



# SPECIFICATION FOR LCD MODULE

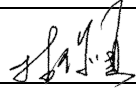
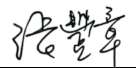

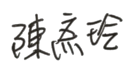
MODULE NO: YB-TG800480S31B-N-A0

Doc.Version:01

Customer Approval:

☐ Accept

☐ Reject

YEEBO	NAME	SIGNATURE	DATE
Prepare	Electronic Engineer		2019.04.25
Check	Mechanical Engineer		2019-04-25
Verify			2019-04-25
Approval			2019.4.25

☒ APPROVAL FOR SPECIFICATIONS ONLY

☐ APPROVAL FOR SPECIFICATIONS AND SAMPLE

WIMRD005-02-D

## 1. Revision History

[illegible]

## **2. Table of Contents:**

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**3. Module Numbering System:**

(Example)

**YB-TG240320S01D-T-A0**

Sample Version: A0~Z0

T: With Resistive Touch panel  
C: With Capacitive Touch panel  
N: Without Touch panel

Version: A~Z

Serial No: 01~99

S: STD Product  
C: Customer MadeDisplay Function:  
Segment Number of Segment  
Characters Lines of Character  
Column and Row of Graphic  
Length \* Width of OtherLCM Display Type  
C: Character Type ;  
G: Graphic Type ;  
GB: Graphic Black/White Type ; (For E-paper)  
GC: Graphic Color Type ; (For E-paper)  
S: Segment TypeLCD Model:  
C: CSTN; T: TFT; L: LTPS; O: OLED;  
P: PLED; S: B/W STN; E: E-paper ;  
Y: Yeetek; N: Others;

YEEBO

#### **4. General Specification:**

ITEM	CONTENTS
Module Size	164.9 (W) * 100.0 (H) * 3.71 (T) mm
Module Size(With FPC)	164.9 (W) * 100.0 (H) * 7.86 (T) mm
Display Size (Diagonal)	7.0 inch
Display Format	800(RGB)* 480 Pixels
Active Area	153.84 (W) * 85.632 (H) mm
Dots Pitch	0.1923 * 0.1784 mm
LCD Type	TFT (16.7M)/ Transmissive / Normal White
View Angle (Gray Inversion)	6 O'clock
The Best Viewing Direction	12 O'clock
Controller IC	EK9716BD4 +EK73002AB
Weight	TBD



## 6. Electrical Characteristics

### 6-1 Absolute Maximum Ratings

TFT IC Parameter (EK9716BD4 &amp; EK73002AB)

(Ta=25°C VSS=0V)

Item	Symbol	Min.	Type	Max.	Unit	Remark
Power Supply voltage	DVDD	-0.3		4.0	Volt	
Operating Temperature	Topr	-10	-	+70	°C	
Storage Temperature	Tstg	-30	-	+80	°C	

### 6-2 Operating Conditions

TFT IC Parameter (EK9716BD &amp; EK73002AB)

(Ta=25°C )

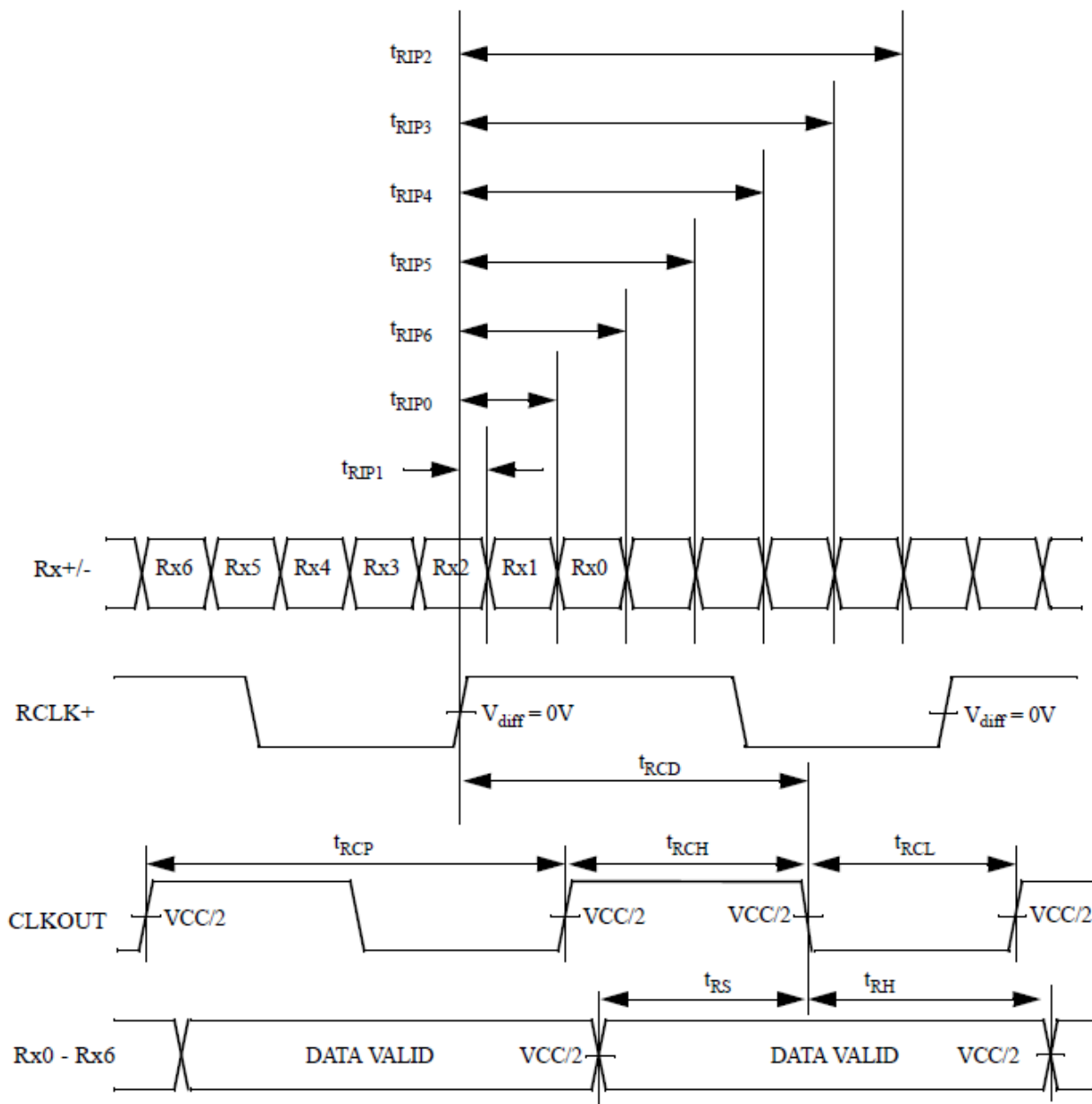
Item	Symbol	Condition	Min.	Typ.	Max.	Unit
Power Supply voltage	VDD	-	3.1	3.3	3.5	Volt
Level Input Voltage (Digital signal)	VIH	-	0.7*VDD	-	VDD	Volt
	VIL	-	GND	-	0.3*VDD	Volt
	VOH	-	VDD-0.4	-	VDD	Volt
	VOL	-	GND	-	GND+0.4	Volt
Power Supply Current for LCM	VDD_IDD	DVDD=3.3V	-	TBD	--	mA

## 6-3 Data Input Timing

VCC= 2.5V ~ 3.6V, Ta = -10°C ~ +70°C

Symbo l	Parameter		Min.	Typ.	Max.	Unit s
t <sub>RCP</sub>	CLK OUT Period	VCC = 3.0 - 3.6V	11.76	T	50.0	ns
		VCC = 2.5 - 3.6V	14.28	T	50.0	ns
t <sub>RCH</sub>	CLK OUT High Time			4T/7		ns
t <sub>RCL</sub>	CLK OUT Low Time			3T/7		ns
t <sub>RCD</sub>	RCLK +/- to CLK OUT Delay			5T/7		ns
t <sub>RS</sub>	TTL Data Setup to CLK OUT		0.35T-0.3			ns
t <sub>RH</sub>	TTL Data Hold from CKL OUT		0.45T-1.6			ns
t <sub>TLH</sub>	TTL Low to High Transition Time			2.0	3.0	ns
t <sub>THL</sub>	TTL High to Low Transition Time			1.8	3.0	ns
t <sub>RIP1</sub>	Input Data Position0 (T = 11.76ns)		-0.4	0.0	0.4	ns
t <sub>RIP0</sub>	Input Data Position1 (T = 11.76ns)		T/7-0.4	T/7	T/7+0.4	ns
t <sub>RIP6</sub>	Input Data Position2 (T = 11.76ns)		2T/7-0.4	2T/7	2T/7+0.4	ns
t <sub>RIP5</sub>	Input Data Position3 (T = 11.76ns)		3T/7-0.4	3T/7	3T/7+0.4	ns
t <sub>RIP4</sub>	Input Data Position4 (T = 11.76ns)		4T/7-0.4	4T/7	4T/7+0.4	ns
t <sub>RIP3</sub>	Input Data Position5 (T = 11.76ns)		5T/7-0.4	5T/7	5T/7+0.4	ns
t <sub>RIP2</sub>	Input Data Position6 (T = 11.76ns)		6T/7-0.4	6T/7	6T/7+0.4	ns
t <sub>RPLL</sub>	Phase Lock Loop Set				10.0	ms

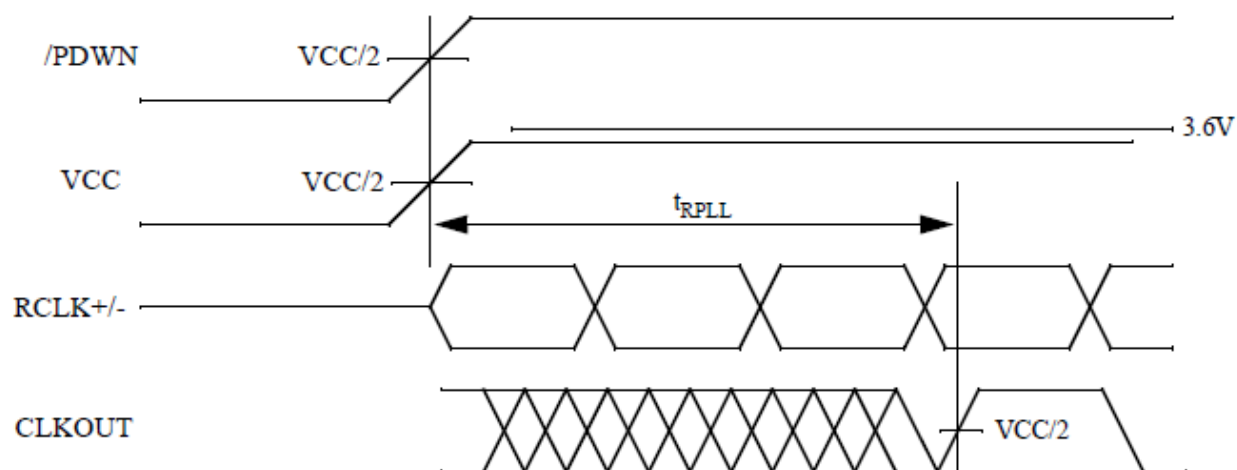
## AC Timing Diagrams



Note:

1)  $V_{diff} = (RA+) - (RA-), \dots, (RCLK+) - (RCLK-)$

# Phase Lock Loop Set Time



## 7. Optical Characteristics:

Item		Symbol	Conditions	Specifications			Unit	Note
				Min	Typ	Max		
Transmittance		T(%)	-	5.0	5.5	-	-	-
Contrast Ratio		CR	$\theta=0$ Normal Viewing angle	-	500	-		(1) (2)
Response time		TR+TF	-	-	25	-	ms	(1) (3)
Viewing angle	Hor.	$\Theta_{x+}$	$CR \geq 10$	60	70	-	deg.	-
		$\Theta_{x-}$		60	70	-		
	Ver.	$\Theta_{y+}$		40	50	-		
		$\Theta_{y-}$		50	60	-		

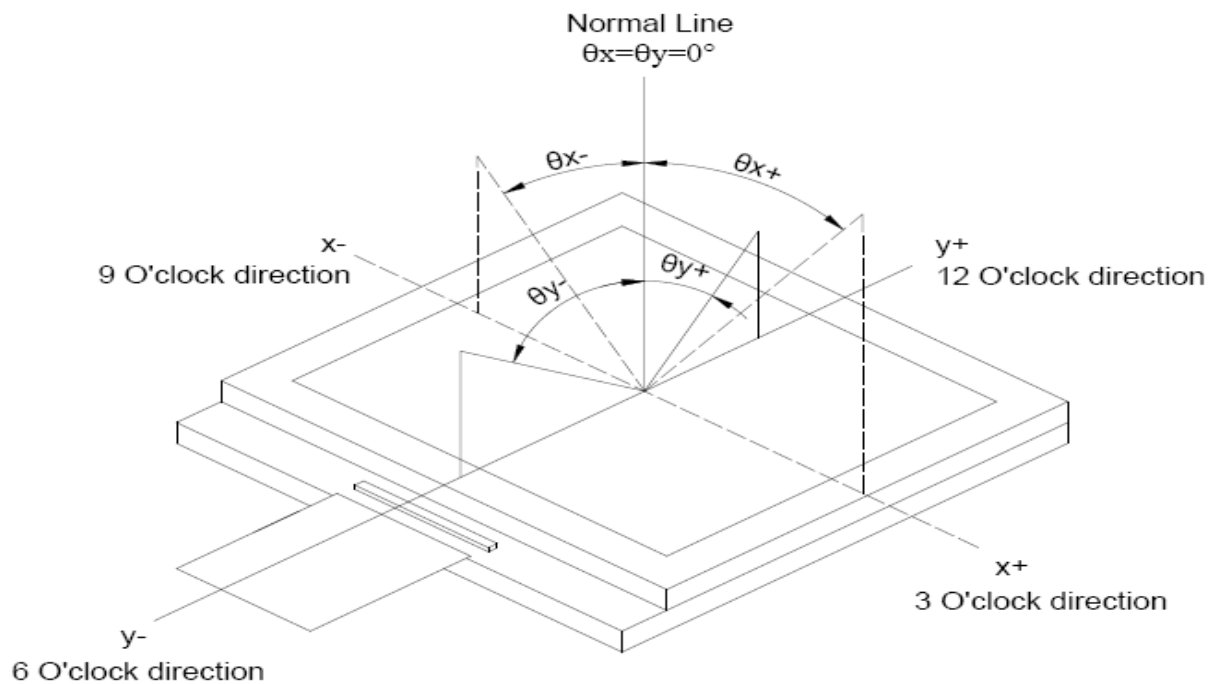
Measuring Condition

1. Measuring surrounding: dark room
2. Ambient temperature:  $25 \pm 2^{\circ}\text{C}$
3. 30 min. Warm-up time.

Color of CIE Coordinate:

Item		Symbol	Condition	Min.	Typ.	Max.
Chromaticity Coordinates (Transmissive)	Red	x	$\theta = \varphi = 0^{\circ}$ LED Backlight Color Degree	TBD	(0.568)	TBD
		y		TBD	(0.325)	TBD
	Green	x		TBD	(0.363)	TBD
		y		TBD	(0.579)	TBD
	Blue	x		TBD	(0.152)	TBD
		y		TBD	(0.114)	TBD
	White	x		TBD	(0.300)	TBD
		y		TBD	(0.331)	TBD

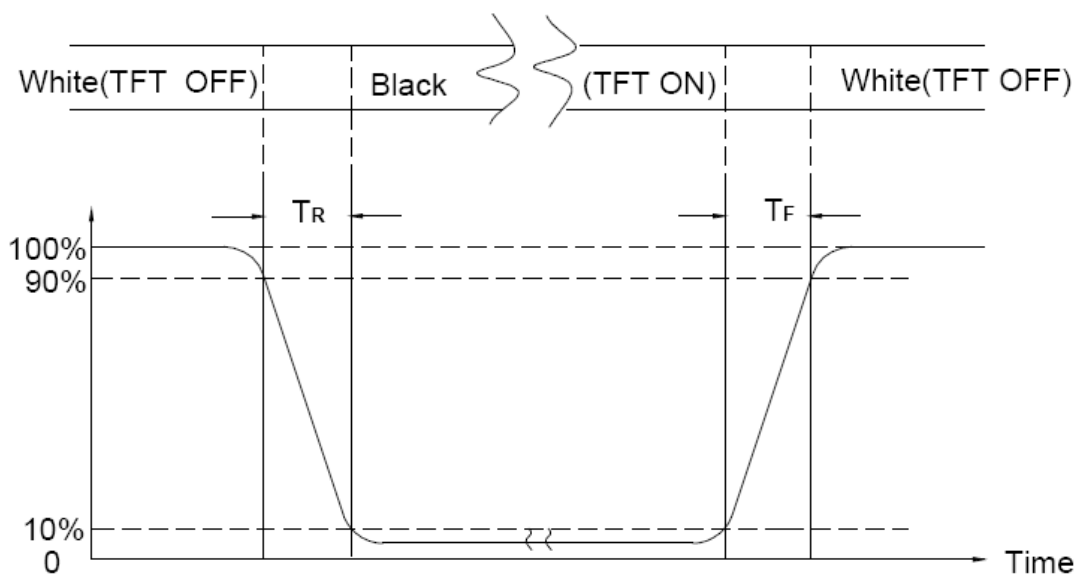
Note (1) Definition of Viewing Angle :



Note (2) Definition of Contrast Ratio(CR) :  
measured at the center point of panel

$$\text{Contrast ratio (CR)} = \frac{\text{Photo detector output when LCD is at "White" state}}{\text{Photo detector output when LCD is at "Black"}}$$

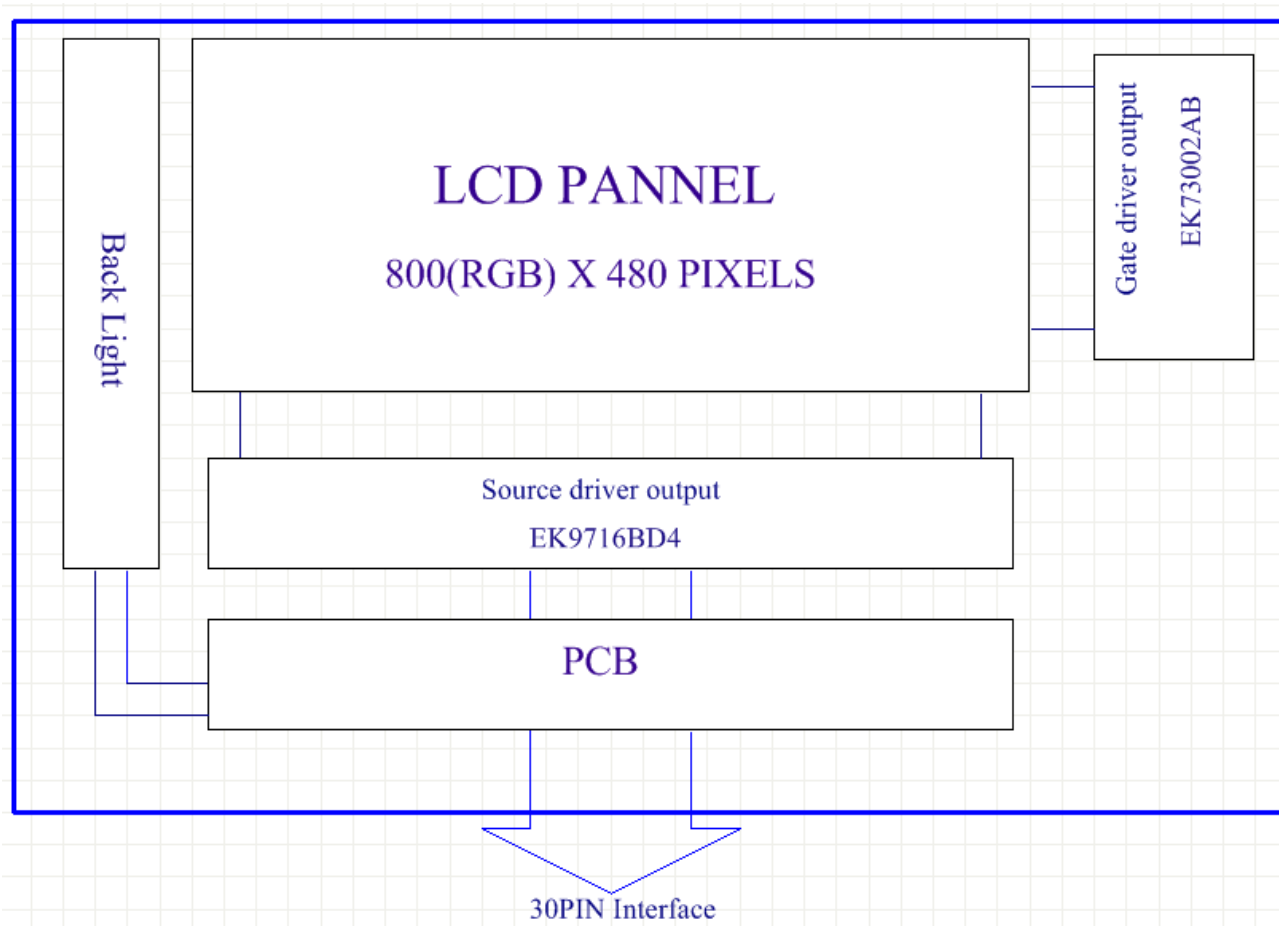
Note (3) Definition of Response Time : Sum of TR and TF



## **8. Interface Pin Assignment:**

### **8-1 LCM FPC Interface**

No.	Symbol	Function
1~2	LED+	Power for LED backlight (Anode)
3	NC	No connection
4~5	LED-	Power for LED backlight (Cathode)
6	NC	No connection
7	GND	Power ground
8	RA-	-LVDS differential data input
9	RA+	+LVDS differential data input
10	GND	Power ground
11	RB-	-LVDS differential data input
12	RB+	+LVDS differential data input
13	GND	Power ground
14	RC-	-LVDS differential data input
15	RC+	+LVDS differential data input
16	GND	Power ground
17	RCLK-	-LVDS differential clock input
18	RCLK+	+LVDS differential clock input
19	GND	Power ground
20	RD-	-LVDS differential data input
21	RD+	+LVDS differential data input
22	GND	Power ground
23	NC	No connection
24,25	VDD	Power supply
26	/PDWN	Hi:Normal operation Low:Power down(all output are all pulled to ground)
27	RESET	Reset pin
28	NC	No connection
29	LCD_LR	Left or Right Display Control
30	LCD_UD	Up / Down Display Control

**9. Block Diagram:**

## 10. Backlight:

### 1. Standard Lamp Styles (Edge Lighting Type):

The LED chips are distributed over the edge light area of the illumination unit, which gives the less power consumption:

### 2. The Main Advantages of the LED Backlight are as following:

#### 2.1 The brightness of the backlight can simply be adjusted.

By a resistor or a potentiometer.

### 3. Data About LED Backlight:

(Ta=25°)

PARAMETER	Sym.	Min.	Typ.	Max.	Unit	Test Condition	Note
Supply Current	I	-	140	-	mA	V=9.6V	
Supply Voltage	V	8.7	9.6	10.2	V	If=140mA	
Reverse Voltage	VR	-	-	5.0	V	-	
Luminous Intensity for LCM	IV	280	330	-	cd/m2	If=140mA	2
Uniformity for LCM	-	70	-	-	%		3
Life Time	-	20000	50000	-	Hr.		4
Color	White						

NOTE:

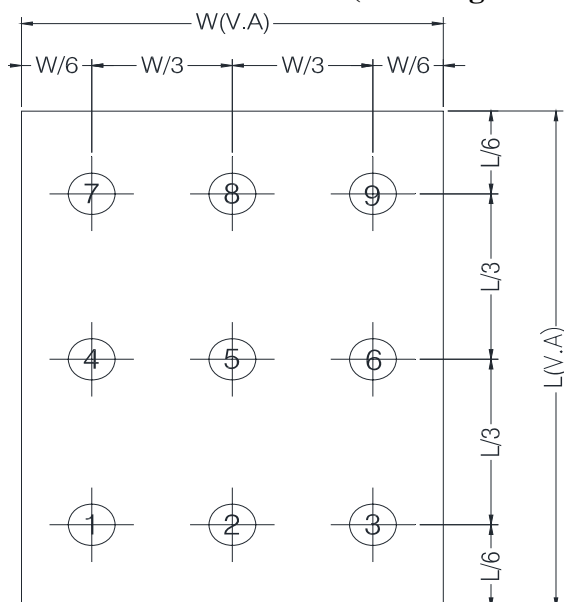
1. Backlight Only

2. Average Luminous Intensity of P1-P9

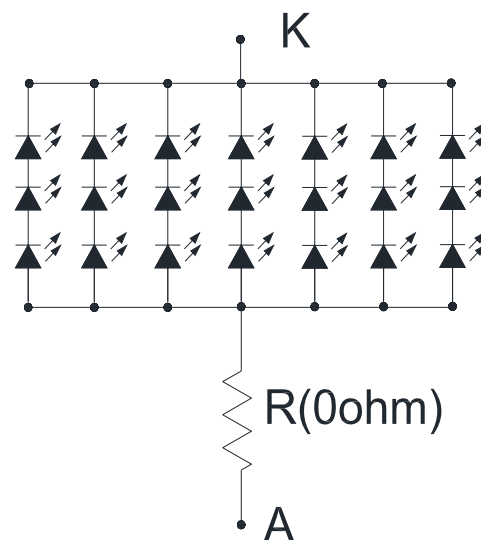
3. Uniformity = Min/Max \* 100%

4. LED life time defined as follow: the final brightness is at 50% of original brightness

#### Measured Method: (X\*Y: Light Area)



#### Internal Circuit Diagram



Using aperture of 1°, distance 50cm.

## **11 Standard Specification for Reliability .:**

### **11-1 Standard Specifications for Reliability of LCD Module**

No	Item	Description
01	High temperature operation	The sample should be allowed to stand at 70℃ for 120 hours under driving condition and then returning it to normal temperature condition, and allowing it stand for 2 hours.
02	Low temperature operation	The sample should be allowed to stand at -10℃ for 120 hours under driving condition and then returning it to normal temperature condition, and allowing it stand for 2 hours.
03	High temperature storage	The sample should be allowed to stand at 80℃ for 240 hours under no-load condition, and then returning it to normal temperature condition, and allowing it stand for 2 hours.
04	Low temperature storage	The sample should be allowed to stand at -30℃ for 240 hours under no-load condition, then returning it to normal temperature condition, and allowing it stand for 2 hours.
05	Moisture storage	The sample should be allowed to stand at 60℃,90%RH MAX for 240 hours under no-load condition, then taking it out and drying it at normal temperature for 2 hours.
06	Thermal shock storage	The sample should be allowed to stand the following 10 cycles : -30℃ for 30 minutes → normal temperature for 5 minutes → +80℃ for 30 minutes → normal temperature for 5 minutes, as one cycle.
07	Packing vibration	Frequency range : 10Hz ~ 55Hz Amplitude of vibration : 1.5mm      Sweep time: 12 min X,Y,Z 2 hours for each direction.
08	Packing drop test	According to ISTA 1A 2001.
09	Electrical Static Discharge	Air: ±6KV 150pF/330Ω 5 times
		Contact: ±4KV 150pF/330Ω 5 time

\*Sample size for each test item is 3~5pcs

## 11- 2. Testing Conditions and Inspection Criteria

For the final test the testing sample must be stored at room temperature for 24 hours, after the tests listed in Table 12.2, Standard specifications for Reliability have been executed in order to ensure stability.

No	Item	Test Model	In section Criteria
01	Current Consumption	Refer To Specification	The current consumption should conform to the product specification.
02	Contrast	Refer To Specification	After the tests have been executed, the contrast must be larger than half of its initial value prior to the tests.
03	Appearance	Visual inspection	Defect free.

## 11-3. MTBF

MTBF	Functions, performance, appearance, etc. shall be free from remarkable deterioration within 50,000 hours under ordinary operating and storage conditions room temperature ( $25\pm 5^{\circ}\text{C}$ ), normal humidity ( $50\pm 10\%$ RH), and in area not exposed to direct sun light.
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## 12.Specification of Quality Assurance:

### 12-1. Purpose

This standard for Quality Assurance should affirm the quality of LCD module products to supply to purchaser by YEEBO CORPORATION (Supplier).

### 12-2. 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

### 12-3. 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.

### 12-4. Agreement items

Both sides should discuss together when the following problems happen.

a. There is any problem of standard of quality assurance, and both sides should think that must be modified.

b. There is any argument item which does not record in the standard of quality assurance.

c. Any other special problem.

## 12-5. Standard of The Product Appearance Test

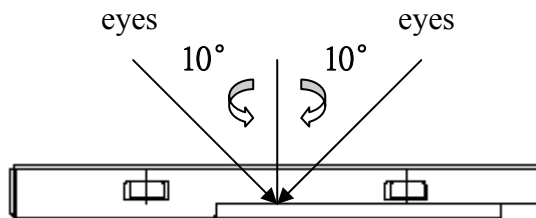
### a. Manner of appearance test:

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

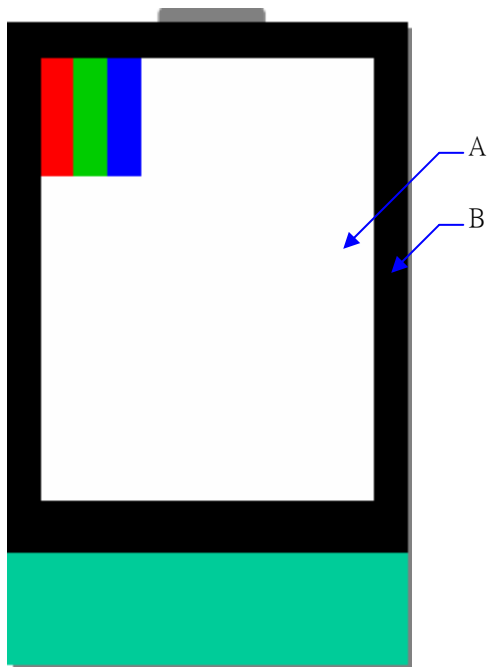
(ii) When test the model of transmissive product must add the reflective plate.

(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.

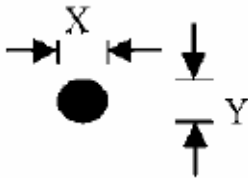
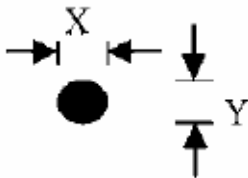
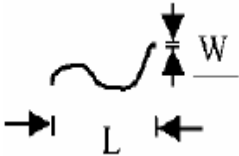
(ii) The sample of the lowest acceptable quality level must be discussed by both supplier and customer when any dispute happened.

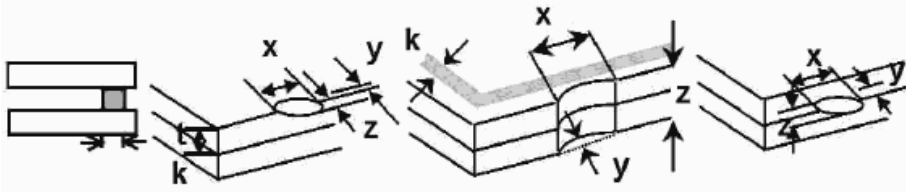
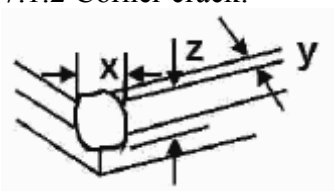
(iii) Must add new item on time when it is necessary.

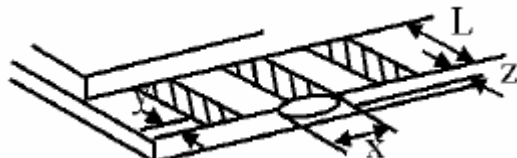
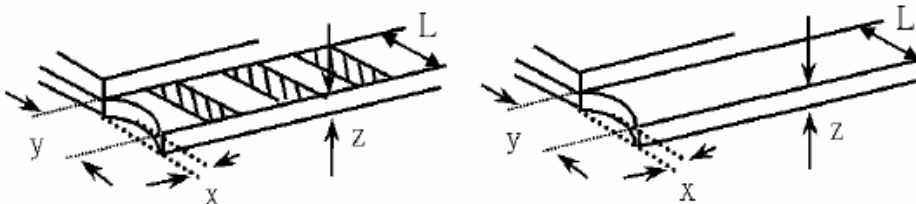
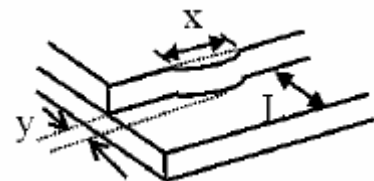
### c. Standard of inspection: (Unit: mm)

12-6. Inspection specification

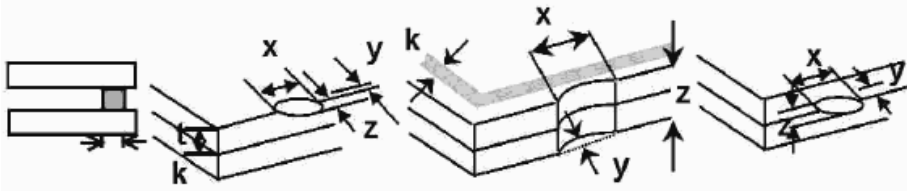
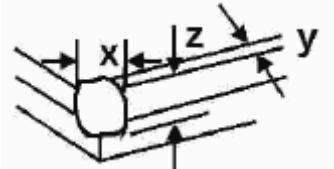
Defect out of viewing area can be neglected.

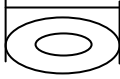
Defect out of viewing area can be neglected.																										
NO	Item	Criterion	AQL																							
01	Electrical Testing	1.1 Missing vertical, horizontal segment, segment contrast defect. 1.2 Missing character, dot or icon. 1.3 Display malfunction. 1.4 No function or no display. 1.5 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 Dot dimension as below drawing: $\Phi = (X+Y) / 2$  <table><tr><th>Size(mm)</th><th>Acceptable Q'ty</th></tr><tr><td><math>\Phi \leq 0.20</math></td><td>Accept no dense</td></tr><tr><td><math>0.20 &lt; \Phi \leq 0.40</math></td><td>5</td></tr><tr><td><math>0.40 &lt; \Phi</math></td><td>0</td></tr></table> 2.2 Not visible through 5% ND filter  * Densely spaced: No more than two spots within 3mm.	Size(mm)	Acceptable Q'ty	$\Phi \leq 0.20$	Accept no dense	$0.20 < \Phi \leq 0.40$	5	$0.40 < \Phi$	0	2.5															
Size(mm)	Acceptable Q'ty																									
$\Phi \leq 0.20$	Accept no dense																									
$0.20 < \Phi \leq 0.40$	5																									
$0.40 < \Phi$	0																									
03	LCD and Touch Panel black spots, white spots, contamination (non – display)	3.1 Round type: As following drawing $\Phi = (X+Y) / 2$  <table><tr><th>Size(mm)</th><th>Acceptable Q'ty</th></tr><tr><td><math>\Phi \leq 0.20</math></td><td>Accept no dense</td></tr><tr><td><math>0.20 &lt; \Phi \leq 0.40</math></td><td>5</td></tr><tr><td><math>0.40 &lt; \Phi</math></td><td>0</td></tr></table> * Densely spaced: No more than two spots within 3mm. 3.2 Line type: (As following drawing)  <table><tr><th>Length(mm)</th><th>Width(mm)</th><th>Acceptable Q'ty</th></tr><tr><td><math>L \leq 10</math></td><td><math>W \leq 0.1</math></td><td>Accept no dense</td></tr><tr><td><math>L \leq 10.0</math></td><td><math>0.1 &lt; W \leq 0.25</math></td><td>4</td></tr><tr><td><math>L &gt; 10</math></td><td>----</td><td>Rejection</td></tr><tr><td>----</td><td><math>0.25 &lt; W</math></td><td>Rejection</td></tr></table> * Densely spaced: No more than two lines within 3mm.	Size(mm)	Acceptable Q'ty	$\Phi \leq 0.20$	Accept no dense	$0.20 < \Phi \leq 0.40$	5	$0.40 < \Phi$	0	Length(mm)	Width(mm)	Acceptable Q'ty	$L \leq 10$	$W \leq 0.1$	Accept no dense	$L \leq 10.0$	$0.1 < W \leq 0.25$	4	$L > 10$	----	Rejection	----	$0.25 < W$	Rejection	2.5
Size(mm)	Acceptable Q'ty																									
$\Phi \leq 0.20$	Accept no dense																									
$0.20 < \Phi \leq 0.40$	5																									
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Length(mm)	Width(mm)	Acceptable Q'ty																								
$L \leq 10$	$W \leq 0.1$	Accept no dense																								
$L \leq 10.0$	$0.1 < W \leq 0.25$	4																								
$L > 10$	----	Rejection																								
----	$0.25 < W$	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>4</td></tr><tr><td>0.50 &lt; Φ ≤ 1.00</td><td>3</td></tr><tr><td>1.00 &lt; Φ</td><td>0</td></tr><tr><td>Total Q'ty</td><td>4</td></tr></table>	Size Φ(mm)	Acceptable Q'ty	Φ ≤ 0.20	Accept no dense	0.20 < Φ ≤ 0.50	4	0.50 < Φ ≤ 1.00	3	1.00 < Φ	0	Total Q'ty	4	2.5						
Size Φ(mm)	Acceptable Q'ty																					
Φ ≤ 0.20	Accept no dense																					
0.20 < Φ ≤ 0.50	4																					
0.50 < Φ ≤ 1.00	3																					
1.00 < Φ	0																					
Total Q'ty	4																					
05	Scratches	Follow NO.3 -2 Line Type.																				
06	Mura	Not visible through 5% ND filter in 50% gray.		2.5																		
07	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 7.1 General glass chip: 7.1.1 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 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> <p>7.1.2 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 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 area	$x \leq 1/8a$	$1/2t < z \leq 2t$	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 area	$x \leq 1/8a$																				
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NO	Item	Criterion	AQL						
08	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>8.1 Protrusion over terminal: 8.1.1 Chip on electrode pad:</p> 	2.5						
		<table border="1"><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>		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				
		$y \leq 0.5\text{mm}$		$x \leq 1/8a$	$0 < z \leq t$				
<p>8.1.2 Non-conductive portion:</p> 									
<table border="1"><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>8.1.3 Substrate protuberance and internal crack</p> 	y: Chip width	x: Chip length	z: Chip thickness	$y \leq L$	$x \leq 1/8a$	$0 < z \leq t$			
y: Chip width	x: Chip length	z: Chip thickness							
$y \leq L$	$x \leq 1/8a$	$0 < z \leq t$							
		<table border="1"><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: width	x: length	$y \leq 1/3L$	$X \leq a$			
y: width	x: length								
$y \leq 1/3L$	$X \leq a$								

NO	Item	Criterion	AQL
09	Cracked glass	The LCD with extensive crack is not acceptable.	2.5
10	Backlight elements	10.1 Illumination source flickers when lit. 10.2 Spots or scratches that appear when lit must be judged. Using LCD spot, lines and contamination standards. 10.3 Backlight doesn't light or color is wrong.	2.5 2.5 0.65
11	Bezel	Bezel must comply with product specifications.	2.5
12	PCB、COB	12.1 COB seal may not have pinholes larger than 0.2mm or contamination. 12.2 COB seal surface may not have pinholes through to the IC. 12.3 The height of the COB should not exceed the height indicated in the assembly diagram. 12.4 There may not be more than 2mm of sealant outside the seal area on PCB. And there should be no more than three places. 12.5 Parts on PCB must be the same as on the production characteristic chart, There should be no wrong parts, missing parts or excess parts. 12.6 The jumper on the PCB should conform to the product characteristic chart.	2.5 2.5 2.5 2.5 0.65 0.65
13	FPC	13.1 FPC terminal damage $\leq$ 1/2 FPC terminal width and can not affect the function , we judge accept. 13.2 FPC alignment hole damage $\leq$ 1/2 alignment area and can not affect the function , we judge accept.	2.5 2.5
14	Soldering	14.1 No cold solder joints, missing solder connections, oxidation or icicle. 14.2 No short circuits in components on PCB or FPC.	2.5 0.65

NO	Item	Criterion	AQL												
15	Touch Panel Chipped glass	<div> <div> <p>Symbols:</p> <p>x: Chip length                      y: Chip width                      z: Chip thickness</p> <p>k: Seal width                      t: Touch Panel Total thickness    a: LCD side length</p> <p>L: Electrode pad length</p> <p>15.1 General glass chip:</p> <p>15.1.1 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>15.1.2 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> </div> </div>	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
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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
16	Touch Panel(Fish eye)	SIZE(mm)	Acceptable Q'ty	2.5
		$L \leq 0.7$	Accept no dense	
		$L > 0.7\text{mm}$	0	
				
17	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
18	Touch Panel Linearity	Less than 2.5% is acceptable.		2.5
19	LCD Ripple	Touch the touch panel , can not see the LCD ripple. Pen: R 1.0mm silicon rubber. Operation Force: 80g		2.5
20	General appearance	20.1 Pin type must match type in specification sheet.		0.65
		20.2 LCD pin loose or missing pins.		0.65
		20.3 Product packaging must the same as specified on packaging specification sheet.		0.65
		20.4 Product dimension and structure must conform to product specification sheet.		0.65

## 13. Handling Precaution:

### 14-1 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.

### 14-2 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.

### 14-3 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.

## 14. Guarantee:

Our products meet requirements of the environment.

YEEBO ROHS requirement is based on European Union Directive 2011/65/EU (ROHS) Requirements and Update.