CHI MEI OPTOELECTRONICS CORP.

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Preliminary

TFT LCD Preliminary Specification

MODEL NO.: M300F1- M01

Customer: _____

Approved by: _____

Note:

記錄	工作	審核	角色	投票
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Version 1.0

- CONTENTS -

REVISION HISTORY 3

1. GENERAL DESCRIPTION 4
   1.1 OVERVIEW
   1.2 FEATURES
   1.3 APPLICATION
   1.4 GENERAL SPECIFICATIONS
   1.5 MECHANICAL SPECIFICATIONS

2. ABSOLUTE MAXIMUM RATINGS 5
   2.1 ABSOLUTE RATINGS OF ENVIRONMENT
   2.2 ELECTRICAL ABSOLUTE RATINGS
      2.2.1 TFT LCD MODULE
      2.2.2 BACKLIGHT UNIT

3. ELECTRICAL CHARACTERISTICS 7
   3.1 TFT LCD MODULE
   3.2 BACKLIGHT UNIT
   3.3 INVERTER SPECIFICATION

4. BLOCK DIAGRAM 11
   4.1 TFT LCD MODULE
   4.2 BACKLIGHT UNIT

5. INPUT TERMINAL PIN ASSIGNMENT 12
   5.1 INPUT SIGNAL
   5.2 INPUT POWER
   5.3 INVERTER INPUT SIGNAL
   5.4 COLOR DATA INPUT ASSIGNMENT

6. INTERFACE TIMING 16
   6.1 INPUT SIGNAL TIMING SPECIFICATIONS
   6.2 SIGNAL TIMING WAVEFORMS
   6.3 POWER ON/OFF SEQUENCE

7. OPTICAL CHARACTERISTICS 19
   7.1 TEST CONDITIONS
   7.2 OPTICAL SPECIFICATIONS

8. PACKAGING 22
   8.1 PACKING SPECIFICATIONS
   8.2 PACKING METHOD

9. DEFINITION OF LABELS 23
   9.1 CMO MODULE LABEL

10. PRECAUTIONS 25
   10.1 ASSEMBLY AND HANDLING PRECAUTIONS
   10.2 SAFETY PRECAUTIONS

11. MECHANICAL CHARACTERISTICS 26

REVISION HISTORY

Version	Date	Section	Description
Ver 1.0	Aug. 30, 06'	-	M300F1-M01 tentative specification was first issued.

1. GENERAL DESCRIPTION

1.1 OVERVIEW

M300F1-M01 is a 30" TFT Liquid Crystal Display module with 16 CCFL Backlight unit and dual link TMDS serial interface. This module supports 2560 x 1600 WQXGA mode and can display up to 16.7M colors. The inverter module for Backlight is not built in.

1.2 FEATURES

- Super MVA extra-wide viewing angle.
- High contrast ratio.
- Fast response time.
- High color saturation.
- Low color shift
- WQXGA (2560 x 1600 pixels) resolution.
- Sync & DE (Data Enable) only mode.
- Dual Link TMDS serial interface (4 pixels/clock).
- RoHS compliance.
- TCO'03 compliance.

1.3 APPLICATION

- Workstation & desktop monitor
- Monitors for industrial machine
- HDTV, medical machine

1.4 GENERAL SPECIFICATI0NS

Item	Specification	Unit	Note
Active Area	641.28 (H) x 400.8 (V) (30" diagonal)	mm	(1)
Bezel Opening Area	646.3 (H) x 405.8 (V)	mm	
Driver Element	a-Si TFT active matrix	-	-
Pixel Number	2560 x R.G.B. x 1600	pixel	-
Pixel Pitch	0.2505 (H) x 0.2505 (V)	mm	-
Pixel Arrangement	RGB vertical stripe	-	-
Display Colors	16.7M	color	-
Transmissive Mode	Normally black	-	-
Surface Treatment	AG type: 3H hard coating, Haze 25 Glare type: 2H hard coating, Reflection < 3%	-	-

1.5 MECHANICAL SPECIFICATIONS

Item		Min.	Typ.	Max.	Unit	Note
Module Size	Horizontal(H)	-	677.3	-	mm	(1)
	Vertical(V)	-	436.8	-	mm	
	Depth(D)	-	-	42.3	mm	
Weight		-	-	5100	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}	—	50	G	(3), (5)
Vibration (Non-Operating)	V_{NOP}	—	1.5	G	(4), (5)

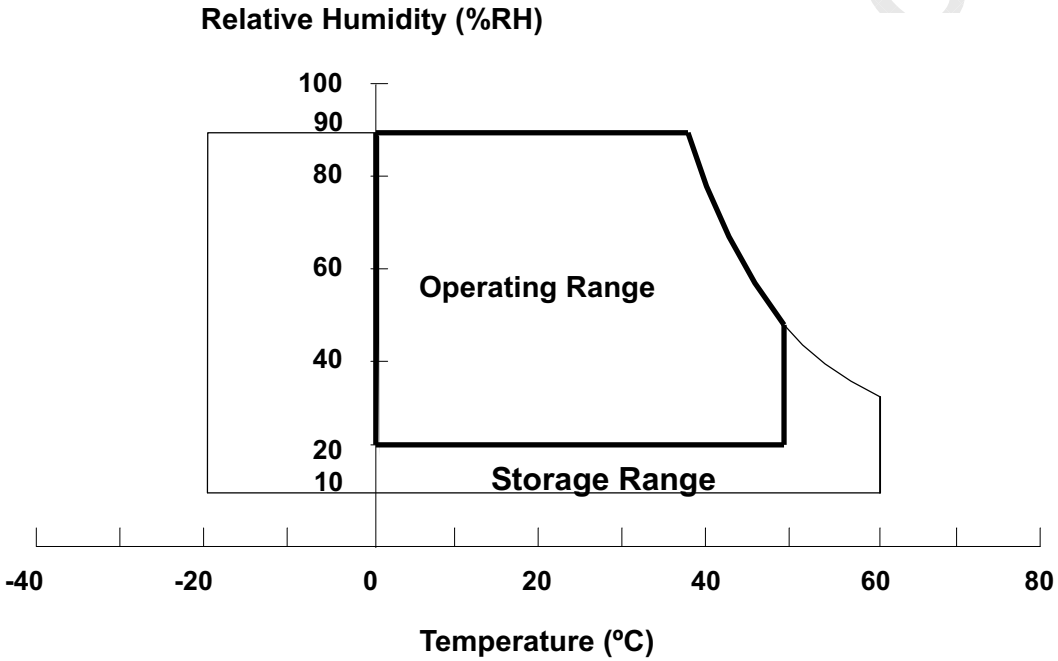
Note (1) Temperature and relative humidity range is shown in the figure below.

(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.

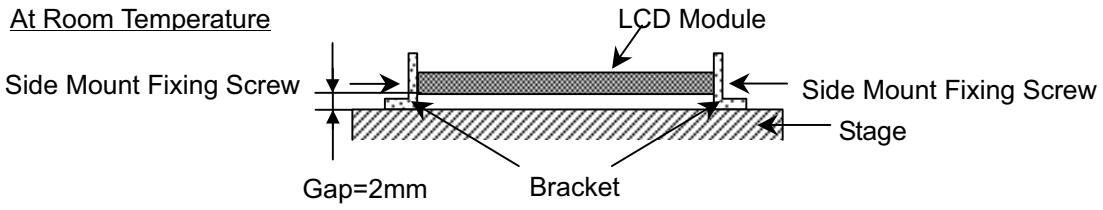


Note (3) 11ms, half sine wave, 1 time for ± X, ± Y, ± Z.

Note (4) 10 ~ 300 Hz, 10min/cycle, 3 cycles 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.

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	Vcc	GND-0.3	21.0	V	(1)
Interface Type	Dual Link TMDS	TMDS (Sil178 or Sil170 TX)			

2.2.2 BACKLIGHT UNIT

Item	Symbol	Value		Unit	Note
		Min.	Max.		
Lamp Voltage	V_L	---	3.0K	V_{RMS}	(1), (2)
Lamp Current	I_L	3.0	6.5	mA_{RMS}	(1), (2)
Lamp Frequency	F_L	40	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).

3. ELECTRICAL CHARACTERISTICS

3.1 TFT LCD MODULE

Ta = 25 ± 2 ºC

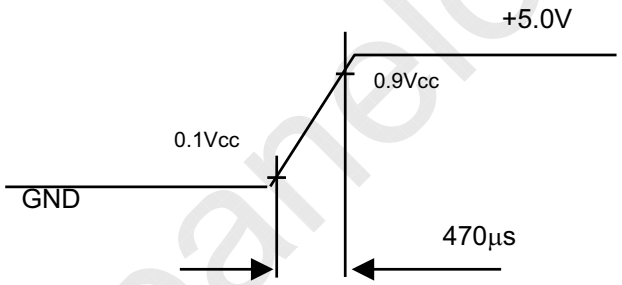
Parameter		Symbol	Value			Unit	Note
			Min.	Typ.	Max.		
Power Supply Voltage		Vcc	17	18	19	V	-
Ripple Voltage		V_{RP}			500	mV	-
Rush Current		I_{RUSH}			4.0	A	(2)
Power Supply Current	White	Icc	900	1000	1100	mA	(3)a
	Black		540	640	740	mA	(3)b
	Vertical Stripe		1100	1200	1300	mA	(3)c
Vsync Frequency		f_V	-	59.97	-	Hz	
Hsync Frequency		f_H	-	74	-	kHz	
Main Frequency		f_{DCLK}	-	134.25	-	MHz	

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

Note (2) Measurement Conditions:

Rush current I_{RUSH} can be measured when Vcc rising time is 470 μs.

Vcc rising time is 470μs



Note (3) The specified power supply current is under the conditions at Vcc = 18.0 V, Ta = 25 ± 2 ºC, f_V = 59.97 Hz, f_{DCLK} = 134.25MHz whereas a power dissipation check pattern below is displayed.

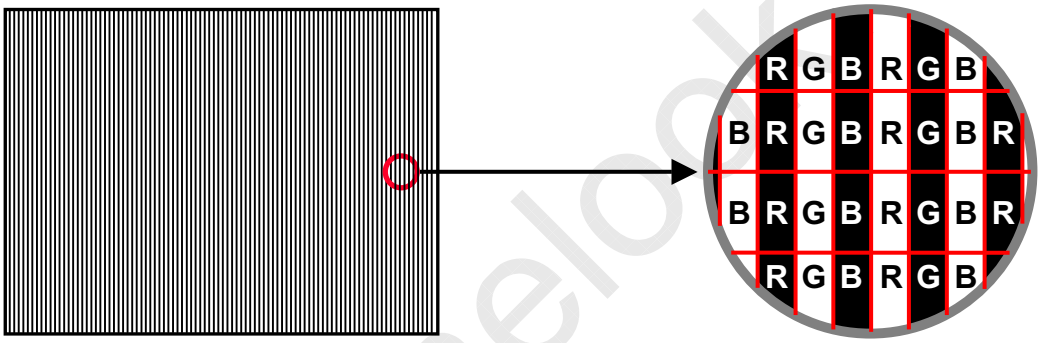
a. White Pattern

Active Area

b. Black Pattern

Active Area

c. Vertical Stripe Pattern



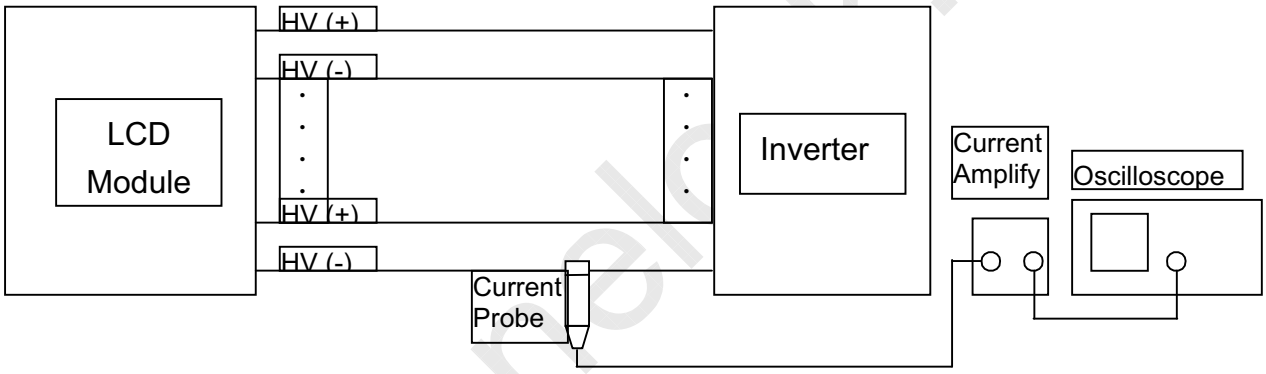
Active Area

3.2 BACKLIGHT UNIT

Ta = 25 ± 2 ºC

Parameter	Symbol	Value			Unit	Note
		Min.	Typ.	Max.		
Lamp Input Voltage	V_L	1044	1160	1276	V_{RMS}	I_L = 5.5 mA
Lamp Current	I_L	---	5.5	---	mA_{RMS}	(1)
Lamp Turn On Voltage	V_S	---	---	2250 (25 °C)	V_{RMS}	(2)
		---	---	2440 (0 °C)	V_{RMS}	(2)
Operating Frequency	F_L	50	55	60	KHz	(3)
Lamp Life Time	L_{BL}	50000	---	---	Hrs	(5), I_L = 5.5 mA
Power Consumption at Gray level 255	P_{255}	---	102.08	---	W	(4), I_L = 5.5 mA
Power Consumption at Gray level 128	P_{128}	---	TBD	---	W	(4)
Power Consumption at Gray level 0	P_0	---	TBD	---	W	(4)

Note (1) Lamp current is measured by current amplify & oscilloscope as shown below:



Measure equipment:
Current Amplify: Tektronix TCPA300
Current probe: Tektronix TCP312
Oscilloscope: TDS3054B

Note (2) The voltage that must be larger than Vs should be applied to the lamp for more than 1 second after startup. Otherwise, the lamp may not be turned on normally.

Note (3) The lamp frequency may produce interference with horizontal synchronization frequency from the display, which might cause line flow on the display. In order to avoid interference, the lamp frequency should be detached from the horizontal synchronization frequency and its harmonics as far as possible.

Note (4) $P_x = I_L \times V_L \times 16$ x=255,128,0

Note (5) The lifetime of lamp can be defined as the time in which it continues to operate under the condition Ta = 25 ±2 °C and I_L = 5.5 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.

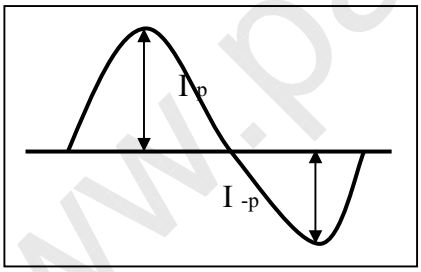
The output of the inverter must have symmetrical (negative and positive) voltage waveform and symmetrical current waveform.(Unsymmetrical ratio is less than 10%) Please do not use the inverter which has unsymmetrical voltage and unsymmetrical current and spike wave. Lamp frequency may produce interface with horizontal synchronous frequency and as a result this may cause beat on the display. Therefore lamp frequency shall be as away possible from the horizontal synchronous frequency and from its harmonics in order to prevent interference.

Requirements for a system inverter design, which is intended to have a better display performance, a better power efficiency and a more reliable lamp. It shall help increase the lamp lifetime and reduce its leakage current.

a. The asymmetry rate of the inverter waveform should be 10% below;

b. The distortion rate of the waveform should be within $\sqrt{2} \pm 10\%$;

c. The ideal sine wave form shall be symmetric in positive and negative polarities



* Asymmetry rate:

$$| I_p - I_{-p} | / I_{rms} * 100\%$$

* Distortion rate

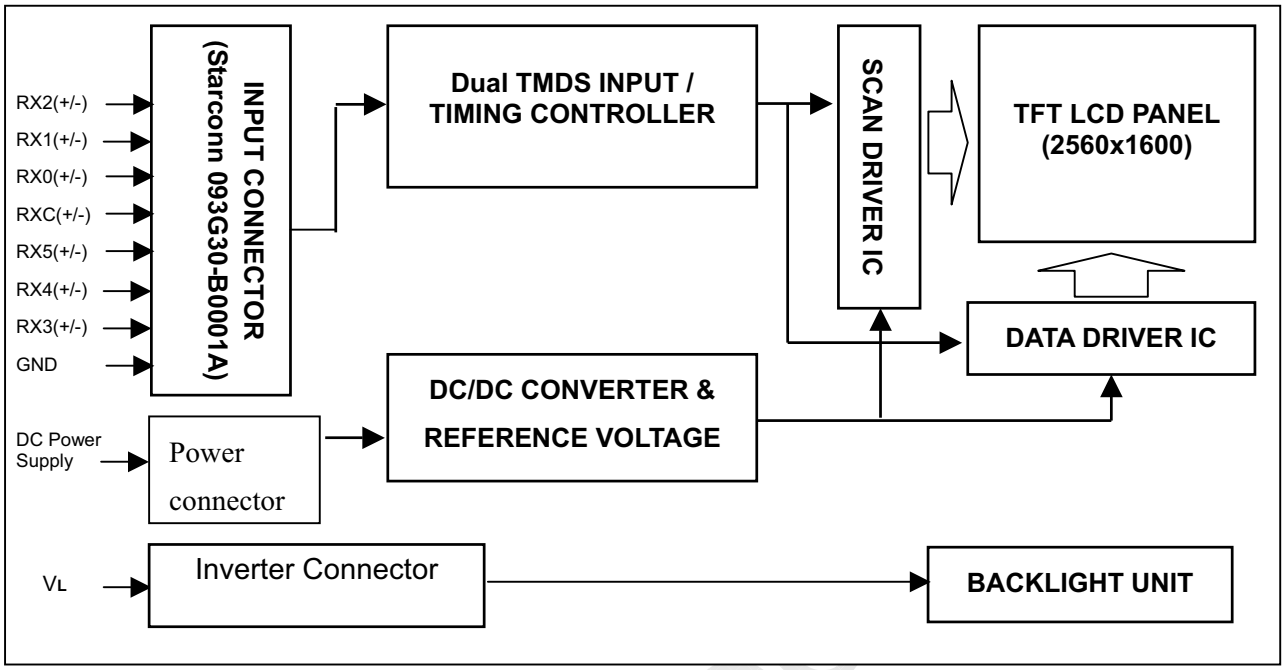
$$I_p \text{ (or } I_{-p}) / I_{rms}$$

3.3 INVERTER SPECIFICATION

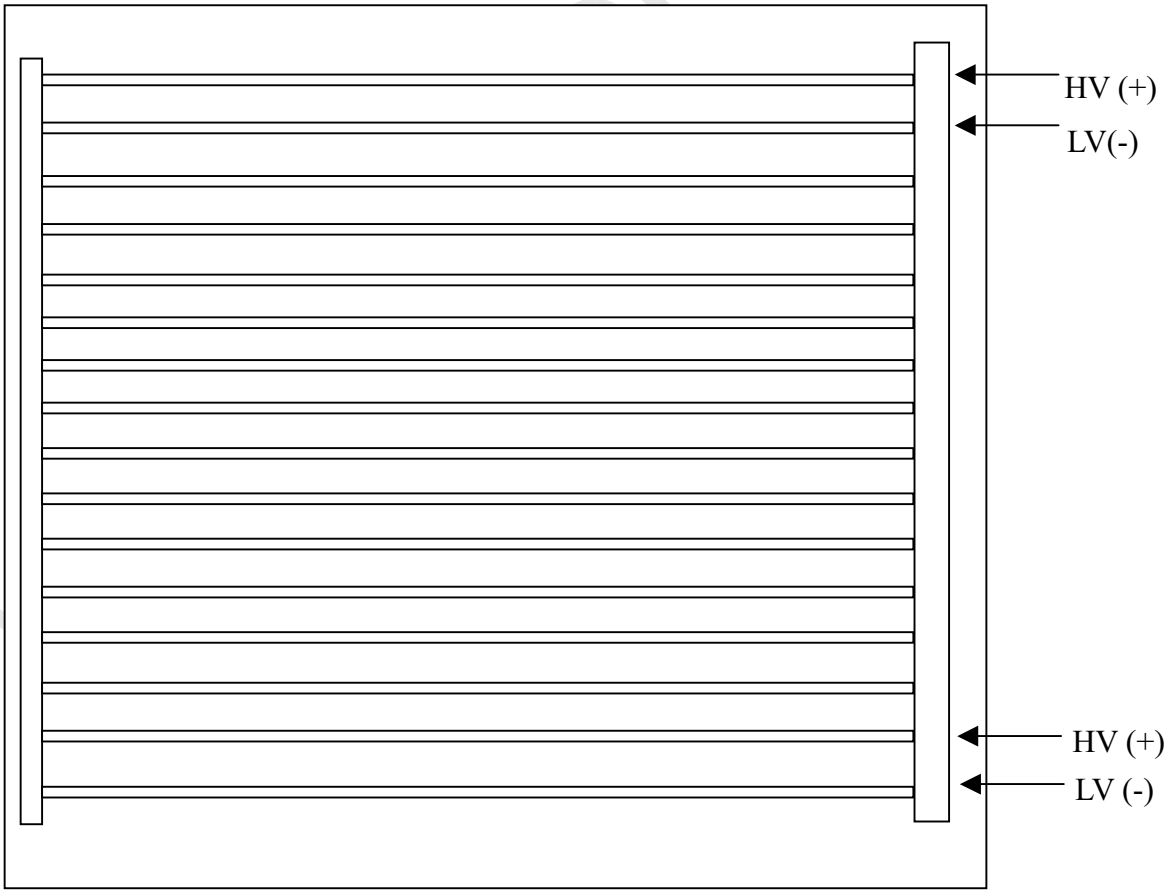
Symbol	Description	Condition	Min.	Typ.	Max.	Unit
Vin	Input Voltage		21.6	24	26.4	VDC
lin	Input Current	Vin=21.6V, VDIM=3.3V	--	--	5	A
BLON	Backlight ON/OFF Control	ON	2.4	--	5.5	V
		OFF	0	--	0.8	V
VDIM	Lamp Current Control		0	--	3.3	V
lout(max)	Output current	Vin=24V, VDIM=3.3V	5.0	5.5	6.0	mArms
lout(min)		Vin=24V, VDIM=0.0V	2.0	2.5	3.0	mArms
Freq.	Lamp Frequency	Vin=24V, VDIM=3.3V	50	55	60	KHz
Vlamp	Lamp voltage		1053	1170	1287	Vrms
Vstart	Lamp ignite voltage	0℃	--	--	2440	Vrms
		25℃	--	--	2250	Vrms
Ts	Lamp ignite time		1	--	2	Sec.
Vpwm	PWM signal	High (ON)	2.5	--	5	V
		Low (OFF)	0.0	--	0.8	V
Fpwm			--	160	240	Hz
Toff	Shutdown time	Lamp open	0.7	1	1.5	sec
Asymmetry	Current waveform symmetrical		--	--	10	%
Distortion	Current waveform distortion		0.9√2	√2	1.1√2	--
Efficiency			85	--	--	%

4. BLOCK DIAGRAM

4.1 TFT LCD MODULE



4.2 BACKLIGHT UNIT



5. INPUT TERMINAL PIN ASSIGNMENT

5.1 INPUT SIGNAL

Pin	Name	Description
1	NC	NC
2	NC	NC
3	NC	NC
4	NC	NC
5	SHLD2	Shield for TMDS Channel 2
6	Rx2+	TMDS positive differential
7	Rx2-	TMDS negative differential
8	SHLD1	Shield for TMDS Channel 1
9	Rx1+	TMDS positive differential
10	Rx1-	TMDS negative differential
11	SHLD0	Shield for TMDS Channel 0
12	Rx0+	TMDS positive differential
13	Rx0-	TMDS negative differential
14	SHLDC	Shield for TMDS Channel C
15	Rxc+	TMDS positive differential
16	RxC-	TMDS negative differential
17	SHLD5	Shield for TMDS Channel 5
18	Rx5+	TMDS positive differential
19	Rx5-	TMDS negative differential
20	SHLD4	Shield for TMDS Channel 4
21	Rx4+	TMDS positive differential
22	Rx4-	TMDS negative differential
23	SHLD3	Shield for TMDS Channel 3
24	Rx3+	TMDS positive differential
25	Rx3-	TMDS negative differential
26	NC	NC
27	NC	NC
28	NC	NC
29	NC	NC
30	NC	NC

Note (1) Connector Part No.: JAE FI-X30SSL-HF.or Compatible

5.2 INPUT POWER

Pin	Symbol	Description	Remark
1	GND	Ground	
2	GND	Ground	Reserved
3	PWR_ON	LCM ON control signal input	
4	GND	Ground	
5	V_{LCD}	LCM power supply, +18V	
6	V_{LCD}	LCM power supply	
7	V_{LCD}	LCM power supply	
8	V_{LCD}	LCM power supply	
9	GND	Ground	
10	NC	NC	
11	NC	NC	
12	GND	Ground	
13	HSYNC	Hsync Output	
14	VSYNC	Vsync Output	
15	PS_ON	Dual/Single mode Output	

Note (1) Connector (Receptacle): Molex 53261 or Compatible

(2) Matting connector (Plug): Molex 51021 or Compatible

5.3 INVERTER INPUT SIGNAL

Pin	Symbol	Description	Remark
1	V_{BL}	Power Supply, +24V	
2	V_{BL}	Power Supply, +24V	
3	V_{BL}	Power Supply, +24V	
4	V_{BL}	Power Supply, +24V	
5	V_{BL}	Power Supply, +24V	
6	GND	Power Ground	
7	GND	Power Ground	
8	GND	Power Ground	
9	GND	Power Ground	
10	GND	Power Ground	
11	NC	No connection	
12	BLON	Backlight On/Off Control signal	ON：2.4V~5.0V OFF：0.0~0.8V
13	VDIM	PWM Dimming control Signal	Max 3.3V/Min 0.0V
14	Status	Lamp Operating Status	Normal：0~0.8V Abnormal：3.0~5.0V

5.4 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	0	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

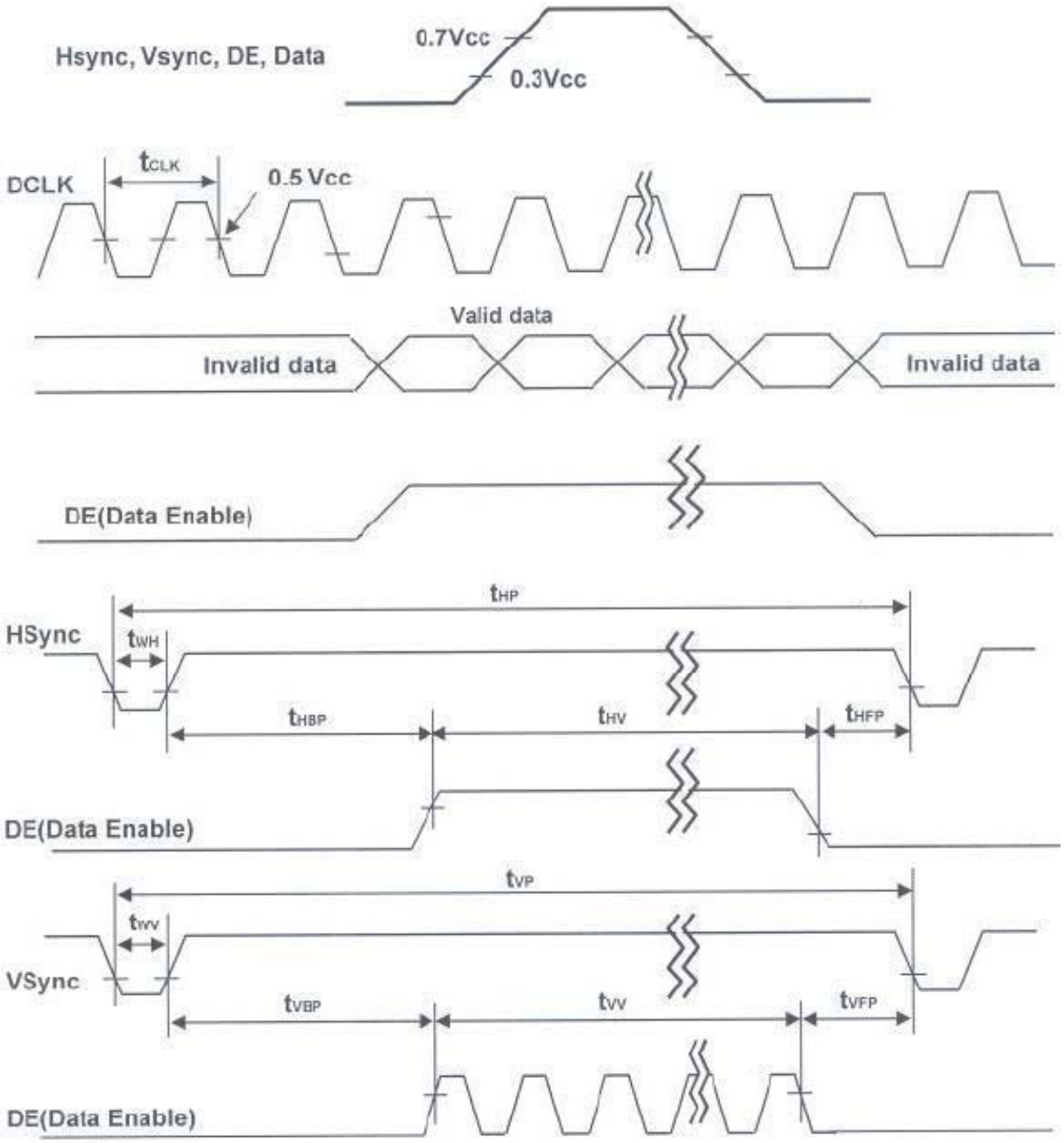
6.1 INPUT SIGNAL TIMING SPECIFICATIONS (Dual Mode：2560 × 1600)

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

Signal	Item	Symbol	Min.	Typ.	Max.	Unit	Note
DCLK	Period	t_{CLK}	7.45	7.45	7.45	ns	
	Frequency	f_{CLK}	134.25	134.25	134.25	MHz	268.5/2
HSync	Width-Total	t_{HP}	2720	2720	2720	Tc	-
	Period	t_{HP}	10.13	10.13	10.13	us	-
	Frequency	f_{H}	98.71	98.71	98.71	kHz	-
	Width	t_{WH}	32	32	32	t_{CLK}	-
VSync	Width-Total	t_{VT}	1646	1646	1646	t_{HP}	-
	Period	t_{VP}	16.68	16.68	16.68		-
	Frequency	f_{V}	59.97	59.97	59.97	Hz	-
	Width	t_{WV}	6	6	6	t_{HP}	-
Data Enable	Horizontal Valid	t_{HV}	2560	2560	2560	t_{CLK}	-
	Horizontal Back Porch	t_{HBP}	80	80	80		-
	Horizontal Front Porch	t_{HFP}	48	48	48		
	Horizontal Blank	-	160	160	160		t_{WH}+ t_{HBP} + t_{HFP}
	Vertical Valid	t_{VV}	1600	1600	1600	t_{HP}	-
	Vertical Back Porch	t_{VBP}	38	38	38		-
	Vertical Front Porch	t_{VFP}	2	2	2		-
	Vertical Blank	-	46	46	46		t_{WV} + t_{VBP} + t_{VFP}

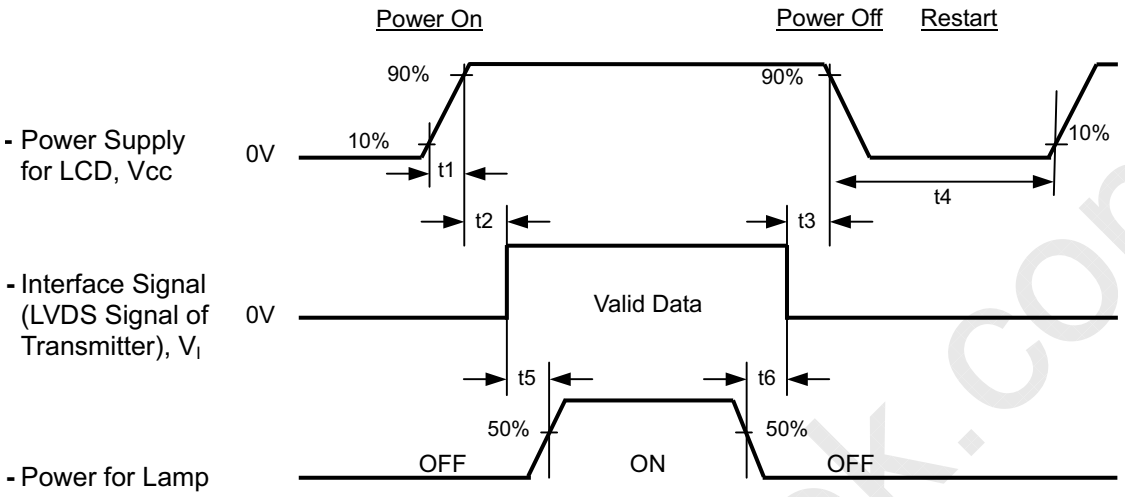
Note: This module is operated by DE only mode.

6.2 SIGNAL TIMING WAVEFORMS



6.3 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

7. OPTICAL CHARACTERISTICS

7.1 TEST CONDITIONS

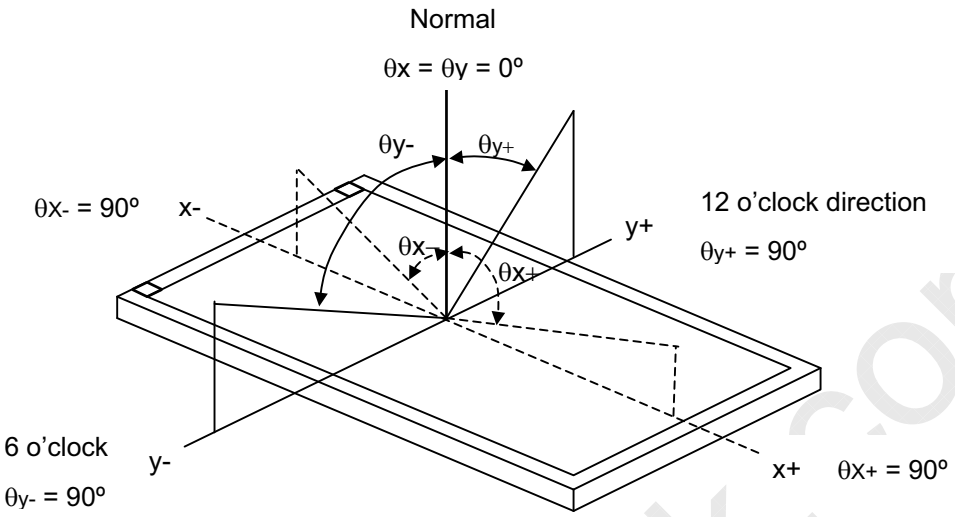
Item	Symbol	Value	Unit
Ambient Temperature	Ta	25±2	°C
Ambient Humidity	Ha	50±10	%RH
Supply Voltage	V_{CC}	5.0	V
Input Signal	According to typical value in "3. ELECTRICAL CHARACTERISTICS"		
Lamp Current	I_L	5.5	mA
Inverter Operating Frequency	F_L	55	KHz
Inverter	VK.89144.109		

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
Color Chromaticity (CIE 1931)	Red	Rx	θ_x=0°, θ_Y =0° CS-1000T	TYP -0.03	(0.648)	TYP +0.03	---	(1), (5)
		Ry			(0.335)			
	Green	Gx			(0.285)			
		Gy			(0.608)			
	Blue	Bx			(0.154)			
		By			(0.087)			
	White	Wx			0.313			
		Wy			0.329			
Center Luminance of White (Center of Screen)		L_C		220	300		cd/m^2	(3), (5)
Contrast Ratio		CR		700	1000	---	---	(2), (5)
Gray to Gray Response Time		$T_{GtG\_AVE\_}$	θ_x=0°, θ_Y =0°	---	8	12	ms	(4)
White Variation		δW	θ_x=0°, θ_Y =0° USB2000	---	1.25	1.4	-	(5), (6)
Viewing Angle	Horizontal	θ_x+	CR ≧ 10 USB2000	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 (1)

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

Note (3) Definition of Luminance of White (L_C):

Measure the luminance of gray level 255 at center point

L_C = L (1)

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

Note (4) Definition of Response Time (T_{GTG_AVE}):

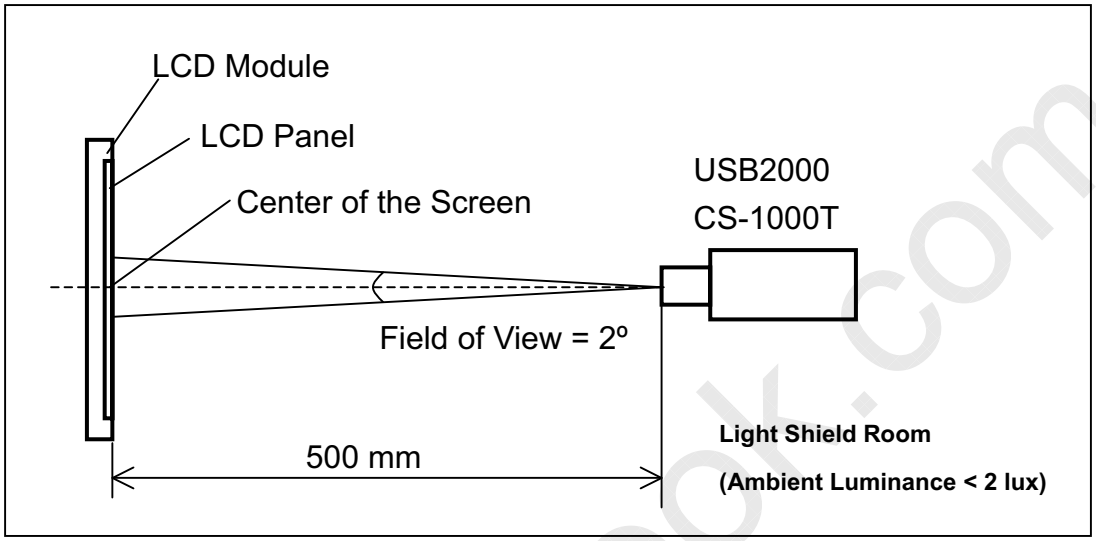
T_{GTG_AVE} is defined as the total average response time for "Gray To Gray ".

The Gray to Gray response time is defined as the following chart.

Gray to Gray		Target Gray				
		G0	G63	G127	G191	G255
Initial Gray	G0					
	G63					
	G127					
	G191					
	G255					

Note (5) Measurement Setup:

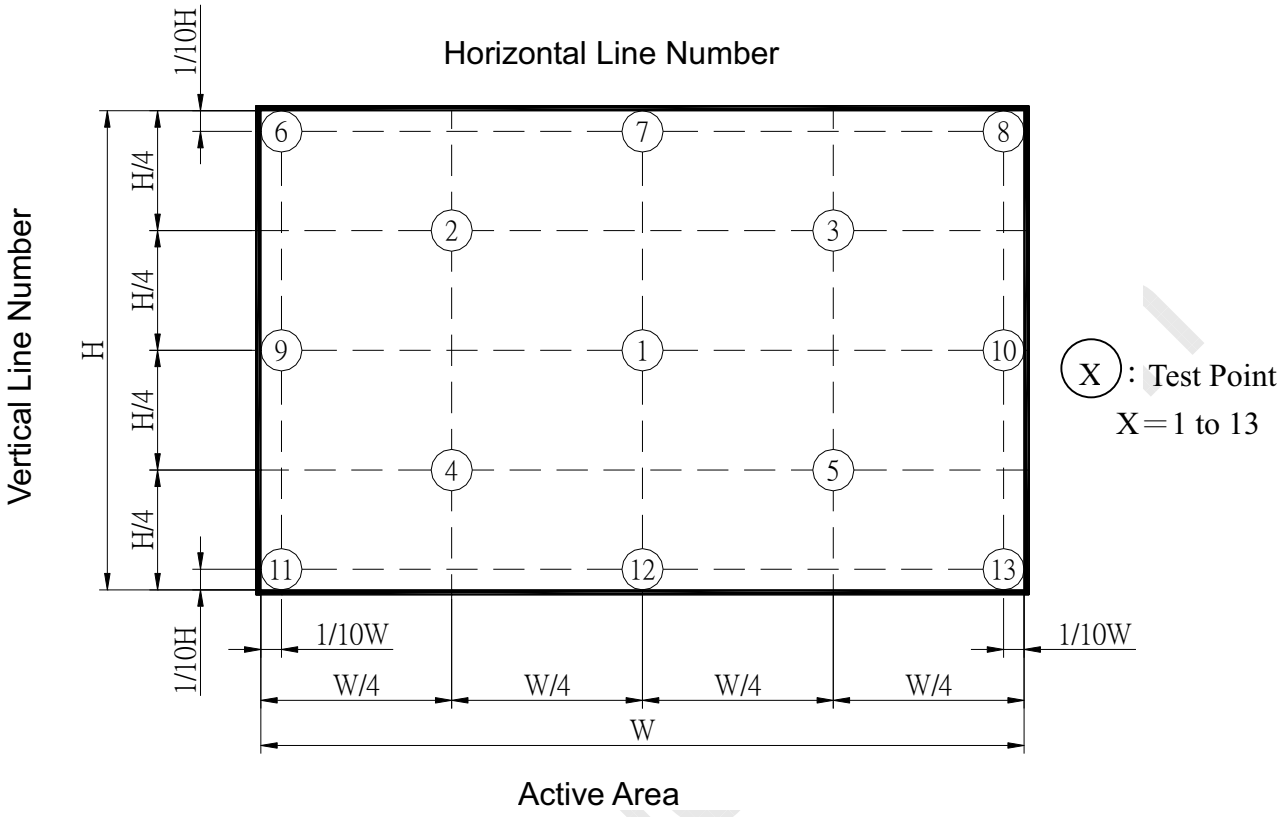
The LCD module should be stabilized at given temperature for 30 minutes to avoid abrupt temperature change during measuring. In order to stabilize the luminance, the measurement should be executed after lighting Backlight for 30 minutes in a windless room.



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

Measure the luminance of gray level 255 at 13 points

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



8. PACKAGING

8.1 PACKING SPECIFICATIONS

(1) 5 LCD modules / 1 Box

(2) Box dimensions: 680(L) X 400(W) X 360(H) mm

(3) Weight: approximately 17.5Kg (5 modules per box)

8.2 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

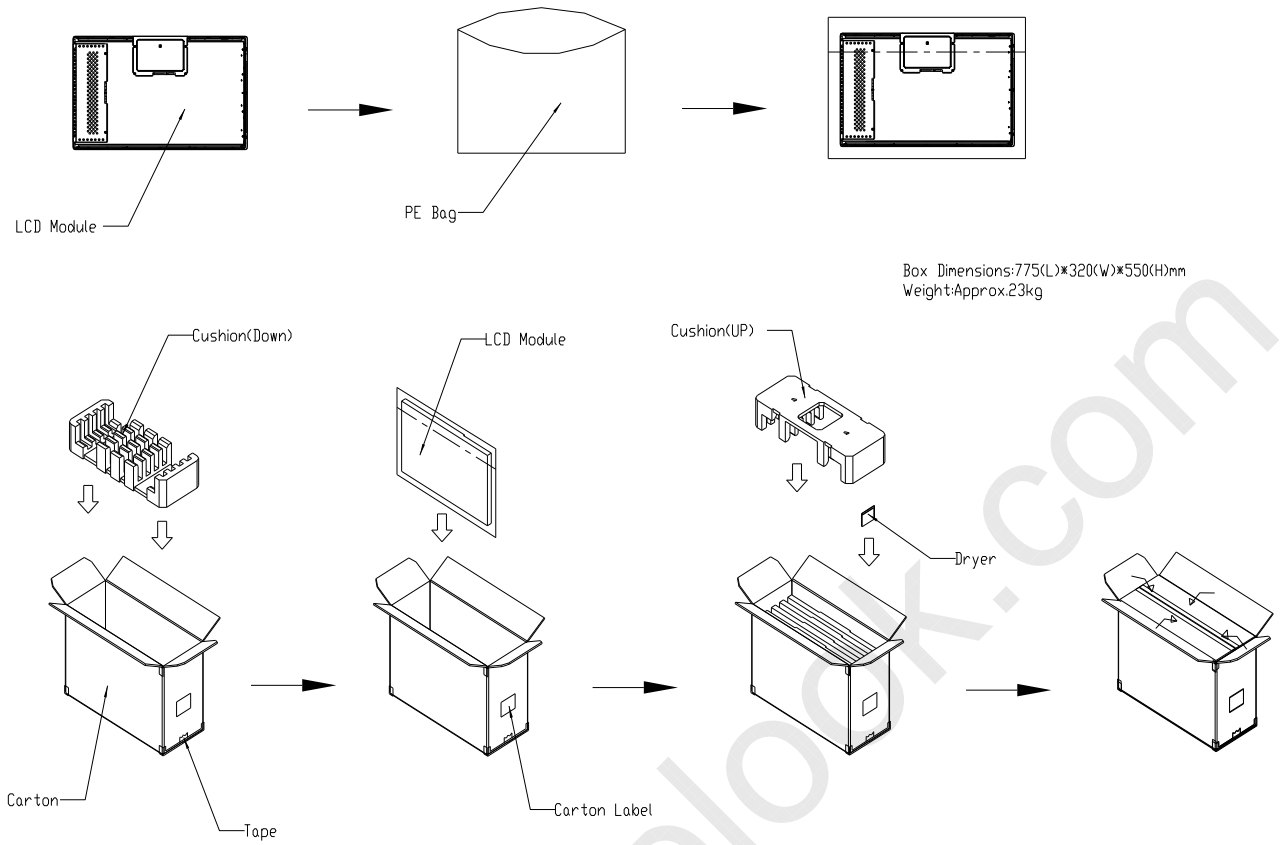


Figure. 8-1 Packing method

For ocean shipping

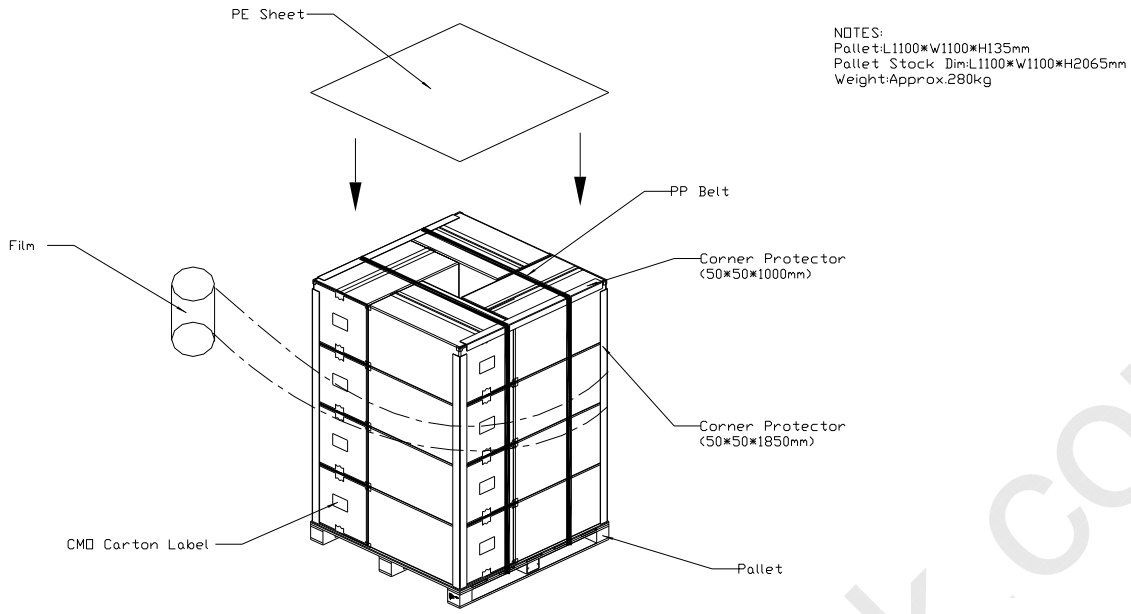


Figure. 8-2 Packing method

For air transport

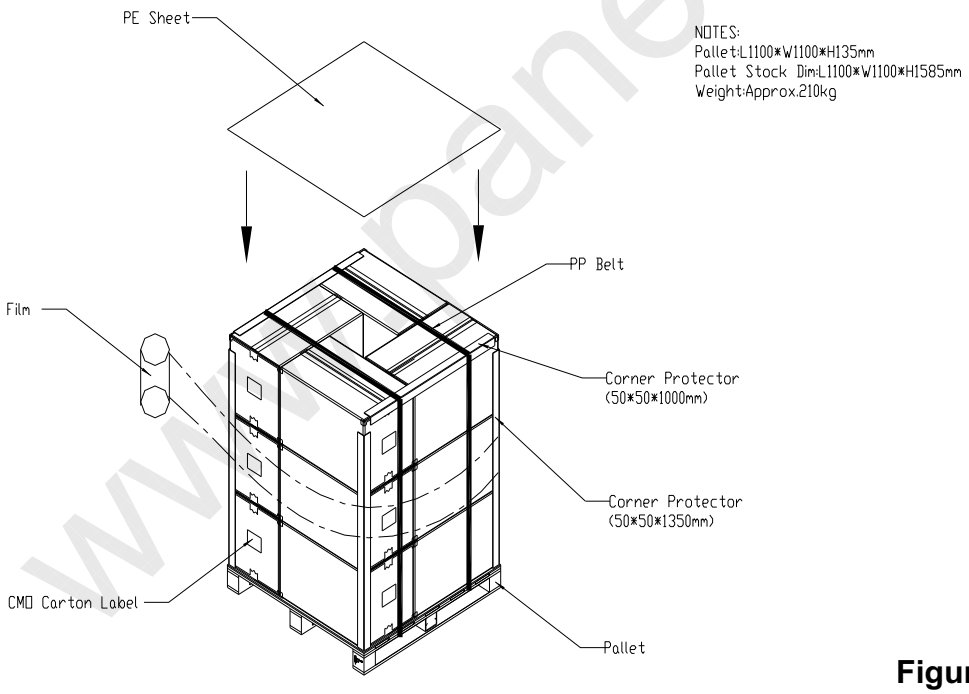


Figure. 8-3 Packing method

9. DEFINITION OF LABELS

9.1 CMO MODULE LABEL

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

(a) Model Name: M300F1-M01

(b) Revision: Rev. XX, for example: A0, A1… B1, B2… or C1, C2…etc.

(c) CMO barcode definition:

Serial ID: XX-XX-X-XX-YMD-L-NNNN

Code	Meaning	Description
XX	CMO internal use	-
XX	Revision	Cover all the change
X	CMO internal use	-
XX	CMO internal use	-
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, ~, W, X, Y, exclude I, O, and U.
L	Product line #	Line 1=1, Line 2=2, Line 3=3, …
NNNN	Serial number	Manufacturing sequence of product

(d) Customer's barcode definition:

Serial ID: CM-30F11-X-X-X-XX-L-XX-L-YMD-NNNN

Code	Meaning	Description
CM	Supplier code	CMO=CM
30F11	Model number	M300F1-M01 = 30F11
X	Revision code	Non ZBD: 1,~,9,0 / ZBD: A~Z
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, Novatec=C, OKI=D, Philips=E, Renasas=F, Samsung=G, Sanyo=H, Sharp=I, TI=J, Topro=K, Toshiba=L, Windbond=M
X	Gate driver IC code	
XX	Cell location	Tainan Taiwan=TN, Ningbo China=CN
L	Cell line #	1~12=0~C
XX	Module location	Tainan Taiwan=TN, Ningbo China=CN
L	Module line #	1~12=0~C
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	By LCD supplier

10. PRECAUTIONS

10.1 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.

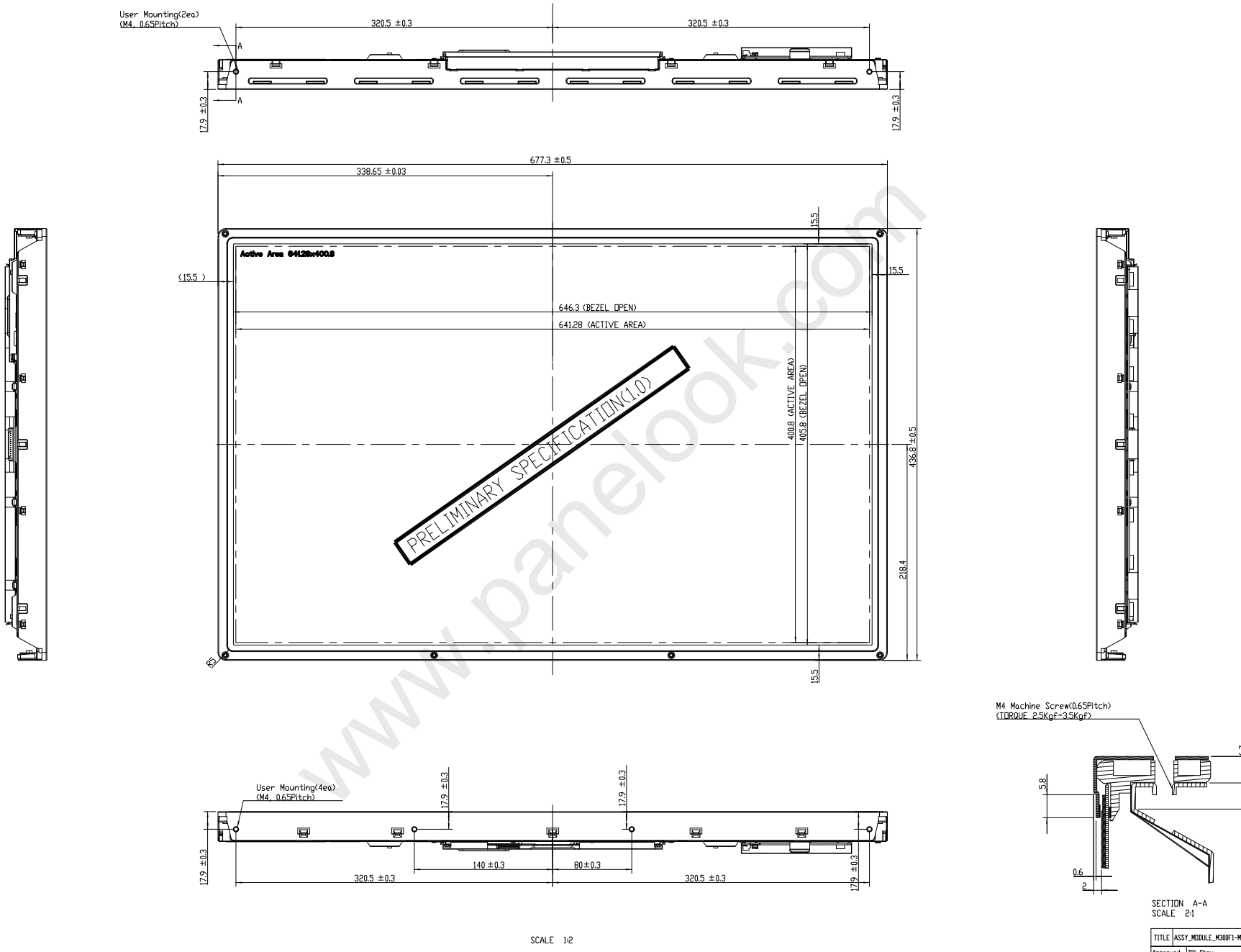
(10) When ambient temperature is lower than 10ºC may reduce the display quality. For example, the response time will become slowly, and the starting voltage of CCFL will be higher than room temperature.

10.2 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.

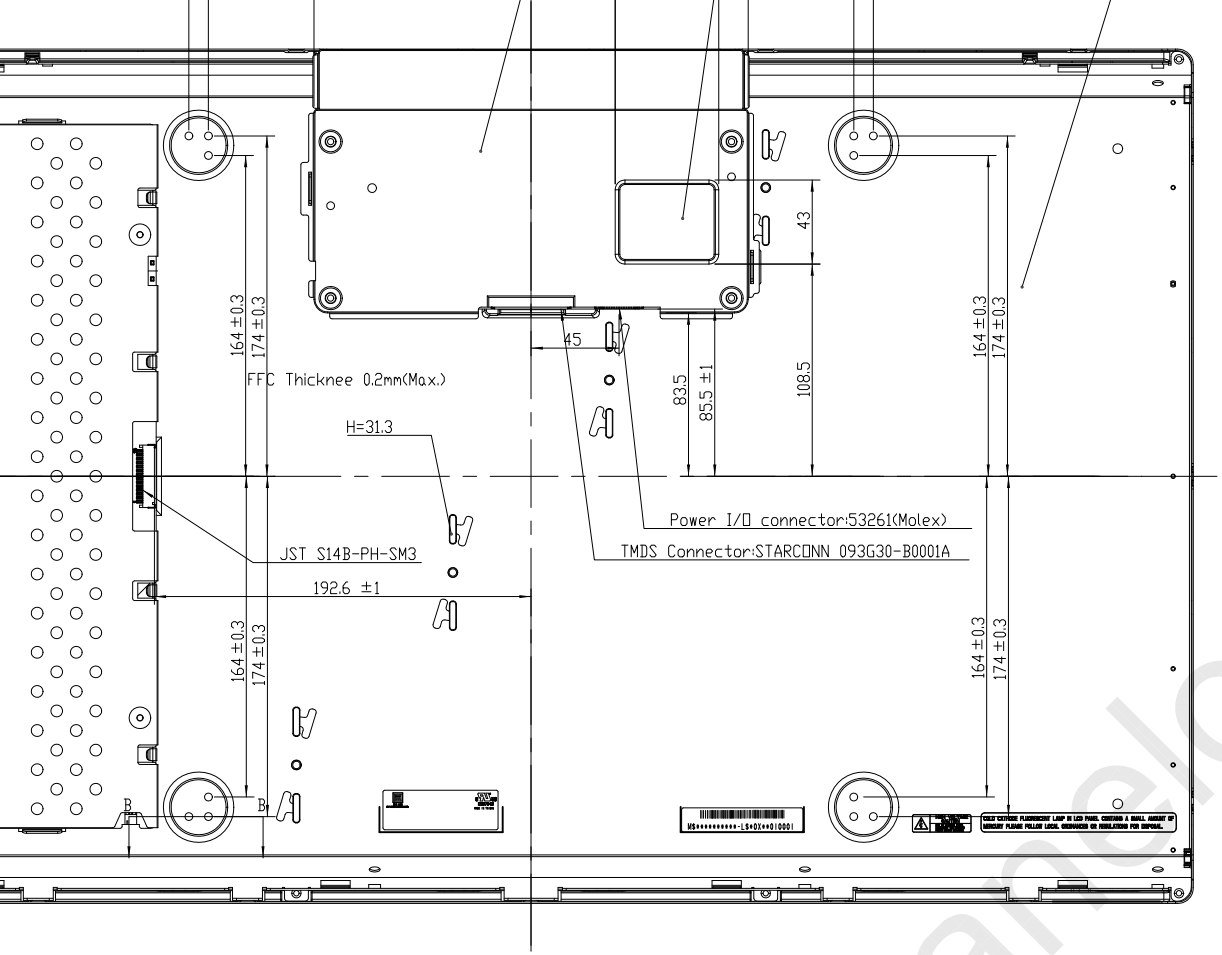


SCALE 1:2

Mark	Description	Date	Changed_By	Approved_By	ECN No.	Remark

TITLE	ASSY_MODULE_M300F1-M01					2D REV.	01
						3D REV.	+
Approved	Bill_Sheu	Drawing No.	M300141011				
Checked	Jemmy_Chang	Part No.	TBD				
Drawer	Taurus_Hsieh	Material	TBD		Sheet	1 / 2	A1
Designer	Taurus_Hsieh	Date	16-Aug-2006	Scale	1:1	Unit	mm

CHI MEI OPTOELECTRONICS CORP.



SCALE 1:2

NOTES
1.Unspecified tolerance are to be ±0.5
2.Gap between Top case and Glass is 0.4+0.5/
3.Both backlight wires and contraction tube
from outline dimension