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SPECIFICATION

CUSTOMER : _____

MODULE NO.: WF43GTIBEDBNO#

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

| SALES BY | APPROVED BY | CHECKED BY | PREPARED BY |
|-------------------------------|-------------|------------|-------------|
| | | | 叶慧芬 |
| ISSUED DATE: 2013-2-19 | | | |



MODLE NO :

RECORDS OF REVISION **DOC. FIRST ISSUE**

| VERSION | DATE | REVISED PAGE NO. | SUMMARY |
|---------|-----------|------------------|-------------|
| 0 | 2013.2.19 | | First issue |

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2.SUMMARY

This technical specification applies to 4.3' color TFT-LCD panel. The 4.3' color TFT-LCD panel is designed for camcorder, digital camera application and other electronic products which require high quality flat panel displays. This module follows RoHS.

3.General Specification

| Item | Dimension | Unit |
|--------------------------------|-----------------------------|------|
| Dot Matrix | 480 x RGBx272(TFT) | dots |
| Module dimension | 106.7 x 83.98 x 7.1 | mm |
| Active area | 95.04 x 53.86 | mm |
| Dot pitch | 0.066 x 0.198 | mm |
| LCD type | TFT, Negative, Transmissive | |
| View Direction | 12 o'clock | |
| Gray Scale Inversion Direction | 6 o'clock | |
| Backlight Type | LED, Normally White | |

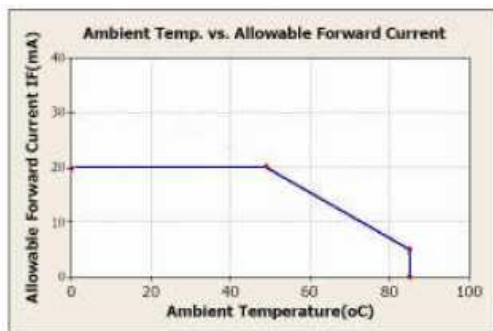
*Color tone slight changed by temperature and driving voltage.

4.Absolute Maximum Ratings

| Item | Symbol | Min | Typ | Max | Unit |
|-----------------------|-----------------|-----|-----|-----|------|
| Operating Temperature | T _{OP} | -20 | — | +70 | °C |
| Storage Temperature | T _{ST} | -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

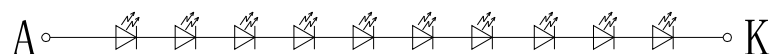
5.1. Operating conditions:

| Item | Symbol | Condition | Min | Typ | Max | Unit |
|--------------------------|--------|-----------|-----|-----|-----|------|
| Supply Voltage For Logic | VCC | — | 3.1 | 3.3 | 3.5 | V |

5.2 LED driving conditions

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Remark |
|-------------------|--------|------|--------|------|------|------------|
| LED current | | - | 20 | - | mA | |
| Power Consumption | | | 640 | 680 | mW | |
| LED voltage | VBL+ | 30 | 32 | 34 | V | Note 1 |
| LED Life Time | | - | 50,000 | - | Hr | Note 2,3,4 |

Note 1 : There are 1 Groups LED



Note 2 : Ta = 25 °C

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

Note 4 : The single LED lamp case

6. DC Characteristics

| Parameter | Symbol | Rating | | | Unit | Condition |
|--------------------------|-----------------|---------|------|---------|------|-----------|
| | | Min. | Typ. | Max. | | |
| Low level input voltage | V _L | 0 | - | 0.3 VCC | V | |
| High level input voltage | V _{IH} | 0.7 VCC | - | VCC | V | |

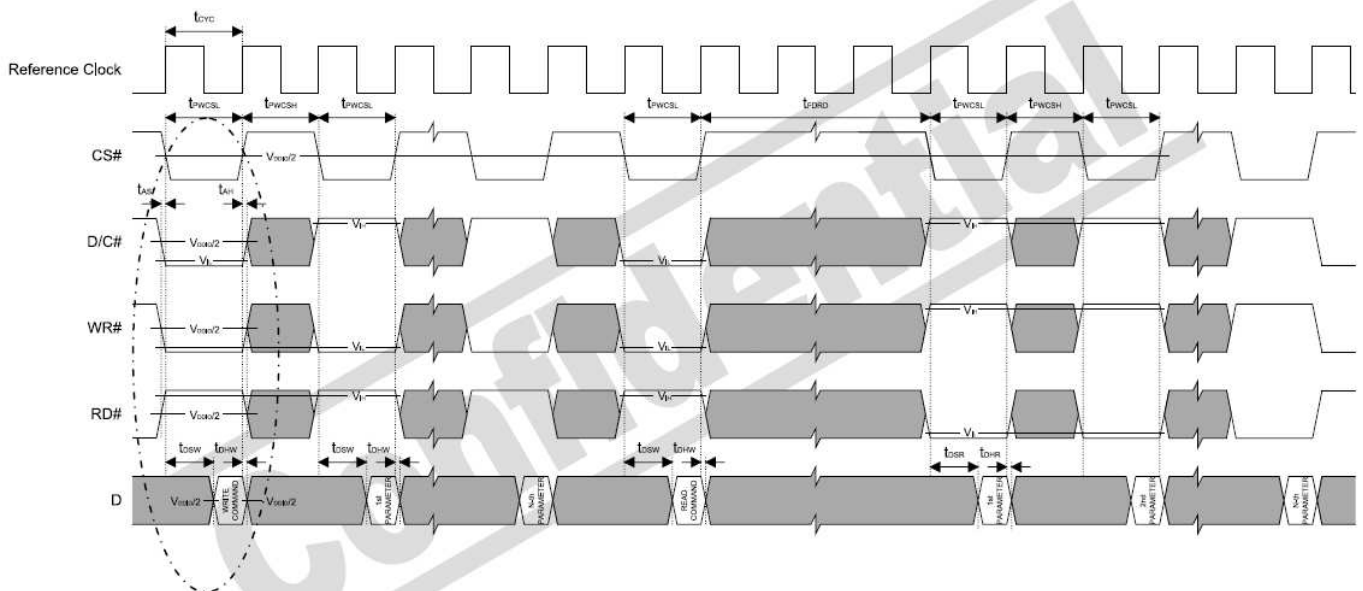
7. Interface Timing

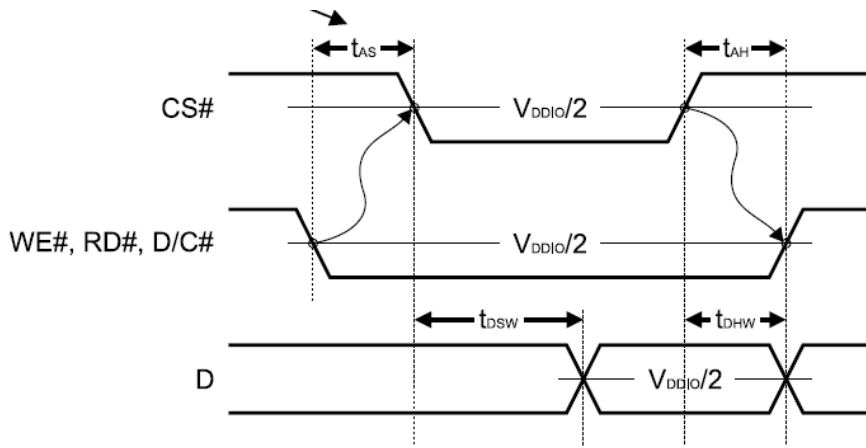
7.1.1 8080 Mode

The 8080 mode MCU interface consist of CS#, D/C#, RD#, WR#, D[23:0] and TE signals (Please refer to Table 6-1 for pin multiplexed with 6800 mode). This interface use WR# to define a write cycle and RD# for read cycle. If the WR# goes low when the CS# signal is low, the data or command will be latched into the system at the rising edge of WR#. Similarly, the read cycle will start when RD# goes low and end at the rising edge of RD#.

7.1.2 8080 Mode Write Cycle

| Symbol | Parameter | Min | Typ | Max | Unit |
|-------------|----------------------------|-----|-----|-----|-----------|
| t_{cyc} | Reference Clock Cycle Time | 9 | - | - | ns |
| t_{PWCSL} | Pulse width CS# low | 1 | - | - | t_{cyc} |
| t_{PWCSH} | Pulse width CS# high | 1 | - | - | t_{cyc} |
| t_{FDRD} | First Read Data Delay | 5 | - | - | t_{cyc} |
| t_{AS} | Address Setup Time | 1 | - | - | ns |
| t_{AH} | Address Hold Time | 1 | - | - | ns |
| t_{DSW} | Data Setup Time | 4 | - | - | ns |
| t_{DHW} | Data Hold Time | 1 | - | - | ns |
| t_{DSR} | Data Access Time | - | - | 5 | ns |
| t_{DHR} | Output Hold time | 1 | - | - | ns |





7.1.3 Pixel Data Format

| Interface | Cycle | D[23] | D[22] | D[21] | D[20] | D[19] | D[18] | D[17] | D[16] | D[15] | D[14] | D[13] | D[12] | D[11] | D[10] | D[9] | D[8] | D[7] | D[6] | D[5] | D[4] | D[3] | D[2] | D[1] | D[0] | |
|----------------------|-----------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|------|------|------|------|------|------|------|------|------|----|
| 24 bits | 1 st | R7 | R6 | R5 | R4 | R3 | R2 | R1 | R0 | G7 | G6 | G5 | G4 | G3 | G2 | G1 | G0 | B7 | B6 | B5 | B4 | B3 | B2 | B1 | B0 | |
| 18 bits | 1 st | | | | | | | R5 | R4 | R3 | R2 | R1 | R0 | G5 | G4 | G3 | G2 | G1 | G0 | B5 | B4 | B3 | B2 | B1 | B0 | |
| 16 bits (565 format) | 1 st | | | | | | | | | R5 | R4 | R3 | R2 | R1 | G5 | G4 | G3 | G2 | G1 | G0 | B5 | B4 | B3 | B2 | B1 | |
| 16 bits | 1 st | | | | | | | | | R5 | R4 | R3 | R2 | R1 | R0 | X | X | G5 | G4 | G3 | G2 | G1 | G0 | X | X | |
| | 2 nd | | | | | | | | | B5 | B4 | B3 | B2 | B1 | B0 | X | X | R5 | R4 | R3 | R2 | R1 | R0 | X | X | |
| | 3 rd | | | | | | | | | G5 | G4 | G3 | G2 | G1 | G0 | X | X | B5 | B4 | B3 | B2 | B1 | B0 | X | X | |
| 9 bits | 1 st | | | | | | | | | | | | | | | | | R5 | R4 | R3 | R2 | R1 | R0 | G5 | G4 | G3 |
| | 2 nd | | | | | | | | | | | | | | | | | G2 | G1 | G0 | B5 | B4 | B3 | B2 | B1 | B0 |
| 8 bits | 1 st | | | | | | | | | | | | | | | | | | R5 | R4 | R3 | R2 | R1 | R0 | X | X |
| | 2 nd | | | | | | | | | | | | | | | | | | G5 | G4 | G3 | G2 | G1 | G0 | X | X |
| | 3 rd | | | | | | | | | | | | | | | | | | B5 | B4 | B3 | B2 | B1 | B0 | X | X |

X: Don't Care

8. Optical Characteristics

| Item | Symbol | Condition. | Min | Typ. | Max. | Unit | Remark | |
|--------------------|--------|---------------------------------------|------------|------|------|-------------------|-------------------|----------|
| Response time | Tr | $\theta = 0^\circ$ 、 $\Phi = 0^\circ$ | - | 10 | 20 | .ms | Note 3 | |
| | Tf | | - | 15 | 30 | .ms | | |
| Contrast ratio | CR | At optimized viewing angle | 400 | 500 | - | - | Note 4 | |
| Color Chromaticity | White | $\theta = 0^\circ$ 、 $\Phi = 0$ | Wx | 0.24 | 0.29 | 0.34 | | Note 2,5 |
| | | | Wy | 0.26 | 0.31 | 0.36 | | |
| Viewing angle | Hor. | $CR \geq 10$ | ΘR | 60 | 70 | | Deg. | Note 1 |
| | | | ΘL | 60 | 70 | | | |
| | Ver. | | ΦT | 40 | 50 | | | |
| | | | ΦB | 60 | 70 | | | |
| Brightness | - | - | 350 | - | 500 | cd/m ² | Center of display | |

Ta=25±2°C, IL=20mA

Note 1: Definition of viewing angle range

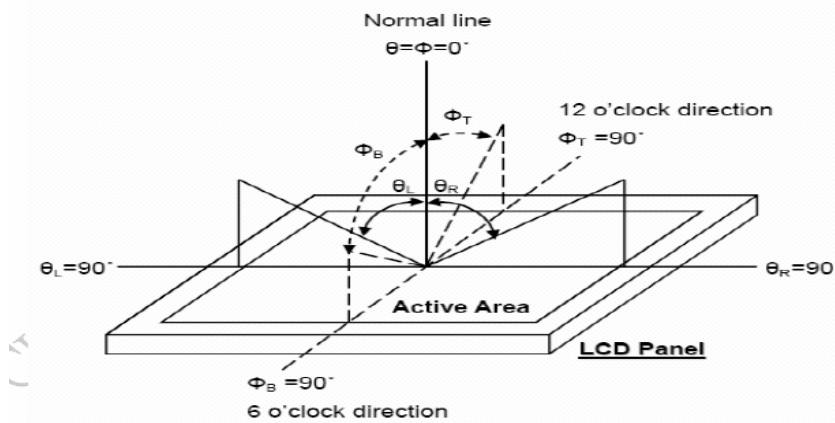


Fig. 8-1 Definition of viewing angle

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 luminance meter 1.0° field of view at a distance of 50cm and normal direction.

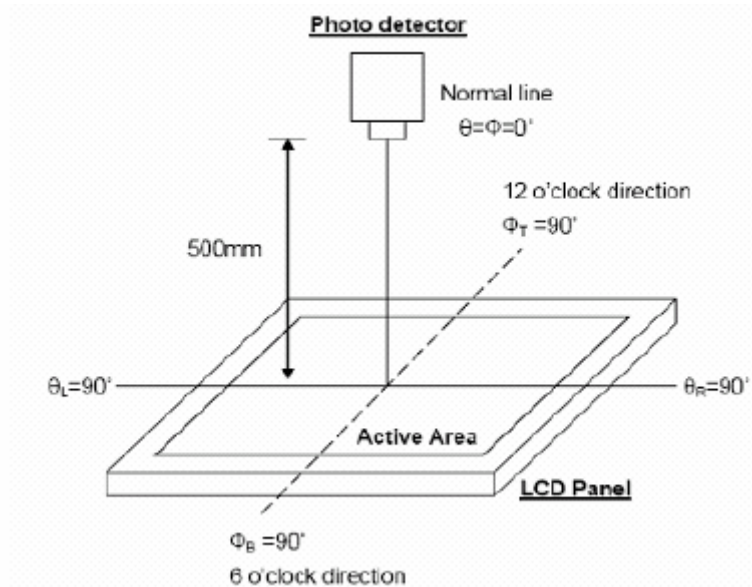


Fig. 8-2 Optical measurement system setup

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%

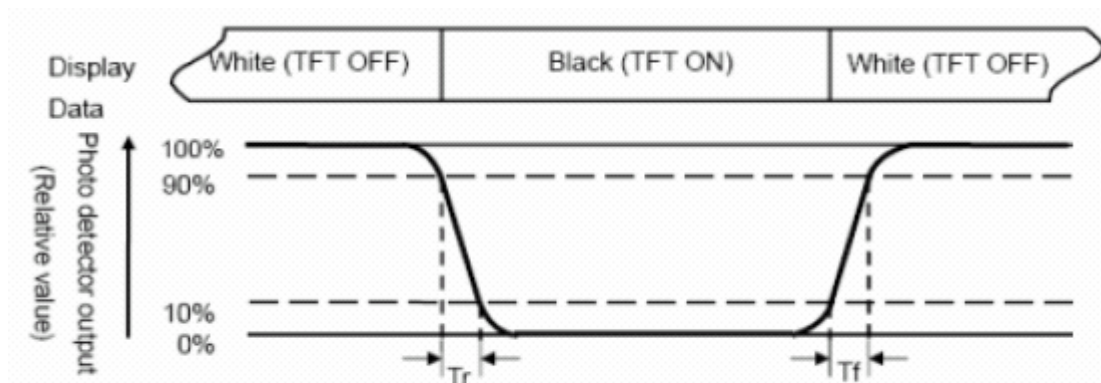


Fig. 3-3 Definition of response time

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 color chromaticity (CIE1931)

Color coordinates measured at center point of LCD.

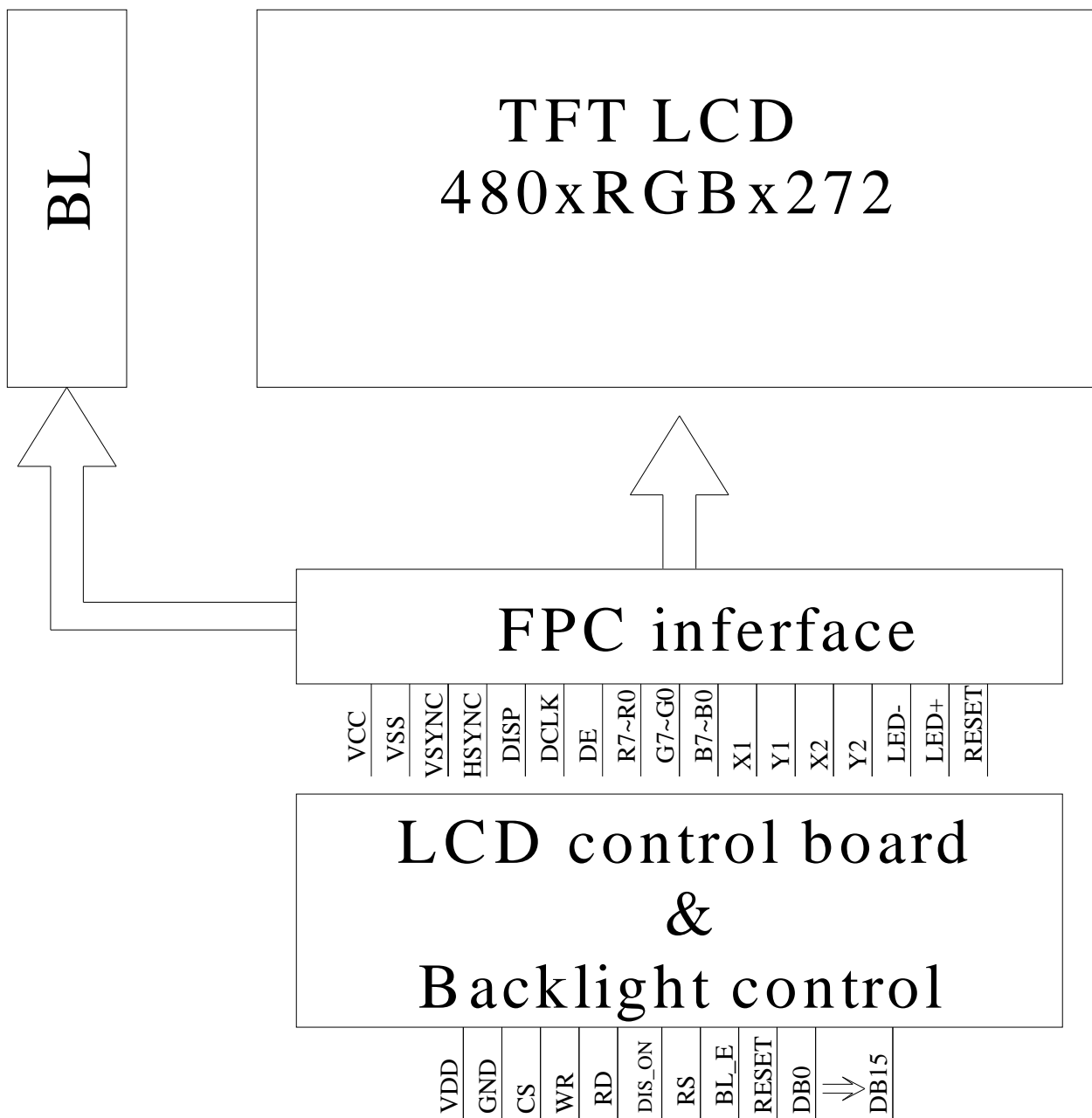
Note 6: All input terminals LCD panel must be ground while measuring the center area of the panel.

9. Interface

9.1. LCM PIN Definition

| Pin | Symbol | I/O | Function | Remark |
|-----|--------|-----|---|--------|
| 1 | GND | P | System ground pin of the IC. Connect to system ground. | |
| 2 | VDD | P | Power Supply : +3.3V | |
| 3 | BL E | I | Backlight control signal , H: On \ L:Off | |
| 4 | RS | I | Data/Command select | |
| 5 | WR | I | Write strobe signal | |
| 6 | RD | I | Read strobe signal | |
| 7 | D0 | I | Data bus | |
| 8 | D1 | I | Data bus | |
| 9 | D2 | I | Data bus | |
| 10 | D3 | I | Data bus | |
| 11 | D4 | I | Data bus | |
| 12 | D5 | I | Data bus | |
| 13 | D6 | I | Data bus | |
| 14 | D7 | I | Data bus | |
| 15 | D8 | I | Data | |
| 16 | D9 | I | Data | |
| 17 | D10 | I | Data | |
| 18 | D11 | I | Data | |
| 19 | D12 | I | Data | |
| 20 | D13 | I | Data | |
| 21 | D14 | I | Data | |
| 22 | D15 | I | Data | |
| 23 | NC | - | No connection | |
| 24 | NC | - | No connection | |
| 25 | CS | I | Chip select | |
| 26 | RST | I | Hardware reset | |
| 27 | NC | - | No connection | |
| 28 | NC | - | No connection | |
| 29 | NC | - | No connection | |
| 30 | NC | - | No connection | |
| 31 | NC | - | No connection | |
| 32 | DIP ON | - | Display control H: On \ L:Off | |

10. BLOCK DIAGRAM



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 high 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 For 96hrs under no-load condition excluding the polarizer, Then taking it out and drying it at normal temperature. | 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;">←—————→</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 : 3 15mm 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=800V,RS=1.5kΩ CS=100pF 1 time | — |

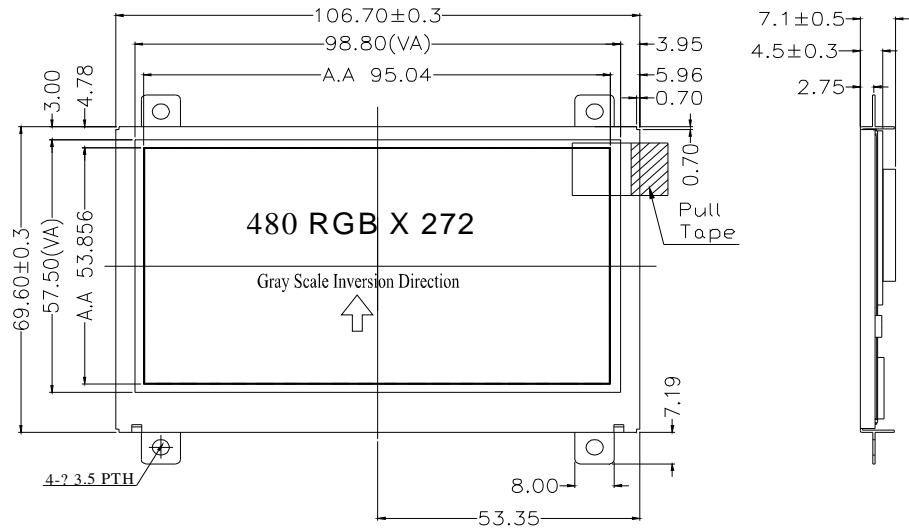
Note1: No dew condensation to be observed.

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

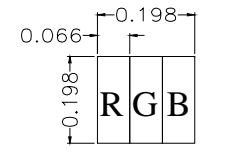
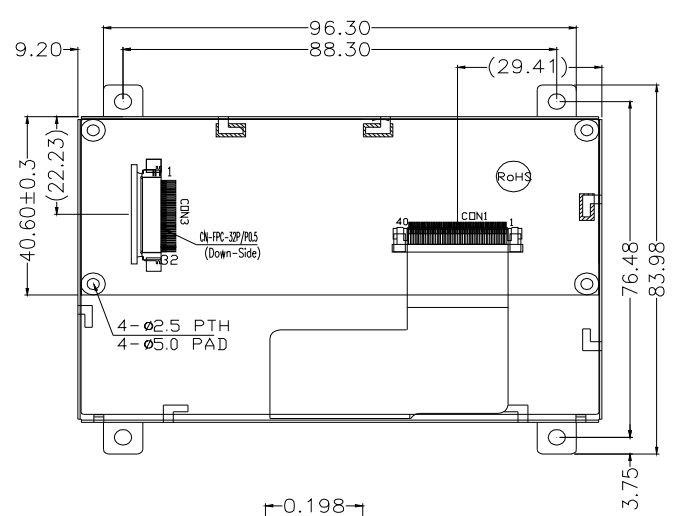
Note3: Vibration test will be conducted to the product itself without putting it in a container.

12. Contour Drawing

| PIN | DESC |
|-----|--------|
| 1 | GND |
| 2 | VDD |
| 3 | BL_E |
| 4 | RS |
| 5 | VR |
| 6 | RD |
| 7 | D0 |
| 8 | D1 |
| 9 | D2 |
| 10 | D3 |
| 11 | D4 |
| 12 | D5 |
| 13 | D6 |
| 14 | D7 |
| 15 | D8 |
| 16 | D9 |
| 17 | D10 |
| 18 | D11 |
| 19 | D12 |
| 20 | D13 |
| 21 | D14 |
| 22 | D15 |
| 23 | NC |
| 24 | NC |
| 25 | CS |
| 26 | RST |
| 27 | NC |
| 28 | NC |
| 29 | NC |
| 30 | NC |
| 31 | NC |
| 32 | DIP_QN |

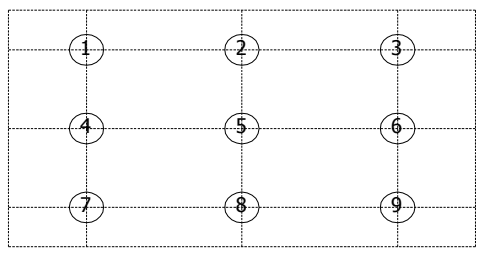


A—K
CIRCUIT DIAGRAM(10指)



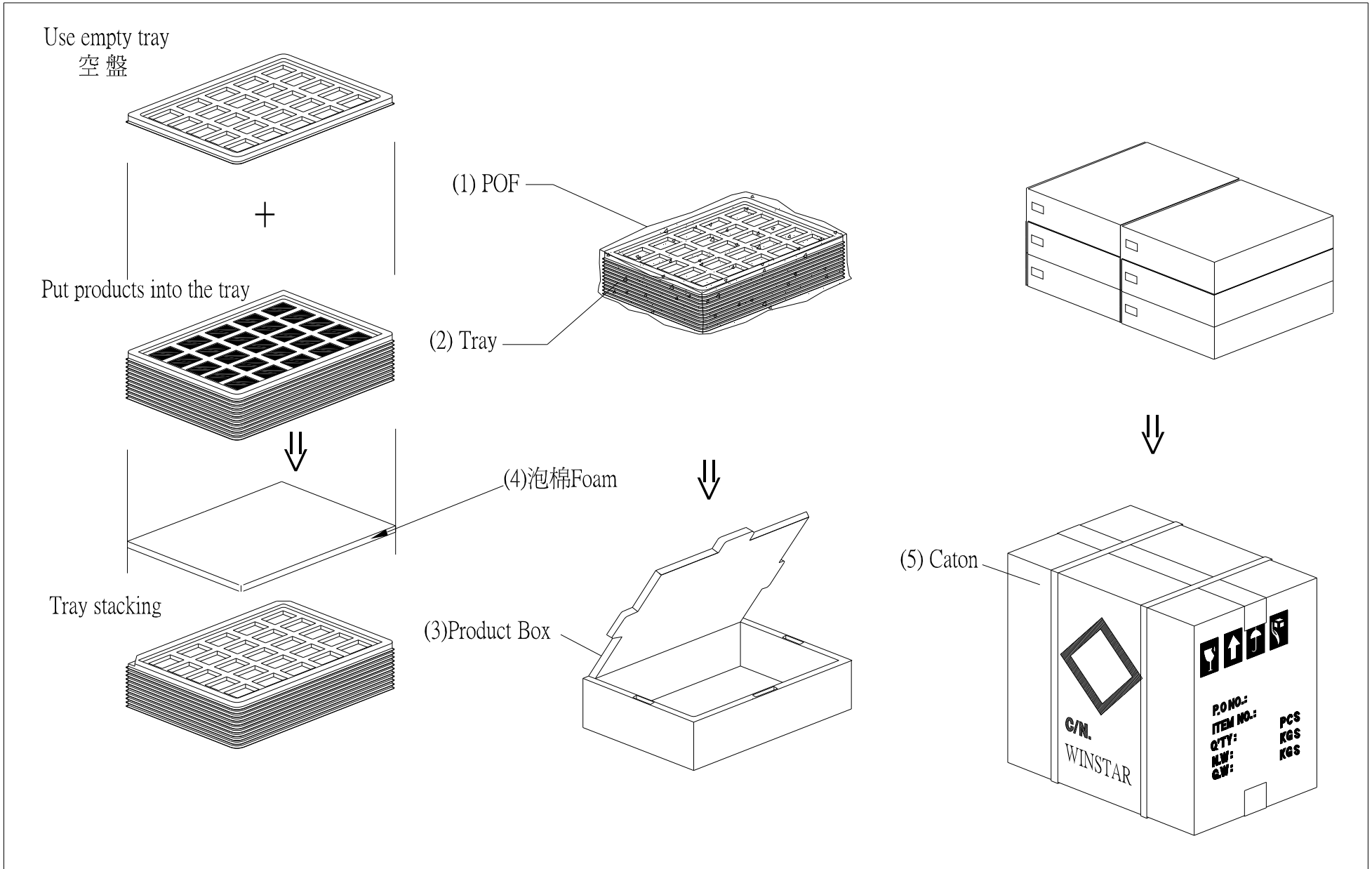
SCALE 1:100

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



13. Package specification

| | | | | | | | | | | |
|---|-----------------------|-------------------------------------|--------------------|-----------------|--------------|----------------|--|--|--|--|
| LCM Model | WF43GTIBEDBN0# | LCM 包裝規格書 | | Approve | Check | Contact | | | | |
| Drawing NO. | | LCM Packaging Specifications | | DATE | 初版 | 版次 Ver | | | | |
| | | | | 12'11/15 | 12'11/15 | 0 | | | | |
| 1.包裝材料規格表 (Packaging Material) :(per carton) | | | | | | | | | | |
| NO. | Item | Model | Dimensions | Quantity | | | | | | |
| 1 | 成品 (LCM) | WF43GTIBEDBN0# | 106.7 x 69.9 x 7.1 | TBD | | | | | | |
| 2 | TRAY 盤 (2) | PKCA1XXXXXXXXXXXX0233 | TBD | TBD | | | | | | |
| 3 | BP01 內盒(3)Product Box | PK3R1XXXXXXXXXXXX0001 | 332 x 280 x 100 | TBD | | | | | | |
| 4 | 泡棉(4)Foam | ----- | 283 x 230 x 8 | TBD | | | | | | |
| 5 | 外紙箱(5)Carton | PK4Q1XXXXXXXXXXXX0000 | 565 x 340 x 320 | TBD | | | | | | |
| 6 | | | | | | | | | | |
| 7 | | | | | | | | | | |
| 8 | | | | | | | | | | |
| 9 | | | | | | | | | | |
| 2.單箱數量規格表(Packaging Specifications and Quantity) : | | | | | | | | | | |
| (1)LCM quantity per box : no per tray | | TBD | x no of tray | TBD | = | TBD | | | | |
| (2)Total LCM quantity in carton : quantity per box | | TBD | x no of boxes | TBD | = | TBD | | | | |
| 特 記 事 項 (REMARK) | | | | | | | | | | |
| 1. Label Specifications : | | | | | | | | | | |
| <table border="1" style="width:100%; height:50px;"> <tr> <td>MOEEL:</td> </tr> <tr> <td>LOT NO :</td> </tr> <tr> <td>QUANTITY:</td> </tr> <tr> <td>CHECK:</td> </tr> </table> | | MOEEL: | LOT NO : | QUANTITY: | CHECK: | | | | | |
| MOEEL: | | | | | | | | | | |
| LOT NO : | | | | | | | | | | |
| QUANTITY: | | | | | | | | | | |
| CHECK: | | | | | | | | | | |



14. Initial Code For Reference

```
void Initial_code()
{
    Write_Command(0x01);
    Delay_ms(10);
    Write_Command(0xe0);
    Write_Parameter(0x01);
    Delay_ms(5);
    Write_Command(0xe0);
    Write_Parameter(0x03);
    Delay_ms(5);

    Write_Command(0xb0);
    Write_Parameter(0x08);
    Write_Parameter(0x80);
    Write_Parameter(0x01);
    Write_Parameter(0xdf);
    Write_Parameter(0x01);
    Write_Parameter(0x0f);
    Write_Parameter(0x00);

    Write_Command(0xf0);
    Write_Parameter(0x00);

    Write_Command(0x3a);
    Write_Parameter(0x50); //0x50 is for 5-6-5 color mode; 0x60 is for 6-6-6 color mode

    //Set the MN of PLL
    Write_Command(0xe2);
    Write_Parameter(0x1d);
    Write_Parameter(0x02);
    Write_Parameter(0x54);

    Write_Command(0xe6);
    Write_Parameter(0x01);
    Write_Parameter(0x55);
    Write_Parameter(0xff);

    //Set front porch and back porch
    Write_Command(0xb4);
    Write_Parameter(0x02);
    Write_Parameter(0x09);
    Write_Parameter(0x00);
    Write_Parameter(0x28);
    Write_Parameter(0x07);
    Write_Parameter(0x00);
    Write_Parameter(0x00);
    Write_Parameter(0x00);

    Write_Command(0xb6);
    Write_Parameter(0x01);
    Write_Parameter(0x19);
```

```
Write_Parameter(0x00);  
Write_Parameter(0x08);  
Write_Parameter(0x01);  
Write_Parameter(0x00);  
Write_Parameter(0x00);
```

```
Write_Command(0x2a);  
Write_Parameter(0x00);  
Write_Parameter(0x00);  
Write_Parameter(0x01);  
Write_Parameter(0xdf);
```

```
Write_Command(0x2b);  
Write_Parameter(0x00);  
Write_Parameter(0x00);  
Write_Parameter(0x01);  
Write_Parameter(0xf);
```

```
Write_Command(0x29);  
Write_Command(0x2c);
```

```
}
```



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 Temperature : Pass NG , _____
- 7. Storage Temperature : Pass NG , _____
- 8. Others : _____

2、Mechanical Specification :

- 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 Type) : 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 <<



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 : ____ / ____ / ____