



## PRODUCT SPECIFICATION

*Part Number*

PT322457A-TLMWD-EM04

|                      |                             |
|----------------------|-----------------------------|
| CUSTOMER             |                             |
| CUSTOMER PART NUMBER |                             |
| DESCRIPTION          | 5.7" TFT LCD, Medium Bright |
| APPROVED BY          |                             |
| DATE                 |                             |

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|     |                                         |      |

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### 3. Module Numbering System

P T \_\_\_\_\_ - \_\_\_\_\_ - \_\_\_\_\_  
 1.      2.      3.      4.      5.      6.      7.      8.      9      10.   11.   12.   13.   14.

#### 1. P-TEC TFT

#### 2. LENGTH x WIDTH PIXELS

If third character is a zero, it is removed to shorten part number. Example: 240 x 320 = PT3224

#### 3. DIAGONAL DIMENSIONS

Example: 3.5" display = 35 in part number

#### 4. PRODUCT VERSION

Series assigned by P-tec

#### 5. LCD MODE

T: TN  
I: IPS  
V: VA

#### 6. POLARIZER

LM: Transmissive  
LF: Transflective

#### 7. BACKLIGHT COLOR

No Backlight: Left Blank  
W: White  
B: Blue/Green  
S: Yellow/Green

#### 8. VIEWING DIRECTION

D: 6 o'clock  
U: 12 o'clock  
F: Full Viewing Angle

#### 9. A ~ Z CODE

Assigned by P-tec

#### 11. TEMPERATURE RANGE

Normal: Left Blank  
Wide: X

#### 12. LUMINANCE

Blank: Normal (<300 nit)  
M: Middle (>= 300 nit)  
H: High (> 600 nit)

#### 13. TOUCH PANEL OPTION

No TP: Left Blank  
C: Capacitive TP  
R: Resistive TP

#### 14. SPECIAL CHARACTERS

Customer special requirements



#### 4. Application

This specification is applied to the 5.7 inch QVGA supported TFT-LCD module, and can display true 262,144 colors(6 bit/ color). The module is designed for OA, Car TV application and other electronic products which require flat panel display of digital signal interface. This module is composed of a 5.7" TFT-LCD panel, a driver circuit and LED backlight unit.

#### 5. Features

- QVGA (320×240 pixels) resolution.
- Digital 18 bit parallel RGB.
- Line inversion mode with stripe type.
- DE mode

#### 6. General Specifications

| Item                | Specifications                                                  | Unit |
|---------------------|-----------------------------------------------------------------|------|
| Screen Size         | 5.7 (Diagonal)                                                  | inch |
| Display Format      | 320RGB(H)×240(V)                                                | dot  |
| Active Area         | 115.2(H)×86.4(V)                                                | mm   |
| Dot Size            | 0.120(H)×0.360(V)                                               | mm   |
| Pixel Configuration | RGB Vertical Stripe                                             | -    |
| Display Mode        | TN Type<br>Transmissive Mode<br>Normally White                  | -    |
| Surface Treatment   | Anti-Glare                                                      | -    |
| Viewing Direction   | 6 O'clock<br>(The Gray Inversion will appear at this direction) | -    |
| Outline Dimension   | 167.0(W)×109.0(H)×8.9(D)                                        | mm   |
| Weight              | 196.5                                                           | g    |



## 7. Absolute Maximum Ratings

### 7.1 Absolute Ratings of Environment

| Item                          | Symbol          | Value |      | Unit | Note |
|-------------------------------|-----------------|-------|------|------|------|
|                               |                 | Min.  | Max. |      |      |
| Storage Temperature           | T <sub>ST</sub> | -30   | +80  | °C   | (1)  |
| Operating Ambient Temperature | T <sub>OP</sub> | -20   | +70  | °C   | (1)  |

Note (1) Temperature and relative humidity range are shown in the figure below.

(a) 90%RH Max. ( $T_a \leq 40^\circ\text{C}$ ).

(b) Wet-bulb temperature should be 39°C Max. ( $T_a > 40^\circ\text{C}$ ).

(c) No condensation.

### 7.2 Electrical Absolute Ratings

#### 7.2.1 TFT-LCD Module

( $T_a = 25 \pm 2^\circ\text{C}$ , GND=VSS=0V)

| Item                         | Symbol | Value |      | Unit | Note |
|------------------------------|--------|-------|------|------|------|
|                              |        | Min.  | Max. |      |      |
| Digital Power Supply Voltage | VCC    | -0.3  | 4.3  | V    | -    |

#### 7.2.2 Backlight Unit

( $T_a = 25 \pm 2^\circ\text{C}$ )

| Item                      | Symbol         | Value |      | Unit | Note |
|---------------------------|----------------|-------|------|------|------|
|                           |                | Min.  | Max. |      |      |
| Current of Backlight Unit | I <sub>B</sub> | -     | 75   | mA   | (1)  |
| Voltage of Backlight Unit | V <sub>B</sub> | -     | 30   | V    | (1)  |

Note (1) Permanent damage to the device may occur if maximum values are exceeded or reverse voltage is loaded.

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## 8. Electrical Characteristics

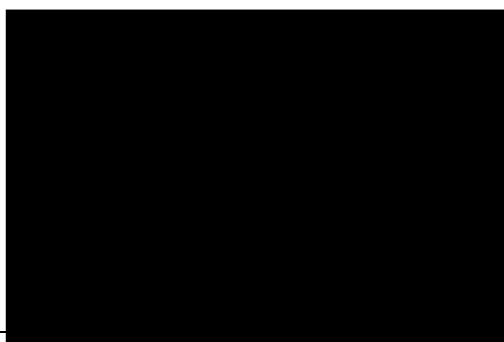
### 8.1 TFT-LCD Module

(Ta=25±2°C)

| Item                         | Symbol         | Value  |        |        | Unit | Note |
|------------------------------|----------------|--------|--------|--------|------|------|
|                              |                | Min.   | Typ.   | Max.   |      |      |
| Power Supply Voltage         | VCC            | 3.0    | 3.3    | 3.6    | V    | -    |
| Input High Threshold Voltage | VIH            | 0.7VCC | -      | VCC    | V    | -    |
| Input Low Threshold Voltage  | VIL            | 0      | -      | 0.3VCC | V    | -    |
| Power Consumption            | P <sub>L</sub> |        | (0.24) |        | W    | (1)  |
| Frame Frequency              | F <sub>V</sub> | -      | 60     | -      | Hz   | -    |
| Dot Clock                    | DCLK           | -      | 6.4    | 7      | MHz  | -    |

Note (1) The specified power consumption is under the conditions at VCC=3.3V,  
F<sub>V</sub>=60Hz, whereas a power dissipation check pattern below is displayed.

Black Pattern / 0 Gray



### 8.2 Backlight Unit

(Ta=25±2°C)

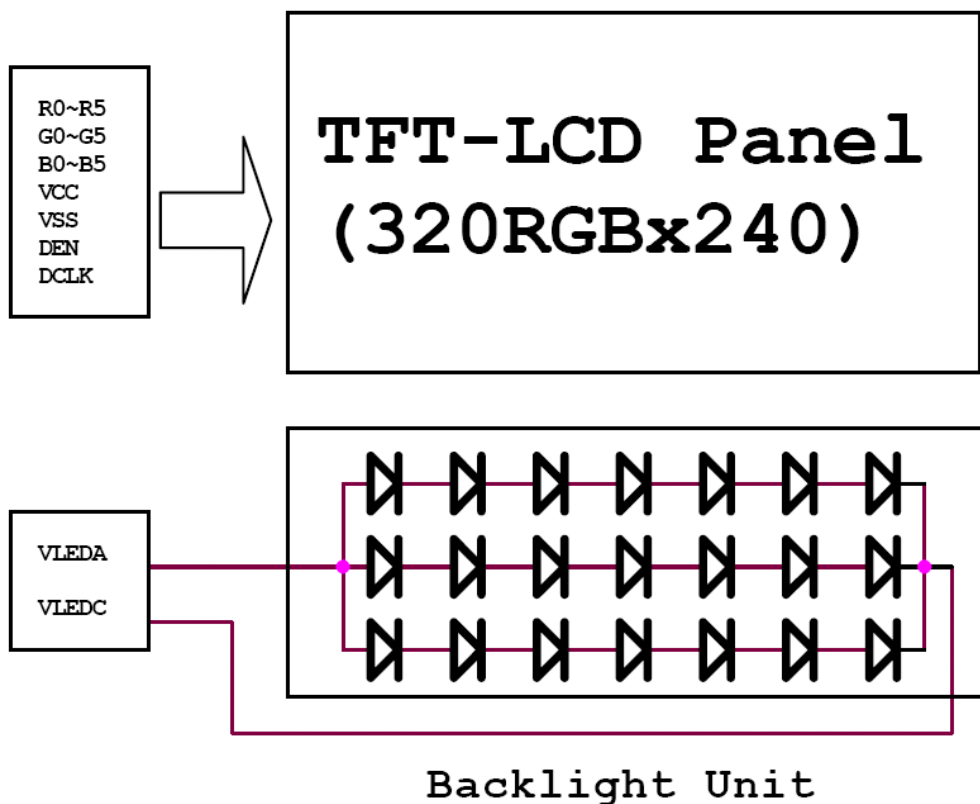
| Item                      | Symbol          | Value       |       |      | Unit | Note                 |
|---------------------------|-----------------|-------------|-------|------|------|----------------------|
|                           |                 | Active Area |       | Max. |      |                      |
| Current of Backlight Unit | I <sub>B</sub>  | -           | 60    | -    | mA   | -                    |
| Voltage of Backlight Unit | V <sub>B</sub>  | -           | 23.1  | -    | V    | I <sub>B</sub> =60mA |
| Power Consumption         | P <sub>BL</sub> | -           | (1.4) | -    | W    | I <sub>B</sub> =60mA |
| LED Life Time(25°C)       |                 | 40000       | --    | --   | hr   | (1)                  |

Note (1) : Lamp life time is defined as under 25±2°C , when the average brightness  
decrease to 50% of original brightness



## 9. Block Diagram

### 9.1 TFT-LCD Module with Backlight Unit





## 10. Input / Output Terminals Pin Assignment

### 10.1 TFT-LCD Module

Connector: CVILUX CF25401D0R0-05

| Pin No | Symbol | Description               | Pin No | Symbol | Description   |
|--------|--------|---------------------------|--------|--------|---------------|
| 1      | VCC    | Powr Supply for Logic     | 21     | G4     | Green data    |
| 2      | VCC    | Powr Supply for Logic     | 22     | G3     | Green data    |
| 3      | VCC    | Powr Supply for Logic     | 23     | VSS    | GND           |
| 4      | VCC    | Powr Supply for Logic     | 24     | G2     | Green data    |
| 5      | NC     | No Connection             | 25     | G1     | Green data    |
| 6      | DEN    | Input data enable control | 26     | G0     | Green data    |
| 7      | VSS    | GND                       | 27     | VSS    | GND           |
| 8      | DCLK   | Dot Clock                 | 28     | R5     | Red data      |
| 9      | VSS    | GND                       | 29     | R4     | Red data      |
| 10     | NC     | No Connection             | 30     | R3     | Red data      |
| 11     | VSS    | GND                       | 31     | VSS    | GND           |
| 12     | B5     | Blue data                 | 32     | R2     | Red data      |
| 13     | B4     | Blue data                 | 33     | R1     | Red data      |
| 14     | B3     | Blue data                 | 34     | R0     | Red data      |
| 15     | VSS    | GND                       | 35     | NC     | No Connection |
| 16     | B2     | Blue data                 | 36     | VSS    | GND           |
| 17     | B1     | Blue data                 | 37     | NC     | No Connection |
| 18     | B0     | Blue data                 | 38     | NC     | No Connection |
| 19     | VSS    | GND                       | 39     | NC     | No Connection |
| 20     | G5     | Green data                | 40     | NC     | No Connection |

### 10.2 Backlight Unit

Connector: JST BHSR-02VS-1(N)

| Pin No. | Symbol | I/O | Description            | Wire Color |
|---------|--------|-----|------------------------|------------|
| 1       | VLEDA  | I   | Backlight LED Anode.   | Red        |
| 2       | VLEDC  | I   | Backlight LED Cathode. | Black      |



### 10.3 Color Data Input Assignment

The brightness of each primary color(red, green and blue) is based on the 6 bit gray scale data input for the color. The higher the binary input, the brighter the color. The table provides the assignment of color versus data input.

| Color               |                 | Data Signal |     |     |     |     |     |       |     |     |     |     |     |      |     |     |     |     |     |
|---------------------|-----------------|-------------|-----|-----|-----|-----|-----|-------|-----|-----|-----|-----|-----|------|-----|-----|-----|-----|-----|
|                     |                 | Red         |     |     |     |     |     | Green |     |     |     |     |     | Blue |     |     |     |     |     |
|                     |                 | D05         | D04 | D03 | D02 | D01 | D00 | D15   | D14 | D13 | D12 | D11 | D10 | D25  | D24 | D23 | D22 | D21 | D20 |
| Basic Colors        | Black           | 0           | 0   | 0   | 0   | 0   | 0   | 0     | 0   | 0   | 0   | 0   | 0   | 0    | 0   | 0   | 0   | 0   | 0   |
|                     | Red             | 1           | 1   | 1   | 1   | 1   | 1   | 0     | 0   | 0   | 0   | 0   | 0   | 0    | 0   | 0   | 0   | 0   | 0   |
|                     | Green           | 0           | 0   | 0   | 0   | 0   | 0   | 1     | 1   | 1   | 1   | 1   | 1   | 0    | 0   | 0   | 0   | 0   | 0   |
|                     | Blue            | 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   |
| Gray Scale Of RED   | Red(0) / Dark   | 0           | 0   | 0   | 0   | 0   | 0   | 0     | 0   | 0   | 0   | 0   | 0   | 0    | 0   | 0   | 0   | 0   | 0   |
|                     | Red(1)          | 0           | 0   | 0   | 0   | 0   | 1   | 0     | 0   | 0   | 0   | 0   | 0   | 0    | 0   | 0   | 0   | 0   | 0   |
|                     | Red(2)          | 0           | 0   | 0   | 0   | 1   | 0   | 0     | 0   | 0   | 0   | 0   | 0   | 0    | 0   | 0   | 0   | 0   | 0   |
|                     | :               | :           | :   | :   | :   | :   | :   | :     | :   | :   | :   | :   | :   | :    | :   | :   | :   | :   | :   |
|                     | :               | :           | :   | :   | :   | :   | :   | :     | :   | :   | :   | :   | :   | :    | :   | :   | :   | :   | :   |
|                     | 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   |
| Gray Scale Of Green | Green(0) / Dark | 0           | 0   | 0   | 0   | 0   | 0   | 0     | 0   | 0   | 0   | 0   | 0   | 0    | 0   | 0   | 0   | 0   | 0   |
|                     | Green(1)        | 0           | 0   | 0   | 0   | 0   | 0   | 0     | 0   | 0   | 0   | 0   | 1   | 0    | 0   | 0   | 0   | 0   | 0   |
|                     | Green(2)        | 0           | 0   | 0   | 0   | 0   | 0   | 0     | 0   | 0   | 0   | 1   | 0   | 0    | 0   | 0   | 0   | 0   | 0   |
|                     | :               | :           | :   | :   | :   | :   | :   | :     | :   | :   | :   | :   | :   | :    | :   | :   | :   | :   | :   |
|                     | :               | :           | :   | :   | :   | :   | :   | :     | :   | :   | :   | :   | :   | :    | :   | :   | :   | :   | :   |
|                     | 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   |
| Gray Scale Of Blue  | Blue(0) / Dark  | 0           | 0   | 0   | 0   | 0   | 0   | 0     | 0   | 0   | 0   | 0   | 0   | 0    | 0   | 0   | 0   | 0   | 0   |
|                     | Blue(1)         | 0           | 0   | 0   | 0   | 0   | 0   | 0     | 0   | 0   | 0   | 0   | 0   | 0    | 0   | 0   | 0   | 0   | 1   |
|                     | Blue(2)         | 0           | 0   | 0   | 0   | 0   | 0   | 0     | 0   | 0   | 0   | 0   | 0   | 0    | 0   | 0   | 0   | 1   | 0   |
|                     | :               | :           | :   | :   | :   | :   | :   | :     | :   | :   | :   | :   | :   | :    | :   | :   | :   | :   | :   |
|                     | :               | :           | :   | :   | :   | :   | :   | :     | :   | :   | :   | :   | :   | :    | :   | :   | :   | :   | :   |
|                     | 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   |



## 11. Interface Timing

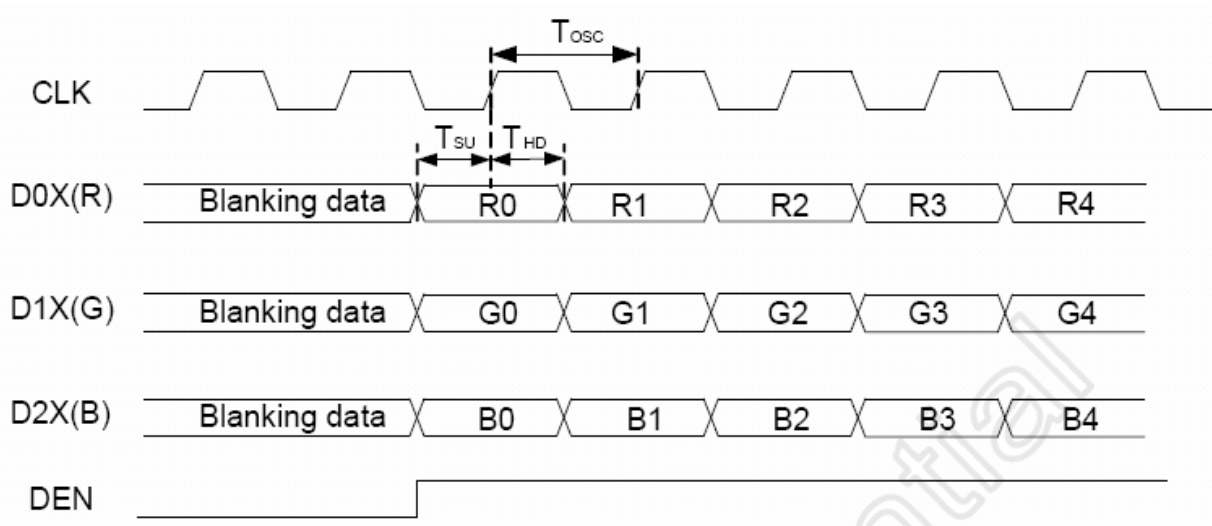
### 11.1 Input Signal Characteristics

#### Digital Parallel RGB Interface (960×240 resolution)

| PARAMETER       | Symbol    | Min. | Typ. | Max. | Unit      |
|-----------------|-----------|------|------|------|-----------|
| CLK period      | $T_{OSC}$ | -    | 156  | -    | ns        |
| Data setup time | $T_{SU}$  | 12   | -    | -    | ns        |
| Data hold time  | $T_{HD}$  | 12   | -    | -    | ns        |
| DEN pulse width | $T_{EP}$  | -    | 320  | -    | $T_{OSC}$ |
| DEN-STH time    | $T_{DES}$ | -    | 1    | -    | $T_{OSC}$ |

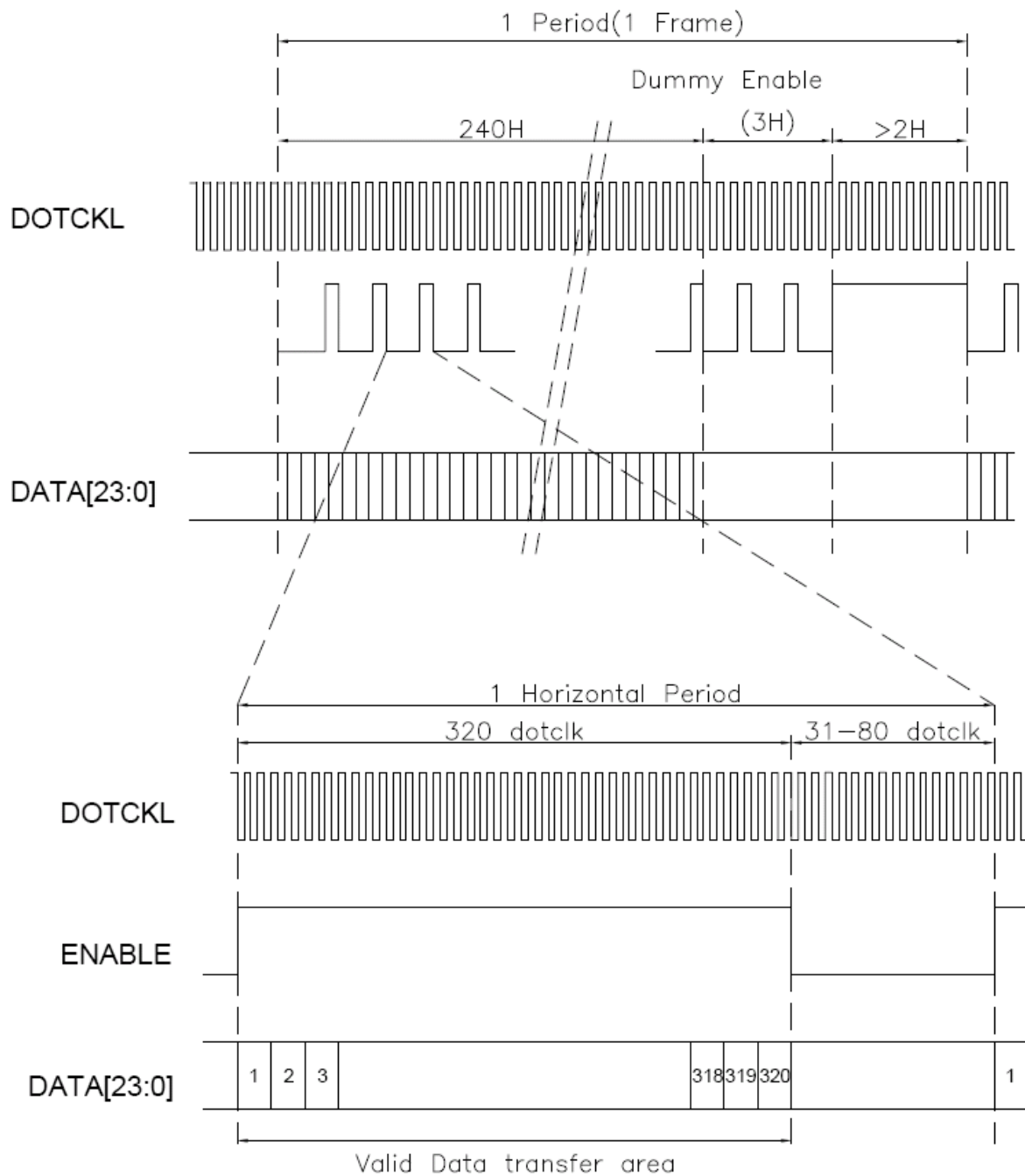
### 11.2 Waveform

#### 11.2.1 Clock and Data Waveform





### 11.2.2 DE Mode



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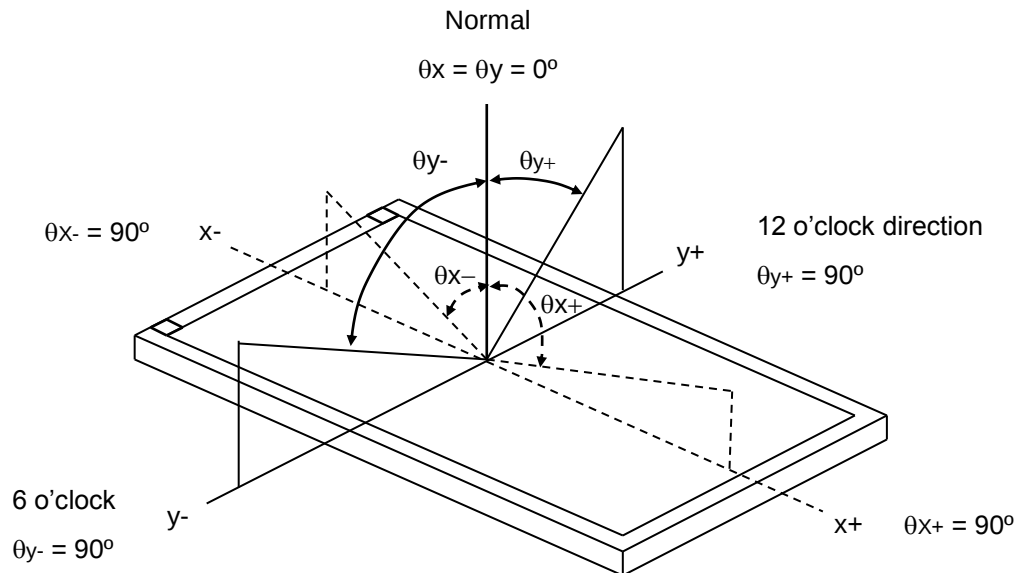
**12. Optical Characteristics**

The optical characteristics should be measured in a dark environment ( $\leq 1$  lux) or equivalent state with the methods shown in Note (4).

| Item                  |            | Symbol         | Conditions                                                      | Min.    | Typ.    | Max.    | Unit              | Note    |
|-----------------------|------------|----------------|-----------------------------------------------------------------|---------|---------|---------|-------------------|---------|
| Contrast Ratio        |            | CR             | $\theta_x=0^\circ, \theta_y=0^\circ$<br>Viewing Normal<br>Angle | 200     | 350     | -       | -                 | (2)     |
| Response Time         |            | $T_R$          |                                                                 | -       | 15      | -       | ms                | (3)     |
|                       |            | $T_F$          |                                                                 | -       | 35      | -       | ms                |         |
| Luminance(Center)     |            | Y              |                                                                 | 300     | (350)   | -       | cd/m <sup>2</sup> | (4)     |
| Brightness uniformity |            | BUNI           |                                                                 | 80      | -       | -       | %                 | (5)     |
| Color Chromaticity    | Red        | R <sub>x</sub> |                                                                 | (0.590) | (0.640) | (0.690) | -                 | (1),(4) |
|                       |            | R <sub>y</sub> |                                                                 | (0.294) | (0.344) | (0.394) | -                 |         |
|                       | Green      | G <sub>x</sub> |                                                                 | (0.269) | (0.319) | (0.369) | -                 |         |
|                       |            | G <sub>y</sub> |                                                                 | (0.525) | (0.575) | (0.625) | -                 |         |
|                       | Blue       | B <sub>x</sub> |                                                                 | (0.091) | (0.141) | (0.191) | -                 |         |
|                       |            | B <sub>y</sub> |                                                                 | (0.045) | (0.095) | (0.145) | -                 |         |
|                       | White      | W <sub>x</sub> |                                                                 | (0.262) | (0.312) | (0.362) | -                 |         |
|                       |            | W <sub>y</sub> |                                                                 | (0.270) | (0.320) | (0.370) | -                 |         |
| Viewing Angle         | Horizontal | $\theta_{x+}$  | CR $\geq$ 10                                                    | (55)    | (60)    | -       | deg.              |         |
|                       |            | $\theta_{x-}$  |                                                                 | (55)    | (60)    | -       |                   |         |
|                       | Vertical   | $\theta_{y+}$  |                                                                 | (45)    | (50)    | -       |                   |         |
|                       |            | $\theta_{y-}$  |                                                                 | (55)    | (60)    | -       |                   |         |



Note (1) Definition of Viewing Angle ( $\theta_x$ ,  $\theta_y$ ):



Note (2) Definition of Contrast Ratio (CR):

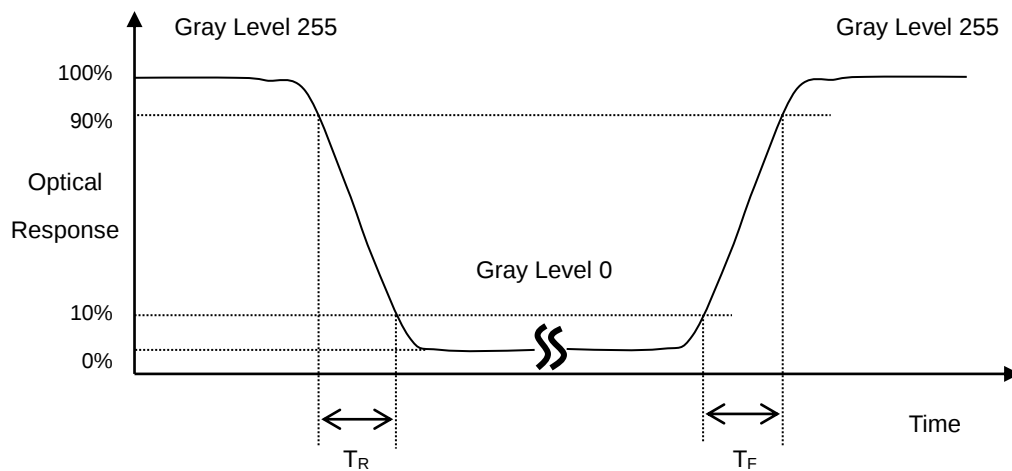
Measured at the center point of panel

$$\text{Contrast Ratio (CR)} = L_{255} / L_0$$

$L_{255}$ : Luminance of gray level 255

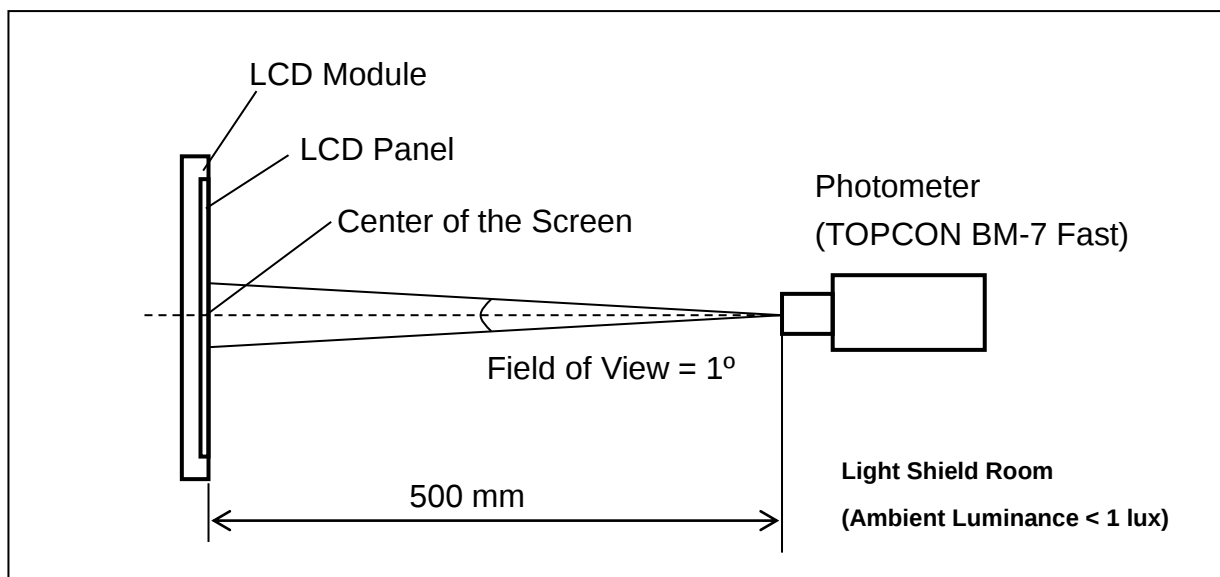
$L_0$ : Luminance of gray level 0.

Note (3) Definition of Response Time ( $T_R$ ,  $T_F$ ):

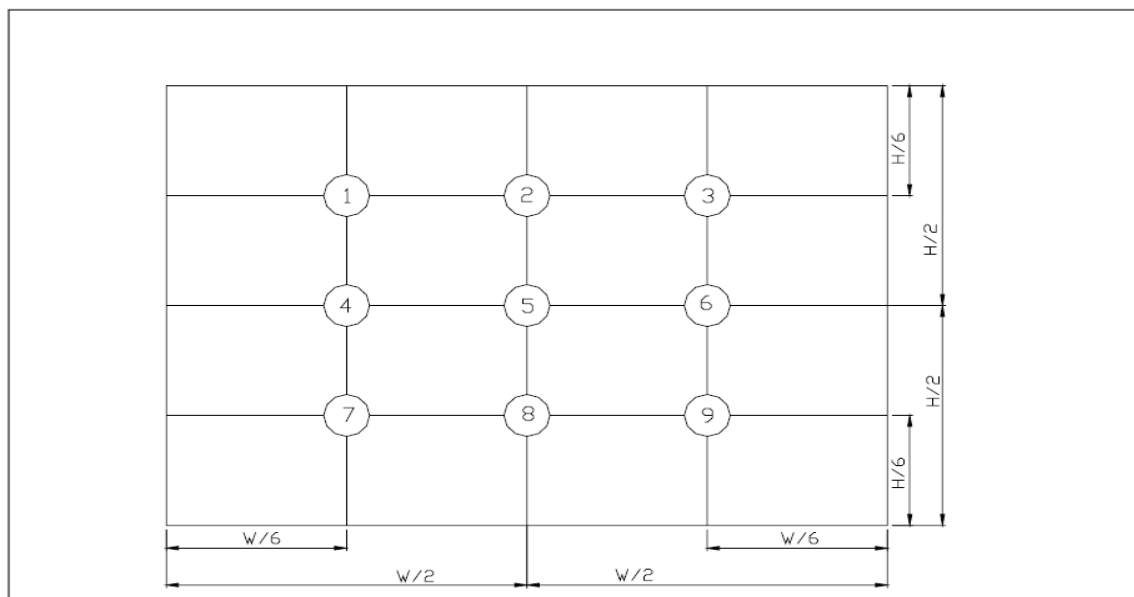


**Note (4) Measurement Set-Up:**

The LCD module should be stabilized at a given temperature for 30 minutes to avoid abrupt temperature change during measuring. In order to stabilize the luminance, the measurement should be executed after lighting Backlight for 30 minutes in a windless room.

**Note (5) Definition of brightness uniformity**

Brightness uniformity=(Min Luminance of 9 points)/(Max Luminance of 9 points)×100%



( 單位 : mm )

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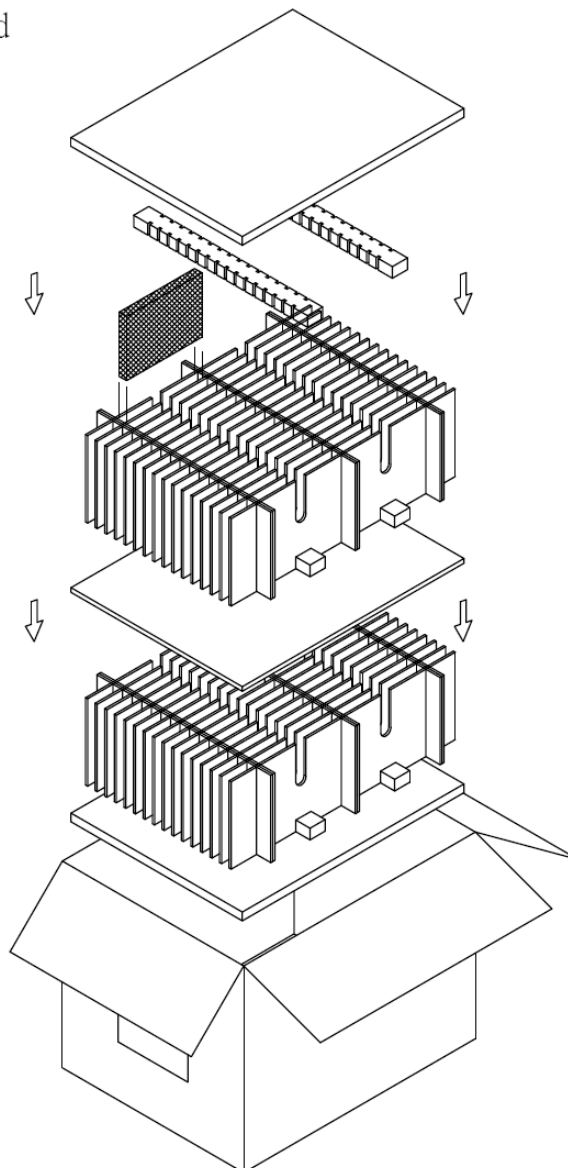
### 13. Reliability Test

| No. | Test Items                                        | Test Condition                                                        | Remark |
|-----|---------------------------------------------------|-----------------------------------------------------------------------|--------|
| 1   | High Temperature Storage Test                     | T <sub>a</sub> = 80°C 240 hours                                       | -      |
| 2   | Low Temperature Storage Test                      | T <sub>a</sub> = -30°C 240 hours                                      | -      |
| 3   | High Temperature Operation Test                   | T <sub>a</sub> = 70°C 240 hours                                       | -      |
| 4   | Low Temperature Operation Test                    | T <sub>a</sub> = -20°C 240 hours                                      | -      |
| 5   | High Temperature and High Humidity Operation Test | T <sub>a</sub> =60°C 90%RH 240 hours                                  | -      |
| 6   | Electro Static Discharge Test (non-operating)     | -Panel Surface/Top Case<br>: 150pF, 330Ω<br>Air: ±15kV, Contact: ±8kV | -      |
| 7   | Mechanical Shock Test (non-operating)             | Half sine wave,<br>80G, 11ms<br>3 times shock of each six surfaces    | -      |
| 8   | Vibration Test (non-operating)                    | Sine wave, 10 ~ 55 ~ 10Hz,<br>3 axis, 2 hours/axis                    | -      |
| 9   | Thermal Shock Test (non-operating)                | -20°C(30min) ~ 70°C(30min), 100 cycles                                | -      |
| 10  | Drop Test(with Carton)                            | Height: 80cm<br>1 corner, 3 edges, 6 surfaces                         | -      |



## 14. Packaging

Packing Method



|   | PARTS LIST           |                     |          |       |      |
|---|----------------------|---------------------|----------|-------|------|
|   | ITEM                 | SIZE(LxWxH) unit:mm | MATERIAL | Q.T.Y | NOTE |
| 1 | STATIC SHIEDING BAGS | 200.0x145.0*0.09    |          | 60    |      |
| 2 | PU FOAM              | 440.0x340.0x15.0    | SPONGE   | 2     |      |
| 3 | EPE PAD              | 345.0x30.0x20.0     |          | 8     |      |
| 4 | CARD BOARD           | 345.0x150.0x3.5     | CARTON   | 12    |      |
| 5 | CARD BOARD           | 450.0x150.0x3.5     | CARTON   | 32    |      |
| 6 | CARD BOARD           | 440.0x340.0x8.0     | CARTON   | 1     |      |
| 7 | EXTERNAL BOX         | 460.0x360.0x355.0   | CARTON   | 1     |      |
| 8 | PRODUCT              | 167.0x109.0x8.9     |          | 60    |      |



## **15. Precautions**

### **15.1 Assembly and Handling Precautions**

- (1) Do not apply rough force such as bending or twisting to the module during assembly.
- (2) It's recommended to assemble or to install a module into the user's system in clean working areas. The dust and oil may cause electrical short or worsen the polarizer.
- (3) Don't apply pressure or impulse to the module to prevent the damage of LCD panel and Backlight.
- (4) Always follow the correct power-on sequence when the LCD module is turned on. This can prevent the damage and latch-up of the CMOS LSI chips.
- (5) Do not plug in or pull out the I/F connector while the module is in operation.
- (6) Do not disassemble the module.
- (7) Use a soft dry cloth without chemicals for cleaning, because the surface of polarizer is very soft and easily scratched.
- (8) Moisture can easily penetrate into LCD module and may cause the damage during operation.
- (9) High temperature or humidity may deteriorate the performance of LCD module. Please store LCD module in the specified storage conditions.
- (10) When ambient temperature is lower than 10°C, the display quality might be reduced. For example, the response time will become slow.

### **15.2 Safety Precautions**

- (1) If the liquid crystal material leaks from the panel, it should be kept away from the eyes or mouth. In case of contact with hands, skin or clothes, it has to be washed away thoroughly with soap.
- (2) After the module's end of life, it is not harmful in case of normal operation and storage.



**P-TEC**

MODEL NO.

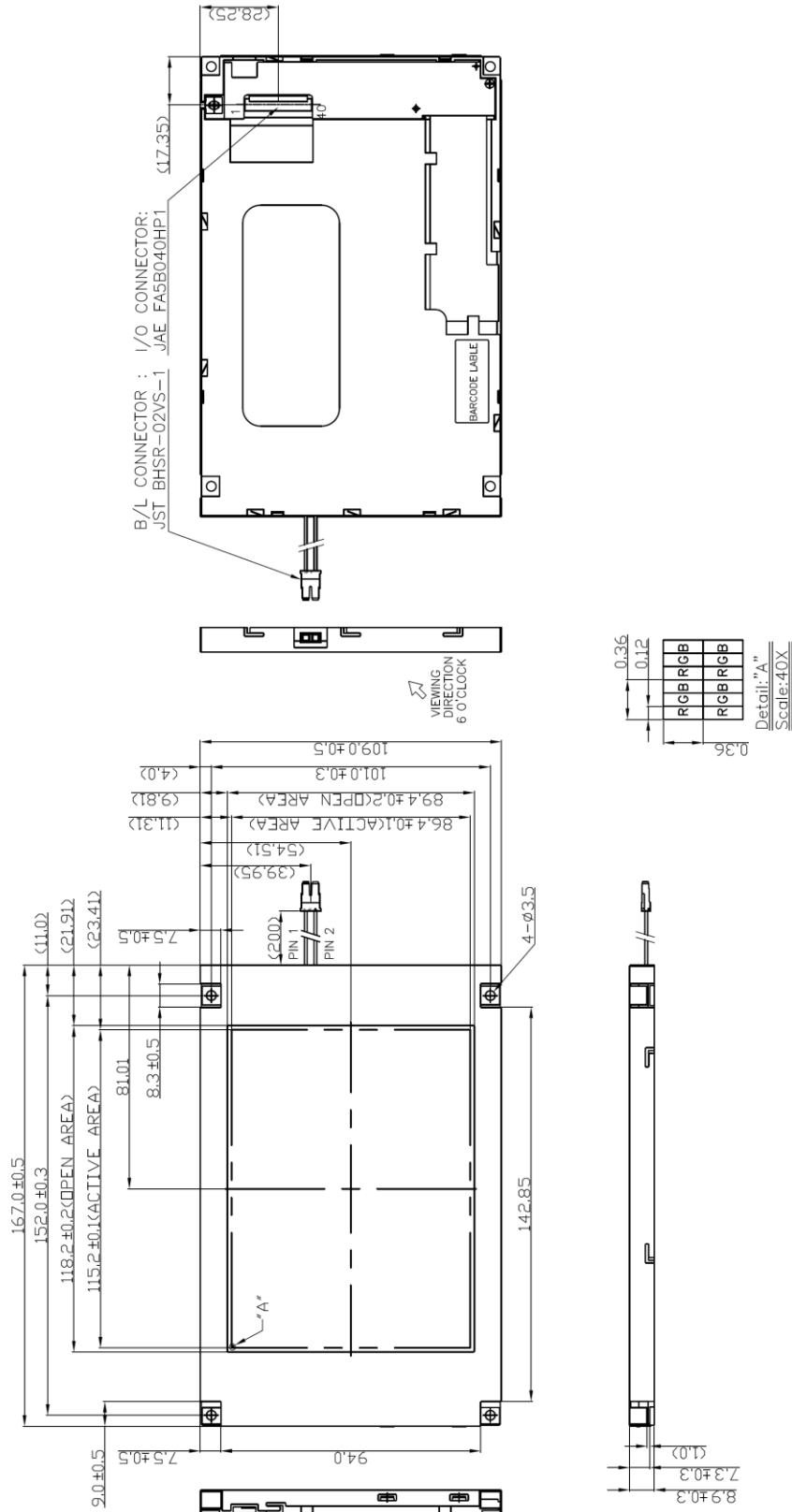
PT322457A-TLMWD-EM04

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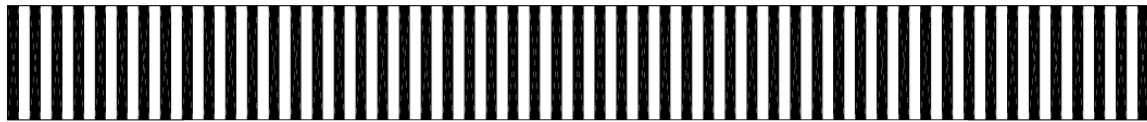
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## 16.Outline Drawing

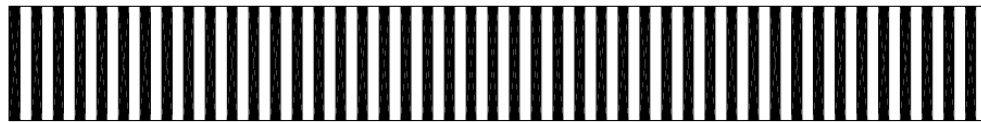


**17. Definition of Labels**

The bar code nameplate is pasted on each module as illustration, and its definitions are as following explanation.



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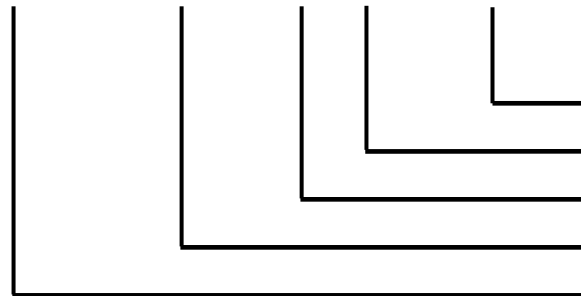


ABCDEFGHIJKLM

(a) Module Name: PT322457A-TLMWD-EM04

(b) Serial ID:

A B C D E F G H I J K L M



Serial No.

Revision Code

Factory Code

Manufactured Date

Screen Size

Serial ID includes the information as below:

(a) Screen size (Diagonal): Inch Code (ABCD)

3.5" → 0350

10.4" → 1040

(b) Manufactured Date: Year, Month, Day (EFG)

Year (E)

| Year | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 |
|------|------|------|------|------|------|------|------|------|------|------|
| Mark | 0    | 1    | 2    | 3    | 4    | 5    | 6    | 7    | 8    | 9    |

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Month (F)

| Month | Jan. | Feb. | Mar. | Apr. | May | Jun. | Jul. | Aug. | Sep. | Oct. | Nov. | Dec. |
|-------|------|------|------|------|-----|------|------|------|------|------|------|------|
| Mark  | 1    | 2    | 3    | 4    | 5   | 6    | 7    | 8    | 9    | A    | B    | C    |

Day (G)

| Day  | 1  | 2  | 3  | 4  | 5  | 6  | 7  | 8  | 9  | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
|------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| Mark | 1  | 2  | 3  | 4  | 5  | 6  | 7  | 8  | 9  | A  | B  | C  | D  | E  | F  | G  |
| Day  | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 |    |
| Mark | H  | I  | J  | K  | L  | M  | N  | O  | P  | Q  | R  | S  | T  | U  | V  |    |

(c) Factory Code (H):

For P-TEC internal use.

(d) Revision Code (I):

Cover all the change, for example: 1: Rev.1, 2: Rev.2, 3: Rev.3...etc.

(e) Serial No. (JKLM):

Manufacturing sequence of product, for example: 0001~9999.



## 18. Incoming Inspection Standards

### 18.1 The environmental condition of inspection

The environmental condition and visual inspection shall be conducted as below.

- (1) Ambient temperature  $25 \pm 5^{\circ}\text{C}$
- (2) Humidity:  $60 \pm 5\%$  RH
- (3) Viewing distance is approximately 35 ~ 40 cm
- (4) Viewing angle is normal to the LCD panel as Fig \_1( $10^{\circ}$ )
- (5) Ambient Illumination: 300 ~ 500 Lux for external appearance inspection

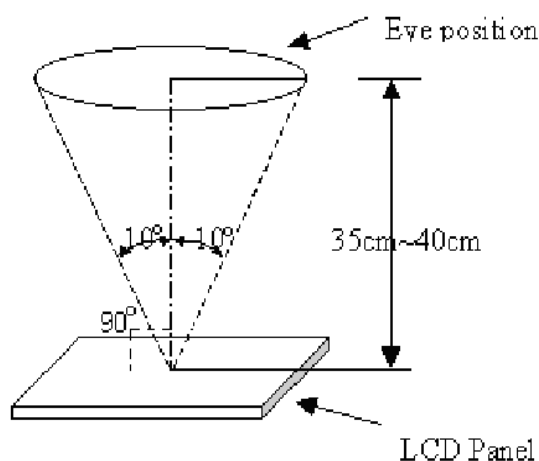


Fig \_ 1

### 18.2 The defects classify of AQL as following:

| Class of defects | AQL   | Definition                                                                                                       |
|------------------|-------|------------------------------------------------------------------------------------------------------------------|
| Major            | 0.65% | It is defect that is likely to result in failure or to reduce materially the usability of the intended function. |
| Minor            | 1.5%  | It is a defect that will not result in functioning problem with deviation classified.                            |

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**18.3 Inspection Parameters**

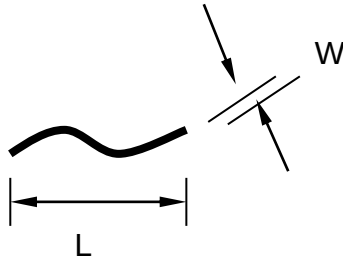
| Item                                   |                                                                                                                                                                                         | Specification/Description                                                                                                                                                                                              |                   |                   |               | Note                |                   |                   |       |       |       |   |        |           |           |   |        |        |
|----------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|-------------------|---------------|---------------------|-------------------|-------------------|-------|-------|-------|---|--------|-----------|-----------|---|--------|--------|
| Display                                | Function                                                                                                                                                                                | No Display                                                                                                                                                                                                             |                   |                   |               | -                   |                   |                   |       |       |       |   |        |           |           |   |        |        |
|                                        |                                                                                                                                                                                         | Malfunction                                                                                                                                                                                                            |                   |                   |               | -                   |                   |                   |       |       |       |   |        |           |           |   |        |        |
| Operating                              | Contrast ratio                                                                                                                                                                          | Out of Spec                                                                                                                                                                                                            |                   |                   |               | -                   |                   |                   |       |       |       |   |        |           |           |   |        |        |
|                                        | Line defect                                                                                                                                                                             | No obvious Vertical and Horizontal line defect in bright , dark and colored.                                                                                                                                           |                   |                   |               | -                   |                   |                   |       |       |       |   |        |           |           |   |        |        |
|                                        | Point Defect<br>(red,green,blue,dark)                                                                                                                                                   | Item                                                                                                                                                                                                                   | Acceptable number |                   |               | Note: 1、2、<br>5、6、7 |                   |                   |       |       |       |   |        |           |           |   |        |        |
|                                        |                                                                                                                                                                                         |                                                                                                                                                                                                                        | A                 | B                 | Total         |                     |                   |                   |       |       |       |   |        |           |           |   |        |        |
|                                        |                                                                                                                                                                                         | BRIGHT DOT                                                                                                                                                                                                             | N≤2               | N≤2               | N≤7           |                     |                   |                   |       |       |       |   |        |           |           |   |        |        |
|                                        |                                                                                                                                                                                         | DARK DOT                                                                                                                                                                                                               | N≤3               | N≤4               |               |                     |                   |                   |       |       |       |   |        |           |           |   |        |        |
|                                        |                                                                                                                                                                                         | TOTAL DOT                                                                                                                                                                                                              | N≤4               | N≤5               |               |                     |                   |                   |       |       |       |   |        |           |           |   |        |        |
|                                        |                                                                                                                                                                                         | TWO ADJACENT DOT                                                                                                                                                                                                       | NOT ALLOWED       |                   |               |                     |                   |                   |       |       |       |   |        |           |           |   |        |        |
|                                        |                                                                                                                                                                                         | THREE OR MORE<br>ADJACENT DOT                                                                                                                                                                                          | NOT ALLOWED       |                   |               |                     |                   |                   |       |       |       |   |        |           |           |   |        |        |
| External Inspection<br>(non-operating) | Scratch on<br>the polarizer                                                                                                                                                             | <table><tr><td>L(mm)</td><td>W(mm)</td><td colspan="2">Acceptable number</td></tr><tr><td>L≤2.5</td><td>W≤0.1</td><td colspan="2">4</td></tr><tr><td>L&gt;2.5</td><td>W&gt;0.1</td><td colspan="2">0</td></tr></table> |                   |                   |               | L(mm)               | W(mm)             | Acceptable number |       | L≤2.5 | W≤0.1 | 4 |        | L>2.5     | W>0.1     | 0 |        | Note:3 |
|                                        |                                                                                                                                                                                         | L(mm)                                                                                                                                                                                                                  | W(mm)             | Acceptable number |               |                     |                   |                   |       |       |       |   |        |           |           |   |        |        |
|                                        |                                                                                                                                                                                         | L≤2.5                                                                                                                                                                                                                  | W≤0.1             | 4                 |               |                     |                   |                   |       |       |       |   |        |           |           |   |        |        |
|                                        | L>2.5                                                                                                                                                                                   | W>0.1                                                                                                                                                                                                                  | 0                 |                   |               |                     |                   |                   |       |       |       |   |        |           |           |   |        |        |
|                                        | Dent or bubble<br>on the polarizer                                                                                                                                                      | <table><tr><td>Dimension(mm)</td><td colspan="3">Acceptable number</td></tr><tr><td>D≤0.5</td><td colspan="3">4</td></tr><tr><td>D≤0.15</td><td colspan="3">Disregard</td></tr></table>                                |                   |                   |               | Dimension(mm)       | Acceptable number |                   |       | D≤0.5 | 4     |   |        | D≤0.15    | Disregard |   |        | Note:4 |
|                                        |                                                                                                                                                                                         | Dimension(mm)                                                                                                                                                                                                          | Acceptable number |                   |               |                     |                   |                   |       |       |       |   |        |           |           |   |        |        |
| D≤0.5                                  |                                                                                                                                                                                         | 4                                                                                                                                                                                                                      |                   |                   |               |                     |                   |                   |       |       |       |   |        |           |           |   |        |        |
| D≤0.15                                 | Disregard                                                                                                                                                                               |                                                                                                                                                                                                                        |                   |                   |               |                     |                   |                   |       |       |       |   |        |           |           |   |        |        |
| Foreign material<br>on the polarizer   | <table><tr><td>Dimension(mm)</td><td colspan="3">Acceptable number</td></tr><tr><td>D≤0.5</td><td colspan="3">4</td></tr><tr><td>D≤0.15</td><td colspan="3">Disregard</td></tr></table> |                                                                                                                                                                                                                        |                   |                   | Dimension(mm) | Acceptable number   |                   |                   | D≤0.5 | 4     |       |   | D≤0.15 | Disregard |           |   | Note:4 |        |
|                                        | Dimension(mm)                                                                                                                                                                           | Acceptable number                                                                                                                                                                                                      |                   |                   |               |                     |                   |                   |       |       |       |   |        |           |           |   |        |        |
|                                        | D≤0.5                                                                                                                                                                                   | 4                                                                                                                                                                                                                      |                   |                   |               |                     |                   |                   |       |       |       |   |        |           |           |   |        |        |
| D≤0.15                                 | Disregard                                                                                                                                                                               |                                                                                                                                                                                                                        |                   |                   |               |                     |                   |                   |       |       |       |   |        |           |           |   |        |        |



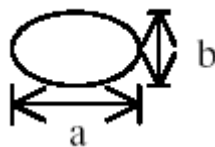
Note1. Distance between point defect distance should be large than 5 mm.

Note2. The definition of dot defect : The dot defect was judged after repair and the size of a defective dot over 1/2 of whole dot is regarded as one defective dot.

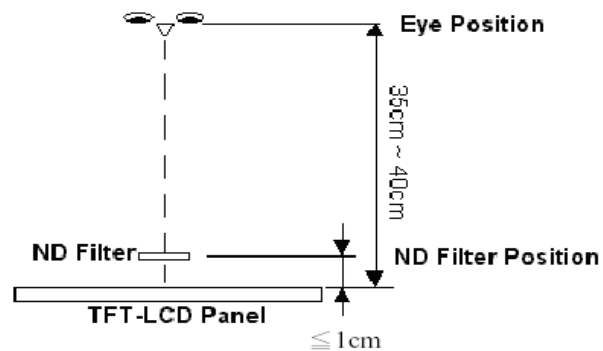
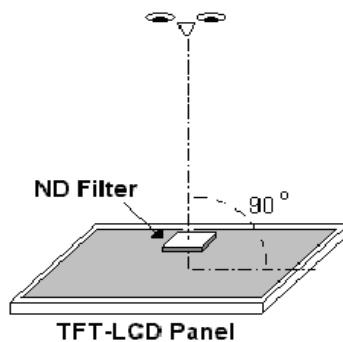
Note3.



Note4. D : Diameter  $D=(a+b)/2$



Note5. Bright dot is defined through 6% transmission ND Filter as following.

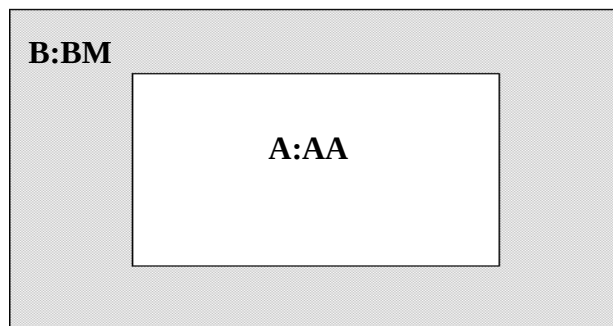


|                                                                                                |                      |             |             |
|------------------------------------------------------------------------------------------------|----------------------|-------------|-------------|
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Note6. ADJACENT DOT



Note7.



## 18.4 Handling of LCM

- (1)Don't give external shock.
- (2)Don't apply excessive force on the surface.
- (3)Liquid in LCD is hazardous substance. Must not lick and swallow. when the liquid is attach to your hand, skin, cloth etc. Wash it out thoroughly and immediately.
- (4)Don't operate it above the absolute maximum rating.
- (5)Don't disassemble the LCM.