

# LITEMAX

SSF/SSH2705-B

Sunlight Readable

27" LED B/L Triangle Display

## User Manual

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**Record of Revision**

Date	Page	Old Description	New Description	Remark
Feb. /9 /2026	all		Initial release	

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## 1 General Description

The **SSF/SSH2705-B** is a 27 inch color TFT-LCD display with special Triangular Display and resolution 1920 x 1080. It is Litemax's Spanixel series product which designed for high brightness 1000 nits with power efficiency LED backlight. It provides LCD panel with specific Triangular Display and sunlight readable for digital signage, public transportation, exhibition hall, department store, and vending machine.

### 1.1 Features

- Triangle Display
- Brightness 1000 nits
- High Color Saturation 91%
- Viewing Angle of 178°(H), 178°(V)
- LED Backlight
- Low Power Consumption

### 1.2 General Specifications

<b>Model Name</b>	<b>SSF/SSH2705-B</b>
<b>Description</b>	27" TFT LCD, 1000nits LED Backlight, 1920x1080, MaxRGB, Triangle Display
<b>Screen Size</b>	27"
<b>Display Area (mm)</b>	578.199(H) x 333.835(V)
<b>Brightness</b>	1000 cd/m <sup>2</sup>
<b>Resolution</b>	1920x1080
<b>Aspect Ratio</b>	16:9
<b>Contrast Ratio</b>	960:1
<b>Pixel Pitch (mm)</b>	0.3114(H) x 0.3114 (V)
<b>Pixel Per Inch (PPI)</b>	82
<b>Viewing Angle</b>	178°(H),178°(V)
<b>Color Saturation (NTSC)</b>	91%
<b>Display Colors</b>	16.7M
<b>Response Time (Typical)</b>	14ms
<b>Panel Interface</b>	LVDS
<b>Input Interface</b>	HDMI, DP
<b>Input Power</b>	DC12V
<b>Power Consumption</b>	26W (29W with AD Board)
<b>OSD Key</b>	4 Keys (Power Switch, Menu, +, -)
<b>OSD Control</b>	Brightness, Color, Contrast, Auto Tuning, H/V Position...etc
<b>Dimensions (mm)</b>	640.65(W)x 371.44(H) x 16.85(D)
<b>Bezel Size(U/B/L/R)</b>	14.2/14.091/14.1
<b>Weight (Net)</b>	1.7 kg
<b>Operating Temperature</b>	0°C ~ 50°C
<b>Storage Temperature</b>	-20°C ~ 60°C
<b>BL MTBF (hours)</b>	100,000

**SSF**= Panel + LED Driving Board

**SSH**= Panel + LED Driving Board + AD Control Board

*Specifications are subject to change without notice.*

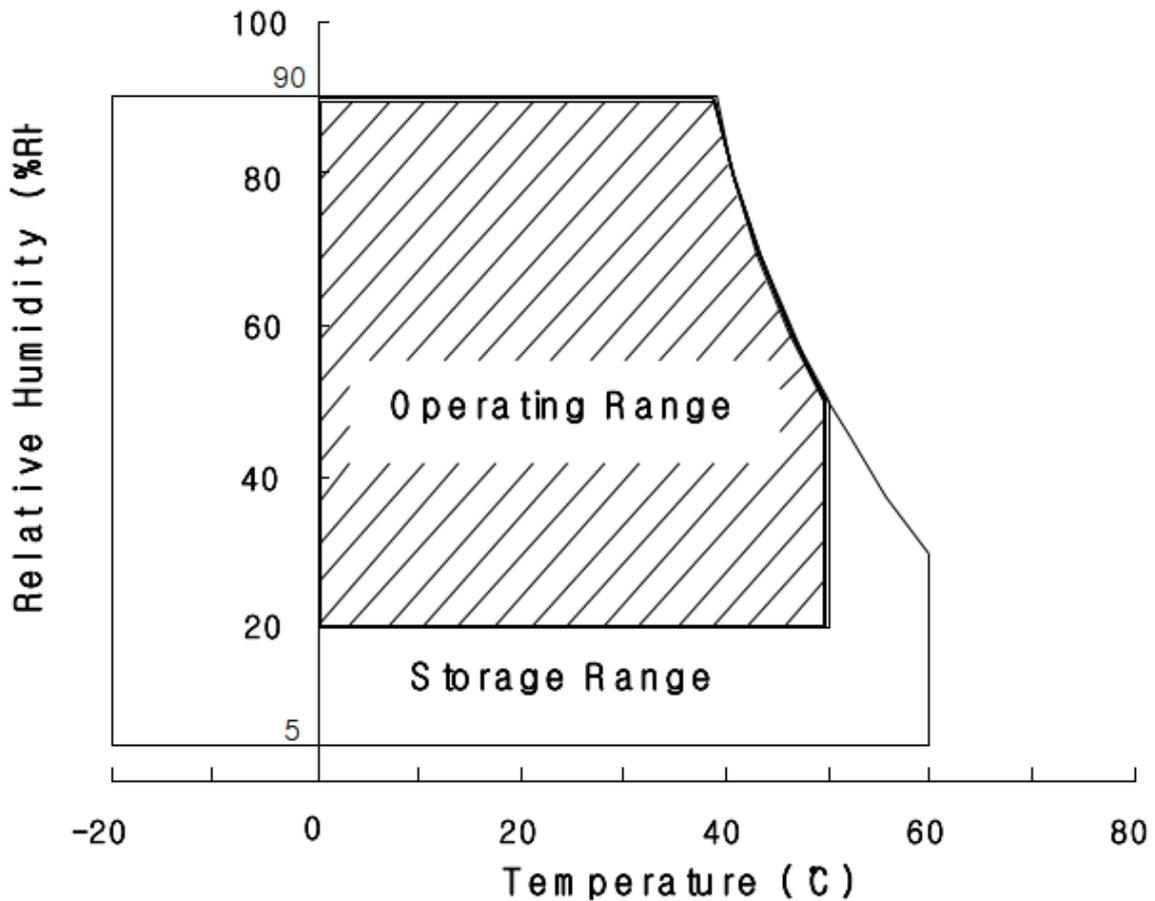
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### 1.3 Absolute Maximum Ratings

The followings are maximum values which, if exceeded, may cause faulty operation or damage to the unit. The operational and non-operational maximum voltage and current values.

Parameter	Symbol	Min.	Max.	Unit	Remarks
Power Supply Voltage	$V_{DD}$	-0.3	6.0	V	Ta = 25 °C
Logic Supply Voltage	$V_{IN}$	VSS-0.3	$V_{DD}+0.3$	V	
Operating Temperature	$T_{OP}$	0	+50	°C	1)
Storage Temperature	$T_{ST}$	-20	+60	°C	1)

Note : 1) Temperature and relative humidity range are shown in the figure below.  
Wet bulb temperature should be 39 °C max. and no condensation of water.



## 2 Electrical Specifications

### 2.1 Electrical Specifications

Parameter		Min.	Typ.	Max.	Unit	Remarks
Power Supply Voltage	$V_{DD}$	4.5	5.0	5.5	V	Note 1
Power Supply Current	$I_{DD}$	-	700	1300	mA	
In-Rush Current	$I_{RUSH}$	-	2.0	3	A	Note 2
Permissible Input Ripple Voltage	$V_{RF}$	-	-	300	mV	$V_{DD} = 5.0V$
High Level Differential Input Threshold Voltage	$V_{IH}$	-	-	+100	mV	
Low Level Differential Input Threshold Voltage	$V_{IL}$	-100	-	-	mV	
Differential input voltage	$ V_{ID} $	200	-	600	mV	
Differential input common mode voltage	$V_{cm}$	1.0	1.2	1.5		$V_{IH}=100mV,$ $V_{IL}=-100mV$

- Notes :
1. The supply voltage is measured and specified at the interface connector of LCM.  
The current draw and power consumption specified is for  $V_{DD}=5.0V$ , Frame rate=75Hz.  
Test Pattern of power supply current.
    - a) Typ: Color Bar pattern
    - b) Max: Vertical Subline pattern
  2. Duration of rush current is about 2 ms and rising time of  $V_{DD}$  is  $520 \mu s \pm 20 \%$

## 2.2 Electrical Interface Connection

CN11 Module Side Connector: UJU IS100-L30R-C23 or Equivalent  
 User Side Connector: JAE FI-X30H or Equivalent

Pin No	Symbol	Function	Remark
1	RXO0-	Negative Transmission data of Pixel 0 (ODD)	
2	RXO0+	Positive Transmission data of Pixel 0 (ODD)	
3	RXO1-	Negative Transmission data of Pixel 1 (ODD)	
4	RXO1+	Positive Transmission data of Pixel 1 (ODD)	
5	RXO2-	Negative Transmission data of Pixel 2 (ODD)	
6	RXO2+	Positive Transmission data of Pixel 2 (ODD)	
7	BIST	Bist function	Note1
8	RXOC-	Negative Transmission Clock (ODD)	
9	RXOC+	Positive Transmission Clock (ODD)	
10	RXO3-	Negative Transmission data of Pixel 3 (ODD)	
11	RXO3+	Positive Transmission data of Pixel 3 (ODD)	
12	RXE0-	Negative Transmission data of Pixel 0 (EVEN)	
13	RXE0+	Positive Transmission data of Pixel 0 (EVEN)	
14	GND	Power Ground	
15	RXE1-	Negative Transmission data of Pixel 1 (EVEN)	
16	RXE1+	Positive Transmission data of Pixel 1 (EVEN)	
17	GNG	Power Ground	
18	RXE2-	Negative Transmission data of Pixel 2 (EVEN)	
19	RXE2+	Positive Transmission data of Pixel 2 (EVEN)	
20	RXEC-	Negative Transmission Clock (EVEN)	
21	RXEC+	Positive Transmission Clock (EVEN)	
22	RXE3-	Negative Transmission data of Pixel 3 (EVEN)	
23	RXE3+	Positive Transmission data of Pixel 3 (EVEN)	
24	GND	Power Ground	Note 2
25	SCL	*Reserved for LCD manufacturer's(SCL)	
26	SDA	*Reserved for LCD manufacturer's(SDA)	
27	NC		
28	VDD	Power Supply: +5V	
29	VDD		
30	VDD		

Note 1: H: White-Black-Red-Green-Blue Pattern Aging, L: Black pattern, when no LVDS signal

Note 2: This pin should be connected with GND.

## 2.3 Signal Timing Specification

The panel is only operated by the DE mode.

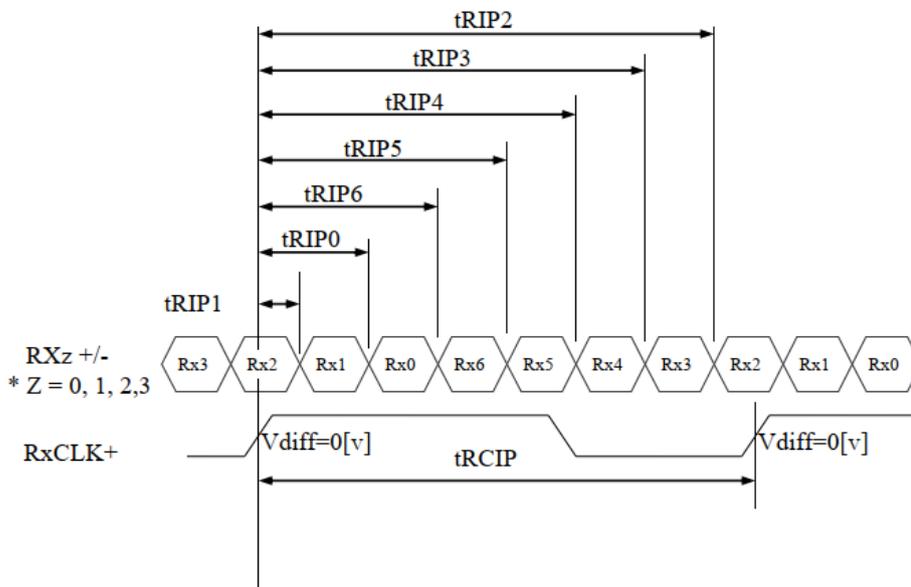
Item	Symbols		Min	Typ	Max	Unit	Note
DCLK	Period	tCLK	10	13.47	16.84	ns	
	Frequency	-	59.4	74.25	100	MHz	
Hsync	Period	tHP	1050	1100	1120	tCLK	
	Horizontal Valid	tHV	960	960	960	tCLK	
	Horizontal Blank	tHB	90	140	160		
	Frequency	fH	56.3	67.5	84.4	KHz	
Vsync	Period	tVP	1110	1125	1755	tHP	
	Vertical Valid	tVV	1080	1080	1080	tHP	
	Vertical Blank	tVB	30	45	675	tHP	
	Frequency	fV	48	60	75	Hz	2)
LVDS Receiver clock	Input spread spectrum ratio	SSr	-3	-	+3	%	
	Spread spectrum modulation frequency	F <sub>SSM</sub>	-	-	300	kHz	

Note 1 : 1). This DCLK range at last line of V-blanking should be set in 0~987.

2). The Vsync Frequency maximum can reach 77Hz when the resolution is applied @ 1152\*900, 1280\*1024.

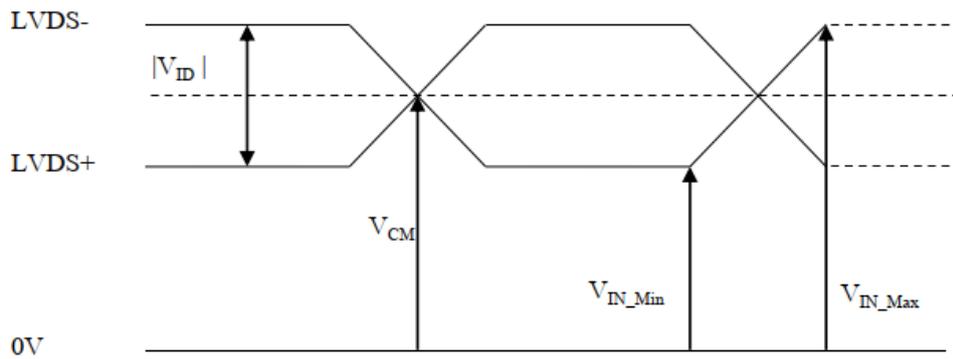
## 2.4 LVDS Rx Interface Timing Parameter

Item	Symbol	Min	Typ	Max	Unit	Remark
CLKIN Period	tRCIP	10.78	13.47	16.84	nsec	
Input Data 0	tRIP1	-0.4	0.0	+0.4	nsec	
Input Data 1	tRIP0	tRCIP/7-0.4	tRCIP/7	tRCIP/7+0.4	nsec	
Input Data 2	tRIP6	$2 \times \text{tRCIP}/7-0.4$	$2 \times \text{tRCIP}/7$	$2 \times \text{tRCIP}/7+0.4$	nsec	
Input Data 3	tRIP5	$3 \times \text{tRCIP}/7-0.4$	$3 \times \text{tRCIP}/7$	$3 \times \text{tRCIP}/7+0.4$	nsec	
Input Data 4	tRIP4	$4 \times \text{tRCIP}/7-0.4$	$4 \times \text{tRCIP}/7$	$4 \times \text{tRCIP}/7+0.4$	nsec	
Input Data 5	tRIP3	$5 \times \text{tRCIP}/7-0.4$	$5 \times \text{tRCIP}/7$	$5 \times \text{tRCIP}/7+0.4$	nsec	
Input Data 6	tRIP2	$6 \times \text{tRCIP}/7-0.4$	$6 \times \text{tRCIP}/7$	$6 \times \text{tRCIP}/7+0.4$	nsec	



\* Vdiff = (RXz+)-(RXz-),..., (RXCLK+)-(RXCLK-)

## 2.5 LVDS DC Specification



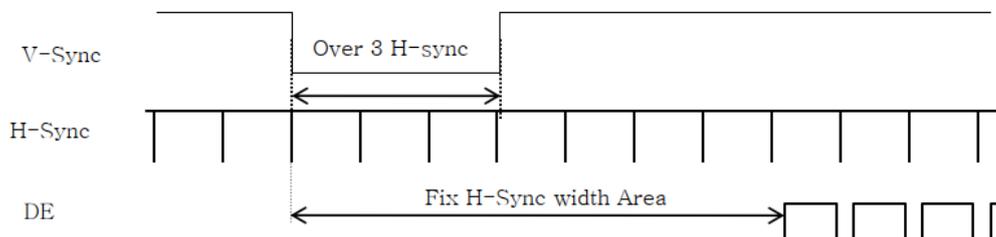
$$|V_{ID}| = |(LVDS+) - (LVDS-)|$$

$$V_{CM} = \{(LVDS+) + (LVDS-)\} / 2$$

Differential input voltage	$ V_{ID} $	200	-	600	mV
Differential input common mode voltage	$V_{CM}$	1.0	1.2	1.5	V

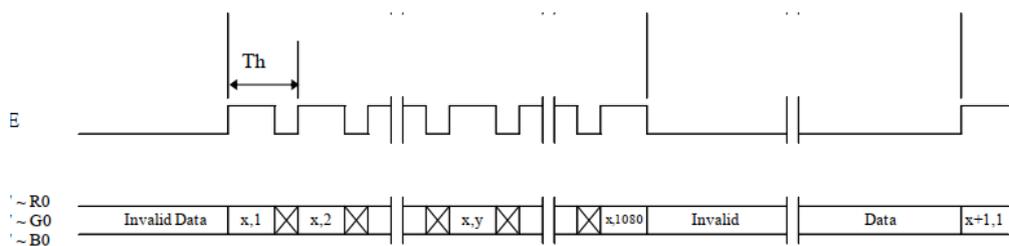
## 2.6 Signal Timing Waveforms Of Interface Signal

### Sync Timing Waveforms

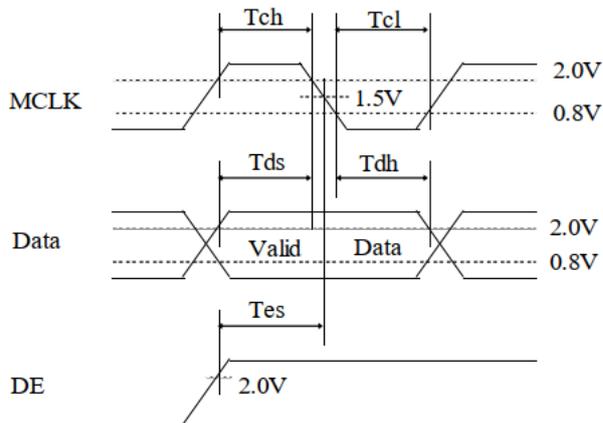
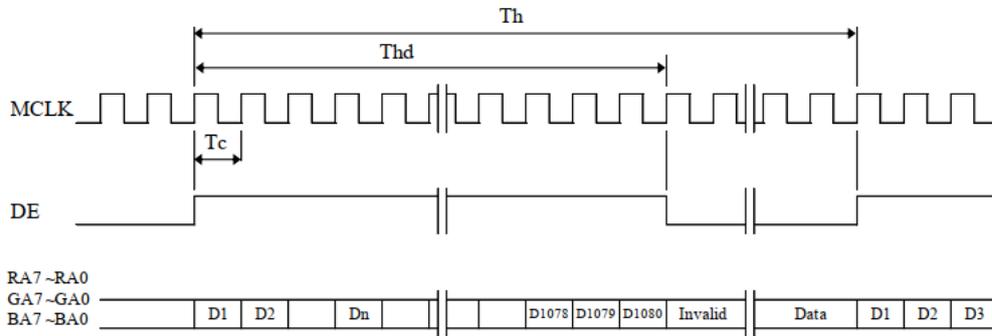


- 1) Need over 3 H-sync during V-Sync Low
- 2) Fix H-Sync width from V-Sync falling edge to first rising edge

### Vertical Timing Waveforms



## Horizontal Timing Waveforms

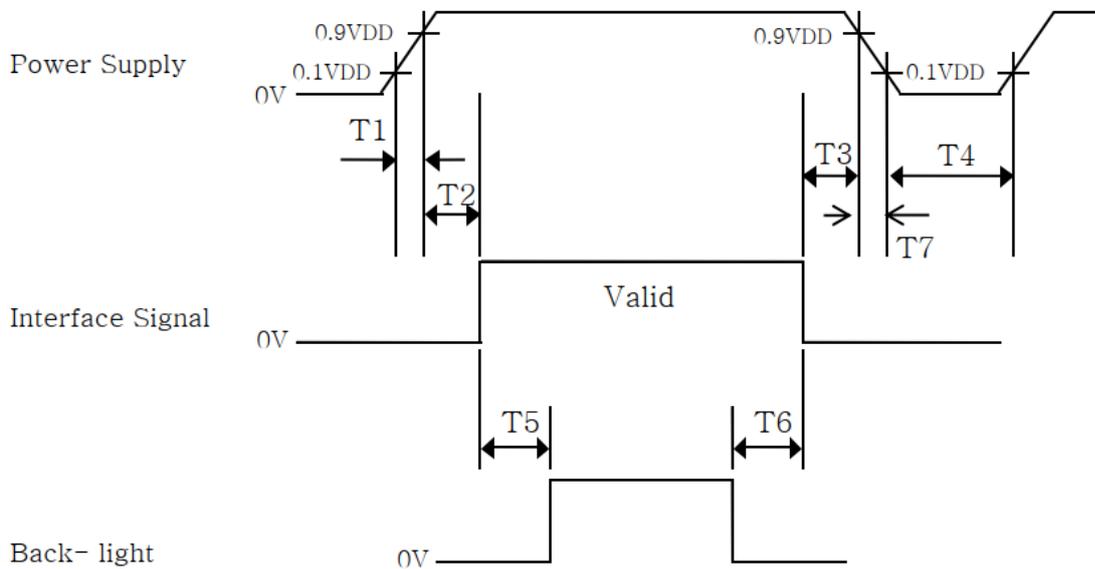


## 2.7 Input Signals, Basic Display Colors & Gray Scale Of Colors

Color & Gray Scale		RED DATA								GREEN DATA								BLUE DATA							
		R7	R6	R5	R4	R3	R2	R1	R0	G7	G6	G5	G4	G3	G2	G1	G0	B7	B6	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
	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
	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
	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
	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
	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	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	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Darker	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	△	↑								↑								↑							
	▽	↓								↓								↓							
	Brighter	1	1	1	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	▽	1	1	1	1	1	1	1	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		
Gray Scale of GREEN	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	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	
	Darker	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0		
	△	↑								↑								↑							
	▽	↓								↓								↓							
	Brighter	0	0	0	0	0	0	0	1	1	1	1	1	1	0	1	0	0	0	0	0	0	0		
	▽	0	0	0	0	0	0	0	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0		
Green	0	0	0	0	0	0	0	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0			
Gray Scale of BLUE	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	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1		
	Darker	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0		
	△	↑								↑								↑							
	▽	↓								↓								↓							
	Brighter	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	0	1		
	▽	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	0		
Blue	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1			
Gray Scale of WHITE	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	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1		
	Darker	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0		
	△	↑								↑								↑							
	▽	↓								↓								↓							
	Brighter	1	1	1	1	1	1	0	1	1	1	1	1	1	0	1	1	1	1	1	1	0	1		
	▽	1	1	1	1	1	1	1	0	1	1	1	1	1	1	0	1	1	1	1	1	1	0		
White	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1			

## 2.8 Power Sequence

To prevent a latch-up or DC operation of the LCD module, the power on/off sequence shall be as shown in below



- $0.5 \text{ ms} \leq T1 \leq 10 \text{ ms}$
- $0 \leq T2 \leq 50 \text{ ms}$
- $0 \leq T3 \leq 50 \text{ ms}$
- $1 \text{ sec} \leq T4$
- $200 \text{ ms} \leq T5$
- $200 \text{ ms} \leq T6$

### Notes:

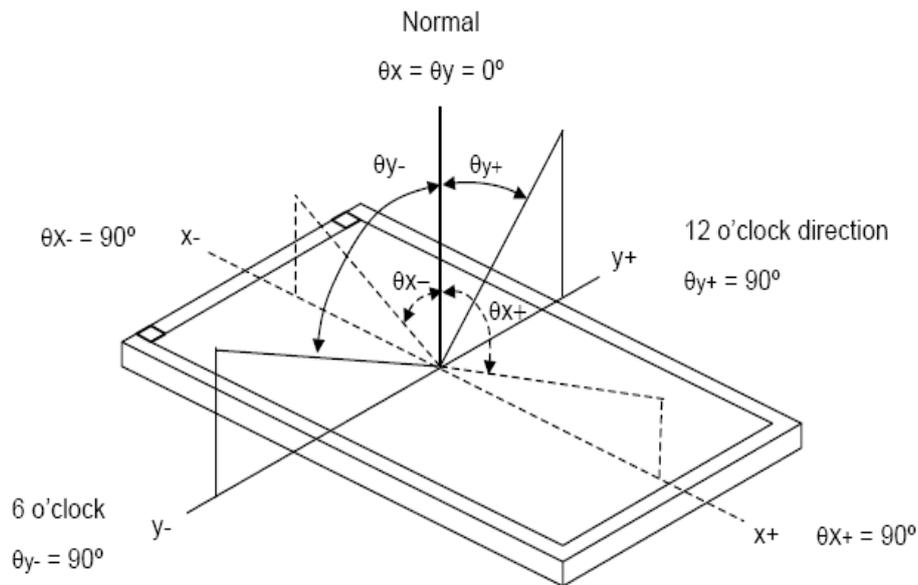
1. When the power supply VDD is 0V, keep the level of input signals on the low or keep high impedance.
2. Do not keep the interface signal high impedance when power is on.
3. Back Light must be turn on after power for logic and interface signal are valid.
4. T7 decreases smoothly, there is none re-bouncing voltage.
5. The above power sequence should be satisfied at these case
  - . DC power ON/OFF
  - . Mode Change(Resolution, frequency, timing, sleep mode, color depth change etc.)
 If not to follow power sequence, there is a risk of abnormal display.
6. If  $T3=0\text{ms}$ , there is a risk of flicker when power ON/OFF.
7. If  $T6=0\text{ms}$ , there is a risk of abnormal display when power off.

### 3 Optical Specification

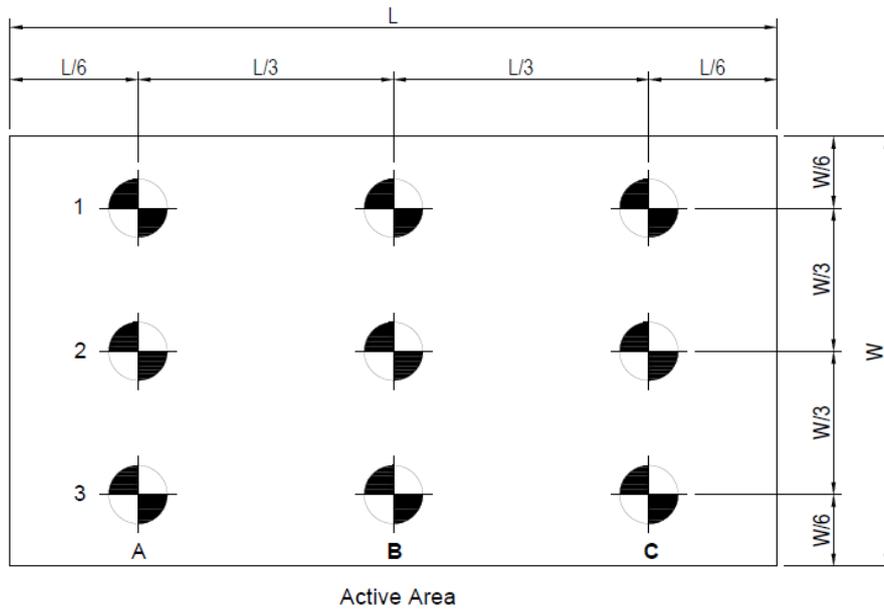
Item		Symbol	Condition	Min.	Typ.	Max.	Unit	Note
Color Chromaticity	Red	Rx	$\theta_x=0$ $\theta_y=0$ CA-410	0.636	0.666	0.696	-	Test Mode: (2) (3)
		Ry		0.281	0.311	0.341	-	
	Green	Gx		0.221	0.251	0.281	-	
		Gy		0.620	0.650	0.680	-	
	Blue	Bx		0.122	0.152	0.182	-	
		By		0.021	0.051	0.081	-	
	White	Wx		0.258	0.288	0.318	-	
		Wy		0.269	0.299	0.329	-	
Center Luminance of White		Lc	$\theta_x=0$	900	1000	1300	cd/m <sup>2</sup>	
Uniform		Lu	$\theta_y=0$ CA-410		79		%	
Contrast Ratio		CR	$\theta_x=0$	864:1	960:1		-	Test Mode: (4)
Color Saturation		NTSC	$\theta_y=0$ Klein K-10		91		%	
Viewing Angle	Horizontal	$\theta_{x+}$	CR $\geq$ 10		89		Deg	Test Mode: (1)
		$\theta_{x-}$			89			
	Vertical	$\theta_{y+}$			89			
		$\theta_{y-}$			89			

**Test Mode :**

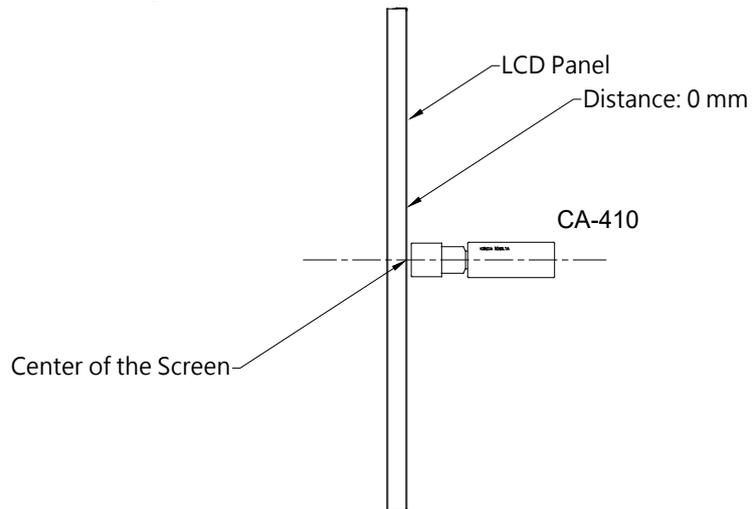
(1) Definition of Viewing Angle ( $\theta_x$  ,  $\theta_y$ ):



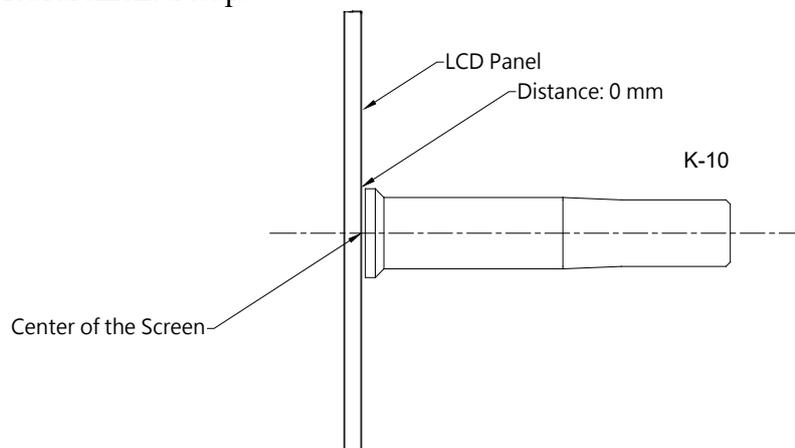
(2) Definition of Test Point:



(3) CA-410 Measurement Setup:



(4) Klein K-10 Measurement Setup:



## 4 LED Driving Board Specifications

This specification is applied to LED converter unit for SSF/SSH/SSD2705 1000nits LED backlight.

### 4.1 Operating Characteristics

Item	Symbol	Condition	MIN.	TYP.	MAX.	Unit	Remark
Input Voltage	Vin		10.0	12.0	14.0	V	
Input Current (High Brightness)	IinH	Brightness = 100%	3.28	2.73	2.34	A	(1)
Input Power Consumption	Pin	Brightness = 100%	-----	32.76	-----	W	
LED Current (High Brightness)	IoutH	Brightness = 100%	-----	0.86	-----	A	
Working Frequency	W_Freq	Brightness = 100%	-----	400	-----	KHZ	
Brightness Control	DC mode						
	Vadj	Connection of Voltage	0.2	-----	4.8	V	(2)
	PWM mode						
	PWM	Connect to PWM	0	-----	100	%	(3)
Freq	-----		200	-----	Hz	(4)	
ON/OFF Control	Von	Normal Operation	2	-----	5	V	
	Voff		0	-----	0.8	V	
Output Voltage	Vout	Brightness = 100%	-----	34.40	-----	V	
Efficiency	η	Brightness = 100%	-----	90.3	-----	%	(5)

Remark:

(1) This data is based on the testing result of practical input voltage, Iin is measured by related Vin. (min, typ, max) .If the voltage is increased, the current will decrease. If the voltage is decrease, the current will increase.

(2) Max brightness at Vadj=0.2V. Min brightness at Vadj=4.8V.

(3) Max dimming ratio = 1:100.

(4) Frequency can be adjusted in accordance with demand(120Hz minimum, or lights will be flickering)

$$(5) \eta_{max} = V_{out(max)} * I_{outH(max)} / V_{in(max)} * I_{inH(min)}$$

$$\eta_{min} = V_{out(min)} * I_{outH(min)} / V_{in(min)} * I_{inH(max)}$$

## 4.2 Connector Socket

### Input Connector: J3 (JST S9B-PH-SM3-TB or Compatible)

PIN No	Symbol	Description
1	Vin	DC+
2	Vin	DC+
3	Vin	DC+
4	GND	Ground
5	GND	Ground
6	GND	Ground
7	Brightness	Brightness Control
8	Control	ON/OFF Control
9	CL	PWM or DC selection

Note: Pin9 is dimming method control pin, Low → DC dimming, High → PWM dimming.  
If pin9 is be used, please NC JP1.

### Output Connector: J1, J2(JST S2B-EH or Compatible)

PIN NO	Symbol	Description
1	Output	LED High Voltage( + )
2	Output	LED Low Voltage ( - )

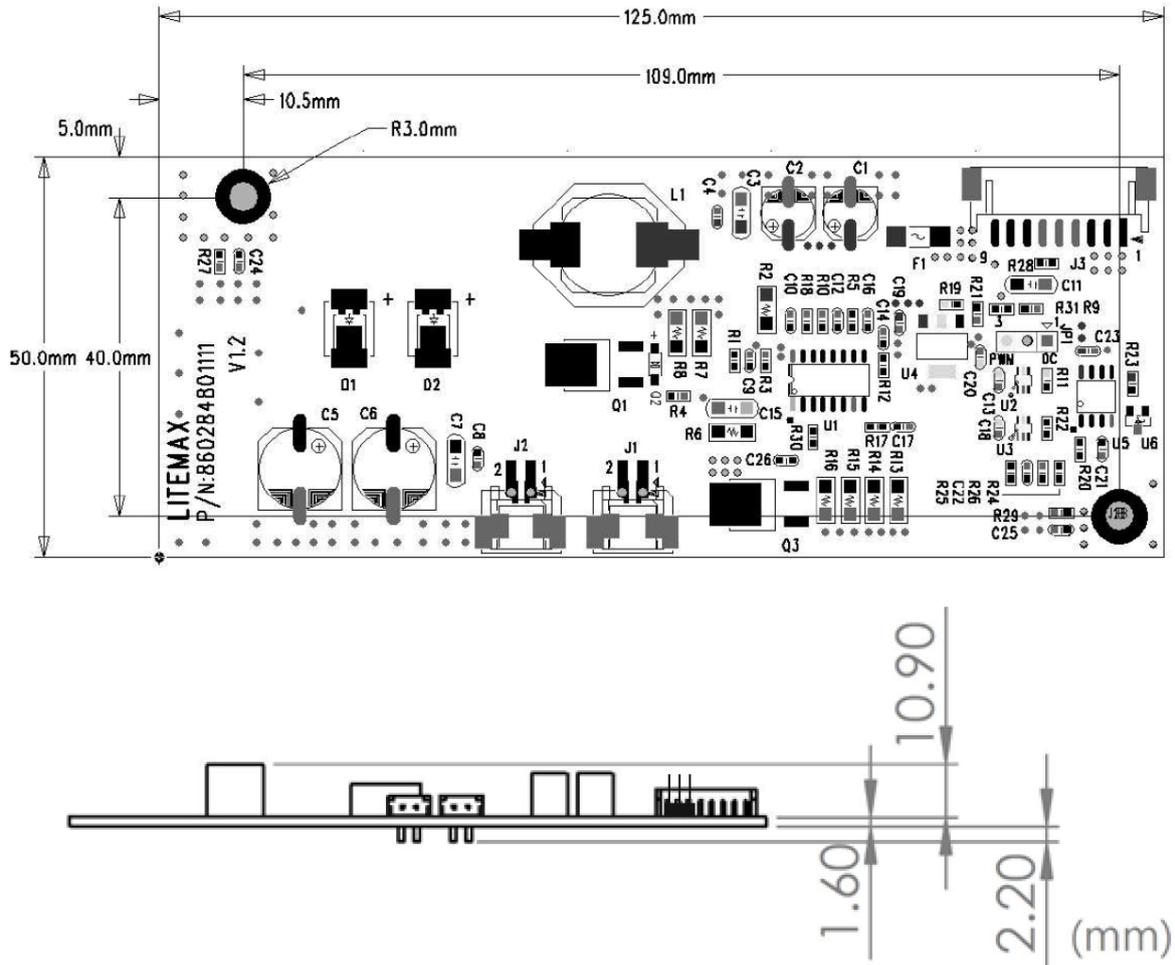
### DC or PWM Connector: JP1

PIN NO	Symbol	Description
1	DC	Close pin 1,2 LED driver is DC dimming
2	GND	
3	PWM	Close pin 2,3 LED driver is PWM dimming

Note: If you use JP1 to set DC/PWM, please NC the pin9 of J3.

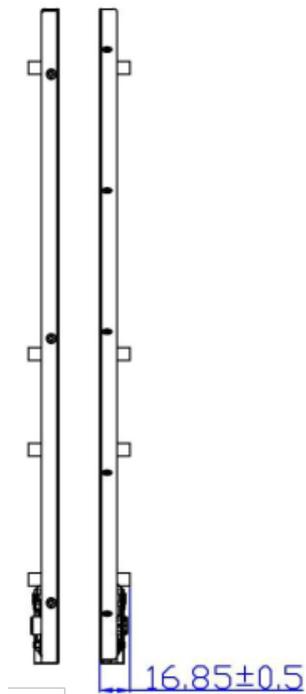
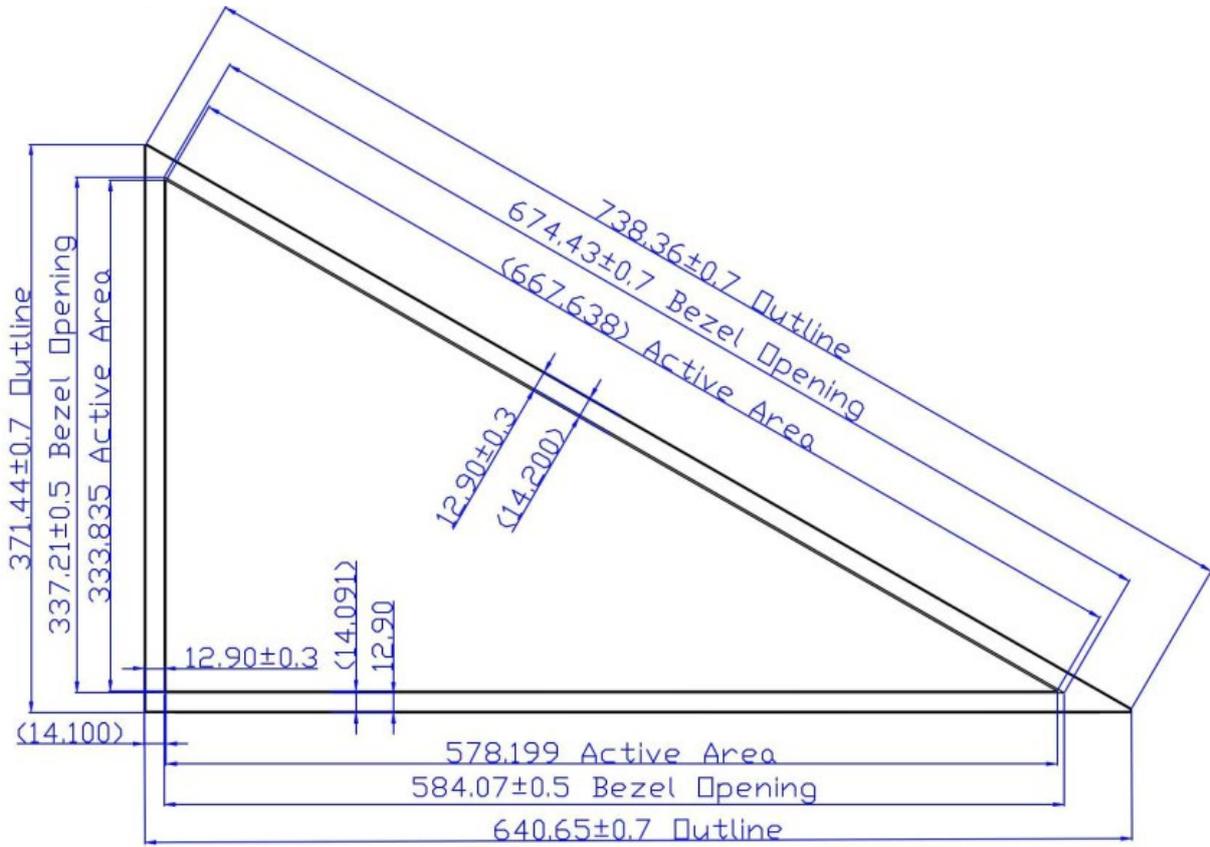
### 4.3 Mechanical Characteristics

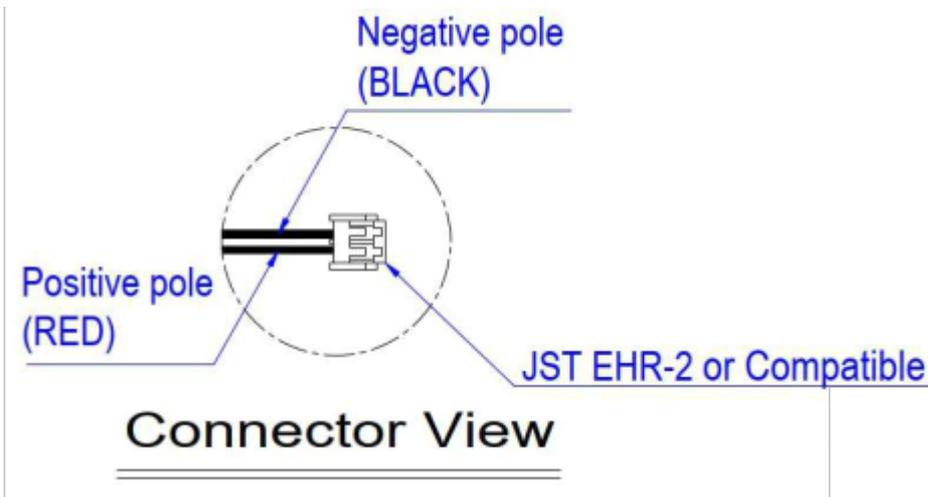
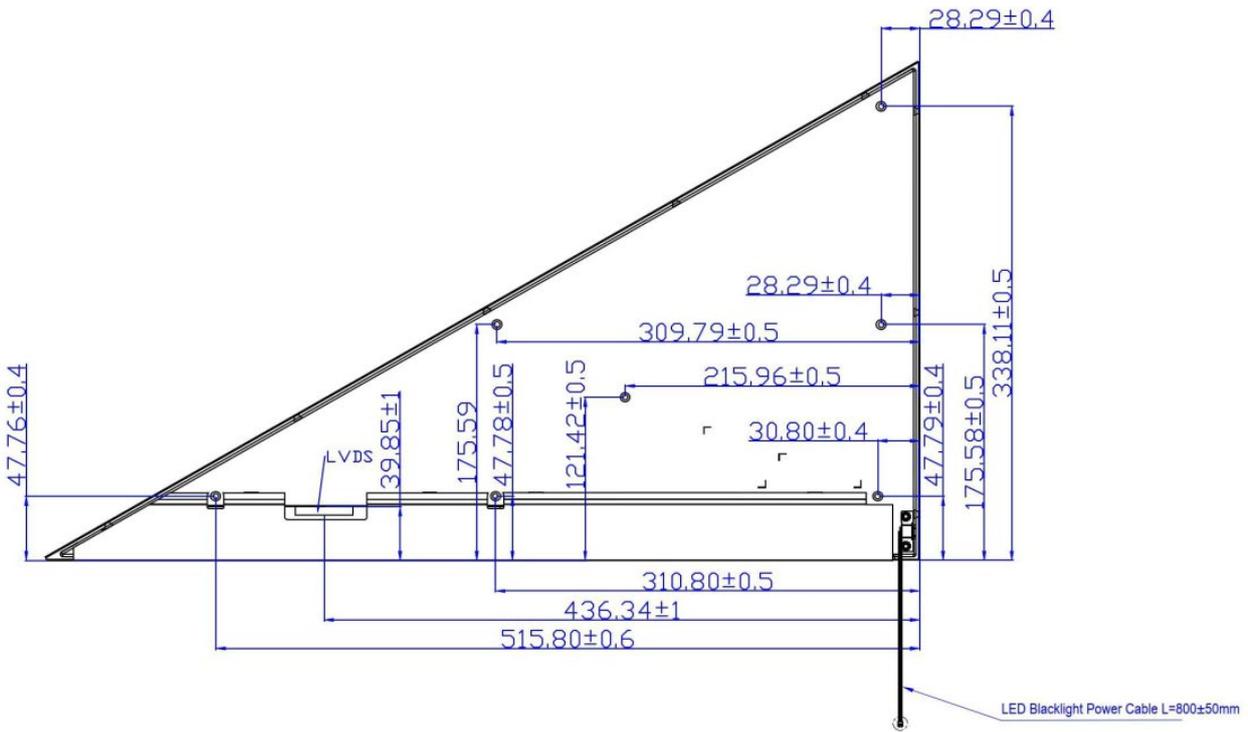
Dimension: 125 x 50 x 12.5mm



# 5 Mechanical Drawing

Unit:mm





Note :

1. M3 USER HOLE SCREW TORQUE 5 kgf- cm MAX , HOLE Depth 6 mm Max.
2. FRONT CASE WITH BLACK PAINT

## 6 AD68862HP Board & OSD Functions

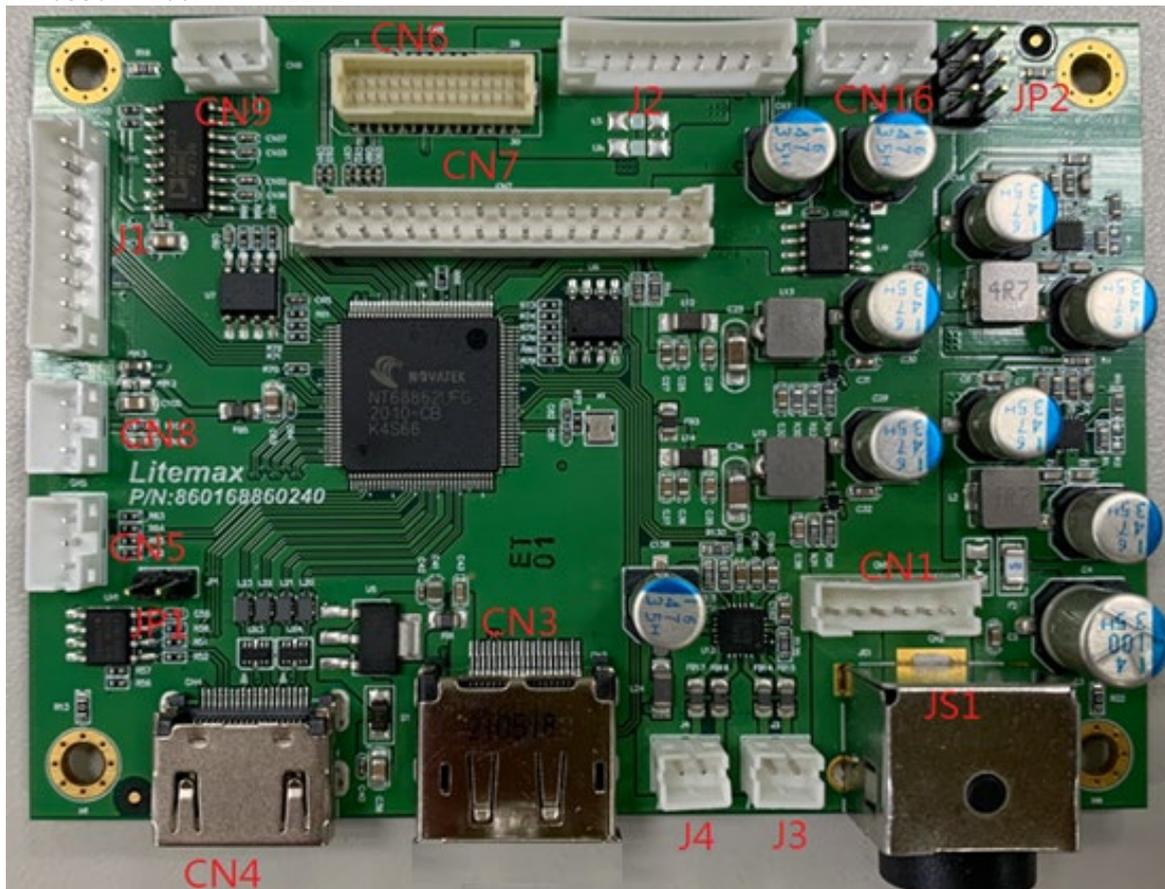
AD68862HP is a good performance AD board for Litemax FHD resolution display product. Input interface supports DP, HDMI. Output support eDP, LVDS panel. Max resolution up to 1920x1080.

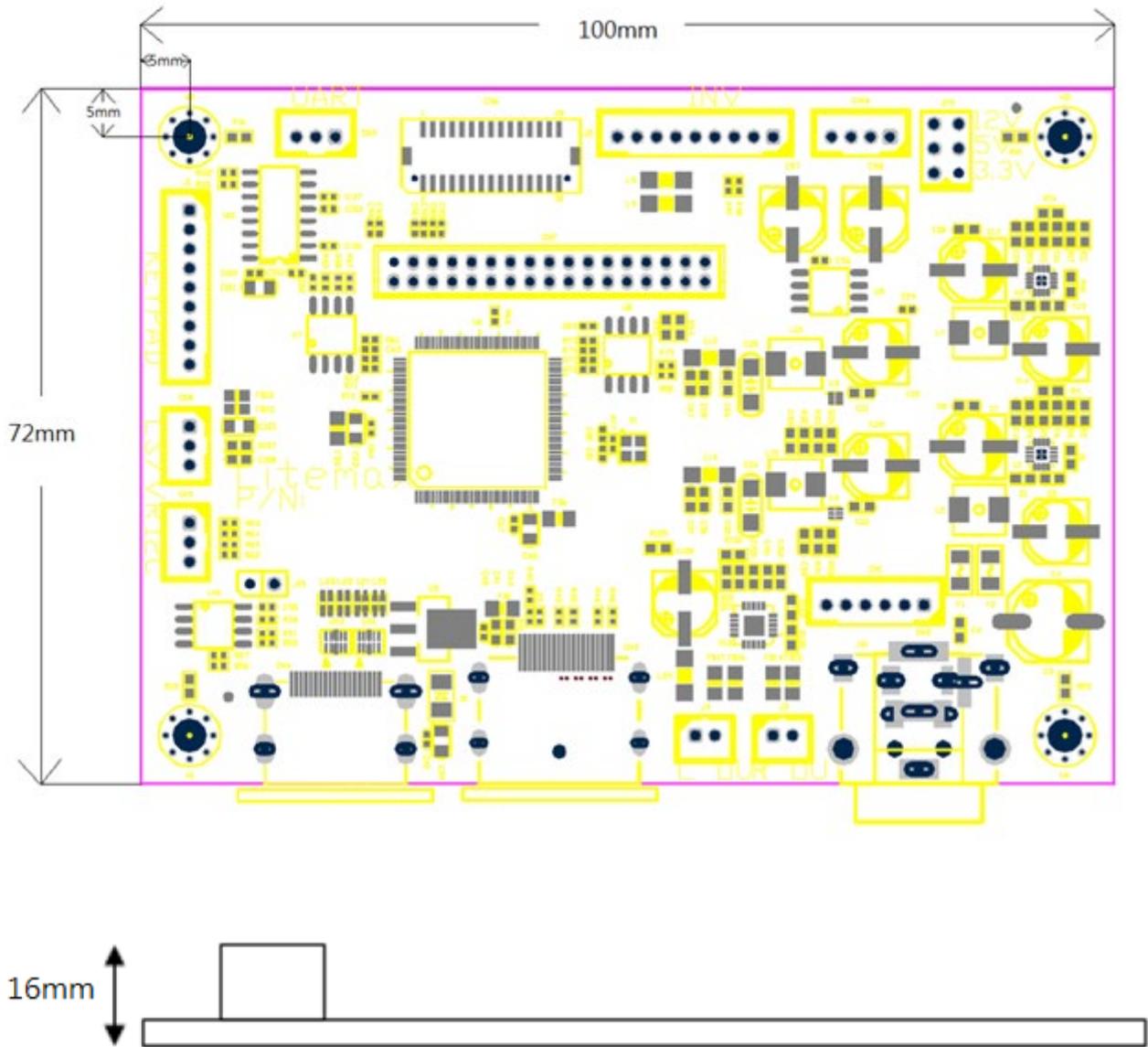
### General Description

- Max resolution 1920x1080 60Hz
- One DP 1.2, supports 1920x1080 60Hz
- One HDMI 1.4, supports 1920x1080 60Hz
- Embedded MCU with ADC port for VR, light sensor application.
- Embedded OSD.
- Support eDP panel.
- Support Dual/Single LVDS
- Size 100mm x 72mm
- Support output voltage 12V(1A) or 5V(1A)

### Outline Dimensions

AD68862 100mm x 72mm





## AD68862HP Board Pin Define

### CN6: eDP output(Wafer 1.0mm, 15\*2P)

Pin	Function	Pin	Function
1	TX0P	16	TXAUX-
2	TX0N	17	TX_HPDP
3	TX1P	18	GND
4	TX1N	19	VCC
5	GND	20	VCC
6	GND	21	DIM_EDP
7	NC	22	ON/OFF_EDP
8	NC	23	INVGND
9	GND	24	INVGND
10	GND	25	INVGND
11	NC	26	GND
12	NC	27	12INV
13	GND	28	12INV
14	GND	29	12INV
15	TXAUX+	30	12INV

### CN7: LVDS output (Wafer 2.0mm,17x2P)

Pin	Function	Pin	Function
1	RXO0-	18	RXE1+
2	RXO0+	19	RXE2-
3	RXO1-	20	RXE2+
4	RXO1+	21	RXEC-
5	RXO2-	22	RXEC+
6	RXO2+	23	RXE3-
7	RXOC-	24	RXE3+
8	RXOC+	25	NC
9	RXO3-	26	NC
10	RXO3+	27	GND
11	NC	28	GND
12	NC	29	+3.3V
13	GND	30	GND
14	GND	31	VCC
15	RXE0-	32	VCC
16	RXE0+	33	VCC
17	RXE1-	34	VCC

**CN3: DP input**

Pin	Function	Pin	Function
1	ML_Lane3(n)	11	GND
2	GND	12	ML_Lane0(p)
3	ML_Lane3(p)	13	CONFIG1
4	ML_Lane2(n)	14	CONFIG2
5	GND	15	AUX_CH(p)
6	ML_Lane2(p)	16	GND
7	ML_Lane1(n)	17	AUX_CH(n)
8	GND	18	Hot_Plug
9	ML_Lane1(p)	19	Return
10	ML_Lane0(n)	20	DP_PWR

**CN4: HDMI input**

Pin	Function	Pin	Function	Pin	Function
1	RX2+	9	RX0-	17	GND
2	GND	10	TMDS Clock+	18	HDMI +5V
3	RX2-	11	HDMI DET	19	HPD
4	RX1+	12	TMDS Clock-		
5	GND	13	NC		
6	RX1-	14	NC		
7	RX0+	15	HDMI_SCL		
8	GND	16	HDMI_SDA		

**CN1: Power input (Wafer 2.0mm pitch 6 pin)**

Pin	Function	Pin	Function
1	Power Input	4	GND
2	Power Input	5	GND
3	Power Input	6	GND

**JS1: Power input (Power Din 4 pin)**

Pin	Function	Pin	Function
1	Power Input	3	GND
2	Power Input	4	GND

**CN2: Power input (Power Jack 3 pin)**

Pin	Function	Pin	Function
1	Power Input	3	GND
2	GND		

**CN16: Power output (Wafer 2.0mm pitch 4 pin)**

Pin	Function	Pin	Function
1	+5V(1A)	3	+12V(1A)
2	GND	4	GND

**J2: Backlight Power and Control (Wafer 2.0mm pitch 9 pin)**

Pin	Function	Pin	Function
1	DC/PWM SEL	6	GND
2	Enable	7	12V (Note3)
3	Dimming	8	12V (Note3)
4	GND	9	12V (Note3)
5	GND		

Note3: Pin 7,8,9 are for 12V version only. If you choose 24V version, these 3 pin are NC.

**J1: Keypad (Wafer 2.0mm pitch 9 pin)**

Pin	Function	Pin	Function
1	POWER KEY	6	MENU KEY
2	GREEN LED	7	NC
3	RED LED	8	GND
4	DOWN KEY	9	NC
5	UP KEY		

**CN8: Light sensor (Wafer 2.0mm pitch 2 pin)**

Pin	Function	Pin	Function
1	3.3V	3.	GND
2	Sensor Out		

**JP2: Panel power selection (2.54mm pitch 2x3 jump)**

Pin	Function	Pin	Function
1-2 close	3.3V	5-6 close	12V
3-4 close	5V		

**CN9: UART (Wafer 2.0mm pitch 3 pin)**

Pin	Function	Pin	Function
1	TX	3	GND
2	RX		

**CN5: I2C (Wafer 2.0mm pitch 3 pin)**

Pin	Function	Pin	Function
1	SDA	3	GND
2	SCL		

**J3: Audio out R (Wafer 2.0mm pitch 2 pin)(2.8W 4ΩLoad)**

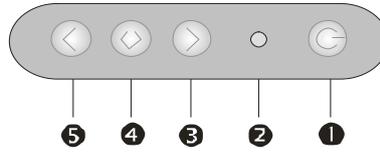
Pin	Function	Pin	Function
1	ROUTP	2	ROUTN

**J4: Audio out L (Wafer 2.0mm pitch 2 pin) (2.8W 4ΩLoad)**

Pin	Function	Pin	Function
1	LOUTP	2	LOUTN

## 6.1 OSD Function

### MEMBRANE CONTROL BUTTOM



- ❶ **POWER SWITCH:** Pushing the power switch will turn the monitor on. Pushing it again to turn the monitor off.
- ❷ **Power LED:** Power ON-Green / Power OFF-No.
- ❸ **Up Key >:** Increase item number or value of the selected item.
- ❹ **Menu Key:** Enter to the OSD adjustment menu. It also used for go back to previous menu for sub-menu, and the change data don't save to memory.
- ❺ **Down Key <:** Decrease item number or item value when OSD is on.

### Screen Adjustment Operation Procedure

#### 1. Entering the screen adjustment

The setting switches are normally at stand-by. Push the **Menu Key** once to display the main menu of the screen adjustment. The adjustable items will be displayed in the main menu.

#### 2. Entering the settings

Use the **Down Key <** and **Up Key >** buttons to select the desired setting icon and push the **SELECT** button to enter sub-menu.

#### 3. Change the settings

After the sub-menu appears, use the **Down Key <** and **Up Key >** buttons to change the setting values.

#### 4. Save

After finishing the adjustment, push the **SELECT** button to memorize the setting.

#### 5. Return & Exit the main menu

Exit the screen adjustment; push the "MENU" button. When no operation is done around 10 sec (default OSD timeout), it goes back to the stand-by mode and no more switching is accepted except MENU to restart the setting.

## 6.2 OSD Menu

Here are some instructions for you to use the OSD (On Screen Display). By pressing the “menu”, you will see the below picture.

Timing shows resolution and V-frequency of the panel. This 2 information is not changeable by user.



There are 6 sub menus within the OSD user interface:

**Brightness, Signal Select, Sound, Color, Tools, and Exit.**



### Brightness

When you press the “menu” button, you enter the “Brightness” sub directory. In this directory, you will see 6 selections: **Brightness Mode, OSD Brightness, Contrast, Sharpness, Auto Tune, Exit.**



### Brightness Mode :

press “menu” once, you can go into the Brightness Mode.



### VR: (OPTION)

press this Icon to activate the VR control of brightness.



### Ambient light sensor: (OPTION)

press this Icon, must to accompany with Litemax ambient light sensor to auto dimming.





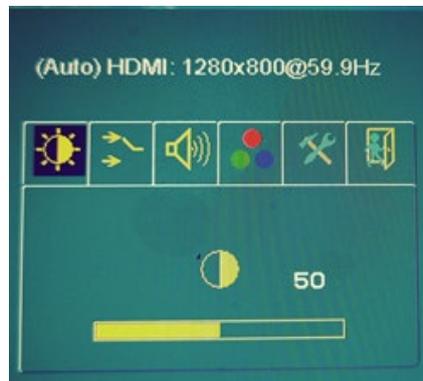
### OSD Brightness :

Press the “menu” once, to adjust the brightness. Press “left” to dim down the brightness to “0”, press “right” to increase the brightness to “100”



### Contrast :

Press “Menu” once, you can adjust the contrast from “0” to “100” by pressing the “Left” and “Right”.



### Sharpness :

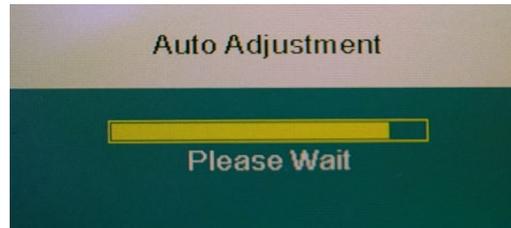
Press “Menu” once, you can adjust the Sharpness from “0” to “4” by pressing the “Left” and “Right”.





**Auto Tune :** (VGA only)

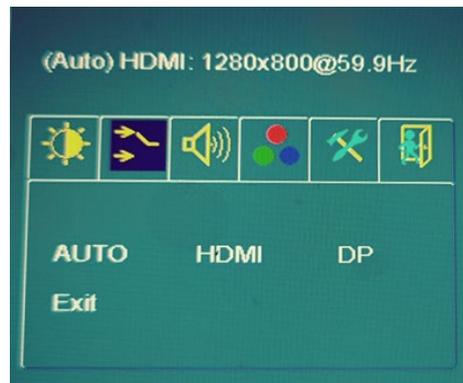
Press “Menu” once, you can activate the Auto Tune.



**Exit:** back to the beginning menu.



**Input Signal:** (default auto detect)



**AUTO**

**AUTO:** auto detect

**HDMI**

**HDMI:** HDMI input

**DP**

**DP:** DisplayPort input

**Exit**

**Exit:** back to the beginning menu.



**Audio:**



**Audio Volume:** Audio volume adjustment, from “0” to “100”.



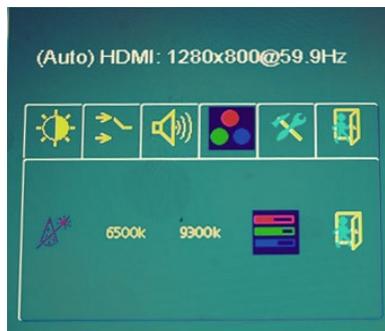
**UnMute/Mute:** You can mute the speaker by pressing this option.



**Exit:** back to the beginning menu.



**Color:**



**Auto Color (VGA only) :**

By navigating over to the “Auto Color” option, optimal color performance is invoked.



**Color Tempture\_6500K:** Warm color scheme.



**Color Tempture\_9300K:** Cold color scheme.



**Color Temperature User Define:** Default is 100 for “R”, “G”, and “B”. Range is “0” to “255”.



**Exit:** back to the beginning menu.



## Other Setting:



**HPos:** You can shift the screen horizontally using this function.



**VPos:** You can shift the screen vertically using this function.



**Rotation:** You can rotate the screen to 0° (No) 、 270° (Yes).



**Load Default:** You can load the default data using this function.



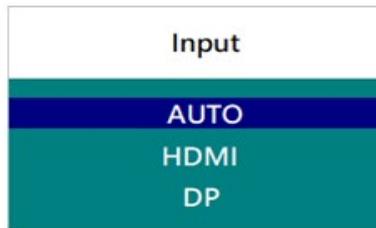
**Exit:** back to the beginning menu.

< Hot Key >

Left click to display brightness adjustment.



Right click to display Input Source Menu.



<Others>

Signal Information will be displayed after powering on or switching the signal.



(Signal Information)

**NO VIDEO INPUT** will be displayed when there is no signal input.



(No Video Input)

**CHECK CABLE CONNECTION** will be displayed when the signal cable is not connected.



(Check Cable Connection)

## 7 Precautions

### 7.1 Handling and Mounting Precautions

- (1) The module should be assembled into the system firmly by using every mounting hole. Do not apply rough force such as bending or twisting to the LCD during assembly.
- (2) You should consider the mounting structure so that uneven force (ex. Twisted stress, Concentrated stress) is not applied to the module. And the case on which a module is mounted should have sufficient strength so that external force is not transmitted directly to the LCD module.
- (3) While assembling or installing LCD modules, it can only be in the clean area. The dust and oil may cause electrical short or damage the polarizer.
- (4) Use fingerstalls or soft gloves in order to keep display clean during the incoming inspection and assembly process.
- (5) Do not press or scratch the surface harder than a HB pencil lead on the panel because the polarizer is very soft and easily be scratched.
- (6) Please attach the surface transparent protection film to the surface in order to protect the polarizer. Transparent protection film should have sufficient strength in order to the resist external force.
- (7) When the transparent protection film is peeled off, static electricity is generated between the film and polarizer. This should be peeled off slowly and carefully by people who are electrically grounded and with well ion-blown equipment or in such a condition, etc.
- (8) 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.
- (9) Wipe off water droplets or oil immediately. Staining and discoloration may occur if they left on panel for a long time.
- (10) 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.
- (11) Protect the LCD module from static electricity, it may cause damage to the C-MOS Gate Array IC.
- (12) Do not disassemble the module.
- (13) Do not pull or fold the lamp wire.
- (14) Pins of I/F connector should not be touched directly with bare hands.

### 7.2 Storage Precautions

- (1) High temperature or humidity may reduce the performance of LCD module. Please store LCD module within the specified storage conditions.
- (2) If possible store them in a dark place. Do not expose the module to sunlight or fluorescent light. Keep the temperature between 5°C and 35°C at normal humidity.
- (3) It is dangerous that moisture come into or contacted the LCD module, because the moisture may damage LCD module when it is operating.
- (4) The polarizer surface should not come in contact with any other object. It is recommended that they be stored in the container in which they were shipped.

### 7.3 Operation Precautions

- (1) Do not pull the I/F connector in or out while the LCD 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) Response time depends on the temperature. (In lower temperature, it becomes longer.)
- (4) Brightness depends on the temperature. (In lower temperature, it becomes lower.)
- (5) Be careful for condensation at sudden temperature change. Condensation makes damage to polarizer or electrical contacted parts. And after fading condensation, smear or spot will occur.
- (6) Module has high frequency circuits. Sufficient suppression to the electromagnetic interference shall be done by system manufacturers. Grounding and shielding methods are very important to minimize the interference.
- (7) Please do not give any mechanical and/or acoustical impact to module. Otherwise, module can't be operated its full characteristics perfectly.
- (8) Since a module is composed of electronic circuits, it is not strong to electrostatic discharge. Make certain that treatment persons are connected to ground through wrist band etc. And don't touch interface pin directly.
- (9) Do not display the fixed pattern for a long time because it may cause image sticking.
- (10) In order to prevent image sticking, periodical power-off or screen save is needed after fixed pattern long time display.
- (11) Black image or moving image is strongly recommended as a screen save.
- (12) Static information display recommended to use with moving image. Cycling display between 10 minutes' information (static) display and 10 seconds' moving image.
- (13) Background and character (image) color change is recommended. Use different colors for background and character, respectively. And change colors themselves periodically.
- (14) LCD system is required to place in well-ventilated environment. Adapting active cooling system is highly recommended.
- (15) Product reliability and functions are only guaranteed when the product is used under right operation usages.
- (16) If product will be used in extreme conditions, such as high temperature/ humidity, shock and vibration it is strongly recommended to contact Litemax for filed application engineering advice. Otherwise, its reliability and function may not be guaranteed. Extreme conditions are commonly found at airports, transit stations, taxi-top, in vehicle and controlling systems.

## 8 Disclaimer

All information in this document are subject to change, please constant LiteMax for any new design.