



# LITEMAX SSF/SSH1033

Spanpixel

Sunlight Readable 9.98" LCD Display

(1<sup>st</sup> Edition 8/13/2013 )

All information is subject to change without notice.

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## RECORD OF REVISION

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Version	Date	Description	Remark
V1.0	Aug/5/2013	Initial Release	

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## 1.0 GENERAL DESCRIPTION

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### OVERVIEW

The SSF/SSH1033 is a 9.98 inch color TFT-LCD display with special aspect ratio 16:3 and wide resolution 800 x 200 (800 horizontal by 200 vertical pixel array). It is Litemax's Spanpixel series product which designed for high brightness 700 nits display, power efficiency LED backlight system and fanless display.

The SSD1033 build in AD board supports input ports VGA ,S-video and AV, optional ports are DVI-D RS232 input.

Each pixel is divided into Red, Green and Blue sub-pixels or dots which are arranged in vertical stripes. Gray scale or the brightness of the sub-pixel color is determined with 8-bit gray scale signal for each dot. It is intended to support display where wide viewing angle, high color saturation, and high color depth.

### FEATURES

- 9.98" Resizing LCD
- Ultra Wide Screen (16:3)
- High Brightness 700 nits
- LED Backlight
- Low Power Consumption
- High Uniformity
- Wide Dimming

### APPLICATION

- Out/Indoor Display
- Out/Indoor Digital Signage
- Quick Service Restaurant Display Product

### GENERAL SPECIFICATIONS

Model No.	SSF/SSH1033
LCD Display	9.98" Resizing LCD
Display Area (mm)	246.6x 61.5 mm mm
Display Surface	Anti-Glare hard coated
Luminance	700 cd/m <sup>2</sup>
Resolution	800 x 200
Contrast Ratio	600 : 1
Display Colors	262K colors
Pixel Arrangement	RGB (Red, Green, Blue) vertical stripe
Pixel Pitch (mm)	0.3075 x 0.3075 mm
Pixel Per Inch (PPI)	82.6
Response Time	35ms
Signal Connector	15 Pin D-sub, 29 Pin DVI
F/R Control Button	Power Switch, Menu, Select (+,-)
OSD Menu	Brightness, Contrast, H/V Position, Color, Phase, Clock, Language, Management
Power Consumption	3.8W / 9.6W
Option	Touch for customize (Resistive/ Capacitive)

※ Specifications subject to change without notice.  
SSD= Panel+ LED Driving Board + Control Board

## 2.0 ABSOLUTE MAXIMUM RATINGS

### ABSOLUTE RATINGS

Parameter	Symbol	Rating	Unit	Remarks
Power Supply Voltage	-0.3 ~ +6.0	V	Ta = 25°C	Ta = 25°C
Input voltage for signals	Vi	-0.3 ~ +3.3	V	Ta = 25°C
Light bar peak forward current	I <sub>F</sub>	≤ 150	mArms	Note 3
Storage temperature	T <sub>st</sub>	-30 ~ +80	°C	Note 4
Operating temperature	T <sub>op</sub>	-20 ~ +70	°C	Note 4, 5
Absolute humidity	AH	≤ 70	g/m <sup>3</sup>	Ta > 50°C
Operating altitude	-	≤ 4,850	m	-20°C ≤ Ta ≤ 70°C
Storage altitude	-	≤ 13,600	m	-30°C ≤ Ta ≤ 80°C

Note1: Display signals are DA0+/-, DA1+/-, DA2+/-, DA3+/-, CKA+/-, DB0+/-, DB1+/-, DB2+/-, DB3+/-, and CKB+/-.

Note2: Function signal is MSL.

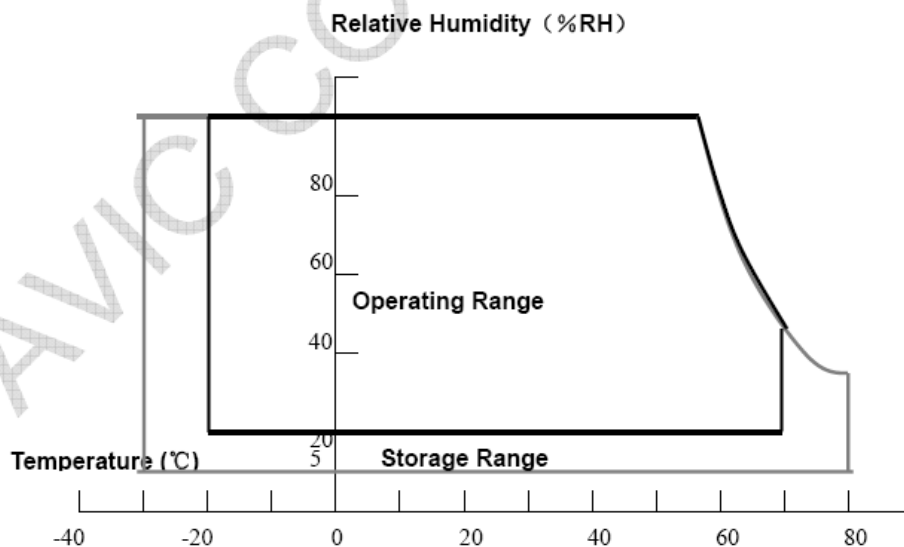
Note3: Temperature and relative humidity range is shown in the figure below.

(a) 90%RH Max. (Ta ≤ 40°C)

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

(c) No condensation.

Note4: The temperature of panel display surface area should be -20°C Min and 80°C Max.



### 3.0 ELECTRICAL SPECIFICATION

#### 3.1 ELECTRICAL CHARACTERISTICS

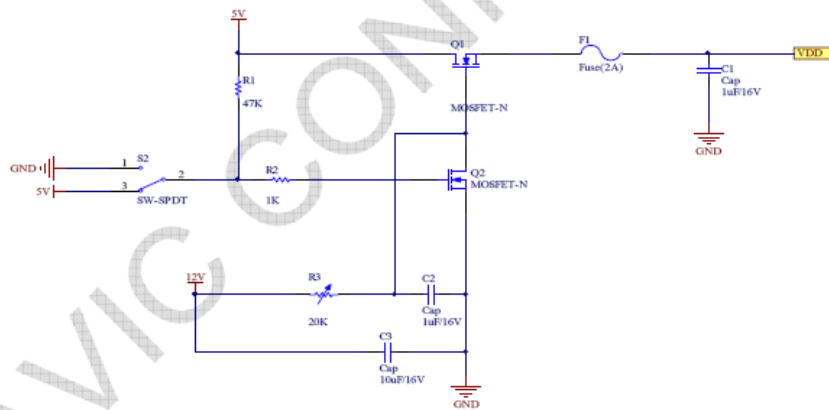
##### DRIVING FOR LCD

Parameter	Symbol	min.	typ.	max.	Unit	Remarks
Power supply voltage	VDD	3.0	3.3	3.6	V	-
Power supply current	IDD	-	-	325 Note 1	mA	at VDD = 3.3V
Permissible ripple voltage	VRP	-	-	100	mV	VDD
Differential input voltage	Vid	250		450	mV	
Differential input threshold voltage for LVDS receiver	Low	VTL	-100	-	mV	VCM = 1.25V Note2
	High	VTH	-	100	mV	
Input voltage width for LVDS receiver	Vi	0	-	2.4	V	-
Terminating resistor	RT	-	100	-	Ω	-
Rush current	I <sub>rush</sub>	-	-	1.5	A	Note3

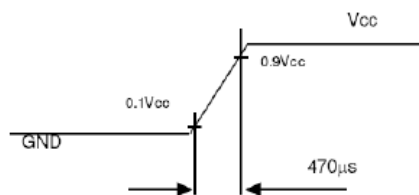
Note 1: All black pattern

Note 2: Common mode voltage for LVDS receiver

Note 3: Measurement Conditions:



**Vcc rising time is 470us**



## DRIVING FOR BACKLIGHT

(Ta=25°C) Note1

Parameter	Symbol	min.	typ.	max.	Unit	Remarks
Light bar operation voltage (for reference)	V <sub>LED</sub>	25	-	33	Vrms	Operating with fixed driving current
Light bar operation current (pin)	I <sub>LED</sub>	-	80	-	mArms	Note1
Light bar operating lifetime	Hr	50000	-	-	Hour	I <sub>LED</sub> =80mA, Note3

Note1: The backlight of this product is made up of 1 light bar, LED to be 3020, 20pieces, 10 serials and 2 parallels.

Note2: The light bar can work normally if the PWM dimming ratio range is from 0% to 100% and the operation current is 80mA.

Note3: The operating lifetime is mean time to half-luminance. In case the product works under room temperature environment.

### 3.2 Interface Connections

CN1: MSB240420HE (Produced by STM) or equivalent.

Pin	Name	Description
1	VCC	3.3V Power Supply
2	VCC	3.3V Power Supply
3	GND	Ground
4	6-8Bit SEL	Select 6 or 8 Bits LVDS Input (VCC:8Bits ; GND/NC: 6Bits)
5	RIN0-	Negative(-) LVDS differential data input
6	RIN0+	Positive(+) LVDS differential data input
7	GND	Ground
8	RIN1-	Negative(-) LVDS differential data input
9	RIN1+	Positive(+) LVDS differential data input
10	GND	Ground
11	RIN2-	Negative(-) LVDS differential data input
12	RIN2+	Positive(+) LVDS differential data input
13	GND	Ground
14	CLKIN-	Clock Signal(-)
15	CLKIN+	Clock Signal(+)
16	GND	Ground
17	RIN3-	Negative(-) LVDS differential data input (Used for 8Bits LVDS Input; NC for 6Bits)
18	RIN3+	Positive(+) LVDS differential data input (Used for 8Bits LVDS Input; NC for 6Bits)
19	REVERSE	Display Reversed Function (VCC: Display Reverse; GND/NC: Normal Display)
20	NC/GND	Test Function Pin(Do not set this pin to High)



### 3.3 Signal Timing Specification

Parameter		Symbol	min.	typ.	max.	Unit	Remarks
Clock	Frequency	1/tc	33.16	39.80	49.74	MHz	LVDS transmitter input
		tc	30.16	25.13	20.10	ns	
	Rise time, Fall time	-	Refer to the timing characteristics of LVDS transmitter			ns	Note 1
Duty	-				-		
Horizontal signals	Cycle	th	148	18.0	26.5	μs	55.5kHz(typ.)
			920	1056	1240	CLK	
	Display period	thd	800			CLK	-
Vertical signals	Cycle	tv	133	16.67	20	ms	60.0Hz(typ.)
			608	628	650	H	
	Display period	tvd	600			H	-
DE/Data	Setup time	-	Refer to the timing characteristics of LVDS transmitter			ns	Note 1
	Hold time	-				ns	
	Rise time, Fall time	-				ns	

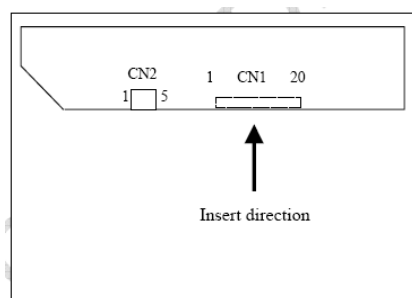
Note1: See the data sheet of LVDS transmitter.

### 3.4 BACKLIGHT

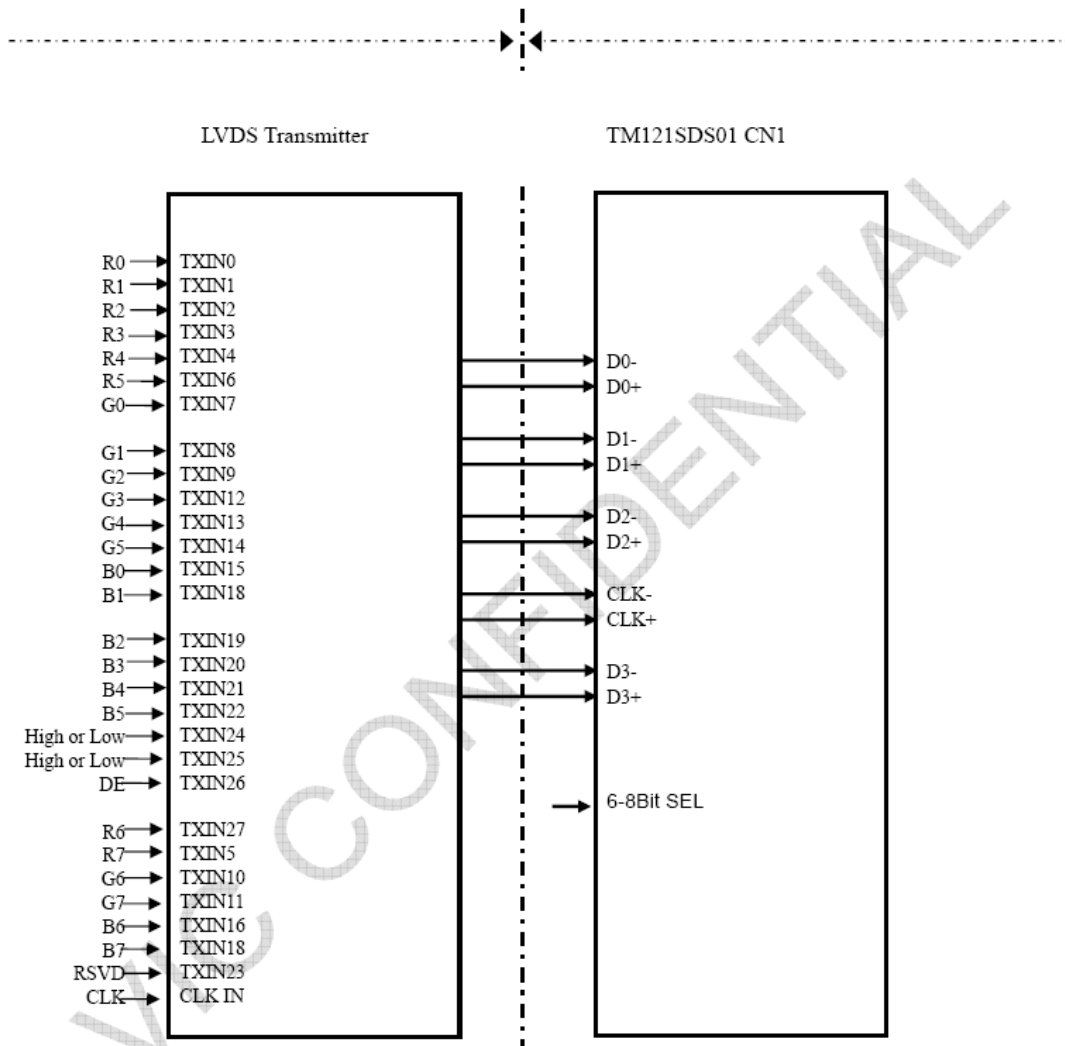
CN2: MSB24038P5 (Produced by STM) or equivalent.

Pin	Symbol	Signal Name
1	Vcc	12V
2	GND	GND
3	Enable	5V-On / 0V-Off
4	Dimming	PWM Dimming or Analog Dimming
5	NC	NC

### 3.5 POSITION OF PLUGS AND A SOCKET



### 3.6 CONNECTION BETWEEN RECEIVER AND TRANSMITTER FOR LVDS



Note1: The lowest bit (RA0, GA0, BA0, RB0, GB0, BB0), the most upper bit (RA7, GA7, BA7, RB7, GB7, BB7)

Note2: Connecting cable between LCD panel's connector and transmitter should use 100Ω twisted line.

Note3: If only Hsync and Vsync, the product don't work. Make sure DE signal has been input.

### 3.7 DISPLAY COLORS AND INPUT DATA SIGNALS

This product can display in equivalent to 16.2M colors in 256 scales. Also the relation between display colors and input data signals is as the following table.

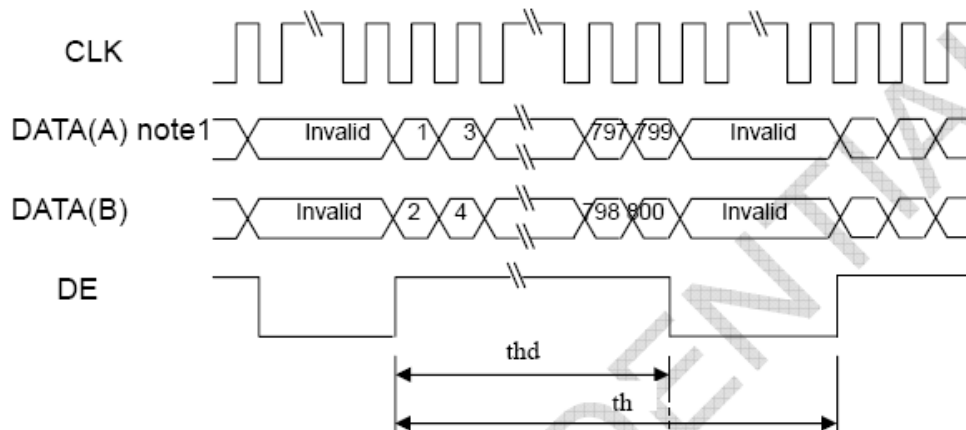
Display colors		Data signal (0:Low level, 1:High Level)																							
		R7	R6	R5	R4	R3	R2	R1	R0	G7	G6	G5	G4	G3	G2	G1	G0	B7	B6	B5	B4	B3	B2	B1	B0
Basic Color	Black	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Blue	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1
	Red	1	1	1	1	1	1	1	1	0	0	0	0	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
	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
	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
Red grayscale	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	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Dark ↑	0	0	0	0	0	0	1	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
	Bright	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	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	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 grayscale	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	1	0	0	0	0	0	0	0	0
	Dark ↑	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	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Bright	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	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	0	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	
Blue grayscale	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	0	0	0	0	1
	Dark ↑	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	0	0	0	0	0	0	0	0	0	0
	Bright	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	0	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	0	1	1	1	1	1	1	1	1	

### 3.8 TIMING CHARACTERISTICS

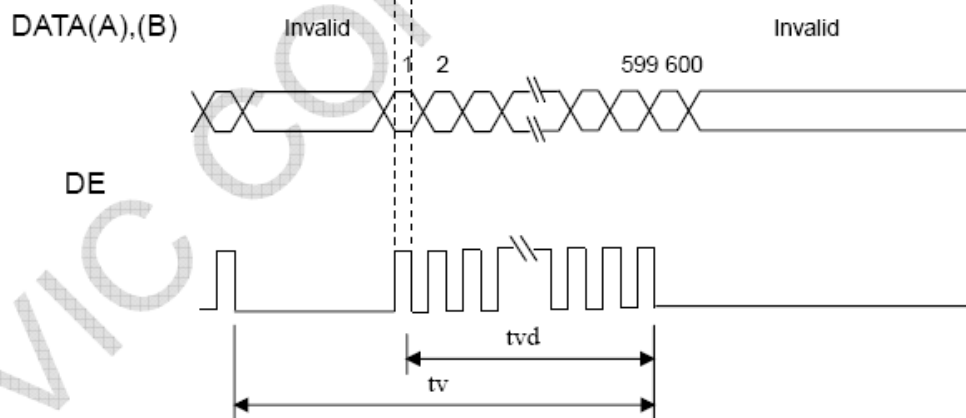
Parameter		Symbol	min.	typ.	max.	Unit	Remarks
Clock	Frequency	1/tc	33.16	39.80	49.74	MHz	LVDS transmitter input
		tc	30.16	25.13	20.10	ns	
	Rise time, Fall time	-	Refer to the timing characteristics of LVDS transmitter			ns	Note 1
	Duty	-				-	
Horizontal signals	Cycle	th	148	18.0	26.5	μs	55.5kHz(typ.)
			920	1056	1240	CLK	
	Display period	thd	800			CLK	-
Vertical signals	Cycle	tv	13.3	16.67	20	ms	60.0Hz(typ.)
			608	628	650	H	
	Display period	tvd	600			H	-
DE/Data	Setup time	-	Refer to the timing characteristics of LVDS transmitter			ns	Note 1
	Hold time	-				ns	
	Rise time, Fall time	-				ns	

Note1: See the data sheet of LVDS transmitter.

### Horizontal timing



### Vertical timing



Note 1:

DATA(A)=RA0-RA7,GA0-GA7,BA0-BA7

DATA(B)=RB0-RB7,GB0-GB7,BB0-BB7

## PIXEL DATA ALIGNMENT OF DISPLAY IMAGE

The following chart is the coordinates of per pixel

Odd Pixel: RA= R DATA

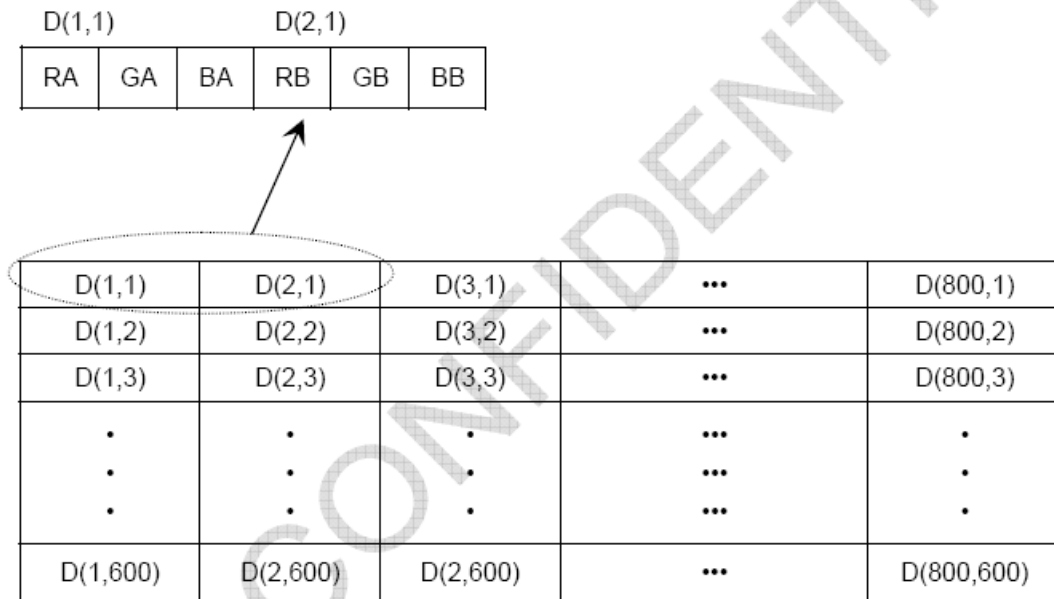
GA= G DATA

BA= B DATA

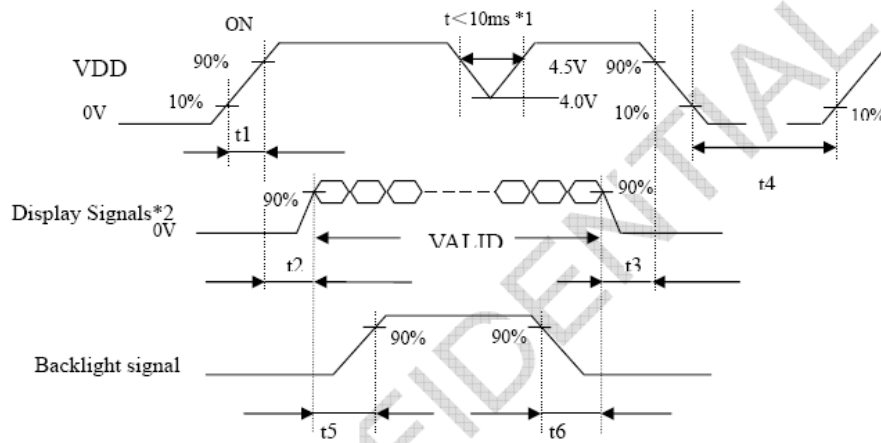
Even Pixel : RB=R DATA

GB=G DATA

BB=B DATA



### 3.9 POWER SUPPLY VOLTAGE SEQUENCE



#### Timing Specifications:

- t1 :0.47ms<t1 <10ms;
- t2 :0.5 ms<t2 <50ms;
- t3 :0ms<t3 <50ms;
- t4 :t4 >1000ms;
- t5 :t5 >200ms;
- t6 :t6 >200ms;

\*1. When VDD is on, but the value is lower than 4.5V, a protection circuit may work, then the module may not display.

\*2 The signal line is not connected with the module, at the end of cable the terminal resistor of 100Ω should be added.

Note1: Display signals (D0+/-, D1+/-, D2+/-, D3+/- and CK+/-) must be "0" voltage, exclude the VALID period (See above sequence diagram). If these signals are higher than 0.3 V, the internal circuit is damaged.

If some of display signals of this product are cut while this product is working, even if the signal input to it once again, it might not work normally. If customer stops the display signals, they should cut VDD.

Note2: When VDD is on, it should be set above 4.0V.

Note3: The backlight power supply voltage should be inputted within the valid period of display and

When the power supply is designed, the next form can give the reference. If the voltage ripple is over the value in next form, the noise should be seen in display area.

Ripple (Measured at input terminal of power supply)

	VDD (3.3V to drive the panel)
Ripple voltage	≤200mVP-P (Including spike noise)

Parameter	Fuse		Rating	Fusing current	Remarks
	Type	Supplier			
VDD	FCC16152ABTP	KAMAYA	1.5A 32V	-	

Note1: There are different power supply systems from the power input terminal. The power supply capacity should be less than the fusing current. If the power supply capacity is above the fusing current, the fuse may blow in a short time, and then nasty smell, smoking and so on may occur.

## 4.0 OPTICAL CHARACTERISTICS

### TEST CONDITIONS

Optical characteristics are determined after the unit has been 'ON' and stable for approximately 45 minutes in a dark environment at 25. The values specified are at an approximate distance 50cm from the LCD surface at a viewing angle of  $\Phi$  and  $\theta$  equal to 0°.

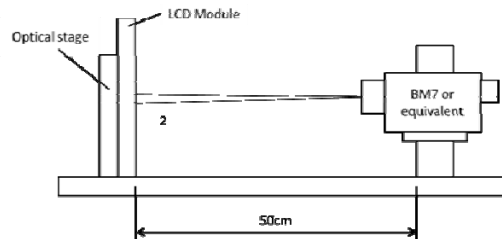


FIG. 1 Measurement Set Up

### Optical Specifications

Item	Symbol	Min.	Typ.	Max.	Unit	Note
Contrast Ratio	CR <sub>n</sub>	-	600	-	-	[1]
Luminance of White	L <sub>Ave</sub>	-	700	-	cd/m <sup>2</sup>	[2]
Response Time	τ <sub>DRV</sub>	-	35	-	ms	[3]
Chroma ticity	Red	R <sub>x</sub>	Typ.-0. 03	0.5859	Typ.+0 .03	-
		R <sub>y</sub>		0.3335		-
	Green	G <sub>x</sub>		0.3195		-
		G <sub>y</sub>		0.6018		-
	Blue	B <sub>x</sub>		0.1469		-
		B <sub>y</sub>		0.0761		-
	White	W <sub>x</sub>		0.2901		-
		W <sub>y</sub>		0.2964		-
Viewing Angle	x axis, right( $\varphi=0^\circ$ )	$\theta_r$	-	80	-	Degree
	x axis, left( $\varphi=180^\circ$ )	$\theta_l$	-	80	-	
	y axis, up( $\varphi=90^\circ$ )	$\theta_u$	-	65	-	
	y axis, down ( $\varphi=0^\circ$ )	$\theta_d$	-	75	-	

#### Note:

1. Contrast Ratio(CR) is defined mathematically as :Surface Luminance at all white pixels CR = Surface Luminance at all black pixels. It is measured at center 1-point.
2. Surface luminance are determined after the unit has been 'ON' and 1Hourafterlighting the backlight in a dark environment at 25±2°C. Surface luminance is the luminance value at center 1-point across the LCD surface 50cm from the surface with all pixels displaying white. For more information see the FIG. 2.
3. The output signals of photo detector are measured when the input signals are changed for "White" to "Black" (falling time) and form "Black" to "White" (rising time), respectively. The response time Interval is between 10% and 90% of amplitudes, see the FIG.3.
4. Viewing angle is the angle at which the contrast ratio is greater than 10. The angles are determined or the horizontal or x axis and the vertical or y axis with respect to the z axis which is normal to the LCD module surface. For more information, see the FIG. 4.



Measuring point for surface luminance & measuring point for luminance variation.

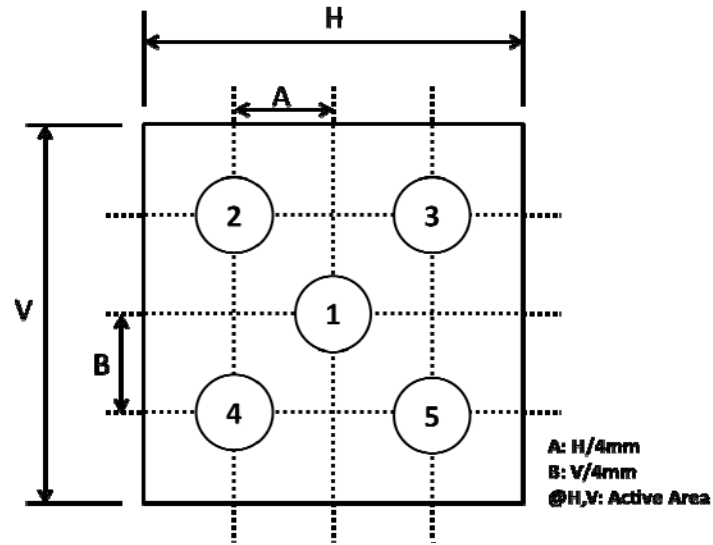


FIG. 2 5 Points for Luminance Measure

Response time is defined as the following figure and shall be measured by switching the input signal for "White" and "Black".

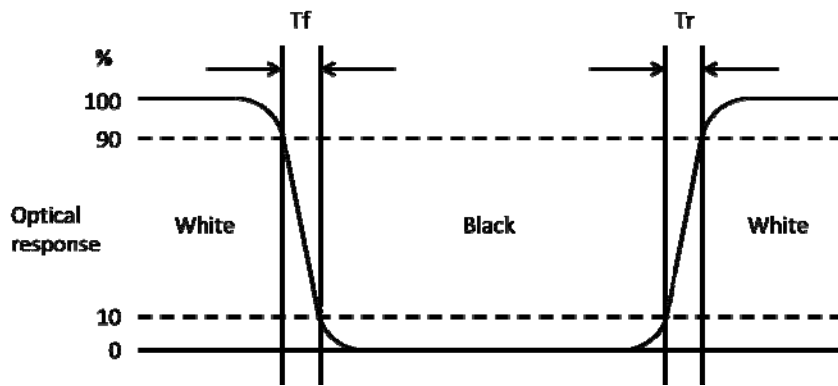


FIG. 3 Response Time

Definition for viewing angle

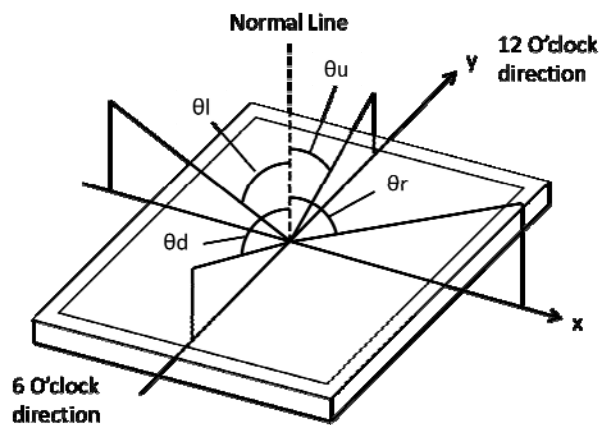


FIG. 4 Viewing Angle



## 6.0 PRECAUTIONS

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### 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 °C. 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.

## 7.0 AD2662GVA Board & OSD Functions

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### AD BOARD GENERAL SPECIFICATIONS

- Max Resolution Up To Full HD 1920x1080
- Analog RGB Input
- ULTRA-RELIABLE DVI INPUT
- CBVS, S-VIDEO, Ycbcr INPUT (optional)
- 1.5Wx2 Audio Out
- Dual/single LVDS interface
- Support Panel DC5V or 3.3V, 12V Output
- Automatic External Fan Control
- OSD Control
- Inverter 0~5V Dimming Control
- \*External V.R. brightness control (optional)
- \*External light sensor brightness control (optional)
- \*External RS232 control (optional)
- Input Power 12Vdc

### SUPPORTED TIMING (\*by your panel resolution)

The following table displays optimum quality modes that the LCD monitor provides. If the other video modes are used, the monitor will stop working or display a poor quality picture.

TIMMING	
MODE	RESOLUTION
VGA	640x480@60Hz
	640x480@72Hz
	640x480@75Hz
SVGA	800x600@56Hz
	800x600@60Hz
	800x600@72Hz
	800x600@75Hz
XGA	1024x768@60Hz
	1024x768@70Hz
	1024x768@75Hz
SXGA	1280x1024@60Hz
	1280x1024@70Hz
	1280x1024@75Hz

WXGA	1366x768@60Hz
WSXGA+	1680x1050@60Hz
SXGA+	1400x1050@60Hz(Pixel f 101.000MHz)
	1400x1050@60Hz(Pixel f 121.750MHz)
	1400x1050@75Hz
UXGA	1600x1200@60Hz
	1600x1200@65Hz
	1600x1200@75Hz
FHD	1920x1080@60Hz
	1920x1080@65Hz
	1920x1080@75Hz



## 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	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	SDA	DDC Serial Data	8	BLUE_RTN	Blue Return
2	SCL	DDC Data Clock	9	BLUE	Analog Blue
3	GND	Reserved	10	GREEN_RTN	Green Return
4	+5V	+5VDDC	11	GREEN	Analog Green
5	GND	Reserved	12	RED_RTN	Red Return
6	VSYNC	Vertical Sync	13	RED	Analog Red
7	HSYNC	Horizontal Sync			

**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&J14: 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 Y,Pb,Pr input**

Pin No.	Function	Pin No.	Function
1	Y IN	4	Y-Return
2	Y-Return	5	Pr IN
3	Pb IN	6	Pr-Return

**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		

**J12: IR connector (3PIN 2.0mm)**

Pin No.	Function	Pin No.	Function
1	IR	2	GND
3	IR VCC		

**JP1: PANEL VCC (3PIN 2.54mm)**

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

**CN3:Composit AV1**

Pin No.	Function	Pin No.	Function
1	AV IN	2	GND

**CN6:S-Video**

Pin No.	Function	Pin No.	Function
1	GND	2	GND
3	Luminance	4	Chrominance

**J9:Composite AV2**

Pin No.	Function	Pin No.	Function
1	AV2 IN	2	GND

**J15: VIDEO INPUT**

Pin No.	Symbol	Description	Pin No.	Symbol	Description
1	GND	GND	5	GND	GND
2	AV1	AV1 INPUT	6	SC	S VIDEOIN
3	GND	GND	7	SY	S VIDEO Y IN
4	AV2	AV2INPUT			

**J16: TV tuner input**

Pin No.	Symbol	Description	Pin No.	Symbol	Description
1	GND	GND	5	SDA	Control TV tuner
2	AV2	TV VIDEO IN	6	GND	GND
3	GND	GND	7	+5V	Tuner 5V
4	SCL	Control TV tuner			

**J13:RS232 IN**

Pin No.	Function	Pin No.	Function
1	+5V	2	TXD
3	RXD	4	GND

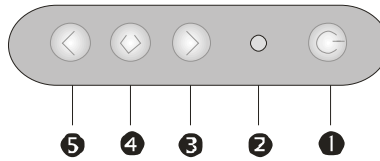
**J17:8P Connector (AUDIO IN)**

Pin No.	Function	Pin No.	Function
1	AUDIO-L	2	GND
3	PC AUDIO_R	4	PC AUDIO_L
5	GND	6	TV_AUDIO_L
7	TV_AUDIO_R	8	AUDIO-R

**CN8:LINE IN (Earphone Jack)**

Pin No.	Function	Pin No.	Function
1	GND	4	GND
2	AUDIO-R	5	AUDIO-L
3	GND		

## 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.  
When OSD is off, it is hot key for input switch between VGA, AV, and S-video.

### 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.

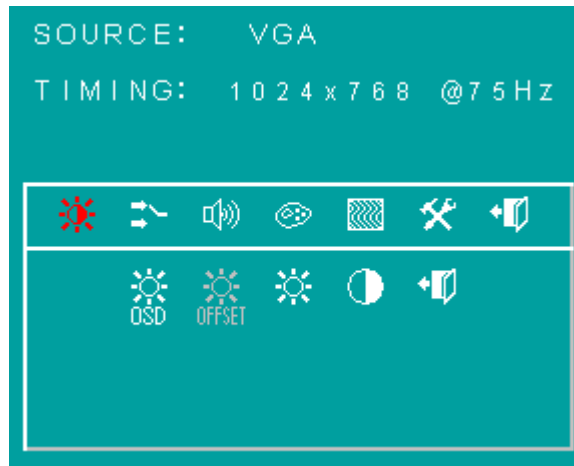
#### 5. Return & Exit the main menu

Exit the screen adjustment; push the "MENU" button. When no operation is done around 30 sec (default OSD timeout), it goes back to the stand-by mode and no more switching is accepted except MENU to restart the setting.

## OSD FUNCTIONS

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)

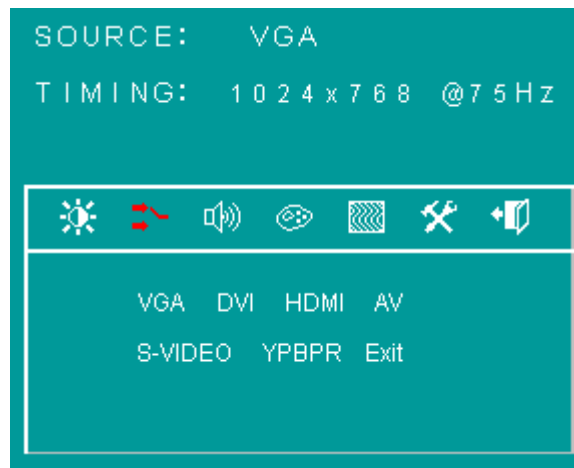


**Contrast:** Press “menu” and “right” you can adjust the contrast from “0” to “100” by pressing the “left” and “right”.



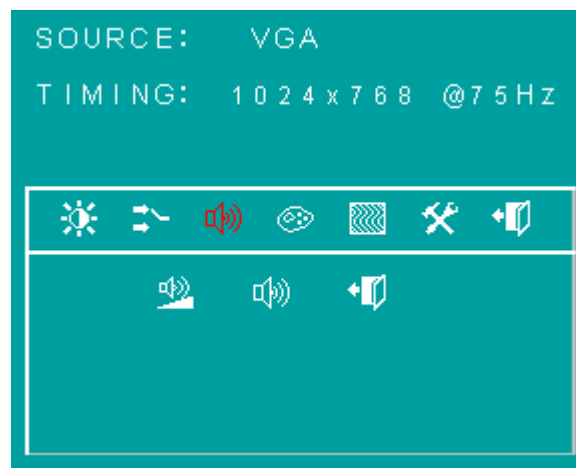
**Exit:** You can exit this sub menu back to normal screen.

**Source :**



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

**Sound :**



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.



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



**sRGB:** Windows standard color setting.



**Color Tempure:** You can have 3 options in this selection.



**Color Tempure User**



**Color Tempure\_6500K**



**Color Tempure\_9300K**

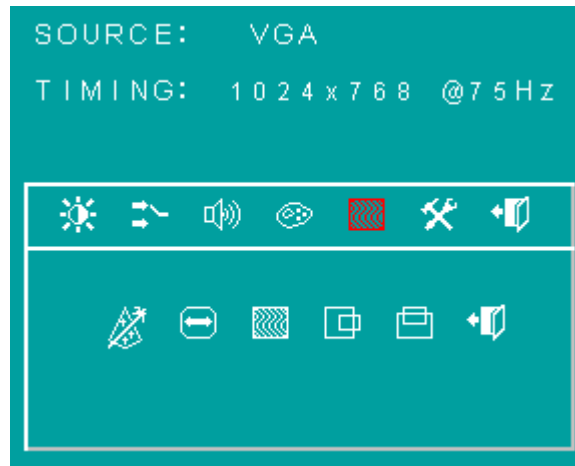
“user mode”, “6500K” (Warm color scheme), “9300K (Cold color scheme).  
Def ault is “user”, and inside all “R”, “G”, and “B” are set “100”



**Exit:** back to the normal screen.

**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 5 icons.



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





**Osd\_time:** You can selection the time of OSD from 2 sec. to 16 sec.

D



**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.



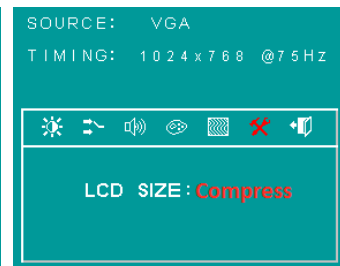
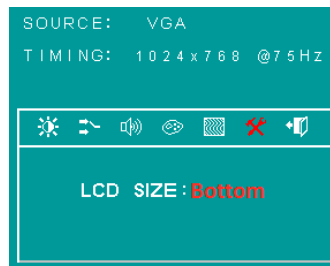
**Factory\_Reset:** By pressing this, the screen will be back to the factory setting on very beginning and lost all the personal settings.



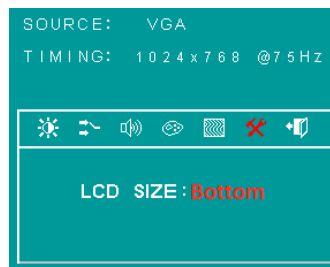
**Sharpness:** You can make the characters looks sharper.



**LCD SIZE:** Select this option, you can control LCD size 3 type, 1.Bottom mode , 2.Top mode,3.Compress mode. (Note: This function depends on panel.)

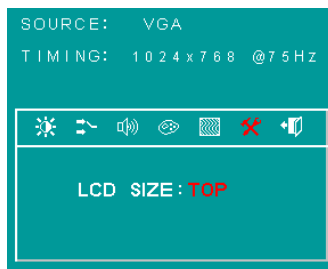


**LCD SIZE:** Some models of LCD size are fixed on the “TOP” & “Bottom”.



## LCD SIZE

**LCD SIZE:** Some models of LCD size is fixed on the “TOP”.



**Exit**

## 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.

