CHI MEI
OPTOELECTRONICS CORP.

TFT LCD Approval Specification

MODEL NO.: N141X6 - L03

Customer :

Approved by :

Note :

Liquid Crystal Display Division		
QRA Dept.	RD Dept.	PD Dept.
Approval	Approval	Approval

Version 3.2

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REVISION HISTORY

Version	Date	Page (New)	Section	Description
Ver 1.0	June.1.'01	All	All	Preliminary Specification was first issued.
Ver 1.1	July.2.'01	4	1.5	Vertical size of module: Min: (226.5) → (226.0) Max: (227.5) → (227.0)
		4	1.5	Weight: TYP: (480) → (470)
		14	6.2	Modify the timing specification from TBD to below value. $0 < t1 \leqq (10)$ msec $0 < t2 \leqq (50)$ msec $0 < t3 \leqq (50)$ msec $t4 \geqq (1)$ sec $t5 \geqq (200)$ msec $t6 \geqq (200)$ msec
		15	7.2	Modify the color chromaticity of the optical specification from TBD to specific value.
		20	9	Add section 9. PACKING
		21	10	Add section 10. LABEL
Ver 1.2	Sep.1.'01	7	3.1	Modify the rush current from TBD to (1.5) A.
		13	6.1	Modify the input signal timing specifications from TBD to specific value.
		21	10.2	Delete 10.2 customer label.
		22	10.3	10.3 change to 10.2
Ver 3.0	Sep.17.'01	4	1.4	Modify surface treatment from Haze 12 to Haze 25
		4	1.5	Revise Mechanical specifications table
		6	2.2.2	Revise Backlight Unit specifications table
		7	3.1	Modify some type-miss items $L_{CC} \to I_{CC}$, $V_{IL} \to V_{IH}$, $V_{IH} \to V_{IL}$ Revise specifications of "3.1 TFT LCD Module" Table
		8	3.2	Revise specifications of "3.2 Backlight Unit" Table
		13	6.1	Revise the input signal timing specifications table and timing diagram Delete 6.1 Note (1) Change Note (2) to Note (1)
		15	7.1	Revise optical test conditions table Inverter Driving Frequency : 55 → 60 Inverter : TBD → Sumida-H05-4783B
		15	7.2	Revise optical specifications table
		20	9.1	Updated Figure 9.1 packing method
		21	10.1	Revise the CMO Module Label
Ver 3.1	Sep.24.'01	7	3.1	Revise specifications of "3.1 TFT LCD Module" Table
		8	3.1	Delete 3.1 Note (3)
		14	7.2	Add specification of Luminance of White Center Luminance Max. : 290 Average Luminance Max. : 280

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Version	Date	Page (New)	Section	Description
Ver 3.2	Oct.15,'01	14	6.2	Update the timing specification $0 < t1 \leqq 15$ msec $t4 \geqq 500$ msec $t6 \geqq 0$ msec
		15	7.2	Update Color Chromaticity Red Rx 0.545(Min.)/0.605(Max.)→0.555(Min.)/0.595(Max.) Red Ry 0.310(Min.)/0.370(Max.)→0.320(Min.)/0.360(Max.) Green Gx 0.280(Min.)/0.340(Max.)→0.290(Min.)/0.330(Max.) Green Gy 0.490(Min.)/0.550(Max.)→0.500(Min.)/0.540(Max.) Blue Bx 0.120(Min.)/0.180(Max.)→0.130(Min.)/0.170(Max.) Blue By 0.100(Min.)/0.160(Max.)→0.110(Min.)/0.150(Max.) White Wx 0.280(Min.)/0.340(Max.)→0.290(Min.)/0.330(Max.) White Wx 0.300(Min.)/0.360(Max.)→0.310(Min.)/0.350(Max.)

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1. GENERAL DESCRIPTION

1.1 OVERVIEW

N141X6- L03 is a 14.1" TFT Liquid Crystal Display module with single CCFL Backlight unit and 20 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 and high brightness

- XGA (1024 x 768 pixels) resolution

- DE (Data Enable) only mode

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

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	288.9 (H) x 217.5 (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 25)	-	-

1.5 MECHANICAL SPECIFICATIONS

Item		Min.	Typ.	Max.	Unit	Note
Module Size	Horizontal(H)	298.0	298.5	299.0	mm	(1)
	Vertical(V)	226.0	226.5	227.0	mm	
	Depth(D)	-	5.2	5.5	mm	
Weight		-	470	485	g	-

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

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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)
Operating Ambient Temperature	T_{OP}	0	+50	ºC	(1), (2)
Shock (Non-Operating)	S_{NOP}	-	180	G	(3), (5)
Vibration (Non-Operating)	V_{NOP}	-	1.5	G	(4), (5)

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

   (a) 90 %RH Max. (Ta $\leq$ 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 60 ºC Max.

Note (3) 2ms, half sine wave, 1 time for ± X, ± Y, ± Z.

Note (4) 10 ~ 500~10 Hz, 0.5 Hr/cycle, 2hr each X, Y, Z,

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.

Relative Humidity (%RH)

Temperature (ºC)

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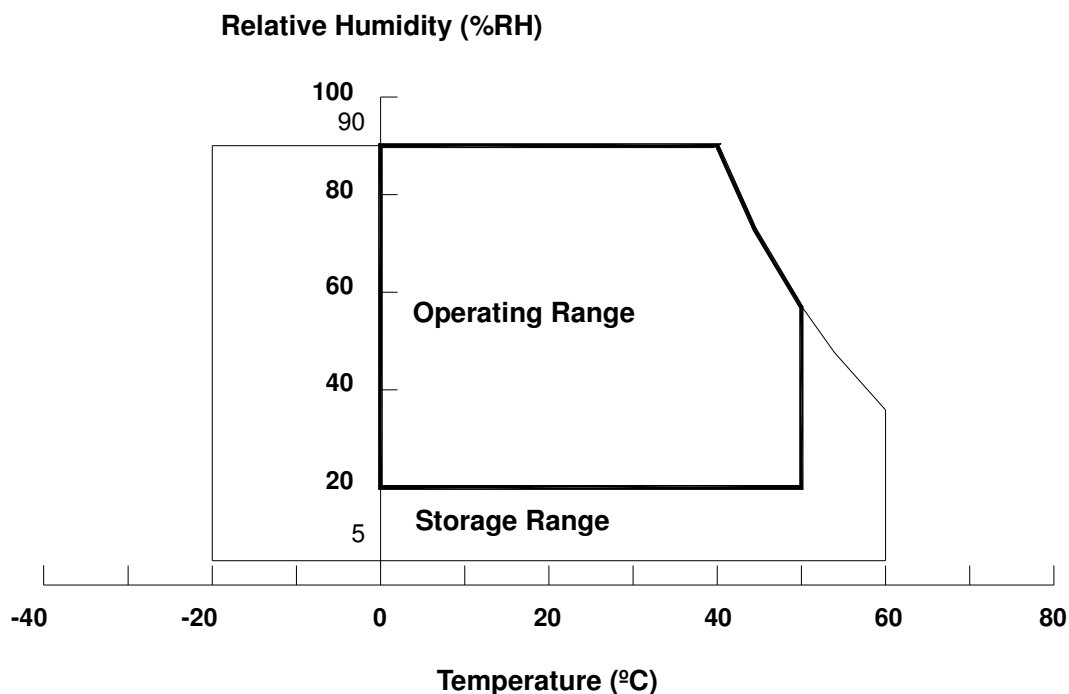
2.2 ELECTRICAL ABSOLUTE RATINGS

2.2.1 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	

2.2.2 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	2.0	7.0	mA_{RMS}	(1), (2)
Lamp Frequency	F_L	45	80	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 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}	-	50	-	mV	-
Rush Current		I_{RUSH}	-	1.0	1.5	A	(2)
Power Supply Current		Icc	-	400	500	mA	
Logical Input Voltage	"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:
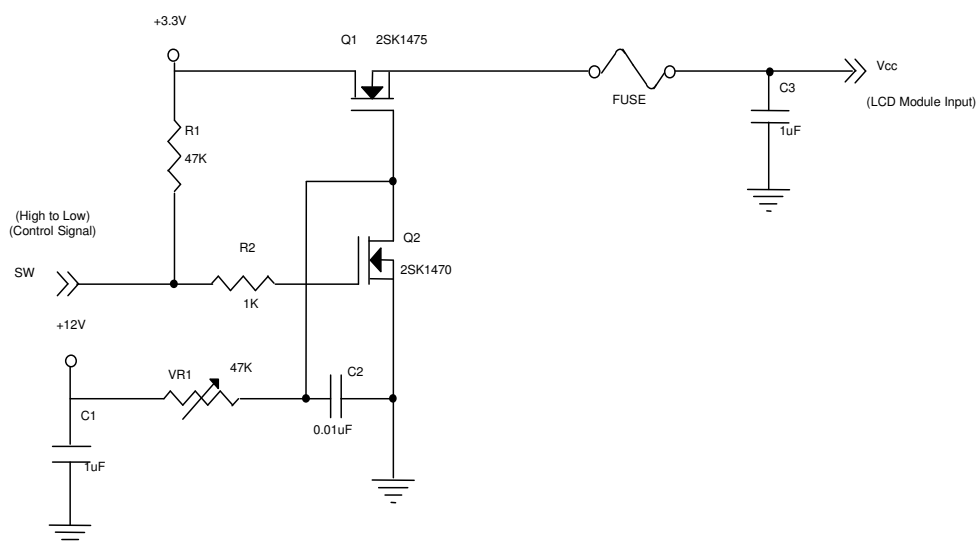

<u>Vcc rising time is 470us</u>

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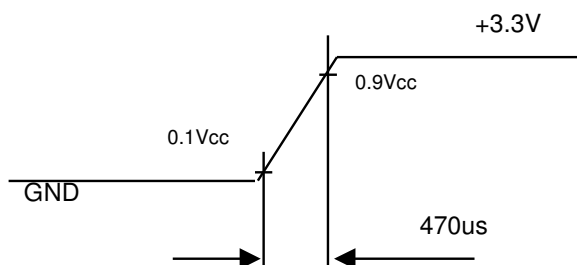
3.2 BACKLIGHT UNIT

Ta = 25 ± 2 ºC

Parameter	Symbol	Value			Unit	Note
		Min.	Typ.	Max.		
Lamp Input Voltage	V_L	580	650	720	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	-	-	890 (25 ^{o}C)	V_{RMS}	(2)
		-	-	1130 (0 ^{o}C)	V_{RMS}	(2)
Operating Frequency	F_L	45	60	80	KHz	(3)
Lamp Life Time	L_{BL}	10,000	15,000	-	Hrs	(5)
Power Consumption	P_L	-	3.9	-	W	(4), I_L = 6.0 mA

Note (1) Lamp current is measured by utilizing a high frequency current meter as shown below:
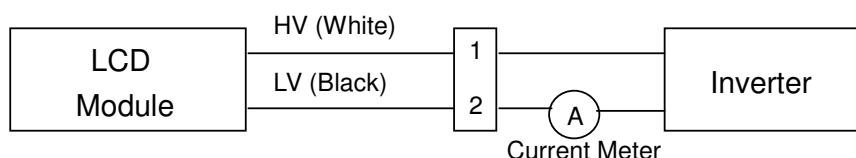
Note (2) The voltage shown above should be applied to the lamp for more than 1 second after startup. Otherwise the lamp may not be turned on.

Note (3) The lamp frequency may 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.
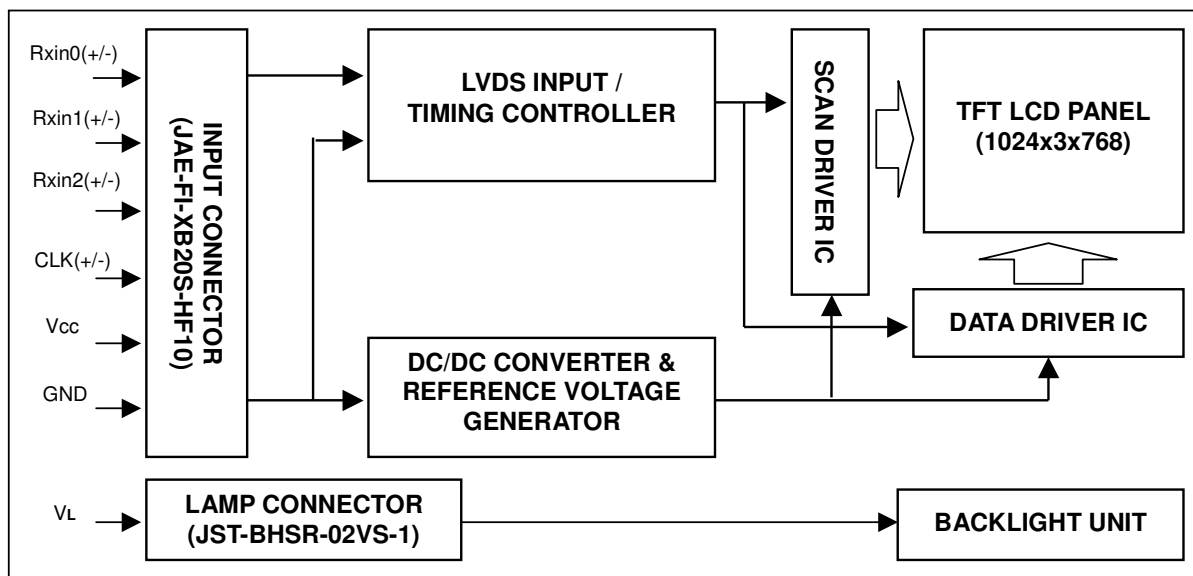
Note (4) $P_L = I_L \times V_L$

Note (5) The lifetime of lamp can be defined as the time in which it continues to operate under the condition Ta = 25 ± 2 ^{o}C and I_L = 2.0 ~ 6.5 mArms until one of the following events occurs:

(a) When the brightness becomes or lower than 50% of its original value.

(b) When the effective ignition length becomes or lower than 80% of 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.)
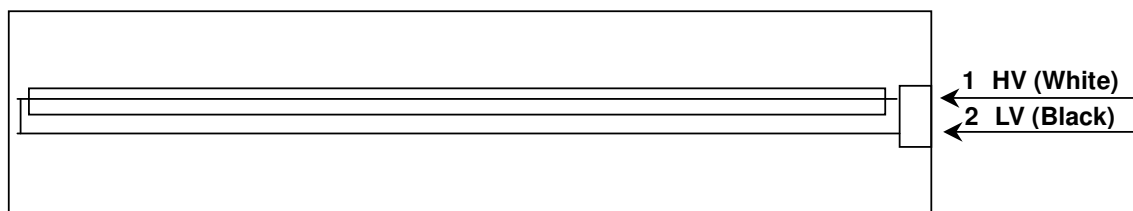
Note (6) The waveform of the voltage output of inverter must be area-symmetric and the design of the inverter must have specifications for the modularized lamp. The performance of the Backlight, such as lifetime or brightness, is greatly influenced by the characteristics of the DC-AC inverter for the lamp. All the parameters of an inverter should be carefully designed to avoid producing 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

Rxin0(+/-)

Rxin1(+/-)

Rxin2(+/-)

CLK(+/-)

Vcc

GND

INPUT CONNECTOR
(JAE-FI-XB20S-HF10)

LVDS INPUT /
TIMING CONTROLLER

SCAN DRIVER IC

TFT LCD PANEL
(1024x3x768)

DC/DC CONVERTER &
REFERENCE VOLTAGE
GENERATOR

DATA DRIVER IC

VL

LAMP CONNECTOR
(JST-BHSR-02VS-1)

BACKLIGHT UNIT

4.2 BACKLIGHT UNIT

1 HV (White)
2 LV (Black)

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5. INPUT TERMINAL PIN ASSIGNMENT

5.1 TFT LCD MODULE

Pin	Symbol	Description	Polarity	Remark
1	Vcc	Power Supply +3.3 V		-
2	Vcc	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	Positive	
16	Vss	Ground		-
17	NC	Non-Connection		-
18	NC	Non-Connection		-
19	Vss	Ground		-
20	Vss	Ground		-

Note (1) Connector Part No.: JAE-FI-XB20S-HF10 or equivalent

Note (2) User's connector Part No: JAE-FI-X20M or equivalent

Note (3) The first pixel is even.

5.2 BACKLIGHT UNIT

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

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

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

5.3 TIMING DIAGRAM OF LVDS INPUT SIGNAL

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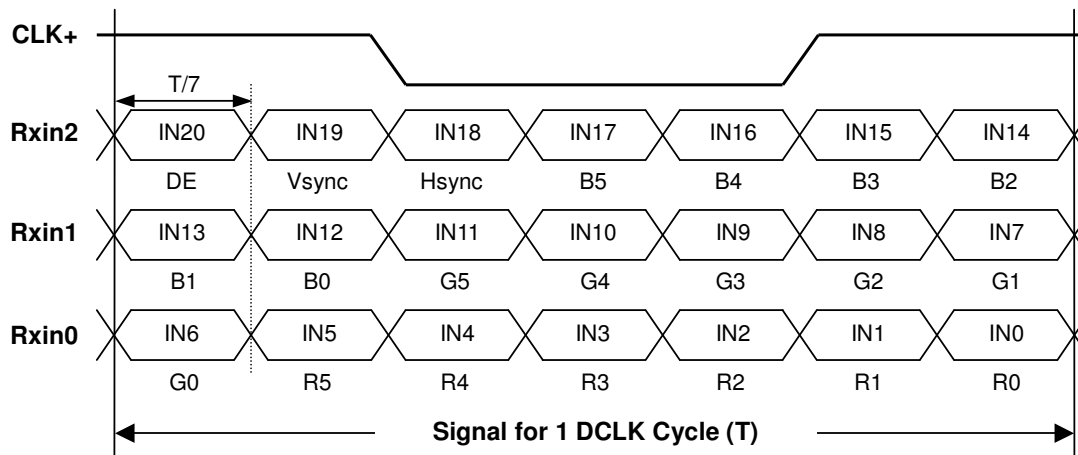
5.4 COLOR DATA INPUT ASSIGNMENT

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
	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
	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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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	$1/T_C$	-	65	-	MHz	-
Frame Frequency	Cycle	T_V	769	806	1000	lines	-
Vertical Active Display Term	Display Period	T_{VD}	768	768	768	lines	-
One Line Scanning Time	Cycle	T_H	1200	1344	1612	clocks	(1)
Horizontal Active Display Term	Display Period	T_{HD}	1024	1024	1024	clocks	-

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

INPUT SIGNAL TIMING DIAGRAM

Valid display data (1024 pixels)

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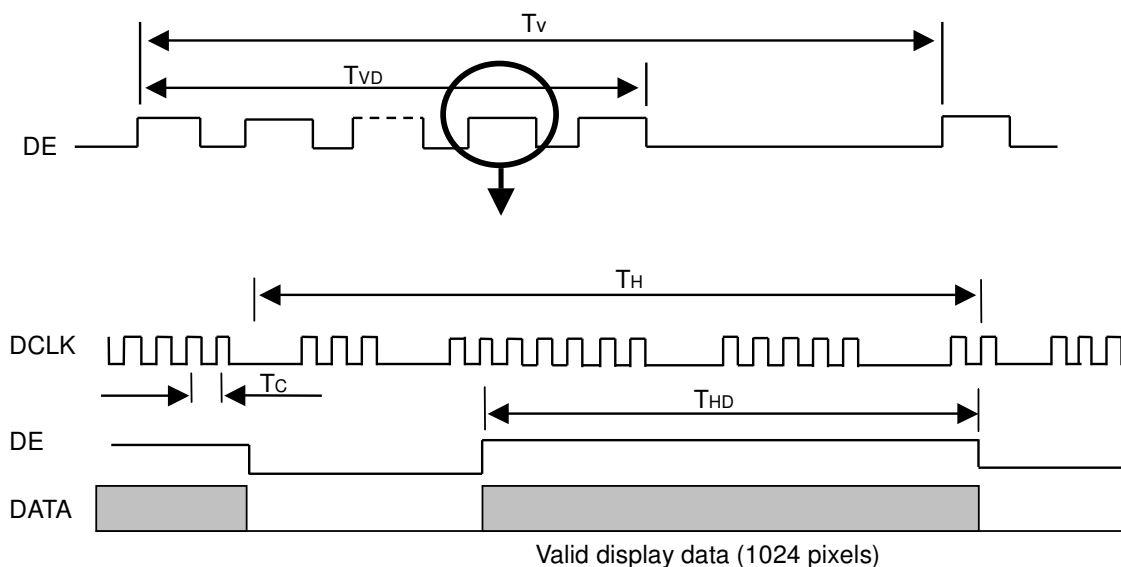
6.2 POWER ON/OFF SEQUENCE
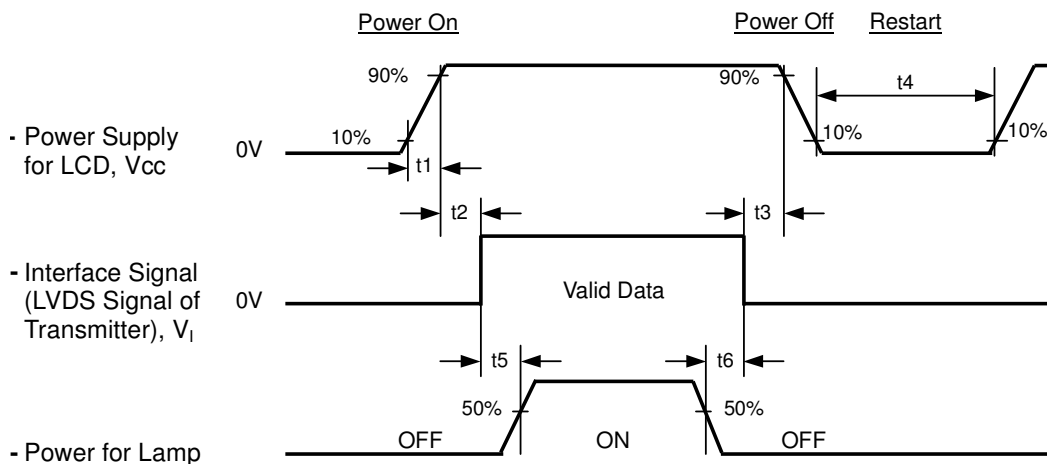
Timing Specifications:

      $0 < t1 \leqq 15$ msec

      $0 < t2 \leqq 50$ msec

      $0 < t3 \leqq 50$ msec

         $t4 \geqq 500$ sec

         $t5 \geqq 200$ 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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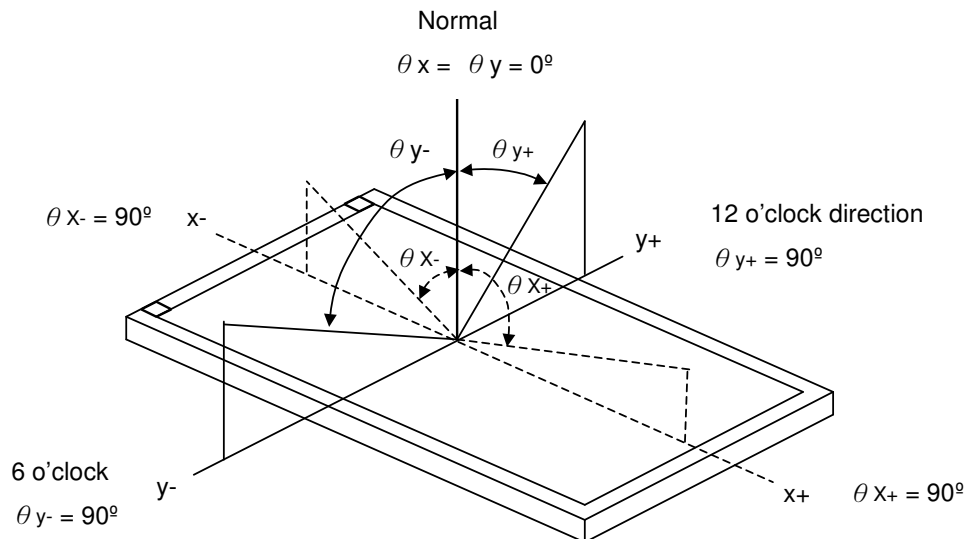## 7. OPTICAL CHARACTERISTICS

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	60	KHz
Inverter	Sumida-H05-4783B		

The relative measurement methods of optical characteristics are shown in 7.2. The following items should be measured under the test conditions described in 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		220	250	290	cd/m^2	(6)
Average Luminance of White		L_{AVE}		210	240	280	cd/m^2	(4), (6)
White Variation		δW		-	1.4	1.6	-	(6), (7)
Cross Talk		CT	θ_x=0º, θ_Y=0º Viewing Normal Angle	-	-	4.0	%	(5), (6)
Color Chromaticity	Red	Rx		0.555	0.575	0.595	-	(1), (6)
		Ry		0.320	0.340	0.360	-	
	Green	Gx		0.290	0.310	0.330	-	
		Gy		0.500	0.520	0.540	-	
	Blue	Bx		0.130	0.150	0.170	-	
		By		0.110	0.130	0.150	-	
	White	Wx		0.290	0.310	0.330	-	
		Wy		0.310	0.330	0.350	-	
Viewing Angle	Horizontal	θ_x+	CR$\geqq$10	40	45	-	Deg.	
		θ_x-		40	45	-		
	Vertical	θ_Y+		10	15	-		
		θ_Y-		30	35	-		

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

Normal
θx = θy = 0º

θy- θy+

θX- = 90º   x-

12 o'clock direction
θy+ = 90º

θX-

y+

θX+

6 o'clock
y-
θy- = 90º

x+ θX+ = 90º

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

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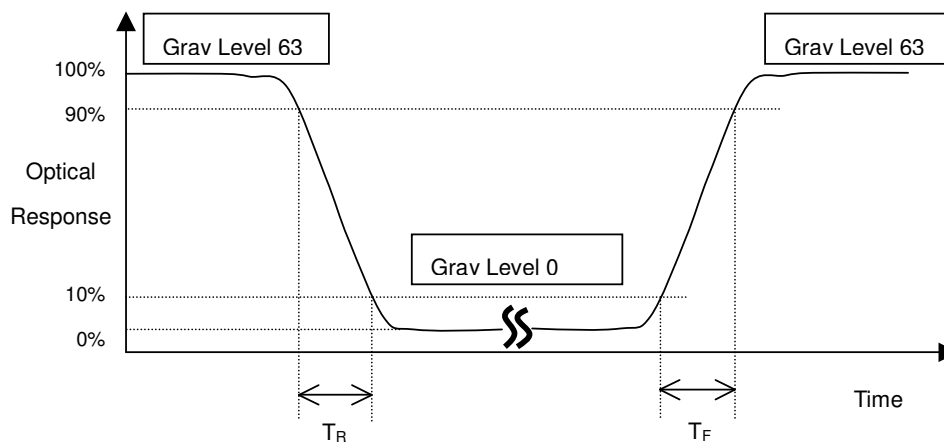
Contrast Ratio (CR) = L63 / L0

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 x 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)
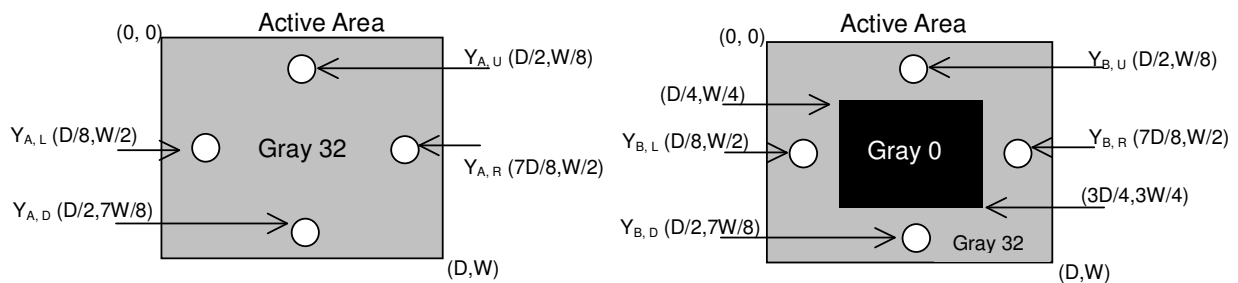
Note (6) Measurement Setup:

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.

Version 3.2
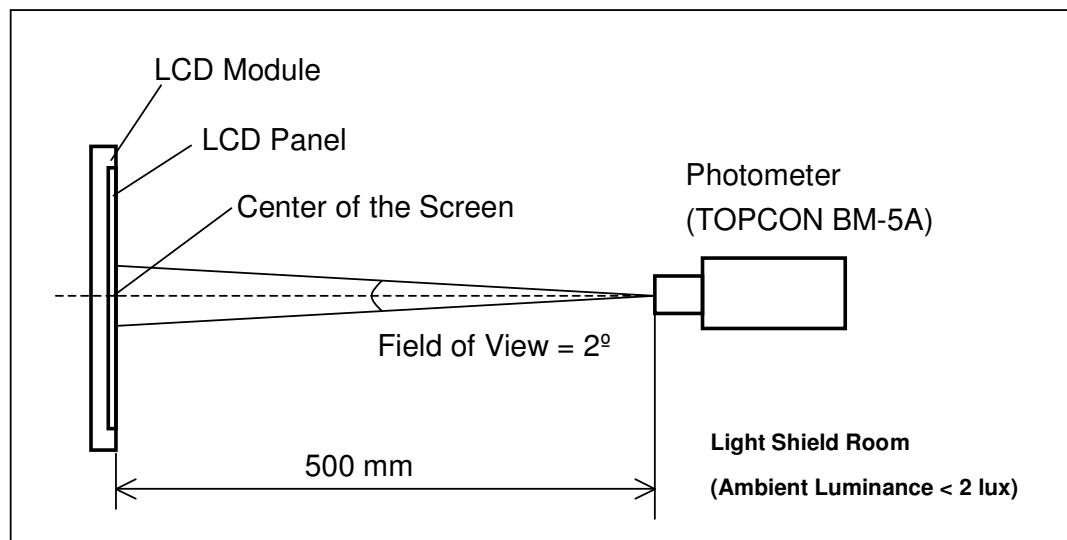
Note (7) Definition of White Variation (δ W):

Measure the luminance of gray level 63 at 5 points

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

Horizontal Line

Active Area
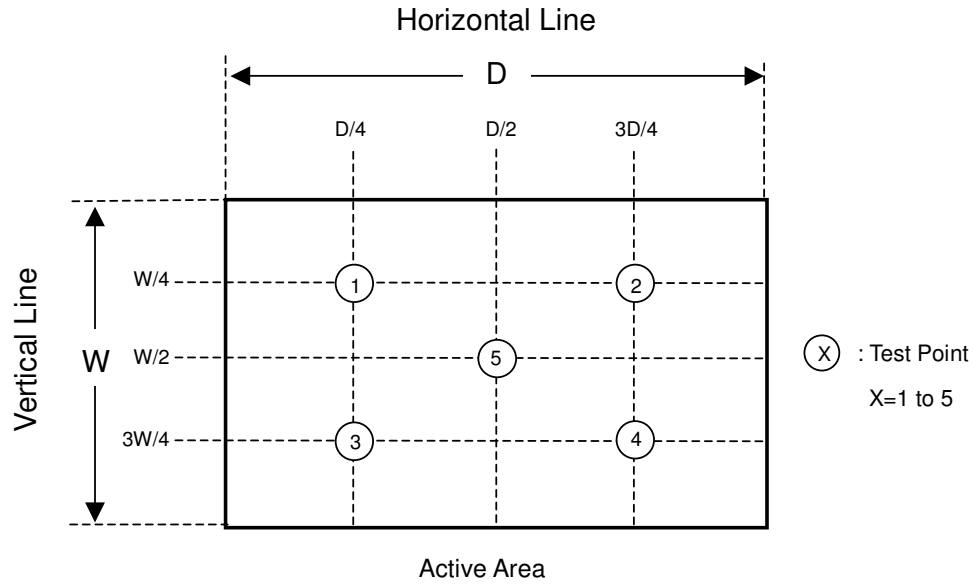
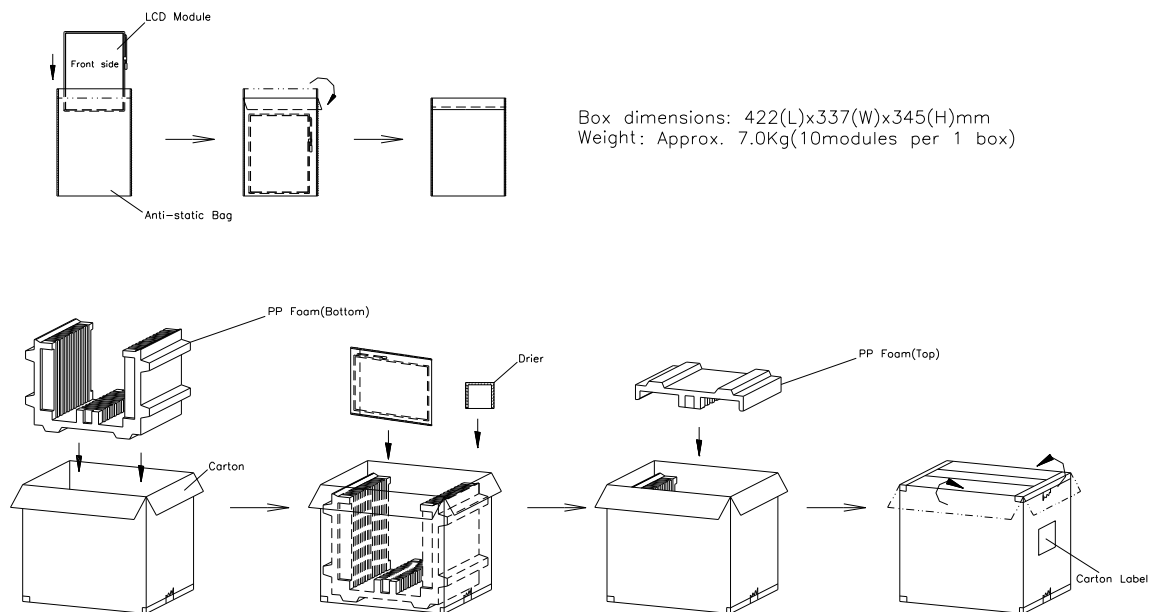## 8. PRECAUTIONS

8.1 ASSEMBLY AND HANDLING PRECAUTIONS

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

(2) To assemble or install module into user's system can be only in clean working areas. The dust and oil may cause electrical short or worsen the polarizer.

(3) It's not permitted to have pressure or impulse on the module because the LCD panel and Backlight will be damaged.

(4) Always follow the correct power sequence when LCD module is connecting and operating. This can prevent damage to the CMOS LSI chips during latch-up.

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

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

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

(10) When ambient temperature is lower than 10ºC may reduce the display quality. For example, the response time will become slowly, and the starting voltage of CCFL will be higher than room temperature.
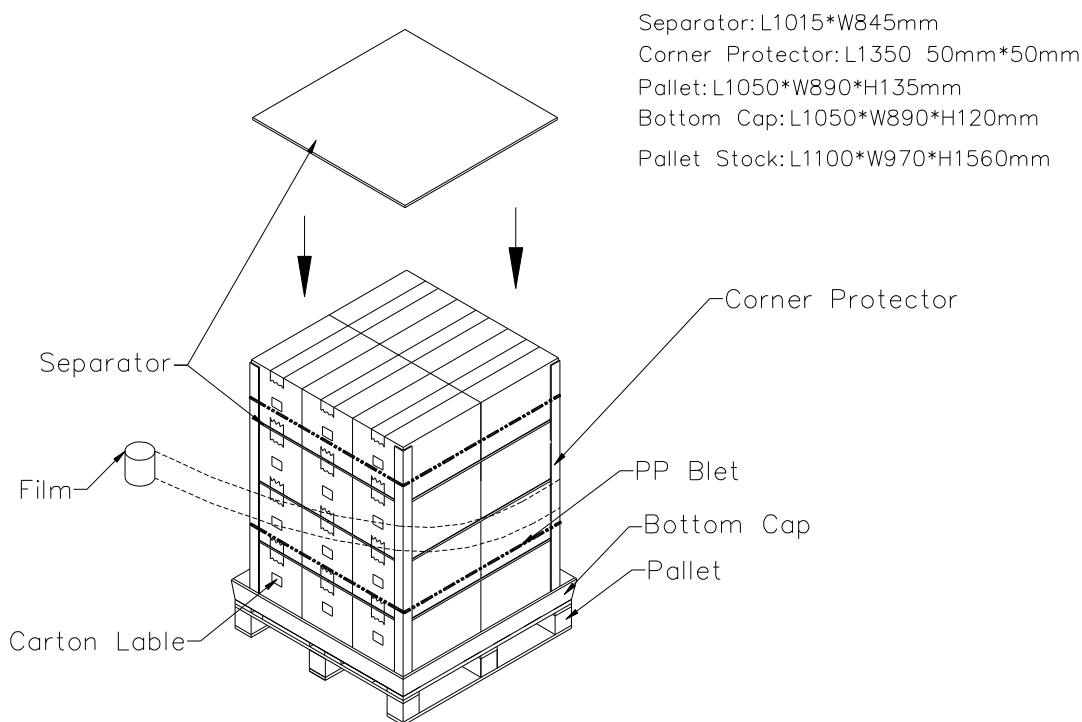
8.2 SAFETY PRECAUTIONS

(1) 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.

(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.

(3) After the module's end of life, it is not harmful in case of normal operation and storage.

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9. PACKING

9.1 CARTON

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

9.2 PALLET

Separator: L1015*W845mm
Corner Protector: L1350 50mm*50mm
Pallet: L1050*W890*H135mm
Bottom Cap: L1050*W890*H120mm
Pallet Stock: L1100*W970*H1560mm

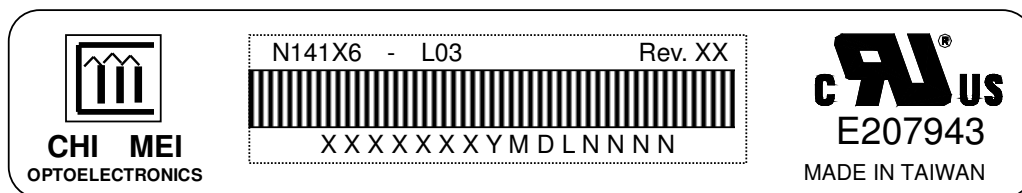**Version 3.2**

CHI MEI
OPTOELECTRONICS CORP.
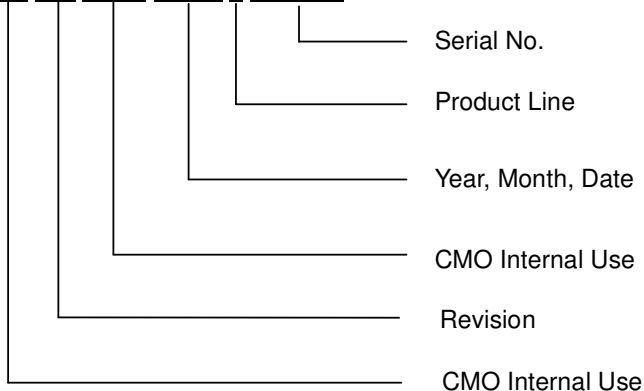
Approval

10. DEFINITION OF LABELS

10.1 CMO MODULE LABEL

The barcode nameplate is pasted on each module as illustration, and its definitions are as following explanation.
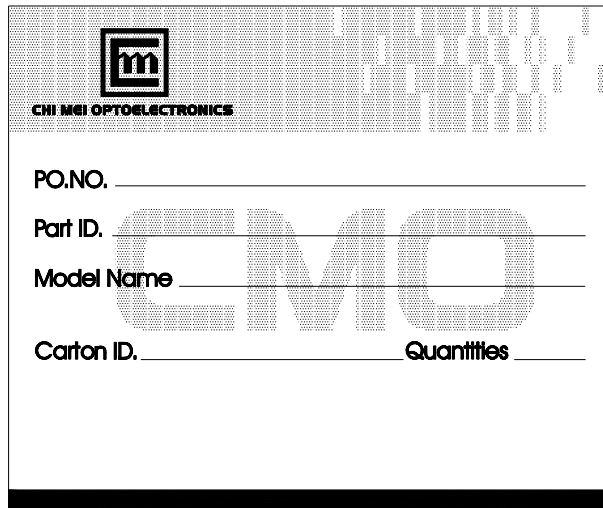
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  ┌─────────────────────────────────────────────────────────────┐
  │  ┌─────┐    N141X6  -  L03              Rev. XX      c(UL)us  │
  │  │ ▥▥▥ │   ║║║║║║║║║║║║║║║║║║║║║║║║║║║║║║║        E207943     │
  │  └─────┘     X X X X X X X Y M D L N N N N                    │
  │  CHI  MEI                                    MADE IN TAIWAN   │
  │  OPTOELECTRONICS                                              │
  └─────────────────────────────────────────────────────────────┘
```

(a) Model Name: N141X6 - L03

(b) Revision: Rev. XX, for example: C1, C2 …etc.

(c) Serial ID: X X X X X X X Y M D L N N N N

             Serial No.

             Product Line

             Year, Month, Date

             CMO Internal Use

             Revision

             CMO Internal Use

Serial ID includes the information as below:

(a) Manufactured Date: Year: 1~9, for 2001~2009

                               Month: 1~9, A~C, for Jan. ~ Dec.

                               Day: 1~9, A~Y, for 1^{st} to 31^{st}, exclude I , O and U

(b) Revision Code: cover all the change

(c) Serial No.: Manufacturing sequence of product

(d) Product Line: 1 -> Line1, 2 -> Line 2, …etc.

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10.2 CARTON LABEL

Version 3.2