

Version :1.0

TECHNICAL SPECIFICATION

MODEL NO. : PD064VL1

Customer's Confirmation

Customer \_\_\_\_\_



Date \_\_\_\_\_

By \_\_\_\_\_

PVI's Confirmation

**FOR MORE INFORMATION:**

AZ DISPLAYS, INC.  
 75 COLUMBIA, ALISO VIEJO, CA, 92656  
[Http://www.AZDISPLAYS.com](http://www.AZDISPLAYS.com)

| Dep  | FAE   | Panel Design   | Electronic Design                                  | Mechanical Design     | Product Verification | Prepared by   |
|------|---|----------------|--|-----------------------|----------------------|---|
| SIGN |  | 吳漢銘<br>6/2 '06 | 施建嘉<br>6/1 '06<br>楊文翰<br>6/1 '06<br>金聖坤<br>6/2 '06 | 林育生<br>6/1 '06<br>申峰州 | 張天龍                  |  |

# TECHNICAL SPECIFICATION

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## 1. Application

This product applies computer peripheral , industrial meter , image communication and multi-media.

## 2. Features

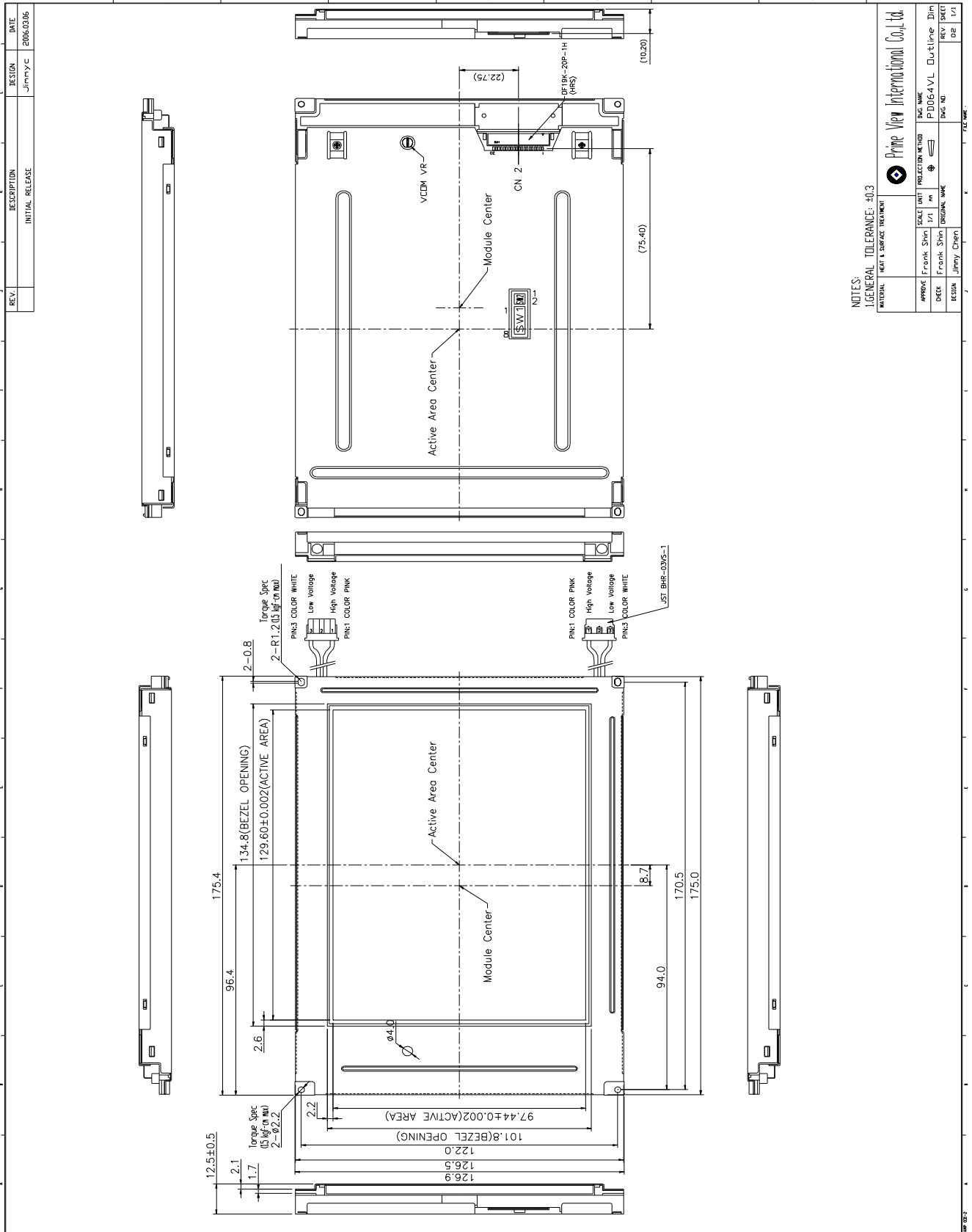
- . Support the DENB mode, Sync mode (Hsync+Vsync)
- . Pixel in stripe configuration
- . Slim and compact
- . Display Colors : 262,144 colors
- . Image Reversion : Up/Down and Left/Right
- . Viewing Direction : 6 o'clock
- . Backlight lamps are Replaceable

## 3. Mechanical Specifications

| Parameter           | Specifications                      | Unit |
|---------------------|-------------------------------------|------|
| Screen Size         | 6.4 (diagonal)                      | inch |
| Display Format      | 640×(R,G,B )×480                    | dot  |
| Active Area         | 129.6 (H)×97.44 (V)                 | mm   |
| Pixel Pitch         | 0.2025 (H)×0.203 (V)                | mm   |
| Pixel Configuration | Stripe                              |      |
| Surface Treatment   | Anti – Glare &Wide View film        |      |
| Outline Dimension   | 175.4 (W)×126.9 (H)×12.5 (D) (Typ.) | mm   |
| Weight              | 332±10                              | g    |

4. Mechanical Drawing of TFT-LCD Module

Outline Drawing : Front View (unit mm)



NOTES:  
1. GENERAL TOLERANCE: ±0.3

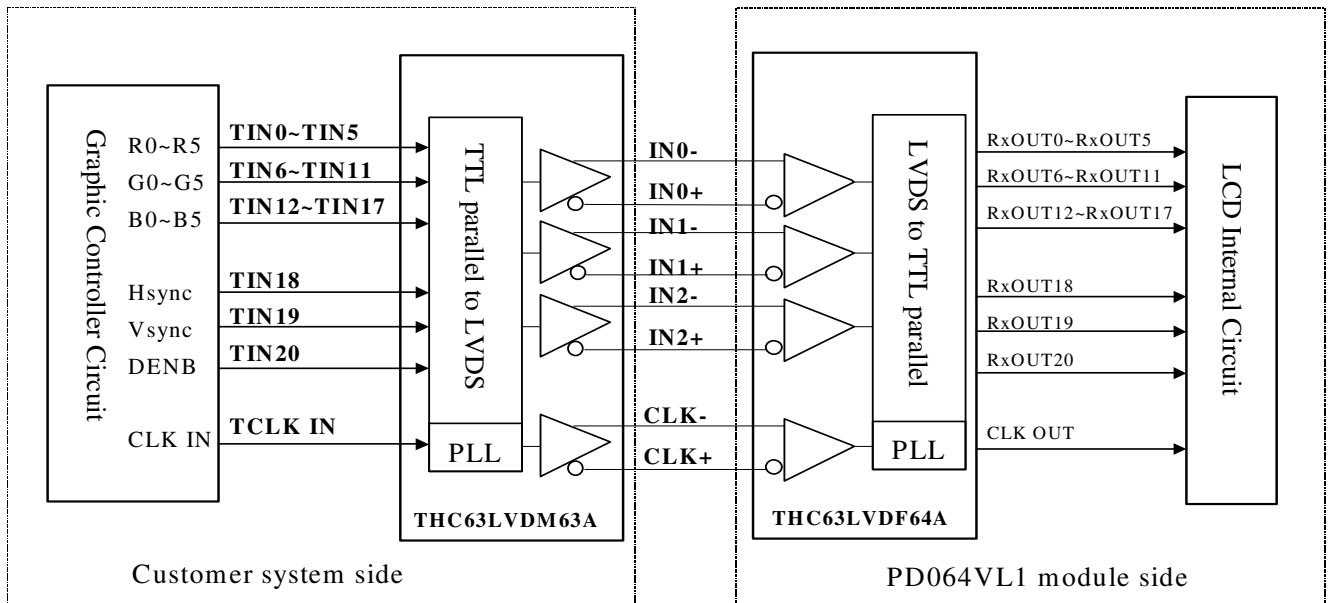
|                                    |                 |
|------------------------------------|-----------------|
| PRIME VIEW INTERNATIONAL CO., LTD. |                 |
| APPROVE                            | DATE            |
| DESIGN                             | 2006-03-06      |
| DESCRIPTION                        | INITIAL RELEASE |
| REV.                               |                 |
| PRIME VIEW INTERNATIONAL CO., LTD. |                 |
| SCALE                              | 1/1             |
| PROJECTION METHOD                  | Outline         |
| DWG. NO.                           | PD064VL         |
| REV. SHEET                         | 02              |
| DESIGNER                           | JIMMY CHEN      |
| CHECKER                            | JIMMY CHEN      |
| DATE                               | 2006-03-06      |

### 5.Input Terminals

5-1) TFT-LCD Panel Driving  
 Connector type: DFL19K-20P-1H(HRS)

| Pin No. | Symbol | Function                       | Remark |
|---------|--------|--------------------------------|--------|
| 1       | Vcc    | +3.3V Power Supply             |        |
| 2       | Vcc    | +3.3V Power Supply             |        |
| 3       | GND    | Ground                         |        |
| 4       | GND    | Ground                         |        |
| 5       | INO-   | LVDS receiver signal channel 0 |        |
| 6       | INO+   | LVDS receiver signal channel 0 |        |
| 7       | GND    | Ground                         |        |
| 8       | IN1-   | LVDS receiver signal channel 1 |        |
| 9       | IN1+   | LVDS receiver signal channel 1 |        |
| 10      | GND    | Ground                         |        |
| 11      | IN2-   | LVDS receiver signal channel 2 |        |
| 12      | IN2+   | LVDS receiver signal channel 2 |        |
| 13      | GND    | Ground                         |        |
| 14      | CLK-   | LVDS receiver signal clock     |        |
| 15      | CLK+   | LVDS receiver signal clock     |        |
| 16      | GND    | Ground                         |        |
| 17      | NC     | No connection                  |        |
| 18      | NC     | No connection                  |        |
| 19      | GND    | Ground                         |        |
| 20      | GND    | Ground                         |        |

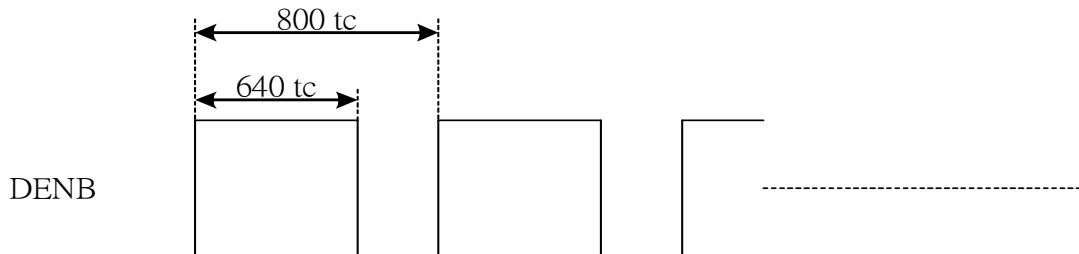
LVDS Interface Block Diagram



Recommended Transmitter (THC63LVDM63A Thine) to PD064VL1 interface Assignment:

| Input terminal of THC63LVDM63A |     | Graphic controller output signal |                                 | Output signal symbol   | To PM070WL1 interface terminal (Symbol) |
|--------------------------------|-----|----------------------------------|---------------------------------|------------------------|---|
| Symbol                         | No. | Symbol                           | Function                        |                        |   |
| TIN0                           | 44  | R0                               | Red pixel data (LSB)            | } Tout0-<br>} Tout0+   | No.5 : IN0-<br>No.6 : IN0+              |
| TIN1                           | 45  | R1                               | Red pixel data                  |                        |   |
| TIN2                           | 47  | R2                               | Red pixel data                  |                        |   |
| TIN3                           | 48  | R3                               | Red pixel data                  |                        |   |
| TIN4                           | 1   | R4                               | Red pixel data                  |                        |   |
| TIN5                           | 3   | R5                               | Red pixel data(MSB)             |                        |   |
| TIN6                           | 4   | G0                               | Green pixel data (LSB)          | } Tout1-<br>} Tout1+   | No.8 : IN1-<br>No.9 : IN1+              |
| TIN7                           | 6   | G1                               | Green pixel data                |                        |   |
| TIN8                           | 7   | G2                               | Green pixel data                |                        |   |
| TIN9                           | 9   | G3                               | Green pixel data                |                        |   |
| TIN10                          | 10  | G4                               | Green pixel data                |                        |   |
| TIN11                          | 12  | G5                               | Green pixel data(MSB)           |                        |   |
| TIN12                          | 13  | B0                               | Blue pixel data(LSB)            | } Tout2-<br>} Tout2+   | No.11 : IN2-<br>No.12 : IN2+            |
| TIN13                          | 15  | B1                               | Blue pixel data                 |                        |   |
| TIN14                          | 16  | B2                               | Blue pixel data                 |                        |   |
| TIN15                          | 18  | B3                               | Blue pixel data                 |                        |   |
| TIN16                          | 19  | B4                               | Blue pixel data                 |                        |   |
| TIN17                          | 20  | B5                               | Blue pixel data(MSB)            |                        |   |
| TIN18                          | 22  | Hsync                            | Horizontal Synchronous Signal   |                        |   |
| TIN19                          | 23  | Vsync                            | Vertical Synchronous Signal     |                        |   |
| TIN20                          | 25  | DENB                             | Compound Synchronization signal |                        |   |
| CLK in                         | 26  | CLK                              | Data sampling clock             | TCLK out-<br>TCLK out+ | No.14 : CLK<br>No.15 : CLK              |

DENB input signal.



If customer wanted to off the DENB mode , you must keep the DENB always High or Low.

(tc: the period of sampling clock)

**6. Absolute Maximum Ratings :**

The followings are maximum values , which if exceeded, may cause faulty operation or damage to the unit.

GND=0V, Ta=25°C

| Parameters            | Symbol           | MIN. | MAX.                 | Unit | Remark   |
|-----------------------|------------------|------|----------------------|------|----------|
| Supply Voltage        | V <sub>CC</sub>  | -0.3 | +7.0                 | V    |          |
| Input Signals Voltage | V <sub>sig</sub> | -0.3 | V <sub>CC</sub> +0.3 | V    | Note 6-1 |

Note 6-1 : Input signals include CLK , Hsync , Vsync , DENB , R[0:5] , G[0:5] and B[0:5].

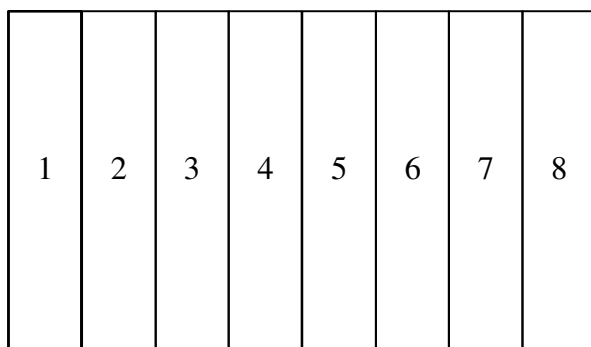
**7. Electrical Characteristics**

**7-1) Recommended Operating Conditions:**

GND = 0V , Ta = 25°C

| Item                                   | Symbol          | Min. | Typ. | Max. | Unit | Remark   |
|--|-----------------|------|------|------|------|----------|
| Supply Voltage                         | V <sub>cc</sub> | 3.0  | 3.3  | 3.6  | V    |          |
| Current Dissipation                    | I <sub>cc</sub> | -    | 175  | 185  | mA   | Note 7-1 |
| LVDS Differential input high threshold | V <sub>TH</sub> | -    | -    | 100  | mV   | Note7-2  |
| LVDS Differential input low threshold  | V <sub>TL</sub> | -100 | -    | -    |      |          |

Note 7-1 : To test the current dissipation of VCC using the “color bars” testing pattern shown as below



1. White
2. Yellow
3. Cyan
4. Green
5. Magenta
6. Red
7. Blue
8. Black

Idd current dissipation testing pattern

Note7-2 : Please refers to THC63LVDF64A specification by THINE Corporation. This LCD module conforms to LVDS standard.

**7-2) Recommended Driving Condition for Back Light**

Ta=25°C

| Item   | Symbol | Min. | Typ. | Max. | Unit | Remark    |
|--|--------|------|------|------|------|-----------|
| Lamp Current                                 | $I_L$  | 3    | 6    | 7    | mA   | Note 6-3  |
| Lamp Voltage                                 | $V_L$  | 330  | 360  | 390  | Vrms | $I_L=6mA$ |
| Lamp frequency                               | $P_L$  | 35   | 40   | 45   | KHz  | Note 7-4  |
| Starting voltage(25°C)<br>(Reference Value)  | $V_s$  | -    | -    | 523  | Vrms | Note 7-5  |
| Starting voltage(0°C)<br>(Reference Value)   | $V_s$  | -    | -    | 682  | Vrms | Note 7-5  |
| Starting voltage(-20°C)<br>(Reference Value) | $V_s$  | -    | -    | 870  | Vrms | Note 7-5  |

Note 7-3 : In order to satisfy the quality of B/L , no matter use what kind of inverter , the output lamp current must between Min. and Max. to avoid the abnormal display image caused by B/L.

Note 7-4: The waveform of lamp driving voltage should be as closed to a perfect SIN wave as possible.

Note 7-5 : The" Max of starting voltage " means the minimum voltage of inverter to turn on the CCFL. and it should be applied to the lamp for more than 1 second to start up. Otherwise the lamp may not be turned on.

Backlight driving connector : JST BHR-03VS-1 , 3 Pins , Pitch : 4 mm

| Pin No | Symbol | Description                       | Remark   |
|--------|--------|-----------------------------------|----------|
| 1      | VL1    | Input terminal (Hi voltage side)  |          |
| 2      | NC     | No Connection                     |          |
| 3      | VL2    | Input terminal (Low voltage side) | Note 6-6 |

Note 7-6 : Low voltage side of backlight inverter connects with ground of inverter circuits.

**7-3) Power Consumption**

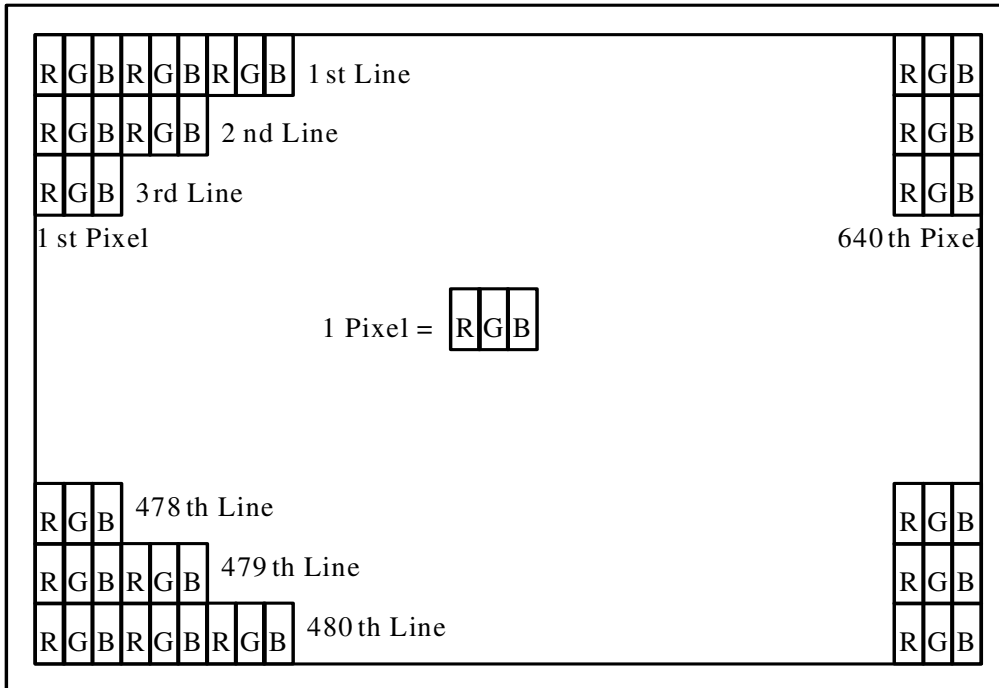
| Parameters                           | Symbol | Typ. | Max. | Unit | Remark   |
|--------------------------------------|--------|------|------|------|----------|
| LCD Panel Power Consumption(W/O B/L) | -      | 0.5  | 0.6  | W    |          |
| Backlight Power Consumption          | -      | 4.32 | -    | W    | Note 6-7 |

Note 6-7: Backlight lamp power consumption is calculated by  $I_L \times V_L$ .



### 8. Pixel Arrangement

The LCD module pixel arrangement is the stripe.

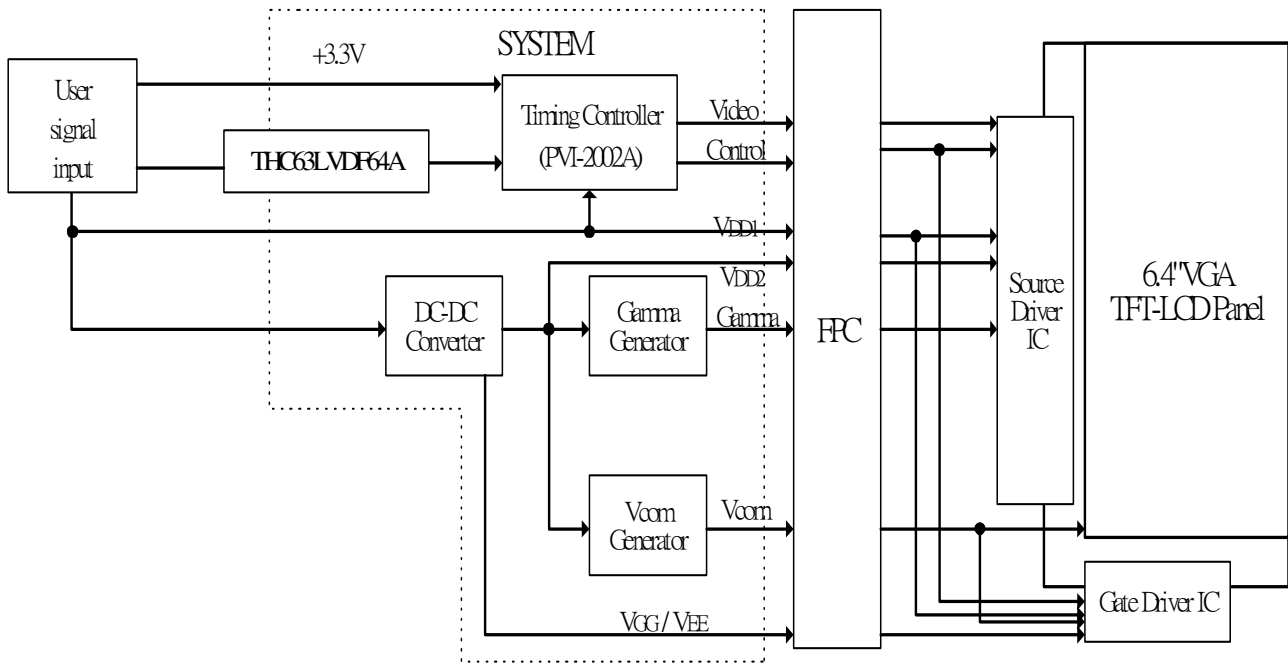


## 9. Display Color and Gray Scale Reference

| Color        |            | Input Color Data |    |    |    |    |       |    |    |    |    |      |    |    |    |    |    |    |    |
|--------------|------------|------------------|----|----|----|----|-------|----|----|----|----|------|----|----|----|----|----|----|----|
|              |            | Red              |    |    |    |    | Green |    |    |    |    | Blue |    |    |    |    |    |    |    |
|              |            | R5               | R4 | R3 | R2 | R1 | R0    | G5 | G4 | G3 | G2 | G1   | G0 | B5 | B4 | B3 | B2 | B1 | B0 |
| Basic Colors | Black      | 0                | 0  | 0  | 0  | 0  | 0     | 0  | 0  | 0  | 0  | 0    | 0  | 0  | 0  | 0  | 0  | 0  | 0  |
|              | Red (63)   | 1                | 1  | 1  | 1  | 1  | 1     | 0  | 0  | 0  | 0  | 0    | 0  | 0  | 0  | 0  | 0  | 0  | 0  |
|              | Green (63) | 0                | 0  | 0  | 0  | 0  | 0     | 1  | 1  | 1  | 1  | 1    | 1  | 0  | 0  | 0  | 0  | 0  | 0  |
|              | Blue (63)  | 0                | 0  | 0  | 0  | 0  | 0     | 0  | 0  | 0  | 0  | 0    | 0  | 1  | 1  | 1  | 1  | 1  | 1  |
|              | Cyan       | 0                | 0  | 0  | 0  | 0  | 0     | 1  | 1  | 1  | 1  | 1    | 1  | 1  | 1  | 1  | 1  | 1  | 1  |
|              | Magenta    | 1                | 1  | 1  | 1  | 1  | 1     | 0  | 0  | 0  | 0  | 0    | 0  | 1  | 1  | 1  | 1  | 1  | 1  |
|              | Yellow     | 1                | 1  | 1  | 1  | 1  | 1     | 1  | 1  | 1  | 1  | 1    | 1  | 0  | 0  | 0  | 0  | 0  | 0  |
|              | White      | 1                | 1  | 1  | 1  | 1  | 1     | 1  | 1  | 1  | 1  | 1    | 1  | 1  | 1  | 1  | 1  | 1  | 1  |
| Red          | Red (00)   | 0                | 0  | 0  | 0  | 0  | 0     | 0  | 0  | 0  | 0  | 0    | 0  | 0  | 0  | 0  | 0  | 0  | 0  |
|              | Red (01)   | 0                | 0  | 0  | 0  | 0  | 1     | 0  | 0  | 0  | 0  | 0    | 0  | 0  | 0  | 0  | 0  | 0  | 0  |
|              | Red (02)   | 0                | 0  | 0  | 0  | 1  | 0     | 0  | 0  | 0  | 0  | 0    | 0  | 0  | 0  | 0  | 0  | 0  | 0  |
|              | Darker     |                  |    |    |    |    |       |    |    |    |    |      |    |    |    |    |    |    |    |
|              | ↓          | ↓                | ↓  | ↓  | ↓  | ↓  | ↓     | ↓  | ↓  | ↓  | ↓  | ↓    | ↓  | ↓  | ↓  | ↓  | ↓  | ↓  | ↓  |
|              | Brighter   |                  |    |    |    |    |       |    |    |    |    |      |    |    |    |    |    |    |    |
|              | Red (61)   | 1                | 1  | 1  | 1  | 0  | 1     | 0  | 0  | 0  | 0  | 0    | 0  | 0  | 0  | 0  | 0  | 0  | 0  |
|              | Red (62)   | 1                | 1  | 1  | 1  | 1  | 0     | 0  | 0  | 0  | 0  | 0    | 0  | 0  | 0  | 0  | 0  | 0  | 0  |
| Red (63)     | 1          | 1                | 1  | 1  | 1  | 1  | 0     | 0  | 0  | 0  | 0  | 0    | 0  | 0  | 0  | 0  | 0  | 0  |    |
| Green        | Green (00) | 0                | 0  | 0  | 0  | 0  | 0     | 0  | 0  | 0  | 0  | 0    | 0  | 0  | 0  | 0  | 0  | 0  | 0  |
|              | Green (01) | 0                | 0  | 0  | 0  | 0  | 0     | 0  | 0  | 0  | 0  | 0    | 1  | 0  | 0  | 0  | 0  | 0  | 0  |
|              | Green (02) | 0                | 0  | 0  | 0  | 0  | 0     | 0  | 0  | 0  | 0  | 1    | 0  | 0  | 0  | 0  | 0  | 0  | 0  |
|              | Darker     |                  |    |    |    |    |       |    |    |    |    |      |    |    |    |    |    |    |    |
|              | ↓          | ↓                | ↓  | ↓  | ↓  | ↓  | ↓     | ↓  | ↓  | ↓  | ↓  | ↓    | ↓  | ↓  | ↓  | ↓  | ↓  | ↓  | ↓  |
|              | Brighter   |                  |    |    |    |    |       |    |    |    |    |      |    |    |    |    |    |    |    |
|              | Green (61) | 0                | 0  | 0  | 0  | 0  | 0     | 1  | 1  | 1  | 1  | 0    | 1  | 0  | 0  | 0  | 0  | 0  | 0  |
|              | Green (62) | 0                | 0  | 0  | 0  | 0  | 0     | 1  | 1  | 1  | 1  | 1    | 0  | 0  | 0  | 0  | 0  | 0  | 0  |
| Green (63)   | 0          | 0                | 0  | 0  | 0  | 0  | 1     | 1  | 1  | 1  | 1  | 1    | 0  | 0  | 0  | 0  | 0  | 0  |    |
| Blue         | Blue (00)  | 0                | 0  | 0  | 0  | 0  | 0     | 0  | 0  | 0  | 0  | 0    | 0  | 0  | 0  | 0  | 0  | 0  | 0  |
|              | Blue (01)  | 0                | 0  | 0  | 0  | 0  | 0     | 0  | 0  | 0  | 0  | 0    | 0  | 0  | 0  | 0  | 0  | 0  | 1  |
|              | Blue (02)  | 0                | 0  | 0  | 0  | 0  | 0     | 0  | 0  | 0  | 0  | 0    | 0  | 0  | 0  | 0  | 0  | 1  | 0  |
|              | Darker     |                  |    |    |    |    |       |    |    |    |    |      |    |    |    |    |    |    |    |
|              | ↓          | ↓                | ↓  | ↓  | ↓  | ↓  | ↓     | ↓  | ↓  | ↓  | ↓  | ↓    | ↓  | ↓  | ↓  | ↓  | ↓  | ↓  | ↓  |
|              | Brighter   |                  |    |    |    |    |       |    |    |    |    |      |    |    |    |    |    |    |    |
|              | Blue (61)  | 0                | 0  | 0  | 0  | 0  | 0     | 0  | 0  | 0  | 0  | 0    | 0  | 1  | 1  | 1  | 1  | 0  | 1  |
|              | Blue (62)  | 0                | 0  | 0  | 0  | 0  | 0     | 0  | 0  | 0  | 0  | 0    | 0  | 1  | 1  | 1  | 1  | 1  | 0  |
| Blue (63)    | 0          | 0                | 0  | 0  | 0  | 0  | 0     | 0  | 0  | 0  | 0  | 0    | 1  | 1  | 1  | 1  | 1  | 1  |    |

**10. Block Diagram**

**10-1) TFT-module Block Diagram**



## 11. Interface Timing

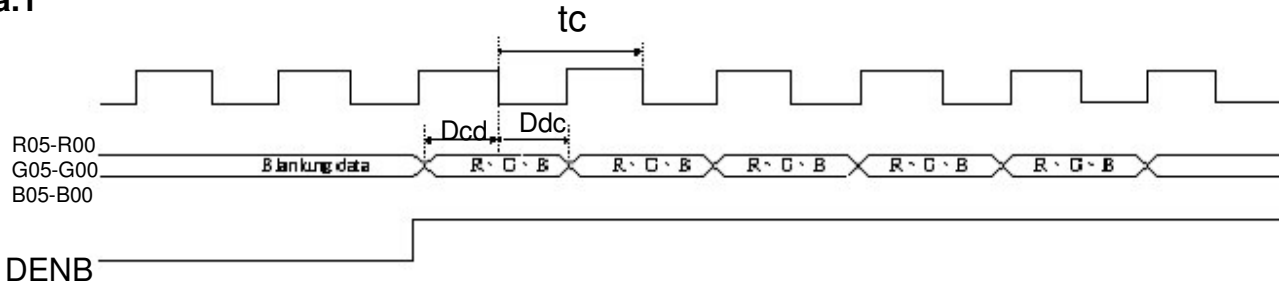
### 11.1) Timing Parameters

|              |                            | Symbol | Min. | Typ. | Max.  | Unit | Remark |  |
|--------------|----------------------------|--------|------|------|-------|------|--------|--|
| Power supply |                            | VCC    | 3.0  | 3.3  | 3.6   | V    |        |  |
| CLK          | Frequency                  | 1/tc   | -    | 25   | -     | MHz  |        |  |
|              |                            | tc     | -    | 40   | -     | ns   |        |  |
| HSYNC        | Period                     | Hp     | -    | 32   | -     | us   |        |  |
|              |                            |        | -    | 800  | -     | tc   |        |  |
|              | Display period             | Hdp    | -    | 640  | -     | tc   |        |  |
|              | Pulse width                | Hpw    | -    | 96   | -     | tc   |        |  |
|              | Back-porch                 | Hbp    | -    | 46   | -     | tc   |        |  |
|              | Front-porch                | Hfp    | -    | 18   | -     | tc   |        |  |
|              | Hpw+Hbp                    |        |      | -    | 142   | -    | tc     |  |
|              | Hsync-CLK                  | Hhc    | 10   | -    | Tc-10 | ns   |        |  |
|              | Vsync-Hsync                | Hvh    | 0    | 0    | 200   | tc   |        |  |
| VSYNC        | Period                     | Vp     | -    | 16.8 | -     | ms   |        |  |
|              |                            |        | -    | 525  | -     | Hp   |        |  |
|              | Display period             | Vdp    | -    | 480  | -     | Hp   |        |  |
|              | Pulse width                | Vpw    | -    | 2    | -     | Hp   |        |  |
|              | Back-porch                 | Vbp    | -    | 33   | -     | Hp   |        |  |
|              | Front-porch                | Vfp    | -    | 10   | -     | Hp   |        |  |
|              | Vpw+Vbp                    |        |      | -    | 35    | -    | Hp     |  |
| DENB         | Horizontal scanning period | T1     | -    | 800  | -     | tc   |        |  |
|              | Horizontal display period  | T2     | -    | 640  | -     | tc   |        |  |
|              | Vertical display period    | T3     | -    | 480  | -     | T1   |        |  |
|              | Frame cycling period       | T4     | 520  | 525  | 800   | T1   |        |  |
| R,G,B        | CLK-DATA                   | Dcd    | 10   | -    | -     | ns   |        |  |
|              | DATA-CLK                   | Ddc    | 8    | -    | -     | ns   |        |  |

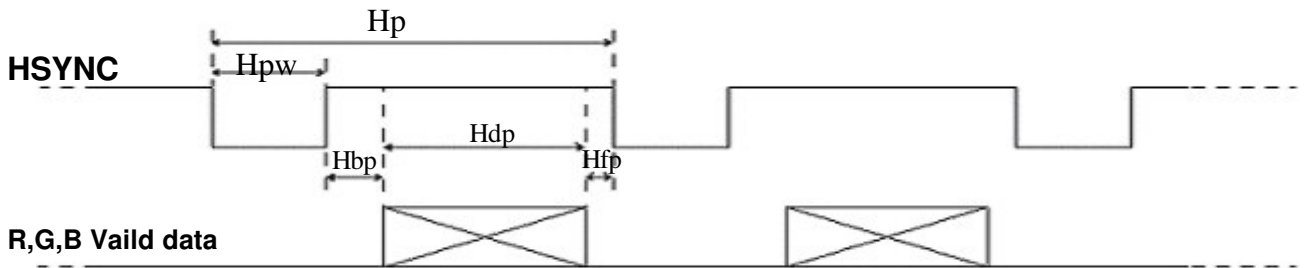
**11.2) The Timing Diagram**

**a. Input signal range**

**a.1**



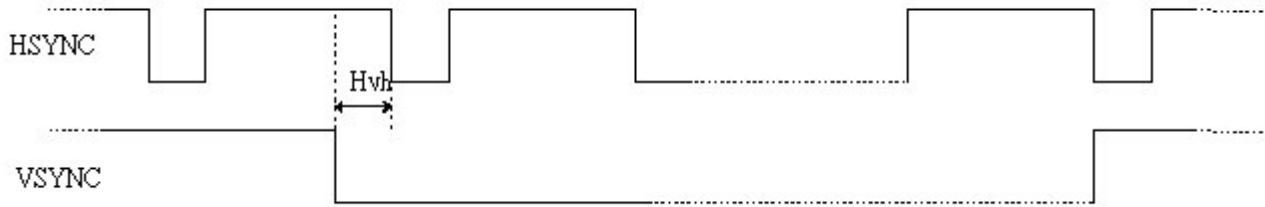
**a.2 HSYNC timing**



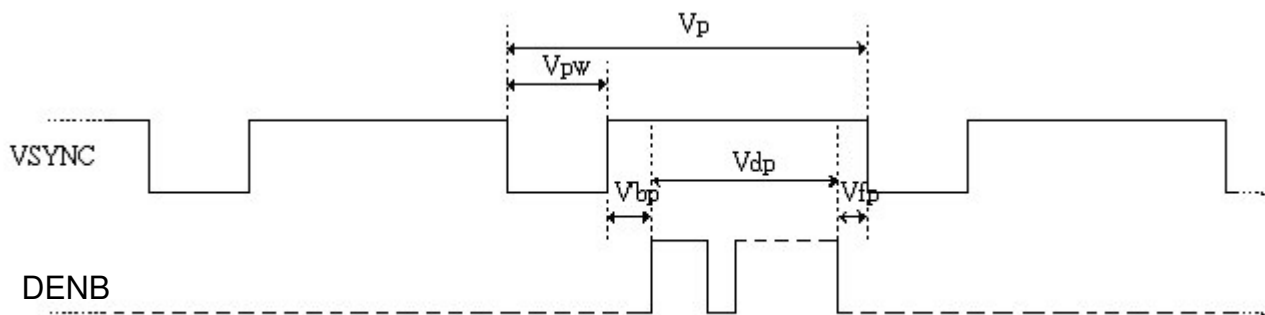
**a.3 CLK, HSYNC relationship**



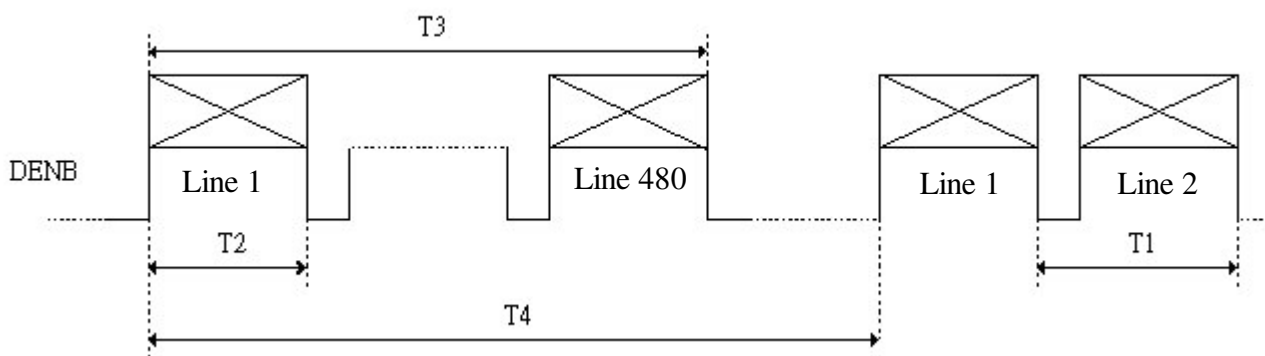
**a.4 HSYNC, VSYNC relationship**



**a.5 VSYNC timing**



**a.6 DENB timing**



**11-3) Control Board Dip Switch Format**

SW1(8 Pins)

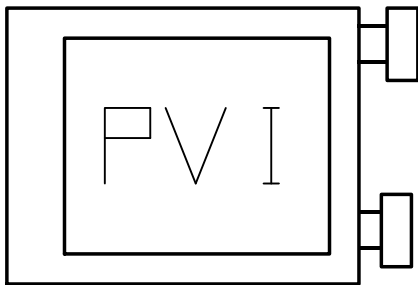
| Item   | Symbol | Condition                 | Remark        |
|--------|--------|---------------------------|---------------|
| SW 1-1 | -      | No connection             | Default (OFF) |
| SW 1-2 | HP3    | Horizontal Shift (8 Line) | Default (ON)  |
| SW 1-3 | HP2    | Horizontal Shift (4 Line) | Default (OFF) |
| SW 1-4 | HP1    | Horizontal Shift (2 Line) | Default (OFF) |
| SW 1-5 | HP0    | Horizontal Shift (1 Line) | Default (ON)  |
| SW 1-6 | VP2    | Vertical Shift (4 Line)   | Default (OFF) |
| SW 1-7 | VP1    | Vertical Shift (2 Line)   | Default (ON)  |
| SW 1-8 | VP0    | Vertical Shift (1Line)    | Default (ON)  |

1. The default state is base on Sync mode
2. Total horizontal shift line are 15 lines (HP0~HP3 on)  
Total vertical shift line are 7 lines (VP0~VP2 on)

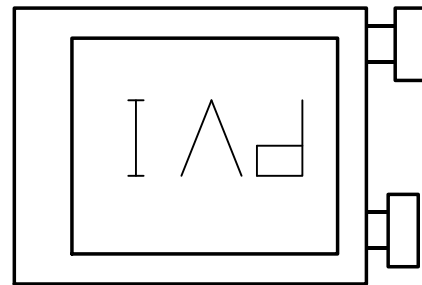
SW2 (2 Pins)

| Item   | Symbol | Condition                               | Remark |
|--------|--------|---|--------|
| SW 2-1 | UD     | Vertical Image Shift-direction Select   | ON     |
| SW 2-2 | RL     | Horizontal Image Shift-direction Select | OFF    |

The definitions of U/D & R/L

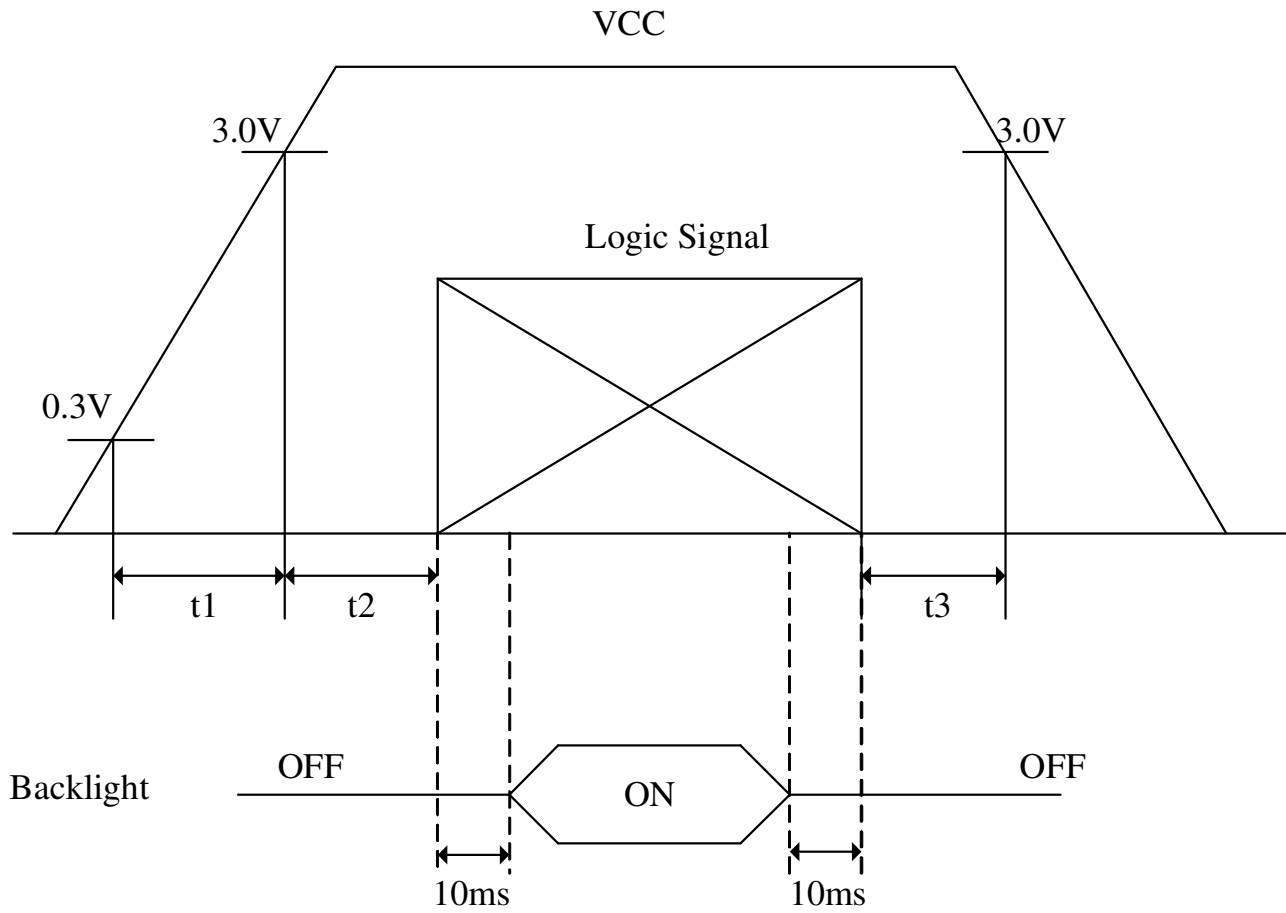


SW2-1=ON, SW2-2=OFF



SW2-1=OFF,SW2-2=ON

**12. Power On Sequence**



1.  $0 < t_1 \leq 20\text{ms}$
2.  $0 < t_2 \leq 50\text{ms}$
3.  $0 < t_3 \leq 1\text{s}$



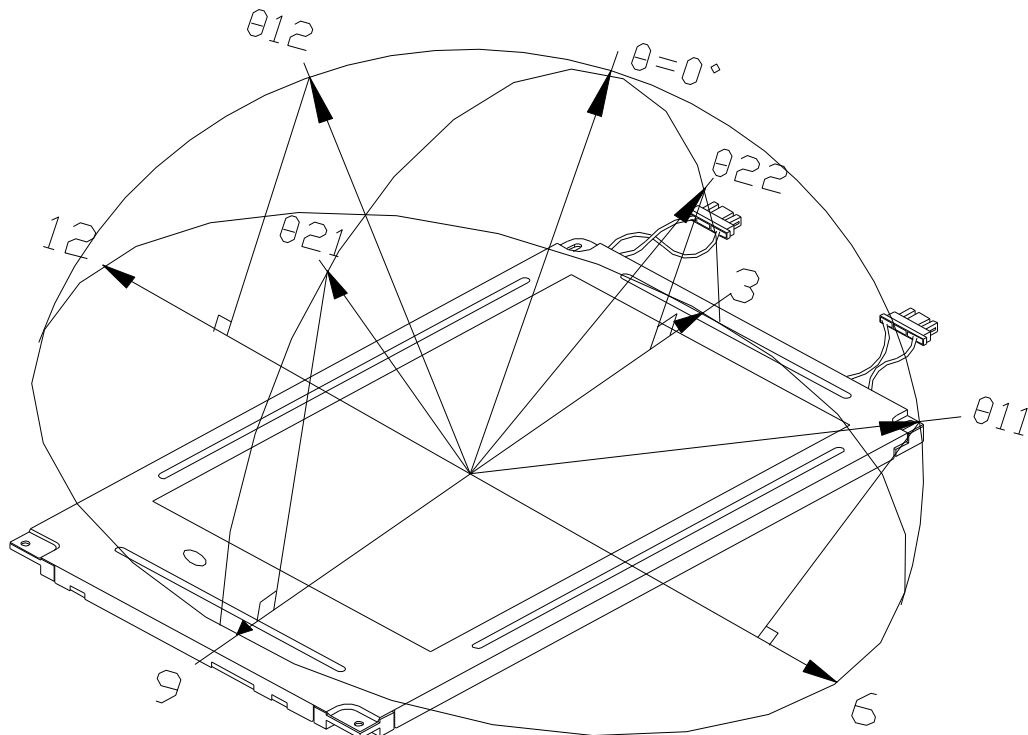
**13. Optical Characteristics**

**11-1) Specification:**

Ta=25°C

| Parameter          |            | Symbol                 | Condition                  | MIN.   | TYP.  | MAX.  | Unit              | Remarks   |
|--------------------|------------|------------------------|----------------------------|--------|-------|-------|-------------------|-----------|
| Viewing Angle      | Horizontal | $\theta 21, \theta 22$ | CR > 10                    | 55     | 60    | -     | deg               | Note 13-1 |
|                    | Vertical   | $\theta 12$            |                            | 35     | 40    | -     | deg               |           |
|                    |            | $\theta 11$            |                            | 50     | 55    | -     | deg               |           |
| Contrast Ratio     |            | CR                     | At optimized Viewing angle | 200    | 400   | -     | -                 | Note 13-2 |
| Response time      | Rise       | Tr                     | $\theta = 0^\circ$         | -      | 15    | 30    | ms                | Note 13-4 |
|                    | Fall       | Tf                     |                            | -      | 25    | 50    | ms                |           |
| Brightness         |            | L                      | $\theta = 0^\circ$         | 350    | 400   | -     | cd/m <sup>2</sup> | Note 13-3 |
| Transmission Ratio |            | T                      | $\theta = 0^\circ$         | 6.7    | 7.2   | -     | %                 |           |
| Uniformity         |            | U                      |                            | 75     | 80    | -     | %                 | Note 13-5 |
| Cross Talk         |            | -                      | $\theta = 0^\circ$         | -      | -     | 3     | %                 | Note 13-6 |
| White Chromaticity |            | x                      | $\theta = 0^\circ$         | 0.264  | 0.294 | 0.324 | -                 | Note 13-3 |
|                    |            | y                      |                            | 0.276  | 0.308 | 0.338 | -                 |           |
| Lamp Life Time     |            | -                      | +25°C                      | 50,000 | -     | -     | hr                |           |

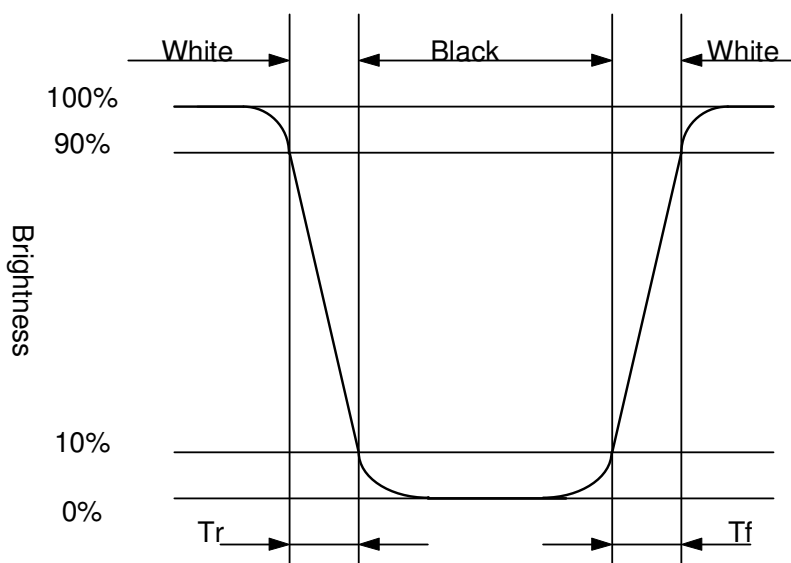
Note 13-1 : The definitions of viewing angle diagrams :



Note 13-2:  $CR = \frac{\text{Luminance when LCD is White}}{\text{Luminance when LCD is Black}}$   
 Contrast Ratio is measured in optimum common electrode voltage.

Note 13-3 : 1. Topcon BM-7 (fast) luminance meter 1° field of view is used in the testing (after 20~30 minutes operation).  
 2.Lamp current : 6 mA  
 3.Inverter model : TDK-347.

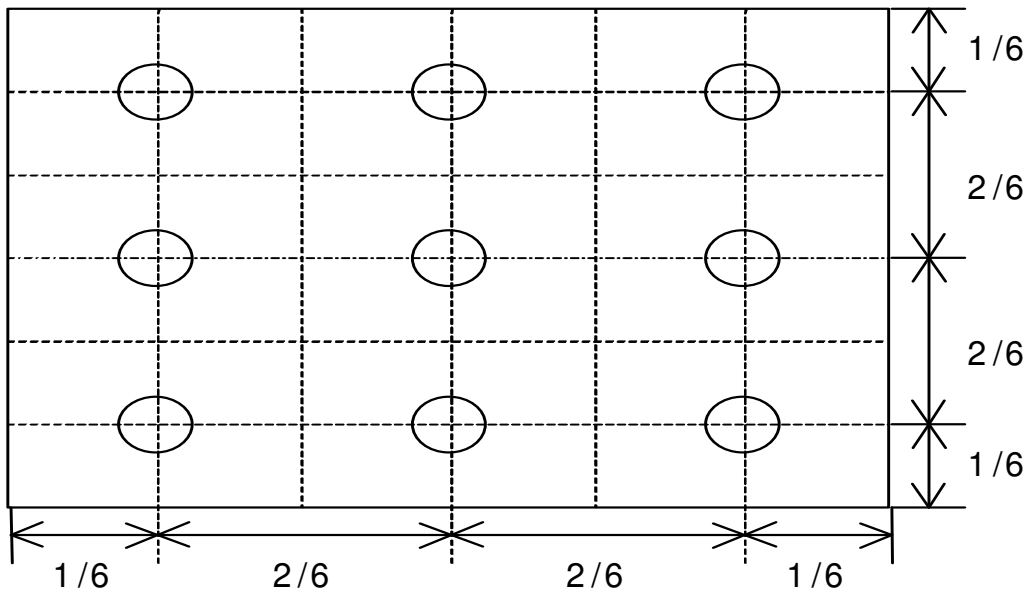
Note 13-4 : The definitions of response time



Note 13-5 : The uniformity of LCD is defined as  

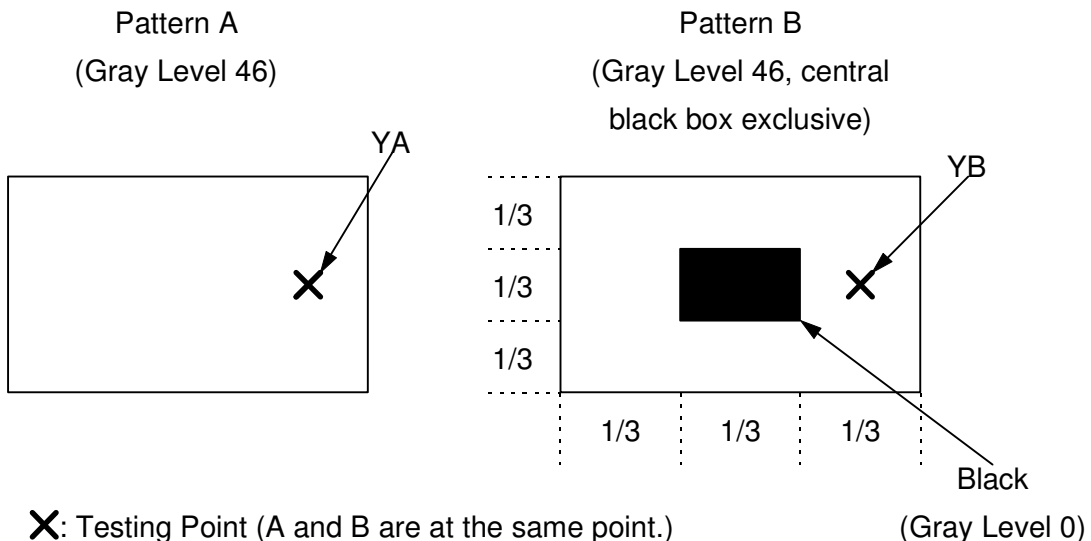
$$U = \frac{\text{The Minimum Brightness of the 9 testing Points}}{\text{The Maximum Brightness of the 9 testing Points}}$$
 Luminance meter : BM-5A or BM-7 fast (TOPCON)  
 Measurement distance : 500 mm +/- 50 mm  
 Ambient illumination : < 1 Lux  
 Measuring direction : Perpendicular to the surface of module

The test pattern is white (Gray Level 63).



Note13-6 : Cross Talk (CTK) =  $\frac{|YA-YB|}{YA} \times 100\%$

YA : Brightness of Pattern A  
 YB : Brightness of Pattern B



## 14. Handling Cautions

### 14-1) Mounting of module

- a) Please power off the module when you connect the input/output connector.
- b) Please connect the ground pattern of the inverter circuit surely. If the connection is not perfect, some following problems may happen possibly.
  - 1.The noise from the backlight unit will increase.
  - 2.The output from inverter circuit will be unstable.
  - 3.In some cases a part of module will heat.
- c) Polarizer which is made of soft material and susceptible to flaw must be handled carefully.
- d) Protective film (Laminator) is applied on surface to protect it against scratches and dirt. It is recommended to peel off the laminator before use and taking care of static electricity.

### 14-2) Precautions in mounting

- a) When metal part of the TFT-LCD module (shielding lid and rear case) is soiled, wipe it with soft dry cloth.
- b) Wipe off water drops or finger grease immediately. Long contact with water may cause discoloration or spots.
- c) TFT-LCD module uses glass which breaks or cracks easily if dropped or bumped on hard surface. Please handle with care.
- d) Since CMOS LSI is used in the module. So take care of static electricity and earth yourself when handling.

### 14-3) Adjusting module

- a) Adjusting volumes on the rear face of the module have been set optimally before shipment.
- b) Therefore, do not change any adjusted values. If adjusted values are changed, the specifications described may not be satisfied.

### 14-4) Others

- a) Do not expose the module to direct sunlight or intensive ultraviolet rays for many hours.
- b) Store the module at a room temperature place.
- c) The voltage of beginning electric discharge may over the normal voltage because of leakage current from approach conductor by to draw lump read lead line around.
- d) If LCD panel breaks, it is possibly that the liquid crystal escapes from the panel. Avoid putting it into eyes or mouth. When liquid crystal sticks on hands, clothes or feet. Wash it out immediately with soap.
- e) Observe all other precautionary requirements in handling general electronic components.
- f) Please adjust the voltage of common electrode as material of attachment by 1 module.

**15. Reliability Test**

| No | Test Item                                       | Test Condition  |
|----|---|---|
| 1  | High Temperature Storage Test                   | Ta = +80 °C, 240 hrs  |
| 2  | Low Temperature Storage Test                    | Ta = -30 °C, 240 hrs  |
| 3  | High Temperature Operation Test                 | Ta = +70 °C, 240 hrs  |
| 4  | Low Temperature Operation Test                  | Ta = -20 °C, 240 hrs  |
| 5  | High Temperature & High Humidity Operation Test | Ta = +60 °C, 90%RH, 240 hrs   |
| 6  | Thermal Cycling Test<br>(non-operating)         | -25°C → +70°C, 200 Cycles<br>30 min 30 min  |
| 7  | Shock Test<br>(non-operating)                   | Gravity :490m/s<br>Direction: ±X, ±Y, ±Z<br>Pulse Width :11ms, half sine wave   |
| 8  | Vibration Test<br>(non-operating)               | Frequency : 10 ~ 57 Hz/Vibration Width :0.075mm<br>58-500 H// Gravity :9.8m/s<br>Sweep time: 11 minutes<br>Test period: 3 hrs for each direction of X, Y, Z |
| 9  | Electrostatic Discharge Test<br>(non-operating) | 150pF, 330Ω<br>Air : ±15KV ; Contact : ±8KV<br>10 times/point , 9 points/panel face   |

Ta: ambient temperature

**[Criteria]**

1. Main LCD should normally work under the normally condition no defect of function, screen quality and appearance (including : mura ,line defect ,no image).
2. After the temperature and humidity test, the luminance and CR (Contrast ratio) ,should not be lower than minimum of specification.
3. After the vibration and shock test , can't be found chip broken.

**16. Packing Diagram**

| ZONE   | REV.       | DOCUMENT NO.      | DESCRIPTION | DATE   | REV. BY                                  |      |          |             |     |        |   |            |        |   |  |   |            |             |    |     |   |  |                 |    |      |   |            |         |   |       |
|--|------------|-------------------|-------------|--------|--|------|----------|-------------|-----|--------|---|------------|--------|---|--|---|------------|-------------|----|-----|---|--|-----------------|----|------|---|------------|---------|---|-------|
|  |            |                   |             |        |  |      |          |             |     |        |   |            |        |   |  |   |            |             |    |     |   |  |                 |    |      |   |            |         |   |       |
| <p><b>NOTE:</b></p> <p>1. QTY: 20 pcs panel/carton.</p> <p>2. Dimension: 530*295*230mm</p> <p>3. Weight: 9.1 Kg</p>  |            |                   |             |        |  |      |          |             |     |        |   |            |        |   |  |   |            |             |    |     |   |  |                 |    |      |   |            |         |   |       |
| <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th>ITEM</th> <th>PART NO.</th> <th>DESCRIPTION</th> <th>QTY</th> <th>REMARK</th> </tr> </thead> <tbody> <tr> <td>4</td> <td>50-0100111</td> <td>CARTON</td> <td>1</td> <td></td> </tr> <tr> <td>3</td> <td>50-0500131</td> <td>防靜電氣泡袋 Pink</td> <td>20</td> <td>抗靜電</td> </tr> <tr> <td>2</td> <td></td> <td>6.4" VGA Module</td> <td>20</td> <td>加下鐵蓋</td> </tr> <tr> <td>1</td> <td>50-0301041</td> <td>瓦楞隔板緩衝材</td> <td>1</td> <td>上蓋+底座</td> </tr> </tbody> </table> |            |                   |             |        |  | ITEM | PART NO. | DESCRIPTION | QTY | REMARK | 4 | 50-0100111 | CARTON | 1 |  | 3 | 50-0500131 | 防靜電氣泡袋 Pink | 20 | 抗靜電 | 2 |  | 6.4" VGA Module | 20 | 加下鐵蓋 | 1 | 50-0301041 | 瓦楞隔板緩衝材 | 1 | 上蓋+底座 |
| ITEM   | PART NO.   | DESCRIPTION       | QTY         | REMARK |  |      |          |             |     |        |   |            |        |   |  |   |            |             |    |     |   |  |                 |    |      |   |            |         |   |       |
| 4  | 50-0100111 | CARTON            | 1           |        |  |      |          |             |     |        |   |            |        |   |  |   |            |             |    |     |   |  |                 |    |      |   |            |         |   |       |
| 3  | 50-0500131 | 防靜電氣泡袋 Pink       | 20          | 抗靜電    |  |      |          |             |     |        |   |            |        |   |  |   |            |             |    |     |   |  |                 |    |      |   |            |         |   |       |
| 2  |            | 6.4" VGA Module   | 20          | 加下鐵蓋   |  |      |          |             |     |        |   |            |        |   |  |   |            |             |    |     |   |  |                 |    |      |   |            |         |   |       |
| 1  | 50-0301041 | 瓦楞隔板緩衝材           | 1           | 上蓋+底座  |  |      |          |             |     |        |   |            |        |   |  |   |            |             |    |     |   |  |                 |    |      |   |            |         |   |       |
| MTL.SPEC.  |            | UNSPECIFIED TOL'S |             | REMARK |  |      |          |             |     |        |   |            |        |   |  |   |            |             |    |     |   |  |                 |    |      |   |            |         |   |       |
|  |            | ANGLE             |             |        |  |      |          |             |     |        |   |            |        |   |  |   |            |             |    |     |   |  |                 |    |      |   |            |         |   |       |
|  |            | ROUGHNESS         |             |        |  |      |          |             |     |        |   |            |        |   |  |   |            |             |    |     |   |  |                 |    |      |   |            |         |   |       |
| APPROVE  | Franks     | '04.10.12         | SCALE       | UNIT   | SHEET                                    |      |          |             |     |        |   |            |        |   |  |   |            |             |    |     |   |  |                 |    |      |   |            |         |   |       |
| CHECK  | Franks     | '04.10.12         |             |        | 1 OF 1                                   |      |          |             |     |        |   |            |        |   |  |   |            |             |    |     |   |  |                 |    |      |   |            |         |   |       |
| DRAWN  | Jimmy      | '04.10.12         | MTL.NO.     |        | DWG FILE:                                |      |          |             |     |        |   |            |        |   |  |   |            |             |    |     |   |  |                 |    |      |   |            |         |   |       |
| 元太科技工業股份有限公司<br>Prime View International Co., Ltd.   |            |                   |             |        | DWG.TITLE<br>6.4"VGA Module Packing Draw |      |          |             |     |        |   |            |        |   |  |   |            |             |    |     |   |  |                 |    |      |   |            |         |   |       |
|  |            |                   |             |        | REV. 01<br>A4 SIZE                       |      |          |             |     |        |   |            |        |   |  |   |            |             |    |     |   |  |                 |    |      |   |            |         |   |       |

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## Revision History

| <b>Rev.</b> | <b>Issued Date</b> | <b>Revised Contents</b>  |
|-------------|--------------------|--|
| 0.1         | Mar.06 ,2006       | Preliminary  |
| 0.2         | May.25,2006        | Page 16<br>9. Optical Characteristic<br>9-1) Specification : lamp life time<br>from 20,000(typ)hrs modify to 50,000 (Min)<br>Modify:<br>.Page13 : Add interface timing ,and modify contents at Page 3. |
| 1.0         | June.08,2006       | Release Version  |