Service Manual

ViewSonic VX2000-1

Model No.VLCDS23723-1W

20.1” *Color TFT LCD Display*

(VX2000-1_SM_558 **-Rev.1a-Oct 2002**)

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

Revision History

Revision	Date	Description Of Changes	Approval
1a	10/29/02	Initial Reversion DCN-**2323**	**Tom.Sears**

TABLE OF CONTENT

PRECAUTIONS AND NOTICES

Prior to using this manual, please ensure that you have carefully followed all the procedures outlined in the user manual for this product.

- Read all of these instructions.
- Save these instructions for later use.
- Follow all warnings and instructions marked on the product.
- Do not use this product near water.
- This display should be installed on a solid horizontal base.
- When cleaning, use only a neutral detergent cleaner with a soft damp cloth. Do not spray with liquid or aerosol cleaners.
- Do not expose this display to direct sunlight or heat. Hot air may cause damage to the cabinet and other parts.
- Adequate ventilation must be maintained to ensure reliable and continued operation and to protect the display from overheating. Do not block ventilation slots and openings with objects or install the display in a place where ventilation may be hindered.
- Do not install this display near a motor or transformer where strong magnetism is generated. Images on the display will become distorted and the color irregular.
- Do not allow metal pieces or objects of any kind fall into the display from ventilation holes.

Slots and openings in the cabinet and the back or bottom are provided for ventilation, to ensure reliable operation of the product and to protect it from overheating, those openings mus**t** not be blocked or covered. The openings should never be blocked by placing the product on a bed, sofa, rug, or other similar surface. This product should never be placed near or over a radiator or heat register. This product should not be placed in a built-in installation unless proper ventilation is provided.

Chapter 1 Introduction

*This manual provides the integral technical information you need to maintain the LCD Monitor. And this manual is applied to the model of 1600*1200 pixels color TFT LCD Monitor with a 20.1" flat panel screen. There are ten topics in this manual, and you can immediately identify problems through this manual.*

This manual is for the technicians and people who have the electronic background. Send the product back to the distributor for repairing and do not attempt to do anything which is complex or not mentioned in the troubleshooting.

1-1 The Appropriate Operation

- *Turn off the Product before cleaning.*
- *Use only a dry soft cloth when cleaning the LCD panel surface.*
- *Use a soft cloth moistured with mild detergent to clean the display housing.*
- *Use only high quality and safety approved AC/DC power Adapter.*
- *Disconnect the Power Plug from AC outlet if the Product is not used for a long period of time.*
- *Do not touch the LCD panel surface with sharp or hard objects.*
- *Do not use abrasive cleaners, waxes or solvents for your cleaning.*

Do not operate the product under the following conditions:

** Extremely hot, cold or humid environment.*

** Areas susceptible to excessive dusts and dirt*

** Near any applicance generating a strong magnetic field.*

** Place in direct sunlight.*

1-2 Product Highlight

- Analog and digital signal inputs
- Active matrix TFT LCD technology
- VESA 1600*1200@60Hz
- 280 cd/m² (max), 250 cd/m² (typ), 200 cd/m² (min)
- 30-82kHz Horizontal Frequency
- 45-85Hz Vertical Refresh Rate
- Auto Image Adjustment
- Multifunction OSD user controls
- VESA DPMS Power saving
- Resolution Compatibility: 640*350, 640*480, 720*400, 800*600, 832*624,1024*768, 1280*720, 1280*1024, 1600*1200

1-3 Technical Specification

I.) Fujitsu Panel

- Active Matrix Type Liquid Crystal Panel
- 20.1" diagonal screen size
- 408.0(H)*306.0(V) Active Size
- 1600*1200 addressable pixels
- 0.255mm*0.255mm pixel pitch
- 280 cd/m² (max), 250 cd/m² (typ), 200 cd/m² (min)
- 650:1(max),500:1(typ),350:1(min)
- Lamp number : 6 CCFLs
- Life: 50,000 hrs (min)

II.) Power Supply

- Input Voltage Range: 90 to 264 VAC
- Input Frequency Range: 47.5 to 63 Hz
- Output Voltage@0 ~ 6.66A Load: 12V DC +/- 5%
- Over Current Protection 8.66A typ at 12.6 VDC
- Power Consumption 80 Watts (typ.)

III.) Audio

- *Line Input Connection: 3.5mm Stereo Jack*
- *Line Input Signal: 1.3Vrms*
- *Maximum Power Output (Electric): 3W @ <5% distortion*

IV.) Look up Table Timing

(Analog)

- *640*350@70Hz, 31.5kHz*
- *640*480@67Hz, 35.0kHz*
- *640*480@72Hz, 37.9kHz*
- *720*400@70Hz, 31.5kHz*
- *800*600@60Hz, 37.9kHz*
- *800*600@72Hz, 48.1kHz*
- *832*624@75Hz, 49.7kHz*
- *1024*768@70Hz, 56.5kHz*
- *1024*768@75Hz, 60.0kHz*
- *1280*1024@60Hz, 63.4kHz*
- *1280*720 @60Hz,45kHz*
- *1600*1200@60Hz,*
- *640*480@60Hz, 31.5kHz*
- *640*480@75Hz, 37.5kHz*
- *640*480@85Hz, 43.27kHz*
- *800*600@56Hz, 35.1kHz*
- *800*600@75Hz, 46.9kHz*
- *800*600@85Hz, 53.7kHz*
- *1024*768@60Hz, 48.4kHz*
- *1024*768@72Hz, 58.1kHz*
- *1024*768@85Hz, 68.67kHz*
- *1280*1024@75Hz, 79.97kHz*

(Digital)

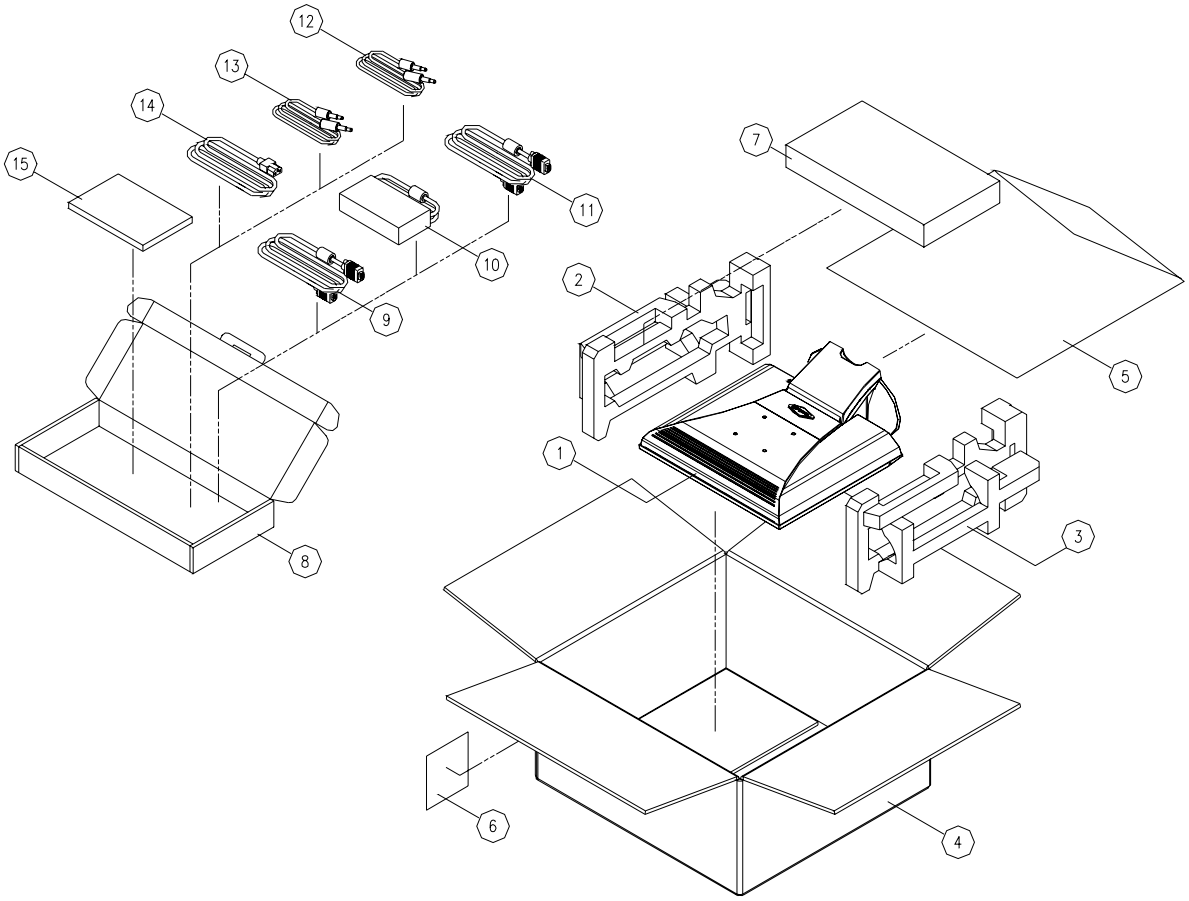
- *640*350@70Hz, 31.5kHz*
- *640*480@60Hz, 31.5kHz*
- *640*480@72Hz, 37.9kHz*
- *720*400@70Hz, 31.5kHz*
- *800*600@60Hz, 37.9kHz*
- *800*600@72Hz, 48.1kHz*
- *1024*768@60Hz, 48.4kHz*
- *1024*768@72Hz, 58.1kHz*
- *1024*768@85Hz, 68.67kHz*
- *1600*1200@60Hz,*
- *640*400@60Hz, 31.5kHz*
- *640*480@75Hz, 37.5kHz*
- *640*480@85Hz, 43.27kHz*
- *800*600@56Hz, 35.1kHz*
- *800*600@75Hz, 46.9kHz*
- *800*600@85Hz, 53.7kHz*
- *1024*768@70Hz, 56.5kHz*
- *1024*768@75Hz, 60.0kHz*
- *1280*720 @60Hz,45kHz*
- *1280*1024@60Hz, 63.4kHz*

V.) Mechanical & Environmental Condition

- *Width*Height*Depth:* *483.0mm*502.1mm*69.5mm(exclude Stand)*
  *483.0mm*502.1mm*210.35mm(full set)*
- *Monitor Weight* *8.4kgs/18.5lbs*
- *Operating Temperature:* *0^0C to +40^0C*
- *Storage Temperature:* *-20^0C to +60^0C*
- *Operating Relative Humidity: 20%~85% RH Non-Condensing*
- *Storage Relative Humidity: 5%~85% RH Non-Condensing*

Chapter 2 Mechanical Construction

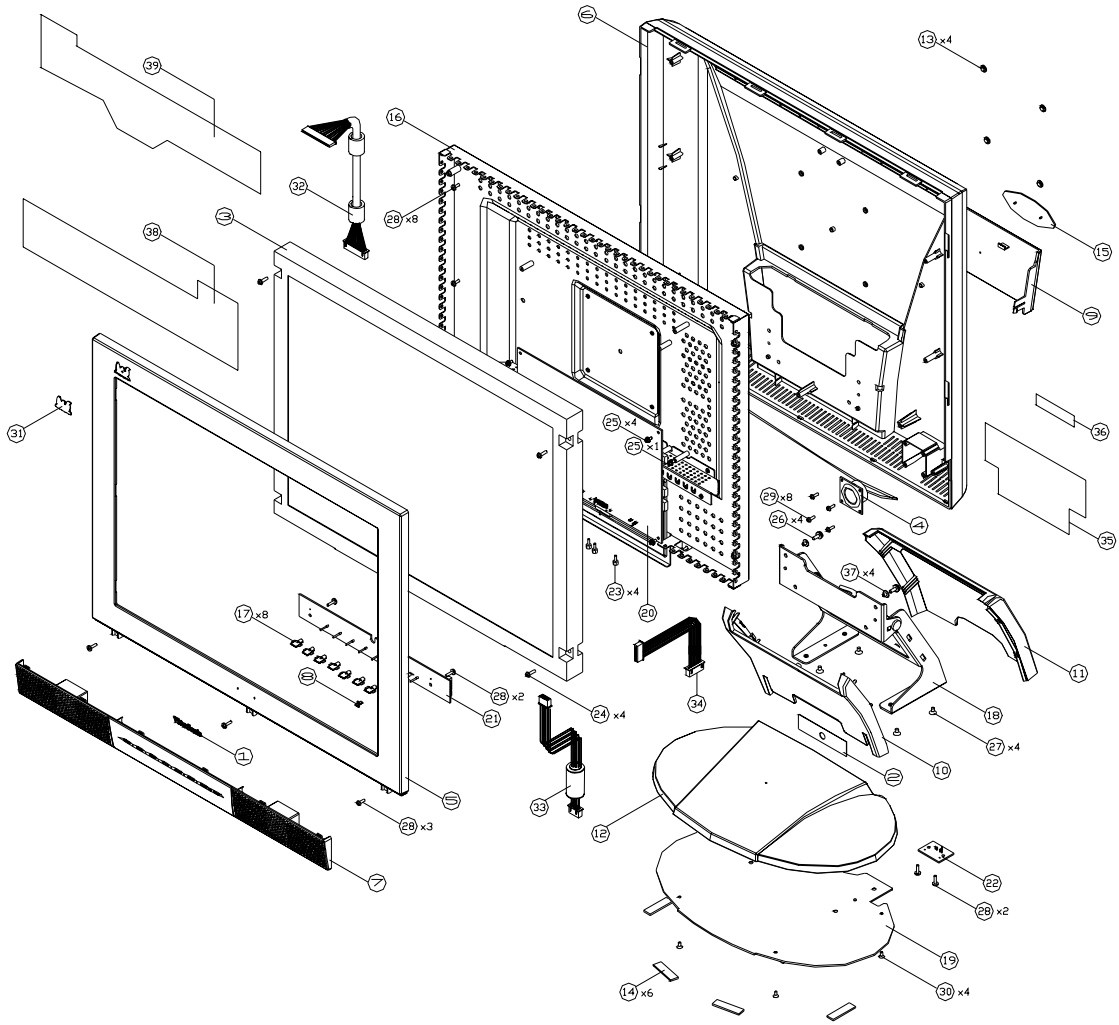
2-1 Package Overview



2-1.1 Replacement Parts List

Item	P/N	Description
1	DC.58701.001	D.C. VX2000(FUJITSU)
2	56.58701.001	CUSHION R EPE VX2000
3	56.58702.001	CUSHION L EPE VX2000
4	55.58701.001	CARTON AB-18 580*540*265mm VX2000
5	51.00081.003	PE BAG LDPE 545*890*0.04t W/HOLE
6	35.58203.001	LABEL CARTON 76*76mm
7	70.587DP.001	COMMON PACKAGE VX2000
8	55.52102.001	BOX B 395*195*53 LMT-5020
9	42.59901.003	CABLE VGA 15P 1800mm 2 CORE VX Series
10	47.58701.001	ADAPTER IN:100-240V OUT:12V/6.66A;LSE
11	42.56108.012	CABLE DVI-DVI 1.8M 2-CORE MOLEX 887-4341-00
12	42.59903.001	CABLE AUDIO 1.8M LM/BK/LM VX2000
13	42.59904.001	CABLE MIC 1.8M PK/BK/PK VX2000
14	42.57207.001	CABLE POWER CORD 1.8M0.1M UNSHIELD (NA)
15	36.58701.001	USER'S GUIDE MULTILINGUAL+CD+TCO'99 ECO DOCUMENT VX2000

2-2 Exploded Overview



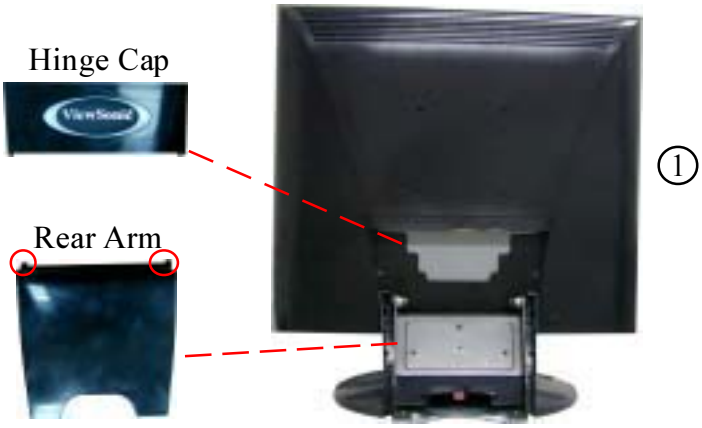
2-2.1 Replacement Parts List

Item	P/N	Description
1	35.90305.001	ViewSonic AL-LOGO
2	35.58702.001	LABEL MIC 77*17.5mm VX2000
3	48.56501.001	TFT LCD 1200*1600 20.1" FUJITSU FLC51UXC8V
4	49.58501.001	ASSY SPEAKER MODULE VG750
5	51.58701.001	FRONT COVER ABS+PC-VS07A VX2000
6	51.58702.001	REAR COVER ABS+PC-VS06 VX2000
7	51.58703.001	COSMETIC CAP ABS+PC-VS06 VX2000
8	51.58705.001	LED LENS PMMA VX2000
9	51.58707.001	HINGE CAP ABS-HB VS06 VX2000
10	51.58708.001	FRONT ARM ABS-HB VS06 VX2000
11	51.58709.001	REAR ARM ABS-HB VS06 VX2000
12	51.58710.001	BASE ABS-HB VS06 VX2000
13	52.00004.001	RUBBER PAD
14	52.57503.002	RUBBER FOOT 35*10*2t VX2000
15	51.58711.001	NAMEPLATE ELLIPSE ViewSonic
16	61.58701.001	SUPPORT BRKT SECC 1.0t VX2000
17	61.58704.001	TOUCH KNOB Zn VX2000
18	61.58702.001	TILT HINGE VX2000
19	61.58703.001	BASE PLATE SPHC-Zn 2.0t VX2000
20	80.58701.001	PCBA MAIN BD VX2000
21	80.58702.001	PCBA CONTROL BD VX2000
22	80.58703.001	PCBA MIC BD VX2000
23	85.005AG.075	SCREW HEX I/O #4-40*H5*L7.5 Ni NYLOK
24	85.1B127.100	SCREW PAN MECH W/S M3.5*10 Mi
25	85.1F123.060	SCREW PAN MECH W/SF M3*6 Ni
26	85.1F324.100	SCREW PAN MECH W/SF M4*10 Ni
27	85.4A524.060	SCREW FLAT MECH M4*6 Ni-NYLOK
28	85.SA123.100	SCREW BINDING TAP TITE-P 2L M3*10 Ni
29	85.UA323.070	SCREW PAN TAP DOUBLE THREADS M3*7 Black
30	85.YA123.060	SCREW FLAT TAP M3*6 Ni
31	35.90303.001	LABEL 3 BIRD LOGO VX3600
32	42.58701.001	W.A. 30/40P UL1571 #30 180mm VX2000;MB-PANEL
33	42.58702.001	W.A. 18P UL1571 #28 260mm VX2000;MB-CTRL

Item	P/N	Description
34	42.58703.001	W.A. 12P UL1007 #26 180mm VX2000;FUJITSU;MB-INV
35	35.58701.001	LABEL SPEC VX2000
36	35.58302.001	LABEL BAR CODE 40*40mm ViewSonic
37	51.00079.001	TRANSISTOR WASHER NYLON PINGOOD 809
38	51.58712.001	LIGHT LEAKAGE PLATE 335*80*0.05mm MYLAR VX2000
39	51.58713.001	LIGHT LEAKAGE PLATE 445*90*0.05mm MYLAR VX2000

Chapter 3 Procedure of Disassembly

3-1 *Disassembly of Stand Unit and Main Body*



1. Lay VX2000 Monitor face down to take off Rear Arm and Hinge Cap.

2. Unscrew the four screws to remove the Stand and Main Unit.

3. Unscrew the four screws to remove the Hinge Tilt and Base Unit.

④ Hinge Tilt Unit

4. Press the tenon of two sides to remove the Front Arm and Hinge Tilt.

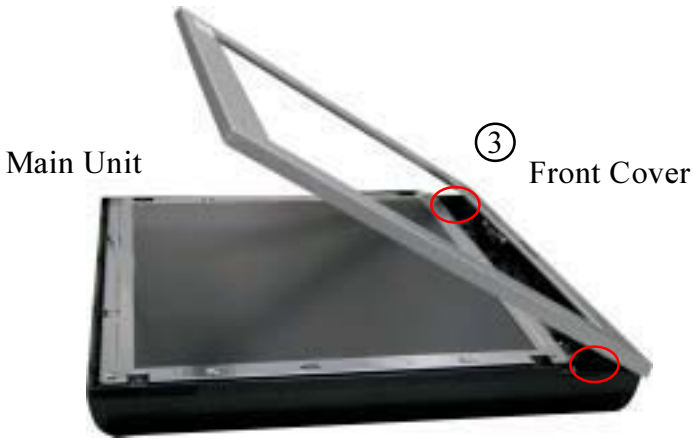
5. Unscrew the four screws to remove the Base Cover and Plate.

6. Unscrew the two screws to remove the Mic Board from Base Cover.

3-2 Disassembly of Control Board, Cosmetic Cap and Front Cover

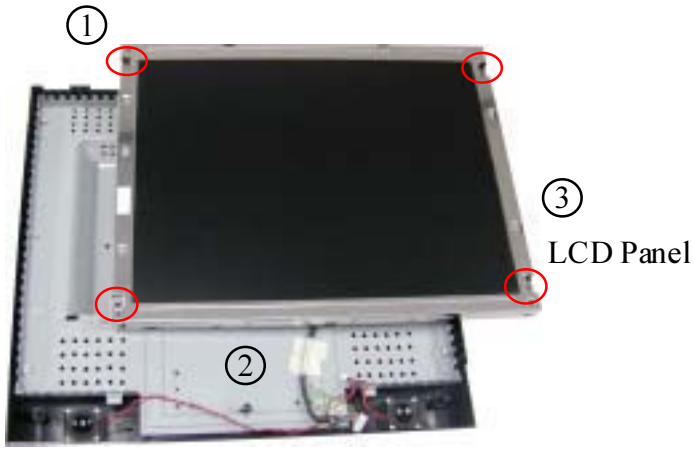
1. First turn over the monitor, push Front Cover upward and press the two sides from up to down to remove the Cosmetic Cap.

2. Unplug the Control wire and unscrew the two screws to remove the Control Board.

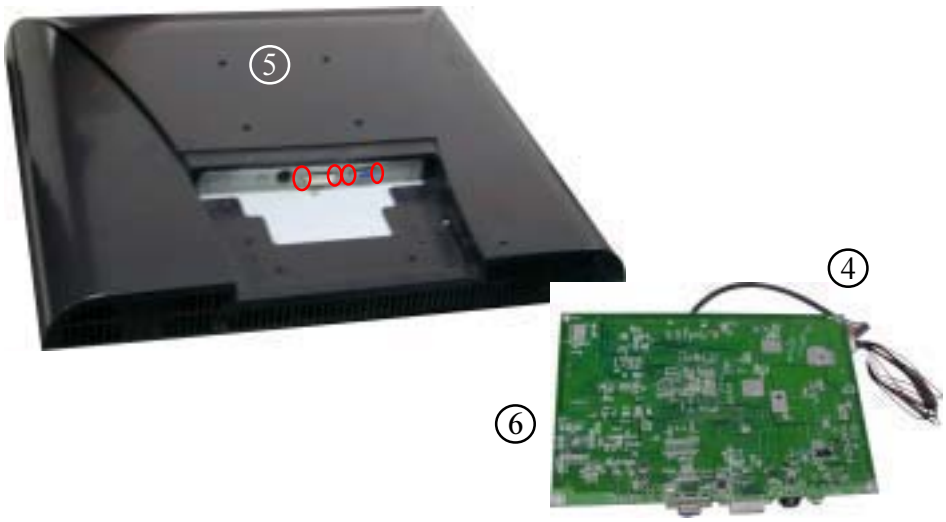


3. Unscrew the three screws of Front Cover and push from down to up to remove it from Main Unit.

3-3 *Disassembly of LCD Panel and Main Board*



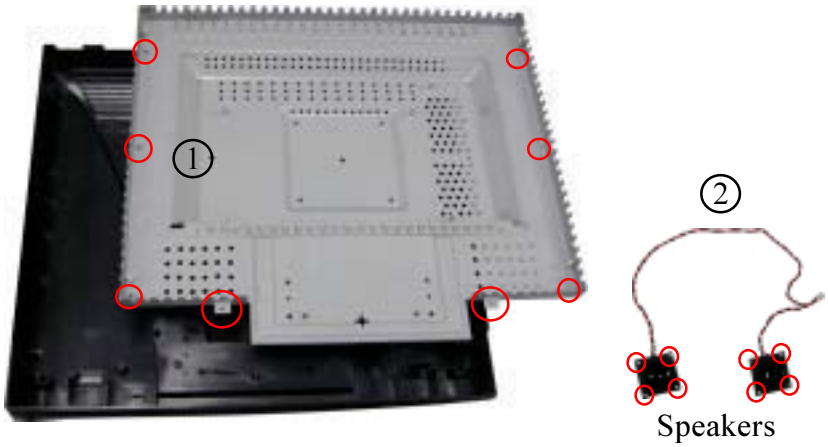
1. **Remove** the EMI tape and unscrew the four screws on the LCD Panel.
2. Unplug all wires on the LCD Panel.
3. Remove the LCD Panel.



Main Board

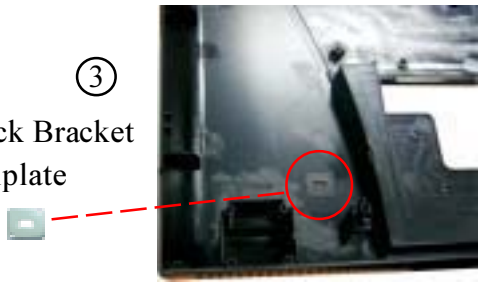
4. Unscrew the four screws on the Main Board.
5. Turn over the Rear Cover Unit and unscrew the four hex screws.
6. Turn over it again and remove the Main Baord.

3-4 Disassembly of Support Bracket and Speakers



1. Unscrew the eight screws on Support Bracket to remove it.

2. Unscrew the eight screws on the Speakers to remove it.

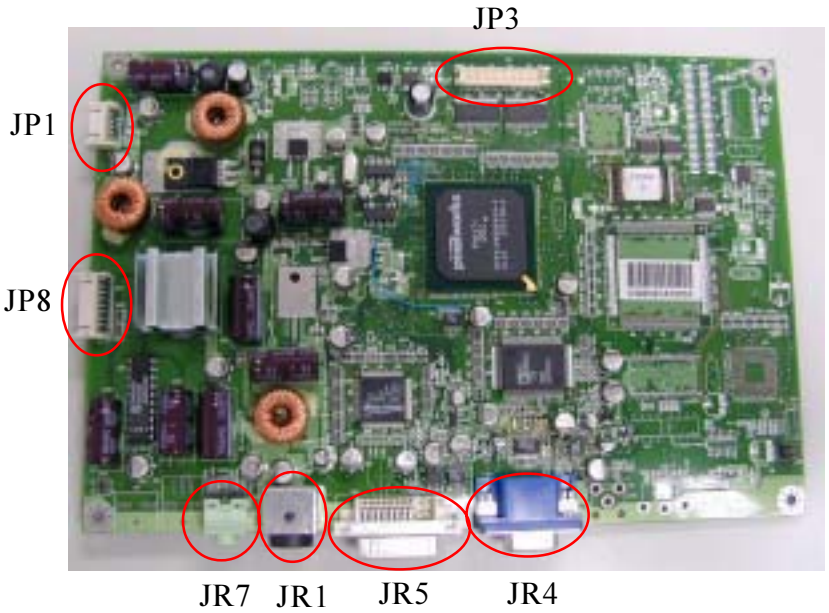


3. **Remove** the Lock Bracket Tinplate from Rear Cover.

Chapter 4 Function of Boards

4-1 Main Board

4-1.1 The Location of Connectors



4-1.2 JP1: Inverter Connector

Pin #	Description	Function
1	BLON_R	Backlight on/off Control
2	DF_BLON	No Connection
3	Brightness	Brightness Adjustment
4	GND	Ground
5	GND	Ground
6	GND	Ground
7	GND	Ground
8	GND	Ground
9	+12VP2	+12V Power Supply
10	+12VP2	+12V Power Supply
11	+12VP2	+12V Power Supply
12	+12VP2	+12V Power Supply

4-1.3 JP3 Connector: Panel Connector

Pin #	Description	Function
1	Power Supply	+12V
2	RAIN0-	Negative Differential Input
3	Power Supply	+12V
4	RAIN0+	Positive Differential Input
5	GND	Ground
6	RAIN1-	Negative Differential Input
7	GND	Ground
8	RAIN1+	Positive Differential Input
9	N.C.	No Connection
10	RAIN2-	Negative Differential Input
11	SEL	Select LVDS Data Order
12	RAIN2+	Positive Differential Input
13	N.C.	No Connection
14	CKAIN-	Negative Differential Input
15	N.C.	No Connection
16	CKAIN+	Positive Differential Input
17	N.C.	No Connection
18	RAIN3-	Negative Differential Input
19	N.C.	No Connection
20	RAIN3+	Positive Differential Input
21	Power Supply	+12V
22	RBIN0-	Negative Differential Input
23	N.C.	No Connection
24	RBIN0+	Positive Differential Input
25	GND	Ground
26	RBIN1-	Negative Differential Input
27	GND	Ground
28	RBIN1+	Positive Differential Input
29	N.C.	No Connection
30	RBIN2-	Negative Differential Input
31	N.C.	No Connection
32	RBIN2+	Positive Differential Input
33	N.C.	No Connection

Pin #	Description	Function
34	CKBIN-	Negative Differential Input
35	N.C.	No Connection
36	CKBIN+	Positive Differential Input
37	N.C.	No Connection
38	RBIN3-	Negative Differential Input
39	LVDSON	LVDS Core Power Down
40	RBIN3+	Positive Differential Input

4-1.4 JR7 Connector: PhoneJack Stereo Sw. Connector

Pin #	Description	Function
1	GND	Ground
2	LIN	Left Channel Input
3	RIN	Right Channel Input
10	GND	Ground
11	GND	Ground

4-1.5 JP8 Connector: OSD Key Connector

Pin #	Description	Function
1	SPL	Speaker Left
2	GND	Ground
3	SPR	Speaker Right
4	GND	Ground
5	PIP_Buzzer	Buzzer
6	+5V	+5V
7	LEDA	Power LED Amber
8	LEDG	Power LED Green
9	GND	Ground
10	N.C.	No Connection
11	Vol_Down	Volume -
12	Power	Power Key
13	Down	Decrease

Pin #	Description	Function
14	SEL 1	Select 1
15	SEL 2	Select 2
16	Up	Increase
17	Mute	Volume Mute
18	Vol_Up	Volume +

4-1.6 JR1 Connector: Power Connector

Pin #	Description	Function
1	+18_12V	+12V Power Supply
2	CIRDIN_4-R	+12V Power Supply
3	GND	Ground
4	GND	Ground
5	GND	Ground
6	GND	Ground
7	GND	Ground
8	GND	Ground
9	GND	Ground

4-1.7 JR4 Connector: VGA Connector

Pin #	Description	Function
1	RIN4	Red Video Input
2	GIN4	Green Video Input
3	BIN4	Blue Video Input
4	N.C.	No Connection
5	GND	Ground
6	GND	Red Video Ground
7	GND	Green Video Ground
8	GND	Blue Video Ground
9	VGA-DET	+5V
10	GND	Ground
11	N.C.	No Connection
12	ADDCSDA	Serial Data
13	AH-In 03	Horizontal Sync.
14	AV-In 03	Vertical Sync.
15	ADDCSCL	Serial Clock

4-1.8 JR5 Connector: DVI-D Connector

Pin #	Description	Function
1	RX2-	TMDS Negative Differential Input Channel 2
2	RX2+	TMDS Positive Differential Input Channel 2
3	GND	Logic Ground
4	N.C.	No Connection
5	N.C.	No Connection
6	DDC-CLK	DDC 2B Clock
7	DDC-DAT	DDC 2B Data
8	N.C.	No Connection
9	RX1-	TMDS Negative Differential Input Channel 1
10	RX1+	TMDS Positive Differential Input Channel 1
11	GND	Logic Ground
12	N.C.	No Connection
13	N.C.	No Connection
14	VCCX	+5V
15	GND	Ground
16	SENS	+5V
17	RX0-	TMDS Negative Differential Input Channel 0
18	RX0+	TMDS Positive Differential Input Channel 0
19	GND	Ground
20	N.C.	No Connection
21	N.C.	No Connection
22	GND	Logic Ground
23	RXC+	TMDS Negative Differential Input Channel 0
24	RXC-	TMDS Positive Differential Input Channel 0
25	N.C.	No Connection
26	N.C.	No Connection
27	N.C.	No Connection
28	N.C.	No Connection
29	GND	Ground

4-2 Control Board

4-2.1 The Location of Connectors

4-2.2 J1 Connector: OSD Key Connector

Pin #	Description	Function
1	SPL	Speaker Left
2	GND	Ground
3	SPR	Speaker Right
4	GND	Ground
5	PIP_Buzzer	Buzzer
6	+5V	+5V
7	LEDA	Power LED Amber
8	LEDG	Power LED Green
9	GND	Ground
10	N.C.	No Connection
11	Vol_Down	Volume-
12	Power	Power Key
13	Down	Decrease
14	Sel 1	Select 1
15	Sel 2	Select 2
16	Up	Increase
17	Mute	Volume Mute
18	Vol_Up	Volume +

4-2.3 J2 Connector: Speakers Connector

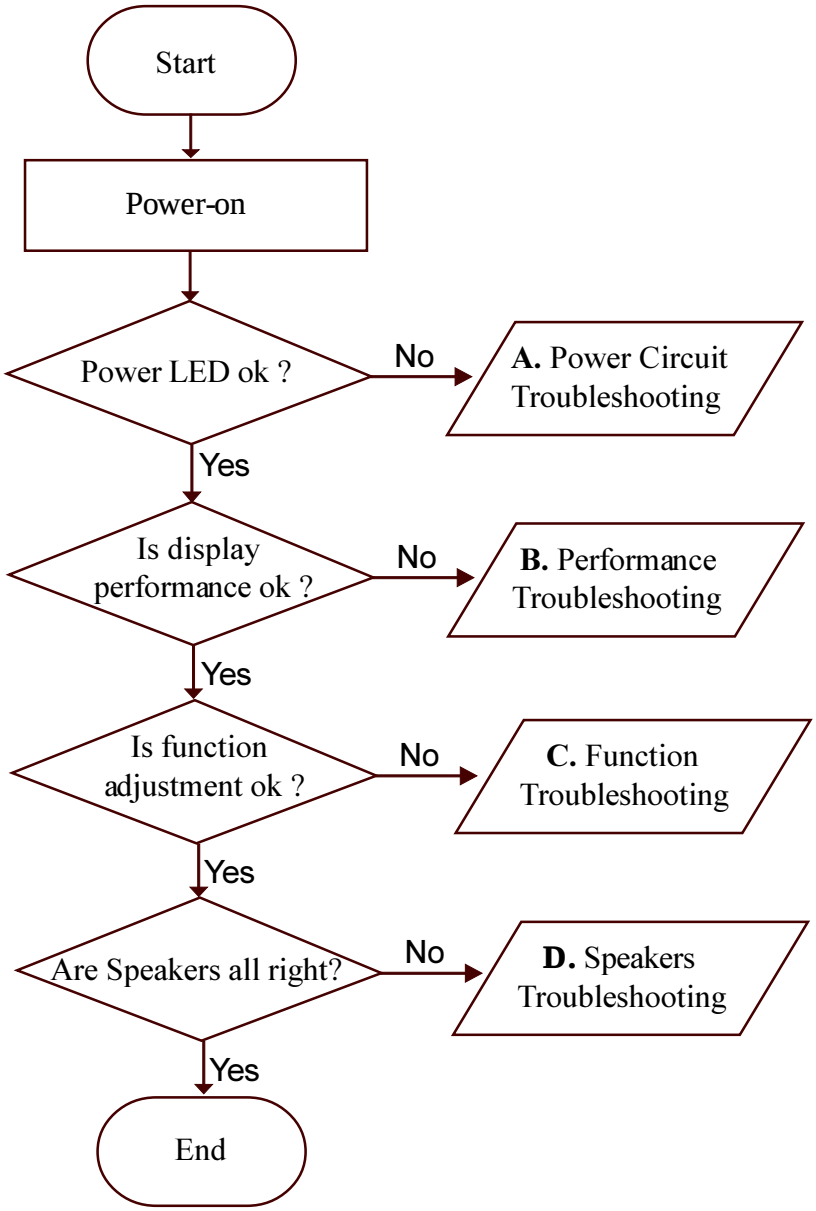
Pin #	Description	Function
1	SPR	Speaker Right
2	GND	Ground
3	SPL	Speaker Left
4	GND	Ground

Chapter 5 Troubleshooting Procedure

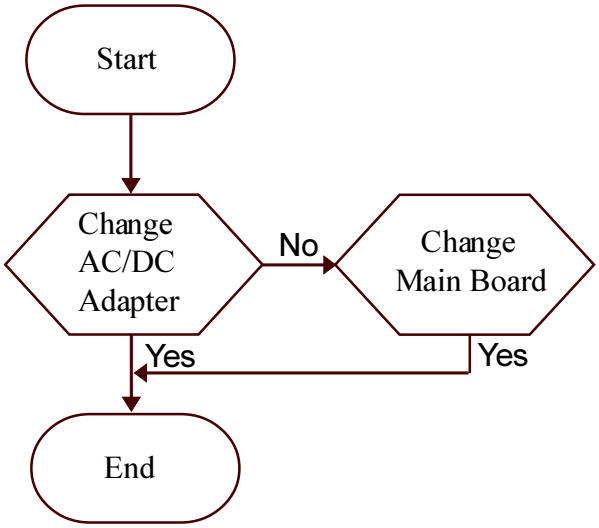
5-1 Equipment Needed

- *VX2000 Monitor*
- *PC (Personal Computer) with 1600*1200 resolution*
- *Screw Driver*

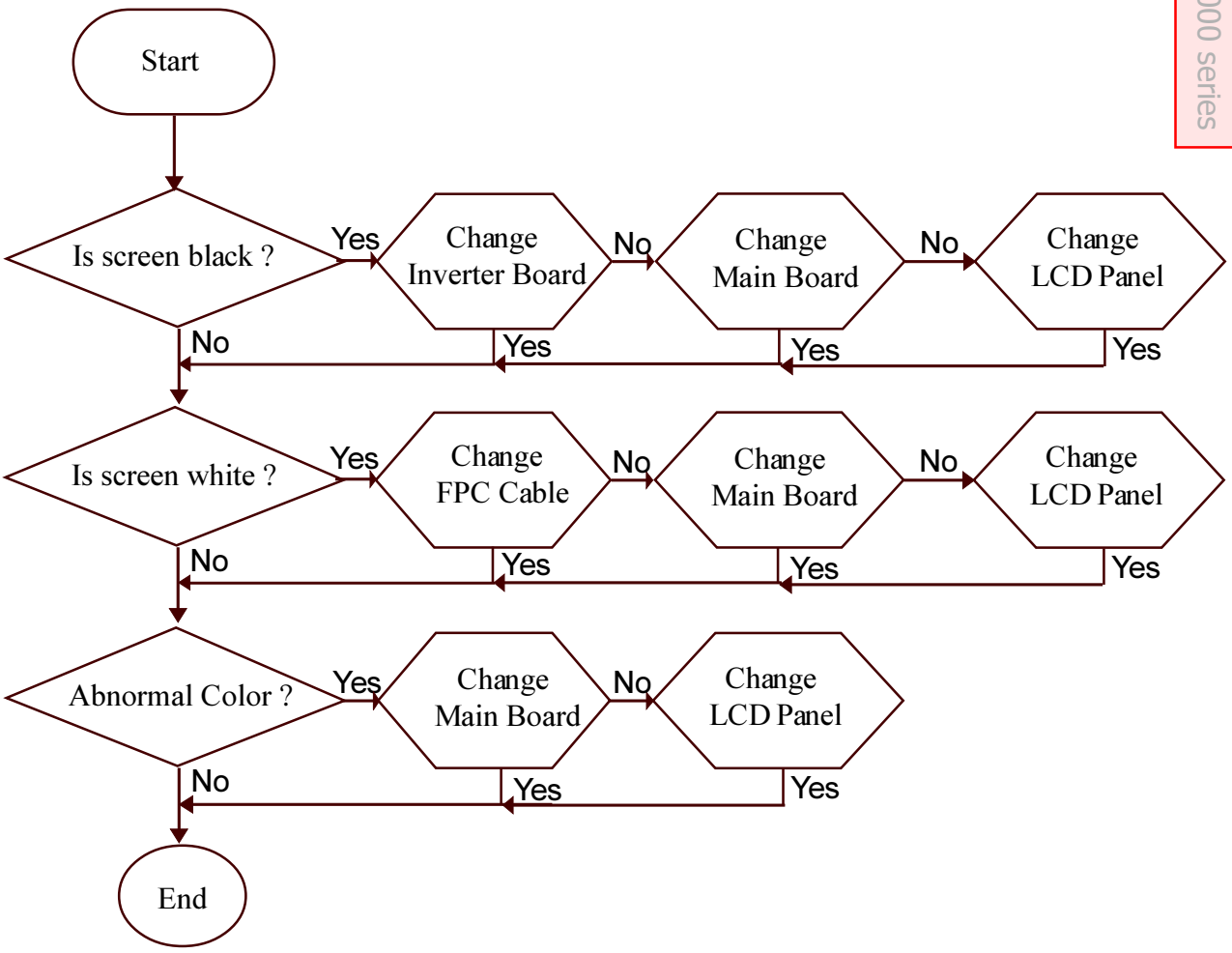
5-2 Main Procedure

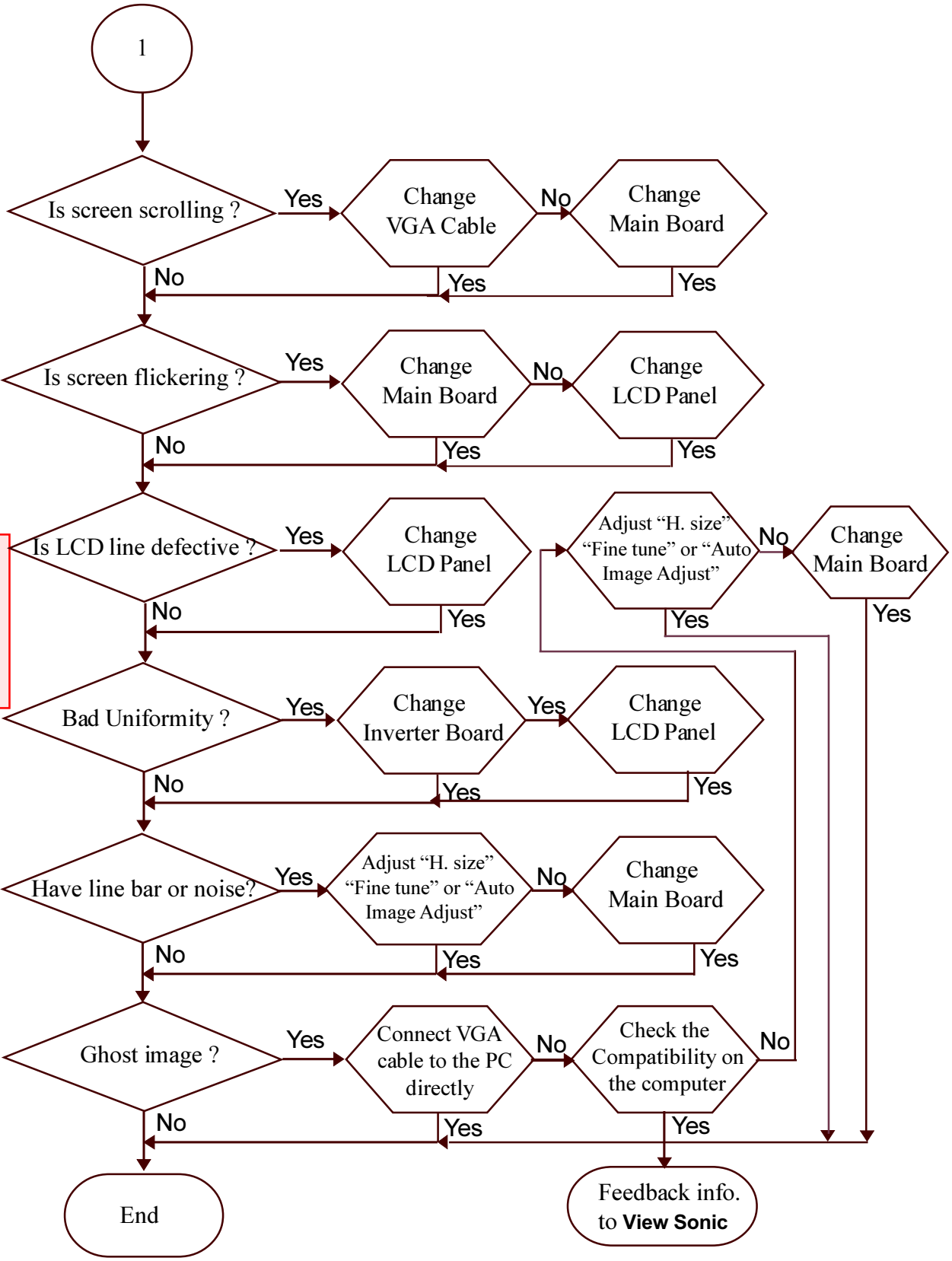


5-2.1 A. Power Circuit Troubleshooting

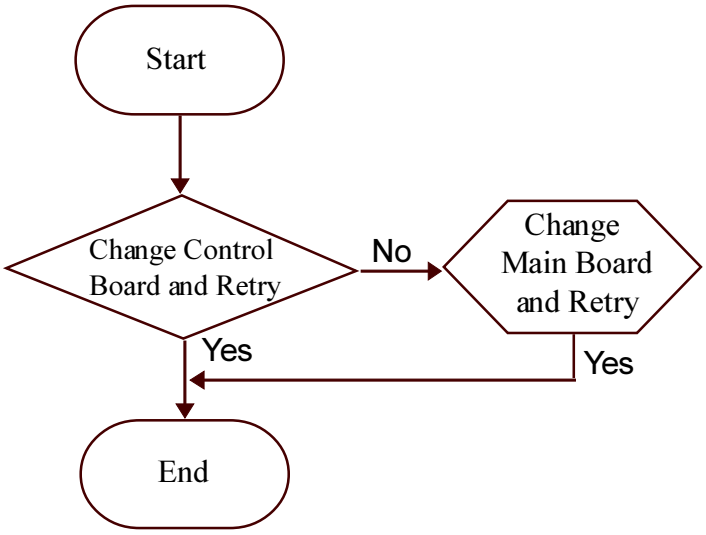


5-2.2 B. Performance Troubleshooting

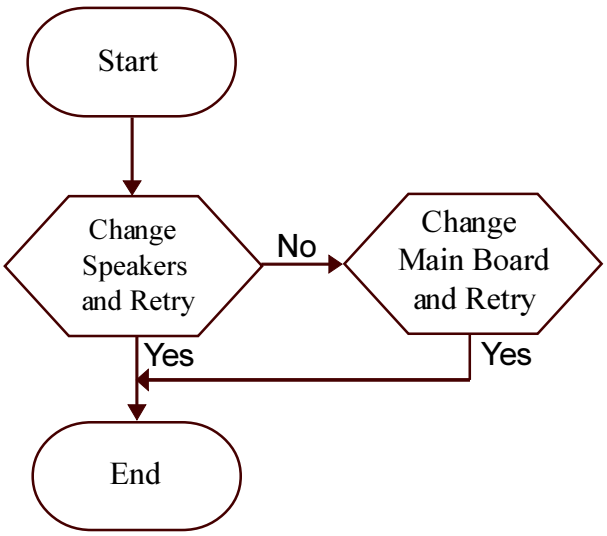



1
Is screen scrolling ?
Yes
Change VGA Cable
No
Change Main Board
No
Yes
Yes
Is screen flickering ?
Yes
Change Main Board
No
Change LCD Panel
No
Yes
Yes
Is LCD line defective ?
Yes
Change LCD Panel
Adjust "H. size" "Fine tune" or "Auto Image Adjust"
No
Change Main Board
No
Yes
Yes
Yes
Bad Uniformity ?
Yes
Change Inverter Board
Yes
Change LCD Panel
No
Yes
Yes
Have line bar or noise?
Yes
Adjust "H. size" "Fine tune" or "Auto Image Adjust"
No
Change Main Board
No
Yes
Yes
Ghost image ?
Yes
Connect VGA cable to the PC directly
No
Check the Compatibility on the computer
No
No
Yes
Yes
End
Feedback info. to View Sonic

5-2.3 C. Function Troubleshooting



5-2.4 D. Speakers Troubleshooting



Chapter 6 Function Test & Alignment Procedure

6-1 Product and Test Equipment:

- *20.1" LCD monitor*
- *Color Video Signal & Pattern (or PC with* **UXGA** *resolution)*

6-2 Hot Key (Service Function):

- *"▲", "▼" and "Power on" buttons with signal input: All Mode Reset*
- *"▲", "▼" and "Power on" buttons without signal input: Burn In Mode*
- *"Audio-" and "Audio+" buttons will recall volume to 50% while in volume Adjustment, or when OSD is not open.*
- *"1" and "▲" buttons for 10 seconds: OSD locked*
  Do again: OSD unlocked.
- *"1" and "▼" buttons for 10 seconds: Power button locked.*
  Do again: Power button unlocked.

6-3 Test Condition:

- *Before function test and alignment, each LCD monitor should be run-in and warmed-up for at least 2 hours with the following conditions:*

  a.) In Room Temperature,
  b.) With full-white screen, R.G.B. Black
  c.) With cycled display modes,

- *640*480 (H=31.5kHz, V=60Hz)*
- *800*600 (H=46.9kHz, V=75Hz)*
- *1024*768 (H=56.5kHz, V=70Hz)*
- *1280*1024 (H=63.4kHz, V=60Hz)*
- *1600*1200 (H=75kHz, V=60Hz)*
- *800*600 (H=37.9kHz, V=60Hz)*
- *1024*768 (H=48.4kHz, V=60Hz)*
- *1024*768 (H=60kHz, V=75Hz)*
- *1280*1024 (H=80kHz, V=75Hz)*

6-4 Test Display Modes & Pattern

6-4.1 Compatible Modes

(Analog)

- *640*350@70Hz, 31.5kHz*
- *640*480@67Hz, 35.0kHz*
- *640*480@72Hz, 37.9kHz*
- *720*400@70Hz, 31.5kHz*
- *800*600@60Hz, 37.9kHz*
- *800*600@72Hz, 48.1kHz*
- *832*624@75Hz, 49.7kHz*
- *1024*768@70Hz, 56.5kHz*
- *1024*768@75Hz, 60.0kHz*
- *1280*1024@60Hz, 63.4kHz*
- *1600*1200@60Hz,*
- *640*480@60Hz, 31.5kHz*
- *640*480@75Hz, 37.5kHz*
- *640*480@85Hz, 43.27kHz*
- *800*600@56Hz, 35.1kHz*
- *800*600@75Hz, 46.9kHz*
- *800*600@85Hz, 53.7kHz*
- *1024*768@60Hz, 48.4kHz*
- *1024*768@72Hz, 58.1kHz*
- *1024*768@85Hz, 68.67kHz*
- *1280*1024@75Hz, 79.97kHz*

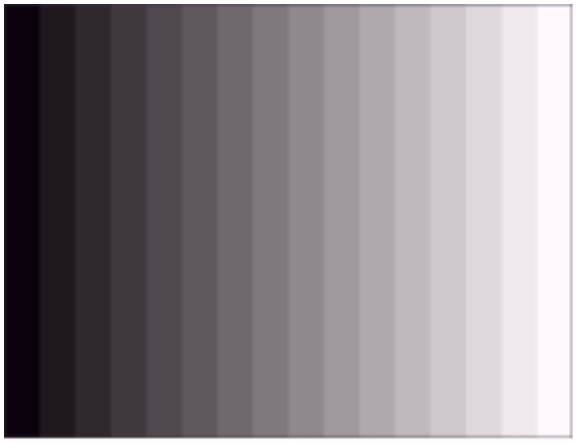
(Digital)

- *640*350@70Hz, 31.5kHz*
- *640*480@60Hz, 31.5kHz*
- *640*480@72Hz, 37.9kHz*
- *720*400@70Hz, 31.5kHz*
- *800*600@60Hz, 37.9kHz*
- *800*600@72Hz, 48.1kHz*
- *1024*768@60Hz, 48.4kHz*
- *1024*768@72Hz, 58.1kHz*
- *1024*768@85Hz, 68.67kHz*
- *1600*1200@60Hz,*
- *640*400@60Hz, 31.5kHz*
- *640*480@75Hz, 37.5kHz*
- *640*480@85Hz, 43.27kHz*
- *800*600@56Hz, 35.1kHz*
- *800*600@75Hz, 46.9kHz*
- *800*600@85Hz, 53.7kHz*
- *1024*768@70Hz, 56.5kHz*
- *1024*768@75Hz, 60.0kHz*
- *1280*1024@60Hz, 63.4kHz*

6-4.2 Function Test Display Pattern

Item	Test Content	Pattern	Specification	Remark
1	Frequency & Tracking	Fine Line Moire	Eliminate visual wavy noise.	*Figure 1*
2	Contrast/Brightness	16 Gray Scale	16 gray levels should be distinguishable.	*Figure 2*
3	Boundary	Horizontal & Vertical Thickness	Horiz. and Vert. position of video should be adjustable to be within the screen frame.	*Figure 3*
4	R,G,B, Color Performance	R.G.B Color Intensities	Contrast of each R,G,B, color should be normal.	*Figure 4,5,6*
5	Screen Uniformity & Flicker	Full White	Should be compliant with the spec.	*Figure 7*
6	Dead Pixel/Line	White Screen Dark Screen	The numbers of dead pixels should be compliant with the spec.	*Figure 8*

Fine Line Morie Pattern (Figure 1)



Gray Scale Pattern (Figure 2)

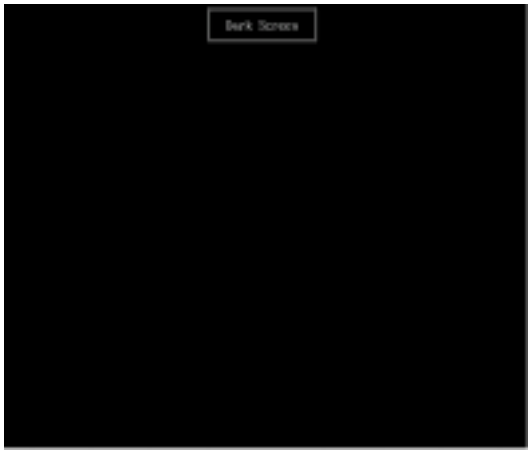
Horizontal & Vertical Thickness Pattern (Figure 3)

R. Color Pattern (Figure 4)

G. Color Pattern (Figure 5)

B. Color Pattern (Figure 6)

Full White Pattern (Figure 7)



Dark Screen Pattern (Figure 8)

6-5 Function Test and Alignment Procedure

6-5.1 All Mode Reset

Input signal to VX2000, turn off the power of VX2000. Press "▲", "▼" and "Power on" buttons on the select knob simultaneously for 3-5 seconds, release "Power on" button first, then other buttons. The screen will show "All Mode Reset". This action will allow you to erase all end-user's settings and restore the factory defaults.

6-5.2 Auto Image Adjust

Please select and enter "Auto Image Adjust" function on OSD Main Menu. The "Auto Image Adjust" function is aimed to offer a better screen quality by built-in ASIC. For optimum screen quality, the user has to adjust each function manually.

6-5.3 Fine Tune

Test Signal: *1600*1200@60Hz*

Test Pattern: *Line Moire Pattern*

* *Check and see if the image has noise and focus is well performed.*

* *If not, readjust by the following steps:*

a.) Select and enter "Manual Image Adjust" function on OSD Main Menu.

b.) Then, select and enter "Fine Tune" function to adjust the image to eliminate visual noise.

6-5.4 Boundary

Test Signal: *1600*1200@60Hz*

Test Pattern: *Horizontal & Vertical Line Thickness Pattern*

* *Check and see if the image boundary is within the screen frame.*

* *If not, readjust by the following steps:*

a.) Select and enter "Manual Image Adjust" function on OSD Main Menu.

b.) Then, select and enter "Horizontal/Vertical Position" or "Scaling\Fit All" function to adjust the video Boundary to be full scanned and within screen frame.

6-5.5 R.G.B. Colors Contrast

Test Signal: *1600*1200@60Hz*

Test Pattern: *R.G.B. Colors Intensities Pattern and 16 gray scale pattern*

* *Check and see if each color is normal and distinguishable*
* *If not, please return the unit to repair area*

6-5.6 Screen Uniformity and Flicker

Test Signal: *1600*1200@60Hz*

Test Pattern: *Full White Pattern*

* *Check and see if it is in normal condition.*

6-5.7 Dead Pixel and Line

Test Signal: *1600*1200@60Hz*

Test Pattern: *Dark Screen Pattern*

* *Check and see if there are dead pixels on LCD panel with shadow gauge and filter film*
* *The total numbers and distance of dead pixels should be compliant with the spec.*

6-5.8 Check for Secondary Display Modes

Test Signal:	*640*350@70Hz*	*640*480@60/67/72/75/85Hz;*
	*720*400@70Hz*	*800*600@56/60/72/75/85Hz;*
	*832*624@75Hz*	*1024*768@60/70/72/75/85Hz;*
	*1280*1024@60/75Hz*	*1600*1200@60Hz*

Normally when the primary mode 1600*1200@60Hz is well adjusted and compliant with the specification, the secondary display modes will also be compliant with spec. They still need to be checked and verified though.

6-5.9 All Mode Reset

After final QC step, we have to erase all saved changes again and restore the factory defaults. You should do "All Mode Reset" again. (ref. 6-5.1)

6-6 Cleaning

Please use non-alcohol cleanser to clean LCD panel and cosmetics material with soft cotton.

6-7 Inspection Standard

- *Appearance Inspection: Scratches/Abrasions*

  a.) *Mechanical: (2 lines,scrapes)*

  Face A: Not Allowed

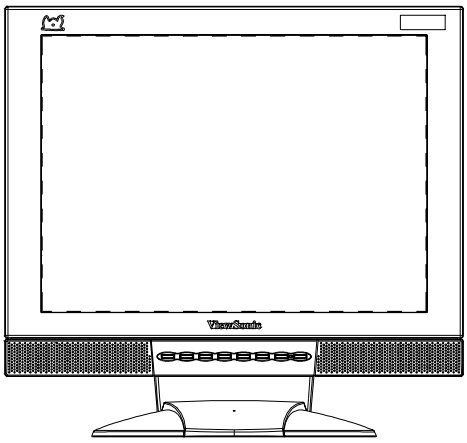


Figure 1: Face A View

Face B: *Length:12.7mm, Width: 0.25mm*

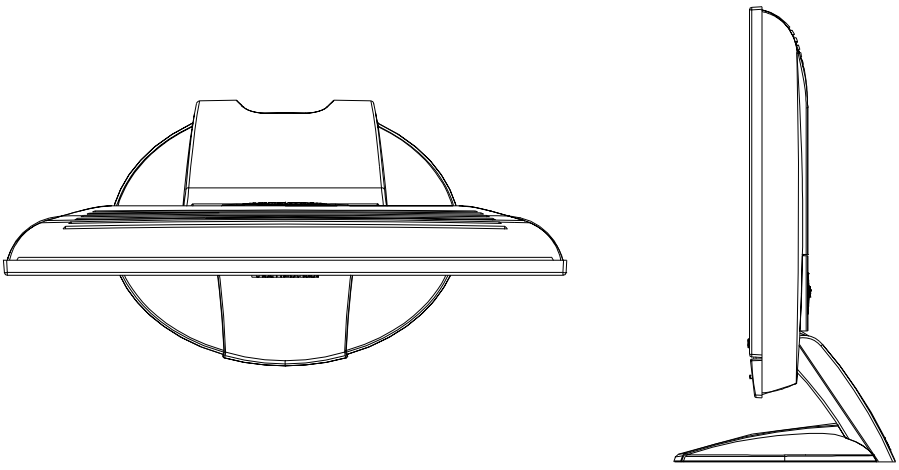


Figure 2: Face B View

Face C: Length:76mm Width:0.76mm

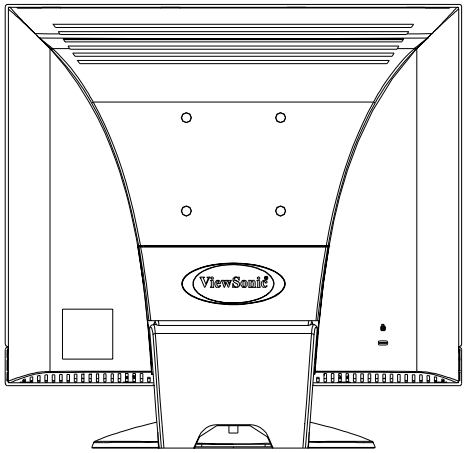


Figure 3: Face C View

Face D: Length:89mm Width:0.76mm

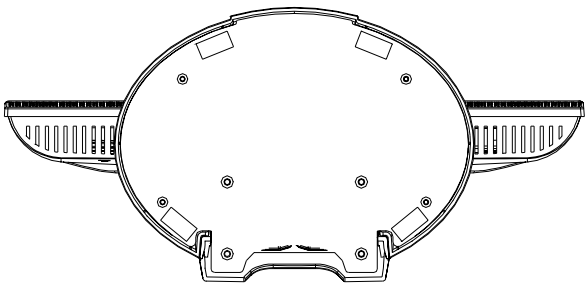
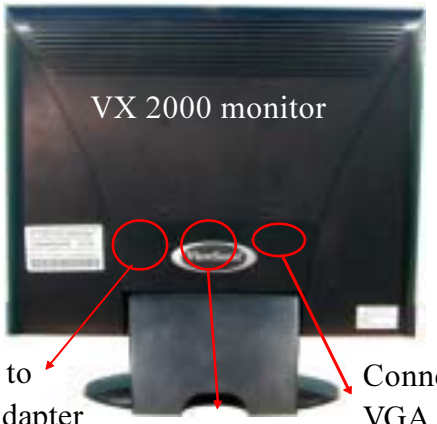


Figure4: Face D View

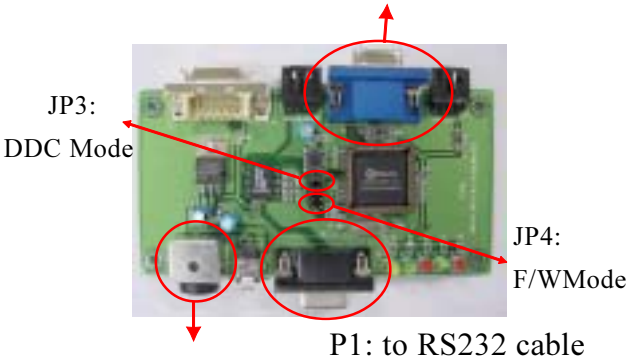
Chapter 7 Firmware Upgrade Procedure

7-1 Equipment Needed

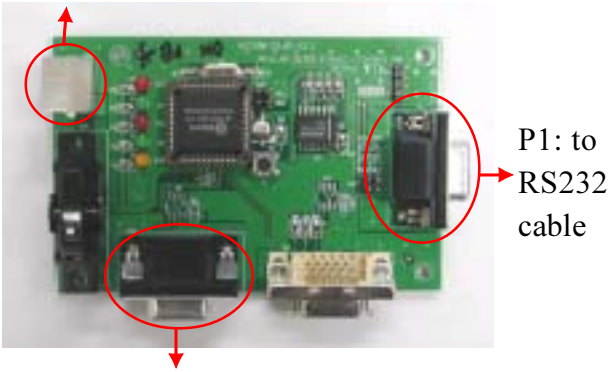
- ❑ VX2000 monitor and an additional monitor
- ❑ Fixture for Firmware Upgrade (Fixture A: JP4 must be closed, Fixture B: JP1 must be closed)
- ❑ RS-232 Cable (P/N: 42.55907.001)
- ❑ Power Adapter (P/N: 47.56001.501) for Fixture A and Power Adapter (P/N: 47.53402.004) for Fixture B
- ❑ VGA Cable (P/N: 42.59901.003)
- ❑ PC (Personal Computer)
- ❑ Firmware Upgrade Program



Fixture A



Fixture B



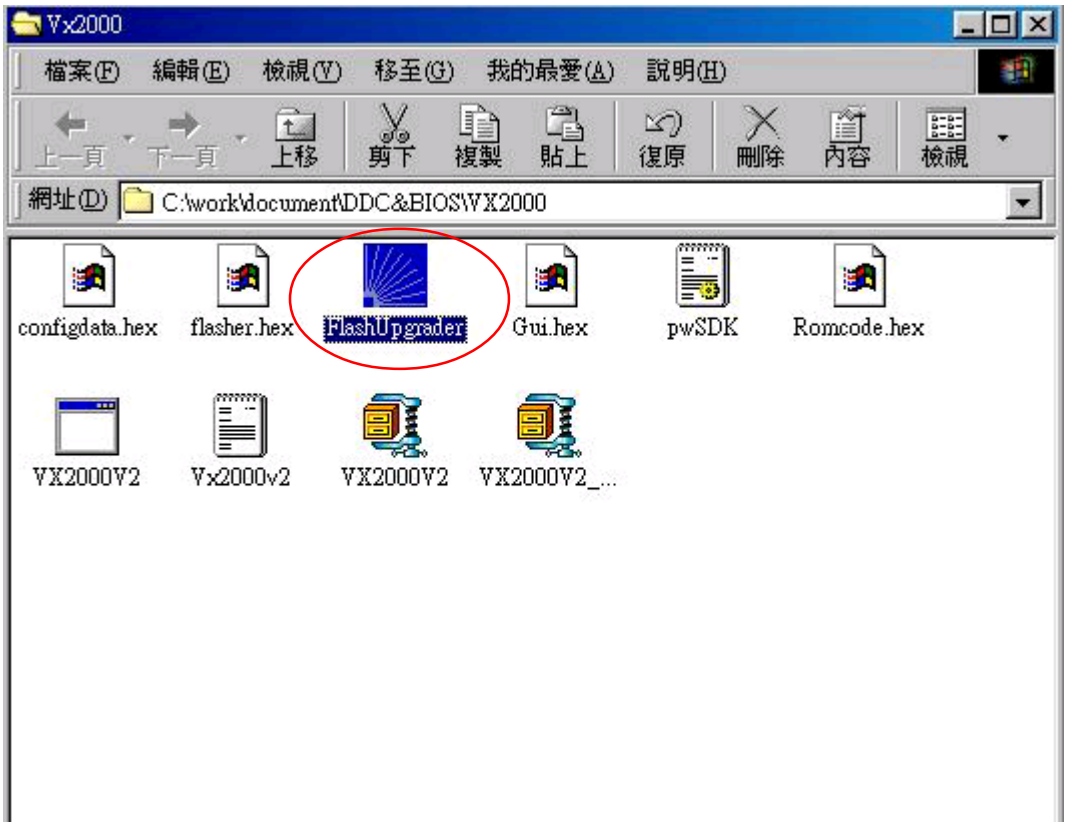
PC

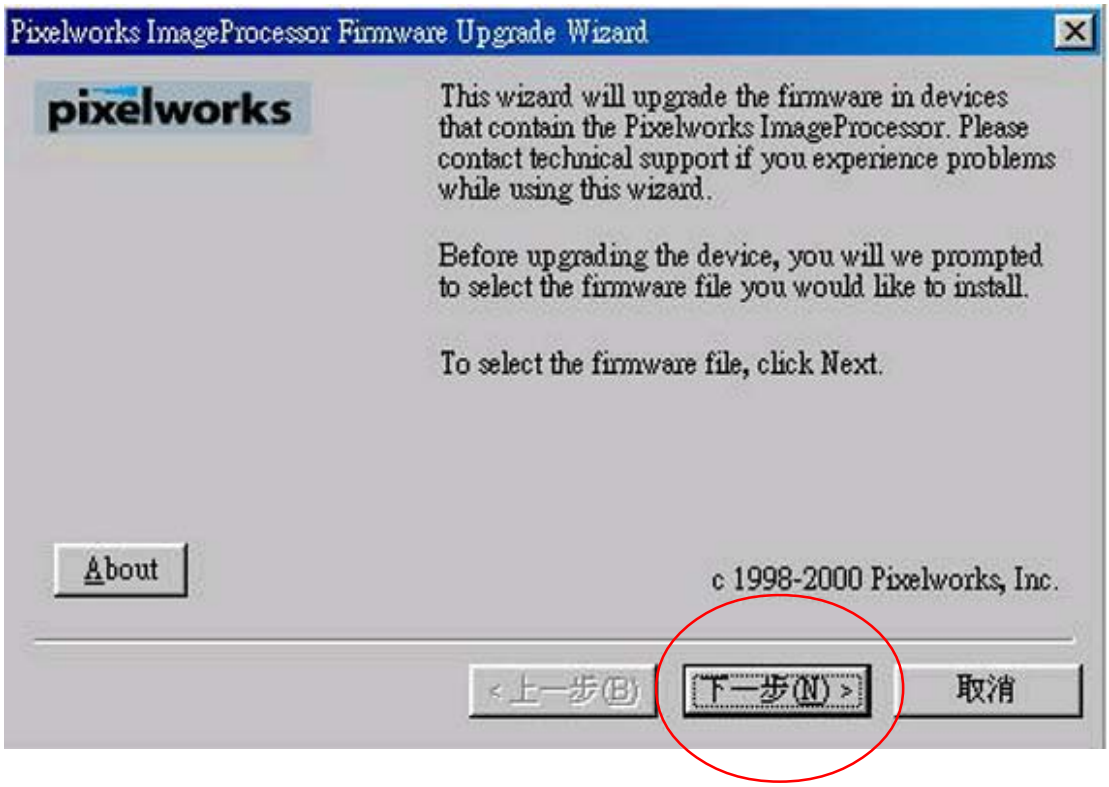
7-2 Setup Procedure

1. Choose alternative fixture: Fixture A or Fixture B.
2. Connect RS232 cable between P1 of Fixture and COM1 of PC.
3. Connect VGA cable between P2 of Fixture and VX2000.
4. Plug Power Adapter into the Fixture.
5. Connect PC to the additional monitor.
6. Power on the Fixture.
7. Do not plug power cord into monitor.

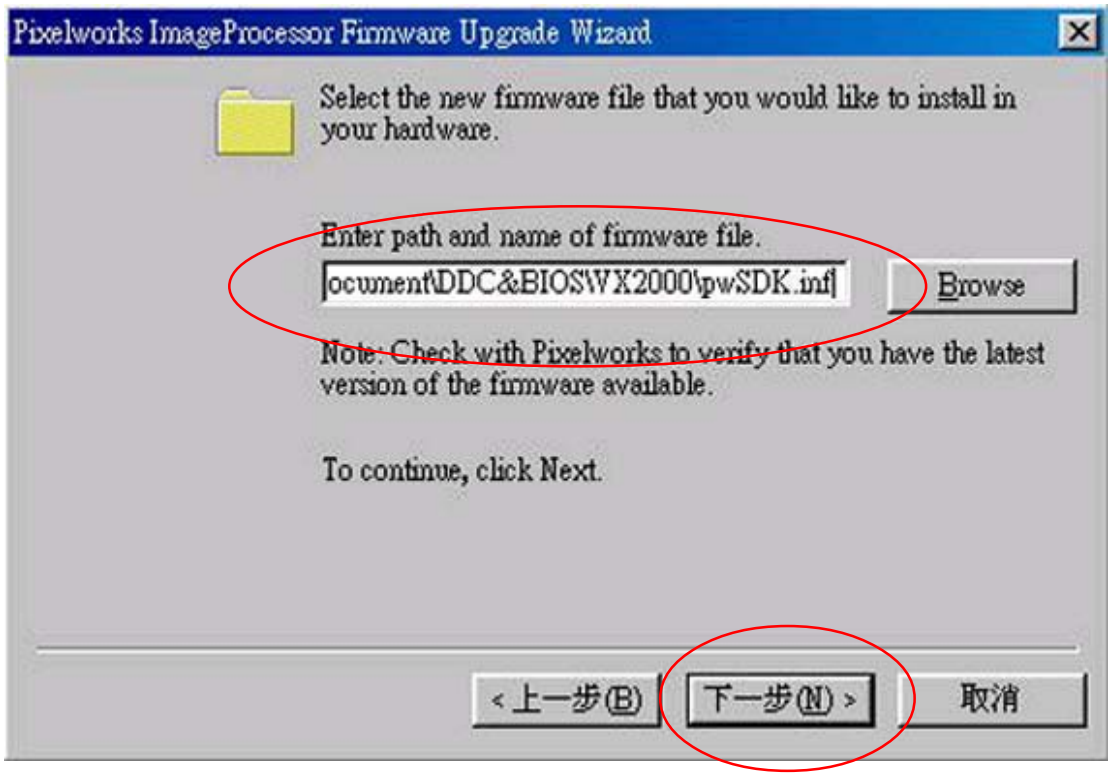
7-3. Firmware Upgrade Procedure

1. Click “Flash Upgrader” icon on the window, and Click “Next” icon.

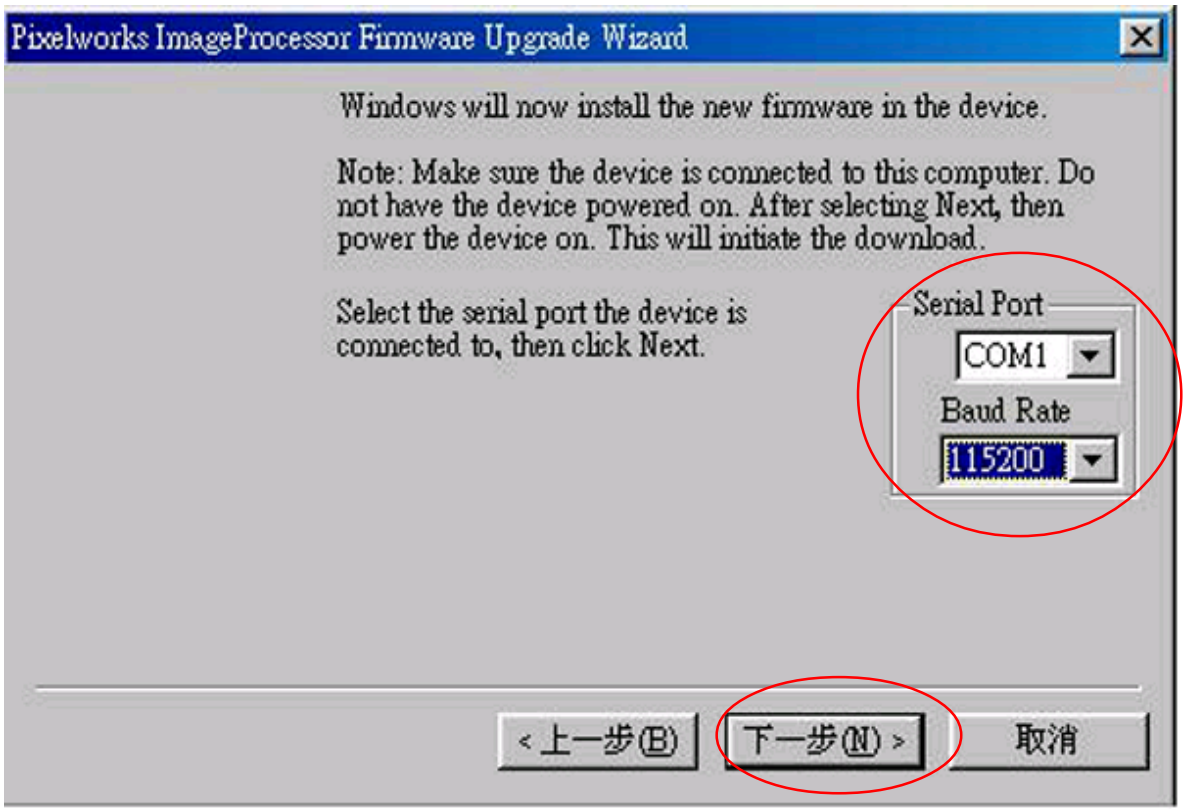




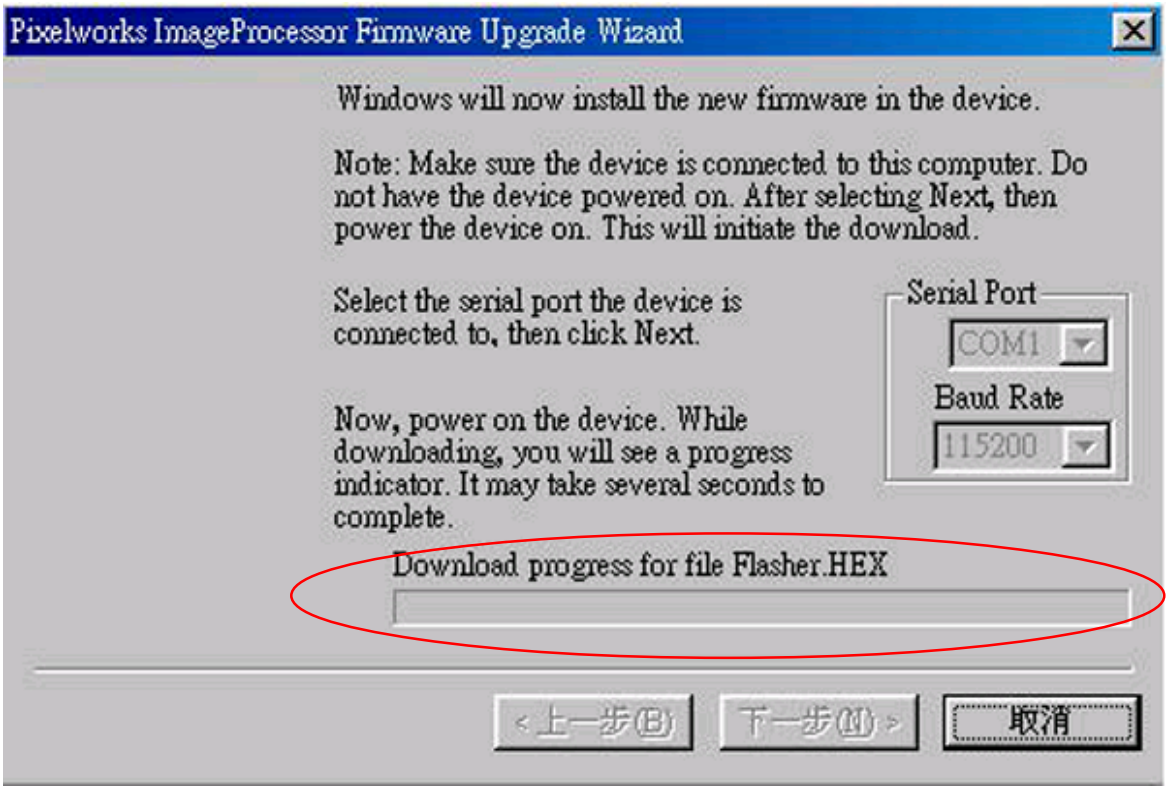
2. Search <pwSDK.inf> from Browse and then Click “Next” icon.



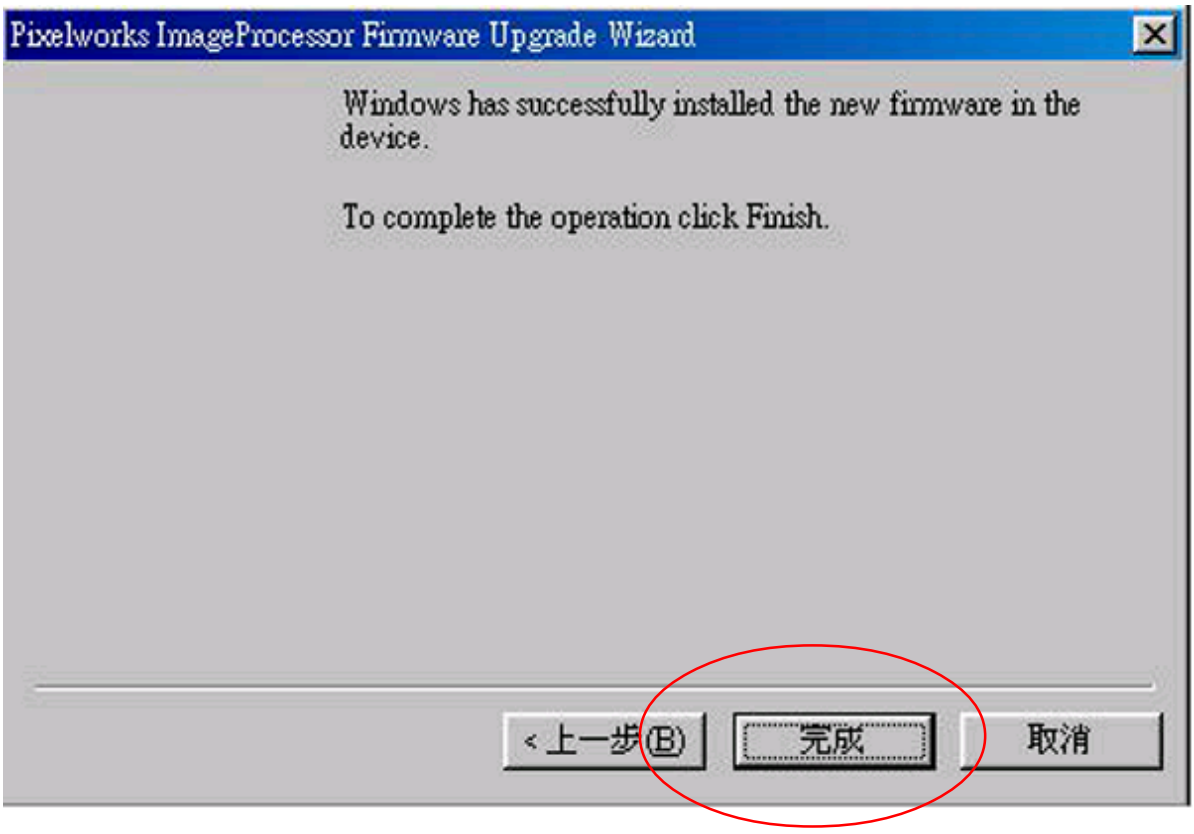
3. Search the Serial Port which you connect with the Fixture and then Click “Next”.



4. After the message “Download progress for file Flasher.Hex” appears, plug the power cord into VX2000, then it will be programming automatically.



5. When the program is finished, the power LED on VX2000 will be on. Then click the “Finish” icon, and do “All Mode Reset” to finish the firmware upgrade procedure.

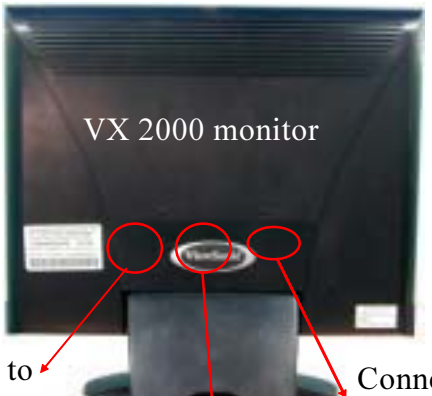


6. After finishing Firmware Upgrade Procedure, go to “Burn In Mode” (Ref 6-2), press any button besides “Power” button to check the Firmware version if it is correct.

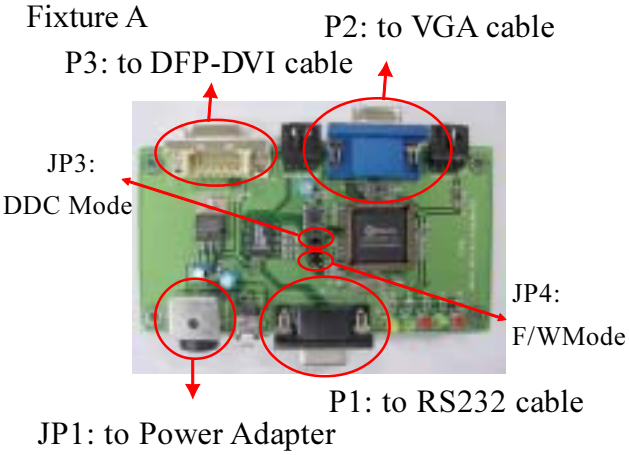
Chapter 8 DDC Key-in Procedure

8-1 Equipment Needed

- ❑ VX2000 monitor and an additional monitor
- ❑ Fixture for DDC Key-In (Fixture A: JP3 must be closed, Fixture B: JP1, JP5 must be closed.)
- ❑ RS-232 Cable (P/N: 42.55907.001)
- ❑ Power Adapter (P/N: 47.56001.501) for Fixture A and Power Adapter (P/N: 47.53402.004) for Fixture B
- ❑ VGA Cable (P/N: 42.59901.003)
- ❑ PC (Personal Computer)
- ❑ DDC Key-in Program
- ❑ DFP-DVI Cable (P/N: 42.81702.001)

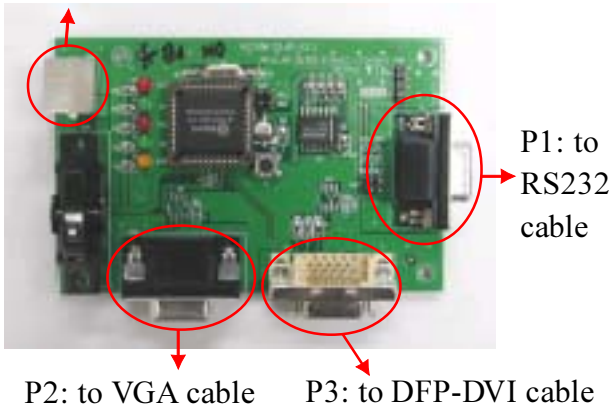


Fixture A



PC

Fixture B



DFP-DVI Cable (P/N: 42.81702.001)

Power Adapter (P/N: 47.56001.501)

RS-232 Cable (P/N: 42.55907.001)

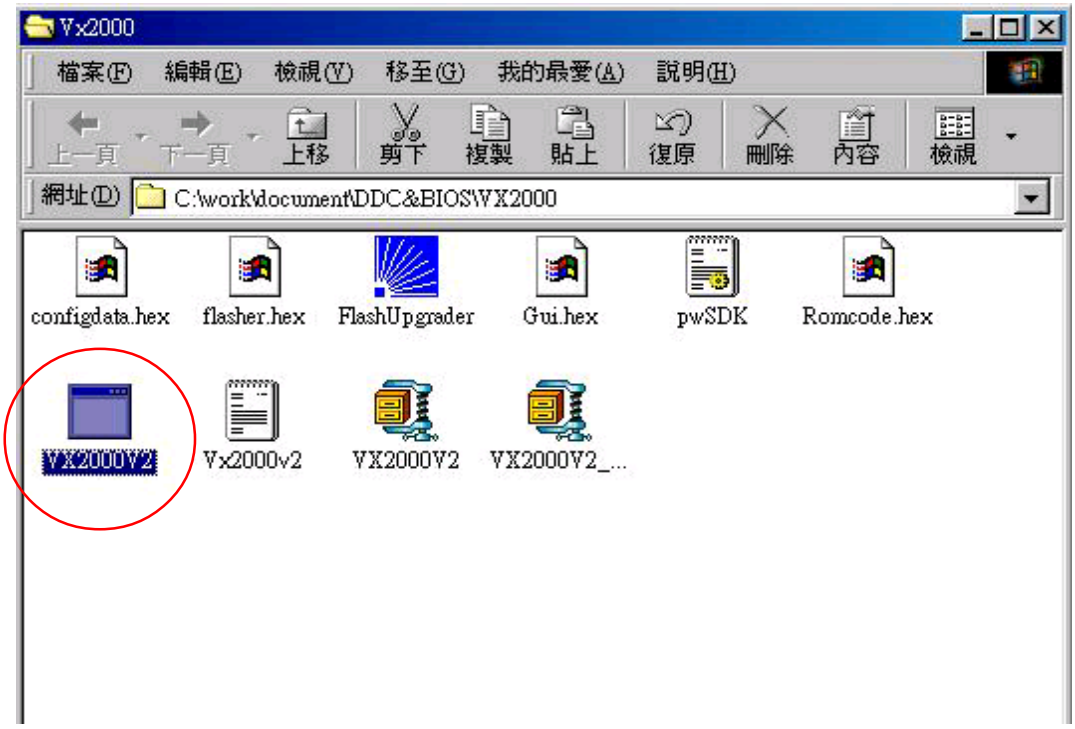
Power Adapter (P/N: 47.3402.004)

8-2 Setup Procedure

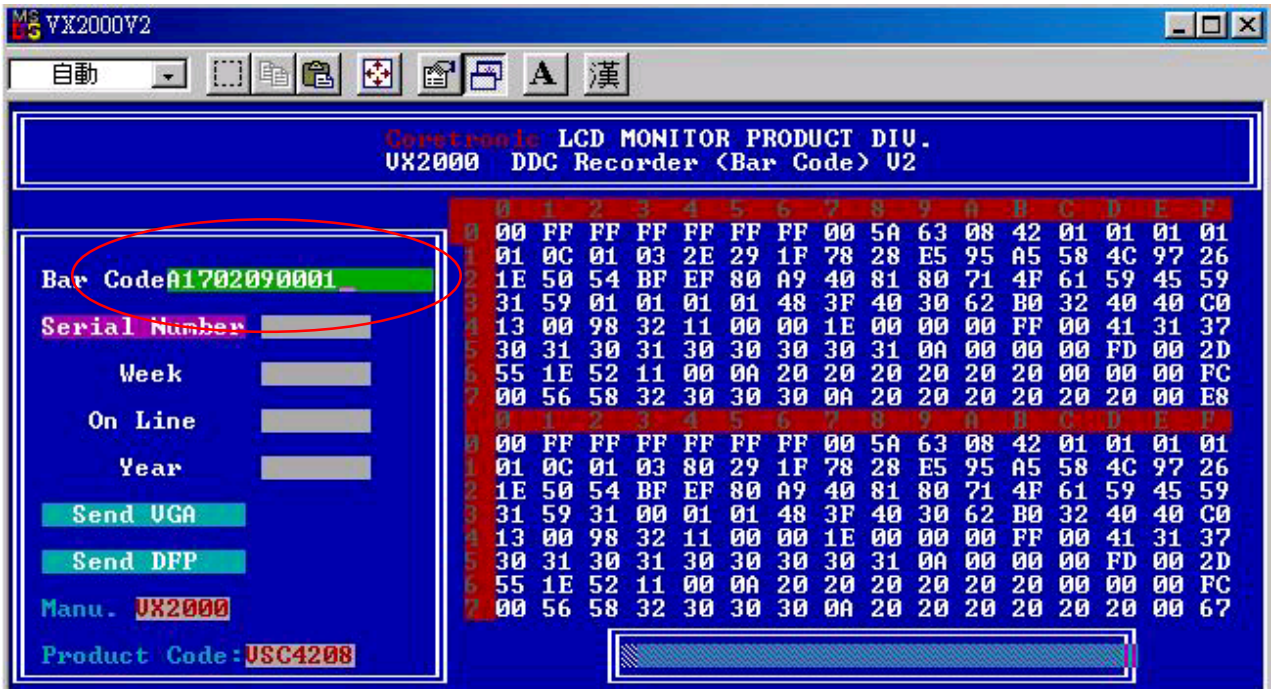
1. Choose alternative fixture: Fixture A or Fixture B.
2. Connect RS232 cable between P1 of Fixture and COM1 of PC.
3. Connect VGA cable between P2 of Fixture and VX2000.
4. Connect DFP-DVI cable between P3 of Fixture and VX2000.
5. Plug Power Adapter into Fixture.
6. Plug Power Cord into VX2000, monitor should be “turn off”.
7. Connect PC to the additional monitor.
8. Power on the Fixture.

8-3. DDC Key-in Procedure

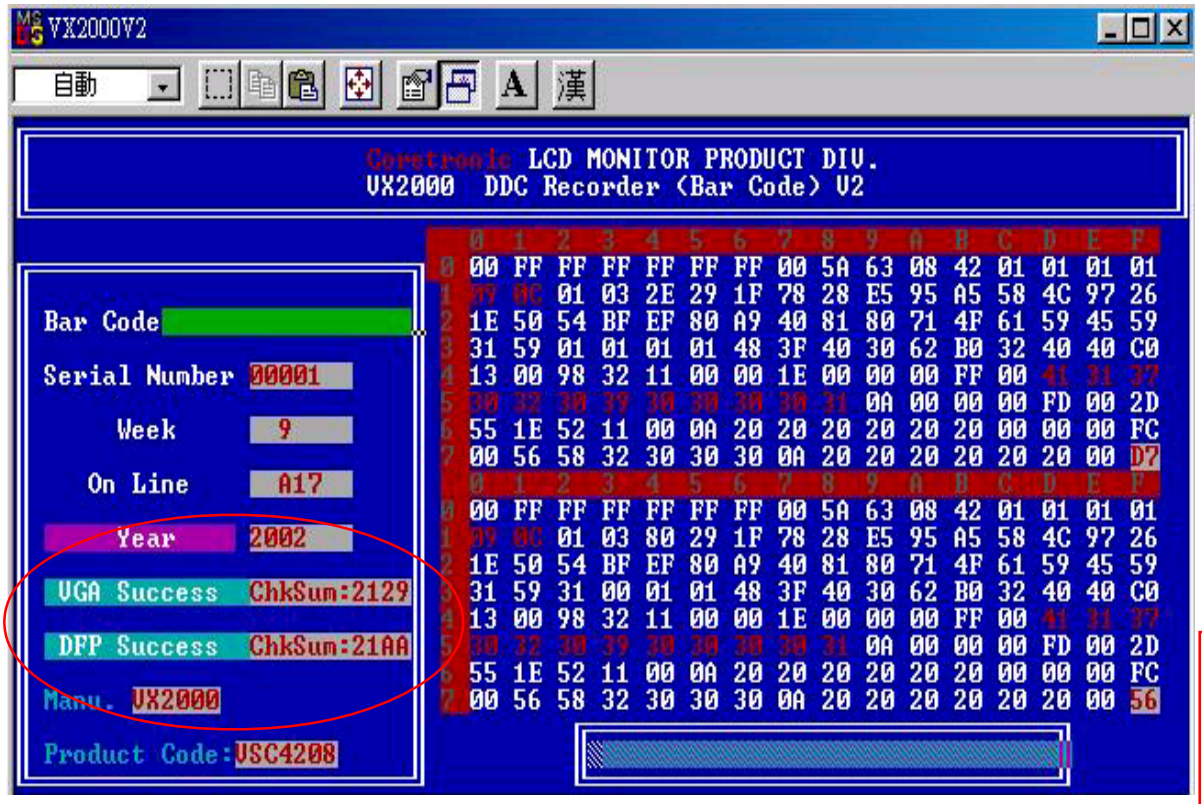
1. Run **<VX2000V2.EXE>** program in the computer.



2. Key-in S/N (serial number) or use the bar code reader scaning, then press “Enter” to begin programming.



3. The successful picture is as the following:
(There is CheckSum value appearing when the VGA and DFP success.)



4. Get into “Burn In Mode”(Ref 6-2) press any button besides “Power” button to check if the S/N is correct.

5. Connect PC signal to VX2000. Press “1” on the select knob, then choose “Information” to double check if the S/N is correct.

Chapter 9 Panel Specification

9-1 LCD Panel (Model#:FLC51UXC8V)

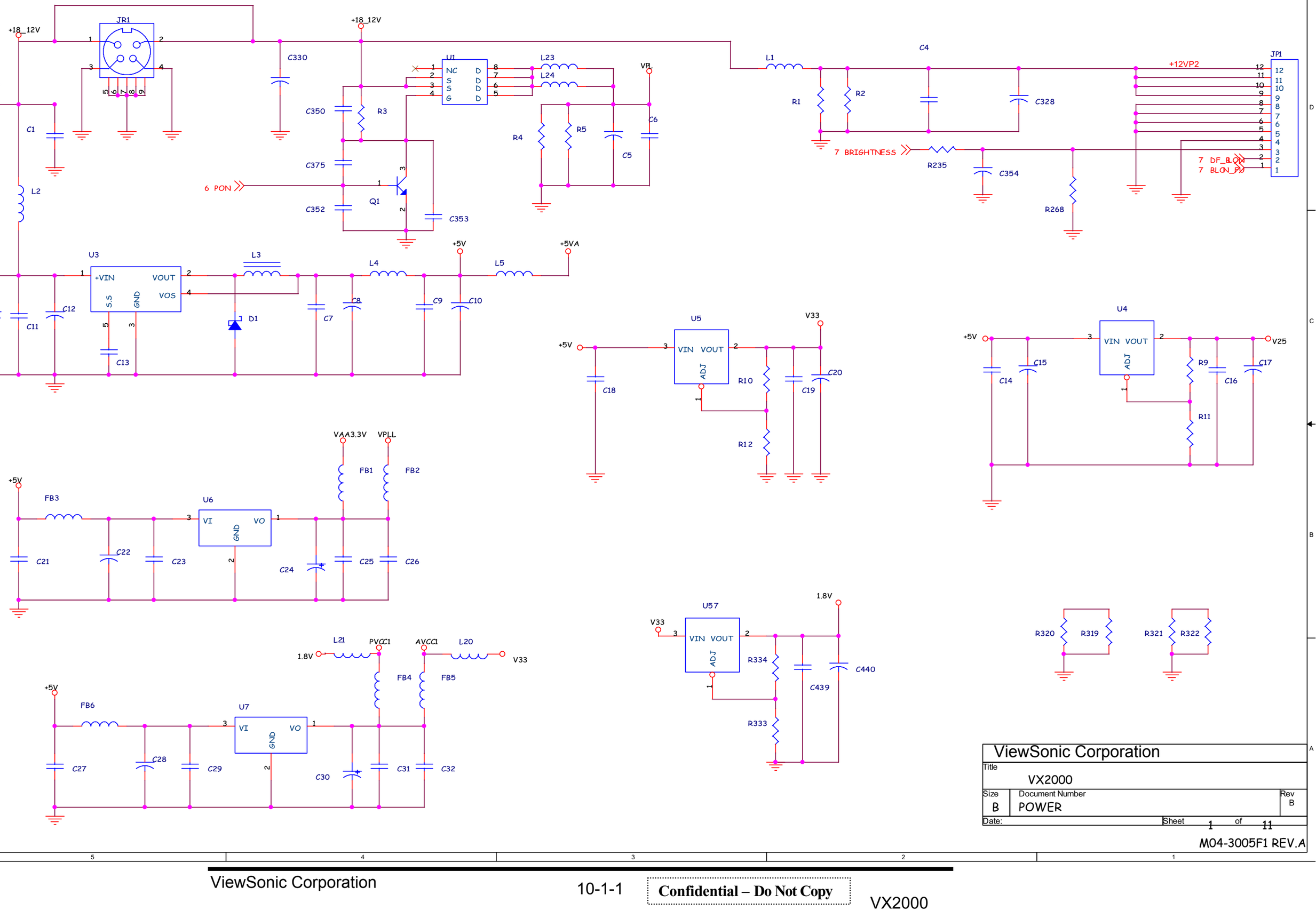
A. Mechanical

Active Area	408.0*306.0mm
Pixel Pitch	(0.085*3)*0.255mm
Mass Typical	3700g
Panel Dimensions (W*D*H)	456.0*(W)*356.0(H)*30.9(D)mm (Typ.)
Resolution	1600*1200
Surface Treatment with Haze value	Anti-glare, 2H
Panel Mode Number	FLC51UXC8V

B. Optical Performance

Contrast Ratio	*650:1(max),500:1(typ),350:1(min)*
Luminance of White (Center)	*280 cd/m² (max), 250 cd/m² (typ), 200 cd/m² (min)*
White Uniformity	>70% (9 points measurement)
Viewing Angle H, V (CR>10)	H:170°, V=170°
Response time (ms)	Typical Tr=15ms; Tf=10ms
Number of Back Light (CCFL)	6 edge type back light
Backlight (hrs)	50,000 hours

Chapter 10 Schematic Diagram & PCB Layout



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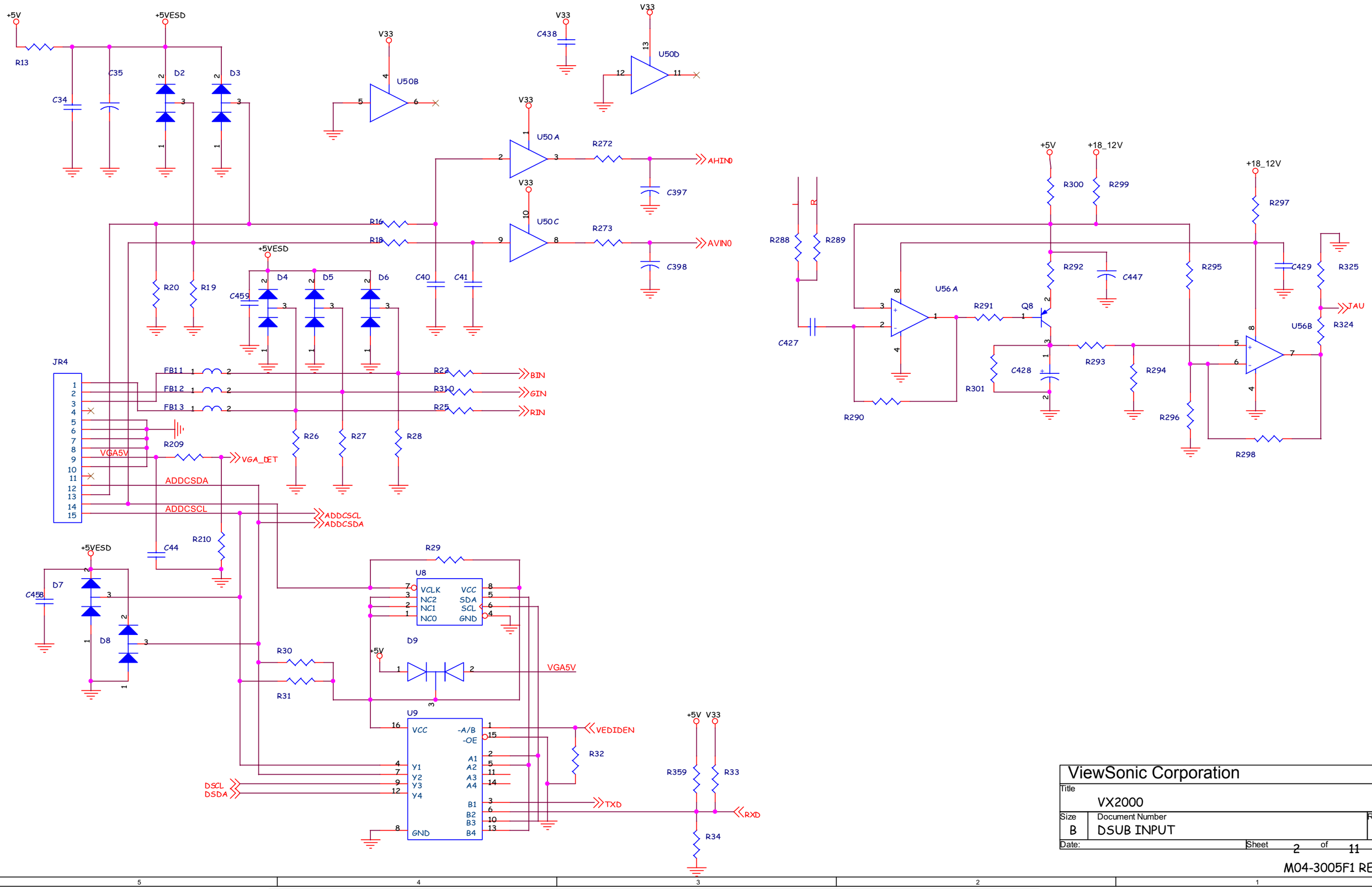
Size: B	Document Number: POWER	Rev: B
Date:	Sheet 1 of 11	

M04-3005F1 REV.A



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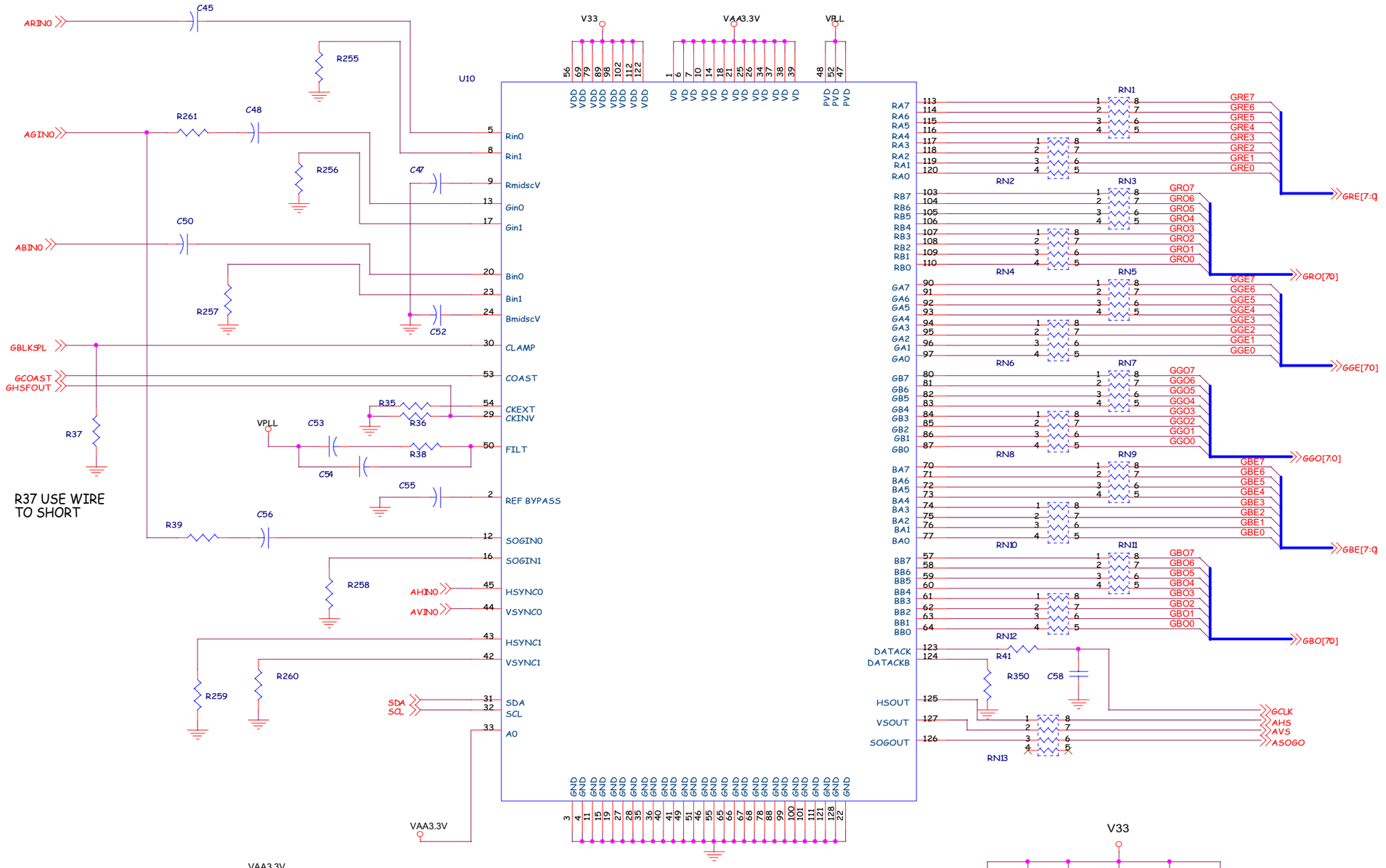
M04-3005F1 REV.A



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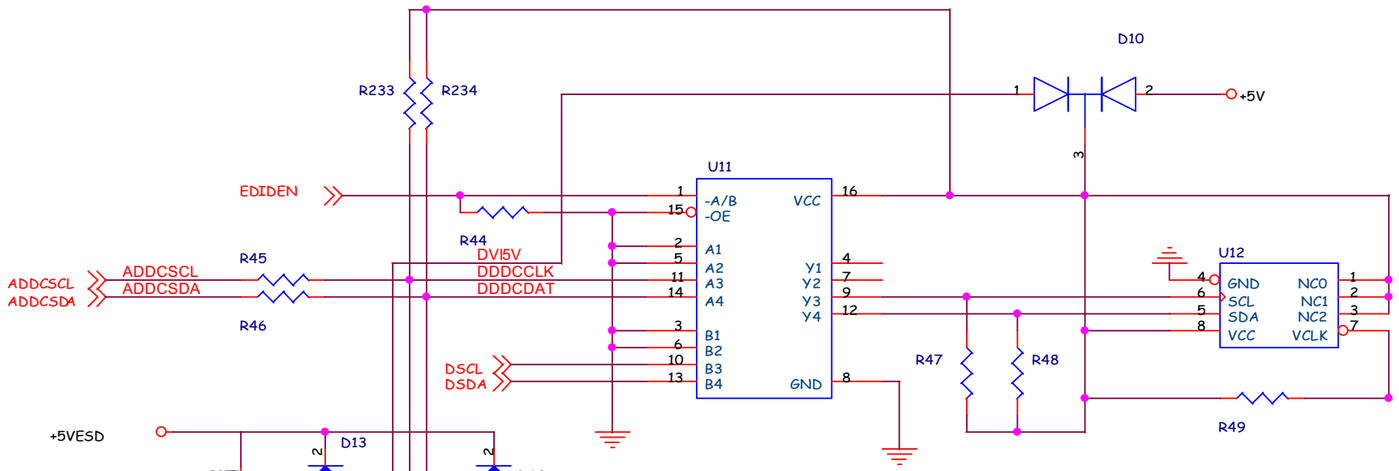

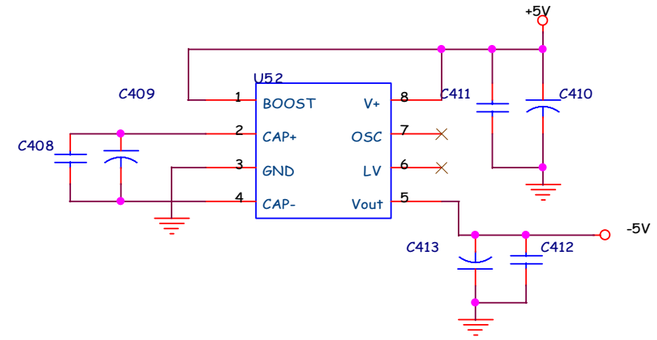

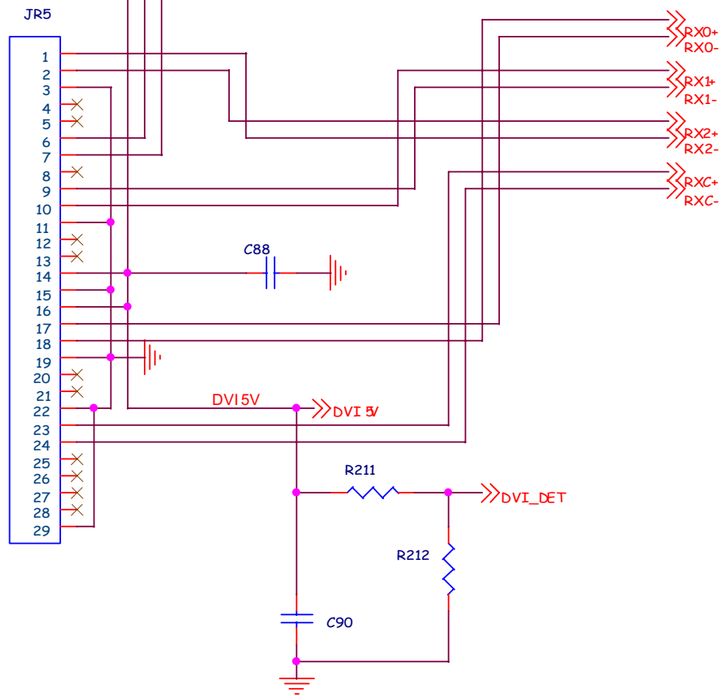

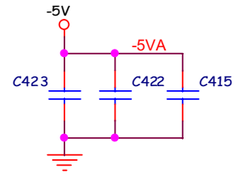

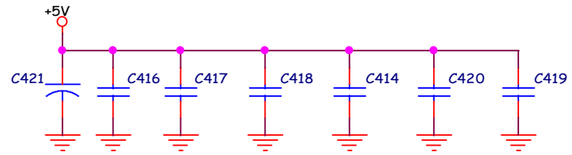

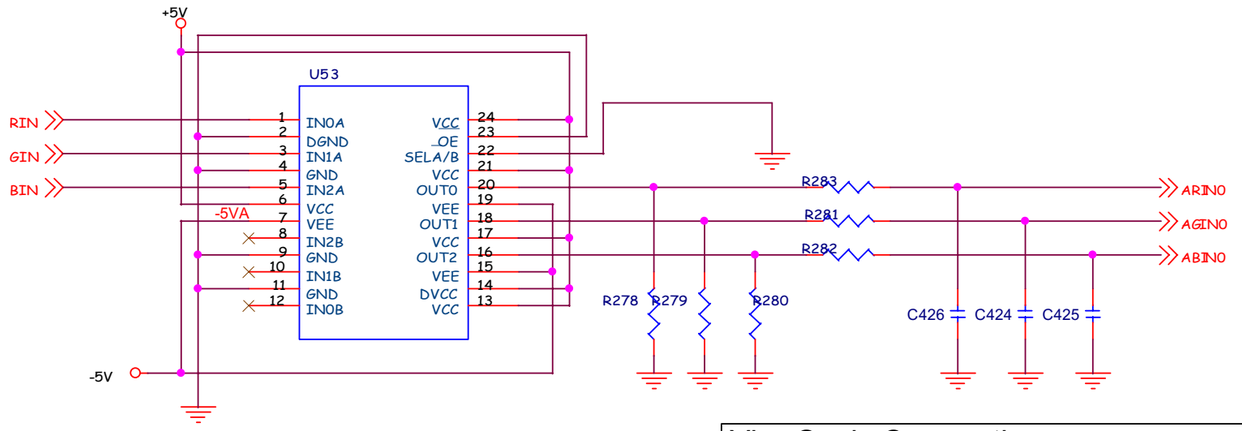

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Date:	Sheet 4 of 11	

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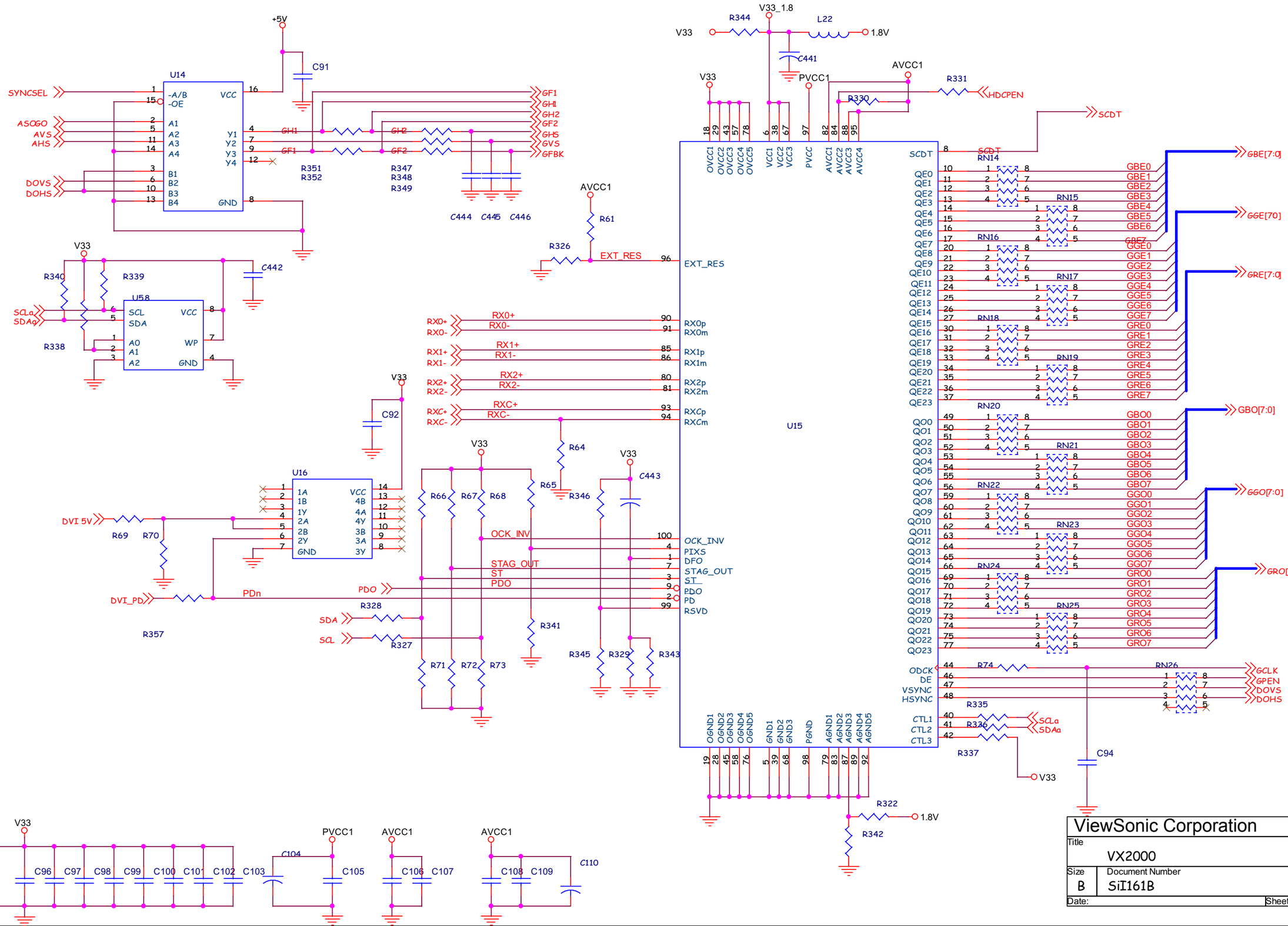

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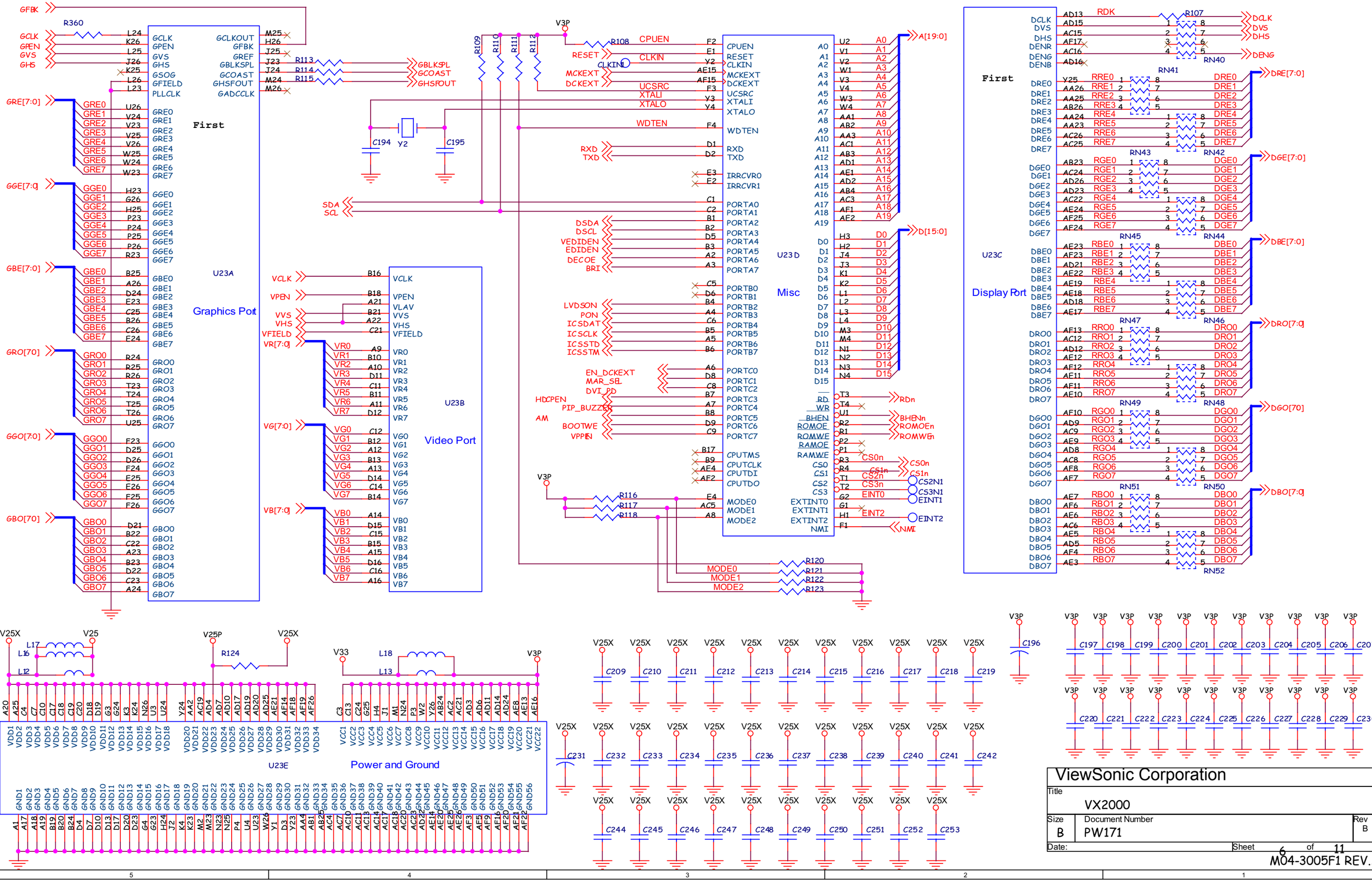

ViewSonic Corporation

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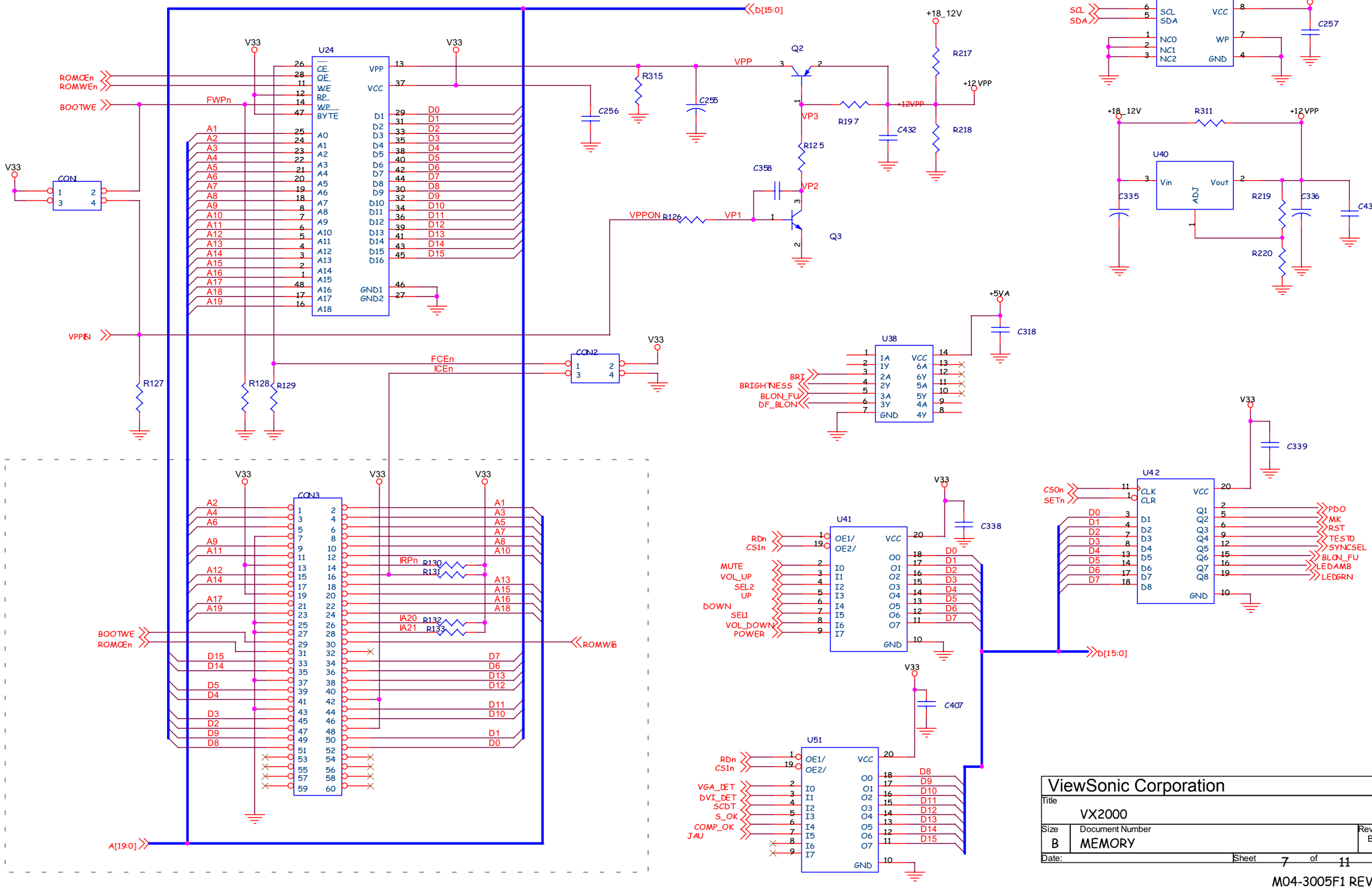

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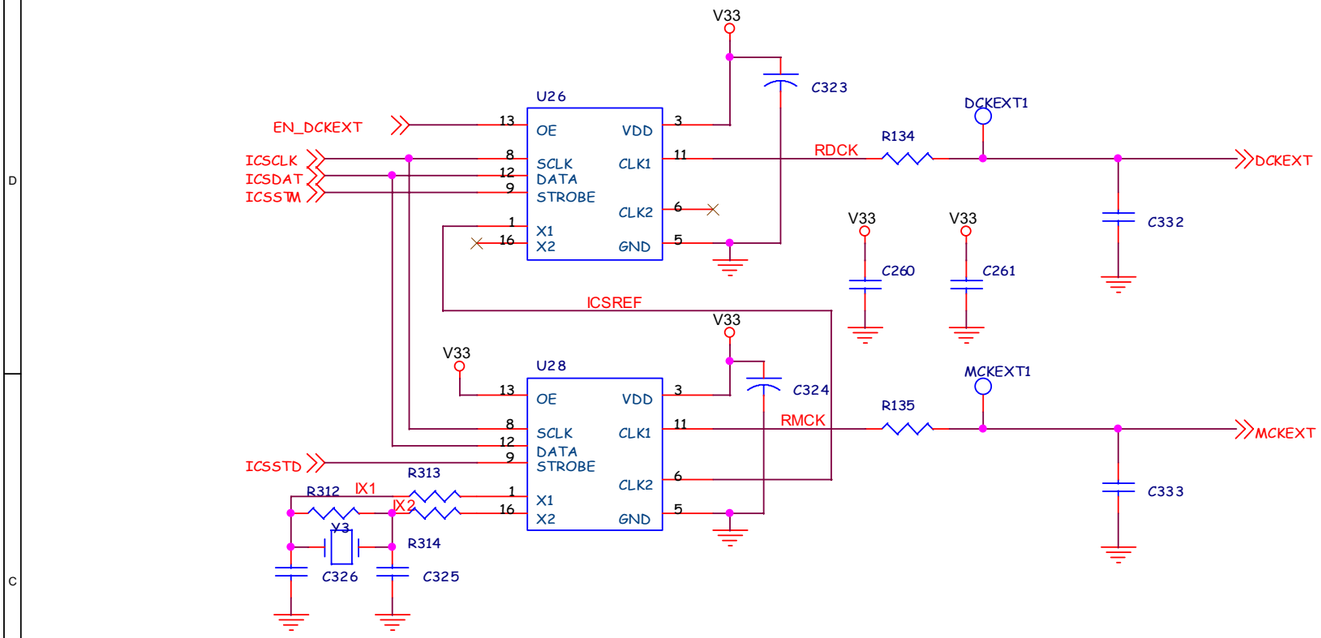

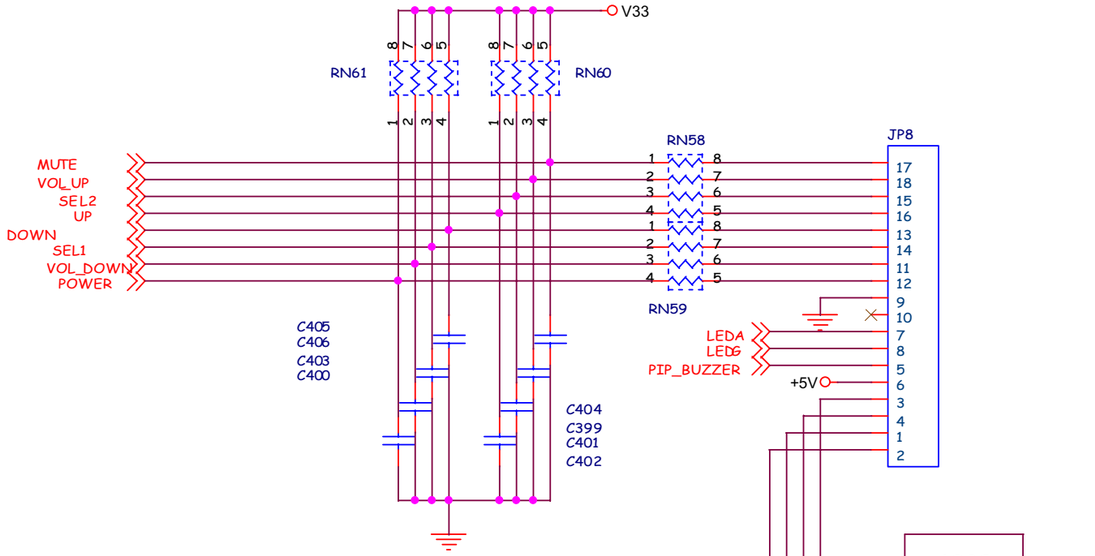

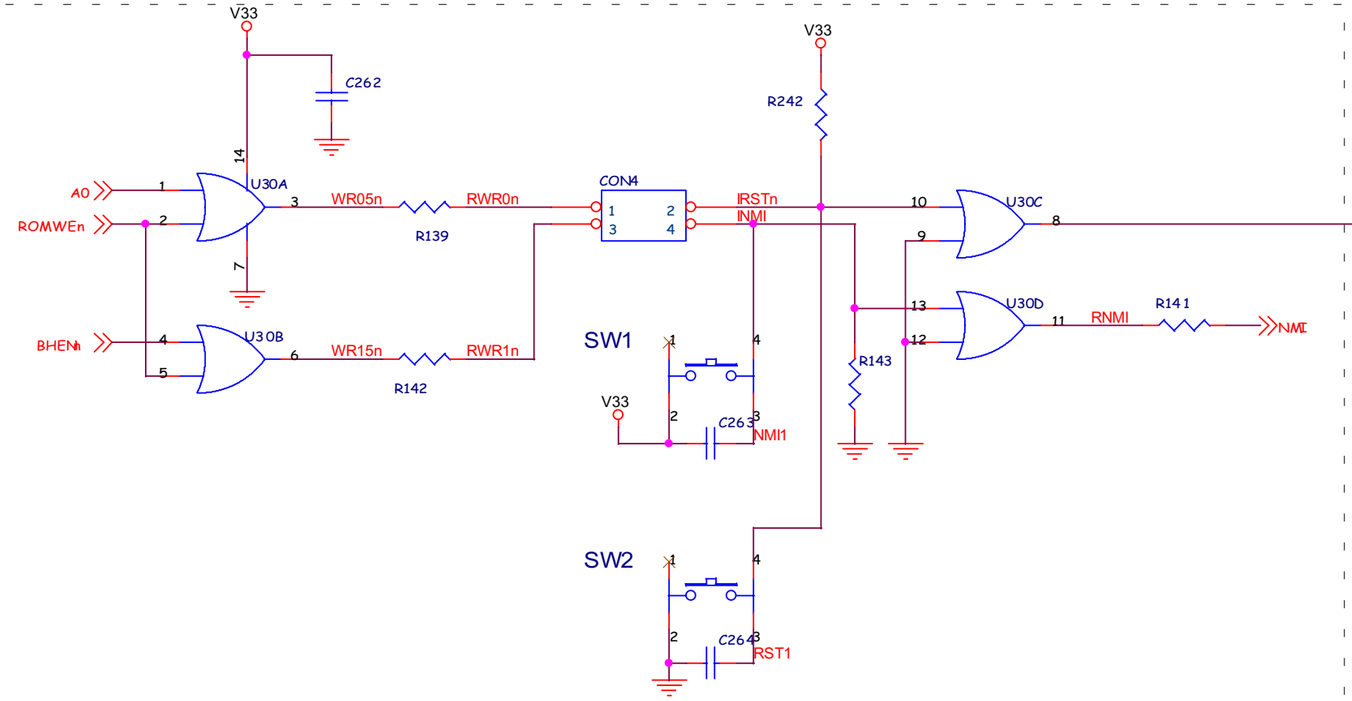

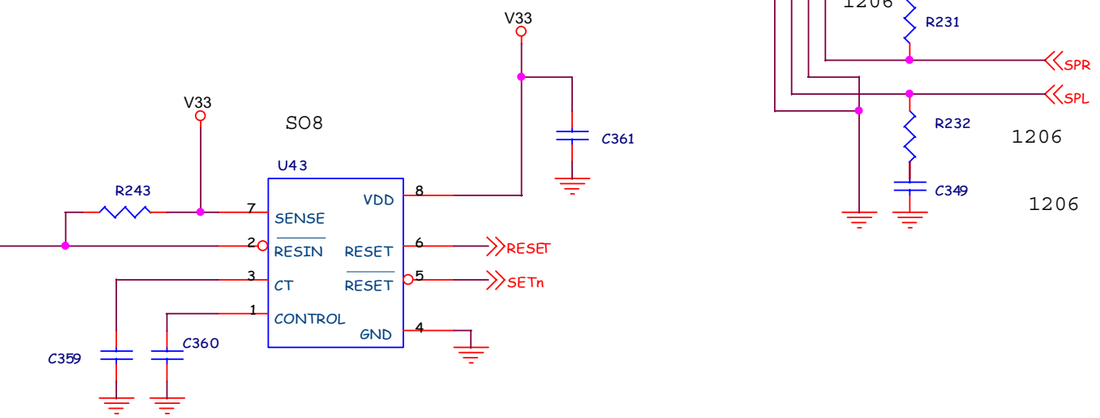

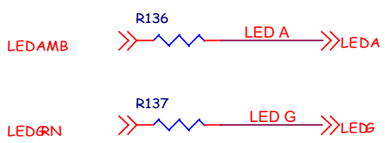

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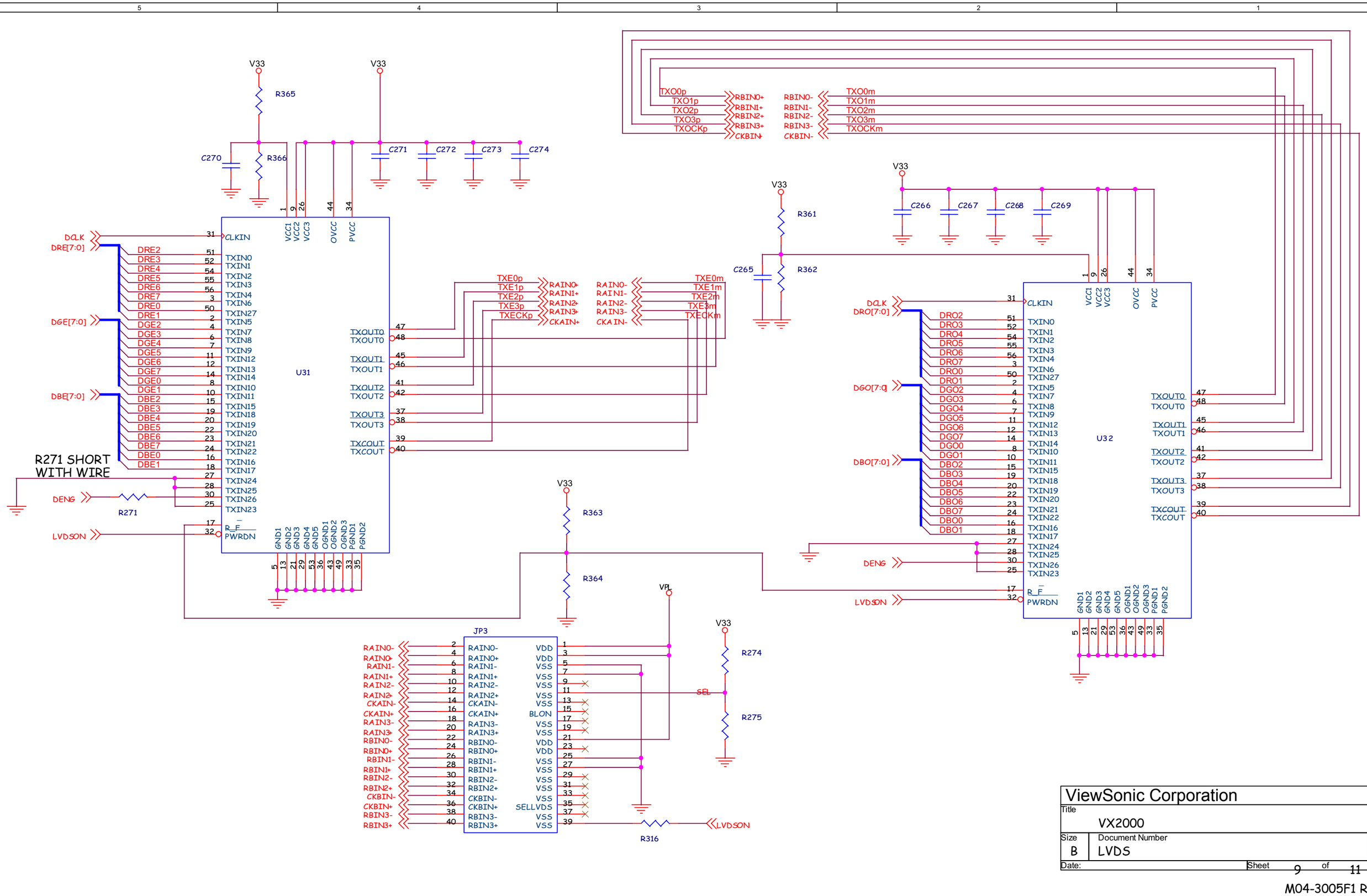

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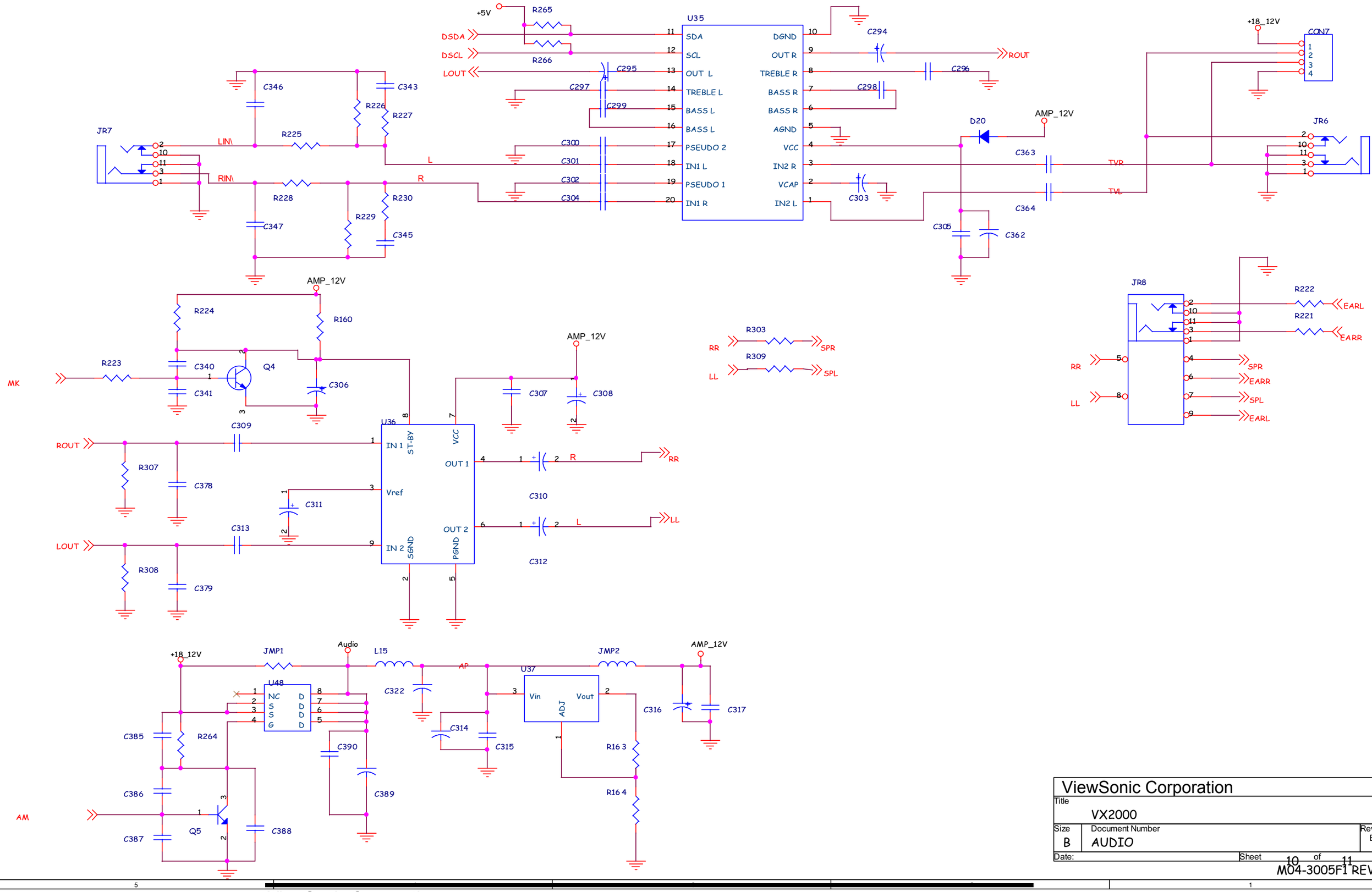

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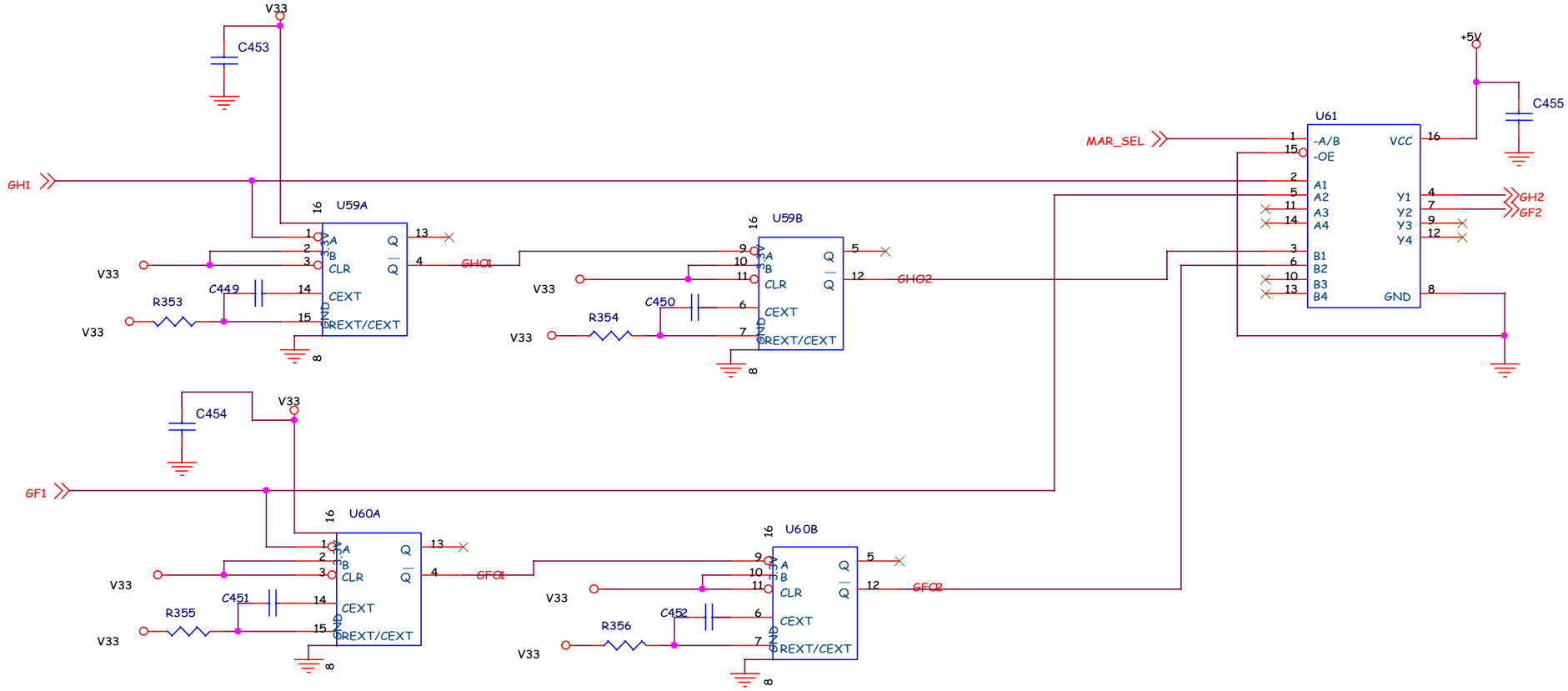

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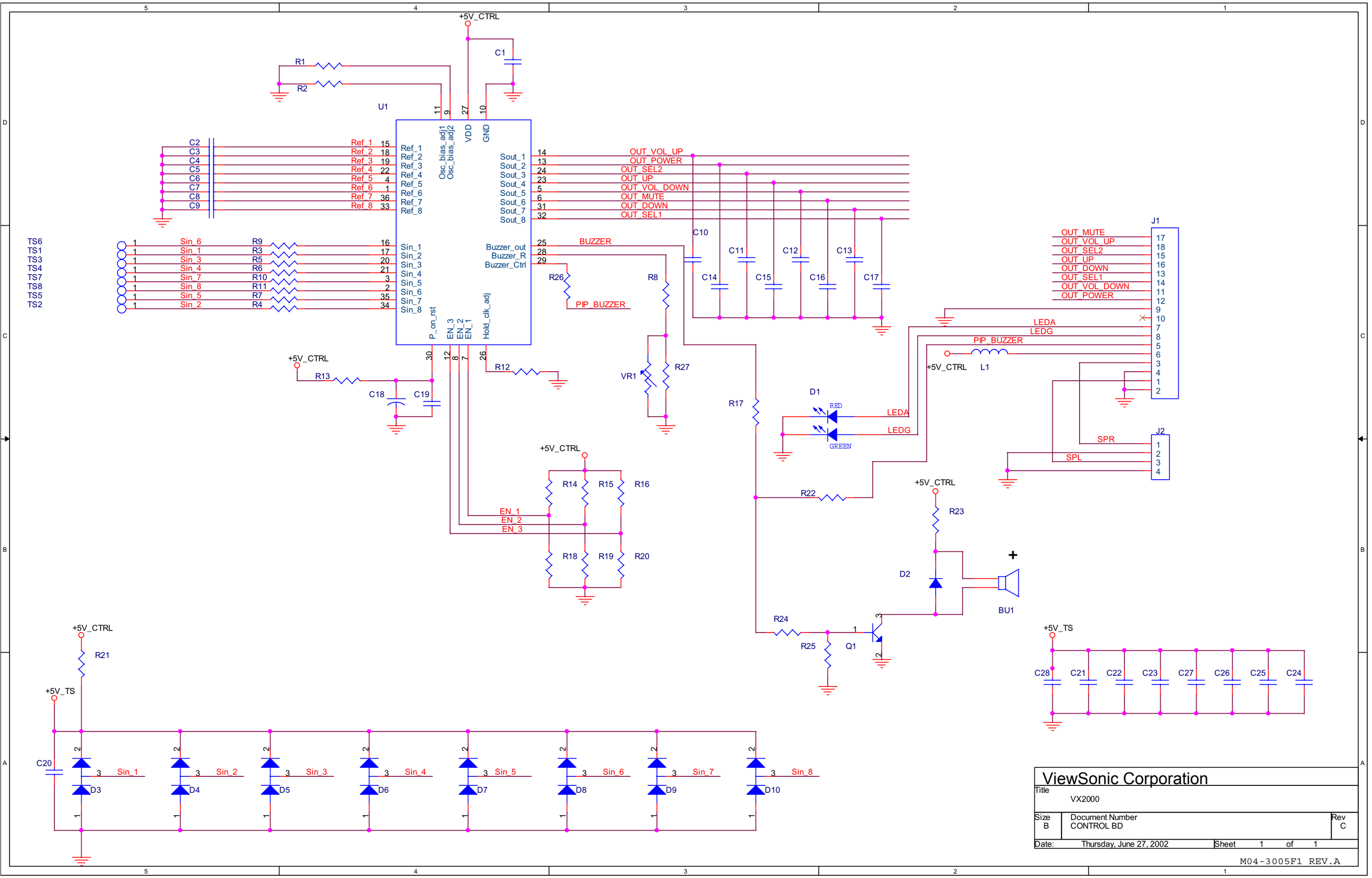

ViewSonic Corporation

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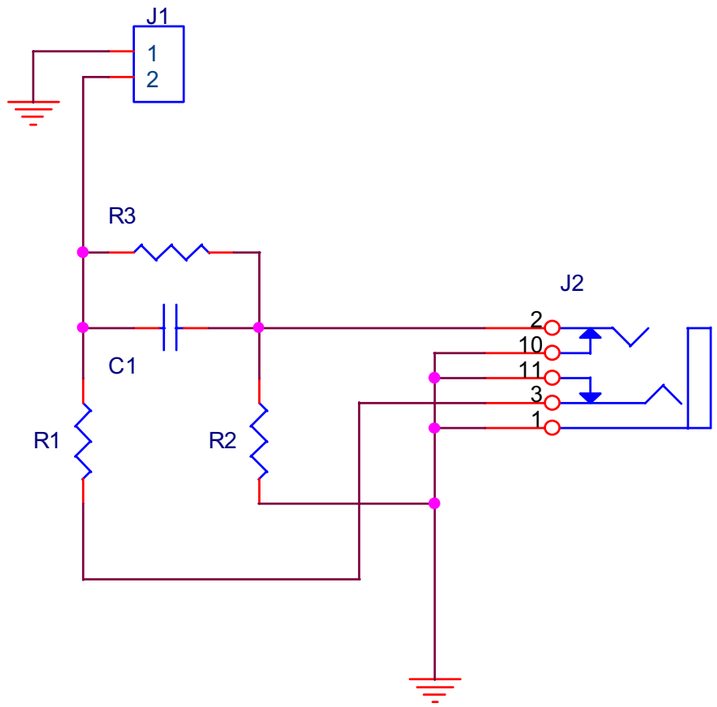

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Size: A	Document Number: MIC	Rev: B
Date: Tuesday, July 02, 2002	Sheet 1 of 1	

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10-1-13

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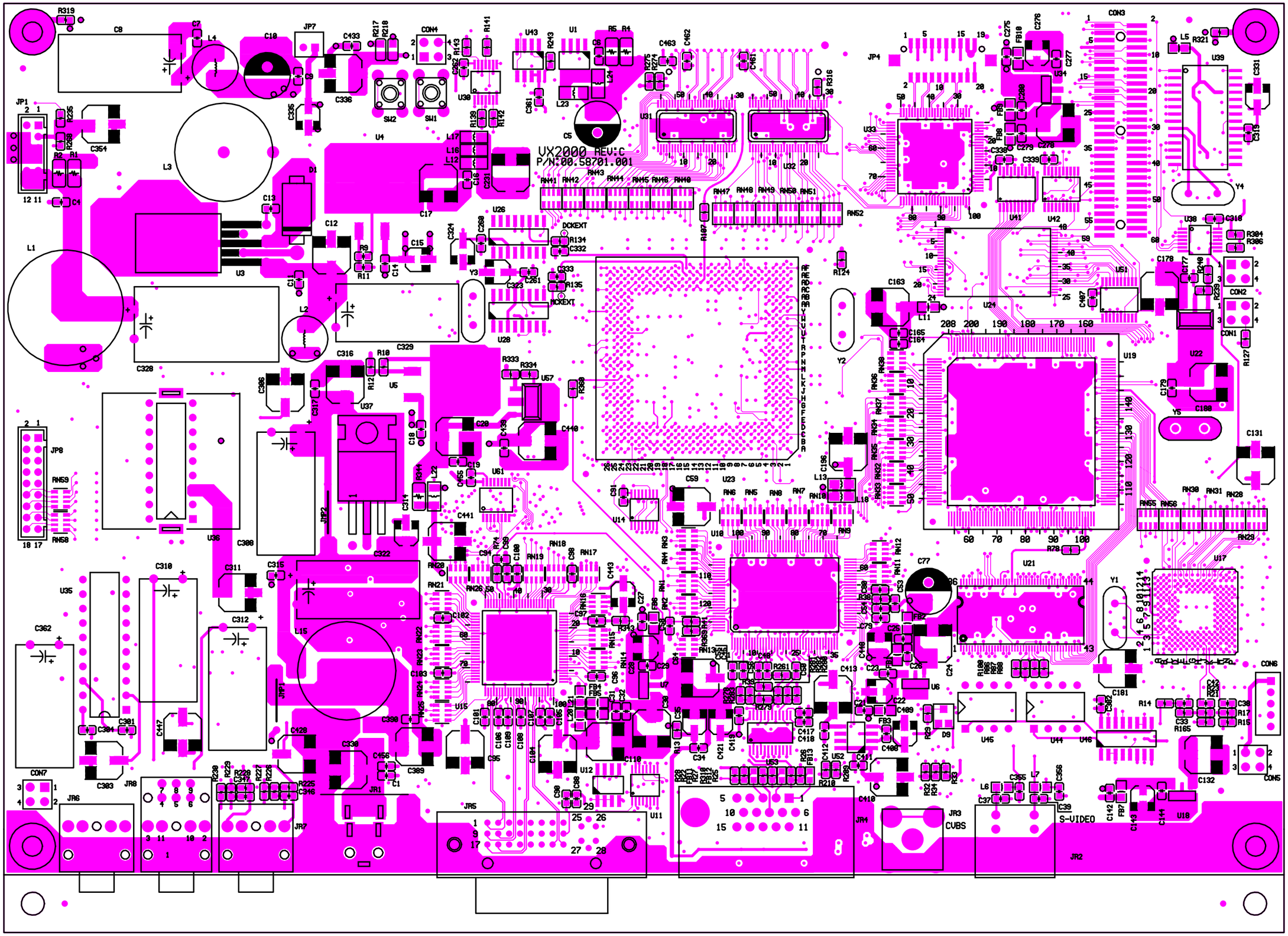
M04-3005F1 REV.A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JFP2
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SW2
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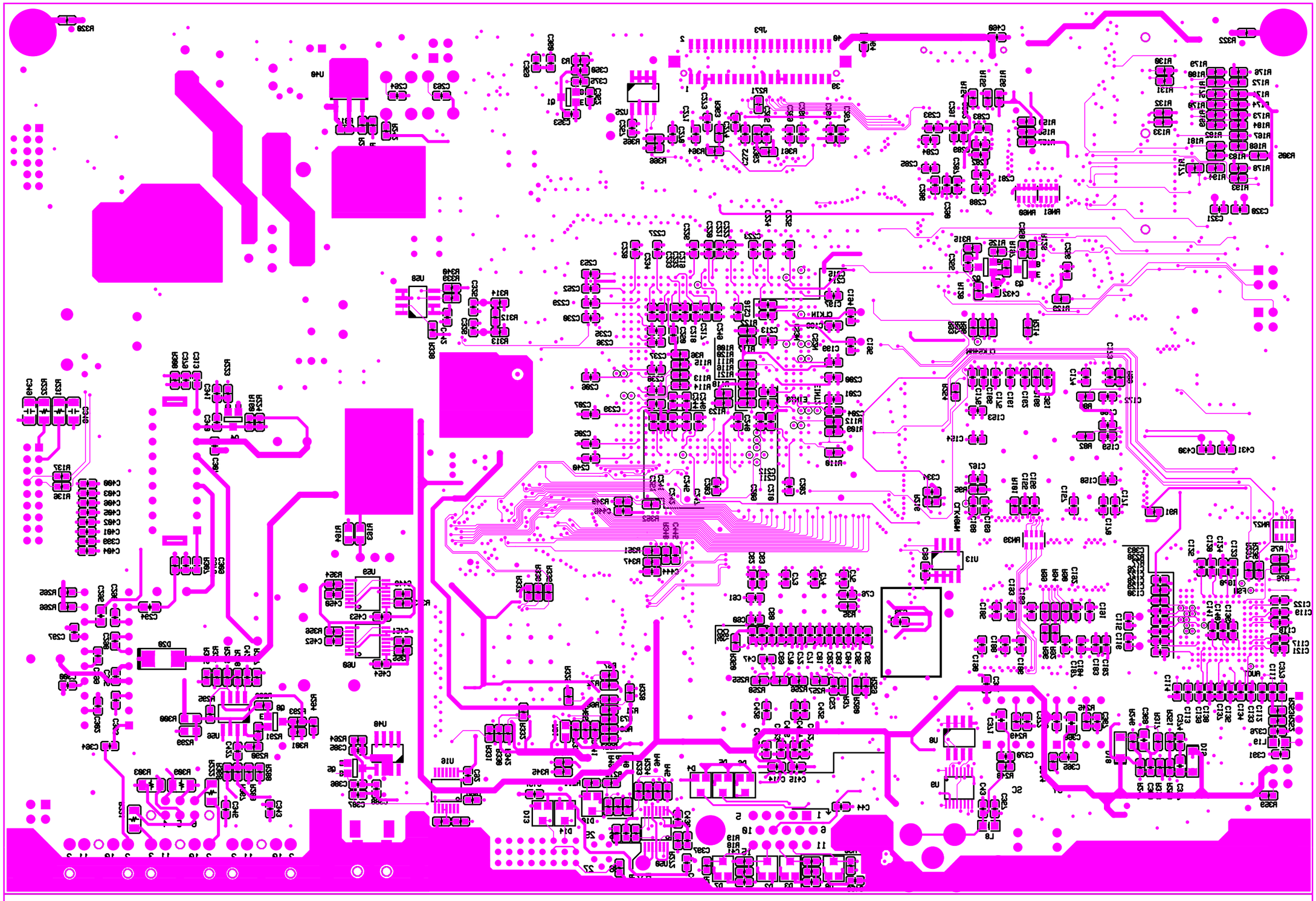

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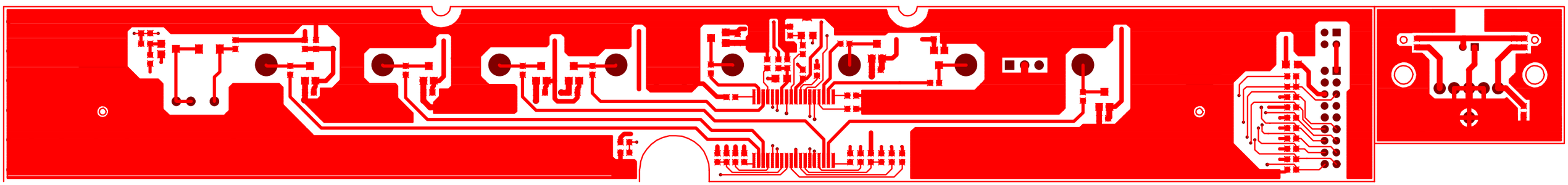
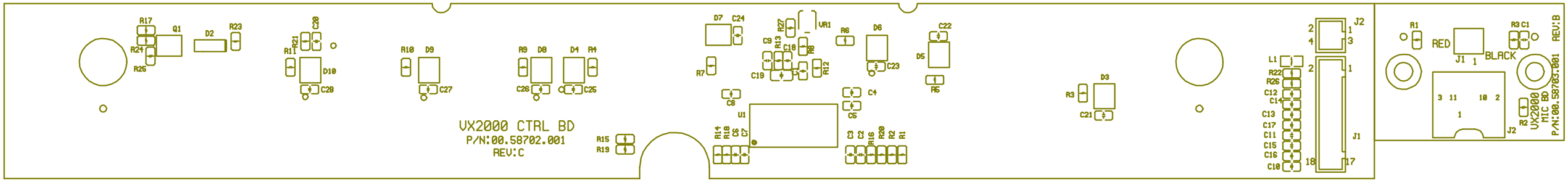


VX2000 CTRL BD
COMP SIDE



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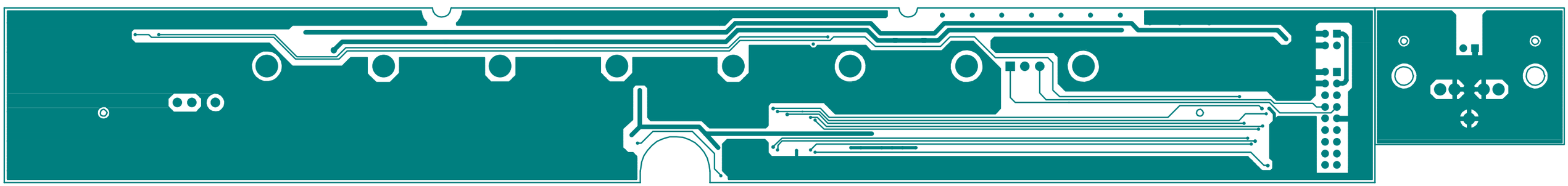

VX2000 CTRL BD
SOLD SIDE

Chapter 11 Appendix

11-1 The Serial Number System Definition

11-1.1 Serial Number for LCD Display

PPP (1) YY (2) WW (3) AAAAA (4)

(1) : PPP: Regional Product ID Code (ex: A17: VX2000.... series)

(2) : YY: Last 2 digits of manufacturing year (ex: 2001 - 01, 2002 - 02)

(3) : WW: Manufacturing week

(4) : AAAAA: Sequence number

EX: A17021300016

This label "A17021300016" represents whole serial number for VX2000 series model. It's produced on 13-week of 2002 and its serial code is 00016.

11-1.2 Serial Number for PCBA Main Board

M VV B Y X A1 EEEE
1 2 3 4 5 6 7

1: M = Vendor (ex.: M= Might)

2: VV = Model Code (ex: G9= VX2000 series...etc.)

3: B = Main Board, A/V Board or others (ex: M= Main Board)

4: Y = Last Number of the Year (ex: 2001 - 1, 2002 - 2)

5: X = Month (ex: Jan. ~ Sept.=1~9, Oct. ~ Dec.=X, Y, Z)

6: A1 = Version (ex: A1, D1..G3...etc.)

7: EEEE = Serial Code (from 0001~)

EX: MG9M23G90014

This label "MG9M23G90014" represents the vendor is Might and Main board of version G9 for VX2000 on March, 2002. Its serial code is 0014.

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 after reading VX2000 series Service Manual?

Unit	*Excellent*	*Good*	*Fair*	*Bad*
1. Introduction				
2. Mechanical Construction				
3. Procedure of Disassembly				
4. Function of Boards				
5. Troubleshooting Procedure				
6. Function Test & Alignment Procedure				
7. Firmware Upgrade Procedure				
8. DDC key-in Procedure				
9. LCD Specification				
10. Appendix				

B. Are you satisfied with the VX2000 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 opinion or suggestion about 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 of Quality Assurance (maupinm@viewsonic.com)