



SPECIFICATION FOR LCD MODULE

MODULE NO: YB-TG1024600S08A-N-A0

Doc.Version:01

Customer Approval:

Accept	<input type="checkbox"/> Reject
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YEEBO	NAME	SIGNATURE	DATE
Prepare	Electronic Engineer		2015.1.08
Check	Mechanical Engineer		2015.1.8
Verify			2015.1.8
Approval			2015.1.8

APPROVAL FOR SPECIFICATIONS ONLY

APPROVAL FOR SPECIFICATIONS AND SAMPLE

WIMRD005-02-C



1. Revision History

Sample Version	DOC. Version	DATE	DESCRIPTION		CHANGED BY
A0	00	2013-12-31	FULL SPEC	First issue	Kai / Jimmy
A0	01	2015-01-08	FULL SPEC	Update item 10~13	Kai / Jimmy



2. Table of Contents:

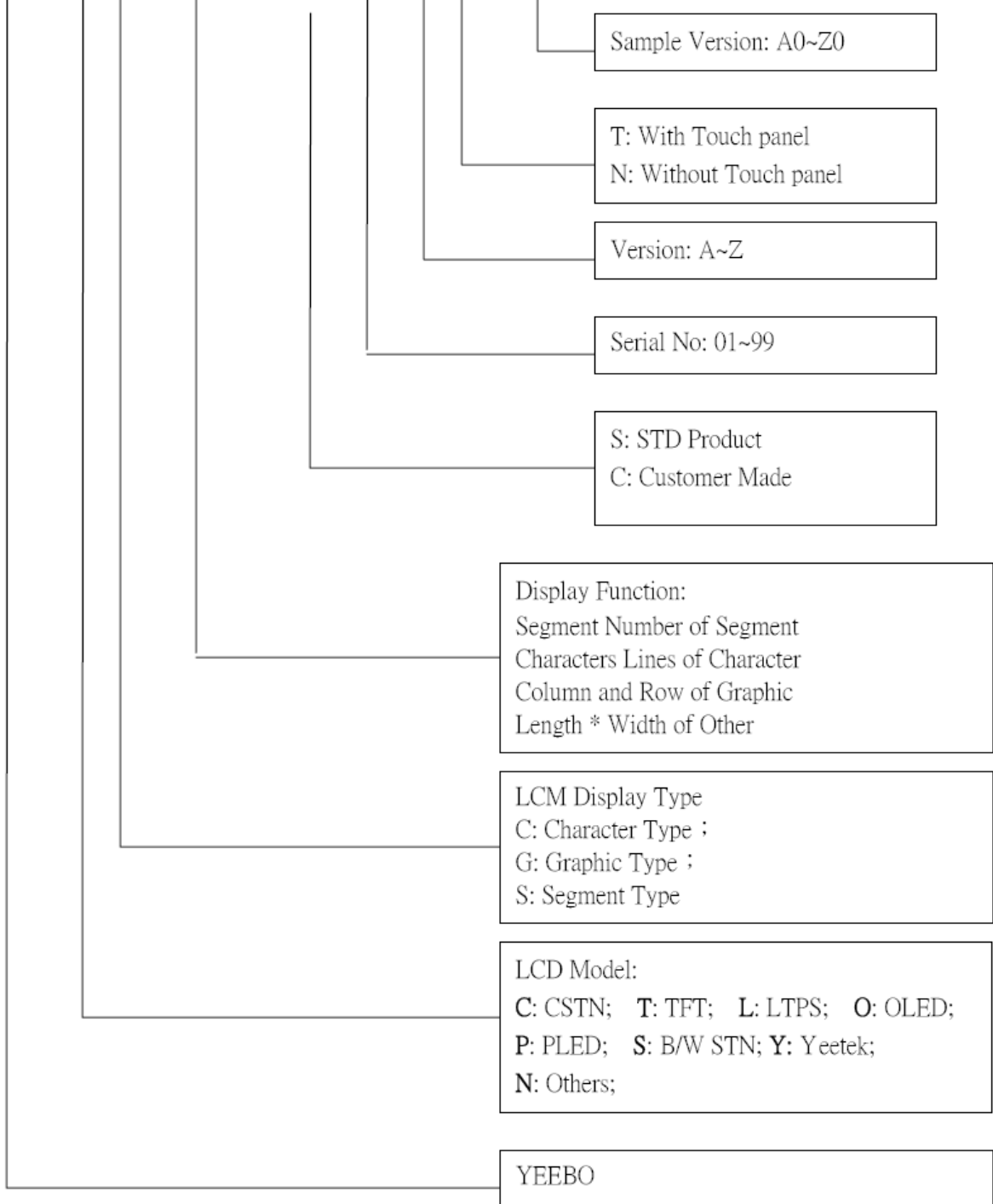
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3. Module Numbering System:

(Example)

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





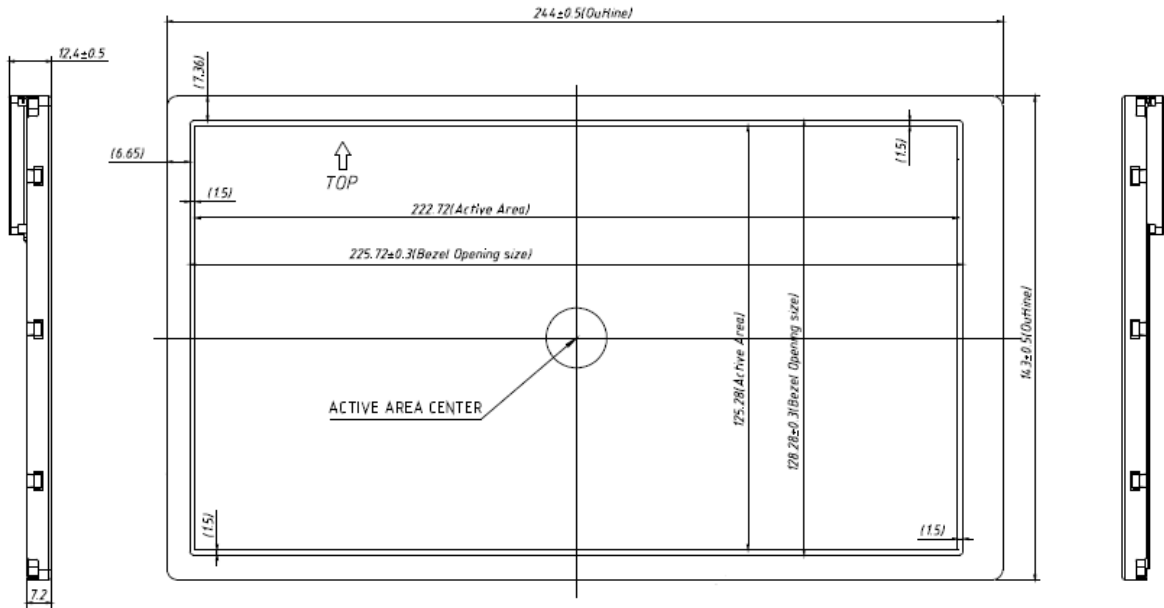
4. General Specification:

ITEM	CONTENTS
Module Size	244.0(W) * 143.0(H) * 12.4(T) mm
Display Size(Diagonal)	10.1 inch
Display Format	1024(RGB) * 600 Pixels
Active Area	222.72(W) * 125.28(H) mm
Pixel Pitch	0.2175 * 0.2088 mm
LCD Type	TFT(16.7M) / Transmissive / Normally White/Anit-glare
View Angle	Free
Interface	LVDS
Weight	440.0 g

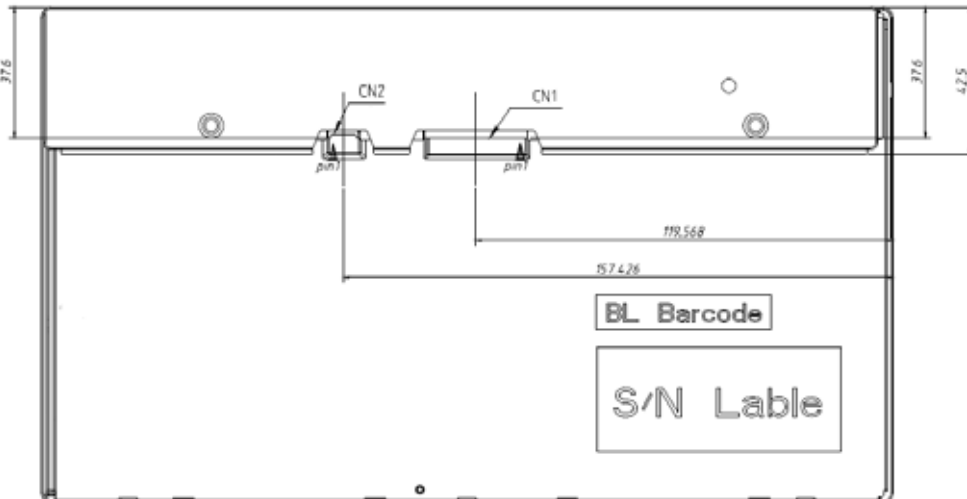


5. LCM drawing:

Front Side



Back Side





6. Electrical Characteristics

6-1 Absolute Maximum Ratings

(Ta=25°C VSS=0V)

Item	Symbol	Min.	Type	Max.	Unit	Remark
Supply Voltage	VIN	-0.3	-	3.6	Volt	Logic power supply voltage
		-0.3	-	24.0	Volt	LED Driver Vin
Input Signal	Vs	-	-	3.6	Volt	LVDS signals
PWM Voltage	VPWM	0.8	-	5.0	Volt	PWM Dimming Voltage
Operating Temperature	Topr	-30	-	+85		
Operating Humidity	Hopr	+10		+85	%RH	
Storage Temperature	Tstg	-30	-	+85		
Storage Humidity	Hstg	+10		+95	%RH	

6-2 Operating Conditions

6-2-1 System Power Supply

(Ta=25°C)

Item	Symbol	Min.	Typ.	Max.	Unit	Remark
Power Supply voltage	V _{IN}	3.0	3.3	3.6	Volt	
Input Power Supply Current	I _{VIN}	-	-	191.0	mA	Black pattern, 60Hz
Input Inrush Current	I _{RUSH}	-	-	1.5	A	0.5ms rise time(10~90%)
Input Power Voltage Ripple	V _{RPL}	-	-	200	mV	V _{p-p}
REV	V _H	2.0	3.3	5.0	Volt	
	V _L	-	-	0.8	Volt	

6-2-2 LED Power Supply

Item	Symbol	Min.	Typ.	Max.	Unit	Remark
Input Power Supply Voltage	V _{LED-IN}	8.0	12.0	16.0	Volt	
Input Power Supply Current	I _{IN}	-	-	543	mA	
EN/PWM	V _H	2.0	3.3	5.0	Volt	
	V _L	-	-	0.8	Volt	

6-2-3 LVDS Signals

Item	Symbol	Min.	Typ.	Max.	Unit	Remark
Differential Input High Threshold	V _{th}	-	-	+100	mV	V _{cm} =+1.2V
Differential Input Low Threshold	V _{tl}	-100	-	-	mV	V _{cm} =+1.2V
Magnitude Differential Input Voltage	V _{id}	200	-	600	mV	
Common Mode Voltage	V _{cm}	1.0	1.2	1.4	V	V _{th} -V _{tl} =200mV
Common Mode Voltage Offset	△V _{cm}	-50	-	+50	mV	V _{th} -V _{tl} =200mV

Note: A. Input signal shall be low or Hi-Z state when V_{IN} is off.

B. All electrical characteristics for LVDS signal are defined and shall be measured at the interface connector of LCD.

C. White Pattern at 3.3V driving voltage.

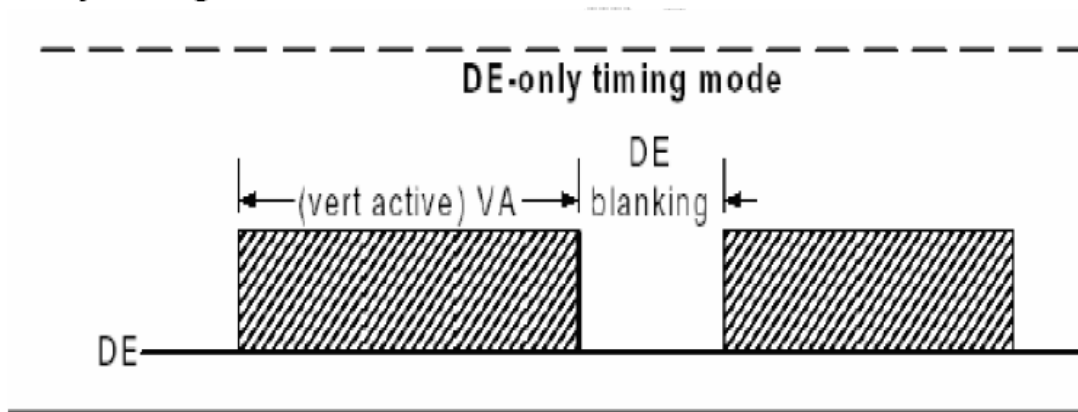
6-3 Interface Timings

6-3-1 Timing Characteristics

Synchronization Method : DE only

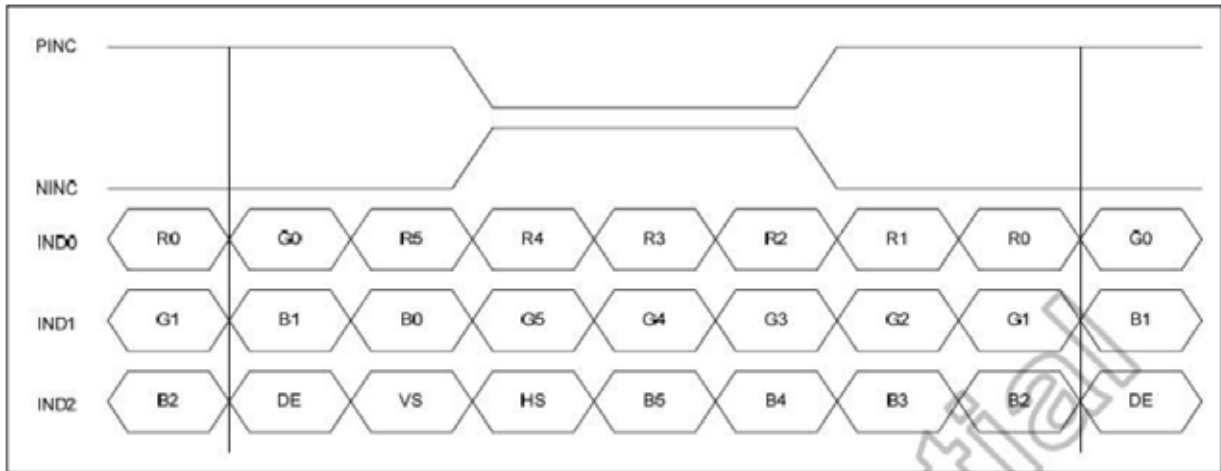
Parameter	Symbol	Unit	Min.	Typ.	Max.
LVDS Clock Frequency <single>	f_{dck}	MHz	45	51.2	57
H Total Time	T_{hp}	clocks	1,324	1,344	1,364
H Active Time	HA	clocks	1,024	1,024	1,024
H Blanking Time	T_{HBLANK}	clocks	300	320	340
V Total Time	T_{vp}	lines	625	635	645
V Active Time	VA	lines	600	600	600
V Blanking Time	T_{VBLANK}	lines	25	35	45
V Frequency	f_v	Hz	55	60	65

DE-only timing mode

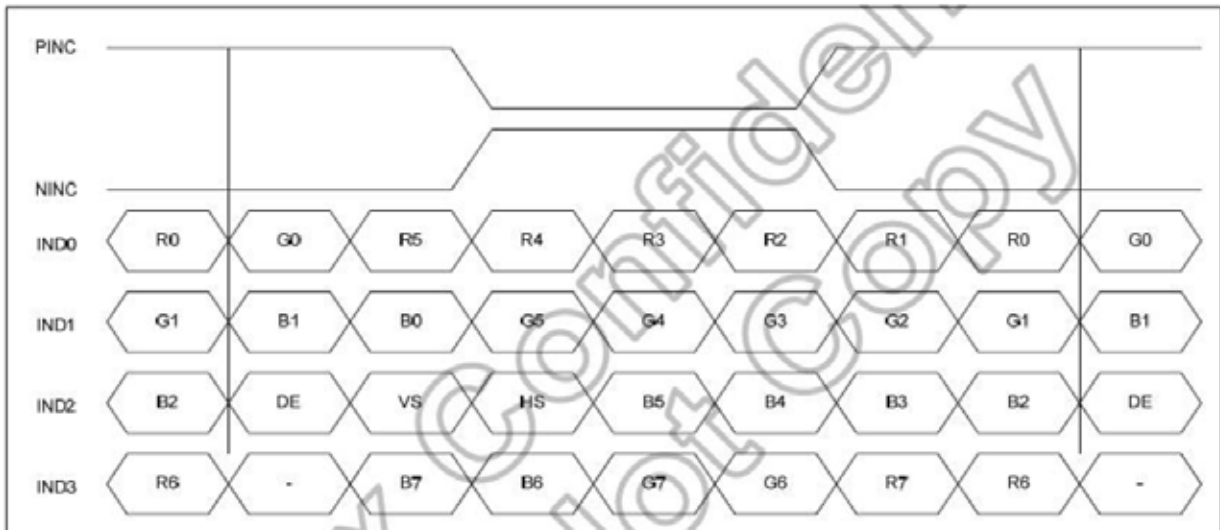


6-3-2 Timing Diagram of Interface Signal LVDS Data Mapping

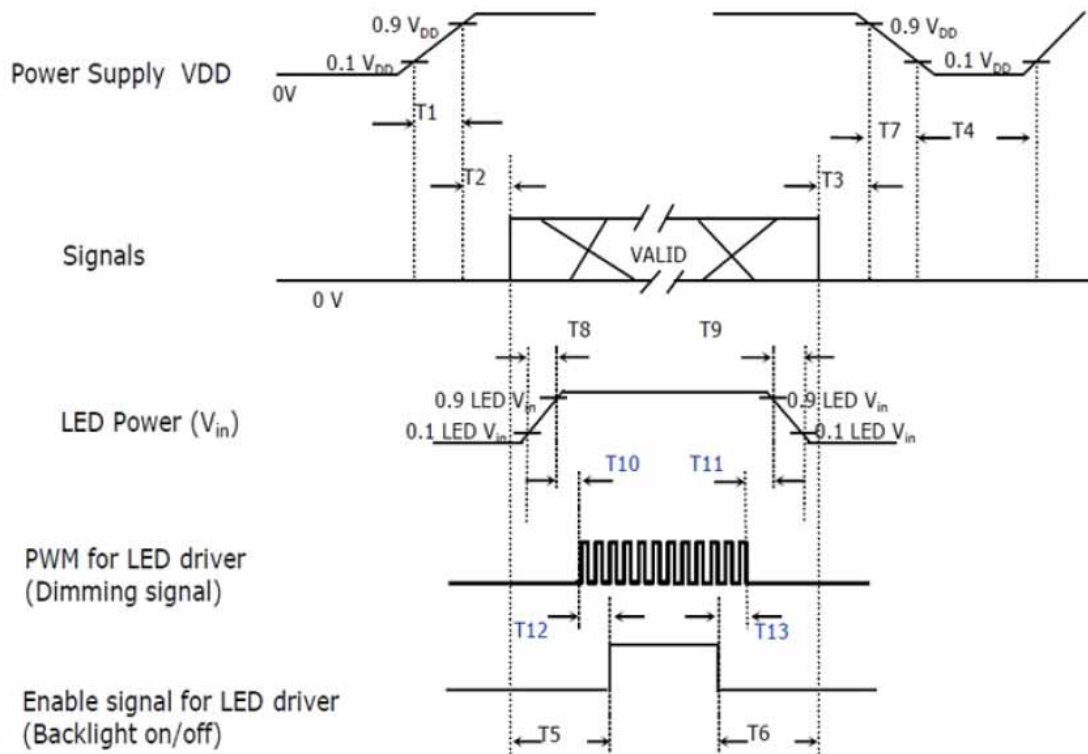
6 bit LVDS input



8 bit LVDS input



6-4 Power ON/OFF Sequence



Power Sequencing Requirements

Parameter	Symbol	Unit	min	typ	max
VDD rising Time from 10% to 90%	T1	ms	0.5	--	10
Delay from VDD to valid data at power ON	T2	ms	0	--	50
Delay from valid data OFF to VDD OFF at power OFF	T3	ms	0	--	50
VDD OFF time for Windows restart	T4	ms	500	--	--
Delay from valid data to B/L enable at power ON	T5	ms	200	--	--
Delay from valid data off to B/L disable at power OFF	T6	ms	200	--	--
VDD falling time from 90% to 10%	T7	ms	0	--	10
LED Vin rising time from 10% to 90%	T8	ms	0.5	--	10
LED Vin falling time from 90% to 10%	T9	ms	0.5	--	10
Delay from LED driver Vin rising time 90% to PWM ON	T10	ms	0	--	10
Delay from PWM Off to LED Driver Vin falling time 10%, Must Keep rule	T11	ms	0	--	--
Delay from PWM ON to B/L Enable ON, Must Keep rule	T12	ms	0	--	--
Delay from B/L Enable Off to PWM Off	T13	ms	0	--	--

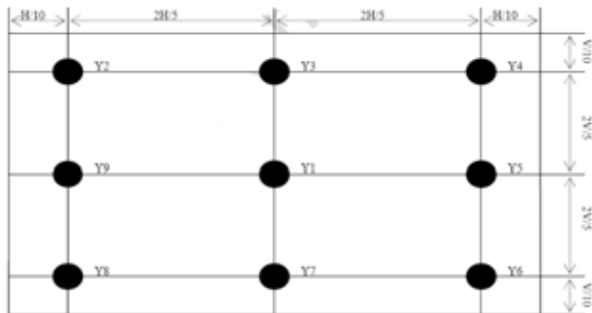
7. Optical Characteristics:

Item	Symbol	Conditions	Specifications			Unit	Remark	
			Min	Typ	Max			
Contrast Ratio	CR	Normal $\theta = \Phi = 0$	400	500	-		Note 3	
Response time	Rising +Falling		-	16	20	ms	Note 2	
Viewing angle (CR \geq 10) B/L ON	Hor.	$\Theta x-$	$\Phi = 180^\circ$ (9 o'clock)	70	80	-	deg.	Note 1
		$\Theta x+$	$\Phi = 0^\circ$ (3 o'clock)	70	80	-		
	Ver.	$\Theta y+$	$\Phi = 90^\circ$ (12 o'clock)	70	80	-		
		$\Theta y-$	$\Phi = 270^\circ$ (6 o'clock)	70	80	-		
White Luminous Intensity for LCM		Center	400	500	-	Cd/m ²		
Uniformity for LCM		9 point	75	80		%		

Measuring Condition

1. Measuring surrounding: dark room
2. Ambient temperature: $25 \pm 2^\circ\text{C}$
3. 30 min. Warm-up time.
4. Average Luminous Intensity of P1-P9
5. Uniformity = $\text{Min/Max} * 100\%$

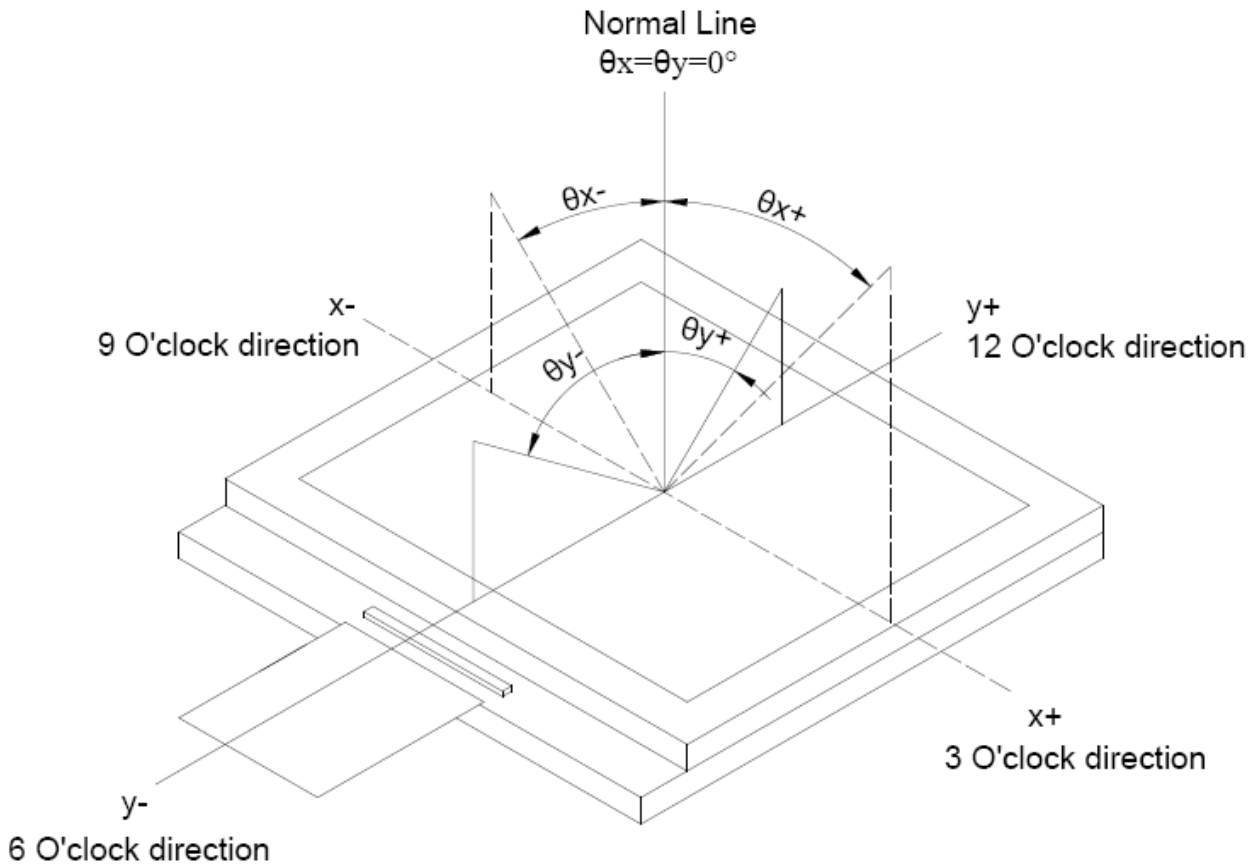
Measured Method: (X*Y: Light Area)



Color of CIE Coordinate:

Item		Symbol	Min.	Typ.	Max.
Chromaticity Coordinates (Transmissive)	Red	x	0.529	0.579	0.629
		y	0.294	0.344	0.394
	Green	x	0.276	0.326	0.376
		y	0.541	0.591	0.641
	Blue	x	0.109	0.159	0.209
		y	0.081	0.131	0.181
	White	x	0.255	0.305	0.355
		y	0.275	0.325	0.375

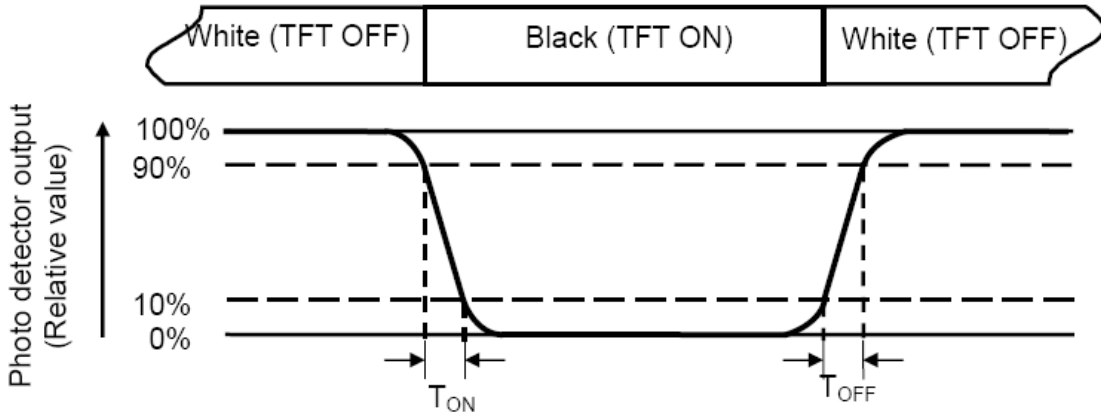
Note 1: Definition of viewing angle range



Note 2 :

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 3 :

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:

8-1 Signal Pin Assignment

CN1 : STM MSB240420HD or equivalent

No.	Symbol	I/O	Function	Remark
1	VDD	P	Power Supply ,3.3V(typical)	
2	VDD	P	Power Supply ,3.3V(typical)	
3	GND	P	Ground	
4	REV	I	Reverse Scan selection	
5	RIN1-	I	-LVDS differential data input	
6	RIN1+	I	+LVDS differential data input	
7	GND	P	Ground	
8	RIN2-	I	-LVDS differential data input	
9	RIN2+	I	+LVDS differential data input	
10	GND	P	Ground	
11	RIN3-	I	-LVDS differential data input	
12	RIN3+	I	+LVDS differential data input	
13	GND	P	Ground	
14	CLKIN-	I	-LVDS differential clock input	
15	CLKIN+	I	+LVDS differential clock input	
16	GND	P	Ground	
17	RIN4-	I	-LVDS differential data input	
18	RIN4+	I	+LVDS differential data input	
19	SEL68	I	6/8 bit LVDS data input selection(H:8bit;L/Floating:6bit)	Table*
20	NC	-	Not connection	

Table*

Signal Name	SYMBOL	MIN.	TYP.	MAX.	UNIT
SEL68	VH	2.0	3.3	5.0	V
	VL	-	-	0.8	V



8-2 B/L Pin Assignment

CN2 : STM MSB24038P5A or equivalent

No.	Symbol	Function	Remark
1	VCC	Power supply, 12V(typical)	
2	GND	Ground	
3	EN	3.3V(typical)	
4	PWM	3.3V(typical)	
5	NC	Not connection	



9. Backlight Characteristics:

LED driver Input and Output Specification

Item	Unit	Min.	Typ.	Max.	Condition
VIN_LED	V	8	12	16	DUTY=100%
IVIN_LED	mA	-	-	543	
FDIM	HZ	100	-	1K	
DUTY	%	5	-	100	
CTRL	VIH	V	2	3.3	5
	VIL	V	0	-	0.8
Vout	V		(22.4)		
Iout	mA		(160)		
效率	%	(80)			
LT	Hours	50,000	-	-	LED Life Time

Note : The LED life time define as the estimated time to 50% degradation of initial luminous.



10. Standard Specification for Reliability .:

10-1. Standard Specifications for Reliability of LCD Module

No	Item	Description
01	High temperature operation	The sample should be allowed to stand at 85°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 -30°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 85°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 → +85°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



10 - 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 10.1, 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.

10- 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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11. Specification of Quality Assurance:

11-1. Purpose

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

11-2. 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%

11-3. 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.

11-4. 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.

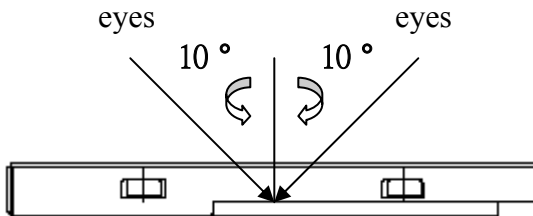
b. There is any argument item which does not record in the standard of quality assurance.

c. Any other special problem.

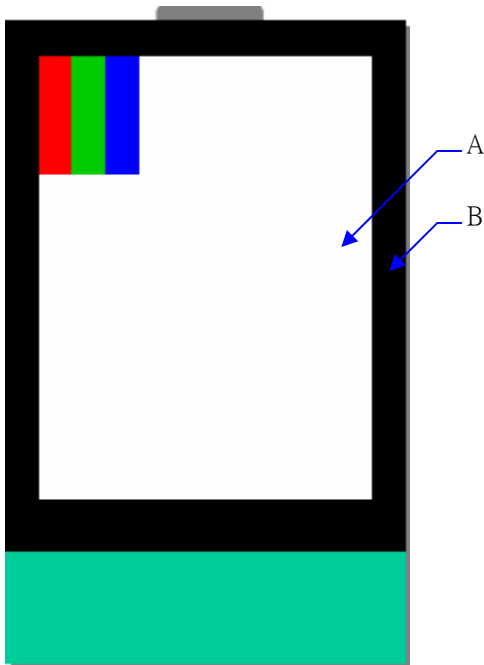
11-5. Standard of The Product Appearance Test

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)

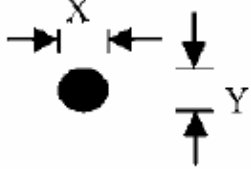
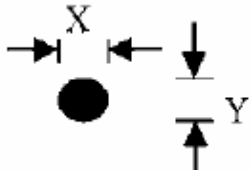
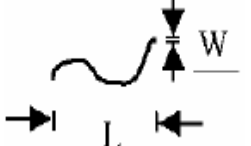
b. Basic principle:

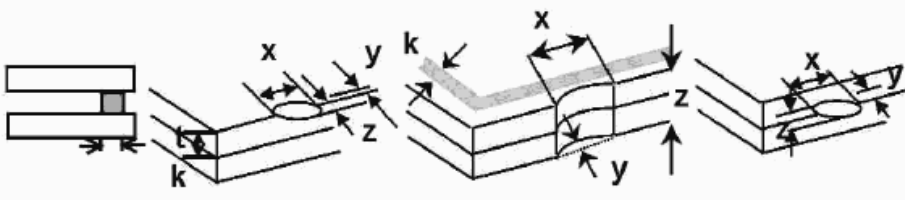
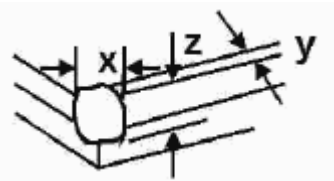
- (i) It will accord to the AQL when the standard can not be described.
- (ii) The sample of the lowest acceptable quality level must be discussed by both supplier and customer when any dispute happened.
- (iii) Must add new item on time when it is necessary.

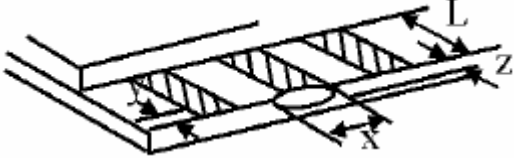
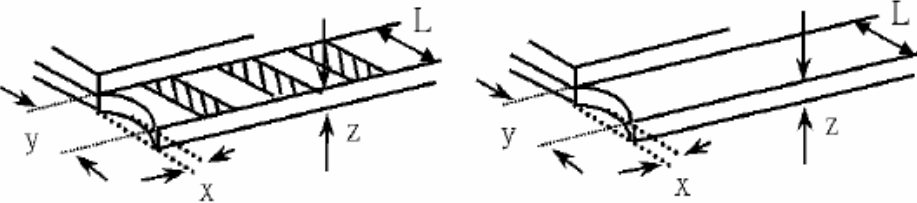
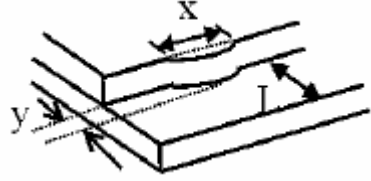
c. Standard of inspection: (Unit: mm)

11-6. Inspection specification

Defect out of viewing area can be neglected.

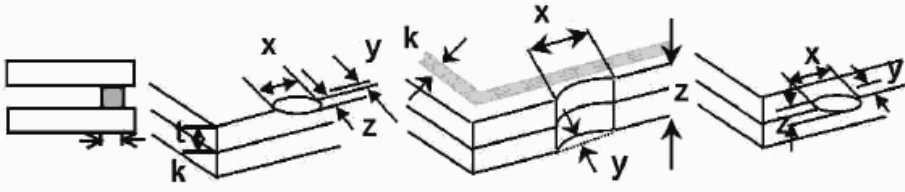
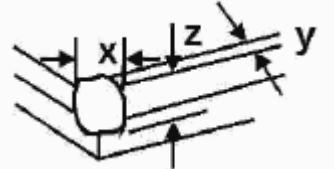
NO	Item	Criterion	AQL													
01	Electrical Testing	1.1 Missing vertical, horizontal segment, segment contrast defect. 1.2 Missing character, dot or icon. 1.3 Display malfunction. 1.4 No function or no display. 1.5 Current consumption exceeds product specifications. 1.6 LCD viewing angle defect. 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 Dot dimension as below drawing: $\Phi = (X+Y) / 2$  <table border="1" data-bbox="790 806 1324 974"> <thead> <tr> <th>Size(mm)</th> <th>Acceptable Q'ty</th> </tr> </thead> <tbody> <tr> <td>$\Phi \leq 0.20$</td> <td>Accept no dense</td> </tr> <tr> <td>$0.20 < \Phi \leq 0.50$</td> <td>5</td> </tr> <tr> <td>$0.50 < \Phi$</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	$0.20 < \Phi \leq 0.50$	5	$0.50 < \Phi$	0	2.5					
Size(mm)	Acceptable Q'ty															
$\Phi \leq 0.20$	Accept no dense															
$0.20 < \Phi \leq 0.50$	5															
$0.50 < \Phi$	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 1198 1324 1366"> <thead> <tr> <th>Size(mm)</th> <th>Acceptable Q'ty</th> </tr> </thead> <tbody> <tr> <td>$\Phi \leq 0.20$</td> <td>Accept no dense</td> </tr> <tr> <td>$0.20 < \Phi \leq 0.50$</td> <td>5</td> </tr> <tr> <td>$0.50 < \Phi$</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	$0.20 < \Phi \leq 0.50$	5	$0.50 < \Phi$	0	2.5					
		Size(mm)	Acceptable Q'ty													
$\Phi \leq 0.20$	Accept no dense															
$0.20 < \Phi \leq 0.50$	5															
$0.50 < \Phi$	0															
3.2 Line type: (As following drawing)  <table border="1" data-bbox="694 1556 1324 1892"> <thead> <tr> <th>Length(mm)</th> <th>Width(mm)</th> <th>Acceptable Q'ty</th> </tr> </thead> <tbody> <tr> <td>L 10</td> <td>$W \leq 0.1$</td> <td>Accept no dense</td> </tr> <tr> <td>$L \leq 10.0$</td> <td>$0.1 < W \leq 0.25$</td> <td>4</td> </tr> <tr> <td>$L > 10$</td> <td>----</td> <td>Rejection</td> </tr> <tr> <td>----</td> <td>$0.25 < W$</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 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 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														

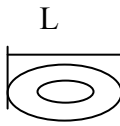
NO	Item	Criterion	AQL																		
04	Polarizer bubbles	If bubbles are visible, judge using black spot specifications, not easy to find, must check in specify direction <table border="1" data-bbox="826 293 1326 535"> <thead> <tr> <th>Size Φ(mm)</th> <th>Acceptable Q'ty</th> </tr> </thead> <tbody> <tr> <td>$\Phi \leq 0.20$</td> <td>Accept no dense</td> </tr> <tr> <td>$0.20 < \Phi \leq 0.50$</td> <td>4</td> </tr> <tr> <td>$0.50 < \Phi \leq 1.00$</td> <td>3</td> </tr> <tr> <td>$1.00 < \Phi$</td> <td>0</td> </tr> <tr> <td>Total Q'ty</td> <td>4</td> </tr> </tbody> </table>	Size Φ (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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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 1193 1176"> <thead> <tr> <th>z: Chip thickness</th> <th>y: Chip width</th> <th>x: Chip length</th> </tr> </thead> <tbody> <tr> <td>$Z \leq 1/2t$</td> <td>Not over viewing area</td> <td>$x \leq 1/8a$</td> </tr> <tr> <td>$1/2t < z \leq 2t$</td> <td>Not exceed 1/3k</td> <td>$x \leq 1/8a$</td> </tr> </tbody> </table> <ul style="list-style-type: none"> ⊙ Unit: mm ⊙ If there are 2 or more chips, x is the total length of each chip 6.1.2 Corner crack:  <table border="1" data-bbox="375 1534 1193 1691"> <thead> <tr> <th>z: Chip thickness</th> <th>y: Chip width</th> <th>x: Chip length</th> </tr> </thead> <tbody> <tr> <td>$Z \leq 1/2t$</td> <td>Not over viewing area</td> <td>$x \leq 1/8a$</td> </tr> <tr> <td>$1/2t < z \leq 2t$</td> <td>Not exceed 1/3k</td> <td>$x \leq 1/8a$</td> </tr> </tbody> </table> <ul style="list-style-type: none"> ⊙ Unit: mm ⊙ If there are 2 or more chips, x is the total length of each chip 	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
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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="517 685 1203 842"> <tr> <td>y: Chip width</td> <td>x: Chip length</td> <td>z: Chip thickness</td> </tr> <tr> <td>$y \leq 0.5\text{mm}$</td> <td>$x \leq 1/8a$</td> <td>$0 < z \leq t$</td> </tr> </table> <p>7.2.2 Non-conductive portion:</p>  <table border="1" data-bbox="517 1205 1203 1361"> <tr> <td>y: Chip width</td> <td>x: Chip length</td> <td>z: Chip thickness</td> </tr> <tr> <td>$y \leq L$</td> <td>$x \leq 1/8a$</td> <td>$0 < z \leq t$</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="836 1675 1278 1832"> <tr> <td>y: width</td> <td>x: length</td> </tr> <tr> <td>$y \leq 1/3L$</td> <td>$X \leq a$</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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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="375 801 1193 1019"> <tr> <td>z: Chip thickness</td> <td>y: Chip width</td> <td>x: Chip length</td> </tr> <tr> <td>$Z \leq t$</td> <td>$\leq 1/2 k$ and not over viewing area</td> <td>$x \leq 1/8a$</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="375 1400 1193 1617"> <tr> <td>z: Chip thickness</td> <td>y: Chip width</td> <td>x: Chip length</td> </tr> <tr> <td>$z \leq t$</td> <td>$\leq 1/2 k$ and not over viewing area</td> <td>$x \leq 1/8a$</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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NO	Item	Criterion	AQL							
15	Touch Panel(Fish eye)	<table border="1"> <tr> <th>SIZE(mm)</th> <th>Acceptable Q'ty</th> </tr> <tr> <td>$L \leq 1.0$</td> <td>Accept no dense</td> </tr> <tr> <td>$L > 1.0\text{mm}$</td> <td>0</td> </tr> </table>	SIZE(mm)	Acceptable Q'ty	$L \leq 1.0$	Accept no dense	$L > 1.0\text{mm}$	0		2.5
		SIZE(mm)	Acceptable Q'ty							
		$L \leq 1.0$	Accept no dense							
$L > 1.0\text{mm}$	0									
Newton ring dimension $\leq 1/2$ touch panel area and not affect font and line distortion($\leq 2.5\%$), it is acceptable.										
Less than 2.5% is acceptable.										
18	LCD Ripple	Touch the touch panel, can not see the LCD ripple. Pen: R 1.0mm silicon rubber. Operation Force: 10~100g	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							



12. Handling Precaution:

12-1 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 FPC 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.

12-2 Storage

- Store in an ambient temperature of 25 ± 10 , and in a relative humidity of $50 \pm 10\%RH$. 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.

12-3 Soldering

- Use only soldering irons with proper grounding and no leakage.
- Iron: No higher than 280 ± 10 and less than 3 sec during Hand soldering.
- Rewiring: no more than 2 times.

13. Guarantee:

Our products meet requirements of the environment.

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