



**Winstar Display Co., LTD**  
**華凌光電股份有限公司**



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## SPECIFICATION

**CUSTOMER :** \_\_\_\_\_

**MODULE NO.:** **WF57BTIACDNT0#**

|                                                      |                                                 |
|------------------------------------------------------|-------------------------------------------------|
| <b>APPROVED BY:</b><br><br>( FOR CUSTOMER USE ONLY ) | <br><br><b>PCB VERSION:</b><br><br><b>DATA:</b> |
|------------------------------------------------------|-------------------------------------------------|

| SALES BY                | APPROVED BY | CHECKED BY | PREPARED BY |
|-------------------------|-------------|------------|-------------|
|                         |             |            | 葉虹蘭         |
| ISSUED DATE: 2014/08/20 |             |            |             |

TFT Display Inspection Specification: <http://www.winstar.com.tw/service.php>



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MODLE NO :

**RECORDS OF REVISION**

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| VERSION | DATE       | REVISED<br>PAGE NO. | SUMMARY                          |
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| 0       | 2013/10/11 |                     | First issue                      |
| A       | 2014/03/26 |                     | Modify Package<br>Specification. |
| B       | 2014/08/20 |                     | Correct contour drawing.         |

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# 1.Module Classification Information

W F 57 B T I A C D N T 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 : 5.7” TFT                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                               |          |          |                                                                             |            |            |
| ④ | Model serials no.                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                               |          |          |                                                                             |            |            |
| ⑤ | Backlight Type :                                                                                                                                         | F→CCFL, White<br>S→LED, High Light White                                                                                                                                                                                                                                                                                                                                                      |          |          | T→LED, White                                                                |            |            |
| ⑥ | LCD Polarize<br>Type/ Temperature<br>range/ Gray Scale<br>Inversion Direction                                                                            | C→Transmissive, N. T, 6:00 ; I→Transmissive, W. T, 6:00<br>F→Transmissive, N.T,12:00 ; L→Transmissive, W.T,12:00<br>N→Transmissive, Super W.T, 6:00<br>Q→Transmissive, Super W.T, 12:00<br>X→Transmissive, W.T, VA TFT<br>V→Transmissive, Super W.T, VA TFT<br>R→Transmissive, Super W.T, O-TFT<br>Z→Transmissive, W.T, O-TFT<br>A→Transmissive, N.T, IPS TFT<br>Y→Transmissive, W.T, IPS TFT |          |          |                                                                             |            |            |
| ⑦ | A : TFT LCD<br>B : TFT+FR+CONTROL BOARD<br>C : TFT+FR+A/D BOARD<br>D : TFT+FR+A/D BOARD+CONTROL BOARD<br>E : TFT+FR+POWER BOARD<br>F : TFT+CONTROL BOARD |                                                                                                                                                                                                                                                                                                                                                                                               |          |          | G : TFT+FR<br>H : TFT+D/V BOARD<br>I : TFT+FR+D/V BOARD<br>J : TFT+POWER BD |            |            |
| ⑧ | Solution:                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                               |          |          |                                                                             |            |            |
|   | 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 | P :1280800 |
| ⑨ | D: Digital L : LVDS                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                               |          |          |                                                                             |            |            |
| ⑩ | Interface : N : without control board A : 8Bit B : 16Bit                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                               |          |          |                                                                             |            |            |
| ⑪ | TS : N : Without TS T : resistive touch panel C : capacitive touch panel (G-F-F)<br>G : capacitive touch panel(G-G)                                      |                                                                                                                                                                                                                                                                                                                                                                                               |          |          |                                                                             |            |            |
| ⑫ | Version                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                               |          |          |                                                                             |            |            |
| ⑬ | Special Code                                                                                                                                             | #:Fit in with ROHS directive regulations                                                                                                                                                                                                                                                                                                                                                      |          |          |                                                                             |            |            |

## **2.Summary**

This technical specification applies to 5.7' color TFT-LCD panel. The 5.7' 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 Specifications

| Item                           | Dimension                         | Unit |
|--------------------------------|-----------------------------------|------|
| Dot Matrix                     | 320 x RGBx240(TFT)                | dots |
| Module dimension               | 149.0(W) x 109.0(H) x 9.6(D)      | mm   |
| Active area                    | 115.2 x 86.40                     | mm   |
| Dot pitch                      | 0.12 x 0.36                       | mm   |
| LCD type                       | TFT, Normally White, Transmissive |      |
| View Direction                 | 12 o'clock                        |      |
| Gray Scale Inversion Direction | 6 o'clock                         |      |
| Backlight Type                 | LED, Normally White               |      |

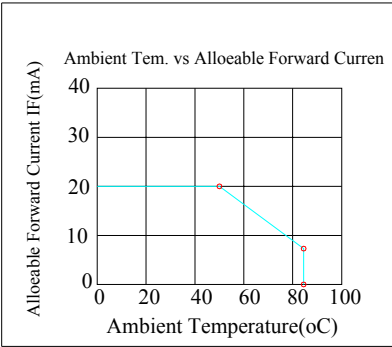
\*Color tone slight changed by temperature and driving voltage.

# 4.Absolute Maximum Ratings

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

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  $60^{\circ}\text{C}$



## 5. Electrical Characteristics

### 5.1. Operating conditions:

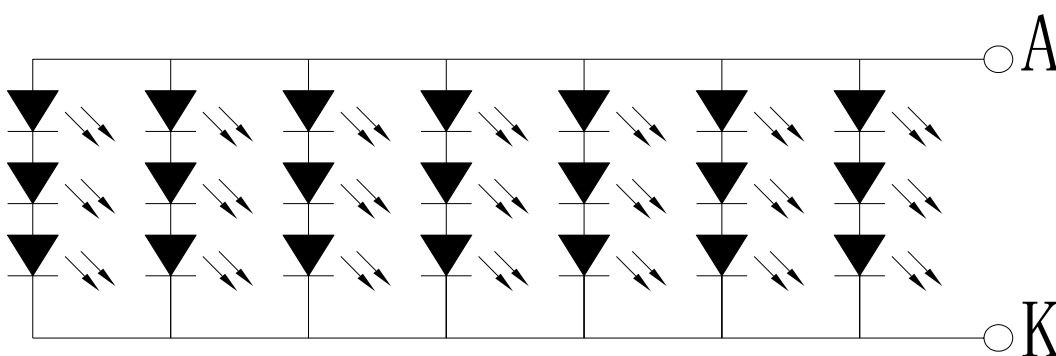
| Item                       | Symbol | Condition | Min     | Typ | Max     | Unit | Remark |
|----------------------------|--------|-----------|---------|-----|---------|------|--------|
| Supply Voltage For LCM     | VCC    | —         | 3.0     | 3.3 | 3.6     | V    | —      |
| Supply Current For LCM     | ICC    | —         | —       | 17  | 25      | mA   | Note1  |
| Input High Volt.           | VIH    | —         | 0.7 VCC | —   | VCC     | V    | —      |
| Input Low Volt.            | VIL    | —         | 0       | —   | 0.3 VCC | V    | —      |
| LCD Driving Supply Voltage | VGH    | —         | 15      | —   | —       | V    | —      |
|                            | VGL    | —         | -10     | —   | —       | V    | —      |
|                            | VCOMH  | —         | 2.5     | —   | 5.5     | V    | —      |
|                            | VCOML  | —         | -2.0    | —   | 0       | V    | —      |
|                            | AVDD   | —         | 4.5     | 5.0 | 5.5     | V    | —      |

Note 1 : This value is test for VCC =3.3V , Ta=25 °C only

### 5.2. LED driving conditions

| Parameter         | Symbol | Min. | Typ.   | Max. | Unit | Remark     |
|-------------------|--------|------|--------|------|------|------------|
| LED current       | -      | -    | 140    | -    | mA   | -          |
| Power Consumption | -      | 1260 | -      | 1470 | mW   | -          |
| LED voltage       | VBL+   | 9.0  | -      | 10.5 | 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.AC CHARACTERISTICS

### 6.1. CCIR601/656 Interface

#### Input signal characteristics

| Parameter       | Symbol          | Min. | Typ. | Max. | Unit |
|-----------------|-----------------|------|------|------|------|
| CLK period      | Tosc            | -    | 37   | -    | ns   |
| Data setup time | Tsu             | 12   | -    | -    | ns   |
| Data hold time  | T <sub>Ho</sub> | 12   | -    | -    | ns   |

#### Hardware reset timing

| Parameter             | Symbol | Min. | Typ. | Max. | Unit    |
|-----------------------|--------|------|------|------|---------|
| Reset low pulse width | TRSB   | 10   | -    | -    | $\mu$ s |

#### Output signal characteristics

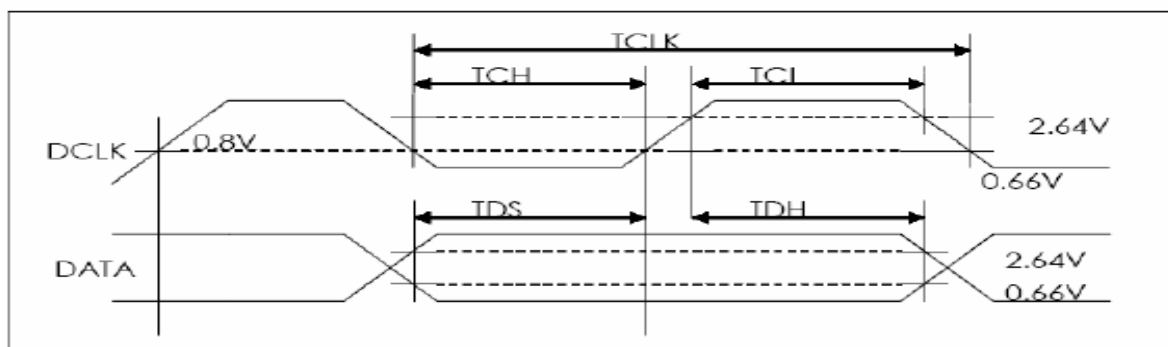
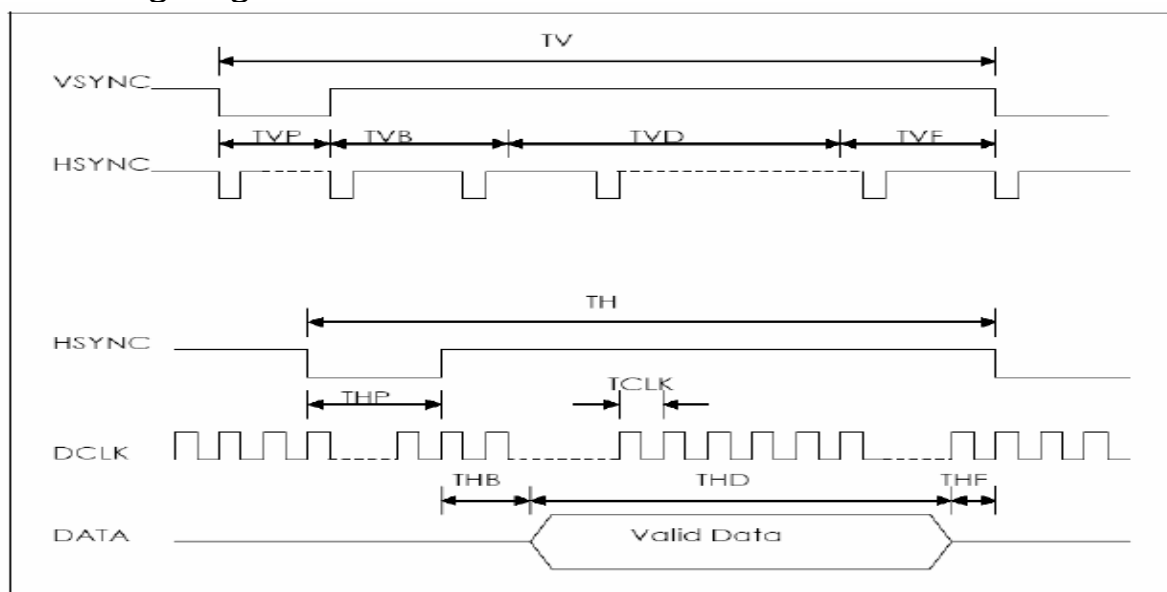
| Parameter                 |      | Symbol           | Min. | Typ. | Max. | Unit           |
|---------------------------|------|------------------|------|------|------|----------------|
| Rising time               |      | Tr               | -    | -    | 10   | ns             |
| Falling time              |      | Tf               | -    | -    | 10   | ns             |
| Internal STH setup time   |      | Tsus             | 12   | -    | -    | ns             |
| Internal STH hold time    |      | T <sub>HDS</sub> | 12   | -    | -    | ns             |
| Internal data setup time  |      | T <sub>SUD</sub> | 60   | -    | -    | ns             |
| Internal I data hold time |      | T <sub>HDD</sub> | 40   | -    | -    | ns             |
| OEH pulse width           |      | T <sub>OEH</sub> | -    | 1248 | -    | ns             |
| OEV pulse width           |      | T <sub>OEV</sub> | -    | 4992 | -    | ns             |
| CKV pulse width           |      | T <sub>CKV</sub> | -    | 3744 | -    | ns             |
| Hsync-DEH time            |      | T <sub>1</sub>   | -    | 4368 | -    | ns             |
| Hsync-CKV time            |      | T <sub>2</sub>   | -    | 2496 | -    | ns             |
| Hsync-OEV time            |      | T <sub>3</sub>   | -    | 624  | -    | ns             |
| Vsync-setup time          |      | T <sub>SUV</sub> | -    | 1872 | -    | ns             |
| Vsync-pulse time          |      | T <sub>STV</sub> | -    | 1    | -    | T <sub>H</sub> |
| Vsync-STV time            | NTSC | T <sub>VSI</sub> | -    | 19   | -    | T <sub>H</sub> |
|                           | PAL  | T <sub>VSI</sub> | -    | 27   | -    | T <sub>H</sub> |
| OEH-STV time              |      | T <sub>HE</sub>  | -    | 2    | -    | T <sub>H</sub> |
| Output settling time      |      | T <sub>OES</sub> | -    | 12   | 20   | $\mu$ s        |

## 6.2. 24-bits parallel RGB Interface

### AC Timing Characteristics

| Signal | Item           |      | Symbol | Min. | Typ.  | Max. | Unit |
|--------|----------------|------|--------|------|-------|------|------|
| Dclk   | Frequency      |      | Dclk   | -    | 6.4   | -    | MHZ  |
|        | High time      |      | Tch    | -    | 78    | -    | ns   |
|        | Low time       |      | Tcl    | -    | 78    | -    | ns   |
| Hsync  | Period         |      | TH     | -    | 408   | -    | DCLK |
|        | Pulse Width    |      | Thp    | -    | 30    | -    | DCLK |
|        | Back-Porch     |      | Thb    | -    | 38    | -    | DCLK |
|        | Display Period |      | Thd    | -    | 320   | -    | DCLK |
|        | Front-Porch    |      | Thf    | -    | 20    | -    | DCLK |
| Vsync  | Period         | NTSC | TV     | -    | 262.5 | -    | DCLK |
|        |                | PAL  |        |      | 312.5 | -    |      |
|        | Pulse Width    |      | Tvp    | 1    | 3     | 5    | TH   |
|        | Back-Porch     | NTSC | Tvb    | -    | 15    | -    | TH   |
|        |                | PAL  |        |      | 23    |      |      |
|        | Display Period |      | Tvd    | -    | 240   | -    | TH   |
|        | Front-Porch    | NTSC | Tvf    | -    | 4.5   | -    | TH   |
|        |                | PAL  |        |      | 46.5  |      |      |

### AC Timing Diagrams

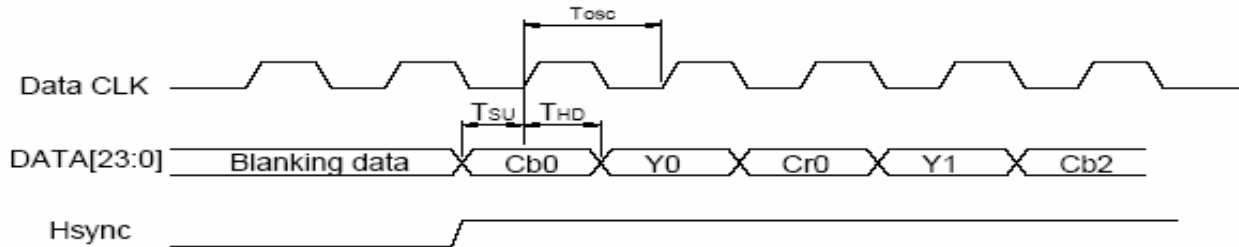


# 7.Waveform

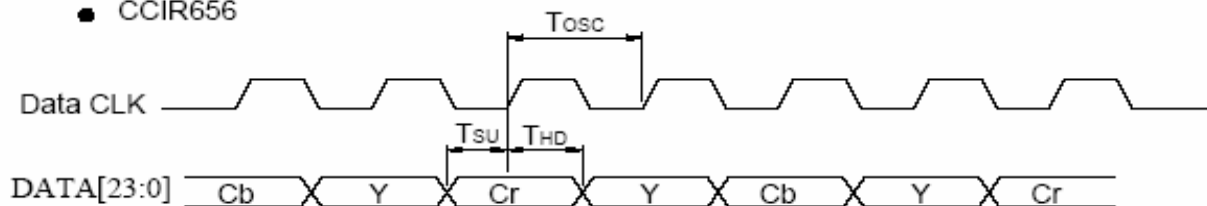
## 7.1. Timing Controller Timing Chart

### Clock and Data waveform

- CCIR601( HS\_POL="L" in Register R2)



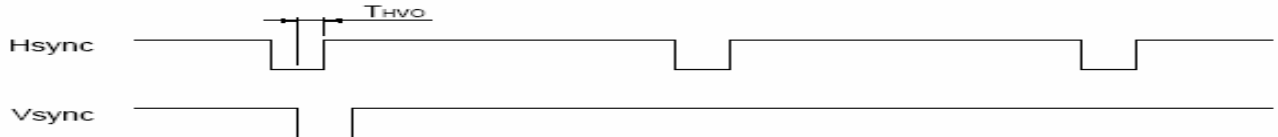
- CCIR656



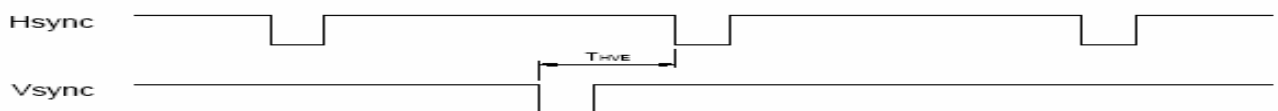
## 7.2. Digital / Analog RGB timing waveform

### Hsync and Vsync timing

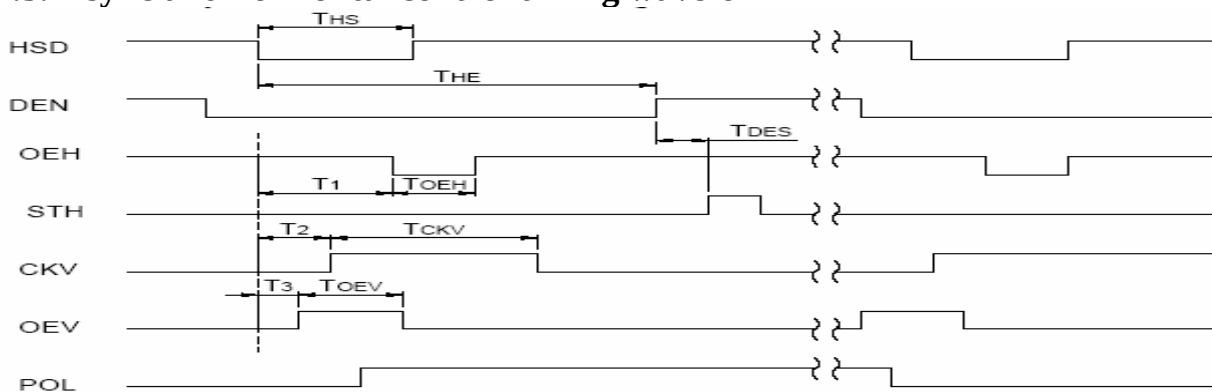
- Odd field



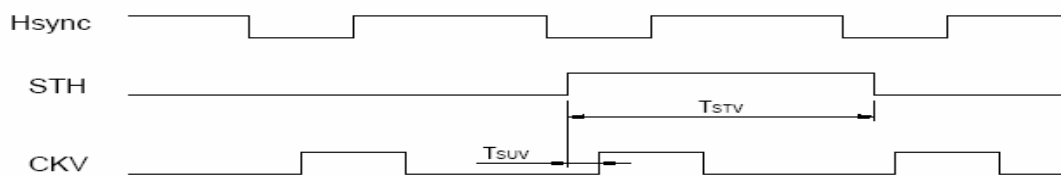
- Even field



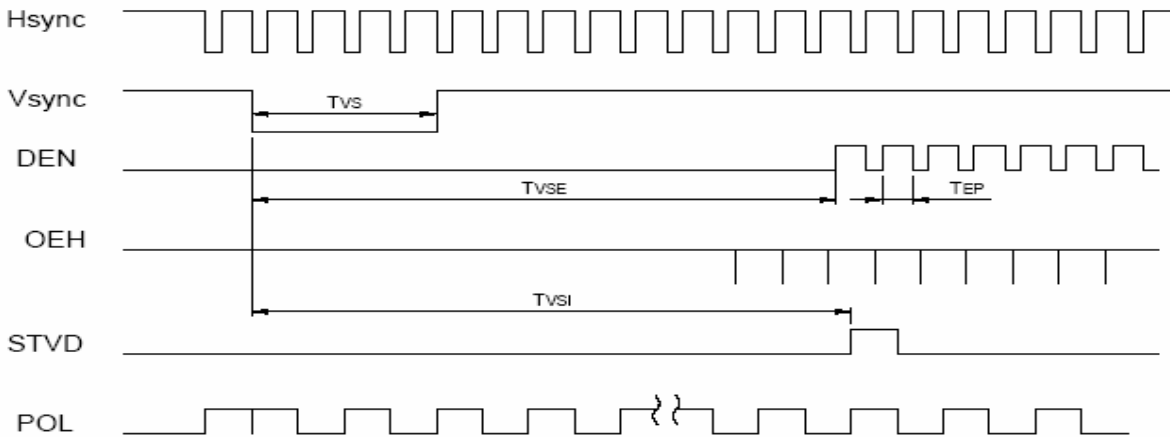
## 7.3. Hsync and horizontal control timing waveform



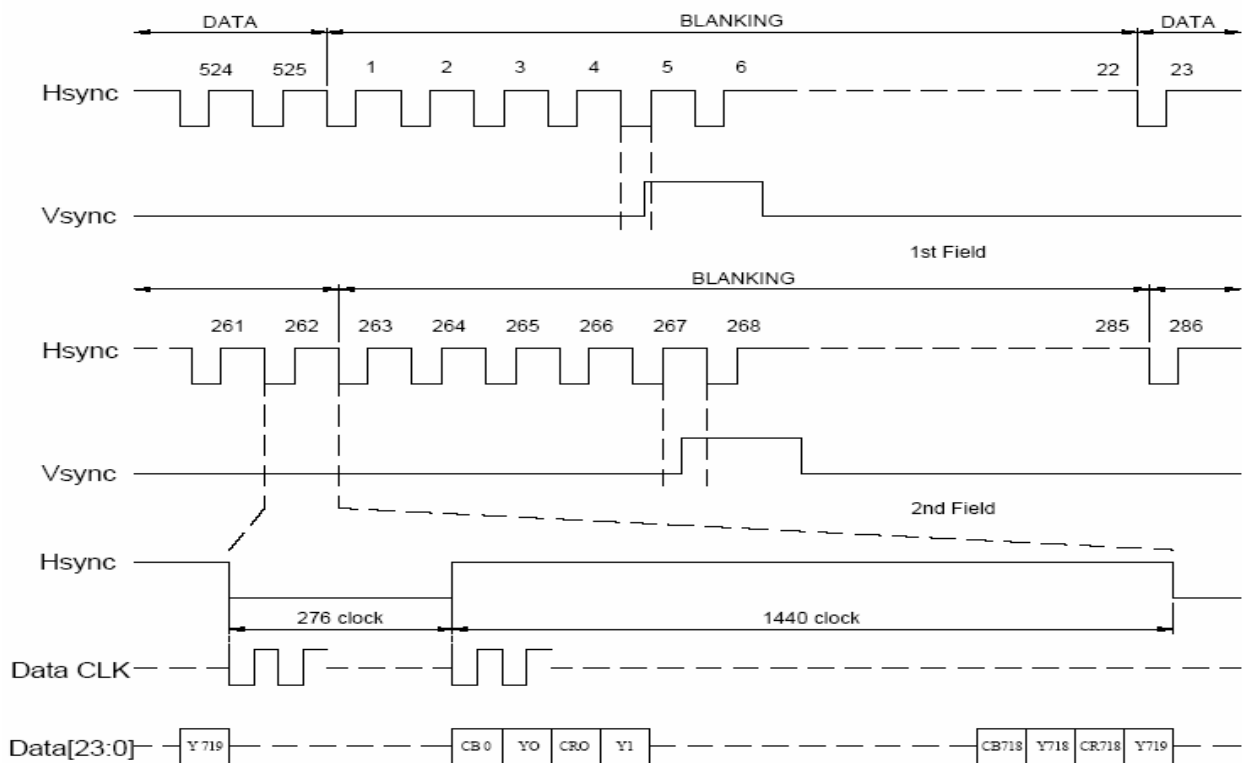
## 7.4. Hsync and vertical shift clock timing waveform



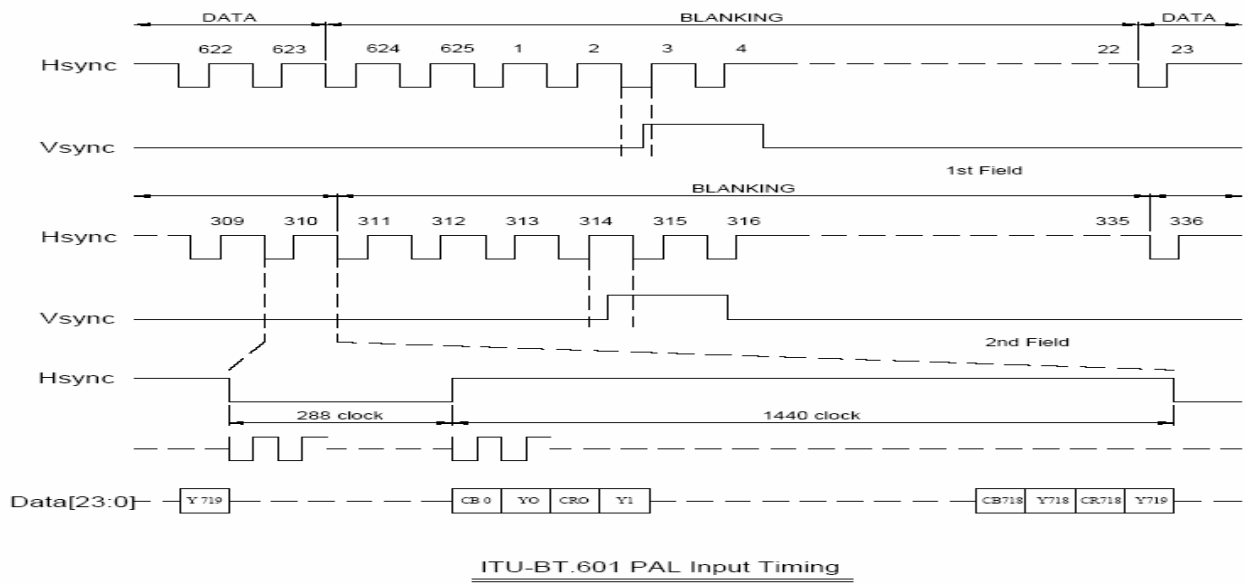
## 7.5. Hsync and vertical shift clock timing waveform



## 7.6. CCIR601 timing waveform (VS\_POL="H" , HS\_POL="L" in Register R2)

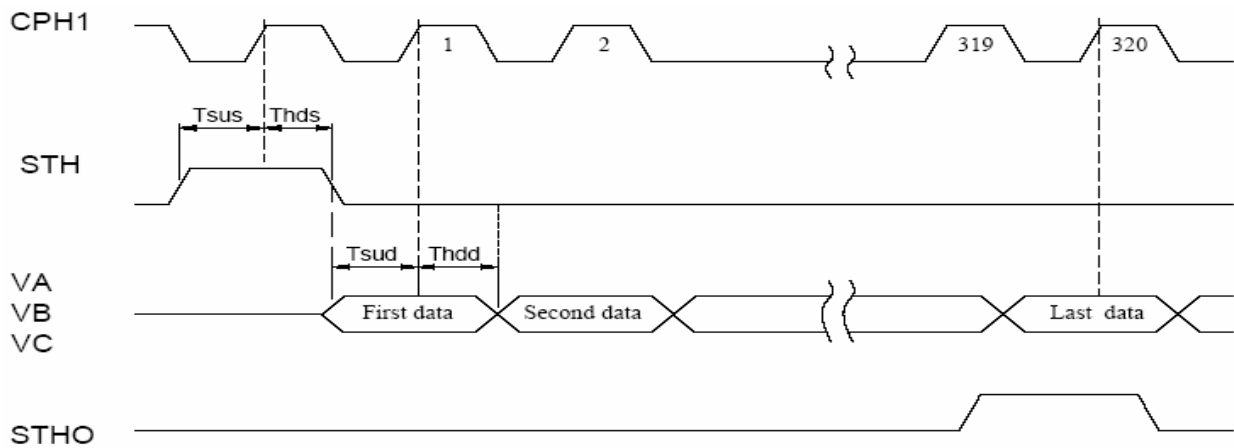


ITU-BT.601 NTSC Input Timing

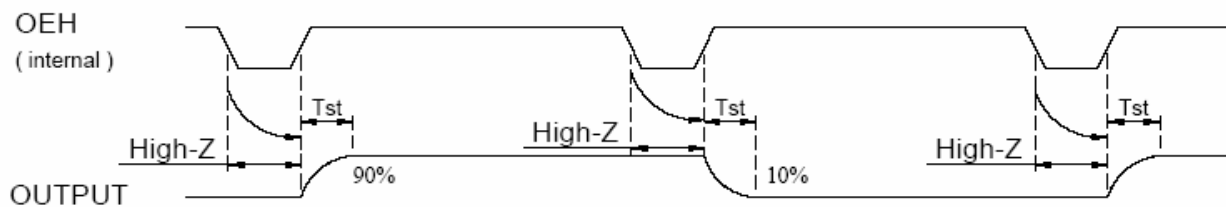


## 7.7. Source Driver Timing Chart

### Clock and Start Pulse timing waveform



## 7.8. OEH and Data Output timing waveform



## 7.9. Analog video signal characteristics

| PARAMETER                           | Symbol    | Min. | Typ.  | Max. | Unit |
|-------------------------------------|-----------|------|-------|------|------|
| Video signal amplitude (VA, VB, VC) | $V_{IAC}$ | -    | 3.81  | -    | V    |
|                                     | $V_{IDC}$ | -    | 2.385 | -    | V    |

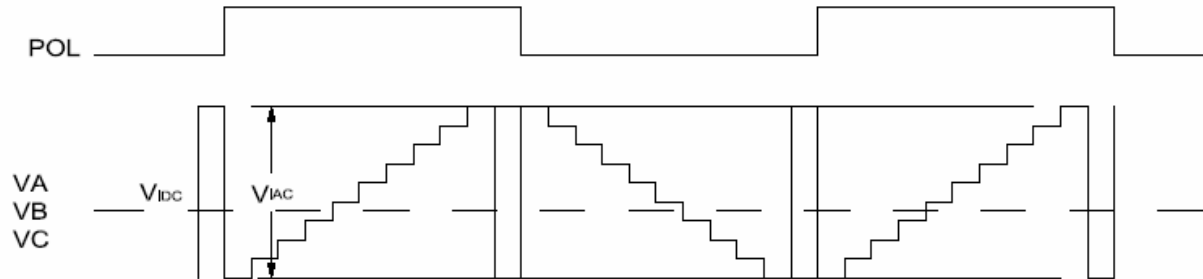
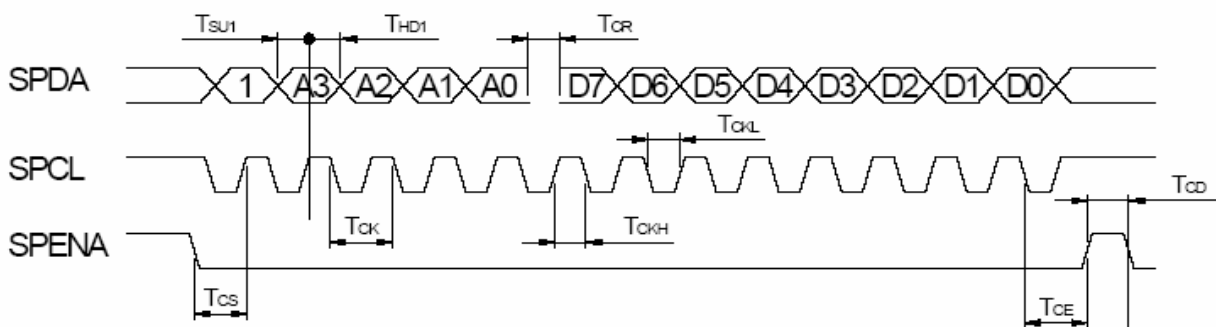


Fig. 4-(a) Horizontal timing

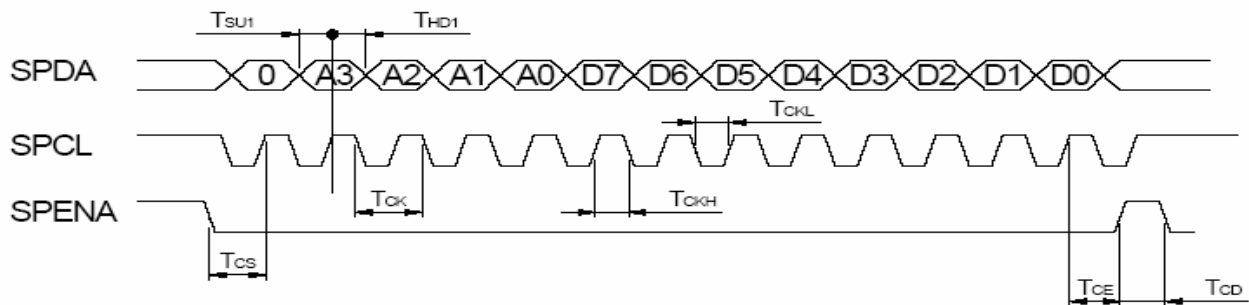
## 7.10. SPI timing characteristics

| Parameter                | Symbol    | Min. | Typ. | Max. | Unit     |
|--------------------------|-----------|------|------|------|----------|
| SPCL period              | $T_{CK}$  | 60   | -    | -    | ns       |
| SPCL high width          | $T_{CKH}$ | 30   | -    | -    | ns       |
| SPCL low width           | $T_{CKL}$ | 30   | -    | -    | ns       |
| Data setup time          | $T_{SU1}$ | 12   | -    | -    | ns       |
| Data hold time           | $T_{HD1}$ | 12   | -    | -    | ns       |
| SPENA to SPCK setup time | $T_{CS}$  | 20   | -    | -    | ns       |
| SPENA to SPDA hold time  | $T_{CE}$  | 20   | -    | -    | ns       |
| SPENA high pulse width   | $T_{CD}$  | 50   | -    | -    | ns       |
| SPDA output latency      | $T_{CR}$  | -    | 1/2  | -    | $T_{CK}$ |

### ● SPI "read" timing

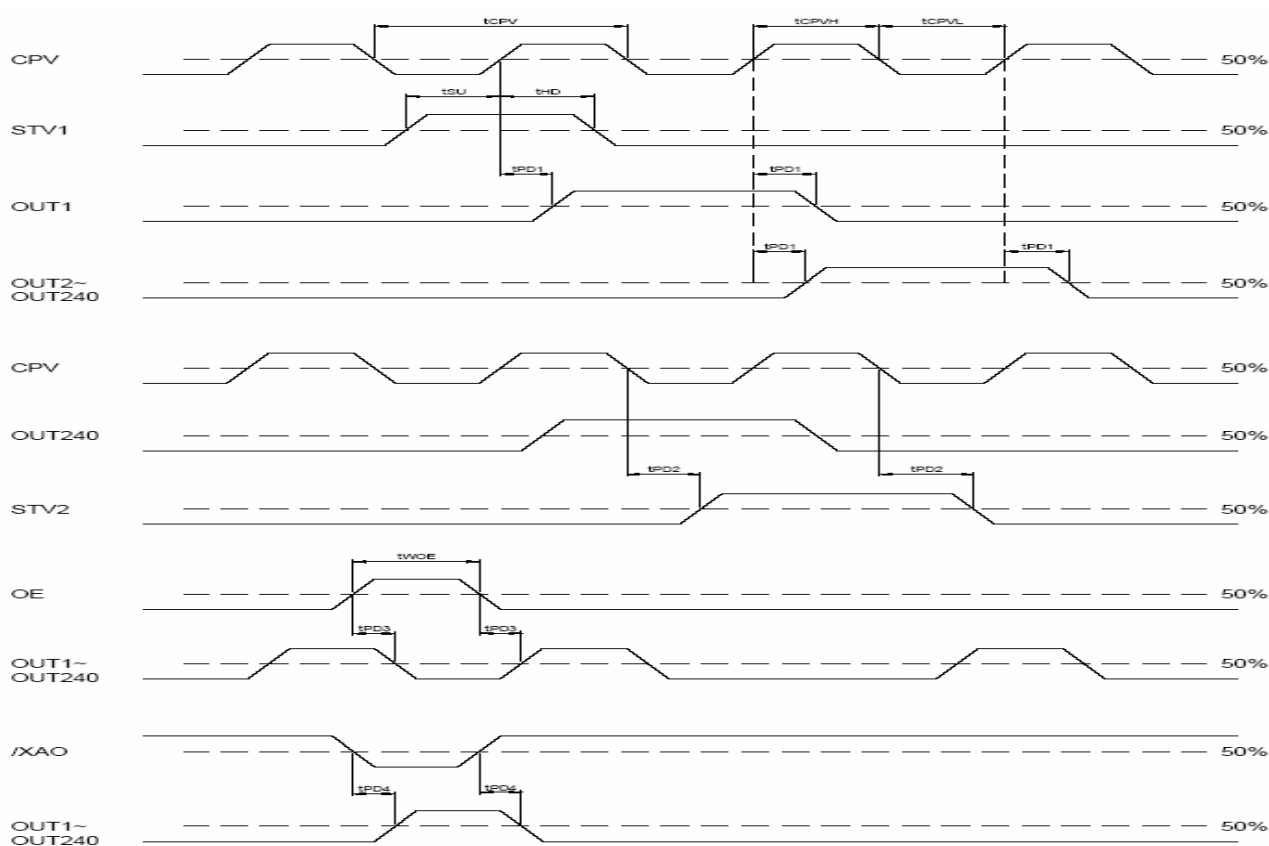


### ● SPI "write" timing



## 7.11. Gate Driver Timing Chart

| Parameter           | Symbol      | Condition     | Spec |      | Unit |
|---------------------|-------------|---------------|------|------|------|
|                     |             |               | Min. | Max. |      |
| Operation frequency | tCPV        | -             | 5    | -    | us   |
| CPV pulse width     | tCPVH,tCPVL | 50%duty cycle | 2.5  | -    |      |
| OE pulse width      | twOE        | -             | 1    | -    |      |
| Data setup time     | tsu         | -             | 0.4  | -    | us   |
| Data hold time      | thd         | -             | 0.7  | -    |      |
| Output delay time   | tpd1        | CL=300pF      | -    | 1    |      |
| Output delay time   | tpd2        | CL=300pF      | -    | 0.8  |      |
| Output delay time   | tpd3        | CL=300pF      | -    | 0.8  |      |
| Output delay time   | tpd4        | CL=300pF      | -    | 10   |      |



## 8.Optical Characteristics

| Item               |       | Symbol     | Condition.                                | Min  | Typ. | Max. | Unit              | Remark            |
|--------------------|-------|------------|-------------------------------------------|------|------|------|-------------------|-------------------|
| Response time      |       | Tr         | $\theta = 0^{\circ}$ 、 $\Phi = 0^{\circ}$ | -    | 15   | 30   | .ms               | Note 3,5          |
|                    |       | Tf         |                                           | -    | 35   | 50   | .ms               |                   |
| Contrast ratio     |       | CR         | At optimized viewing angle                | 150  | 200  | -    | -                 | Note 4,5          |
| Color Chromaticity | White | Wx         | $\theta = 0^{\circ}$ 、 $\Phi = 0$         | 0.27 | 0.32 | 0.37 |                   | Note 2,6,7        |
|                    |       | Wy         |                                           | 0.30 | 0.35 | 0.40 |                   |                   |
| Viewing angle      | Hor.  | $\Theta$ R | $CR \geq 10$                              | 60   | 70   |      | Deg.              | Note 1            |
|                    |       | $\Theta$ L |                                           | 60   | 70   |      |                   |                   |
|                    | Ver.  | $\Phi$ T   |                                           | 40   | 50   |      |                   |                   |
|                    |       | $\Phi$ B   |                                           | 60   | 70   |      |                   |                   |
| Brightness         |       | -          | -                                         | 280  | 350  |      | cd/m <sup>2</sup> | Center of display |

Ta=25±2℃, IL=140mA

Note 1: Definition of viewing angle range

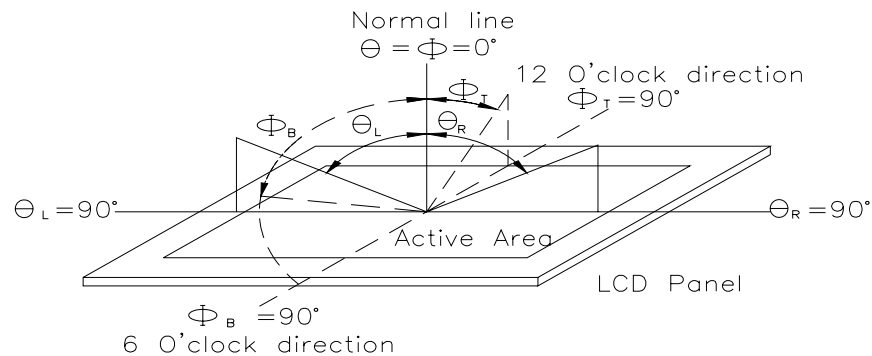


Fig.8.1. Definition of viewing angle

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 or BM-5 luminance meter 1.0° field of view at a distance of 50cm and normal direction.

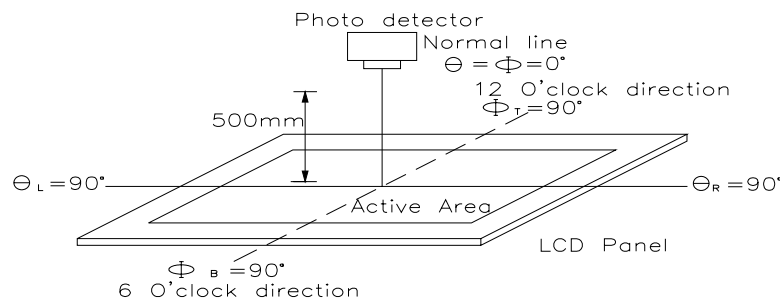


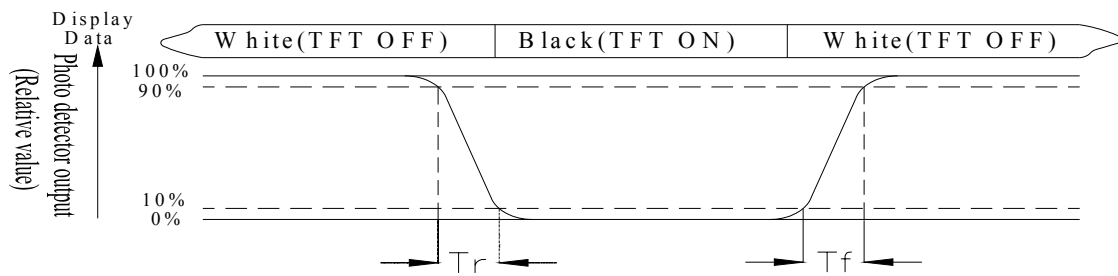
Fig.8.2. Optical measurement system setup

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, Tr, 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: White  $V_i = V_{i50} \pm 1.5V$

Black  $V_i = V_{i50} \pm 2.0V$

“±” means that the analog input signal swings in phase with VCOM signal.

“±” means that the analog input signal swings out of phase with VCOM signal.

The 100% transmission is defined as the transmission of LCD panel when all the input terminals of module are electrically opened.

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.

# 9.Interface

## 9.1. LCM PIN Definition

| Pin | Symbol | Function                                         | Remark |
|-----|--------|--------------------------------------------------|--------|
| 1   | IF1    | Input data format control                        | Note1  |
| 2   | IF2    | Input data format control                        | Note1  |
| 3   | POL    | Polarity Signal connect to VCOM driving circuit. | Note3  |
| 4   | RESET  | Hardware reset                                   |        |
| 5   | SPENA  | Chip select                                      | Note2  |
| 6   | SPCL   | Serial Clock                                     | Note2  |
| 7   | SPDA   | Serial Data                                      |        |
| 8   | B0     | Blue Data bit                                    |        |
| 9   | B1     | Blue Data bit                                    |        |
| 10  | B2     | Blue Data bit                                    |        |
| 11  | B3     | Blue Data bit                                    |        |
| 12  | B4     | Blue Data bit                                    |        |
| 13  | B5     | Blue Data bit                                    |        |
| 14  | B6     | Blue Data bit                                    |        |
| 15  | B7     | Blue Data bit                                    |        |
| 16  | G0     | Green Data bit                                   |        |
| 17  | G1     | Green Data bit                                   |        |
| 18  | G2     | Green Data bit                                   |        |
| 19  | G3     | Green Data bit                                   |        |
| 20  | G4     | Green Data bit                                   |        |
| 21  | G5     | Green Data bit                                   |        |
| 22  | G6     | Green Data bit                                   |        |
| 23  | G7     | Green Data bit                                   |        |
| 24  | R0     | Red Data bit                                     |        |
| 25  | R1     | Red Data bit                                     |        |

|    |              |                                                            |          |
|----|--------------|------------------------------------------------------------|----------|
| 26 | R2           | Red Data bit                                               |          |
| 27 | R3           | Red Data bit                                               |          |
| 28 | R4           | Red Data bit                                               |          |
| 29 | R5           | Red Data bit                                               |          |
| 30 | R6           | Red Data bit                                               |          |
| 31 | R7           | Red Data bit                                               |          |
| 32 | Hsync        | Horizontal synchronous signal                              |          |
| 33 | Vsync        | Vertical synchronous signal                                |          |
| 34 | Data CLK     | Dot data clock                                             |          |
| 35 | AVDD(analog) | Analog power: 4.5V~5.5V                                    |          |
| 36 | AVDD(analog) | Analog power: 4.5V~5.5V                                    |          |
| 37 | VCC(Digital) | Digital power: 3V~3.6V                                     |          |
| 38 | VCC(Digital) | Digital power: 3V~3.6V                                     |          |
| 39 | NPC          | NTSC/PAL mode Auto detection result H:NTSC/L:PAL           |          |
| 40 | VGL          | Gate off power                                             |          |
| 41 | VGL          | Gate off power                                             |          |
| 42 | UD           | Up/down selection                                          | Note 5,6 |
| 43 | VGH          | Gate on power                                              |          |
| 44 | LRC          | Shift direction of device internal shift register control. | Note 5,6 |
| 45 | GND          | System ground pin of the IC.<br>Connect to system ground.  |          |
| 46 | VCOM         | VCOM driving input                                         | Note3    |
| 47 | VCOM         | VCOM driving input                                         |          |
| 48 | ENB          | Signal to settle the horizontal display position           | Note4    |
| 49 | GND          | System ground pin of the IC.<br>Connect to system ground.  |          |
| 50 | GND          | System ground pin of the IC.<br>Connect to system ground.  |          |

Note1: Control the input data format.

| IF2,IF1      | Input data format |
|--------------|-------------------|
| L,L(default) | Serial RGB        |
| L,H          | Parallel RGB      |
| H,L          | CCIR601           |
| H,H          | CCIR656           |

Note 2: Pin 5、Pin 6 usually pull high.

Note 3: The polarity of VCOM (Pin 46,47) should be generated from POL (Pin 3).

Note 4: For digital RGB input data format, both SYNC mode and DE+SYNC mode are supported. If ENB signal is fixed low, SYNC mode is used. Otherwise, DE+SYNC mode is used.

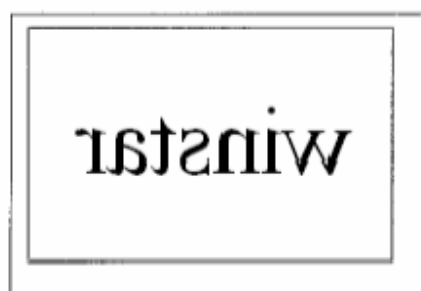
Note 5: Selection of scanning mode

| Setting of scan control input |     | Scanning direction        |
|-------------------------------|-----|---------------------------|
| U/D                           | L/R |                           |
| L                             | H   | Up to down, left to right |
| H                             | L   | Down to up, right to left |
| L                             | L   | Up to down, right to left |
| H                             | H   | Down to up, left to right |

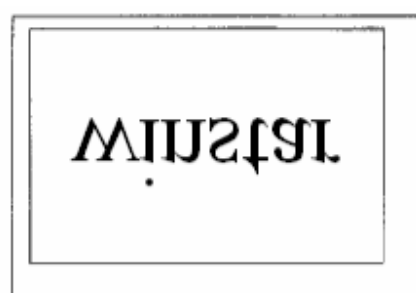
Note 6: Definition of scanning direction Refer to the figure as below:



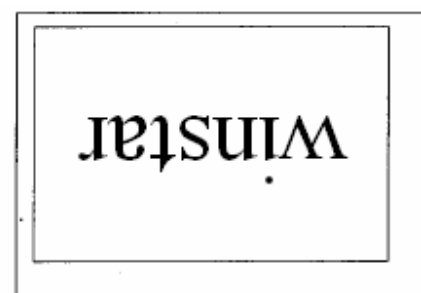
U/D=L, L/R=H



U/D=L, L/R=L

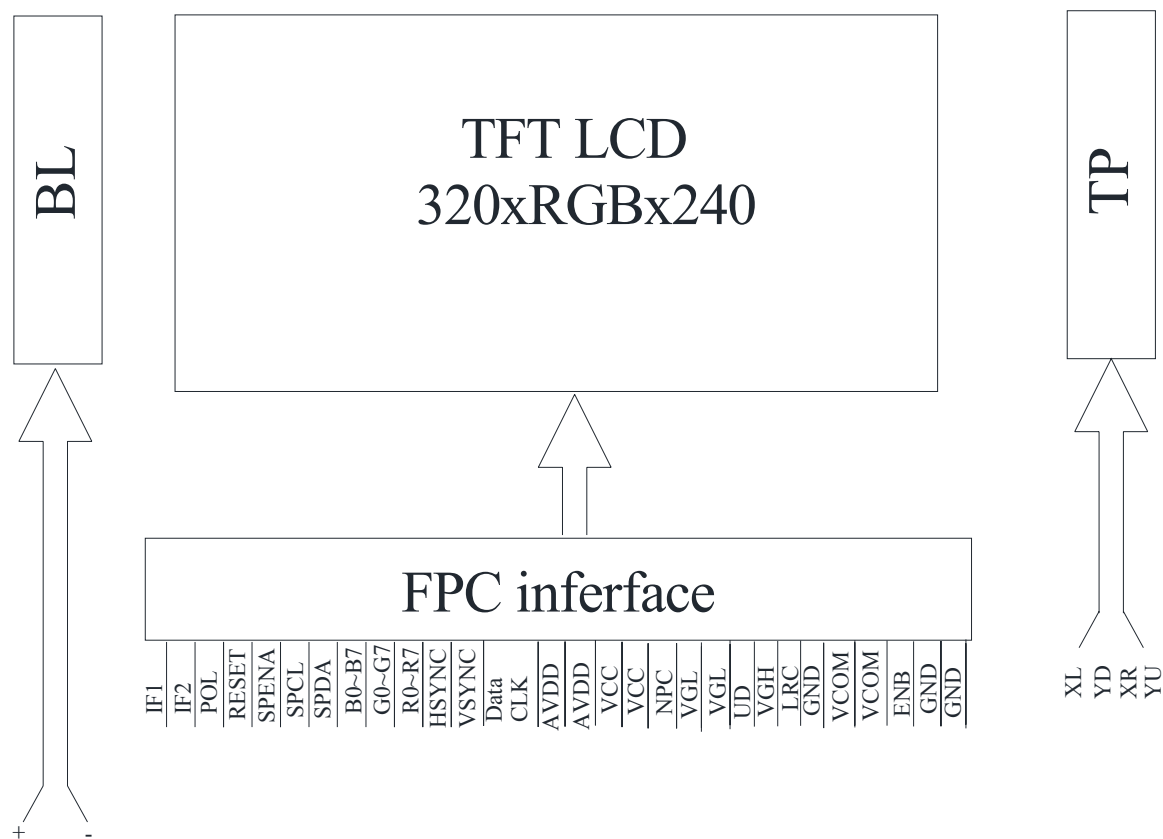


U/D=H, L/R=H



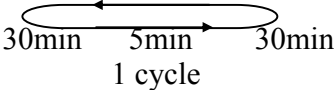
U/D=H, L/R=L

# 10.Block Diagram



# 11. Reliability

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

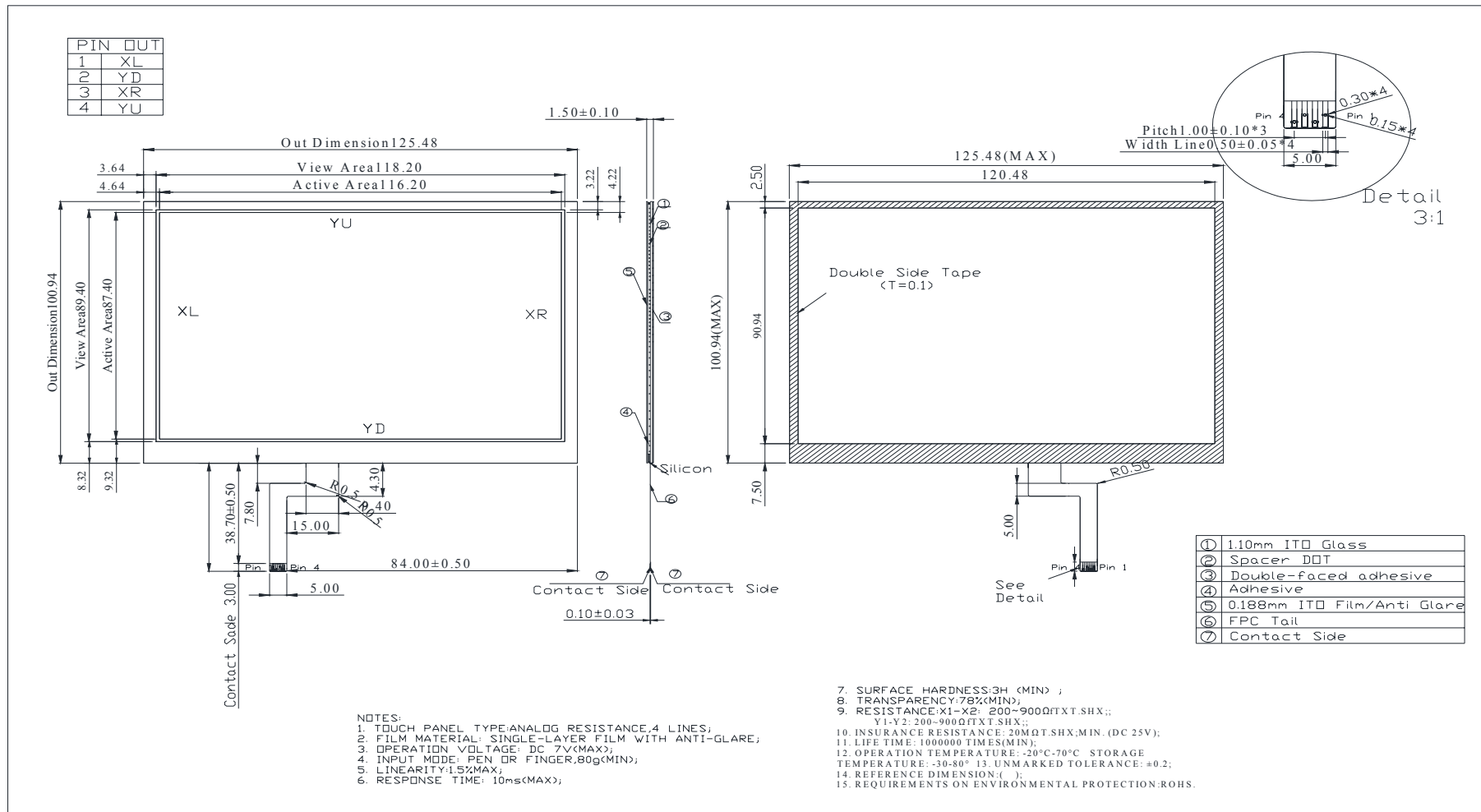
| Environmental Test                      |                                                                                                                                                                                                                                                           |                                                                                                                                    |      |
|-----------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------|------|
| Test Item                               | Content of Test                                                                                                                                                                                                                                           | Test Condition                                                                                                                     | Note |
| High Temperature storage                | Endurance test applying the high storage temperature for a long time.                                                                                                                                                                                     | 80°C<br>200hrs                                                                                                                     | 2    |
| Low Temperature storage                 | Endurance test applying the low storage temperature for a long time.                                                                                                                                                                                      | -30°C<br>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<br>200hrs                                                                                                                     | —    |
| Low Temperature Operation               | Endurance test applying the electric stress under low temperature for a long time.                                                                                                                                                                        | -20°C<br>200hrs                                                                                                                    | 1    |
| High Temperature/<br>Humidity Operation | The module should be allowed to stand at 60 °C,90%RH max<br>For 96hrs under no-load condition excluding the polarizer, Then taking it out and drying it at normal temperature.                                                                            | 60°C,90%RH<br>96hrs                                                                                                                | 1,2  |
| Thermal shock resistance                | The sample should be allowed stand the following 10 cycles of operation<br><br><div style="text-align: center;">           -20°C      25°C      70°C<br/><br/>  </div> | -20°C/70°C<br>10 cycles                                                                                                            | —    |
| Vibration test                          | Endurance test applying the vibration during transportation and using.                                                                                                                                                                                    | Total fixed amplitude : 15mm<br>Vibration Frequency : 10~55Hz<br>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,<br>RS=1.5kΩ<br>CS=100pF<br>1 time                                                                                         | —    |

Note1: No dew condensation to be observed.

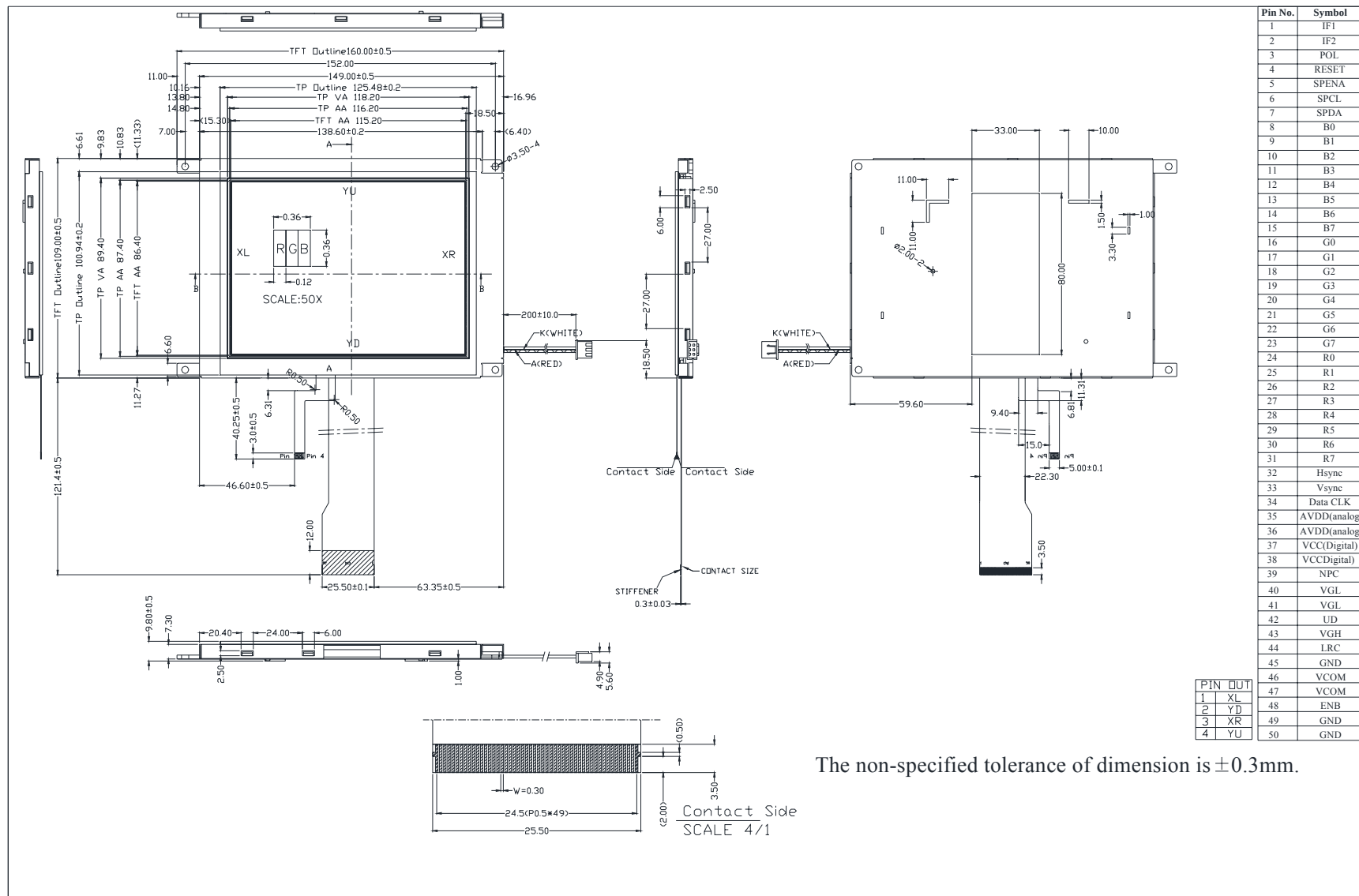
Note2: The function test shall be conducted after 4 hours storage at the normal Temperature and humidity after remove from the test chamber.

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

# 12.Touch Panel Information



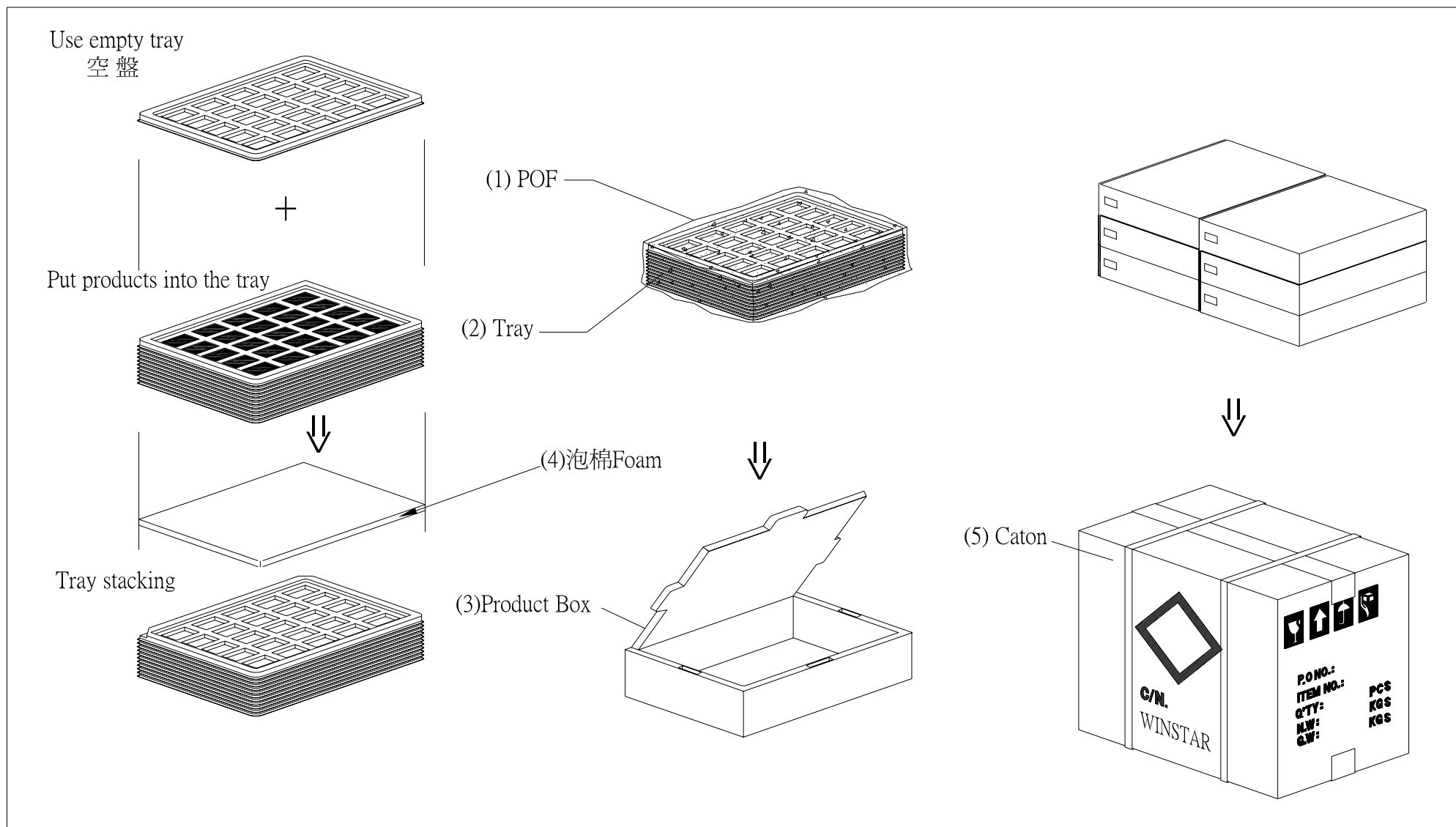
# 13. Contour Drawing





## 14. PACKAGE SPECIFICATION

|                                                                             |                       |                                                              |               |                                                                    |                                                               |                                                               |
|-----------------------------------------------------------------------------|-----------------------|--------------------------------------------------------------|---------------|--------------------------------------------------------------------|---------------------------------------------------------------|---------------------------------------------------------------|
| <div>LCM ModelWF57BTIACDNT0#</div> <div>Drawing NO.</div>                   |                       | <div>LCM 包裝規格書</div> <div>LCM Packaging Specifications</div> |               | <div>Approve</div> <div></div> <div>DATE</div> <div>14'02/07</div> | <div>Check</div> <div></div> <div>初版</div> <div>13'7/23</div> | <div>Contact</div> <div></div> <div>版次 Ver</div> <div>A</div> |
| 1.包裝材料規格表（Packaging Material）:(per carton)                                  |                       |                                                              |               |                                                                    |                                                               |                                                               |
| NO.                                                                         | Item                  | Model                                                        | Dimensions    | Quantity                                                           |                                                               |                                                               |
| 1                                                                           | 成品（LCM）               | WF57BTIACDNT0#                                               |               | 60                                                                 |                                                               |                                                               |
| 2                                                                           | TRAY 盤 (2)            | PKCA1XXXXXXXXXXXX0183                                        | 315mm*265mm   | 30                                                                 |                                                               |                                                               |
| 3                                                                           | BP01 內盒(3)Product Box | PK3Y1XXXXXXXXXXXX0001                                        | 332*280*100mm | 6                                                                  |                                                               |                                                               |
| 4                                                                           | 泡棉(4)Foam             | -----                                                        |               | 6                                                                  |                                                               |                                                               |
| 5                                                                           | 外紙箱(5)Carton          | PK4X1XXXXXXXXXXXX0000                                        | 565*340*320mm | 1                                                                  |                                                               |                                                               |
| 6                                                                           |                       |                                                              |               |                                                                    |                                                               |                                                               |
| 7                                                                           |                       |                                                              |               |                                                                    |                                                               |                                                               |
| 8                                                                           |                       |                                                              |               |                                                                    |                                                               |                                                               |
| 9                                                                           |                       |                                                              |               |                                                                    |                                                               |                                                               |
| 2.單箱數量規格表(Packaging Specifications and Quantity)：                           |                       |                                                              |               |                                                                    |                                                               |                                                               |
| (1)LCM quantity per box：no per tray2x no of tray5 = 10                      |                       |                                                              |               |                                                                    |                                                               |                                                               |
| (2)Total LCM quantity in carton：quantity per box10x no of boxes6 = 60       |                       |                                                              |               |                                                                    |                                                               |                                                               |
| 特 記 事 項 (REMARK)                                                            |                       |                                                              |               |                                                                    |                                                               |                                                               |
| 1. Label Specifications：                                                    |                       |                                                              |               |                                                                    |                                                               |                                                               |
| <div>MOOEL:</div> <div>LOT NO：</div> <div>QUANTITY:</div> <div>CHECK:</div> |                       |                                                              |               |                                                                    |                                                               |                                                               |





winstar

## LCM Sample Estimate Feedback Sheet

Module Number : \_\_\_\_\_

Page: 1

### **1、Panel Specification :**

- |                            |                               |                                     |
|----------------------------|-------------------------------|-------------------------------------|
| 1. Panel Type :            | <input type="checkbox"/> Pass | <input type="checkbox"/> NG , _____ |
| 2. View Direction :        | <input type="checkbox"/> Pass | <input type="checkbox"/> NG , _____ |
| 3. Numbers of Dots :       | <input type="checkbox"/> Pass | <input type="checkbox"/> NG , _____ |
| 4. View Area :             | <input type="checkbox"/> Pass | <input type="checkbox"/> NG , _____ |
| 5. Active Area :           | <input type="checkbox"/> Pass | <input type="checkbox"/> NG , _____ |
| 6. Operating Temperature : | <input type="checkbox"/> Pass | <input type="checkbox"/> NG , _____ |
| 7. Storage Temperature :   | <input type="checkbox"/> Pass | <input type="checkbox"/> NG , _____ |
| 8. Others :                | _____                         |                                     |

### **2、Mechanical Specification :**

- |                             |                               |                                     |
|-----------------------------|-------------------------------|-------------------------------------|
| 1. PCB Size :               | <input type="checkbox"/> Pass | <input type="checkbox"/> NG , _____ |
| 2. Frame Size :             | <input type="checkbox"/> Pass | <input type="checkbox"/> NG , _____ |
| 3. Material of Frame :      | <input type="checkbox"/> Pass | <input type="checkbox"/> NG , _____ |
| 4. Connector Position :     | <input type="checkbox"/> Pass | <input type="checkbox"/> NG , _____ |
| 5. Fix Hole Position :      | <input type="checkbox"/> Pass | <input type="checkbox"/> NG , _____ |
| 6. Backlight Position :     | <input type="checkbox"/> Pass | <input type="checkbox"/> NG , _____ |
| 7. Thickness of PCB :       | <input type="checkbox"/> Pass | <input type="checkbox"/> NG , _____ |
| 8. Height of Frame to PCB : | <input type="checkbox"/> Pass | <input type="checkbox"/> NG , _____ |
| 9. Height of Module :       | <input type="checkbox"/> Pass | <input type="checkbox"/> NG , _____ |
| 10. Others :                | <input type="checkbox"/> Pass | <input type="checkbox"/> NG , _____ |

### **3、Relative Hole Size :**

- |                             |                               |                                     |
|-----------------------------|-------------------------------|-------------------------------------|
| 1. Pitch of Connector :     | <input type="checkbox"/> Pass | <input type="checkbox"/> NG , _____ |
| 2. Hole size of Connector : | <input type="checkbox"/> Pass | <input type="checkbox"/> NG , _____ |
| 3. Mounting Hole size :     | <input type="checkbox"/> Pass | <input type="checkbox"/> NG , _____ |
| 4. Mounting Hole Type :     | <input type="checkbox"/> Pass | <input type="checkbox"/> NG , _____ |
| 5. Others :                 | <input type="checkbox"/> Pass | <input type="checkbox"/> NG , _____ |

### **4、Backlight Specification :**

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

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



Winstar      Module Number : \_\_\_\_\_

Page: 2

**5、Electronic Characteristics of Module :**

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

**6、Summary :**

Sales signature : \_\_\_\_\_

Customer Signature : \_\_\_\_\_

Date :        /        /