

Doc. Number :

- Tentative Specification
 Preliminary Specification
 Approval Specification

MODEL NO.: M200HJJ
SUFFIX: P01

Customer: Common

APPROVED BY **SIGNATURE**

Name / Title

Note

Product version C2

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

Approved By	Checked By	Prepared By
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REVISION HISTORY

Version	Date	Page	Description																								
3.0	2014.12.11	All	Spec Ver.3.0 was first issued.																								
3.1	2015.06.22	5	1.2 GENERAL SPECIFICATIONS Add Display Orientation																								
3.1	2015.06.22	9	4.2 INTERFACE CONNECTIONS Note (1) The first pixel is odd.																								
3.1	2015.06.22	17	Add 4.7 Flicker Adjustment																								
3.1	2015.06.22	18	5.2 OPTICAL SPECIFICATIONS Color Chromaticity : <table border="1" style="display: inline-table; vertical-align: middle;"> <tr><th></th><th>x</th><th>y</th></tr> <tr><td>R</td><td>0.638</td><td>0.341</td></tr> <tr><td>G</td><td>0.314</td><td>0.631</td></tr> <tr><td>B</td><td>0.150</td><td>0.054</td></tr> </table> => <table border="1" style="display: inline-table; vertical-align: middle;"> <tr><th></th><th>x</th><th>y</th></tr> <tr><td>R</td><td>0.648</td><td>0.337</td></tr> <tr><td>G</td><td>0.319</td><td>0.620</td></tr> <tr><td>B</td><td>0.152</td><td>0.055</td></tr> </table>		x	y	R	0.638	0.341	G	0.314	0.631	B	0.150	0.054		x	y	R	0.648	0.337	G	0.319	0.620	B	0.152	0.055
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1. GENERAL DESCRIPTION

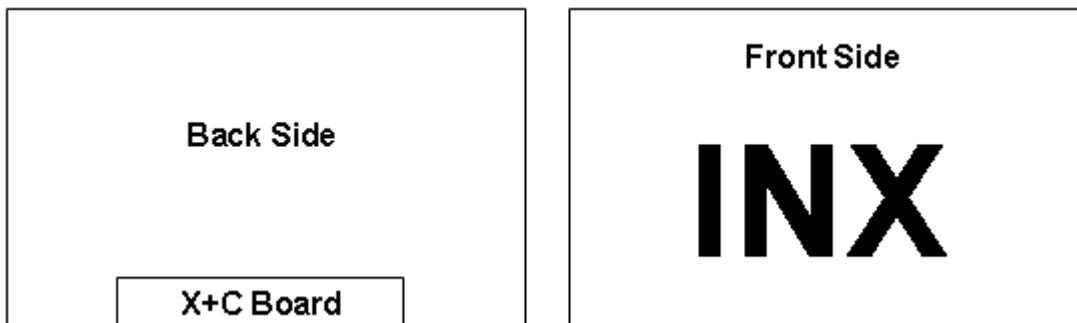
1.1 OVERVIEW

The M200HJJ-P01 is a 19.53" TFT Liquid Crystal Display MNT cell with driver ICs and a 30-pins-2ch-LVDS circuit board. The product supports 1920 x 1080 Full HD mode and can display up to 16.7M colors. The backlight unit is not built in.

1.2 GENERAL SPECIFICATIONS

Item	Specification	Unit	Note
Screen Size	19.53 inch Diagonal	mm	
Driver Element	a-si TFT active matrix	-	-
Pixel Number	1920 x R.G.B. x 1080	pixel	-
Pixel Pitch	0.2265 (H) x 0.221 (V)	mm	-
Pixel Arrangement	RGB vertical stripe	-	-
Display Colors	16.7M	color	-
Transmissive Mode	Normally Black	-	-
Display Orientation	Signal input with " INX"	-	(1)
Surface Treatment	AG type, 3H hard coating, Haze 25	-	-
Power Consumption	Total cell: 5.5 W (Max.)		

Note(1)



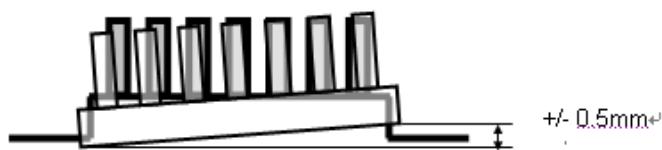
2. MECHANICAL SPECIFICATIONS

Item	Min.	Typ.	Max.	Unit	Note
Weight	315	335	355	g	
I/F connector mounting position	The mounting inclination of the connector makes the screen center within $\pm 0.5\text{mm}$ as the horizontal.				(2)

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

(2) Connector mounting position

(3) Please refer to sec.3.1 for more information of power consumption.



3. ABSOLUTE MAXIMUM RATINGS

3.1 ABSOLUTE RATINGS OF ENVIRONMENT

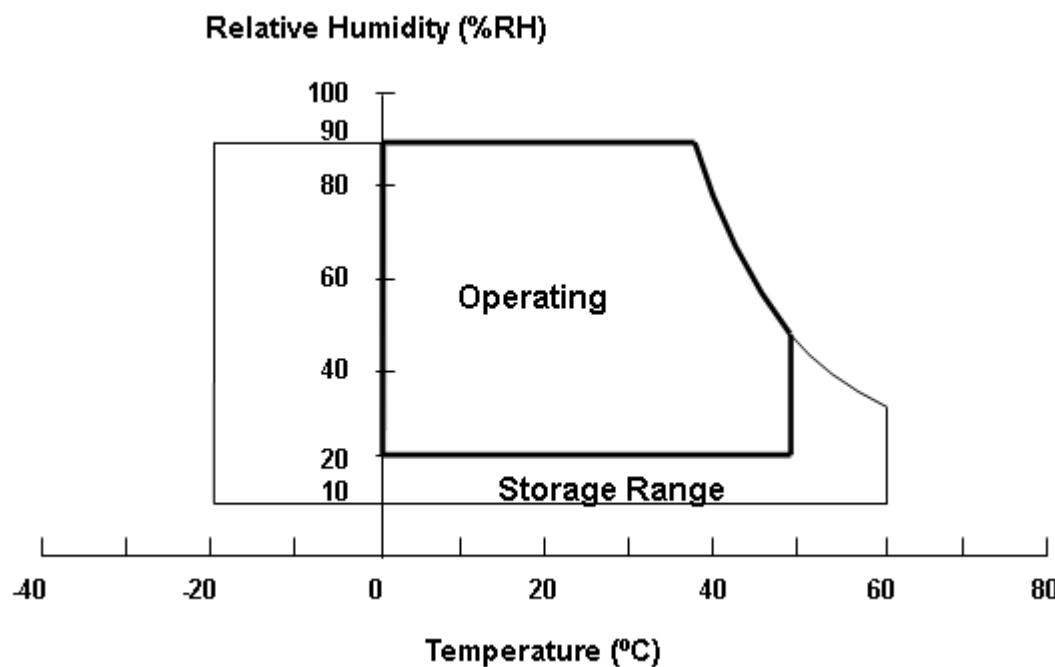
Item	Symbol	Value		Unit	Note
		Min.	Max.		
Storage Temperature	TST	-20	60	°C	(1)
Operating Ambient Temperature	TOP	0	50	°C	(1), (2)

Note (1)

- (a) 90 %RH Max.
- (b) Wet-bulb temperature should be 39 °C Max.
- (c) No condensation.

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

Panel surface temperature should be 0°C min. and 60°C max under Vcc=5.0V, Input fr =60Hz, typical LED string current, 25°C ambient temperature, and no humidity control. Any condition of ambient operating temperature, the surface of active area should be keeping not higher than 60°C.



3.2 ELECTRICAL ABSOLUTE RATINGS

3.2.1 TFT LCD OPEN CELL

Item	Symbol	Value		Unit	Note
		Min.	Max.		
Power Supply Voltage	VCCS	-0.3	6.0	V	(1)
Logic Input Voltage	V _{IN}	-0.3	3.6	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.

3.3 ABSOLUTE RATINGS OF ENVIRONMENT (OPEN CELL)

High temperature or humidity may reduce the performance of panel. Please store LCD panel within the specified storage conditions.

Storage Condition: With packing.

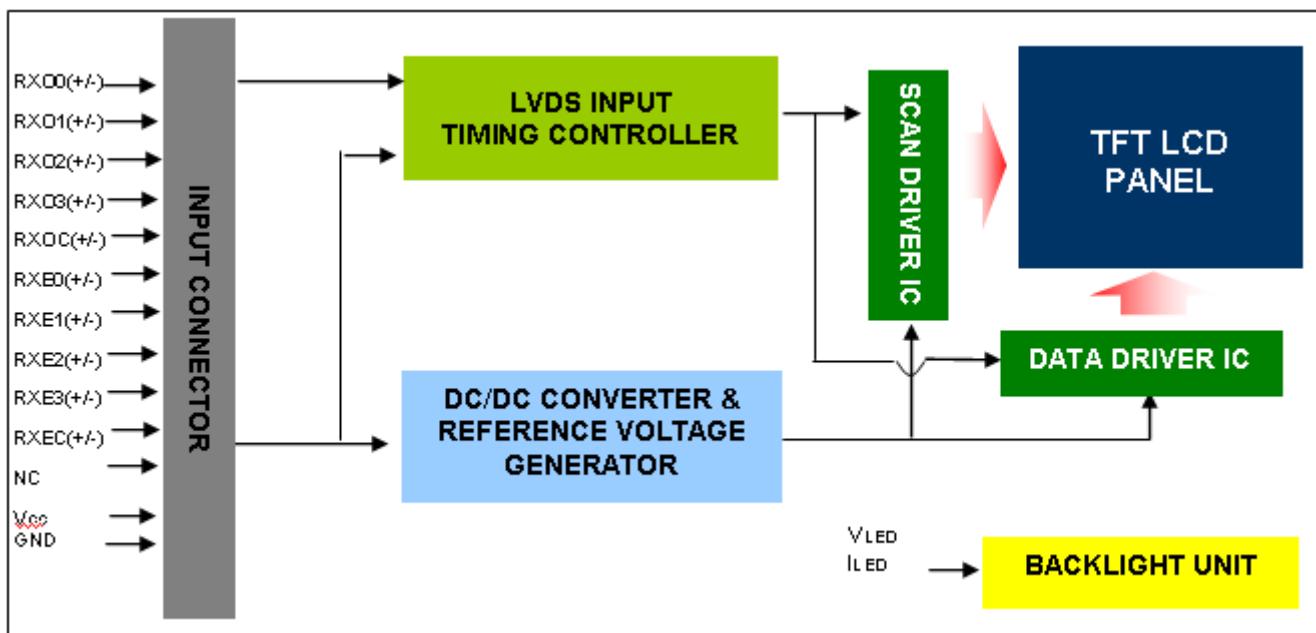
Storage temperature range: 25 ± 5 °C.

Storage humidity range: $50\pm 10\%$ RH.

Shelf life: 30days

4. ELECTRICAL SPECIFICATIONS

4.1 FUNCTION BLOCK DIAGRAM



4.2 INTERFACE CONNECTIONS

PIN ASSIGNMENT

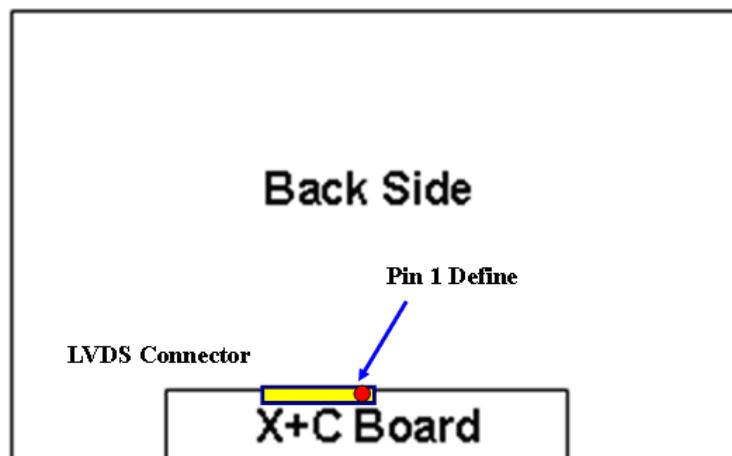
Pin	Name	Description
1	RXO0-	Negative LVDS differential data input. Channel O0 (odd)
2	RXO0+	Positive LVDS differential data input. Channel O0 (odd)
3	RXO1-	Negative LVDS differential data input. Channel O1 (odd)
4	RXO1+	Positive LVDS differential data input. Channel O1 (odd)
5	RXO2-	Negative LVDS differential 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	For LCD internal use only, Do not connect
26	SCL	I2C clock (for auto Vcom)
27	SDA	I2C data (for auto Vcom)
28	VCC	+5.0V power supply
29	VCC	+5.0V power supply
30	VCC	+5.0V power supply

Connector Information

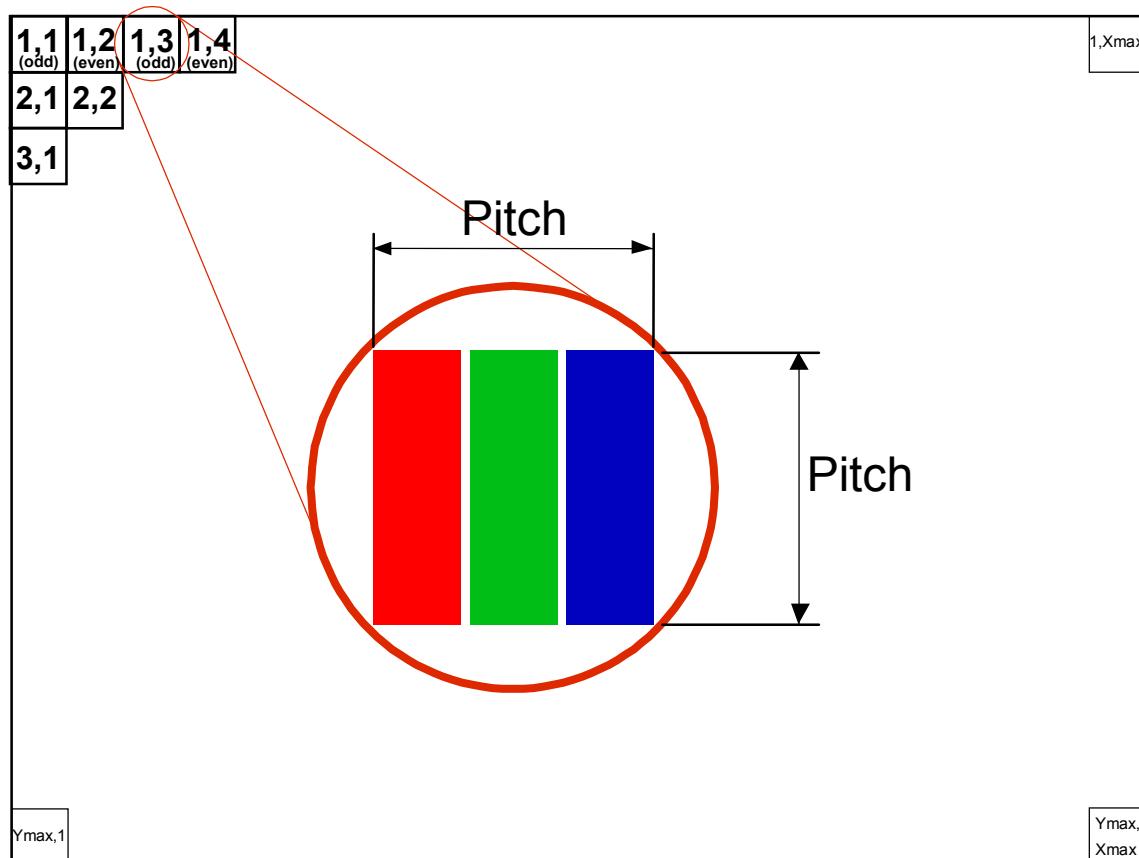
Item	Description
Manufacturer	P-TWO/FCN
Type part number	P-TWO:187098-30091 FCN: WF13-422-3033
User's Mating housing part number	FI-X30HL(JAE) FI-X30H(JAE)

*Notice: There would be compatible issues if not using the indicated connectors in the matching list.

Note (1) The first pixel is odd.



Note (2) Input signal of even and odd clock should be the same timing.



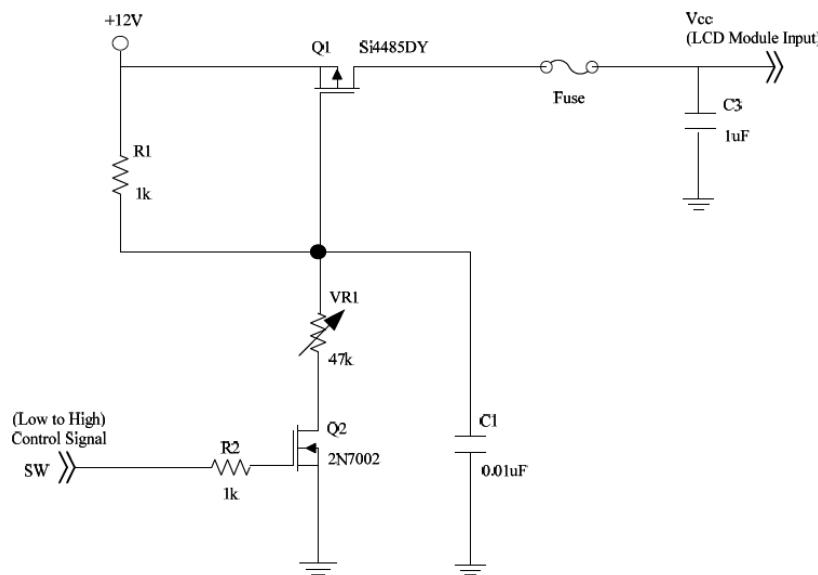
4.3 ELECTRICAL CHARACTERISTICS

4.3.1 LCD ELECTRONICS SPECIFICATION

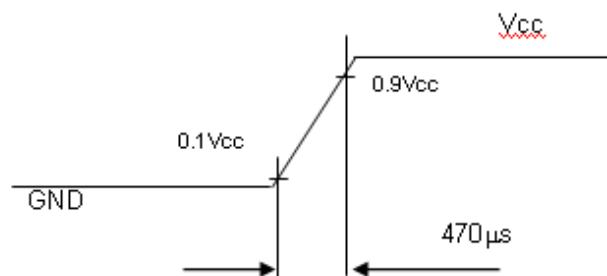
Parameter	Symbol	Value			Unit	Note
		Min.	Typ.	Max.		
Power Supply Voltage	V _{CC}	4.5	5.0	5.5	V	-
Ripple Voltage	V _{RP}			300	mV	-
Rush Current	I _{RUSH}			3	A	(2)
Power Supply Current	White		0.7	0.83	A	(3)a
	Black		0.67	0.79	A	(3)b
	Vertical Stripe		0.92	1.1	A	(3)c
Power Consumption	PLCD		4.6	5.5	Watt	(4)
LVDS interface	Differential Input Voltage	V _{ID}	100	-	600	mV
	Common Input Voltage	V _{CM}	1.0	1.2	1.4	V
	Differential Input High Threshold Voltage	V _{TH}		-	0.1	V
	Differential Input Low Threshold Voltage	V _{TL}	-0.1	-		V

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

Note (2) Measurement Conditions:



V_{CC} rising time is 470μs



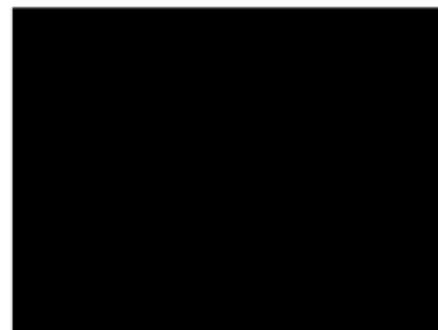
Note (3) The specified power supply current is under the conditions at $V_{CC} = 5.0\text{ V}$, $T_a = 25 \pm 2^\circ\text{C}$, $F_r = 60\text{Hz}$, whereas a power dissipation check pattern below is displayed.

a. White Pattern



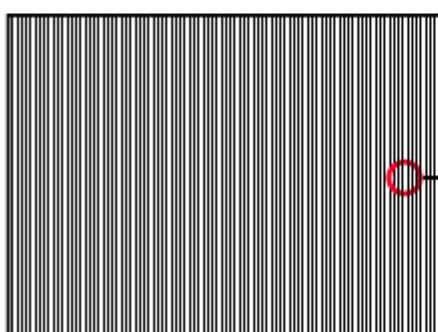
Active Area

b. Black Pattern

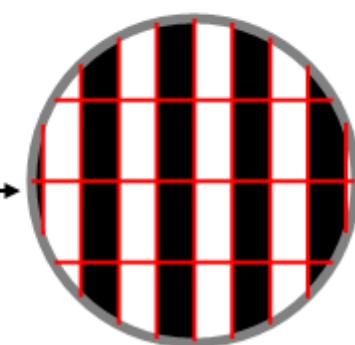


Active Area

c. Vertical Stripe Pattern



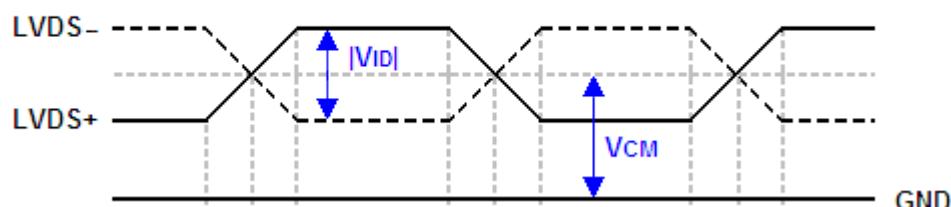
Active Area



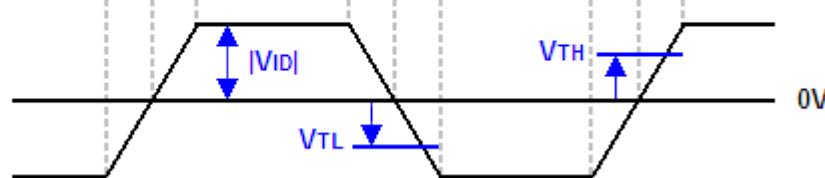
Note (4) The power consumption is specified at the pattern with the maximum current.

Note (5) The LVDS input characteristics are as follows:

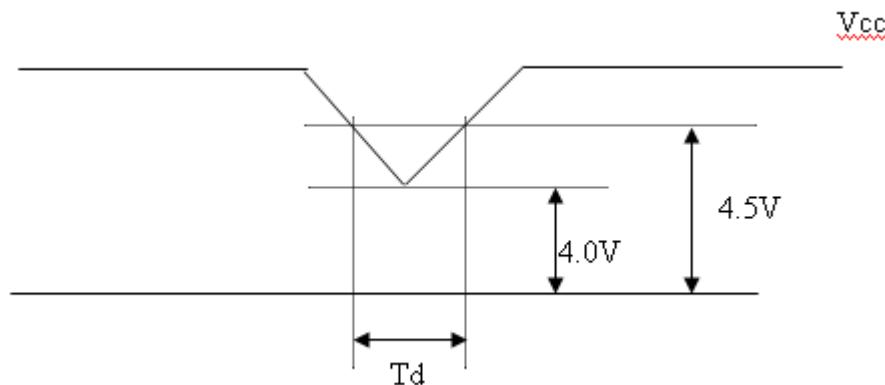
Single-end Signals



Differential Signal



4.3.2 VCC POWER DIP CONDITION



Dip condition: $4.0 \leq V_{cc} \leq 4.5$, $T_d \leq 20\text{ms}$

4.4 LVDS INPUT SIGNAL SPECIFICATIONS

4.4.1 LVDS DATA MAPPING TABLE

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

4.4.2 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	G7	G6	G5	G4	G3	G2	G1	G0	B7	B6	B5	B4	B3	B2	B1
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
	Red	1	1	1	1	1	1	1	1	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
	Blue	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	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
	Magenta	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	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
	White	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
	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
	Red(2)	0	0	0	0	0	0	0	1	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
	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
	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
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
	Green(1)	0	0	0	0	0	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	0	0	0	0	0	0	0	0	0	0	0	0	0
	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	
	Green(253)	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	0	1	0	0	0	0	0	0
	Green(254)	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	0	0	0	0	0	0	0
	Green(255)	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	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
	Blue(1)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	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
	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	
	Blue(253)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	0
	Blue(254)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	0
	Blue(255)	0	0	0	0	0	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

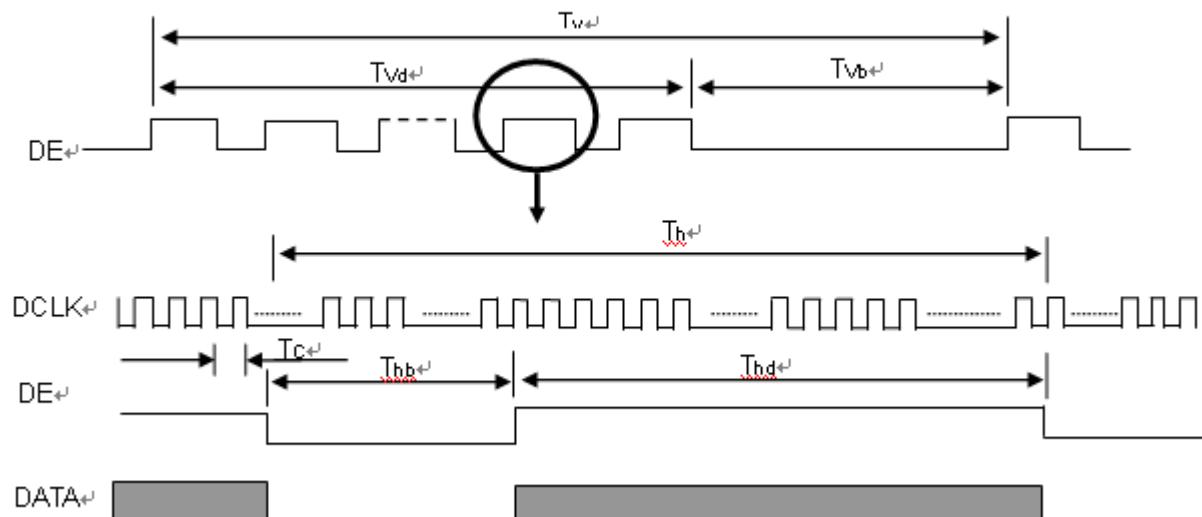
4.5 DISPLAY TIMING SPECIFICATIONS

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

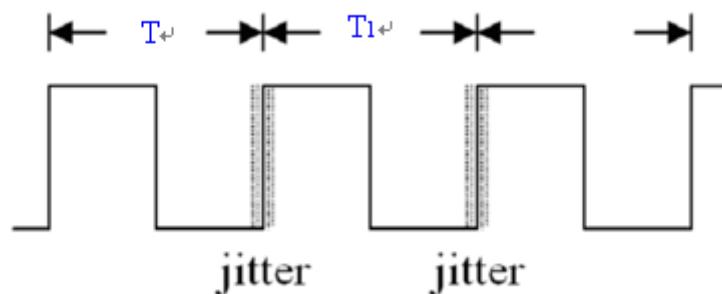
Signal	Item	Symbol	Min.	Typ.	Max.	Unit	Note
LVDS Clock	Frequency	F _c	58.54	74.25	97.98	MHz	-
	Period	T _c		13.47		ns	
	Input cycle to cycle jitter	T _{rcl}	-0.02*T _c	-	0.02*T _c	ns	(1)
	Input Clock to data skew	TLVCCS	-0.02*T _c	-	0.02*T _c	ps	(2)
	Spread spectrum modulation range	F _{Clkin_mod}	0.97*F _c	-	1.03*F _c	MHz	(3)
	Spread spectrum modulation frequency	F _{SSM}	-	-	100	KHz	
Vertical Display Term	Frame Rate	F _r	50	60	75	Hz	T _v =T _{vd} +T _{vb}
	Total	T _v	1115	1125	1136	Th	-
	Active Display	T _{vd}	1080	1080	1080	Th	-
	Blank	T _{vb}	T _v -T _{vd}	T _v -T _{vd}	T _v -T _{vd}	Th	-
Horizontal Display Term	Total	T _h	1050	1100	1150	T _c	T _h =T _{hd} +T _{hb}
	Active Display	T _{hd}	960	960	960	T _c	-
	Blank	T _{hb}	T _h -T _{hd}	T _h -T _{hd}	T _h -T _{hd}	T _c	-

Note: Because this module is operated by DE only mode, Hsync and Vsync input signals are ignored.

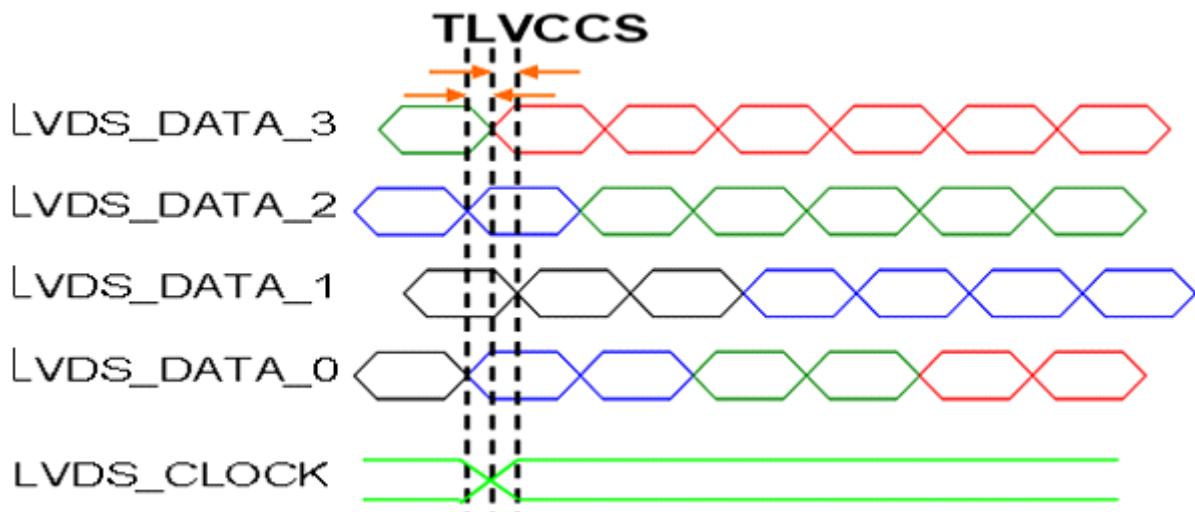
INPUT SIGNAL TIMING DIAGRAM



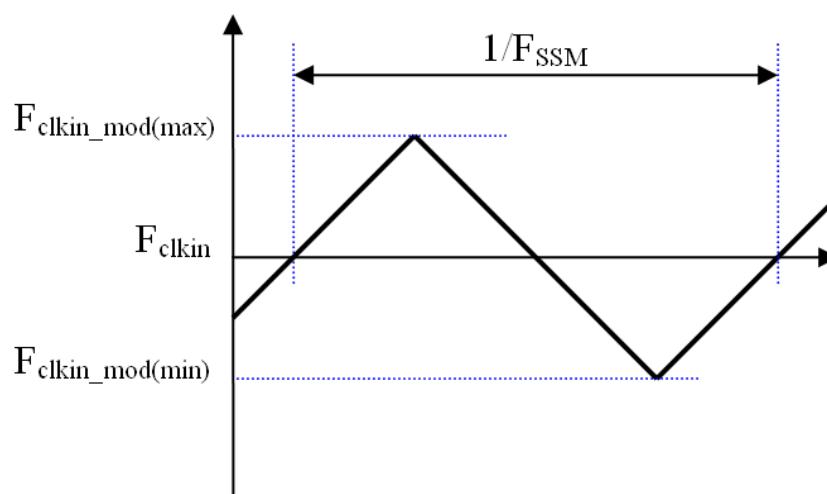
Note (1) The input clock cycle-to-cycle jitter is defined as below figures. Trcl = | T1 - T1'



Note (2) Input Clock to data skew is defined as below figures.



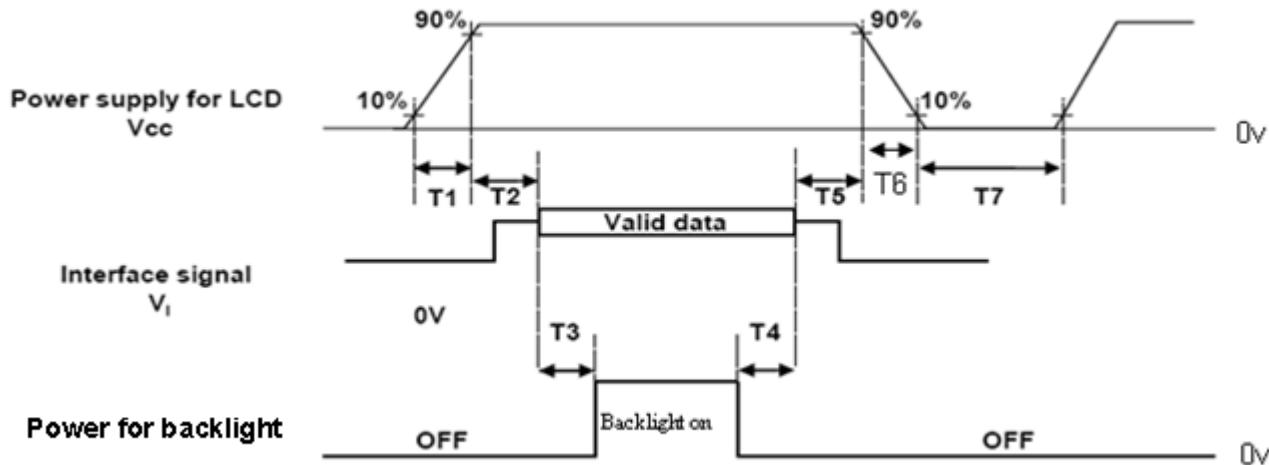
Note (3) The SSCG (Spread spectrum clock generator) is defined as below figures.



Note (4) The DCLK range at last line of V-blank should be set in 0 to Hdisplay/2

4.6 POWER ON/OFF SEQUENCE

The power sequence specifications are shown as the following table and diagram.



Timing Specifications:

Parameters	Values			Units
	Min	Typ.	Max	
T1	0.5	-	10	ms
T2	0	30	50	ms
T3	450	--	-	ms
T4	100	250	-	ms
T5	0	20	50	ms
T6	0.1	-	100	ms
T7	1000	-	-	ms

Note (1) The supply voltage of the external system for the module input should be the same as the definition of V_{cc}.

Note (2) When the backlight turns on before the LCD operation of the LCD turns off, the display may momentarily become abnormal screen.

Note (3) In case of VCC = off level, please keep the level of input signals on the low or keep a high impedance.

Note (4) T7should be measured after the module has been fully discharged between power off and on period.

Note (5) Interface signal shall not be kept at high impedance when the power is on.

Note (6) INX won't take any responsibility for the products which are damaged by the customers not following the Power Sequence.

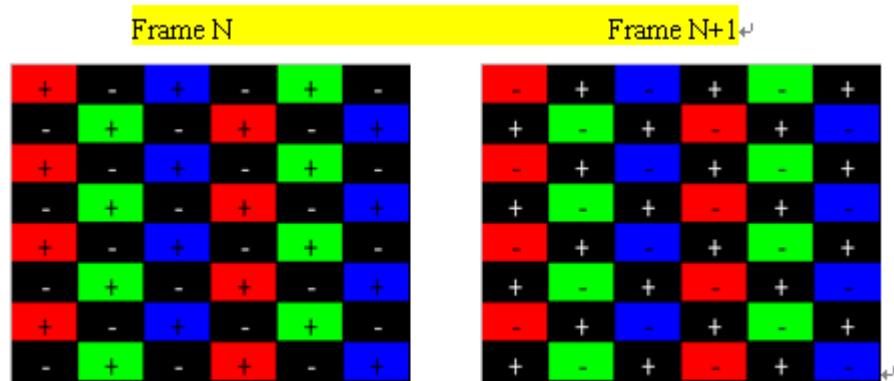
Note (7) There might be slight electronic noise when LCD is turned off (even backlight unit is also off). To avoid this symptom, we suggest "Vcc falling timing" to follow "t6 spec".

4.7 Flicker Adjustment

Flicker must be finely adjusted after module assembly and aging. Please follow the instructions below.

(1) Vcom adjustment type : Auto Vcom

(2) Flicker Pattern :



5. OPTICAL CHARACTERISTICS

5.1 TEST CONDITIONS

Item	Symbol	Value	Unit
Ambient Temperature	T _a	25±2	°C
Ambient Humidity	H _a	50±10	%RH
Supply Voltage	V _{CC}	5	V
Input Signal	According to typical value in "3. ELECTRICAL CHARACTERISTICS"		
LED Light Bar Input Current Per Input Pin	I _{PIN}	80 ± 1.5	mA
PWM Duty Ratio	D	100	%
LED Light Bar Test Converter	INX R373B0000U000		

5.2 OPTICAL SPECIFICATIONS

The relative measurement methods of optical characteristics are shown in 5.2. The following items should be measured under the test conditions described in 5.1 and stable environment shown in Note (7).

Item	Symbol	Condition	Min.	Typ.	Max.	Unit	Note		
Color Chromaticity (CIE 1931)	Red	$\theta_x=0^\circ, \theta_Y=0^\circ$ CS-2000 R=G=B=255 Gray scale	Typ - 0.03	0.648	Typ + 0.03	-	(1), (5)		
				0.337					
	Green			0.319					
				0.620					
	Blue			0.152					
				0.055					
	White			0.313					
				0.329					
Center Transmittance	T%			4.2			(1), (6)		
Contrast Ratio	CR		2000	3000	-	-	(1), (3)		
Response Time	T _R		15	20	ms	(3)			
	T _F		5	10	ms	(3)			
	T _{GtG_AVE_}	$\theta_x=0^\circ, \theta_Y=0^\circ$	-	25	30	ms	(3)		
Viewing Angle	Horizontal	CR ≥ 10	80	88	-	Deg.	(1), (2)		
			80	88	-				
Viewing Angle	Vertical		80	88	--				
			80	88	---				

Note (1) Definition of Viewing Angle (_x, _y):

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

L₀: Luminance of gray level 0

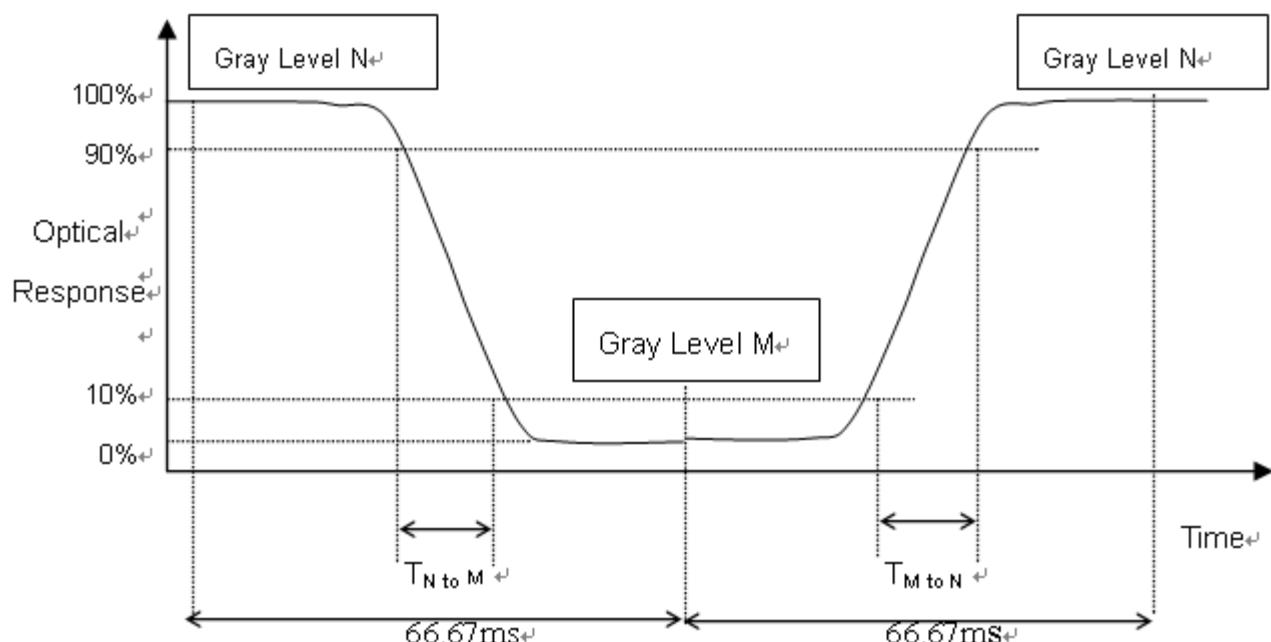
CR = CR (5)

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

Note (3) Definition of Response Time :

-The TR is the rising-time means the transition time from "Full-Black (gray 0)" to "Full-White (gray 255)" and the TF is the falling-time means the transition time from "Full-White (gray 255)" to "Full-White (gray 0)" as the following figure.(Measured by TEKTRONIX TDS3054B).

-The TGtG is the response time means the transition time from "Gray N" to "Gray M" (N,M=0~255).



- T_{GTG_AVE} is the total average of the T_{GTG} data (Measured by INX GTG instrument)

- The gray (N,M) stands for the (0,31,63,~255) as the following table.

- If system use ODC (Over Driving Circuit) function, T_{GTG_AVE} may be 5ms~10ms.

* It depends on Overshoot rate

Gray to Gray		Rising time								
		0	31	63	95	127	159	191	223	255
Falling time	0									
	31									
	63									
	95									
	127									
	159									
	191									
	223									
	255									

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

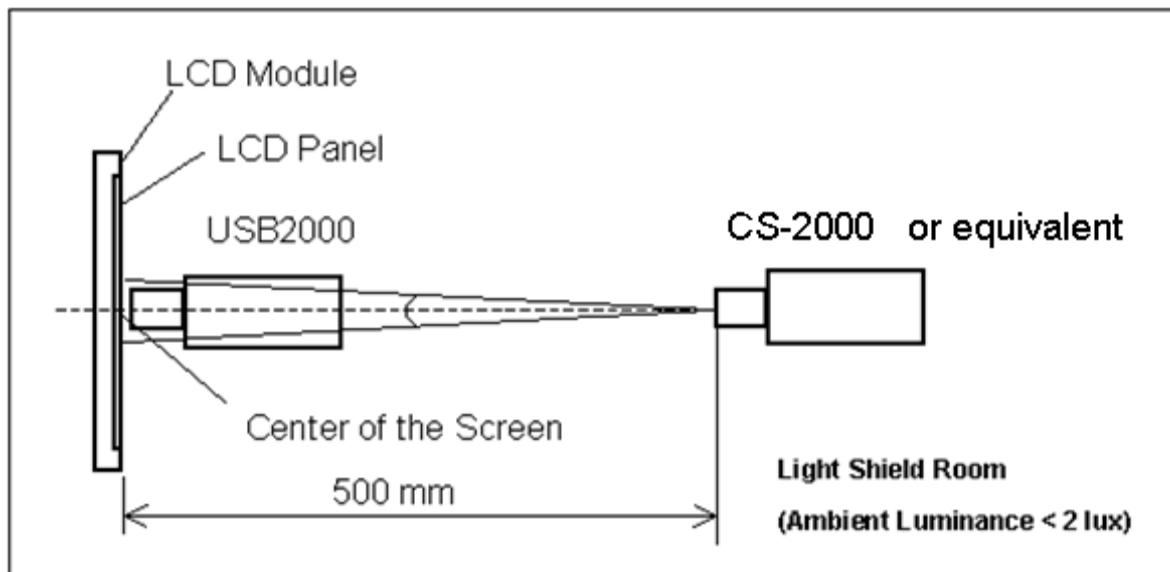
Measure the luminance of gray level 255 at center point

$$LC = L(5)$$

$L(x)$ is corresponding to the luminance of the point X at Figure in Note (6).

Note (5) Measurement Setup:

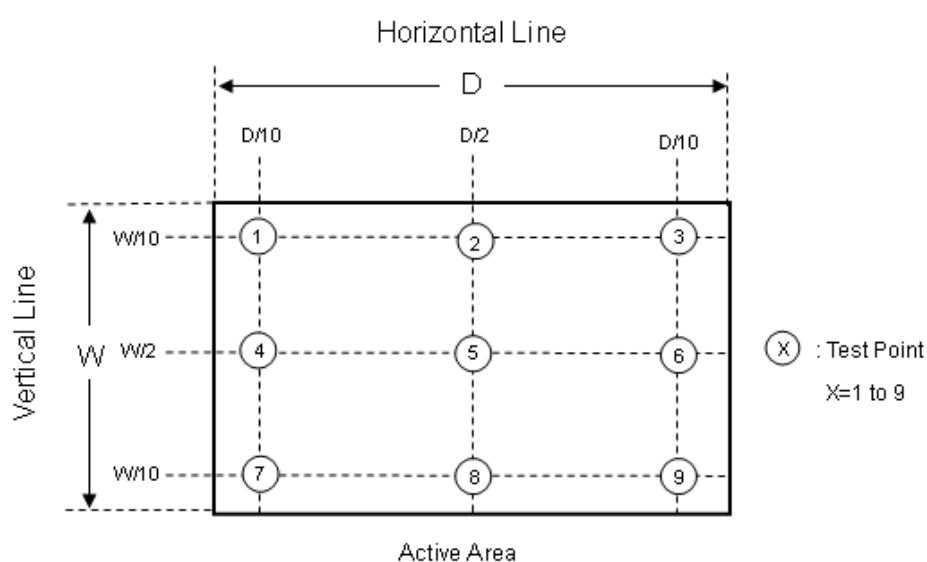
The LCD module should be stabilized at given temperature for 40 minutes to avoid abrupt temperature change during measuring. In order to stabilize the luminance, the measurement should be executed after lighting Backlight for 40 minutes in a windless room.



Note (6) Definition of White Variation ($_W$):

Measure the luminance of gray level 255 at 9 points

$$_W = (\text{Minimum } [L(1) \sim L(9)] / \text{Maximum } [L(1) \sim L(9)]) * 100\%$$

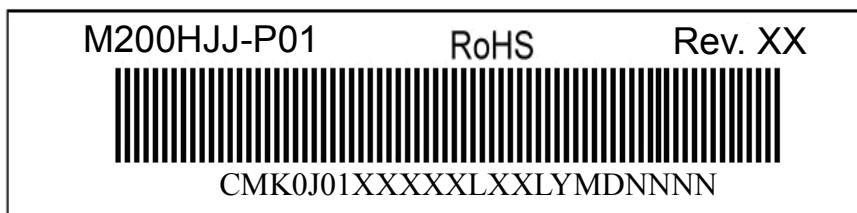


6. RELIABILITY TEST ITEM

Items	Required Condition	Note
Temperature Humidity Bias (THB)	Ta= 50°C, 80%RH, 240hours	(1)
High Temperature Operation (HTO)	Ta= 50°C, 240hours	
Low Temperature Operation (LTO)	Ta= 0°C, 240hours	
High Temperature Storage (HTS)	Ta= 60°C, 240hours	
Low Temperature Storage (LTS)	Ta= -20°C, 240hours	
Package Vibration Test	ISTA STANDARD 1.14Grms Random, Frequency Range: 1 ~ 200 Hz Top & Bottom: 30 minutes (+Z), 10 min (-Z), Right & Left: 10 minutes (X) Back & Forth 10 minutes (Y)	(2)
Thermal Shock Test (TST)	-20°C/30min, 60°C / 30min, 100 cycles	(1)
On/Off Test	25°C, On/10sec, Off /10sec, 30000 cycles	
Altitude Test	Operation: 10000 ft / 24hours Non-Operation: 30000 ft / 24hours	

Note (1) The tests are done with LCD modules (M200HJJ-L20).

Note (2) The test is done with a package shown in Section 8

7. LABEL**7.1 INX OPEN CELL LABEL**

Barcode definition:

Serial ID: CM-K0J01-X-X-X-XX-L-XX-L-YMD-DDDD

Code	Meaning	Description
CM	Supplier code	INX =CM
K0J01	Model number	M200HJJ-P01= K0J01
X	Revision code	C1:1, C2:2, ...
X	Source driver IC code	Century=1, CLL=2, Demos=3, Epson=4, Fujitsu=5, Himax=6, Hitachi=7, Hynix=8, LDI=9, Matsushita=A, NEC=B, Novatek=C, OKI=D, Philips=E, Renasas=F, Samsung=G, Sanyo=H, Sharp=I, TI=J, Topro=K, Toshiba=L, Windbond=M ILITEK=Q, Fiti=Y, None IC =Z
XX	Cell location	Tainan, Taiwan=TN Ningbo China=CN, Hsinchu Taiwan=SC
L	Cell line #	1,2,~,9,A,B,~,Y,Z
XX	Module location	Tainan, Taiwan=TN ; Ningbo China=NP, Shenzhen China=SH
L	Module line #	1,2,~,9,A,B,~,Y,Z
YMD	Year, month, day	Year: 2001=1, 2002=2, 2003=3, 2004=4... Month: 1~12=1, 2, 3, ~, 9, A, B, C Day: 1~31= 1, 2, 3, ~, 9, A, B, C, ~, T, U, V
NNNN	Serial number	Manufacturing sequence of product

8. PACKING**8.1 PACKING SPECIFICATIONS**

- (1) 25 PCS OPEN CELL / 1 Box
- (2) Box dimensions : 555 (L) X 405 (W) X143 (H)mm
- (3) Weight : approximately 9.5 Kg
- (4) 800 PCS OPEN CELL / 1 Group

8.2 PACKING METHOD

Packing method (EPP Box) is shown in following figures.

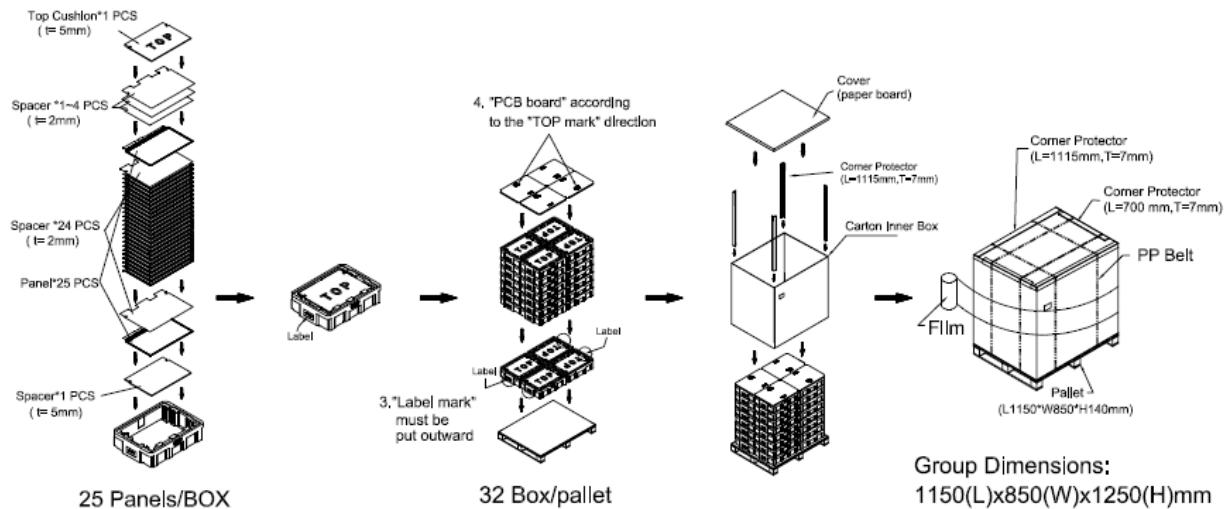
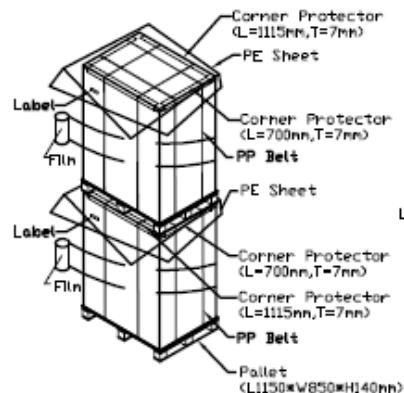


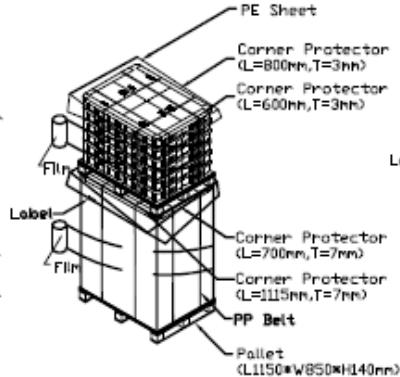
Figure.8-1 packing method

Sea & Land Transportation (40ft HQ Container)



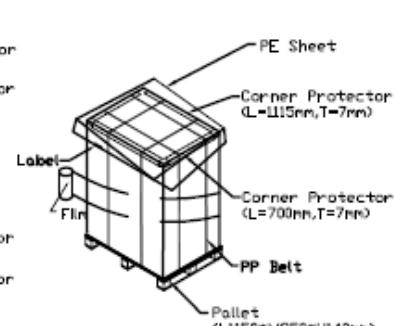
(32 Box / Pallet) + (32 Box / Pallet)

Sea & Land Transportation



(32 Box / Pallet) + (24 Box / Pallet)

Air Transportation



32 Box / Pallet

Figure.8-2 packing method

8.3 UN-PACKAGING METHOD

Un-packaging method (EPP Box) is shown in following figures.

Unpacking Method

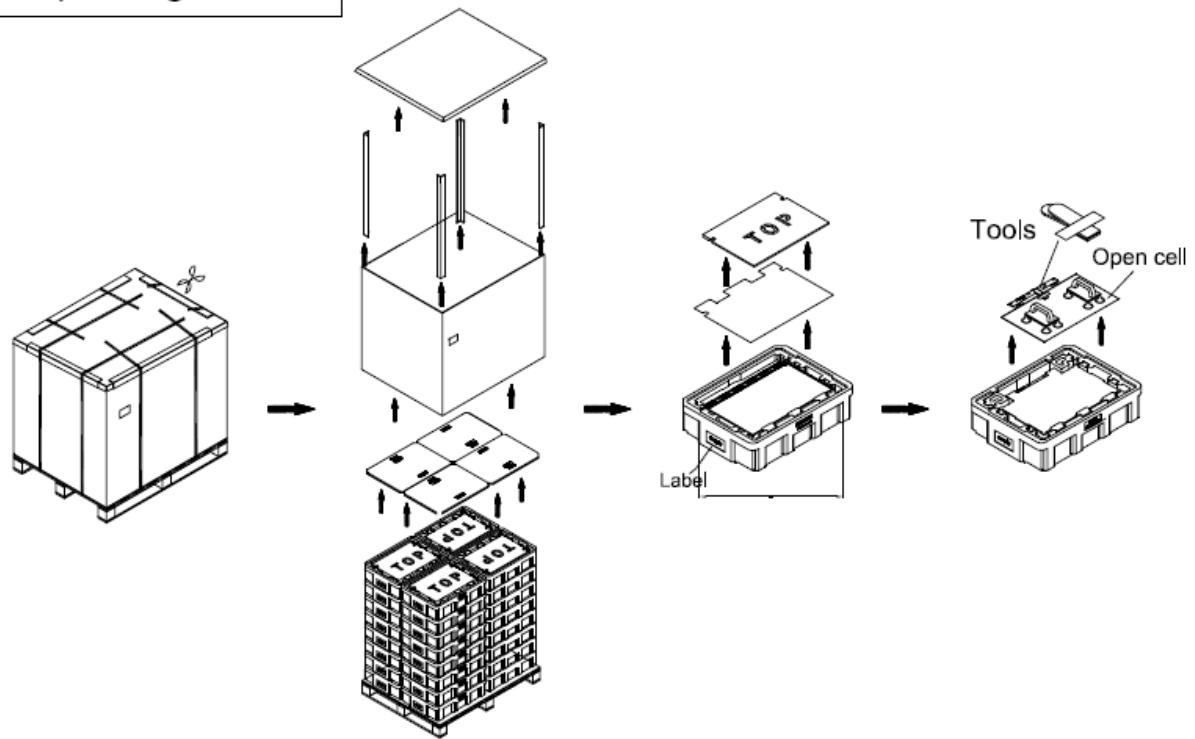


Figure.8-3 unpacking method

9. PRECAUTION

9.1 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 10°C may reduce the display quality. For example, the response time will become slowly.
- (11) While touching the panel surface under the patterns with higher grey levels, a shadow or mura phenomenon would be seen. This phenomenon is totally recoverable by switching the patterns to lower grey levels. It is a product feature.

9.2 STORAGE PRECAUTIONS

- (1) Do not leave the module in high temperature, and high humidity for a long time. It is highly recommended to store the module with temperature from 0°C to 35°C and relative humidity of less than 70%
- (2) Do not store the TFT – LCD module in direct sunlight
- (3) The module should be stored in dark place. It is prohibited to apply sunlight or fluorescent light in storing

9.3 OPERATION PRECAUTIONS

- (1) The LCD product should be operated under normal condition.
Normal condition is defined as below :
Temperature : $20\pm15^{\circ}\text{C}$
Humidity: $65\pm20\%$
Display pattern : continually changing pattern(Not stationary)
- (2) If the product will be used in extreme conditions such as high temperature, high humidity, high altitude ,display pattern or operation time etc...It is strongly recommended to contact INX for application engineering advice . Otherwise, its reliability and function may not be guaranteed.

9.4 SAFETY PRECAUTIONS

- (1) 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.
- (2) After the module's end of life, it is not harmful in case of normal operation and storage.

9.5 SAFETY STANDARDS

The LCD module should be certified with safety regulations as follows:

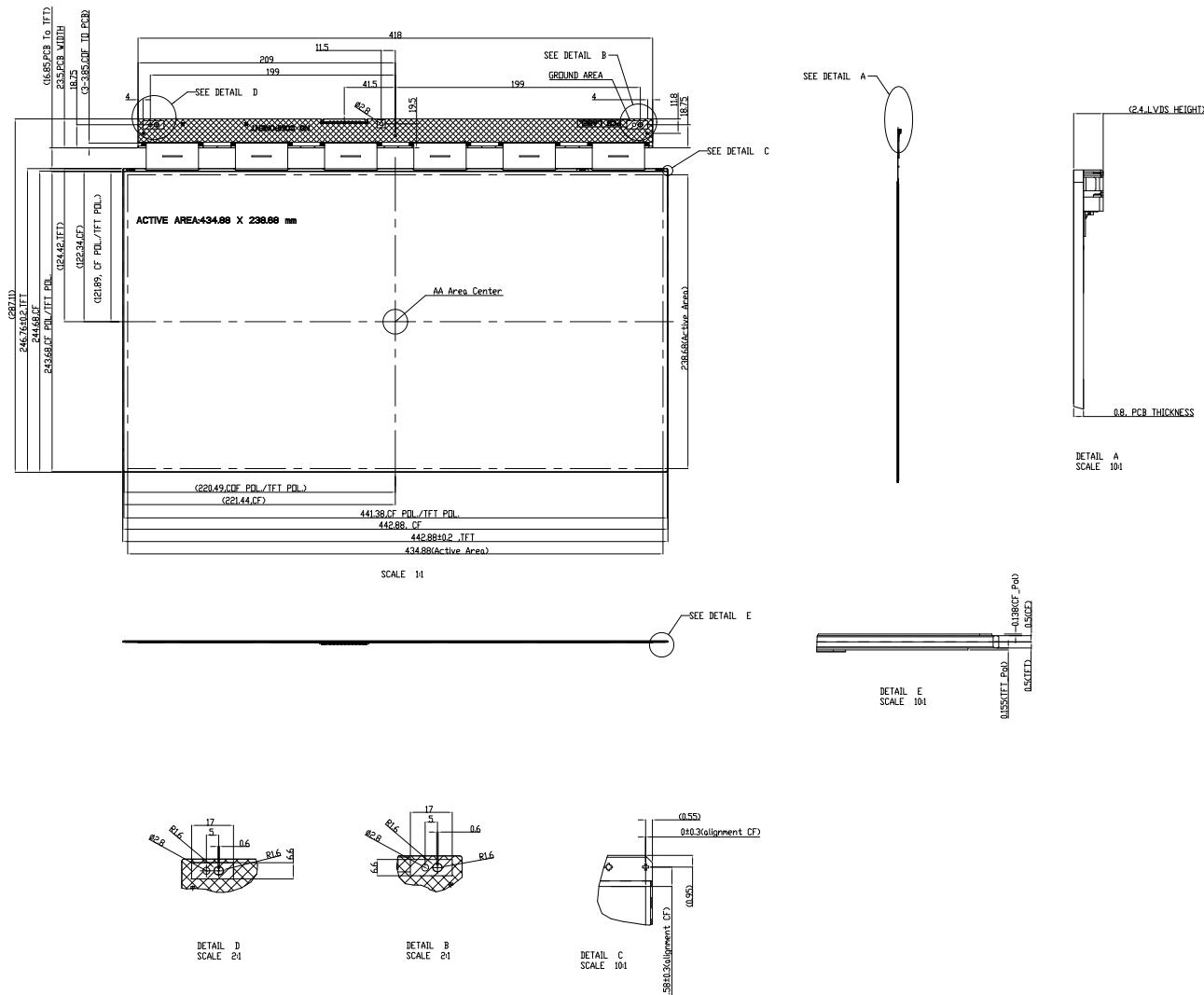
- (1) UL60950-1 or updated standard.
- (2) IEC60950-1 or updated standard.

9.6 OTHER

When fixed patterns are displayed for a long time, remnant image is likely to occur.

Appendix. OUTLINE DRAWING

REV	EC NUMBER	DESCRIPTION	DATE
A		First Release	2014/09/19



NOTES:
 1. ■: NO COMPONENT AREA
 2. ■: GND AREA
 3. COMPONENT HEIGHT LIMITATIONS 2.0MM, UNLESS OTHERWISE INDICATED.
 4. LVDS TYPE: P-TWO 187098-30091 or compatible

DESIGNER SIGNATURE	DESIGNER	DATE	REVISION	PART NUMBER	PRINT RE
	J.C.Young			IN0418164	A
APPROVED				Open Cell M204LU-L20	1/1
CHECKED	IvanShu				
DESIGNED	HaoJunYu			InnoLux	A1