



# SPECIFICATION FOR LCD MODULE

MODULE NO: YB-TG800480S23A-N-A0

Doc.Version:01

Customer Approval:

<input type="checkbox"/> Accept	<input type="checkbox"/> Reject
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YEEBO	NAME	SIGNATURE	DATE
Prepare	Electronic Engineer		2014.3.27
Check	Mechanical Engineer		2014.3.27
Verify			2014.3.27
Approval			2014.3.27

APPROVAL FOR SPECIFICATIONS ONLY

APPROVAL FOR SPECIFICATIONS AND SAMPLE

WIMRD005-02-C





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

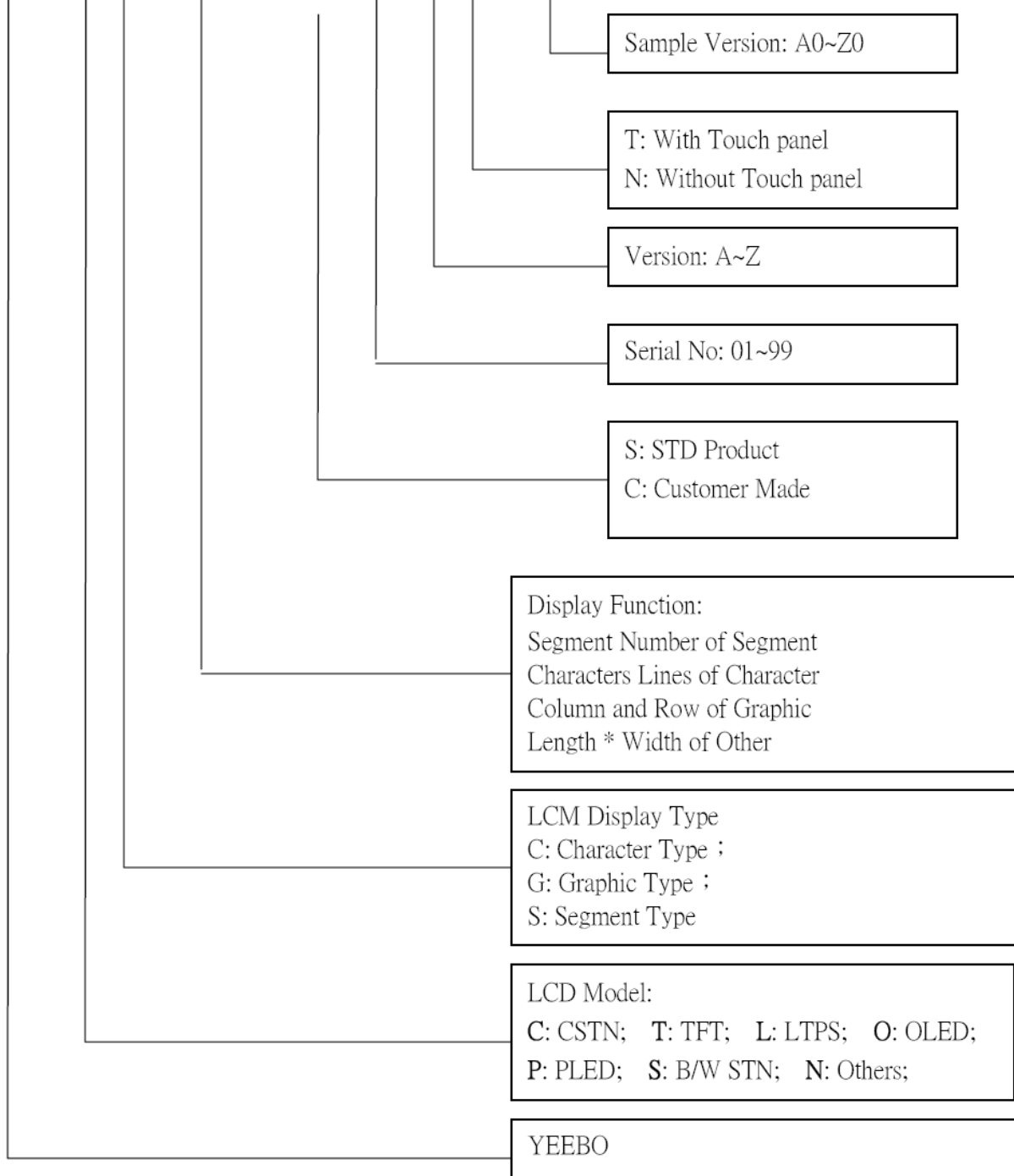
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### 3. Module Numbering System:

(Example)

**YB - T G 240320 S 01 D - T - A0**

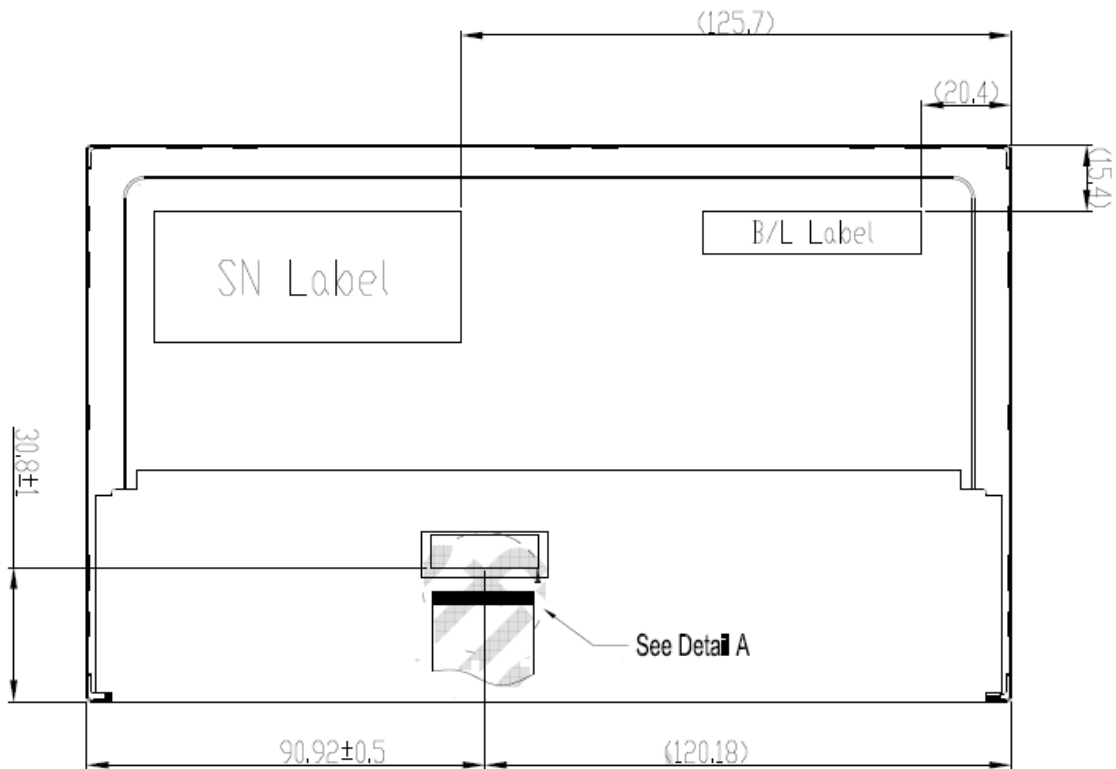
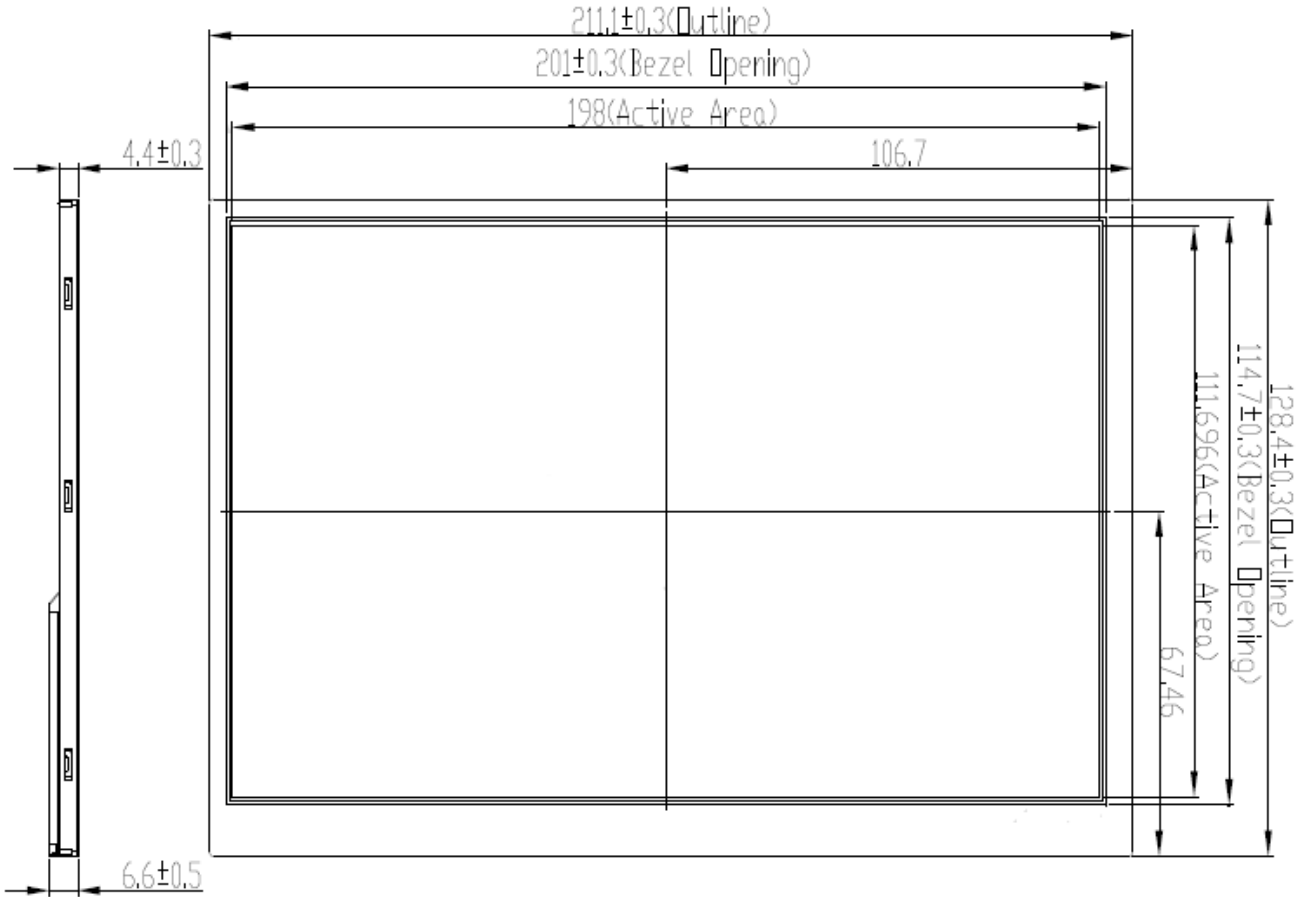




#### **4. General Specification:**

ITEM	CONTENTS
Module Size	128.4(W) * 211.1(H) * 6.6(T) mm
Module Size(With FPC)	128.4(W) * 211.1(H) * 6.6(T) mm
Display Size(Diagonal)	9.0 inch
Display Format	800(RGB) * 480 Pixels
Active Area	198(W) * 111.696(H) mm
Pixel Pitch	0.0825 * 0.2327 mm
LCD Type	TFT(16.7M) / Transmissive / Normal White
View Angle	6 O'clock
Interface	TTL
Weight	255g

### 5. LCM drawing:



## 6. Electrical Characteristics

### 6-1 Absolute Maximum Ratings

( $T_a=25^{\circ}\text{C}$   $V_{SS}=0\text{V}$ )

Item	Symbol	Min.	Type	Max.	Unit	Remark
Power Supply voltage	DVDD	-0.3	-	4.0	V	
Operating Temperature	TOP	-20	-	+75	$^{\circ}\text{C}$	
Operating Humidity	HOP	10		90	%RH	
Storage Temperature	TST	-30	-	+80	$^{\circ}\text{C}$	
Storage Humidity	HST	10	-	90	%RH	

Note : When you apply the LCD module for OA system. Please make sure to keep the temperature of LCD module is less than  $75^{\circ}\text{C}$

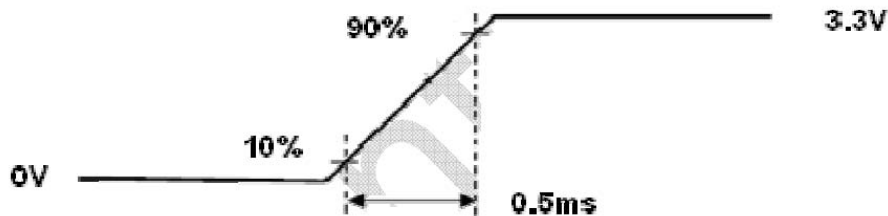
### 6-2 Operating Conditions

( $T_a=25^{\circ}\text{C}$  )

Item	Symbol	Min.	Typ.	Max.	Unit	Remark
Logic/LCD Drive Voltage	DVDD	3.0	3.3	3.6	[V]	
VDD Current	IDD	-	0.1	-	[A]	
VDD Power	PDD	-	-	0.7	[W]	
Rush Current	Irush	-5.7	-5.0	1.5	[A]	Note 1
Allowable Logic/LCD Drive Ripple Voltage	VDDrp	3.2	4.2	5.2	[mV]p-p	Note 2

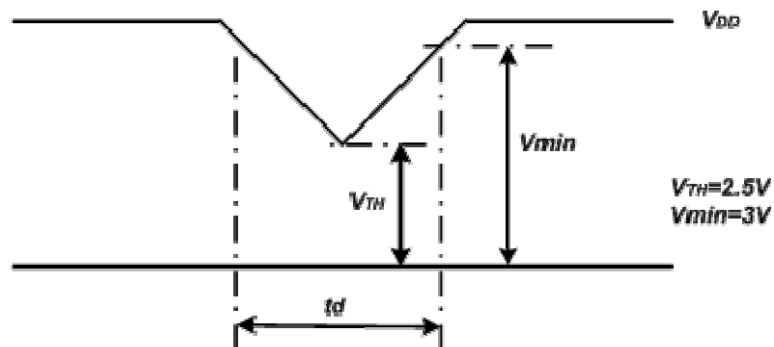
Note 1. Measure Condition

**VDD rising time**



Note 2. VDD Power Dip Condition

Figure 10 VDD Power Dip

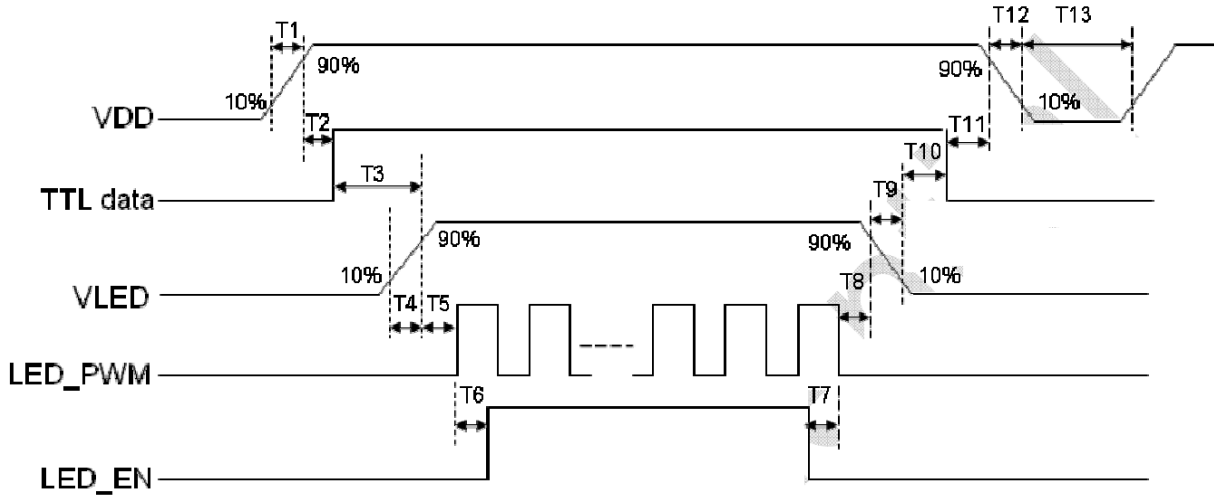


If  $V_{TH} < V_{DD} \leq V_{min}$  , then  $t_d \leq 10\text{ms}$  ;

When the voltage return to normal our pane must revive automatically.

### 6.3 Power ON/OFF Sequence

VDD power on/off sequence is as follows. Interface signals are also shown in the chart. Signals from any system shall be Hi-Z state or low level when VDD is off.



Parameter	Symbol	Unit	Min	Typ	Max
VDD Rise Time	T1	ms	0.5	--	10
VDD Good to Signal Valid	T2	ms	30	--	90
Signal Valid to Backlight On	T3	ms	200	--	--
Backlight Power On Time	T4	ms	0.5	--	--
Backlight Power Good to System PWM On	T5	ms	10	--	--
System PWM ON to Backlight Enable On	T6	ms	10	--	--
Backlight Enable Off to System PWM Off	T7	ms	0	--	--
System PWM Off to B/L Power Disable	T8	ms	10	--	--
Backlight Power Off Time	T9	ms	--	10	30
Backlight Off to Signal Disable	T10	ms	200	--	--
Signal Disable to VDD Down	T11	ms	0	--	50
VDD Fall Time	T12	ms	1	--	30
VDD Off Time	T13	ms	500	--	--





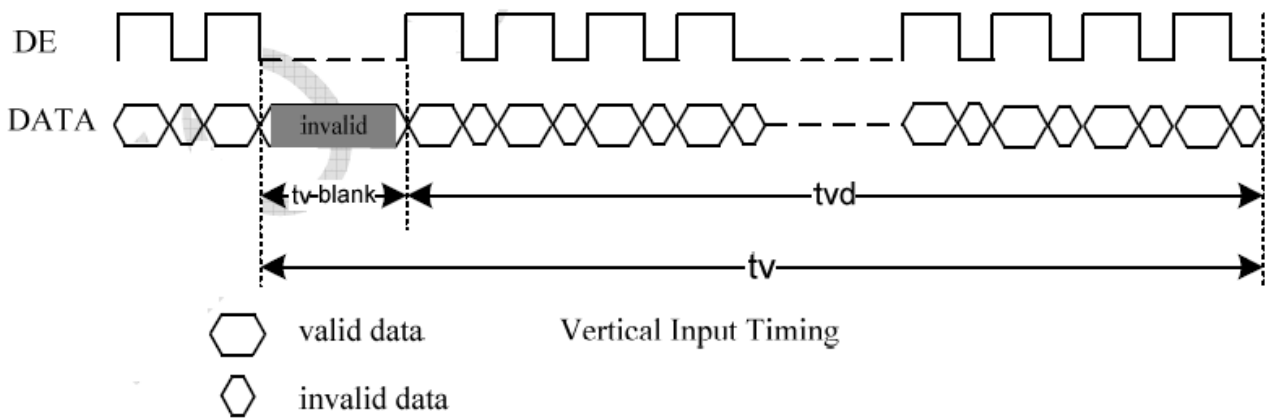
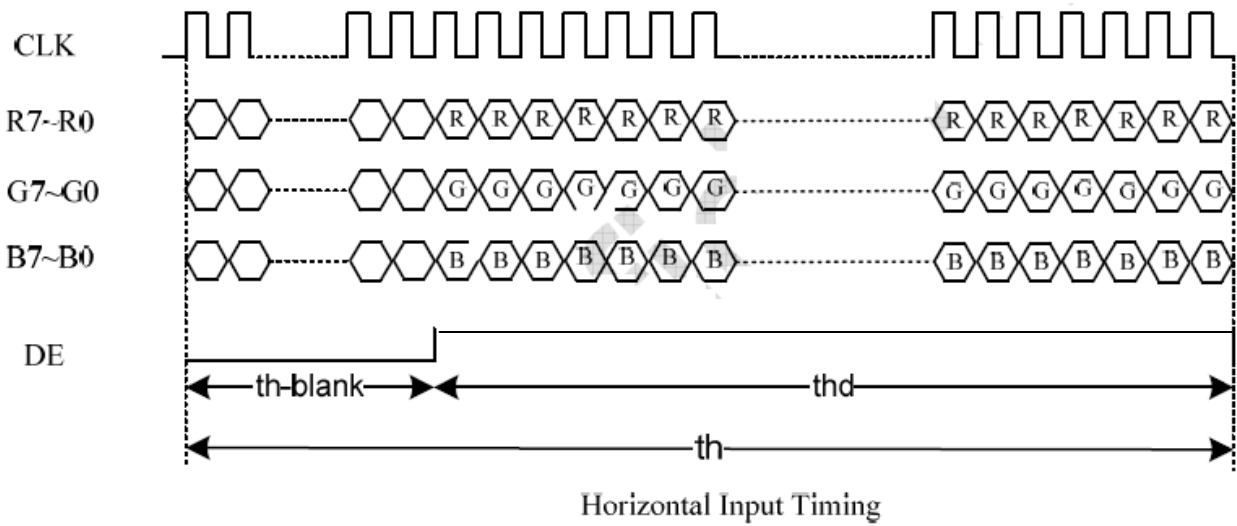
## 6-5 Timing Characteristics

### 6-4 Interface Timings

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
CLKIN cycle time	Tcph	20			ns	-
CLKIN pulse duty	Tcwh	40	50	50	%	-
Data set-up time	Tdsu	8	-	-	ns	-
Data hold time	Tdhd	8	-	-	ns	-
DE setup time	Tesu	8	-	-	ns	-
DE hold time	Tehd	8	-	-	ns	-
Output stable time	Tsst	-	-	6	us	-
DCLK Frequency	Fclk	28	30	40	MHZ	-
Horizontal Display Area	Thd	800			DCLK	-
One Horizontal Line	Th	908	928	1080	DCLK	-
H Blank Area	th-blank	108	128	280	DCLK	-
Vertical Display Area	Tvd	480			H	-
V Period time	Tv	517	525	704	H	-
V Blank Area	tv-blank	37	45	224	H	-

### DC Electrical

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Low level input voltage	Vil	0	-	0.3*VDD	V	For the digital Circuit
High level input voltage	Vih	0.7*VDD	-	VDD	V	For the digital circuit





## 7. Optical Characteristics:

Item	Symbol	Conditions	Specifications			Unit	Remark	
			Min	Typ	Max			
Transmittance	T(%)	Normal $\theta = \Phi = 0^\circ$		6.2	-	%		
Contrast Ratio	CR		400	500	-		Note 4	
Response time	T <sub>ON</sub>		-	10	20	ms	Note 3	
	T <sub>OFF</sub>			15	30	ms		
Viewing angle (CR ≥ 10) B/L ON	Hor.	$\theta_L$	$\Phi = 180^\circ$ (9 o'clock)	60	70	-	deg.	Note 1
		$\theta_R$	$\Phi = 0^\circ$ (3 o'clock)	60	70	-		
	Ver.	$\theta_T$	$\Phi = 90^\circ$ (12 o'clock)	40	50	-		
		$\theta_B$	$\Phi = 270^\circ$ (6 o'clock)	60	70	-		
White Luminous Intensity for LCM		Center	250	300	-	Cd/m <sup>2</sup>		
Uniformity for LCM		9 point	70	-		%		

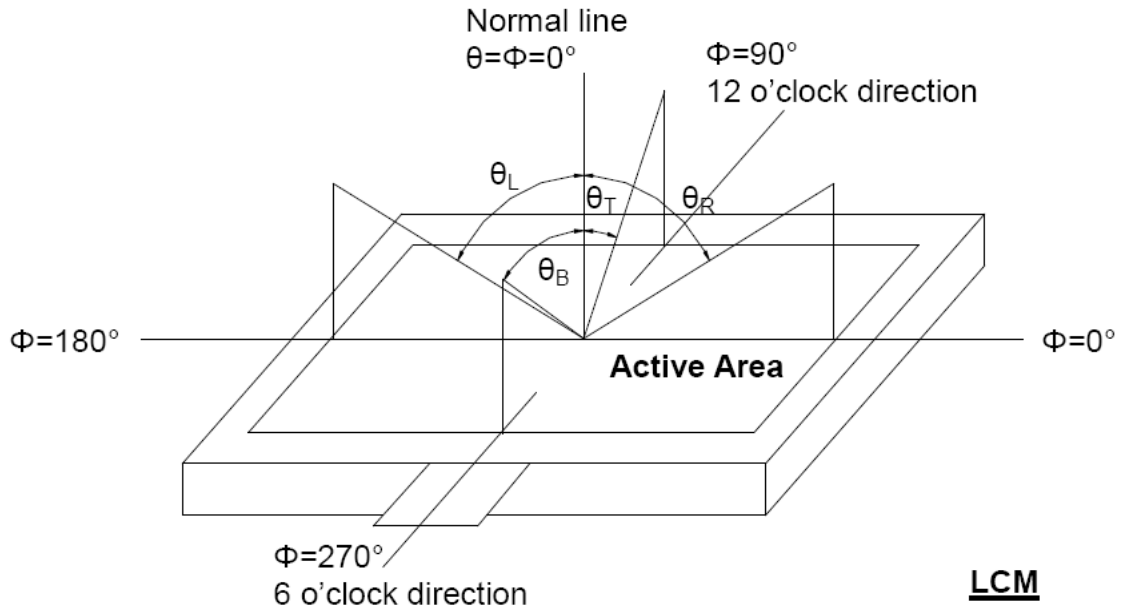
### Measuring Condition

1. DVDD=3.3V, the ambient temperature is 25°C.
2. The test systems refer to Note 2.

### Color of CIE Coordinate:

Item		Symbol	Min.	Typ.	Max.
Chromaticity Coordinates (Transmissive)	Red	x	0.534	0.584	0.634
		y	0.308	0.358	0.408
	Green	x	0.272	0.332	0.382
		y	0.515	0.565	0.615
	Blue	x	0.105	0.155	0.205
		y	0.043	0.093	0.143
	White	x	0.263	0.313	0.363
		y	0.279	0.329	0.379

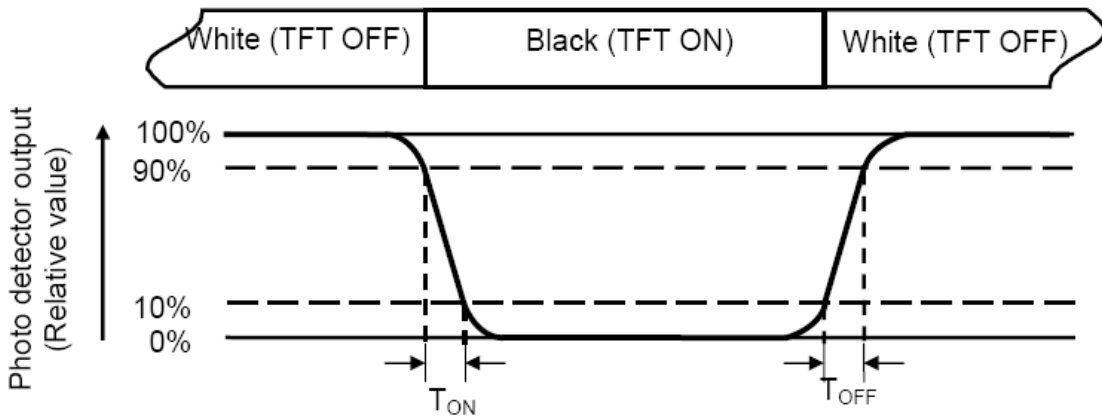
Note 1: Definition of viewing angle range



Note 3 :

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%.



Note 4 :

Definition of contrast ratio

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



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

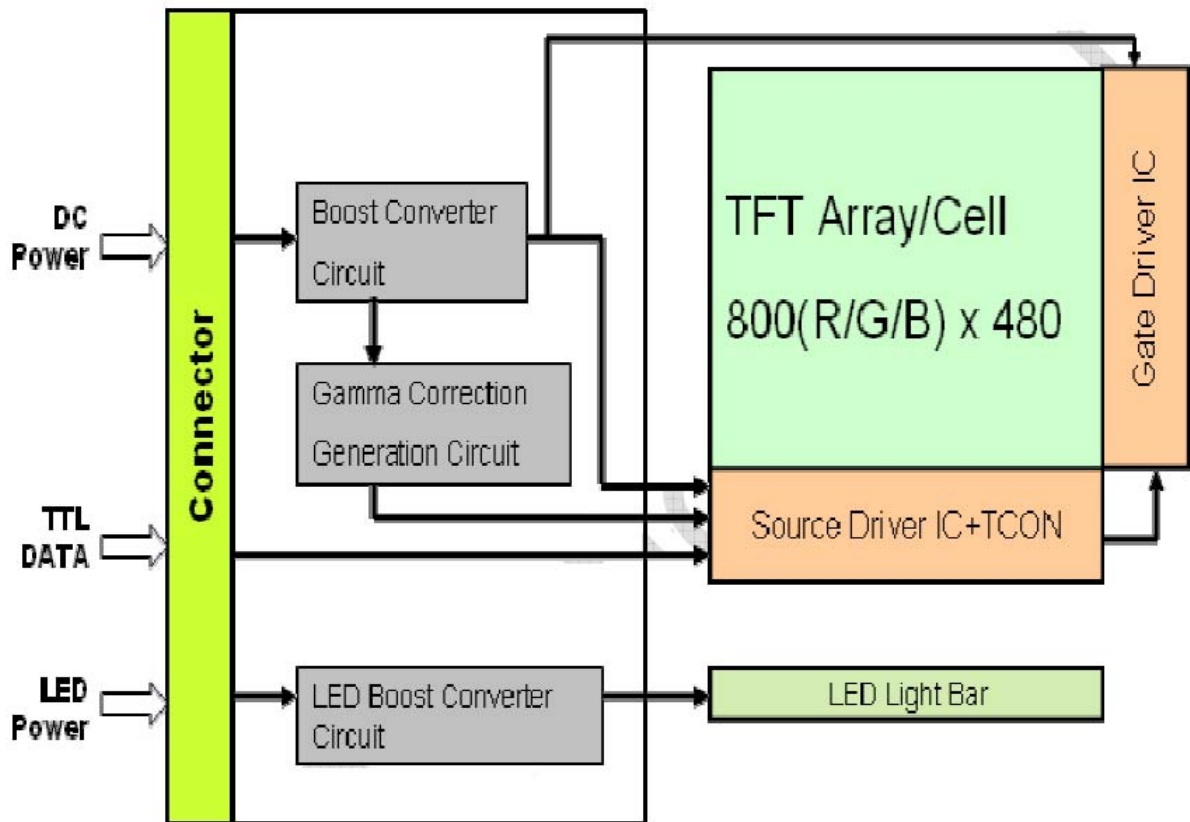
<b>No.</b>	<b>Symbol</b>	<b>Function</b>
1	GND	Ground
2	GND	Ground
3	VDD	Power Supply
4	VDD	Power Supply
5	UPDN	Gate up or down scan control
6	SHLR	Source right or left sequence control
7	GND	Ground
8	R0	Data Input (LSB)
9	R1	Data Input
10	R2	Data Input
11	R3	Data Input
12	GND	Data Input
13	R4	Data Input
14	R5	Data Input
15	GND	Ground
16	R6	Data Input
17	R7	Data Input(MSB)
18	GND	Ground
19	G0	Data Input (LSB)
20	G1	Data Input
21	G2	Data Input
22	G3	Data Input
23	GND	Ground
24	G4	Data Input
25	G5	Data Input
26	GND	Ground
27	G6	Data Input
28	G7	Data Input(MSB)
29	GND	Ground
30	B0	Data Input(LSB)
31	B1	Data Input



No.	Symbol	Function
32	B2	Data Input
33	B3	Data Input
34	GND	Ground
35	G4	Data Input
36	G5	Data Input
37	GND	Ground
38	G6	Data Input
39	G7	Data Input(MSB)
40	GND	Ground
41	DCLK	Clock Input
42	GND	Ground
43	DE	Data Input Enable
44	BIST	Aging Mode
45	GND	Ground
46	GND	Ground
47	LED_PWM	System PWM Signal Input
48	LED_EN	LED Enable Pin
49	VLED	LED Power Supply
50	VLED	LED Power Supply

When input 18 bits RGB data, the two low bits of R,G and B data must be grounded.  
Data shall be latched at falling edge of DCLK.  
Selection of scanning mode

## 9. Block Diagram







## 10. Backlight Characteristics:

### LED driver Input and Output Specification

Symbol	parameter	Min.	Typ.	Max.	Units	Condition	
VLED	LED Input	5	12	21	V	Ta=25°C	
PLED	LED Power Consumption	-	-	2.1W	W	Ta=25°C	
VLED_PWMFDIM	PWM diming Voltage	High	2.5	-	5.5	V	Ta=25°C
		Low	-	-	0.5		
Fpwm	PWM Diming Frequency	100	-	1K	Hz	Ddim ≥ 1%	
		100	-	5K		Ddim ≥ 5%	
VLED_EN	LED Enable Voltage	High	2.5	-	5.5	V	-
		Low	-	-	0.5		
LT	LED Life Time	20000	-	-	Hours	Ta=25°C	



## 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 75°C 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 -20°C 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°C 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°C 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°C, 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°C for 30 minutes → normal temperature for 5 minutes → +80°C 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 MIL-STD105E.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

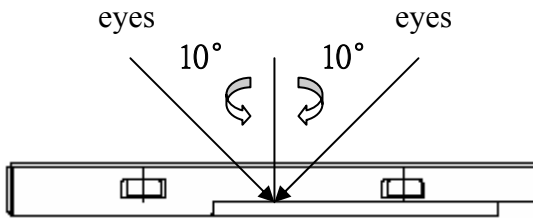
a. Manner of appearance test:

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

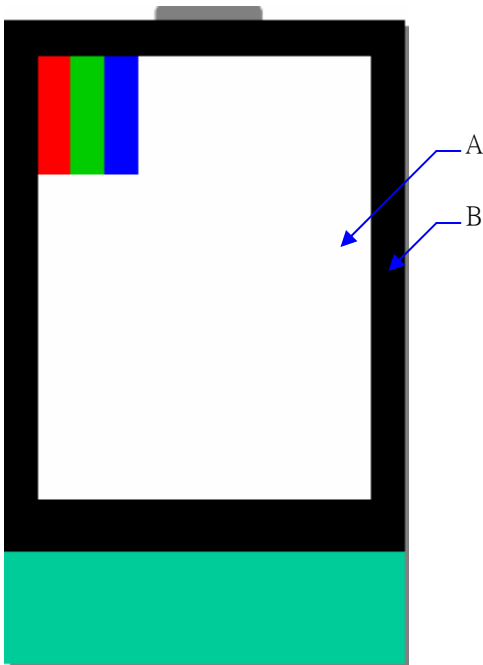
(ii) When test the model of transmissive product must add the reflective plate.

(iii) The test direction is base on around 10° of vertical line.

(iiii) Temperature: 25±5°C Humidity: 60±10%RH



(iv) Definition of area:



A. Area: Viewing area.

B. Area: Out of viewing area.

(Outside viewing area)

b. Basic principle:

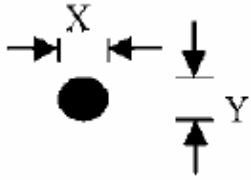
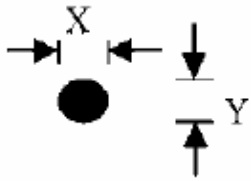
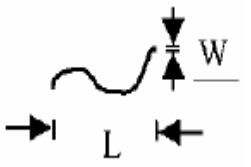
(i) It will accord to the AQL when the standard can not be described.

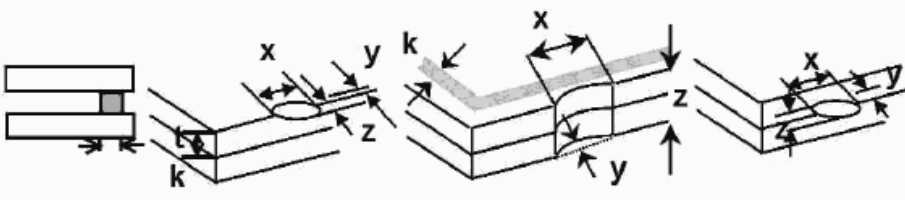
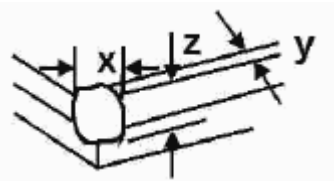
(ii) The sample of the lowest acceptable quality level must be discussed by both supplier and customer when any dispute happened.

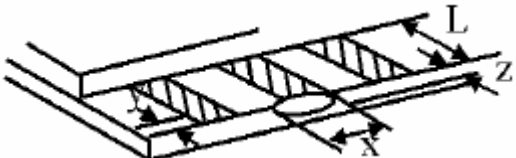
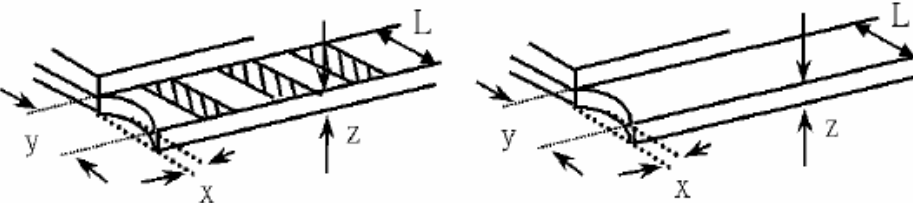
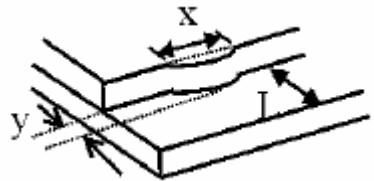
(iii) Must add new item on time when it is necessary.

c. Standard of inspection: (Unit: mm)

12-6. Inspection specification

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 border="1" data-bbox="790 734 1324 900"> <thead> <tr> <th>Size(mm)</th> <th>Acceptable Q'ty</th> </tr> </thead> <tbody> <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> </tbody> </table> <p>* Densely spaced: No more than two spots within 3mm.</p>	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 border="1" data-bbox="790 1124 1324 1290"> <thead> <tr> <th>Size(mm)</th> <th>Acceptable Q'ty</th> </tr> </thead> <tbody> <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> </tbody> </table> <p>* Densely spaced: No more than two spots within 3mm.</p>	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															
3.2 Line type: (As following drawing)  <table border="1" data-bbox="694 1489 1324 1825"> <thead> <tr> <th>Length(mm)</th> <th>Width(mm)</th> <th>Acceptable Q'ty</th> </tr> </thead> <tbody> <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> </tbody> </table> <p>* Densely spaced: No more than two lines within 3mm.</p>	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
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 border="1" data-bbox="826 293 1321 533"> <thead> <tr> <th>Size <math>\Phi</math>(mm)</th> <th>Acceptable Q'ty</th> </tr> </thead> <tbody> <tr> <td><math>\Phi \leq 0.20</math></td> <td>Accept no dense</td> </tr> <tr> <td><math>0.20 &lt; \Phi \leq 0.50</math></td> <td>4</td> </tr> <tr> <td><math>0.50 &lt; \Phi \leq 1.00</math></td> <td>3</td> </tr> <tr> <td><math>1.00 &lt; \Phi</math></td> <td>0</td> </tr> <tr> <td>Total Q'ty</td> <td>4</td> </tr> </tbody> </table>	Size $\Phi$ (mm)	Acceptable Q'ty	$\Phi \leq 0.20$	Accept no dense	$0.20 < \Phi \leq 0.50$	4	$0.50 < \Phi \leq 1.00$	3	$1.00 < \Phi$	0	Total Q'ty	4	2.5						
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$1.00 < \Phi$	0																				
Total Q'ty	4																				
05	Scratches	Follow NO.3 -2 Line Type.																			
06	Chipped glass	Symbols: x: Chip length      y: Chip width      z: Chip thickness k: Seal width      t: Glass thickness      a: LCD side length L: Electrode pad length 6.1 General glass chip: 6.1.1 Chip on panel surface and crack between panels:  <table border="1" data-bbox="375 1019 1189 1176"> <thead> <tr> <th>z: Chip thickness</th> <th>y: Chip width</th> <th>x: Chip length</th> </tr> </thead> <tbody> <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> </tbody> </table> <ul style="list-style-type: none"> <li>⊙ Unit: mm</li> <li>⊙ If there are 2 or more chips, x is the total length of each chip</li> </ul> 6.1.2 Corner crack:  <table border="1" data-bbox="375 1534 1189 1691"> <thead> <tr> <th>z: Chip thickness</th> <th>y: Chip width</th> <th>x: Chip length</th> </tr> </thead> <tbody> <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> </tbody> </table> <ul style="list-style-type: none"> <li>⊙ Unit: mm</li> <li>⊙ If there are 2 or more chips, x is the total length of each chip</li> </ul>	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																			
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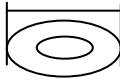
NO	Item	Criterion	AQL																
07	Glass crack	<p>Symbols:  x: Chip length                      y: Chip width                      z: Chip thickness  k: Seal width                      t: Glass thickness                      a: LCD side length  L: Electrode pad length</p> <p>7.2 Protrusion over terminal:  7.2.1 Chip on electrode pad:</p>  <table border="1" data-bbox="515 685 1203 842"> <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 border="1" data-bbox="515 1202 1203 1359"> <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 border="1" data-bbox="834 1675 1276 1832"> <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
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$y \leq 1/3L$	$X \leq a$																		





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:            x: Chip length                      y: Chip width                      z: Chip thickness            k: Seal width                      t: Touch Panel Total thickness    a: LCD side length            L: Electrode pad length</p> <p>14.1 General glass chip:            14.1.1 Chip on panel surface and crack between panels:</p> <table border="1" data-bbox="371 801 1193 1019"> <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            ⊙ If there are 2 or more chips, x is the total length of each chip</p> <p>14.1.2 Corner crack:</p> <table border="1" data-bbox="371 1397 1193 1615"> <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            ⊙ 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
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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
15	Touch Panel(Fish eye)	SIZE(mm)	Acceptable Q'ty	2.5
		$L \leq 0.7$	Accept no dense	
		$L > 0.7\text{mm}$	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.		0.65
		19.2 LCD pin loose or missing pins.		0.65
		19.3 Product packaging must the same as specified on packaging specification sheet.		0.65
		19.4 Product dimension and structure must conform to product specification sheet.		0.65



## 13. Handling Precaution:

### 13-1 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.

### 13-2 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.

### 13-3 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.