DOCUMENT NUMBER AND REVISION

FS-8815P02072 REV. A

(SFGL2WHES-12-RA-HDC)

DOCUMENT TITLE:

SPECIFICATION

OF

LCD MODULE TYPE

CUSTOMER	
MODEL NUMBER	**8815P02072**
CUSTOMER APPROVAL	
DATE	

DEPARTMENT	NAME	SIGNATURE	DATE
PREPARED BY	LIANG YUN		2012.11.29
CHECKED BY	ZHANG LIANG RONG		2012.11.29
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DOCUMENT REVISION HISTORY 1:

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A	2012.11.29	First Release.	LIANG YUN	ZHANG LIANG RONG

CONTENTS

Specification of LCD Module Type
Item No.: 8815P02072

1. General Description

- 240 x 128 Dots STN grey Positive Transflective Dot Matrix LCD Module.
- Viewing Angle: 12 O'clock direction.
- Driving duty: 1/128 Duty, 1/12 bias.
- RA6963C LCD Controller or equivalent. (SMT)
- SDN8080G Driver or equivalent. (COB)
- Power Supply: +5.0V.
- DC-DC IC built in temperature compensation circuit.
- Quartz crystal resonator.
- White backlight. (Side LED)

2. Mechanical Specifications

The mechanical detail is shown in Fig. 1 and summarized in Table 1 below.

Table 1

Parameter	Specifications	Unit
Outline dimensions	144.0(L) x 104.0(W) x 14.3MAX(H)	mm
Viewing area	114.0 (L) x 64.0(W)	mm
Display format	240 x 128	dots
Dot size	0.43(L) x 0.43(W)	mm
Dot spacing	0.02(L) x 0.02(W)	mm
Dot pitch	0.45(L) x 0.45(W)	mm

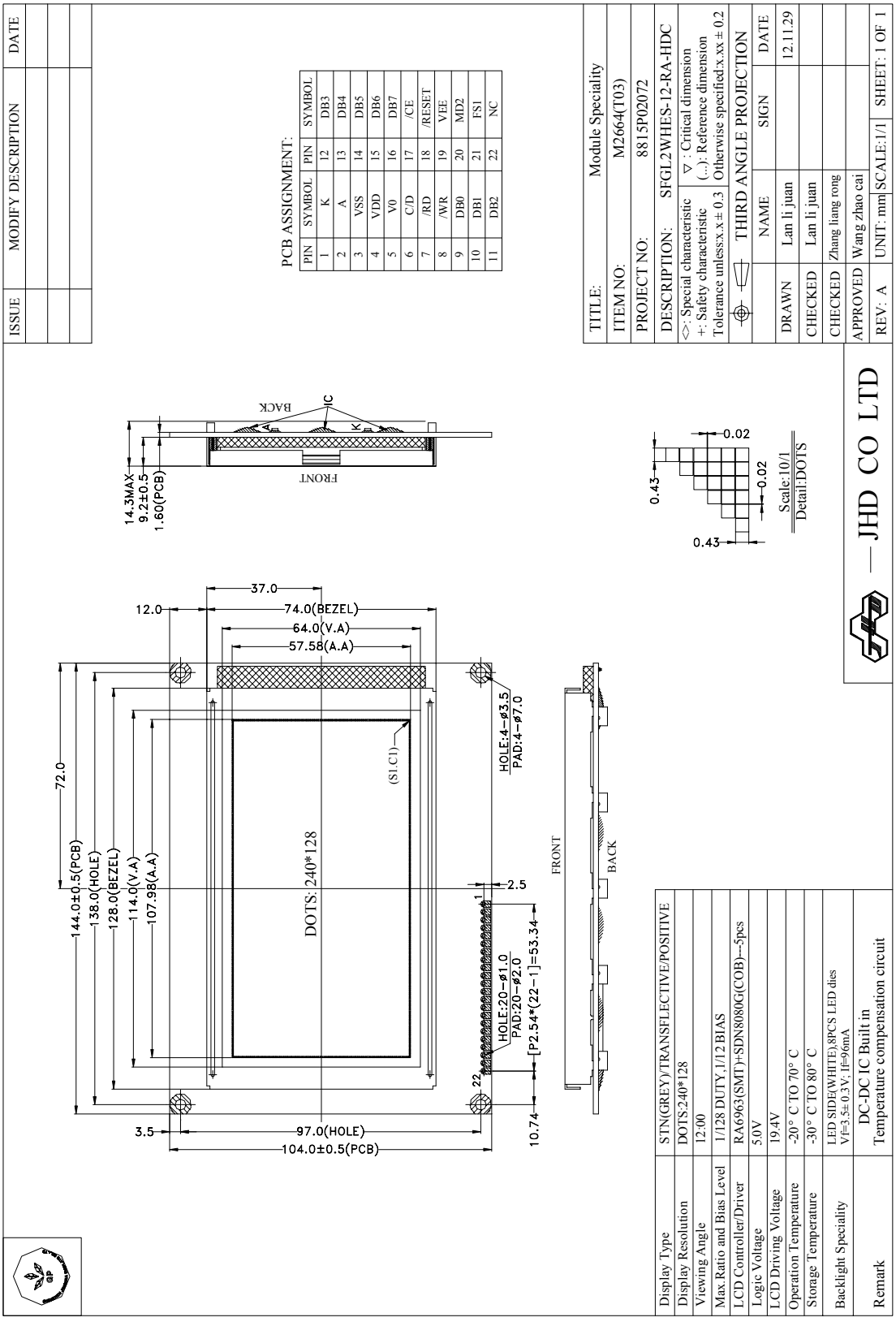


Figure 1: Module Specification

3. Interface signals

Table 2

<table>
<tr><th>Pin No.</th><th>Symbol</th><th>Description</th></tr>
<tr><td>1</td><td>K</td><td>Cathode of the backlight.</td></tr>
<tr><td>2</td><td>A</td><td>Anode of the backlight.</td></tr>
<tr><td>3</td><td>VSS</td><td>Ground. (0V)</td></tr>
<tr><td>4</td><td>VDD</td><td>Power supply for logic.</td></tr>
<tr><td>5</td><td>V0</td><td>External bias voltage for LCD driver.</td></tr>
<tr><td>6</td><td>C/D</td><td>Command/Data Select or Register Select
This is a Data or Command select signal.
<table>
<tr><th>C/$\overline{D}$</th><th>$\overline{WR}$ = Low</th><th>$\overline{RD}$ = Low</th></tr>
<tr><td>High</td><td>Command Write</td><td>Status Read</td></tr>
<tr><td>Low</td><td>Data Write</td><td>Data Read</td></tr>
</table></td></tr>
<tr><td>7</td><td>/RD</td><td>Read Control
RD is a data read signal. When Low, MPU read data from RA6963.</td></tr>
<tr><td>8</td><td>/WR</td><td>Write Control
WR is a data write signal. When Low, MPU write data into RA6963.</td></tr>
<tr><td>9</td><td>DB0</td><td>Data bus.</td></tr>
<tr><td>10</td><td>DB1</td><td>Data bus.</td></tr>
<tr><td>11</td><td>DB2</td><td>Data bus.</td></tr>
<tr><td>12</td><td>DB3</td><td>Data bus.</td></tr>
<tr><td>13</td><td>DB4</td><td>Data bus.</td></tr>
<tr><td>14</td><td>DB5</td><td>Data bus.</td></tr>
<tr><td>15</td><td>DB6</td><td>Data bus.</td></tr>
<tr><td>16</td><td>DB7</td><td>Data bus.</td></tr>
<tr><td>17</td><td>/CE</td><td>Chip Enable
This s chip enable of RA6963. When MPU communicate with RA6963, this pin must be Low.</td></tr>
<tr><td>18</td><td>/RESET</td><td>Reset pin. There is a RC reset circuit inside.</td></tr>
<tr><td>19</td><td>VEE</td><td>Power supply.</td></tr>
<tr><td>20</td><td>MD2</td><td>Columns Selection（MD3 = High, inside）
<table>
<tr><td>MD2</td><td>H</td><td>L</td><td>H</td><td>L</td></tr>
<tr><td>MD3</td><td>H</td><td>H</td><td>L</td><td>L</td></tr>
<tr><td>Columns</td><td>32</td><td>40</td><td>64</td><td>80</td></tr>
</table></td></tr>
<tr><td>21</td><td>FS1</td><td>Font Selection（FS0 = Low, inside）
<table>
<tr><td>FS0</td><td>H</td><td>L</td><td>H</td><td>L</td></tr>
<tr><td>FS1</td><td>H</td><td>H</td><td>L</td><td>L</td></tr>
<tr><td>Font</td><td>5 X 8</td><td>6 X 8</td><td>7 X 8</td><td>8 X 8</td></tr>
</table></td></tr>
<tr><td>22</td><td>NC</td><td>No connection.</td></tr>
</table>

4. Absolute Maximum Ratings

4.1 Electrical Maximum Ratings (Ta = 25 ºC)

Table 3

Parameter	Symbol	Min.	Max.	Unit
Power Supply voltage (Logic)	V_{DD} (Note)	-0.3	+7.0	V
Input Voltage	V_{IN} (Note)	-0.3	V_{DD}+0.3	V

Note:

Referenced to V_{SS}=0V.

4.2 Environmental Condition

Table 4

Item	Operating Temperature (Topr)		Storage Temperature (Tstg)		Remark
	Min.	Max.	Min.	Max.	
Ambient Temperature	-20°C	+70°C	-30°C	+80°C	Dry

5. Electrical Specifications

5.1 Typical Electrical Characteristics

At Ta = 25 °C, V_{DD} = 5.0±0.2V, V_{SS}=0V.

Table 5

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Supply voltage (Logic)	V_{DD}-V_{SS}		4.8	5.0	5.2	V
Supply voltage (LCD)	V_{LCD}=V_{EE}-V_{SS}	V_{DD} =+5.0V, Note 1	19.1	19.4	19.7	V
Input signal voltage	V_{IH}	"H" level	VDD-2.2	-	VDD	V
	V_{IL}	"L" level	0	-	0.8	V
Output voltage	V_{OH}	"H" level	VDD-0.3	-	VDD	V
	V_{OL}	"L" level	0	-	0.3	V
Supply Current (Logic)	I_{DD}	Note 1	-	23.0	34.5	mA
Supply voltage for Backlight	V_{LED}	Forward current=96mA Lv≥400cd/m^2	3.2	3.5	3.8	V

Note 1: There is tolerance in optimum LCD driving voltage during production and it will be within the specified range.

5.2 Timing Specifications

At Ta = -20 °C To +70 °C, V_{DD} = 5.0±0.2V, V_{SS} = 0V.

Refer to Fig. 2, the bus-timing diagram for MPU Interface Timing

Table 6

Item	Symbol	Test Conditions	Min.	Max.	Unit
C/$\overline{D}$ Set Up Time	t_{CDS}	--	100	--	ns
C/$\overline{D}$ Hold Time	t_{CDH}	--	10	--	ns
$\overline{CE}$, $\overline{RD}$, $\overline{WR}$ Pulse Width	t_{CE}, t_{RD}, t_{WR}	--	80	--	ns
Data Set Up Time	t_{DS}	--	80	--	ns
Data Hold Time	t_{DH}	--	40	--	ns
Access Time	t_{ACC}	--	--	150	ns
Output Hold Time	t_{OH}	--	10	50	ns

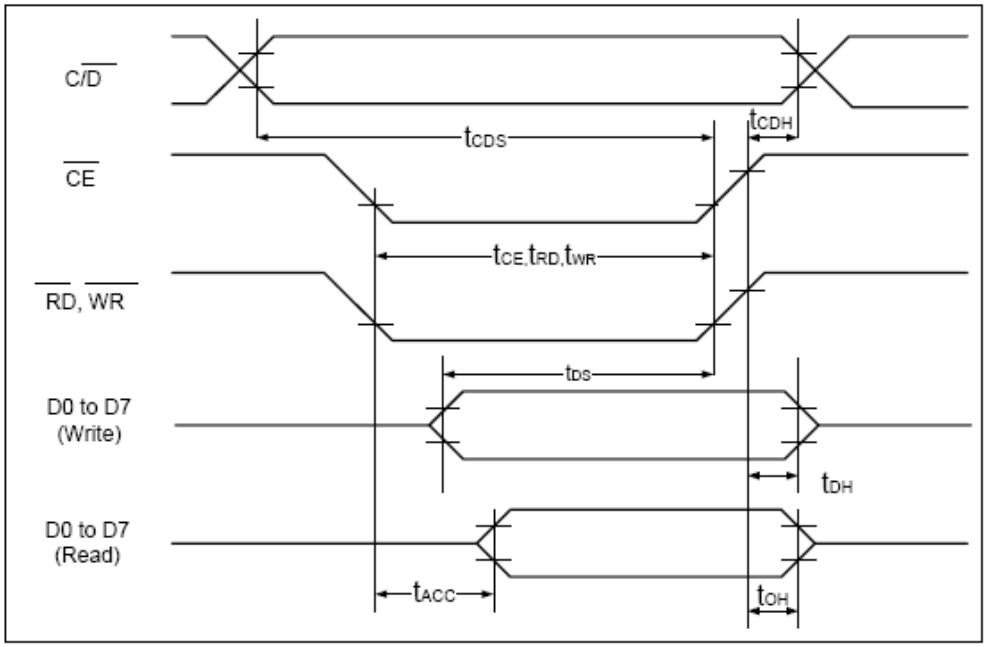


Figure 2: MPU Interface Timing

At Ta = -20 °C To +70 °C, V_{DD} = 5.0V±0.2V, V_{SS} = 0V.
Refer to Fig. 3, the bus-timing diagram for Driver Interface Timing.

Table 7

Item	Symbol	Test Conditions	Min.	Max.	Unit
Operating Frequency	f_{SCP}	Ta = -20~70℃	--	9	MHz
SCP Pulse Width	t_{CWH}, t_{CWL}	--	150	--	ns
SCP Rise/Fall Time	t_r,t_f	--	--	30	ns
LP Setup Time	t_{LSU}	--	150	290	ns
LP Hold Time	t_{LHD}	--	5	40	ns
Data Setup Time	t_{DSU}	--	170	--	ns
Data Hold Time	t_{DHD}	--	80	--	ns
FR Delay Time	t_d	--	0	90	ns
CDATA Setup Time	t_{CSU}	--	450	850	ns
CDATA Hold Time	t_{CHD}	--	450	950	ns

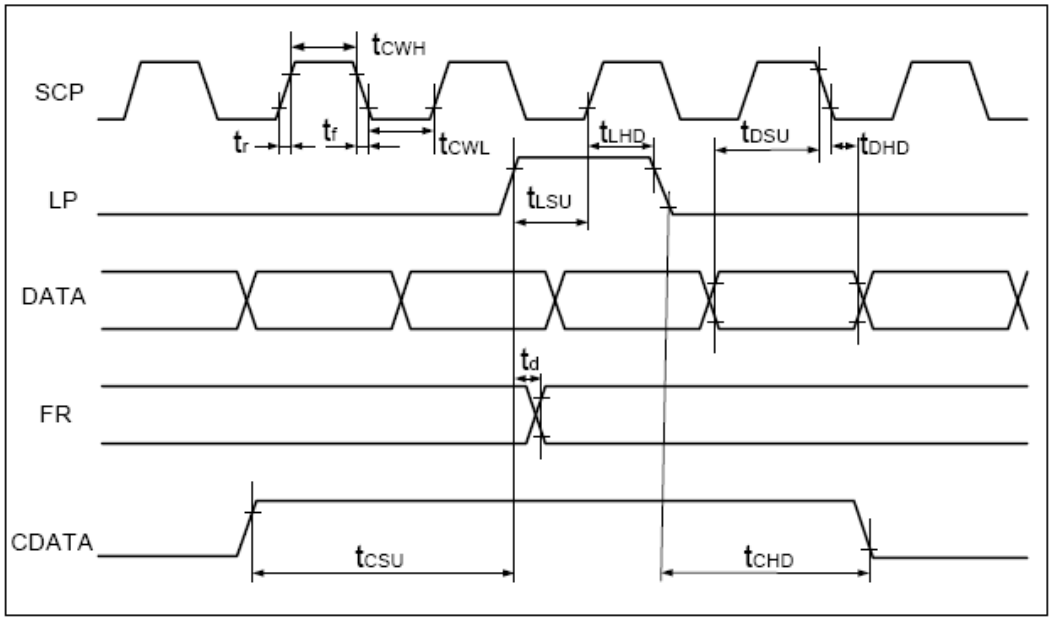


Figure 3: Driver Interface Timing

At Ta = -20 °C To +70 °C, V_{DD} = 5.0V±0.2V, V_{SS} = 0V.
Refer to Fig. 4 the bus timing diagram for External Memory Interface.

Table 8

Item	Symbol	Test Conditions	Min.	Max.	Unit
Address Delay Time	t_{d1}	--	--	250	ns
$\overline{MCE}$ Fall Delay Time(Read)	t_{d2}	--	--	180	ns
$\overline{MCE}$ Rise Delay Time(Read)	t_{d3}	--	--	180	ns
Data Setup Time	t_{DS}	--	--	--	ns
Data Hold Time	t_{DH}	--	--	--	ns
$\overline{MCE}$ Fall Delay Time(Write)	t_{d4}	--	--	200	ns
$\overline{MCE}$ Rise Delay Time(Write)	t_{d5}	--	--	200	ns
MRW Fall Delay Time	t_{d6}	--	--	180	ns
MRW Rise Delay Time	t_{d7}	--	--	180	ns
Data Stable Time	t_{d8}	--	--	450	ns
Data Hold Time	t_{d9}	--	--	200	ns

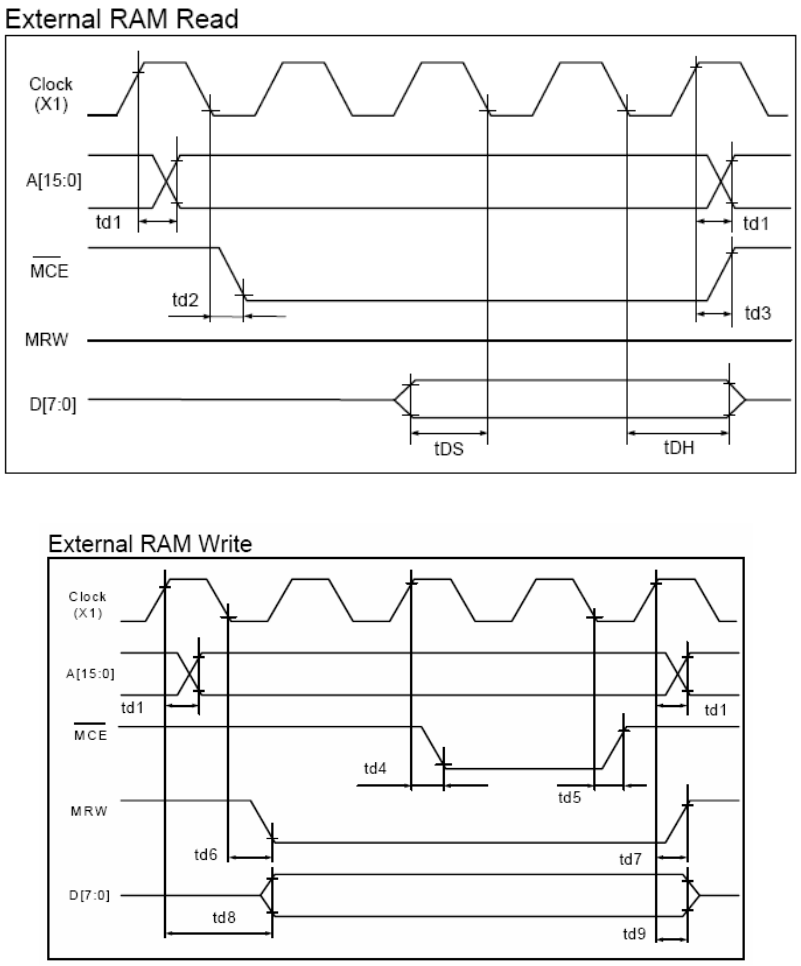


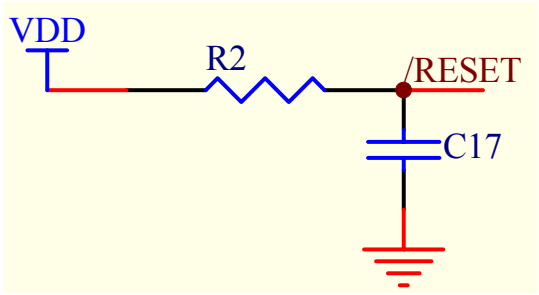
Figure 4: External Memory Interface

At Ta = -20 °C To +70 °C, V_{DD} = 5.0V±0.2V, V_{SS} = 0V.
Refer to Fig. 5 the bus timing diagram for reset timing.

Table 9

Item	Symbol	Max.	Typ.	Min.	Unit
Treset	Reset active time	20	-	1	ms
POR (Power-on reset)	There is a RC circuit inside: R2=10KΩ, C17=1uF (Note 1)	-	-	-	-

Note 1: RC circuit:



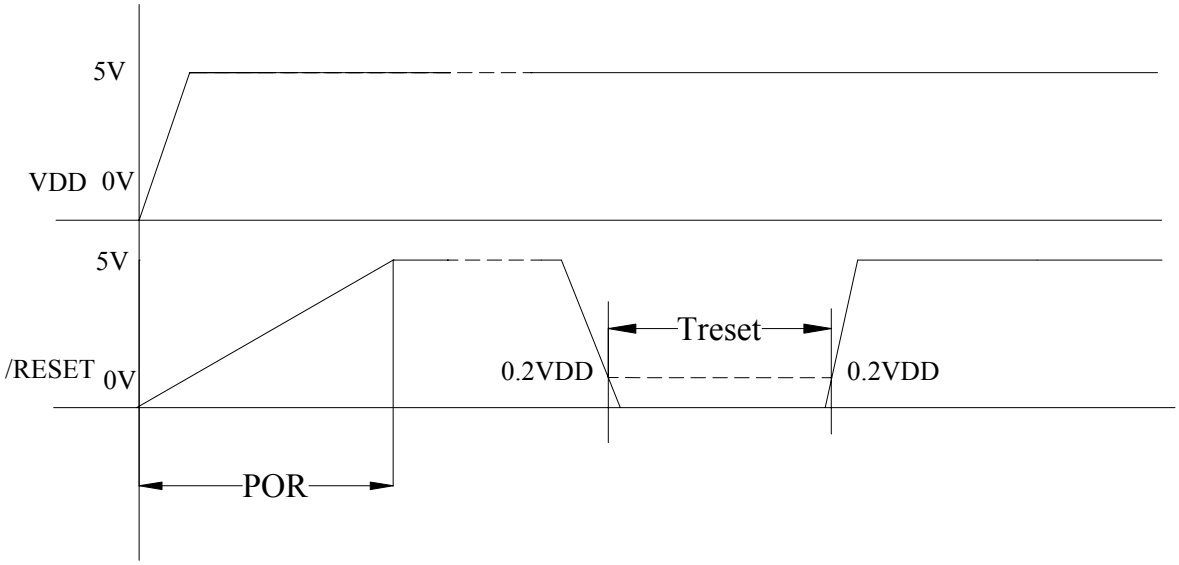


Figure 5: reset timing

6. Quality Units

6.1.0 Purpose

This standard for quality assurance should define the quality of LCD module products to customer by JINGHUA DISPLAYS LTD.

6.2.0 Scope

This document defines general provisions as well as inspection standards for LCD module supplied by JINGHUA DISPLAYS LTD, except of those with special requirements from customer.

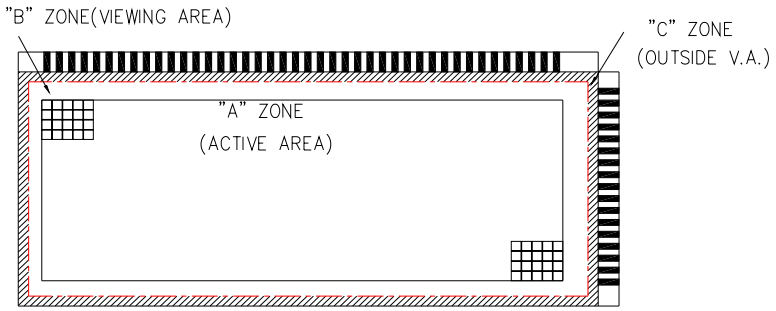
6.3.0 Definition

6.3.1 Definition of area

A Zone: Active area.

B Zone: Viewing area.

C Zone: Outside Viewing area.



6.3.2 Definition of size

Large size(L):1～6 pcs LCD screens are cut out of from each 14” ×16” motherglass.

Middle size(M):7～99 pcs LCD screens are cut out of from each 14” ×16” unit motherglass.

Small size(S):> 99 pcs LCD screens are cut out of from each 14” ×16” unit motherglass.

6.4.0 Quality Specification

6.4.1 Conditions of Inspection

6.4.1.1 Tests should be conducted under the following conditions:

Ambient temperature: 22±5℃.

Ambient humidity: 65±20%RH.

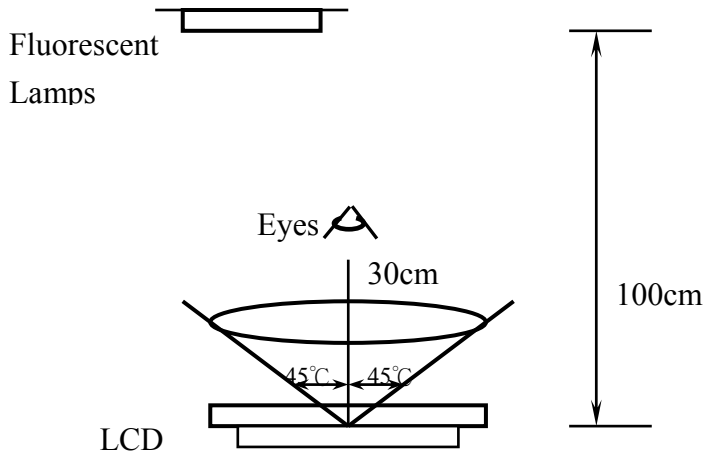
Function Test:

With fluorescent lamps, the light should be under 200Lux, the product should be inspected with 30cm to LCD surface; Viewing direction for inspection is 45° from the product’s view angle;

Cosmetic Inspection:

With fluorescent lamps, the light should be 600~800Lux, the product should be inspected with 30cm to

LCD surface;



6.4.1.2 When test the model of transmissive product must add the reflective plate.

6.4.2 Sampling plan

Unless otherwise agreed in written, the sampling inspection shall be applied to the incoming inspection of customer.

- Lot size: Quantity of shipment lot per model.
- Sampling type: Normal inspection, single sampling.
- Sampling Level: Level II.
- Sampling table: GB/T2828.1. (GB-national standard of China.)

6.4.3 Classification of defects and Acceptable quality level

Defects and classified as either a major or minor defect defined as bellows:

- Major defect: It is a defect that is likely to result in failure or to reduce materially the usability of the product for the intended function.
- Minor defect: It is a defect that will not result in functioning problem with deviation classified.

The AQL for major and minor defects is defined as follows:

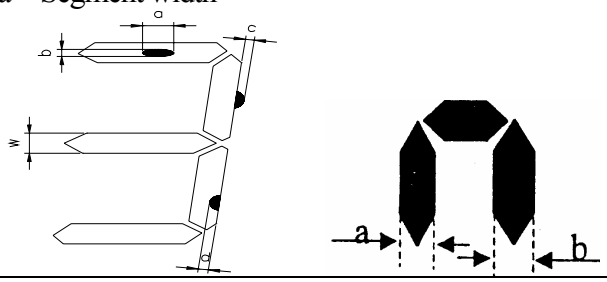
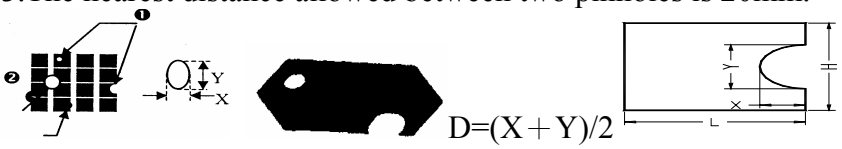
Partition	Definition	AQL
Major defect	Functional defective as product.	0.4
Minor defect	Satisfy all functions as product but not satisfy cosmetic standard.	1.0

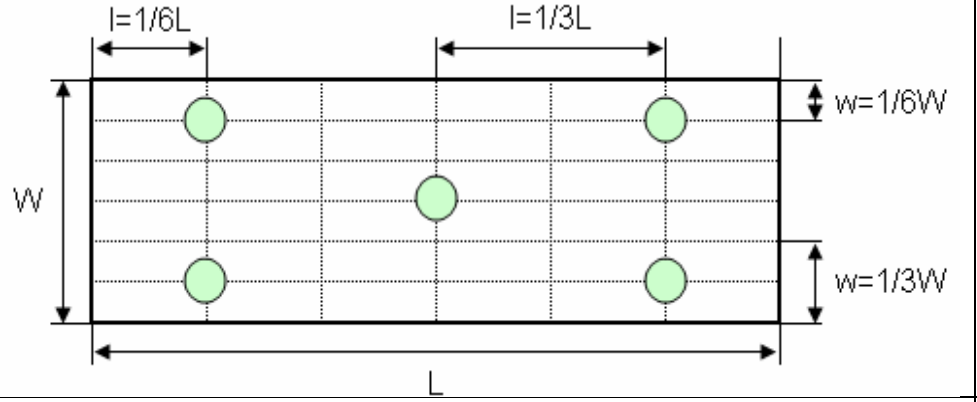
6.4.4 Applicable instrument

- LCD module tester.
- Multi-meter.
- Caliper.
- Defect size filming standard.

6.4.5 Inspection quality criterion

6.4.5.1 Function Inspection：

<table>
<tr><th>Content</th><th>Item</th><th>Inspection list and Standard</th><th>Defect</th></tr>
<tr><td rowspan="13">Display</td><td>1</td><td>LCD cross talk;</td><td>Maj.</td></tr>
<tr><td>2</td><td>Segment missing, line missing,</td><td>Maj.</td></tr>
<tr><td>3</td><td>Display uniformity not good;</td><td>Maj.</td></tr>
<tr><td>4</td><td>No display or display error;</td><td>Maj.</td></tr>
<tr><td>5</td><td>Pattern deformation: segment fatter or smaller.;
Accept if c or d≤1/4—1/5W; or refer to the defect specimen.
W= Segment width
Accept if | a-b | ≤1／4a; or refer to the defect specimen.
a = Segment width
  </td><td>Min.</td></tr>
<tr><td rowspan="11">6</td><td colspan="3">Pinholes: black spot/ white spot at activated state.</td></tr>
<tr><td>Product Type</td><td>Defect Size</td><td>Accept Qt’y</td></tr>
<tr><td>Large Size</td><td colspan="2">Within 1m inspection, the defect is unobvious and not get bigger when display;</td></tr>
<tr><td rowspan="4">Middle Size</td><td>D≤0.15</td><td>Ignorance</td></tr>
<tr><td>0.15＜D≤0.25</td><td>3</td></tr>
<tr><td>0.25＜D≤0.35</td><td>1</td></tr>
<tr><td>0.35＜D</td><td>0</td></tr>
<tr><td rowspan="4">Small Size</td><td>D≤0.15</td><td>Ignorance</td></tr>
<tr><td>0.15＜D≤0.25</td><td>2</td></tr>
<tr><td>0.25＜D≤0.3</td><td>1</td></tr>
<tr><td>0.3＜D</td><td>0</td></tr>
<tr><td colspan="3">1. For the dot pattern: accept if the area of defect is less than or equal to half of one lattice’s.
2. Only allow one defect in one segment.
3.The nearest distance allowed between two pinholes is 20mm.
  </td></tr>
<tr><td>7</td><td>When character displays, the background is deeper or lighter than simple.</td><td>Min.</td></tr>
<tr><td>8</td><td>The color of character is lighter than sample;</td><td>Min.</td></tr>
<tr><td rowspan="3">Back-light</td><td>9</td><td>The light die is death;</td><td>Maj.</td></tr>
<tr><td>10</td><td>When working, the light is flashing;</td><td>Maj.</td></tr>
<tr><td>11</td><td>The backlight does not work or the color is wrong;</td><td>Maj.</td></tr>
</table>

	12	When working, the obvious gridding is visual;	Min
	13	The uniformity inspection: As followed picture, we use the 5-points test method to confirm the uniformity, the standard is: Min/Max≥70%; Average both length and width to 6 parts, and test points as followed(green points): 	Min
Others	14	The product model does not match the specification;	Maj.
	15	LCD view angle does not match the specification;	Maj.
	16	The color is obviously different;	Min

6.4.5.2 Final Assembly cosmetic inspection

Content	Item	Inspection list and Standard	Defect
Final Assembly cosmetic inspection	1	The product structure should match the specification. It can not be titled or loosed;	Maj.
	2	The silica gel of LCD can not be over the upper polarizer;	Maj.
	3	When heating, the touch area of PAD/ ITO between two parts should be≧1/2w (eg: FFC to PCB; FFC to FFC)	Maj.
	4	The product holder is tilted(can not be assembled) or cracked;	Maj.
	5	Polarizer scalded: the protect film can not be torn off or can be seen in view area;	Maj.
	6	The size of LCM does not match the drawing;	Maj.
	7	The height of silica gel can not be over the upper polarizer;	Min
	8	The tape should not be missing;	Min
	9	The label should follow the specification, and should be sticked in right position and can not be missing;	Min
	10	The label can be scanned, and the ink can not be off easily;	Min

6.4.5.3 LCD cosmetic inspection:

Content	Item	Inspection list and Standard	Defect
L C D	1	Crack on LCD: not accept;	Maj.
	2	LCD rainbow;(compare with the sample)	Min
	3	The spot in LCD:	Min

①A 区
①Zone A:

Product Type	Defect Size	Accept Qt'y
Positive Large Size	Within 1m inspection, the defect is unobvious and not get bigger when display;	
Positive Middle Size	D≤0.15	Ignorance
	0.15＜D≤0.25	3
	0.25＜D≤0.35	1
Positive Small Size	D≤0.15	Ignorance
	0.15＜D≤0.25	2
	0.25＜D≤0.3	1
	D＞0.3	0
Negative Large Size	D≤0.15	Ignorance
	0.15＜D≤0.3	4
	0.3＜D≤0.5	1
	D＞0.5	0
Negative Middle Size	D≤0.15	Ignorance
	0.15＜D≤0.3	3
	D＞0.3	0
Negative Small Size	D≤0.15	Ignorance
	0.15＜D≤0.25	3
	D＞0.25	0

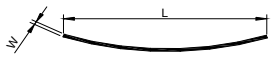
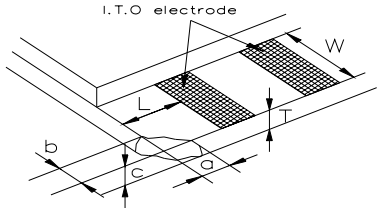
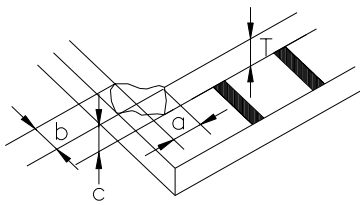
②Zone B: the defect size is 1.5 times than Zone A;
③Zone C: Ignore the spot defect;
The distance between two defect should longer than 20mm;

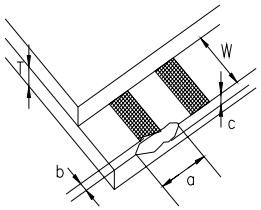
D=(X+Y)/2

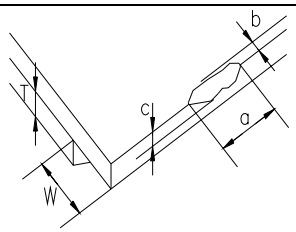
4 The scratch / line defect on LCD or polarizer — Min

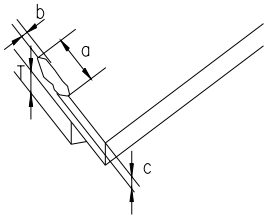
①Zone A:

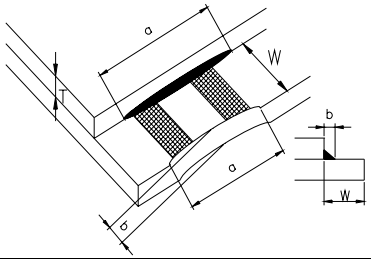
Product Type	Defect Width	Defect Length	Accept Qt'y
Positive Large Size	Within 1m inspection, the defect is unobvious and not get bigger when display;		
Positive Middle Size	W≤0.02	/	Ignorance
	0.02＜W≤0.03	L≤4	2
	0.02＜W≤0.03	L>4	0
	0.03＜W≤0.05	L≤3	2
	0.03＜W≤0.05	L>3	0
	W＞ 0.05	/	Same as the spot
Positive Small Size	W≤0.02	/	Ignorance
	0.02＜W≤0.03	L≤4	2

		0.02＜W≤0.03	L>4	0	
		0.03＜W≤0.05	L≤2	2	
		0.03＜W≤0.05	L>2	0	
		W＞ 0.05	/	Same as the spot	
	Negative Large Size	W≤0.02	/	Ignorance	
		0.02＜W≤0.03	L≤5	3	
		0.02＜W≤0.03	L>5	0	
		0.03＜W≤0.05	L≤4	2	
		0.03＜W≤0.05	L>4	0	
		W＞ 0.05	/	Same as the spot	
	Negative Middle Size	W≤0.02	/	Ignorance	
		0.02＜W≤0.03	L≤4	2	
		0.02＜W≤0.03	L>4	0	
		0.03＜W≤0.05	L≤2	2	
		0.03＜W≤0.05	L>2	0	
		W＞ 0.05	/	Same as the spot	
	Negative Small Size	W≤0.02	/	Ignorance	
		0.02＜W≤0.03	L≤3	2	
		0.02＜W≤0.03	L>3	0	
		0.03＜W≤0.05	L≤2	1	
		0.03＜W≤0.05	L>2	0	
		W＞ 0.05	/	Same as the spot	
	②Zone B: the defect size is 1.5 times than Zone A; ③Zone C: Ignore the spot defect; The distance between two defect should longer than 20mm; 				
5	Chipped glass on corner:  ITO side  Others				Min
	Zone	a	b	c	Acc Qt'y
	ITO side	a≤5mm(L≥5mm)	b≤W	c≤T	3
		a<L(L<5mm)	b≤W	c≤T	3
	Others	not exceed 1/2 width of seal		c≤T	3
6	Glass chip on edge				Min

<table>
<tr><td></td><td></td><td>


ITO touch side


ITO back side


Others
<table>
<tr><th>Zone</th><th>a</th><th>b</th><th>c</th><th>Acc Qt’y</th></tr>
<tr><td>ITO touch side(COG and TAB)</td><td>a≤3mm(and not exceed 4 ITO terminal</td><td>b≤W/5</td><td>c≤1/2T(T＞0.7mm) c≤T(T≤0.7mm)</td><td>3</td></tr>
<tr><td>ITO touch side(except COG and TAB)</td><td>a≤4mm(and not exceed 4 ITO terminal</td><td>b≤W/4</td><td>c≤T</td><td>3</td></tr>
<tr><td>ITO back side(COG and TAB)</td><td>a≤3mm</td><td>b≤1/4W</td><td>c≤3/4T(T＞0.7mm) c≤T(T≤0.7mm)</td><td>3</td></tr>
<tr><td>ITO back side(except COG and TAB)</td><td>a≤5mm</td><td>b≤1/3W</td><td>C≤T</td><td>3</td></tr>
<tr><td>Others</td><td>a≤5mm</td><td>Not exceed 1/2 width of seal</td><td>c≤T</td><td>3</td></tr>
</table>
</td><td>Min</td></tr>
<tr><td></td><td>7</td><td>Extended crack inspector shall attempt to remove the chip with tweezers, re-evaluate if the remaining defect is still a crack or a chip:
b≤1/4W, accept Qt’y: 2 ;
 
</td><td></td></tr>
<tr><td>C
O
G</td><td>8</td><td>The silica gel is missing;</td><td>Maj.</td></tr>
<tr><td></td><td>9</td><td>The FPC is open, short;</td><td>Maj.</td></tr>
<tr><td></td><td>10</td><td>The protection for COG ITO: ITO should be fully cover with silica gel and the height of silica should not over the LCD upper side, and the width should not overrun the side of LCD;(If there is special command, follow it)
No dust or foreign in this zone;</td><td>Min.</td></tr>
<tr><td></td><td>11</td><td>The gobo tape should totally cover IC;</td><td>Min.</td></tr>
</table>

		The bubble under tape should less than 0.5mm;	
	12	Missing the gobo tape/ silica gel/ protect tape etc.	Min.
Polarizer	13	Bubble under polarizer: Zone A: it is visual at 30cm inspection; Zone B: ignorance;	Min.
	14	The size or position of polarizer can not match the drawing; It should cover the view zone and can not exceed the edge of LCD or cover the ITO;	Min.
Silk	15	The silk is discontinuous;	Min.
	16	Burr: Reject if the thick or thin is more than 1/4W	Min.
	17	Spot/ pinhole: same as the spec of LCD pinhole;	Min.
	18	Reject if the thick or thin is more than 1/2W. (W: normal width)	Min.
	19	The width of silk is not uniformity: Reject when Wmax—Wmin>1/3W.	Min.
Others	20	Wrong assembly direction of LCD;	Maj.
	21	LC leakage;	Maj.
	22	Finger prints/ dirty on LCD surface;	Min.

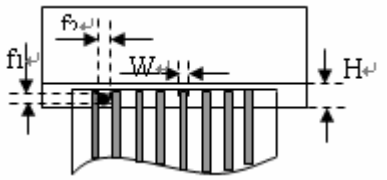
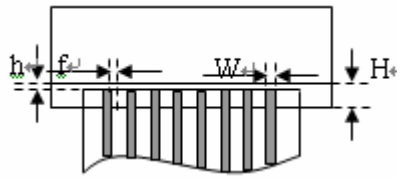
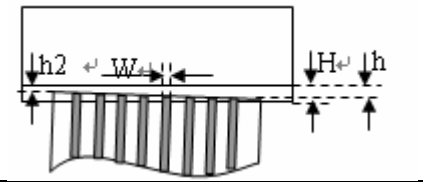
6.4.5.3 PCBA Cosmetic Inspection

Content	Item	Inspection list and Standard	Defect
P C B A	1	The connecting finger of COB can not be leaked outside;	Maj
	2	The pinholes is deep to IC: not accept;	Maj.
	3	The surface of COB can not be scratched;	Min.
	4	The diameter of pinholes on Cob surface should be under 0.2mm; And there is no foreign;	Min.
	5	The height of COB should match the specification;	Min.
	6	The glue should be inside of PCB silk-circle;	Min.
	7	If there is some tin remained at the screw hole, it should be removed to make the hole surface smooth;	Min.
	8	The solder standard: IPC-610D;	/

6.4.5.4 Bezel Inspection

Content	Item	Inspection list and Standard	Defect
Bezel	1	The material, surface processing, color should match the specification;	Maj.
	2	The holder of bezel is cracked;	Maj.
	3	Wrong twist direction;	Maj.
	4	The bezel should not be oxydic, bended, deformed, finger prints, oil, dirty etc…	Maj.
	5	The bezel can not be scratched to the inner material;	Min.
	6	The burr can not exceed into view area;	Min.
	7	The angle of holder should be 30°～70°;If the copper is shaved, it should be cleaned;	Min.

6.4.5.5 Connector Inspection

Content	Item	Inspection list and Standard	Defect
TCP/FPC	1	The pin should not be oxydic, dirty, bended, cracked;	Maj.
	2	TCP IC broken or torn off from LCD;	Maj.
	3	FPC/TCP broken (The circuit is broken)	Maj.
	4	The holder board should be sticked closely and the size should match the specification;	Min.
	5	FPC/TCP broken (The circuit is OK)	Min.
Heat Seal Connector	6	Heat Seal Connector broken (The circuit is broken);	Maj.
	7	Silica gel is missing; (If there is no special request from customer, the connecting area should be project by silica gel)	Maj.
	8	Heat Seal: foreign or bubble: the connecting area should be under≦1/2 ITO (But if it make the surface not smooth, it is not accept)  Heat position not perfect matched: f≤1/3W,h≤1/4H: accept  Not horizontal: ｜h2-h1｜≤1/8H: accept;  	Maj.
	9	Pull test and remain inspection: 1.Test the force of pulling the heat seal connector instantly; It should be > 500g.f/cm ×L (L: the length of connecting, CM); 2.After tearing, 70% of heal seal connector remains on every ITO of LCD;	Maj.
	10	Heat Seal Connector broken (The circuit is OK);	Min.
	11	Heat Seal Connector is dirty;	Min.
Connector (Pin)	12	Connector is loose;	Maj.
	13	The pin is tilted, and can not be assembled;	Maj.
	14	Connector is broken, and can not be assembled;	Maj.

6.4.5.6 Others

Content	Item	Inspection list and Standard	Defect
Back-light	1	The size should match the specification;	Maj.
	2	Back-light is broken or cracked, bended;	Maj.
	3	The standard of spots/ scratches is the same as LCD;	Min.
Glue	5	According the drawing and sample, check all the glue is OK or not;	Maj.
	6	The quantity of glue is not enough;	Min.
	7	The color of glue does not match the BOM or sample;	Maj.

6.4.5.7 Special Commands from Customer

If there is some standard need to be discussed or some special command, it should be confirmed by both customer and JHD.

6.5.0 Reliability

The LCD module should not fail the following reliability test.

ITEM	Condition		Criterion
High temperature operation	+70℃ 24h		1.Total current consumption should be below double of initial value. 2.Cosmetic defects should not be happened.
Low temperature operation	-20℃ 24h		
Humidity	Storage	40℃ 93%RH 24h	
	Operation	40℃ 93%RH 8h	
High temperature storage	+80℃ 24h		
Low temperature storage	-30℃ 24h		
Thermal shock storage	-20℃→+70℃ 60min→60min 5 cycle		
Vibration (Package state)	50Hz 0.7mm 30min in each direction (X, Y, Z).		
ESD	C=150pF,R=330Ω,5point/panel Air:±8KV,5times; Contact:±6KV,5times (Environment:15℃~35℃, 30%~60%.86Kpa~106Kpa)		
Falling test (Packaged state)	Weight≥15kg; Falling height: 80cm. Weight＜15kg; Falling height: 100cm.		

6.6.Quality Assurance

6.6.1 JINGHUA DISPLAYS will only replace or repair any of its LCD which is found defective electrically or visually when inspected in accordance with the LCM specification, for a period of one year from the date of shipment. Confirmation of such date shall be based on freight documents.
No warranty can be granted if any of the precautions stated in handing LCD and LCD Modules above have been disregarded.

6.6.2 In returning the LCD and LCD Modules, they must be properly packaged and there should be detailed description of the failures or defects. Broken glass, scratches on polarizers, mechanical damages as well as defects that are caused by accelerated environmental tests are excluded from warranty.

6.7. Precautions in Use of LCM

6.7.1 Handling of LCM

6.7.1.1 Don't give external shock.

6.7.1.2 Liquid crystal is chemical hazardous substance. Once the liquid crystal inside it leaks out, be sure not to get any in your mouth. If the liquid is adhered your skin or clothes etc, wash it off using soap and water thoroughly and immediately.

6.7.1.3 Don't apply excessive force on the display surface.

6.7.1.4 Don't scratch and dirty polarizer of covering the display surface of the LCD module.

6.7.1.5 In order to prevent static electricity from destructing, be sure to ware gauntlet that is tested up to grade.

6.7.2. Storage

6.7.2.1 Store in dark places and do not expose to sunlight or fluorescent light. Keep the temperature between 0℃ and 40℃ and the humidity lower than 60%RH. Please consult JINGHUA DISPLAYS LTD. for other storage requirements.

6.7.2.2 Storage in a clean environment, free-dust and well ventilated.

6.7.2.3 Storage in anti-static electricity container.

6.7.3. Soldering

6.7.3.1 The soldering temperature is 260+5℃(with Pb)/ 330+5℃(No Pb) and soldering Time should be less than 3 sec,and soldering iron power should be less than 30w.

6.7.3.2 Re-soldering: no more than 3 times.

6.7.3.3 The soldering point should be further than 1.6 mm from body.

"Shenzhen Jinghua Displays CO.,LTD. reserves the right to change this specification"

- END -