Service
Service
Service

247E4LHAB/00
247E4LHAB/57
247E4LHAB/69

247E4LHSB/00
247E4LHSB/01
247E4LHSB/27
247E4LHSB/96
247E4LHSB/75

Service Manual

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 TRANSFOMER FOR THIS UNIT WHEN SERVICING

REFER TO BACK COVER FOR IMPORTANT SAFETY GUIDELINES

飛利浦 PHILIPS

Revision List

Version	Release Date	Revision History
A00	Jan.11, 2013	Initial release, Draft Version
A01	Mar.15,2013	Add new model 247E4LHSB/01
A02	Jun.7,2013	Add new model 247E4LHSB/27
A03	Jul.12,2013	Add new model 247E4LHAB/57
A04	Aug.2,2013	Add new model 247E4LHSB/96
A05	Aug.16,2013	Add new model 247E4LHAB/69
A06	Aug.30,2013	Add new model 247E4LHSB/75

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(247E4LSB, 247E4LHAB, 247E4LHSB)	
Monitor Panel Type	TFT LCD
Backlight	LED
Panel Size	23.6" W (59.9cm)
Aspect Ratio	16:9
Pixel Pitch	0.272 x 0.272 mm
Brightness	250 cd/m²
SmartContrast	20,000,000:1
Contrast Ratio (typ.)	1000:1
Response Time (typ.)	5ms
SmartResponse (available for selected models)	2ms
Optimum Resolution	1920x1080@60Hz
Viewing Angle	170° (H) / 160° (V) @ C/R > 10
Picture Enhancement	SmartImage Lite
Display Colors	16.7M
Vertical Refresh Rate	56Hz - 76Hz
Horizontal Frequency	30kHz - 83kHz
sRGB	YES
Connectivity	
Signal Input	247E4LSB:VGA(Analog), DVI(Digital,HDCP) 247E4LHAB, 247E4LHSB:VGA(Analog), HDMIx2(Digital,HDCP)
Audio In/Out	247E4LHSB : HDMI audio out 247E4LHAB : PC audio-in, Earphone out
Input Signal	Separate Sync, Sync on Green

Convenience	
Built-in webcam	2.0 megapixel camera with microphone and LED indicator (Only available on 247E4QHKAD model)
User Convenience	247E4QSD, 247E4LSB, 247E4QHSD, 247E4LHSB: ▼ ▲ ◀ OK ⏻ 247E4QHAD,247E4QHKAD, 247E4LHAB: ▼ ▲ ◀ OK ⏻
OSD Languages	English, French, German, Spanish, Italian, Russian, Simplified Chinese, Portuguese, Turkish
Other Convenience	Kensington Lock
Plug & Play Compatibility	DDC/CI, sRGB, Windows 7/Windows 8, Mac OSX, Linux
Stand	
Tilt	-5° / +20°

Power(247E4LHAB)	
On Mode	21.3W(typ.), 29.7W(max.)
Sleep (typ.)	0.5W
Off (typ.)	0.3W
Power LED indicator	On mode: White, Standby/Sleep mode: White (blinking)
Power Supply	External, 100-240VAC, 50-60Hz

Power(247E4LHSB)	
On Mode	21.3W(typ.),
Sleep (typ.)	0.5W
Off (typ.)	0.3W
Power LED indicator	On mode: White, Standby/Sleep mode: White (blinking)
Power Supply	External, 100-240VAC, 50-60Hz

Dimension	
Product with stand (WxHxD)	557 x 434 x 193 mm
Product without stand (WxHxD)	557 x 348 x 39 mm
Weight	
Product with stand	3.44 kg
Product without stand	3.16 kg
Product with packaging	5.60 kg

Operating Condition	
Temperature range (operation)	0°C to 40 °C
Temperature range (Non-operation)	-20°C to 60°C
Relative humidity	20% to 80%
MTBF	30,000hrs

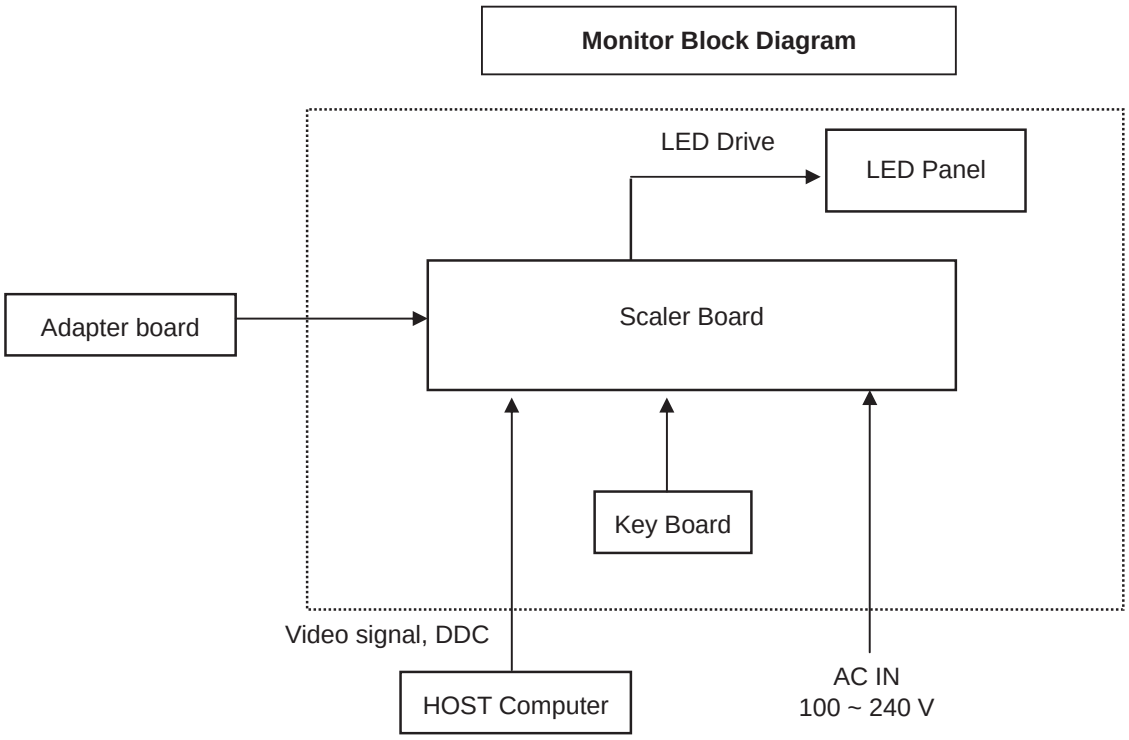
Environmental	
ROHS	YES
EPEAT	Silver (www.epeat.net)
Packaging	100% recyclable
Specific Substances	100% PVC BFR free housing
Energy Star	YES
Compliance and standards	
Regulatory Approvals	CE Mark, FCC Class B, GOAST, SEMKO, TCO Certified, UL/cUL, ISO9241-307
Cabinet	
Color	247E4L: Black/247E4Q: Black Cherry, or other color options as applicable in your region
Finish	Glossy

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 and a key board. The scaler board houses the flat panel control logic, brightness control logic and DDC.



3. Operating Instructions

3.1 General Instructions

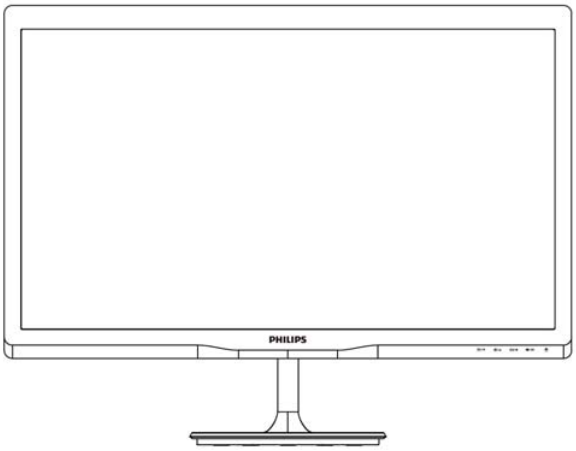
Press the power button to turn the monitor on or off. The other control knobs are located at front panel of the monitor. By changing these setting, the picture can be adjusted to your personal preference.

* 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

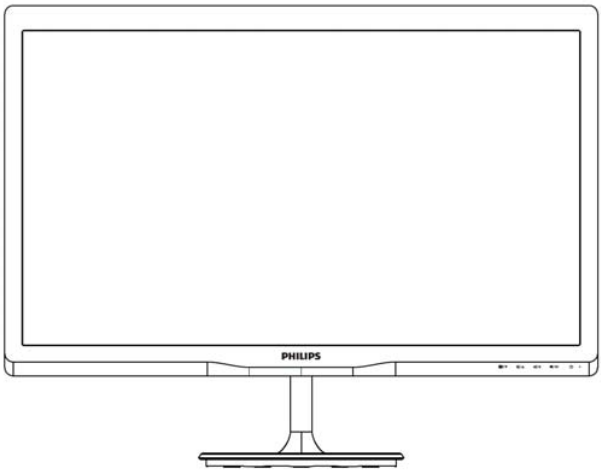
Operating the Monitor

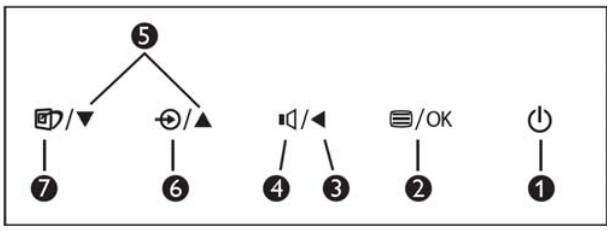
Model 247E4QSD,247E4LSB,247E4QHSD, 247E4LHSB:



1	⏻	Switch monitor's power ON and OFF.
2	/OK	Access the OSD menu.
3	◀	Return to previous OSD level.
4	◀	Change display format.
5	▲▼	Adjust the OSD menu.
6	⊖	Change the signal input source.
7		SmartImage Lite. There are three modes to be selected: *Standard*, *Internet* and *Game*.

Model 247E4QHAD, 247E4LHAB,247E4QHKAD:

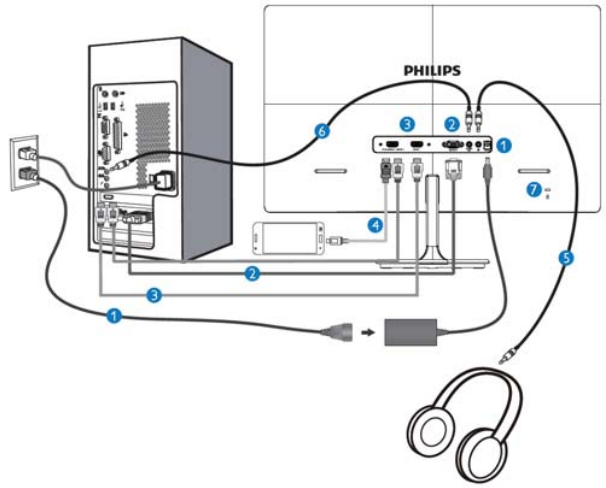




1	⏻	Switch monitor's power ON and OFF.
2	/OK	Access the OSD menu.
3	◀	Return to previous OSD level.
4	◀	Adjust the speaker volume.
5	▲▼	Adjust the OSD menu.
6	⊖	Change the signal input source.
7		SmartImage Lite. There are three modes to be selected: *Standard*, *Internet* and *Game*.

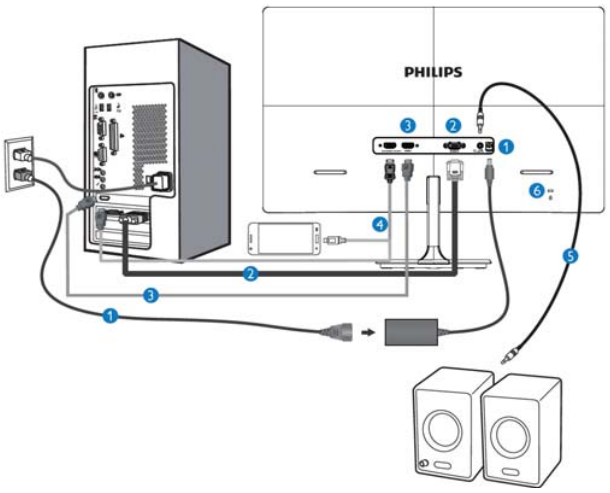
Connecting to your PC

Model 247E4QHAD,247E4QHKAD, 247E4LHAB:



1. AC/DC power input
2. VGA input
3. HDMI input
4. HDMI or MHL input(option)
5. Earphone output
6. Audio input
7. Kensington anti-theft lock

Model 247E4QHSD, 247E4LHSB:



1. AC/DC power input
2. VGA input
3. HDMI input
4. HDMI or MHL input(option)
5. HDMI audio output
6. Kensington anti-theft lock

Connect to PC

1. Connect the power cord to the back of the monitor firmly.
2. Turn off your computer and unplug its power cable.
3. Connect the monitor signal cable to the video connector on the back of your computer.
4. Plug the power cord of your computer and your monitor into a nearby outlet.
5. Turn on your computer and monitor. If the monitor displays an image, installation is complete.

3.3 OSD Menu

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

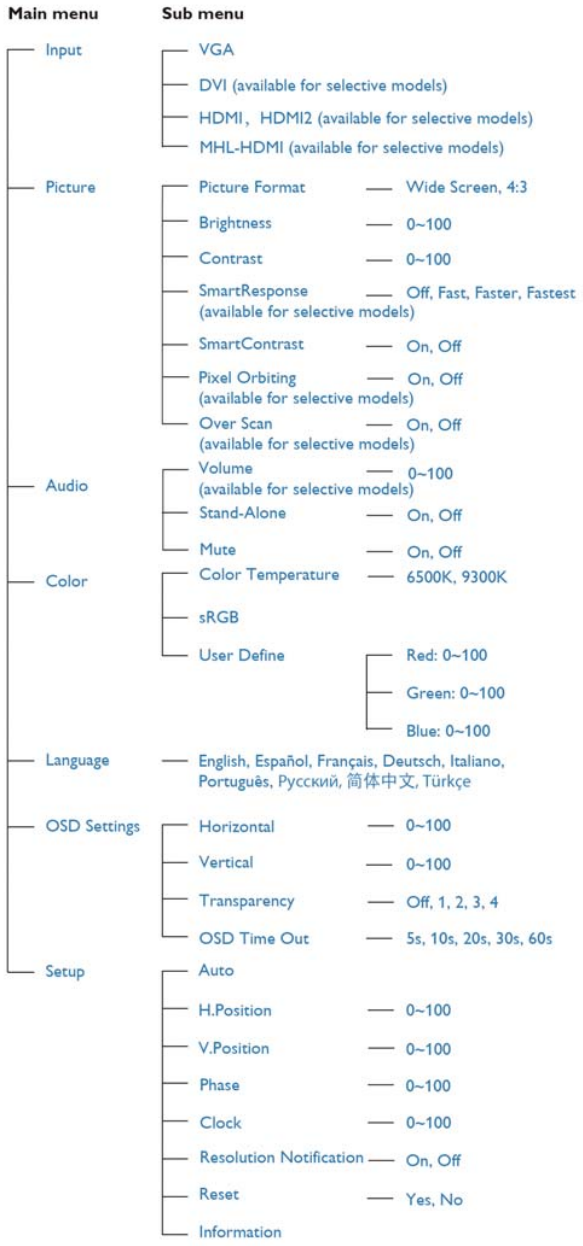
Model 247E4LHSB,247E4LHAB:

Basic and simple instruction on the control keys

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

The OSD Menu

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.

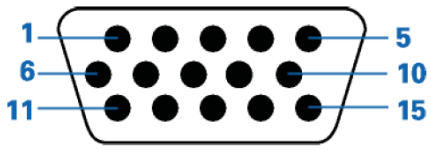


4. Input/ Output Specification

4.1 Input Signal Connector

D-sub Connector

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



HDMI Connector

Pin No.	Description
1	TMDS Data2+
2	TMDS Data2 Shield
3	TMDS Data2–
4	TMDS Data1+
5	TMDS Data1 Shield
6	TMDS Data1–
7	TMDS Data0+
8	TMDS Data0 Shield
9	TMDS Data0–
10	TMDS Clock+
11	TMDS Clock Shield
12	TMDS Clock–
13	CEC
14	Reserved (HDMI 1.0-1.3c), HEC Data- (Optional, HDMI 1.4+ with Ethernet)
15	SCL (I²C Serial Clock for DDC)
16	SDA (I²C Serial Data Line for DDC)
17	DDC/CEC/HEC Ground
18	+5 V Power (max 50 mA)
19	Hot Plug Detect (All versions) and HEC Data+ (Optional, HDMI 1.4+ with Ethernet)

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	720x400	70.09
31.47	640x480	59.94
35.00	640x480	66.67
37.86	640x480	72.81
37.50	640x480	75.00
37.88	800x600	60.32
46.88	800x600	75.00
48.36	1024x768	60.00
60.02	1024x768	75.03
63.89	1280x1024	60.02
79.98	1280x1024	75.03
55.94	1440x900	59.89
70.64	1440x900	74.98
65.29	1680x1050	59.95
67.50	1920x1080	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

If you have VESA DPM compliance display card or software installed in your PC, the monitor can automatically reduce its power consumption when not in use. If an input from a keyboard, mouse or other input device is detected, the monitor will 'wake up' automatically. The following table shows the power consumption and signaling of this automatic power saving feature:

247E4LHAB:

Power Management Definition					
VESA Mode	Video	H-sync	V-sync	Power Used	LED Color
Active	ON	Yes	Yes	21.3 W (typ.) 29.7 W(max.)	White
Sleep	OFF	No	No	0.5 W (typ.)	White (blink)
Switch Off	OFF	-	-	0.3 W (typ.)	OFF

247E4LHSB:

Power Management Definition					
VESA Mode	Video	H-sync	V-sync	Power Used	LED Color
Active	ON	Yes	Yes	21.3 W (typ.)	White
Sleep	OFF	No	No	0.5 W (typ.)	White (blink)
Switch Off	OFF	-	-	0.3 W (typ.)	OFF

The following setup is used to measure power consumption on this monitor.

·Native resolution:1920×1080

·Contrast: 50%

·Brightness: 250 nits

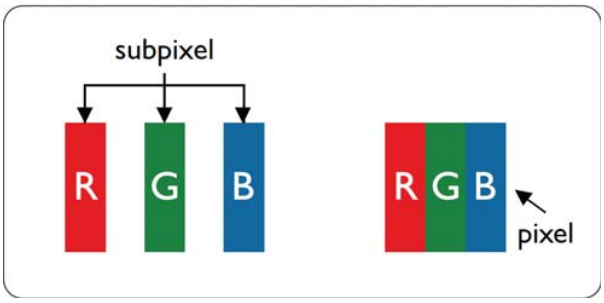
·Color temperature:6500k with full white pattern

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 processes and practice stringent quality control. However, pixel or sub pixel defects on the TFT Monitor panels used in flat panel monitors are sometimes unavoidable. No manufacturer can guarantee that all 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 Monitor panel must exceed these acceptable levels. For example, no more than 0.0004% of the sub pixels on a monitor may be defective. Furthermore, Philips sets even higher quality standards for certain types or combinations of pixel defects that are more noticeable than others. This policy is valid worldwide.



Pixels and Sub pixels

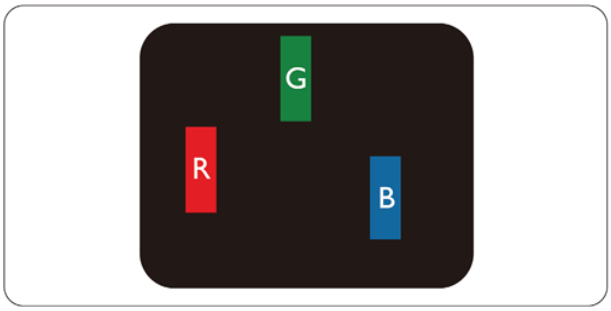
A pixel, or picture element, is composed of three sub pixels in the primary colors of red, green and blue. Many pixels together form an image. When all sub pixels of pixel are lit, the three colored sub pixels together appear as a single white pixel. When all are dark, the three colored sub pixels together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

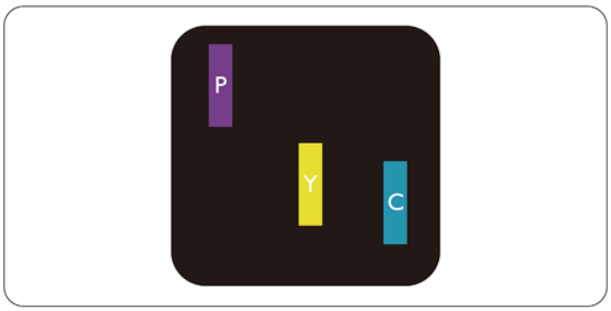
Bright Dot Defects Bright dot defects appear as pixels or sub pixels that are always lit or ‘on’. That is, a bright dot is a sub-pixel that stands out on the screen when the monitor displays a dark pattern. There are three types of bright dot defects:

One lit red, green or blue sub pixel

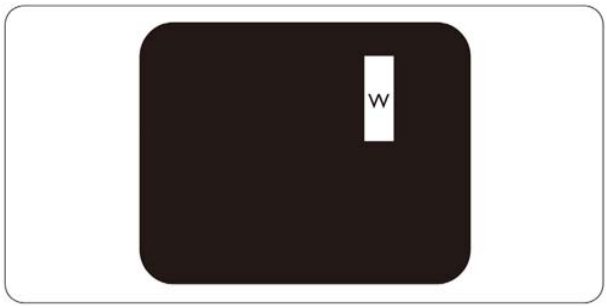


Two adjacent lit sub pixels:

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



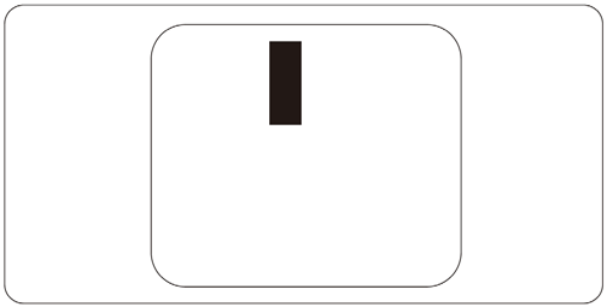
Three adjacent lit sub pixels (one white pixel)

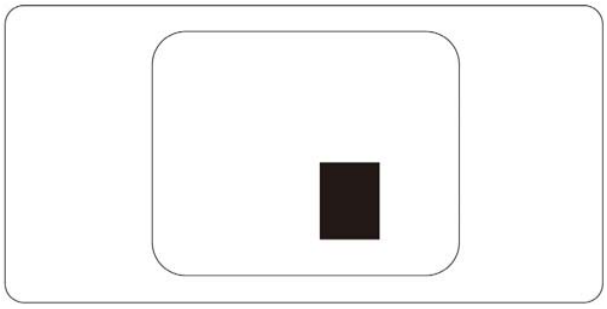


Note:

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:





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.

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.

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

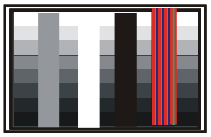
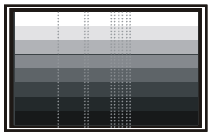
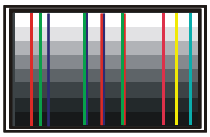
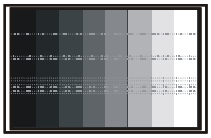
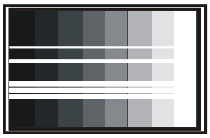
Note:

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

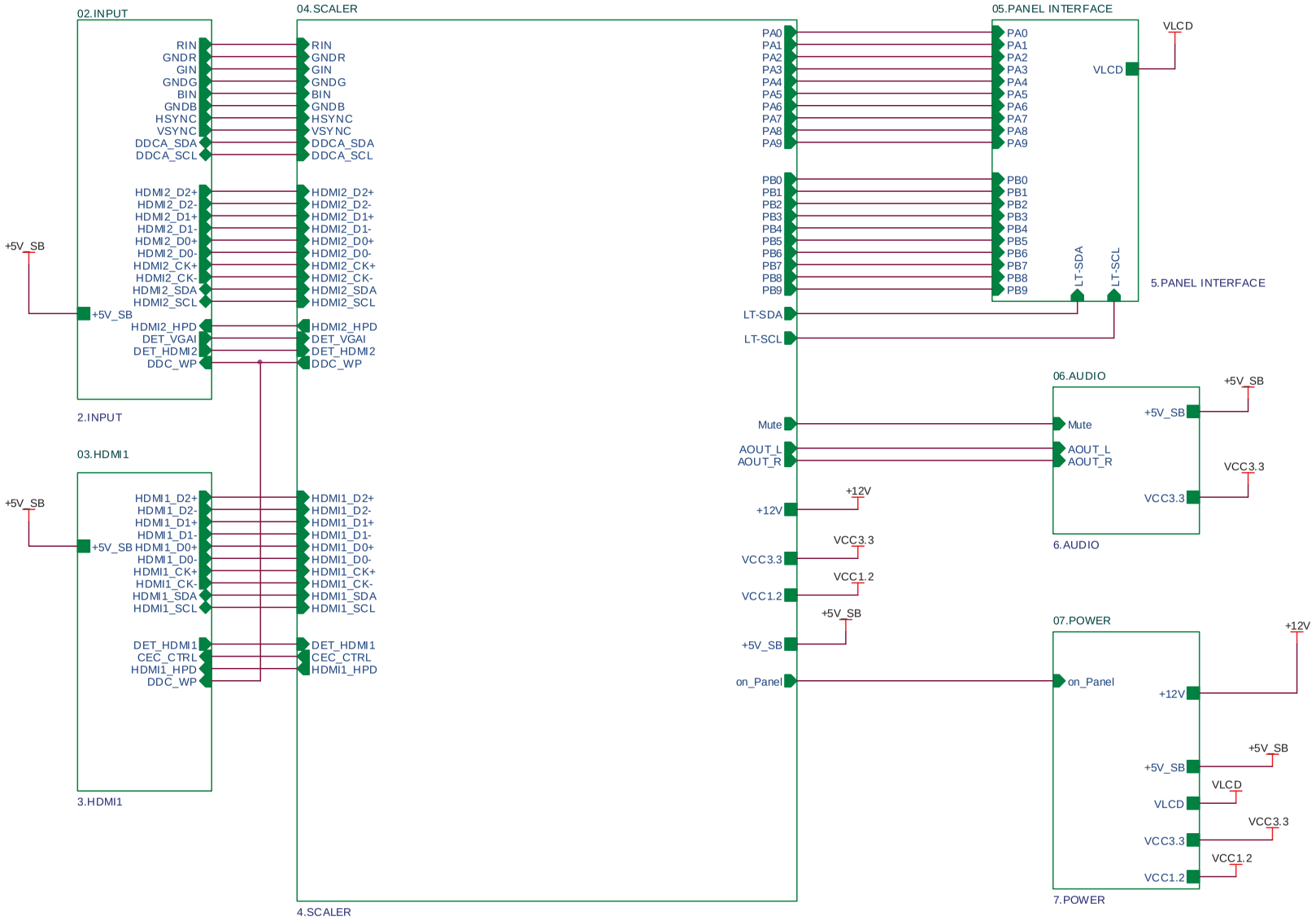
Quick reference for failure mode of LCD panel

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.

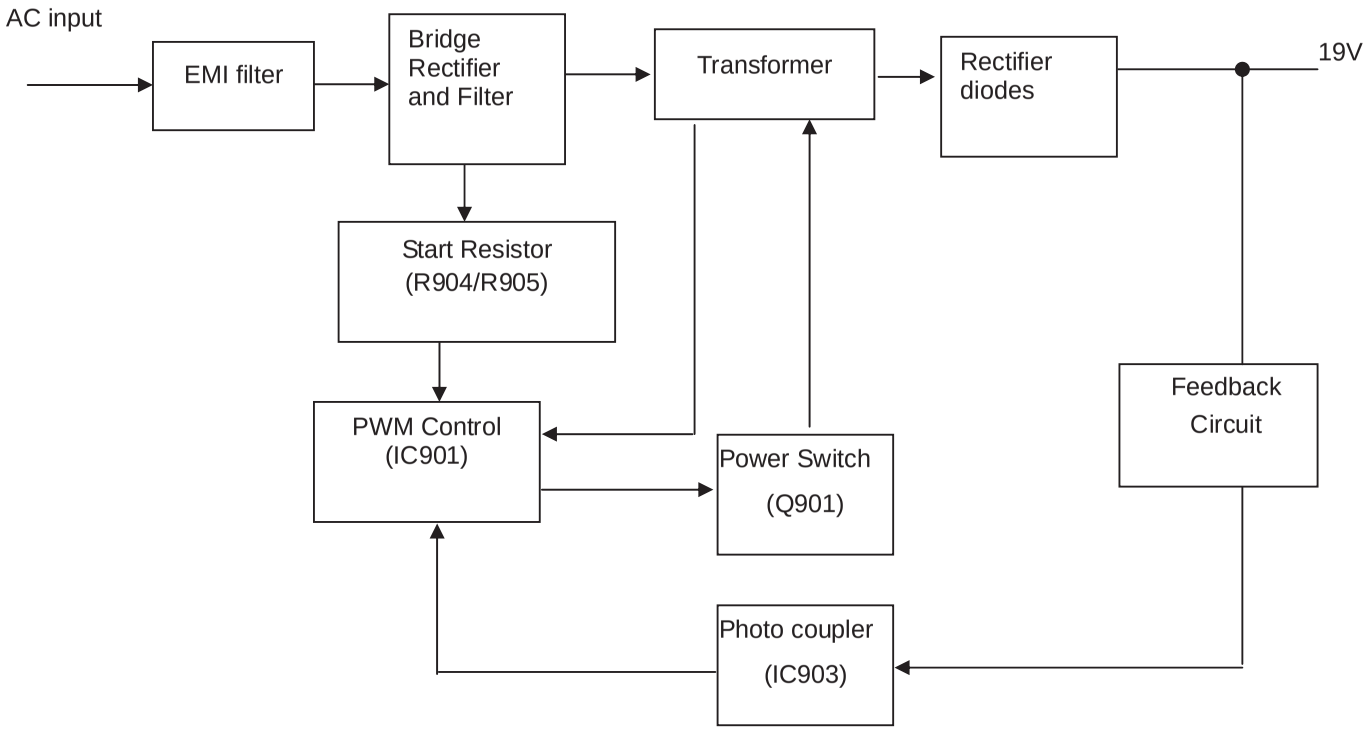
Failure description	Phenomenon
Vertical block defect	
Vertical dim lines	
Vertical lines defect (Always bright or dark)	
Horizontal block defect	
Horizontal dim lines	
Horizontal lines defect (Always bright or dark)	
Has bright or dark pixel	
Polarizer has bubbles	
Polarizer has bubbles	
Foreign material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

5. Block Diagram

5.1 Scaler Board



5.2 Power Board

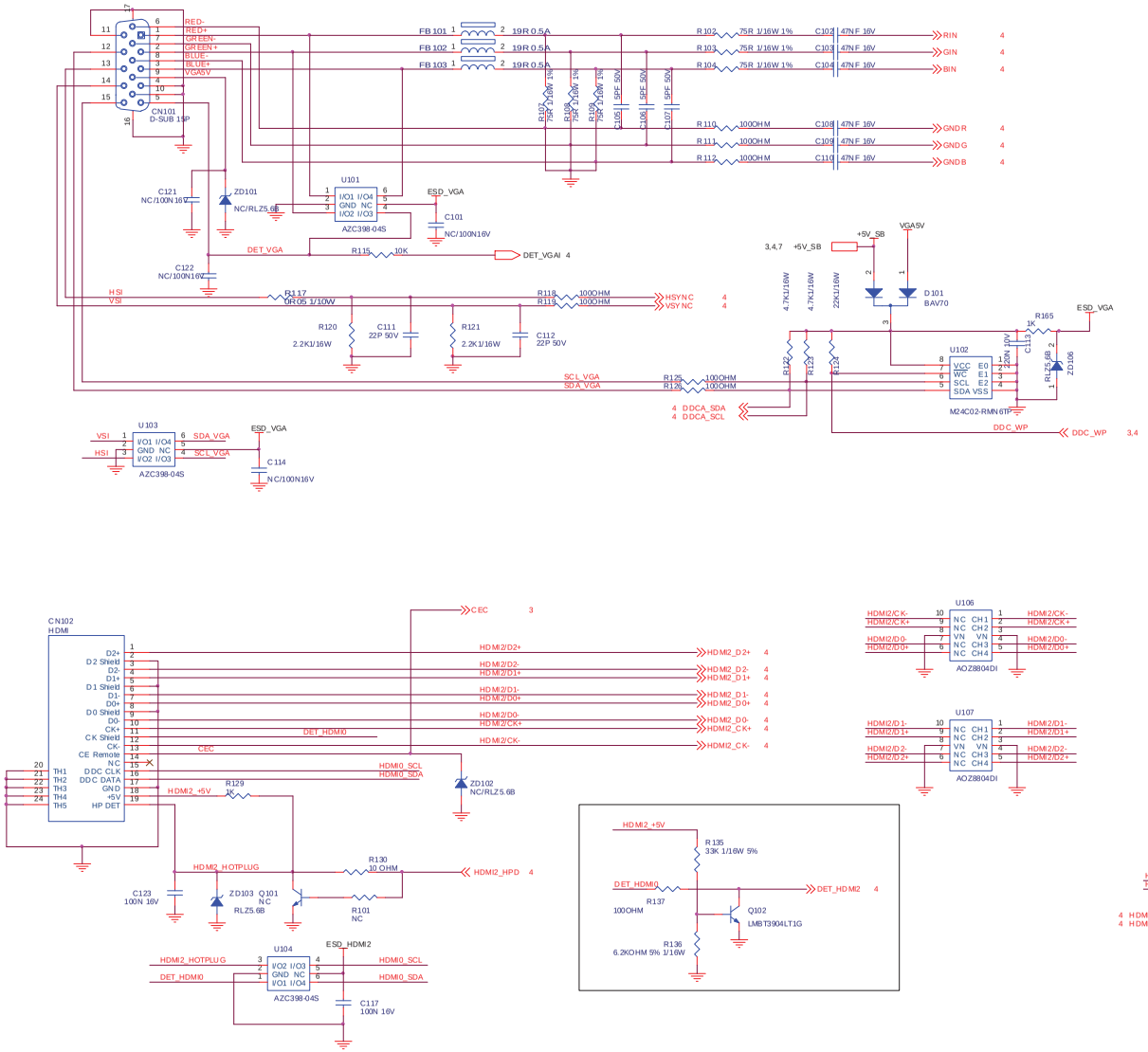


6. Schematic

6.1 Scaler Board (715G5452M01000004Q) (for 247E4LHAB)

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

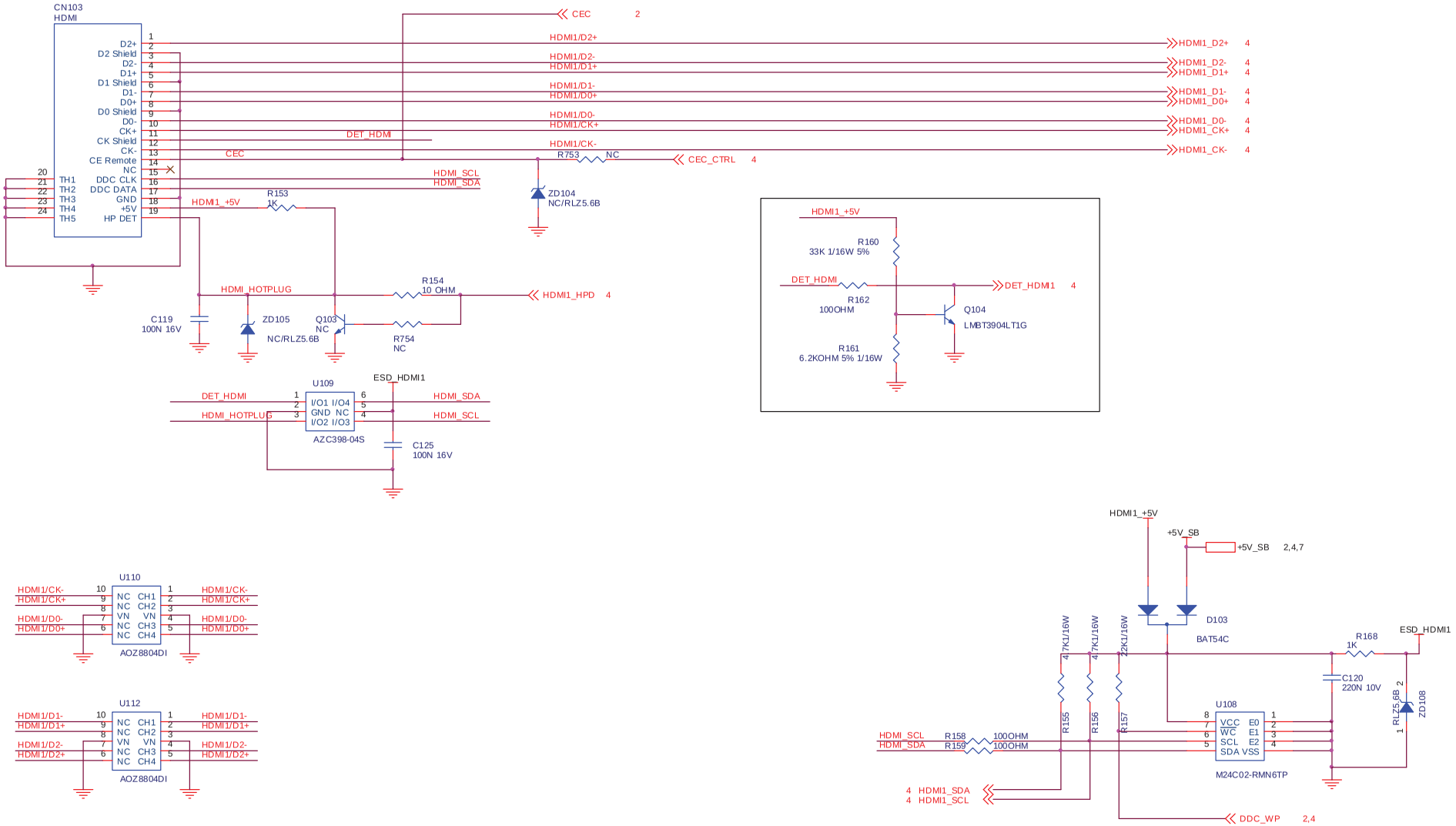
INPUT



20 Meridian 3

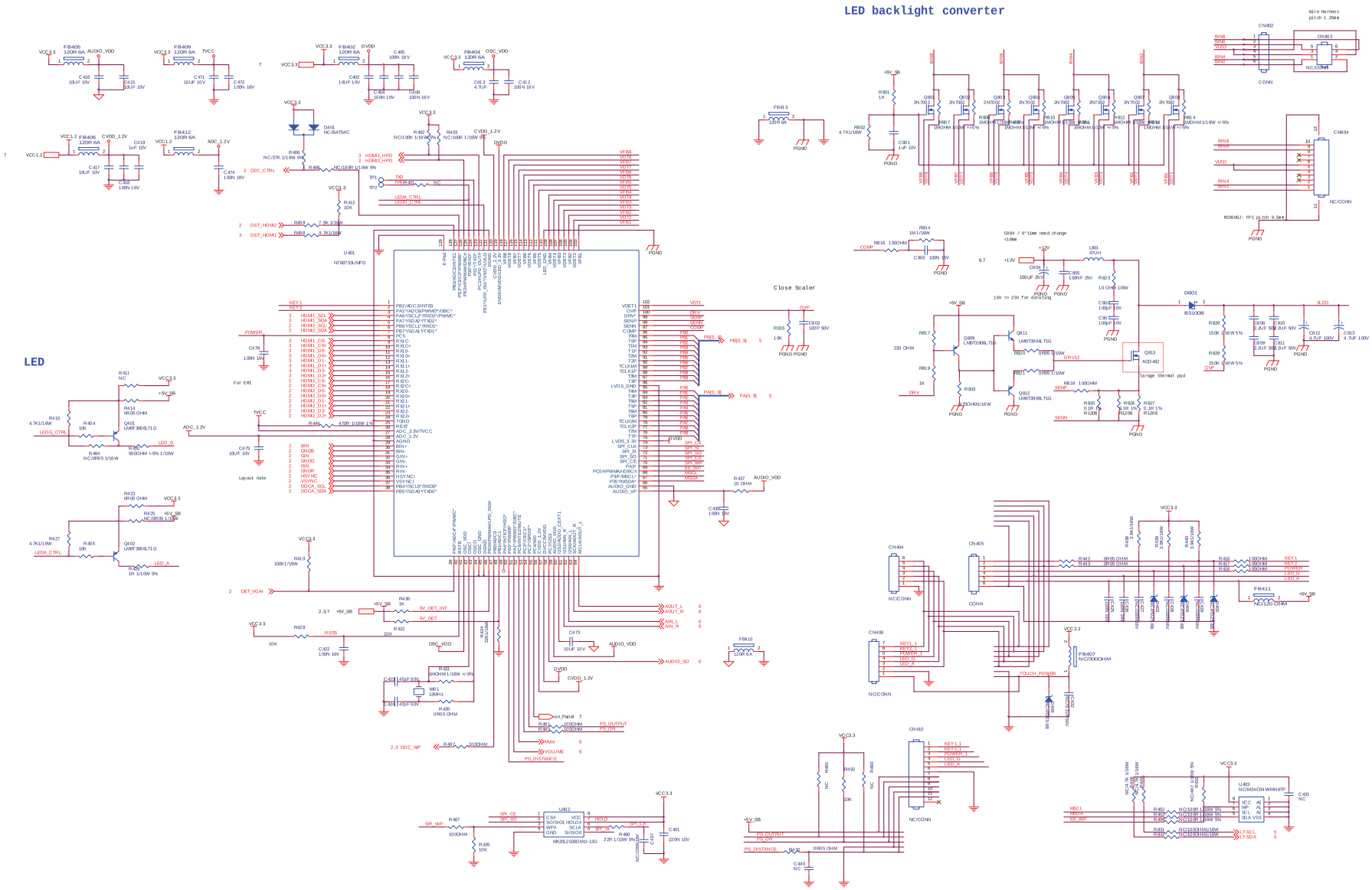
Remark: Parts position can be searched by using FIND function in PDF.

HDMI1



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

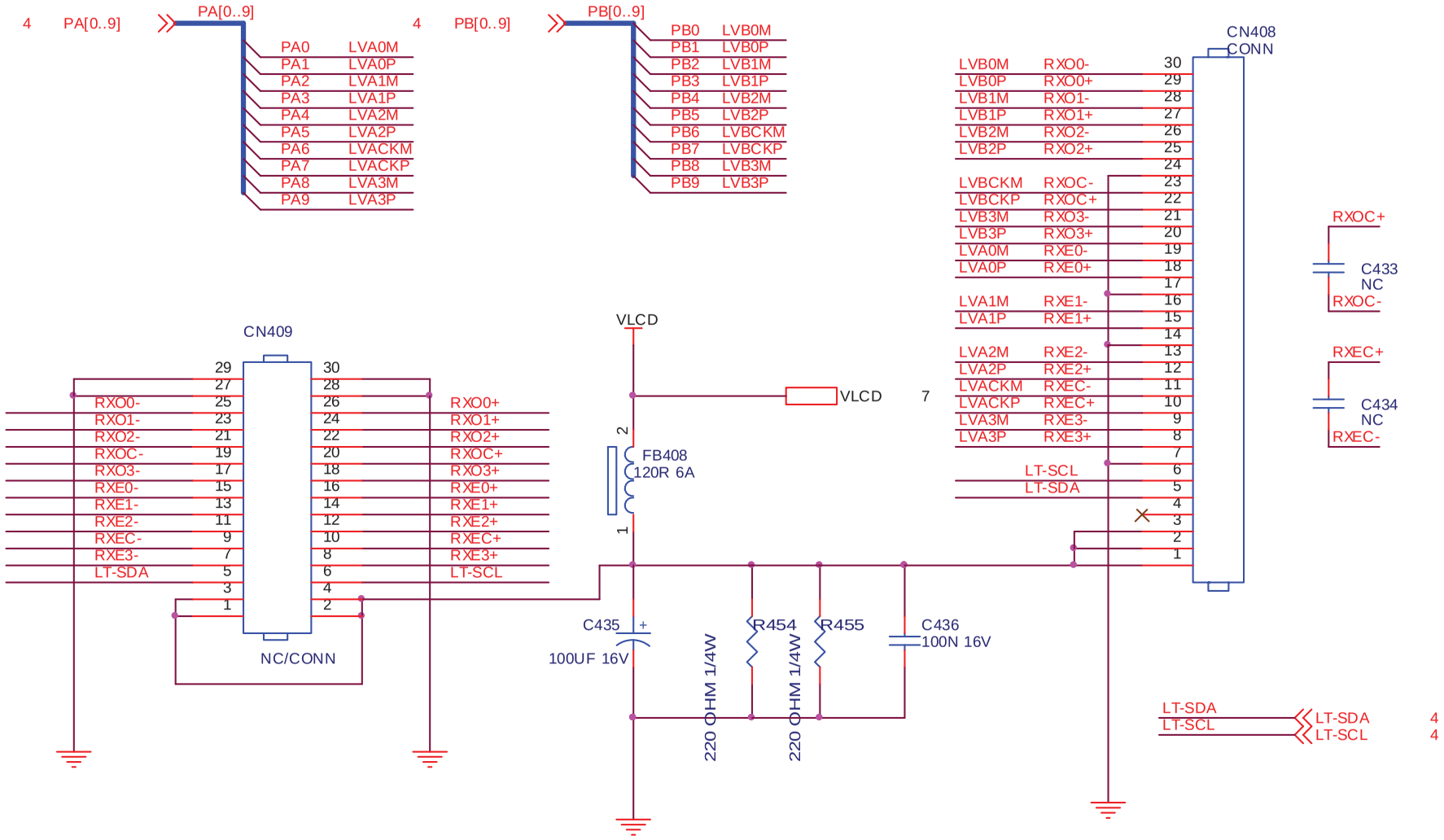
SCALER NT68753UMFG



22 Meridian 3

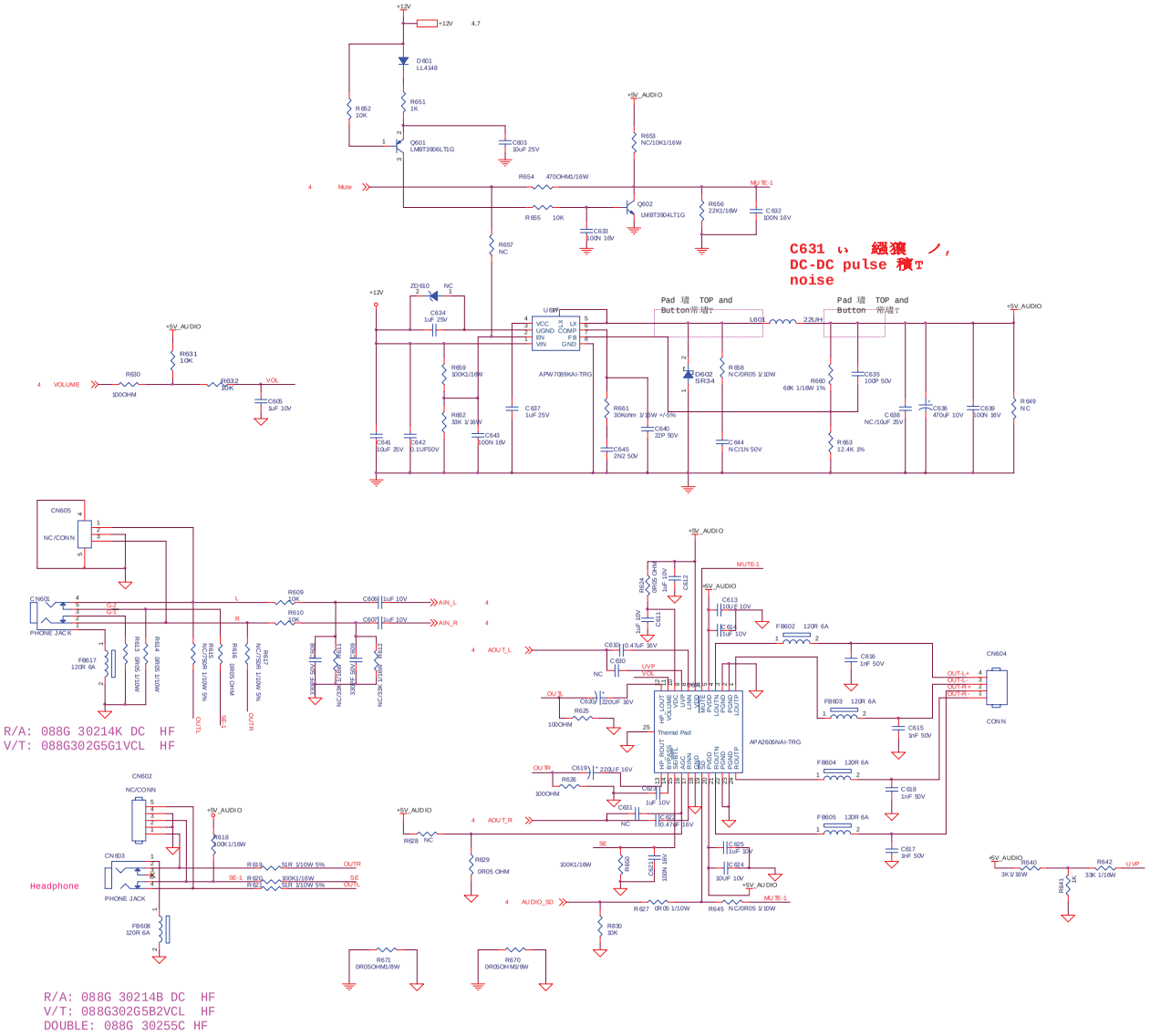
Remark: Parts position can be searched by using FIND function in PDF.

PANEL INTERFACE



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

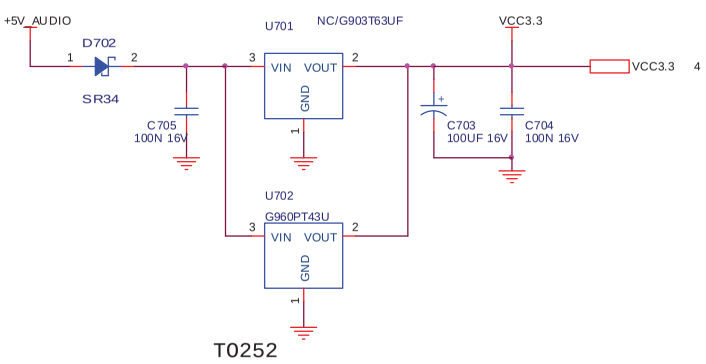
AUDIO APA2606 & APW7080

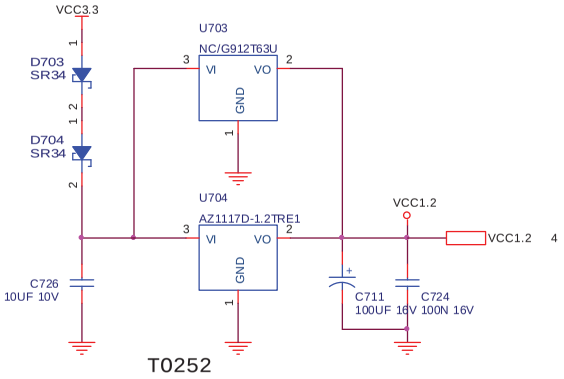


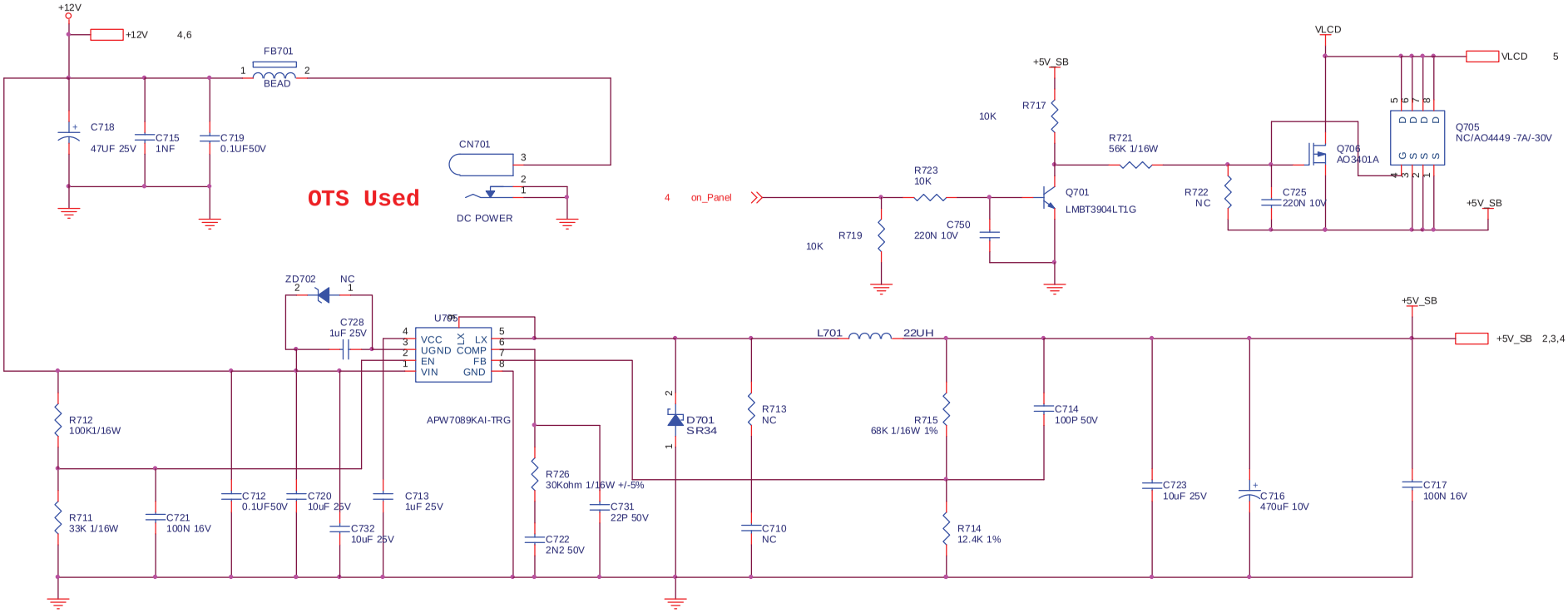
24 Meridian 3

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

POWER



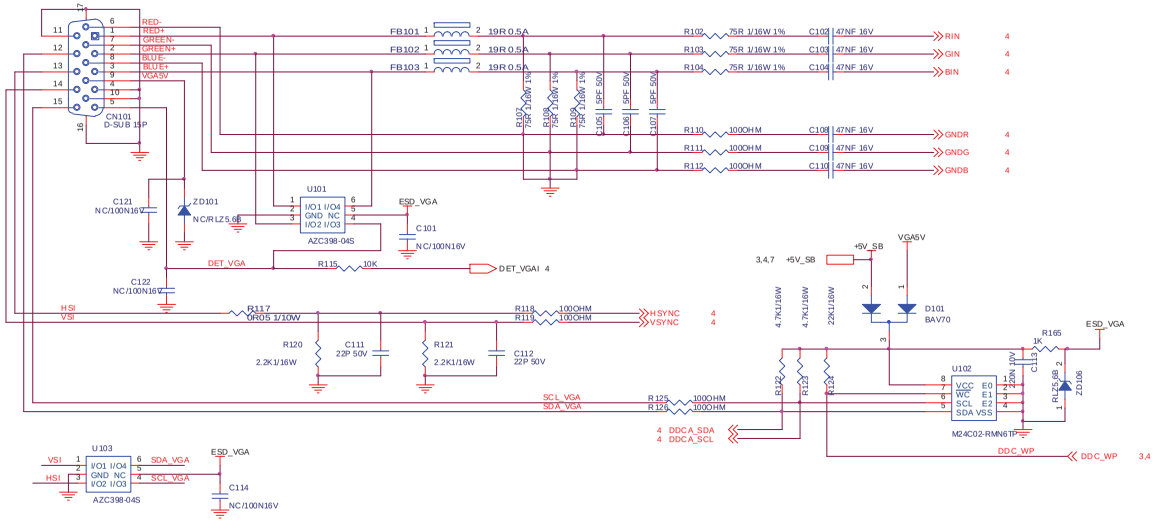


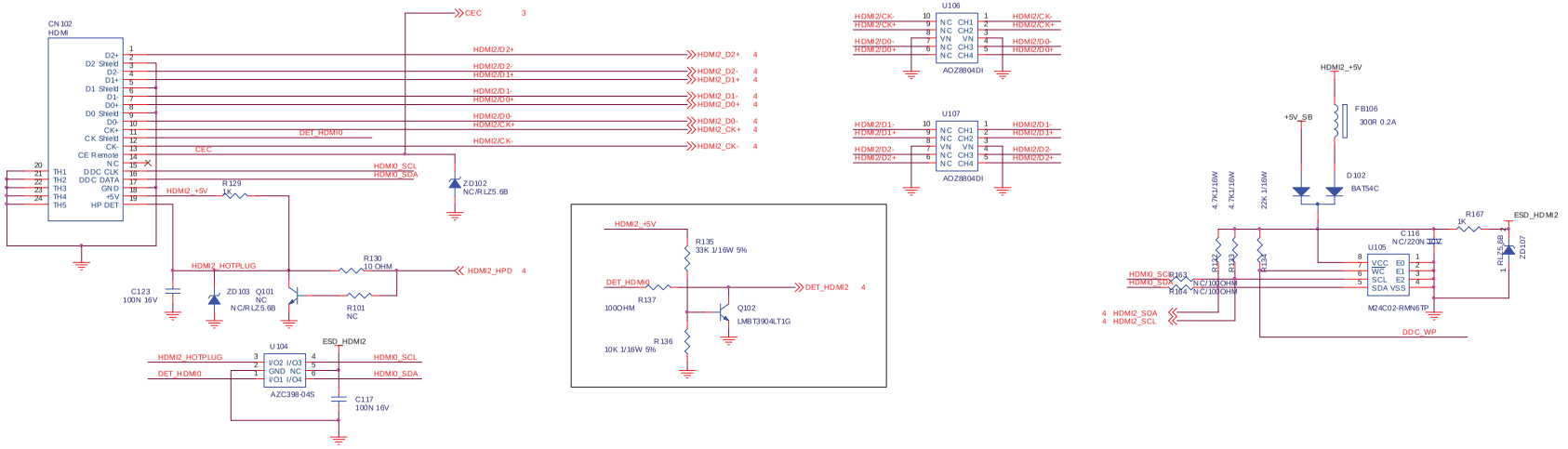


715G5452M01000004Q (for 247E4LHSB)

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

INPUT

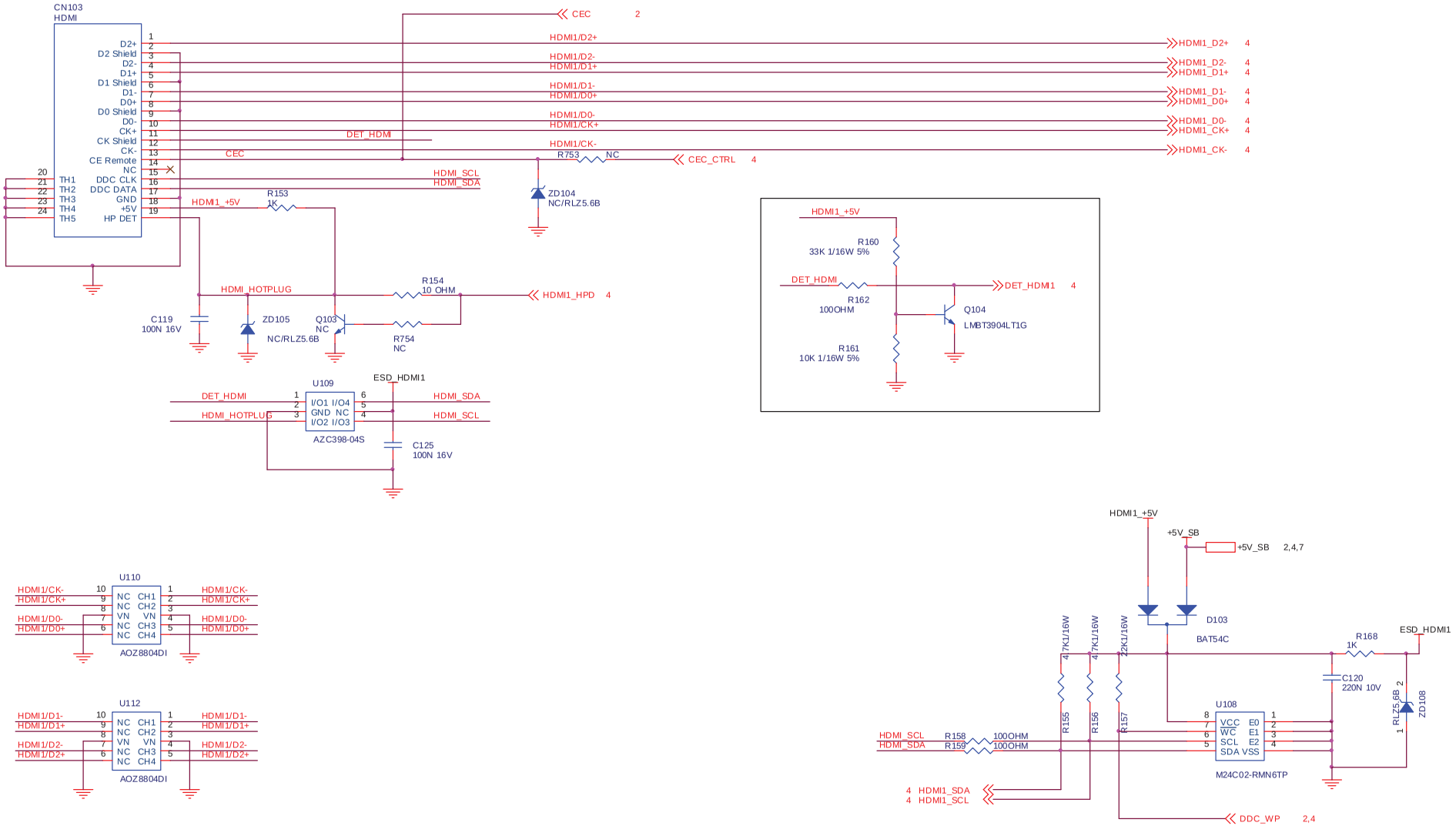




26 Meridian 3

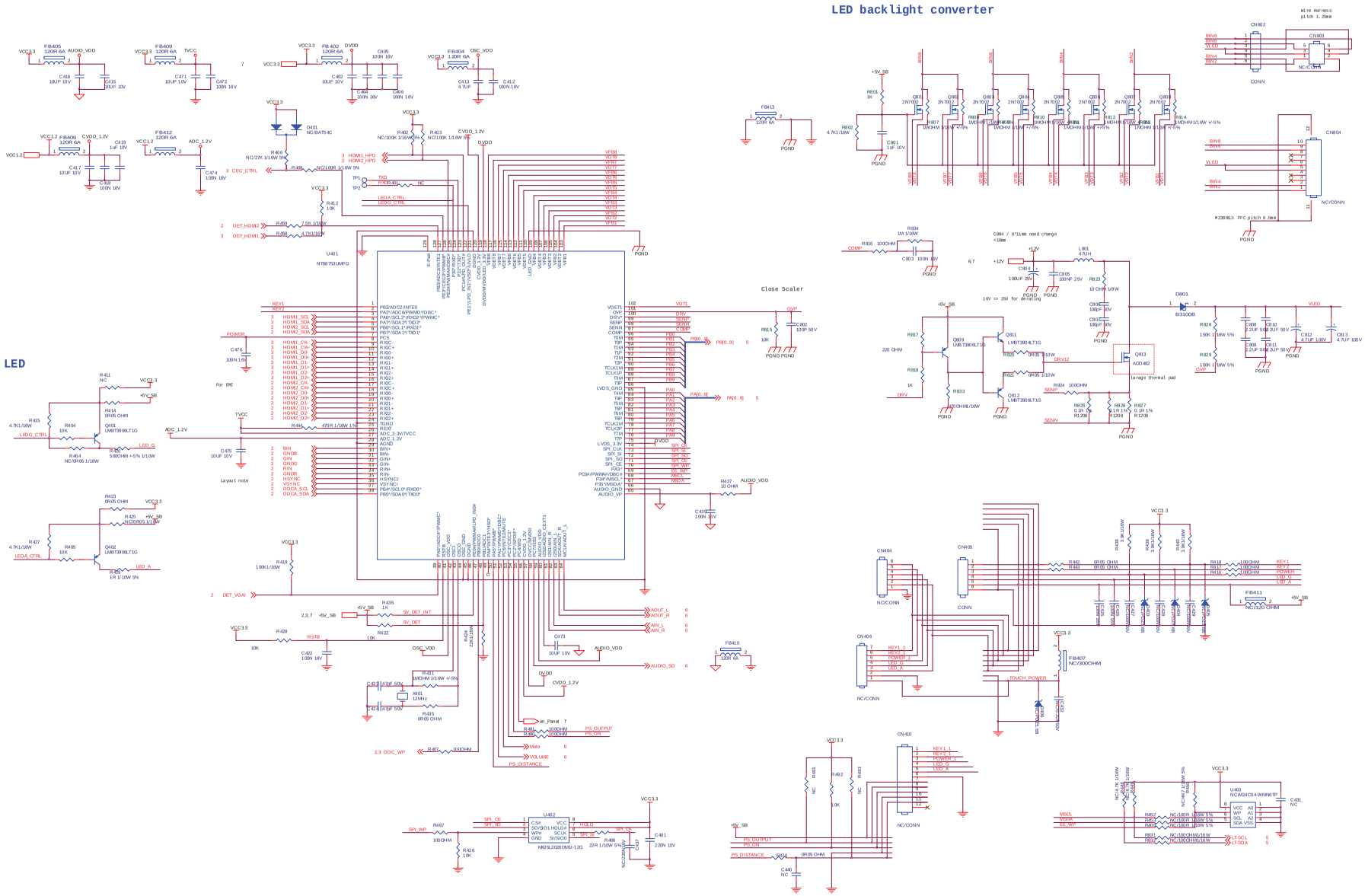
Remark: Parts position can be searched by using FIND function in PDF.

HDMI1



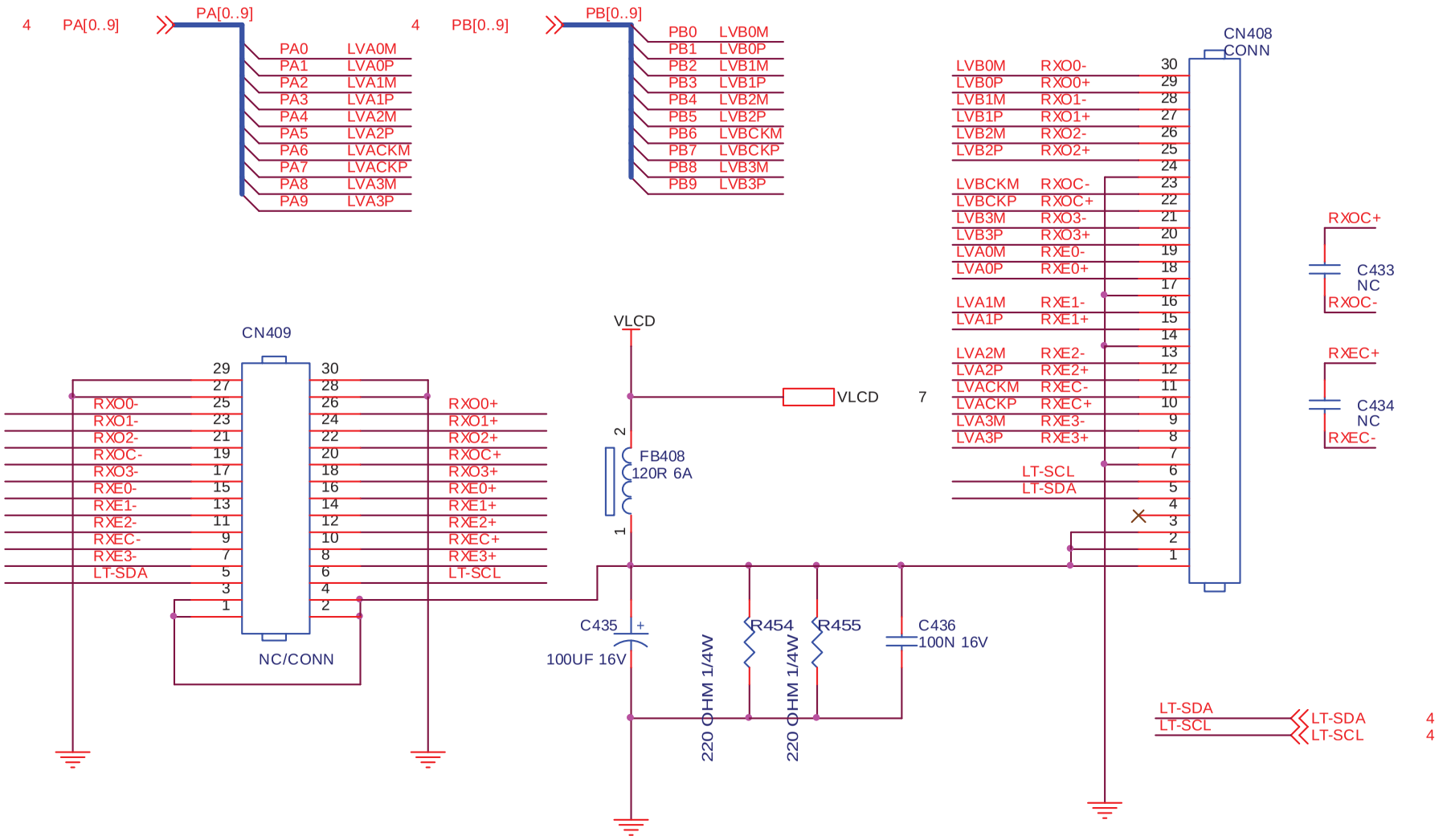
Remark: Parts position can be searched by using FIND function in PDF.

SCALER NT68753UMFG



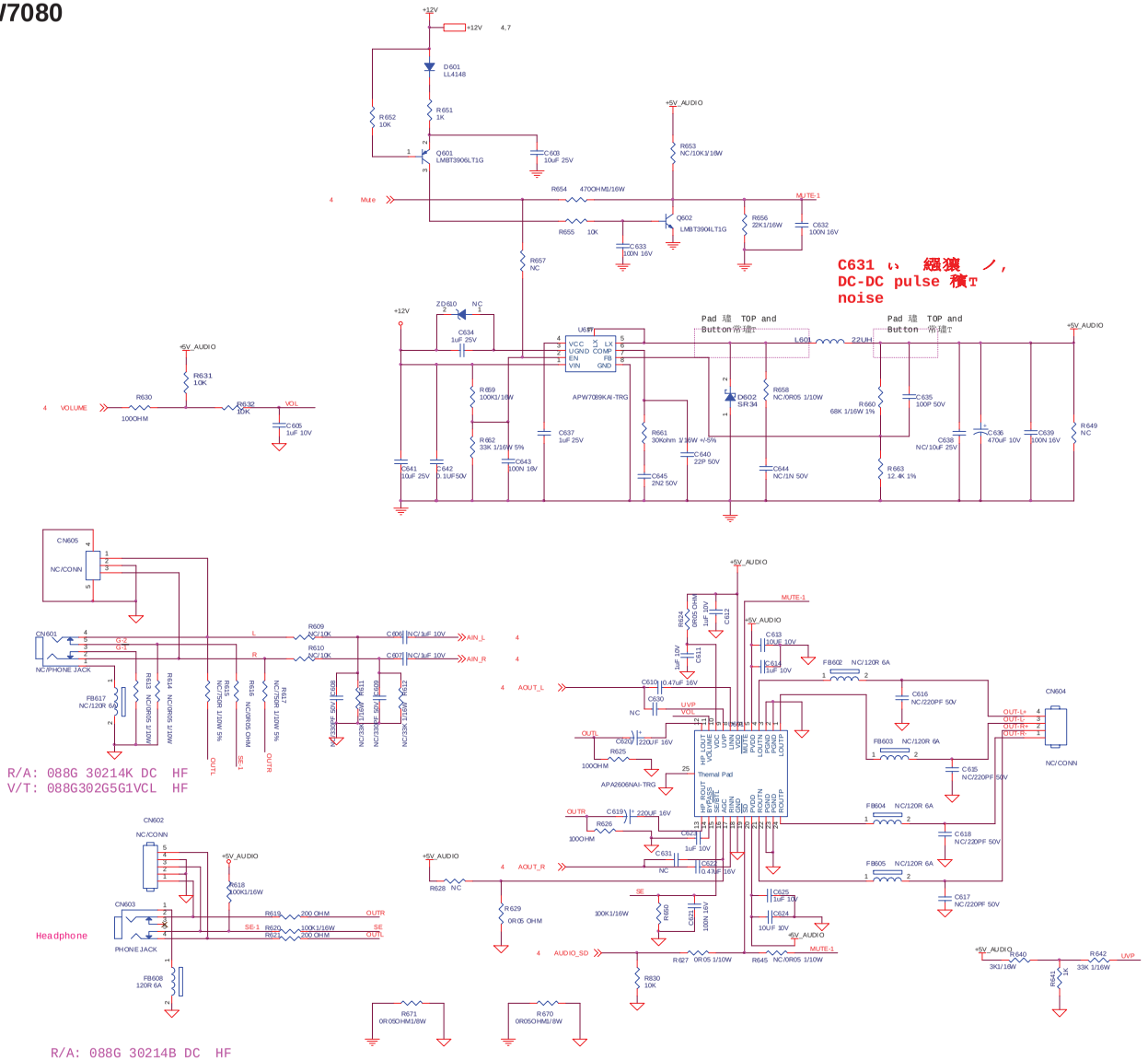
Remark: Parts position can be searched by using FIND function in PDF.

PANEL INTERFACE



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

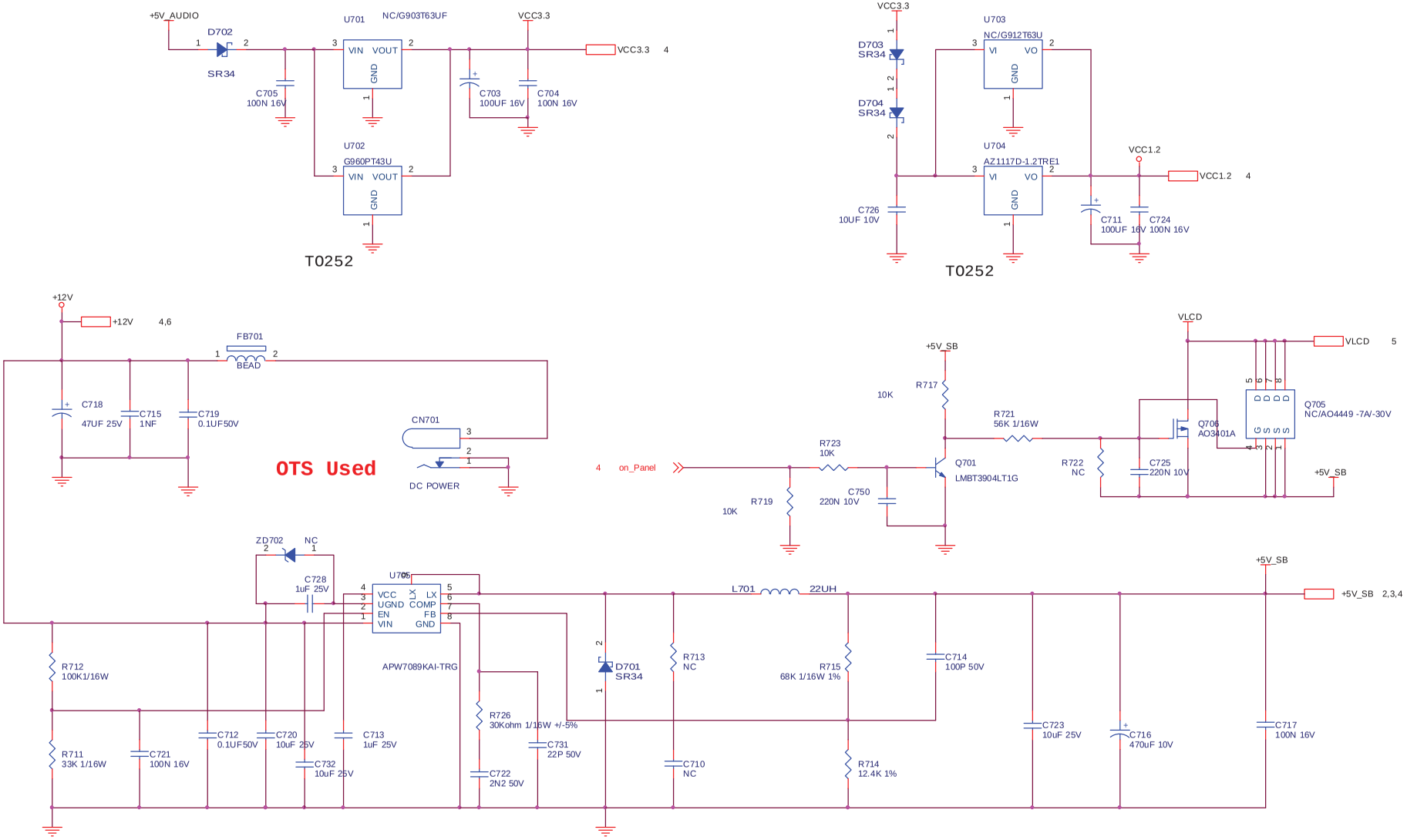
AUDIO APA2606 & APW7080



30 Meridian 3

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

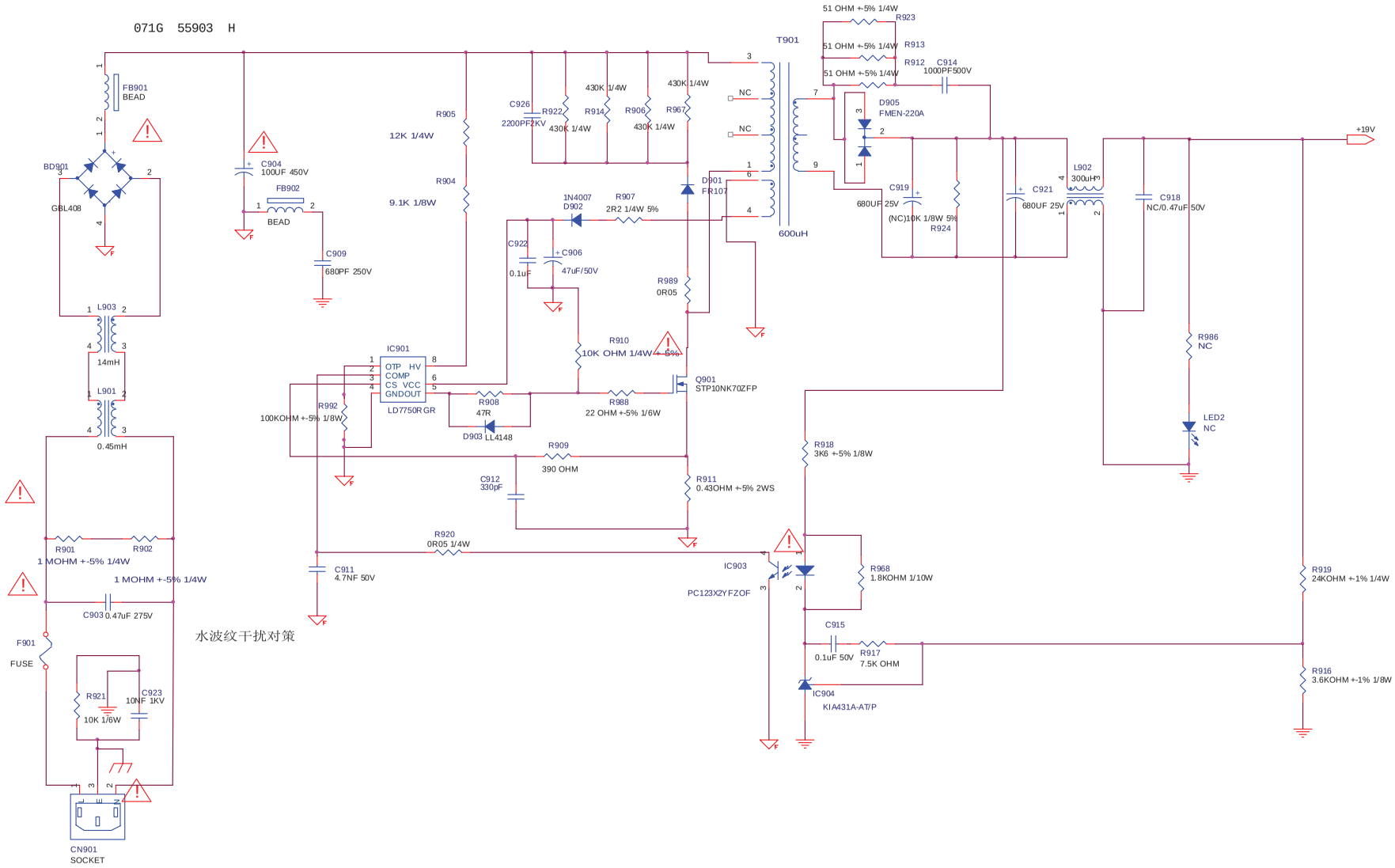
POWER



6.2 Power Board (715G4962P01000001S)

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

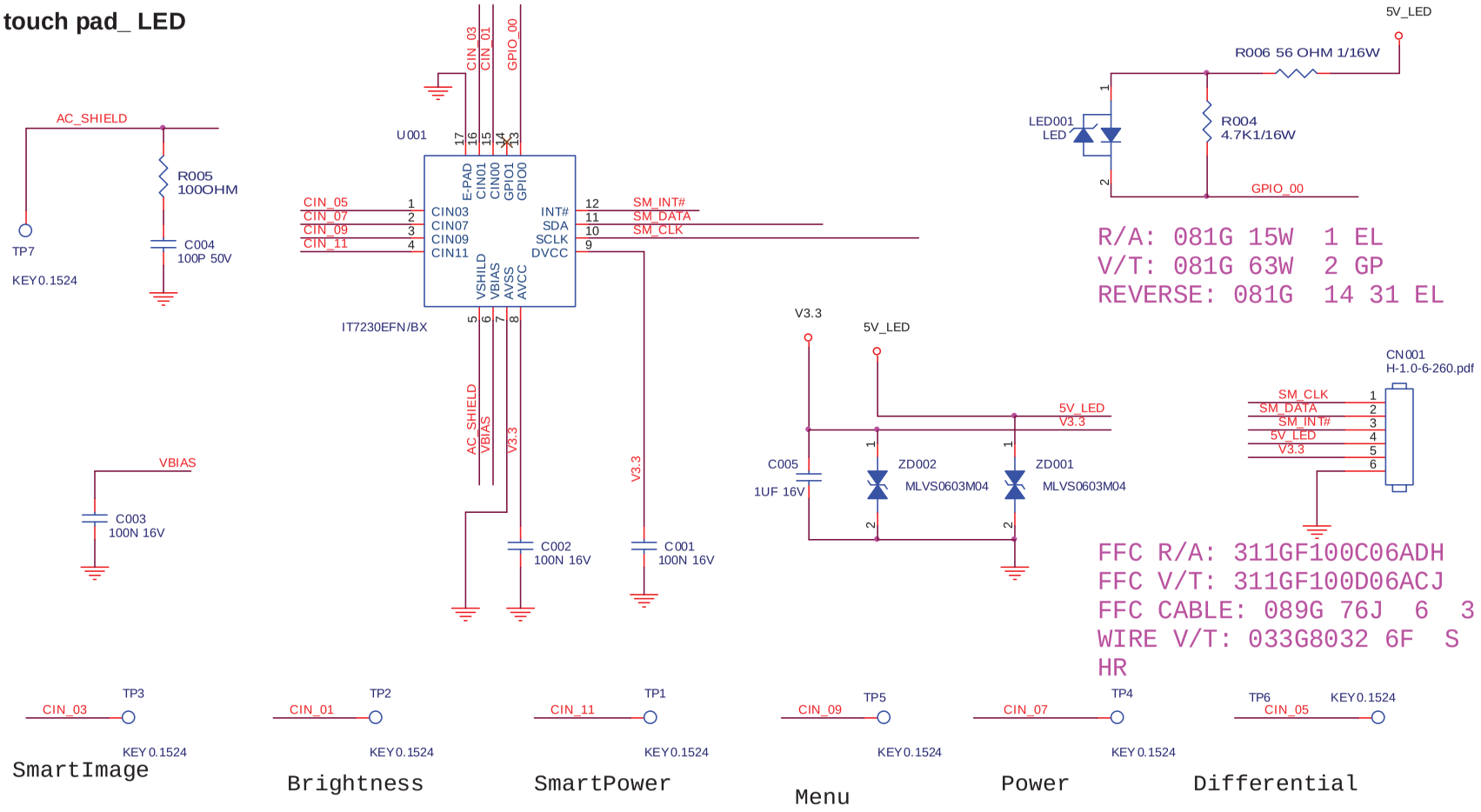
Adapter



6.3 Key Board (715G5453K02000004S)

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

Key- touch pad_ LED

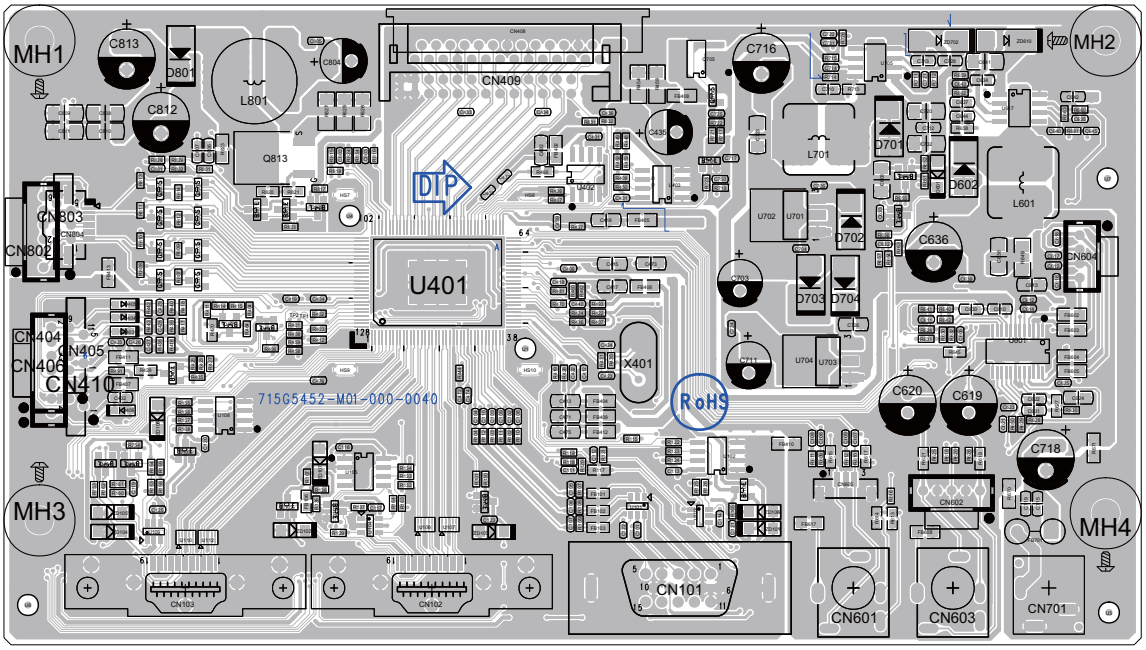


SmartImage	Brightness	SmartPower	Menu	Power

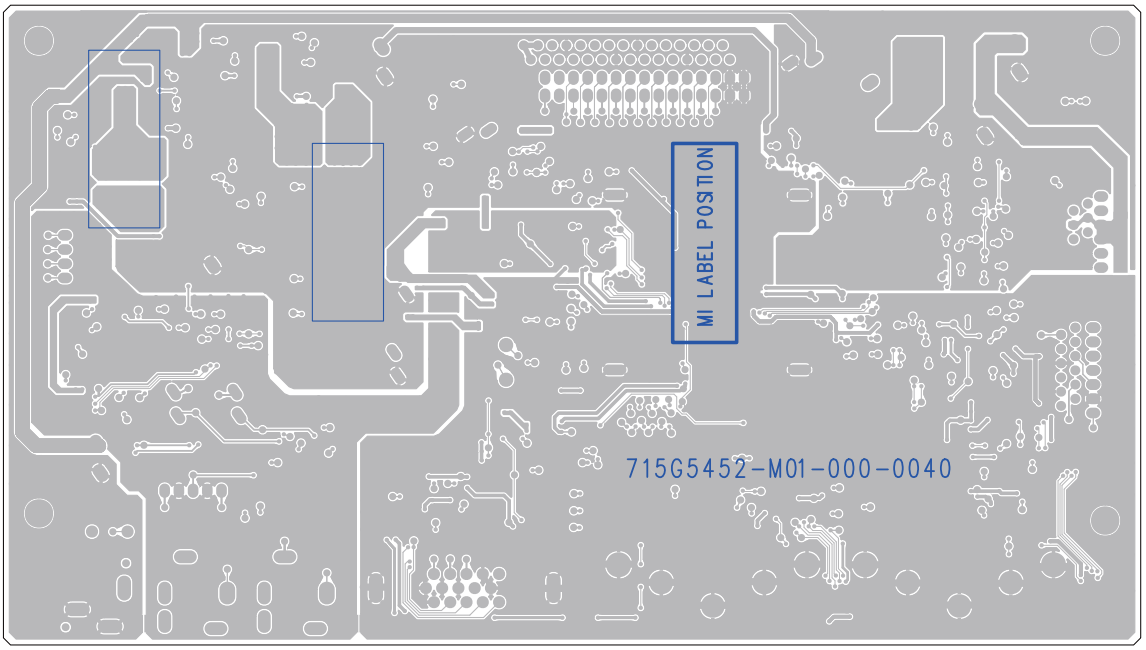
7. PCB Layout

7.1 Scaler Board (715G5452M01000004Q)

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

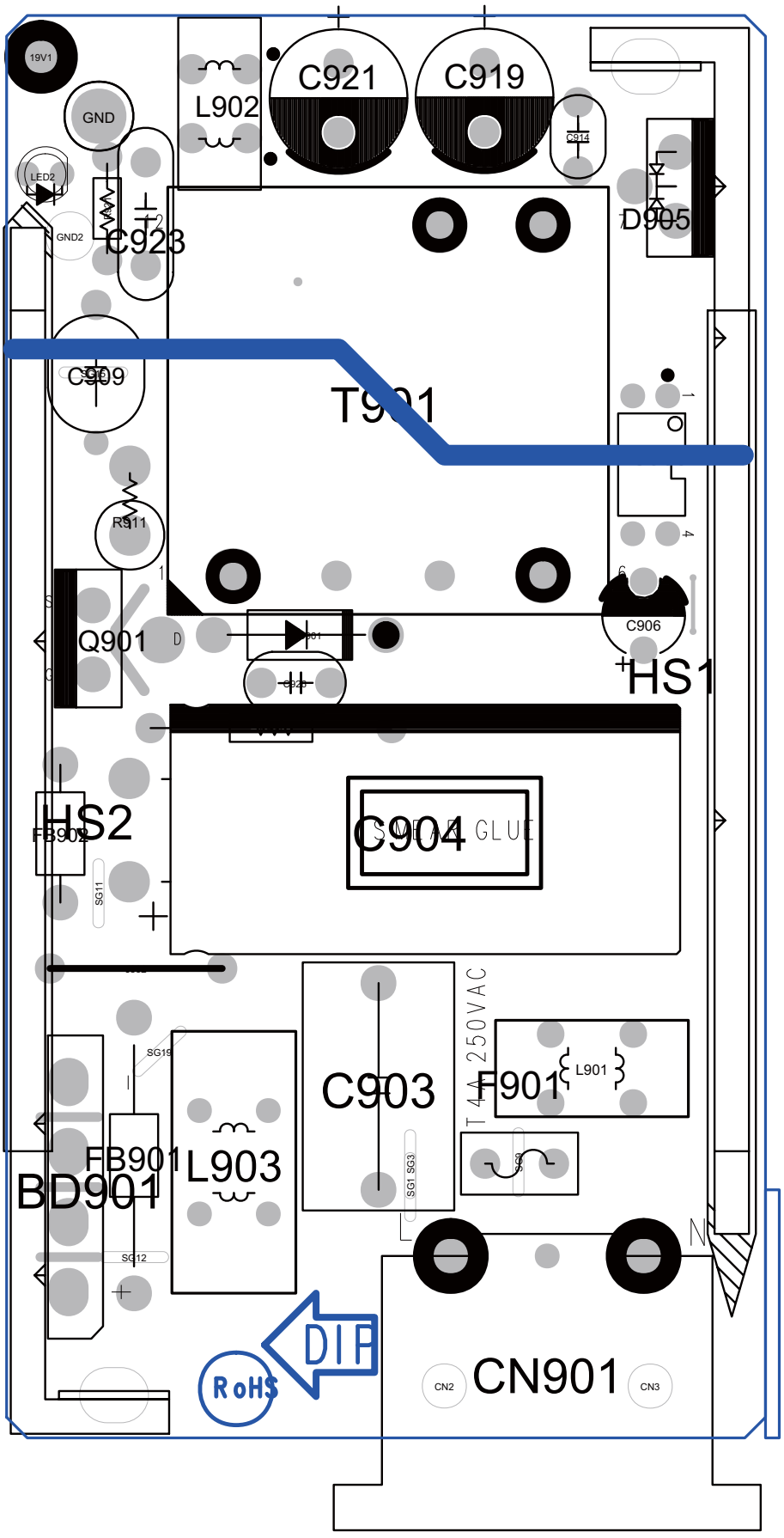


Remark: Parts position can be searched by using FIND function in PDF.

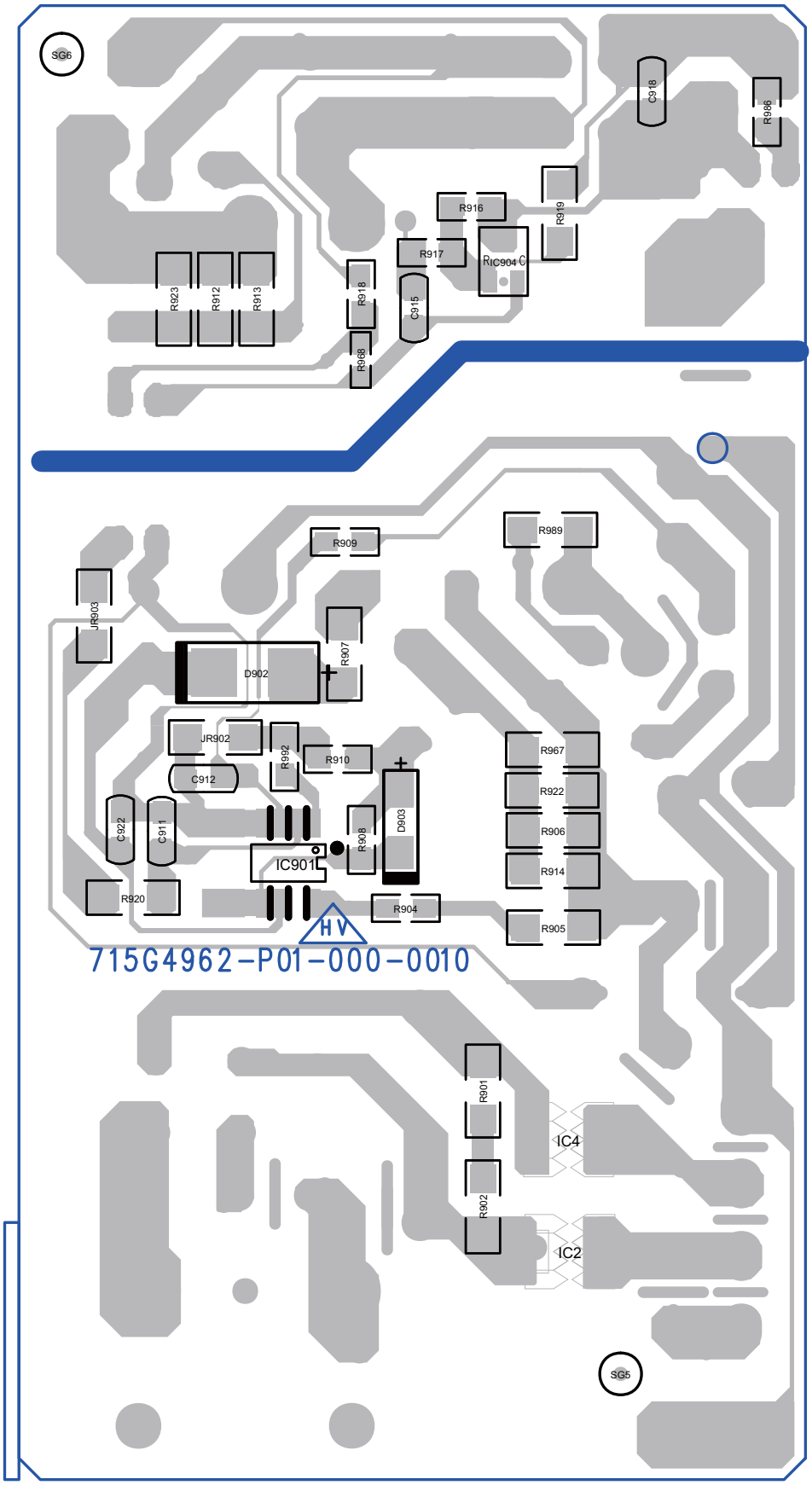


7.2 Power Board (715G4962P01000001S)

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



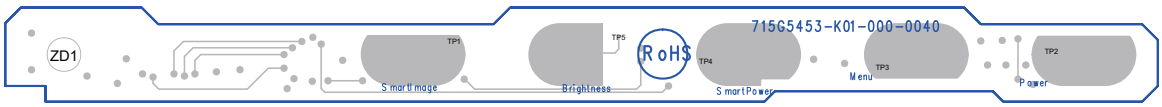
Remark: Parts position can be searched by using FIND function in PDF.



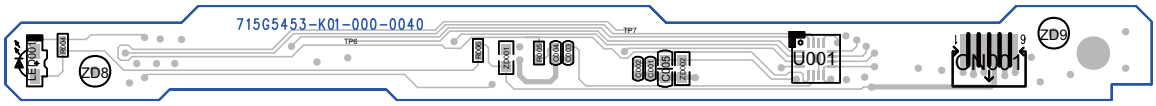
7.3 Key Board

715G5453K02000004S

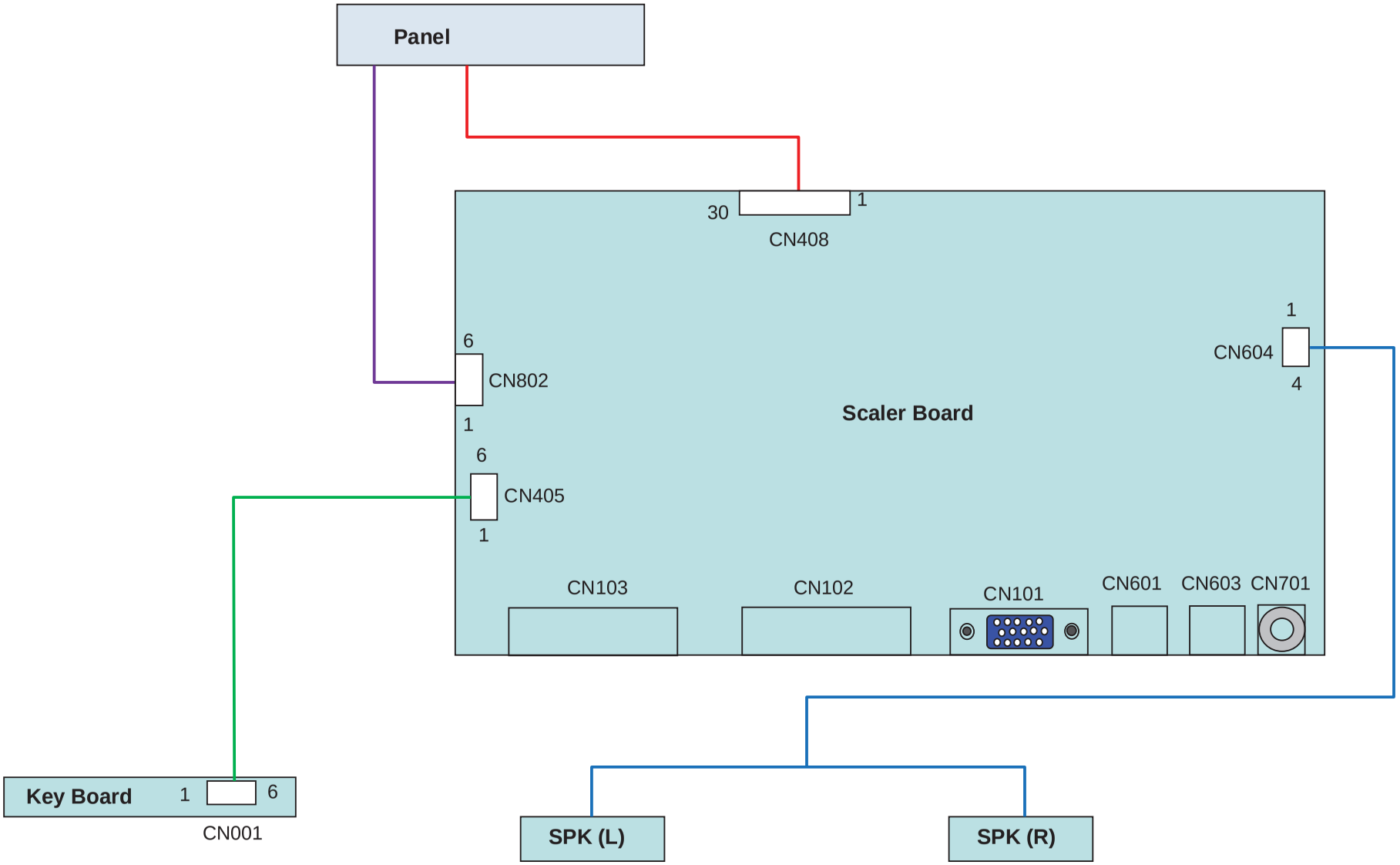
Remark: Parts position can be searched by using FIND function in PDF.



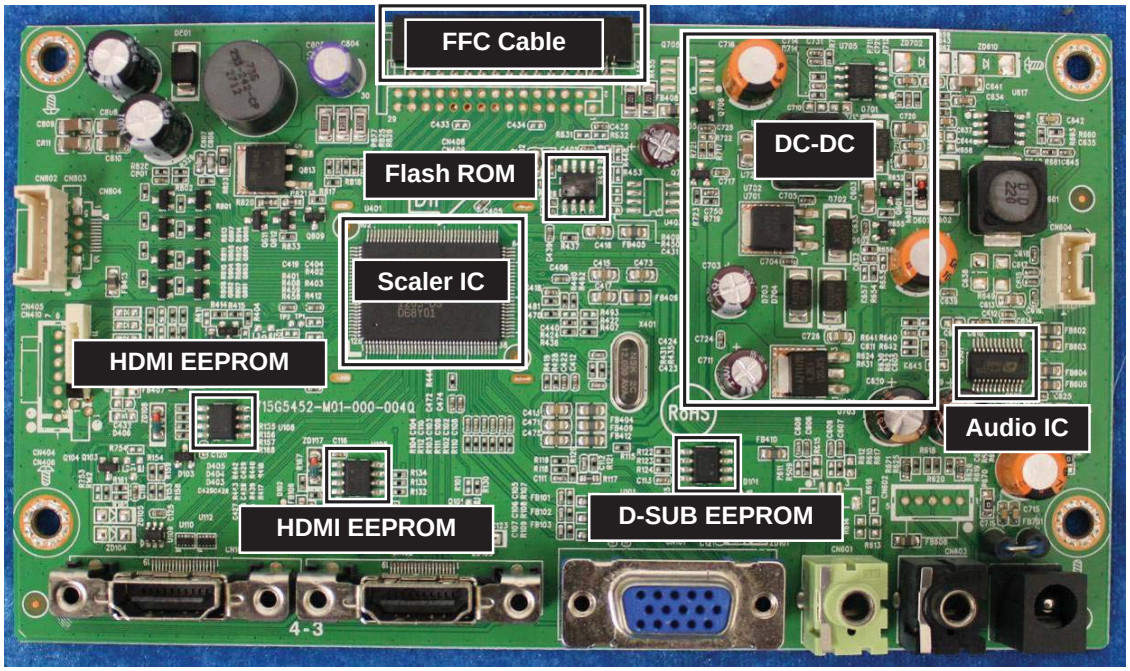
Remark: Parts position can be searched by using FIND function in PDF.



8. Wring Diagram



9. Scaler Board Overview



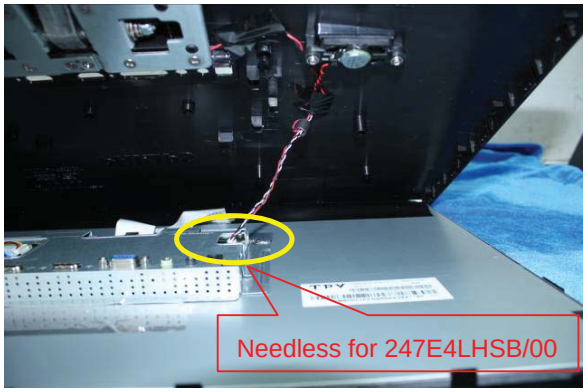
10. Mechanical Instructions

Note: 247E4LHSB/00 have no speakers, so some steps are needless for it.

Step 1: Remove Bezel and Rear cover with stand and HINGE ASSY

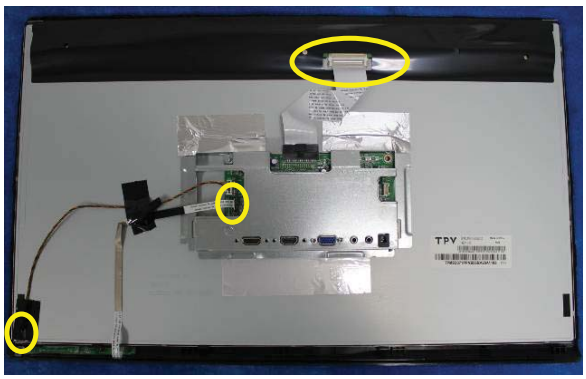
1. Place the monitor face on a safe surface, and open the latches and along the red arrowhead direction as the picture to open other latches. Than remove the screws and the pin on the scaler board.

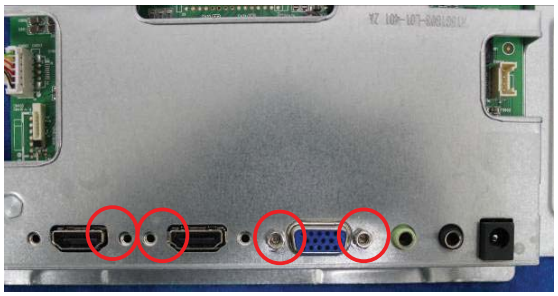
2. Disconnect the connector to remove the Rear cover.

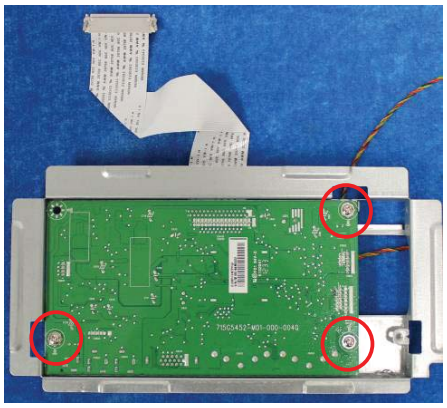


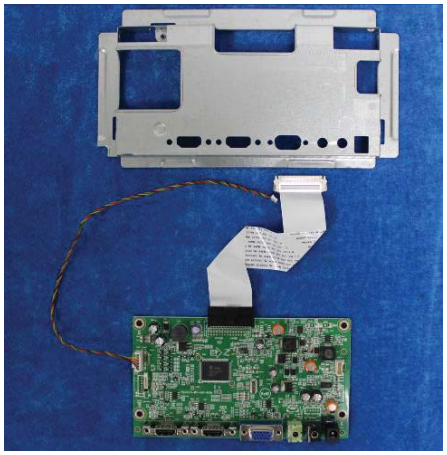
Step 2: Remove the scaler board

1. Disconnect all the connectors and remove the screw to remove the scaler board.









2. The scaler board.

Step 3: Separate Panel and Bezel.

1. The panel

2. The Bezel and Key Board.

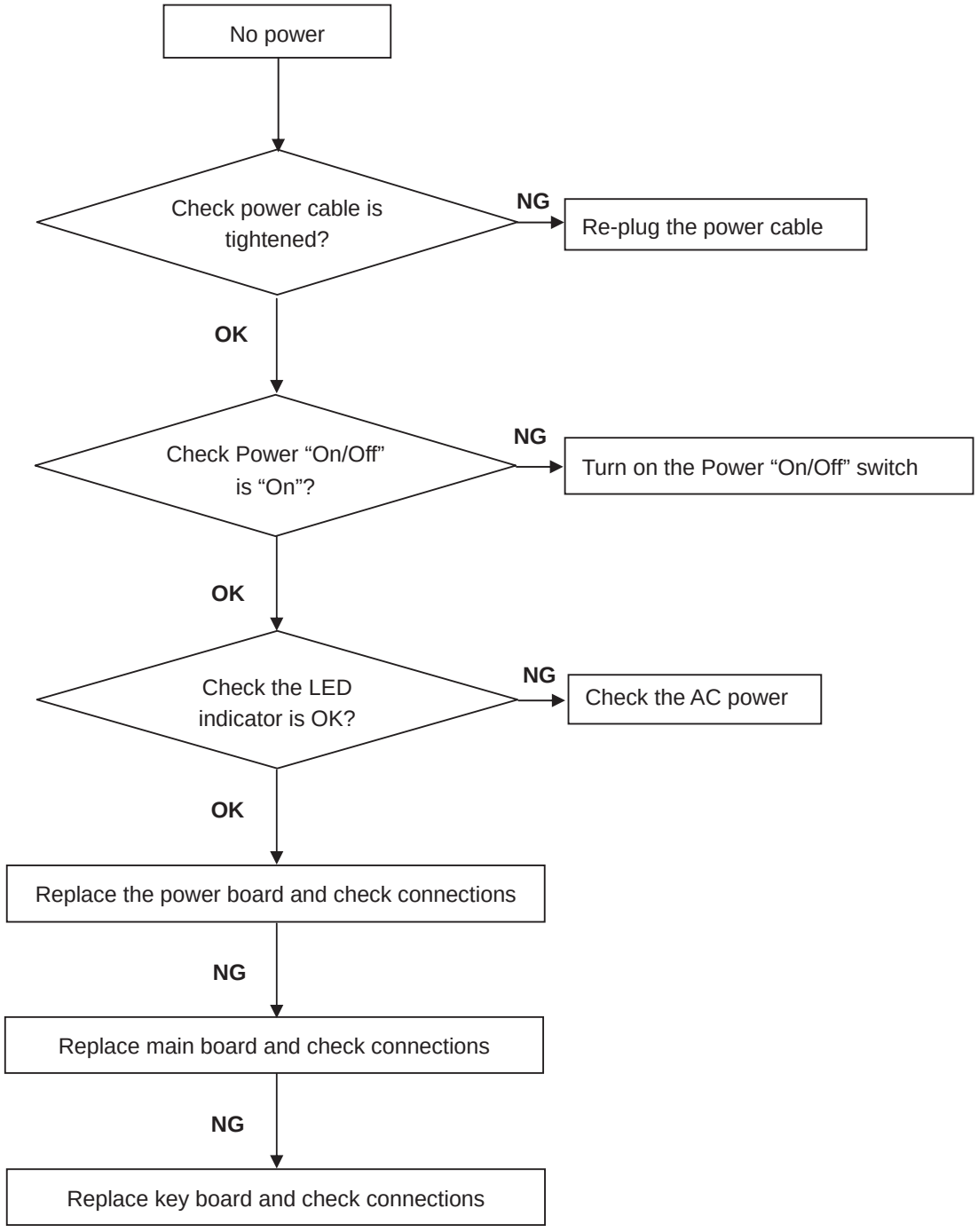
Step 4: Rear cover with Speakers 、 stand and HINGE ASSY

Note：247E4LHSB/00 have no Speaker.

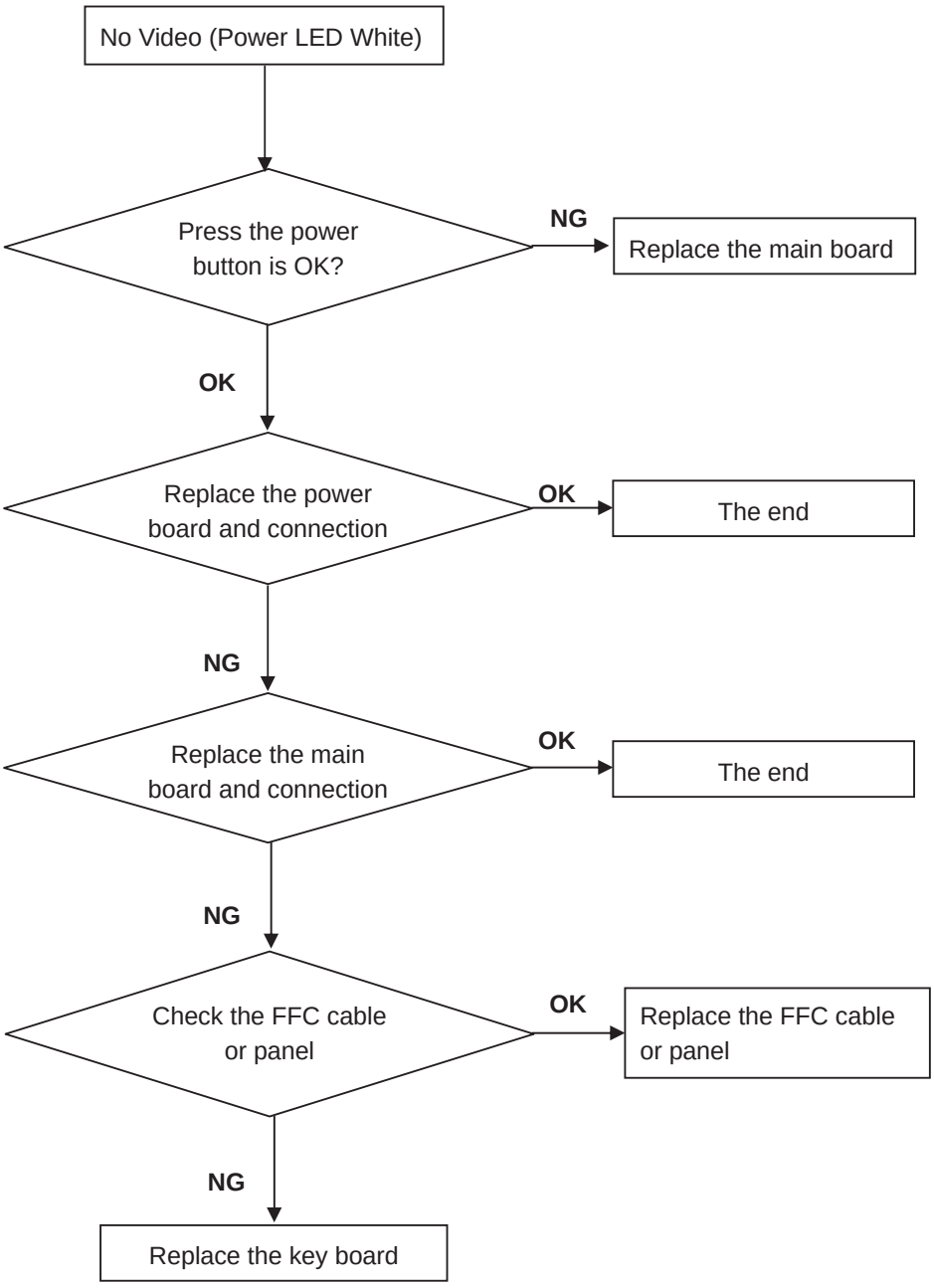
Step 5: Remove the screw to remove the Base.

11. Repair Flow Chart

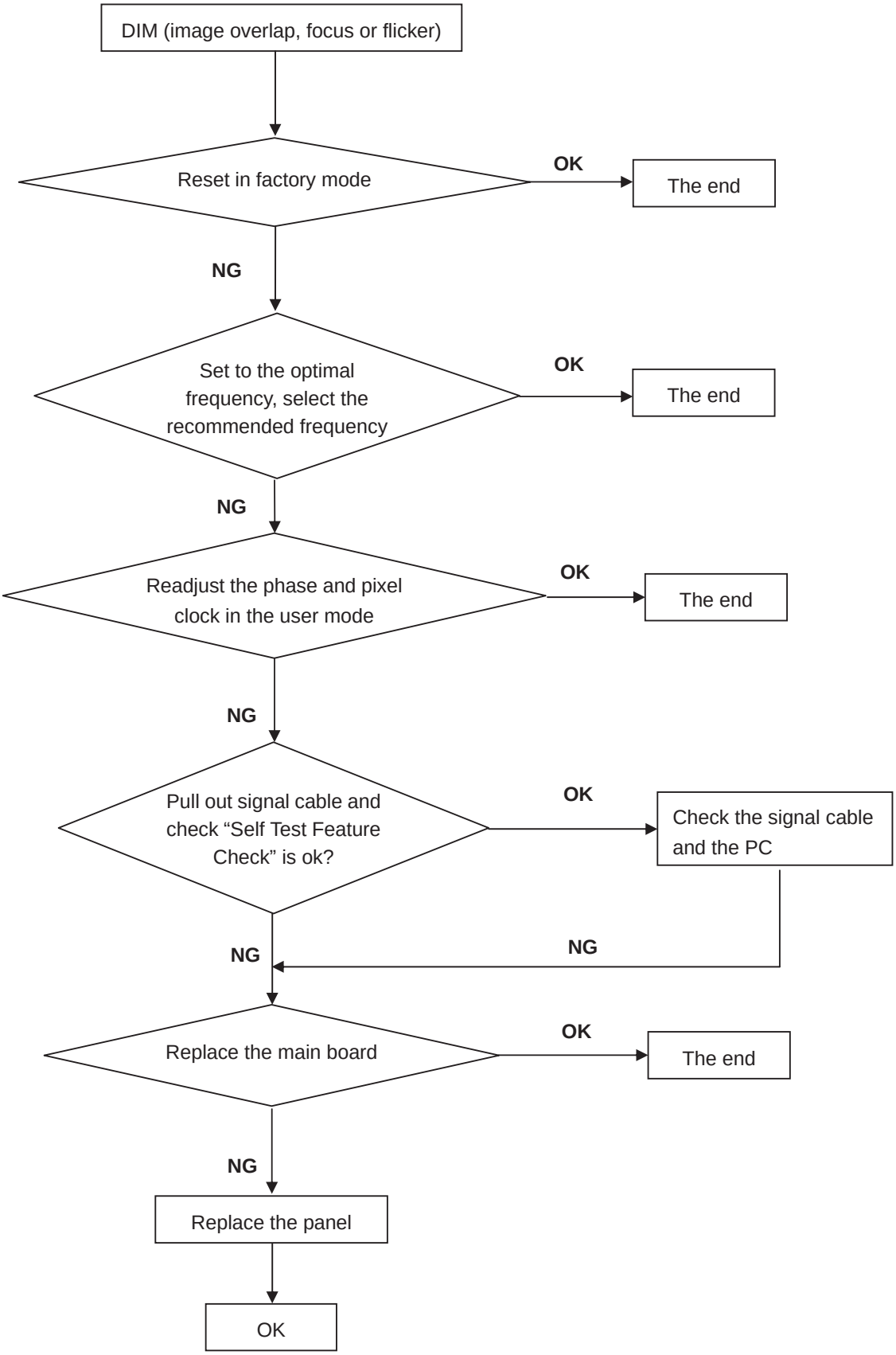
1. No Power



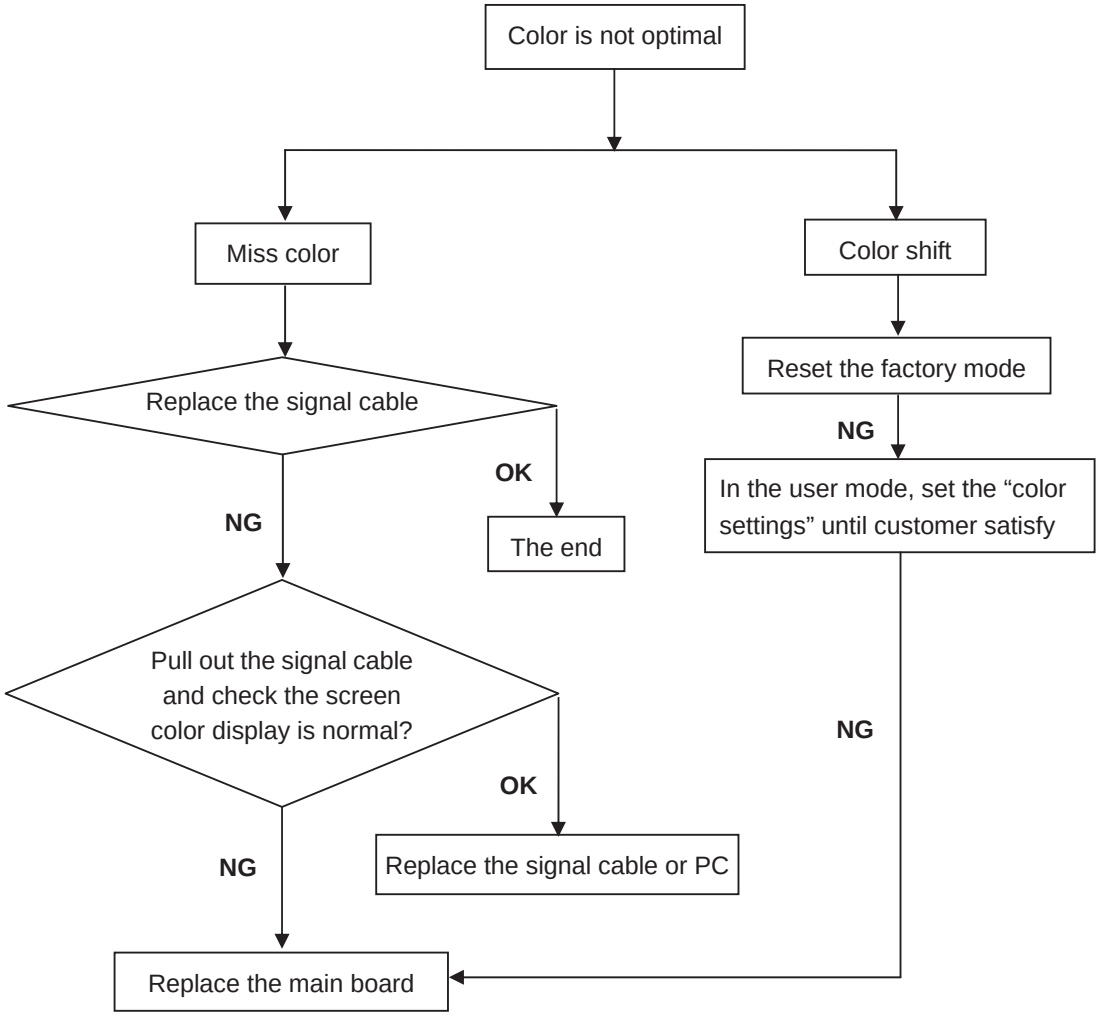
2. Video (Power LED White)



3. DIM



4. Color is not optimal



12. ISP Instruction

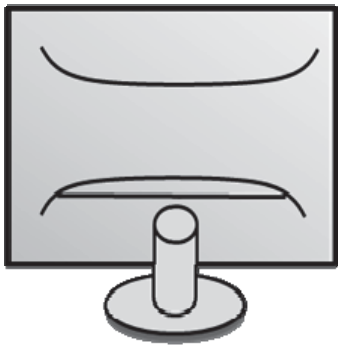
12.1 Materials list

ISP JIG: 715GT089-B/C

VGA cable

TPV P/N: 089G728 GAA DB

PC



Monitor

USB cable

TPV P/N: 089G1758 X

FTC100103(MSTAR) usb drive.rar

USB port driver

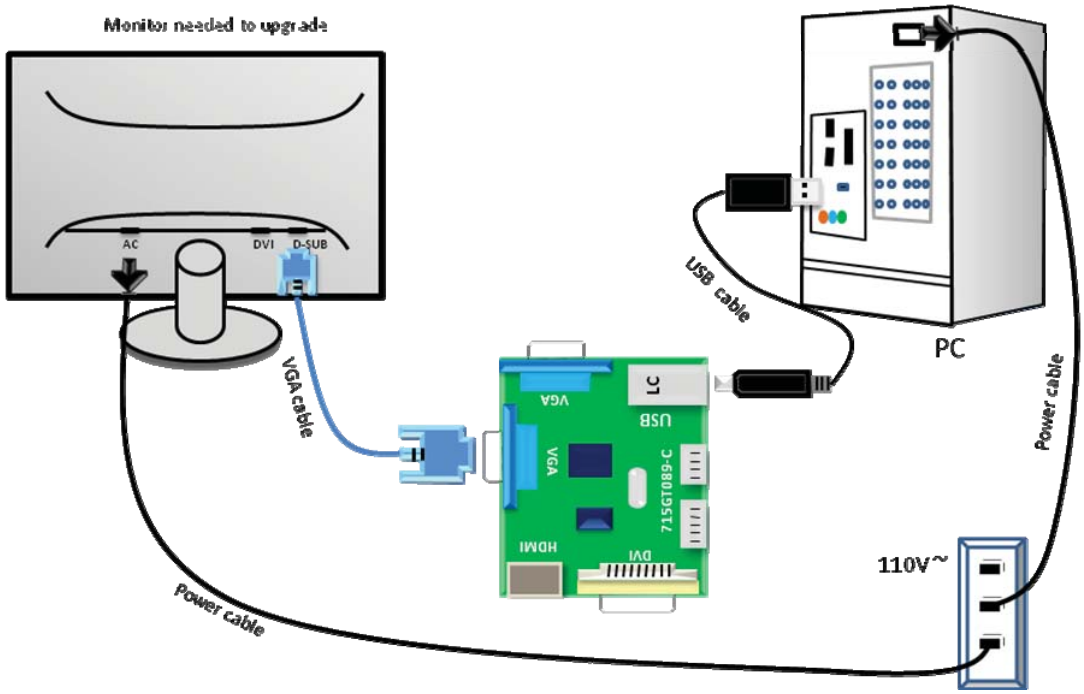
EasyWriterV2011.1123_XP_W7_32.exe

ISP tool:

PH_247E4_LHAB_TPM236H3_HGEL02_753_1A2H_120922_V100_6A66.hex

New F/W

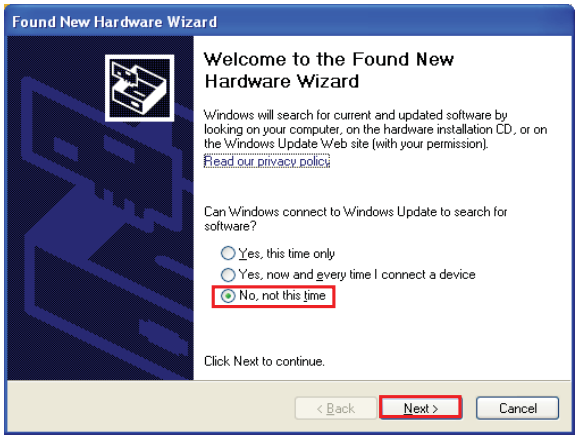
12.2 Connect the ISP board, PC and monitor as follow:

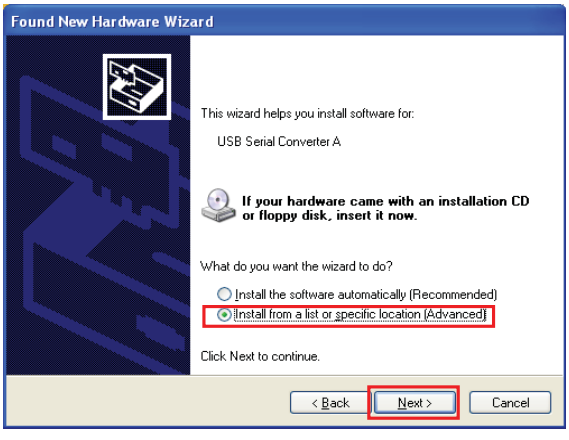


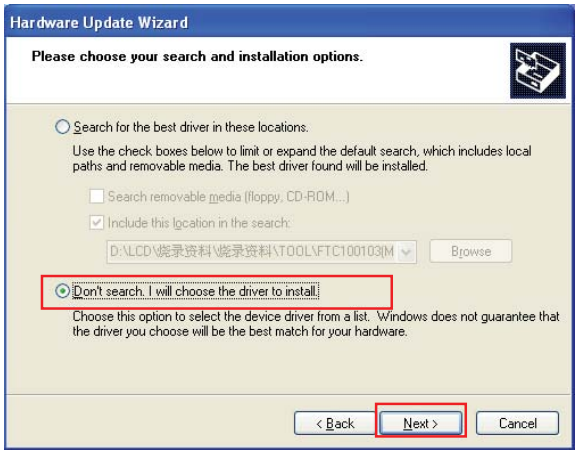
12.3 Install USB driver.

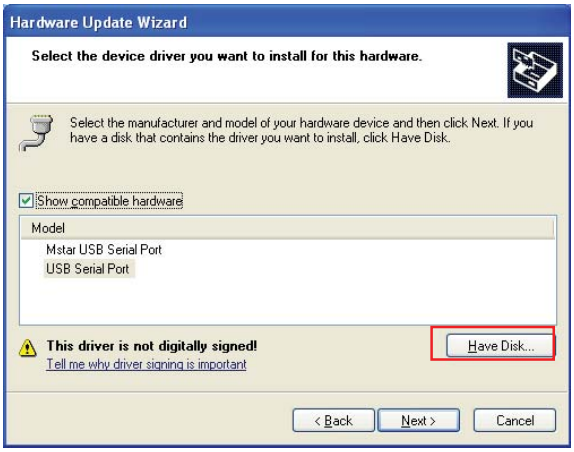
12.3.1 When insert the USB cable to PC USB port, will pop up a Hardware Wizard to help you install the USB driver if you use this ISP board first time. You can install it successfully as the below instruction step by step.

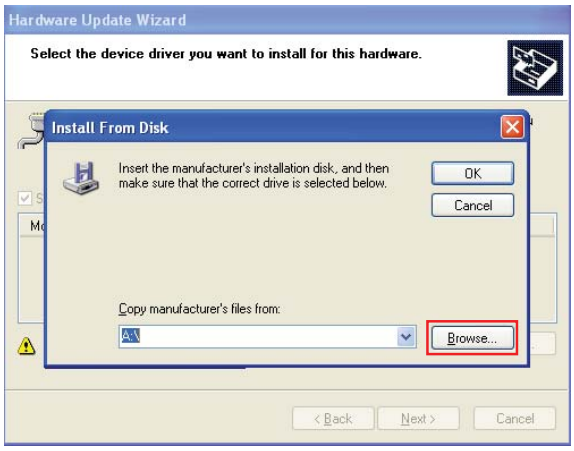
Remark: The USB driver files path: D:\FTC100103(Mstar)\FTCUSB.INF

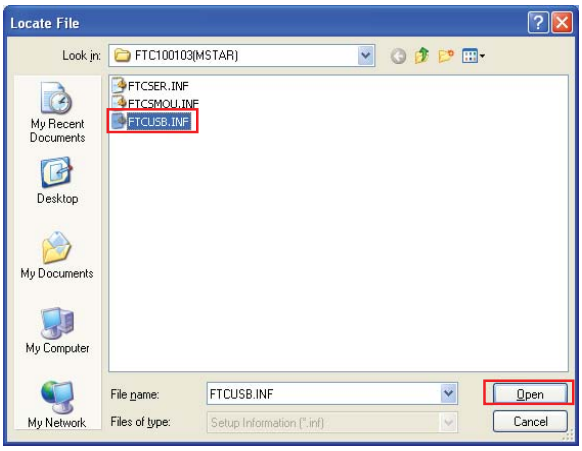


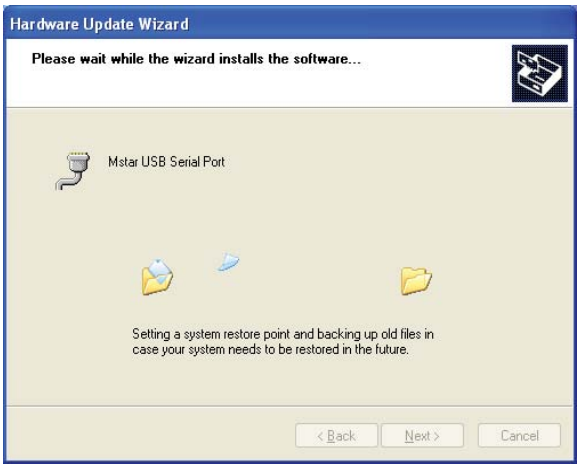


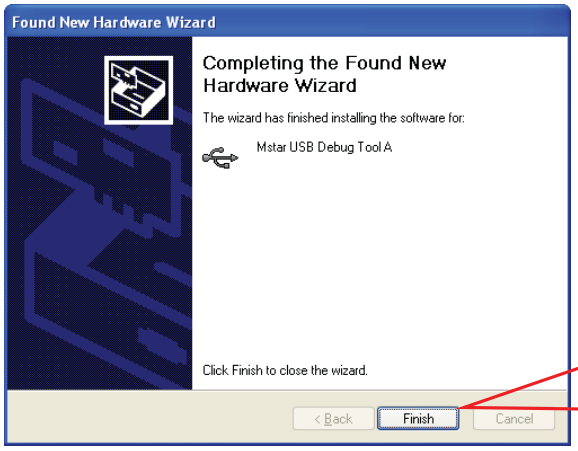








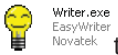


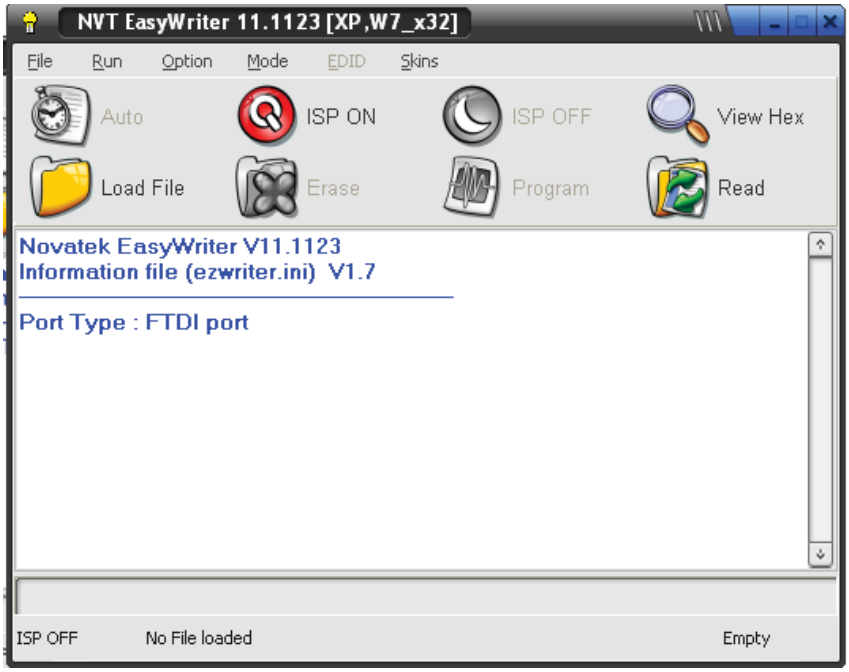


Click “Finish” to complete the USB serial port driver installation.

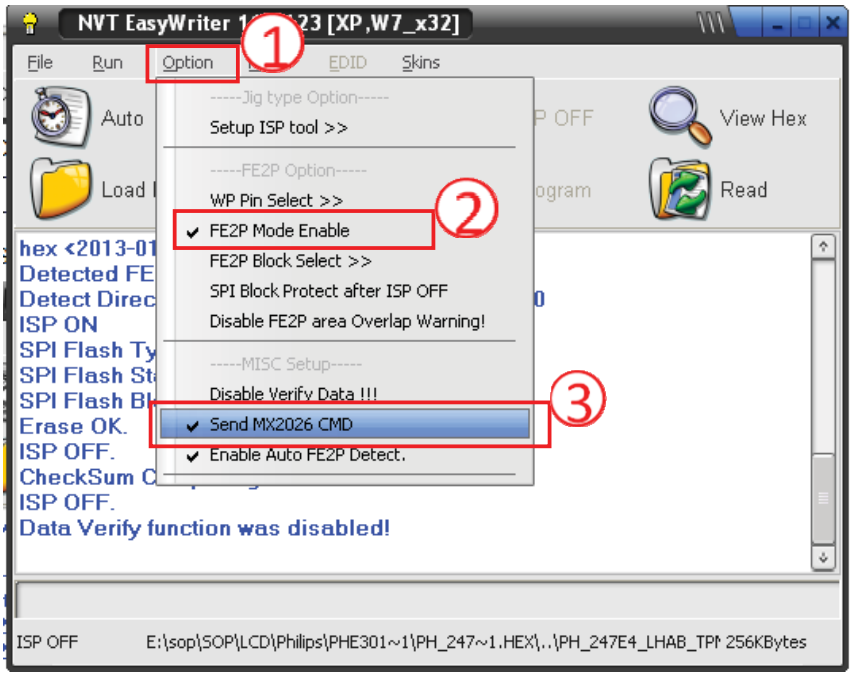
12.4 Install the ISP tool.

12.4.1 Double-click  to install ISP program.

12.4.2 Double-click  to run the ISP tool.



12.4.3 Set the parameters to restore the HDCP key if the monitor has DVI or HDMI port.



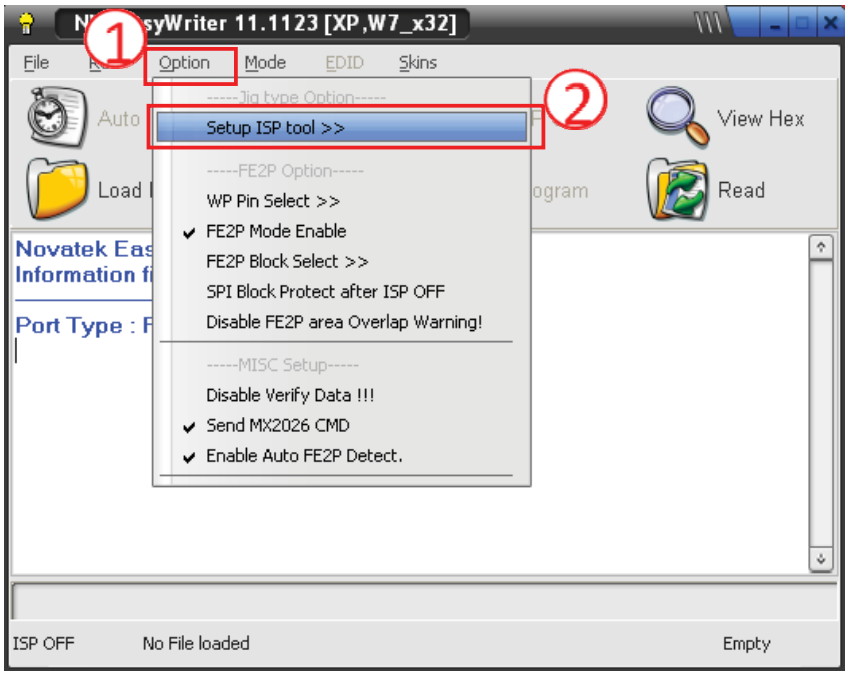
(1) Click the “Option” item.

(2) Tick “FE2P Mode Enable”.

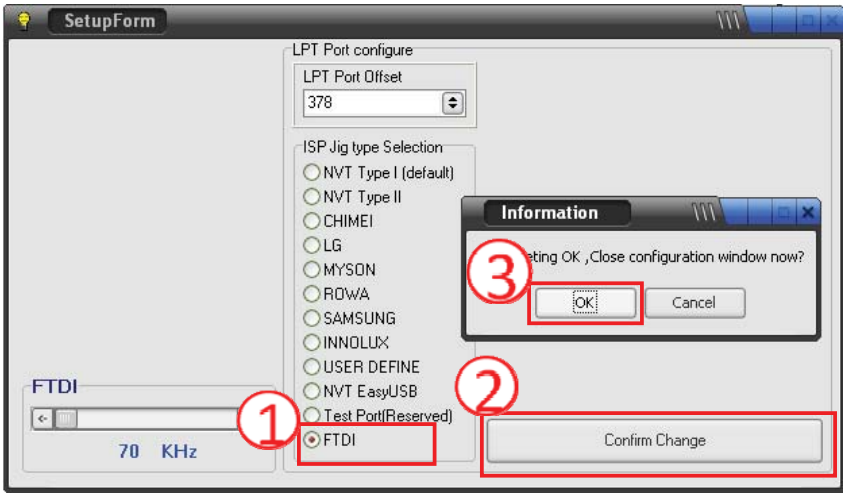
(3) Tick “Enable Auto FE2P Detect”.

(4) Tick”Send MX2026 CMD”

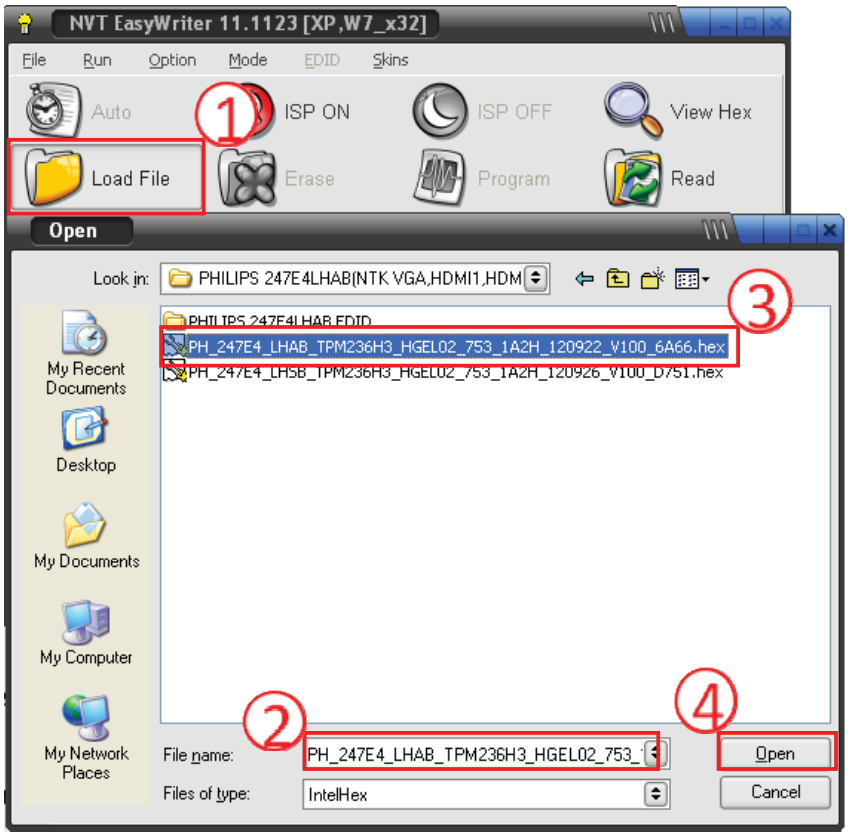
12.4.4 Setup ISP tool. Click “Setup ISP tool” to open the configuration window.



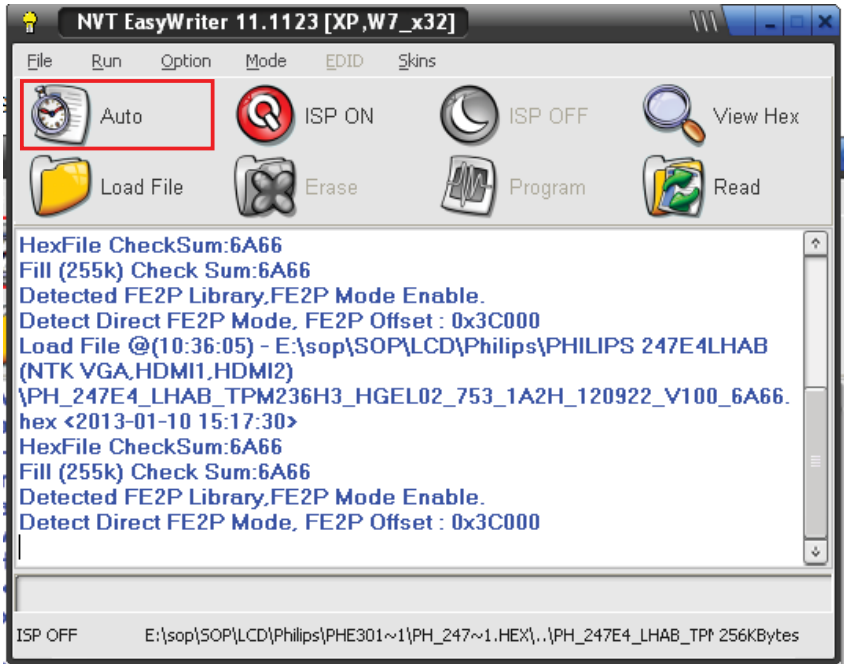
12.4.5 Configuration for ISP tool. Tick “FTDI”.



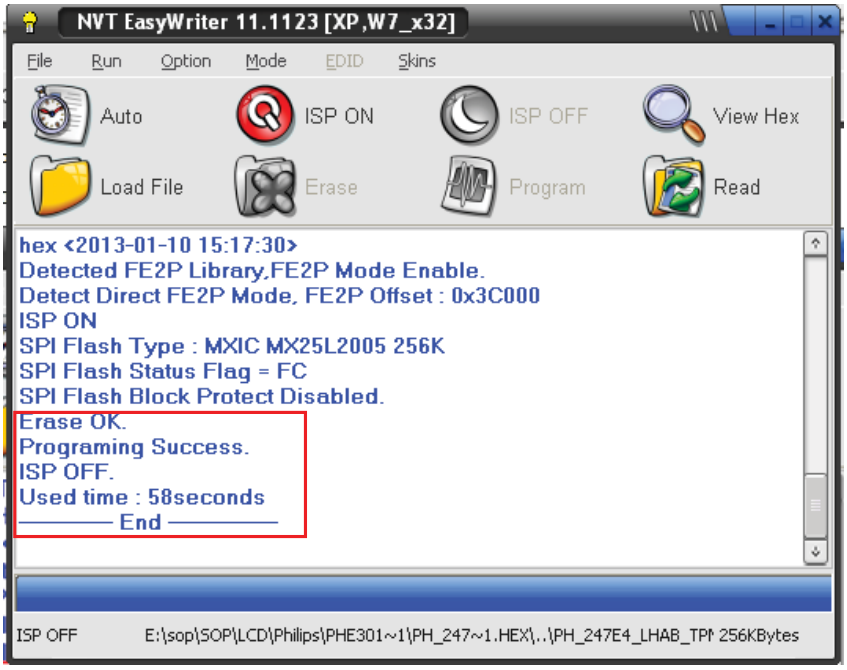
12.4.6 Load the F/W you want to upgrade.



12.4.7 Start to program. Click “Auto” to start programming.



12.4.8 Programing success. There will be the message in the red frame after successful programming.

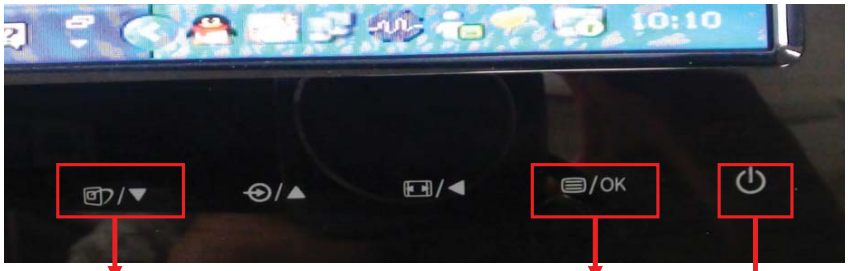


12.5 Check the FW version after upgrade.

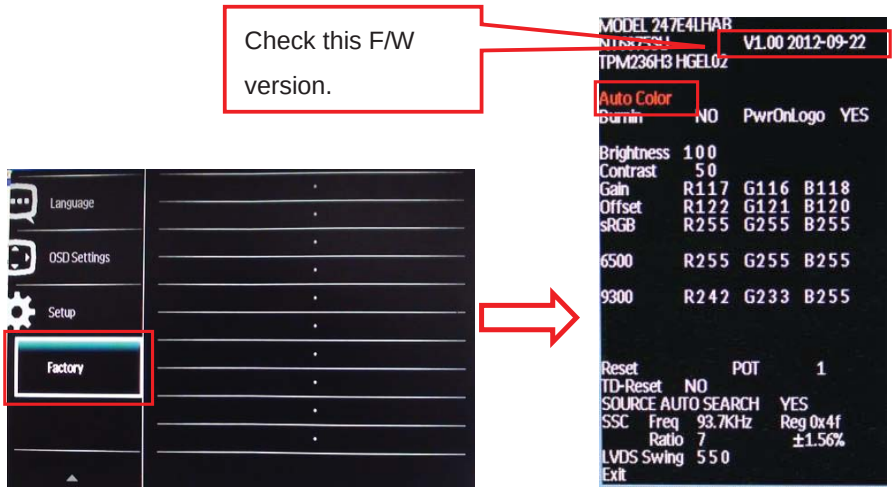
12.5.1 The way to open factory menu.

(1)Connect video source to monitor and AC on.

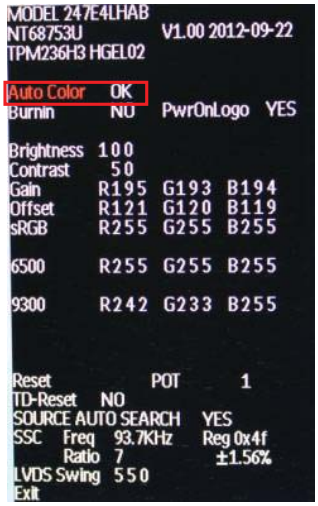
(2)The way to factory menu: Press “MENU” and “+” keys synchronously (The rightmost and leftmost keys in the touch keyboard), and DC on. When the screen lights, release the two keys and press “MENU” again to open factory menu.



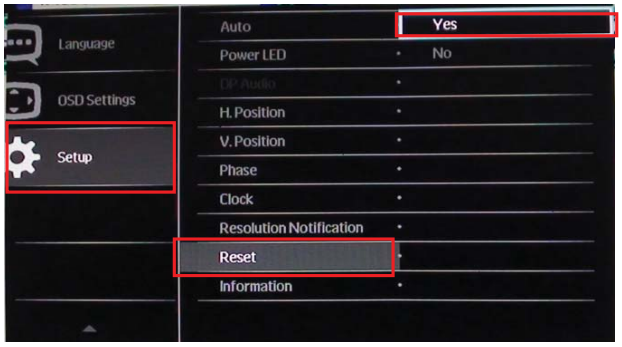
(3)Select “factory” and press menu key to open factory menu as below.



(4)Please do “Auto Color” in factory menu after change main board and upgrade F/W.



12.5.2 Do factory reset in user menu. User menu – Setup – Reset - Yes.

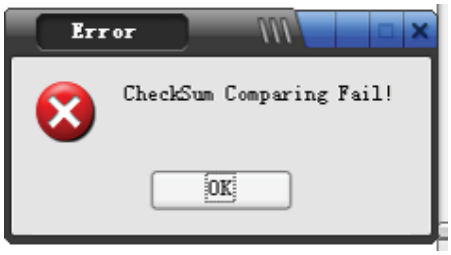


(1)Restart the monitor after open factory menu. And then open the user menu.

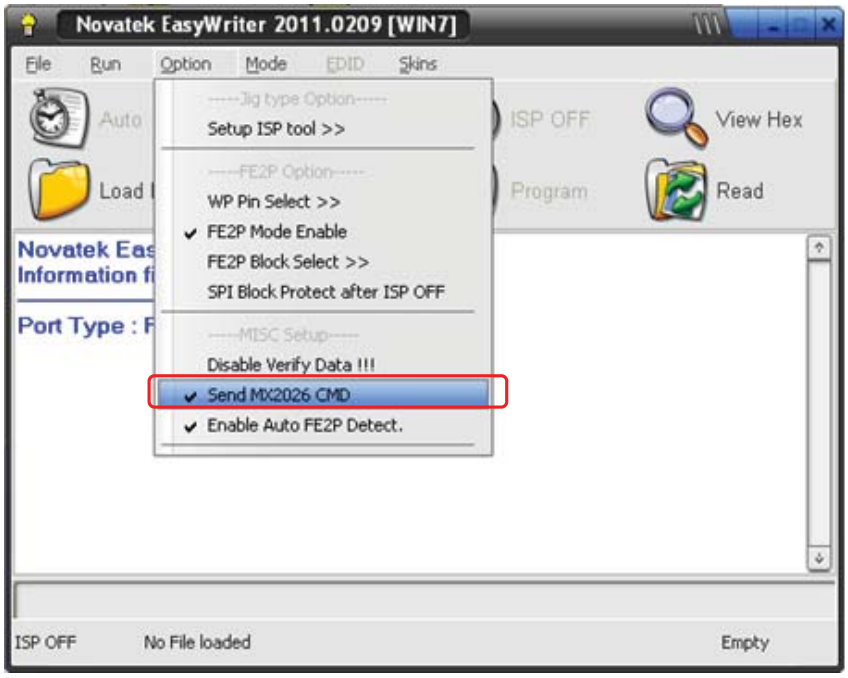
(2)Factory reset will turn off “Burn in” mode which screen color switches among red, green, blue and black.

12.6 Troubleshooting.

12.6.1 “CheckSum Comparing Fail!” error.



Method: Tick the “Send MX2060 CMD” at Option item.



12.6.2 When can’t upgrade, please retry below several ways to upgrade.

(1) When the tool appears erase error, you can change another version tool to try.

(2) The program must be in the monitor standby state, while the fail communication with monitor might result the monitor power off. In this situation, you may AC off the monitor for a while and then AC on to retry. Maybe the defect will be cured.

(3) Change ISP JIG or cable.

(4) Change PC

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.

LPT cable (male to male)

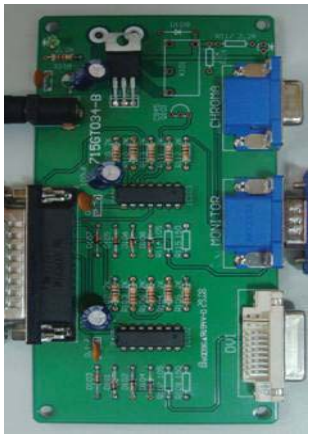
TPV P/N: N/A

VGA cable

TPV P/N: 089G728 GAA DB

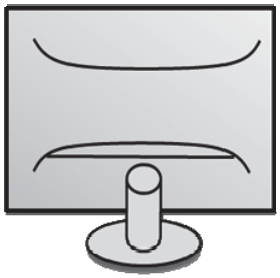
12V DC adapter

TPV P/N: ADPC12416BEP



ISP JIG: 715GT034-B

PC



Monitor

PORT95NT.EXE

LPT port driver

HdmiSinglePort.exe

ISP tool

PHILIPS 247E4LHAB
EDID

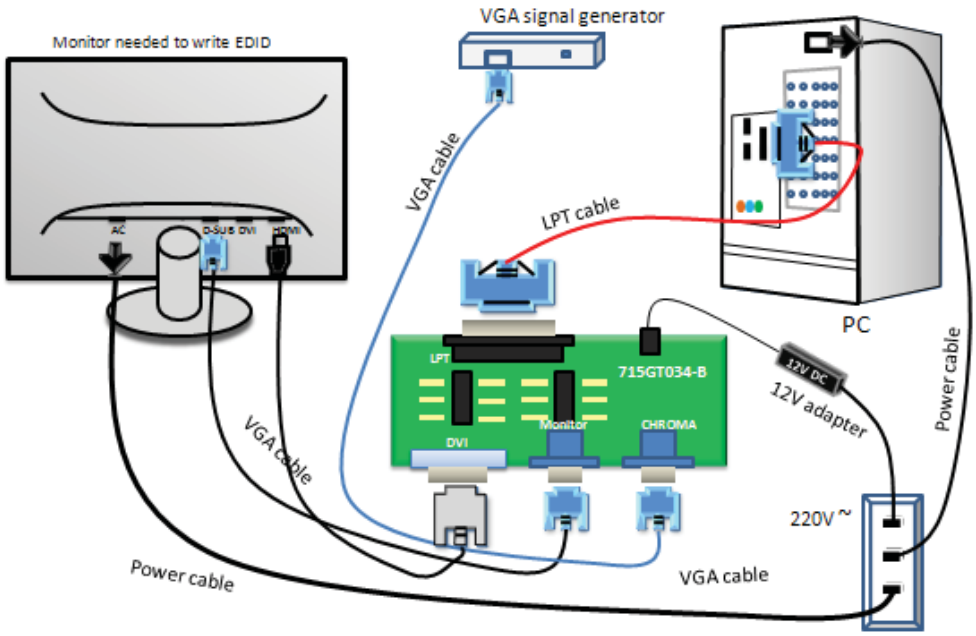
EDID

DVI to HDMI cable

TPV P/N: 089G183GAA501

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

EDID by HDMI port connection



13.2 Install LPT drive

1. Double click the icon 

to install the driver. Restart PC after installation.

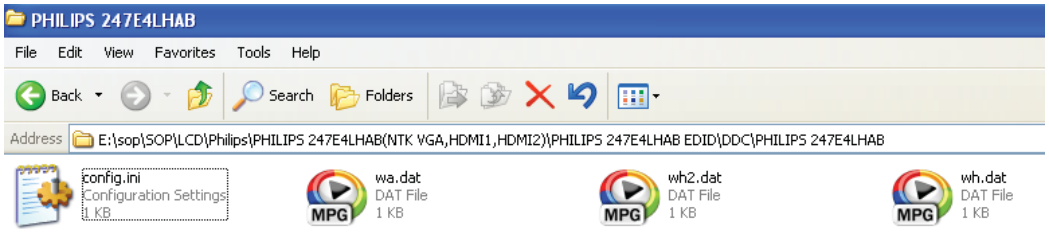
13.3 Prepare the EDID written

1. Change the EDID files name as below rule.

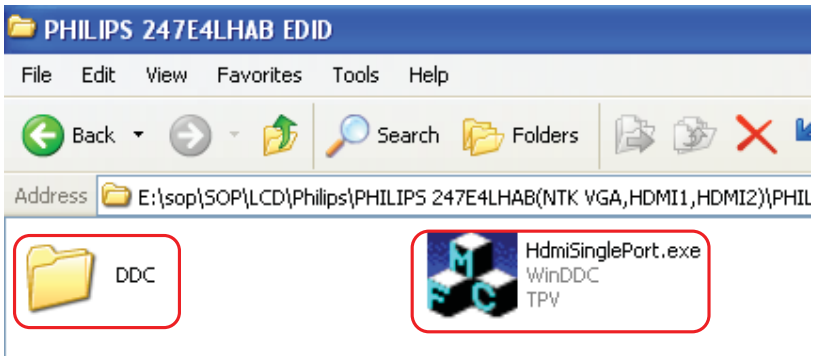
Anolog EDID ⟶ WA.dat HDMI2 EDID ⟶ WH2.dat

HDMI EDID ⟶ WH.dat

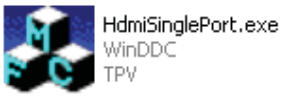
2. Copy these four files to one folder named as PHILIPS 247E4LHAB which must contains “config.ini” file.



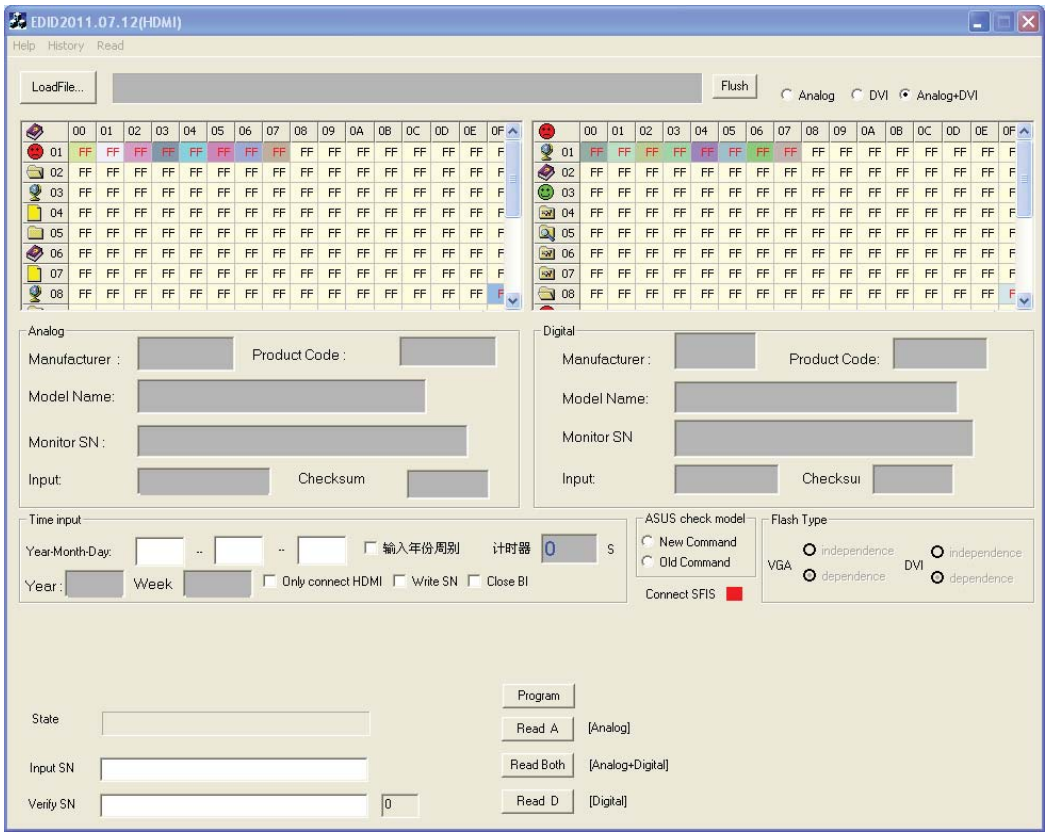
3. Copy PHILIPS 247E4LHAB to DDC folder and put DDC and ISP tool together.



13.4. Run the ISP tool.

1. Double-click the icon 

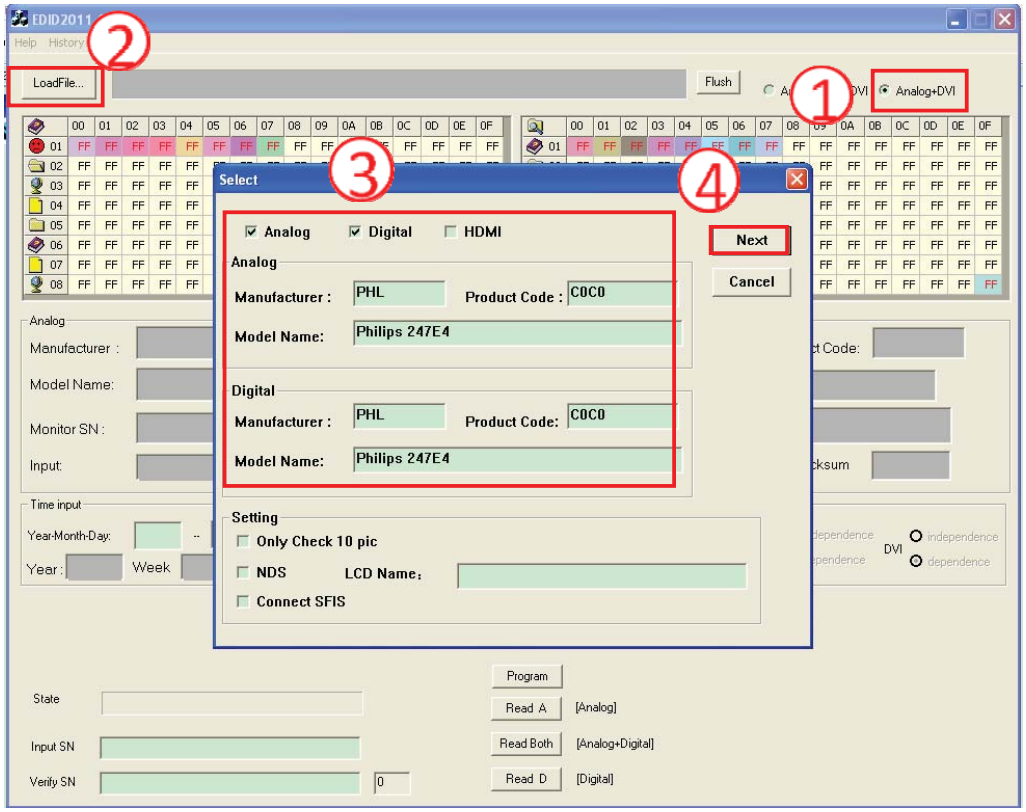
to open the tool.



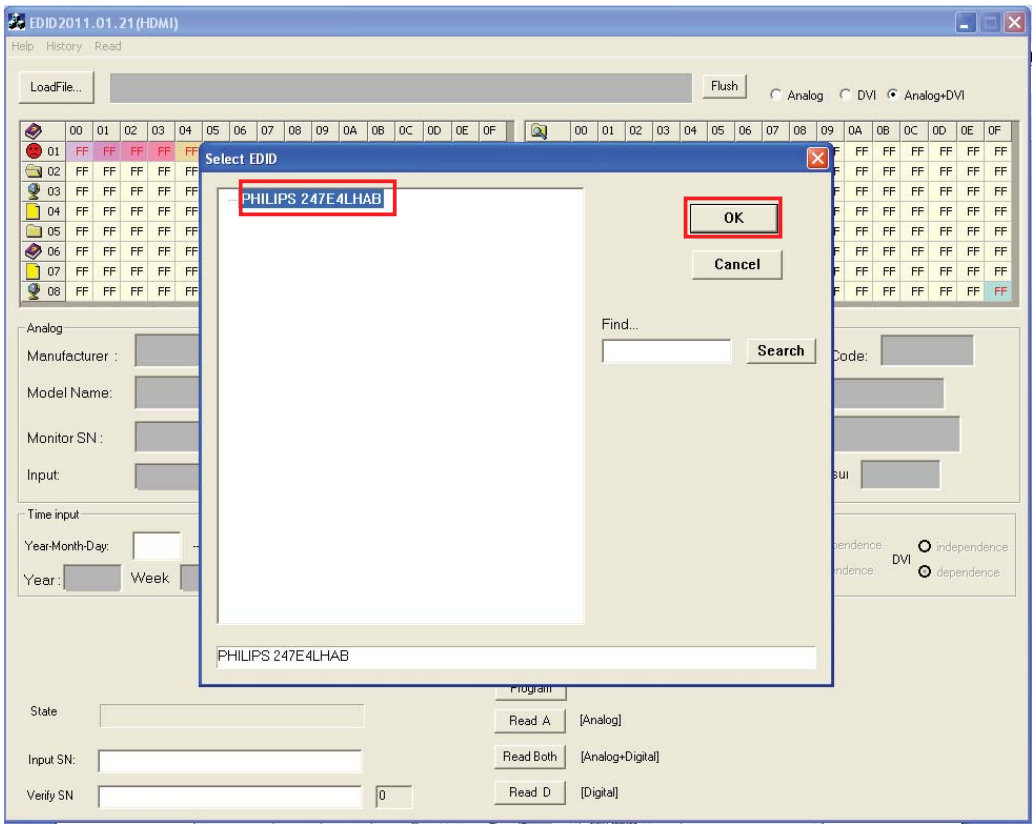
2. Tick the “Analog+DVI” and click “Loadfile” to set the parameters.

(1).Tick “Analog”, and “HDMI” .

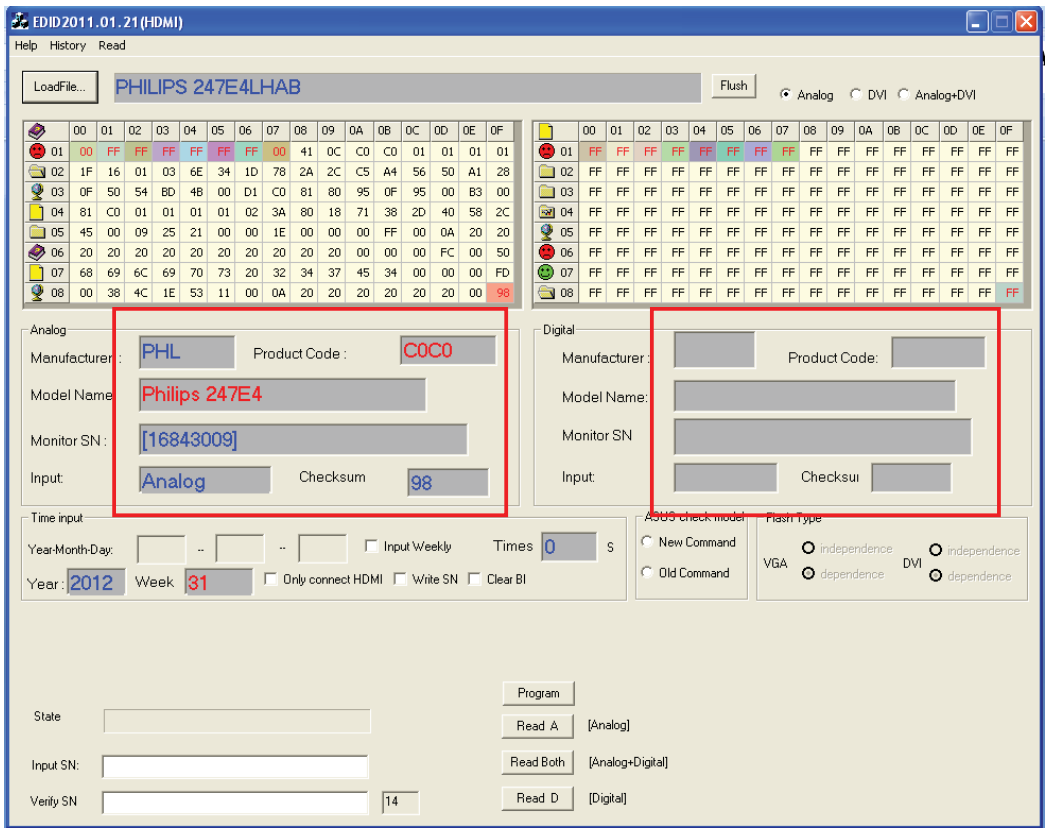
(2).Manufacturer: PHL Product Code: C0 C0 Model Name: 247E4



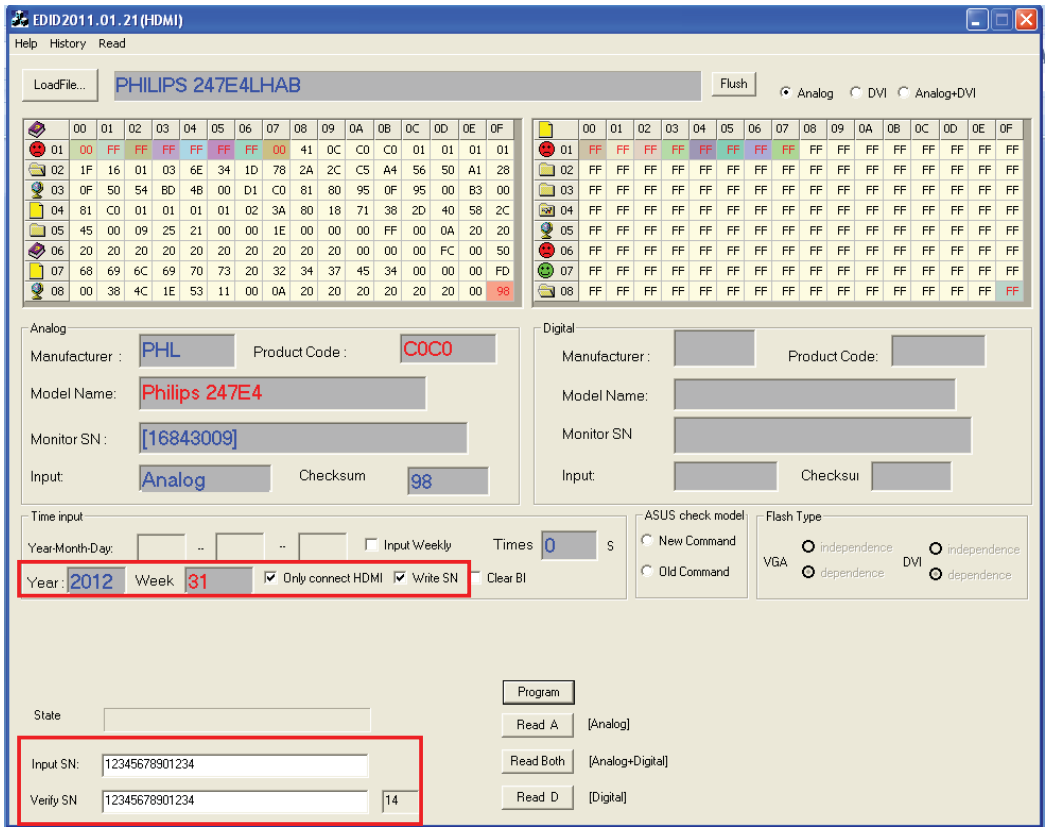
3. Select the EDID folder. Select correct folder.



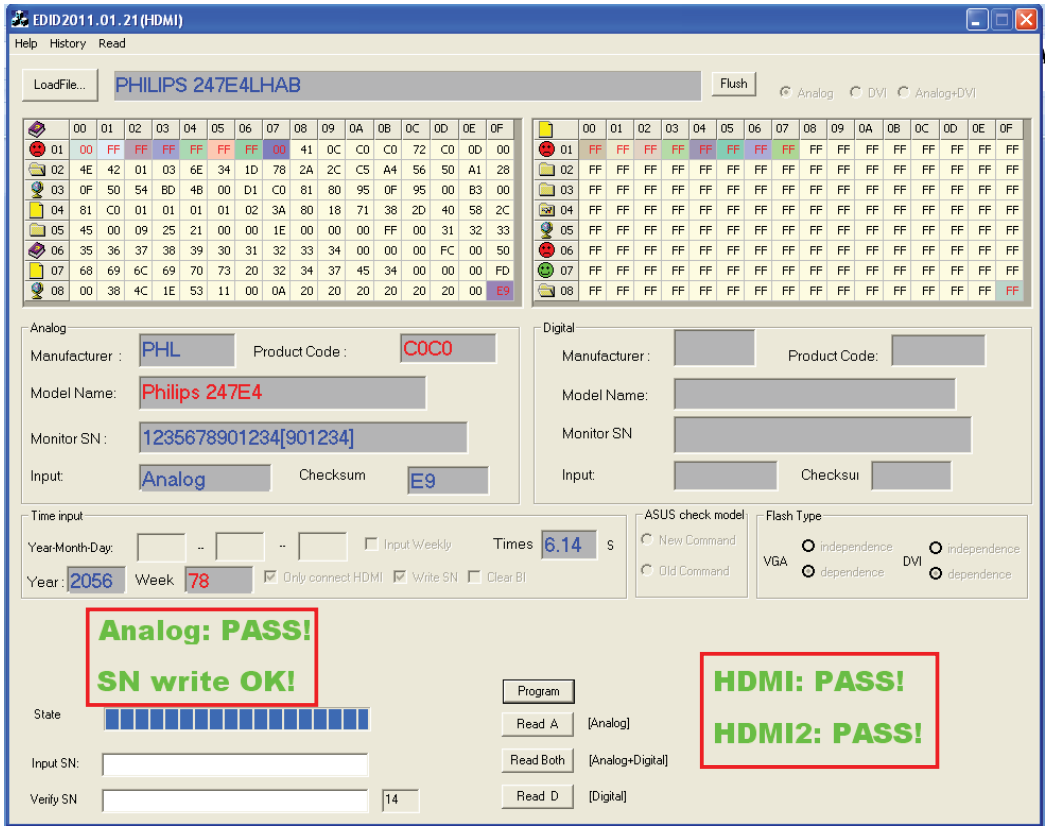
4. Load EDID successful.



5. Tick the “Only connect HDMI”and “write SN”, and type in the 14 digit S/N.

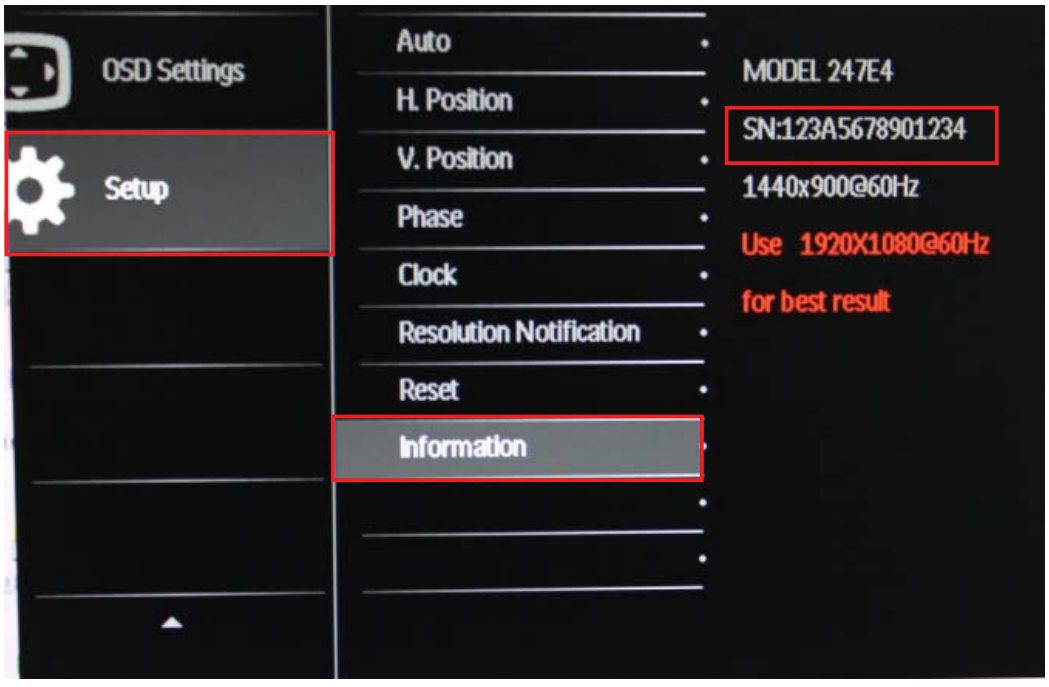


6. Start to writing. Click “Program” to start writing. When The green “PASS” appear, the process is finished.



7. Check the S/N in monitor user menu.

Press “MENU” and select “Information”—“SN”, you can check the SN.



13.5. Troubleshooting.

1. Can’t write!

(1)AC on the monitor and turn on it.(Restart the monitor)

(2)Although we write all EDID through by HDMI single port in this SOP, I can also write it one by one when can’t

write into.

(3)Take apart the monitor and connect the 7pin of EEPROM to GND to diable write protection then write EDID one by one.

(4)Set the Burn in on last to try again.

247E4LHAB/00 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 C0 C0 01 01 01 01
 10| 1F 16 01 03 6E 34 1D 78 2A 2C C5 A4 56 50 A1 28
 20| 0F 50 54 BD 4B 00 D1 C0 81 80 95 0F 95 00 B3 00
 30| 81 C0 01 01 01 01 02 3A 80 18 71 38 2D 40 58 2C
 40| 45 00 09 25 21 00 00 1E 00 00 00 FF 00 0A 20 20
 50| 20 20 20 20 20 20 20 20 20 20 00 00 00 FC 00 50
 60| 68 69 6C 69 70 73 20 32 34 37 45 34 00 00 00 FD
 70| 00 38 4C 1E 53 11 00 0A 20 20 20 20 20 20 00 98
```

EDID Structure Version/Revision: 01 03

<-Vendor/Product Identification:->

ID Manufacturer Name: PHL
ID Product Code: C0C0
ID Serial Number: No Use
Week of Manufacture: 31
Year of Manufacture: 2012

<-Basic Display Parameters/Features:->

Video i/p definition: Analog
Max. H. Image Size : 52cm
Max. V. Image Size : 29cm
Display Gamma : 2.2

<-Color Characteristics:->

Rx: 0.641 Gx: 0.314 Bx: 0.159 Wx: 0.313
Ry: 0.338 Gy: 0.629 By: 0.059 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 x1024 @ 75Hz VESA

Established Timings 3:00

<-Standard Timing Identification:->

1920 x 1080 @ 60Hz

1280 x 1024 @ 60Hz

1440 x 900 @ 75Hz

1440 x 900 @ 60Hz

1680 x 1050 @ 60Hz

1280 x 720 @ 60Hz

<-Detailed Timing Descriptions:->

FC (Monitor Name) : Philips 247E4

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) :

Detailed Timing : 1920x1080 @ 60Hz

Extension Flag : 00

Block0 Checksum : 98

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 C0 C0 01 01 01 01
10| 1F 16 01 03 80 34 1D 78 2A 2C C5 A4 56 50 A1 28
20| 0F 50 54 BD 4B 00 D1 C0 81 80 95 0F 95 00 B3 00
30| 81 C0 01 01 01 01 02 3A 80 18 71 38 2D 40 58 2C
40| 45 00 09 25 21 00 00 1E 00 00 00 FF 00 0A 20 20
50| 20 20 20 20 20 20 20 20 20 20 00 00 00 FC 00 50
60| 68 69 6C 69 70 73 20 32 34 37 45 34 00 00 00 FD
70| 00 38 4C 1E 53 11 00 0A 20 20 20 20 20 20 00 86
```

EDID Structure Version/Revision: 01 03

<-Vendor/Product Identification:->

ID Manufacturer Name: PHL
ID Product Code: C0C0
ID Serial Number: No Use
Week of Manufacture: 31
Year of Manufacture: 2012

<-Basic Display Parameters/Features:->

Video i/p definition: Digital
Max. H. Image Size : 52cm
Max. V. Image Size : 29cm
Display Gamma : 2.2

<-Color Characteristics:->

Rx: 0.641 Gx: 0.314 Bx: 0.159 Wx: 0.313
Ry: 0.338 Gy: 0.629 By: 0.059 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 x1024 @ 75Hz VESA

Established Timings 3:00

<-Standard Timing Identification:->

1920 x 1080 @ 60Hz

1280 x 1024 @ 60Hz

1440 x 900 @ 75Hz

1440 x 900 @ 60Hz

1680 x 1050 @ 60Hz

1280 x 720 @ 60Hz

<-Detailed Timing Descriptions:->

FC (Monitor Name) : Philips 247E4

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) :

Detailed Timing : 1920x1080 @ 60Hz

Extension Flag : 00

Block0 Checksum : 86

HDMI 1

```
     00 01 02 03 04 05 06 07 08 09 0A 0B 0C 0D 0E 0F
          ----------------------Block 0----------------------
  00| 00 FF FF FF FF FF FF 00 41 0C C0 C0 01 01 01 01
  10| 1F 16 01 03 80 34 1D 78 2A 2C C5 A4 56 50 A1 28
  20| 0F 50 54 BD 4B 00 D1 C0 81 80 95 0F 95 00 B3 00
  30| 81 C0 01 01 01 01 02 3A 80 18 71 38 2D 40 58 2C
  40| 45 00 09 25 21 00 00 1E 00 00 00 FF 00 0A 20 20
  50| 20 20 20 20 20 20 20 20 20 20 00 00 00 FC 00 50
  60| 68 69 6C 69 70 73 20 32 34 37 45 34 00 00 00 FD
  70| 00 38 4C 1E 53 11 00 0A 20 20 20 20 20 20 01 85
          ----------------------Block 1----------------------
  00| 02 03 22 F1 4F 01 02 03 05 06 07 10 11 12 13 14
  10| 15 16 1F 04 23 09 17 07 83 01 00 00 65 03 0C 00
  20| 10 00 02 3A 80 18 71 38 2D 40 58 2C 45 00 09 25
  30| 21 00 00 1E 8C 0A D0 8A 20 E0 2D 10 10 3E 96 00
  40| 09 25 21 00 00 18 01 1D 00 72 51 D0 1E 20 6E 28
  50| 55 00 09 25 21 00 00 1E 8C 0A D0 90 20 40 31 20
  60| 0C 40 55 00 09 25 21 00 00 18 00 00 00 00 00 00
  70| 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 F9

------------------------------------------------------------
Block 0:

EDID Structure Version/Revision: 01 03
<-Vendor/Product Identification:->
        ID Manufacturer Name:    PHL
        ID Product Code:           C0C0
        ID Serial Number:         No Use
        Week of Manufacture:     31
        Year of Manufacture:     2012


<-Basic Display Parameters/Features:->
        Video i/p definition:    Digital
        Max. H. Image Size :     52cm
        Max. V. Image Size :     29cm
        Display Gamma :            2.2


<-Color Characteristics:->
```

Rx: 0.641 Gx: 0.314 Bx: 0.159 Wx: 0.313
Ry: 0.338 Gy: 0.629 By: 0.059 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 x1024 @ 75Hz VESA
Established Timings 3:00

<-Standard Timing Identification:->
1920 x 1080 @ 60Hz
1280 x 1024 @ 60Hz
1440 x 900 @ 75Hz
1440 x 900 @ 60Hz
1680 x 1050 @ 60Hz
1280 x 720 @ 60Hz

<-Detailed Timing Descriptions:->
Detailed Timing : 1920x1080 @ 60Hz
FF (Monitor SN) :
FC (Monitor Name) : Philips 247E4
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

Extension Flag : 01

Block0 Checksum : 85

Block 1:

Extended Block Type: CEA 861B

Detailed Timing Blocks start at Byte: 22

DTV Underscan YES

DTV Basic Audio YES

YCbCr (4:4:4) YES

YCbCr (4:2:2) YES

<-Video Short Block Description:->

640 x 480 P 59.94/60Hz 4:3

720 x 480 P 59.94/60Hz 4:3

720 x 480 P 59.94/60Hz 16:9

1920 x 1080 I 59.94/60Hz 16:9

720(1440) x 480 I 59.94/60Hz 4:3

720(1440) x 480 I 59.94/60Hz 16:9

1920 x 1080 P 59.94/60Hz 16:9

720 x 576 P 50Hz 4:3

720 x 576 P 50Hz 16:9

1280 x 720 P 50Hz 16:9

1920 x 1080 I 50Hz 16:9

720(1440) x 576 I 50Hz 4:3

720(1440) x 576 I 50Hz 16:9

1920 x 1080 P 50Hz 16:9

1280 x 720 P 59.94/60Hz 16:9

<-Audio Short Block Description:->

Numbers of Audio Channels: 2

Audio Format Description: Linear PCM

Audio Supported: 96KHz 48KHz 44KHz 32KHz

Audio Bit Rate: 24bit 20bit 16bit

<-Speaker Allocation:->

Speaker Allocation: FL/FR

<-Detailed Timing Descriptions: ->

Detailed Timing Descriptions: 1920x1080 @ 60Hz

H Image Size: 521 mm V Image Size: 293 mm

Pixel Clock: 148 Hz Refreshed Mode: Non-Interlaced

Detailed Timing Descriptions: 720x480 @ 60Hz

H Image Size: 521 mm V Image Size: 293 mm

Pixel Clock: 27 Hz Refreshed Mode: Non-Interlaced

Detailed Timing Descriptions: 1280x720 @ 60Hz

H Image Size: 521 mm V Image Size: 293 mm

Pixel Clock: 74 Hz Refreshed Mode: Non-Interlaced

Detailed Timing Descriptions: 720x576 @ 50Hz

H Image Size: 521 mm V Image Size: 293 mm

Pixel Clock: 27 Hz Refreshed Mode: Non-Interlaced

Block1 Checksum : F9

HDMI 2

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

----------Block 0----------

00| 00 FF FF FF FF FF FF 00 41 0C C0 C0 01 01 01 01

10| 1F 16 01 03 80 34 1D 78 2A 2C C5 A4 56 50 A1 28

20| 0F 50 54 BD 4B 00 D1 C0 81 80 95 0F 95 00 B3 00

30| 81 C0 01 01 01 01 02 3A 80 18 71 38 2D 40 58 2C

40| 45 00 09 25 21 00 00 1E 00 00 00 FF 00 0A 20 20

50| 20 20 20 20 20 20 20 20 20 20 00 00 00 FC 00 50

60| 68 69 6C 69 70 73 20 32 34 37 45 34 00 00 00 FD

70| 00 38 4C 1E 53 11 00 0A 20 20 20 20 20 20 01 85

----------Block 1----------

00| 02 03 22 F1 4F 01 02 03 05 06 07 10 11 12 13 14

10| 15 16 1F 04 23 09 17 07 83 01 00 00 65 03 0C 00

20| 20 00 02 3A 80 18 71 38 2D 40 58 2C 45 00 09 25

30| 21 00 00 1E 8C 0A D0 8A 20 E0 2D 10 10 3E 96 00

40| 09 25 21 00 00 18 01 1D 00 72 51 D0 1E 20 6E 28

50| 55 00 09 25 21 00 00 1E 8C 0A D0 90 20 40 31 20

60| 0C 40 55 00 09 25 21 00 00 18 00 00 00 00 00 00

70| 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 E9

Block 0:

EDID Structure Version/Revision: 01 03

<-Vendor/Product Identification:->

ID Manufacturer Name: PHL

ID Product Code: C0C0

ID Serial Number: No Use

Week of Manufacture: 31

Year of Manufacture: 2012

<-Basic Display Parameters/Features:->

Video i/p definition: Digital

Max. H. Image Size : 52cm

Max. V. Image Size : 29cm

Display Gamma : 2.2

<-Color Characteristics:->

Rx: 0.641 Gx: 0.314 Bx: 0.159 Wx: 0.313

Ry: 0.338 Gy: 0.629 By: 0.059 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 x1024 @ 75Hz VESA

Established Timings 3:00

<-Standard Timing Identification:->

1920 x 1080 @ 60Hz

1280 x 1024 @ 60Hz
1440 x 900 @ 75Hz
1440 x 900 @ 60Hz
1680 x 1050 @ 60Hz
1280 x 720 @ 60Hz

<-Detailed Timing Descriptions:->
Detailed Timing : 1920x1080 @ 60Hz
FF (Monitor SN) :
FC (Monitor Name) : Philips 247E4
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

Extension Flag : 01
Block0 Checksum : 85

Block 1:

Extended Block Type: CEA 861B
Detailed Timing Blocks start at Byte: 22
DTV Underscan YES
DTV Basic Audio YES
YCbCr (4:4:4) YES
YCbCr (4:2:2) YES

<-Video Short Block Description:->
640 x 480 P 59.94/60Hz 4:3
720 x 480 P 59.94/60Hz 4:3
720 x 480 P 59.94/60Hz 16:9
1920 x 1080 I 59.94/60Hz 16:9
720(1440) x 480 I 59.94/60Hz 4:3
720(1440) x 480 I 59.94/60Hz 16:9
1920 x 1080 P 59.94/60Hz 16:9

720 x 576 P 50Hz 4:3

720 x 576 P 50Hz 16:9

1280 x 720 P 50Hz 16:9

1920 x 1080 I 50Hz 16:9

720(1440) x 576 I 50Hz 4:3

720(1440) x 576 I 50Hz 16:9

1920 x 1080 P 50Hz 16:9

1280 x 720 P 59.94/60Hz 16:9

<-Audio Short Block Description:->

Numbers of Audio Channels: 2

Audio Format Description: Linear PCM

Audio Supported: 96KHz 48KHz 44KHz 32KHz

Audio Bit Rate: 24bit 20bit 16bit

<-Speaker Allocation:->

Speaker Allocation: FL/FR

<-Detailed Timing Descriptions: ->

Detailed Timing Descriptions: 1920x1080 @ 60Hz

H Image Size: 521 mm V Image Size: 293 mm

Pixel Clock: 148 Hz Refreshed Mode: Non-Interlaced

Detailed Timing Descriptions: 720x480 @ 60Hz

H Image Size: 521 mm V Image Size: 293 mm

Pixel Clock: 27 Hz Refreshed Mode: Non-Interlaced

Detailed Timing Descriptions: 1280x720 @ 60Hz

H Image Size: 521 mm V Image Size: 293 mm

Pixel Clock: 74 Hz Refreshed Mode: Non-Interlaced

Detailed Timing Descriptions: 720x576 @ 50Hz

H Image Size: 521 mm V Image Size: 293 mm

Pixel Clock: 27 Hz Refreshed Mode: Non-Interlaced

Block1 Checksum : E9

14. White Balance, Luminance Adjustment

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

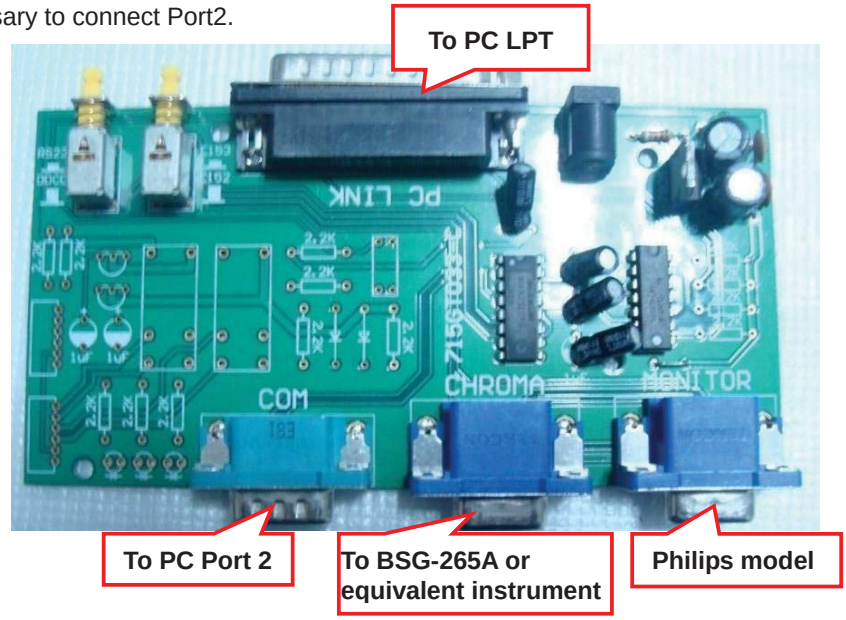
2. Equipment installation:

a. 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

b. Install Port95NT drive program, set PC printer connector mode as ECP mode and reset PC after finish installing.

c. Connect tool as follow:

Note: It's not necessary to connect Port2.



3. Adjustment

Preparation before adjustment:

a. Monitor should be warmed up for more than half an hour.

b. Make sure that the tools are connected right and drive programs have been installed OK.

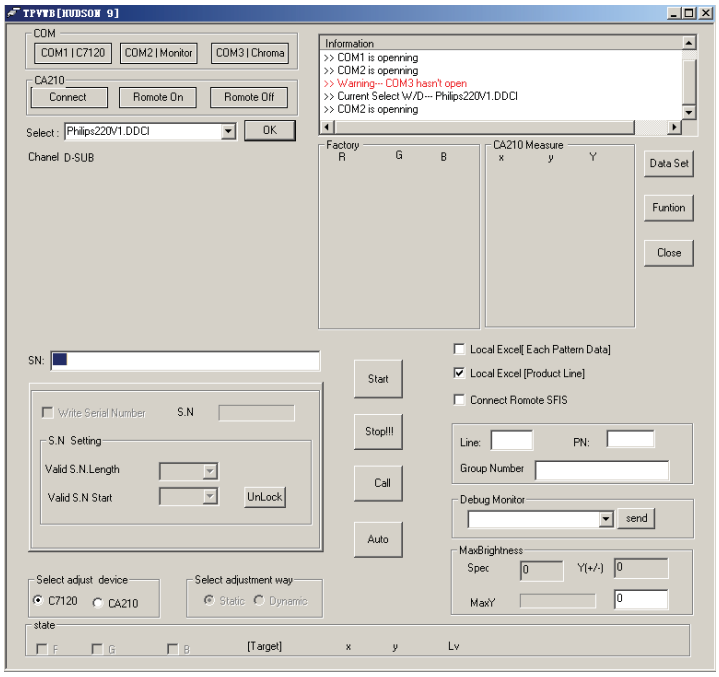
4. Adjustment process:

a. Press the power of CA-210, shut off the lens, press 0-Cal and open the lens after analyzer reset.

b. Open white balance adjustment program, select the right parameter according with the program and click OK.

c. Make sure that the lens of CA-210 aims at the center of the screen, then click START to adjust.

d. After finish adjusting, the adjustment program displays pass, and the START button changes for NEXT, which means that you can adjust another monitor.



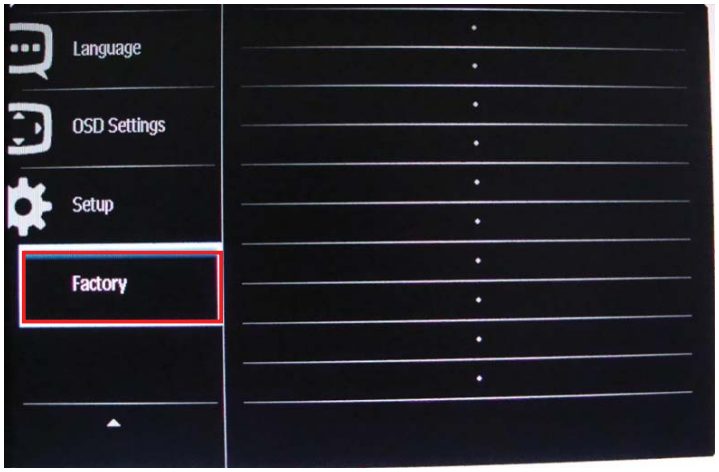
5. Color Temp confirmation

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

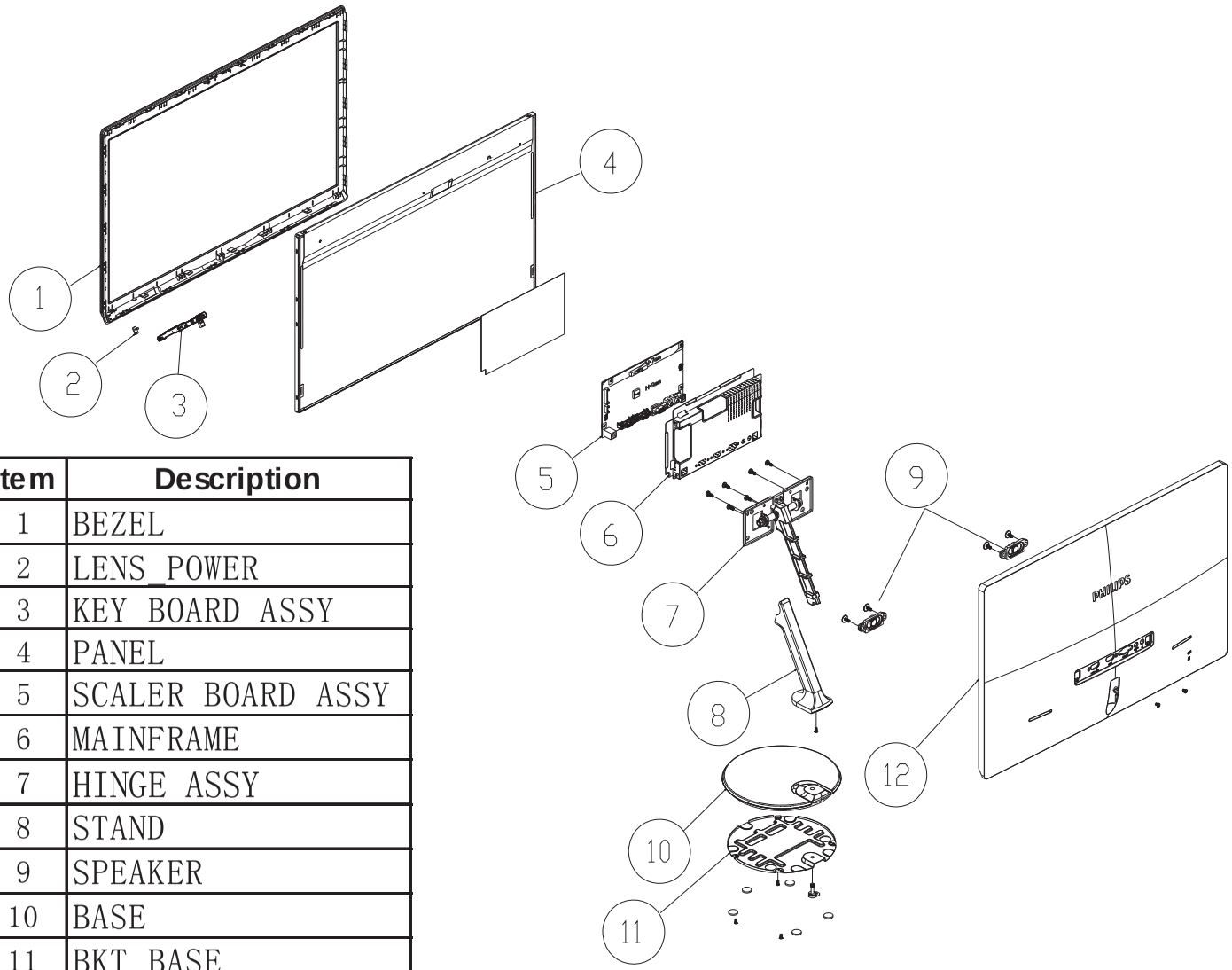
6. How to enter into the factory mode:

1. Connect the video 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.



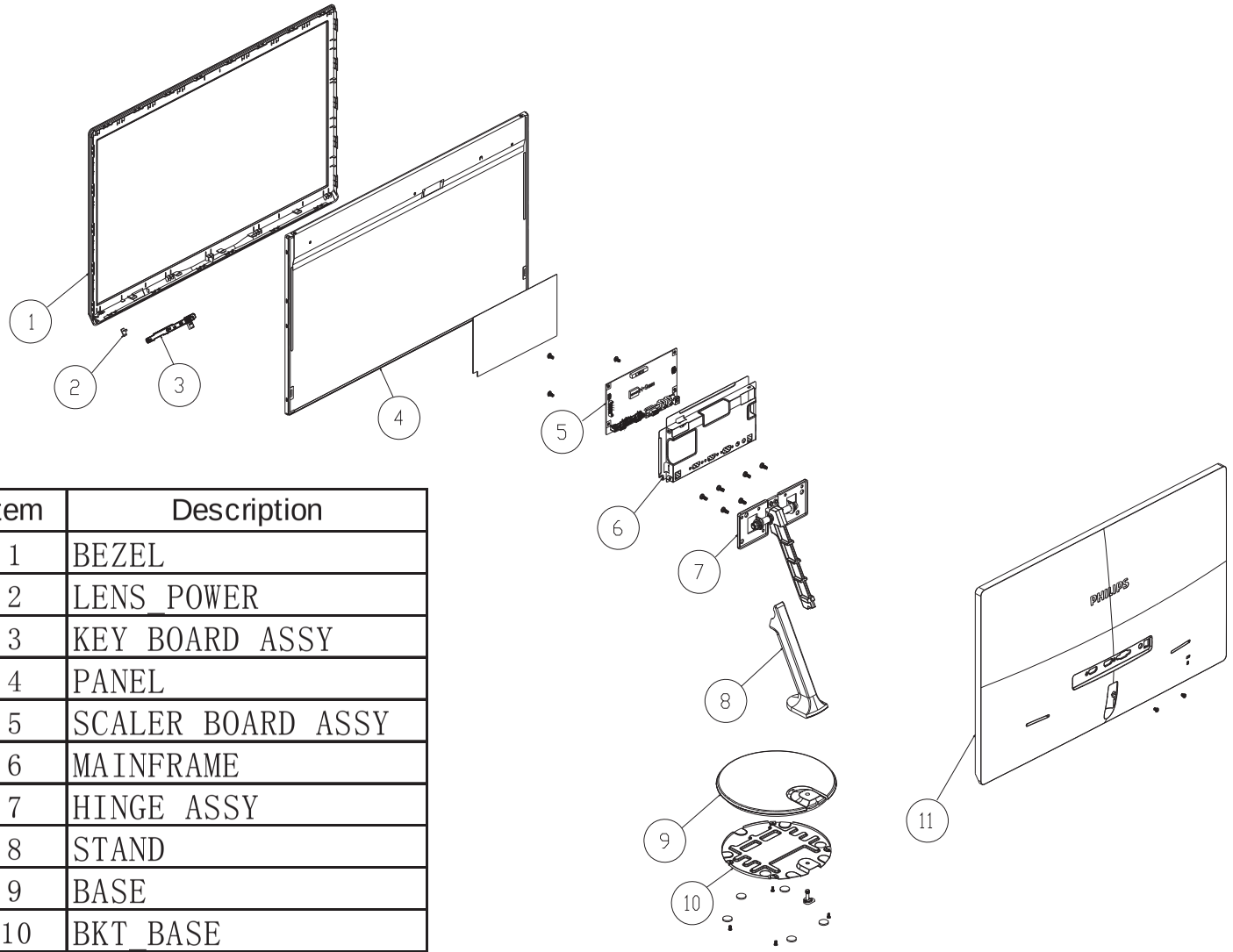
15. Monitor Exploded View

247E4LHAB/00



Item	Description
1	BEZEL
2	LENS_POWER
3	KEY_BOARD_ASSY
4	PANEL
5	SCALER_BOARD_ASSY
6	MAINFRAME
7	HINGE_ASSY
8	STAND
9	SPEAKER
10	BASE
11	BKT_BASE
12	REAR_COVER

247E4LHSB/00



Item	Description
1	BEZEL
2	LENS_POWER
3	KEY BOARD ASSY
4	PANEL
5	SCALER BOARD ASSY
6	MAINFRAME
7	HINGE ASSY
8	STAND
9	BASE
10	BKT_BASE
11	REAR_COVER

16. Recommended & Spare Parts List

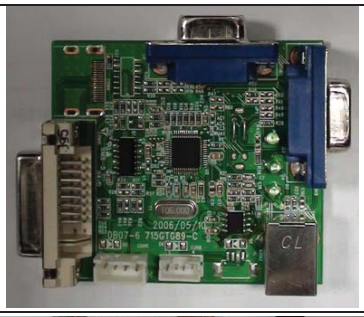
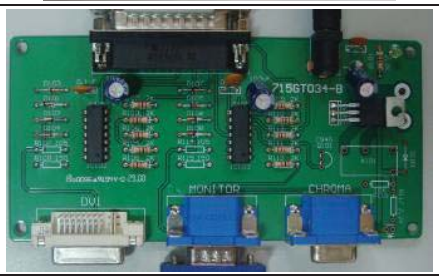
Note: Take the 247E4LHAB/00 BOM for example. The following information of initial version BOM are only for reference of repair, not place the order as the basis and are subject to change without notice. Please base on RSPL or Service BOM (http://cs.tpv.com.cn) , thank you!

Item	Location	PCM Codes	Description	Remark
1	FQ105	A34G3106AFLB3B0130	BEZEL	
2	FQ153	A33G1333 2 1C0100	LENS_POWER	
4	E750	750GBV236GE231N000	LCD TPM236H3-HGEL02 C1C FQ TPV	
5	FQ002	CBPCVN7PHQ1	SCALER BOARD ASSY	
6	FQ124	A15G1803L01401 ZA	MAINFRAME	
7	FQ104	A37G03120120FH	HINGE ASSY	
8	FQ119	A34G2942AFL 1B0100	STAND	
9	SP01	378G0025518YAC	SPEAKER 4 OHM 2.5W 40X20 50mm NO	
10	FQ109	A34G2941AFL 1B0100	BASE	
11	FQ143	A15G1855101	BKT_BASE	
12	FQ106	A34G3107AFL 5B0100	REAR_COVER	
	E08904	089G 17356G553	AUDIO CABLE 1800MM	
	E08902	089G 725CAA 2G	D-SUB CABLE 1500MM	
	E08901	089G404A15N HL	AC POWER CORD 1500mm	
	ECN802	095G8014 6XM10	HARNESS 6P(2008)-6P(CI1406S) 290mm	
	ECN408	395G179E30NF36	FFC CABLE 30P 154 1.0MM	
	ECN604	395G801404X651	HARNESS 4P-2P+2P 430/145	
	FQ003	ADPCB1945YN1	POWER BOARD ASSY	
	IC903	056G 139 3A	PC123Y22FZOF SHARP	
	IC904	056G 158501	IC AS431AN-E1 SOT23	
	IC901	056G 379190	AC/DC CONVERTER LD7750RGR SOP-7	
	F901	084G 56 4 B	FUSE 4A 250V	
	T901	S80GL19P522V	X'FMR 620UH 5%	
	FQ002	756GQCCB0PH0950000	SCALER BOARD ASSY(CBPC*)	
	U402	100GPNVD006NT1	PHILIPS 247E4LHAB	
	U401	056G 562A61	MCU ASSY(056G2233501)	
	U704	056G 563145	IC AZ1117D-1.2TRE1 1A/1.2V TO252-2	
	U702	056G 563204 C	HF LDO G960PT43U 1A 3.3V TO-252	
	U601	056G 616112	AUDIO APA2606NAI-TRG 2.8W SSOP-24P	
	U107	056G 662 21	IC AOZ8804DI DFN-10	
	U101	056G 662 52	ESD PROTECT AZC398-04S.R7G SOT23-6	
	U105	056G1133 34 1	EEPROM M24C02-RMN6TP 2Kb SO-8	
	U705	356G0563419	DC/DC APW7089KAI-TRG 4A 26V SOP-8P	
	FQ004	KEPCVQP9	KEY BOARD ASSY	
	U001	056G 669 45	TOUCH KEY IT7230EFN/BX QFN16	

247E4LHSB/00

Item	Location	PCM Codes	Description	Remark
1	FQ105	A34G3106AFLC3B0130	BEZEL	
2	FQ153	A33G1333 2 1C0100	LENS_POWER	
3	FQ004	KEPCVQP9	KEY BOARD ASSY	
4	E750	750GBV236GE231N000	LCD TPM236H3-HGEL02 C1C FQ TPV	
5	FQ002	CBPCVN7PHQ2	SCALER BOARD ASSY	
6	FQ124	A15G1803L01401 ZA	MAINFRAME	
7	FQ104	A37G03120120FH	HINGE ASSY	
8	FQ119	A34G2942AFL 1B0100	STAND	
9	FQ109	A34G2941AFL 1B0100	BASE	
10	FQ143	A15G18551020WD	BKT_BASE	
11	FQ106	A34G3107ANG06B0100	REAR_COVER	
	E08902	089G 725CAA 2G	D-SUB CABLE 1500MM	
	ECN802	095G8014 6XM10	HARNESS 6P(2008)-6P(CI1406S) 290mm	
	E08901	389G404A15NHLP	AC POWER CORD 1500 for Europe	
	ECN408	395G179E30NF36	FFC CABLE 30P 154 1.0MM	
	FQ205	705GQCCS044216	EPS ASSY	
	FQ202	Q44GK07781302A0PY2	ARTWORK CARTON	
	FQ218	Q45G990160940900X1	PROTECT BAG	
	FQ002	756GQCCB0PH0960000	SCALER BOARD ASSY(CBPC*)	
	U402	100GPNVD008NT1	MCU ASSY(056G2233501)	
	X401	093G 2251B J	CRYSTAL 12MHZ NXS12.000AC30F-KAB10	
	U401	056G 562A61	SCALER NT68753UMFG LQFP-128	
	U704	056G 563145	IC AZ1117D-1.2TRE1 1A/1.2V TO252-2	
	U702	056G 563204 C	HF LDO G960PT43U 1A 3.3V TO-252	
	U601	056G 616112	AUDIO APA2606NAI-TRG 2.8W SSOP-24P	
	U107	056G 662 21	IC AOZ8804DI DFN-10	
	U103	056G 662 52	ESD PROTECT AZC398-04S.R7G SOT23-6	
	U108	056G1133 34 1	EEPROM M24C02-RMN6TP 2Kb SO-8	
	U001	056G 669 45	TOUCH KEY IT7230EFN/BX QFN16	
	FQ003	ADPCB1945YN1	POWER BOARD ASSY	
	IC903	056G 139 3A	PC123Y22FZOF SHARP	
	F901	084G 56 4 B	FUSE 4A 250V	
	T901	S80GL19P522V	X'FMR 620UH 5%	
	IC904	056G 158501	IC AS431AN-E1 SOT23	
	IC901	056G 379190	AC/DC CONVERTER LD7750RGR SOP-7	

Service Kit

Description	Part No.	Picture
ISP TOOL	715GT089-B/C	
EDID TOOL	715GT034-B	

17. General Product Specification

. ANALOG and DVI dual input (DVI can be optional)

. AUTO PICTURE ADJUSTMENT

. 16 FACTORY PRESET MODES and 42 USER MODES

. USER FRIENDLY OSD DISPLAY FOR MODE IDENTIFICATION /ADJUSTMENT

. MAX. RESOLUTION 1920*1080 NON-INTERLACED AT 60 HZ

. 23.6” WIDE FHD 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 7compliant

. HDCP support for DVI input

. SMART Contrast 20M:1(max.)

. True Vision (FACTORY GAMMA ALIGNMENT) (FGA) REQUIREMENT

. POWER ON PHILIPS LOGO REQUIREMENT

. WEEE REQUIREMENT

. RoHS REQUIREMENT

Quick Specification table:

Model	Input	Feature
247E4QSD	1A1D	XPS/APS panel
247E4QHKAD	1A2H+OD+MHL+Speaker+Webcam	XPS/APS panel
247E4QHAD	1A2H+OD+MHL+Speaker	XPS/APS panel
247E4QHSD	1A2H+OD+MHL+HDMI audio out	XPS/APS panel
247E4LSB	1A1D	TN panel
247E4LHAB	1A2H+OD+Speaker	TN panel
247E4LHSB	1A2H+OD+HDMI audio out	TN panel

FOREWORD

This specification describes a 23.6" FHD multi-scan color TFT LCD monitor with maximum resolution up to 1920 x 1080 /60Hz non-interlaced. This model uses 250nits panel.

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

PRODUCT PROFILE

EDID header

Data for EDID & .inf file

1	User visible strings on .inf file	Philips 247E4 (24inch Wide LCD MONITOR 247E4)
2	Manufacturer ID (EDID data)	PHL
3	Product ID, "xxxx" 4 codes	MSB(byte 12): C0
		LSB (byte 11): C0
4	maximum resolution	1920x1080
5	Horizontal Frequency Range	30~83 KHz
6	Vertical Frequency Range	56~76Hz
7	Monitor Name (13 characters max.)	Philips 247E4

LCD

Suppliers to offer panel specifications.

Panel incoming specification: Follow Philips' specification.

CMI

Type NR. : LCD M236HFE-L30 C1/C2 NB
Resolution : 1920 x 1080 (Full HD)
Outside dimensions : 544.8(H) Typ. x 320.5(V) Typ. x 11.0(D) Typ.
Pitch (mm) : 0.2715mm x 0.2715mm
Color pixel arrangement : RGB vertical stripe
Display surface : AG type,Hard coating (3H),Haze 25
Color depth : 16.7M
Backlight : LED
Active area (W x H) : 521.22(H) x 293.22(V) mm
View angle (CR=10) : =178 for Right/Left (Typ)
: =178 for Up/Down (Typ)
Contrast ratio : 1000:1 (Typ), 700:1(Min.)
White luminance : 250cd/m2(Typ.), 200cd/m2(Min.)
Color gamut : 72% (Typ.)
Gate IC : Fiti/Novatek
Source IC : Fiti/Novatek
Response time : Tr + Tf <=14 ms (Typ)
Vertical frequency range : 50~75Hz

CMI-TPM

Type NR. : LCD TPM236H3-HGEL02 C1C FQ TPV
Resolution : 1920 x 1080 (Full HD)
Outside dimensions : 544.8(H) Typ. x 320.5(V) Typ. x 10.5(D) Typ.
Pitch (mm) : 0.2715mm x 0.2715mm
Color pixel arrangement : RGB vertical stripe
Display surface : AG type,Hard coating (3H),Haze 25
Color depth : 16.7M colors
Backlight : LED
Active area (W x H) : 521.28(H) x 293.22(V) mm

View angle (CR>=10): R/L 170(Typ.), U/D 160(Typ.)
Contrast ratio : 700:1(min.), 1000:1 (Typ)
White luminance : 200 cd/m2(Min.), 250 cd/m2(Typ.)
Color gamut : 72% (Typ.)
Gate IC : Novatek
Source IC : Novatek
Response time : <=5 ms (Typ)
Vertical frequency range : 50~75Hz

Scanning frequencies

Hor. : 30 – 83 K Hz
Ver. : 56 - 76 Hz
Video dot rate: < 170 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 ± 2 Hz
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
c. XS SYNC SELECT: H EOR V
(3) DVI digital Panel Link TMDS inputs, HDCP supported.

Ambient temperature:

0 °C - 40 °C

Power Range

FULL RANGE POWER SUPPLY 90 – 264 VAC

MHL Chargers

247E provides 500mA/5V charging to MHL device and 5V tolerance is 4.75V to 5.25V

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 SmartContras, 20M:1 DCR preferred
4) VGA signal Auto adjustment:
Monitor automatically adjusts and optimizes resolution and frequency based on input signal defined by “Source” function. “NO VIDEO INPUT” (source)”(Note A)message to be displayed on screen while no signal is detected. Monitor will automatically optimize resolution and frequency whenever connected to different signal source. When press the “Auto”, the screen also show a status bar. During adjustment period, a status bar will show on screen from 0% to 100% to indicate the progress of adjustment.
Auto auto adjustment : new timing & preset modes (non- factory preset mode) should do auto adjustment at first time detection and save the related date into memory.
Resolution ≦ 800x600 , do not do auto auto adjustment.

Note A : source mybe D-SUB,DVI,HDMI

Interface signals

1). 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)

2). DVI-D Digital

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

3) HDMI (option , refer to Quick specification table)

Follow HDMI 1.4 specification

4). MHL

The MHL specification is an HD video and digital audio interface optimized for connecting mobile phones and portable devices to displays(Monitor/TV) and other home entertainment products. It features a single cable with a 5-pin interface able to support up to 1080p HD video and digital audio while simultaneously providing power to the mobile device.

TMDS channel:

- Carries audio, video and auxiliary data.
- Signaling method: According to DVI 1.0 specification. Single-link (Type A HDMI).
- Video pixel rate: 25 MHz to 165 MHz (Type A)
- Pixel encodings: RGB 4:4:4, YCbCr 4:2:2, YCbCr 4:4:4.
- Audio sample rates: 32 kHz, 44.1 kHz, 48 kHz
- Audio channels: **2.**

DDC channel:

- Allows source to interrogate capabilities of sink.
- I²C signaling with 100 kHz clock.
- E-EDID data structure according to EIA/CEA-861D and VESA Enhanced EDID.

Content protection:

According to High-Definition Content Protection (HDCP) Specification 1.10.

HDMI video input should support timing defined in **CEA 861-D** specification with extended EDID blocks

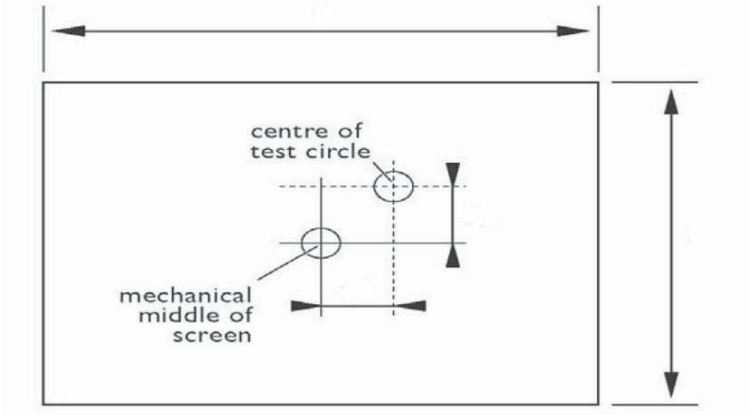
Video Timing Support :

Format	Resolution	Type	Vertical frequency
480p	720 x 480	SD	60Hz
576p	720 x 576	SD	50Hz
720p	1280 x 720	HD	50Hz , 60Hz
1080i	1920 x 1080	HD	50Hz , 60Hz
1080p	1920 x 1080	HD	50Hz, 60Hz

MHL Timing:

Format	Resolution	Type	Vertical frequency
480p	640 x 480	SD	60Hz
480p	720 x 480	SD	60Hz
576p	720 x 576	SD	50Hz
720p	1280 x 720	HD	50Hz , 60Hz

- Picture centering - H & V ≤ 0.5 %. (for TV, 480i/p, 576i/p, 720p, 1080i/p)



Over Scan -

1. RGB signal : OFF (no this function)
2. YUV signal : (Video timming) ON (Be use and set ON/OFF)
   (But only 1080p define is OFF)

PC timing: to follow PC timing table

TMDS/+5V/DDC/HPD/CEC Signals

(TMDS Signal)

Termination Supply Voltage AV_{CC}	:	3.3V±5%
Differential Voltage Level :		150mV – 1200mV
Common Mode Voltage :		(AV_{CC} – 300mV) – (AV_{CC} – 37.5mV)
Differential Sensitivity :		150mVp-p
Maximum differential Voltage :		1560mVp-p

(+5V Power)

Power Supply Voltage :	4.7V – 5.3V
Maximum Current Consumption :	50mA

(DDC Signal)

Maximum Capacitance :	50pF

(HPD Signal)

High Voltage Level :	2.4V – 5.0V
Low Voltage Level :	0 – 0.4V
Output Resistance :	1KΩ±20%

(CEC Signal, not supported by this model)

Input Low Voltage :	< 0.8V
Input High Voltage :	> 2.0V
Output Low Voltage:	0 – 0.4V
Output High Voltage:	2.5V – 3.6V
Pull-up Resistor:	2.7KΩ±10%
Leakage Current in standby/off :	< 1.8uA
Maximum Capacitance:	100pF

4). DisplayPort (option , refer to Quick specification table)
Follow DisplayPort 1.1 specification.

5). USB Hub 2.0 (option , refer to Quick specification table)
USB port (1 upstream, 2 or 4 downstream)

6). Audio in (option , refer to Quick specification table)
Input signal: 1Vrms
Loudspeaker: stereo of RMS Power
Frequency range: (WAIT FOR SUPPLIER INPUT)
Headphone connection will mute speaker

7). USB PLUG (option , refer to Quick specification table)
USB port (1 upstream, 1 downstream), black jack color

8). HDMI audio out (headphone): (option, refer to Quick specification table)
Stereo, > 50mVrms for headphone of 32Ω

Interface

D-Sub Cable

Length : Please refer to M3 cable bundle summary file
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 No.	SIGNAL
1	Red
2	Green/ SOG
3	Blue
4	Sense (GND)
5	Cable Detect (GND)
6	Red GND
7	Green GND
8	Blue GND
9	DDC +3.3V or +5V
10	Logic GND
11	Sense (GND)
12	Bi-directional data
13	H/H+V sync
14	V-sync
15	Data clock

DVI Cable

The input signals are applied to the display through DVI-D cable.
Length : Please refer to M3 cable bundle summary file
Connector type : DVI-D male with DDC-2B pin assignments
White connector thumb-operated jackscrews
With transplant pin protective cover.

Pin Assignment:

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

19	T.M.D.S. data0 shield
20	No Connect
21	No Connect
22	T.M.D.S clock shield
23	T.M.D.S. clock+
24	T.M.D.S. clock-

HDMI Cable

The input signals are applied to the display through HDMI cable.

Length : Please refer to M4 cable bundle summary file

Connector type : HDMI male with DDC-2B pin assignments
White connector thumb-operated jackscrews
With transplant pin protective cover.

Pin Assignment:

Pin No.	Description
1	TMDS Data2+
2	TMDS Data2 Shield
3	TMDS Data2–
4	TMDS Data1+
5	TMDS Data1 Shield
6	TMDS Data1–
7	TMDS Data0+
8	TMDS Data0 Shield
9	TMDS Data0–
10	TMDS Clock+
11	TMDS Clock Shield
12	TMDS Clock–
13	CEC
14	Reserved (HDMI 1.0-1.3c), HEC Data- (Optional, HDMI 1.4+ with Ethernet)
15	SCL (I²C Serial Clock for DDC)
16	SDA (I²C Serial Data Line for DDC)
17	DDC/CEC/HEC Ground
18	+5 V Power (max 50 mA)
19	Hot Plug Detect (All versions) and HEC Data+ (Optional, HDMI 1.4+ with Ethernet)

Timing requirement

Factory Preset mode definition:

1. Perfect FOS while presenting those timings.
2. Will specify those timing in User's Manual

Preset mode definition:

1. Need to support those timings.
2. Perfect FOS after auto adjustment.

User mode

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

Mode storing capacity

Factory preset modes : Refer to Timing table_

preset modes : Refer to Timing table
User modes : Refer to Timing table

Timing pixel clock over H/W limitation do not support.
Timing pixel clock over H/W limitation do not support.
VGA Video timing : interlace modes do not support.

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


01. M3 and M4 Timing table_2012

2. Video timing mode for DVI/HDMI (internal firmware support) ,
   60Hz: 480p/720p/1080i/1080p
   50Hz: 576p/720p/1080i/1080p

OSD/Keypad functions

ITEM			
1	OSD/keypad definition	 M3 MICON SPEC_20110406.doc	Reset - No: Exit Yes: Auto adjustment for displaying timing mode and recall factory preset
2	OSD Translation	 OSD_String_M4_20111128.xlsx  M4 OSD Button definition _ 2012	English, French, German, Spanish, Italian, Russian, Simplified Chinese, Portuguese, Turkish (9)
3	Power On logo	 Philips_Logo_1920x1080.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.
4	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	

Horizontal scanning

Sync polarity : Positive or Negative
Scanning frequency : 30 – 83 K Hz

PS : Item 3.4 and 3.5 , as far as possible to be display (another Horizontal and Vertical)

Vertical scanning

Sync polarity : Positive or Negative
Scanning frequency : 56 - 76 Hz

Power input connection

Power cord length :please refer to M4 cable bundle summary file
Power cord type : 3 leads power cord with protective earth plug.

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	<35W (typ.) < 45W (max.) (MHL+SPK<54W(max.))	White LED	--
Standby (Sleep mode)	Off	Off	Blanked	< 0.5W	Blinking white LED Period 3ec on, 3sec off	Note 1 Note 2
DC Power Off			N/A	< 0.3W	LED Off	

Note 1 :

a. D-SUB ,HDMI mode,
Normal node to Power saving mode: 19/s (typ.)
Power saving mode to Normal: 4/s(typ.)
Source / timming change : 10/s (typ.)

b. DVI mode,
Normal node to Power saving mode: 19/s(typ.)
Power saving mode to Normal: 10s(typ.)
Source / timing change : 10/s (typ.)

Note 2 :

Measurement power Saving.

measurement of power saving.pdf Power consumption measure the way -090

PS: SmartImage Economy mode: < EPA5.0 spec. (Brightness=20%)
EPA 5.0 spec. as below

Note 3 :

1. < 0.34Watt -- 測試三台, 符合 即 pass
2. 判斷規範 0.3Watt(typ.) -- < 0.34Watt

Panel size	Native resolution	Max. Power (W)
16"(16:9)	1366x768	14.5
17"(4:3)	1280x1024	21.9
17"(16:10)	1440x900	21.2
18.5"(16:9)	1366x768	16.6
19"(16:10)	1440x900	22.7
19"(4:3)	1280x1024	23.6
20"(16:10)	1680x1050	28
20"(16:9)	1600x900	24.5
22"(16:10)	1680x1050	30
22"(16:9)	1920x1080	31.6
23"(16:9)	1920x1080	32.9

24"(16:10)	1920x1200	36.8
24"(16:9)	1920x1080	34

EPA 5.1 VS EPA6.0

Maximum On Mode Power Requirements ($P_{ON\ MAX}$)				
Veiwable Diagonal screen size (inch) d < 30.0		A (inch²)	EPA displays v.5.1 Tier 1 2009-10-30	EPA displays v.6.0 draft 2 2012-09-30
			$P_{ON\ MAX}$ (W), A in inch²	$P_{ON\ MAX}$ (W), A in inch²
d < 12.0				
12.0 ≤ d < 25.0	15.6	104.0	14.5	11.8
	17	141.0	21.8	13.9
	18.5	146.2	16.6	12.4
	19	176.1	23.6	14.4
	19	162.2	22.8	14.1
	20	170.9	24.5	15.1
	21.5	197.5	31.5	19.3
	22	217.5	29.8	17.7
	23	226.0	33.0	19.7
	23.6	238.0	33.6	19.9
	24	258.9	36.7	21.6
25.0 ≤ d < 30.0	25	267.1	35.0	20.5
	26	288.9	36.1	24.4
	27	311.5	37.2	28.5
	28	352.4	41.4	37.2

VGA Display identification

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

DVI Display identification

In accordance with DVI requirement (DDWG digital Visual Interface revision 1.0)

use DDC-2B, DDC/CI, and EDID V1.3

DDC /CI Support and Smart Manage/Control

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

Hot-key definition

M4 OSD Button definition _ 2012(

Smart image

03. OSD_Function definition_20111205-

PerfectTune II (formerly FGA, FACTORY GAMMA Alignment)

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 < 10

audio

3.17.1 Frequency Response

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

3.17.2 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 1.0Vrms.

3.17.3 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.

3.17.4 Audio Amplifier

The amplifier shall provide two channels of audio up to 2.0 Watts per channel from 100 Hz to 20 kHz, based upon an audio signal input of 1.0V RMS per channel.

3.17.5 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%.

3.17.6 Speaker Sensitivity

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

3.17.7 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.

Voltage dividers may be used to reduce the input signal level.

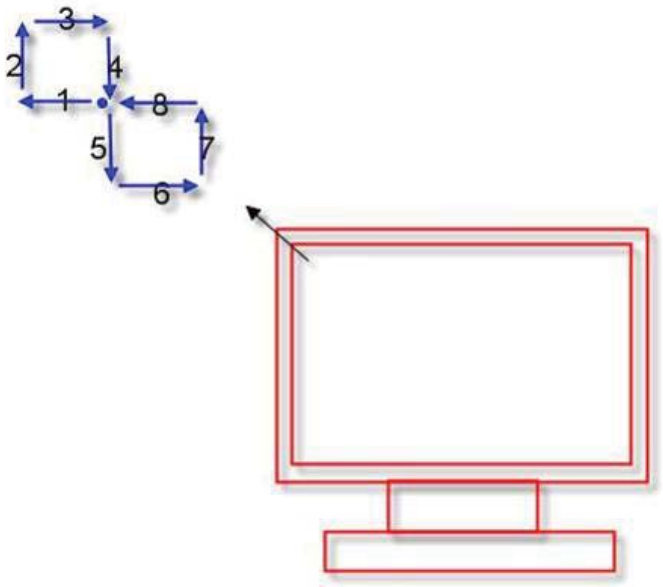
3.17.8 Monitor Audio Amplifier Input Impedance

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

Pixel –orbiting function (option)

On wide view angle models(IPS/e-IPS/AMVA/PVA/MVA)
Functional description

Every 1min to shift one pixel for whole picture,8 min. to original point and Routing path (H-1,V+1,H+1,V-1,V-1,H+1,V+1,H-1)



VISUAL CHARACTERISTICS

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 250 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

Brightness/ Brightness uniformity

Follow Panel specification.

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 ± 0.02 y = 0.281 ± 0.02	PerfecTune II
9300K	x = 0.283 ± 0.02 y = 0.297 ± 0.02	PerfecTune II
8200K	x = 0.291 ± 0.02	PerfecTune II

	y = 0.306 ± 0.02	
7500K	x = 0.298 ± 0.02 y = 0.314 ± 0.02	PerfecTune II
6500K/sRGB	x = 0.313 ± 0.02 y = 0.329 ± 0.02	PerfecTune II
sRGB	x = 0.313 ± 0.02 y = 0.329 ± 0.02	PerfecTune II
5000K	x = 0.345 ± 0.02 y = 0.357 ± 0.02	PerfecTune II

Production alignment spec.

CIE coordinates	(x,y)	
11500K	x = 0.270 ± 0.006 y = 0.281 ± 0.006	PerfecTune II
9300K	x = 0.283 ± 0.006 y = 0.297 ± 0.006	PerfecTune II
8200K	x = 0.291 ± 0.006 y = 0.306 ± 0.006	PerfecTune II
7500K	x = 0.298 ± 0.006 y = 0.314 ± 0.006	PerfecTune II
6500K/sRGB	x = 0.313 ± 0.006 y = 0.329 ± 0.006	PerfecTune II
sRGB	x = 0.313 ± 0.006 y = 0.329 ± 0.006	PerfecTune II
5000K	x = 0.345 ± 0.006 y = 0.357 ± 0.006	PerfecTune II

Quality Inspection specification:

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

Note: Color temperature of User Define is following Panel native specification as below:

x = 0.313 ± 0.03

y = 0.329 ± 0.03

MECHANICAL CHARACTERISTICS

Cosmetic -

Philips ID

Mechanical data files -

ProE files required

Location of Philips logo -

Per Philips make-up sheet

Gap between panel and front bezel

≤ 1.2mm(typ.)

Location of Control icons -

Per Philips Graphic sheet

Color for resin/paint -

Per Philips make-up sheet

Fire enclosure request

Shielding Cover should fulfill international standard

Resins

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

If paint is used

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

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.

Plastics flammability

- All Plastics to be Flame Retardant UL 94-HB or Better.
- Base / Pedestal 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”.

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”.

- Glossy surface > = 80 gloss units

Tilt and swivel base

- **Tilt angle : -3.5 ° ±1.5 ° (forward)**
  +21.5 ° ±1.5 ° (backward)
- Swivel angle : nil
- High Adjustment : nil
- Portrait Display : nil

Kensington Lock

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

Label

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

Product dimension / Weight (Refer to Philips approved SHT 191/SHT560)

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

Transportation

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

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.

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 except China/India

- 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)

Pallet / Container loading (Refer to Philips approved SHT 560)

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 with Pallet

C. 20’/40’/40’HQ Container loading for WW with slip sheet

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 (1000X1200mm pallet)

ENVIRONMENTAL CHARACTERISTICS

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

7.1Susceptibility of display to external environment

Operating

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

Storage

- Temperature : -20 to 60 degree C

- Humidity : 95% max
- Altitude : 0-12192m
- Air pressure : 300-1100 mBAR

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

7.2Transportation tests

Refer to 5.15.2

7.3Display disturbances from external environment

According to IEC 801-2 for ESD disturbances

7.4 Display disturbances to external environment

TELEVISION/MONITOR SAFFTY 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 servicer may have left an unsafe condition,which could be unknowingly passed on to your customer. Be sure to check all of the following:

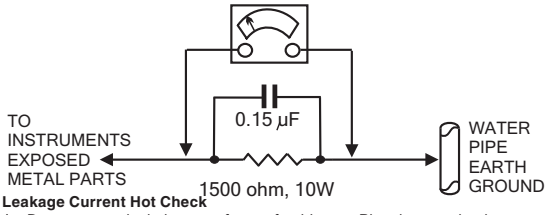
Fire and Shock Hazard
1. Be sure all components are positioned in such a way as to avoid the possibility of adjacent component shorts. This is especially important on those chassis which are transported to and from the service shop.
2. Never release a repaired unit unless all protective devices such as insulators, barries, 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 ans 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 an 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 safety 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 operathng 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-diation 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 0.15uf. 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.