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221B3LPCB/27
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221B3LPCB/75
221B3LPCB/02
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Service Manual

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SAFETY NOTICE

ANY PERSON ATTEMPTING TO SERVICE THIS CHASSIS MUST FAMILIARIZE HIMSELF WITH THE CHASSIS AND BE AWARE OF THE NECESSARY SAFETY PRECAUTIONS TO BE USED WHEN SERVICING ELECTRONIC EQUIPMENT CONTAINING HIGH VOLTAGES.

CAUTION: USE A SEPARATE ISOLATION TRANSFORMER FOR THIS UNIT WHEN SERVICING

REFER TO BACK COVER FOR IMPORTANT SAFETY GUIDELINES

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飛利浦



PHILIPS

Revision List

[illegible]

Important Safety Notice

This electronic user guide is intended for anyone who uses the Philips monitor. Take time to read this user manual before you use your monitor. It contains important information and notes regarding operating your monitor. The Philips guarantee applies provided the product is handled properly for its intended use, in accordance with its operating instructions and upon presentation of the original invoice or cash receipt, indicating the date of purchase, dealers name and model and production number of the product.

Warnings

Use of controls, adjustments or procedures other than those specified in this documentation may result in exposure to shock, electrical hazards and/or mechanical hazards. Read and follow these instructions when connecting and using your computer monitor.

Operation

- Keep the monitor out of direct sunlight and away from stoves or any other heat source.
- Remove any object that could fall into ventilation holes or prevent proper cooling of the monitor's electronics.
- Do not block the ventilation holes on the cabinet.
- When positioning the monitor, make sure the power plug and outlet are easily accessible.
- If turning off the monitor by detaching the power cable or DC power cord, wait for 6 seconds before attaching the power cable or DC power cord for normal operation.
- Please use approved power cord provided by Philips all the time. If your power cord is missing, please contact with your local service center. (Please refer to Customer Care Consumer Information Center)
- • Do not subject the monitor to severe vibration or high impact conditions during operation.
- • Do not knock or drop the monitor during operation or transportation.

Maintenance

- To protect your monitor from possible damage, do not put excessive pressure on the LCD panel. When moving your monitor, grasp the frame to lift; do not lift the monitor by placing your hand or fingers on the LCD panel.
- Unplug the monitor if you are not going to use it for an extensive period of time.
- Unplug the monitor if you need to clean it with a slightly damp cloth. The screen may be wiped with a dry cloth when the power is off. However, never use organic solvent, such as, alcohol, or ammonia-based liquids to clean your monitor.
- To avoid the risk of shock or permanent damage to the set, do not expose the monitor to dust, rain, water, or excessive moisture environment.
- If your monitor gets wet, wipe it with dry cloth as soon as possible.
- If foreign substance or water gets in your monitor, please turn the power off immediately and disconnect the power cord. Then, remove the foreign substance or water, and send it to the maintenance center.
- Do not store or use the monitor in locations exposed to heat, direct sunlight or extreme cold.
- In order to maintain the best performance of your monitor and use it for a longer lifetime, please use the monitor in a location that falls within the following temperature and humidity ranges.
 - Temperature: 0-40°C 32-95°F
 - Humidity: 20-80% RH

- **IMPORTANT:** Always activate a moving screen saver program when you leave your monitor unattended. Always activate a periodic screen refresh application if your monitor will display unchanging static content. Uninterrupted display of still or static images over an extended period may cause “burn in”, also known as “after-imaging” or “ghost imaging”, on your screen. “Burn-in”, “after-imaging”, or “ghost imaging” is a well-known phenomenon in LCD panel technology. In most cases, the “burned in” or “after-imaging” or “ghost imaging” will disappear gradually over a period of time after the power has been switched off.

Warning

Severe “burn-in” or “after-image” or “ghost image” symptoms will not disappear and cannot be repaired. The damage mentioned above is not covered under your warranty.

Service

- The casing cover should be opened only by qualified service personnel.
- If there is any need for any document for repair or integration, please contact with your local service center. (Please refer to the chapter of “Consumer Information Center”)
- For transportation information, please refer to “Technical Specifications”.
- Do not leave your monitor in a car/trunk under direct sun light.

Note

Consult a service technician if the monitor does not operate normally, or you are not sure what procedure to take when the operating instructions given in this manual have been followed.

1. Monitor Specifications

Technical specifications

Picture/Display			
Monitor Panel Type	TFT-LCD		
Backlight	LED		
Panel Size	21.5" W (54.6 cm)		
Aspect Ratio	16:9		
Pixel Pitch	0.248 x 0.248 mm		
Brightness	250 cd/m²		
SmartContrast	20M:1		
Contrast Ratio (typical)	1000:1		
Response Time (typical)	5 ms		
Optimum Resolution	1920 x 1080 @ 60Hz		
Viewing Angle	176° (H) / 170° (V) @ C/R ≥10		
Picture Enhancement	SmartImage		
Display Colors	16.7 M		
Vertical Refresh Rate	56Hz - 76Hz		
Horizontal Frequency	30 KHz - 83 KHz		
sRGB	YES		
Connectivity			
Signal Input	DVI-D (Digital), VGA (Analog)		
Input Signal	Separate Sync, Sync on Green		
Convenience			
User Convenience	SmartImage/▼, Volume/▲, Power On/Off, Sensor/Back, Menu (OK)		
OSD Languages	English, French, German, Italian, Russian, Spanish, Simplified Chinese, Portuguese		
Plug & Play Compatibility	DDC/CI, sRGB, Windows 7 / Vista / XP, Mac OSX, Linux		
Stand			
Tilt	-5 / +20		
Swivel	-65 / +65		
Height Adjustment	70mm		
Power			
On mode	20.1 W (typ.), 30W (max.)		
On mode (ECO mode)	11.8W (typ.)		
Energy Consumption (EnergyStar 5.0 test method)	AC Input Voltage at 100V AC +/- 5V AC, 50Hz +/- 3Hz	AC Input Voltage at 115V AC +/- 5V AC, 60Hz +/- 3Hz	AC Input Voltage at 230V AC +/- 5V AC, 50Hz +/- 3Hz
Normal Operation (typ.)	18.10 W	17.80 W	17.70 W
Sleep	0.1 W	0.1 W	0.1 W
Off	0.1 W	0.1 W	0.1 W

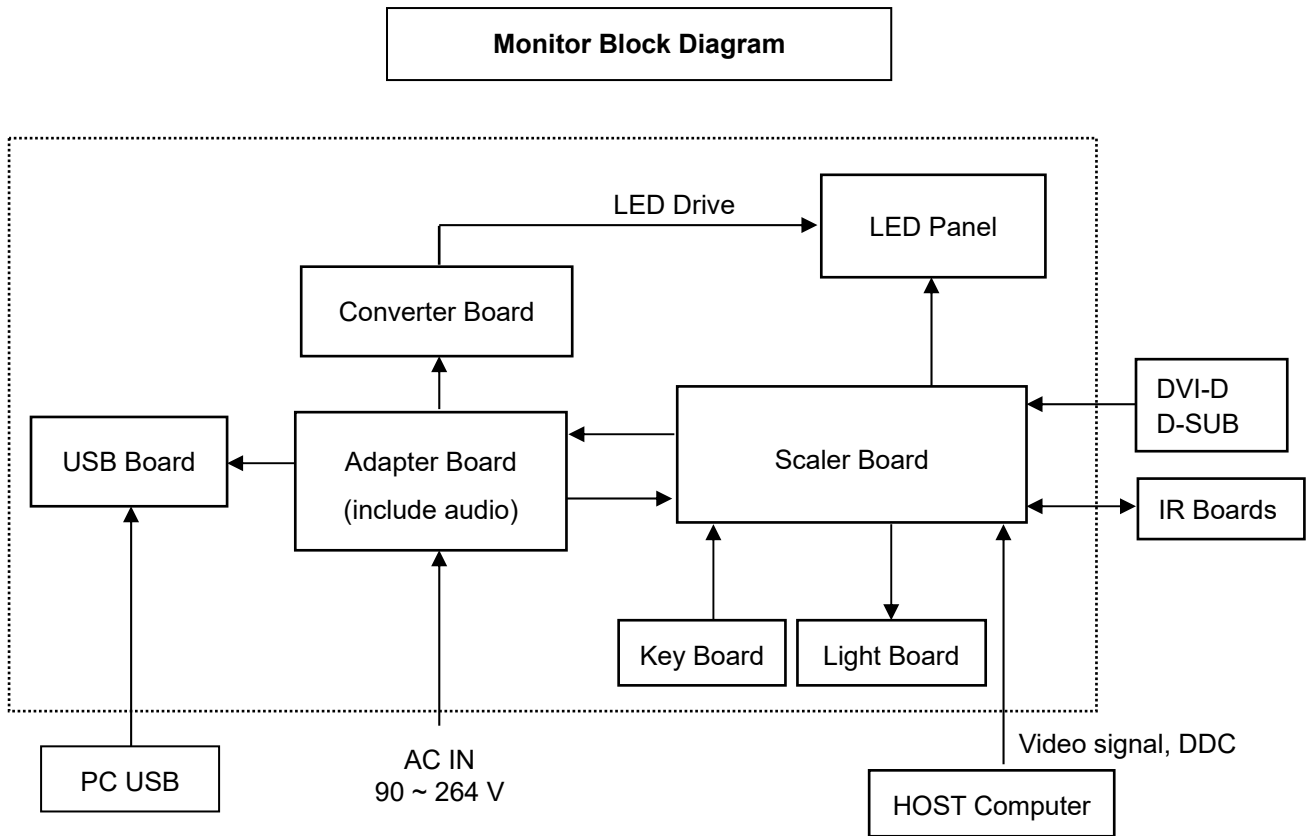
Heat Dissipation*	AC Input Voltage at 100V AC +/- 5V AC, 50Hz +/- 3Hz	AC Input Voltage at 115V AC +/- 5V AC, 60Hz +/- 3Hz	AC Input Voltage at 230V AC +/- 5V AC, 50Hz +/- 3Hz
Normal Operation	57.37 BTU/hr	56.89 BTU/hr	56.65 BTU/hr
Sleep	0.341BTU/hr	0.341BTU/hr	.0341BTU/hr
Off	0.341BTU/hr	0.341BTU/hr	.0341BTU/hr
Power LED Indicator	On mode: White, Standby/Sleep mode: White (blinking)		
Power Supply	Build-in, 100-240VAC, 50/60 Hz		
Dimension			
Product with Stand (W x H x D)	507 x 400 x 220 mm		
Product without Stand (W x H x D)	507 x 323 x 59 mm		
Box Dimension (W x H x D)	565 x 466 x 175 mm		
Weight			
Product with Stand	4.8 kg		
Product without Stand	3.4 kg		
Product with Packaging	6.67 kg		
Operating Condition			
Temperature Range (operation)	0°C to 40 °C		
Temperature Range (storage)	-20°C to 60°C		
Relative Humidity	20% to 80%		
Altitude	operation: +120,000 ft (3,658 m)		
	Non-operation: + 40,000ft (12,192 m)		
MTBF	30,000hrs (LED)		
Environmental			
ROHS	YES		
EPEAT	Gold. (www.epeat.net)		
Packaging	100% recyclable		
Compliance and standards			
Regulatory Approvals	BSMI, CE Mark, FCC Class B, GOAST, SEMKO, TCO5.1, TÜV Ergo, TÜV/ GS, UL/cUL		
Cabinet			
Color	Black / Silver		
Finish	Texture		


Note:

1. EPEAT Gold or Silver is valid only where Philips registers the product. Please visit www.epeat.net for registration status in your country.
2. This data is subject to change without notice. Go to www.philips.com/support to download the latest version of leaflet.

2. LCD Monitor Description

The LCD monitor will contain a scaler board, an adapter board, an USB board, a light board, a key board and two IR boards. The scaler board houses the flat panel control logic, brightness control logic and DDC. The adapter board will provide AC to DC inverter voltage to drive the backlight of panel and the scaler board chips each voltage.



3. Operating Instructions

3.1 General Instructions

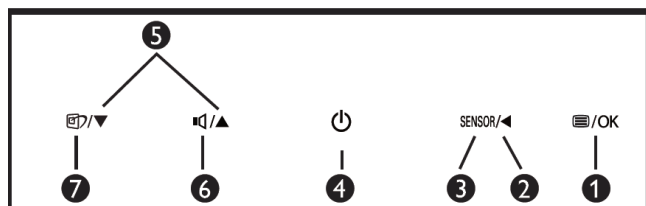
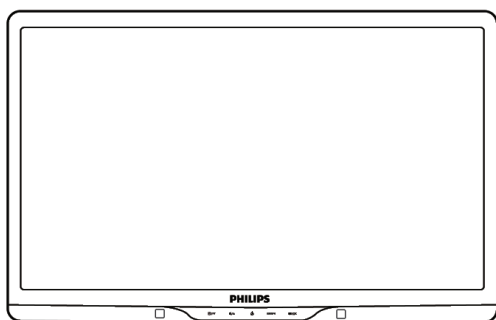
Press the power button to turn the monitor on or off.

The other control knobs are located at front panel of the monitor. By changing these setting, the picture can be adjusted to your personal preference.

- * The power cord should be connected.
 - * Press the power button to turn on the monitor.
- The power indicator will light up.

3.2 Control Buttons

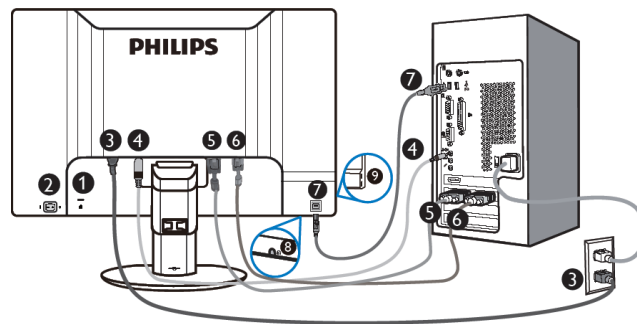
Operating the Monitor



Front view product description

1. /OK: To access the OSD menu.
2. : Return to previous OSD level.
3. **SENSOR**: power sensor.
4. : To switch monitor's power on and off.
5. : To adjust the OSD menu.
6. : To adjust brightness of this monitor.
7. : SmartImage: there are 6 modes to be selected: Office, Photo, Movie, Game, Economy, Off.

Connecting to your PC



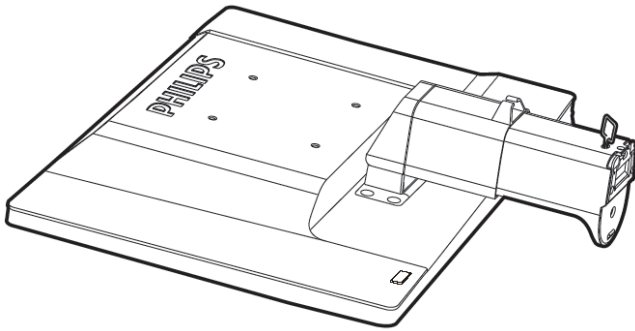
1. Kensington anti-thief lock
2. Power switch
3. AC power input
4. Audio input
5. DVI-D input
6. D-sub input
7. USB upstream
8. Earphone
9. USB downstream

Connect to PC

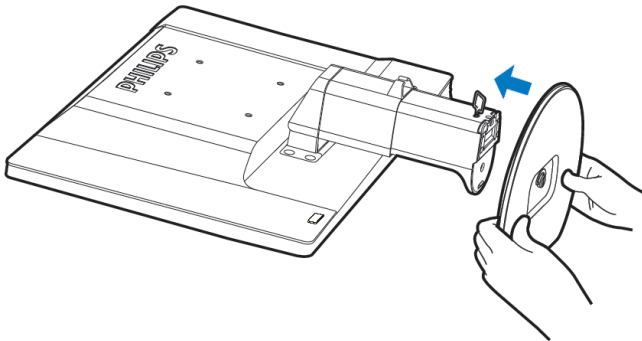
1. Turn off your computer and unplug its power cord.
2. Connect the VGA or DVI signal cable for video connection.
3. Connect the audio cable for audio connection.
4. Plug the power cord into a nearby AC power outlet.
5. Connect the USB upstream port on the monitor and the USB port on your computer with a USB cable. The USB downstream port is now ready for any USB device to plug in.
6. Turn on your computer and monitor. If the monitor displays images, the installation is done.

Install base stand

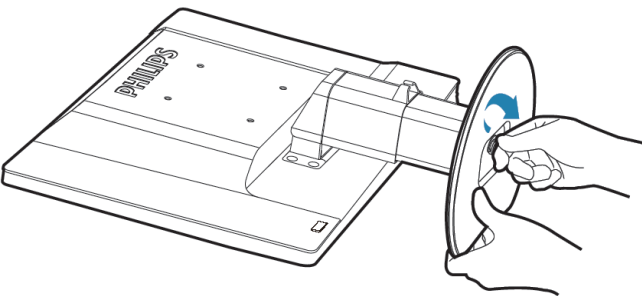
1. Place the monitor face down a smooth surface taking care to avoid scratching or damaging the screen.



2. Hold the monitor base stand with both hands and firmly insert the base stand into the base column.

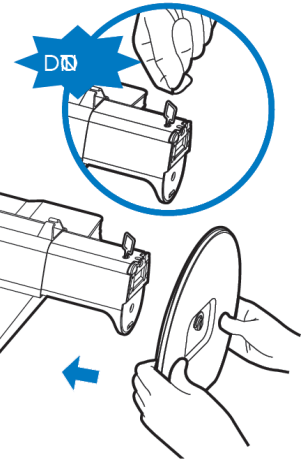


3. Attach the monitor base stand to the base column then fasten base stand.



Caution

Do not release the height adjustment pin lock from the base column before the base stand is firmly fixed.



3.3 OSD Menu

On-screen Display (OSD) is feature in all Philips monitors. It allows an end user to adjust screen performance or select functions of the monitors directly through an on-screen instruction window. A user friendly on screen display inter face is shown as below:



Basic and simple instruction on the control keys

In the OSD shown above users can press ▼▲ buttons at the front bezel of the monitor to move the cursor, **OK** to confirm the choice or change.

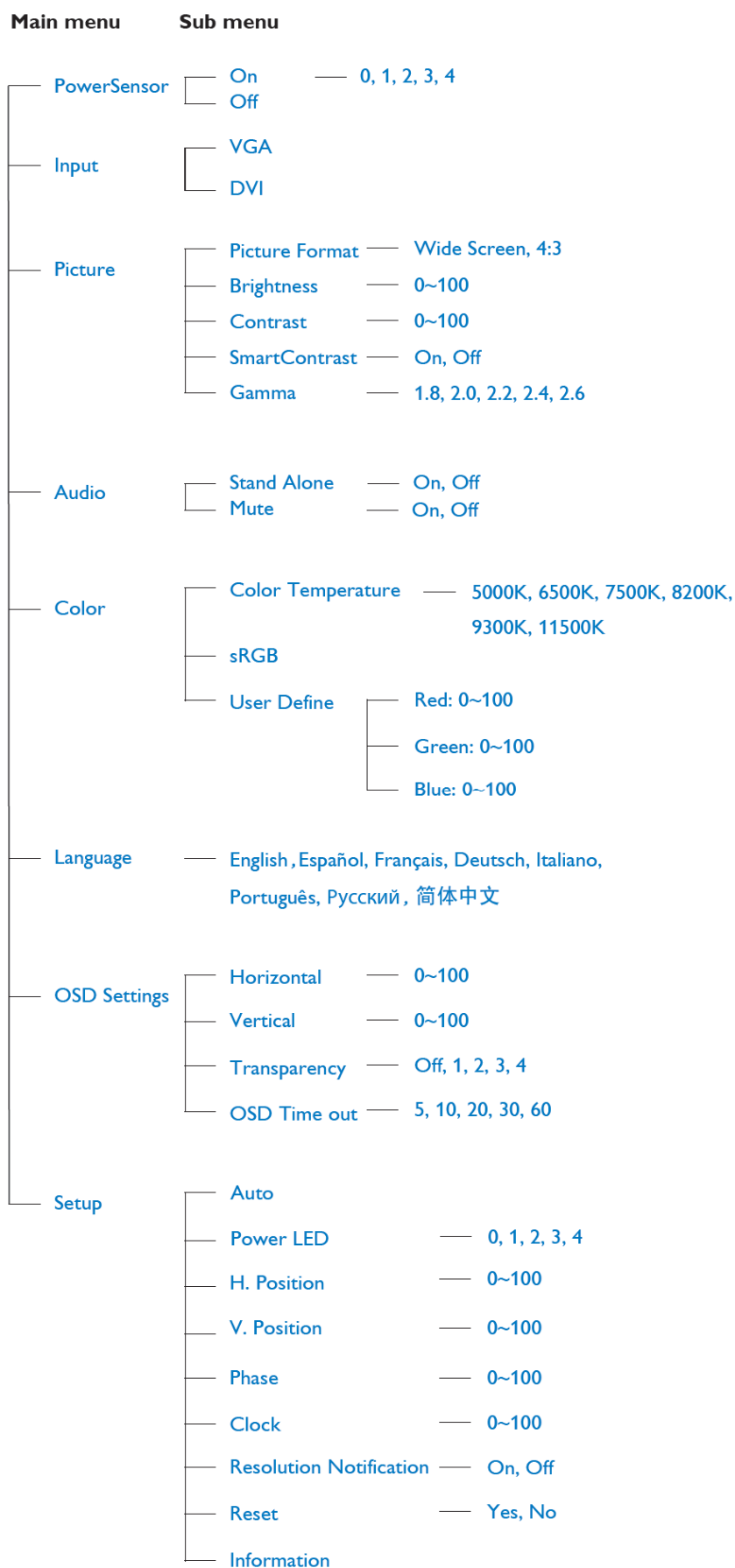
To Lock/Unlock OSD function (User Mode)

The OSD function can be locked by pressing “MENU” button for more than 10 seconds.

Locked OSD function can be released by pressing “MENU” button for more than 10 seconds again.

The OSD tree

Below is an overall view of the structure of the On-Screen Display. You can use this as a reference when you want to work your way around the different adjustments later on.



4. Input/ Output Specification

4.1 Input Signal Connector

Analog Connector

Pin No.	Signal Name	Pin No.	Signal Name
1	Red	9	DDC +3.3V or +5V
2	Green/ SOG	10	Logic GND
3	Blue	11	Sense (GND)
4	Sense (GND)	12	Bi-directional data
5	Cable Detect (GND)	13	H/H+V sync
6	Red GND	14	V-sync
7	Green GND	15	Data clock
8	Blue GND		

Digital Connector

Pin No.	Signal Name	Pin No.	Signal Name
1	T.M.D.S. data2-	13	No Connect
2	T.M.D.S. data2+	14	+5V Power
3	T.M.D.S. data2 shield	15	Ground (for +5V)
4	No Connect	16	Hot plug detect
5	No Connect	17	T.M.D.S. data0-
6	DDC clock	18	T.M.D.S. data0+
7	DDC data	19	T.M.D.S. data0 shield
8	No Connect	20	No Connect
9	T.M.D.S. data1-	21	No Connect
10	T.M.D.S. data1+	22	T.M.D.S. clock shield
11	T.M.D.S. data1 shield	23	T.M.D.S. clock+
12	No Connect	24	T.M.D.S. clock-

4.2 Resolution & Preset Modes

Maximum Resolution

1920 x 1080 at 60 Hz (analog input)

1920 x 1080 at 60 Hz (digital input)

Recommended Resolution

1920 x 1080 at 60 Hz (digital input)

H. freq (kHz)	Resolution	V. freq (Hz)
31.47	720 x 400	70.09
31.47	640 x 480	59.94
35.00	640 x 480	66.67
37.86	640 x 480	72.81
37.50	640 x 480	75.00
37.88	800 x 600	60.32
46.88	800 x 600	75.00
48.36	1024 x 768	60.00
60.02	1024 x 768	75.03
63.89	1280 x 1024	60.02
79.98	1280 x 1024	75.03
55.94	1440 x 900	59.89
70.64	1440 x 900	74.98
65.29	1680 x 1050	59.95
67.50	1920 x 1080	60.00



Note:

Please notice that your display works best at native resolution of 1920 x 1080@60Hz. For best display quality, please follow this resolution recommendation.

Power Management Definition

Power Management Definition					
VESA Mode	Video	H-Sync	V-Sync	Power Used	LED Color
Active	ON	Yes	Yes	< 20.1 W (typ.)	White
Sleep	OFF	No	NO	< 0.1 W (typ.)	White (Blinking)
Switch off	OFF	-	-	0 W (typ. AC switch)	OFF



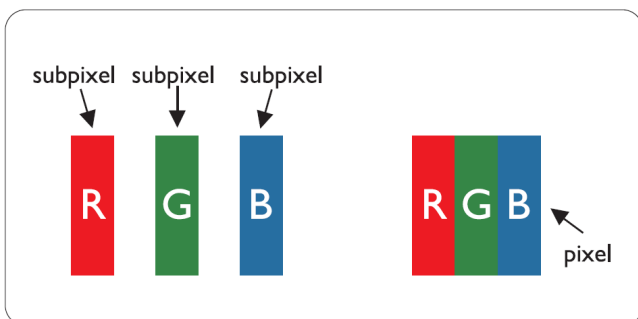
Note:

This data is subject to change without notice.

4.3 Pixel Defect Policy

Philips strives to deliver the highest quality products.

We use some of the industry's most advanced manufacturing process and practice stringent quality control. However, pixel or sub pixel defects on the TFT LCD panels used in flat panel monitors are sometimes unavoidable. No manufacturer can guarantee that panels will be free from pixel defects, but Philips guarantees that any monitor with an unacceptable number of defects will be repaired or replaced under warranty. This notice explains the different types of pixel defects and defines acceptable defect levels for each type. In order to qualify for repair or replacement under warranty, the number of pixel defects on a TFT LCD panel must exceed these acceptable levels. For example, no more than 0.0004% of the sub pixels on a 21.5" XGA monitor may be defective. Furthermore, Philips sets even higher quality standard for certain types or combinations of pixel defects that are more noticeable than others. This policy is valid worldwide.



Pixels and Sub pixels

A pixel, or picture element, is composed of three sub pixels in the primary colors of red, green and blue. Many pixels together form an image. When all sub pixels of pixel are lit, the three colored sub pixels together appear as a single white pixel. When all are dark, the three colored sub pixels together appear as a signal black pixel. Other combinations of lit and dark sub appear as single pixels of other colors.

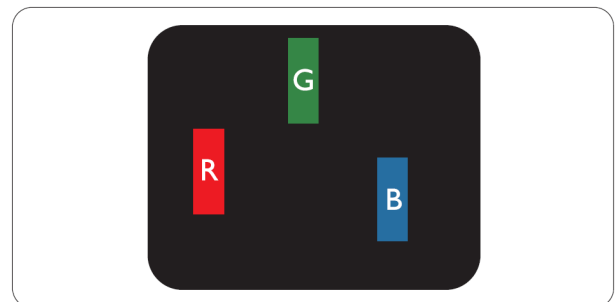
Types of Pixel Defects

Pixel and sub pixel defects appear on the screen in different ways. There are two categories of pixel

defects and several types of sub pixel defects within each category.

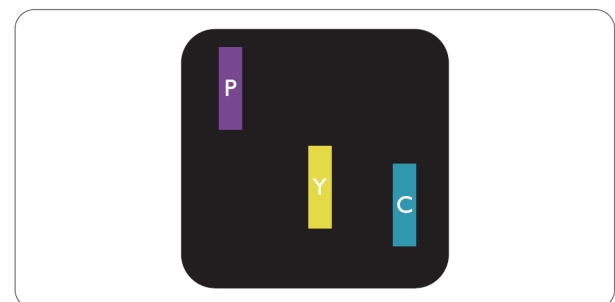
Bright Dot Defects Bright dot defects appear as pixels or sub pixels that are always lit or 'on'. That is, a Bright dot is a sub-pixel that stands out on the screen when the monitor displays a dark pattern. There are three types of bright dot defects:

One lit red, green or blue sub pixel



Two adjacent lit sub pixels:

- Red + Blue = Purple
- Red + Green = Yellow
- Green + Blue = Cyan (Light Blue)



Three adjacent lit sub pixels (one white pixel)

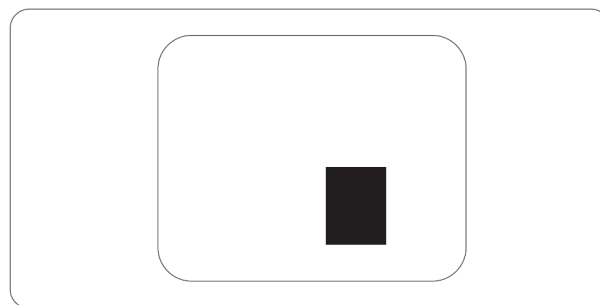
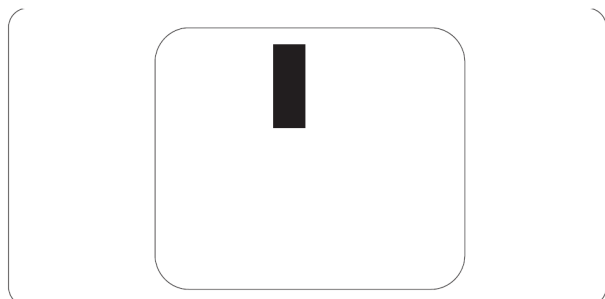


Note:

A red or blue bright dot must be more than 50 percent brighter than neighboring dots while a green bright dot

is 30 percent brighter than neighboring dots.

Black Dot Defects Black dot defects appear as pixels or sub pixels that are always dark or 'off'. That is, a dark dot is a sub-pixel that stands out on the screen when the monitor displays a light pattern. There are two types of black dot defects:



Proximity of Pixel Defects

Because pixel and sub pixels defects of the same type that are near to one another may be more noticeable, Philips also specifies tolerances for the proximity of pixel defects.

Pixel Defect Tolerances

In order to qualify for repair or replacement due to pixel defects during the warranty period, a TFT LCD panel in a Philips flat panel monitor must have pixel or sub pixel defects exceeding the tolerances listed in the following tables.

Bright Dot Defects	Acceptable level
1 lit subpixel	3
2 adjacent lit subpixels	1
3 adjacent lit subpixels (one white pixel)	0
Distance between two bright dot defects*	>15mm
Total bright dot defects of all types	3

Black Dot Defects	Acceptable level
1 dark subpixel	5 or fewer
2 adjacent dark subpixels	2 or fewer
3 adjacent dark subpixels	0
Distance between two black dot defects*	>15mm
Total black dot defects of all types	5 or fewer

Total Dot Defects	Acceptable level
Total bright or black dot defects of all types	5 or fewer



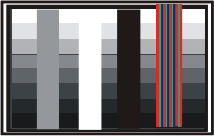
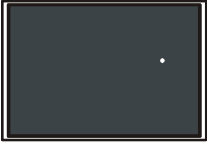
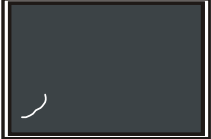
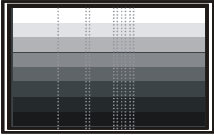
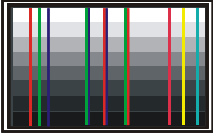



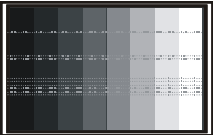
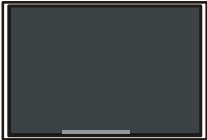
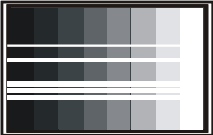
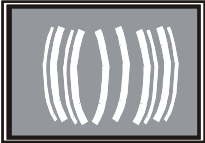
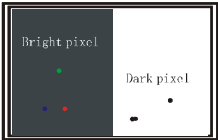

Note: 1. 1 or 2 adjacent sub pixel defects = 1 dot defect.

2. This monitor is ISO9241-307 compliant. (ISO9241-307: Ergonomic requirement, analysis and compliance test methods for electronic visual displays)

4.4 Failure Mode Of Panel

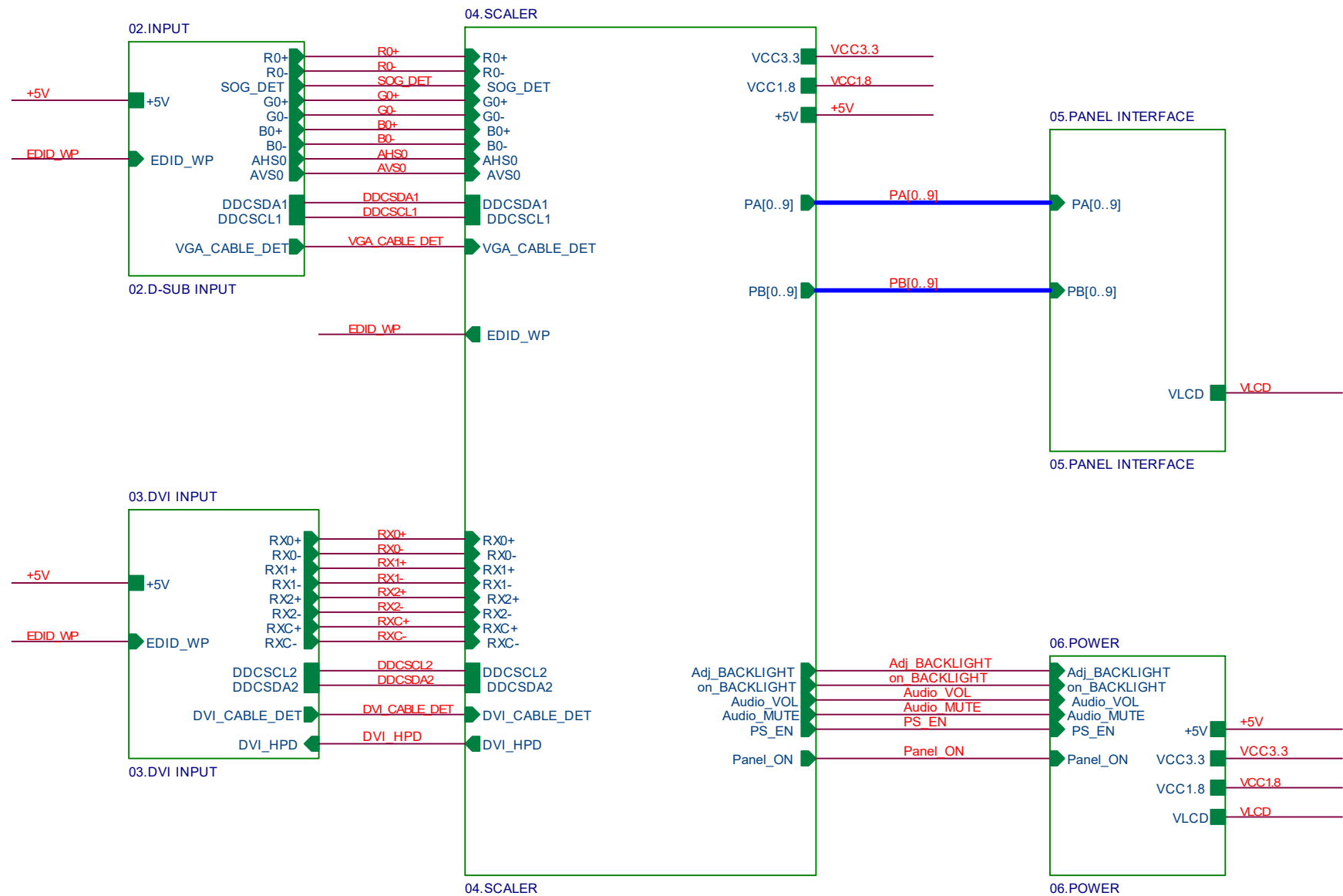
Quick reference for failure mode of LCD panel

this page presents problems that could be made by LCD panel.
It is not necessary to repair circuit board. Simply follow the mechanical instruction on this manual to eliminate failure by replace LCD panel.

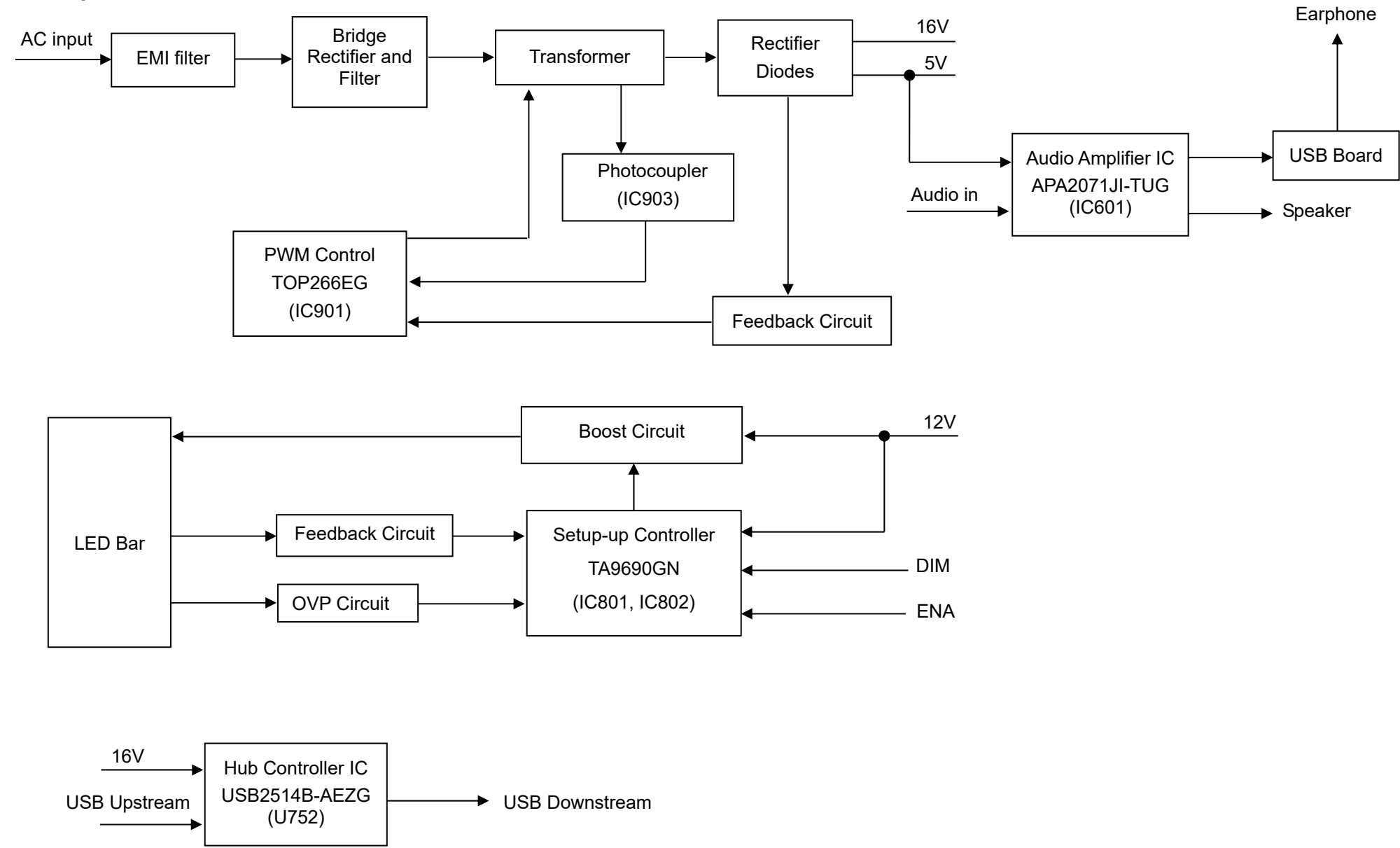
Failure description	Phenomenon		
		Polarizer has bubbles	
Vertical block defect		Polarizer has bubbles	
Vertical dim lines			
Vertical lines defect (Always bright or dark)		Foreign material inside polarizer. It shows liner or dot shape.	
Horizontal block defect		Concentric circle formed	
Horizontal dim lines		Bottom back light of LCD is brighter than normal	
Horizontal lines defect (Always bright or dark)		Back light un-uniformity	
Has bright or dark pixel		Backlight has foreign material. Black or white color, liner or circular type	

5. Block Diagram

5.1 Scaler Board



5.2 Adapter/USB Board

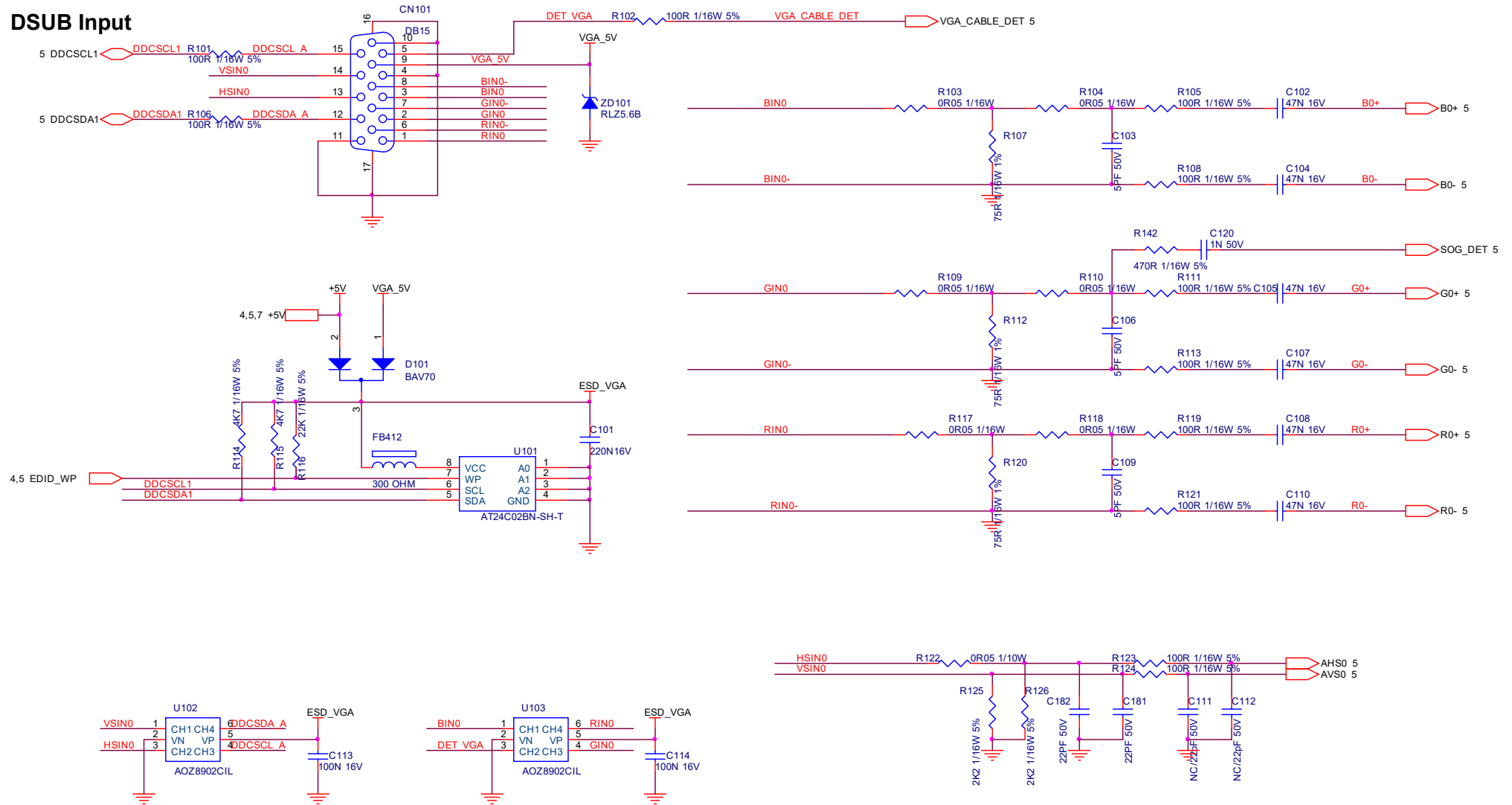


6. Schematic

6.1 Scaler Board (715G4592M0D000004I)

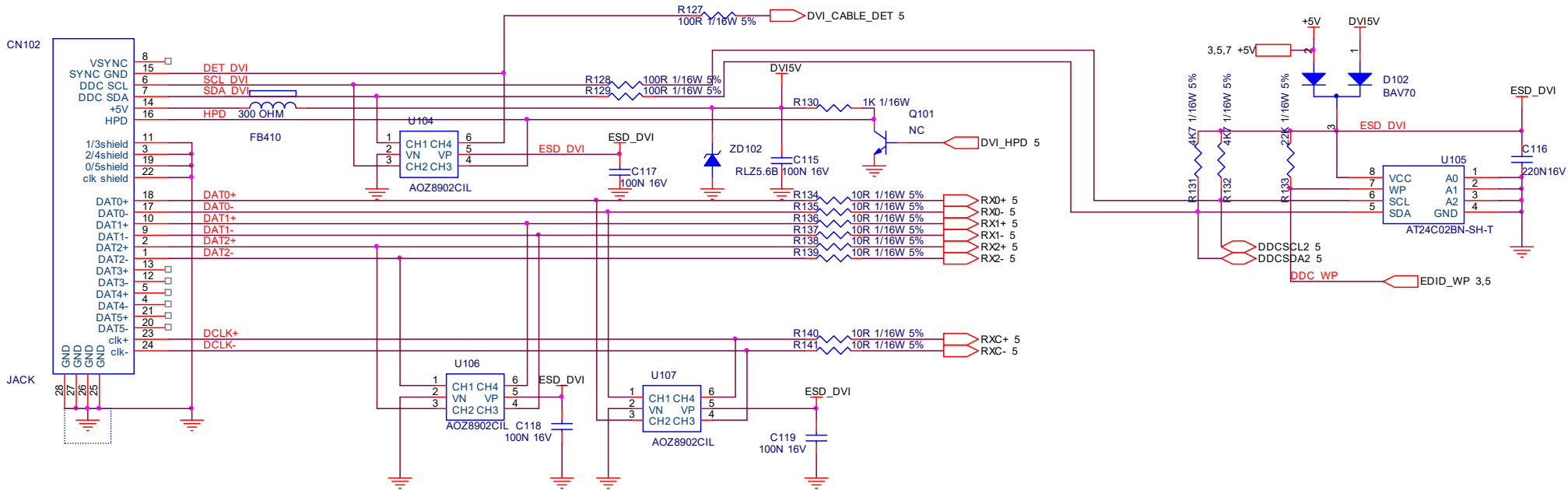
Remark: Parts position can be searched by using FIND function in PDF.

DSUB Input

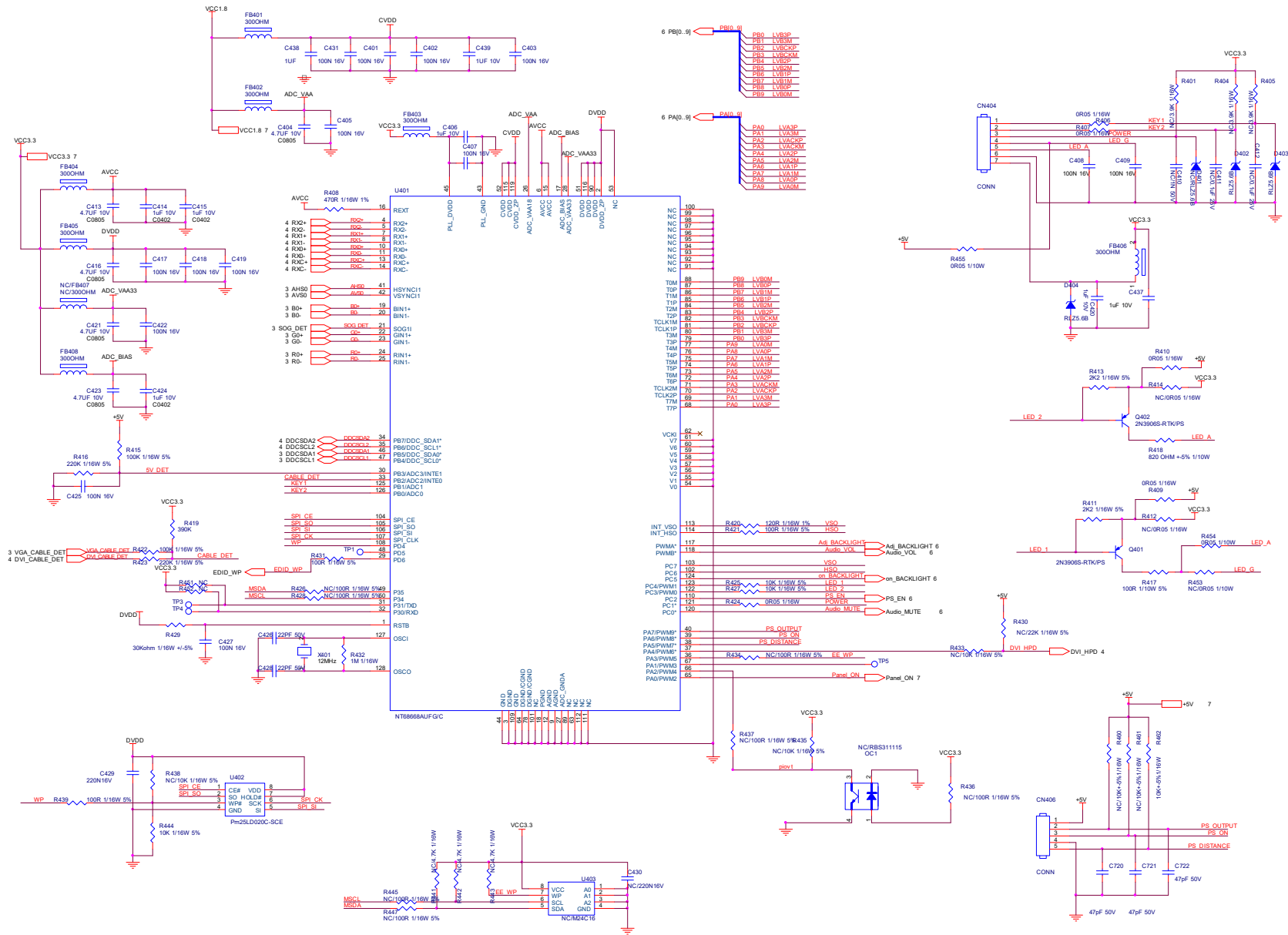


Remark: Parts position can be searched by using FIND function in PDF.

DVI Input

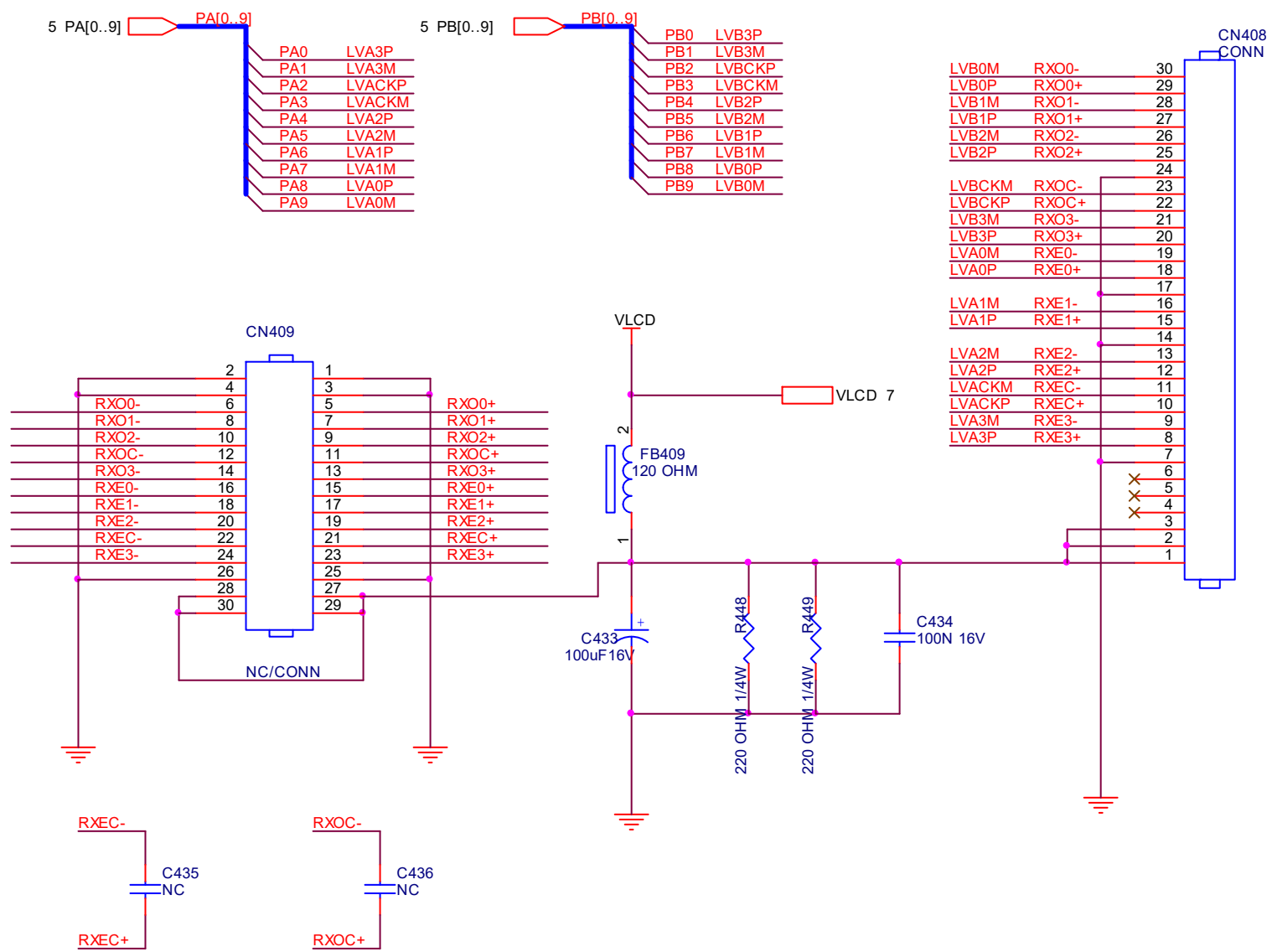


Scaler



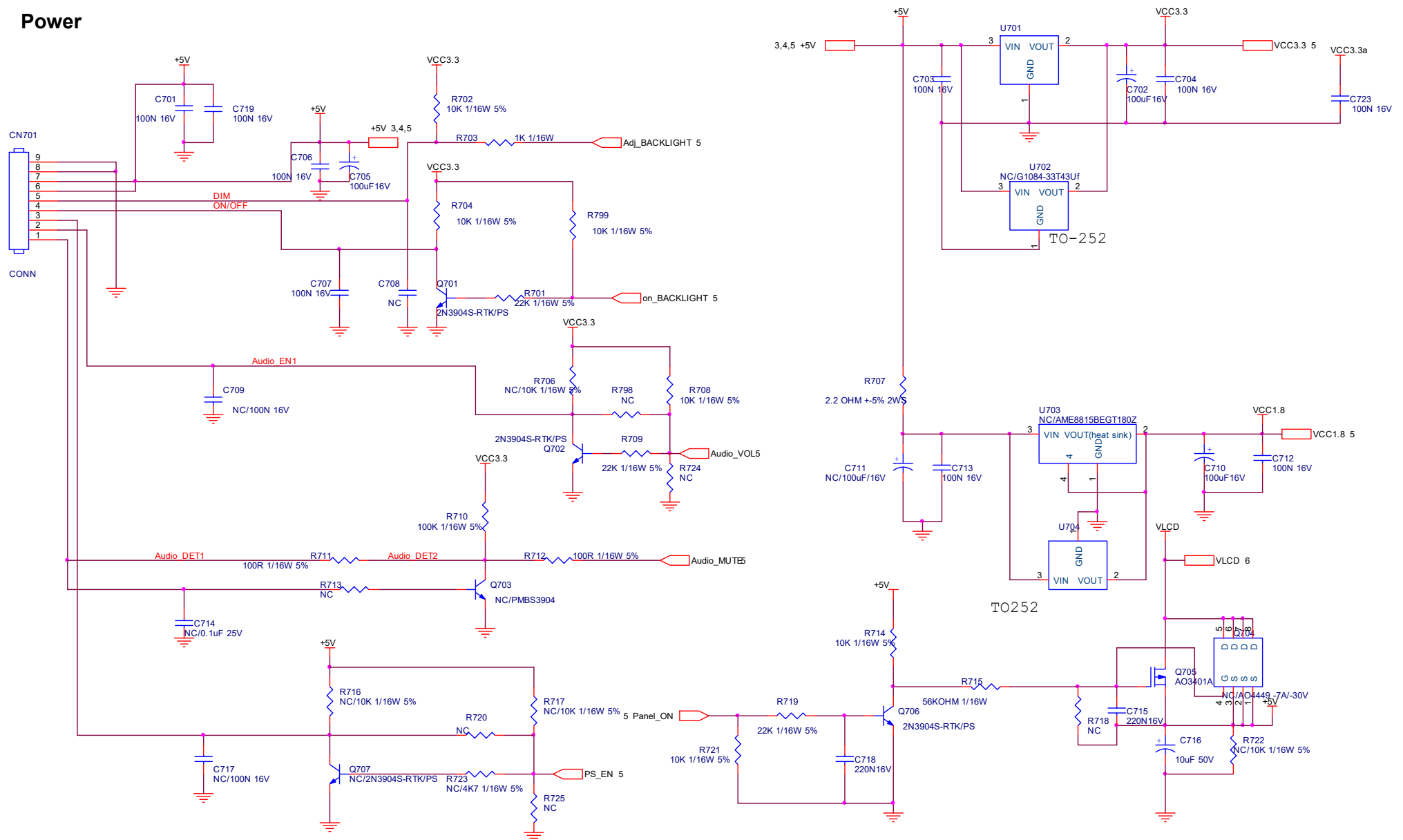
Remark: Parts position can be searched by using FIND function in PDF.

Panel Interface



Remark: Parts position can be searched by using FIND function in PDF.

Power

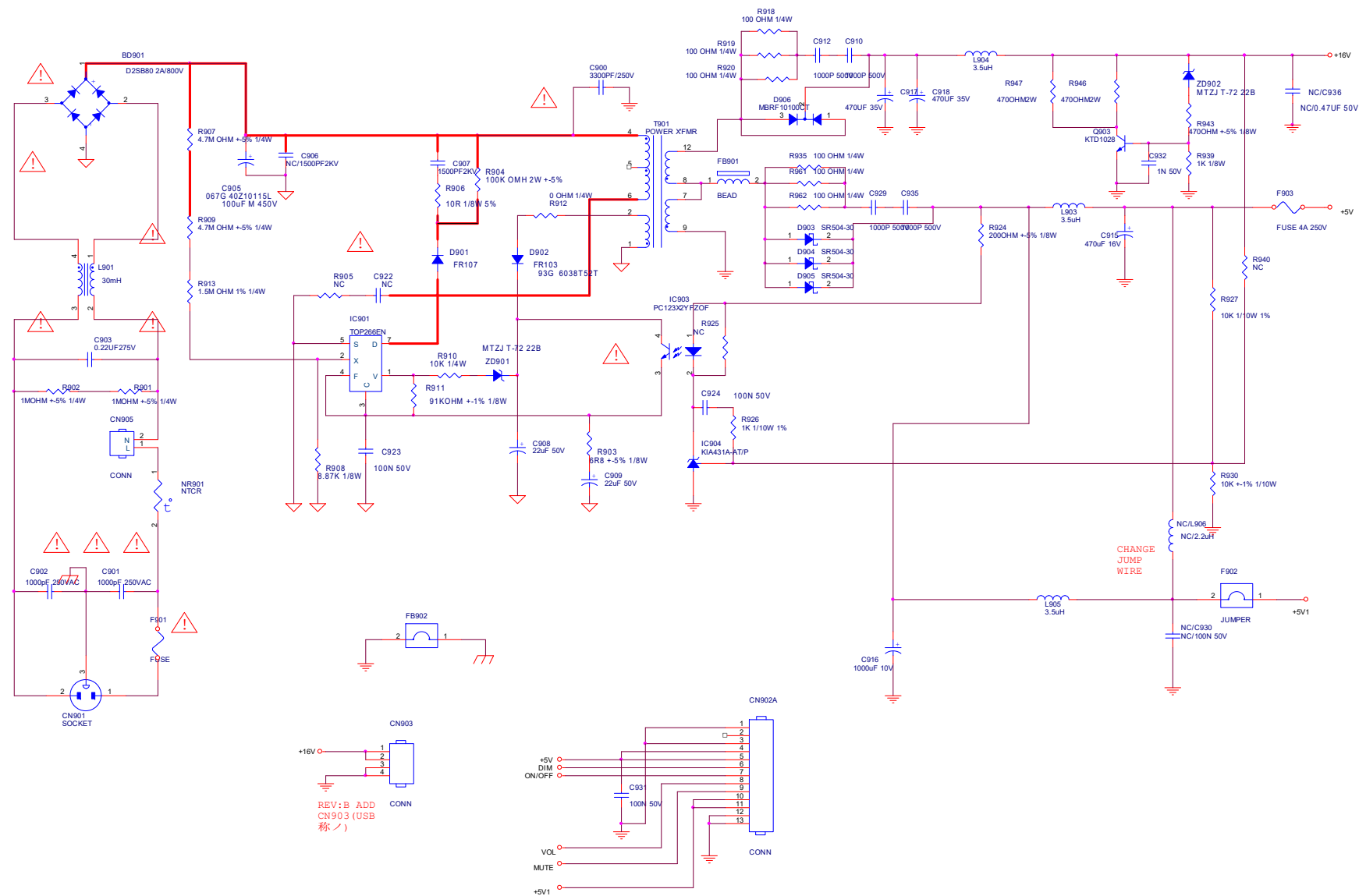


6.2 Adapter Board

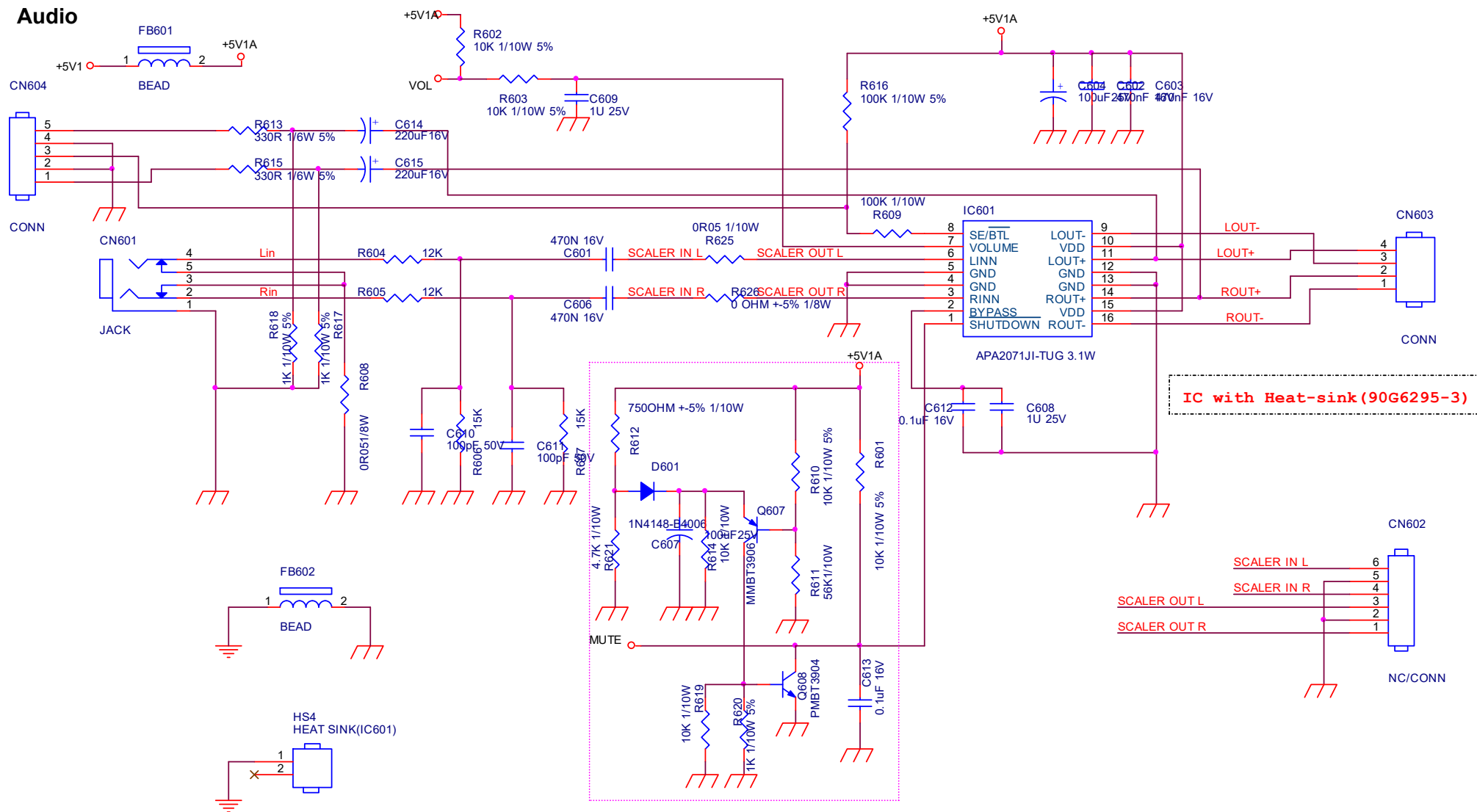
Adapter 715G3974P1C001001S

Remark: Parts position can be searched by using FIND function in PDF.

Power

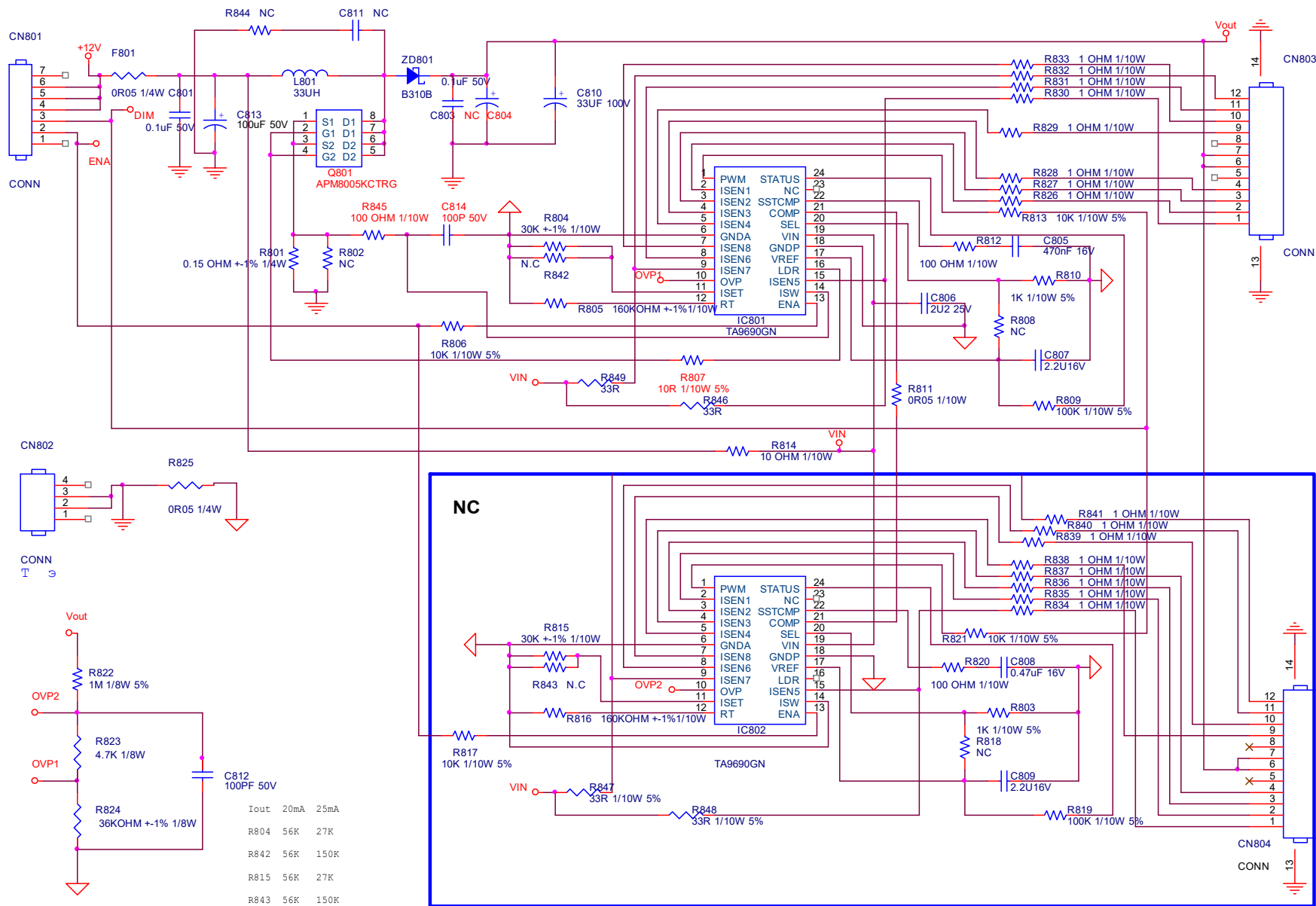


Audio



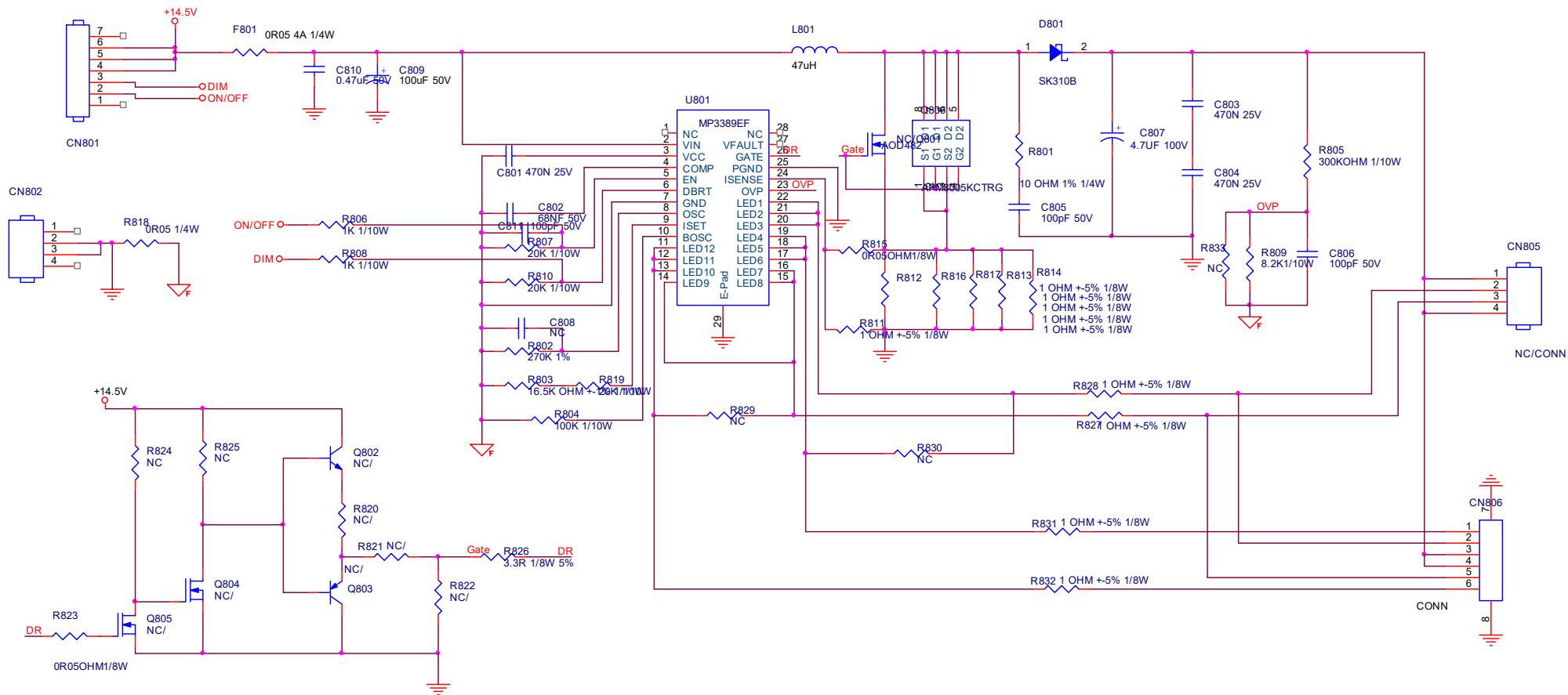
Converter 715G4107P02000004S for CMI LA1 panel

Remark: Parts position can be searched by using FIND function in PDF.



Converter 715G4013P03001004S for CMI L10 and CPT panel

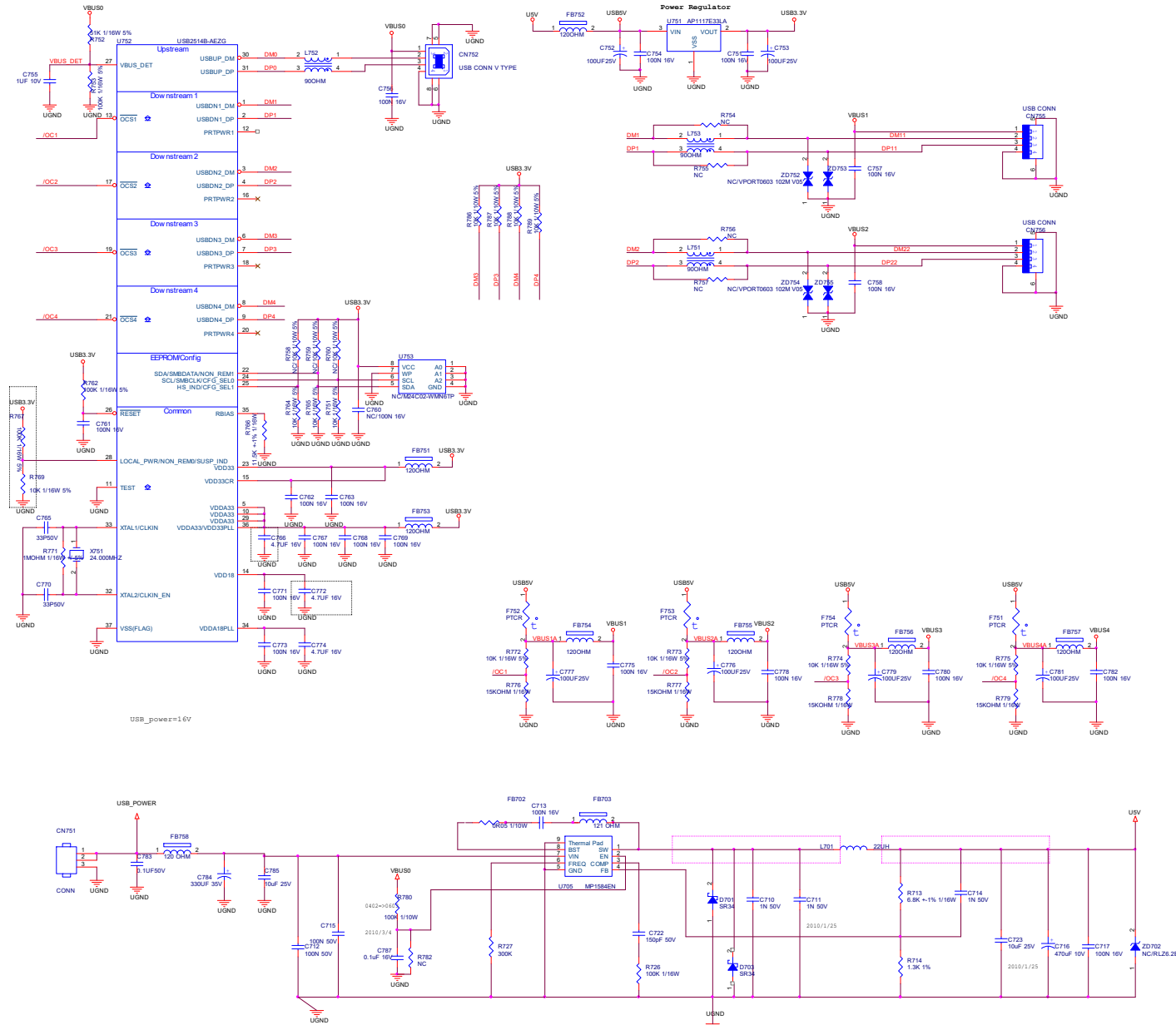
Remark: Parts position can be searched by using FIND function in PDF.



6.3 USB Board (715G4597T0D000004I)

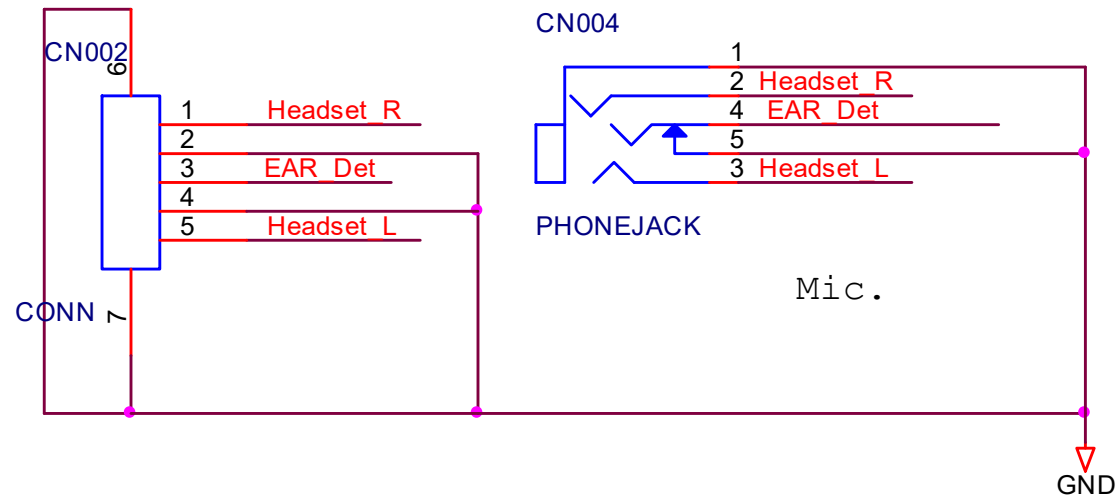
Remark: Parts position can be searched by using FIND function in PDF.

USB 2514



Remark: Parts position can be searched by using FIND function in PDF.

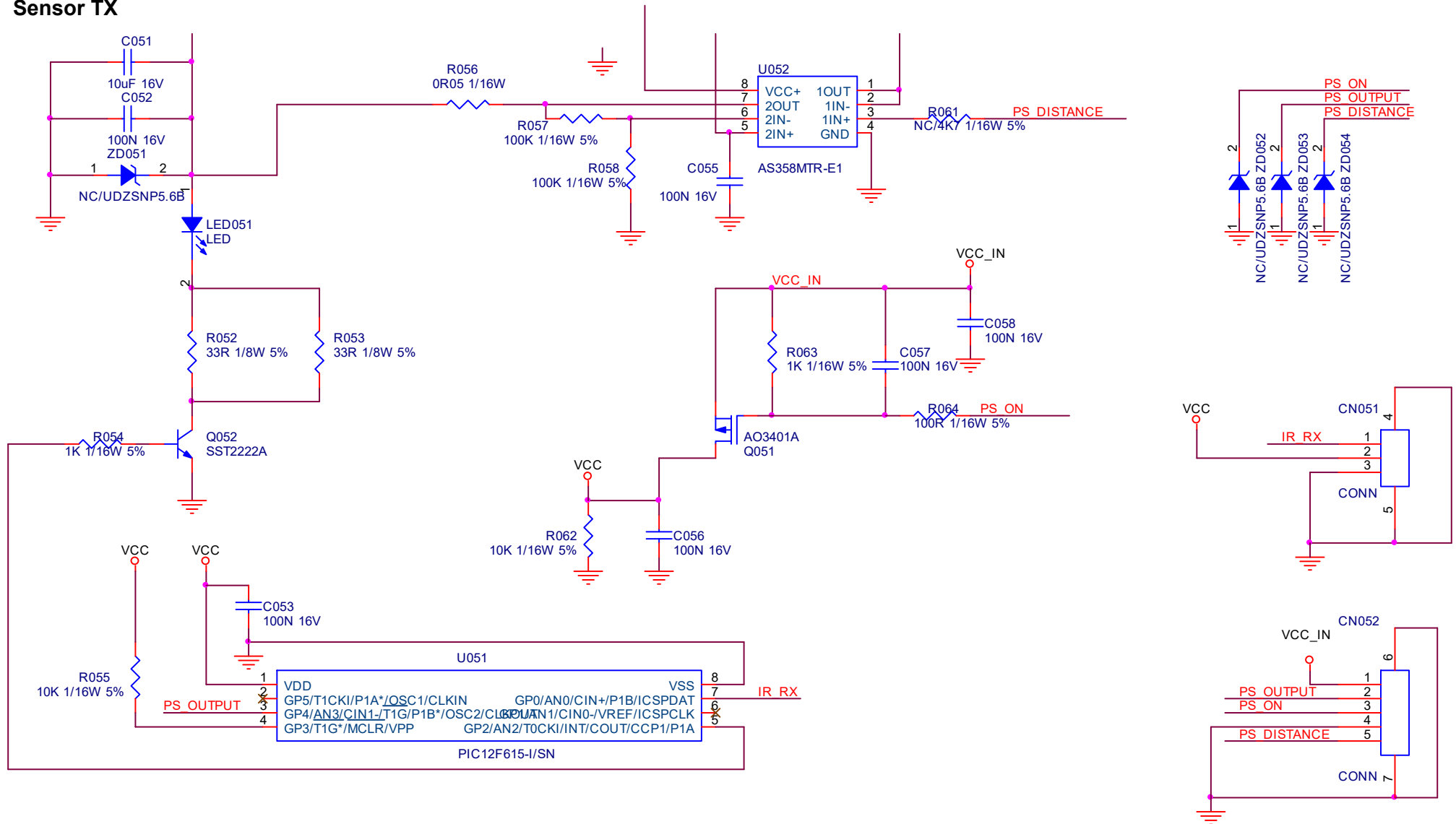
Earphone



6.4 IR Board
715G4594T0C000004S

Remark: Parts position can be searched by using FIND function in PDF.

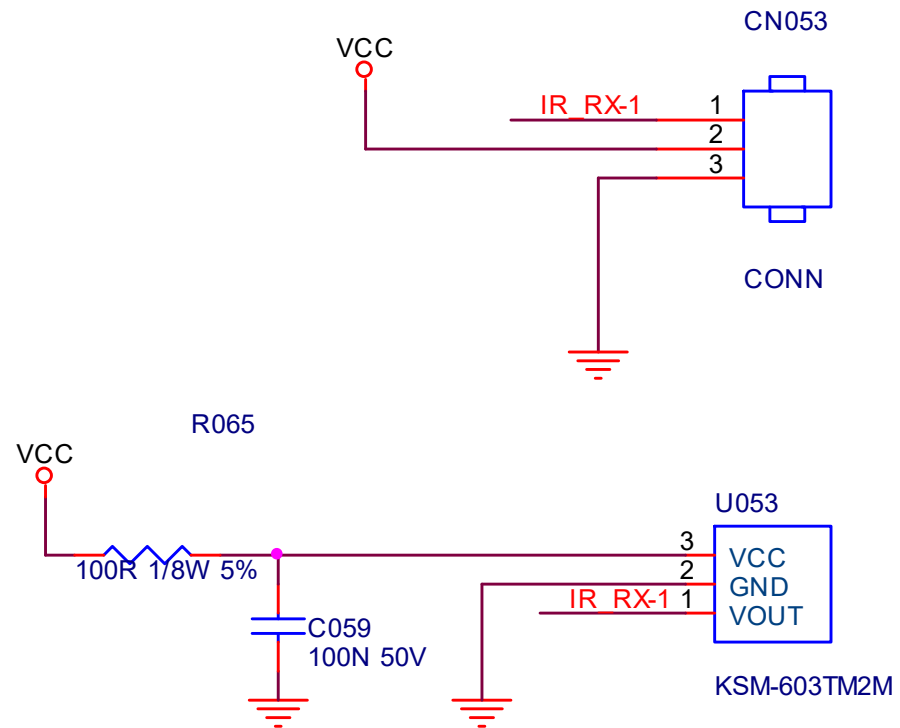
Sensor TX



715G4595R0B000004S

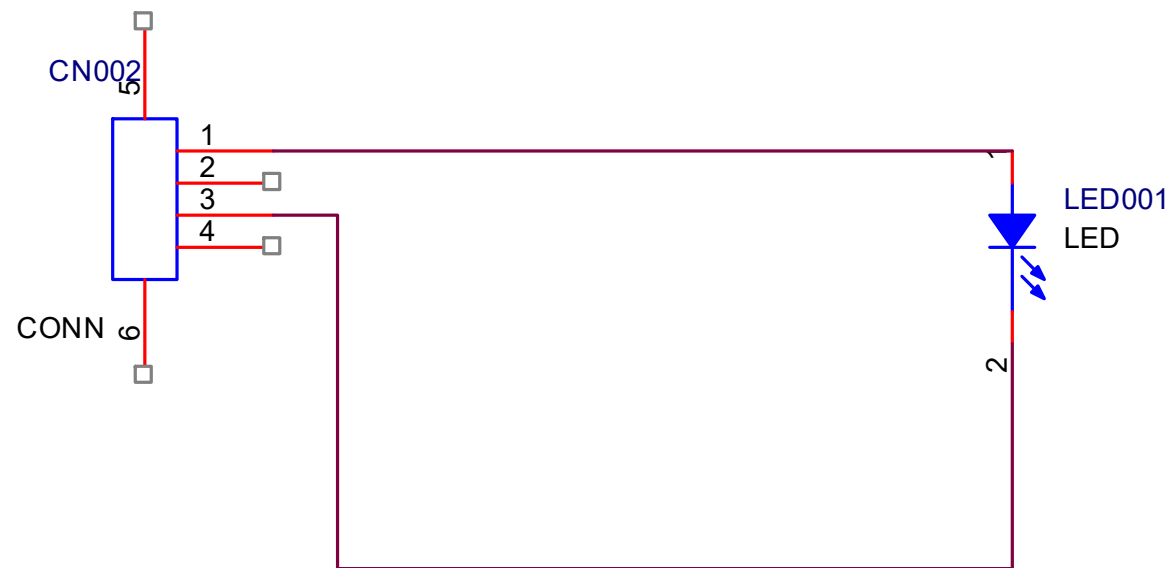
Remark: Parts position can be searched by using FIND function in PDF.

Sensor RX



6.5 Light Board (715G3997T01000004F)

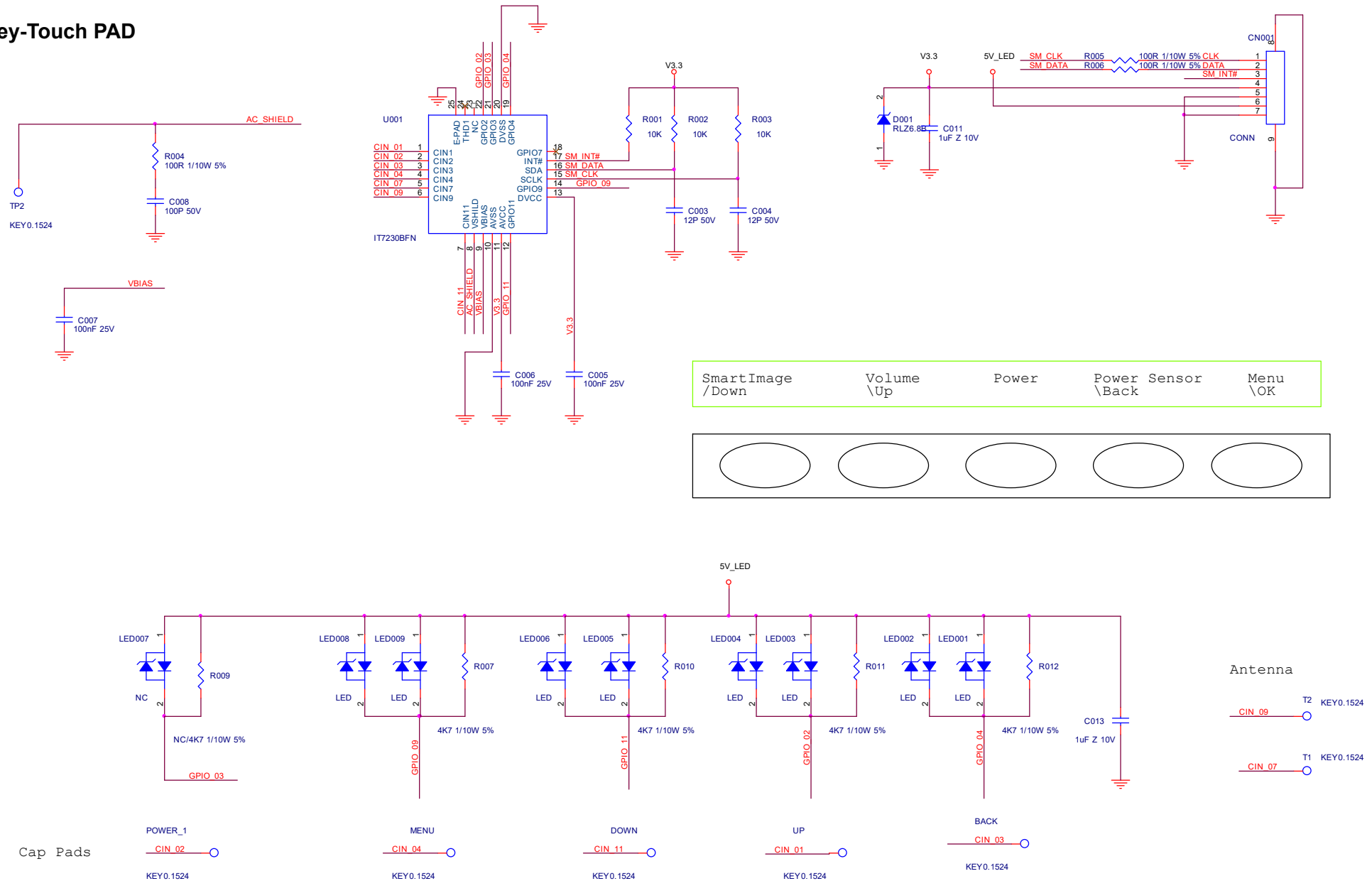
Remark: Parts position can be searched by using FIND function in PDF.



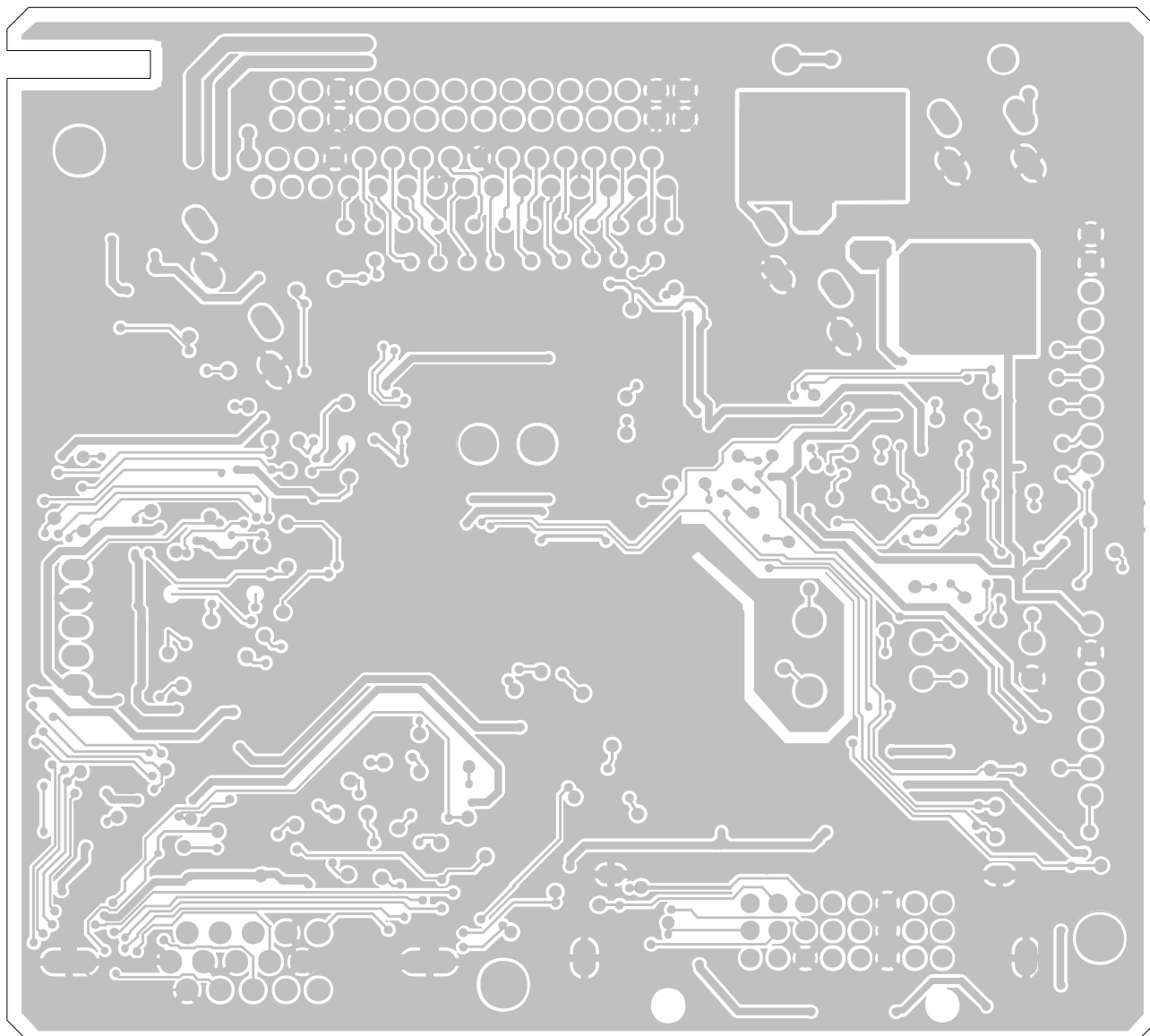
6.6 Key Board (715G4596K0C000004F)

Remark: Parts position can be searched by using FIND function in PDF.

Key-Touch PAD



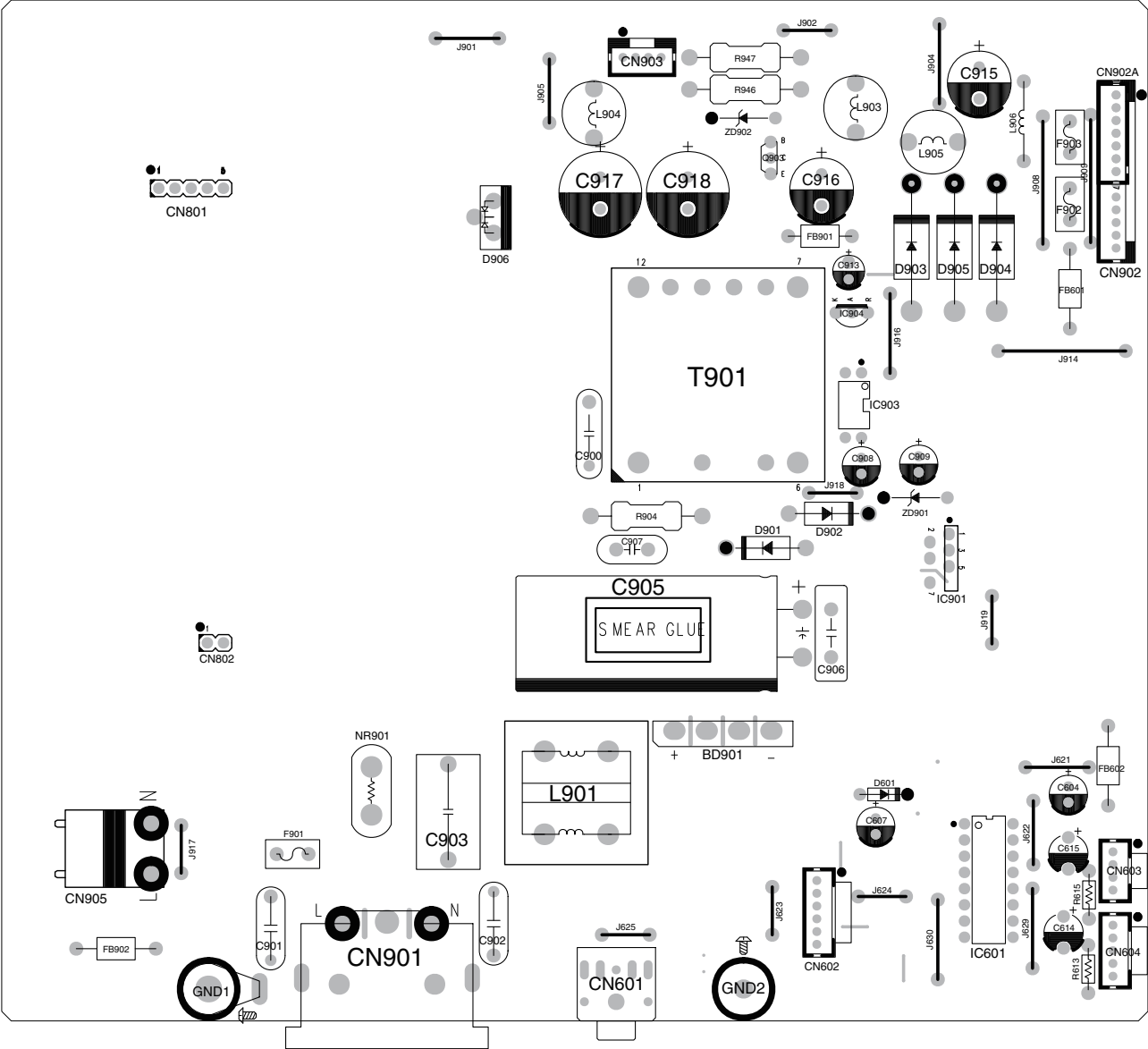
Remark: Parts position can be searched by using FIND function in PDF.



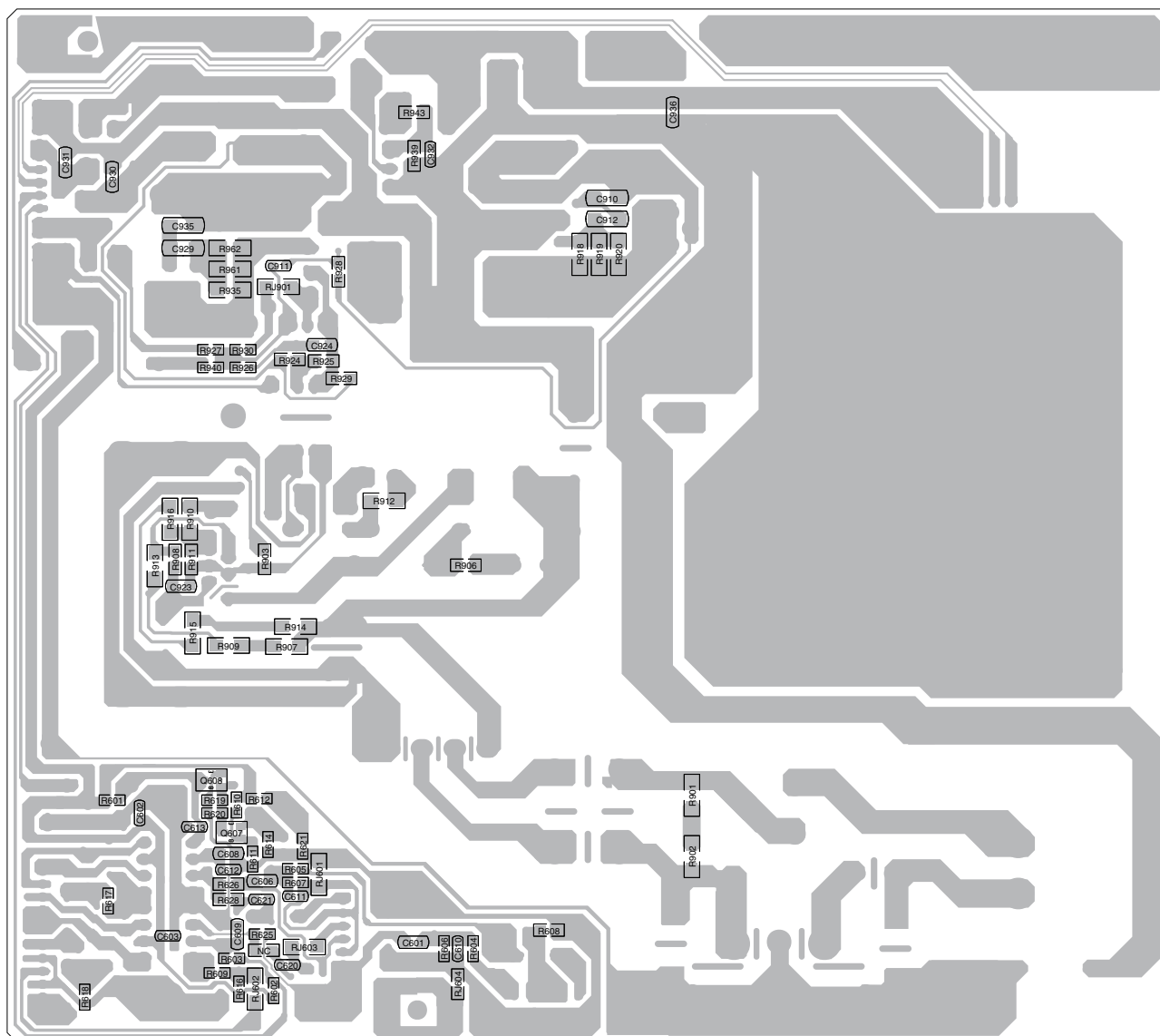
7.2 Adapter Board

Adapter 715G3974P1C001001S

Remark: Parts position can be searched by using FIND function in PDF.

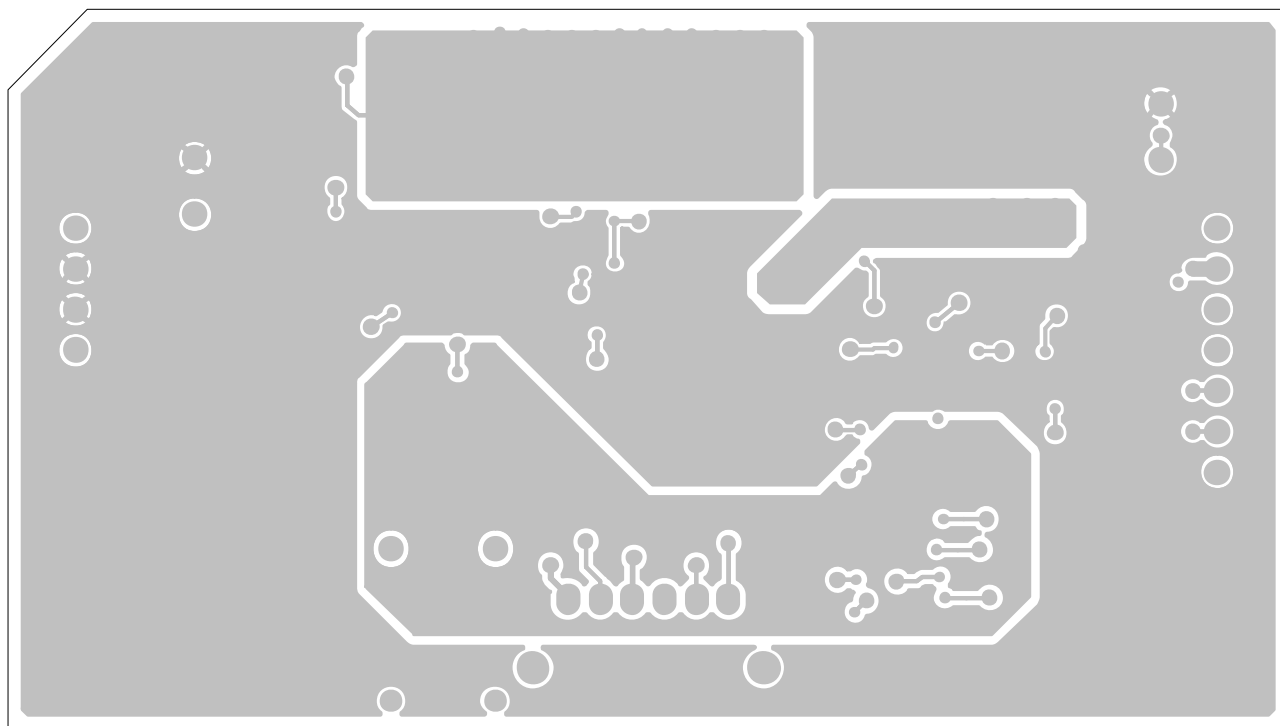
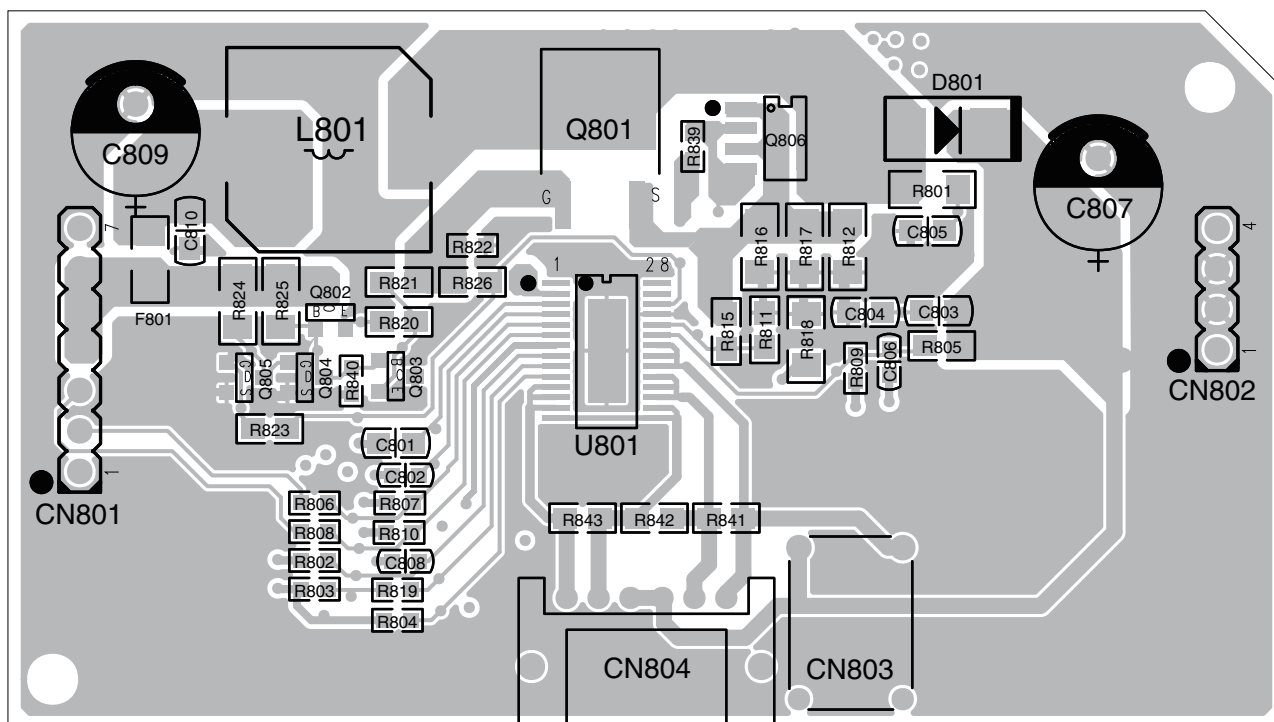


Remark: Parts position can be searched by using FIND function in PDF.



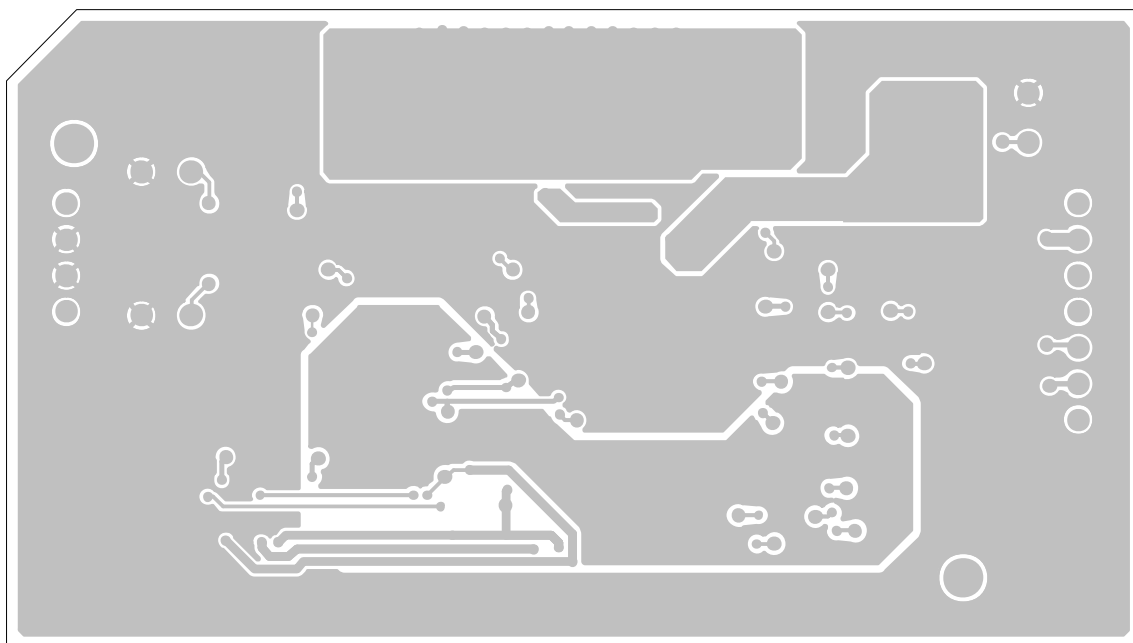
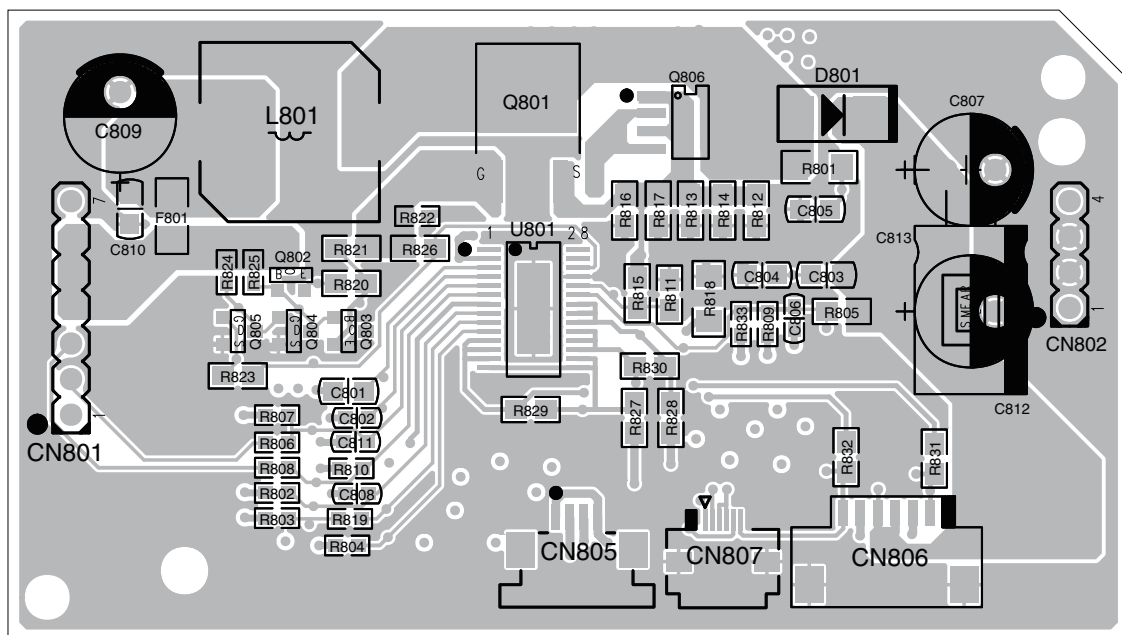
Converter 715G4107P02000004S for CMI LA1 panel

Remark: Parts position can be searched by using FIND function in PDF.



Converter 715G4013P03001004S for CMI L10 and CPT panel

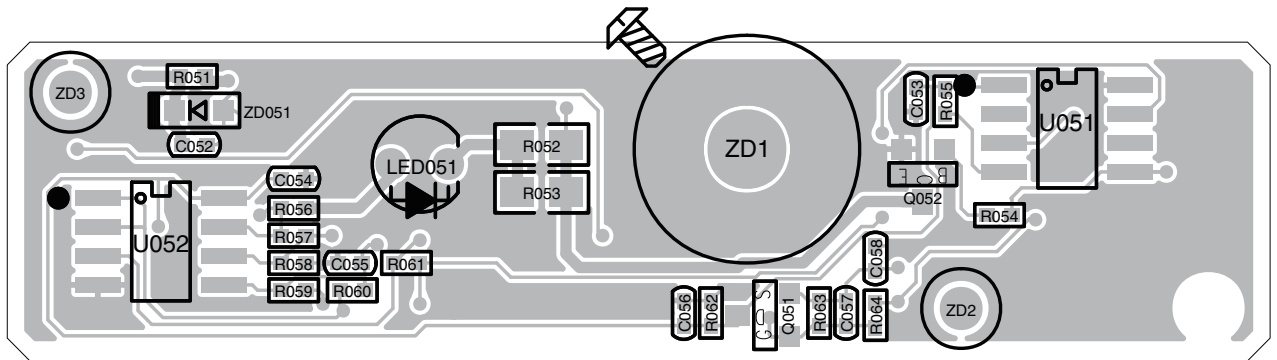
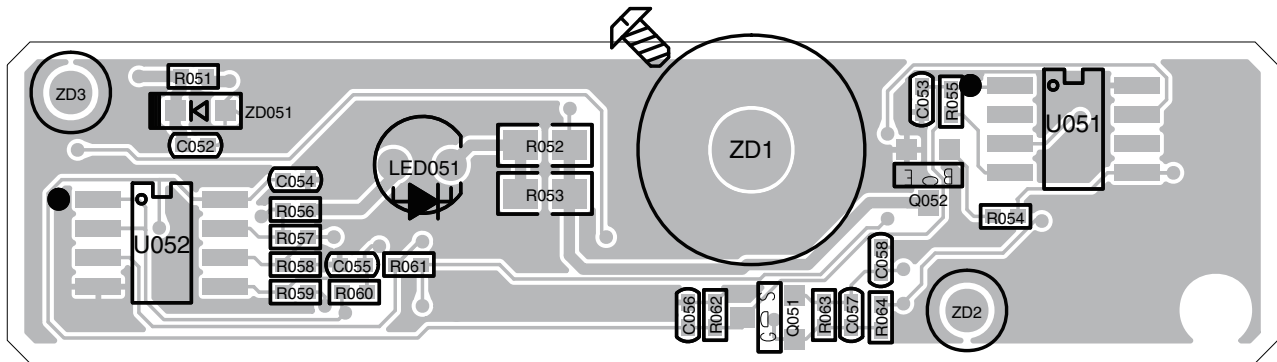
Remark: Parts position can be searched by using FIND function in PDF.



7.4 IR Board

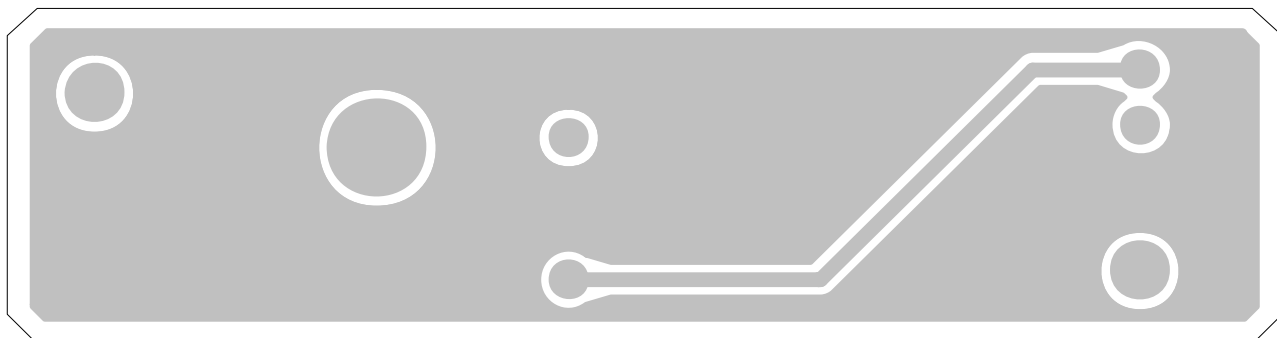
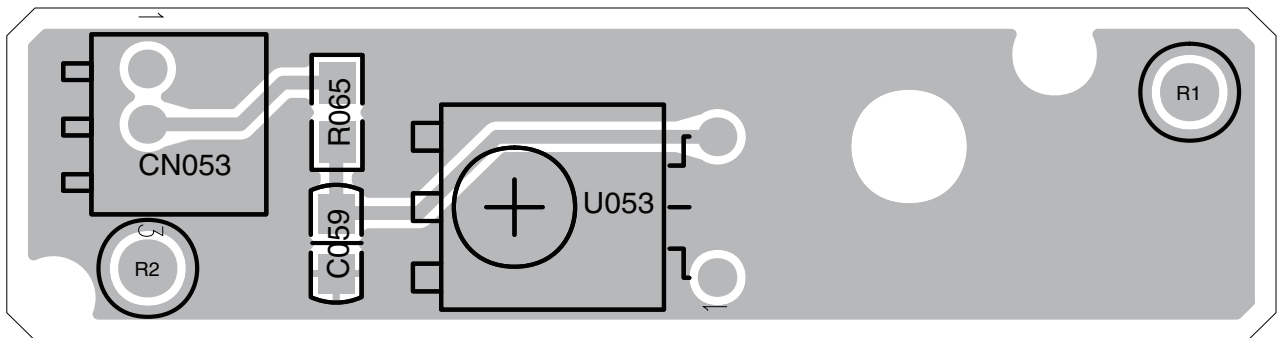
715G4594T0C000004S

Remark: Parts position can be searched by using FIND function in PDF.



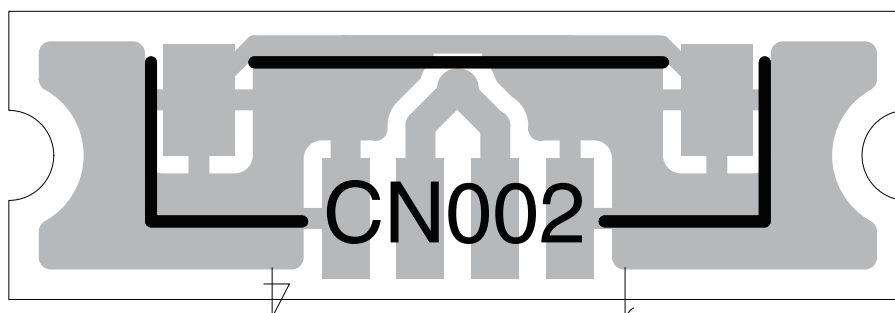
715G4595R0B000004S

Remark: Parts position can be searched by using FIND function in PDF.



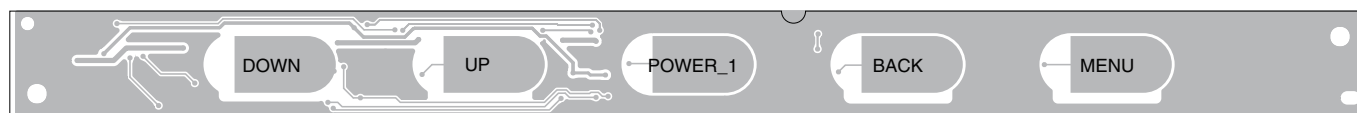
7.5 Light Board (715G3997T01000004F)

Remark: Parts position can be searched by using FIND function in PDF.

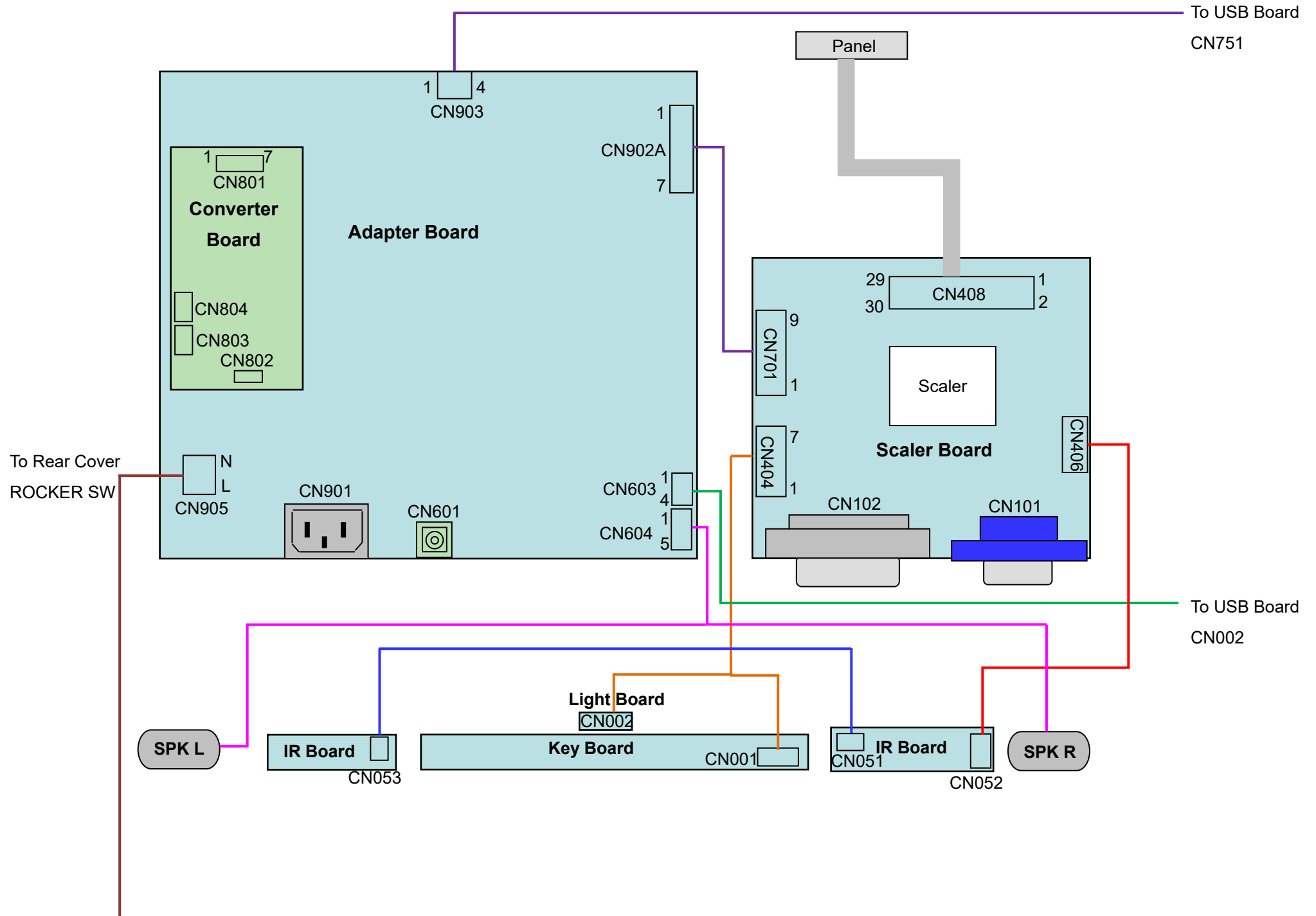


7.6 Key Board (715G4596K0C000004F)

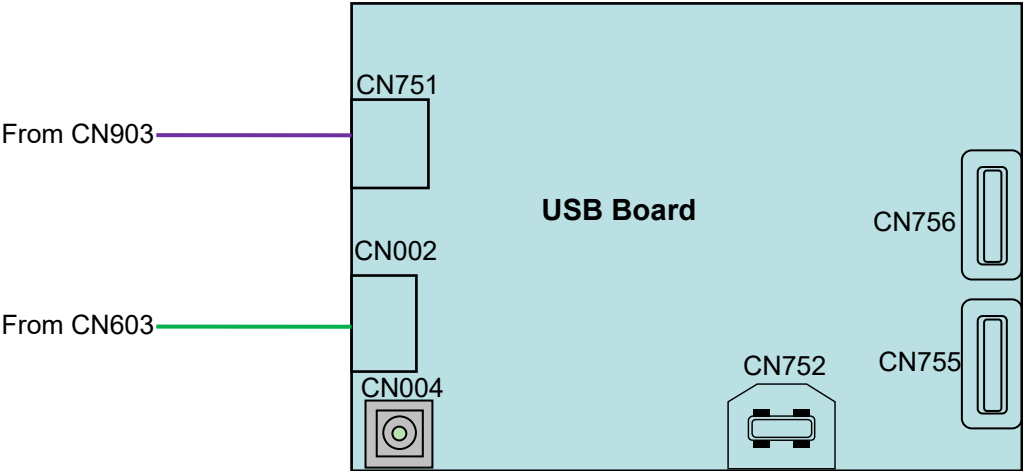
Remark: Parts position can be searched by using FIND function in PDF.



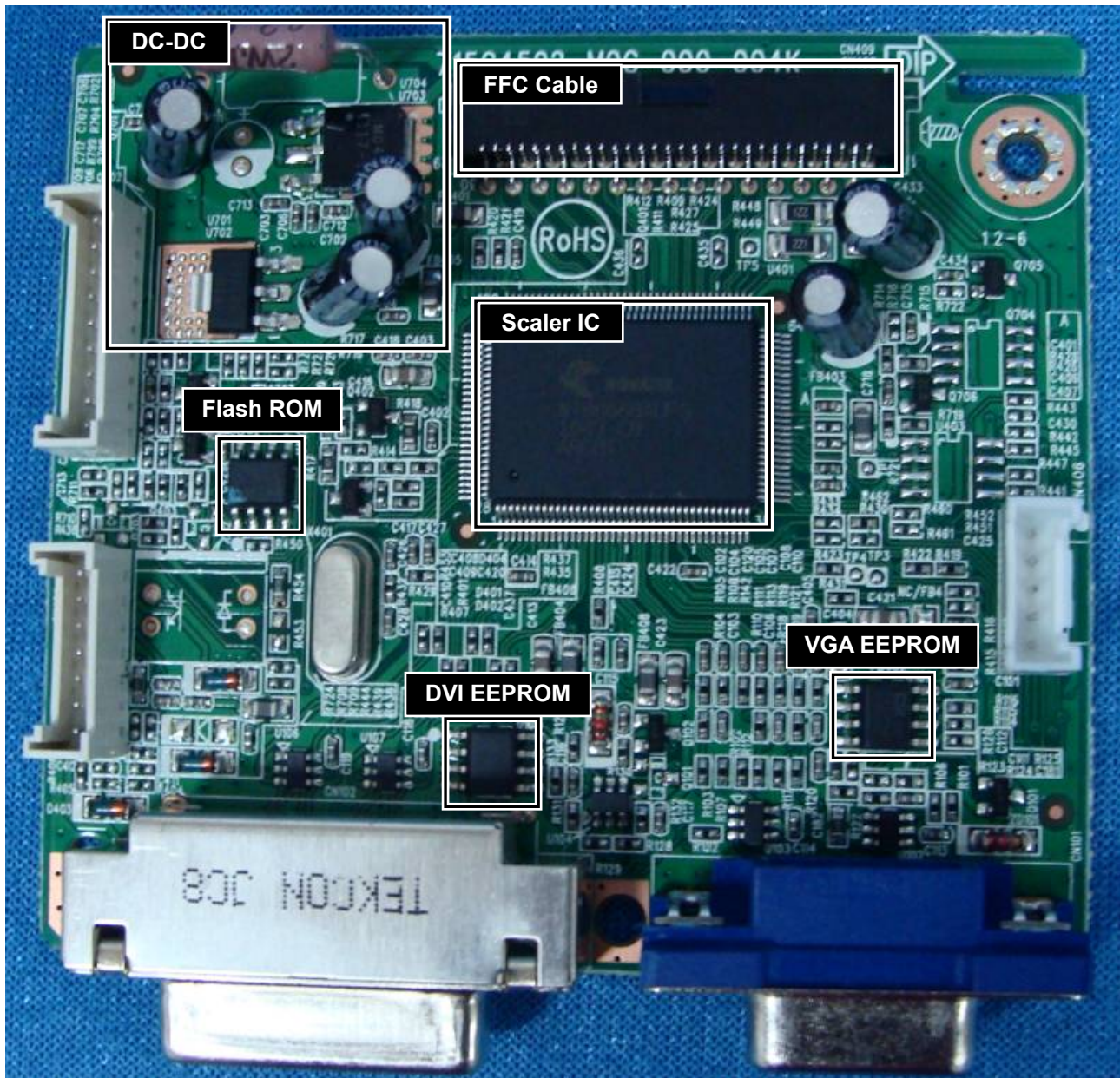
8. Wiring Diagram



ROCKER SW



9. Scaler Board Overview



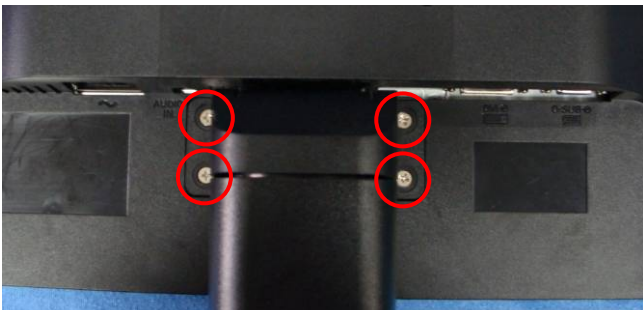
Note: DVI EEPROM is available for selective models.

10. Mechanical Instructions



Step 1: Remove the stand-base assy

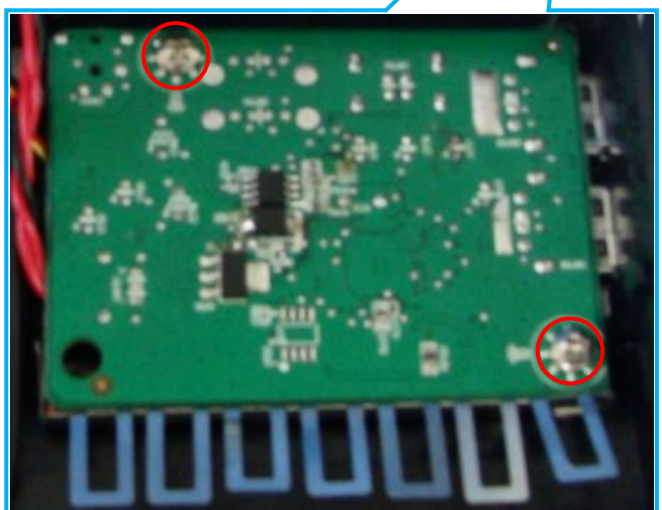
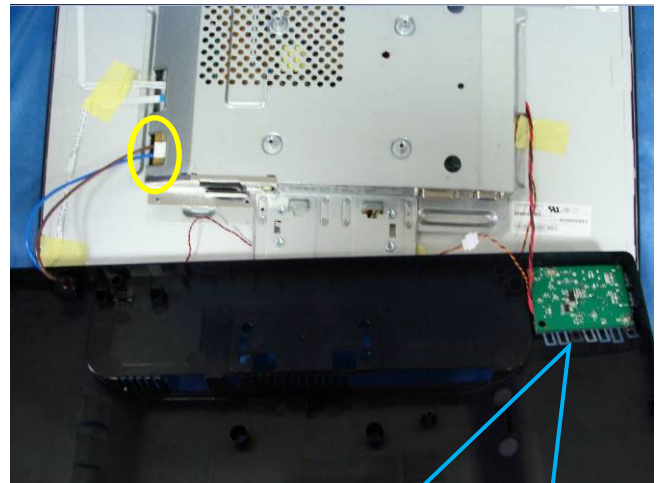
1. Place the monitor face on a safe surface, and remove the **four** screws to remove the stand base assy from the monitor.



Step 2: Remove the rear cover

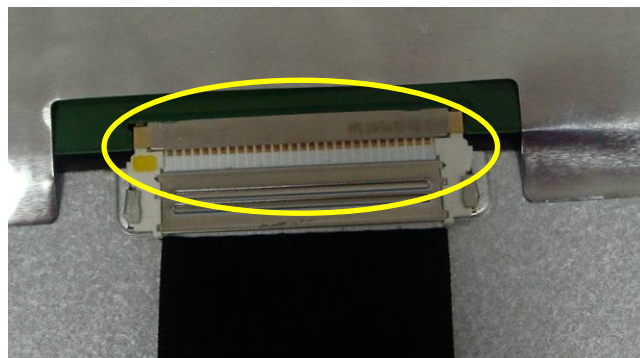
1. Open the latches and along the red arrowhead direction as the picture to open other latches.

2. Disconnect the rocker switch cable and remove the two screws to remove the USB board.

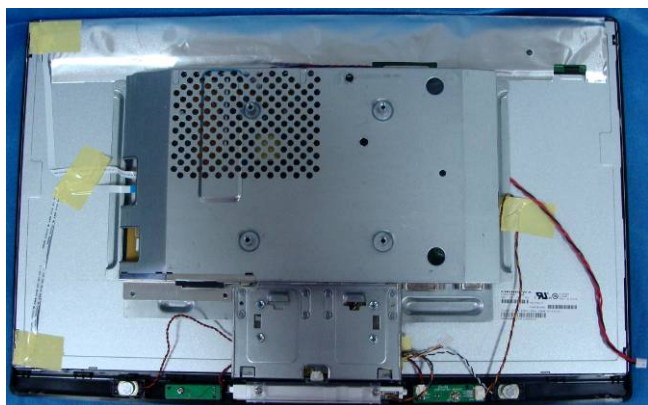




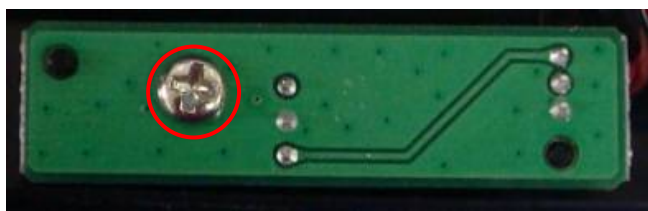
3. Disconnect the FFC cables.



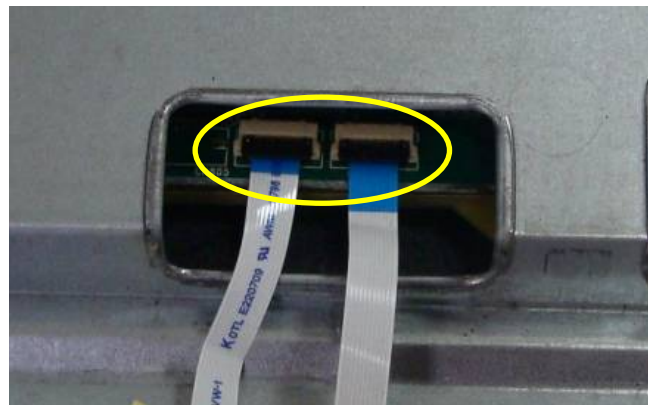
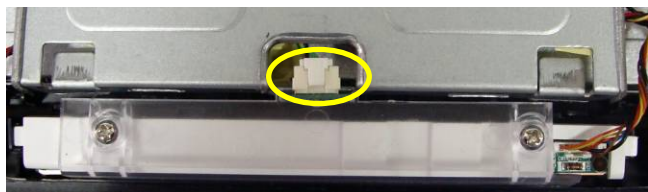
Step 4: Remove the mainframe



1. Disconnect the IR cables and remove the **two** screws to remove the IR boards.

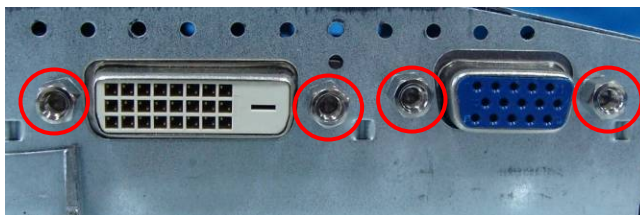


2. Disconnect the light cable and key cable.



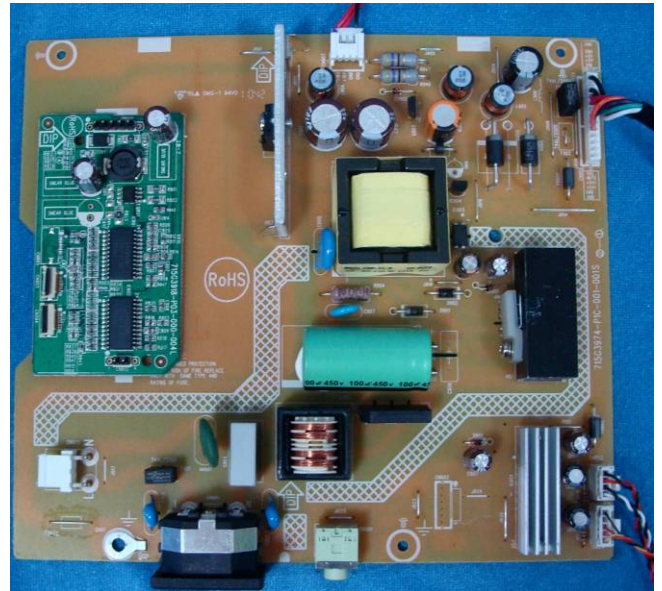
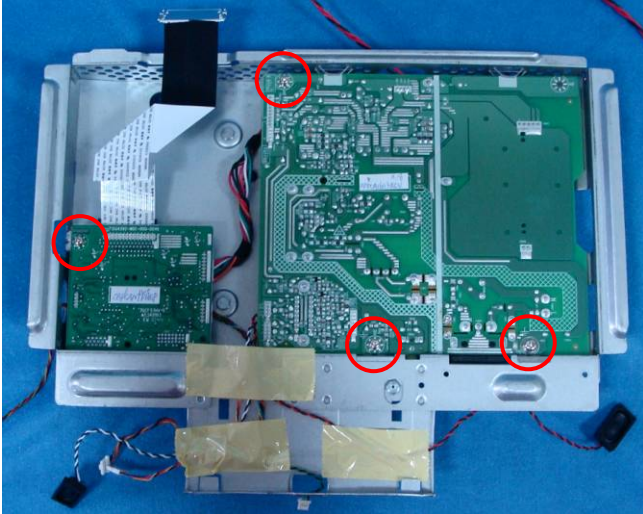
Step 5: Remove the boards

1. Remove the **four** screws that secure the connectors.

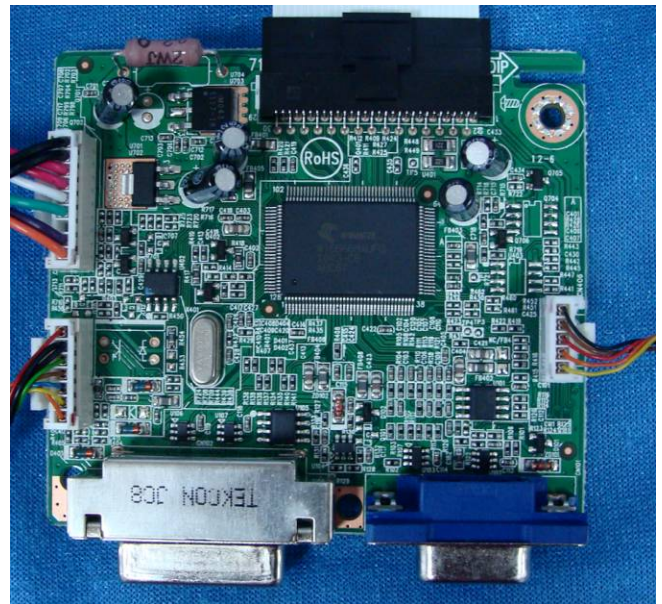
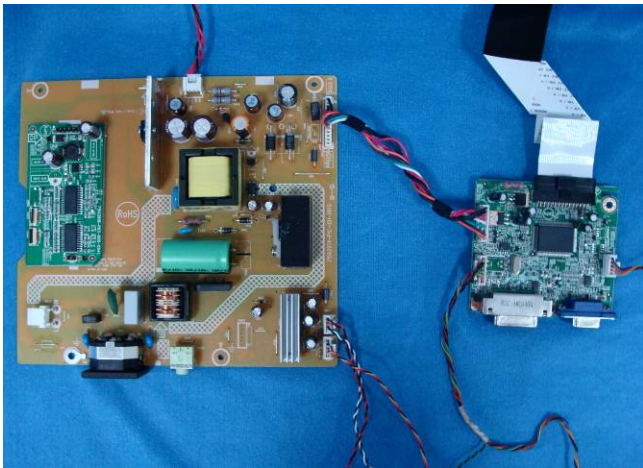


2. Remove the **four** screws to remove the power board

and scaler board from the main frame.

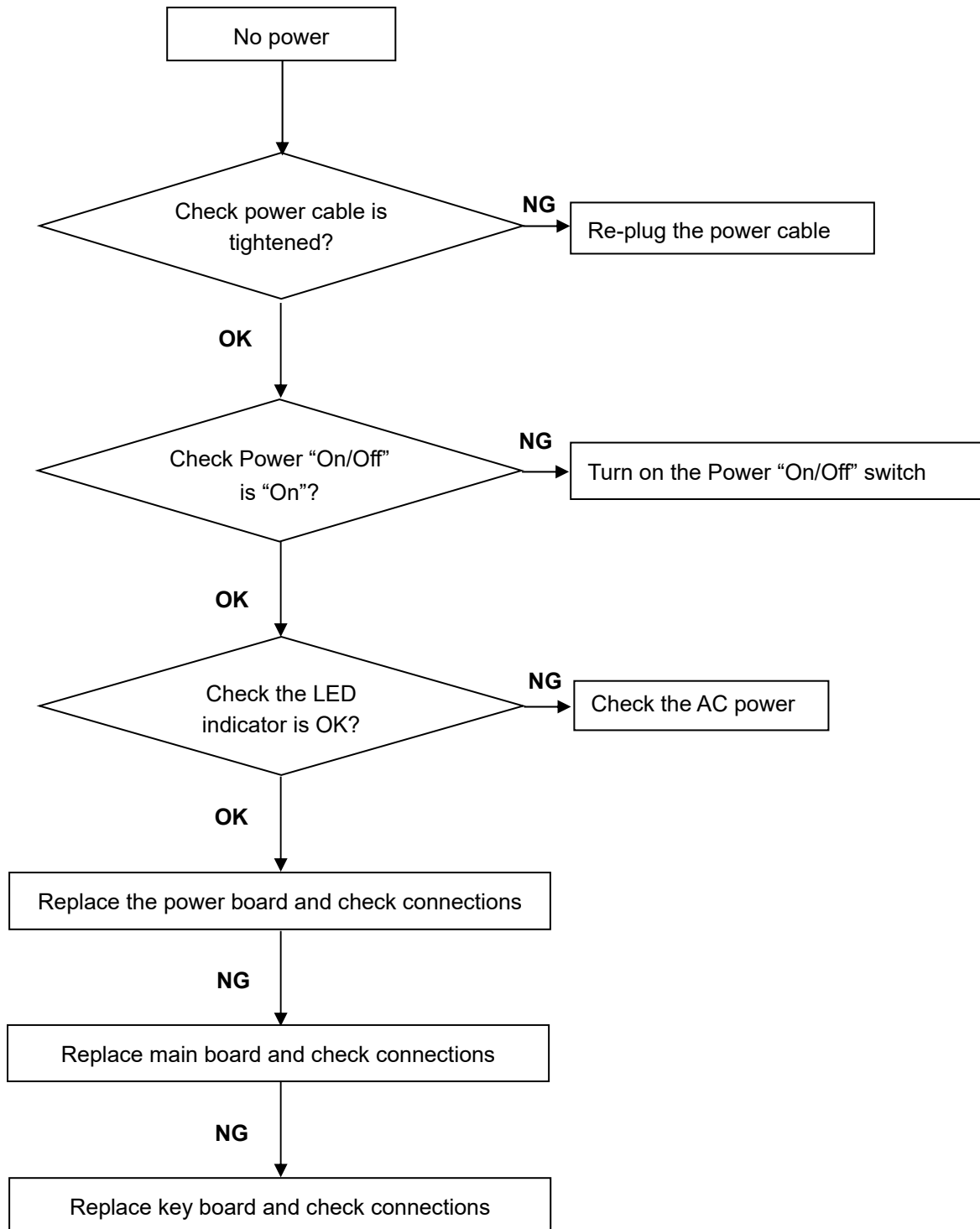


3. Disconnect all the connectors.

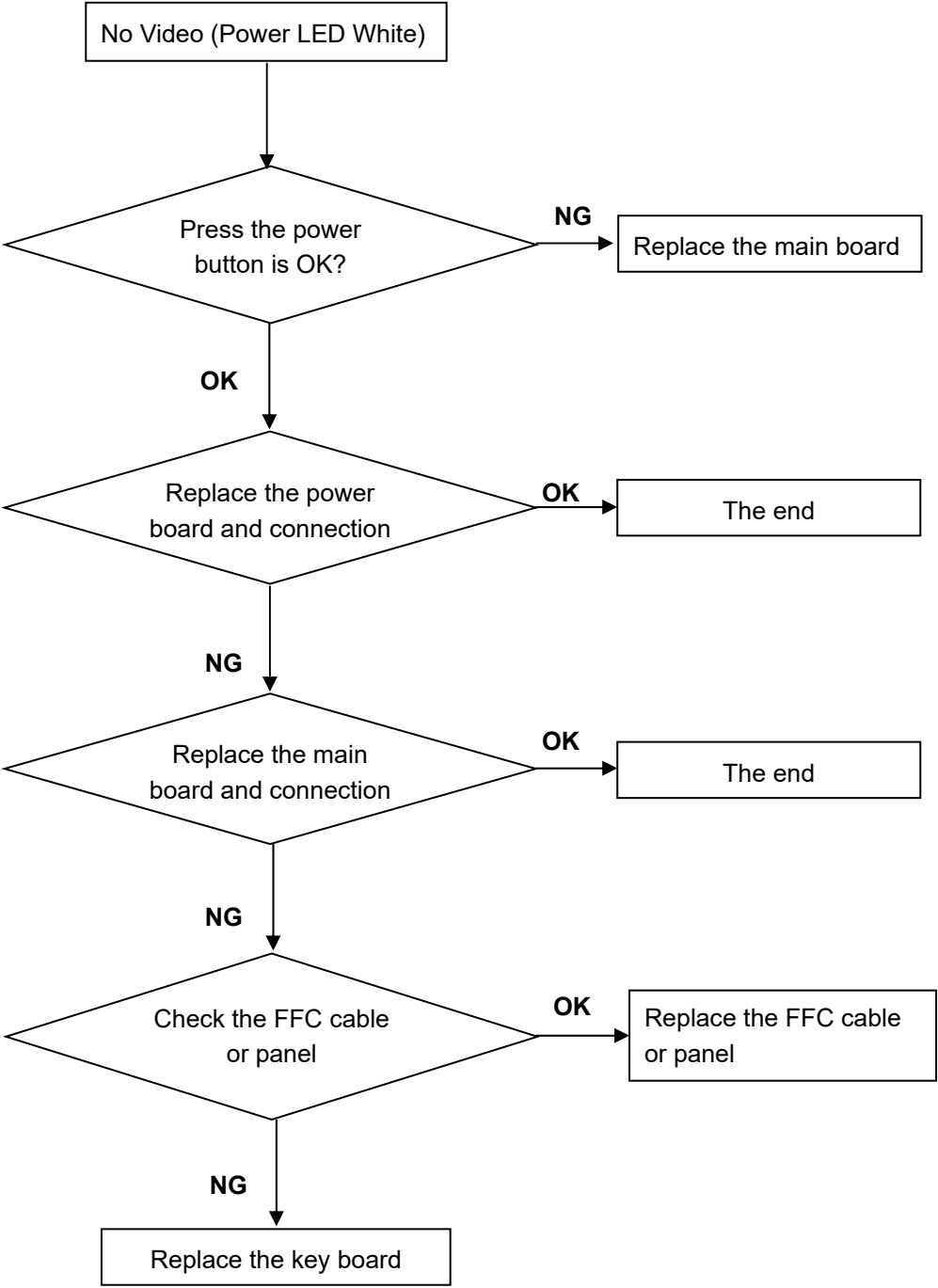


11. Repair Flow Chart

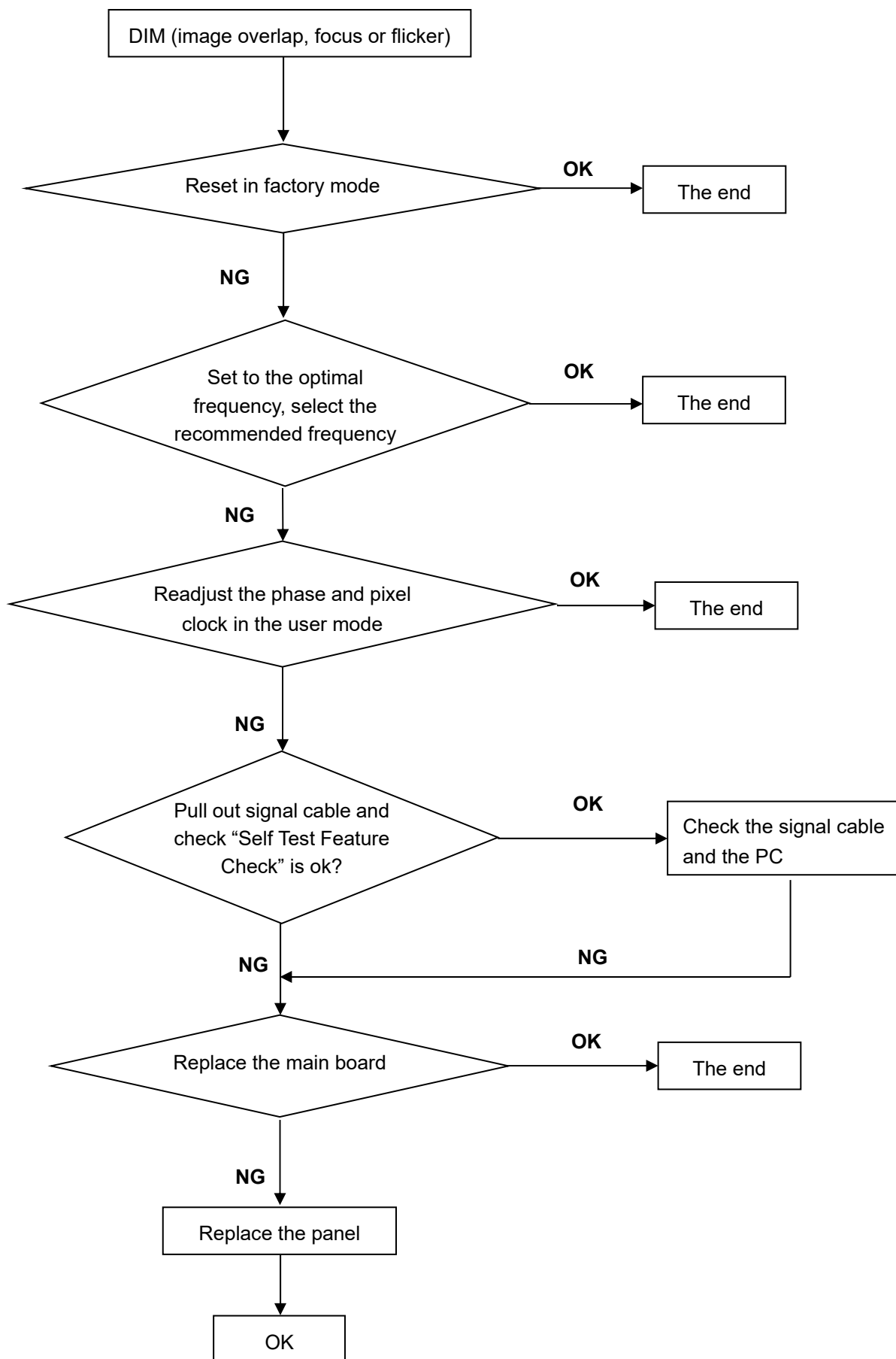
1. No Power



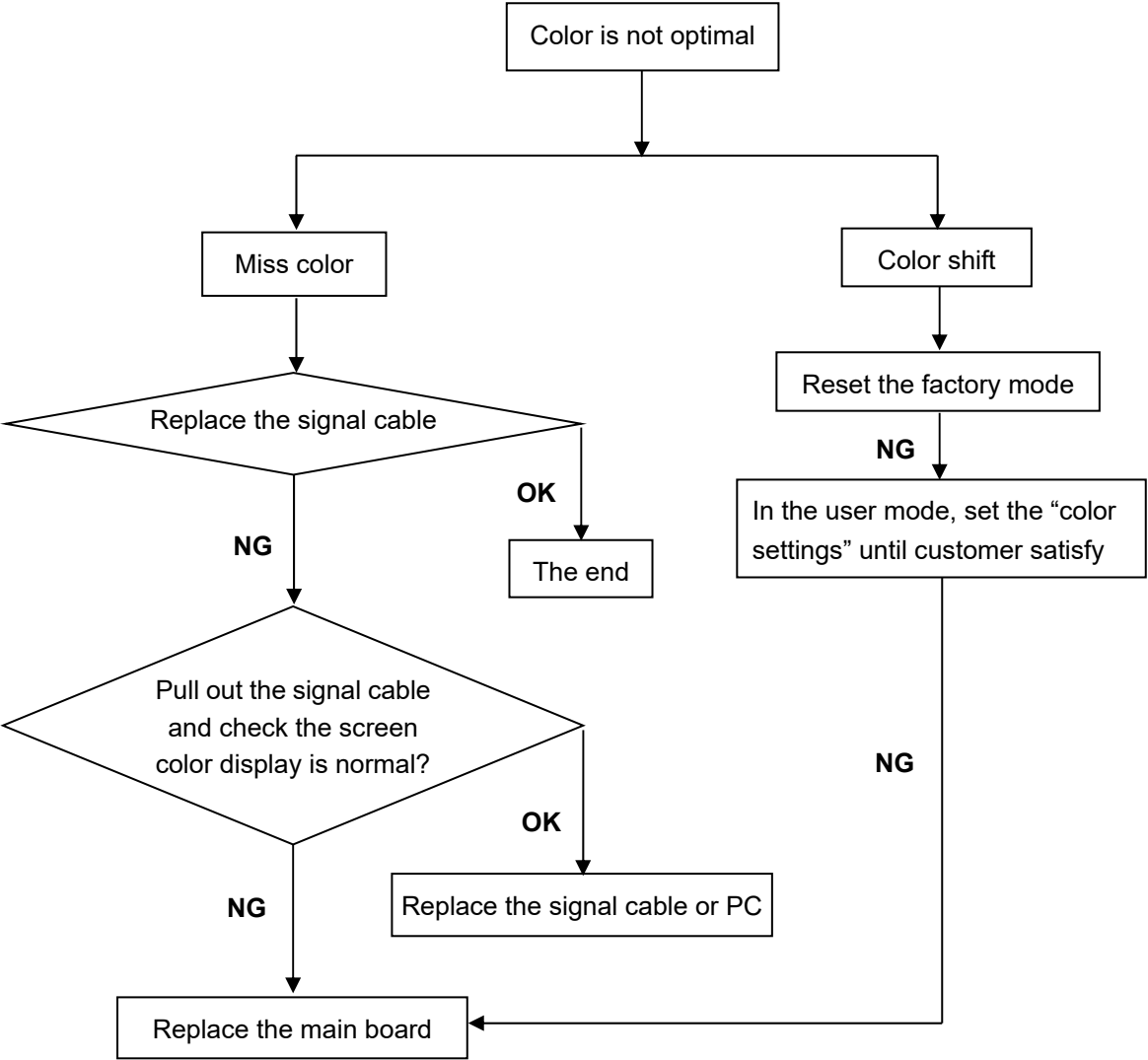
2. No Video (Power LED White)



3. DIM



4. Color is not optimal

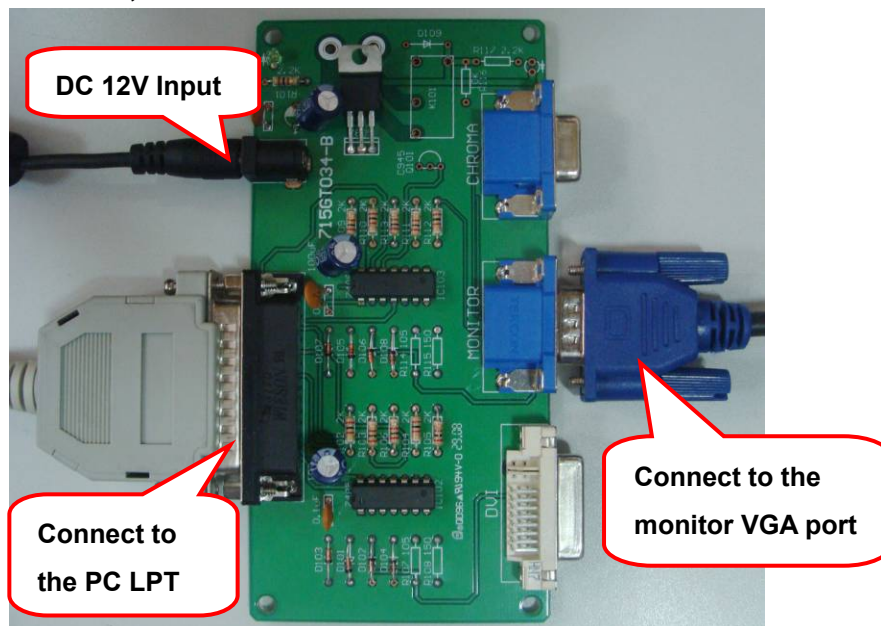


12. ISP Instruction

When do the parts, need the tools as follow:

1. An i486 (or above) personal computer or compatible.
2. Microsoft operation system Windows 95/98/2000/XP.
3. LPT drive "PORT95NT.exe" and ISP tool "EasyWrite V2010.exe"
4. ISP Board (715GT034-B) x1
5. Printer cable x1, VGA cable x1
6. 12V DC power source
7. software



12.1. Connect the ISP board, PC and monitor as follow:

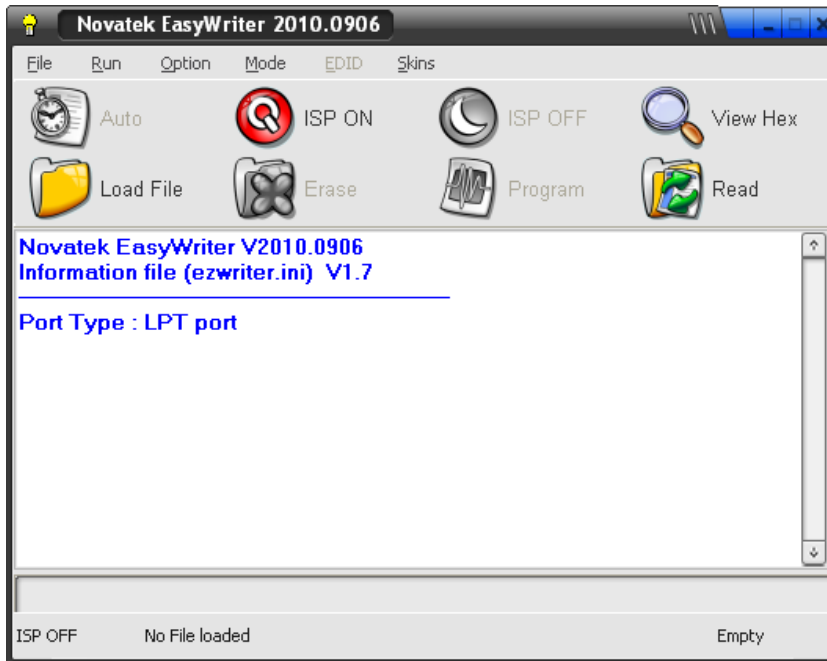


12.2 Install the LPT driver.

1. Double click the icon  to install the driver.
2. Restart the PC after the LPT driver installation

12.3 Install the ISP tool and run it:

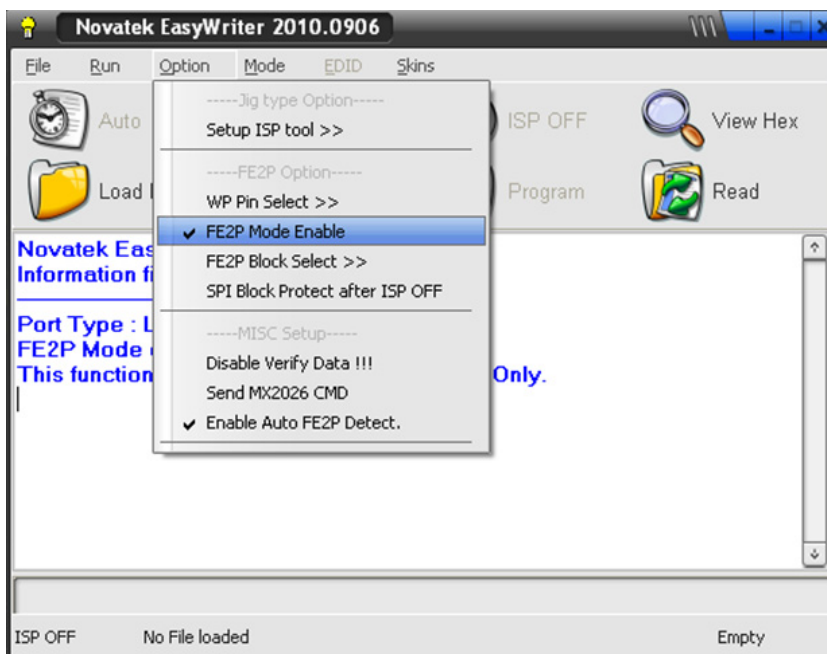
1. Double-click  to install ISP program.
2. Double-click  to run the program after installation.



Note. If you use the latest version program, you should install “ntport24.zip”, or it will pop up the message.



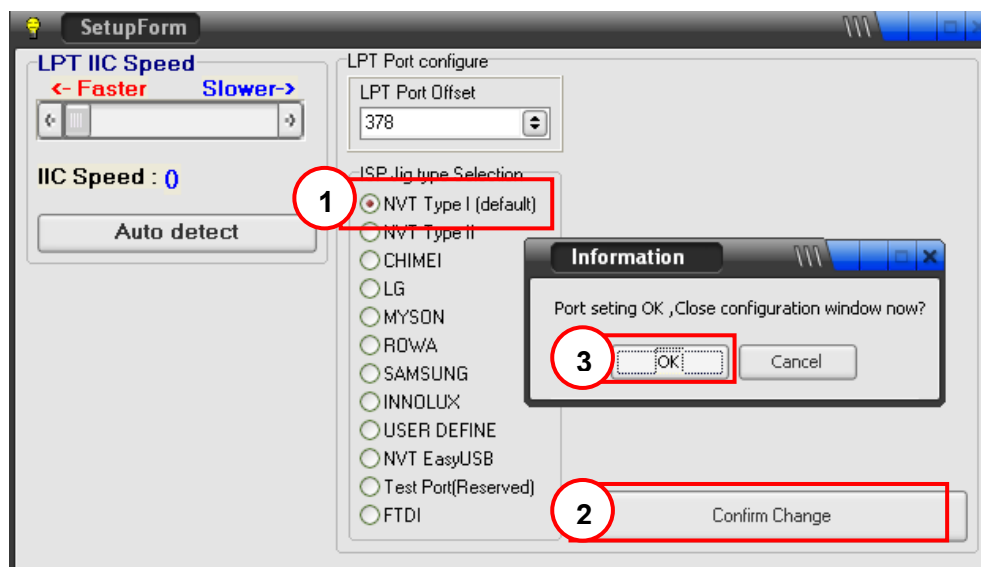
- Click the “option” item and select “FE2P Mode Enable” and “Enable Auto FE2P Detect” to restore “HDCP” key.




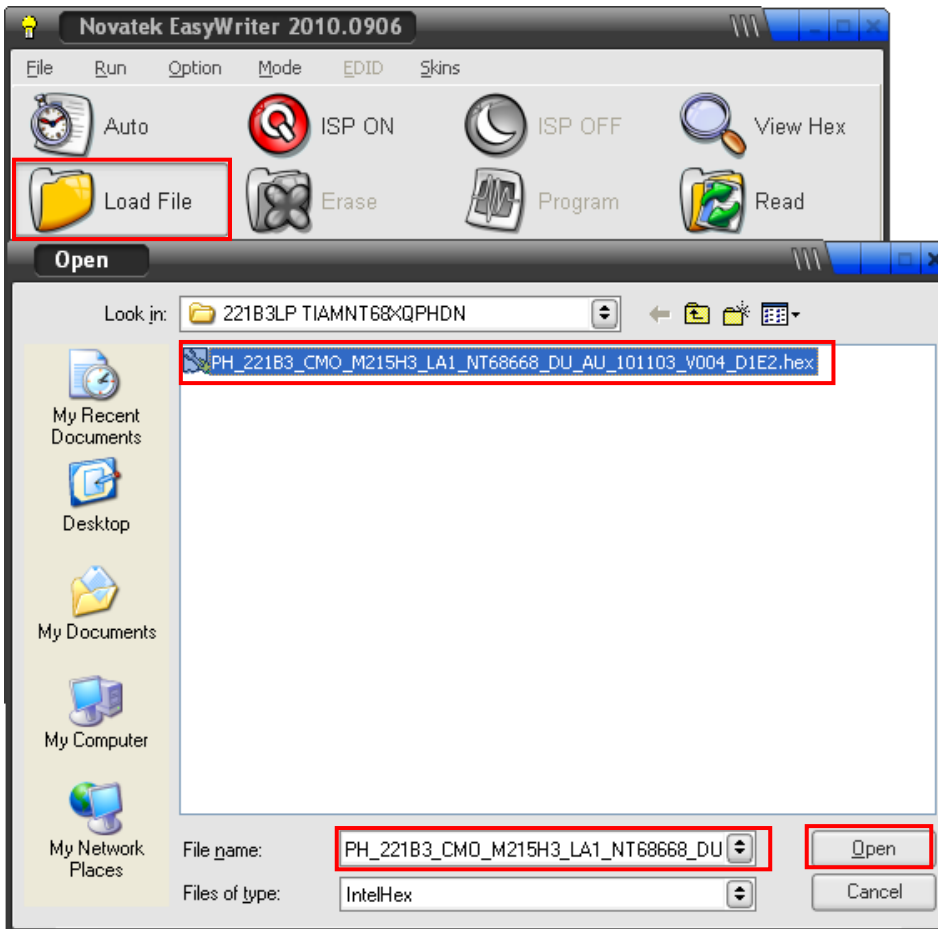
4. Click “option” and select “Setup ISP tool ”,




5. Select the “NVT Type I (default)”, click the icon “Confirm Change”. and then click the “OK”





6. Click  icon, choose the correct program, and then click “open” to load the FW:

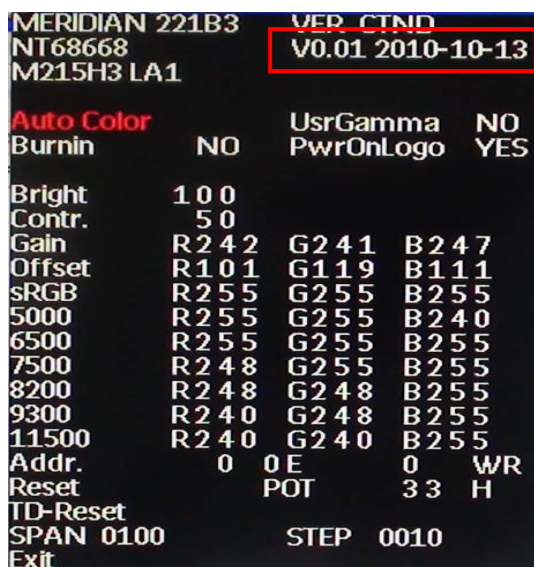


7. Click  icon to program. After display “Chip erase OK.”, “Programming Success”, “ISP OFF”, it means F/W updated OK, it will show as the follow picture. After upgrade, the monitor Burn in is on.

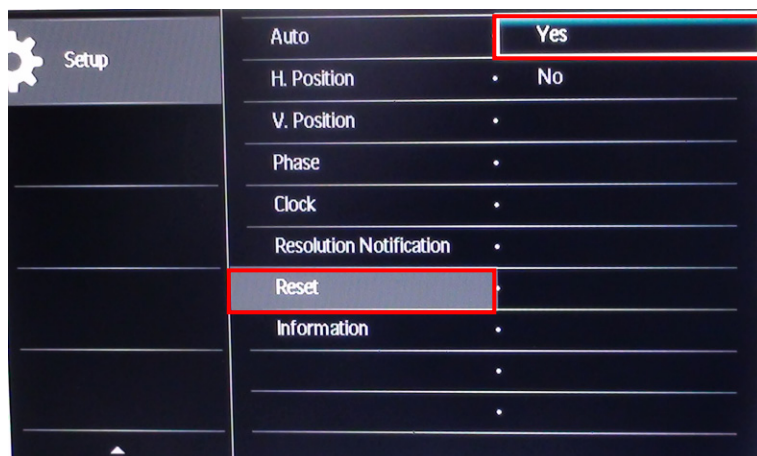


12.4 Check the firmware version:

1. Connect VGA or DVI source and power off the monitor.
2. Press /▼ and /OK buttons at the same time, power on the monitor, and then press the menu again; the picture will appear on the top left corner.
3. Select the “Factory” and press the “MENU” button to enter the factory mode.



4. Power off/on to exit the factory mode.
5. Press the “MENU” button to enter the user menu, choose the “Reset” to do factory reset.



13. DDC Instruction

General

DDC Data Re-programming

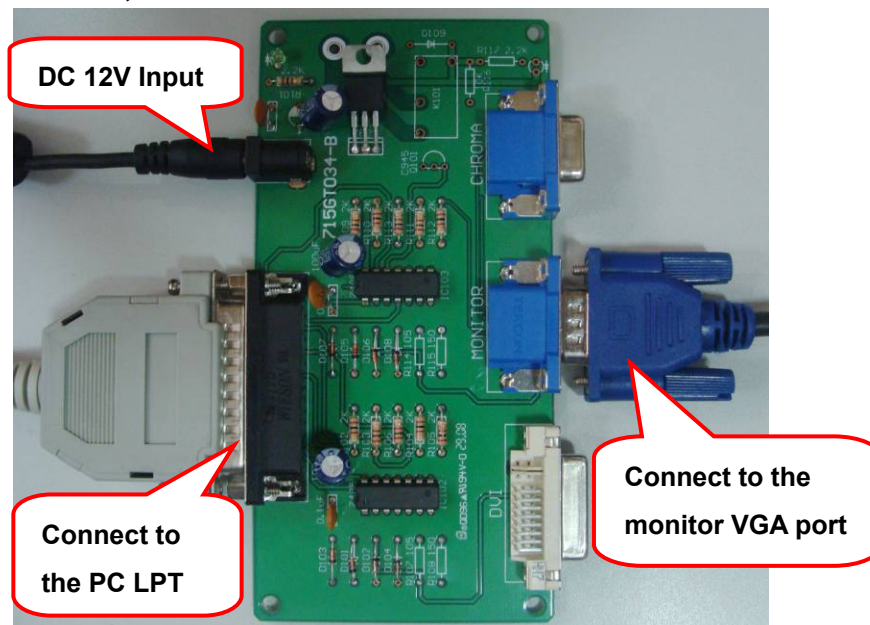
In case the main EEPROM with Software DDC which store all factory settings were replaced because a defect repaired monitor' the serial numbers have to be re-programmed.

It is advised to re- soldered the main EEPROM with Software DDC from the old board onto the new board if circuit board have been replaced, in this case the DDC data does not need to be re-programmed.

Additional information about DDC (Display Data Channel) may be obtained from Video Electronics Standards Association (VESA). Extended Display Identification Data (EDID) information may be also obtained from VESA.

1. An i486 (or above) personal computer or compatible.
2. Microsoft operation system Windows 95/98/2000/XP.
3. LPT drive "PORT95NT.exe" and EDID tool "VGA_PHL.exe"
4. EDID Board (715GT034-B) x1,
5. Printer cablex1, VGA cable x 1, DVI-D cable x 1
6. 12V DC power source
7. EDID data

13.1 Connect the ISP board, PC and monitor as follow:



13.2 Install the LPT drive

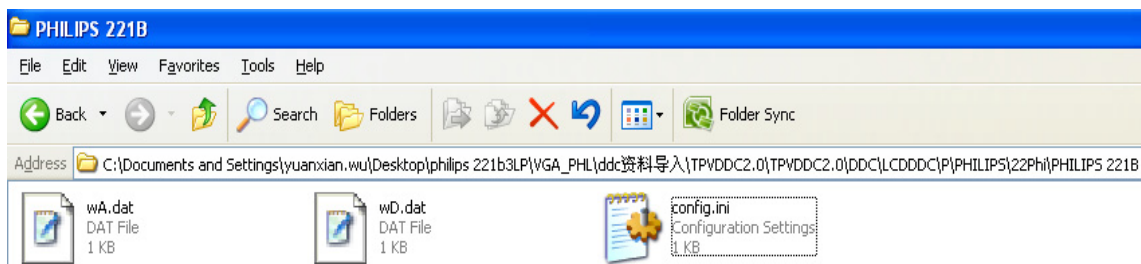


PORT95NT.EXE
PackageForTheWeb Stub
InstallShield Software Corpora.

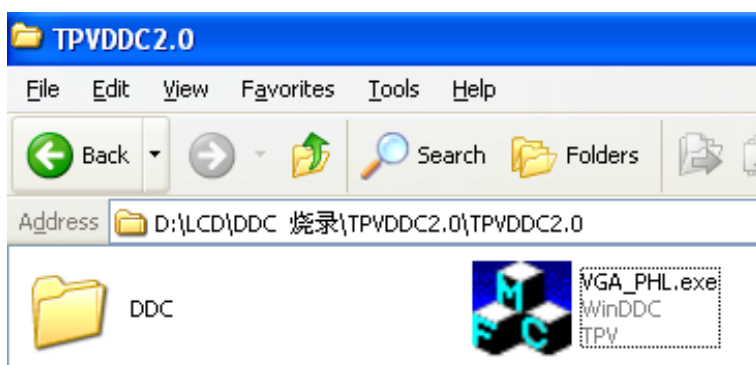
1. Double click the icon to install the driver.
2. Restart the PC after the LPT driver installation

13.3 The process of writing EDID and SN

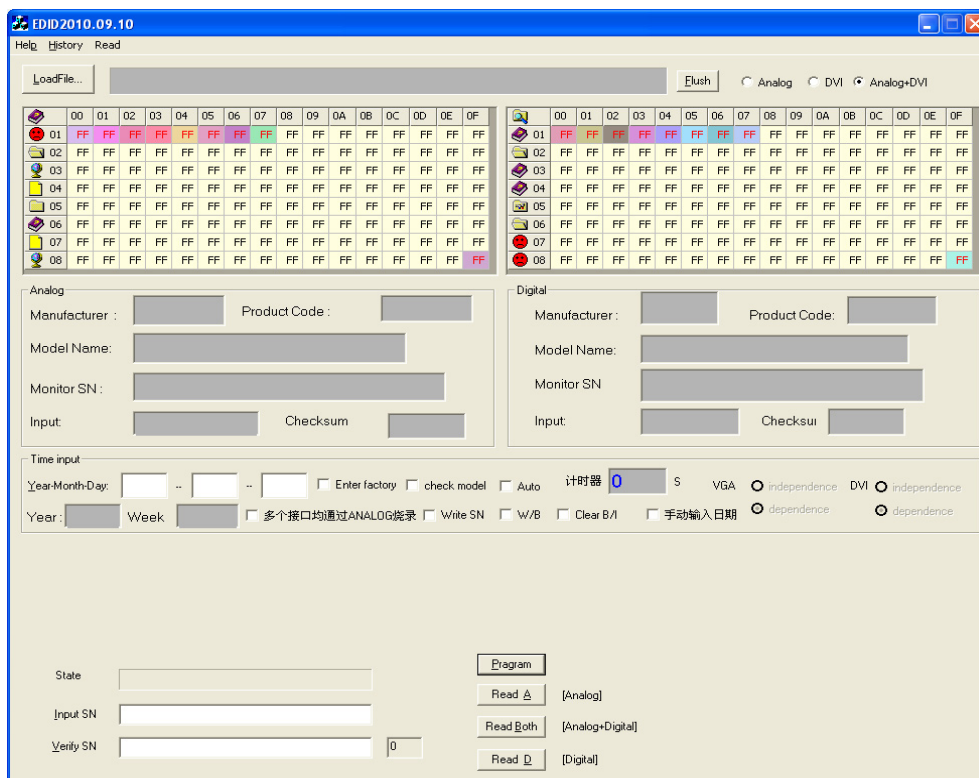
1. Rename the analog EDID to “wa.dat” and digital EDID to “wd.dat”.
2. Put the “wa.dat”, “wd.dat” and “config.ini” files into one folder named Philips 221S.



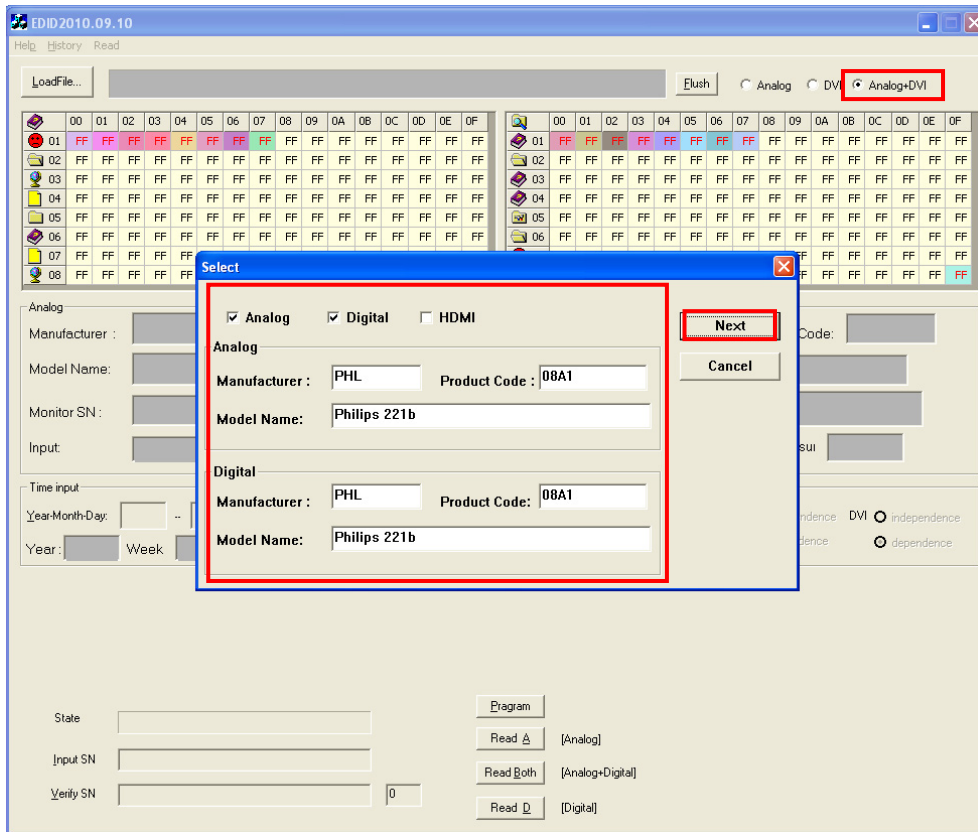
3. Copy the folder named Philips 221S to the “ddc” folder. (It must be “ddc” instead of other names).



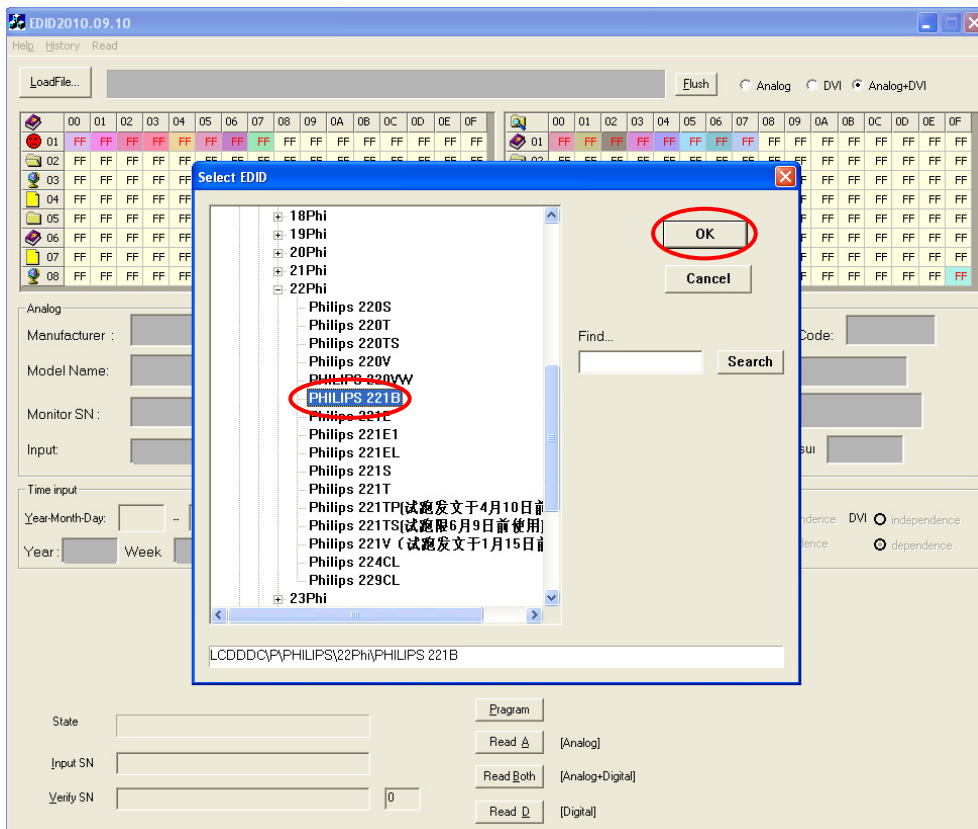
4. Double-click the icon  to open the tool.



5. Choose the “Analog and DVI”, and click “Loadfile” to set the parameters as below picture:



6. Click the “Next” to load the EDID file.



7. Click “OK”, the tool will read the EDID information:

EDID2010.09.10

Help History Read

LoadFile... LCDDDC:\PHILIPS\22Phi\PHILIPS 221B Flush Analog DVI Analog+DVI

00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F
01	00	FF	FF	FF	FF	FF	00	41	0C	A1	08	94	BA	0A	00
02	01	10	01	03	6C	30	18	78	2E	12	F5	A7	55	4A	9B
03	15	50	54	BD	4B	00	D1	C0	81	80	B3	00	95	00	95
04	01	01	01	01	01	01	02	3A	80	18	71	38	2D	40	58
05	45	00	DD	0C	11	00	00	1E	00	00	00	FF	00	31	33
06	34	36	39	38	37	30	33	31	32	34	00	00	FD	00	38
07	4C	1E	53	11	00	0A	20	20	20	20	20	20	00	00	FC
08	00	50	68	69	6C	69	70	73	20	32	32	31	42	0A	00

Analog Manufacturer: PHL Product Code: 08A1 Model Name: Philips 221B Monitor SN: 1324698703124[703124] Input: Analog Checksum: E5

Digital Manufacturer: PHL Product Code: 08A1 Model Name: Philips 221B Monitor SN: 1324698703124[703124] Input: Digital Checksum: D1

Time input: Year-Month-Day: Year: 2006 Week: 1 Enter factory check model Auto 计时器 0 S VGA independence DVI independence Year: 2006 Week: 1 多个接口均通过ANALOG烧录 Write SN W/B Clear B/I 手动输入日期 dependence dependence

State Program Read [Analog] Read Both [Analog+Digital] Read [Digital]

Input SN Verify SN 14

8. Choose the “多个接口通过 ANALOG 烧录” and “Write SN”, and key in the 14 digital S/N which must be the same as the barcode S/N of monitor.

EDID2010.09.10

Help History Read

LoadFile... LCDDDC:\PHILIPS\22Phi\PHILIPS 221B Flush Analog DVI Analog+DVI

00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F
01	00	FF	FF	FF	FF	FF	00	41	0C	A1	08	94	BA	0A	00
02	01	10	01	03	6C	30	18	78	2E	12	F5	A7	55	4A	9B
03	15	50	54	BD	4B	00	D1	C0	81	80	B3	00	95	00	95
04	01	01	01	01	01	01	02	3A	80	18	71	38	2D	40	58
05	45	00	DD	0C	11	00	00	1E	00	00	00	FF	00	31	33
06	34	36	39	38	37	30	33	31	32	34	00	00	FD	00	38
07	4C	1E	53	11	00	0A	20	20	20	20	20	20	00	00	FC
08	00	50	68	69	6C	69	70	73	20	32	32	31	42	0A	00

Analog Manufacturer: PHL Product Code: 08A1 Model Name: Philips 221B Monitor SN: 1324698703124[703124] Input: Analog Checksum: E5

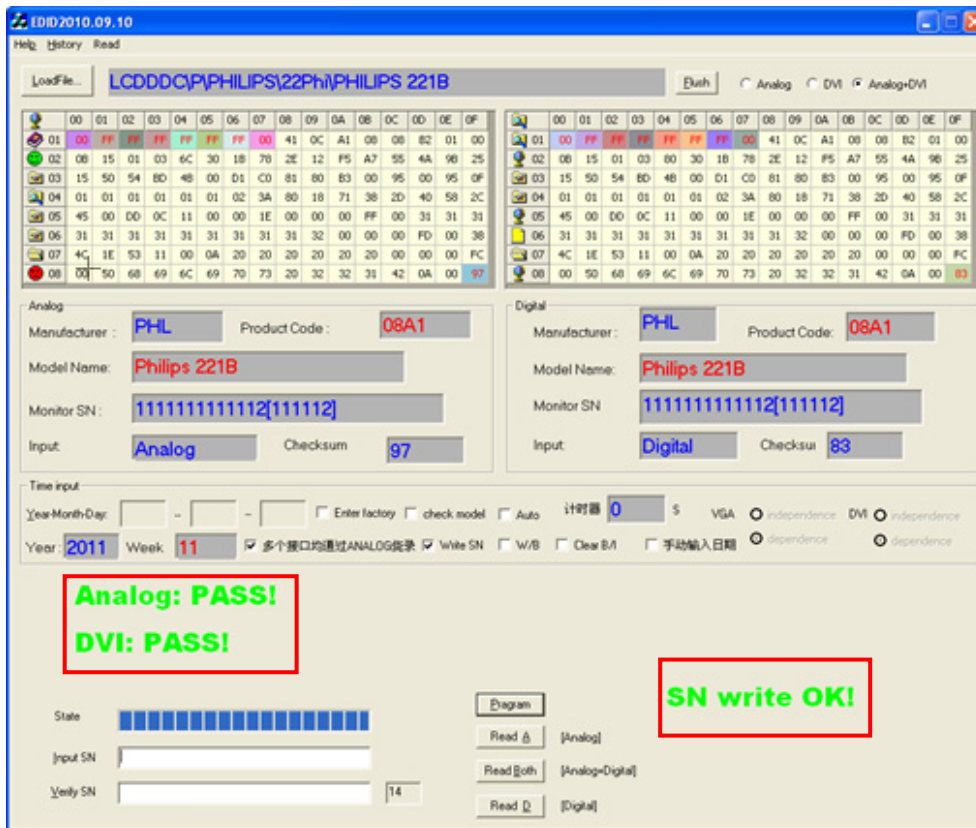
Digital Manufacturer: PHL Product Code: 08A1 Model Name: Philips 221B Monitor SN: 1324698703124[703124] Input: Digital Checksum: D1

Time input: Year-Month-Day: Year: 2006 Week: 1 Enter factory check model Auto 计时器 0 S VGA independence DVI independence Year: 2006 Week: 1 多个接口均通过ANALOG烧录 Write SN W/B Clear B/I 手动输入日期 dependence dependence

State Program Read [Analog] Read Both [Analog+Digital] Read [Digital]

Input SN 11111111111112 Verify SN 11111111111112 14

9. Click the “Program” to start programming after monitor DC on. When it shows “Analog: PASS, DVI: PASS and SN write OK”. The EDID and SN writing process are finished.



13.4 Check the SN

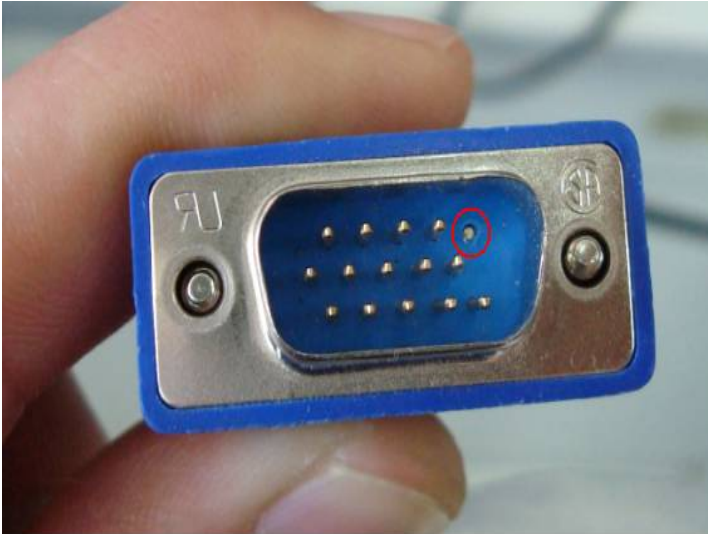
1. Connect the VGA or DVI source and power on monitor.
2. Press the “MENU” button to enter the user menu. We can check the 14 digital SN on the bottom right of the menu.



3. If this SN number is the same as what we had written by EDID tool, the EDID and SN writing is completed finally

Note: When you can't burn in the EDID and SN, try the following ways.

1. AC on the monitor and turn on it.
2. Cut off the 5 pin of VGA cable terminal connected to monitor



3. Take apart the monitor and connect the 7pin of EEPROM to GND to disable write protection.

221B3 EDID

Analog

00 01 02 03 04 05 06 07 08 09 0A 0B 0C 0D 0E 0F

00| 00 FF FF FF FF FF FF 00 41 0C A1 08 94 BA 0A 00
10| 01 10 01 03 6C 30 1B 78 2E 12 F5 A7 55 4A 9B 25
20| 15 50 54 BD 4B 00 D1 C0 81 80 B3 00 95 00 95 0F
30| 01 01 01 01 01 01 02 3A 80 18 71 38 2D 40 58 2C
40| 45 00 DD 0C 11 00 00 1E 00 00 00 FF 00 31 33 32
50| 34 36 39 38 37 30 33 31 32 34 00 00 00 FD 00 38
60| 4C 1E 53 11 00 0A 20 20 20 20 20 20 00 00 00 FC
70| 00 50 68 69 6C 69 70 73 20 32 32 31 42 0A 00 E5

EDID Structure Version/Revision: 01 03

<-Vendor/Product Identification: ->

ID Manufacturer Name: PHL
ID Product Code: 08A1
ID Serial Number: 703124
Week of Manufacture: 1
Year of Manufacture: 2006

<-Basic Display Parameters/Features: ->

Video i/p definition: Analog
Max. H. Image Size: 48cm
Max. V. Image Size: 27cm
Display Gamma: 2.2

<-Color Characteristics: ->

Rx: 0.652 Gx: 0.289 Bx: 0.147 Wx: 0.313
Ry: 0.333 Gy: 0.607 By: 0.085 Wy: 0.329

<-Established Timings: ->

Established Timings 1: BD
720 x 400 @ 70Hz VGA, IBM
640 x 480 @ 60Hz VGA, IBM
640 x 480 @ 67Hz Apple, Mac II
640 x 480 @ 72Hz VESA
640 x 480 @ 75Hz VESA

64 Meridian 3

800 x 600 @ 60Hz VESA

Established Timings 2:4B

800 x 600 @ 75Hz VESA

1024 x 768 @ 60Hz VESA

1024 x 768 @ 75Hz VESA

1280 x 1024 @ 75Hz VESA

Established Timings 3:00

<-Standard Timing Identification: ->

1920 x 1080 @ 60Hz

1280 x 1024 @ 60Hz

1680 x 1050 @ 60Hz

1440 x 900 @ 60Hz

1440 x 900 @ 75Hz

<-Detailed Timing Descriptions: ->

FC (Monitor Name): Philips 221B

FD (Monitor Limits):

Min. V. rate: 56 Hz

Max. V. rate: 76 Hz

Min. H. rate: 30 KHz

Max. H. rate: 83 KHz

Max. P Clock: 170 MHz

FF (Monitor SN): 1324698703124

Detailed Timing: 1920x1080 @ 60Hz

Extension Flag: 00

Block0 Checksum: E5

Digital

00 01 02 03 04 05 06 07 08 09 0A 0B 0C 0D 0E 0F

00| 00 FF FF FF FF FF FF 00 41 0C A1 08 94 BA 0A 00
10| 01 10 01 03 80 30 1B 78 2E 12 F5 A7 55 4A 9B 25
20| 15 50 54 BD 4B 00 D1 C0 81 80 B3 00 95 00 95 0F
30| 01 01 01 01 01 01 02 3A 80 18 71 38 2D 40 58 2C
40| 45 00 DD 0C 11 00 00 1E 00 00 00 FF 00 31 33 32
50| 34 36 39 38 37 30 33 31 32 34 00 00 00 FD 00 38
60| 4C 1E 53 11 00 0A 20 20 20 20 20 00 00 00 FC
70| 00 50 68 69 6C 69 70 73 20 32 32 31 42 0A 00 D1

EDID Structure Version/Revision: 01 03

<-Vendor/Product Identification: ->

ID Manufacturer Name: PHL
ID Product Code: 08A1
ID Serial Number: 703124
Week of Manufacture: 1
Year of Manufacture: 2006

<-Basic Display Parameters/Features: ->

Video i/p definition: Digital
Max. H. Image Size: 48cm
Max. V. Image Size: 27cm
Display Gamma: 2.2

<-Color Characteristics: ->

Rx: 0.652 Gx: 0.289 Bx: 0.147 Wx: 0.313
Ry: 0.333 Gy: 0.607 By: 0.085 Wy: 0.329

<-Established Timings: ->

Established Timings 1: BD
720 x 400 @ 70Hz VGA, IBM
640 x 480 @ 60Hz VGA, IBM
640 x 480 @ 67Hz Apple, Mac II
640 x 480 @ 72Hz VESA
640 x 480 @ 75Hz VESA
800 x 600 @ 60Hz VESA

Established Timings 2:4B

800 x 600 @ 75Hz VESA

1024 x 768 @ 60Hz VESA

1024 x 768 @ 75Hz VESA

1280 x 1024 @ 75Hz VESA

Established Timings 3:00

<-Standard Timing Identification: ->

1920 x 1080 @ 60Hz

1280 x 1024 @ 60Hz

1680 x 1050 @ 60Hz

1440 x 900 @ 60Hz

1440 x 900 @ 75Hz

<-Detailed Timing Descriptions: ->

FC (Monitor Name): Philips 221B

FD (Monitor Limits):

Min. V. rate: 56 Hz

Max. V. rate: 76 Hz

Min. H. rate: 30 KHz

Max. H. rate: 83 KHz

Max. P Clock: 170 MHz

FF (Monitor SN): 1324698703124

Detailed Timing: 1920x1080 @ 60Hz

Extension Flag: 00

Block0 Checksum: D1

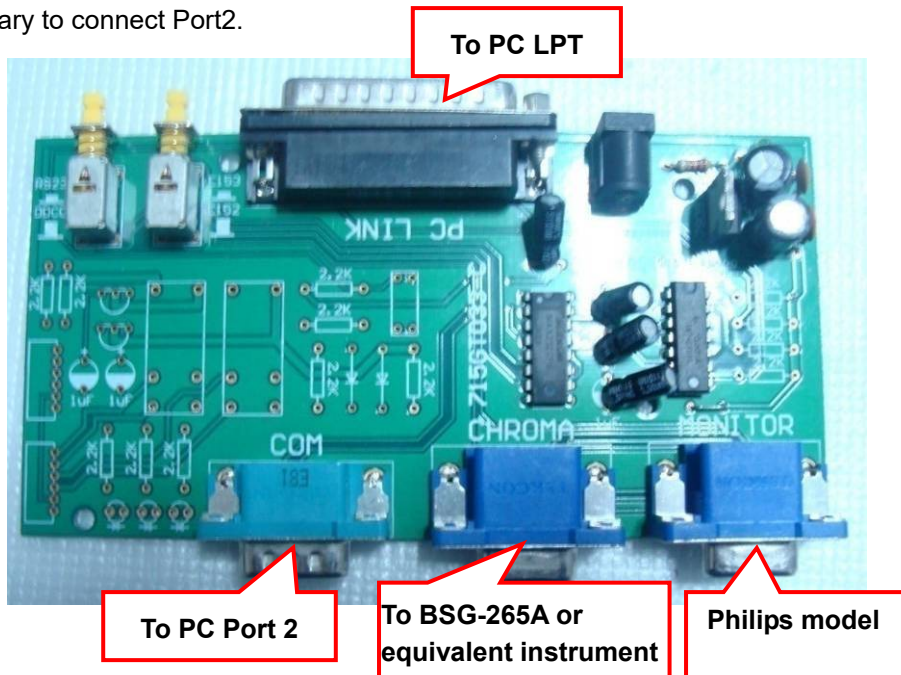
14. White Balance, Luminance Adjustment

1. Apparatuses and program: analyzer CA-210, PC, tool, FGA adjustment program (PHILIPS 221B3.DDCI), Pattern generator.

2. Equipment installation:

- Connect analyzer CA-210 to PC by USB connector, install drive program CA-SDK Ver4.00 for CA-210 and restart PC after finish installing
- Install Port95NT drive program, set PC printer connector mode as ECP mode and reset PC after finish installing.
- Connect tool as follow:

Note: It's not necessary to connect Port2.



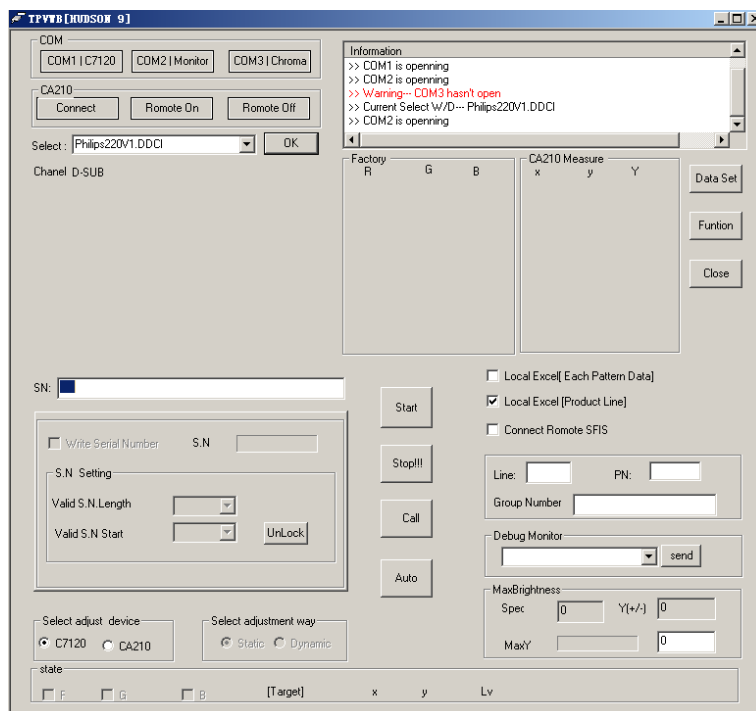
3. Adjustment

Preparation before adjustment:

- Monitor should be warmed up for more than half an hour.
- Make sure that the tools are connected right and drive programs have been installed OK.

4. Adjustment process:

- Press the power of CA-210, shut off the lens, press 0-Cal and open the lens after analyzer reset.
- Open white balance adjustment program, select the right parameter according with the program and click OK.
- Make sure that the lens of CA-210 aims at the center of the screen, then click START to adjust.
- After finish adjusting, the adjustment program displays pass, and the START button changes for NEXT, which means that you can adjust another monitor.



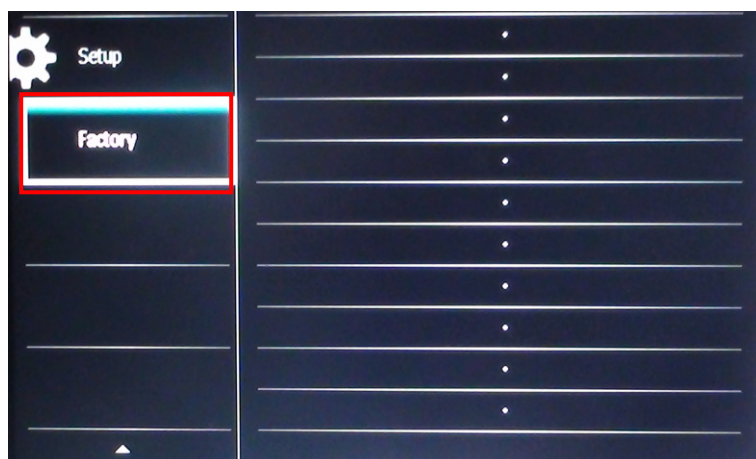
5. Color Temp confirmation

Connect the signal to the monitor, the monitor displays white-picture, use CA-210 to measure the Color Temp of the screen center and select the OSD to make sure whether the Color Temps accord with the SPEC.

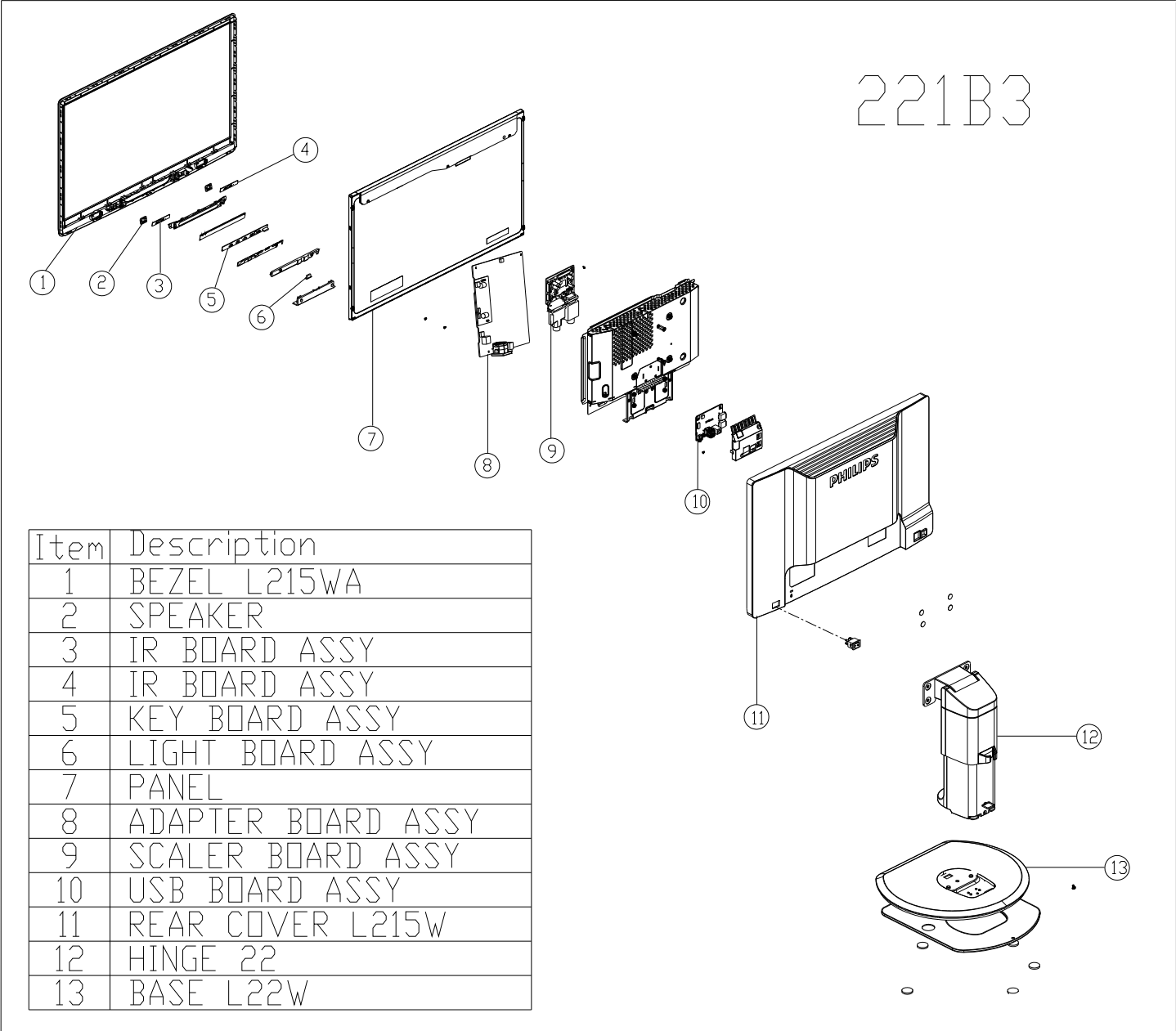
CIE coordinates	11500K	9300K	8200K	7500K	6500K/sRGB	sRGB	5000K
x	0.270±0.02	0.283±0.02	0.291±0.02	0.298±0.02	0.313±0.02	0.313±0.02	0.345±0.02
y	0.281±0.02	0.297±0.02	0.306±0.02	0.314±0.02	0.329±0.02	0.329±0.02	0.357±0.02

6. How to enter into the factory mode:

1. Connect the VGA or DVI source and power off the monitor.
2. Press /▼ and /OK buttons at the same time, power on the monitor, and then press the menu again; the picture will appear on the top left corner.
3. Select the “Factory” and press the “MENU” button to enter the factory mode.



15. Monitor Exploded View



16. Recommended & Spare Parts List

Note: The following information of initial version BOM are only for reference of repair, not place the order as the basis and are subject to change without notice. Please base on RSPL or Service BOM (<http://cs.tpv.com.cn>) , thank you!

Recommended Parts List for 221B3LPCS/00

Item	Location	PCM Codes	Description	Remark
1	FQ106	A34G2418 VOB3B0102	BEZEL L215WA-Tph1b-P1	
2	FQ401	078G020A 4 V	SPEAKER 4 OHM 2W 26.8X13.8mm 280/200mm	
3	FQ007	IRPCAQA4	IR BOARD ASSY	
4	FQ007	IRPCAQA5	IR BOARD ASSY	
5	FQ004	KEPCAQP2	KEY BOARD ASSY	
6	FQ012	KEPC9QL4	LIGHT BOARD ASSY	
7	E750	750GBM215H3A22M0PH	LCD M215H3-LA1 C2(66) NB CMO	
7	E750	750GBM215H3A22N000	LCD M215H3-LA1 C2(66) NB CMO	
7	E750	750GLM215H3A12M0PH	LCD M215H3-LA1 C1(CC) NB CMI	
7	E750	750GLM215H3A12N000	PANEL M215H3-LA1 C1 NB CMO	
7	E750	750GBM215GE012M0PH	LCD M215HGE-L10 C1(CC) NB CMI	
7	E750	750GBM215GE012N000	LCD M215HGE-L10 C1(CC) NB CMI	
7	E750	750GBM215GE022M0PH	LCD M215HGE-L10 C2(66) NB CMI	
7	E750	750GBM215GE022N000	LCD M215HGE-L10 C2(66) NB CMI	
7	E750	750GBC215FA433M0PH	LCD CLAA215FA04 8D9 FZ CPT	
7	E750	750GBC215FA433N000	LCD CLAA215FA04 8D9 FZ CPT	
7	E750	750GBC215FA443M0PH	LCD CLAA215FA04 8EA FZ CPT	
7	E750	750GBC215FA443N000	LCD CLAA215FA04 8EA FZ CPT	
8	FQ010	ADPCA1603QCN	ADAPTER BOARD ASSY	CMI LA1
8	FQ010	ADPCB1604QB7	POWER BOARD ASSY	CMI L10
8	FQ010	ADPCB1604QB8	POWER BOARD ASSY	CPT
9	FQ002	756GQACB PH150 00	SCALER BOARD ASSY(CBPCANTP3QP)	CMI LA1
9	FQ002	756GQACB PH202 00	SCALER BOARD ASSY(CBPCANTP3QP)	CMI L10
9	FQ002	756GQACB PH201 00	SCALER BOARD ASSY(CBPCANTP3QP)	CPT
10	FQ006	USBAQPP	USB BOARD ASSY	
11	FQ105	A34G2419ADT 3B0130	REAR COVER L215W-Tph1	CMO
11	FQ105	A34G2419ADT 4B0130	REAR COVER L215W-Tph1	CPT
12	FQ112	Q37G0199014	STAND_ASSY 21.5	
13	FQ109	A34G1983 VO 2B0100	BASE	
	FQ305	089G 17356G553	AUDIO CABLE 1800MM	
	E08902	089G 728HAA 2G	SIGNAL CABLE	CMO
	E08902	089G 728CAA 2G	SIGNAL CABLE	CPT
	E08903	089G1748HAA AC	DVI CABLE	
	E08901	089G404A18N CX	AC POWER CORD 1800MM	

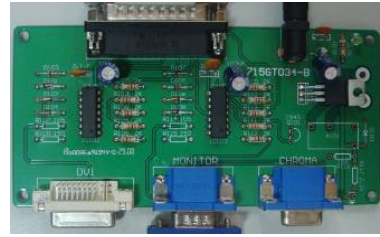
	FQ205	803GQA44101	L215WA-Tph1b-P1 221B3 EPS ASSY	
	FQ202	Q44GB074813 1A	CARTON	
	FQ210	Q45G 88606 R	PE BAG FOR BASE	
	FQ209	Q45G 88609206 N	EPE BAG	
	FQ304	S89G179T30N521	FFC CABLE 30P 210mm P1.0MM	
	IC903	056G 139 7	IC EL817MC M-TYPE	
	IC601	056G 616 51	IC APA2071JI-TUG 3.1W DIP-16	
	T901	080GL19P 11 S	XFMR 650UH 10% 15UH BCK-EFD30-29009	
	IC904	056G 158 10 T	LDO IC AZ431AZ-AE1 TO-92 150MA 40V TO-92	
	F903	084G 56 4 B	FUSE 4A 250V	
	F901	084G 56 4 B	FUSE 4A 250V	
	IC801	056G 379185	AC/DC CONVERTER TA9690GN-A1-0-TR SOP-24	
	U801	056G 700 5	IC LED driver MP3389EF TSSOP28	
	U402	100GPNMI002NT1	MCU ASSY(056G2233 11)	CMI LA1
	U402	100GPNMI009NT1	MCU ASSY(056G2233 11)	CMI L10
	U402	100GPNCI00JNT1	MCU ASSY(056G2233 11)	CPT
	X401	093G 2251B J	CRYSTAL 12MHZ NXS12.000AC30F-KAB10	
	U401	056G 562328	IC Scaler NT68668AUFQ QFP-128	
	U704	056G 563125	IC G1117-18T43Uf TO-252	
	U701	056G 563149	IC G903T63UF 0.6A/3.3V SOT-223	
	U102	056G 662504	IC ESD AOZ8902CIL 24KV 5A SOT23-6 AOS	
	U103	056G 662504	IC ESD AOZ8902CIL 24KV 5A SOT23-6 AOS	
	U104	056G 662504	IC ESD AOZ8902CIL 24KV 5A SOT23-6 AOS	
	U106	056G 662504	IC ESD AOZ8902CIL 24KV 5A SOT23-6 AOS	
	U107	056G 662504	IC ESD AOZ8902CIL 24KV 5A SOT23-6 AOS	
	U402	056G2233 11	IC Pm25LD020C-SCE SIOC-8(150mil) 2M	
	U053	056G 627911	IR 38KHZ KSM-603TM2M	
	U052	056G 192 25	D-AMP AS358MTR-E1 SOIC-8	
	U051	056G1125200	IC MCU PIC12F615-I/SN SOIC-8	
	U001	056G 669 15	TOUCH KEY IT7230BFN/BX-0001(R) QFN24	
	U705	056G 563215	IC DC/DC MP1584EN SOIC8E	
	U751	056G 585 4A	LDO AP1117E33G-13 1A 3.3V SOT223	
	U752	056G 659 30	USB USB2514B-AEZG QFN-36	

Service Kit

Description	Part No.	Picture
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EDID & ISP TOOL

715GT034-B



17. General Product Specification

- ANALOG AND DIGITAL (optional) DUAL INPUT
- AUTO PICTURE ADJUSTMENT
- 17 FACTORY PRESET MODES and 49 PRESET MODES WHICH CAN BE RECOVERED TO PRESET MODES, 10 USER MODES
- USER FRIENDLY OSD DISPLAY FOR MODE IDENTIFICATION / ADJUSTMENT
- MAX. RESOLUTION 1920 x 1080 NON-INTERLACED AT 60 Hz (VGA)
- 21.5" COLOR TFT LCD FLAT PANEL
- FULL RANGE POWER SUPPLY 90 – 264 VAC
- CE ENVIRONMENTAL POLICY
- ANTI-GLARE TO REDUCE LIGHT REFLECTION
- POWER MANAGEMENT CAPABILITY
- SOG SUPPORT
- Windows 7 / Vista Premium / XP Logo Certification
- HDCP SUPPORT
- USB 2.0 SUPPORT
- AUDIO SUPPORT
- SMART CONTROL PREMIUM
- Smart Contrast 500000:1 (typ.) (lamp), 20M:1 (LED) Waiting for supplier input
- SmartImage
- PerfectTune II (formerly FGA, FACTORY GAMMA Alignment)
- PHILIPS LOGO DISPLAYED WHILE POWER ON
- WEEE REQUIREMENT
- RoHS REQUIREMENT
- TCO5.0 REQUIREMENT

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- 3.2 Ambient Temperature

3. Electrical Characteristics

- 3.1 Interface Signals
- 3.2 Interface
- 3.3 Timing Requirement
- 3.4 Horizontal Scanning
- 3.5 Vertical Scanning
- 3.6 Power Input Connection
- 3.7 Power Management
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- 3.11 DDC /CI Support and Smart Manage/Control
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- 3.13 Smart Contrast (Dynamic Contrast Ratio)
- 3.14 SmartImage
- 3.15 Perfect Tune
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- 9.5 Check Cross Talk(s)
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- 5.4 Gap between Panel and Front Bezel
- 5.5 Location Control Icons
- 5.6 Color for Resin/Paint
- 5.7 Fire Enclosure Request
- 5.8 Resins

- 5.9 If Paint is used
- 5.10 Plastic Mold Tooling
- 5.11 Plastics Flammability
- 5.12 Texture/Glossing of House
- 5.13 Tilt and Swivel Base
- 5.14 Kensington Lock
- 5.15 Label
- 5.16 Product Dimension / Weight (refer to Philips approved SHT191 / SHT560)
- 5.17 Transportation
- 5.18 Pallet / Container Loading (refer to Philips approved SHT560)

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- 6.3 Display Disturbances from External Environment
- 6.4 Display Disturbances to External Environment

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8. Quality Assurance Requirements

- 8.1 Acceptance Test

9. Philips' Flat Panel Monitors Pixel Defect Policy

10. Regulatory Compliance

- 10.1 Worldwide Regulatory
- 10.2 EMC Requirements
- 10.3 RoHS
- 10.4 WEEE
- 10.5 Ongoing Regulatory

1. Foreword

This specification describes a 21.5" FHD multi-scan color TFT LCD monitor with maximum resolution up to 1920 x 1080 /75Hz non-interlaced. This model uses 250nits panel.

All optical characteristics are determined according to panel specification after warming up approximate 30 minutes.

2. Product Profile

2.1 EDID Header

Data for EDID & .inf file

1	User visible strings on .inf file	Philips 221B (22inch WIDE LCD MONITOR 221B3)
2	Manufacturer ID (EDID data)	PHL
3	Product ID, "xxxx" 4 codes	MSB(byte 12): 08
		LSB (byte 11): A1
4	maximum resolution	1920 x 1080
5	Horizontal Frequency Range	30~83 KHz
6	Vertical Frequency Range	56~76Hz
7	Monitor Name (13 characters max.)	Philips 221B

2.2 LCD

Suppliers to offer panel specifications

Panel incoming specification: follow Philips' specification

CMI

Type NR.	: CMI M215H3-LA1
Resolution	: 1920 x 1080 (WSXGA+)
Outside dimensions	: 495.6(H) x 292.2(V) Typ. x 12.0(D) (max.)
Pitch (mm)	: 0.248 mm x 0.248 mm
Color pixel arrangement	: RGB vertical strip
Display surface	: Haze 25% Hard coating (3H)
Color depth	: 16.7M (6 bit Hi-FRC)
Backlight	: LED
Active area (W x H)	: 476.64(H) x 268.11(V) mm
View angle (CR=10)	: 170 for Right/Left (typ.) 160 for Up/Down (typ.)
Contrast ratio	: 1000:1 (typ.)
White luminance	: 250 cd/m2 (Typ.)
Color gamut	: 72% (typ.)
Gate IC	: HIMAX
Source IC	: HIMAX
Response time	: Tr + Tf <=5 ms (typ.)
Vertical Frequency Range	: 56 -76 Hz

CPT

Type NR.	: CPT CLAA215FA04 345366
Resolution	: 1920 x 1080 (WSXGA+)
Outside dimensions	: 495.6 (H) x 292.2 (V) x 9.85 (D) (typ.)
Pitch (mm)	: 0.248 mm x 0.248 mm
Color pixel arrangement	: RGB vertical strip
Display surface	: Hard coating (3H), Anti-glare treatment of the front polarizer
Color depth	: 16.7M colors
Backlight	: LED
Active area (W x H)	: 476.64 (H) x 268.11 (V) mm 21.53 inches diagonal (aspect ratio 16:9)
View angle (CR=10)	: R/L 160 (typ.) U/D 160 (typ.)
Contrast Ratio	: 1000:1 (typ.)
White luminance	: 250 cd/m2 (typ. Center 1 point)
Color gamut	: 72% (typ.)
Gate IC	: N/A
Source IC	: Magna, OKI
Response time	: <=5 ms (typ.)
Vertical Frequency Range	: 50 -75 Hz

LGD

Type NR.	: LGD LM215WF1-TLF1
Resolution	: 1920 x 1080 (WSXGA+)
Outside dimensions	: 495.6 (H) x 292.2 (V) x 16.5 (D) (typ.)
Pitch (mm)	: 0.248 mm x 0.248 mm
Color pixel arrangement	: RGB vertical strip
Display surface	: Hard coating (3H), Anti-glare treatment of the front polarizer
Color depth	: 16.7M colors
Backlight	: Lamp
Active area (W x H)	: 476.64 (H) x 268.11 (V) mm 21.53 inches diagonal (aspect ratio 16:9)
View angle (CR=10)	: R/L 170 (typ.) U/D 160 (typ.)
Contrast Ratio	: 1000:1 (typical)
White luminance	: 300 cd/m2 (typ. Center 1 point)
Color gamut	: 72% (typ.)
Gate IC	: N/A
Source IC	: N/A
Response time	: <=5 ms (typ.)
Vertical Frequency Range	: 50 -75 Hz

3.3 Scanning Frequencies

Hor.	: 30 - 83 K Hz
Ver.	: 56 - 76 Hz
Video dot rate	: < 210 MHz for VGA and < 170 MHz for DVI, Warning message must be displayed while over 165 MHz (supplier to provide accurate scaler bandwidth number)
Power input	: 90-264 V AC, 50/60 \pm 2 Hz
Power consumption	: On mode: <58 W (max.), TBD W (typ.) EPA 5.0 spec.: <31.6 W (max.) EPA 5.0 measure data <TBD W SmartImage ECO mode: < TBD W

Functions:

1. D-SUB analog R/G/B separate inputs, H/V sync separated, Composite (H+V) TTL level
2. SOG sync: a. Sync select: H+V
b. Sync select: SERR
3. DVI digital Panel Link TMDS inputs, HDCP supported.

3.4 Ambient temperature: 0 °C - 40 °C**4. Electrical Characteristics**

Scaler should be capable of below items.

- 1) Scaler must support color engine for Image enhancement feature (SmartImage)
- 2) Scaler must have enough memory to support PerfecTune feature and Philips OSD
- 3) Scaler must support SmartContrast, 500K: 1 DCR preferred

4.1 Interface signals

a) D-Sub Analog

Input signal : Video, Hsync, Vsync

Video : 0.7 Vp-p, input impedance, 75 ohm @DC

Sync. : Separate sync TTL level, input impedance 2.2k ohm terminate

Hsync: Positive/Negative

Vsync: Positive/Negative

Composite sync TTL level, input impedance 2.2k ohm terminate (Positive/Negative)

Sync on green video 0.3 Vp-p Negative (Video 0.7 Vp-p Positive)

b) DVI-D Digital (HDCP supported)

Input signal: Single TMDS link (Three channels: RX0-/+, RX1-/+, RX2-/+)

c) USB Hub 2.0

USB port (1 upstream, 2 downstream)

d) Audio

Input signal: 1Vrms

Loudspeaker: 1.5W + 1.5W stereo of RMS power

Frequency Range: (Wait for supplier input)

Headphone connection will mute speakers

4.2 Interface

3.2.1 D-Sub Cable

Length : 1.8 M +/- 50 mm

Fix with monitor when packing, with transplant pin protective cover.

Connector type : D-Sub male with DDC2B pin assignments.

Blue connector thumb-operated jack screws

Pin assignments:

Pin	Signal Assignment	Pin	Signal Assignment
1	Red	9	DDC +3.3V or +5V
2	Green / SOG	10	Logic GND
3	Blue	11	Sense (GND)
4	Sense (GND)	12	Bi-directional data
5	Cable Detected (GND)	13	H /H+V sync
6	Red GND	14	V-sync
7	Green GND	15	Data clock
8	Blue GND		

3.2.2 DVI Cable

The input signals are applied to the display through DVI-D cable.

Length : 1.8 M +/- 50 mm

Connector type : DVI-D male with DDC-2B pin assignments

White connector thumb-operated jackscrews

With transplant pin protective cover.

Pin Assignment:

Pin	Signal Assignment	Pin	Signal Assignment
1	T.M.D.S. data2-	13	No Connect
2	T.M.D.S. data2+	14	+5V Power
3	T.M.D.S. data2 shield	15	Ground (for +5V)
4	No Connect	16	Hot plug detect
5	No Connect	17	T.M.D.S. data0-
6	DDC clock	18	T.M.D.S. data0+
7	DDC data	19	T.M.D.S. data0 shield
8	No Connect	20	No Connect
9	T.M.D.S. data1-	21	No Connect
10	T.M.D.S. data1+	22	T.M.D.S. clock shield
11	T.M.D.S. data1 shield	23	T.M.D.S. clock+
12	No Connect	24	T.M.D.S. clock-

4.3 Timing Requirement

Factory Preset Mode Definition:

- a. Perfect FOS while presenting those timings.
- b. Will specify those timing in User's Manual

Preset Mode Definition

- a. Need to support those timings
- b. Perfect FOS after auto adjustment.

User Mode

- a. Can save those timing that not in Preset mode and can be showed (not over scaler or Panel spec.)
- b. It needs to reserve the 10 timings space in memory size.

3.3.1 Mode Storing Capacity

Factory preset modes	: 15
User modes	: 41
User modes	: 10





3.3.2 Factory Preset Modes (D-SUB 15 modes)

1. Factory modes and preset modes are defined in the enclosed timing table file



M3 221 Series
Timing table list

3.3.3 Software control functions via OSD / control adjustable functions:

ITEM			
1	OSD DEFINITIONS	 Hudson 8 OSD Definition - v14.doc	Reset - No: Exit Yes: Auto adjustment for displaying timing mode and recall factory preset
2	OSD LANGUAGES	 OSD_String_M3_201 01021.xlsx	8 LANGUAGES
3	OSD TREE	 M3 OSD Button definition_ 20101116	
4	POWER ON LOGO	 1920x1080_new. bmp	Power On Logo: Power On → Show up Philips logo 3 seconds → Change to input signal. This picture is reference only. The official drawing will send out by PM.

5	Audio Selection	Stand-alone – On: Isolate video and audio control input Stand-alone – Off: Integrate video and audio control input Mute – On: Turn off audio Mute – Off: Turn on audio	
---	-----------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--

4.4 Horizontal scanning

Sync polarity : Positive or Negative

Scanning frequency : 30 - 83 KHz

4.5 Vertical scanning

Sync polarity : Positive or Negative

Scanning frequency : 56 - 76 Hz

4.6 Power input connection

Power cord length : 1.8 M

Power cord type : 3 leads power cord with protective earth plug.

4.7 Power management

The monitor must comply with the Microsoft On Now specification, and meet EPA requirements.

Mode	HSYNC	VSYNC	Video	Pwr-cons.	Indication	Rec. time
Power-On	On	On	Active	< TBD W (typ.) < 58 W (max.) EPA5.0 < 31.6W	White LED	--
Standby Power Saving	Off	Off	Blanked	< 0.1W (typ.) < 0.3 W (typ.)	Blinking white LED Period 3sec on, 3sec off (in smile LED)	Note 1 Note 2
DC Power Off			N/A	< 0.1W	LED Off	
AC SW Off				0W	LED Off	

Note 1:

a. D-SUB mode,

Normal mode to Power saving mode: 15/s (typ.)

Power saving mode to Normal: 4/s (typ.)

b. DVI mode,

Normal mode to Power saving mode: 15/s (typ.)

Power saving mode to Normal: 3.8s (typ.)

Note 2:

Measurement power saving.



measurement of
power saving.pdf



Power consumption
measure the way -090

4.8 VGA Display Identification

In accordance with VESA Display Channel Standard Ver.1.0 and DDC 2B capability

4.9 DVI Display Identification

In accordance with DVI requirement (DDWG digital Visual Interface revision 1.0) use DDC-2B, DDC/CI, and EDID V1.3

4.10 USB support

Connect the upstream port of the monitor to host PC's USB port via USB cable. Then attach external device to the downstream port of the monitor. Check if the device can work properly.

4.11 DDC /CI Support and Smart Manage /Control

In accordance with VESA DDC/CI and MDCS ver.2.0, the monitor should be workable with Philips SmartManage, SmartControl V6.1 and Portrait Display Tune at least.

4.12 Hot-key definition



D:\ENG\monitor
projects\spec\H8\hot k

4.13 Smart Contrast (Dynamic Contrast Ratio)

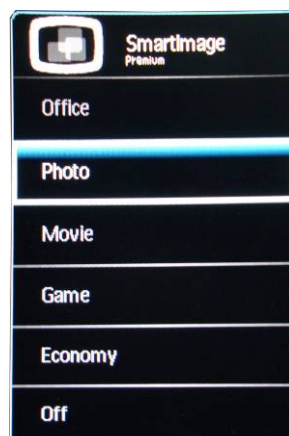
Smart Contrast is a kind of dynamic backlight control.

This function changes the panel backlight dynamically according to the frame brightness histogram.

At least the minimum contrast ratio has to be > **20,000,000:1 (typ.) (LED), 500,000 (LAMP)**

4.14 SmartImage

SmartImage (Premium) OSD outlook



Position

The position of the button is at the bottom center of the screen.

SmartImage Logo & Banner

As design to keep the LightFrame logo at header but change the name to "SmartImage" with bitmap format.

Icon of each profile

Each profile will use text instead of icon & text before.

User Operation Procedure

- A. 5 different modes are switched to next in the sequence from 1 to 5 then back to 1 while pressing this button: **1) Office Work 2) Image Viewing 3) Entertainment 4) Economy 5) Off**. The default setting is “Off”.
- B. The FOS optimization will be changed in real time by which profile to be scrolled, users don't need to confirm to enable.
- C. The SmartImage OSD will remain on screen for 5 seconds after user last action. Or user can also press [MENU] to close the SmartImage OSD immediately.
- D. Except using [MENU] button to scroll down profile. If SmartImage OSD already launched on screen. User is allowed to use up/down key to choose profile and press [MENU] to confirm selection and close the SmartImage OSD.
- E. If the model has multiple inputs including VGA and DVI, each input has their own set of profiles. When user switch input, the profile to be applied will also change.
- F. Each input can memorize their individual “SmartImage” profile status.
For example, SmartImage is on with “Office” profile at VGA input, when switch to DVI input, the SmartImage will revert to previous profile of DVI.
In the input switching processes the “SmartImage” OSD will also show up to present which profile is selected if “SmartImage” is enabled at that input.
The SmartImage status will also be stored after the monitor is resumed from AC on/off or power switch on/off.

Linkage between SmartImage Lite OSD and main OSD

- A. Settings within main OSD have linkage with SmartImage OSD.
 - i. Brightness
 - ii. Contrast
 - iii. Color Temperature
- B. Because each preset profiles will define default setting of these 3 parameters. Users can understand the value of that in preset profile by open the main OSD.
- C. When any SmartImage Lite profile had been enabled. The parameters in main OSD are still available for user to adjust. But these adjustments are temporary only. If users switch to another profile and then go back. The setting in main OSD will be store values of that SmartImage profile enabled.

Profile Definitions (system integrators to input at design stages)

A. Office

- i. Purpose: Design for general office application, like word processing, Spreadsheet and email.
The screen is dominated by text.
- ii. Enhancement point:
 1. A little sharpness for increasing the details of e.g. an excel grid.
No other type of enhancement as it won't bring value.
 2. Color temperature remains in 6500°K.

3. Brightness level should be 70%.
4. SmartContrast set to "Off".

B. Movie

- i. Purpose: Design for video application, Like Microsoft Media Player or Real Player. The screen is dominated by video.
- ii. Enhancement Point:
 1. SmartContrast enhancement by histogram analysis should be implemented.
 2. Sharpness enhanced 90%.
 3. Color enhancement set as the same with Video.
 4. Color temperature set to 7500° (**Based on final PQ settings**) (if higher)
 5. Brightness level sets to maximum.
 6. Smart Contrast set to "On"
 7. Gamma set to 2.4

C. Photo

- i. Purpose: Design for image viewing application, especially in slide show. The screen is dominated by picture. Powerpoint presentation could use this profile also.
- ii. Enhancement Point:
 1. Dynamic contrast enhancement by histogram analysis (DLC) should be off.
 2. Sharpness and color to be enhanced 75%.
 3. Color temperature 6500°K
 4. Brightness level sets to maximum.
 5. Smart Contrast set to "Off".

D. Economy

- i. Purpose: Adjust brightness level for reducing power consumptions
- ii. No optimization by SmartImage.
- iii. Design:
 1. Brightness level set to 20 a little higher brightness level than laptop PC, fine tune brightness level before DVT exit.
 2. Color temperature set to 6500K.
 3. Gamma set to 2.2.

E. Game

- i. Purpose: Design for video application, like Microsoft Media or Real Player. The screen is dominated by video.
- ii. Enhancement Point:
 1. Dynamic contrast enhancement by histogram analysis (DLC) should be implemented.
 2. Sharpness enhanced 90%.
 3. Color enhancement set as the same with Video.
 4. Color temperature set to user define (if higher)

5. Brightness level sets to maximum.
6. SmartContrast set to "On"
7. Gamma set to 2.2.

F. Off

- i. Purpose: No optimization by SmartImage.
- ii. Design:
 1. This will follow user OSD setting. If any change by user, it will be saved. When switch back from other SmartImage profiles, it will go back to last saved setting.
 2. Gamma Table is turn on to reduce bad color tracking.

Demo mode

- A. Purpose: Built-in demo mode for sales in-store demo.
- B. Design:
 - i. Dynamically split screen to 2 vertical frames with one vertical white line. The line width is 2 pixels. The left frame will be enhanced by SmartImage Lite and right frame remains original performance.
 - ii. There is OSD showing "SmartImage On / SmartImage Off" in left frame and "Original Image" if right frame.
 - iii. The OSD word color is white with transparent background.
 - iv. The demo profile will be "Video Playback" profile with "High" ODC setting.
- C. Hot keys to trigger:

Press [SmartImage] 3 seconds or more to trigger the demo mode.

When demo mode is On, press 3 seconds or more to turn off the demo mode.

When the demo mode is enabled, the blue LED ~~will flash until demo mode disabled.~~

4.15 Perfect Tune

- A. PerfectTune must be done after warming 30 minutes at least.
- B. PerfectTune must be performed after Auto Color.
- C. PerfectTune must be conducted through DVI or scaler embedded patterns.
- D. Delta E < 2.5

4.16 Audio

3.15.1 Frequency Response

The amplifier and speaker combination shall provide a frequency response of 300Hz to 20 KHz, with +/-3dB variation over the entire response range.

3.15.2 Total Harmonic Distortion

Total harmonic distortion shall be limited to 5% THD at the maximum wattage speaker rating specified in section 1.3, at 1 KHz, when the input is 1.3Vrms.

3.15.3 Power Handling

Each speaker transducer shall accept up to the specified wattage of audio power without damage or exceeding the frequency response and total harmonic distortion specifications.

3.15.4 Audio Amplifier

The amplifier shall provide two channels of audio up to 1.5Watts per channel from 100Hz to 20 KHz, base upon an audio signal input of 1.3V RMS per channel.

3.15.5 Volume Control

For monitors with a manual volume control, the direction (at the bottom) of the bezel volume control is “-”key for minimum volume and “+” key for maximum volume. The default shipping position of the volume control shall be approximately 90%.

3.15.6 Speaker Sensitivity

The speakers shall support a minimum sensitivity of 75 dB +/-3 dB at 2W /1m at 1 KHz.

3.15.7 Maximum Audio Card Output

The monitor audio amplifier shall accept a maximum input voltage of 1.5 Vrms and meet the following requirements at the maximum monitor volume setting:

1. The ratings of the audio amplifier may not be exceeded.
2. The ratings of the speakers may not be exceeded.
3. There must not be any clipping of the audio amplifier output signal.
4. Voltage dividers may be used to reduce the input signal level.

3.15.8 Monitor Audio Amplifier Input Impedance

The monitor audio amplifier shall have minimum 10K ohm AC input impedance.

4.17 USB HUB 2.0 Support

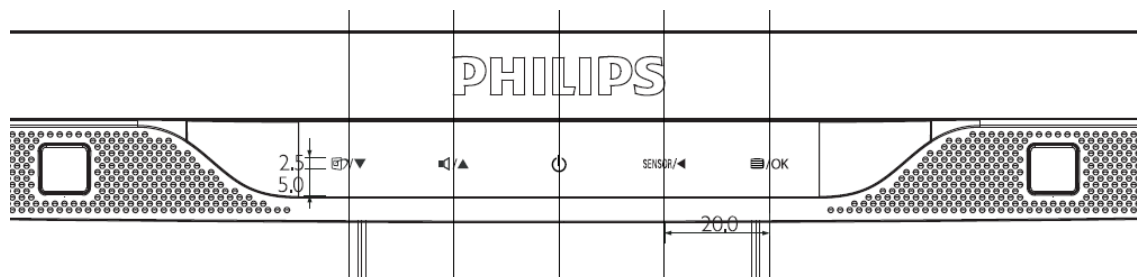
Connect the HUB port of the monitor to host PC's USB port via USB cable, then attach external device to the downstream port of the monitor. Check if the device can work properly.

4.18 Power Sensor

Functional Requirement for the front detection

For the presence sensor functionality, the following requirements are defined.

- Two IRs be used for user present detections, one IR is for transmission signals, the other one is for receiving reflection IR signals.



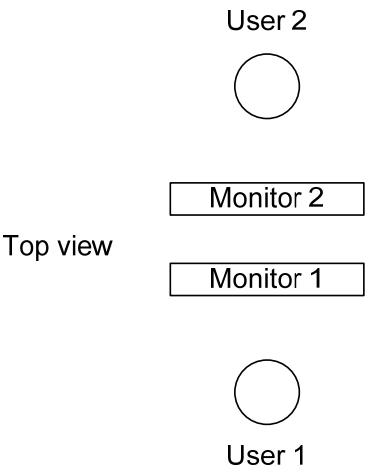
- User must be detected in the following range: 0 up to 100cm (+20 cm)
- Detection angle: +/- 30 degree
- Sensor key control: adjust detection distance (0~4 scales), default is 3
0: off, 1: 55 cm, 2: 70 cm, 3: 85 cm, 4: 100cm
- Anti-interference between two monitors, monitors must have anti-interference methods (coding...etc) to

prevent monitors to talk to each other.

Power Sensor Functional Behavior

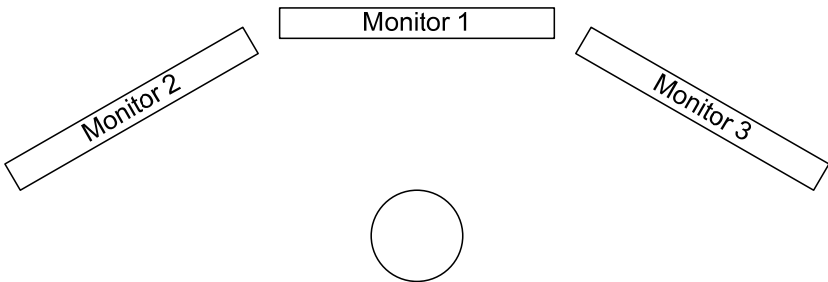
Time Period	60sec	60sec ~ 180sec	180sec ~
Power Sensor	No ACTION	Lower down backlight brightness	Backlight & LCD panel shutdown
Power Saving	0	50%	80%

The following setup will be supported:



Monitors standing back to back

The monitors may influence each other. So Monitor 1 may produce unexpected brightness-switches in monitor 2 (and vice versa). Furthermore, user 1 could perhaps (via monitor 1) influence the power sensor readout on monitor 2



Set up of multiple monitors under an angle

Factory requirements

Factory requirements are taken into account.
It needs to do calibration to make sure the same detection distance.

Service requirements

Service requirements are taken into account.
In the factory mode, it needs to reserve the max. Distance adjustment value to adjust distance ranges.

4. Visual Characteristics

4.1 Test conditions

Unless otherwise specified, this specification is defined under the following conditions.

- 1) Input signal: As defined in 3.3, 1920 x 1080 non-interlaced mode (1920 x 1080 @60Hz), signal sources must have 75 ohm output impedance.
- 2) Luminance setting: controls to be set to 300 nits with full screen 100 % duty cycle white signal
- 3) Warm up: more than 30 minutes after power on with signal supplied.
- 4) Ambient light: 400 -- 600 lux.
- 5) Ambient temperature: 20 ± 5 °C

4.2 Brightness

Follow Panel specification.

4.3 Image size

Actual display size 337.920 (H) x 270.336 (V) mm

4.4 Brightness Uniformity

Set contrast at 100% and turn the brightness to get average above 300 nits at centre of the screen.

Apply the Fig 1; it should comply with the following formula:

$$\frac{(B_{\max} - B_{\min})}{B_{\max}} \times 100\% > 75\%$$

Where B_{\max} = Maximum brightness

B_{\min} = Minimum brightness

4.5 Check Cross talk (s)

Apply Pattern 2. Set contrast and brightness at 100 %.

Measure YA. Then output Pattern 3 and measure YB.

The cross talk value:

$$\frac{ABS(YA - YB)}{YA} \times 100\% < 1.5\%$$

4.6 Color Temperature Adjustment

There are three factory preset white color 9300K, 6500K, sRGB.

Apply full white pattern, with brightness in 100 % position and the contrast control at 50 % position.

The 1931 CIE Chromaticity (color triangle) diagram (x, y) coordinate for the screen center should be:

Product Specification

CIE coordinates	(x, y)	
11500K	$x = 0.270 \pm 0.02$ $y = 0.281 \pm 0.02$	PerfecTune II
9300K	$x = 0.283 \pm 0.02$ $y = 0.297 \pm 0.02$	PerfecTune II

8200K	$x = 0.291 \pm 0.02$ $y = 0.306 \pm 0.02$	PerfecTune II
7500K	$x = 0.298 \pm 0.02$ $y = 0.314 \pm 0.02$	PerfecTune II
6500K/sRGB	$x = 0.313 \pm 0.02$ $y = 0.329 \pm 0.02$	PerfecTune II
sRGB	$x = 0.313 \pm 0.02$ $y = 0.329 \pm 0.02$	PerfecTune II
5000K	$x = 0.345 \pm 0.02$ $y = 0.357 \pm 0.02$	PerfecTune II

Production Alignment Specification

CIE coordinates	(x, y)	
11500K	$x = 0.270 \pm 0.06$ $y = 0.281 \pm 0.06$	PerfecTune II
9300K	$x = 0.283 \pm 0.06$ $y = 0.297 \pm 0.06$	PerfecTune II
8200K	$x = 0.291 \pm 0.06$ $y = 0.306 \pm 0.06$	PerfecTune II
7500K	$x = 0.298 \pm 0.02$ $y = 0.314 \pm 0.02$	PerfecTune II
6500K/sRGB	$x = 0.313 \pm 0.02$ $y = 0.329 \pm 0.02$	PerfecTune II
sRGB	$x = 0.313 \pm 0.02$ $y = 0.329 \pm 0.02$	PerfecTune II
5000K	$x = 0.345 \pm 0.02$ $y = 0.357 \pm 0.02$	PerfecTune II

Quality Inspection specification:

CIE coordinates	(x, y)
9300K	$x = 0.283 \pm 0.015$ $y = 0.297 \pm 0.015$
6500K/sRGB	$x = 0.313 \pm 0.015$ $y = 0.329 \pm 0.015$
sRGB	$x = 0.313 \pm 0.015$ $y = 0.329 \pm 0.015$

5. Mechanical Characteristics

5.1 Cosmetic -

Philips ID

5.2 Mechanical data files -

ProE files required

5.3 Location of Philips logo -

Per Philips make-up sheet

5.4 Gap between panel and front bezel

< 1.2 mm (typ.)

5.5 Location of Control icons -

Per Philips Graphic sheet

5.6 Color for resin/paint -

Per Philips make-up sheet

5.7 Fire Enclosure Request

Shielding cover should fulfill international standard.

5.8 Resins

- RoHS required
- WEEE required.
- Resin type/selection refers to Project Book Section 7.2 Plastic material.

5.9 If paint is used

- RoHS required
- WEEE require
- If new painting type needs to implement, refer to UN-D 1235.

5.10 Plastic mold tooling

- Tooling to be designed to minimize cosmetic defects induced by molding process (sink, blush, weld lines, gate marks, ejector marks, etc.). Refer to “TYV61-90007”.
- Painting to cover up cosmetic defects due to molding is strongly discouraged.
- China RoHS mark requested.

5.11 Plastics flammability

- All Plastics to be Flame Retardant UL 94-HB or better.
- Base / Rear to be Flame Retardant UL 94-HB.
- All major plastic parts (bezel, back cover) need to be molded from same resin.
- Plastic resin type selection should be referred to “plastic-Philips Pool monitor”.

5.12 Texture/Glossing of housing

- The texture area and texture no should follow Philips make-up sheet.
- The exterior surfaces shall have a uniform texture.
- Philips must approve the mold texturing.
- Detail document for texture refer to “UN-D249”, “UN-D 600”.
- ≤ 20 gloss units

5.13 Tilt and swivel base

- Tilt angle: $-5^{\circ} +2/- 0^{\circ}$ (forward)
 $+20^{\circ} + 0/- 3^{\circ}$ (backward)
- Swivel Angle nil
- High Adjustment nil
- Portrait Display nil

5.14 Kensington Lock

- Must meet Kensington_slot.spec “TYE-M0004”.
- MMD request metal plate in Kensington hole.

5.15 Label

- Regulatory label / Carton label should follow Philips requirement.
- China RoHS label
- Detail document refer to Philips Engineering Reference Book

5.16 Product dimension / Weight (Refer to Philips approved SHT191/ SHT560)

- Unit dimension:
- Packed unit dimension:
- Net weight:
- Gross weight:

5.17 Transportation

Transportation standards refer to UAN-D1534/00/01/02.

5.17.1 Transportation packages

- Net weight Packaging and wrapping shall be sufficient to protect the product against damage or loss during shipment from the supplier to the destination specified in the purchase order. All packaging materials are subject to test and evaluation per UAN-D1534/00/01/02.
- The cushion material shall be constructed using EPS material.
- The doggy hole is requested

5.17.2 Transportation Test

Overall tests refer to UAN-D1534/00/01/02.

Vibration, drop test should be performed at ambient temperature (20°C to 23°C) and relative humidity (40% to 65%).

A. Transportation test specification for all regions

- Package test
 1. Random Vibration test
 2. Drop test
 3. Cold Drop test (for design reference)
- Un-package test
 1. Half sine shock test (non operation)

B. Transportation test specification for China/India

- Package test
 1. Random Vibration test
 2. Drop test
 3. Cold Drop test (for design reference)
- Un-package test
 1. Sine vibration (operating)
 2. Half sine shock test (non operation)

5.18 Pallet / Container loading

Transportation standards refer to TYE-M0002, UAN-D1534 and UAW-0309.

- Air shipment -

- Sea container 20'(pallet/slip sheet)
- Sea container 40'(pallet/slip sheet)
- Sea container 40' High Cube (pallet/slip sheet)
- Land 45' Truck and Trailer (800X1200mm pallet)
- Land 45' Truck and Trailer (1000X1200mm pallet) for UK
- Truck shipment-

Transportation request for all regions except China/India

- A. Air shipment
- B. 20'/40'/40'HQ Container loading for WW

Transportation request for China and India

- A. Container loading for China and India
- B. Truck loading

Transportation request for EU

- A. Land 45' Truck and Trailer (800X1200mm pallet)
- B. Land 45' Truck and Trailer (1000X1200mm pallet) for UK

6. Environmental Characteristics

The following sections define the interference and susceptibility condition limits that might occur between external environment and the display device.

6.1 Susceptibility of display to external environment

Operating

- Temperature: 0 to 40 degree C
- Humidity: 80% max
- Altitude: 0 -3658 ft
- Air pressure: 600-1100 mBAR

Storage

- Temperature: -20 to 60 degree C
- Humidity: 95% max
- Altitude: 0 -12192ft
- Air pressure: 300-1100 mBAR

Note: recommend at 5 to 35°C, Humidity less than 60%.

6.2 Transportation tests

Refer to 5.15.2

6.3 Display disturbances from external environment

According to IEC 801-2 for ESD disturbances

6.4 Display disturbances to external environment

7. Reliability

7.1 Mean Time between Failures

System MTBF (Including the LCD panel and CCFL): 50,000 hrs

8. Quality Assurance Requirements

8.1 Acceptance test

According to MIL-STD-1916D Control II level

AQL: NA

(Please also refer to annual quality agreement)

Customer acceptance criteria: UAW0377/00

9. Philips' Flat Panel Monitors Pixel Defect Policy

Philips' Flat Panel Monitors Pixel Defect Policy

Bright Dot Defects	Acceptable Level
MODEL	221B3
1 lit sub-pixel	3
2 adjacent lit sub-pixels	1
3 adjacent lit sub-pixels (one white pixel)	0
Distance between two bright dots	15mm
Bright dot defects within 20 mm circle	0
Total bright dot defects of all type	3

Black Dot Defects	Acceptable Level
MODEL	221B3
1 dark sub-pixel	5
2 adjacent dark sub-pixels	2
3 adjacent dark sub-pixels (one white pixel)	1
Distance between two black dots	15mm
Black dot defects within 20 mm circle*	1
Total black dot defects of all type	5

Total Dot Defects	Acceptable Level
MODEL	221B3
Total bright or black dot defects of all type	5

* 1 or 2 adjacent sub-pixel defects = 1 dot defect

Fig 1: Measurement locations of Brightness Uniformity

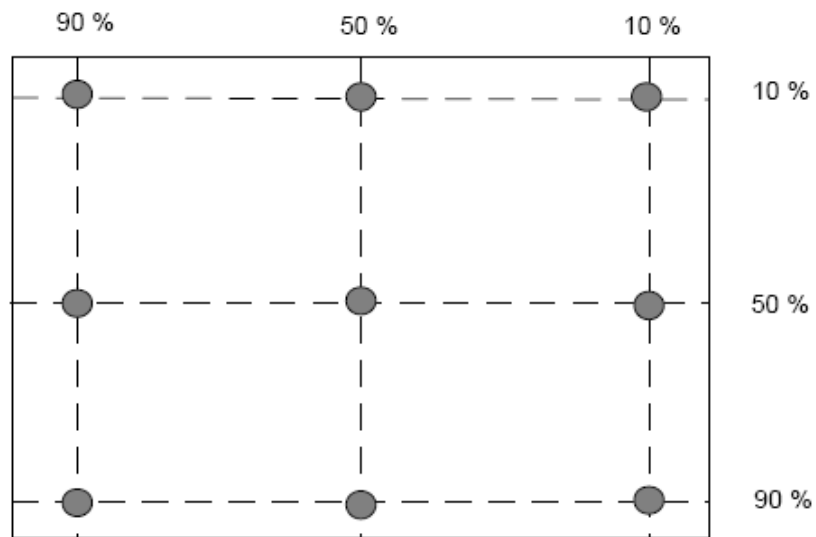


Fig 2: Cross talk pattern

Gray level 127 (255 Gray level)

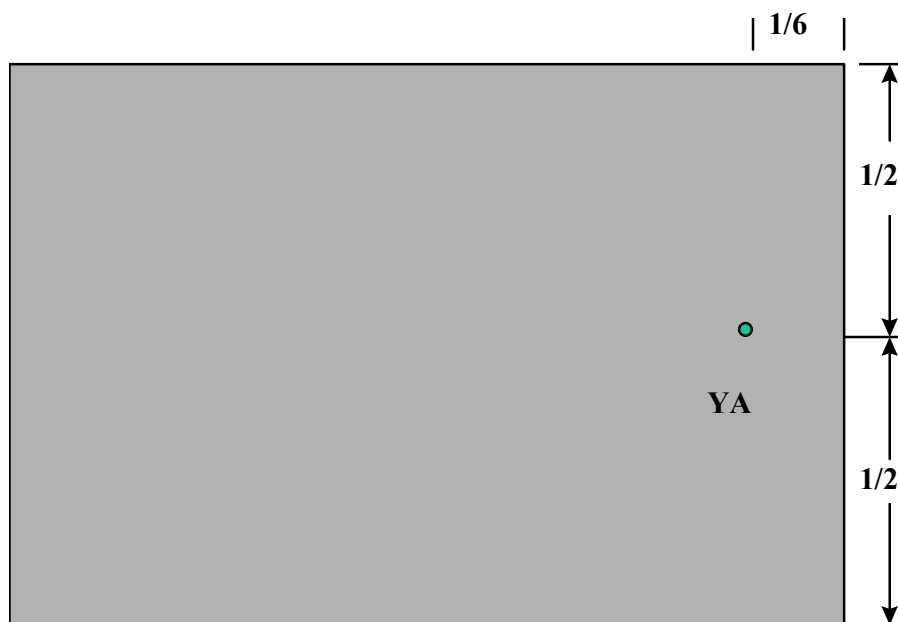
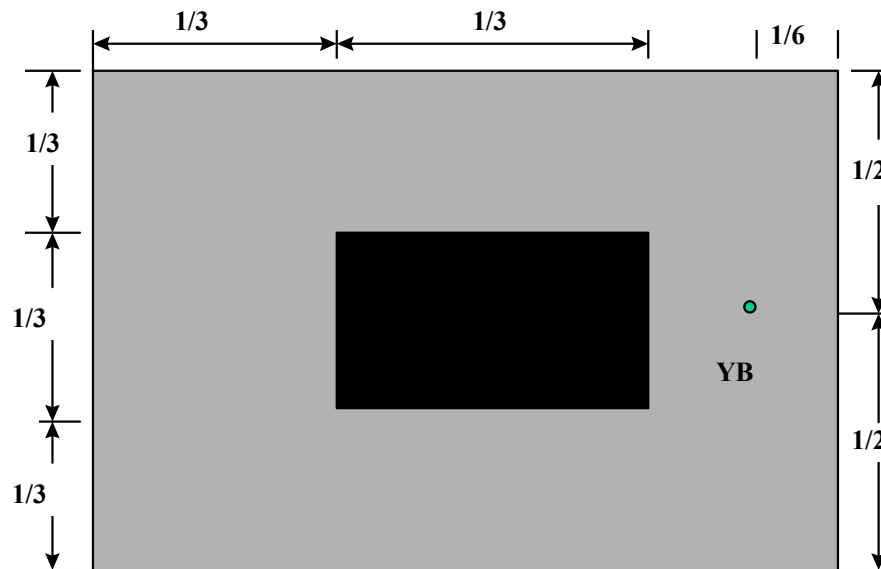


Fig 3: Cross talk Pattern**Center at Gray level 0 (Black)**

10. Regulatory Compliance

10.1 Worldwide Regulatory

Follow up agreed approbation plan TYE-A0004



WW_Regulatory.xls

10.2 EMC Requirements

Supplier DVT EMI test result must be submitted prior to DVT samples delivery, and PVT EMI test result must be submitted again prior to PVT samples delivery, which also has to meet Philips' immunity testing specification.

10.3 RoHS

Restriction on the use of certain hazardous substances.

Lead, Cadmium, Mercury, Hexavalent Chromium, Polybrominated Biphenyl (PBB) and Polybrominated Biphenyl Ether (PBDE) (flame retardant).

10.4 WEEE

Producers (Philips) responsible for retailer take back schemes and recycling.

--System implemented.

--Collection and recycle targets.

10.5 Ongoing Regulatory

There's a possibility that other regulatory certificates will be required during the life of the product. It is the

responsibility of the supplier to provide related documentation.

TELEVISION/MONITOR SAFETY GUIDELINES FOR THE PROFESSIONAL SERVICE TECHNICIAN

Safety Checks

After the original service problem has been corrected, a complete safety check should be made. Be sure to check over the entire set, not just the areas where you have worked. Some previous service may have left an unsafe condition, which could be unknowingly passed on to your customer. Be sure to check all of the following:

Fire and Shock Hazard

1. Be sure all components are positioned in such a way as to avoid the possibility of adjacent component shorts. This is especially important on those chassis which are transported to and from the service shop.
2. Never release a repaired unit unless all protective devices such as insulators, barriers, covers, strain reliefs, and other hardware have been installed in accordance with the original design.
3. Soldering and wiring must be inspected to locate possible cold solder joints, solder splashes, sharp solder points, frayed leads, pinched leads, or damaged insulation (including the ac cord). Be certain to remove loose solder balls and all other loose foreign particles.
4. Check across-the-line components and other components for physical evidence of damage or deterioration and replace if necessary. Follow original layout, lead length, and dress.
5. No lead or component should touch a receiving tube or a resistor rated at 1 watt or more. Lead tension around protruding metal surfaces or edges must be avoided.
6. Critical components having special safety characteristics are identified with an asterisk by the Ref. No. in the parts list and enclosed within a broken line * (where several critical components are grouped in one area) along with the safety symbols on the schematic diagrams and/or exploded views.
7. When servicing any unit, always use a separate isolation transformer for the chassis. Failure to use a separate isolation transformer may expose you to possible shock hazard, and may cause damage to servicing instruments.
8. Many electronic products use a polarized ac line cord (one wide pin on the plug.) Defeating this safety feature may create a potential hazard to the service and the user. Extension cords which do not incorporate the polarizing feature should never be used.
9. After reassembly of the unit, always perform a leakage test or resistance test from the line cord to all exposed metal parts of the cabinet. Also check all metal control shafts (with knobs removed), antenna terminals, handles, screws, etc. to be sure the unit may be safely operated without danger of electrical shock.

* Broken line

Implosion

1. All picture tubes used in current model receivers are equipped with an integral implosion system. Care should always be used, and safety glasses worn, whenever handling any picture tube. Avoid scratching or otherwise damaging the picture tube during installation.
2. Use only replacement tubes specified by the manufacturer.

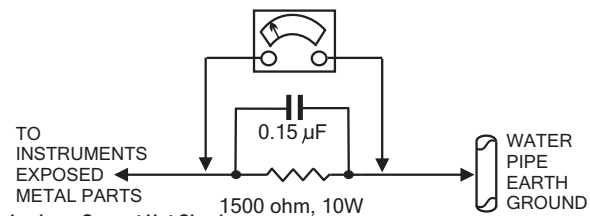
X-radiation

1. Be sure procedures and instructions to all your service personnel cover the subject of X-radiation. Potential sources of X-rays in TV receivers are the picture tube and the high voltage circuits. The basic precaution which must be exercised is to keep the high voltage at the factory recommended level.
2. To avoid possible exposure to X-radiation and electrical shock, only the manufacturer's specified anode connectors must be used.
3. It is essential that the service technician has an accurate HV meter available at all times. The calibration of this meter should be checked periodically against a reference standard.
4. When the HV circuitry is operating properly there is no possibility of an X-radiation problem. High voltage should always be kept at the manufacturer's rated value—no higher—for optimum performance. Every time a color set is serviced, the brightness should be run up and down while monitoring the HV with a meter to be certain that the HV is regulated correctly and does not exceed the specified value. We suggest that you and your technicians review test procedures so that HV and HV regulation are always checked as a standard servicing procedure, and the reason for this prudent routine is clearly understood by everyone. It is important to use an accurate and reliable HV meter. It is recommended that the HV recorded on each customer's invoice, which will demonstrate a proper concern for the customer's safety.
5. When troubleshooting and making test measurements in a receiver with a problem of excessive high voltage, reduce the line voltage by means of a Variac to bring the HV into acceptable limits while troubleshooting. Do not operate the chassis longer than necessary to locate the cause of the excessive HV.

6. New picture tubes are specifically designed to withstand higher operating voltages without creating undesirable X-radiation. It is strongly recommended that any shop test fixture which is to be used with the new higher voltage chassis be equipped with one of the new type tubes designed for this service. Addition of a permanently connected HV meter to the shop test fixture is advisable. The CRT types used in these new sets should never be replaced with any other types, as this may result in excessive X-radiation.
7. It is essential to use the specified picture tube to avoid a possible X-radiation problem.
8. Most TV receivers contain some type of emergency "Hold Down" circuit to prevent HV from rising to excessive levels in the presence of a failure mode. These various circuits should be understood by all technicians servicing them, especially since many hold down circuits are inoperative as long as the receiver performs normally.

Leakage Current Cold Check

1. Unplug the ac line cord and connect a jumper between the two prongs of the plug.
2. Turn on the power switch.
3. Measure the resistance value between the jumpered ac plug and all exposed cabinet parts of the receiver, such as screw heads, antennas, and control shafts. When the exposed metallic part has a return path to the chassis, the reading should be between 1 megohm and 5.2 megohms. When the exposed metal does not have a return path to the chassis, the reading must be infinity. Remove the jumper from the ac line cord.

**Leakage Current Hot Check**

1. Do not use an isolation transformer for this test. Plug the completely reassembled receiver directly into the ac outlet.
2. Connect a 1.5k, 10w resistor paralleled by a 0.15µf. capacitor between each exposed metallic cabinet part and a good earth ground such as a water pipe, as shown above.
3. Use an ac voltmeter with at least 5000 ohms volt sensitivity to measure the potential across the resistor.
4. The potential at any point should not exceed 0.75 volts. A leakage current tester may be used to make this test; leakage current must not exceed 0.5 milliamps. If a measurement is outside of the specified limits, there is a possibility of shock hazard. The receiver should be repaired and rechecked before returning it to the customer.
5. Repeat the above procedure with the ac plug reversed. (Note: An ac adapter is necessary when a polarized plug is used. Do not defeat the polarizing feature of the plug.)

Picture Tube Replacement

The primary source of X-radiation in this television receiver is the picture tube. The picture tube utilized in this chassis is specially constructed to limit X-radiation emissions. For continued X-radiation protection, the replacement tube must be the same type as the original, including suffix letter, or a Philips approved type.

Parts Replacement

Many electrical and mechanical parts in Philips television sets have special safety related characteristics. These characteristics are often not evident from visual inspection nor can the protection afforded by them necessarily be obtained by using replacement components rated for higher voltage, wattage, etc. The use of a substitute part which does not have the same safety characteristics as the Philips recommended replacement part shown in this service manual may create shock, fire, or other hazards.

WARNING: Before removing the CRT anode cap, turn the unit **OFF** and short the HIGH VOLTAGE to the CRT DAG ground.
SERVICE NOTE: The CRT DAG is not at chassis ground.