



深圳市海创通科技有限公司

Shenzhen HCT Technology Co.,Ltd



CERT. No. QAC0946535 (ISO9001) CERT. No. HKG002005 (ISO14001)

Product Specification

Customer: _____

Model Name: **H020PQ 40E2502**

Date: _____

Version: _____

Preliminary Specification

Final Specification

For Customer's Acceptance

Approved by	Comment

Approved by	Reviewed by	Prepared by



深圳市海创通科技有限公司
Shenzhen HCT Technology Co.,Ltd

Contents

1.Record of Revision.....	3
2 .General Specifications.....	4
3 .Input/Output Terminals	5
4. Absolute Maximum Ratings	6
5 .Electrical Characteristics	6
6 .Interface Timing.....	7
7. Optical Characteristics	10
8 . Environmental / Reliability Tests	14
9. Mechanical Drawing.....	12
1 0.Packing.....	13
11. Precautions For Use of LCD modules	14



深圳市海创通科技有限公司
Shenzhen HCT Technology Co.,Ltd

1. Record of Revision

Version	Revise Date	Content	Editor
1.0	2016/06/12	First Release.	Rich Liang



深圳市海创通科技有限公司

Shenzhen HCT Technology Co.,Ltd

2 General Specifications

	Feature	Spec
Characteristics	LCD Size	2 inch
	Display Format	320 (RGB) × 240
	Interface	RGB
	Color Depth	262K
	Technology type	a-Si
	Display Spec.	
	Display Mode	Normally White
	Driver IC	ILI9342C
	Surface Treatment	Haze 20%
	Viewing Direction	12 O'clock
	Gray Viewing Direction	6 O'clock
	Mechanical	LCM (W x H x D) (mm)
Active Area(mm)		40.8x 30.6
With /Without TSP		Without TSP
Weight (g)		TBD
LED Numbers		3 LEDs

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%



深圳市海创通科技有限公司
Shenzhen HCT Technology Co.,Ltd

3 Input/Output Terminals

NO.	Symbol	Level	Function
1-11	NC	-	No connection.
12	GND	VSS	Ground.
13-18	NC	-	No connection.
19	LEDK		LED, cathode.
20-21	NC	-	No connection.
22	LEDA		LED, cathode.
23	GND	VSS	Ground.
24	VCC	2.8V(typ)	Power supply.
25	VSYNC	H/L	Frame synchronizing signal for RGB.
26	HSYNC	H/L	Line synchronizing signal for RGB.
27	DCLK	H/L	Dot clock signal for RGB.
28-29	GND	VSS	Ground.
30-35	DB0-DB5	H/L	Data bus.
36	SDA	H/L	Serial in/out signal.
37	SCL	H/L	Serial interface clock.
38	CS	H/L	Chip selection.
39	NC	-	No connection.
40	RESET	H/L	Reset signal.



4 Absolute Maximum Ratings

Item	Symbol	MIN	MAX	Unit	Remark
Supply Voltage	V_{DD}	-0.3	5.0	V	
Input Signal Voltage	V_{in}	-0.3	$V_{DD}+0.3$	V	
Logic Output Voltage	V_{OUT}	-0.3	$V_{DD}+0.3$	V	
Operating Temperature	T_{OPR}	-10	60	°C	
Storage Temperature	T_{STG}	-20	70	°C	

5 Electrical Characteristics

5.1 Operating conditions:

Parameter	Symbol	MIN	TYP	MAX	Unit	Remark
Power Voltage	V_{cc}	2.6	2.8	3.4	V	
Driver supply voltag	VGH-VGL		0~30			

5.2 Driving Backlight

Item	Symbol	MIN	TYP	MAX	Unit	Remark
LED current	I_F	-	40	50	mA	Note 1 Note 2,3
Power Consumption					mW	
LED Voltage	V_F		3.2		V	
LED Life Time	W_{BL}	-	TBD	-	Hr	

Note 1 : There are 1 Groups LED

Note 2 : $T_a = 25^{\circ}\text{C}$

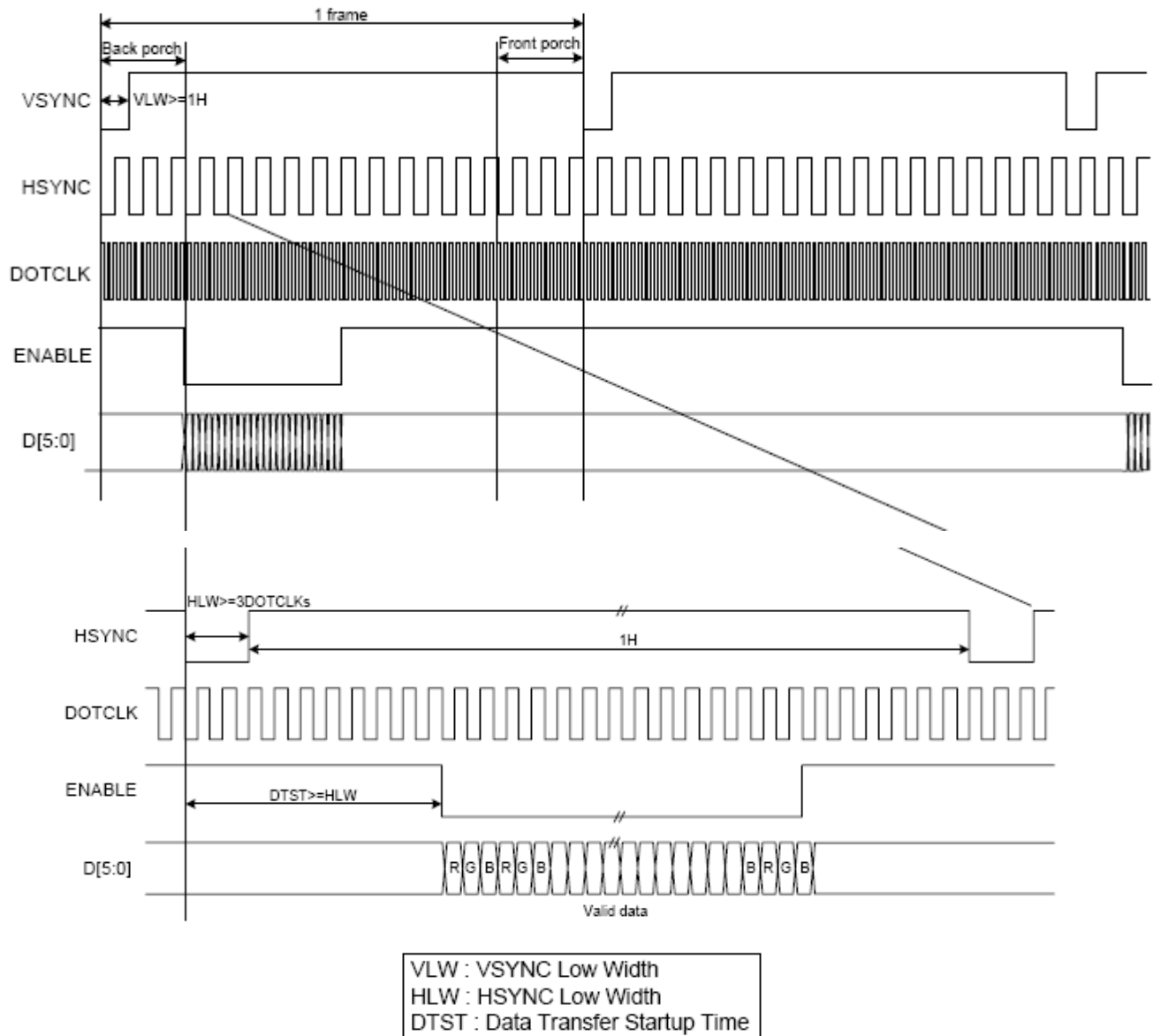
Note 3 : Brightness to be decreased to 50% of the initial value



6 Interface Timing

6.1 RGB Interface Timing

The timing chart of 6-bit RGB interface mode is shown as below:



Note 1: The DE signal is not needed when RGB interface SYNC mode is selected.

Note 2: VSPL='0', HSPL='0', DPL='0' and EPL='1' of "Interface Mode Control (B0h)" command.

Note 3: In 6-bit RGB interface mode, each dot of one pixel (R, G and B) is transferred in synchronization with DOTCLK.

Note 4: In 6-bit RGB interface mode, set the cycles of VSYNC, HSYNC and DE to 3 multiples of DOTCLK.



7 Optical Characteristics

Items	Symbol	Condition	Min.	Typ.	Max.	Unit	Remark	
Viewing angles	θ_T	Center CR \geq 10		30	-	Degree.	Note2	
	θ_B			45	-			
	θ_L			45	-			
	θ_R			45	-			
Contrast Ratio	CR	$\Theta = 0$	-	500	-	-	Note1, Note3	
Response Time	T_{ON}	25°C	-	20	35	ms	Note1, Note4	
	T_{OFF}		-	25	40			
Chromaticity	White	Backlight is on	X_W	0.282	0.312	0.342	-	Note1, Note5
			Y_W	0.319	0.349	0.379	-	
	Red		X_R	0.609	0.639	0.669	-	
			Y_R	0.314	0.344	0.374	-	
	Green		X_G	0.264	0.294	0.324	-	
			Y_G	0.557	0.587	0.617	-	
	Blue		X_B	0.102	0.132	0.162	-	
			Y_B	0.106	0.136	0.166	-	
Uniformity	U		80	-	-	%	Note1, Note6	
NTSC				50		%	Note5	
Luminance	L		200	250			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.

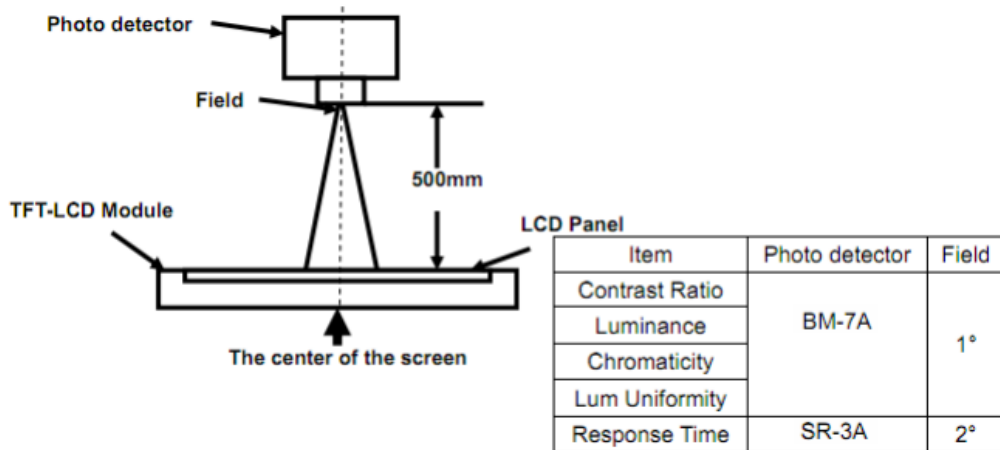
Note 1: Definition of optical measurement system.

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.



深圳市海创通科技有限公司

Shenzhen HCT Technology Co.,Ltd



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).

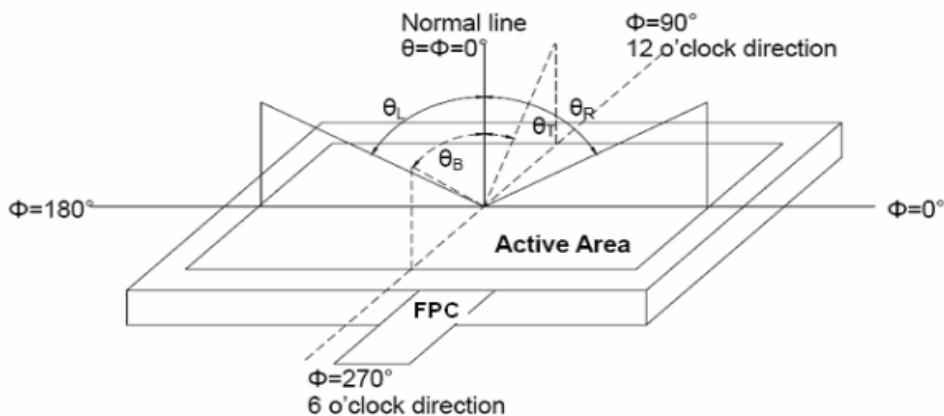


Fig. 1 Definition of viewing angle

Note 3: Definition of contrast ratio

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

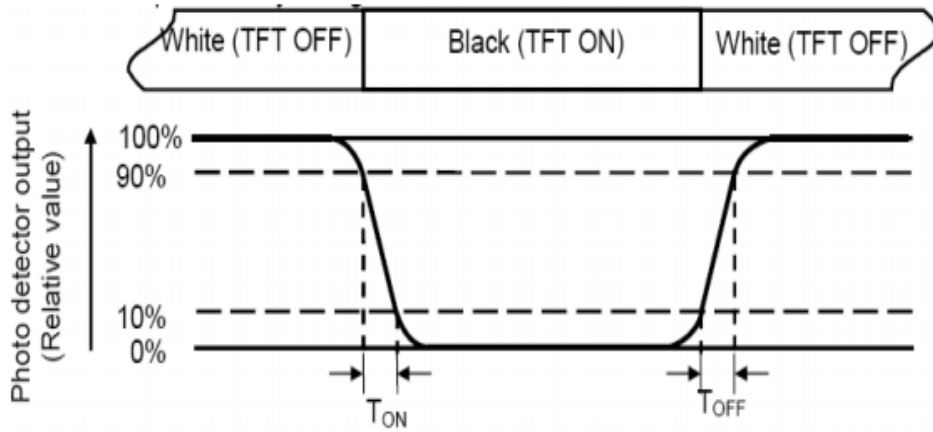
Note 4: Definition of Response time

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%



深圳市海创通科技有限公司

Shenzhen HCT Technology Co.,Ltd



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

$$\text{Luminance Uniformity (U)} = \text{Lmin} / \text{Lmax} \times 100\%$$

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

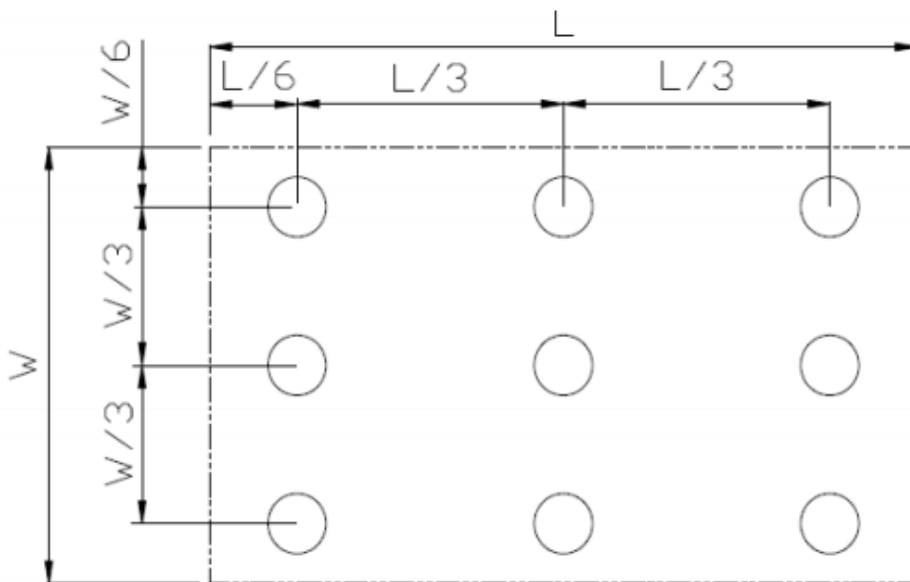


Fig. 2 Definition of uniformity

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.



深圳市海创通科技有限公司

Shenzhen HCT Technology Co.,Ltd

8 Environmental / Reliability Tests

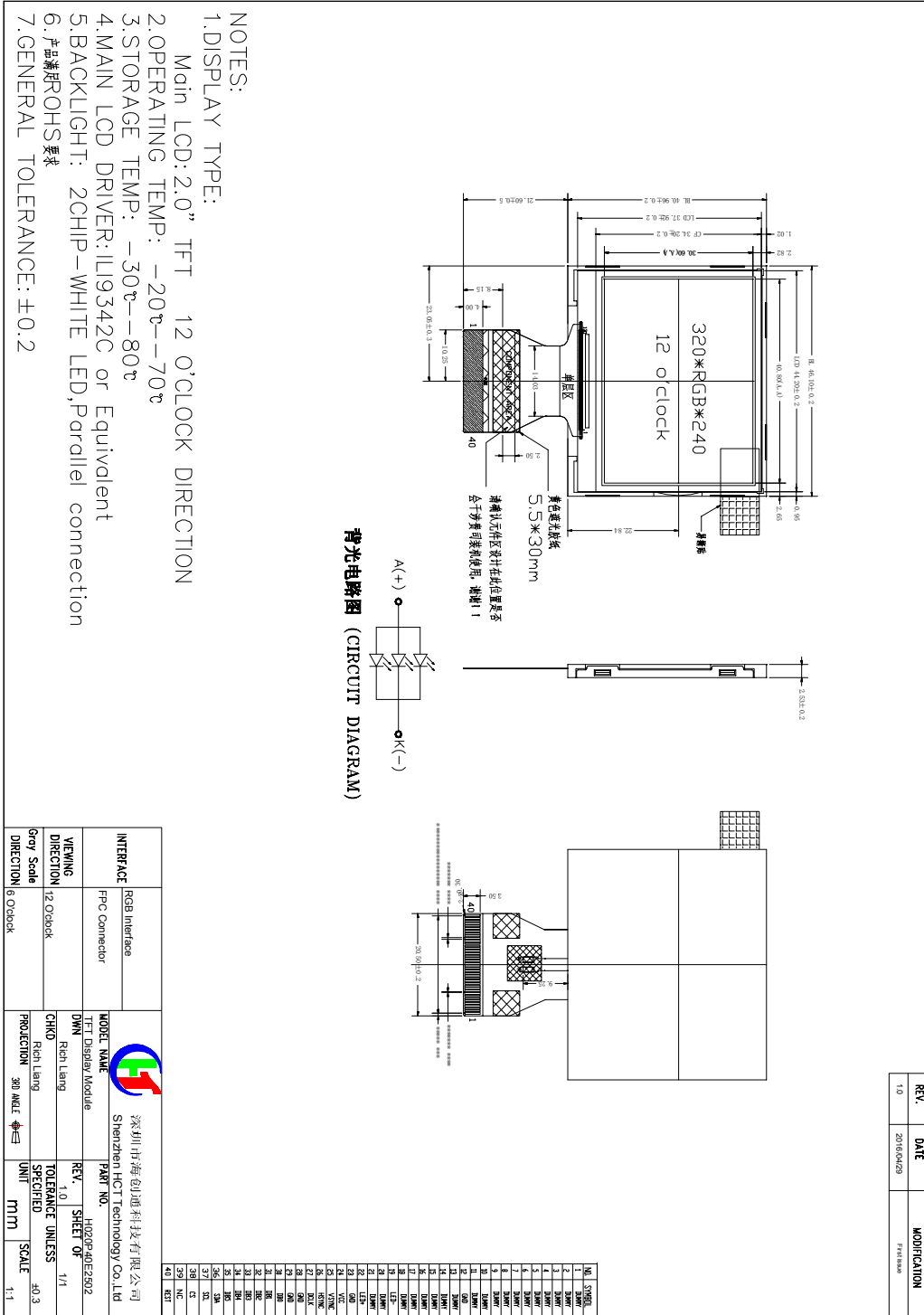
No	Test Item	Condition	Remarks
1	High Temperature Operation	T _s = 60°C, 240hrs	Note 1 IEC60068-2-2, GB2423. 2-89
2	Low Temperature Operation	T _a = -10°C, 240hrs	Note 2 IEC60068-2-1 GB2423.1-89
3	High Temperature Storage	T _a = +70°C, 240hrs	IEC60068-2-2 GB2423. 2-89
4	Low Temperature Storage	T _a = -20°C, 240hrs	IEC60068-2-1 GB/T2423.1-89
5	High Temperature & Humidity Storage	T _a = +60°C, 90% RH max, 160 hours	IEC60068-2-3 GB/T2423.3-2006
6	Thermal Shock (Non-operation)	-30°C 30 min ~ +80°C 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°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: 60 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.



深圳市海创通科技有限公司 Shenzhen HCT Technology Co.,Ltd

9 Mechanical Drawing





深圳市海创通科技有限公司
Shenzhen HCT Technology Co.,Ltd

1 0.Packing

TBD



深圳市海创通科技有限公司

Shenzhen HCT Technology Co.,Ltd

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°C ~ 40°C Relatively humidity: ≤80%

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

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.