MODEL NO. : GBE101WX02J

ISSUED DATE: 2017-06-14

VERSION: 1.0

Table of Contents

1. Record of Revision

Rev	Issued Date	Description	
1.0	2017/06/14	First Release.	

2 General Specifications

Feature		Spec
Characteristics	Size	10.1 inch
	Resolution	1280(horizontal)*800(Vertical)
	Interface	LVDS
	Connect type	Connector
	Color Depth	16.7M
	Technology type	a-Si
	Display Spec. Pixel pitch (mm)	-
	Pixel Configuration	R.G.B.-Vertical Stripe
	Display Mode	Normally Black
	Driver IC	TBD
	Surface Treatment	HC
	Viewing Direction	ALL
Mechanical	LCM (W x H x D) (mm)	229.46*149.3*2.5
	Active Area(mm)	216.96X135.6
	With /Without TSP	Without TSP
	Weight (g)	TBD
	LED Numbers	45LEDs (3*15)

Note 1: Viewing direction is following the data which measured by optics equipment.
Note 2: Requirements on Environmental Protection: RoHS
Note 3: LCM weight tolerance: +/- 5%

3 Pin definition

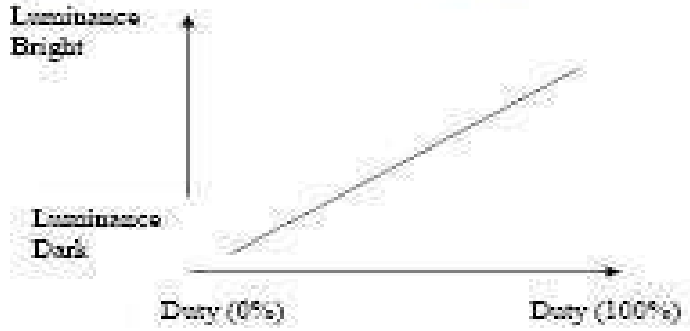
No.	Symbol	Description	Remark
1	Vcom	**Common Voltage**	
2,3	VDD	**Power Supply**	
4	NC	**No connection**	
5	NC	**Receive for BIST**	**BIST function enable**
6	NC	**No connection**	
7	GND	**Ground**	
8	Rxin0-	**-LVDS Differential Data Input**	**R0~R5, G0**
9	Rxin0+	**+LVDS Differential Data Input**	
10	GND	**Ground**	
11	Rxin1-	**-LVDS Differential Data Input**	**G1~G5, B0, B1**
12	Rxin1+	**+LVDS Differential Data Input**	
13	GND	**Ground**	
14	Rxin2-	**-LVDS Differential Data Input**	**B2~B5, HS, VS, DE**
15	Rxin2+	**+LVDS Differential Data Input**	
16	GND	**Ground**	
17	RxCLK-	**-LVDS Differential Clock Input**	
18	RxCLK+	**+LVDS Differential Clock Input**	
19	GND	**Ground**	
20	Rxin3-	**-LVDS Differential Data Input**	**R6, R7, G6, G7, B6, B7**
21	Rxin3+	**+LVDS Differential Data Input**	
22	GND	**Ground**	
23, 24	NC	**No connection**	
25	GND	**Ground**	
26~28	NC	**No connection**	
29	AVDD	**Analog Power Supply**	
30	GND	**Ground**	
31, 32	LED-	**LED Cathode**	
33, 34	NC	**No connection**	
35	VGL	**TFT Gate Off Voltage**	
36, 37	NC	**No connection**	
38	VGH	**TFT Gate On Voltage**	
39, 40	LED+	**LED Anode**	

I: Input, O: output, P: Power

Note1: The setting of CABC function are as follows.

Pin	Enable	Disable
CABC_EN	High Voltage	Low Voltage or open

Note2: LED_PWM is used to adjust backlight brightness.



4 Absolute Maximum Ratings

Item	Symbol	Min.	Max.	Unit	Conditions
Digital Supply Voltage	DVDD	-0.5	5	V	Ta=25℃
Supply VLED Voltage	AVDD	-0.5	15	V	
Gate On Voltage	VGH	-0.3	40	V	
Gate Off Voltage	VGL	-20	0.3	V	
Gate On-Gate Off Voltage	VGH-VGL	12	40	V	

5 Electrical Characteristics

5.1 Operating Conditions

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Digital Power Supply Voltage	VDD	3.0	3.3	3.6	V	
Digital Power Supply Voltage	VDDA	8.0	8.2	8.4	V	
Gate On Power Supply Voltage	VGH	18	19	20	V	
Gate Off Power Supply Voltage	VGL	-9	-8	-7	V	
Common Power Supply Voltage	VCOM	3.0	3.2	3.4	V	
Item	Symbol	Min	Typ	Max	Unit	condition
Gate on power current	IVGH		0.6		mA	VGH =19
Gate off power current	IVGL		0.4		mA	VGL=-8
Digital power current	IVCC		18		mA	VCC =3.2
Analog power current	IAVDD		34		mA	AVDD =8.2

5.2 BACKLIGHT CHARACTERISTICS

Item	Symbol	MIN	TYP	MAX	Unit	Remark
LED current	I_F	-	300		mA	
Power Consumption					mW	
LED Voltage	V_F	-	9.6		V	Note 1
LED Life Time	W_{BL}	30000	-	-	Hr	Note 2,3

5.3 LVDS Receiver

5.1 Signal Electrical Characteristics for LVDS Receiver

The built-in LVDS receiver is compatible with (ANSI/TIA/TIA-644) standard.

Table 6 LVDS Receiver Electrical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
LVDS Input High Threshold	Vth	-	-	+100	mV	Vcmlvds=1.2V
LVDS Input Low Threshold	Vtl	-100	-	-	mV	Vcmlvds=1.2V
Magnitude Differential Input Voltage	|Vid|	100	-	600	mV	
Common Mode Voltage	Vcm	1.0	1.2	1.4	V	
Common Mode Voltage Offset	ΔVcm	-	-	50	mV	

Note:

A. Input signals shall be low or Hi-Z state when VDD is

B. All electrical characteristics for LVDS signal are defined the interface connector of LCD.

Note: All values are at VDD=3.3V, Ta=25 degree C.

Figure 7 Voltage Definitions

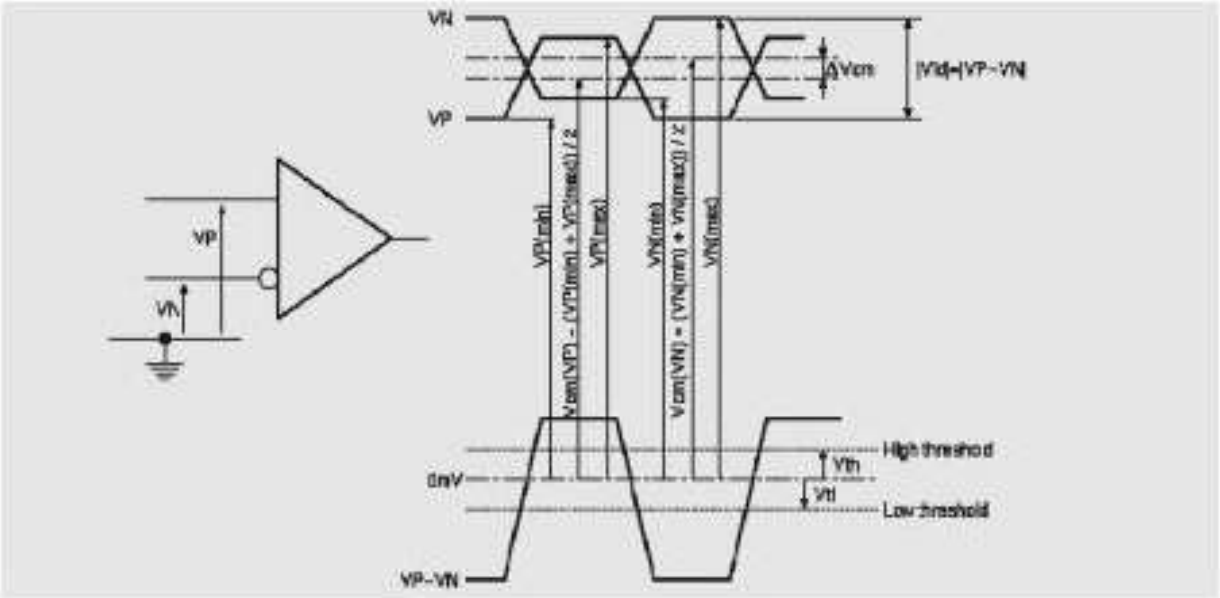


Figure 8 Measurement System

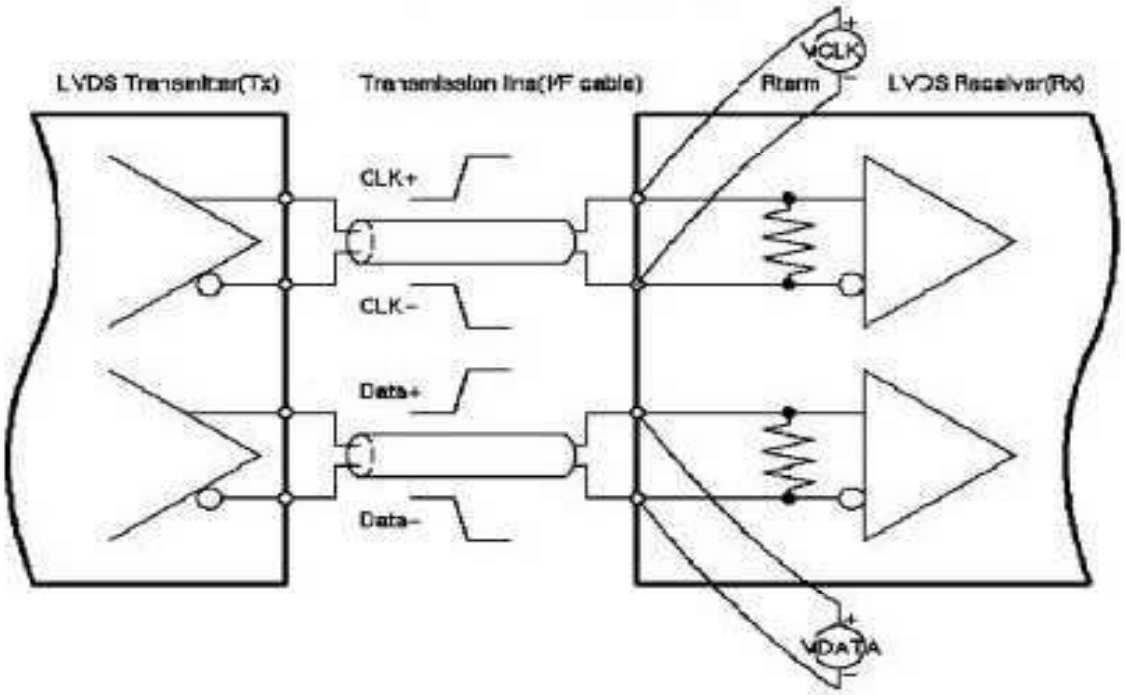
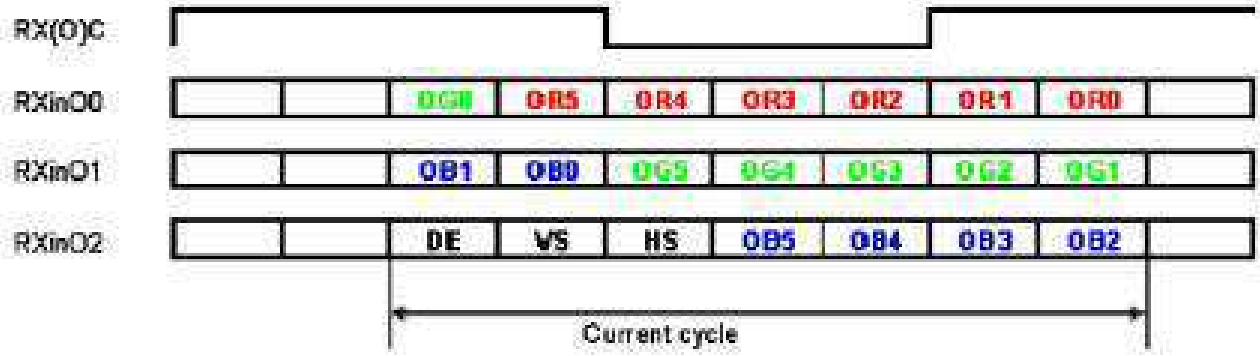


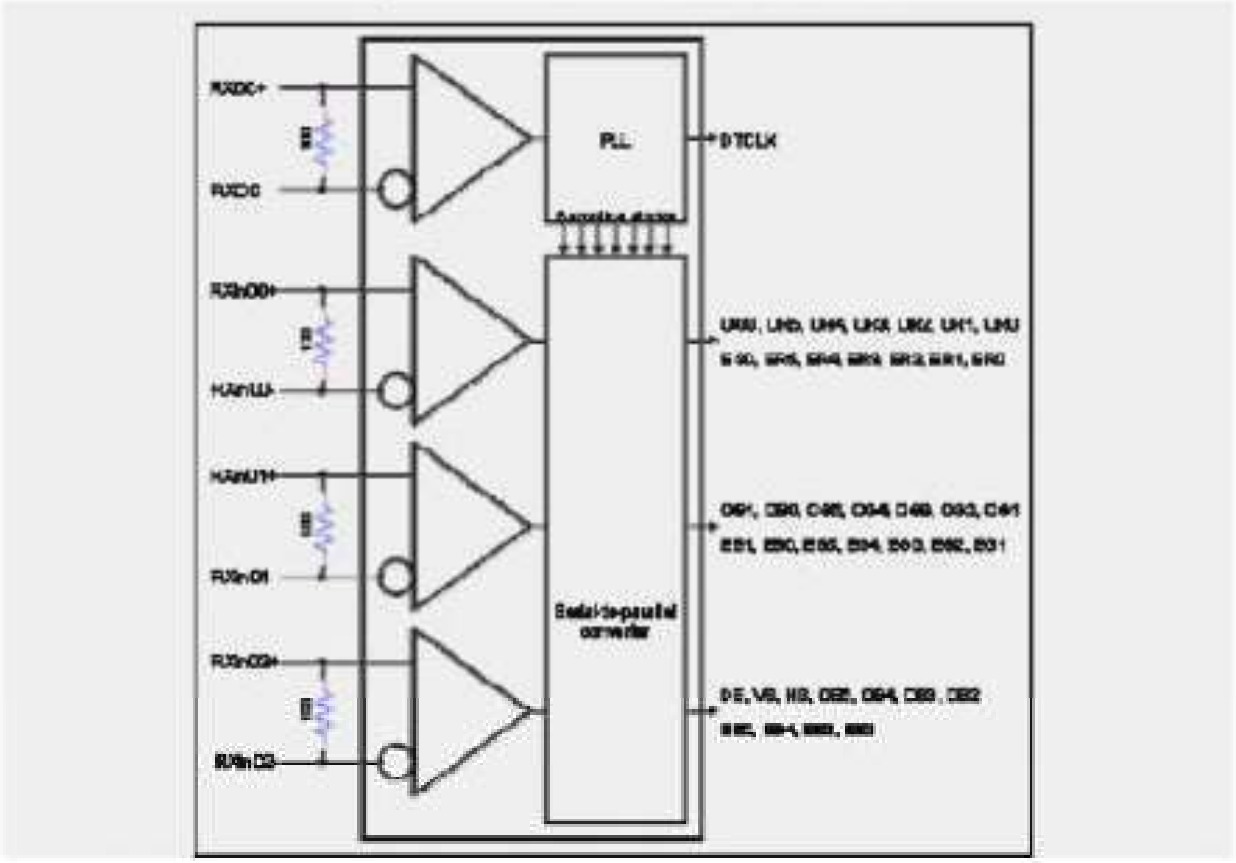
Figure 9 Data mapping



5.2 LVDS Receiver Internal Circuit

Figure 10 LVDS Receiver Internal Circuit shows the internal block diagram of the LVDS receiver. This LCD module equips termination resistors for LVDS link.

Figure 10 LVDS Receiver Internal Circuit



5.4. Interface Timings

Timing Characteristics

Signal	Item	Symbol	Min	Type	Max	Unit
DCLK	Frequency	1/TC	60	65	70	MHz
	Cycle	Tc	16.66	15.38	14.3	ns
DE	Horizontal Period	THd	1280	1280	1280	Tc
	Horizontal Cycle	TH	1310	1330	1560	Tc
		TH_time	19.5	20.46	21.83	ns
	Vertical Period	TVd	800	800	800	Tc
	Vertical Cycle	TV	-	812	-	Tc

Figure 11 Timing Characteristics

36	Detailed timing/monitor descriptor #1	64	100		65.00	65MHz Main clock
37		19	25			
38		00	0		1280	Hor Active = 1280
39		32	50		50	Hor Blanking = 50
3A		50	80		-	4 bits of Hor. Active + 4 bits of Hor. Blanking
3B		20	32		800	Ver Active = 768
3C		0C	12		12	Ver Blanking = 12
3D		30	48		-	4 bits of Ver. Active + 4 bits of Ver. Blanking
3E		0A	10		10	Hor Sync Offset = 10
3F		20	32		32	H Sync Pulse Width = 32
40		36	54		3	V sync Offset = 3 line
41		00	0		6	V Sync Pulse width : 6 line
42		D9	217		217	Horizontal Image Size = 217 mm (Low 8 bits)
43		88	136		136	Vertical Image Size = 136 mm (Low 8 bits)
44		00	0		-	4 bits of Hor Image Size + 4 bits of Ver Image Size
45		00	0		0	Hor Border (pixels)
46		00	0		0	Vertical Border (Lines)
47		19	25			Refer to right table

Note: TES is data enable signal setup time.

5.5 Power Consumption

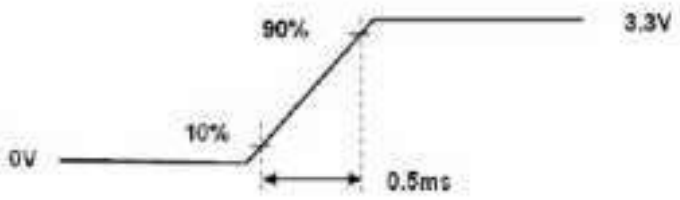
Input power specifications are as follows.

Table 8 Power Consumption

Symbol	Parameter	Min.	Typ.	Max.	Units	Condition
VDD	Logic/LCD Drive Voltage	3.0	3.3	3.6	V	
IDD	VDD Current	--	160	250	mA	All black pattern, 60Hz
PDD	VDD Power	--	0.50	--	W	
Irush	Rush Current	--	--	TBD	A	Note1
VDDrp	Allowable Logic/LCD Drive Ripple Voltage	--	--	300	[mVp-p]	

Note: 1.Measure Condition

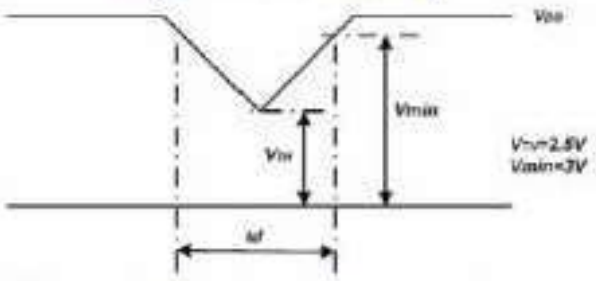
Figure 12 VDD rising time



VDD rising time

2.VDD Power Dip Condition

Figure 13 VDD Power Dip



If VTH＜VDD≤Vmin，then td≤10ms，when the voltage return to normal our panel must revive automatically.

5.6 Power ON/OFF Sequence

VDD power, interface signals, and lamp on/off sequence are shown in Figure 12.Signals shall be Hi-Z state or low level when VDD is off.

Figure 12 Power Sequence

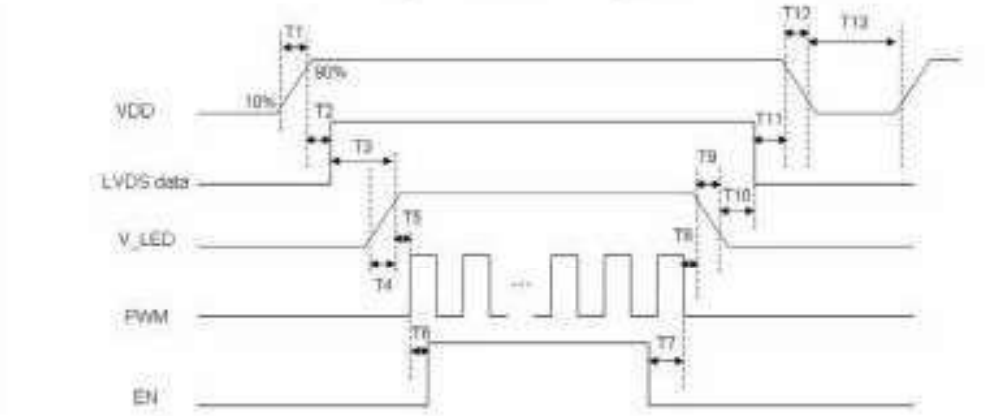


Table 9 Power Sequencing Requirements

Parameter	Symbol	Unit	min	typ	max
VDD Rise Time	T1	ms	0.5	--	10
VDD Good to Signal Valid	T2	ms	30		90
Signal Valid to Backlight On	T3	ms	200	--	--
Backlight Power On Time	T4	ms	0.5	--	--
Backlight VDD Good to System PWM On	T5	ms	10	--	--
System PWM ON to Backlight Enable ON(If Have)	T6	ms	10	--	--
Backlight Enable Off to System PWM Off(If Have)	T7	ms	0	--	--
System PWM Off to B/L Power Disable	T8	ms	10	--	--
Backlight Power Off Time	T9	ms	--	10	30
Backlight Off to Signal Disable	T10	ms	200	--	--
Signal Disable to Power Down	T11	ms	0	--	50
VDD Fall Time	T12	ms	--	10	30
Power Off	T13	ms	500	--	--

6 Optical Characteristics

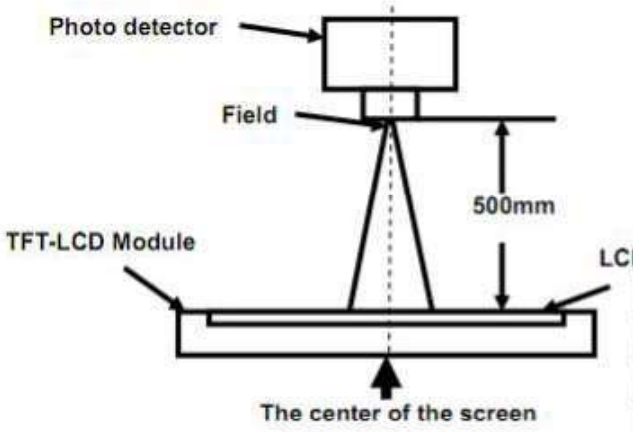
Items		Symbol	Condition	Min.	Typ.	Max.	Unit	Remark
Viewing angles		θ_T	Center CR≥10		80	-	Degree.	Note2
		θ_B			80	-		
		θ_L			80	-		
		θ_R			80	-		
Contrast Ratio		CR	Θ =0	-	600	-	-	Note1, Note3
Response Time		T_{ON}	25°C	-	6	8	ms	Note1, Note4
		T_{OFF}		-	20	28		
Chromaticity	White	X_W		-	-	-	-	Note1, Note5
		Y_W		-	-	-	-	
Uniformity		U		-	75	-	%	Note1, Note6
Luminance		L		700	800		nits	Note1, Note7

Test Conditions:

1. IF= 20mA (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.



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

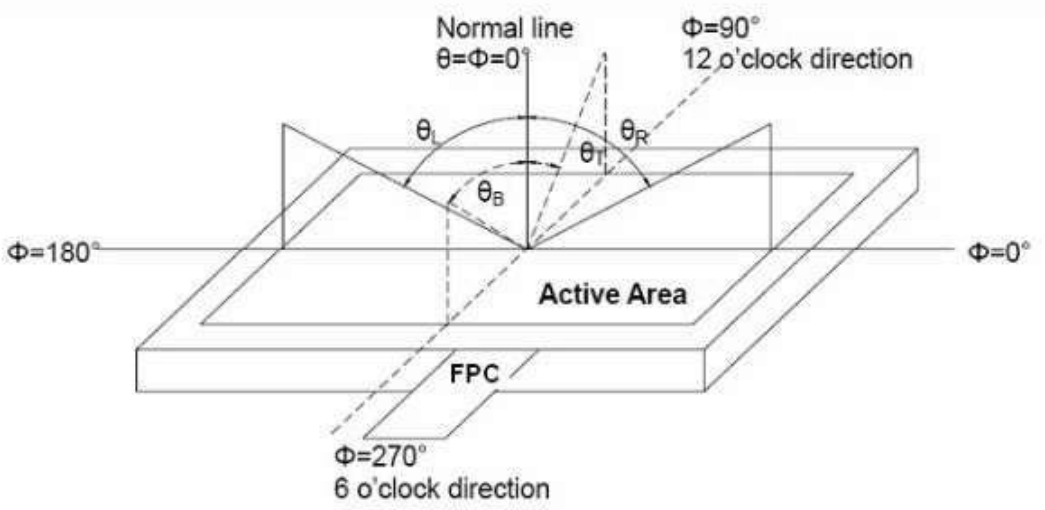
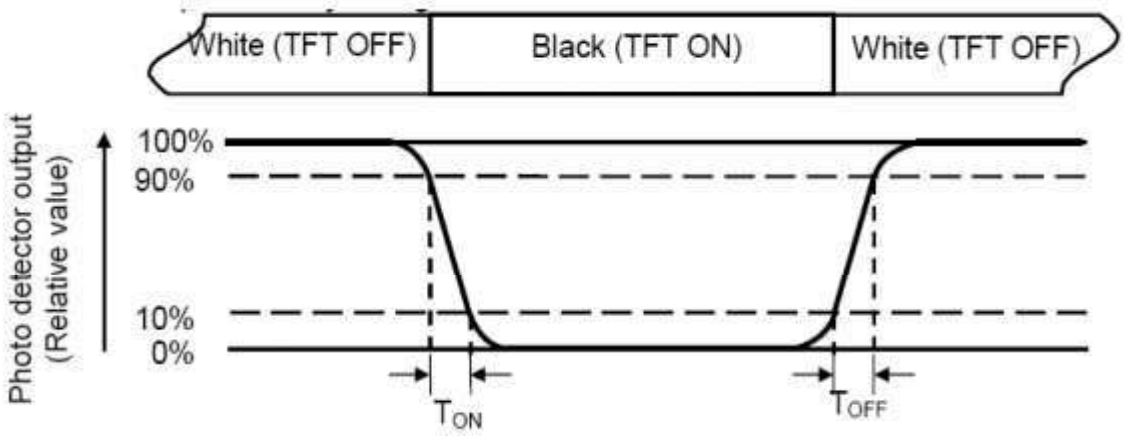


Fig. 1 Definition of viewing angle

Note 3: Definition of contrast ratio

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

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.
Luminance Uniformity (U) = Lmin/ Lmax X100%
L-------Active area length W----- Active area width

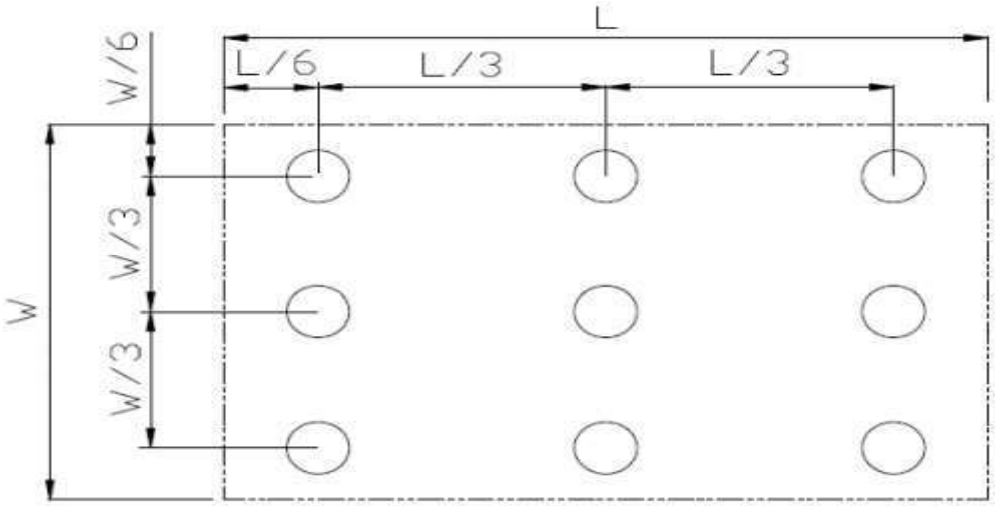


Fig. 2 Definition of uniformity
Lmax: The measured maximum luminance of all measurement position.
Lmin: The measured minimum luminance of all measurement position.

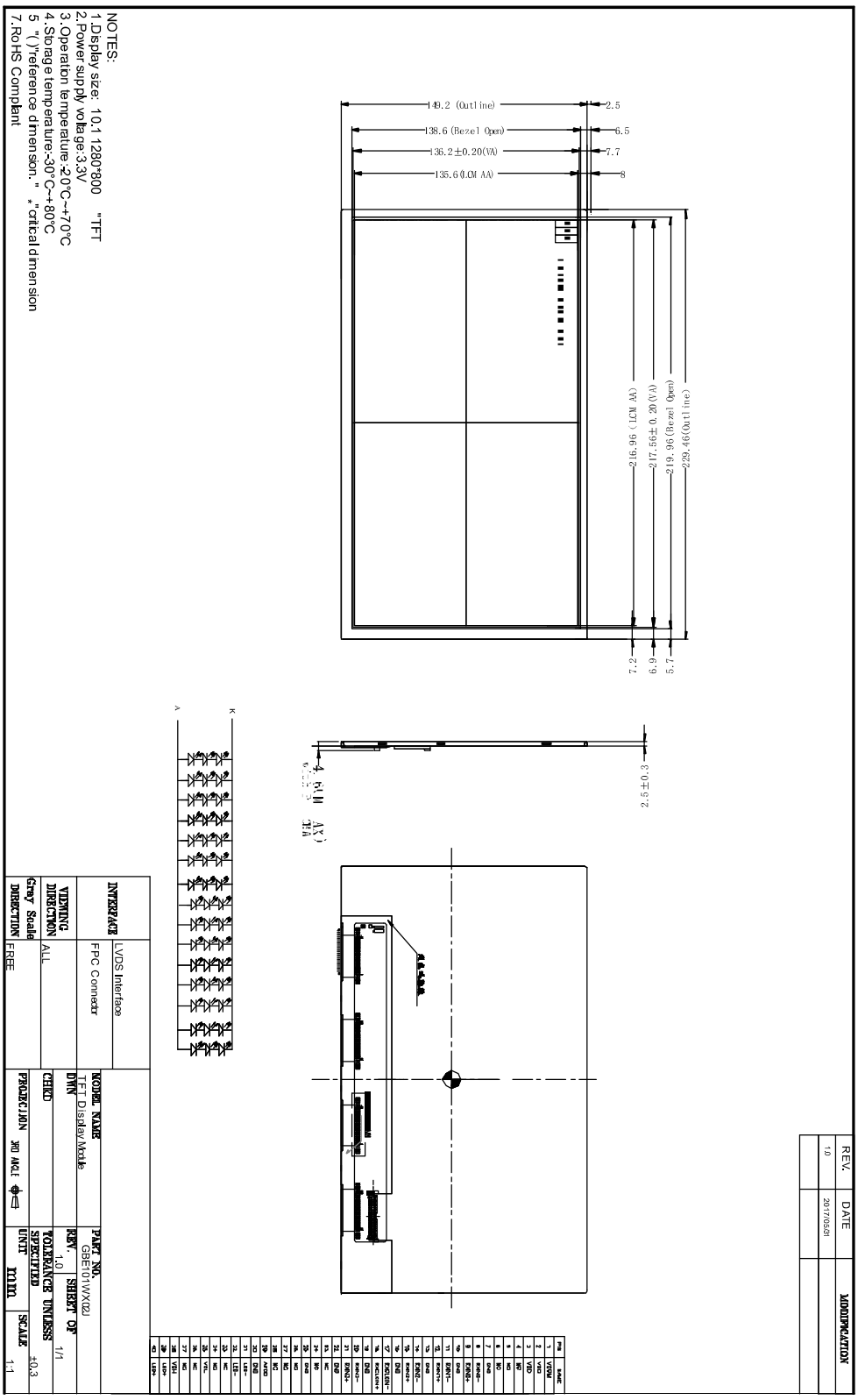
Note 7: Definition of Luminance:
Measure the luminance of white state at center point.

7 Environmental / Reliability Tests

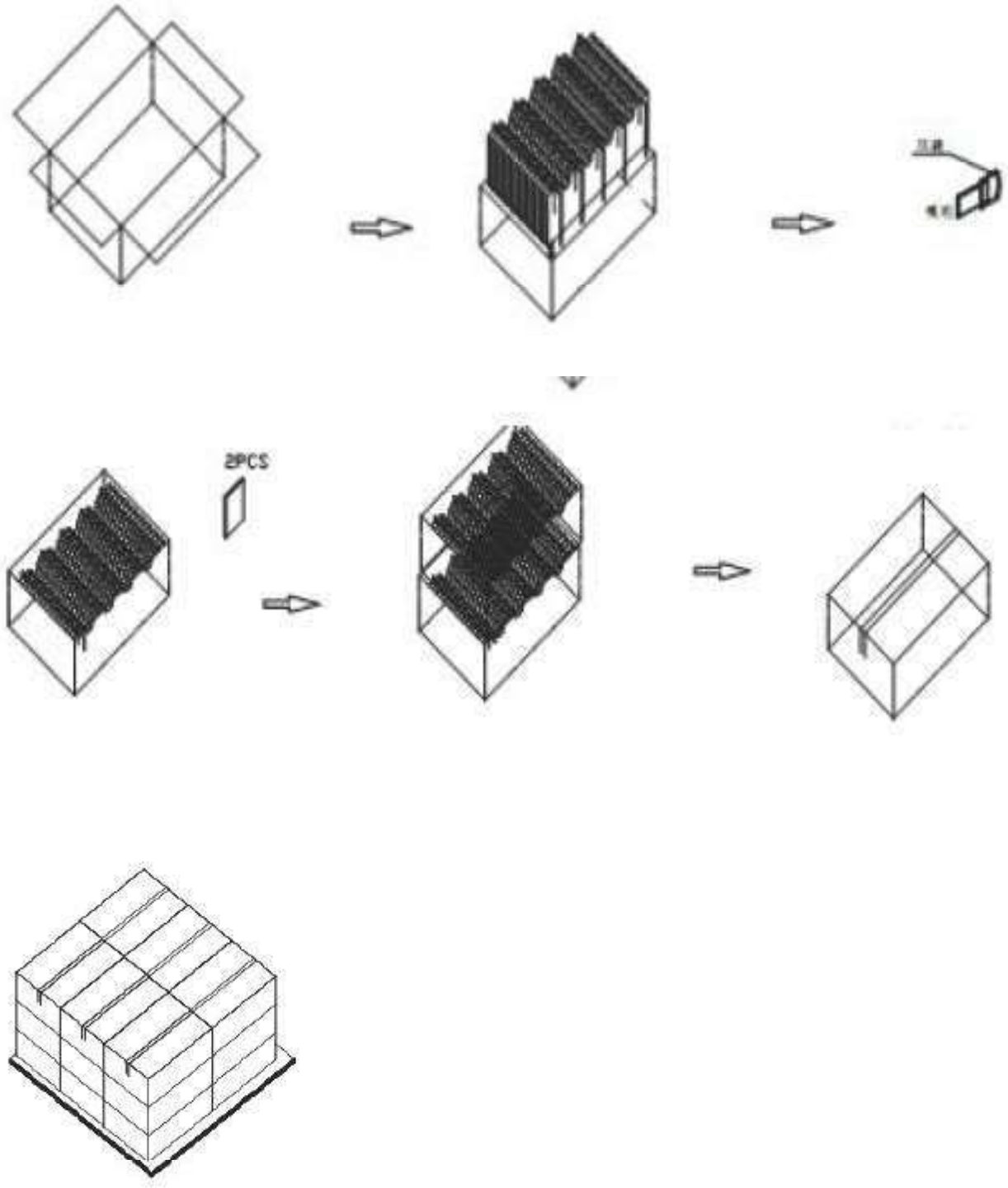
No	Test Item	Condition	Remarks
1	High Temperature Operation	Ts= +70℃, 240hrs	Note 1 IEC60068-2-2, GB2423. 2-89
2	Low Temperature Operation	Ta= -20℃, 240hrs	Note 2 IEC60068-2-1 GB2423.1-89
3	High Temperature Storage	Ta= +80℃, 240hrs	IEC60068-2-2 GB2423. 2-89
4	Low Temperature Storage	Ta= -30℃, 240hrs	IEC60068-2-1 GB/T2423.1-89
5	High Temperature & Humidity Storage	Ta= +60℃, 90% RH max, 160 hours	IEC60068-2-3 GB/T2423.3-2006
6	Thermal Shock (Non-operation)	-30℃ 30 min ~ +80℃ 30 min Change time: 5min, 30 Cycle	Start with cold temperature, end with high temperature IEC60068-2-14, GB2423.22-87
7	Electro Static Discharge (Operation)	C=150pF, R=330 Ω, 5 points/panel Air:±8KV, 5 times; Contact: ±4KV, 5 times; (Environment: 15℃ ~ 35℃, 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. Ta is the ambient temperature of sample.

8 Mechanical Drawing



9 Packing



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.