CHI MEI OPTOELECTRONICS CORP.

Approval

TFT LCD Approval Specification

MODEL NO.: N141X7 -L04

Customer : **IBM PCD**

Approved by : _____

Note :

Liquid Crystal Display Division	
QRA Division.	OA Head Division.
Approval	Approval
陳 永一 93. 1. 16	林 93. 1. 14

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REVISION HISTORY

Version	Date	Page (New)	Section	Description
Ver 3.0	Jul. 11. '03	All	All	Approval specification first issued.
Ver 3.1	Aug. 1. '03	4	1.2	Add dot inversion driving
		4	1.4	Update
		5	2.2	Add 2.2 image sticking
		7	3.1	Update power supply current of electrical characteristics
		12	5.2	Delete equivalent connector of backlight
		14	6.1	Update input signal timing specification
		15	6.2	Add Self-protection mode spec
		16	7.2	Update optical specification
		19	7.2	Add the definition of 13 point location
		24	11.0	Add National test Lab requirement
Ver 3.2	Sep. 8. '03	-	Outline drawing	Add a tape to cover backlight reflector and lamp cover
Ver 3.3		16	7.2	Modify the Specification of White Variation from Max/Min to Min/Max
		19	7.2	Modify the definition of White Variation from Max/Min to Min/Max

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1. GENERAL DESCRIPTION

1.1 OVERVIEW

N141X7 -L04 is a 14.1" TFT Liquid Crystal Display module with single CCFL Backlight unit and 30 pins LVDS interface. This module supports 1024 x 768 XGA mode and can display 262,144 colors. The optimum viewing angle is at 6 o'clock direction. The inverter module for Backlight is not built in.

1.2 FEATURES

- Thin and light weight

- XGA (1024 x 768 pixels) resolution

- DE (Data Enable) only mode

- Dot inversion driving only

- 3.3V LVDS (Low Voltage Differential Signaling) interface with 1 pixel/clock

- SPWG (Standard Panel Working Group) Style B compatible

1.3 APPLICATION

- TFT LCD Notebook

1.4 GENERAL SPECIFICATI0NS

Item	Specification	Unit	Note
Active Area	285.7 (H) x 214.3 (V) (14.1" diagonal)	mm	(1)
Bezel Opening Area	288.7 (H) x 217.55 (V)	mm	
Driver Element	a-si TFT active matrix	-	-
Pixel Number	1024 x R.G.B. x 768	pixel	-
Pixel Pitch	0.279 (H) x 0.279 (V)	mm	-
Pixel Arrangement	RGB vertical stripe	-	-
Display Colors	262,144	color	-
Transmissive Mode	Normally white	-	-
Surface Treatment	Hard coating (3H), Anti-glare (Haze 40), Low-Reflection(less 3%)	-	-

1.5 MECHANICAL SPECIFICATIONS

Item		Min.	Typ.	Max.	Unit	Note
Module Size	Horizontal(H)	298.5	299.0	299.5	mm	(1)
	Vertical(V)	226.0	226.5	227.0	mm	
	Depth(D)	-	5.2	5.5	mm	
Weight		-	400	415	g	-
I/F connector mounting position		The mounting inclination of the connector makes the screen center within ±0.5mm as the horizontal.				(3)

Note (1) Please refer to the attached drawings for more information of front and back outline dimensions.

(2) Connector mounting position

+/- 0.5mm

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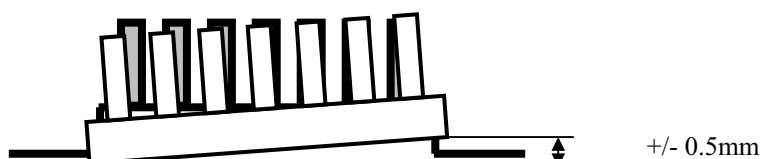
2. ABSOLUTE MAXIMUM RATINGS

2.1 ABSOLUTE RATINGS OF ENVIRONMENT

Item	Symbol	Value		Unit	Note
		Min.	Max.		
Storage Temperature	T_{ST}	-20	+60	ºC	(1)
Storage Humidity	H_{ST}	5	95	%RH	(1)
Operating Ambient Temperature	T_{OP}	0	+50	ºC	(1), (2)
Operating Ambient Humidity	H_{OP}	8	95	%RH	(1)
Shock (Non-Operating)	S_{NOP}	-	50 18 220 2	G ms G ms	(3), (4), (5)
Vibration (Non-Operating)	V_{NOP}	-	1.5 10-200	G Hz	(4), (5)

Note (1) (a) 95 %RH Max. (Ta $\leqq$ 40 ºC).

　　　　 (b) Wet-bulb temperature should be 39 ºC Max. (Ta > 40 ºC).

　　　　 (c) No condensation .

Note (2) The temperature of panel surface should be 0 ºC Min. and 50 ºC Max.

Note (3) Condition for 50G 18ms is Rectangle Wave. Condition for 220G 2ms is Half Sine Wave.

Note (4) The fixing condition is shown as below:

At Room Temperature　　　　　　　　　　LCD Module

Side Mount Fixing Screw　　　　　　　　　　Side Mount Fixing Screw

　　　　　　　　　　　　　　　　　　　　　Stage

Gap=2mm　　　　Bracket
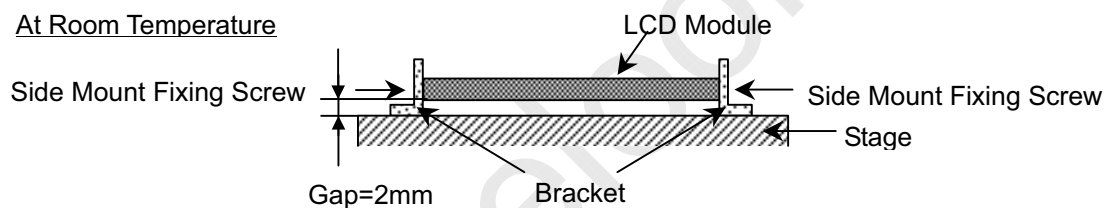
Note (5) At testing Vibration and Shock, the fixture in holding the module has to be hard and rigid enough

　　　　　so that the module would not be twisted or bent by the fixture.

2.2 IMAGE STICKING

　　　No image sticking appears to anywhere of the display area after 10 hours kept with static images, 25degC

　　(30degC with LCD Module stand alone)

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2.3 ELECTRICAL ABSOLUTE RATINGS

2.3.1 TFT LCD MODULE

Item	Symbol	Value		Unit	Note
		Min.	Max.		
Power Supply Voltage	Vcc	-0.3	+4.0	V	(1)
Logic Input Voltage	V_{IN}	-0.3	Vcc+0.3	V	

2.3.2 BACKLIGHT UNIT

Item	Symbol	Value		Unit	Note
		Min.	Max.		
Lamp Voltage	V_L	-	2.5K	V_{RMS}	(1), (2), I_L = 6.0 mA
Lamp Current	I_L	-	7.0	mA_{RMS}	(1), (2)
Lamp Frequency	F_L	-	85	KHz	

Note (1) Permanent damage to the device may occur if maximum values are exceeded. Function operation

should be restricted to the conditions described under Normal Operating Conditions.

Note (2) Specified values are for lamp (Refer to Section 3.2 for further information).

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3. ELECTRICAL CHARACTERISTICS

3.1 TFT LCD MODULE

Ta = 25 ± 2 ºC

Parameter		Symbol	Value			Unit	Note
			Min.	Typ.	Max.		
Power Supply Voltage		Vcc	3.0	3.3	3.6	V	-
Ripple Voltage		V_{RP}	-	-	100	mV	-
Rush Current		I_{RUSH}	-	-	1.5	A	(2)
Power Supply Current	White Pattern	Icc	-	300	-	mA	(3)a
	Black Pattern for typical case		-	350	-	mA	(3)b
	Vertical Stripe Pattern		-	350	-	mA	(3)c
	2H1V Pattern for maximum case		-	520	600	mA	(3)d
Differential Input Voltage for LVDS Receiver Threshold	"H" Level	V_{IH}	-	-	+100	mV	-
	"L" Level	V_{IL}	-100	-	-	mV	-
Terminating Resistor		R_T	-	100	-	Ohm	-

Note (1) The module should be always operated within above ranges.

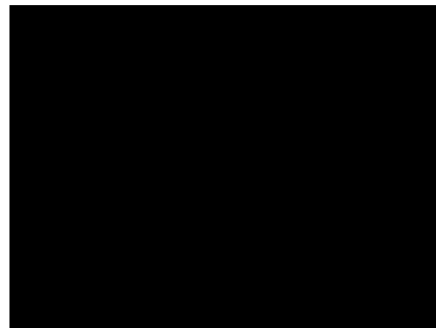Note (2) Measurement Conditions:
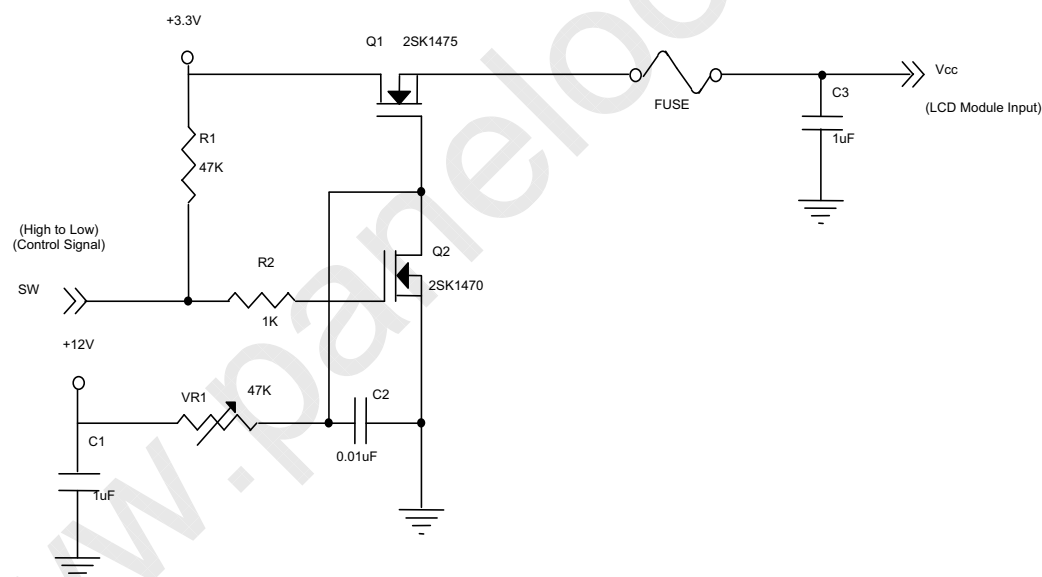
Vcc rising time is 470us

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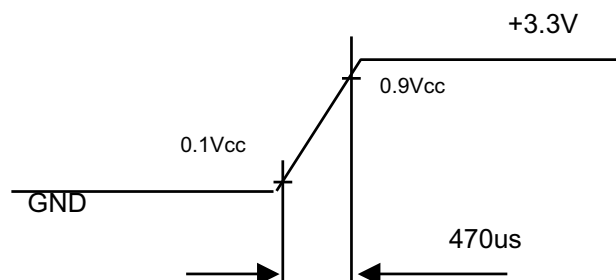
Note (3) The specified power supply current is under the conditions at Vcc = 3.3 V, Ta = 25 ± 2 ºC, DC Current and f_v = 60 Hz, whereas a power dissipation check pattern below is displayed.

a. White Pattern

Active Area

b. Black Pattern

Active Area

c. Vertical Stripe Pattern
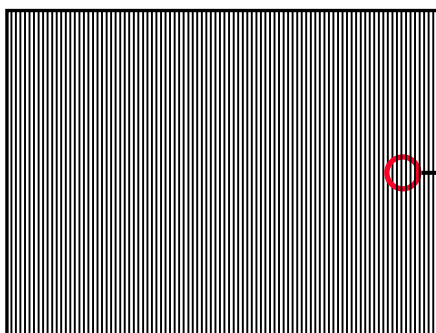
Active Area
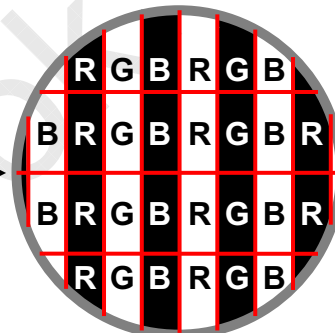
d. Set Gray Level =7 on 6-bit TN panel.

3.2 BACKLIGHT UNIT
Ta = 25 ± 2 ºC

Parameter	Symbol	Value			Unit	Note
		Min.	Typ.	Max.		
Lamp Input Voltage	V_L	599	665	732	V_{RMS}	I_L = 6.0 mA
Lamp Current	I_L	2.0	6.0	7.0	mA_{RMS}	(1)
Lamp Turn On Voltage	V_S	-	-	1110 (25 ºC)	V_{RMS}	(2)
		-	-	1450 (0 ºC)	V_{RMS}	(2)
Operating Frequency	F_L	40	-	80	KHz	(3)
Lamp Life Time	L_{BL}	10,000	-	-	Hrs	(5)
Power Consumption	P_L	-	3.99	-	W	(4), I_L = 6.0mA

Note (1) Lamp current is measured by utilizing a high frequency current meter as shown below:

LCD Module — HV (Pink) / LV (White) — 1 / 2 — (A) Current Meter — Inverter

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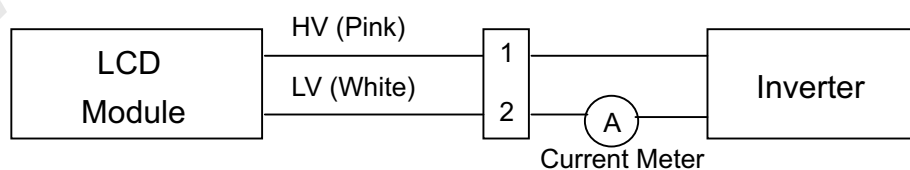
Note (2) The voltage shown above should be applied to the lamp for more than 1 second after startup. Otherwise the lamp may not be turned on.

Note (3) The lamp frequency may generate 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.

Note (4) $P_L = I_L \times V_L$

Note (5) The lifetime of lamp is defined as the time when it continues to operate under the conditions at Ta = 25 $\pm$2 ^{o}C and I_L = 6.5 mA$_{RMS}$ until one of the following events occurs:

(a) When the brightness becomes $\leqq$ 50% of its original value.

(b) When the effective ignition length becomes $\leqq$ 80% of its original value. (Effective ignition length is defined as an area that the brightness is less than 70% compared to the center point.)

Note (6) 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 carefully designed to avoid generating 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. If the above situation is confirmed, the module should be operated in the same manners when it is installed in your instrument.

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4. BLOCK DIAGRAM

4.1 TFT LCD MODULE

4.2 BACKLIGHT UNIT

1 HV (Pink)
2 LV (White)

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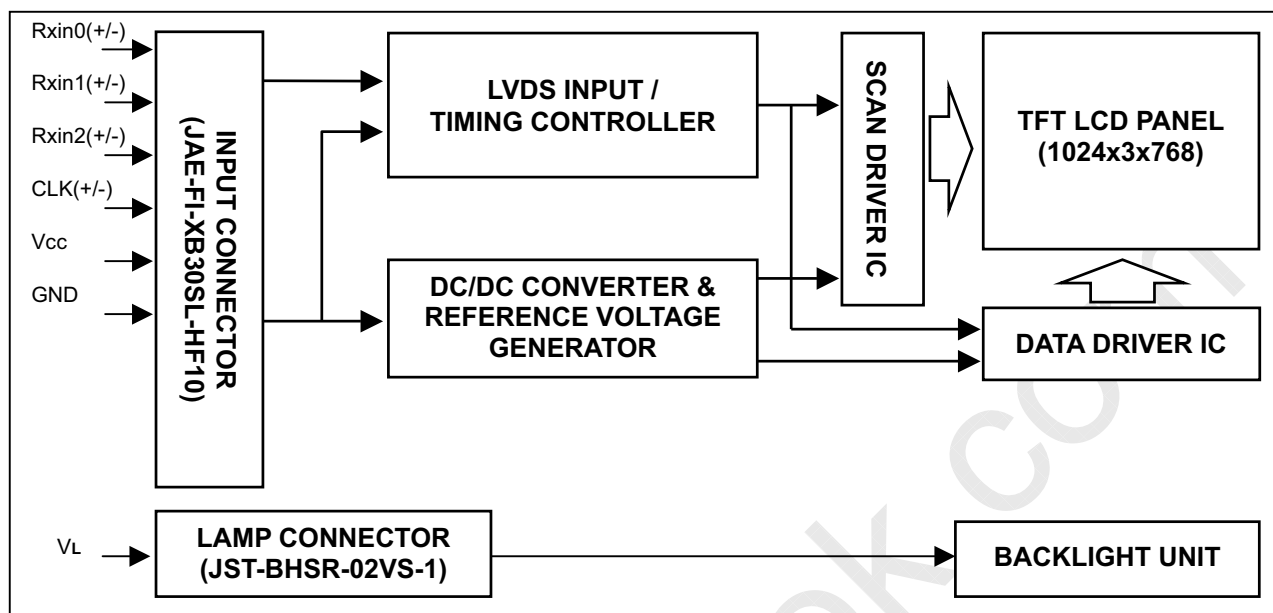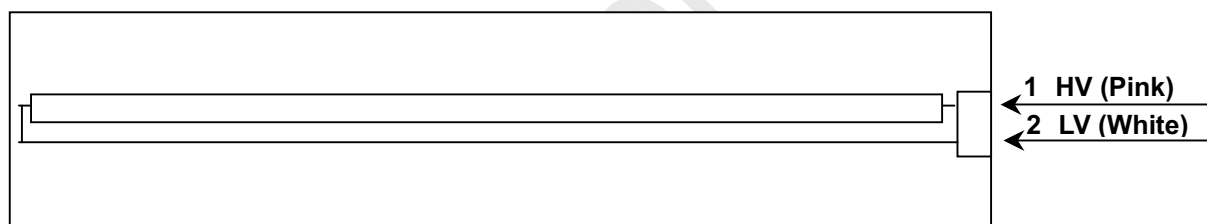
5. INPUT TERMINAL PIN ASSIGNMENT

5.1 TFT LCD MODULE

Pin	Symbol	Description	Polarity	Remark
1	Vss	Ground		-
2	Vcc	Power Supply +3.3 V		-
3	Vcc	Power Supply +3.3 V		-
4	NC	-		
5	NC	-	-	-
6	NC	-		
7	NC	-		
8	Rxin0-	LVDS Differential Data Input	Negative	-
9	Rxin0+	LVDS Differential Data Input	Positive	R0~R5,G0
10	Vss	Ground		
11	Rxin1-	LVDS Differential Data Input	Negative	
12	Rxin1+	LVDS Differential Data Input	Positive	G1~G5,B0,B1
13	Vss	Ground		
14	Rxin2-	LVDS Differential Data Input	Negative	
15	Rxin2+	LVDS Differential Data Input	Positive	B2~B5,Hsync,Vsync,DE
16	Vss	Ground		
17	CLK-	LVDS Clock Data Input	Negative	
18	CLK+	LVDS Clock Data Input	Positive	LVDS Level
19	Vss	Ground		
20	NC	-	-	-
21	NC	-	-	-
22	NC	-	-	-
23	NC	-	-	-
24	NC	-	-	-
25	NC	-	-	-
26	NC	-	-	-
27	NC	-	-	-
28	NC	-	-	-
29	NC	-	-	-
30	NC	-	-	-

Note (1) Connector Part No.: JAE-FI-XB30SL-HF10 or equivalent

Note (2) User's connector Part No: JAE-FI-X30C2L or equivalent

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5.2 BACKLIGHT UNIT

Pin	Symbol	Description	Color
1	HV	High Voltage	Pink
2	LV	Ground	White

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

Note (2) User's connector Part No.: JST-SM02B-BHSS-1-TB

5.3 TIMING DIAGRAM OF LVDS INPUT SIGNAL

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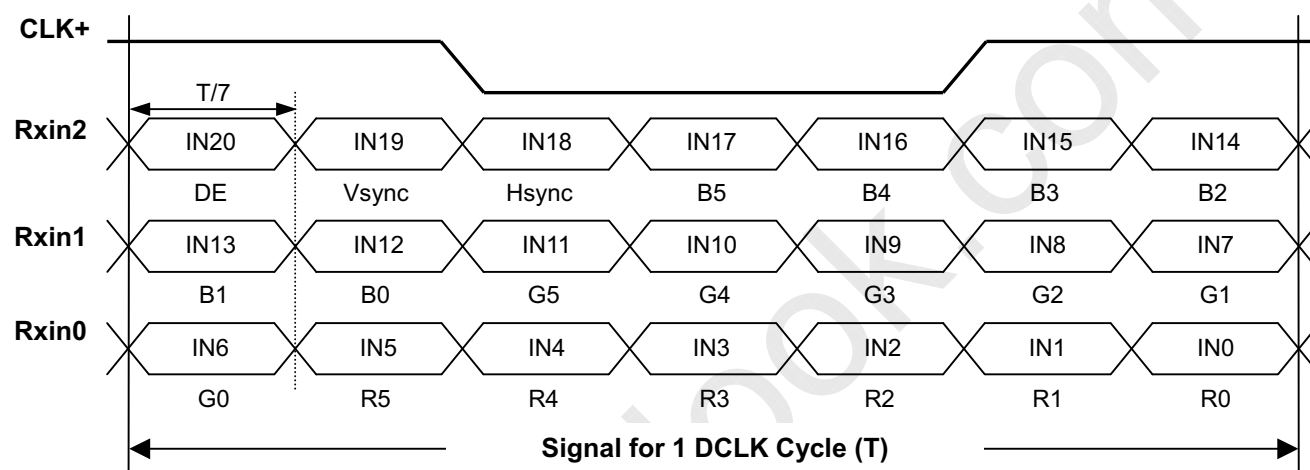
5.4 COLOR DATA INPUT ASSIGNMENT

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 below provides the assignment of color versus data input.

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
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	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
	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

Note (1) 0: Low Level Voltage, 1: High Level Voltage

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DCC No.:1402Z262
Issued Date: Jan. 16, 2004
Model No.: N141X7 -L04

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6. INTERFACE TIMING

6.1 INPUT SIGNAL TIMING SPECIFICATIONS

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

Signal	Item	Symbol	Min.	Typ.	Max.	Unit	Note
Clock	Frequency	1/Tc	40	65	80	MHz	-
	High Time	T_{CH}	13	-	-	nsec	-
	Low Time	T_{CL}	13	-	-	nsec	-
Data	Setup Time	T_{DS}	4	-	-	nsec	-
	Hold Time	T_{DH}	4	-	-	nsec	-
Vsync Frequency	Frequency	Vsync	40	60	-	Hz	(1)
Hsync Frequency	Frequency	Hsync	-	48	-	KHz	
Data Enable	Pulse width	T_{DEP}	100	-	-	clocks	(2)
Data Enable	Setup Time	T_{ES}	3.5	4.0	-	nsec	(2)
Frame Frequency	Cycle	T_V	770	806	1000	lines	-
Vertical Active Display Term	Display Period	T_{VD}	-	768	-	lines	-
One Line Scanning Time	Cycle	T_H	1180	1344	2000	clocks	(3)
Horizontal Active Display Term	Display Period	T_{HD}	-	1024	-	clocks	-

Note (1) If Vsync frequency is lower than 60Hz, flicker will be accepted.

Note (2) Because this module is operated by DE only mode, Hsync and Vsync input signals should be set to low logic level or ground. Otherwise, this module would operate abnormally.

Note (3) The duration of DE signal must be longer than 1 clock period at every horizontal sync. period.

INPUT SIGNAL TIMING DIAGRAM

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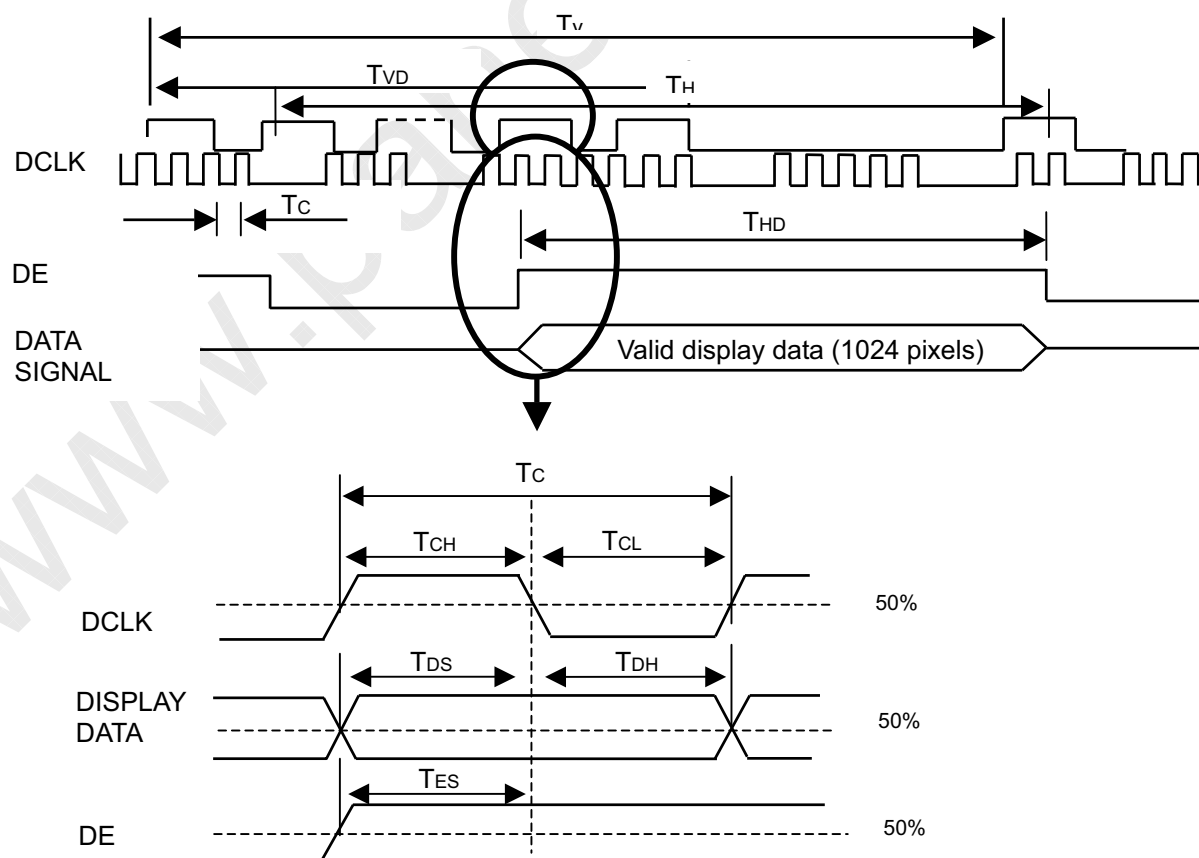
6.2 Self-Protection Mode

There are two kind of conditions that timing controller will go to the self-protection mode.
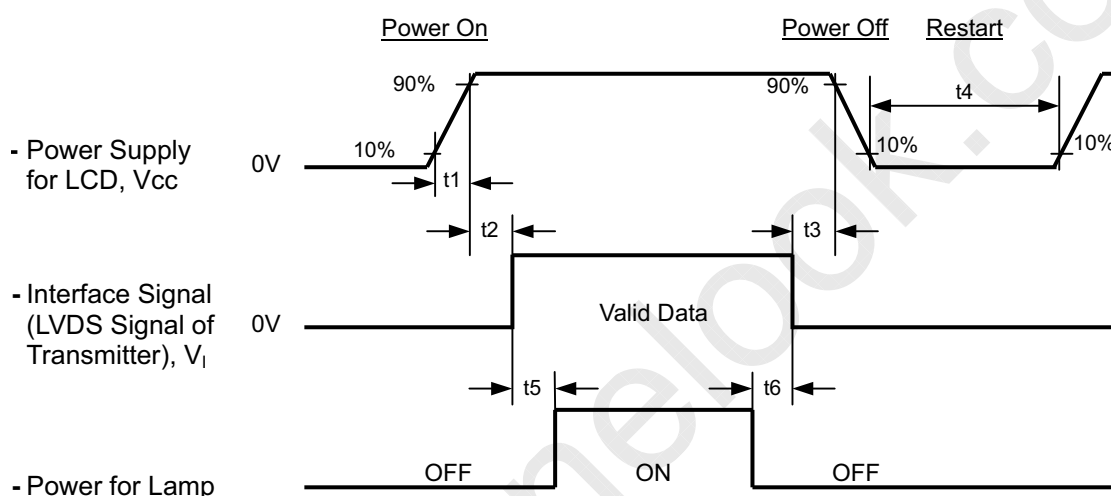
(1) Clock Stop Detection

If dot clock stops still about 100ms, timing controller goes into the self-protection mode.

(2) DE Signal Detection

If the time of DE as low is longer than 1 frame, timing controller goes into the self-protection mode.

Once the self-protection mode is active, the panel will display black pattern.

6.3 POWER ON/OFF SEQUENCE

Timing Specifications:

$0 < t1 \leqq 10$ msec

$0 < t2 \leqq 50$ msec

$t3 \geqq 0$ msec

$t4 \geqq 100$ msec

$t5 \geqq 200$ msec

$t6 \geqq 0$ msec

Note (1) Please avoid floating state of interface signal at invalid period.

Note (2) When the interface signal is invalid, be sure to pull down the power supply of LCD Vcc to 0 V.

Note (3) The Backlight inverter power must be turned on after the power supply for the logic and the interface signal is valid. The Backlight inverter power must be turned off before the power supply for the logic and the interface signal is invalid.

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7 OPTICAL CHARACTERISTICS

7.1 TEST CONDITIONS

Item	Symbol	Value	Unit
Ambient Temperature	Ta	25±2	^{o}C
Ambient Humidity	Ha	50±10	%RH
Supply Voltage	V_{CC}	3.3	V
Input Signal	According to typical value in "3. ELECTRICAL CHARACTERISTICS"		
Inverter Current	I_L	6.0	mA
Inverter Driving Frequency	F_L	55	KHz
Inverter	Sumida-H05-4915		

The measurement methods of optical characteristics are shown in Section 7.2. The following items should be measured under the test conditions described in Section 7.1 and stable environment shown in Note (6).

7.2 OPTICAL SPECIFICATIONS

Item		Symbol	Condition	Min.	Typ.	Max.	Unit	Note
Contrast Ratio		CR		150	200	-	-	(2), (6)
Response Time		T_R		-	15	30	ms	(3)
		T_F		-	35	50	ms	
Center Luminance of White		L		135	165	-	cd/m^2	(4), (6)
Average Luminance of White		L_{AVE}		126	154	-	cd/m^2	(4), (6)
White Variation of 5points		δW		80	-	-	%	(6), (7)
White Variation of 13points		δW		65	-	-	%	(6), (7)
Cross Talk		CT	θ_x=0°, θ_Y =0° Viewing Normal Angle	-	-	4.0	%	(5), (6)
Color Chromaticity	Red	Rx		0.538	0.568	0.598	-	(1), (6)
		Ry		0.309	0.339	0.369	-	
	Green	Gx		0.290	0.320	0.350	-	
		Gy		0.536	0.566	0.596	-	
	Blue	Bx		0.121	0.151	0.181	-	
		By		0.095	0.125	0.155	-	
	White	Wx		0.285	0.313	0.341	-	
		Wy		0.309	0.329	0.349	-	
	Color Gamut	C.G%			45	-	%	(8)
Viewing Angle	Horizontal	θ_x+	CR≥10	40	45	-	Deg.	(1), (6)
		θ_x-		40	45	-		
	Vertical	θ_Y+		10	15	-		
		θ_Y-		30	35	-		
Gamma Corrected Gray Scale		L0 L7 L15 L23 L31 L39 L47 L55 L63	θ_x=0°, θ_Y =0° Viewing Normal Angle	-	0 2 5 10 22 36 53 75 100	-	%	6bit

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Note (1) Definition of Viewing Angle (θx, θy):

Normal

$\theta x = \theta y = 0°$

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

$\theta x- = 90°$ x-

$\theta x-$

$\theta x+$

y+

12 o'clock direction

$\theta y+ = 90°$

6 o'clock

y-

$\theta y- = 90°$

x+ $\theta x+ = 90°$
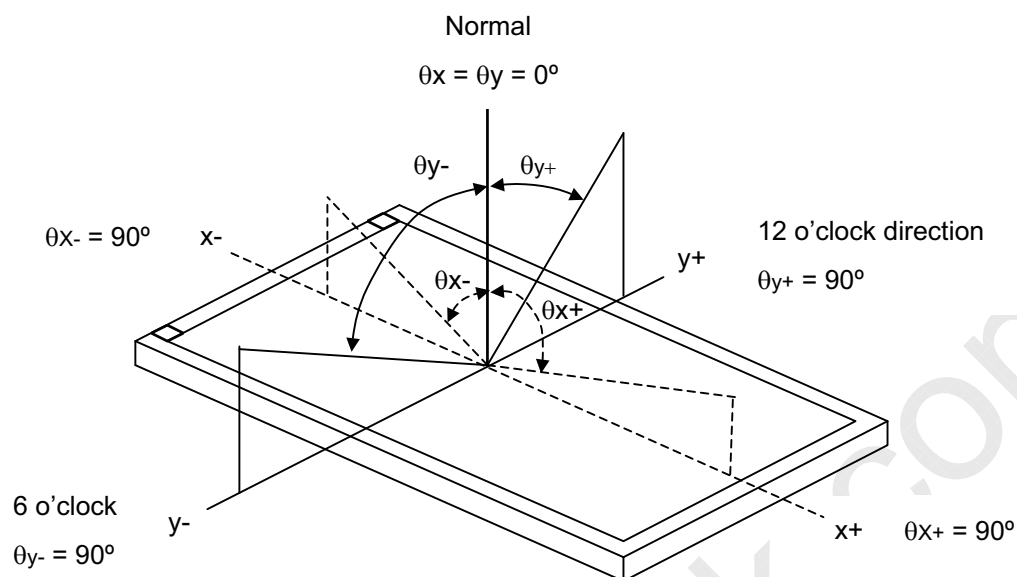
Note (2) Definition of Contrast Ratio (CR):

The contrast ratio can be calculated by the following expression.
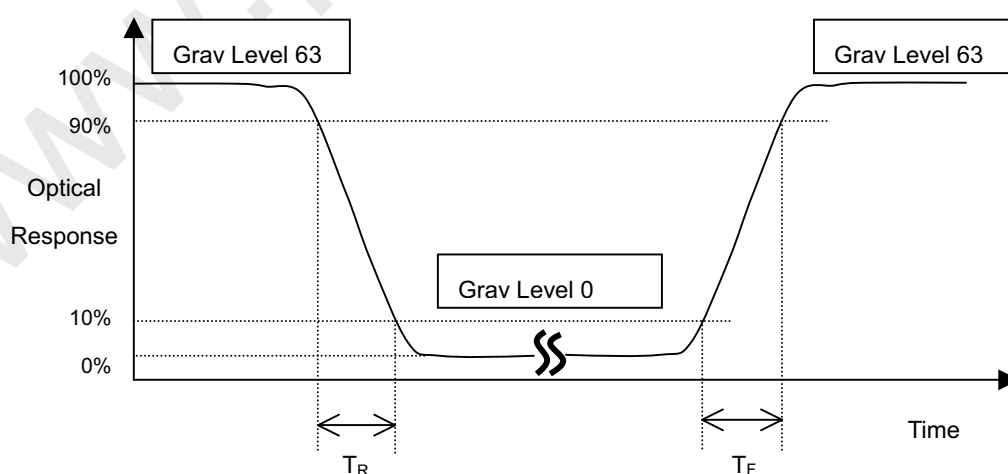
Contrast Ratio (CR) = L63 / L0

L63: Luminance of gray level 63

L 0: Luminance of gray level 0

CR = CR (5)

CR (X) is corresponding to the Contrast Ratio of the point X at Figure in Note (7).

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

Grav Level 63

Grav Level 63

100%

90%

Optical

Response

Grav Level 0

10%

0%

Time

T_R T_F

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Note (4) Definition of Average Luminance of White (L_{AVE}):

Measure the luminance of gray level 63 at 5 points

L_{AVE} = [L (1)+ L (2)+ L (3)+ L (4)+ L (5)] / 5

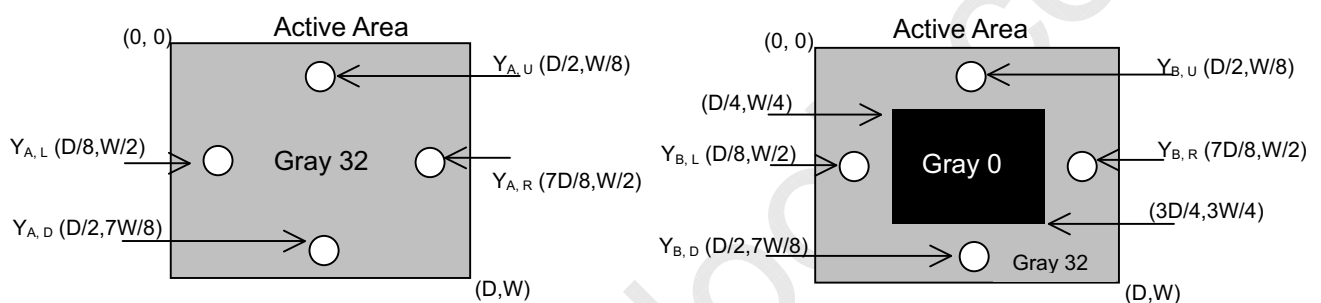L (x) is corresponding to the luminance of the point X at Figure in Note (7).

Note (5) Definition of Cross Talk (CT):

CT = | Y_B – Y_A | / $Y_A \times$ 100 (%)

Where:

Y_A = Luminance of measured location without gray level 0 pattern (cd/m^2)

Y_B = Luminance of measured location with gray level 0 pattern (cd/m^2)

Note (6) Measurement Setup:

The LCD module should be stabilized at given temperature for 20 minutes to avoid abrupt temperature change during measuring. In order to stabilize the luminance, the measurement should be executed after lighting Backlight for 20 minutes in a windless room.
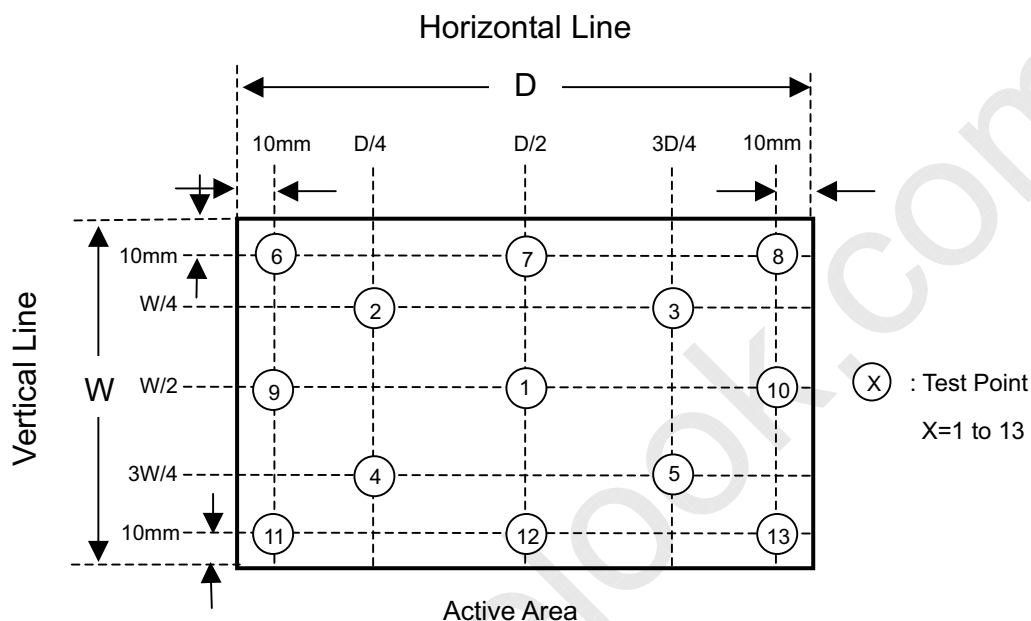

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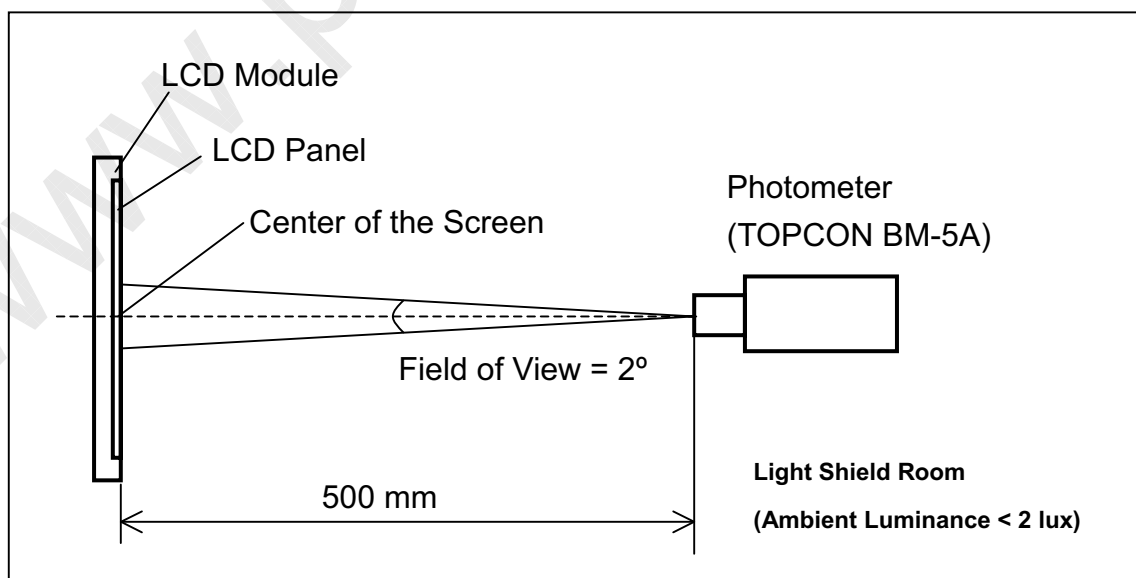
Note (7) Definition of White Variation (δW):

Measure the luminance of gray level 63 at 13 points

δW = Minimum [L (1), L (2), L (3), L (4), L (5)] / Maximum [L (1), L (2), L (3), L (4), L (5)]

$$\delta W = \frac{\text{Minimum} [L (1), L (6), L (7), L (8), L (9), L (10), L (11), L (12), L (13)]}{\text{Maximum} [L (1), L (6), L (7), L (8), L (9), L (10), L (11), L (12), L (13)]}$$

Horizontal Line

D

10mm   D/4   D/2   3D/4   10mm

Vertical Line   W

10mm   ⑥   ⑦   ⑧

W/4   ②   ③

W/2   ⑨   ①   ⑩

3W/4   ④   ⑤

10mm   ⑪   ⑫   ⑬

Ⓧ : Test Point

X=1 to 13

Active Area

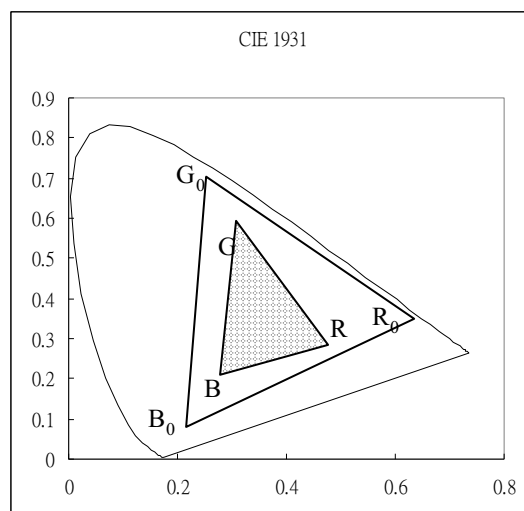Note (8) Definition of color gamut (C.G%):

C.G%= $\Delta R\,G\,B / \Delta R_0\,G_0\,B_0$,*100%

R_0, G_0, B_0 : color coordinates of red, green, and blue defined by NTSC, respectively.

R, G, B : color coordinates of module on 63 gray levels of red, green, and blue, respectively.

$\Delta R_0\,G_0\,B_0$: area of triangle defined by R_0, G_0, B_0

$\Delta R\,G\,B$: area of triangle defined by R, G, B

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8 PRECAUTIONS

8.1 HANDLING PRECAUTIONS

(1) The module should be assembled into the system firmly by using every mounting hole. Be careful not to twist or bend the module.

(2) While assembling or installing modules, it can only be in the clean area. The dust and oil may cause electrical short or damage the polarizer.

(3) Use fingerstalls or soft gloves in order to keep display clean during the incoming inspection and assembly process.

(4) Do not press or scratch the surface harder than a HB pencil lead on the panel because the polarizer is very soft and easily scratched.

(5) If the surface of the polarizer is dirty, please clean it by some absorbent cotton or soft cloth. Do not use Ketone type materials (ex. Acetone), Ethyl alcohol, Toluene, Ethyl acid or Methyl chloride. It might permanently damage the polarizer due to chemical reaction.

(6) Wipe off water droplets or oil immediately. Staining and discoloration may occur if they left on panel for a long time.

(7) If the liquid crystal material leaks from the panel, it should be kept away from the eyes or mouth. In case of contacting with hands, legs or clothes, it must be washed away thoroughly with soap.

(8) Protect the module from static electricity, it may cause damage to the C-MOS Gate Array IC.

(9) Do not disassemble the module.

(10) Do not pull or fold the lamp wire.

(11) Pins of I/F connector should not be touched directly with bare hands.

8.2 STORAGE PRECAUTIONS

(1) High temperature or humidity may reduce the performance of module. Please store LCD module within the specified storage conditions.

(2) It is dangerous that moisture come into or contacted the LCD module, because the moisture may damage LCD module when it is operating.

(3) It may reduce the display quality if the ambient temperature is lower than 10 ºC. For example, the response time will become slowly, and the starting voltage of lamp will be higher than the room temperature.

8.3 OPERATION PRECAUTIONS

(1) Do not pull the I/F connector in or out while the module is operating.

(2) Always follow the correct power on/off sequence when LCD module is connecting and operating. This can prevent the CMOS LSI chips from damage during latch-up.

(3) The startup voltage of Backlight is approximately 1000 Volts. It may cause electrical shock while assembling with inverter. Do not disassemble the module or insert anything into the Backlight unit.

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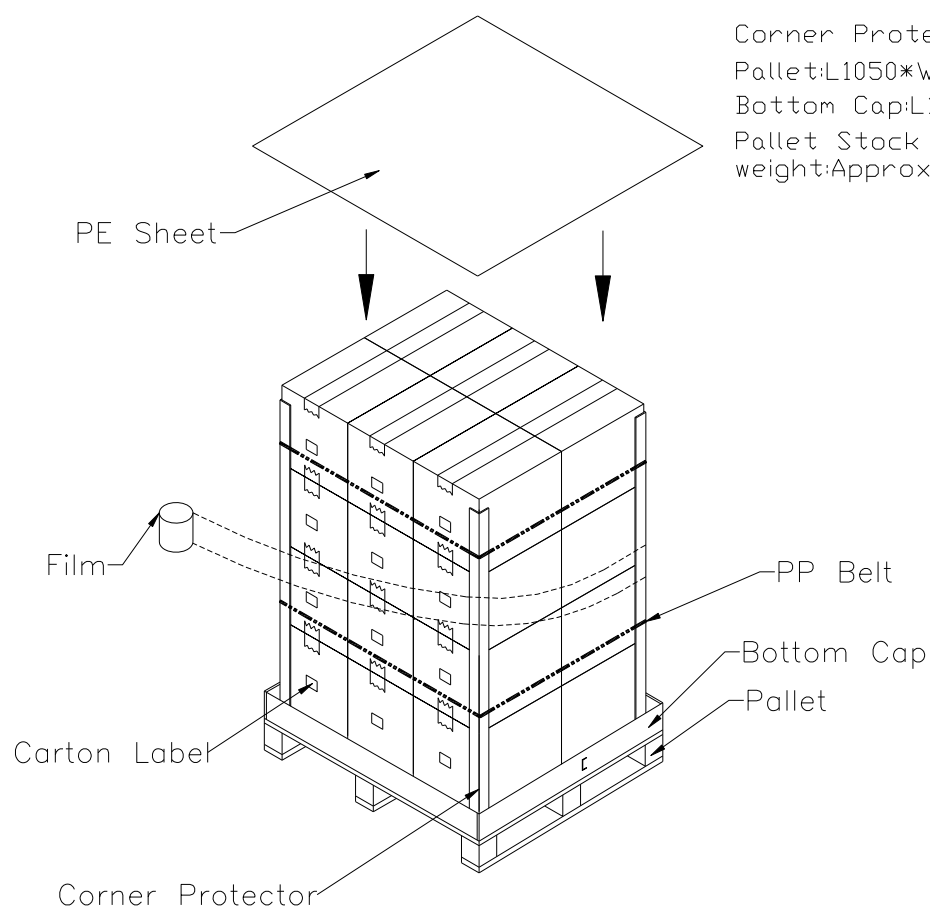
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9. PACKING

9.1 CARTON
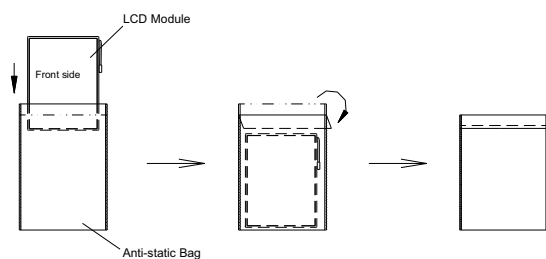
Box dimensions:422(L)x337(W)x345(H)mm
Weight:Appox. 6.1kg(10 module per 1 box).

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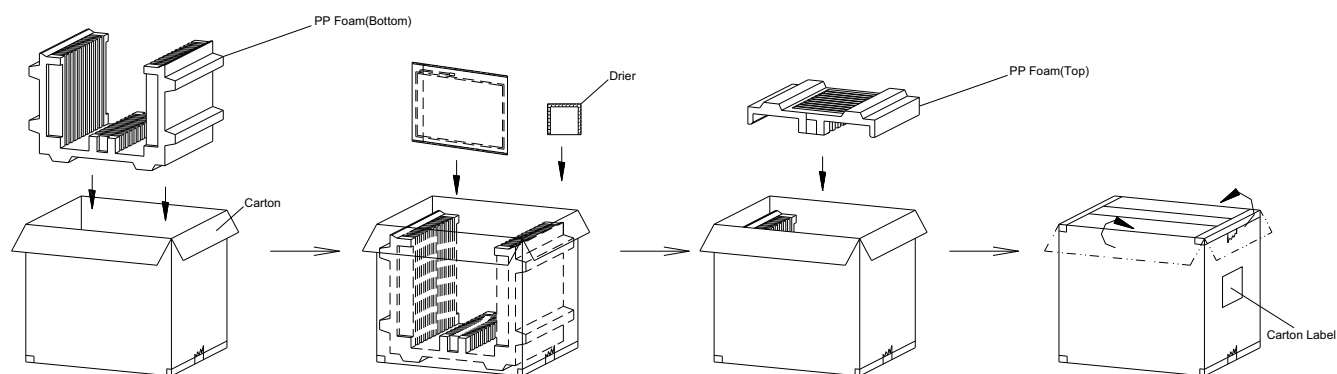
9.2 PALLET

Corner Protector:L1380mm*50mm*50mm

Pallet:L1050*W870*H135mm

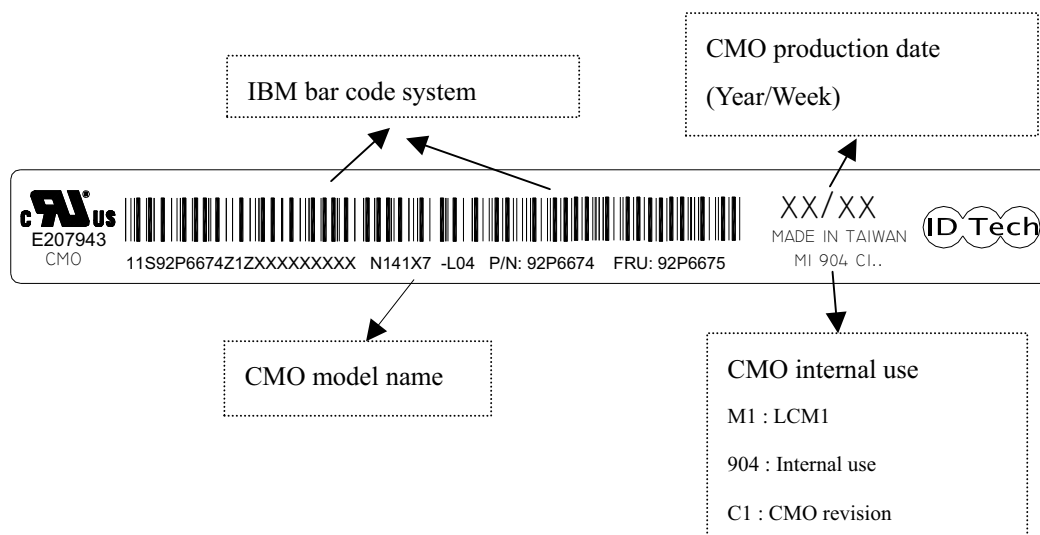Bottom Cap:L1050*W870*H120mm

Pallet Stock Dim:L1050*W870*H1380mm
weight:Approx.152kg

PE Sheet

Film

PP Belt

Bottom Cap

Pallet

Carton Label

Corner Protector

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DCC No.:1402Z262
Issued Date: Jan. 16, 2004
Model No.: N141X7 -L04

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10. DEFINITION OF LABELS

10.1 MODULE LABEL

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

IBM bar code system

CMO production date
(Year/Week)

XX/XX
MADE IN TAIWAN
MI 904 CI..

E207943
CMO
11S92P6674Z1ZXXXXXXXXX N141X7 -L04 P/N: 92P6674 FRU: 92P6675

ID Tech

CMO model name

CMO internal use
M1 : LCM1
904 : Internal use
C1 : CMO revision

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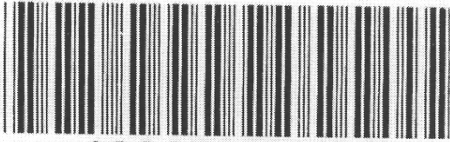## 10.2 CMO CARTON LABEL


```
PART NAME : N141X7 -L04
P / N     : D0092P6674
QTY       : XX pcs
SHIP DATE : XX/XX/XX
                          Made in Taiwan
03/28                              *
MADE IN TAIWAN  IDTech  M1 904 C1

        *030707T002*
```
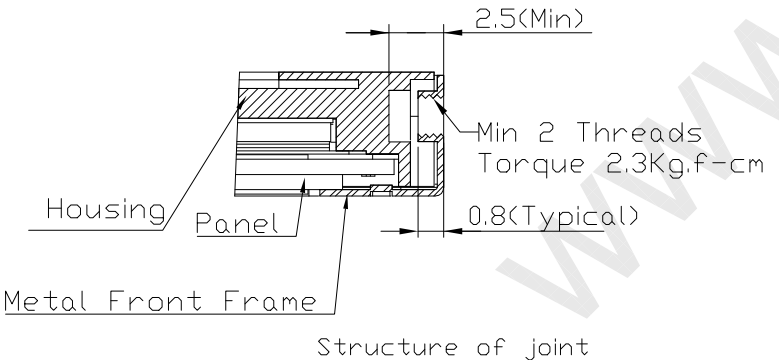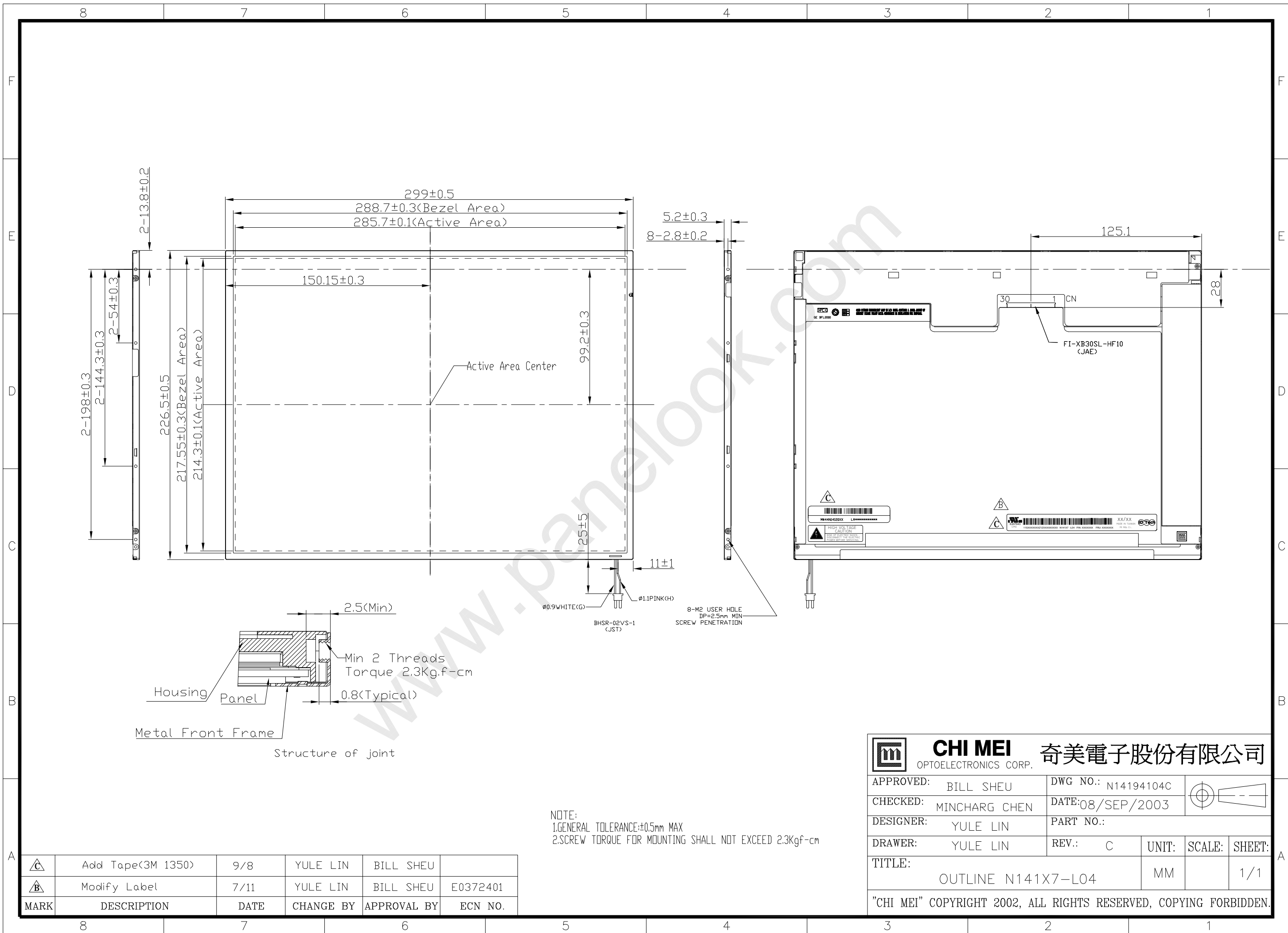
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11. NATIONAL TEST LAB REQUIREMENT

The display module is authorized to Apply the UL Recognized Mark.

Conditions of Acceptability

Conditions of Acceptability   - When installed on the end-product, consideration shall be given to the following;

1. This component has been judged on the basis of the required spacings in the Standard for Safety of Information Technology Equipment, CSA/UL60950, which would cover the component itself if submitted for Listing.

2. The unit is intended to be supplied by SELV and Limited Power Source. Also separated from electrical parts, which may produce high temperature that could cause ignition by as least 13mm of air or by a solid barrier of material of V-1 minimum.

3. The terminals and connectors are suitable for factory wiring only.

4. A suitable electrical enclosure shall be provided.

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Active Area Center

299±0.5
288.7±0.3(Bezel Area)
285.7±0.1(Active Area)
150.15±0.3
99.2±0.3

5.2±0.3
8-2.8±0.2

125.1
28

30   1   CN

FI-XB30SL-HF10
(JAE)

2-13.8±0.2
2-54±0.3
2-144.3±0.3
2-198±0.3
226.5±0.5
217.55±0.3(Bezel Area)
214.3±0.1(Active Area)

25±5

11±1

Ø1.1PINK(H)
Ø0.9WHITE(G)

8-M2 USER HOLE
DP≧2.5mm MIN
SCREW PENETRATION

BHSR-02VS-1
(JST)

HIGH VOLTAGE CAUTION

2.5(Min)

Min 2 Threads
Torque 2.3Kg.f-cm

Housing   Panel

0.8(Typical)

Metal Front Frame

Structure of joint

NOTE:
1.GENERAL TOLERANCE:±0.5mm MAX
2.SCREW TORQUE FOR MOUNTING SHALL NOT EXCEED 2.3Kgf-cm

CHI MEI
OPTOELECTRONICS CORP.
奇美電子股份有限公司

APPROVED:	BILL SHEU	DWG NO.: N14194104C	
CHECKED:	MINCHARG CHEN	DATE:08/SEP/2003	
DESIGNER:	YULE LIN	PART NO.:	
DRAWER:	YULE LIN	REV.: C	UNIT: MM	SCALE:	SHEET: 1/1
TITLE: OUTLINE N141X7-L04			

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MARK	DESCRIPTION	DATE	CHANGE BY	APPROVAL BY	ECN NO.
C	Add Tape(3M 1350)	9/8	YULE LIN	BILL SHEU	
B	Modify Label	7/11	YULE LIN	BILL SHEU	E0372401