

SPECIFICATION FOR APPROVAL

DESCRIPTION: 10.1"LCD Module _____

CUSTOMER: _____

Product No: BR101JII3650-A3 V.3 _____

Released Date: 2020.09.01 _____

Revision: .01 _____

PLEASE RETURN TO US ONE COPY OF "SPECIFICATION FOR APPROVAL" WITH YOUR APPROVED SIGNATURES.

APPROVED SIGNATURES			

Table of Contents

1. Record of Revision.....	3
2 General Specifications.....	4
3 Input/Output Terminals.....	5
4 Operation Specification.....	5
5 Timing characteristics.....	7
6 Optical Characteristics.....	10
7 Environmental / Reliability Tests.....	13
8 Mechanical Drawing.....	14
9 Packing.....	15
10 Precautions For Use of LCD modules.....	16

1. Record of Revision

Rev	Issued Date	Description	Editor
1.0	2020/09/01	First Release.	XW.Qin

2 General Specifications

Feature		Spec
Characteristics	Size	10.1 inch
	Resolution	1024(horizontal)*600(Vertical)
	Interface	RGB
	Connect type	Connector
	Color Depth	16.7M
	Technology type	a-Si
	Display Spec. Pixel pitch (mm)	0.1695*0.1695
	Pixel Configuration	R.G.B.-Vertical Stripe
	Display Mode	IPS Normally Black
	NTSC	50%
	Surface Treatment	HC
	Viewing Direction	ALL
Mechanical	LCM (W x H x D) (mm)	235(W)×143(H)×5.1(D)
	Active Area(mm)	222.72(H)x125.28(V)
	With /Without TSP	Without TSP
	Weight (g)	-
	LED Numbers	36

Note 1: Viewing direction is follow the data which measured by optics equipment.

Note 2: Requirements on Environmental Protection: RoHS

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

3 Input/Output Terminals

No.	Symbol	Description
1,2	NC	NO connection
3,4	NC	NO connection
5	GND	Ground
6	VCOM	Common voltage
7	DVDD	Power for Digital Circuit
8	MODE	DE/SYNC mode select
9	DE	Data input Enable
10	VS	Vertical sync signal
11	HS	Horizontal sync Signal
12~19	B7~B0	Data bus
20~27	G7~G0	Data bus
28~35	R7~R0	Data bus
36	GND	Power ground
37	DCOLK	Sample clock
38	GND	Power ground
39	L/R	Left/right selection
40	U/D	Up/down selection
41	VGH	Gata on voltage
42	VGL	Gata off voltage
43	AVDD	Power for analog circuit
44	RESET	Global reset pin
45	NC	NO connection
46	VCOM	Common Voltage
47	DITHB	Dither function
48	GND	Power ground
49~50	NC	NO connection

1:input,0:output ,P:Power

Note 1:DE/SYNC mode select.Normally pull high

When select DE mode ,MODE="1",VS and HS must high

When select SYNC mode ,MODE="0",DE must be grounded

Note 2: when input 18 bit PGB data ,the two low bit of R,G and B and must be grounded

Note 3: Data shall be latched at the falling edge of DCLK

Setting of scan control input		Scanning direction
U/D	L/R	
GND	VDD	Up to down, left to right
VDD	GND	Down to up, right to left
GND	GND	Up to down, right to left
VDD	VDD	Down to up, left to right

4 Operation Specification

Item	Symbol	Min.	Max.	Unit	Remark
Power Supply Voltage	VDD	-0.3	3.6	V	
	AVDD	-0.3	15	V	
	VGH	-0.3	30	V	
	VGL	-15	0.3	V	
Storage temperature	Tstg	-30	+80	°C	
Operating Temperature	Topr	-20	+70	°C	

Note:

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

4.2 TFT LCD MODULE

Item	Symbol	Value			Units	Remark
		Min	Typ	Max		
Power supply voltage	VDD	3.0	3.3	3.6	V	
	AVDD	12	12.2	12.4	V	
	VGH	20	22	24	V	
	VGL	-11	-10	-9	V	
Input signal voltage	VCOM	4.39	5.39	6.39	V	
Logic high level input voltage	VIH	0.7xVDD	-	VDD	V	
Logic low level input voltage	VIL	VSS	-	0.3xVDD	V	

Note:

*1. VGH is TFT Gate operating Voltage.

*2. VGL is TFT Gate operating Voltage.

The storage structure of this model is C_{ST} (Storage on Common)

*3. Vcom must be adjusted to optimize display quality Crosstalk, Contrast Ratio and etc.

5 Timing characteristics

5.3 Timing Characteristics

DE mode

DE mode					
Parameter	Symbol	Value			Unit
		Min.	Typ.	Max.	
DCLK frequency @Frame rate=60hz	fclk	40.8	51.2	67.2	Mhz
Horizontal display area	thd	1024			DCLK
HSYNC period time	th	1164	1344	1400	DCLK
HSYNC blanking	thb+thfp	140	320	376	DCLK
Vertical display area	tvd	600			H
VSYNC period time	tv	610	635	800	H
VSYNC blanking	tvb+tvfp	10	35	200	H

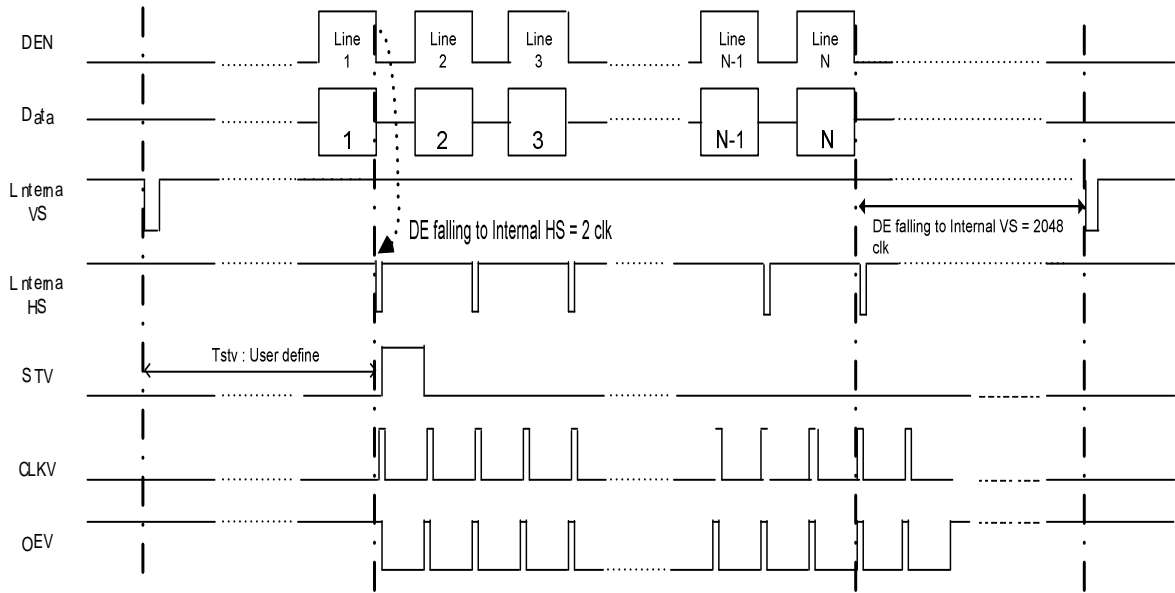
HV mode(1)

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

HV mode(2)

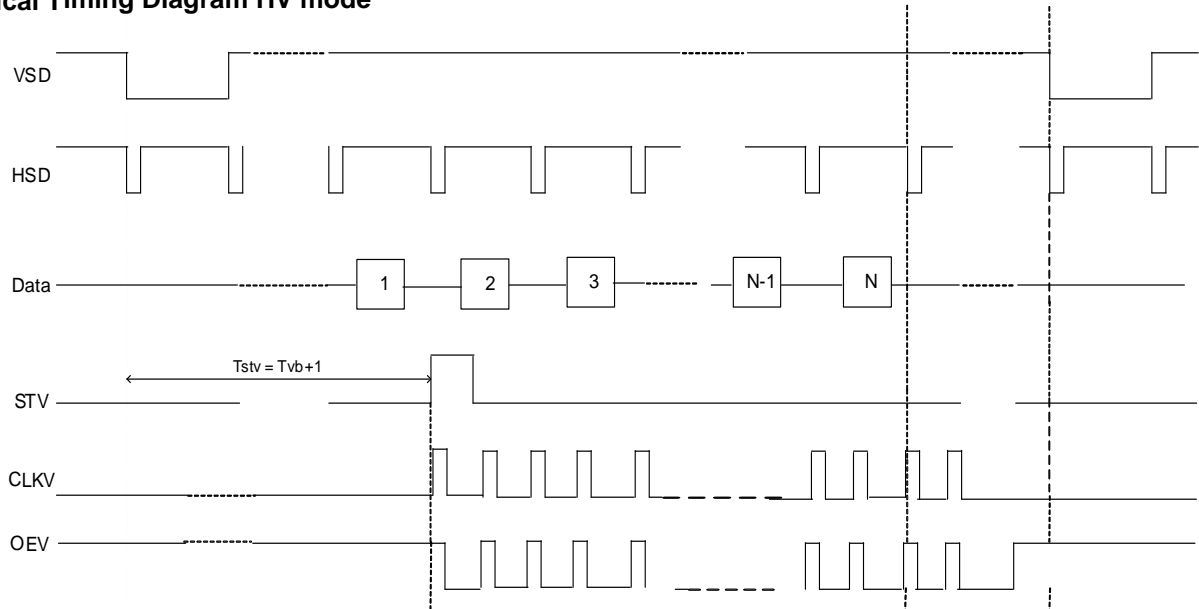
Vertical input timing					
Parameter	Symbol	Value			Unit
		Min.	Typ.	Max.	
Vertical display area	tvd	600			H
VSYNC period time	tv	624	635	750	H
VSYNC pulse width	tvpw	1	—	20	H
VSYNC back porch	tvb	23	23	23	H
VSYNC front porch	tvfp	1	12	127	H

Vertical Timing Diagram DE mode



Vertical Timing Diagram DE mode

Vertical Timing Diagram HV mode



Vertical Timing Diagram HV mode

5.4 Driving Backlight

Item	Symbol	MIN	TYP	MAX	Unit	Remark
Forward Current	I_F	240	300	360	mA	
Forward Voltage	V_F	8.4	9.0	9.6	V	
Backlight Power consumption	W_{BL}	25000	-	-	H	

Note 1: Each LED : $I_F = 25 \text{ mA}$, $V_F = 3.0 \text{ V}$.

Note 2: Optical performance should be evaluated at $T_a = 25^\circ \text{C}$ only.

Note 3: If LED is driven by high current, high ambient temperature & humidity condition. The life time of LED will be reduced. Operating life means brightness goes down to 50% initial brightness. Typical operating life time is estimated data.

6 Optical Characteristics

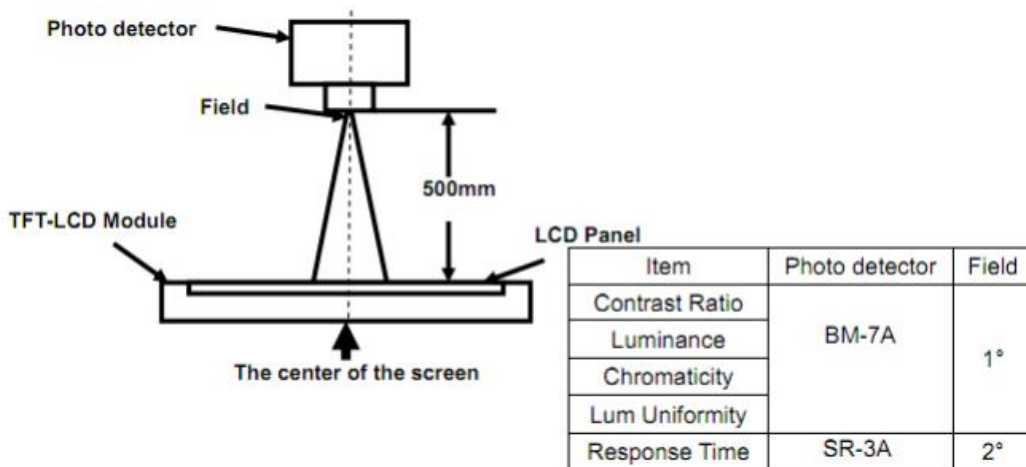
Items		Symbol	Condition	Min.	Typ.	Max.	Unit	Remark
Viewing angles		θ_T	Center CR \geq 10	75	80	-	Degree.	Note2
		θ_B		75	80	-		
		θ_L		75	80	-		
		θ_R		75	80	-		
Contrast Ratio		CR	$\Theta = 0$		800	-	-	Note1, Note3
Response Time		$T_{ON+T_{off}}$	25°C	-	25	35	ms	Note1, Note4
Chromaticity	Red	R_X	$\Theta = 0$ Normal viewing angle	0.510	0.560	0.610	-	
		R_Y		0.295	0.345	0.395	-	
	Green	G_X		0.273	0.323	0.373		
		G_Y		0.549	0.599	0.649		
	Blue	B_X		0.102	0.152	0.202		
		B_Y		0.066	0.116	0.166		
	White	W_X		0.260	0.310	0.360		
		W_Y		0.280	0.330	0.380		
Uniformity		U		70	75	-	%	Note1, Note6
Luminance		L		270	300			Note1, Note7

Test Conditions:

1. IF= 25mA(one channel),the ambient temperature is 25°C
2. The test systems refer to Note 1 and Note 2.

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.



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).

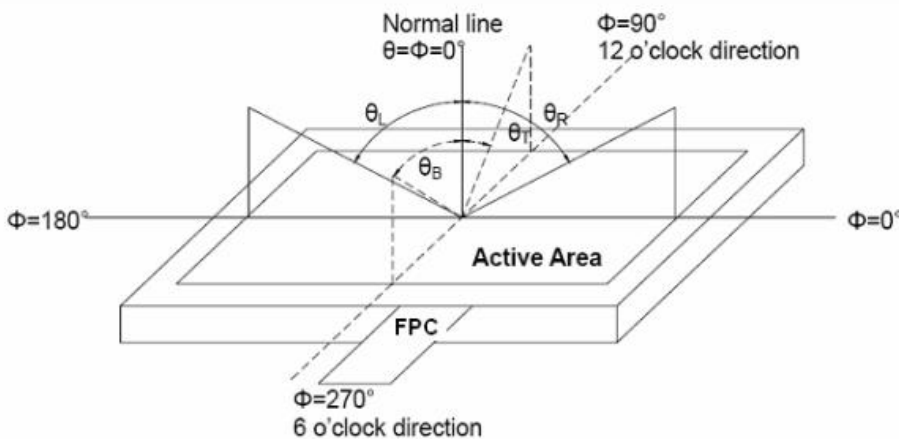
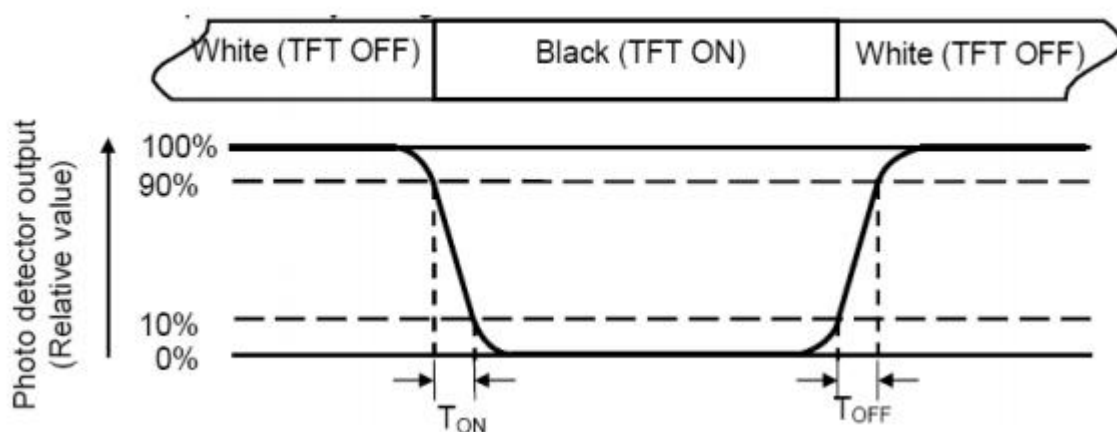


Fig. 1 Definition of viewing angle

Note 3: Definition of contrast ratio

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 (TON) is the time between photo detector output intensity changed from 90% to 10%. And fall time (TOFF) 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.

$$\text{Luminance Uniformity}(U) = L_{\min} / L_{\max} \times 100\%$$

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

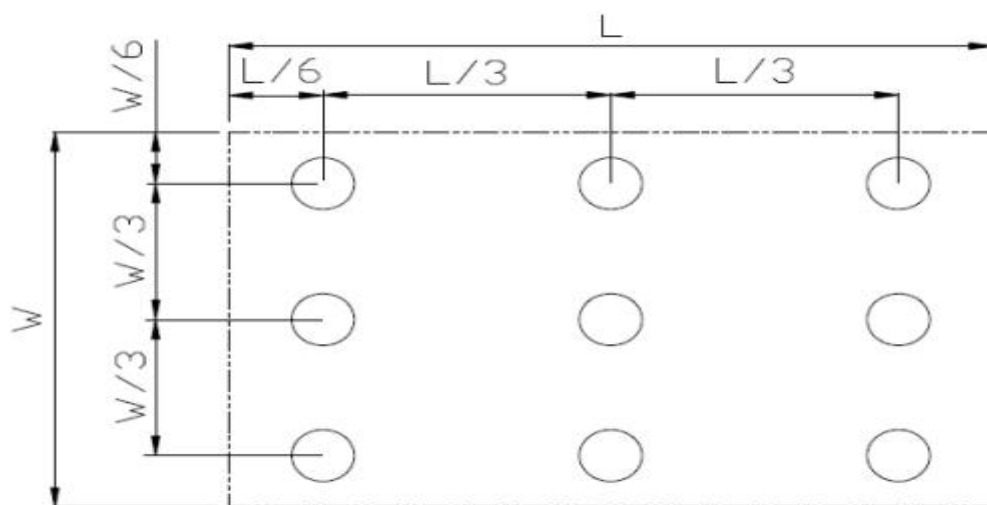


Fig. 2 Definition of uniformity

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 :

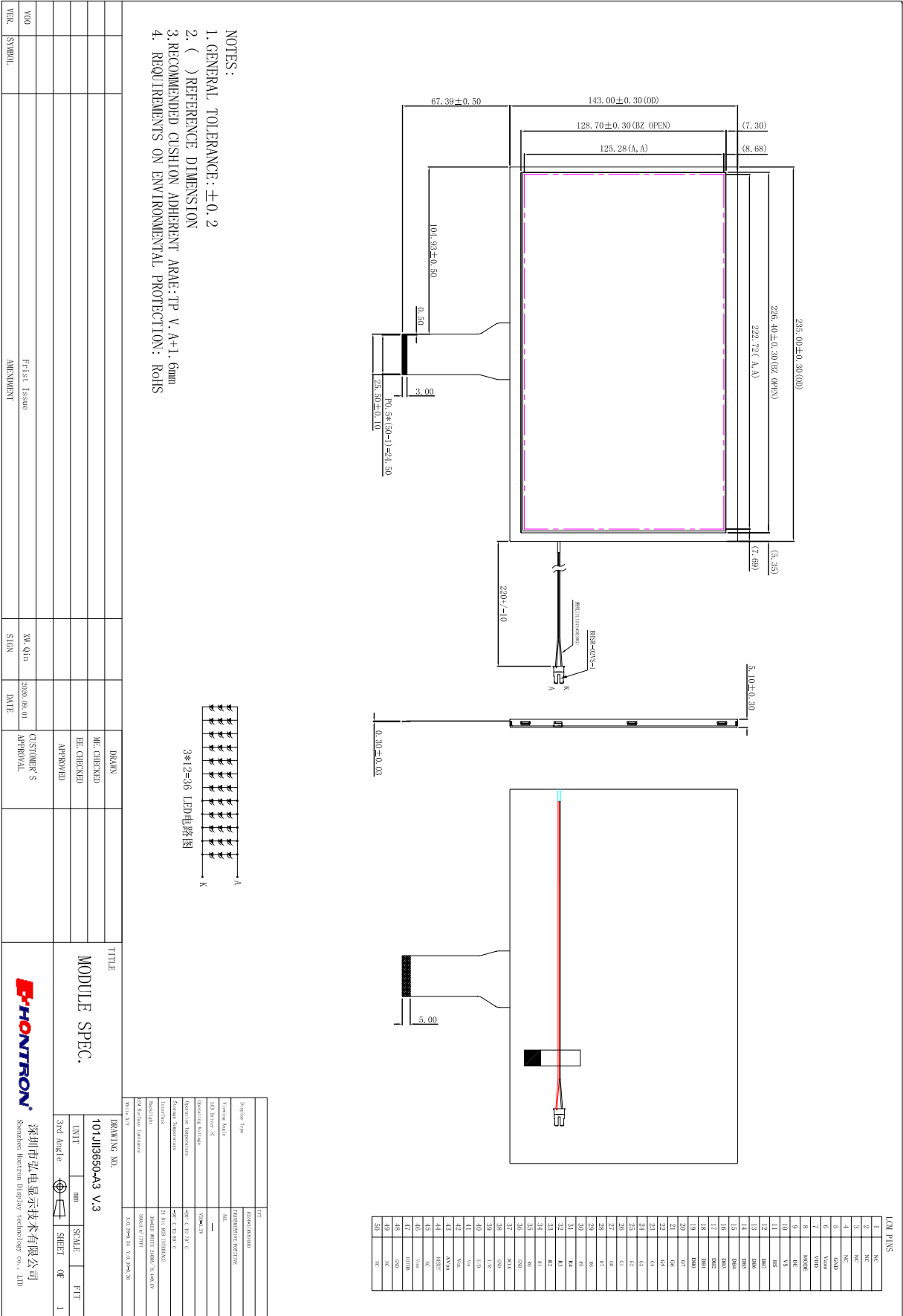
Measure the luminance of white state at center point.

7 Environmental / Reliability Tests

No	Test Item	Condition	Remarks
1	High Temperature Opeartion	Ts= +70°C, 96hrs	Note 1 IEC60068-2-2, GB2423. 2-89
2	Low Temperature Opeartion	Ta= -20°C, 96hrs	Note 2 IEC60068-2-1 GB2423.1-89
3	High Temperature Storage	Ta= +80°C, 96hrs	IEC60068-2-2 GB2423. 2-89
4	Low Temperature Storage	Ta= -30°C, 96hrs	IEC60068-2-1 GB/T2423.1-89
5	High Temperature & Humidity Storage	Ta= +60°C, 90% RH max, 96 hours	IEC60068-2-3 GB/T2423.3-2006
6	Thermal Shock (Non-operation)	-20°C 30 min ~ +60°C 30 min Change time: 5min, 30 Cycle	Start with cold temperature,end with high temperature IEC60068-2-14, GB2423.22-87
7	Electro Discharge (Opeartion) Static	C=150pF, R=330 Ω, 5 points/panel Air:±8KV, 5 times; Contact: ±4KV, 5 times; (Environment: 15°C ~ 35°C, 30% ~ 60%, 86Kpa ~ 106Kpa)	IEC61000-4-2 GB/T17626.2-1998
8	Vibration (Non-operation)	Frequency range: 10~55Hz, Stroke: 1.mm Sweep: 10Hz~55Hz~10Hz 2 hours for each direction of X .Y. Z. (package condition)	IEC60068-2-6 GB/T2423.5-1995
9	Shock (Non-operation)	60G 6ms, ± X, ±Y , ± Z 3 times for each direction	IEC60068-2-27 GB/T2423.5-1995
10	Package Drop Test	Height: 80 cm, 1 corner, 3 edges, 6 surfaces	IEC60068-2-32 GB/T2423.8-1995

Note: 1. T_S is the temperature of panel's surface.
 2. T_a is the ambient temperature of sample.

8 Mechanical Drawing

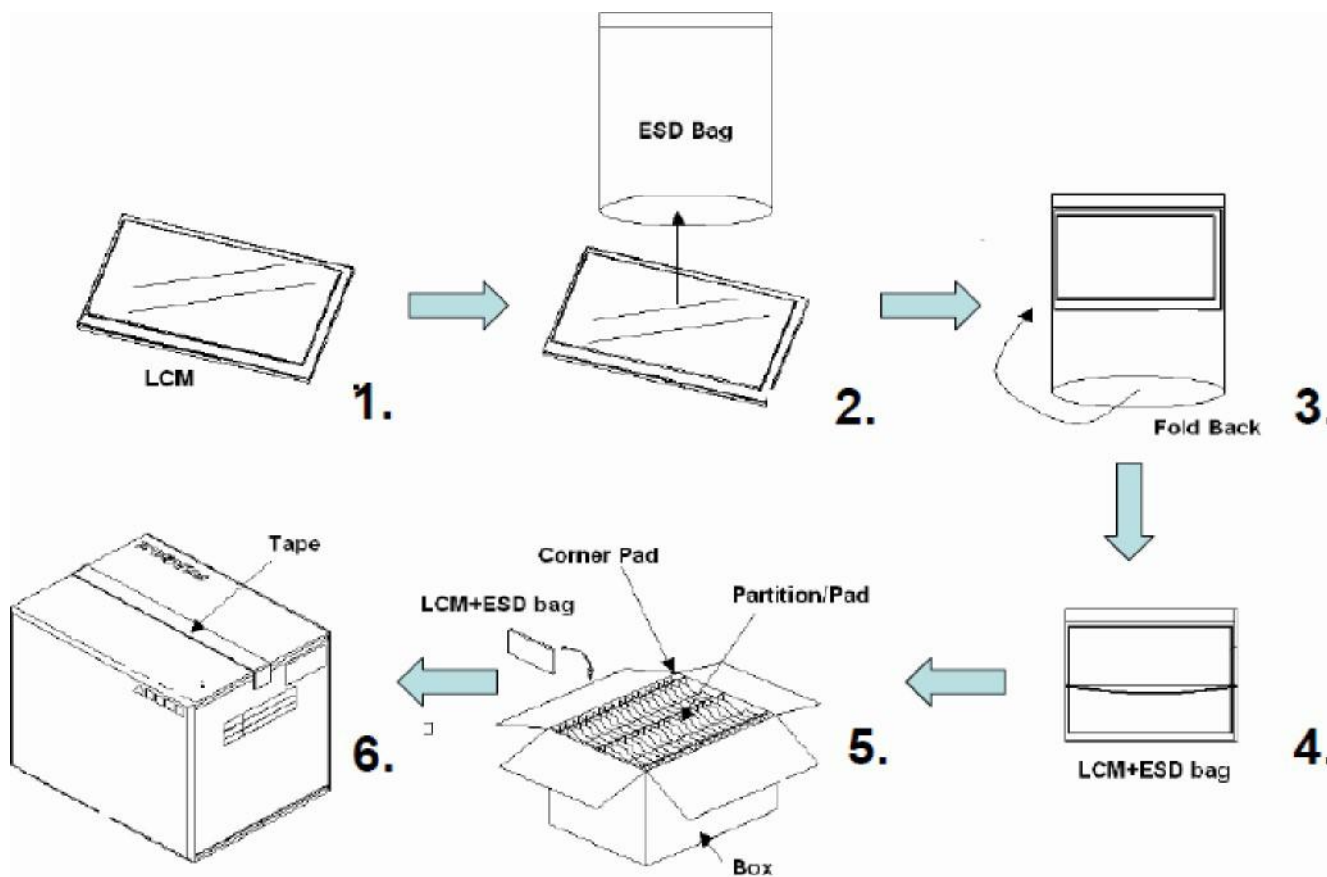


9.0 PACKAGE SPECIFICATION

9.1 Packing form

LCM Model	LCM Qty. in the box	Inner Box Size (mm)	Note
101JII3650-A3 V.3	40 pcs/box	490±5 x 340±5 x 250±5	

9.2 Packing assembly drawings



Items	Material	Notice
Box	Corrugated Paper Board	AB Flute
Partition/Pad	Corrugated Paper Board	B Flute
Corner Pad	Corrugated Paper Board	AB Flute
ESD bag	PE	

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:

Temperature : 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

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