



SPECIFICATION

PV043021T0140W

Preliminary Specification

Final Specification

KINGTECH:

CUSTOMER:

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Date:

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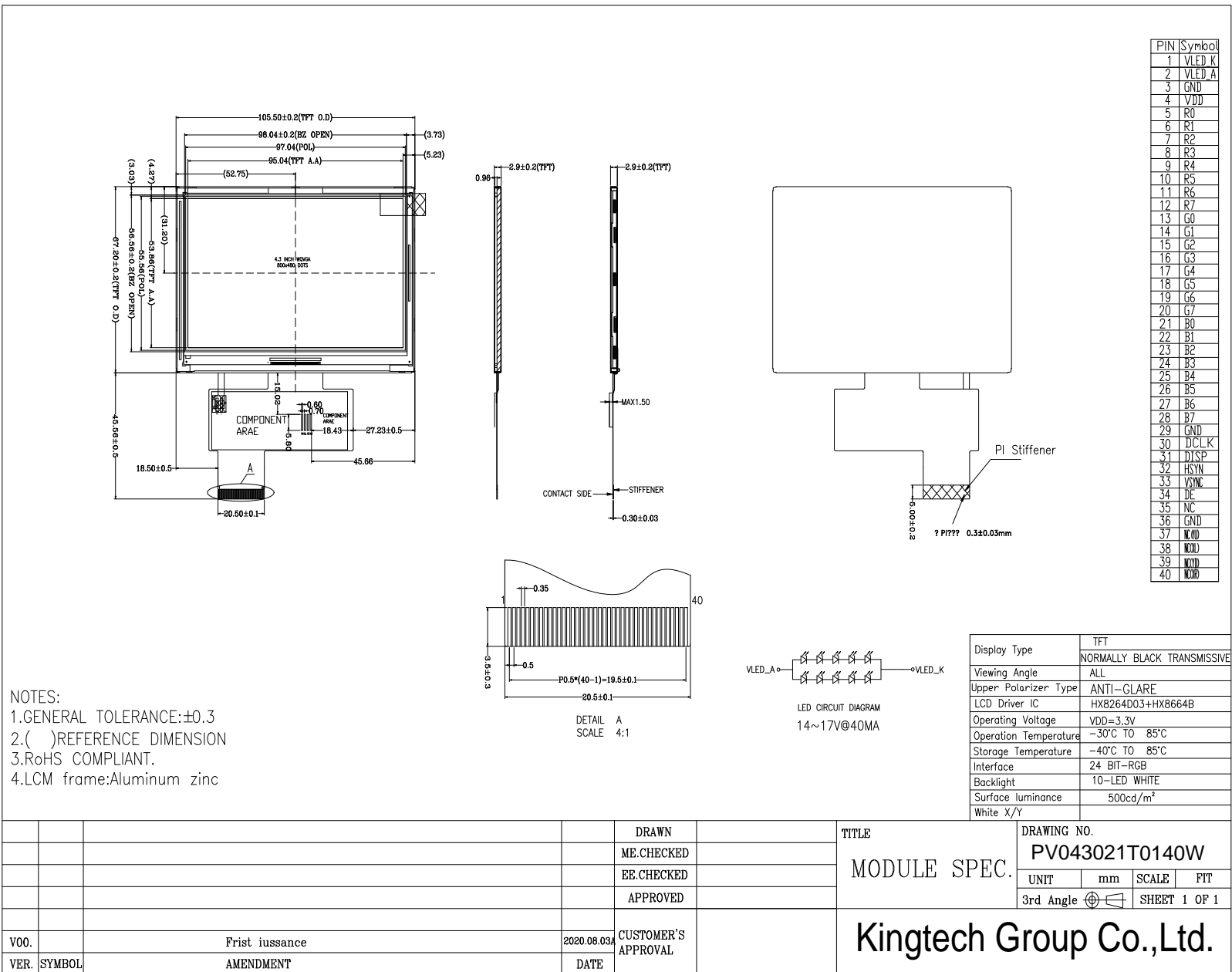


1. General Specification

| Item | Contents | Unit |
|--------------------------------|-------------------|-------------|
| LCD TYPE | TFT/TRANSMISSIVE | |
| MODULE SIZE (W*H*T) | 105.5*67.2*2.9 | MM |
| ACTIVE SIZE (W*H) | 95.04*53.86 | MM |
| PIXEL PITCH (W*H) | 0.1188*0.1122 | MM |
| NUMBER OF DOTS | 800*480 | |
| DRIVER IC | HX8264D03+HX8664B | |
| INTERFACE TYPE | 24 BIT RGB | |
| TOP POLARIZER TYPE | ANTI-GLARE | |
| RECOMMEND VIEWING DIRECTION | ALL | O'CLOCK |
| GRAY SCALE INVERSION DIRECTION | - | O'CLOCK |
| BACKLIGHT TYPE | 10-DIES WHITE LED | |
| TOUCH PANEL TYPE | WITHOUT | |

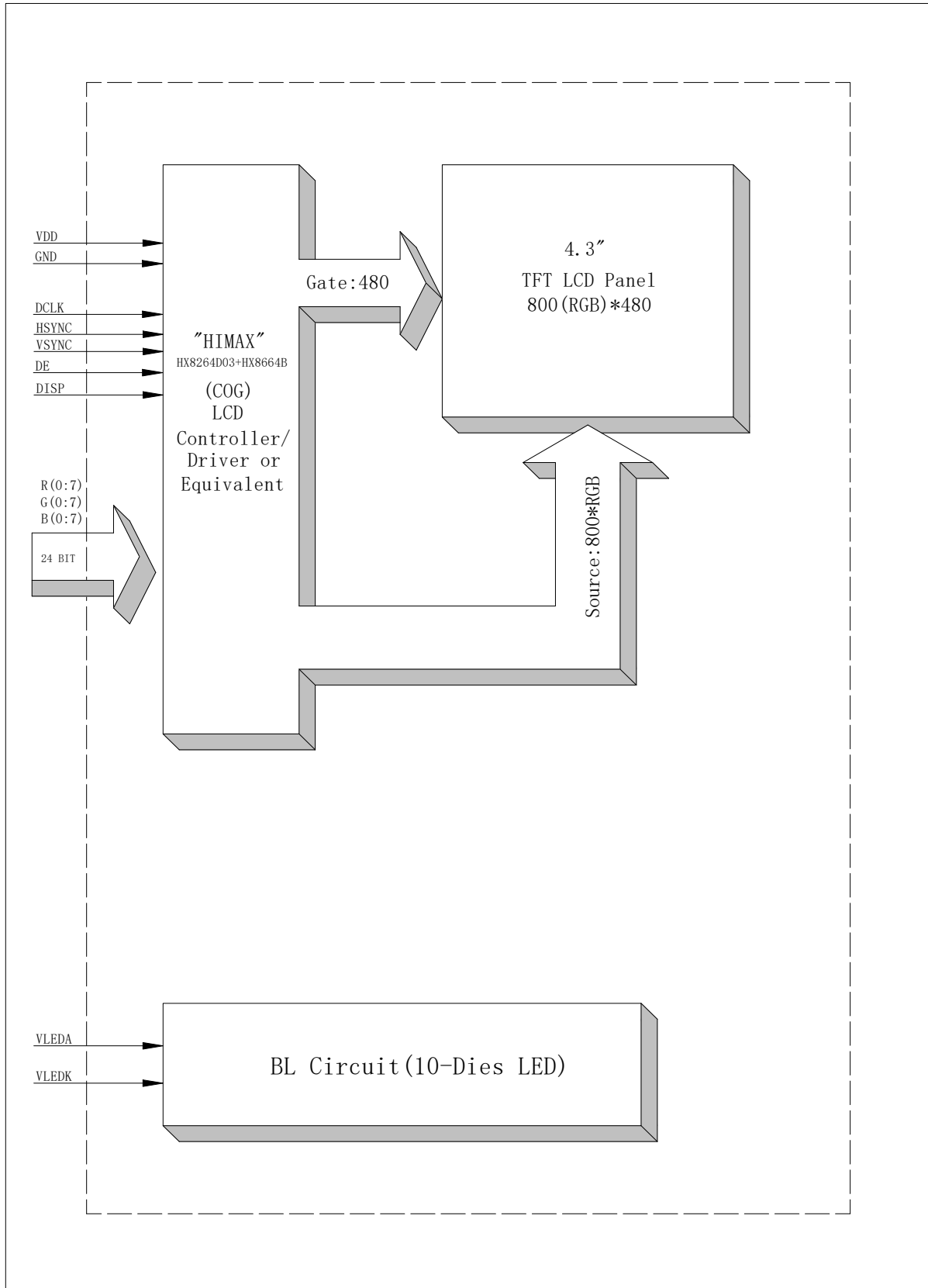


2. Mechanical Drawing





3. Block Diagram





4. Interface Pin Function

| Pin No. | Symbol | Description |
|---------|--------|--------------------------|
| 1 | VLEDK | Cathode of led backlight |
| 2 | VLEDA | Anode of led backlight |
| 3 | GND | Power ground |
| 4 | VDD | Power voltage |
| 5 | R0 | Red data(LSB) |
| 6 | R1 | Red data |
| 7 | R2 | Red data |
| 8 | R3 | Red data |
| 9 | R4 | Red data |
| 10 | R5 | Red data |
| 11 | R6 | Red data |
| 12 | R7 | Red data(MSB) |
| 13 | G0 | Green data(LSB) |
| 14 | G1 | Green data |
| 15 | G2 | Green data |
| 16 | G3 | Green data |
| 17 | G4 | Green data |
| 18 | G5 | Green data |
| 19 | G6 | Green data |
| 20 | G7 | Green data(MSB) |
| 21 | B0 | Blue data(LSB) |
| 22 | B1 | Blue data |
| 23 | B2 | Blue data |
| 24 | B3 | Blue data |
| 25 | B4 | Blue data |
| 26 | B5 | Blue data |
| 27 | B6 | Blue data |
| 28 | B7 | Blue data(MSB) |
| 29 | GND | Power ground |
| 30 | DCLK | Pixel clock |
| 31 | DISP | Display on/off |
| 32 | HSYNC | Horizontal sync signal |
| 33 | VSNC | Vertical sync signal |
| 34 | DE | Data enable |
| 35 | NC | No connect |
| 36 | GND | Power ground |
| 37 | NC(YU) | No connect |
| 38 | NC(XL) | No connect |
| 39 | NC(YD) | No connect |
| 40 | NC(XR) | No connect |



5. Absolute Maximum Ratings

| Parameter | Symbol | Min | Max | Unit |
|---------------------------|------------------|------|------|------|
| Supply voltage for analog | VDD | -0.3 | 3.96 | V |
| Supply voltage for logic | VDD | -0.3 | 3.96 | V |
| Supply current (One LED) | I _{LED} | | 30 | mA |
| Operating temperature | T _{OP} | -30 | +85 | °C |
| Storage temperature | T _{ST} | -40 | +85 | °C |

Note: The absolute maximum rating values of this product are not allowed to be exceeded at any times. Should a module be used with any of the absolute maximum ratings exceeded, the characteristics of the module may not be recovered, or in an extreme case, the module may be permanently destroyed.



6. Electrical Characteristics

6.1 Input Power

| Item | Symbol | Min | Typ. | Max | Unit | Applicable terminal |
|---------------------------|------------------|---------|------|--------|------|---------------------|
| Supply Voltage for Analog | VDD | 2.7 | 3.3 | 3.6 | V | |
| Supply Voltage for Logic | VDD | 2.7 | 3.3 | 3.6 | V | |
| Input Voltage | V _{IL} | GND | - | 0.4VDD | V | |
| | V _{IH} | 0.7 VDD | - | VDD | | |
| Input leakage Current | I _{LKG} | - | | - | μA | |

6.2 Backlight Driving Conditions

| Item | Symbol | Value | | | Unit | Remark |
|---------------------------|----------------|--------|--------|------|------|----------------------|
| | | Min. | Typ. | Max. | | |
| Voltage for LED Backlight | V _F | 14 | 15.5 | 17 | V | I _L =40mA |
| Current for LED Backlight | I _L | | 40 | - | mA | |
| Power Consumption | P | | 0.62 | | W | |
| LED Life Time | | 30,000 | 50,000 | | Hr | Note |

Note: Brightness to be decreased to 50% of the initial value at ambient temperature TA=25°C

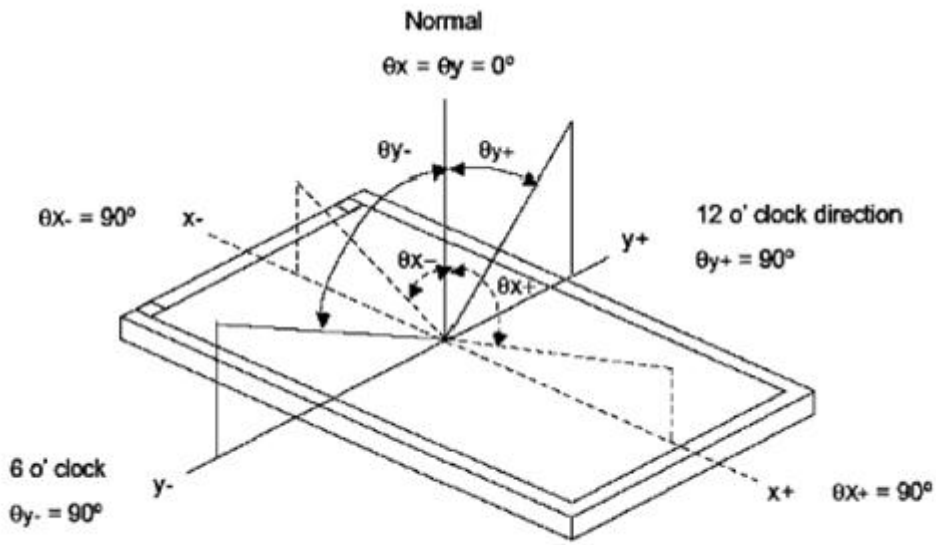


7. Optical Characteristics

| ITEM | SYMBOL | CONDITIONS | SPECIFICATIONS | | | UNIT | NOTE |
|----------------------------|------------------|---------------------|-------------------------|------|-----|-----------------|------|
| | | | MIN | TYP. | MAX | | |
| Luminance | L | $I_L = 40\text{mA}$ | 400 | 500 | 700 | Cd/m^2 | |
| Contrast Ratio | CR | $\theta = 0^\circ$ | 640 | 800 | | | |
| Response Time | T_{ON} | 25°C | | 30 | 40 | ms | |
| | T_{OFF} | | | | | | |
| CIE Color Coordinate | Red | X_R | Viewing normal angle | | | | |
| | | Y_R | | | | | |
| | Green | X_G | | | | | |
| | | Y_G | | | | | |
| | Blue | X_B | | | | | |
| | | Y_B | | | | | |
| | White | X_W | | | | | |
| | | Y_W | | | | | |
| Viewing Angle | Hor. | θ_{X+} | $CR \geq 10$ | 70 | 80 | Degree | |
| | | θ_{X-} | | 70 | 80 | | |
| | Ver. | θ_{Y+} | | 70 | 80 | | |
| | | θ_{Y-} | | 70 | 80 | | |
| Uniformity | Un | | | 80 | | % | |



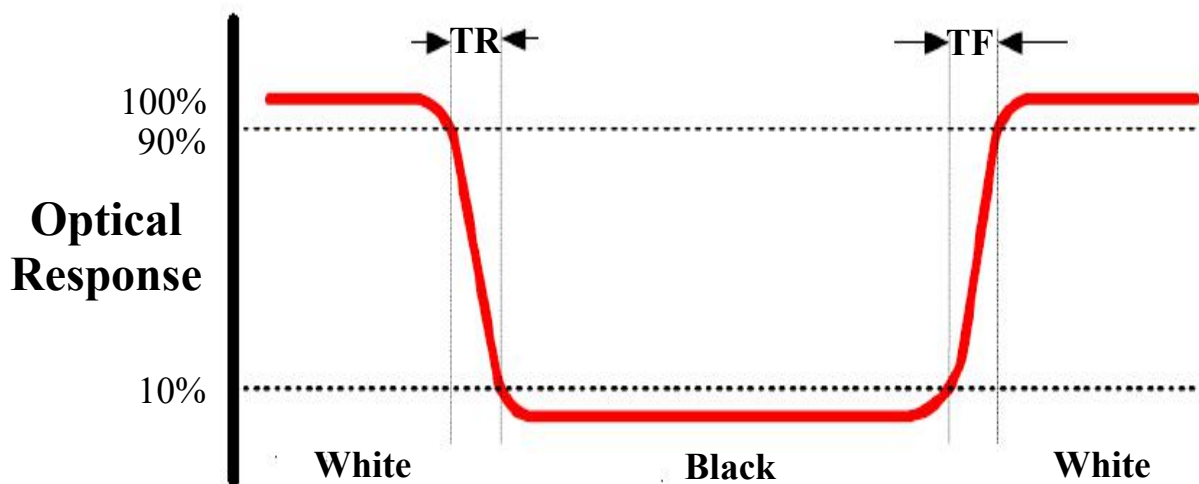
Note 1: Definition of Viewing Angle θ_x and θ_y :



Note 2: Definition of contrast ratio CR:

$$CR = \frac{\text{Luminance of white state}}{\text{Luminance of black state}}$$

Note 3: Definition of Response Time (T_r, T_f)

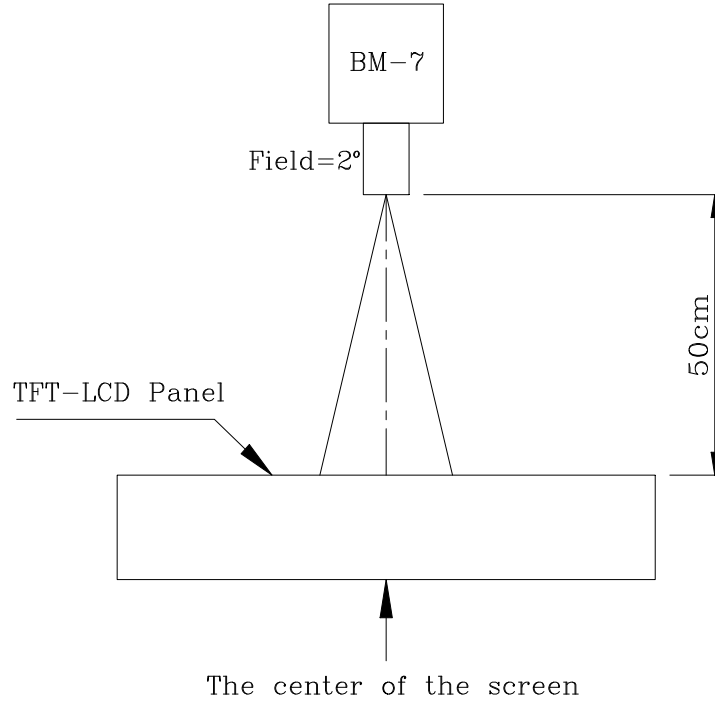




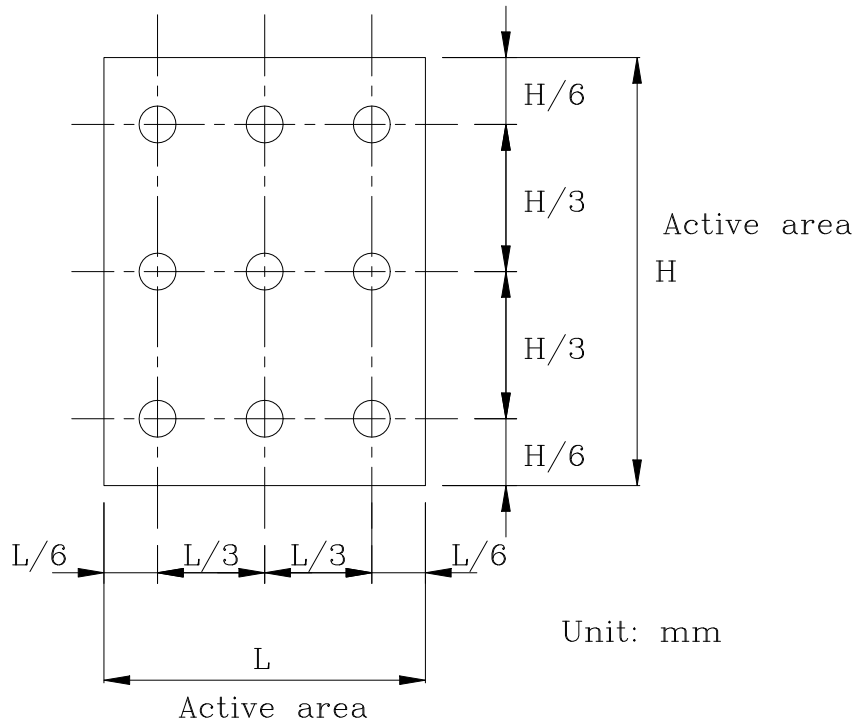
Note 4: Definition of Luminance

① The Brightness Test Equipment Setup

Field=2° (As measuring “black” image, field=2° is the best testing condition)



② The Brightness Test Point Setup





8. Timing Characteristics

8.1 AC electrical characteristics

| Parameter | Symbol | Spec. | | | Unit |
|------------------------|-----------|-------|------|------|---------|
| | | Min. | Typ. | Max. | |
| HS setup time | T_{hst} | 8 | - | - | ns |
| HS hold time | T_{hhd} | 8 | - | - | ns |
| VS setup time | T_{vst} | 8 | - | - | ns |
| VS hold time | T_{vhd} | 8 | - | - | ns |
| Data setup time | T_{dsu} | 8 | - | - | ns |
| Data hold time | T_{dhd} | 8 | - | - | ns |
| DE setup time | T_{esu} | 8 | - | - | ns |
| DE hold time | T_{ehd} | 8 | - | - | ns |
| VDD Power On Slew rate | T_{POR} | - | - | 20 | ms |
| RSTB pulse width | T_{Rst} | 10 | - | - | μ s |
| CLKIN cycle time | T_{cph} | 20 | - | - | ns |
| CLKIN pulse duty | T_{cwh} | 40 | 50 | 60 | % |
| Output stable time | T_{sst} | - | - | 6 | μ s |

8.2 Data input format

- **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 |



● **Horizontal timing**

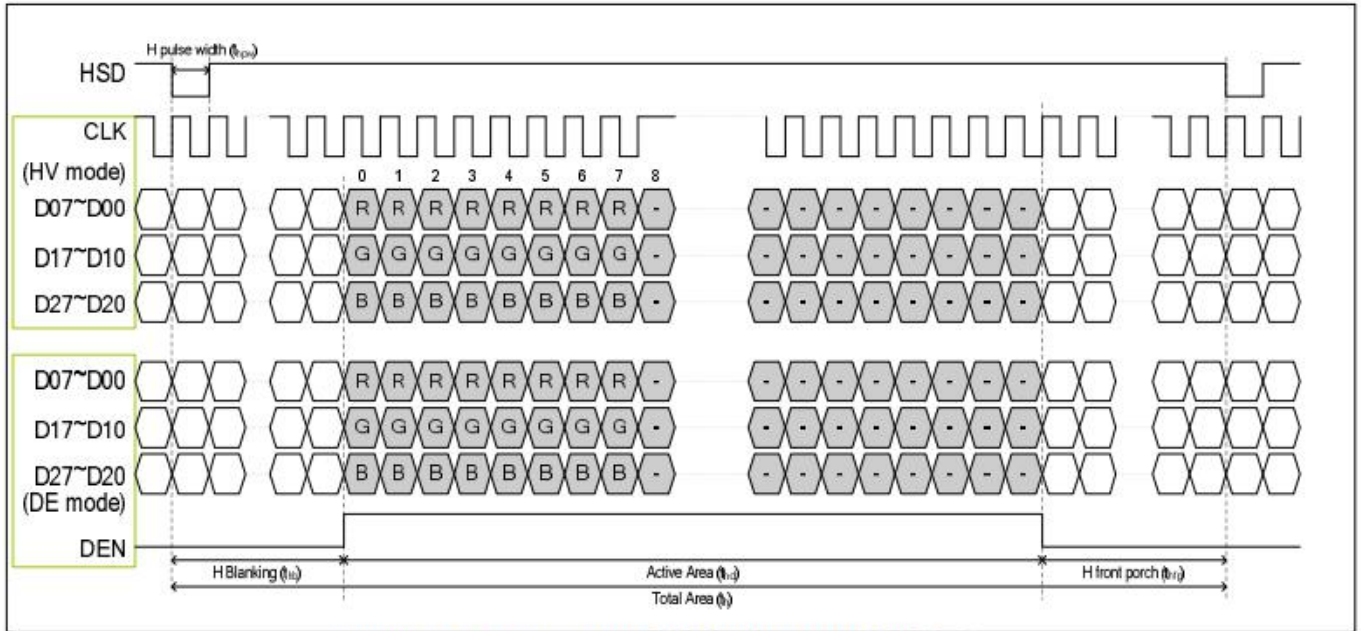


Figure 11.1: Horizontal Input Timing Diagram

● **Vertical timing**

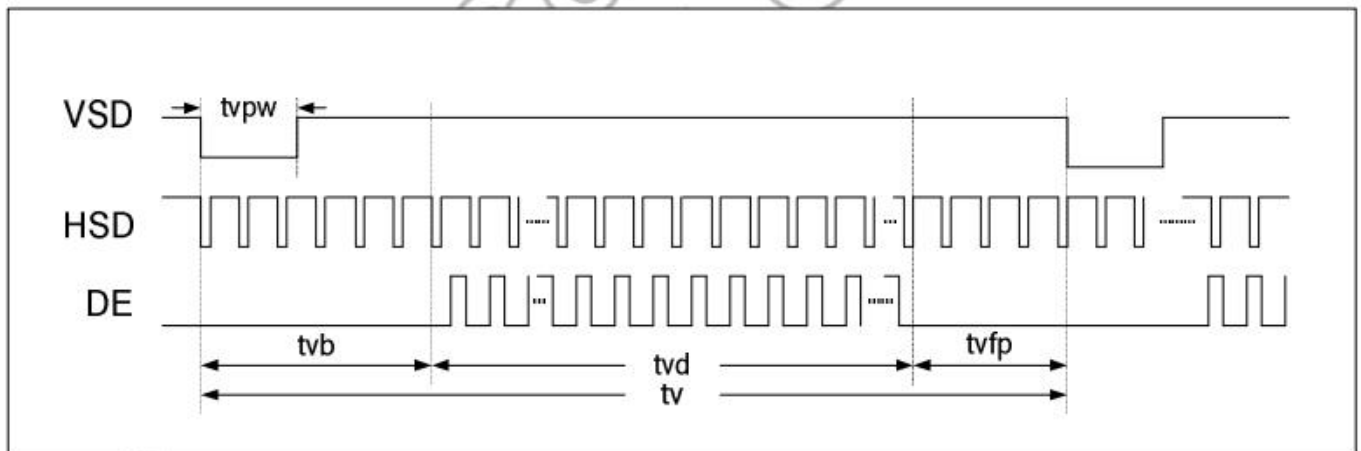


Figure 11.2: Vertical Input Timing Diagram



9. Standard Specification for Reliability

9.1 Standard Specification for Reliability of LCD Module

| No | Test Item | Condition | Remarks |
|----|--|---|---|
| 1 | High Temperature Operation | T _s = +85°C, 240 hours | IEC60068-21:2007 GB2423.2-2008 |
| 2 | Low Temperature Operation | T _a = -30°C, 240 hours | IEC60068-2-1:2007 GB/2423.1-2008 |
| 3 | High Temperature Storage | T _a = +85°C, 240 hours | IEC60068-21:2007 GB/2423.2-2008 |
| 4 | Low Temperature Storage | T _a = -40°C, 240 hours | IEC60068-21:2007 GB/2423.1-2008 |
| 5 | Storage at High Temperature and Humidity | T _a = +60°C, 90% RH max, 240 hours | IEC60068-2-78 :2001 GB/T2423.3—2006 |
| 6 | Thermal Shock (non-operation) | -30°C 30 min~+80°C 30 min, Change time:5min, 20 Cycle | Start with cold temperature, End with high temperature, IEC60068-214:1984, GB/2423.22-2002 |
| 7 | ESD | C=150pF,R=330Ω,5point/panel Air:±8Kv,5times; Contact:±4Kv,5times (Environment:15°C~35°C, 30%~60%.86Kpa~106Kpa) | IEC61000-42:2001 GB/T17626.2-2006 |
| 8 | Vibration Test | Frequency range:10~55Hz Stroke:1.5mm Sweep:10Hz~55Hz~10Hz 2 hours for each direction of X.Y.Z (6 hours for total) | IEC60068-2-6:1982 GB/T2423.101995 |
| 9 | Mechanical Shock (Non Op) | Half Sine Wave60G 6ms, ±X,±Y,±Z 3times for each direction | IEC60068-2-27:1987 GB/T2423.5—1995 |
| 10 | Package Drop Test | Height:80cm, 1corner,3 edges,6 surfaces | IEC60068-2-32:1990 GB/T2423.8—1995 |

Note1: T_s is the temperature of panel's surface.

Note2: T_a is the ambient temperature of sample.



9.2 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 9.2, standard specifications for reliability will be 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. |

9.3 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°C), normal humidity (50±10% RH), and in area not exposed to direct sun light. |
|------|---|



10. General Precautions

10.1. Safety

- Liquid crystal is poisonous. Do not put it in your mouth. If liquid crystal touches your skin or clothes, wash it off immediately by using soap and water.

10.2. Handling

- The LCD panel is plate glass. Do not subject the panel to mechanical shock or to excessive force on its surface.
- The polarizer attached to the display is easily damaged. Please handle it carefully to avoid scratch or other damages.
- To avoid contamination on the display surface, do not touch the module surface with bare hands.
- Keep a space so that the LCD panels do not touch other components.
- Put cover board such as acrylic board on the surface of LCD panel to protect panel from damages.
- Transparent electrodes may be disconnected if you use the LCD panel under environmental conditions where the condensation of dew occurs.
- Do not leave module in direct sunlight to avoid malfunction of the ICs.

10.3. Static Electricity

- Be sure to ground module before turning on power or operating module.
- Do not apply voltage which exceeds the absolute maximum rating value.

10.4. Storage

- Store the module in a dark room where must keep at $25\pm 10^{\circ}\text{C}$ and 65%RH or less.
- Do not store the module in surroundings containing organic solvent or corrosive gas.
- Store the module in an anti-electrostatic container or bag.

10.5. Cleaning

- Do not wipe the polarizer with dry cloth. It might cause scratch.
- Only use a soft cloth with IPA to wipe the polarizer, other chemicals might permanent damage to the polarizer.



11. Specification of Quality Assurance

This standard of Quality Assurance confirms to the quality of LCD module products supplied by Kingtech.

11.1 Quality Test

Before delivering, the supplier should conduct the following tests to confirm the quality of products.

- Electrical-Optical Characteristics: According to the individual specification to test the product.
- Appearance Characteristics: According to the individual specification to test the product.
- Reliability Characteristics: According to the definition of reliability on the specification for testing products.

11.2 Delivery Test

Before delivering, the supplier should conduct the delivery test.

- Test method: According to MIL-STD105E. General Inspection Level II take a single Time.
- The defects classify of AQL as following:
 - Major defect: AQL = 0.65
 - Minor defect: AQL = 1.5
 - Total defects: AQL = 1.5

11.3 Non-conforming Analysis & Deal With Manners

11.3.1 Non-conforming Analysis

- Purchaser should provide the data detail of non-conforming sample and the non-conforming.
- After receiving the data detail from purchaser, the analysis of non-conforming should be finished within two weeks.
- If the analysis can't be finished on time, supplier must notice purchaser 3 days in advance.



11.3.2 Disposition of non-conforming

- If any product defect be found during assembling, supplier must change the good for every defect after confirmation.
- Both supplier and customer should analyze the reason and discuss the disposition of non-conforming when the reason of nonconforming is not sure.

11.4 Agreement items

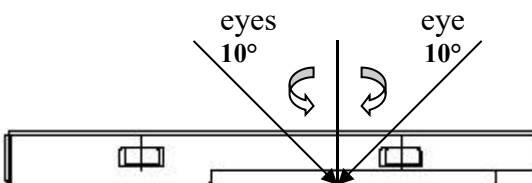
Both parties should negotiate together when the following problems happen.

- There is any problem of standard of quality assurance, and both sides should agree that it must be modified.
- There is any argument item which does not record in the standard of quality assurance.
- Any other special problem.

11.5 Standard of The Product Appearance Test

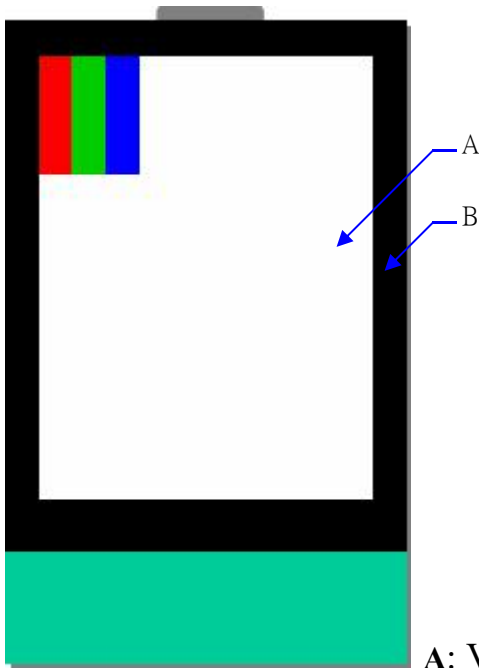
11.5.1 Manner of appearance test

- The test must be under 20W × 2 or 40W fluorescent light, and the distance of view must be at 30±5cm.
- When test the model of transmissive product must add the reflective plate.
- The test direction is base on around 10° of vertical line.
- Temperature: 25±5°C Humidity: 60±10%RH





- Definition of area:



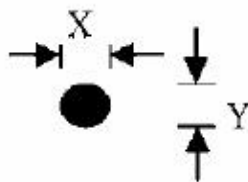
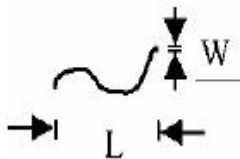
A: Viewing area B: Outside viewing area

11.5.2 Basic principle

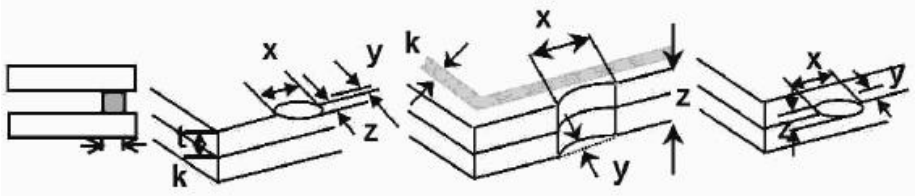
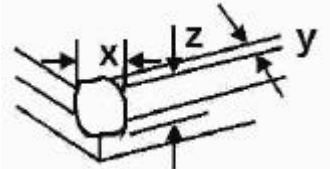
- When the standard can not be described, AQL will be applied.
- The sample of the lowest acceptable quality level must be negotiated by both supplier and customer when any dispute happened.
- New item must be added on time when it is necessary.



11.6 Inspection Specification

| NO. | Item | Criterion | AQL | | | | | | | | | | | | |
|---|---|--|-----------------|-----------------|------------------|-----------------|-------------------------|----------------------|-------------------------|--------------|-------------------------|-----|---------------|-----------|-----|
| 01 | Electrical Testing | 1.1 Missing vertical, horizontal segment, segment contrast defect. 1.2 Missing character, dot or icon. 1.3 Display malfunction. 1.4 No function or no display. 1.5 Current consumption exceeds product specifications. 1.6 LCD viewing angle defect. 1.7 Mixed product types. 1.8 Flicker | 0.65 | | | | | | | | | | | | |
| 02 | Black or White spots or Bright spots or Color spots on LCD (Display only) | 2.1 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. | 1.5 | | | | | | | | | | | | |
| 03 | LCD and Touch Panel black spots, white spots, contamination (non – display) | 3.1 Round type: As following drawing $\Phi = (X+Y) / 2$  <table border="1" data-bbox="821 1086 1348 1332"> <thead> <tr> <th>Size(mm)</th> <th>Acceptable Q'ty</th> </tr> </thead> <tbody> <tr> <td>$\Phi \leq 0.10$</td> <td>Accept no dense</td> </tr> <tr> <td>$0.10 < \Phi \leq 0.20$</td> <td>2</td> </tr> <tr> <td>$0.20 < \Phi \leq 0.25$</td> <td>2</td> </tr> <tr> <td>$0.25 < \Phi \leq 0.30$</td> <td>1</td> </tr> <tr> <td>$0.30 < \Phi$</td> <td>0</td> </tr> </tbody> </table> <p>* Densely spaced: No more than two spots within 3mm.</p> | Size(mm) | Acceptable Q'ty | $\Phi \leq 0.10$ | Accept no dense | $0.10 < \Phi \leq 0.20$ | 2 | $0.20 < \Phi \leq 0.25$ | 2 | $0.25 < \Phi \leq 0.30$ | 1 | $0.30 < \Phi$ | 0 | 1.5 |
| | | Size(mm) | Acceptable Q'ty | | | | | | | | | | | | |
| $\Phi \leq 0.10$ | Accept no dense | | | | | | | | | | | | | | |
| $0.10 < \Phi \leq 0.20$ | 2 | | | | | | | | | | | | | | |
| $0.20 < \Phi \leq 0.25$ | 2 | | | | | | | | | | | | | | |
| $0.25 < \Phi \leq 0.30$ | 1 | | | | | | | | | | | | | | |
| $0.30 < \Phi$ | 0 | | | | | | | | | | | | | | |
| 3.2 Line type: (As following drawing)  <table border="1" data-bbox="726 1489 1348 1758"> <thead> <tr> <th>Length(mm)</th> <th>Width(mm)</th> <th>Acceptable Q'ty</th> </tr> </thead> <tbody> <tr> <td>---</td> <td>$W \leq 0.02$</td> <td>Accept no dense</td> </tr> <tr> <td>$L \leq 3.0$</td> <td>$0.02 < W \leq 0.05$</td> <td rowspan="2">2</td> </tr> <tr> <td>$L \leq 2.5$</td> <td>$0.03 < W \leq 0.08$</td> </tr> <tr> <td>---</td> <td>$0.08 < W$</td> <td>Rejection</td> </tr> </tbody> </table> <p>* Densely spaced: No more than two lines within 3mm.</p> | Length(mm) | Width(mm) | Acceptable Q'ty | --- | $W \leq 0.02$ | Accept no dense | $L \leq 3.0$ | $0.02 < W \leq 0.05$ | 2 | $L \leq 2.5$ | $0.03 < W \leq 0.08$ | --- | $0.08 < W$ | Rejection | 1.5 |
| Length(mm) | Width(mm) | Acceptable Q'ty | | | | | | | | | | | | | |
| --- | $W \leq 0.02$ | Accept no dense | | | | | | | | | | | | | |
| $L \leq 3.0$ | $0.02 < W \leq 0.05$ | 2 | | | | | | | | | | | | | |
| $L \leq 2.5$ | $0.03 < W \leq 0.08$ | | | | | | | | | | | | | | |
| --- | $0.08 < W$ | Rejection | | | | | | | | | | | | | |

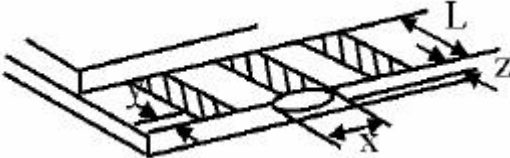
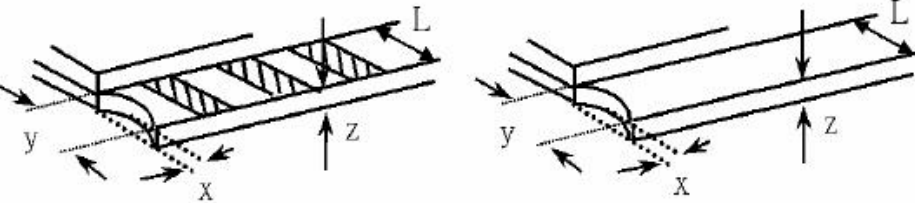
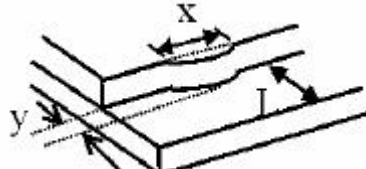


| NO. | Item | Criterion | | AQL | |
|---------------------|-----------------------|--|-------------------------|-----------------|----------------|
| 04 | Polarizer bubbles | If bubbles are visible, judge using black spot specifications, not easy to find, must check in specify direction | Size Φ (mm) | Acceptable Q'ty | 1.5 |
| | | | $\Phi \leq 0.20$ | Accept no dense | |
| | | | $0.20 < \Phi \leq 0.50$ | 3 | |
| | | | $0.50 < \Phi \leq 1.00$ | 2 | |
| | | | $1.00 < \Phi$ | 0 | |
| | | | Total Q'ty | 3 | |
| 05 | Scratches | Follow NO.3 -2 Line Type. | | | |
| 06 | Chipped glass | Symbols: x: Chip length y: Chip width z: Chip thickness k: Seal width t: Glass thickness a: LCD side length L: Electrode pad length | | 1.5 | |
| | | 6.1 General glass chip: | | | |
| | | 6.1.1 Chip on panel surface and crack between panels: | | | |
| | |  | | | |
| | | 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 | $x \leq 1/8a$ | | | |
| ⊙ Unit: mm | | ⊙ If there are 2 or more chips, x is the total length of each chip | | | |
| 6.1.2 Corner crack: | |  | | | |
| 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 | $x \leq 1/8a$ | | | |
| ⊙ Unit: mm | | ⊙ If there are 2 or more chips, x is the total length of each chip | | | |

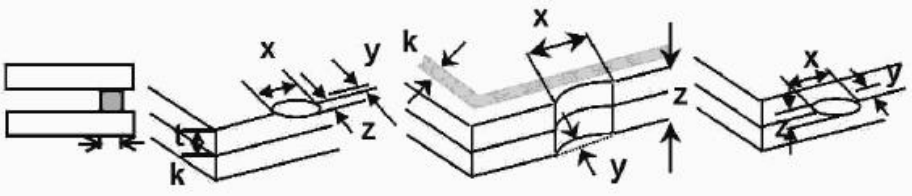
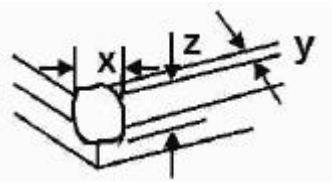


| NO. | Item | Criterion | AQL |
|-----|--------------------|--|--|
| 08 | Cracked glass | The LCD with extensive crack is not acceptable. | 1.5 |
| 09 | Backlight elements | 9.1 Illumination source flickers when lit. 9.2 Spots or scratches that appear when lit must be judged. Using LCD spot, lines and contamination standards. 9.3 Backlight doesn't light or color is wrong. | 1.5 1.5 0.65 |
| 10 | Bezel | Bezel must comply with product specifications. | 1.5 |
| 11 | PCB、COB | 11.1 COB seal may not have pinholes larger than 0.2mm or contamination. 11.2 COB seal surface may not have pinholes through to the IC. 11.3 The height of the COB should not exceed the height indicated in the assembly diagram. 11.4 There may not be more than 2mm of sealant outside the seal area on PCB. And there should be no more than three places. 11.5 Parts on PCB must be the same as on the production characteristic chart, There should be no wrong parts, missing parts or excess parts. 11.6 The jumper on the PCB should conform to the product characteristic chart. | 1.5 1.5 1.5 1.5 0.65 0.65 |
| 12 | FPC | 12.1 FPC terminal damage \cong 1/2 FPC terminal width and can not affect the function , we judge accept. 12.2 FPC alignment hole damage \cong 1/2 alignment area and can not affect the function , we judge accept. | 1.5 1.5 |
| 13 | Soldering | 13.1 No cold solder joints, missing solder connections, oxidation or icicle. 13.2 No short circuits in components on PCB or FPC. | 1.5 0.65 |

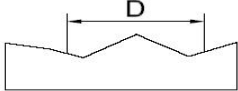
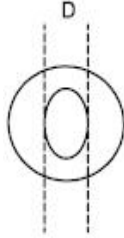


| NO. | Item | Criterion | AQL | | | | | | | | | | | | | | | | |
|-----------------------|----------------|--|---------------|----------------|-------------------|-----------------------|---------------|----------------|---------------|----------------|-------------------|------------|---------------|----------------|----------|-----------|---------------|------------|-----|
| 07 | Glass crack | <p>Symbols: x: Chip length y: Chip width z: Chip thickness k: Seal width t: Glass thickness a: LCD side length L: Electrode pad length</p> <p>7.2 Protrusion over terminal: 7.2.1 Chip on electrode pad:</p>  <table border="1" data-bbox="558 716 1236 862"> <tr> <td>y: Chip width</td> <td>x: Chip length</td> <td>z: Chip thickness</td> </tr> <tr> <td>$y \leq 0.5\text{mm}$</td> <td>$x \leq 1/8a$</td> <td>$0 < z \leq t$</td> </tr> </table> <p>7.2.2 Non-conductive portion:</p>  <table border="1" data-bbox="558 1232 1236 1377"> <tr> <td>y: Chip width</td> <td>x: Chip length</td> <td>z: Chip thickness</td> </tr> <tr> <td>$y \leq L$</td> <td>$x \leq 1/8a$</td> <td>$0 < z \leq t$</td> </tr> </table> <p>⊙ If there chipped area touches the ITO terminal, over 2/3 of the ITO must remain and be inspected according to electrode terminal specifications. ⊙ If the product will be heat sealed by the customer, the alignment mark must not be damaged.</p> <p>7.2.3 Substrate protuberance and internal crack</p>  <table border="1" data-bbox="885 1702 1316 1848"> <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 | $y \leq 1/3L$ | $X \leq a$ | 1.5 |
| 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 | | | | | | | | | | | | |
|-------------------|--|--|-------------------|---------------|----------------|------------|--|---------------|-------------------|---------------|----------------|------------|--|---------------|-----|
| 14 | Touch Panel Chipped glass | <p>Symbols: x: Chip length y: Chip width z: Chip thickness k: Seal width t: Touch Panel Total thickness a: LCD side length L: Electrode pad length</p> <p>14.1 General glass chip: 14.1.1 Chip on panel surface and crack between panels:</p>  <table border="1" data-bbox="451 752 1270 967"> <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;">$\cong 1/2 k$ 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>14.1.2 Corner crack:</p>  <table border="1" data-bbox="451 1346 1270 1561"> <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;">$\cong 1/2 k$ 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 | $Z \leq t$ | $\cong 1/2 k$ and not over viewing area | $x \leq 1/8a$ | z: Chip thickness | y: Chip width | x: Chip length | $z \leq t$ | $\cong 1/2 k$ and not over viewing area | $x \leq 1/8a$ | 1.5 |
| z: Chip thickness | y: Chip width | x: Chip length | | | | | | | | | | | | | |
| $Z \leq t$ | $\cong 1/2 k$ and not over viewing area | $x \leq 1/8a$ | | | | | | | | | | | | | |
| z: Chip thickness | y: Chip width | x: Chip length | | | | | | | | | | | | | |
| $z \leq t$ | $\cong 1/2 k$ and not over viewing area | $x \leq 1/8a$ | | | | | | | | | | | | | |



| NO. | Item | Criterion | AQL | | | | | | | | | | |
|--------------------|---|--|------------------------------|-----------------|-----------------|-----------------|--------------------|---|--------------------|---|-----------|---|-----|
| 15 | Touch Panel(Fish eye、dent and bubble on film) | <table border="1" data-bbox="443 342 976 548"> <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> <div style="display: flex; justify-content: space-around; align-items: center; margin-top: 10px;">   </div> | 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 | 1.5 |
| 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 | | | | | | | | | | | | |
| 16 | Touch Panel Newton ring | Newton ring dimension $\leq 1/2$ touch panel area and not affect font and line distortion($\leq 2.5\%$), it is acceptable. | 1.5 | | | | | | | | | | |
| 17 | Touch Panel Linearity | Less than 1.5% is acceptable. | 1.5 | | | | | | | | | | |
| 18 | LCD Ripple | Touch the touch panel , can not see the LCD ripple. Pen: R 1.0mm silicon rubber. Operation Force: 80g | 1.5 | | | | | | | | | | |
| 19 | General appearance | 19.1 Pin type must match type in specification sheet. 19.2 LCD pin loose or missing pins. 19.3 Product packaging must the same as specified on packaging specification sheet. 19.4 Product dimension and structure must conform to product specification sheet. | 0.65 0.65 0.65 0.65 | | | | | | | | | | |



12.Packing Method

| No. | Item | Dimensions(mm) | Quantity | Remark |
|-----|--------------|---|----------|--------|
| 1 | LCM Module | 105.5*67.2*2.9 | 160PCS | |
| 2 | PALLET | 344*285*85 (include 80pcs products/one pallet) | 2PCS | |
| 3 | LARGE CARTON | 385*315*227 (include 160pcs products/one carton) | 1PCS | |