Doc. Number :

■ Tentative Specification
☐ Preliminary Specification
☐ Approval Specification

MODEL NO.: G260JJE
SUFFIX: L07

Customer:

APPROVED BY **SIGNATURE**

Name / Title
Note

Please return 1 copy for your confirmation with your signature and comments.

Approved By	Checked By	Prepared By

- CONTENTS -

REVISION HISTORY

Version	Date	Section	Description
0.0	JUN 10, 2013	All	G260JJE-L07 Tentative Spec. was first issued.

1. GENERAL DESCRIPTION

1.1 OVERVIEW

G260JJE-L06 model is a 25.54" MVA TFT-LCD module with a white LED Backlight Unit and a 30 pins 2 channels LVDS interface. This module supports 1920 x 1200 WUXGA mode and can display up to 16.7 millions colors. The converter for the Backlight Unit is built in.

1.2 GENERAL SPECIFICATIONS

Item	Specification	Unit	Note
Active Area	550.08 (H) x 343.8 (V) (25.54" diagonal)	mm	(1)
Bezel Opening Area	554.1 (H) x 347.8 (V)	mm	
Driver Element	a-Si TFT active matrix	-	-
Pixel Number	1920 x R.G.B. x 1200	pixel	-
Pixel Pitch	0.2865 (H) x 0.2865 (V)	mm	-
Pixel Arrangement	RGB vertical stripe	-	-
Display Colors	16.7M	color	-
Transmissive Mode	Normally black	-	-
Surface Treatment	AG type, 3H hard coating,	-	-

1.3 MECHANICAL SPECIFICATIONS

Item		Min.	Typ.	Max.	Unit	Note
Module Size	Horizontal(H)	(581.5)	(582.0)	(582.5)	mm	(1)
	Vertical(V)	(375.1)	(375.6)	(376.1)	mm	
	Depth(D)	(29.6)	(30.1)	(30.6)	mm	
Weight		-	(3770)	-	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}	-	(40)	G	(3), (5)
Vibration (Non-Operating)	V_{NOP}	-	(1.5)	G	(4), (5)

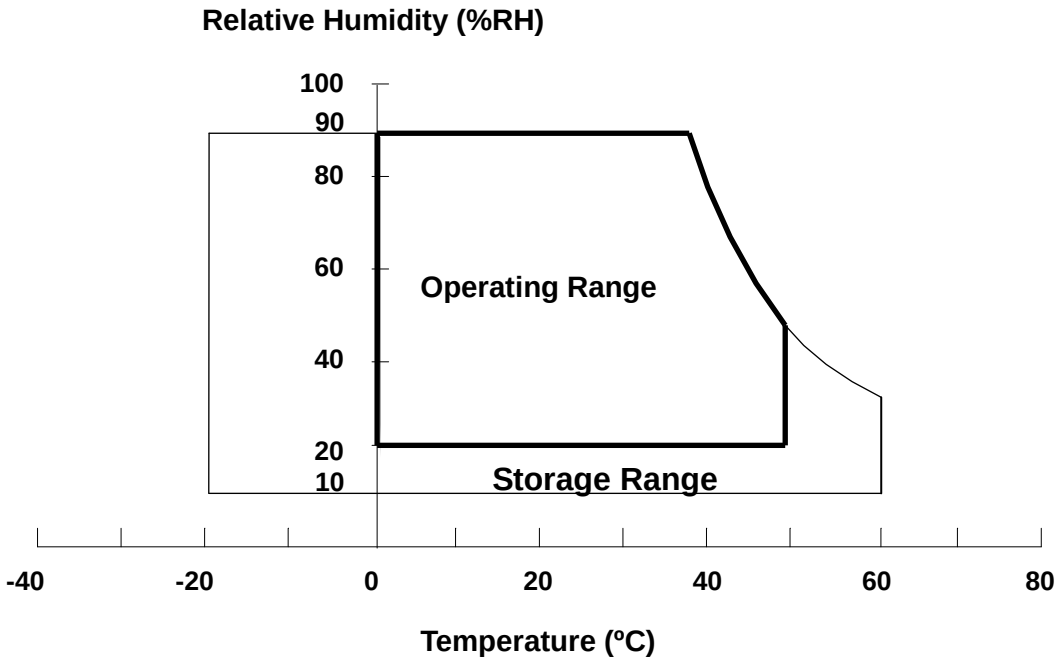
Note (1) Temperature and relative humidity range is shown in the figure below.

(a) 90 %RH Max. (Ta ≦ 40 ºC).

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

(c) No condensation.

Note (2) The temperature of panel display surface area should be 0 ºC Min. and 60 ºC Max

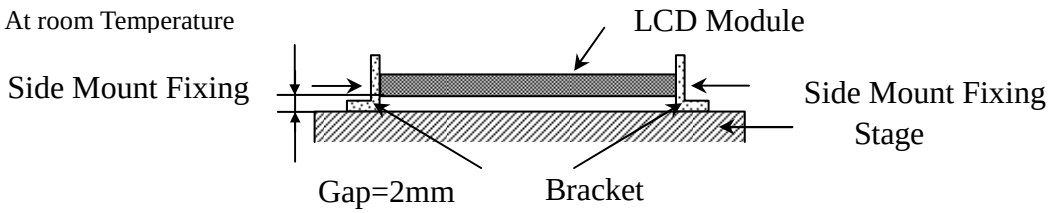


Note (3) 1 time for ± X, ± Y, ± Z. for Condition (25G / 6ms) is half Sine Wave,.

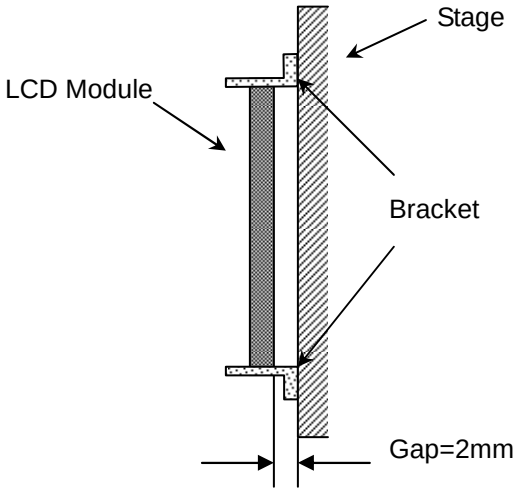
Note (4) 5- 9Hz: 3,5mm amplitude 9- 500Hz: 1g- each 10 cycles / axis (X,Y,Z); 1 octave / min.

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:



X Direction



Y Direction

2.2 ELECTRICAL ABSOLUTE RATINGS

2.2.1 TFT LCD MODULE

Item	Symbol	Value		Unit	Note
		Min.	Max.		
Power Supply Voltage	Vcc	(-0.3)	(+6.0)	V	(1)

2.2.2 BACKLIGHT UNIT

Item	Value			Unit	Note
	Min	Typ.	Max.		
LED Light Bar Input voltage	-	(37.2)	(40.8)	V_{DC}	(1), (2)
LED Light Bar Input Current	-	(720)	(780)	A_{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

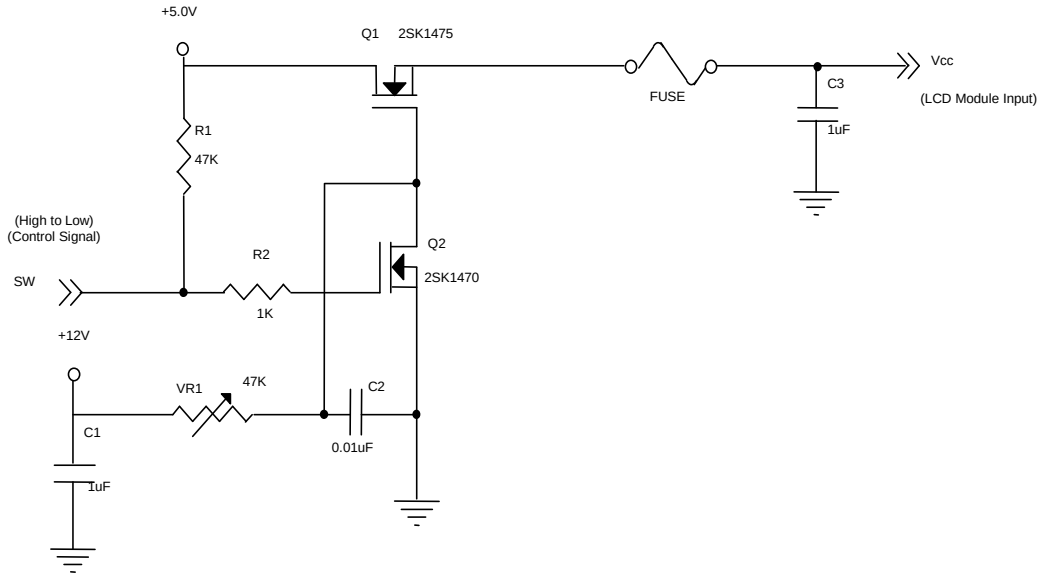
3.1 TFT LCD MODULE

Ta = 25 ± 2 ºC

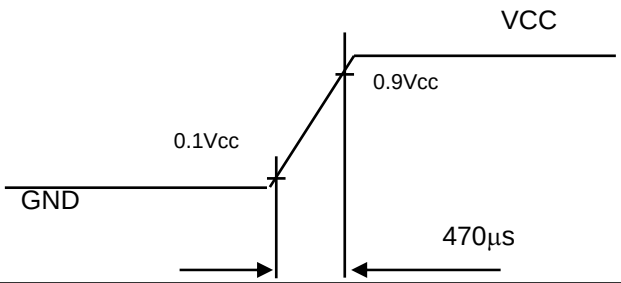
Parameter		Symbol	Value			Unit	Note
			Min.	Typ.	Max.		
Power Supply Voltage		Vcc	(4.5)	(5.0)	(5.50)	V	-
Ripple Voltage		V_{RP}	-	-	(100)	mV	-
Rush Current		I_{RUSH}	-	-	(3.8)	A	(2)
Power Supply Current	White	-	-	(1.36)	(1.9)	A	(3)a
	Black	-	-	(0.9)	(1.26)	A	(3)b
	Vertical Stripe	-	-	(1.4)	(1.96)	A	(3)c
LVDS Differential Input High Threshold		VTH(LVDS)	-	-	+100	mV	Vic=1.2V
LVDS Differential Input Low Threshold		VTL(LVDS)	(-100)	-	-	mV	Vic=1.2V
LVDS differential input voltage		Vid	(100)	-	(600)	mV	
LVDS common input voltage		Vic	-	(1.2)	-	V	
Logic “L” input voltage		Vil	Vss	-	(0.8)	V	

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

Note (2) Measurement Conditions:



Vcc rising time is 470μs



Note (3) The specified power supply current is under the conditions at Vcc = 5.0 V, Ta = 25 ± 2 ºC, f_v = 60 Hz, whereas a power dissipation check pattern below is displayed.

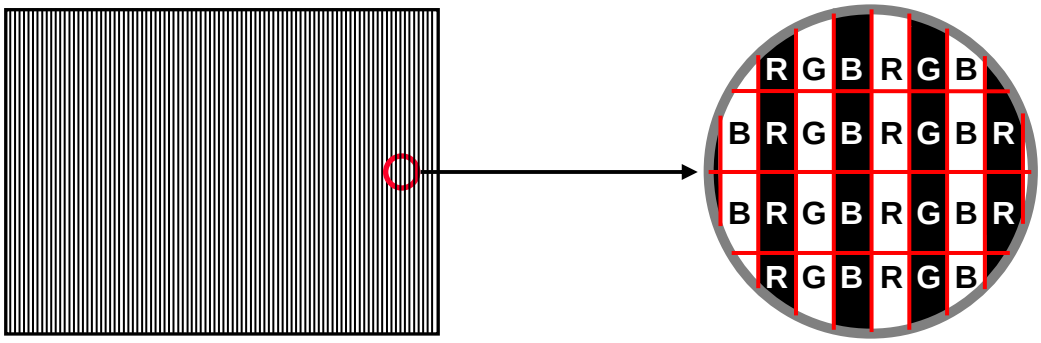
a. White Pattern

Active Area

b. Black Pattern

Active Area

c. Vertical Stripe Pattern



Active Area

3.2 BACKLIGHT UNIT

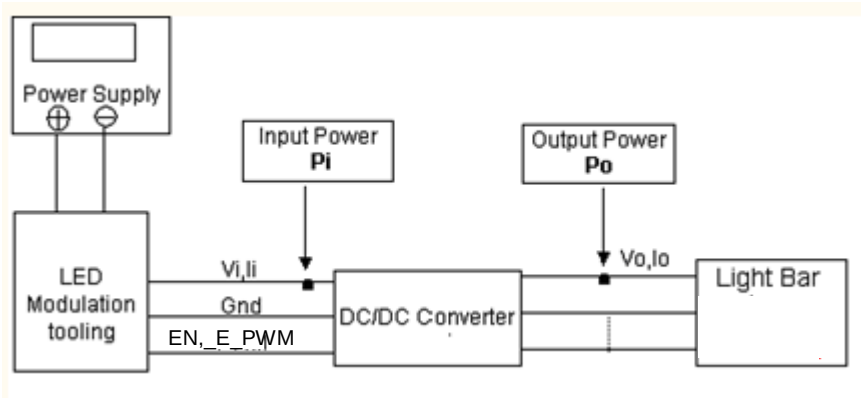
Ta = 25 ± 2 ºC

Parameter		Symbol	Value			Unit	Note
			Min.	Typ.	Max.		
Converter Power Supply Voltage		V_i	(21.6)	(24.0)	(26.4)	V	(Duty 100%)
Converter Power Supply Current		I_i	---	(1.2)	(1.5)	A	@ Vi = 24V (Duty 100%)
LED Power Consumption		P_O	---	(30)	(35)	W	@ Vi = 24V (Duty 100%),(3)
EN Control Level	Backlight on	EN1, EN2	(2)	(3.3)	(5.0)	V	
	Backlight off		(0)	(0)	(0.8)	V	
PWM Control Level	PWM High Level	PWM1, PWM2	(2.0)	(3.3)	(5.0)	V	
	PWM Low Level		(0)	(0)	(0.8)	V	
PWM Control Duty Ratio			(1)		(100)	%	
PWM Control Frequency		f_{PWM}	(100)	(200)	(210)	Hz	
LED Life Time		L_L	(50,000)			Hrs	(1), (2)

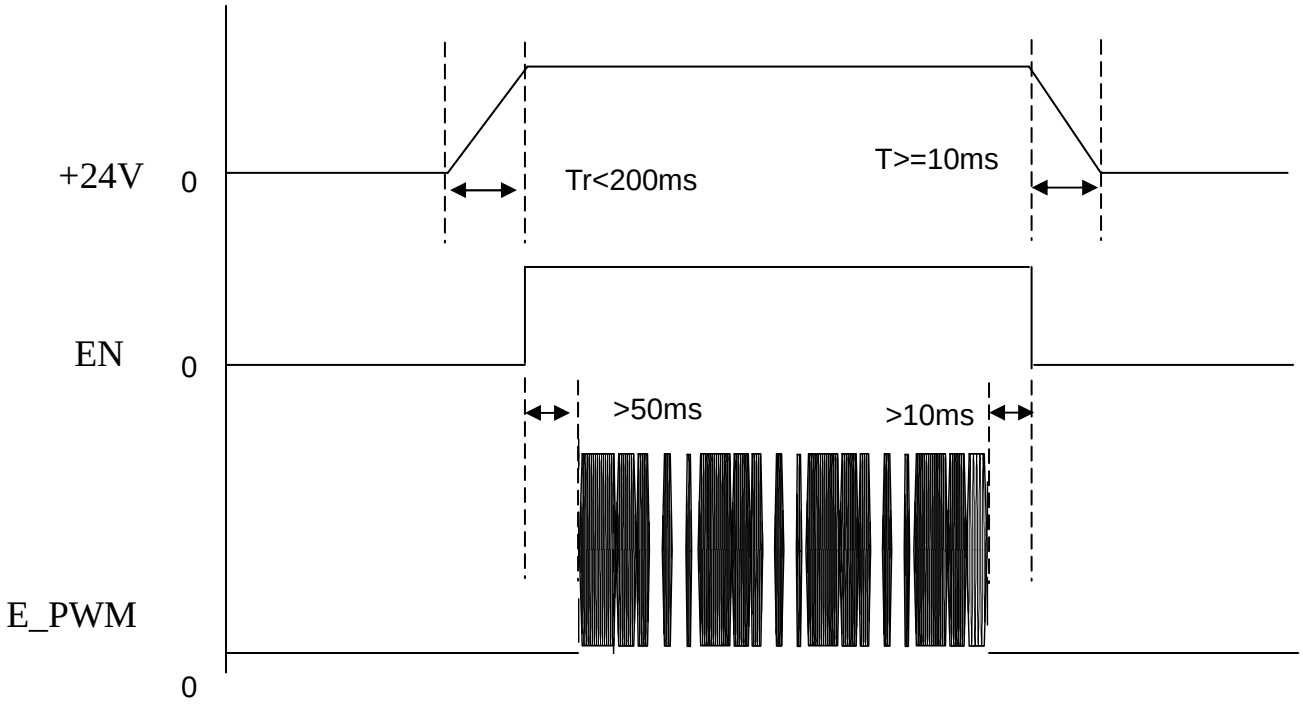
Note (1) LED current is measured by utilizing a high frequency current meter as shown below:

Note (2) The lifetime of LED is defined as the time when it continues to operate under the conditions at Ta = 50±2 ℃ and I_{LED} = 60mA_{DC}(LED forward current) until the brightness becomes ≦ 50% of its original value.

Note (3) $P_O = I_o \times V_o$



Power sequence and control signal timing are shown in the following figure



Note ：While system is turned ON or OFF, the power sequences must follow as below descriptions:

Turn ON sequence: Vi(+24V) → EN → E_PWM signal

Turn OFF sequence: E_PWM signal → EN → Vi(+24V)

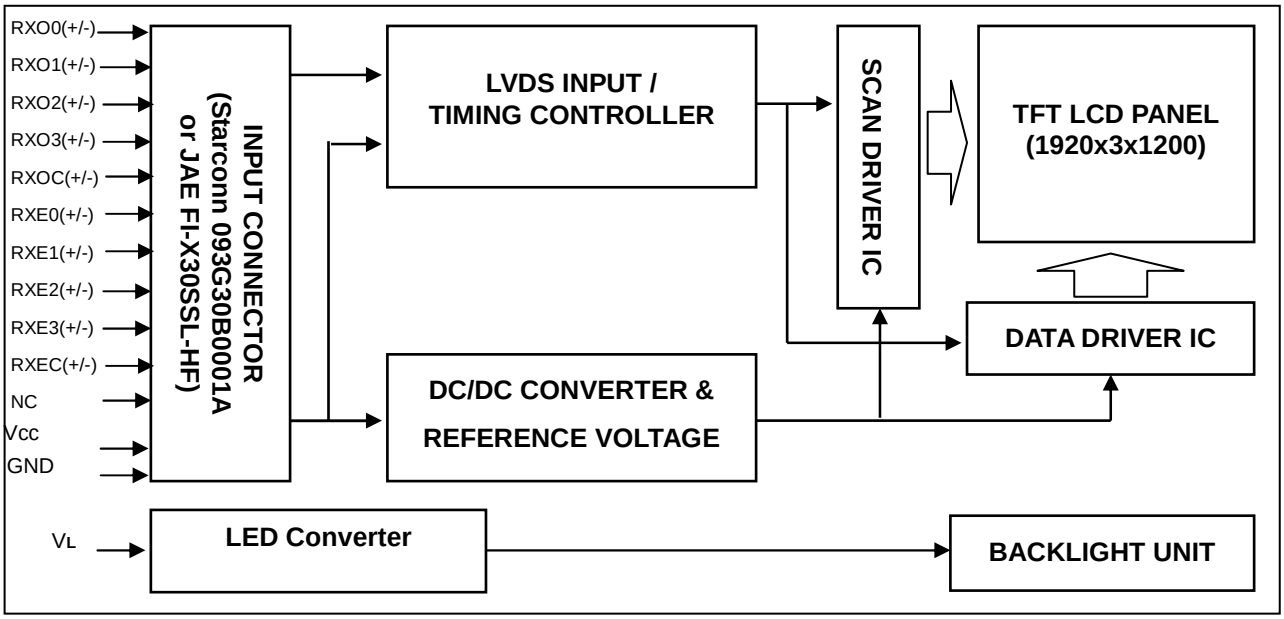
INPUT TERMINAL PIN ASSIGNMENT

Pin	Name	Description
1	Vi	Converter Power Supply(+24V)
2	Vi	Converter Power Supply(+24V)
3	Vi	Converter Power Supply(+24V)
4	Vi	Converter Power Supply(+24V)
5	Vi	Converter Power Supply(+24V)
6	GND	Ground
7	GND	Ground
8	GND	Ground
9	GND	Ground
10	GND	Ground
11	NC	No connection
12	EN	Enable Control (for light Bar)
13	NC	No connection
14	E_PWM	Dimming Control (for light Bar)

Note (1) Connector Part No.: FCN_JH2-D4-143N.

4. BLOCK DIAGRAM

4.1 TFT LCD MODULE



5. INPUT TERMINAL PIN ASSIGNMENT

5.1 TFT LCD MODULE

Pin	Name	Description
1	RXO0-	Negative LVDS differential data input. Channel O0 (odd)
2	RXO0+	Positive LVDS differential data input. Channel O0 (odd)
3	RXO1-	Negative LVDS differential data input. Channel O1 (odd)
4	RXO1+	Positive LVDS differential data input. Channel O1 (odd)
5	RXO2-	Negative LVDS differential data input. Channel O2 (odd)
6	RXO2+	Positive LVDS differential data input. Channel O2 (odd)
7	GND	Ground
8	RXOC-	Negative LVDS differential clock input. (odd)
9	RXOC+	Positive LVDS differential clock input. (odd)
10	RXO3-	Negative LVDS differential data input. Channel O3(odd)
11	RXO3+	Positive LVDS differential data input. Channel O3 (odd)
12	RXE0-	Negative LVDS differential data input. Channel E0 (even)
13	RXE0+	Positive LVDS differential data input. Channel E0 (even)
14	GND	Ground
15	RXE1-	Negative LVDS differential data input. Channel E1 (even)
16	RXE1+	Positive LVDS differential data input. Channel E1 (even)
17	GND	Ground
18	RXE2-	Negative LVDS differential data input. Channel E2 (even)
19	RXE2+	Positive LVDS differential data input. Channel E2 (even)
20	RXEC-	Negative LVDS differential clock input. (even)
21	RXEC+	Positive LVDS differential clock input. (even)
22	RXE3-	Negative LVDS differential data input. Channel E3 (even)
23	RXE3+	Positive LVDS differential data input. Channel E3 (even)
24	GND	Ground
25	NC	No connection, this pin should be opened.
26	NC	No connection, this pin should be opened.
27	VCC	+5.0V power supply
28	VCC	+5.0V power supply
29	VCC	+5.0V power supply
30	VCC	+5.0V power supply

Note (1) Connector Part No.: P2 187114-30091.

Note (2) The first pixel is odd.

Note (3) Input signal of even and odd clock should be the same timing.

5.2 The Input Data Format

LVDS Channel O0	LVDS output	D7	D6	D4	D3	D2	D1	D0
	Data order	OG0	OR5	OR4	OR3	OR2	OR1	OR0
LVDS Channel O1	LVDS output	D18	D15	D14	D13	D12	D9	D8
	Data order	OB1	OB0	OG5	OG4	OG3	OG2	OG1
LVDS Channel O2	LVDS output	D26	D25	D24	D22	D21	D20	D19
	Data order	DE	NA	NA	OB5	OB4	OB3	OB2
LVDS Channel O3	LVDS output	D23	D17	D16	D11	D10	D5	D27
	Data order	NA	OB7	OB6	OG7	OG6	OR7	OR6
LVDS Channel E0	LVDS output	D7	D6	D4	D3	D2	D1	D0
	Data order	EG0	ER5	ER4	ER3	ER2	ER1	ER0
LVDS Channel E1	LVDS output	D18	D15	D14	D13	D12	D9	D8
	Data order	EB1	EB0	EG5	EG4	EG3	EG2	EG1
LVDS Channel E2	LVDS output	D26	D25	D24	D22	D21	D20	D19
	Data order	DE	NA	NA	EB5	EB4	EB3	EB2
LVDS Channel E3	LVDS output	D23	D17	D16	D11	D10	D5	D27
	Data order	NA	EB7	EB6	EG7	EG6	ER7	ER6

5.3 COLOR DATA INPUT ASSIGNMENT

The brightness of each primary color (red, green and blue) is based on the 8-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							
		R7	R6	R5	R4	R3	R2	R1	R0	R7	R6	G5	G4	G3	G2	G1	G0	R7	R6	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	0	0	0	0	0	0
	Red	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Green	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0
	Blue	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1
	Cyan	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Magenta	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1
	Yellow	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	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	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	0	0	0	0	0	0
	Red(1)	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Red(2)	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
	Red(253)	1	1	1	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Red(254)	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Red(255)	1	1	1	1	1	1	1	1	0	0	0	0	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	0	0	0	0	0	0
	Green(1)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
	Green(2)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
	Green(253)	0	0	0	0	0	0	0	0	1	1	1	1	1	1	0	1	0	0	0	0	0	0	0	0
	Green(254)	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0
	Green(255)	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	0	0	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	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	0	0	0	0	0	1	1
	Blue(2)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
	Blue(253)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	0	1
	Blue(254)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	0
	Blue(255)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1

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

6. INTERFACE TIMING

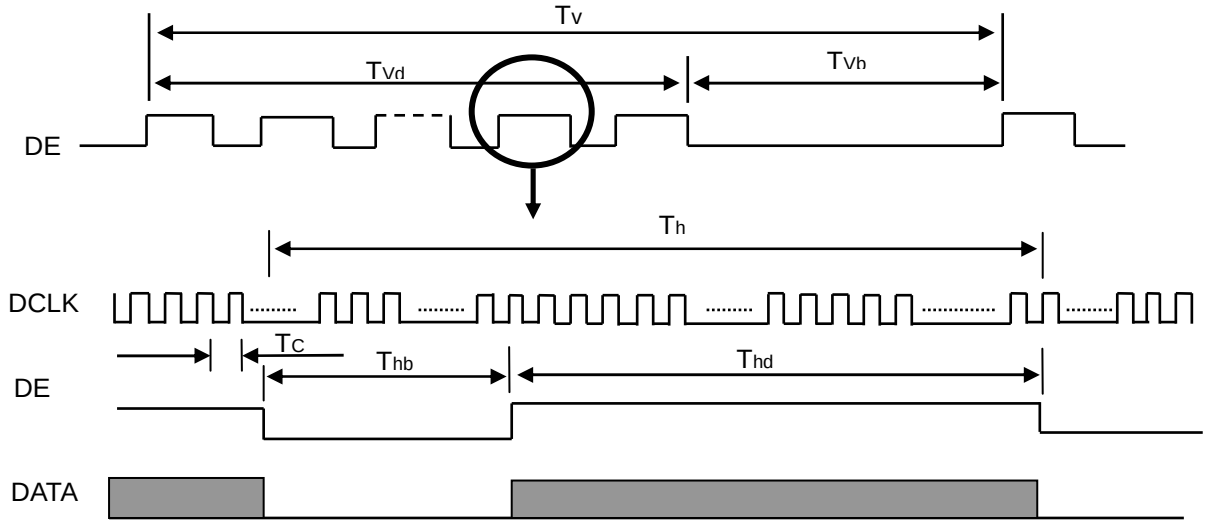
6.1 INPUT SIGNAL TIMING SPECIFICATIONS

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

Signal	Item	Symbol	Min.	Typ.	Max.	Unit	Note
LVDS Clock	Frequency	Fc	(50.0)	(77)	(83.0)	MHz	-
	Period	Tc	-	(13.0)	-	ns	
	High Time	Tch	-	(4/7)	-	Tc	-
	Low Time	Tcl	-	(3/7)	-	Tc	-
LVDS Data	Setup Time	Tlvs	(600)	-	-	ps	-
	Hold Time	Tlvh	(600)	-	-	ps	-
Vertical Active Display Term	Frame Rate	Fr	(40)	(60)	(63)	Hz	Tv=Tvd+Tvb
	Total	Tv	(1209)	(1235)	(1245)	Th	-
	Display	Tvd	(1200)	(1200)	(1200)	Th	-
	Blank	Tvb	(9)	(35)	Tv-Tvd	Th	-
Horizontal Active Display Term	Total	Th	(1030)	(1040)	(1060)	Tc	Th=Thd+Thb
	Display	Thd	(960)	(960)	(960)	Tc	-
	Blank	Thb	(70)	(80)	Th-Thd	Tc	-

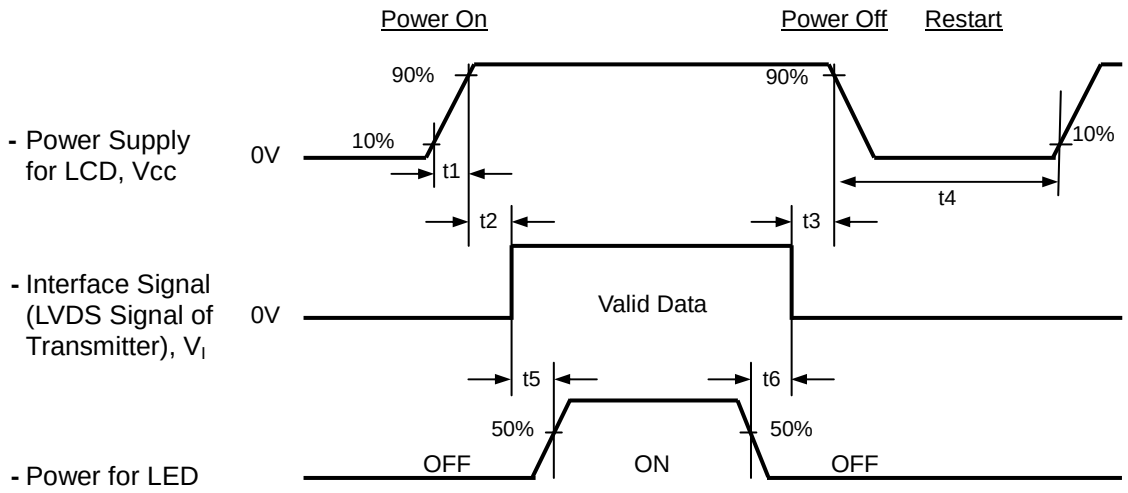
Note: Because this module is operated by DE only mode, Hsync and Vsync input signals should be set to low logic level or ground. Otherwise, this module would operate abnormally.

INPUT SIGNAL TIMING DIAGRAM



6.2 POWER ON/OFF SEQUENCE

To prevent a latch-up or DC operation of LCD module, the power on/off sequence should be as the diagram below.



Timing Specifications:

0.5< t1 ≦ 10 msec

0 < t2 ≦ 50 msec

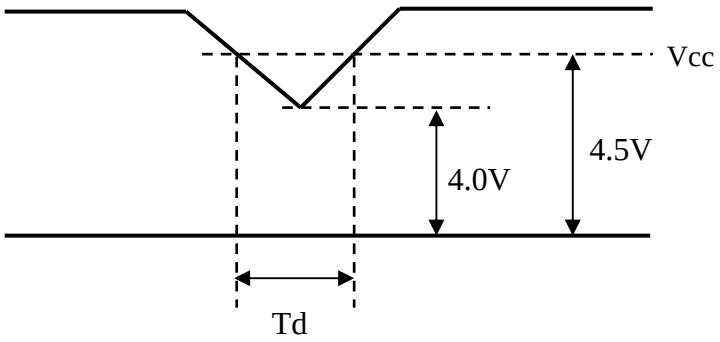
0 < t3 ≦ 50 msec

t4 ≧ 500 msec

t5 ≧ 500 msec

t6 ≧ 90 msec

6.3 VDD Power DIP Condition



Dip condition: $4.0V \le Vcc \le 4.5V, Td \le 20ms$

7. OPTICAL CHARACTERISTICS

7.1 TEST CONDITIONS

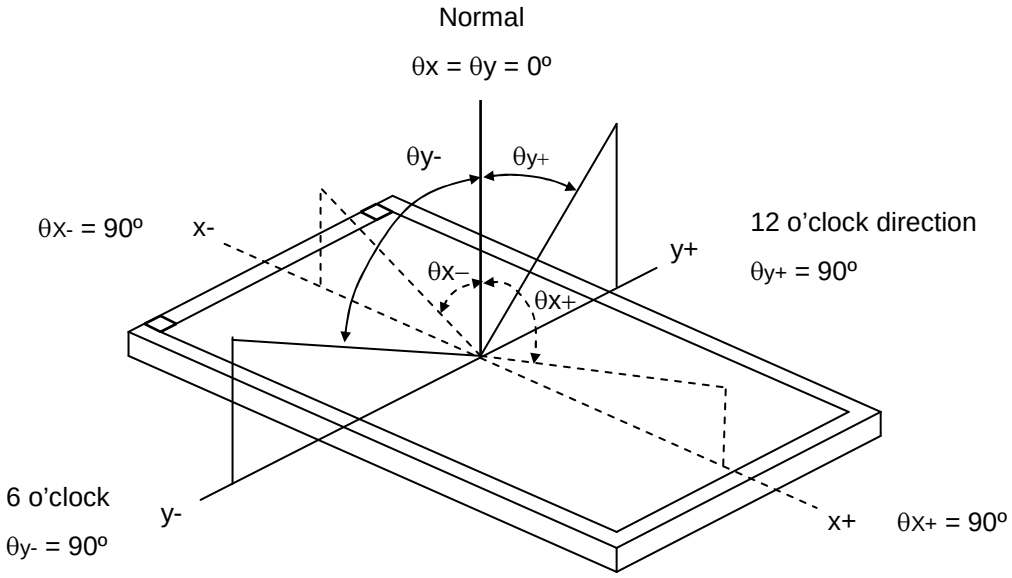
Item	Symbol	Value	Unit
Ambient Temperature	Ta	(25±2)	°C
Ambient Humidity	Ha	(50±10)	%RH
Supply Voltage	V_{CC}	(5)	V
Input Signal	According to typical value in "3. ELECTRICAL CHARACTERISTICS"		
Converter PWM duty		(100%)	

7.2 OPTICAL SPECIFICATIONS

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 (5).

Item		Symbol	Condition	Min.	Typ.	Max.	Unit	Note
Contrast Ratio		CR	θ_x=0°,θ_Y=0° Viewing Normal Angle	(1000)	(1500)	-	-	(2), (5)
Response Time		T_R		-	(15)	-	ms	(3)
		T_F		-	(5)	-	ms	
Center Luminance of White		L_C		(300)	(350)	-	cd/m^2	(4), (5)
White Variation		δW		-	(1.4)	(1.5)	-	(5), (6)
Color Chromaticity	Red	Rx		Typ.- 0.05	(0.638)	Typ.+ 0.05	-	(1), (5)
		Ry			(0.342)		-	
	Green	Gx			(0.310)		-	
		Gy			(0.616)		-	
	Blue	Bx			(0.153)		-	
		By			(0.055)		-	
	White	Wx			(0.298)		-	
		Wy			(0.308)		-	
Viewing Angle	Horizontal	θ_x+	CR≥10	80	88	-	Deg.	(1), (5)
		θ_x-		80	88	-		
	Vertical	θ_Y+		80	88	-		
		θ_Y-		80	88	-		

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) = L255 / L0

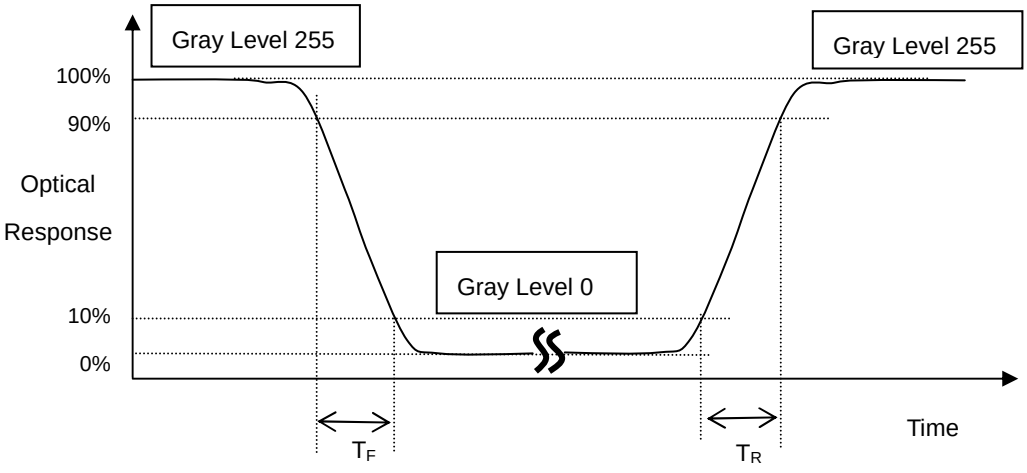
L255: Luminance of gray level 255

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 (6).

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

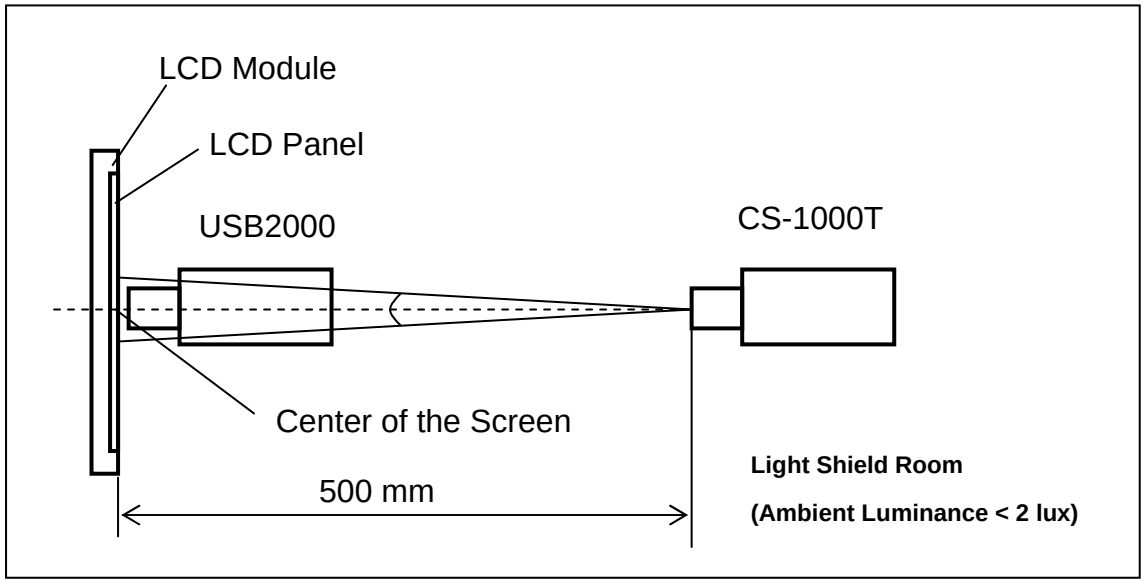


Note (4) Definition of Luminance of White (L_C):

L_C = L (1), where L (X) is corresponding to the luminance of the point X at the figure in Note (6)

Note (5) Measurement Setup:

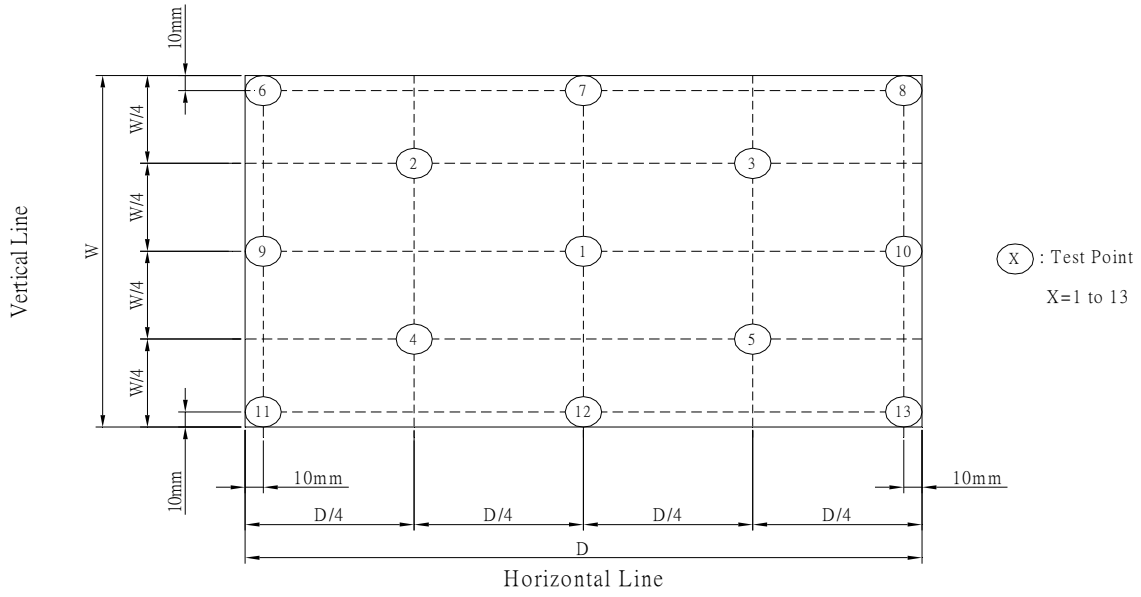
The LCD module should be stabilized at given temperature for 20 minutes to avoid abrupt temperature change during measuring. In order to stabilize the luminance, the measurement should be executed after lighting Backlight for 20 minutes in a windless room.



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

Measure the luminance of gray level 255 at 13 points

$$\delta W = \frac{\text{Maximum [L (1), L (2), L (3), L (4), L (5),L (6),L (7),L (8),L (9),L (10),L (11),L (12),L (13)]}}{\text{Minimum [L (1), L (2), L (3), L (4), L (5) ,L (6),L (7),L (8),L (9),L (10),L (11),L (12),L (13)]}}$$



Active Area

8. Reliability Test Criteria

Test Item	Test Condition	Note
High Temperature Storage Test	(60ºC,240 hours)	(1)(2)(4)
Low Temperature Storage Test	(-20ºC, 240 hours)	
Thermal Shock Storage Test	(-20ºC, 0.5hour←→60 ºC, 0.5hour; 1hour/cycle,100cycles)	
High Temperature Operation Test	(50ºC, 240 hours)	
Low Temperature Operation Test	(-0ºC, 240 hours)	
High Temperature & High Humidity Operation Test	(50ºC,80%RH, 240hours)	
Shock (Non-Operating)	(40g, half sine, duration: 11ms,1times for ±X, ±Y, ±Z)	(3)(4)
Vibration (Non-Operating)	(f＝10～300Hz, 1.5G, 10min/cycles,3cycles each X, Y, Z,)	(3)(4)

Note (1) There should be no condensation on the surface of panel during test.

Note (2) Temperature of panel display surface area should be 70 ºC Max.

Note (3) 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.

Note (4) In the standard conditions, there is no function failure issue occurred. All the cosmetic specification is judged before reliability test.

9. PACKAGING

9.1 PACKING SPECIFICATIONS

(1) 5 LCD modules / 1 Box

(2) Box dimensions: 713(L)x429(W)x453(H)mm

(3) Weight: approximately 21.1Kg (5 modules per box)

9.2 PACKING METHOD

(1) Carton Packing should have no failure in the following reliability test items.

Test Item	Test Conditions	Note
Vibration	ISTA STANDARD Random, Frequency Range: 1 – 200 Hz Top & Bottom: 30 minutes (+Z), 10 min (-Z), Right & Left: 10 minutes (X) Back & Forth 10 minutes (Y)	Non Operation
Dropping Test	1 Angle, 3 Edge, 6 Face, 60cm	Non Operation

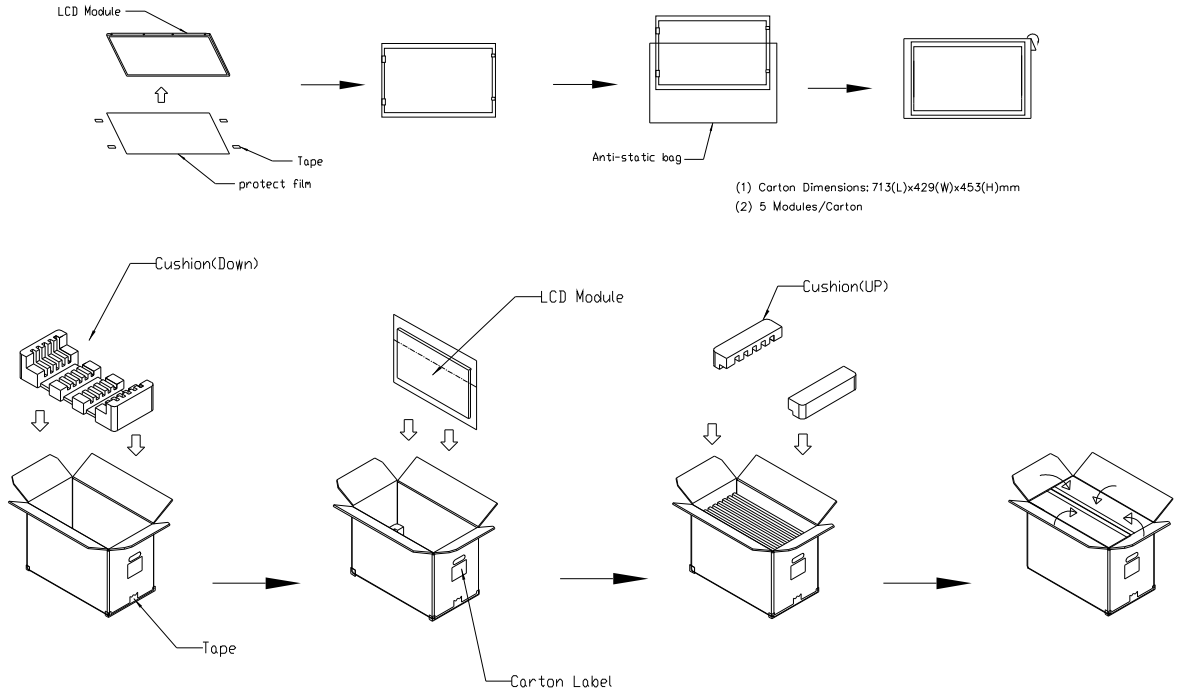


Figure. 9-1 Packing method

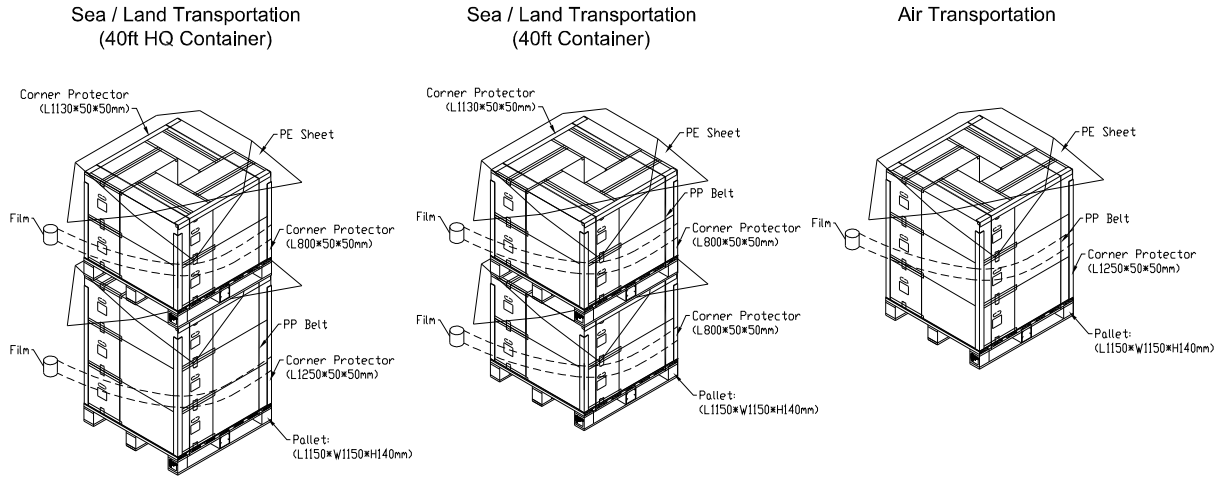
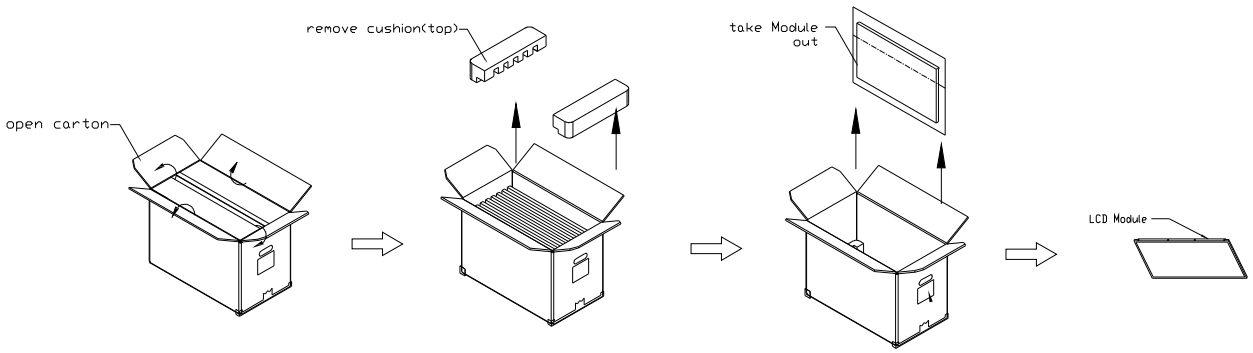


Figure. 9-2 Packing method

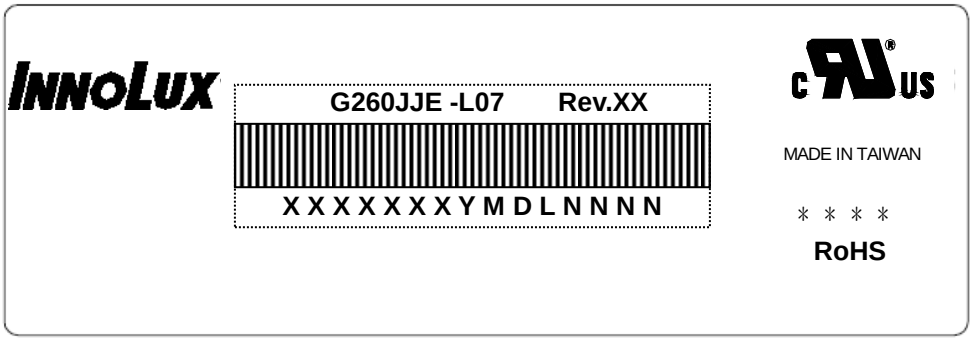
9.3 UN-PACKING METHOD



10. DEFINITION OF LABELS

10.1 Innolux MODULE LABEL

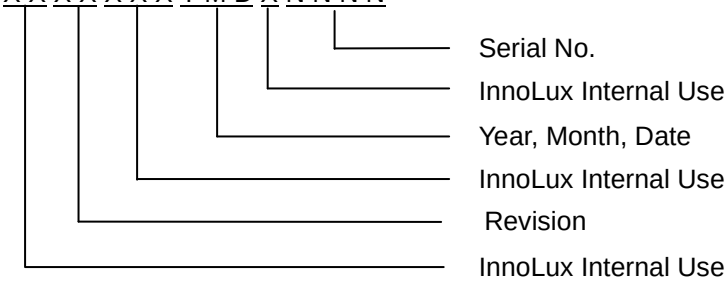
The barcode nameplate is pasted on each module as illustration, and its definitions are as following explanation.



(a) Model Name: G260JJE -L07

(b) Revision: Rev. XX, for example: A1, B1,C1, C2 …etc.

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



Serial ID includes the information as below:

(a) Manufactured Date: Year: 1~9, for 2011~2019

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. PRECAUTIONS

11.1 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 backlight will be higher than room temperature.

(11) Do not keep same pattern in a long period of time. It may cause image sticking on LCD.

11.2 SAFETY PRECAUTIONS

(1) 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.

12. MECHANICAL CHARACTERISTICS