

## LCD MODULE SPECIFICATION

<b>Model:</b>	UE018HV-RB39-A004A
<b>Version:</b>	V1.0
<b>Date:</b>	2025-03-17

### Customer Confirmation

Approved by	Notes

Please return one of the copies of the specification with your signature to us within two weeks after you receive this document. If it is not returned, we will assume that you agree to the entire contents of this specification document.

### VIEWE Confirmation

Prepared by	Reviewed by	Approved by

## REVISION HISTORY

Revision	Date	Contents of Revision Change	Remarks
V1.0	2025-03-17	Preliminary release	

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## 1. GENERAL INFORMATION

Features	Details	Unit
Display Size(Diagonal) 显示尺寸(对角线)	1.85	inch
LCD type 液晶显示屏类型	$\alpha$ -Si TFT	-
Display Mode 显示模式	IPS / Transmissive / Normally Black	-
Resolution 分辨率	360RGB x 360	-
Active Area 显示区	45.68(H)×45.68(V)	mm
Module Outline 模组外形	48.08(H) ×49.95(V)×2.12(T)	mm
Display Colors 显示颜色	262K	-
Interface 接口	MIPI/QSPI/8BIT/SRGB	-
Driver IC 驱动IC	77916	-
TP Viewing Area TP 视窗	46.08(H)×46.08(V)	mm
TP Outline(assembly) TP 外形	55(H) ×55(V)×0.7(T)	mm
Luminance on surface 亮度	400	cd/m <sup>2</sup>
View Direction 视角方向	All	Best image
Contrast ratio 对比度	1200:1	
Color gamut 色域	70%	
PPI 图像点密集度	200	-
Window effect 视窗效果	无一体黑	-
Cover plate surface effect 盖板表面效果	无AF/AG	-
Operating Temperature 工作温度	-20~70	°C
Storage Temperature 储存温度	-30~80	°C
Weight 重量	TBD	g
连接器	OK-F302-39115	

## 2. ABSOLUTE MAXIMUM RATINGS

Item	Symbol	Min.	Max.	Unit	Remark
Power supply voltage	VDD	-0.3	4.6	V	Note1
Power supply voltage	IOVDD	-0.3	4.6	V	Note1
LED forward current	I <sub>F</sub>	-0.001	60	mA	For each led,Note1
LED Reverse Voltage	V <sub>R</sub>	-	3.3	V	For each led,Note1
Operating temperature	T <sub>op</sub>	-20	70	°C	Note1,2
Storage temperature	T <sub>st</sub>	-30	80	°C	Note1,2
Humidity	H <sub>st</sub>	10	90	%RH	Note1,3

(Ta=+25°C,GND=0V)

Note1:If the module exceeds the absolute maximum ratings, it may be damaged permanently. Also if the module operates with the absolute maximum ratings for a long time, the reliability may drop.

Note2: In case of temperature below 0°C,the response time of liquid crystal (LC) becomes slower and the color of panel darker than normal one.

Note3: Temp. ≤ 60°C , 90% RH MAX.

Temp. > 60°C , Absolute humidity shall be less than 90% RH.



## 4. I/O CONNECTION

NO	SYMBOL	FUNCTION																																													
1	GND	Power Ground																																													
2	LEDK	LED Cathode																																													
3	LEDA	LED Anode																																													
4	GND	Power Ground																																													
5	CP	MIPI-DSI clock lane positive-end input pin																																													
6	CN	MIPI-DSI clock lane negative-end input pin																																													
7	GND	Power Ground																																													
8	D0P	MIPI-DSI data lane positive-end input pin. (Data lane 0 positive polarity))																																													
9	D0N	MIPI-DSI data lane negative-end input pin.(Data lane 0 negative polarity)																																													
10	GND	Power Ground																																													
11	IM0	<table><tr><th>IM2</th><th>IM1</th><th>IM0</th><th>MPU Interface Mode</th><th>Data pin</th></tr><tr><td>0</td><td>0</td><td>0</td><td>3-line 9bit serial I/F</td><td>SDA: in/out</td></tr><tr><td>0</td><td>0</td><td>1</td><td>MIPI_3-line 9bit serial I/F</td><td>SDA: in/out DP/DN</td></tr><tr><td>0</td><td>1</td><td>0</td><td>2 data lane serial I/F</td><td>SDA1: in/out SDA2: in</td></tr><tr><td>0</td><td>1</td><td>1</td><td>QSPI I/F</td><td>SDA[3:0]: in/out</td></tr><tr><td>1</td><td>0</td><td>0</td><td>RGB_3-line 9bit serial I/F</td><td>SDA: in/out DB[5:0]: out</td></tr><tr><td>1</td><td>0</td><td>1</td><td>RGB_4-line 8bit serial I/F</td><td>SDA: in/out DB[5:0]: out</td></tr><tr><td>1</td><td>1</td><td>0</td><td>4-line 8bit serial I/F</td><td>SDA: in/out</td></tr><tr><td>1</td><td>1</td><td>1</td><td>80-8bit parallel I/F</td><td>DB[7:0]</td></tr></table>	IM2	IM1	IM0	MPU Interface Mode	Data pin	0	0	0	3-line 9bit serial I/F	SDA: in/out	0	0	1	MIPI_3-line 9bit serial I/F	SDA: in/out DP/DN	0	1	0	2 data lane serial I/F	SDA1: in/out SDA2: in	0	1	1	QSPI I/F	SDA[3:0]: in/out	1	0	0	RGB_3-line 9bit serial I/F	SDA: in/out DB[5:0]: out	1	0	1	RGB_4-line 8bit serial I/F	SDA: in/out DB[5:0]: out	1	1	0	4-line 8bit serial I/F	SDA: in/out	1	1	1	80-8bit parallel I/F	DB[7:0]
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1	1	1	80-8bit parallel I/F	DB[7:0]																																											
12	IM1																																														
13	IM2																																														
14	IOVCC	Power Supply for logic, VDDIO= 1.65V~3.3V.																																													
15	VCC	Power Supply for Analog, VDD=2.4V~3.3V																																													
16	VS	Vertical (Frame) synchronizing input signal in RGB interface																																													
17	HS	Horizontal (Line) synchronizing input signal in RGB interface																																													
18	TE	Tearing effect output pin to synchronize MCU to frame writing. This pin is low																																													
19	RESET	This signal low will reset the device and must be applied to properly initialize the																																													
20	GND	Power Ground																																													
21	D7	Data signal for DBI Type B mode																																													
22	D6	Data signal for DBI Type B mode																																													
23	D5	Data signal for DBI Type B mode																																													

24	D4	Data signal for DBI Type B mode
25	D3(SDA3)	Data signal for DBI Type B mode
26	D2(SDA2)	Data signal for DBI Type B mode
27	D1(SDA1)	Data signal for DBI Type B mode
28	D0(SDA0)	Data signal for DBI Type B mode
29	CS	Chip select pin of DBI Type B mode. Low active.
30	RD(SCL)	Read Control pulse H duration
31	WR	Write enable in MCU parallel interface
32	DCX	Display data/command selection pin in parallel interface
33	GND	Power Ground
34	NC	OPEN
35	NC	OPEN
36	NC	OPEN
37	NC	OPEN
38	NC	OPEN
39	GND	Power Ground

I: Input; O: Output; P: Power



## 5. ELECTRICAL CHARACTERISTICS

### 5.1 TFT-LCD Panel Driving Section

Item	Symbol	Min.	Typ.	Max.	Unit	Remark
Supply Voltage	VDD	2.4	2.8	3.3	V	-
	VCI	2.5	2.8	3.3	V	-
	IOVDD	1.65	1.8/2.8	3.3	V	-
Logic Input High Voltage	V <sub>IH</sub>	0.7*IOVDD	-	IOVDD	V	-
Logic Input Low Voltage	V <sub>IL</sub>	-0.3*IOVDD	-	0.3*IOVDD	V	-
Logic Output High Voltage	V <sub>OH</sub>	0.8*IOVDD	-	-	V	-
Logic Output Low Voltage	V <sub>OL</sub>	-	-	0.2*IOVDD	V	-
Current Consumption	I <sub>vdd</sub>	-	11	-	mA	Normal display
	I <sub>vdd</sub>	-	60	-	uA	Standby mode

(Ta=+25°C,GND=0V)

### 5.2 Back Light Driving Section

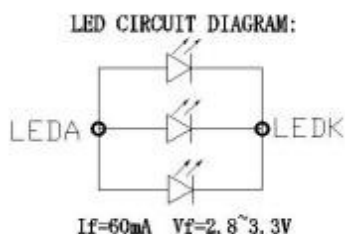
Item	Symbol	Min.	Typ.	Max.	Unit	Remark
Forward Voltage	V <sub>F</sub>	-	3	-	V	Note1
Forward Current	I <sub>F</sub>	-	60	-	mA	Note1
Backlight Power consumption	P <sub>BL</sub>	-	0.18	-	Watt	Note1
LED Quantity		3			PCS	

(Ta=+25°C,GND=0V)

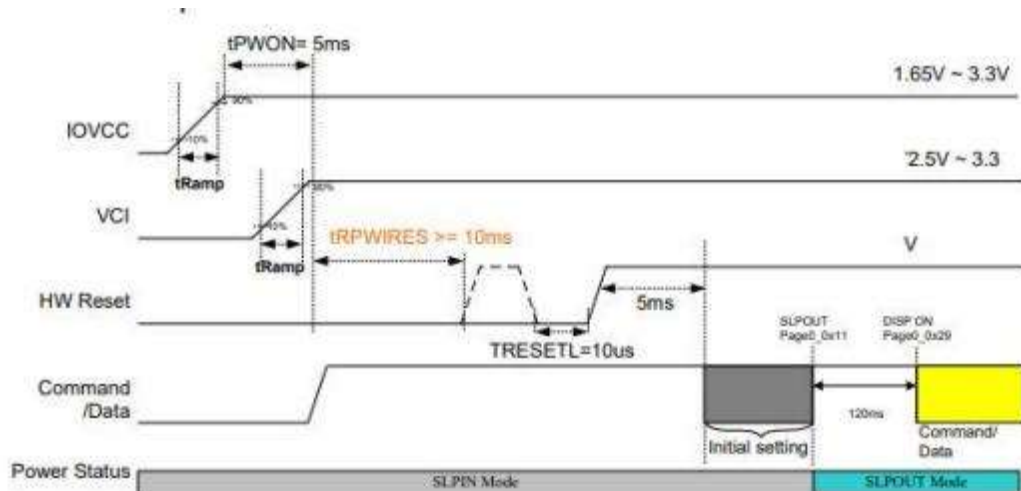
Note1: The LED driving condition is defined for each LED module (3 LED Parallel)。

For each LED : I<sub>F</sub>=20mA,V<sub>F</sub>=3V(Typ.)/3.3V(Max.),Ta=25°C。

Note2:The “LED life time” is defined as the module brightness decrease to 50% of original brightness at I<sub>LED</sub>=20mA(Per Led). The LED life time could be decreased if operating I<sub>LED</sub> is larger than 20mA.

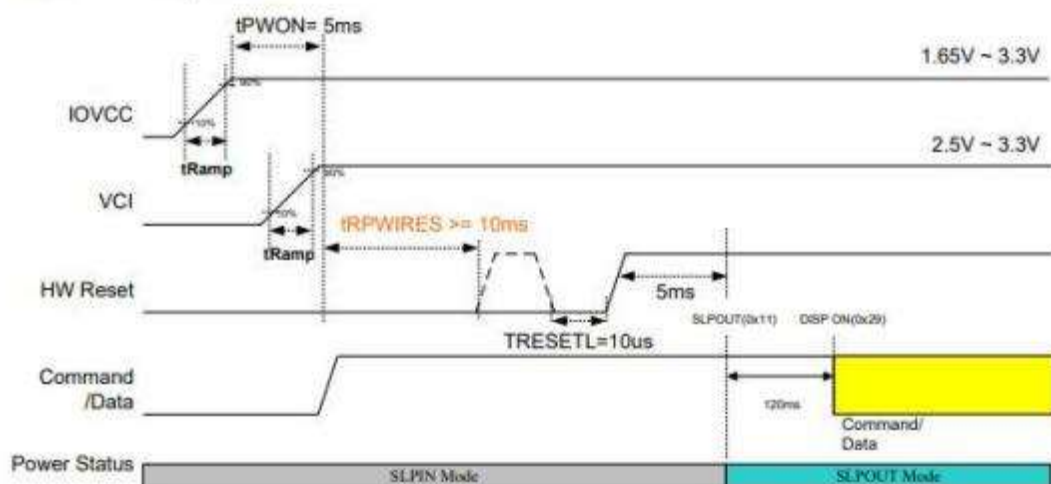


## 5.3 Power On/Off Sequence



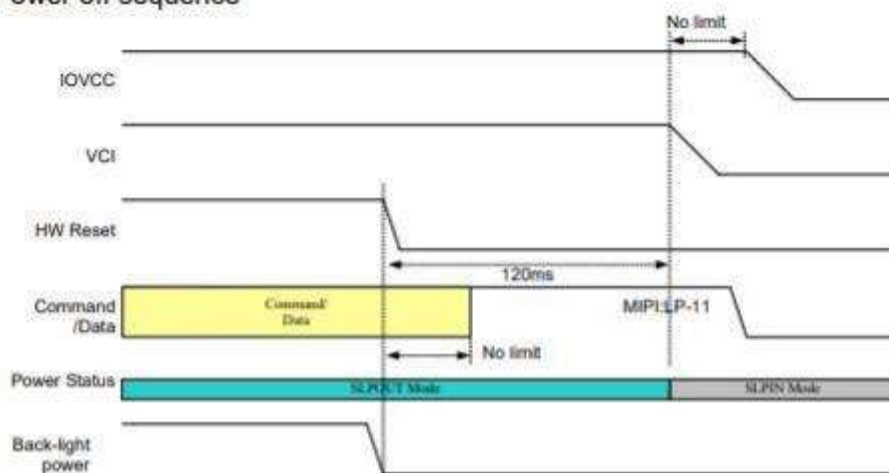
Option2: Host only send SLPOUT and DISP ON

Power on sequence



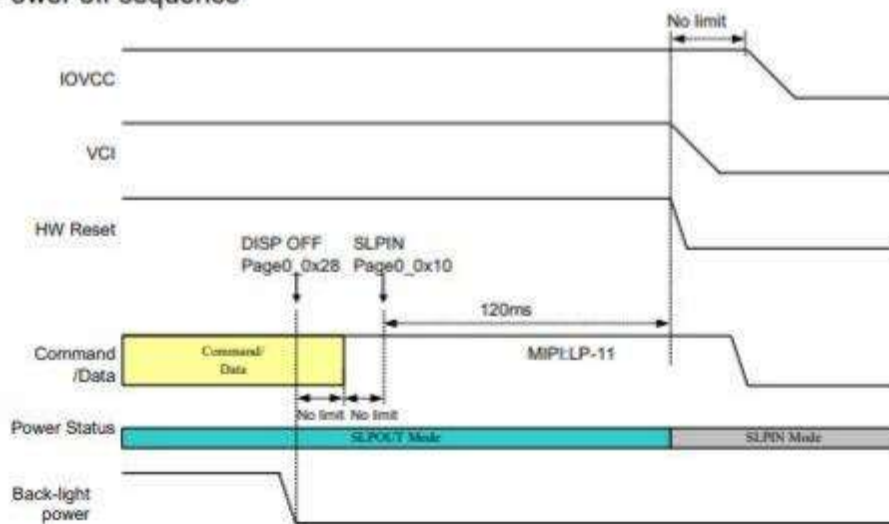
	Min	Typ	Max
Power up tRamp for VCI/IOVCC	0.2mS		20mS

### Power off sequence



### Power Off Option2:

#### Power off sequence



GRB RESET is internal reset, power on automatic reset.。

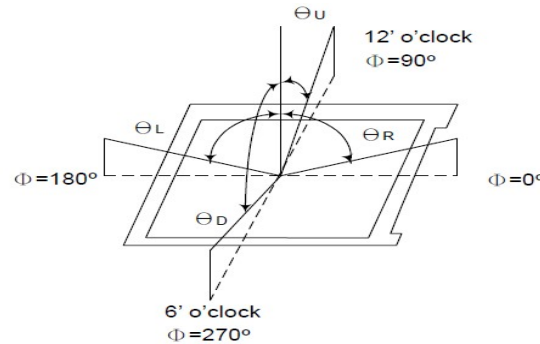
## 6. OPTICAL CHARACTERISTICS

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit	Remark
Luminance on surface( I <sub>f</sub> =20mA)	L <sub>v</sub>	$\theta = 0^\circ$	-	400	-	cd/=m <sup>2</sup>	Note(4)
Contrast Ratio	C/R	$\theta = 0^\circ$	800	1200	-	-	Note(4)
NTSC Ratio	S	$\theta = 0^\circ$	65	70	-	%	Note(7)
Luminance uniformity	U <sub>w</sub>	$\theta = 0^\circ$	75	80	-	%	Note(3)
Response Time	T <sub>R</sub> + T <sub>F</sub>	25 °C	-	30	35	ms	Note(2)
Color Coordination	W <sub>X</sub>	$\theta = 0^\circ$ (Center) Normal viewing angle B/L On	-0.03	0.297	+0.03	NTSC (x,y)	Note(6)
	W <sub>Y</sub>			0.337			
	R <sub>X</sub>			0.665			
	R <sub>Y</sub>			0.324			
	G <sub>X</sub>			0.273			
	G <sub>Y</sub>			0.594			
	B <sub>X</sub>			0.133			
	B <sub>Y</sub>			0.122			
Viewing Angle	$\theta_L$	C/R>10	80	85	-	Degree	Note(1)
	$\theta_R$		80	85	-		
	$\theta_U$		80	85	-		
	$\theta_D$		80	85	-		

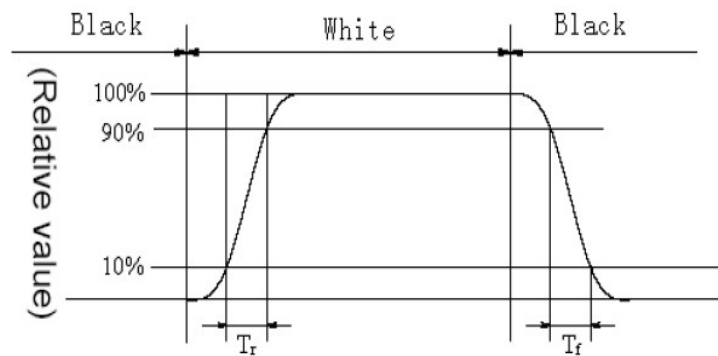
Test Conditions:

1. VDD=3.3V, I<sub>F</sub>=20mA (Backlight current), the ambient temperature is +25°C.
2. The test systems refer to Note 8.

**Note1:** Definition of Viewing Angle: The viewing angle range that the CR>10

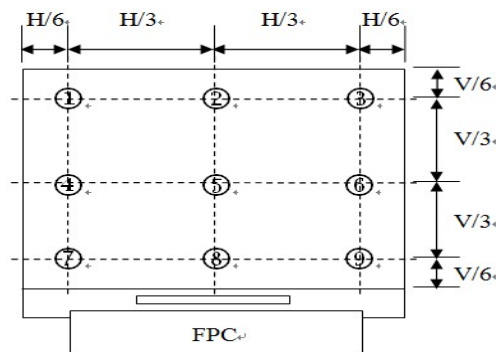


**Note2:** Definition of Response time: Sum of T<sub>R</sub> and T<sub>F</sub>



**Note 3:** Definition of Luminance Uniformity: Active area is divided into 9 measuring areas, every measuring point is placed at the center of each measuring area.

$$\text{Luminance Uniformity} = \frac{\text{Min Luminance of white among 9-points}}{\text{Max Luminance of white among 9-points}} \times 100\%$$



**Note4:** Definition of Contrast Ratio (CR): measured at the center point of panel

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

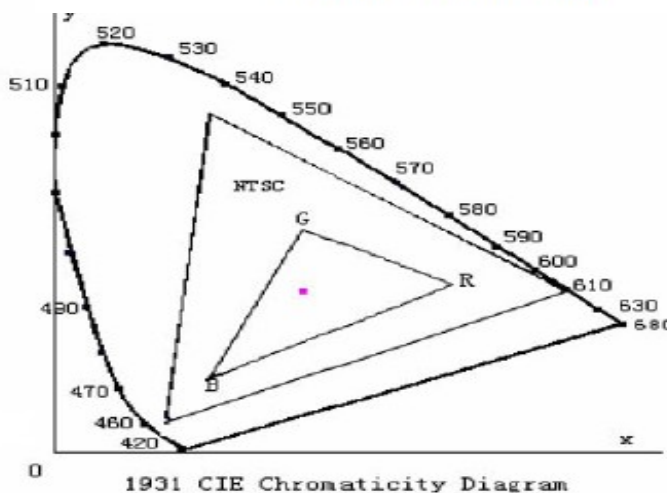
**Note 5:** Definition of Luminance: Center Luminance of white is defined as luminance values of 1point average across the LCD surface.

**Note 6:** Definition of Color Chromaticity (CIE 1931)

Color coordinates of white & red, green, blue measured at center point of LCD.

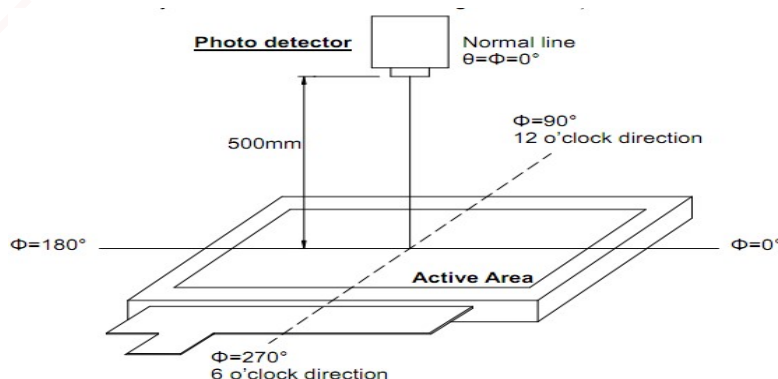
**Note 7:** Definition of NTSC ratio:

$$\text{NTSC ratio} = \frac{\text{Area of RGB triangle}}{\text{Area of NTSC triangle}}$$



**Note 8:** 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.(Response time is measured by Photo detector TOPCON BM-7, Field of view: 1°/Height: 500mm.)



## 7.RELIABILITY

Item	Test Condition	Remark
High Temperature Storage	Ta =+80°C / 96Hours	Note1,2,3
Low Temperature Storage	Ta =-30°C / 96Hours	Note1,2,3
High Temperature Operating	Ta =+70°C / 96Hours	Note1,2,3
Low Temperature Operating	Ta =-20°C / 96Hours	Note1,2,3
Temperature Cycle storage Test	-20°C/30min Δ+70°C /30min for 30cycles,Transfer time less than 5min	Note2,3
Thermal humidity storage Test	40°C x 90%RH / 96Hours	Note2,3
Package Vibration Test	Frequency: 10Hz~55Hz,Amplitude:1.5mm, 1 hrs for each direction of X, Y, Z	Note2
Packing shock test	Drop to the ground from 60cm height, 1 corner, 3 edges, 6 surfaces.	Note2

### Inspection after Test :

Note1:Ta is the ambient temperature of samples.

Note 2: In the standard condition, there shall be no practical problem that may affect the display function. After the reliability test, the product only guarantees operation, but doesn't guarantee all the cosmetic specification.

Note 3: Before cosmetic and function tests , the product must have enough recovery time, at least 2 hours at room temperature.

Note 4: In case of malfunction defect caused by ESD damage, if it would be recovered to normal state after resetting, it would be judged as a good part.

## 8. Specification of Quality Assurance:

### 8-1. Purpose

This standard for Quality Assurance should affirm the quality of LCD module products to supply to purchaser by VIEWE.

### 8-2. Standard for Quality Test

#### a. Inspection:

Before delivering, the supplier should take the following tests, and affirm the quality of product.

#### b. Electro-Optical Characteristics:

According to the individual specification to test the product.

#### c. Test of Appearance Characteristics:

According to the individual specification to test the product.

#### d. Test of Reliability Characteristics:

According to the definition of reliability on the specification for testing products.

#### e. Delivery Test :

Before delivering, the supplier should take the delivery test.

(i) Test method: According to ISO2859-1. General Inspection Level II take a single time.

(ii) The defects classify of AQL as following :

Major defect: AQL = 0.65

Minor defect: AQL = 2.5

Total defects: AQL = 2.5

### 8-3. Non- conforming Analysis & Deal With Manners

#### a. Non- conforming Analysis :

(i) Purchaser should supply the detail data of non- conforming sample and the non- conforming.

(ii) After accepting the detail data from purchaser, the analysis of non- conforming should be finished in two weeks.

(iii) If supplier can not finish analysis on time, must announce purchaser before 3 days.

#### b. Disposition of non- conforming:

(i) If find any product defect of supplier during assembly time, supplier must change the good product for every defect after recognition.

(ii) Both supplier and customer should analyze the reason and discuss the disposition of non- conforming when the reason of nonconforming is not sure.

### 8-4. Agreement items

Both sides should discuss together when the following problems happen.

- There is any problem of standard of quality assurance, and both sides should think that must be modified.
- There is any argument item which does not record in the standard of quality assurance.
- Any other special problem.



#### 8-5. Standard of The Product Appearance Test

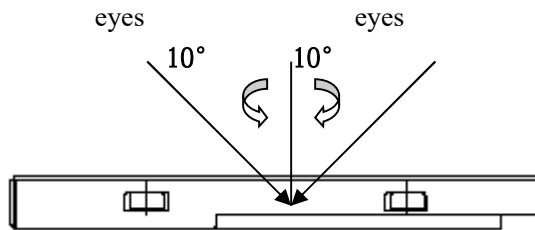
##### a. Manner of appearance test:

(i) The test must be under  $20W \times 2$  or  $40W$  fluorescent light, and the distance of view must be at  $30 \pm 5cm$ .

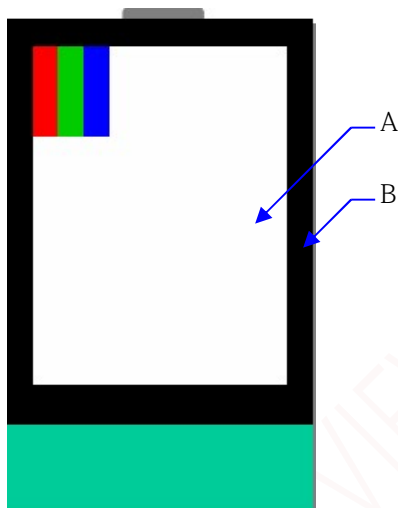
(ii) When test the model of transmissive product must add the reflective plate.

(iii) The test direction is base on around  $10^\circ$  of vertical line.

(iii) Temperature:  $25 \pm 5^\circ C$  Humidity:  $60 \pm 10\% RH$



##### (iv) Definition of area :



A. Area: Viewing area.

B. Area: Out of viewing area.  
(Outside viewing area)

##### b. Basic principle::

(i) It will accord to the AQL when the standard can not be described.

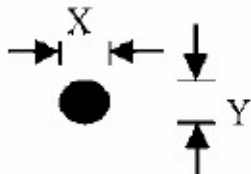
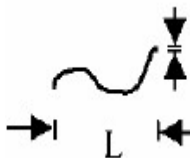
(ii) The sample of the lowest acceptable quality level must be discussed by both supplier and customer when any dispute happened.

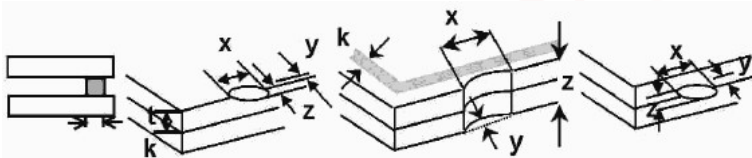
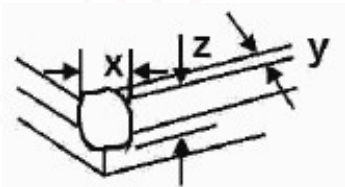
(iii) Must add new item on time when it is necessary.

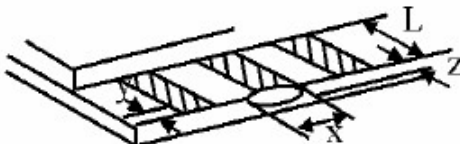
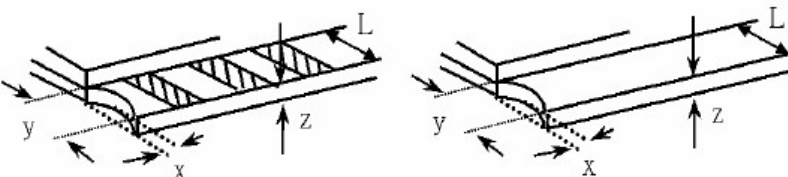
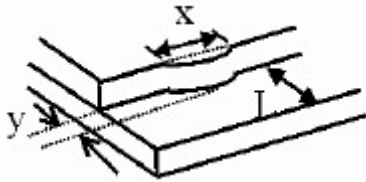
##### c. Standard of inspection : (Unit: mm)

## 8-6. Inspection specification

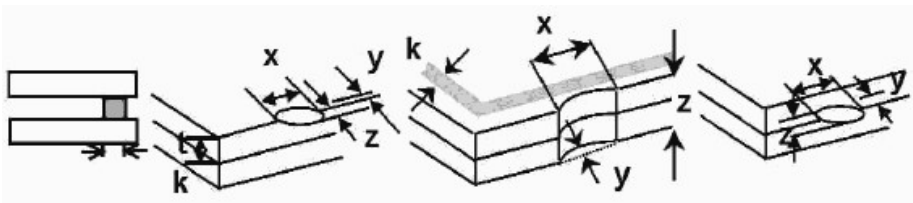
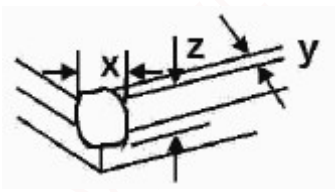
Defect out of viewing area can be neglected

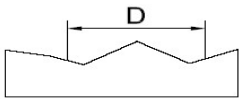
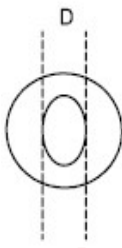
NO	Item	Criterion	AQL														
01	Electrical Testing	1.1 Missing vertical, horizontal segment, segment contrast defect. 1.2 Missing character, dot or icon. 1.3 Display malfunction. 1.4 No function or no display. 1.5 Current consumption exceeds product specifications. 1.6 LCD viewing angle defect. 1.7 Mixed product types. 1.8 Flicker	0.65														
02	Black or White spots or Bright spots or Color spots on LCD (Display only)	2.1 White and black or color spots on display $\cong 0.25\text{mm}$ , no more than Five spots. 2.2 Densely spaced: No more than three spots within 3mm.	2.5														
03	LCD and Touch Panel black spots, white spots, contamination (non – display)	3.1 Round type: As following drawing $\Phi = (X+Y) / 2$  <table><thead><tr><th>Size(mm)</th><th>Acceptable Q'ty</th></tr></thead><tbody><tr><td><math>\Phi \cong 0.10</math></td><td>Accept no dense</td></tr><tr><td><math>0.10 &lt; \Phi \cong 0.20</math></td><td>3</td></tr><tr><td><math>0.20 &lt; \Phi \cong 0.25</math></td><td>2</td></tr><tr><td><math>0.25 &lt; \Phi \cong 0.30</math></td><td>1</td></tr><tr><td><math>0.30 &lt; \Phi</math></td><td>0</td></tr></tbody></table> <p>* Densely spaced: No more than two spots within 3mm.</p>	Size(mm)	Acceptable Q'ty	$\Phi \cong 0.10$	Accept no dense	$0.10 < \Phi \cong 0.20$	3	$0.20 < \Phi \cong 0.25$	2	$0.25 < \Phi \cong 0.30$	1	$0.30 < \Phi$	0	2.5		
		Size(mm)	Acceptable Q'ty														
$\Phi \cong 0.10$	Accept no dense																
$0.10 < \Phi \cong 0.20$	3																
$0.20 < \Phi \cong 0.25$	2																
$0.25 < \Phi \cong 0.30$	1																
$0.30 < \Phi$	0																
		3.2 Line type: (As following drawing)  <table><thead><tr><th>Length(mm)</th><th>Width(mm)</th><th>Acceptable Q'ty</th></tr></thead><tbody><tr><td>---</td><td><math>W \cong 0.02</math></td><td>Accept no dense</td></tr><tr><td><math>L \cong 3.0</math></td><td><math>0.02 &lt; W \cong 0.05</math></td><td rowspan="2">2</td></tr><tr><td><math>L \cong 2.5</math></td><td><math>0.03 &lt; W \cong 0.15</math></td></tr><tr><td>---</td><td><math>0.15 &lt; W</math></td><td>Rejection</td></tr></tbody></table> <p>* Densely spaced: No more than two lines within 3mm.</p>	Length(mm)	Width(mm)	Acceptable Q'ty	---	$W \cong 0.02$	Accept no dense	$L \cong 3.0$	$0.02 < W \cong 0.05$	2	$L \cong 2.5$	$0.03 < W \cong 0.15$	---	$0.15 < W$	Rejection	2.5
Length(mm)	Width(mm)	Acceptable Q'ty															
---	$W \cong 0.02$	Accept no dense															
$L \cong 3.0$	$0.02 < W \cong 0.05$	2															
$L \cong 2.5$	$0.03 < W \cong 0.15$																
---	$0.15 < W$	Rejection															

NO	Item	Criterion		AQL																		
04	Polarizer bubbles	If bubbles are visible, judge using black spot specifications, not easy to find, must check in specify direction	<table><tr><th>Size Φ(mm)</th><th>Acceptable Q'ty</th></tr><tr><td>Φ ≤ 0.20</td><td>Accept no dense</td></tr><tr><td>0.20 &lt; Φ ≤ 0.50</td><td>3</td></tr><tr><td>0.50 &lt; Φ ≤ 1.00</td><td>2</td></tr><tr><td>1.00 &lt; Φ</td><td>0</td></tr><tr><td>Total Q'ty</td><td>3</td></tr></table>	Size Φ(mm)	Acceptable Q'ty	Φ ≤ 0.20	Accept no dense	0.20 < Φ ≤ 0.50	3	0.50 < Φ ≤ 1.00	2	1.00 < Φ	0	Total Q'ty	3	2.5						
Size Φ(mm)	Acceptable Q'ty																					
Φ ≤ 0.20	Accept no dense																					
0.20 < Φ ≤ 0.50	3																					
0.50 < Φ ≤ 1.00	2																					
1.00 < Φ	0																					
Total Q'ty	3																					
05	Scratches	Follow NO.3 -2 Line Type.																				
06	Chipped glass	<p>Symbols: x: Chip length    y: Chip width    z: Chip thickness k: Seal width    t: Glass thickness    a: LCD side length L: Electrode pad length</p> <p>6.1 General glass chip: 6.1.1 Chip on panel surface and crack between panels :</p> <div></div> <table><tr><td>z: Chip thickness</td><td>y: Chip width</td><td>x: Chip length</td></tr><tr><td><math>Z \leq 1/2t</math></td><td>Not over viewing are</td><td><math>x \leq 1/8a</math></td></tr><tr><td><math>1/2t &lt; z \leq 2t</math></td><td>Not exceed 1/3k</td><td><math>x \leq 1/8a</math></td></tr></table> <p>⊙ Unit: mm ⊙ If there are 2 or more chips, x is the total length of each chip</p> <p>6.1.2 Corner crack :</p> <div></div> <table><tr><td>z: Chip thickness</td><td>y: Chip width</td><td>x: Chip length</td></tr><tr><td><math>Z \leq 1/2t</math></td><td>Not over viewing area</td><td><math>x \leq 1/8a</math></td></tr><tr><td><math>1/2t &lt; z \leq 2t</math></td><td>Not exceed 1/3k</td><td><math>x \leq 1/8a</math></td></tr></table> <p>⊙ Unit: mm ⊙ If there are 2 or more chips, x is the total length of each chip</p>		z: Chip thickness	y: Chip width	x: Chip length	$Z \leq 1/2t$	Not over viewing are	$x \leq 1/8a$	$1/2t < z \leq 2t$	Not exceed 1/3k	$x \leq 1/8a$	z: Chip thickness	y: Chip width	x: Chip length	$Z \leq 1/2t$	Not over viewing area	$x \leq 1/8a$	$1/2t < z \leq 2t$	Not exceed 1/3k	$x \leq 1/8a$	2.5
z: Chip thickness	y: Chip width	x: Chip length																				
$Z \leq 1/2t$	Not over viewing are	$x \leq 1/8a$																				
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$1/2t < z \leq 2t$	Not exceed 1/3k	$x \leq 1/8a$																				

NO	Item	Criterion	AQL																
07	Glass crack	<p>Symbols: x: Chip length   y: Chip width   z: Chip thickness k: Seal width   t: Glass thickness   a: LCD side length L: Electrode pad length</p> <p>7.2 Protrusion over terminal : 7.2.1 Chip on electrode pad :</p>  <table><tr><td>y: Chip width</td><td>x: Chip length</td><td>z: Chip thickness</td></tr><tr><td><math>y \leq 0.5\text{mm}</math></td><td><math>x \leq 1/8a</math></td><td><math>0 &lt; z \leq t</math></td></tr></table> <p>7.2.2 Non-conductive portion :</p>  <table><tr><td>y: Chip width</td><td>x: Chip length</td><td>z: Chip thickness</td></tr><tr><td><math>y \leq L</math></td><td><math>x \leq 1/8a</math></td><td><math>0 &lt; z \leq t</math></td></tr></table> <p>⊙ If there chipped area touches the ITO terminal, over 2/3 of the ITO must remain and be inspected according to electrode terminal specifications. ⊙ If the product will be heat sealed by the customer, the alignment mark must not be damaged.</p> <p>7.2.3 Substrate protuberance and internal crack</p>  <table><tr><td>y: width</td><td>x: length</td></tr><tr><td><math>y \leq 1/3L</math></td><td><math>X \leq a</math></td></tr></table>	y: Chip width	x: Chip length	z: Chip thickness	$y \leq 0.5\text{mm}$	$x \leq 1/8a$	$0 < z \leq t$	y: Chip width	x: Chip length	z: Chip thickness	$y \leq L$	$x \leq 1/8a$	$0 < z \leq t$	y: width	x: length	$y \leq 1/3L$	$X \leq a$	2.5
		y: Chip width	x: Chip length	z: Chip thickness															
		$y \leq 0.5\text{mm}$	$x \leq 1/8a$	$0 < z \leq t$															
y: Chip width	x: Chip length	z: Chip thickness																	
$y \leq L$	$x \leq 1/8a$	$0 < z \leq t$																	
y: width	x: length																		
$y \leq 1/3L$	$X \leq a$																		

NO	Item	Criterion	AQL
08	Cracked glass	The LCD with extensive crack is not acceptable.	2.5
09	Backlight elements	9.1 Illumination source flickers when lit. 9.2 Spots or scratches that appear when lit must be judged. Using LCD spot, lines and contamination standards. 9.3 Backlight doesn't light or color is wrong.	2.5 2.5 0.65
10	Bezel	Bezel must comply with product specifications.	2.5
11	PCB、COB	11.1 COB seal may not have pinholes larger than 0.2mm or contamination. 11.2 COB seal surface may not have pinholes through to the IC. 11.3 The height of the COB should not exceed the height indicated in the assembly diagram. 11.4 There may not be more than 2mm of sealant outside the seal area on PCB. And there should be no more than three places. 11.5 Parts on PCB must be the same as on the production characteristic chart, There should be no wrong parts, missing parts or excess parts. 11.6 The jumper on the PCB should conform to the product characteristic chart.	2.5 2.5 2.5 2.5 0.65 0.65
12	FPC	12.1 FPC terminal damage $\leq$ 1/2 FPC terminal width and can not affect the function, we judge accept. 12.2 FPC alignment hole damage $\leq$ 1/2 alignment area and can not affect the function, we judge accept.	2.5 2.5
13	Soldering	13.1 No cold solder joints, missing solder connections, oxidation or icicle. 13.2 No short circuits in components on PCB or FPC.	2.5 0.65

NO	Item	Criterion	AQL												
14	Touch Panel Chipped glass	<p>Symbols :</p> <p>x: Chip length    y: Chip width    z: Chip thickness</p> <p>k: Seal width    t: Glass thickness    a: LCD side length</p> <p>L: Electrode pad length</p> <p>14.1 General glass chip :</p> <p>14.1.1 Chip on panel surface and crack between panels:</p>  <table><tr><td>z: Chip thickness</td><td>y: Chip width</td><td>x: Chip length</td></tr><tr><td><math>Z \leq t</math></td><td><math>\leq 1/2 k</math> and not over viewing area</td><td><math>x \leq 1/8a</math></td></tr></table> <p>⊙ Unit: mm</p> <p>⊙ If there are 2 or more chips, x is the total length of each chip</p> <p>14.1.2 Corner crack:</p>  <table><tr><td>z: Chip thickness</td><td>y: Chip width</td><td>x: Chip length</td></tr><tr><td><math>z \leq t</math></td><td><math>\leq 1/2 k</math> and not over viewing area</td><td><math>x \leq 1/8a</math></td></tr></table> <p>⊙ Unit: mm</p> <p>⊙ If there are 2 or more chips, x is the total length of each chip</p>	z: Chip thickness	y: Chip width	x: Chip length	$Z \leq t$	$\leq 1/2 k$ and not over viewing area	$x \leq 1/8a$	z: Chip thickness	y: Chip width	x: Chip length	$z \leq t$	$\leq 1/2 k$ and not over viewing area	$x \leq 1/8a$	2.5
z: Chip thickness	y: Chip width	x: Chip length													
$Z \leq t$	$\leq 1/2 k$ and not over viewing area	$x \leq 1/8a$													
z: Chip thickness	y: Chip width	x: Chip length													
$z \leq t$	$\leq 1/2 k$ and not over viewing area	$x \leq 1/8a$													

NO	Item	Criterion	AQL										
15	Touch Panel(Fish eye、dent and bubble on film)	<table> <tr> <th>SIZE(mm)</th> <th>Acceptable Q'ty</th> </tr> <tr> <td><math>\Phi \leq 0.2</math></td> <td>Accept no dese</td> </tr> <tr> <td><math>0.2 &lt; D \leq 0.4</math></td> <td>5</td> </tr> <tr> <td><math>0.4 &lt; D \leq 0.5</math></td> <td>2</td> </tr> <tr> <td><math>0.5 &lt; D</math></td> <td>0</td> </tr> </table> <div>   </div>	SIZE(mm)	Acceptable Q'ty	$\Phi \leq 0.2$	Accept no dese	$0.2 < D \leq 0.4$	5	$0.4 < D \leq 0.5$	2	$0.5 < D$	0	2.5
SIZE(mm)	Acceptable Q'ty												
$\Phi \leq 0.2$	Accept no dese												
$0.2 < D \leq 0.4$	5												
$0.4 < D \leq 0.5$	2												
$0.5 < D$	0												
16	Touch Panel Newton ring	Newton ring dimension $\leq 1/2$ touch panel area and not affect font and line distortion ( $\leq 2.5\%$ ), it is acceptable.	2.5										
17	Touch Panel Linearity	Less than 2.5% is acceptable.	2.5										
18	LCD Ripple	Touch the touch panel, can not see the LCD ripple. Pen: R 1.0mm silicon rubber. Operation Force: 80g	2.5										
19	General appearance	19.1 Pin type must match type in specification sheet. 19.2 LCD pin loose or missing pins. 19.3 Product packaging must the same as specified on packaging specification sheet. 19.4 Product dimension and structure must conform to product specification sheet.	0.65 0.65 0.65 0.65										

## 9. Handling Precaution :

### 9-1 Handling of LCM

- Don't give external shock.
- Don't apply excessive force on the surface.
- Liquid in LCD is hazardous substance. Must not lick and swallow. when the liquid is attach to your hand, skin, cloth etc. Wash it out thoroughly and immediately.
- Don't operate it above the absolute maximum rating.
- Don't disassemble the LCM.
- The operators should be grounded whenever he/she comes into contact with the module. Never touch any of the conductive parts such as the LSI pads, the copper leads on the PCB and the interface terminals with any parts of the human body.
- The modules should be kept in antistatic bags or other containers resistant to static for storage.
- The 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.

### 9-2 Storage

- Store in an ambient temperature of  $25\pm 10^{\circ}\text{C}$ , and in a relative humidity of  $50\pm 10\%\text{RH}$ . Don't expose to sunlight or fluorescent light.
- Storage in a clean environment, free from dust, active gas, and solvent.
- Store in anti-static electricity container.
- Store without any physical load.

### 9-3 Soldering

- Use only soldering irons with proper grounding and no leakage.
- Iron: No higher than  $280\pm 10^{\circ}\text{C}$  and less than 3 sec during Hand soldering.
- Rewiring: no more than 2 times.



## 10. PACKAGE DRAWING

