



深圳市思迪科科技有限公司

SHENZHEN CDTECH ELECTRONICS

Product Specification

Model Name	S070SWV35HG
Description	Standard LCD Module 7.0" WVGA 800(RGB)x480 Dots
Date	2020/12/08
Version	1.0

Approved by/Date	Check by/Date	Prepared by/Date
ZHP 2020/12/08	HZX 2020/12/08	ZWF 2020/12/08

Customer Approval	
Date	



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1. Record of Revision

Rev	Issued Date	Description	Editor
1.0	2020/12/08	First Release.	ZWF

2. General Specifications

	Feature	Spec
Characteristics	Size	7 inch
	Resolution	800(horizontal)*480(Vertical)
	Interface	LVDS
	Connect type	Connector
	Display Colors	16.7M
	Technology type	a-Si
	Pixel pitch (mm)	0.1926*0.1790
	Pixel Configuration	R.G.B.-Stripe
	Display Mode	Normally White
	LCD Driver IC	TBD
	Viewing Direction	12 O'clock
	Gray Inversion Direction	6 O'clock
Mechanical	LCM (W x H x D) (mm)	164.9*100.0*5.7
	Active Area(mm)	154.08 x 85.92
	With /Without TSP	Without TSP
	Weight (g)	TBD
	LED Numbers	27 LEDs

Note 1: Requirements on Environmental Protection: RoHs

Note 2: LCM weight tolerance: +/- 5%

3. Input/Output Terminals

No.	Symbol	Description	
1	VCOM	Common Voltage	
2-3	DVDD	Power Supply (3.3V)	
4	NC	No Connect	
5	RESET	Reset Signal Input pin	
6	STBYB	Standby mode, normally pull high	
7	GND	Ground	
8	LVDS_D0-	LVDS differential data input D0-	
9	LVDS_D0+	LVDS differential data input D0+	
10	GND	Ground	
11	LVDS_D1-	LVDS differential data input D1-	
12	LVDS_D1+	LVDS differential data input D1+	
13	GND	Ground	
14	LVDS_D2-	LVDS differential data input D2-	
15	LVDS_D2+	LVDS differential data input D2+	
16	GND	Ground	
17	LVDS_CLK-	LVDS differential clock input CLK-	
18	LVDS_CLK+	LVDS differential clock input CLK+	
19	GND	Ground	
20	LVDS_D3-	LVDS differential data input D3-	
21	LVDS_D3+	LVDS differential data input D3+	
22	GND	Ground	
23-24	NC	No Connect	
25	GND	Ground	
26-28	NC	No Connect	
29	AVDD	Power supply for analog circuit	
30	GND	Ground	
31-32	LED-	Cathode of LED Backlight	
33	L/R	Left/Right display control	Note1
34	U/D	Up/Down display control	Note1

35	VGL	Negative Power for TFT
36-37	NC	No Connect
38	VGH	Positive Power for TFT
39-40	LED+	Anode of LED Backlight

Note 1: Left/Right, Up/Down (pins 33, pin 34)

U/D	L/R	Scanning Direction
0	0	Up to Down, Right to Left
0	1	Up to Down, Left to Right
1	0	Down to Up, Right to Left
1	1	Down to Up, Left to Right

4. Absolute Maximum Rating

Item	Symbol	MIN	Typ	MAX	Unit	Remark
Supply Voltage	VDD	-0.3	-	5.0	V	-
Operating Temperature	TOPR	-30	-	85	°C	-
Storage Temperature	TSTG	-30	-	85	°C	

Item	Symbol	MIN	TYP	MAX	Unit	Remark
Power supply for LCD	I _{VDD}	25	35	60	mA	
	I _{AVDD}	20	25	50	mA	
	I _{VGH}	0.8	1	1.2	mA	
	I _{VGL}	0.8	1	1.2	mA	
	I _{VCOM}	6	8.2	15	mA	

5. Electrical Characteristics

5.1 Driving TFT LCD Panel

Item	Symbol	MIN	MAX	Unit	Remark
Power voltage	V_{DD}	3.0	3.6	V	
	AVDD	10.2	10.6	V	
	VGH	15.3	16.7	V	
	VGL	-9.7	-8.3	V	
Input signal voltage	V_{COM}	2.8	4.8	V	
Input logic high voltage	V_{IH}	$0.7V_{DD}$	V_{DD}	V	
Input logic low voltage	V_{IL}	0	$0.3V_{DD}$	V	

5.2 LED Driving Conditions

Item	Symbol	MIN	TYP	MAX	Unit	Remark
Forward Current	I_F	-	180	-	mA	
Forward Voltage	V_F	9.0	9.6	10.2	V	
Backlight Power consumption	W_{BL}	-	1.728	-	W	
LED Lifetime		-	30000	-	Hrs	

Note 1: Each LED: $I_F = 20 \text{ mA}$, $V_F = 3.2 \pm 0.2 \text{ V}$.

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.

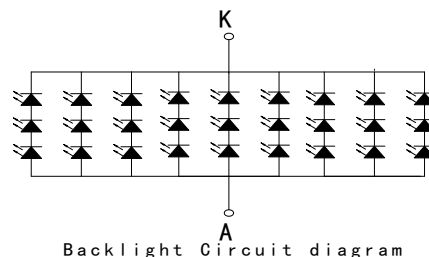
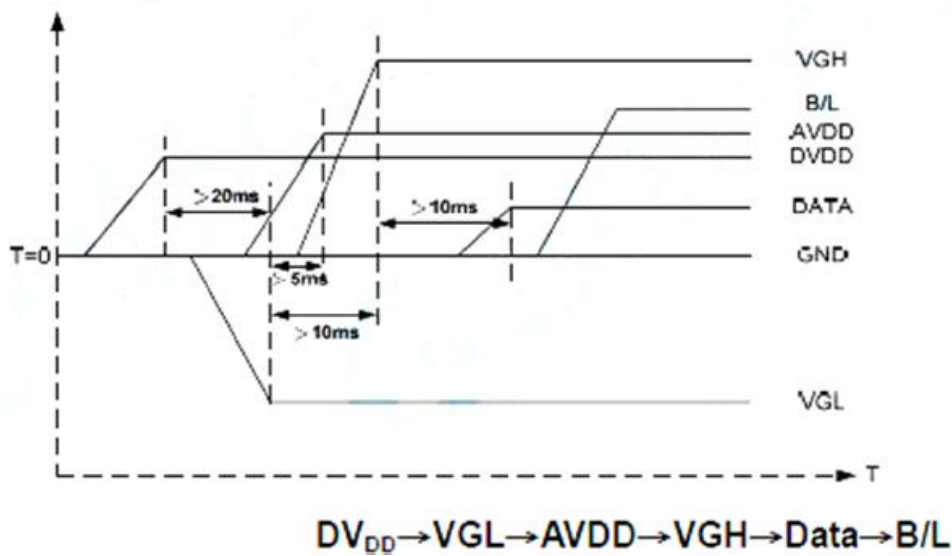


Figure: LED connection of backlight(Constant Current)

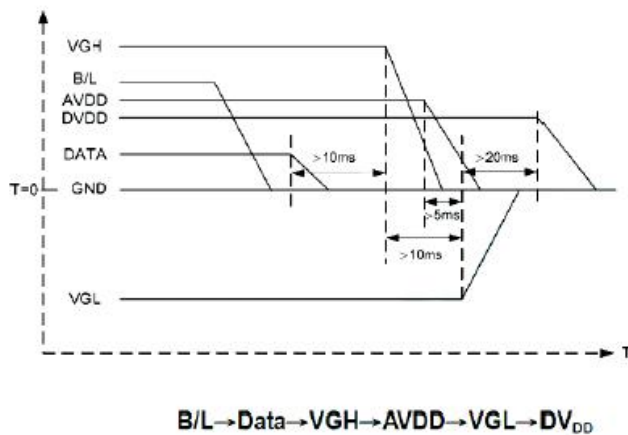
6. Interface Timing

6.1 Power Sequence

a. Power on:



b. Power off:



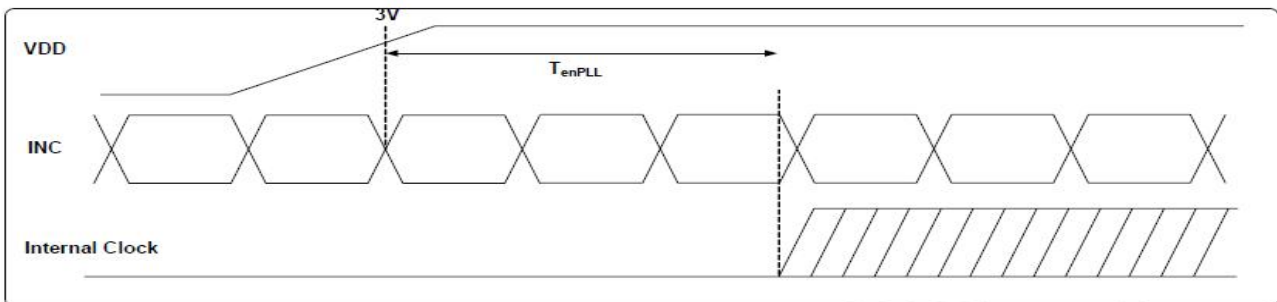
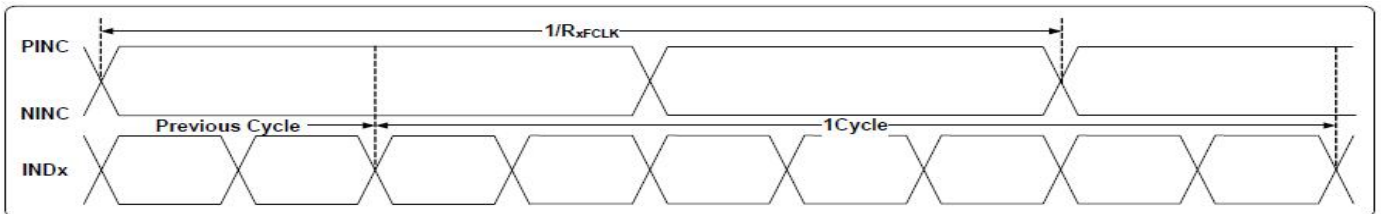
Note: Data include R0~R7, B0~B7, GO~G7, U/D, L/R, DCLK, HS, VS, DE.

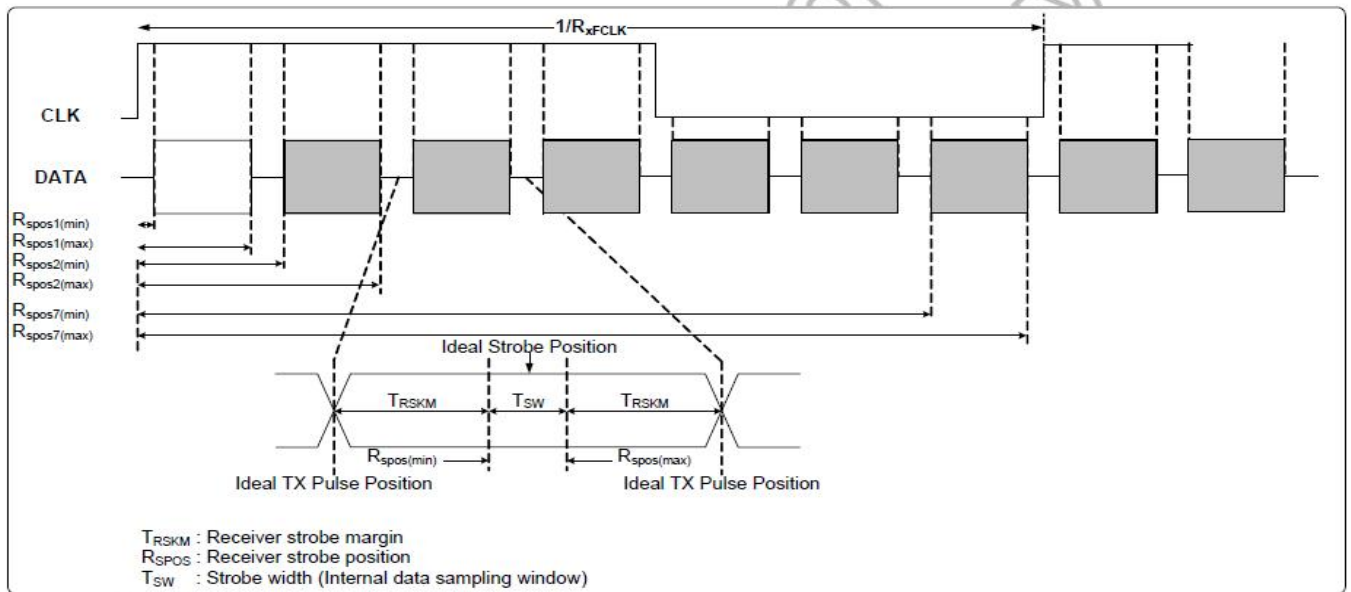
6.2 Timing Characteristics

6.2.1 AC Electrical Characteristics

Parameter	Symbol	Spec.			Unit	Condition
		Min.	Typ.	Max.		
Clock frequency	R_{XFCLK}	20	-	71	MHz	-
Input data skew margin	T_{RSKM}	500	-	-	pS	$ V_{ID} =400mV$ $R_{XVCM}=1.2V$ $R_{XFCLK}=71MHz$
Clock high time	T_{LVCH}	-	$4/(7 * R_{XFCLK})$	-	ns	-
Clock low time	T_{LVCL}	-	$3/(7 * R_{XFCLK})$	-	ns	-
PLL wake-up time	T_{emPLL}	-	-	150	μs	-

6.2.2 Input Clock and Data Timing Diagram





LVDS FIGURE

Parameter	Symbol	Min.	Spec. Typ.	Max.	Unit	Condition
Modulation Frequency	SSC_{MF}	23	-	93	KHz	-
Modulation Rate	SSC_{MR}	-	-	± 3	%	LVDS clock = 71MHz center spread

SSC table

6.2.3 Data Input Format

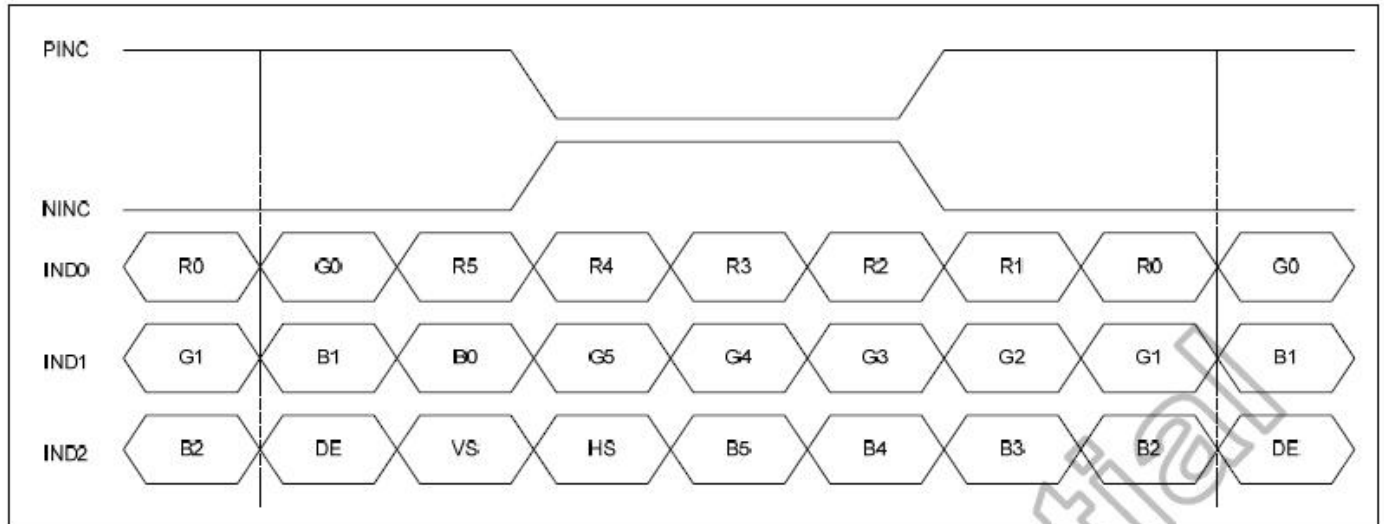


Figure 10.4: 6-bit LVDS input

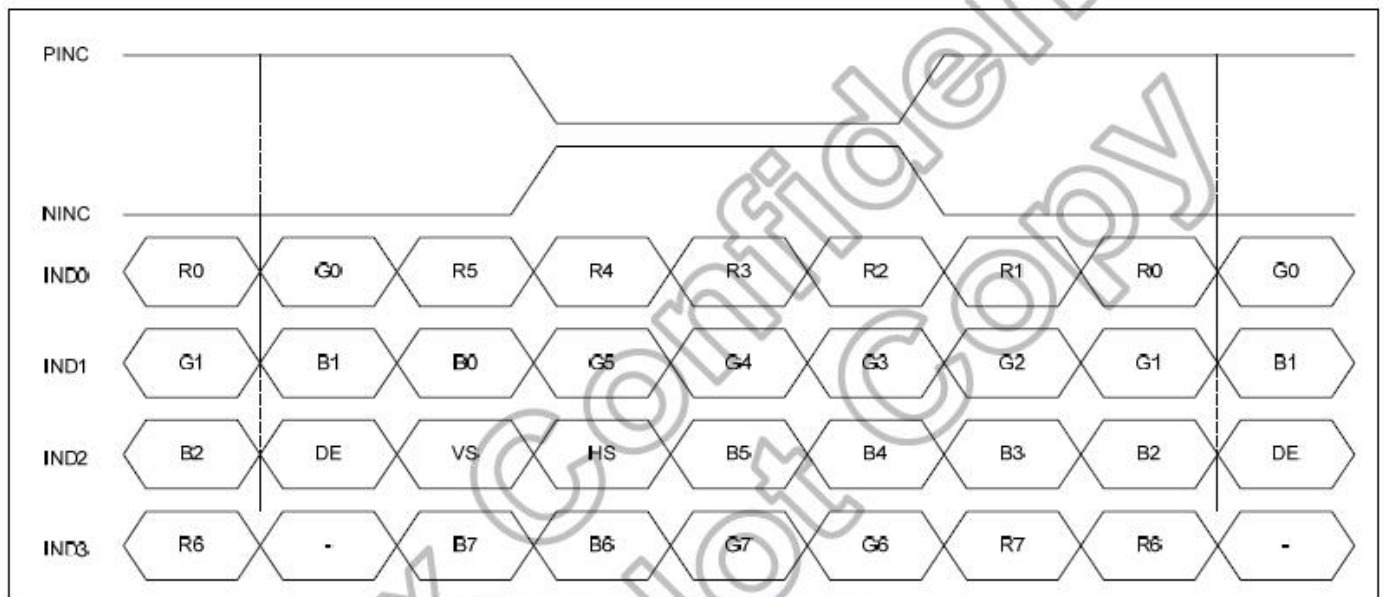


Figure 10.5: 8-bit LVDS Input

7. Optical Characteristics

Items		Symbol	Condition	Min.	Typ.	Max.	Unit	Remark	Note
Response time		Tr+Tf	-	-	25	35	ms	FIG.1	Note4
Contrast Ratio		CR		500	700	-	-	FIG.2	Note1
Surface luminance		LV	$\theta=0^\circ$	600	700	-	cd/m2	FIG.2	Note2
Luminance uniformity		Yu	$\theta=0^\circ$	75	80	-	%	FIG.2	Note3
Viewing angle		θ_T	Center CR ≥ 10	-	65	-	deg	FIG.3	Note6
		θ_B		-	55	-	deg	FIG.3	
		θ_L		-	65	-	deg	FIG.3	
		θ_R		-	65	-	deg	FIG.3	
Chromaticity	Red	R _X	$\theta=0^\circ$ $\phi=0^\circ$ Ta=25°	0.521	0.571	0.621	-	FIG.2 CIE1931	Note5
		R _Y		0.294	0.344	0.394	-		
	Green	G _X		0.302	0.352	0.402	-		
		G _Y		0.548	0.598	0.648	-		
	Blue	B _X		0.102	0.152	0.202	-		
		B _Y		0.034	0.084	0.134	-		
	White	W _X		0.261	0.312	0.362	-		
		W _Y		0.279	0.329	0.379	-		

Note1. Definition of contrast ratio

Contrast ratio(Cr) is defined mathematically by the following formula. For more information see FIG.2.

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

For contrast ratio, Surface Luminance, Luminance uniformity and CIE, the testing data is based on TOPCON's BM-5 or BM-7 photo detector or compatible.

Note2. Definition of surface luminance.

Surface luminance is the luminance with all pixels displaying white. For more information see FIG.2.

Lv = Average Surface Luminance with all white pixels(P1,P2,P3,,Pn)

Note3. Definition of luminance uniformity

The luminance uniformity in surface luminance is determined by measuring luminance at each test position 1 through n, and then dividing the maximum luminance of n points luminance by minimum luminance of n points luminance. For more information see FIG.2.

$$YU = \frac{\text{Minimum surface luminance with all white pixels (P1,P2,P3,.....,Pn)}}{\text{Maximum surface luminance with all white pixels (P1,P2,P3,.....,Pn)}}$$

Note4. 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 90% to 10%. And fall time (T_f) is the time between photo detector output intensity changed from 10% to 90%.

For additional information see FIG1.

Note5. Definition of color chromaticity (CIE1931)

CIE (x,y) chromaticity, The x,y value is determined by screen active area center position P5. For more information see FIG.2.

Note6. Definition of viewing angle

Viewing angle is the angle at which the contrast ratio is greater than 10. Angles are determined for the horizontal or x axis and the vertical or y axis with respect to the z axis which is normal to the LCD surface. For more information see FIG.3.

For viewing angle and response time testing, the testing data is base on Autronic-Melchers’s ConoScope or DMS series Instruments or compatible.

FIG.1. The definition of response Time

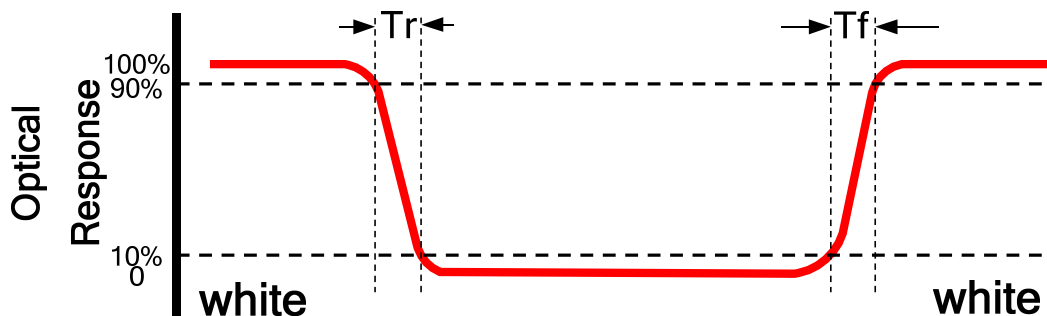


FIG.2. Measuring method for contrast ratio, surface luminance, luminance uniformity, CIE (x,y) chromaticity

Size : $S \leq 5"$ (see Figure a) A : 5 mm B : 5 mm

H,V : Active area

Light spot size $\varnothing = 5\text{mm}$ (BM-5) or $\varnothing = 7.7\text{mm}$ (BM-7) 50cm distance or compatible distance from the LCD surface to detector lens.

test spot position : see Figure a.

measurement instrument : TOPCON’s luminance meter BM-5 or BM-7 or compatible (see Figure c).

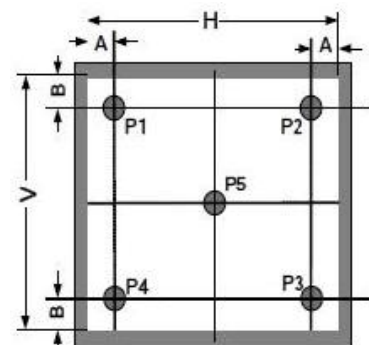


Figure a

Size : $5" < S \leq 12.3"$ (see Figure b) H,V : Active area

Light spot size $\varnothing = 5\text{mm}$ (BM-5) or $\varnothing = 7.7\text{mm}$ (BM-7) 50cm distance or compatible distance from the LCD surface to detector lens.

test spot position : see Figure b.

measurement instrument : TOPCON’s luminance meter BM-5 or BM-7 or compatible (see Figure c).

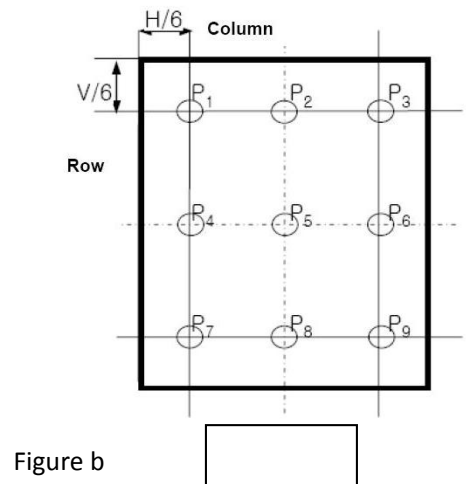
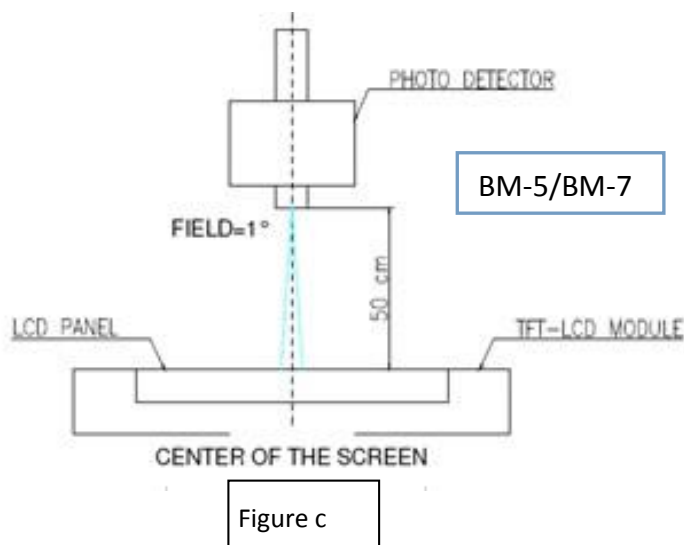
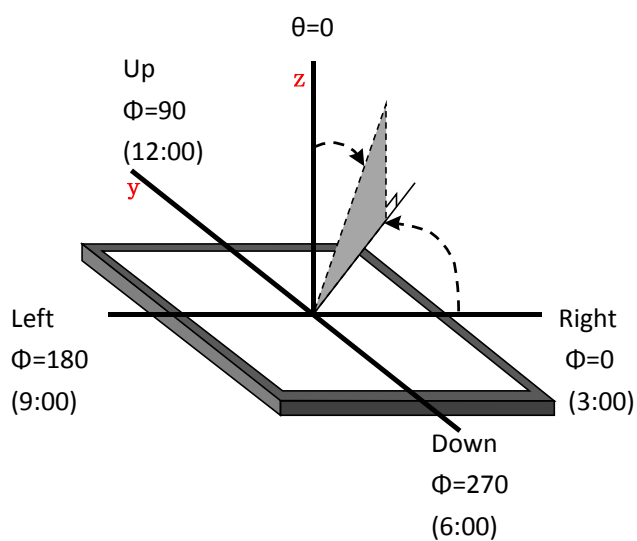


FIG.3.The definition of viewing angle



8. Environmental / Reliability Tests

No	Test Item	Condition	Remarks
1	High Temperature Operation	Ts= +85℃, 96hrs	IEC60068-2-1:2007 GB2423. 2-2008
2	Low Temperature Operation	Ta= -30℃, 96hrs	IEC60068-2-1:2007 GB2423.1-2008
3	High Temperature Storage	Ta= +85℃, 96hrs	IEC60068-2-1:2007 GB2423. 2-2008
4	Low Temperature Storage	Ta= -30℃, 96hrs	IEC60068-2-1:2007 GB2423.1-2008
5	High Temperature & Humidity Operation	Ta= +60℃, 90% RH max, 96 hours	IEC60068-2-78:2001 GB/T2423.3-2006
6	Thermal Shock (Non-operation)	-30℃ 30 min ~ +80℃ 30 min Change time: 5min, 20 Cycle	Start with cold temperature, end with high temperature IEC60068-2-14:1984, GB2423.22-2002
7	ESD	C=150pF, R=330 Ω, 5 points/panel , Air:±8KV, 5 times Contact: ±4KV, 5 times (Environment: 15℃ ~ 35℃, 30% ~ 60%, 86Kpa ~ 106Kpa)	IEC61000-4-2:2001 GB/T17626.2-2006
8	Vibration (Non-operation)	Frequency range: 10~55Hz, Stroke: 1.5mm , Sweep: 10Hz~55Hz~10Hz 2 hours for each direction of X .Y. Z. (6 hours for total)	IEC60068-2-6:1982 GB/T2423.10-1995
9	Mechanical Shock (Non-operation)	Half Sine Wave 60G ,6ms,±X,±Y,±Z 3times for each direction	IEC60068-2-27:1987 GB/T2423.5—1995
10	Package Drop Test	Height: 60 cm, 1 corner, 3 edges, 6 surfaces	IEC60068-2-32:1990 GB/T2423.8-1995



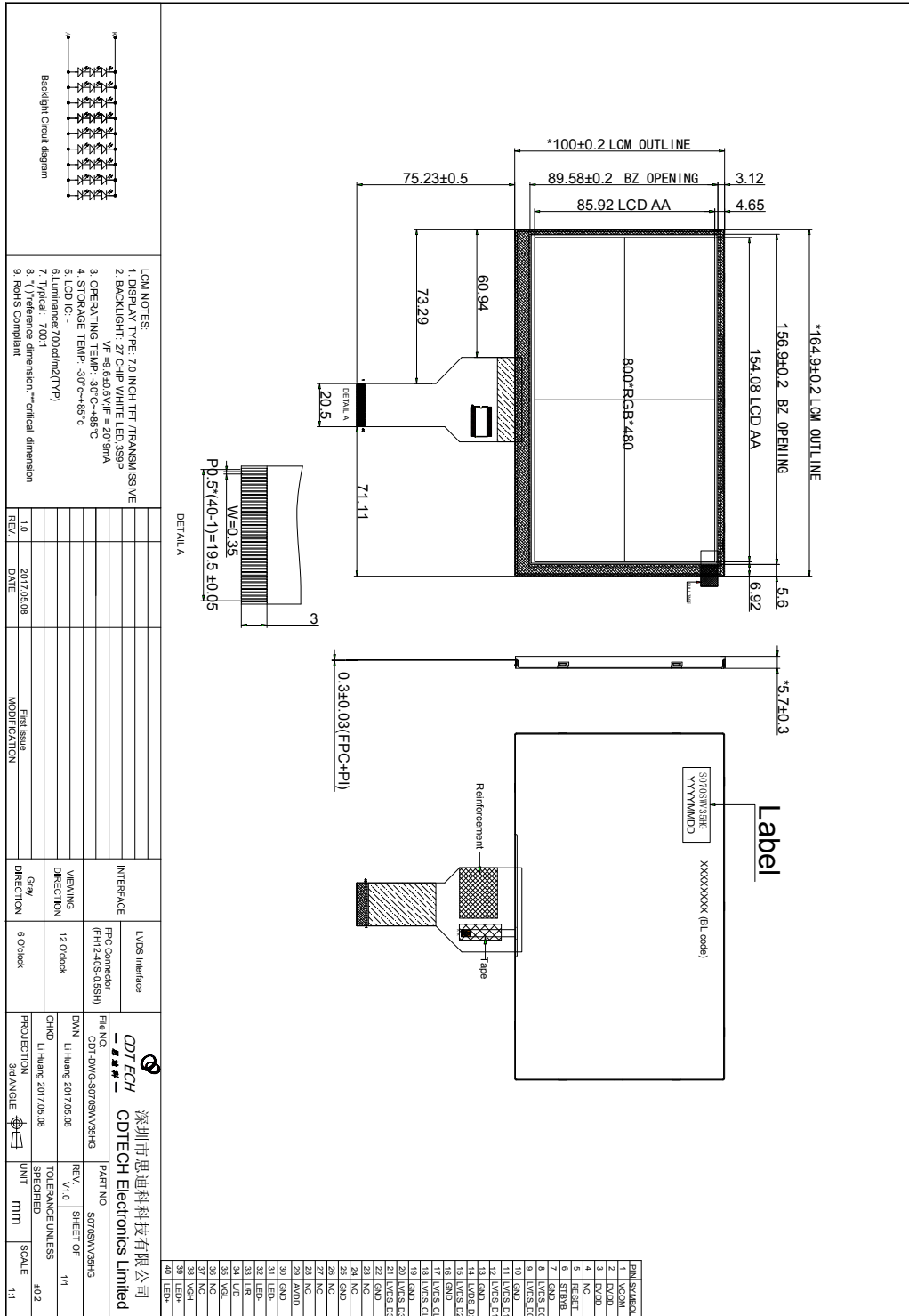
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Notes:

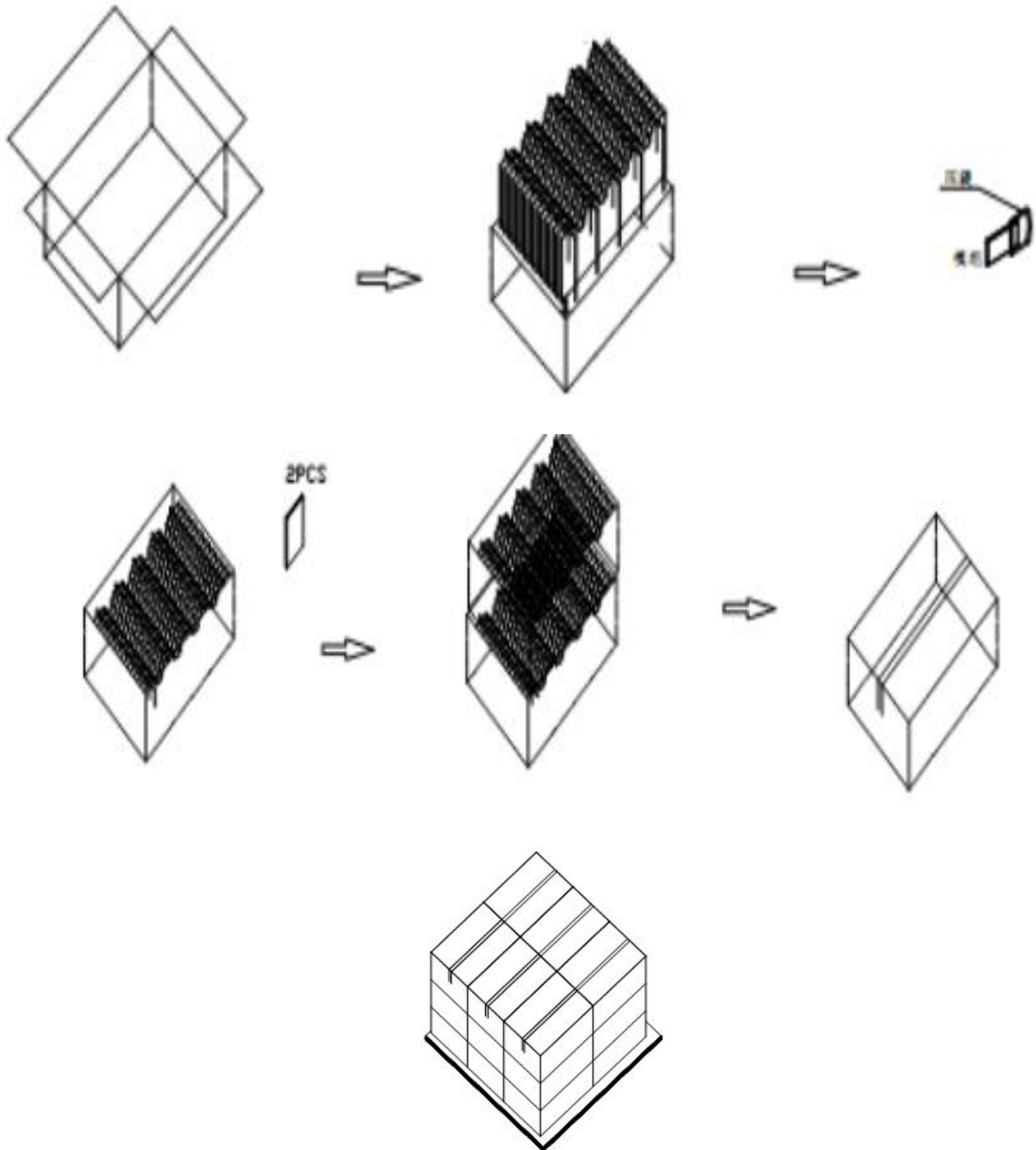
1. The test result shall be evaluated after the sample has been left at room temperature and humidity for 2 hours without load. No condensation shall be accepted. The sample will not be accepted if appear these defects:
 - 1).Air bubble in the LCD;
 - 2).Seal leak
 - 3).Non-display
 - 4).missing segments
 - 5).Glass crack
 - 6).CR reduction >40%
 - 7).IDD increase >100%
 - 8).Brightness reduction >50%
 - 9).Color coordinate tolerance >0.05
- 2.≤7.0 inch: The size of sample is 5pcs;
 >7.0 inch: The size of sample is 2pcs;
3. One test sample must complete each test item;
- 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.In the test of High Temperature Operation and High Temperature & Humidity Operation ,the operation temperature is the surface temperature of module.

9. Mechanical Drawing



10. Packing

Packing Method



11. Precautions for Use of LCD modules

11.1 Handling Precautions

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

11.1.2. 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.

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

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

11.1.5. 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
- Ketene
- Aromatic solvents

11.1.6. Do not attempt to disassemble the LCD Module.

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

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

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

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

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

11.1.8.4. 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.

11.2 Storage Precautions

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

11.2.2. 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%

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



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11.3 Transportation Precautions

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