

Engineer Specification

Model No.: ST-HB32A2X(L04)

(w/RS232 Audio) (24V)

Customer: _____

Approved by: _____

Note:

System Integrator	QA	Safety	RD	Product Manager
Approval	Approval	Approval	Approval	Approval

CONTENTS

REVISION HISTORY	4
1. GENERAL DESCRIPTION.....	5
1.1 OVERVIEW.....	5
1.2 FEATURES	5
1.3 APPLICATION.....	5
1.4 GENERAL SPECIFICATIONS.....	5
2. ELECTRICAL SPECIFICATIONS.....	6
3. ELECTRICAL CHARACTERISTICS.....	7
3.1 MEASURING CONDITIONS	7
3.2 OPTICAL SPECIFICATIONS	7
4. EDID CODE.....	10
5. OSD FUNCTIONS	11
5.1 OSD BUTTON.....	12
5.2 OSD REMOTE CONTROLLER (OPTIONAL).....	12
5.3 FACTORY DEFAULT SETTING	12
6. CONNECTER PIN ASSIGNMENT.....	13
6.1 D-SUB 15 PIN CONNECTER	13
6.2 DVI-D 24 PIN CONNECTER	13
6.3 S-VIDEO	14
6.4 COMPONENT.....	14
6.5 COMPOSITE VIDEO (RCA).....	14
6.6 RS232 (OPTIONAL).....	14
7. ENVIRONMENT TEST.....	15
7.1 HIGH TEMPERATURE- STORAGE TEST	15
7.2 LOW TEMPERATURE- STORAGE TEST.....	15
7.3 HUMIDITY OPERATING TEST	15
7.4 HIGH TEMPERATURE OPERATING TEST	15
7.5 LOW TEMPERATURE OPERATING TEST	16
8. RELIABILITIES.....	17
8.1 TEMPERATURE CYCLE TEST.....	17
8.2 ENVIRONMENTAL CHARACTERISTICS- OPERATING CONDITIONS	17
8.3 ENVIRONMENTAL CHARACTERISTICS- NON-OPERATING CONDITIONS	17
8.4 ALTITUDE.....	17
8.5 PACKAGE VIBRATION TEST.....	17

8.6 PACKAGE DROP TEST (WITH CARTON BOX).....	18
9. SAFETY	19
9.1 INSULATION RESISTANCE.....	19
9.2 INSULATION DIELECTRIC STRENGTH.....	19
10. ACCESSORY BOX	20
APPENDIX 1 BLOCK DIAGRAM.....	20
APPENDIX 2 COMPLIANT TIMING	21
APPENDIX 2 COMPLIANT TIMING	22
APPENDIX 3 DIMENSION	23
APPENDIX 4 OSD DISPLAY EXAMPLES.....	24
APPENDIX 5 SHIPPING	25

Revision History

Version	Date	Page	Section	Description
01	Oct.11.06'	All		ST-HB32A2X Specification was first issued.
				

1. General Description

1.1 Overview

ST-HB32A2X is a 32" TFT Liquid Display with 16-CCFL Backlight unit and 1-ch LVDS interface. This display supports 1366 x 768 WXGA format and can display true 16.7M colors (8-bit/color). The inverter module for backlight is built-in.

1.2 Features

- High brightness (500 its)
- Ultra-high contrast ratio (1200:1)
- Faster response time (Gray to Gray average 6.5ms)
- High color saturation NTSC 75%
- Ultra wide viewing angle: 176(H)/176(V)(CR>20) with Super MVA technology
- DE (data enable) only mode
- LVDS (Low Voltage Differential Signaling) interface
- Max resolution 1360 x 768@59.9 Hz
- Low color shift function option
- Support PIP/PAP function

1.3 Application

- Public Display Application
- Home Theater Application
- MFM Application

1.4 General Specifications

Item	Specification	Unit
Active Area	708.954(H) x 398.592(V) (32.02"diagonal)	mm
Bezel Opening Area	714.96(H) x 404.6(V)	mm
Driver Element	a-si TFT active matrix	-
Pixel Number	1366 x R.G.B x 768	pixel
Pixel Pitch(sub-Pixel)	0.1730(H) x 0.5190(V)	mm
Pixel Arrangement	RGB vertical stripe	-
Display Colors	16.7M	Color
Display operation Mode	Transmissive mode / Normally black	-
Surface Treatment	Anti-Glare coating(Haze 25%), Hard coating (3H)	-

2. Electrical Specifications

Item		Specification	Unit
LCD panel	Model no.	CMO V320B1-L04	
	Resolution	1360 x 768	-
	Brightness	500	Nits
	Contrast Ratio	1200	
	Response time	6.5 ms (typ.)(Gray to Gray)	ms
	Aspect Ratio	16 :9	
Graphic	Separate Sync.	LVDS Level	-
	Horizontal Sync.	Positive / Negative	-
	Vertical Sync.	Positive / Negative	-
	Input Connector	D-Sub 15 pins, DVI-D 24 pins, Component, Composite, S-Video,	-
Scan Rate	Horizontal	26~91	KHz
	Vertical	50~85	Hz
Performance	Auto Adjust	Clock, Phase, H-Position &-V Position	-
	Screen Scaling	VGA/SVGA/XGA/WXGA Full Screen Display	-
	Power Management	VESA DPMS, DVI DMPM	-
	Color Adjustment	User, 6500K,5400K,9300K	-
	OSD Language	English	-
	Amplifier	5W Audio in (L/R;RCA jack) Audio out(L/R; RCA jack)	
Power source	Power Input	AC100~240V (Worldwide)	V
Power consumption	Operation Mode	180 (Max)	W
	Power Saving Mode	22W(Max)	W
Physical	Dimension(w/o stand)	671.2*413.2*82.32 (W*D*H),	mm
	Net weight(w/ stand)	16.5 [15 KG w/o stand]	KG
	Gross weight(w/ stand)	20 [18.5 KG w/o stand]	KG
Environment	Storage Temper.	Min -20 ~ Max 60	
	Operating Temper.	Min 5 ~ Max 40	
DCC	Plug & Play	DDC 2B Compliance	-
Function	OSD key	7 keys 【Power; Select; ; - ; < ; > ; Exit】	Key
	RS232C in x1 Option	communication port	-

3. Electrical Characteristics

3.1 Measuring Conditions

Item	Description
Input AC Power	110[V] /60[Hz]
Input Signal	Maximum load timing
Brightness VR	100 (Max)
Contrast VR	50 (Center)
Lighting	Outside optical interception
Distance from LCD	0 cm

3.2 Optical Specifications

The relative measurement methods of optical characteristics are shown in 3.1. The following items should be measured under the test conditions described in 3.1 and stable environment shown in Note (6).

Item		Symbol	Condition	Min	Typ.	Max.	Unit	Note		
Contrast Ratio		CR		900	1200	-	-	(1)		
Response Time		Gray to Gray		-	6.5	12	ms	(2)		
Center Luminance of White		L _C		400	500	-	cd/m ²	(3)		
Average Luminance of White		L _{AVE}		350	400		cd/m ²	(3)		
White Variation		δW				1.3	-	(4)		
Cross Talk		CT		-	-	4.0	%	(5)		
Color Chromaticity	White	W _x	θ _x =0°,θ _y =0° Viewing Normal Angle	Typ.	0.285	Typ.	Target	(6)		
		W _y			0.293					
	Red	R _x			0.652					
		R _y			0.333					
	Green	G _x			-0.03				0.275	+0.03
		G _y			0.595					
	Blue	B _x			0.143					
		B _y			0.063					
Color Gamut		CG		72	75	-	%	NTSC		
Viewing Angle	Horizontal	θ _x ⁺	CR 20		80		Deg.	(7)		
		θ _x ⁻			80					
	Vertical	θ _y ⁺			80					
		θ _y ⁻			80					

Note (1) Definition of Contrast Ratio (CR):

The contrast ratio can be calculated by the following expression.

$$\text{Contrast Ratio (CR)} = L_{255} / L_0$$

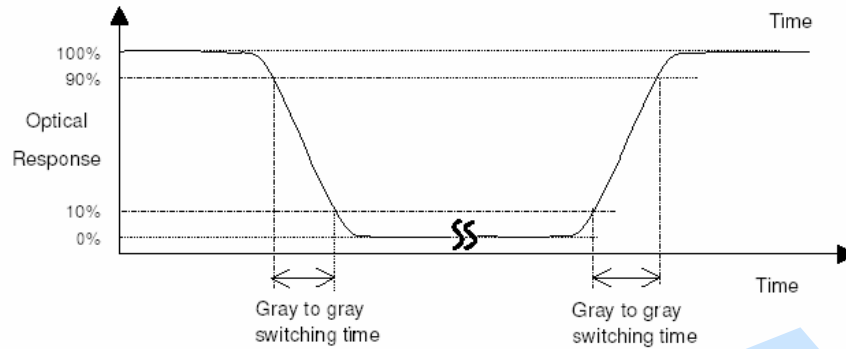
L₂₅₅: Luminance of gray level 255

L₀: Luminance of gray level 0

$$\text{CR} = \text{CR} (5)$$

CR(X) is corresponding to the Contrast Ratio of the point X at the figure in Note (4)

Note (2) Definition of Gray to Gray Switching Time:



The driving signal means the signal of gray level 0, 63, 127, 191, 255.

Gray to gray average time means the average switching time of gray level 0, 63, 127, 191, 255 to each other.

Note (3) Definition of Luminance of White (L_C , L_{AVE}):

Measure the luminance of gray level 255 at center point and 5 points

$$L_C = L(5)$$

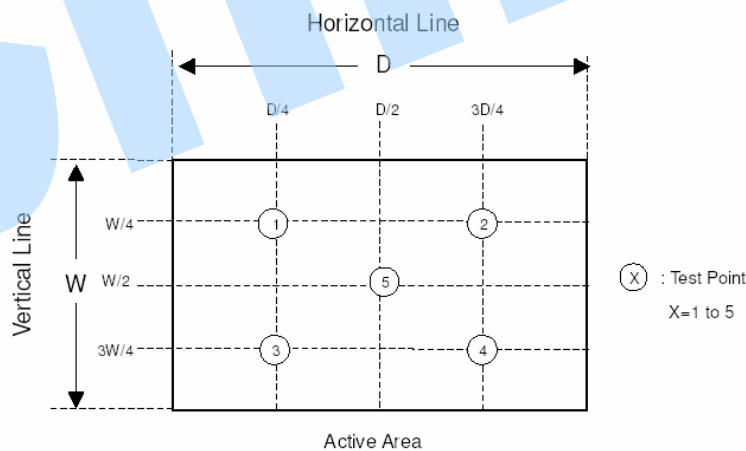
$$L_{AVE} = \frac{L(1)+L(2)+L(3)+L(4)+L(5)}{5}$$

$L(X)$ is corresponding to the luminance of the point X at the figure in Note (4).

Note (4) Definition of White Variation (δW):

Measure the luminance of gray level 255 at 5 points

$$\delta W = \frac{\text{Maximum } [L(1)+L(2)+L(3)+L(4)+L(5)]}{\text{Minimum } [L(1)+L(2)+L(3)+L(4)+L(5)]}$$



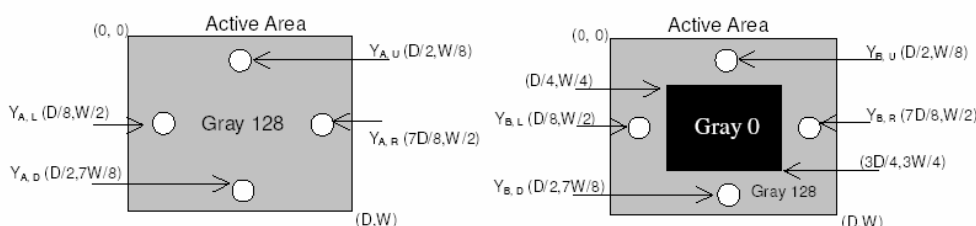
Note (5) Definition of Cross Talk (CT)

$$CT = \frac{|Y_B - Y_A|}{Y_A} \times 100(\%)$$

Where:

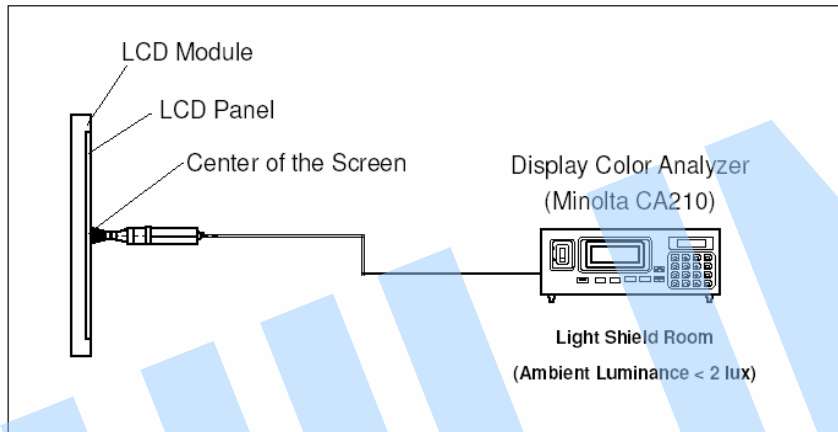
Y_A = Luminance of measured location without gray level 0 pattern (cd/m^2)

Y_B = Luminance of measured location with gray level 0 pattern (cd/m^2)



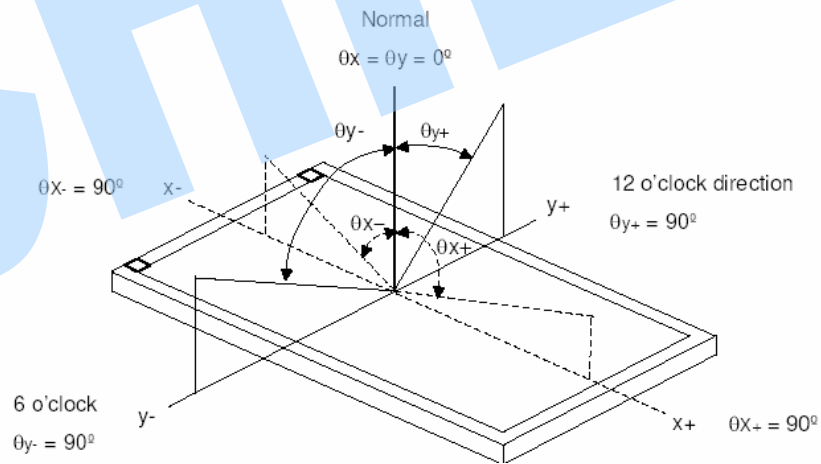
Note (6) Measurement Setup:

The LCD module should be stabilized at given temperature for 1 hour to avoid abrupt temperature change during measuring. In order to stabilize the luminance, the measurement should be executed after lighting backlight for 1 hour in a windless room.



Note (7) Definition of Viewing Angle (θ_x , θ_y):

Viewing angles are measured by EZ-Contrast 160R (Eldim)








4. EDID Code
Analog code (VGA)

Address	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F
0	00	FF	FF	FF	FF	FF	FF	00	38	B8	D0	02	01	00	00	00
10	0F	0D	01	03	0F	80	68	B4	EB	FA	87	A1	5B	57	8E	23
20	11	4D	53	3F	EE	80	31	59	45	59	61	59	81	80	81	C0
30	01	01	01	01	01	01	30	2A	00	98	51	00	2A	40	30	70
40	13	00	78	2D	11	00	00	1E	00	00	00	FD	00	38	55	1E
50	50	0E	00	0A	20	20	20	20	20	20	00	00	00	FC	00	44
60	4C	50	20	48	44	32	0A	20	20	20	20	20	00	00	00	FF
70	00	44	4C	50	20	48	44	32	0A	20	20	20	20	20	00	B1

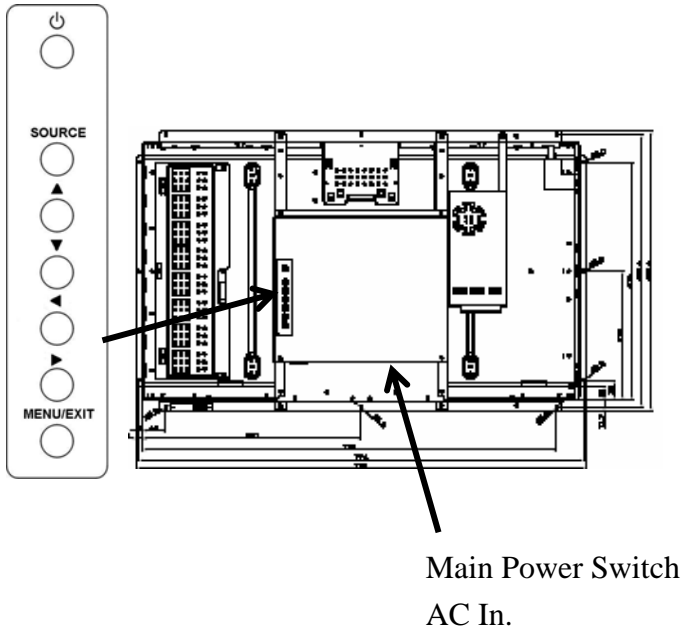
Digital code (DVI-D)

Address	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F
0	00	FF	FF	FF	FF	FF	FF	00	38	B8	D0	02	01	00	00	00
10	0F	0D	01	03	0F	80	68	B4	EB	FA	87	A1	5B	57	8E	23
20	11	4D	53	3F	EE	80	31	59	45	59	61	59	81	80	81	C0
30	01	01	01	01	01	01	30	2A	00	98	51	00	2A	40	30	70
40	13	00	78	2D	11	00	00	1E	00	00	00	FD	00	38	55	1E
50	50	0E	00	0A	20	20	20	20	20	20	00	00	00	FC	00	44
60	4C	50	20	48	44	32	0A	20	20	20	20	20	00	00	00	FF
70	00	44	4C	50	20	48	44	32	0A	20	20	20	20	20	00	B1

5. OSD Functions

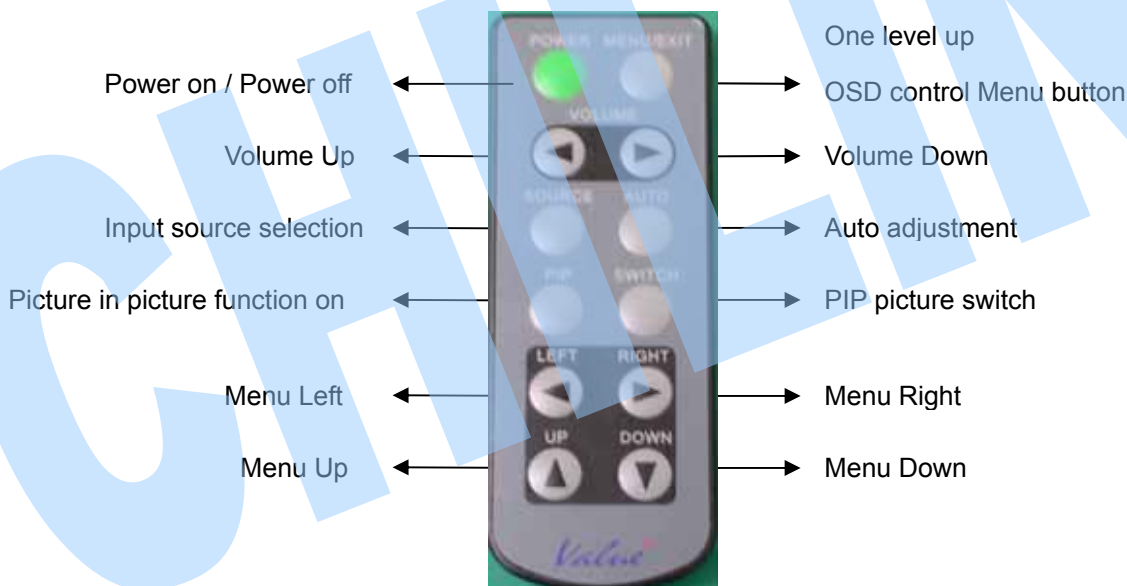
Main Menu	Sub-Menu	Description	Setting		
	Picture (Video mode)	Contrast	Adjust the contrast of the screen	0,100	
		Brightness	Adjust the brightness of the screen	0,100	
		Hue	Adjust the picture hue of the screen	0,100	
		Saturation	Adjust the picture saturation of the screen	0,100	
		Color-Tone	Adjust the picture tone of the screen	6500K,5400K,9300K	
		Scale	Select the picture ratio.	Full,Zoom1,Zoom2,Normal	
		Picture Mode	Select the picture display mode	Standard,Movie,vivid,user	
	Sound	Volume	Adjust the volume of the audio	0,100	
		Bass	Adjust the bass of the audio	0,100	
		Treble	Adjust the treble of the audio	0,100	
		Balance	Adjust the balance of the audio	0,100	
	Function	Set Display ID	Set ID number of Display	00,255(didn't see it)	
		Multi-Picture	H-Position	Adjust the H-position of PIP	0,100(can't in PC mode)
			V-Position	Adjust the V-position of PIP	0,100(can't in PC mode)
			Border Color	Adjust the PIP border color	Blue,Black
			Swap	Swap main & PIP signal	Select(can't in PC mode)
	PC (VGA mode)	Contrast	Adjust the contrast of the screen	0,100	
		Brightness	Adjust the brightness of the screen	0,100	
		H-Position	Move the picture left/right on the screen	0,100	
		V-Position	Move the picture up/down on the screen	0,100	
		Clock	Adjust the display clock	0,255	
		Phase	Adjust the display phase	0,255	
		Color Mode-	Select the color temperature setting	sRGB,User,6500K 5400K,9300K	
		Red	Adjust red color	0,100	
		Green	Adjust green color	0,100	
		Blue	Adjust blue color	0,100	
		AUTO	Auto adjustment	Select	
	OSD	Language	Language setting(no need, because no other language to choose from)	English	
		H-Position	Adjust the OSD menu H-position	0,100(can't tell)	
		V-Position	Adjust the OSD menu V-position	0,100(can't tell)	
		Duration	Adjust the OSD menu duration	0,60	
		Half tone	Adjust the OSD menu tone	0,100	
		Information	Display resolution & F/W check sum	Select	
		Memory recall	Reset to the factory default setting	Select	

5.1 OSD Button



Key		Descriptions
Power Switch		Power on / Power off
Source		Input source selection
+		Menu Right
-		Menu Left
◀		Menu Down; volume up
▶		Menu Up; volume down
EXIT		OSD control Menu button
LED Front bezel	Green	Normal operation
	Orange	Power Management
	Off	Power off

5.2 OSD Remote Controller

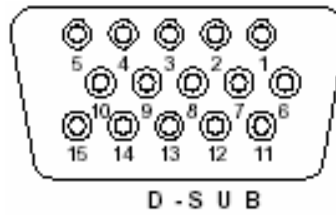


5.3 Factory Default Setting

Item	Default
Power switch	Off
Brightness	100
Contrast	50
Color temp.	User
Red	255
Green	255
Blue	255
Language	English
Auto Config	On

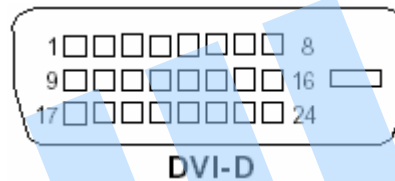
6. Connector Pin Assignment

6.1 D-sub 15 pin connector



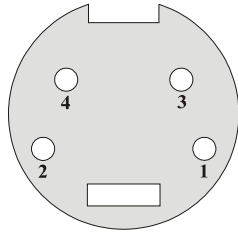
Pin No.	Pin Function	Pin No.	Pin Function
1	Red video input	9	NC
2	Green video input	10	Ground
3	Blue video input	11	No connection
4	NC	12	(SDA)
5	Ground	13	Horizontal sync (Composite sync)
6	Red video ground	14	Vertical sync
7	Green video ground	15	(SCL)
8	Blue video ground		

6.2 DVI-D 24 pin connector



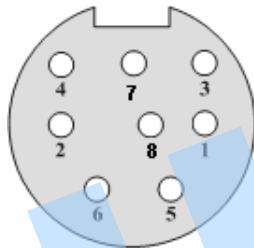
Pin No.	Pin Function	Pin No.	Pin Function
1	T.M.D.S Data 2-	13	NC
2	T.M.D.S Data 2+	14	NC
3	T.M.D.S Data 2 Ground	15	Ground
4	NC	16	Hot Plug Detect
5	NC	17	T.M.D.S Data 0-
6	Clock line (SCL)	18	T.M.D.S Data 0+
7	Data line (SDA)	19	T.M.D.S Data 0 Ground
8	NC	20	NC
9	T.M.D.S Data 1-	21	NC
10	T.M.D.S Data 1+	22	T.M.D.S Clock Ground
11	T.M.D.S Data 1 Ground	23	T.M.D.S Clock+
12	NC	24	T.M.D.S Clock-

6.3 S-Video



Lama Level	1.0 Vpp
Chroma Level	0.286 Vpp
Connector Type	4 pin mini-Din
Termination	75

6.4 Component



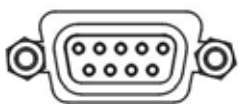
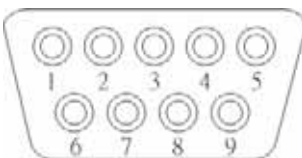
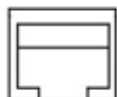
Pin No	Pin Function
1	GND
2	CB
3	GND
4	Y
5	GND
6	CR
7	NC
8	NC

6.5 Composite Video (RCA)



Signal Level	1.0 Vpp
Connector Type	RCA Jack
Termination	75

6.6 RS232 & RS485 (Optional)

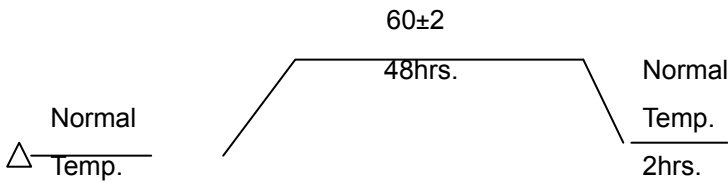

RS232
A

RS485 IN
B

RS485 OUT
C

Pin No.	Function
1	Black data carrier detect(DCD)
2	Brown receive data (RD)
3	Red Transmit data (TD)
4	Orange data terminal ready (DTR)
5	Ground
6	Green red data set ready (DSR)
7	Blue request to send (RTS)
8	Purple clear to send (CTS)
9	Gray ring indicator (RI)
A	communication port
B	communication port
C	communication port-command transfer/receive

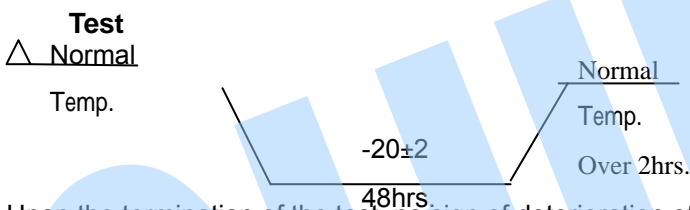
7. Environment Test

7.1 High Temperature- Storage Test Test



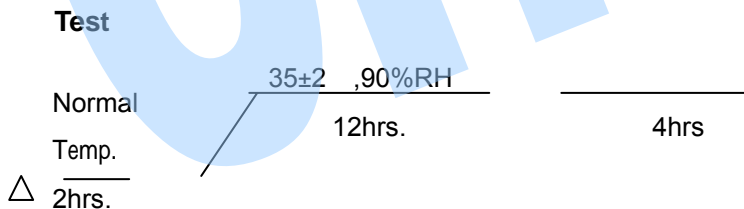
Upon the termination of the test, no sign of deterioration of performance, irregularities of functions and operations, abnormalities of appearance, operational ease, rust, corrosion, or any other abnormalities shall be observed.

7.2 Low Temperature- Storage Test



Upon the termination of the test, no sign of deterioration of performance, irregularities of functions and operations, abnormalities of appearance, operational ease, rust, corrosion, or any other abnormalities shall be observed.

7.3 Humidity Operating Test



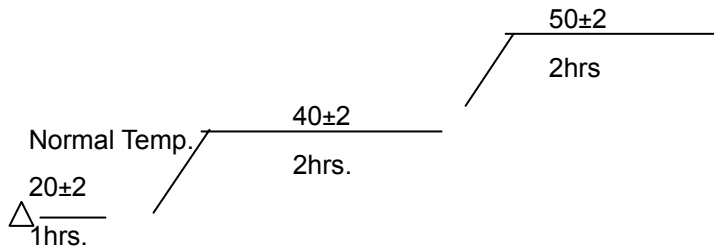
After the test no sign of deterioration of performance, irregularities of function, operations, abnormalities of appearance, operational ease, or any abnormalities shall be observed.

7.4 High Temperature Operating Test

This test evaluates the operational reliability of the DUT (Device Under Test) at high temperature.

Test Condition

Item	Description
Input AC Power	110[V] /60[Hz]
Input Signal	All preset timing
Contrast VR	Center(50)
Brightness VR	MAX (100)
Temperature	20, 50 ± 2
Pattern	1 dot stripe, 16 step gray tone, all white, all black

Test

Test Criteria

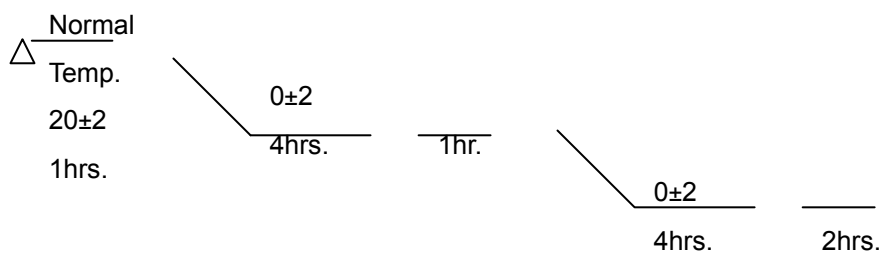
- ▶ At 25~50 test, no sign of noticeable deterioration of performance, deterioration of appearance, operational ease, or any other abnormalities shall be observed.
- ▶ After the high temperature operation test, no destruction or loss of contents the back up memory shall be observed at standard environmental condition.

7.5 Low Temperature Operating Test

This test evaluates the operational reliability the DUT (Device Under Test) at low temperature.

Test Condition

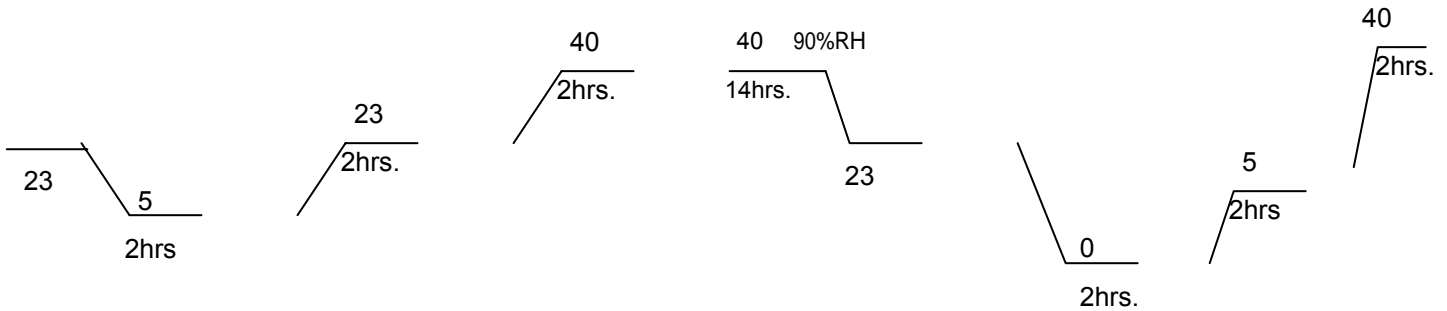
Item	Description
Input AC Power	110[V] /60[Hz]
Input Signal	All preset timing
Contrast VR	Center(50)
Brightness VR	MAX (100)
Temperature	20 ± 2 , 0
Pattern	1 dot stripe, 16 step gray tone, all white, all black

Test

Test Criteria

- ▶ At 20 test, no sign of noticeable deterioration of performance, deterioration of appearance, operational ease, or any other abnormalities shall be observed.
- ▶ At 0 test, sign of significant deterioration of appearance, operational ease, or any other abnormalities of and operations shall be observed.

8. Reliabilities

8.1 Temperature Cycle Test



Test Criteria

- ▶ When the unit is under the condition which temperature is cycle the display status must be within the criteria.
- ▶ At Cycle test, no sign of noticeable deterioration of performance, deterioration of appearance, operational ease, or any other abnormalities shall be observed.

8.2 Environmental Characteristics- Operating Conditions

Temperature	0 ~ +50
Humidity	20~80%

8.3 Environmental Characteristics- Non-Operating Conditions

Temperature	-20 ~ +60
Humidity	20~85%

8.4 Altitude

Temperature	Not more than 3,000m
Non-Operating	Not more than 12,000m

8.5 Package Vibration Test

This test evaluates the equipment against influence of vibration encountered during the transportation.

Test Conditions: Random Vibration

Item	Description
Test Axis	3 axis
Search Frequency	5~200 Hz
Acceleration	1.47 G (zero to peak)
Dwelling Time	30 minutes x 3 axis.
Mounting	Fixed firmly on the vibration table.

Test Criteria

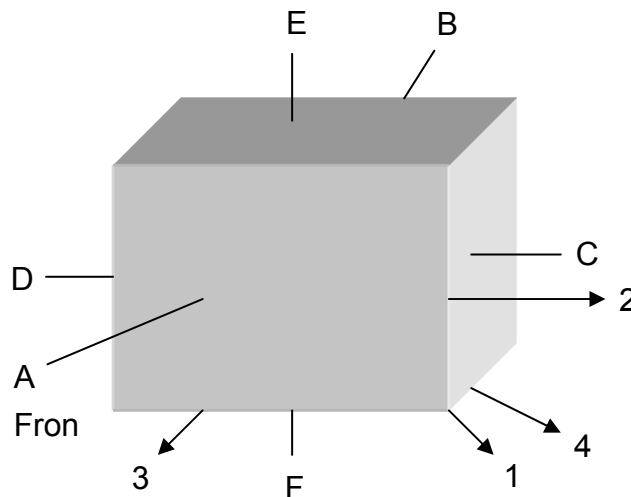
- ▶ Upon the termination of non-operating test, there was no sign of damage, scratches, loosened screws, loose parts, removed connectors, printed-foil floating, or any other faults, Upon Power up. Normal operations are observed.
- ▶ No sign of operational abnormalities shall be observed during operating test.

8.6 Package Drop Test (with carton box)

This test evaluates the DUT (Device Under Test) against the effects of drop encountered during the process of transportation.

Test Conditions

Item	Position	Drop Height
Corner	1	30 cm
Edges	2,3,4	30 cm
Surface	A, B, C, D, E, F	30 cm
Drop Sequence	1 2 3 4 A B C D E F	
After one Corner and three Edges test, changed the cushions to test six Faces.		



Test Criteria

- ▶ After test, there was no sign of damage, scratches, loosened screws, loose parts, removed connectors, printed-foil floating, or any other faults.
- ▶ Crushes of all corners on carton box are less than 40% against each side.

8.7 Electrostatic Discharge

The objective of this test is to evaluate the reliability of the product against discharge of electrostatic potentials stored by the human-body & the Styrofoam fillers used to ship the product.

Test Criteria

No damage from air discharge . Test conducted using capacitor discharge method (150pF + 330Ω)

Air-Discharge: ±4KV, no restart error.

Contact-Discharge: ±4KV, no restart error.

9. Safety

This Product was tested to the following standards and found Compliance.

Standards :

FCC : CFR47, Part 15 / CISPR 22 3rd Edition : 1997, Class B

ANSI C63.4 : 2003

Canadian ICES-003

CE : EN 55022 : 1998+A1 : 2000+A2 : 2003, Class B

EN 55024 : 1998+A1 : 2001+A2 : 2003 IEC 61000-4 Series

EN 61000-3-2 : 2000 & EN 61000-3-3 : 1995+A1 : 2001

UL : UL 60950-1 : 2003, First Edition

CSA C22.2 No. 60950-1-03 1st Ed. April 1, 2003

TUV : IEC 60950-1 : 2001, First Edition

9.1 Insulation Resistance

The resistance of the insulation between the power terminal and the earth ground contact is more than 10 M while withstanding a voltage of 500V(DC).

Test Conditions

Item	Description
Voltage	500V
Resistance Value	10 M

Test Criteria

The power terminal and the earth ground contact is more than 4M while withstanding a voltage of 500V(dc).

9.2 Insulation Dielectric Strength

The evaluation conforms to safety standard of shipment area.

Test Conditions

Item	Description	
Voltage	500V	1.6k Vac
Time	3 secs	3 secs
Current	20 mA (max)	20 mA (max)

Test Criteria

There is no breakdown of the insulators or short circuits when applying an alternating potential of 1.5k Vac and 1.6k Vac for duration of 20m and 3 seconds respectively between the metallic chassis and the input power supply active and neutral terminals connected together.

10. Accessory Box



	Item	Q'ty
1	Power cord US type.(option) Black1800mm±50mm	1
2	VGA Cable- Black 1800mm±50mm	1
3	DVI-D Cable- Black 1800mm±50mm	1
4	S-Video Cable- Black 1800mm±50mm	1
5	Component Cable- Black 1800mm±50mm	1
6	Composite(RCA)Cable- Black 1500mm±50mm	1
7	OSD Remote Control	1

Power Cord –black



VGA Cable (D-sub)



DVI-D Cable



S-Video Cable



Component Cable



Composite(AV RCA) Cable

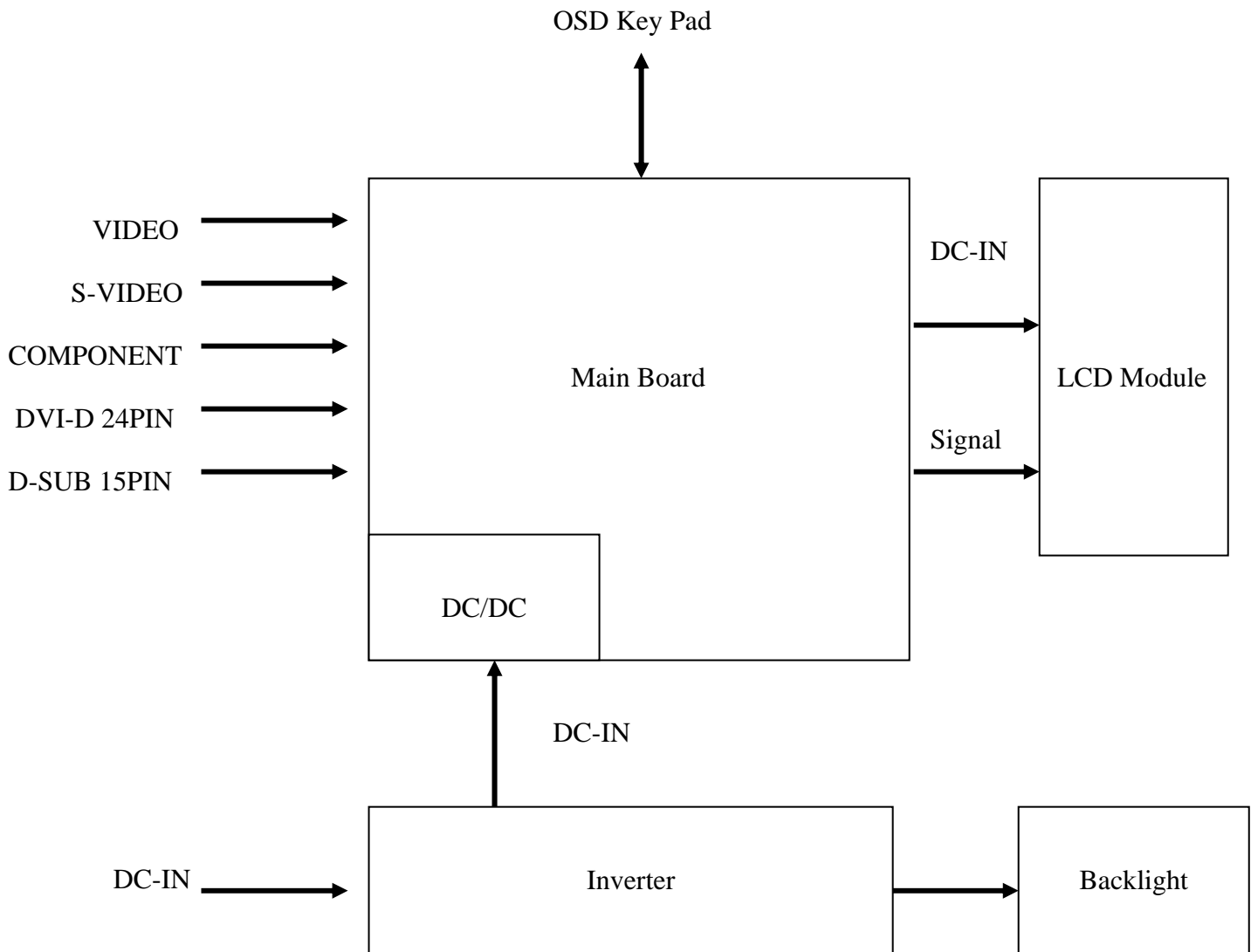


OSD Remote Control (Optional)

1 piece Lithium battery (CR2032) is included inside.



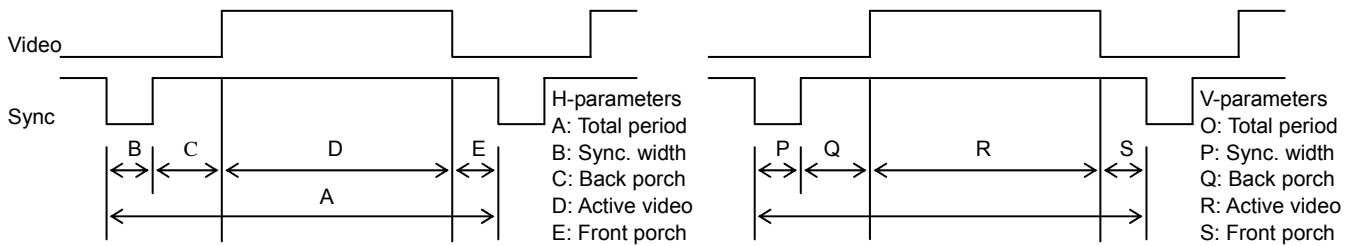
Appendix 1 Block Diagram



Appendix 2 Compliant Timing

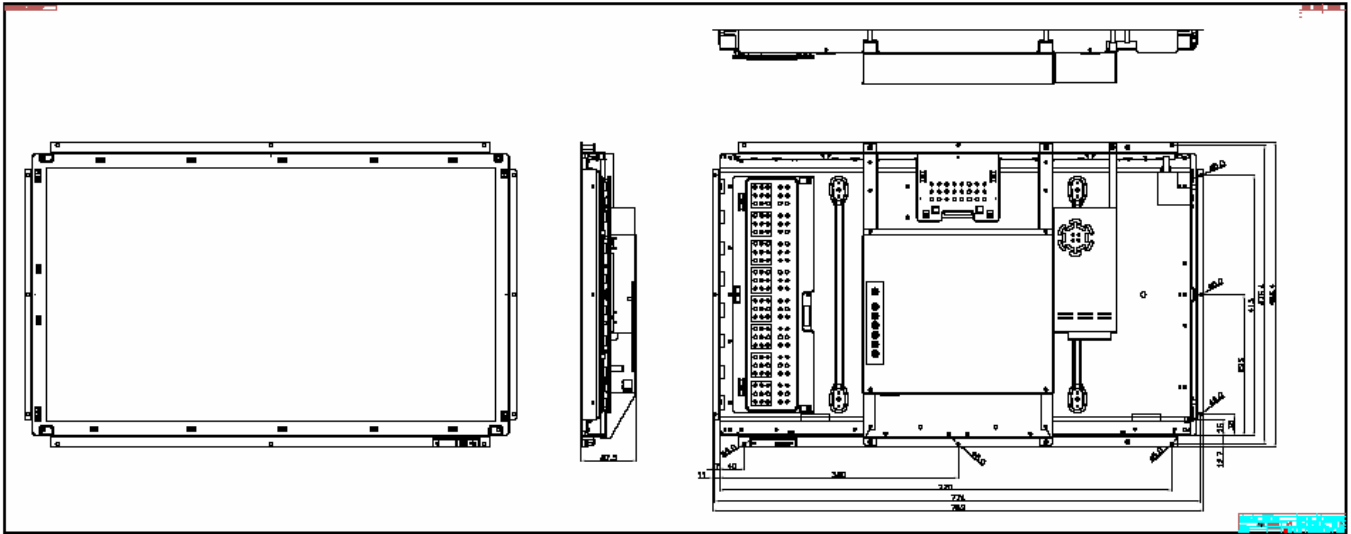
< Horizontal >

< Vertical >



Item	Video Mode		fH (kHz)	fV (Hz)	Dot clock (MHz)	Sync polarity		Horizontal (dot)					Vertical (line)					Analog	Digital (Optional)	
						H	V	A	B	C	D	E	O	P	Q	R	S			
1	VESA	VGA 640x480	31.469	59.940	25.175	N	N	800	96	48	640	16	526	2	33	480	11	O	O	
2			37.861	72.809	31.500	N	N	832	40	128	640	24	520	3	28	480	9	O	O	
3			37.500	75.000	31.500	N	N	840	64	120	640	16	500	3	16	480	1	O	O	
4		SVGA 800x600		35.156	56.250	36.000	P	P	1024	72	128	800	24	625	2	22	600	1	O	-
5				37.879	60.317	40.000	P	P	1056	128	88	800	40	628	4	23	600	1	O	O
6				48.077	72.188	50.000	P	P	1040	120	64	800	56	666	6	23	600	37	O	O
7				46.875	75.000	49.500	P	P	1056	80	160	800	16	625	3	21	600	1	O	O
8		XGA 1024x768		48.363	60.004	65.000	N	N	1344	136	160	1024	24	806	6	29	768	3	O	O
9				56.476	70.069	75.000	N	N	1328	136	144	1024	24	806	6	29	768	3	O	O
10				60.023	75.029	78.750	P	P	1312	96	176	1024	16	800	3	28	768	1	O	O
11		SXGA	1152x864	67.500	75.000	108.000	P	P	1600	128	256	1152	64	900	3	32	864	1	O	O
12			1280x1024	63.981	60.020	108.000	P	P	1688	112	248	1280	48	1066	3	38	1024	1	O	O
13				79.976	75.025	135.000	P	P	1688	144	248	1280	16	1066	3	38	1024	1	O	-
14	VGA TEXT	720x400	31.469	70.087	28.322	N	P	900	108	45	720	27	449	2	35	400	12	O	O	
15	Macintosh	640x480	35.000	66.667	30.240	N	N	864	64	96	640	64	525	3	39	480	3	O	-	
16		832x624	49.725	74.500	57.283	N	N	1152	64	224	832	32	667	3	39	624	1	O	-	
17	720p-50	1024x768	60.150	74.720	80.000	N	N	1330	96	168	1024	42	805	3	31	768	3	O	-	
18		1280x720	37.50	50.000	74.250			1980	40	220	1280	440	750H	5H	20H	720H	5H	O	-	
19		1280x720	44.96	59.94	74.18			1650	40	220	1280	110	750H	5H	20H	720H	5H	O		
20	720p-60	1280x720	45.00	60.00	74.25			1650	40	220	1280	110	750H	5H	20H	720H	5H	O		
21	768-60	1360x768	47.72	59.95	84.75			1776	152	176	1360	88	796H	3H	24H	768H	1H	O		
Item	Video Mode		fH (kHz)	fV (Hz)	Dot clock (MHz)															
1	NTSC	NTSC 358-443	15.743	59.94	16.521															
2	PAL	PAL SECAM	15.625	50.00	16.406															

Appendix 3 Dimension



Appendix 4 OSD Display Examples

Picture : OSD color is yellow



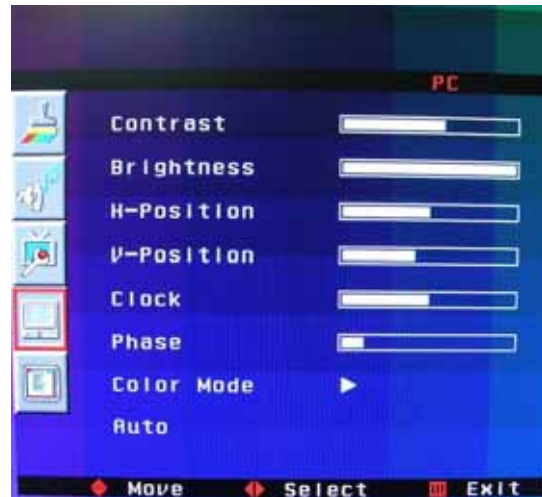
Sound : OSD color is Orange



Function : OSD color is Green



PC : OSD color is Red



OSD : OSD color is Brown



Appendix 5 Shipping
