CONTENTS

REVISION HISTORY

Version	Date	Page (New)	Section	Description
Ver 0.0	AUG. 25, 2008	All	All	Tentative specification first issued.

1. GENERAL DESCRIPTION

1.1 OVERVIEW

N101N6-L01 is a 10.06" TFT Liquid Crystal Display module with LED Backlight unit and 40 pins LVDS interface. This module supports 1024 x 576 Wide-SVGA mode and can display 262,144 colors. The optimum viewing angle is at 6 o'clock direction. The converter module for Backlight is built in.

1.2 FEATURES

- Thin and Light
- WSVGA (1024 x 576 pixels) resolution
- 3.3V LVDS (Low Voltage Differential Signaling) interface with 1 pixel/clock
- Build in LED Converter

1.3 APPLICATION

- TFT LCD Notebook

1.4 GENERAL SPECIFICATI0NS

Item	Specification	Unit	Note
Active Area	222.72 (H) x 125.28 (V) (10.06" diagonal)	mm	(1)
Bezel Opening Area	226.34 (H) x 128.1 (V)	mm	
Driver Element	a-si TFT active matrix	-	-
Pixel Number	1024 x R.G.B. x 576	pixel	-
Pixel Pitch	0.2175 (H) x 0.2175 (V)	mm	-
Pixel Arrangement	RGB vertical stripe	-	-
Display Colors	262,144	color	-
Transmissive Mode	Normally white	-	-
Surface Treatment	Hard coating (3H), Anti-glare Type	-	-

1.5 MECHANICAL SPECIFICATIONS

Item		Min.	Typ.	Max.	Unit	Note
Module Size	Horizontal(H)	234.5	235.0	235.5	mm	(1)
	Vertical(V)	142.5	143.0	143.5	mm	
	Thickness(T)	-	4.9	5.2	mm	
Weight		-	180	190	g	

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

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}	-	220/2	G/ms	(3), (5)
Vibration (Non-Operating)	V_{NOP}	-	1.5	G	(4), (5)

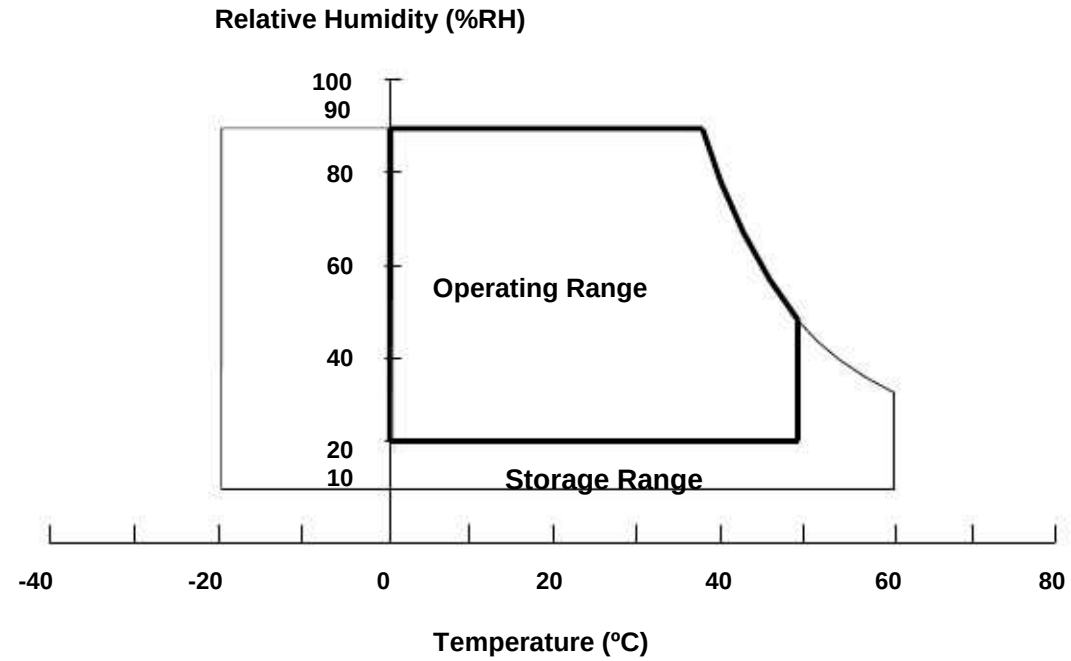
Note (1) Temperature and relative humidity range is shown in the figure below.

(a) 90 %RH Max. (Ta <= 40 ºC).

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

(c) No condensation.

Note (2) The temperature of panel surface area should be 0 ºC min. and 60 ºC max.

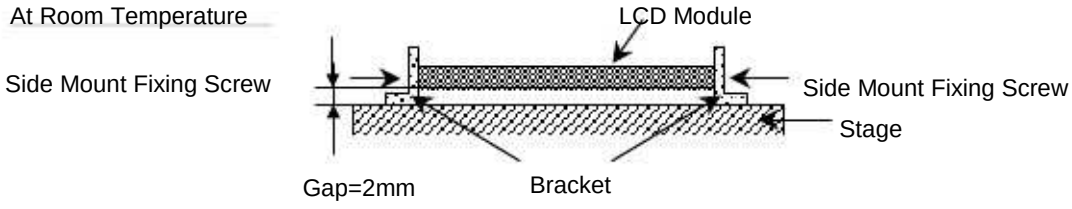


Note (3) 1 time for ± X, ± Y, ± Z. for Condition (220G / 2ms) is half Sine Wave,.

Note (4) 10~500 Hz, 30 min/cycle, 1cycle for X,Y,Z-axis.

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.

The fixing condition is shown as below:



2.2 ELECTRICAL ABSOLUTE RATINGS

2.2.1 TFT LCD MODULE

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

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.

2.2.2 BACKLIGHT UNIT

Item	Value		Unit	Note
	Min	Max.		
LED Light Bar Power Supply Voltage	-5 * 9	3.4 * 9	V_{DC}	(1), (2)
LED Light Bar Power Supply Current	--	25 * 3	mA_{DC}	

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 LED (Refer to Section 3.2 for further information).

3. ELECTRICAL CHARACTERISTICS

3.1 TFT LCD MODULE

Ta = 25 ± 2 ºC

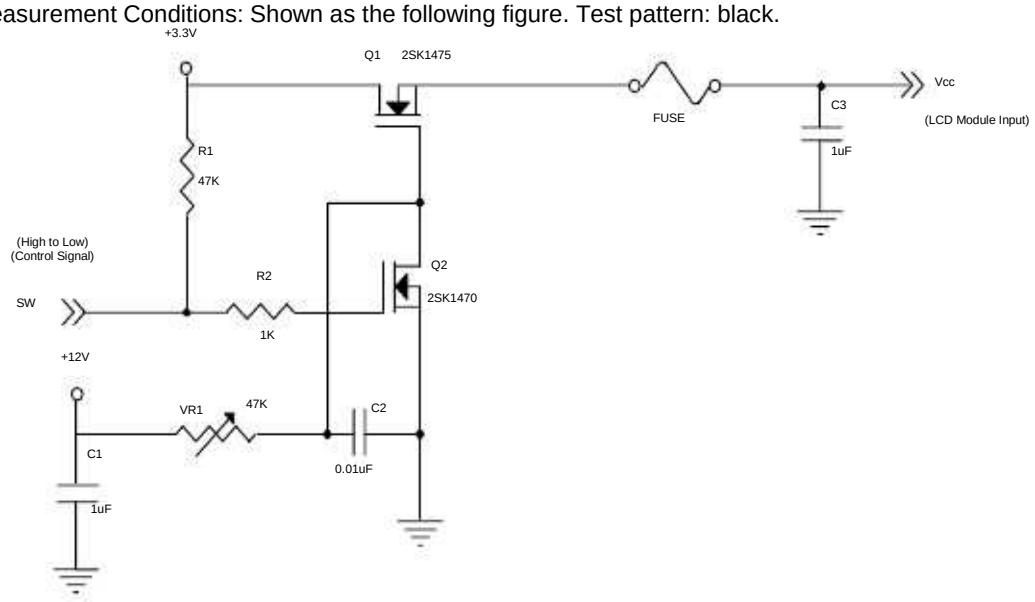
Parameter		Symbol	Value			Unit	Note
			Min.	Typ.	Max.		
Power Supply Voltage		Vcc	3.0	3.3	3.6	V	-
Ripple Voltage		V_{RP}	-	50		mV	-
Rush Current		I_{RUSH}	-	-	1.5	A	(2)
Initial Stage Current		I_{IS}	-	-	1.0	A	(2)
Power Supply Current	White	Icc	-	(154)	(164)	mA	(3)a
	Black			(180)	(197)	mA	(3)b
LVDS Differential Input High Threshold		$V_{TH(LVDS)}$	-	-	+100	mV	(5), V_{CM}=1.2V (5)
LVDS Differential Input Low Threshold		$V_{TL(LVDS)}$	-100	-	-	mV	V_{CM}=1.2V (5)
LVDS Common Mode Voltage		V_{CM}	1.125	-	1.375	V	(5) -
LVDS Differential Input Voltage		$\|V_{ID}\|$	100	-	600	mV	(4)
Terminating Resistor		R_T	-	100	-	Ohm	
Power per EBL WG		P_{EBL}	-	TBD	-	W	

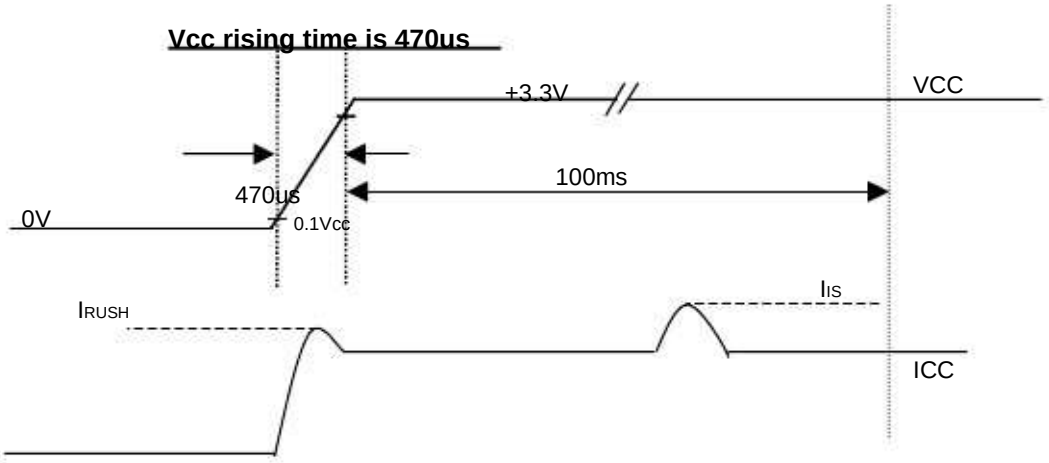
Note (1) The ambient temperature is Ta = 25 ± 2 ºC.

Note (2) I_{RUSH}: the maximum current when VCC is rising

I_{IS}: the maximum current of the first 100ms after power-on

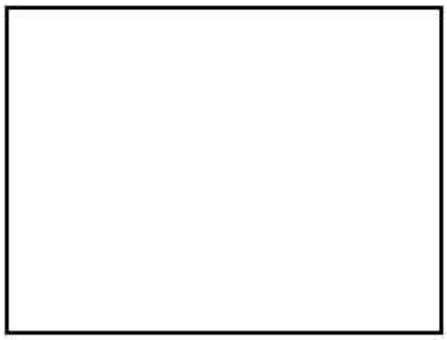
Measurement Conditions: Shown as the following figure. Test pattern: black.





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

Note (4) The specified power are the sum of LCD panel electronics input power and the inverter input power. Test conditions are as follows.

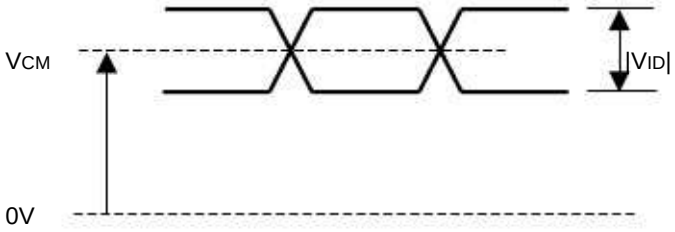
(a) Vcc = 3.3 V, Ta = 25 ± 2 ºC, f_v = 60 Hz,

(b) The pattern used is a black and white 32 x 36 checkerboard, slide #100 from the VESA file "Flat Panel Display Monitor Setup Patterns", FPDMSU.ppt.

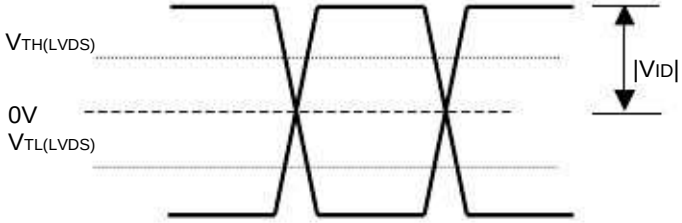
(c) Luminance: 60 nits.

Note (5) The parameters of LVDS signals are defined as the following figures.

Single Ended



Differential

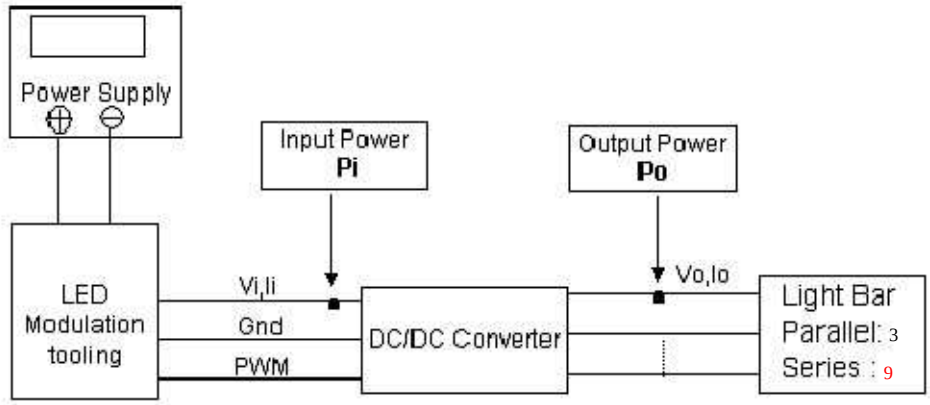


3.2 BACKLIGHT UNIT

Ta = 25 ± 2 ºC

Parameter	Symbol	Value			Unit	Note
		Min.	Typ.	Max.		
LED Quantity			27		PCS	(1)
LED Light Bar Power Supply Voltage	Vo	26.1	28.8	30.6	V	(1) (Duty 100%)
LED Light Bar Power Supply Current	Io	42	45	60	mA	
Power Consumption	Po	1.17	1.30	1.38	W	(2)(@Io=45mA)
LED Life Time	LBL	15000	-	-	Hrs	(3)

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

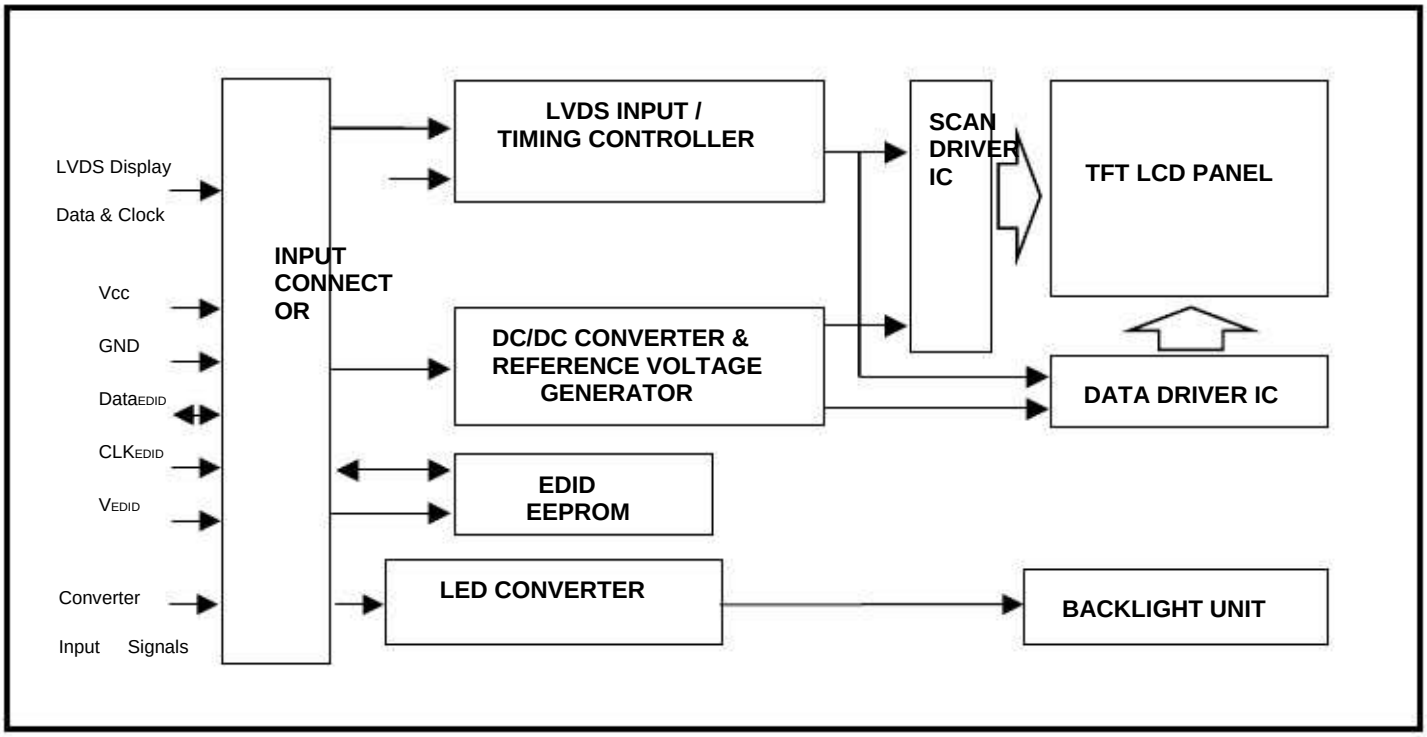


Note (2) $P_O = I_O \times V_O$

Note (3) The lifetime of LED is defined as the time when it continues to operate under the conditions at Ta = 25 ±2 °C and I = 15 mA(Per EA) until the brightness becomes ≦ 50% of its original value.

4. BLOCK DIAGRAM

4.1 TFT LCD MODULE



5. INPUT TERMINAL PIN ASSIGNMENT

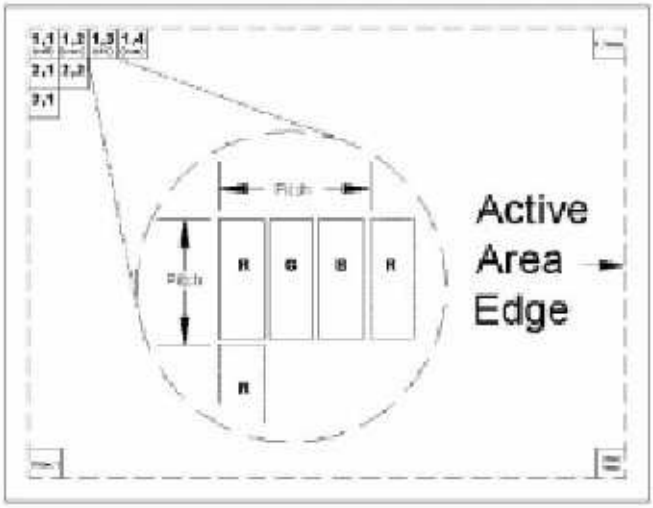
5.1 TFT LCD MODULE

Pin	Symbol	Description	Polarity	Remark
1	NC	No Connection (Reserve)		
2	VDD	Power Supply (3.3V typ.)		
3	VDD	Power Supply (3.3V typ.)		
4	VEDID	DDC 3.3V power		
5	NC	No Connection (Reserve for CMO test)		
6	CLKEDID	DDC clock		
7	DATAEDID	DDC data		
8	Rxin0-	LVDS differential data input		
9	Rxin0+	LVDS differential data input	Negative	R0-R5, G0
10	VSS	Ground	Positive	
11	Rxin1-	LVDS differential data input		
12	Rxin1+	LVDS differential data input		
13	VSS	Ground	Negative	G1~G5, B0, B1
14	Rxin2-	LVDS Differential Data Input	Positive	
15	Rxin2+	LVDS Differential Data Input		
16	VSS	Ground		
17	RxCLK-	LVDS differential clock input	Negative	B2-B5,HS,VS, DE
18	RxCLK+	LVDS differential clock input	Positive	
19	VSS	Ground		
20	NC	No Connection (Reserve)		
21	NC	No Connection (Reserve)		
22	VSS	Ground		
23	NC	No Connection (Reserve)		
24	NC	No Connection (Reserve)		
25	VSS	Ground		
26	NC	No Connection (Reserve)		
27	NC	No Connection (Reserve)		
28	VSS	Ground		
29	NC	No Connection (Reserve)		
30	NC	No Connection (Reserve)		
31	VSS	LED Ground		
32	VSS	LED Ground		
33	VSS	LED Ground		
34	NC	No Connection (Reserve)		
35	PWM	LED BLU Brightness Control		
36	LED_EN	LED Converter Enable		
37	NC	No Connection (Reserve)		
38	VLED	LED Converter Input Power (5~20V)		
39	VLED	LED Converter Input Power (5~20V)		
40	VLED	LED Converter Input Power (5~20V)		
				(+3.3V Swing)
				(+3.3V Input)

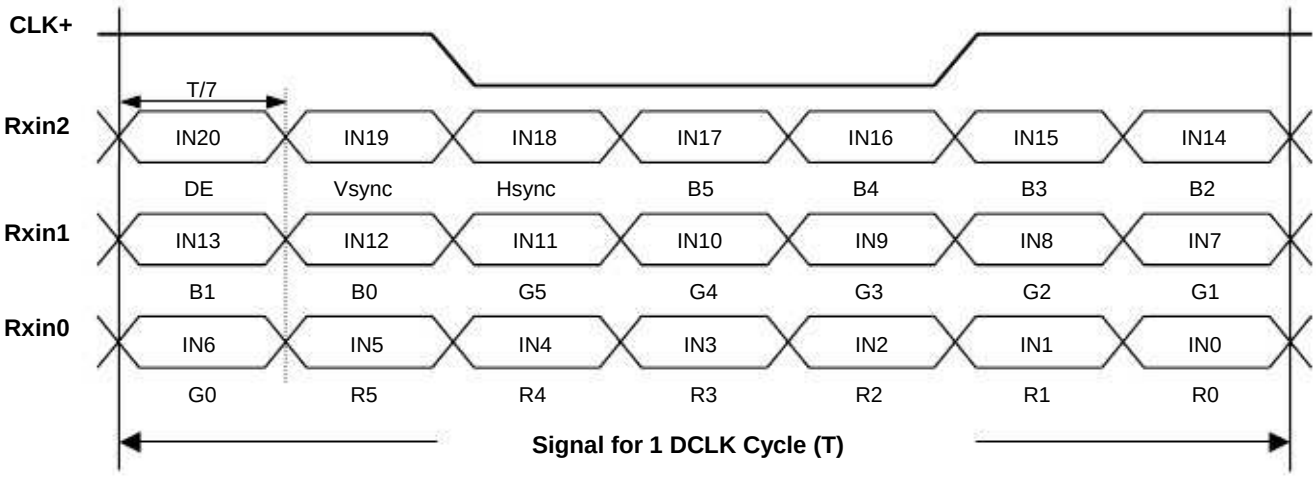
Note (1) Connector Part No.: IPEX-20455-040E-12 or equivalent

Note (2) User's connector Part No: IPEX-20453-040T-01 or equivalent

Note (3) The first pixel is odd as shown in the following figure.



5.2 TIMING DIAGRAM OF LVDS INPUT SIGNAL



5.3 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 below provides the assignment of color versus data input.

	Data Signal																	
Color	Red						Green						Blue					
	R5	R4	R3	R2	R1	R0	G5	G4	G3	G2	G1	G0	B5	B4	B3	B2	B1	B0
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
Basic Blue	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1
Colors Cyan	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1
Magenta	1	1	1	1	1	1	0	0	0	0	0	0	1	1	1	1	1	1
Yellow	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0
White	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Red(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
Gray Red(2)	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Scale::::::::::::::::::																		
Of::::::::::::::::::																		
RedRed(61)	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Red(62)	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Red(63)	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
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
Gray Green(2)	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
Scale::::::::::::::::::																		
Of::::::::::::::::::																		
Green Green(61)	0	0	0	0	0	0	0	0	0	1	1	1	0	1	0	0	0	0
Green(62)	0	0	0	0	0	0	0	0	0	0	1	1	1	1	0	0	0	0
Green(63)	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	0	0	0
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
Gray Blue(2)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Scale::::::::::::::::::																		
Of::::::::::::::::::																		
Blue Blue(61)	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	1
Blue(62)	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	0
Blue(63)	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1

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

5.4 EDID DATA STRUCTURE

The EDID (Extended Display Identification Data) data formats are to support displays as defined in the VESA Plug & Display and FPDI standards.

Byte # (decimal)	Byte # (hex)	Field Name and Comments	Value (hex)	Value (binary)
00		Header	00	00000000
11		Header	FF	11111111
22		Header	FF	11111111
33		Header	FF	11111111
44		Header	FF	11111111
55		Header	FF	11111111
66		Header	FF	11111111
77		Header	00	00000000
88		EISA ID manufacturer name (“CMO”)	0D	00001101
99		EISA ID manufacturer name (Compressed ASCII)	AF	10101111
100A		ID product code (N101N6-L01)		00000001
110B		ID product code (hex LSB first; N101N6-L01)		00010000
120C		ID S/N (fixed “0”)		00000000
130D		ID S/N (fixed “0”)		00000000
140E		ID S/N (fixed “0”)	01	00000000
150F		ID S/N (fixed “0”)	10	00000000
1610		Week of manufacture (fixed week code)	00	00101100
1711		Year of manufacture (fixed year code)	00	00010010
1812		EDID structure version # (“1”)	00	00000001
1913		EDID revision # (“3”)	00	00000011
2014		Video I/P definition (“digital”)	2C	10000000
2115		Max H image size (“22.272cm”)	12	00010110
2216		Max V image size (“12.53cm”)	01	00001100
2317		Display Gamma (Gamma = ”2.2”)	03	01111000
2418		Feature support (“Active off, RGB Color”)	80	00001010
2519		Rx1, Rx0, Ry1, Ry0, Gx1, Gx0, Gy1, Gy0	16	11001111
261A		Bx1, Bx0, By1, By0, Wx1, Wx0, Wy1, Wy0	0C	01000101
271B		Rx=0.565	78	10010000
281C		Ry=0.348	0A	01011001
291D		Gx=0.343		01010111
301E		Gy=0.585		10010101
311F		Bx=0.161		00101001
3220		By=0.121		00011111
3321		Wx=0.313		01010000
3422		Wy=0.329		01010100
3523		Established timings 1	CF	00000000
3624		Established timings 2	45	00000000
3725		Manufacturer’s reserved timings	90	00000000
38			59	00000001
	26		57	
3927			95	
4028			29	
			1F	
			50	
			54	
			00	
			00	
			00	
			01	
		Standard timing ID # 1		
		Standard timing ID # 1	01	00000001
		Standard timing ID # 2	01	00000001

Byte # (decimal)	Byte # (hex)	Field Name and Comments	Value (hex)	Value (binary)
4129		Standard timing ID # 2	01	00000001
422A		Standard timing ID # 3	01	00000001
432B		Standard timing ID # 3	01	00000001
442C		Standard timing ID # 4	01	00000001
452D		Standard timing ID # 4	01	00000001
462E		Standard timing ID # 5	01	00000001
472F		Standard timing ID # 5	01	00000001
4830		Standard timing ID # 6	01	00000001
4931		Standard timing ID # 6	01	00000001
5032		Standard timing ID # 7	01	00000001
5133		Standard timing ID # 7	01	00000001
5234		Standard timing ID # 8	01	00000001
5335		Standard timing ID # 8	01	00000001
54	36	Detailed timing description # 1 Pixel clock (“42.13MHz”, According to VESA CVT Rev1.1)		
5537		# 1 Pixel clock (hex LSB first)		
5638		# 1 H active (“1024”)		
5739		# 1 H blank (“160”)		
583A		# 1 H active : H blank (“1024 : 160”)	75	01110101
593B		# 1 V active (”576”)		
603C		# 1 V blank (”17”)	10	00010000
613D		# 1 V active : V blank (”576 :17”)	00	00000000
623E		# 1 H sync offset (”48”)	A0	10100000
633F		# 1 H sync pulse width (”32”)	40	01000000
6440		# 1 V sync offset : V sync pulse width (”3 : 5”)	40	01000000
		# 1 H sync offset : H sync pulse width : V sync offset : V sync width (”48: 32 : 3 : 5”)	17	00010111
		# 1 H image size (”222.72 mm”)	20	00100000
		# 1 V image size (”125.28 mm”)	30	00110000
		# 1 H image size : V image size (”303 : 190”)	20	00100000
		# 1 H boarder (”0”)	35	00110101
		# 1 V boarder (”0”)		
		# 1 Non-interlaced, Normal, no stereo, Separate sync, H/V pol Negatives		
65	41	Detailed timing description # 2	00	00000000
		# 2 Flag		
66	42	# 2 Reserved	DE	11011110
67	43	# 2 FE (hex) defines ASCII string (Model Name “N101N6-L01”, ASCII)	7D	01111101
68	44	# 2 Flag	00	00000000
69	45	# 2 1st character of name (“N”)	00	00000000
70	46	# 2 2nd character of name (“1”)	00	00000000
		# 2 3rd character of name (“0”)		
		# 2 4th character of name (“1”)		
71	47	# 2 5th character of name (“N”)	18	00011000
		# 2 6th character of name (“6”)		
72	48	# 2 7th character of name (“-”)	00	00000000
73	49		00	00000000
74	4A		00	00000000
	4B		FE	11111110
75			00	00000000
76	4C		4E	01001110
77	4D		31	00110001
78	4E		30	00110000
79	4F		31	00110001
80	50		4E	01001110
81	51		36	00110110
82	52		2D	00101101
83	53			

Byte # (decimal)	Byte # (hex)	Field Name and Comments	Value (hex)	Value (binary)
8454			4C	01001100
8555		of name (“L”)		00110000
8656			30	00110001
8757		of name (“0”)		00001010
8858			31	00110000
8959		of name (“1”)		00100000
905A			0A	00000000
915B		character indicates end of ASCII string		00000000
925C			20	00000000
935D		“Blank” character		11111110
945E			20	00000000
		“Blank” character		01000011
			00	01001101
		description # 3		01001111
			00	00001010
			00	00100000
95	5F		FE	00100000
96	60	defines ASCII string (Vendor “CMO”, ASCII)		00100000
97	61		00	00100000
98	62		43	00100000
99	63	of string (“C”)		00100000
100	64		4D	00100000
101	65	character of string (“M”)		00100000
102	66		4F	00100000
103	67	of string (“O”)		00000000
104	68		0A	00000000
105	69	character indicates end of ASCII string		00000000
106	6A		20	11111110
107	6B	“Blank” character		00000000
108	6C		20	01001110
109	6D	“Blank” character		00110001
110	6E		20	01110000
111	6F	“Blank” character		00110001
112	70		20	01001110
113	71	“Blank” character		00110110
114	72		20	01001101
115	73	“Blank” character		01001100
116	74		20	01110000
117	75	“Blank” character		00110001
118	76		20	00001010
119	77	“Blank” character		00100000
120	78	# 4 1st character of name (“N”)	4E	00100000
121	79	# 4 2nd character of name (“1”)	31	00000000
122	7A	“Blank” character # 4 3rd character of name (“0”)	30	00000111
123	7B	# 4 4th character of name (“1”)	31	
124	7C	“Blank” character # 4 5th character of name (“N”)	4E	
125	7D	# 4 6th character of name (“6”)	36	
126	7E	description # 4 # 4 7th character of name (“-”)	2D	
127	7F	# 4 8th character of name (“L”)	4C	
		# 4 9th character of name (“0”)	30	
		# 4 9th character of name (“1”) # 4 FE (hex) defines ASCII string (Model Name“N101N6-L01”, ASCII)	31	
		# 4 New line character indicates end of ASCII string	0A	
		# 4 Padding with “Blank” character	20	
		# 4 Padding with “Blank” character	20	
		Extension flag	00	
		Checksum	07	

00	Detailed timing	
00	# 4 Flag	
00	# 4 Reserved	
00	# 4 Flag	

6.CONVERTER SPECIFICATION

6.1 ABSOLUTE MAXIMUM RATINGS

Symbol	Ratings
Vin	29.0V
Gnd	+/-0.3V
PWM, EN	-0.3V~7.0V

6.2 RECOMMENDED OPERATING RATINGS

Parameter	Symbol	Value			Unit	Note
		Min.	Typ.	Max.		
Converter Input power supply voltage	VLED	5	12	20	V	
EN Control Level Backlight on	LED_EN	2.0	---	5.5	V	
EN Control Level Backlight off	LED_EN	0	---	1	V	
PWM Control Level PWM High Level	PWM	1.4	---	5.5	V	
PWM Control Level PWM Low Level	PWM	0	---	0.55	V	
PWM Control Duty Ratio		(20)		100	%	
PWM Control Frequency	f_{PWM}	(190)		(230)	Hz	
LED Power Current VLED=7V	I_{LED}		(210)	TBD	mA	
LED Power Current VLED=20V	I_{LED}		(223)	TBD	mA	(1)
			(78)			(2)

Note (1) The specified LED power supply current is under the conditions at Vcc = 7V, Ta = 25 ± 2 ºC, f_v = 200 Hz.

Note (2) The specified LED power supply current is under the conditions at Vcc = 20V, Ta = 25 ± 2 ºC, f_v = 200 Hz..

7. INTERFACE TIMING

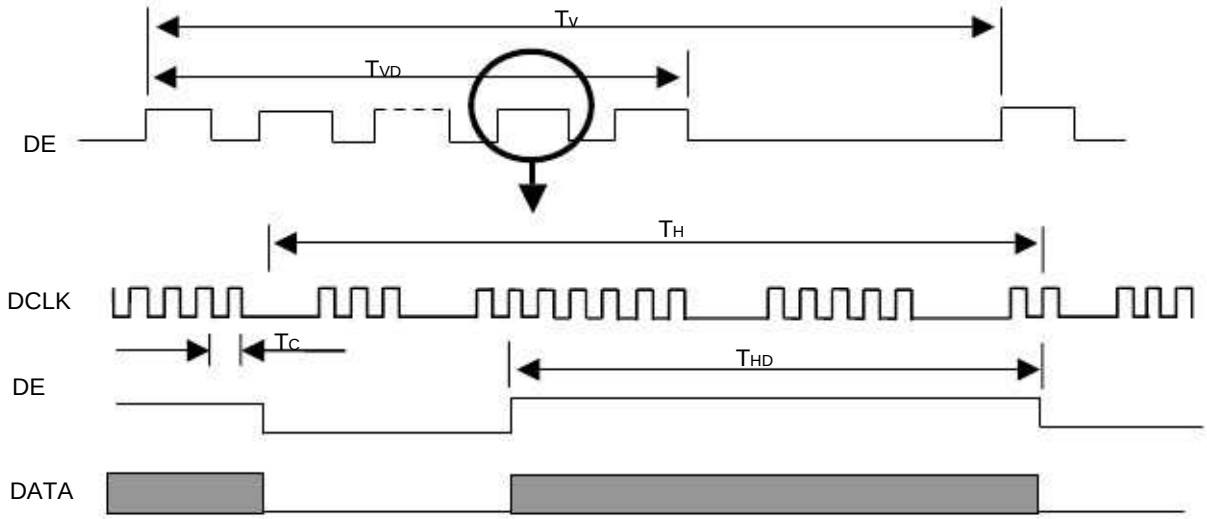
7.1 INPUT SIGNAL TIMING SPECIFICATIONS

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

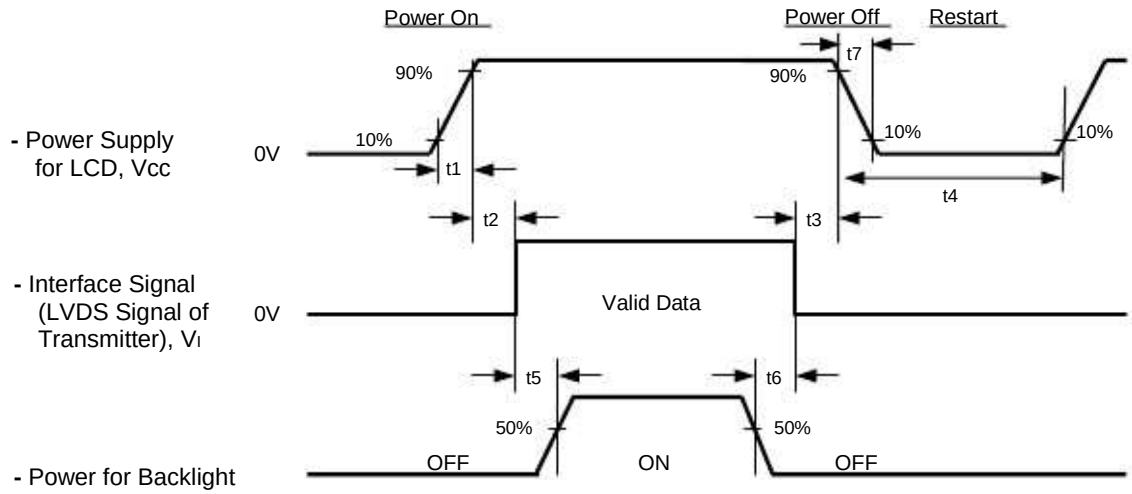
Signal	Item	Symbol	Min.Typ.Max.	Unit	Note
DCLK	Frequency	1/Tc	(37.9) 42.13 (44.23)	MHz	(2)
DE	Vertical Total Time	TV	(578)593(600)	TH	-
	Vertical Active Display Period	TVD	576576576	TH	-
	Vertical Active Blanking Period	TVB	TV-TVD17TV-TVD	TH	
	Horizontal Total Time	TH	(1026) 1184 (1224)	Tc	
	Horizontal Active Display Period	THD	102410241024	Tc	(2)
	Horizontal Active Blanking Period	THB	TH-THD160 TH-THD	Tc	(2)
					(2)

Note (1) Because this module is operated by DE only mode, Hsync and Vsync are ignored.

INPUT SIGNAL TIMING DIAGRAM



7.2 POWER ON/OFF SEQUENCE



Timing Specifications:

0.5< t1 <= 10 msec

0 < t2 <= 50 msec

0 < t3 <= 50 msec

t4 >= 500 msec

t5 >= 200 msec

t6 >= 200 msec

Note (1) Please follow the power on/off sequence described above. Otherwise, the LCD module might be damaged.

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

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

Note (4) Sometimes some slight noise shows when LCD is turned off (even backlight is already off). To avoid this phenomenon, we suggest that the Vcc falling time is better to follow (50us)□t7□ (10 ms).

8. OPTICAL CHARACTERISTICS

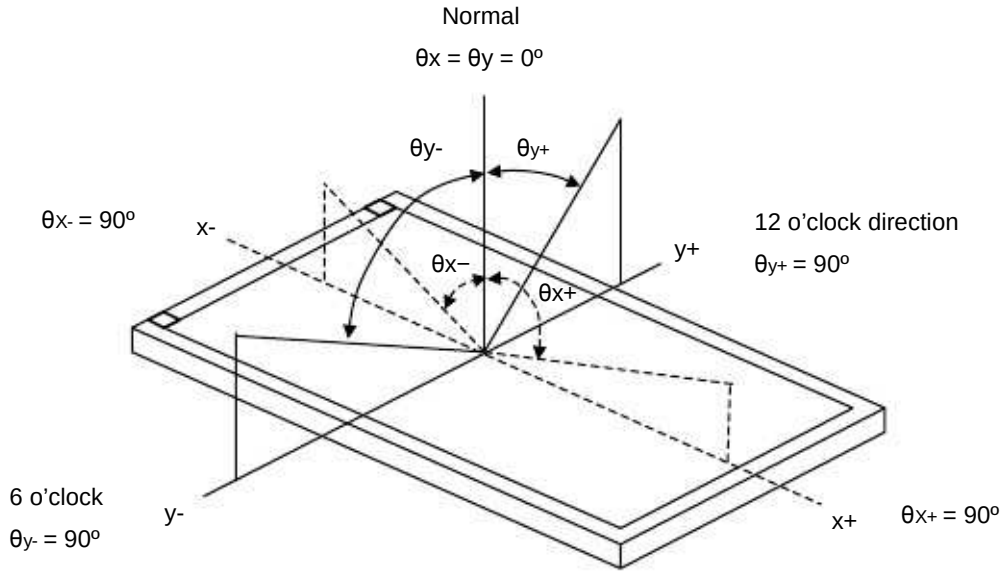
8.1 TEST CONDITIONS

Item	Symbol	Value	Unit
Ambient Temperature	Ta	25±2	°C
Ambient Humidity	Ha	%RH 50±10	
Supply Voltage	V_{CC}	3.3V	
Input Signal	According to typical value in "3. ELECTRICAL CHARACTERISTICS"		
LED Light Bar Input Current	I_L	45mA	

8.2 OPTICAL SPECIFICATIONS

Item		Symbol	Condition	Min.	Typ.	Max.	Unit	Note
Contrast Ratio		CR	θ_x=0°, θ_Y=0° Viewing Normal Angle	400	500	-	-	(2), (5)
Response Time		T_R		-	3	8	ms	(3)
		T_F		-	7	12	ms	
Average Luminance of White		L_{AVE}		160	200	-	cd/m²	
		Rx			0.568		-	(4), (5)
Color Chromaticity	Red	Ry			0.352		-	(1)
		Gx			0.339		-	
	Green	Gy			0.577		-	
		Bx			0.157		-	
	Blue	By		TYP. -0.03	0.130	TYP. +0.03	-	
		Wx			0.313		-	
	White	Wy			0.329		-	
Viewing Angle	Horizontal	θ_x+	CR≥10	40	45	-	Deg.	(1),(5)
		θ_x-		40	45	-		
	Vertical	θ_Y+		15	20	-		
		θ_Y-		40		-		
		δW_{5p}		80		-		
White Variation of 5 Points			θ_x=0°, θ_Y=0°				%	(5),(6)

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



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

The contrast ratio can be calculated by the following expression.

Contrast Ratio (CR) = L63 / L0

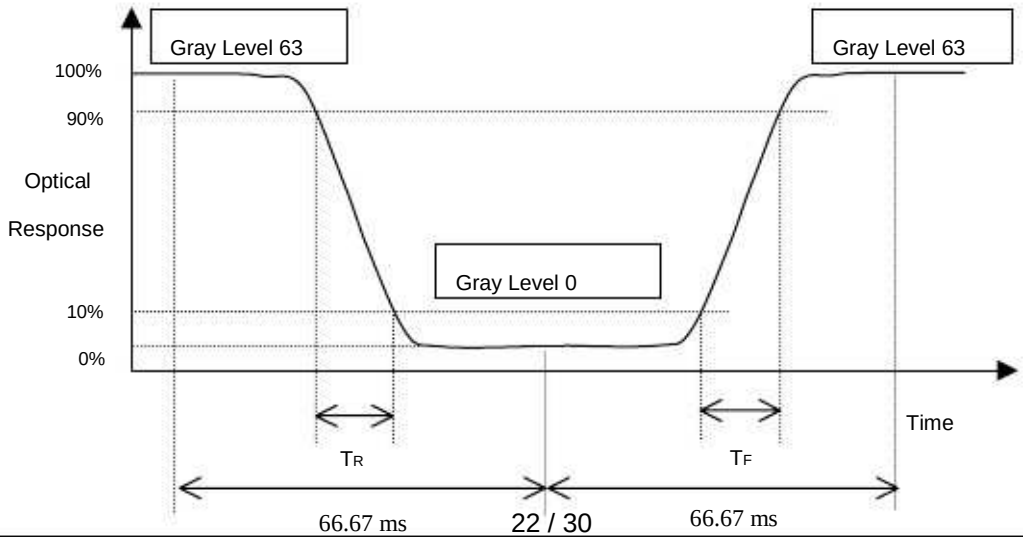
L63: Luminance of gray level 63

L 0: Luminance of gray level 0

CR = CR (1)

CR (X) is corresponding to the Contrast Ratio of the point X at Figure in Note (6).

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



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

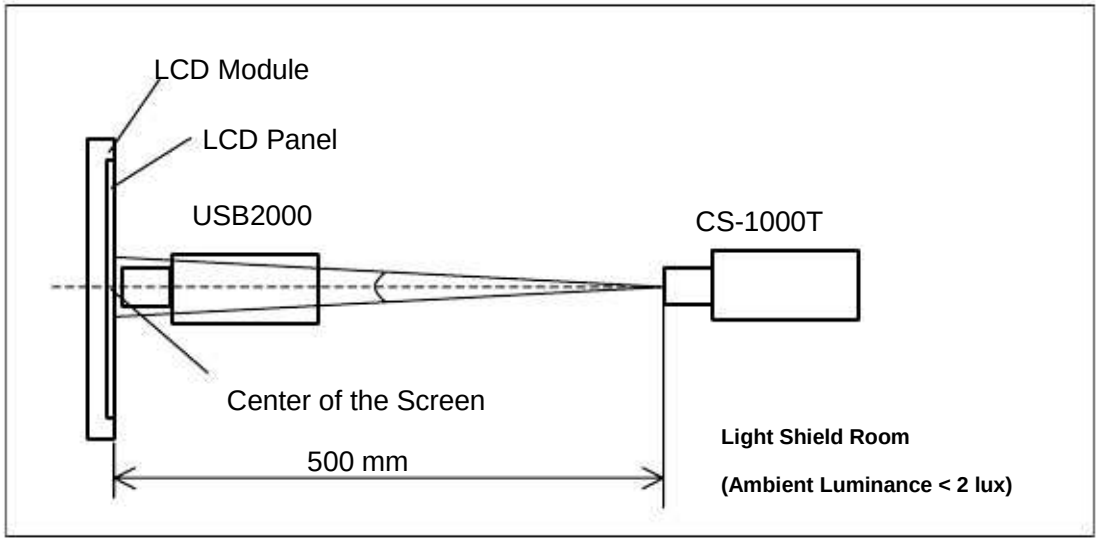
Measure the luminance of gray level 63 at 5 points

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 (6)

Note (5) Measurement Setup:

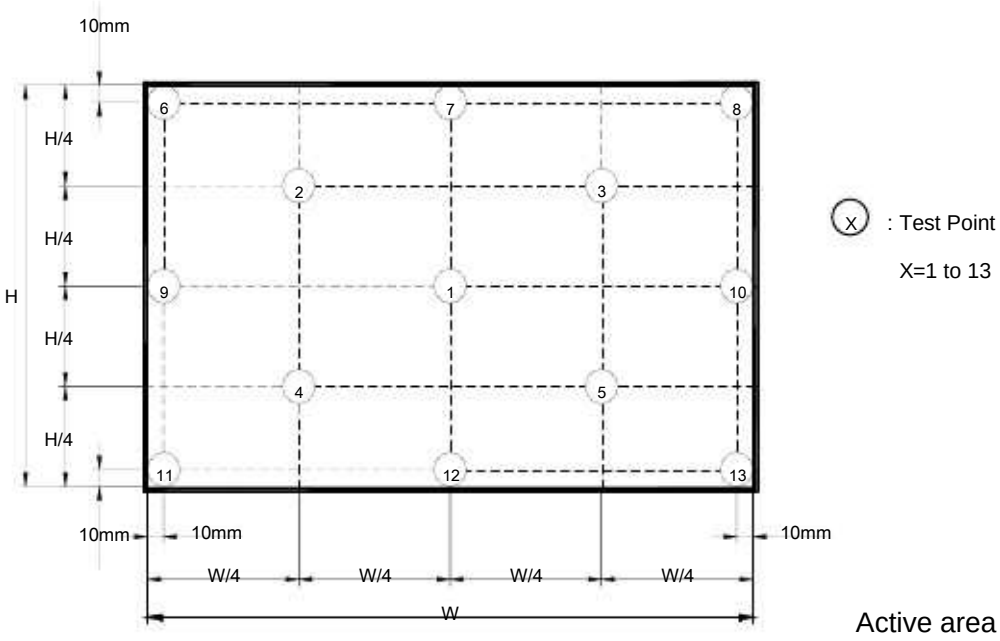
The LCD module should be stabilized at given temperature for 20 minutes to avoid abrupt temperature change during measuring. In order to stabilize the luminance, the measurement should be executed after lighting Backlight for 20 minutes in a windless room.



Note (6) Definition of White Variation (δW):

Measure the luminance of gray level 63 at 5 points

δW_{5p} = Minimum [L (1)+ L (2)+ L (3)+ L (4)+ L (5)] / Maximum [L (1)+ L (2)+ L (3)+ L (4)+ L (5)]



9. PRECAUTIONS

9.1 SYSTEM MATCHING PRECAUTIONS

(1) Refer to the drawing.

(2) To avoid wireless noise interference, please keep the antenna away from LCD control board.

9.2 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.

9.3 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.

9.4 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.

10. PACKING

10.1 CARTON

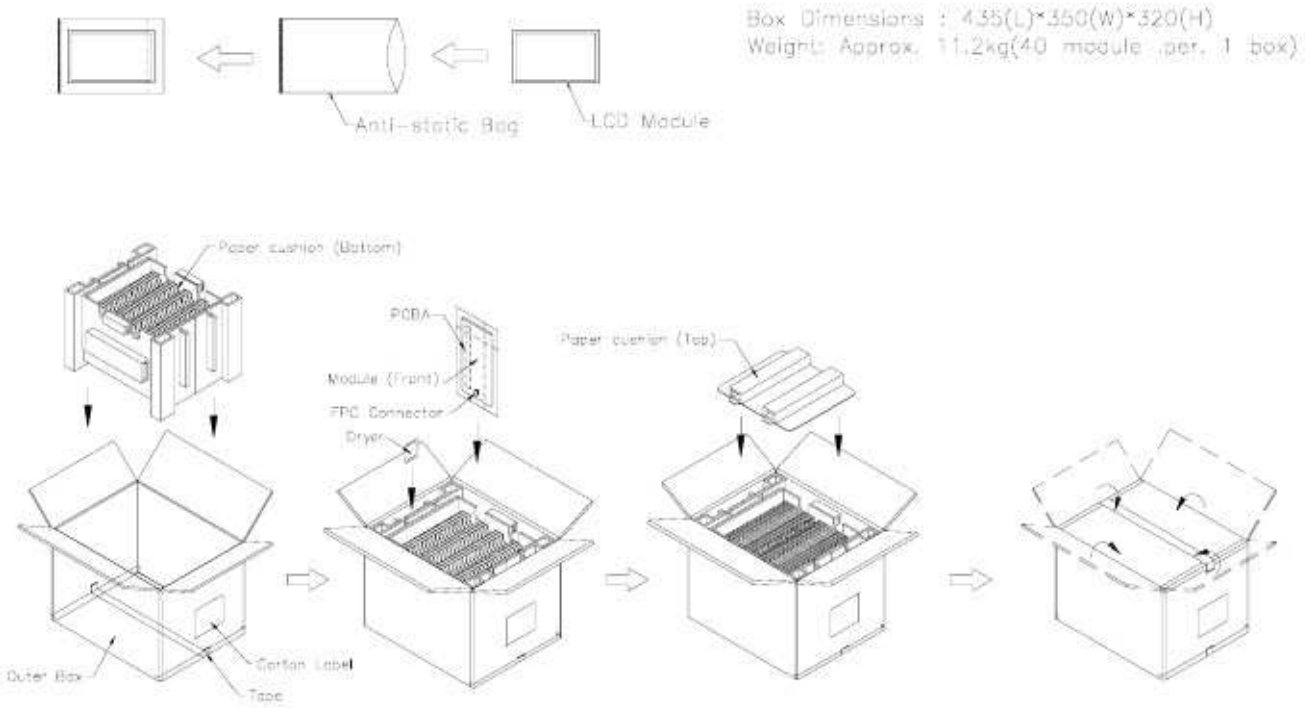


Figure. 10-1 Packing method

10.2 PALLET

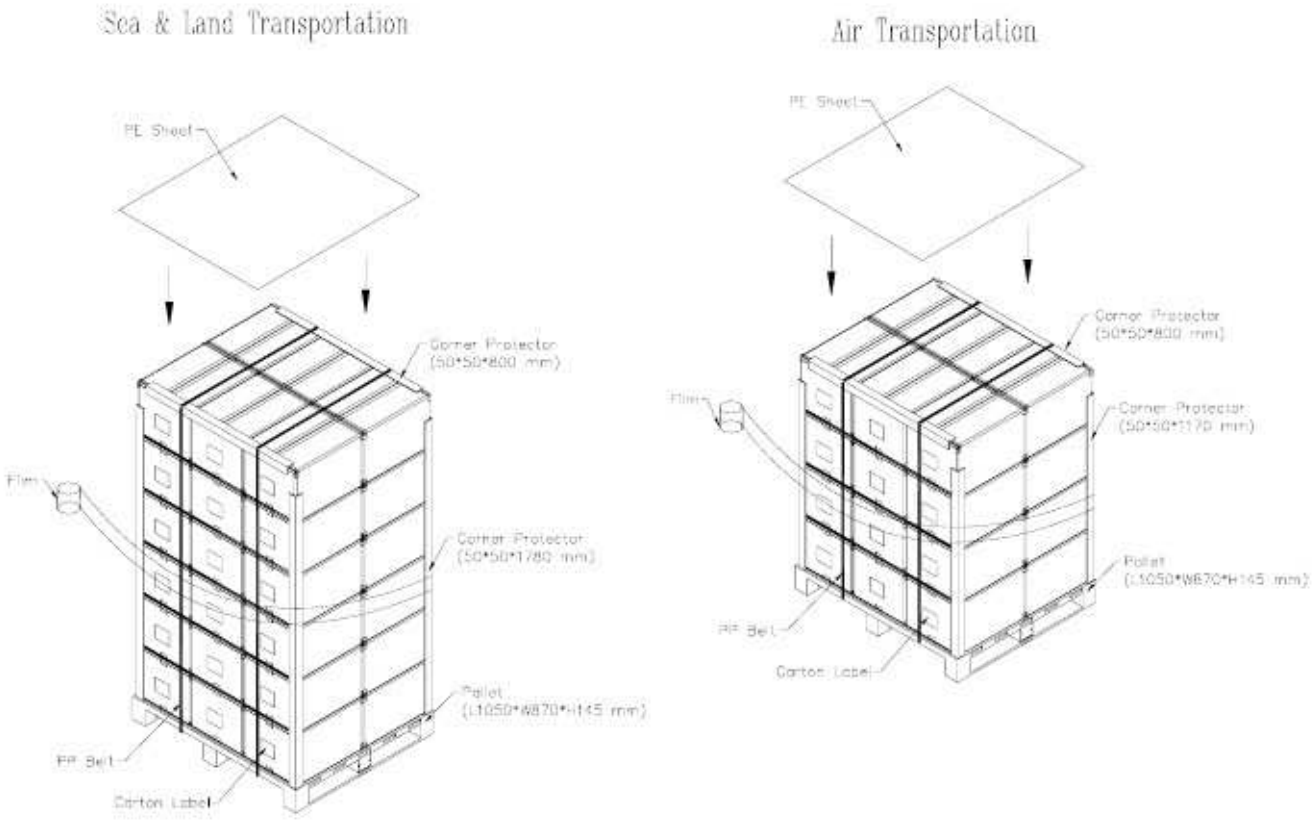
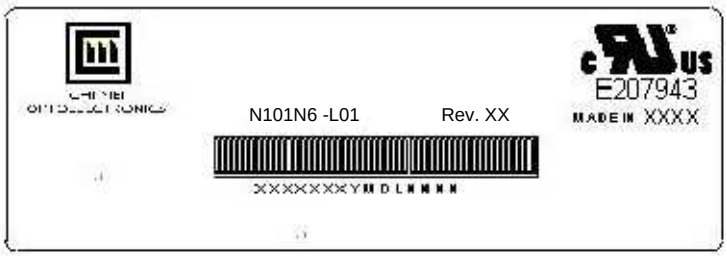


Figure. 10-2 Packing method

11. DEFINITION OF LABELS

11.1 CMO MODULE LABEL

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



(a) Model Name: N101N6 - L01

(b) Revision: Rev. XX, for example: A1, …, C1, C2 …etc.

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

- Serial No.
- CMO Internal Use
- Year, Month, Date
- CMO Internal Use
- Revision
- CMO Internal Use

(d) Production Location: MADE IN XXXX. XXXX stands for production location.

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 1st to 31st, exclude I , O and U

(b) Revision Code: cover all the change

(c) Serial No.: Manufacturing sequence of product

11.2 CARTON LABEL

Production location: Made In XXXX. XXXX stands for production location.