深圳市思迪科科技有限公司
SHENZHEN CDTECH ELECTRONICS

# Product Specification

| | |
|---|---|
| **Model Name** | S101HWX39ND |
| **Description** | 1280(RGB)x800 Dots<br>10.1" TFT LCD |
| **Date** | 2020/11/20 |
| **Revision** | 1.0 |

| Approved by/Date | Check by/Date | Prepared by/Date |
|---|---|---|
| ZHP 2020/11/20 | HZX 2020/11/20 | ZWF 2020/11/20 |

| Customer Approval | |
|---|---|
| | |
| **Date** | |

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## 1. Record of Revision

| Rev | Issued Date | Description | Editor |
|---|---|---|---|
| 1.0 | 2020/11/20 | First Release. | ZWF |
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## 2 General Specifications

| Feature | | Spec |
|---|---|---|
| Characteristics | Size | 10.1 inch |
| | Resolution | 1280(Horizontal)*800(Vertical) |
| | Interface | LVDS(8bit) |
| | Connect type | Connector |
| | Color Depth | 16.7M |
| | Technology type | a-Si |
| | Display Spec. Pixel pitch (mm) | 0.1695(H)×0.1695(V) |
| | Pixel Configuration | R.G.B. Vertical Stripe |
| | Display Mode | Normally Black |
| | Driver IC | EK79202 |
| | Viewing Direction | ALL |
| Mechanical | LCM (W x H x D) (mm) | 229.46(W)*149.10(H)*4.5 (D) |
| | Active Area(mm) | 216.96(H)x 135.60(V) |
| | With /Without TP | Without TP |
| | Weight (g) | TBD |
| | LED Numbers | 40 LEDs |

Note 1: Requirements on Environmental Protection: RoHS
Note 2: LCM weight tolerance: +/- 5%

# 3 Input/Output Terminals

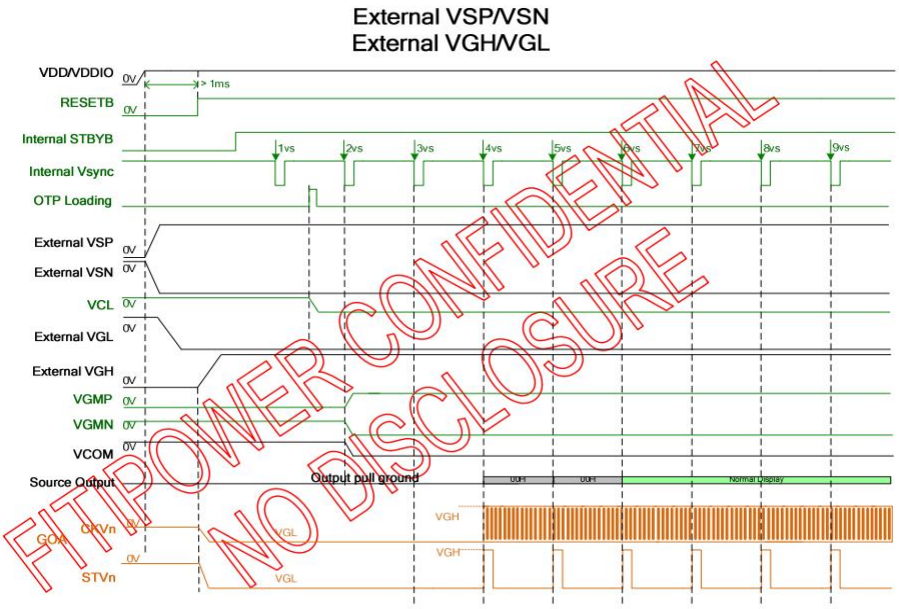
| No. | Symbol | Description | Note |
|---|---|---|---|
| 1 | NC | No connection | |
| 2-3 | VDD（3.3V） | Power Supply | |
| 4-7 | NC | No connection | |
| 8 | RXIN0- | - LVDS differential data input | |
| 9 | RXIN0+ | + LVDS differential data input | |
| 10 | GND | Ground | |
| 11 | RXIN1- | - LVDS differential data input | |
| 12 | RXIN1+ | + LVDS differential data input | |
| 13 | GND | Ground | |
| 14 | RXIN2- | - LVDS differential data input | |
| 15 | RXIN2+ | + LVDS differential data input | |
| 16 | GND | Ground | |
| 17 | RXCLK- | - LVDS differential clock input | |
| 18 | RXCLK+ | + LVDS differential clock input | |
| 19 | GND | Ground | |
| 20 | RXIN3- | - LVDS differential data input | |
| 21 | RXIN3+ | + LVDS differential data input | |
| 22 | GND | Ground | |
| 23 | NC | No connection | |
| 24 | NC | No connection | |
| 25 | GND | Ground | |
| 26 | NC | No connection | |
| 27 | NC | No connection | |
| 28 | GND | Ground | |
| 29 | NC | No connection | |
| 30 | NC | No connection | |
| 31-33 | GND | Ground | |
| 34 | NC | No connection | |
| 35 | PWM | PWM dimming control. | |
| 36 | LED-EN | BL Enable pin,Active High | |
| 37 | NC | No connection | |
| 38-40 | VLED | BL power supply.（12V） | |

# 4 Absolute Maximum Ratings

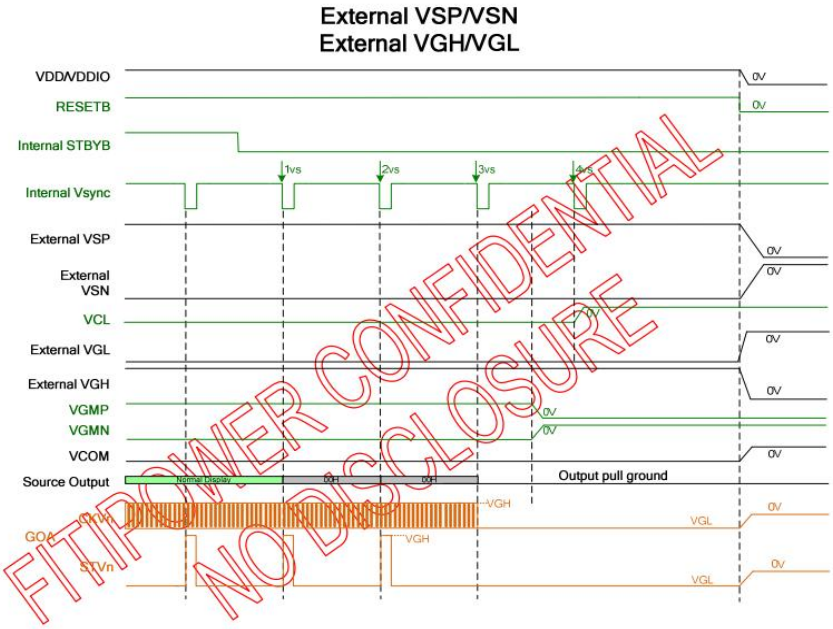
| Item | Symbol | MIN | Typ | MAX | Unit |
|---|---|---|---|---|---|
| Supply Voltage | VDD | -0.3 | 3.3 | 3.6 | V |
| Input voltage “H”level | VIH | 0.7VDD | - | VDD | V |
| Input voltage “L”level | VIL | 0 | - | 0.3VDD | V |
| Operating Temperature | TOPR | -20 | - | 70 | ℃ |
| Storage Temperature | TSTG | -30 | - | 80 | ℃ |

# 5 Electrical Characteristics

## 5.1 POWER ON/OFF SEQUENCE




Power on sequence with PMODE=H




Power off sequence with PMODE=H

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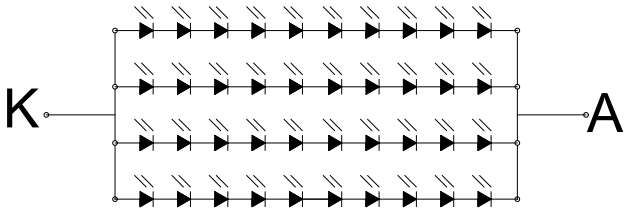
NO DISCLOSURE

## 5.2 Driving Backlight

| Item | Symbol | MIN | TYP | MAX | Unit | Remark |
|---|---|---|---|---|---|---|
| Forward Current | $I_F$ | 450 | 300 | 500 | mA | |
| Forward Voltage | BL-9V | - | 12V | - | V | |
| BL Enable pin | BL-EN | 3.0 | 3.3 | 3.6 | V | |
| Backlight Power consumption | $W_{BL}$ | - | 3.6W | - | W | |
| LED Lifetime | | - | 30000 | - | Hrs | |

Note 1: Each LED: IF =20 mA, VF =3.2+/0.2V.
Note 2: Optical performance should be evaluated at Ta=25℃ only.
Note 3: If LED is driven by high current, high ambient temperature & humidity condition. The life Time of LED will be reduced. Operating life means brightness goes down to 50% initial brightness. Typical operating life time is estimated data.



## 5.3 RESET TIMING CHARACTERISTICS

When RESETB of the reset pin equals to Low, it will be in the condition of reset. When it is in the condition of reset, it will make the device recover the initial set.

However, in order to avoid the reset noise cause reset, there is a mechanism to judge about whether the reset is needed or not.

The closed interval of Low can be shown as the following.

(Test condition: VDDIO=2.3V~3.6V, VSS=0V, $T_A$=-20 ~+85 )

| Parameter | Symbol | Conditions | Spec. | | | Unit |
|---|---|---|---|---|---|---|
| | | | Min. | Typ. | Max | |
| Reset low pulse width | Trst | | 20 | - | - | μs |

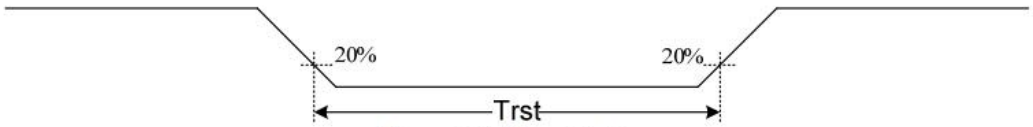
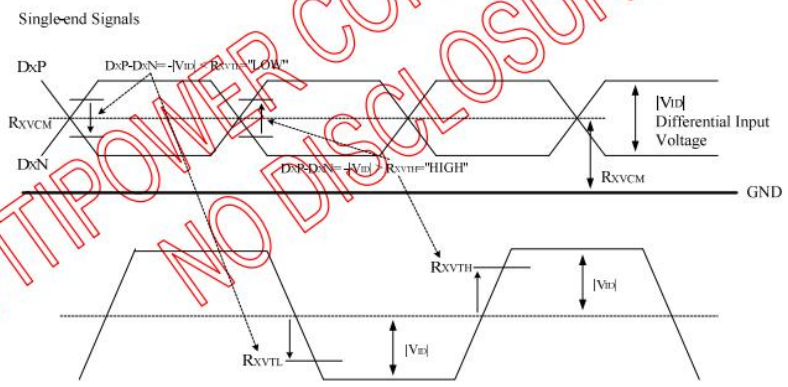



**Figure 13.5: Reset timing**

### 12.5 LVDS DC electrical characteristics

(VDD=VDDIO=VDDIF=2.3 to 3.6V, VSS=VSSA=VSS_IF=0V, TA=-20 to +85℃)

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Condition |
|---|---|---|---|---|---|---|
| Differential input high threshold voltage | $R_{XVTH}$ | +0.1 | 0.2 | 0.3 | V | $R_{XVCM}$=1.2V |
| Differential input low threshold voltage | $R_{XVTL}$ | -0.3 | -0.2 | -0.1 | V | |
| Input voltage range (singled-end) | $R_{XVIN}$ | 0.7 | - | 1.7 | V | |
| Differential input common mode voltage | $R_{XVCM}$ | 1 | 1.2 | 1.4 | V | $\|V_{ID}\|$=0.2 |
| Differential input impedance | $Z_{ID}$ | 80 | 100 | 125 | ohm | |
| Differential input voltage | $\|V_{ID}\|$ | 0.2 | - | 0.6 | V | |
| Differential input leakage current | $I_{LCLVDS}$ | -10 | - | +10 | uA | |
| LVDS Digital Operating Current | $I_{VDDMIPI}$ | - | 15 | 20 | mA | $F_{DCLK}$=80MHz,VDD=3.3V, Input pattern: 55h->AAh->55h->AAh |
| LVDS Digital Stand-by Current | $I_{STMIPI}$ | - | - | 250 | uA | Clock & all Functions are stopped |

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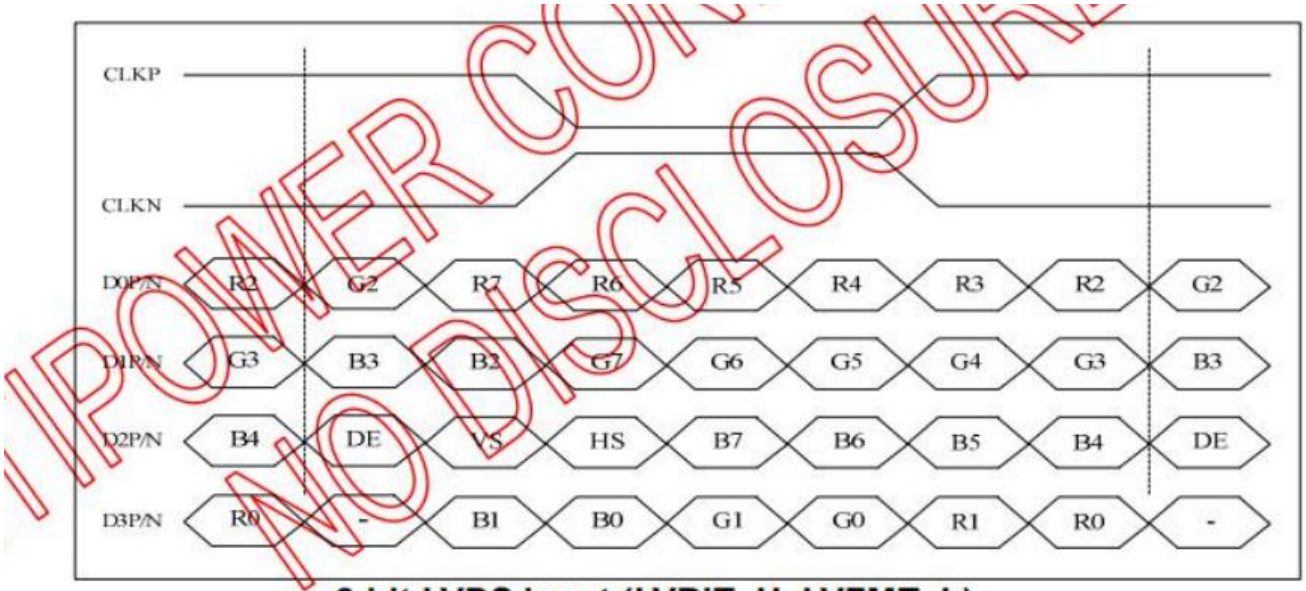
NO DISCLOSURE

## 5.4 LVDS interface CHARACTERISTCS




**8-bit LVDS input (LVBIT=H, LVFMT=L)**

For 1280RGBx800

| Parameter | | Symbol | Value | | | Unit |
|---|---|---|---|---|---|---|
| | | | Min. | Typ. | Max. | |
| DCLK frequency @Frame rate=60Hz (LVDS) | | $F_{DCLK}$ | 66.3 | 72.4 | 78.9 | MHz |
| HSYNC period time | | $T_H$ | 1380 | 1440 | 1500 | DCLK |
| Horizontal display area | | $T_{HD}$ | | 1280 | | DCLK |
| HSYNC pulse width | Min. | $T_{HPW}$ | | 1 | | |
| | Typ. | | | - | | |
| | Max. | | | 40 | | |
| HSYNC back porch(with pulse width) | | $T_{HBP}$ | 88 | 88 | 88 | DCLK |
| HSYNC front porch | | $T_{HFP}$ | 12 | 72 | 132 | DCLK |
| VSYNC period time | | $T_V$ | 824 | 838 | 872 | H |
| Vertical display area | | $T_{VD}$ | | 800 | | H |
| VSYNC pulse width | Min. | $T_{VPW}$ | | 1 | | H |
| | Typ. | | | - | | |
| | Max. | | | 20 | | |
| VSYNC back porch(with pulse width) | | $T_{VBP}$ | 23 | 23 | 23 | H |
| VSYNC front porch | | $T_{VFP}$ | 1 | 15 | 49 | H |

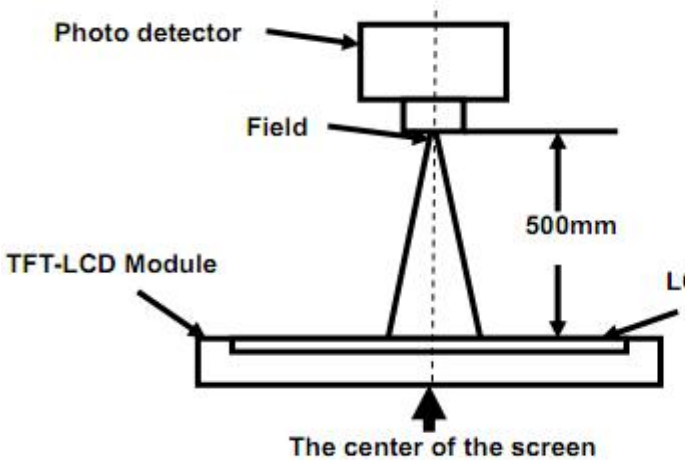
## 6 Optical Characteristics

| Items | | Symbol | Condition | Min. | Typ. | Max. | Unit | Remark |
|---|---|---|---|---|---|---|---|---|
| Viewing angles | | $\theta_T$ | Center CR≥10 | | 80 | - | Degree. | Note2 |
| | | $\theta_B$ | | | 80 | - | | |
| | | $\theta_L$ | | | 80 | - | | |
| | | $\theta_R$ | | | 80 | - | | |
| Contrast Ratio | | CR | Θ =0 | 800 | 1000 | - | - | Note1, Note3 |
| Response Time | | $T_{ON}$ | 25°C | - | 25 | 35 | ms | Note1, Note4 |
| | | $T_{OFF}$ | | | | | | |
| Chromaticity | White | $X_W$ | Backlight is on | 0.272 | 0.322 | 0.372 | - | Note1, Note5 |
| | | $Y_W$ | | 0.294 | 0.344 | 0.394 | - | |
| Color Gamut | | U | | 45 | 50 | - | % | Note1, Note6 |
| Luminance Uniformity | | U | | 70 | 75 | - | % | Note1, Note6 |
| Luminance | | L | | 300 | 350 | | cd/m2 | Note1, Note7 |

Test Conditions:
1. IF= 20mA(one channel),the ambient temperature is 25°C.
2. The test systems refer to Note 1 and Note 2.

Note 1:Definition of optical measurement system.

The optical characteristics should be measured in dark room. After 5 minutes operation, the optical properties are measured at the center point of the LCD screen. All input terminals LCD panel must be ground when measuring the center area of the panel.




| Item | Photo detector | Field |
|---|---|---|
| Contrast Ratio | SR-3A | 1° |
| Luminance | | |
| Chromaticity | | |
| Lum Uniformity | | |
| Response Time | BM-7A | 2° |

Note 2: Definition of viewing angle range and measurement system.
viewing angle is measured at the center point of the LCD by CONOSCOPE(ergo-80).

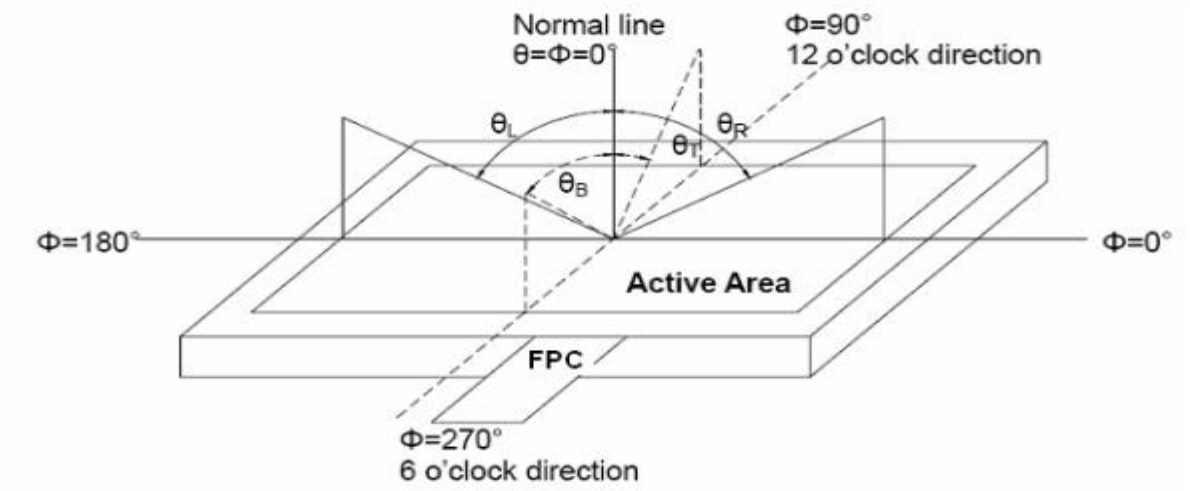



Fig. 1 Definition of viewing angle

Note 3: Definition of contrast ratio

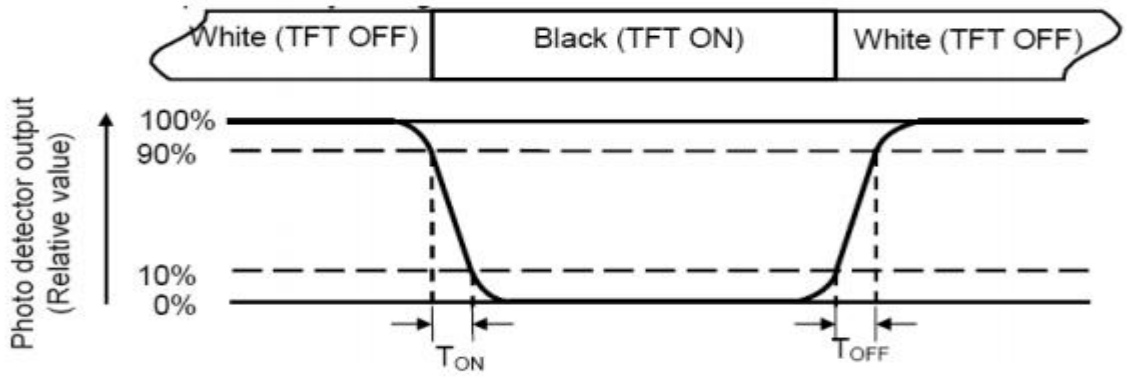
$$\text{Contrast ratio (CR)} = \frac{\text{Luminance measured when LCD is on the "White" state}}{\text{Luminance measured when LCD is on the "Black" state}}$$

“White state “:The state is that the LCD should driven by Vwhite.

“Black state”: The state is that the LCD should driven by Vblack.

Vwhite: To be determined  Vblack: To be determined.

Note 4: Definition of Response time
The response time is defined as the LCD optical switching time interval between “White” state and “Black” state. Rise time (TON) is the time between photo detector output intensity changed from 90% to 10%. And fall time (TOFF) is the time between photo detector output intensity changed from 10% to 90%.




Note 5: Definition of color chromaticity (CIE1931)
Color coordinates measured at center point of LCD.
Note 6: Definition of Luminance Uniformity
Active area is divided into 9 measuring areas (Refer Fig. 2). Every measuring point is placed at the center of each measuring area.

Luminance Uniformity(U) = Lmin/ Lmax X100%
L-------Active area length W----- Active area width

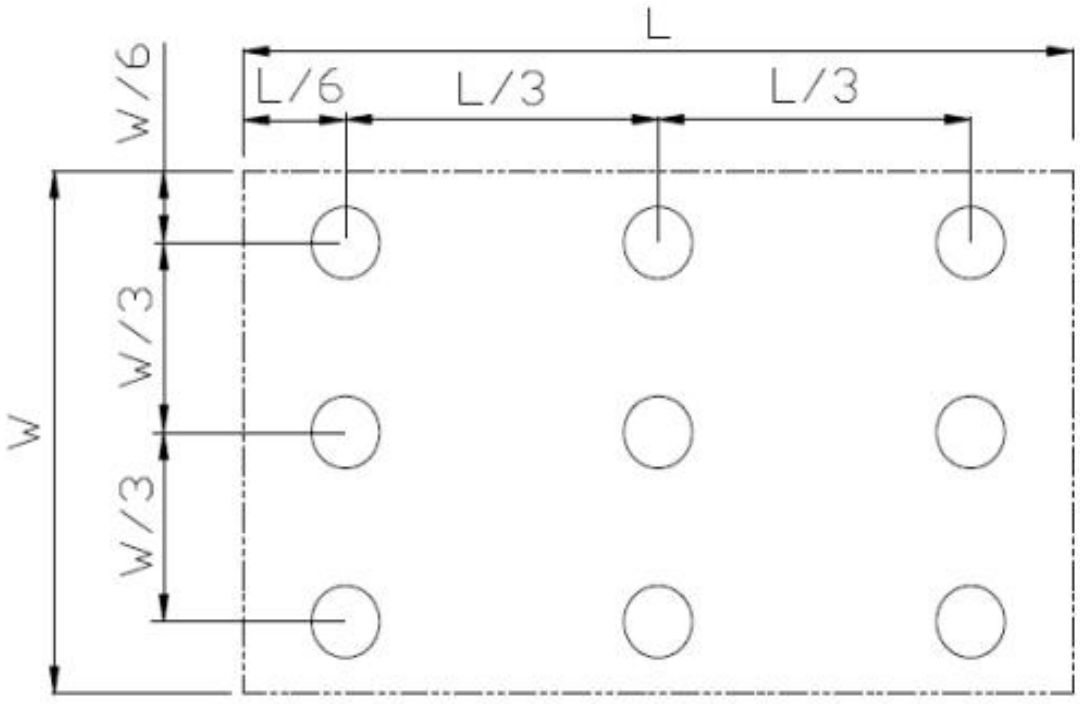



Fig. 2 Definition of uniformity
Lmax: The measured maximum luminance of all measurement position.
Lmin: The measured minimum luminance of all measurement position.

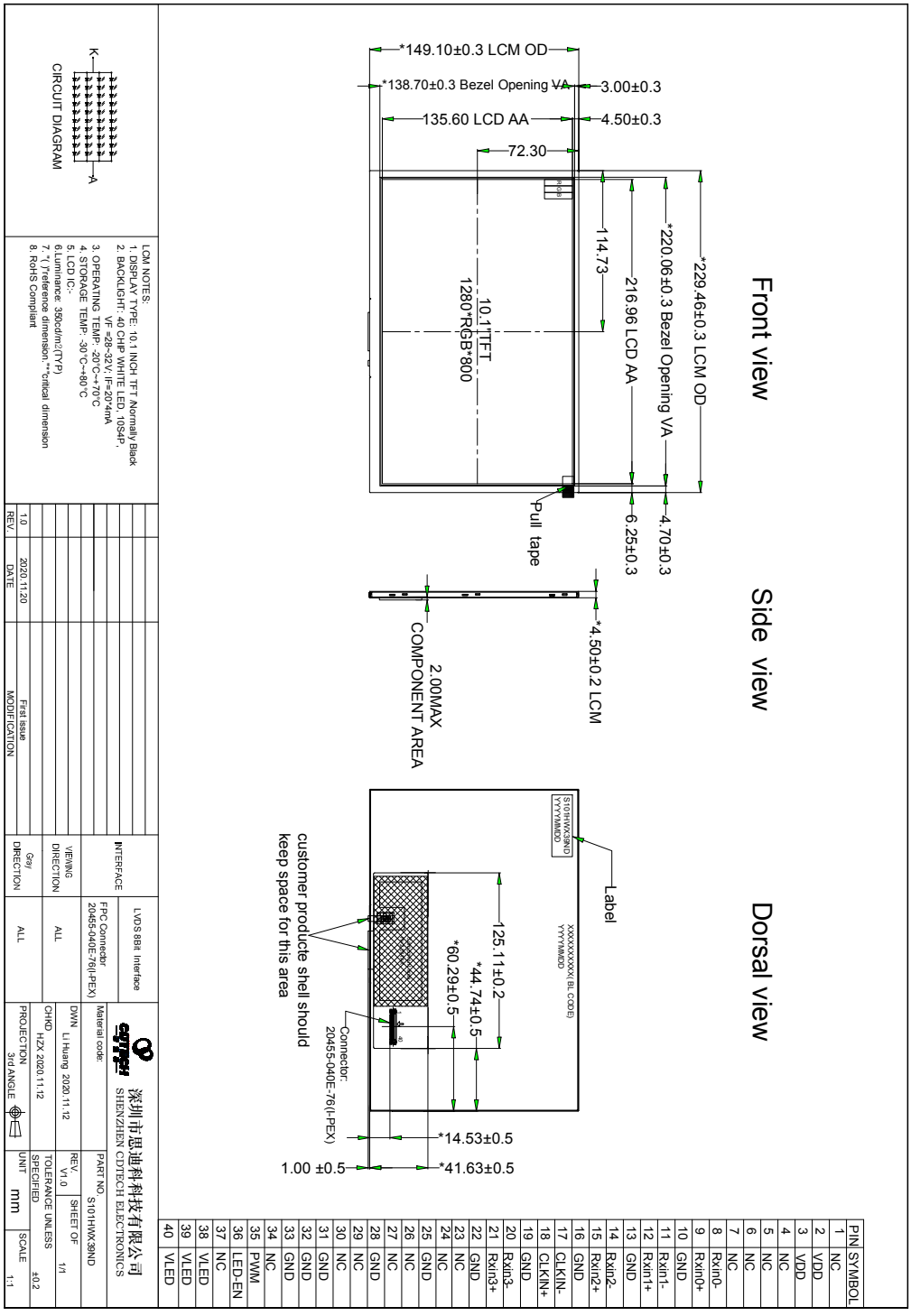
Note 7: Definition of Luminance :
Measure the luminance of white state at center point.

## 7 Environmental / Reliability Tests

| No | Test Item | Condition | Remarks |
|---|---|---|---|
| 1 | High Temperature Operation | Ts= +70℃, 96hrs | IEC60068-2-1:2007<br>GB2423. 2-2008 |
| 2 | Low Temperature Operation | Ta= -20℃, 96hrs | IEC60068-2-1:2007<br>GB2423.1-2008 |
| 3 | High Temperature Storage | Ta= +80℃,96hrs | IEC60068-2-1:2007<br>GB2423. 2-2008 |
| 4 | Low Temperature Storage | Ta= -30℃, 96hrs | IEC60068-2-1:2007<br>GB2423.1-2008 |
| 5 | High Temperature & Humidity Operation | Ta= +60℃, 90% RH max,96 hours | IIEC60068-2-78:2001<br>GB/T2423.3-2006 |
| 6 | Thermal Shock (Non-operation) | -30℃ 30 min ~ +80℃ 30 min<br>Change time: 5min, 20 Cycle | Start with cold temperature, end with high temperature<br>IEC60068-2-14:1984,<br>GB2423.22-2002 |
| 7 | ESD | C=150pF, R=330 Ω,<br>5 points/panel ,<br>Air:±8KV, 5 times<br>Contact: ±4KV, 5 times<br>(Environment: 15℃ ~ 35℃, 30% ~ 60%, 86Kpa ~ 106Kpa) | IEC61000-4-2:2001<br>GB/T17626.2-2006 |
| 8 | Vibration (Non-operation) | Frequency range: 10~55Hz,<br>Stroke: 1.5mm ,<br>Sweep: 10Hz~55Hz~10Hz<br>2 hours for each direction of X .Y. Z.<br>(6 hours for total) | IEC60068-2-6:1982<br>GB/T2423.10-1995 |
| 9 | Mechanical Shock (Non-operation) | Half Sine Wave<br>60G ,6ms,±X,±Y,±Z<br>3times for each direction | IEC60068-2-27:1987<br>GB/T2423.5—1995 |
| 10 | Package Drop Test | Height: 60 cm,<br>1 corner, 3 edges, 6 surfaces | IEC60068-2-32:1990<br>GB/T2423.8-1995 |

Notes:
1. The test result shall be evaluated after the sample has been left at room temperature and humidity for 2 hours without load. No condensation shall be accepted. The sample will not be accepted if appear these defects:
1).Air bubble in the LCD;
2).Seal leak
3).Non-display
4).missing segments
5).Glass crack
6).CR reduction >40%
7).IDD increase >100%
8).Brightness reduction >50%
9).Color coordinate tolerance >0.05
2.≤7.0 inch：The size of sample is 5pcs；
　＞7.0 inch：The size of sample is 2pcs；
3. One test sample must complete each test item;
4.In case of malfunction defect caused by ESD damage, if it would be recovered to normal state after resetting, it would be judge as a good part.
5.In the test of High Temperature Operation and High Temperature & Humidity Operation ,the operation temperature is the surface temperature of module.

# 8 Mechanical Drawing




| PIN | SYMBOL |
|---|---|
| 1 | NC |
| 2 | VDD |
| 3 | VDD |
| 4 | NC |
| 5 | NC |
| 6 | NC |
| 7 | NC |
| 8 | RxIn0- |
| 9 | RxIn0+ |
| 10 | GND |
| 11 | RxIn1- |
| 12 | RxIn1+ |
| 13 | GND |
| 14 | RxIn2- |
| 15 | RxIn2+ |
| 16 | GND |
| 17 | CLKIN- |
| 18 | CLKIN+ |
| 19 | GND |
| 20 | RxIn3- |
| 21 | RxIn3+ |
| 22 | GND |
| 23 | NC |
| 24 | NC |
| 25 | GND |
| 26 | NC |
| 27 | NC |
| 28 | GND |
| 29 | NC |
| 30 | NC |
| 31 | GND |
| 32 | GND |
| 33 | GND |
| 34 | NC |
| 35 | PWM |
| 36 | LED-EN |
| 37 | NC |
| 38 | VLED |
| 39 | VLED |
| 40 | VLED |

# 9 Packing

**Packing Method**

TBD

# 10. Precautions for Use of LCD modules

## 10.1 Handling Precautions

10.1.1. The display panel is made of glass. Do not subject it to a mechanical shock by dropping it from a high place, etc.

10.1.2. If the display panel is damaged and the liquid crystal substance inside it leaks out, be sure not to get any in your mouth, if the substance comes into contact with your skin or clothes, promptly wash it off using soap and water.

10.1.3. Do not apply excessive force to the display surface or the adjoining areas since this may cause the color tone to vary.

10.1.4. The polarizer covering the display surface of the LCD module is soft and easily scratched. Handle this polarizer carefully.

10.1.5. If the display surface is contaminated, breathe on the surface and gently wipe it with a soft dry cloth. If still not completely clear, moisten cloth with one of the following solvents:

- Isopropyl alcohol
- Ethyl alcohol

Solvents other than those mentioned above may damage the polarizer. Especially, do not use the following:

- Water
- Ketene

10.1.6. Do not attempt to disassemble the LCD Module.

10.1.7. If the logic circuit power is off, do not apply the input signals.

10.1.8. To prevent destruction of the elements by static electricity, be careful to maintain an optimum work environment.

10.1.8.1. Be sure to ground the body when handling the LCD Modules.

10.1.8.2. Tools required for assembly, such as soldering irons, must be properly ground.

10.1.8.3. To reduce the amount of static electricity generated, do not conduct assembly and other work under dry conditions.

10.1.8.4. The LCD 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.

## 10.2 Storage Precautions

10.2.1. When storing the LCD modules, avoid exposure to direct sunlight or to the light of fluorescent lamps.

10.2.2. The LCD modules should be stored under the storage temperature range If the LCD

modules will be stored for a long time, the recommend condition is:
Temperature : 0℃ ～ 40℃ Relatively humidity: ≤80%
10.2.3. The LCD modules should be stored in the room without acid, alkali and harmful gas.

## 10.3 Transportation Precautions

The LCD modules should be no falling and violent shocking during transportation, and also should avoid excessive press, water, damp and sunshine.