YEEBO Limited
CTP Specialist

SPECIFICATION
FOR
CTP MODULE

MODULE NO: YB-TG800480S25A-C-C0

Doc.Version:00

Customer Approval:

☐ Accept	☐ Reject

YEEBO	NAME	SIGNATURE	DATE
Prepare	Electronic Engineer		2019/5/22
Check	Mechanical Engineer		2019/5/22
Verify			2019/5/22
Approval			2019/5/23

■ APPROVAL FOR SPECIFICATIONS ONLY

☐ APPROVAL FOR SPECIFICATIONS AN SAMPLE

WIMRD005-02-C

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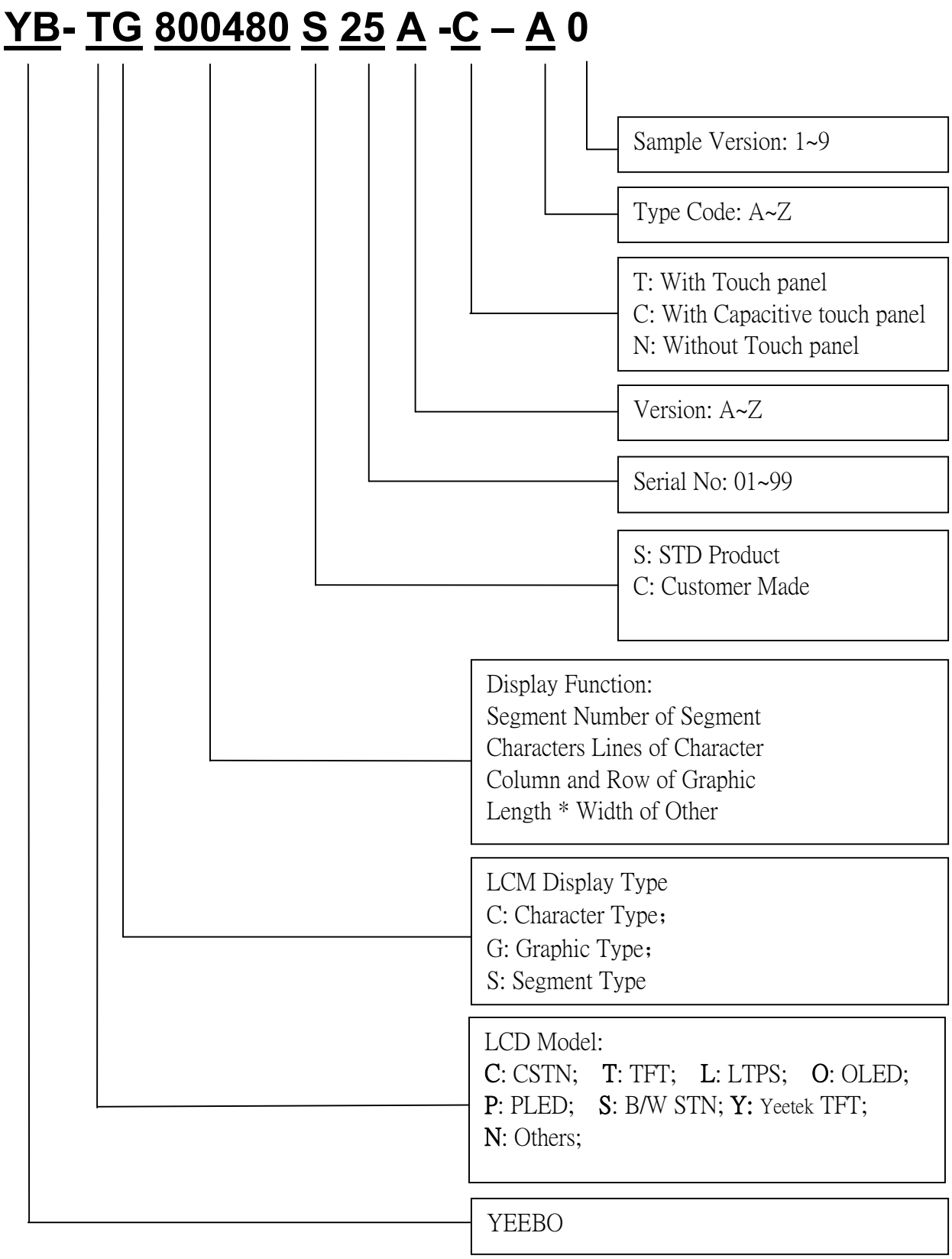
1. Revision History

Sample Version	DOC. Version	DATE	DESCRIPTION		CHANGED BY
A0	00	2019-05-22	Spec Only	First issue	ZHANGLEI

2. Table of Contents:

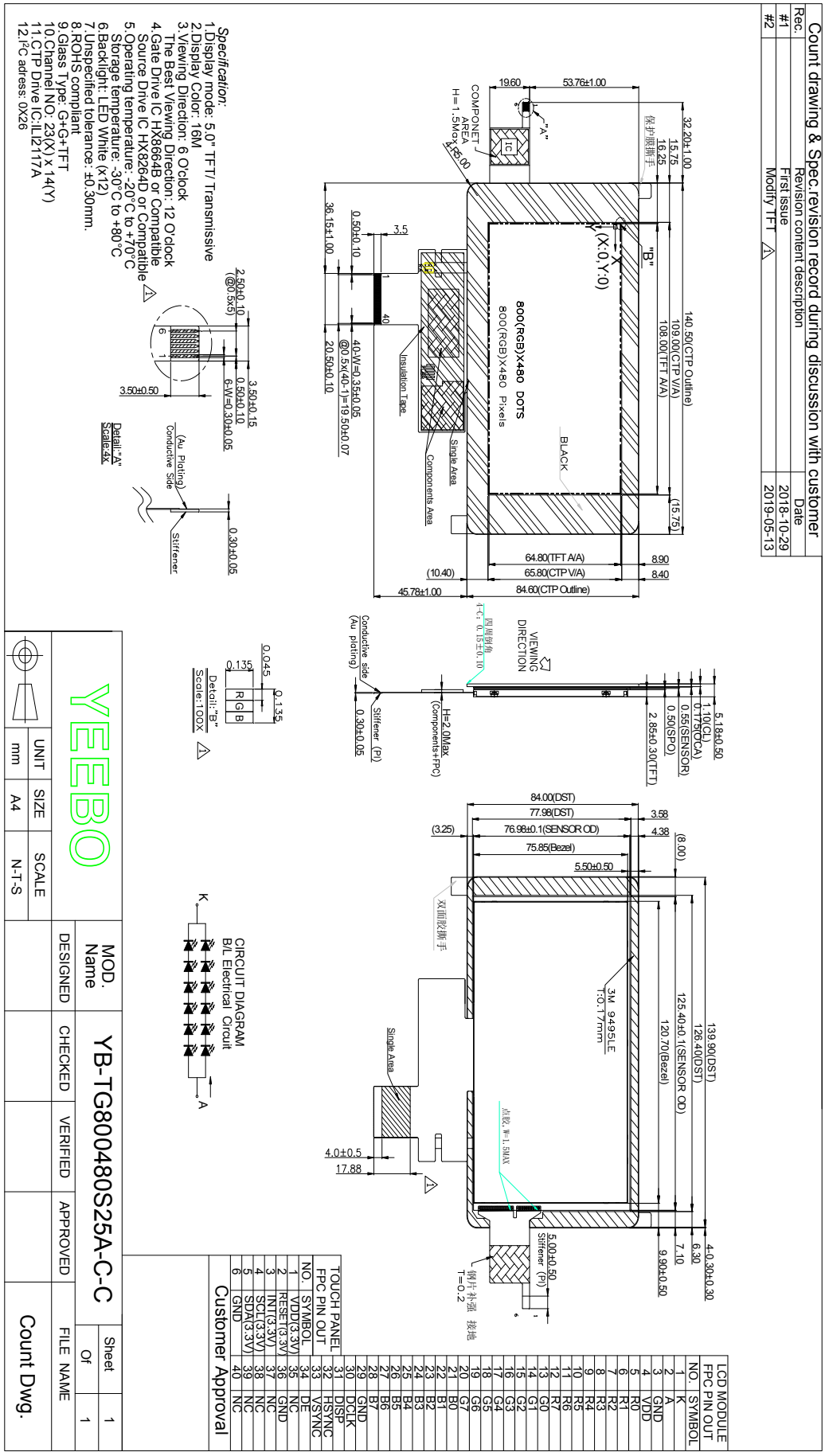
3. Module Numbering System:



4. General Specification:

ITEM	CONTENTS
Module Size(Without FPC)	140.5(W) * 84.6(H) * 5.18(T) mm
Display Size(Diagonal)	5.0inch
Display Format	800(RGB)* 480 WVGA
Pixel Pitch	0.135 (H)mm*0.135(V) mm
LCD Type	Active matrix TFT/ Transmissive
Input Data	24 bit RGB interface
View Area	109.4(W)*65.4(H)mm
Viewing Direction (Gray inversion)	6 O'clock
The Best Viewing Direction	12 O'clock
Source Drive IC	HX8264D or Compatible
Gate Drive IC	HX8664B or Compatible
CTP IC	ILI2117A
Sensor Number	23(X)*14(Y)
CTP Interface	I2C
Weight(g)	TBD
Fireware	TBD
Test Configuration	TBD

5. LCM drawing:



6. Electrical Characteristics

6-1 TP Electrical Characteristics

6-1-1 Absolute Maximum Ratings

Item	Symbol	Min	Typ	Max	Unit
System power supply voltage	VDD			3.6	V
High voltage power supply	V_{PVDD_CP}		3.6	3.7	V
Analog input voltage	V_{INANA}			VDD	V
Digital input voltage	V_{INDIG}			5	V
Storage temperature	T_{STG}	-40		150	℃

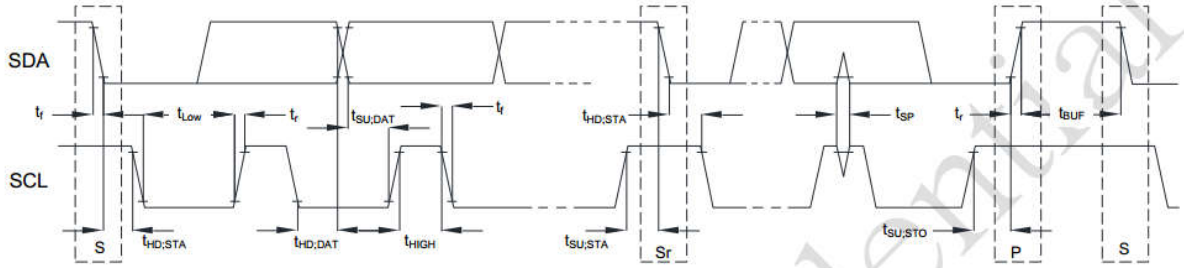
Notes: Stresses above those listed in Absolute Maximum Ratings may cause permanent damage to the device. This is a stress rating only and does not imply functional operation of the device. Exposure to absolute maximum ratings for extended periods may affect device reliability.

6-1-2 Operating Conditions (Ta=25℃)

Item	Symbol	Min	Typ.	Max	Unit
System power supply voltage	VDD	2.8	3.3	3.6	V
Ambient operating temperature	T_A	-40		85	℃
Junction Temperature	T_J			125	℃

6-1-3 Timing Characteristics

I^2C 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

6-2 TFT Electrical Characteristics_

6-2-1 Absolute Maximum Ratings

TFT IC HX8264D+HX8664B **(Ta=25℃)**

Item	Symbol	Min.	Type	Max.	Unit	Remark
Power Voltage	VDD	-0.5	-	+3.96	V	Note1 Note2
Operating Temperature	TOPR	-20	-	+70	℃	Note1 Note2
Storage Temperature	TSTR	-30	-	+80	℃	Note1 Note2

Note 1: The driver IC may be permanently damaged if it is used under the condition exceeding the above absolute maximum values. It is also recommended to use the driver IC within the limit of its electric characteristics during normal operation. Exceeding the conditions may lead to malfunction of it and affect its credibility.

Note 2: The voltage from GND.

6-2-2 Electrical Characteristics

TFT IC HX8264D+HX8664B **(Ta=25℃)**

Item	Symbol	Rating			Unit	Remark
		Min	Typ	Max		
Power Voltage Logic	VDD	3.0	3.3	3.6	V	Note 1
`Input voltage L level	VIL	GND	-	0.3*VDD	V	VDD=3.0 ~3.6V
Input voltage H level	VIH	0.7* VDD	-	VDD	V	
LCD Drive Power current	ILCD	-	63	94.5	mA	VDD= 3.3V

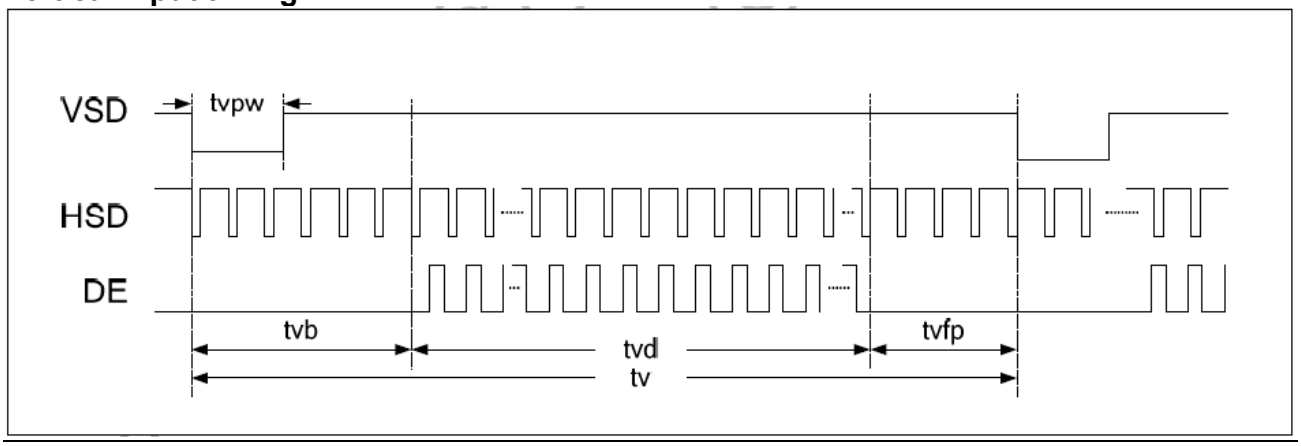
Note1:

Vcom must be adjusted to optimize display quality: Cross-talk, Contrast Ratio and etc.

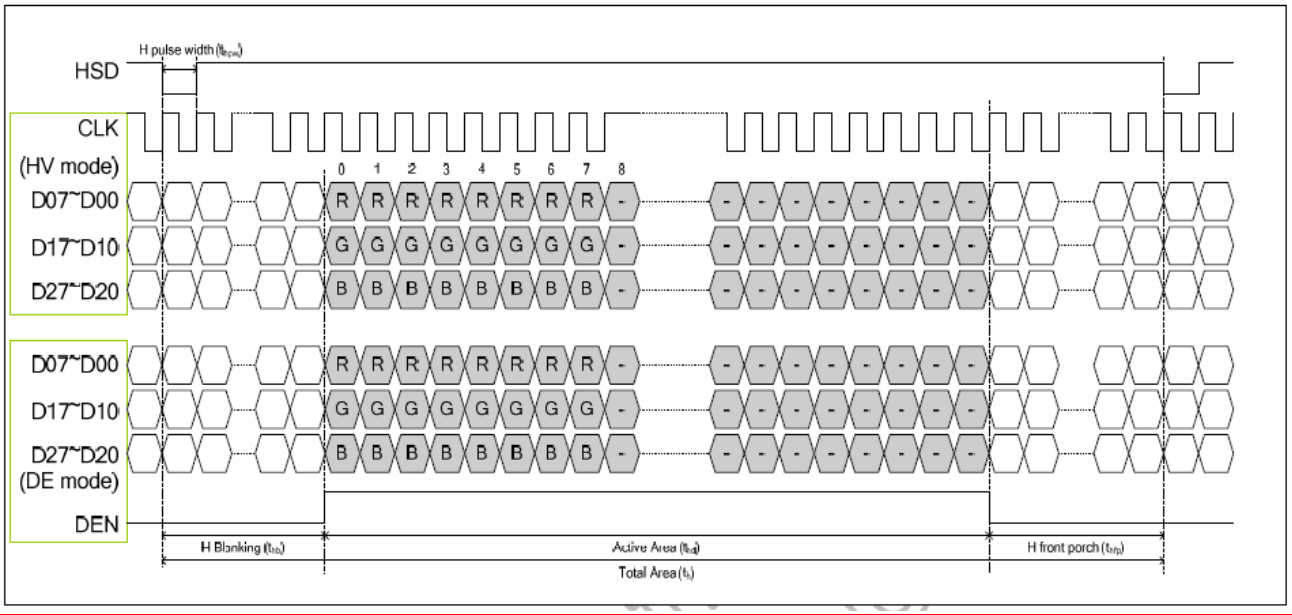
6-2-3 Timing Characteristics

6-2-3-1 TFT IC HX8264D+HX8664B Data Input Format

Vertical input timing



Horizontal input timing



6-2-3-2 TFT IC HX8264D+HX8664B Timing Conditions

Resolution：800x480

- **Horizontal timing**

Parameter	Symbol	Spec.			Unit
		Min.	Typ.	Max.	
Horizontal Display Area	thd		800		DCLK
DCLK frequency	fclk	-	30	50	MHz
One Horizontal Line	th	889	928	1143	DCLK
HS pulse width	thpw	1	48	255	DCLK
HS Back Porch (Blanking)	thb		88		DCLK
HS Front Porch	thfp	1	40	255	DCLK
DE mode Blanking	th-thd	85	128	512	DCLK

- **Vertical timing**

Parameter	Symbol	Spec.			Unit
		Min.	Typ.	Max.	
Vertical Display Area	tvd		480		T_H
VS period time	tv	513	525	767	T_H
VS pulse width	tvpw	3	3	255	T_H
VS Back Porch (Blanking)	tvb		32		T_H
VS Front Porch	tvfp	1	13	255	T_H
DE mode Blanking	tv-tvd	4	45	255	T_H

7. Optical Characteristics:

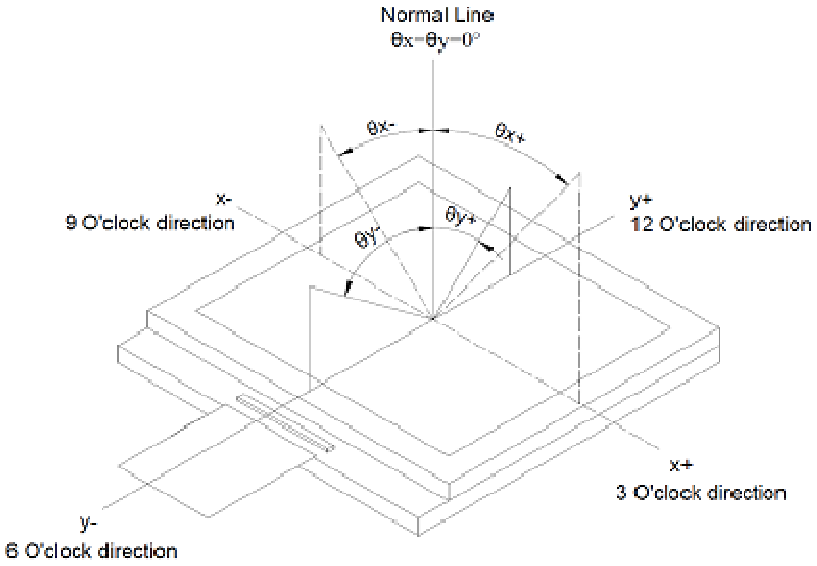
Item		Symbol	Conditions	Specifications			Unit	Note
				Min	Typ	Max		
Transmittance		T(%)	−	4.0	4.3	-	%	-
Contrast Ratio		CR	Θ=0 Normal Viewing angle	350	500	-		(1) (2)
Response time		TR+TF	−	-	25	-	ms	(1) (3)
Viewing angle	Hor.	Θx+	CR≧10	-	65	-	deg.	(1)
		Θx-		-	65	-		
	Ver.	Θy+		-	50	-		
		Θy-		-	60	-		

Measuring Condition
1. Measuring surrounding: dark room
2. Ambient temperature: 25±2℃
3. 30 min. Warm-up time.

Color of CIE Coordinate:

Item		Symbol	Condition	Min.	Typ.	Max.
Chromaticity Coordinates (Transmissive)	Red	x	θ = ϕ = 0° LED Backlight	0.5408	0.5908	0.6048
		y		0.2655	0.3155	0.3655
	Green	x		0.2950	0.3450	0.3950
		y		0.4760	0.5260	0.5760
	Blue	x		0.0967	0.1467	0.1967
		y		0.0399	0.0899	0.1399
	White	x		0.2339	0.2839	0.3339
		y		0.2598	0.3098	0.3598

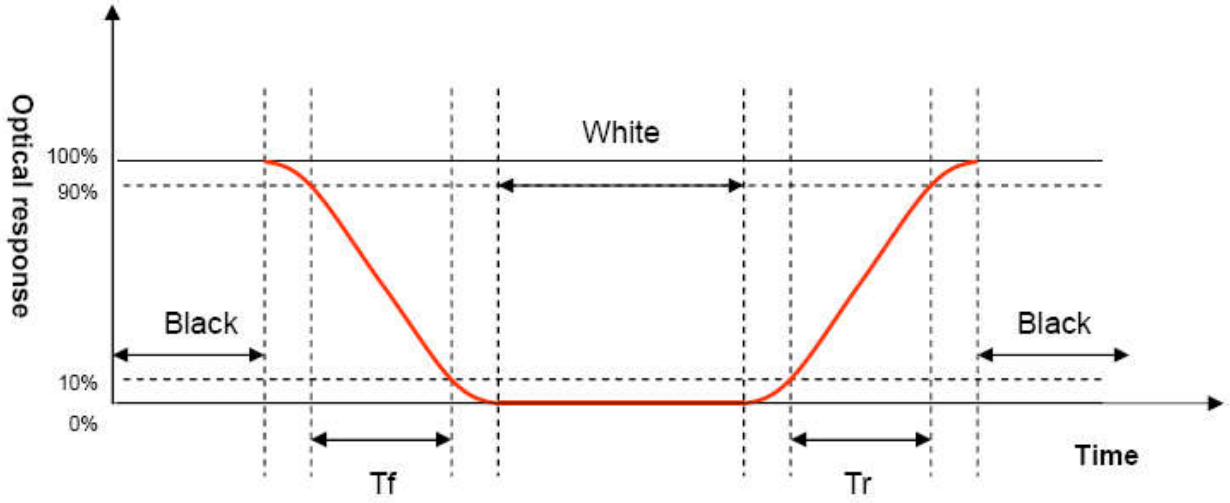
Note (1) Definition of Viewing Angle :



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

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

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



8. Interface Pin Assignment:

8-1 TP FPC Interface

No.	Symbol	I/O	Function
1	VDD	I/O	Power Voltage for digital circuit
2	RST	I	Active low external reset
3	INT	O	Indicate coordinate data ready
4	SCL	I/O	I^2C Serial Clock
5	SDA	I/O	I^2C Serial Data
6	GND	P	Ground

8-2 TFT FPC Interface

PIN NO.	Symbol	I/O	Description
1	K	P	Power for LED backlight cathode
2	A	P	Power for LED backlight anode
3	GND	P	Power ground
4	VDD	P	Power voltage
5~12	R0~R7	I	Red data
13~20	G0~G7	I	Green data
21~28	B0~B7	I	Blue data
29	GND	P	Power ground
30	DCLK (CLK)	I	Pixel clock
31	DISP	I	Display on/off , normally pulled high
32	HSYNC (HSD)	I	Horizontal sync signal If not used, fix this pin at VDD
33	VSYNC (VSD)	I	Vertical sync signal If not used, fix this pin at VDD
34	DEN (DE)	I	Data enable (active High)
35	NC	-	No connect
36	GND	P	Power ground
37	NC	-	No connect
38	NC	-	No connect
39	NC	-	No connect
40	NC	-	No connect

9. Backlight:

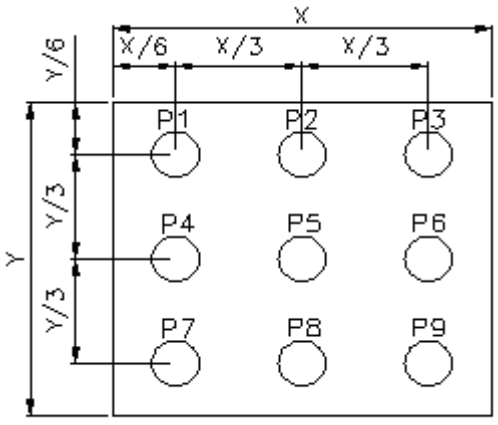
1. Standard Lamp Styles (Edge Lighting Type):
The LED chips are distributed over the edge light area of the illumination unit, which gives the less power consumption:

2. The Main Advantages of the LED Backlight are as following:
2.1 The brightness of the backlight can simply be adjusted.
By a resistor or a potentiometer.

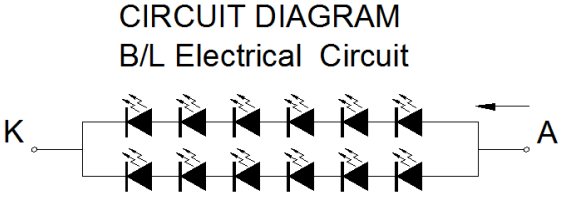
3. Data About LED Backlight: **(Ta=25℃)**

PARAMETER	Sym.	Min.	Typ.	Max.	Unit	Test Condition	Note
Supply Voltage	V	16.2	18.6	21.0	V	If=40mA	
Luminous Intensity for LCM	IV	250	290	-	Cd/m^2	If=40mA	2
Uniformity for LCM	-	70	-	-	%		3
Life Time	-	20000	-	-	Hr.		4
Color	White						

NOTE:
1. Backlight Only
2. Average Luminous Intensity of P1-P9
3. Uniformity = Min/Max * 100%
4. LED life time defined as follows: The final brightness is at 50% of original brightness

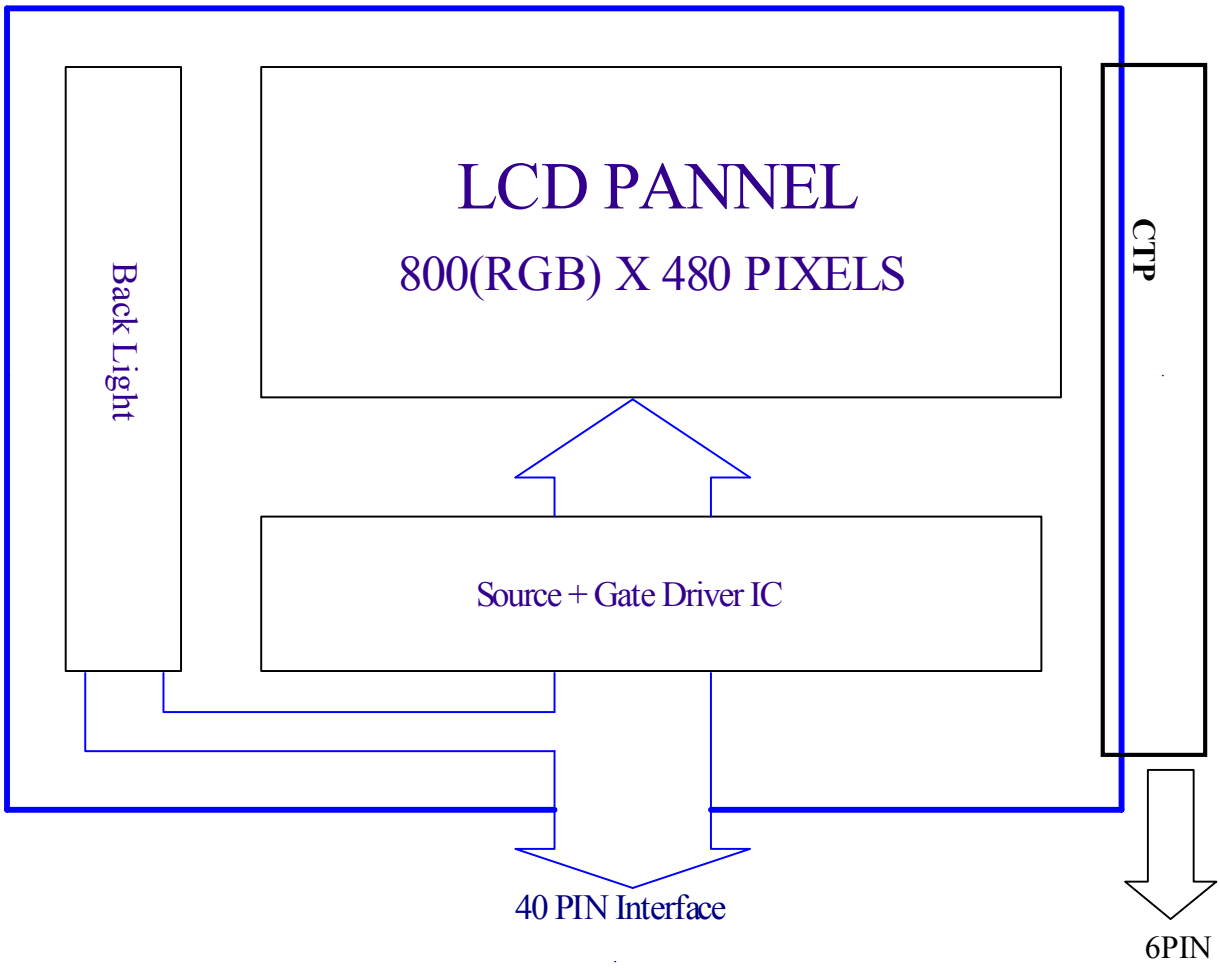


Internal Circuit Diagram



(Effective spatial Distribution)
Using aperture of 1°, distance 50cm.

10. Block diagram



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℃ 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℃ for 120 hours under driving condition and then returning it to normal temperature condition, and allowing it stand for 2 hours.
03	High temperature storage	The sample should be allowed to stand at 80℃ for 240 hours under no-load condition, and then returning it to normal temperature condition, and allowing it stand for 2 hours.
04	Low temperature storage	The sample should be allowed to stand at -30℃ for 240 hours under no-load condition, then returning it to normal temperature condition, and allowing it stand for 2 hours.
05	Moisture storage	The sample should be allowed to stand at 60℃,90%RH MAX for 240 hours under no-load condition, then taking it out and drying it at normal temperature for 2 hours.
06	Thermal shock storage	The sample should be allowed to stand the following 10 cycles : -30℃ for 30 minutes → normal temperature for 5 minutes → +80℃ for 30 minutes → normal temperature for 5 minutes, as one cycle.
07	Packing vibration	Frequency range : 10Hz ~ 55Hz Amplitude of vibration : 1.5mm Sweep time: 12 min X,Y,Z 2 hours for each direction.
08	Packing drop test	According to ISTA 1A 2001.

*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 11.2, 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±5℃), normal humidity (50±10% RH), and in area not exposed to direct sun light.

12. Specification of Quality Assurance:

12-1. Pupose

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

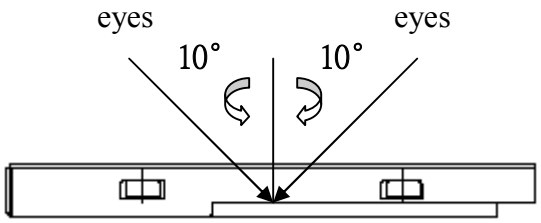
a. Manner of appearance test:

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

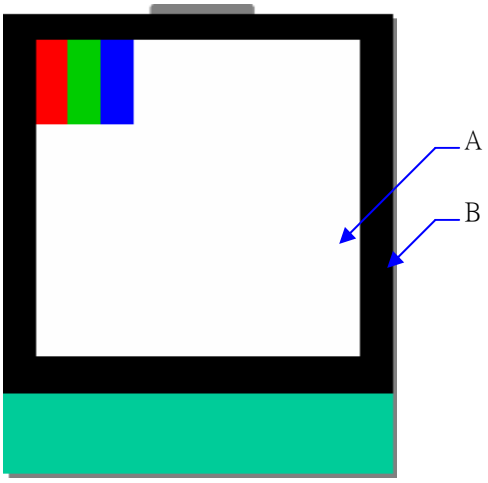
(ii) When test the model of transmissive product must add the reflective plate.

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

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



(iv) Definition of area:



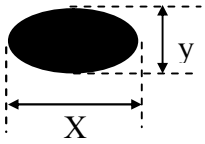
A. Area: Viewing area.
B. Area: Out of viewing area.
(Outside viewing area)

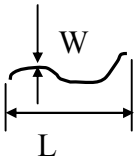
b. Basic principle:

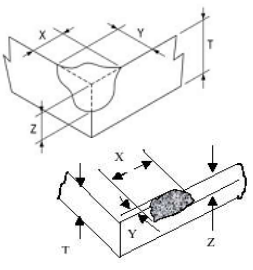
(i) It will accord to the AQL when the standard can not be described.
(ii) The sample of the lowest acceptable quality level must be discussed by both supplier and customer when any dispute happened.
(iii) Must add new item on time when it is necessary.

c. Standard of inspection: (Unit: mm)

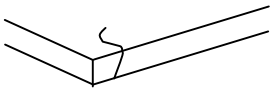
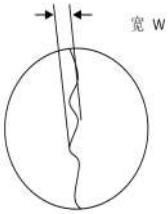
12-6. Inspection specification

<table>
<tr><th>Item</th><th>Specification Unit : mm</th><th>AQL</th></tr>
<tr><td>Electrical Testing</td><td>1.1 Open
1.2 Short
1.3 T/P failure
1.4 Missing vertical, horizontal segment, segment contrast defect.
1.5 Missing character, dot or icon.
1.6 Display malfunction.
1.7 No function or no display.
1.8 Current consumption exceeds product specifications.
1.9 LCD viewing angle defect.
1.10 Mixed product types.
1.11 Flicker</td><td>0.65</td></tr>
<tr><td>Black spots / White spots /Bright spots/ Color spots /polluted inside/ punctured</td><td>
<table>
<tr><th>Size(mm)</th><th>Acceptable numbers</th></tr>
<tr><td>≤0.2</td><td>ignored (No more than five spots within 5mm)</td></tr>
<tr><td>0.2<D≤0.3</td><td>3</td></tr>
<tr><td>0.3<D≤0.5</td><td>2</td></tr>
<tr><td>D>0.5</td><td>NG</td></tr>
</table>


D=(x+y)/2
1.Product’s front side checked according to this specification, back side ignored, but light leakage is not allowed.
2.Printing ink peel off is not allowed.
3、The particle will be ignored when it is removable by cleaning
* Densely spaced: No more than two spots within 10mm</td><td>2.5</td></tr>
<tr><td>Linear Object: Fiber, scurf, scratches and other linear defects (not affecting function)</td><td>
<table>
<tr><th>W(mm)</th><th>L(mm)</th><th>Acceptable numbers</th></tr>
<tr><td>≤0.1</td><td>L≤10</td><td>ignored (No more than five lines within 5mm)</td></tr>
<tr><td>0.1<W≤0.25</td><td>L≤10</td><td>4</td></tr>
<tr><td>W〉0.25</td><td></td><td>NG</td></tr>
<tr><td></td><td>L〉10</td><td>NG</td></tr>
</table>
The reverse side scratches, not affect to the electronic circuit, cannot find the scratches from the front side is acceptable
* Densely spaced: No more than two lines within 10mm


</td><td>2.5</td></tr>
<tr><td>Glass edge chipping、edge breakage</td><td>
<table>
<tr><td colspan="2">Edge breakage can’t affect visual effection (edge breakage can’t cause damage to circuit); over lens have no visual damage</td></tr>
<tr><td>conditions</td><td>Acceptable numbers</td></tr>
<tr><td>X≤1.5mm, Y≤2mm, Z≤T</td><td>4</td></tr>
</table>


</td><td>2.5</td></tr>
</table>

<table>
<tr><td colspan="2">Glass broken</td><td>Visual broken is NG, and there is no potential fault.
  </td><td>0.65</td></tr>
<tr><td colspan="2">1. V/A printed edges sawtooth inspected according to this standard
2. LOGO’s sawtooth</td><td>Some contentious defect judged according to samples
<table>
<tr><td>Product type</td><td>Conditions</td></tr>
<tr><td>Same size</td><td>1、width below 0.2 inch（included）ignored，above 0.2 NG
2、Length not accounted</td></tr>
</table>

</td><td>2.5</td></tr>
<tr><td colspan="2">Specific dimension</td><td>In accordance with product outline drawing or specification (key dimension) or engineering sample.</td><td>2.5</td></tr>
<tr><td colspan="2">Glue overflow/Frame</td><td>1. Glue overflow exceed 0.2mm to the black frame is not allowed.
  </td><td>2.5</td></tr>
<tr><td rowspan="3">FPC</td><td>Bonding bubble/ Misalignment</td><td>FPC golden finger hot pressure’s bubble or impurity diameter shall be below 1/2 of the pressed area, pressed deviation shall not exceed 1/2 of the silver line width, and 40X microscope cannot have obvious cracks.</td><td>0.65</td></tr>
<tr><td>Folded mark （minor fault）</td><td>Linearity irreversibility folded mark and acute angle folded mark is NG.</td><td>2.5</td></tr>
<tr><td>EMI FILM （minor fault）</td><td>Surface broken, scratched≦0.3mm
Surface broken below 5mm can be modified by print ink, after modified, the result shall be achieved to EMI</td><td>2.5</td></tr>
</table>

13. Handling Precaution:

13.1 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 cannot 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 3months from YEEBO production.
5. 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 CTP which is found defective electrically or visually when inspected in accordance with YB GENERAL CTP INSPECTION STANDARD.

13.2. Precautions in Use of CTP Module

13.2-1. Handling of CTP Module

13.2-1-1 Please operate the capacitive touch panel by touch the panel surface with finger or electric pen

13.2-1-2 Store the products at the temperature and humidity mentioned in the specification in a good package do not expose the products under direct sunlight.

13.2-1-3 Do not hit the capacitive touch panel in strong force , or drop it down, it is made of glass and friable.

13.2-1-4 Put on finger coats，glovers or mask to protect the products from fingerprint of stain. Do not upload/unload the touch panel by holding the FPC cable. Do not bend the FPC cableoften or pull it hard when installing, as FPC cable is soft and connected to touch panel body.

13.2-1-5 Pay attention to the prevention from high voltage and static electricity.

13.2-2 Storage

13.2-2-1 Store in ambient temperature of 25±5℃, and relative humidity of 50±10%RH. Do not expose to sunlight or fluorescent light.

13.2-2-2 Storage in a clean environment, free from dust, active gas, and solvent.

13.2-2-3 Store in anti-static electricity container.

13.2-2-4 Store without any physical load.

13.2-2-5 Appearance,3months;Function,1year;within the validity, failed CTP can be replaced 1 to 1

13.3 Guarantee

Our products meet requirements of the environment.YEEBO ROHS requirement is based on European Union Directive 2011/65/EU (ROHS) Requirements and Update.