



深圳市思迪科科技有限公司

SHENZHEN CDTECH ELECTRONICS

Product Specification

Model Name	S050HWV31HS-DC50
Description	5.0" WVGA 800(RGB)x480 Dots
Date	2020/07/21
Version	1.0

Approved by/Date	Check by/Date	Prepared by/Date
ZHP 2020/07/21	HZX 2020/07/21	Yigui.Han 2020/07/21

Customer Approval	
Date	



深圳市思迪科科技有限公司

SHENZHEN CDTECH ELECTRONICS

Table of Contents

1. Record of Revision	3
2. General Specifications	4
3. Input/Output Terminals	5
4. Electrical Characteristics	6
5. Interface Timing	7
6. Optical Characteristics	10
7. Environmental / Reliability Tests	13
8. Mechanical Drawing	15
9. Packing	16
10. Precautions for Use of LCD modules	17



深圳市思迪科科技有限公司

SHENZHEN CDTECH ELECTRONICS

1. Record of Revision

Rev	Issued Date	Description	Editor
1.0	2020/07/21	First Release.	ZHP

2. General Specifications

	Feature	Spec
Characteristics	Size	5 inch
	Resolution	800(horizontal)*480(Vertical)
	Interface	MIPI-2lane
	Connect type	Connector
	Display Colors	16M
	Technology type	a-Si
	Pixel pitch (mm)	0.135*0.135
	Pixel Configuration	R.G.B.-Stripe
	Display Mode	Normally Black
	LCM Driver IC	ICN6211
	CTP Driver IC	GT911
	Viewing Direction	Full view
Mechanical	LCM (W x H x D) (mm)	120.7*93.05*9.02
	Active Area(mm)	108 x 64.80
	Weight (g)	TBD
	LED Numbers	12 LEDs

Note 1: Requirements on Environmental Protection: RoHs

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

3. Input/Output Terminals

No.	Symbol	Description
1	GND	Ground
2	MP-DP1	MIPI Positive data1 signal(+)
3	MP-DN1	MIPI Negative data1 signal(-)
4	GND	Ground
5	MP - DCN	MIPI Positive clock signal(+)
6	MP - DCP	MIPI Positive clock signal(-)
7	GND	Ground
8	MP-DP0	MIPI Positive data0 signal(+)
9	MP-DN0	MIPI Negative data0 signal(-)
10	GND	Ground
11	SCL0	I2C0 clock signal
12	SDA0	I2C0 data signal
13	GND	Ground
14	VDD	Power supply(3.3V)
15	VDD	Power supply(3.3V)

4. Electrical Characteristics

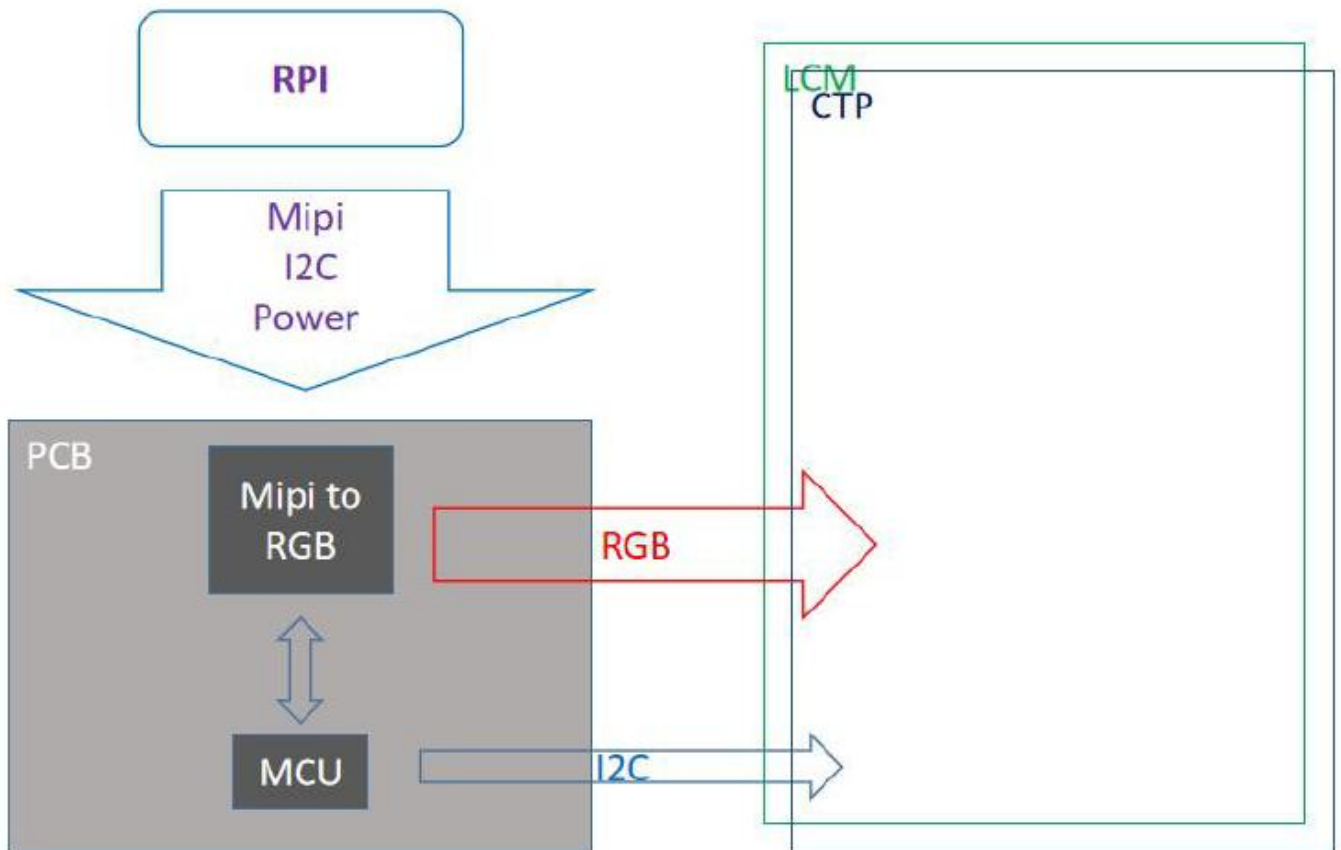
4.1 Driving TFT LCD Panel

Item	Symbol	MIN	Typ	MAX	Unit	Remark
Supply Voltage	VDD	-0.5	3.3	3.96	V	-
Direct Current	I _{VDD}	90	110	130	mA	
Operating Temperature	TOPR	-20	-	70	°C	-
Storage Temperature	TSTG	-30	-	80	°C	
LED life		-	30000	-	Hrs	

Note 1: Optical performance should be evaluated at Ta=25°C only.

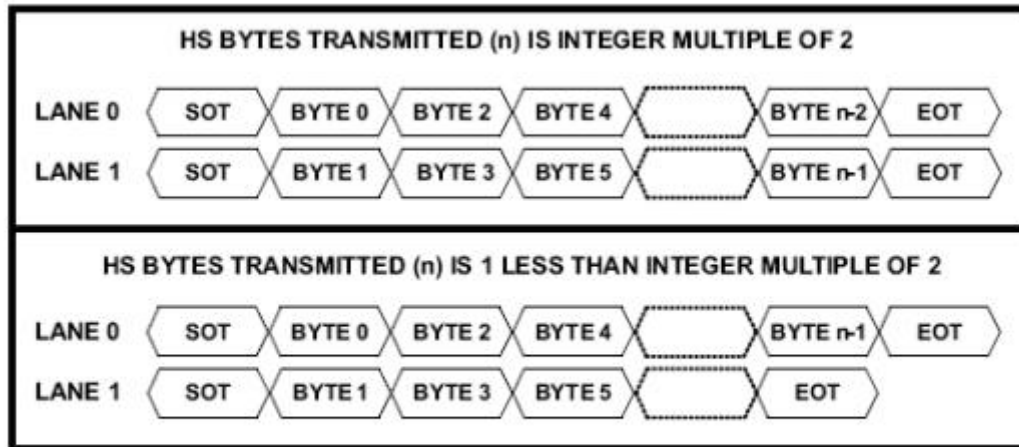
Note 2: If LED is driven by high current, high ambient temperature & humidity condition. The life Time of LED will be reduced. Operating life means brightness goes down to 50% initial brightness. Typical operating life time is estimated data.

4.2 Block Diagram



5. Interface Timing

ICN6211 support four DSI data lanes, and may be configured to one, two or three DSI data lanes. Unused DSI input lanes should be left unconnected or driven to LP11 state.



2 DSI Data Lane Configuration

Refer to Figure 7-2.

parameter	Description	MIN	TYP	MAX	UNIT
V_{IL}	Low Power logic 1 input voltage	880			mV
V_{IH}	Low Power logic 0 input voltage			550	mV
$ V_{ID} $	HS differential input voltage: $ V_{dp} - V_{dn} $	70	200	270	mV
$ V_{IDT} $	HS differential input voltage threshold			50	mV
$V_{IL4ULPS}$	Low Power receiver logic 0 voltage, ULP state			300	mV
$V_{CMRX(DC)}$	Common-mode voltage HS receive mode	70		330	mV
$\Delta V_{CMRX(DC)}$	HS common-mode interference			100	mV
V_{IHHS}	HS single-ended input high voltage			460	mV
V_{ILHS}	HS single-ended input low voltage	-40			mV
$V_{TERM4EN}$	Single-ended threshold for HS termination enable			450	mV
Z_{ID}	Differential input impedance	80	100	124	Ω

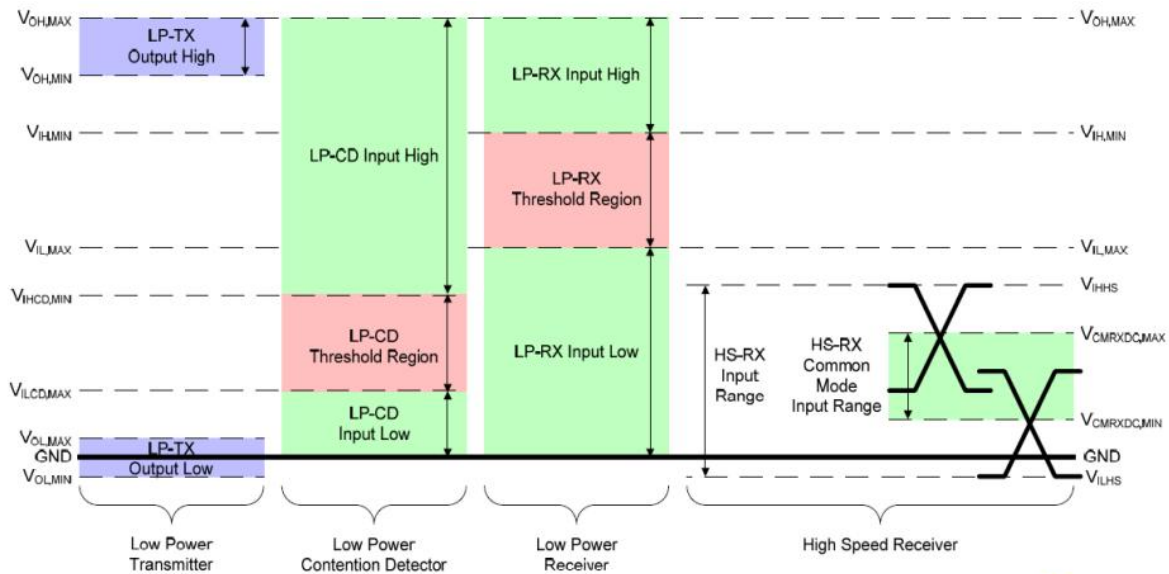


Figure 7-2 DSI HS/LP signaling and Contention Voltage

ICN6211 supports Non-Burst Mode with Sync Pulses, Non-Burst Mode with Sync Events and Burst mode.

- Non-Burst Mode with Sync Pulses: enables the peripheral to accurately reconstruct original video timing, including sync pulse widths.
- Non-Burst Mode with Sync Events: similar to above, but accurate reconstruction of sync pulse widths is not required, so a single Sync Event is substituted.
- Burst mode: RGB pixel packets are time-compressed, leaving more time during a scan line for LP mode(saving power).

For all three sequences, the first line of a video frame shall start with a VSS packet, and all other lines start with VSE or HSS. The position of the synchronization packets in time is of utmost importance since this has a direct impact on the visual performance of the display panel; that is, the LVDS output video timing(HS-Horizontal sync and VS-Vertical sync) are generated based on the synchronization.

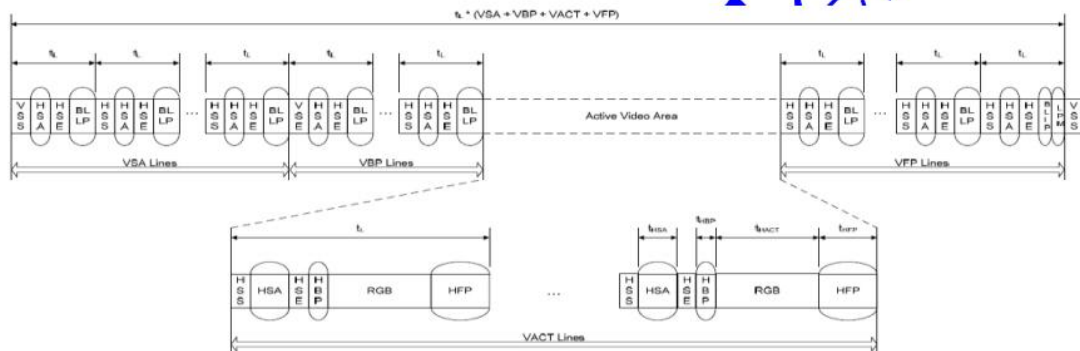


Figure 6-5 Non-Burst Mode with Sync Pulses

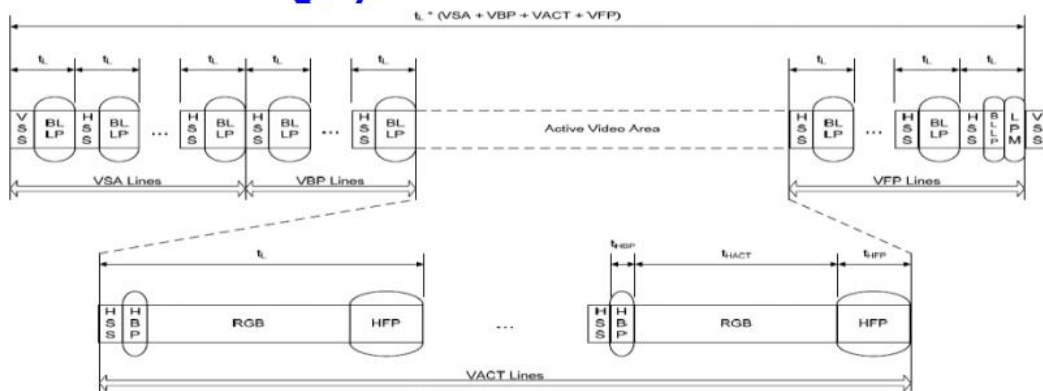


Figure 6-6 Non-Burst Mode with Sync Events

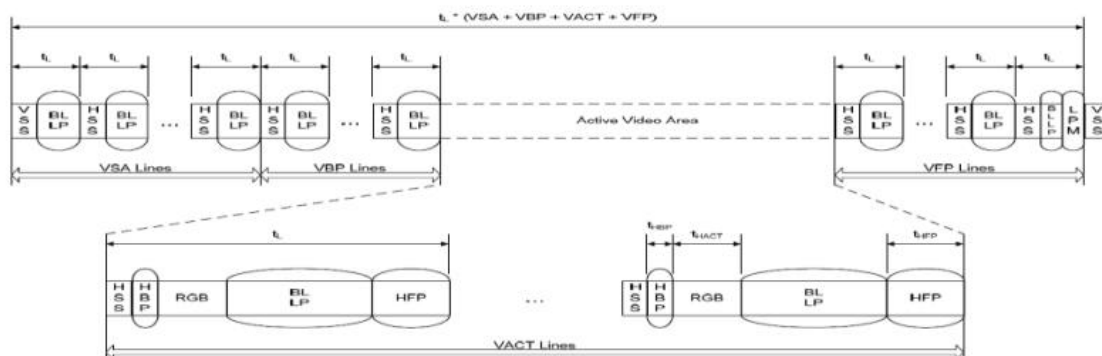


Figure 6-7 Burst mode

6. Optical Characteristics

Items		Symbol	Condition	Min.	Typ.	Max.	Unit	Remark	Note
Response time		Tr+Tf	-	-	30	40	ms	FIG.1	Note4
Contrast Ratio		CR		800	1000	-	-	FIG.2	Note1
Surface luminance		LV	$\theta = 0^\circ$	350	400	-	cd/m2	FIG.2	Note2
NTSC		-	$\theta = 0^\circ$	45	50	-	%	FIG.2	Note5
Viewing angle		θ_T	Center	-	80	-	deg	FIG.3	Note6
		θ_B		-	80	-	deg	FIG.3	
		θ_L		-	80	-	deg	FIG.3	
		θ_R		-	80	-	deg	FIG.3	
Chromaticity	Red	R _X	$\theta = 0^\circ$ $\phi = 0^\circ$ Ta=25°	0.579	0.629	0.679	-	FIG.2 CIE1931	Note5
		R _Y		0.276	0.326	0.376	-		
	Green	G _X		0.287	0.337	0.387	-		
		G _Y		0.496	0.546	0.596	-		
	Blue	B _X		0.086	0.136	0.186	-		
		B _Y		0.093	0.143	0.193	-		
	White	W _X		0.250	0.300	0.350	-		
		W _Y		0.260	0.310	.0360	-		

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 base 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.

L_v = Average Surface Luminance with all white pixels($P_1, P_2, P_3, \dots, P_n$)

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.

$$YU = \frac{\text{Minimum surface luminance with all white pixels } (P_1, P_2, P_3, \dots, P_n)}{\text{Maximum surface luminance with all white pixels } (P_1, P_2, P_3, \dots, P_n)}$$

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

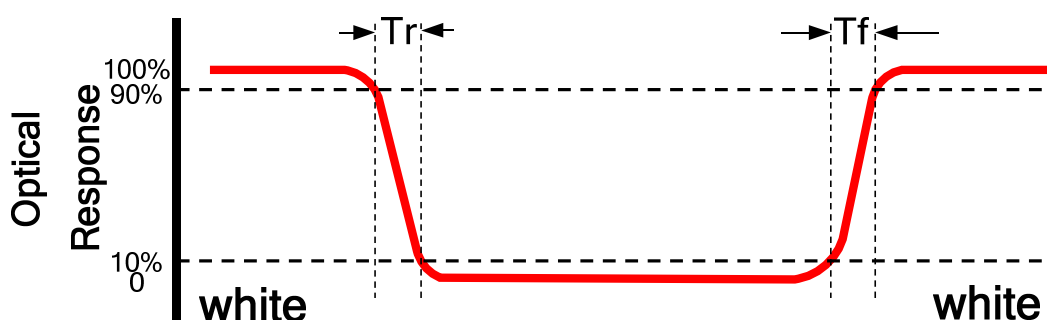


FIG.2. Measuring method for contrast ratio, surface luminance,

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).

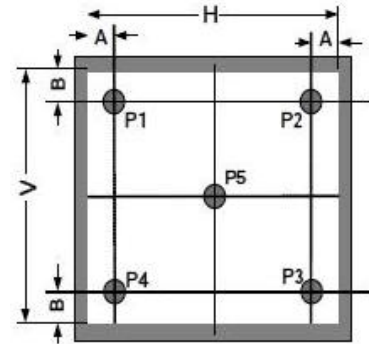


Figure a

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).

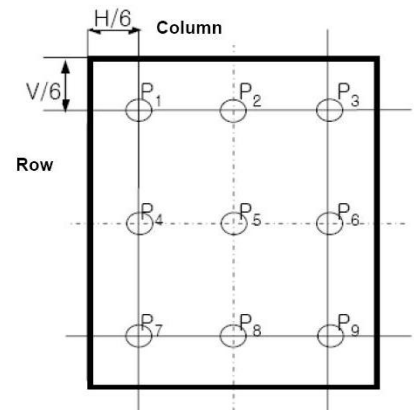


Figure b

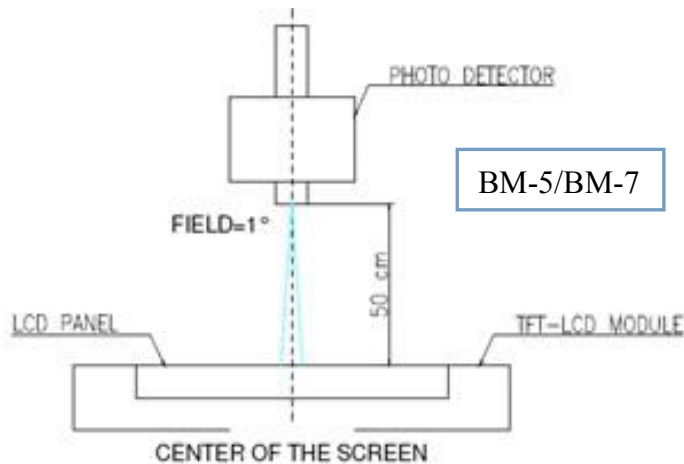
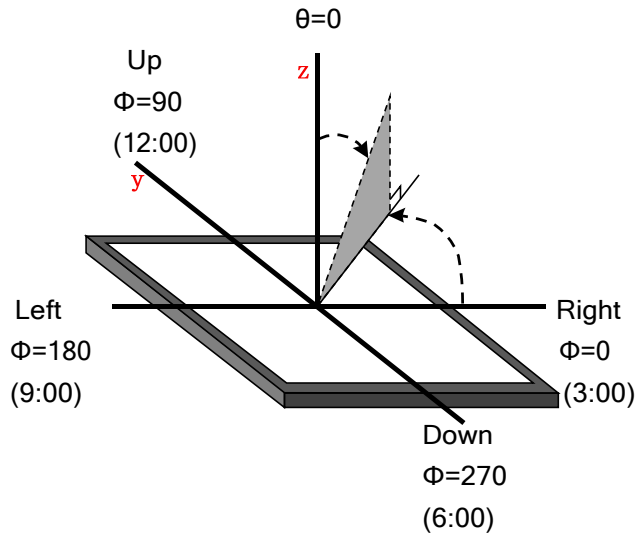


Figure c

FIG.3.The definition of viewing angle



7. Environmental / Reliability Tests

No	Test Item	Condition	Remarks
1	High Temperature Operation	Ts= +70℃, 96hrs	Note 1 IEC60068-2-2, GB2423. 2-89
2	Low Temperature Operation	Ta= -20℃, 96hrs	Note 2 IEC60068-2-1 GB2423.1-89
3	High Temperature Storage	Ta= +80℃, 96hrs	IEC60068-2-2 GB2423. 2-89
4	Low Temperature Storage	Ta= -30℃, 96hrs	IEC60068-2-1 GB/T2423.1-89
5	High Temperature & Humidity Storage	Ta= +60℃, 90% RH max, 96 hours	IEC60068-2-3 GB/T2423.3-2006
6	Thermal Shock (Non-operation)	-20℃ 30 min ~ +60℃ 30 min Change time: 5min, 30 Cycle	Start with cold temperature, end with high temperature IEC60068-2-14, GB2423.22-87

7	Electro Discharge (Operation)	Static	C=150pF, R=330 Ω , 5 points/panel Air: ± 8 KV, 5 times; Contact: ± 4 KV, 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: 1mm 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, $\pm X$, $\pm Y$, $\pm Z$ 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. Ts is the temperature of panel's surface.
 2. Ta is the ambient temperature of sample.
 3. The size of sample is 5pcs.

[illegible]



深圳市思迪科科技有限公司

SHENZHEN CDTECH ELECTRONICS

9. Packing

Packing Method

TBD

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
- Ketene
- 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.



深圳市思迪科科技有限公司 SHENZHEN CDTECH ELECTRONICS

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.