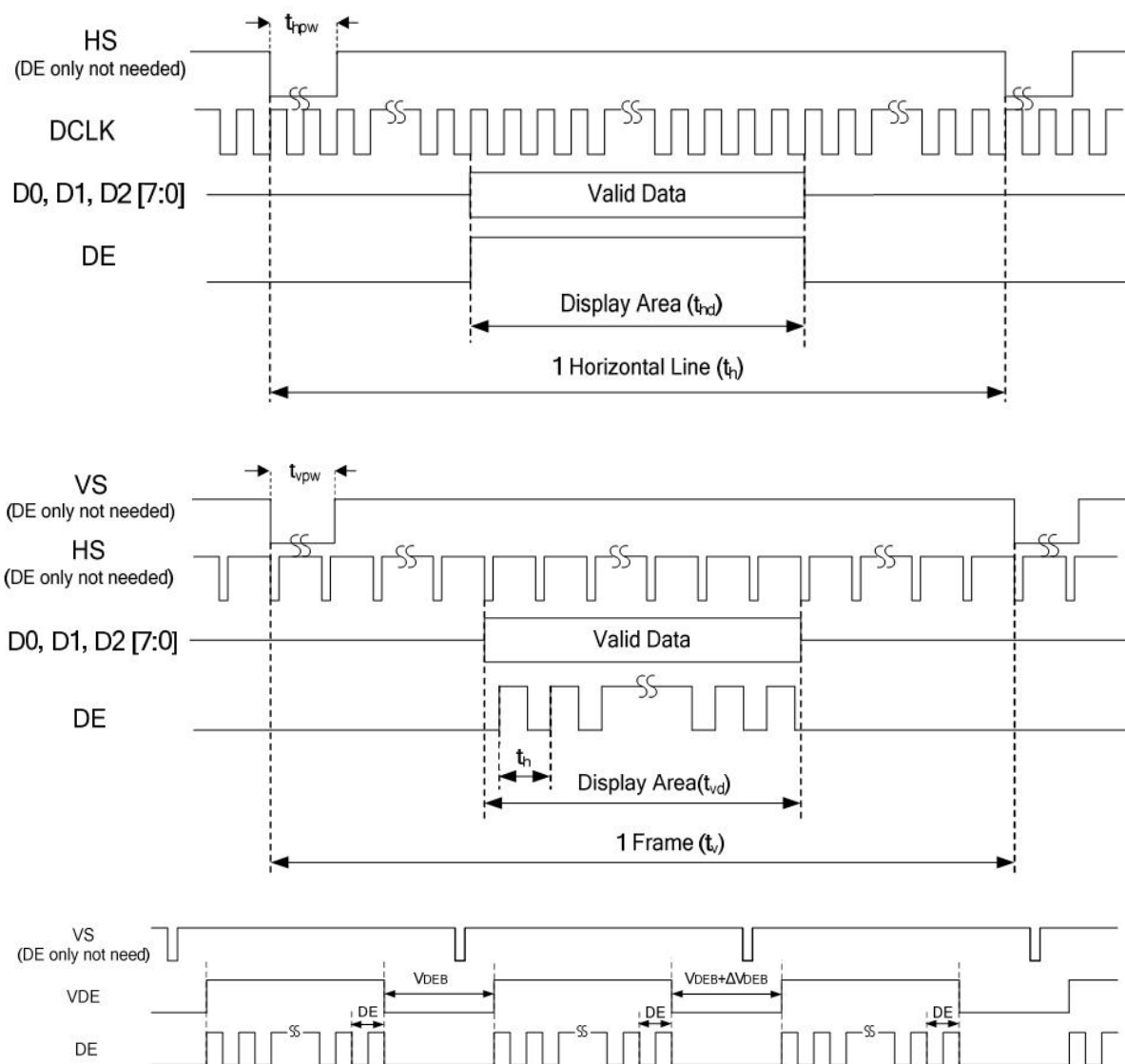


• Vertical



Parameter	Symbol	1280xRGBx480			Unit
		Min.	Typ.	Max.	
DCLK frequency	F_{DCLK}	-	40.06	-	MHz
Horizontal valid data	t_{hd}	1280			DCLK
Hsync pulse Width	t_{hpw}	10	12	-	DCLK
Hsync back porch	$t_{hbp}^{(1)}$	5	16	-	DCLK
Hsync front porch	t_{hfp}	50	50	-	DCLK
1 horizontal line	$t_h^{(2)}$	1335	1346	1664	DCLK
Vertical valid data	t_{vd}	480			H
Vsync pulse width	t_{vpw}	1	3	-	H
Vsync back porch	$t_{vbp}^{(3)}$	4	8	-	H
Vsync front porch	t_{vfp}	6	8	-	H
1 vertical field	t_v	490	496	504	H
Frame rate	$FR^{(4)}$	-	60	-	Hz

9.2. Parallel RGB with DE only mode



Note: (1) The variation of vertical blank ($\Delta VDEB$) must be less than 50 DCLK with DE only mode when GIP mode (GDSEL=L) is used.

Parameter	Symbol	1280xRGBx480			Unit
		Min.	Typ.	Max.	
DCLK frequency	F_{DCLK}	-	40.06	-	MHz
Horizontal valid data	t_{hd}	1280			DCLK
1 horizontal line	t_h	1335	1346	1664	DCLK
Vertical valid data	t_{vd}	480			H
1 vertical field	$t_v^{(1)}$	490	496	504	H
Frame rate	$FR^{(2)}$	-	60	-	Hz

9.3. TTL mode AC electrical characteristics

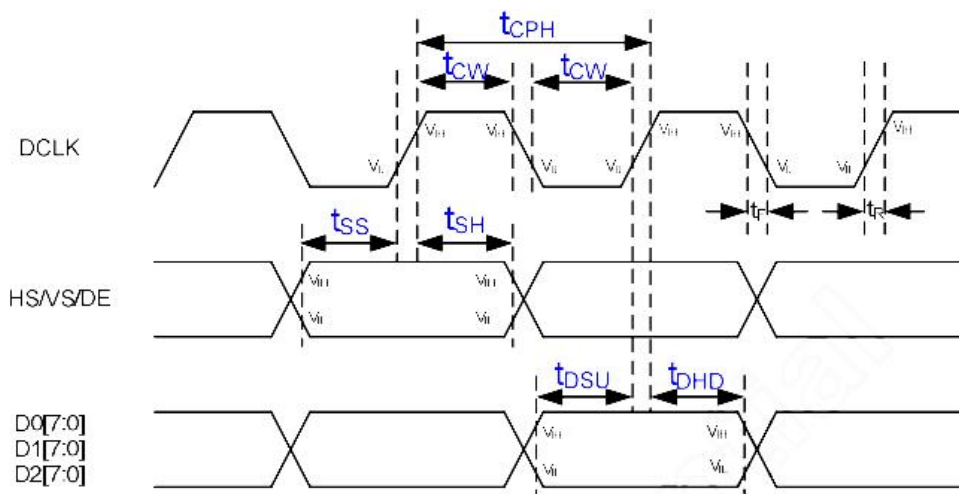


Figure 9.7: Input signal timing

Input data/sync. parameters

(VCC1=VCC1P=VCC2=VCCIF=3.0V to 3.6V, VSS1=VSS2=VSSA=0V, $T_A = -40^{\circ}\text{C}$ to $+105^{\circ}\text{C}$)

Parameter	Symbol	Spec.			Unit
		Min.	Typ.	Max.	
DCLK period	t_{CPH}	16.67	-	-	ns
DCLK clock high/low width	t_{CW}	6	-	-	ns
Data setup time	t_{DSU}	5	-	-	ns
Data hold time	t_{DHD}	5	-	-	ns
HS/VS/DE setup time	t_{SS}	5	-	-	ns
HS/VS/DE hold time	t_{SH}	5	-	-	ns
Input signal rising time	t_R	-	-	10	ns
Input signal falling time	t_F	-	-	10	ns

10. Quality Assurance

10.1.Purpose

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

10.2.Standard for Quality Test

10.2.1. Sampling Plan:

GB2828.1-2012

Single sampling, general inspection level II

10.2.2. Sampling Criteria:

Visual inspection: AQL 1.5

Electrical functional: AQL 0.65.

10.2.3. Reliability Test:

Detailed requirement refer to Reliability Test Specification.

10.3.Nonconforming Analysis & Disposition

10.3.1. Nonconforming analysis:

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

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

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

10.3.2. Disposition of nonconforming:

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

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

10.4.Agreement Items

Shall negotiate with customer if the following situation occurs:

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

10.4.2. Additional requirement to be added in product specification.

10.4.3. Any other special problem.

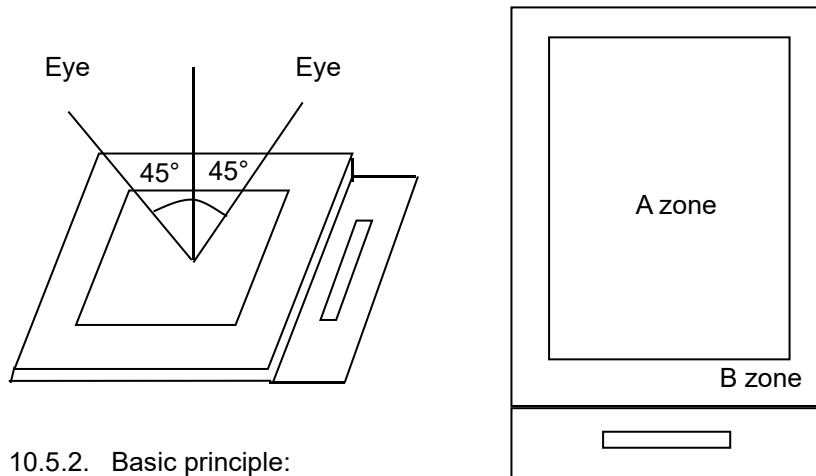
10.5.Standard of the Product Visual Inspection

10.5.1. Appearance inspection:

10.5.1.1. The inspection must be under illumination about 1000 – 1500 lx, and the distance of view must be at 30cm ± 2cm and Telecommunication function detection, ambient light less than 300lux and light on inspection less than 100lux.

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

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

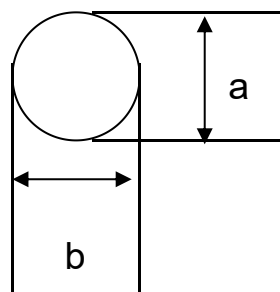


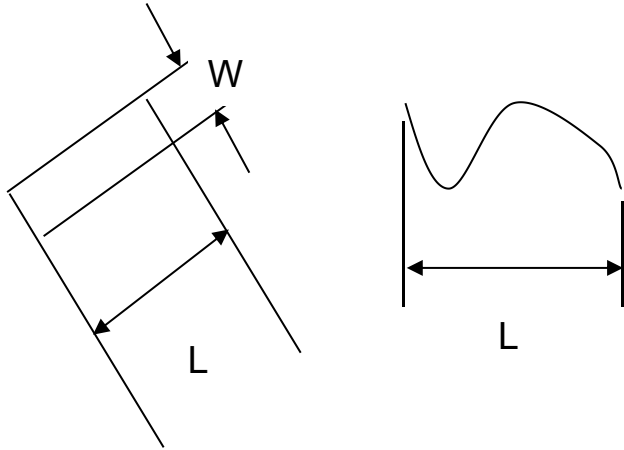
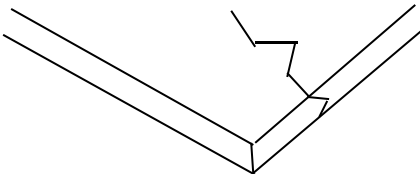
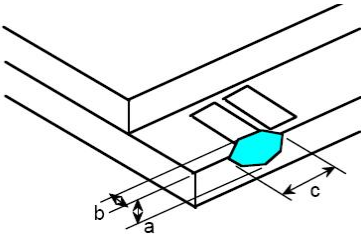
10.5.2. Basic principle:

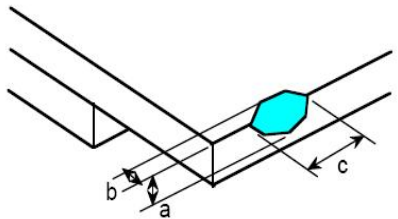
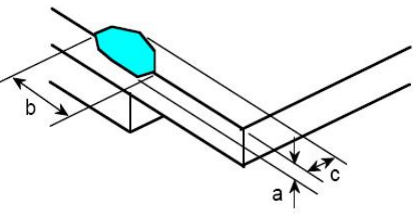
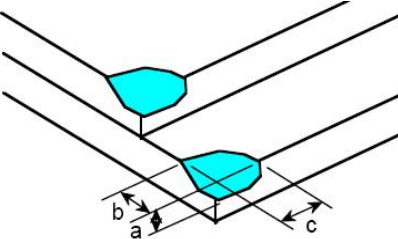
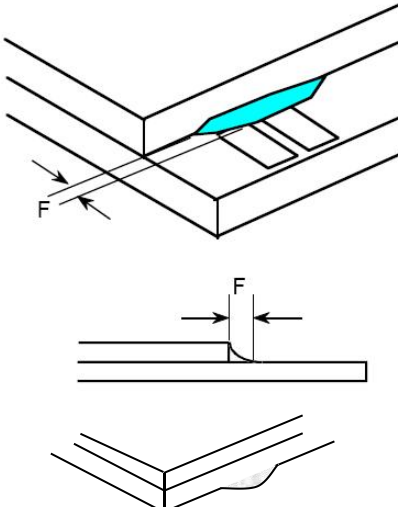
10.5.2.1. A set of sample to indicate the limit of acceptable quality level must be discussed by both us and customer when there is any dispute happened.

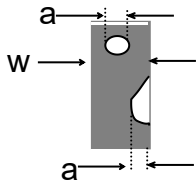
10.5.2.2. New item must be added on time when it is necessary.

10.6. Inspection Specification

No.	Item	Criteria (Unit: mm)																		
01	Black / White spot Foreign material (Round type) Pinholes Stain Particles inside cell. (Minor defect)	 $\varphi = (a + b) / 2$ Distance between 2 defects should more than 5mm apart.	<table><tr><th>Size \ Area</th><th>Acc. Qty</th></tr><tr><td>$\varphi \leq 0.20$</td><td>Ignore</td></tr><tr><td>$0.20 < \varphi \leq 0.50$</td><td>$N \leq 3$</td></tr><tr><td>$0.50 < \varphi$</td><td>0</td></tr></table>	Size \ Area	Acc. Qty	$\varphi \leq 0.20$	Ignore	$0.20 < \varphi \leq 0.50$	$N \leq 3$	$0.50 < \varphi$	0									
Size \ Area	Acc. Qty																			
$\varphi \leq 0.20$	Ignore																			
$0.20 < \varphi \leq 0.50$	$N \leq 3$																			
$0.50 < \varphi$	0																			
02	Electrical Defect (Minor defect)	<table><tr><th rowspan="2">Bright dot</th><th>Display Area</th><th>Total</th><th rowspan="4">Note1</th></tr><tr><th>$N \leq 2$</th><th>$N \leq 2$</th></tr><tr><th>Dark dot</th><th>$N \leq 4$</th><th>$N \leq 4$</th></tr><tr><th>Total dot</th><th>$N \leq 4$</th><th>$N \leq 4$</th></tr><tr><th>Mura</th><td colspan="2">Not visible through 5% ND filters.</td><th>Note 2</th></tr></table> Remark: 1. Bright dot caused by scratch and foreign object accords to item 1.	Bright dot	Display Area	Total	Note1	$N \leq 2$	$N \leq 2$	Dark dot	$N \leq 4$	$N \leq 4$	Total dot	$N \leq 4$	$N \leq 4$	Mura	Not visible through 5% ND filters.		Note 2		
Bright dot	Display Area	Total		Note1																
	$N \leq 2$	$N \leq 2$																		
Dark dot	$N \leq 4$	$N \leq 4$																		
Total dot	$N \leq 4$	$N \leq 4$																		
Mura	Not visible through 5% ND filters.		Note 2																	

03	Black and White line Scratch Foreign material (Line type) (Minor defect)	 <table border="1"><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	PCB	14.1 No distortion or contamination on PCB terminals. 14.2 All components on PCB must same as documented on the BOM/component layout. 14.3 Follow IPC-A-600F.								
15	Soldering	Follow IPC-A-610C standard								
16	Electrical Defect (Major defect)	The below defects must be rejected. 16.1 Missing vertical / horizontal segment, 16.2 Abnormal Display. 16.3 No function or no display. 16.4 Current exceeds product specifications. 16.5 LCD viewing angle defect. 16.6 No Backlight. 16.7 Dark Backlight. 16.8 Touch Panel no function.								

Remark: LCD Panel Broken shall be rejected. Defect out of LCD viewing area is acceptable.

10.7. Classification of Defects

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

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

10.8. Identification/marketing criteria

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

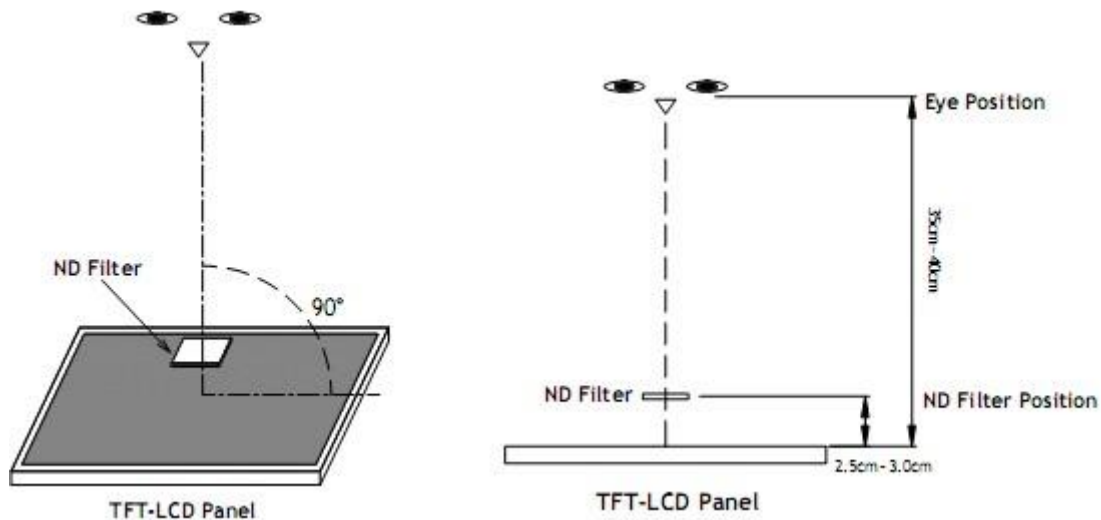
10.9. Packing

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

10.9.2. Modules inside package box should have compliant mark.

10.9.3. 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.

11. Reliability Specification

No	Item	Condition	Quantity	Criteria
1	High Temperature Operating	70°C, 96Hrs	2	GB/T2423.2-2008
2	Low Temperature Operating	-20°C, 96Hrs	2	GB/T2423.1-2008
3	High Humidity Storage	50°C, 90%RH, 96Hrs	2	GB/T2423.3-2016
4	High Temperature Storage	80°C, 96Hrs	2	GB/T2423.2-2008
5	Low Temperature Storage	-30°C, 96Hrs	2	GB/T2423.1-2008
6	Thermal Cycling Test Storage	-20°C, 60min~70°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.	-	GB/T5170.14-2009
8	Electrical Static Discharge	Air: $\pm 4\text{KV}$ 150pF/330 Ω 5 times Contact: $\pm 2\text{KV}$ 150pF/330 Ω 5 times	2	GB/T17626.2-2018
9	Drop Test (Packaged)	Height:80 cm,1 corner, 3 edges, 6 surfaces.	-	GB/T2423.7-2018

Note1. No defection cosmetic and operational function allowable.

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

12. Precautions and Warranty

12.1.Safety

- 12.1.1. 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.
- 12.1.2. Since the liquid crystal cells are made of glass, do not apply strong impact on them. Handle with care.

12.2.Handling

- 12.2.1. Reverse and use within ratings in order to keep performance and prevent damage.
- 12.2.2. 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.

12.3.Storage

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

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

12.4.1. Pins of LCD and Backlight

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

12.4.1.2. Recommended Soldering Conditions

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

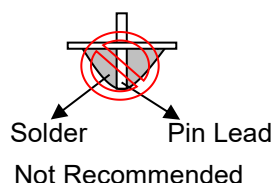
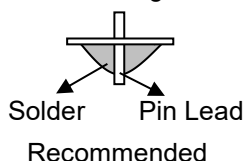
Maximum Solder Temperature: 370°C

Maximum Solder Time: 3s at the maximum temperature

Recommended Soldering Temp: 350±20°C

Typical Soldering Time: ≤3s

12.4.1.3. Solder Wetting



12.4.2. Pins of EL

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

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

12.4.2.3. Recommended Soldering Conditions

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

Recommended Solder Temperature: 270~290°C

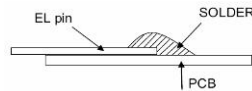
Typical Soldering Time: ≤2s

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

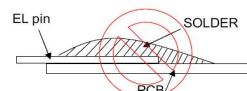
- 12.4.2.4. No horizontal press on the EL leads during soldering.

- 12.4.2.5. 180° bend EL leads three times is not allowed.
-

12.4.2.6. Solder Wetting

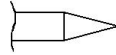


Recommended

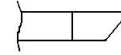


Not Recommended

12.4.2.7. The type of the solder iron:

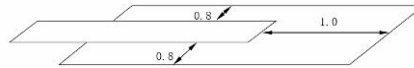


Recommended



Not Recommended

12.4.2.8. Solder Pad



12.5. Operation

- 12.5.1. Do not drive LCD with DC voltage
- 12.5.2. Response time will increase below lower temperature
- 12.5.3. Display may change color with different temperature
- 12.5.4. Mechanical disturbance during operation, such as pressing on the display area, may cause the segments to appear “fractured”.
- 12.5.5. Do not connect or disconnect the LCM to or from the system when power is on.
- 12.5.6. Never use the LCM under abnormal condition of high temperature and high humidity.
- 12.5.7. 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.
- 12.5.8. *Do not display the fixed pattern for long time (we suggest the time not longer than one hour) because it will develop image sticking due to the TFT structure.*

12.6. Static Electricity

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

12.7. Limited Warranty

- 12.7.1. Our warranty liability is limited to repair and/or replacement. We will not be responsible for any consequential loss.
- 12.7.2. 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.
- 12.7.3. 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.

13. Packaging

TBD

Front View Dimensions:
 Total width: 258.6±0.3 LCM (243.84) LCD A.A.
 Bezel opening: 246.6±0.3 (231.84) LCD A.A.
 Total height: 107.55±0.3 LCM (94.66) LCD A.A.
 Bezel opening height: 94.66±0.3 (80.16) LCD A.A.
 TFT area: 10.25" TFT (260.4) LCD A.A.
 Tear Tape location: 5.95±0.3 (7.38)

Top View Dimensions:
 Total width: 258.6±0.3 LCM (243.84) LCD A.A.
 Bezel opening: 246.6±0.3 (231.84) LCD A.A.
 Total height: 107.55±0.3 LCM (94.66) LCD A.A.
 Bezel opening height: 94.66±0.3 (80.16) LCD A.A.
 TFT area: 10.25" TFT (260.4) LCD A.A.
 Tear Tape location: 5.95±0.3 (7.38)

Side View Dimensions:
 Total thickness: 10.25±0.1 (11.21)
 Bezel thickness: 5.95±0.3 (7.38)
 TFT area: 10.25±0.1 (11.21)
 Tear Tape location: 5.95±0.3 (7.38)

Component Labels:
 Engrave Line
 Insulation Tape
 Tear Tape
 NTC1, NTC2, NTC3
 LEDK1, LEDK2, LEDK3
 Backlight LED Circuit: 7x6=42 (LED)
 I=60mA; V=18.22.4V

Notes:
 1. Display size: 10.25" TFT IPS
 2. Viewing direction: D01 view
 3. Display mode: Transmissive/Normal Black/Glare
 4. Operation temperature: -20° C ~ 70° C
 5. Storage temperature: -30° C ~ 80° C
 6. Driver IC: B82102-A00
 7. Power supply voltage: 3.3 V
 8. Backlight: 7x6=42 LED / 20.3 (TYP) V/60mA
 9. LCM Luminance: 350 (TYP) cd/m²
 10. Interface type: RGB
 11. ROLDS must be complied
 * The dimension with mark brackets "()" just for reference