Service Manual

ViewSonic Q191wb-1

Model No. VS11584

19” Color TFT LCD Display

(Q191wb-1_SM Rev. 1a Oct. 2006)

ViewSonic 381 Brea Canyon Road, Walnut, California 91789 USA - (800) 888-8583

Revision History

Revision	SM Editing Date	ECR Number	Description of Changes	Editor
1a	10/16/2006		Initial Release	Jamie Chang

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1. Precautions and Safety Notices

Instructions for Federal Communications Commission (FCC) Compliance

This device has passed the tests stipulated by Article 15 of FCC Compliance and conforms to the limitations and provisions for Class-B digital equipment. The restrictions are formulated to prevent the harmful interference with radio frequencies produced by or used by household appliances. This unit will emit electromagnetic waves during operation and therefore, it may interfere with the radio-frequency signal if it is not configured and operated as directed in the user manual. It is not guaranteed that this device will not cause interference with specific equipment--in particular when it is being powered on or off. In case this device interferes with TV sets or wireless networking equipment, the user may prevent the interference by using one or several of the methods stated below:

——Relocate the reception antenna of the equipment

——Increase the distance between this device and the equipment

——Connect the power plug of this device and that of the equipment into sockets for different lines

——Contact an experienced technician familiar with wireless networking equipment or TV sets

In order to satisfy the limitations regarding electromagnetic emissions and to prevent interference with TV sets and/or wireless networking equipment nearby, the accessories provided with this unit should be used. This device should not be modified without the authorization or confirmation of the manufacturer.

CE Statement

This is to state that this 17" LCD monitor complies with the following compulsory regulations:

- **Safety**

This appliance complies with 73/23 EEC, 93/68/EEC Low Voltage Direction (EN60950-1:2001) requirements:

- Electrical shock protection
- Energy risk protection
- Fire hazard protection
- Hazardous electromagnetic emissions protection
- Protection against hazardous substances produced during normal operation or malfunction
- Mechanical and moving parts hazards

- **EMC**

This device complies with the 89/336/EEC requirements.

Electromagnetic interference generated by this device is less than that produced by radios or other long-distance communication equipment. During normal operation, interference effects should be at an acceptable level; this device also incorporates a sound internal anti-interference design. When correctly configured and maintained, it should operate normally in typical home or office environments.

EMI: Radio interference characteristics are in conformity with EN55022:1998 + A1: 2000 + A2: 2003 Class B *Limit Value & Test Method for Radio Interference Characteristics for Information Technology Equipment*

A) Electromagnetic emissions

B) Conducted emission

EN61000-3-2:2000; Class A Harmonic Current Emission

EN61000-3-3:1995+A1:2001 Voltage Fluctuation & Flicker

EMS: Anti-interference levels are in conformity with EN55024:1998 +A1:2001 + A2: 2003 class B

Limit Value & Test Method for Anti- Interference Level for Information Technology Equipment

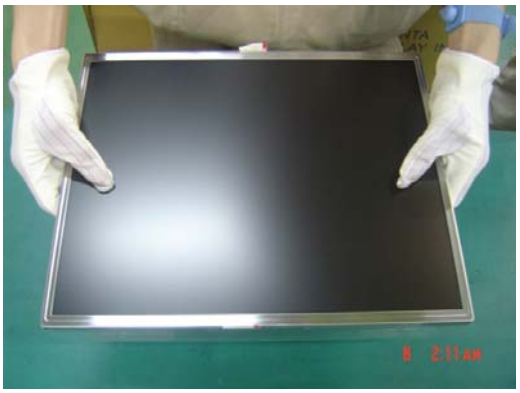
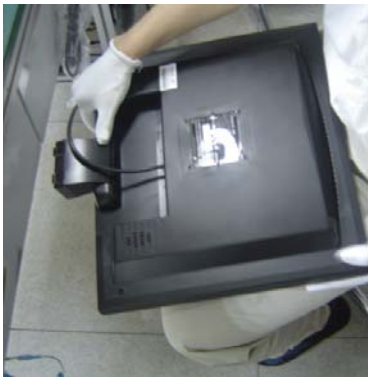
IEC61000-4-2: 2001	Electrostatic (ESD)
IEC61000-4-3: 2002	Immunity to RF field strength
IEC61000-4-4: 2001	Electrical fast transient
IEC61000-4-5: 2001	SURGE
IEC61000-4-6: 2001	CS
IEC61000-4-8:1993+A1:2000	Magnetic-immunity
IEC61000-4-11: 2001	Voltage Dips/Interruptions

Safety Instructions

1. Please carefully read this manual before operating the device and keep it available for future reference.
2. To avoid the danger of the monitor falling and thereby possibly causing injury and/or serious damage to the monitor itself, do not place it on unstable cars or desks. Be careful to avoid placing any stress on the LCD screen during handling.
3. Do not place this monitor in areas that are wet or where water or other liquids may come in contact with it, such as bathrooms, kitchens, wet floors, near washing machines or by swimming pools.
4. Remove the power plug from the electrical socket before cleaning. No water-containing cleaning agent should be used to clean the screen, but only cleaning agents formulated specifically for cleaning LCD screens. Do not put any liquid cleaning agent directly on the screen, but put it on a soft cloth first and then gently apply the cloth to the screen.
5. In order to guarantee reliable operation and adequate heat dissipation, do not cover or block vent holes on the monitor. Do not put the monitor close to heat sources. Do not place the monitor on furniture such as a bookshelf, unless sufficient ventilation is available.
6. A 3-pin grounding plug is provided for this monitor. In order to guarantee normal operation and safety of this unit, this plug should be used with a matching grounded power socket.
7. Please follow all warnings and instructions that accompany the monitor.
8. Please pay special attention to power supply overloads, as electrical shock or fire may occur.
9. Do not place anything on the power cord. Do not hang the power cord over an area where people or objects may pass.
10. In case the monitor is not be used for an extended period, turn off power to avoid the possibility of short circuits caused by lightning.
11. In order to avoid electrical shock or fire risks, do not insert any object through any openings in the monitor's enclosure. Do not allow any liquid to come in contact with the monitor.
12. In case of any abnormal noise or odor caused by incorrect operation, turn off power immediately and contact a professional technician. Do not attempt to repair this monitor by yourself, as electrical shock may occur when opening the back cover or accessing internal components.
13. If any of the following conditions occurs, turn off power and contact a repair service provider:
    1) the power cord is damaged or worn;
    2) liquid has gotten into the monitor, or the monitor has experienced immersion or wetting;
    3) the monitor has fallen;
    4) the monitor's performance shows obvious changes;
    5) the monitor fails to work normally when correct procedures are followed. In that case, please make any adjustments in accordance with instructions supplied with the monitor; do not attempt any changes to established procedures, as further damage may occur, making successful repair of the monitor more difficult.

14. In case parts need to be replaced, you must use identical parts or those supplied by our certified manufacturers. Any other parts used without our authorization may result in electrical shock or fire risk.

Handing and Placing methods

Correct methods	Incorrect methods
Only touch the metal frame of the LCD panel or the front cover of the monitor, DO not touch the surface of the POL	Surface of the LCD panel is pressed by fingers and that may cause”mura”
	
Take out the monitor with cushions	Taking out the monitor by grasping the LCD panel, that May cause”mura”
	
Place the monitor on a clean and soft foam pad	Placing the monitor on a foreign objects, that could scratch The surface of the "Panel" or cause "mura"
	
	The panel is placed facedown the lap,that may cause "mura"
	

2. Specification

Instruction

FEATURES		Q191wb-1
TFTLCD PANEL	Size	19” wide
	Luminance (Typ, cd/㎡)	270 cd/㎡
	Contrast Ratio (Typ)	650:1
	Colors (6 bit + 2 bit FRC)	16.2 M colors
	Response Time (Typ)	5 ms
	Viewing Angle (H/V)	170 ° / 160 °
	Recommend resolution	1440 x 900@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)	38W(max) / 33W(typ)
	Active Off Mode (Max)	2W
Audio	Amplifier / Speaker	No
Ergonomics	Tilt (20 ° **to** -5 °)	Yes
	Swivel	No
	Pivot	No
	Height Adjust	No
OSD Control	[MENU] [◀] [⏻] [▶] [OK]	Yes
Dimension	Physical (W x H x D mm)	449.8 x 368.2 x 169 (mm)
	Package (W x H x D mm)	524 x 448 x 161 (mm)
Weight	Physical (Net kg/lb)	4.37kg (9.9lb)
	Package (Gross Kg/lb)	5.89kg (13.7lb)
Operating Condition	Temperature (℉/℃)	41℉-95℉/+0℃-+40℃
	Humidity (%)	20 % - 80 %
Storage Condition	Temperature (℉/℃)	-4℉-131℉/-20℃-55℃
	Humidity (%)	20 % - 85 %
Regulation	CB / TCO03 / UL/CUL / FCC(include ICES 003) / Argentina-IRAM / Energy Star only test report /BSMI / PSB / C-Tick / CCC	

Product definition and specification

Region	VSA (M)	VSAP (P)	VSE (E)	VSCN (G)
Product Name	Q191wb-1			
Model Number	VS11584			
OSD Languages	English, French, German, Italian, Spanish, Traditional Chinese, Simplified Chinese			
TFT LCD Panel and Model #	Vendor : CMO, Model # : M190A1-L02			
Scalar	Model # : Realtek RTD 2533V			
Input Signal	Analog			
Sync Compatibility	Separate			
Audio	No			
Adapter	No			
Power Cable	Refer to Appendix D			
Analog Cable (1.8 m, color : black), with PC 2001 and Hot Plug Detect &DDC	**YES**			
Audio Cable (1.8m, Color: black) with PC 2001	**No**			
DVI Cable(1.8m, color: black) with PC 2001	**No**	**No**	**No**	**No**
ViewSonic CD Wizard	No			
ViewSonic Quick Start Guide	English, French, German, Italian, Spanish, Traditional Chinese, Simplified Chinese			
Screen Protector Mylar	**YES**	**YES**	**YES**	**YES**
Warranty Sticker	NO	NO	NO	**YES**
Warranty Card	NO	NO	NO	**YES**
Carton Sticker	NO	NO	NO	**YES**
PE bag of Carton	NO	NO	NO	**NO**

GENERAL specification

Test Resolution & Frequency	1440 x 900 @ 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
Digital Input Connector	N/A
Default Input Connector	Defaults to the first detected input
Video Cable Strain Relief	Equal to twice the weight of the monitor for five minutes
Video Cable Connector DB-15 Pin out	Compliant DDC 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	TTL
DDC 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 864, 1152 x 870, 1280 x 960, 1280 x 1024, 1440 x 900 * The image vertical size might not be full screen. But the image vertical position should be at the center.
Exclusions	Not compatible with interlaced video

OWER SUPPLY

Power Supply (Adapter)	Part Number: PI-SB02
Input Voltage Range	90 to 264 VAC
Input Frequency Range	47 to 63 Hertz
Short Circuit Protection	Output can be shorted without damage
Over Current Protection	5 A typical at 5 VDC
Leakage Current	1.0 mA (Max) at 254VAC / 60Hz
Efficiency	80 % typical at 100VAC @60HZ
Fuse	Internal and not user replaceable
Power Dissipation	33 Watts
Max Input AC Current	1.0 Arms @ 90VAC, 0.8 Arms @180VAC
Inrush Current (Cold Start)	30 A @ 90 VAC, 60 A(max) @ 264 VAC
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 EN61000-4-4 ±2KV transient test with no damage
Power Supply Line Surge Immunity	Shall be able to withstand ±2KV (L-L) and ±2.3KV (L-PE) 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 defined to be in compliance with ISO 7779 (DIN EN27779:1991) Noise measurements of machines acoustics. Power Switch noise shall not be considered
Power Saving Operation(Method)	VESA DPMS Signaling
Power Consumption	ON Mode < 38W (max) / 33W (typ) ACTIVE OFF < 1 W
Recovery Time	ON Mode = N/A, ACTIVE OFF < 5 sec

ELECTRICAL REQUIREMENT

Horizontal / Vertical Frequency

Horizontal Frequency	30 – 82 kHz
Vertical Refresh Rate	56-75Hz.
Maximum Pixel Clock	135 MHz (EDID file is 140MHz)
Sync Polarity	Independent of sync polarity.

Timing Table

Item	Timing	Analog	Digital
1	640 x 350 @ 70Hz, 31.5kHz	Yes	No
2	640 x 400 @ 60Hz, 31.5kHz	Yes*	No
3	640 x 400 @ 70Hz, 31.5kHz(OSD show:720X400@70Hz)	Yes	No
4	640 x 480 @ 60Hz, 31.5kHz	Yes	No
5	640 x 480 @ 67Hz, 35.0kHz	Yes	No
6	640 x 480 @ 72Hz, 37.9kHz	Yes	No
7	640 x 480 @ 75Hz, 37.5kHz	Yes	No
8	720 x 400 @ 70Hz, 31.5kHz	Yes	No
9	800 x 600 @ 56Hz, 35.1kHz	Yes	No
10	800 x 600 @ 60Hz, 37.9kHz	Yes	No
11	800 x 600 @ 75Hz, 46.9kHz	Yes	No
12	800 x 600 @ 72Hz, 48.1kHz	Yes	No
13	832 x 624 @ 75Hz, 49.7kHz	Yes	No
14	1024 x 768 @ 60Hz, 48.4kHz	Yes	No
15	1024 x 768 @ 70Hz, 56.5kHz	Yes	No
16	1024 x 768 @ 75Hz, 60.0kHz	Yes	No
17	1152 x 870 @ 75Hz	Yes	No
18	1152 x 864 @ 75Hz, 67.5kHz	Yes	No
19	1280 x 1024 @ 60Hz, 63.4kHz	Yes	No
20	1280 x 1024 @ 75Hz, 79.97kHz	Yes	No

21	1280 x 960 @ 60Hz, 60kHz	Yes	No
22	1440 x 900 @ 60Hz, 55.96kHz	Yes	No
23	1440 x 900 @ 75Hz	Yes	No
*The image vertical size might not be full screen.			

Primary Presets

1440 x 900 @ 60Hz

User Presets

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

Changing Modes

- Under DOS mode (640 x 350, 720 x 400 & 640 x 400), there is no “Auto Adjust” feature.
- The monitor needs to do “Auto Adjust” the first time a new mode is detected but except the DOS mode 640 x 350, 720 x 400 & 640 x 400.(see section “0-Touch™ Function Actions”)

IMAGE PERFORMANCE

Factory Defaults

Item	Defaults	Item	Defaults
Contrast	70%	Scaling	Full Screen
Brightness	100%	OSD H. Position	50%
Volume	No	OSD V. Position	50%
Color Temperature	6500K	OSD Time Out	15 Sec

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) X 100% = 87% ± 5%

Display Size

Horizontal Display Size, Primary Preset	FULL SCREEN
Vertical Display Size, Primary Preset	FULL SCREEN

Saturation

Contrast = Default	NO VISIBLE SATURATION

Brightness = Default Test pattern = 32-gray	
Contrast = 100% Brightness = 100% Test pattern = 16 gray	2 LEVEL SATURATION

Preset Color Temperatures

Preset 1 9300K	CT range 8500 ~ 10250
Preset 2 6500K (Primary)	CT range 6100 ~ 6950
Preset 3 5400K	CT range 6000 ~ 4935
Preset Color Temperature Adjustability	Each color preset shall be adjustable. Red, Green, and Blue shall be individually controlled.

Video Cards Compatibility

Peaking Performance: Peaking is not adjustable

Raster Artifacts

- Video Artifacts : No visible streaking, sag, or smearing artifacts when driven by the specified video cards in the primary mode and after user adjustment to best condition
- Power Supply, and Grounding Artifacts : No visible artifacts in any specified video mode within the horizontal or vertical frequency range of the monitor
- Temperature Drift : Image shall not drift or lose fine-tune adjustment

MECHANICAL

Dimension (Desktop)

Width	449.8 mm
Height	368.32 mm
Depth	168.61 mm
Monitor Weight	4.37 Kg

*Refer to Figure 1

Dimension (Head only)

Width	449.8 mm
Height	269.7 mm
Depth	57 mm

Ergonomics

Tilt Up	20 °±2°
Tilt Down	5°±2°

VIDEO COMMUNICATIONS

EDID Standard and Structure

EDID File Format	VESA's EDID Standard Version #3, Revision #0, EDID Structure Version #1, Revision #3.
EDID VENDOR NAME	VSC: Byte 8 – 0x, Byte 9 – 0x.
EDID PRODUCT ID	Byte 10 – 1F , Byte 11 – 4E
EDID File	Shall be approved by VSC prior to MP.

CODING ASSIGNMENT

Product Name	ViewSonic Q191wb
Model NO	VS11584
S/N Coding – ID Label and Small S/N Sticker (Code '128' format)	PPPYYWWSxxxx where PPP = Regional Product ID Code YY= Last 2 digits of manufacturing year WW = Manufacturing week S = control code xxxx = Sequence number S = 0 to 1 CMO M190A1-L02 with RTD 2533V S = 2 to 9 back up
Regional Product ID Code	ID Code: QH0
UPC Coding (Code '39' format)	UPC Code: 766907 24551 6
FCC ID	Self Certification

RELIABILITY

Reliability test

Follow DDL's reliability test item, but drop test / vibration test have to follow VS's request

MTBF

Required MTBF	100,000 hours by the most current revision of MIL Handbook 217 , excluding the backlight. There is no guarantee for 100,000 hours warranty
Thermal Test Plan and Procedures	Shall be submitted for ViewSonic review and approval prior to DVT
Thermal Test Results	Shall be submitted for ViewSonic review and approval
Life Test Plan and Procedures	Shall be submitted for ViewSonic review and approval prior to DVT
Life Test Duration	Shall be based on a minimum of 100,000 actual operating hours, excluding the backlight. There is no guarantee for 100,000 hours warranty

Life Test Samples	Life Test shall be conducted on a minimum of 25 units
Life Test Failures	Failed units may be repaired and used for further Life Test. Failures shall be noted in the test report
Life Test Sample ECN/ECO Upgrades	Units under test may be upgraded against an approved ECN/ECO. Hours of test after the upgrade shall be noted in the test report. Hours of test before the upgrade shall not be used in calculating total operating hours
Preliminary Life Test Results	Preliminary Life Test Results for DVT level product shall be submitted for ViewSonic review and approval prior to Mass Production Release. The preliminary report shall be based on a minimum of 30,000 hours
Life Test Results	Life Test Results for DVT level product shall be submitted for ViewSonic review and approval no later than 90 days after Mass Production Release

MASS PRODUCTION RELEASE

- Mass Production Approval : Mass Production shall not begin until ViewSonic has issued an MP Release
- Component Approvals : All exterior plastic components, screen printed components, labels, shipping cartons, protective foam, and printed materials require approval by ViewSonic prior to Mass Production Release

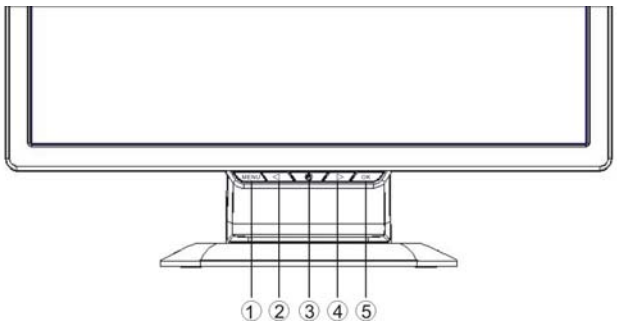
TFT LCD PANEL

Panel Characteristics:

Model number	M190A1-L02	
Type	TN TYPE WITH TTL INTERFACE	
Active Size	410.4MM(H) X 256.5MM(V)	
Pixel Arrangement	RGB VERTICAL STRIPE	
Pixel Pitch	0.285 MM(V) X 0.285MM(H)	
Glass Treatment	ANTI GLARE (HARD COATING 3H)	
# of Backlights	4 CCFL DIRECT LIGHT	
Backlight Life	50,000 HOURS (MIN)	
Luminance (Center) – Condition: CT = 6500K, Contrast = Max, Brightness = Max	270 CD/㎡ (TYP AFTER 15 MINUTE WARM UP) 230 CD/㎡ (MIN AFTER 15 MINUTE WARM UP)	
Brightness Uniformity (13 Points)	u = 1.3 (TYP), 1.5 (MAX). u = MIN LUMINANCE IN 13 POINTS / MAX LUMINANCE IN 13 POINTS	
Contrast Ratio	650:1 (TYP), 500 (MIN)	
Color Depth	16.2 MILLION COLORS (6 BIT + 2 BIT FRC)	
Viewing Angle (Horizontal)	@ CR>10 TYPICAL: 170 MINIMUM: 150	@ CR>5 TYPICAL: TBD MINIMUM: TBD
Viewing Angle (Vertical)	@ CR>10 Typical: 160 Minimum: 140	@ CR>5 Typical: TBD Minimum: TBD
Response Time 10%-90% @ Ta=25°C	5ms (typ) 15 ms (max)	
Panel Defects	Please see Panel Quality Specifications.	

3. Front Panel Function Control Description

3-1 OSD Controls



	Buttons	Functions
❶	**MENU**	To have the main menu Enters the option or the sub- menu
❷	◀	Anti-clockwise movement in the menu level decreasing
❸	**Power Switch**	Power ON/OFF the monitor Green – Normal operation Amber – Power Management
❹	▶	clockwise movement in the menu level increasing
❺	**OK**	Automatically adjust clock phase image position

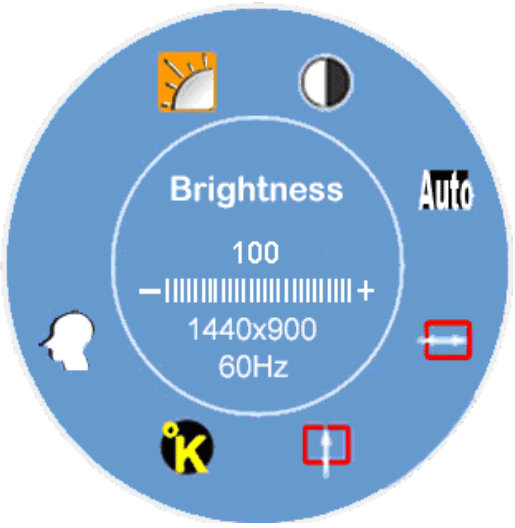
3-2 OSD Operating Procedures

You may use the five buttons on the front bezel to adjust the OSD.

1. Press **Power** button to turn on the LCD monitor.
2. Press **MENU** button to pop up the main OSD menu.
3. Press ◀ or ▶ button to select main menu items counterclockwise or clockwise
4. Press **MENU** button to enter the advanced setup menu or enter the adjustment of the items used often
5. Press ◀ or ▶ button to select advanced setup menu items or adjust directly the selected item on the main OSD menu .
6. Press **MENU** button to enter the state of user setting if under the advanced setup menu condition.
7. Press◀ or ▶ button to select from the existing items or adjust the intensity.
8. Press **OK** button when finished adjusting and save the user setting to exit the main OSD menu or return to the main OSD menu from the advanced setup OSD menu.

3-3 Main OSD menu adjustment

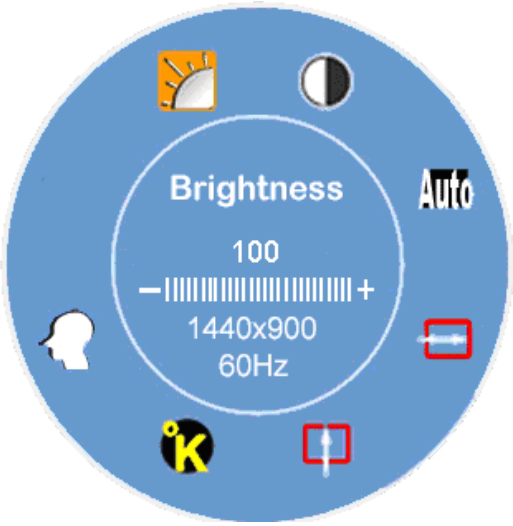
Press MENU button to enter the main OSD menu shown below. It includes such items as Brightness, Contrast, Auto Config and so on used often. In addition, advanced setup is also included.



The selected item is indicated by highlighted orange background. When the ◄ or ► button is pressed, the selection moves counterclockwise or clockwise by one item. Press **MENU** button to enter the state of adjustment. When changing the item intensity, use ◄ or ► buttons to make the adjustments. Press **OK** button to exit OSD menu.

Brightness

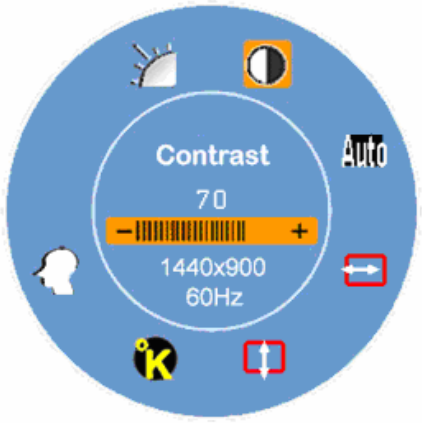
Press **MENU** button to pop up the main OSD menu and press **MENU** button again to enter the brightness adjustment state to adjust the brightness to the desired value by pressing ◄ or ► button. The adjustable range is from 0 to 100, and the default is100. Press **OK** button to exit at any time.



Contrast

Press **OK** button to exit brightness adjustment state or press **MENU** button to pop up the main OSD menu when there is no OSD menu displaying .

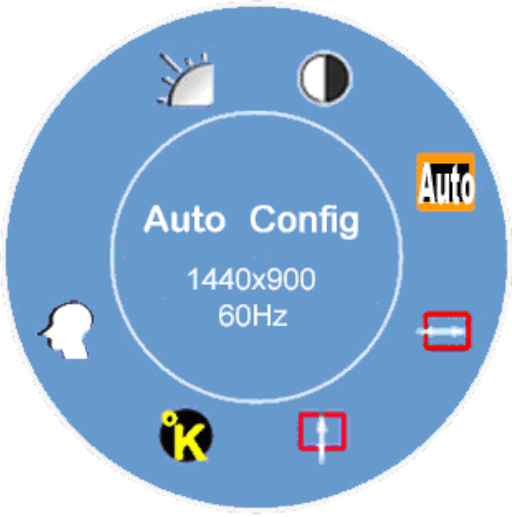
Then press ◀ or ▶ button to select the Contrast item. Press **MENU** button to enter contrast adjustment state to adjust the contrast to the desired value by pressing ◀ or ▶ button. The adjustable range is from 0 to 100, and the default is 70. Press **OK** button to exit at any time.



Auto Setup

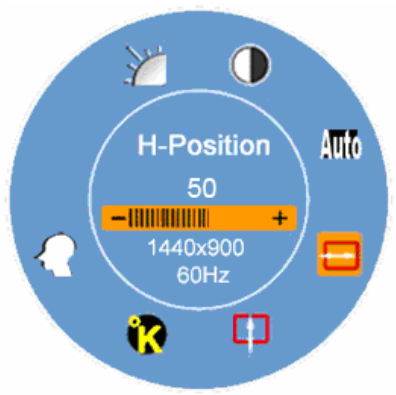
Press **OK** button to exit contrast adjustment or press **MENU** button to pop up the main OSD menu when there is no OSD menu displaying .

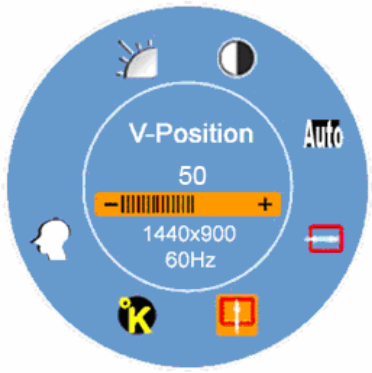
Then press ◀ or ▶ button to select the Auto Config item. Next press **MENU** button to adjust image position, Clock, Phase, H-Position and V-Position settings automatically.



Horizontal / Vertical Position

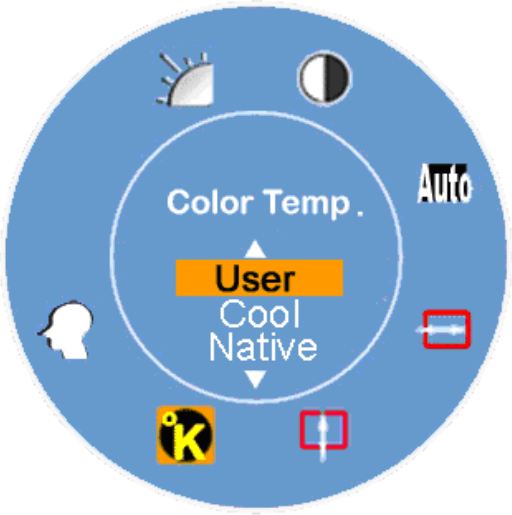
Press MENU button to pop up the main OSD menu when there is no OSD menu displaying. Then press ◀ or ▶ button to select the horizontal (or vertical) position adjustment item. Next press MENU button to enter the horizontal (or Vertical) position adjustment state. Press ◀ or ▶ button to move the whole image rightwards or leftwards. Press OK button to exit at any time.

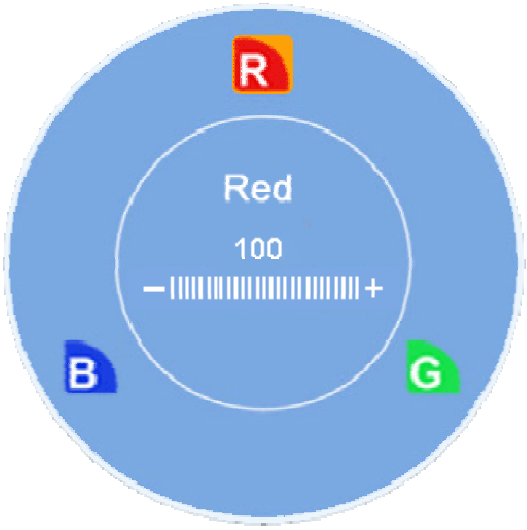




Color Temperature

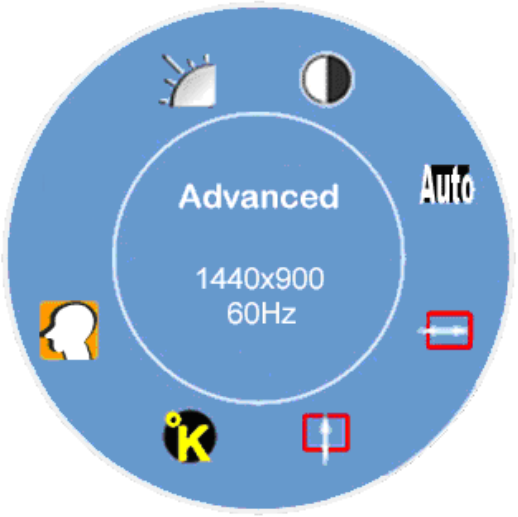
Press **MENU** button to pop up the main OSD menu when there is no OSD menu displaying . Then press ◄ or ► button to select the color temperature adjustment item. Next press **MENU** button to make it in active state. Press ◄ or ► button to select the desired color temperature. Select User to enter user mode to adjust the color temperature to the state what you like. Press **OK** button to exit at any time.





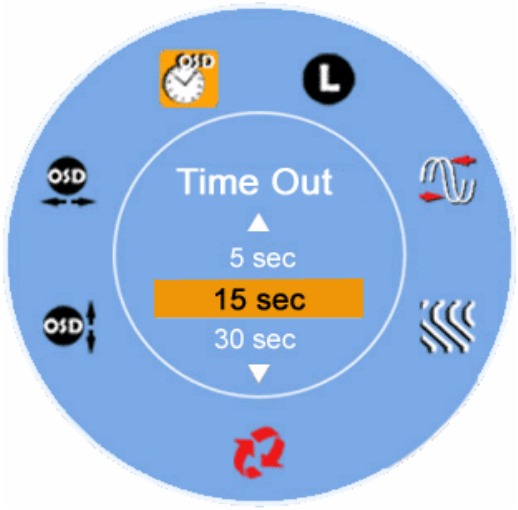
Advanced Setup

Press **MENU** button to pop up the main OSD menu when there is no OSD menu displaying . Then press ◀ or ▶ button to select the advanced setup item. Press **MENU** button to enter the advanced setup menu as below on the right. Press **OK** button to return to the main OSD menu at any time.



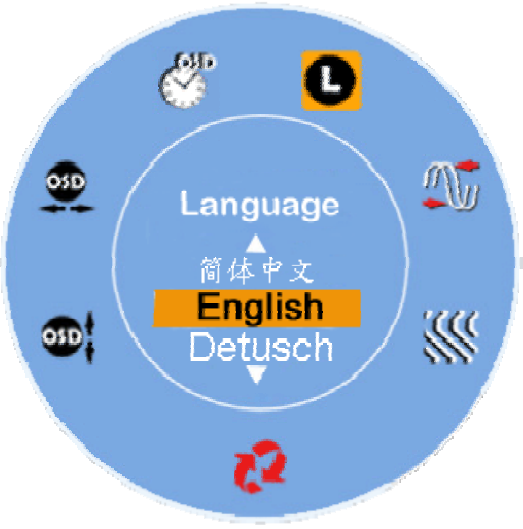
OSD Timeout

Under the state of advanced setup menu, press MENU button to enter OSD timeout adjustment state. Three modes including 5 seconds 、15 seconds and 30 seconds have been supplied for our selection, and we may press ◀ or ▶ button to choose one of them to determine the time that the OSD menu displays on the screen. Press **OK** button to return to the main OSD menu at any time.



Language

Under the state of advanced setup menu, press ◄ or ► button to select the Language item. Then press MENU button to enter the language selection state .Next press ◄ or ► to select the desired language from the 7 languages. Press **OK** button to return to the main OSD menu at any time.

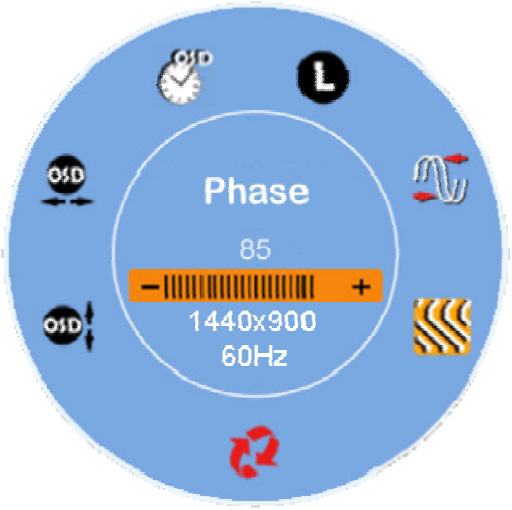


Clock

Under the state of advanced setup menu, press ◄ or ► button to select the Clock item. Then press MENU button to enter the clock adjustment state. Press ◄ or ► button to adjust the PLL parameters to control over the synchronization of the PLL clock . The adjustable range is from 0 to 100, and the default is 50. Press **OK** button to return to the main OSD menu at any time.

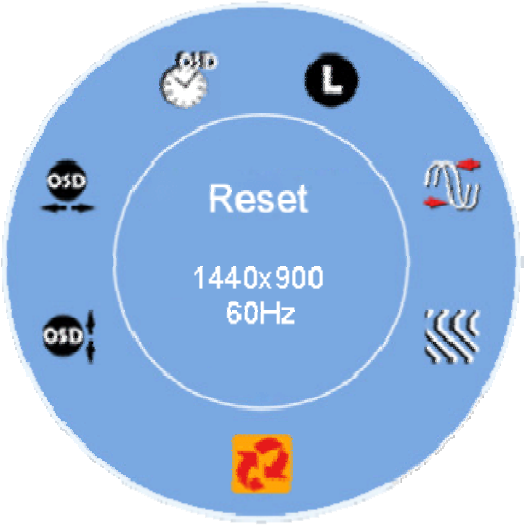
Phase

Under the state of advanced setup menu, press◀ or ▶ button to select the Phase item. Then press MENU button to enter the phase adjustment state. Press◀ or ▶ button to adjust the PLL parameters to control over the synchronization of the PLL phase. The adjustable range is from 0 to 100.The difference from clock is that the value will change when the pattern of the input signal changes. Press **OK** button to return to the main OSD menu at any time.



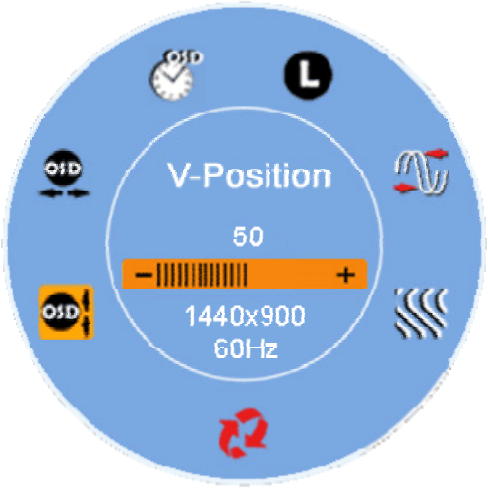
Reset

Under the state of advanced setup menu, press ◀ or ▶ button to select the reset item. Then press MENU button to run reset function to make all user settings return to the factory preset value.



OSD Vertical Position

Under the state of advanced setup menu, press ◄ or ► button to select the OSD vertical position adjustment item. Then press MENU button to enter the OSD vertical position adjustment state . Press ◄ or ► button to move the whole OSD menu upwards or downwards to the desired position . The adjustable range is from 0 to 100 , and the default is 50. Press OK button to return to the main OSD menu at any time.



OSD Horizontal Position

Under the state of advanced setup menu, press ◄ or ► button to select the OSD horizontal position adjustment item. Then press **MENU** button to enter the OSD horizontal position adjustment state. Press ◄ or ► button to move the whole OSD menu rightwards◄ or ►leftwards to the desired position . The adjustable range is from 0 to 100 , and the default is 50. Press OK button to return to the main OSD menu at any time.

Hot Key Control

Auto Config

Press **OK** button to pop up the auto config menu as below to automatically adjust image position 、CLOCK、PHASE、 H-POSITION and V-POSITION settings when there is no menu Displaying.

AUDIO INTERFACE (SPEAKER SPECIFICATION) --- No support

Line input connection	No
Line input signal	No
Line input impedance	No
Maximum power output (Electric)	No
Signal to Noise Ratio	No
Frequency response	No
Distortion	No
Vibration	No
Screen image	No
Connector PC99 requirement Audio in	No
Cable type / length	No
Audio DPMS	No

4. Circuit Description

A. AC-DC CONVERTER

The power supply with a high-integrated green-mode PWM controller provides several features to enhance the performance of power flyback converters.

U801 is a PWM controller and provides many protection functions.

U802 is a photo couple to transfer the feedback signal from the second side which U803 detected both of the output DC voltage on 5V and 24V.

Z802 detected the working voltage on U801 and Q802 would pull down the voltage on U801 pin5 to shut down U801 if feedback loop was failed.

R828 would be a dynamic load which was active while backlight was turned off and system still working on, this kept 24V output voltage under 32V to protect the panel. After system went to power saving mode, the R828 would no loaded. This was detected by Z803 active the R828 to load or not.

B，Scaling Controller

Overview

Realtek RTD2533V series products are all-in-one LCD monitor controllers support up to SXGA/WXGA+(optional), and integrate Realtek high performance ADC, TMDS Rx(optional), scaling engine, OSD engine, LVDS TX, RSDS TX and so on. Moreover, all products are pin compatible in low pin count package to save cost and make the design easier

General

- Embedded dual DDC support DDC1, DDC2B, DDC/CI
- Zoom scaling up and down
- Support input format up to 1680/1440-pixel width(optional)
- No external memory required.
- Require only one crystal to generate all timing
- Embedded reset control output
- Embedded crystal output to MICROP
- 3 channels 8 bits PWM output, and selectable PWM clock frequency.

Pin Description

(I/O Legend: A = Analog, I = Input, O = Output, P = Power, G = Ground)

■ **ADC: 15 pins**

Name	I/O	Pin No	Description	Note
ADC_GND	AG	22	ADC ground	
ADC_REFIO	AP	28	ADC band-gap voltage de-coupling	1.20V
ADC_VDD	AP	21	Analog power	(3.3V)
BLUE+	AI	31	Analog input from BLUE channel	
BLUE-	AI	30	Analog input ground from BLUE channel	
ADC_GND	AG	37	ADC ground	
SOG/ADC_TEST	AIO	34	SOG in/ADC test pin	

GREEN+	AI	33	Analog input from GREEN channel	
GREEN-	AI	32	Analog input ground from GREEN channel	
ADCB_VDD	AP	38	Analog power	(3.3V)
RED+	AI	36	Analog input from RED channel	
RED-	AI	35	Analog input ground from RED channel	
ADC_GND	AG	39	Analog ground	
ADC_GND	AG	40	Analog ground	
ADC_VDD	AP	41	Analog power	(3.3V)
AHS	AI	39	Analog HS input	**(10)**, (4), (5)
AVS	AI	40	Analog VS input	(2), (4), (5)

■ PLL: 8 pins

Name	I/O	Pin No	Description	Note
XO	AI	127	Reference clock output	
XI	AO	128	Reference clock input	
DPLL_GND	AG	126	Ground for digital PLL	
DPLL_VDD	AP	125	Power for digital PLL	(3.3V)
APLL_VDD	AP	2	Power for multi-phase PLL	(3.3V)
PLL_TEST1	AIO	3	Test Pin 1 / IRQ#	
PLL_TEST2	AIO	4	Test Pin 2/Power-on-latch for crystal out Frequency	
APLL_GND	AG	1	Ground for multi-phase PLL	

■ Control Interface: 7 pins

Name	I/O	Pin No	Description	Note
SDIO [0]/ TCON 13	IO	52	Serial control I/F data in / Parallel port data [0]	(2), (3), / 2mA
SDIO [1] / TCON 7	IO	53	Parallel port data [1] / TCON [4] / TTL BBLU [0]	(1), (2), (3), / 2mA
SDIO [2] / TCON 11	IO	54	Parallel port data [2] / TCON [3] / TTL BBLU [1]	(1), (2), (3), / 2mA
SDIO [3] / TCON 0	IO	55	Parallel port data [1] / TCON [4] / PWM2	(1), (2), (3), / 2mA
SCLK/ TCON3	I	57	Serial control I/F clock	(2), (3), (5)
SCSB/ TCON12	I	56	Serial control I/F chip select	(2), (3), (5)
RESET	O	123	RESET output for Micron	(2), (5), (6) / 2mA

■ Display & TCON/VIDEO-8 Port: 54 pins

■:LVDS+RSDS+TTLO ■:RSDS+TTLO ■:RSDS+TTLIO■:TTLO ■:TTLIO

Pin NO.	6-bits Dual RSDS	6 bits Single RSDS	8/6 bits Dual/Single LVDS	8 bits Dual/Single TTL	6 bits Dual/Single TTL	Note
51	S[3] / TCON[2] / PWM2	S[3] / TCON[2] / PWM2	S[3] / TCON[2] / PWM2	S[3] / TCON[2] / PWM2	S[3] / TCON[2] / PWM2	(1), (2), (3)/ 2mA

52	S[2] / TCON[3]	S[2] / TCON[3]	S[2] / TCON[3]	S[2] /BBLU[1] / TCON[3]	S[2] / TCON[3]	(1), (2), (3)/ 2mA
53	S[1] / TCON[4]	S[1] / TCON[4]	S[1] / TCON[4]	S[1]/ BBLU[0] / TCON[4]	S[1] / TCON[4]	(1), (2), (3)/ 2mA
55	PWM2 / COUT / TCON[13]	PWM2 / COUT / TCON[13]	PWM2 / COUT / TCON[13]	PWM2 / COUT / TCON[13]	PWM2 / COUT / TCON[13]	(1), (2), (3)/ 2mA
61	BB3P	BB3P	NC	BBLU [7]	BBLU [7]	
62	BB3N	BB3N	NC	BBLU [6]	BBLU [6]	
63	BB2P	BB2P	NC	BBLU [5]	BBLU [5]	
64	BB2N	BB2N	NC	BBLU [4]	BBLU [4]	
65	BB1P	BB1P	NC	BBLU [3]/T0	BBLU [3]	
66	BB1N	BB1N	NC	BBLU [2]/T1	BBLU [2]	
67	BCLKP	BCLKP	NC	BGRN [1]/T2	TCON [6]	
68	BCLKN	BCLKN	NC	BGRN [0]/T3	TCON [5]	
69	BG3P	BG3P	NC	BGRN [7]	BGRN [7]	
70	BG3N	BG3N	NC	BGRN [6]	BGRN [6]	
73	BG2P	BG2P	TODP	BGRN [5]/T4	BGRN [5]	
74	BG2N	BG2N	TODN	BGRN [4]/T5	BGRN [4]	
75	BG1P	BG1P	TOCLKP	BGRN [3]/T6	BGRN [3]	
76	BG1N	BG1N	TOCLKN	BGRN [2]/T7	BGRN [2]	
77	BR3P	BR3P	TOCP	BRED [7]/T8	BRED [7]	
78	BR3N	BR3N	TOCN	BRED [6]/T9	BRED [6]	
79	BR2P	BR2P	TOBP	BRED [5]/T10	BRED [5]	
80	BR2N	BR2N	TOBP	BRED [4]/T11	BRED [4]	
81	BR1P	BR1P	TOAP	BRED [3]/T12	BRED [3]	
82	BR1N	BR1N	TOAP	BRED [2]/T13	BRED [2]	
85	AB3P	NC	TEDP	ABLU [7]/T14	ABLU [7]	
86	AB3N	NC	TEDN	ABLU [6]/T15	ABLU [6]	
87	AB2P	NC	TECLKP	ABLU [5]/T16	ABLU [5]	
88	AB2N	NC	TECLKN	ABLU [4]/T17	ABLU [4]	
89	AB1P	NC	TECP	ABLU [3]/T18	ABLU [3]	
90	AB1N	NC	TECN	ABLU [2]/T19	ABLU [2]	
91	ACLKP	NC	TEBP	ABLU [1]/T20	TCON [1]	
92	ACLKN	NC	TEBN	ABLU [0]/T21	TCON [0]	
93	AG3P	NC	TEAP	AGRN [7]/T22	AGRN [7]	
94	AG3N	NC	TEAN	AGRN [6]/T23	AGRN [6]	
97	AG2P	TCON [11]	NC	AGRN [5]/T24	AGRN [5]	
98	AG2N	TCON [10]	NC	AGRN [4]/T25	AGRN [4]	
99	AG1P	TCON [9]	NC	AGRN [3]/T26	AGRN [3]	
100	AG1N	TCON [8]	NC	AGRN [2]/T27	AGRN [2]	

101	AR3P	TCON [7]	NC	ARED [7]/T28	ARED [7]	
102	AR3N	TCON [6]	NC	ARED [6]/T29	ARED [6]	
103	AR2P	TCON [5]	NC	ARED [5]/TH	ARED [5]	
104	AR2N	TCON [1]	NC	ARED [4]/TV	ARED [4]	
105	AR1P	TCON [0]	NC	ARED [3]/TE	ARED [3]	
106	AR1N	NC	NC	ARED [2]/TK	ARED [2]	
113	PWM2 / COUT / TCON[12]	PWM2 / COUT / TCON[12]	PWM2 / COUT / TCON[12]	ARED [1]	PWM2 / COUT / TCON[12]	(9)
114	TCON [11] /V[0]	V [0]	V [0]	ARED [0]	TCON [11]	(1), (7), (8)
115	TCON [10] /V[1]	V [1]	V [1]	BRED [1]	TCON [10]	(1), (7), (8)
116	TCON [9] / V[2]	V [2]	V [2]	BRED [0]	TCON [9]	(1), (7), (8)
117	TCON [8] / V[3]	V [3]	V [3]	AGRN [1]	TCON [8]	(1), (7), (8)
118	TCON [7] / V[4]	V [4]	V [4]	AGRN [0]	TCON [7]	(1), (7), (8)
119	TCON [6] / V[5]	V [5]	V [5]	DHS	DHS	(1), (7), (8)
122	TCON [5] / V[6]	V [6]	V [6]	DVS	DVS	(1), (7), (8)
123	TCON [1] / V[7]	V [7]	V [7]	DENA	DENA	(1), (7), (8)
124	TCON [0] / VCLK	VCLK	VCLK	DCLK / TCLK	DCLK / TCLK	(1), (7), (8)

■ TMDS: 18 pins

Name	I/O	Pin No	*Description*	Note
TMDS_TST/ PWM1	AIO	5	TMDS_TEST Pin / PWM1 / Power-on-latch for serial / parallel port	
TMDS_GND	G	10		
TMDS_VDD	P	7		(3.3V)
EXT_RES	A	6	Impedance Match Reference.	
TMDS_VDD	P	13		(3.3V)
RX2P	I	8	Differential Data Input	
RX2N	I	9	Differential Data Input	
TMDS_GND	G	16		
RX1P	I	11	Differential Data Input	
RX1N	I	12	Differential Data Input	
TMDS_VDD	P	13		(3.3V)
RX0P	I	14	Differential Data Input	
RX0N	I	15	Differential Data Input	
TMDS_GND	G	16		
RXCP	I	17	Differential Data Input	
RXCN	I	18	Differential Data Input	

■ PWM Interface: 3-2=1 pin (PWM1, PWM2 can be selected from 1 of 3 possible pins.)

Name	I/O	Pin No	Description	Note
PWM2 / TCON [2] / S [3]	O	49	PWM2 / TCON [2] / SDIO [3]	(1), (2), (3), (5), (8),
PWM2 / TCON [13] / COUT	O	55	PWM2 / TCON [13] / Crystal out	(2), (8), (9)
PWM2 / TCON [12] / COUT	O	113	PWM2 / TCON [12] / Crystal out	(2), (8), (9)
PWM1 / TMDS_TST	AIO	9	PWM1/ TMDS_TEST Pin / Power-on-latch for serial / parallel port	(2), (7), (8)
PWM1 / DDCSDA / TCON [1] / BBLU [0]	IO	47	PWM1 / DDC serial control I/F data input / output / TCON [4]	(1), (2), (3), (5), (8),
PWM1 / DDCSDA2 (HDCP) / TCON [7]	IO	125	PWM1 / DDC serial control I/F data input / output / TCON [7]	(1), (2), (3), (5), (8),
PWM0 / REFCLK	IO	112	PWM0 / (In / out) test pin for DCLK / Video8 even-odd signal	(2), (9)

■ DDC Channel: 4 pins

Name	I/O	Pin No	Description	Note
DDCSCL / TCON [0] / BBLU [1]	I	46	DDC serial control I/F clock / TCON [0] / TTL BBLU [1]	(2), (3), (5)
DDCSDA / TCON [1] / PWM1 / BBLU [0]	IO	47	DDC serial control I/F data input / output / TCON [1] / PWM1 / TTL BBLU [0]	(1), (2), (3), (5), (6), (8)/ 8mA /no slew
DDCSCL2 (HDCP) / TCON [5]	I	126	DDC serial control I/F clock / TCON [5]	(2), (3), (5)
DDCSDA2 (HDCP) / TCON [7] /PWM1	IO	125	DDC serial control I/F data input / output / TCON [7] / PWM1	(1), (2), (3), (5), (6), (8)/ 8mA /no slew

■ Power & Ground: 22 pins

Name	I/O	Pin No	Description
3.3V Power	P	59,108,72,83,95	VCCIO: 2
3.3V Ground	G	60,71,84,96,107	GNDIO: 2
1.8V Power	P	47,116	PVCC: 5
3.3V Ground	G	46,117	PGND: 5

Note: (1) TTL compatible CMOS Input (Vt=1.7V); VCC=3.3V;
(2) 5V tolerance pad;
(3) Internal 75K Ohms pull high resistor.
(4) Internal 75K Ohms pull low resistor.
(5) Schmitt trigger CMOS Input (Vt=1.4-~2.2V);
(6) Open-Drain, Output Drive low & Pull-high.
(7) Bi-directional input/output
(8) Programmable driving current (2~10mA)
(9) TTL output 5V & 3.3V
(10) 4V tolerance pad

C,RTD2120

The RTD2120micro-controller is an 8051 CPU core embedded device especially tailored for flat panel display applications. It includes an 8051 CPU core, 768-byte SRAM, 4 channels of 6-bit ADC, 3 external counters/timers, 6 channels of PWM DAC, VESA DDC interface, and a 64K-byte internal program Flash-ROM memory in 44-pin PLCC package

FEATURES

Features

1. Operating voltage range : 3.0V to 3.6V
2. 2.8051 core, CPU operating frequency up to 50MHz
3. 3.4 clocks per machine cycle
4. 256-byte internal RAM
5. 5.512-byte external data RAM, including 256-byte DDC RAM(128-byte x 2) and 256-byte general purpose RAM
6. 6.96K-byte flash memory, 64k for program and 32k for saving parameter
7. Two DDC ports Compliant with VESA DDC1/2B/2Bi/CI
8. Three channels of PWM DAC with programable frequency from 100K to 100Hz
9. Watchdog timer with programmable interval
10. Three 16-bit counters/timers (T0, T1, and T2)
11. One PLL to provide programmable operating frequency and clock output, 2 clock output ports
12. One full-duplex serial port
13. Six interrupt sources with 2 external interrupts
14. Four channels of 6-bit ADC
15. Hardware In System Programming(ISP) capability, no boot code required
16. Built-in Low voltage reset circuit Embedded 1.8V regulator Code protection
17. Available in 44-pin PLCC or 48-pin LQFP package

D. INVERTER

In order to drive the CCFLs embedded in the panel module, there is a push-pull inverter to convert by the controller. from input 24V up to hundreds of AC voltage output peak to peak.

The inverter is formed by symmetric in order to drive the separate lamp modules.

The input stage consists of a PWM controller, push-pull inverter, and switching MOSFET to convert DC input into AC output.

The output stage consists of a tuning capacitor, transformer, and push-pull MOSFET pair to boost AC output up to hundreds of voltage peak to peak.

And one resister is serial to lamp for output voltage feedback.

There are two signals which controls the inverter come from system to turn on the inverter and control brightness.

Logic “low” level which send to U901 is turn on the inverter.

BL-ADJ signal control brightness by DC level which was integral from PWM signal.

5. Adjustment Procedure

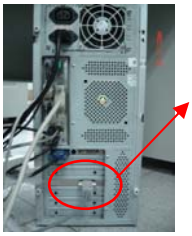
DDC Key In Procedure

Note:

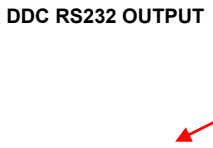
1. **After having assembled the monitor, please do the DDC Key In procedure.**
2. **If you find the DDC does not conform to the monitor, please do the DDC Key In again.**

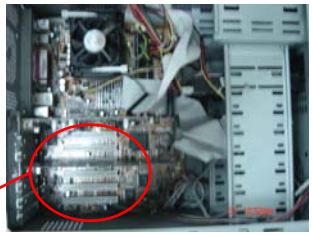
1.1 Equipment Needed

- **WM19E-AB Series Monitor**
- **RS232-VGA Cable*1**
- **RS232-DVI Cable*1**
- **AC POWER Cable*1**
- **TEST PC with Windows XP**
- **Display Data Channel (D8330 DDC Card) to plug PC_PCI _Slot**
- **DYNACOLOR DDC Tester System software**
- **Barcode Scanner *1**
- **AC POWER Source**
- **One additional monitor for Test System displaying**



PC





DDC CORD

Barcode Scanner

Monitor_WM19E-AB

RS232-VGA Cable

AC POWER Cable

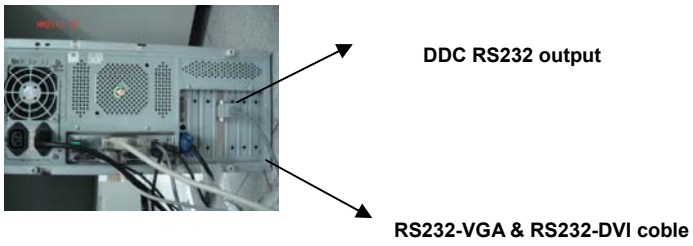
RS232-DVI Cable

DDC TESTER SOFT

Setup Procedure

1. **Open computer's box cover, plug D8330 CORD in PCI slot, close cover and connect AC power, Monitor, Barcode Scanner, Mouse, Keyboard with PC**
   - **1.1. Connect RS232-VGA cable to DDC RS232 OUT port of PC (if you do DDC Key In for D_SUB)**
   - **1.2. Connect RS232-DVI cable to DDC RS232 OUT port of PC (if you do DDC key In for D_DVI)**
2. **Turn on PC power, choose DDC Tester System application, run it**
3. **Connect AC power, RS232-VGAwith VG930 Monitor.**
4. **DDC Key In**

NOTE: Barcode Scanner and Keyboard can plug in Keyboard port of computer together

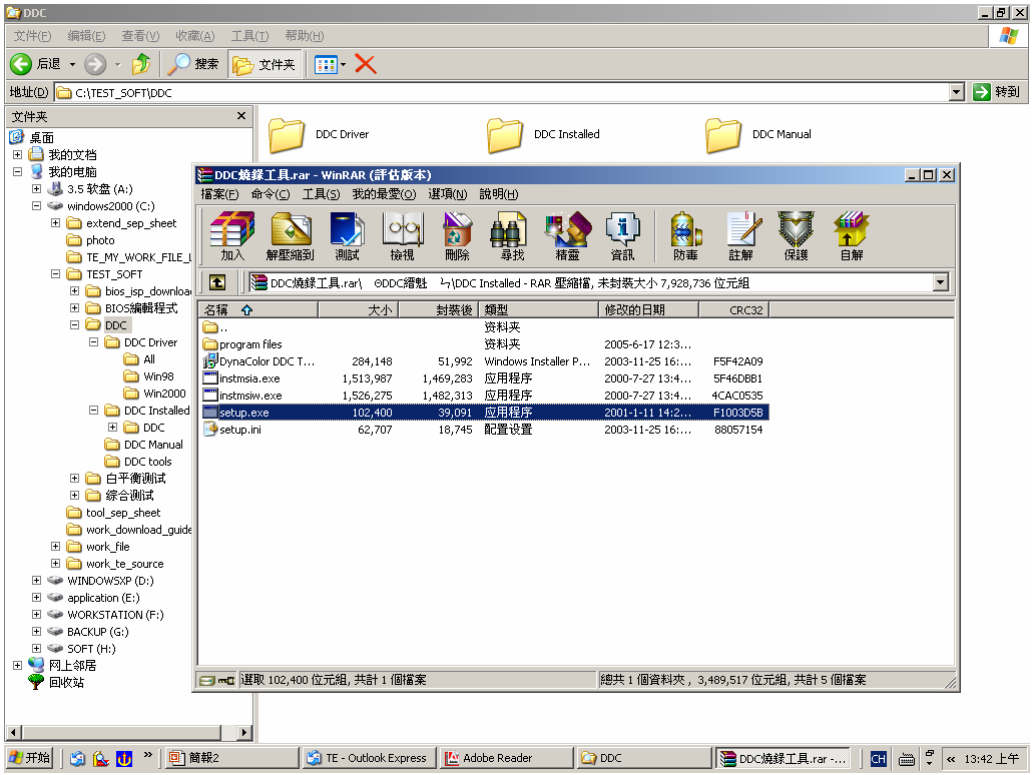


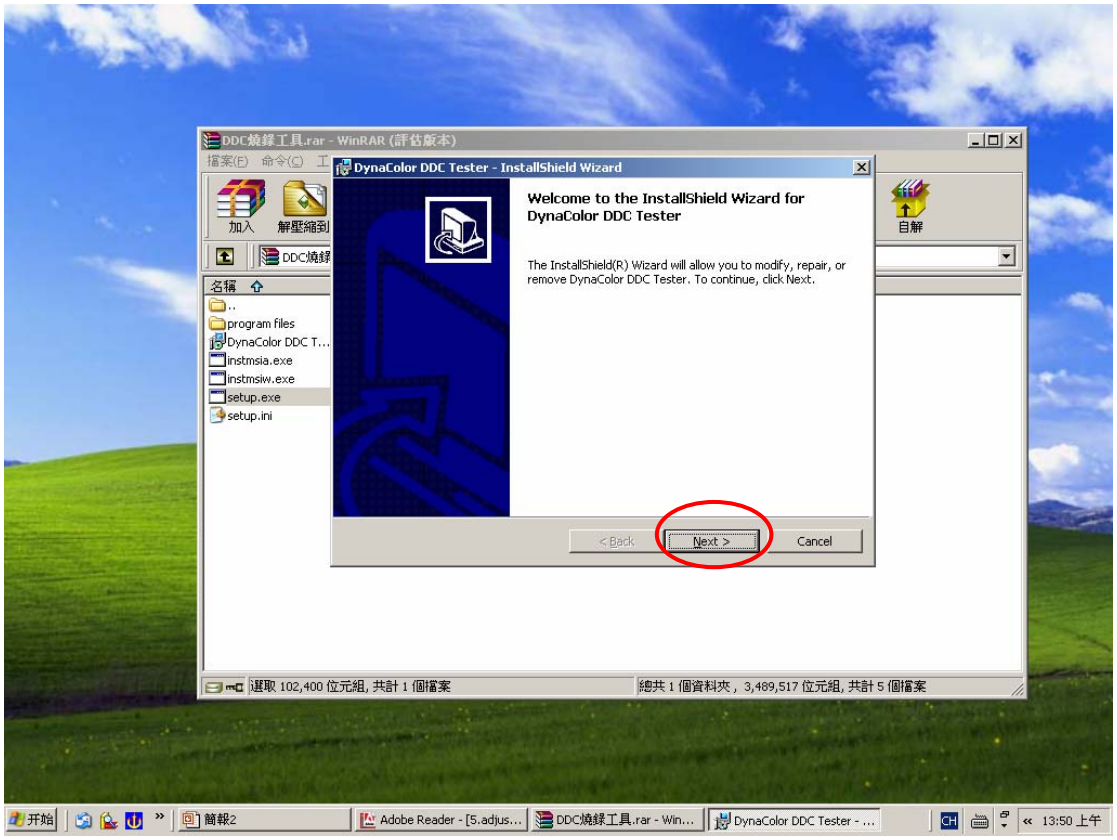
1.3 DDC TESTER SYSTEM SOFT SETUP(from disk file)

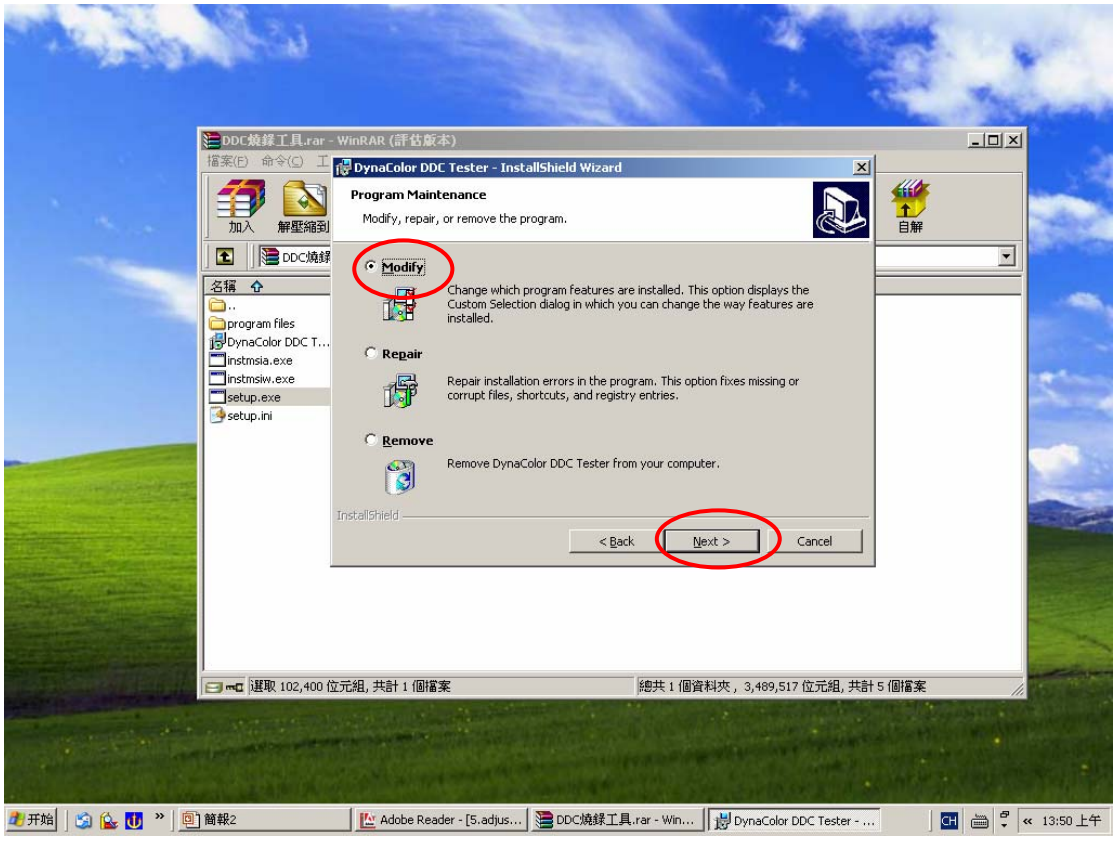
NOTE:

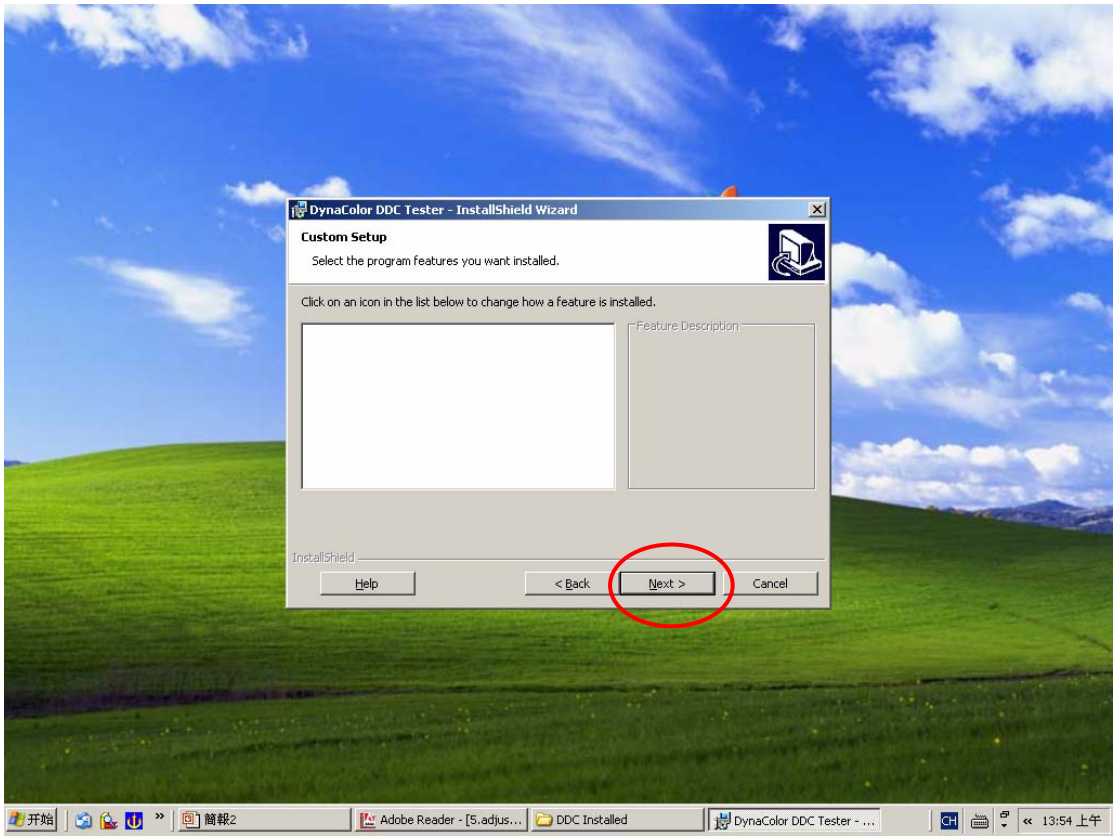
Before install DDC Tester System soft, please check that the D8330 CORD is plugged. Or the DDC Tester application couldn't be run.

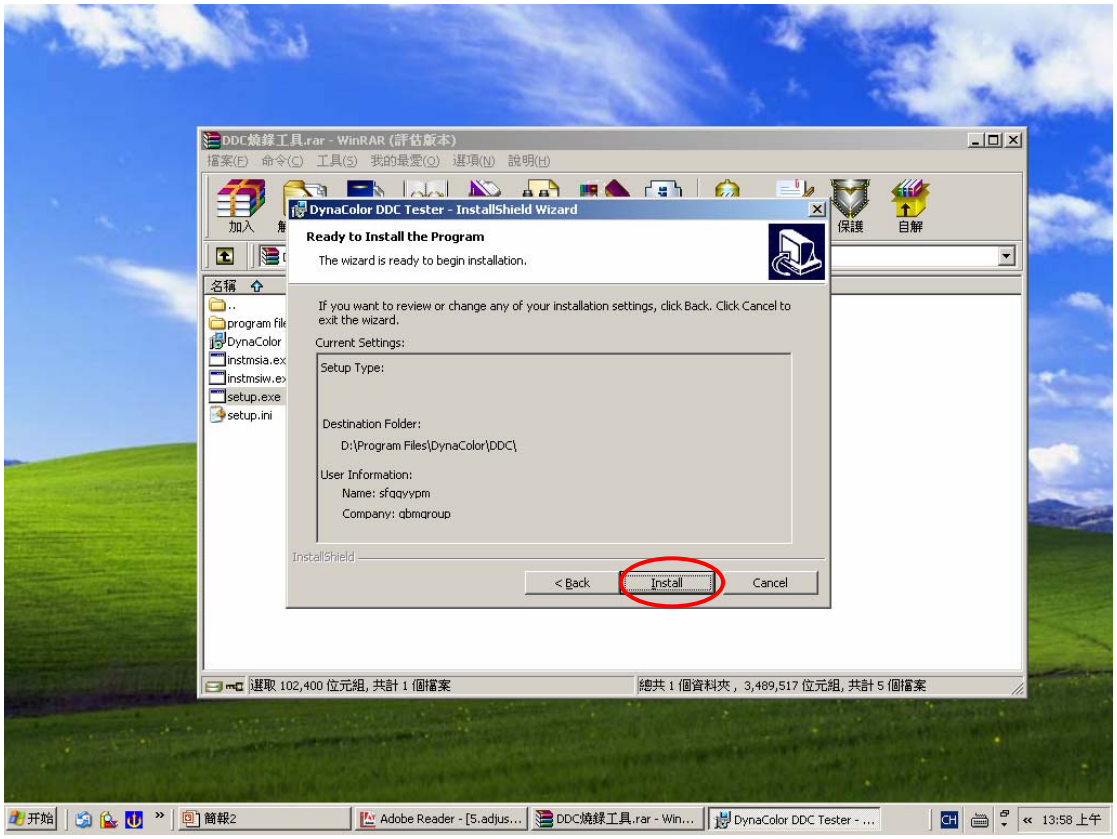
1.3.1 Install DDC Tester System by selecting and checking" setup.exe" icon. Press "YES" or "NEXT" Buttons until the installation is completed.

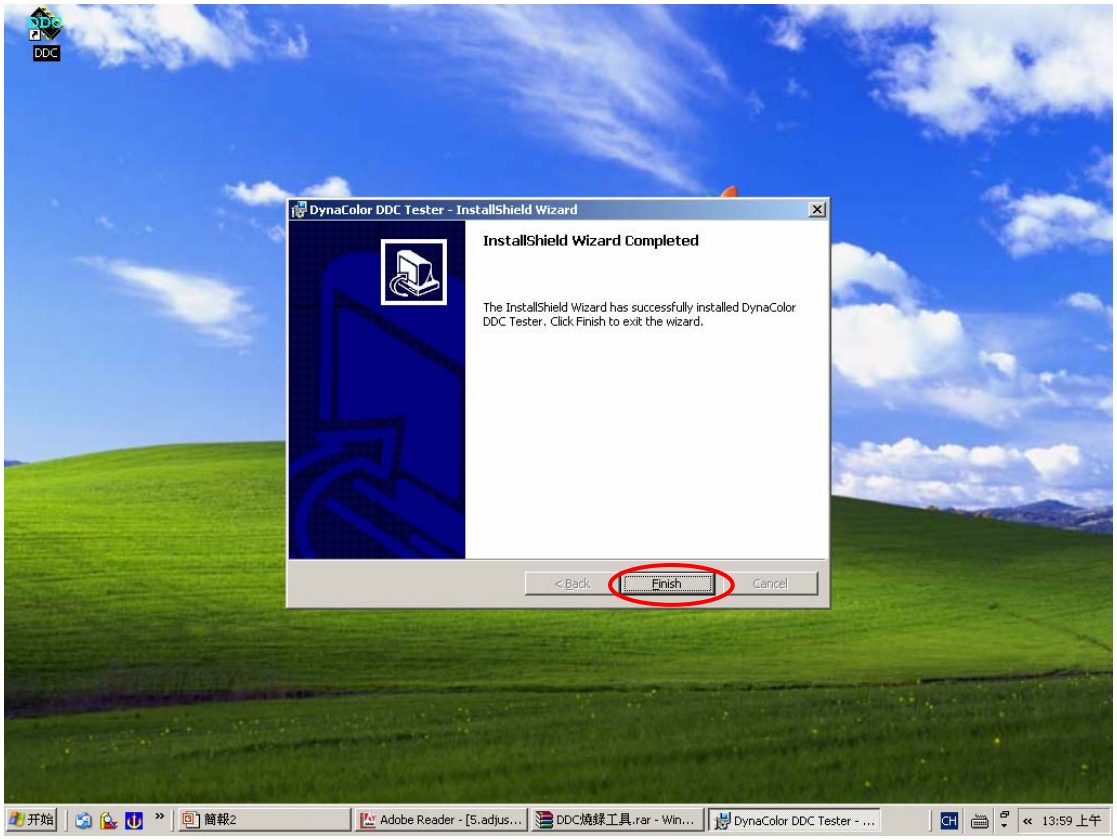



DDC燒錄工具.rar - WinRAR (評估版本)
DynaColor DDC Tester - InstallShield Wizard
Welcome to the InstallShield Wizard for DynaColor DDC Tester
The InstallShield(R) Wizard will allow you to modify, repair, or remove DynaColor DDC Tester. To continue, click Next.
< Back
Next >
Cancel


DDC燒錄工具.rar - WinRAR (評估版本)
DynaColor DDC Tester - InstallShield Wizard
Program Maintenance
Modify, repair, or remove the program.
Modify
Change which program features are installed. This option displays the Custom Selection dialog in which you can change the way features are installed.
Repair
Repair installation errors in the program. This option fixes missing or corrupt files, shortcuts, and registry entries.
Remove
Remove DynaColor DDC Tester from your computer.
InstallShield
< Back
Next >
Cancel

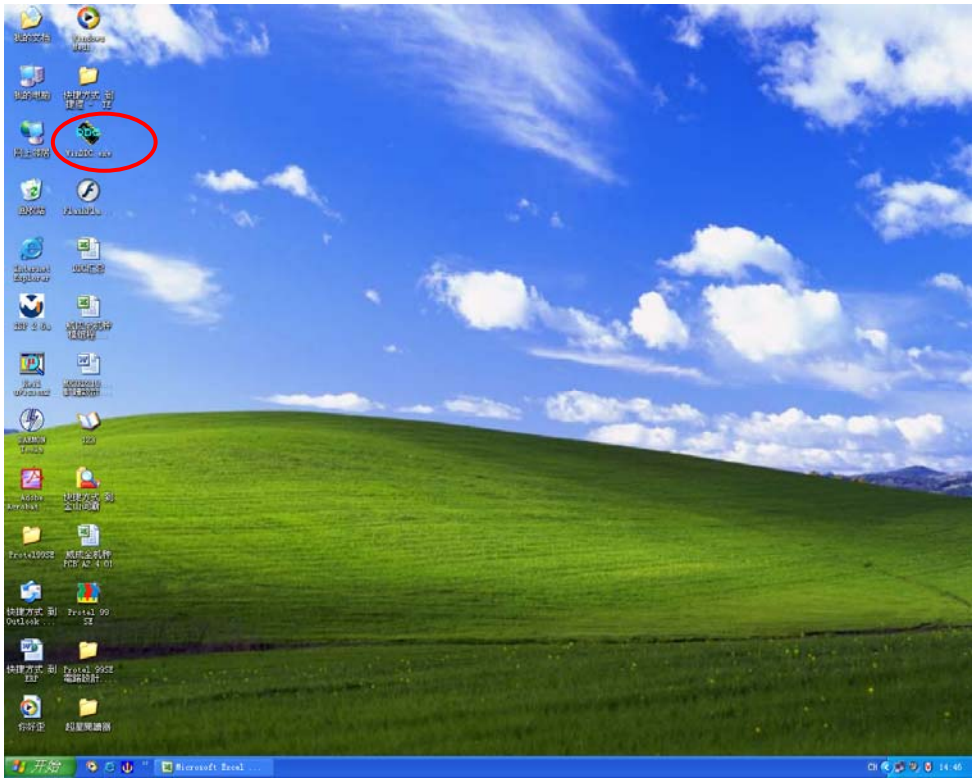

DynaColor DDC Tester - InstallShield Wizard
Custom Setup
Select the program features you want installed.
Click on an icon in the list below to change how a feature is installed.
Feature Description
InstallShield
Help
< Back
Next >
Cancel
開始
簡報2
Adobe Reader - [5.adjus...
DDC Installed
DynaColor DDC Tester - ...
13:54 上午


DDC燒錄工具.rar - WinRAR (評估版本)
檔案(F) 命令(C) 工具(S) 我的最愛(O) 選項(N) 說明(H)
加入
保護
自解
名稱
..
program file
DynaColor
instmsia.ex
instmsiw.ex
setup.exe
setup.ini
DynaColor DDC Tester - InstallShield Wizard
Ready to Install the Program
The wizard is ready to begin installation.
If you want to review or change any of your installation settings, click Back. Click Cancel to exit the wizard.
Current Settings:
Setup Type:
Destination Folder:
D:\Program Files\DynaColor\DDC\
User Information:
Name: sfqqvypm
Company: qbmqroup
InstallShield
< Back
Install
Cancel
選取 102,400 位元組, 共計 1 個檔案
總共 1 個資料夾, 3,489,517 位元組, 共計 5 個檔案
開始
簡報2
Adobe Reader - [5.adjus...
DDC燒錄工具.rar - Win...
DynaColor DDC Tester - ...
13:58 上午



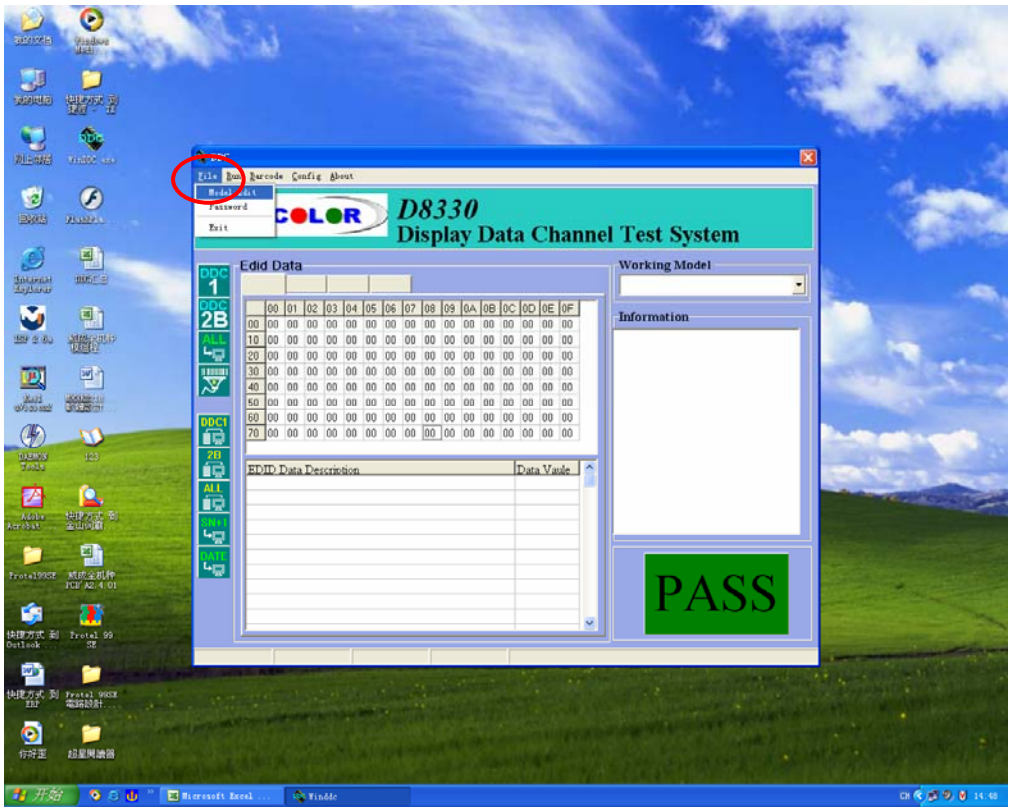
1.4.0 DDC Key In Procedure

Step 1 select and execute DDC Key In program (winDDC.exe icon on desktop)

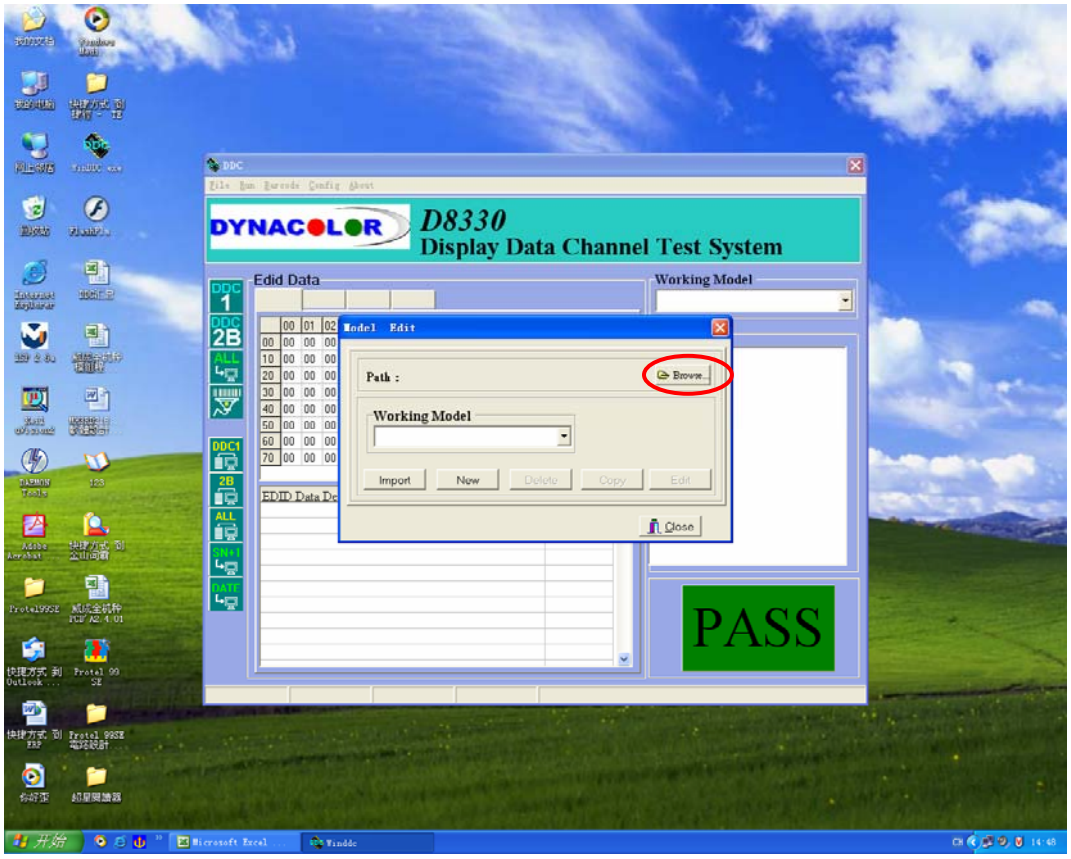


Step 2 Load DDC source file

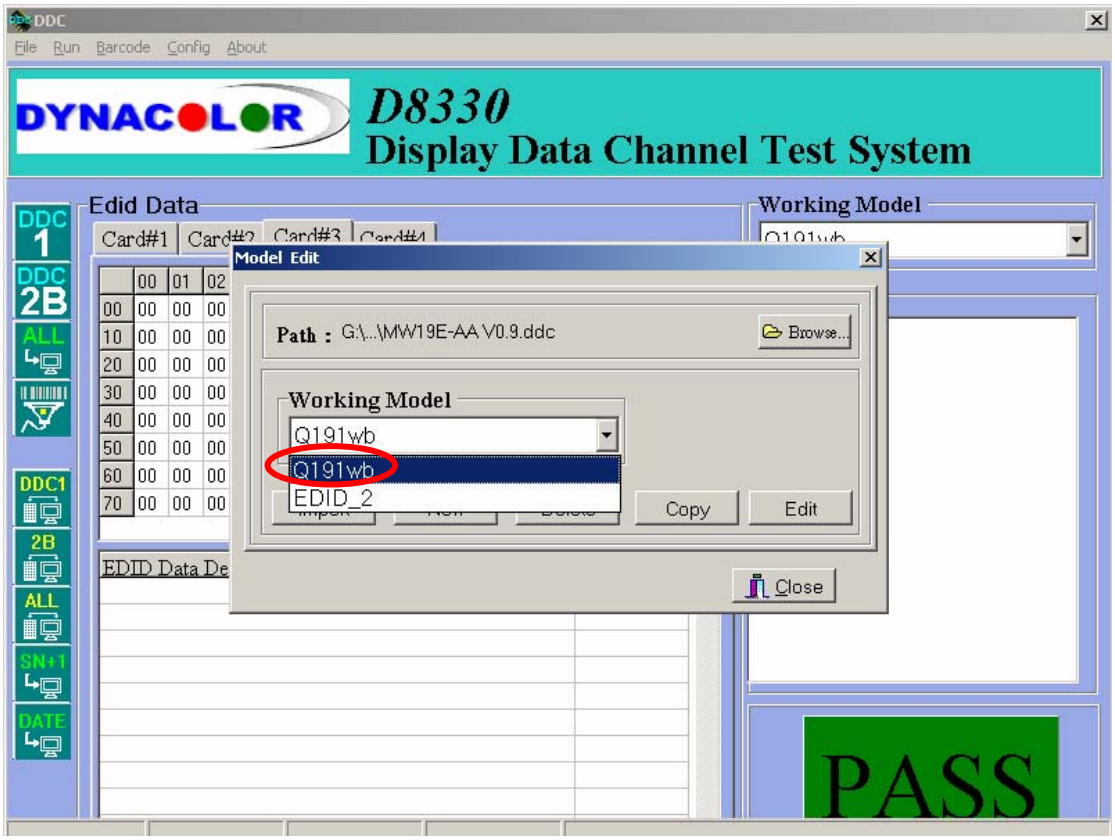
Step2.1 Choose “File “menu, click “Model Edit “button into ” model edit “ dialog



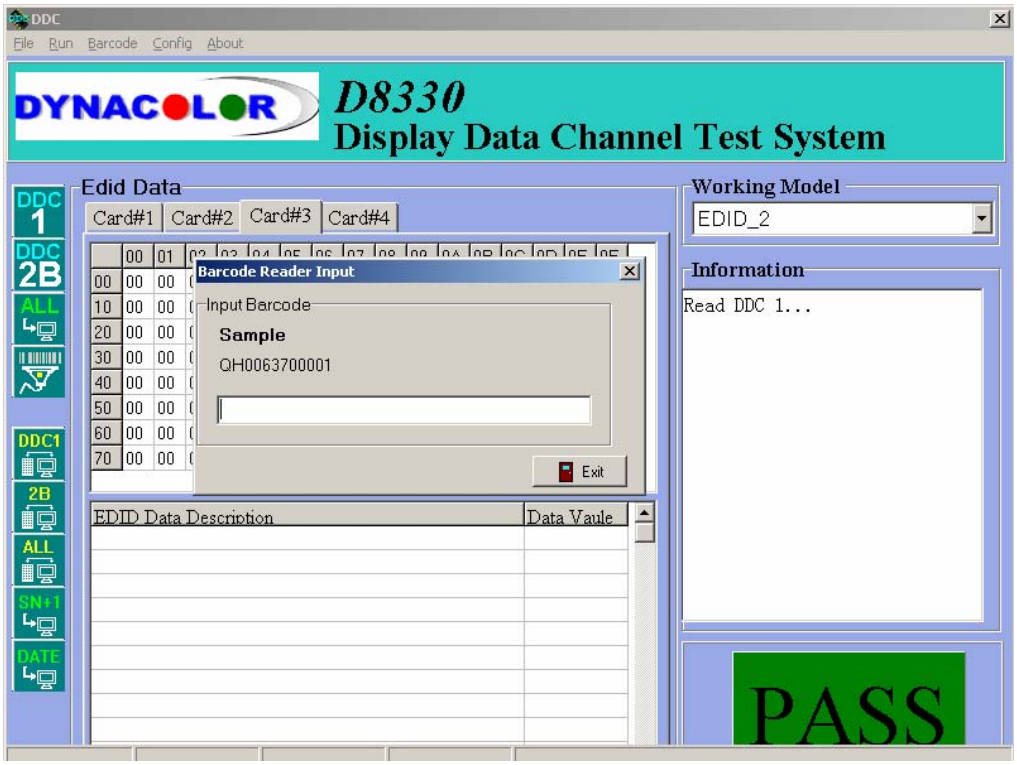
Step2.2 Press “Brower” button set current DDC_LOAD_FILE working path



Step2.3 click “working Model”, select Model in list box



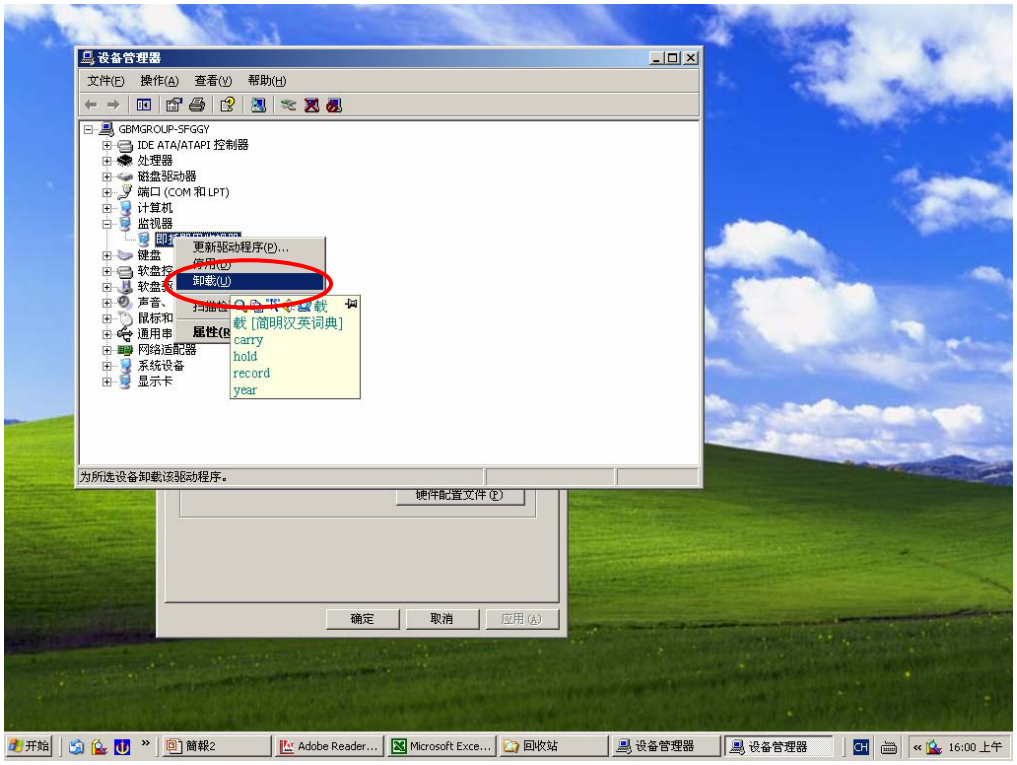
Step3 Double click the “input barcode” icon at the toolbar, Key in the serial number or Use Barcode Scanner to scan the barcode of the monitor. And press the “enter” key.



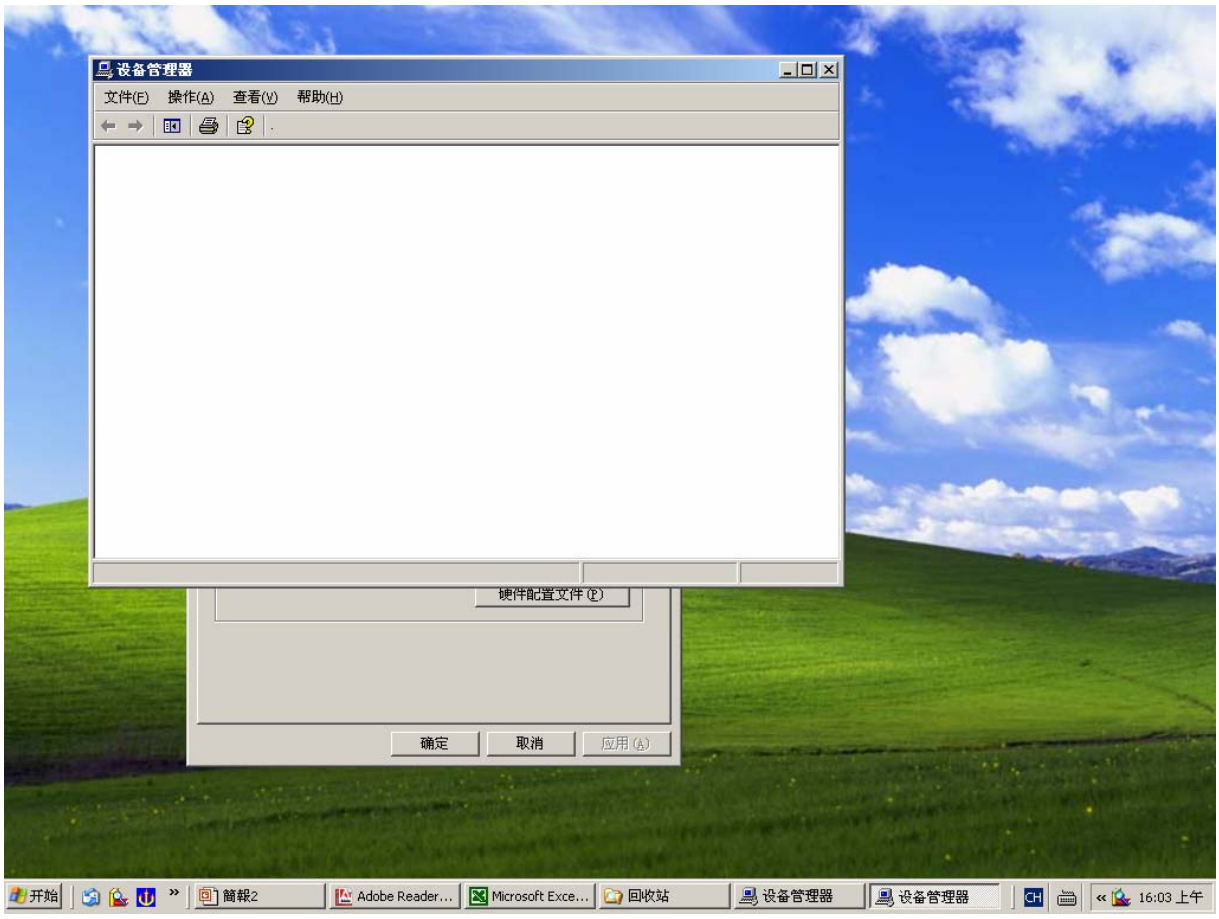
Step 4 Checking Methods

Step5.1 exit “winddc.exe”, take RS232-VGA cable out of the monitor, connect the monitor with a computer By the VGA lable

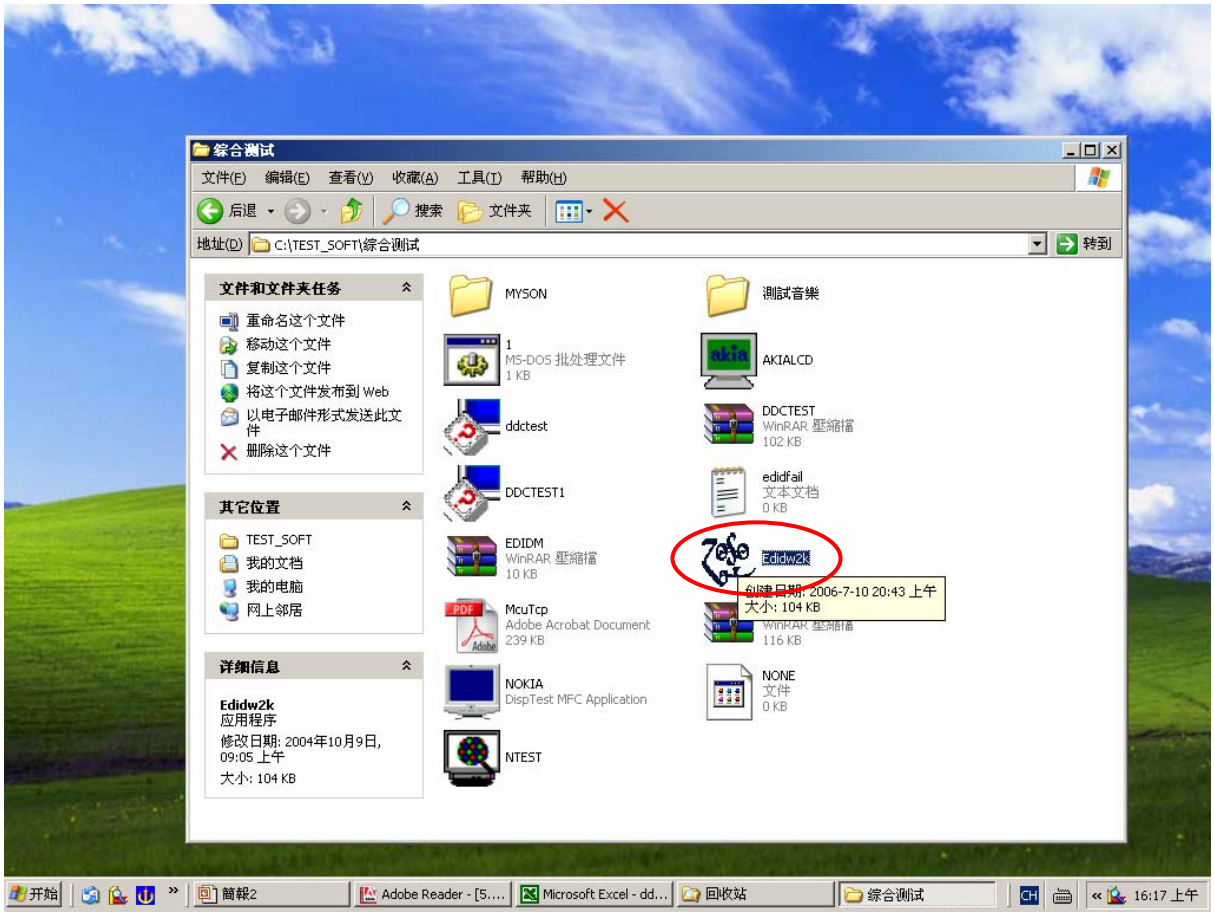
Step5.2 open up the "my computer" attribute dialog box, select the "hardware" option, open "drive management". Below the monitor catalog, uninstall the monitor.



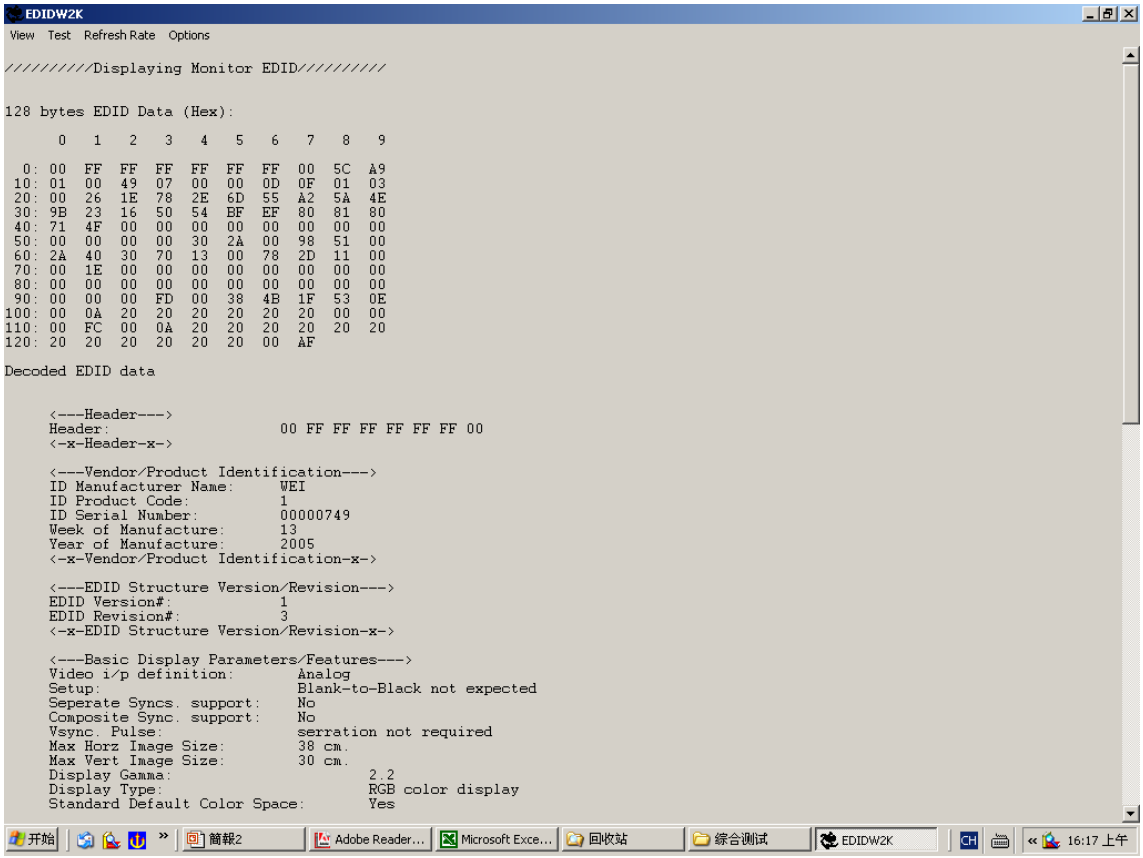
Step4.1 Scan the hardware change, until system find the new monitor driver



Step4.2Select and click the “EDIDW2K.EXE “file, the EDID information will show on the screen



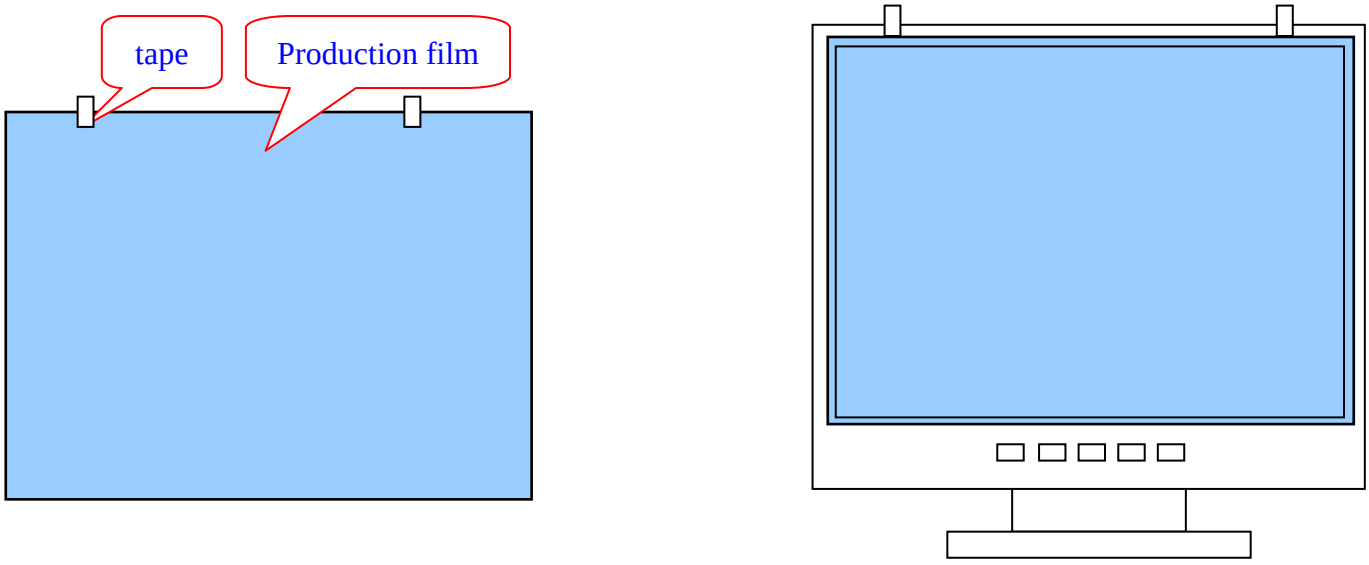
Setp4.3 Check the DDC



Packing for shopping

1. Packing Procedure

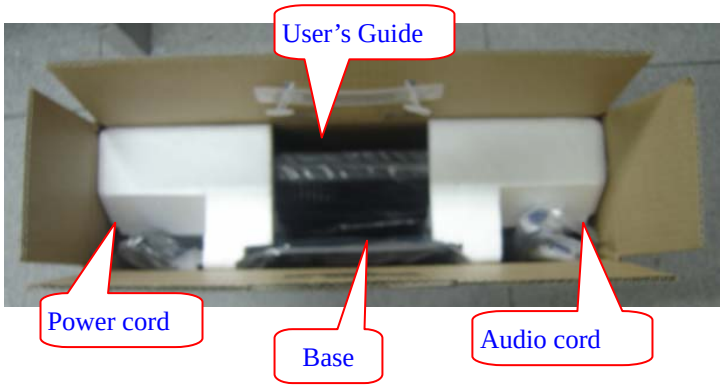
1.1 Paste production film to protect the monitor screen.(Figure 1)



1.2 Put the monitor in the PE bag and seal bag with type (Figure 2)

1.3 Put the cushions on the monitor, put the base in PE bag, and place the base on the cushions. (Figure 3)

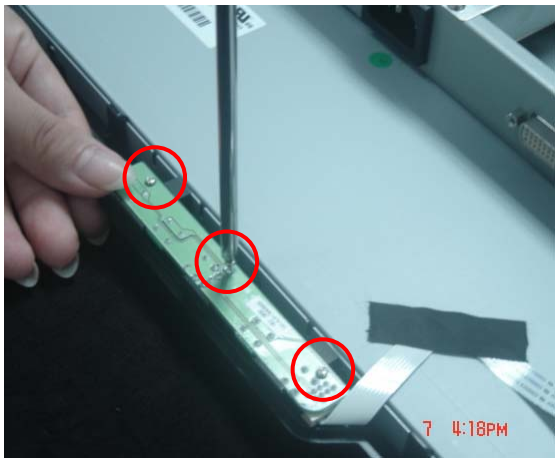
Place the monitor into the carton and then put all accessories into carton .At last, close the carton.



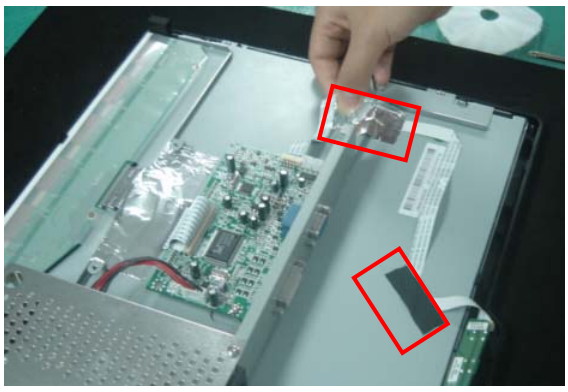
Monitor Disassembly Procedure

1. Insert plastic flake to hole ,and pull the flake along the gap between the bezel and housing, to separate the housing from bezel.

2.Unscrew 3 pcs screws from the key board



3. Tear off the aluminum foil where cover the signal cable

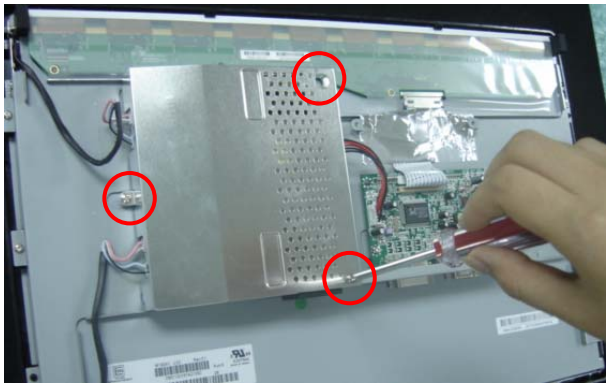


4. Push up the signal cable connecter from the main board, and remove the key board and signal cable.

5. Tear off the aluminum foil where cover the lamp wire.

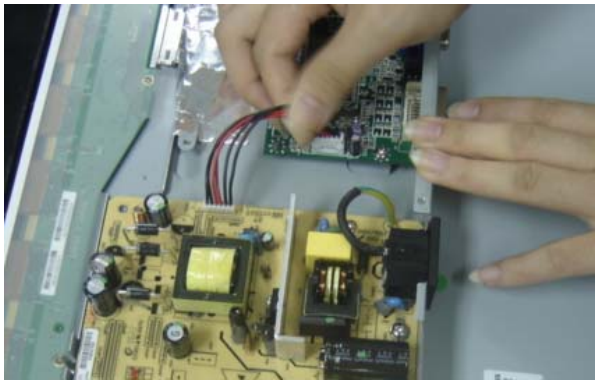
6. Remove 4 pcs screws, take out.

7. Unscrew 3 pcs screws from the shield cover.



8. Take out the lamp wire connecter from the power board

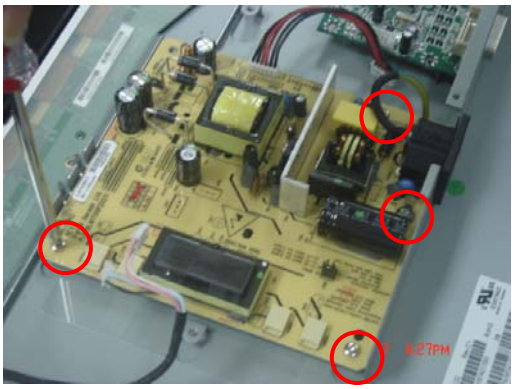
9. Take out the wire which connecter the power board and mainboard



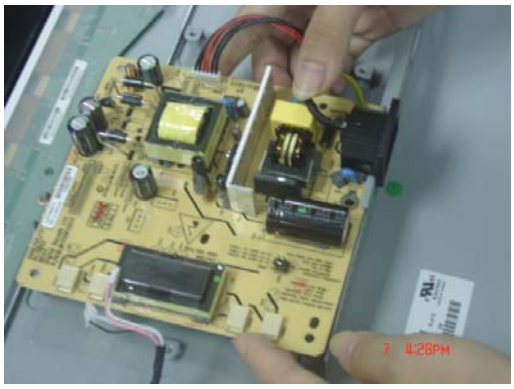
10. Tear off the aluminum foil from the FFC cable

11. Take out the FFC cable connecter the panel and mainboard

12. Unscrew 5 pcs screws from the mainboard and power board



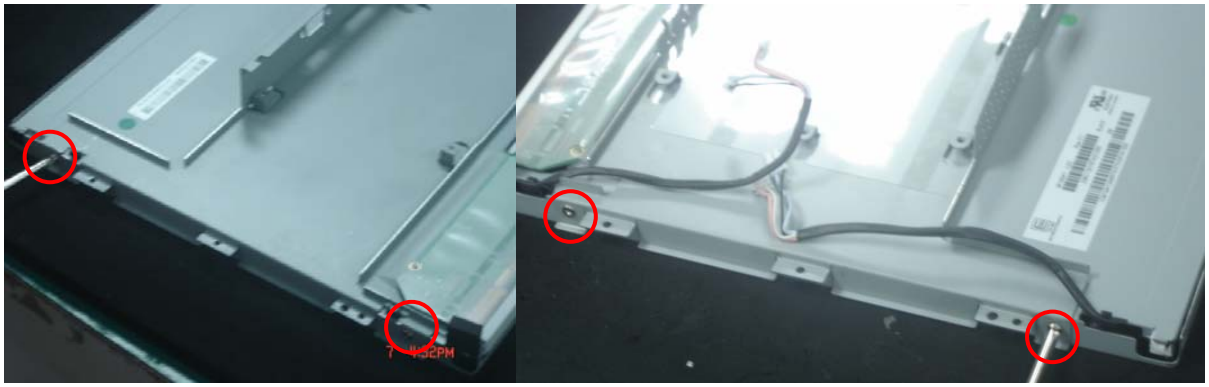
13. Take out the power board and mainboard from frame



14. Unscrew 6 pcs screws from the frame and bezel

15. Take out the bezel

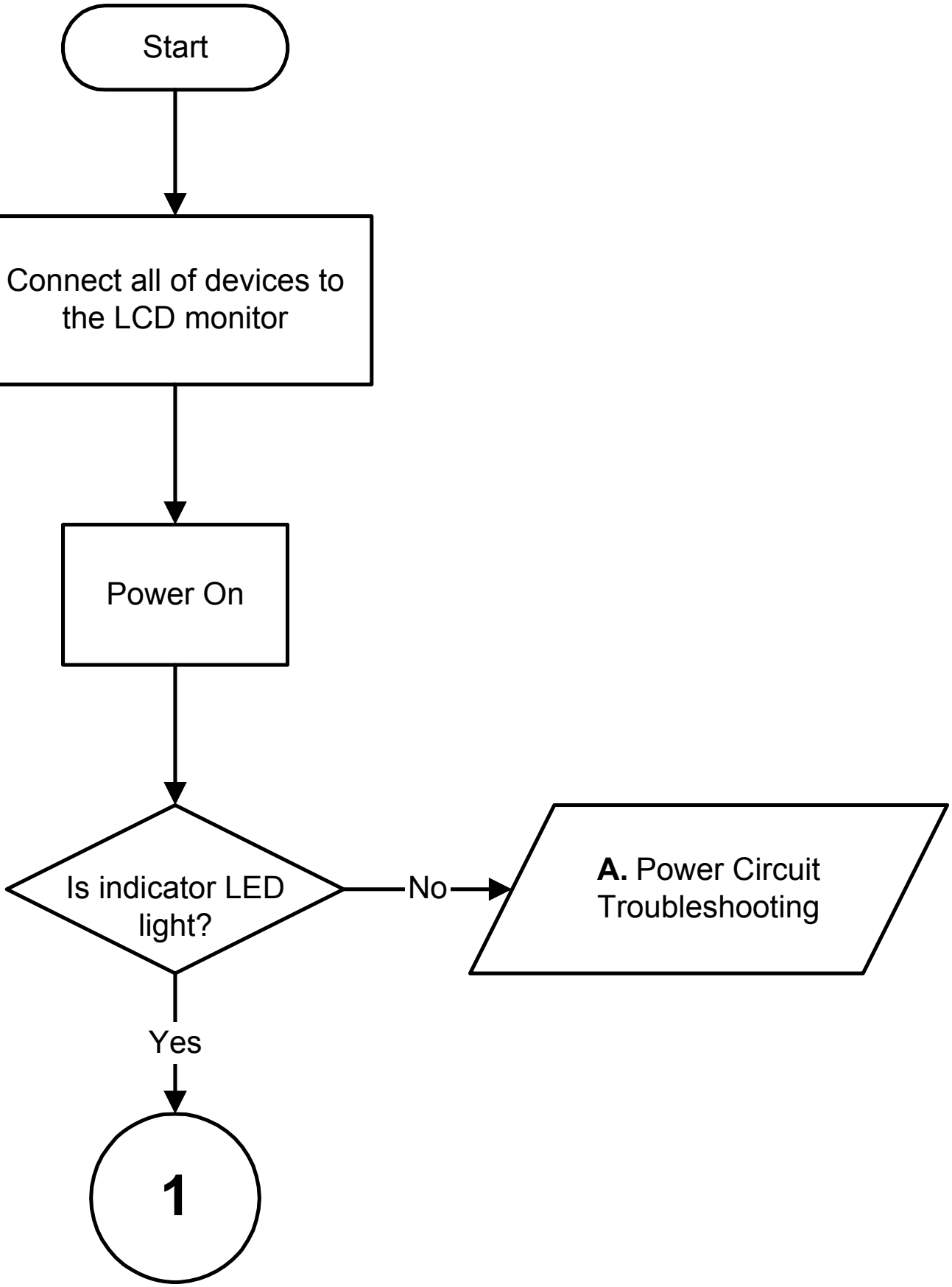
16. Unscrew 4 pcs screws from the frame

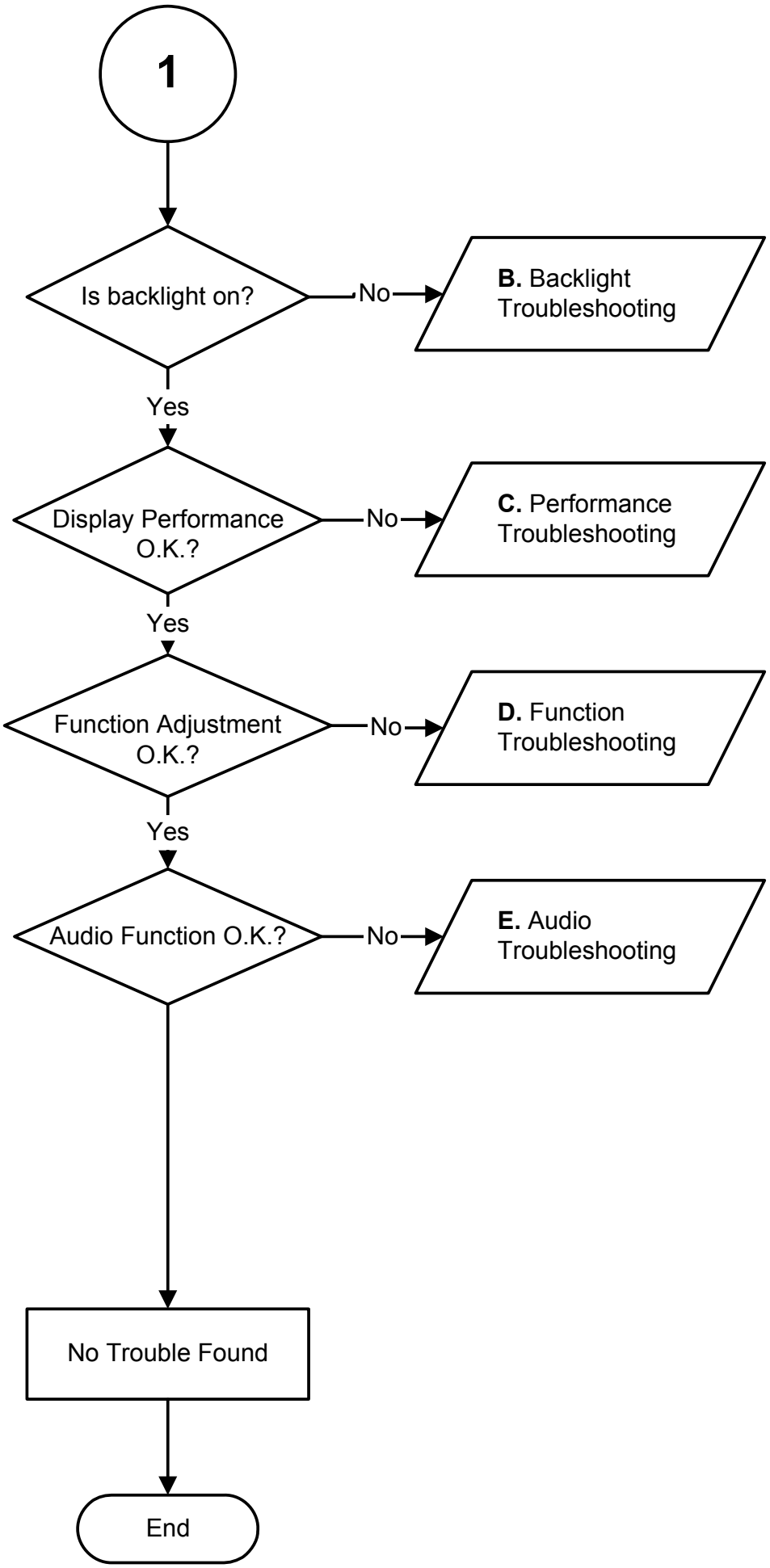


17. Take out the frame

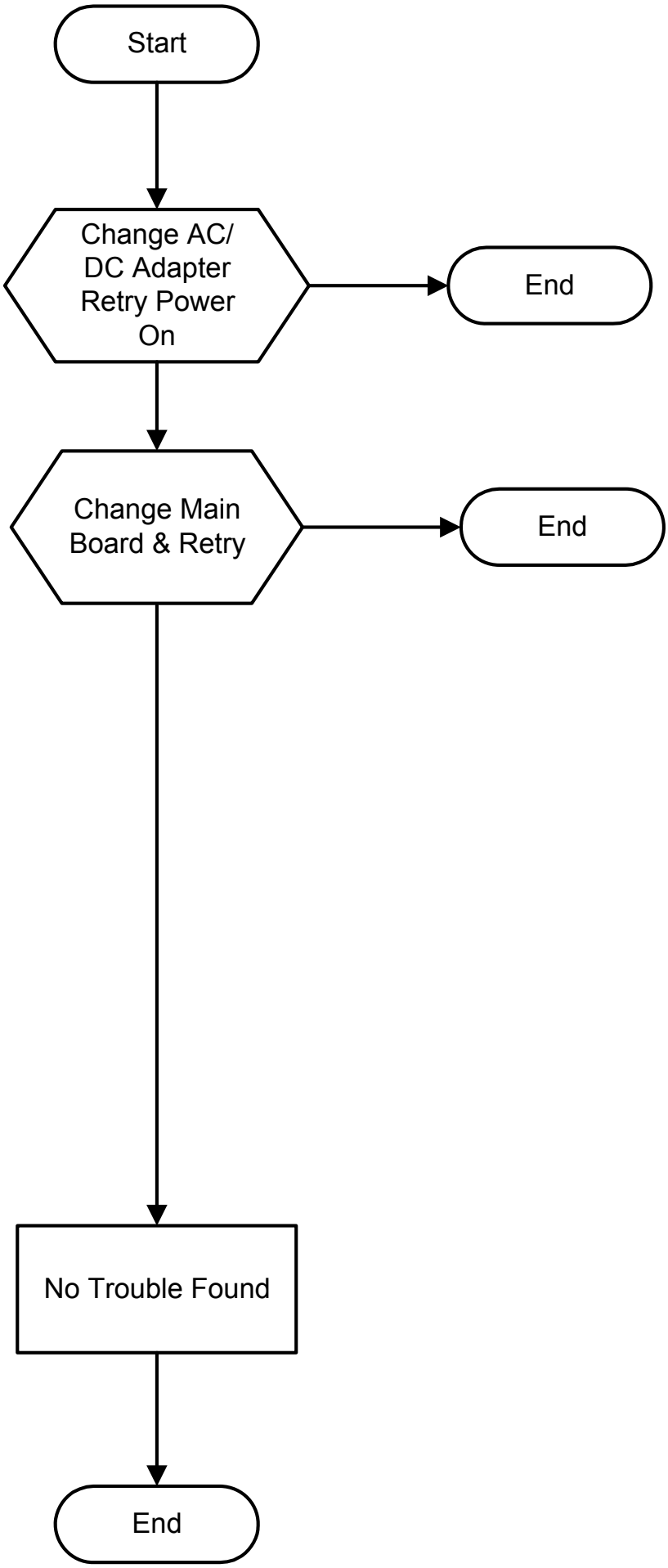
6. Troubleshooting Flow Chart

Main Procedure

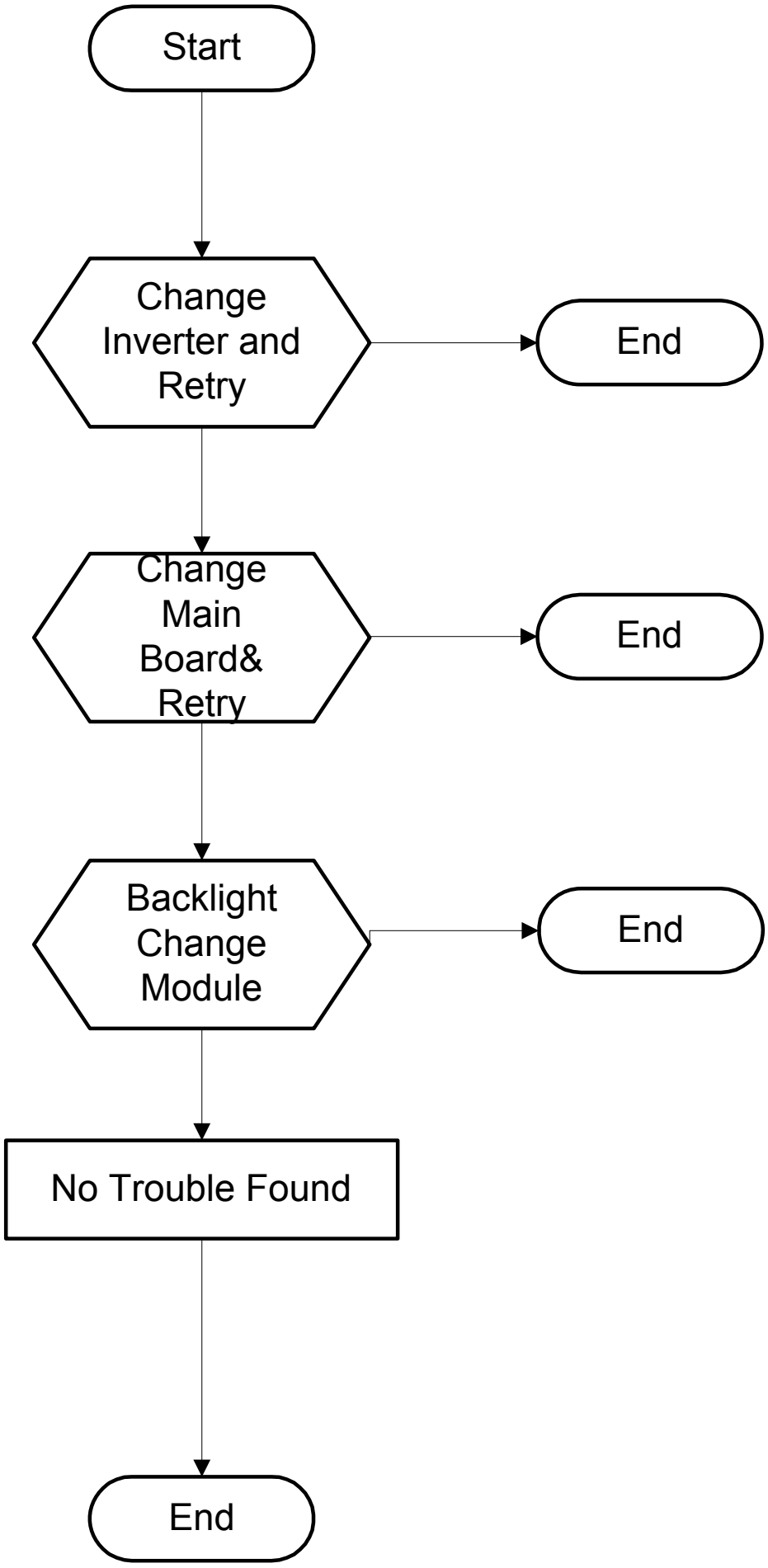



1
Is backlight on?
No
B. Backlight Troubleshooting
Yes
Display Performance O.K.?
No
C. Performance Troubleshooting
Yes
Function Adjustment O.K.?
No
D. Function Troubleshooting
Yes
Audio Function O.K.?
No
E. Audio Troubleshooting
No Trouble Found
End

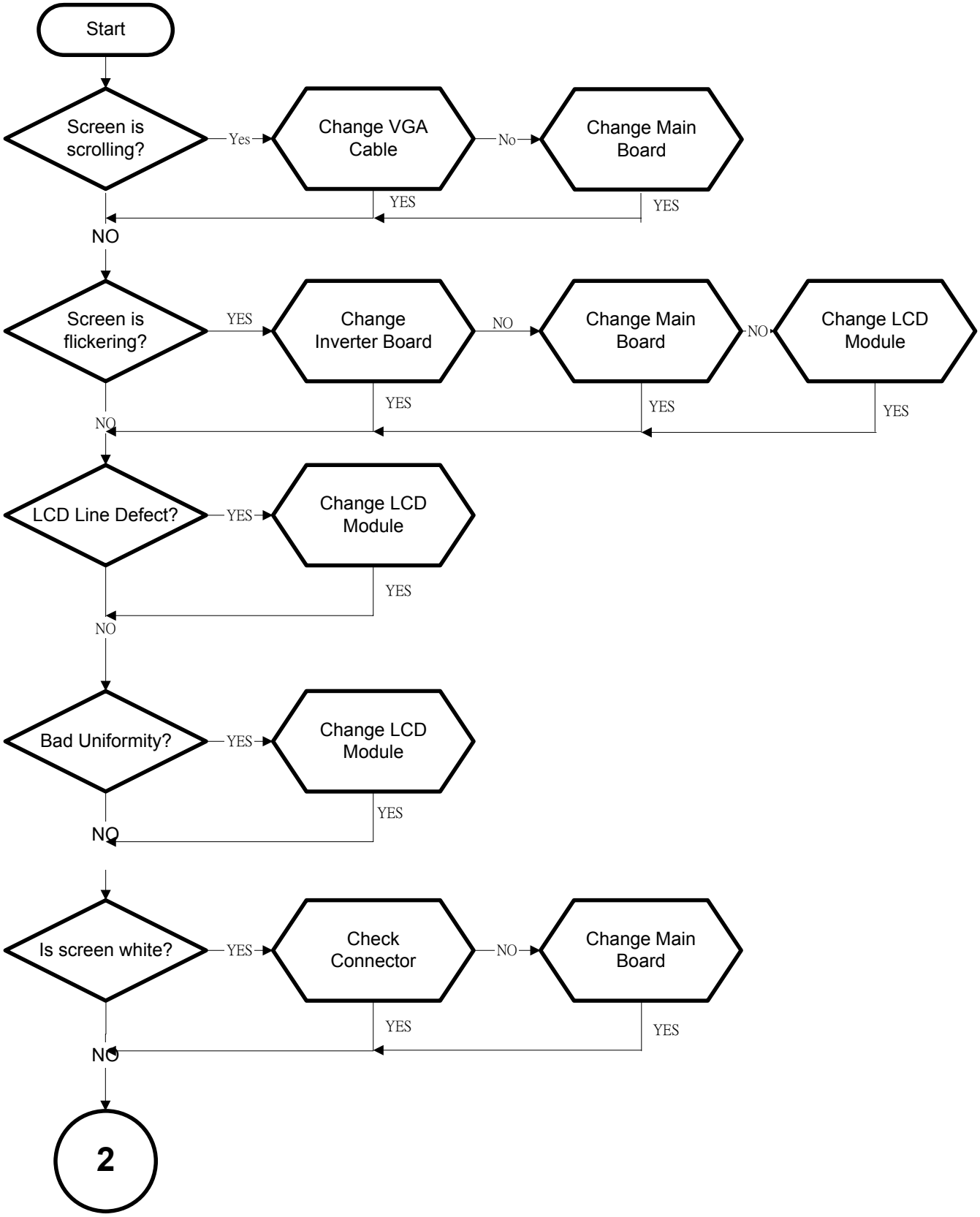
A. Power Circuit Troubleshooting

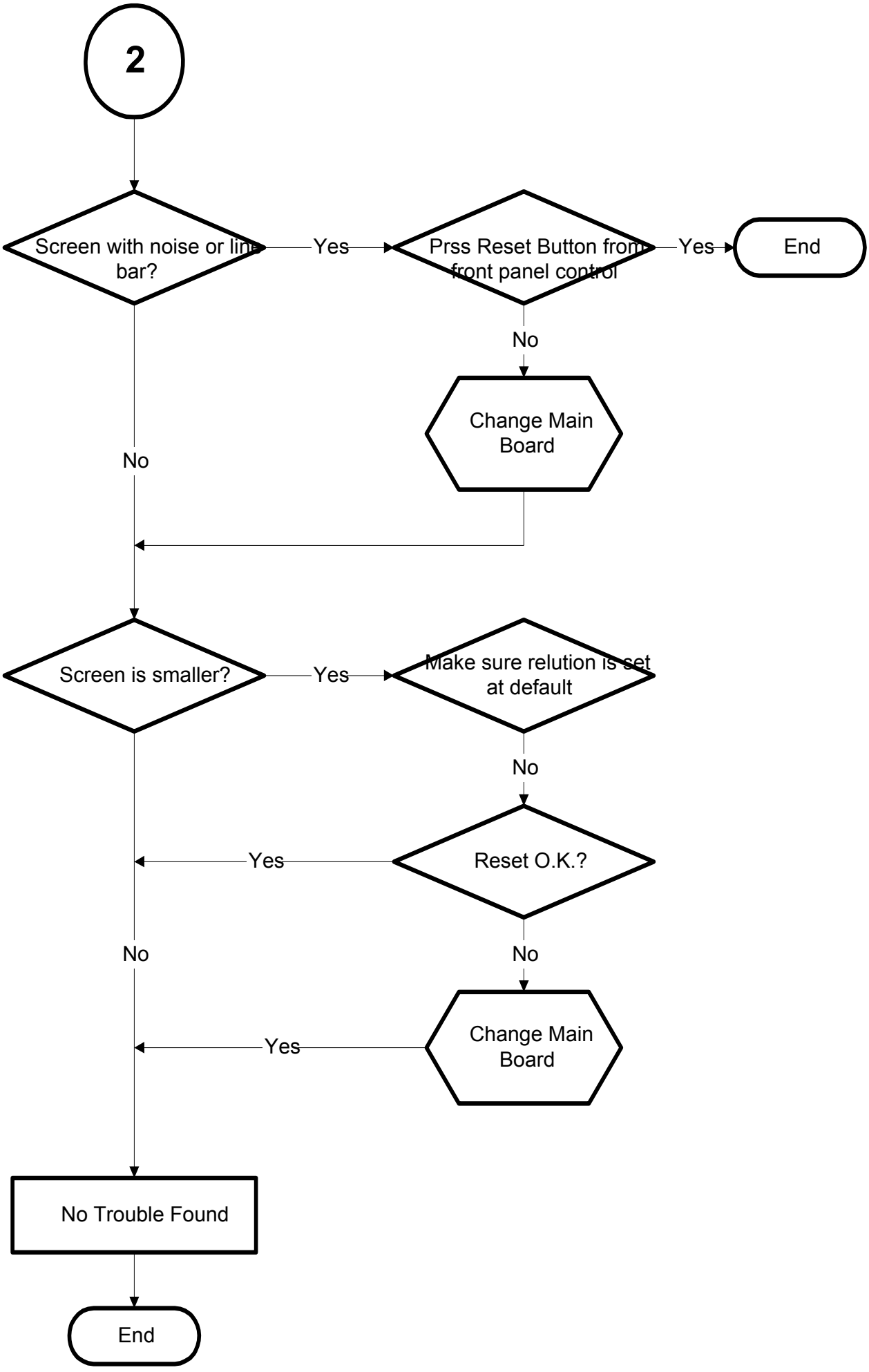


B. Backlight Troubleshooting

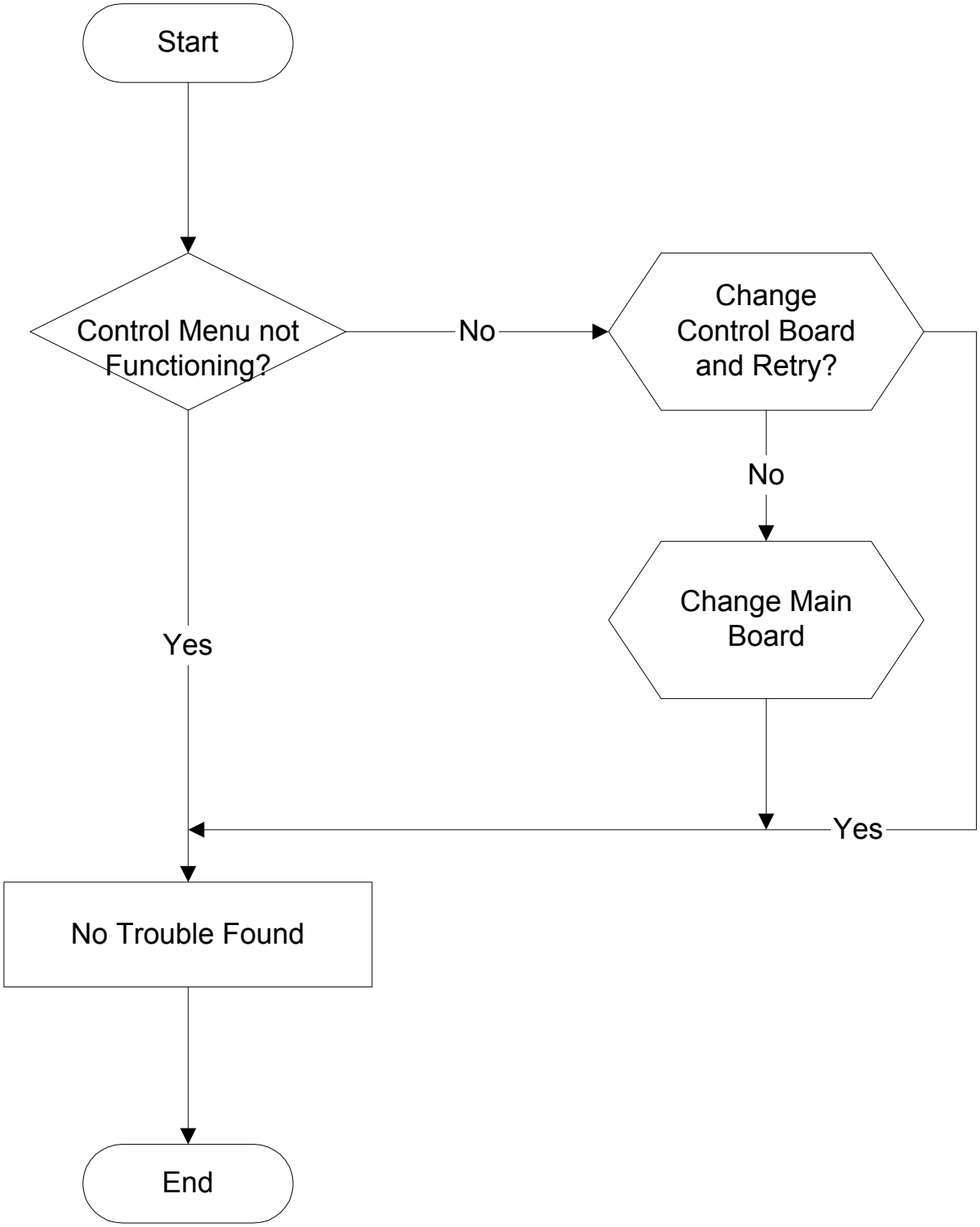


C. Performance Troubleshooting

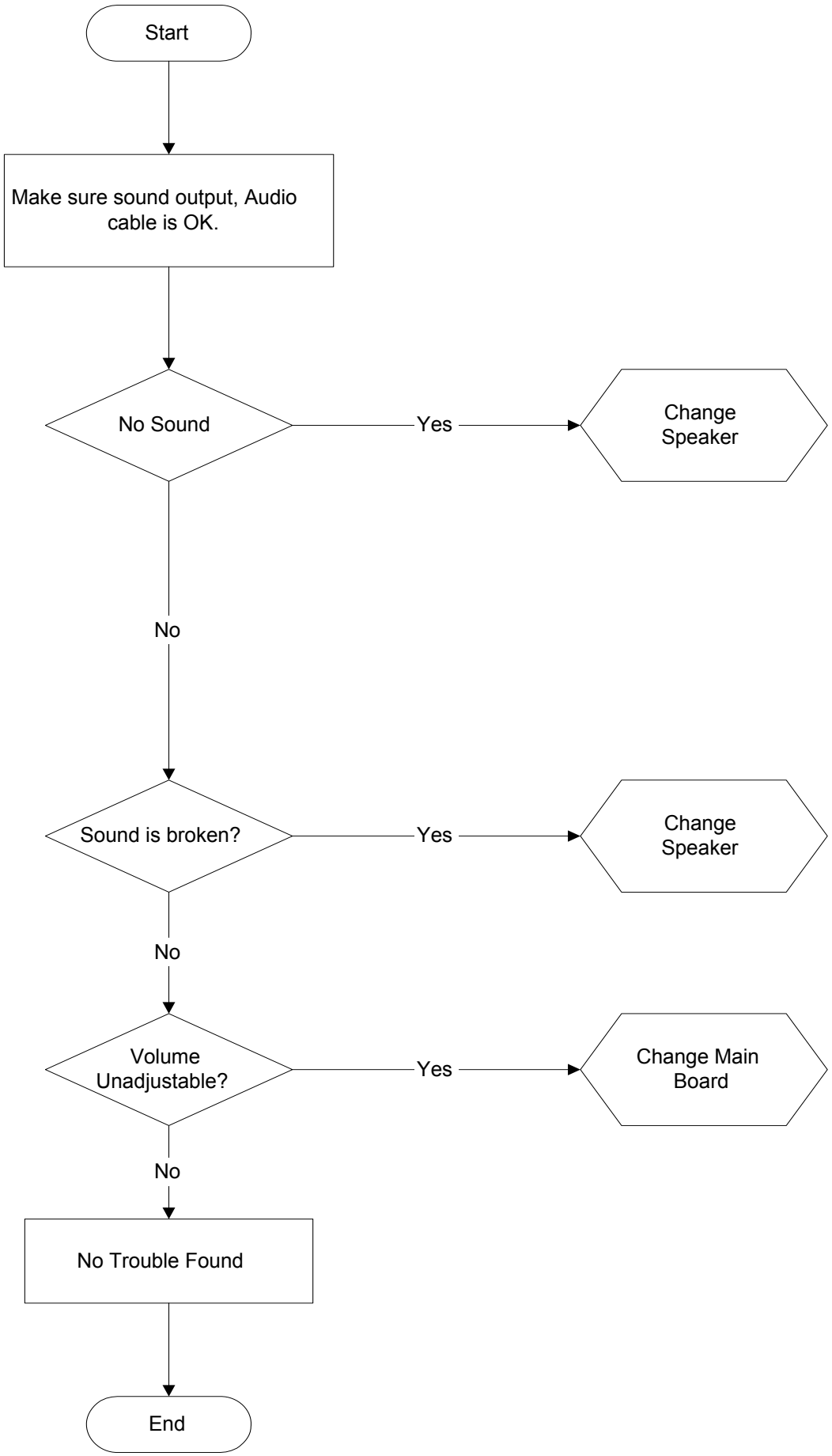



2
Screen with noise or line bar?
Yes
Prss Reset Button from front panel control
Yes
End
No
Change Main Board
No
Screen is smaller?
Yes
Make sure relution is set at default
No
Yes
Reset O.K.?
No
No
Change Main Board
Yes
No Trouble Found
End

D. Function Troubleshooting



E. Audio Troubleshooting



7. Recommended Spare Parts List

RECOMMENDED SPARE PARTS LIST (Q191wb-1)

ViewSonic Model: VS11584
Rev: 1a
Serial No. Prefix: QH0

Item	Description		ECR/ECN	ViewSonic P/N	Ref. P/N	Location	Universal number#
1	**PC Board Assembly:**	Main Board - (LM/MW19E-AA 19"&22" Wide)		B-00008084	XLM19EA040006		
2		Power Board + Inverter Board (LM/17"&19")		B-00008085	XLM1700390012-SF		
3		Key Board - LM/MR17E-ABAD		B-00008086	XLM17EA050001		
4	**Cabinets:**	Front Panel - LM/MW19E-AA (BLACK 426C)		C-00008116	XLM19EA100015		
5		Cover - Housing LM/MW19E-ABAD		C-00008117	XLM19EA110003		
6		Base Assembly (C-type) LM/MR17E-ABAD		C-00008118	XLM17EA280005		
7	**Cables:**	VGA Cable 30AWG UL20276 L1800mm 15PIN		CB-00006504	W0926418AQ951		
8		Flat Cable - 1.0mm 8PIN L300mm		CB-00008037	W47B100830001		
9		Wire 18AWG 1PIN 180° L45mm		CB-00008038	W432181020451		
10	**Electronic Components:**	LCD Module (M190A1-L02 19" LVDS CMO)		E-00008078	E34M1G190CC01		
11	**Hardware:**	Bracket (Front) (B-type LM/MR17E-ABAD REV:0)		HW-00008016	P711A91PLM040-A		
12		Bracket (Back) LM/MR17E-AAAD REV:0		HW-00008017	P711A91PLM030-A		
13	**Packing Material:**	Craft Box (LM/MW19E-ABAD)		P-00008099	F40072219EA02		
14		Foam (Left)- LM/MW19E-ABMD		P-00008100	F2013319EA004		
15		Foam (Right) LM/MW19E-ABMD		P-00008101	F2014319EA004		
16		Generic Foam		P-00001347	30833		
17		Generic Box		P-00002515	20653		

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 (Q191wb-1)

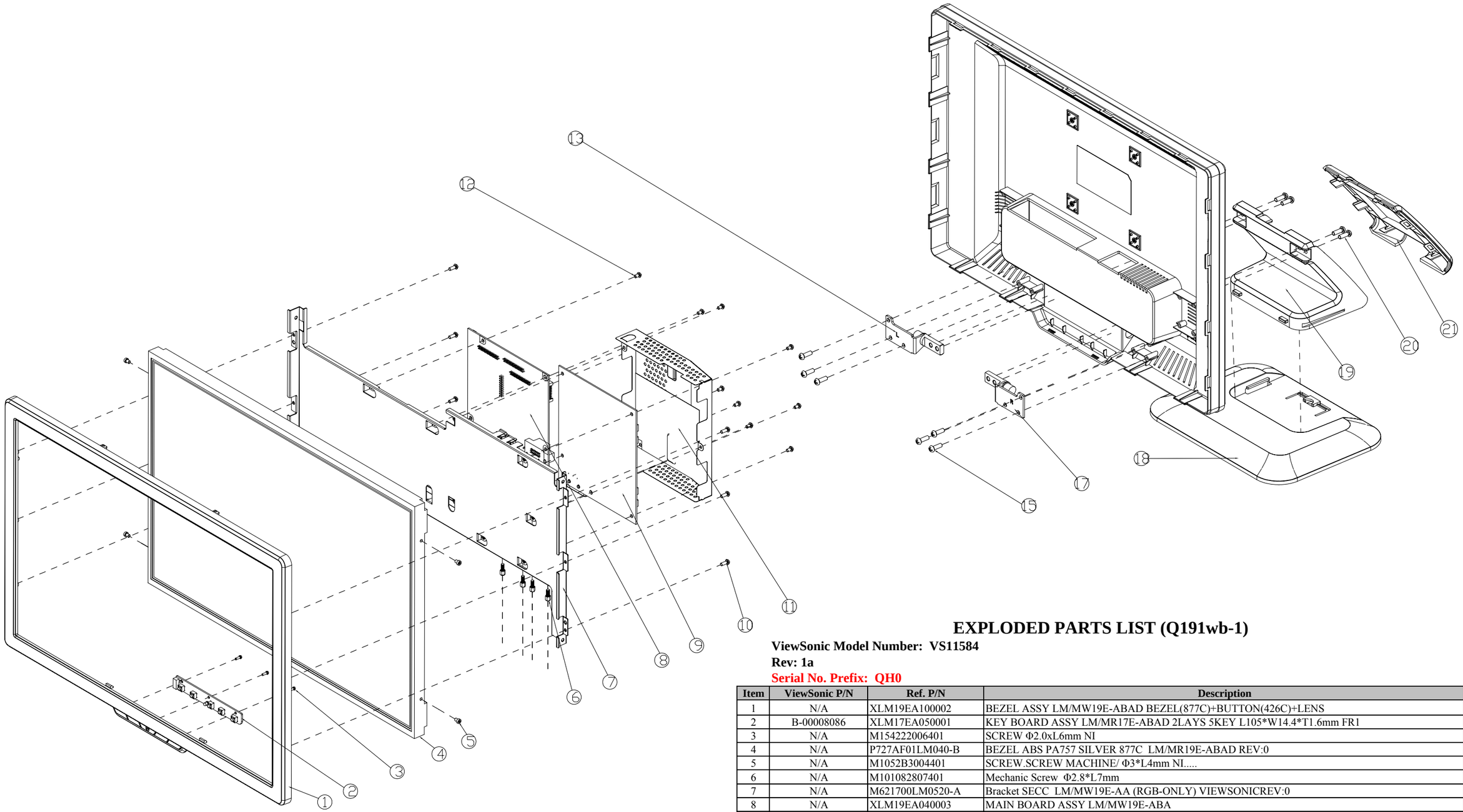
ViewSonic Model Number: VS11584

Rev: 1a

Serial No. Prefix: QH0

Item	ViewSonic P/N	Ref. P/N	Description	Location	Universal number#	Q'ty
1	E-00008078	E34M1G190CC01	LCD MODULE M190A1-L02 1440×900 19" LVDS CMO LEAD FREE			1
2	N/A	F103010LM0003	Blank Label copper paper LM/MONITOR SERIES L85*W24mm			1
3	DC-00008065	F103015171A01	Blank Label LM/MR17I-AAA L36*W9mm for viewsonic china			1
4	P-00008100	F2013319EA004	POLYETHYLENE-L EPSLM/MW19E-ABMD L413*W145*H178mm REV:1			1
5	P-00008101	F2014319EA004	POLYETHYLENE-R EPS LM/MW19E-ABMD L416*W145*H175mm REV:1			1
6	N/A	F300250000053	BAG /PE L300*W200*T0.07mm（contain Environmental protection）			1
7	N/A	F300250000054	BAG L600*W500*T0.07mm（contain Environmental protection）			1
8	P-00008099	F40072219EA02	BAG LM/MW19E-ABAD L524*W161*H448mm			1
9	N/A	F401422LM0001	PARTITION SUPPORT BC(Kraft paper) LM/MONITOR SERIES L800*W50*H50*T5mm			0.0357
10	N/A	F401422LM0002	PARTITION SUPPORT BC(Kraft paper LM/MONITOR SERIES L1800*W50*H50*T5mm			0.0714
11	N/A	F50206175M001	PALLET GLUE Plywood LM/F175M L1080*W980*H120mm FOR GTC			0.0185
12	N/A	F900181000001	PE LIMPID W500*T0.03mm 1500m/roll			0.000178
13	N/A	F900311000001	PE LIMPID LIMPID L1500*W1200*T0.15mm			0.01789
14	N/A	F9008G2000002	PACKTHREAD PP WHITE W14.5mm*T0.8mm 1300m/roll			0.0003
15	N/A	M101082807401	SCREW COPPER Φ2.8*L7mmWITH NICKEL			2
16	N/A	M105243005401	SCREW MACHINE (Binding) Φ3.0mm L5mmNICKEL			7
17	N/A	M105244012B01	SCREW MACHINE (Binding) Φ4.0*L12mm NICKEL			4
18	N/A	M1052B3004401	SCREW.SCREW MACHINE(Binding) Φ3*L4mm NI.....			4
19	N/A	M108253006401	SCREW MACHINE(Binding) Φ3*L6mm NI			1
20	N/A	M154222006401	SCREW STEEL Φ2.0xL6mm NI			3
21	N/A	M155223008401	SCREW STEELΦ3.0* L8mm NICKEL			6
22	N/A	M155244012401	SCREW STEELΦ4.0*L12mm NICKEL			6
23	N/A	M621700LM0520-A	Bracket SECC LM/MW19E-AA (RGB-ONLY) VIEWSONICREV:0			1
24	N/A	M701900LM0160-K	Hinge-L SPCC LM/MW19E- ABAD REV:0			1
25	N/A	M701900LM0170-K	Hinge-R SPCC LM/MW19E-ABAD REV:0			1
26	N/A	M711200LM0091-E	Shielding covering SPTE T0.3mm LM/MR19-A1AD REV:1			1
27	N/A	P36A089010001	MAYLAR L102*W87*T0.15mm			1
28	N/A	P36A4A3020001	MYLAR L142.5*W137.5*T0.25mm			1
29	N/A	P36D3B8010001	MYLAR L438*W284*T0.12mm FOR LM/MW19E -ABAD			1
30	N/A	P440808500001	RUBBER MAT L8mm*W8mm*H5mm(Y7410051G400)			2
31	N/A	P441507A40001	RUBBER CUSHION L15*W7*T14mm			2
32	N/A	P441508980001	RUBBER CUSHION /RUBBER L15*W8*T9.8mm			1
33	N/A	P711A91PLM020-A	BRACKET(FRONT) A-TYPE ABS HB BLACK 426C LM/MR17E-AAAD REV:0			1
34	HW-00008017	P711A91PLM030-A	BRACKET(BACK) ABS HB BLACK 426C LM/MR17E-AAAD REV:0			1
35	N/A	V300800000001	GLUE 50g/BOTTLE（: -60℃~+200℃）			0.01
36	N/A	V5004AP150201	Rubberized fabric L25000*W15*T0.25mm 25m/ROLL			0.006
37	N/A	V5011A5150101	Sticky tape L50000*W15mm*T0.1mm Able to bear the high temperature			0.005
38	N/A	V900505020003	AL FOIL L50×W30×T0.10mm			1
39	N/A	V900505030001	Aluminium foil L100xW40xT0.07mm			1
40	N/A	V900505030007	AL FOIL L100xW30*T0.35mm(Y78400004G *1)			4
41	CB-00006504	W0926418AQ951	VGA CABLE 30AWG UL20276 L1800mm 15PIN BLACK			1
42	A-00005760	W40218A022631	.POWER CORD/AC USA ..18AWG L1500mm BLACK.C. YISHENG 125V 10A....			1
43	N/A	W47A103014001	FFC line CY050408001With the side P=1.0mm 30PIN L140mm HUNG FU			1
44	CB-00008037	W47B100830001	FFC line FFCC0605T2350EC Without the side P=1.0mm 8PIN L300mm HANQUAN			1
45	B-00008085	XLM1700390012-SF	POWER BOARD+INVERTER BOARD ASSY LM/17"&19"LCD MONITOR +5V +24V PI-SB02(FENGHONG)			1
46	N/A	XLM1700390012-SH	POWER BOARD+INVERTER BOARD ASSY LM/17"&19"LCD MONITOR +5V +24V PI-SB02(HUANGLONG) **(substitute)**			1
47	B-00008086	XLM17EA050001	KEY BOARD ASSY LM/MR17E- ABAD 2LAYS 5KEY L105*W14.4*T1.6mm FR1			1
48	N/A	BLM17EAB10131	BARE PCB LM/MR17E-ABAD BUTTON BOARD 2SIDES FR-4 T1.6mm REV:3.1			1
49	N/A	D462102211201	LED,Φ3.0x5.3 mmP=2.54 YELLOW/GREEN (DIP)			1
50	N/A	J4509100085C1	FFC CONNECTOR P=1mm 10PIN 90° CF16061D0T0 HANQUAN (DIP)			1
51	N/A	P764P295LM010	SWITCH PA66 BLACK LCDMONITOR SERIES REV:0			5
52	C-00008118	XLM17EA280005	BASE ASSY(C-TYPE) LM/MR17E- ABAD BLACK 426C			1
53	N/A	P441000300001	RUBBER FOOT Φ10(外)*T3mm W/ADHESIVE			5
54	N/A	P610058010001	RUB FOOT L25*W5*T1.5mm BLACK			1
55	N/A	P74AA91PLM050-A	BASE(A-TYPE) ABS HB BLACK 426C LM/MR17E-AAAD REV:0			1
56	B-00008084	XLM19EA040006	MAIN BOARD ASSY LM/MW19E-AA RGB ONLY RTD2533V For 19"&22" WIDE			1
57	N/A	A01F241615A21	IC EEPROM AT24C16 2500ns ATMEL SOIC-8 2K*8 (SMD)			1
58	N/A	A03D111703G03	IC LINEAR IC VOLTAGE REGULATOR GL1117A-3.3 (INPUT 4.8~12V OUTPUT 3.3V) SOT-223 GTM LeadFree (SMD)			1
59	N/A	A03D111703A54	IC LINEAR VOLTAGE REGULATOR AP1117E33A SOT-223 ANACHIP (SMD)			1
60	N/A	A03D111703U01	IC LINEAR VOLTAGE REGULATOR LD1117-18-A SOT-223 3PIN 1.8V UTC (SMD)			1
61	N/A	A07D212005R01	IC MCU RTD2120L 96KB LQFP48 Realtek LeadFree (SMD)			1
62	N/A	A082533VR2001	IC ASIC RTD2533V QFP128 REALTEK LEAD FREE (SMD)			1
63	N/A	BLM17F4M10115	BARE PCB LM/MR17-F4AD MAIN BOARD 2SIDES FR-4 T1.2mm REV:1.5			1
64	N/A	C02205003C111	CAP MLCC NPO 5pF 50V ±0.25%(C) 0603 TAPPING (SMD)			3
65	N/A	C02210003J111	CAP MLCC NPO 10pF 50V ±5% 0603 TAPPING (SMD)			2

Item	ViewSonic P/N	Ref. P/N	Description	Location	Universal number#	Q'ty
66	N/A	C02212003J111	CAP MLCC /NPO 12PF 50V ±5%(J) 0603 TAPPING (SMD)			1
67	N/A	C02222003J111	CAP MLCC /NPO 22PF 50V ±5%(J) 0603 TPPING (SMD)			3
68	N/A	C02310501K111	CAP MLCC X5R 1uF 16V ±10% (K) 0603 TAPING (SMD)			2
69	N/A	C02410403K111	CAP MLCC X7R 0.1UF/50V ±10%(K) 0603 TAPPING(SMD)			32
70	N/A	C02447302K111	CAP MLCC/ X7R 0.047uF /25V ±10%(K) 0603 TAPPING(SMD)			6
71	N/A	C02447401K111	CAP MLCC X7R 470nf 16V ±10%(K) 0603 TAPING lead free (SMD)			1
72	N/A	C4021006M2431	CAP EC(S) -40~105℃ 10uF 25V ±20% (M) Φ5×H7mm P=2.5mm (DIP)			3
73	N/A	C4021014M2222	CAP EC(S) -40~105℃ 100uF 16V ±20% (M) Φ5×H11mm P=2.0mm (DIP)			6
74	N/A	C4022204M2322	CAP EC -40~105℃ 22UF/16V ±20%(M) ∮5*H5MM P=2.0MM (DIP)			1
75	N/A	C4024704M2422	CAP EC -40° ~105℃ 47UF/16V ±20% (M) ∮5*H7MM P=2.0MM(DIP)			1
76	N/A	D00BAV9905G01	DIODE BAV99 SOT-23 GTM (SMD)			3
77	N/A	D00L414803Y11	DIODE LL4148 SOD-123 YING SMD			5
78	N/A	D01ZT52C03K01	DIODE BZT52C SOD-123 KINGWELL 5.6V (SMD)			6
79	N/A	J4507270155B1	D-SUB H/D,15PIN,VGA PC99(LIGHT BLUE)DIP 90°,3 ROW,1285-15S-004-98C-01,TEKCON			1
80	N/A	J4509100085C1	FFC CONN P=1mm 8PIN 90° Cream-coloured CF16061D0T0 HANQUAN (DIP)			1
81	N/A	J4509100306H1	FFC CONN ,30 PIN,1.0,DIP 180°,1 ROW,Cvilux 16301V0T or compatible			1
82	N/A	L012700201111	BEAD CHOKE Ferrite(generalcircuit)DDY160808U121MB 70Ω 200mA 0603(1608) TAPING FORD GLORY LEAD FREE (SMD)			3
83	N/A	L013121302A11	CHIP BEAD Ferrite Chip Beads (high current)WB201209B601QLT02 120Ω 3000mA 1206 Walsin (SMD)			5
84	N/A	Q441240047151	CRYSTAL QUARTZ/Only frequently 24MHZ 30PPM 20PF 49US CRE (DIP)			2
85	N/A	R070331J10111	RES CHIP 330Ω ±5%(J) 1/10 0603 TAPPING (SMD)			2
86	N/A	R070470J10111	RESISTOR.RES CHIP 47Ω ±5%(J) 1/10W.0603 TAPPING (SMD)			3
87	N/A	R070750J10111	RESISTOR.RES CHIP 75Ω ±5%(J) 1/10W.0603 TAPPING (SMD).....			3
88	N/A	R071000J10111	RES CHIP 100Ω ±5%(J) 1/10 0603 TAPPING (SMD)			14
89	N/A	R071001J20111	05: RESISTOR.RES CHIP 1KΩ ±5%(J) 1/8W.0603 TAPPING (SMD).....			6
90	N/A	R071002J20111	05: RESISTOR.RES CHIP 10KΩ ±5%(J) 1/8W.0603 TAPPING(SMD).....			2
91	N/A	R071003J10111	RES CHIP 100KΩ ±5%(J) 1/1 0603 TAPPING (SMD)			1
92	N/A	R071004J30111	RES CHIP 1MΩ ±5%(J) 1/16W 0603 TAPPING (SMD)			1
93	N/A	R071502F30111	RES CHIP 15KΩ ±1%(F) 1/16 0603 TAPPING (SMD)			1
94	N/A	R072001J30111	RES CHIP 2KΩ ±5%(J) 1/16W 0603 TAPPING （SMD)(Y180222001J0)			3
95	N/A	R072200J20111	05: RESISTOR.RES CHIP 220Ω ±5%(J) 1/8W.0603 TAPPING(SMD).....			8
96	N/A	R073002J10111	05: RESISTOR.RES CHIP 30KΩ ±5%(J) 1/10W.0603 TAPPING (SMD).....			1
97	N/A	R074701J20111	RESISTOR.RES CHIP 4.7KΩ ±5%(J) 1/8W.0603 TAPPING(SMD).....			11
98	N/A	R074702J20111	05: RESISTOR.RES CHIP 47KΩ ±5%(J) 1/8W.0603 TAPPING (SMD).....			2
99	N/A	R076801J10111	RESISTOR.RES 6.8KΩ ±5%(J) 1/10W 0603 TAPPING (SMD)			2
100	N/A	R144701J20112	RES ARRAY 4.7KΩ ±5%(J) 1/10W 8P4R 3216 TAPPING (SMD)			6
101	N/A	T00T390402G01	TR GMBT3904 SOT-23 GTM (SMD)			3
102	N/A	T00T390602G01	TR GMBT3906 SOT-23 GTM (SMD)			4
103	N/A	T01A340102A21	XSTR AO3401/ST3401, SOT- 23;3 , Alpha & Omega/ST			1
104	N/A	Y64115HB06*1	CONNECTOR 180℃ 2mm 6PIN			1
105	C-00008116	XLM19EA100015	BEZEL ASSY LM/MW19E-AA BEZEL(BLACK 426C paint)+BUTTON(BLACK 426C)+LENS			1
106	N/A	P727A91PLM270-B	BEZEL ABS HB BLACK 426C panit LM/MW19E-AA W/O LOGO REV:0			1
107	N/A	P763A91PLM040-C	FUNCTION BUTTON ABS HB BLACK 426Cprint SILVER 877C LM/MR17E-ABAD REV:0			1
108	N/A	P791P300LM040-A	LENS PC NATURA LM/MR17E-ABAD REV:0			1
109	C-00008117	XLM19EA110003	HOUSING ASSY LM/MW19E-ABAD BLACK 426C			1
110	N/A	M410810130001	SCREW Φ4.0*L8mm NICKEL WITH WASHER			4
111	N/A	M632700LM0060	Fix Plate SECC T0.8mm LM/ML17A2-a REV:0			1
112	N/A	P728AF1PLM090-A	HOUSING ABS PA757 BLACK 426C LM/MW19E-ABAD REV:0			1



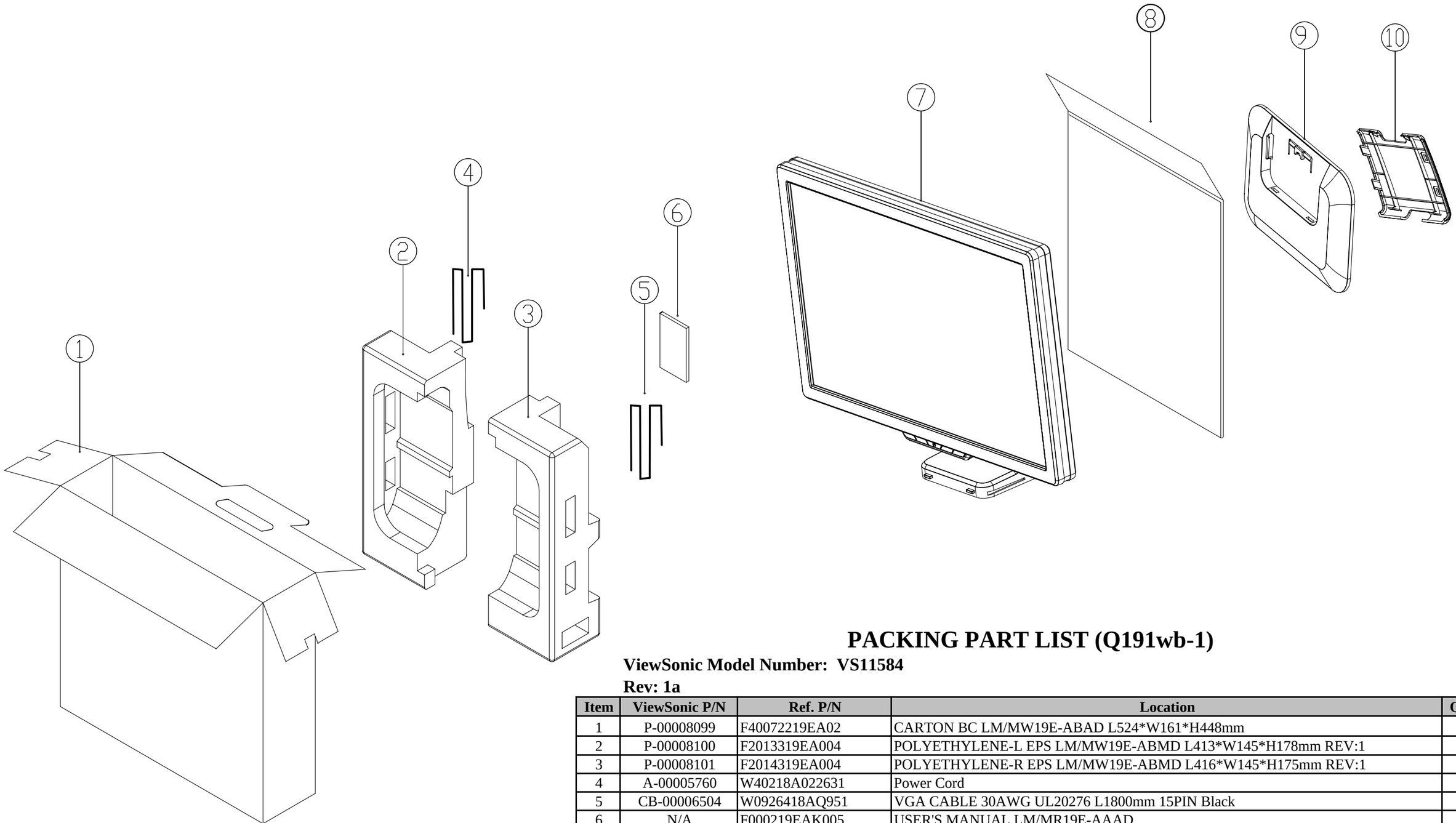
EXPLODED PARTS LIST (Q191wb-1)

ViewSonic Model Number: VS11584

Rev: 1a

Serial No. Prefix: QH0

Item	ViewSonic P/N	Ref. P/N	Description	Q'ty
1	N/A	XLM19EA100002	BEZEL ASSY LM/MW19E-ABAD BEZEL(877C)+BUTTON(426C)+LENS	1
2	B-00008086	XLM17EA050001	KEY BOARD ASSY LM/MR17E-ABAD 2LAYS 5KEY L105*W14.4*T1.6mm FR1	1
3	N/A	M154222006401	SCREW Φ2.0xL6mm NI	3
4	N/A	P727AF01LM040-B	BEZEL ABS PA757 SILVER 877C LM/MR19E-ABAD REV:0	1
5	N/A	M1052B3004401	SCREW.SCREW MACHINE/ Φ3*L4mm NI.....	1
6	N/A	M101082807401	Mechanic Screw Φ2.8*L7mm	1
7	N/A	M621700LM0520-A	Bracket SECC LM/MW19E-AA (RGB-ONLY) VIEWSONICREV:0	1
8	N/A	XLM19EA040003	MAIN BOARD ASSY LM/MW19E-ABA	1
9	B-00008085	XLM1700390012-SF	POWER BOARD+INVERTER BOARD ASSY LM/17"&19"LCD MONITOR +5V +24V PI-SB02(飛鴻)	1
10	N/A	M155223008401	SCREW Φ3.0* L8mm NICKEL	1
11	N/A	XLM19A1270001	MECHANICAL ASSY LM/MR19-A1AB/MR19系列(EMI蓋+麥拉片)	1
12	N/A	M105243005401	SCREW MACHINE B頭(Binding) Φ3.0mm L5mm NICKEL	2
13	N/A	M701900LM0080-K	Hinge-L SPCC NI LM/MR17E-ABAD REV:0	1
15	N/A	M155244012401	SCREW Φ4.0*L12mm NICKEL	1
17	N/A	M701900LM0090-K	Hinge-R SPCC NI LM/MR17E-ABAD REV:0	1
18	C-00008118	XLM17EA280005	BASE ASSY(C-TYPE) LM/MR17E-ABAD BLACK 426C	1
19	HW-00008016	P711A91PLM040-A	BRACKET(FRONT) B-TYPE ABS HB BLACK 426C LM/MR17E-ABAD REV:0	1
20	N/A	M105244012B01	SCREW MACHINE Φ4.0*L12mm	4
21	N/A	P74AA91PLM030-A	BASE ABS HB BLACK 426C LM/MR17-D1AD REV:0	1



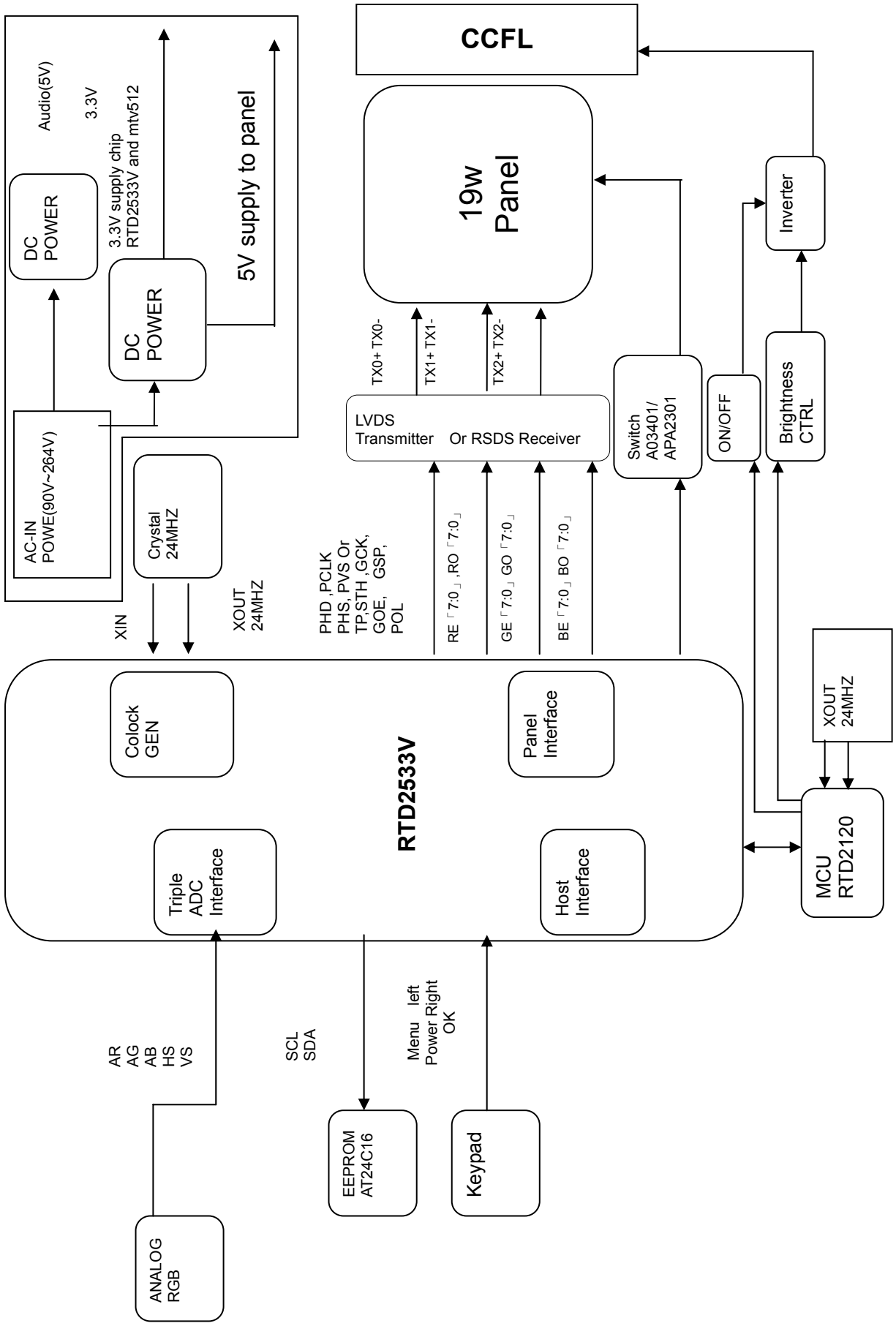
PACKING PART LIST (Q191wb-1)

ViewSonic Model Number: VS11584

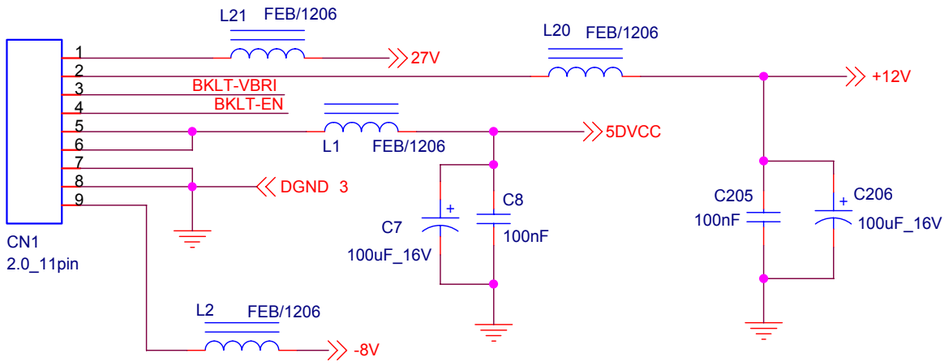
Rev: 1a

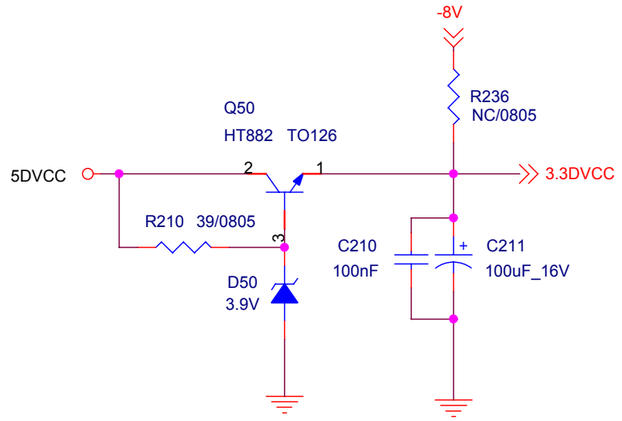
Item	ViewSonic P/N	Ref. P/N	Location	Q'ty
1	P-00008099	F40072219EA02	CARTON BC LM/MW19E-ABAD L524*W161*H448mm	
2	P-00008100	F2013319EA004	POLYETHYLENE-L EPS LM/MW19E-ABMD L413*W145*H178mm REV:1	
3	P-00008101	F2014319EA004	POLYETHYLENE-R EPS LM/MW19E-ABMD L416*W145*H175mm REV:1	
4	A-00005760	W40218A022631	Power Cord	
5	CB-00006504	W0926418AQ951	VGA CABLE 30AWG UL20276 L1800mm 15PIN Black	
6	N/A	F000219EAK005	USER'S MANUAL LM/MR19E-AAAD	1
7	C-00008118	XLM17EA280005	BASE ASSY(C-TYPE) LM/MR17E-ABAD BLACK 426C	1
8			Monitor Head Only	1
9	N/A	F300250000054	PE Bag L600*W500*T0.07mm	1
10	N/A	P74AA91PLM030-A	BASE ABS HB BLACK 426C LM/MR17-D1AD REV:0	1

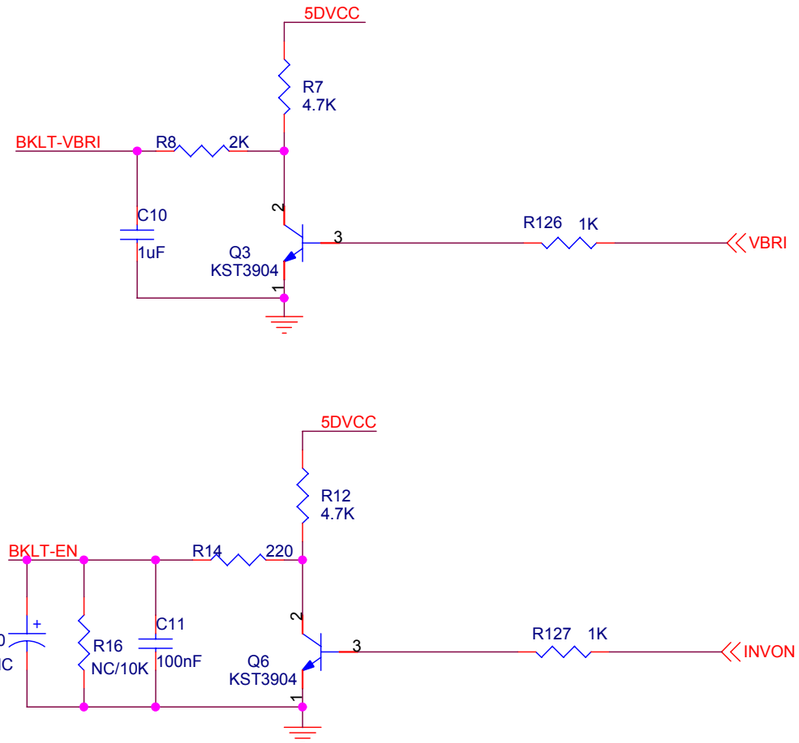
9. Block Diagram

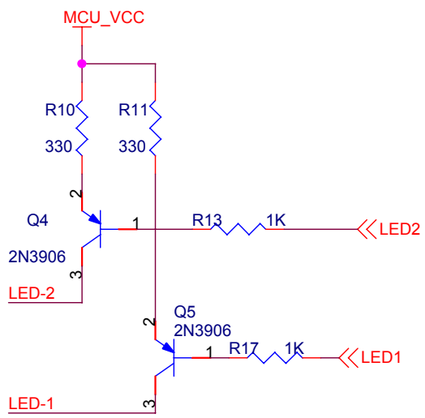


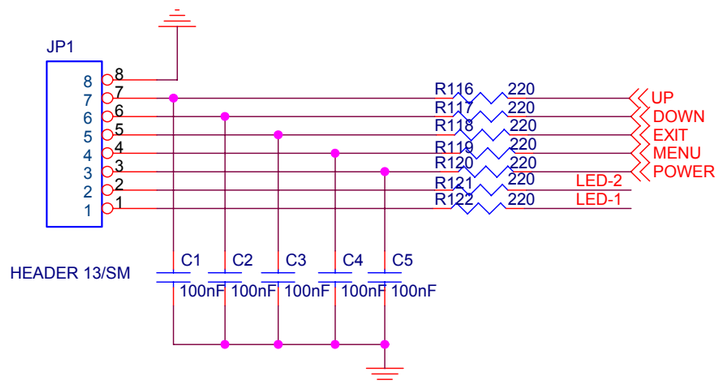
10. Schematic Diagrams



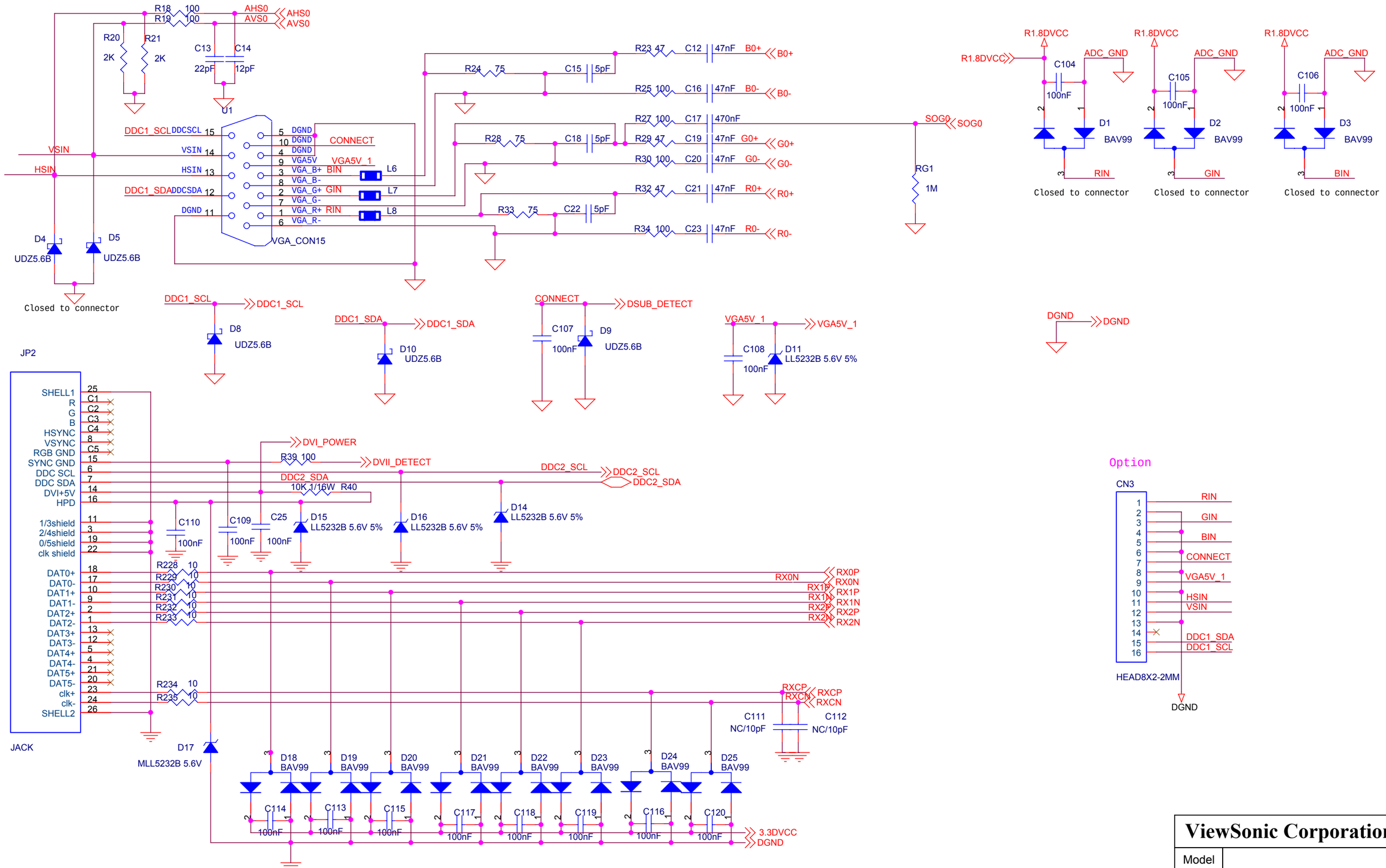




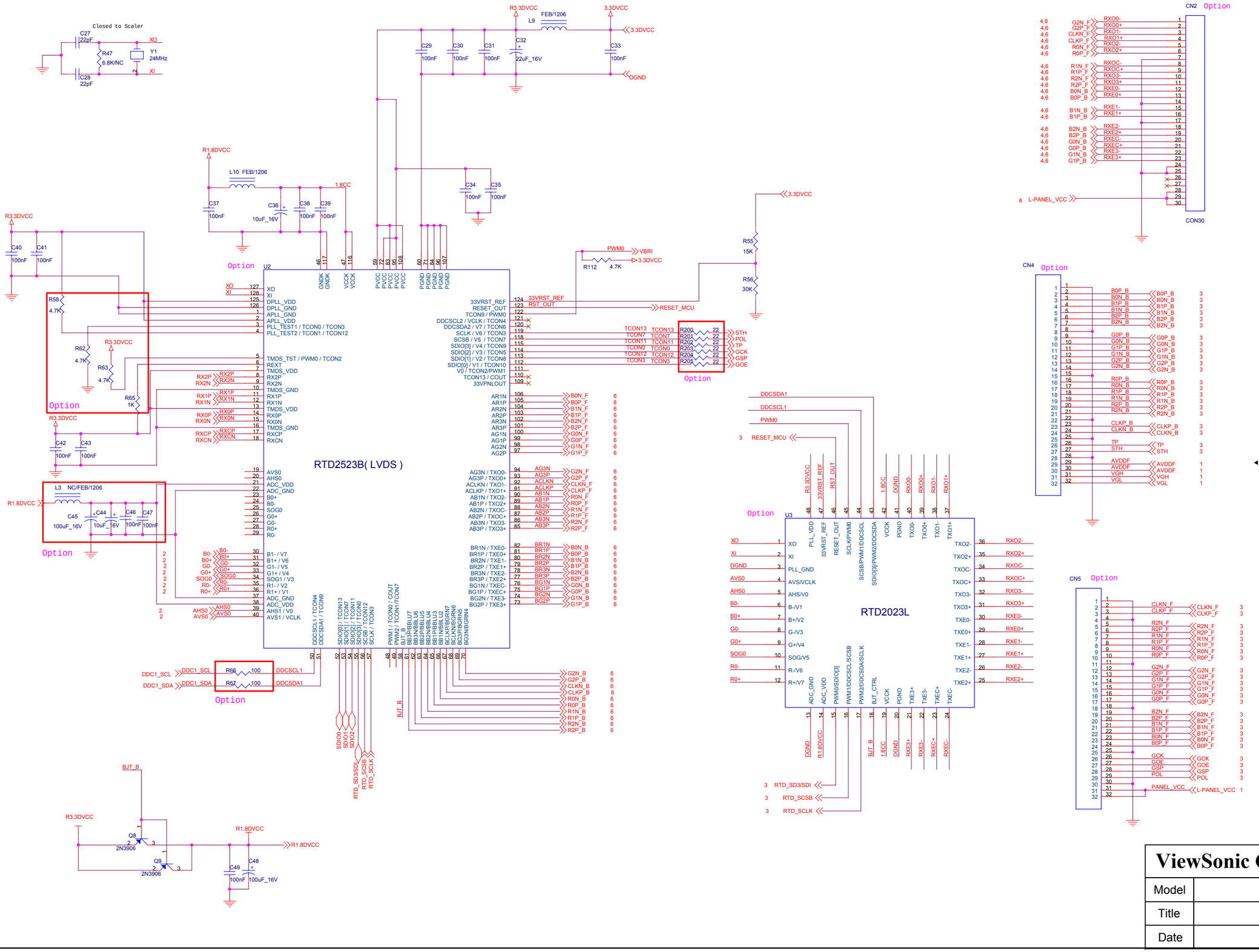


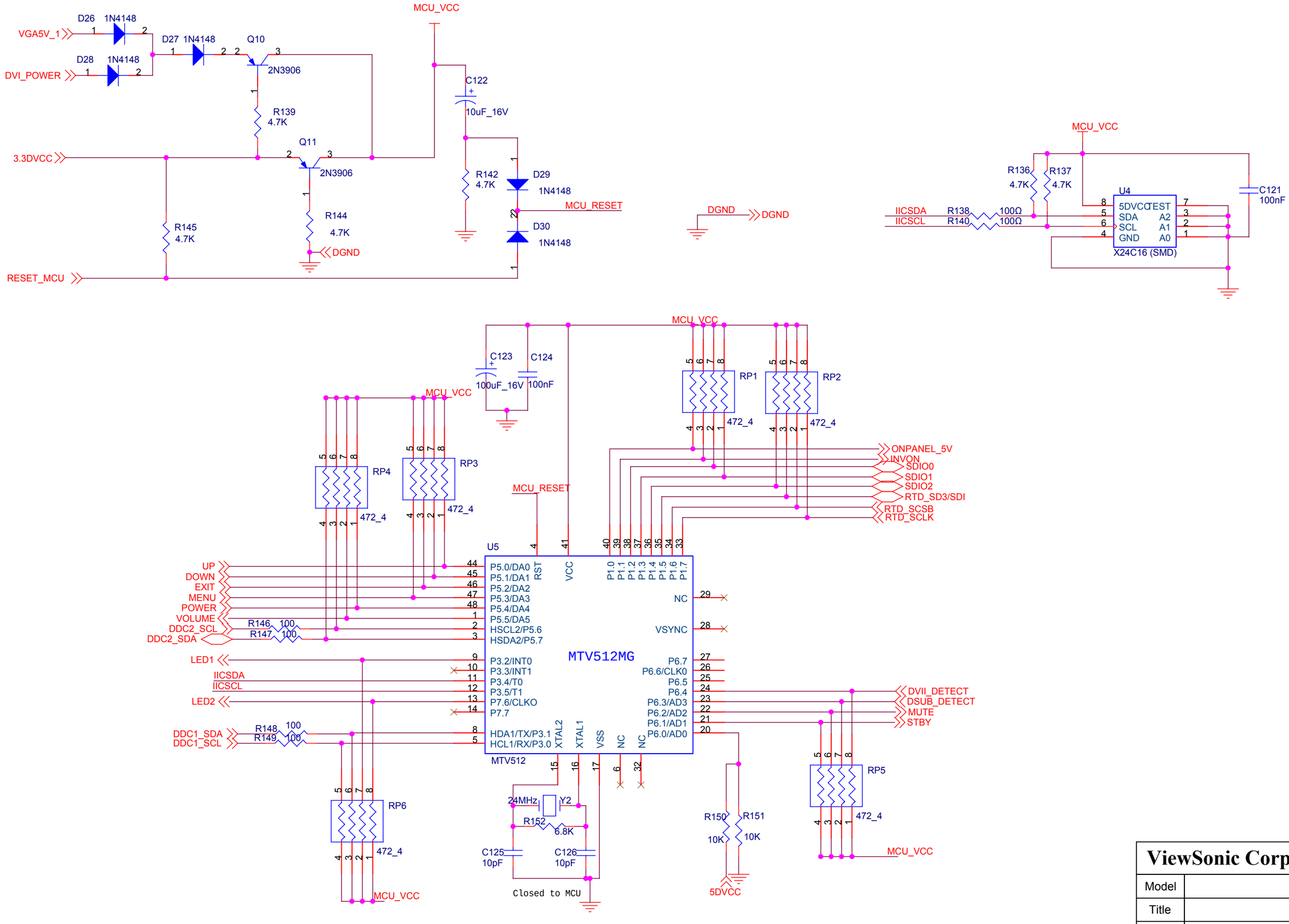


ViewSonic Corporation		
Model		
Title		
Date		Rev:

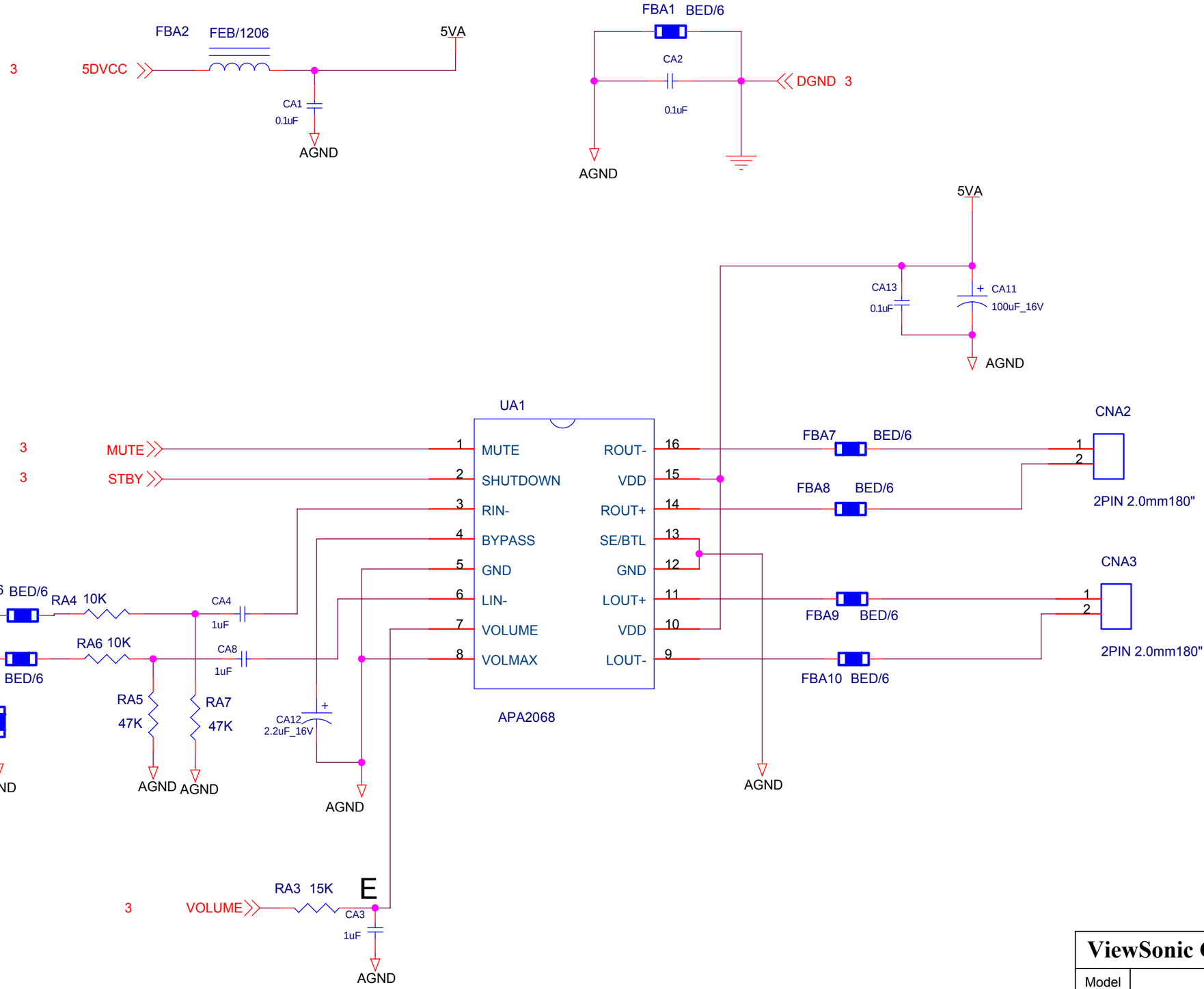


ViewSonic Corporation		
Model		
Title		
Date		Rev:

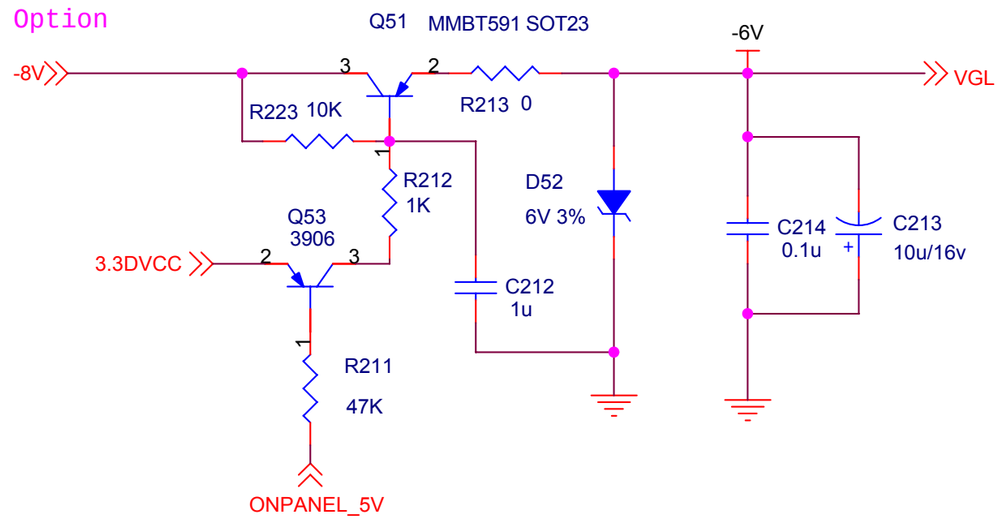

RTD2523B(LVDS)
RTD2023L
Option
Closed to Scaler
CN2 Option
CON30
CN4 Option
CN5 Option
L-PANEL_VCC
PANEL_VCC
RESET_MCU
DDCSDA1
DDCSCL1
PWM0
VBRI
RTD_SD3/SDI
RTD_SCSB
RTD_SCLK
BJT_B
ViewSonic Corporation
Model
Title
Date
Rev:

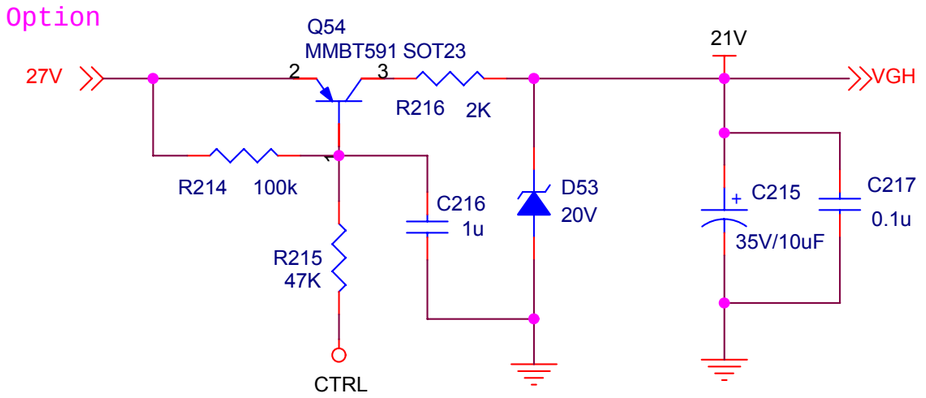


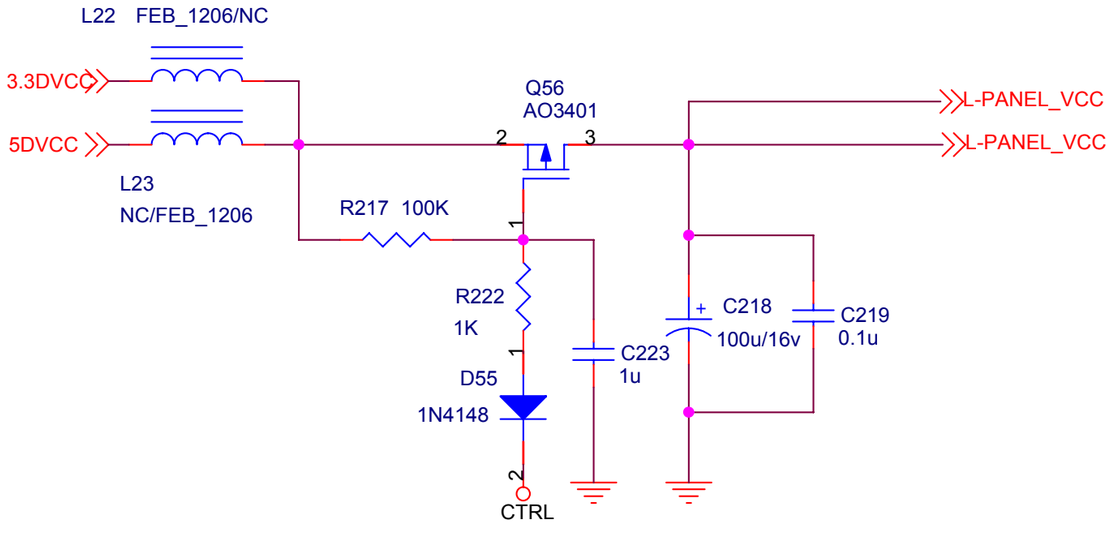
ViewSonic Corporation		
Model		
Title		
Date		Rev:

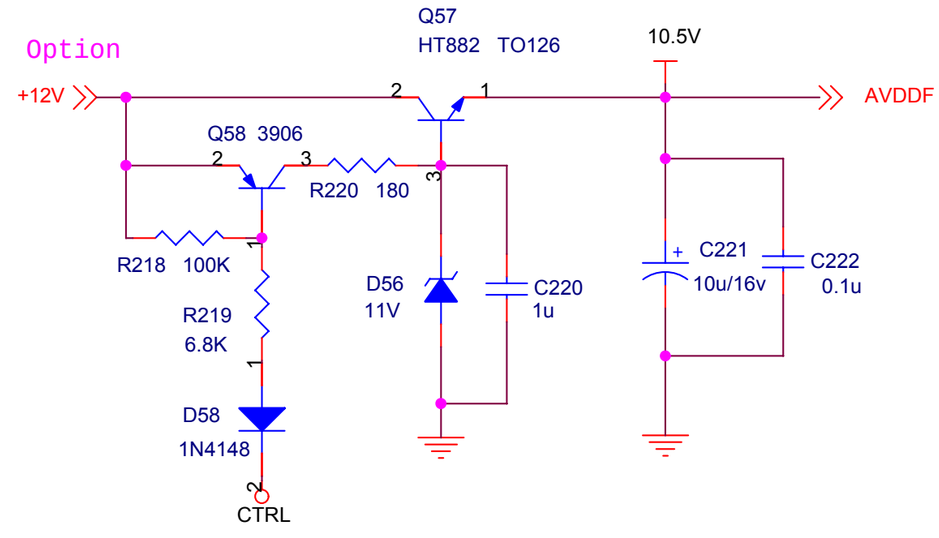


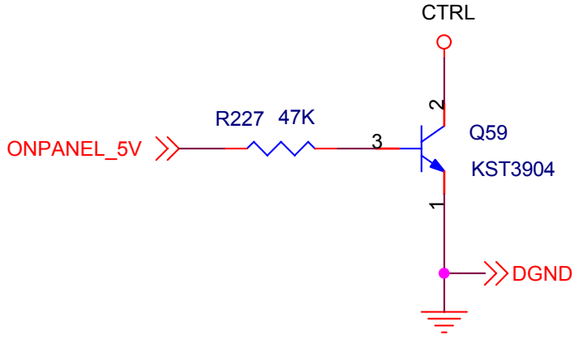
ViewSonic Corporation		
Model		
Title		
Date		Rev:





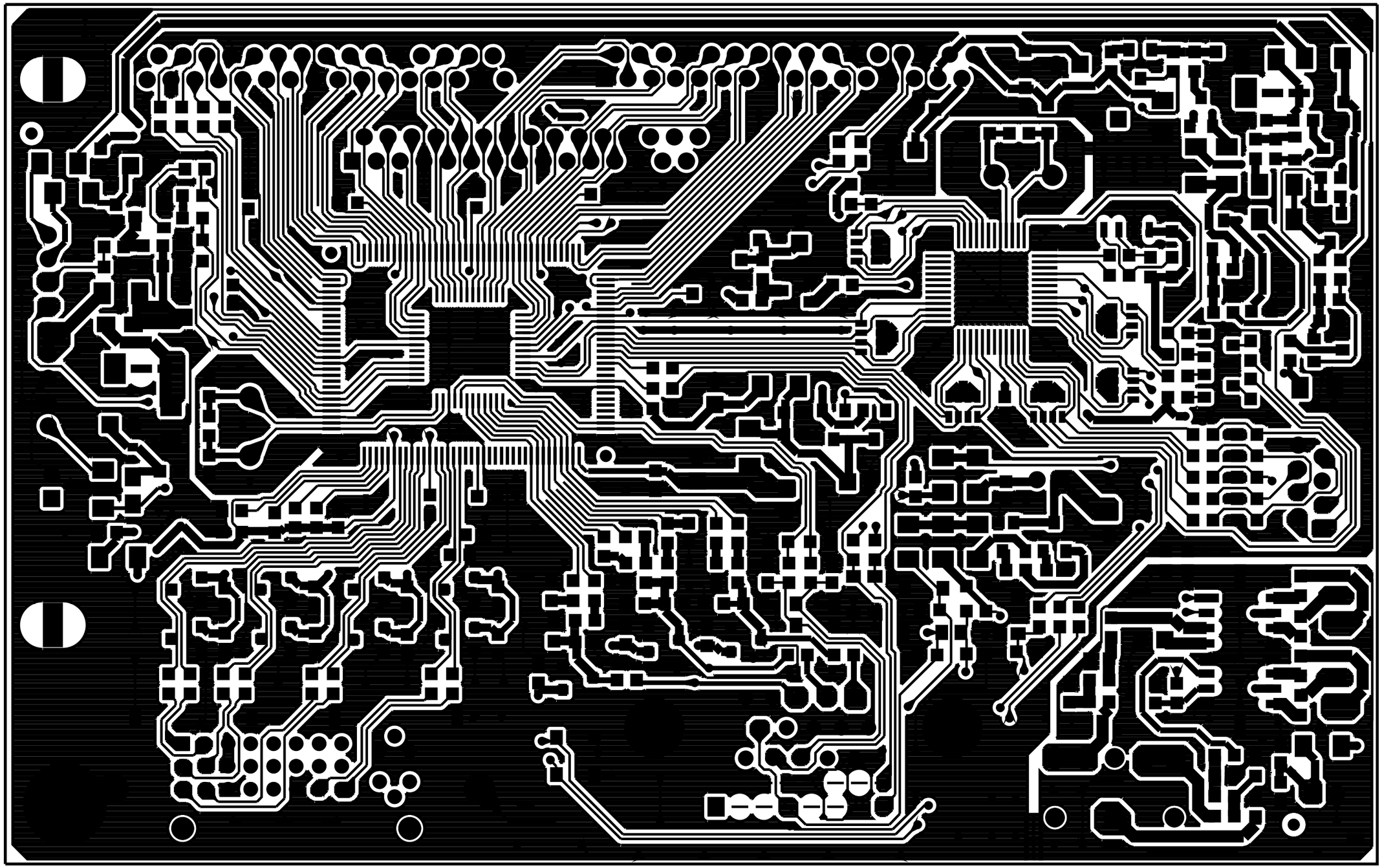




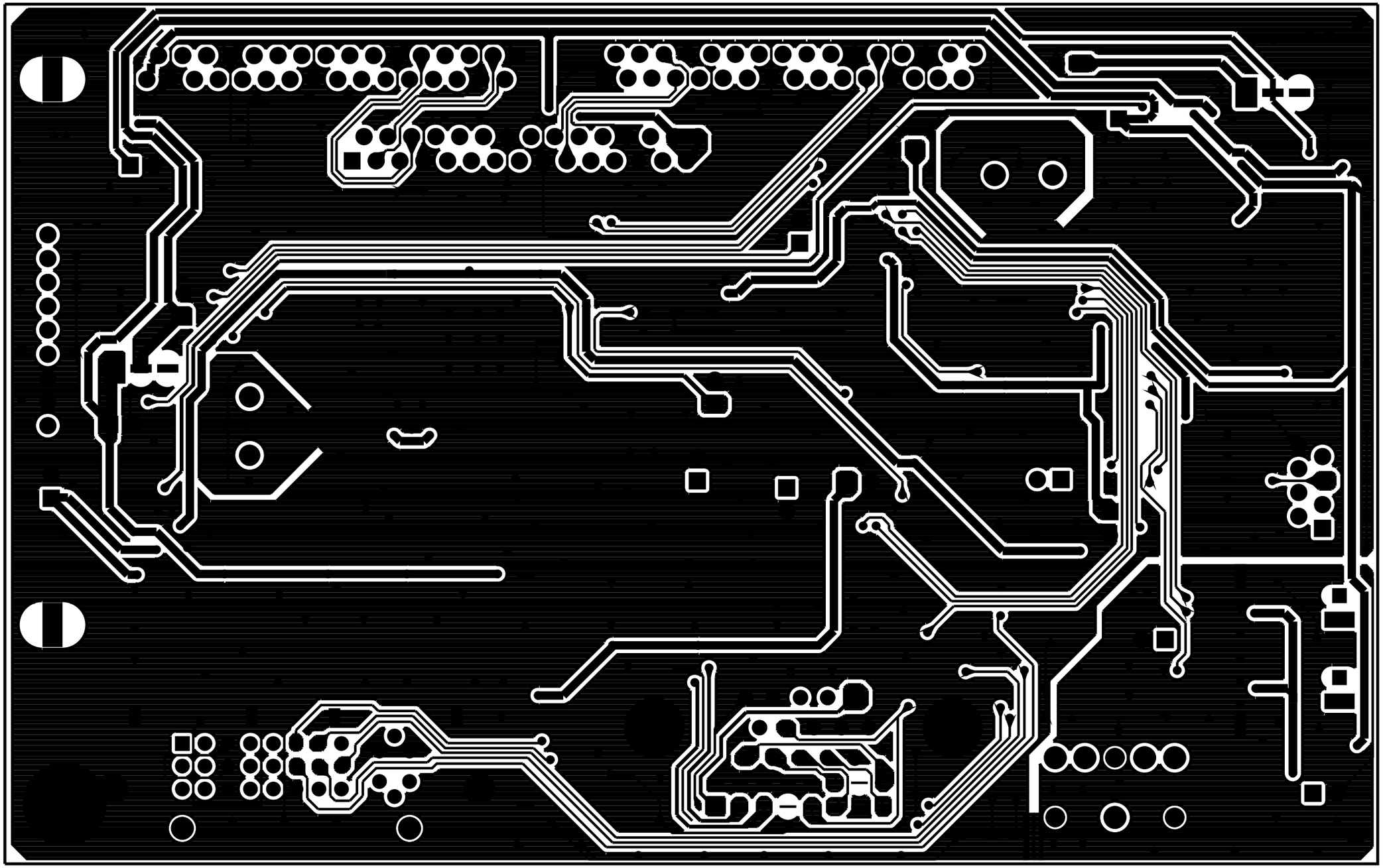


ViewSonic Corporation		
Model		
Title		
Date		Rev:

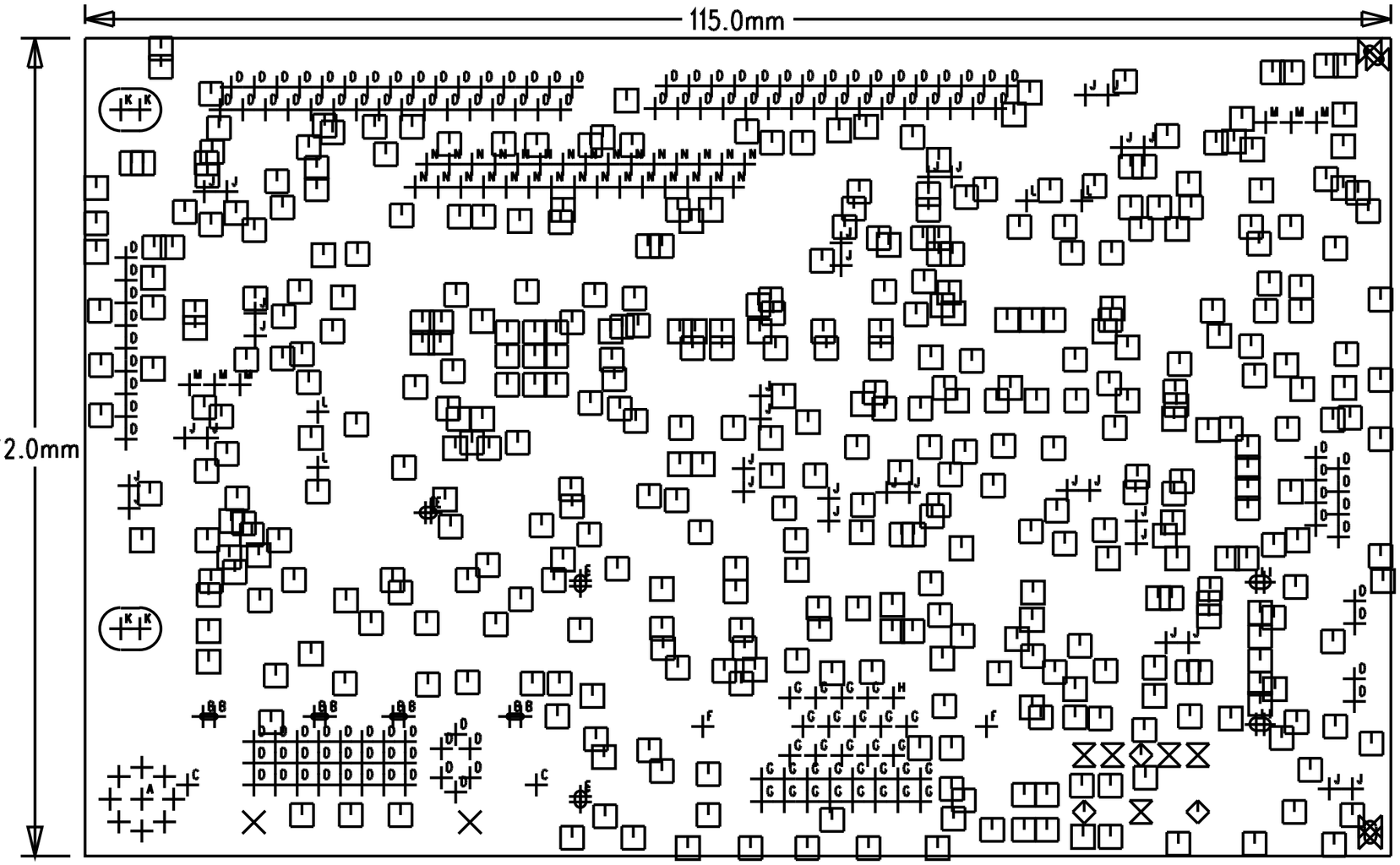
11. PCB Layout Diagrams



ViewSonic Corporation		
Model		
Title	TOP SIDE	
Date		Rev:

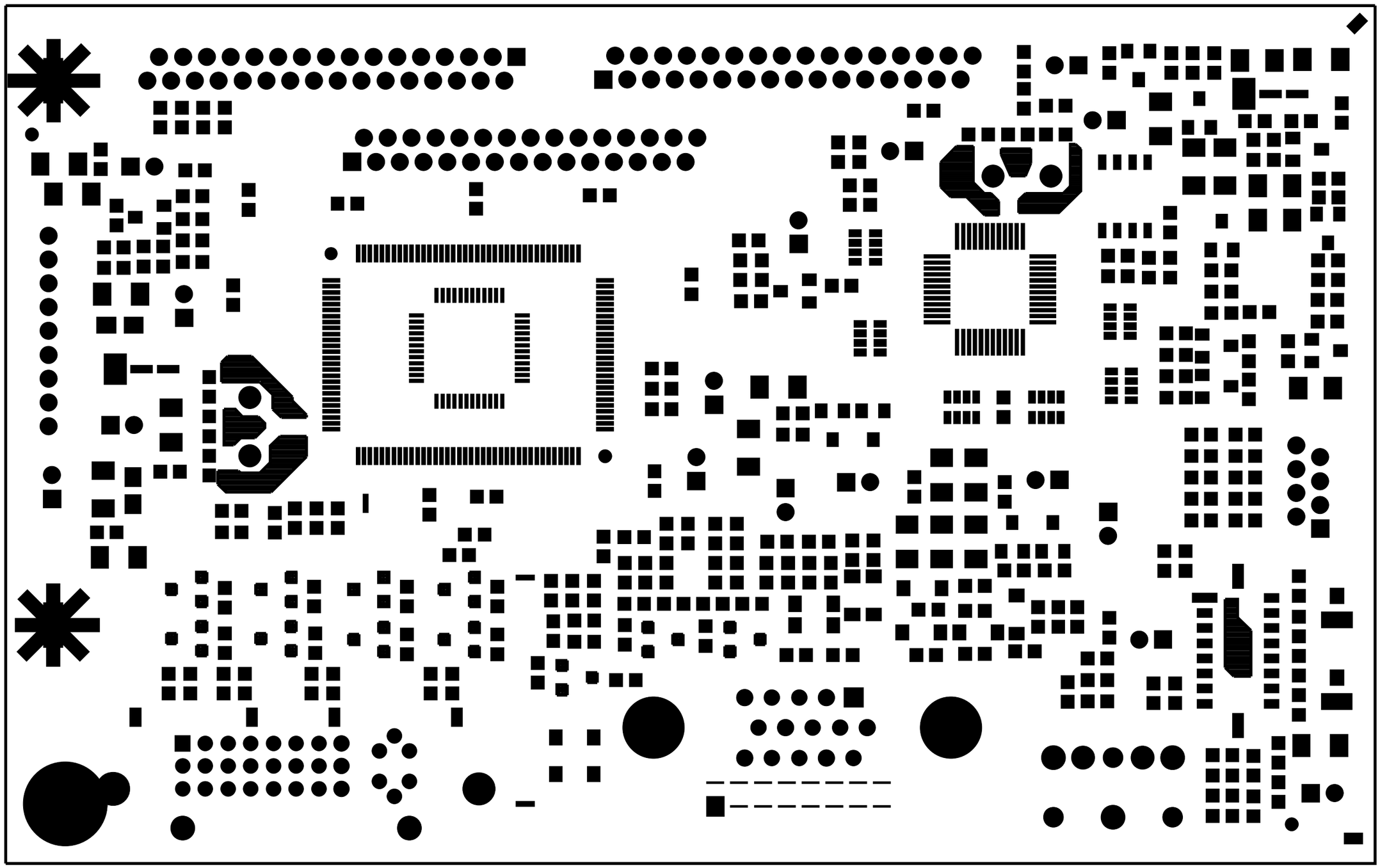


ViewSonic Corporation		
Model		
Title	BOTTOM SIDE	
Date		Rev:

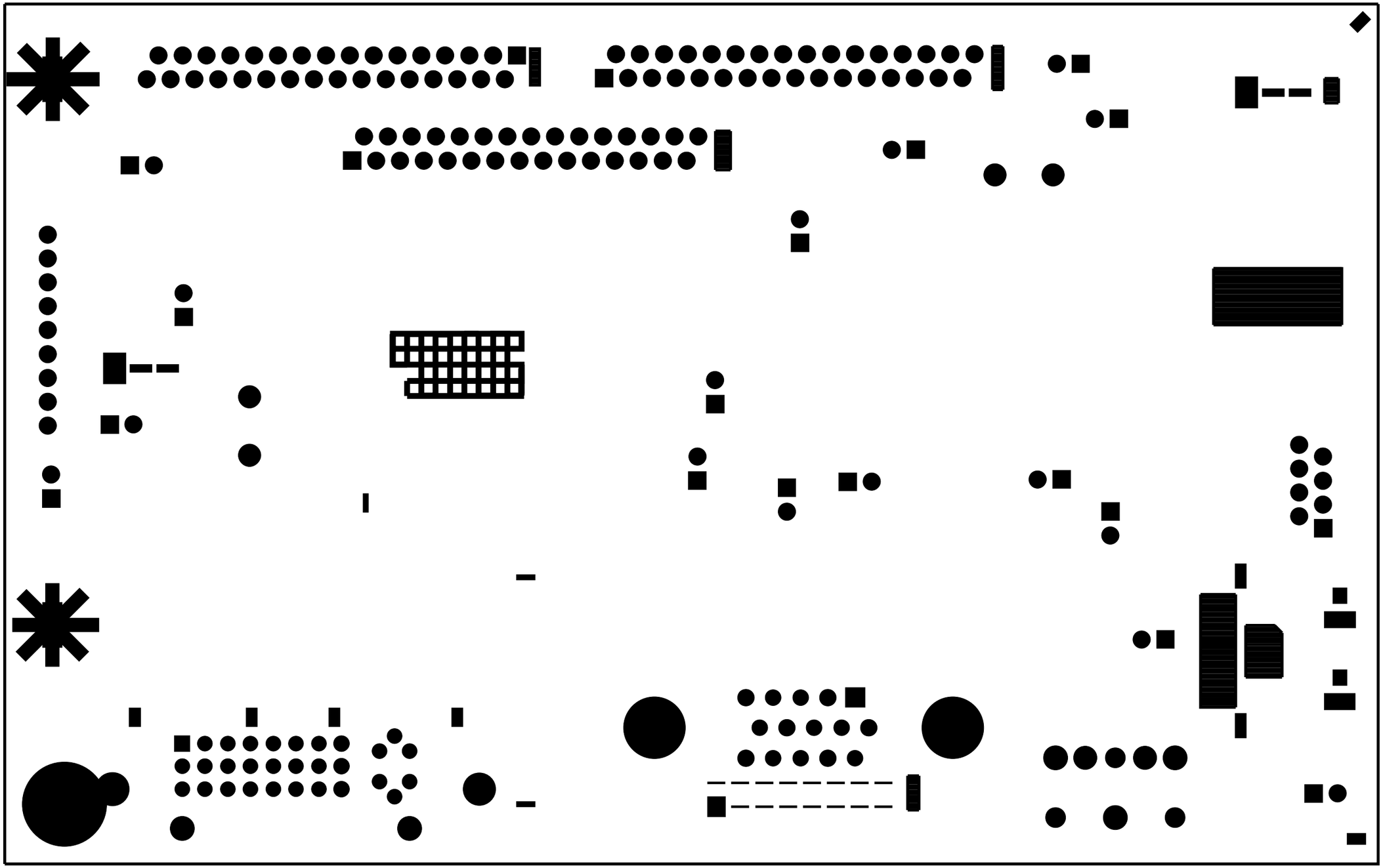


SIZE	QTY	SYM	PLTD	TOL
16	435	□	YES	+/-0.06MM
19.69 x 59.06	4	B	YES	+/-0.06MM
23.62	8		YES	+/-0.06MM
28	32	J	YES	+/-0.06MM
31.5	115	D	YES	+/-0.06MM
32	30	N	YES	+/-0.06MM
35.43	30	G	YES	+/-0.06MM
39	1	H	YES	+/-0.06MM
39.37 x 78.74	2	⋈	NO	+/-0.06MM
39.37 x 59.06	3	E	YES	+/-0.06MM
40	4	L	YES	+/-0.06MM
43.31 x 70.87	2		YES	+/-0.06MM
47.24	6	M	YES	+/-0.06MM
50	5	⧖	YES	+/-0.06MM
62.99	3	◇	NO	+/-0.06MM
76	2	✕	NO	+/-0.06MM
76	2	C	YES	+/-0.06MM
126	2	F	YES	+/-0.06MM
145.67 x 212.6	2	K	YES	+/-0.06MM
157.48	1	A	YES	+/-0.06MM

ViewSonic Corporation		
Model		
Title	DRILL DRAWING	
Date		Rev:



ViewSonic Corporation		
Model		
Title	MASK TOP	
Date		Rev:



ViewSonic Corporation		
Model		
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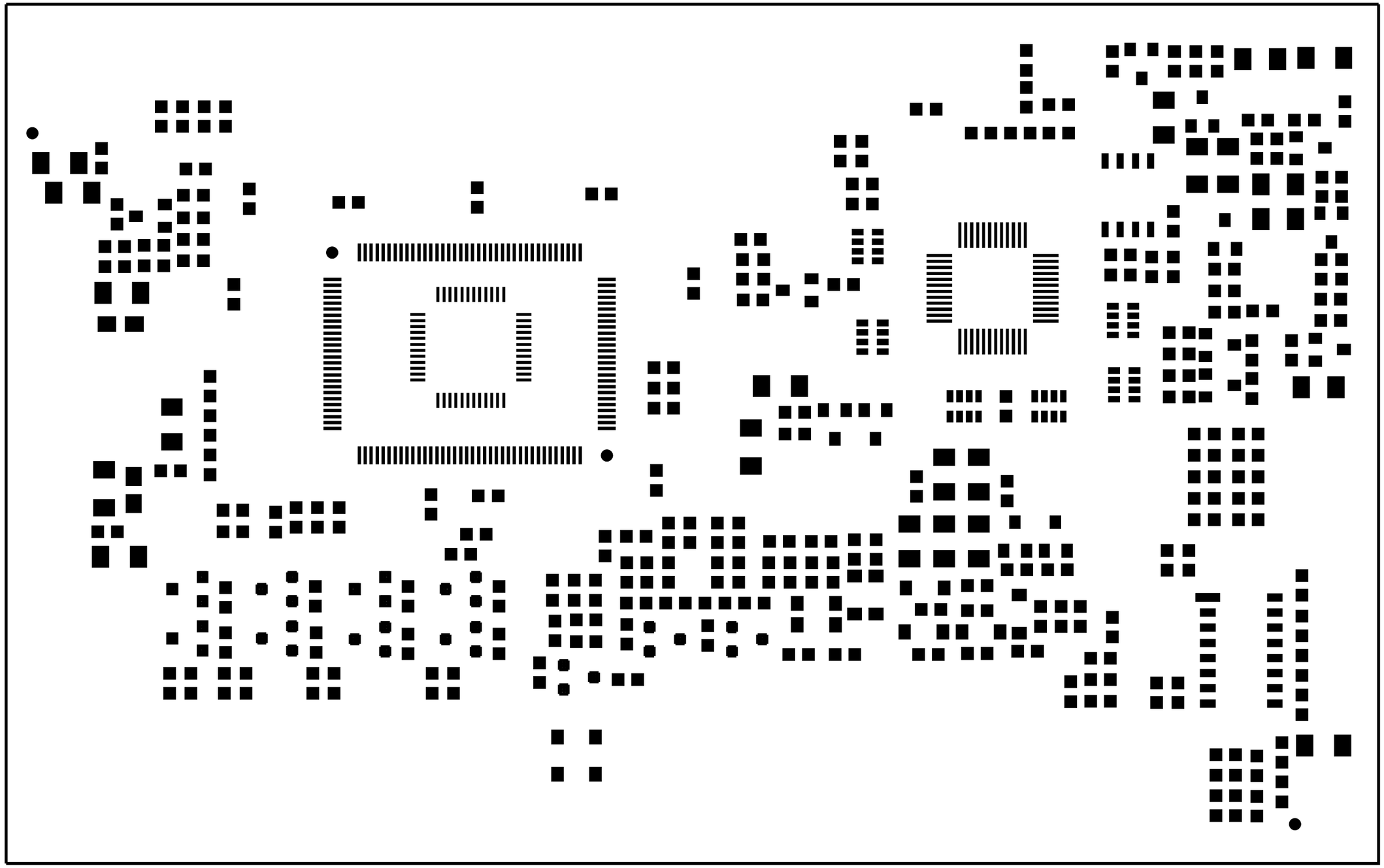
Date		Rev:



ViewSonic Corporation		
Model		
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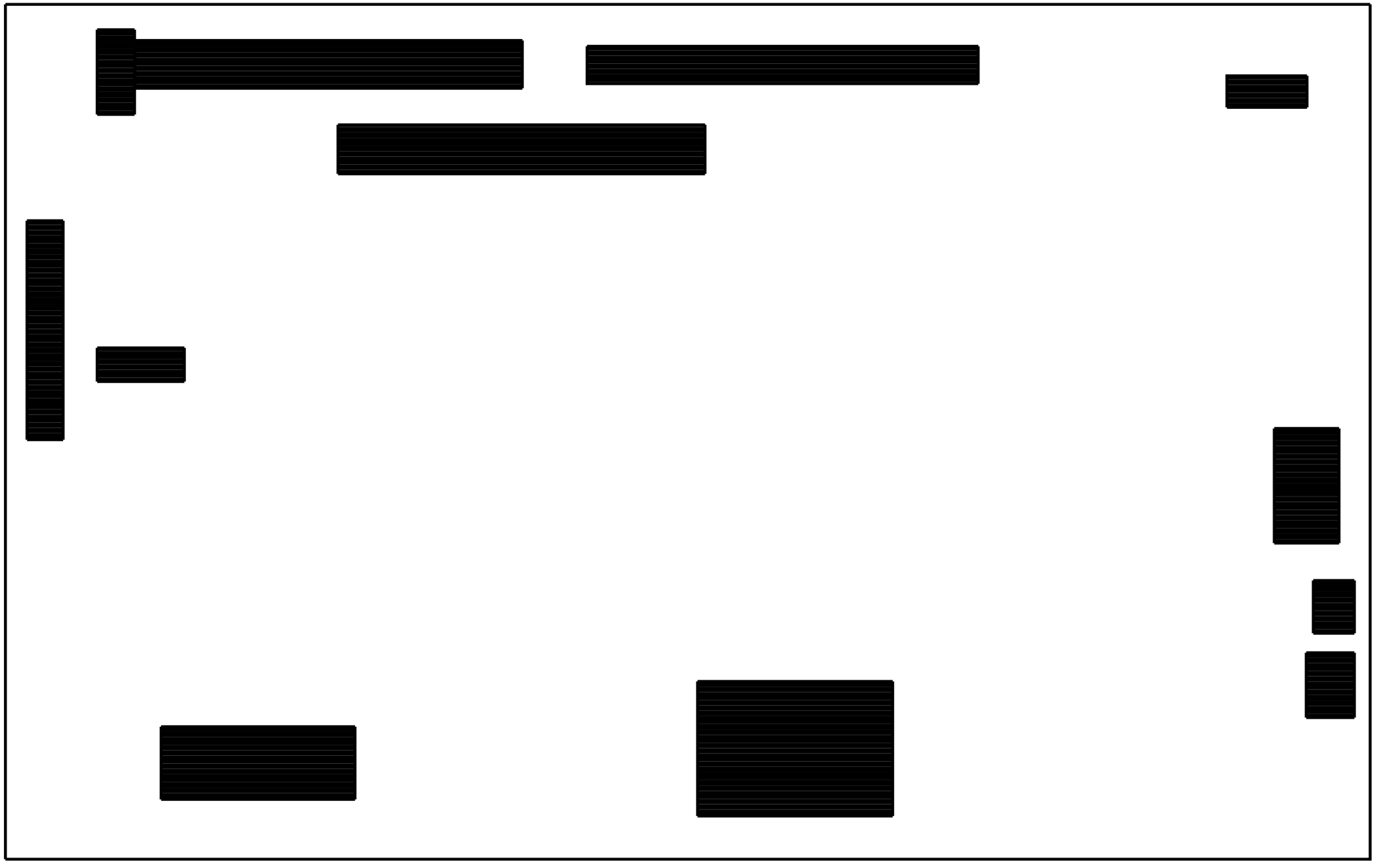
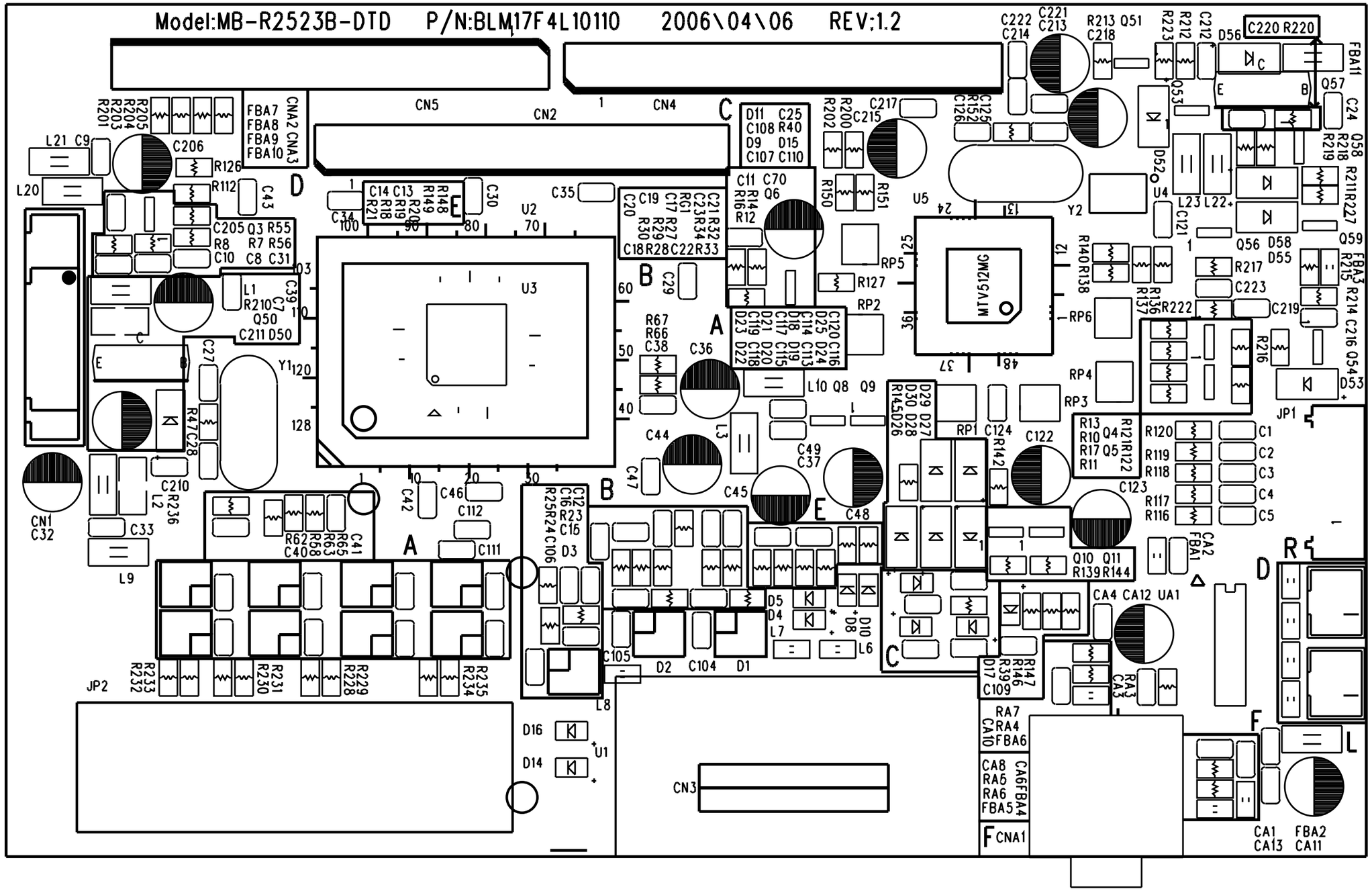
Date		Rev:



ViewSonic Corporation		
Model		
Title	SILKSCREEN BOTTOM	
Date		Rev:



ViewSonic Corporation		
Model		
Title	SILKSCREEN TOP	
Date		Rev:

* 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?

Unit	*Excellent*	*Good*	*Fair*	*Bad*
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?

Item	*Excellent*	*Good*	*Fair*	*Bad*
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 dada:

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)