LITEMAX SSD1623

Spanpixel

16.3" LED B/L Ultra-Wide LCD

(1st Edition 2014/Apr/14)

All information is subject to change without notice.

Approved by	Checked by	Prepared by

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RECORD OF REVISION

Version and Date	Page	Old Description	New Description	Remark
14,Apr,2014	all		Initial Release	

Contents

1.0 GENERAL DESCRIPTION

SSD1623 is 16.3" ultra wide TFT Liquid Crystal Display module with LED Backlight unit. This module supports 1366 x 238 and can display 16.7M colors. It provides LCD panel with specific ratios for digital signage, public transportation, Gaming, department store, vending machine and industrial applications.

1.1 FEATURES

- Resizing LCD
- Ultra Wide Screen (16 : 2.8)
- LED Backlight
- Brightness 400nits
- Low Power Consumption
- High Uniformity
- Wide Dimming

1.2 GENERAL SPECIFICATIONS

Model No.	SSD1623
Description	16.3" Resizing LCD Module, 400nits, LED backlight, 1366x238
Display Area	409.8x71.4 mm
Brightness	400nits
Resolution	1366 x 238
Aspect Ratio	16 : 2.8
Contrast Ratio	1000:1
Pixel Pitch (mm)	0.3 x 0.3
Viewing Angle	170°(H), 160°(V)
Display Colors	16.7M
Response Time (Typical)	5 ms
Power Consumption	10W
Dimensions (mm)	436.3x100.2x47.1mm
Weight (Net)	1.8Kg
Multi-touch support (Optional)	10-point

SSD= Panel+ LED Driving Board + Control Board + Housing

1.3 ABSOLUTE MAXIMUM RATINGS

Item	Symbol	Min	Max	Unit	Conditions
Logic/LCD Drive Voltage	VDD	-0.3	+6.0	[Volt]	*Note 1,2*

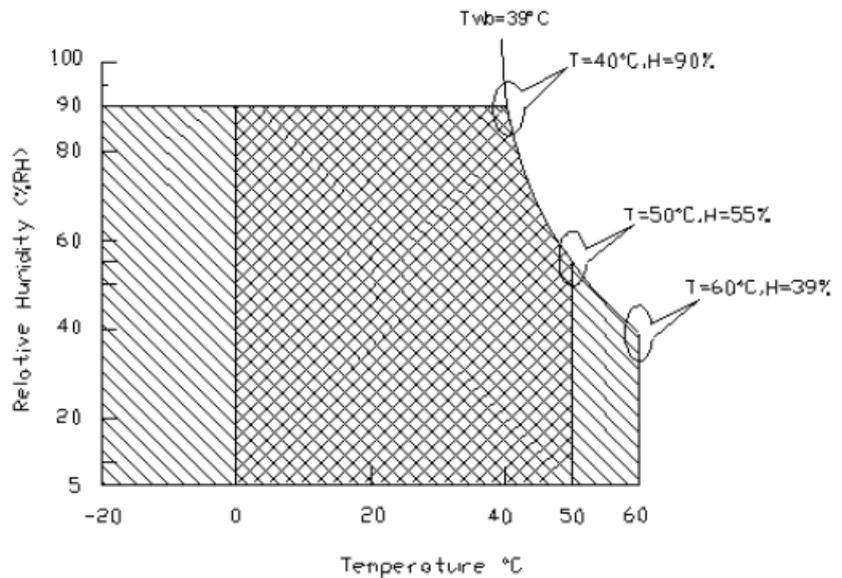| Item	Symbol	Min.	Max.	Unit	Conditions
Operating Temperature	TOP	0	+50	[°C]	*Note 3*
Glass surface temperature (operation)	TGS	0	+65	[°C]	*Note 3, Note 4*
Operation Humidity	HOP	5	90	[%RH]	*Note 3*
Storage Temperature	TST	-20	+60	[°C]	
Storage Humidity	HST	5	90	[%RH]	

Note 1: With in Ta (25℃)
Note 2: Permanent damage to the device may occur if exceeding maximum values
Note 3: Temperature and relative humidity range are shown as the below figure.

     1. 90% RH Max (Ta ≦39℃)
     2. Max wet-bulb temperature at 39℃ or less. (Ta ≦39℃)
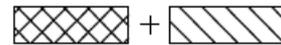   3. No condensation
Note 4: Function Judged only
Note 5: IRLED1,2,3,4 and IPLED1,2,3,4 define as per strings LED current.

2.0 Electrical characteristics

TFT LCD Module Power Specification
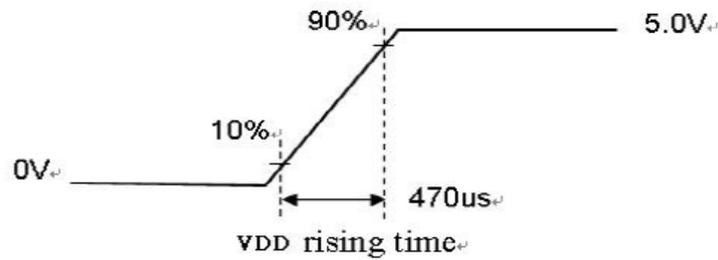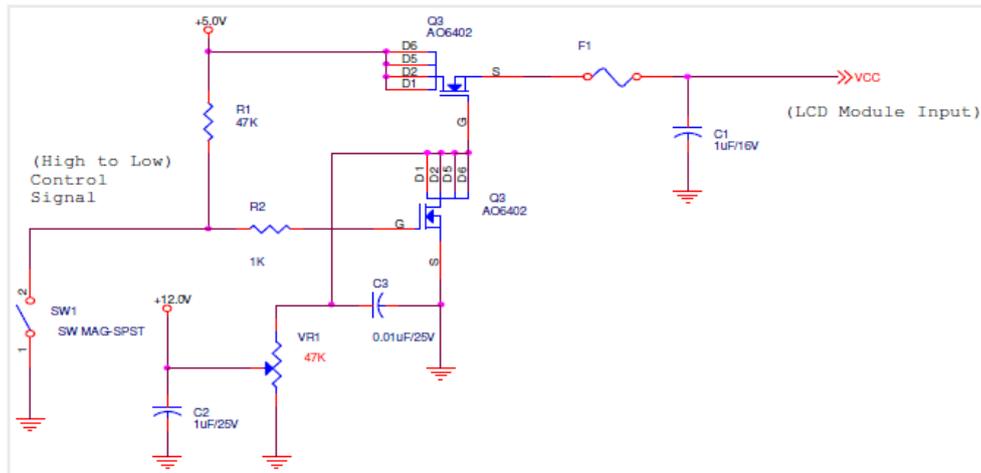
Input power specifications are as following:

Symbol	Parameter	Min	Typ	Max	Unit	Conditions
VDD	Logic/LCD Drive Voltage	4.5	5.0	5.5	[Volt]	+/-10%
IDD	Input Current	-	0.35	0.42	[A]	VDD= 5.0V, All Black Pattern At 60Hz,
		-	0.42	0.5		VDD= 5.0V, All Black Pattern At 75Hz
PDD	VDD Power	-	1.75	2.1	[Watt]	VDD= 5.0V, All Black Pattern At 60Hz
		-	2.1	2.5		VDD= 5.0V, All Black Pattern At 75Hz
IRush	Inrush Current	-	-	2	[A]	Note 1
VDDrp	Allowable Logic/LCD Drive Ripple Voltage	-	-	350	[mV] p-p	VDD= 5.0V, All Black Pattern At 75Hz

Note 1: Measurement conditions:

The duration of rising time of power input is 470us.

Signal Electrical Characteristics

Input signals shall be low or Hi-Z state when VDD is off. Please refer to specifications of SN75LVDS82DGG (Texas Instruments) in detail.

1. DC Characteristics of each signal are as following:

Symbol	Parameter	Min	Typ	Max	Units	Condition
VTH	Differential Input High Threshold	-	-	+100	[mV]	VCM = 1.2V *Note 1*
VTL	Differential Input Low Threshold	-100	-	-	[mV]	VCM = 1.2V *Note 1*
| VID |	Input Differential Voltage	100	-	600	[mV]	*Note 1*
VCM	Differential Input Common Mode Voltage	+1.0	+1.2	+1.5	[V]	VTH-VTL = 200MV (max) *Note 1*

Note 1: LVDS Signal Waveform
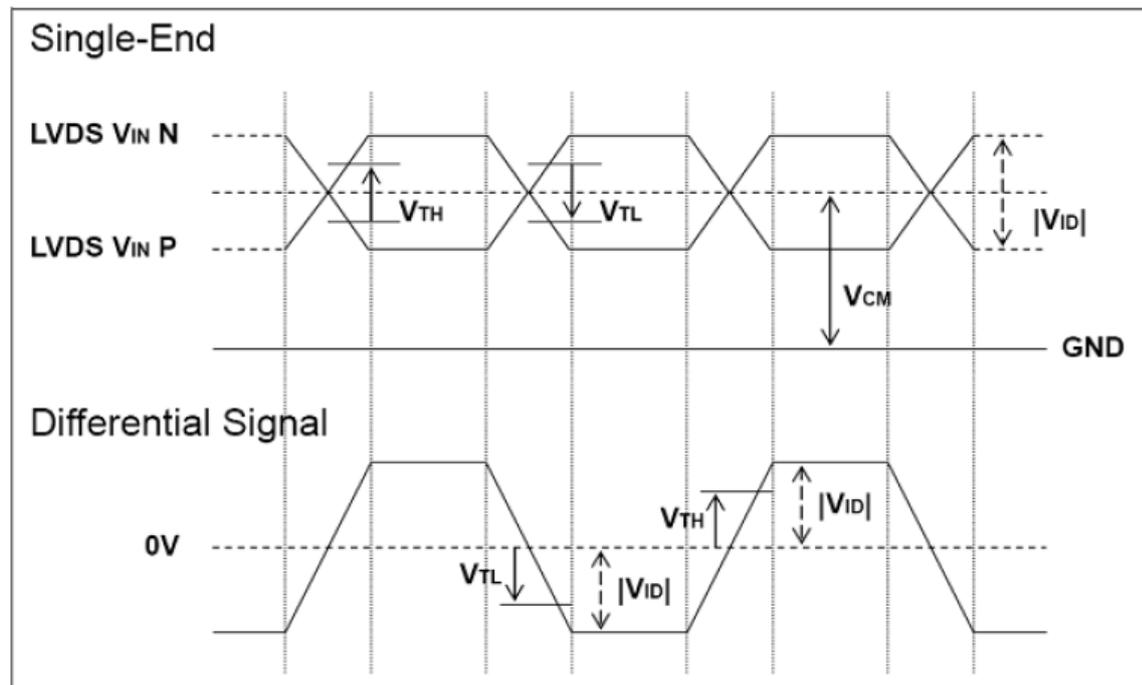
2. AC Characteristics

Description	Symbol	Min	Max	Unit	Note
Maximum deviation of input clock frequency during SSC	F_{DEV}	-	± 3	%	
Maximum modulation frequency of input clock during SSC	F_{MOD}	-	200	KHz	

Freq

F_{max}

F_{center} * F_{DEV}

F_{center}

F_{min}

$\dfrac{1}{F_{MOD}}$

< Spread Spectrum >

time
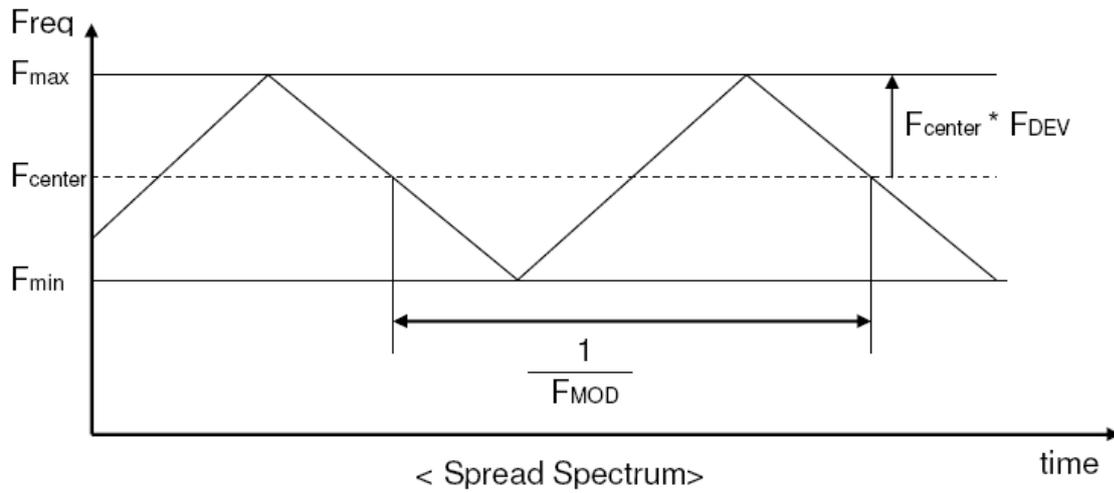
Pixel Format Image

Following figure shows the relationship of the input signals and LCD pixel format.

The input data format
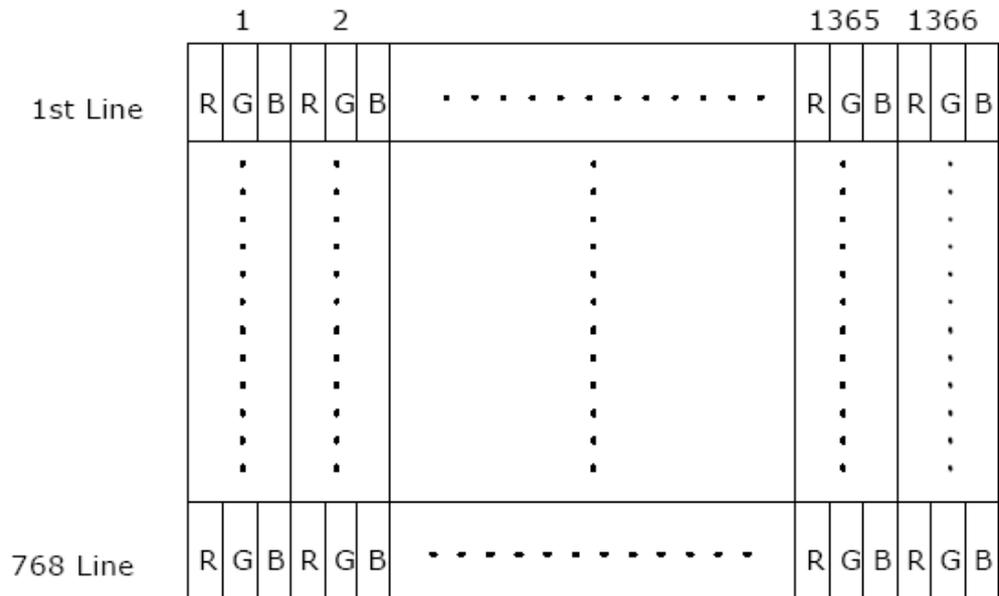
LVDS Data Mapping of NS Format

Note1: Normally, DE, VS, HS on EVEN channel are not used.
Note2: 8-bits signal input.

Signal Description

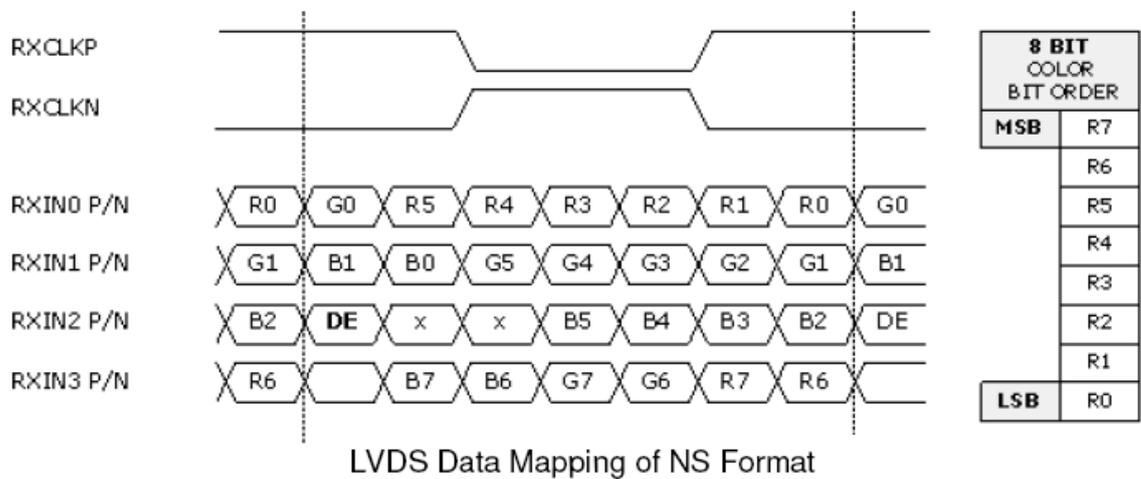| PIN #	SIGNAL NAME	DESCRIPTION
1	NC	No contact (For AUO internal use)
2	NC	No contact (For AUO internal use)
3	NC	No contact (For AUO internal use)
4	GND	Power Ground
5	RXIN0-	Negative LVDS differential data input (0)
6	RXIN0+	Positive LVDS differential data input (0)
7	GND	Power Ground
8	RXIN1-	Negative LVDS differential data input (1)
9	RXIN1+	Positive LVDS differential data input (1)
10	GND	Power Ground
11	RXIN2-	Negative LVDS differential data input (2)
12	RXIN2+	Positive LVDS differential data input (2)
13	GND	Power Ground
14	RXCLKIN-	Negative LVDS differential clock input (clock)
15	RXCLKIN+	Positive LVDS differential data input (clock)
16	GND	Power Ground
17	RXIN3-	Negative LVDS differential data input (3)
18	RXIN3+	Positive LVDS differential data input (3)
19	GND	Power Ground
20	NC	No contact (For AUO internal use)
21	NC	No contact (For AUO internal use)
22	NC	No contact (For AUO internal use)
23	GND	Power Ground
24	GND	Power Ground
25	GND	Power Ground
26	VDD	+5V power supply
27	VDD	+5V power supply
28	VDD	+5V power supply
29	VDD	+5V power supply
30	VDD	+5V power supply

Timing Characteristics

Basically, interface timing described here is not actual input timing of LCD module but close to output timing of SN75LVDS82DGG (Texas Instruments) or equivalent.

Signal	Item	Symbol	Min	Typ	Max	Unit
V-section	Period	Tv	788	808	1313	Th
	Active	Tdisp(v)	768	768	768	Th
	Blanking	Tblk(v)	20	40	545	Th
H-section	Period	Th	1432	1606	2047	Tclk
	Active	Tdisp(h)	1366	1366	1366	Tclk
	Blanking	Tblk(h)	66	240	681	Tclk
Clock	Period	Tclk	10.64	12.8	17.72	ns
	Frequency	Freq	55	78	90	MHz
Frame Rate	Frame Rate	F	50	60	76	Hz

Note1 : DE mode only
Note2 : Clock Frequency 90MHz(Max.)= 1416(H)*847(V)*75Hz

Timing diagram
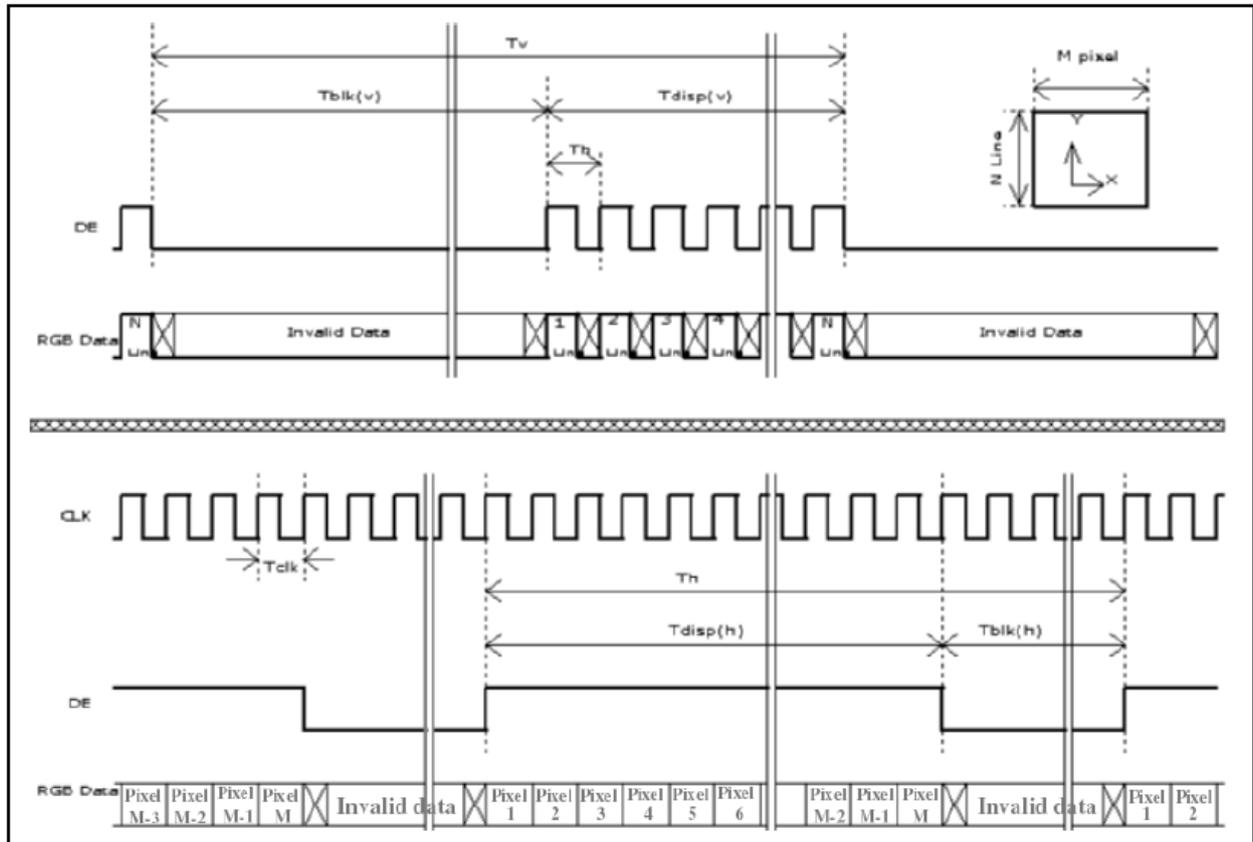
Power ON/OFF Sequence

VDD power and lamp on/off sequence are as follows. Interface signals are also shown in the chart. Signals from any system shall be Hi-Z state or low level when VDD is off.
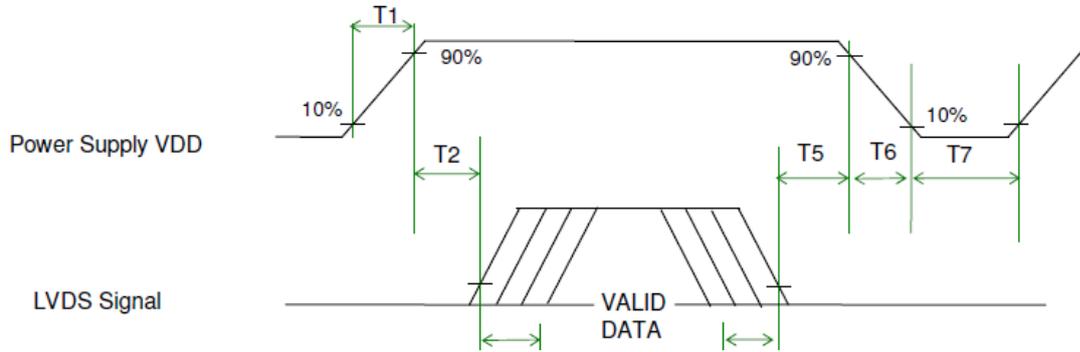

Connector & Pin Assignment

Physical interface is described as for the connector on module. These connectors are capable of accommodating the following signals and will be following components.

TFT LCD Module

Connector Name / Designation	Interface Connector / Interface card
Manufacturer	STM or P-TWO
Type Part Number	MSCKT2407P30HB (STM) / AL230F-A0G1D-P (P-TWO)
Mating Housing Part Number	FI-X30HL(JAE) (Locked Type) FI-X30H (JAE)(Unlocked Type)

Pin Assignment

Pin#	Signal Name	Pin#	Signal Name
1	NC	2	NC
3	NC	4	GND
5	RXIN0-	6	RXIN0+
7	GND	8	RXIN1-
9	RXIN1+	10	GND
11	RXIN2-	12	RXIN2+
13	GND	14	RXCLKIN-
15	RXCLKIN+	16	GND
17	RXIN3-	18	RXIN3+
19	GND	20	NC
21	NC	22	NC
23	GND	24	GND
25	GND	26	VDD
27	VDD	28	VDD
29	VDD	30	VDD

4.0 OPTICAL SPECIFICATION

Optical

Item		Symbol	Condition	Data	Unit	Note
Color chromaticity	Red	Rx	θ x=0 θ y=0 BM-7	0.649$\pm$0.03	-	Test Mode： （1）（2）（3）
		Ry		0.325$\pm$0.03	-	
	Green	Gx		0.309$\pm$0.03	-	
		Gy		0.640$\pm$0.03	-	
	Blue	Bx		0.148$\pm$0.03	-	
		By		0.049$\pm$0.03	-	
	White	Wx		0.299$\pm$0.03	-	
		Wy		0.310$\pm$0.03	-	
Center Luminance of White		Lc		400	cd/㎡	
Uniform		Lu		80	%	
Contrast Ratio		CR	θ x=0 θ y=0 Klein K-10	1000：1	-	Test Mode： （1）（4）
Color Saturation		NTSC		80	%	
Viewing Angle	Horizontal	θ x+	CR$\geqq$10	85	Deg	Test Mode： （1）（3）
		θ x-		85		
	Vertical	θ y+		80		
		θ y-		80		

Test Mode：

（**1**） Definition of Viewing Angle（θx，θy）：
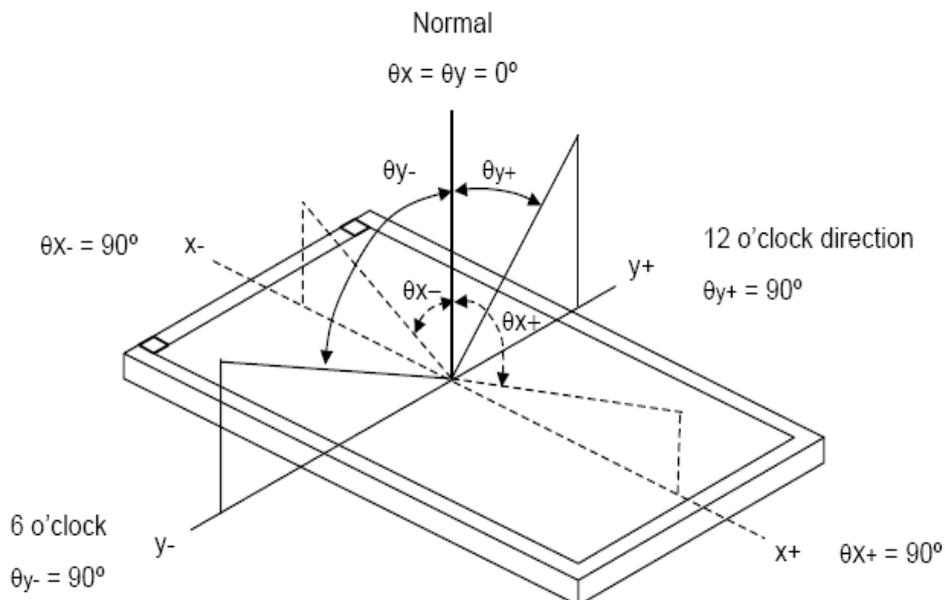
（**2**） Definition of Test Point：

Active Area
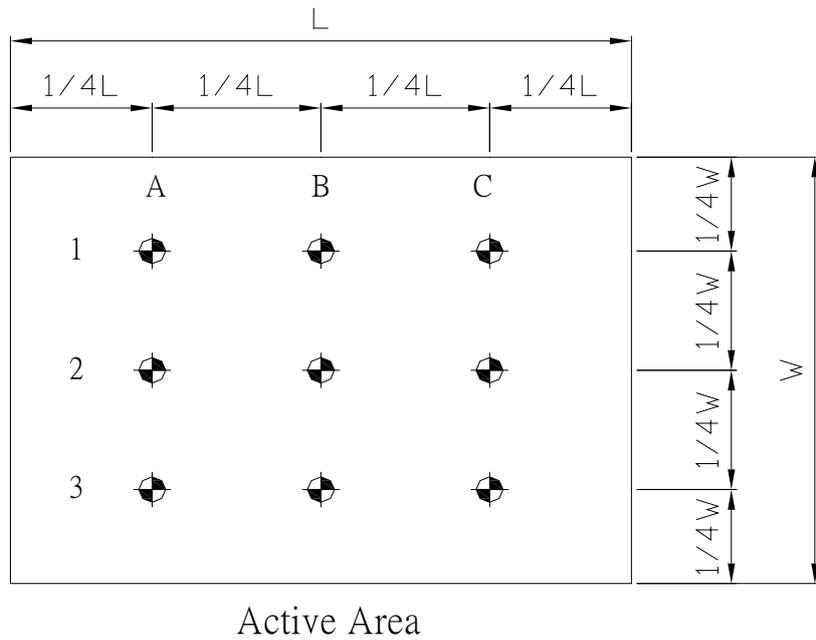
（**3**）**BM-7** Measurement Setup**:**
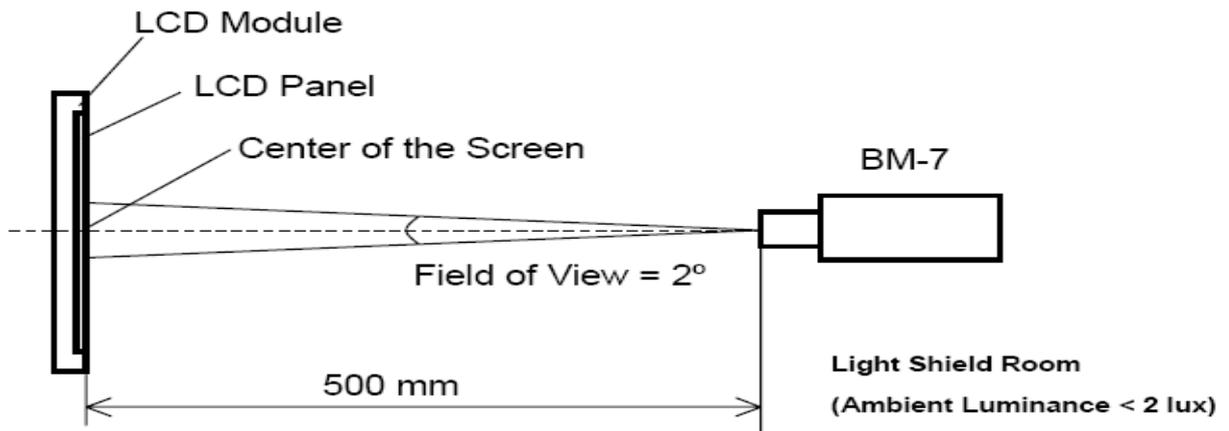
（**4**）**Klein K-10** Measurement Setup**:**
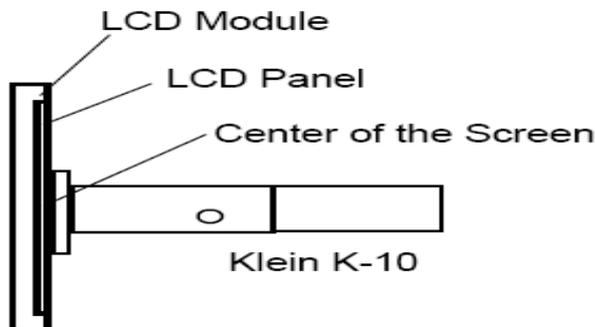
5.0 LED Driving Board

1. LED Application
This specification is applied to LED converter unit for LED backlight

2. Operating Characteristics

Item	Symbol	Conditions	MIN.	TYP.	MAX.	Unit	Remark
Input Voltage	Vin		10	12	14	V	DC
Input Current (Low Brightness)	IinL	VIN=Input Voltage, PWM =0%	0.0	-----	-----	A	
Input Current (High Brightness)	IinH	VIN=Input Voltage, PWM =100%	0.355	0.293	0.252	A	
LED Current (Low Brightness)	IoutL	VIN=Input Voltage, PWM =0%	0.0	-----	-----	Arms	
LED Current (High Brightness)	IoutH	VIN=Input Voltage, PWM =100%	0.130	0.134	0.138	A	
Working Frequency	Freq	VIN=Input Voltage, PWM =100%	800	1000	1200	KHZ	
PWM Frequency	Freq	VIN=Input Voltage	190	200	210	HZ	
Brightness Control	PWM	Connection of PWM	0	-----	100	%	DUTY
ON/OFF Control	Von	Normal Operation	2.5	-----	5	V	DC
ON/OFF Control	Voff	Normal Operation	0	-----	1.8	V	DC
Output Voltage	Vout	VIN=Input Voltage, PWM =100%	23.30	23.35	23.4	V	DC
Efficiency	η	VIN=Input Voltage, PWM =100%	85.2	88.9	91.5	%	Note 1

Note 1:Efficiency＝[(IoutH* Vout)/(IinH* Vin)] * 100%,Tolerance ±0.5%

3. Connector Socket

3-1. Input Connector : Input Connector :J1(JST S 8B-PH-SM3-TB or Compatible):

PIN No	Symbol	Description
1	Vin	DC+12V
2	Vin	DC+12V
3	Vin	DC+12V
4	GND	Ground
5	GND	Ground
6	GND	Ground
7	Brightness	Brightness PWM Control
8	Control	ON/OFF Control 0V(OFF) 2.5~5.0V(ON)

3-2 .Output Connector : J3(JST ZR-SM3A-TF or Compatible):

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

4. Mechanical Characteristics
   Dimension: 50mm*20mm*7mm
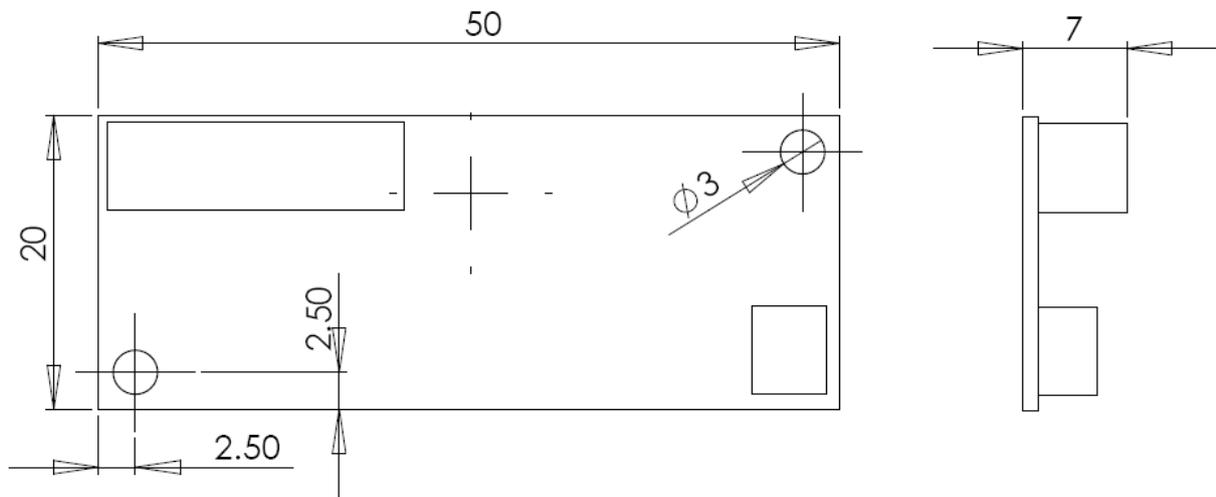
7.0 AD2662GDHM Specification & OSD Functions

We developed this A/D board to support industrial high brightness and commercial applications. This A/D board has many functions. It has an external luminance sensor as an option, an optional VR button to control brightness, fan rotation and RS232..

General Description

- Max Resolution Up To WUXGA
- Analog RGB Input up to 205MHz
  ULTRA-RELIABLE DVI INPUT
- HDMI INPUT
- Dual/single LVDS interface
- Support Panel DC5V or 3.3V, 12V Output
- External Fan Control by Software
- OSD Control
- Inverter Analog or PWM Dimming Control
- *External V.R. brightness control (optional)
- *External light sensor brightness control (optional)
- *External RS232 control (optional)
- CBVS, S-VIDEO, **YCbCr (optional) INPUT
  Audio in and 2Wx2 Audio Out(optional)

AD2662GDHM 125mmX75mm
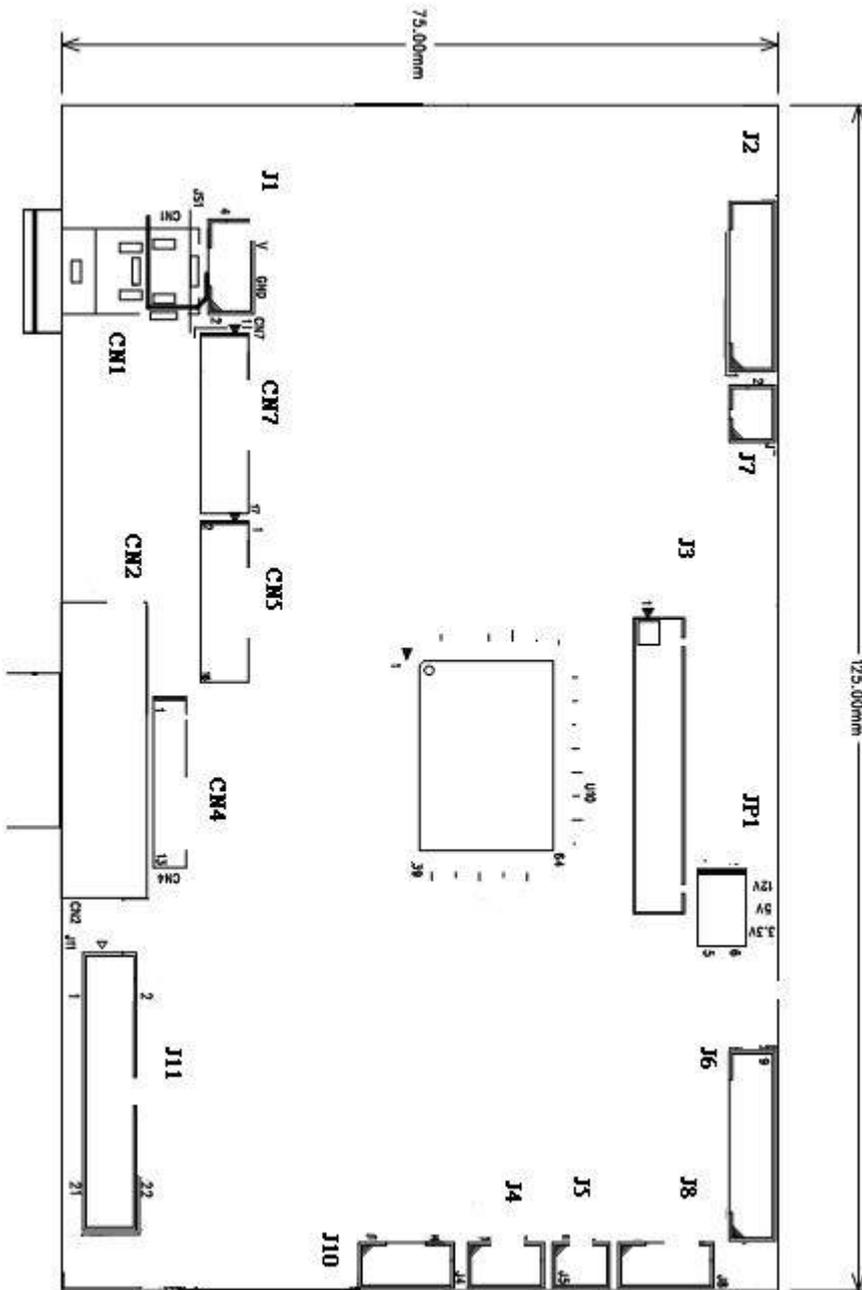
2. AD2662GDHM Board Pin Define

J3: Panel connector

Pin No.	Function	Pin No.	Function
1	RxO0-	16	RxE1+
2	RxO0+	17	RxE2-
3	RxO1-	18	RxE2+
4	RxO1+	19	RxEC-
5	RxO2-	20	RxEC+
6	RxO2+	21	RxE3-
7	RxOC-	22	RxE3+
8	RxOC+	23	GND
9	RxO3-	24	GND
10	RxO3+	25	GND
11	GND	26	GND
12	GND	27	NC
13	RxE0-	28	PANEL-VCC
14	RxE0+	29	PANEL-VCC
15	RxE1-	30	PANEL-VCC

CN7: HDMI Connector (18pin 2.0mm)

Pin No.	Function	Pin No.	Function	Pin No.	Function
1	T.M.D.S. Data2+	9	T.M.D.S. Data0+	17	HDMI_SCL
2	T.M.D.S. Data2-	10	T.M.D.S. Data0-	18	HDMI_SDA
3	Shield	11	Shield		
4	Shield	12	CEC		-
5	T.M.D.S. Data1+	13	T.M.D.S. Clock+		
6	T.M.D.S. Data1-	14	T.M.D.S. Clock-		
7	Shield	15	HDMI 5V		
8	Shield	16	Hot Plug Detect		

CN5: **DVI-D Connector (16pin 2.0mm)**

Pin No.	Function	Pin No.	Function	Pin No.	Function
1	RX2-	7	DDC_SDA	13	GND
2	RX2+	8	DDC_SCL	14	GND
3	RX1-	9	GND	15	DVI HP
4	RX1+	10	GND	16	DVI_5V
5	RX0-	11	RXC-		
6	RX0+	12	RXC+		

CN2: **Analog RGB Input connector (D-SUB 15Pin)**

Pin No.	Symbol	Description	Pin No.	Symbol	Description
1	RED	Analog Red	9	+5V	+5VDDC
2	GREEN	Analog Green	10	SGND	Sync GND
3	BLUE	Analog Blue	11	NCD	Reserved
4	GND	Reserved	12	SDA	DDC Serial Data
5	NC	VGA_CAB	13	HSYNC	Horizontal Sync
6	RED_RTN	Red Return	14	VSYNC	Vertical Sync
7	GREEN_RTN	Green Return	15	SCL	DDC Data Clock
8	BLUE_RTN	Blue Return			

CN4: **Analog RGB Input connector (13pin connector)**

Pin No.	Symbol	Description	Pin No.	Symbol	Description
1	SCL	DDC Data Clock	8	BLUE	Analog Blue
2	SDA	DDC Serial Data	9	GGND	Green Return
3	GND	Reserved	10	GREEN	Analog Green
4	GND	Reserved	11	RGND	Red Return
5	HSYNC	Horizontal Sync	12	RED	Analog Red
6	VSYNC	Vertical Sync	13	+5V	+5VDDC
7	BGND	Blue Return			

JS1: **Power DIN(12V)**

Pin No.	Function	Pin No.	Function
1	12VDC	2	12VDC
3	GND	4	GND

CN1: Power Jack (12V)

Pin No.	Function	Pin No.	Function
1	12VDC	2	GND
3	GND		

J1: Power connector (12V) (4PIN 2.0mm)

Pin No.	Function	Pin No.	Function
1	GND	2	GND
3	12VDC	4	12VDC

J8: Power out connector (5V/12v)(4PIN 2.0mm)

Pin No.	Function	Pin No.	Function
1	5VDC	2	GND
3	12VDC	4	GND

J2: Inverter Connector(8PIN 2.0mm)

Pin No.	Symbol	Description	Pin No.	Symbol	Description
1	ON/OFF	Backlight ON/OFF	5	GND	GND
2	BRIGHT	Dimming adjust	6	12VDC	Input 12VDC
3	GND	GND	7	12VDC	Input 12VDC
4	GND	GND	8	12VDC	Input 12VDC

J7: FAN (2PIN 2.0mm)

Pin No.	Function	Pin No.	Function
1	FAN(+)	2	GND

J6: Key Pad (9PIN 2.0mm)

Pin No.	Function	Pin No.	Function
1	POWER KEY	6	MENU KEY
2	GREEN LED	7	AUTO KEY
3	RED LED	8	GND
4	DOWN KEY	9	FUNCTION KEY
5	UP KEY		

J10: Speaker Connector (4PIN 2.0mm)

Pin No.	Function	Pin No.	Function
1	SPK_R+	2	SPK_R-
3	SPK_L-	4	SPK_L+

J11 Extern Funtion Connector (11P X 2PIN 2.0mm)

Pin No.	Function	Pin No.	Function
1	Pb	2	Y
3	GND	4	Pr
5	GND	6	SY
7	GND	8	SC
9	GND	10	AV
11	GND	12	GND
13	TXD	14	RXD
15	GND	16	GND
17	GND	18	GND
19	Audio-R	20	Audio-L
21	GND	22	GND

J5: Ambient (2PIN 2.0mm)

Pin No.	Function	Pin No.	Function
1	3.3VDC	2	Sensor Out

J4: VR connector (3PIN 2.0mm)

Pin No.	Function	Pin No.	Function
1	3,3VDC	2	VR Out
3	GND		

JP1: PANEL VCC (3PIN 2.54mm)

Pin No.	Function	Pin No.	Function
1-2	12V	5-6	3.3V
3-4	5V		

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, H-frequency,and V-frequency of the panel.Version shows the firmware control version. This 2 information is not changeable by user.

There are 7 sub pages inside the OSD manual, Brightness, Signal select, Sound, Color, Image, Tools, and Exit.

When you press "menu" button, you enter the "Brightness" sub page.   You will see 5 selections:

press ''menu''   press ''menu   press ''menu''

OSD Brightness:

press ''right'' key

press "menu" once, you can go into adjust the brightness.   Press "left" you can dim down the brightness to "0", while press "right" you can increase the brightness to "100".

Ambient light sensor: press this Icon, must to accompany with Litemax ambient light sensor to auto dimming.(OPTION)

Potentiometer: press this icon, adjust VR function.(OPTION)

Ambient light sensor with OSD offset: press this Icon

Press 'menu'' once, you can adjust min. luminance to fit your application (OPTION)
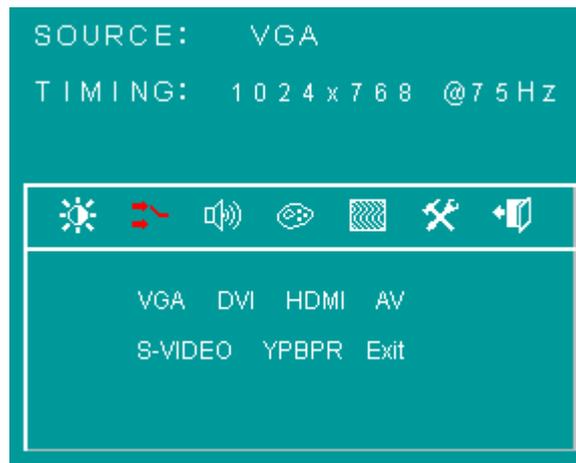
Contrast: Press "menu" and "right" you can adjust the contrast from "0" to "100" by pressing the "left" and "right".

Exit: You can exit this sub menu back to normal screen.

Source :

```
SOURCE:    VGA
TIMING:   1024x768  @75Hz


☀  ⇥  ◁»  ◉  ▨  ✕  ◄▯

     VGA  DVI  HDMI  AV
    S-VIDEO  YPBPR  Exit
```

There are 6 options for "Source"sub page.
There have VGA,DVI,HDMI,AV,S-VIDEO,YPBPR source input.

Sound :

```
SOURCE:    VGA
TIMING:   1024x768  @75Hz


☀  ⇥  ◁»  ◉  ▨  ✕  ◄▯

       ◁»     ◁»     ◄▯
```

There are 3 options for "Sound" sub page.

Audio Volume: Audio volume adjustment.

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

Exit: back to the normal screen.

Color :

 Auto Color: by press this "Auto Color" option, you can get the optimal color performance.

 SRGB: Windows standard color setting.

 Color Tempture: You can have 3 options in this selection , have User/6500/9300

 Color Tempture User

 Color Tempture_6500K

 Color Tempture_93OOK

 Exit: back to the normal screen.

"user mode", "6500K" (Warm color scheme), "9300K (Cold color scheme).
Default is "user", and inside all "R", "G", and "B" are set "100"

Image :

Go into the "Image" page, you can see below picture.
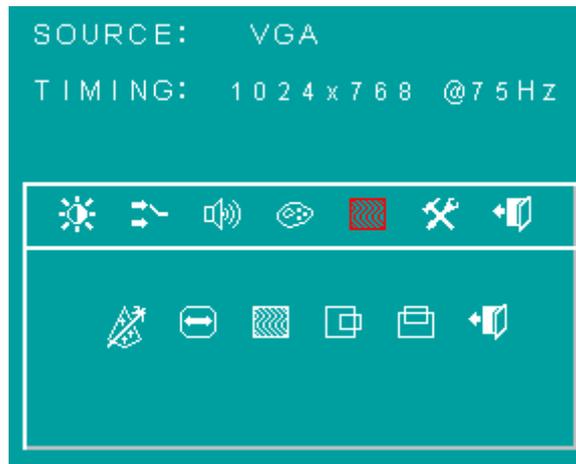
	Auto just: Pressing this option, the AD5621 will adjust the optimal frequency of horizontal and vertical. You will see "Auto tune…." On the screen for around 3 seconds.
	Clock: If you are not satisfied about the Autotune result, you can adjust manually by "Clock". The screen will be "wider" if you adjust this function.
	Phase: If you see "double image" on characters, you can adjust "Phase" to make it perfect image.
	HPos: You can shift the screen horizontally by this function.
	Vpos: You can shift the screen vertically by this function.
	Exit: Back to normal screen.

TOOLS :

On the "Tools" sub menu, you will see 4 icons.

Osd Control: Select this option, you will see 4 more options:

Factory_Reset: By pressing this, the screen will be back to the factory setting on very beginning and lost all the personal settings.

Sharpness: You can make the characters looks sharper.

Exit

Osd_time: You can selection the time of OSD from 2 sec. to 16 sec.   □

Osd_HPos: You can move the OSD horizontally over the screen.

Osd_VPos: You can move the OSD Vertically over the screen.

Exit: back to main menu.

BURNIN   MODE :

Factory Burn-in mode: While your VGA cable is connected on the monitor, press "Menu" and Left and Right <" simultaneously, you will see "BURN IN MODE" on the center of the screen for 3 sec. Then unplug the VGA cable, the screen will show Red, Green, Blue, White, and Black in sequence automatically.

You can plug in the VGA signal cable,   and re-plug the power connector to exit the burn-in mode.

KEY LOCK MODE :

OSD Lock Function: It is possible to lock all the OSD buttons to prevent unauthorized changes to occur by pressing "Menu" and "right >" buttons simultaneously.   You will see the "lock" icon below on the center of the screen for 3 seconds.   If any button is pushed after the lock function is initiated, the below icon will appear on the screen.'
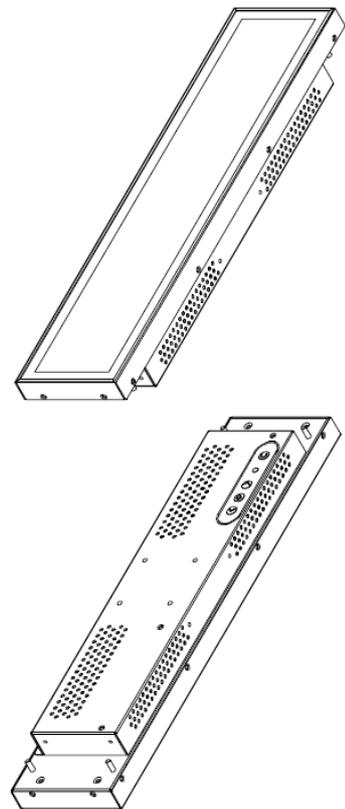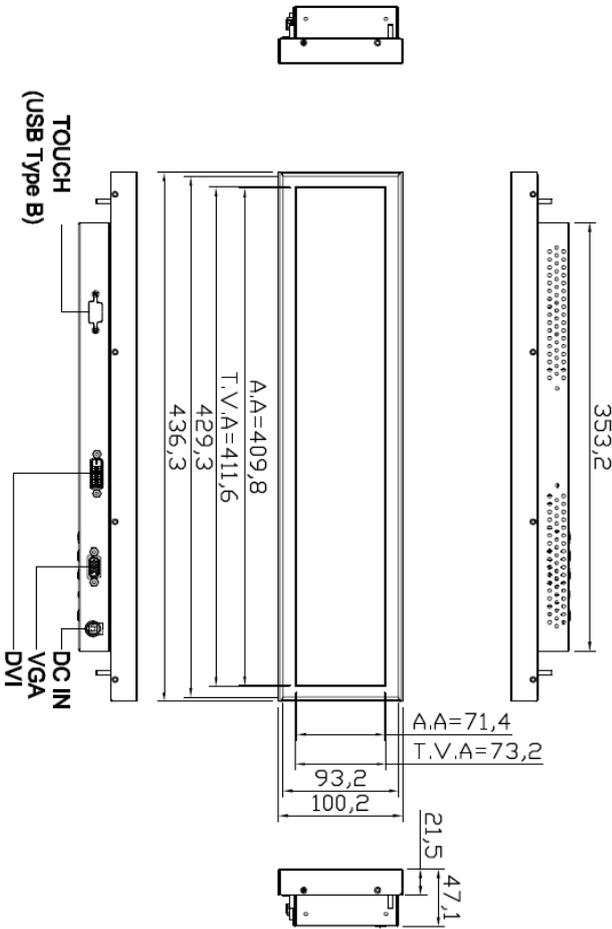

To release the OSD lock, press "Menu" and "Right >".   The below icon will appear on the center of

the screen for 3 seconds.   Now all OSD keys are active again.

8.0 MECHANICAL DRAWING

9.0 PRECAUTIONS

HANDLING PRECAUTIONS
(1) The module should be assembled into the system firmly by using every mounting hole. Be careful not to twist or bend the module.
(2) While assembling or installing modules, it can only be in the clean area. The dust and oil may cause electrical short or damage the polarizer.
(3) Use fingerstalls or soft gloves in order to keep display clean during the incoming inspection and assembly process.
(4) Do not press or scratch the surface harder than a HB pencil lead on the panel because the polarizer is very soft and easily scratched.
(5) If the surface of the polarizer is dirty, please clean it by some absorbent cotton or soft cloth. Do not use Ketone type materials (ex. Acetone), Ethyl alcohol, Toluene, Ethyl acid or Methyl chloride. It might permanently damage the polarizer due to chemical reaction.
(6) Wipe off water droplets or oil immediately. Staining and discoloration may occur if they left on panel for a long time.
(7) If the liquid crystal material leaks from the panel, it should be kept away from the eyes or mouth. In case of contacting with hands, legs or clothes, it must be washed away thoroughly with soap.
(8) Protect the module from static electricity, it may cause damage to the C-MOS Gate Array IC.
(9) Do not disassemble the module.
(10) Do not pull or fold the lamp wire.
(11) Pins of I/F connector should not be touched directly with bare hands.

STORAGE PRECAUTIONS

(1) High temperature or humidity may reduce the performance of module. Please store LCD module within the specified storage conditions.
(2) It is dangerous that moisture come into or contacted the LCD module, because the moisture may damage LCD module when it is operating.
(3) It may reduce the display quality if the ambient temperature is lower than 10 ℃. For example, the response time will become slowly, and the starting voltage of lamp will be higher than the room temperature.

OPERATION PRECAUTIONS
(1) Do not pull the I/F connector in or out while the module is operating.
(2) Always follow the correct power on/off sequence when LCD module is connecting and operating. This can prevent the CMOS LSI chips from damage during latch-up.