



WINSTAR Display Co.,Ltd.
華凌光電股份有限公司



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華凌光電股份有限公司



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SPECIFICATION

CUSTOMER : _____

MODULE NO.: WF101LSYAPLNGO#

| | |
|---|--|
| <p style="text-align: center;">APPROVED BY:</p> <p style="text-align: center;">(FOR CUSTOMER USE ONLY)</p> | <p>PCB VERSION: _____</p> <p>DATA: _____</p> |
|---|--|

| SALES BY | APPROVED BY | CHECKED BY | PREPARED BY |
|--------------------------------|-------------|------------|-------------|
| | | | 葉虹蘭 |
| ISSUED DATE: 2022/01/27 | | | |

TFT Display Inspection Specification: <https://www.winstar.com.tw/technology/download.html>

Precaution in use of TFT module: <https://www.winstar.com.tw/technology/download/declaration.html>

MODLE NO :

| RECORDS OF REVISION | | | DOC. FIRST ISSUE |
|---------------------|------------|------------------|---|
| VERSION | DATE | REVISED PAGE NO. | SUMMARY |
| 0 | 2021/11/09 | | First issue |
| A | 2021/12/02 | | Add Backlight Driving Part Modify General Specifications & Current Consumption |
| B | 2022/01/27 | | Modify CN |

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1.Module Classification Information

W F 101 L S Y A P L N G 0 #
 ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪ ⑫ ⑬

| | | | | | | | | | | | | |
|---|---|---|---|---------|---|---|--|------------------------------------|---------------|--------------------------------|---|---------|
| ① | Brand : WINSTAR DISPLAY CORPORATION | | | | | | | | | | | |
| ② | Display Type : F→TFT Type, J→Custom TFT | | | | | | | | | | | |
| ③ | Display Size : 10.1” TFT | | | | | | | | | | | |
| ④ | Model serials no. | | | | | | | | | | | |
| ⑤ | Backlight Type : | F→CCFL, White S→LED, High Light White | | | | | T→LED, White Z→Nichia LED, White | | | | | |
| ⑥ | LCD Polarize Type/ Temperature range/ Gray Scale Inversion Direction | A→Transmissive, N.T, IPS TFT C→Transmissive, N. T, 6:00 ; F→Transmissive, N.T,12:00 ; I→Transmissive, W. T, 6:00 K→Transflective, W.T,12:00 L→Transmissive, W.T,12:00 N→Transmissive, Super W.T, 6:00 | | | | | Q→Transmissive, Super W.T, 12:00 R→Transmissive, Super W.T, O-TFT V→Transmissive, Super W.T, VA TFT W→Transmissive, Super W.T, IPS TFT X→Transmissive, W.T, VA TFT Y→Transmissive, W.T, IPS TFT Z→Transmissive, W.T, O-TFT | | | | | |
| ⑦ | A : TFT LCD B : TFT+SCREW HOLES+CONTROL BOARD C : TFT+ SCREW HOLES +A/D BOARD D : TFT+ SCREW HOLES +A/D BOARD+CONTROL BOARD E : TFT+ SCREW HOLES +POWER BOARD | | | | | F : TFT+CONTROL BOARD G : TFT+ SCREW HOLES H : TFT+D/V BOARD I : TFT+ SCREW HOLES +D/V BOARD J : TFT+POWER BD | | | | | | |
| ⑧ | Resolution: | | | | | | | | | | | |
| | A | 128160 | B | 320234 | C | 320240 | D | 480234 | E | 480272 | F | 640480 |
| | G | 800480 | H | 1024600 | I | 320480 | J | 240320 | K | 800600 | L | 240400 |
| | M | 1024768 | N | 128128 | P | 1280800 | Q | 480800 | R | 640320 | S | 480128 |
| | T | 800320 | U | 8001280 | V | 176220 | W | 1280398 | X | 1024250 | Y | 1920720 |
| | Z | 800200 | 2 | 1024324 | 3 | 7201280 | 4 | 19201200 | 5 | 1366768 | 6 | 1280320 |
| ⑨ | D: Digital L : LVDS M:MIPI | | | | | | | | | | | |
| ⑩ | Interface: | | | | | | | | | | | |
| | N | Without control board | | | A | 8Bit | | B | 16Bit | | H | HDMI |
| | I | I2C Interface | | | R | RS232 | | S | SPI Interface | | U | USB |
| ⑪ | TS: | | | | | | | | | | | |
| | N | Without TS | | | T | Resistive touch panel | | | C | Capacitive touch panel (G-F-F) | | |
| | G | Capacitive touch panel (G-G) | | | | | C1 | Capacitive touch panel (G-F-F)+OCA | | | | |
| | C2 | Capacitive touch panel (G-F-F)+OCR | | | | | G1 | Capacitive touch panel (G-G)+OCA | | | | |
| | G2 | Capacitive touch panel (G-G)+OCR | | | | | B | CTP+GG+USB | | | | |
| ⑫ | Version: X:Raspberry pi | | | | | | | | | | | |
| ⑬ | Special Code #:Fit in with ROHS directive regulations | | | | | | | | | | | |

2.Summary

TFT 10.1" is a color active matrix thin film transistor (TFT) liquid crystal display (LCD) that uses amorphous silicon TFT as a switching device. This model is composed of a TFT LCD panel, a driving circuit and a back light system. This TFT LCD has a 10.1 inch diagonally measured active display area with HD (1280 horizontal by 800 vertical pixel) resolution.

3. General Specifications

| Item | Dimension | Unit |
|-------------------|-------------------------------|-------------|
| Screen Diagonal | 10.1 | inch |
| Number of Pixels | 1280 x 3(R GB) x 800 | dots |
| Module dimension | 257.96 x 168.6 x 9.48 | mm |
| Active area | 216.96 (H) x 135.6(V) | mm |
| Pixel pitch | 0.1695 × 0.1695 | mm |
| Display Mode | Normally Black , Transmissive | |
| Viewing Angle | 80/80/80/80 | |
| Pixel Arrangement | R.G.B. Vertical Stripe | |
| TFT Drive IC | EK79202B1 or Equivalent | |
| Backlight Type | LED, Normally White | |
| Aspect Ratio | 16:10 | |
| TFT Interface | LVDS | |
| CTP FW Version | 80 | |
| CTP IC | GT928 or equivalent | |
| CTP Interface | I2C | |
| CTP Resolution | 1280*800 | |
| With /Without TP | With CTP | |
| Surface | Glare | |

*Color tone slight changed by temperature and driving voltage.

4. Absolute Maximum Ratings

| Item | Symbol | Min | Typ | Max | Unit |
|-----------------------|---------------|------------|------------|------------|-------------|
| Operating Temperature | TOP | -20 | — | +70 | °C |
| Storage Temperature | TST | -30 | — | +80 | °C |

Note: Device is subject to be damaged permanently if stresses beyond those absolute maximum ratings listed above

1. Temp. $\leq 60^{\circ}\text{C}$, 90% RH MAX. Temp. $> 60^{\circ}\text{C}$, Absolute humidity shall be less than 90% RH at 60°C

5. Electrical Characteristics

5.1. Typical Operation Conditions (Note 1)

| Item | Symbol | Values | | | Unit | Remark |
|--------------------------------|--------|--------|------|------|------|--------|
| | | Min. | Typ. | MAX. | | |
| Power voltage | VCC | 3.0 | 3.3 | 3.5 | V | |
| | VGH | | 18 | | V | Note 1 |
| | VGL | | -10 | | V | Note 2 |
| | VSP | | 5.5 | | V | Note 3 |
| | VSN | | -5.5 | | V | Note 3 |
| Supply Voltage For Touch Logic | VDDT | 2.8 | — | 3.3 | V | |

Note:

1. VGH is TFT Gate operating Voltage.

2. VGL is TFT Gate operating Voltage.

3. VSP / VSN does not require an external power supply voltage, it is provided by IC on the PCB

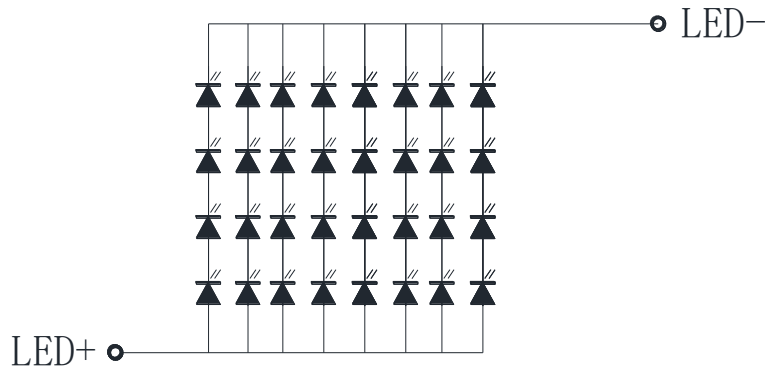
5.2. Current Consumption

| Item | Symbol | Values | | | Unit | Remark |
|--------------------|--------|--------|------|------|------|------------|
| | | Min. | Typ. | MAX. | | |
| Current for Driver | IGH | — | 7.7 | — | mA | VGH = 18V |
| | IGL | — | 7.7 | — | mA | VGL = -10V |
| | IVCC | — | 85 | 130 | mA | — |

5.3. Backlight Characteristics

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Remark |
|---------------------------------------|--------|-------|------|------|------|--------|
| Supply voltage of white LED backlight | VL | 10.8 | 12.8 | 13.6 | V | Note 1 |
| Current for LED backlight | IL | — | 480 | — | mA | |
| LED life time | - | 50000 | - | - | Hr | Note 1 |

Note 1 : There are 1 Groups LED



Note 2 : $T_a = 25\text{ }^\circ\text{C}$

Note 3 : Brightness to be decreased to 50% of the initial value

Note 4 : The single LED lamp case

6.AC Characteristics

6.1. LVDS mode AC electrical characteristics

| Parameter | Symbol | Spec. | | | Unit | Condition |
|------------------------|-------------|-------|---------------------|------|------|---|
| | | Min. | Typ. | Max. | | |
| Clock frequency | R_{xFCLK} | 30 | - | TBD | MHz | Refer to input timing table for each display resolution |
| Input data skew margin | T_{RSKM} | 500 | ┆ | - | ps | $ VID = 200mV$ $RxVCM = 1.2V$ $RxFCLK = 81MHz$ |
| Clock high time | T_{LVCH} | - | $4/(7 * R_{xFCLK})$ | - | ns | |
| Clock low time | T_{LVCL} | - | $3/(7 * R_{xFCLK})$ | - | ns | |
| PLL wake-up time | T_{enPLL} | - | - | 150 | us | |

Table 1: LVDS mode AC electrical characteristics

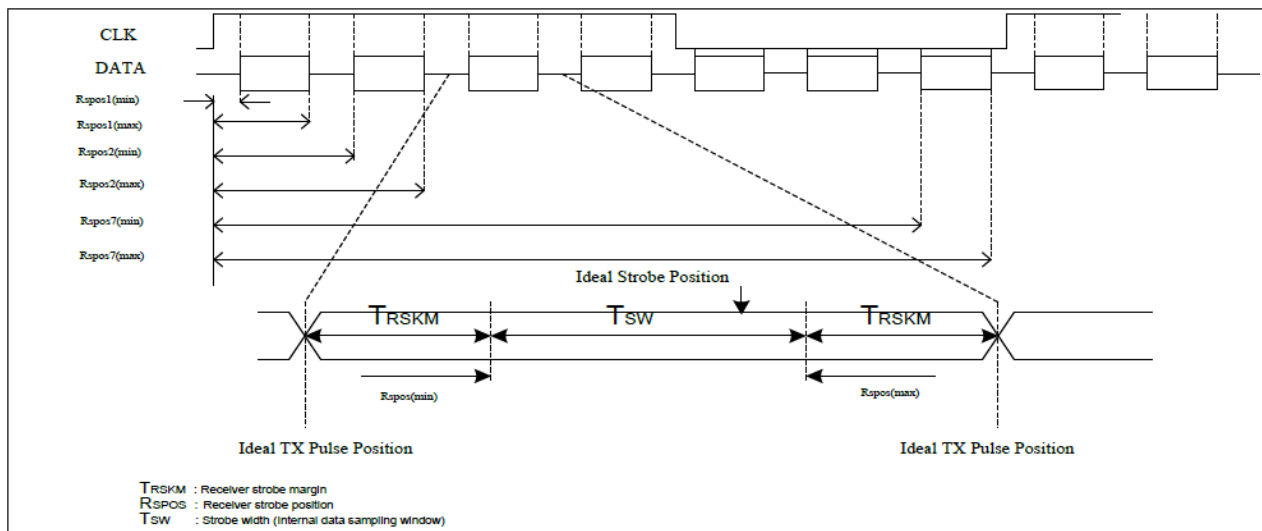
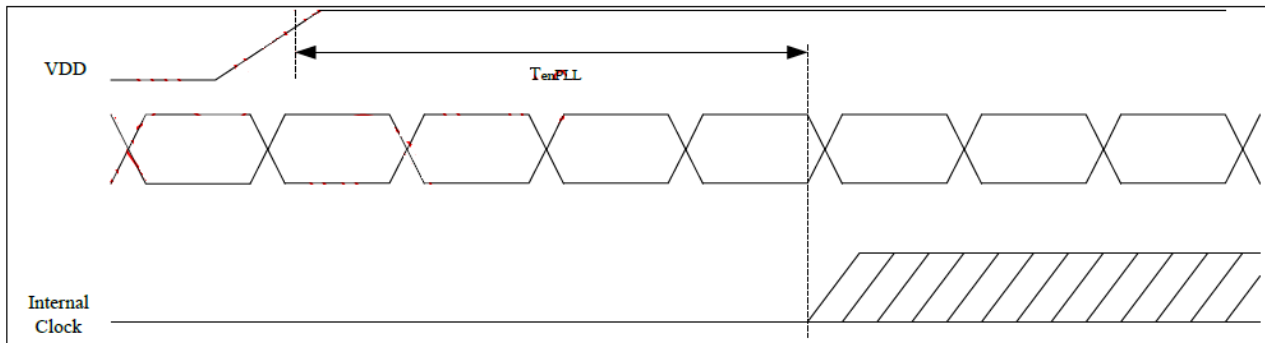
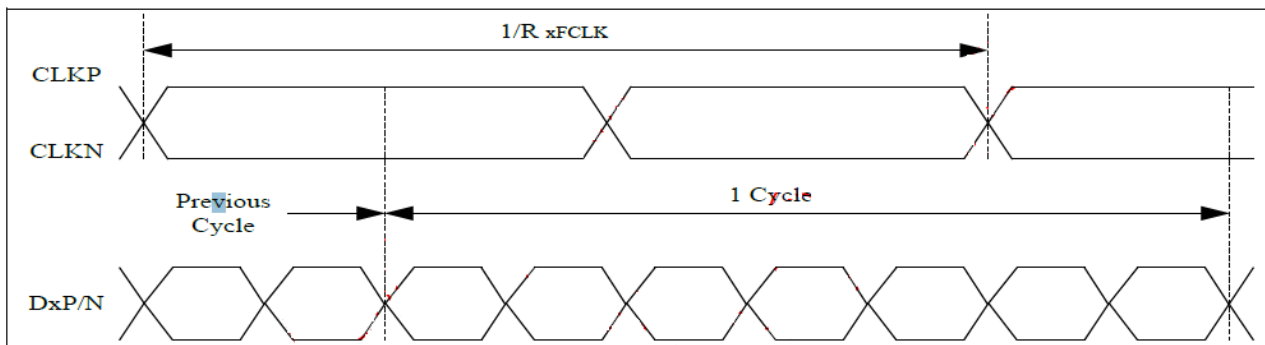
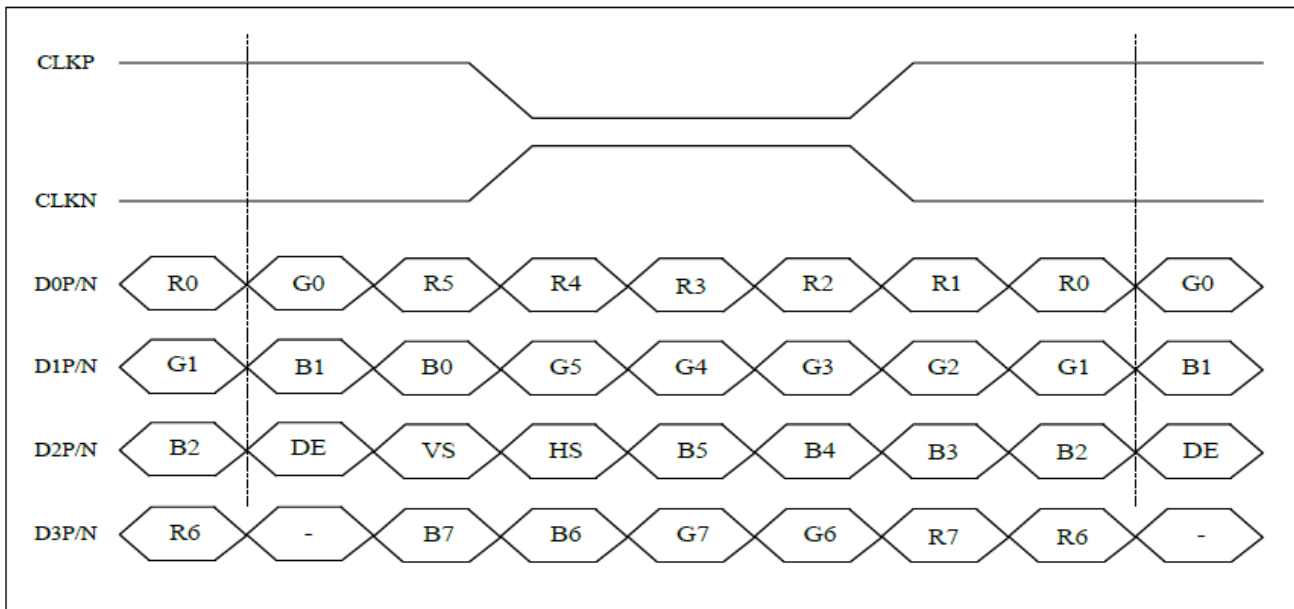


Figure 1: LVDS figure

7.LVDS Input Timing Table

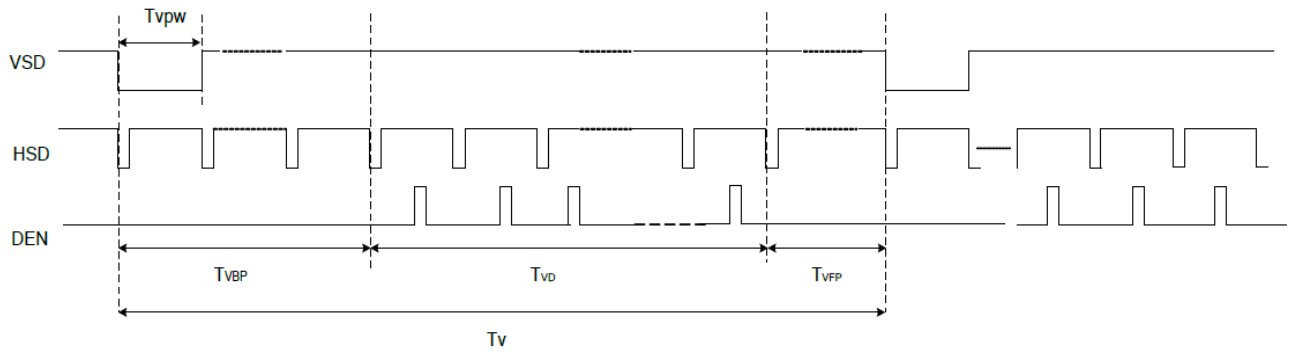
For 1280RGBx800 timing table

| Parameter | Symbol | Value | | | Unit |
|--|-------------------|-------|------|------|------|
| | | Min. | Typ. | Max. | |
| DCLK frequency @Frame rate=60Hz (LVDS) | F_{DCLK} | 69.7 | 75 | 80.9 | MHz |
| Horizontal display area | T_{HD} | 1280 | | | DCLK |
| HSYNC period time | T_H | 1380 | 1440 | 1500 | DCLK |
| HSYNC blanking | $T_{HBP}+T_{HFP}$ | 100 | 160 | 220 | DCLK |
| Vertical display area | T_{VD} | 800 | | | H |
| VSYNC period time | T_V | 842 | 838 | 872 | H |
| VSYNC blanking | $T_{VBP}+T_{VFP}$ | 24 | 38 | 72 | H |

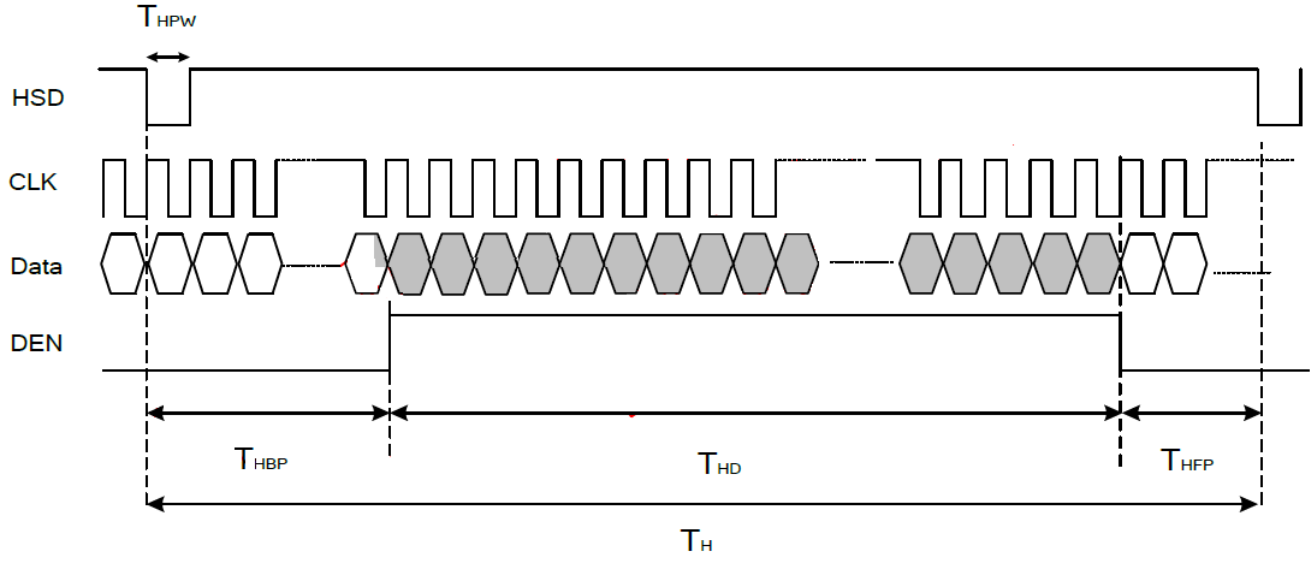


8-bit LVDS input

Vertical timing



Horizontal timing



8. Power Sequence

8.1. Power Generation

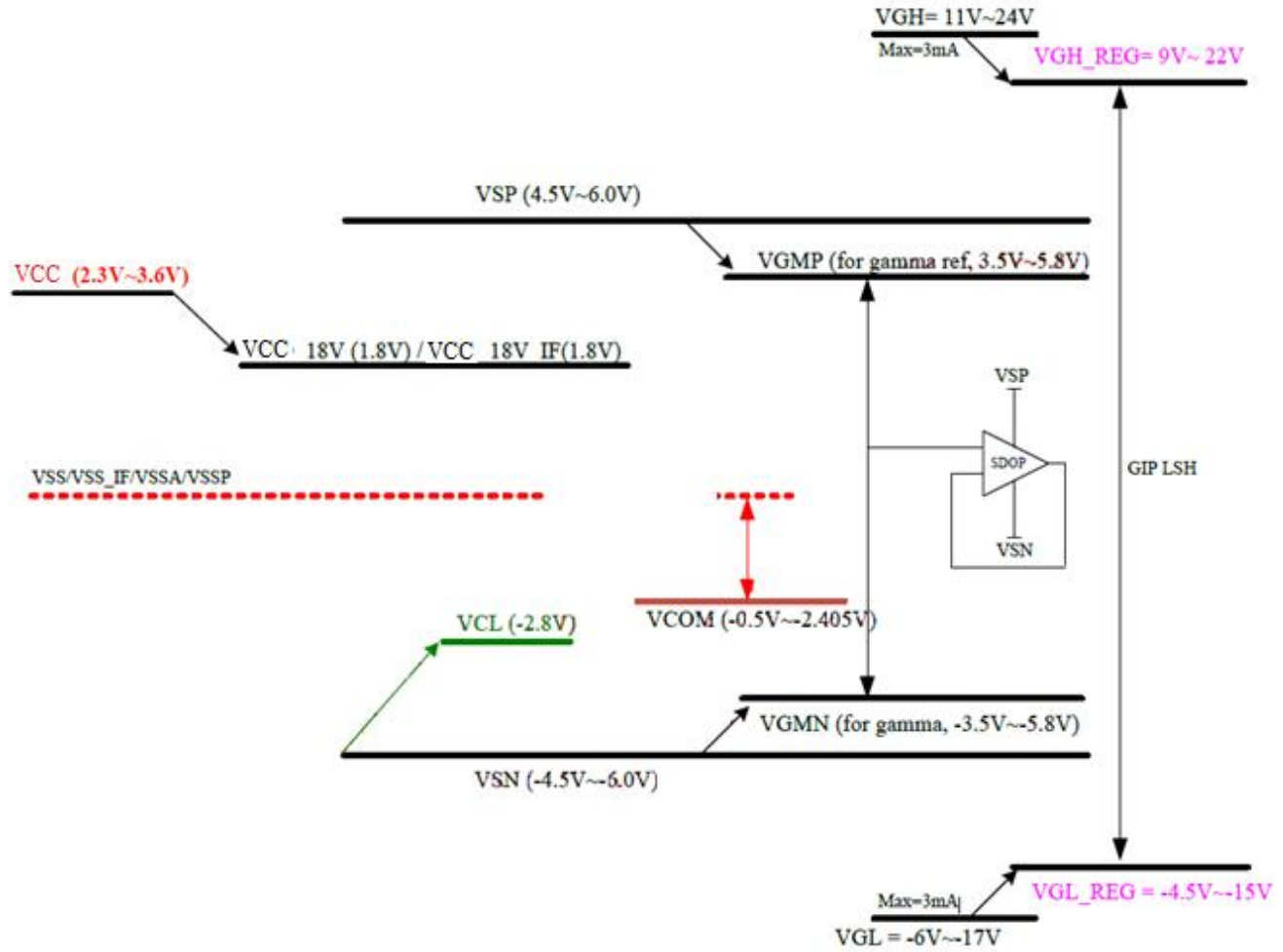
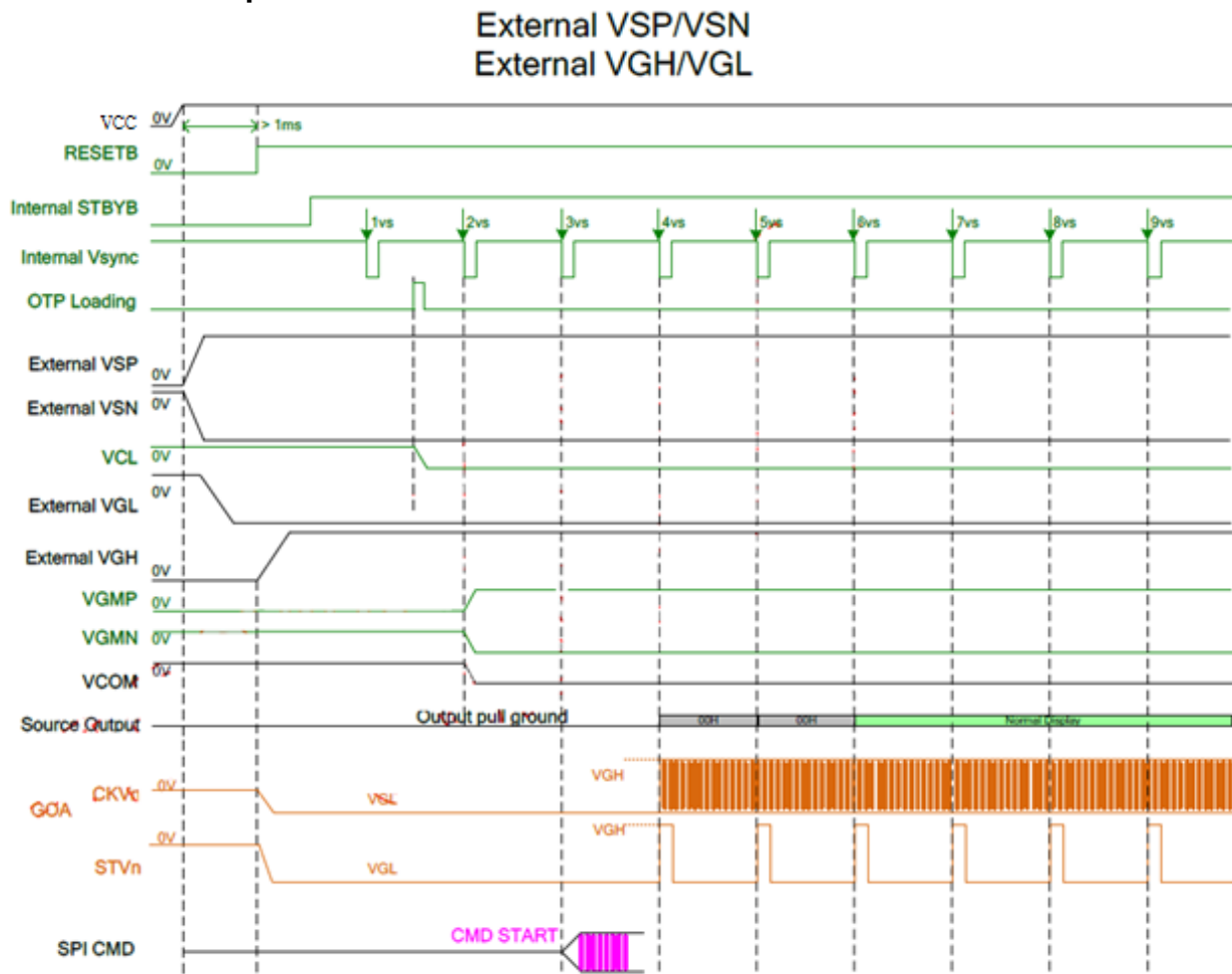
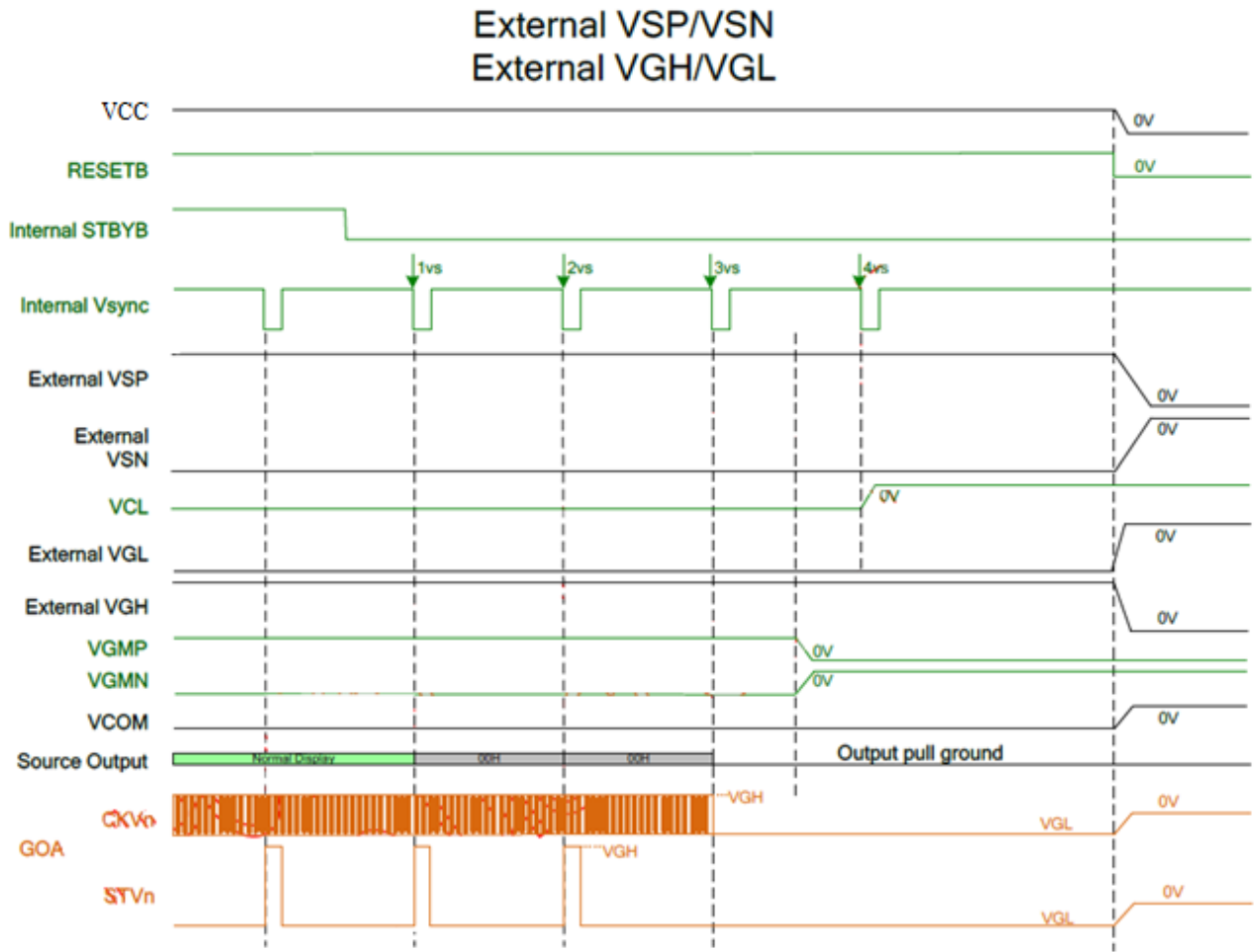


Figure 1 power generation

8.2. Power on sequence



8.3. Power off sequence



9. Optical Characteristics

| Item | Symbol | Condition. | Min | Typ. | Max. | Unit | Remark | |
|--------------------|--------|-----------------------------------|-----------------------------------|-------|-------|-------------------|-------------------|------------|
| Response time | Tr+ Tf | $\theta=0^\circ$ 、 $\Phi=0^\circ$ | - | 25 | 35 | .ms | Note 3 | |
| Contrast ratio | CR | At optimized viewing angle | 800 | 1000 | - | - | Note 4 | |
| Color Chromaticity | White | Wx | $\theta=0^\circ$ 、 $\Phi=0^\circ$ | 0.272 | 0.322 | 0.372 | - | Note 2,6,7 |
| | | Wy | | 0.294 | 0.344 | 0.394 | - | |
| Viewing angle | Hor. | Θ_R | $CR \geq 10$ | 70 | 80 | - | Deg. | Note 1 |
| | | Θ_L | | 70 | 80 | - | | |
| | Ver. | Φ_T | | 70 | 80 | - | | |
| | | Φ_B | | 70 | 80 | - | | |
| Brightness | - | - | 800 | 900 | - | cd/m ² | Center of display | |
| Uniformity | (U) | - | 70 | - | - | % | Note 5 | |

Ta=25±2°C

Note 1: Definition of viewing angle range

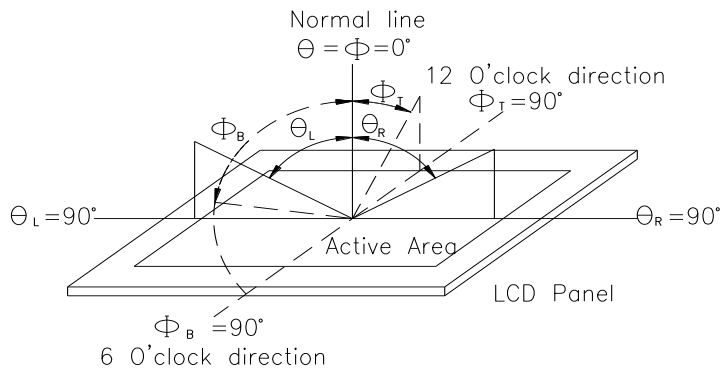


Fig. 9.1. Definition of viewing angle

Note 2: Test equipment setup:

After stabilizing and leaving the panel alone at a driven temperature for 10 minutes, the measurement should be executed. Measurement should be executed in a stable, windless, and dark room. Optical specifications are measured by Topcon BM-7 or BM-5 luminance meter 1.0° field of view at a distance of 50cm and normal direction.

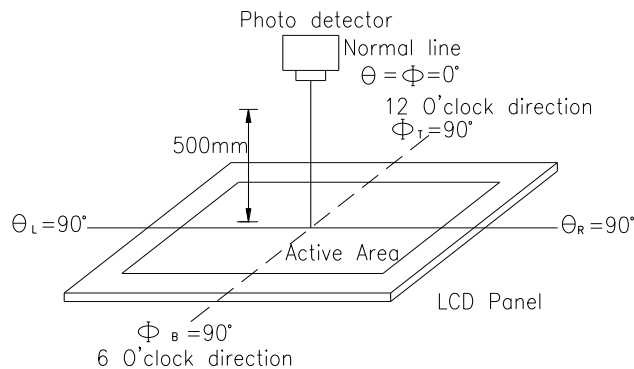
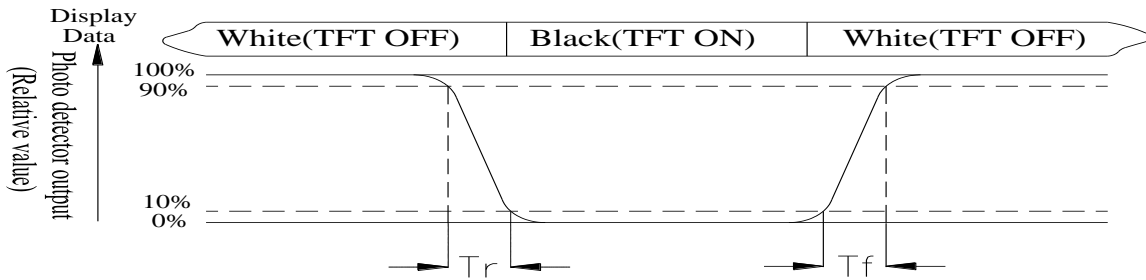


Fig. 9.2. Optical measurement system setup

Note 3: Definition of Response time:

The response time is defined as the LCD optical switching time interval between "White" state and "Black" state. Rise time, T_r , is the time between photo detector output intensity changed from 90% to 10%. And fall time, T_f , is the time between photo detector output intensity changed from 10% to 90%



Note 4: Definition of contrast ratio:

The contrast ratio is defined as the following expression.

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

Note 5: Definition of Luminance Uniformity

Active area is divided into 9 measuring areas (reference the picture in below). Every measuring point is placed at the center of each measuring area.

$$\text{Luminance Uniformity (U)} = \text{Lmin/Lmax} \times 100\%$$

L = Active area length

W = Active area width

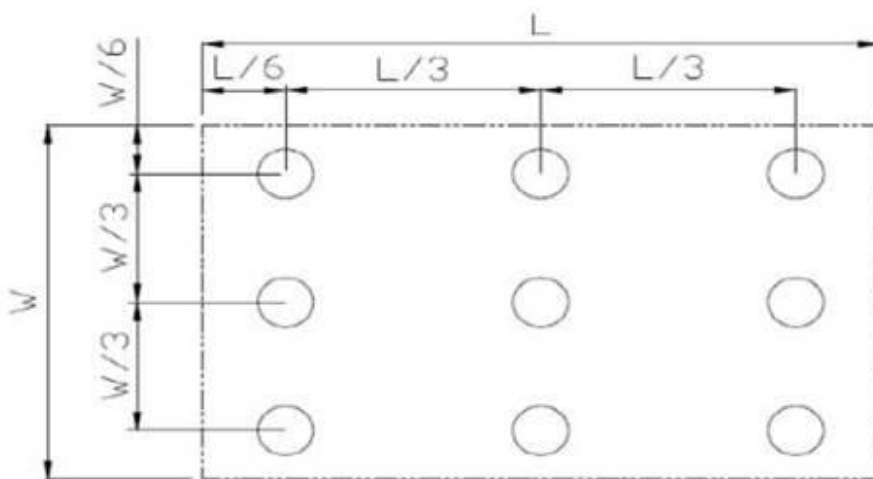


Fig9.3. Definition of uniformity

Note 6: Definition of color chromaticity (CIE 1931)

Color coordinates measured at the center point of LCD

Note 7: Measured at the center area of the panel when all the input terminals of LCD panel are electrically opened.

10.Interface

10.1. Interface Connector

A 40pin connector is used for the module electronics interface. The recommended model is F62240-H1210B manufactured by Vigorconn.

| Pin No. | Symbol | I/O | Function | Remark |
|---------|--------|-----|--------------------------------|-----------------------|
| 1 | NC | - | No connection | |
| 2 | VCC | P | Power Supply | |
| 3 | VCC | P | Power Supply | |
| 4 | NC | - | No connection | |
| 5 | NC | - | No connection | |
| 6 | NC | - | No connection | |
| 7 | GND | P | Ground | |
| 8 | Rxin0- | I | -LVDS Differential Data Input | R0-R5,G0 |
| 9 | Rxin0+ | I | +LVDS Differential Data Input | |
| 10 | GND | P | Ground | |
| 11 | Rxin1- | I | -LVDS Differential Data Input | G1G5,B0,B1 |
| 12 | Rxin1+ | I | +LVDS Differential Data Input | |
| 13 | GND | P | Ground | |
| 14 | Rxin2- | I | -LVDS Differential Data Input | B2-B5,HS,VS, DE |
| 15 | Rxin2+ | I | +LVDS Differential Data Input | |
| 16 | GND | P | Ground | |
| 17 | RxCLK- | I | -LVDS Differential Clock Input | LVDS CLK |
| 18 | RxCLK+ | I | +LVDS Differential Clock Input | |
| 19 | GND | P | Ground | |
| 20 | Rxin3- | I | -LVDS Differential Data Input | R6,R7,G6,G7, B6,B7 |
| 21 | Rxin3+ | I | +LVDS Differential Data Input | |
| 22 | GND | P | Ground | |
| 23 | NC | - | No connection | |
| 24 | NC | - | No connection | |
| 25 | GND | P | Ground | |
| 26 | NC | - | No connection | |
| 27 | NC | - | No connection | |
| 28 | NC | - | No connection | |
| 29 | NC | - | No connection | |
| 30 | GND | P | Ground | |

| | | | | |
|----|-----|---|------------------|--|
| 31 | NC | - | No connection | |
| 32 | NC | - | No connection | |
| 33 | NC | - | No connection | |
| 34 | NC | - | No connection | |
| 35 | VGL | P | Gate OFF Voltage | |
| 36 | NC | - | No connection | |
| 37 | NC | - | No connection | |
| 38 | VGH | P | Gate ON Voltage | |
| 39 | NC | - | No connection | |
| 40 | NC | - | No connection | |

I: input, O: output, P: Power

10.2. CTP PIN Definition

| Pin | Symbol | Function | Remark |
|-----|--------|--------------------------------|--------|
| 1 | SDA | I2C data input and output | |
| 2 | SCL | I2C clock input | |
| 3 | RST | External Reset, Low is active | |
| 4 | INT | External interrupt to the host | |
| 5 | VDDT | Power Supply : +3.3V | |
| 6 | VSS | Ground for analog circuit | |

10.3. Backlight Driving Part

| Pin No. | Symbol | Function |
|---------|--------|---------------------|
| 1 | LED+ | Red, LED_ Anode |
| 2 | LED- | Black, LED_ Cathode |

Note: The backlight interface connector is a model A3501Y-02(BH-Y) or equivalent

11. Reliability

Content of Reliability Test (Wide temperature, -20°C~70°C)

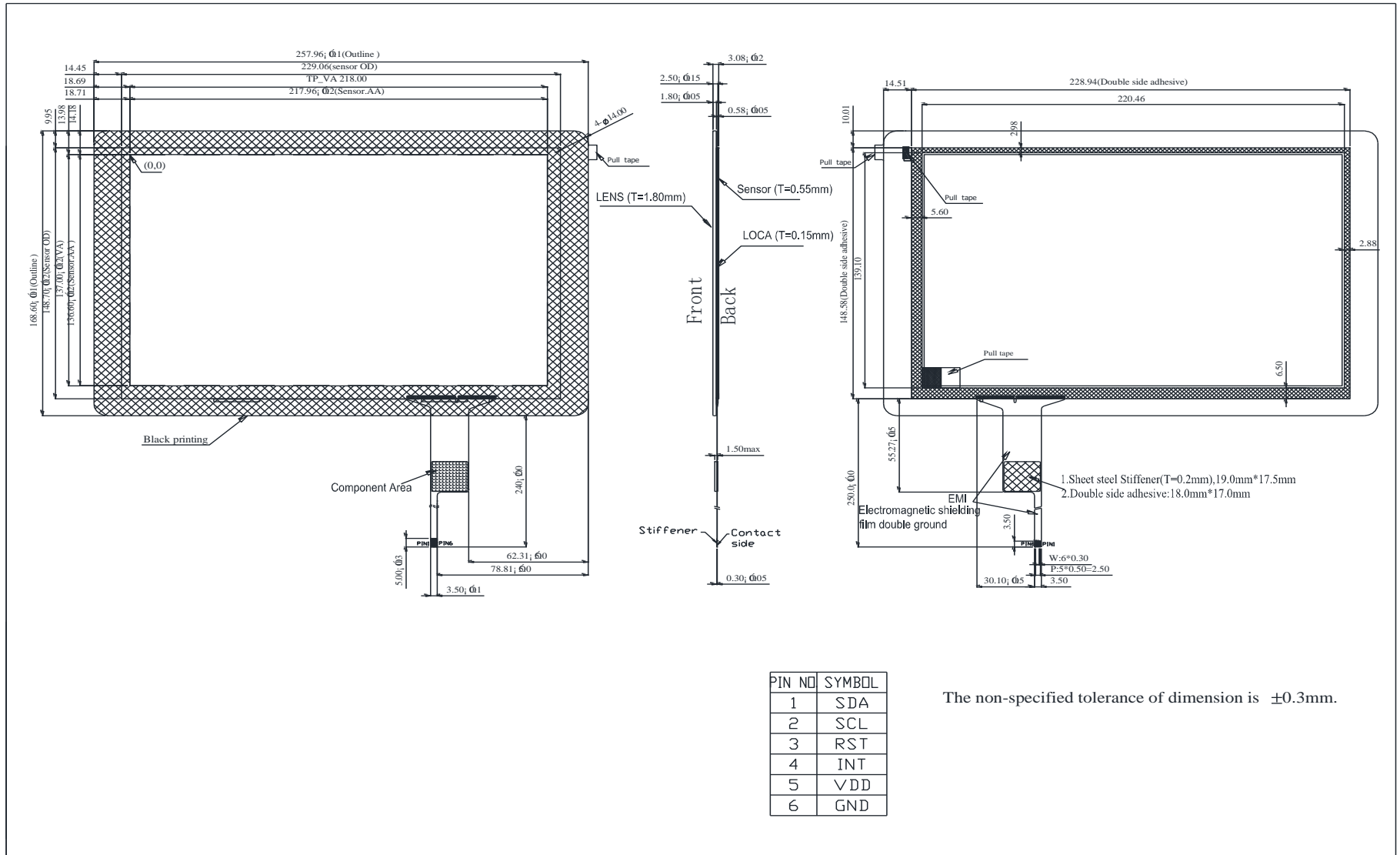
| Environmental Test | | | |
|---|--|--|------|
| Test Item | Content of Test | Test Condition | Note |
| High Temperature storage | Endurance test applying the high storage temperature for a long time. | 80°C 200hrs | 2 |
| Low Temperature storage | Endurance test applying the low storage temperature for a long time. | -30°C 200hrs | 1,2 |
| High Temperature Operation | Endurance test applying the electric stress (Voltage & Current) and the thermal stress to the element for a long time. | 70°C 200hrs | — |
| Low Temperature Operation | Endurance test applying the electric stress under low temperature for a long time. | -20°C 200hrs | 1 |
| High Temperature/ Humidity Operation | The module should be allowed to stand at 60°C,90%RH max | 60°C,90%RH 96hrs | 1,2 |
| Thermal shock resistance | The sample should be allowed stand the following 10 cycles of operation <div style="text-align: center;"> <p style="margin: 0;">-20°C 25°C 70°C</p> <p style="margin: 0;">30min 5min 30min</p> <p style="margin: 0;">1 cycle</p> </div> | -20°C/70°C 10 cycles | — |
| Vibration test | Endurance test applying the vibration during transportation and using. | Total fixed amplitude : 1.5mm Vibration Frequency : 10~55Hz One cycle 60 seconds to 3 directions of X,Y,Z for Each 15 minutes | 3 |
| Static electricity test | Endurance test applying the electric stress to the terminal. | VS=±600V(contact), ±800v(air), RS=330Ω CS=150pF 10 times | — |

Note1: No dew condensation to be observed.

Note2: The function test shall be conducted after 4 hours storage at the normal Temperature and humidity after remove from the test chamber.

Note3: The packing have to including into the vibration testing.

12.Touch Panel Information



| PIN NO | SYMBOL |
|--------|--------|
| 1 | SDA |
| 2 | SCL |
| 3 | RST |
| 4 | INT |
| 5 | VDD |
| 6 | GND |

The non-specified tolerance of dimension is $\pm 0.3\text{mm}$.

12.1. Timing for Read Operation

First, set address pointer based on the aforesaid Write Operation timing sequence. Then, resend

Start condition to perform Read addressing and read data in the registers.



Address_R: Slave address with Read control bit.

NACK: Host issues NACK after reading the last byte.

After setting Read addresses, the host can read one or more than one byte at a time.

GT927/GT928/GT9110 will automatically increase the address pointer and send subsequent data in sequence.

The Stop condition (the first E signal as shown in the above diagram) after setting the address pointer is optional. However, the repeated Start condition has to be sent.

12.2. Coordinate registers

| Addr | Access | bit7 | bit6 | bit5 | bit4 | bit3 | bit2 | bit1 | bit0 |
|--------|--------|-------------------------------------|------|------|------|------|------|------|------|
| 0x8140 | R | Product ID(first Byte, ASCII) | | | | | | | |
| 0x8141 | R | Product ID(second Byte, ASCII) | | | | | | | |
| 0x8142 | R | Product ID(third Byte, ASCII) | | | | | | | |
| 0x8143 | R | Product ID(forth Byte, ASCII) | | | | | | | |
| 0x8144 | R | Firmware version(HEX.low byte) | | | | | | | |
| 0x8145 | R | Firmware version (HEX.high byte) | | | | | | | |
| 0x8146 | R | x coordinate resolution (low byte) | | | | | | | |
| 0x8147 | R | x coordinate resolution (high byte) | | | | | | | |
| 0x8148 | R | y coordinate resolution (low byte) | | | | | | | |
| 0x8149 | R | y coordinate resolution (high byte) | | | | | | | |

| | | | | | | |
|--------|-----|---|--------------|----------|---------|------------------------|
| 0x814A | R | Vendor_id(ID of the current module) | | | | |
| 0x814B | R | Reserved | | | | |
| 0x814C | R | Reserved | | | | |
| 0x814D | R | Reserved | | | | |
| 0x814E | R/W | buffer status | large detect | Reserved | HaveKey | number of touch points |
| 0x814F | R | track id as 32 indicates HotKnot proximity detection signal | | | | |
| 0x8150 | R | PxyOk | Reserved | | | |
| 0x8151 | R | PxyOk | Reserved | | | |
| 0x8152 | R | Reserved | | | | |
| 0x8153 | R | Reserved | | | | |
| 0x8154 | R | Reserved | | | | |
| 0x8155 | R | Reserved | | | | |
| 0x8156 | R | Reserved | | | | |
| 0x8157 | R | pen_sta | Reserved | | | track id |
| 0x8158 | R | point 1 x coordinate (low byte) | | | | |
| 0x8159 | R | point 1 x coordinate (high byte) | | | | |
| 0x815A | R | point 1 y coordinate (low byte) | | | | |
| 0x815B | R | point 1 y coordinate (high byte) | | | | |
| 0x815C | R | Point 1 size (low byte) | | | | |
| 0x815D | R | point 1 size (high byte) | | | | |
| 0x815E | R | Reserved | | | | |
| 0x815F | R | track id | | | | |
| 0x8160 | R | point 2 x coordinate (low byte) | | | | |
| 0x8161 | R | point 2 x coordinate (high byte) | | | | |
| 0x8162 | R | point 2 y coordinate (low byte) | | | | |
| 0x8163 | R | point 2 y coordinate (high byte) | | | | |
| 0x8164 | R | point 2 size (low byte) | | | | |
| 0x8165 | R | point 2 size (high byte) | | | | |
| 0x8166 | R | Reserved | | | | |
| 0x8167 | R | track id | | | | |
| 0x8168 | R | point 3 x coordinate (low byte) | | | | |
| 0x8169 | R | point 3 x coordinate (high byte) | | | | |
| 0x816A | R | point 3 y coordinate (low byte) | | | | |
| 0x816B | R | point 3 y coordinate (high byte) | | | | |
| 0x816C | R | point 3 size (low byte) | | | | |
| 0x816D | R | point 3 size (high byte) | | | | |
| 0x816F | R | track id | | | | |
| 0x8170 | R | point 4 x coordinate (low byte) | | | | |
| 0x8171 | R | point 4 x coordinate (high byte) | | | | |
| 0x8172 | R | point 4 y coordinate (low byte) | | | | |

| | | |
|--------|---|----------------------------------|
| 0x8173 | R | point 4 y coordinate (high byte) |
| 0x8174 | R | point 4 size (low byte) |
| 0x8175 | R | point 4 size (high byte) |
| 0x8176 | R | Reserved |
| 0x8177 | R | track id |
| 0x8178 | R | point 5 x coordinate (low byte) |
| 0x8179 | R | point 5 x coordinate (high byte) |
| 0x817A | R | point 5 y coordinate (low byte) |
| 0x817B | R | point 5 y coordinate (high byte) |
| 0x817C | R | point 5 size (low byte) |
| 0x817D | R | point 5 size (high byte) |
| 0x817E | R | Reserved |
| 0x817F | R | track id |
| 0x8180 | R | point 6 x coordinate (low byte) |
| 0x8181 | R | point 6 x coordinate (high byte) |
| 0x8182 | R | point 6 y coordinate (low byte) |
| 0x8183 | R | point 6 y coordinate (high byte) |
| 0x8184 | R | point 6 size (low byte) |
| 0x8185 | R | point 6 size (high byte) |
| 0x8186 | R | Reserved |
| 0x8187 | R | track id |
| 0x8188 | R | point 7 x coordinate (low byte) |
| 0x8189 | R | point 7 x coordinate (high byte) |
| 0x818A | R | point 7 y coordinate (low byte) |
| 0x818B | R | point 7 y coordinate (high byte) |
| 0x818C | R | point 7 size (low byte) |
| 0x818D | R | point 7 size (high byte) |
| 0x818E | R | Reserved |
| 0x818F | R | track id |
| 0x8190 | R | point 8 x coordinate (low byte) |
| 0x8191 | R | point 8 x coordinate (high byte) |
| 0x8192 | R | point 8 y coordinate (low byte) |
| 0x8193 | R | point 8 y coordinate (high byte) |
| 0x8194 | R | point 8 size (low byte) |
| 0x8195 | R | point 8 size (high byte) |
| 0x8196 | R | Reserved |
| 0x8197 | R | track id |
| 0x8198 | R | point 9 x coordinate (low byte) |
| 0x8199 | R | point 9 x coordinate (high byte) |
| 0x819A | R | point 9 y coordinate (low byte) |
| 0x819B | R | point 9 y coordinate (high byte) |

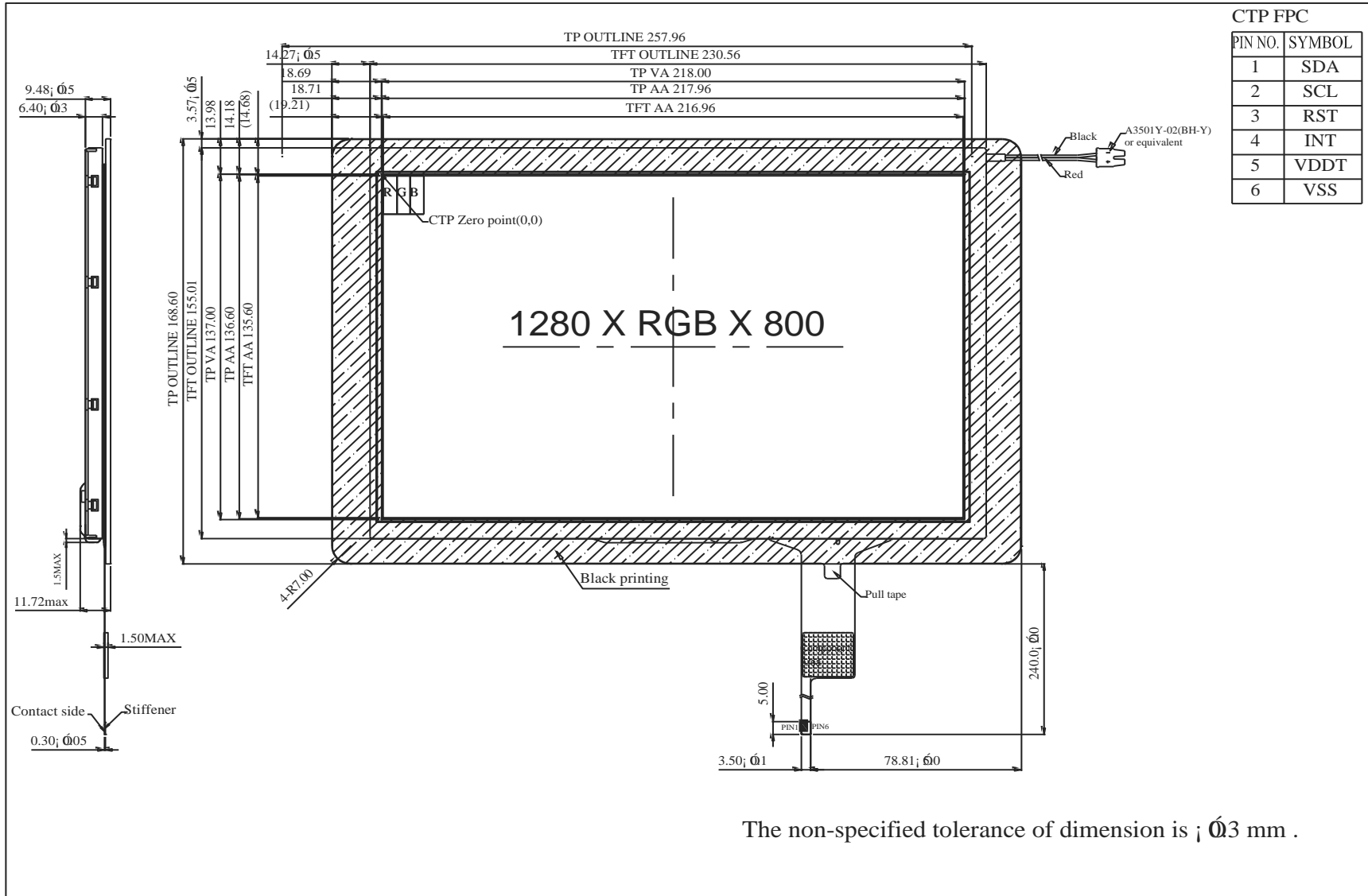
| | | |
|--------|---|-----------------------------------|
| 0x819C | R | point 9 size (low byte) |
| 0x819D | R | point 9 size (high byte) |
| 0x819E | R | Reserved |
| 0x819F | R | track id |
| 0x81A0 | R | point 10 x coordinate (low byte) |
| 0x81A1 | R | point 10 x coordinate (high byte) |
| 0x81A2 | R | point 10 y coordinate (low byte) |
| 0x81A3 | R | point 10 y coordinate (high byte) |
| 0x81A4 | R | point 10 size (low byte) |
| 0x81A5 | R | point 10 size (high byte) |
| 0x81A6 | R | Reserved |
| 0x81A7 | R | KeyValue |

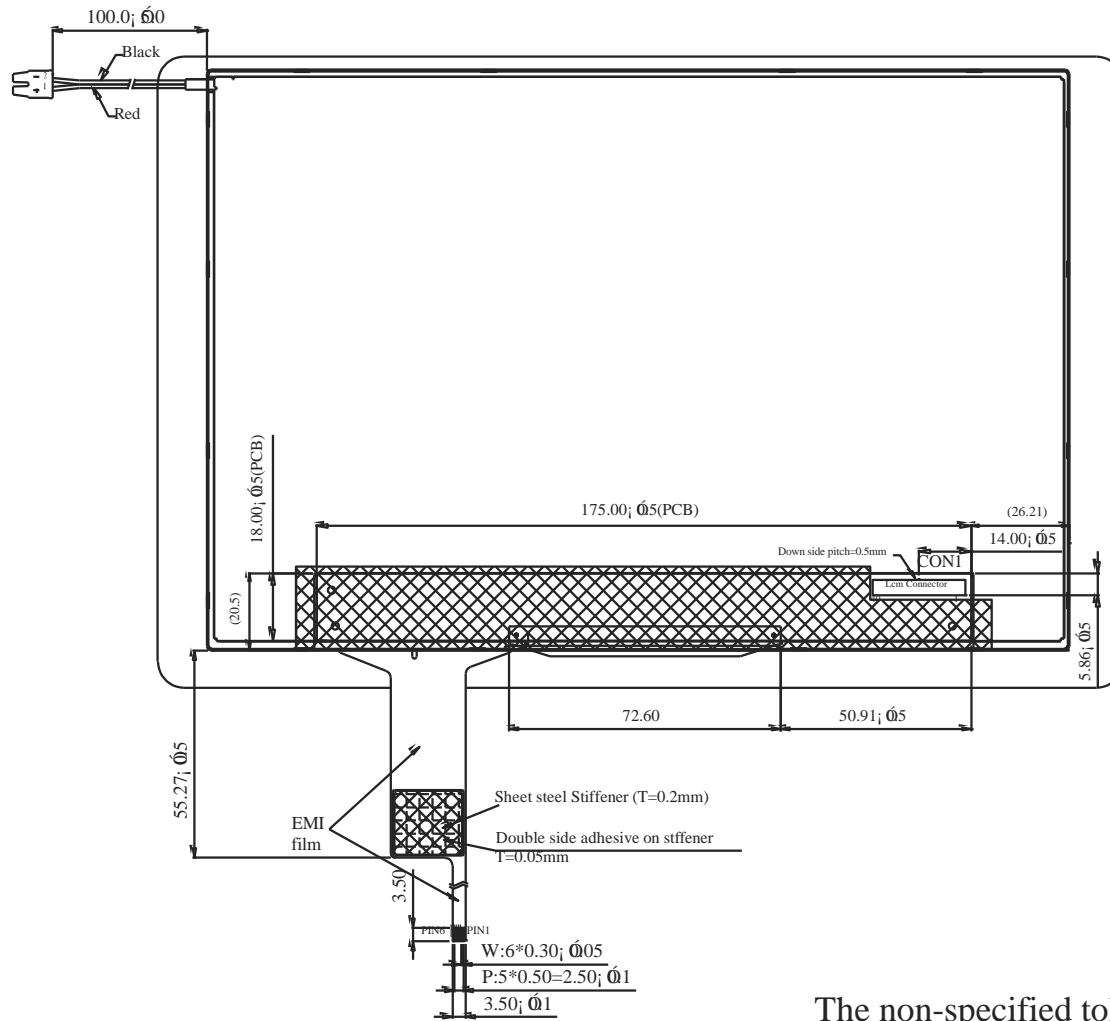
12.3. I2C protocol

3.3V ,400BPS ,pull high 2K ohm

| Parameter | Symbol | Min. | Max. | Unit |
|------------------------------------|-----------|------|------|------|
| SCL low period | t_{lo} | 0.9 | - | us |
| SCL high period | t_{hi} | 0.8 | - | us |
| SCL setup time for START condition | t_{st1} | 0.4 | - | us |
| SCL setup time for STOP condition | t_{st3} | 0.4 | - | us |
| SCL hold time for START condition | t_{hd1} | 0.3 | - | us |
| SDA setup time | t_{st2} | 0.4 | - | us |
| SDA hold time | t_{hd2} | 0.4 | - | us |

13. Contour Drawing





| PIN NO | SYMBOL |
|--------|--------|
| 1 | LED+ |
| 2 | LED- |

CN1

| PIN NO. | SYMBOL | PIN NO. | SYMBOL |
|---------|--------|---------|--------|
| 1 | NC | 21 | Rxin3+ |
| 2 | VCC | 22 | GND |
| 3 | VCC | 23 | NC |
| 4 | NC | 24 | NC |
| 5 | NC | 25 | GND |
| 6 | NC | 26 | NC |
| 7 | GND | 27 | NC |
| 8 | Rxin0- | 28 | NC |
| 9 | Rxin0+ | 29 | NC |
| 10 | GND | 30 | GND |
| 11 | Rxin1- | 31 | NC |
| 12 | Rxin1+ | 32 | NC |
| 13 | GND | 33 | NC |
| 14 | Rxin2- | 34 | NC |
| 15 | Rxin2+ | 35 | VGL |
| 16 | GND | 36 | NC |
| 17 | RxCLK- | 37 | NC |
| 18 | RxCLK+ | 38 | VGH |
| 19 | GND | 39 | NC |
| 20 | Rxin3- | 40 | NC |

The non-specified tolerance of dimension is ± 0.3 mm .



Module Number : _____

1、Panel Specification :

- 1. Panel Type : Pass NG , _____
- 2. View Direction : Pass NG , _____
- 3. Numbers of Dots : Pass NG , _____
- 4. View Area : Pass NG , _____
- 5. Active Area : Pass NG , _____
- 6. Operating : Pass NG , _____
- 7. Storage Temperature : Pass NG , _____
- 8. Others : _____

2、Mechanical

- 1. PCB Size : Pass NG , _____
- 2. Frame Size : Pass NG , _____
- 3. Material of Frame : Pass NG , _____
- 4. Connector Position : Pass NG , _____
- 5. Fix Hole Position : Pass NG , _____
- 6. Backlight Position : Pass NG , _____
- 7. Thickness of PCB : Pass NG , _____
- 8. Height of Frame to PCB : Pass NG , _____
- 9. Height of Module : Pass NG , _____
- 10. Others : Pass NG , _____

3、Relative Hole Size :

- 1. Pitch of Connector : Pass NG , _____
- 2. Hole size of Connector : Pass NG , _____
- 3. Mounting Hole size : Pass NG , _____
- 4. Mounting Hole Type : Pass NG , _____
- 5. Others : Pass NG , _____

4、Backlight Specification :

- 1. B/L Type : Pass NG , _____
- 2. B/L Color : Pass NG , _____
- 3. B/L Driving Voltage (Reference for LED) : Pass NG , _____
- 4. B/L Driving Current : Pass NG , _____
- 5. Brightness of B/L : Pass NG , _____
- 6. B/L Solder Method : Pass NG , _____
- 7. Others : Pass NG , _____

>> **Go to page 2** <<



Winstar Module Number : _____

Page: 2

5、Electronic Characteristics of Module :

- 1. Input Voltage : Pass NG , _____
- 2. Supply Current : Pass NG , _____
- 3. Driving Voltage for LCD : Pass NG , _____
- 4. Contrast for LCD : Pass NG , _____
- 5. B/L Driving Method : Pass NG , _____
- 6. Negative Voltage Output : Pass NG , _____
- 7. Interface Function : Pass NG , _____
- 8. LCD Uniformity : Pass NG , _____
- 9. ESD test : Pass NG , _____
- 10. Others : Pass NG , _____

6、Summary :

Sales signature : _____

Customer Signature : _____

Date : / / _____