



**Customer :** \_\_\_\_\_

**Customer Approved By :** \_\_\_\_\_

**Comment:**

**Module No: FBA-1260D41-xxxxx**

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**Approved By**

**Checked By**

**Prepared By**

**Record of revision**

Version	Revise Date	Page	Description
V1.0	2009/09/11		First issue
V2.0	2010/07/10		<ol style="list-style-type: none"> <li>1. Revise 1.8V,3.3V with switch power, saving power.</li> <li>2. add EMI solution</li> </ol>
V2.1	2010/08/30		<ol style="list-style-type: none"> <li>1. Add EDID signals on W5.</li> <li>2. Delete YPbPr</li> <li>3. Delete wafer (SPI1), The signals DDC_SCL and DDC_SDA for the exercise of programming would merge into W5.</li> </ol>
	2010/12/06		<ol style="list-style-type: none"> <li>1. Page 6 “W2” pin number position correct</li> <li>2. Page 13 “W2” Pin assignment modify</li> </ol>
V3.0	2011/4/25		Change power solution to reduce ripple noise.
FBA1260D41+	2016/6/20		Add EMI solution component. Size, wafer position no change



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**\*\*\*The content of this information is subject to be change without notice**



## General Description

FBA1260D41 is an advanced TFT-LCD Monitor Driving Board. This design enables a traditional CRT monitor & video and audio replacement with a large size Active Matrix LCD module. It is suitable for panel resolution up to SXGA @ 60Hz in all display modes. The full display area of the module is used.

FBA1260D30 is designed to support various TFT-LCDs up to SXGA resolution by BIOS option.

### 1. General Features:

#### . Available panel I/F:

ZIF\_33P/40P/50P: Supported TTL\_18Bit/24Bit(Max) output for panels.

Header\_2x9P : Supported single LVDS\_18Bit/24Bit(Max) output for panels.

#### . Supported display modes input:

PC Mode : Max 1280\*1024@60Hz

: Min CGA @ Hor:15.7KHz, Ver: 60Hz

Video Mode : NTSC, PAL, SECAM

. Channel CVBS1/S-Video. (Selectable)

. Channel CVBS2

. Channel CVBS3 for CCD input.

. Plug & Play : VESA\_DDC2B2.0

. Panel Supported : Various TFT panels size from 5.7" ~ 12.1"

. Video decoder : High quality adaptive 2D comb filter for both NTSC and PAL.

. LED driver(BLU) : Offer Max power consumption to 6W.

. Audio w/Amp : Suitable for 2W speaker with 4 Ohm.

. OSD control : Keypad / IR

. Power source : Widely 12V ~ 24V input with common filter for EMI solution.  
Rush current & voltage protection with TVS diode.

. RoHS Compliant

**NOTE: Any option requirement change, be advised factory before order.**

**Some of specific functions description:****\*\*CCD channel input situation:**

**This channel got the first priority right to display.**

**During power on mode:**

If firmware detected a signal input from CCD channel during power on mode.

It should to switch channel display on CCD immediately, no matter which channel was display currently. Until CCD signal was not existed anymore, the display should go back to the previously channel.

**During sleep mode:**

If firmware detected a signal input from CCD channel during sleep mode.

It should resume the system and switching channel display on CCD immediately, Until CCD signal was not existed anymore, the display should go back to the previously channel and system should back to sleep mode either.

**\*\*Backlight adjustment:****Manual adjustment:**

While the item “**lightsensor**” of Factory Menu was set with “Off”. The system provided manner with **Item “Brightness of main Menu” or “Hotkey-Dimming”** for backlight adjustment. They change the duty cycle of PWM for backlight adjustment and base on frequency 300Hz. In this case Auto-dimming is disabled.

**Auto dimming with Light Sensor:**

While the item “**lightsensor**” of Factory Menu was set with “On”. The backlight would be Auto-adjusted depends on what environment be detected by light sensor.

The user able to define a default brightness of backlight with three different level of environment in **Factory Menu**.

**\*\*Auto Power On:****Auto Power On after DC-Power Plug-in**

This configure is system default setting. Unless user had turned the system off by power key. The system would not change setting.

**Auto Power On after Signal-in**

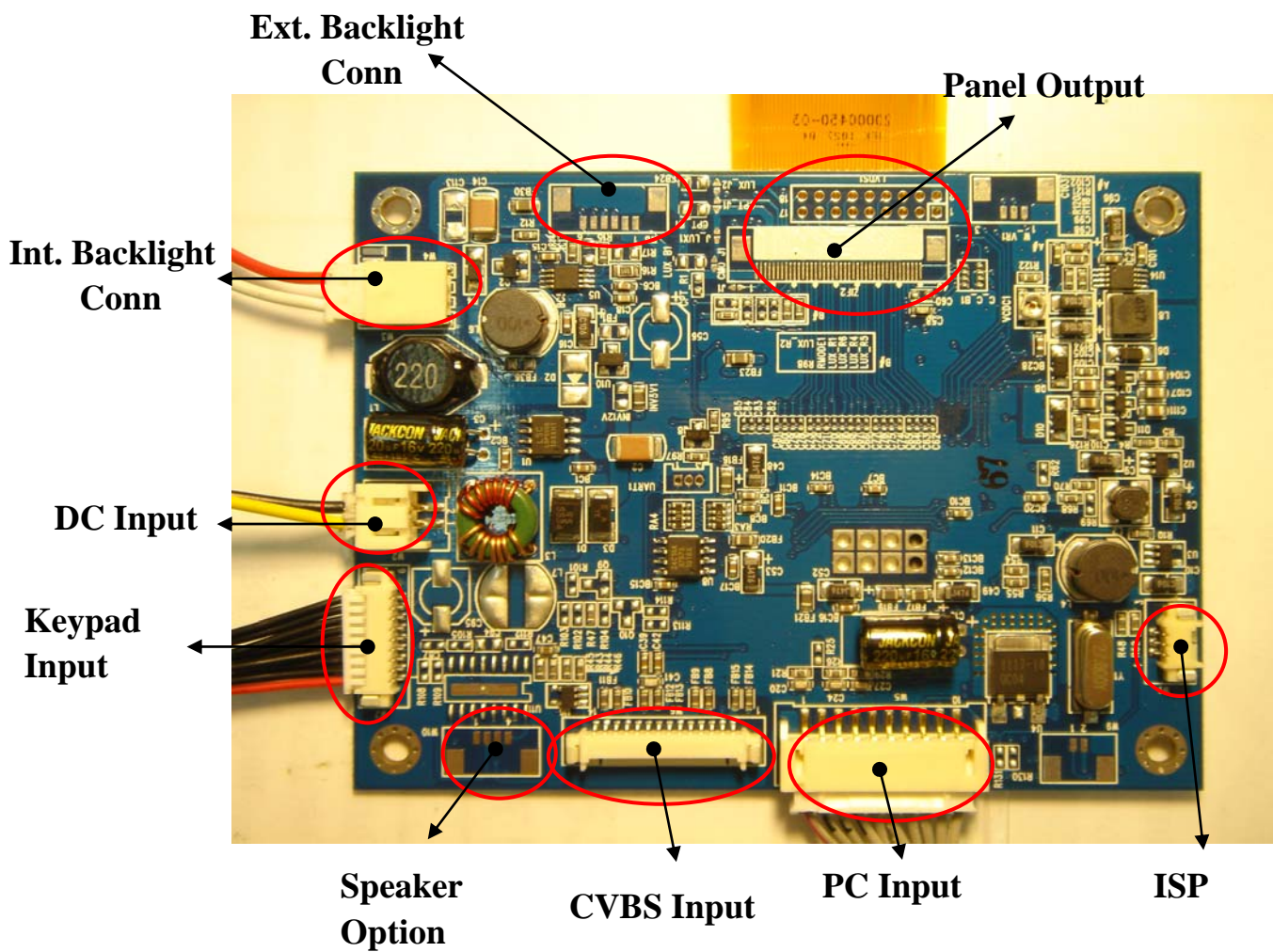
To recognize the setting on the item “**Signal in & Play**” of **Factory menu**.

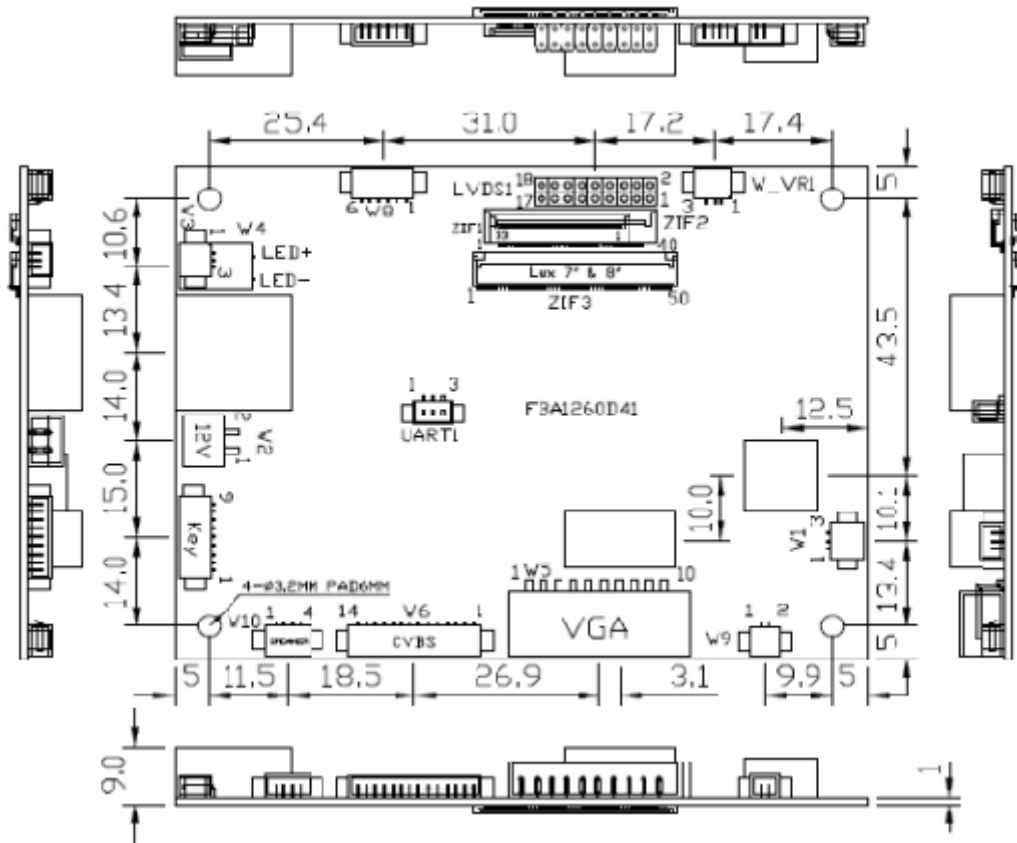


If this item didn't been set with "Off" selection. During sleep mode, the firmware would still check the channel which had been selected on . If there was signal exist then system should **Auto-on** from this channel.

## 2. Dimension

### 2.1: FBA1260D41 AD Board







### 3. Electrical Characteristics:

#### 3.1) Absolute maximum ratings:

GND = 0V , VCC = 5V , Ta = 25 °C

Parameter	Symbol	Max	Unit	Remark
Analog signal input level	Signal	1.4	Vp-p	
Power supply	DC IN	27	V	
Digital signal input level		Vcc+0.3	V	
Storage Temperature		-40~130	°C	
Operation Temperature		0~60	°C	

#### 3. 2) Recommended operating condition:

GND = 0V , VCC= 5V , DC-IN=12V , Ta = 25 °C ,

Parameter	Symbol	Min	Typ	Max	Unit	Remark
Analog signal input level	Signal	0.5	0.7	1.2	Vp-p	
RGB/Composite AV	DC	GND	-	0.3	V	
Power supply	DC IN	11	12	24	V	In video mode
	Current	-	320	-	mA	
Continue Power consumption	Watt	-	3.84	-	W	
Standby Current		-	20	90	mA	
Digital input H/Vsync , Ext. keys	VI-H	0.7Vcc	-	Vcc	V	
	VI-L	GND	-	0.3Vcc	V	
Digital ouput Rx6/Gx6/Bx6 , H/V , DE		TBD	3.3	TBD	V	

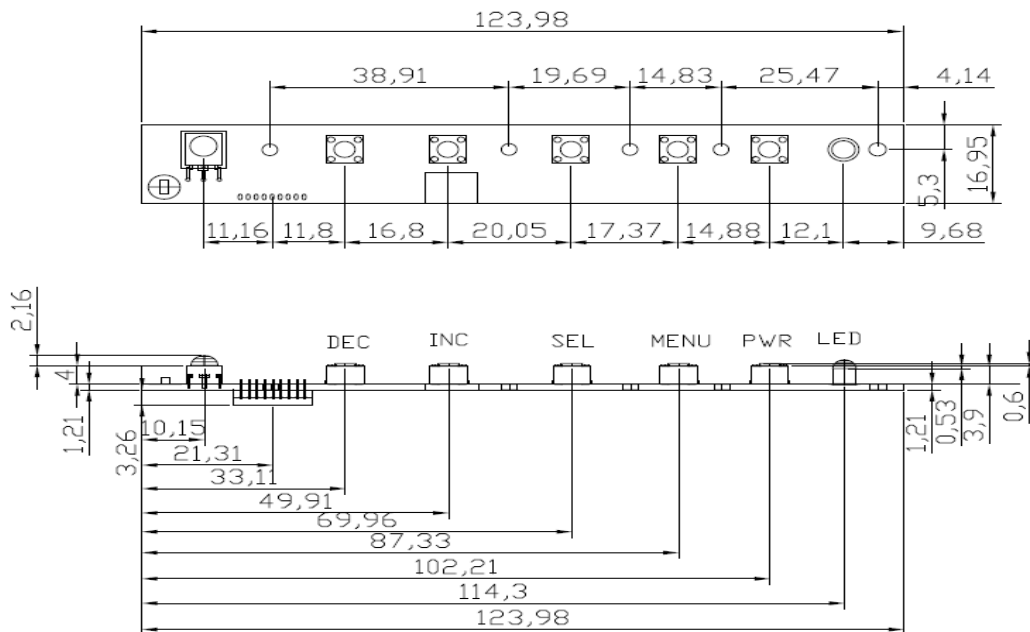




### 4. Ext. keys & OSD Function Description:

#### 4.1: Keypad:

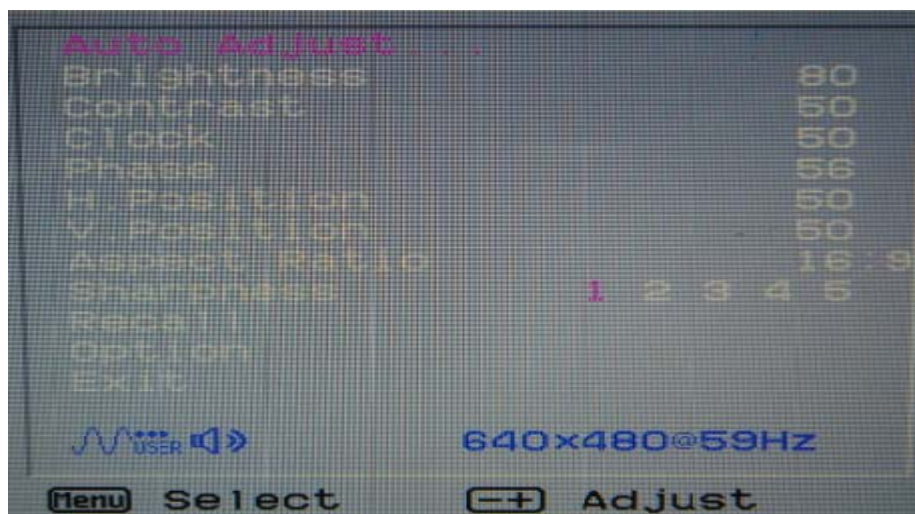
- 1) **Power key**- While **system off**: As a power key to turn system on.  
 While **system on**: As a function “**power-off**” key to entry into standby mode if the key is held for 3 sec more longer.  
 As a function “**Channel switching**” key to switch display channel according to routine VGA-> CVBS1/S\_V->CVBS2-> VGA. If each channel is enable setting on OSD menu.
- 2) **Menu key** - While **menu off**: As menu-key for **main menu** on, if the key is held more than 5 sec longer will turn the **Factory Menu** on.  
 While **menu on**: As an “Item selection key” for OSD menu down selection.
- 3) **Inc key** - While **menu off** and **Audio function enable**: As a volume-up control key.  
 While **menu off** and **Audio function disable**: As a brightness-up control key.  
 While **menu on**: As a value increase or setting change or entry key.
- 4) **Dec key** - While **menu off** and **Audio function enable**: As a volume-down control key.  
 While **menu off** and **Audio function disable**: As a brightness-down control key.  
 While **menu on**: As a value increase or setting change or entry key.
- 5) **The Mid Key(SEL)** - To be defined as either Dimmer or Auto-Tune key by the definition in the Factory Menu.





### 4.2 The OSD for VGA channel:

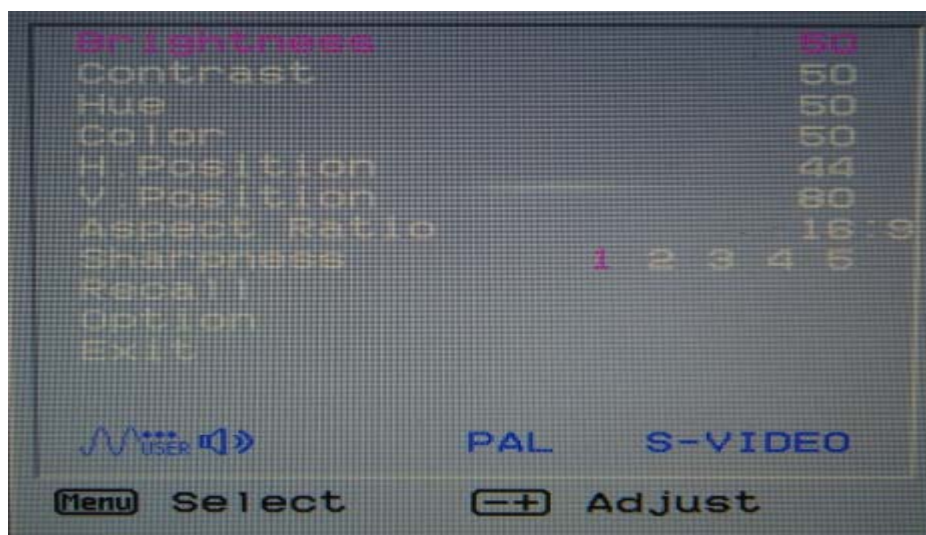
Function	Description
Auto adjust	Available as image full screen only. Auto adjust clock , Clock, phase, H_position , V_position.
Brightness	Adjust Brightness by Inc/Dec key. (rang 0 ~ 100,default 50)
Contrast	Adjust contrast by Inc/Dec key. (rang 0 ~ 100,default 50)
Clock	Adjust image focus by Inc/Dec key. (rang 0 ~ 100,default 50)
Phase	Adjust CLK phase alignment by Inc/Dec key.(rang 0 ~ 100,default 50) Some jitter situation could be avoidable by CLK phase adjusting.
H_position	Adjust Horizontal position by Inc/Dec key. (rang 0 ~ 100,default 50)
V_position	Adjust Vertical position by Inc/Dec key. (rang 0 ~ 100,default 50)
Aspect ratio	Adjust display mode between 4:3 and 16:9 by Inc/Dec key.
Sharpness	Adjust Sharpness by Inc/Dec key. (level 0 ~ 5)
Recall	Load default value and only available on items <b>“brightness, contrast, clock, phase”</b>
Option	The function Audio and color temperature is defined in this page
Exit	Turn off OSD





### 4.3 The OSD for Video channel:

Function	Description
<b>Brightness</b>	Adjust Brightness by Inc/Dec key. (rang 0 ~ 100,default 50)
<b>Contrast</b>	Adjust contrast by Inc/Dec key. (rang 0 ~ 100,default 50)
<b>Hue</b>	Adjust Hue by Inc/Dec key. (rang 0 ~ 100,default 50)
<b>Color</b>	Adjust Color by Inc/Dec key. (rang 0 ~ 100,default 50)
<b>H_ position</b>	Adjust Horizontal position by Inc/Dec key. (rang 0 ~ 100)
<b>V_ position</b>	Adjust Vertical position by Inc/Dec key. (rang 0 ~ 100)
<b>Aspect ratio</b>	Adjust display mode between <b>4:3</b> and <b>16:9</b> by Inc/Dec key.
<b>Sharpness</b>	Adjust Sharpness by Inc/Dec key. (level 0 ~ 5)
<b>Recall</b>	Load default value. and only available on items <b>“brightness, contrast, Hue, color”</b>
<b>Option</b>	The function Audio and color temperature is defined in this page
<b>Exit</b>	Turn off OSD

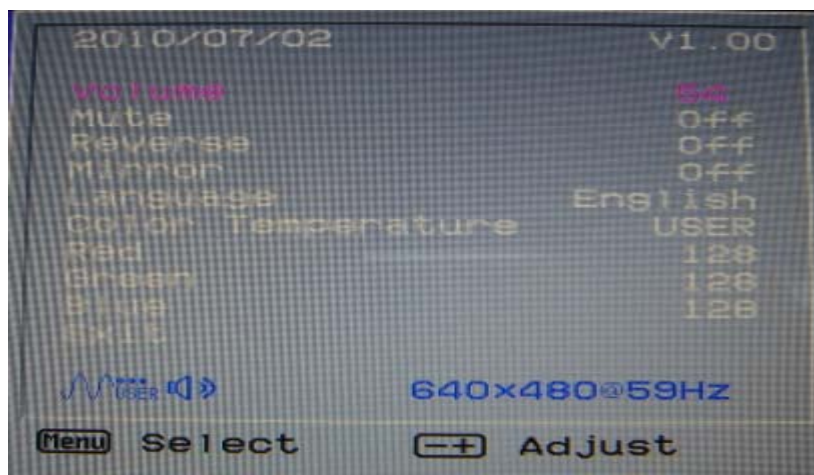




## 4.4 Option menu

Function	Description
<b>Volume</b>	Adjust Volume by Inc/Dec key. (rang 0 ~ 100,default 50)
<b>Mute</b>	On: Audio Mute enable. Selection by Inc/Dec key. Off: Audio Mute disable. <b>(default setting)</b>
<b>Reverse</b>	On: Display is upside down enable. Selection by Inc/Dec key. Off: Display normally. <b>(default setting)</b> <b>(function available on panel supported)</b>
<b>Mirror</b>	On: Enable opposite display of image. Selection by Inc/Dec key. Off: Display normally. <b>(default setting)</b> <b>(function available on panel supported)</b>
<b>Language</b>	English, French, German, Italian and Mandarin character are all available choose.
<b>Color Temperature</b>	There are four subjects could be selected “ <b>9300K,6500K,User</b> ” The <b>default</b> item means the value is suitable for panel.
<b>Red</b>	Only available while “ <b>Color Temperature</b> ” set to <b>User</b> mode.
<b>Green</b>	Only available while “ <b>Color Temperature</b> ” set to <b>User</b> mode.
<b>Blue</b>	Only available while “ <b>Color Temperature</b> ” set to <b>User</b> mode.
<b>Exit</b>	Back to OSD main menu.

**Note:** Which item was shown with gray color manes this function has been disable

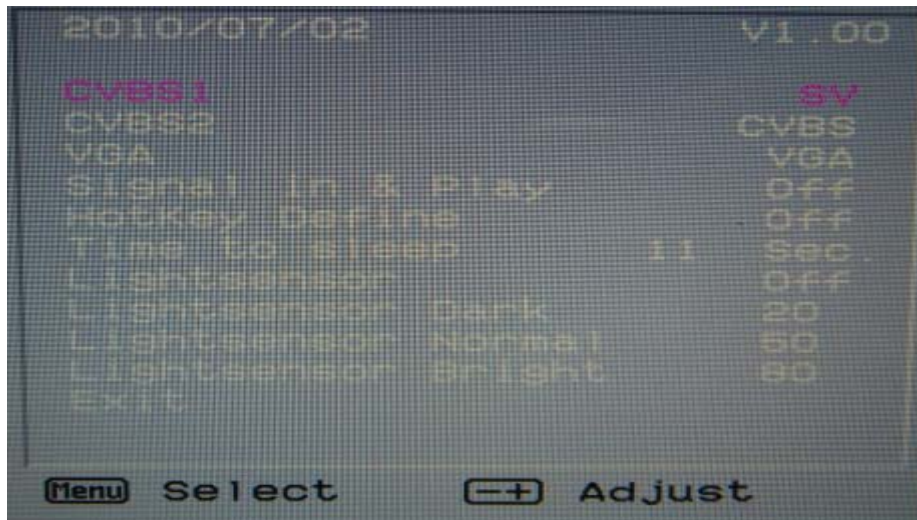




## 4.5 Factory Menu :

To push and hold the menu key of keypad for 5 sec longer. Will entry Factory mode until turn off by Item “Exit”.

Function	Description
CVBS1	To define the video format input with <b>CVBS / S-Video or off</b> , The “off” means CVBS1 of channel would be disabled and un-selectable in channel switching routine.
CVBS2	To define the video format input with <b>CVBS or off</b> , The “off” means CVBS2 of channel would be disabled and un-selectable in channel switching routine.
VGA	To define the video format input with <b>VGA or off</b> , The “off” means VGA of channel would be disabled and un-selectable in channel switching routine.
Signal in & Play	Be able to change originally channel setting from <b>VGA to CVBS1, CVBS2 or off</b> as input signal detection. While controller board had entry into standby mode. It would automatically check the channel which was selected from this item. If there is a signal input, the controller board would display automatically from this selected channel.
Hot Key Define	Define The <b>Mid key(SEL)</b> of keypad to be a <b>tuning / dimming or off</b> function.
Time to sleep	Adjusting the time to sleep while the status of no signal input is detected. The <b>Mid key(SEL)</b> of keypad can change the time unit to Sec or Min.
Light sensor	<b>On/Off</b> the function light sensor detection, if “On”, The function <b>item Brightness &amp; Dimming of OSD</b> will be disable for adjustment.
Light sensor Dark	Define a custom brightness for a <b>Dark</b> environment.
Light sensor normal	Define a custom brightness for a <b>Normal</b> environment.
Light sensor bright	Define a custom brightness for a <b>Bright</b> environment.
Exit	Turn off the Factory Menu.



## 5. Pin assignment of main board

### 5.1: W2: DC power Input (Wafer\_2pin\_2.0mm/ side entry )

Pin	Description
1	DC_IN.(12V or 24V)
2	DC power GND

### 5.2: W8: Connecting Ext. LED/CCFL Driver (**Reservation**). (Wafer\_6pin\_1.25mm\side entry)

Pin	Description
1	5V or DC_IN
2	5V or DC_IN
3	GND
4	GND
5	Ext_BLK_Enable (1: on, 0: off)
6	Ext_BLK_Adj

**5.3: W3/W4: The Connector of Inside LED driver for Backlight****(W4:wafer\_2pin\3.5mm\side entry)****(W3:wafer\_2pin\1.25mm\side entry)**

Pin	Description
1	LED Anode (+)
2	LED Cathode(-)

**5.4: W\_VR1: Ext. VR-dimming connector (**Reservation**)****(wafer\_3pin\_1.25mm/ Side Entry)****Only available working with inside LED driver.**

Pin no	Symbol	Description
1	Power Source	A resister (47K Ohm) damp to 5V.
2	Ext-VR-Dimming	DC level( 0.8V ~ 1.4V).
3	GND	A resister (10K Ohm) damp to GND.

**A Ext-VR-10K of potentiometer was recommended.****5.5: W9: Ext. Light sensor connector (wafer\_2pin\_1.25mm/ Side Entry)**

Pin	Description
1	Collector
2	Emitter

**5.6: W7: Connecting Key pad. (wafer\_9pin\_1.25mm/side entry )**

Pin	Description
1	LED signal, active high
2	Resident power (5V)
3	IR signal input.
4	GND
5	<b>Power</b> key, active low.
6	<b>Menu</b> key, active low.
7	<b>Mid</b> key ( <b>SEL</b> ), function definition by OSD.
8	<b>INC</b> key, active low
9	<b>DEC</b> key, active low

**5.7: W5: VGA input connector. (wafer\_10pin\_2.0mm/side entry )**

Pin	Description
1	Red
2	Green
3	Blue
4	AGND
5	Hsync
6	Vsync
7	GND
8	EDID_SCL
9	EDID_SDA
10	VGA_5V

**5.8: W6: Video input connector. (wafer\_14pin\_1.25mm/side entry )**

Pin	Description	Pin	Description
1	CVBS1_GND	8	N.C.
2	CVBS1 / S_video_Y	9	N.C.
3	AUD_R	10	N.C.
4	AUD_GND	11	S_video_C
5	AUD_L	12	N.C.
6	CVBS2_GND	13	CCD_GND
7	CVBS2	14	CCD input

**5.9: W10: Connecting Ext. Speaker. (wafer\_4pin\_1.25mm/side entry )**

Pin no	Symbol
1	Speaker_Left+
2	Speaker_Left -
3	Speaker_Right+
4	Speaker_Right -

*Note: Speaker should be 1W/ 8 Ohm or 2W/4 Ohm*



**5.10: W1: Power 5V supplier connector. (Wafer\_3pin\_1.25mm\side entry).**

Pin	Description
1	GND
2	5V
3	5V

**5.11: Summary of Panel connector.****5.11.1: ZIF1: (ZIF\_33pin\_0.5mm\_down contact).**

Pin	Description	Pin	Description	Pin	Description
1	GND	12	GND	23	B3
2	CLK	13	G0	24	B4
3	Hsync	14	G1	25	B5
4	Vsync	15	G2	26	GND
5	GND	16	G3	27	DISP
6	R0	17	G4	28	3.3V
7	R1	18	G5	29	3.3V
8	R2	19	GND	30	RL
9	R3	20	B0	31	UD
10	R4	21	B1	32	N.C.
11	R5	22	B2	33	GND

**5.11.2: ZIF2: (ZIF\_40pin\_0.5mm\_down contact).**

Pin	Lux_AT070TN83/84	CMO_LW700AT9003	CPT_CLAA057VA01CW
1	LED_5V	GND	UD
2	LED_5V	GND	NC
3	ADJ_300Hz	NC	NC
4	LED_GND	NC	LED_5V



5	LED_GND	NC	LED_5V
6	3.3V	NC	LED_5V
7	3.3V	3.3V	3.3V
8	MODE	3.3V	NC
9	DE	DE	DE
10	Vsync	GND	GND
11	Hsync	GND	GND
12	GND	GND	ADJ_200Hz
13	B5	B5	B5
14	B4	B4	B4
15	B3	B3	B3
16	GND	GND	GND
17	B2	B2	B2
18	B1	B1	B1
19	B0	B0	B0
20	GND	GND	GND
21	G5	G5	G5
22	G4	G4	G4
23	G3	G3	G3
24	GND	GND	GND
25	G2	G2	G2
26	G1	G1	G1
27	G0	G0	G0
28	GND	GND	GND
29	R5	R5	R5
30	R4	R4	R4
31	R3	R3	R3
32	GND	GND	GND
33	R2	R2	R2
34	R1	R1	R1
35	R0	R0	R0
36	GND	GND	GND



37	DCLK	GND	GND
38	GND	DCLK	DCLK
39	LR	GND	GND
40	UD	GND	LR

**5.11.3: ZIF3: (ZIF\_50pin\_0.5mm\_down contact).**

Pin	Description	Pin	Description	Pin	Description	Pin	Description	Pin	Description
1	LED+	11	Hsync	21	G6	31	R4	41	VGH
2	LED+	12	B7	22	G5	32	R3	42	VGL
3	LED-	13	B6	23	G4	33	R2	43	AVDD
4	LED-	14	B5	24	G3	34	R1	44	RESET
5	GND	15	B4	25	G2	35	R0	45	3.3V
6	VCOM	16	B3	26	G1	36	GND	46	VCOM
7	3.3V	17	B2	27	G0	37	CLK	47	DITHER
8	MODE/BLK_ADJ	18	B1	28	R7	38	GND	48	GND
9	DISP	19	B0	29	R6	39	RL	49	GND
10	Vsync	20	G7	30	R5	40	UD	50	NC/ BLK_EN

**5.11.4: LVDS1: (Header 2x9Pin/2.0mm/side entry).**

Pin	Description	Pin	Description
1	3.3V	2	3.3V
3	RL	4	UD
5	T0M	6	T0P
7	GND	8	T1M
9	T1P	10	GND
11	T2M	12	T2P
13	GND	14	TCKM
15	TCKP	16	NC
17	T3M	18	T3P

**Appendix 1:**

<b>FBA2260X Acceptable Display Modes</b>					
<b>Item</b>	<b>Resolution (Visible)</b>	<b>Nominal H_freq (pol) ± 1 KHz</b>	<b>Nominal V_freq (pol) ± 1Hz</b>	<b>Nominal Pixel Clock MHz</b>	<b>Polarity: H ,V</b>
1	640x350	21.8K	60	17.4	- , -
2	640x350	31.5K	70	25.2	+ , -
3	720x348	18.4K	50	16.9	<b>X , X</b>
4	640x400	24.8K	56	21	- , -
5	720x236	15.7k	60	14.4	<b>X , X</b>
6	720x400	29.2K	70	26.3	<b>X , X</b>
7	720x400	31.5K	70	28.4	- , + // + , +
8	720x400	31.5K	70.1	25.2	- , -
9	640x480	31.5K	60	25.2	- , - // + , - // + , +
10	640x480	35K	66	30.2	- , - // + , - // - , +
11	640x480	37.8K	72.8	31.4	- , - // + , - // + , +
12	640x480	37.5K	75	31.5	- , - // + , - // + , +
13	800x480	29.9K	57	29.7	<b>X , X</b>
14	800x480	37.6K	60	39.1	+ , + (Not recommend mode for the panel whose resolution is 800x600 )
15	800x480	34K	60	33.75	- , +
16	800x480	35K	66	34.7	<b>X , X</b>
17	800x480	37.6K	70	39.1	<b>X , X</b>
18	800x480	39.6K	77	41.8	+ , +
19	800x600	35.1K	56	36.0	<b>X , X</b>
20	800x600	37.8K	60	39.9	- , - // + , - // - , + (Not recommend mode for the panel whose resolution is 800x480 )



21	800x600	48K	72	49.9	X , X
22	800x600	46.8K	75	49.4	X , X
23	832x624	49.7K	75	57.3	X , X
24	1024x768	48.3K	60	64.9	X , X
25	1024x768	54K	66	71.7	- , -
26	1024x768	56.4K	70	74.9	-,- // +,- // +,+
27	1024x768	60K	75	78.7	-,- // +,- // +,+
28	1024x800	62K	74	82.3	X , X
29	1152x864	53.7K	60	81.2	X , X
30	1152x864	64.2K	70	94.5	X , X
31	1152x864	67.5K	75	108	X , X
32	1152x870	68.6K	75	99.9	X , X
33	1152x900	61.8K	66	94.4	X , X
34	1152x900	71.8K	76	108	X , X
35	1280x600	37.3K	60	63	X , X
36	1280x720	44.7K	60	74	X , X
37	1280x720	56.4K	75	95.2	X , X
38	1280x768	47.7K	60	79.6	X , X
39	1280x768	56K	70	94.8	X , X
40	1280x768	60.1K	75	102.5	X , X
41	1280x800	49.6K	60	82.7	- , +
42	1280x800	58.3K	70	98.6	- , +
43	1280x800	60K	72	101.5	- , +
44	1280x800	62.7K	75	107	- , +
45	1280x960	60K	60	108	X , X
46	1280x960	75K	75	126	X , X
47	1280x1024	64K	60	108	X , X
48	1280x1024	74.6K	70	128.5	X , X
49	1280x1024	80K	75	134.9	X , X

**\*\*Foremike TFT not recommend to use “item 14” mode .**

**Appendix 2:****Ordering Number**

<b>FBA1260D21_XXXXX</b>		
<b>1</b>	<b>FBA1260D30_XXXxx</b>	18P: LVDS1 connector be mounted for panel 33P: ZIF1 connector be mounted for panel
		<b>40A: ZIF2 be assembled for AT070TN83</b>
		<b>40B: ZIF2 be assembled for LW700AT9003</b>
		<b>40C: ZIF2 be assembled for CLAA057VA01</b>
		50P: ZIF3 connector be mounted for panel
<b>2</b>	<b>FBA1260D30_xxxXx</b>	B: with LED driver inside X: without
<b>3</b>	<b>FBA1260D30_xxxxX</b>	A: with Audio amp inside
<b>4</b>	<b>FBA1260D41_xxxxX</b>	A: with Audio amp inside
		X: without