LCD TELEVISION

SERVICE MANUAL

SERVICE MANUAL SERVICE MANUAL

NS-32LCD

CONTENTS

Attention: This service manual is only for service personnel to take reference with. Before servicing please read the following points carefully.

Safety precautions

1. Instructions

Be sure to switch off the power supply before replacing or welding any components or inserting/plugging in connection wire Anti static measures to be taken (throughout the entire production process!):

a) Do not touch here and there by hand at will;

b) Be sure to use anti static electric iron;

c) It's a must for the welder to wear anti static gloves.

Please refer to the detailed list before replacing components that have special safety requirements. Do not change the specs and type at will.

2. Points for attention in servicing of LCD

2.1 Screens are different from one model to another and therefore not interchangeable. Be sure to use the screen of the original model for replacement.

2.2 The operation voltage of LCD screen is 700-825V. Be sure to take proper measures in protecting yourself and the machine when testing the system in the course of normal operation or right after the power is switched off. Please do not touch the circuit or the metal part of the module that is in operation mode. Relevant operation is possible only one minute after the power is switched off.

2.3 Do not use any adapter that is not identical with the TV set. Otherwise it will cause fire or damage to the set.

2.4 Never operate the set or do any installation work in bad environment such as wet bathroom, laundry, kitchen, or nearby fire source, heating equipment and devices or exposure to sunlight etc. Otherwise bad effect will result.

2.5 If any foreign substance such as water, liquid, metal slices or other matters happens to fall into the module, be sure to cut the power off immediately and do not move anything on the module lest it should cause fire or electric shock due to contact with the high voltage or short circuit.

2.6 Should there be smoke, abnormal smell or sound from the module, please shut the power off at once. Likewise, if the screen is not working after the power is on or in the course of operation, the power must be cut off immediately and no more operation is allowed under the same condition.

2.7 Do not pull out or plug in the connection wire when the module is in operation or just after the power is off because in this case relatively high voltage still remains in the capacitor of the driving circuit. Please wait at least one minute before the pulling out or plugging in the connection wire.

2.8 When operating or installing LCD please don't subject the LCD components to bending, twisting or extrusion, collision lest mishap should result.

2.9 As most of the circuitry in LCD TV set is composed of CMOS integrated circuits, it's necessary to pay attention to anti statics. Before servicing LCD TV make sure to take anti static measure and ensure full grounding for all the parts that have to be grounded.

2.10 There are lots of connection wires between parts behind the LCD screen. When servicing or moving the set please take care not to touch or scratch them. Once they are damaged the screen

would be unable to work and no way to get it repaired.
2.11 Special care must be taken in transporting or handling it. Exquisite shock vibration may lead to breakage of screen glass or damage to driving circuit. Therefore it must be packed in a strong case before the transportation or handling.
2.12 For the storage make sure to put it in a place where the environment can be controlled so as to prevent the temperature and humidity from exceeding the limits as specified in the manual. For prolonged storage, it is necessary to house it in an anti-moisture bag and put them altogether in one place. The ambient conditions are tabulated as follows:

Temperature	Scope for operation	0 ~ +50 ^{o}C
	Scope for storage	-20 ~ +60 ^{o}C
Humidity	Scope for operation	20% ~ 85%
	Scope for storage	10% ~ 90%

2.13 Display of a fixed picture for a long time may result in appearance of picture residue on the screen, as commonly called “ghost shadow”. The extent of the residual picture varies with the maker of LCD screen. This phenomenon doesn’t represent failure. This “ghost shadow” may remain in the picture for a period of time (several minutes). But when operating it please avoid displaying still picture in high brightness for a long time.

3. Points for attention during installation

3.1 The front panel of LCD screen is of glass. When installing it please make sure to put it in place.
3.2 For service or installation it’s necessary to use specified screw lest it should damage the screen.
3.3 Be sure to take anti dust measures. Any foreign substance that happens to fall down between the screen and the glass will affect the receiving and viewing effect
3.4 When dismantling or mounting the protective partition plate that is used for anti vibration and insulation please take care to keep it in intactness so as to avoid hidden trouble.
3.5 Be sure to protect the cabinet from damage or scratch during service, dismantling or mounting.

Alignment instructions

1. Test equipment

PM5515 (video signal generator)

VG-849 (YUV, VGA, HDMI signal generator)

CA210 (white balancer)

2. The alignment flow chart (see below figure)

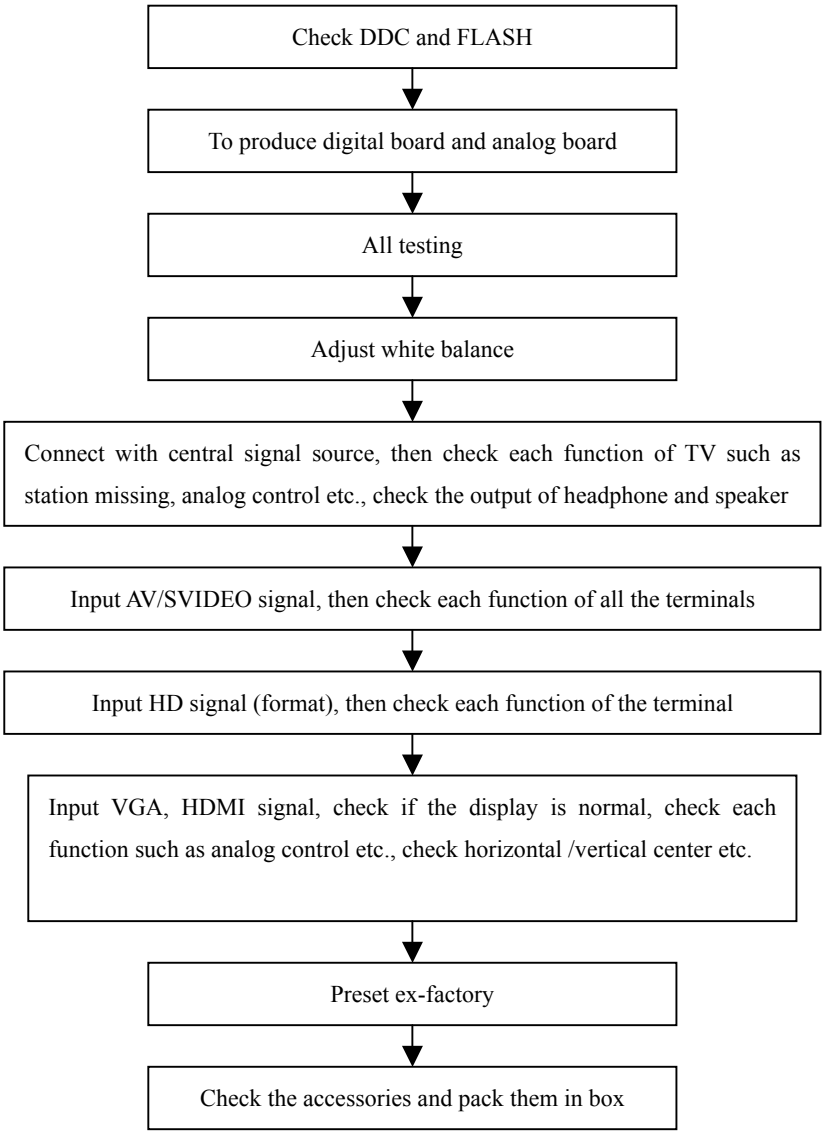


Fig-1 adjustment flow-chart

3. Description of adjustment

3.1 Unit adjustment

Connect the digital board, analog board, video processing board, button board and remote control receiver board according to the wiring diagram 203-L27FB18-01JL or 203-L32FB18-01JL. Connect with power and observe the display.

Method for using factory menu: press ”VOL” button to decrease the volume to 0, then press”9876” 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 WBGG_HDMI to 50H, adjust WBRG_HDMI, WBBG_HDMI, let the color coordinate of third level on the right be (270,283) at 400nits; 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 400nits 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 WBGG_NTSC to 50H, adjust WBRG_NTSC, WBBG_ NTSC, let the color coordinate of third level on the right be (270,283) at 400nits; 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 400nits 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 WBGG_VGA to 128, adjust WBRG_ VGA, WBBG_VGA, let the color coordinate of third level on the right be (270,283) at 400nits; fixed WBGO_VGA to 128, adjust WBRO_VGA, WBBO_VGA, let the color coordinate of third level on the left be (270,283) at 5nits. The brightness of 400nits 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, WBGG_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 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: 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
   Tine: 50
   Color Temperature: Cool
   Skin Tome: White
   Auto Contrast Enhancement: Off
   Black Bar Detection: Off
   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) 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	● 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	● 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:

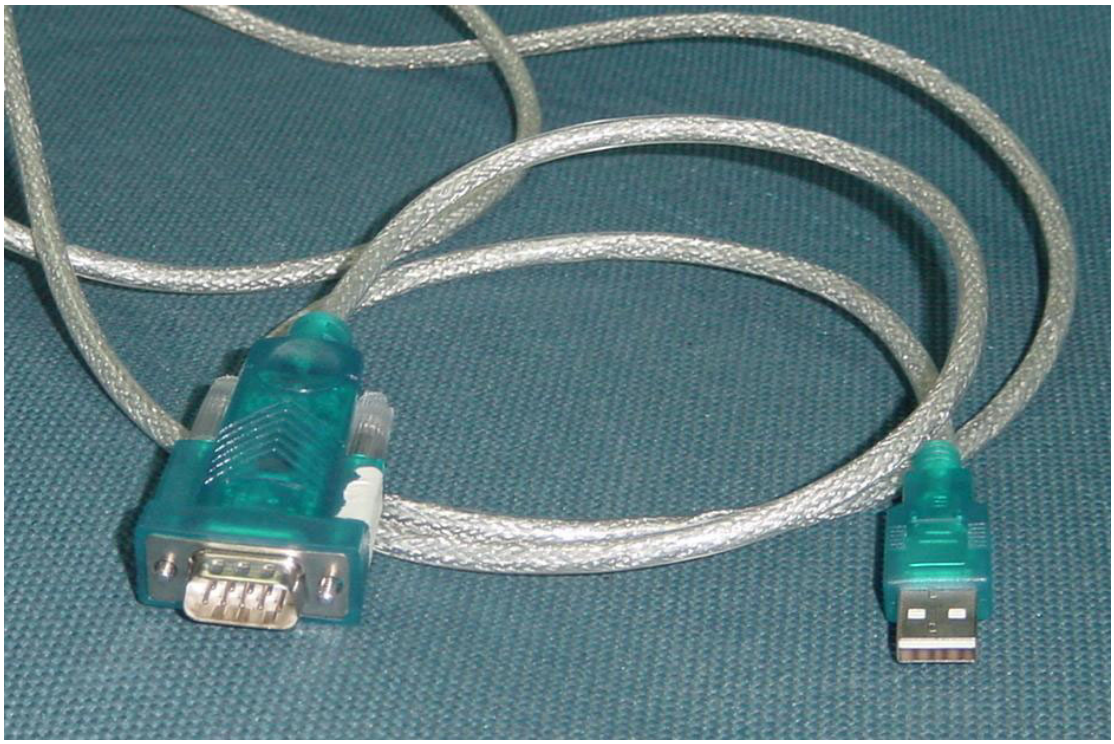
Symptoms	Possible cause
Unable to switch the power on	● Check to see if the power plug has been inserted properly into the socket.
No picture and sound	● Check to see if the power supply of liquid crystal TV has been switched on. (as can be indicated by the red LED at the front of the TV set) ● See if 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.

Symptoms	Possible cause
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 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.	● 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

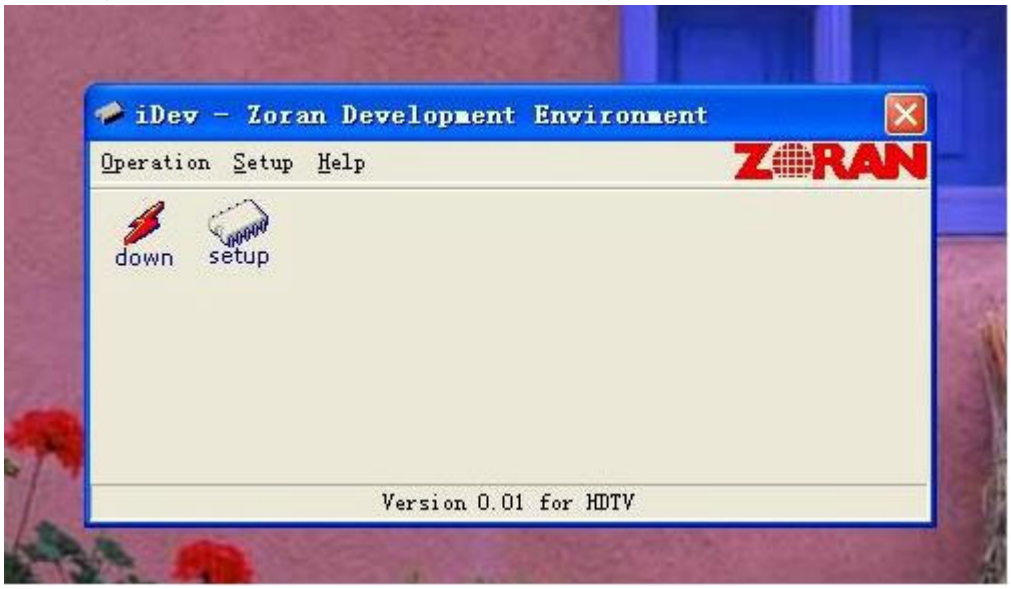
Method of software upgrading

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.



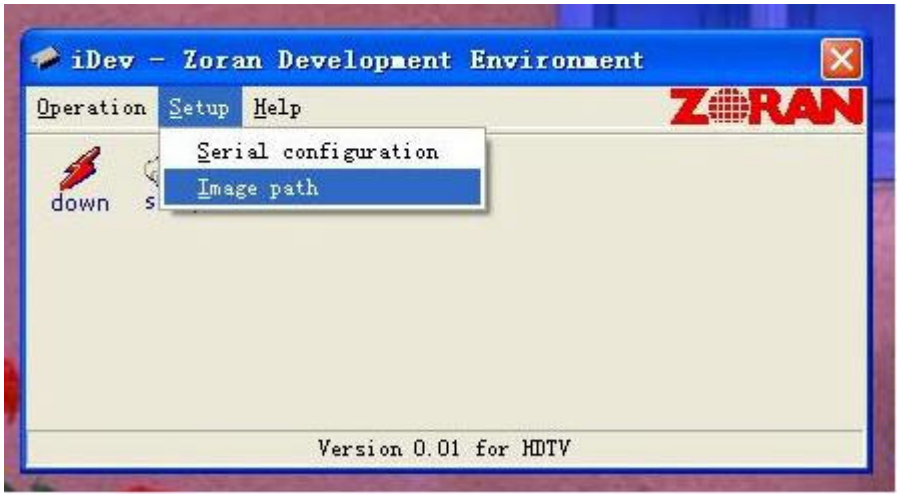
3. Copy the update tools (iDev.exe) to the path you want to do it, and double click it.



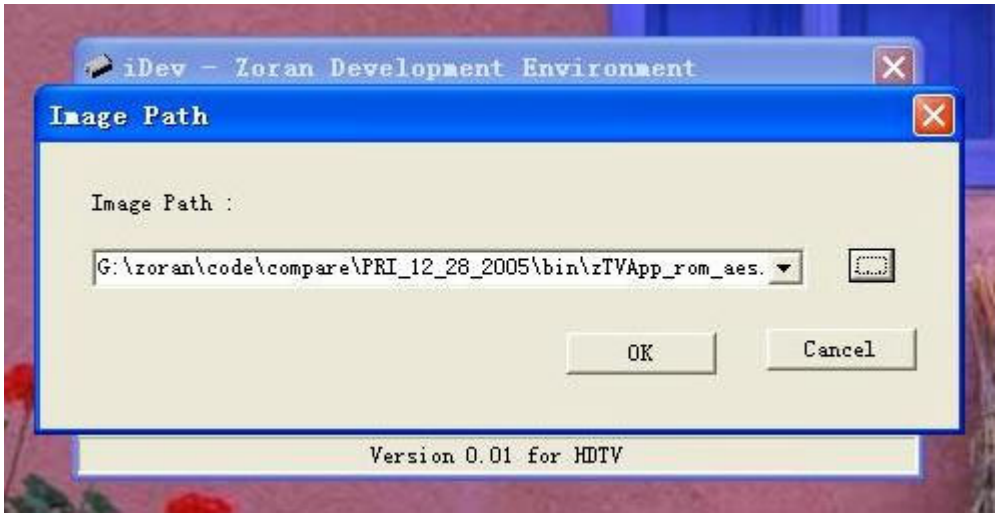
4. Select “setup” menu.

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

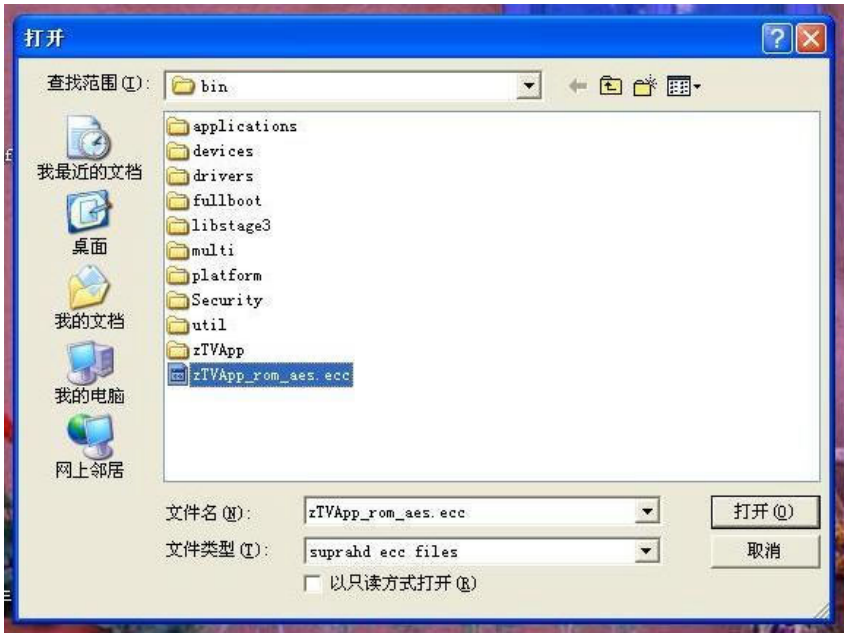
6. Select the “Image path” menu.



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.

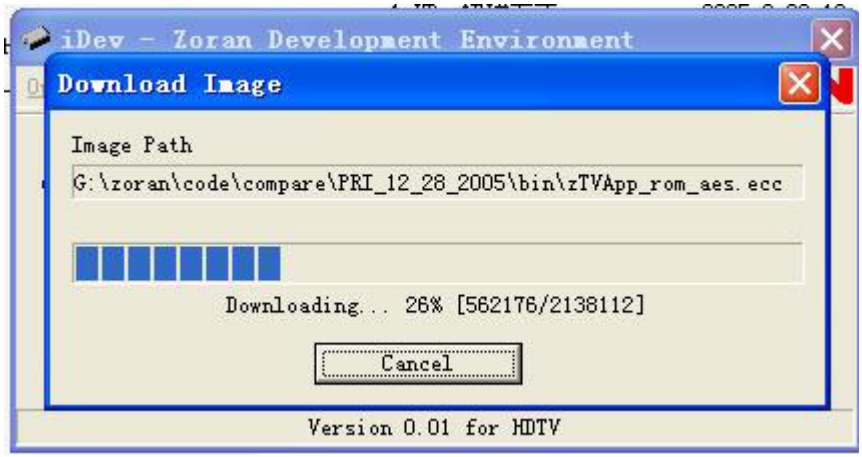


9. You also can click the setup button to select and config, but **please don't select the red one(update boot sector).**

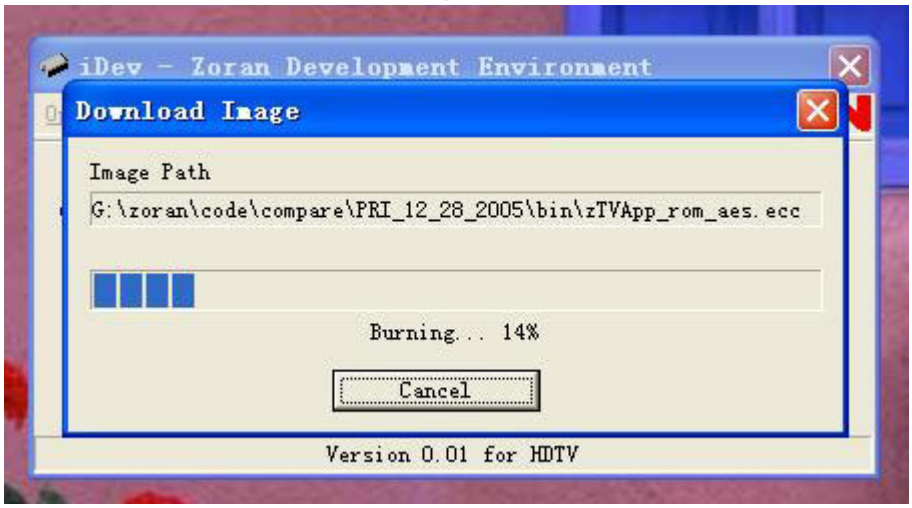
10. Then click the "down" button.

11. You can see the “waiting” window.

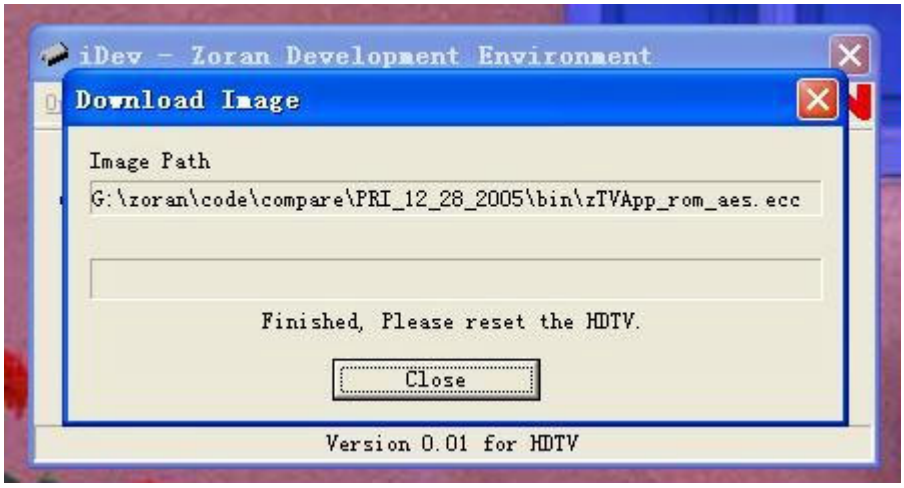
12. Then power (off then) on the TV set.



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 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 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.

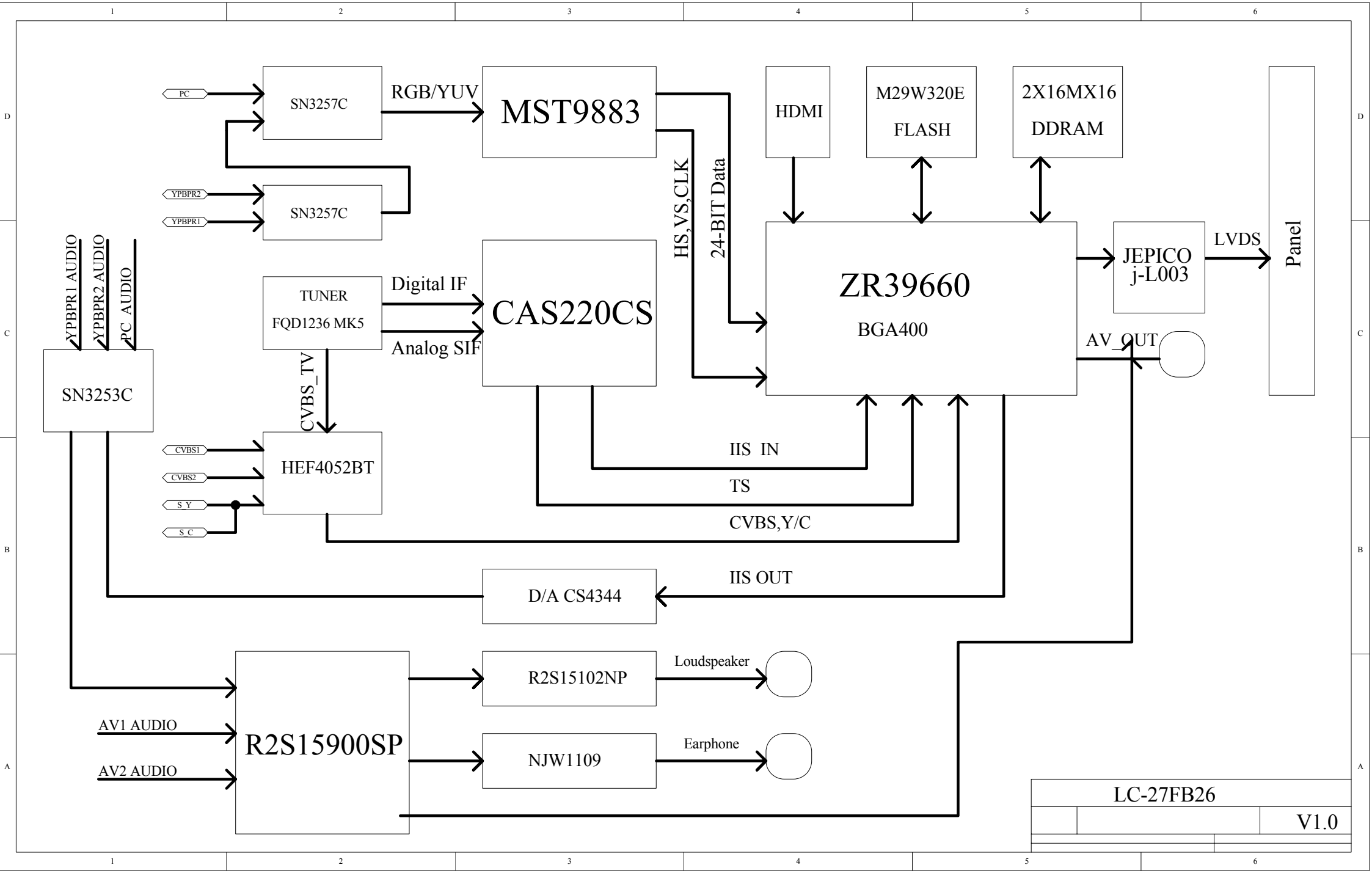
Sound signal (PC, YPrPb) via switch diverter HEF4052BT to output signal, it send to R2S15900SP (sound processing and volume control) switch of audio. Select right/left sound channel, their send to digital sound amplifier TPA3001 amplify, then send to speaker.

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.

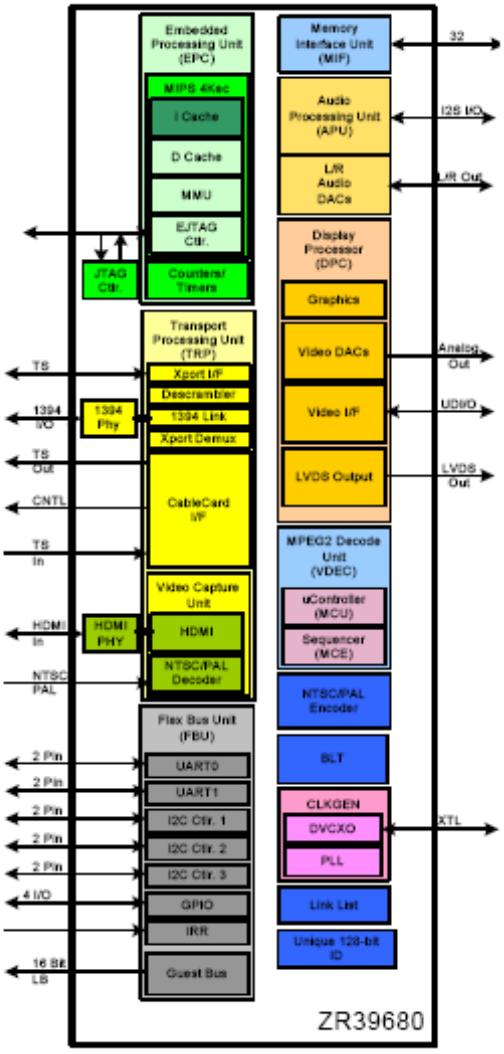
Block diagram



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 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



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

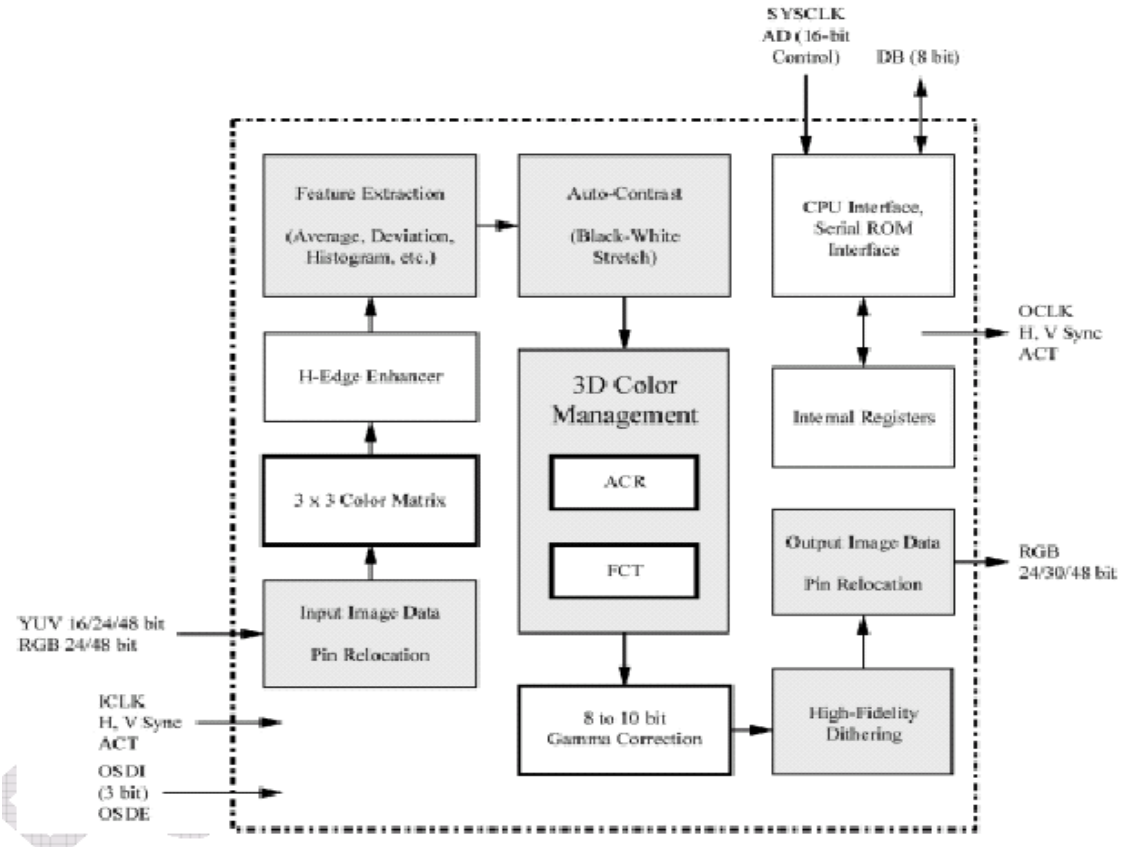
(7) UART and I2C Interface
N1: UART 0 Transmit
P1: UART 0 Receive
R1:I2C Compatible Clock 0
P2:I2C Compatible Data 0
M3:I2C Compatible Clock 1
M2:I2C Compatible Data 1

(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

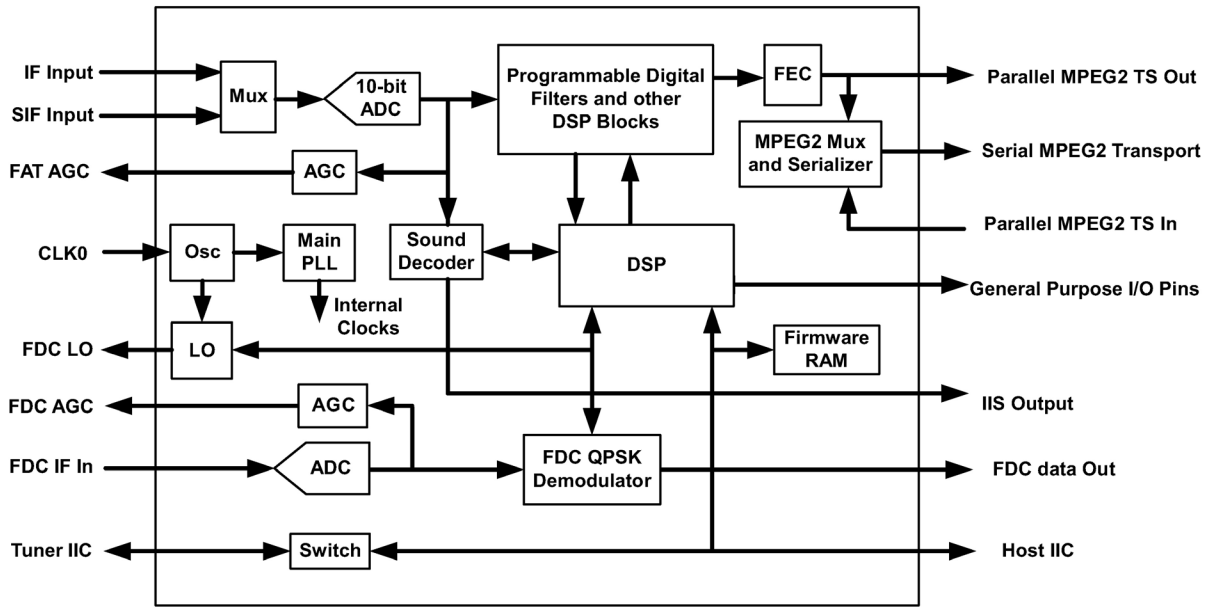
(3) I/O CONTROL

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

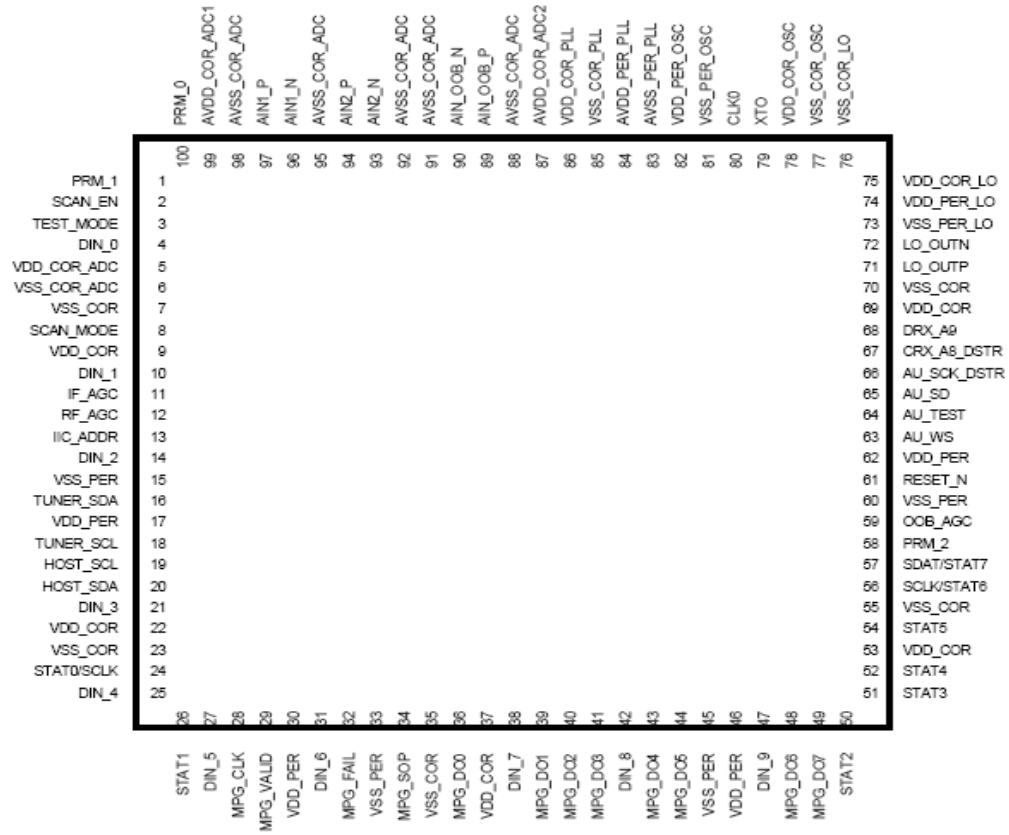
3. CAS220/CS

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:



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

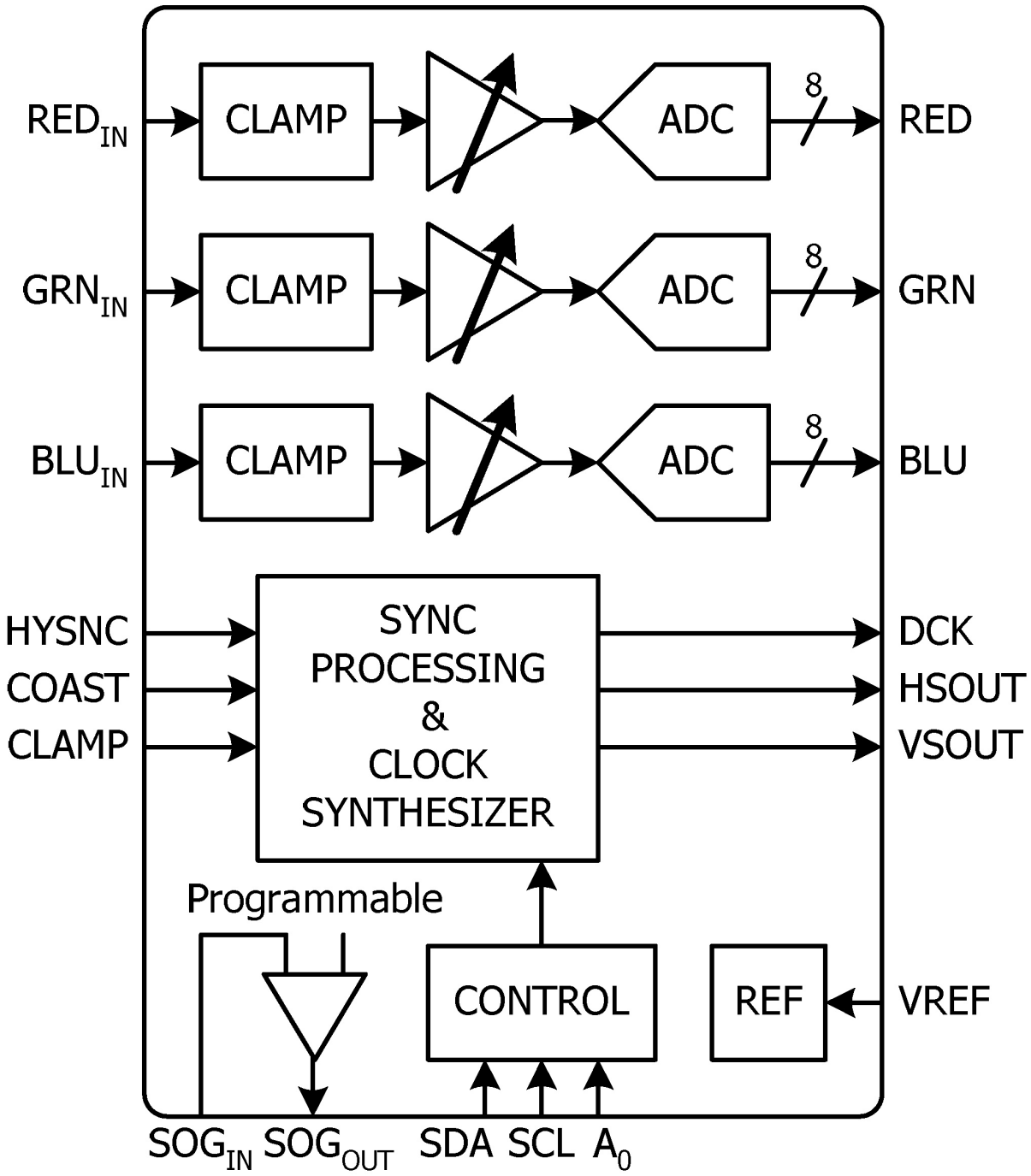
5,9,22,37,53,69,75,78,86,87,99: Power Supply 1.8V

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

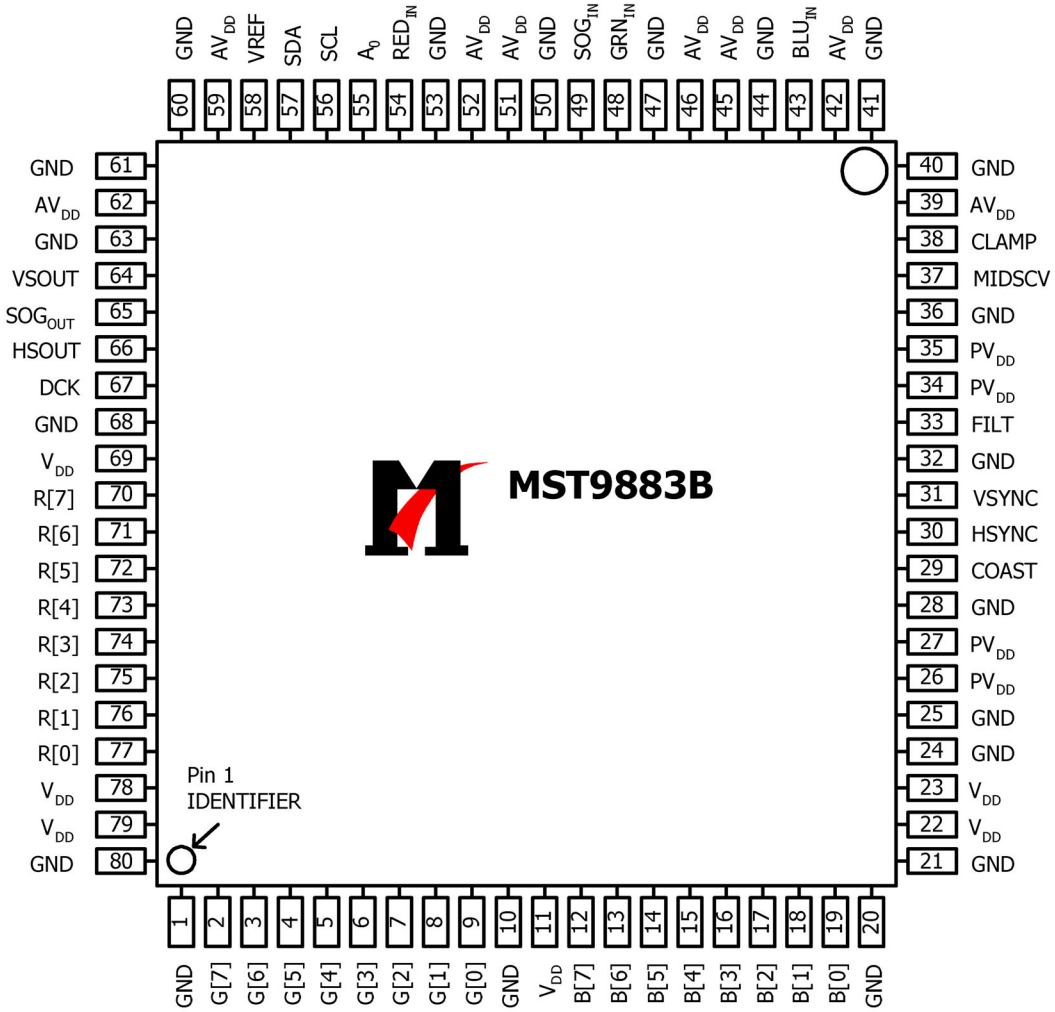
4. MST9883

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:



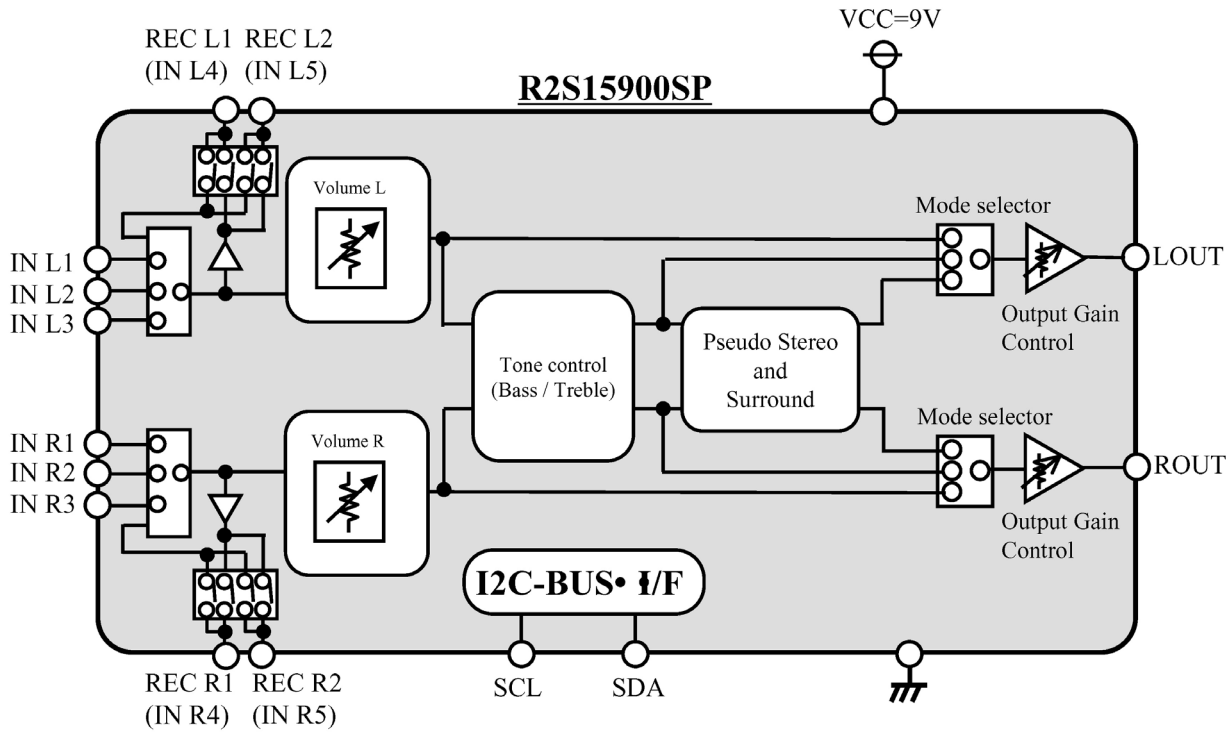
Pin descriptions of MST9883:

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

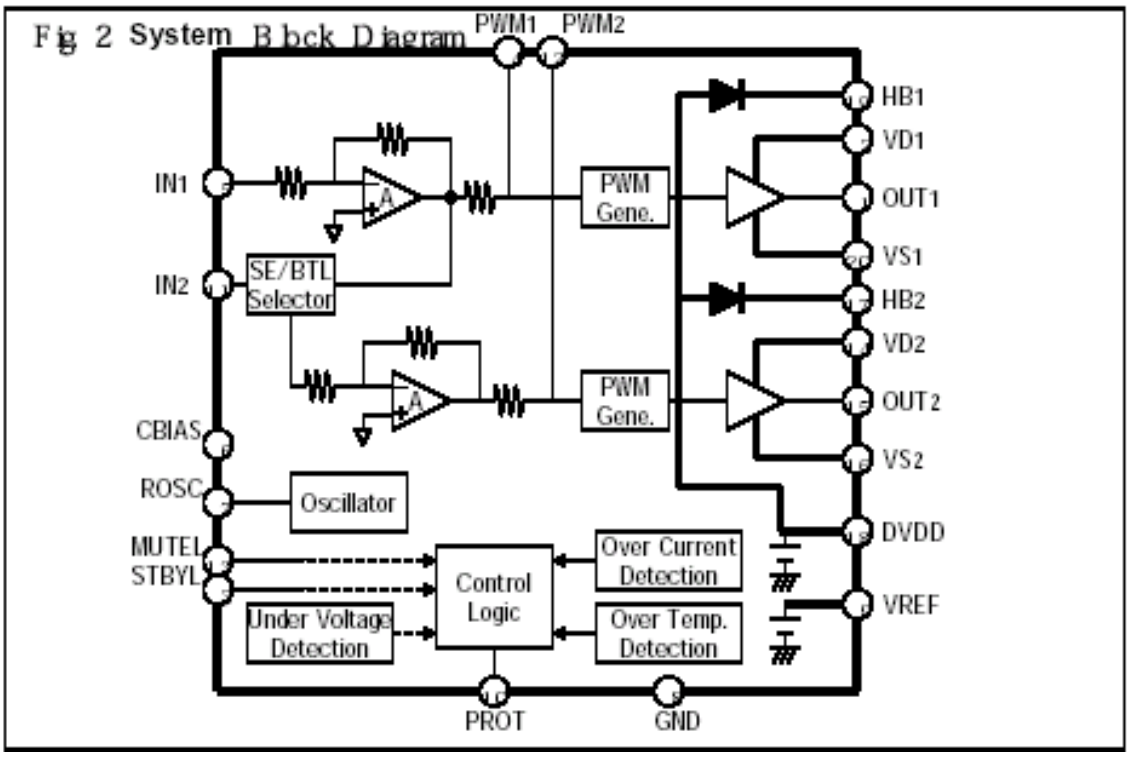
6. R2S15102NP 10Wx2ch(SE)/20Wx1ch(BTL) Digital Audio Power Amplifier

R2S15102NP is a Digital Power Amplifier IC developed for TV

R2S15102NP can realize maximum Power 10Wx2ch (VD=24V, THD=10%, SE) at 8Ω load.

It is possible to replace from the conventional analog amplifier system to the digital amplifier system easily.

.Block Diagram

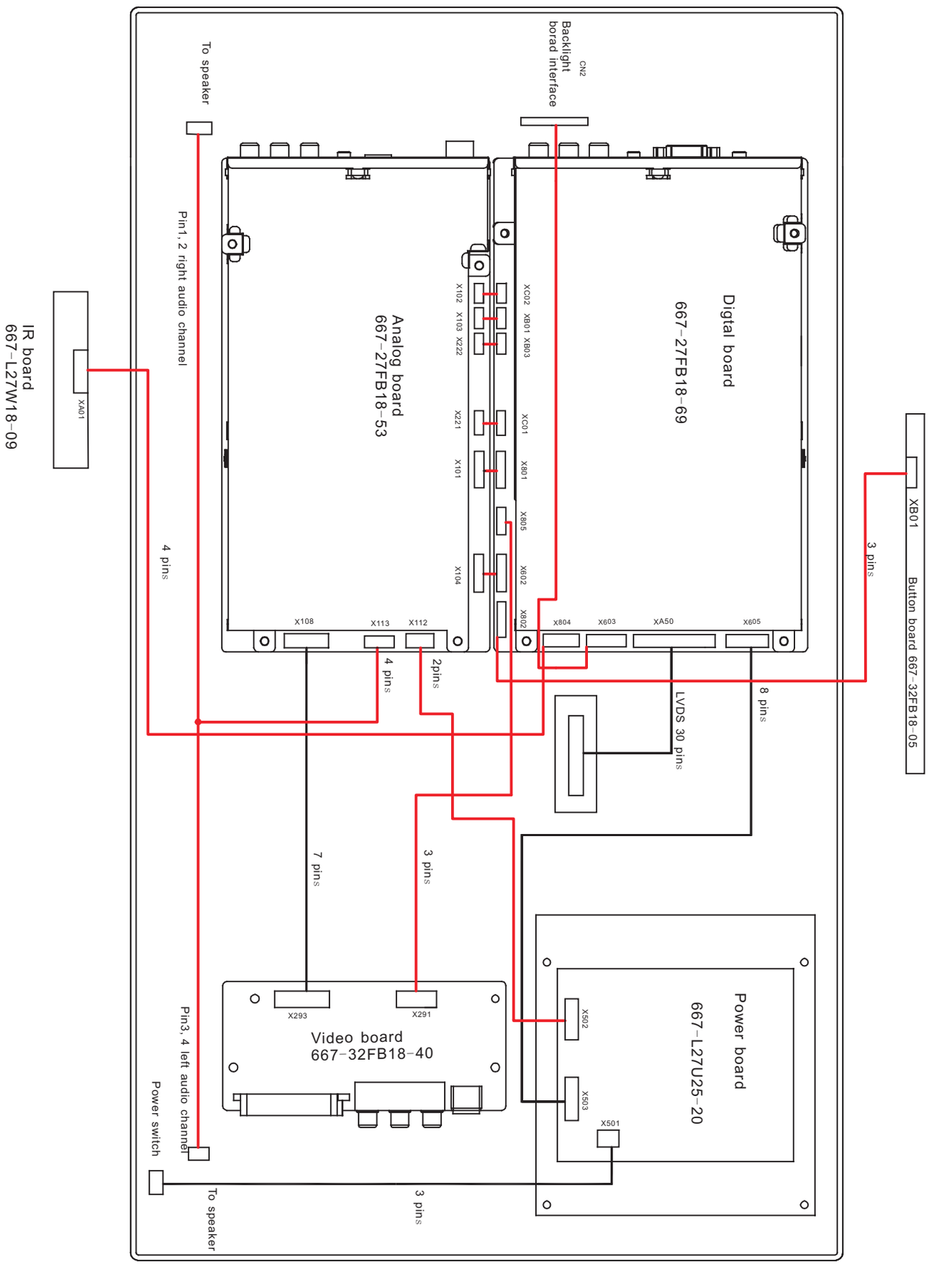


Pin Configuration

No.	NAME	I/O	Description
1	OUT1	O	Power Output pin #1
2	VD1	-	Power supply pin for power output stage #2
3	STBYL	I	Stand-by control pin. When this is “L”, circuit current is reduced. There is the pull-down resistor: 50K ohm(typ.).
4	PWM1	I	PWM input pin #1 (for phase compensation)
5	IN1	I	Analog input #1.The gain is depended on the external resistance.
6	CBIAS	I/O	A capacitor is connected so that it may not be influenced of power supply change (Ripple Filter).
7	ROSC	I	Control pin for PWM carrier frequency
8	GND	-	GND pin for analog block
9	VREF	I/O	Capacitor connection pin for analog block reference voltage source
10	PROT	O	Protection Timer pin. At protection mode, the output becomes ”L”-level. (The timing capacitor is connected)

11	IN2	I	SE operation	Analog input #2(as same as IN1)
		I	BTL operation	When this is connected to DVDD pin via the resister, Reversed signal of OUT1 is output to OUT2.
12	PWM2	I	PWM input pin #2 (for phase compensation)	
13	MUTEL	I	Mute control pin. When this is “L”, it becomes mute status.	
14	VD2	-	Power supply pin for power output stage #2	
15	OUT2	O	Power Output pin #2	
16	VS2	-	Ground pin for power output stage #2	
17	HB2	I/O	Capacitor connection pin for bootstrap	
18	DVDD	O	Built-in power supply pin for internal digital block.	
19	HB1	I/O	Capacitor connection pin for bootstrap #1	
20	VS1	-	Ground pin for power output stage #!	

Wiring diagram:



203-L27FB18-01JL

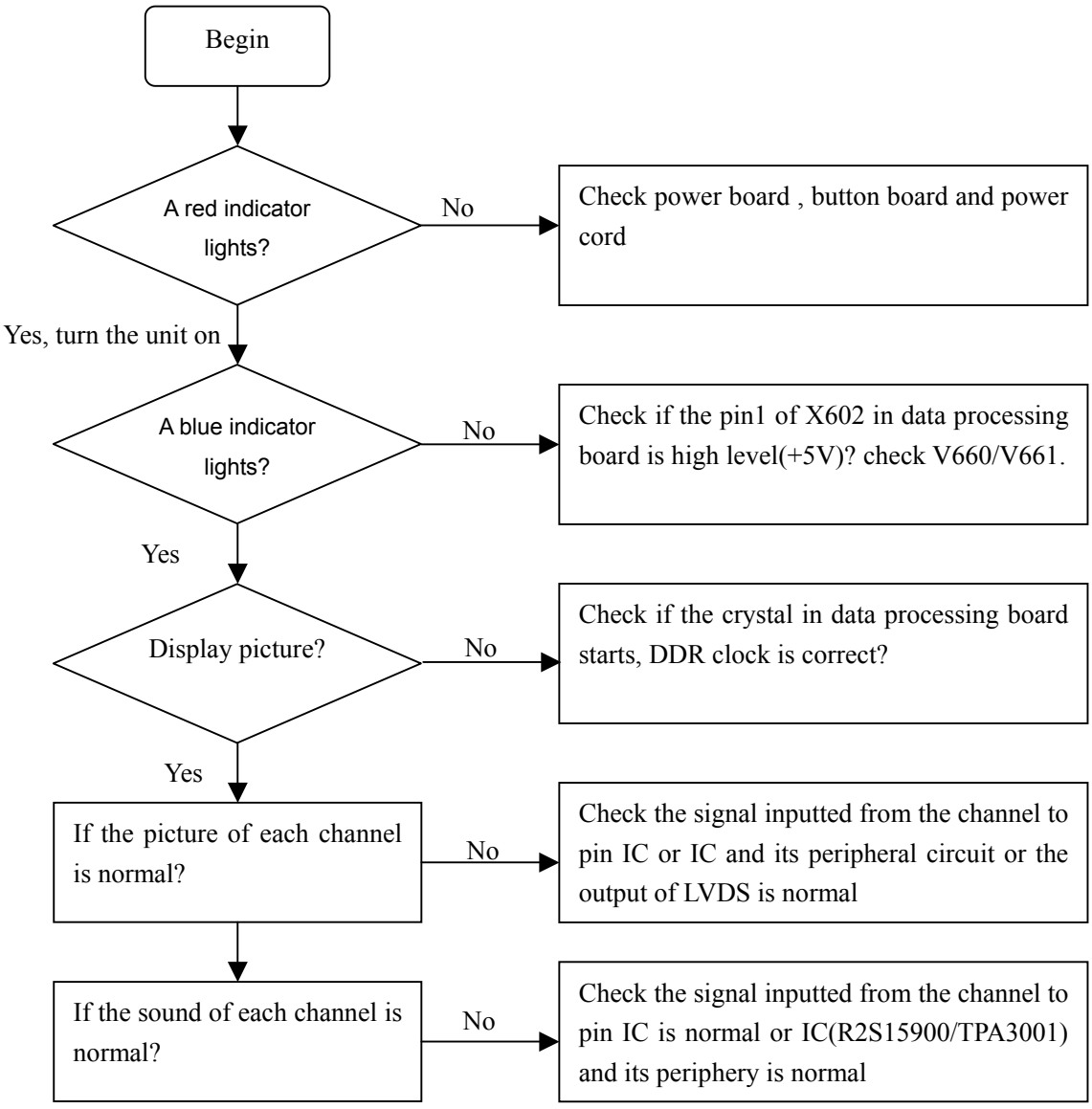
Identification criteria for the bright spot and dark spot of the LCD screen

<table>
<tr><th rowspan="2">Category</th><th rowspan="2">Criteria</th><th colspan="5">Quantity allowed</th><th colspan="5">Distance between two spots</th></tr>
<tr><th>15"</th><th>20"</th><th>22"</th><th>30"</th><th>40"</th><th>15"</th><th>20"</th><th>22"</th><th>30"</th><th>40"</th></tr>
<tr><td rowspan="3">Bright spot</td><td>One single spot</td><td>≤5</td><td>≤2</td><td>≤5</td><td>≤2</td><td>≤3</td><td rowspan="6">≥15mm</td><td colspan="4" rowspan="3">≥15mm</td></tr>
<tr><td>Two neighboring spots</td><td>≤2</td><td>≤1</td><td>≤2</td><td>≤1</td><td>≤1</td></tr>
<tr><td>Total No.</td><td>≤5</td><td>≤2</td><td>≤5</td><td>≤2</td><td>≤3</td></tr>
<tr><td rowspan="3">Dark spots</td><td>One single spot</td><td>≤6</td><td>≤7</td><td>≤5</td><td>≤4</td><td>≤10</td><td rowspan="3">≥10mm</td><td colspan="4" rowspan="3">≥5mm</td></tr>
<tr><td>Two neighboring spots</td><td>≤2</td><td>≤2</td><td>≤2</td><td>≤1</td><td>≤5</td></tr>
<tr><td>Total No.</td><td>≤6</td><td>≤7</td><td>≤5</td><td>≤4</td><td>≤10</td></tr>
<tr><td colspan="2">Total defected point</td><td>≤8</td><td>≤7</td><td>≤5</td><td>≤4</td><td>/</td><td colspan="5"></td></tr>
</table>

Notes:

1. Definition of defected point (bright spot, dark spot): It is identified as a defected point if its area exceeds 1/2 of a single picture element (R, G, B).
2. Definition of bright spot: It is identified as a bright spot if it is bright in the state of dark field and its bright size remains unchanged
3. Definition of dark spot: It is identified as a dark spot if it is dark in the state of white field and its dark size remains unchanged
4. Definition of two neighboring points: Defects of a group of picture elements (RB, RG, GB).

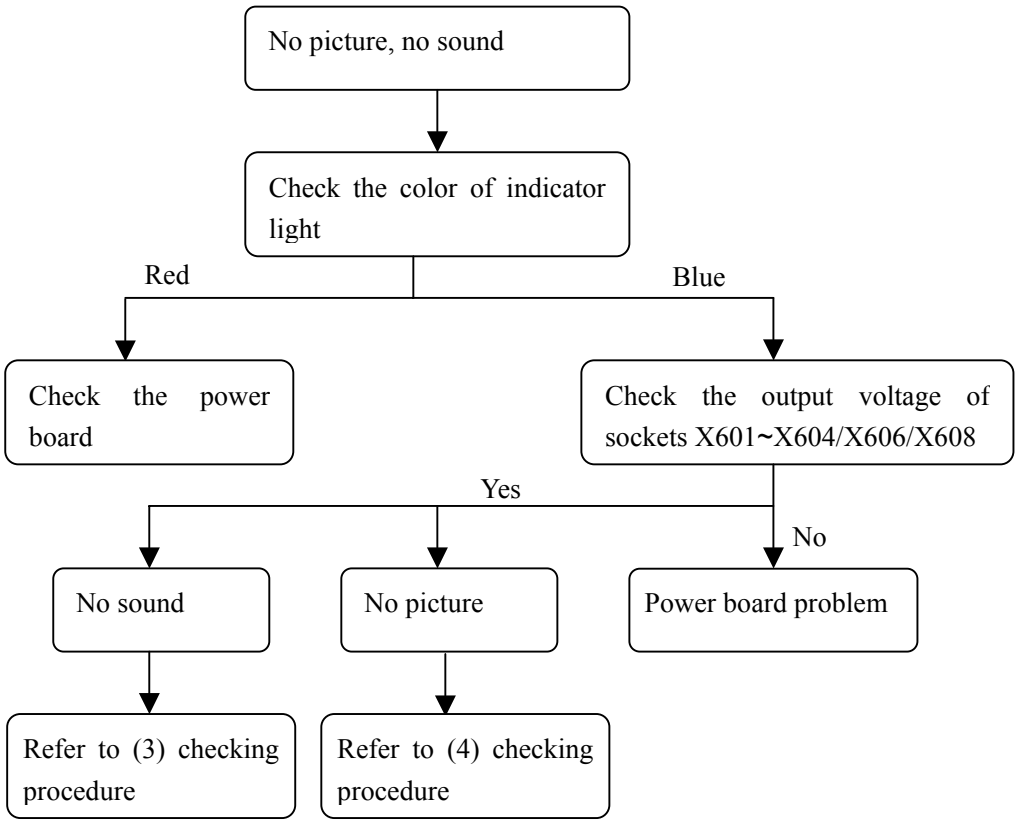
Troubleshooting guide



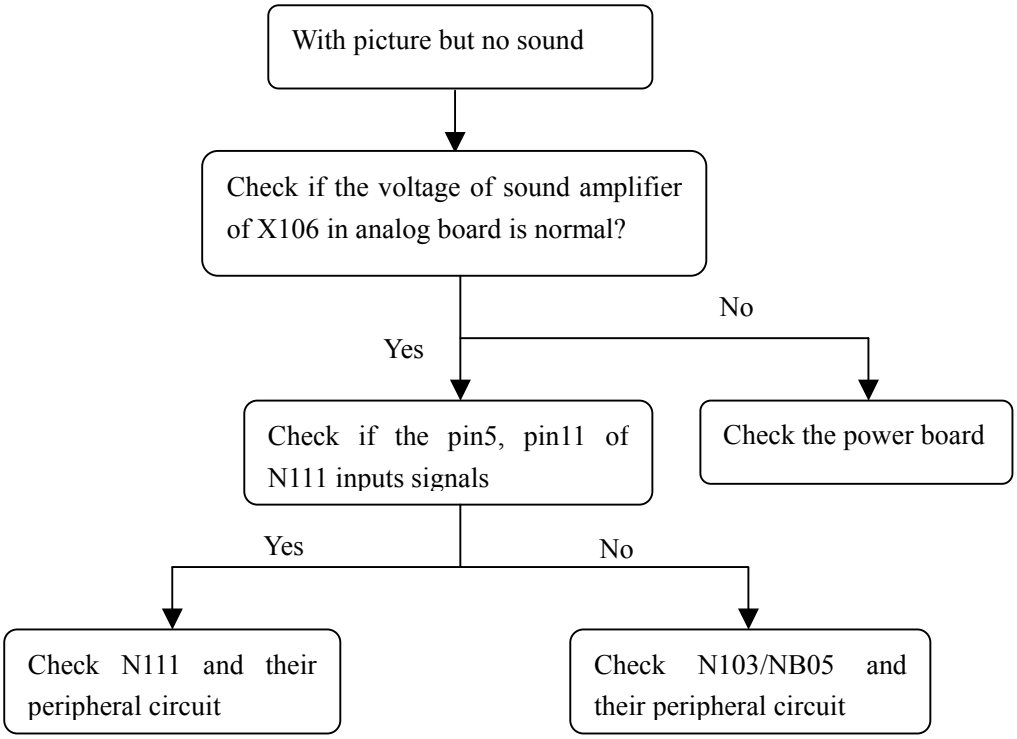
(1) abnormal picture

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.

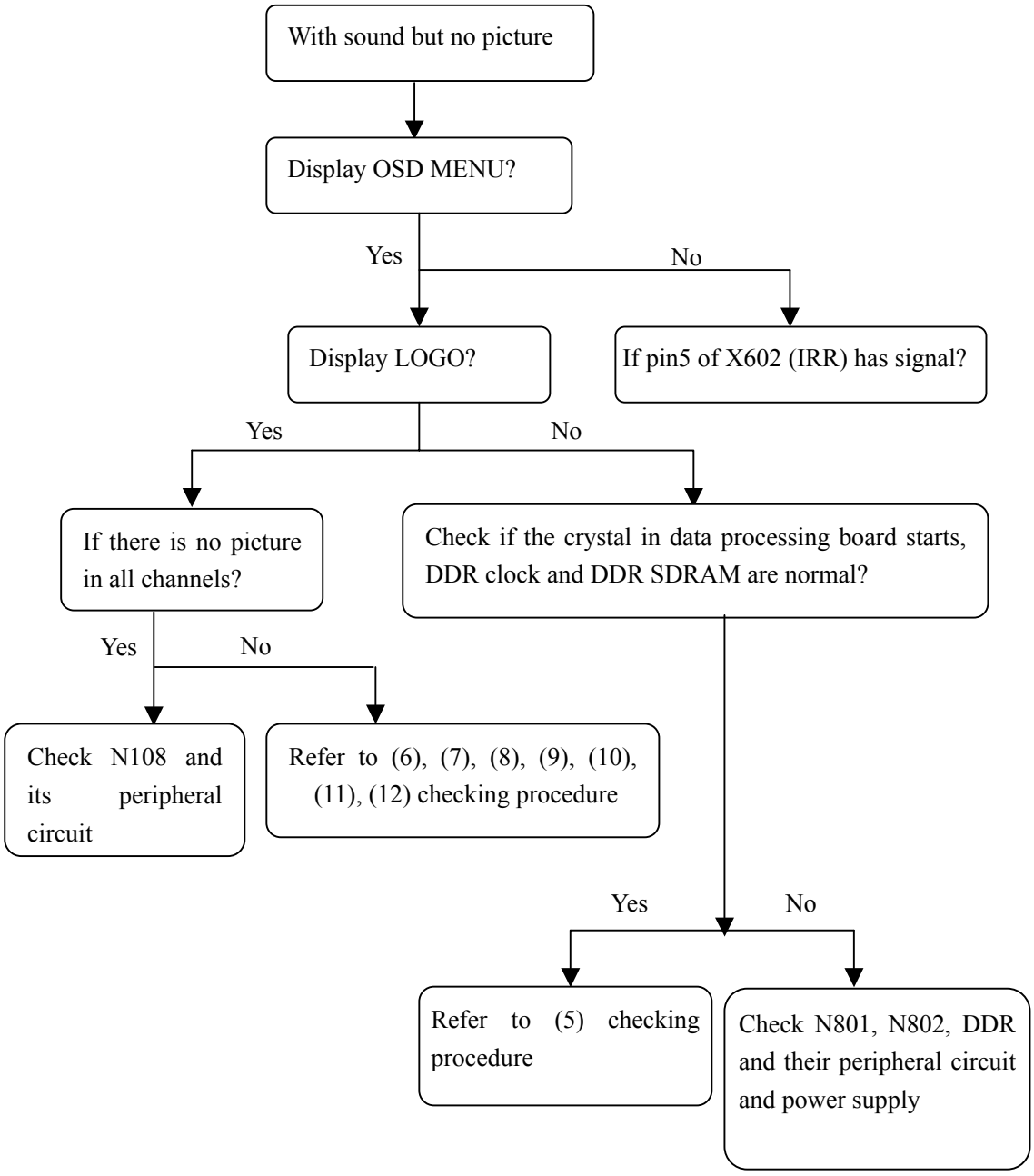
(2) no picture, no sound



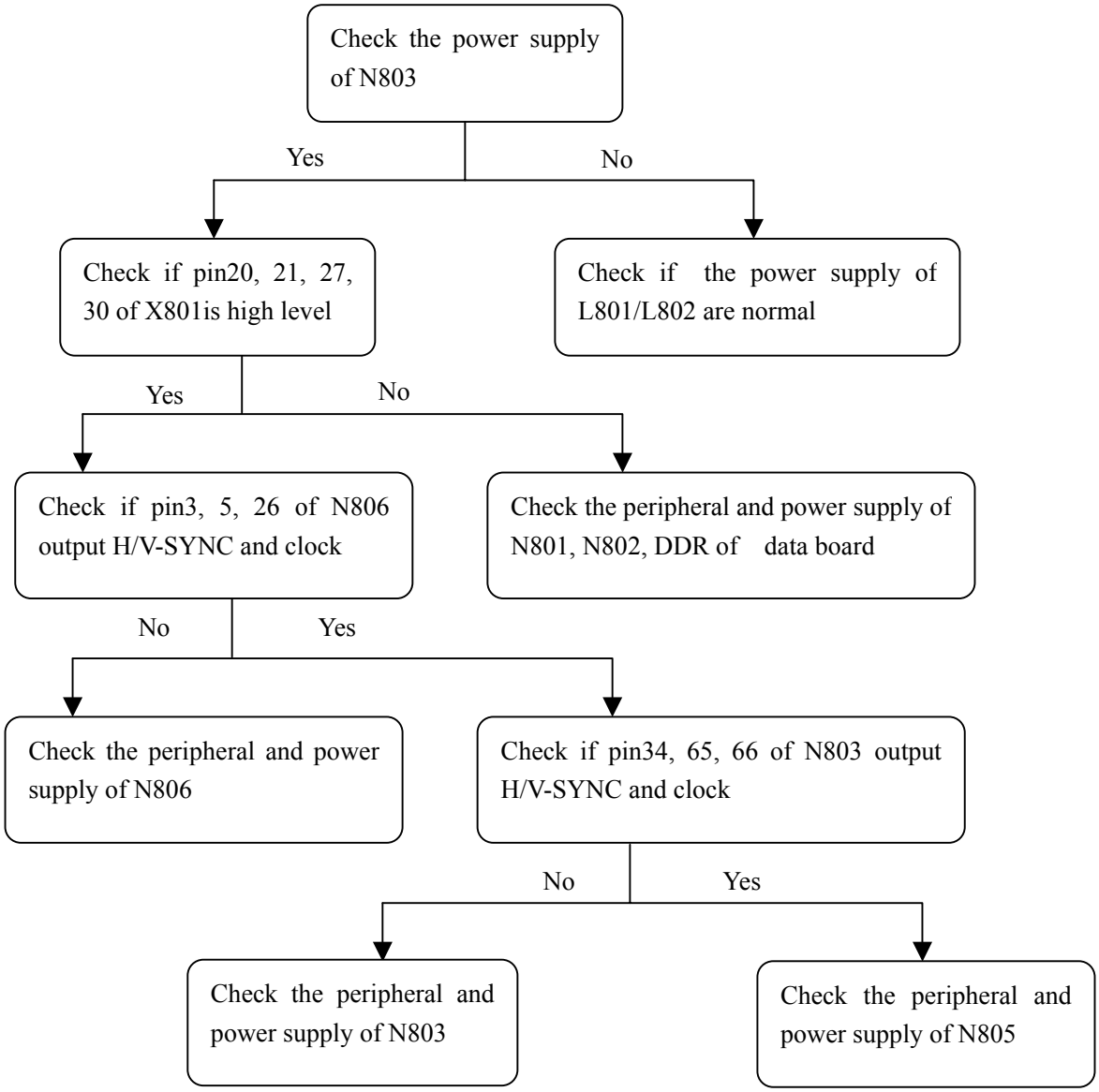
(3) with picture but no sound



(4) with sound but no picture

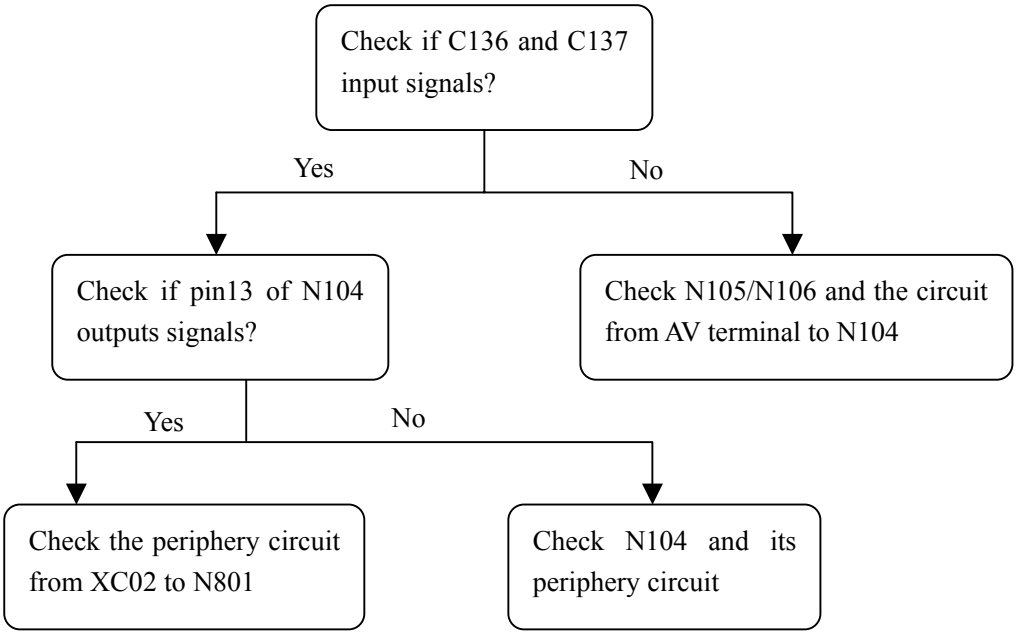


(5) Check image processing board

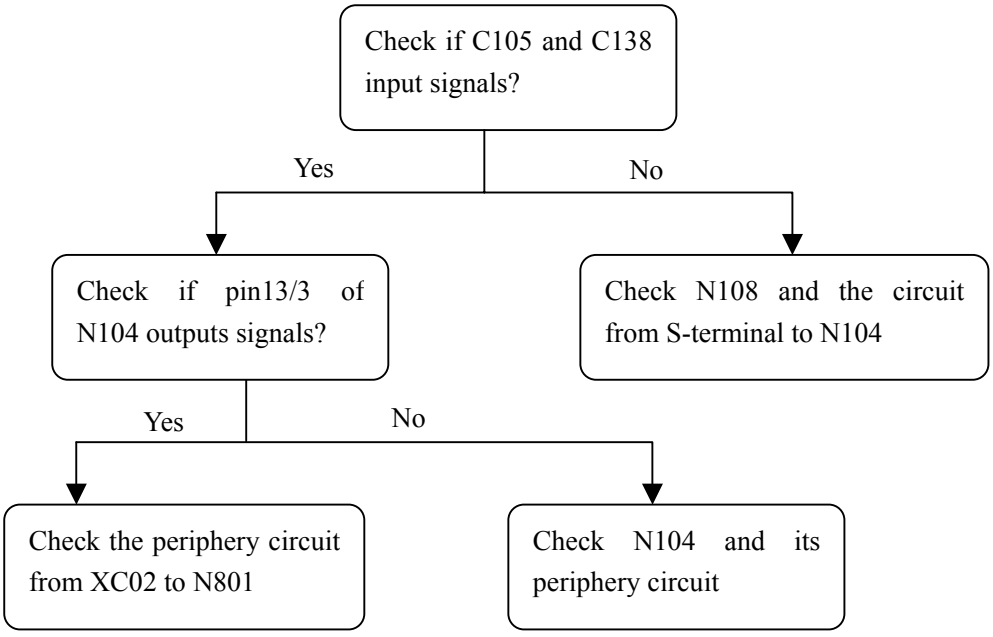


Note: please make sure that the data of FLASH N804 is correct before checking the image processing board.

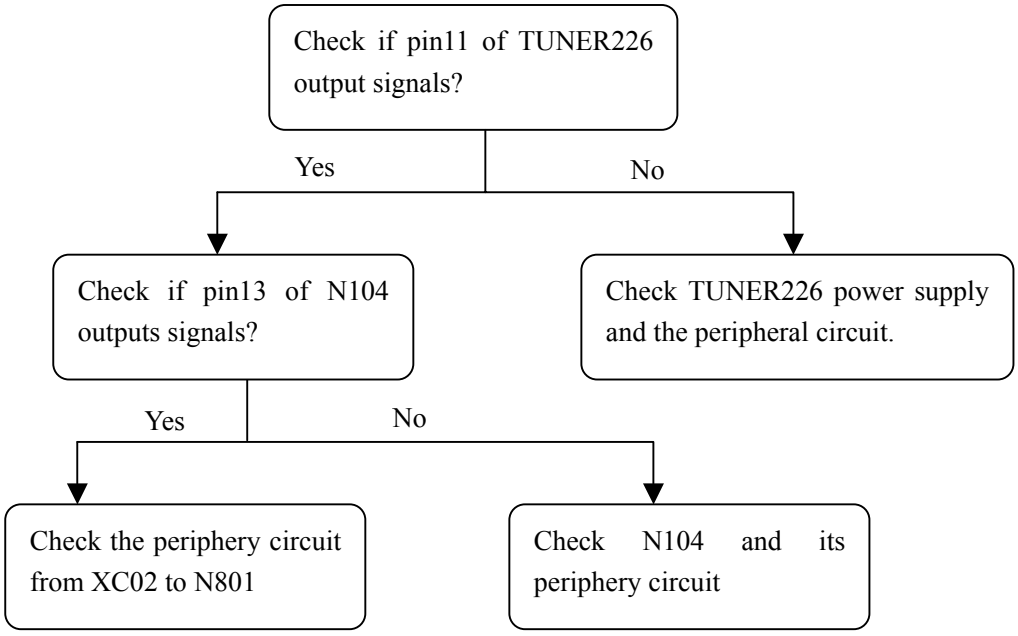
(6) AV no picture



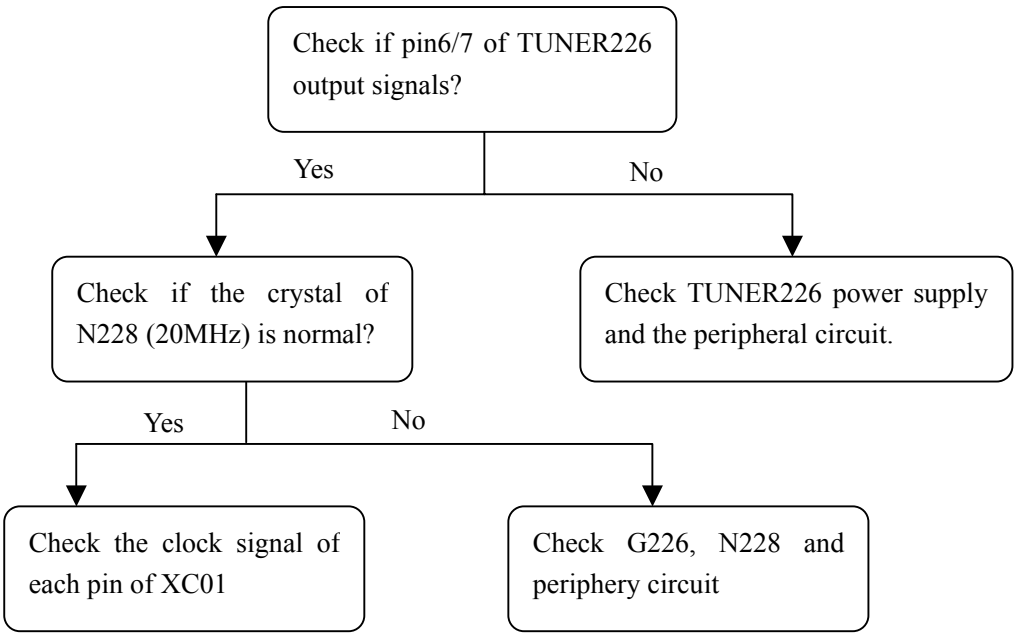
(7) S-terminal no picture



(8) NTSC channel no picture



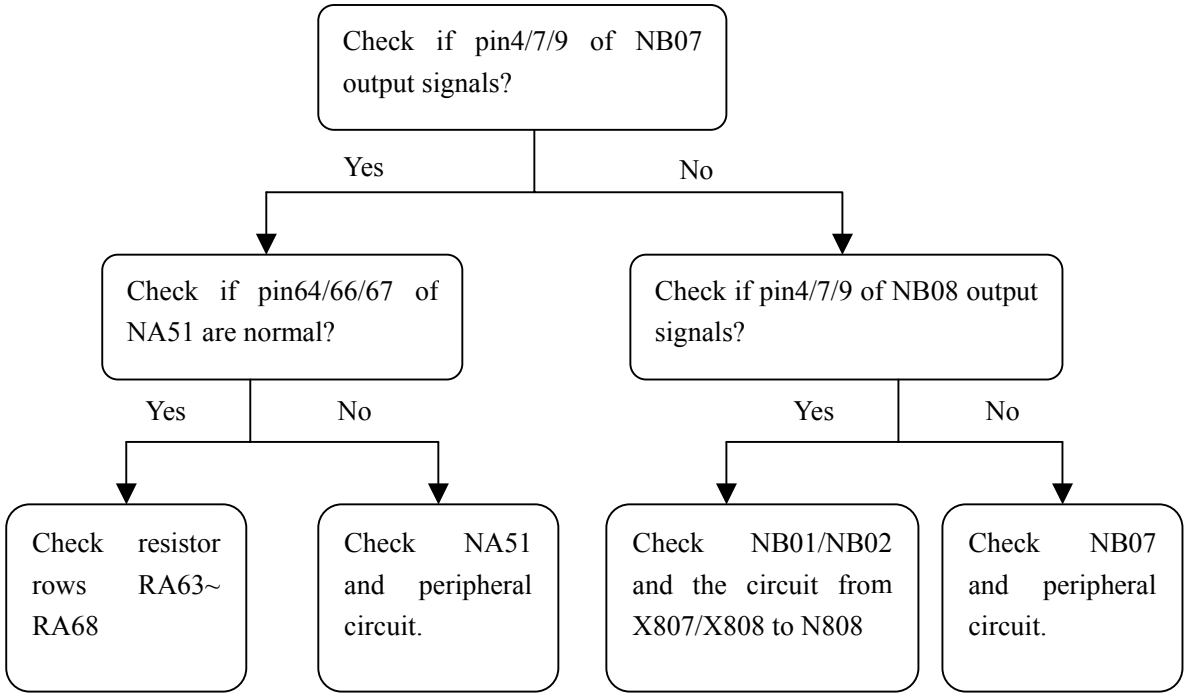
(9) ATSC channel no picture



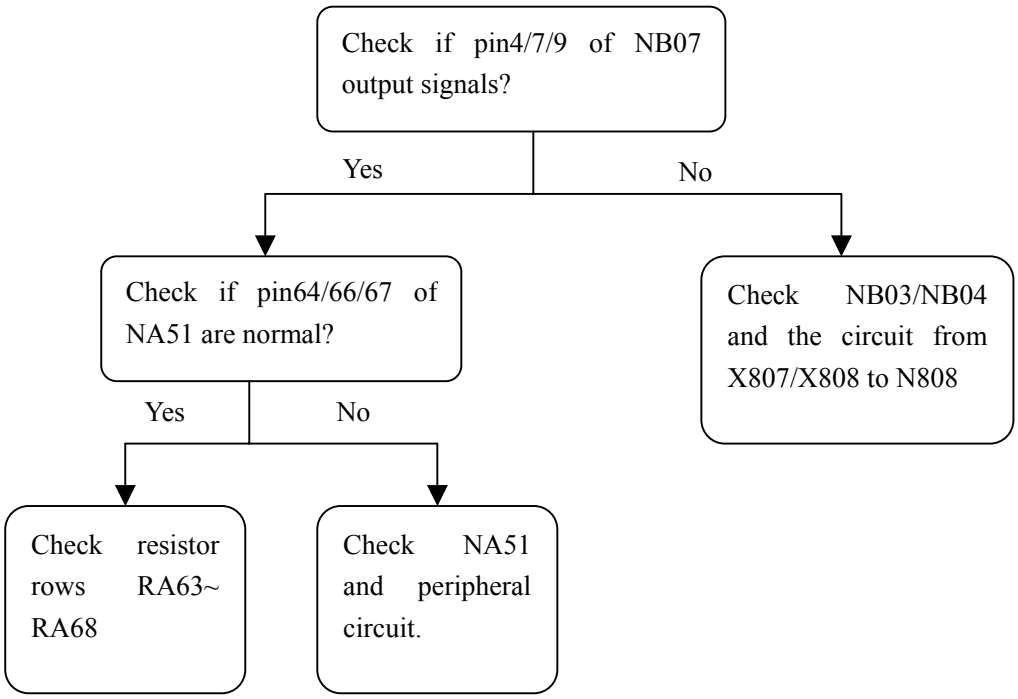
Note :

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.

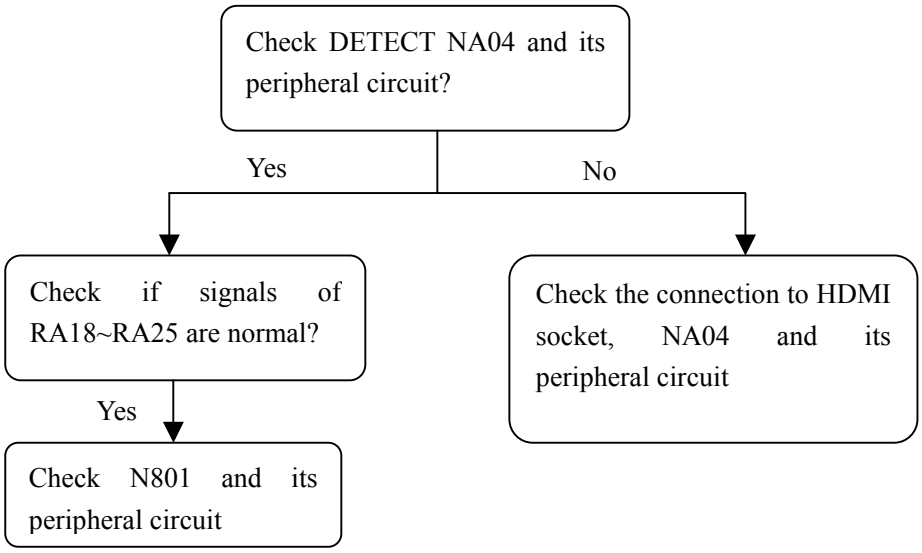
(10) YprPb or Ycrcb channel no picture



(11) D-sub channel no picture



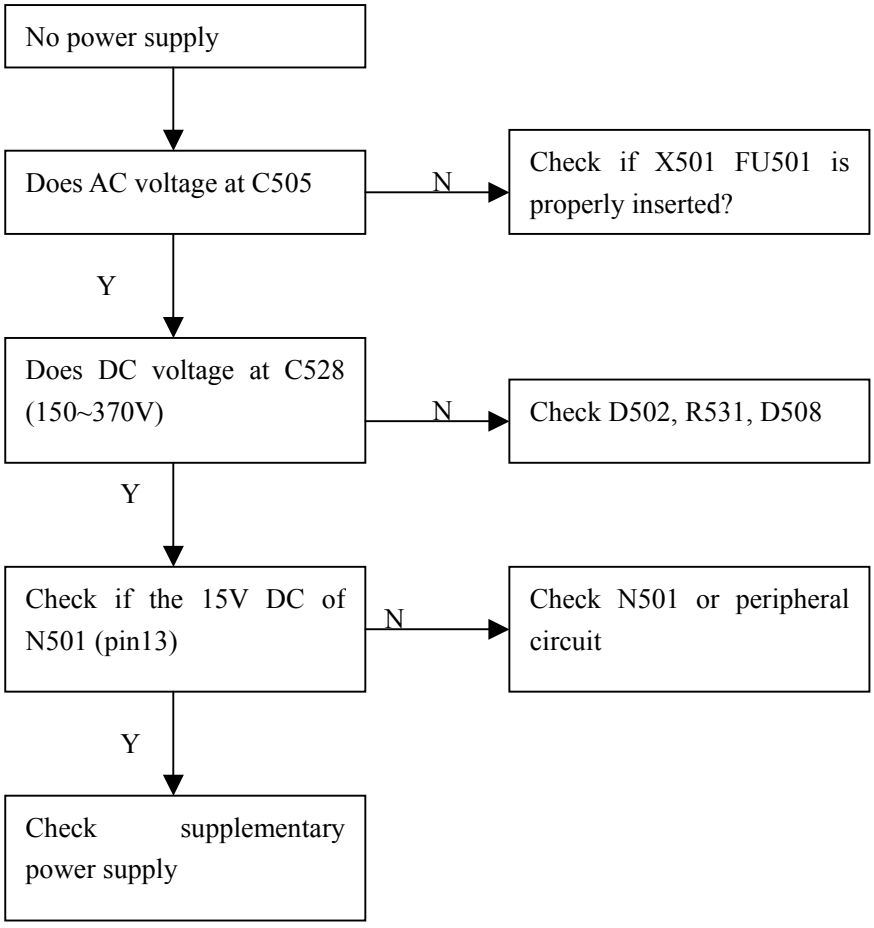
(12) HDMI channel no picture



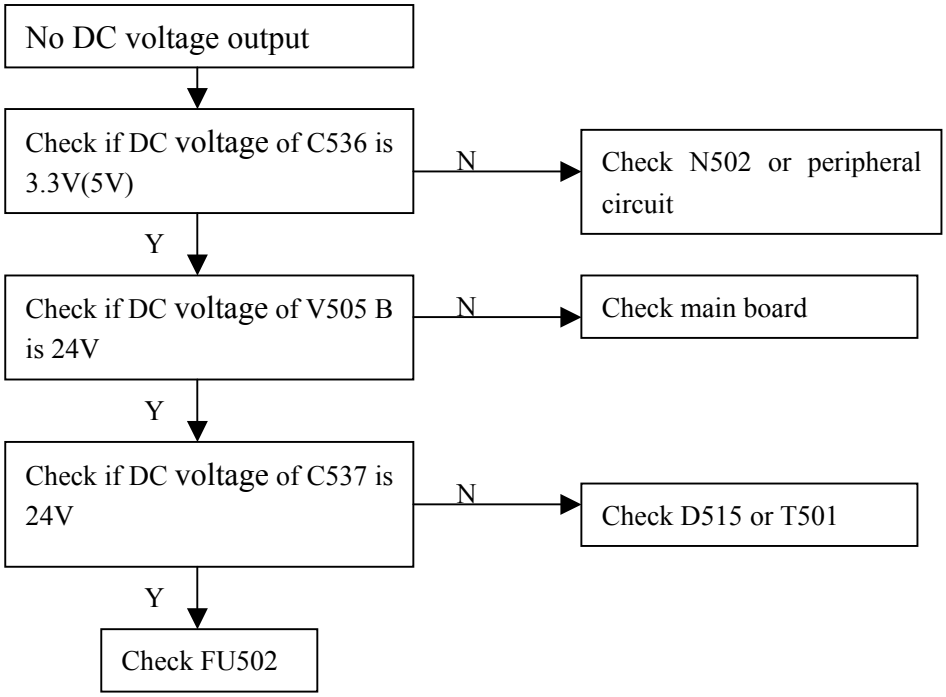
Note: N801 embeds FLASH, which stores DDC and HDCP information of HDMI, so make sure the connection between HDMI socket/interface and the bus line is well- going, the picture will display.

(13) Troubleshooting guide of power supply board (23" and 27")

a. No power supply



b. No DC voltage output



OPTION

N801
ZR39660
Guest Bus

GDATA15 T15
GDATA14 P15
GDATA13 W15 GDAT[13]
GDATA12 Y15 GDAT[12]
GDATA11 V15 GDAT[11]
GDATA10 U15 GDAT[10]
GDATA9 R15 GDAT[9]
GDATA8 Y16 GDAT[8]
GDATA7 Y17 GDAT[7]
GDATA6 T16 GDAT[6]
GDATA5 V16 GDAT[5]
GDATA4 W16 GDAT[4]
GDATA3 U16 GDAT[3]
GDATA2 R16 GDAT[2]
GDATA1 W17 GDAT[1]
GDATA0 V17 GDAT[0]

GADR15 V10 GADR[15]
GADR14 V8 GADR[14]
GADR13 Y8 GADR[13]
GADR12 Y11 GADR[12]
GADR11 W6 GADR[11]
GADR10 W5 GADR[10]
GADR9 Y7 GADR[9]
GADR8 V7 GADR[8]
GADR7 V11 GADR[7]
GADR6 Y12 GADR[6]
GADR5 W12 GADR[5]
GADR4 U12 GADR[4]
GADR3 W13 GADR[3]
GADR2 V13 GADR[2]
GADR1 U13 GADR[1]
GADR0 W14 GADR[0]

GALE T14
GIORD_N V6
GIOWR_N W7
GDIR U17
GOE_N Y6
GWE_N Y9
GWS_ACK Y13
GCS_N0 W19
GCS_N1 Y19
GCS_N2 U18
GCS_N3 V18
GCS_N4 W18
GCS_N5 Y18

GIRQ3 V19
GIRQ2 Y20
GIRQ1 W20
GIRQ0 V9

A

N802
W19B320ABT7H

GADR[0]
GADR[1] 25
GADR[2] 24
GADR[3] 23
GADR[4] 22
GADR[5] 21
GADR[6] 20
GADR[7] 19
GADR[8] 18
GADR[9] 8
GADR[10] 7
GADR[11] 6
GADR[12] 5
GADR[13] 4
GADR[14] 3
GADR[15] 2

GDAT[8] 1
GDAT[9] 48
GDAT[10] 17
GDAT[11] 16
GDAT[12] 9
GDAT[13] 10

A0 A1 A2 A3 A4 A5 A6 A7 A8 A9 A10 A11 A12 A13 A14 A15 A16 A17 A18 A19 A20

DQ0 29 GDAT[0]
DQ1 31 GDAT[1]
DQ2 33 GDAT[2]
DQ3 35 GDAT[3]
DQ4 38 GDAT[4]
DQ5 40 GDAT[5]
DQ6 42 GDAT[6]
DQ7 44 GDAT[7]
DQ8 30
DQ9 32
DQ10 34
DQ11 36
DQ12 39
DQ13 41
DQ14 43
DQ15 45

NC1 13
BYTEN 47
VDD 37
VSS 27
VSS 46
RESETN 12
CEN 26
OEN 28
WEM 11
VPP/WPN 14
RBN 15

VCC3_3
8 RST_P
KEY 8
MENU
YPBPR1_YPBPR2_SEL 5
HT_P 3
RGB_YPBPR_SEL 5
PWRDOWN 6
ADID1 6
ADID0 6
SMMRST 6
RST_J 6

R804 4.7K
R805 4.7K
R810 4.7K
R814 4.7K
R815 4.7K
R843 4.7K
R811 4.7K
R812 4.7K
R813 4.7K
R816 4.7K
C813 10p
R817 0
R818 0
R819 0
R820 0
R821 0
R822 0
R823 0
C801 100n
C802 100n
C803 100n
C804 100n
R825 4.7K

R801 0
R803 0
R802 0

X801
TJC10-11A

R806 0
R807 0
I2C0CLK 6
I2C0DATA 6
RESETN 4
MUTE 4
CVBS_SEL1
CVBS_SEL0
SRS_MONO
SRS_STEREO
I2C1CLK
I2C1DATA

R808 0
R809 0

NB04
AT24LC32A/SN
A0 A1 A2 GND Vcc WP SCL SDA
R824 10K
R836 10K
R840 22K
I2C0CLK 6
I2C0DATA 6

TPB01 CON-01-2.54
TPB02 CON-01-2.54
TPB04 CON-01-2.54
TPB03 CON-01-2.54

X802

N801
ZR39660
Super I/O

IRR L4
UART0TX N1
UART0RX P1
UART1TX L3
UART1RX M1
TPBIAS0 H2
TPA0_N G2
TPA0 F1
TPB0_N G1
TPB0 H3
TPBIAS1 J4
TPA1_N J1
TPA1 H1
TPB1_N J3
TPB1 J2
1394_RSET G3
I2C0CLK R1
I2C0DAT P2
I2C1CLK M3
I2C1DAT M2
TRSTN K5
TDI K2
TDO K4
TMS K3
TCK L1
TAPSEL K1
GPIO0 W4
GPIO1 V5
GPIO2 U6
GPIO3 Y4
RESETN N5
CLKIN M4
CLKOUT N3

E

VCC3_3
R827 4.7K
DB01 LL4148
+5VSB
IRR 8
C814 10p
X804
LED
C809 1u
VCC5_0
R826 3.9K
R828 4.7K
R829 4.7K
R830 4.7K
R831 4.7K
R832 4.7K
R834 1K
R838 1K
R841 1K

N803
MAX3232CSE
C1+ V+ C1- C2+ C2- V- T2OUT R2IN Vcc GND T1OUT R1IN R1OUT T1IN T2IN R2OUT
C807 1u
C808 1u
C810 1u
R852 100
R851 100

R837 33
R833 1K
TRSTN
TDI
TDO
TMS
TCK
TAPSEL

C811 30p
C812 30p
X805

R835 4.7K
R839 4.7K
R842 4.7K
R844 4.7K
R848 1K
R849 1K
R847 1K
R850 0

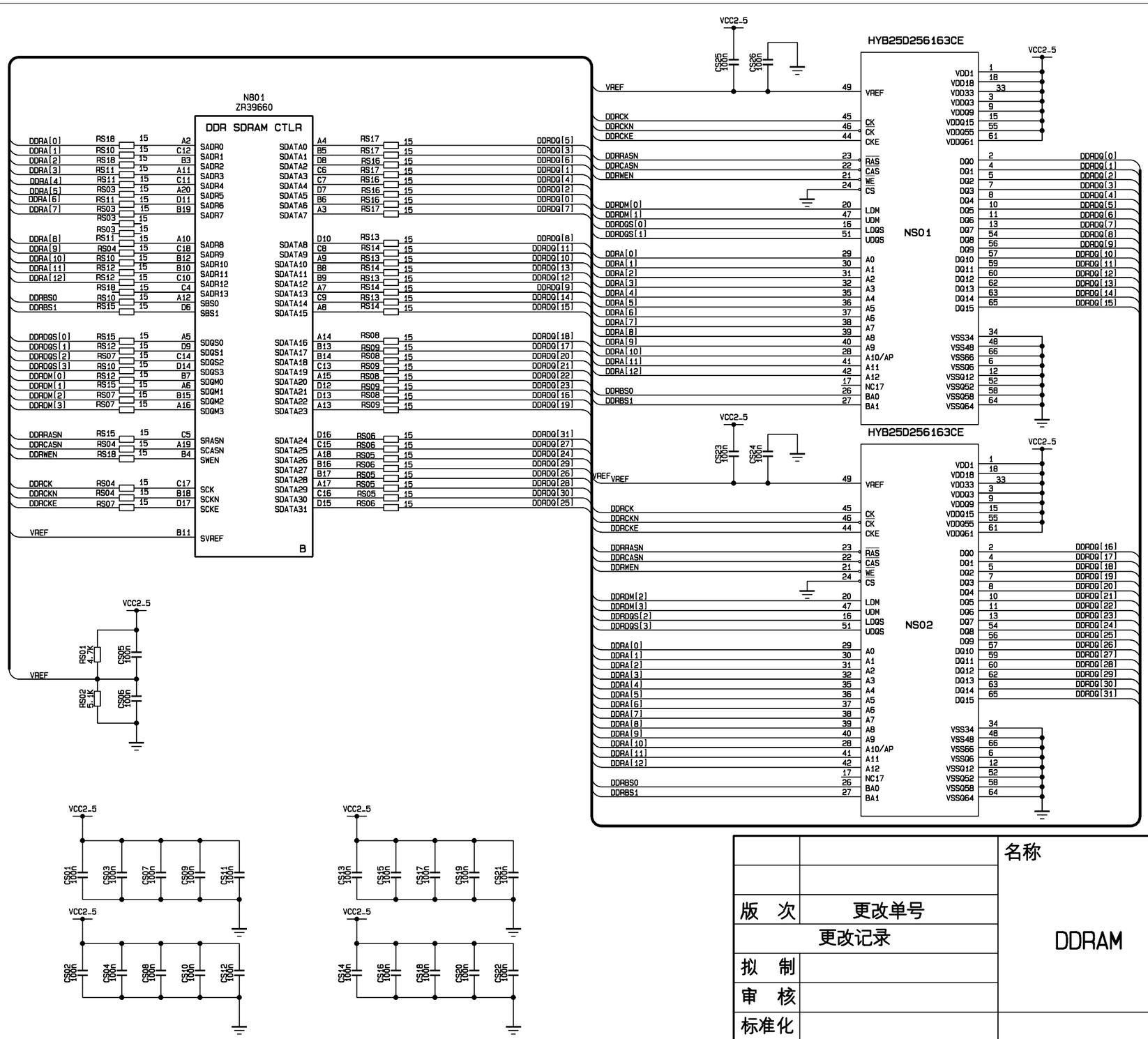
I2C0CLK 6
I2C0DATA 6
I2C1CLK
I2C1DATA

LHZ-30S-B-060/014
X803

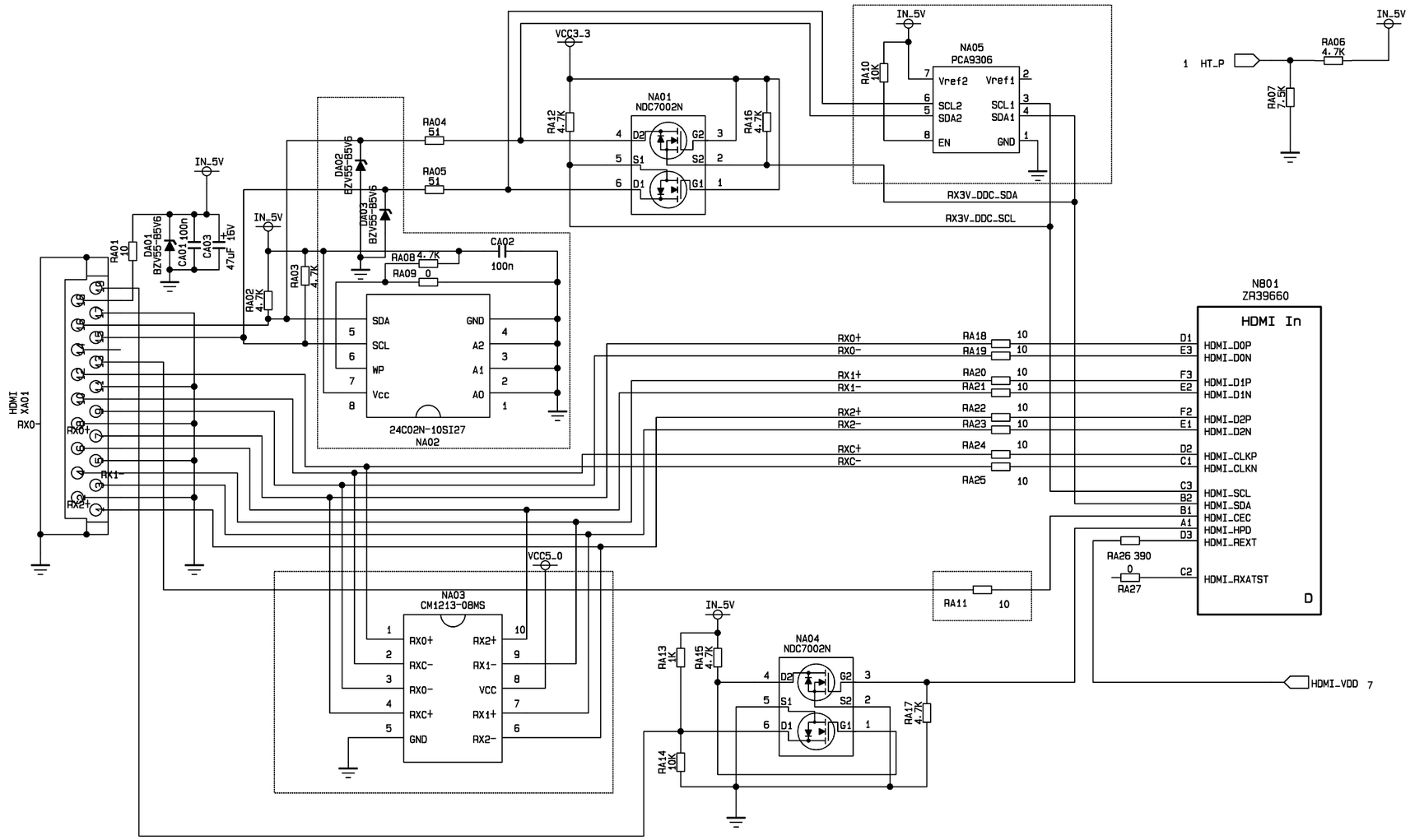
G801 24.576MHz
C805 30p
C806 30p

RST_P 8

		名称	编号
			602.L27FB26-01
版 次	更改单号	CPU/FLASH	版次 A1.0
更改记录			第 1 页 共 11 页
拟 制			
审 核			
标准化			厦门华侨电子股份有限公司
工 艺			
批 准			



		名称	编号
		DDRAM	602.L27FB26-01
版 次	更改单号		版次 A1.0
更改记录			第 2 页 共 11 页
拟 制			
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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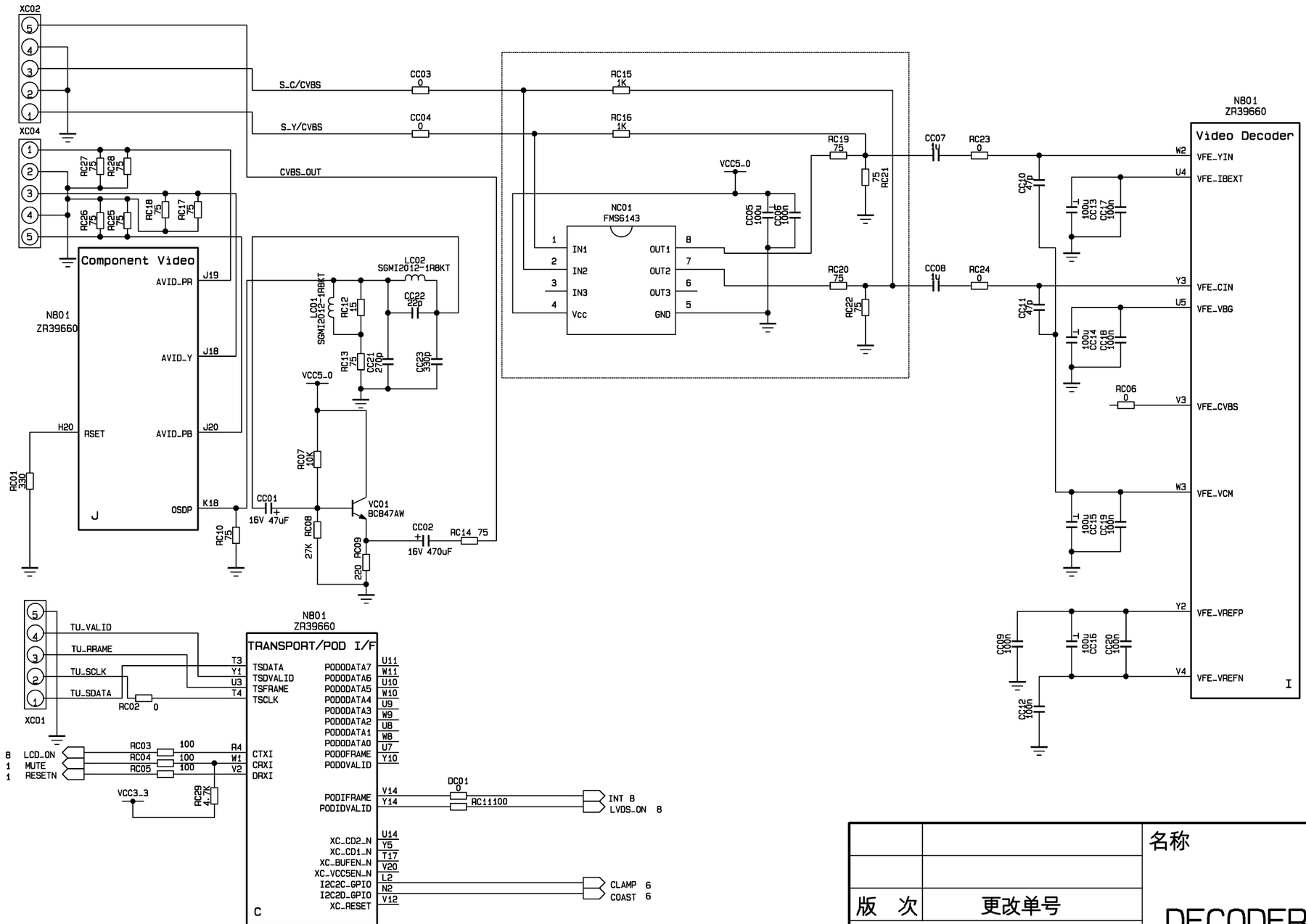

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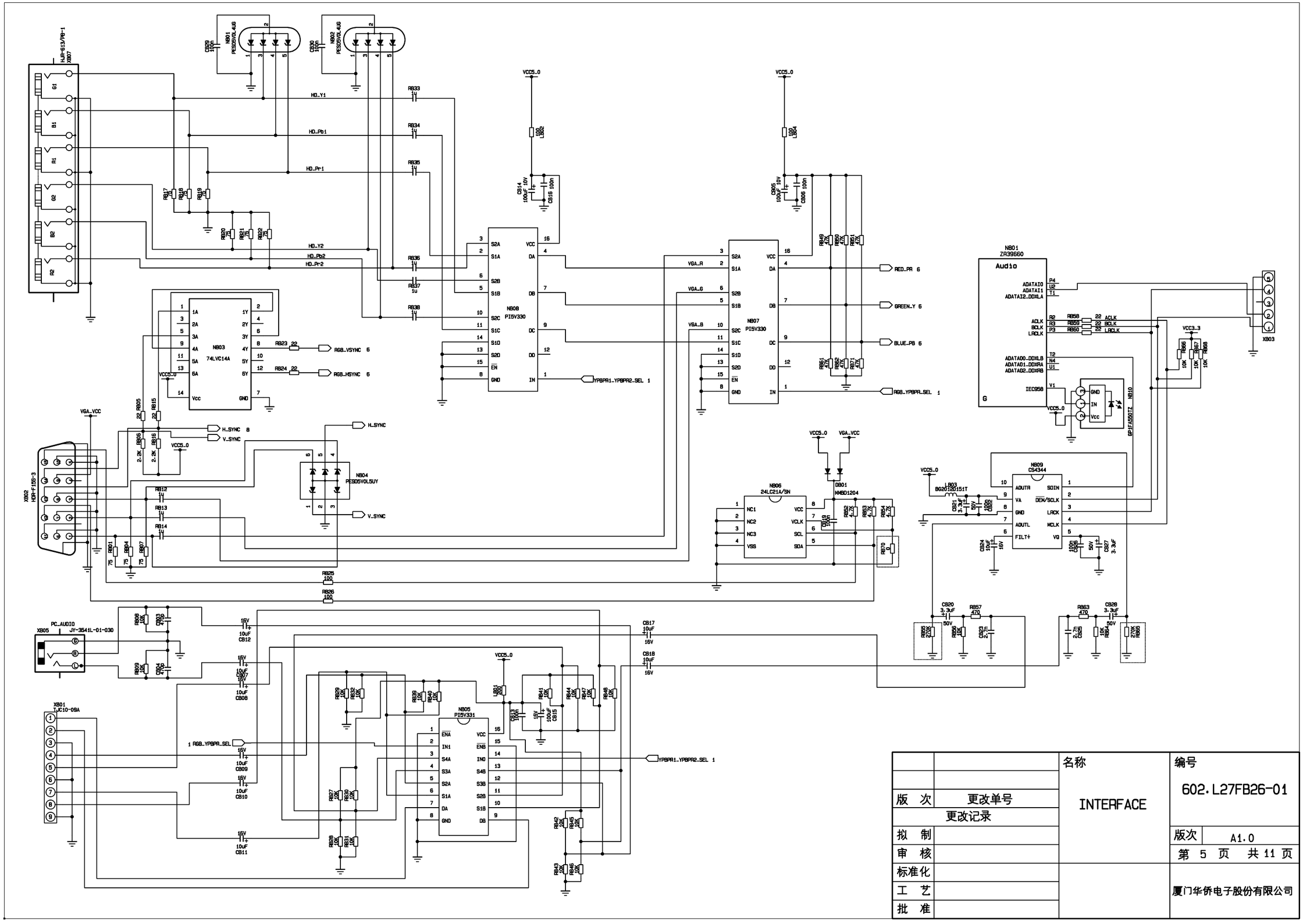

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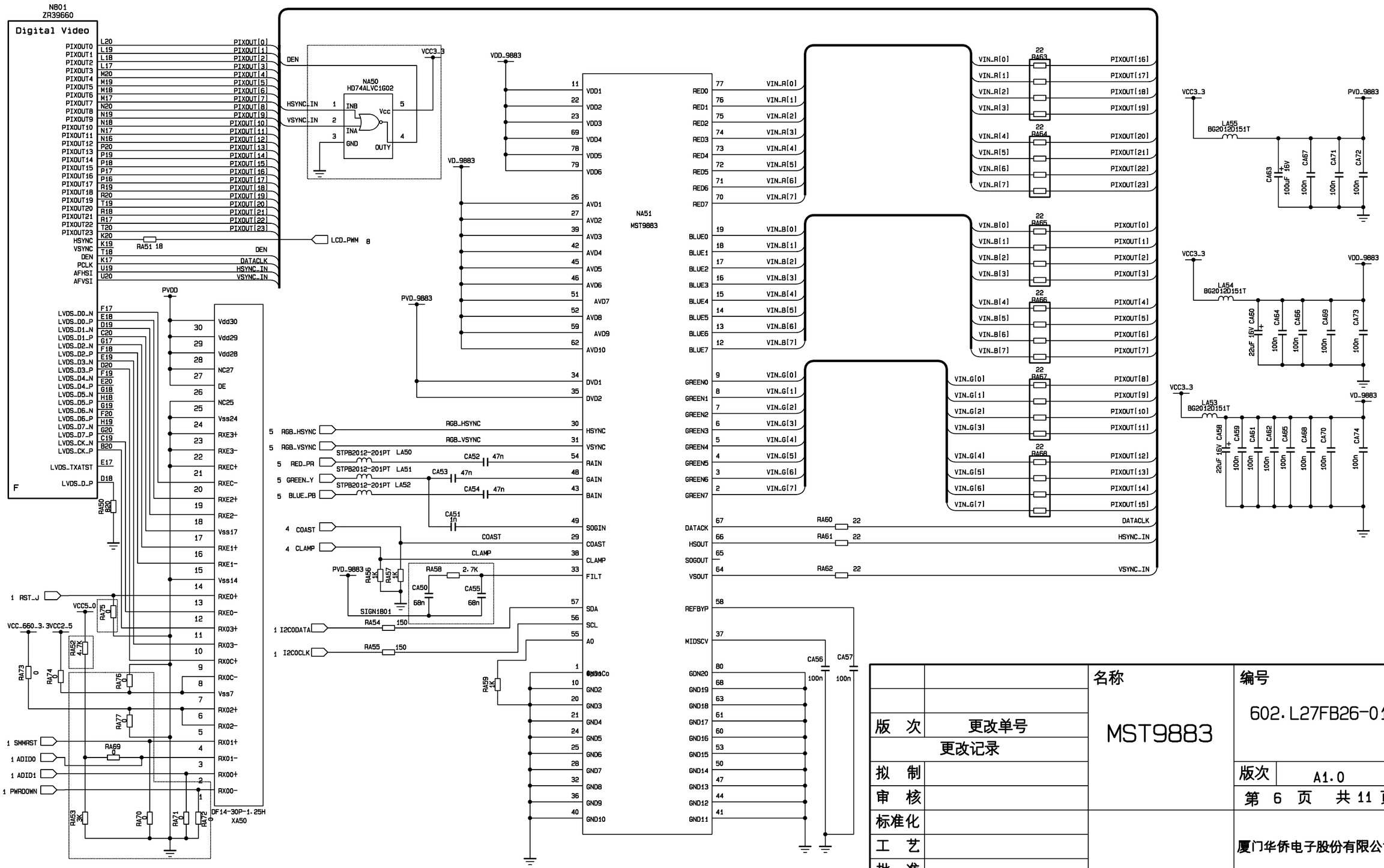

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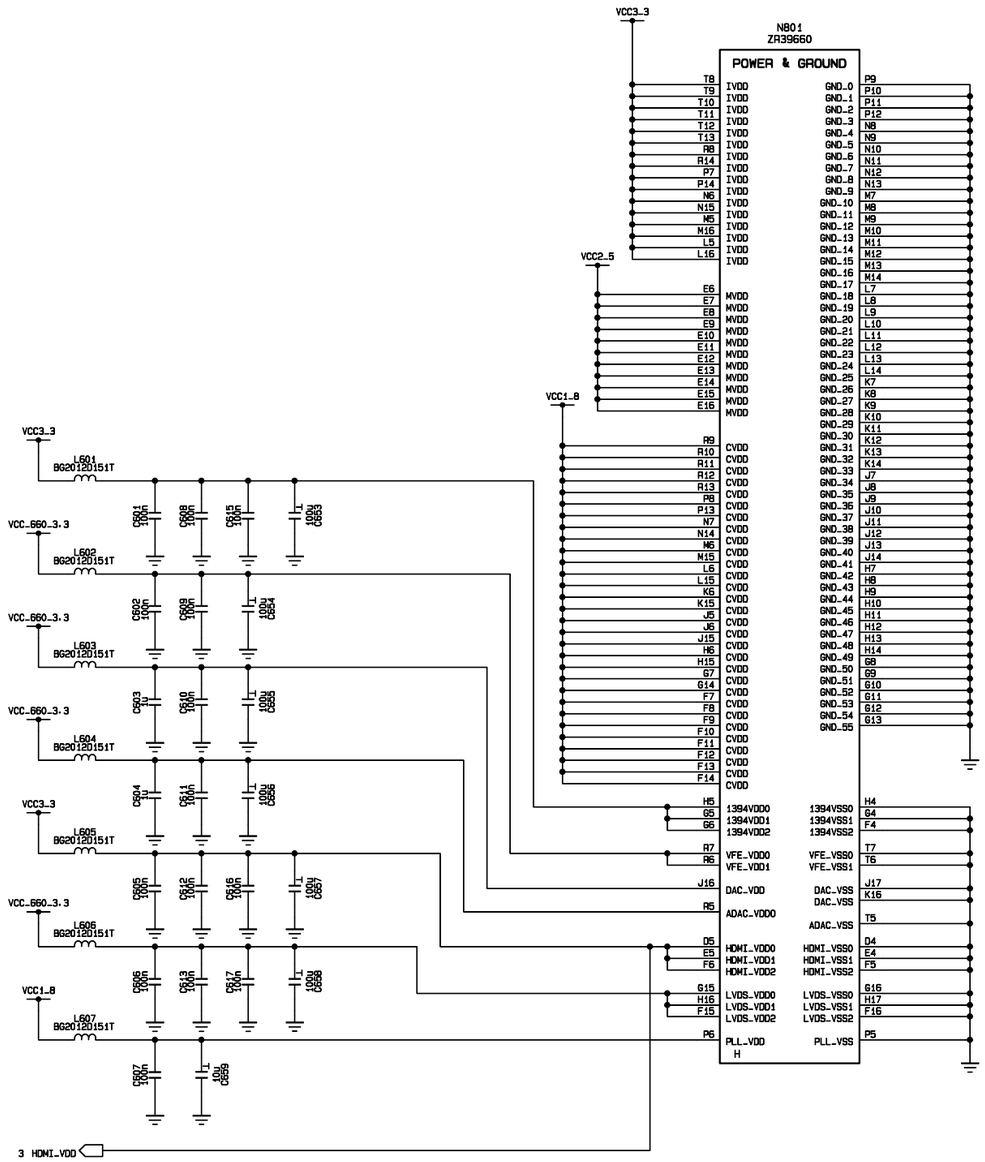

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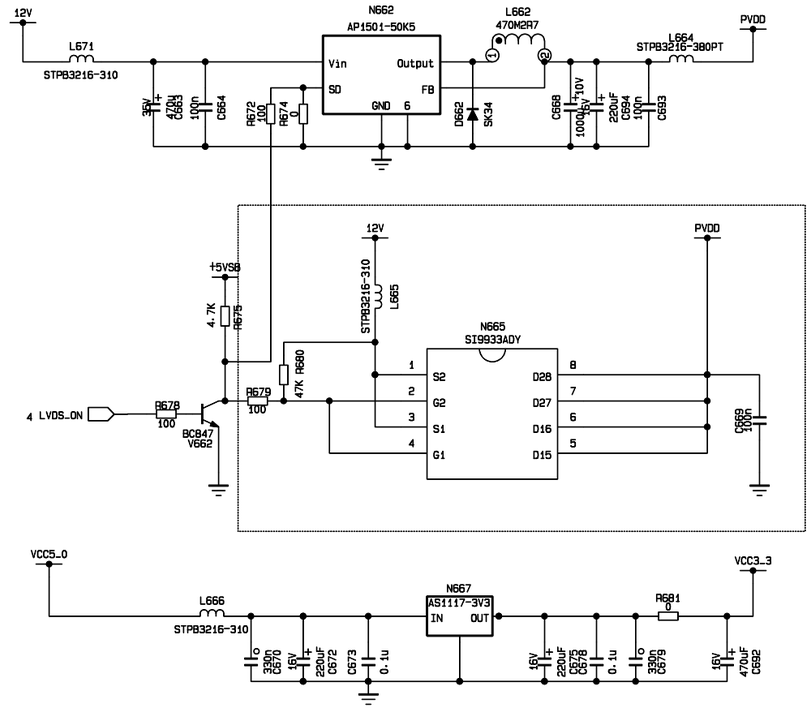

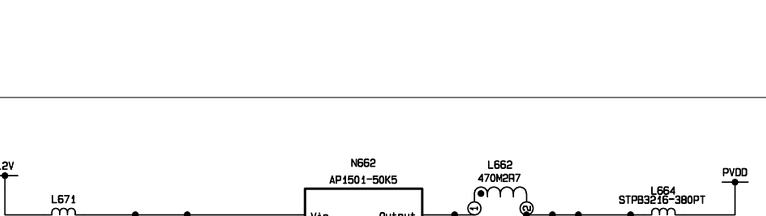

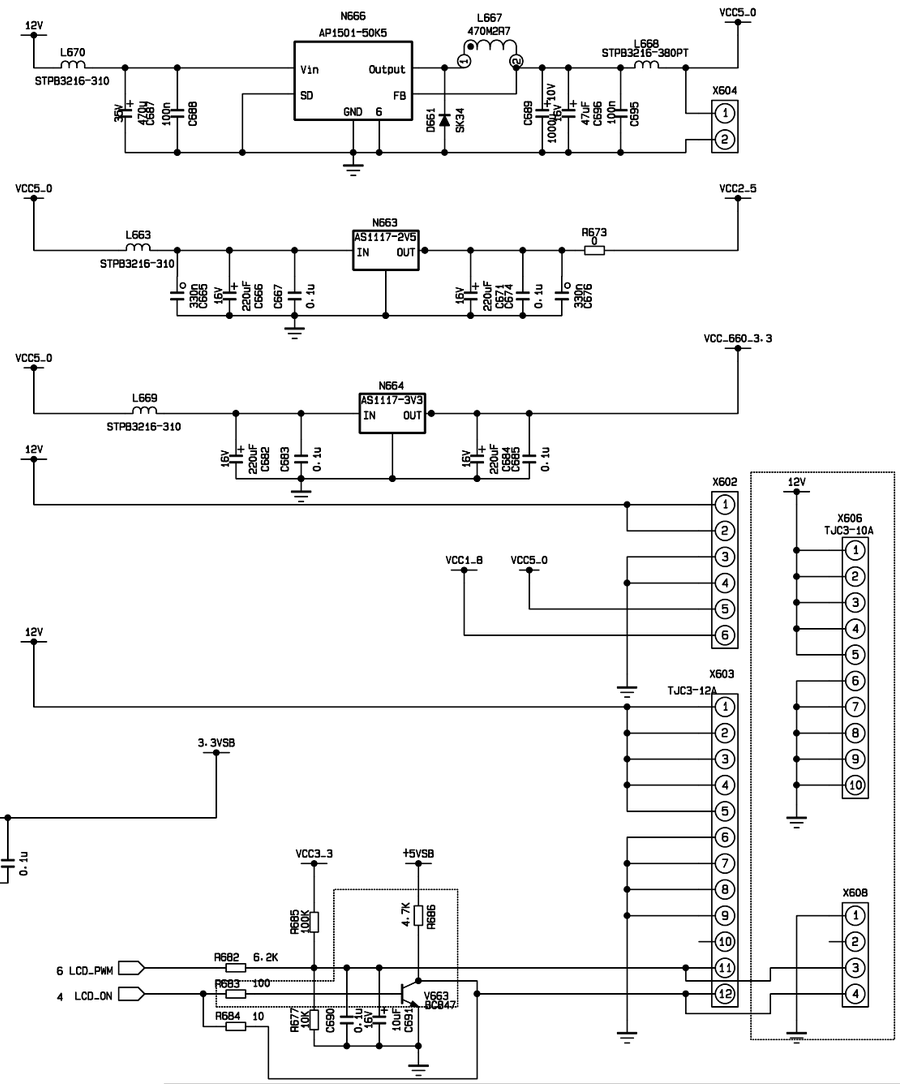

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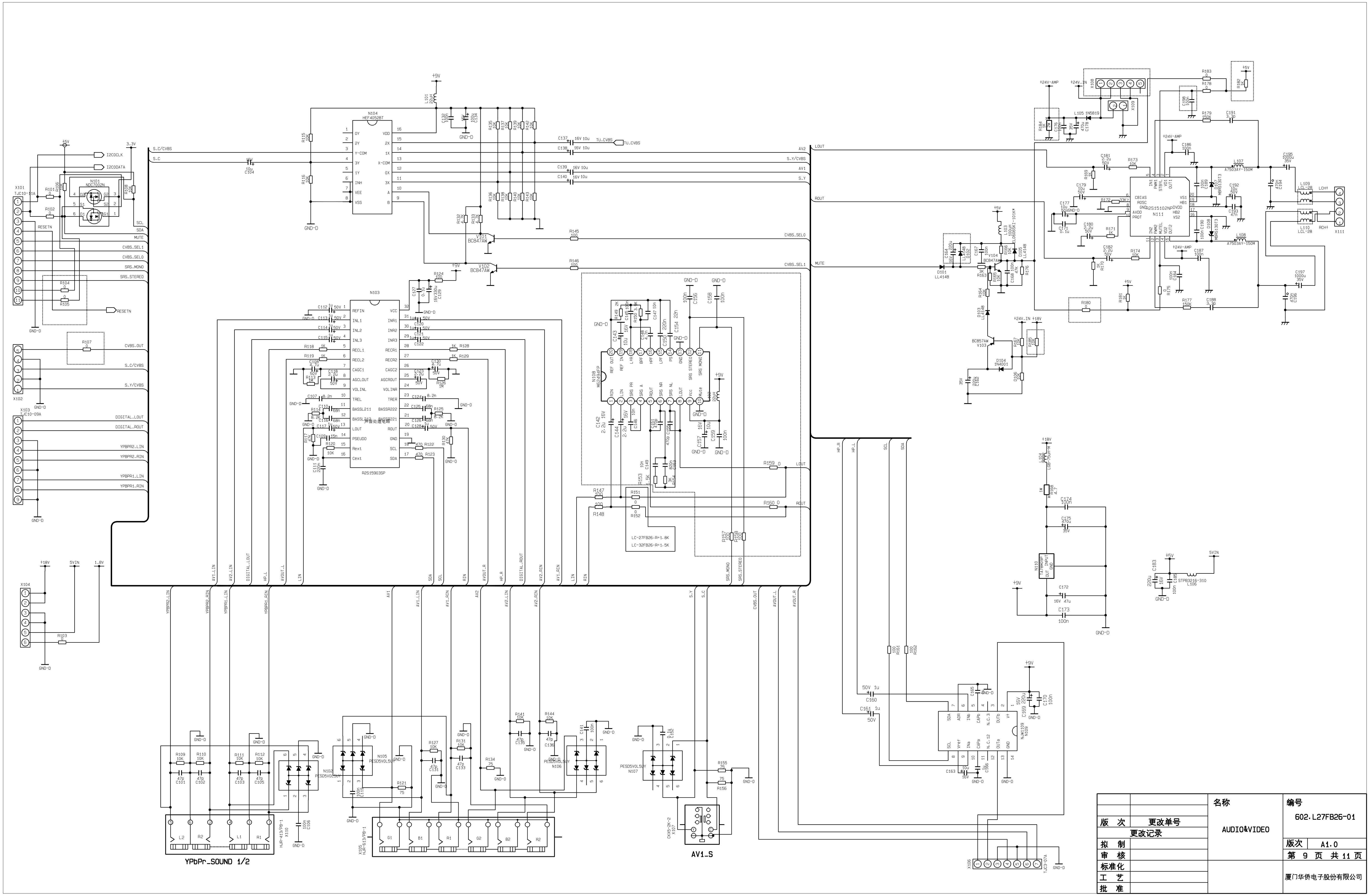

YPbPr_SOUND 1/2
AV1_S
名称
AUDIO&VIDEO
编号
602.L27FB26-01
版次
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拟制
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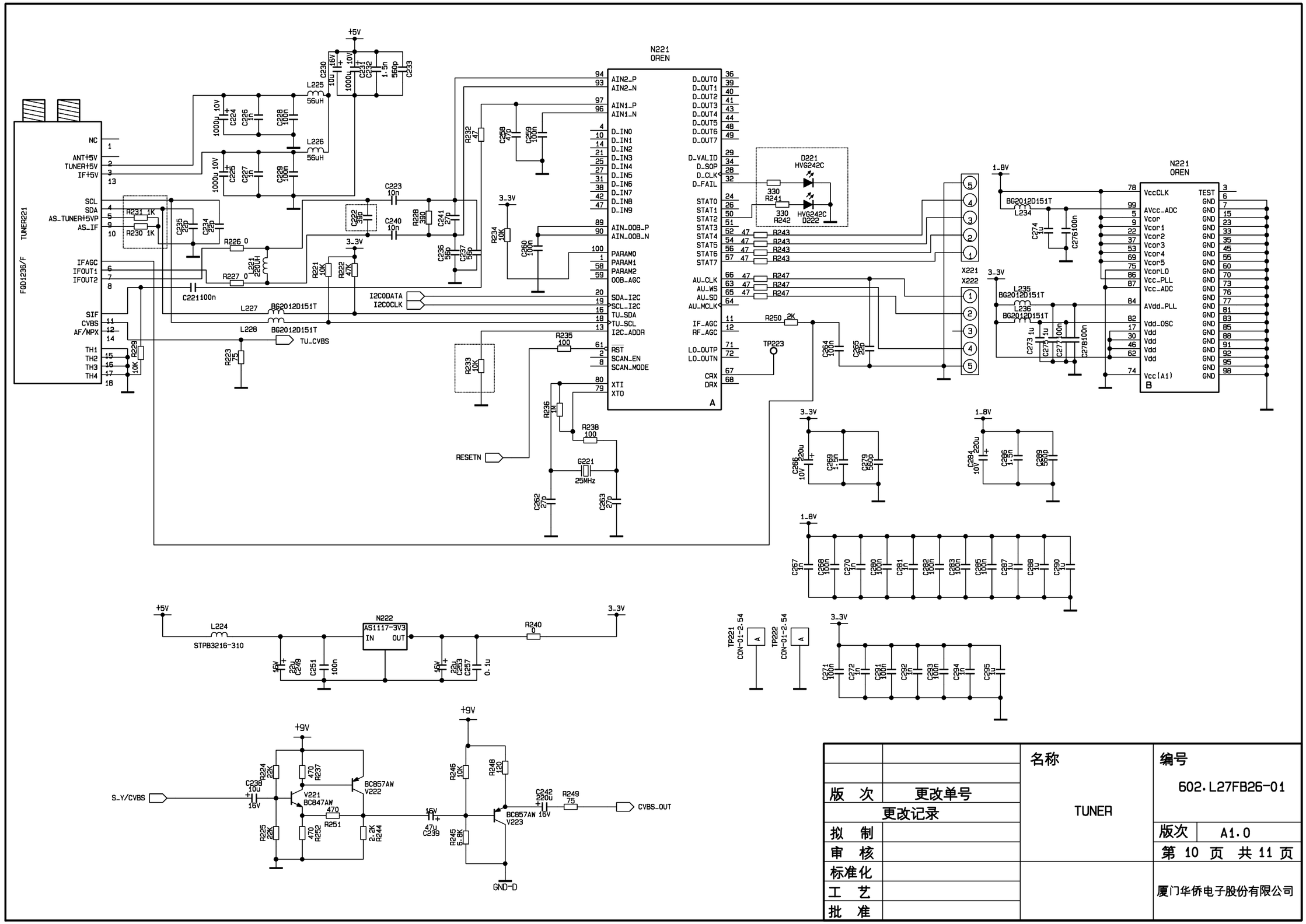

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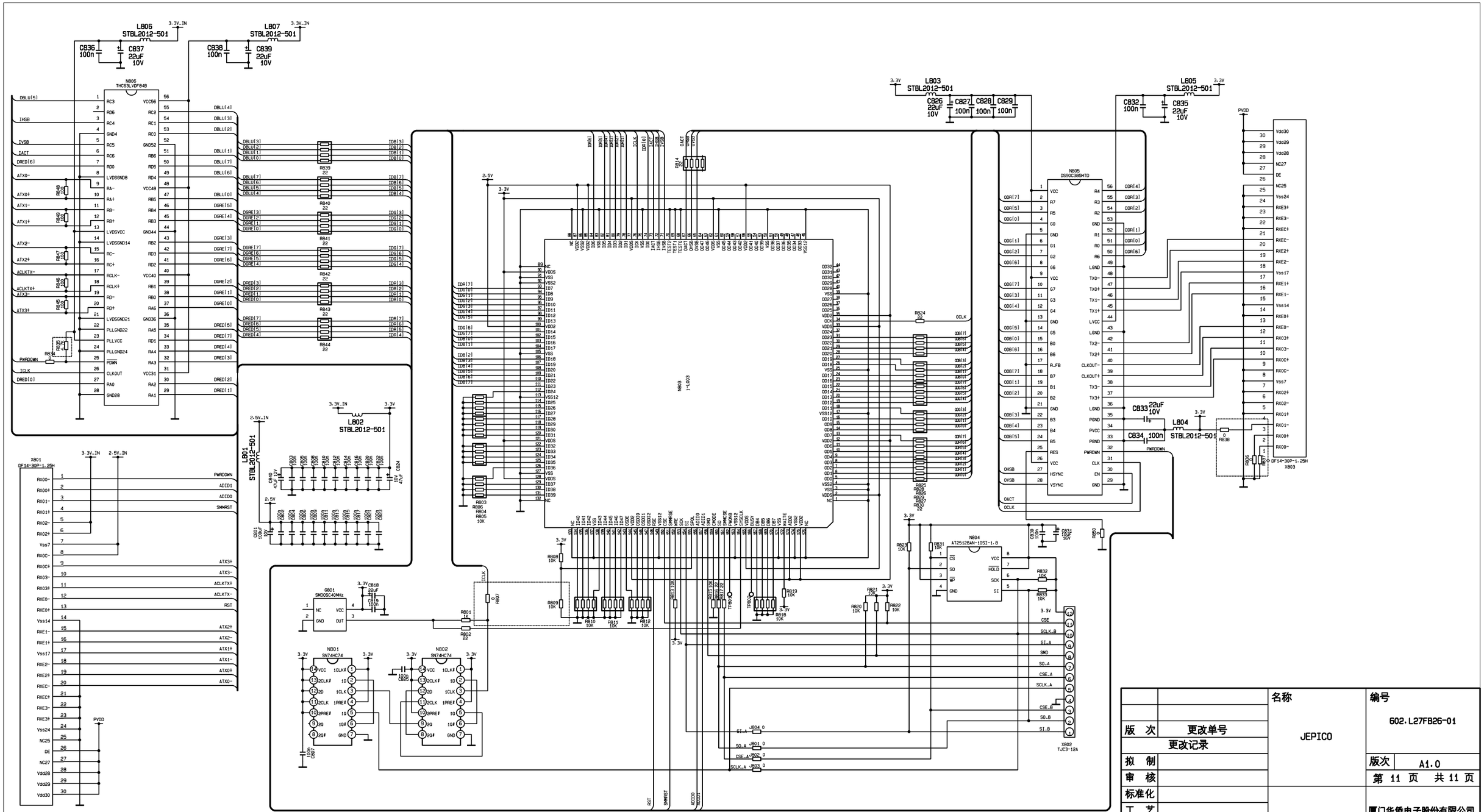

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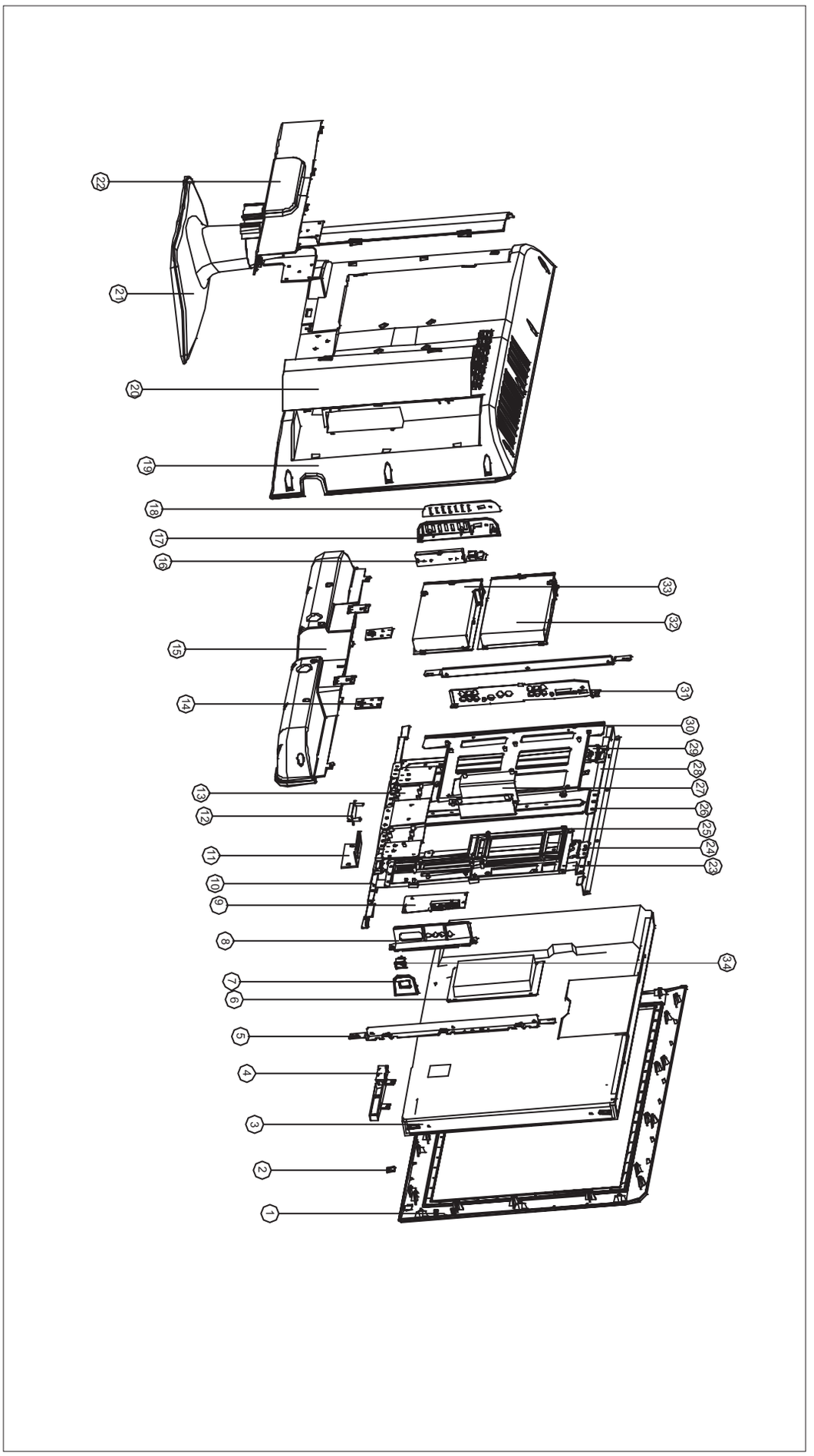
拟 制			
审 核			
标准化			厦门华侨电子股份有限公司
工 艺			
批 准			

APPENDIX-A: Main assembly list

Model(NS-32LCD)	Part No.	Description
203.L32FB26-10	667.32FB26-09	IR receive board
	667.32FB18-52	Image processing board
	667.32FB26-05	Key board
	667.32FB18-40	Video processing board
	667.32FB26-20	Power board
	667.32FB26-53	Analog board
	667.32FB18-69	Data processing board
	301.D42FB6-10A	Remote control
	335.32012-00	Panel

APPENDIX: Exploded view (LC-32X26)



PART LIST OF EXPLODED VIEW (LC-32X26)		
NO.	**PART NO.**	**DESCRIPTION**
1	780-G26W0-AC0	Front cover
2	615-10425-00	Trans-connecting bracket assy
3		Screen
4		reception board assy
5	870-10288-00	Connecting bracket of screen(left right)
6		Power board assy
7	870-3A241-120/870-30241-120	Main switch bracket
8	808-1E969-121	AV baffle (right)
9		Trans-connecting board assy
10	870-10417-00	crystal FRAME (bottom)
11	808-10970-120	AV baffle (bottom)
12	364-44206-00	Socket
13	870-10409-00	Stand bracket
14	804-20468-00	Connecting piece of speaker box(2)
15	615-20558-00	Speaker box assy
16		button board assy
17	870-30239-120	SIDE Button bracket
18	808-60947-3C1	Buttonbaffle
19	780-G26WH-120	Rear cabinet
20	808-10966-120	Rear cabinetCover(1)
21	615-10649-00	Stand assy
22	808-10967-120	Rear cabinetCover(2)
23	870-10411-00	trans-connector
24	870-1A408-00	crystal frame (right)
25	863-6A189U000	Power board frame
26	870-10407-00	crystal frame (middle)
27	870-10410-00	Mounting holder
28	870-10416-00	crystal frame (upper)
29	870-1A406-00	crystal frame (left)
30	863-60188U000	Main board frame
31	808-1F968-120	AV baffle (left)
32		CPU board assy
33		Analog board assy
34	360-30042-00 (option)	Power switch

603-L32FB26-10
Ver.1.0