

Service Manual

ViewSonic VA702-1

VA702b-1

Model No. VS10781

17" Color TFT LCD Display

(VA702-1_ VA702b-1_SM Rev. 1b Sep. 2006)

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Revision History

Revision	SM Editing Date	ECR Number	Description of Changes	Editor
1a	10/20/05		Initial Release	G. Han
1b	9/12/2006		Add 2 nd panel V7 & VA (updated RSPL, BOM)	Jamie Chang

TABLE OF CONTENTS

1. Precautions and Safety Notices	1
2. Specification	4
3. Front Panel Function Control Description	13
4. Circuit Description	18
5. Adjustment Procedure	29
6. Troubleshooting Flow Chart	35
7. Recommended Spare Parts List	42
8. Exploded Diagram and Exploded Parts List	47
9. Block Diagram	49
10. Schematic Diagrams	50
11. PCB Layout Diagrams	58

1. Precautions and Safety Notices

1. SAFETY PRECAUTIONS

This monitor is manufactured and tested on a ground principle that a user's safety comes first. However, improper use or installation may cause damage to the monitor as well as to the user.

WARNINGS:

- This monitor should be operated only at the correct power sources indicated on the label on the rear of the monitor. If you're unsure of the power supply in your residence, consult your local dealer or Power Company.
- Use only the special power adapter that comes with this monitor for power input.
- Do not try to repair the monitor by yourself, as it contains no user-serviceable parts. Only the qualified technician can repair it.
- Do not remove the monitor cabinet. There are high-voltage parts inside that may cause electric shock to human bodies.
- Stop using the monitor if the cabinet is damaged. Have it checked by a service technician.
- Put your monitor only in a lean, cool, dry environment. If it gets wet, unplug the power cable immediately and consult your closed dealer.
- Always unplug the monitor before cleaning it. Clean the cabinet with a clean, dry cloth. Apply non-ammonia based cleaner onto the cloth, not directly onto the glass screen.
- Do not place heavy objects on the monitor or power cord.





2. PRODUCT SAFETY NOTICE

Many electrical and mechanical parts in this chassis have special safety visual inspections and the protection afforded by them cannot necessarily be obtained by using replacement components rated for higher voltage, wattage, etc. Before replacing any of these components read the parts list in this manual carefully. The use of substitute replacement parts, which do not have the same safety characteristics as specified in the parts list, may create shock, fire, or other hazards.

3. SERVICE NOTES

- When replacing parts or circuit boards, clamp the lead wires around terminals before soldering.
- Keep wires away from high voltage, high temperature components and sharp edges.
- Keep wires in their original position so as to reduce interference.
- Adjustment of this product please refers to the user's manual.

4. Handling and Placing Methods

Correct Methods:	Incorrect Methods:
<p data-bbox="135 338 810 443">Only touch the metal of the LCD panel or the front cover of the monitor. Do not touch the surface of the polarizer.</p> 	<p data-bbox="837 338 1513 443">Surface of the LCD panel is pressed by fingers and that may cause "Mura".</p> 
<p data-bbox="135 1122 603 1171">Take out the monitor with cushions.</p> 	<p data-bbox="837 1122 1513 1193">Taking out the monitor by grasping the LCD panel. That may cause "Mura".</p> 

Correct Methods:

Place the monitor on a clean and soft foam pad.



Incorrect Methods:

Placing the monitor on foreign objects, That could scratch the surface of the panel or cause "Mura".



The panel is placed facedown on the lap. That may cause "Mura".



2. Specification

INTRODUCTION

	FEATURES	VA702/b
TFTLCD PANEL	Size	17 "
	Luminance (Typ)	300 cd/m ²
	Contrast Ratio (Typ)	500:1
	Colors (6 bits + 2 bits FRC)	16.2 M
	Response Time (Typ)	12 ms
	Viewing Angle (H/V)	140 ° / 125 °
	Recommend resolution	1280x1024@60Hz
2 nd TFTLCD PANEL	Size	17 "
	Luminance (Typ)	300 cd/m ²
	Contrast Ratio (Typ)	500:1
	Colors (6 bits + 2 bits FRC)	16.2 M
	Response Time (Typ)	8 ms
	Viewing Angle (H/V)	150 ° / 135 °
	Recommend resolution	1280x1024@60Hz
3 rd TFTLCD PANEL	Size	17 "
	Luminance (Typ)	280 cd/m ²
	Contrast Ratio (Typ)	600:1
	Colors (6 bits + 2 bits FRC)	16.2 M
	Response Time (Typ)	8 ms
	Viewing Angle (H/V)	150 ° / 135 °
	Recommend resolution	1280x1024@60Hz
Input Signal	Analog (75ohms, 0.7/1.0 Vp-p)	Yes
	Digital	No
Sync Compatibility	Separate Sync	Yes
	Composite Sync	No
	Sync on Green	No
Compatibility	PC	Yes
	Power Mac	Yes
	TV Box (NextVision 6)	Yes
Power Voltage	AC 100-240V, 50/60Hz	Yes
Power Consumption	On Mode(Max / Typ)	36 W/ 35 W
	Off Mode (Max)	≤ 1 W
Ergonomics	Tilt (20 ° - -5 °)	Yes
	Swivel	No
	Pivot	No
	Height Adjust	No
OSD Control	[1] [▼] [▲] [2] [⊙]	Yes
Dimension	Physical (W x H x D)	378 x 374 x 196 mm
	Package (W x H x D)	440 x 511 x 132 mm
Weight	Physical (Net Weight)	4.5 kg
	Package (Gross Weight)	6.2 kg
Operating Condition	Temperature (°F/°C)	32°F-104°F / 0°C-40°C
	Humidity (%)	10 % - 90 %
Storage Condition	Temperature (°F/°C)	-4°F-140°F / -20°C-60°C
	Humidity (%)	5 % - 90 %
Regulation	UL, cUL, FCC-B, CB, CE, ENERGY, NOM, TUV/GS, TUV ERGO (covers ISO13406-2 & MPRII), TCO'03, GOST-R+20 ORIGINAL COPIES HYGIENIC, SASO, PCBC, VCCI, BSMI, CCC, (PSB), (C-TICK), TUV-S, Green Mark, Energy Star, RoHS, WEEE	

GENERAL specification

Test Resolution & Frequency	1280x1024 @ 60Hz
Test Image Size	Full Size
Contrast and Brightness Controls	Factory Default: Contrast = 70%, Brightness = 100%

VIDEO INTERFACE

Analog Input Connector	DB-15 (Analog), refer the appendix A
Video Cable Strain Relief	Equal to twice the weight of the monitor for five minutes
Video Cable Connector DB-15 Pin out	Compliant DDC 1/2B
Video Signals	Video RGB (Analog) - Separate
Video Impedance	75 Ohms (Analog)
Maximum PC Video Signal	950 mV with no damage to monitor
Maximum Mac Video Signal	1250 mV with no damage to monitor
Sync Signals	LVDS
DDC 1/2B	Compliant with Revision 1.3
Sync Compatibility	Separate Sync
Video Compatibility	Shall be compatible with all PC type computers, Macintosh computers, and after market video cards
Resolution Compatibility	640 x 350, 640 x 480, 720 x 400 (640 x 400*), 800 x 600, 832 x 624, 1024 x 768, 1152 x 870, 1280 x 720, 1280 x 1024
Exclusions	Not compatible with interlaced video

POWER SUPPLY

Internal Power Supply	Part Number: ILIPI-004
Input Voltage Range	90 TO 264 VAC
Input Frequency Range	47.5 TO 63 HERTZ
Short Circuit Protection	Output can be shorted without damage
Over Current Protection	2.4 A typical at 14.2 VDC
Leakage Current	3.5mA (Max) at 254VAC / 60Hz
Efficiency	80% typical at 115VAC Full Load
Fuse	Internal and not user replaceable
Power Dissipation	35 Watts (typ)
Max Input AC Current	0.8 Arms @ 90VAC, 0.4 Arms @265VAC
INRUSH CURRENT (COLD START)	30 A @ 120VAC, 50 A (max) @ 220VAC
Power Supply Cold Start	Shall start and function properly when under full load, with all combinations of input voltage, input frequency, and operating temperature
Power Supply Transient Immunity	Shall be able to withstand an ANSI/IEEE C62.41-1980 2000V 200 ampere ring wave transient test with no damage
Power Supply Line Surge Immunity	Shall be able to withstand 1.5 times nominal line voltage for one cycle with no damage
Power Supply Missing Cycle Immunity	Shall be able to function properly, without reset or visible screen artifacts, when ½ cycle of AC power is randomly missing at nominal input
Power Supply Acoustics	The power supply shall not produce audible noise that would be detectable by the user. Audible shall be defined to be in compliance with ISO 7779 (DIN EN27779:1991) Noise measurements of machines acoustics. Power Switch noise shall not be considered
US Type Power Cable	Separate 3-prong NEMA 5-15P type plug. Length = 1.8m. Connects to display. Color = Black
European Type Power Cable	Schuko CEE7-7 type plug. Length = 1.8m, Connects to display. Color = Black
CCC Type Power Cable	Separate 3-prong type plug. Length = 1.8m. Connects to display. Color = Black
PSE Type Power Cable	Separate 2-prong NEMA 1-15P type plug. Length = 1.8m. Connects to display. Color = Black
Power Saving Operation(Method)	VESA DPMS Signaling
Power Consumption	On Mode < 36 W (max) / 35 W(typ) Off Mode< 1W
Recovery Time	On Mode = N/A, Active Off < 3 sec

ELECTRICAL REQUIREMENT

Horizontal / Vertical Frequency

Horizontal Frequency	30 – 82 KHZ
Vertical Refresh Rate	50 – 85* HZ. * WHEN THE RESOLUTION IS SET TO 1280 X 1024, THE VERTICAL REFRESH RATE MAY BE UP TO 75 HZ; FOR ALL OTHER RESOLUTIONS, THE VERTICAL REFRESH RATE MAY BE UP TO 85HZ.
Maximum Pixel Clock	140 MHz
Sync Polarity	Independent of sync polarity.

Timing Table

Item	Timing	Analog
1	640 x 350 @ 70Hz, 31.5kHz	Yes
2	640 x 400 @ 60Hz, 31.5kHz	Yes
3	640 x 400 @ 70Hz, 31.5kHz	Yes
4	640 x 480 @ 50Hz, 24.7kHz	Yes
5	640 x 480 @ 60Hz, 31.5kHz	Yes
6	640 x 480 @ 67Hz, 35.0kHz	Yes
7	640 x 480 @ 72Hz, 37.9kHz	Yes
8	640 x 480 @ 75Hz, 37.5kHz	Yes
9	640 x 480 @ 85Hz, 43.27kHz	Yes
10	720 x 400 @ 70Hz, 31.5kHz	Yes
11	800 x 600 @ 56Hz, 35.1kHz	Yes
12	800 x 600 @ 60Hz, 37.9kHz	Yes
13	800 x 600 @ 75Hz, 46.9kHz	Yes
14	800 x 600 @ 72Hz, 48.1kHz	Yes
15	800 x 600 @ 85Hz, 53.7kHz	Yes
16	832 x 624 @ 75Hz, 49.7kHz	Yes
17	1024 x 768 @ 60Hz, 48.4kHz	Yes
18	1024 x 768 @ 70Hz, 56.5kHz	Yes
19	1024 x 768 @ 72Hz, 58.1kHz	Yes
20	1024 x 768 @ 75Hz, 60.0kHz	Yes
21	1024 x 768 @ 85Hz, 68.67kHz	Yes
22	1152 x 870 @ 75Hz, 68.7kHz	Yes
23	1280 x 1024 @ 60Hz, 63.4kHz	Yes
24	1280 x 1024 @ 75Hz, 79.97kHz	Yes
25	1280x 720 @ 60Hz, 45kHz (HDTV)	Yes

Primary Presets

1280x1024 @ 60Hz

User Presets

Number of User Presets (recognized timings) Available: 10 presets total in FIFO configuration

Changing Modes

- Maximum Mode Change Blank Time for image stability: 3 seconds (Max), excluding “Auto Image Adjust” time.
- Under DOS mode (640 x 350, 720 x 400 & 640 x 400), it should recall factory setting when execute “Auto Image Adjust”.
- The monitor needs to do “Auto Image Adjust” the first time when a new mode is detected. (See section “0-Touch™ Function Actions”)

AUDIO INTERFACE (SPEAKER SPECIFICATION)

No Audio function

TFT LCD PANEL

Panel Characteristics:

1st Source Panel

Model number	Innolux MT170EN01 V1	
Type	TN type with LVDS interface	
Active Size	337.9 (H) x 270.3 (V)	
Pixel Arrangement	RGB Vertical Stripe	
Pixel Pitch	0.264 mm	
GLASS TREATMENT	Anti Glare (Hard coating 3H)	
# OF BACKLIGHTS	4 CCFL edge-light (2 top / 2 bottom)	
BACKLIGHT LIFE	40,000 Hours (Min) / 50,000 (Typ)	
Luminance (Center) – Condition: CT = 6500K, Contrast = Max, Brightness = Max	300 cd/m2 (Typ after 30 minute warm up) 250 cd/m2 (Min after 30 minute warm up)	
Brightness Uniformity (13 points)	0.8 (Typ), 0.75(Min) δ = Min Luminance of 13 points/Max Luminance of 13 points	
Contrast Ratio	500:1 (Typ), 400:1 (min)	
Color Depth	16.2 million colors (6 bits + 2 bits FRC)	
Viewing Angle (Horizontal)	@ CR>=10 Typical: 140° Minimum: 130°	@ CR>= 5 Typical: 160° Minimum: 150°
VIEWING ANGLE (VERTICAL)	@ CR>=10 Typical: 130° Minimum: 120°	@ CR>= 5 Typical: 160° Minimum: 150°
Response Time 10%-90% @ Ta=25°C	12 ms (Tr= 3 ms, Tf = 9 ms) (typ) 16 ms (Tr= 5 ms, Tf = 11 ms)(max)	
Panel Defects	Please see Panel Quality Specifications.	

2nd Source Panel

Model number	Innolux MT170EN01 V4
Type	TN type with LVDS interface
Active Size	337.9 (H) x 270.3 (V)
Pixel Arrangement	RGB Vertical Stripe
Pixel Pitch	0.264 mm
GLASS TREATMENT	Anti Glare (Hard coating 3H)
# OF BACKLIGHTS	4 CCFL edge-light (2 top / 2 bottom)
BACKLIGHT LIFE	40,000 Hours (Min) / 50,000 (Typ)
Luminance (Center) – Condition: CT = 6500K, Contrast = Max, Brightness = Max	300 cd/m ² (Typ after 30 minute warm up) 250 cd/m ² (Min after 30 minute warm up)
Brightness Uniformity (13 points)	0.8 (Typ), 0.75(Min) δ = Min Luminance of 13 points/Max Luminance of 13 points
Contrast Ratio	500:1 (Typ), 400:1 (min)
Color Depth	16.2 million colors (6 bits + 2 bits FRC)
Viewing Angle (Horizontal)	@ CR>=10 Typical: 150° @ CR>= 5 Typical: 170°
VIEWING ANGLE (VERTICAL)	@ CR>=10 Typical: 135° @ CR>= 5 Typical: 155°
Response Time 10%-90% @ Ta=25°C	8 ms (Tr= 2 ms, Tf = 6 ms) (typ) 18 ms (Tr= 7 ms, Tf = 11 ms)(max)
Panel Defects	Please see Panel Quality Specifications.

3rd Source Panel

Model number	Innolux MT170EN01 V7	
Type	TN type with LVDS interface	
Active Size	337.9 (H) x 270.3 (V)	
Pixel Arrangement	RGB Vertical Stripe	
Pixel Pitch	0.264 mm	
GLASS TREATMENT	Anti Glare (Hard coating 3H)	
# OF BACKLIGHTS	4 CCFL edge-light (2 top / 2 bottom)	
BACKLIGHT LIFE	40,000 Hours (Min) / 50,000 (Typ)	
Luminance (Center) – Condition: CT = 6500K, Contrast = Max, Brightness = Max	280 cd/m2 (Typ after 30 minute warm up) 250 cd/m2 (Min after 30 minute warm up)	
Brightness Uniformity (13 points)	0.8 (Typ), 0.75(Min) δ = Min Luminance of 13 points/Max Luminance of 13 points	
Contrast Ratio	600:1 (Typ), 400:1 (min)	
Color Depth	16.2 million colors (6 bits + 2 bits FRC)	
Viewing Angle (Horizontal)	@ CR \geq 10 Typical: 150° @ CR \geq 5 Typical: 170°	@ CR \geq 10 Typical: 140° Minimum: 130°
VIEWING ANGLE (VERTICAL)	@ CR \geq 10 Typical: 135° @ CR \geq 5 Typical: 155°	@ CR \geq 10 Typical: 130° Minimum: 120°
Response Time 10%-90% @ Ta=25°C	8 ms (Tr= 2 ms, Tf = 6 ms) (typ) 16 ms (Tr= 6 ms, Tf = 10 ms)(max)	
Panel Defects	Please see Panel Quality Specifications.	

IMAGE PERFORMANCE

Factory Defaults

Item	Defaults	Item	Defaults
Contrast	70%	OSD H. Position	50%
Brightness	100%	OSD V. Position	50%
Color Temperature	6500K	OSD Time Out	15 Sec
Sharpness	33%	OSD Background	On
720x400/640x400	720x400	Resolution Notice	Enabled

Luminance

Lv (Max) – Condition: Contrast = 100% Brightness = 100% Color Temperature = 6500K	Same as the Luminance in section 4-7 “TFT LCD PANEL”
Lv (Def) – Condition: Contrast = Default Brightness = Default Color Temperature = 6500K	$Lv (Def) / Lv (Max) \times 100\% \geq 85\%$

Display Size

Horizontal Display Size, Primary Preset	Full Screen
Vertical Display Size, Primary Preset	Full Screen

Saturation

Contrast = Default Brightness = Default Test Pattern = 32-Gray	No visible saturation
Contrast = 100% Brightness = 100% Test Pattern = 32-Gray	6 – 8 level saturation (Max)

Preset Color Temperatures

sRGB	It should meet IEC 61966-2-1 (1999-10) standard
Preset 1 9300K CCT (Max) = 10250K. CCT (Min) = 8500K	$W_x = 0.283 \pm 0.02$, $W_y = 0.298 \pm 0.02$
Preset 2 6500K (Primary) CCT (Max) = 6950K CCT (Min) = 6100K	$W_x = 0.313 \pm 0.02$ $W_y = 0.329 \pm 0.02$
Preset 3 5400K CCT (Max) = 5915K CCT (Min) = 4935K	$W_x = 0.335 \pm 0.02$ $W_y = 0.350 \pm 0.02$
Preset Color Temperature Adjustability	Each color preset shall be adjustable. Red, Green, and Blue shall be individually controlled.

MECHANICAL

Dimension (Desktop)

Width	378mm (14.9 inch)
Height	374 mm (14.7 inch)
Depth	196 mm (7.7 inch)
Monitor Weight	4.5 Kg (9.9 lbs)

*Refer to Figure 1

Dimension (Head Only / Wall Mount) – Unfolding the Monitor Stand

Width	378 mm (14.9 inch)
Height	424 mm (16.7 inch)
Depth	61 mm (2.38 inch)
Monitor Weight	4.5 Kg (9.9 lbs)

*Refer to Figure 1

Ergonomics

Tilt Up	From 0° up to $\geq 20^\circ$
Tilt Down	From 0° down to $-3^\circ \sim -5^\circ$

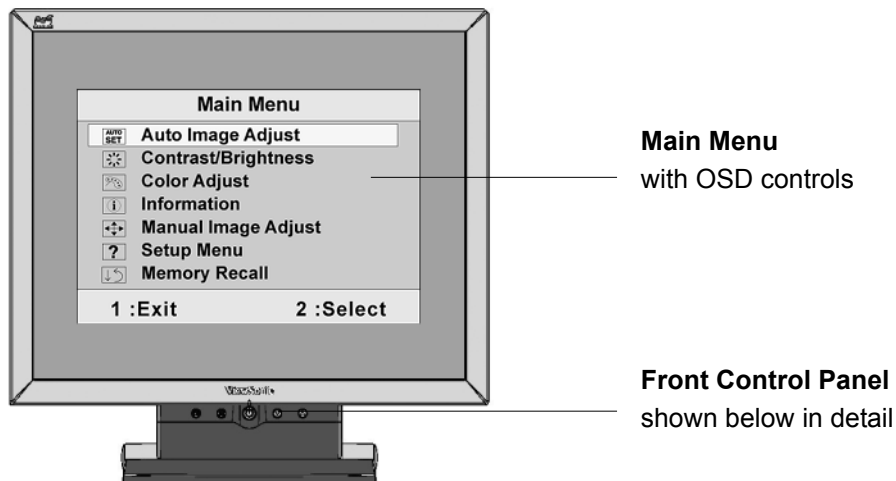
Cabinet Material

Display Head Plastic Material	ABS UL94-HB
Neck/Base Plastic Material	ABS UL94-HB
Internal Plastic Cabinet Components	All internal plastic cabinet components shall be in compliance with the requirements of TCO'03
Front Bezel Color	The reference for the bezel is the silver color (VA702) and the midnight gray color (VA702b) chip provided by ViewSonic
Neck, Base, and Rear Cover Color	The reference for the bezel is the black color (VA702) and the midnight gray color (VA702b) chip provided by ViewSonic. The color difference between any two cabinet components shall be less than 0.80 "Delta E", in the 1976 CIE L*a*b Colorspace.
Rear logo color	The rear logo is silver color with the black color background (VA702) and midnight gray color and background (VA702b) chip provided by ViewSonic
Cabinet Color Drift Due To UV-Light	The color drift due to UV-Light shall be less than 3.0 "Delta E" in the 1976 CIE L*a*b colorspace. Testing shall be performed according to the requirements of ASTM Test Method D4459-93.
Cabinet Texture	Mold-Tech # 11010 used on all external textured surfaces.
Samples	The supplier shall submit textured color chips, plastic material specifications, and Material Safety Data Sheets for approval.

3. Front Panel Function Control Description

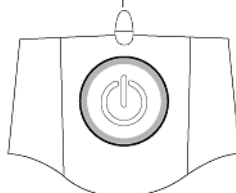
Adjusting the Screen Image

Use the buttons on the front control panel to display and adjust the OSD controls which display on the screen. The OSD controls are explained at the top of the next page and are defined in “Main Menu Controls” on page 10.



Displays the control screen for the highlighted control.
Also toggles between two controls on some screens.
Also a shortcut to Auto Image Adjust.

Displays the Main Menu or exits the control screen and saves adjustments.

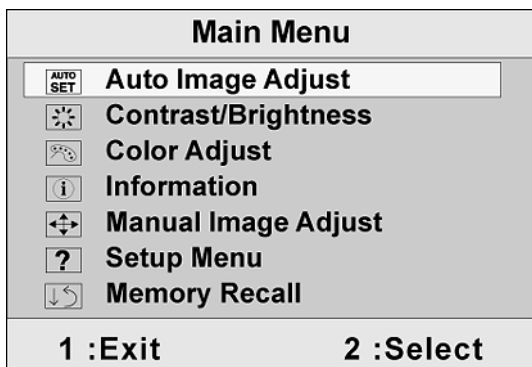


Power light
Green = ON
Orange = Power Saving
Standby Power On/Off

Scrolls through menu options and adjusts the displayed control.
Also a shortcut to display the Contrast adjustment control screen.

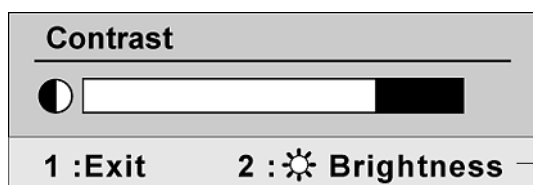
Do the following to adjust the display setting:

1. To display the Main Menu, press button [1].



NOTE: All OSD menus and adjustment screens disappear automatically after about 15 seconds. This is adjustable through the OSD timeout setting in the setup menu.

2. To select a control to adjust, press▲or▼to scroll up or down in the Main Menu.
3. After the desired control is selected, press button [2]. A control screen like the one shown below appears.



The line at the bottom of the screen shows the current functions of buttons 1 and 2: Exit or select the Brightness control.

4. To adjust the setting, press the up▲or down▼buttons.
5. To save the adjustments and exit the menu, press button [1] *twice*.

The following tips may help you optimize your display:

- Adjust the computer's graphics card so that it outputs a 1280 x 1024 @ 60Hz video signal to the LCD display. (Look for instructions on “changing the refresh rate” in the graphics card's user guide.)
- If necessary, make small adjustments using H. POSITION and V. POSITION until the screen image is completely visible. (The black border around the edge of the screen should barely touch the illuminated “active area” of the LCD display.)

Main Menu Controls

Adjust the menu items shown below by using the up▲and down▼buttons.

Control Explanation



Auto Image Adjust automatically sizes, centers, and fine tunes the video signal to eliminate waviness and distortion. Press the [2] button to execute Auto Image Adjust.

NOTE: Auto Image Adjust works with most common video cards. If this function does not work on your LCD display, then lower the video refresh rate to 60 Hz and set the resolution to its pre-set value.



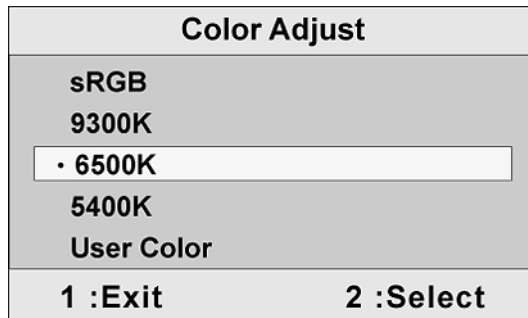
Contrast adjusts the difference between the image background (black level) and the foreground (white level).



Brightness adjusts background black level of the screen image.



Color Adjust provides several color adjustment modes, including preset color temperatures and a User Color mode which allows independent adjustment of red (R), green (G), and blue (B). The factory setting for this product is 6500K (6500 Kelvin).



sRGB - This is quickly becoming the industry standard for color management, with support being included in many of the latest applications. Enabling this setting allows the LCD display to more accurately display colors the way they were originally intended. Enabling the sRGB setting will cause the Contrast and Brightness adjustments to be disabled.

9300K - Adds blue to the screen image for cooler white (used in most office settings with fluorescent lighting).

6500K - Adds red to the screen image for warmer white and richer red.

5400K - Adds green to the screen image for a darker color.

Control Explanation

User Color - Individual adjustments for red (R), green (G), and blue (B).

1. To select color (R, G or B) press button [2].
2. To adjust selected color, press▲or▼.
3. When all color adjustments are complete, press button [1] *twice*.







Information displays the timing mode (video signal input) coming from the graphics card in the computer, the LCD model number, the serial number, and the ViewSonic® website URL. See your graphics card's user guide for instructions on changing the resolution and refresh rate (vertical frequency).

NOTE: VESA 1280 x 1024 @ 60Hz (recommended) means that the resolution is 1280 x 1024 and the refresh rate is 60 Hertz.

Information	
H. Frequency: XX	kHz
V. Frequency: XX	Hz
Pixel Clock: XX	MHz
Resolution: XXXXXXXX	
Model No: XXXXXXXXXXXX	
Serial No:	
www.ViewSonic.com	
1 :Exit	



Manual Image Adjust

Manual Image Adjust	
 H. / V. Position	
 H. Size	
 Fine Tune	
 Sharpness	
1 :Exit	2 :Select



H./V. Position (Horizontal/Vertical Position) moves the screen image left or right and up or down. Press button [2] to toggle between Horizontal and Vertical. The Horizontal setting moves the screen image to the left or to the right. The Vertical setting moves the screen image up and down.



H. Size (Horizontal Size) adjusts the width of the screen image.



Fine Tune sharpens the focus by aligning text and/or graphics with pixel boundaries.

NOTE: Try the Auto Adjust function before using the Fine Tune control.

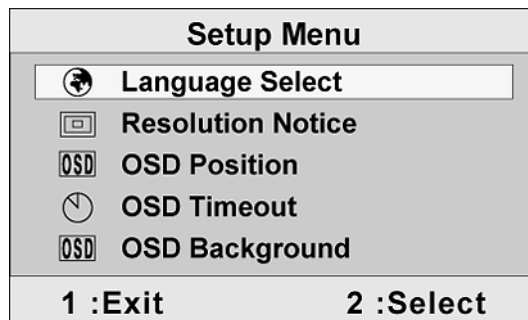


Sharpness adjusts the clarity and focus of the screen image.

Control Explanation



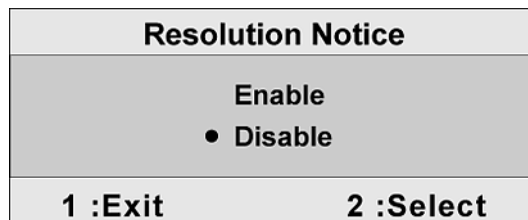
Setup Menu displays the menu shown below:



Language Select allows the user to choose the language used in the menus and control screens.



Resolution Notice advises the optimal resolution to use.



OSD Position allows the user to move the OSD menus and control screens.



OSD Timeout sets the length of time the OSD screen is displayed. For example, with a “15 second” setting, if a control is not pushed within 15 seconds, the display screen disappears.



OSD Background allows the user to turn the OSD background On or Off.



Memory Recall returns the adjustments back to factory settings if the display is operating in a factory Preset Timing Mode listed in the Specifications of this manual.

4. Circuit Description

Electronic Circuit Theory

1 Switching Mode Power Supply

1.1 AC Current Input Circuit

P801 is a connector for connecting AC Power. F801 is a fuse to protect all the circuit. AC input voltage is from 90V to 264V. R820 and R821 joined between two inputting main circuit to prevent man from shock. L801 is used to clear up low frequency wave. C801 and C806 are used to discharge the waves that L801 produced. High frequency waves are damped by C801 and C806. D801 is a rectifier which composed of 4 build-in diodes, it inverts AC to DC.

1.2 High Voltage to Low Voltage Control Circuit

C805 is used to smooth the wave from rectifier. IC802 is a highly integrated PWM controller, which build-in a power MOSFET. When rectified DC high voltage is applied to the DRAIN pin during start-up, the MOSFET is off initially, and the CONTROL pin capacitor is charged through a switched high voltage current source connected internally between the DRAIN and CONTROL pins. When the CONTROL pin voltage V_c reaches approximately 5.8V, the control circuitry is activated and the soft-start begins. The soft-start circuit gradually increases the duty cycle of the MOSFET from zero to the maximum value over approximately 10ms. If no external feedback/supply current is fed into the CONTROL pin by the end of the soft-start, the high voltage current source is turned off and the CONTROL pin will start discharging in response to the supply current drawn by the control circuitry.

Resistor R803, R807, R824 and R825 are for line over voltage shut-down (OVP) and line under-voltage detection (UVP). Resistors R801, R805, R822, and R823 are for external current limit adjustment, and used to reduce the current limit externally to a value close to the operating peak current of primary about 1.35A. The mean is power will protected when the primary current over about 1.35A.

When PWM is turned off, the main current flow will be consumed through D804 and ZD802, This will prevent MOSFET which built-in IC802 from being damaged under large current impulse and voltage spike.

D806 and C815 provide internal Auxiliary current to CONTROL pin during normal operation. In addition, error amplifier and feedback current to the CONTROL pin are for duty cycle control.

1.3 DC 5V and DC 14V Output Circuit

For DC 5V, D805 is used to rectify the inducted current. R806 and C811 are used to store energy when current is reversed. The parts including C812, C814, C822, C821, B801 and L803 are used to smooth the current waves.

For DC 14V, D803 is used to rectify the inducted current. R802 and C802 are used to store energy when current is reversed. The parts including C808, C810 and L802 are used to smooth the current waves.

1.4 Feedback and OVP Protect Circuit

Pin R of IC803 is supplied 2.5V stable voltage. It is connected to 5V and 14V output through R811, R810 and R818. R811, R810 and R818 are output sampling resistor. When the sampling voltage more than 2.5V or less than 2.5V, feedback current of IC802 will change, this can change the voltage from transformer T801.

For 5V_{DC} output OVP, ZD803 is a zener diode, when 5V output voltage becomes up to 5.6V, the zener current cause R819 voltage become up to 0.7V, Q801 is triggered and OVP starts. For 12V_{DC} output OVP, ZD804 is a Zener Diode, when 14V output voltage becomes up to 16V, the zener current cause R819 voltage become up to 0.7V, Q801 is triggered and OVP starts. The collector current of Q801 is used to make build-in diode light. FB Current of IC802 will be changed; it can change the voltage from T801.

Q802, R827, R828 and ZD801 make up of dummy loading circuit. For start-up sequence, during 5V output take place high loading first, this dummy loading circuit operated to insure 14V not be increased.

2 Inverter circuit

2.1 Low voltage to high voltage circuit

12V_{DC} supplies the power to IC501 through F501; the control signals that BRIGHTNESS and ON/OFF come from I/F board. ON/OFF signal connect to pin8 of IC501 and makes IC501 enabled.

BRIGHTNESS is connected to pin7 of IC501 to adjust the panel luminance. R524, R529, C505 make up of a delay-time circuit and R528, R523, R524 make up of a voltage divided circuit. C504 is used to filter the high frequency noise. The operation frequency is determined by R522 and C529. For BURST MODE, its dimming frequency is determined by R527 and C506. C502 is used for soft start and compensation, C502, C528 are used to filter noise.

The output drives, including NDR4, NDRV2, PDRV3, PDRV1 (pins1, 3, 15, 16 respectively), generate a square pulses to drive MOSFET U501, U502. And U501, U502 works as full-bridge topology, it is high efficient, zero voltage switch.

During start up, VSEN (pin9) detects the voltage at the transformer secondary. When VSEN reaches 3.0V, the output voltage is regulated. If no current is detected for around 1.5 seconds, IC501 will shut down.

The current flowing through CCFL is detected and regulated through sense resistor R509, R511. The feedback voltage through R506, R507, and C508 connected to Pin11 (ISEN), and then compared with a reference voltage (1.5V) via a current amplifier, resulting in PWM drive outputs to full-bridge switches.

2.2 Protection circuit

Over Voltage Protection: R501 and R502 are connected in high voltage output connector, the divided AC voltage is inverted DC voltage through D508, R505 and C507 are used to rectify wave & dump noise. Then the voltage signal reaches Pin9 VSEN of IC501, when the voltage changes, build-in PWM of IC501 will adjust output voltage.

Open Lamp Protection: In normal operation, the resistors R510, R511, R512, R509 are sensed a high level AC voltage, the AC signal IS1 invert DC voltage through D509, R515, C533, and the high level DC voltage reaches the gate pin of Q502, similarly, the gate pin of Q503, Q504, Q505 has high level DC voltage. So the gate pin of Q501 has a low level voltage, and the IC501 is normal operation. Once one of signal IS1, IS2, IS3, and IS4 is low, the voltages of Q501 gate pin is high level, and make the voltage of ISEN low level, the IC501 will shut down.

3 I/F Board Circuit

3.1 Power Input

+5V is from the power board and supply for U101(FS8860-18PJ), U102(FS8860-33PJ), U105(MCU:W78E65P) and panel. +3.3V output is generated from +5V through C169 and C102 filtering, and U102 outputs. +3.3V is used for U104 (Scaler: TSU16AK). +1.8V output is generated from +5V through C169, C105 and C102 filtering, and U101 outputs. +1.8V is also used for U104.

3.2 MCU (W78E65P)

VDD is +5V and its frequency of XTAL1 is 22.1184MHz. U105 #2 is defined as panel-enable. When the I/O port is low, Q101 and Q102 are conducted. And then after C109 and C110 filtering, obtain the voltage of VLCD, which will be connected to CN103. U105 #3 is defined as CCFL-enable. When the I/O port is low, Q103 is pulled up and the backlights are on; When the I/O port is high, Q103 is conducted and the backlights are off. U105 #4 is defined as DET-VGA, connected with CN102 #5. U105 #14, #36, #37, #38, #39, #40, #41, #42, #43 are the communications with U104 (Scaler), which are connected to #72, #31, #78, #77, #30, #70, #71, #69, #32 of Scaler. U105 #43 outputs reset signal to U104 (Scaler).

U106 is EEPROM used for saving EDID data, which is connected by SCL and SDA pins with #16 and #17 of MCU. Connect #12 to #26 of U105 for ISP.

3.3 Scaler (TSU16AK)

The frequency of XTAL2 is 14.318MHz. U104 #1, #102-#103, #106-#113, #118-#125, #128 output LVDS digital data of 8 bit to panel control circuit through CN103. U104 #73 generates a PWM waveform by regulating the duty to control the brightness of the backlights. U104 #30-#32, #69-#72, #77-#78 are the communications with U105 (MCU) that are connected to #36-#43 of MCU. These communications include HWRESET, CSZ/ALE, SCL/RDZ, SDA/WRZ, and AD0-AD3.

3.4 VGA Input

Signal R, G, B, SOG input through CN102 #1, #2, #3, and C115, C116, C117 and C118 filtering the high frequency noise. Signal HSYNC and VSYNC input through CN102 #13 and #14, and C119, R119, C120, R120 filtering. Then the analog signal enters U104, and then U104 deals with it internally. In addition, TVS101, TVS102, TVS103 (the three are BAV99), TVS104, TVS105, TVS106, TVS107 (they are constant voltage diode of 5V6) are ESD protector. Signal DDC-SCL inputs via CN102 #15, and then passes through TVS107 for ESD protection, goes into EDID EEPROM IC U103. Signal DDC-SDA inputs via CN102 #12, and then passes through TVS106 for ESD protection, goes into EDID EEPROM IC U103. CN102 #5 is defined as cable detect pin, this detector realizes via R107 and U105 #4. The PC-5V of U103 is supplied by PC via CN103 #9 with D103 for ESD protection, or supplied by Monitor self via D104. U103 is an EEPROM IC, which is a kind of memory and used for saving EDID data.

3.5 Button Control

Button “Key-Power” is defined as power on/off, which is connected to U105 #24 through CN106 #4. Button “Key-2” is defined as two functions of selecting and adjustment, which is connected to U105 #25 through CN106 #1.

Button “Key-Up” is defined as plus, which is connected to U105 #26 through CN106 #3.

Button “Key-Down” is defined as minus, which is connected to U105 #27 through CN106 #5.

Button “Key-1” is defined as two functions of menu and exit, which is connected to U105 #28 through CN106 #2.

LED indicator on the front bezel is defined as follows:

- a. When press button “Key-Power”, U105 #6 is pulled down and U105 #7 is pulled high, so Q104 is conducted and the LED indicator is green.
- b. When in power-saving mode, U105 #6 is pulled high and U105 #7 is pulled down, so Q105 is conducted and the LED indicator is orange.

3. FACTORY PRESET TIMING TABLE

Item	Resolution	H-Freq. (KHz)	V-Freq. (Hz)	Dot Clock (MHz)
1	640 x 350	31.5kHz	70Hz	25.2
2	640 x 400	31.5kHz	60Hz	25.2
3	640 x 400	31.5kHz	70Hz	25.2
4	640 x 480	24.7kHz	50Hz	19.8
5		31.5kHz	60Hz	25.2
6		35.0kHz	67Hz	30.2
7		37.9kHz	72Hz,	31.5
8		37.5kHz	75Hz,	31.5
9		43.27kHz	85Hz	36.0
10	720 x 400	31.5kHz	70Hz	28.3
11	800 x 600	35.1kHz	56Hz	36.0
12		37.9kHz	60Hz	40.0
13		48.1kHz	72Hz	50.0
14		46.9kHz	75Hz	49.5
15		53.7kHz	85Hz	56.3
16	832 x 624	49.7kHz	75Hz	57.3
17	1024 x 768	48.4kHz	60Hz	65.0
18		56.5kHz	70Hz	75.0
19		58.1kHz	72Hz	78.5
20		60.0kHz	75Hz	78.8
21		68.67kHz	85Hz	94.5
22	1152 x 870	68.6kHz	75Hz	100
23	1280 x 1024	63.4kHz	60Hz	108
24		79.97kHz	75Hz	135
25	1280 x 720	45kHz	60Hz	74.2

4. Power On/Off Sequence

4.1 Hardware Power ON

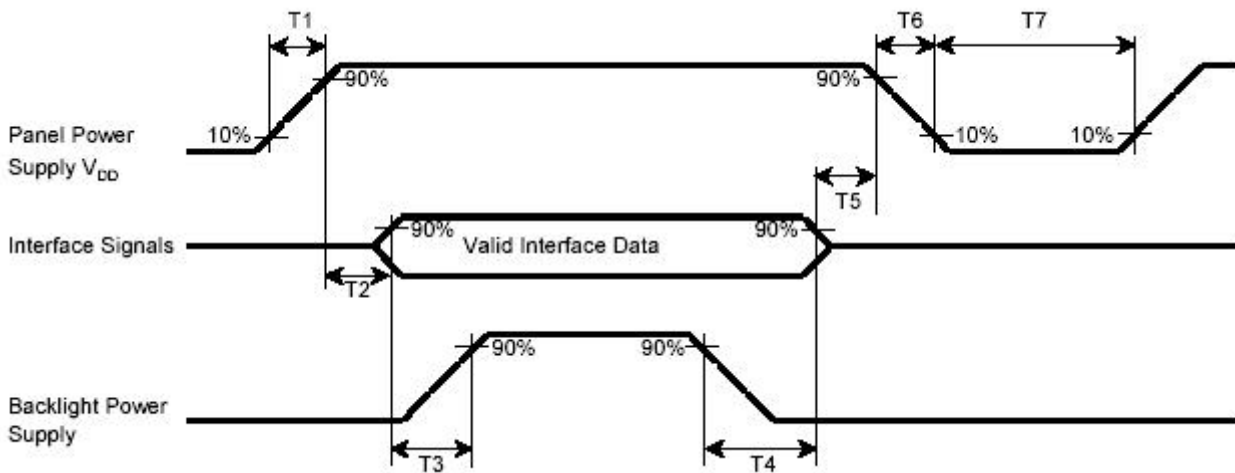
When power cord is plugged into AC socket, SMPS starts work and provides U105 and U106 with VCC5V. When VCPU inputs to U105, U105 resets circuit active, sets U105 all registers to preset modes, and then U105 #43 sends out a HWRESET signal voltage to reset U104, and then monitor goes into stand-by mode. That means hardware power on has been completed.

4.2 Software Power ON/OFF

When press power key, U105 #24 receives low pulse, and sends out “Power on/off” order back to U104, and then U104 will do the power on/off.

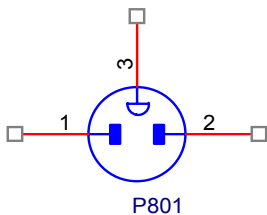
- If Power ON, U105 #6 (LED_Green) will send out High potential, and then LED green on.
- If Power OFF, U105 #7 (LED_Orange) will send out High potential, and then LED Orange on.

The Panel_Vcc, Backlight_En, CLK/DATA output to panel will follow the following sequence.



T1 (ms)	T2 (ms)	T3 (ms)	T4 (ms)	T5 (ms)	T6 (ms)	T7 (ms)
0.1~10	0~10	>200	>100	0~50	0.1~10	>1000

5. AC Outlet Pin Assignment



Pin	Symbol	Description
1	L	Live
2	N	Neutral
3	E	GND

6. Inner Connector Pin Assignment

6.1 CN501, CN502, CN503, CN504 (Connect to Panel Backlight, SM02B-BHSS-1-TB or equivalent)

Pin	Symbol	Description
1	H.V.	High voltage for lamp
2	L.V.	Low voltage for lamp

6.2 CN101 (Power BD to Interface BD)

Pin No.	Symbol	Description
1,2	+5V (VCC5V)	+5.2V output
3,6	GND	Ground

4	BRIGHTNESS	Brightness Control
5	ON/OFF	CCFL on/off Control

6.3 CN106 (Interface BD to Keypad)

Pin No.	Symbol	Description
1	KEY_SELECT/AUTO	Select control and auto adjustment control
2	KEY_MENU/EXIT	OSD page selection and exit
3	KEY_UP	OSD “▲” control to adjust value to increase
4	KEY_POWER	DC power on/off control
5	KEY_DOWN	OSD “▼” control to adjust value to decrease
6	LED_GREEN	Green LED lighting control
7	GND	Ground
8	LED_ORANGE	Orange LED lighting control

6.4 CN103 (Connect I/F BD to panel, FI-X30S-H or Equivalent)

Pin No.	Symbol	Function
1	RXO0-	minus signal of odd channel 0(LVDS)
2	RXO0+	plus signal of odd channel 0(LVDS)
3	RXO1-	minus signal of odd channel 1(LVDS)
4	RXO1+	plus signal of odd channel 1(LVDS)
5	RXO2-	minus signal of odd channel 2(LVDS)
6	RXO2+	plus signal of odd channel 2(LVDS)
7	GND	Ground
8	RXOC-	minus signal of odd clock channel (LVDS)
9	RXOC+	plus signal of odd clock channel (LVDS)
10	RXO3-	minus signal of odd channel 3(LVDS)
11	RXO3+	plus signal of odd channel 3(LVDS)
12	RXE0-	minus signal of even channel 0(LVDS)
13	RXE0+	plus signal of even channel 0(LVDS)
14	GND	Ground
15	RXE1-	minus signal of even channel 1(LVDS)
16	RXE1+	plus signal of even channel 1(LVDS)
17	GND	Ground
18	RXE2-	minus signal of even channel 2(LVDS)
19	RXE2+	plus signal of even channel 2(LVDS)
20	RXEC-	minus signal of even clock channel (LVDS)
21	RXEC+	plus signal of even clock channel (LVDS)
22	RXE3-	minus signal of even channel 3(LVDS)
23	RXE3+	plus signal of even channel 3(LVDS)
24	GND	Ground
25	GND	Ground
26	GND	Ground or Open
27	GND	Ground
28	VCC	Power supply (5.0 V)
29	VCC	Power supply (5.0 V)
30	VCC	Power supply (5.0 V)

6.5 CN102 (D-SUB Connector)

Pin	Symbol	Pin	Symbol	Pin	Symbol
1	Red video input	6	Red GND	11	NC
2	Green video input	7	Green GND	12	Serial data (SDA)
3	Blue video input	8	Blue GND	13	H / H+V SYNC

4	NC	9	+5V(from PC)	14	VSYNC
5	Cable Detect	10	GND	15	Data clock line (SCL)

7. Key Parts Pin Assignment

7.1 IC802 (TOP246Y, Power Control IC)

Pin	Symbol	I/O	Description
1	C	I	Control
2	L	I	Line Sense
3	X	I	External Current Limit
4	S	O	Source of MOSFET(GND)
5	F	I	Frequency
6	D	I	Drain of MOSFET

7.2 IC501 (OZ9910G, CCFL inverter controller IC)

Pin No.	Symbol	I/O	Description
1	NDRV4	O	Bottom MOSFET gate drive output in dual forward converter
2	PGND		High-current power ground
3	NDRV2	O	Bottom MOSFET gate drive output in dual forward converter
4	GNDA		Low-current signal ground
5	CT	I	Timing capacitor of high frequency oscillator
6	LCT	I	Timing capacitor of set LPWM frequency
7	ADJ	I	Control command input –DC
8	ENA	I	Enable input
9	VSEN	I	Voltage sense feedback
10	CMP_SST	I	Soft start and loop compensation capacitor
11	ISEN	I	Current sense feedback
12	VREF	O	Reference voltage output
13	VIN	I	Supply voltage for IC
14	HSB	I	High side driver buffer output
15	PDRV3	O	Top MOSFET gate drive output in dual forward converter
16	PDRV1	O	Top MOSFET gate drive output in dual forward converter

7.3 U104 (TSU16AK)

Pin	Symbol	I/O	Description
1	LVBOM	O	B-Link Negative LVDS Differential Data
2	GND		Ground
3	BYPASS		For External Bypass Capacitor
4	NC		Not connected
5	NC		Not connected
6	BUSTYPE	IN	Low : Serial bus; High : Direct bus
7	NC		Not connected
8	NC		Not connected
9	NC		Not connected
10	GND		Ground
11	VDDP	O	Digital Output Power
12	NC		Not connected
13	NC		Not connected
14	NC		Not connected
15	NC		Not connected
16	NC		Not connected

17	NC		Not connected
18	VDDC	I	Digital Core Power
19	GND		Ground
20	GND		Ground
21	VDDP	O	Digital Output Power
22	NC		Not connected
23	NC		Not connected
24	NC		Not connected
25	NC		Not connected
26	NC		Not connected
27	NC		Not connected
28	NC		Not connected
29	NC		Not connected
30	AD0	I/O	DDR direct bus AD0; 4mA driving strength
31	AD3	I/O	DDR direct bus AD3; 4mA driving strength
32	HWRESET	I	Hardware reset; active high
33	XIN	I	Crystal Oscillator Input
34	XOUT	O	Crystal Oscillator Output
35	AVDD_MPLL		MPLL Power
36	GND		Ground
37	HSYNC0	I	Analog HSYNC input
38	VSYNC0	I	Analog VSYNC input
39	GND		Ground
40	NC		Not connected
41	NC		Not connected
42	GND		Ground
43	NC		Not connected
44	NC		Not connected
45	VDD_ADC	I	ADC Power
46	NC		Not connected
47	NC		Not connected
48	GND		Ground
49	NC		Not connected
50	NC		Not connected
51	VDD_ADC	I	ADC Power
52	REXT		External resistor 390 ohm to AVDD_ADC
53	AVDD_PLL	I	PLL Power
54	GND		Ground
55	AVDD_ADC	I	ADC Power
56	GND		Ground
57	BINOM	I	Reference ground for analog blue input
58	BINO	I	Analog blue input
59	GINOM	I	Reference ground for analog green input
60	GINO	I	Analog green input
61	SOGIN0	I	Sync-on-green input
62	RINOM	I	Reference ground for analog red input
63	RINO	I	Analog red input
64	GND		Ground
65	AVDD_ADC	I	ADC Power
66	REFP		Internal ADC top de-coupling pin
67	REFM		Internal ADC bottom de-coupling pin
68	GND		Ground
69	ALE/CS	I	DDR direct bus ALE; active high
70	WRZ/SDA	I/O	DDR direct bus WRZ; active low
71	RDZ/SCL	I	DDR direct bus RDZ; active low
72	INT	O	CPU interrupt; 4mA driving strength
73	PWM0	O	PWM0; 4mA driving strength
74	PWM1	O	PWM1; 4mA driving strength
75	NC		Not connected
76	NC		Not connected

77	AD1	I/O	DDR direct bus AD1; 8mA driving strength
78	AD2	I/O	DDR direct bus AD2; 8mA driving strength
79	NC		Not connected
80	NC		Not connected
81	NC		Not connected
82	NC		Not connected
83	NC		Not connected
84	VDDP	O	Digital Output Power
85	GND		Ground
86	GND		Ground
87	VDDC	I	Digital Core Power
88	NC		Not connected
89	NC		Not connected
90	NC		Not connected
91	NC		Not connected
92	NC		Not connected
93	NC		Not connected
94	VDDP	O	Digital Output Power
95	GND		Ground
96	GND		Ground
97	VDDC	I	Digital Core Power
98	NC		Not connected
99	NC		Not connected
100	NC		Not connected
101	NC		Not connected
102	LVA3P	O	A-Link Positive LVDS Differential Data
103	LVA3M	O	A-Link Negative LVDS Differential Data
104	VDDP	O	Digital Output Power
105	GND		Ground
106	LVACKP	O	A-Link Positive LVDS Differential Clock
107	LVACKM	O	A-Link Negative LVDS Differential Clock
108	LVA2P	O	A-Link Positive LVDS Differential Data
109	LVA2M	O	A-Link Negative LVDS Differential Data
110	LVA1P	O	A-Link Positive LVDS Differential Data
111	LVA1M	O	A-Link Negative LVDS Differential Data
112	LVA0P	O	A-Link Positive LVDS Differential Data
113	LVA0M	O	A-Link Negative LVDS Differential Data
114	VDDP	O	Digital Output Power
115	GND		Ground
116	GND		Ground
117	VDDC		Digital Core Power
118	LVB3P	O	B-Link Positive LVDS Differential Data
119	LVB3M	O	B-Link Negative LVDS Differential Data
120	LVBCKP	O	B-Link Positive LVDS Differential Clock
121	LVBCKM	O	B-Link Negative LVDS Differential Clock
122	LVB2P	O	B-Link Positive LVDS Differential Data
123	LVB2M	O	B-Link Negative LVDS Differential Data
124	LVB1P	O	B-Link Positive LVDS Differential Data
125	LVB1M	O	B-Link Negative LVDS Differential Data
126	VDDP	O	Digital Output Power

127	GND		Ground
128	LVBOP	O	B-Link Positive LVDS Differential Data

7.4 U105 (Micro-controller: W78E65P-40)

Pin	Symbol	I/O	Description
1	P4.2/INT3		A bi-directional I/O port with alternate function.
2	P1.0/T2	O	Enable panel power on
3	P1.1/T2EX	O	Enable CCFL work
4	P1.2	I	VGA cable detection
5	P1.3/PWM0	O	provide alternated function of PWM Volume
6	P1.4/PWM1	O	provide alternated function of PWM Green LED lighting control
7	P1.5/PWM2	O	provide alternated function of PWM Orange LED lighting control
8	P1.6/PWM3		Function is the same as that of standard 8052
9	P1.7/PWM4		Function is the same as that of standard 8052
10	RST	I	Reset control pin
11	P3.0/RXD		SCL line of I2C for EDID, debug function
12	P4.3/INT2		PORT 4: A bi-directional I/O port with alternate function.
13	P3.1/TXD		SDA line of I2C for EDID, debug function
14	P3.2/INT0	I	Interrupt request control pin
15	P3.3/INT1	O	Shut Down Volume Mute standard 8052.
16	P3.4/T0	O	SCL line of I2C communication with EEPROM
17	P3.5/T1	I/O	SDA line of I2C communication with EEPROM
18	P3.6/WR	I	DVI cable detection standard 8052.
19	P3.7/RD	O	EEPROM write protection control for DVI EDID Prevent E2PROM Write in standard 8052.
20	XTAL2		Crystal 22.1184MHz In
21	XTAL1		Crystal 22.1184MHz out
22	GND		Sink voltage ground
23	P4.0		A bi-directional I/O port with alternate function.
24	P2.0/A8		DC power on/off control
25	P2.1/A9		OSD “▶” control to adjust value to increase
26	P2.2/A10		OSD “◀” control to adjust value to decrease
27	P2.3/A11		Selection of menu command listed
28	P2.4/A12		OSD page selection
29	P2.5/A13		Auto adjustment control
30	P2.6/A14		A bi-directional I/O port with internal pull-ups
31	P2.7/A15		A bi-directional I/O port with internal pull-ups
32	PSEN		Program Store Enable
33	ALE		Address Latch Enable
34	P4.1		A bi-directional I/O port with alternate function
35	EA	I	External Access Enable external ROM. The ROM address and data will not be presented on the bus if the EA pin is high and the program counter is within the 64 KB area.
36	P0.7/AD7	I/O	DDR Direct Bus Communication with Scaler
37	P0.6/AD6	I/O	DDR Direct Bus Communication with Scaler
38	P0.5/AD5	I/O	DDR Direct Bus Communication with Scaler
39	P0.4/AD4	I/O	DDR Direct Bus Communication with Scaler
40	P0.3/AD3	I/O	WRZ line of DDR Direct Bus
41	P0.2/AD2	I/O	RDZ line of DDR Direct Bus
42	P0.1/AD1	I/O	ALE line of DDR Direct Bus
43	P0.0/AD0	O	Hardware reset to Scaler
44	+5V	I	+5V for MCU working voltage

Disassembly Block

VA702/b (INL PANEL)DIS-ASSEMBLY BLOCK

BASE SUB-ASSM *1
HINGE COVER*2
(SCREW,P,CROSS,M5*22, Ni*4)

BEZEL SUB-ASSM *1
(SCREW,B,CROSS,T4*10, BLK*4)

HINGE,RIGHT*1
HINGE,LEFT*1
(SCREW,F,CROSS,T4*10, Ni*4)
(SCREW,I ,CROSS,M3*4,Zw*1)

BACK COVER SUB-ASS'Y*1

BRACKET_R*1
GROUND WIRE*1
KEYPAD CABEL*
KEYPAD ASSM*1
(SCREW,PW,CROSS,M3*5, Ni *2)
(SCREW,I ,CROSS,M3*4,Zw*2)
(Ace tape*4)

INL PANEL*1
BRACKET_R*1
(SCREW,PW,CROSS,M3*5, Ni *2)
(SCREW,I ,CROSS,M3*4,Zw*2)
(Ace tape *2)

IF BOARD*1
POWER BOARD*1
FFC CABLE*1
CLIP,WIRE*1
(SCREW,PW,CROSS,M3*5, Ni*5)
(BOLT, #4-40x11.8, Ni*2)

BEZEL SUB-ASSM(G/S) → BUTTON FUNCTION KEY*1

FRONT BEZEL (G/S)*1 ← LED LENS*1

BACK COVER SUB-ASS'Y → SUPPORT VESA *1

BACK COVER *1

Rubber spacer*1
Logo *1

BASE COVER SUB-ASS'Y → PLATE BASE *1

BASE COVER *1

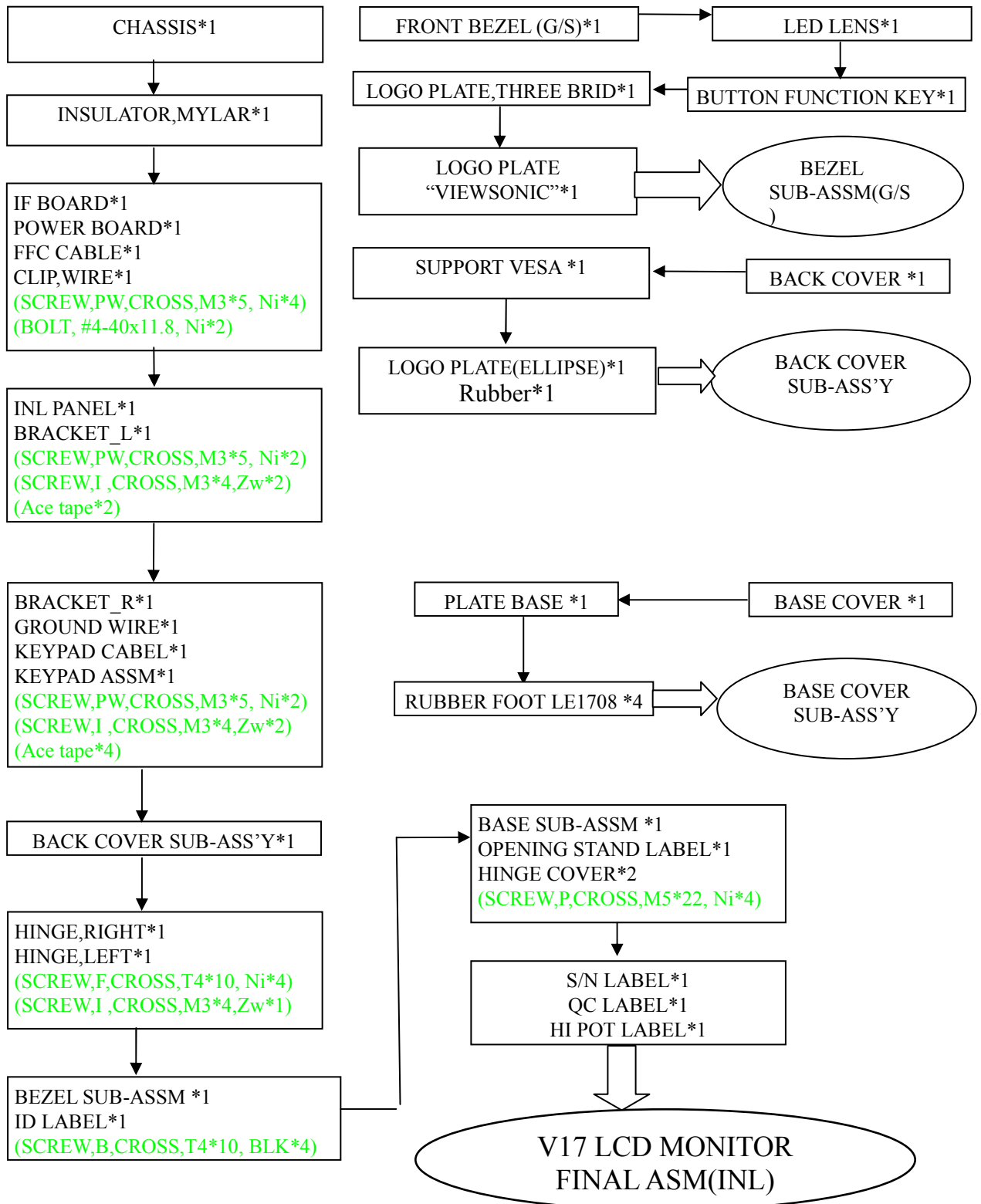
CHASSIS*1

INSULATOR,MYLAR*1

Note: Arrows are disassembly directions.

Assembly Block

VA702/b (INL panel) ASSEMBLY BLOCK



Note: Arrows are assembly directions.

5. Adjustment Procedure

1. Key Function Description

CONTROL KEY	KEYS FUNCTION
[AUTO] [2]	By pressing [AUTO] key, "Auto Image Adjust" is performed
[MENU] [1]	By pressing [MENU] key, Main menu display
[▼] [▲]	A. When "MENU OSD" display, press these keys to change the contents of an adjustment item, or change an adjustment value B. When "MENU OSD" is un-display, press these keys to change brightness and contrast
[POWER]	Power on or power off the monitor

2. Hot Key Operation

CONTROL KEY	KEYS FUNCTION
[▼] + [▲]	Recall Contrast or Brightness while in the Contrast or Brightness adjustment, or recall both of Contrast and Brightness when the OSD is not open.
[1] + [2]	Toggle 720x400 and 640x400 mode when input 720x400 or 640x400 mode.
[1] + [▼] + [▲]	White Balance (Not shown on user's guide)
[1] + [▼]	Power Lock
[1] + [▲]	OSD Lock
Remark : All the short cuts function are only available while OSD off	

3. OSD Control

3.1 OSD table

Layer 1	Layer 2	Layer 3	
Auto Image Adjust			
Contrast/Brightness	Contrast (+ / -)		
	Brightness (+ / -)		
Color Adjust	Srgb		
	9300K		
	6500K		
	5400K		
	User Color		Red (+ / -)
			Green (+ / -)
		Blue (+ / -)	
Information			
Manual Image Adjust	H/V Position	H Position (+ / -)	
		V Position (+ / -)	
	H Size	+ / -	

	Fine Tune	+ / -
	Sharpness	+ / -
Setup Menu	Language Select	English
		French
		German
		Italian
		Spanish
		Finnish
		Japanese
		Simplified Chinese
		Traditional Chinese
	Resolution Notice	On/Off
	OSD Position	H Position (+ / -) V Position (+ / -)
	OSD Time Out	
	OSD Background	On/Off
Memory Recall		

3.2 OSD lock Menu function

OSD Lock Menu Function Check		
Item	Method	Phenomenon
Activate OSD lock	[1] + [▲] 10S	Press any of buttons "1", "▼", "▲", "2" will appear "OSD Locked" 3s
Deactivate OSD lock:	[1] + [▲] 10S(again)	
NOTICE: When the OSD is locked will lock all functions. Status bar indicating OSD Lock or Unlock is in progress and when complete it will indicate "OSD Locked" OSD Lock should not lock Power Button and Power Lock function		

3.3 Power lock Menu function

Power Lock Menu Function Check		
Item	Method	Phenomenon
Activate Power Lock	[1] + [▼] 10S	Can not turn off the LCD; Press the power button will appear "Power Button Locked" OSD 3s; LCD would automatically turn back "On" when power is restored after a power failure
Deactivate Power Lock	[1] + [▼] 10S(again)	
NOTICE: Status bar indicating Power Button lock or unlock is in progress and when complete it will indicate "Power Button Locked" Power should only be lockable in the "On State"		

3.4 Resolution notice function

Resolution Notice Menu		
Item	Method	Phenomenon
Activate Resolution Notice Menu	Resolution Notice OSD should show on screen after changing to non-native mode for 30 sec, And it should disappear after 10s or by pushing button [1] or [2]	-----
Deactivate Resolution Notice Menu	Push button [2] under Resolution Notice OSD, select Disable	-----

3.5 Factory Mode Introduction

When input the signal, press “power key” to turn off the monitor. Press” [▼] +[▲] +[⏻] “at the same time so as to enter factory mode. After power on, press ‘Menu[1]’ key, you can see the Factory menu.

INL : Currently using panel model name
V2 050526 : Currently using firmware version information.
Auto Color : Automatically calibrate chip ADC parameter by using chip internal DAC
Color Temperature : The R, G, B of 9300K and 6500K and 5400K and User Mode
Colors are all generated from scaling back end.

4. Burn-in pattern

If it is a new monitor, and in factory mode, if no VGA signal input, Burn-in pattern will self generate automatically. Burn in patterns are: full Red, Green, Blue, White and Black. You can not escape from Burn-in pattern until plug in VGA Cable, and then press the power key. Turn the monitor off and then turn it on.

5. Auto Color (Automatically calibrate chip ADC parameter by using chip internal DAC)

If it is a new-built set and it is first time to do the “auto color”, please confirm the following steps:
-Connect the VGA cable with the standard video pattern generator and display 16-gray pattern on the monitor.
- Press “Power” to power off the monitor.
- Press” [▼] +[▲] +[⏻] “simultaneously to enter factory mode.
- Press ‘Menu[1]’, then press ‘Auto[2]’ to execute Auto color item.
- After the “Auto Color” process finished, please press “Power” to restart monitor.

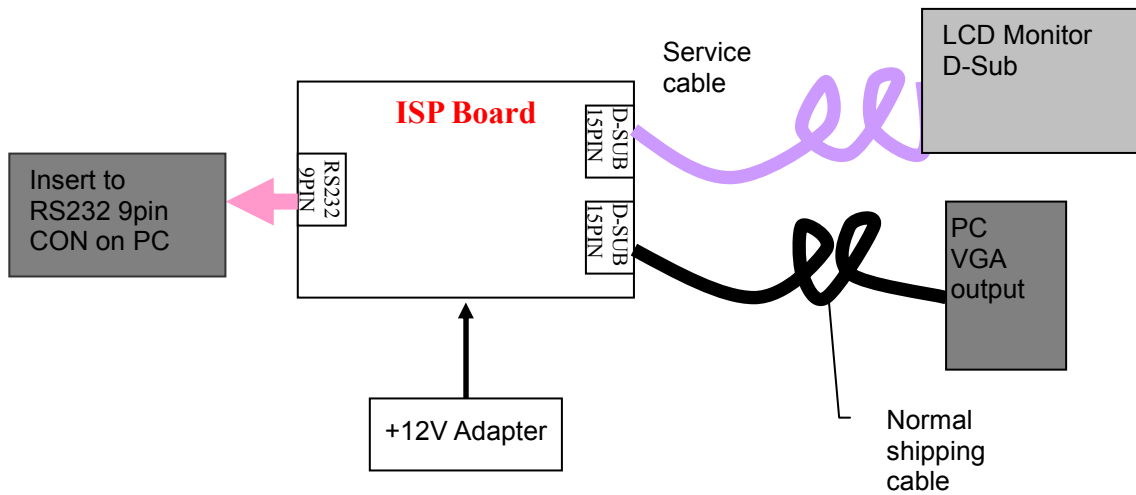
6. EDID (Rewrite EDID data to EEPROM)

If we need to rewrite the EEPROM data, please confirm the following steps.

1. Plug in VGA Cable; we can rewrite the EDID data to EEPROM by using “EDID Rewrite” program.
2. If the “EDID Rewrite” process finished, please pull out VGA cable and press “2”+”▲” at the same time.
3. Pull out AC power cable or press power key to restart.

7. Upload firmware to MCU via VGA Cable

7.1 Connect ISP board between monitor and PC as below configure



7.2 Before plug in the power cord, make sure keep “▲” key to be pressed, when power on you can enter ISP mode.

7.3 8051ispwriter.exe will detect automatically which MCU used in this monitor. Do it as the order shown on the screen, choose the corresponding firmware version, and load to MCU.

7.4 After finish, please plug out power cable and re-start monitor again.

8 After repair, to ensure the quality you should do the following test and adjustment

Item	Content	Equipment
Test OSD function	<ol style="list-style-type: none"> 1.Signal is set as 1280x1024@60Hz 2. LCM button are from left to right, checking whether each single function key and compound function key can be worked. 	Chroma Signal Generator
Contrast Check	<ol style="list-style-type: none"> 1. Set input mode to 1280x1024@60Hz 2. Set Pattern to 32 gray shades 3. Set contrast to the max. The brightest 5~6 shades brightness cannot be distinguished. 	Chroma Signal Generator
Color Temperature	<ol style="list-style-type: none"> 1. Do “Auto color” at 1280 x 1024@60Hz, 32gray shades 2. Measure color temperature, check it complies with the following temperature: 5400K $x=0.335 \pm 0.02, y=0.350 \pm 0.02$ 6500K $x=0.313 \pm 0.02, y=0.329 \pm 0.02$ 9300K $x=0.283 \pm 0.02, y=0.298 \pm 0.02$ 	Chroma Signal Generator and color analyzer
Modes switching check	<ol style="list-style-type: none"> 1. Use Chroma Pattern Generator to make sequence. VESA (640x480 800x600 1024x768 1280x1024), MAC 832x624 DOS (640x350 720x400), the detail supported modes and power saving signal. 2. Confirm the above timing modes must be full screen and the picture must be normal. 3. LED is Orange at power saving mode. 	Chroma Signal Generator

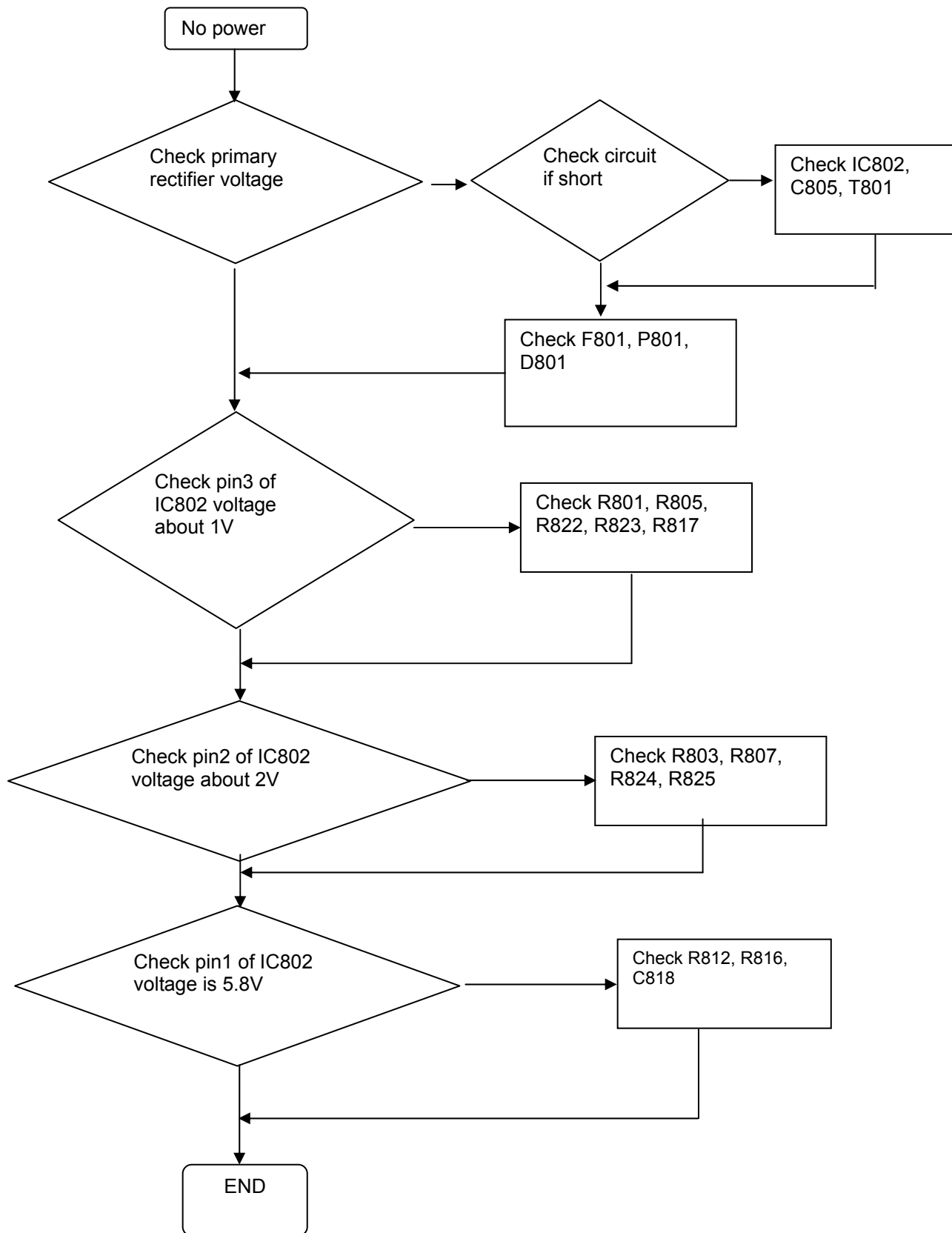
Y measurement at default setting	<ol style="list-style-type: none"> 1. Set brightness to default value 100 and contrast to default value 70 at 6500K 2. At full white patten, Measure Y, which should be 250+/-10cd/m² (QDI 220+/- 10cd/m²) 	Chroma Signal Generator and Color Analyzer												
Panel Flicker check	<ol style="list-style-type: none"> 1. Mode: 1280x1024@60Hz 2. Set Brightness& contrast to default value 3. Do “Auto Image Adjust” 4. Shut down PC to check whether there’s glitter on the center of the picture. 	Equipment:: Chroma Signal Generator & PC												
Power saving	<ol style="list-style-type: none"> 1. Mode: 1280x1024@60Hz 2. Pattern: full white 3. Brightness: Max. 4. Contrast: Default 5. Check power consumption at each modes <table border="1" data-bbox="379 707 1177 911"> <thead> <tr> <th data-bbox="379 707 635 786">State</th> <th data-bbox="635 707 919 786">Power Consumption</th> <th data-bbox="919 707 1177 786">LED color</th> </tr> </thead> <tbody> <tr> <td data-bbox="379 786 635 831">Normal</td> <td data-bbox="635 786 919 831">< 38W</td> <td data-bbox="919 786 1177 831">Green</td> </tr> <tr> <td data-bbox="379 831 635 875">Stand By</td> <td data-bbox="635 831 919 875">< 1W</td> <td data-bbox="919 831 1177 875">Orange</td> </tr> <tr> <td data-bbox="379 875 635 911">Power Key Off</td> <td data-bbox="635 875 919 911">< 1W</td> <td data-bbox="919 875 1177 911">No</td> </tr> </tbody> </table>	State	Power Consumption	LED color	Normal	< 38W	Green	Stand By	< 1W	Orange	Power Key Off	< 1W	No	Chroma signal generator and Power meter AC input: 230V/50Hz
State	Power Consumption	LED color												
Normal	< 38W	Green												
Stand By	< 1W	Orange												
Power Key Off	< 1W	No												

6. Troubleshooting Flow Chart

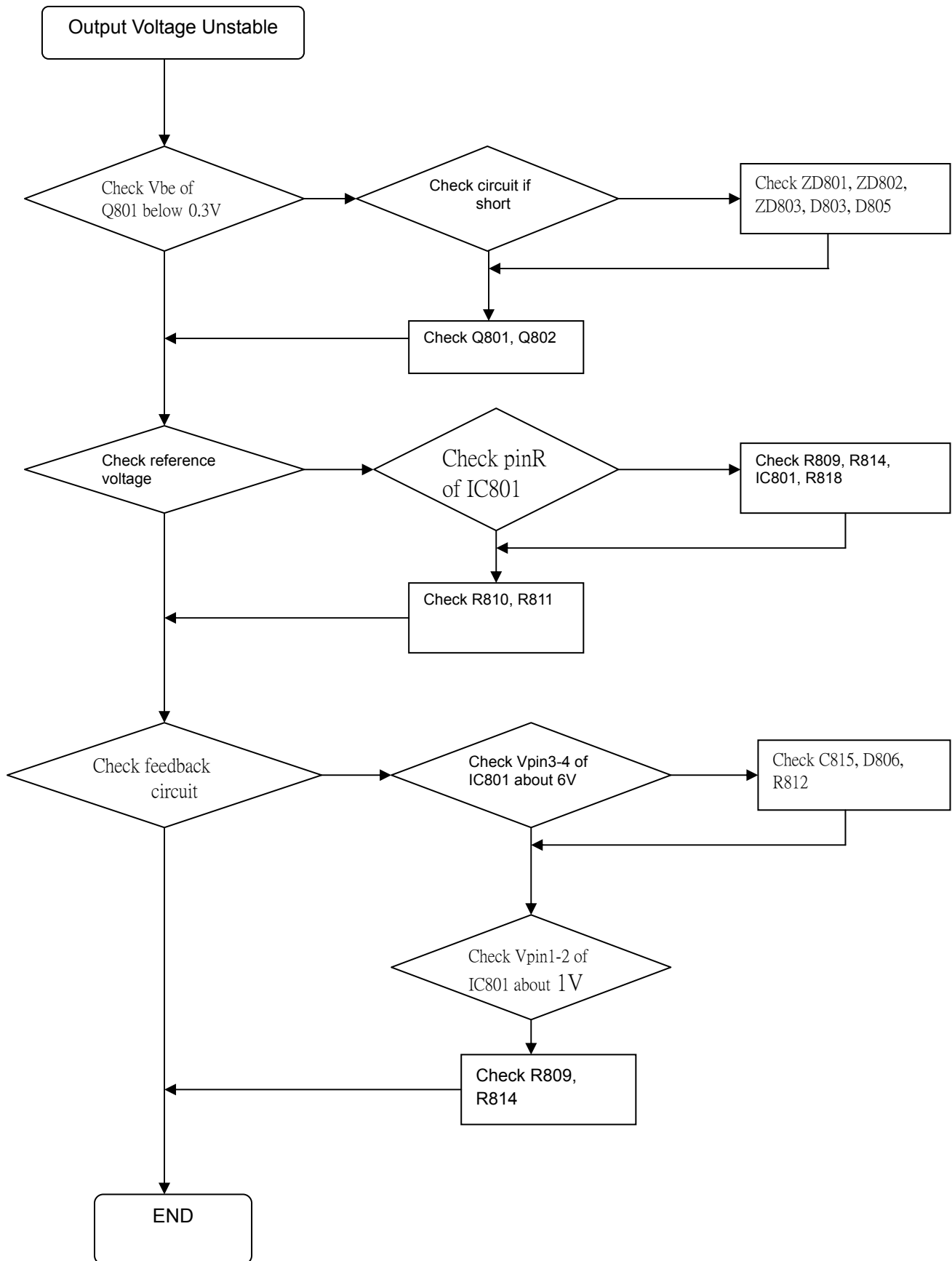
1. Common Acknowledge

- If you change the interface board, be sure that the U105, U106 and U103 these three components also changed to the new I/F board because there was program inside. If not, please re-write EDID or upload firmware into MCU via VGA Cable.
- If you adjust clock and phase, please do it at the condition of Windows shut down pattern.
- If you confirm the R.G.B. color is normal or not, please do it under 16-grey scalar pattern.
- This LCM is analog interface. So if the entire screen is an abnormal color that means the problem happen in the analog circuit part, if only some scale appears abnormal color that stand the problem happen in the digital circuit part.
- If you check the H/V position, please use the crosshatch pattern.
- This LCM support more than 30 timing modes, if the input timing mode is out of specification, the picture may appears abnormally.
- If brightness uneven, repairs Inverter circuit or change a new panel.
- If you find the vertical line or horizontal line lost on the screen, please change panel.

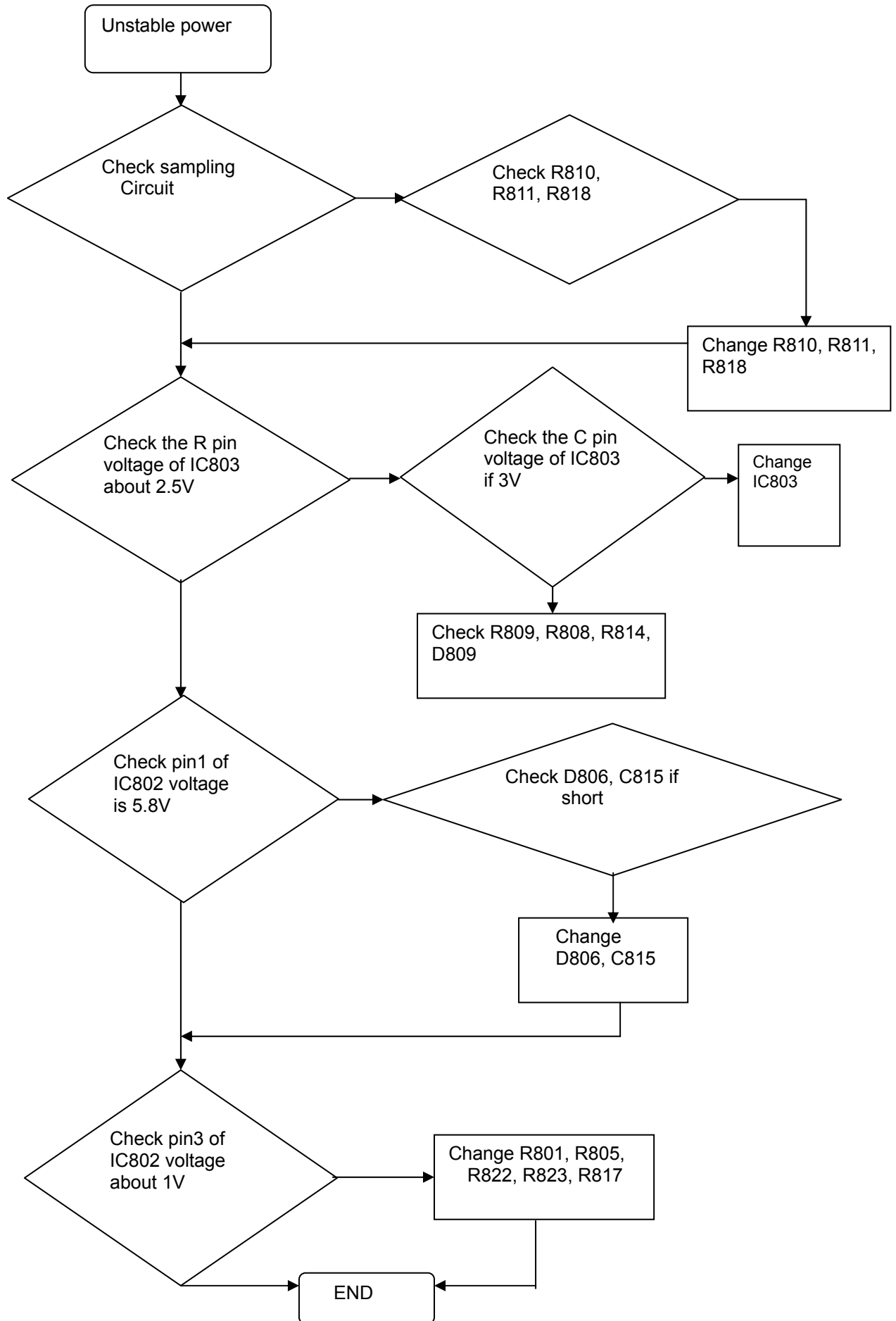
2. No Power & Power LED Off



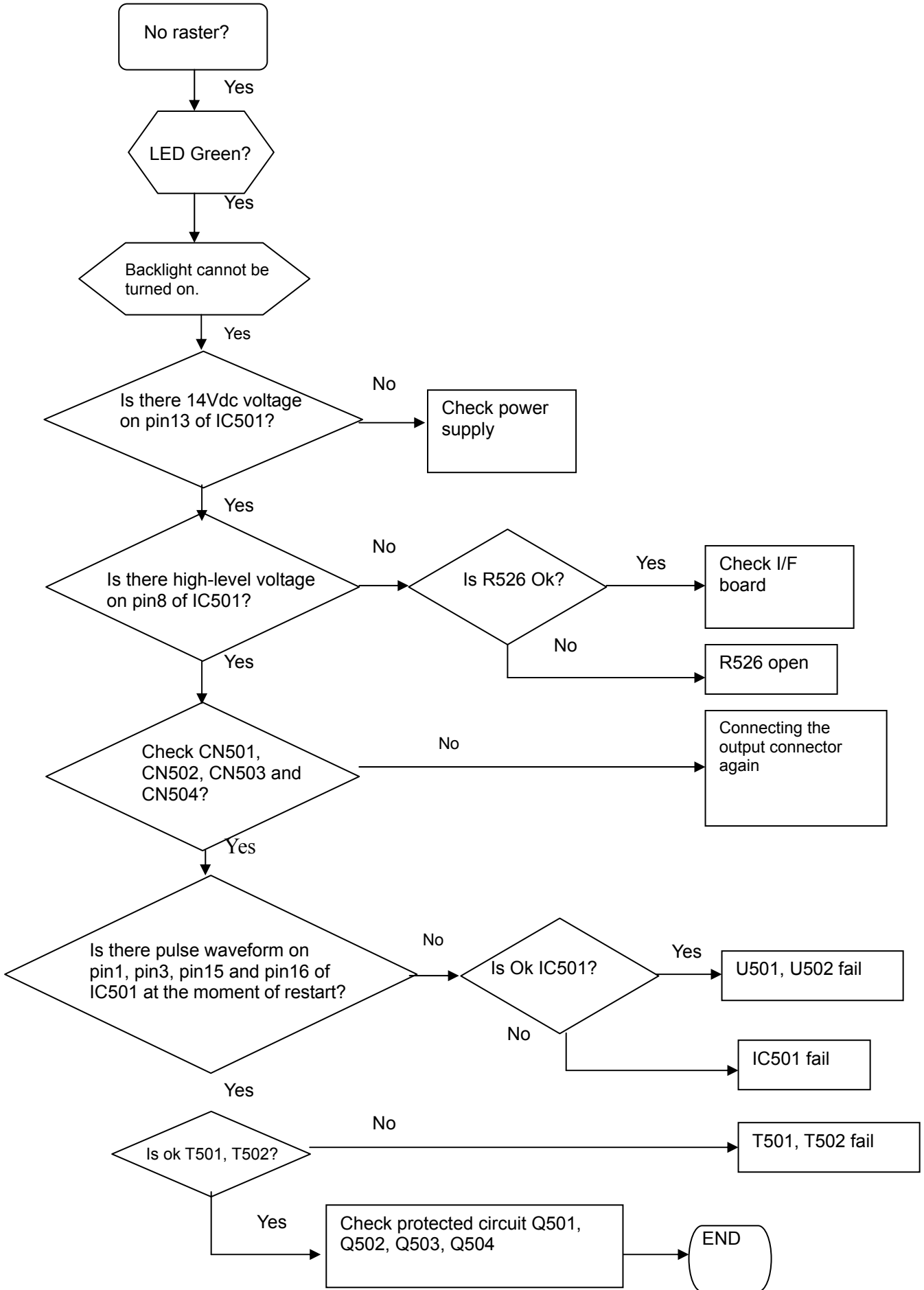
3. DC output voltage is unstable



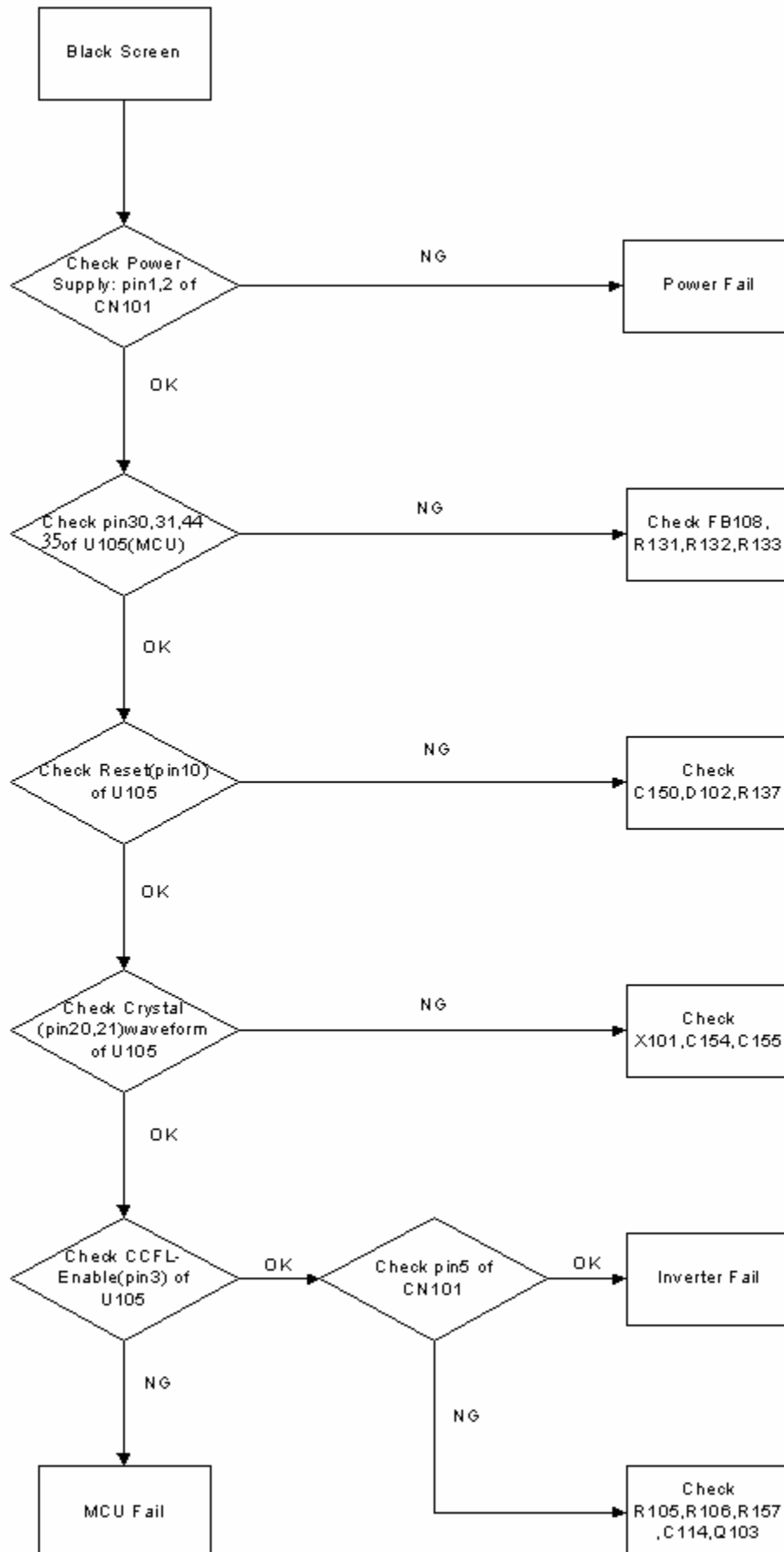
4. Output power is unstable



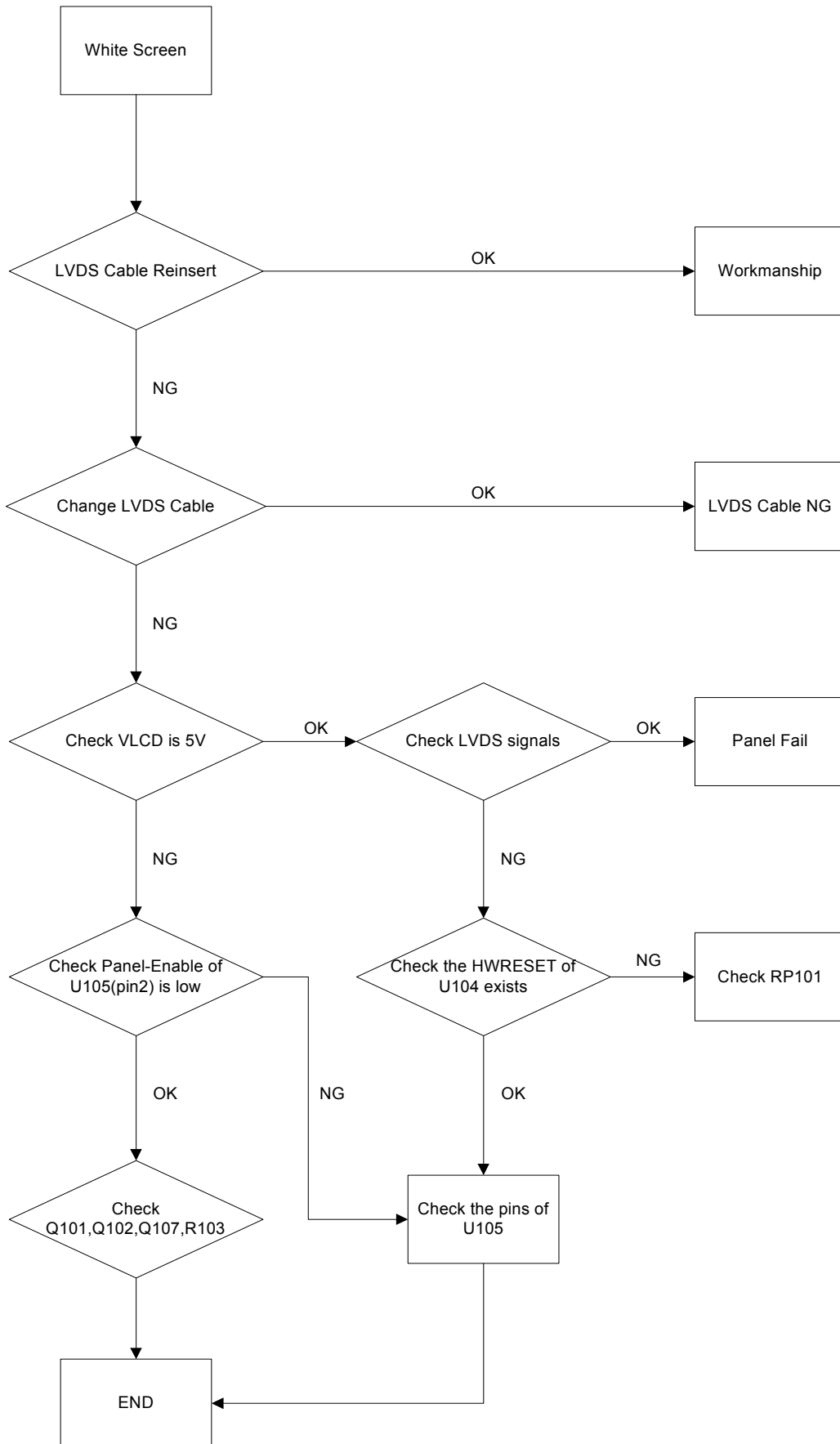
5. Backlight can't be turned on



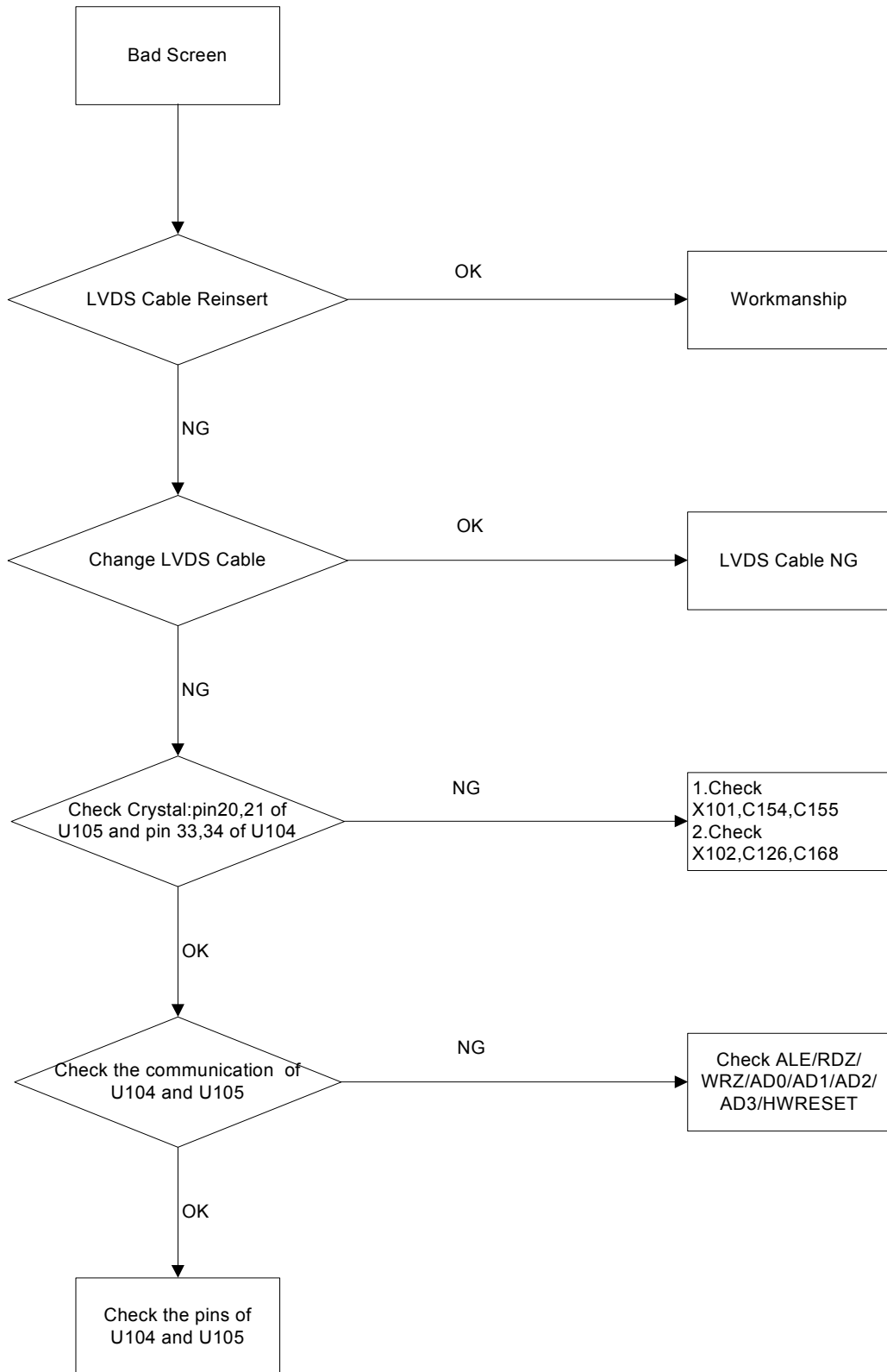
6. Black Screen and backlight turn on



7. White Screen



8. Bad Screen



7. Recommended Spare Parts List

RECOMMENDED SPARE PARTS LIST (VA702-1)

ViewSonic Model Number: VS10781

Rev: 1b

Serial No. Prefix: PST

Item	Description	ECR/ECN	ViewSonic P/N	Ref. P/N	Location	Universal number#
1	Accessories: KIT,ACCESSORY(INL), LE1709		A-00003039	70300000500		
2	PWR CORD 10A/125V BLK 6FT UL/CSA,SVT 18x		A-00003040	453070800250		
3	PWRCORD 10A/250V BLK 6FT CHINA,RVV 3Gx0, RoHS	Added on 9/11/06	A-00005255	453070800170R		
4	KIT,ACCESSORY,VA702-INL V7,LE1709 RoHS	Added on 9/11/06	A-00005274	70300000506R		
5	PC Board Assembly: PCBA,IF BOARD, LE1709-6A0		B-00003041	790411300600		
6	PCBA,KEYPAD BOARD, LE1709		B-00003042	790411500000		
7	PCBA,KEYPAD BOARD, LE1709 RoHS	Added on 9/11/06	B-00005278	790411500000R		
8	PCBA,PWR&INV./B, LE1709-6A0		B-00003043	790411400600		
9	PCBA,PWR&INV./B, LE1709-6A0 RoHS	Added on 9/11/06	B-00005279	790411400600R		
10	PCBA,IF BOARD(V7), LE1709- 6A0 RoHS	Added on 9/11/06	B-00008066	790411300630R		
11	Cabinets: BASE, LE1709		C-00003044	501240201000		
12	BEZEL,FRONT(SILVER),VA702, LE1709		C-00003045	501010202700		
13	COVER,BACK, LE1709		C-00003046	501020202900		
14	ASSY,BASE, LE1709 RoHS	Added on 9/11/06	C-00005262	714020002400R		
15	ASSY,BEZEL(S),LE1709,VA702 RoHS	Added on 9/11/06	C-00005263	714030002400R		
16	ASSY,BACK COVER, LE1709 RoHS	Added on 9/11/06	C-00005264	714050002400R		
17	COVER,HINGE, LE1709 RoHS	Added on 9/11/06	C-00006088	501020203000R		
18	Cables: CABLE,D-SUB 15P MALE 6FT BLACK/BLUE,SZ40		CB-00003047	453010100100		
19	CABLE,D-SUB 15P MALE 6FT BLACK/BLUE,SZ40 RoHS	Added on 9/11/06	CB-00005254	453010100100R		
20	HRN LVDS FFC 30P 234mm,RoHSACCX30234KU28 RoHS	Added on 9/11/06	CB-00005259	430303000140R		
21	HRN ASSY 4x2P 189mm UL2651#28SZ504479B, RoHS	Added on 9/11/06	CB-00005260	430300800320R		
22	HRN ASSY 1P 137mm BLACK,UL100 7 #20, RoHS	Added on 9/11/06	CB-00005261	430300100210R		
23	Electronic Components: LCD PANEL 17" MT170EN01-V1(INNOLUX)		E-00003048	631102070270		
24	LCD PANEL 17" MT170EN01-V7-G1,AM17000057 RoHS	Added on 9/11/06	E-00008006	631102071910R		
25	LCD PANEL 17" MT170EN01-V7-G2,AM17000057 RoHS	Added on 9/11/06	E-00008007	631102071920R		
26	LCD PANEL 17" MT170EN01-V7-G3,AM17000057 RoHS	Added on 9/11/06	E-00008008	631102071930R		
27	Hardware: SCREW,B,CROSS,T.T-4*10,BLK ,RoHS	Added on 9/11/06	HW-00005265	509412610500R		
28	SCREW,F,CROSS,T.T-4*10,Ni,RoHS	Added on 9/11/06	HW-00005266	509212610300R		
29	SCREW,P,CROSS,M5*22,Ni,RoHS	Added on 9/11/06	HW-00005267	509116822300R		
30	SCREW,PW,CROSS,W/WAS,M3*5,Ni RoHS	Added on 9/11/06	HW-00005269	509146305300R		
31	BOLT,#4-40x11.8,Ni FOR D-SUB/DVI CONN. RoHS	Added on 9/11/06	HW-00005270	509000007000R		
32	SCREW,LCROSS,M3*4,Zw,RoHS	Added on 9/11/06	HW-00005271	509016304102R		
33	HINGE,RIGHT, LE1709 RoHS	Added on 9/11/06	HW-00005276	502060401910R		
34	HINGE,LEFT, LE1709 RoHS	Added on 9/11/06	HW-00005277	502060401900R		
35	Packing Material: GENERIC FOAM SET	Added on 9/11/06	P-00001347	30833		
36	GENERIC BOX	Added on 9/11/06	P-00002515	20653		
37	BAG,PLASTIC,L550xW450xT0.05mm,LE1709		P-00003049	506120004300		
38	CARTON,VA702, LE1709		P-00003050	506020006800		
39	CARTON,VA702, LE1709 RoHS	Added on 9/11/06	P-00005256	506020006800R		
40	CUSHION,EPS-L, LE1709		P-00003051	506040005500		
41	CUSHION,EPS-L, LE1709 RoHS	Added on 9/11/06	P-00005257	506040005500R		
42	CUSHION,EPS-R, LE1709		P-00003052	506040005510		
43	CUSHION,EPS-R, LE1709 RoHS	Added on 9/11/06	P-00005253	506040005510R		
44	BAG,PE+EPE,L590xW480xT0.6mm (PRINTED)LE1 RoHS	Added on 9/11/06	P-00005272	506120300400R		
45	BAG,PLASTIC,l690xW(455+145)xT0.05mm, LE1 RoHS	Added on 9/11/06	P-00005273	506120004500R		
46	Plastics: RUBBER,FOOT,OD14.1xT2.5mm,3M, LE1708		PL-00003053	503020002600		

Remark 1: Above listed items are examples, supplier can expand the rows to add more necessary items.

Remark 2: All revised RSPLs with newly added items or any change made should be highlighted and correlated with the ECN/ECR approved by ViewSonic Corporation. This is to eliminate repeated cross checks of each item between this version and prior versions.

RECOMMENDED SPARE PARTS LIST (VA702B-1)

ViewSonic Model Number: VS10781

Rev: 1b

Serial No. Prefix: PSX

Item	Description	ECR/ECN	ViewSonic P/N	Ref. P/N	Location	Universal number#
1	Accessories: PWR CORD 10A/125V BLK 6FT UL/CSA,SVT 18x		A-00003040	453070800250		
2	KIT,ACCESSORY,VA702B-INL,LE1709		A-00003054	703000000510		
3	PWRCORD 10A/250V BLK 6FT CHINA.RVV 3Gx0. RoHS	Added on 9/11/06	A-00005255	453070800170R		
4	Board Assembly: PCBA,IF BOARD, LE1709-6A0		B-00003041	790411300600		
5	PCBA,KEYPAD BOARD, LE1709		B-00003042	790411500000		
6	PCBA,KEYPAD BOARD, LE1709 ROHS	Added on 9/11/06	B-00005278	790411500000R		
7	PCBA,PWR&INV./B, LE1709-6A0		B-00003043	790411400600		
8	PCBA,PWR&INV./B, LE1709-6A0 ROHS	Added on 9/11/06	B-00005279	790411400600R		
9	PCBA,IF BOARD(V7), LE1709- 6A0 ROHS	Added on 9/11/06	B-00008066	790411300630R		
10	Cabinets: BASE, LE1709		C-00003044	501240201000		
11	COVER,BACK, LE1709		C-00003046	501020202900		
12	BEZEL,FRONT(GRAY),VA702b, LE1709		C-00003055	501010202710		
13	ASSY,BASE,LE1709 RoHS	Added on 9/11/06	C-00005262	714020002400R		
14	ASSY,BACK COVER,LE1709 RoHS	Added on 9/11/06	C-00005264	714050002400R		
15	COVER,HINGE, LE1709 RoHS	Added on 9/11/06	C-00006088	501020203000R		
16	ASSY,BEZEL(G),LE1709,VA702b RoHS	Added on 9/11/06	C-00008095	714030002410R		
17	Cables: CABLE,D-SUB 15P MALE 6FT BLACK/BLUE,SZ40		CB-00003047	453010100100		
18	CABLE,D-SUB 15P MALE 6FT BLACK/BLUE,SZ40 RoHS	Added on 9/11/06	CB-00005254	453010100100R		
19	HRN LVDS FFC 30P 234mm,RoHSACCX30234KU28 RoHS	Added on 9/11/06	CB-00005259	430303000140R		
20	HRN ASSY 4x2P 189mm UL2651#28SZ504479B, RoHS	Added on 9/11/06	CB-00005260	430300800320R		
21	HRN ASSY 1P 137mm BLACK,UL100 7 #20, RoHS	Added on 9/11/06	CB-00005261	430300100210R		
22	Electronic Components: LCD PANEL 17" MT170EN01-V1(INNOLUX)		E-00003048	631102070270		
23	LCD PANEL 17" MT170EN01-V7-G1,AM17000057 RoHS	Added on 9/11/06	E-00008006	631102071910R		
24	LCD PANEL 17" MT170EN01-V7-G2,AM17000057 RoHS	Added on 9/11/06	E-00008007	631102071920R		
25	LCD PANEL 17" MT170EN01-V7-G3,AM17000057 RoHS	Added on 9/11/06	E-00008008	631102071930R		
26	Hardware: SCREW,B,CROSS,T.T-4*10,BLK,ROHS	Added on 9/11/06	HW-00005265	509412610500R		
27	SCREW,F,CROSS,T.T-4*10,Ni,ROHS	Added on 9/11/06	HW-00005266	509212610300R		
28	SCREW,P,CROSS,M5*22,Ni,ROHS	Added on 9/11/06	HW-00005267	509116822300R		
29	SCREW,PW,CROSS,W/WAS,M3*5,Ni RoHS	Added on 9/11/06	HW-00005269	509146305300R		
30	BOLT,#4-40x11.8,Ni FOR D-SUB/DVI CONN,RoHS	Added on 9/11/06	HW-00005270	509000000700R		
31	SCREW,LCROSS,M3*4,Zw,ROHS	Added on 9/11/06	HW-00005271	509016304102R		
32	HINGE,RIGHT, LE1709 RoHS	Added on 9/11/06	HW-00005276	502060401910R		
33	HINGE,LEFT, LE1709 RoHS	Added on 9/11/06	HW-00005277	502060401900R		
34	Packing Material: BAG,PLASTIC,L550xW450xT0.05mm,LE1709		P-00003049	506120004300		
35	FOAM,EPS-L, LE1709		P-00003051	506040005500		
36	FOAM,EPS-L, LE1709 RoHS	Added on 9/11/06	P-00005257	506040005500R		
37	FOAM,EPS-R, LE1709		P-00003052	506040005510		
38	FOAM,EPS-R, LE1709 RoHS	Added on 9/11/06	P-00005253	506040005510R		
39	BOX,VA702B, LE1709		P-00003056	506020006810		
40	BOX,VA702b, LE1709 RoHS	Added on 9/11/06	P-00008079	506020006810R		
41	BAG,PE+EPE,L590xW480xT0.6mm (PRINTED)LE1 RoHS	Added on 9/11/06	P-00005272	506120300400R		
42	BAG,PLASTIC,l690xW(455+145)xT0.05mm, LE1 RoHS	Added on 9/11/06	P-00005273	506120004500R		
43	GENERIC BOX	Added on 9/11/06	P-00002515	20653		
44	GENERIC FOAM SET	Added on 9/11/06	P-00001347	30833		
45	Plastics: RUBBER,FOOT,OD14.1xT2.5mm,3M, LE1708		PL-00003053	503020002600		

Remark 1: Above listed items are examples, supplier can expand the rows to add more necessary items.

Remark 2: All revised RSPLs with newly added items or any change made should be highlighted and correlated with the ECN/ECR approved by ViewSonic Corporation. This is to eliminate repeated cross checks of each item between this version and prior versions.

BOM LIST (VA702-1)

ViewSonic Model Number: VS10781

Serial No. Prefix: PST

Rev: 1b

Item	ViewSonic P/N	Ref. P/N	Description	Location	Universal number#	Q'ty (PC)
1	CB-00005261	430300100210R	HRN ASS'Y 1P 137mm BLACK,UL1007 #20,RoHS			100
2	CB-00005260	430300800320R	HRN ASS'Y 4x2P 189mm UL2651#28SZ504479B,	For VSI		1
3	CB-00005259	430303000140R	HRN LVDS FFC 30P 234mm,RoHSACCX30234KU28	For VSI		1
4	CB-00005254	453010100100R	CABLE,D-SUB 15P MALE 6FT BLACK/BLUE,SZ40	For VSI		1
5	A-00003675	453070800230R	PWRCORD 5A/250V BLK 6FT UK3Gx.75mm(SP60/ For V7 Panel	For Singapore		1
6	A-00003671	453070800420R	PWRCORD 10A/250V BLACK 6FT SAA,H05W-F/3G For V7 Panel	For Australia		1
7	A-00006733	453070800480R	PWRCORD 7A/125V BLK 6FT CNS,VCTF 3Gx0.75 For V7 Panel	For TWN		1
8	A-00006734	453070800500R	PWRCORD 16A/250V BLK 6FT KTL,H05VV-F 3Gx For V7 Panel	For Korea		1
9	N/A	501010202700R	BEZEL,FRONT(SILVER),VA702,LE1709			100
10	N/A	501020202900R	COVER,BACK, LE1709	For VSI		1
11	C-00006088	501020203000R	COVER,HINGE, LE1709	For VSI		2
12	N/A	501030201900R	BUTTON,FUNCTION KEY, LE1709	For VSI		1
13	N/A	501120101200R	LENS, LE1709	For VSI		1
14	N/A	501240201000R	BASE, LE1709	For VSI		1
15	N/A	502020300700R	BRACKET,LEFT, LE1709	For VSI		1
16	N/A	502020300710R	BRACKET,RIGHT, LE1709	For VSI		1
17	HW-00005277	502060401900R	HINGE,LEFT, LE1709	For VSI		1
18	HW-00005276	502060401910R	HINGE,RIGHT, LE1709	For VSI		1
19	N/A	502080300300R	SUPPORT,VESA, LE1709 ROHS			100
20	N/A	502090301300R	CHASSIS, LE1709	For VSI		1
21	N/A	502170300400R	PLATE,BASE,LE1709	For VSI		1
22	N/A	503010001700R	RUBBER,SPACER,L25xW10xT4.0mm,LE1709	For VSI		1
23	N/A	503020002600R	RUBBER,FOOT,OD14.1xT2.5mm,3M, LE1708 ROH			400
24	N/A	505040202000R	INSULATOR,MYLAR,L79.7xW62.7mm,CHASSIS, L	For VSI		1
25	N/A	505040203600R	INSULATOR,PET,355x292x0.1mm, LE1709			100
26	P-00005256	506020006800R	CARTON,VA702, LE1709	For VSI		1
27	N/A	506037003700R	CARDBOARD,COVER,L1120xW980xH120xT5mm,LE1	For VSI		0.02778
28	N/A	506039001200R	CORNER PAPER,820x50x50mm	For VSI		0.0556
29	N/A	506039002301R	CORNER PAPER,2050x50x50xT3mm,LE1709 ROHS			5.556
30	P-00005257	506040005500R	CUSHION,EPS-L, LE1709	For VSI		1
31	P-00005253	506040005510R	CUSHION,EPS-R, LE1709	For VSI		1
32	N/A	506102000300R	LOGO PLATE,VIEWSONIC, LE1709	For VSI		1
33	N/A	506102000400R	LOGO PLATE,VIEWSONIC, LE1709(THREE BIRDS	For VSI		1
34	N/A	506102000500R	LOGO PLATE,VIEWSONIC, LE1709(ELLIPSE)	For VSI		1
35	P-00005272	506120300400R	BAG,PE+EPE,L590xW480xT0.6mm(PRINTED)LE19			100
36	N/A	506150001310R	PALLET,1120x980x120mm,LE1709 ROHS			1.389
37	N/A	506250005102R	LBL,AGENCY(VA702), LE1709(KOREA MARK)	For VSI		1
38	N/A	506380001800R	TAPE,WRAPPING TYPE,48mmx50M ROHS LE1915			1.2
39	N/A	506380002100R	TAPE,WRAPPING TYPE(VIEWSONIC),50mmx75M,L	For VSI		0.00513ROL
40	N/A	506381000700R	TAPE,ACE,45mmx30M(PC=10x45mm),LE1709 ROH			0.1
41	N/A	506390000400R	LABEL,OPENING STAND, LE1709	For VSI		1
42	N/A	506390000600R	LABEL,HI-POT PASS, LE1709	For VSI		1
43	N/A	506390210110R	LABEL,CARTON(8ms),PRC, LE1709 For V7 Panel	For VSI		1
44	N/A	506390400100R	LABEL,PRODUCT(2), LE1709	For VSI		1
45	N/A	506390500100R	LABEL,ENERGY STAR, LE1709	For VSI		1
46	N/A	506431000300R	FILM,PE 500mmx900M ROHS			0.05
47	N/A	506440002300R	LABEL,BLANK,76.2x76.2mm,LE1709(UPC)	For VSI		1
48	N/A	506440002400R	LABEL,BLANK,50x25mm,LE1709(S/N)	For VSI		1
49	N/A	506440002600R	LABEL,BLANK,210x65mm,LE1709(PALLET)	For VSI		0.02778
50	N/A	506440003000R	LABEL,BLANK,35x8mm, LE1709 ROHS For V7 Panel	For VSI		2
51	HW-00005270	509000000700R	BOLT,#4-40x11.8,Ni FOR D-SUB/DVI CONN.RO	For VSI		2
52	HW-00005271	509016304102R	SCREW,I,CROSS,M3*4,Zw,ROHS			100
53	HW-00005267	509116822300R	SCREW,P,CROSS,M5*22,Ni,ROHS	For VSI		4
54	HW-00005269	509146305300R	SCREW,PW,CROSS,W/WAS,M3*5,Ni	For VSI		9
55	HW-00005266	509212610300R	SCREW,F,CROSS,T.T-4*10,Ni ROHS	For VSI		4
56	HW-00005265	509412610500R	SCREW,B,CROSS,T.T-4*10,BLK ,ROHS	For VSI		4
57	N/A	511100001500R	CLIP,WIRE.CH-01P(PG), LE1709	For VSI		1
58	E-00008006	631102071910R	LCD PANEL 17" MT170EN01-V7-G1,AM17000057	For VSI		1
59	E-00008007	631102071920R	LCD PANEL 17" MT170EN01-V7-G2,AM17000057	For VSI		1
60	E-00008008	631102071930R	LCD PANEL 17" MT170EN01-V7-G3,AM17000057	For VSI		1
61	N/A	703000000500R	KIT,ACCESSORY,VA702-INL,LE1709	For VSI		1
62	C-00005262	714020002400R	ASSY,BASE, LE1709	For VSI		1
63	C-00005263	714030002400R	ASSY,BEZEL(S),LE1709	For VSI		1
64	C-00005264	714050002400R	ASSY,BACK COVER, LE1709	For VSI		1
65	N/A	71407276B100R	ASSY,FIANL(S,V7/G1&2&3),LE1709-6A0	For VSI		1
66	N/A	71408276B100R	ASSY,PANEL(V7/G1&2&3),LE1709-6A0	For VSI		1
67	B-00008066	790411300630R	PCBA,IF BOARD(V7), LE1709- 6A0 ROHS	For VSI		1
68	B-00005279	790411400600R	PCBA,PWR&INV./B, LE1709-6A0 ROHS	For VSI		1
69	B-00005278	790411500000R	PCBA,KEYPAD BOARD, LE1709 ROHS	For VSI		1

BOM LIST (VA702B-1)

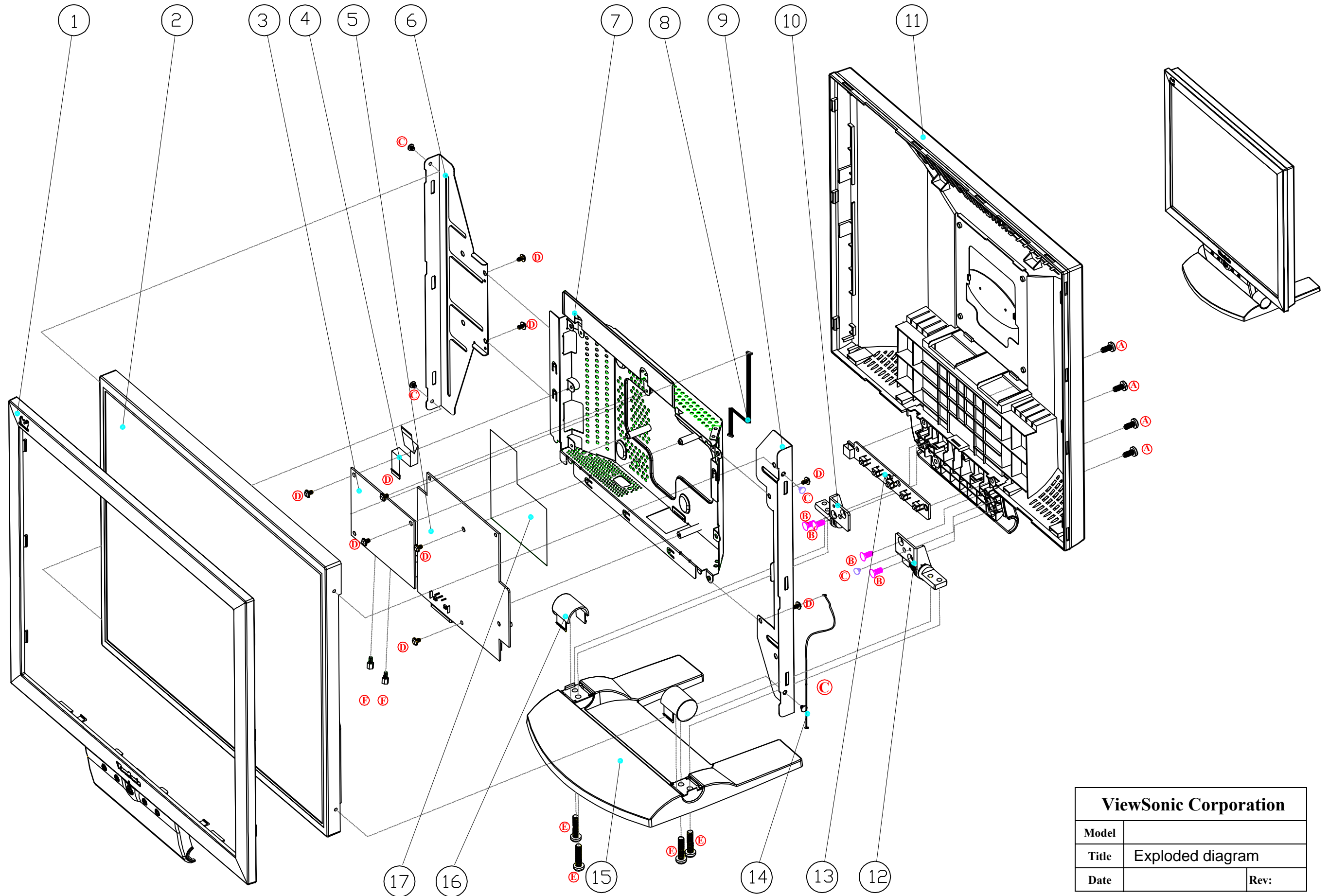
ViewSonic Model Number: VS10781

Serial No. Prefix: PSX

Rev: 1b

Item	ViewSonic P/N	Ref. P/N	Description	Location	Universal number#	Q'ty (PC)
1	CB-00005261	430300100210R	HRN ASS'Y 1P 137mm BLACK,UL100 7 #20,ROHS	For VSI&VSA		1
2	CB-00005260	430300800320R	HRN ASS'Y 4x2P 189mm UL2651#28SZ504479B,	For VSI&VSA		1
3	CB-00005259	430303000140R	HRN LVDS FFC 30P 234mm,RoHSACCX30234KU28	For VSI&VSA		1
4	CB-00005254	453010100100R	CABLE,D-SUB 15P MALE 6FT BLACK/BLUE,SZ40	For VSI&VSA		1
5	A-00003675	453070800230R	PWRCORD 5A/250V BLK 6FT UK3Gx.75mm(SP60/	For Singapore		1
6	A-00006679	453070800250R	PWR CORD 10A/125V BLK 6FT UL/CSA,SVT 18x	For VSA		1
7	A-00003671	453070800420R	PWRCORD 10A/250V BLACK 6FT SAA,H05W-F/3G	For Australia		1
8	A-00006733	453070800480R	PWRCORD 7A/125V BLK 6FT CNS,VCTF 3Gx0.75	For TWN		1
9	A-00006734	453070800500R	PWRCORD 16A/250V BLK 6FT KTL,H05VV-F 3Gx	For Korea		1
10	N/A	501010202710R	BEZEL,FRONT(GRAY),VA702B,LE1709	For VSI&VSA		1
11	N/A	501020202900R	COVER,BACK, LE1709	For VSI&VSA		1
12	C-00006088	501020203000R	COVER,HINGE, LE1709	For VSI&VSA		2
13	N/A	501030201900R	BUTTON,FUNCTION KEY, LE1709	For VSI&VSA		1
14	N/A	501120101200R	LENS, LE1709	For VSI&VSA		1
15	N/A	501240201000R	BASE, LE1709	For VSI&VSA		1
16	N/A	502020300700R	BRACKET,LEFT, LE1709	For VSI&VSA		1
17	N/A	502020300710R	BRACKET,RIGHT, LE1709	For VSI&VSA		1
18	HW-00005277	502060401900R	HINGE,LEFT, LE1709	For VSI&VSA		1
19	HW-00005276	502060401910R	HINGE,RIGHT, LE1709	For VSI&VSA		1
20	N/A	502080300300R	SUPPORT,VESA, LE1709	For VSI&VSA		1
21	N/A	502090301300R	CHASSIS,LE1709	For VSI&VSA		1
22	N/A	502170300400R	PLATE,BASE,LE1709	For VSI&VSA		1
23	N/A	503010001700R	RUBBER,SPACER,L25xW10xT4.0mm,LE1709	For VSI&VSA		1
24	N/A	503020002600R	RUBBER,FOOT,OD14.1xT2.5mm,3M, LE1708	For VSI&VSA		4
25	N/A	505040202000R	INSULATOR,MYLAR,L79.7xW62.7mm,CHASSIS, L	For VSI&VSA		1
26	P-00008079	506020006810R	CARTON,VA702B, LE1709	For VSI&VSA		1
27	N/A	506037003700R	CARDBOARD,COVER,L1120xW980xH120xT5mm,LE1	For VSI&VSA		0.02778
28	N/A	506039001200R	CORNER PAPER,820x50x50mm	For VSI&VSA		0.0556
29	N/A	506039002301R	CORNER PAPER,2050x50x50xT3mm,LE1705	For VSI&VSA		0.05556
30	P-00005257	506040005500R	CUSHION,EPS-L, LE1709	For VSI&VSA		1
31	P-00005253	506040005510R	CUSHION,EPS-R, LE1709	For VSI&VSA		1
32	N/A	506102000300R	LOGO PLATE,VIEWSONIC, LE1709	For VSI&VSA		1
33	N/A	506102000400R	LOGO PLATE,VIEWSONIC, LE1709(THREE BIRDS)	For VSI&VSA		1
34	N/A	506102000500R	LOGO PLATE,VIEWSONIC, LE1709(ELLIPSE)	For VSI&VSA		1
35	P-00005272	506120300400R	BAG,PE+EPE,L590xW480xT0.6mm (PRINTED)LE1	For VSI&VSA		1
36	N/A	506150001310R	PALLET,1120x980x120mm,LE1709	For VSI&VSA		0.01389
37	N/A	506250005112R	LBL,AGENCY(VA702B), LE1709(KOREA MARK)	For VSI&VSA		1
38	N/A	506380001800R	TAPE,WRAPPING TYPE,48mmx50M LE1X04/05	For VSI&VSA		0.004ROL
39	N/A	506380002100R	TAPE,WRAPPING TYPE(VIEWSONIC),50mmx75M,L	For VSI&VSA		0.00513ROL
40	N/A	506381000700R	TAPE,ACE,45mmx30M(PC=10x45mm),LE1709	For VSI&VSA		0.001ROL
41	N/A	506390000400R	LABEL,OPENING STAND, LE1709	For VSI&VSA		1
42	N/A	506390000600R	LABEL,HI-POT PASS, LE1709	For VSI&VSA		1
43	N/A	506390210110R	LABEL,CARTON(8ms),PRC, LE1709	For VSI&VSA		1
44	N/A	506390500100R	LABEL,ENERGY STAR, LE1709	For VSI&VSA		1
45	N/A	506431000300R	FILM,PE 500mmx900M	For VSI&VSA		0.0004ROL
46	N/A	506440002300R	LABEL,BLANK,76.2x76.2mm,LE1709(UPC)	For VSI&VSA		1
47	N/A	506440002400R	LABEL,BLANK,.50x25mm,LE1709(S/N)	For VSI&VSA		1
48	N/A	506440002600R	LABEL,BLANK,210x65mm,LE1709(PALLET)	For VSI&VSA		0.02778
49	N/A	506440003000R	LABEL,BLANK,35x8mm, LE1709 ROHS	For VSI&VSA		2
50	HW-00005270	509000000700R	BOLT,#4-40x11.8,Ni FOR D-SUB/DVI CONN.RO	For VSI&VSA		2
51	HW-00005271	509016304102R	SCREW,I,CROSS,M3*4,Zw,ROHS	For VSI&VSA		4
52	HW-00005267	509116822300R	SCREW,P,CROSS,M5*22,Ni,ROHS	For VSI&VSA		4
53	HW-00005269	509146305300R	SCREW,PW,CROSS,W/WAS,M3*5,NI	For VSI&VSA		9
54	HW-00005266	509212610300R	SCREW,F,CROSS,T.T-4*10,Ni ROHS	For VSI&VSA		4
55	HW-00005265	509412610500R	SCREW,B,CROSS,T.T-4*10,BLK ,ROHS	For VSI&VSA		4
56	N/A	511100001500R	CLIP,WIRE.CH-01P(PG), LE1709	For VSI&VSA		1
57	E-00008006	631102071910R	LCD PANEL 17" MT170EN01-V7-G1,AM17000057	For VSI&VSA		1
58	E-00008007	631102071920R	LCD PANEL 17" MT170EN01-V7-G2,AM17000057	For VSI&VSA		1
59	E-00008008	631102071930R	LCD PANEL 17" MT170EN01-V7-G3,AM17000057	For VSI&VSA		1
60	N/A	703000000510R	KIT,ACCESSORY,VA702B-INL,LE1709	For VSI&VSA		1
61	C-00005262	714020002400R	ASSY,BASE, LE1709	For VSI&VSA		1
62	C-00008095	714030002410R	ASSY,BEZEL(G),LE1709	For VSI&VSA		1
63	C-00005264	714050002400R	ASSY,BACK COVER, LE1709	For VSI&VSA		1
64	N/A	71407276B101R	ASSY,FIANL(G,V7/G1&2&3),LE1709-6A0	For VSI&VSA		1
65	N/A	71408276B100R	ASSY,PANEL(V7/G1&2&3),LE1709-6A0	For VSI&VSA		1
66	B-00008066	790411300630R	PCBA,IF BOARD(V7), LE1709- 6A0 ROHS	For VSI&VSA		1
67	B-00005279	790411400600R	PCBA,PWR&INV./B, LE1709-6A0 ROHS	For VSI&VSA		1
68	B-00005278	790411500000R	PCBA,KEYPAD BOARD, LE1709 ROHS	For VSI&VSA		1

8. Exploded Diagram and Exploded Parts List



ViewSonic Corporation	
Model	
Title	Exploded diagram
Date	Rev:

EXPLODED PARTS LIST (VA702-1)

ViewSonic Model Number: VS10781

Rev: 1a

Item	ViewSonic P/N	Ref. P/N	Description	Q'ty
1	C-00003154	714030002400	ASSY,BEZEL(S),LE1709	1
2	E-00003048	631102070270	LCD PANEL 17" MT170EN01-V1(INNOLUX)	1
3	B-00003041	790411300600	PCBA,IF BOARD, LE1709-6A0	1
4	CB-00003155	430303000140	HRN LVDS FFC 30P 234mm,ACCX30234KU28MY	1
5	B-00003043	790411400600	PCBA,PWR&INV./B, LE1709-6A0	1
6	HW-00003156	502020300700	BRACKET,LEFT, LE1709	1
7	B-00003172	502090301300	CHASSIS, LE1709	1
8	CB-00003157	430300800320	HRN ASS'Y 4x2P 189mm UL2651#28SZ504479B	1
9	HW-00003158	502020300710	BRACKET,RIGHT, LE1709	1
10	HW-00003159	502060401900	HINGE,LEFT, LE1709	1
11	C-00003160	714050002400	ASSY,BACK COVER, LE1709	1
12	HW-00003161	502060401910	HINGE,RIGHT, LE1709	1
13	B-00003042	790411500000	PCBA,KEYPAD BOARD, LE1709	1
14	CB-00003162	430300100190	HRN ASS'Y 1P 157mm BLACK,UL1007#20	1
15	C-00003163	714020002400	ASSY,BASE, LE1709	1
16	C-00003164	501020203000	COVER,HINGE, LE1709	2
17	M-00003165	505040202000	INSULATOR,MYLAR,L79.7xW62.7mm,CHASSIS, L (Chassis)	1
18	HW-00003166	509412610500	SCREW,B,CROSS,T.T-4*10,BLK (Back cover & Bezel)	4
19	HW-00003167	509212610300	SCREW,F,CROSS,T.T-4*10,Ni (Hinge & Back cover)	4
20	HW-00003168	509016304102	SCREW,I,CROSS,M3*4,Zw (chassis&bracket*4,GND*1)	5
21	HW-00003169	509146305300	SCREW,PW,CROSS W/WAS,M3*5,Ni (PCB&chassis*5, Bracket & Chassis*4)	9
22	HW-00003170	509116822300	SCREW,P,CROSS,M5*22,Ni (Hinge & Base ASM)	4
23	M-00003171	509000000700	BOLT,#4-40x11.8,NiFOR D-SUB/DVI CONN. (D-SUB)	2

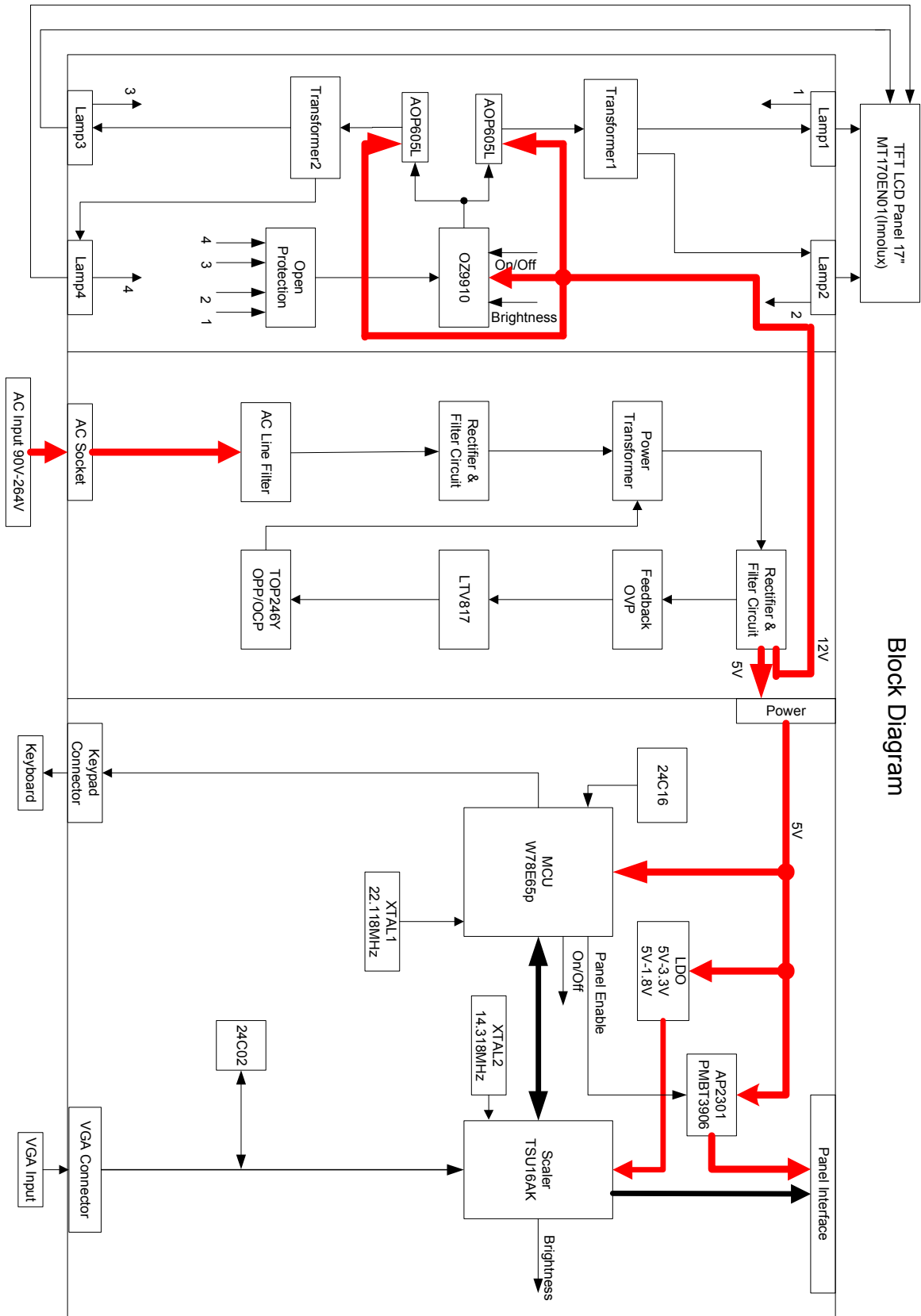
EXPLODED PARTS LIST (VA702b-1)

ViewSonic Model Number: VS10781

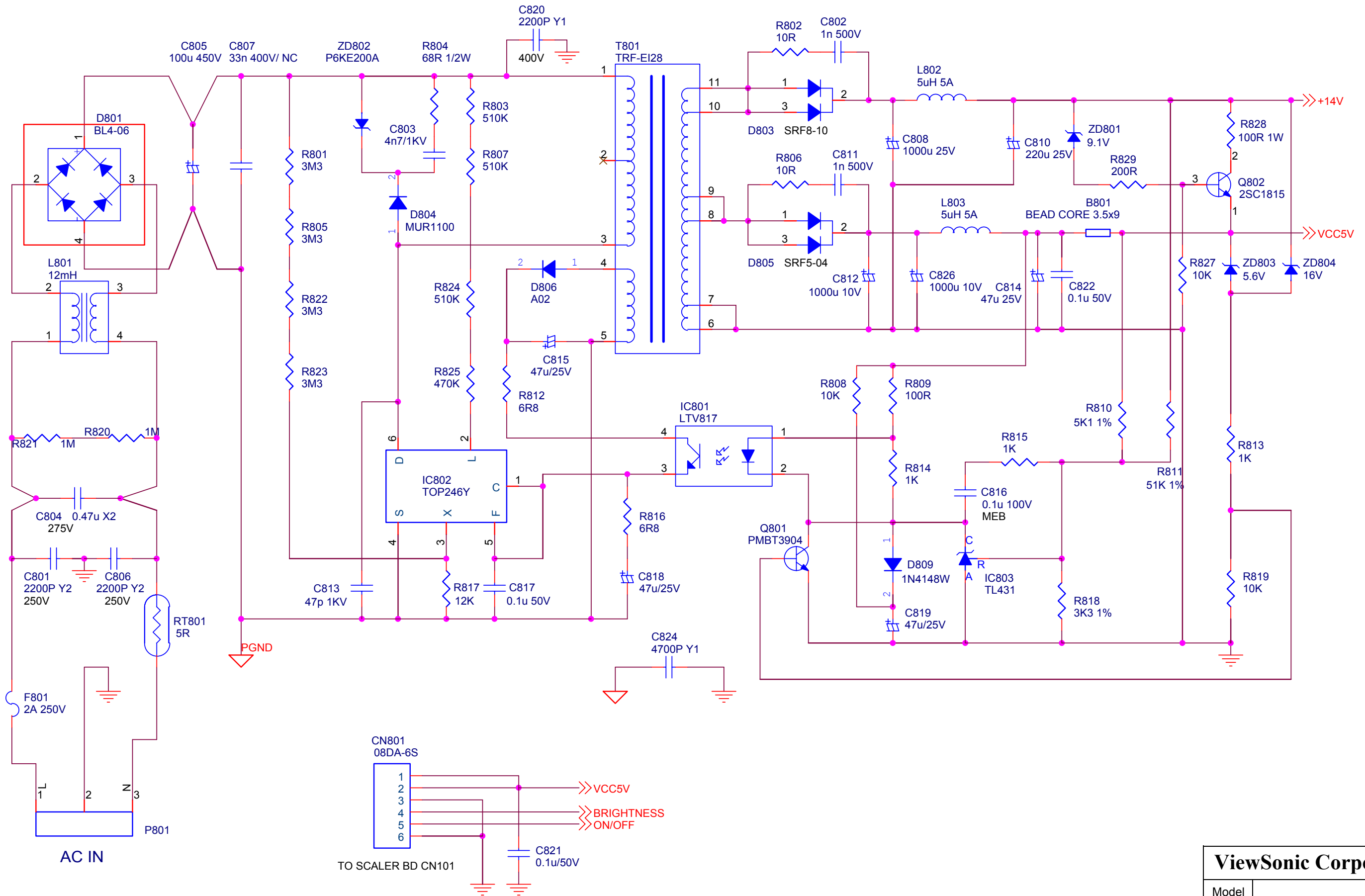
Rev: 1a

Item	ViewSonic P/N	Ref. P/N	Description	Q'ty
1	C-00003173	714030002410	ASSY,BEZEL(G),LE1709	1
2	E-00003048	631102070270	LCD PANEL 17" MT170EN01-V1(INNOLUX)	1
3	B-00003041	790411300600	PCBA,IF BOARD, LE1709-6A0	1
4	CB-00003155	430303000140	HRN LVDS FFC 30P 234mm,ACCX30234KU28MY	1
5	B-00003043	790411400600	PCBA,PWR&INV./B, LE1709-6A0	1
6	HW-00003156	502020300700	BRACKET,LEFT, LE1709	1
7	B-00003172	502090301300	CHASSIS, LE1709	1
8	CB-00003157	430300800320	HRN ASS'Y 4x2P 189mm	1
9	HW-00003158	502020300710	BRACKET,RIGHT, LE1709	1
10	HW-00003159	502060401900	HINGE,LEFT, LE1709	1
11	C-00003160	714050002400	ASSY,BACK COVER, LE1709	1
12	HW-00003161	502060401910	HINGE,RIGHT, LE1709	1
13	B-00003042	790411500000	PCBA,KEYPAD BOARD, LE1709	1
14	CB-00003162	430300100190	HRN ASS'Y 1P 157mm BLACK,UL1007#20	1
15	C-00003163	714020002400	ASSY,BASE, LE1709	1
16	C-00003164	501020203000	COVER,HINGE, LE1709	2
17	M-00003165	505040202000	INSULATOR,MYLAR,L79.7xW62.7mm,CHASSIS, L (Chassis)	1
18	HW-00003166	509412610500	SCREW,B,CROSS,T.T-4*10,BLK (Back cover & Bezel)	4
19	HW-00003167	509212610300	SCREW,F,CROSS,T.T-4*10,Ni (Hinge & Back cover)	4
20	HW-00003168	509016304102	SCREW,I,CROSS,M3*4,Zw (chassis&bracket*4,GND*1)	5
21	HW-00003169	509146305300	SCREW,PW,CROSS W/WAS,M3*5,Ni (PCB&chassis*5, Bracket & Chassis*4)	9
22	HW-00003170	509116822300	SCREW,P,CROSS,M5*22,Ni (Hinge & Base ASM)	4
23	HW-00003171	509000000700	BOLT,#4-40x11.8,NiFOR D-SUB/DVI CONN. (D-SUB)	2

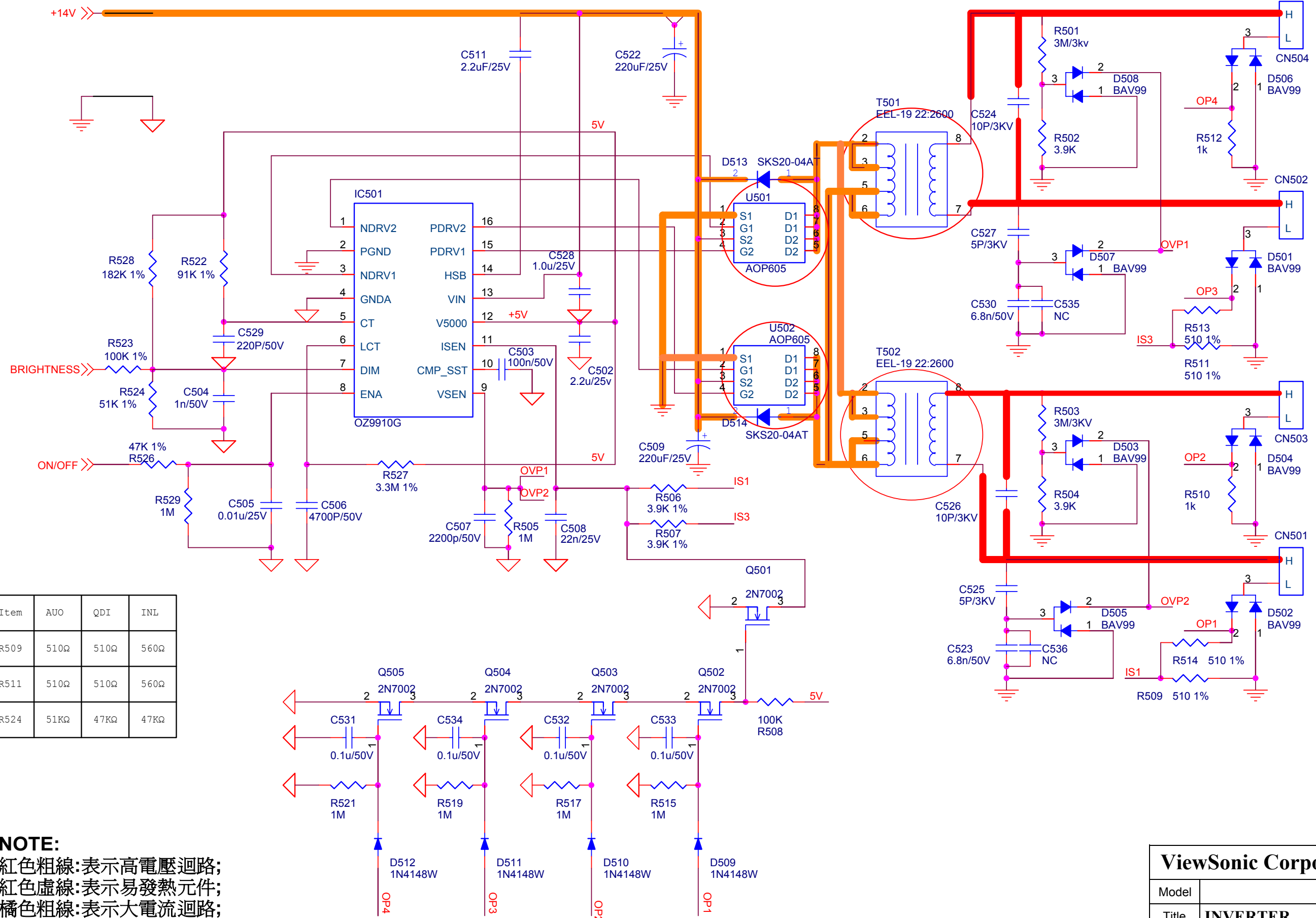
9. Block Diagram



10. Schematic Diagrams



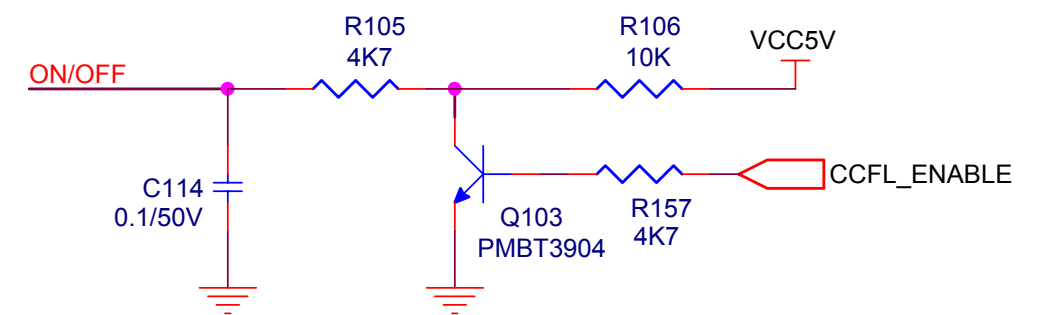
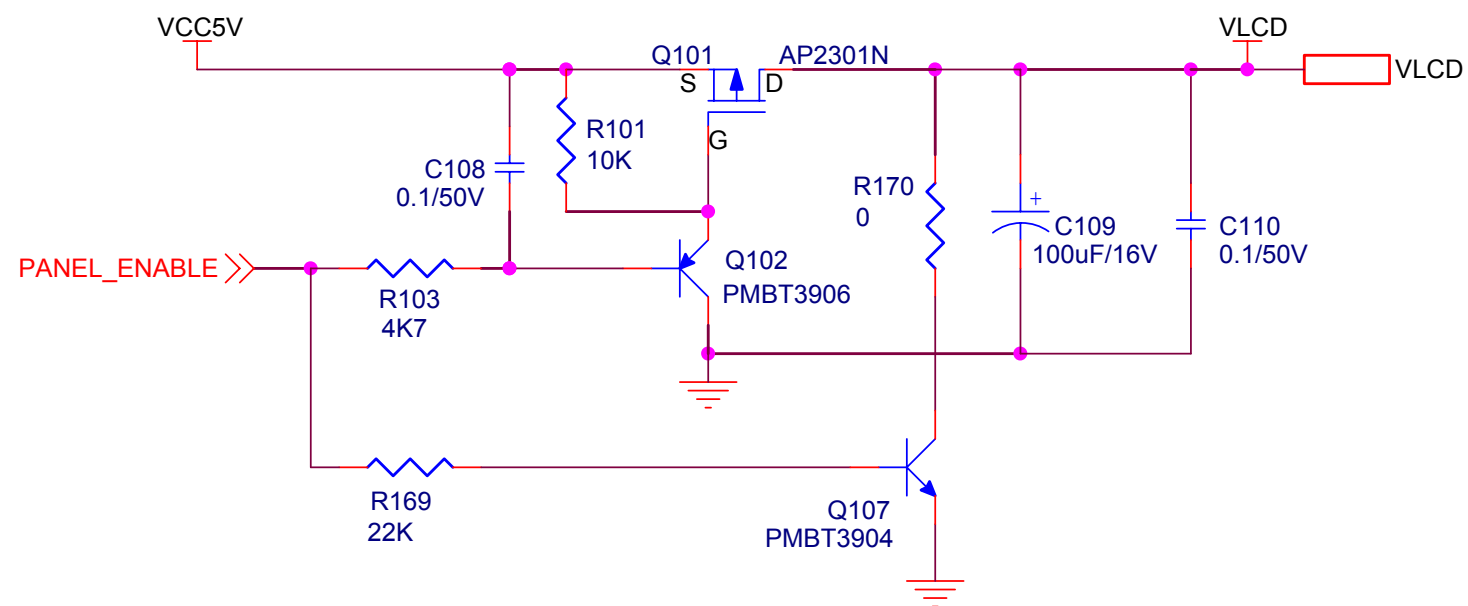
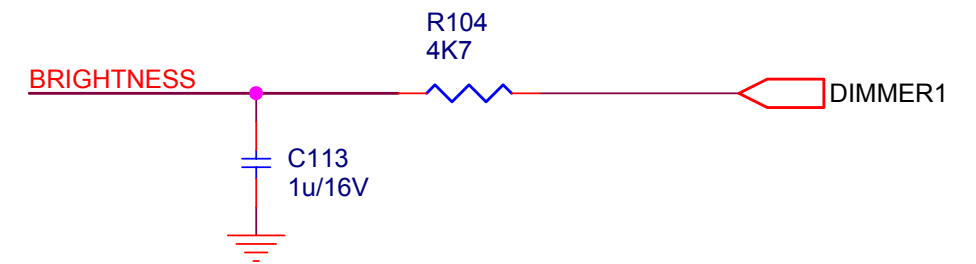
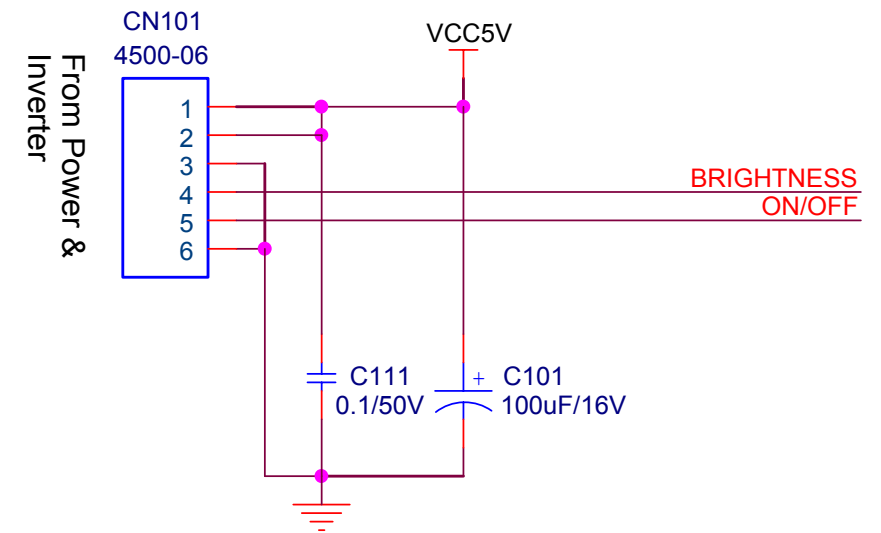
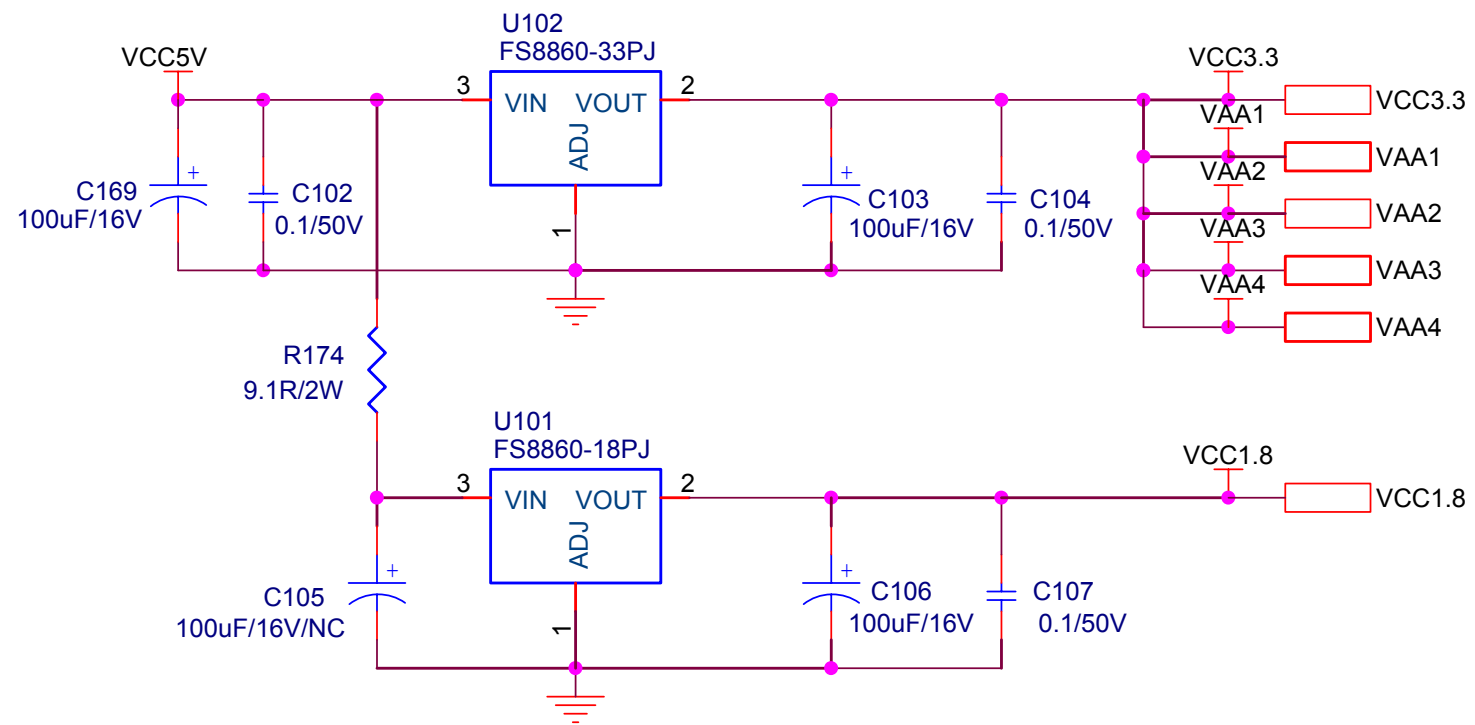
ViewSonic Corporation	
Model	
Title	POWER SUPPLY
Date	Rev:



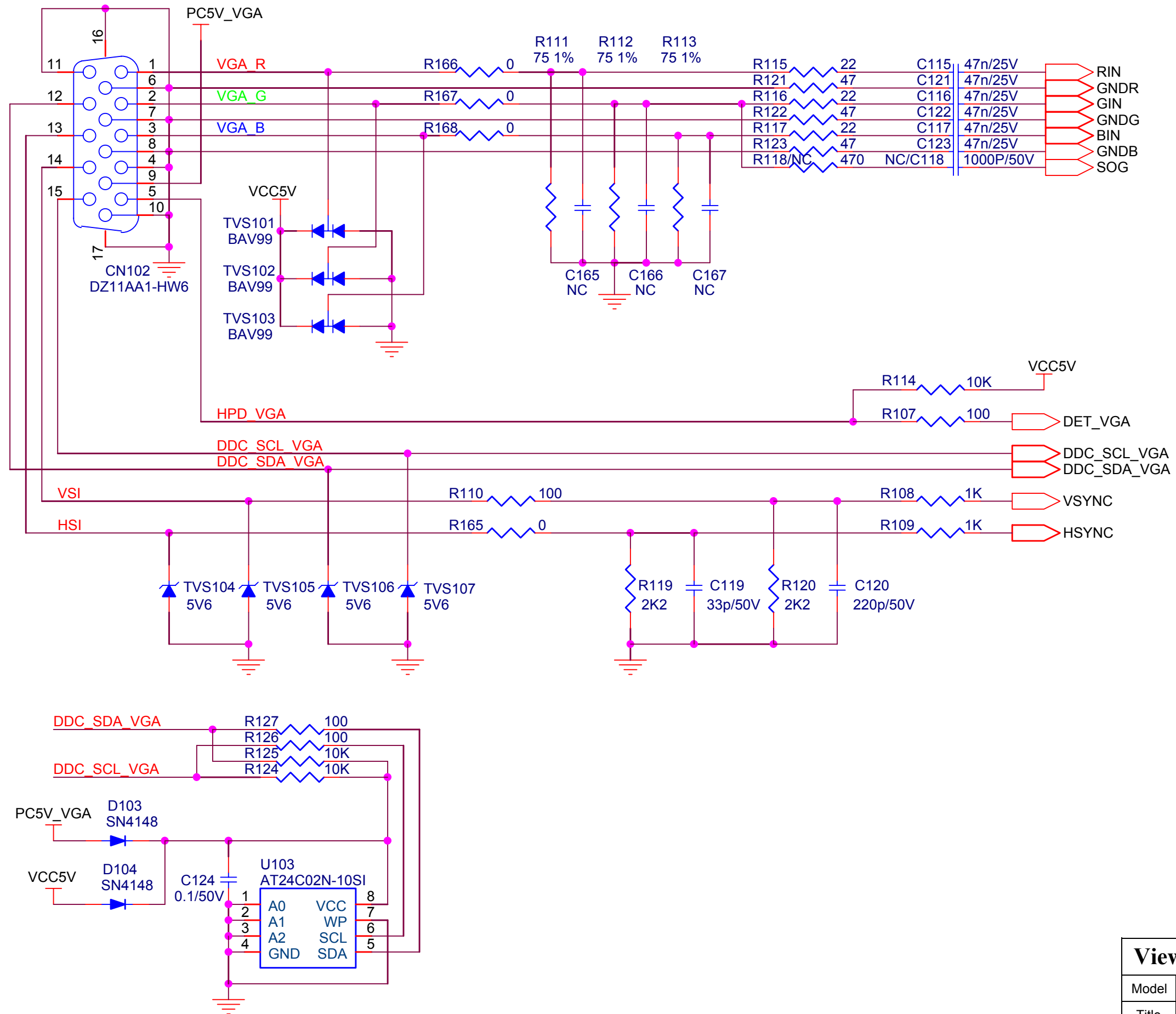
Item	AU0	QDI	INL
R509	510Ω	510Ω	560Ω
R511	510Ω	510Ω	560Ω
R524	51KΩ	47KΩ	47KΩ

NOTE:
 紅色粗線:表示高電壓迴路;
 紅色虛線:表示易發熱元件;
 橘色粗線:表示大電流迴路;

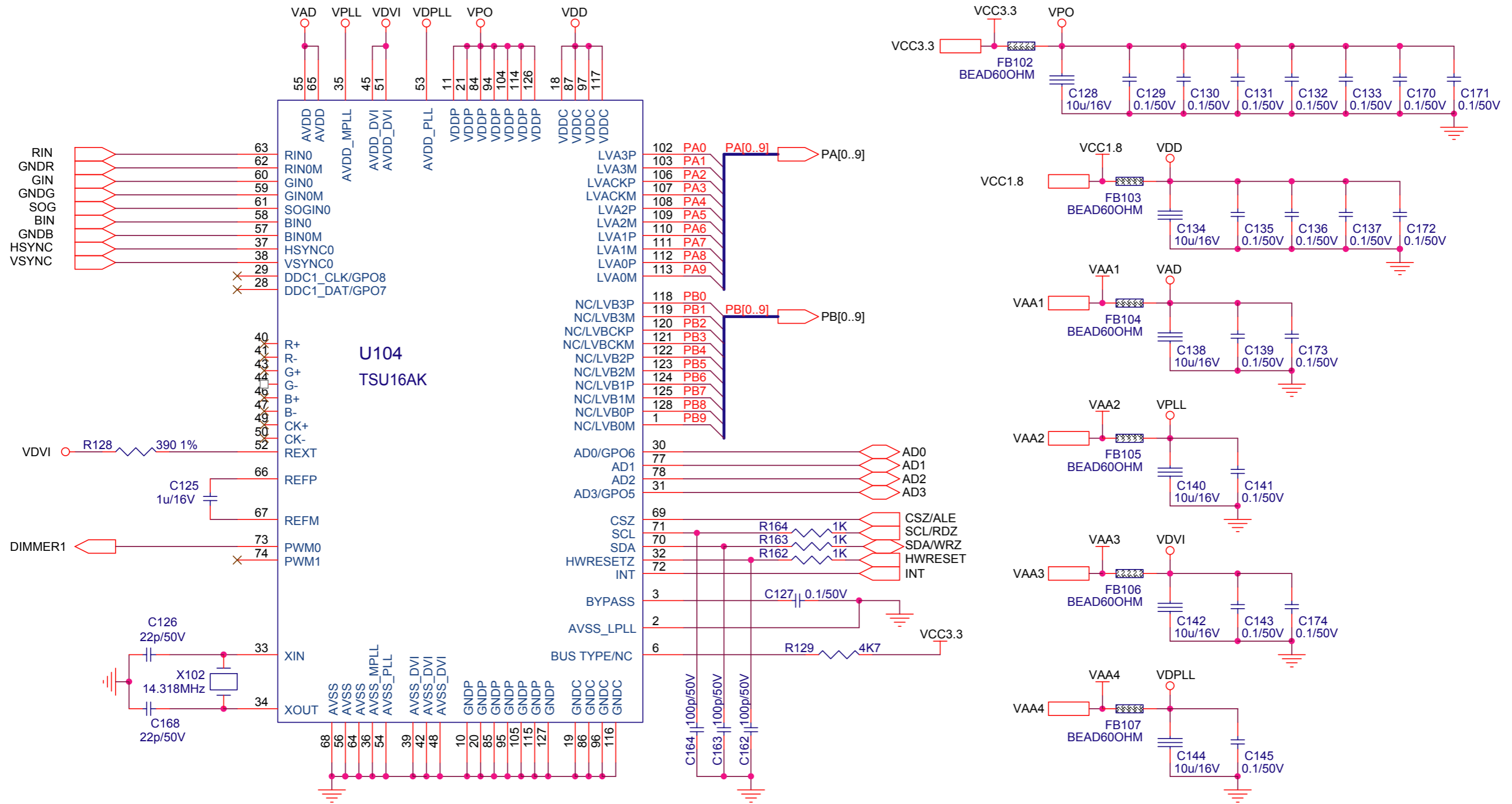
ViewSonic Corporation	
Model	
Title	INVERTER
Date	
Rev:	



ViewSonic Corporation	
Model	
Title	DC INPUT
Date	Rev:

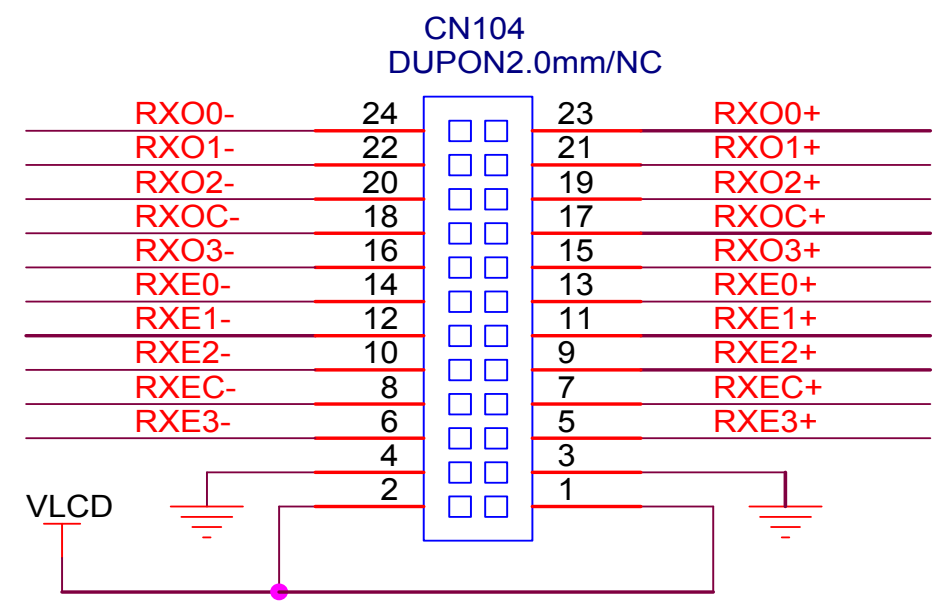
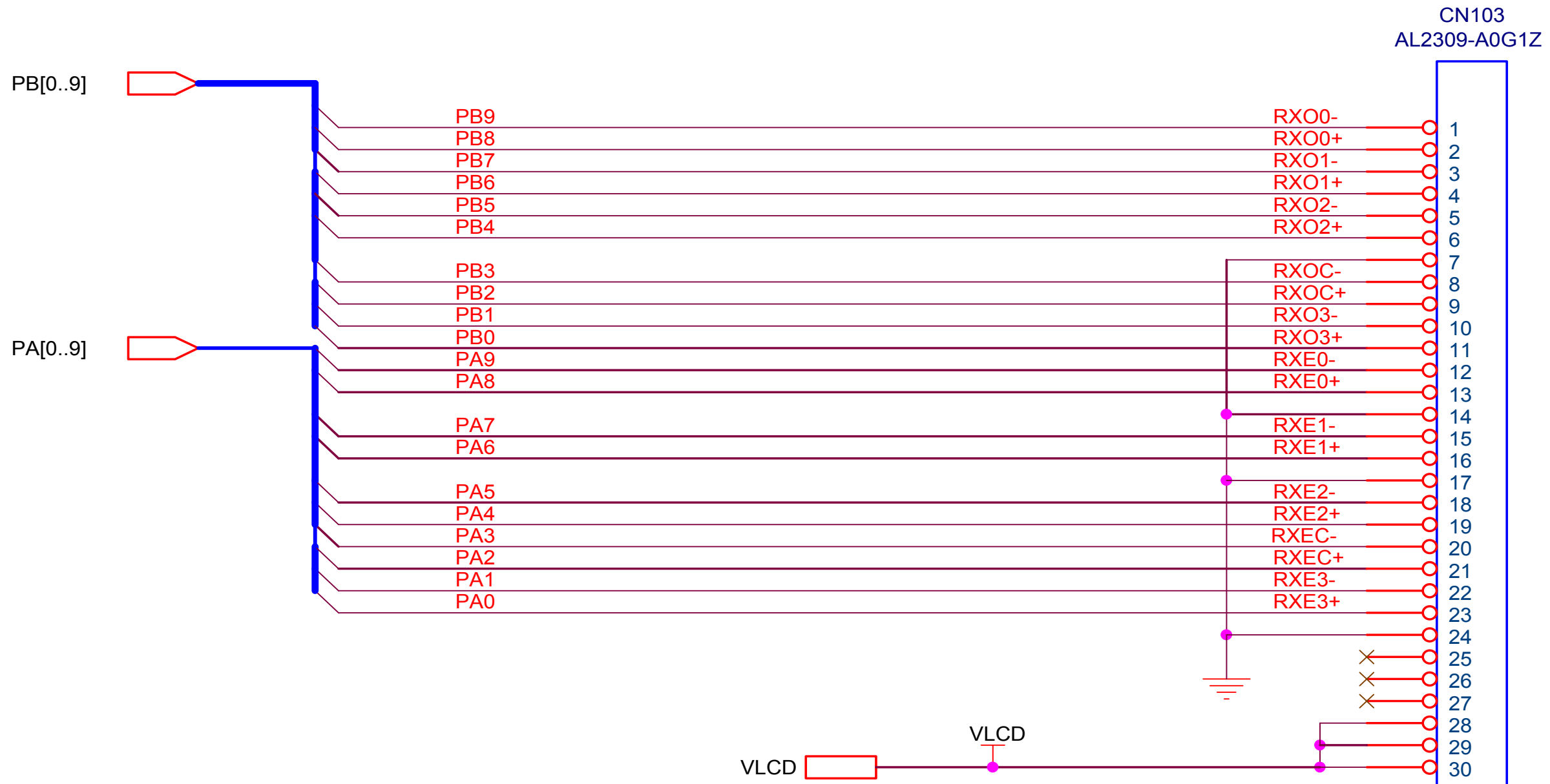


ViewSonic Corporation	
Model	
Title	VGA_INPUT
Date	Rev:

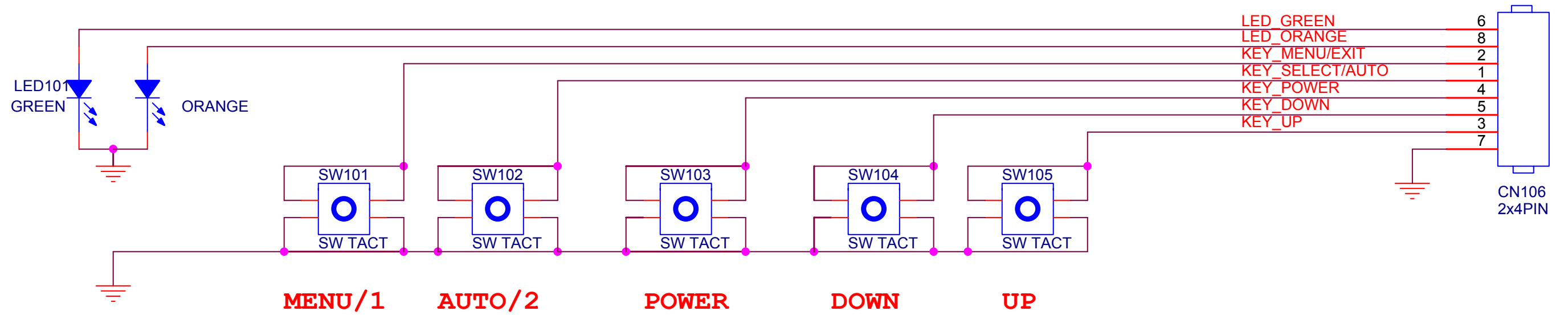


Note: U104 pin4,5,7~9,12~17,22~27,75,76,79~83,88~93,98~101 are all NC (open)

ViewSonic Corporation	
Model	
Title	SCALER
Date	Rev:

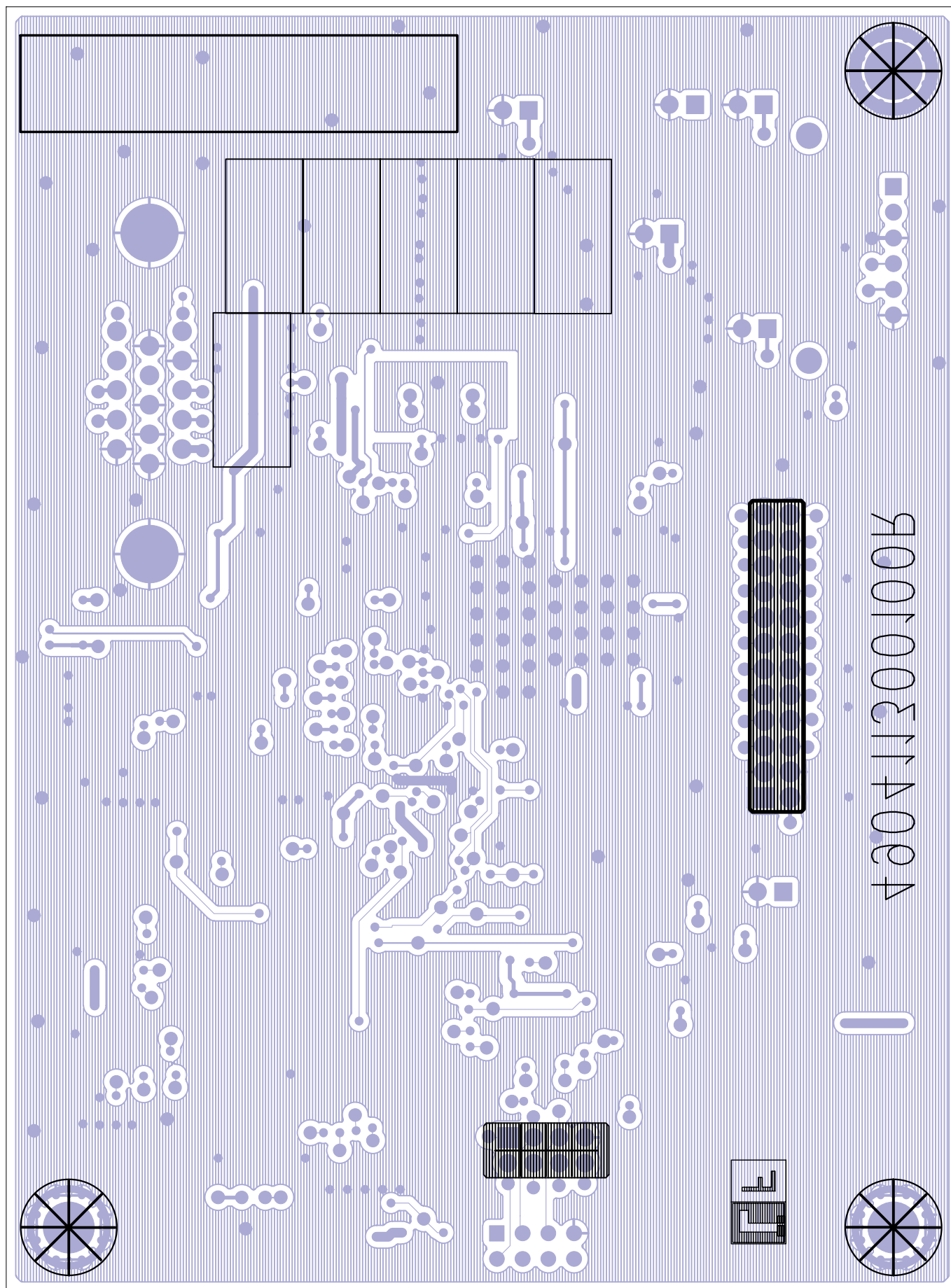


ViewSonic Corporation	
Model	
Title	PANEL INTERFACE
Date	Rev:

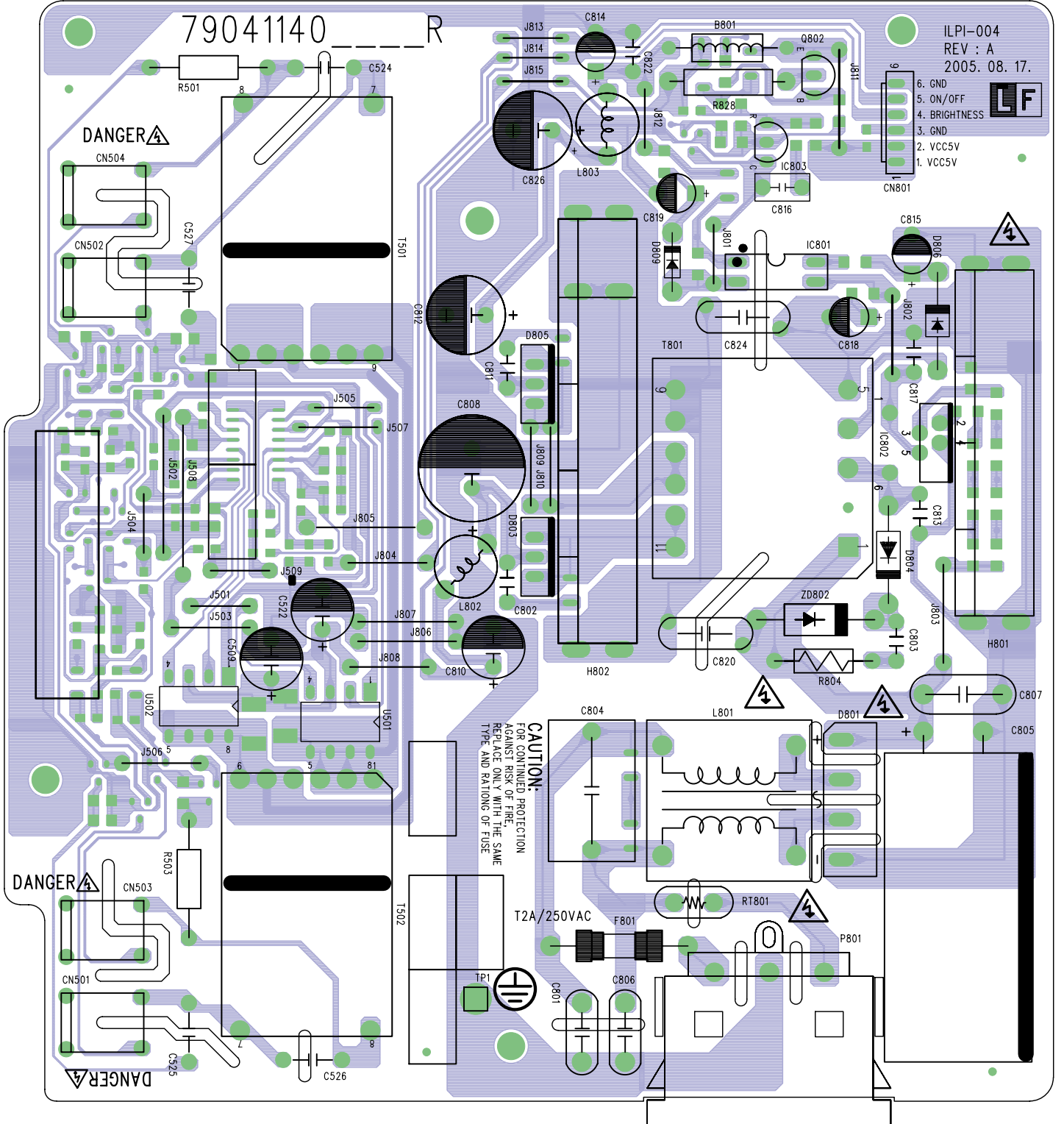


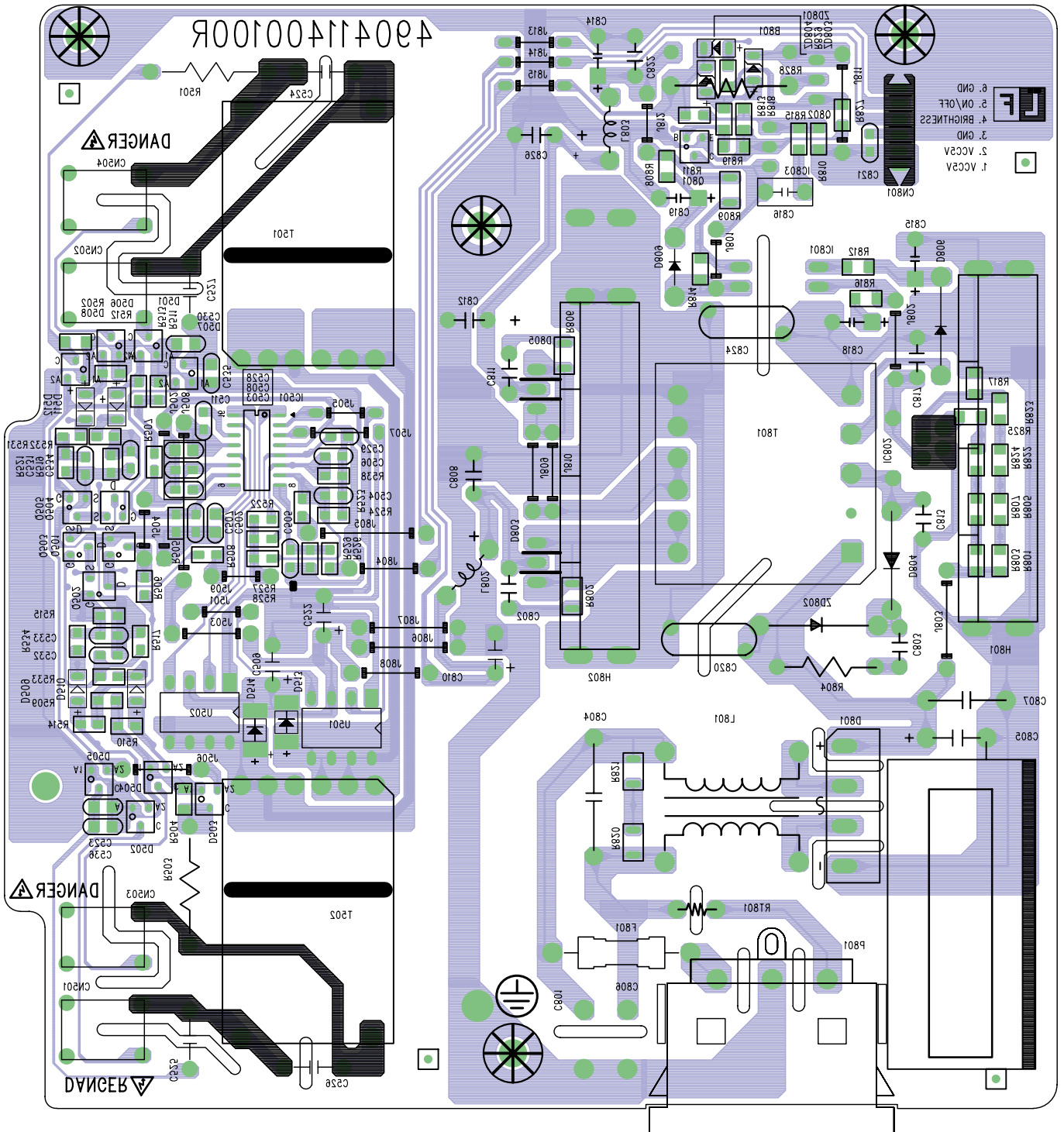
ViewSonic Corporation	
Model	
Title	KEYPAD
Date	Rev:

Main board bottom Layout



POWER board





* *Reader's Response* *

Dear Readers:

Thank you in advance for your feedback on our Service Manual, which allows continuous improvement of our products. We would appreciate your completion of the Assessment Matrix below, for return to ViewSonic Corporation.

Assessment

A. What do you think about the content of this Service Manual?

<i>Unit</i>	<i>Excellent</i>	<i>Good</i>	<i>Fair</i>	<i>Bad</i>
1. Precautions and Safety Notices				
2. Specification				
3. Front Panel Function Control Description				
4. Circuit Description				
5. Adjustment Procedure				
6. Troubleshooting Flow Chart				
7. Recommended Spare Parts List				
8. Exploded Diagram and Exploded Parts List				
9. Block Diagrams				
10. Schematic Diagrams				
11. PCB Layout Diagrams				

B. Are you satisfied with this Service Manual?

<i>Item</i>	<i>Excellent</i>	<i>Good</i>	<i>Fair</i>	<i>Bad</i>
1. Service Manual Content				
2. Service Manual Layout				
3. The form and listing				

C. Do you have any other opinions or suggestions regarding this service manual?

Reader's basic data:

Name:		Title:	
Company:			
Add:			
Tel:		Fax:	
E-mail:			

After completing this form, please return it to ViewSonic Quality Assurance in the USA at facsimile 1-909-839-7943. You may also e-mail any suggestions to the Director, Quality Systems & Processes (marc.maupin@viewsonic.com)