# CHI MEI
## OPTOELECTRONICS CORP.

# TFT-LCD Specification

# Model No: N141X201

Customer : _____

Approved by : _____

Note :

| Liquid Crystal Division | | |
|---|---|---|
| QRA Dept. | RD Dept. | System Dept. |
| Approval | Approval | Approval |
| | | |

CHI MEI
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## REVISION HISTORY

| VERSION | Date | DESCPIPTION |
|---|---|---|
| Ver 1.0 | Sep.10'99 | Issue Preliminary Specification. |
| Ver 2.0 | Nov.11'99 | Page 5/19<br>- Change Bezel opening area:<br>290.0(W) x 218.6(H) → 288.8(W)x217.4(H)<br><br>- To revise the MECHANICAL SPECIFICATIONS<br><br>Page 6/19<br>- To Change the ABSOLUTE MAXIMUM RATINGS of Humidity<br>- To add Notes statement in ELECTRICAL SPECIFICATIONS<br><br>Page 9/19<br>- 3.2 INPUT SIGNAL TIMING SPECIFICATIONS is modified and added the values which is TBD in version 1.0.<br><br>Page 10/19<br>- To revise the Tvdb interval in INPUT SIGNAL TIMING DIAGRAM.<br><br>Page 12/19<br>- The illustration of POWER UP/DOWN SEQUENCE is modify.<br><br>Page 13/19 ~ 16/19<br>- To revise the OPTICAL SPECIFICATIONS and modify the Illustration of Notes.<br><br>Page 16/19<br>- Add the PRECAUTION statement.<br><br>Page 17/19~19/19<br>- Add the illustration of PACKAGING method |
| Ver 2.1 | Jan.25'00 | Issue Approval Specification.<br><br>Page 5/19<br>- Add BLOCK DIAGRAM.<br><br>Page 6/19<br>- Change the humidity condition in ABSOLUTE MAXIMUM RATINGS.<br>    Old  ->Operation   : 20% ~ 90% relative humidity<br>               Non operation  : 5% ~ 85% relative humidity<br>    New  ->Operation   :≤ 85% relative humidity , Ta≤40ºC<br>               Storage       :≤ 85% relative humidity , Ta≤50ºC<br>- Add rush current specification in ELECTRICAL SPECIIFICATIONS.<br>Page 13/19<br>- Change Response Time in OPTICAL SPECIFICATIONS<br>    Old  ->Tr = 20 ms (typ.)/35 ms (max.)<br>              Tf = 30 ms (typ.)/45 ms (max.)<br>    New  -> Tr = 15ms (typ.)/30 ms (max.)<br>              Tf = 35 ms (typ.)/50 ms (max.) |

# REVISION HISTORY ( Continuation)

| VERSION | Date | DESCPIPTION |
|---------|------|-------------|
| Ver 2.2 | Feb.17'00 | Page 6/19<br>-Change the lamp current from 3mA to 2mA(min.) |
|  | Feb.17'00 | Page 16/19<br>- To revise the OUTLINE drawing on the attached page. |
| Ver 2.3 | Mar. 7'00 | Page 6/19<br>- Change the humidity condition in ABSOLUTE MAXIMUM RATINGS |

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## GENERAL DESCRIPTION

### OVERVIEW

This product is a 14.1" TFT Liquid Crystal Display Module with a Backlight unit and 20 pins LVDS (Low Voltage Differential Signal) interface. This module supports 1024 x 768 XGA mode and can display 262,144 colors. The inverter module for Backlight is not built in.

### BLOCK DIAGRAM
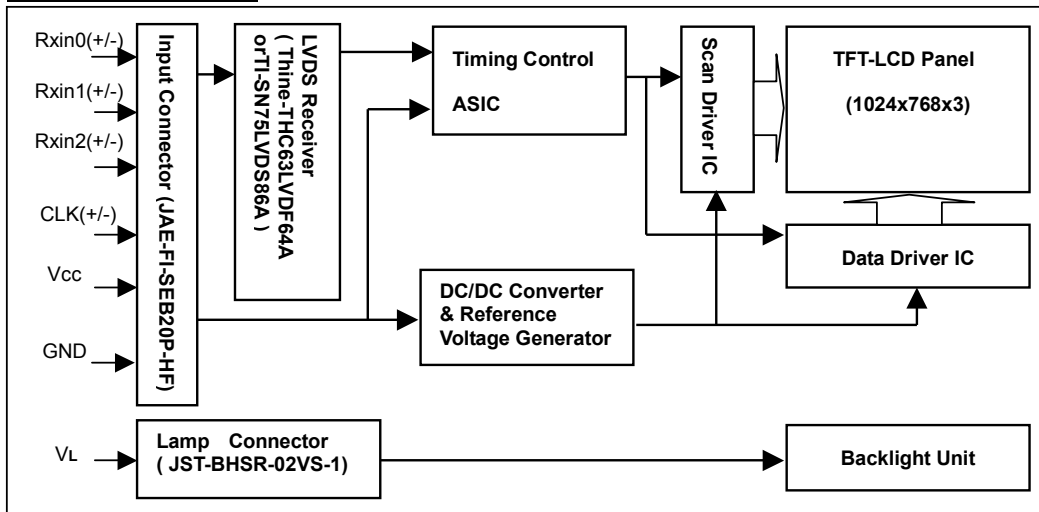


### APPLICATION

-Note Book PC

### GENERAL SPECIFICATI0NS

| Item | Specifications | Unit |
|------|----------------|------|
| Screen Size | 14.1 Diagonal | inch |
| Bezel opening area | 288.8(W)x217.4(H) | mm |
| Effective display area | 285.7(W)x214.3(H) | mm |
| Pixel number | 1024 x R.G.Bx768 | pixel |
| Pixel pitch | 0.279(H)x0.279(V) | mm |
| Pixel Arrangement | R.G.B Vertical Stripe | - |
| Display Color | 6 bits, 262,144 | color |
| Transmissive mode | Normally white | - |
| Surface treatments | Hard coating(3H) and anti-glare | - |

### MECHANICAL SPECIFICATIONS

| ITEM | | MIN. | TYP. | MAX. | Unit |
|------|------|------|------|------|------|
| Module size | Horizontal | 298 | 298.5 | 299 | mm |
| | Vertical | 227 | 227.5 | 228 | mm |
| | Depth | - | 5.8 | 6.1 | mm |
| | Weight | - | 570 | 590 | g |

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## 1. ABSOLUTE MAXIMUM RATINGS

| Parameter | Symbol | Values Min. | Values Max. | Unit | Remarks |
|---|---|---|---|---|---|
| Power supply voltage | $V_{CC}$ | -0.3 | +4.0 | V | |
| Logic input voltage | $V_{IN}$ | -0.3 | $V_{CC}$+0.3 | V | Ta=25ºC |
| Operating temperature | Top | 0 | +50 | ºC | Note |
| Storage temperature | Tst | -20 | +60 | ºC | |

Note : 90% RH MAX. ( at Ta $\leq$ 40 $^0$C)

Maximum wet-bulb temperature : 39 $^0$C or lower ( at Ta > 40 $^0$C)

## 2. ELECTRICAL SPECIFICATIONS

| MODULE | | | | | | |
|---|---|---|---|---|---|---|
| Parameter | Symbol | Value Min. | Value Typ. | Value Max. | Unit | Notes |
| Power Supply Voltage | $V_{CC}$ | 3.0 | 3.3 | 3.6 | V | |
| "H" level LVDS signal input | $V_{IH}$ | - | - | +100 | mV | |
| "L" level LVDS signal input | $V_{IL}$ | -100 | - | - | mV | |
| Power Supply Current | $I_{CC}$ | - | 400 | 500 | mA | 1 |
| Rush Current | $I_{RUSH}$ | - | 1.6 | 1.8 | A | |
| Ripple voltage | $V_{RP}$ | - | 50 | - | mV | |
| Terminating resistor | Rt | - | 100 | - | Ohm | |

| BACKLIGHT ( 1 Lamp) | | | | | | Ta=25±2ºC |
|---|---|---|---|---|---|---|
| Parameter | Symbol | Value Min. | Value Typ. | Value Max. | Unit | Notes |
| Lamp Voltage | $V_L$ | - | 700 | - | $V_{RMS}$ | $I_L$=6.0mA |
| Lamp Current | $I_L$ | 2.0 | 6.0 | 7.0 | mA | 2 |
| Startup Voltage | $V_S$ | - | 860 | 1030 (25ºC) | $V_{RMS}$ | 3 |
| | | - | 1075 | 1300 (0 ºC) | $V_{RMS}$ | 3 |
| Operating Frequency | $F_L$ | 40 | 55 | 70 | KHz | 4 |
| Power Consumption | $P_L$ | - | 4.2 | - | W | 5, $I_L$=6.0mA |
| Lamp Life time | $L_{BL}$ | 10000 | 15000 | - | Hrs | 6 |

### The connector information of Black light unit.

| Pin | Symbol | Description | Remark |
|---|---|---|---|
| 1 | HV | Lamp power input | White |
| 2 | LV | Ground | Black |

Connector Part No.: BHSR-02VS-1(JST)

User's connector Part No.: SM02B-BHSS-1-TB (JST)

Note 1: The operating temperature range is 0 ~ 50 ºC, and the typical value of Power Supply

Current is measured in black pattern.

Note2: Lamp current is measured by utilizing a current meter for high frequency as shown

below:

```
                    Hot(White)
  ┌──────────┐ ─────────────── ┌───┐        ┌──────────┐
  │   LCD    │                 │ 1 │        │          │
  │          │                 │ 2 │  (A)   │ Inverter │
  │  Module  │ ─────────────── └───┘        │          │
  └──────────┘   GND(Black)        Current meter └──────────┘
```
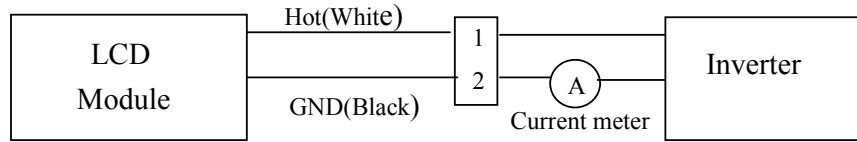
Note3: The voltage shown above should be applied to the lamp for more than 1 second after

startup. Otherwise the lamp may not be turned on.

Note4: The lamp frequency may produce interference with horizontal synchronous frequency

from the display, and this may cause line flow on the display. In order to avoid

interference the lamp frequency should be detached from the horizontal synchronous

frequency and its harmonics as far as possible.

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Note5: $P_L = I_L \times V_L$.

Note6: The lifetime (Hr) of a lamp can be defined as the time in which it continues to operate

under the condition Ta = $25\pm2^oC$ and $I_L$ = 6.0 mArms until one of the following event

occurs:

(1) When the brightness becomes 50% or lower than its original,

(2) When the effective ignition length becomes 80% or lower than its original value.

(Effective ignition length is defined as an area that has less than 70% brightness

compared to the brightness in the center point.)

Note7: The waveform of the voltage output of inverter must be area-symmetric and the design

of the inverter must have specifications for the modularized lamp. The performance of

the backlight, such as lifetime or brightness, is greatly influenced by the characteristics

of the DC-AC inverter for the lamp. All the parameters of an inverter should be

designed with care so as not to produce too much current leakage from high-voltage

output of the inverter. When designing or ordering the inverter, please make sure that

a poor lighting caused by the mismatch of the backlight and the inverter (miss-lighting,

flicker, etc.) never occurs. When the above situation is confirmed, the module should

be operated in the same manners as it is installed in your instrument.

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## 3. INTERFACE SPECIFICATIONS

## 3.1 THE PIN ASSIGNMENT OF INTERFACE CONNECTOR.

| Pin | Symbol | Description | Notes |
|---|---|---|---|
| 1 | $V_{CC}$ | Power supply +3.3 v | |
| 2 | $V_{CC}$ | Power supply +3.3 v | |
| 3 | Vss | Ground | |
| 4 | Vss | Ground | |
| 5 | Rxin0- | LVDS differential data input (Negative) | R0~R5,G0 |
| 6 | Rxin0+ | LVDS differential data input (Positive) | |
| 7 | Vss | Ground | |
| 8 | Rxin1- | LVDS differential data input (Negative) | G1~G5,B0,B1 |
| 9 | Rxin1+ | LVDS differential data input (Positive) | |
| 10 | Vss | Ground | |
| 11 | Rxin2- | LVDS differential data input (Negative) | B2~B5,DE,Hsync, Vsync |
| 12 | Rxin2+ | LVDS differential data input (Positive) | |
| 13 | Vss | Ground | |
| 14 | CLK- | LVDS Clock Data input (Negative) | LVDS level |
| 15 | CLK+ | LVDS Clock Data input (Negative) | |
| 16 | Vss | Ground | |
| 17 | NC | Non-connection | |
| 18 | NC | Non-connection | |
| 19 | Vss | Ground | |
| 20 | Vss | Ground | |

Connector Part No.: FI-SEB20P-HF13R (JAE) or Equivalent

User's connector Part No: FI-S20S or FI-SE20M (JAE)

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## 3.2 INPUT SIGNAL TIMING SPECIFICATIONS

The specifications of input signal timing are as the following table and timing diagram.

| Signal | Parameter | Symbol | Min | Typ | Max | Unit | Remarks |
|--------|-----------|--------|-----|-----|-----|------|---------|
| DCLK | Pixel clock period | Tck | - | 15 | - | ns | |
| | Duty ratio (%Tch) | - | 40 | 50 | 60 | % | Tch/Tck |
| | Rise time | Trck | - | 4.9 | - | ns | |
| | Fall time | Tfck | - | 4.7 | - | ns | |
| DATA | Setup time | Tsd | - | 4.8 | - | ns | |
| | Hold time | Thd | - | 4.2 | - | ns | |
| | Rise time | Trd | - | 5.5 | - | ns | |
| | Fall time | Tfd | - | 5.5 | - | ns | |
| DE | Setup time | Tsde | 3.5 | 4.0 | - | ns | |
| | Hold time | Thde | 3.5 | 4.2 | - | ns | |
| VSYNC | Vertical period | Tvp | 771 | 806 | 812 | Thp | |
| | Vertical display blank period | Tvdb | 3 | 38 | 44 | Thp | |
| | Vertical display active period | Tvda | 768 | 768 | 768 | Thp | |
| | Vertical sync. back porch | Vbp | 0 | 29 | 44 | Thp | |
| | Vertical sync. front porch | Vfp | 0 | 3 | 43 | Thp | |
| | Vertical sync. pulse width | Vpw | 1 | 6 | 44 | Thp | |
| HSYNC | Horizontal period | Thp | 1340 | 1344 | 1366 | Tck | |
| | Horizontal display blank period | Thdb | 178 | 320 | 342 | Tck | |
| | Horizontal display active period | Thda | 1024 | 1024 | 1024 | Tck | |
| | Horizontal sync. back porch | Hbp | 0 | 160 | 342 | Tck | |
| | Horizontal sync. front porch | Hfb | 0 | 24 | 319 | Tck | |
| | Horizontal sync. pulse width | Hpw | 23 | 145 | 342 | Tck | |

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## INPUT SIGNAL TIMING DIAGRAM

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## 3.3 COLOR DATA INPUT ASSIGNMENT

| Color | | Data Signal | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 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 | 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 |

## 3.4 POWER UP/DOWN SEQUENCE
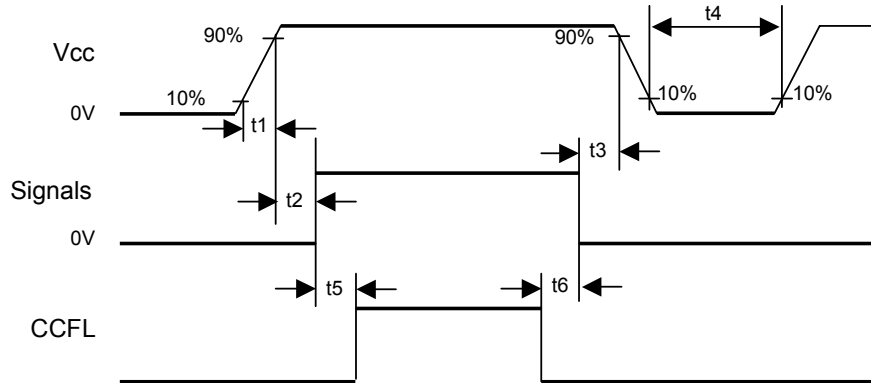


Timing Specifications:

$0 \leq t1 \leq 10mS$

$0 \leq t2 \leq 50mS$

$0 \leq t3 \leq 50mS$
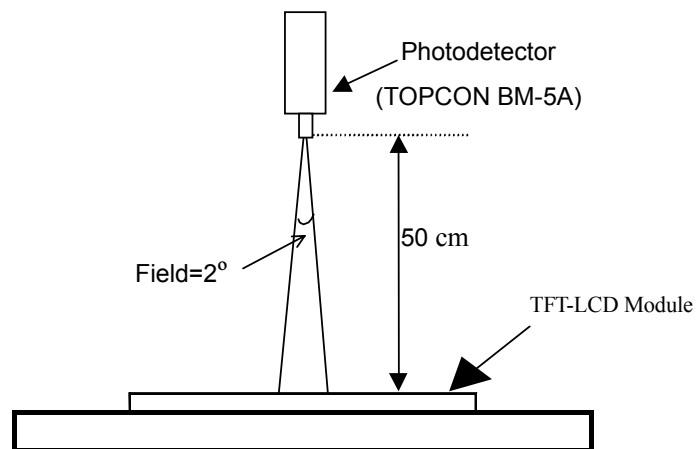
$t4 \geq 1S$

$t5 \geq 170mS$

$t6 \geq 200mS$ (min.)

Notes:    1. Please avoid floating state of interface signal at invalid period.

2. When the interface signal is invalid, be sure to pull down the power supply for

LCD Vcc to 0V.

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## 4. OPTICAL SPECIFICATIONS

The following optical specifications shall be measured in a dark room or equivalent state (ambient luminance ≤1 lux, and at room temperature). The measurement must be taken after backlight warming up for 20 minutes. The operation temperature is 25°C ± 2°C. The measurement method is shown in Note 1.

| Parameter | | Symbol | Condition | Min. | Typ. | Max. | Unit | Note |
|---|---|---|---|---|---|---|---|---|
| Central Luminance | | L | Center,$I_L$ =6.0mA | 120 | 150 | - | Cd/m$^2$ | 1, 2, 4 |
| Contrast ratio | | CR | Center | 150 | 200 | - | - | 1, 3 |
| Viewing Angle | Horizontal | $\theta$x+ | Center | 40 | 45 | 50 | degree | 1, 4 |
| | | $\theta$x- | CR ≥10 | 40 | 45 | 50 | | |
| | Vertical | $\theta$y+ | Center | 10 | 15 | 20 | | |
| | | $\theta$y- | CR ≥10 | 30 | 35 | 40 | | |
| Average Luminance | | Lavg | $I_L$ = 6.0mA | 100 | 130 | - | Cd/m$^2$ | 1, 5 |
| Brightness Uniformity | | Buni | $\theta$x = $\theta$y = 0° | 1.0 | 1.4 | 1.6 | | 1, 6 |
| Response Time | Rising | Tr | Center | - | 15 | 30 | ms | 1, 7 |
| | Falling | Tf | $\theta$x = $\theta$y = 0° | - | 35 | 50 | ms | |
| Chromaticity | | Xw | Center $\theta$x = $\theta$y = 0° | 0.290 | 0.310 | 0.330 | | 1, 8 |
| | | Yw | | 0.310 | 0.330 | 0.350 | | |
| | | $X_R$ | | 0.546 | 0.566 | 0.586 | | |
| | | $Y_R$ | | 0.308 | 0.328 | 0.348 | | |
| | | $X_G$ | | 0.280 | 0.300 | 0.320 | | |
| | | $Y_G$ | | 0.547 | 0.567 | 0.587 | | |
| | | $X_B$ | | 0.126 | 0.146 | 0.166 | | |
| | | $Y_B$ | | 0.104 | 0.124 | 0.144 | | |

Note 1: The method of optical measurement:

Photodetector
(TOPCON BM-5A)

50 cm

Field=2°

TFT-LCD Module

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Note 2: Definition of Central Luminance (L):
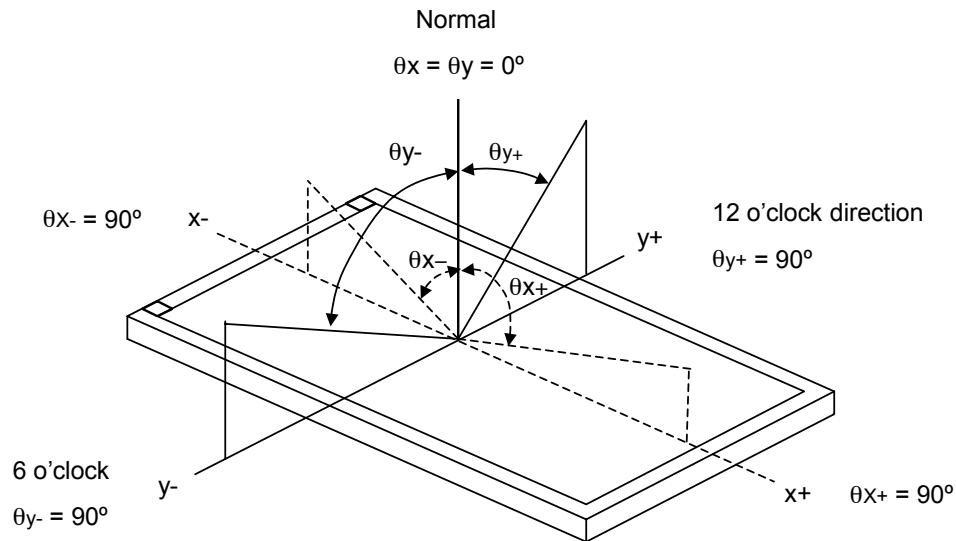
Central Luminance must be measured at the central point of the LCD module and at the viewing angle of the $\theta x = \theta y = 0°$ (Note 4).

Note 3: Definition of Contrast Ratio (CR):

Contrast ratio measurement must be made at the viewing angle of the $\theta x = \theta y = 0°$ (Note 4) and at the central point of the LCD module. The Luminance (Note 2) shall be measured with all pixels in the viewing field set initially to be white state, then black state.

$$CR = \frac{\text{Luminance with all pixels in white state}}{\text{Luminance with all pixels in black state}}$$

Note 4: Definitions of Viewing Angle (CR $\geq$ 10):

Normal

$\theta x = \theta y = 0°$

$\theta y-$    $\theta y+$

$\theta x- = 90°$   x-                         12 o'clock direction

$\theta x-$      y+    $\theta y+ = 90°$

$\theta x+$

6 o'clock    y-

$\theta y- = 90°$                             x+    $\theta x+ = 90°$

Note 5: Definition of Average Luminance:

The Average Luminance is defined as arithmetic mean value of five spots across the LCD surface at white state. The Luminance (Note 2) shall be measured with all pixels in the viewing field at white state. The measuring spots must be taken at the locations shown in the following figure, where a = b = 15mm.

$$Lave = \frac{L1 + L2 + L3 + L4 + L5}{5}$$

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Luminance Measuring Points
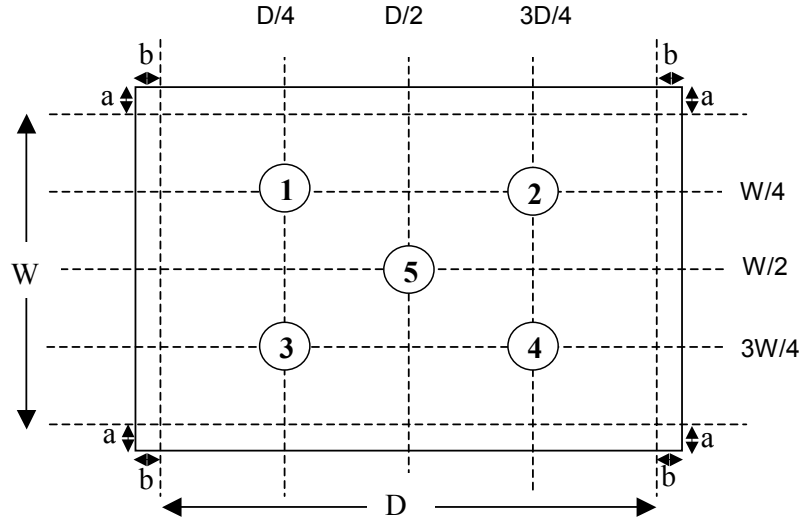


Note 6: Definition of Brightness Uniformity (Buni):

$$Buni= \frac{\text{Maximum luminance of 5 points}}{\text{Minimum luminance of 5 points}} \quad \text{(Note 5)}.$$

Note 7: Definition of Response Time:

The Response Time is set initially by defining the " Rising Time (Tr)" and the " Falling Time (Tf)" respectively. Tr and Tf are defined as following figure.

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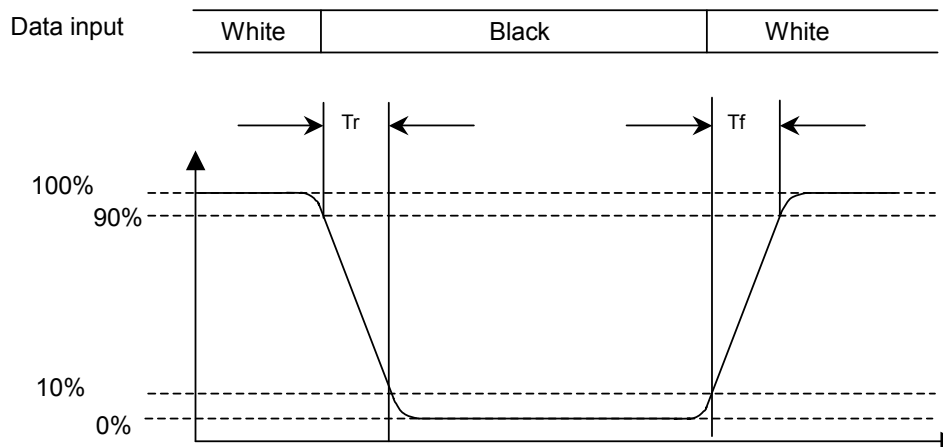
Note 8: Definition of Chromaticity:

The color coordinates (Xw, Yw), (X$_R$,Y$_R$), (X$_G$,Y$_G$), and (X$_B$,Y$_B$) are obtained with all pixels in the viewing field at white, red, green, and blue states, respectively.

## 5. MECHNICAL DRAWING

Please refer to the attached drawings.

## 6. PRECAUTION

## 6. 1 ASSEMBLY AND HANDLING PRECAUTION

(1) Do not apply rough force such as bending or twisting to the module during assembly.

(2) To assembly and install module into user's system are only in clean working areas. The Dust and oil may cause an electrical short or worsen the polarizer.

(3) It's not permitted to pressure or impulse the module because the LCD panel and backlight,

(4) Always follow the correct power sequence when user connects and operates the LCD module to prevent damage to the CMOS LSI chips during latchup.

(5) Do not pull the I/F connectors in or out while the module is operation.

(6) Do not disassembly the module.

(7) Use a soft dry cloth without chemicals for cleaning, because the surface of polarizer is very soft and easily scratched.

(8) Any moisture come into contact with the LCD module is dangerous because LCD modules is turned on with moisture on its surface may cause it damage.

(9) The high temperature or humidity may reduce the performance of module, to store LCD module within the specified storage condition.

(10)The ambient temperature is lower than 10ºC may reduce the display quality, for example, response time become slowly, the starting voltage of CCFL is higher than room temperature.

(11)The mounting screw method is recommended in Figure 6.1.

## 6.2  SAFTY PRECAUTION

(1) The startup voltage of backlight is approximately 1000 Volts. It may cause electrical shock during assembly with inverter. Do not disassemble the module or insert anything into the backlight unit.

(2) 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.

Structure of joint

Lamp Cover

(3)

1.95

Panel
Housing

Metal Front Frame

Min:2.0mm

Max:2.5mm
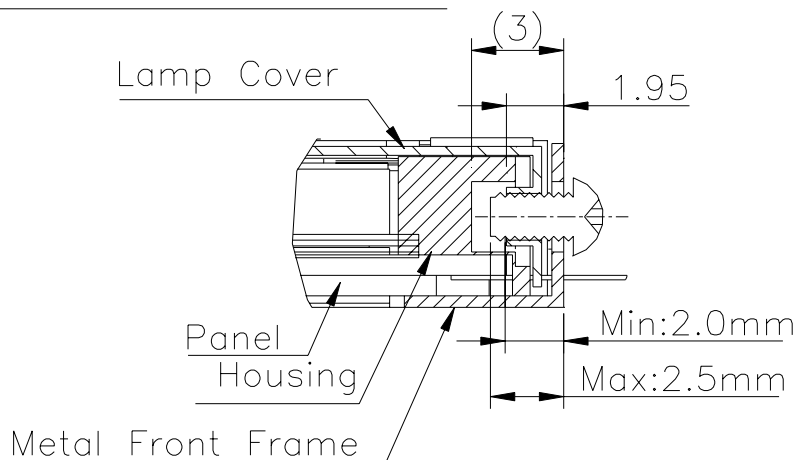
*Mounting Screw depth:2.0[mm]Min.2.5[mm]Max.
*Torque:1.3~1.5[Kgf.cm]
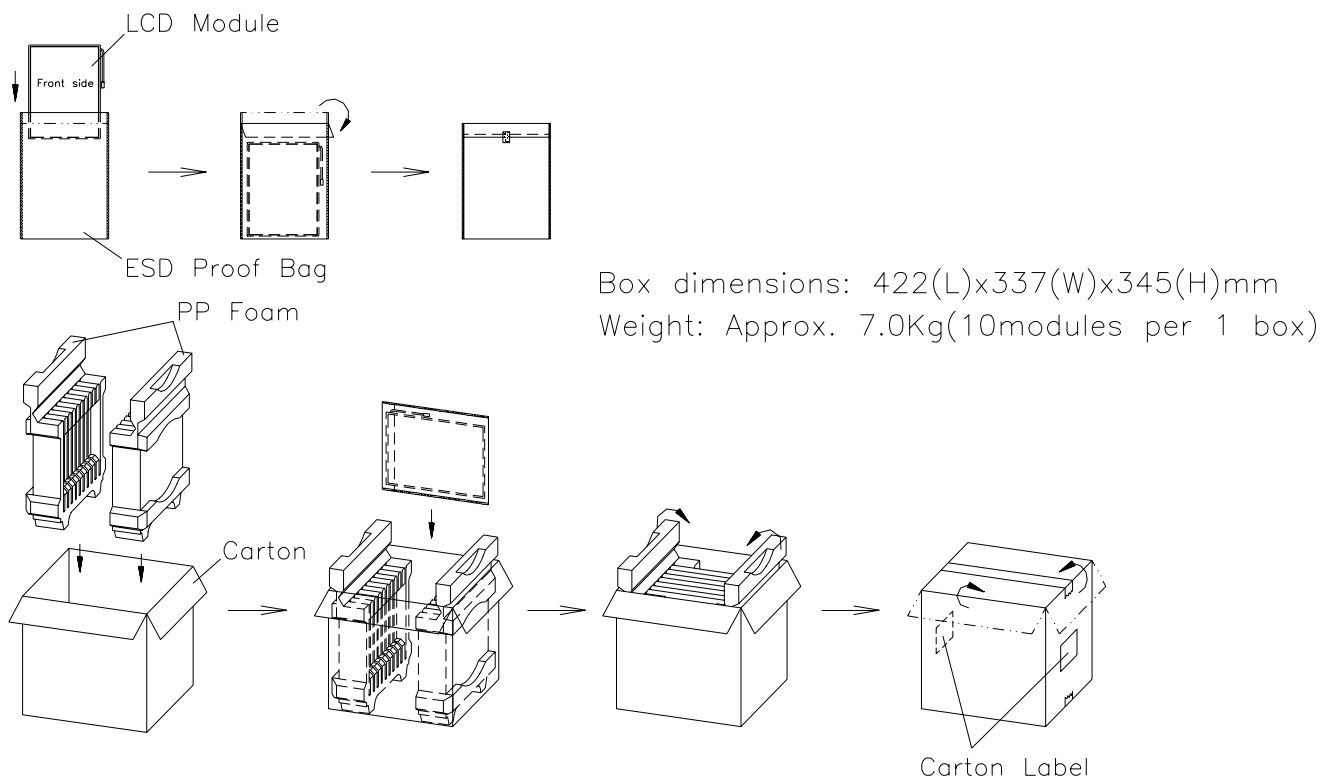
**Figure 6.1 : Mounting Screw Method**
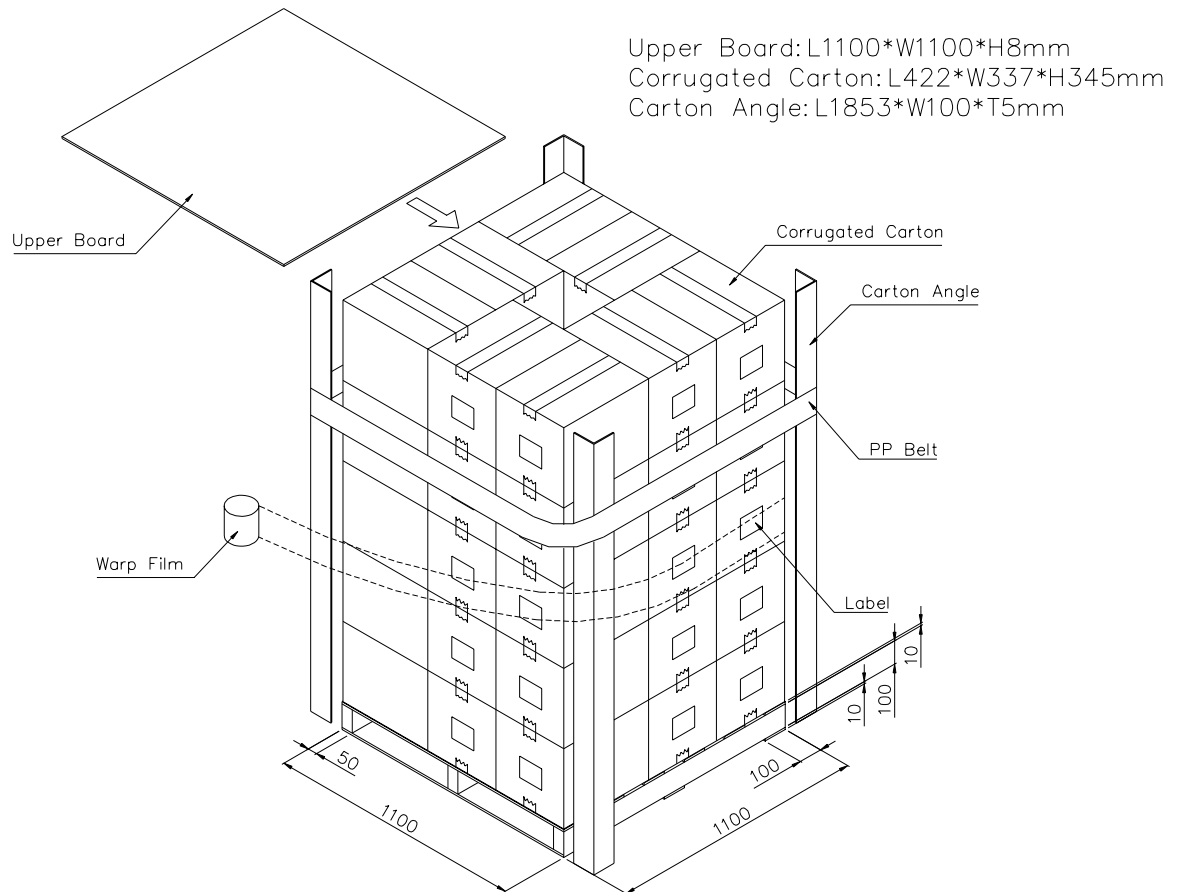
# 7. PACKAGING

## 7.1 PACKING SPECIFICATIONS

   (1)   10 LCD modules / 1 Box

   (2)   Box dimensions : 422(L) X 337(W) X 345(H) mm

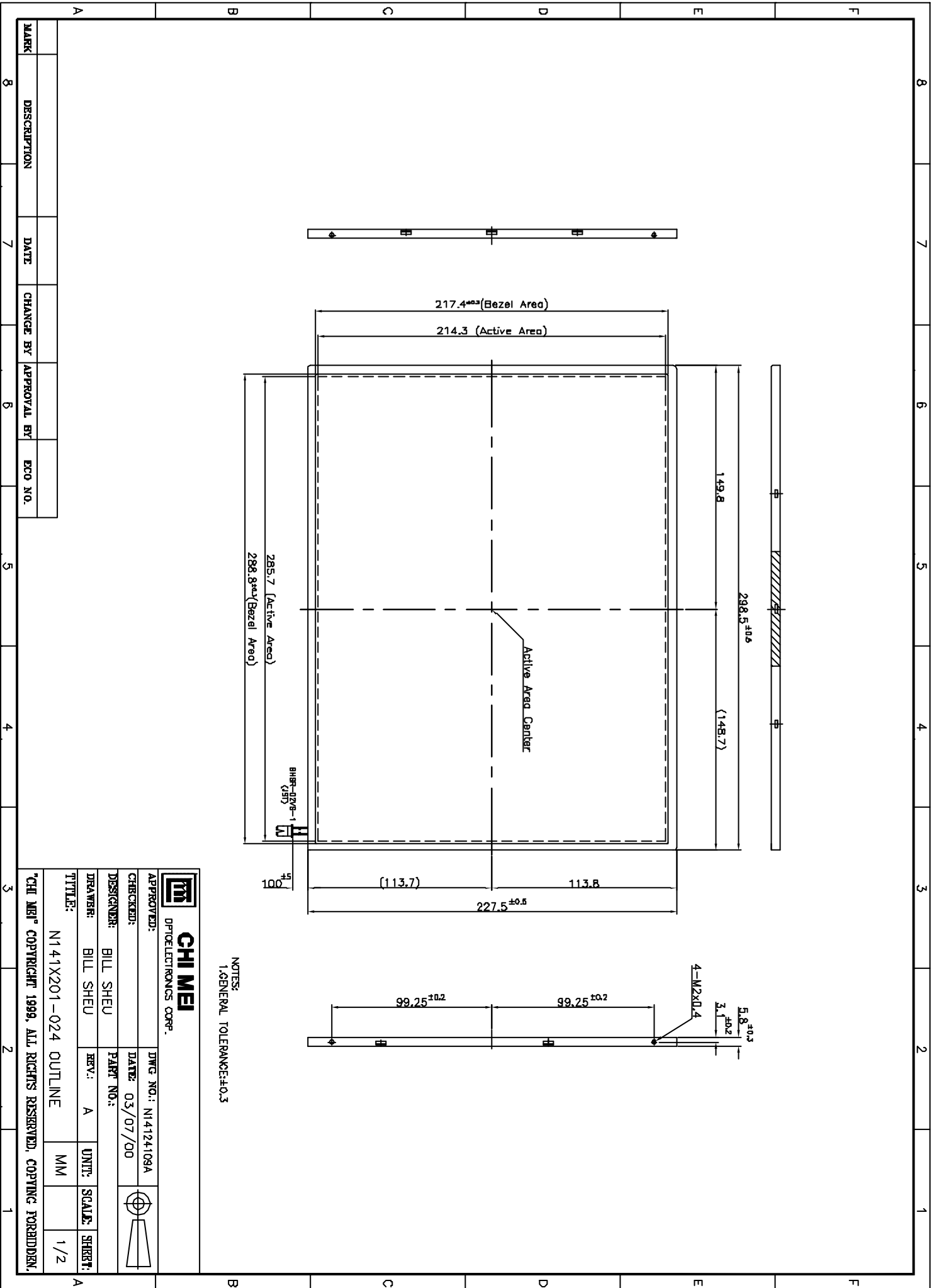   (3)   Weight : approximately  7.0Kg ( 10 modules per box)

## 7.1 PACKING Method

The Figure. 7-1,2 show the packing method.



Box dimensions: 422(L)x337(W)x345(H)mm
Weight: Approx. 7.0Kg(10modules per 1 box)

**<u>Figure. 7-1 Packing method</u>**

# CHI MEI
## OPTOELECTRONICS CORP.

Upper Board: L1100*W1100*H8mm
Corrugated Carton: L422*W337*H345mm
Carton Angle: L1853*W100*T5mm

Upper Board

Corrugated Carton

Carton Angle

PP Belt

Warp Film

Label

50

1100

100

1100

10

100

10

**Figure. 7-2   Packing method**

217.4±0.3(Bezel Area)
214.3 (Active Area)

149.8

285.7 (Active Area)
288.8±0.4(Bezel Area)

298.5±0.4

(148.7)

Active Area Center

BHSR-02V8-1
(JST)

100±5
(113.7)
113.8
227.5±0.5

99.25±0.2
99.25±0.2

4-M2x0.4
3.1 ±0.2
5.8 ±0.3

NOTES:
1.GENERAL TOLERANCE:±0.3

CHI MEI
OPTOELECTRONICS CORP.

APPROVED:
CHECKED:
DESIGNER: BILL SHEU
DRAWER: BILL SHEU
TITLE: N141X201-024 OUTLINE

DWG NO.: N14124109A
DATE: 03/07/00
PART NO.:
REV.: A
UNIT: MM
SCALE:
SHEET: 1/2

| MARK | DESCRIPTION | DATE | CHANGE BY | APPROVAL BY | ECO NO. |
|------|-------------|------|-----------|-------------|---------|

**CHI MEI** OPTOELECTRONICS CORP.

| APPROVED: | | DWG NO.: N14124109A | | |
| --- | --- | --- | --- | --- |
| CHECKED: | | DATE: 03/07/00 | PART NO.: | |
| DESIGNER: BILL SHEU | | | | |
| DRAWER: BILL SHEU | REV.: A | UNIT: MM | SCALE: | SHEET: 2/2 |
| TITLE: N141X201-024 OUTLINE | | | | |

| MARK | DESCRIPTION | DATE | CHANGE BY | APPROVAL BY | ECO NO. |
| --- | --- | --- | --- | --- | --- |

CAUTION
DON'T PRESS HERE

45 ±0.5

57.7 ±0.5

>PC<

N141X201