

深圳市亿显国际科技有限公司 ShenZhen Yes-Display International Technology CO.,LTD.			10.4 寸液晶显示屏 10.4 Inch LCD Display Screen	
File NO.		REV	A/01	http://www.yes-display.com

SPECIFICATION FOR

Module:YS-T1040I17P-03D V1.0

Designed by	R&D Checked by	Quality Department by	Approved by

Approval by Customer:

OK

NG, Problem survey

Approved By _____

File NO.

REV

A/01

<http://www.yes-display.com>

Revision Record

REV NO.	REV DATE	Contents Before Change	Contents After Change	Note
V1.0	2021.04.01	NEW ISSUE		

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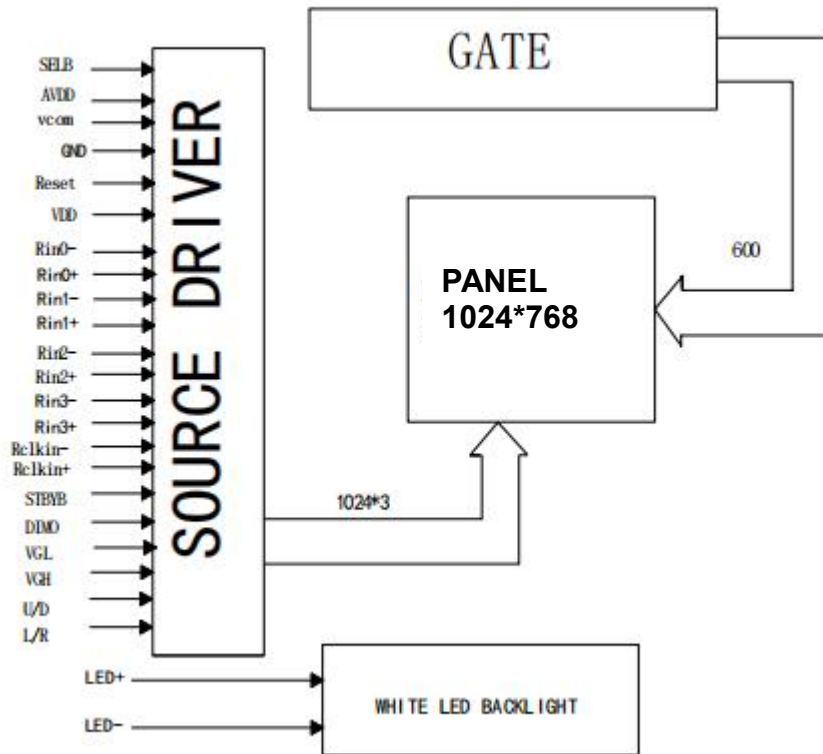
深圳市亿显国际科技有限公司 ShenZhen Yes-Display International Technology CO.,LTD.			10.4 寸液晶显示屏 10.4 Inch LCD Display Screen	
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1. Technical parameters

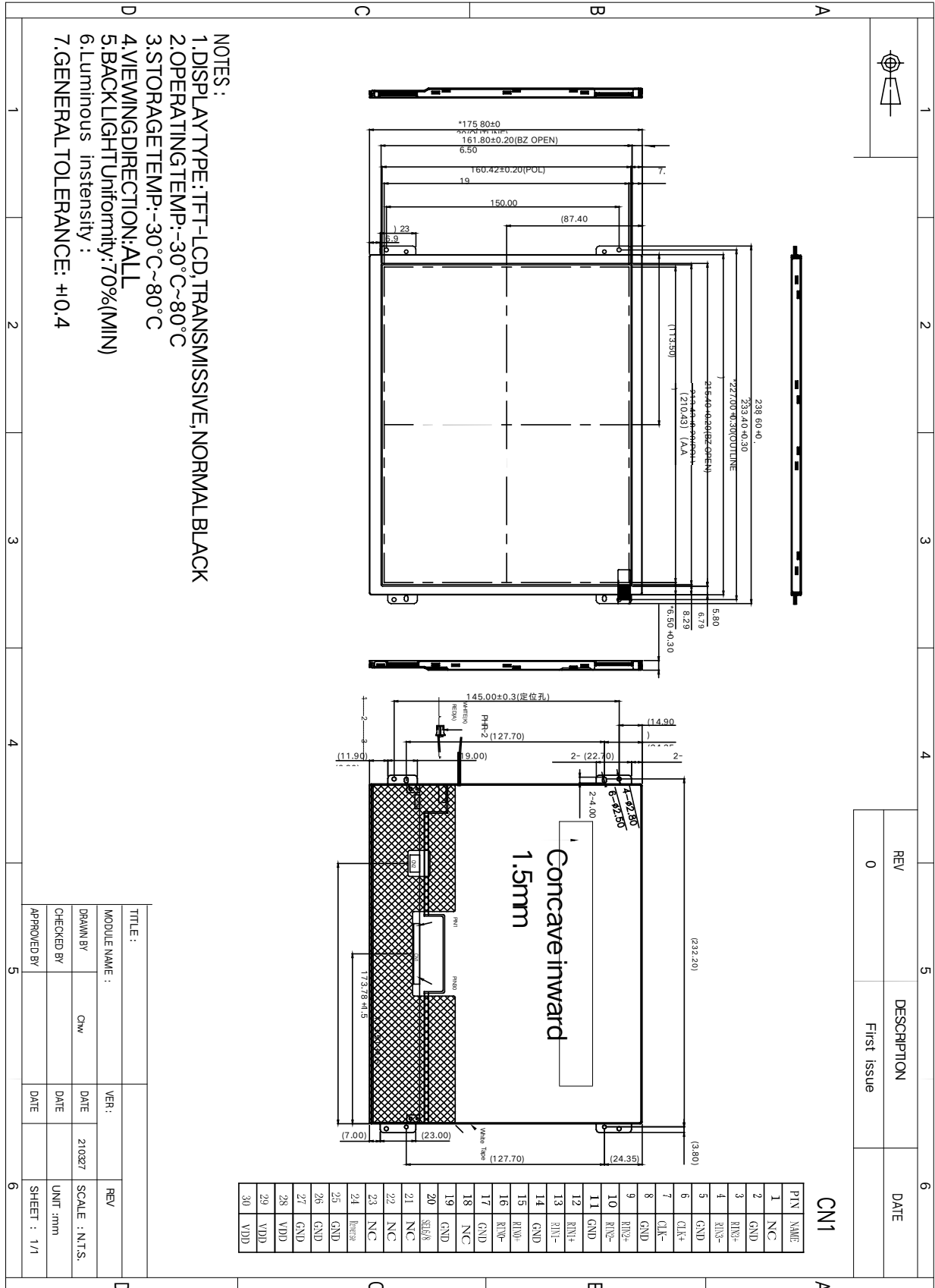
1.1 LCM General Information

ITEM	STANDARD VALUES	UNITS
LCD type	10.4 TFT	--
Dot arrangement	1024(RGB)×768	dots
Color filter array	RGB vertical stripe	--
Display mode	IPS / Transmission / Normally Black	-
Eyes Viewing Direction	ALL	--
Driver IC	TBD	--
Module size	238.6(W)×175.8(H)×6.5(T)	mm
Active area	210.43(W)×125.82(H)	mm
Interface	LVDS	--
Operating temperature	-20 ~ +70	°C
Storage temperature	-30 ~ +80	°C
Back Light	TBD	--

2. Block Dimension



3. Outline Dimensions

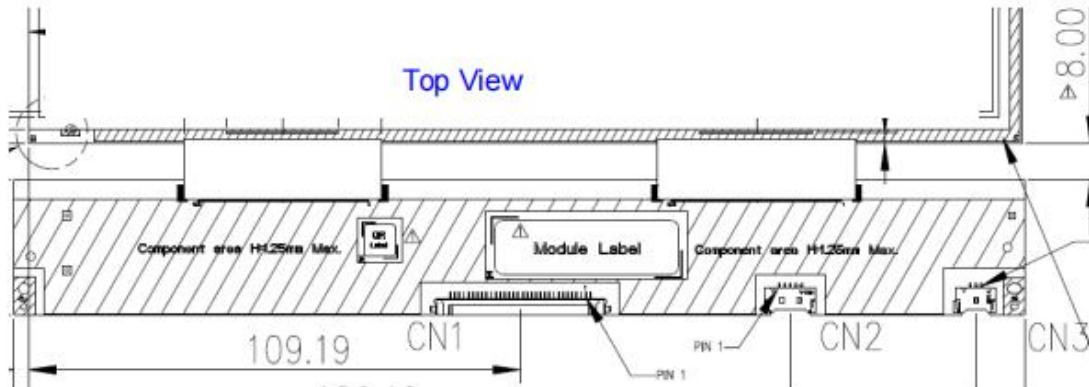


4. Input terminal Pin Assignment Description

4.1 TFT Pin Description

Connector

There are 3 connectors on PCBA, location & Pin1 is showed on below figure.



Connectors' type:

1. CN1 : Input LVDS CONN,30pins, P-two , 187098-30091
2. CN2: Input BL power CONN,5pins, Cillux,CI4205M2HRD-NH
3. CN3: Output BL power CONN, 3pins, Cillux,CI4203M2HRD-NH

PIN assignment

Connector 1 :

A 30pin connector of P-two 187098-30091 is used for the module electronics interface.

And a special plug needed for connecting this connector, the recommended model is P-two 187130-30xx or JAE FI-X30H.

No	Symbol	I/O	Function	Remark
1	NC	I	Reserved as BIST function for INX test	1
2	GND	P	Ground	
3	Rin3+	I	Positive LVDS differential data input (+)	
4	Rin3-	I	Negative LVDS differential data input (-)	
5	GND	P	Ground	
6	CLK+	I	Clock signal (+)	
7	CLK-	I	Clock signal (-)	
8	GND	P	Ground	
9	Rin2+	I	Positive LVDS differential data input (+)	
10	Rin2-	I	Negative LVDS differential data input (-)	
11	GND	P	Ground	
12	Rin1+	I	Positive LVDS differential data input (+)	
13	Rin1-	I	Negative LVDS differential data input (-)	
14	GND	P	Ground	

Note:

1. Pin1 is reversed as BIST function for test, don't connect signal to this pin, keep floating.
2. SEL6/8 is used for selecting 6bit/8bit LVDS data input, L or NC: 8bit; High:6bit.
3. Pin21,22,23 are used as SPI interface for OTP function, don't connect any signal to these pin, and don't short them, keep floating.
4. Reverse pin is used for selecting scanning direction.



Fig. 1 Normal scan (Pin24, Reverse = Low or NC)



Fig. 2 Reverse scan (Pin24, Reverse = High)

Connector 2: Cillux, CI4205M2HRD-NH

5-pin connector is used for input power & control signals for BL converter power IC

No	Symbol	I/O	Function	Remark
1	LED_VCCS	P	12V input	
2	LED_VCCS	P	12V input	
3	GND	P	Ground	
4	LED_PWM	I	PWM	
5	LED_EN	I	Converter power IC Enable (Active High)	

Connector 3: Cillux, CI4203M2HRD-NH

3-pin connector is used for output power to BL module.

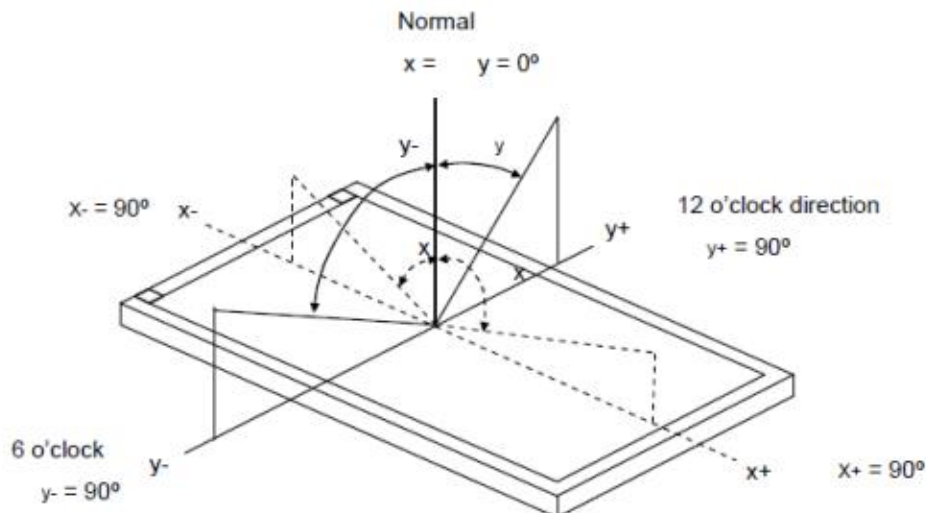
No	Symbol	I/O	Function	Remark
1	LED+	P	Red wire	BL output power
2	LED1-	P	White wire	BL feedback channel1
3	LED2-	P	White wire	BL feedback channel2

5. LCD Optical Characteristics

The relative measurement methods of optical characteristics are shown

Item	Symbol	Condition	Min.	Typ.	Max.	Unit	Note				
Color Chromaticity (CIE 1931) FOG Only with C-light	Red	Rx	Typ - 0.02	0.645	Typ + 0.02	-	C Light Source (5) (7),(8)				
		Ry		0.334							
	Green	Gx		0.284							
		Gy		0.564							
	Blue	Bx		0.137							
		By		0.121							
	White	Wx		0.319							
		Wy		0.369							
	Color gamut	C.G		55				61.2	-	%	
	Center Transmittance	T%		5.16				5.64	-	%	INX BLU w/o DBEF (1),(4),(6)
Contrast Ratio	CR	800	1000	-	-	(2)					
Response Time	T_R+T_F	$\theta_x=0^\circ, \theta_y=0^\circ$	-	25	35	ms	(3)				
Viewing Angle	Horizontal	x+	CR \geq 10	80	-	-	Deg.	(1),(5)			
		x-		80	-	-					
	Vertical	y+		80	-	-					
		y-		80	-	-					

Note (1) Definition of Viewing Angle (θ_x, θ_y):



Note (2) Definition of Contrast Ratio (CR):

The contrast ratio can be calculated by the following expression.

$$\text{Contrast Ratio (CR)} = L_{255} / L_0$$

L255: Luminance of gray level 255

L 0: Luminance of gray level 0

CR = CR (5)

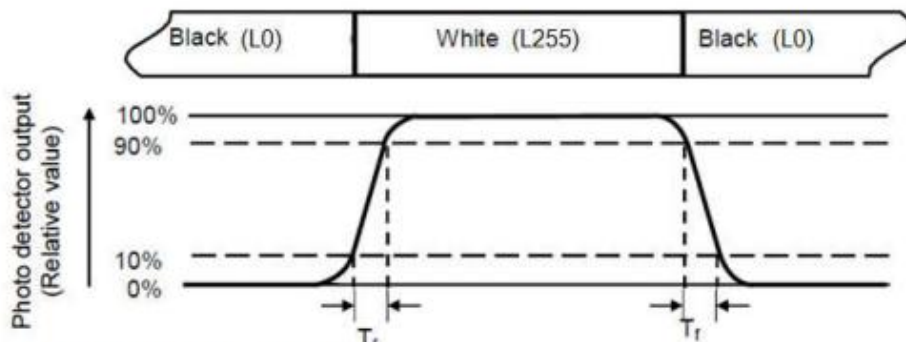
CR (X) is corresponding to the Contrast Ratio of the point X at Figure in Note (6).

Note (3) Definition of Response Time :

The response time is defined as the LCD optical switching time interval between "White" state and "Black" state. Rise time (T_r) is the time between photo detector output intensity changed from 10% to 90%. And fall time (T_f) is the time between photo detector output intensity changed from 90% to 10%.

RT = RT (5)

RT (X) is corresponding to the Response Time of the point X at Figure in Note (6).



Note (4) Definition of Luminance of White (L_c):

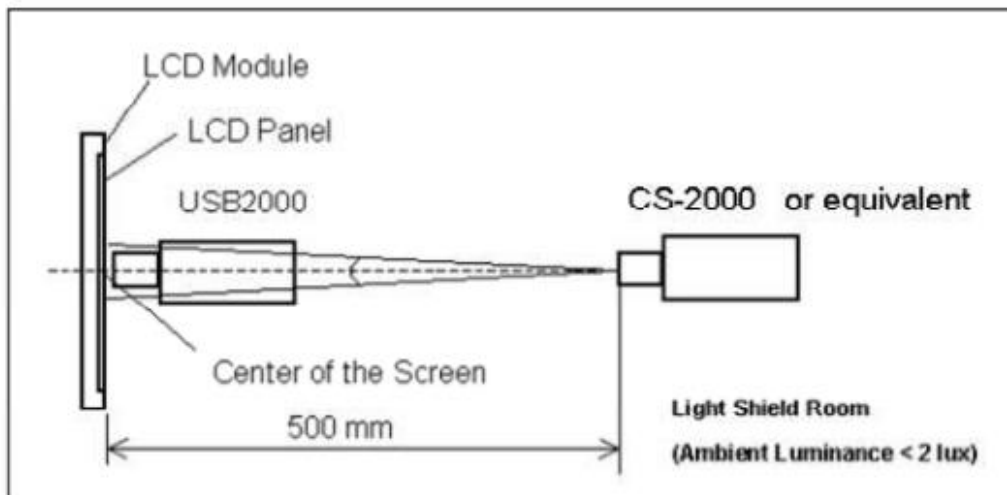
Measure the luminance of gray level 255 at center point

LC = L (5)

L (x) is corresponding to the luminance of the point X at Figure in Note (6).

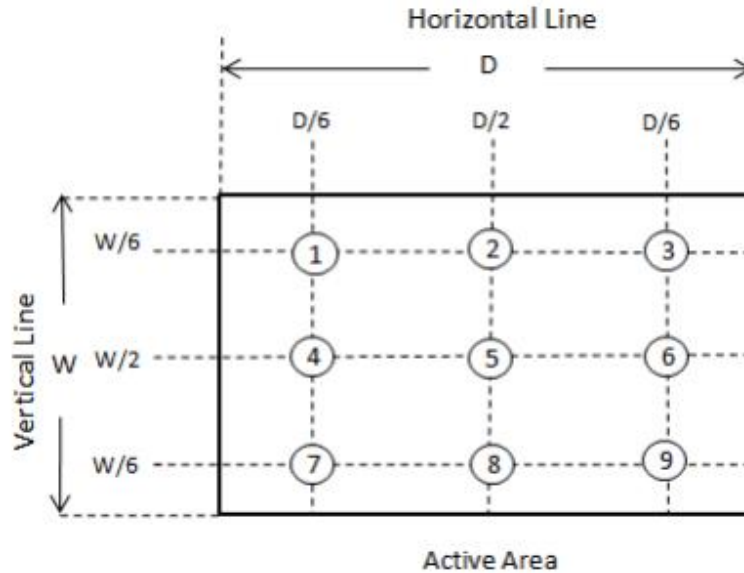
Note (5) Measurement Setup:

The LCD module should be stabilized at given temperature for 40 minutes to avoid abrupt temperature change during measuring. In order to stabilize the luminance, the measurement should be executed after lighting Backlight for 40 minutes in a windless room.



Note (6) Definition of White Variation ($_W$):

Measure the luminance of gray level 255 at 9 points



Note (7) The listed optical specifications refer to the initial value of manufacture, but the condition of the specifications after long-term operation will not be warranted.

Note (8) Definition of color gamut (C.G%):

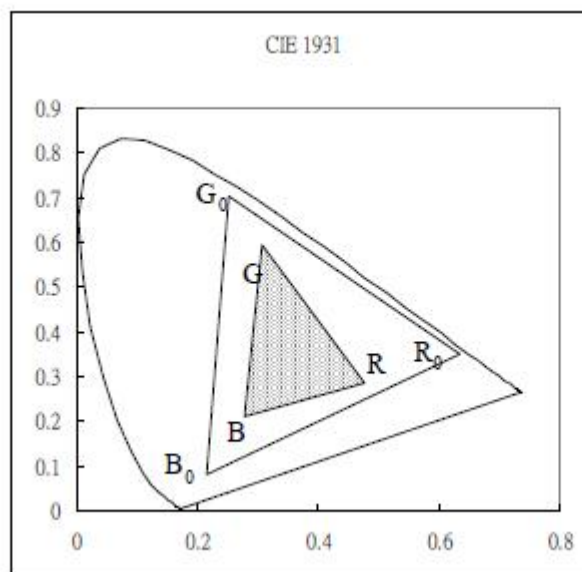
$$C.G\% = \frac{R G B}{R_0 G_0 B_0} \cdot 100\%$$

R_0, G_0, B_0 : color coordinates of red, green, and blue defined by NTSC, respectively.

R, G, B : color coordinates of module on 255 gray levels of red, green, and blue, respectively.

$R_0 G_0 B_0$: area of triangle defined by R_0, G_0, B_0

$R G B$: area of triangle defined by R, G, B



6. TFT Electrical Characteristics

6.1 Absolute Maximum Ratings

Item	Symbol	Min.	Max.	Unit	Remark
Power Supply Voltage	VDD	-0.3	3.8	V	
	LED_VCCS	-0.3	25	V	
Storage Temperature	Tstg	-30	+80	°C	
Operating Temperature	Topr	-30	+80	°C	

Note:

- (1) All of the voltages listed above are with respect to GND= 0V
- (2) Device is subject to be damaged permanently if stresses beyond those absolute maximum ratings listed above.

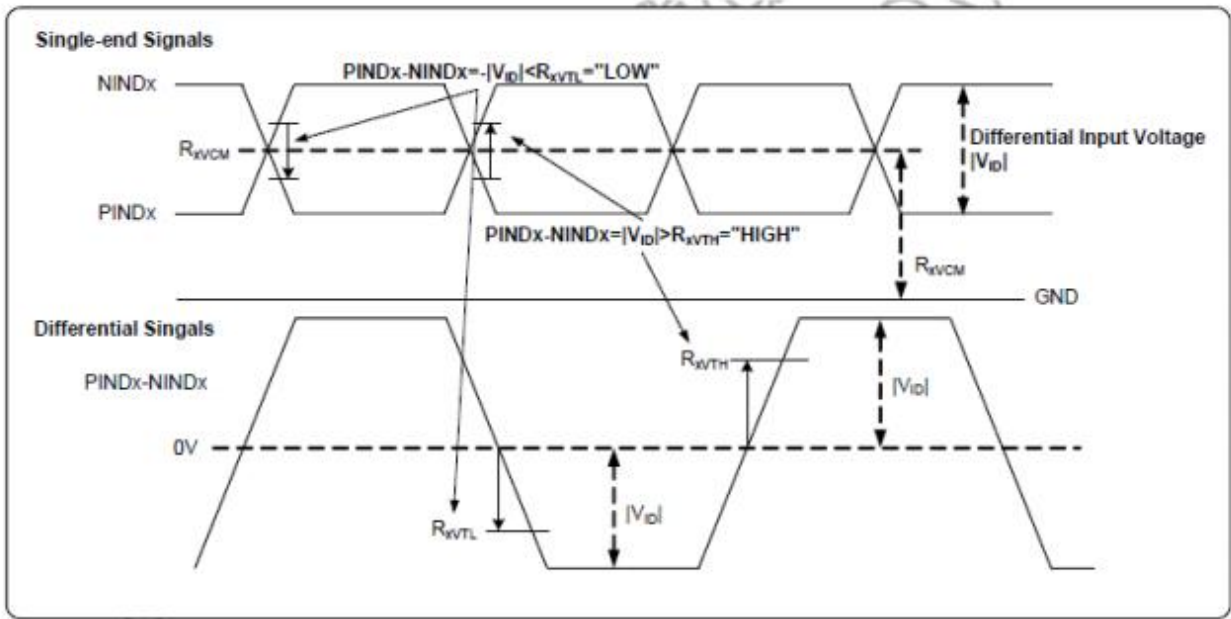
6.2 DC Characteristics

Item	Symbol	Values			Unit	Remark
		Min.	Typ.	Max.		
Power voltage	VDD	3.0	3.3	3.6	V	
	LED_VCCS	11	12	13	V	
Input logic high voltage	V _{IH}	0.7VDD	-	VDD	V	1
Input logic low voltage	V _{IL}	0	-	0.3VDD	V	
Current for Power	I _{VDD}		385	424	mA	VDD =3.3V@frame 60 Hz, White pattern
	I _{LED_VCCS}	-	0.52	-	A	100% PWM Duty @ VLED+ =33V, ILED=80mA*2
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	f _{PWM}	1K	-	20K	Hz	2

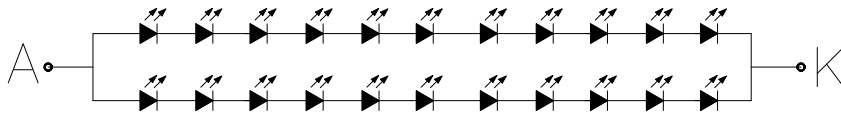
Note 1: Including signal: SEL6/8 & Reverse

Note 2: LED_PWM duty >10%.

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 (Singled-end)	R _{xVIN}	0	-	VDD-1.2+ V _{ID} /2	V	
LVDS Differential input common mode voltage	R _{xVCM}	V _{ID} /2	-	VDD-1.2	V	
LVDS Differential voltage	V _{ID}	0.2	-	0.6	V	



6.3 LED Backlight Characteristics



Backlight 22pcs LED Circuit
($I_f = 40\text{mA}$, 35.2V)

Item	Symbol	MIN	TYP	MAX	UNIT	Test Condition
Supply Voltage	V_f	-	35.2	-	V	$I_f = 40\text{mA}$
Supply Current	I_f	-	40	-	mA	-
Luminous Intensity for LCM	-	-	500	-	cd/m^2	$I_f = 40\text{mA}$
Uniformity for LCM	-	-	60	-	%	$I_f = 40\text{mA}$
Life Time	-	-	50000	-	Hr	$I_f = 40\text{mA}$
Backlight Color	White					

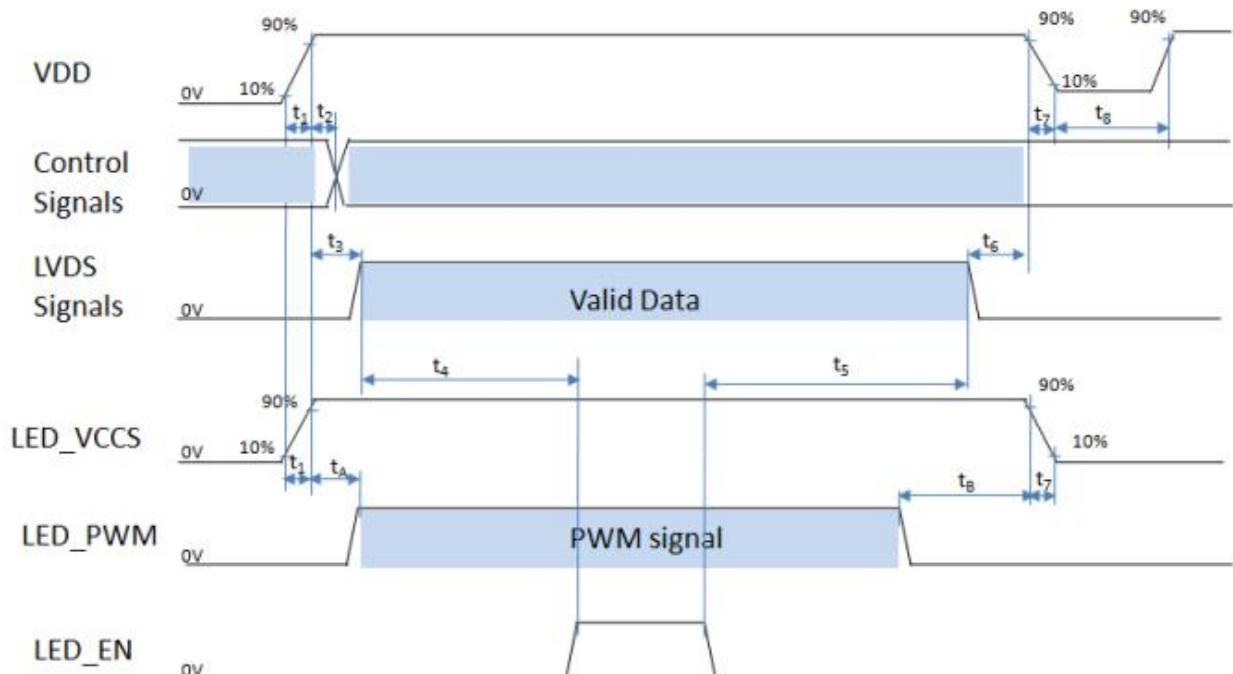
7. Timing Characteristics

7.1 TFT Timing Characteristics

7.1.1 Power on/off control

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.

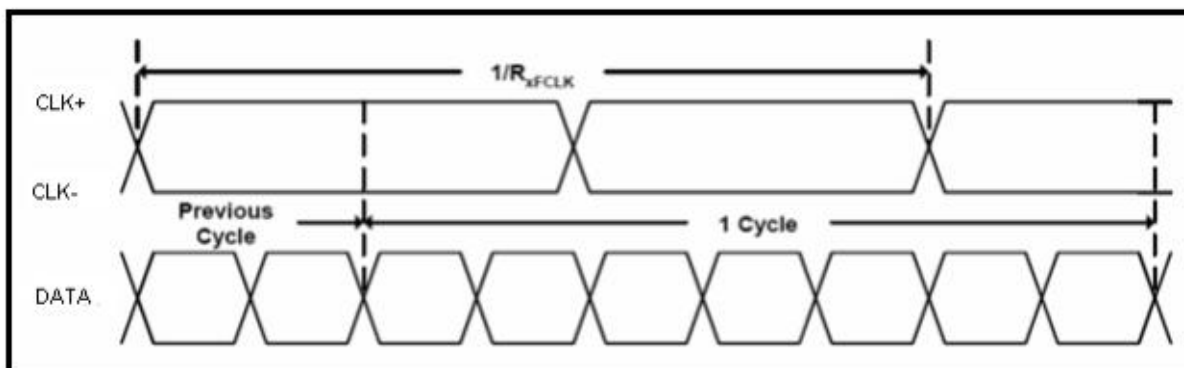
Note 3: It is recommended that the backlight power must be turned on after the power supply for LCD and the interface signal is valid.

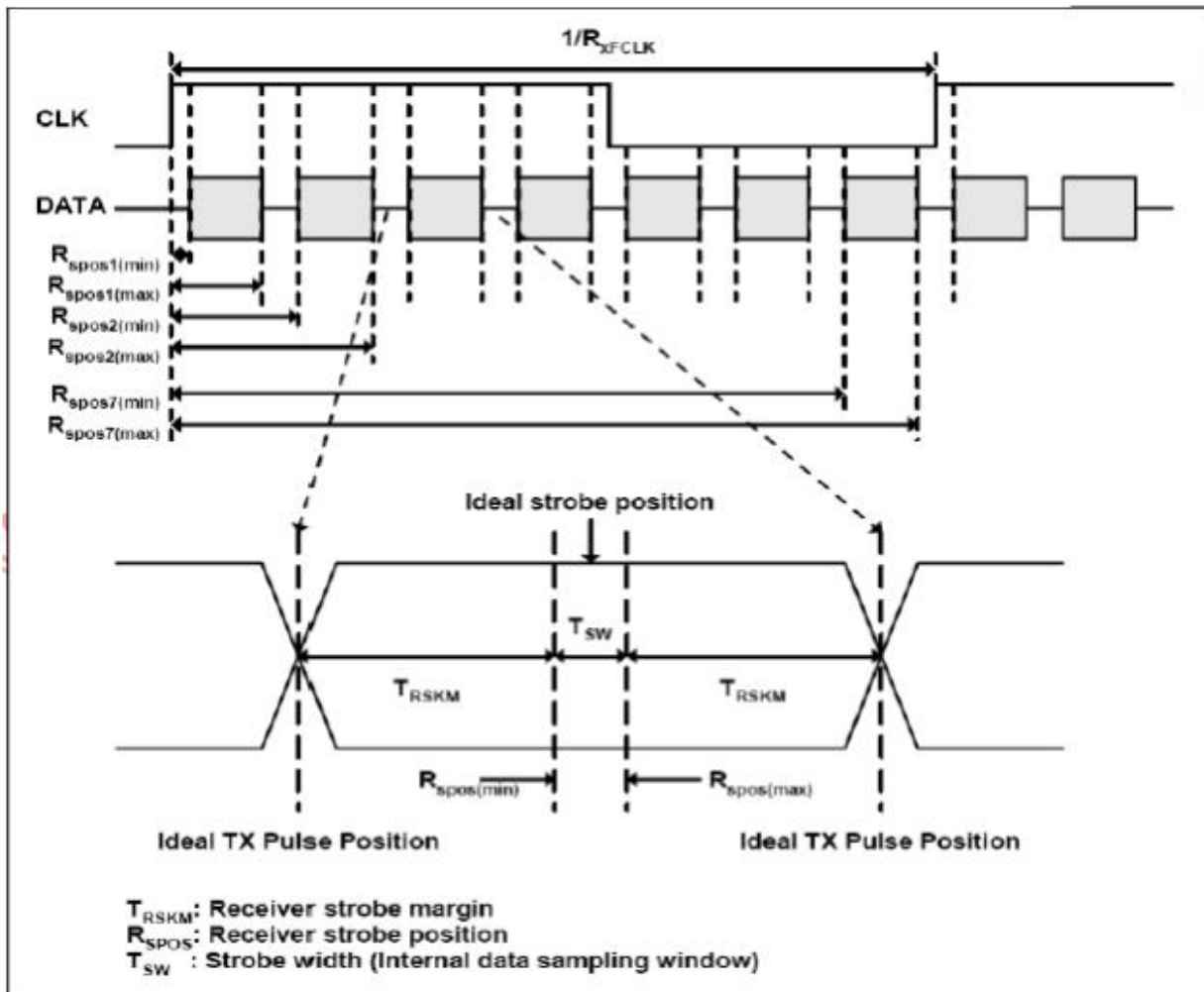
Note 4: Control signals include SEL6/8 & Reverse.

7.1.2 AC Electrical Characteristics

Parameter	Symbol	Min	Typ	Max	Units	Condition
Clock frequency	RxFCLK	26.2	51.2	71	MHz	
Input data skew margin	TRSKM	500	500	$1/(2 \times RxFCLK)$	ps	Typical value for 1024*600 resolution
Clock high time	TLVCH		$4/(7 \times RxFCLK)$		ns	VID =400mv RxVCM=1.2V RxFCLK=71MHz VDD_LVDS=3.3V
Clock low time	TLVCL		$3/(7 \times RxFCLK)$		ns	
VSD setup time	TenPLL	0	TenPLL	150	us	

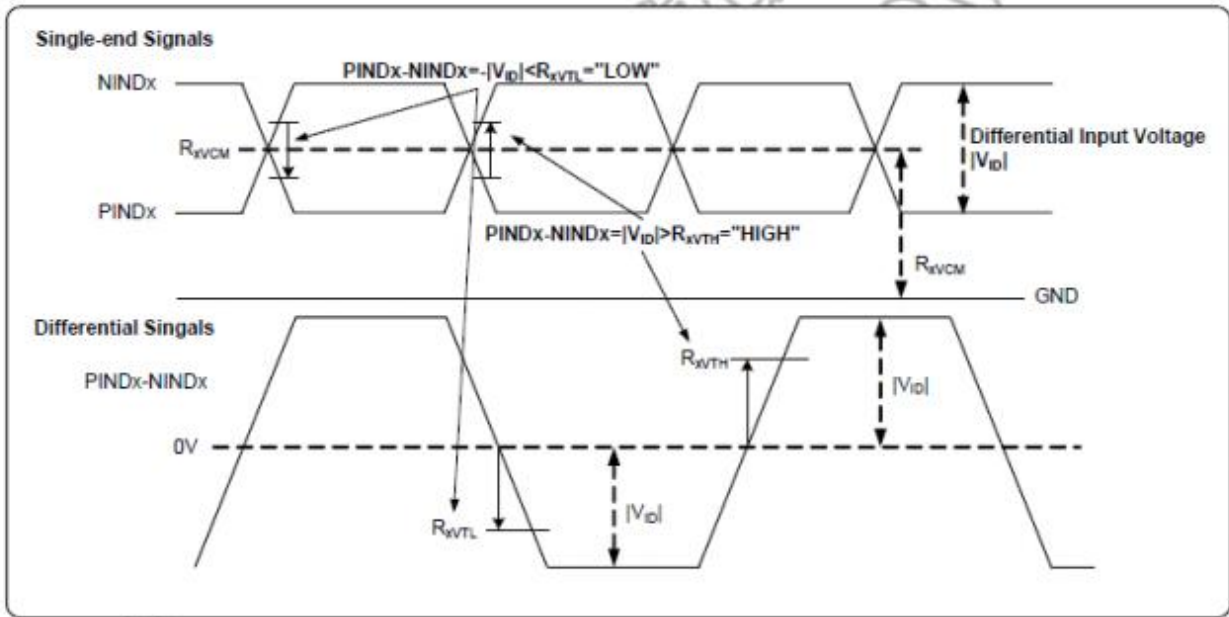
7.1.3 Input Clock and Data Timing Diagram





7.1.4 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 (Singled-end)	R_{XVIN}	0	-	$VDD-1.2+ V_{ID} /2$	V	
LVDS Differential input common mode voltage	R_{XVCM}	$ V_{ID} /2$	-	$VDD-1.2$	V	
LVDS Differential voltage	$ V_{ID} $	0.2	-	0.6	V	

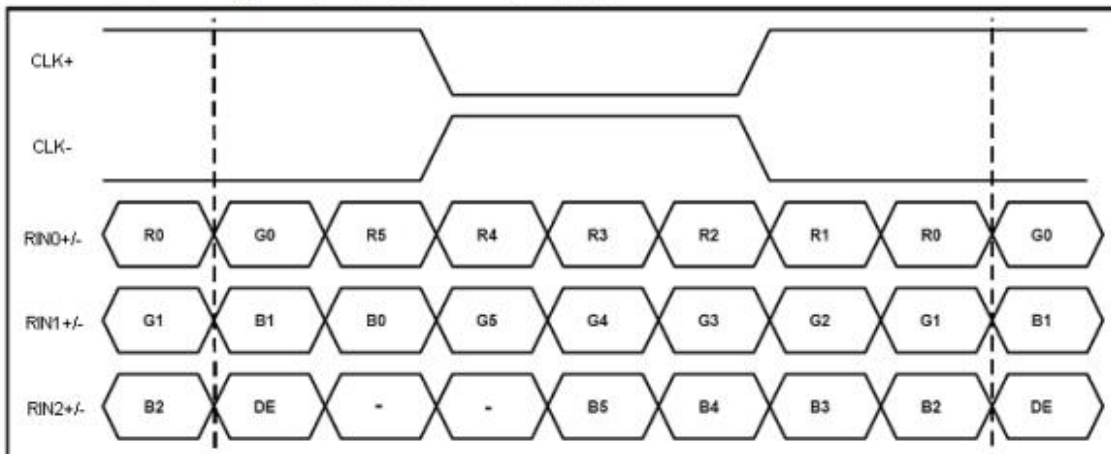


7.1.5 Timing

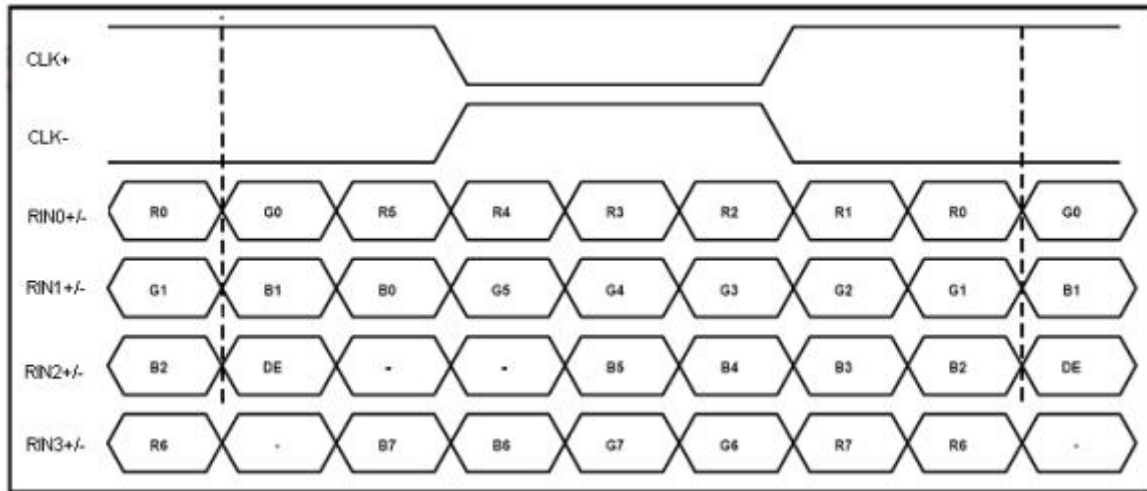
Parameter	Symbol	Spec.			Unit
		Min.	Typ.	Max.	
DCLK frequency	fclk	52	65	71	MHz
Horizontal display area	thd	1024			DCLK
HSD period	th	1114	1344	1400	DCLK
HSD blanking	thb+thfp	90	320	376	DCLK
Vertical display area	tvd	768			T_H
VSD period	tv	778	806	845	T_H
VSD blanking	tvbp+tvfp	10	38	77	T_H

7.1.6 Data input format for LVDS

SEL6/8 = "High" for 6 bits LVDS Input



SEL6/8 = "Low" or "NC" for 8 bits LVDS Input



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8. Inspection Standard

8.1 Incoming Inspection and Standard:

The below incoming inspection are applied to the TFT LCM Modules supplied by ShenZhen Yes-Display International Technology CO.,LTD. The customers should inspect the LCM within 14 days after receiving the goods. The result of inspection should be notified to the Seller in the writing copy promptly, if the customer do not send them within 14 days, the seller has the right to judge as acceptance of goods. The inspection lot size is treated as the quantity per shipment and per model. The sampling plan shall be inspected under MIL-STD015E in Level II by single sampling. The acceptable quality level (AQL) are categorized as below grades:

CRITICAL= 0.4%, MAJOR= 0.65%, MINOR= 1.5%

8.2 Inspection condition and Warranty policy:

The delivered LCM should be stored properly, ideally under climate-controlled environment at 25 (±5) degree Celsius as well as 60% (±10) Relative Humidity. The LCM shall be inspected in the viewing angle of 45 degree from the four major angles (U/D/L/R) under the single fluorescent lamp of 20W (equal to 300 to 500 lux). For warranty, ShenZhen Yes-Display International Technology CO.,LTD. will provide 12 months of warranty period as standard, and provide the new replacement for the defective products which belong to the Seller's responsibility verified by the quality department.

8.3 Inspection Criteria:

8.3.1 Critical defect

Item No.	Inspection content	Judgement
8.3.1.1	Functional defects	No display, abnormal display, short circuit, missing line, off-contrast and chromaticity, Touch Panel non-function
8.3.1.2	Model mixed	Other model mixed

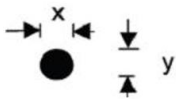
8.3.2 Major defect:


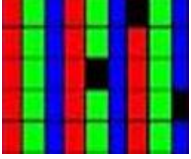
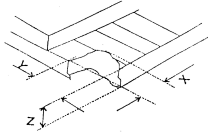
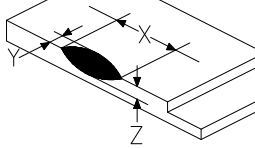
Item No.	Inspection content	Judgement
8.3.2.1	Product indication	Missing model no. and wrong model no. is indicated on the LCM.
8.3.2.2	Glass cracking	The LCD and touch panel glass crack or breakage

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8.3.2.3	Missing component	The function component missing such as connector, cable, etc.
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8.3.3 Minor defect (LCD) :

Item No.	Inspection content	Judgement												
8.3.3.1	Black/White spot Foreign particles Dust in the cell	$\varphi = (x+y) / 2$  <table border="1"> <thead> <tr> <th>Diameter (mm)</th> <th>Acceptable Q'ty</th> </tr> </thead> <tbody> <tr> <td>$\Phi \leq 0.1$</td> <td>Ignore</td> </tr> <tr> <td>$0.1 < \Phi \leq 0.25$</td> <td>3 (Distance>5mm)</td> </tr> <tr> <td>$0.25 < \Phi$</td> <td>Not allowed</td> </tr> </tbody> </table>	Diameter (mm)	Acceptable Q'ty	$\Phi \leq 0.1$	Ignore	$0.1 < \Phi \leq 0.25$	3 (Distance>5mm)	$0.25 < \Phi$	Not allowed				
Diameter (mm)	Acceptable Q'ty													
$\Phi \leq 0.1$	Ignore													
$0.1 < \Phi \leq 0.25$	3 (Distance>5mm)													
$0.25 < \Phi$	Not allowed													
8.3.3.2	Linear defect Black/white line Black/white scratch	<table border="1"> <thead> <tr> <th>Length(mm)</th> <th>Width (mm)</th> <th>Acceptable Q'ty</th> </tr> </thead> <tbody> <tr> <td></td> <td>$W \leq 0.03$</td> <td>Ignore</td> </tr> <tr> <td>$L \leq 5.0$</td> <td>$0.03 < W \leq 0.07$</td> <td>3</td> </tr> <tr> <td></td> <td>$0.07 < W$</td> <td>Follow 8.3.3.1</td> </tr> </tbody> </table>	Length(mm)	Width (mm)	Acceptable Q'ty		$W \leq 0.03$	Ignore	$L \leq 5.0$	$0.03 < W \leq 0.07$	3		$0.07 < W$	Follow 8.3.3.1
Length(mm)	Width (mm)	Acceptable Q'ty												
	$W \leq 0.03$	Ignore												
$L \leq 5.0$	$0.03 < W \leq 0.07$	3												
	$0.07 < W$	Follow 8.3.3.1												
8.3.3.3	Polarizer Bubbles Dent on polarizer	<table border="1"> <thead> <tr> <th>Diameter (mm)</th> <th>Acceptable Q'ty</th> </tr> </thead> <tbody> <tr> <td>$\Phi \leq 0.2$</td> <td>Ignore</td> </tr> <tr> <td>$0.2 < \Phi \leq 0.5$</td> <td>2 (Distance>5mm)</td> </tr> <tr> <td>$0.5 < \Phi$</td> <td>Not allowed</td> </tr> </tbody> </table>	Diameter (mm)	Acceptable Q'ty	$\Phi \leq 0.2$	Ignore	$0.2 < \Phi \leq 0.5$	2 (Distance>5mm)	$0.5 < \Phi$	Not allowed				
Diameter (mm)	Acceptable Q'ty													
$\Phi \leq 0.2$	Ignore													
$0.2 < \Phi \leq 0.5$	2 (Distance>5mm)													
$0.5 < \Phi$	Not allowed													

<p>8.3.3.4</p>	<p>Electrical Defect Dot</p>	<p>Bright dot and Dark dot definition:</p>  <p>or</p>  <p>(Two adjacent dot)</p> <p>Inspection pattern: black, white, red, green, and blue screen.</p> <table border="1" data-bbox="730 730 1441 913"> <thead> <tr> <th>Items</th> <th>Acceptable Q'ty</th> </tr> </thead> <tbody> <tr> <td>Bright dot</td> <td>$N \leq 4$ (Distance >5mm)</td> </tr> <tr> <td>Dark dot</td> <td>$N \leq 4$ (Distance >5mm)</td> </tr> </tbody> </table>	Items	Acceptable Q'ty	Bright dot	$N \leq 4$ (Distance >5mm)	Dark dot	$N \leq 4$ (Distance >5mm)
Items	Acceptable Q'ty							
Bright dot	$N \leq 4$ (Distance >5mm)							
Dark dot	$N \leq 4$ (Distance >5mm)							
<p>8.3.3.5</p>	<p>Glass Defect- Corner chipping</p>	 <table border="1" data-bbox="730 1104 1441 1379"> <thead> <tr> <th>Size(mm)</th> <th>Judgement</th> </tr> </thead> <tbody> <tr> <td> $X \leq 3\text{mm}$, $Y \leq S$, $Z \leq T$ (S= ITO length, T=Single glass thickness) </td> <td>Accept</td> </tr> </tbody> </table>	Size(mm)	Judgement	$X \leq 3\text{mm}$, $Y \leq S$, $Z \leq T$ (S= ITO length, T=Single glass thickness)	Accept		
Size(mm)	Judgement							
$X \leq 3\text{mm}$, $Y \leq S$, $Z \leq T$ (S= ITO length, T=Single glass thickness)	Accept							
<p>8.3.3.6</p>	<p>Glass Defect- Side fragment</p>	 <table border="1" data-bbox="730 1574 1441 1787"> <thead> <tr> <th>Size(mm)</th> <th>Judgement</th> </tr> </thead> <tbody> <tr> <td> $X \leq 2 \text{ mm}$, $Y \leq \text{border edge}$ $Z \leq T$ (T= single glass thickness) </td> <td>Accept</td> </tr> </tbody> </table>	Size(mm)	Judgement	$X \leq 2 \text{ mm}$, $Y \leq \text{border edge}$ $Z \leq T$ (T= single glass thickness)	Accept		
Size(mm)	Judgement							
$X \leq 2 \text{ mm}$, $Y \leq \text{border edge}$ $Z \leq T$ (T= single glass thickness)	Accept							

8.3.4 Minor defect (Touch Panel)

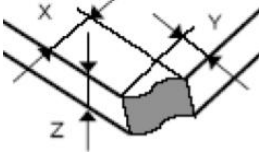
Item No.	Inspection content	Judgement
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File NO.

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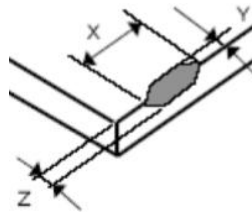
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8.3.4.1	Scratch, dust, particles, foreign materials in "linear type"	<table border="1"> <thead> <tr> <th>Size (mm)</th> <th>Acceptable Q'ty</th> </tr> </thead> <tbody> <tr> <td>$W \leq 0.05\text{mm}, L \leq 10\text{mm}$</td> <td>Ignore</td> </tr> <tr> <td>$0.05\text{mm} < W \leq 0.07\text{mm}, L \leq 10\text{mm}$</td> <td>3</td> </tr> <tr> <td>$W > 0.07\text{mm}$</td> <td>Reject</td> </tr> </tbody> </table>	Size (mm)	Acceptable Q'ty	$W \leq 0.05\text{mm}, L \leq 10\text{mm}$	Ignore	$0.05\text{mm} < W \leq 0.07\text{mm}, L \leq 10\text{mm}$	3	$W > 0.07\text{mm}$	Reject
Size (mm)	Acceptable Q'ty									
$W \leq 0.05\text{mm}, L \leq 10\text{mm}$	Ignore									
$0.05\text{mm} < W \leq 0.07\text{mm}, L \leq 10\text{mm}$	3									
$W > 0.07\text{mm}$	Reject									
8.3.4.2	Scratch, dust, particles, foreign materials in "round type"	<table border="1"> <thead> <tr> <th>Diameter (mm)</th> <th>Acceptable Q'ty</th> </tr> </thead> <tbody> <tr> <td>$\Phi \leq 0.25\text{mm}$</td> <td>Ignore</td> </tr> <tr> <td>$0.25\text{mm} < \Phi \leq 0.35\text{mm}$</td> <td>5</td> </tr> <tr> <td>$\Phi > 0.35\text{mm}$</td> <td>Reject</td> </tr> </tbody> </table>	Diameter (mm)	Acceptable Q'ty	$\Phi \leq 0.25\text{mm}$	Ignore	$0.25\text{mm} < \Phi \leq 0.35\text{mm}$	5	$\Phi > 0.35\text{mm}$	Reject
Diameter (mm)	Acceptable Q'ty									
$\Phi \leq 0.25\text{mm}$	Ignore									
$0.25\text{mm} < \Phi \leq 0.35\text{mm}$	5									
$\Phi > 0.35\text{mm}$	Reject									
8.3.4.3	Air bubbles	<table border="1"> <thead> <tr> <th>Diameter (mm)</th> <th>Acceptable Q'ty</th> </tr> </thead> <tbody> <tr> <td>$\Phi \leq 0.2\text{mm}$</td> <td>Ignore</td> </tr> <tr> <td>$0.2\text{mm} < \Phi \leq 0.5\text{mm}$</td> <td>3</td> </tr> <tr> <td>$\Phi > 0.5\text{mm}$</td> <td>Reject</td> </tr> </tbody> </table>	Diameter (mm)	Acceptable Q'ty	$\Phi \leq 0.2\text{mm}$	Ignore	$0.2\text{mm} < \Phi \leq 0.5\text{mm}$	3	$\Phi > 0.5\text{mm}$	Reject
Diameter (mm)	Acceptable Q'ty									
$\Phi \leq 0.2\text{mm}$	Ignore									
$0.2\text{mm} < \Phi \leq 0.5\text{mm}$	3									
$\Phi > 0.5\text{mm}$	Reject									
8.3.4.5	Scratch on printing area	<table border="1"> <thead> <tr> <th>Size (mm)</th> <th>Acceptable Q'ty</th> </tr> </thead> <tbody> <tr> <td>$W \leq 0.03\text{mm}, L \leq 5\text{mm}$</td> <td>Ignore</td> </tr> <tr> <td>$0.03\text{mm} < W \leq 0.05\text{mm}, L \leq 5\text{mm}$</td> <td>3</td> </tr> <tr> <td>$W > 0.05\text{mm}$ or $L > 5\text{mm}$</td> <td>Reject</td> </tr> </tbody> </table>	Size (mm)	Acceptable Q'ty	$W \leq 0.03\text{mm}, L \leq 5\text{mm}$	Ignore	$0.03\text{mm} < W \leq 0.05\text{mm}, L \leq 5\text{mm}$	3	$W > 0.05\text{mm}$ or $L > 5\text{mm}$	Reject
Size (mm)	Acceptable Q'ty									
$W \leq 0.03\text{mm}, L \leq 5\text{mm}$	Ignore									
$0.03\text{mm} < W \leq 0.05\text{mm}, L \leq 5\text{mm}$	3									
$W > 0.05\text{mm}$ or $L > 5\text{mm}$	Reject									
8.3.4.6	Corner chipping	 <table border="1"> <thead> <tr> <th>Size(mm)</th> <th>Judgement</th> </tr> </thead> <tbody> <tr> <td>$X \leq 2\text{mm}, Y \leq 2\text{mm}$ $Z < 1/2T$ (T= single glass thickness)</td> <td>Accept</td> </tr> </tbody> </table>	Size(mm)	Judgement	$X \leq 2\text{mm}, Y \leq 2\text{mm}$ $Z < 1/2T$ (T= single glass thickness)	Accept				
Size(mm)	Judgement									
$X \leq 2\text{mm}, Y \leq 2\text{mm}$ $Z < 1/2T$ (T= single glass thickness)	Accept									

8.3.4.7

Edge chipping



Size(mm)	Judgement
$X \leq 3 \text{ mm}$, $Y \leq 3 \text{ mm}$ $Z \leq 1/2 T$ (T= single glass thickness)	Accept

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9. Reliability Test Conditions and Methods

9.1 Reliability Test Conditions and Methods:

NO.	TEST ITEMS	TEST CONDITION	INSPECTION AFTER TEST
①	High Temperature Storage	80°C±2°C×96Hours	Inspection after 2~4hours storage at room temperature, the samples should be free from defects: 1, Air bubble in the LCD. 2, Seal leak. 3, Non-display. 4, Missing segments. 5, Glass crack. 6, Current IDD is twice higher than initial value. 7, The surface shall be free from damage. 8, The electric characteristic requirements shall be satisfied.
②	Low Temperature Storage	-30°C±2°C×96Hours	
③	High Temperature Operating	70°C±2°C×96Hours	
④	Low Temperature Operating	-20°C±2°C×96Hours	
⑤	Temperature Cycle(Storage)	$ \begin{array}{c} -20^{\circ}\text{C} \longleftrightarrow 25^{\circ}\text{C} \longleftrightarrow 70^{\circ}\text{C} \\ (30\text{min}) \longleftarrow (5\text{min}) \longrightarrow (30\text{min}) \\ \text{1cycle} \\ \text{Total 10cycle} \end{array} $	
⑥	Damp Proof Test (Storage)	50°C±5°C×90%RH×96Hours	
⑦	Vibration Test	Frequency:10Hz~55Hz~10Hz Amplitude:1.5MM X,Y,Z direction for total 3hours (packing condition test will be tested by a carton)	
⑧	Drooping Test	Drop to the ground from 1M height one time every side of carton. (packing condition test will be tested by a carton)	
⑨	ESD Test	Voltage:±8KV,R:330Ω,C:150PF,Air Mode,10times	

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REMARK:

- 1, The Test samples should be applied to only one test item.
- 2, Sample side for each test item is 5~10pcs.
- 3, For Damp Proof Test, Pure water(Resistance > 10MΩ) should be used.
- 4, In case of malfunction defect caused by ESD damage, if it would be recovered to normal state after resetting, it would be judge as a good part.
- 5, EL evaluation should be accepted from reliability test with humidity and temperature: Some defects such as black spot/blemish can happen by natural chemical reaction with humidity and Fluorescence EL has.
- 6, Failure Judgment Criterion: Basic Specification Electrical Characteristic, Mechanical Characteristic, Optical Characteristic.

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10. Cautions and Handling Precautions

10.1 Mounting method

The LCD panel of TFT module consists of two thin glass plates with polarizes which easily be damaged. And since the module in so constructed as to be fixed by utilizing fitting holes in the printed circuit board.

Extreme care should be needed when handling the LCD modules.

10.2 Caution of LCD handling and cleaning

When cleaning the display surface, Use soft cloth with solvent

[Recommended below] and wipe lightly

- Isopropyl alcohol
- Ethyl alcohol

Do not wipe the display surface with dry or hard materials that will damage the polarizer surface.

Do not use the following solvent:

- Water
- Aromatics

Do not wipe ITO pad area with the dry or hard materials that will damage the ITO patterns

Do not use the following solvent on the pad or prevent it from being contaminated:

- Soldering flux
- Chlorine (Cl) , Sulfur (S)

If goods were sent without being silicon coated on the pad, ITO patterns could be damaged due to the corrosion as time goes on.

If ITO corrosion happen by miss-handling or using some materials such as Chlorine (Cl), Sulfur (S) from customer, Responsibility is on customer.

10.3 Caution against static charge

The LCD module use C-MOS LSI drivers, so we recommended that you:

Connect any unused input terminal to power or ground, do not input any signals before power is turned on, and ground your body, work/assembly areas, and assembly equipment to protect against static electricity.

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10.4 packing

- Module employs LCD elements and must be treated as such.
- Avoid intense shock and falls from a height.
- To prevent modules from degradation, do not operate or store them exposed direct to sunshine or high temperature/humidity

10.5 Caution for operation

- It is an indispensable condition to drive LCD's within the specified voltage limit since the higher voltage then the limit cause the shorter LCD life.
- An electrochemical reaction due to direct current causes LCD's undesirable deterioration, so that the use of direct current drive should be avoided.
- Response time will be extremely delayed at lower temperature then the operating temperature range and on the other hand at higher temperature LCD's how dark color in them. However those phenomena do not mean malfunction or out of order with LCD's, which will come back in the specified operation temperature.
- If the display area is pushed hard during operation, some font will be abnormally displayed but it resumes normal condition after turning off once.
- Slight dew depositing on terminals is a cause for electro-chemical reaction resulting in terminal open circuit.

Usage under the maximum operating temperature, 50%Rh or less is required.

10.6 storing

In the case of storing for a long period of time for instance, for years for the purpose or replacement use, the following ways are recommended.

- Storage in a polyethylene bag with the opening sealed so as not to enter fresh air outside in it. And with no desiccant.
- Placing in a dark place where neither exposure to direct sunlight nor light's keeping the storage temperature range.
- Storing with no touch on polarizer surface by the anything else.

[It is recommended to store them as they have been contained in the inner container at the time of delivery from us

10.7 Safety

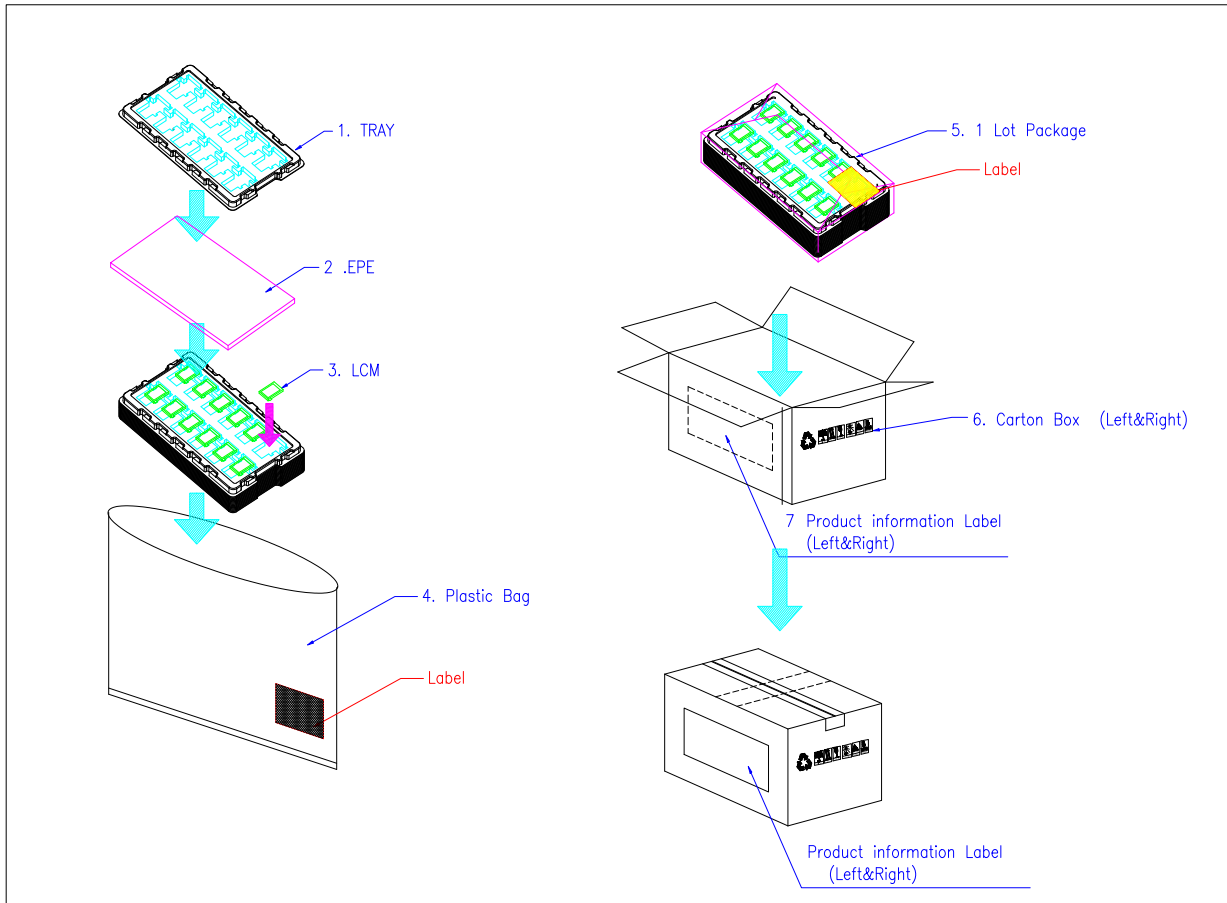
- It is recommendable to crash damaged or unnecessary LCD's into pieces and wash off liquid crystal by either of solvents such as acetone and ethanol, which should be burned up later.

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- When any liquid leaked out of a damaged glass cell comes in contact with your hands, please wash it off well with soap and water

11. Packing Method

11.1 Method



11.2 Packing Label

TBD