



億都集團

YEEBO GROUP

SPECIFICATION FOR LCD MODULE

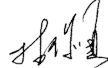
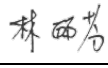
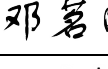
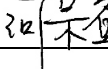
MODULE NO: YB-TG800480S33B-N-A0

Doc.Version:01

Customer Approval:

☐ Accept

☐ Reject

| YEEBO | NAME | SIGNATURE | DATE |
|----------|---------------------|---|------------|
| Prepare | Electronic Engineer |  | 2019.11.08 |
| Check | Mechanical Engineer |  | 2019.11.08 |
| Verify | |  | 2019/11/8 |
| Approval | |  | 2019/11/8 |

☐ APPROVAL FOR SPECIFICATIONS ONLY

☒ APPROVAL FOR SPECIFICATIONS AND SAMPLE

WIMRD005-02-D

1. Revision History

[illegible]



2. Table of Contents:

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3. Module Numbering System:

(Example)

YB-TG240320S01D-T-A0

Sample Version: A0~Z0

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

Version: A~Z

Serial No: 01~99

S: STD Product
 C: Customer Made

Display Function:
 Segment Number of Segment
 Characters Lines of Character
 Column and Row of Graphic
 Length * Width of Other

LCM Display Type
 C: Character Type ;
 G: Graphic Type ;
 GB: Graphic Black/White Type ; (For E-paper)
 GC: Graphic Color Type ; (For E-paper)
 S: Segment Type

LCD Model:
 C: CSTN; T: TFT; L: LTPS; O: OLED;
 P: PLED; S: B/W STN; E: E-paper ;
 Y: Yeetek; N: Others;

YEEBO

**4. General Specification:**

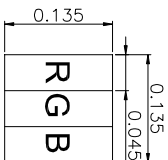
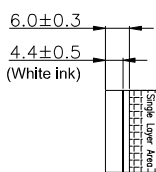
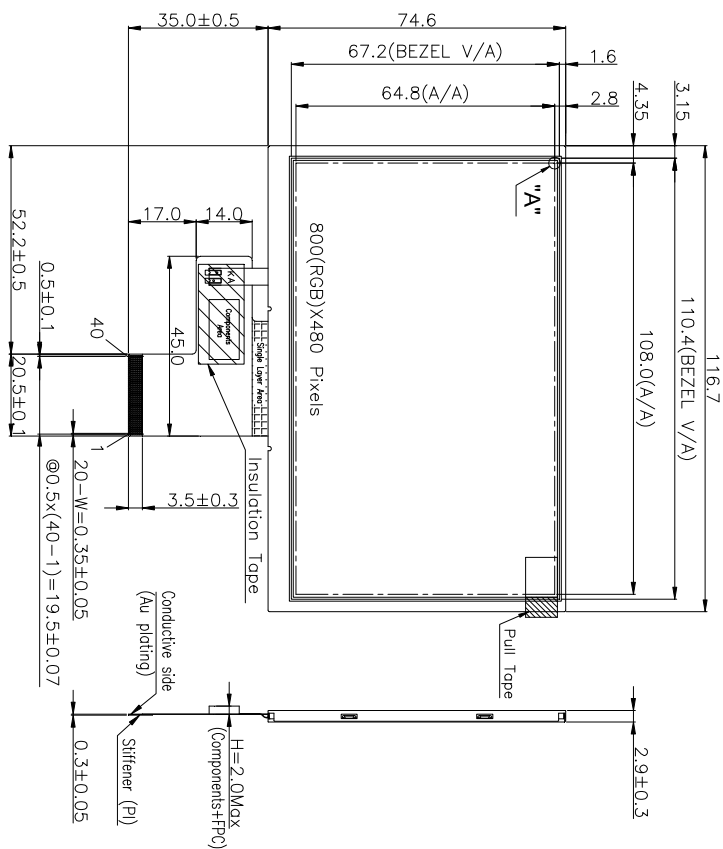
| ITEM | CONTENTS |
|-------------------------|--|
| Module Size | 116.7 (W) * 74.6 (H) * 2.9(T) mm |
| Module Size(With FPC) | 116.7 (W) * 109.6 (H) * 2.9(T) mm |
| Display Size (Diagonal) | 5.0 inch |
| Display Format | 800(RGB)* 480 Pixels |
| Active Area | 108 (W) * 64.8 (H) mm |
| Dots Pitch | 0.135 * 0.135 mm |
| LCD Type | TFT (16.7M)/ Transmissive / Normal Black |
| View Angle | Free |
| Controller IC | ST7262 |
| Weight | 50g |

5. LCM drawing:

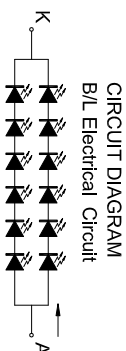
| Count drawing & Spec. revision record during discussion with customer | | |
|---|------------------------------|------------|
| Rec. | Revision content description | Date |
| #1 | FIRST ISSUE | 2019-08-23 |

Specification:


1. Display mode: 5.0" TFT (16.7M) / Transmissive / Normal Black
2. Viewing Direction: Free
3. Drive IC: ST7262 or Compatible
4. Operating temperature: -30°C to +85°C
Storage temperature: -30°C to +85°C
5. Backlight: LED White (x12)(LED MUST HAVE JAPAN PATENT RIGHT)
6. Unspecified tolerance: $\pm 0.30\text{mm}$.
7. ROHS compliant



Detail:"A"
Scale:200X



| LCD MODULE | |
|-------------|-------|
| FPC PIN OUT | |
| 1 | LEDK |
| 2 | LEDA |
| 3 | GND |
| 4 | VDD |
| 5 | R0 |
| 6 | R1 |
| 7 | R2 |
| 8 | R3 |
| 9 | R4 |
| 10 | R5 |
| 11 | R6 |
| 12 | R7 |
| 13 | G0 |
| 14 | G1 |
| 15 | G2 |
| 16 | G3 |
| 17 | G4 |
| 18 | G5 |
| 19 | G6 |
| 20 | G7 |
| 21 | B0 |
| 22 | B1 |
| 23 | B2 |
| 24 | B3 |
| 25 | B4 |
| 26 | B5 |
| 27 | B6 |
| 28 | B7 |
| 29 | GND |
| 30 | DCLK |
| 31 | DISP |
| 32 | HSYNC |
| 33 | VSYNC |
| 34 | DE |
| 35 | NC |
| 36 | GND |
| 37 | NC |
| 38 | NC |
| 39 | NC |
| 40 | NC |

| | | | | | | | | | | |
|---|--|------|-------|----------|-----|---------------------|------------|---------|------------|----------|
| <div>YEEBO</div> | | | | MOD. | | YB-TG800480S33B-N-A | | Sheet | | 1 |
| | | | | Name | | | | Of | | 1 |
| | | | | DESIGNED | | | | CHECKED | | VERIFIED |
|  | | UNIT | SIZE | SCALE | 林丽芬 | | 2019-08-23 | | Count Dwg. | |
| mm | | A4 | N-T-S | | | | | | | |
| | | | | | | | | | | |

6. Electrical Characteristics

6-1 Absolute Maximum Ratings

(Ta=25°C VSS=0V)

| Item | Symbol | Min. | Type | Max. | Unit | Remark |
|-----------------------|--------|------|------|------|------|--------|
| Power Supply voltage | VDD | -0.3 | | +4.0 | Volt | |
| Operating Temperature | TOPR | -30 | - | +85 | °C | |
| Storage Temperature | TSTG | -30 | - | +85 | °C | |

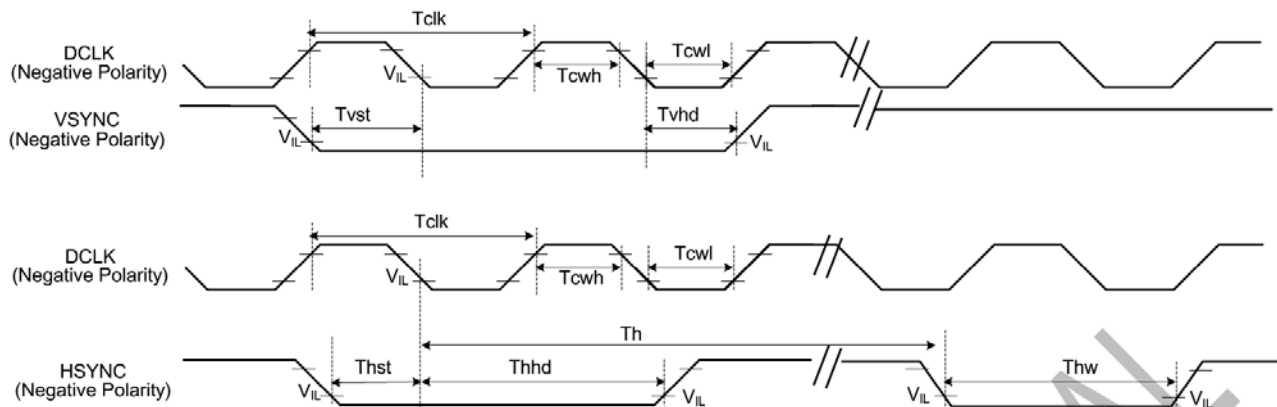
6-2 Operating Conditions

(Ta=25°C)

| Item | Symbol | Condition | Min. | Typ. | Max. | Unit |
|---|--------|-----------|----------|------|----------|------|
| Power Supply voltage | VDD | - | 3.3 | 3.3 | 3.6 | Volt |
| Level Input Voltage (Digital signal) | VIH | - | 0.7*VDDI | - | VDDI | Volt |
| | VIL | - | GND | - | 0.3*VDDI | Volt |
| | VOH | - | VDDI-0.4 | - | VDDI | Volt |
| | VOL | - | GND | - | GND+0.4 | Volt |
| Power Supply Current for LCM | IDD | VDD=3.3V | - | 70 | 105 | mA |

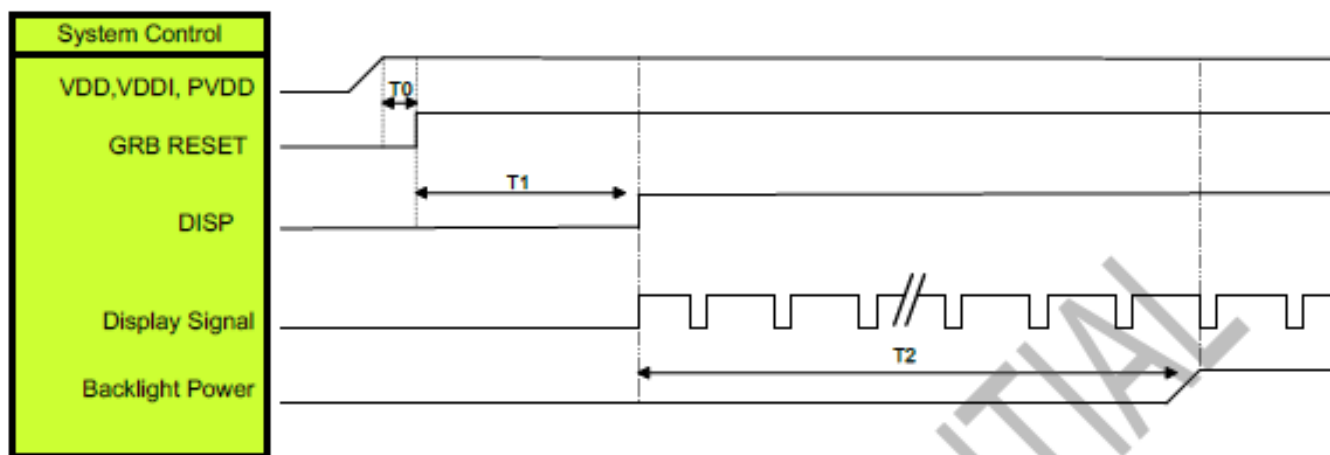
6-3 Data Input Timing

System Bus Timing for RGB Interface



| Item | Symbol | Min. | Typ. | Max. | Unit | Conditions |
|------------------|--------|------|------|------|------|------------|
| CLK Pulse Duty | Tcw | 40 | 50 | 60 | % | |
| HSYNC Width | Thw | 2 | - | - | DCLK | |
| HSYNC Period | Th | 55 | 60 | 65 | us | |
| VSYNC Setup Time | Tvst | 12 | - | - | ns | |
| VSYNC Hold Time | Tvhd | 12 | - | - | ns | |
| HSYNC Setup Time | Thst | 12 | - | - | ns | |
| HSYNC Hold Time | Thhd | 12 | - | - | ns | |
| Data Setup Time | Tdsu | 12 | - | - | ns | |
| Data Hold Time | Tdhd | 12 | - | - | ns | |
| DE Setup Time | Tdest | 12 | - | - | ns | |
| DE Hold Time | Tdehd | 12 | - | - | ns | |

Power On Sequence

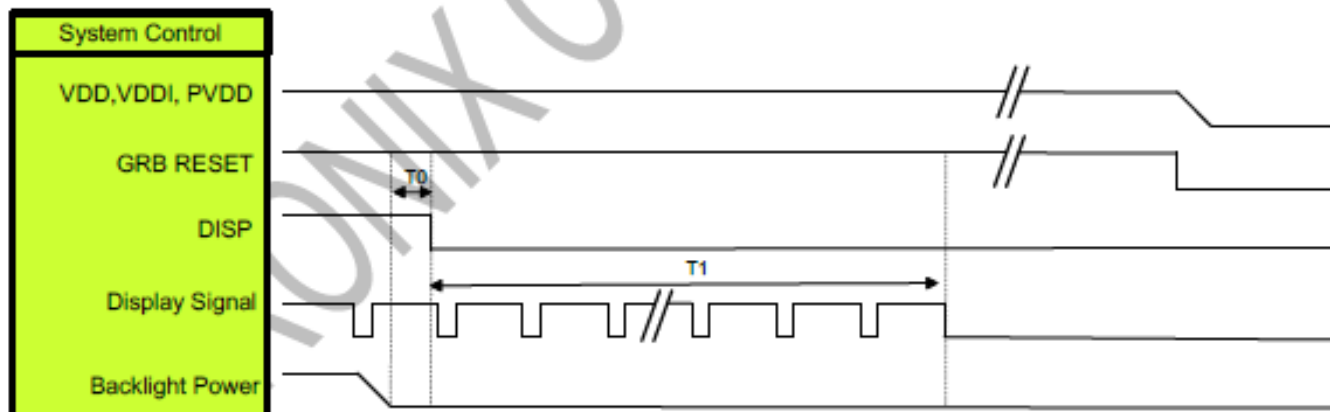


| Symbol | Description | Min. Time | Unit |
|--------|---|-----------|------|
| T0 | System power stability to GRB RESET signal | 0 | ms |
| T1 | GRB RESET= "High" to DISP="High" | 10 | ms |
| T2 | Display Signal output to Backlight Power on | 250 | ms |

Note: RGB interface Display signal: DCLK; VSYNC; HSYNC; DE; DR[7:0]; DG[7:0]; DB[7:0]

Note: LVDS interface Display signal: DCLK P/N; RX[3:0]P/N

Power Off Sequence



| Symbol | Description | Min. Time | Unit |
|--------|--|-----------|------|
| T0 | Backlight Power off to DISP="Low" | 5 | ms |
| T1 | DISP="Low" to IC internal voltage discharge complete | 100 | ms |

Note: RGB interface Display signal: DCLK; VSYNC; HSYNC; DE; DR[7:0]; DG[7:0]; DB[7:0]

Note: LVDS interface Display signal: DCLK P/N; RX[3:0]P/N

7. Optical Characteristics:

| Item | | Symbol | Conditions | Specifications | | | Unit | Note |
|------------------|------|---------------|--|----------------|------|-----|------|---------|
| | | | | Min | Typ | Max | | |
| Transmittance | | T(%) | - | - | 4.8 | - | - | - |
| Contrast Ratio | | CR | $\theta=0$ Normal Viewing angle | 800 | 1000 | - | | (1) (2) |
| Response time | | TR+TF | - | - | 30 | 40 | ms | (1) (3) |
| Viewing angle | Hor. | Θ_{x+} | $CR \geq 10$ | - | 80 | - | deg. | - |
| | | Θ_{x-} | | - | 80 | - | | |
| | Ver. | Θ_{y+} | | - | 80 | - | | |
| | | Θ_{y-} | | - | 80 | - | | |
| | | | | - | 80 | - | | |

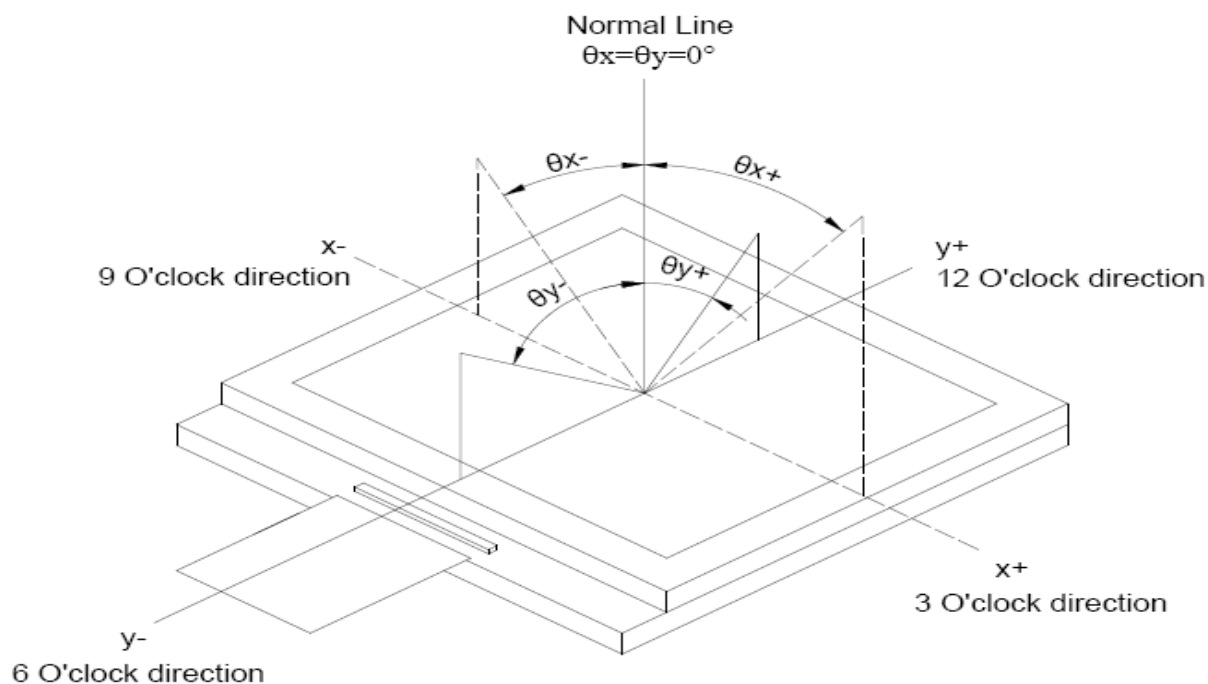
Measuring Condition

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

Color of CIE Coordinate:

| Item | | Symbol | Condition | Min. | Typ. | Max. |
|---|-------|--------|---|-------|-------|-------|
| Chromaticity Coordinates (Transmissive) | Red | x | $\theta = \varphi = 0^{\circ}$ LED Backlight Color Degree | 0.560 | 0.610 | 0.660 |
| | | y | | 0.297 | 0.347 | 0.397 |
| | Green | x | | 0.333 | 0.383 | 0.433 |
| | | y | | 0.517 | 0.567 | 0.617 |
| | Blue | x | | 0.095 | 0.145 | 0.195 |
| | | y | | 0.064 | 0.114 | 0.164 |
| | White | x | | 0.278 | 0.328 | 0.378 |
| | | y | | 0.296 | 0.346 | 0.396 |

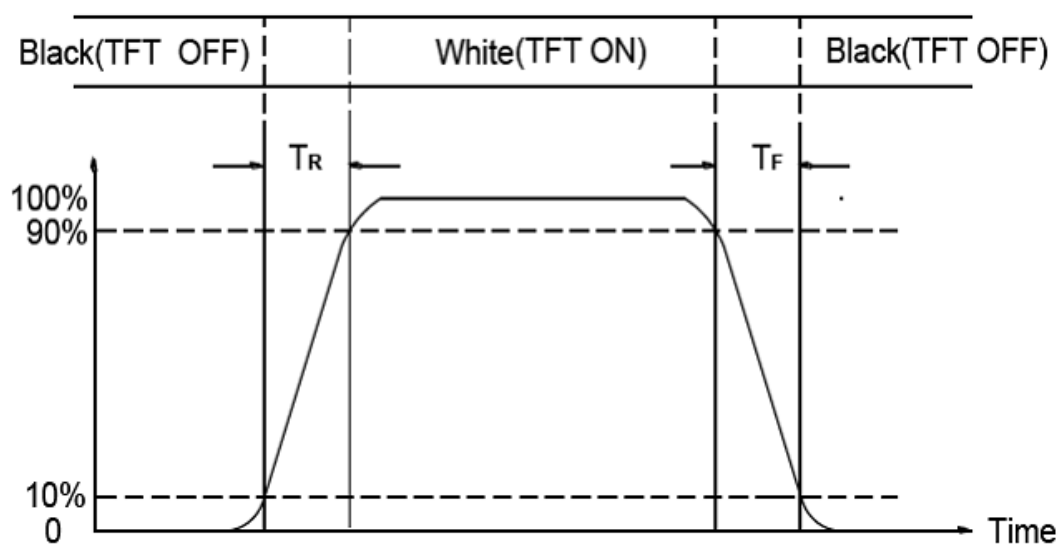
Note (1) Definition of Viewing Angle :



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

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

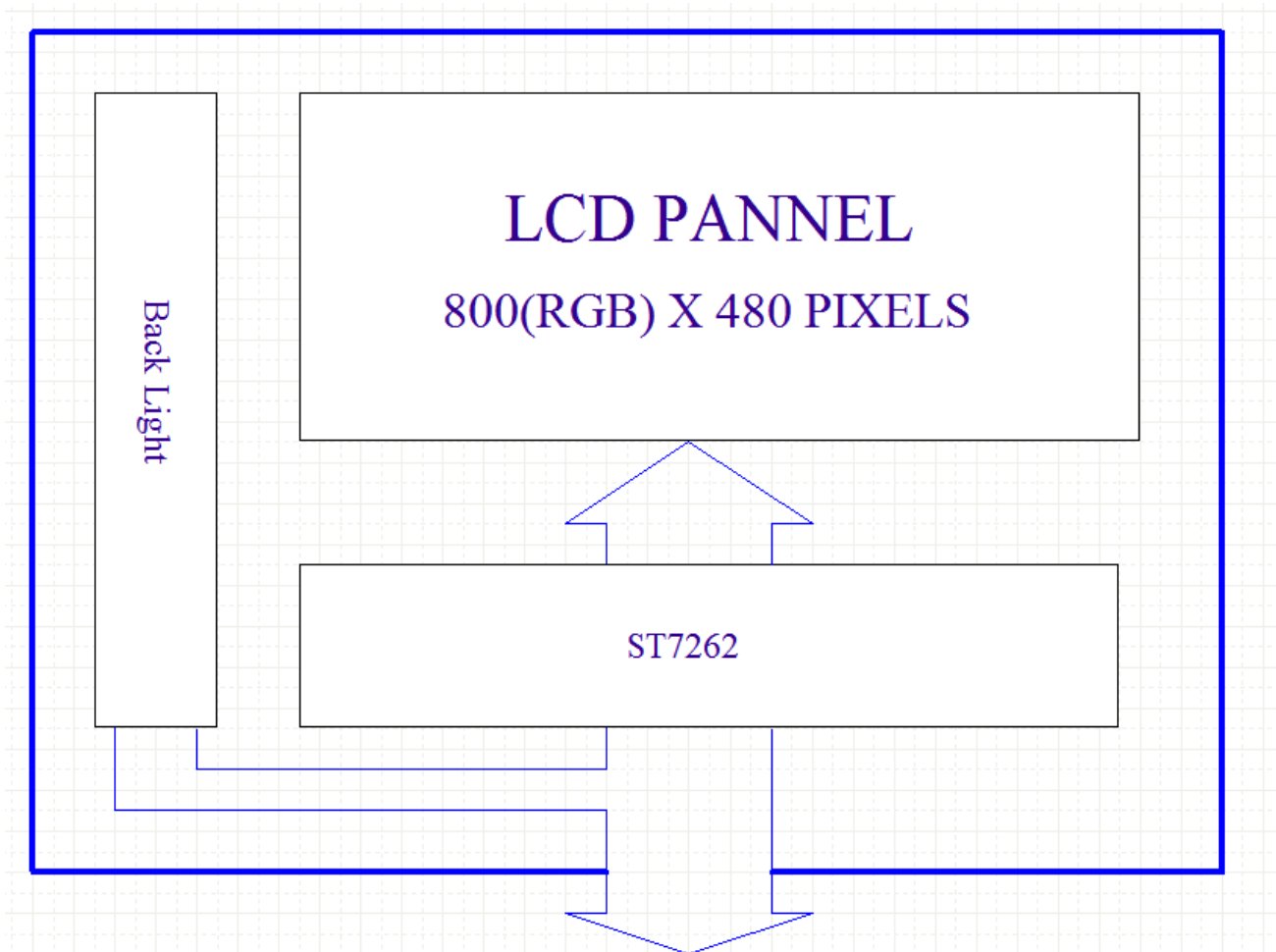
Note (3) Definition of Response Time : Sum of TR and TF



8. Interface Pin Assignment:**LCM FPC Interface**

| No. | Symbol | Function |
|-------|--------|---|
| 1 | LEDK | Cathode of LED backlight |
| 2 | LEDA | Anode of LED backlight |
| 3 | GND | GND Power ground |
| 4 | VDD | Power voltage. |
| 5~12 | R0~ R7 | Digital data input.R0(LSB),R7(MSB) |
| 13~20 | G0~ G7 | Digital data input.G0(LSB),G7(MSB) |
| 21~28 | B0~ B7 | Digital data input.B0(LSB),B7(MSB) |
| 29 | GND | Power ground |
| 30 | DCLK | Data clock signal input |
| 31 | DISP | Display on/off mode control. (a) DISP=L, standby mode. (b) DISP=H, normal display mode. |
| 32 | HSYNC | Horizontal sync signal input |
| 33 | VSYNC | Vertical sync signal input |
| 34 | DE | Data enable input. |
| 35 | NC | No connection |
| 36 | GND | Power ground |
| 37~40 | NC | No connection |

9. Block Diagram:



10. Backlight:

1. Standard Lamp Styles (Edge Lighting Type):

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

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

2.1 The brightness of the backlight can simply be adjusted.

By a resistor or a potentiometer.

3. Data About LED Backlight:

(Ta=25°)

| PARAMETER | Sym. | Min. | Typ. | Max. | Unit | Test Condition | Note |
|----------------------------|-------|-------|------|------|-------|----------------|------|
| Supply Current | I | - | 40 | - | mA | V=19.2V | |
| Supply Voltage | V | 16.2 | 19.2 | 20.5 | V | If=40mA | |
| Luminous Intensity for LCM | IV | 300 | 350 | - | Cd/m2 | If=40mA | 2 |
| Uniformity for LCM | - | 70 | - | - | % | | 3 |
| Life Time | - | 50000 | | - | Hr. | | 4 |
| Color | White | | | | | | |

NOTE:

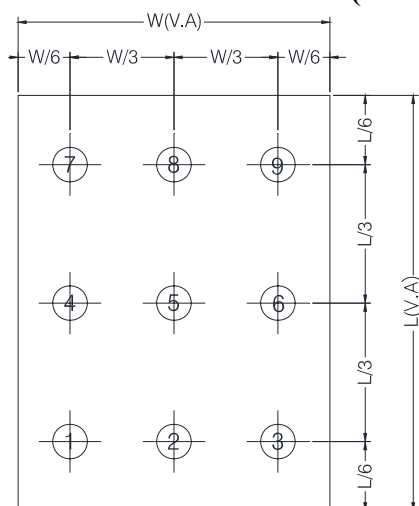
1. Backlight Only

2. Average Luminous Intensity of P1-P9

3. Uniformity = Min/Max * 100%

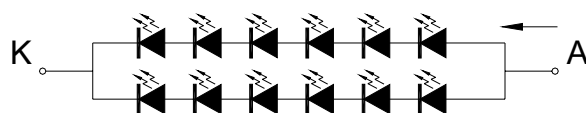
4. LED life time defined as follow: the final brightness is at 50% of original brightness

Measured Method: (X*Y: Light Area)



Internal Circuit Diagram

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 Module

| No | Item | Description |
|----|-----------------------------|---|
| 01 | High temperature operation | The sample should be allowed to stand at 85℃ 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℃ 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℃ 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 → +85℃ 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. |
|------|---|

12. Specification of Quality Assurance:

12-1. Purpose

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

12-2. Standard for Quality Test

a. Inspection:

Before delivering, the supplier should take the following tests, and affirm the quality of product.

b. Electro-Optical Characteristics:

According to the individual specification to test the product.

c. Test of Appearance Characteristics:

According to the individual specification to test the product.

d. Test of Reliability Characteristics:

According to the definition of reliability on the specification for testing products.

e. Delivery Test:

Before delivering, the supplier should take the delivery test.

(i) Test method: According to **ISO2859-1**. General Inspection Level II take a single time.

(ii) The defects classify of AQL as following:

Major defect: AQL = 0.65

Minor defect: AQL = 2.5

Total defects: AQL = 2.5

12-3. Non- conforming Analysis & Deal With Manners

a. Non- conforming Analysis:

(i) Purchaser should supply the detail data of non- conforming sample and the non- conforming.

(ii) After accepting the detail data from purchaser, the analysis of non- conforming should be finished in two weeks.

(iii) If supplier can not finish analysis on time, must announce purchaser before 3 days.

b. Disposition of non- conforming:

(i) If find any product defect of supplier during assembly time, supplier must change the good product for every defect after recognition.

(ii) Both supplier and customer should analyze the reason and discuss the disposition of non- conforming when the reason of nonconforming is not sure.

12-4. Agreement items

Both sides should discuss together when the following problems happen.

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

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

c. Any other special problem.

12-5. Standard of The Product Appearance Test

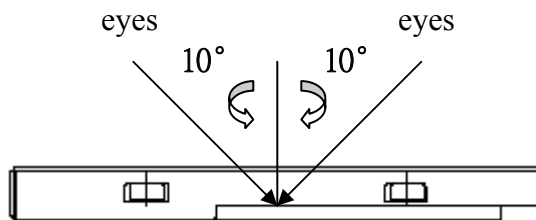
a. Manner of appearance test:

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

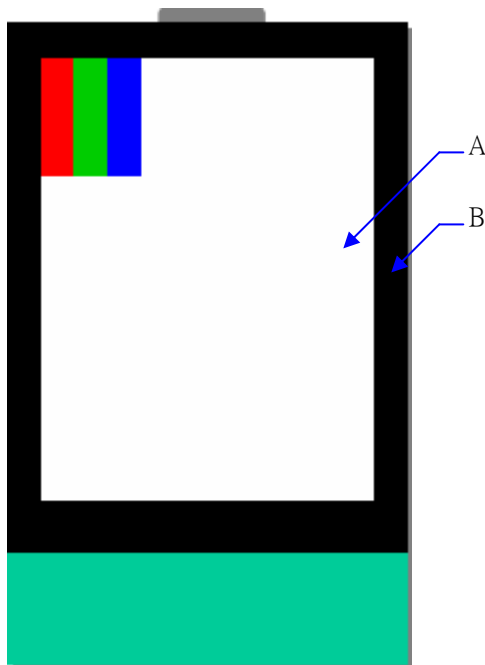
(ii) When test the model of transmissive product must add the reflective plate.

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

(iiii) Temperature: $25 \pm 5^\circ C$ Humidity: $60 \pm 10\% RH$



(iv) Definition of area:



A. Area: Viewing area.

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

b. Basic principle:

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

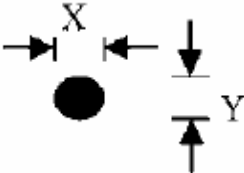
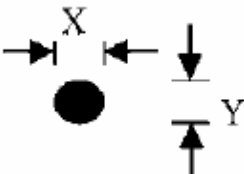
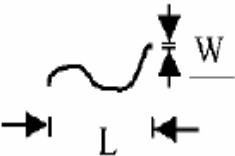
(ii) The sample of the lowest acceptable quality level must be discussed by both supplier and customer when any dispute happened.

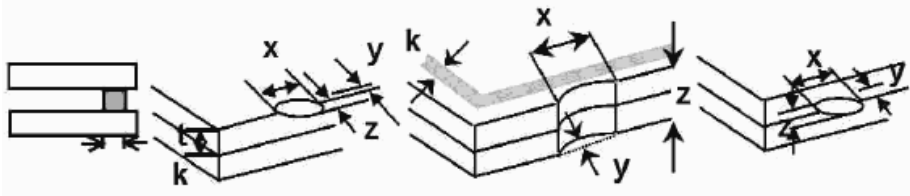
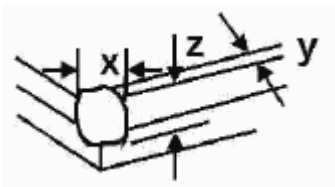
(iii) Must add new item on time when it is necessary.

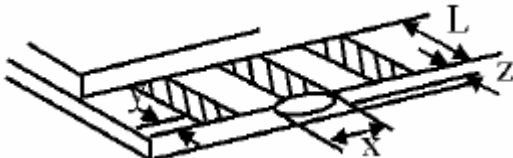
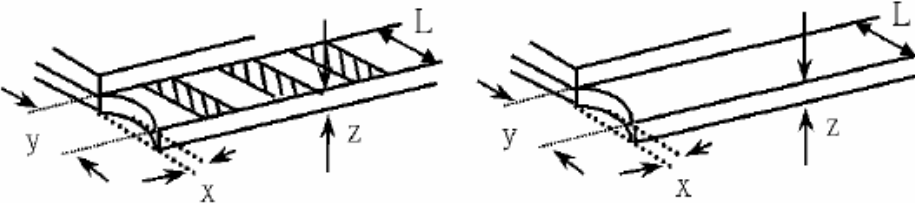
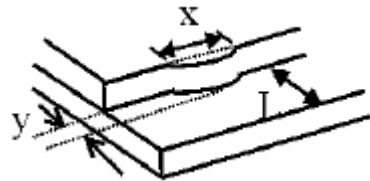
c. Standard of inspection: (Unit: mm)

12-6. Inspection specification

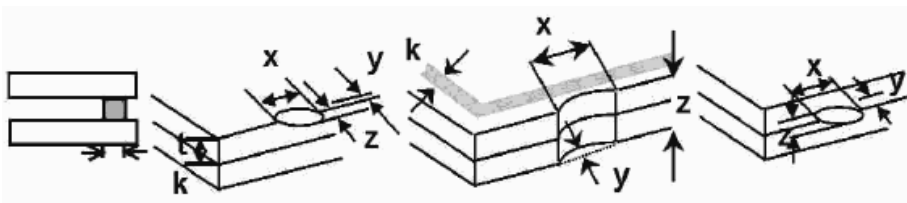
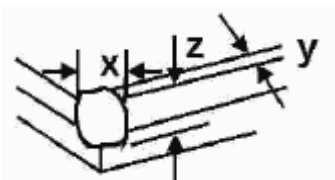
Defect out of viewing area can be neglected.

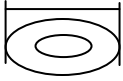
| Defect out of viewing area can be neglected. | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|---|--|----------|-----------------|------------------|-----------------|-------------------------|---|---------------|---|------------|-----------|-----------------|-------------|--------------|-----------------|---------------|---------------------|---|----------|------|-----------|------|------------|-----------|-----|
| NO | Item | Criterion | AQL | | | | | | | | | | | | | | | | | | | | | | | |
| 01 | Electrical Testing | 1.1 Missing vertical, horizontal segment, segment contrast defect. 1.2 Missing character, dot or icon. 1.3 Display malfunction. 1.4 No function or no display. 1.5 Current consumption exceeds product specifications. 1.6 LCD viewing angle defect. 1.7 Mixed product types. 1.8 Flicker | 0.65 | | | | | | | | | | | | | | | | | | | | | | | |
| 02 | Black or White spots or Bright spots or Color spots on LCD (Display only) | 2.1 Dot dimension as below drawing: $\Phi = (X+Y) / 2$ <div></div> <table><tr><th>Size(mm)</th><th>Acceptable Q'ty</th></tr><tr><td>$\Phi \leq 0.20$</td><td>Accept no dense</td></tr><tr><td>$0.20 < \Phi \leq 0.40$</td><td>5</td></tr><tr><td>$0.40 < \Phi$</td><td>0</td></tr></table> 2.2 Not visible through 5% ND filter * Densely spaced: No more than two spots within 3mm. | Size(mm) | Acceptable Q'ty | $\Phi \leq 0.20$ | Accept no dense | $0.20 < \Phi \leq 0.40$ | 5 | $0.40 < \Phi$ | 0 | 2.5 | | | | | | | | | | | | | | | |
| Size(mm) | Acceptable Q'ty | | | | | | | | | | | | | | | | | | | | | | | | | |
| $\Phi \leq 0.20$ | Accept no dense | | | | | | | | | | | | | | | | | | | | | | | | | |
| $0.20 < \Phi \leq 0.40$ | 5 | | | | | | | | | | | | | | | | | | | | | | | | | |
| $0.40 < \Phi$ | 0 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 03 | LCD and Touch Panel black spots, white spots, contamination (non – display) | 3.1 Round type: As following drawing $\Phi = (X+Y) / 2$ <div></div> <table><tr><th>Size(mm)</th><th>Acceptable Q'ty</th></tr><tr><td>$\Phi \leq 0.20$</td><td>Accept no dense</td></tr><tr><td>$0.20 < \Phi \leq 0.40$</td><td>5</td></tr><tr><td>$0.40 < \Phi$</td><td>0</td></tr></table> * Densely spaced: No more than two spots within 3mm. 3.2 Line type: (As following drawing) <div></div> <table><tr><th>Length(mm)</th><th>Width(mm)</th><th>Acceptable Q'ty</th></tr><tr><td>$L \leq 10$</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></table> * Densely spaced: No more than two lines within 3mm. | Size(mm) | Acceptable Q'ty | $\Phi \leq 0.20$ | Accept no dense | $0.20 < \Phi \leq 0.40$ | 5 | $0.40 < \Phi$ | 0 | Length(mm) | Width(mm) | Acceptable Q'ty | $L \leq 10$ | $W \leq 0.1$ | Accept no dense | $L \leq 10.0$ | $0.1 < W \leq 0.25$ | 4 | $L > 10$ | ---- | Rejection | ---- | $0.25 < W$ | Rejection | 2.5 |
| Size(mm) | Acceptable Q'ty | | | | | | | | | | | | | | | | | | | | | | | | | |
| $\Phi \leq 0.20$ | Accept no dense | | | | | | | | | | | | | | | | | | | | | | | | | |
| $0.20 < \Phi \leq 0.40$ | 5 | | | | | | | | | | | | | | | | | | | | | | | | | |
| $0.40 < \Phi$ | 0 | | | | | | | | | | | | | | | | | | | | | | | | | |
| Length(mm) | Width(mm) | Acceptable Q'ty | | | | | | | | | | | | | | | | | | | | | | | | |
| $L \leq 10$ | $W \leq 0.1$ | Accept no dense | | | | | | | | | | | | | | | | | | | | | | | | |
| $L \leq 10.0$ | $0.1 < W \leq 0.25$ | 4 | | | | | | | | | | | | | | | | | | | | | | | | |
| $L > 10$ | ---- | Rejection | | | | | | | | | | | | | | | | | | | | | | | | |
| ---- | $0.25 < W$ | Rejection | | | | | | | | | | | | | | | | | | | | | | | | |

| NO | Item | Criterion | AQL | | | | | | | | | | | | | | | | | | |
|-------------------------|-----------------------|---|-------------------|-----------------|------------------|-----------------|-------------------------|---------------|-------------------------|-----------------|---------------|-------------------|---------------|----------------|---------------|-----------------------|---------------|--------------------|-----------------|---------------|-----|
| 04 | Polarizer bubbles | <div><div>If bubbles are visible, judge using black spot specifications, not easy to find, must check in specify direction</div><table><tr><th>Size Φ(mm)</th><th>Acceptable Q'ty</th></tr><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></table></div> | 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 | | | | | | |
| 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 | | | | | | | | | | | | | | | | | | | | |
| 05 | Scratches | Follow NO.3 -2 Line Type. | | | | | | | | | | | | | | | | | | | |
| 06 | Mura | Not visible through 5% ND filter in 50% gray. | 2.5 | | | | | | | | | | | | | | | | | | |
| 07 | Chipped glass | <div><div>Symbols: x: Chip length y: Chip width z: Chip thickness k: Seal width t: Glass thickness a: LCD side length L: Electrode pad length</div><div>7.1 General glass chip: 7.1.1 Chip on panel surface and crack between panels:</div><div></div><div><table><tr><td>z: Chip thickness</td><td>y: Chip width</td><td>x: Chip length</td></tr><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></table></div><div><div>⊙ Unit: mm</div><div>⊙ If there are 2 or more chips, x is the total length of each chip</div></div><div><div>7.1.2 Corner crack:</div><div></div><div><table><tr><td>z: Chip thickness</td><td>y: Chip width</td><td>x: Chip length</td></tr><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></table></div><div><div>⊙ Unit: mm</div><div>⊙ If there are 2 or more chips, x is the total length of each chip</div></div></div></div> <td>2.5</td> | z: Chip thickness | y: Chip width | x: Chip length | $Z \leq 1/2t$ | Not over viewing area | $x \leq 1/8a$ | $1/2t < z \leq 2t$ | Not exceed 1/3k | $x \leq 1/8a$ | z: Chip thickness | y: Chip width | x: Chip length | $Z \leq 1/2t$ | Not over viewing area | $x \leq 1/8a$ | $1/2t < z \leq 2t$ | Not exceed 1/3k | $x \leq 1/8a$ | 2.5 |
| z: Chip thickness | y: Chip width | x: Chip length | | | | | | | | | | | | | | | | | | | |
| $Z \leq 1/2t$ | Not over viewing area | $x \leq 1/8a$ | | | | | | | | | | | | | | | | | | | |
| $1/2t < z \leq 2t$ | 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 | $x \leq 1/8a$ | | | | | | | | | | | | | | | | | | | |

| NO | Item | Criterion | AQL | | | | | | | | | | | | | | | | |
|---------------|---------------|---|----------------|-------------------|-------------------|-----------------------|---------------|----------------|---------------|----------------|-------------------|------------|---------------|----------------|----------|-----------|---------------|------------|-----|
| 08 | Glass crack | <p>Symbols: x: Chip length y: Chip width z: Chip thickness k: Seal width t: Glass thickness a: LCD side length L: Electrode pad length</p> <p>8.1 Protrusion over terminal: 8.1.1 Chip on electrode pad:</p>  <table><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>8.1.2 Non-conductive portion:</p>  <table><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>8.1.3 Substrate protuberance and internal crack</p>  <table><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 |
| | | 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 | | | | | | | | | | | | | | | | | | |
| $y \leq 1/3L$ | $X \leq a$ | | | | | | | | | | | | | | | | | | |

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

| NO | Item | Criterion | AQL | | | | | | | | | | | | |
|-------------------|--|--|-------------------|---------------|----------------|------------|--|---------------|-------------------|---------------|----------------|------------|--|---------------|-----|
| 15 | Touch Panel Chipped glass | <div> <div> <p>Symbols:</p> <p>x: Chip length y: Chip width z: Chip thickness</p> <p>k: Seal width t: Touch Panel Total thickness a: LCD side length</p> <p>L: Electrode pad length</p> <p>15.1 General glass chip:</p> <p>15.1.1 Chip on panel surface and crack between panels:</p>  <table> <tr> <td>z: Chip thickness</td> <td>y: Chip width</td> <td>x: Chip length</td> </tr> <tr> <td>$Z \leq t$</td> <td>$\leq 1/2 k$ and not over viewing area</td> <td>$x \leq 1/8a$</td> </tr> </table> <p>⊙ Unit: mm</p> <p>⊙ If there are 2 or more chips, x is the total length of each chip</p> <p>15.1.2 Corner crack:</p>  <table> <tr> <td>z: Chip thickness</td> <td>y: Chip width</td> <td>x: Chip length</td> </tr> <tr> <td>$z \leq t$</td> <td>$\leq 1/2 k$ and not over viewing area</td> <td>$x \leq 1/8a$</td> </tr> </table> <p>⊙ Unit: mm</p> <p>⊙ If there are 2 or more chips, x is the total length of each chip</p> </div> </div> | z: Chip thickness | y: Chip width | x: Chip length | $Z \leq t$ | $\leq 1/2 k$ and not over viewing area | $x \leq 1/8a$ | z: Chip thickness | y: Chip width | x: Chip length | $z \leq t$ | $\leq 1/2 k$ and not over viewing area | $x \leq 1/8a$ | 2.5 |
| 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 | $x \leq 1/8a$ | | | | | | | | | | | | | |

| NO | Item | Criterion | | AQL |
|----|-------------------------|---|-----------------|------|
| 16 | Touch Panel(Fish eye) | SIZE(mm) | Acceptable Q'ty | 2.5 |
| | | $L \leq 0.7$ | Accept no dense | |
| | | $L > 0.7\text{mm}$ | 0 | |
| | |  | | |
| 17 | Touch Panel Newton ring | Newton ring dimension $\leq 1/2$ touch panel area and not affect font and line distortion($\leq 2.5\%$) , it is acceptable. | | 2.5 |
| 18 | Touch Panel Linearity | Less than 2.5% is acceptable. | | 2.5 |
| 19 | LCD Ripple | Touch the touch panel , can not see the LCD ripple. Pen: R 1.0mm silicon rubber. Operation Force: 80g | | 2.5 |
| 20 | General appearance | 20.1 Pin type must match type in specification sheet. | | 0.65 |
| | | 20.2 LCD pin loose or missing pins. | | 0.65 |
| | | 20.3 Product packaging must the same as specified on packaging specification sheet. | | 0.65 |
| | | 20.4 Product dimension and structure must conform to product specification sheet. | | 0.65 |

13. Handling Precaution:

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.