PDP TELEVISION

SERVICE MANUAL

PH-42/50FB31

CONTENTS

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.

If the connection wires, connectors or components fixed by the thermotropic glue need to disengage when service, please soak the thermotropic glue into the alcohol and then pull them out in case of damage.

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 42" Plasma PDP panel:

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.

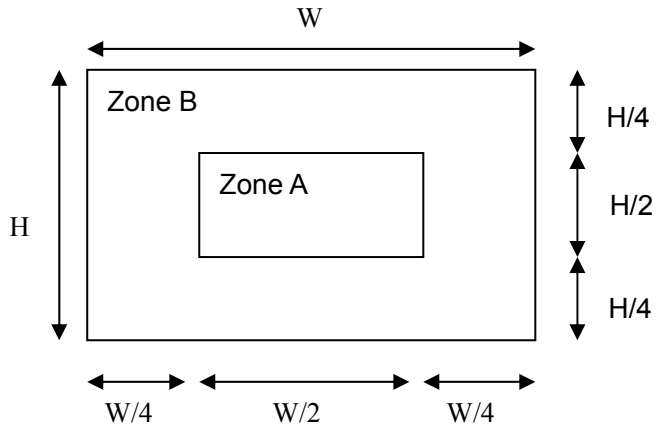


Figure 1 Defective Points

Table 1 Criterion for Three Kinds of Defective Points

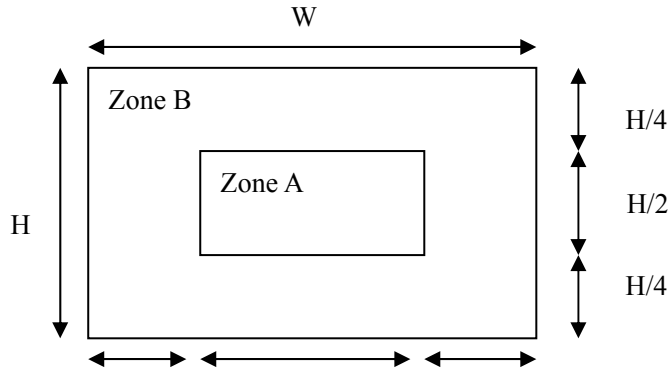
Kind	Area A	Area B	Remark
Dark spots	No more than 2	No more than 8	Total number of defective points in A and B shall not exceed 8. The distance between two defective points shall not be shorter than 15mm.
Bright spot	No more than 1	No more than 2	
Flickering spot	No more than 1	No more than 2	

2.2 50" Plasma PDP panel:

There may appear three kinds of defective points for this model as shown in Fig.2 i.e., bright spot (remain bright); dark spot (non-illuminating); flickering spot (remain flickering).

However they should not exceed the specification as in table 2. Otherwise the product shall be

deemed as sub-standard.



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	

Figure 2 Defective Points

Table 2 Criterion for Three Kinds of Defective Points

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)

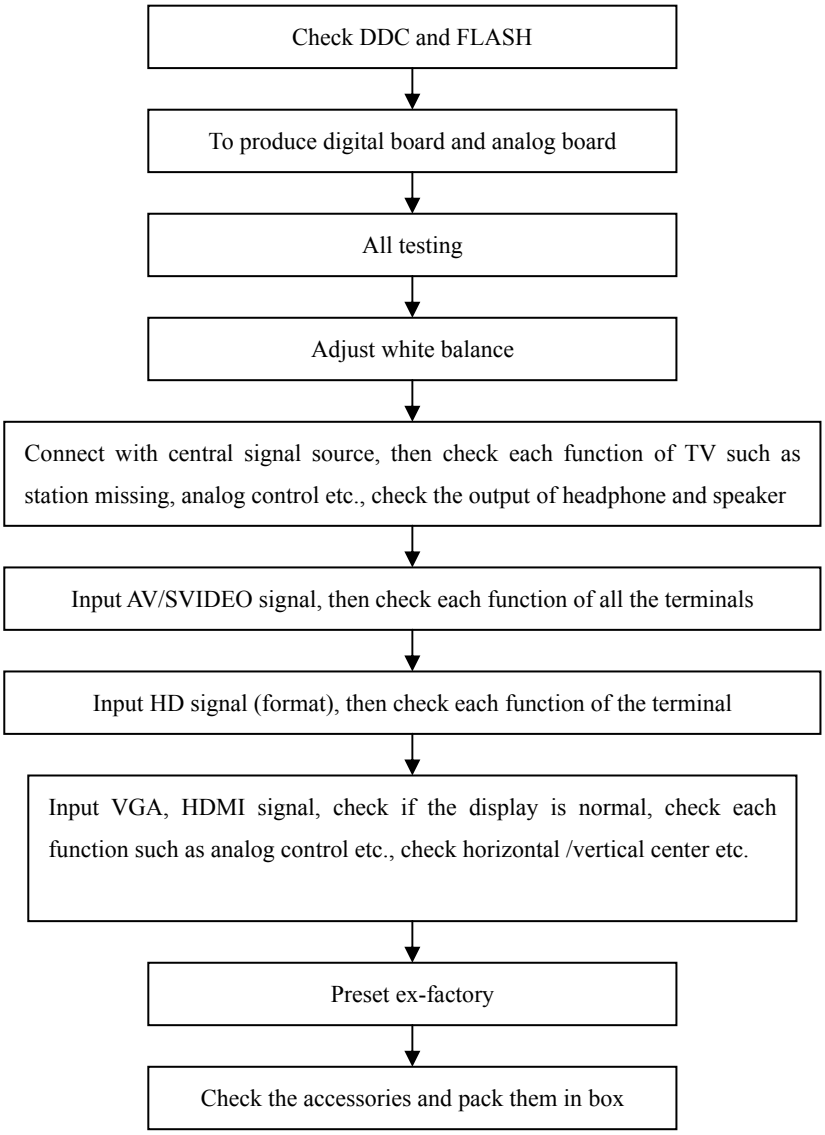


Fig-1 adjustment flow-chart

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. Connect with power and observe the display.

3.2 Method for using factory menu

Press ”Source” button, then press”2580” to enter level one factory menu. Press ”▲” and “▼“ to

select adjustment page, then press “OK” to access. Press “▲” and “▼“ to move cursor up and down, when the cursor stays on a certain adjustment item, you can adjust it according the prompt. Press “MENU” exit to the level one factory menu; press “MENU” again to exit from the factory menu. The adjustment item is list as table 3.

Table 3 adjustment item

No.	Item	Specification
1	Factory Preset	Reset to the default data
2	Spatial NR	Noise reduce setting, the preset data of each channel is different, please don’t change it.
3	Speckel NR	
4	Temporal NR	
5	White Balance	White balance adjustment
6	Auto Color	A/D correction
7	DTV Manual Scan	If search DTV at manual scan, default= Off

3.3 adjustment of white balance

3.3.1 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 GG to 5000, adjust RG, BG, let the color coordinate of third level on the right be (270,283) at 120nits; fixed BO to 5000, adjust RO, GO, 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.

3.3.2 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 GG to 5000, adjust RG, BG, let the color coordinate of third level on the right be (270,283) at 120nits; fixed BO to 5000, adjust RO, GO, 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.

3.3.3 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 GG to 5000, adjust RG, BG let the color coordinate of third level on the right be (270,283) at 120nits; fixed GO to 5000, adjust RO, BO, 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.

3.3.4 input 16 level gray-scale signal of 480P from VG849 to YPbPr channel, enter white balance adjustment page of factory menu, select cool color temperature of item, fixed RG, GG, BG to 5000, and RO to 5000, adjust RO, BO, 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.

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. Especially check the signal of PAL and DVB-T, check if the S/PDIF output of DVB-T is normal.

4.2 AV/S-VIDEO terminal

Input AV/S signal, check if the picture and sound are normal. The main system is NTSC and PAL.

4.3 YPbPr/YCbCr terminal

Input YUV signal (VG-849 signal generator), separate input YUV format signal of table 4 and check if the picture and sound are normal.

Table 4 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
5	15.625	50	SDTV 576i
6	31.25	50	HDTV 576p
7	37.5	50	HDTV 720p

4.4 VGA terminal

Input VGA signal (VG-849 signal generator), separate input VGA format signal of table 3 and check if the picture and sound are normal. If the image is deflection of the H/V-field, select manual correction of Advanced Video Menu.

4.5 HDMI terminal

HDMI signal format receives the 8 high-definition signals: 480I, 480P, 720P/60 Hz, 1080I/60 Hz, 576I, 576P, 720P/50Hz,1080I/50Hz except for the table 5 signal. Separate input the signals from VG-849. Check if the image (contain HDCP ON and OFF) and sound are normal, if the output of S/PDIF is normal.

Table 5 VGA signal format

No	Resolution	H-frequency(kHz)	V-frenquency(Hz)	Point clock pulse frenquency(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: 40
2) Video menu, Picture Mode: Vivid (other items: Mild, Custom, Standard), Aspect Ratio: Wide
3) Video menu, Advanced Video Menu:

Color Temperature: Cool

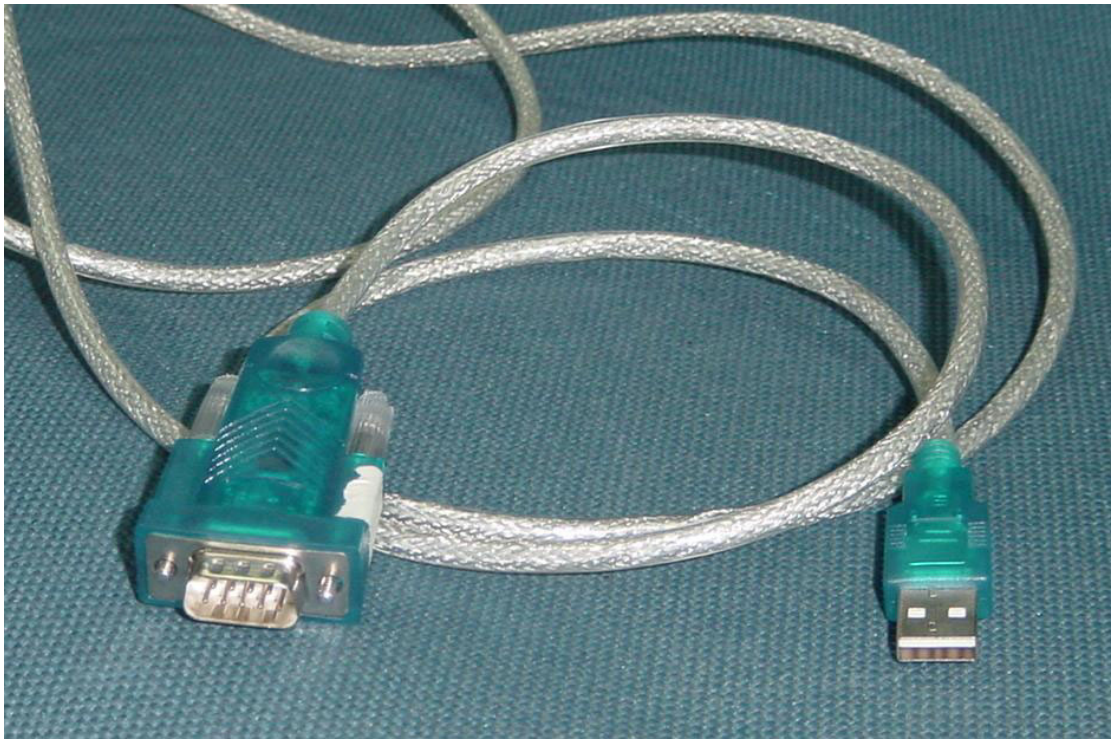
4) Audio menu, Audio Mode: Speech(other items: Custom, Music, Movie)
   Balance: 50, SPDIF Mode: Auto, HP Volume:50
5) Rate menu, Rating: No Block, Parent Lock: off
6) System menu, State: NSW/ACT(other items: VIC, QLD, SA, WA, TAS, NT)

Note: the default password of Rate menu is”0000”

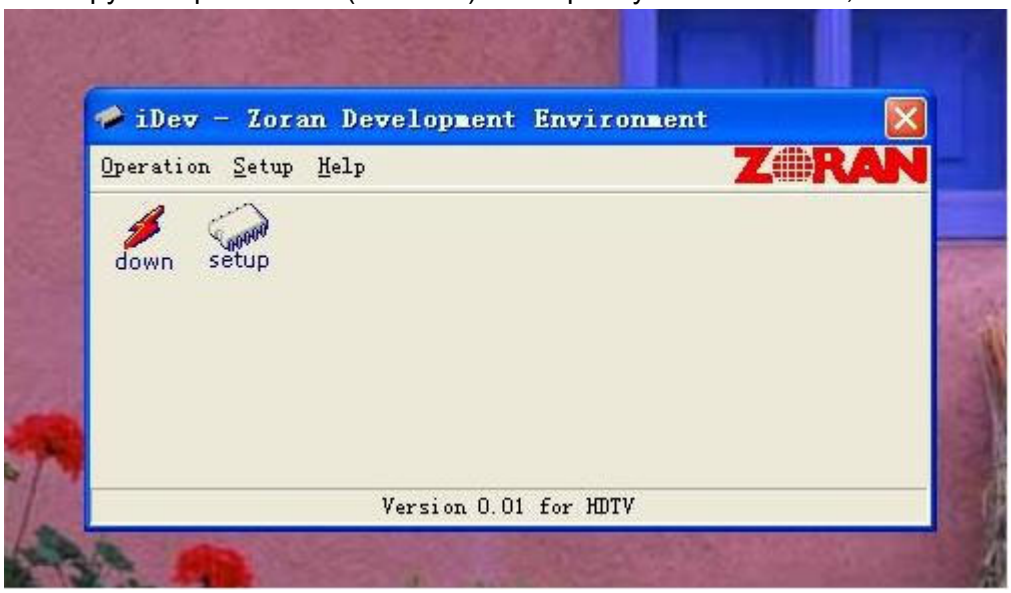
Method of software upgrading

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.

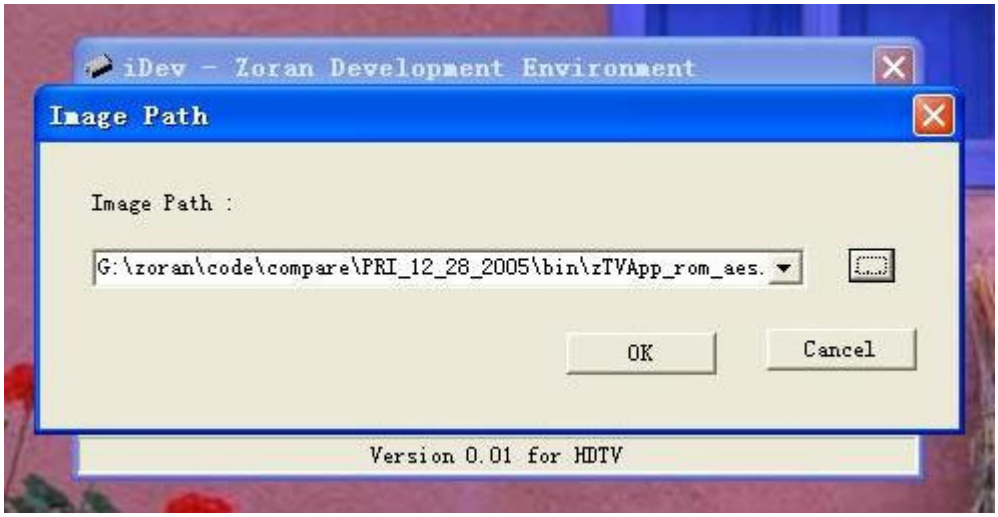


4. Select “setup” menu.

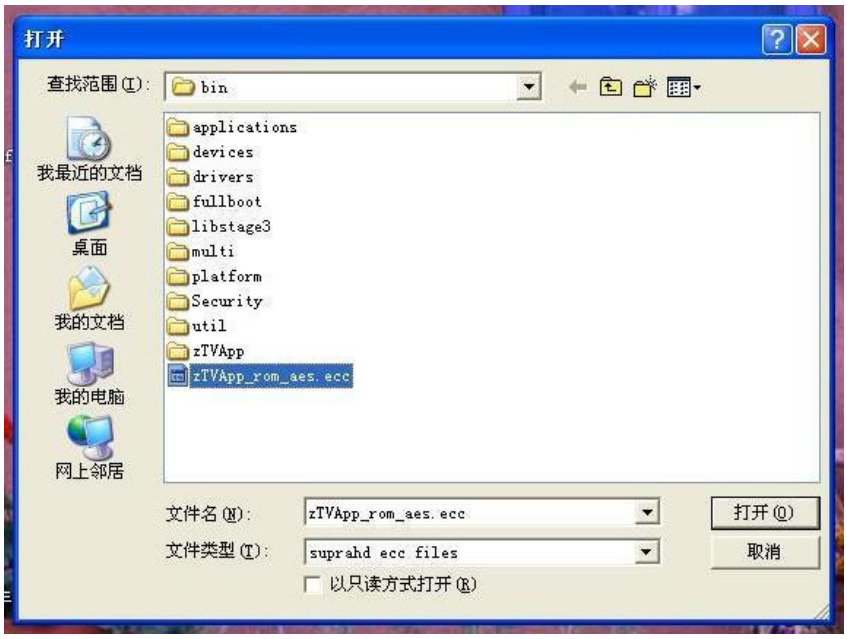
5. Confirm the Serial port is right. Base on the port which using for update. And set the band rate to 115200 (default).

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.

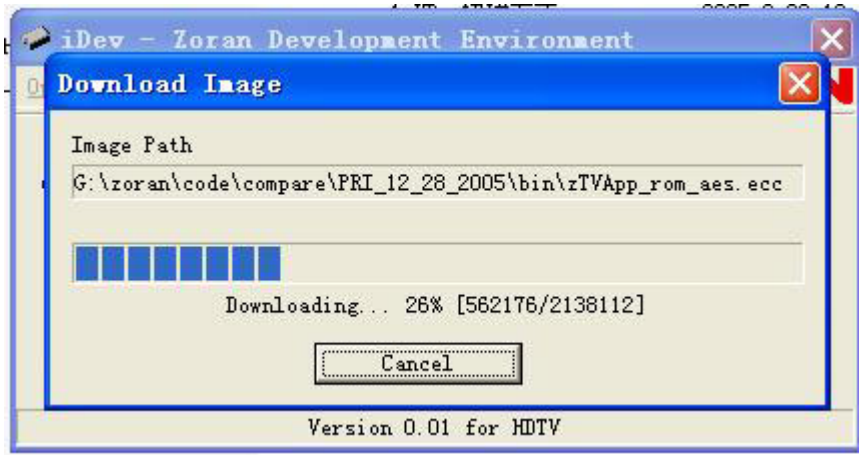


9. You also can click the setup button to select and config, but **please don't select the red one(update boot sector).**

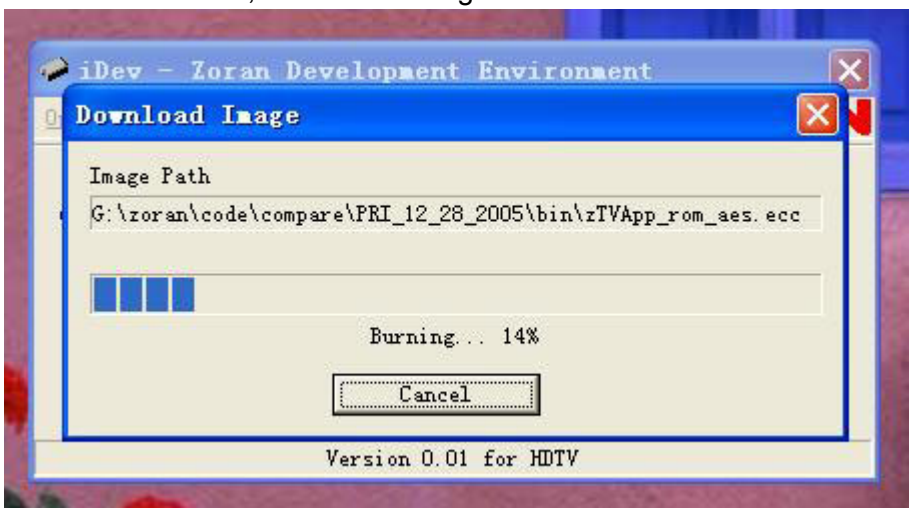
10. Then click the “down” button.

11. You can see the “waiting” window.

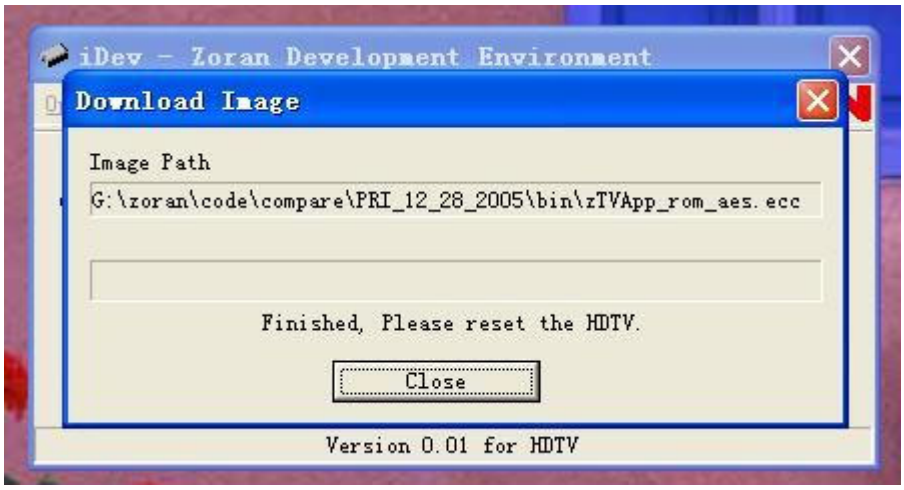
12. Then power (off then) on the TV set.



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

Feature:

1. PDP PANEL

SIZE: 42” 50”
Pixel Rate:1024X768 1366X768
Interface: LVDS(Single 24bits)

2. SIGNAL FEATURES

TV: PAL-BG / DVB-T
RF Frequency Range:46.25~855.25MHz
PC Max. Resolution: Up to 1280 x 1024 60Hz
PC Max. Pixel Rate:110MHz
COMPONENT:480i,480p,576i,576p,720p/50Hz,
1080i/50Hz,720p/60Hz,1080i/60Hz
HDMI Max. Resolution: Up to 1920 x 1080i
HDMI Data Protection: HDCPv1.1

3. OSD FEATURES

Size: Full Screen Size
Color: 24bit True Color
Type: Graphical & Text UI
Language: English

4. CONNECTION FEATURES

VIDEO INPUT: AV X2, S-VIDEO X1, RGB(PC) X1, COMPONENT X2, HDMI X1.
AUDIO INPUT: AV X2, RGB(PC) X1, COMPONENT X2.
VIDEO OUTPUT: AV OUT X1.
AUDIO OUTPUT: Audio Out x 1, S/PDIF X1, Earphone X1, Speaker Out x 2.
TV INPUT: RF X1
Service(input):RS-232 X1

5. OTHERS

Wide power voltage range, low power consumption at standby(≤1W)
Digital decoder with 3D comb filter
High efficiency D class audio amplifier, high quality output
Wide power voltage input: AC110V-240V,50HZ/60HZ

Working principle

1. PAL-BG signal flow:

Antenna reception PAL-BG signal send to the integrative tuner FQD1216, which contains HF and IF amplifier circuit and video decoding circuit. It is controlled by main IC ZR39660 (inside CPU) through I2C bus. The PAL-BG 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 VEDIO 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 SGTV5810, via demodulate, pre-amplify, woof adjust and volume control, output left/right sound signal to digital audio amplifier TPA3001 amplify, then send to speaker.

2. DVB-T signal flow:

Antenna reception DVB-T signal send to tuner FQD1216, after frequency tuning, HF amplification, IF amplification and SAW FILTER, output IF signal to demodulation chip DRX3975, via QAM demodulation, 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 CS4345 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 Triple Video A/D Converter TDA8759 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.

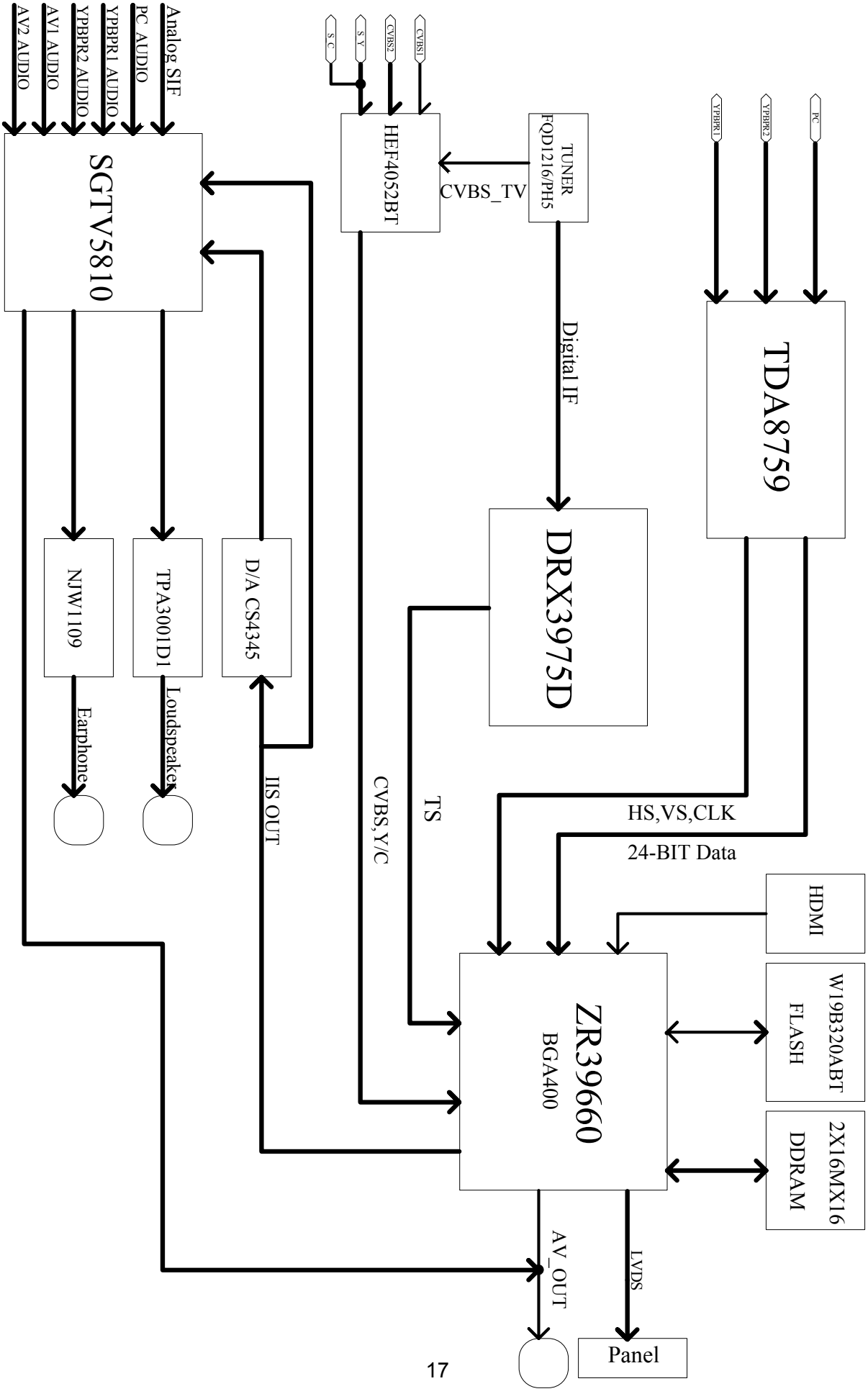
Sound signal (PC, YPrPb) via matched resistance and a-c couple, it send to SGTV5810 (sound processing and volume control) switch of audio. Select right/left sound channel, their send to digital sound amplifier TPA3001 amplify, then send to speaker.

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. ZR39660

- **Embedded Processing Unit**
  - Integrated High-Performance MIPS® 4KEc™ CPU, 166 MHz
  - Intended to run RTOS, audio decode and Application software
  - 32-bit MIPS32 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 I^2C 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 1.3 GByte/second peak memory throughput
  - 256 MByte memory address range
- **Integrated Digital VCXO**
- **Process Technology**
  - 0.18u 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

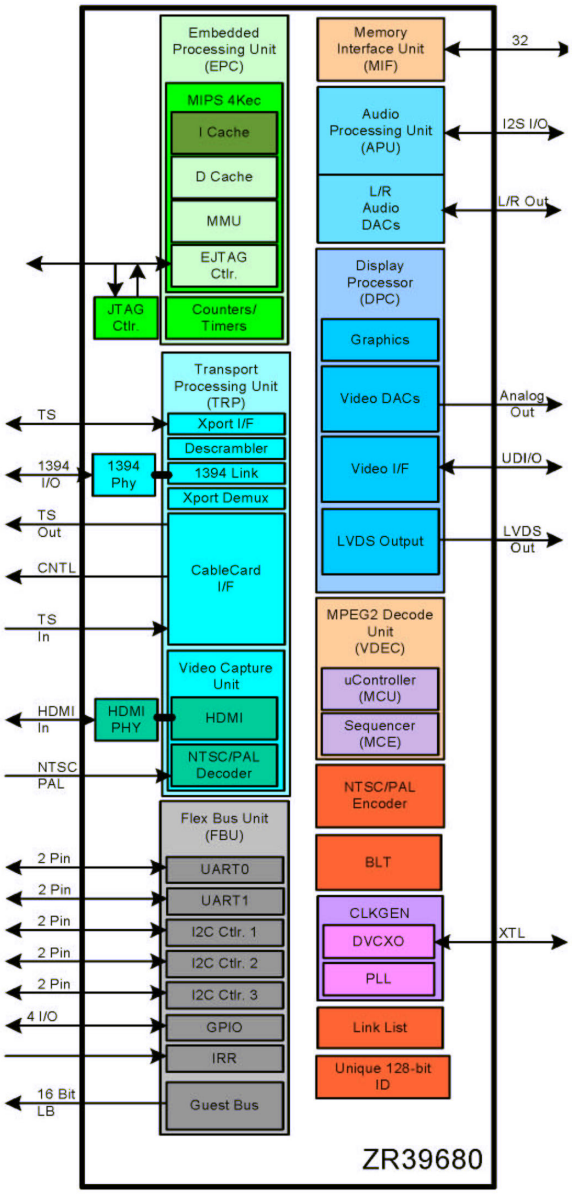


Figure 1 SupraHD-680 IC Block Diagram

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

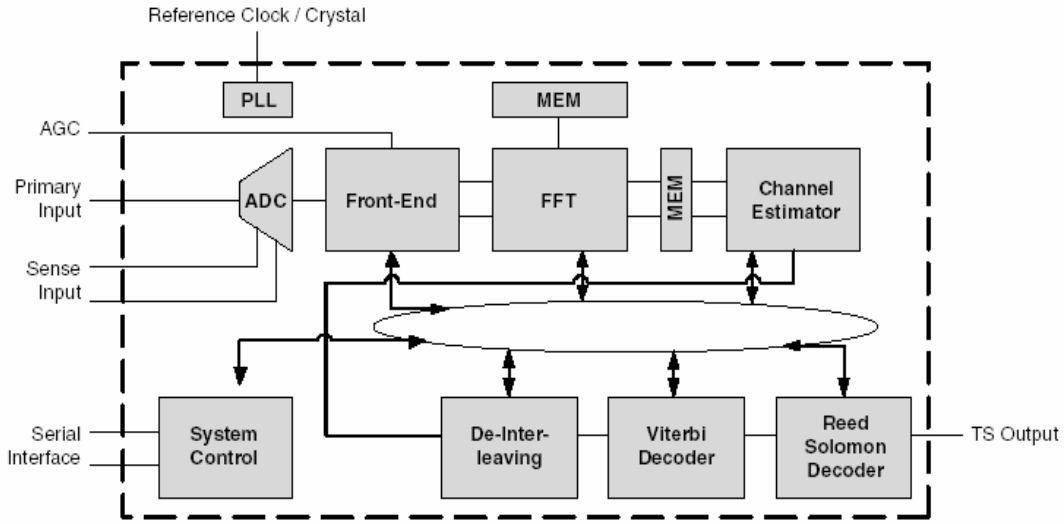
(8) Miscellaneous
M4, N3:Two pins required to support the 24.576 MHz crystal

N5:Power On Reset
L4:Infrared Receive

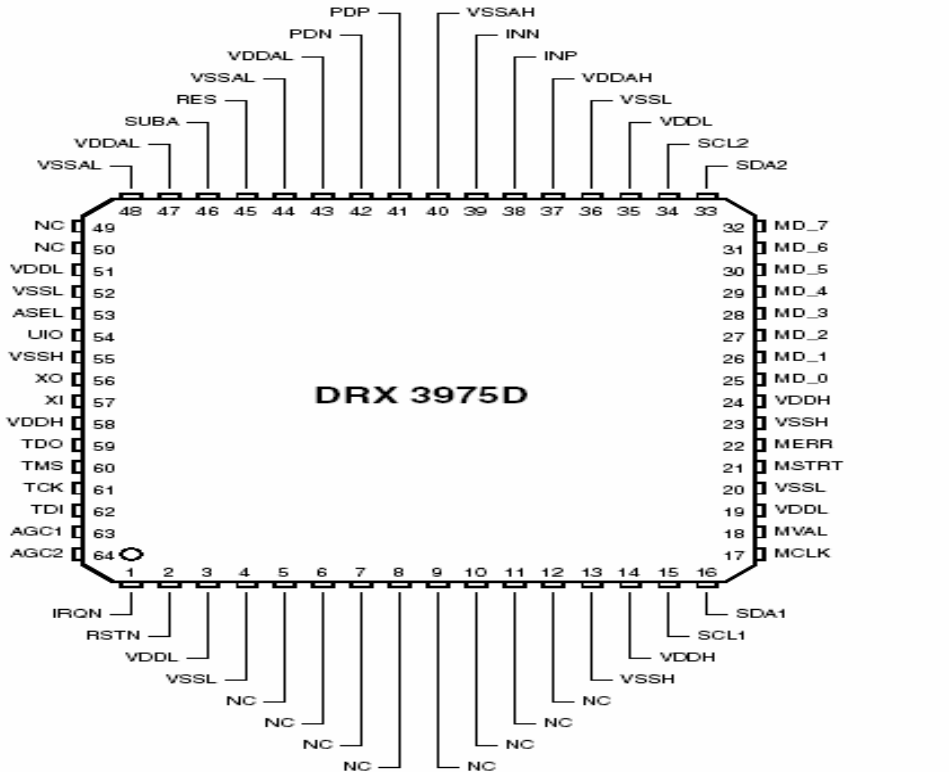
2. DRX3975D

The DRX 3975D is a fourth-generation COFDM demodulator that offers today's highest level of front-end integration resulting in ultimate DVB-T digital reception, compliant to ETS 300 744, DTG D-Book,EICTA E-Book, and Nordig Unified v1.0.2 .

The IC applies cutting-edge digital filtering techniques in combination with a high-performance A/D-converter and PLL configuration, resulting in superior performance figures in the presence of digital- and analog adjacent channels.



Pin configuration of DRX3975D:



Pin description of DRX3975D:

2: RESET_N 56, 57: Oscillator

22: Select I2C address 33: I2C data for host communication with the tuner

34: I2C clock to the tuner 15: I2C clock from host

16: I2C data from/to host 38, 39: Differential input for IF

17, 18, 21,25: Serial Transport Output Port

3. ADC conversion TDA8759

5 BLOCK DIAGRAM

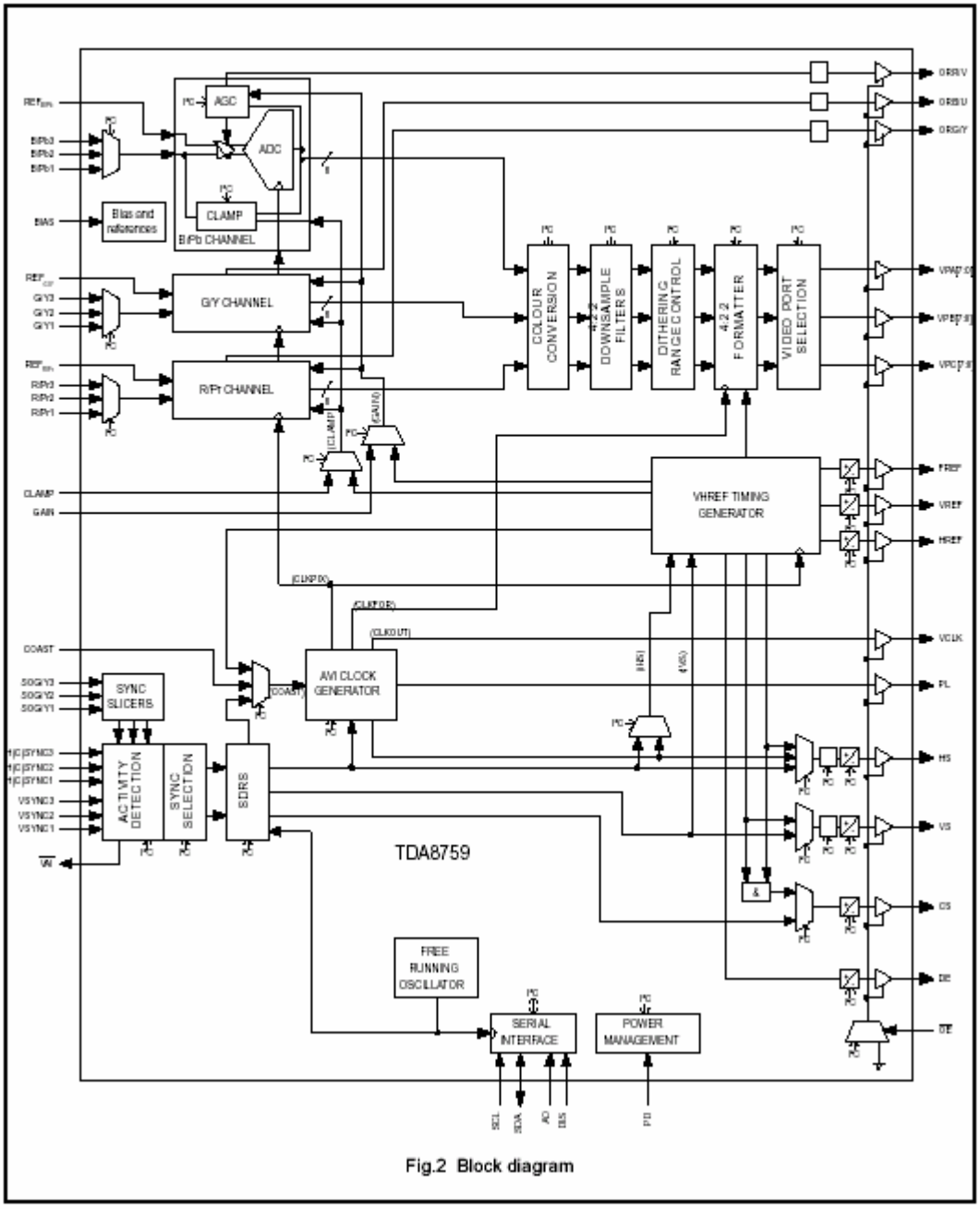
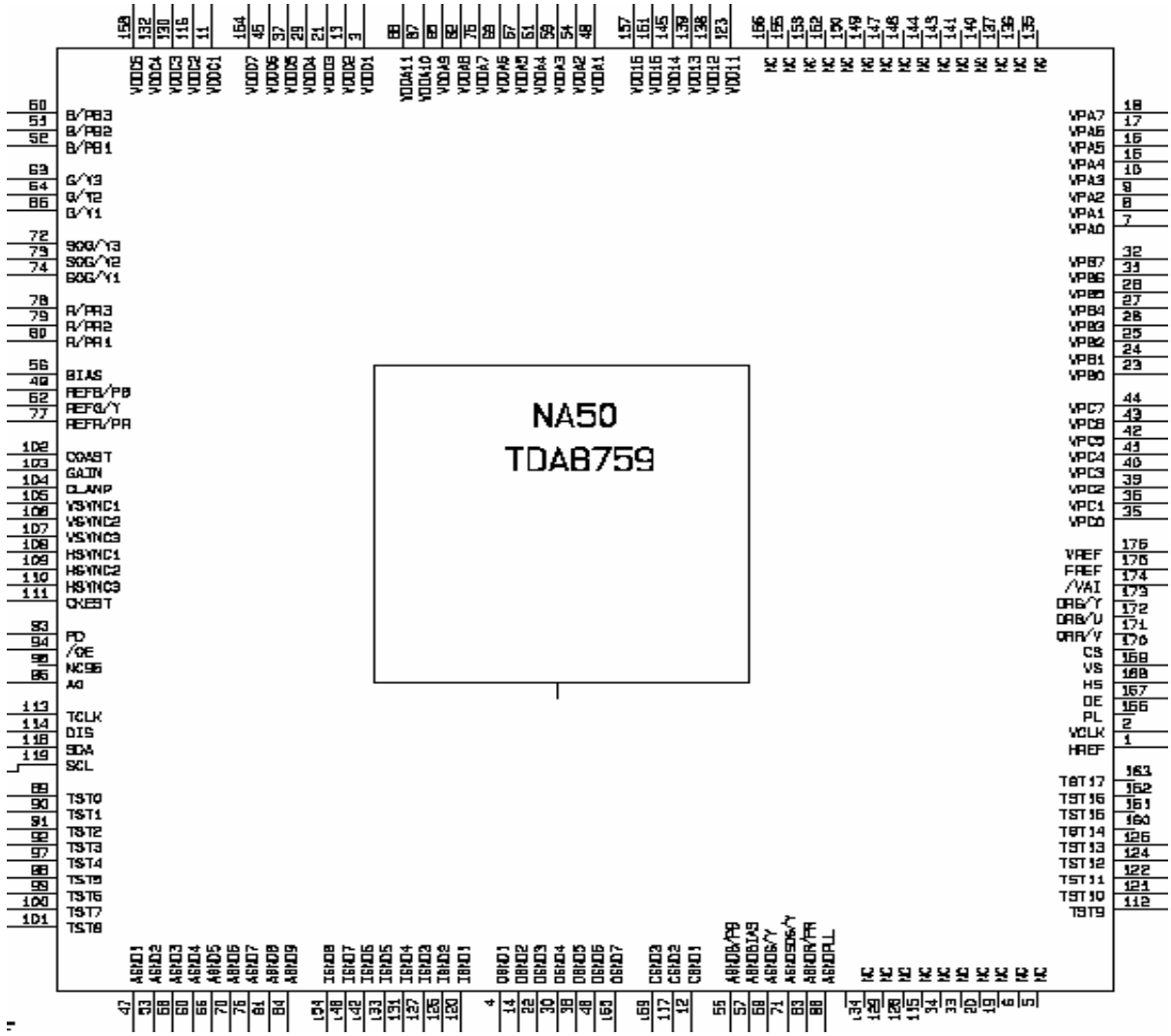


Fig.2 Block diagram

Pin configuration of TDA8759:



Pin description:

78,79,80: Red analog input

63,64,65: Green analog input

50,51,52: Blue analog input

72,73,74: Sync on Green analog input

108,109,110: Horizontal SYNC Input

105,106,107: Vertical SYNC Input

29: Hold PLL Frequency, do not track HSYNC

119: Serial Interface clock

118: Serial Interface data pin

96: Serial interface address pin

7-10, 15-18: Red output data

35,36,39-44: Green output data

23-28,31,32: Blue output data

2: Output data clock

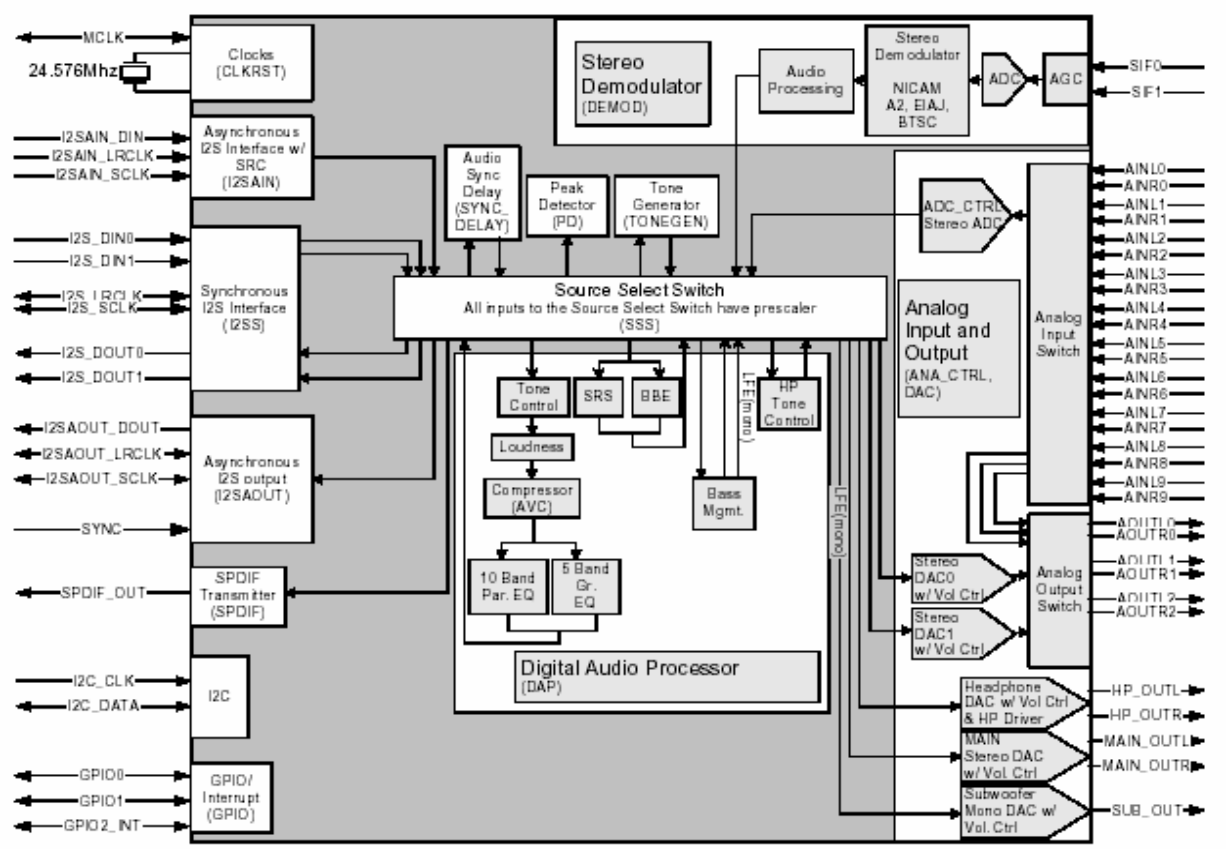
167: DE output

168: HSYNC output

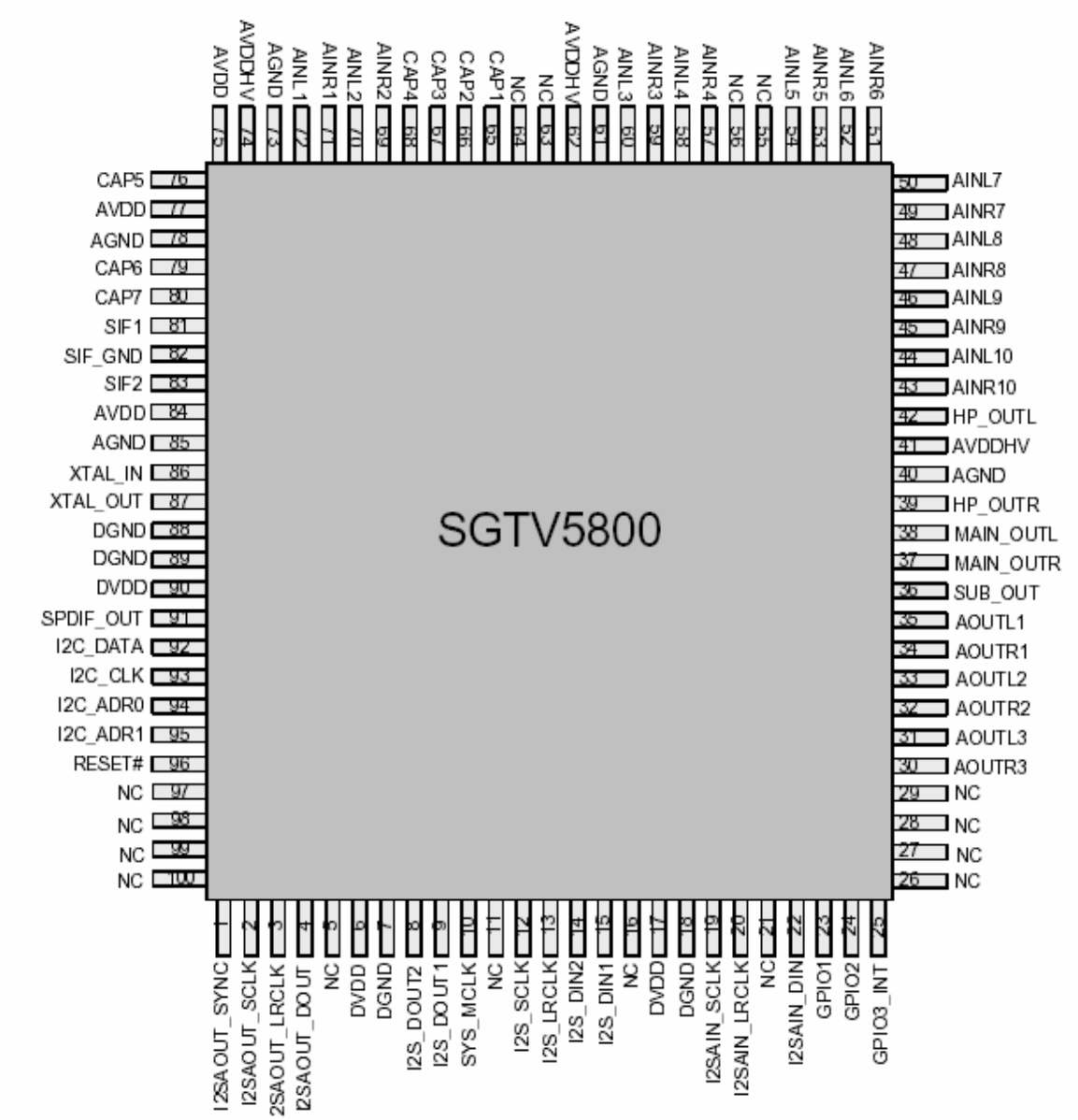
169: VSYNC output

4. Audio processor SGTV5810

The SGTV58xy is a TV audio processor designed to serve as a low cost, integrated audio CODEC for hybrid (analog and digital) TVs, digital only TVs, and analog TVs. Other applications include set top boxes or other media applications where a low cost, high fidelity audio processor is required. The SGTV58xy has highly integrated features and input/output that simplify TV audio design.



Pin configuration of SGTV5810:



Pin description of SGTV5810:

69-72,57-60,51-54,43-50: Analog AUDIO INPUT L/R

42,39: EAR PHONE L/R

30-35: AV AUDIO OUT L/R

38,37: MAIN AUDIO OUTPUT L/R

93,92: I2C SDA/SCL

95,94: Serial interface address pin

96: RESET_N

83,81:SIF INPUT

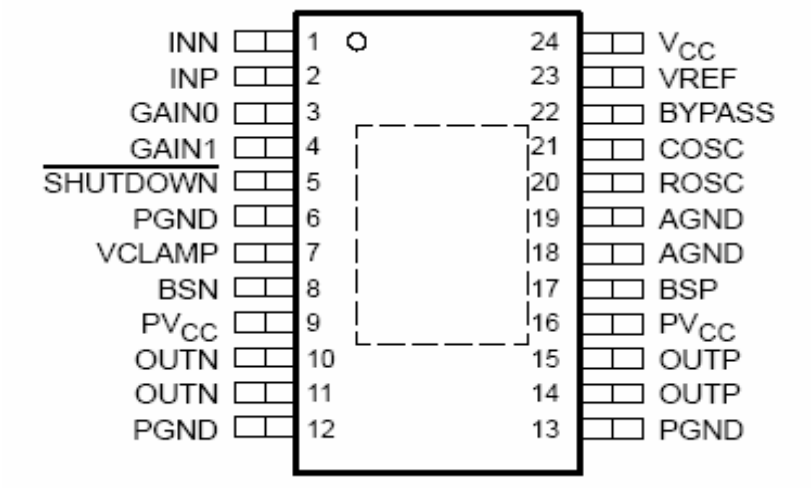
87,86: Oscillator

5. TPA3001

The sound power amplifier TPA3001 Class D AMP is the high effective D type of power amplifier of the single track. The BTL output power can reach 20W(10% THD+N) 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 descriptions of TPA3001:

1: Negative differential input；

2: Positive differential input；

3, 4: gain control；

10, 11: Negative BTL output；

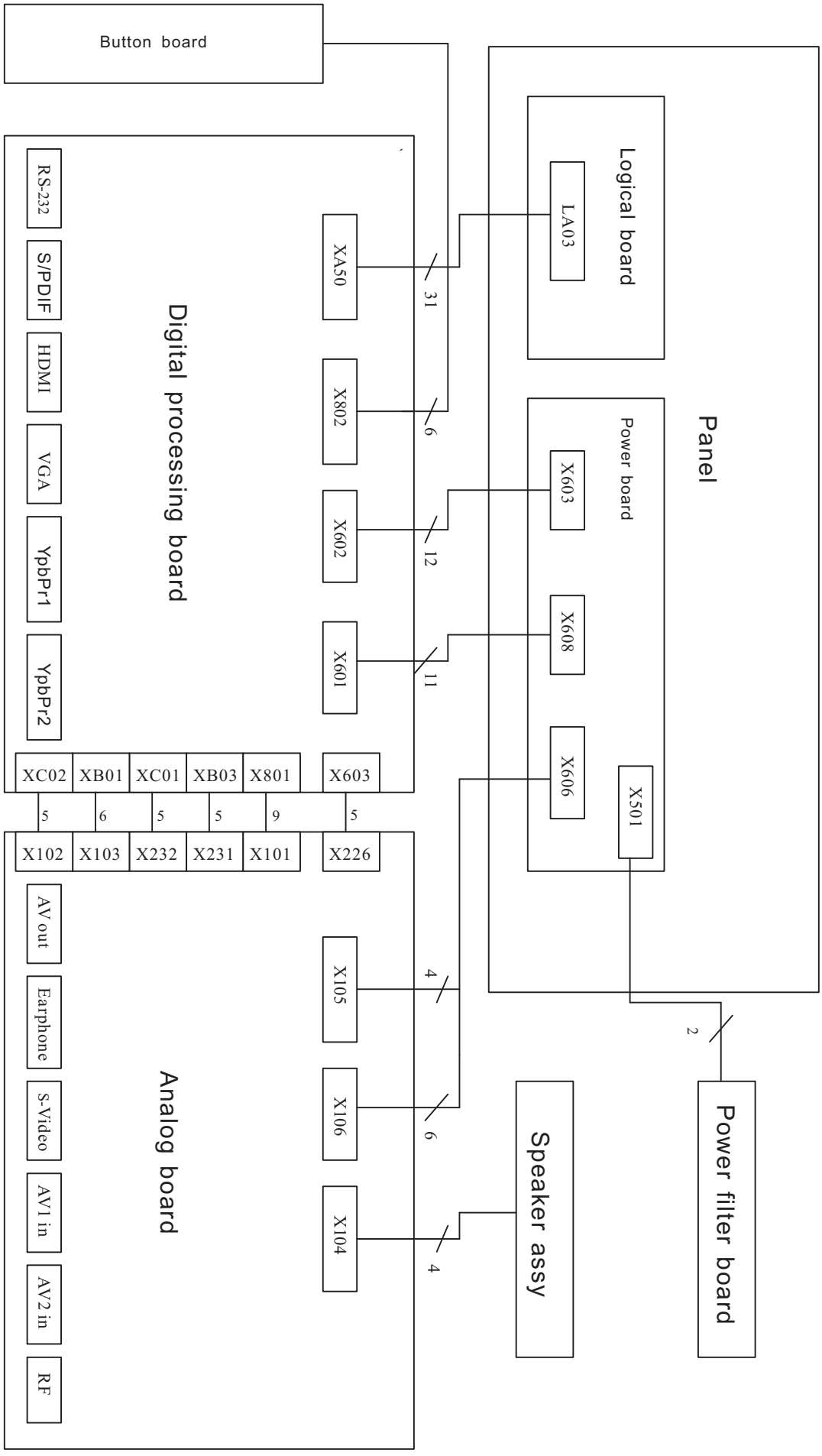
14, 15: Positive BTL output；

9, 16, 24: Power Supply；

6, 12, 13, 18, 19: Power Ground；

5 : Shutdown terminal；

Wiring diagram



Trouble shooting

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

1.Antenna(signal):

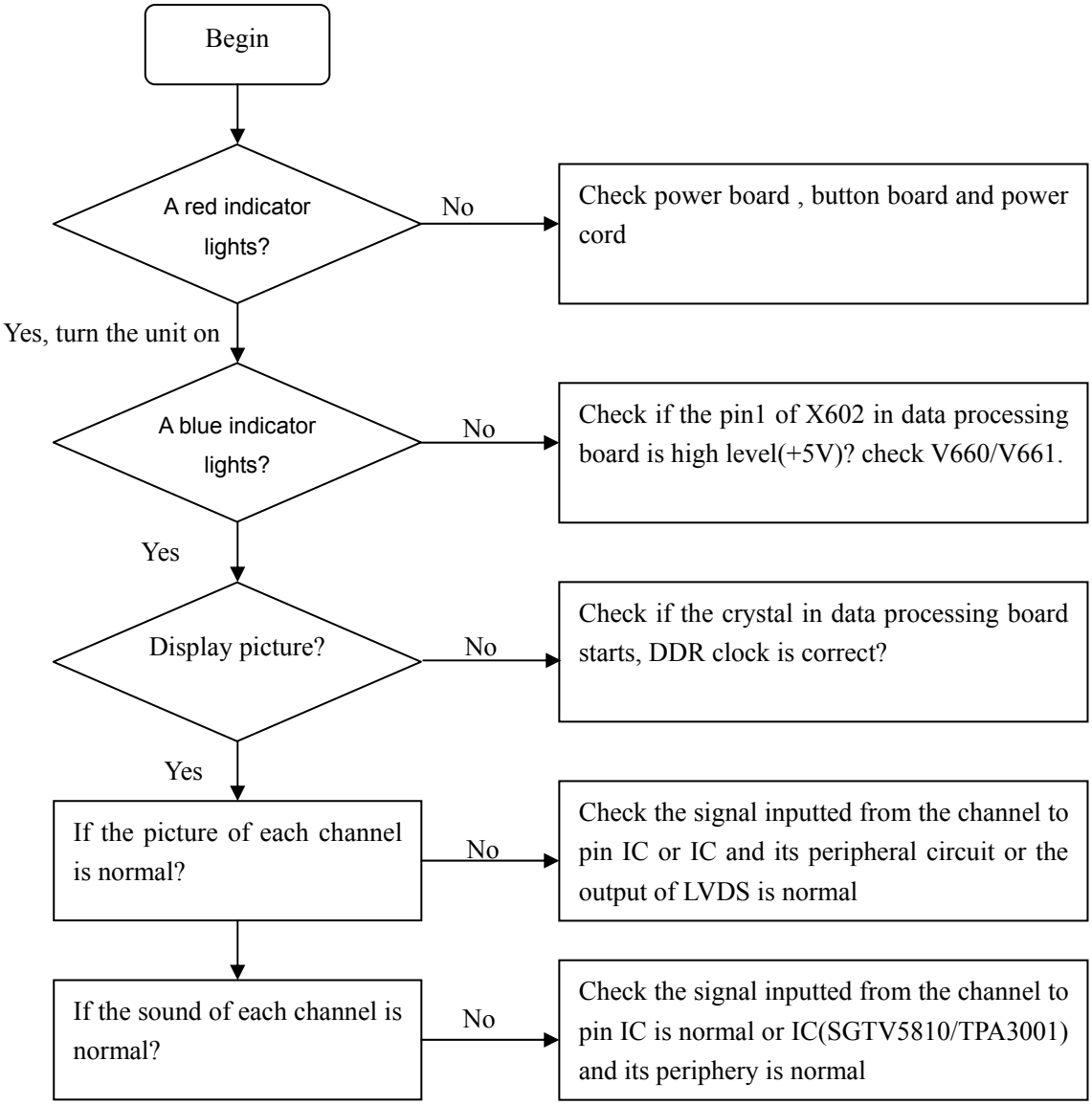
Picture is out of focus or jumping	6. Bad status in signal receiving 7. Poor signal 8. Check if there are failures with the electrical connector or the antenna. 9. Check if the antenna is properly connected.
Fringe in picture	● Check if the antenna is correctly oriented. ● Maybe there is electric wave reflected from hilltop or building.
Picture is interfered by stripe shaped bright spots	● 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	● 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	● Check to see if the power plug has been inserted properly into the socket.
No picture and sound	● 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	● Check if all the picture setups have been corrected.
Screen position or size is not proper	● Check is the screen position and size is correctly set up.
Picture is twisted and deformed	● Check to see if the picture-frame ratio is properly set up.
Picture color changed or colorless	● Check the "Component" or "RGB" settings of the liquid crystal TV set and make proper adjustment according to

Symptoms	Possible cause
	the signal types.
Picture too bright and there is distortion in the brightest area	● 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	● 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.	● 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)	● 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	● 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.	● Check if the antenna cable is correctly connected, or if it has received the video signal correctly.
Blur picture	● Check if the antenna cable is correctly connected. ● Of if it has received the right video signal.
No sound	● 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.	10. 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

Troubleshooting guide



(1) abnormal picture

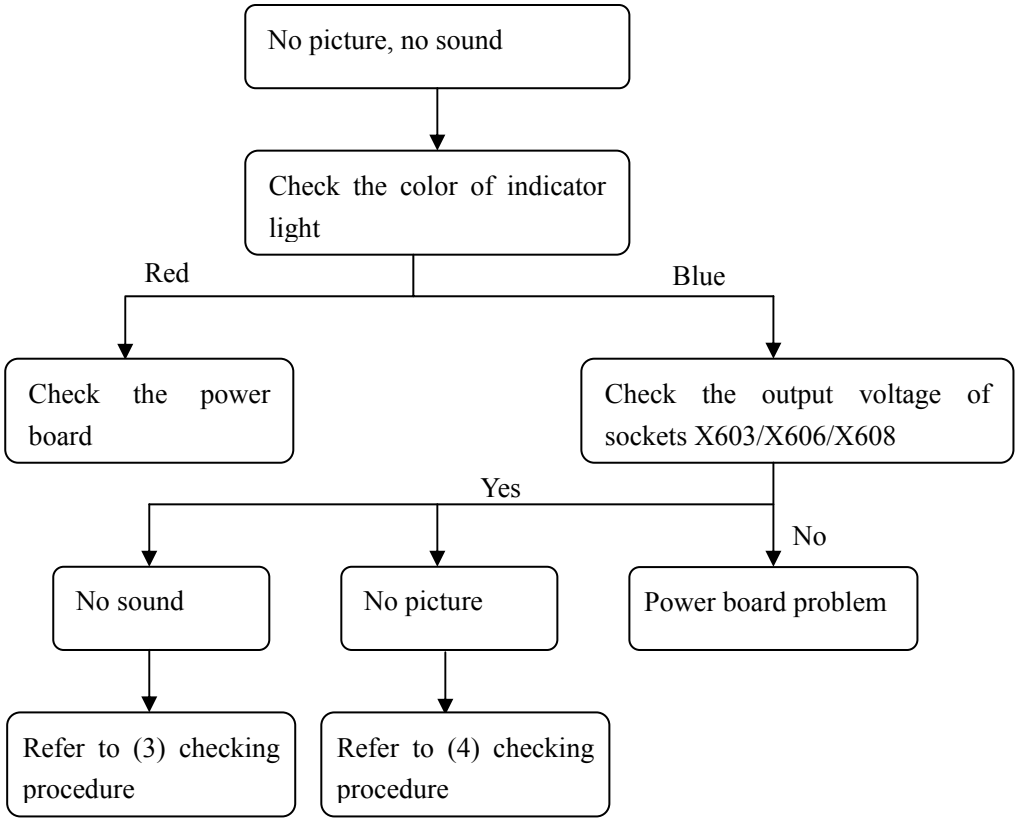
a) A certain differential wire pair of LVDS of XA50 (RX0+/-, RX1+/-, RX2+/-, RX3+/-)is abnormal, which may lead to lack of color or color splash.

b) 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.

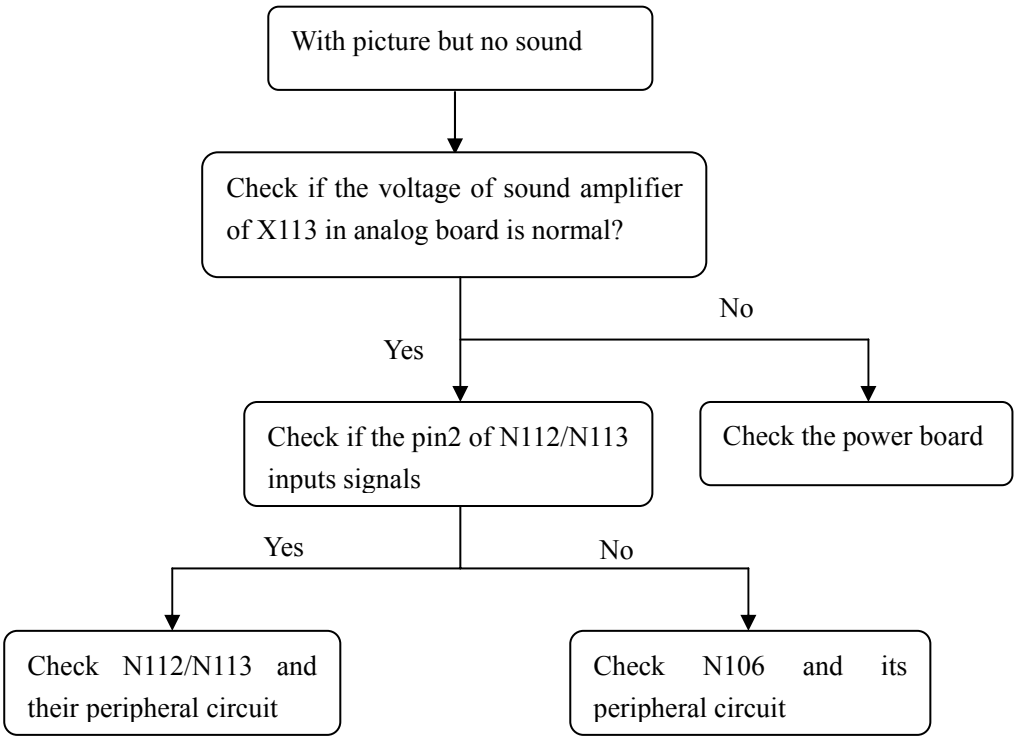
c) Failure with NA50 and its periphery components, which may lead to picture abnormal of PC, YPrPb and YCrCb.

d) Failure with N103, which may lead to picture abnormal of TV, AV1, AV2, S-VIDEO.

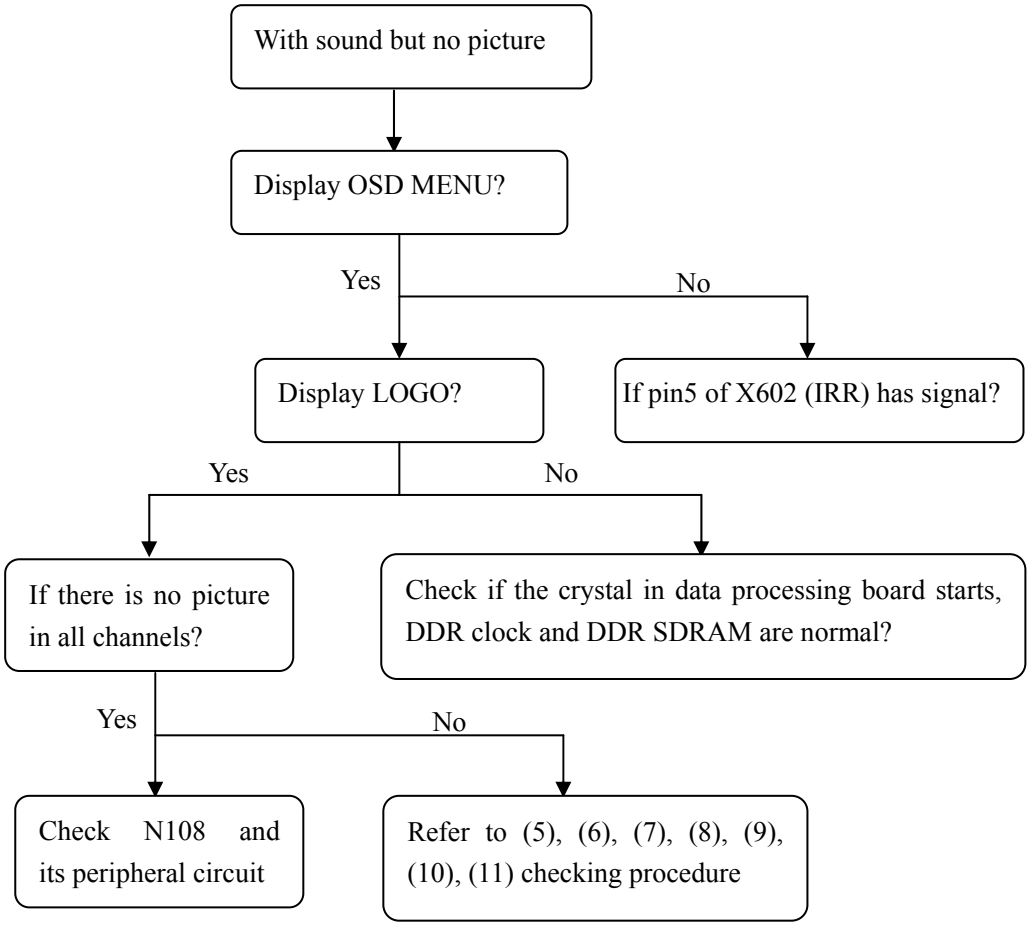
(2) no picture, no sound



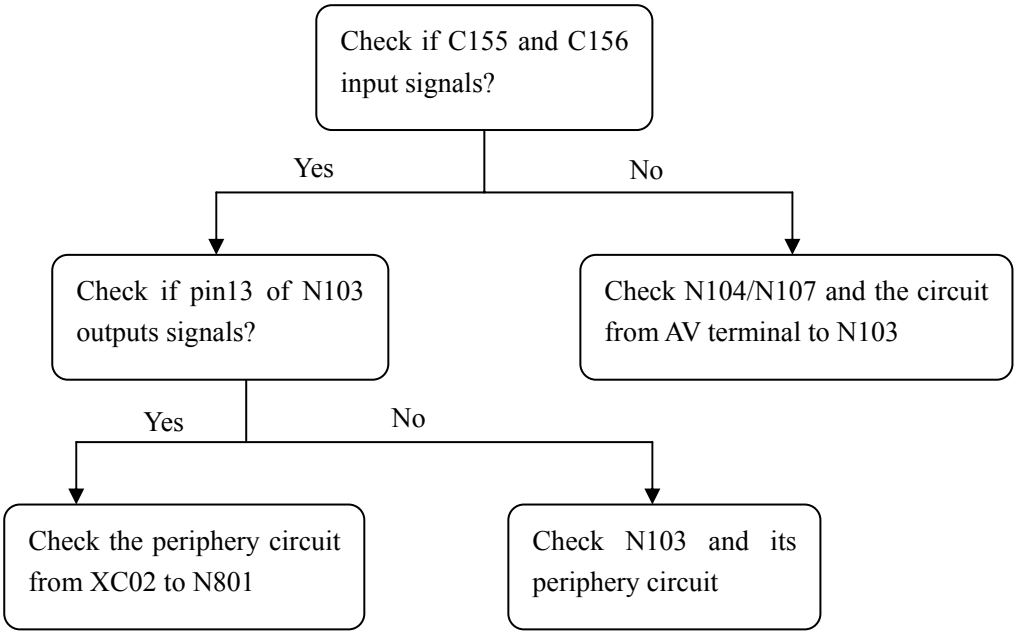
(3) with picture but no sound



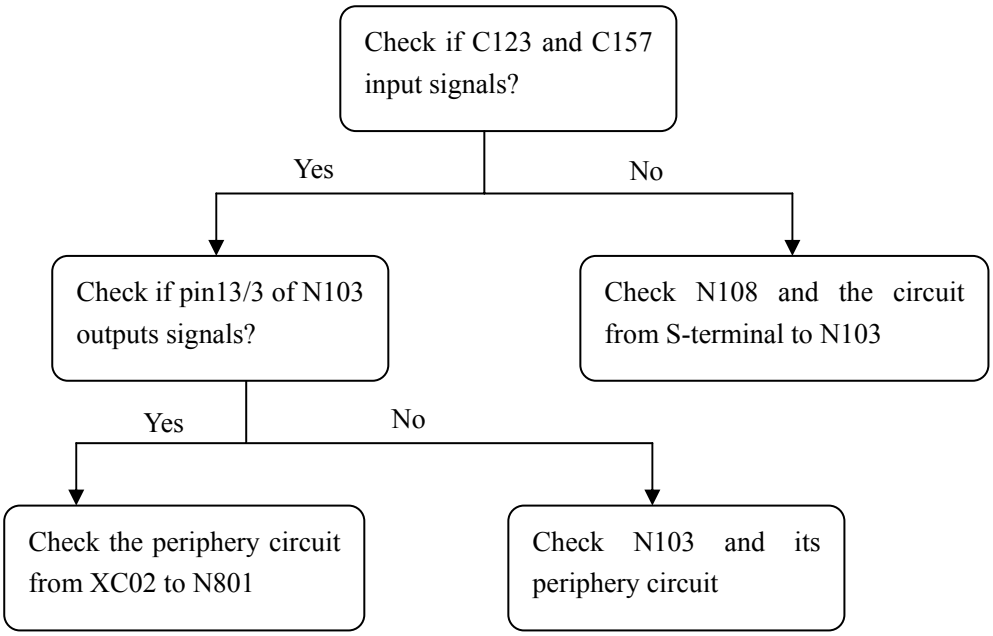
(4) with sound but no picture



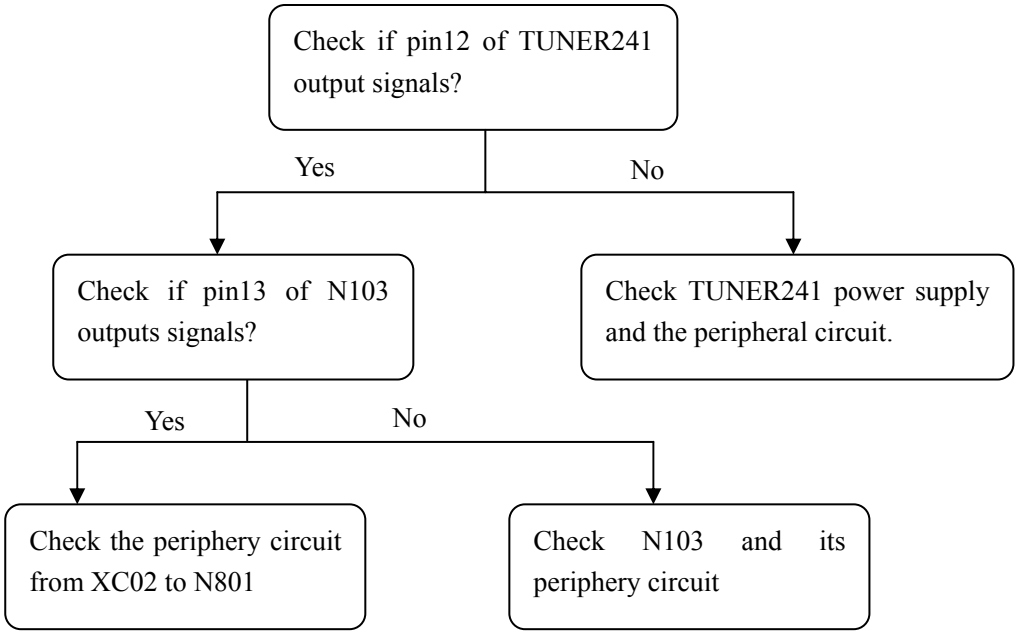
(5) AV no picture



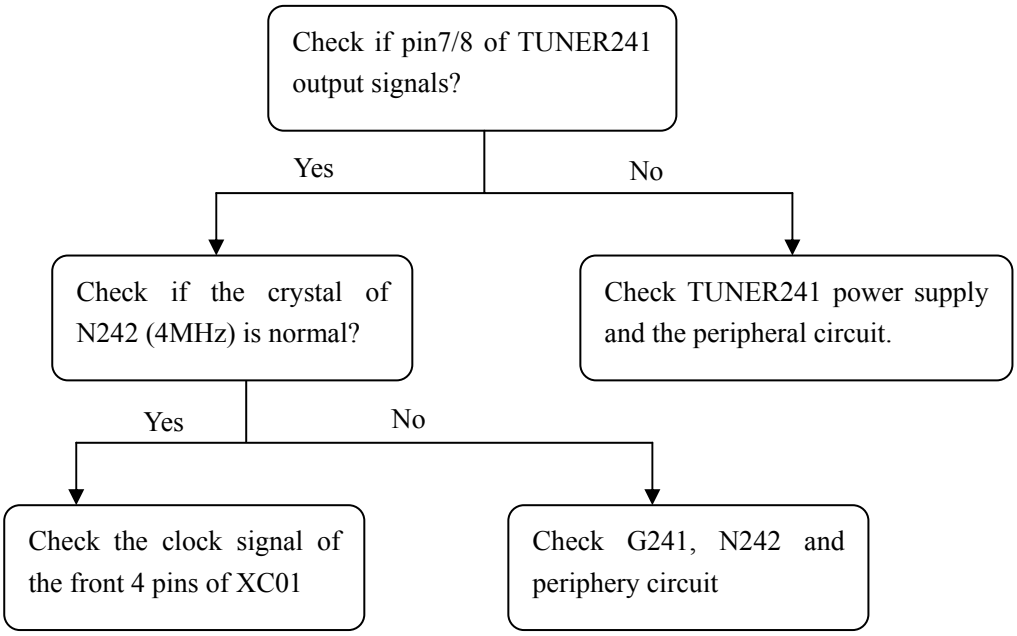
(6) S-terminal no picture



(7) TV channel no picture



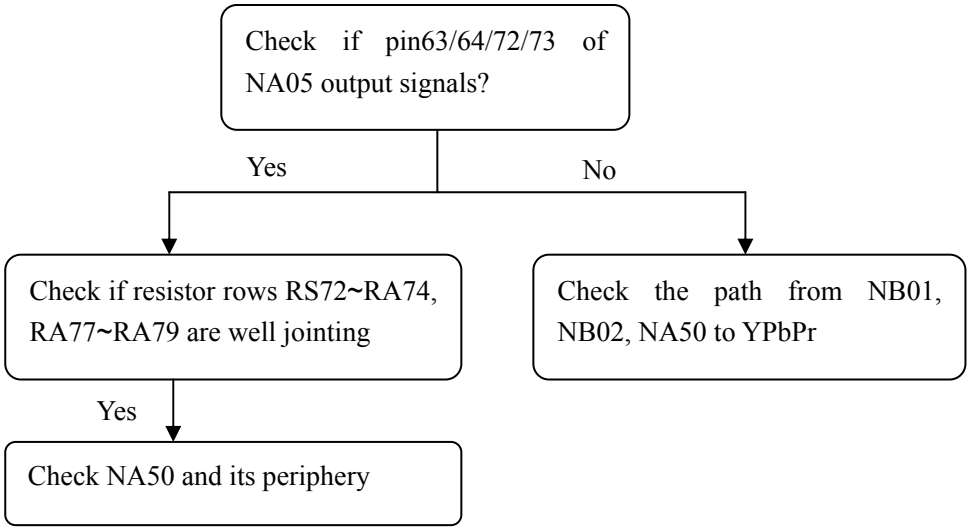
(8) DVB-T channel no picture



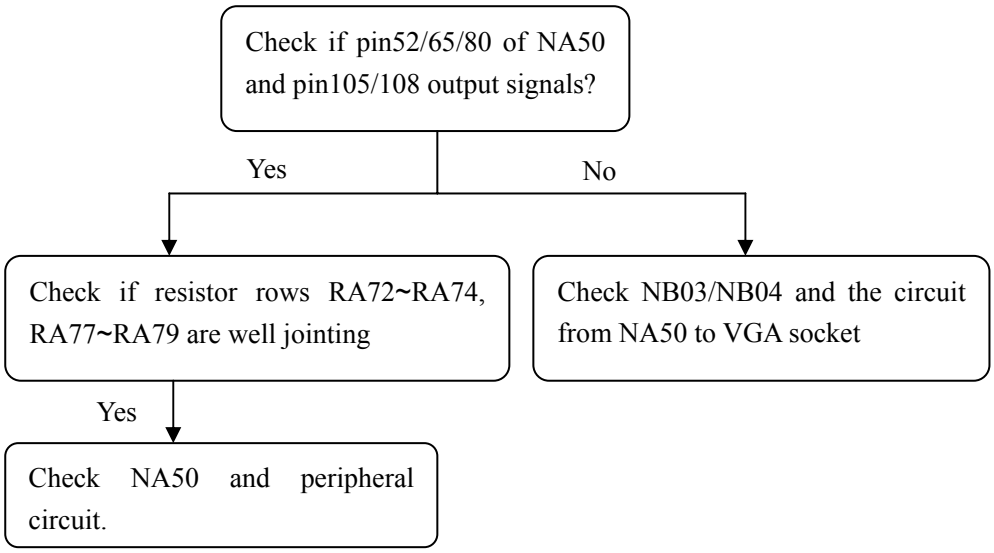
Note :

The I2C bus line control of TUNER is switch through the bus line of N242, so after checking the power supply and peripheral circuit of TUNER241, it is still no picture in TV and DVB-T channel, please check N242 emphatically.

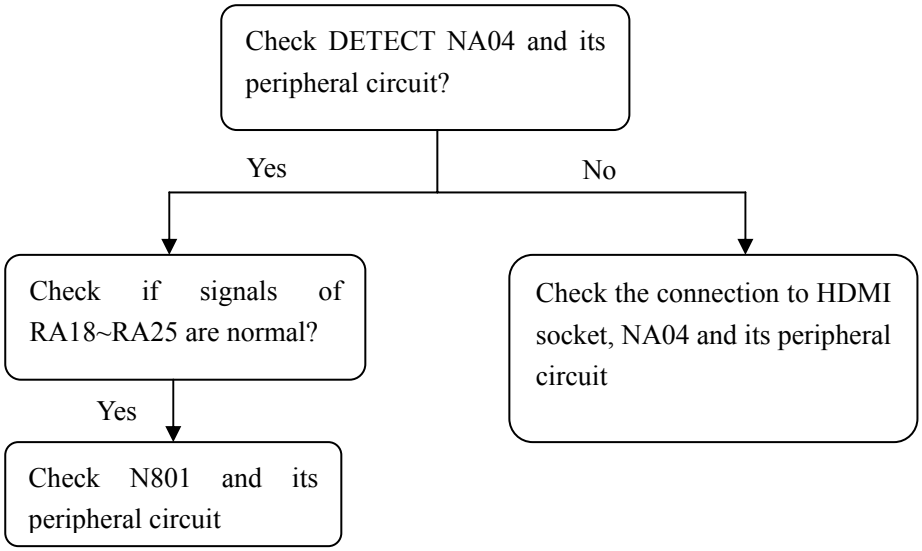
(9) YPrPb or YCrCb channel no picture



(10) D-sub channel no picture

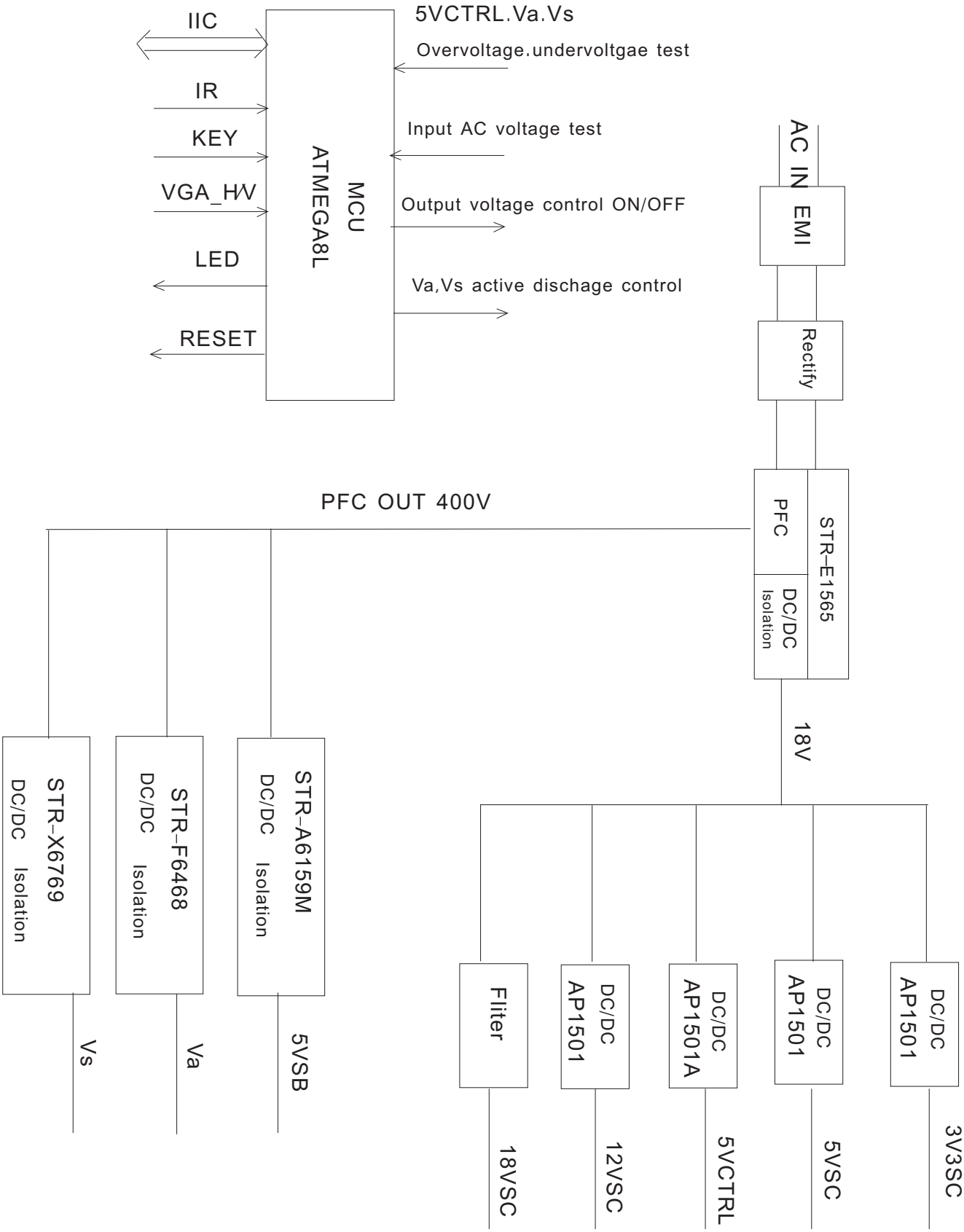


(11) HDMI channel no picture



Note: N801 embeds FLASH, which stores HDCP information of HDMI, while EDID data stored in external EEPROM(NA02), so make sure the connection between HDMI socket/interface and the data of NA02 is well flash write, the picture and sound will display normally.

Block diagram of 42” power board



Troubleshooting of 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, jf 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.

A B C D E F

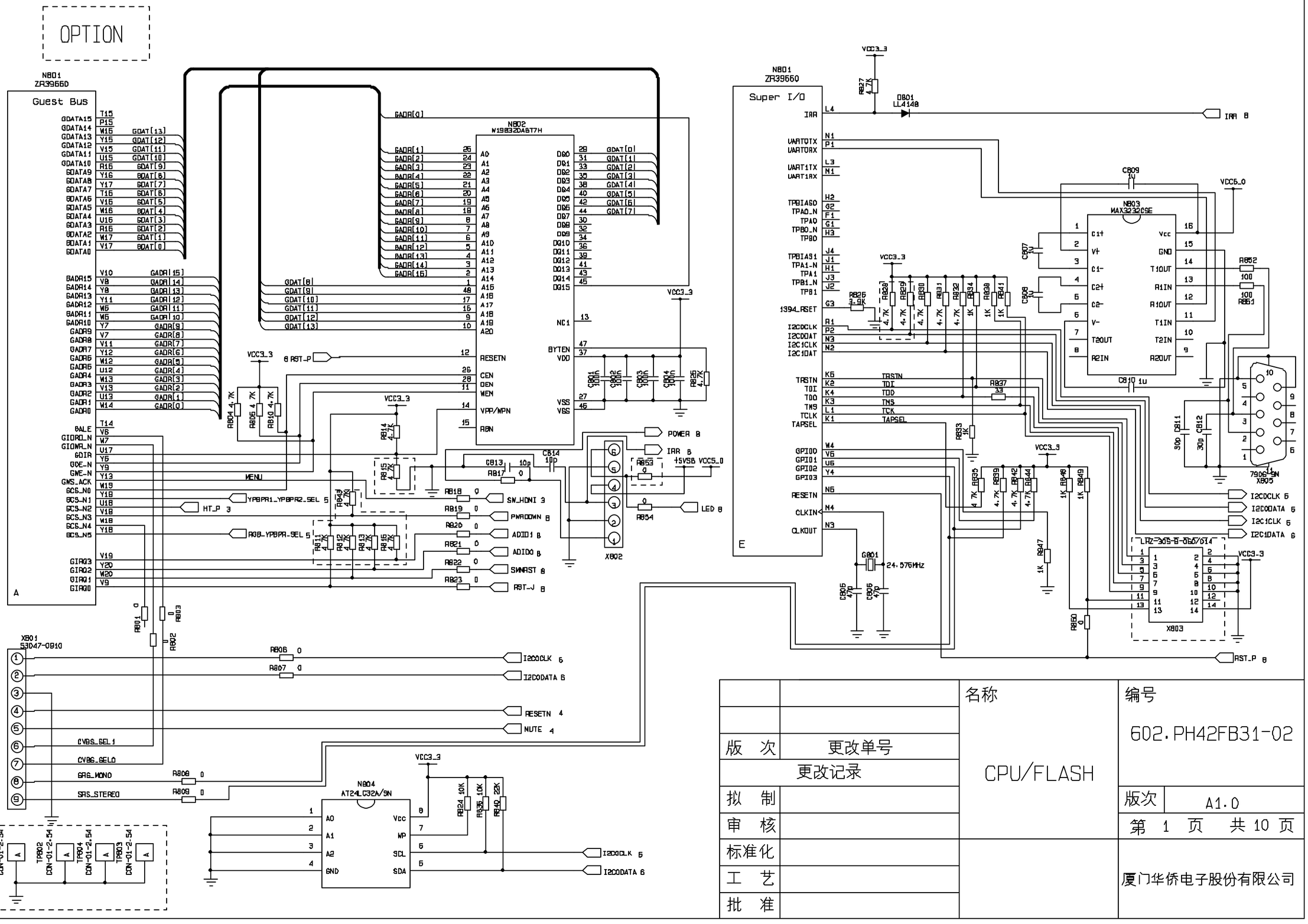
1

2

3

4

OPTION



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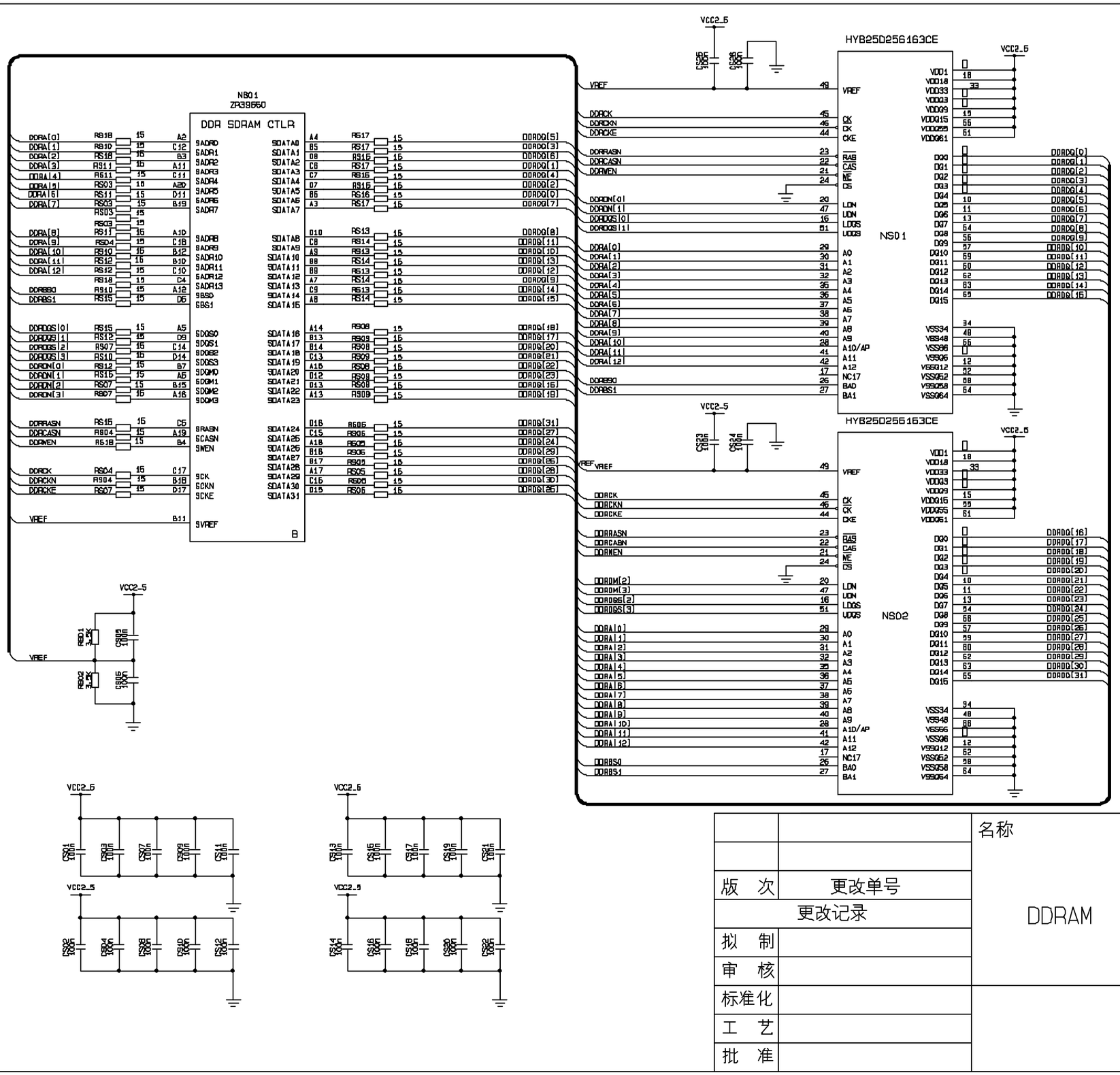
标准化			
工 艺			
批 准			



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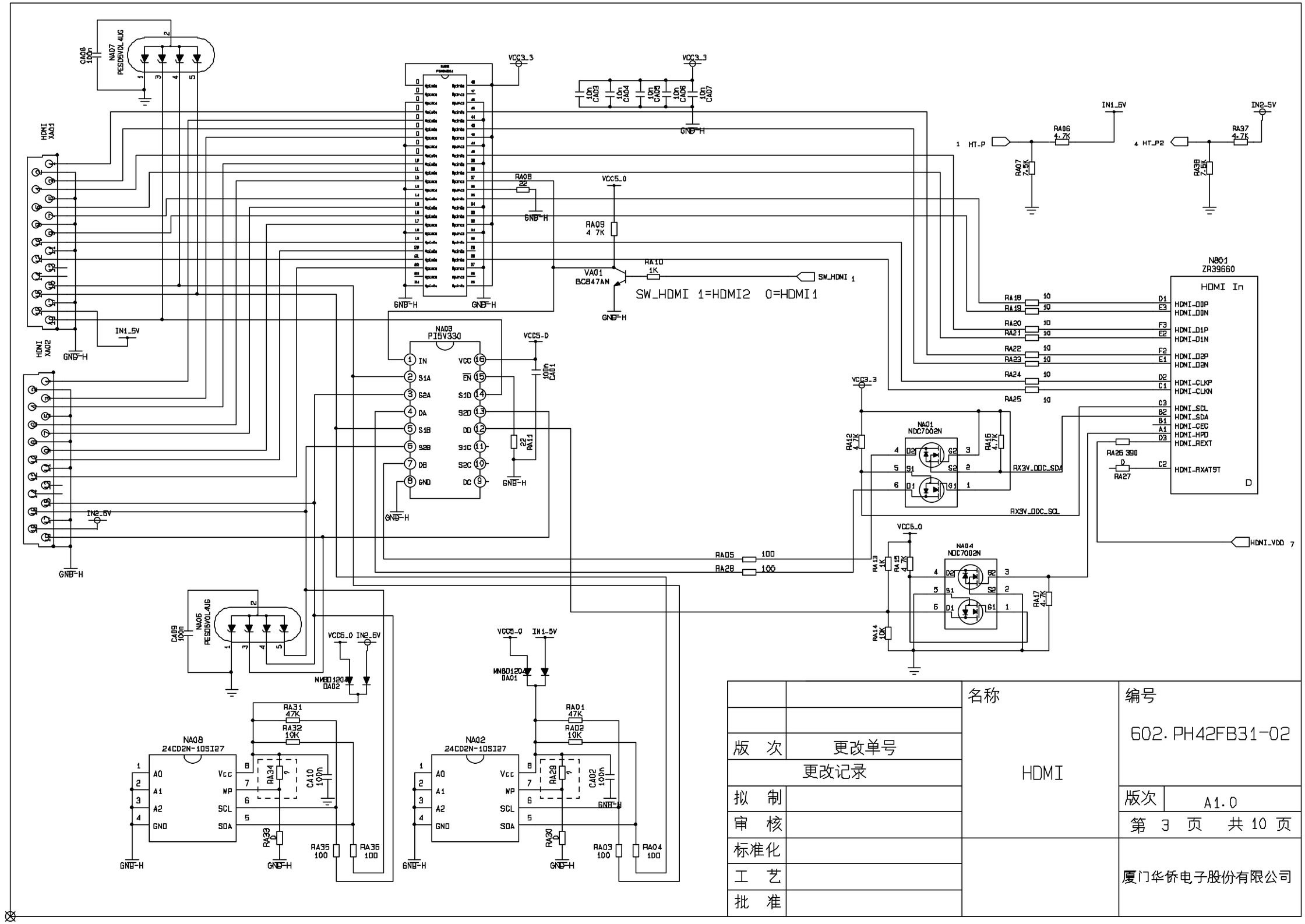

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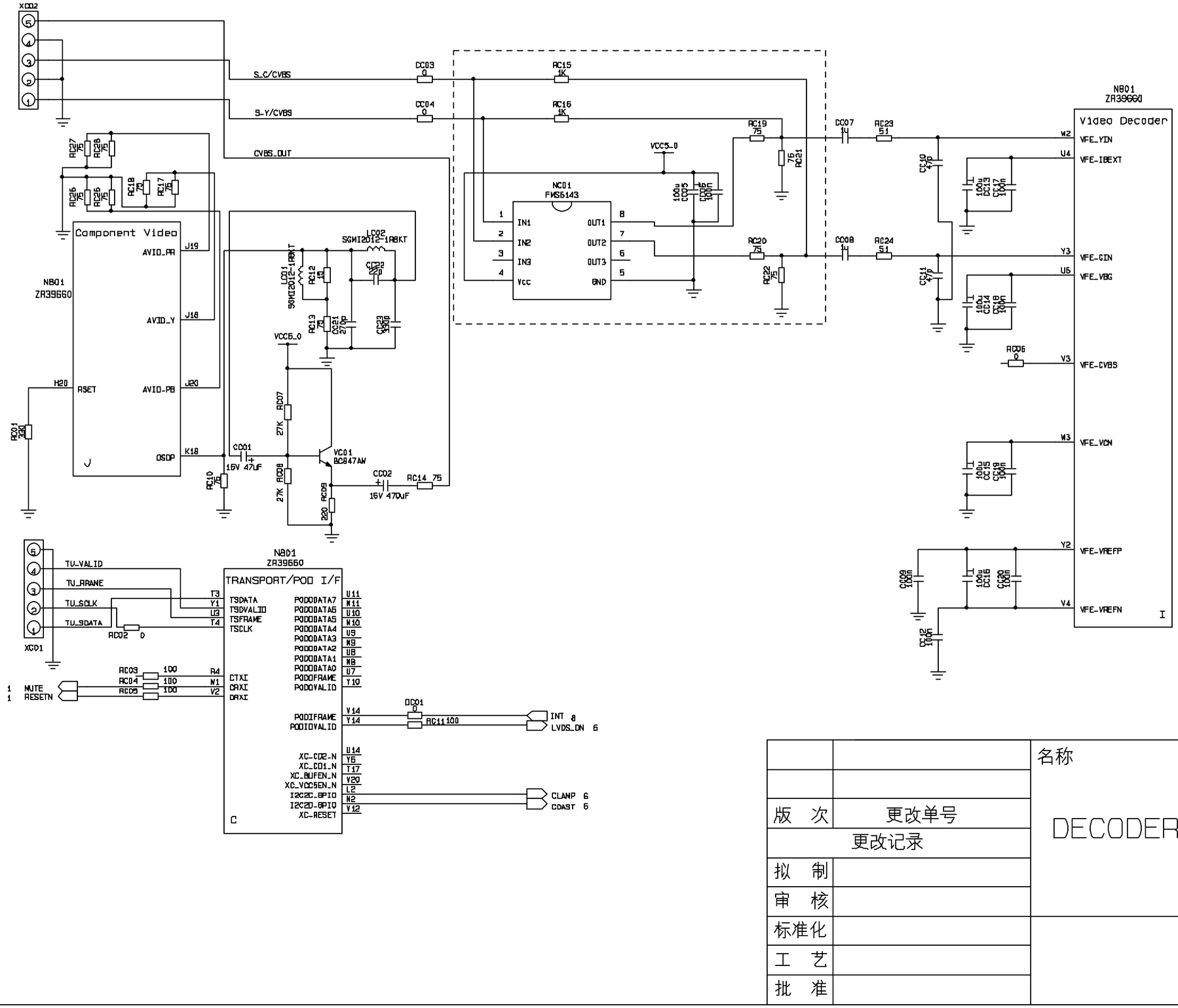

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审 核			
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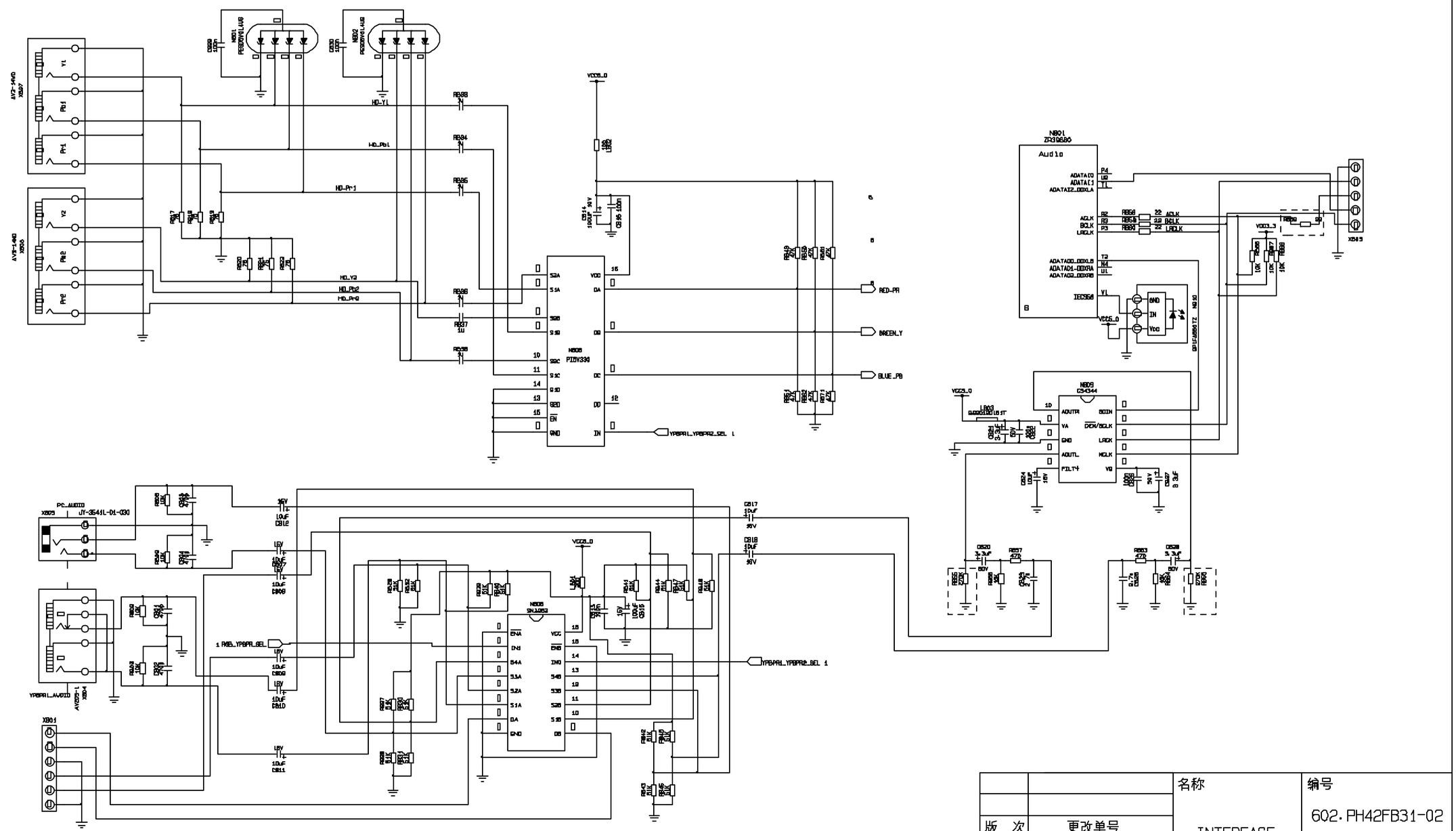
工 艺			
批 准			

A B C D E F G H

1 2 3 4 5 6



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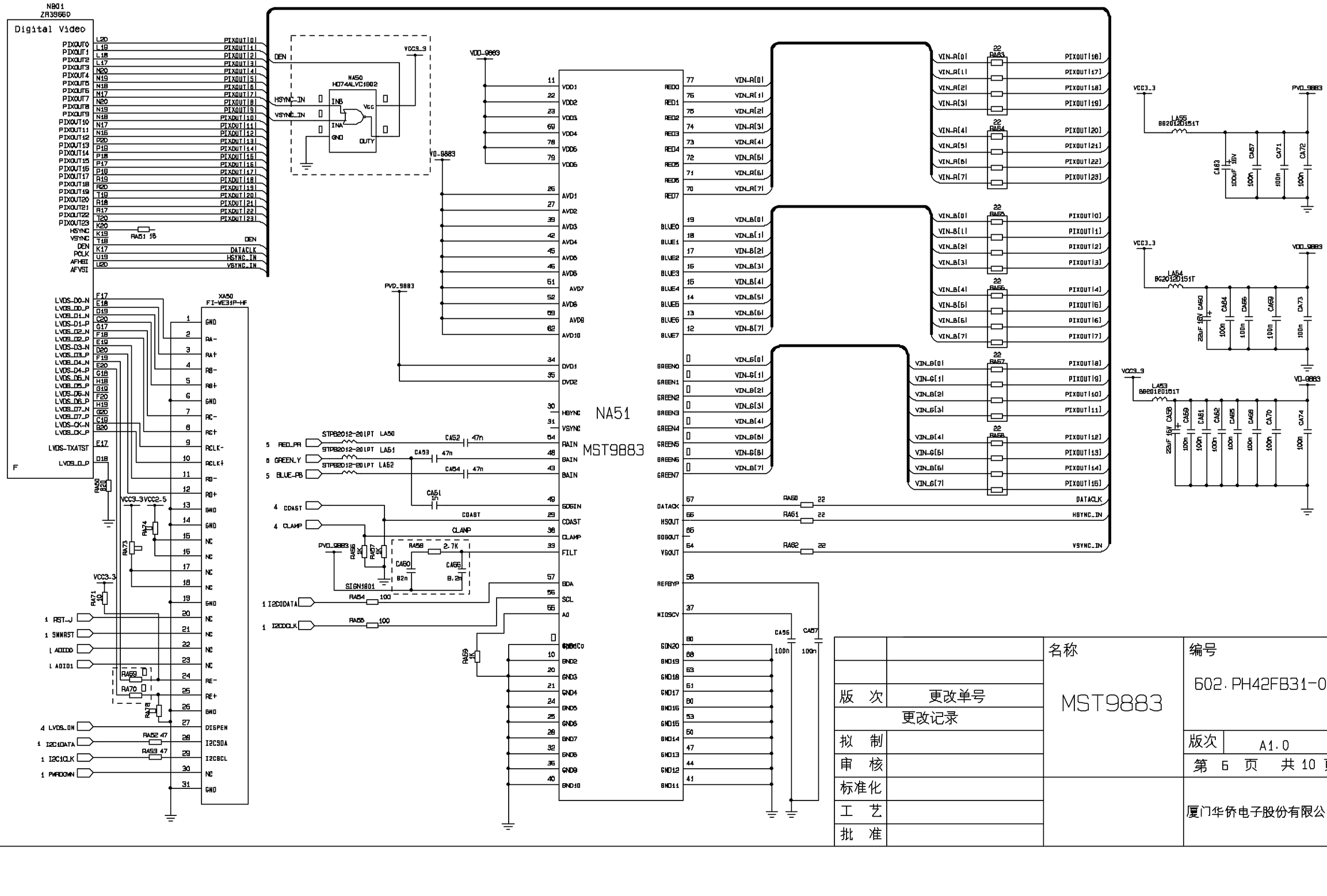

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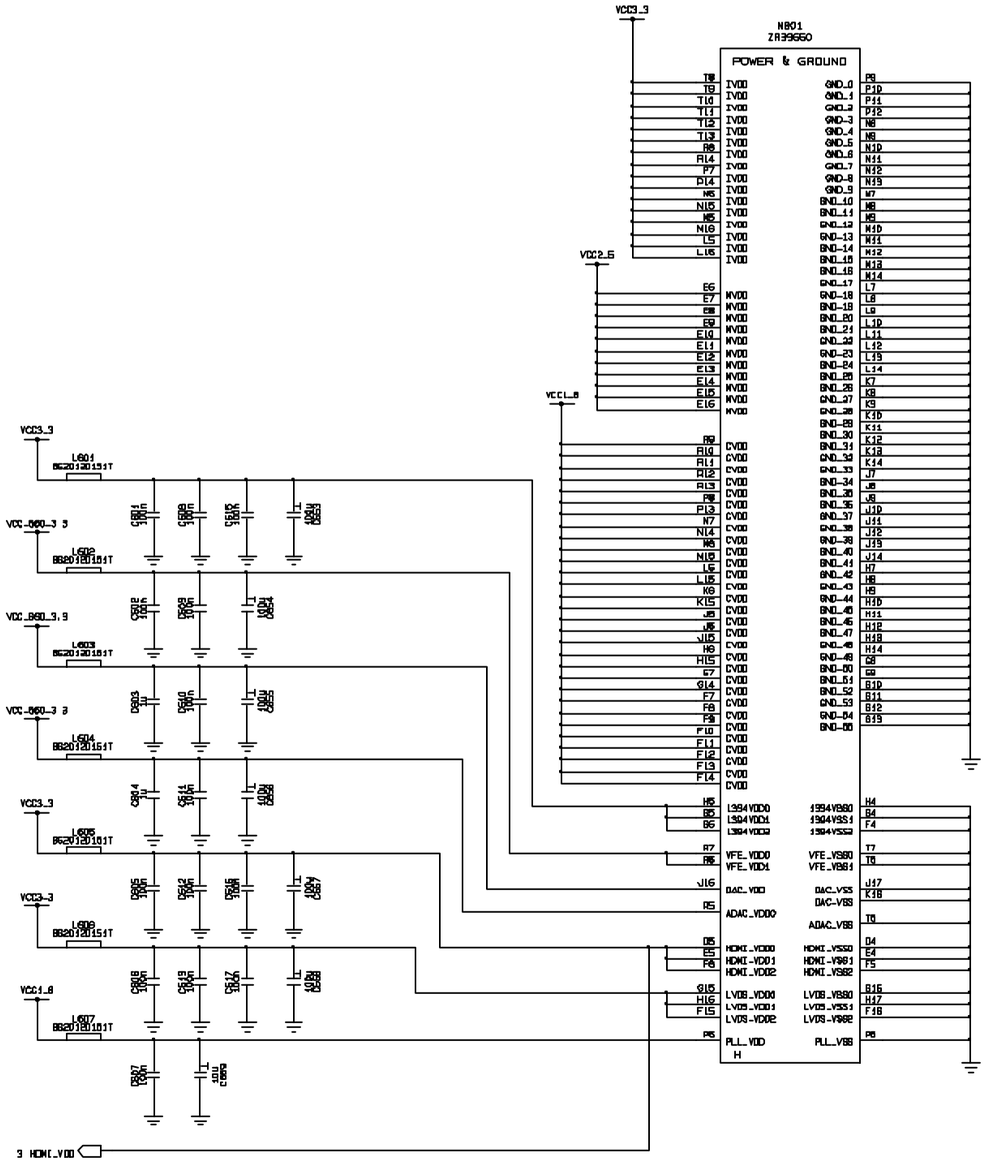

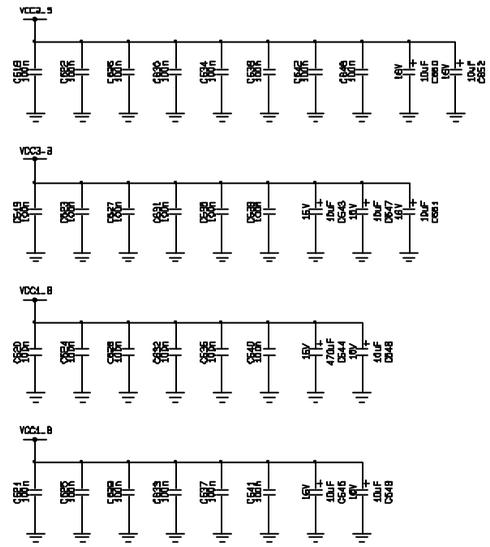

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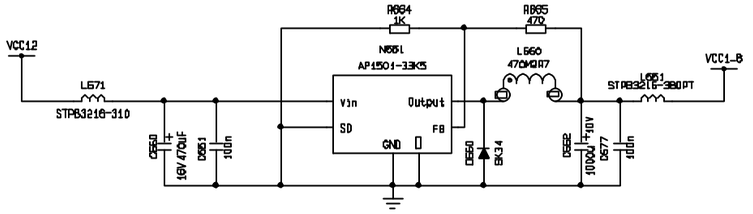
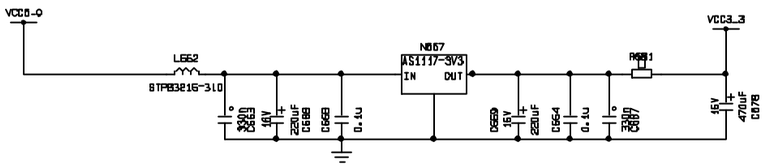
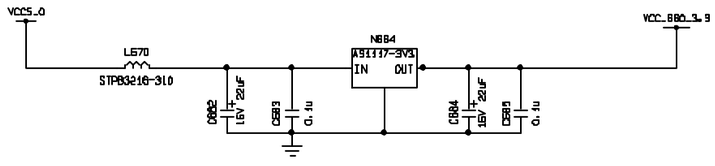
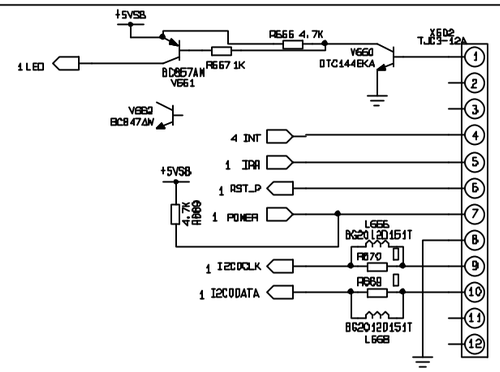
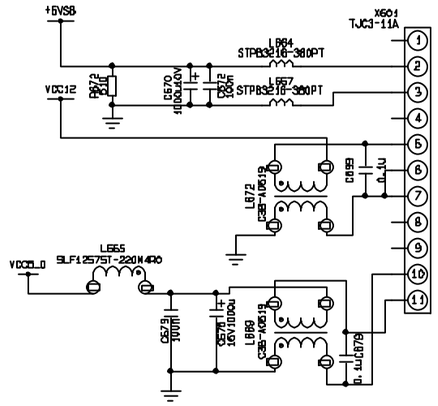
批 准			

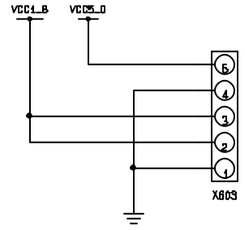












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版 次	更改单号		版次 A1.0
更改记录			第 8 页 共 10 页
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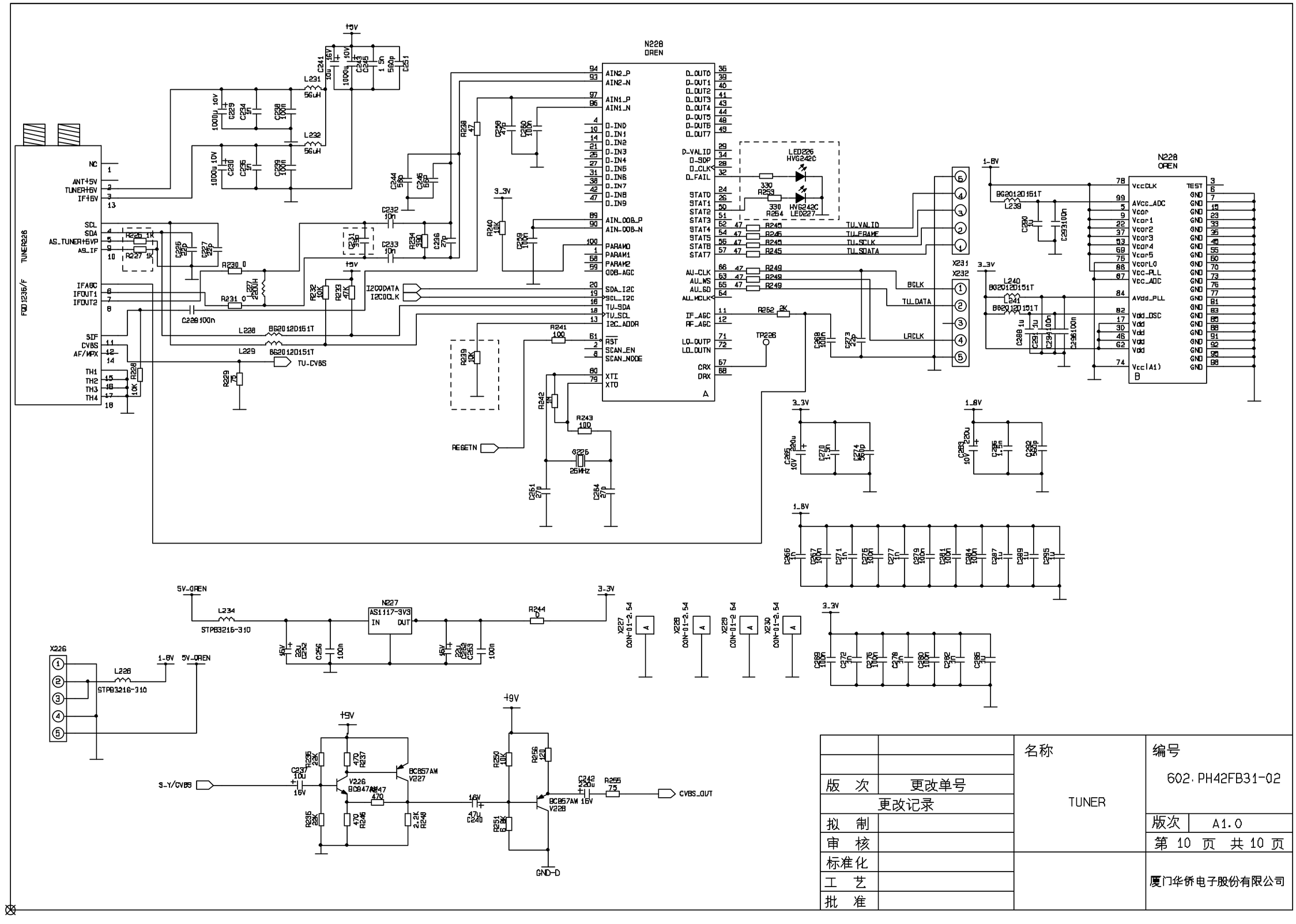
审 核			
标准化			厦门华侨电子股份有限公司
工 艺			
批 准			



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			602.PH42FB31-02
版 次	更改单号	TUNER	版次 A1.0
更改记录			第 10 页 共 10 页
拟 制			
审 核			
标准化			厦门华侨电子股份有限公司
工 艺			
批 准			

APPENDIX-A: Main assembly

Model	Part name	No.
PH-42FB31	Digital processing board	667.PHIFB31-69
	Key board	667.PHIFC31-05
	IR receiver board	667.PHIFC31-09
	Power board	667.PH42FB6-20
	Power filter board	667.PH42T8-51
	Analog board	667.PS42FB6-53
	Remote control	301.D42FB6-06
	Panel	335.42014-00
PH-50FB31	Digital processing board	667.PHIFB31-69
	Key board	667.PHIFC31-05
	IR receiver board	667.PHIFC31-09
	Power board	667.PHST18-20
	Power filter board	667.50FB18-51
	Analog board	667.50FB18-53
	Remote control	301.D42FB6-06
	Panel	335.50005-00