

PDP TELEVISION

SERVICE MANUAL

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NS-42PDP

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Note: This maintenance manual is intended only for the reference of the maintenance people. Please pay attention to the following points before carrying out the maintenance work.

Safety Precautions

Please read the “Points for attention for the Maintenance & Repair of PDP” and “Criterion for Identifying the Defects on Screen” as below, before inspecting and adjusting the TV set.

1. “Points for attention for the Maintenance & Repair of PDP”

To avoid possible danger, damage or jeopardy to health and to prevent PDP screen from new damage, the maintenance people must read the following carefully. If they ignore the following warnings, there will be deathful risks:

- 1.1 Screens vary from one model to another and therefore not interchangeable. Be sure to use the same type of screen in the replacement.
- 1.2 The operation voltage is approximately 350V for PDP module (including screen, driving circuit, logic circuit and power module). If you want to conduct maintenance work on PDP module when the set is in normal operation or just after the power is off, you must take proper measures to avoid electric shock and never have direct contact or touch with the circuitry of the working module or metal parts. That's because within a short time relatively high voltage still remains on the capacitor of the driving part even after the power is off. Make sure to begin relevant maintenance operation at least one minute after the power is off.
- 1.3 Don't apply on the module any power supply that is higher than the specification. If the power supply used deviates from the value given in the specification, there might be a possibility of leading to fire or damage to the module.
- 1.4 Never have operation or mounting work under unsuitable environment such as areas in the vicinity of water – bathroom, laundry, water chute of kitchen – sources of fire, heat-radiation parts or direct exposure to sunlight. Otherwise there will be kickbacks.
- 1.5 In case foreign substances such as water, liquid, metal slices or others fall into the module carelessly power must be cut off immediately. Keep the module as it is and do not move anything on the module. Otherwise it might be possible to contact the high voltage or cause shock short circuit so that it may lead to fire or electric shock.
- 1.6 If there is smoke, abnormal smell or sound from the module, please cut the power off immediately. Likewise in case the screen doesn't work when the power is on or during the operation, please also cut off the power at once. No more operation in this case.
- 1.7 Do not remove or plug its connection wire when the module is in operation or right after the power is off. That's because there remains a relatively high voltage on the capacitor of the driving circuit. If there is a need to remove or plug in the connection wire, please wait at least one minute after the power is off.
- 1.8 Considering the module has a glass faceplate, please avoid extrusion by external force lest it should cause glass breakage that may get people injured. Two people are needed in cooperation to move this module lest contingency takes place.
- 1.9 The complete TV set is designed on the basis of full consideration of thermal dissipation by convection, with the round hole on the top for heat emission. To avoid overheat, please do not have any covering on the hole during normal operation and never put it in the place where the space is narrow and in bad ventilation.
- 1.10 There is quite a number of circuits in PDP that are integrated ones. Please be on guard against

static electricity. During maintenance operation be sure to cover yourself with anti-static bag and before operation make sure to have it sufficiently grounded.

1.11 There are a big number of connection wires distributed around the screen. Please take care not to touch or scuff them during maintenance or removing the screen, because once they are damaged the screen will fail to work and it's not possible to repair it.

1.12 Connector for the circuit board of the screen part is relatively fine and delicate. Please take care in the replacement operation lest it should get damaged.

1.13 Special care must be taken during transportation and handling because strenuous vibration could lead to screen glass breakage or damage on the driving circuitry. Be sure to use a strong outer case to pack it up before transportation or handling.

1.14 Please put it for storage in an environment in which the conditions are under control so as to prevent the temperature and humidity from exceeding the scope stipulated in the specification. For prolonged storage please cover it with anti-moisture bag and have them piled and stored in one place. The environmental conditions are tabulated as below:

Temperature	Scope for operation	0~50centigrade
	Scope for storage	-15~60centigrade
Humidity	Scope for operation	20%~80%
	Scope for storage	20%~80%

1.15 If a fixed picture is displayed for a long time, difference in its brightness and color may occur compared with movable pictures. But it doesn't show any problem and the reason is that there is reduced density of fluorescent powder in the former. On the other hand, even if changes take place in the picture, it can keep its brightness for a period of time (several minutes). It's a feature inherent with plasma and it's not abnormal. However please try as much as possible to avoid showing a still picture of high brightness for a long time during operation.

1.16 As a digitalized display devise, this module is provided with error diffusion technology and the gray scale and false enhancement of contour can be displayed by reusing of sub-field. As compared with cathode ray tube, it can be found in the moving picture that at the brim of the face of a person there are some wrong colors.

1.17 During the display of graph (indicating the gradual change in brightness horizontally or vertically) resulting from gray scale test it can be found that the brightness for the two adjacent levels is uneven. This is caused by the reuse of sub-field, the display of load rectification and the electrolysis.

1.18 The screen front plate is of glass. Please make sure that the screen has been put in place during erection. If it is not in place before the erection begins it may lead to screen crack or breakage.

1.19 Make sure the screw used in the mounting of the screen is of the original specs lest it should cause damage to the screen due to mismatch. Special care should be taken not to use too long or too big screw.

1.20 Care must be taken to guard against dust during assembling or dismantling, especially to avoid dirt from falling in between the screen and the glass lest it should harm the receiving and viewing effect.

1.21 There is piece of insulator stuck on the rear chassis corresponding to the power supply board. It is used to isolate the cool part from the hot part. Please take care to keep it intact lest it should

become a potential safety trouble.

1.22 In addition to plasma screen, the glass is a part of high value. It has such functions as anti-radiation, adjustment of color temperature etc. Please handle it carefully.

2. “Criterion for Identifying the Defects on Screen”

The PDP produced by our Company at present uses the following criterion for identifying the defective points:

2.1 Model PS-42XX:

There may appear three kinds of defective points for this model as shown in Fig.1, i.e., bright spot (remain bright); dark spot (non-illuminating); flickering spot (continuously flickering).

However they should not exceed the specification as in table 1. Otherwise the product shall be deemed as sub-standard.

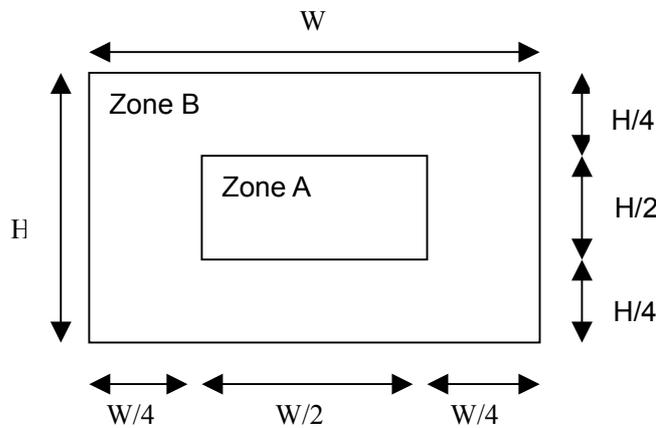


Figure 1 Defective Points

Table 1 Criterion for Three Kinds of Defective Points

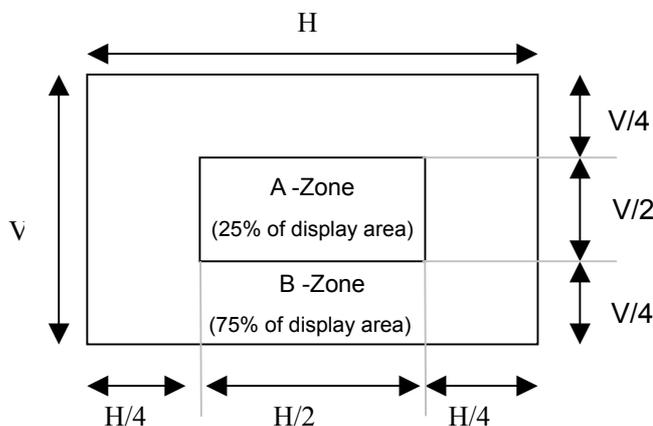
Kind	Area A	Area B	Remark
Dark spots	No more than 2	No more than 8	Total number of defective points in A and B shall not exceed 8. The distance between two defective points shall not be shorter than 15mm.
Bright spot	No more than 1	No more than 2	
Flickering spot	No more than 1	No more than 2	

2.2 Model PH-42XX:

Table 2 Cell Defect Specifications

Defect	Specification		
	Number of Cell Defects (N)	Distance between two defects (D)	
Non-Ignition Dot* ¹⁾ +Unstable Dot* ²⁾	A-zone	<ul style="list-style-type: none"> ▶ Total $N \leq 4$ [cells/full screen] ▶ $N \leq 2$ [cells/each R,G,B screen] ▶ $N=0$ [adjacency of 2-cells/full-white screen] 	<ul style="list-style-type: none"> ▶ A-Zone: $\geq 100\text{mm}$ ▶ B-Zone: $N \leq 2$ (100mm circle/screen: 2points allowed) ▶ A, B Zone overlap: $N \leq 2$ (100mm circle/screen: 2points allowed)
	B-zone	<ul style="list-style-type: none"> ▶ Total $N \leq 11$ [cells/full screen] ▶ $N \leq 5$ [cells/each R,G,B screen] ▶ $N \leq 5$ [adjacency of 2-cells/full-white screen] =0[adjacency of 3-cells/full-white screen] 	
Uncontrollable Dot* ³⁾	A-zone	▶ $N \leq 1$ [cells/each R,G,B screen]	
	B-zone	▶ Total $N \leq 3$ [cells/ full screen]	
Non-Extinguishing Dot* ⁴⁾	A-zone	▶ $N=0$	
	B-zone	▶ $N=0$	
▶ Total sum of all defects $N \leq 17$ [cells/full-white screen]			
Stain* ⁵⁾	<ul style="list-style-type: none"> ▶ $N \leq 6$, for the stain of which longer-axis length is 5mm or shorter. ▶ $N=0$, for the stain of which longer-axis length is longer than 5mm. 	▶ $D \geq 50\text{mm}$	

- 1) Non-Ignition Dot (Dark Defect) is defined as “A cell of which more than 50% area is not ignited”
 - 2) Unstable Dot (Flickering) is defined as “A cell which repeats On and Off”
 - 3) Uncontrollable Dot is defined as “A cell which is distinctly brighter or darker than other cells around it” and/or “A cell of which color is distinctly different from that of other cells around it”
 - 4) Non-Extinguishing Dot (brightness defect) is defined as “A cell of which more than 50% area is always ON”
 - 5) Stain is defined as “A blob due to local color contamination in white or simple color pattern”
- The decision distance is 3H away from the panel, intensity of illumination is between 100 Lux and 200 Lux.



2.3 Model PH-50XX:

There may appear three kinds of defective points for this model as shown in Fig.3 i.e., bright spot (remain bright); dark spot (non-illuminating); flickering spot (remain flickering).

However they should not exceed the specification as in table 3. Otherwise the product shall be deemed as sub-standard.

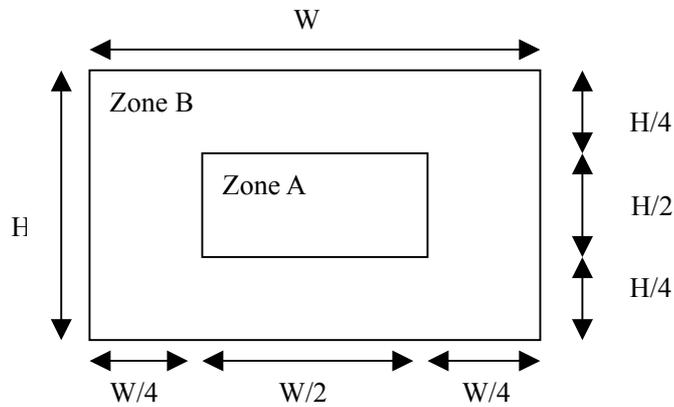


Figure 2 Defective Points

Table 3 Criterion for Three Kinds of Defective Points

Item	Kind	Area A	Area B	Remark
1	Dark spots	No more than 4	No more than 10	Total number of defective points in A and B shall not exceed 14. The distance between two defective points shall not be shorter than 10mm.
2	Bright spot	No more than 1	No more than 3	
3	Flickering spots	No more than 1	No more than 3	

Alignment instructions

1. Test equipment

- PM5515 (video signal generator)
- VG-849 (YUV, VGA, HDMI signal generator)
- CA100 (white balancer)

2. The alignment flow chart (see below figure)

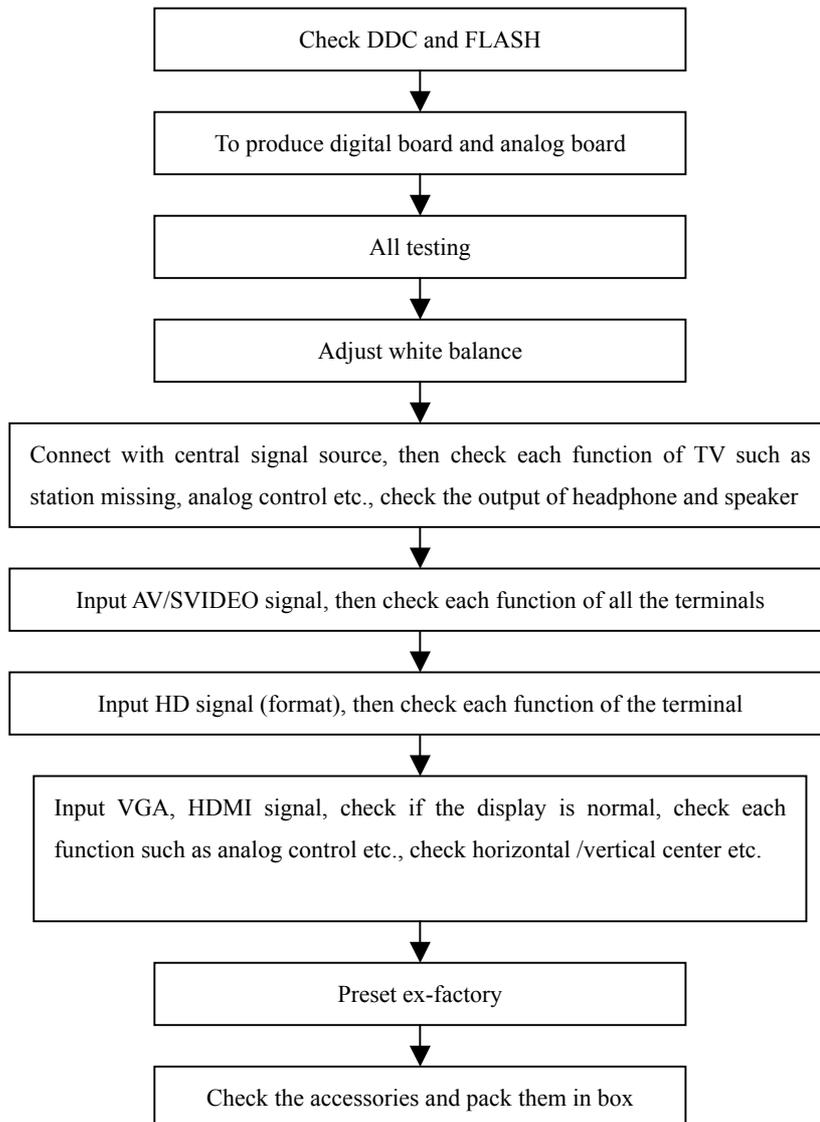


Fig-1 adjustment flow-chart

3. Description of adjustment

3.1 Unit adjustment

Connect the digital processing board, analog board, power board, power filter board and button board according to the wiring diagram 203-PH42FB8-01JL. Connect with power and observe the display.

Method for using factory menu: press "INPUT" button, then press "2580" to enter level one factory menu. Press "CH+" and "CH-" to select adjustment page, then press "OK" to access. Press "CH+"

and “CH-“ to move cursor up and down, when the cursor stays on a certain adjustment item, press “VOL-“ and “VOL+” to adjust. Press “MENU” exit to the level one factory menu; press “EXIT” to exit from the factory menu at any situation.

Note: channel switch isn’t available at adjustment menu, only after return to level one factory menu, you can switch channel.

3.2 adjustment of white balance

3.2.1 input 16 level gray-scale signal from VG849 to HDMI channel (TMIING: select a support format of HDMI), enter white balance adjustment page of factory menu, select cool color temperature of item, fixed WBGH_HDMI to 50H, adjust WBRG_HDMI, WBBG_HDMI, let the color coordinate of third level on the right be (270,283) at 120nits; fixed WBBO_HDMI to 50H, adjust WBRO_HDMI, WBGO_HDMI, let the color coordinate of third level on the left be (270,283) at 5nits. The brightness of 120nits and 5nits may obtain by adjusting the contrast and brightness of menu.

3.2.2 input 16 level gray-scale signal from VG849 to AV channel (TMIING:968), enter white balance adjustment page of factory menu, select cool color temperature of item, fixed WBGH_NTSC to 50H, adjust WBRG_NTSC, WBBG_NTSC, let the color coordinate of third level on the right be (270,283) at 120nits; fixed WBBO_NTSC to 50H, adjust WBRO_NTSC, WBGO_NTSC, let the color coordinate of third level on the left be (270,283) at 5nits. The brightness of 120nits and 5nits may obtain by adjusting the contrast and brightness of menu.

3.2.3 input 16 level gray-scale signal from VG849 to VGA channel (TMIING: select a support format of VGA), enter white balance adjustment page of factory menu, select cool color temperature of item, fixed WBGH_VGA to 128, adjust WBRG_VGA, WBBG_VGA, let the color coordinate of third level on the right be (270,283) at 120nits; fixed WBBO_VGA to 128, adjust WBRO_VGA, WBGO_VGA, let the color coordinate of third level on the left be (270,283) at 5nits. The brightness of 120nits and 5nits may obtain by adjusting the contrast and brightness of menu.

3.2.4 input 16 level gray-scale signal of 480i from VG849 to YPbPr channel, enter white balance adjustment page of factory menu, select cool color temperature of item, fixed WBRG_YPbPr480i, WBGH_YPbPr480i, WBBG_YPbPr480i to 128, and WBRO_YPbPr480i to 128, adjust WBRO_YPbPr480i, WBBO_YPbPr480i, let the color coordinate of third level on the left be (270,283) at 5nits. The brightness of 5nits may obtain by adjusting the contrast and brightness of menu.

Input format signals separately list on table 1, repeat the operation above until the white balance pass muster.

Note: the white balance adjustment of VGA and YPBPR must be done at the situation that the white balance adjustment of HDMI is accurate.

4 Performance check

4.1 TV function

Connect RF-TV terminal to the central signal source, enter the setup menu→ auto search, check if there is station skipping, the output of earphone and speaker, the picture are normal.

4.2 AV/S-VIDEO terminal

Input AV/S signal, check if the picture and sound are normal.

4.3 YPbPr/YCbCr terminal

Input YUV signal (VG-849 signal generator), separate input YUV format signal of table 1 and check if the picture and sound are normal.

Table 1 YUV signal format

No	H-frequency (KHz)	V-frequency (KHz)	Signal
1	15.734	59.94	SDTV 480i

2	31.469	59.94	HDTV 480p
3	44.955	59.94	HDTV 720p
4	33.716	59.94	HDTV 1080i

4.4 VGA terminal

Input VGA signal (VG-849 signal generator), separate input VGA format signal of table 2 and check if the picture and sound are normal. If the image is deflection of the H-field, select manual correction of Advanced Video Menu.

4.5 HDMI terminal

HDMI signal format receives the three high-definition signals: 480I, 480P, 720P/60Hz, 1080I/60Hz, except for the table 2 signal. Check if the image (contain HDCP ON and OFF) and sound are normal.

Table 2 VGA signal format

No	Resolution	H-frequency(kHz)	V-frenquency(Hz)	Point clock pulse frequency(MHz)	Remark
1	720 X 400	31.469	70.086	28.322	IBM
2	640 X 480	31.469	59.94	25.175	IBM
3	640 X 480	37.861	72.809	31.5	VESA
4	640 X 480	37.5	75	31.5	VESA
5	640 X 480	43.269	85.008	36	VESA
6	800 X 600	35.156	56.25	36	VESA
7	800 X 600	37.879	60.317	40	VESA
8	800 X 600	48.077	72.188	50	VESA
9	800 X 600	46.875	75	49.5	VESA
10	800 X 600	53.674	85.061	56.25	VESA
11	1024 X 768	48.363	60.004	65	VESA
12	1024 X 768	56.476	70.069	75	VESA
13	1024 X 768	60.023	75.029	78.75	VESA

5 Ex-factory setting of user menu

- 1) Select TV channel, volume: 25
- 2) Video menu, Picture Mode: Nature, Aspect Ratio: Wide
- 3) Video menu, Advanced Video Menu:
 - Noise Reduction——Spatial: On
 - Noise Reduction——Speckle: Off
 - Noise Reduction——Temporal: On
 - Sharpness: 0
 - Tint: 50
 - Color Temperature: Cool
 - 3D Y/C: On
- 4) Audio menu, Sound Mode: News, Balance: 31, Earphone Vo1:31
 - Digital Audio Output: AC-3, MTS: Mono
- 5) Setup menu, Tuning Band: Air
- 6)

6) Feature menu, Sleep Timer: Off, Menu Language: English

Note: Except for Color Temperature of Cool, the Advanced Video Menu of YPbPr/YCbCr and VGA channels sets according to the adjustment of factory.

Trouble shooting

Before servicing please check to find the possible causes of the troubles according to the table below.

1. Antenna(signal):

Picture is out of focus or jumping	<ul style="list-style-type: none"> ● Bad status in signal receiving ● Poor signal ● Check if there are failures with the electrical connector or the antenna. ● Check if the antenna is properly connected.
Fringe in picture	<ul style="list-style-type: none"> ● Check if the antenna is correctly oriented. ● Maybe there is electric wave reflected from hilltop or building.
Picture is interfered by stripe shaped bright spots	<ul style="list-style-type: none"> ● Possibly due to interference from automobile, train, high voltage transmission line, neon lamp etc. ● Maybe there is interference between antenna and power supply line. Please try to separate them in a longer distance. ● Maybe the shielded-layer of signal wire is not connected properly to the connector.
There appear streaks or light color on the screen	<ul style="list-style-type: none"> ● Check if interfered by other equipment and if interfered possibly by the equipment like transmitting antenna, non professional radio station and cellular phone.

2. TV set:

Symptoms	Possible cause
Unable to switch the power on	<ul style="list-style-type: none"> ● Check to see if the power plug has been inserted properly into the socket.
No picture and sound	<ul style="list-style-type: none"> ● Check to see if the power supply of liquid crystal TV has been switched on. (as can be indicated by the red LED at the front of the TV set) ● See if it's receiving the signal that is transmitted from other source than the station ● Check if it's connected to the wrong terminal or if the input mode is correct. ● Check if the signal cable connection between video frequency source and the liquid crystal TV set is correct.
Deterioration of color phase or color tone	<ul style="list-style-type: none"> ● Check if all the picture setups have been corrected.
Screen position or size is not proper	<ul style="list-style-type: none"> ● Check is the screen position and size is correctly set up.

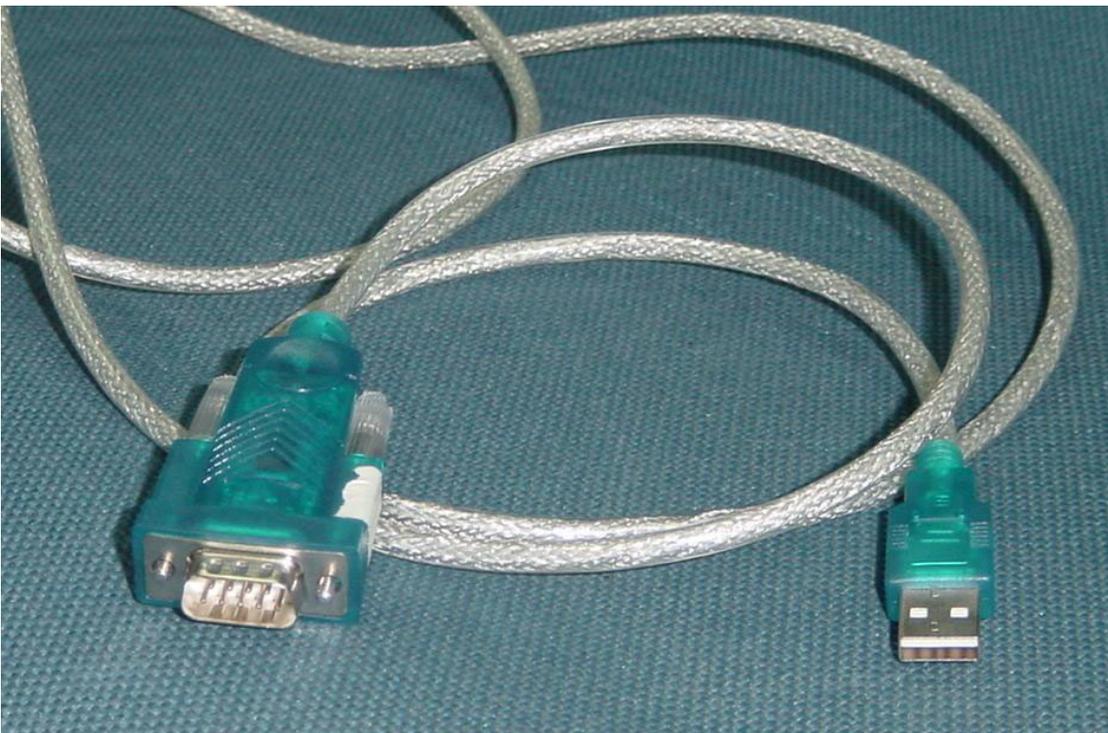
Symptoms	Possible cause
Picture is twisted and deformed	<ul style="list-style-type: none"> ● Check to see if the picture-frame ratio is properly set up.
Picture color changed or colorless	<ul style="list-style-type: none"> ● Check the “Component” or “RGB” settings of the liquid crystal TV set and make proper adjustment according to the signal types.
Picture too bright and there is distortion in the brightest area	<ul style="list-style-type: none"> ● Check if the contrast setting is too high. ● Possibly the output quality of DVD broadcaster is set too high. ● It maybe also due to improper terminal connection of the video frequency signal in a certain position of the system.
Picture is whitish or too bright in the darkest area of the picture	<ul style="list-style-type: none"> ● Check if the setting for the brightness is too high ● Possibly the brightness grade of DVD player (broadcaster) is set too high.
No picture or signal produced from the displayer if “XXX in search” appears.	<ul style="list-style-type: none"> ● Check if the cable is disconnected. ● Check if it’s connected to the proper terminal or if the input mode is correct.
There appears an indication - “outside the receivable scope)	<ul style="list-style-type: none"> ● Check if the TV set can receive input signal. The signal is not correctly identified and VGA format is beyond the specified scope.
Remote control cannot work properly	<ul style="list-style-type: none"> ● Check if the batteries are installed in the reverse order. ● Check if the battery is effective. ● Check the distance or angle from the monitor. ● Check if there is any obstruct between the remote control and the TV set. ● Check if the remote control signal- receiving window is exposed to strong fluorescence.
No picture and sound, but only hash.	<ul style="list-style-type: none"> ● Check if the antenna cable is correctly connected, or if it has received the video signal correctly.
Blur picture	<ul style="list-style-type: none"> ● Check if the antenna cable is correctly connected. ● Of if it has received the right video signal.
No sound	<ul style="list-style-type: none"> ● Check if the “mute” audio frequency setting is selected. ● Check if the sound volume is set to minimum. ● Make sure the earphone is not connected. ● Check if the cable connection is loose.
When playing VHS picture search tape, there are lines at the top or bottom of the picture.	<ul style="list-style-type: none"> ● When being played or in pause VHS picture search tape sometimes can’t provide stable picture, which may lead to incorrect display of the liquid crystal TV, In this case please press “auto” key on the remote control so as to enable the liquid crystal TV set to recheck the signal and then to display correct picture signal

Method of software upgrading

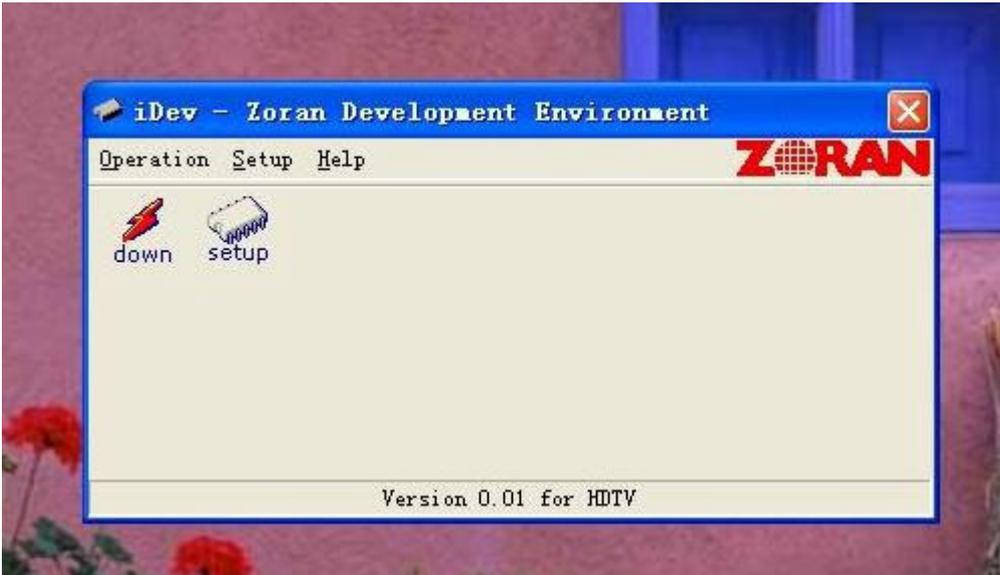
1. Connect RS-232 cable to computer and TV set. **The cable must be a female to female RS-232 cable, and the line is TXD to RXD and RXD to TXD cross-link.** It's popular for PC to PC connection.



2. If the computer has no RS-232 serial port(e.g. Notebook PC),you needs a additional USB to serial port cable.



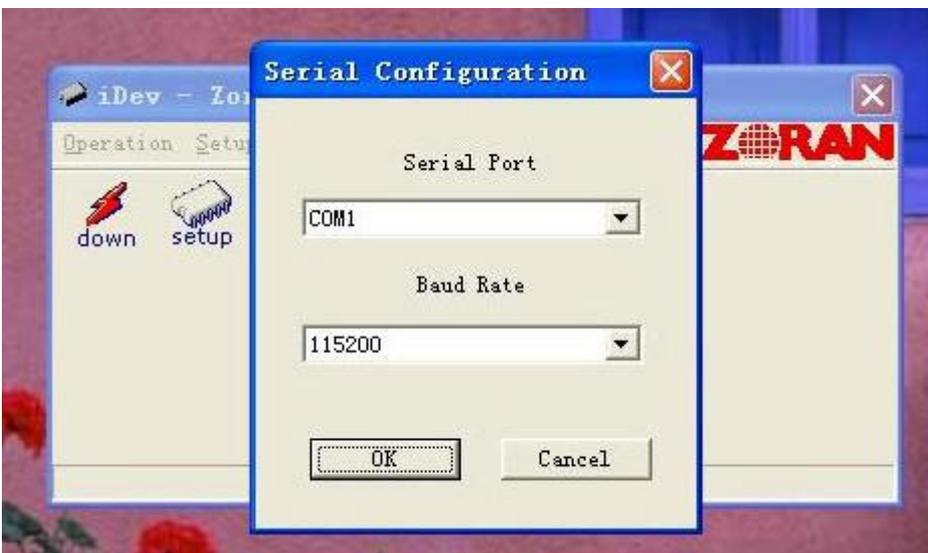
3. Copy the update tools (iDev.exe) to the path you want to do it, and double click it.



4. Select "setup" menu.



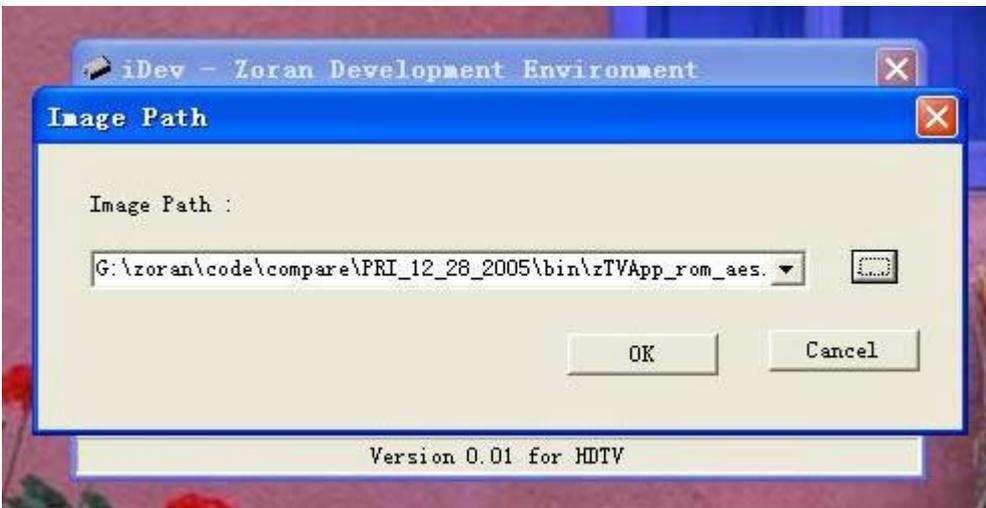
5. Confirm the Serial port is right. Base on the port which using for update. And set the band rate to 115200 (default).



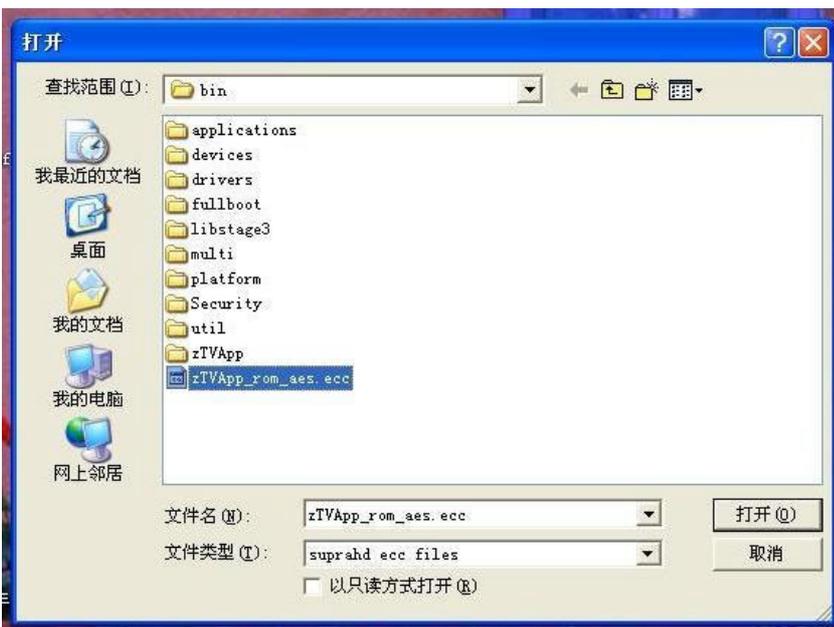
6. Select the "Image path" menu.



7. Confirm it's the right file.



8. If it's not right(Maybe you didn't select it before),click the "..."button to select "*.ecc" file. Sometimes the image file you got it will be "*.rar" or "*.zip" zip file, needs unzip it first.



9. You also can click the setup button to select and config, but **please don't select the red one(update boot sector).**



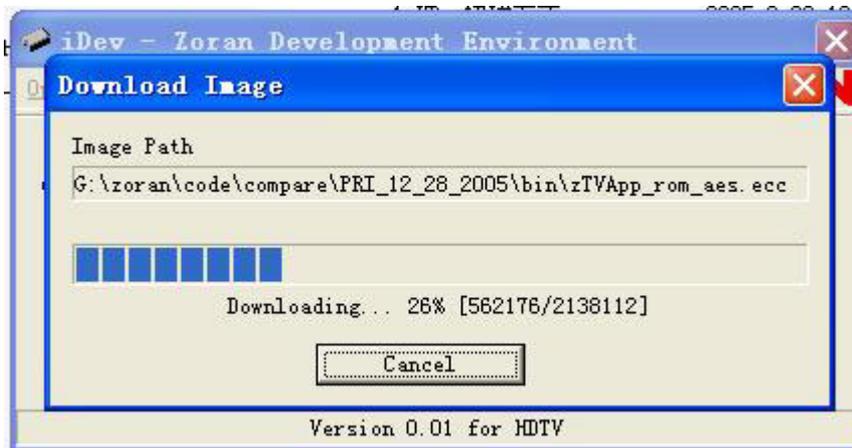
10. Then click the “down” button.



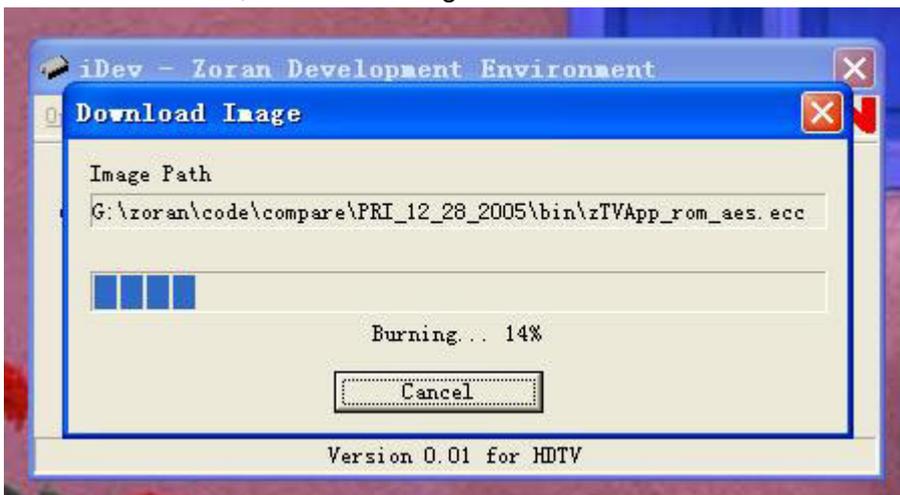
11. You can see the "waiting" window.



12. Then power (off then) on the TV set.



13. After download, it will be burning.



14. Last it will be finished



15. Press the (IR/ locate keypad) power key and holding for several second to force power off TV set, then power on again. It would be ok now. If it's failure you can try once again.

Working principle analysis of the unit

1. NTSC signal flow:

Antenna reception NTSC signal send to the integrative tuner FQD1236, which contains HF and IF amplifier circuit and video decoding circuit. It is controlled by main IC ZR39660 (inside CPU) through I2C bus. The NTSC signal via frequency tuning, HF amplification, IF amplification, system switching and decoding, output video signal TV-CVBS of 1Vpp and sound IF signal (SIF).

TV-CVBS and AV1-CVBS, AV2-CVBS input from AV terminal, via switch IC HEF4052 to output signal, one way send to ZR39660 for VIDEO DECODER, DEINTERLACE and SCALER, then send to LVDS level drive for LCD screen, another way is output through AV output socket as AV OUT.

The sound IF (SIF) is fed into demodulation IC CAS220, via decoding and A/D conversion, it is fed into ZR39660 for analog control in the format of I2S. ZR39660 outputs audio data of I2S format, it is fed into audio D/A converter IC CS4344, output analog L/R signal. The L/R signal and sound signal of PC/YPRPB via diverter switch HEF4052BT, send to R2S15900SP (sound processing and volume control). Select right/left sound channel, their send to digital sound amplifier TPA3001 amplify, then send to speaker.

2. ATSC signal flow:

Antenna reception ATSC signal send to tuner FQD1236, after frequency tuning, HF amplification, IF amplification and SAW FILTER, output IF signal to demodulation chip CAS220, via VSB or QAM demodulation, Sound stereo decoder, fed to ZR39660 for information source decoding in the format of standard serial TS stream.

HD video signal via decoding to A/D conversion and OSD superposition, at last send to LVDS drive level for PDP panel.

HD audio signal, via decoder built-in ZR39660, resumed to multi-channel sound of Dolby AC-3, at the same time output data stream of I2S format and S/PDIF data stream. Audio data of I2S format is fed to audio D/A conversion chip CS4344 to output analog L/R signal. S/PDIF data stream directly output from optical fiber interface.

3. PC/YPrPb signal flow

PC and two YPBPR signal via matched resistance, it a-c couple to video switch SN74CBT3257CDR, via switching to selected signal to Triple Video A/D Converter MST9883 A/D conversion. Send B/G/B of 24 bit to main IC ZR39660 digital decode, image scale and OSD superposition, then send to LVDS level drive for LCD screen.

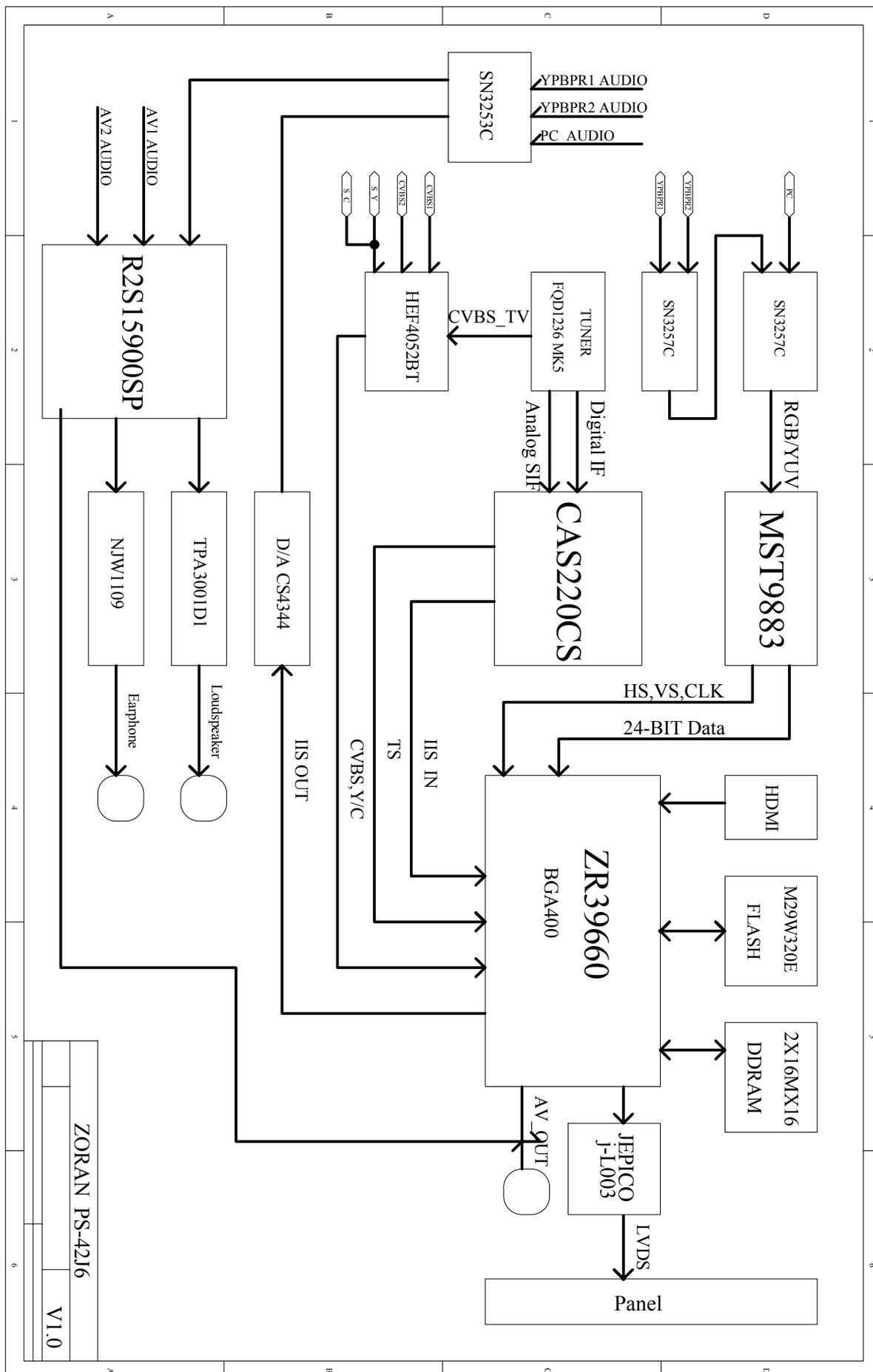
Sound signal (PC, YPrPb) via switch diverter HEF4052BT to output signal, it send to R2S15900SP (sound processing and volume control) switch of audio. Select right/left sound channel, their send to digital sound amplifier TPA3001 amplify, then send to speaker.

4. HDMI signal flow

HDMI video signal is directly fed to main IC ZR39660 (with HDCP function of HDMI) digital decode, image scale and OSD superposition, then output LVDS drive level for screen.

HDMI audio signal, via decoder built-in ZR39660, output data stream of I2S format and S/PDIF data stream at the same time. Audio data of I2S format is fed to audio D/A conversion chip CS4344 to output analog L/R signal. S/PDIF data stream directly output from optical fiber interface.

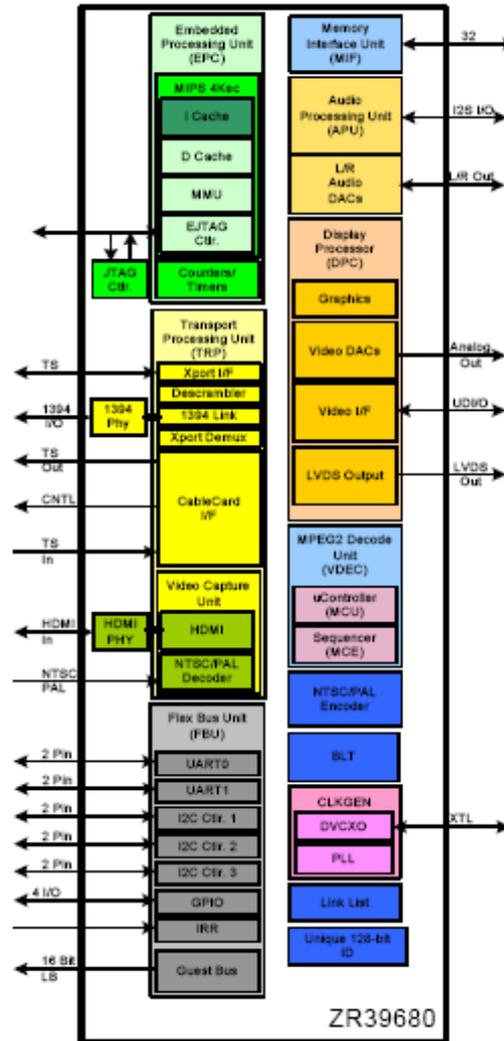
Block diagram



IC block diagram

1. ZR39140

- Embedded Processing Unit**
 - Integrated High-Performance MIPS® 4KEc™ CPU, 166 MHz
 - Intended to run RTOS, audio decode and Application software
 - 32-bit MIPS62 enhanced architecture
 - 8K instruction cache, 8K data cache, (4-way set associative)
 - MMU with 16-dual entry Joint Translation Lookaside Buffer
 - Two 32-bit Counter Timers for CPU timing functions
 - One 32-bit Watchdog timer
- Integrated HDMI Link and PHY**
- High-Performance MPEG-2 Video Decoding Engine**
- Transport Processing Unit with Integrated CableCard support**
- Uncompressed Digital Interface**
- Accelerated 2-D Graphics**
- Integrated PAL/NTSC Decoder**
- 1394A High Speed Interface (Integrated Link and PHY)**
- Video Scaling and Format Conversion**
- Display Processor & Controller**
- Audio Processing Unit (APU)**
- System Interfaces**
 - Two 2-signal UARTs
 - Four I²C master or slave interfaces (up to 400kb/s)
 - One IR Receive, with hardware demodulation
 - Guest bus interface
- Device Unique Chip ID**
 - 128-bit device unique secret key
- Memory Interface Unit**
 - High performance 32-bit DDR interface (200MHz)
 - Up to 1.5 GByte/second peak memory throughput
 - 256 MByte memory address range
- Integrated Digital VCXO**
- Process Technology**
 - 0.18µm CMOS
- Power**
 - 1.8V core voltage, 2.5 V Memory I/F, 3.3V I/O
- Packaging**
 - 27mm x 27mm Plastic Ball Grid Array package
 - 400 PBGA



Pin descriptions of ZR39660:

(1) Serial Transport Input Port

T4: MPEG Transport Port Input Clock

T3: MPEG Transport Input Data

U3: MPEG Transport Input Frame

Y1: MPEG Transport Input Valid

(2) HDMI Input

D1,E3,F3,E2,F2,E1: HDMI Differential Data Pairs

D2,C1: HDMI Differential Clock Pair

C3: HDMI Serial Clock

B2: HDMI Serial Data

A1: HDMI Hot Plug Detect

D3: HDMI Current Set

(3) NTSC/PAL Analog Input Port

W2: Video Front End Luminance In

Y3: Video Front End Chroma In

W3: Video Front End Common Mode Reference

(4) Analog Video Output

K18: Composite Data Output (CVBS)

J20: Blue/Pb Pixel Data Output

J18: Green/Y Pixel Data Output

J19: Red/Pr Pixel Data Output

(5) Audio I/O

R2: Audio Clock

R3: Bit Clock

P3: Left/Right Channel Selector

U2: Serial Audio Data Input

T2: Serial Audio Data Output

V1: IEC958 Format Out

(6) LVDS Panel Interface

B20,C19: Output Clock Pair

E18,F17: Output Data Pairs 0

C20,D19: Output Data Pairs 1

F18,G17: Output Data Pairs 2

D20,E19: Output Data Pairs 3

E20,F19: Output Data Pairs 4

H18,G18: Output Data Pairs 5

F20,G19: Output Data Pairs 6

G20,H19: Output Data Pairs 7

D18 : External Resistor Connection

(7) UART and I2C Interface

N1: UART 0 Transmit

P1: UART 0 Receive

R1:I2C Compatible Clock 0

P2:I2C Compatible Data 0

M3:I2C Compatible Clock 1

M2:I2C Compatible Data 1

(8) Miscellaneous

M4, N3: Two pins required to support the 24.576 MHz crystal

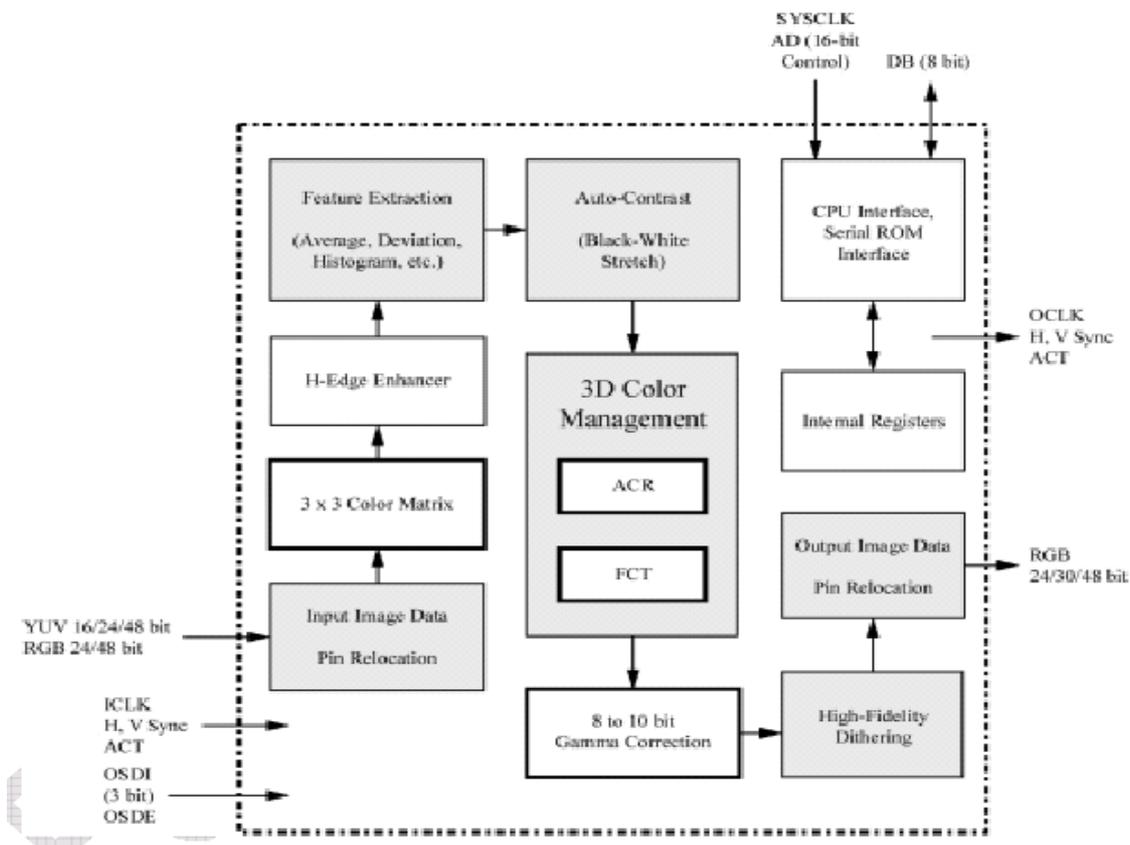
N5: Power On Reset

L4: Infrared Receive

2. j-L003(Higobashi)

The j-L003(Higobashi) LSI provides a variety of image quality adjustment functions designed to produce sharp, well-defined coloration in personal computer LCD monitors and LCDTV screens, as well as dot-matrix displays in rear projection TVs, PDPs, and other devices.

The image-enhancement functions built into the j-L003 use a proprietary color management technology that makes it possible to produce images that are closer than ever to nature. The j-L003 also includes black-white stretch, brightness correction, horizontal edge enhancement, and gamma correction functions: these expand your capabilities even farther, to enable you to achieve your own custom image-processing methods.



Pin configuration of j-L003:

(1) TTL SIGNAL INPUT

71: VS INPUT 72: HS INPUT 73: DE 76: CLK INPUT;
 74, 78, 79, 80, 81, 82, 84, 93: RED Signal INPUT;
 94, 95, 96, 97, 98, 99, 101, 102: GREEN Signal INPUT;
 103, 104, 106, 107, 108, 109, 110, 111: BLUE Signal INPUT;

(2) TTL SIGNAL OUTPUT

65: VS OUTPUT 66: HS OUTPUT 67: DE 34: CLK OUTPUT
 05, 06, 07, 08, 09, 10, 11, 13: RED Signal OUTPUT
 14, 15, 16, 18, 19, 20, 21, 22: GREEN Signal OUTPUT
 23, 24, 26, 27, 28, 29, 30, 31: BLUE Signal OUTPUT

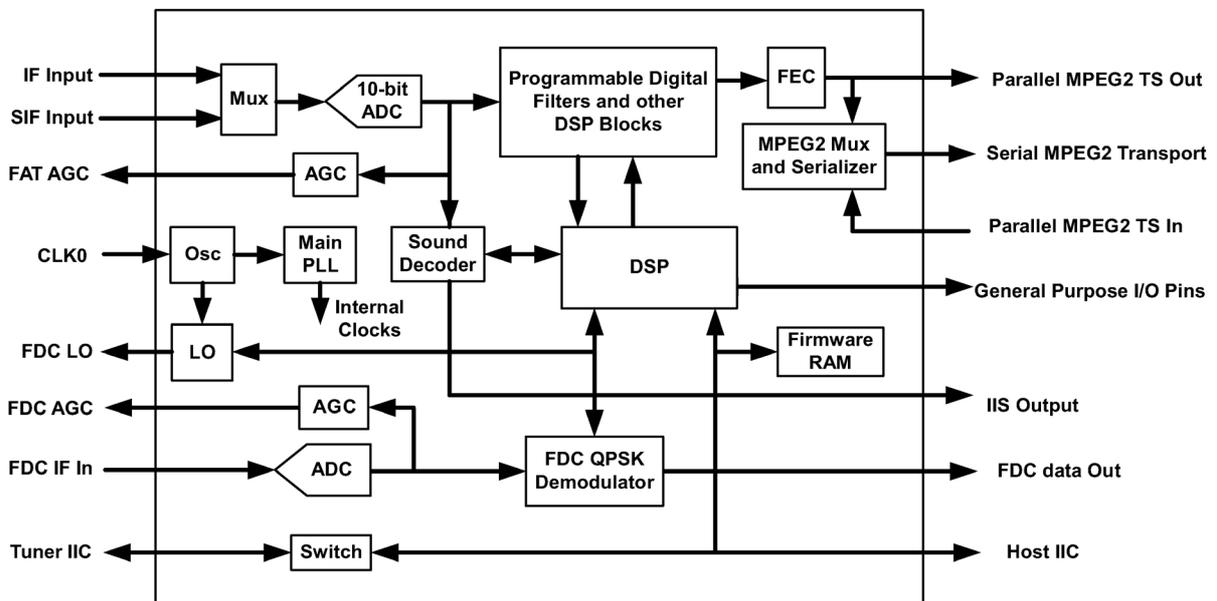
(3) I/O CONTROL

148: RESET 151: SMMRSE 156: ADID0 157: ADID1

3. CAS220/CS

The CAS-220/CSO is a multi-standard demodulator and decoder for terrestrial and digital cable TV reception. It is designed to support 8-VSB (Vestigial Side Band) in full compliance with ATSC Digital Television Standards, ITU-T J.83 Annex B, and OpenCable™ Out-of-Band Signaling. The CAS-220/CSO also demodulates analog BTSC and Korea A2 sound.

Its basic function is to recover the digital data encoded into the broadcast signal, which includes video and sound program information and ancillary data service.



Pin configuration of CAS220/CS:

PRM_0	100		
AVDD_COR_ADC1	99		
AVSS_COR_ADC	98		
AIN1_P	97		
AIN1_N	96		
AVSS_COR_ADC	95		
AIN2_P	94		
AIN2_N	93		
AVSS_COR_ADC	92		
AVSS_COR_ADC	91		
AIN_OOB_N	90		
AIN_OOB_P	89		
AVSS_COR_ADC	88		
AVDD_COR_ADC2	87		
VDD_COR_PLL	86		
VSS_COR_PLL	85		
AVDD_PER_PLL	84		
AVSS_PER_PLL	83		
VDD_PER_OSC	82		
VSS_PER_OSC	81		
CLK0	80		
XTO	79		
VDD_COR_OSC	78		
VSS_COR_OSC	77		
VSS_COR_LO	76		
PRM1	1	75	VDD_COR_LO
SCAN_EN	2	74	VDD_PER_LO
TEST_MODE	3	73	VSS_PER_LO
DIN_0	4	72	LO_OUTN
VDD_COR_ADC	5	71	LO_OUTP
VSS_COR_ADC	6	70	VSS_COR
VSS_COR	7	69	VDD_COR
SCAN_MODE	8	68	DRX_A9
VDD_COR	9	67	CRX_AS_DSTR
DIN_1	10	66	AU_SCK_DSTR
IF_AGC	11	65	AU_SD
RF_AGC	12	64	AU_TEST
IIC_ADDR	13	63	AU_WS
DIN_2	14	62	VDD_PER
VSS_PER	15	61	RESET_N
TUNER_SDA	16	60	VSS_PER
VDD_PER	17	59	OOB_AGC
TUNER_SCL	18	58	PRM_2
HOST_SCL	19	57	SDAT/STAT7
HOST_SDA	20	56	SCLK/STAT6
DIN_3	21	55	VSS_COR
VDD_COR	22	54	STAT5
VSS_COR	23	53	VDD_COR
STAT0/SCLK	24	52	STAT4
DIN_4	25	51	STAT3
STAT1	26		
DIN_5	27		
MPG_CLK	28		
MPG_VALID	29		
VDD_PER	30		
DIN_6	31		
MPG_FAIL	32		
VSS_PER	33		
MPG_SOP	34		
VSS_COR	35		
MPG_D00	36		
VDD_COR	37		
DIN_7	38		
MPG_D01	39		
MPG_D02	40		
MPG_D03	41		
DIN_8	42		
MPG_D04	43		
MPG_D05	44		
VSS_PER	45		
VDD_PER	46		
DIN_9	47		
MPG_D06	48		
MPG_D07	49		
STAT2	50		

Pin descriptions of CAS220/CS:

61: RESET_N

79, 80 oscillator

13 Select I2C address

16: I2C data for host communication with the tuner

18: I2C clock to the tuner

19: I2C clock from host

20: I2C data from/to host

93,94: Differential input for IF

96,97: Differential input for SIF

63: Digital Sound Word select (L/R select)

65: Digital Sound Serial data output

66: Digital Sound Serial clock.

17,30,46,62,74,82,84: Power Supply 3.3V

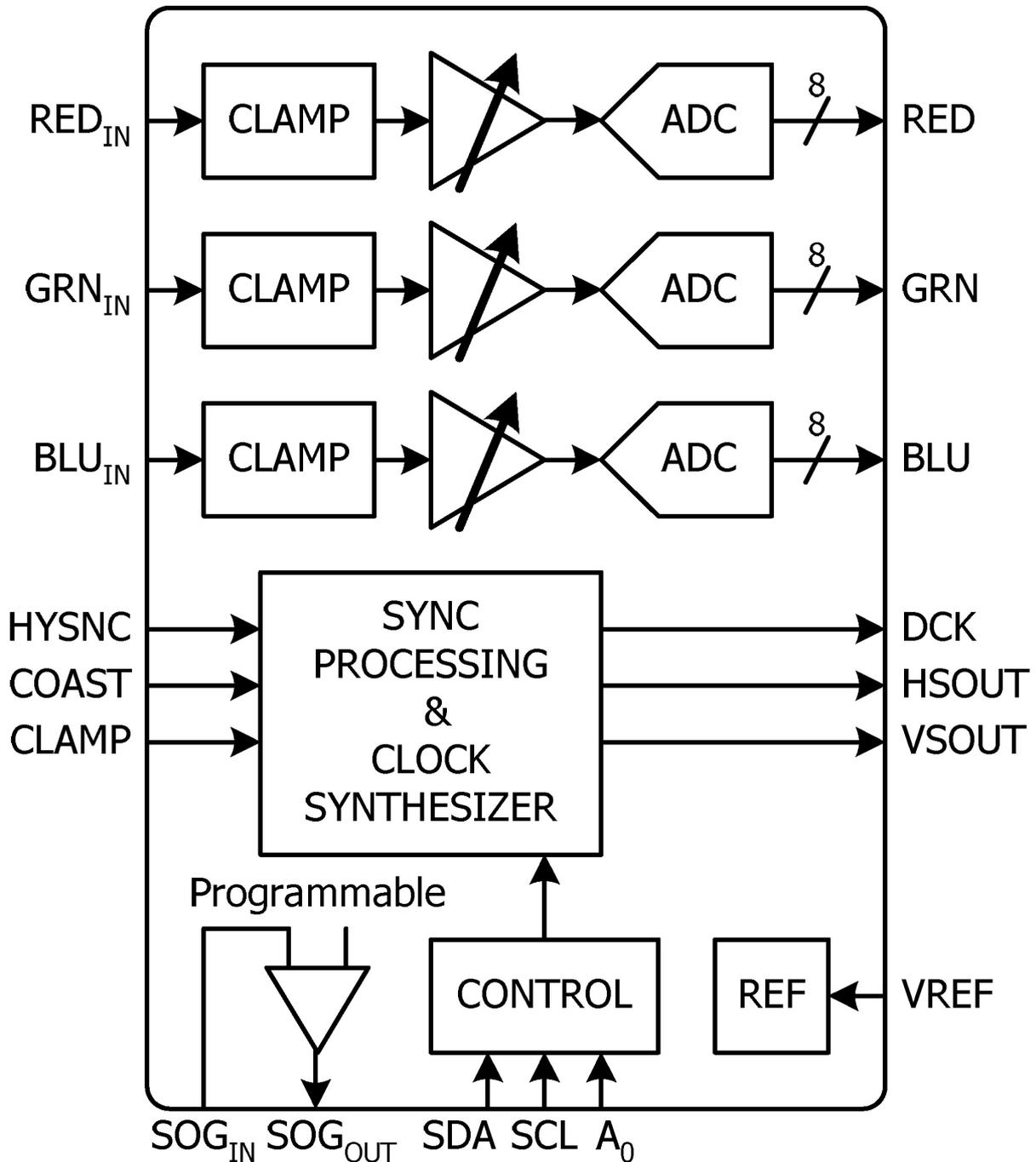
5,9,22,37,53,69,75,78,86,87,99: Power Supply 1.8V

6,7,15,23,33,35,45,55,60,70,73,76,77,81,83,85,88,91,92,95,98: Ground

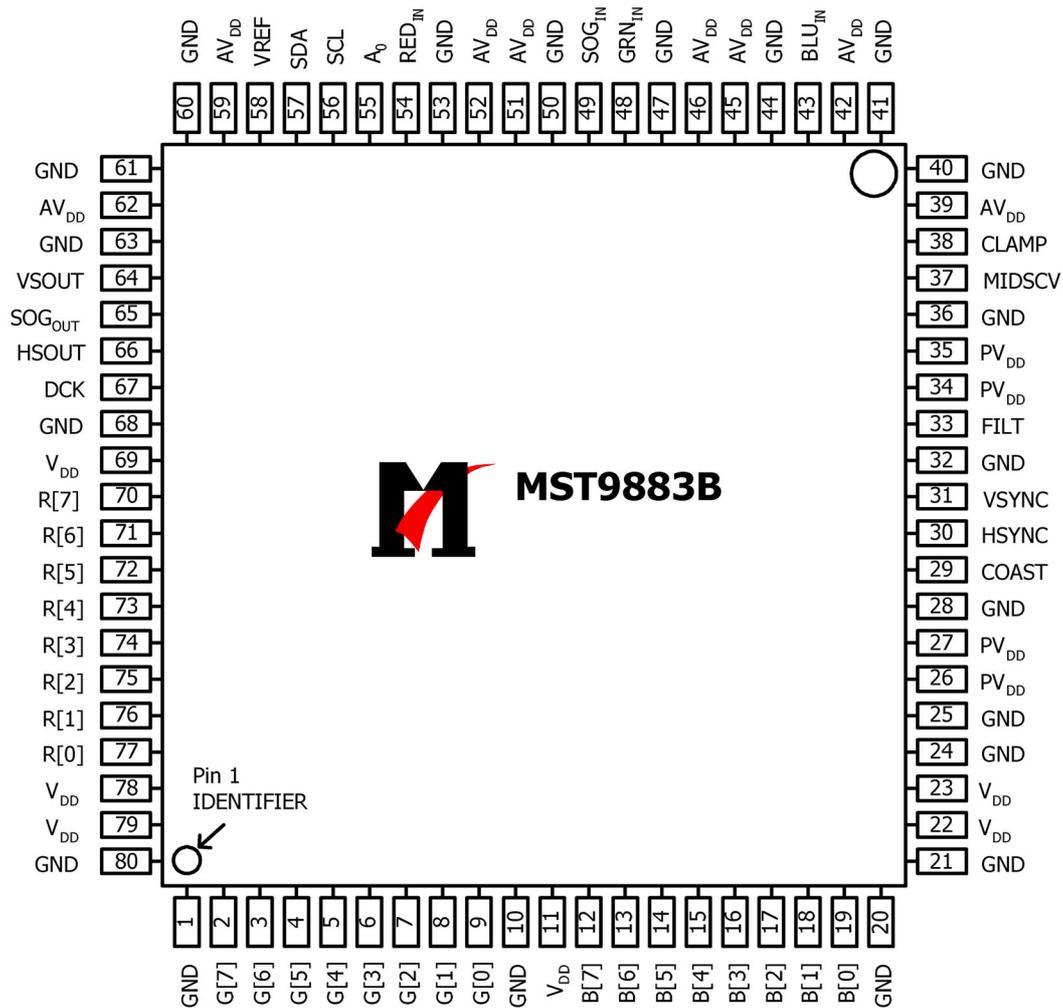
4. MST9883

MST9883 is a Triple Video A/D Converter with Clamps & Pixel Clock Synthesizer. The triple ADC support 12 - 110 MHz Sampling Rate. It integrated 5-bit pixel clock phase adjustment for precise sample timing control. It's Output support 4:2:2 Format Mode and it can Pin Compatible with AD9883A.

Block diagram of MST9883 is flow:



Pin configuration of MST9883:



Pin descriptions of MST9883:

- 54: Red analog input
- 48: Green analog input
- 43: Blue analog input
- 49: Sync on Green analog input
- 38: External Clamp Input
- 30: Horizontal SYNC Input
- 31: Vertical SYNC Input
- 29: Hold PLL Frequency, do not track HSYNC
- 56: Serial Interface clock
- 57: Serial Interface data pin
- 55: Serial interface address pin
- 70-77: Red output data
- 2-9: Green output data
- 12-19: Blue output data
- 67: Output data clock
- 66: HSYNC output
- 64: VSYNC output
- 39,42,45,46,51,52,59,62: Analog Power

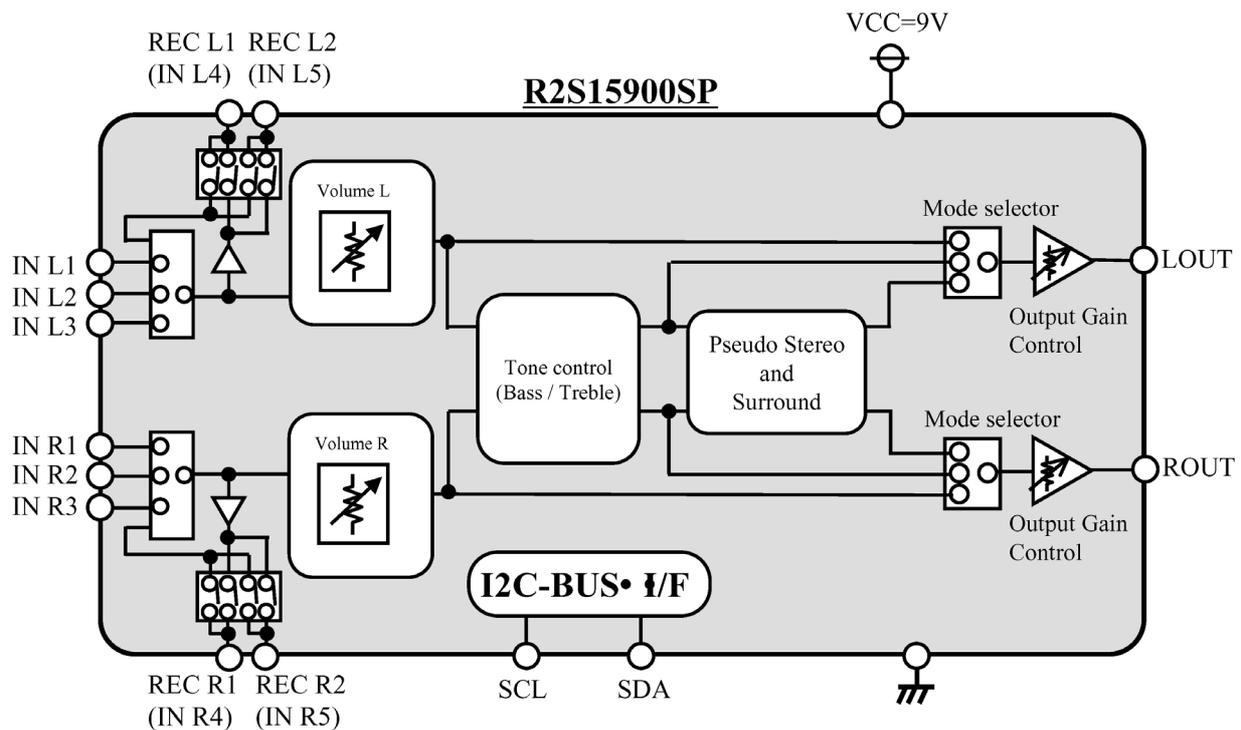
26,27,34,35: PLL Power

11,22, 23, 69,78,79: Digital Output Power

1,10,20,21,24,25,28,32,36,40,41,44,47,50,53,60,61,63,68,80:Ground

5. R2S15900SP

R2S15900SP is an audio signal processor. It has MUTE and Volume/Tone control. It can support 5 input selector.



Pin descriptions of R2S15900SP:

2,27: AV1 AUDIO INPUT L/R

3,26: AV2 AUDIO INPUT L/R

4,25: DTV AUDIO INPUT L/R

5,24: EAR PHONE L/R

6,23: AV OUT L/R

11,19: AUDIO OUTPUT L/R

17,18:I2C SDA/SCL

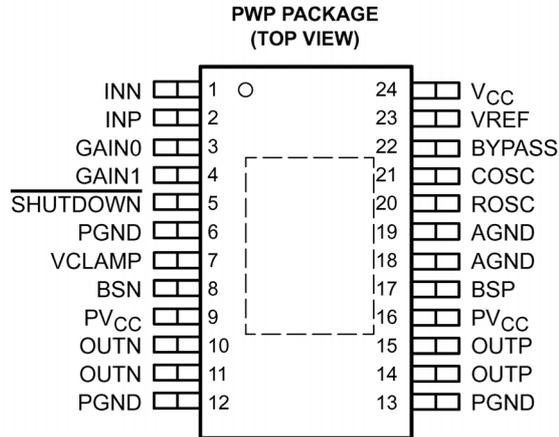
28: Power Supply

12: Ground

6. TPA3001

The sound power amplifier TPA3001 Class D AMP is the high effective D type of power amplifier of the single track. The output power can reach 20W with 8-Ω speakers, +18V power supply, eliminating the need for heat sinks. The TPA3001D1 is available in the 24-pin thermally enhanced TSSOP package.

Pin configuration of TPA3001:



Pin description of TPA3001:

1: Negative differential input

2: Positive differential input

3,4: gain control

10,11: Negative BTL output

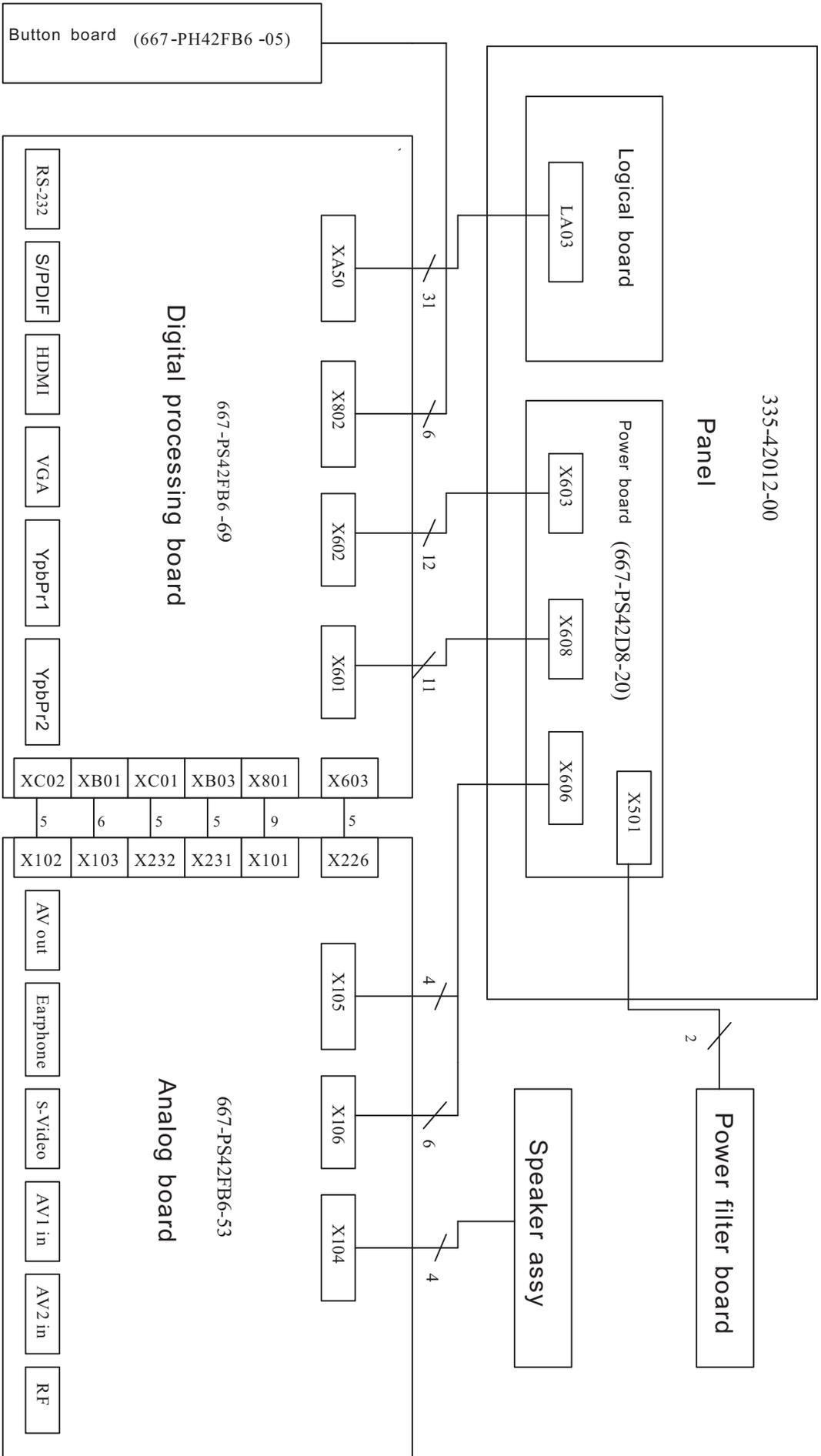
14,15: Positive BTL output

9,16,24: Power Supply

6,12,13,18,19: Power Ground

5: Shutdown terminal

Wiring diagram

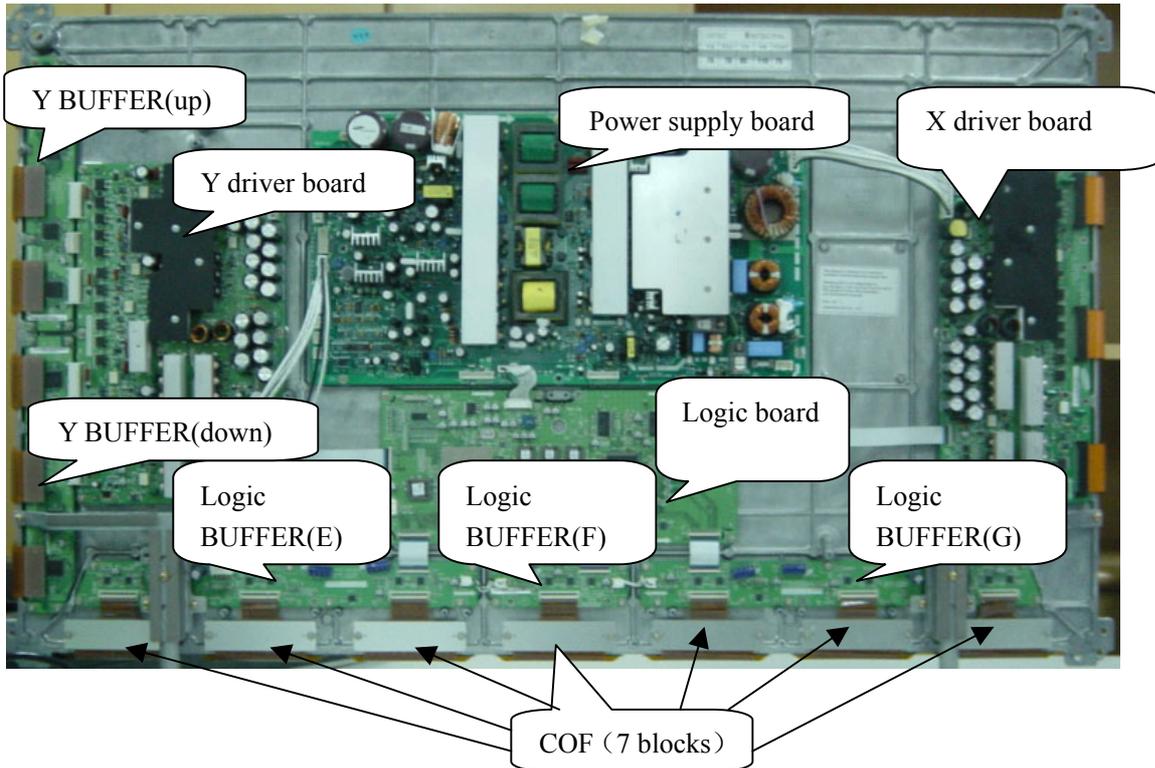


Diagnosis for Plasma Screen of PH42/50FBXX

And Maintenance of the Functions of Various Modules on Screen

1. Functions of Various Modules on Screen

As shown in the figure below, PDP screen can be divided into power supply board, X driving board, Y driving board, logic board, logic BUFFER board (E, F, G), Y BUFFER board (upper and lower), COF etc.:



- * **Power supply board:** to supply power for the screen, other functional modules on the screen, our own main board, and video frequency processing board.
- * **X driving board:** to produce and provide driving signal for X electrode according to the time sequence signal sent from logic board.
- * **Y driving board:** to produce and provide driving signal for Y electrode according to the time sequence signal sent from logic board.
- * **Logic board:** to process the image signal sent from the main board, to produce addressing signal and to provide driving signal for X and Y driving boards.
- * **Logic BUFFER board (E, F):** To convert the data signal and control signal sent from the logic board into the signals required by COF
- * **Y BUFFER board (Upper, Lower) :** to transmit the scanning signal from the Y driving board to the screen, which is divided into upper and lower parts.
- * **COF:** to convert the signal sent from the logic BUFFER board into the address signal used by the screen.

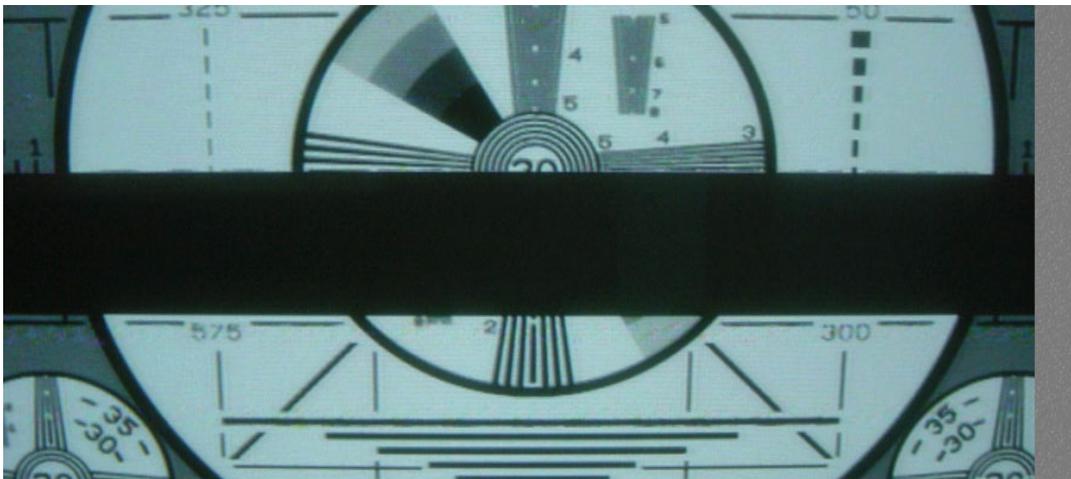
2. Trouble diagnosis:

1) The screen is not bright:

- a. Check to see if the power supply plug from the power filter board to the power supply board is well inserted into the socket. If not, plug it in.
- b. Check if the fuse on the power supply board is blown up. If yes, replace it for a good one.
- c. Remove digital processing board and analog board, ground socket X601 of the power supply board to the AUTO mode.

Switch the power on and check if the output voltages of the power board are normal. If normal, then the problem lies in digital processing board and analog board, which will be dealt with separately. If abnormal, then first replace the power supply board to see if the problem is solved.

2) There appears on the screen a line or several unlit lines.

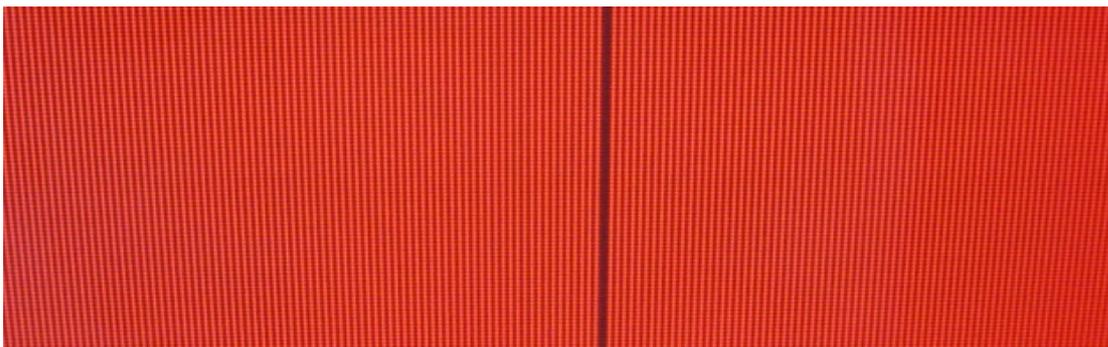


Check if the socket between Y driving board and Y BUFFER is plugged well. If not, plug it well. If yes then replace Y BUFFER (upper, lower) in respect to the upper, lower part of the dark line on the screen.

3) There appear on the screen one or several horizontal lines that are much brighter than the remaining horizontal lines at the edge:

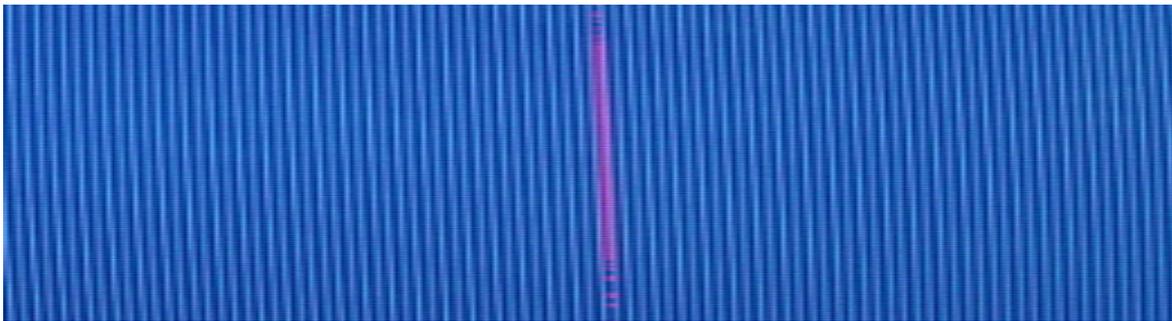
Check if the socket between Y driving board and Y BUFFER is plugged well. If not, plug it well. If yes then replace Y BUFFER (upper, lower) in respect to the upper, lower part of the dark line on the screen.

4) There appear on the screen one vertical unlit line or a vertical entirely unlit block



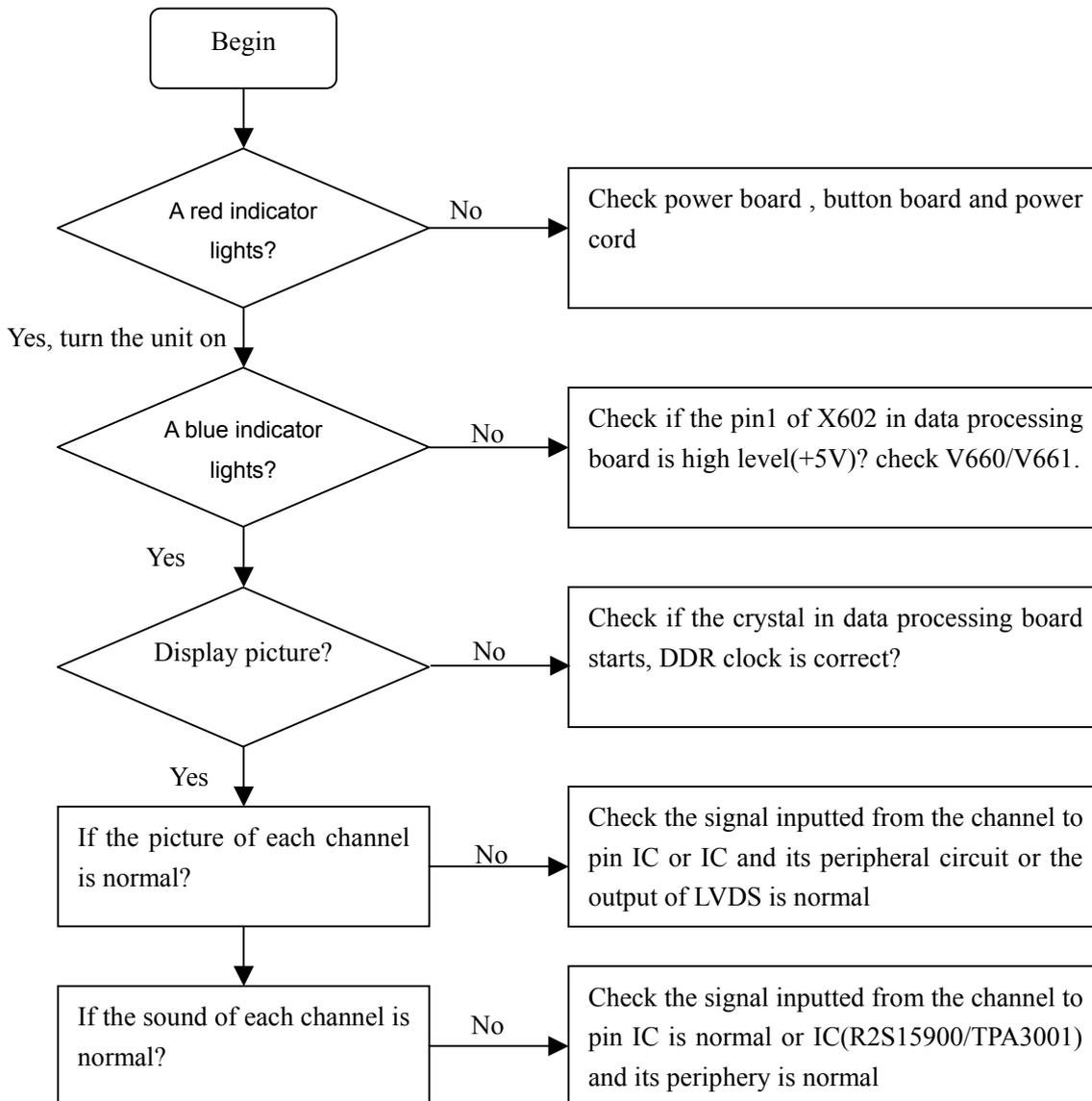
- a. If it's one vertical unlit line, then COF has problem.
- b. If it's a vertical entirely unlit block, then first check if the connection socket between COF and logic BUFFER has problem. If not, check if the connection socket between the logic BUFFER and the logic board is normal. If yes, replace the logic BUFFER. Finally, if the problem still remains when the replacement is over, then replace the logic board.

5) There appears on the screen a mono color signal and one or several vertical bright lines of other colors:



- a. If it's a vertical bright line of other colors, then the problem lies with COF or the screen.
 - b. If it's an entire vertical block of other colors, then first check to see if the connection socket between COF and logic BUFFER has problem. If no problem, check if the connection socket between the logic BUFFER and the logic board is normal. If it's normal, then replace the logic BUFFER. If the problem still remains after the replacement, then replace the logic board. Finally if the problem is still there, then the problem lies with COF.
- 6) There appear on the screen abnormal bright spots or blocks that are different from what's described above:
- a. Check if the connection socket between COF and logic BUFFER board has been well plugged.
 - b. Replace the logic BUFFER board. If it's not solved then replace logic board. If the problem still remains, then it's the problem with COF.

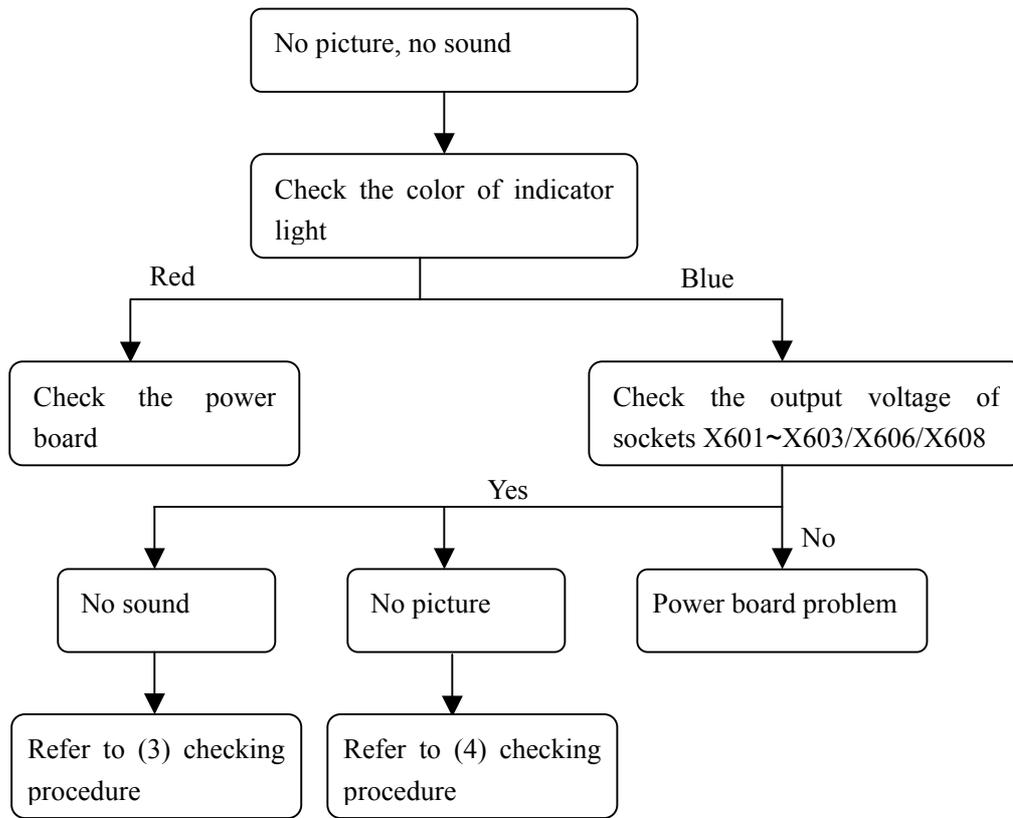
Troubleshooting guide



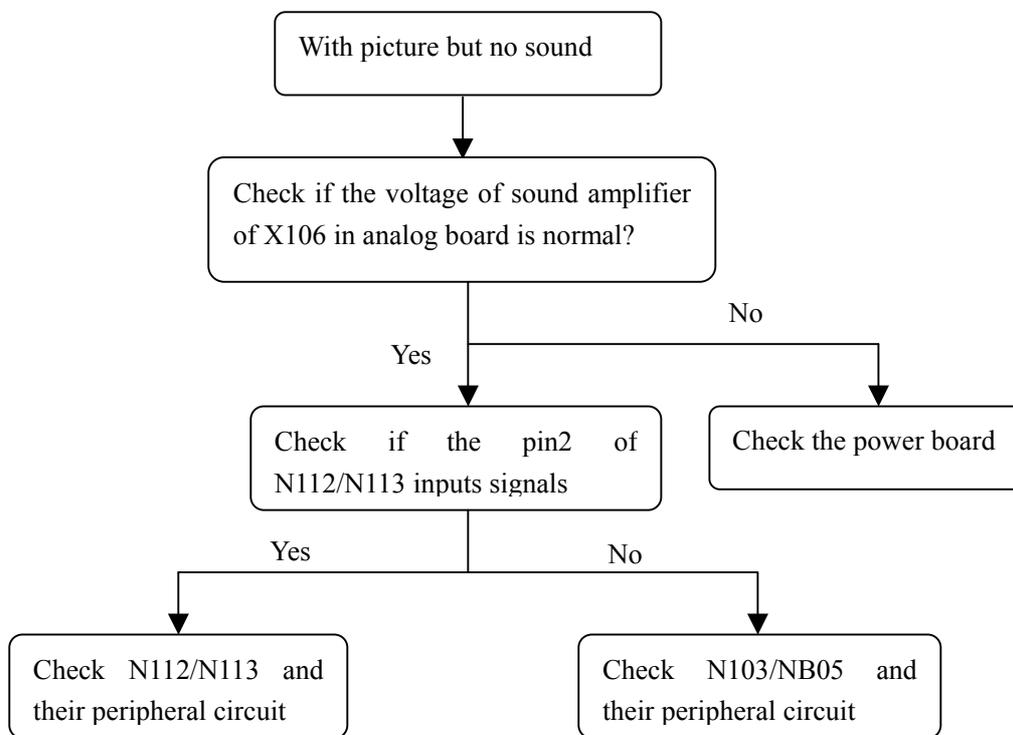
(1) abnormal picture

- a) Failure with resistor rows R839~R844 of image processing board, which may lead to lack of color or color splash.
- b) Failure with resistor rows R825~R830 of image processing board, which may lead to lack of color or color splash.
- c) A certain differential wire pair of LVDS of XA50 or X803(RX0+/-, RX1+/-, RX2+/-, RX3+/-) is abnormal, which may lead to lack of color or color splash.,
- d) Failure with resistor rows RA18~RA25, which may lead to loss of corresponding color from the gray degree corresponding to the picture of channel HDMI.
- e) Failure with NB07, NA51 and their peripheral circuit, which may lead to picture abnormal of PC, YPrPb and YCrCb.
- f) Failure with N104, which may lead to picture abnormal of TV, AV1, AV2, S-VIDEO.
- g) Failure with N803/N805/N806, which may lead to picture abnormal in all channels.

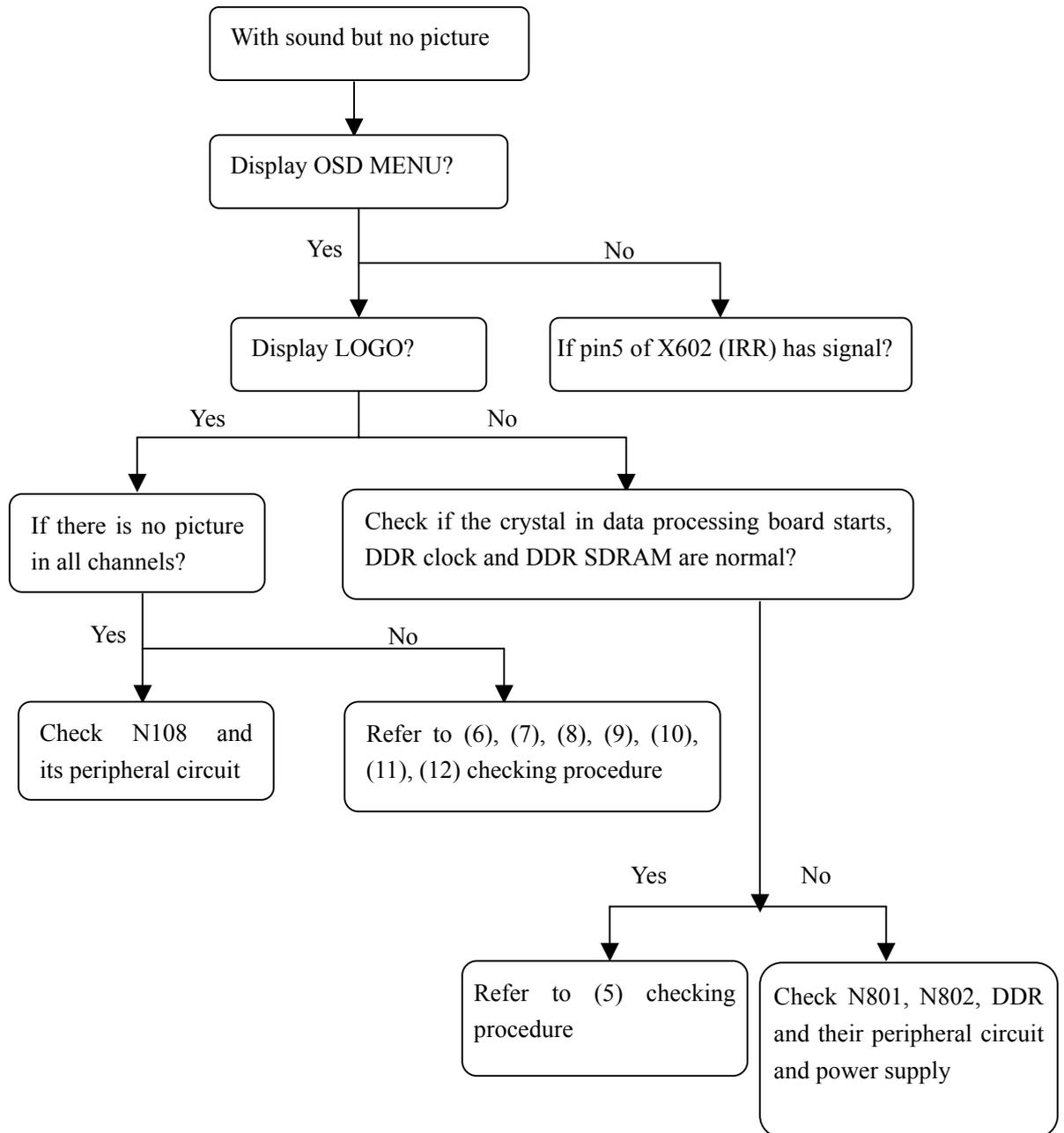
(2) no picture, no sound



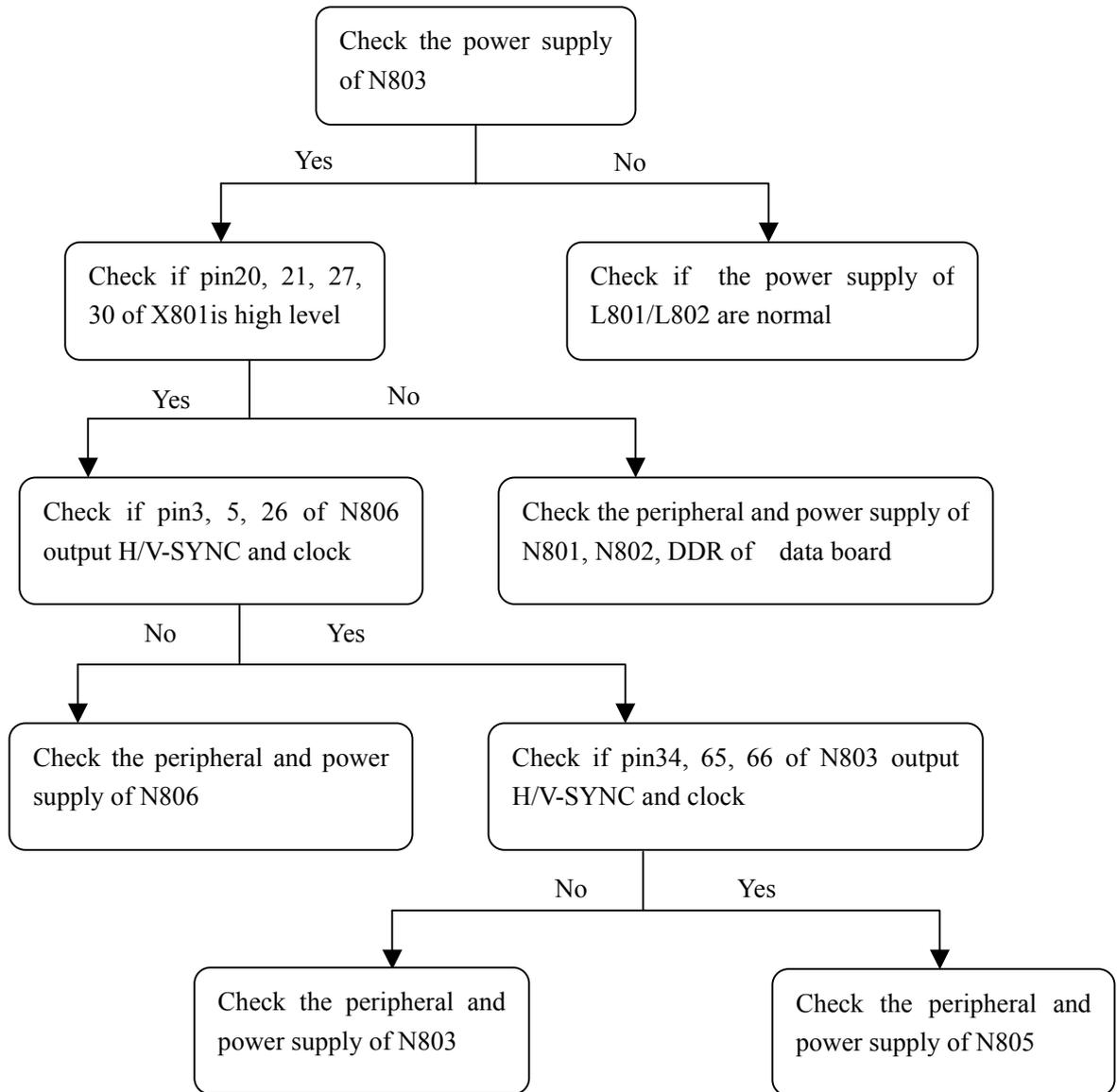
(3) with picture but no sound



(4) with sound but no picture

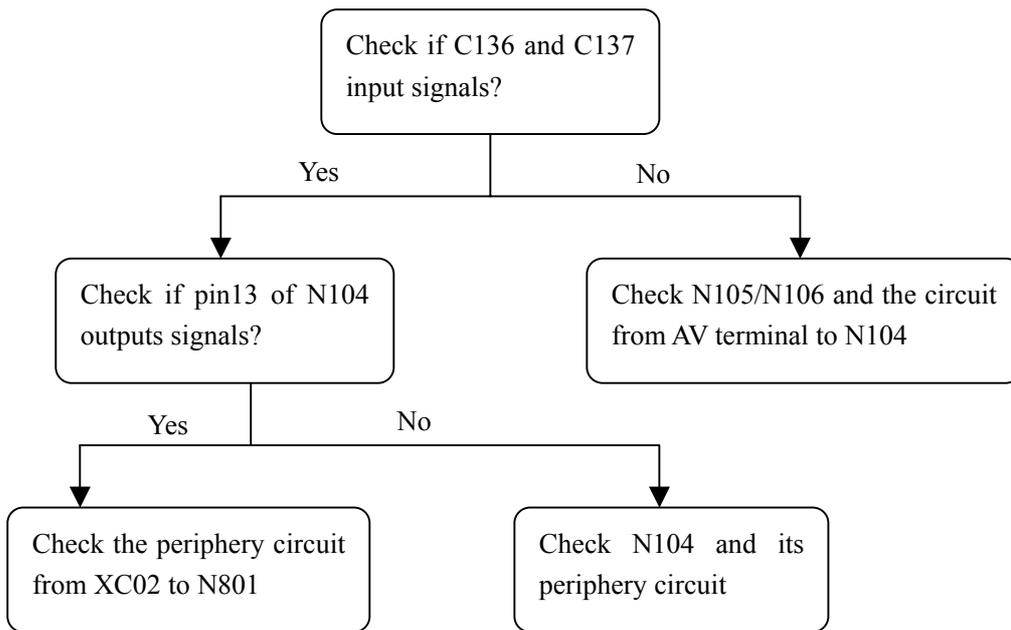


(5) Check image processing board

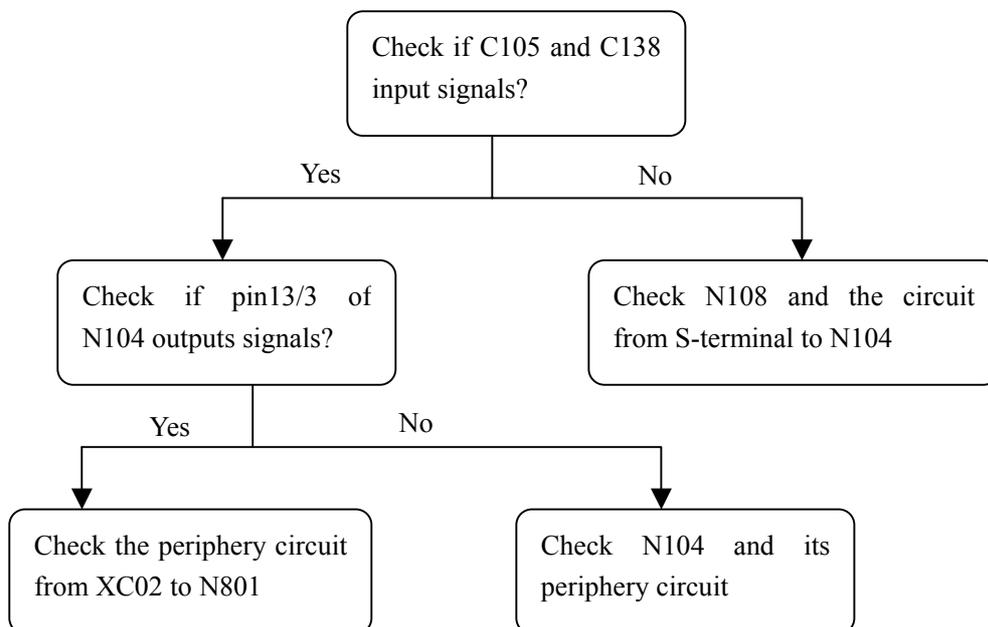


Note: please make sure that the data of FLASH N804 is correct before checking the image processing board.

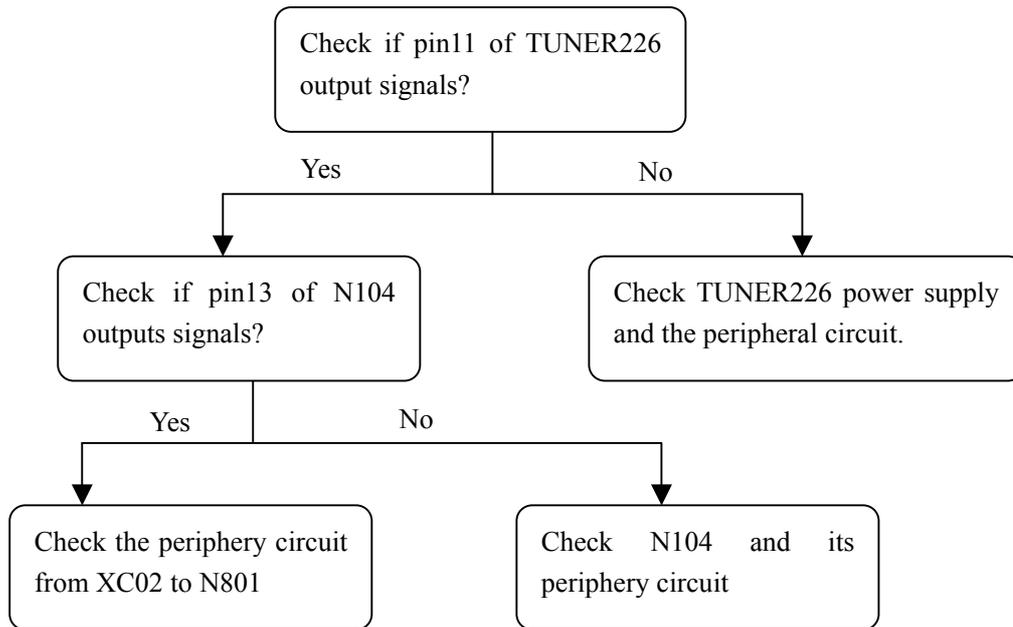
(6) AV no picture



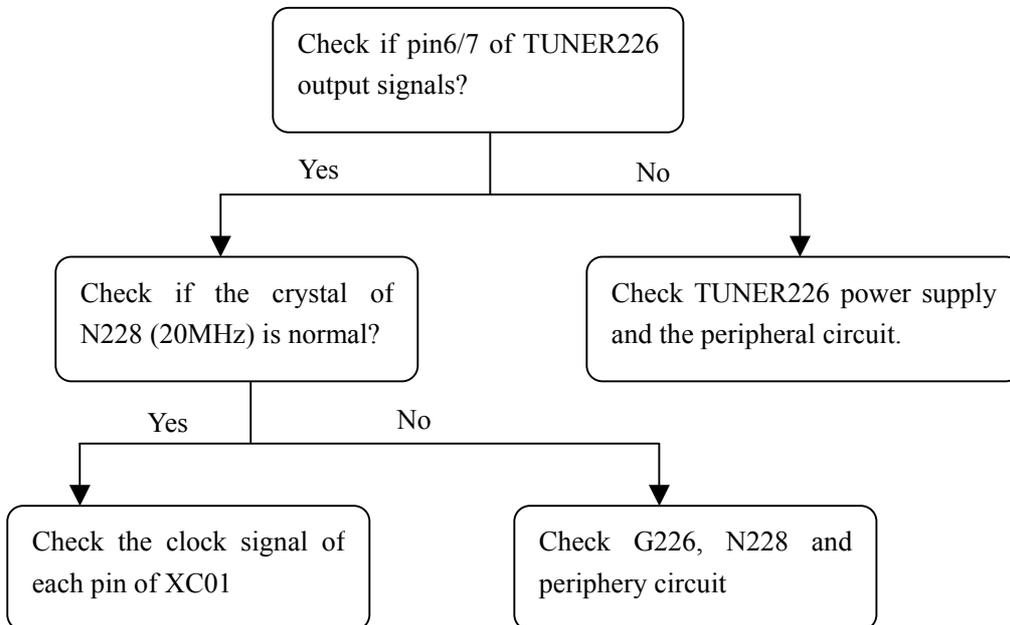
(7) S-terminal no picture



(8) NTSC channel no picture



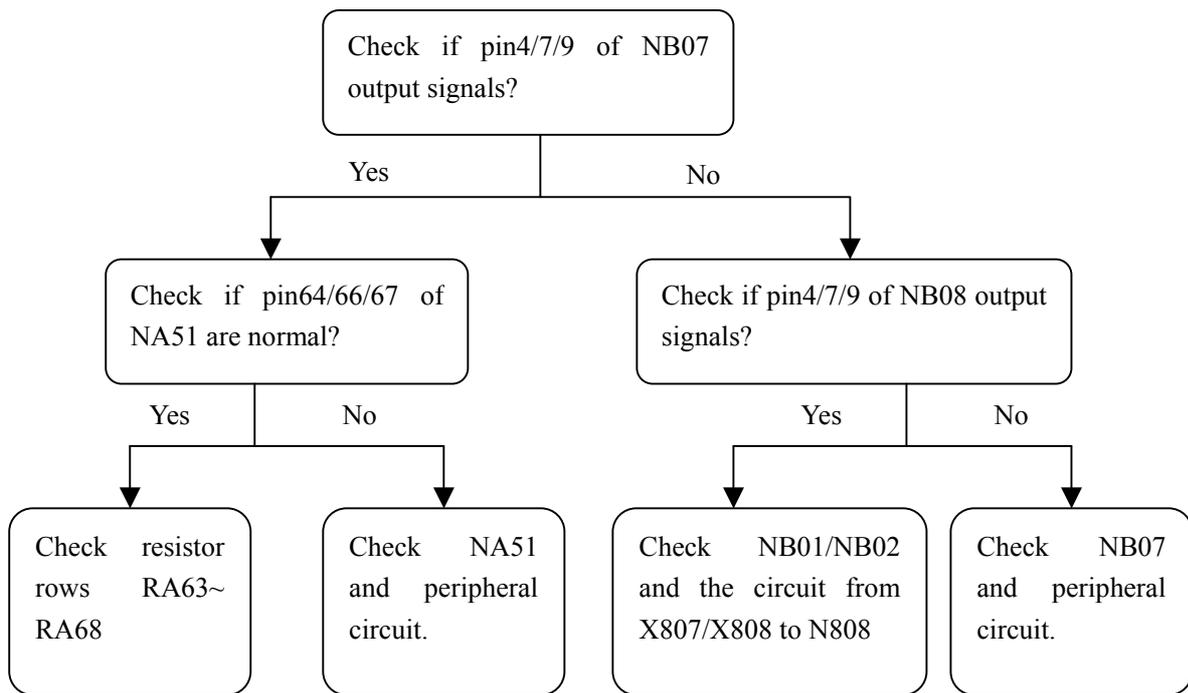
(9) ATSC channel no picture



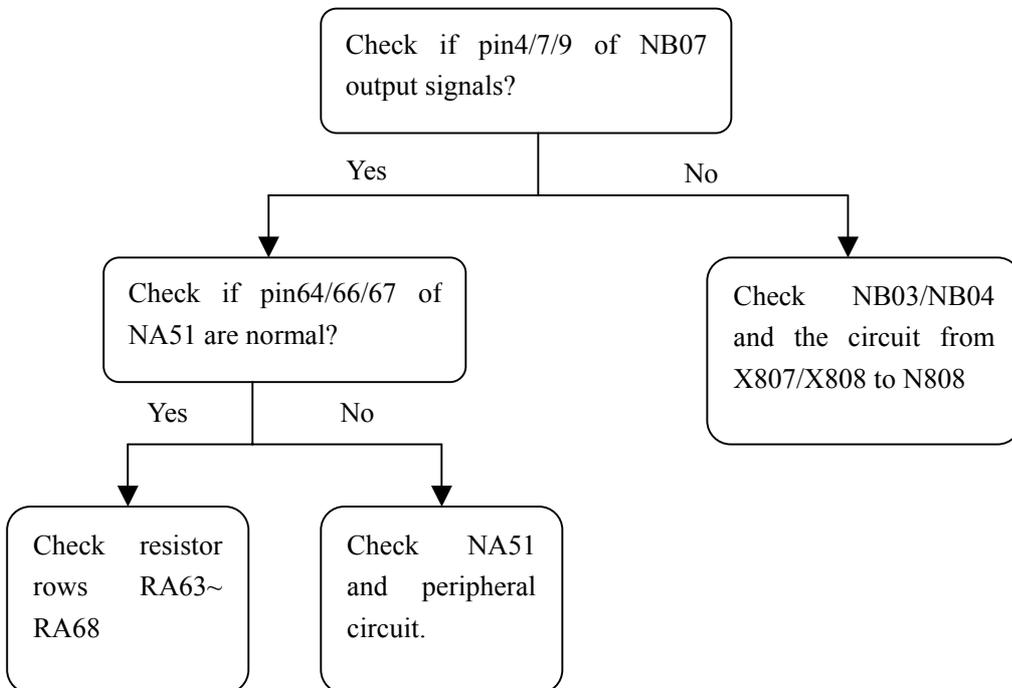
Note :

The I2C bus line control of TUNER is switch through the bus line of N228, so after checking the power supply and peripheral circuit of TUNER226, it is still no picture in NTSC and ATSC channel, please check N228 emphatically.

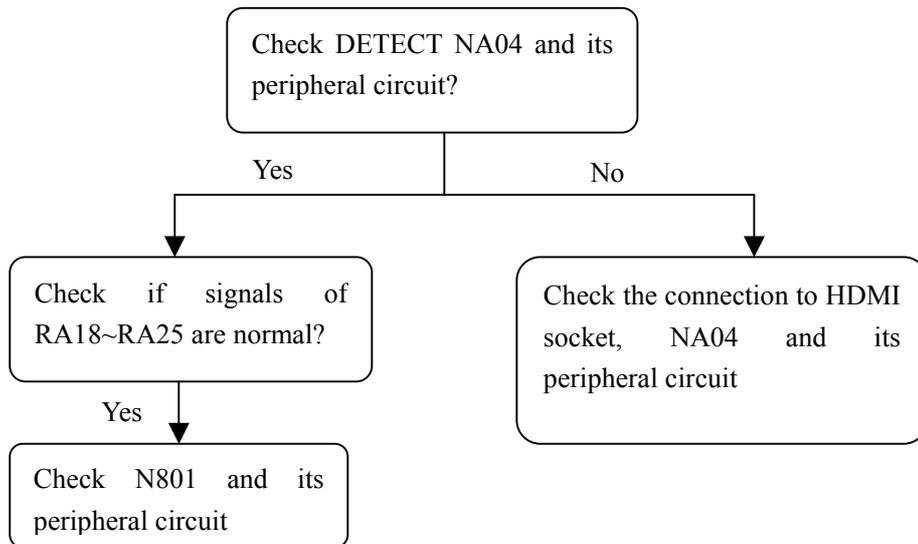
(10) YprPb or Ycrcb channel no picture



(11) D-sub channel no picture

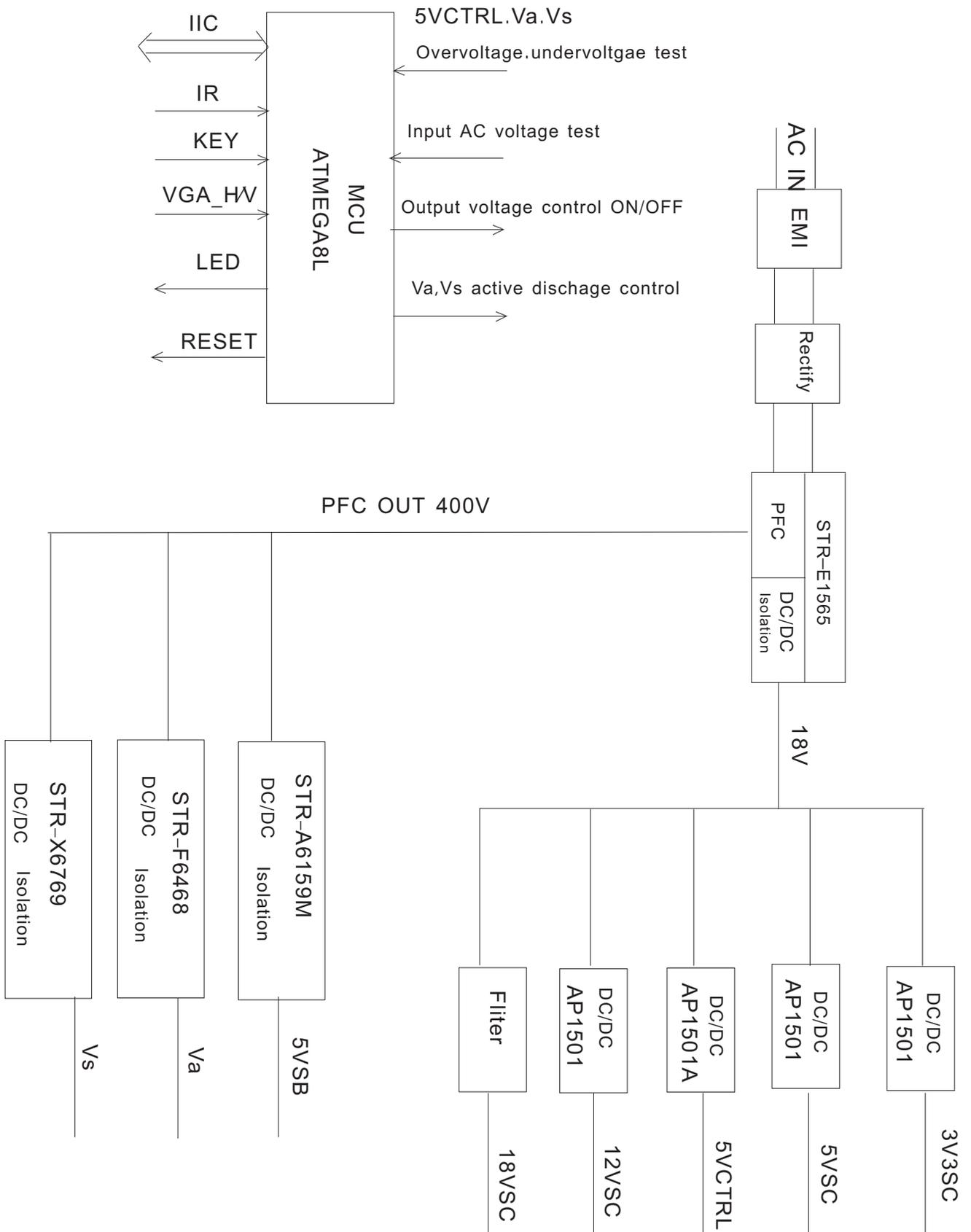


(12) HDMI channel no picture

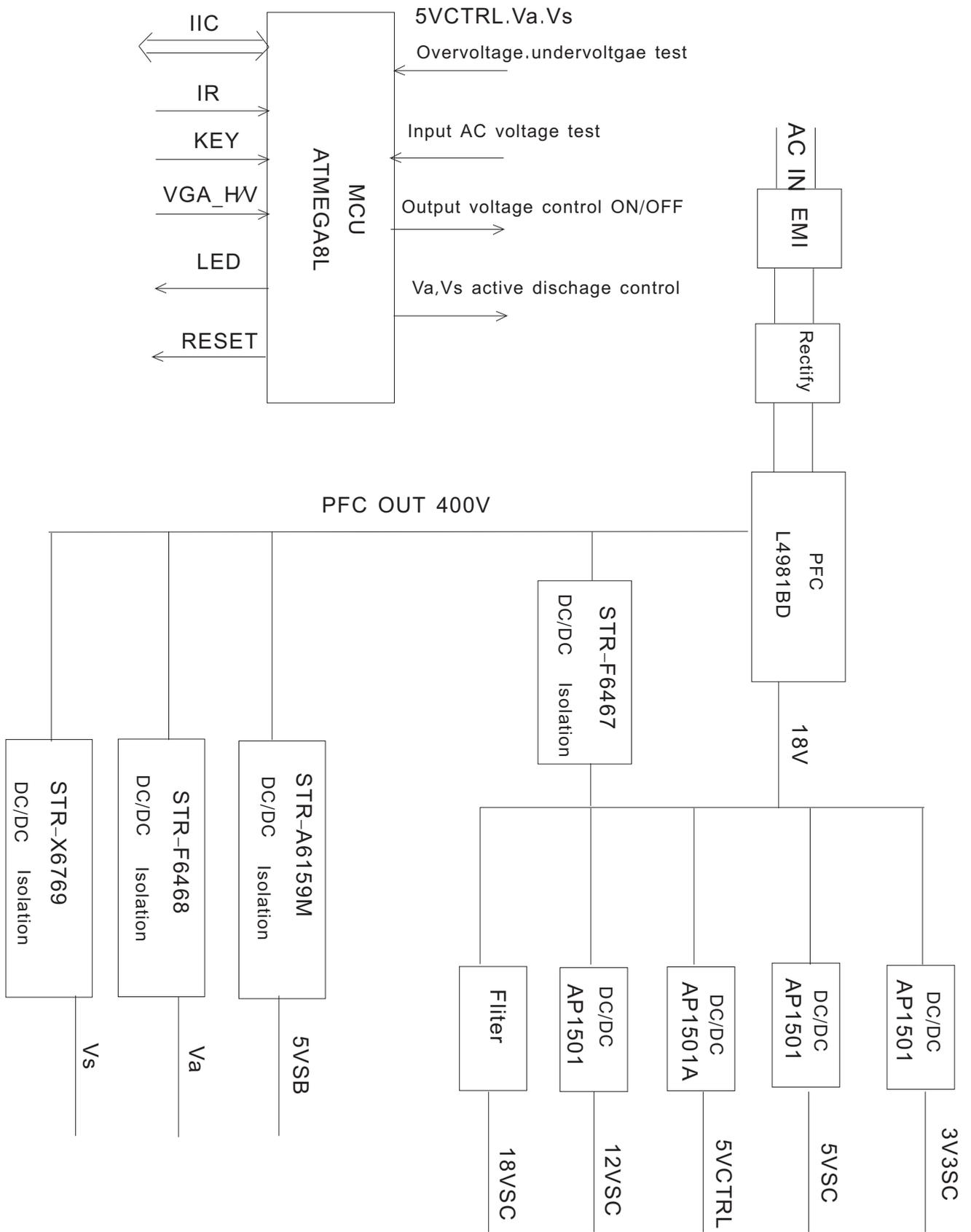


Note: N801 embeds FLASH, which stores DDC and HDCP information of HDMI, so make sure the connection between HDMI socket/interface and the bus line is well- going, the picture will display.

Block diagram of LG 42" power board



Block diagram of LG 50" power board



Troubleshooting of LG 42" power board

Instruction of system and time sequence control

The whole system is composed of EMI, rectify, PFC, DC/DC and MCU. Therein MCU is the control core of the whole system. On the one hand, it controls ON/OFF time sequence of each voltage and the main, AC voltage test. On the other hand, it performs the standby CPU function with IIC bus to the main CPU.

Time sequence

The system has two working modes: AUTO and NORMAL, AUTO mode is used for adjustment and service, while NORMAL mode is used for TV at normal time. At AUTO mode(short X610), connect 5VCTRL with load of about 2A, turn on power, then output several low-voltage power supplies, delay 1.5s or so and output Va, Vs. First stop the output of Va, Vs at power-down, and active discharge to output-capacitor of Va,Vs. on condition that the voltage Va,Vs each is lower than 10 percent (if unsatisfied, then wait), then delay 0.5s and stop all the low-voltage power supplies except for 5VSB into Standby mode.

At NORMAL mode, MCU receives power-on control of IR or button board, outputs several low-voltage power supplies, after main CPU sending Va,Vs start-control through IIC bus, outputs Va,Vs. at the status of turn on, MCU receives power-down control from main CPU and performs power-down time sequence (power-down time sequence is the same at AUTO mode).

At the two modes, when detect the lower input AC voltage, it will not perform power-on. At the status of turn on, when detect the lower input AC voltage or 5VCTRL,Va,Vs beyond normal scope value, it will perform the power-down time sequence above and enter into Standby mode.

Trouble diagnosis

The voltage 5VSB is normal, while the voltages of other circuits are zero, in this case, it may switch power on at AUTO mode and check if 5VCTRL delay 1.5s or so, if NO, check 5VCTRL and its fore-circuit; if YES, check LED (LED601), if LED lights, check the circuit of Va, if not, check the circuit of Vs (note: premise N608 and its periphery circuit are normal). If the voltages of other circuits are abnormal, check the corresponding circuits.

Trouble phenomenon (premise the voltage 5VSB is normal)

The main voltage of power board is abnormal, which is commonly detected to enter into Standby mode, the phenomenon is that switch power off immediately after switching power on.

AC detect circuit or IR, button circuit is abnormal, which will lead to unable to switch power on.

The low-voltage power supplies are normal, while the voltage Va, Vs is zero, it maybe communication abnormal of IIC bus between MCU and main CPU.

Troubleshooting of LG 50" power board

Instruction of system and time sequence control

The whole system is composed of EMI, rectify, PFC, DC/DC and MCU. Therein MCU is the control core of the whole system. On the one hand, it controls ON/OFF time sequence of each voltage and the main, AC voltage test. On the other hand, it performs the standby CPU function with IIC bus to the main CPU.

Time sequence

The system has two working modes: AUTO and NORMAL, AUTO mode is used for adjustment and service, while NORMAL mode is used for TV at normal time. At AUTO mode(short X5201), connect 5VCTRL with load of about 2A, turn on power, then output several low-voltage power supplies, delay 1.5s or so and output Va, Vs. First stop the output of Va, Vs at power-down, and active discharge to output-capacitor of Va,Vs. on condition that the voltage Va,Vs each is lower than 10 percent (if unsatisfied, then wait), then delay 0.5s and stop all the low-voltage power supplies except for 5VSB into Standby mode.

At NORMAL mode, MCU receives power-on control of IR or button board, outputs several low-voltage power supplies, after main CPU sending Va,Vs start-control through IIC bus, outputs Va,Vs. at the status of turn on, MCU receives power-down control from main CPU and performs power-down time sequence (power-down time sequence is the same at AUTO mode).

At the two modes, when detect the lower input AC voltage, it will not perform power-on. At the status of turn on, when detect the lower input AC voltage or 5VCTRL,Va,Vs beyond normal scope value, it will perform the power-down time sequence above and enter into Standby mode.

Trouble diagnosis

The voltage 5VSB is normal, while the voltages of other circuits are zero, in this case, it may switch power on at AUTO mode and check if 5VCTRL delay 1.5s or so, if NO, check 5VCTRL and its fore-circuit; if YES, check LED (LED5201), if LED lights, check the circuit of Va, if not, check the circuit of Vs (note: premise N608 and its periphery circuit are normal). If the voltages of other circuits are abnormal, check the corresponding circuits.

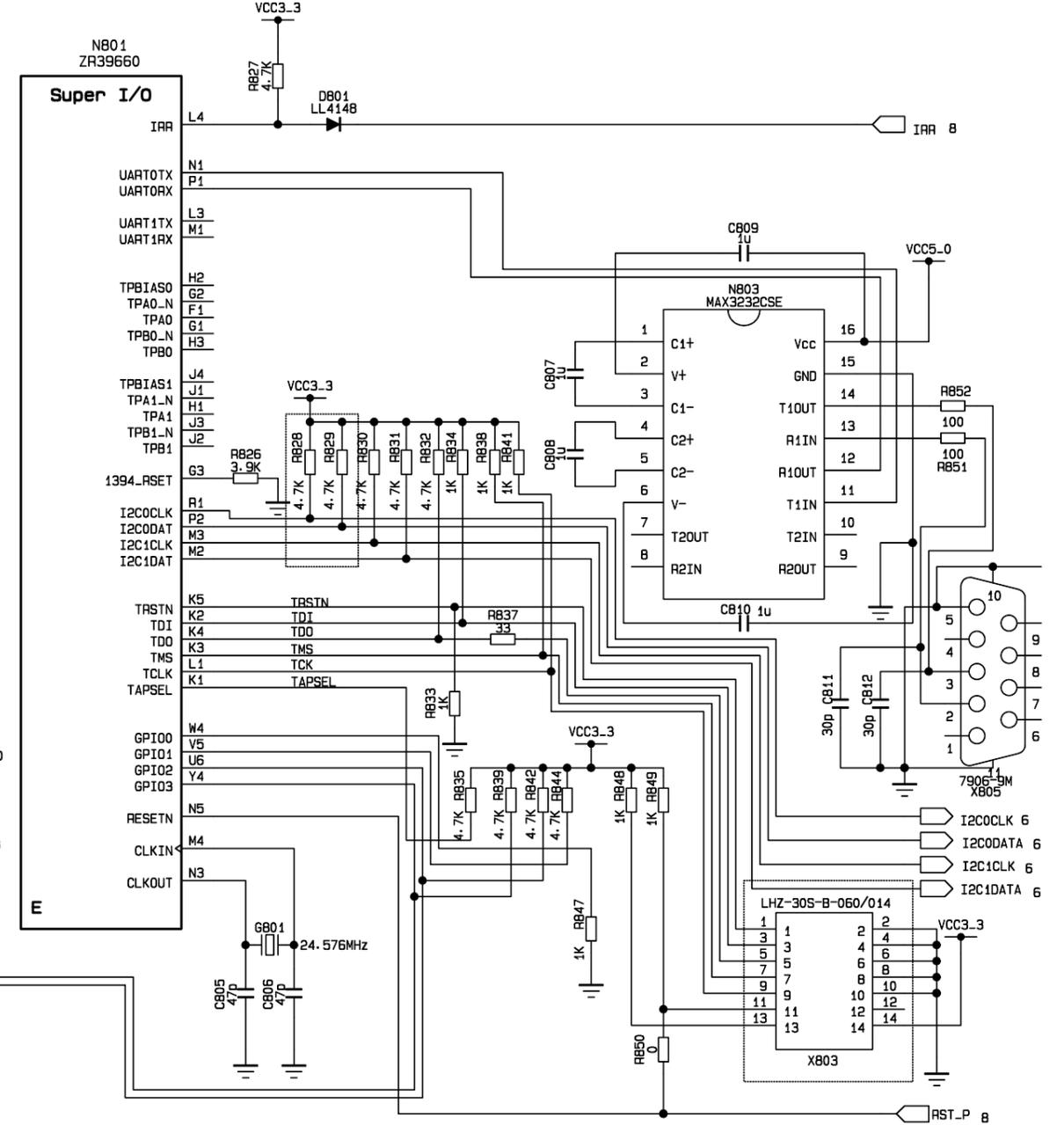
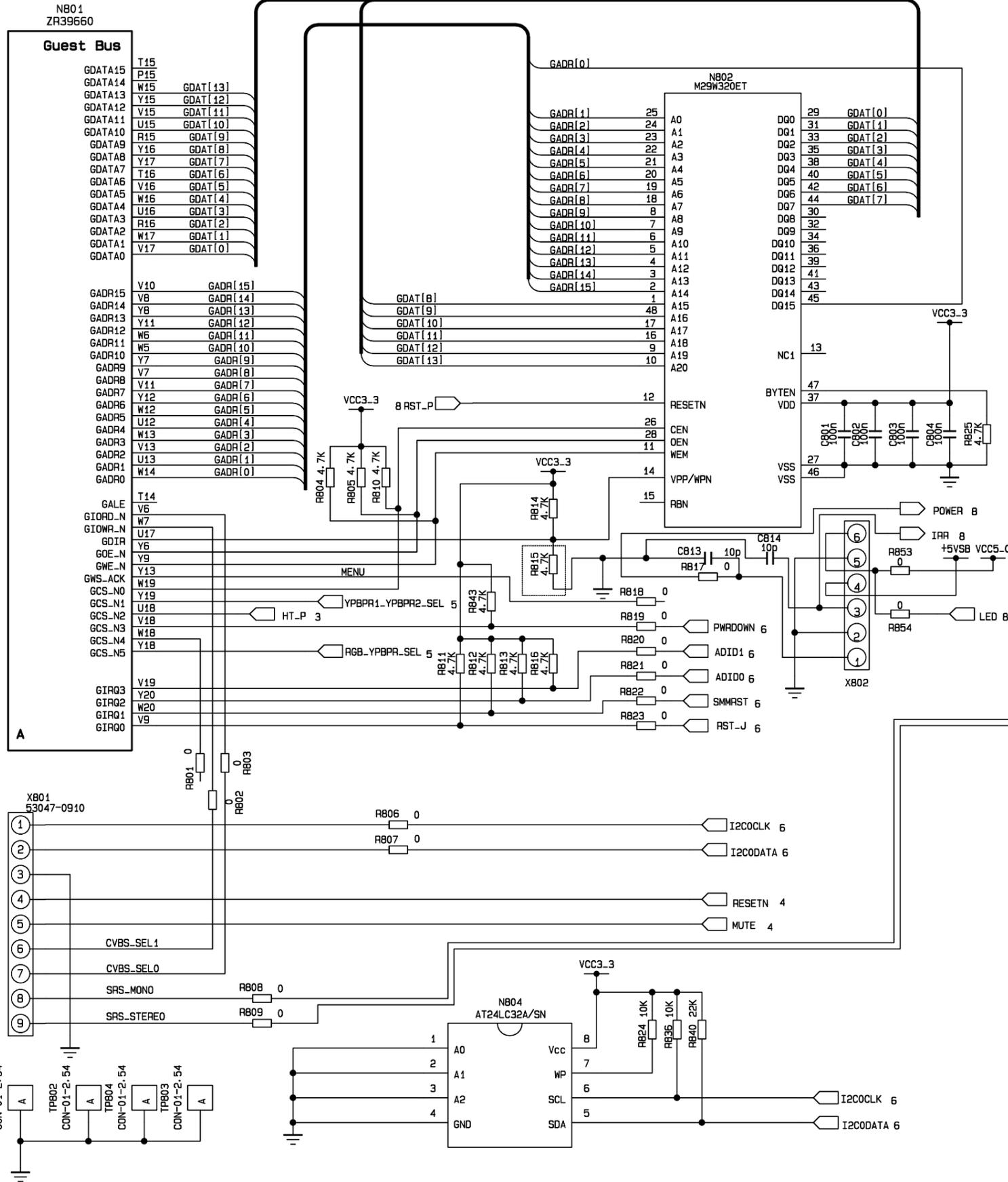
Trouble phenomenon (premise the voltage 5VSB is normal)

The main voltage of power board is abnormal, which is commonly detected to enter into Standby mode, the phenomenon is that switch power off immediately after switching power on.

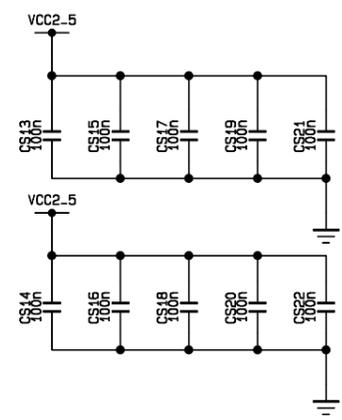
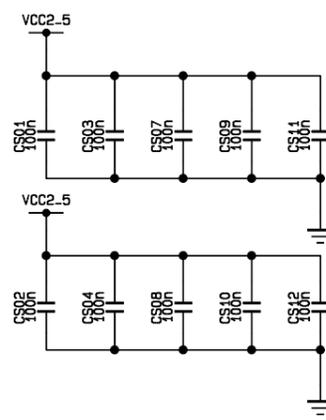
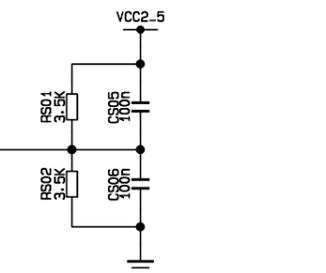
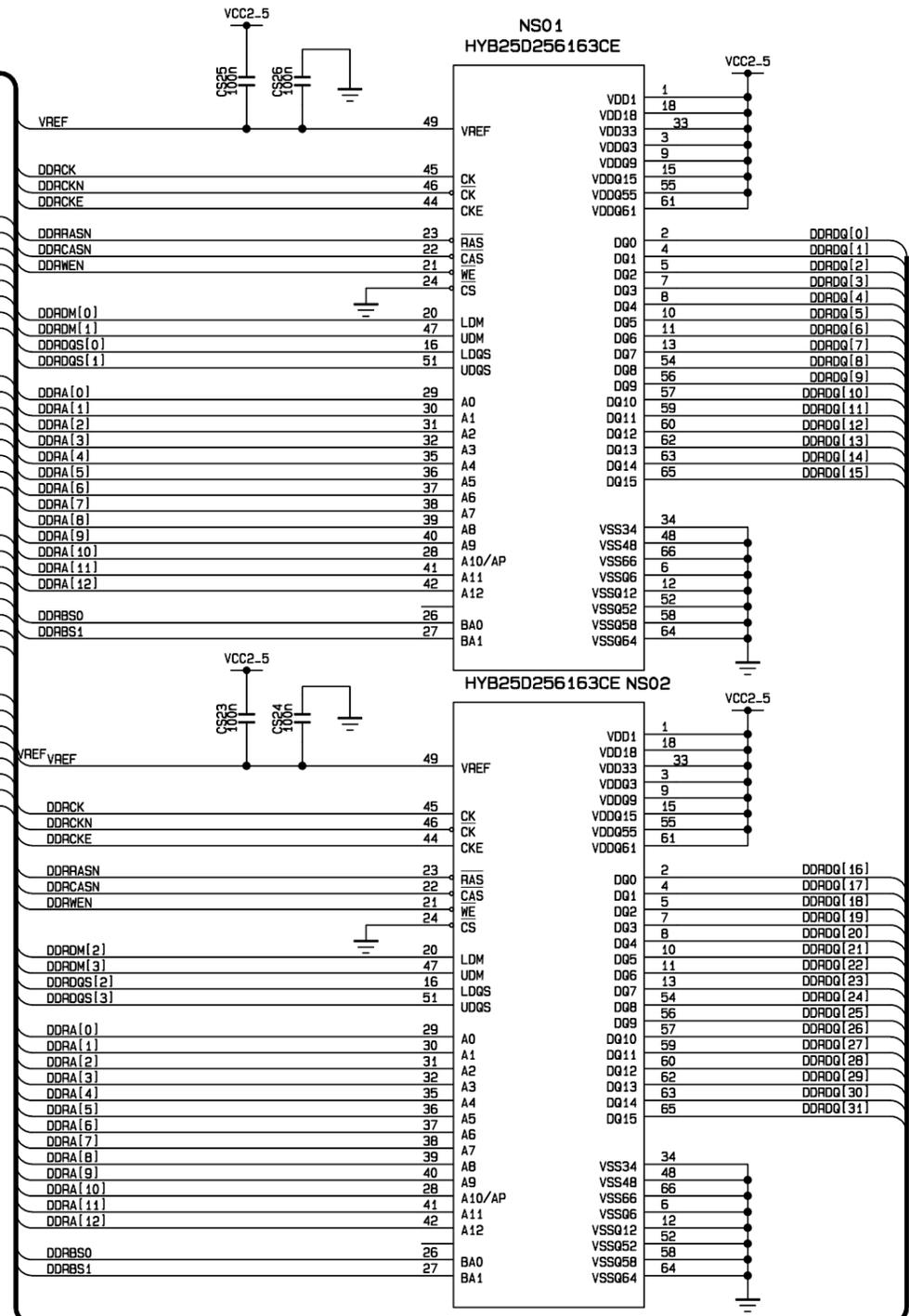
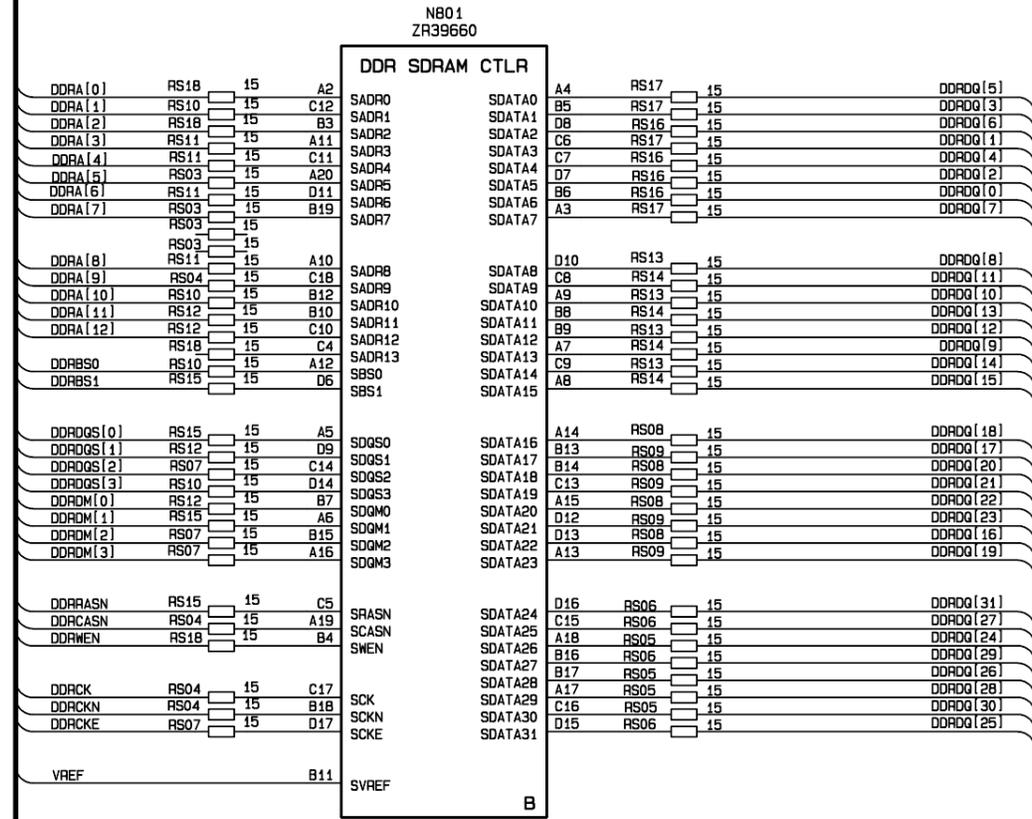
AC detect circuit or IR, button circuit is abnormal, which will lead to unable to switch power on.

The low-voltage power supplies are normal, while the voltage Va, Vs is zero, it maybe communication abnormal of IIC bus between MCU and main CPU.

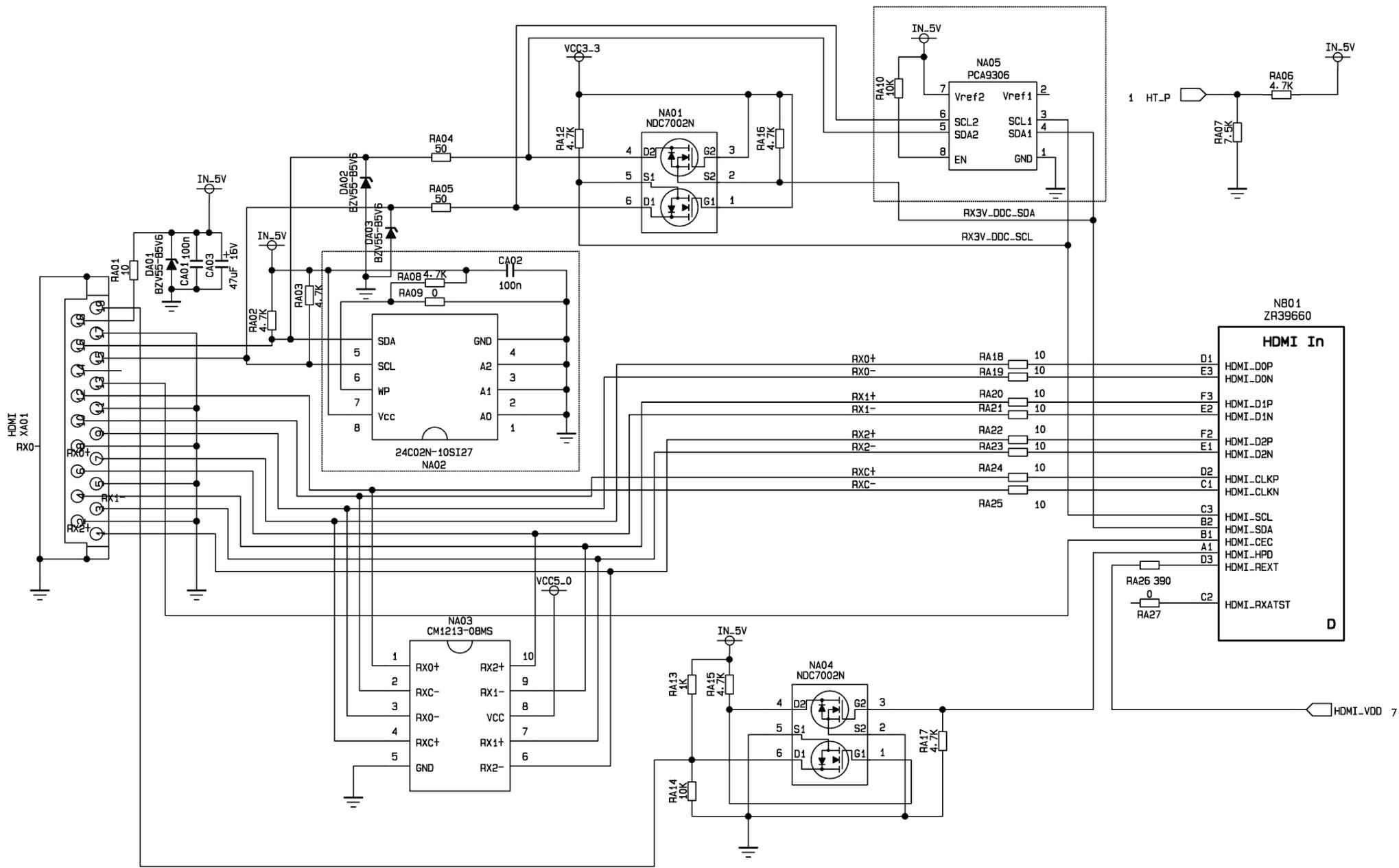
OPTION



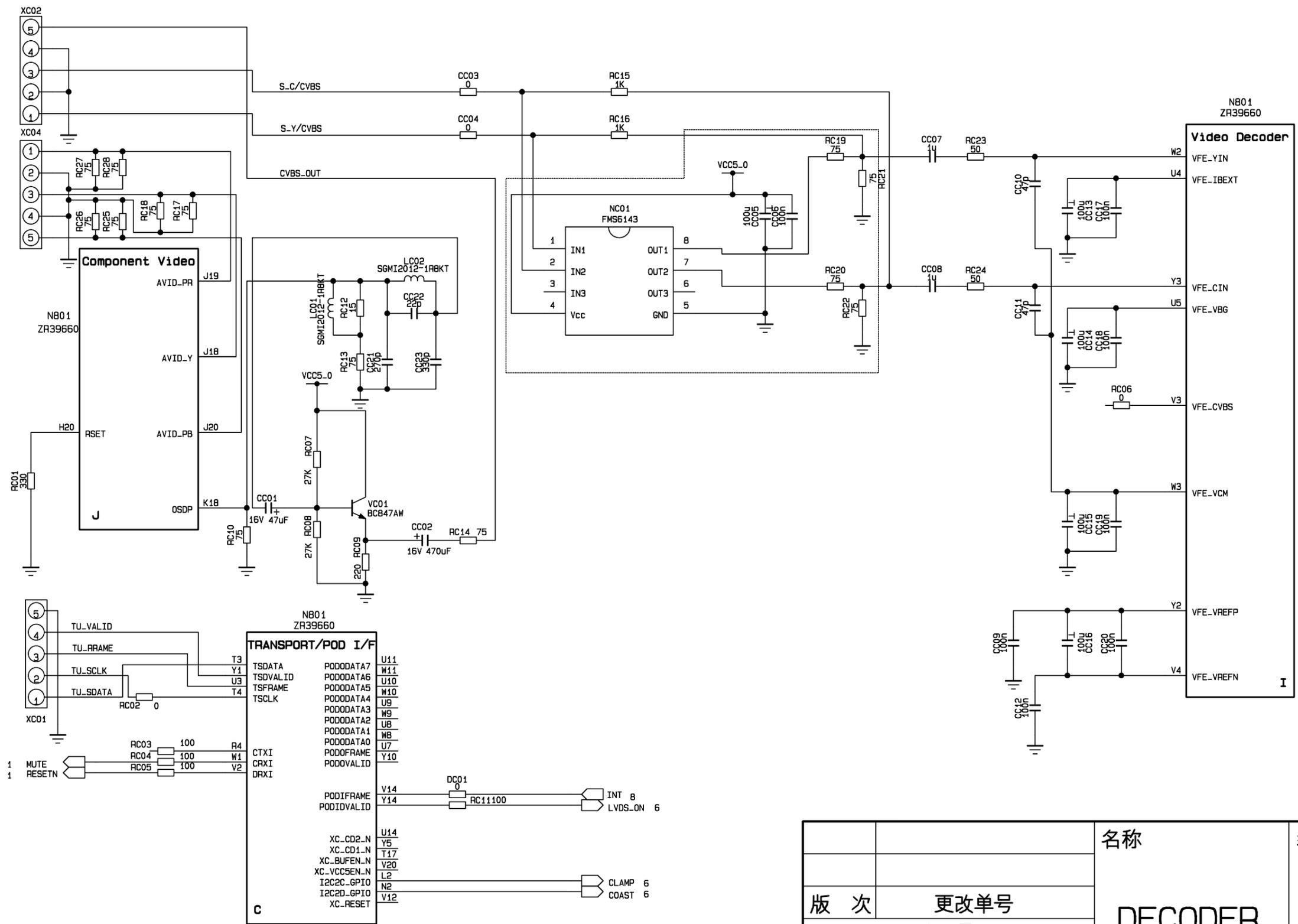
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审核		
标准化		
工艺		
批准		厦门华侨电子股份有限公司



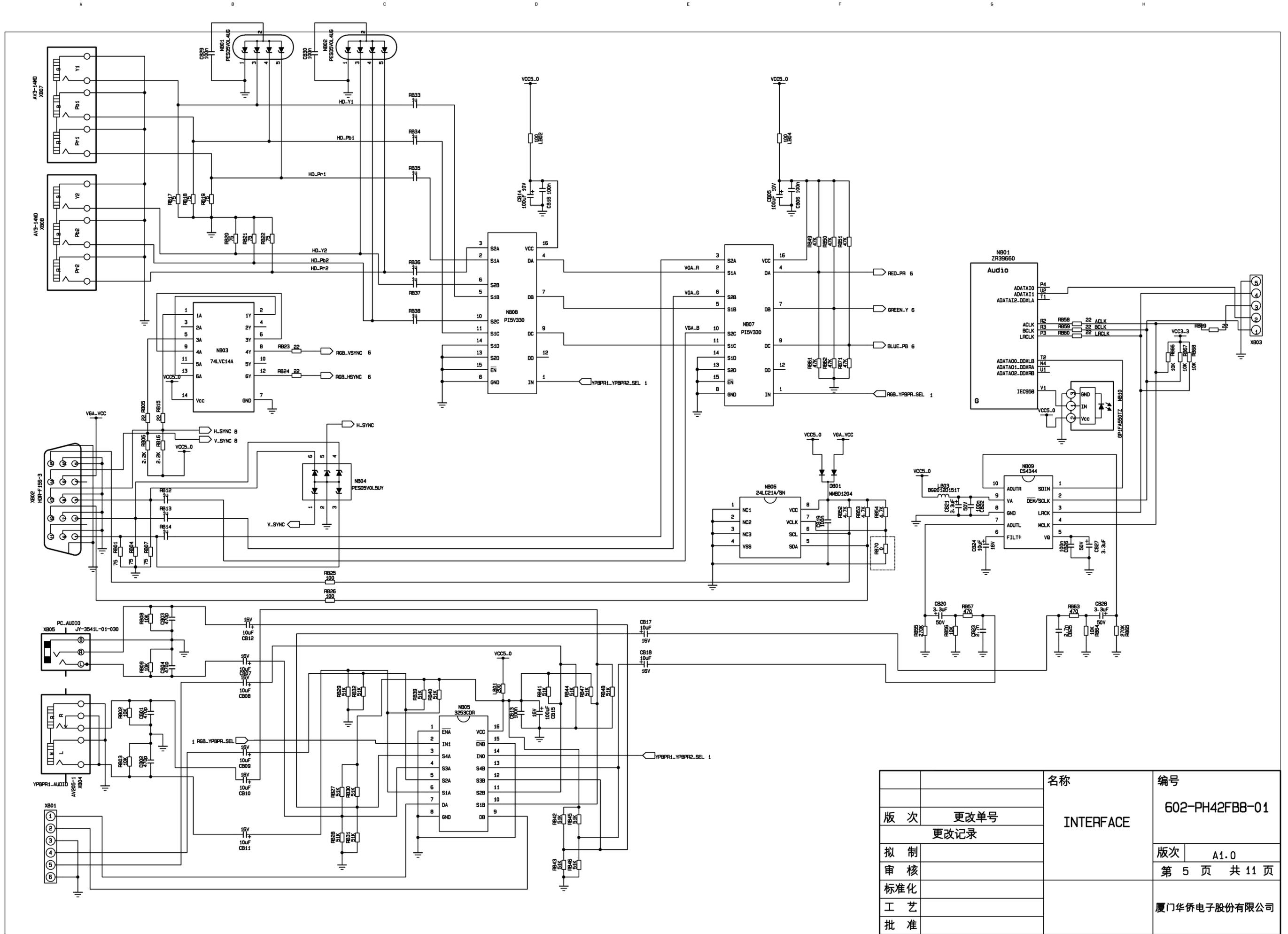
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更改记录		版次		
A1.0		第 2 页 共 11 页		
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审核				
标准化				
工艺				
批准				



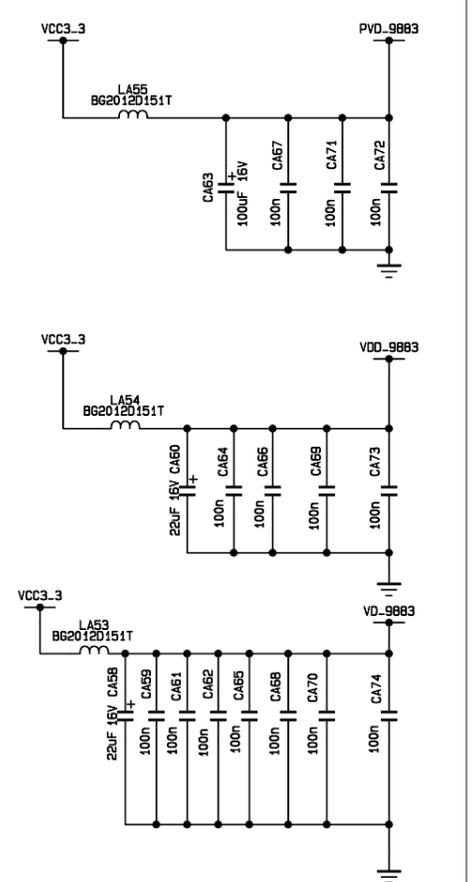
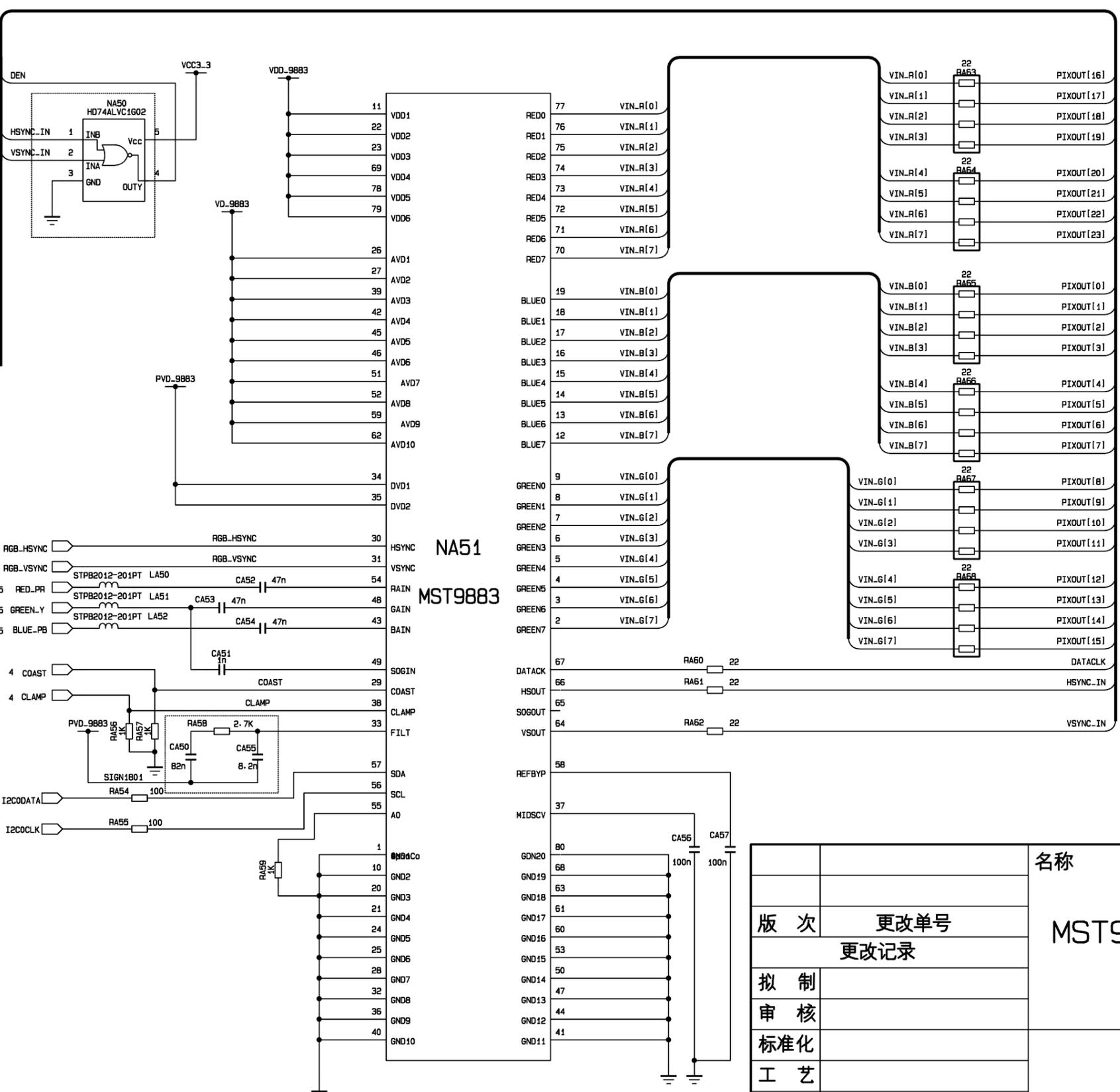
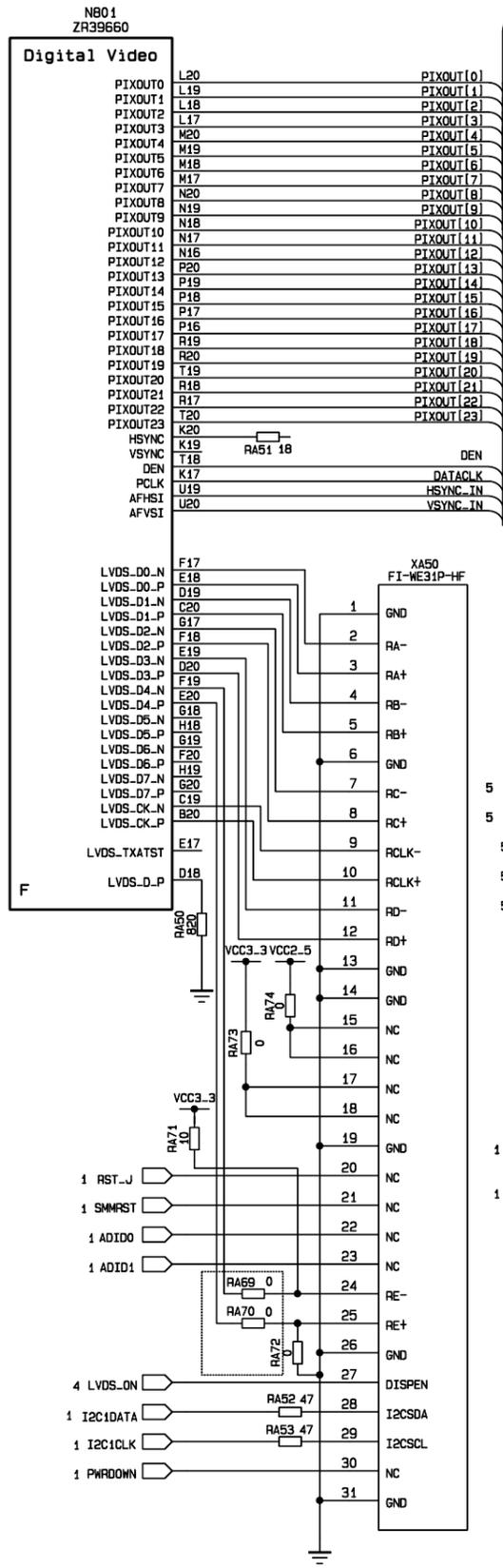
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审核				
标准化				
工艺				
批准				
		厦门华侨电子股份有限公司		



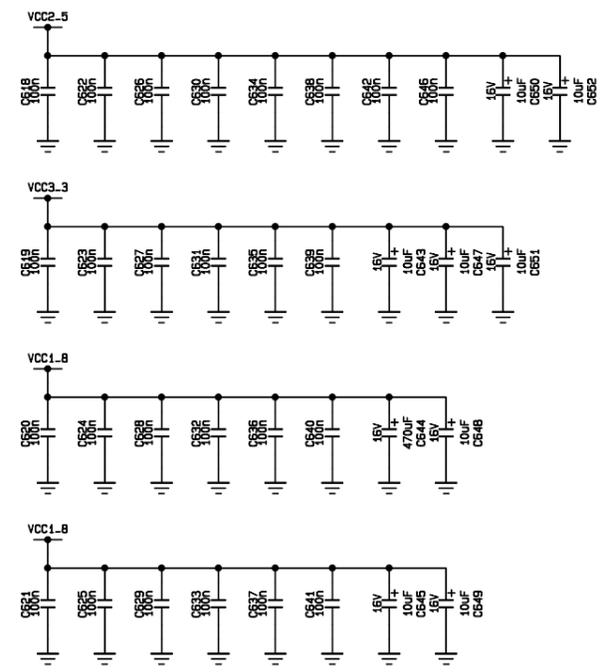
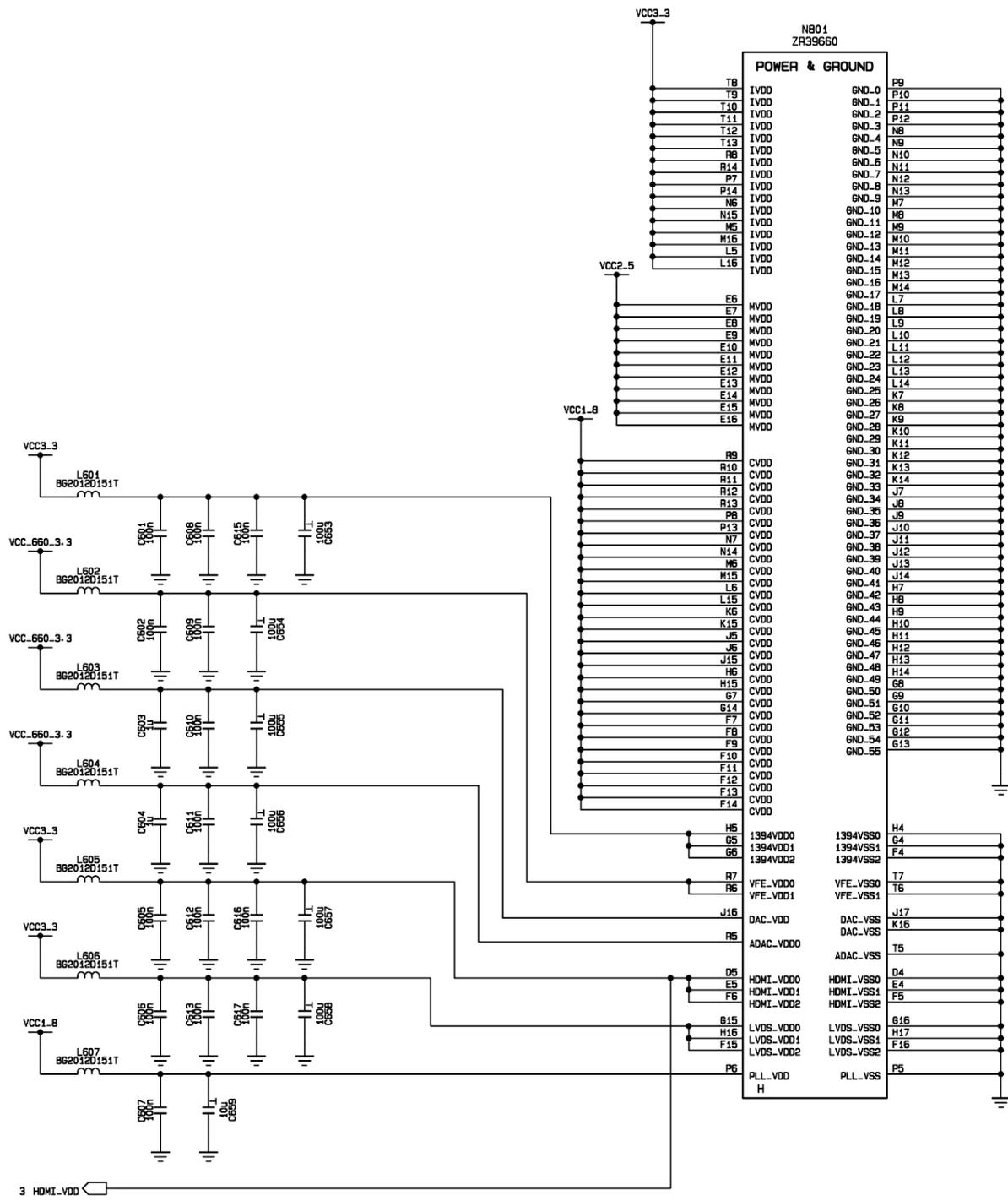
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DECODER		602-PH42FB8-01	
版次	更改单号	版次	A1.0
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审核			
标准化			
工艺			
批准			



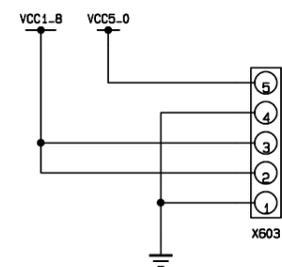
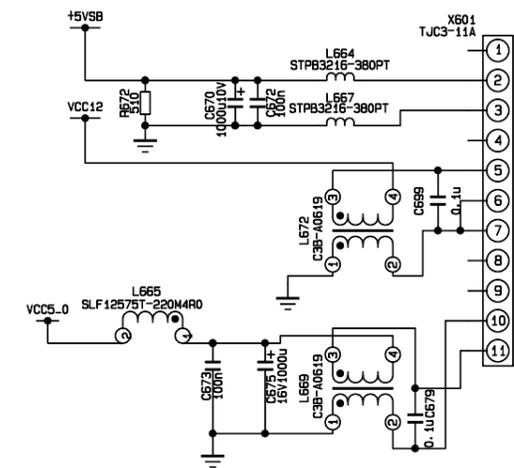
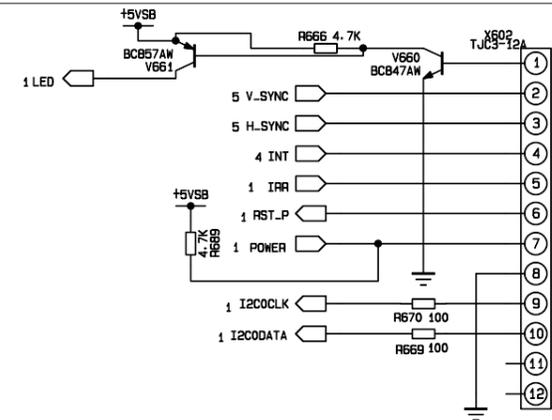
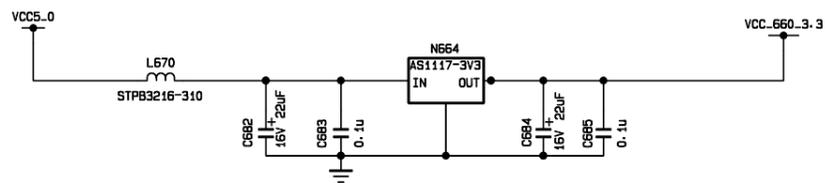
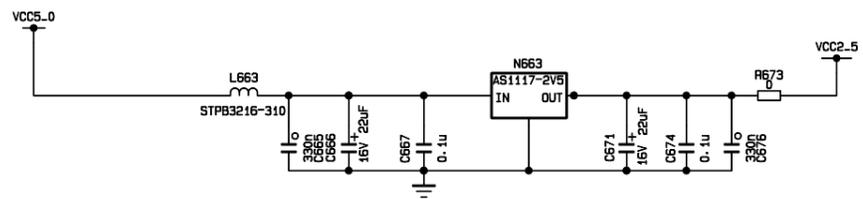
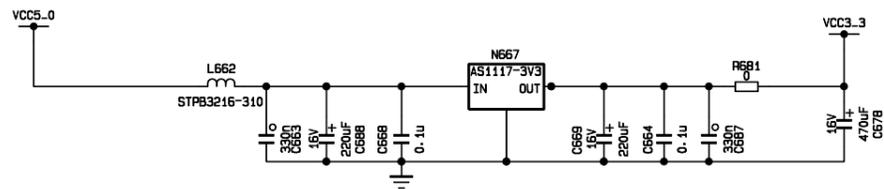
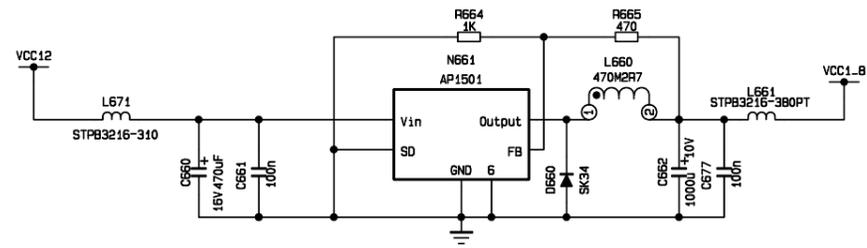
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审核			
标准化			
工艺			
批准		厦门华侨电子股份有限公司	



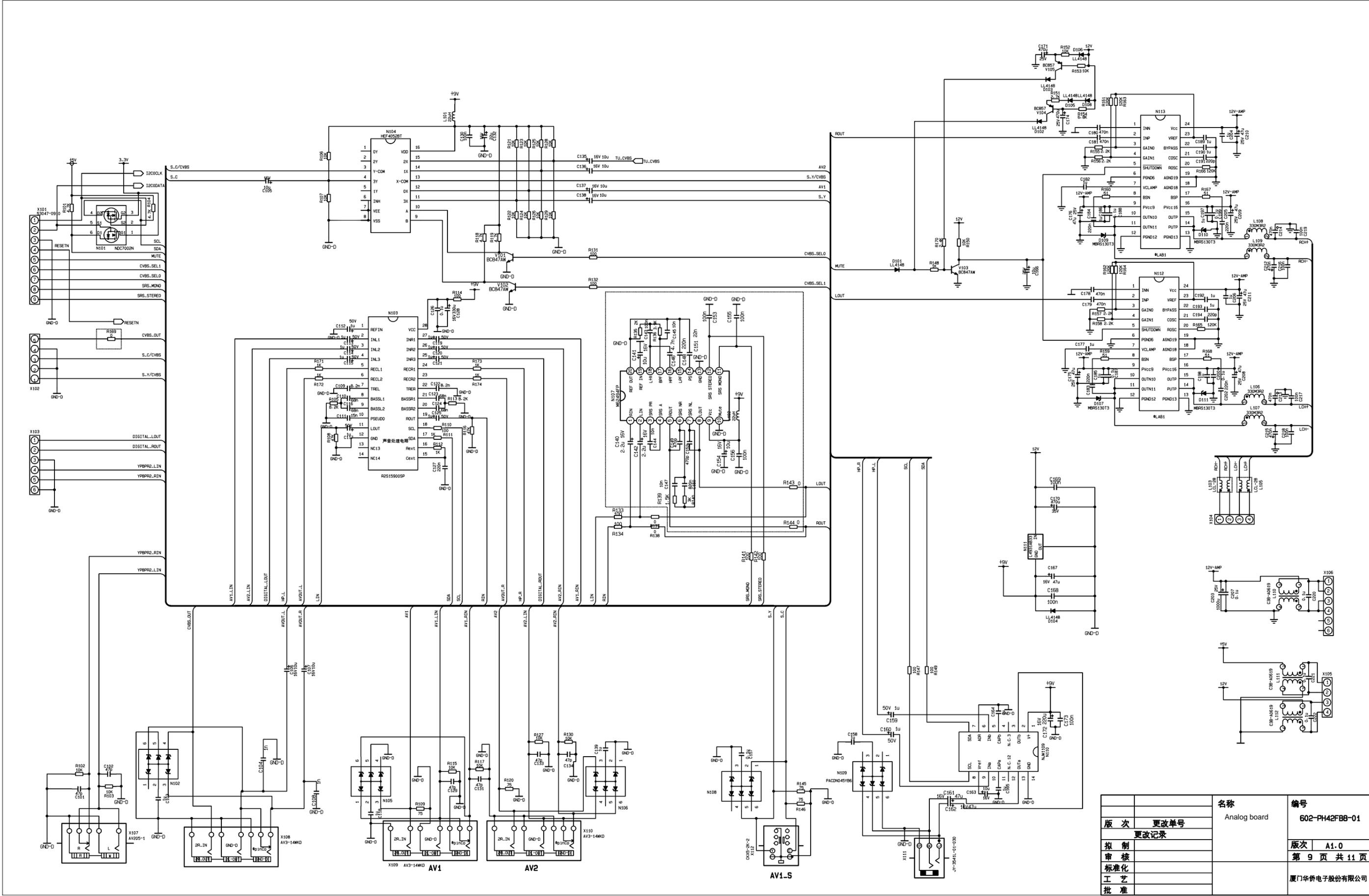
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版次	更改单号	版次	A1.0
更改记录		第 6 页 共 11 页	
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审核			
标准化			
工艺			
批准			



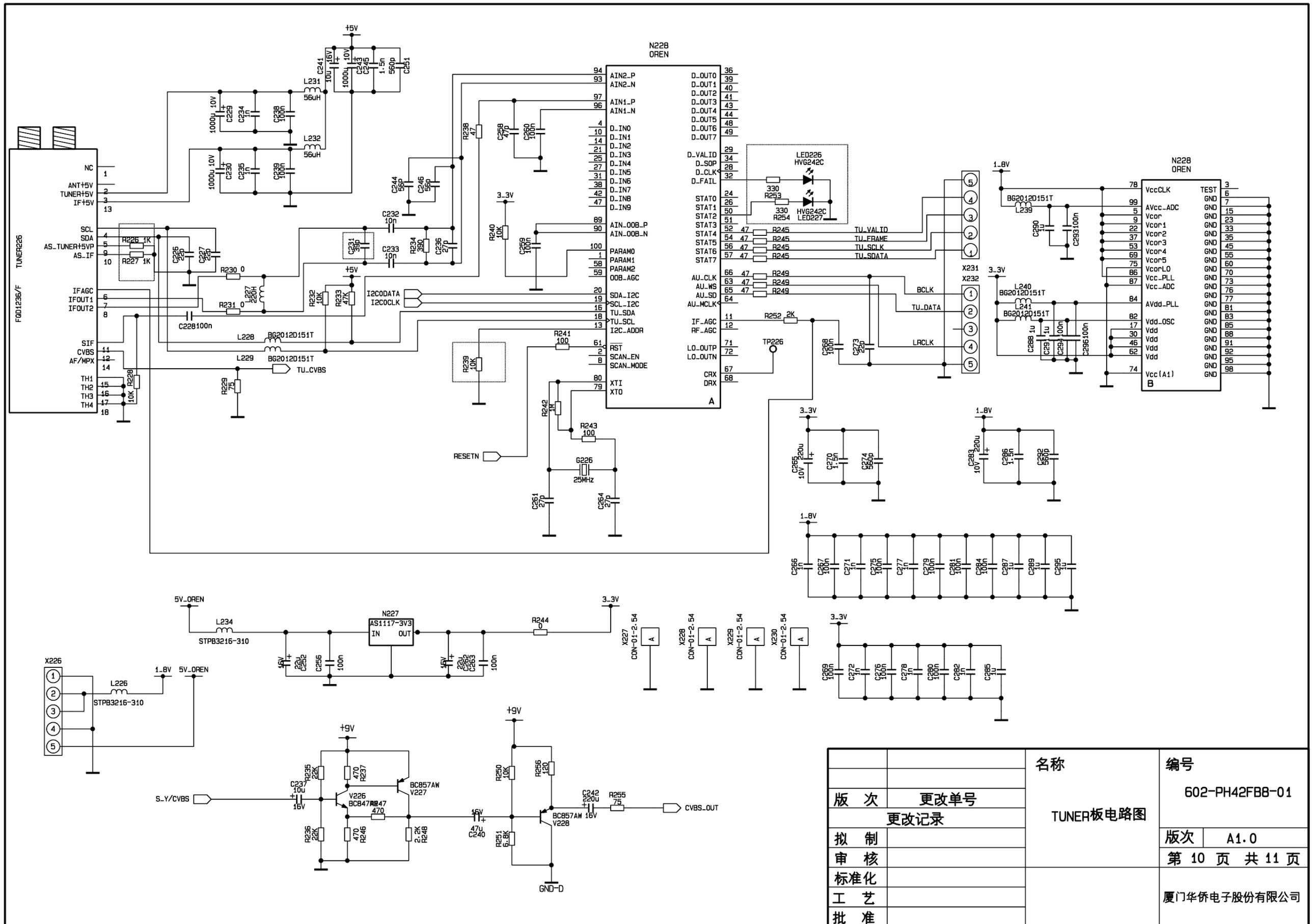
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版次	更改单号		版次	A1.0
更改记录			第 7 页 共 11 页	
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审核				
标准化				
工艺				
批准				
		厦门华侨电子股份有限公司		



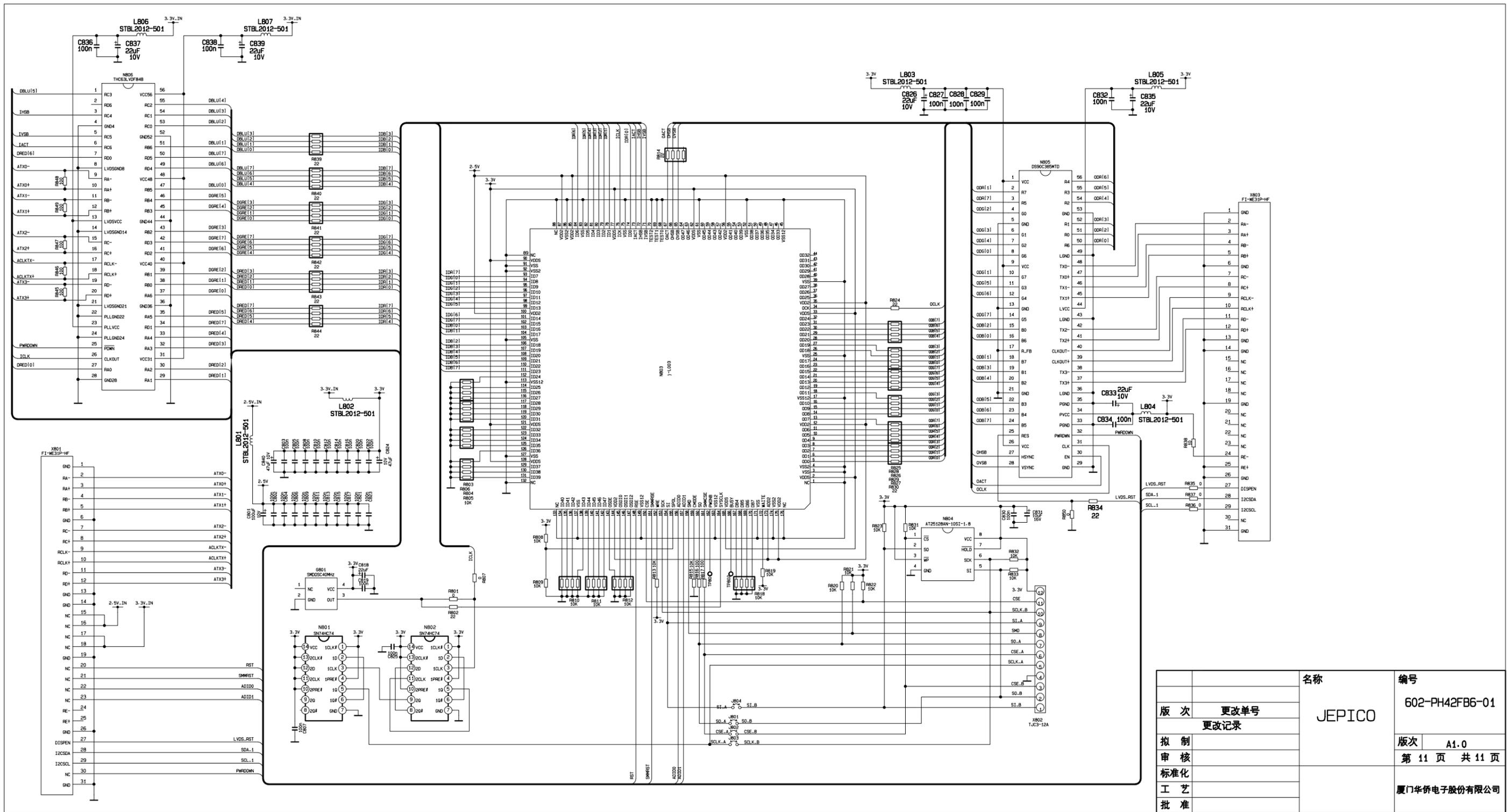
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版次	更改单号	POWER	602-PH42FB8-01
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标准化		厦门华侨电子股份有限公司	
工艺			
批准			



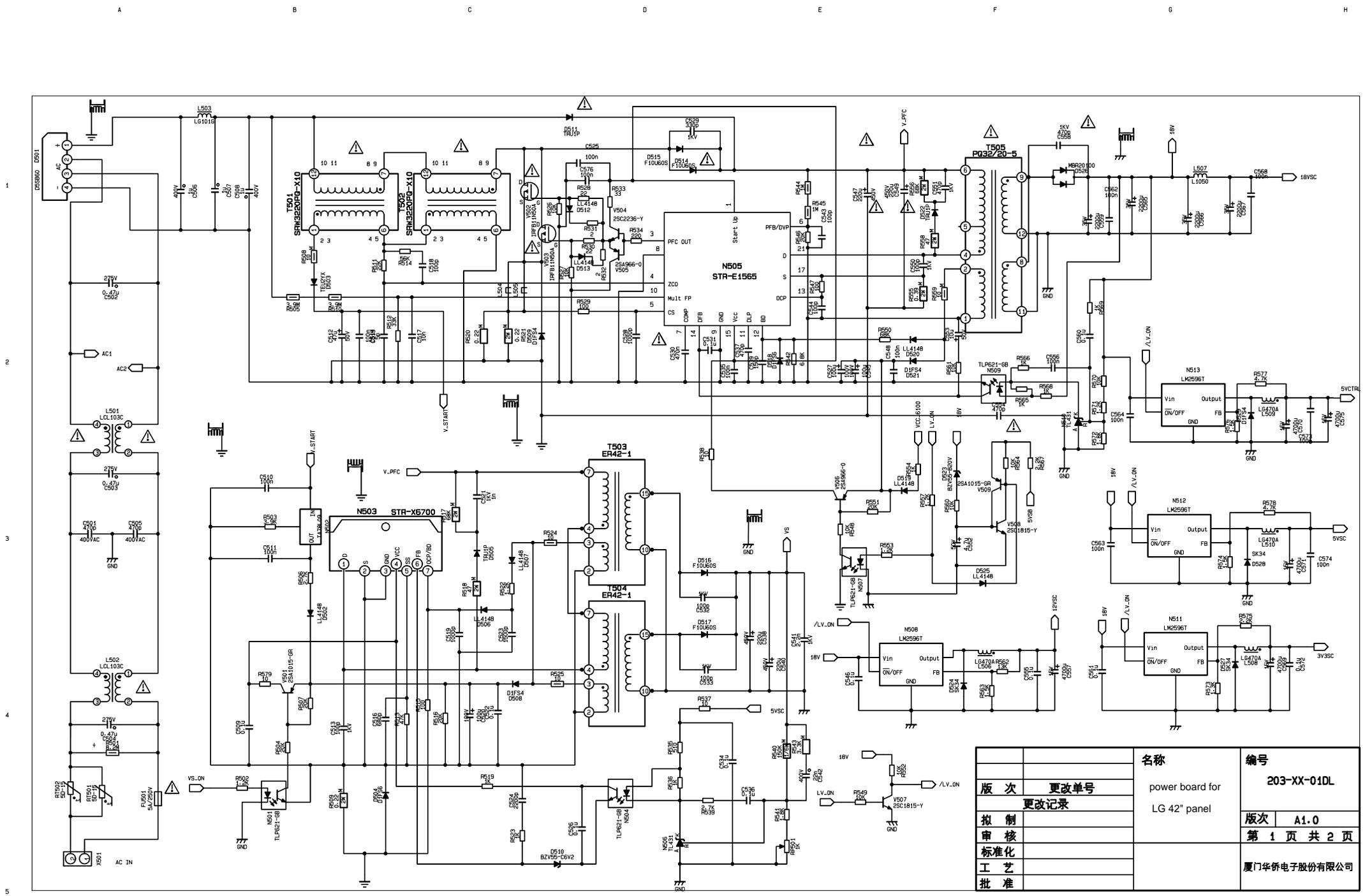
更改记录		名称	编号
版次	更改单号	Analog board	602-PH42F8B-01
审核			版次 A1.0
标准化			第 9 页 共 11 页
工艺			厦门华桥电子股份有限公司
批准			



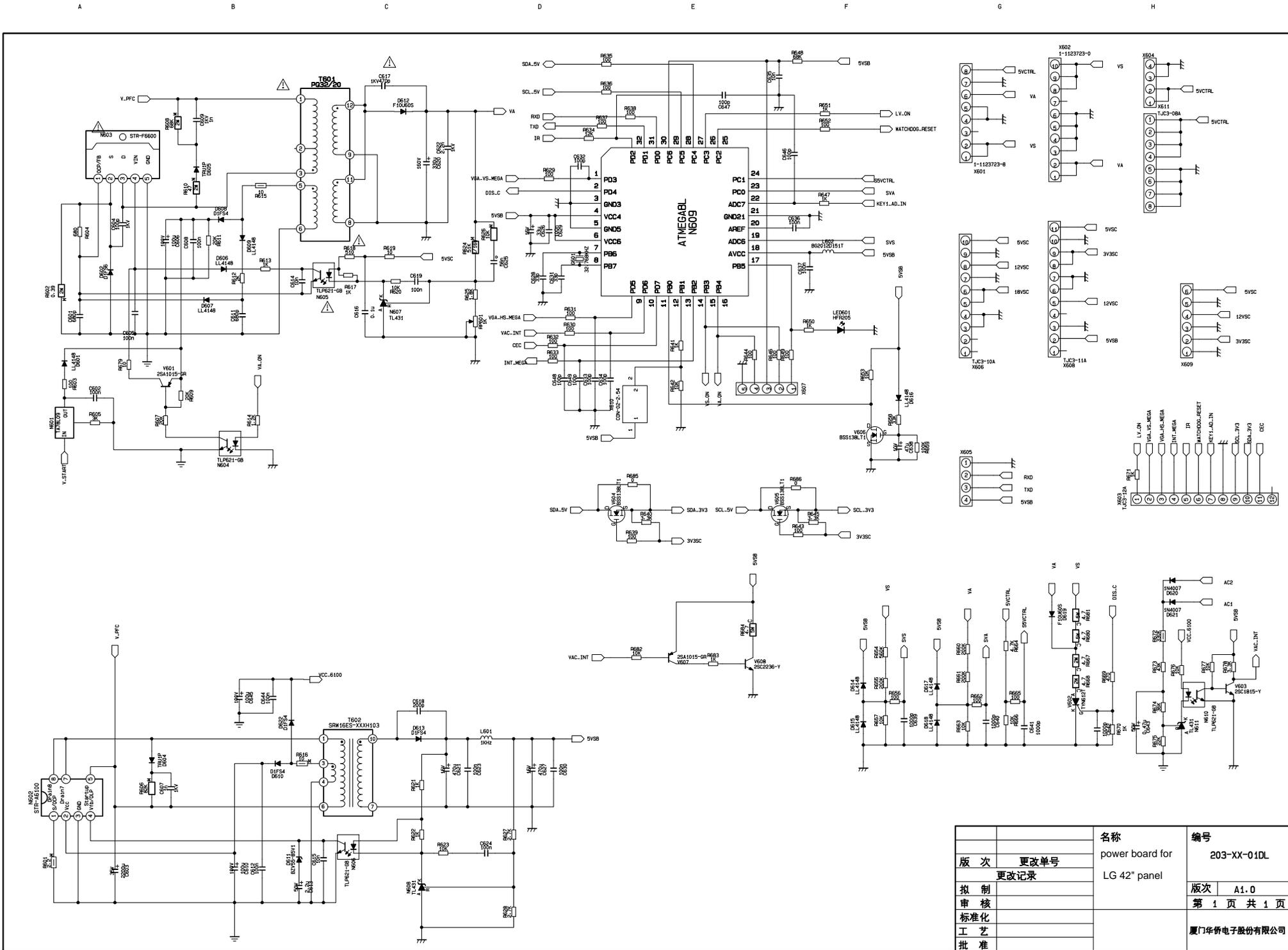
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版次	更改单号	版次	A1.0
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拟制		厦门华侨电子股份有限公司	
审核			
标准化			
工艺			
批准			



		名称	编号
		JEPICO	602-PH42FB6-01
版次	更改单号		版次
更改记录		第 11 页 共 11 页	
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审核			
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工艺			
批准			

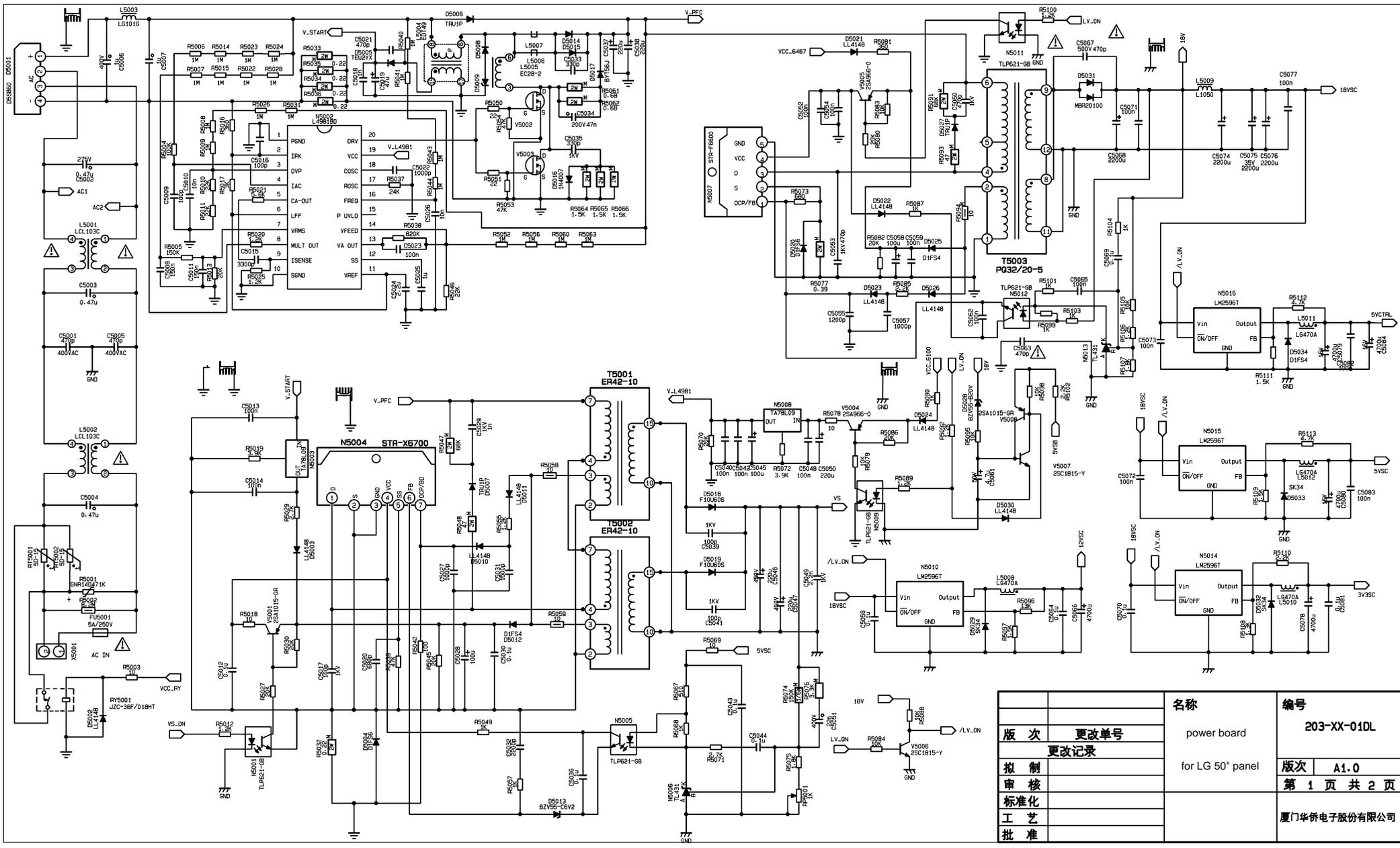


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拟制	更改记录	第 1 页 共 2 页	
审核		厦门华侨电子股份有限公司	
标准化			
工艺			
批准			



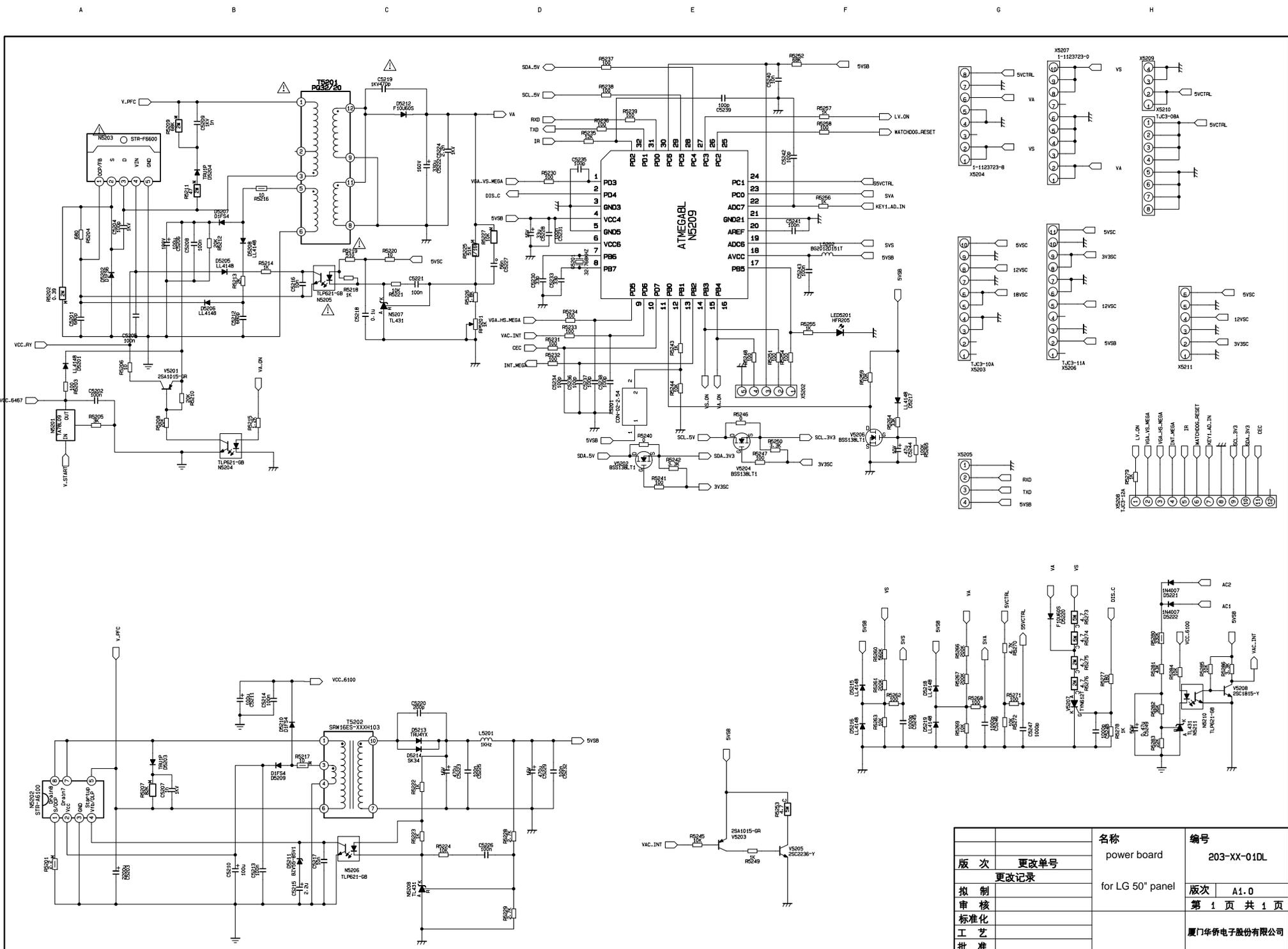
版次	更改单号	名称	编号
编制	更改记录	power board for	203-XX-01DL
审核		LG 42" panel	
标准化			版次 A1.0
批准			第 1 页 共 1 页
			厦门华侨电子股份有限公司

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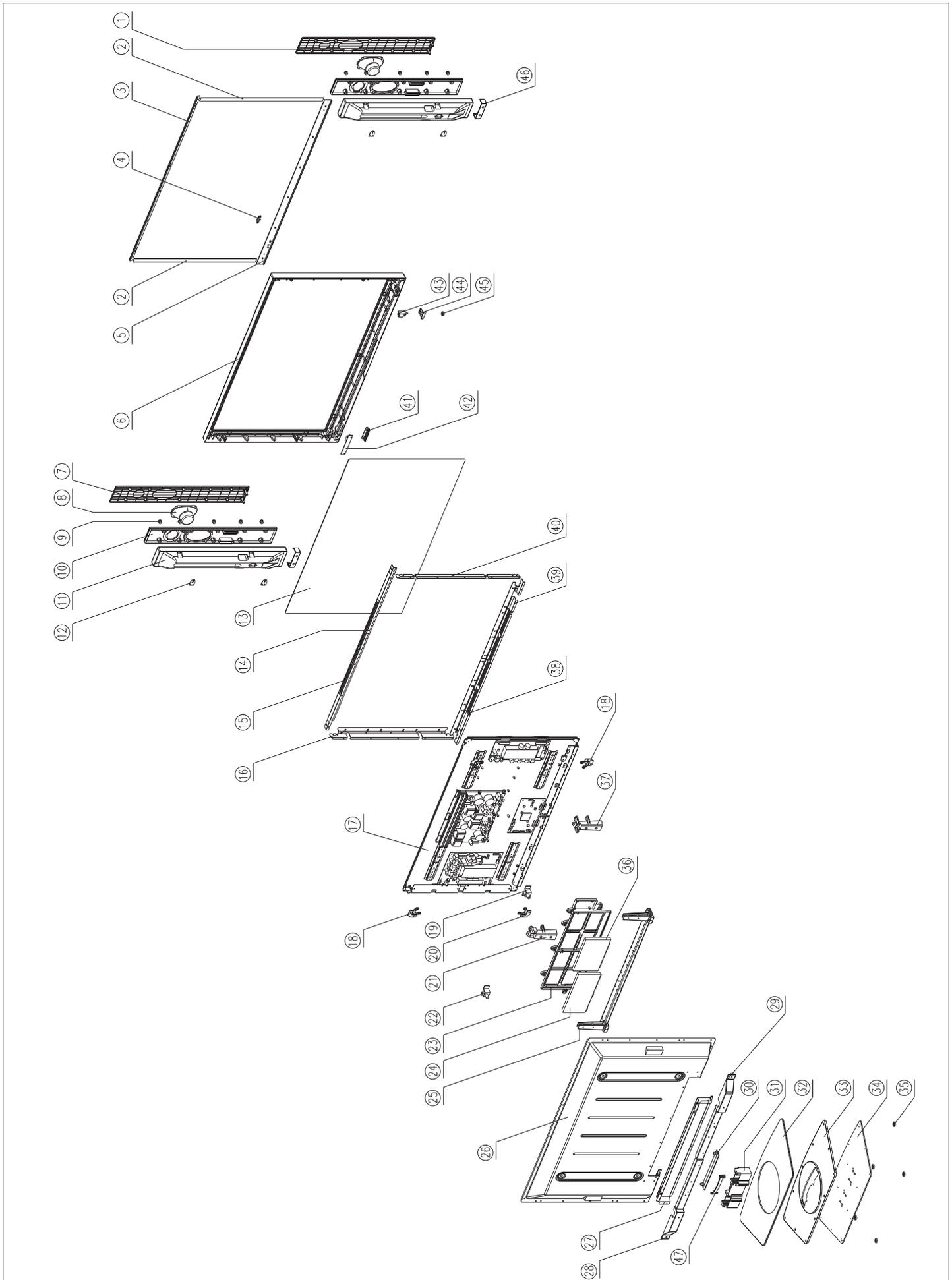
名称		编号
power board		203-XX-01DL
for LG 50" panel		版次 A1.0
		第 1 页 共 2 页
		厦门华侨电子股份有限公司

版次	更改单号
拟制	更改记录
审核	
标准化	
工艺	
批准	



版次	更改单号	名称	编号
编制	更改记录	power board	203-XX-01DL
审核		for LG 50" panel	版次 A1.0
标准化			第 1 页 共 1 页
批准			厦门华侨电子股份有限公司

APPENDIX: Exploded view(PH-42X6)



PART LIST OF EXPLODED VIEW

NO.	PART NO.	DESCRIPTION
1	808-10884-AW0	Speaker front cover (left)
2	808-20338-222	PMMA Decorative board
3	743-10206-AM0	front cover Decorate piece (upper)
4	700-60186-00A	LED column
5	743-10207-AM1	front cover Decorate piece (bottom)
6	780-I06R0-7A1	Front cover
7	808-10889-AW0	Speaker front cover (right)
8	384-41504-50	Speaker
9	822-10192-00	bush
10	780-3A133-AF0	Speaker front cover
11	780-30134-AF0	Speaker back cover
12	804-20337-AF0	Speaker fixed board
13	740-10138-00	Filter glass
14	803-30207-00	upper Push board (right)
15	803-30206-00	upper Push board (left)
16	803-30204-00	leftPush board
17		Screen
18	870-3A121-00	ear frame (leftupper rightbottom)
19	870-10313-00	bracket (right)
20	870-3A122-00	ear frame (rightupper leftbottom)
21	870-10312-00	Trans-connecting bracket (left)
22	870-10312-00	bracket (left)
23	863-6C171U000B	Main frame
24		digital processing board assy
25	615-10532-00	crossbeam assy
26	611-108RQ-AF1A	Rear cabinet assy
27	804-2H445-AF0	Rear baffle
28	808-10880-AF0	Rear cabinet (left)
29	808-10881-AF0	Rear cabinet (right)
30	808-10882-AF0	Rear cabinet (middle)
31	870-40199-AW0	base column
32	743-10208-00	base Decorative board
33	808-10883-AC0	base cover
34	820-20059-00	base bob-weight board

35	868-2A448-00	base underlay
36		High frequency board assy
37	870-10313-00	Trans-connecting bracket (right)
38	803-30208-00B	bottom Push board (left)
39	803-30209-00B	bottom Push board (right)
40	803-30205-00	rightPush board
41	877-60593-G0	button
42		Button board assy
43	360-30041-00	Power switch
44	870-10186-00	power bracket
45	877-60632-0G0	Power button
46	808-10722-AF0	Speaker box cover
47	742-30079-00	Line clasp

APPENDIX-B: Main assembly

Model	Parts	Parts No.
NS-42PDP	Analog board	667-PS42FB6-53
	Data processor board	667-PS42FB6-69
	Image processor board	667-PH42FB6-52
	Power supply board	667-PH42FB6-20
	Power filter board	667-PH42T8-51
	Key board	667-PH42FB6-05
	Remote parts	301.D42FB6-06F
	Panel	335-42014-00

