



TM150XDHG01 V1.1

MODEL NO. : TM150XDHG01ISSUED DATE: 2015-10-30VERSION : Ver 1.1

- ☐ Preliminary Specification
☒ Final Product Specification

Customer : _____

Approved by	Notes

SHANGHAI TIANMA Confirmed :

Prepared by	Checked by	Approved by

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Record of Revision

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1 General Specifications

Feature		Spec
Display Spec.	Size	15 inch
	Resolution	1600(RGB) x 1200
	Technology Type	a-Si TFT
	Pixel Configuration	R.G.B. Vertical Stripe
	Pixel pitch(mm)	0.1905x0.1905
	Display Mode	Transmissive, Normally white
	Surface Treatment	Anti-Glare
	Viewing Direction	12 o'clock
	Gray Scale Inversion Direction	6 o'clock
Mechanical Characteristics	LCM (W x H x D) (mm)	318.7(W)x242.65(H) x6.5(D)(Max)
	Active Area(mm)	304.8x228.6
	With /Without TSP	Without TSP
	CN1 Matching Connection Type	FI-S30S or FI-SE30M
	CN2 Matching Connection Type	DF19G-14S-1C(05) or DF19-14S-1C
	LED Numbers	56
	Weight (g)	620
Electrical Characteristics	Interface	2 ports LVDS(6bit)
	Color Depth	262K

Note 1: Viewing direction for best image quality is different from TFT definition. There is a 180 degree shift.

Note 2: Requirements on Environmental Protection: Q/S0002

Note 3: LCM weight tolerance: +/- 5%

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2 Input/Output Terminals

2.1 CN1 of Connector

CN1:FI-XB30SL-HF10

Pin	Symbol	I/O	Description	Remark
1	E_CLKIN+	I	+LVDS differential Clock input (Even pixel)	
2	E_CLKIN-	I	-LVDS differential Clock input (Even pixel)	
3	VSS	P	GND	
4	E_RIN3+	I	+LVDS differential data input (R6~R7,G6~G7 , B6~B7) (Even pixel),Please let it open or connect it to ground if not used	
5	E_RIN3-	I	-LVDS differential data input (R6~R7,G6~G7 , B6~B7) (Even pixel), Please let it open or connect it to ground if not used	
6	E_RIN2+	I	+LVDS differential data input (B2~B5,HS,VS,DE) (Even pixel)	
7	E_RIN2-	I	-LVDS differential data input (B2~B5,HS,VS,DE) (Even pixel)	
8	VSS	P	GND	
9	E_RIN1+	I	+LVDS differential data input (G1~G5,B0,B1) (Even pixel)	
10	E_RIN1-	I	-LVDS differential data input (G1~G5,B0,B1) (Even pixel)	
11	E_RIN0+	I	+LVDS differential data input (R0~R5,G0) (Even pixel)	
12	E_RIN0-	I	-LVDS differential data input (R0~R5,G0) (Even pixel)	
13	VSS	P	GND	
14	O_CLKIN+	I	+LVDS differential Clock input (Odd pixel)	
15	O_CLKIN-	I	-LVDS differential Clock input (Odd pixel)	
16	VSS	P	GND	
17	O_RIN3+	I	+LVDS differential data input (R6~R7,G6~G7 , B6~B7) (Odd pixel), Please let it open or connect it to ground if not used	
18	O_RIN3-	I	-LVDS differential data input (R6~R7,G6~G7 , B6~B7) (Odd pixel), Please let it open or connect it to ground if not used	
19	O_RIN2+	I	+LVDS differential data input (B2~B5,HS,VS,DE) (Odd pixel)	
20	O_RIN2-	I	-LVDS differential data input (B2~B5,HS,VS,DE) (Odd pixel)	
21	VSS	P	GND	
22	O_RIN1+	I	+LVDS differential data input (G1~G5,B0,B1) (Odd pixel)	
23	O_RIN1-	I	+LVDS differential data input (G1~G5,B0,B1) (Odd pixel)	
24	O_RIN0+	I	+LVDS differential data input (R0~R5,G0) (Odd pixel)	
25	O_RIN0-	I	-LVDS differential data input (R0~R5,G0) (Odd pixel)	
26	VSS	P	GND	
27	VSS	P	GND	
28	VDD	P	Power Supply : +3.3V (typical)	
29	VDD	P	Power Supply : +3.3V (typical)	
30	VDD	P	Power Supply : +3.3V (typical)	

I---Input, O---Output, P--- Power/Ground, “-” ---No connection

Table 2.1 terminal pin assignments

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2.2 CN2 of Connector

CN2: DF19L-14P-1H

Terminal	Symbol	Functions
1	VSS	Ground
2	VLED+	Power Supply:+12V
3	VLED+	Power Supply:+12V
4	VLED+	Power Supply:+12V
5	VLED+	Power Supply:+12V
6	VLED+	Power Supply:+12V
7	NC	No Connection
8	EN	BL On/Off
9	PWM	PWM Brightness Control
10	VSS	Ground
11	VSS	Ground
12	VSS	Ground
13	VSS	Ground
14	VSS	Ground

3 Absolute Maximum Ratings

GND=0V, Ta = 25℃

Item	Symbol	MIN	MAX	Unit	Remark
Power Voltage	VDD	-0.3	4.0	V	
Data Input voltage	V _{IN}	-0.3	4.0	V	
Backlight forward current	I _{LED}	-	1000	mA	
Operating Temperature	Top	-30	70	℃	
Storage Temperature	Tst	-40	80	℃	

Table 3.1 absolute maximum rating

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4 Electrical Characteristics

4.1 Recommended Operating Condition

Parameter	Symbol	min.	typ.	max.	Unit	Remarks
Power supply voltage	VDD	3.0	3.3	3.6	V	-
Power supply ripple	Vp-p			100	mV	Including spike noise
Power supply current	ICC	-	990		mA	at VDD = 3.3V Note 1

Note 1: Black pattern, DCLK Frequency = 80Mhz

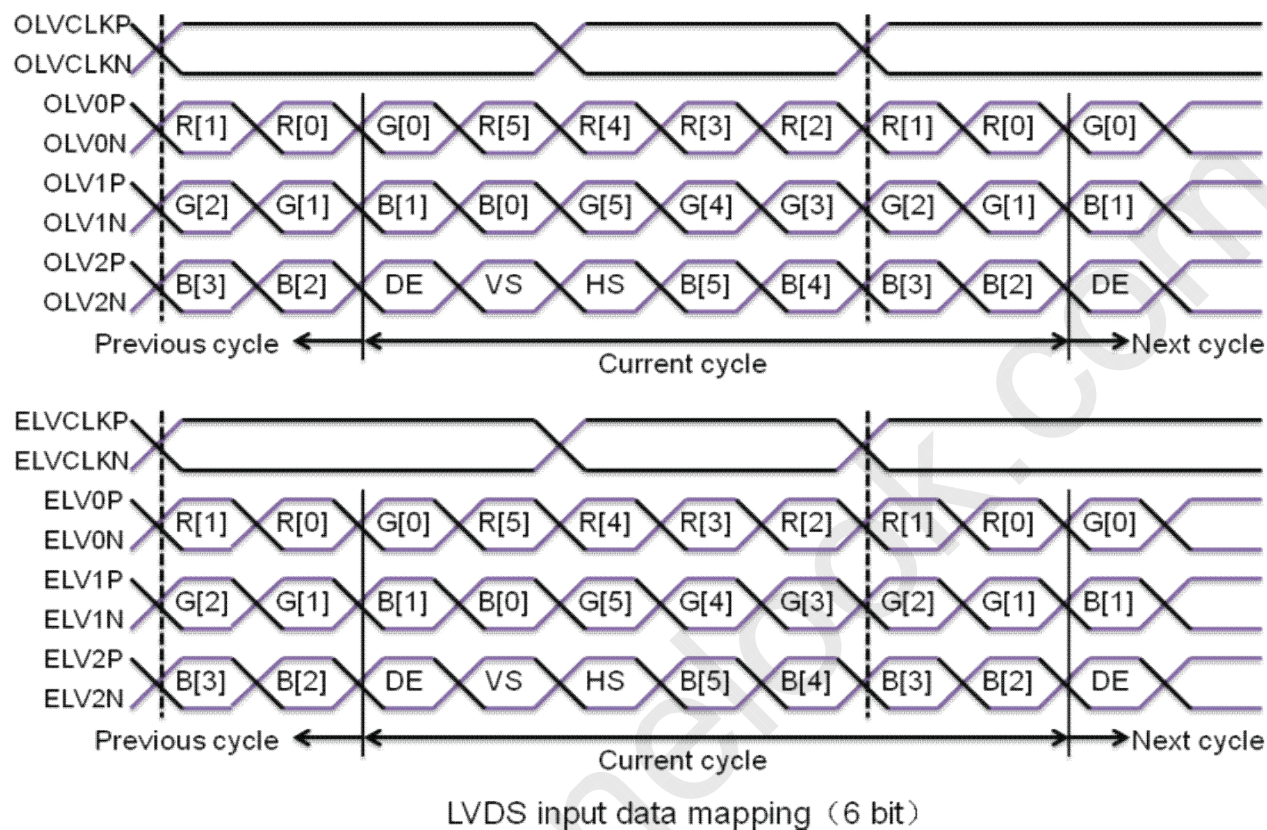
4.2 Driving For Backlight

Parameter		Symbol	min.	typ.	max.	Unit	Remarks
Power supply voltage		VDD	10.8	12.0	13.2	V	
Power supply current		IDD	-	1140	1290	mA	
Light bar life time		Hr	20000	30000	-	Hour	Note1
Input voltage for PWM signal	High	VDFH1	2.0		5.0	V	
	Low	VDFL1	0		0.4	V	
Input voltage for BRTC signal	High	VDFH2	2.0		5.0	V	
	Low	VDFL2	0		0.4	V	
PWM frequency		fpwm	200		(10K)	Hz	
PWM pulse width		tPWH	10			us	

Note1: The operating lifetime is mean time to half-luminance. In case the product works under room temperature environment.

5 Timing Chart

5.1 Data Map



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5.2 LVDS AC electrical characteristics

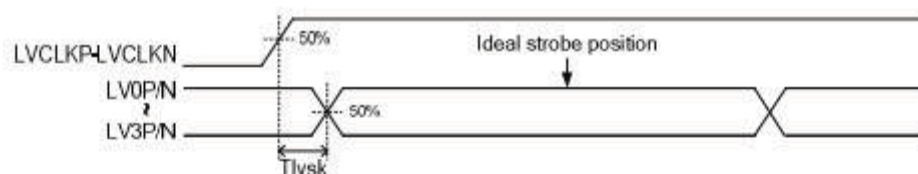


Figure 8.1: LVDS channel to channel skew

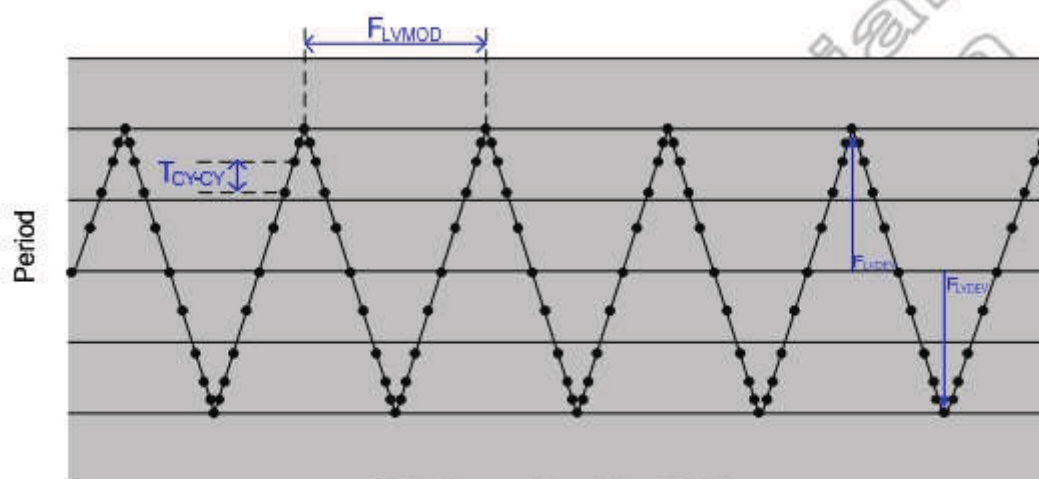
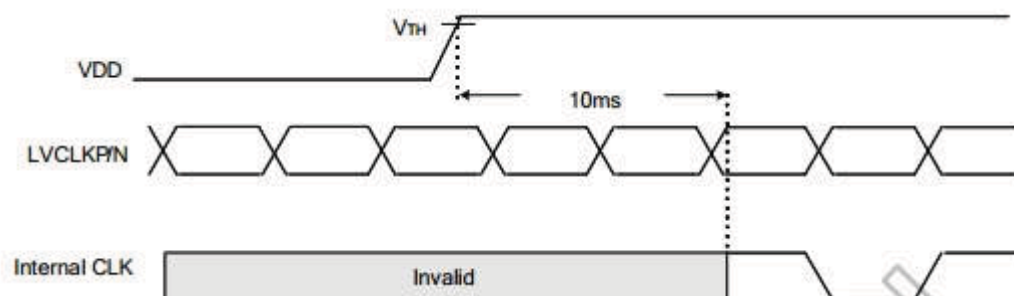


Figure 8.2: LVDS input SSC

Symbol	Parameter	Condition	Spec.			Unit
			Min.	Typ.	Max.	
F	LVDS Input frequency	-	25	-	110	MHz
Tlvsk	LVDS channel to channel skew	F=65MHz V _{IC} =1.2V V _{ID} =±200mV	-600	-	+600	ps
F _{LVMOD}	Modulating frequency of input clock during SSC	F=85MHz V _{IC} =1.2V V _{ID} =±200mV	10	-	300	KHz
F _{LVDEV}	Maximum deviation of input clock frequency during SSC		-3	-	+3	%
T _{CY-CY}	Cycle to cycle jitter		-	-	200	ps

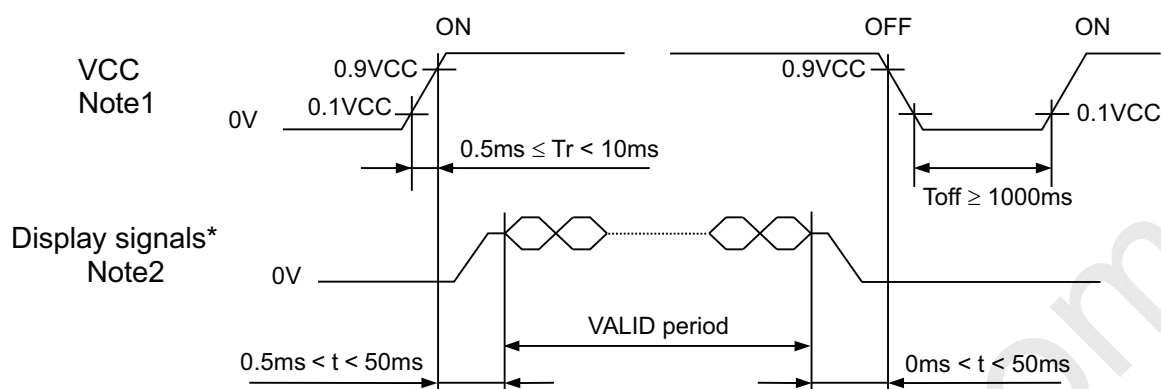
5.3 Phase Lock Loop wake-up time



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5.4 Power up sequence

5.4.1 LCD panel signal processing board



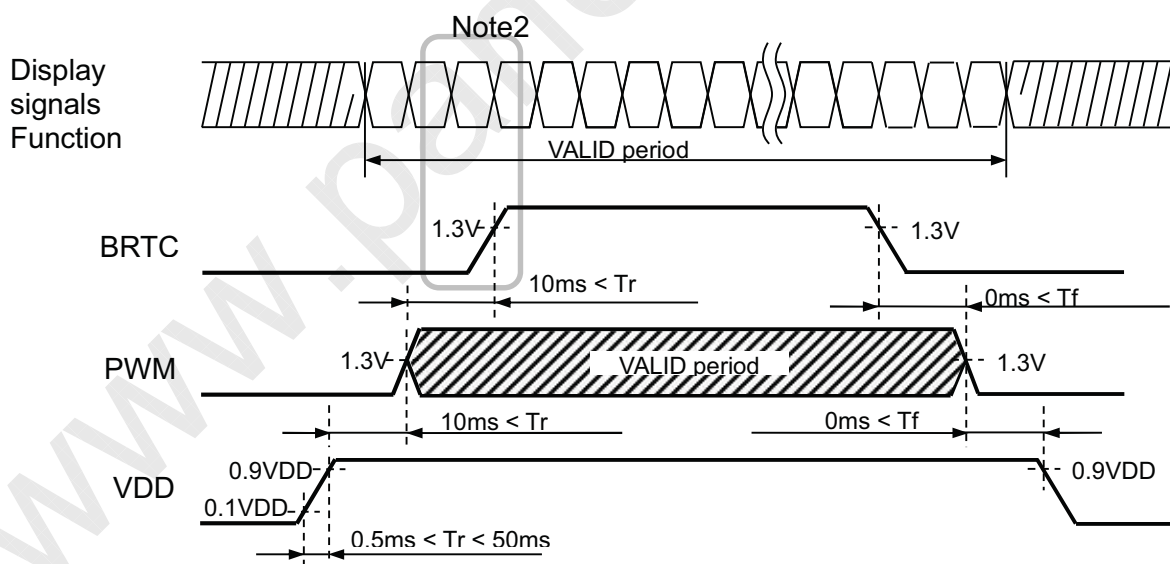
* These signals should be measured at the terminal of 100Ω resistance.

Note1: If there is a voltage variation (voltage drop) at the rising edge of VCC below 3.0V, there is a possibility that a product does not work due to a protection circuit.

Note2: Display signals (LV0P/N, LV0P/N, LV0P/N, LV0P/N and LVCLKP/N) must be set to Low or High-impedance, except the VALID period (See above sequence diagram), in order to avoid the circuitry damage.

If some of display of this product are cut while this product is working, even if the signal input to it once again, it might not work normally. If a customer stops the display and function signals, VCC also must be shut down.

5.4.2 LED driver board

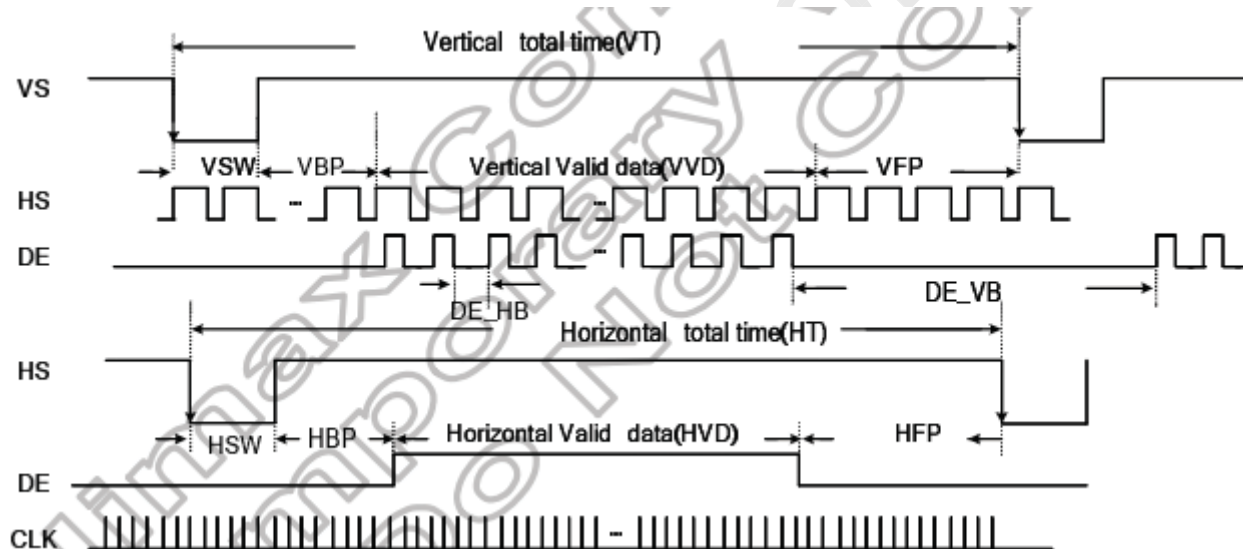


Note1: These are the display and function signals for LCD panel signal processing board.

Note2: The backlight should be turned on within the valid period of display and function signals, in order to avoid unstable data display.

5.5 Input signal timing

Parameter	Symbol	Condition	1600*1200	Unit
Horizontal total timing	HT	Min.	2100	Clock
		Typ.	2160	Clock
		Max.	2960	Clock
Horizontal active timing	HVD	Typ.	1600	Clock
Vertical total timing	VT	Min.	1210	Line
		Typ.	1250	Line
		Max.	1460	Line
Vertical active timing	VVD	Typ.	1200	Line



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6 Optical Characteristics

Ta=25℃

Item		Symbol	Condition	Min	Typ	Max	Unit	Remark
View Angles		θT	CR≧ 10	70	80	-	Degree	Note 2
		θB		70	80	-		
		θL		70	80	-		
		θR		70	80	-		
Contrast Ratio		CR	θ=0°	800	1000	-		Note1 Note3
Response Time		T _{ON}	25℃	-	20	30	ms	Note1
		T _{OFF}						Note4
Chromaticity	White	x	Backlight is on	0.263	0.313	0.363		Note1 Note5
		y		0.279	0.329	0.379		
	Red	x		0.545	0.595	0.645		
		y		0.288	0.338	0.388		
	Green	x		0.252	0.302	0.352		
		y		0.515	0.565	0.615		
	Blue	x		0.107	0.157	0.207		
		y		0.049	0.099	0.149		
Uniformity		U		75	80	-	%	Note1 Note6
NTSC				-	50	-	%	Note 5
Luminance (Without TP)		L		800	1000	-	cd/m ²	Note1 Note7

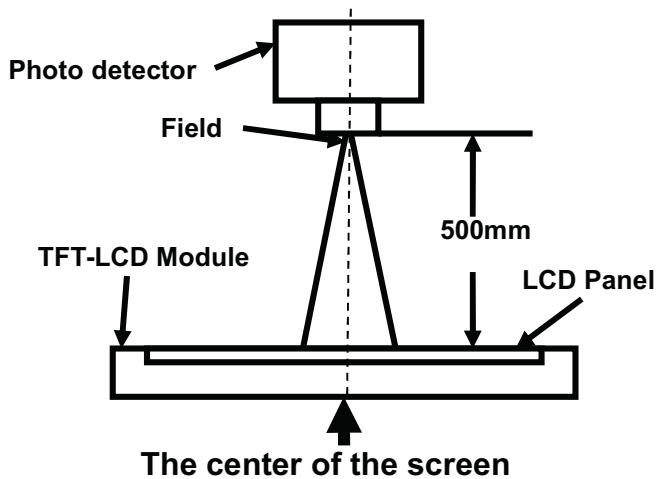
Test Conditions:

1. The ambient temperature is 25±2℃.humidity is 65±7%
2. The test systems refer to Note 1 and Note 2.

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Note 1: Definition of optical measurement system.

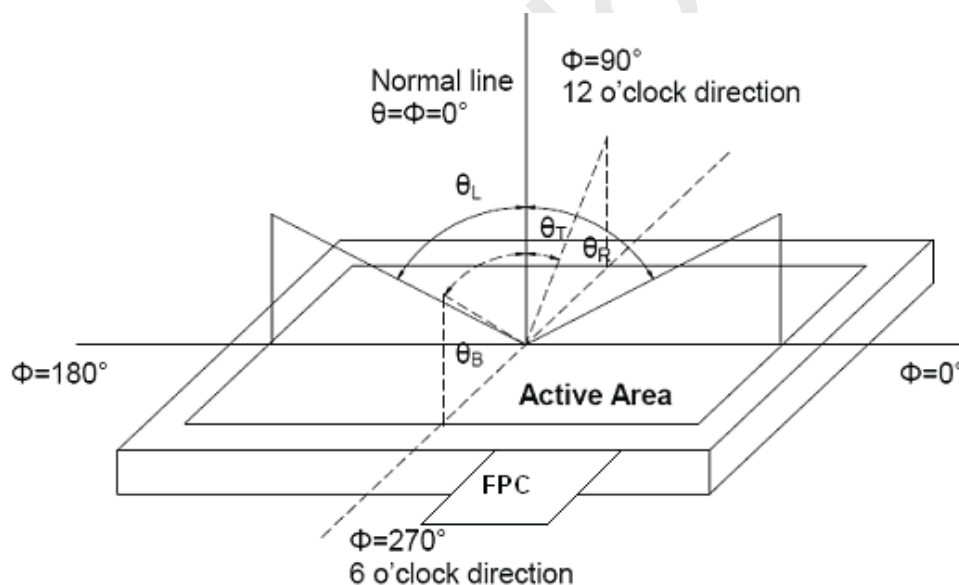
The optical characteristics should be measured in dark room. After 5 Minutes operation, the optical properties are measured at the center point of the LCD screen. All input terminals LCD panel must be ground when measuring the center area of the panel.



Item	Photo detector	Field
Contrast Ratio	SR-3A	1°
Luminance		
Chromaticity		
Lum Uniformity		
Response Time	BM-7A	2°

Note 2: Definition of viewing angle range and measurement system.

viewing angle is measured at the center point of the LCD by CONOSCOPE(ergo-80).



Note 3: Definition of contrast ratio

$$\text{Contrast ratio (CR)} = \frac{\text{Luminance measured when LCD is on the "White" state}}{\text{Luminance measured when LCD is on the "Black" state}}$$

“White state”: The state is that the LCD should drive by V_{white} .

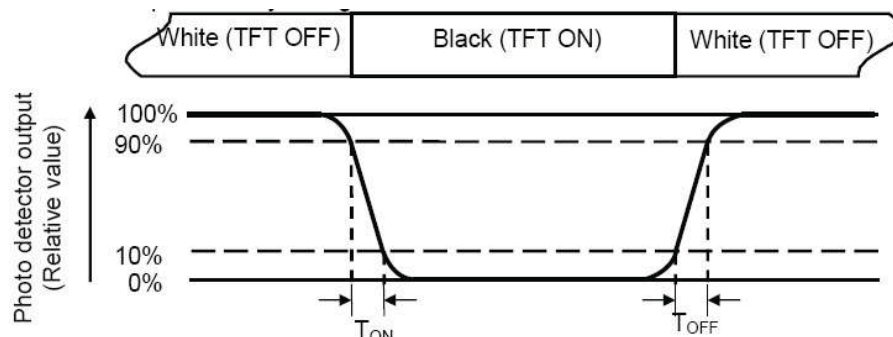
“Black state”: The state is that the LCD should drive by V_{black} .

V_{white} : To be determined V_{black} : To be determined.

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Note 4: 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_{ON}) is the time between photo detector output intensity changed from 90% to 10%. And fall time (T_{OFF}) is the time between photo detector output intensity changed from 10% to 90%.



Note 5: Definition of color chromaticity (CIE1931)

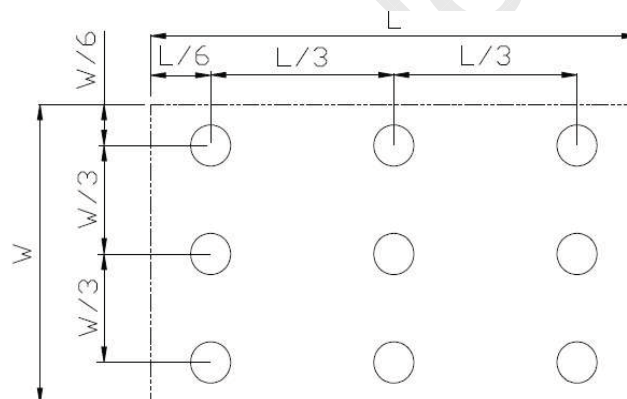
Color coordinates measured at center point of LCD.

Note 6: Definition of Luminance Uniformity

Active area is divided into 9 measuring areas (Refer Fig. 2). Every measuring point is placed at the center of each measuring area.

$$\text{Luminance Uniformity (U)} = L_{\min} / L_{\max}$$

L-----Active area length W----- Active area width



$L_{\max}$: The measured Maximum luminance of all measurement position.

$L_{\min}$: The measured Minimum luminance of all measurement position.

Note 7: Definition of Luminance:

Measure the luminance of white state at center point.

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7 Environmental / Reliability Test

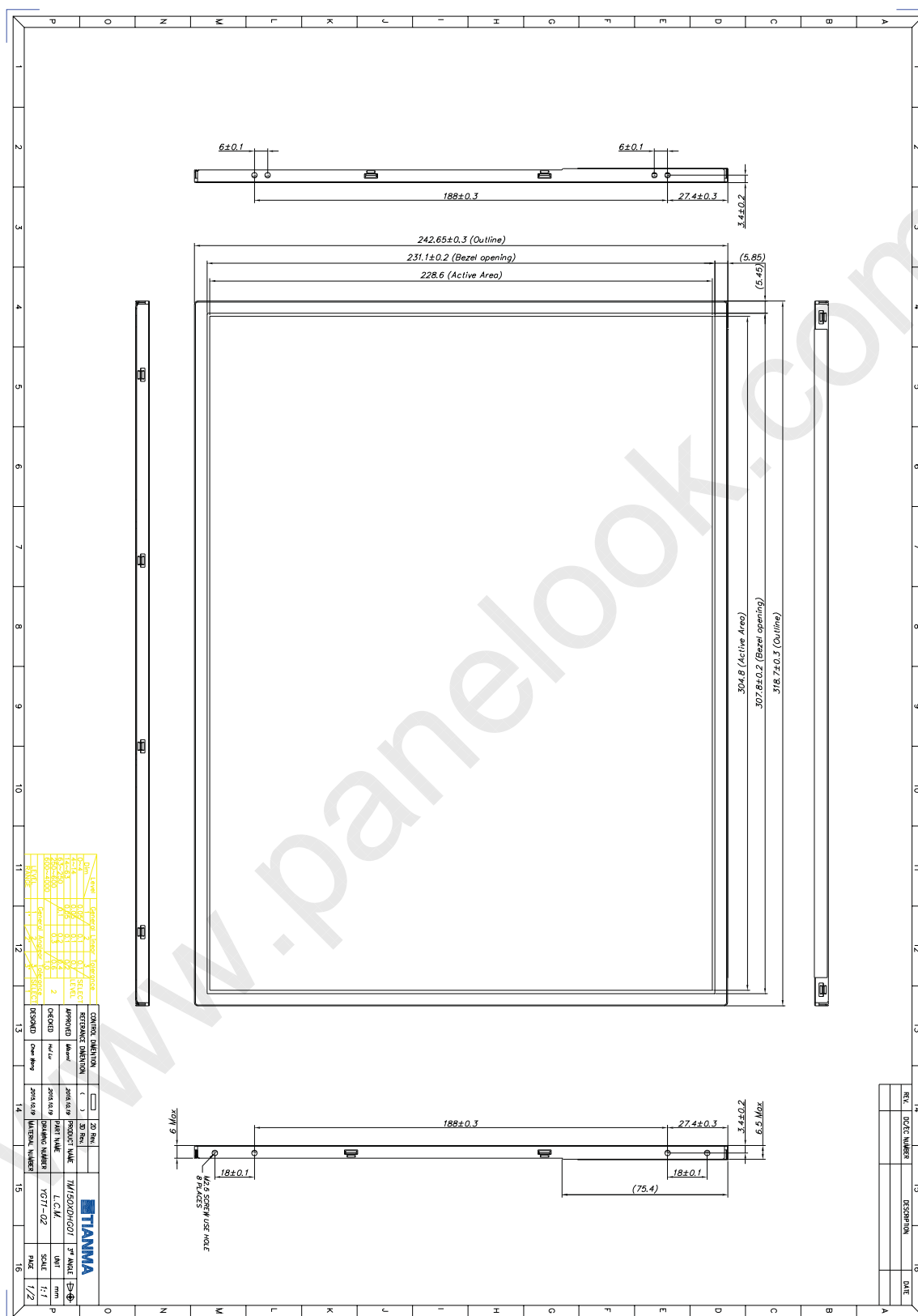
No	Test Item	Condition	Remarks
1	High Temperature Operation	Ts = +70℃, 240 hours	IEC60068-2-1 GB2423.2
2	Low Temperature Operation	Ta = -30℃, 240 hours	IEC60068-2-1 GB2423.1
3	High Temperature Storage	Ta = +80℃, 240 hours	IEC60068-2-1 GB2423.2
4	Low Temperature Storage	Ta = -40℃, 240 hours	IEC60068-2-1 GB2423.1
5	Storage at High Temperature and Humidity	Ta = +60℃, 90% RH max,240hours	IEC60068-2-78 GB/T2423.3
6	Thermal Shock (non-operation)	-30℃ 30 min~+80℃ 30 min, Change time:5min, 20 Cycle	Start with cold temperature, End with high temperature, IEC60068-2-14,GB2423.22
7	ESD	C=150pF,R=330Ω,5point/panel Air:±15Kv,5times; Contact:±8Kv,5times (Environment:15℃~35℃, 30%~60%.86Kpa~106Kpa)	IEC61000-4-2 GB/T17626.2
8	Vibration Test	Frequency range:10~55Hz Stroke:1.5mm Sweep:10Hz~55Hz~10Hz 2 hours for each direction of X.Y.Z. (6 hours for total)	IEC60068-2-6 GB/T2423.10
9	Mechanical Shock (Non Op)	60G,6ms,X,Y,Z 3times,For each direction	IEC60068-2-27 GB/T2423.5
10	Package Drop Test	Height:60cm, 1corner,3edges,6surfaces	IEC60068-2-32 GB/T2423.8

Note1: Ts is the temperature of panel's surface.

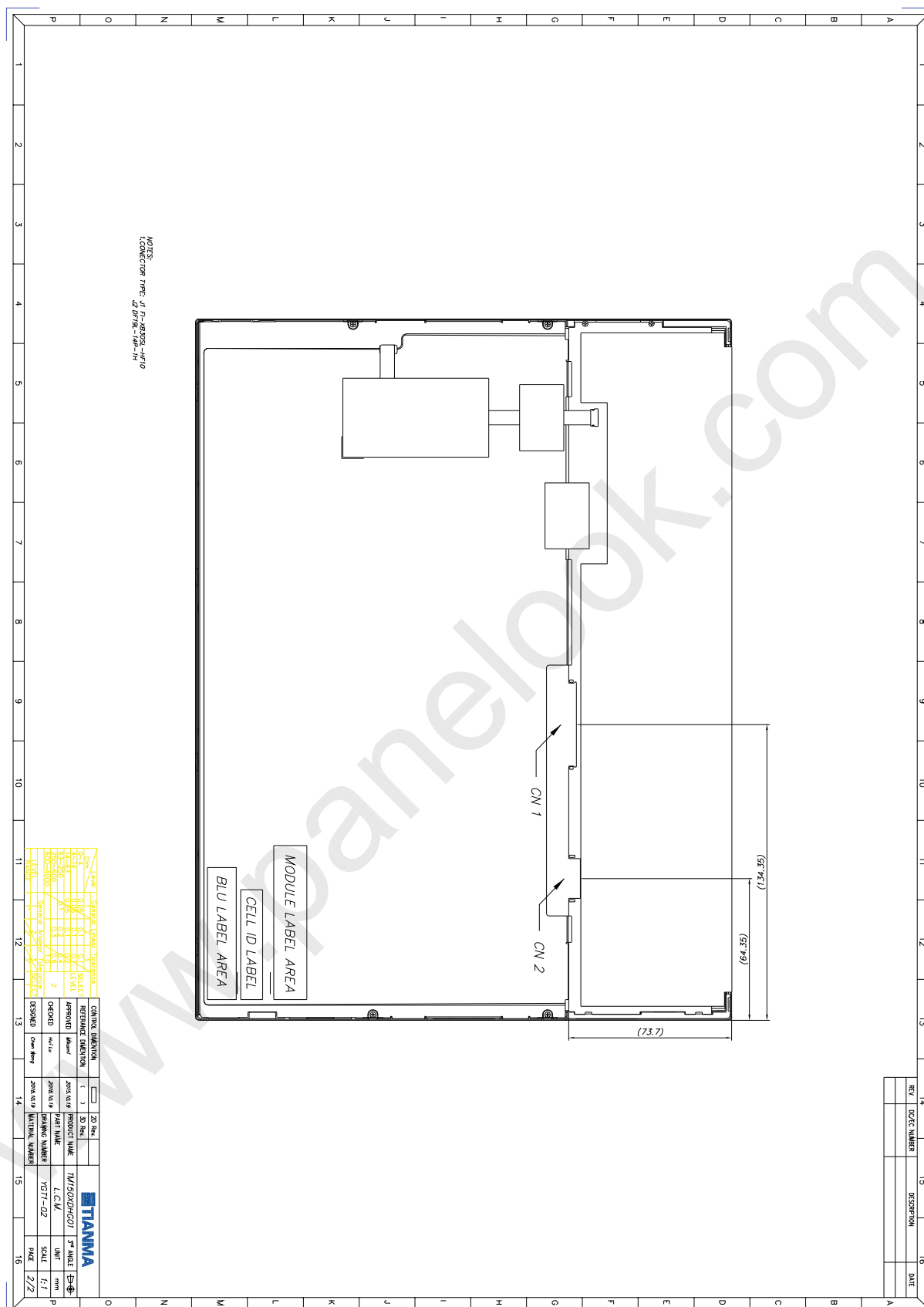
Note2: Ta is the ambient temperature of samples.

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8 Mechanical Drawing



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One step solution for LCD / PDP / OLED panel application: Datasheet, inventory and accessory! www.panelook.com

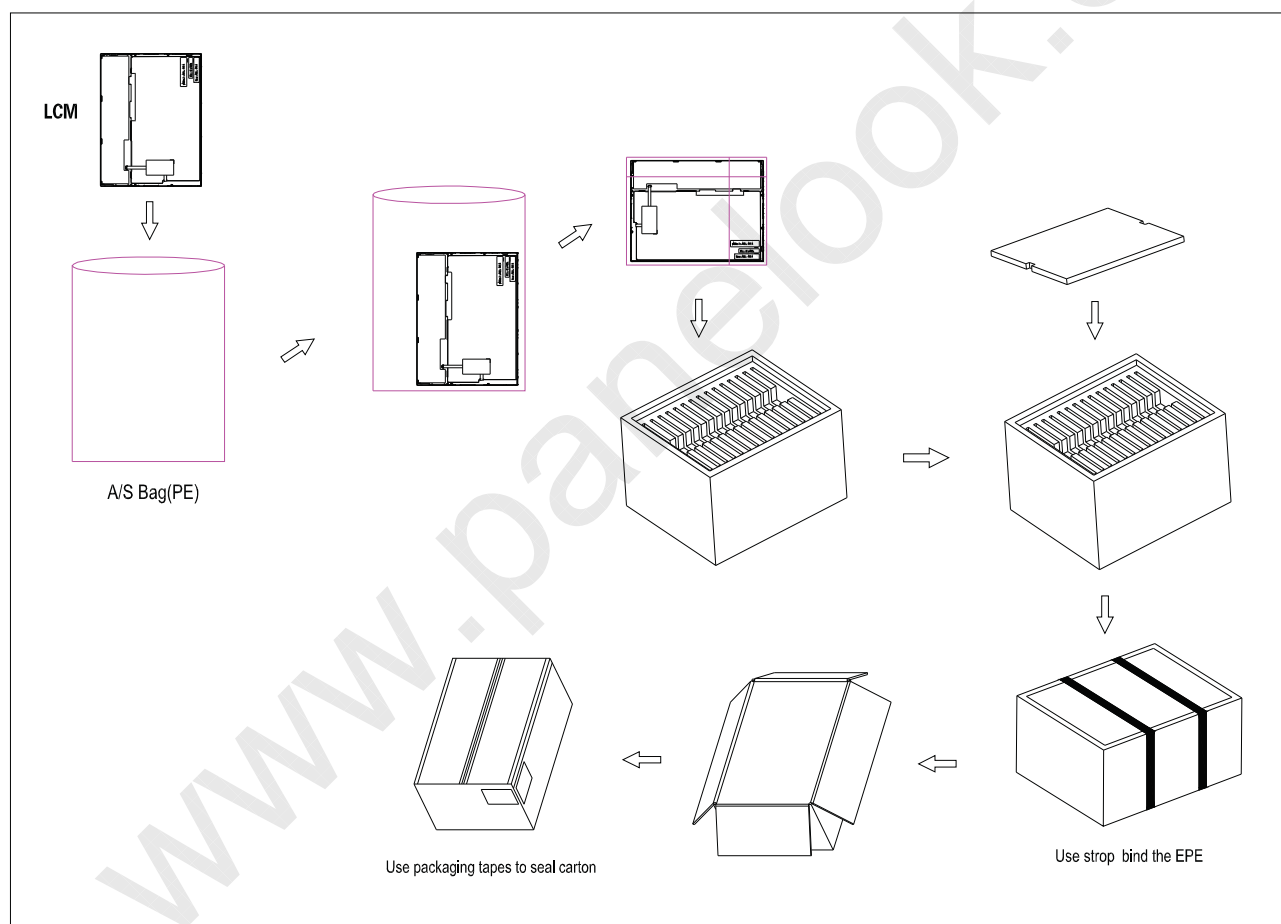


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9 Packing drawing

No.	Item	Model (Material)	Dimensions(mm)	Unit Weight(Kg)	Quantity	Remark
1	LCM module	TM150XDHG01	318.7(W)x242.65(H)x6.5(D)	0.63	15	
2	Partition_1	EPE(Bottom)	510x425x325	1.222	1	
3	Partition_2	EPE(Top)	470x375x20	0.066	1	
4	Anti-static Bag	PE	450x300	0.001	15	Anti-static
5	Carton	Corrugated Paper	520x435x330	2	1	
6	Total weight	12.753±10% kg				

Table 9: Packing specification and quantity



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10 Precautions for Use of LCD Modules

10.1 Handling Precautions

10.1.1 The display panel is made of glass. Do not subject it to a mechanical shock by dropping it from a high place, etc.

10.1.2 If the display panel is damaged and the liquid crystal substance inside it leaks out, be sure not to get any in your mouth, if the substance comes into contact with your skin or clothes, promptly wash it off using soap and water.

10.1.3 Do not apply excessive force to the display surface or the adjoining areas since this may cause the color tone to vary.

10.1.4 The polarizer covering the display surface of the LCD module is soft and easily scratched. Handle this polarizer carefully.

10.1.5 If the display surface is contaminated, breathe on the surface and gently wipe it with a soft dry cloth. If still not completely clear, moisten cloth with one of the following solvents:

- Isopropyl alcohol
- Ethyl alcohol

Solvents other than those mentioned above may damage the polarizer. Especially, do not use the following:

- Water
- Ketone
- Aromatic solvents

10.1.6 Do not attempt to disassemble the LCD Module.

10.1.7 If the logic circuit power is off, do not apply the input signals.

10.1.8 To prevent destruction of the elements by static electricity, be careful to maintain an optimum work environment.

10.1.8.1 Be sure to ground the body when handling the LCD Modules.

10.1.8.2 Tools required for assembly, such as soldering irons, must be properly ground.

10.1.8.3 To reduce the amount of static electricity generated, do not conduct assembly and other work under dry conditions.

10.1.8.4 The LCD Module is coated with a film to protect the display surface. Be care when peeling off this protective film since static electricity may be generated.

10.2 Storage precautions

10.2.1 When storing the LCD modules, avoid exposure to direct sunlight or to the light of fluorescent lamps.

10.2.2 The LCD modules should be stored under the storage temperature range. If the LCD modules will be stored for a long time, the recommend condition is 0℃ ~ 40℃, Relatively humidity: ≤80%

10.2.3 The LCD modules should be stored in the room without acid, alkali and harmful gas.

10.3 Transportation Precautions

10.3.1 The LCD modules should be no falling and violent shocking during transportation, and also should avoid excessive press, water, damp and sunshine.

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