

DATA SHEET

MODEL : FLORA – Digital

Part Nr. : FCB-AOD-Axx5

Data Sheet (VER 1.3)

June 2003

D.C.D. Display Solution srl
Via Timermans 6 Torino ITALY
Tel : 39-011-7731830
Fax : 39-011-7728663
E-mail : info@dcd.it

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The information presented in this document may form a part of quotation or contract under the agreement of both parties. Otherwise, this datasheet is subjected to be changed without notice.

RECORD OF REVISIONS

Revision No.	Date	Page	Description
VER0.0	Oct. 02	All	First Draft, Preliminary Specification
VER1.0	Nov.20	10~12	osd & inverter & TTL connector change
		19	osd menu summary
VER1.1	Nov.26	19~23	osd menu image
VER1.2	May,14,03	6	Add height drawing
VER1.3	Jun,24	10	change of connector no. (J3 --> J8)

1. FEATURES

- State of the art high performance picture quality design
- Analog RGB / DVI (Digital Video Interface) / Audio input (PC) / Speaker out (x1)
- Optional input combination, e.g., PC Monitor only.
- Full CRT multi-sync monitor compatibility
- Multi-sync capability up to SXGA resolution @ 75Hz, compatible standard SVGA, XGA and SXGA VESA timing
- Expand DOS, VGA, SVGA and SXGA to full screen display
- True color (16.7M) data processing and display driving
- Single control operated & transparent On-Screen-Display (hereafter 'OSD') user interface
- Full control of all relevant display and interface parameters via OSD
- Multi language support
- VESA DDC1/2B compliant
- Compatible with VESA DPMS power saving modes
- Form factor: 100mm (L) x 150mm (W) x 17mm(H)
- +12VDC single power: 48watts AC/DC power adapter recommended.
- Operating temperature: 0 to 50 C
- The 2watt x 2 ch. @ 8 ohms audio capability with treble, bass, volume and mute control through either OSD or remote controller.
- OSD & Power switch board : FOSD-xxx

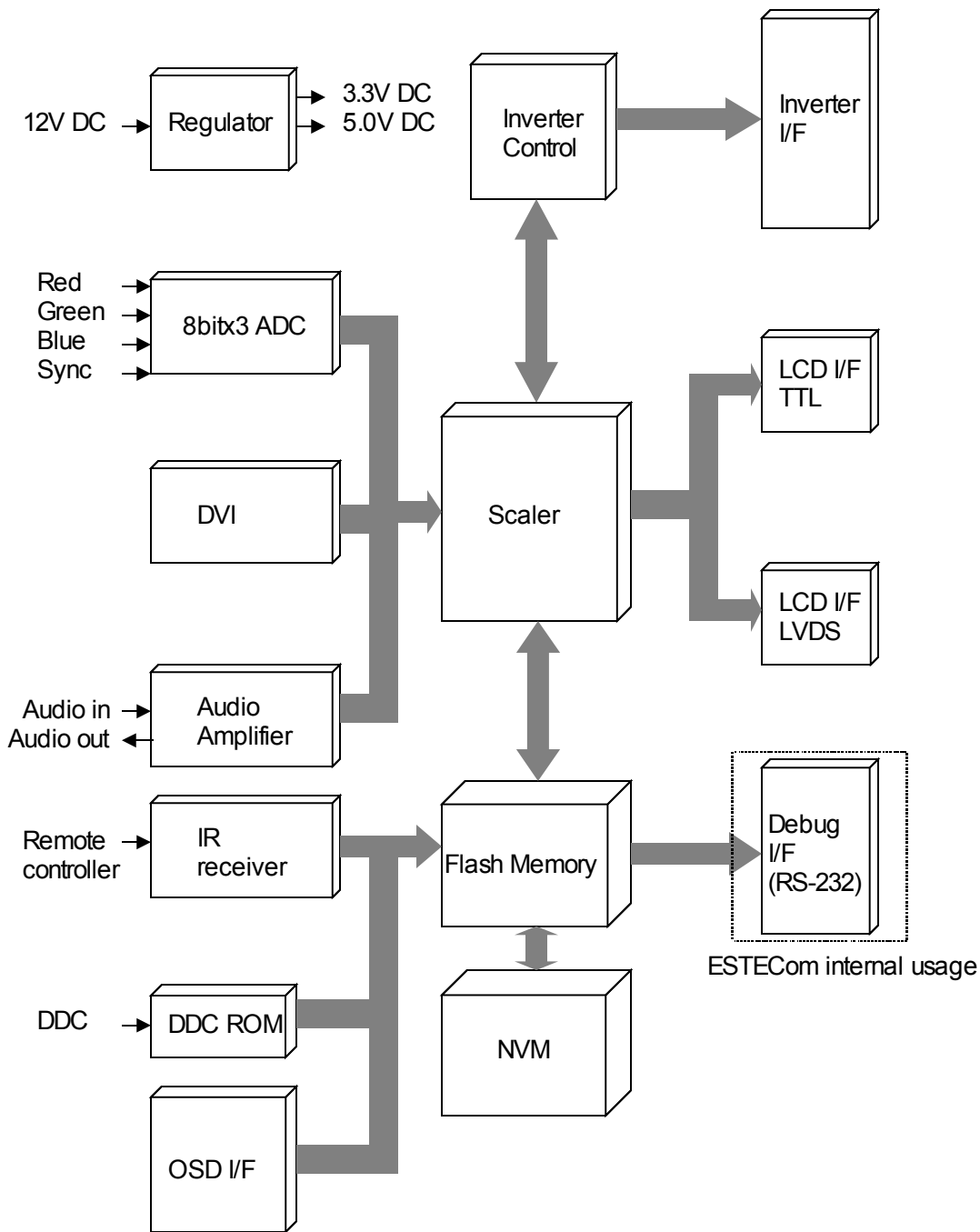
2. GENERAL DESCRIPTIONS

FCB-xxx-Axx5 is an advanced TFT LCD Monitor Control Board. This design enables a full conventional CRT monitor and/or video & audio replacement with a large size Active Matrix LCD module. It is suitable for video resolution up to SXGA @ 75Hz in all video modes, the full display area of the module is used. The design is implemented as a single printed circuit board.

The FCB-xxx-Axx5 is designed to act as a full monitor and/or video & audio interface. Besides the main functionality of an analog and digital video interface, also stereo audio amplifier with 1 input.

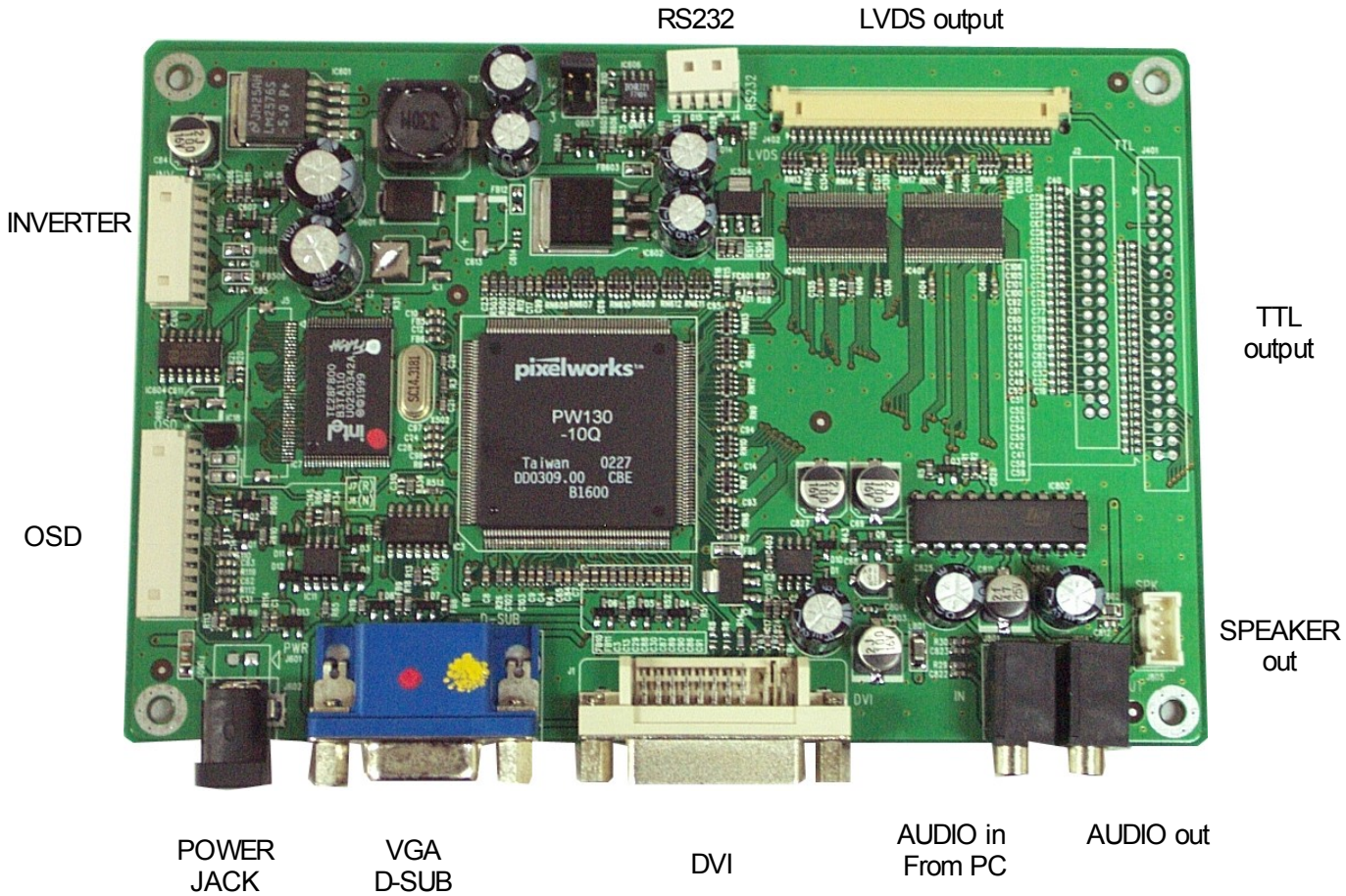
The FCB-xxx-Axx5 is designed to support various TFT LCDs under SXGA resolution by BIOS option, customers line-up their monitors with their own identity with following options.

3. BLOCK DIAGRAM



Data Sheet : FCB-AOD-Axx5

4.1.2. BOARD WITH THE STANDARD CONNECTORS CONFIGURATION



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4.2. CONNECTORS INFORMATION

4.2.1. INPUT CONNECTORS

- Power Input connector

Connector : DC12 Jack (J602)

Pin No.	Symbol	Description	Pin No.	Symbol	Description
2, 1	GND	GND	3	Vin	+12Vdc

- Power Input connector (**Alternative**)

Connector : Molex 5267-02 (J601)

Pin No.	Symbol	Description	Pin No.	Symbol	Description
1	GND	GND	2	Vin	+12Vdc

- Analog RGB Input connector

Connector : Mini D_Sub 15pin(J101)

pin no	Symbol	Description	pin no	Symbol	Description
1	RED	Analog Red	9	NC	+5Vdc
2	GREEN	Analog Green	10	SGND	Sync GND
3	BLUE	Analog Blue	11	NC	NO CONNECTION
4	GND	NO CONNECTION	12	SDA	DDC Serial Data
5	GND	Digital GND	13	HSYNC	Horizontal Sync
6	RGND	Red Return	14	VSNC	Vertical Sync.
7	GGND	Green Return	15	SCL	DDC Data Clock
8	BGND	Blue Return			

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- DVI-I Input connector
Connector : DVI-I (J1)

Pin No.	Symbol	Pin No.	Symbol	Pin No.	Symbol
1	T.M.D.S. Data2-	9	T.M.D.S. Data1-	17	T.M.D.S. Data0-
2	T.M.D.S. Data2+	10	T.M.D.S. Data1+	18	T.M.D.S. Data0+
3	T.M.D.S. Data2/4 Shield	11	T.M.D.S. Data1/3 Shield	19	T.M.D.S. Data0/5 Shield
4	T.M.D.S. Data4-	12	T.M.D.S. Data3-	20	T.M.D.S. Data5-
5	T.M.D.S. Data4+	13	T.M.D.S. Data3+	21	T.M.D.S. Data5+
6	DDC Clock	14	+5V Power	22	T.M.D.S. Clock Shield
7	DDC Data	15	Ground	23	T.M.D.S. Clock+
			(return for +5V, Hsync, and Vsync)		
8	Analog Vertical Sync	16	Hot Plug Detect	24	T.M.D.S. Clock-
C1	Analog Red	C2	Analog Green	C3	Analog Blue
C4	Analog Horizontal Sync	C5	Analog Ground		
			(analog R,G, &B return)		

- Audio input Connector
Input Connector : STEREO Jack (J801)

Pin No.	Symbol	Description	Pin No.	Symbol	Description
1	GND	GND	4	NC	NO CONNECTION
2	NC	NO CONNECTION	5	AUDIO	External Audio-R
3	AUDIO	External Audio-L			

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- Audio output Connector
Output Connector : STEREO Jack (J804)

Pin No.	Symbol	Description
1	GND	GND
2	NC	No connect
3	AUDIO	Audio out L+
4	NC	No Connect
5	AUDIO	Audio out R+

* Input Connector :
STEREO Jack (J801)
Output Connector :
STEREO Jack (J804)

- Speaker Connector : 4pin connect (J805) (**Alternative of J804**)

Pin No.	Symbol	Description	Pin No.	Symbol	Description
1	AUDIO	Sound out_R+	3	GND	GND
2	GND	GND	4	AUDIO	Sound out_L+

- OSD, LED Interface Connector : J8
Connector : 53015-1210 made by Molex(J8)

Pin No.	Symbol	Description	Pin No.	Symbol	Description
1	LED 1	LED 1	7	KEY2	INCREASE
2	LED 0	LED 0	8	KEY3	DECREASE
3	Vcc	Vcc 5V	9	KEY4	DOWN (Hot key : Auto config)
4	RCVR	remote control	10	KEY5	MENU
5	GND	GND	11	KEY6	SOURCE SELECT
6	KEY1	POWER	12	KEY7	UP(NOT USE)

- RS-232C Connector : J4
Connector : 53015-0410 made by Molex(J4)

Pin No.	Symbol	Description
1	GND	GND
2	RX	TXD
3	TX	RXD
4	VCC	VCC

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4.2.2. OUTPUT CONNECTORS

- LVDS out put connector (J402) : 30 PINS (DF14-30S)

Pin no.	Symbol	Pin no.	Symbol
1	Tx0- E	16	Tx1+ O
2	Tx0+ E	17	GND
3	Tx1- E	18	Tx2- O
4	Tx1+ E	19	Tx2+ O
5	GND	20	TxCLK- O
6	Tx2- E	21	TxCLK+ O
7	Tx2+ E	22	Tx3- O
8	TxCLK- E	23	Tx3- O
9	TxCLK+ E	24	GND
10	Tx3- E	25	ODE
11	Tx3+ E	26	GND
12	GND	27	VCC
13	Tx0- O	28	VCC
14	Tx0+ O	29	VCC
15	Tx1- O	30	VCC

- Backlight Power Connector

Connector : 53015-0810 made by Molex(J502)

Pin No.	Symbol	Description	Pin No.	Symbol	Description
1	BRIGHT	Brightness adjustment	5	GND	Ground
2	ON/OFF	Backlight on/off	6	GND	Ground
3	GND	Ground	7	12V	12V
4	5V	5V (NOT USE)	8	12V	12V

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● TTL Output (ODD) : HIROSE 40 PIN Header (J401)

Pin No.	Symbol	Pin No.	Symbol	Pin No.	Symbol	Pin No.	Symbol
1	VCC	11	ODD RED DATA1	21	ODD GREEN DATA1	31	ODD BLUE DATA1
2	VCC	12	GND4	22	GND6	32	GND8
3	GND1	13	ODD RED DATA2	23	ODD GREEN DATA2	33	ODD BLUE DATA2
4	MCLK	14	ODD RED DATA3	24	ODD GREEN DATA3	34	ODD BLUE DATA3
5	GND2	15	ODD RED DATA4	25	ODD GREEN DATA4	35	ODD BLUE DATA4
6	VSYNC	16	ODD RED DATA5	26	ODD GREEN DATA5	36	ODD BLUE DATA5
7	HSYNC	17	ODD RED DATA6	27	ODD GREEN DATA6	37	ODD BLUE DATA6
8	DE	18	ODD RED DATA7	28	ODD GREEN DATA7	38	ODD BLUE DATA7
9	GND3	19	GND5	29	GND7	39	VCC
10	ODD RED DATA0	20	ODD GREEN DATA0	30	ODD BLUE DATA0	40	VCC

● TTL Output (EVEN) : HIROSE 34 PIN Header (J301)

Pin No.	Symbol	Pin No.	Symbol	Pin No.	Symbol	Pin No.	Symbol
1	GND1	9	EVEN RED DATA6	17	GND4	25	EVEN BLUE DATA3
2	EVEN RED DATA0	10	EVEN RED DATA7	18	EVEN GREEN DATA5	26	EVEN BLUE DATA4
3	EVEN RED DATA1	11	GND3	19	EVEN GREEN DATA6	27	GND6
4	EVEN RED DATA2	12	EVEN GREEN DATA0	20	EVEN GREEN DATA7	28	EVEN BLUE DATA5
5	EVEN RED DATA3	13	EVEN GREEN DATA1	21	GND5	29	EVEN BLUE DATA6
6	EVEN RED DATA4	14	EVEN GREEN DATA2	22	EVEN BLUE DATA0	30	EVEN BLUE DATA7
7	GND2	15	EVEN GREEN DATA3	23	EVEN BLUE DATA1	31	GND7
8	EVEN RED DATA5	16	EVEN GREEN DATA4	24	EVEN BLUE DATA2	32~34	NC

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5. REFERENCE DATA

Video input timing;

Supported vertical refresh rates for each modes are as follow:

640x350		70Hz
640x400	70Hz	
720x350		70Hz
720x400	70Hz	
640x480		60~75Hz
800x600		60~75Hz
1024x768	60~75Hz	
1152x864	60~75Hz	
1280x1024	60~75Hz	

Sync. : H/V Separated TTL

ELECTRICAL PARAMETERS

reference FCB-xx-Axx5, t_A 25 ° C

Symbol	Description	Min	Typ	Max	Unit
V_{DD}	+12V DC power supply	10.8	12.0	13.2	V
$V_{(RGB)}$	Video input signal (w.r.t. GND)	0.5	0.7	1.0	V_{PP}
f_S	Video sample rate			80	MHz
f_{HS}	Horizontal sync frequency	30		60	KHz
f_{VS}	Vertical sync frequency	56		75	Hz
F_{SH}	Sync input high level	2.5			V
V_{SL}	Sync input low level			0.8	VDC
I_{DD2}	Supply current +12V (with LCD & inverter)		3.0	3.3	A

Note 1. Power consumption measuring condition is 2pixel checkerboard pattern @ XGA 75Hz and maximum brightness with Samsung LTM170E4 & inverter at t_A 25° C.

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ELECTRICAL PARAMETERS

Item	Symbol	Condition	MIN.	TYP.	MAX.	Unit
Panel Logic Voltage	Vdd	-----	4.75	5	5.25	Vdc
Output Signal	Vout	High Level	0.8Vdd	5	Vdd	Vdc
Voltage(3.3V Logic)		Low Level	-----	0.1	0.2Vdd	Vdc
Panel Logic Voltage	Vdd	-----	3.14	3.3	3.47	Vdc
Output Signal	Vout	High Level	0.7Vdd	3.3	Vdd	Vdc
Voltage(3.3V Logic)		Low Level	-----	0.1	0.2Vdd	Vddc
Data Shiftclk Freq.	CP		25.175		70	MHz
Hsync(Latch Clk)	LP/Hsync		31.469			KHz
Frame Frequency	FLM/Vsync		56		75	Hz
Panel Logic Voltage	Vdd	-----	4.75	12	13.2	Vdc
Output Signal	Vout	High Level	0.8Vdd	12	Vdd	Vdc
Voltage(3.3V Logic)		Low Level	-----	0.1	0.2Vdd	Vdc

6. SUPPORTED INPUT FORMATS

6.1. VIDEO MODE SUPPORT

The FCB-xxx-Axx5 series can support any video mode at the input within the following constraints:

- The signal sample frequency on the input 80MHz
- The horizontal sync frequency between 30KHz and 80KHz

The modes are detected when presented to the input and previous alignments for setup are automatically recalled. A true multi-sync monitor emulation is implemented.

The factory preset supported modes include:

Mode ^{*1}	Resolution	Refresh rate	H-freq.	Pixel freq.	Remarks ^{*1}
VGA	640 x 350	70Hz	31.47KHz	25.175MHz	VESA Standard
VGA	720 x 400	59.940HZ	31.469KHZ	25.175MHZ	IBM VGA 3H
VGA	640 x 480	60Hz	31.5KHz	25.175MHz	Industry Standard
VGA	640 x 480	72Hz	37.9KHz	31.500MHz	VESA Standard
VGA	640 x 480	75HZ	37.5KHZ	31.500MHZ	VESA Standard
SVGA	800 x 600	60Hz	37.9KHz	40.000MHz	VESA Guidelines
SVGA	800 x 600	72Hz	48.1KHz	50.000MHz	VESA Standard
SVGA	800 x 600	75HZ	46.9KHZ	49.500MHZ	VESA Standard
XGA	1024 x 768	60Hz	48.4KHz	65.000MHz	VESA Guidelines
XGA	1024 x 768	70Hz	56.5KHz	75.000MHz	VESA Standard
XGA	1024 x 768	75HZ	60KHZ	78.750MHZ	VESA Standard
SXGA	1280 x 1024	60Hz	64KHZ	108.000 MHZ	VESA Standard
SXGA	1280 x 1024	75HZ	80KHZ	135.000 MHZ	VESA Standard

Notes:

2. All mentioned modes are non-interlaced. The maximum and minimum frame rates are determined by the TFTLCD.
3. Factory preset modes are overwritten by additional user alignments for automatic recall. At all times it remains possible to recall the initial factory presets.

6.2. LCD PANEL & I/O SUPPORT

The FCB-xxx-Axx5 is an advanced and general application TFT LCD Monitor Control board.

Therefore execution of this board is not limited to panel manufacturer as well as model.

Furthermore, this board operates with any TTL, TMDS and LVDS interface panel ranging from VGA to SXGA that can be driven with three or less timing signals. The usual timing signals to the panel are H-sync, V-sync and Data Enable.

For backlight intensity control mechanism, the built in DC dimming drive signal is prepared to the CCFL

inverter control port. The CCFL inverter DC power, generally 12V DC, is prepared to the same port.

The users can design own key pad board using OSD & power tact switch and two color LED. Power on/off and OSD input signal is detected and executed by the micro controller.

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6.3. AUDIO SUPPORT

The FCB-xxx-Axx5 has Hi-Fi Stereo Audio amplifier that users control using OSD interface. There are 1 input channel to the audio input port. The audio output is 2 x 2 watt, and users easily configure the audio interface features using earphone output, speaker output ports.

Output max.: 2 x 2 watts @ 8ohm

Current: 450mA max.

Input voltage: 12VDC

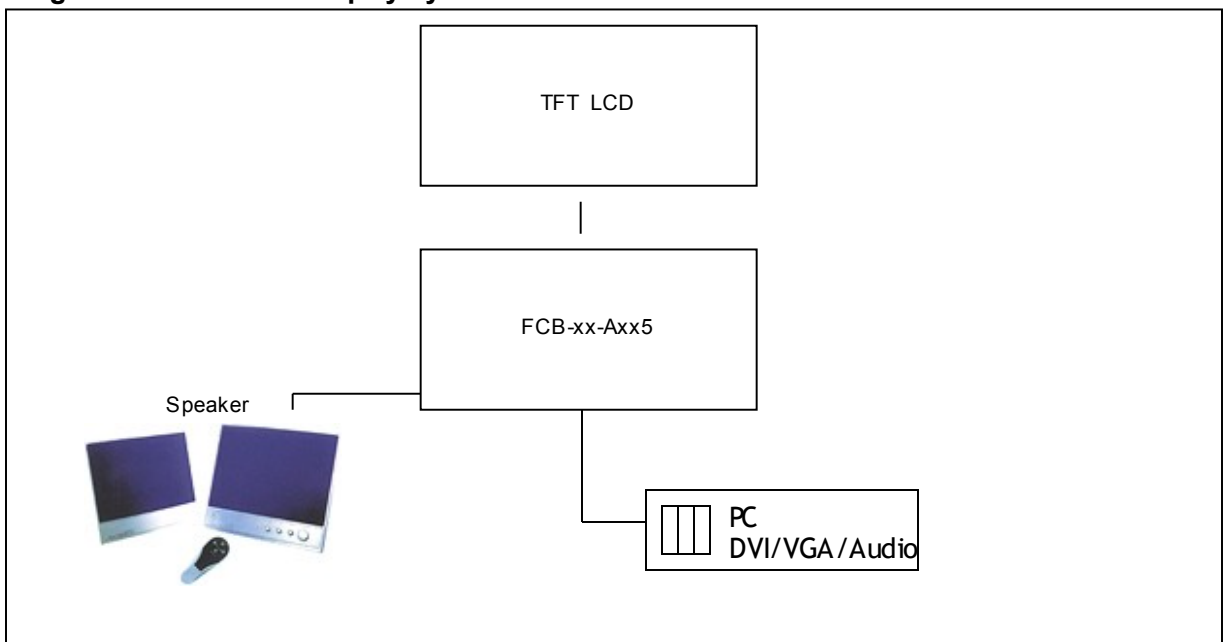
THD (Total Harmonic Distortion): 0.15%

S/N: 105dB

6.4. DVI (Digital Video Interface)

The FCB-xxx-Axx5 has one DVI input port, which complies with VESA DVI standard. So, users can make direct interface to the DVI output of Digital VGA cards. The signal source can be switched through OSD.

High-end Multi-media Display System



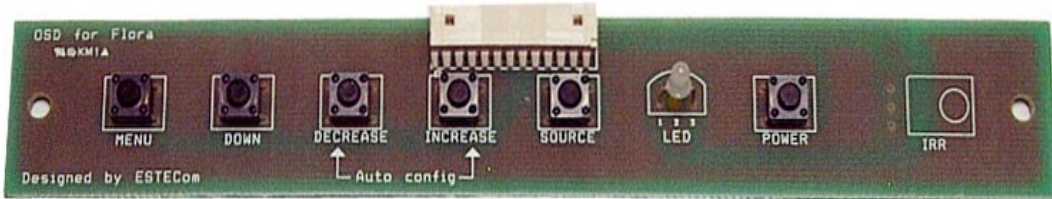
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7. OSD (On Screen Display)

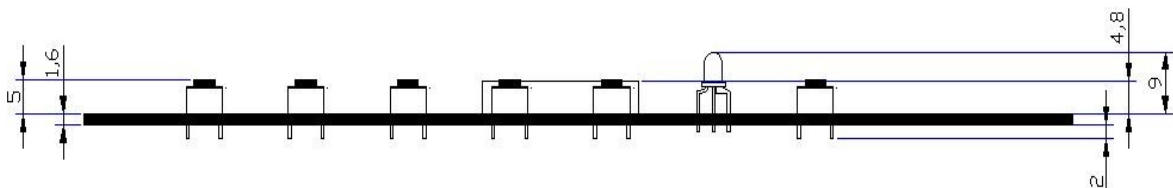
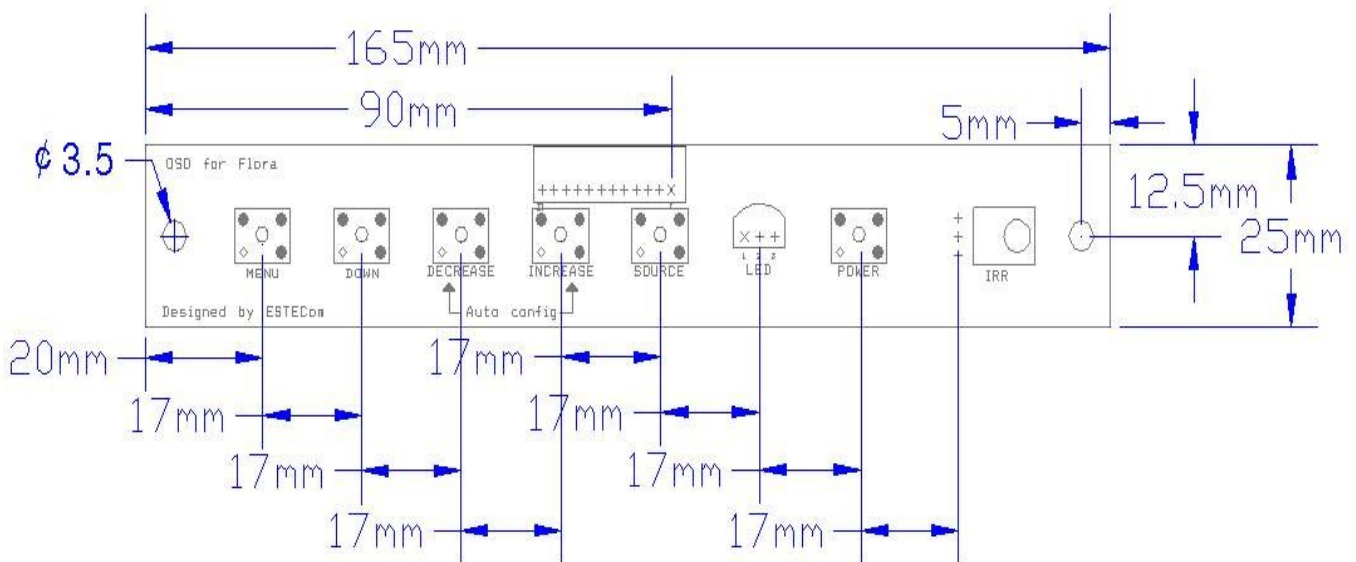
7.1. OSD Board Dimension

7.1.1. OSD Board with 6 buttons

Part number : FOSD-T01



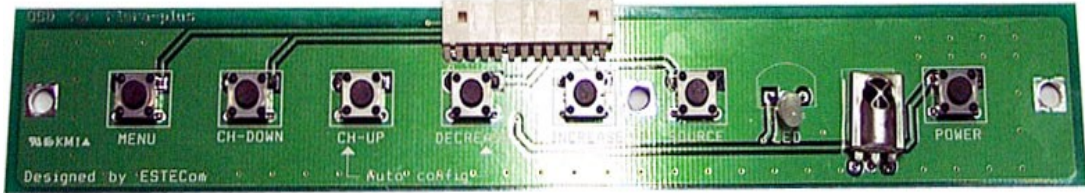
MENU / DOWN(AUTO CONFIG) / DECREASE(LEFT) / INCREASE(RIGHT) / SOURCE SELECT / POWER



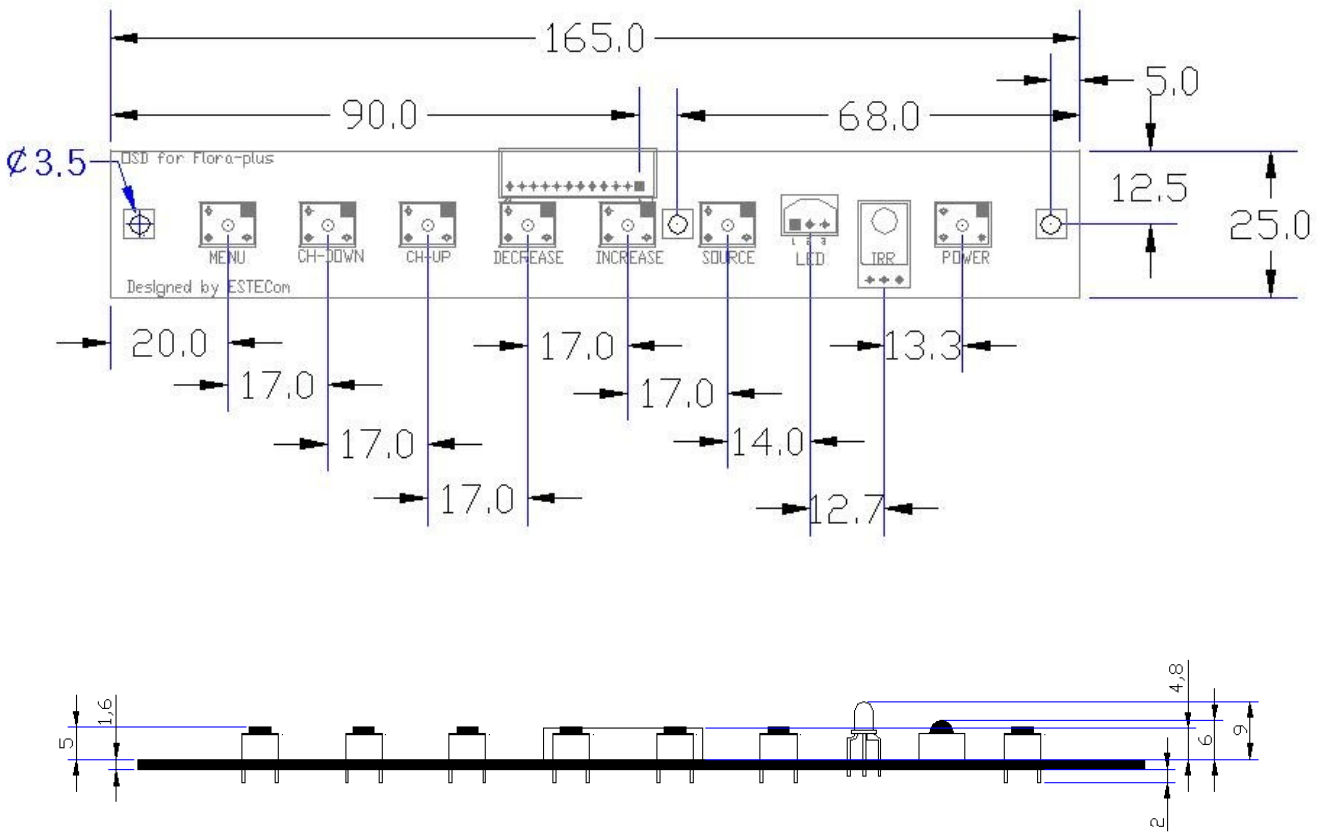
Data Sheet : FCB-AOD-Axx5

7.1.2 OSD Board with 7 buttons

Part number : FOSD-T02

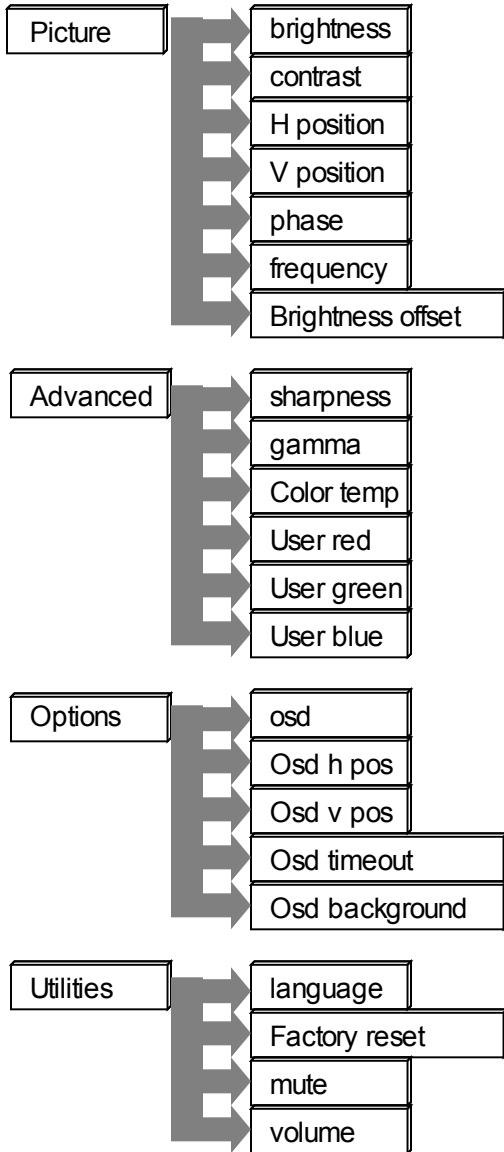


MENU / DOWN / UP / DECREASE(LEFT) / INCREASE(RIGHT) / SOURCE / POWER

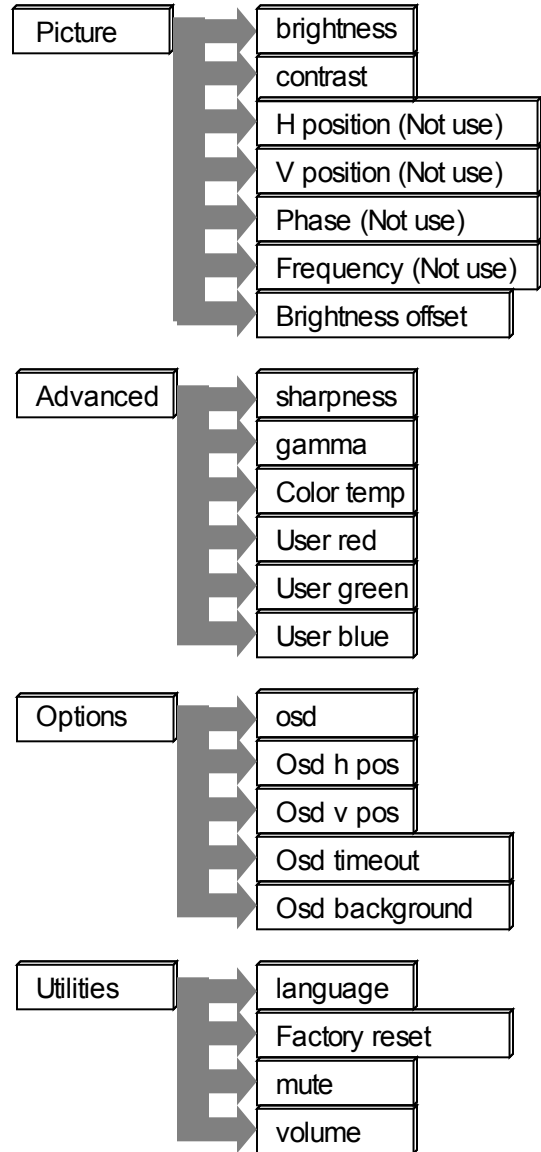


7.2. SUMMARY OF OSD MENU

Analog RGB



DIGITAL (DVI)



OSD KEY DESCRIPTION

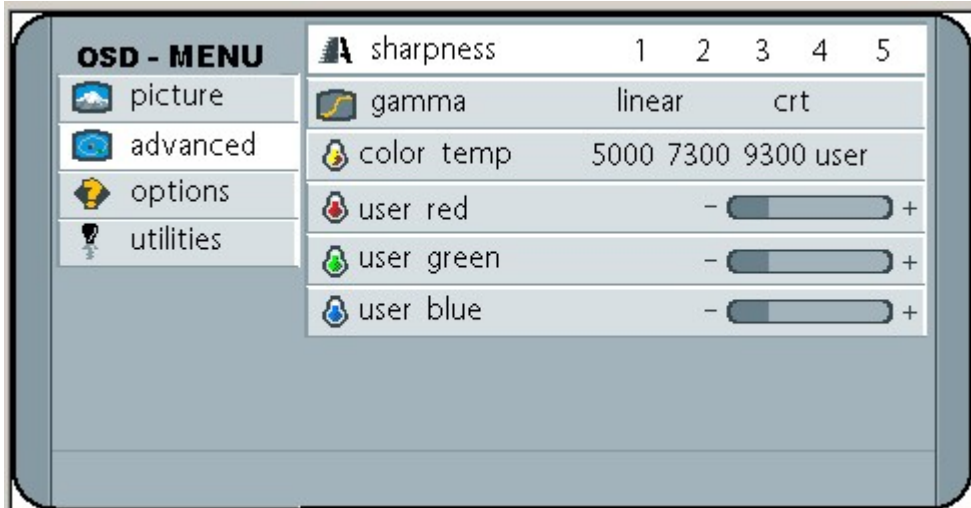
- MENU : menu key
- DOWN : down key (HOT key : Auto config)
- DECREASE : decrease key, left key (HOT key : Audio decrease)
- INCREASE : increase key, right key (HOT key : Audio increase)
- SOURCE : source select key (HOT key : source select [Analog – Digital])

7.3. OSD Menu enables user to manipulate the image and settings.

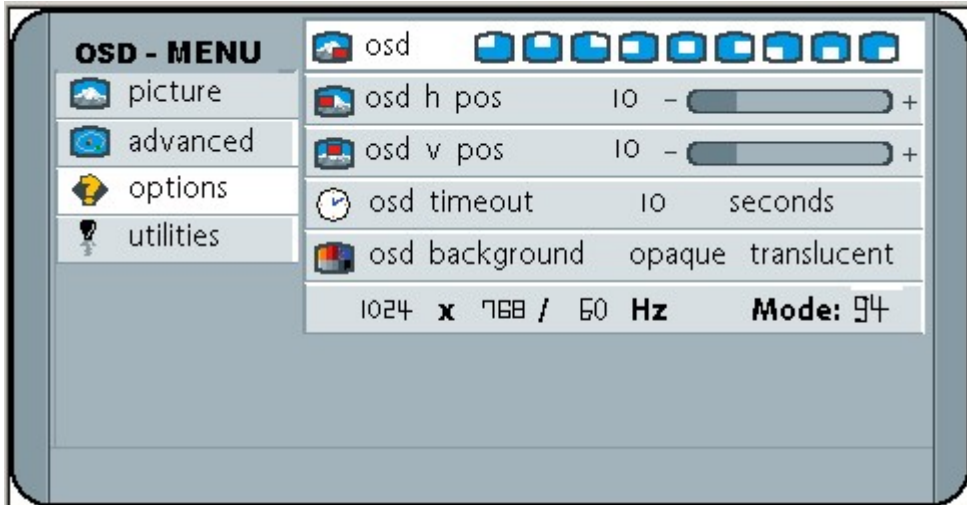


- Brightness : It is used to adjust brightness of the screen. (used to pwm control)
- Contrast : It is used to adjust distinction.
- H position : It is used to move screen right-wards or left-wards.
- V position : It is used to move screen upwards or downwards.
- Phase : It is used to adjust the phase of the screen. Please use it in case there is noises or lines are overlapped.
- Frequency : It is used to adjust horizontal size of the screen by increasing or decreasing number of picture elements.
- Brightness offset : It is used to adjust brightness of the screen. (used to internal offset)

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- Sharpness : You can adjust sharpness of colors in 5 levels.
- Gamma : You can choose linear or "CRT" by it. Initial value is set at linear.
- Color temp : You can choose one among 5000, 7300, 9300, and user's option. Initial value is set at 7300. In case you choose user's option, you can adjust R, G, B respectively.
 - 5000 : It chooses screen tinged with red color.
 - 9300 : It chooses screen tinged with blue color.



- Osd : It adjusts the position of OSD menu screen
- Osd h pos : It adjusts the horizontal position of OSD menu by value.
- Osd v pos : It adjusts the vertical position of OSD menu by value.
- Osd timeout : (osd turn-off time)It adjusts the time within which OSD menu disappears.
You can adjust it to disappear if there is no input for maximum 1 minute.
- Osd background : (osd basic color) You can choose between "clear" and "opaque" for the basic color of OSD menu.



- Language : You can choose one among English, Japan, Korean, German.
- Factory reset : (initial set-up) It changes the set up value to the initial value at time of forwarding at the factory.
- Mute : You can choose sound on or off.
- Volume : It adjusts the volume of sound.