

SPECIFICATION FOR CTP MODULE

MODULE NO: YB-TG1024600C21C-C-A2

Doc.Version:03

Customer Approval:

<input type="checkbox"/> Accept	<input type="checkbox"/> Reject
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YEEBO	NAME	SIGNATURE	DATE
Prepare	Mechanical Engineer	张雷	2021/9/13
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Approval		孙亚南	2021/9/13

■ APPROVAL FOR SPECIFICATIONS ONLY

APPROVAL FOR SPECIFICATIONS AND SAMPLE

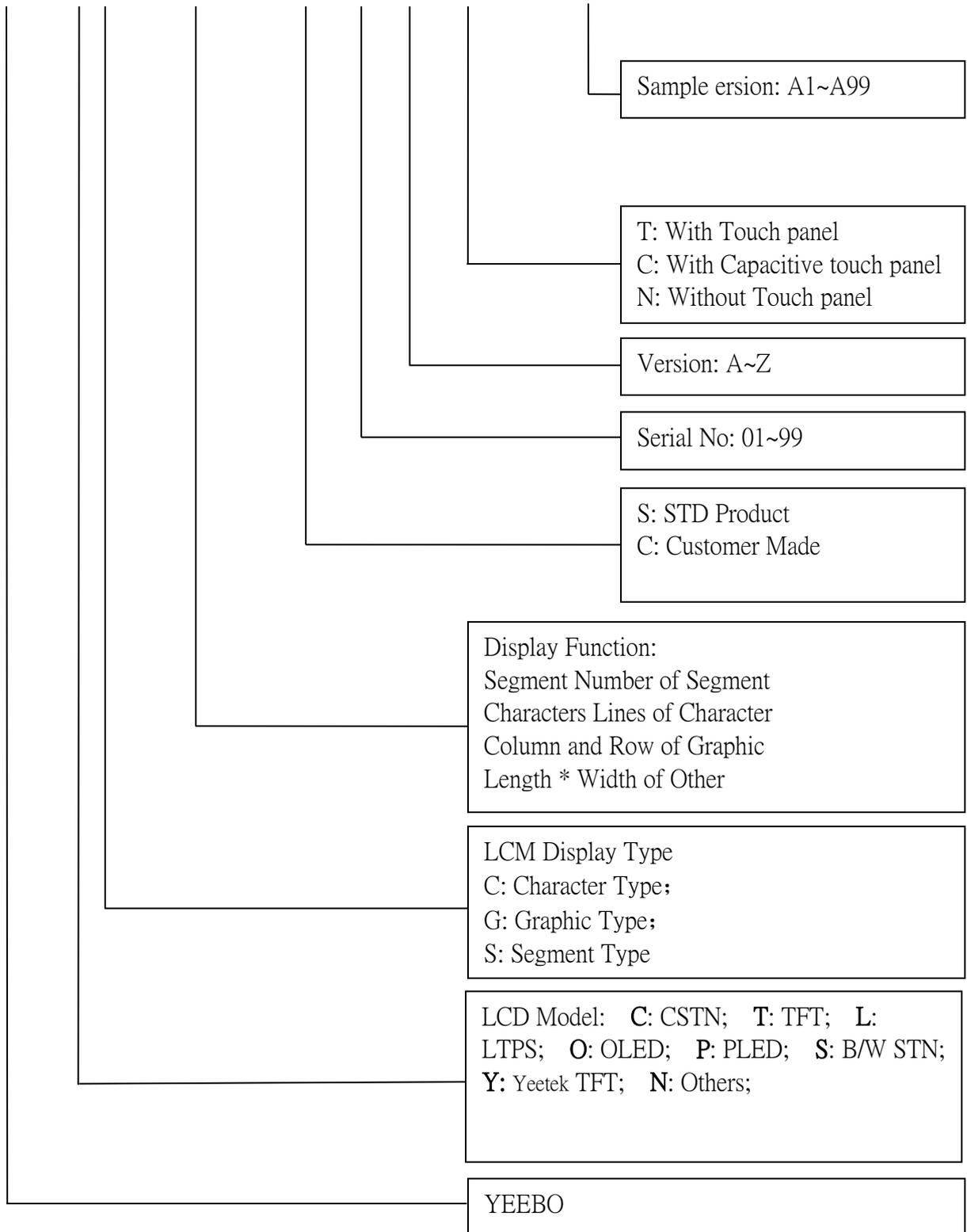
WIMRD005-02-D

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3. Module Numbering System:

YB- TG 1204600 C 21 C -C – A1



4. General Specification:

ITEM	CONTENTS
Module Size	178.00(W) * 124.50(H) * 6.62(T) mm
Display Size(Diagonal)	7inch
Display Format	1024(RGB)* 600 Pixels
Pixel Pitch	0.1506 (H)mm*0.1432(V) mm
LCD Type	TFT(16.7M)/ Transmissive/Normal Black
Active Area	154.21(W)*85.92(H)mm
View Angle	Free
Drive IC	EK79007AD3 & EK73217BCGA
CTP IC	ILI2117A
Weight(g)	≈300
Fireware	8819_130k_v1.6.bin
Test Configuration	autosettinga.ini

6. Electrical Characteristics

6-1 Absolute Maximum Ratings

6-1-1 TFT Absolute Maximum Ratings (Ta=25°C VSS=0V)

Item	Symbol	Min.	Type	Max.	Unit	Remark
Power Supply voltage	VDD	-0.5	-	5.0	Volt	
	AVDD	-0.5	-	15.0	Volt	
Operating Temperature	Topr	-20	-	+70	°C	
Storage Temperature	Tstg	-30	-	+80	°C	

Note1: Absolute maximum rating is the limit value beyond which the IC maybe broken.

6-2 Operating Conditions

6-2-1 TFT Operating Conditions (Ta=25°C)

Item	Symbol	Condition	Min.	Typ.	Max.	Unit
Power Supply voltage	VDD	-	3.0	3.3	3.6	Volt
	AVDD	-	(9.4)	(9.6)	(9.8)	Volt
	VGH	-	(16)	(18)	(20)	Volt
	VGL	-	(-7)	(-6)	(-5)	Volt
Input Voltage	VCOM		(3.1)	(3.2)	(4)	Volt
Power Supply Current for Driver	IVDD	DVDD=3.3V	-	98.67	148	mA

6-2-2 TP Operating Conditions

(Ta=25°C)

Table 5-2: Power Supply

Item	Symbol	Min	Typ.	Max	Unit
System power supply voltage	VDD	2.8		3.3	V
Ambient operating temperature	T _A	-40		85	°C
Junction Temperature	T _J			125	°C

Table 5-3: DC Characteristics (T_{opr} = 25°C)

Item	Symbol	Min	Typ.	Max	Unit
Input Voltage, High 1	(V _{IH1}) ¹	1			V
Input Voltage, High 2	(V _{IH2}) ²	1.3			V
Input Voltage, Low	(V _{IL})			0.5	V
Output Voltage, High 1	(V _{OH1}) ³		See Note3		V
Output Voltage, High 2	(V _{OH2}) ⁴	V _{VDD} - 0.1			V
Output Voltage, Low	(V _{OL})			0.1	V

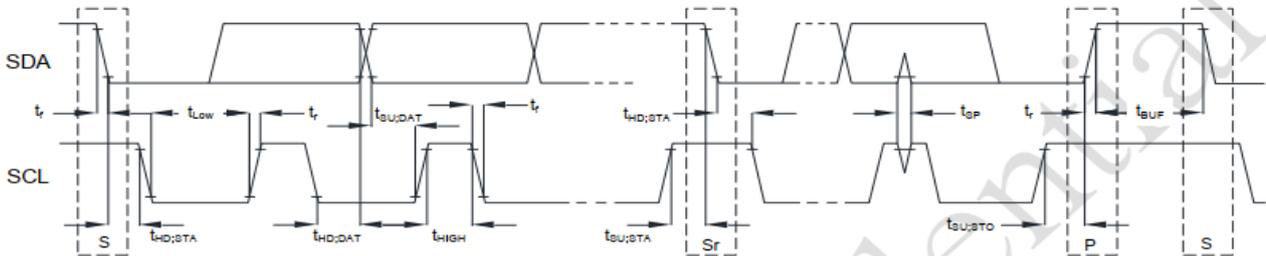
Specifications are subjected to change without notice.

Notes:

1. V_{IH1} includes pins CHIP_EN, SDA, SCL, INT
2. V_{IH2} includes pin EXT_CLK
3. V_{OH1} is for INT output voltage level which is programmable by registers. Typical values are 1.2V/1.5V/1.8V/V_{VDD}.
4. V_{OH2} refers to other digital pins.

6-3 Timing Characteristics

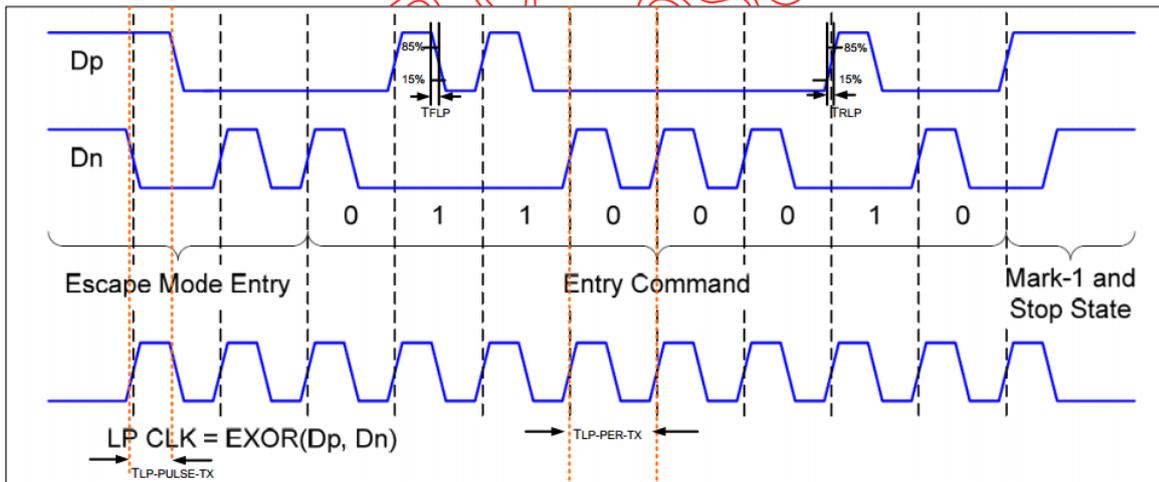
6-3-1 TP I²C interface



Symbol	Parameter	100KHz			400KHz		
		Min	Max	Unit	Min	Max	Unit
f _{SCL}	SCL clock frequency	0	100	kHz	0	400	KHz
t _{HD,STA}	Hold time (repeated) START condition. After this period, the first clock pulse is generated	4.0	–	µs	0.6	–	µs
t _{LOW}	LOW period of the SCL clock	4.7	–	µs	1.3	–	µs
t _{HIGH}	HIGH period of the SCL clock	4.0	–	µs	0.6	–	µs
t _{SU,STA}	Set-up time for a repeated START condition	4.7	–	µs	0.6	–	µs
t _{HD,DAT}	Data hold time	0	3.45	µs	0	0.9	µs
t _{SU,DAT}	Data set-up time	250	–	ns	100	–	ns
t _r	Rise time of both SDA and SCL signals	–	1000	ns	–	300	ns
t _f	Fall time of both SDA and SCL signals	–	300	ns	–	300	ns
t _{SU,STO}	Set-up time for STOP condition	4.0	–	µs	0.6	–	µs
t _{BUF}	Bus free time between a STOP and START condition	4.7	–	µs	1.3	–	µs

6-3-2 TFT LP Transmitter AC Specification

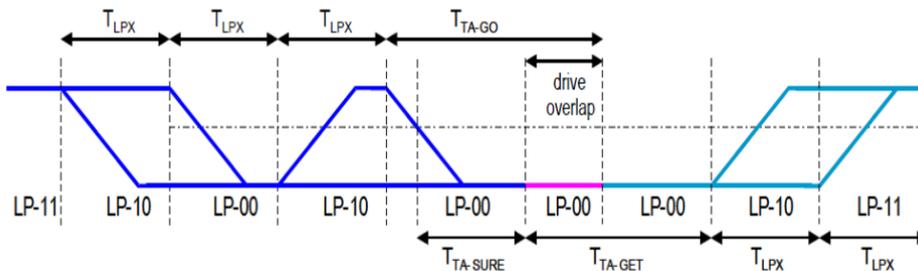
Parameter	Symbol	Min	Typ	Max	Units	Notes	
15%~85% rising time and falling time	T_{RLP}/T_{FLP}	-	-	25	ns	-	
30%~85% rising time and falling time	T_{REOT}	-	-	35	ns	-	
Pulse width of LP exclusive-OR clock	$T_{LP-PULSE-TX}$	First LP EXOR clock pulse after STOP state or Last pulse before stop state	40	-	-	ns	-
		All other pulses	20	-	-	ns	-
Period of the LP EXOR clock	$T_{LP-PER-TX}$	90	-	-	mV/ns	-	
Slew Rate @CLOAD =0pF	$\delta V/\delta t_{SR}$	30	-	500	mV/ns	-	
Slew Rate @CLOAD =5pF		30	-	200	mV/ns	-	
Slew Rate @CLOAD =20pF		30	-	150	mV/ns	-	
Slew Rate @CLOAD =70pF		30	-	100	mV/ns	-	
Load Capacitance	T_{RLP}	-	-	70	pF	-	



6-3-3 Turnaround Procedure

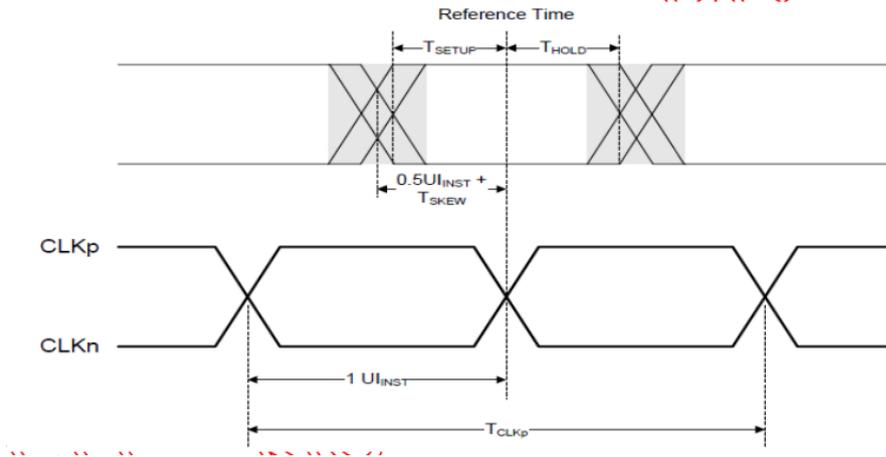
Turnaround Procedure Operation Timing Parameters

Parameter	Symbol	Min	Typ	Max	Units
Length of any Low-Power state period: Master side	T_{LPX}	50	-	75	ns
Length of any Low-Power state period: Slave side	T_{LPX}	50	55.56	58.34	ns
Ratio of T_{LPX} (Master)/ T_{LPX} (Slave) between Master and Slave side	T_{LPX}	2/3	-	3/2	
Time-out before new TX side start driving	$T_{TA-Sure}$	T_{LPX}	-	$2T_{LPX}$	ns
Time to drive LP-00 by new TX	T_{TA-GET}	-	$5T_{LPX}$	-	ns
Time to drive LP-00 after Turnaround Request	T_{TA-GO}	-	$4T_{LPX}$	-	ns



6-3-4 High speed transmission

Parameter	Symbol	Min	Typ	Max	Units
UI instantaneous	U_{INST}	2	-	12.5	ns
Data to Clock Skew(measured at transmitter)	$T_{SKEW(TX)}$	-0.15	-	0.15	U_{INST}
Data to Clock Setup time(measured at receiver)	$T_{SETUP(RX)}$	0.15	-	-	U_{INST}
Data to Clock Hold time(measured at receiver)	$T_{HOLD(RX)}$	0.15	-	-	U_{INST}
20%~80% rise time and fall time	T_R, T_F	150	-	0.3	ps
		-	-	-	U_{INST}



6-3-5 High Speed Clock Transmission

Parameter	Symbol	Min	Typ	Max	Units
Time that the transmitter shall continue sending HS clock after the last associated Data Lane has transitioned to LP mode	$T_{CLK-POST}$	$60+52U_I$	-	-	ns
Detection time that the clock has stopped toggling	$T_{CLK-MISS}$	-	-	60	ns
Time to drive LP-00 to prepare for HS clock transmission	$T_{CLK-PREPARE}$	38	-	95	ns
Minimum lead HS-0 drive period before starting clock	$T_{CLK-PREPARE} + T_{CLK-ZERO}$	300	-	-	ns
Time to enable Clock Lane receiver line termination measured from when D_n cross $V_{IL,MAX}$	$T_{HS-TERM-EN}$	-	-	38	ns
Minimum time that the HS clock must be prior to any associated data lane beginning the transmission from LP to HS mode	$T_{CLK-PRE}$	8	-	-	UI
Time to drive HS differential state after last payload clock bit of a HS transmission burst	$T_{CLK-TRAIL}$	60	-	-	ns

7. Optical Characteristics:

Item	Symbol	Conditions	Specifications			Unit	Note	
			Min	Typ	Max			
Transmittance (With PL)	T(%)	-	4.8	5.0	-	-	-	
Contrast Ratio	CR	$\Theta=0$ Normal Viewing Angle		800	-	-	(1) (2)	
Response Time	TR+TF	-	-	30	40	ms	(1) (3)	
Color Gamut	-	-	-	50	-	%		
Viewing angle	Hor	Θ_{x+}	CR ≥ 10	-	85	-	deg.	-
		Θ_{x-}		-	85	-		
	Ver	Θ_{y+}		-	85	-		
		Θ_{y-}		-	85	-		

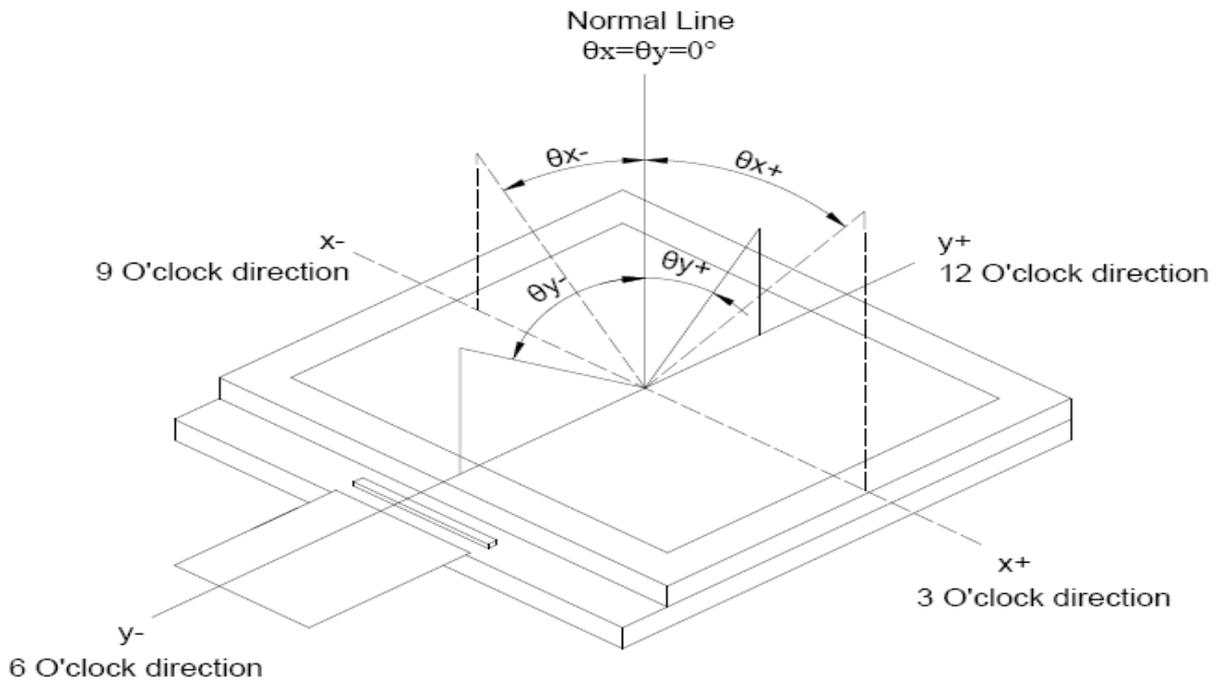
Measuring Condition

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	$\theta = \phi = 0^{\circ}$ LED Backlight	0.5572	0.6072	0.6572
		y		0.2960	0.3460	0.3960
	Green	x		0.3023	0.3523	0.4023
		y		0.5180	0.5680	0.6180
	Blue	x		0.1001	0.1501	0.2001
		y		0.0555	0.1055	0.1555
	White	x		0.2772	0.3272	0.3772
		y		0.2994	0.3494	0.3994

Note (1) Definition of Viewing Angle :

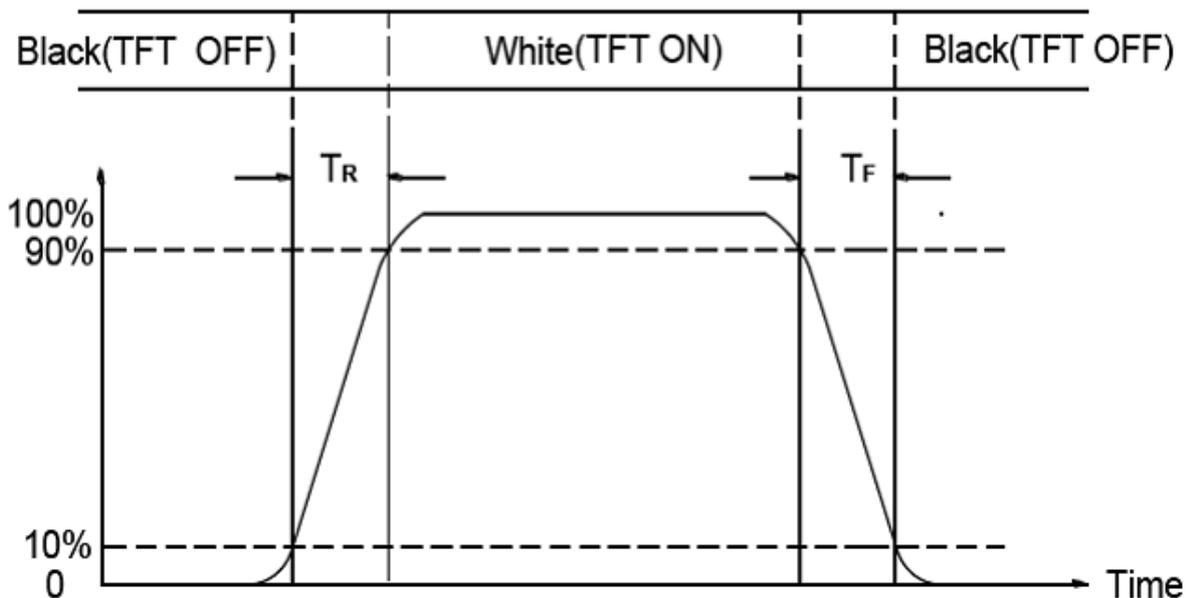


Note (2) Definition of Contrast Ratio(CR) :

measured at the center point of panel

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

Note (3) Definition of Response Time : Sum of T_R and T_F

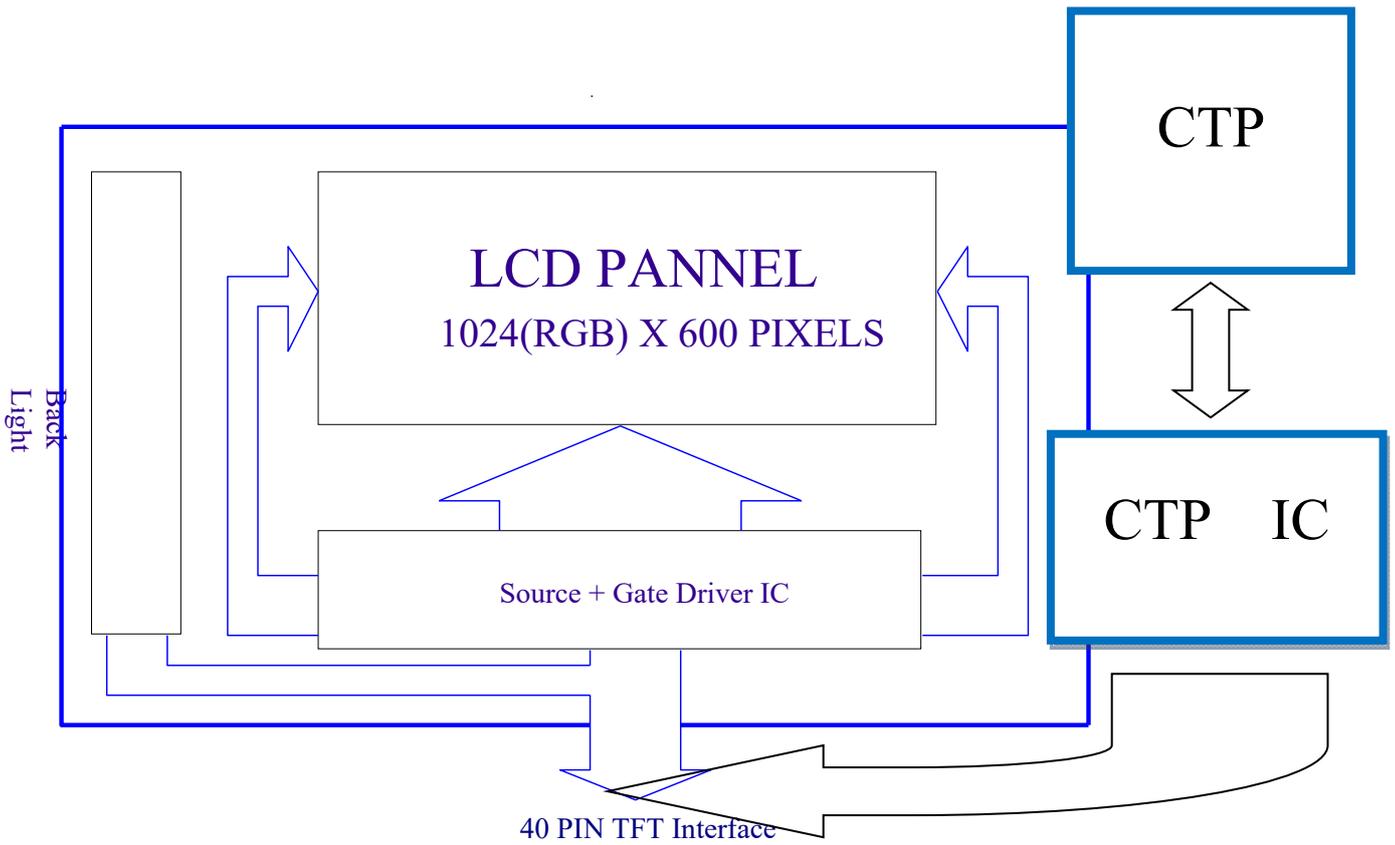


8. Interface Pin Assignment:

No.	Symbol	Function
1	LED+	LED Anode
2	LED+	LED Anode
3	LED-	LED Cathode
4	LED-	LED Cathode
5	GND	Ground
6	NC	No Connect
7	VDD	Power supply for digital circuits
8	VDD	Power supply for digital circuits
9	GND	Ground
10	UPDN	Gate up or down scan control. UPDN = "L", STV2 output vertical start pulse and UD pin output logical "L" to Gate driver. (default) UPDN = "H", STV1 output vertical start pulse and UD pin output logical "H" to Gate driver
11	SHLR	Source right or left sequence control. SHLR = "L", shift left: last data = S1←S2←S3·····←S1536 = first data. SHLR = "H", shift right: first data = S1→S2→S3·····→S1536 = last data.(default)
12	GND	Ground
13	RESET	Global reset pin. Active Low to enter Reset State. Normally pull high.
14	STBYB	Standby mode. STBYB = "H", normal operation(default) STBYB = "L", timing controller, source driver will turn off, all output are High-Z.
15	GND	Ground
16	MIPI_TDP0	MIPI data input.
17	MIPI_TDN0	MIPI data input.
18	GND	Ground
19	MIPI_TDP1	MIPI data input.
20	MIPI_TDN1	MIPI data input.
21	GND	Ground
22	MIPI_TCP	MIPI clock input.
23	MIPI_TCN	MIPI clock input.
24	GND	Ground
25	MIPI_TDP2	MIPI data input.
26	MIPI_TDN2	MIPI data input.
27	GND	Ground

28	MIPI_TDP3	MIPI data input.
29	MIPI_TDN3	MIPI data input.
30	GND	Ground
31	NC	No Connect
32	NC	No Connect
33	NC	No Connect
34	GND	Ground
35	VDD-CTP	2.8V~3.6V power supply; connect 1uF X5R ceramic capacitor to Ground
36	INT-CTP	Interrupt signal/ Supports output open drain type
37	SCL-CTP	I2C Serial Clock Input / Output
38	SDA-CTP	I2C Serial Data Input / Output
39	RESET-CTP	Power Voltage for digital circuit
40	GND-CTP	E-pad should be connected to system GND net.

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:

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

PARAMETER	Sym.	Min.	Typ.	Max.	Unit	Test Condition	Note
Supply Current	I	-	160	-	mA	--	--
Voltage of the Backlight	V_{BL}	10.8	12.4	14.0	V	If=160mA	--
Luminous Intensity for LCM	IV	500	585	-	cd/m ²		2
Uniformity for LCM	-	70	-	-	%		3
LED Life Time	-	30000	-	-	Hr		4
Color	White						

NOTE:

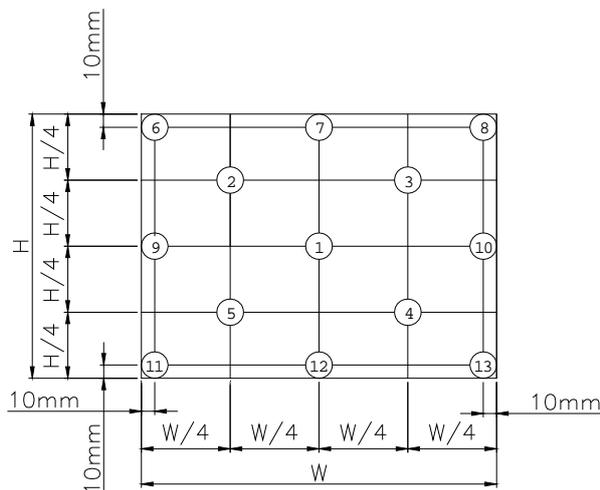
1. Backlight Only

2. Average Luminous Intensity of P1-P13

3. Uniformity = Min/Max * 100%

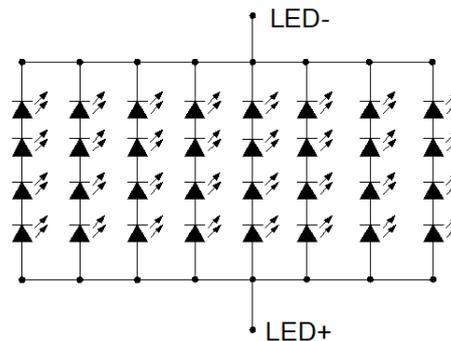
4. LED life time defined as follows: The final brightness is at 50% of original brightness

Measured Method: (X*Y: Light Area)



Internal Circuit Diagram

CIRCUIT DIAGRAM
B/L Electrical Circuit



(Effective spatial Distribution)

Using aperture of 1°, distance 50cm.

11. Standard Specification for Reliability:

11-1. Standard Specifications for Reliability of (LCD+CTP) Module

No	Item	Description
01	High temperature operation	The sample should be allowed to stand at 70°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.

*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 11-1, 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.

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 = 0.40

Minor defect: AQL = 1.0

Total defects: AQL = 1.0

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

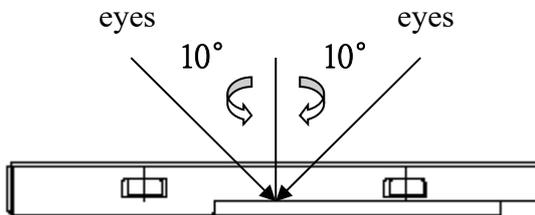
a. Manner of appearance test:

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

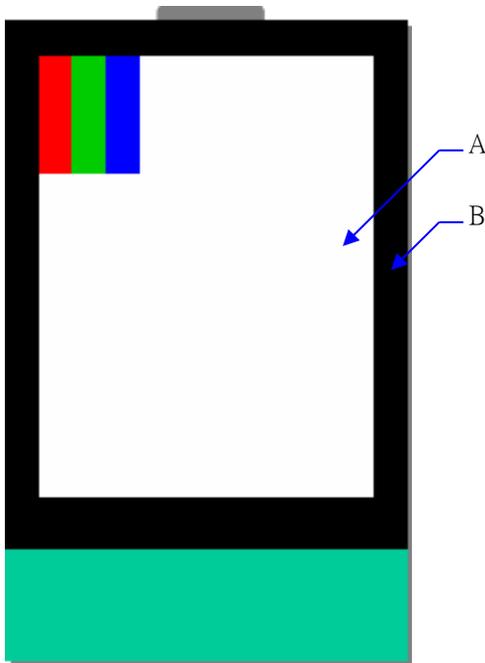
(ii) When test the model of transmissive product must add the reflective plate.

(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:

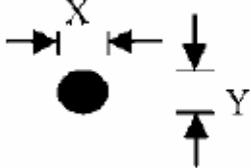
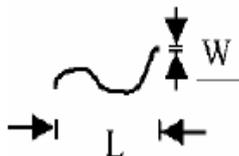
(i) It will accord to the AQL when the standard can not be described.

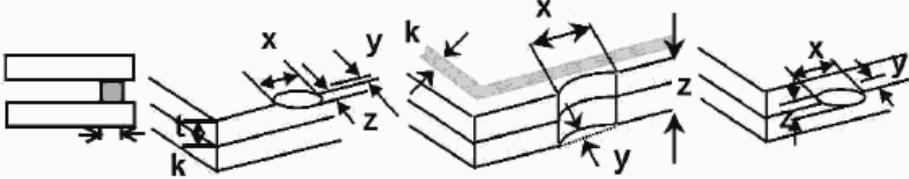
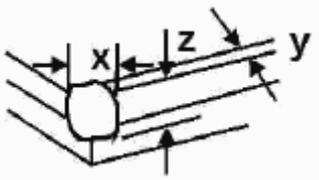
(ii) The sample of the lowest acceptable quality level must be discussed by both supplier and customer when any dispute happened.

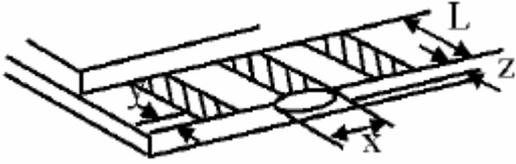
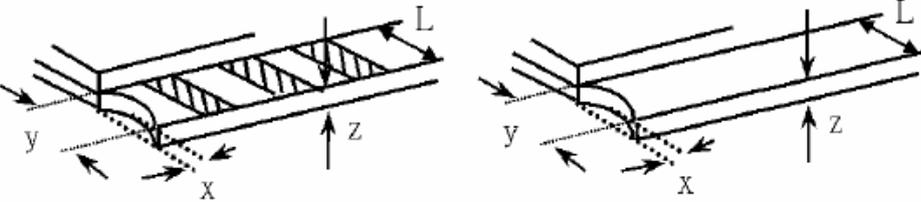
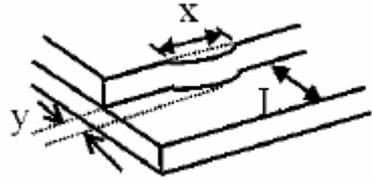
(iii) Must add new item on time when it is necessary.

c. Standard of inspection: (Unit: mm)

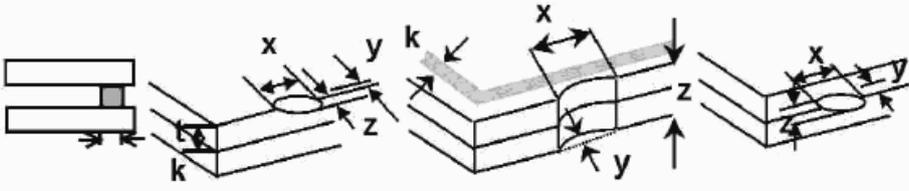
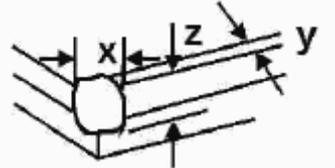
12-6. Inspection specification
Defect out of viewing area can be neglected.

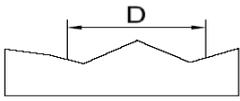
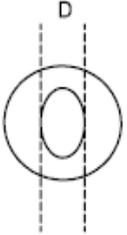
NO	Item	Criterion	AQL																					
01	Electrical Testing	1.1 Missing vertical, horizontal segment, segment contrast defect. 1.2 Missing character, dot or icon. 1.3 Display malfunction. 1.4 No function or no display. 1.5 Current consumption exceeds product specifications. 1.6 LCD viewing angle defect. 1.7 Mixed product types. 1.8 Flicker	0.4																					
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 $\leq 0.25\text{mm}$, no more than Five spots. 2.2 Densely spaced: No more than three spots within 3mm. 2.3 Not visible through 5% ND filter	1.0																					
03	LCD and Touch Panel black spots, white spots, contamination	3.1 Round type: As following drawing $\Phi = (X+Y) / 2$  <table border="1" data-bbox="758 1034 1292 1422"> <thead> <tr> <th>D</th> <th>Acceptable numbers</th> </tr> </thead> <tbody> <tr> <td>≤ 0.25</td> <td>ignored (No more than five spots within 5mm)</td> </tr> <tr> <td>$0.25 < D \leq 0.5$</td> <td>3</td> </tr> <tr> <td>$0.5 < D \leq 0.8$</td> <td>2</td> </tr> <tr> <td>$0.8 < D \leq 1.5$</td> <td>1</td> </tr> <tr> <td>$D > 1.5$</td> <td>NG</td> </tr> </tbody> </table> <p>* Densely spaced: No more than two spots within 3mm.</p> 3.2 Line type: (As following drawing) <table border="1" data-bbox="363 1556 997 1787"> <tbody> <tr> <td>≤ 0.05</td> <td>≤ 6</td> <td>ignored (No more than five lines within 5mm)</td> </tr> <tr> <td>$0.05 < W \leq 0.25$</td> <td>≤ 6</td> <td>2</td> </tr> <tr> <td>$W > 0.25$</td> <td></td> <td>NG</td> </tr> </tbody> </table>  <p>* Densely spaced: No more than two lines within 3mm.</p>	D	Acceptable numbers	≤ 0.25	ignored (No more than five spots within 5mm)	$0.25 < D \leq 0.5$	3	$0.5 < D \leq 0.8$	2	$0.8 < D \leq 1.5$	1	$D > 1.5$	NG	≤ 0.05	≤ 6	ignored (No more than five lines within 5mm)	$0.05 < W \leq 0.25$	≤ 6	2	$W > 0.25$		NG	1.0
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NO	Item	Criterion	AQL																		
04	Polarizer bubbles	<p>If bubbles are visible, judge using black spot specifications, not easy to find, must check in specify direction</p> <table border="1"> <thead> <tr> <th>Size Φ(mm)</th> <th>Acceptable Q'ty</th> <th>Area</th> </tr> </thead> <tbody> <tr> <td>$\Phi \leq 0.15$</td> <td>Accept no dense</td> <td>V.A</td> </tr> <tr> <td>$0.15 < \Phi \leq 0.3$</td> <td>3</td> <td>V.A</td> </tr> <tr> <td>$0.30 < \Phi \leq 0.5$</td> <td>1</td> <td>V.A</td> </tr> <tr> <td>$0.50 < \Phi \leq 1$</td> <td>2</td> <td>Out of V.A</td> </tr> <tr> <td>$1 < \Phi$</td> <td>0</td> <td>-</td> </tr> </tbody> </table>	Size Φ (mm)	Acceptable Q'ty	Area	$\Phi \leq 0.15$	Accept no dense	V.A	$0.15 < \Phi \leq 0.3$	3	V.A	$0.30 < \Phi \leq 0.5$	1	V.A	$0.50 < \Phi \leq 1$	2	Out of V.A	$1 < \Phi$	0	-	1.0
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$1 < \Phi$	0	-																			
05	Scratches	Follow NO.3 -2 Line Type.																			
06	Mura	Not visible through 5% ND filter in 50% gray.	1.0																		
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</p> <p>7.1 General glass chip: 7.1.1 Chip on panel surface and crack between panels:</p>  <table border="1"> <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> <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 border="1"> <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> <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	$x \leq 1/8a$	1.0
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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>8.2 Protrusion over terminal: 8.2.1 Chip on electrode pad:</p>  <table border="1" data-bbox="485 645 1171 801"> <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>8.2.2 Non-conductive portion:</p>  <table border="1" data-bbox="485 1160 1171 1317"> <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>8.2.3 Substrate protuberance and internal crack</p>  <table border="1" data-bbox="804 1630 1246 1787"> <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	$y \leq 1/3L$	$X \leq a$	1.0
y: Chip width	x: Chip length	z: Chip thickness																	
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$y \leq 1/3L$	$X \leq a$																		

NO	Item	Criterion	AQL
09	Cracked glass	The LCD with extensive crack is not acceptable.	1.0
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.	1.0 1.0 0.4
11	Bezel	Bezel must comply with product specifications.	1.0
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. 12.7 PCBA cosmetic control base on latest IPC standard,IPC-A-610,acceptalbe limit of grade 2.	1.0 1.0 1.0 1.0 0.4 0.4 1.0
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.	1.0 1.0
14	Soldering	14.1 No cold solder joints, missing solder connections, oxidation or icide. 14.2 No short circuits in components on PCB or FPC.	1.0 0.4

NO	Item	Criterion	AQL												
15	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>15.1 General glass chip: 15.1.1 Chip on panel surface and crack between panels:</p>  <table border="1" data-bbox="343 806 1157 1019"> <tr> <td style="text-align: center;">z: Chip thickness</td> <td style="text-align: center;">y: Chip width</td> <td style="text-align: center;">x: Chip length</td> </tr> <tr> <td style="text-align: center;">$Z \leq t$</td> <td style="text-align: center;">$\leq 1/2 k$ and not over viewing area</td> <td style="text-align: center;">$x \leq 1/8a$</td> </tr> </table> <p>⊙ Unit: mm ⊙ If there are 2 or more chips, x is the total length of each chip</p> <p>15.1.2 Corner crack:</p>  <table border="1" data-bbox="343 1400 1157 1612"> <tr> <td style="text-align: center;">z: Chip thickness</td> <td style="text-align: center;">y: Chip width</td> <td style="text-align: center;">x: Chip length</td> </tr> <tr> <td style="text-align: center;">$z \leq t$</td> <td style="text-align: center;">$\leq 1/2 k$ and not over viewing area</td> <td style="text-align: center;">$x \leq 1/8a$</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	$x \leq 1/8a$	1.0
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NO	Item	Criterion	AQL										
16	Touch Panel(Fish eye、dent and bubble on film)	<table border="1"> <thead> <tr> <th>SIZE(mm)</th> <th>Acceptable Q'ty</th> </tr> </thead> <tbody> <tr> <td>$\Phi \leq 0.2$</td> <td>Accept no dense</td> </tr> <tr> <td>$0.2 < D \leq 0.4$</td> <td>5</td> </tr> <tr> <td>$0.4 < D \leq 0.5$</td> <td>2</td> </tr> <tr> <td>$0.5 < D$</td> <td>0</td> </tr> </tbody> </table>  	SIZE(mm)	Acceptable Q'ty	$\Phi \leq 0.2$	Accept no dense	$0.2 < D \leq 0.4$	5	$0.4 < D \leq 0.5$	2	$0.5 < D$	0	1.0
SIZE(mm)	Acceptable Q'ty												
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$0.2 < D \leq 0.4$	5												
$0.4 < D \leq 0.5$	2												
$0.5 < D$	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.	1.0										
18	Touch Panel Linearity	Less than 2.5% is acceptable.	1.0										
19	LCD Ripple	Touch the touch panel , can not see the LCD ripple. Pen: R 1.0mm silicon rubber. Operation Force: 80g	1.0										
20	General appearance	20.1 Pin type must match type in specification sheet. 20.2 LCD pin loose or missing pins. 20.3 Product packaging must the same as specified on packaging specification sheet. 20.4 Product dimension and structure must conform to product specification sheet.	0.4 0.4 0.4 0.4										

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 $310\pm 10^{\circ}\text{C}$ and less than 3 sec during Hand soldering.
- Rewiring: no more than 2 times.

14. Warranty

This product has been manufactured to specifications as a part for use in your company's general electronic products. It is guaranteed to perform according to delivery specifications. For any other use apart from general electronic equipment, we will not take responsibility if the product is used in medical devices, nuclear power control equipment, aerospace equipment, fire and security systems, or any other applications in which there is a direct risk to human life and where extremely high levels of reliability are required. If the product is to be used in any of the above applications, we will need to enter into a separate product liability agreement.

1. We cannot accept responsibility for any defect arise after additional process of the product (including disassembly and reassembly), after product delivery.
2. We cannot accept responsibility for any defect, which may arise after the application of strong external force to the product.
3. We cannot accept responsibility for any defect, which may arise due to the application of static electricity after the product has passed your company's acceptance inspection procedures.
4. We can not accept responsibility for industrial property, which may arise through the use of your product , with exception to those issues relating directly to the structure or method of manufacturing of our product within one year from YEEBO shipment.
5. For Heatseal Product which required to heatseal by customer side, parts must be used within three months after delivery from factory.
6. For TAB Product which required to solder by customer side, parts must be used within three months after delivery from factory.
7. The liability of YB is limited to repair or replacement on the terms set forth below. YB will not be responsible for any subsequent or consequential events or injury or damage to any personnel or user including third party personnel and/or user. Unless otherwise agreed in writing between YB and the customer, YB will only replace or repair any of its LCD which is found defective electrically or visually when inspected in accordance with YB GENERAL LCD INSPECTION STANDARD.

15. Guarantee:

Our products meet requirements of the environment.

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