



厦门市易阳光电子有限公司

XIAMEN ESHINE DISPLAY CO.,LTD

Specifications for Approval

TFT MODULE

MODEL:ET121XFLG74-CT Ver:A

CUSTOMER'S APPROVAL	
CUSTOMER :	
SIGNATURE:	DATE:

APPROVED BY	PM REVIEWD	PD REVIEWD	PREPARED By
KEN		BOSE	J.N

◆ This specification is subject to change without notice. Please contact E-Shine or its representative before designing your product based on this specification.

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1. General Specification

Item	Dimension	Unit
Display Size	12.1	inch
Display Type	Transmissive, a-Si	-
Active Area (HxV)	245.76 (H) x 184.32 (V)	mm
Number of Dots (HxV)	1024 x RGB x 768	dot
Pixel Pitch(HxV)	0.08 x 0.08	mm
Color Arrangement	RGB Stripe	-
Color Numbers	256K/16.7 M	-
Outline Dimension (HxVxT)	267.8(H)x211.08(V)x11.30(D)	mm
Interface	LVDS	

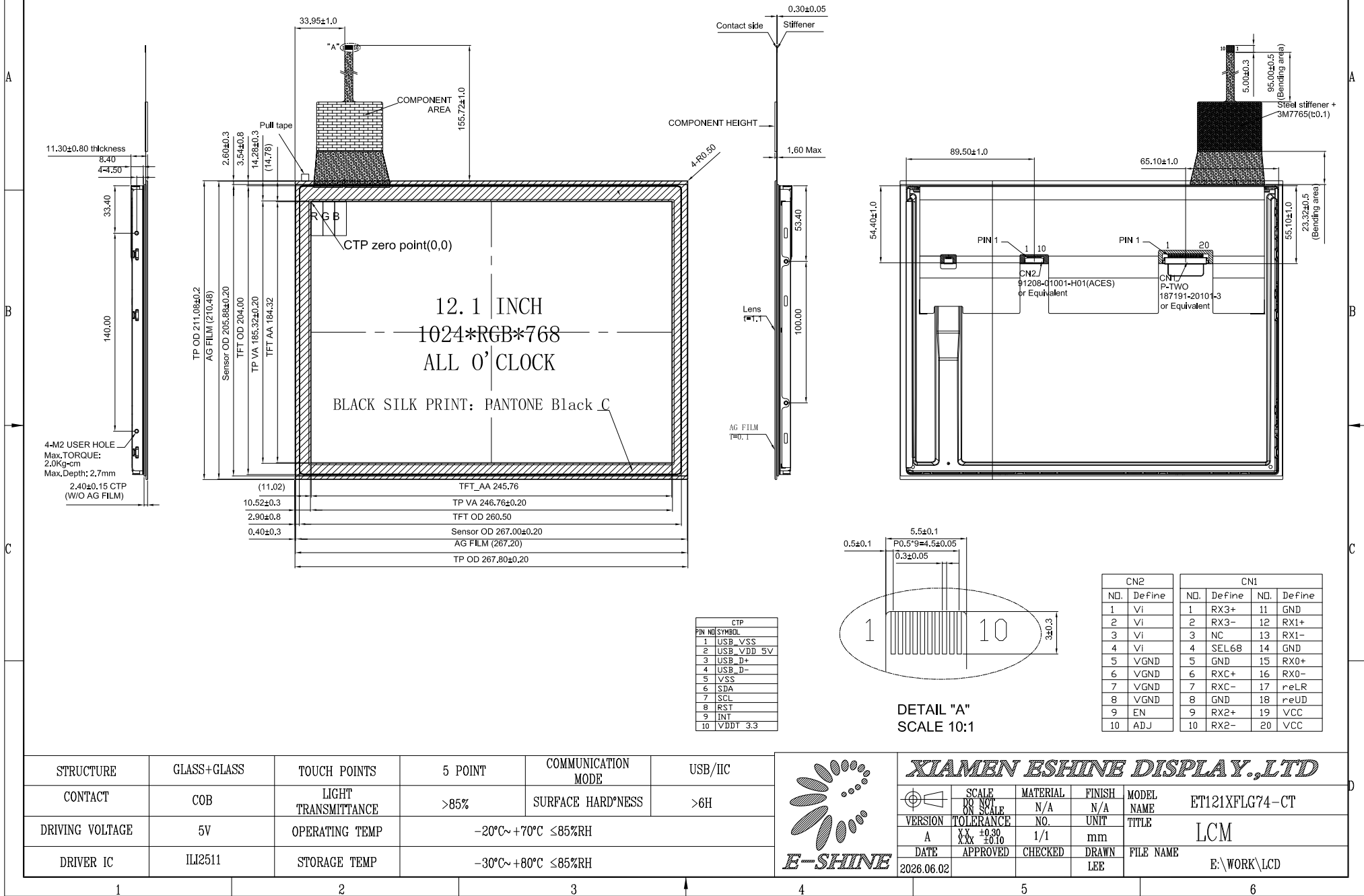
2. Mechanical Drawing

E-SHINE DISPLAY

Module: ET121XFLG74-CT

Product Specification

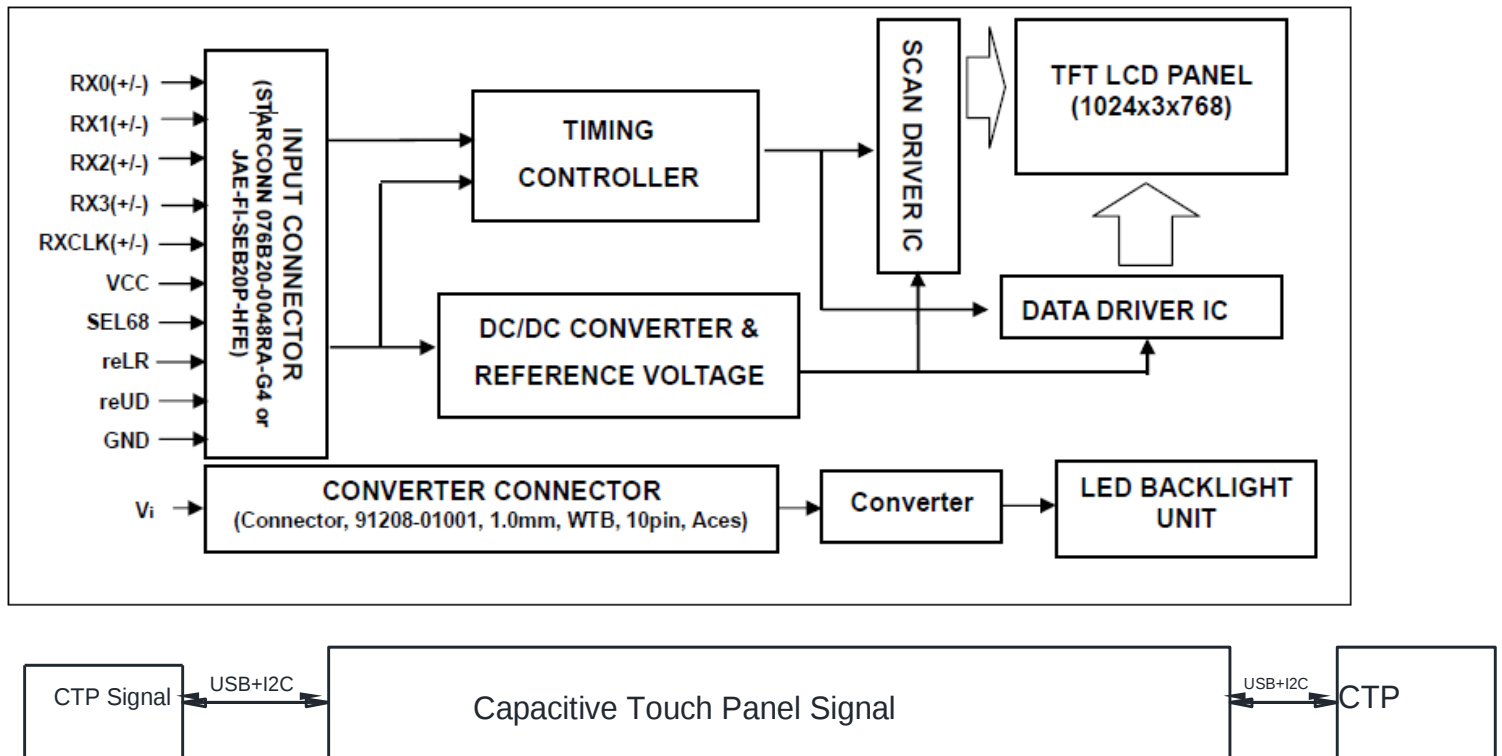
REV	DESCRIPTION:	DATE



XIAMEN ESHINE DISPLAY.,LTD

SCALE	DO NOT ON SCALE	MATERIAL	N/A	FINISH	N/A	MODEL NAME	ET121XFLG74-CT
VERSION	A	TOLERANCE	XX ±0.30 XX ±0.10	NO.	1/1	UNIT	mm
DATE	2026.06.02	APPROVED		CHECKED		DRAWN	LEE
						FILE NAME	E:\WORK\LCD

3. Block Diagram



4.Interface Pin Function

No	Symbol	Description
1	RX3+	Differential Data Input, CH3 (Positive)
2	RX3-	Differential Data Input, CH3 (Negative)
3	NC	NC
4	SEL68	LVDS 6/8 bit select function control SEL68=1: LVDS input data is 8 bit SEL68=0: LVDS input data is 6 bit
5	GND	Ground
6	RXC+	Differential Clock Input (Positive)
7	RXC-	Differential Clock Input (Negative)
8	GND	Ground
9	RX2+	Differential Data Input, CH2 (Positive)
10	RX2-	Differential Data Input, CH2 (Negative)
11	GND	Ground
12	RX1+	Differential Data Input, CH1 (Positive)
13	RX1-	Differential Data Input, CH1 (Negative)
14	GND	Ground
15	RX0+	Differential Data Input, CH0 (Positive)
16	RX0-	Differential Data Input, CH0 (Negative)
17	reLR	Left or right display control LR=1: Left-->Right LR=0:Right--> Left
18	reUD	Up or Down display control LR=1: Up-->Down LR=0: Down--> Up
19	VDD	Power supply. 3.3V
20	VDD	Power supply. 3.3V

BL

Pin	Name	Description
1	VI	12V
2	VI	12V
3	VI	12V
4	VI	12V
5	GND	Ground
6	GND	Ground
7	GND	Ground
8	GND	Ground
9	EN	Enable, 3.3V
10	ADJ	Backlight Adjust, PWM Dimming(190-210Hz, 3.3V)

5. Absolute Maximum Ratings

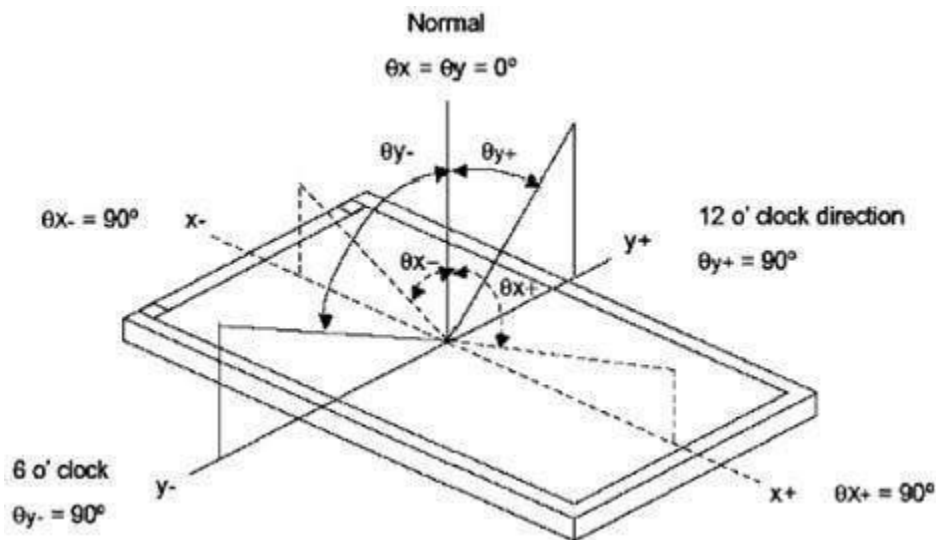
Item	Symbol	Min	Max	Unit
Power Supply Voltage	VDD	-0.3	3.6	V
Operating Temperature	TOP	-30	+80	°C
Storage Temperature	TST	-40	+90	°C

6. Electrical Characteristics

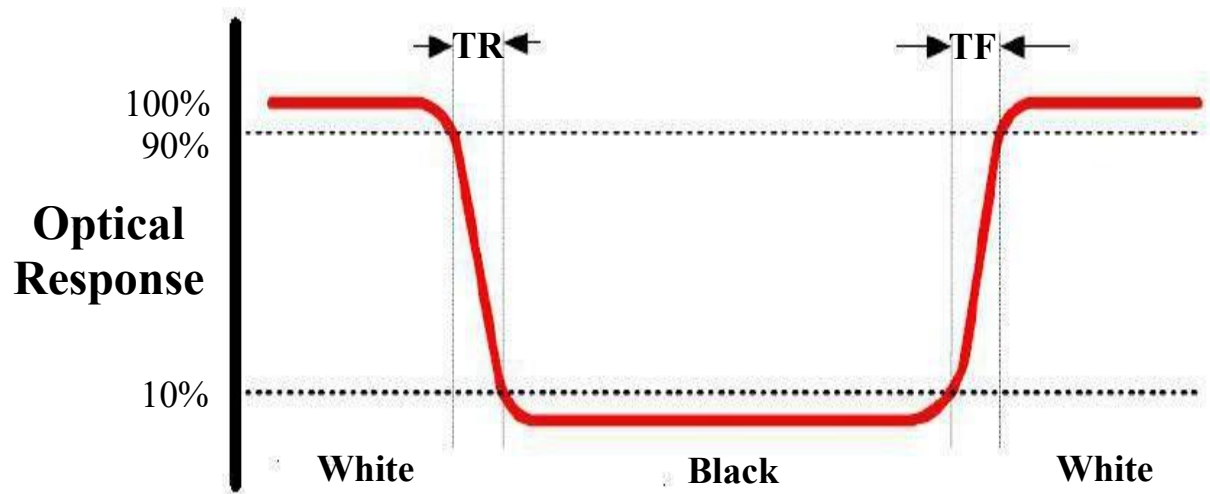
Item	Symbol	Value			Unit
		Min.	Typ.	Max.	
Power voltage	VDD	3.0	3.3	3.6	V
	LED_VCCS	11	12	13	V
Input logic high voltage	VIH	0.7VDD	-	VDD	V
Input logic low voltage	VIL	0	-	0.3VDD	V
Current for Power	IVDD		-	(610)	mA
	ILED_VCCS	1100	-	1235	mA
LED_EN Control Level	BL On	3.0	-	5	V
	BL Off	0	-	0.3	V
LED_PWM Control Level	PWM High Level	3.0	-	5	V
	PWM Low Level	0	-	0.3	V
LED_PWM Control Frequency	fPWM	1K	-	20K	Hz

7. Optical Characteristics

Item		Symbol	Condition	Min.	Typ.	Max.	Unit.
Contrast Ratio		CR	$\Theta=0$ Normal viewing angle	700	1000	--	
Response time		TR+TF		-	25	35	msec
LCM Luminance		LV		350	450	-	cd/m2
Uniformity		AVg		70	80	-	%
Transmittance		Tr		3.8	4.5	-	%
Color Gamut		CG		67	72	-	%
Color Filter Chromaticity	White	Wx		0.278	0.308	0.338	-
		Wy		0.297	0.327	0.357	-
	Red	Rx		0.619	0.649	0.679	-
		Ry		0.308	0.338	0.368	-
	Green	Gx		0.294	0.324	0.354	-
		Gy		0.574	0.604	0.634	-
	Blue	Bx		0.112	0.142	0.172	-
		By		0.026	0.056	0.086	-
Viewing angle	Hor.	Θ_L	CR>10	85	89	-	Dg
		Θ_R		85	89	-	
	Ver.	Θ_U		85	89	-	
		Θ_D		85	89	-	

Note 1: Definition of Viewing Angle θ_x and θ_y :**Note 2: Definition of contrast ratio CR:**

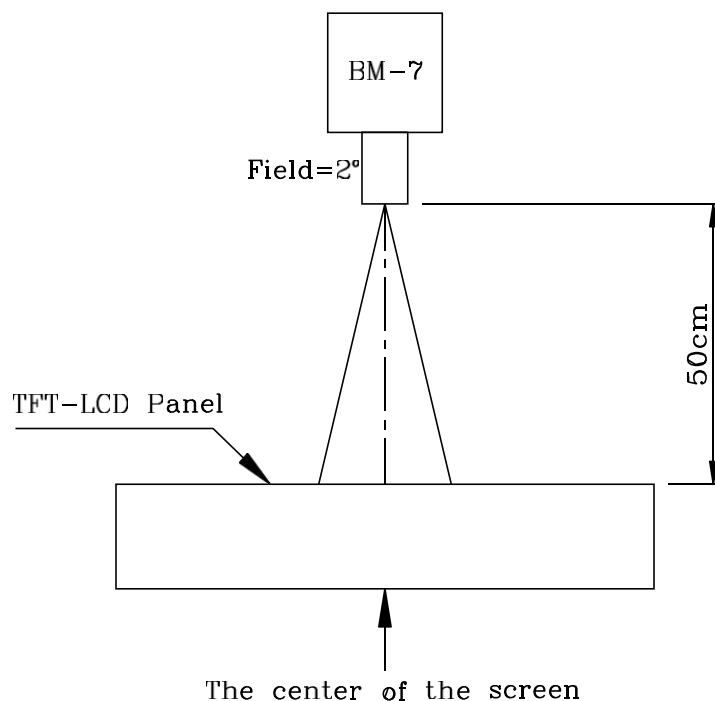
$$CR = \frac{\text{Lum i nance of w h i t e s t a t e}}{\text{Lum i nance of b l a c k s t a t e}}$$

Note 3: Definition of Response Time(T_r , T_f)

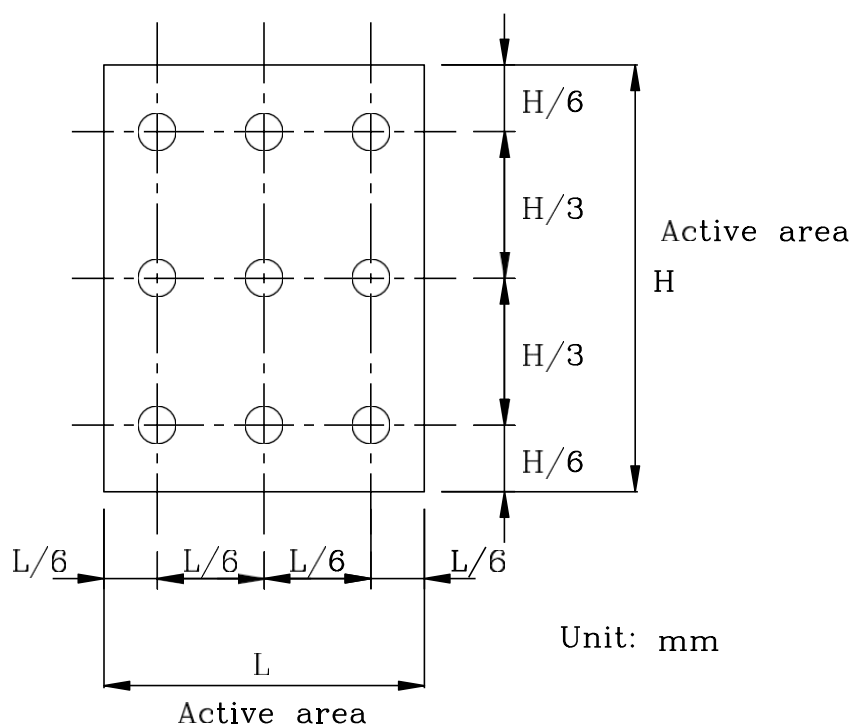
Note 4: Definition of Luminance

①The Brightness Test Equipment Setup

Field= 2° (As measuring “black” image, field= 2° is the best testing condition)



②The Brightness Test Point Setup

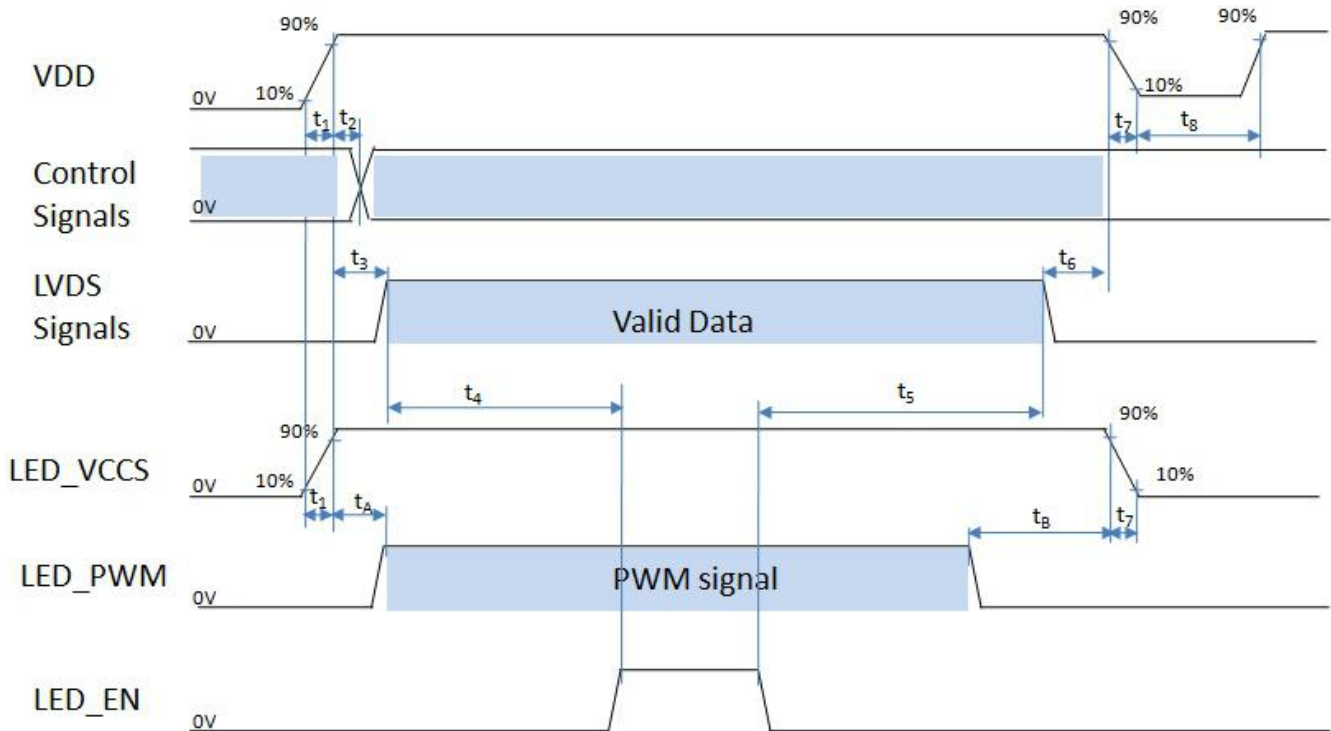


8. Operating Instructions

Power sequence

The power sequence specifications are shown as the following table and diagram.

Symbol	Value		Unit
	Min.	Max.	
t_1	1	20	ms
t_2	1	5	ms
t_3	10	50	ms
t_4	200	500	ms
t_5	200	500	ms
t_6	50	200	ms
t_7	0	20	ms
t_8	500	–	ms
t_A	0	50	ms
t_B	0	50	ms



Note 1: Please don't plug the interface cable of on when system is turned on.

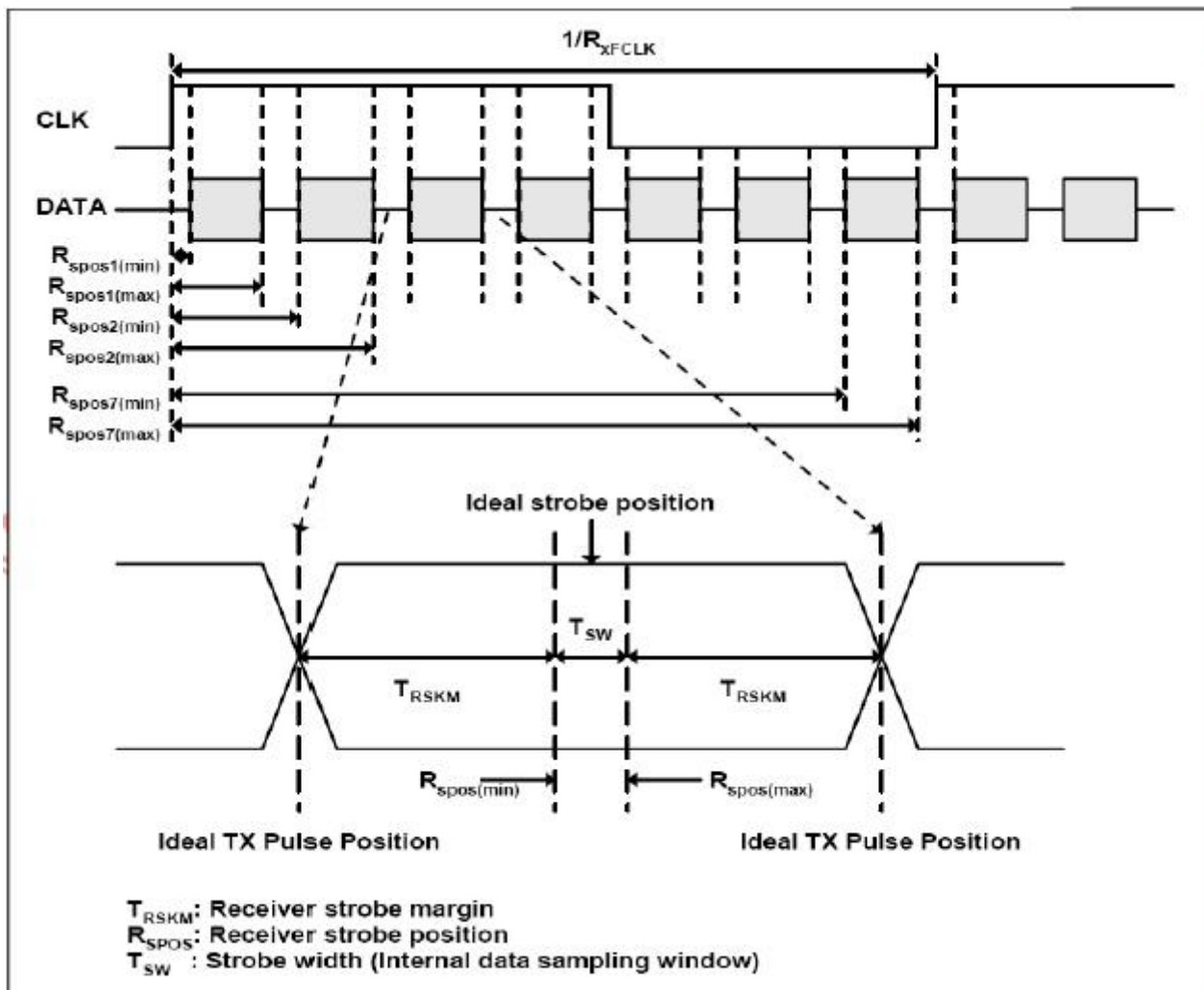
Note 2: Please avoid floating state of the interface signal during signal invalid period.

Note 3: It is recommended that the backlight power must be turned on after the power supply for LCD and the interface signal is valid.

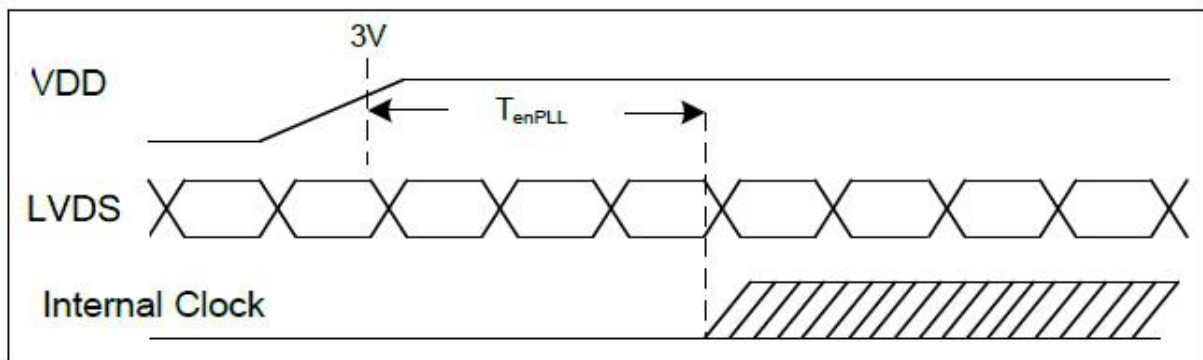
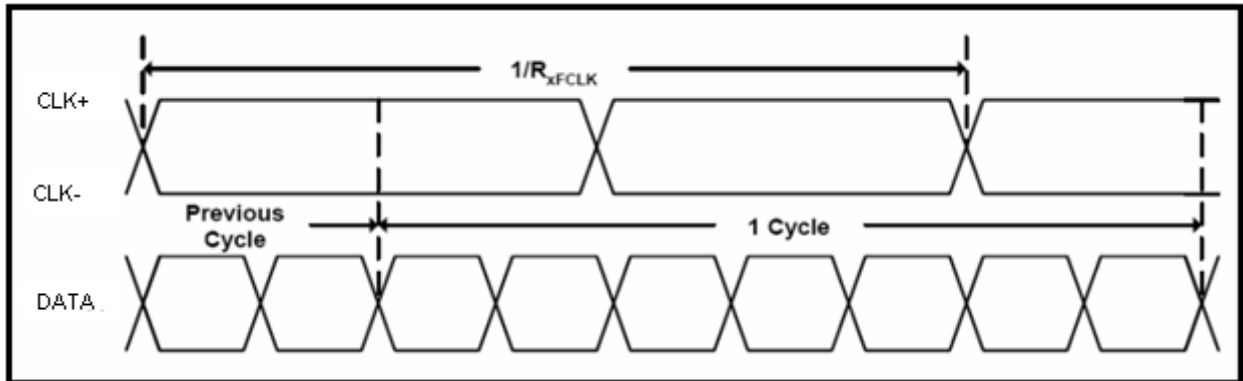
Note 4: Control signals include BIST, SEL68 , reUD & reLR.

AC Electrical characteristics

Parameter	Symbol	Min	Typ	Max	Units	Condi tion
Clock frequency	RxFCLK	26.2	–	71	MHz	
Input data skew margin	TRSKM	500	–	–	ps	VID ≧ 400mV RxVCM=1.2V RxFCLK=71MHz
Clock high time	TLVCH	–	$4/(7 \times \text{RxFCLK})$	–	ns	
Clock low time	TLVCL	–	$3/(7 \times \text{RxFCLK})$	–	ns	
PLL wake-up time	TenPLL	–	–	150	us	



Input clock and data timing diagram



DC electrical characteristics

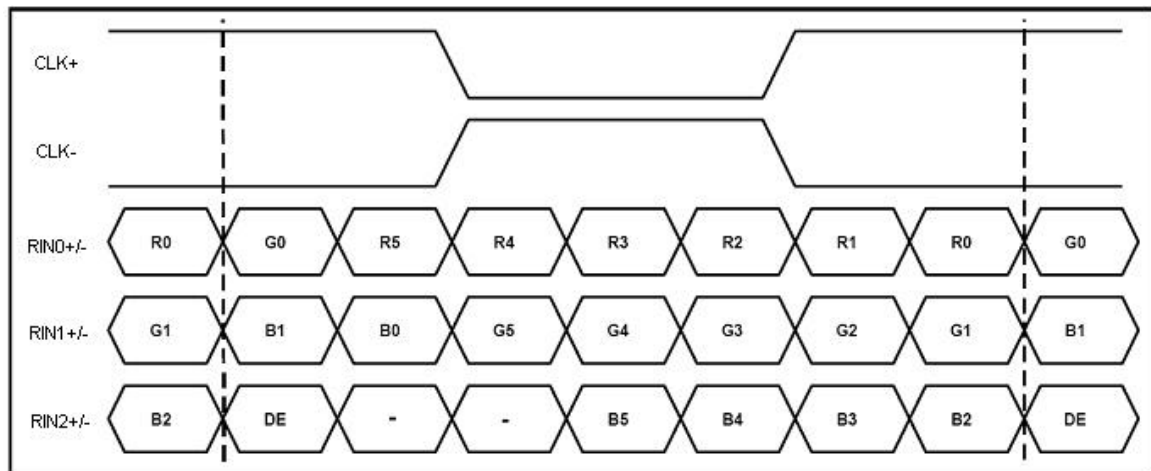
Parameter	Symbol	Values			Unit	Remark
		Min.	Typ.	Max.		
LVDS Differential input high Threshold voltage	R_{xVTH}	–	–	+100	mV	$R_{xVCM}=1.2V$
LVDS Differential input low Threshold voltage	R_{xVTL}	–100	–	–	mV	
Input Voltage range (Singed-end)	R_{xVIN}	0	–	2.4	V	
LVDS Differential input common mode voltage	R_{xVCM}	$ V_D /2$	–	$2.4- V_D /2$	V	
LVDS Differential input voltage	$ V_D $	0.2	–	0.6	V	

6.4 data timing

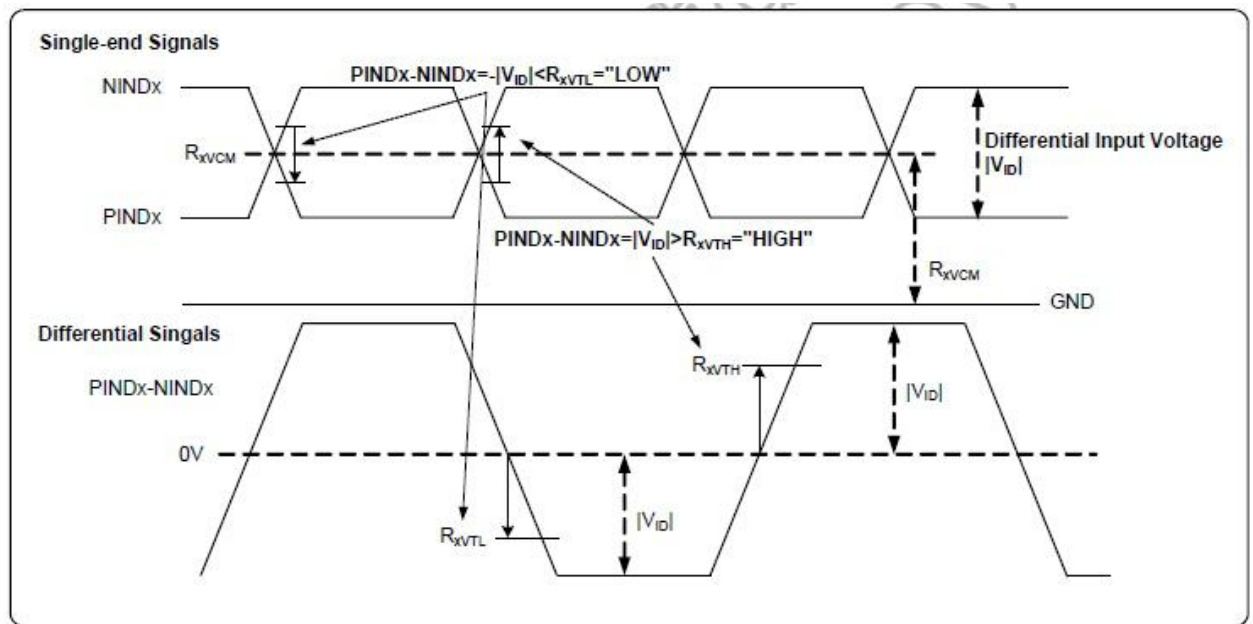
Parameter	Symbol	Spec.			Unit
		Min.	Typ.	Max.	
DCLK frequency	fclk	52	65	71	MHz
Horizontal display area	thd	1024			DCLK
HSD period	th	1114	1344	1400	DCLK
HSD blanking	thb+thfp	90	320	376	DCLK
Vertical display area	tvd	768			T_H
VSD period	tv	778	806	845	T_H
VSD blanking	tvbp+tvfp	10	38	77	T_H

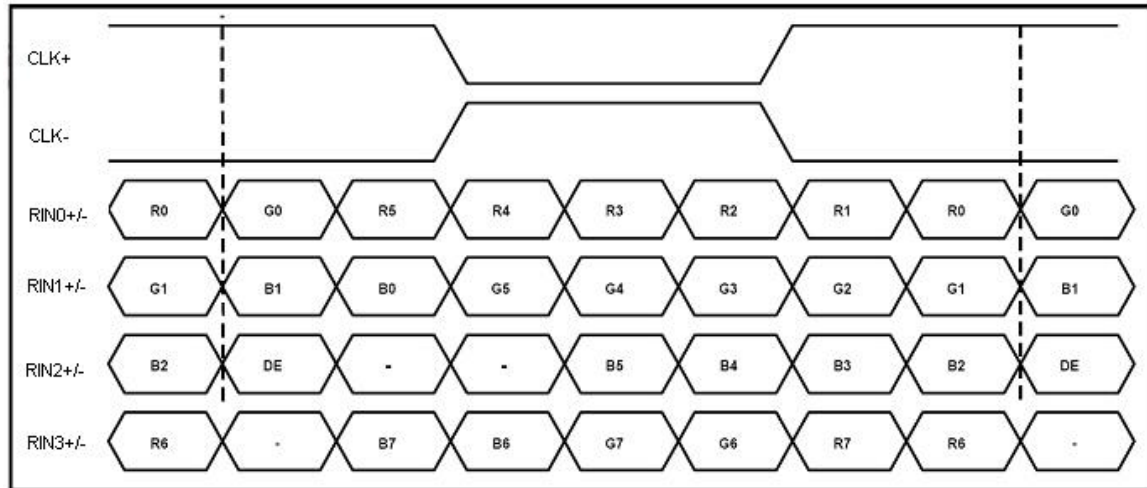
LVDS data input format

SEL68 = "Low" for 6 bits LVDS Input



SEL68 = "High" for 8 bits LVDS Input





9. Specification for Reliability

9.1 Standard Specification for Reliability of LCD Module

No.	Item	Description
01	High temperature operation	The sample should be allowed to stand at 70℃ for 120 hours under driving condition and then returning it to normal temperature condition, and allowing it stand for 2 hours.
02	Low temperature operation	The sample should be allowed to stand at -20℃ for 120 hours under driving condition and then returning it to normal temperature condition, and allowing it stand for 2 hours.
03	High temperature storage	The sample should be allowed to stand at 80℃ for 240 hours under no-load condition, and then returning it to normal temperature condition, and allowing it stand for 2 hours.
04	Low temperature storage	The sample should be allowed to stand at -30℃ for 240 hours under no-load condition, then returning it to normal temperature condition, and allowing it stand for 2 hours.
05	Moisture storage	The sample should be allowed to stand at 60℃,90%RH MAX for 240 hours under no-load condition, then taking it out and drying it at normal temperature for 2 hours.
06	Thermal shock storage	The sample should be allowed to stand the following 10 cycles : -40℃ for 30 minutes → normal temperature for 5 minutes → +90℃ for 30 minutes → normal temperature for 5 minutes, as one cycle.
07	Packing vibration	Frequency range : 10Hz ~ 55Hz Amplitude of vibration : 1.5mm Sweep time: 12 min X,Y,Z 2 hours for each direction.
08	Packing drop test	According to ASTM-D-5327.
09	Electrical Static Discharge	Air: ±4KV 150pF/330Ω 5 times
		Contact: ±2KV 150pF/330Ω 5 time

*Sample size for each test item is 3~5pcs

9.2 Testing Conditions and Inspection Criteria

For the final test, the testing sample must be stored at room temperature for 24 hours. After the tests listed in Table 9.2, standard specifications for reliability will be executed in order to ensure stability.

No.	Item	Test Model	In section Criteria
01	Current Consumption	Refer To Specification	The current consumption should conform to the product specification.
02	Contrast	Refer To Specification	After the tests have been executed, the contrast must be larger than half of its initial value prior to the tests.
03	Appearance	Visual inspection	Defect free.

10. Specification of Quality Assurance

This standard of Quality Assurance confirms to the quality of LCD module products supplied by E-SHINE.

10.1 Quality Test

Before delivering, the supplier should conduct the following tests to confirm the quality of products.

Electrical-Optical Characteristics: According to the individual specification to test the product.

Appearance Characteristics: According to the individual specification to test the product.

Reliability Characteristics: According to the definition of reliability on the specification for testing products.

10.2 Delivery Test

Before delivering, the supplier should conduct the delivery test.

- Test method: According to MIL-STD105E.General Inspection Level II take a single Time.

The defects classify of AQL as following:

Major defect: AQL = 0.65

Minor defect: AQL = 2.5

Total defects: AQL = 2.5

10.3 Non-conforming Analysis & Deal With Manners

10.3.1 Non-conforming Analysis

Purchaser should provide the data detail of non-conforming sample and the non-conforming.

After receiving the data detail from purchaser, the analysis of non-conforming should be finished within two weeks.

- If the analysis can't be finished on time, supplier must notice purchaser 3 days in advance.

10.3.2 Disposition of non-conforming

If any product defect be found during assembling, supplier must change the good for every defect after confirmation.

Both supplier and customer should analyze the reason and discuss the disposition of non-conforming when the reason of nonconforming is not sure.

10.4 Agreement items

Both parties should negotiate together when the following problems happen.
There is any problem of standard of quality assurance, and both sides should agree that it must be modified.

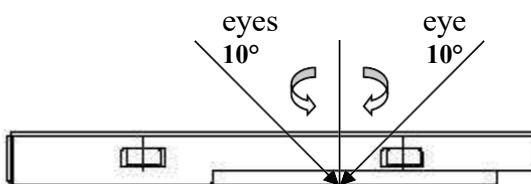
There is any argument item which does not record in the standard of quality assurance.

Any other special problem.

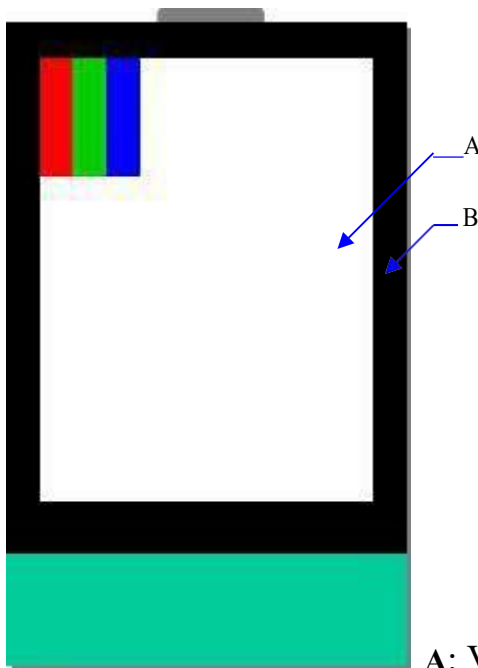
10.5 Standard of The Product Appearance Test

10.5.1 Manner of appearance test

- The test must be under 20W × 2 or 40W fluorescent light, and the distance of view must be at 30±5cm.
- When test the model of transmissive product must add the reflective plate.
- The test direction is base on around 10° of vertical line.
- Temperature: 25±5°C Humidity: 60±10%RH



Definition of area:



A: Viewing area B: Outside viewing area

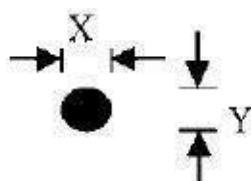
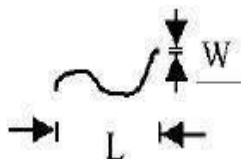
10.5.2 Basic principle

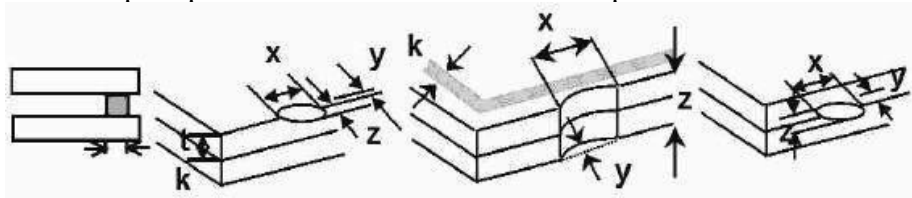
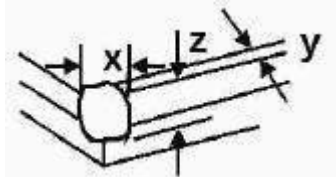
When the standard can not be described, AQL will be applied.

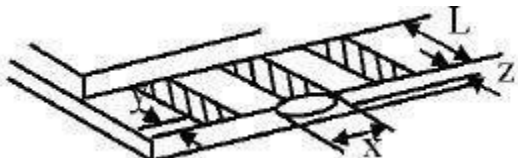
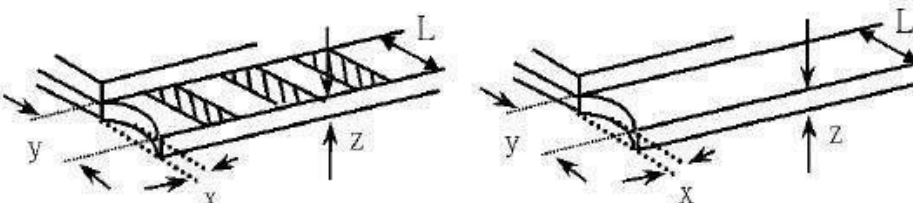
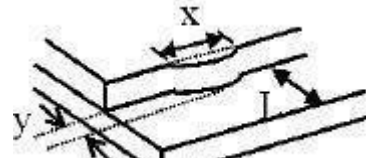
The sample of the lowest acceptable quality level must be negotiated by both supplier and customer when any dispute happened.

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

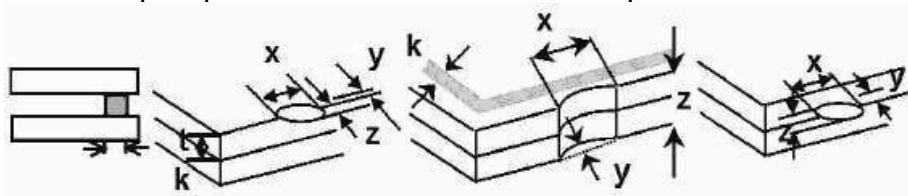
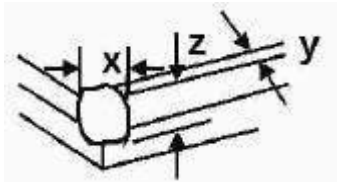
10.6 Inspection Specification

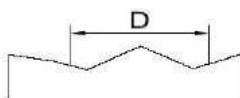
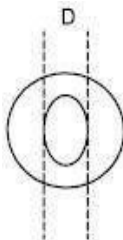
NO.	Item	Criterion	AQL																										
01	Electrical Testing	1.1 Missing vertical, horizontal segment, segment contrast defect. 1.2 Missing character, dot or icon. 1.3 Display malfunction. 1.4 No function or no display. 1.5 Current consumption exceeds product specifications. 1.6 LCD viewing angle defect. 1.7 Mixed product types. 1.8 Flicker	0.65																										
02	Black or White spots or Bright spots or Color spots on LCD (Display only)	2.1 White and black or color spots on display ≦ 0.25mm, no more than Five spots. 2.2 Densely spaced: No more than three spots within 3mm.	2.5																										
03	LCD and Touch Panel black spots, white spots, contamination (non – display)	3.1 Round type: As following drawing $\Phi = (X+Y) / 2$  <table><tr><th>Size(mm)</th><th>Acceptable Q'ty</th></tr><tr><td>$\Phi \leq 0.10$</td><td>Accept no dense</td></tr><tr><td>$0.10 < \Phi \leq 0.20$</td><td>2</td></tr><tr><td>$0.20 < \Phi \leq 0.25$</td><td>2</td></tr><tr><td>$0.25 < \Phi \leq 0.30$</td><td>1</td></tr><tr><td>$0.30 < \Phi$</td><td>0</td></tr></table> * Densely spaced: No more than two spots within 3mm. 3.2 Line type: (As following drawing)  <table><tr><th>Length(mm)</th><th>Width(mm)</th><th>Acceptable Q'ty</th></tr><tr><td>---</td><td>$W \leq 0.02$</td><td>Accept no dense</td></tr><tr><td>$L \leq 3.0$</td><td>$0.02 < W \leq 0.05$</td><td rowspan="2">2</td></tr><tr><td>$L \leq 2.5$</td><td>$0.03 < W \leq 0.08$</td></tr><tr><td>---</td><td>$0.08 < W$</td><td>Rejection</td></tr></table> * Densely spaced: No more than two lines within 3mm.	Size(mm)	Acceptable Q'ty	$\Phi \leq 0.10$	Accept no dense	$0.10 < \Phi \leq 0.20$	2	$0.20 < \Phi \leq 0.25$	2	$0.25 < \Phi \leq 0.30$	1	$0.30 < \Phi$	0	Length(mm)	Width(mm)	Acceptable Q'ty	---	$W \leq 0.02$	Accept no dense	$L \leq 3.0$	$0.02 < W \leq 0.05$	2	$L \leq 2.5$	$0.03 < W \leq 0.08$	---	$0.08 < W$	Rejection	2.5
Size(mm)	Acceptable Q'ty																												
$\Phi \leq 0.10$	Accept no dense																												
$0.10 < \Phi \leq 0.20$	2																												
$0.20 < \Phi \leq 0.25$	2																												
$0.25 < \Phi \leq 0.30$	1																												
$0.30 < \Phi$	0																												
Length(mm)	Width(mm)	Acceptable Q'ty																											
---	$W \leq 0.02$	Accept no dense																											
$L \leq 3.0$	$0.02 < W \leq 0.05$	2																											
$L \leq 2.5$	$0.03 < W \leq 0.08$																												
---	$0.08 < W$	Rejection																											

NO.	Item	Criterion			AQL
04	Polarizer bubbles	If bubbles are visible, judge using black spot specifications, not easy to find, must check in specify direction	Size Φ (mm)	Acceptable Q'ty	2.5
			$\Phi \leq 0.20$	Accept no dense	
			$0.20 < \Phi \leq 0.50$	3	
			$0.50 < \Phi \leq 1.00$	2	
			$1.00 < \Phi$	0	
			Total Q'ty	3	
05	Scratches	Follow NO.3 -2 Line Type.			
06	Chipped glass	Symbols: x: Chip length y: Chip width z: Chip thickness k: Seal width t: Glass thickness a: LCD side length L: Electrode pad length 6.1 General glass chip: 6.1.1 Chip on panel surface and crack between panels:			2.5
					
		z: Chip thickness	y: Chip width	x: Chip length	
		$Z \leq 1/2t$	Not over viewing area	$x \leq 1/8a$	
		$1/2t < z \leq 2t$	Not exceed 1/3k	$x \leq 1/8a$	
		⊙ Unit: mm ⊙ If there are 2 or more chips, x is the total length of each chip 6.1.2 Corner crack:			
					
		z: Chip thickness	y: Chip width	x: Chip length	
		$Z \leq 1/2t$	Not over viewing area	$x \leq 1/8a$	
		$1/2t < z \leq 2t$	Not exceed 1/3k	$x \leq 1/8a$	
		⊙ Unit: mm ⊙ If there are 2 or more chips, x is the total length of each chip			

NO.	Item	Criterion	AQL						
07	Glass crack	Symbols: x: Chip length y: Chip width z: Chip thickness k: Seal width t: Glass thickness a: LCD side length L: Electrode pad length 7.2 Protrusion over terminal: 7.2.1 Chip on electrode pad: 	2.5						
		<table><tr><td>y: Chip width</td><td>x: Chip length</td><td>z: Chip thickness</td></tr><tr><td>$y \leq 0.5\text{mm}$</td><td>$x \leq 1/8a$</td><td>$0 < z \leq t$</td></tr></table>		y: Chip width	x: Chip length	z: Chip thickness	$y \leq 0.5\text{mm}$	$x \leq 1/8a$	$0 < z \leq t$
		y: Chip width		x: Chip length	z: Chip thickness				
		$y \leq 0.5\text{mm}$		$x \leq 1/8a$	$0 < z \leq t$				
		7.2.2 Non-conductive portion: 							
<table><tr><td>y: Chip width</td><td>x: Chip length</td><td>z: Chip thickness</td></tr><tr><td>$y \leq L$</td><td>$x \leq 1/8a$</td><td>$0 < z \leq t$</td></tr></table>	y: Chip width	x: Chip length	z: Chip thickness	$y \leq L$	$x \leq 1/8a$	$0 < z \leq t$			
y: Chip width	x: Chip length	z: Chip thickness							
$y \leq L$	$x \leq 1/8a$	$0 < z \leq t$							
⊙ If there chipped area touches the ITO terminal, over 2/3 of the ITO must remain and be inspected according to electrode terminal specifications. ⊙ If the product will be heat sealed by the customer, the alignment mark must not be damaged. 7.2.3 Substrate protuberance and internal crack 									
		<table><tr><td>y: width</td><td>x: length</td></tr><tr><td>$y \leq 1/3L$</td><td>$X \leq a$</td></tr></table>	y: width	x: length	$y \leq 1/3L$	$X \leq a$			
y: width	x: length								
$y \leq 1/3L$	$X \leq a$								

NO.	Item	Criterion	AQL
08	Cracked glass	The LCD with extensive crack is not acceptable.	2.5
09	Backlight elements	9.1 Illumination source flickers when lit. 9.2 Spots or scratches that appear when lit must be judged. Using LCD spot, lines and contamination standards. 9.3 Backlight doesn't light or color is wrong.	2.5 2.5 0.65
10	Bezel	Bezel must comply with product specifications.	2.5
11	PCB、COB	11.1 COB seal may not have pinholes larger than 0.2mm or contamination. 11.2 COB seal surface may not have pinholes through to the IC. 11.3 The height of the COB should not exceed the height indicated in the assembly diagram. 11.4 There may not be more than 2mm of sealant outside the seal area on PCB. And there should be no more than three places. 11.5 Parts on PCB must be the same as on the production characteristic chart, There should be no wrong parts, missing parts or excess parts. 11.6 The jumper on the PCB should conform to the product characteristic chart.	2.5 2.5 2.5 2.5 0.65 0.65
12	FPC	12.1 FPC terminal damage $\leq$ 1/2 FPC terminal width and can not affect the function , we judge accept. 12.2 FPC alignment hole damage $\leq$ 1/2 alignment area and can not affect the function , we judge accept.	2.5 2.5
13	Soldering	13.1 No cold solder joints, missing solder connections, oxidation or icicle. 13.2 No short circuits in components on PCB or FPC.	2.5 0.65

NO.	Item	Criterion	AQL												
14	Touch Panel Chipped glass	Symbols: x: Chip length y: Chip width z: Chip thickness k: Seal width t: Touch Panel Total thickness a: LCD side length L: Electrode pad length 14.1 General glass chip: 14.1.1 Chip on panel surface and crack between panels:  <table><tr><td>z: Chip thickness</td><td>y: Chip width</td><td>x: Chip length</td></tr><tr><td>$Z \leq t$</td><td>$\leq 1/2 k$ and not over viewing area</td><td>$x \leq 1/8a$</td></tr></table> ⊙ Unit: mm ⊙ If there are 2 or more chips, x is the total length of each chip 14.1.2 Corner crack:  <table><tr><td>z: Chip thickness</td><td>y: Chip width</td><td>x: Chip length</td></tr><tr><td>$z \leq t$</td><td>$\leq 1/2 k$ and not over viewing area</td><td>$x \leq 1/8a$</td></tr></table> ⊙ Unit: mm ⊙ If there are 2 or more chips, x is the total length of each chip	z: Chip thickness	y: Chip width	x: Chip length	$Z \leq t$	$\leq 1/2 k$ and not over viewing area	$x \leq 1/8a$	z: Chip thickness	y: Chip width	x: Chip length	$z \leq t$	$\leq 1/2 k$ and not over viewing area	$x \leq 1/8a$	2.5
z: Chip thickness	y: Chip width	x: Chip length													
$Z \leq t$	$\leq 1/2 k$ and not over viewing area	$x \leq 1/8a$													
z: Chip thickness	y: Chip width	x: Chip length													
$z \leq t$	$\leq 1/2 k$ and not over viewing area	$x \leq 1/8a$													

NO.	Item	Criterion	AQL										
15	Touch Panel(Fish eye、dent and bubble on film)	<table> <tr> <th>SIZE(mm)</th> <th>Acceptable Q'ty</th> </tr> <tr> <td>$\Phi \leq 0.2$</td> <td>Accept no dense</td> </tr> <tr> <td>$0.2 < D \leq 0.4$</td> <td>5</td> </tr> <tr> <td>$0.4 < D \leq 0.5$</td> <td>2</td> </tr> <tr> <td>$0.5 < D$</td> <td>0</td> </tr> </table>  	SIZE(mm)	Acceptable Q'ty	$\Phi \leq 0.2$	Accept no dense	$0.2 < D \leq 0.4$	5	$0.4 < D \leq 0.5$	2	$0.5 < D$	0	2.5
SIZE(mm)	Acceptable Q'ty												
$\Phi \leq 0.2$	Accept no dense												
$0.2 < D \leq 0.4$	5												
$0.4 < D \leq 0.5$	2												
$0.5 < D$	0												
16	Touch Panel Newton ring	Newton ring dimension $\leq 1/2$ touch panel area and not affect font and line distortion($\leq 2.5\%$) , it is acceptable.	2.5										
17	Touch Panel Linearity	Less than 2.5% is acceptable.	2.5										
18	LCD Ripple	Touch the touch panel , can not see the LCD ripple. Pen: R 1.0mm silicon rubber. Operation Force: 80g	2.5										
19	General appearance	19.1 Pin type must match type in specification sheet. 19.2 LCD pin loose or missing pins. 19.3 Product packaging must the same as specified on packaging specification sheet. 19.4 Product dimension and structure must conform to product specification sheet.	0.65 0.65 0.65 0.65										

11. General Precautions

11.1. 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.

11.2. Handling

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

11.3. Static Electricity

- Be sure to ground module before turning on power or operating module.
- Do not apply voltage which exceeds the absolute maximum rating value.

11.4. Storage

- Store the module in a dark room where must keep at $25\pm 10^{\circ}\text{C}$ and 65%RH or less.
- Do not store the module in surroundings containing organic solvent or corrosive gas.
- Store the module in an anti-electrostatic container or bag.

11.5. Cleaning

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

12. Packing Method

----TBD