

LCD TELEVISION

SERVICE MANUAL

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Customer#: NS-LCD37

Factory#: LC-37HA37

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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.

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.

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 °C
	Scope for storage	-20 ~ +60 °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)
- MK8258 (YUV, VGA signal generator)
- CA210 (white balancer)

2. The alignment flow chart (see below figure)

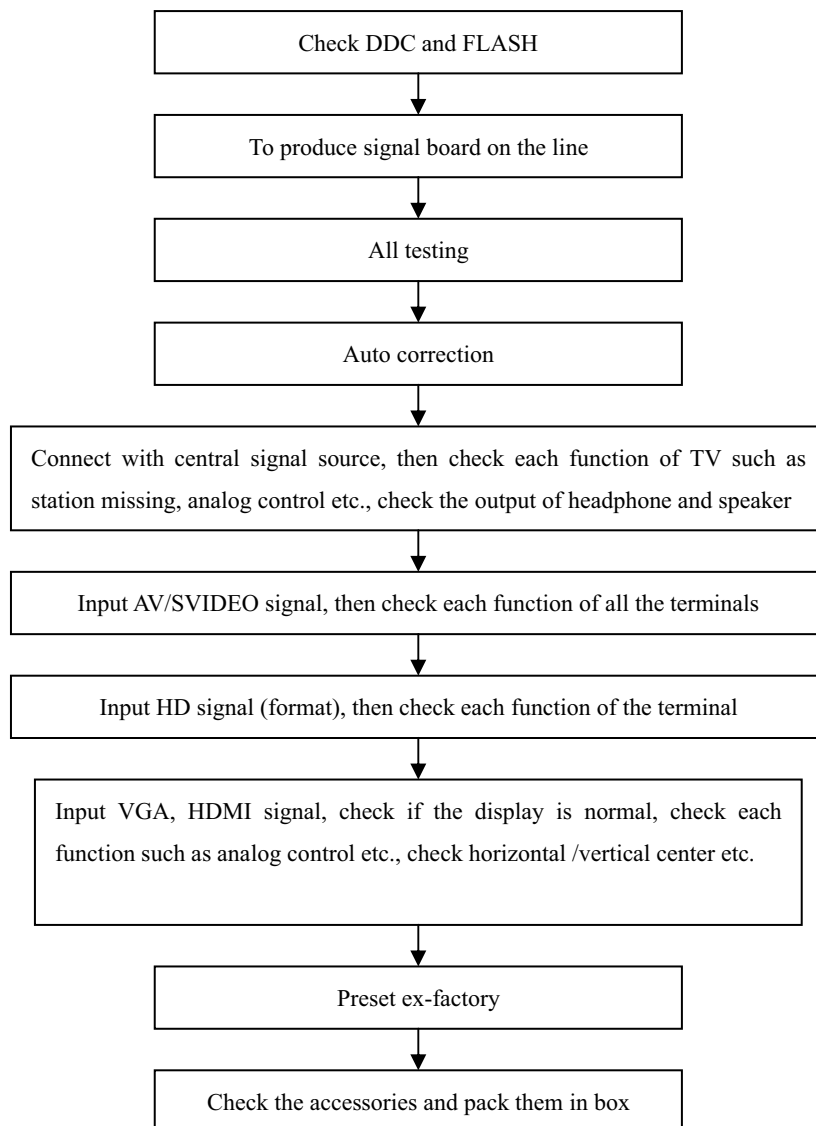


Fig-1 adjustment flow-chart

3. Description of adjustment

3.1 Unit adjustment

Connect the signal processing board, side AV board, button board and remote control receiver board according to the wiring diagram. Connect with power and observe the display.

Method for using factory menu: press "INPUT" button, then press "2580" to enter level one factory menu. Press "CH+" and "CH-" to select adjustment page, then press "OK" to access. Press "CH+" and "CH-" to move cursor up and down, when the cursor stays on a certain adjustment item, press

“VOL-“ and “VOL+” to adjust. Press “MENU” exit to the level one factory menu; press “EXIT” to exit from the factory menu at any situation.

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

3.2 Auto color adjustment

3.2.1 input 16 level gray-scale signal from MK8258 to D-sub channel, enter auto color adjustment page of factory menu (AUTO COLOR), enter TEST PATTERN and use OK button to select GREY SCALER16, then enter START and press OK.

3.2.2 input SMPTE COLOR BAR signal from MK8258 to YPbPr channel, enter auto color adjustment page of factory menu (AUTO COLOR), enter TEST PATTERN and use OK button to select SMPTE COLOR BAR, then enter START and press OK. (SMPTE COLOR BAR signal of MK8258 should be OIRE standard, that’s ATTER 96. TYPE CODE of PATTERNEDID 6.)

Note: after auto color adjustment, it must press the power button on the remote controller to turn off the unit and then turn on, can the information be stored in FLASH!

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. The signal should include NTSC and ATSC.

4.2 AV/S-VIDEO terminal

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

4.3 YPbPr/YCbCr terminal

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

Table 1 YUV signal format

No	H-frequency (KHz)	V-frequency (KHz)	Signal
1	15.734	59.94	SDTV 480i
2	31.469	59.94	HDTV 480p
3	44.955	59.94	HDTV 720p
4	33.716	59.94	HDTV 1080i

4.4 VGA terminal

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

4.5 HDMI terminal

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

Table 2 VGA signal format

No	Resolution	H-frequency(kHz)	V-frenquency(Hz)	Point clock pulse frequency(MHz)	Remark
1	720 X 400	31.469	70.086	28.322	IBM
2	640 X 480	31.469	59.94	25.175	IBM

3	640 X 480	37.861	72.809	31.5	VESA
4	640 X 480	37.5	75	31.5	VESA
5	640 X 480	43.269	85.008	36	VESA
6	800 X 600	35.156	56.25	36	VESA
7	800 X 600	37.879	60.317	40	VESA
8	800 X 600	48.077	72.188	50	VESA
9	800 X 600	46.875	75	49.5	VESA
10	800 X 600	53.674	85.061	56.25	VESA
11	1024 X 768	48.363	60.004	65	VESA
12	1024 X 768	56.476	70.069	75	VESA
13	1024 X 768	60.023	75.029	78.75	VESA

4.6 YPBPR and TV brightness check (use 100IRE white window signal)

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
 - 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	<ul style="list-style-type: none"> ● Bad status in signal receiving ● Poor signal ● Check if there are failures with the electrical connector or the antenna. ● Check if the antenna is properly connected.
Fringe in picture	<ul style="list-style-type: none"> ● Check if the antenna is correctly oriented. ● Maybe there is electric wave reflected from hilltop or building.
Picture is interfered by stripe	<ul style="list-style-type: none"> ● Possibly due to interference from automobile, train, high

shaped bright spots	<p>voltage transmission line, neon lamp etc.</p> <ul style="list-style-type: none"> ● Maybe there is interference between antenna and power supply line. Please try to separate them in a longer distance. ● Maybe the shielded-layer of signal wire is not connected properly to the connector.
There appear streaks or light color on the screen	<ul style="list-style-type: none"> ● Check if interfered by other equipment and if interfered possibly by the equipment like transmitting antenna, non professional radio station and cellular phone.

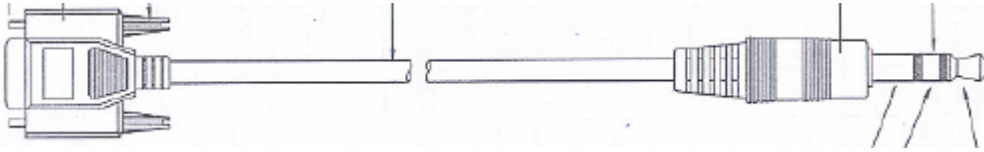
2.TV set:

Symptoms	Possible cause
Unable to switch the power on	<ul style="list-style-type: none"> ● Check to see if the power plug has been inserted properly into the socket.
No picture and sound	<ul style="list-style-type: none"> ● Check to see if the power supply of liquid crystal TV has been switched on. (as can be indicated by the red LED at the front of the TV set) ● See if it's receiving the signal that is transmitted from other source than the station ● Check if it's connected to the wrong terminal or if the input mode is correct. ● Check if the signal cable connection between video frequency source and the liquid crystal TV set is correct.
Deterioration of color phase or color tone	<ul style="list-style-type: none"> ● Check if all the picture setups have been corrected.
Screen position or size is not proper	<ul style="list-style-type: none"> ● Check is the screen position and size is correctly set up.
Picture is twisted and deformed	<ul style="list-style-type: none"> ● Check to see if the picture-frame ratio is properly set up.
Picture color changed or colorless	<ul style="list-style-type: none"> ● Check the "Component" or "RGB" settings of the liquid crystal TV set and make proper adjustment according to the signal types.
Picture too bright and there is distortion in the brightest area	<ul style="list-style-type: none"> ● Check if the contrast setting is too high. ● Possibly the output quality of DVD broadcaster is set too high. ● It maybe also due to improper terminal connection of the video frequency signal in a certain position of the system.
Picture is whitish or too bright in the darkest area of the picture	<ul style="list-style-type: none"> ● Check if the setting for the brightness is too high ● Possibly the brightness grade of DVD player (broadcaster) is set too high.
No picture or signal produced from the displayer if "XXX in search" appears.	<ul style="list-style-type: none"> ● Check if the cable is disconnected. ● Check if it's connected to the proper terminal or if the input mode is correct.
There appears an indication -	<ul style="list-style-type: none"> ● Check if the TV set can receive input signal. The signal is

Symptoms	Possible cause
"outside the receivable scope)	not correctly identified and VGA format is beyond the specified scope.
Remote control cannot work properly	<ul style="list-style-type: none"> ● Check if the batteries are installed in the reverse order. ● Check if the battery is effective. ● Check the distance or angle from the monitor. ● Check if there is any obstruct between the remote control and the TV set. ● Check if the remote control signal- receiving window is exposed to strong fluorescence.
No picture and sound, but only hash.	<ul style="list-style-type: none"> ● Check if the antenna cable is correctly connected, or if it has received the video signal correctly.
Blur picture	<ul style="list-style-type: none"> ● Check if the antenna cable is correctly connected. ● Of if it has received the right video signal.
No sound	<ul style="list-style-type: none"> ● Check if the "mute" audio frequency setting is selected. ● Check if the sound volume is set to minimum. ● Make sure the earphone is not connected. ● Check if the cable connection is loose.
When playing VHS picture search tape, there are lines at the top or bottom of the picture.	<ul style="list-style-type: none"> ● When being played or in pause VHS picture search tape sometimes can't provide stable picture, which may lead to incorrect display of the liquid crystal TV, In this case please press "auto" key on the remote control so as to enable the liquid crystal TV set to recheck the signal and then to display correct picture signal


Method of software upgrading

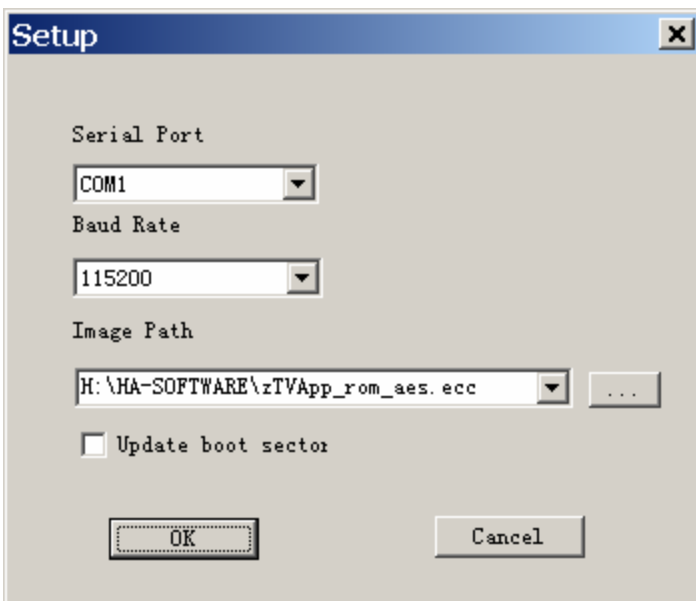
1. Connect computer serial port and TV parallel port with serial wire 665.D0002-645.




2. Open iDev.exe



3. Click  , enter the setting interface.

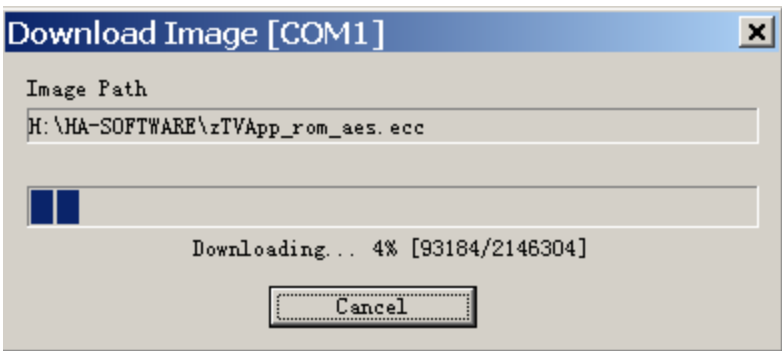


Set Serial Port to the current COM port, set the Baud Rate to 1152000, Image Path to the path of the new software. If the new software renews Bootcode, pitch on "Update boot sector" option and then click OK.

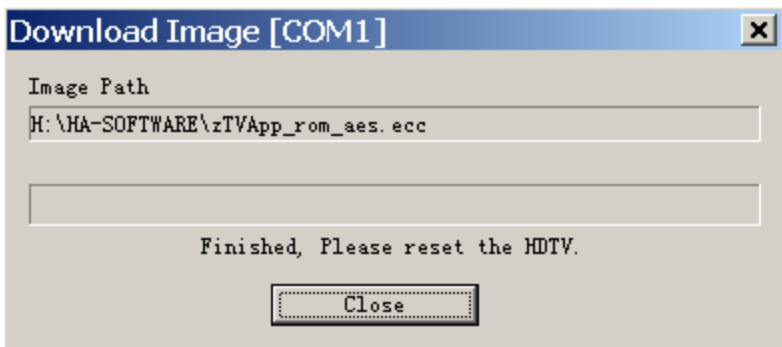
4. Click  to enter the interface below:



5. Turn on the TV, the software begins to be written.



6. After the software written, Press the power key (local keypad) and holding for several second to force power off TV set,



7. Turn on the TV again and enter the factory menu initialization setting.

Working principle analysis of the unit

1. NTSC signal flow:

Antenna reception NTSC signal send to the integrative tuner TDQDU4-508A, which contains HF and IF amplifier circuit and video decoding circuit. It is controlled by main IC ZR39760 (integrate 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, AV1-CVBS, AV2-CVBS input from AV terminal and S-VIDEO via switch IC N52797EP to output signal, one way send to ZR39760 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 ZR39760, via decoding and A/D conversion, it is fed into ZR39760 for analog control in the format of I2S. ZR39760 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 R2S15903SP (sound processing and volume control). Select right/left sound channel, their send to class D sound amplifier R2S15102 amplify, then send to speaker.

2. ATSC signal flow:

Antenna reception ATSC signal send to tuner TDQU4-508A, after frequency tuning, HF amplification, IF amplification and SAW FILTER, fed to ZR39760 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 LCD panel.

HD audio signal, via decoder built-in ZR39760, 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 converter 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 ZR39760 digital decode, image scale and OSD superposition, then send to LVDS level drive for LCD screen.

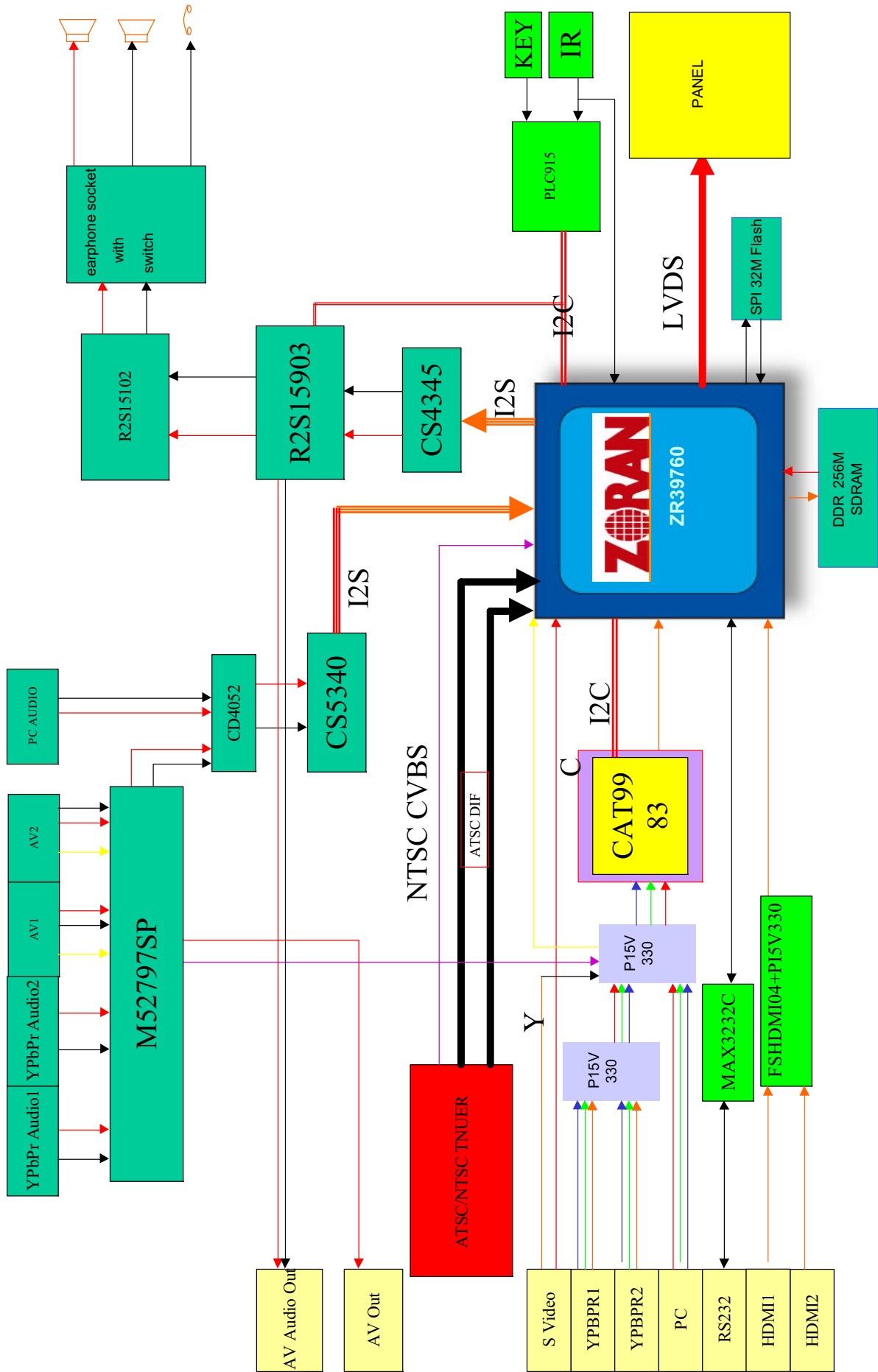
Sound signal (PC, YPrPb) via switch diverter HEF4052BT to output signal, it send to R2S15903SP (sound processing and volume control) switch of audio. Select right/left sound channel, their send to class D sound amplifier R2S15102 amplify, then send to speaker.

4. HDMI signal flow

HDMI video signal is directly fed to main IC ZR39760 (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 ZR39760, 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 converter chip CS4344 to output analog L/R signal. S/PDIF data stream directly output from optical fiber interface.

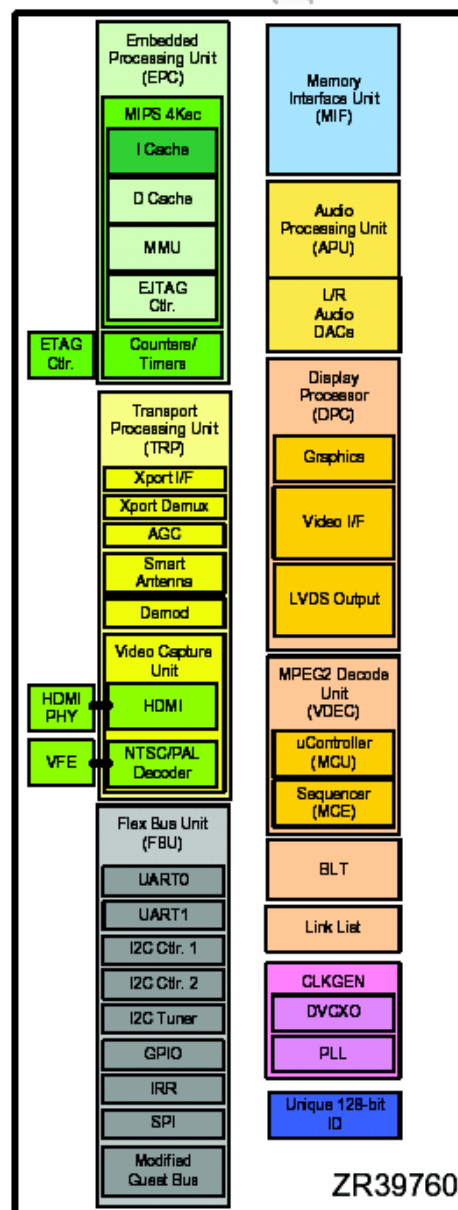
Block diagram



IC block diagram

1. ZR39760

- **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
 - 8 K instruction cache, 8 K data cache, (2-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 Demodulator**
- **Integrated HDMI Link and PHY**
- **High-Performance MPEG-2 Video Decoding Engine**
- **Transport Processing Unit**
- **Integrated Dual Channel LVDS Output for direct Panel Display support**
- **24-bit Uncompressed Digital I/O Interface**
- **Accelerated 2-D Graphics**
- **Integrated PAL/NTSC Decoder**
- **Video Scaling and Format Conversion**
- **Display Processor & Controller**
- **Audio Processing Unit (APU)**
- **System Interfaces**
 - Two 2-signal UARTs
 - Three I²C master or slave interfaces (up to 400 kb/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 16-bit DDR interface (212.5 MHz)
 - Up to 650 MByte/second peak memory throughput
 - 128 MByte memory address range
- **Integrated Digital VCXO**
- **Process Technology**
 - 0.18 μ CMOS
- **Power**
 - 1.8 V core voltage, 2.5 V Memory I/F, 3.3 V I/O
- **Packaging**
 - 27 mm x 27 mm Plastic Ball Grid Array package
 - 400 PBGA

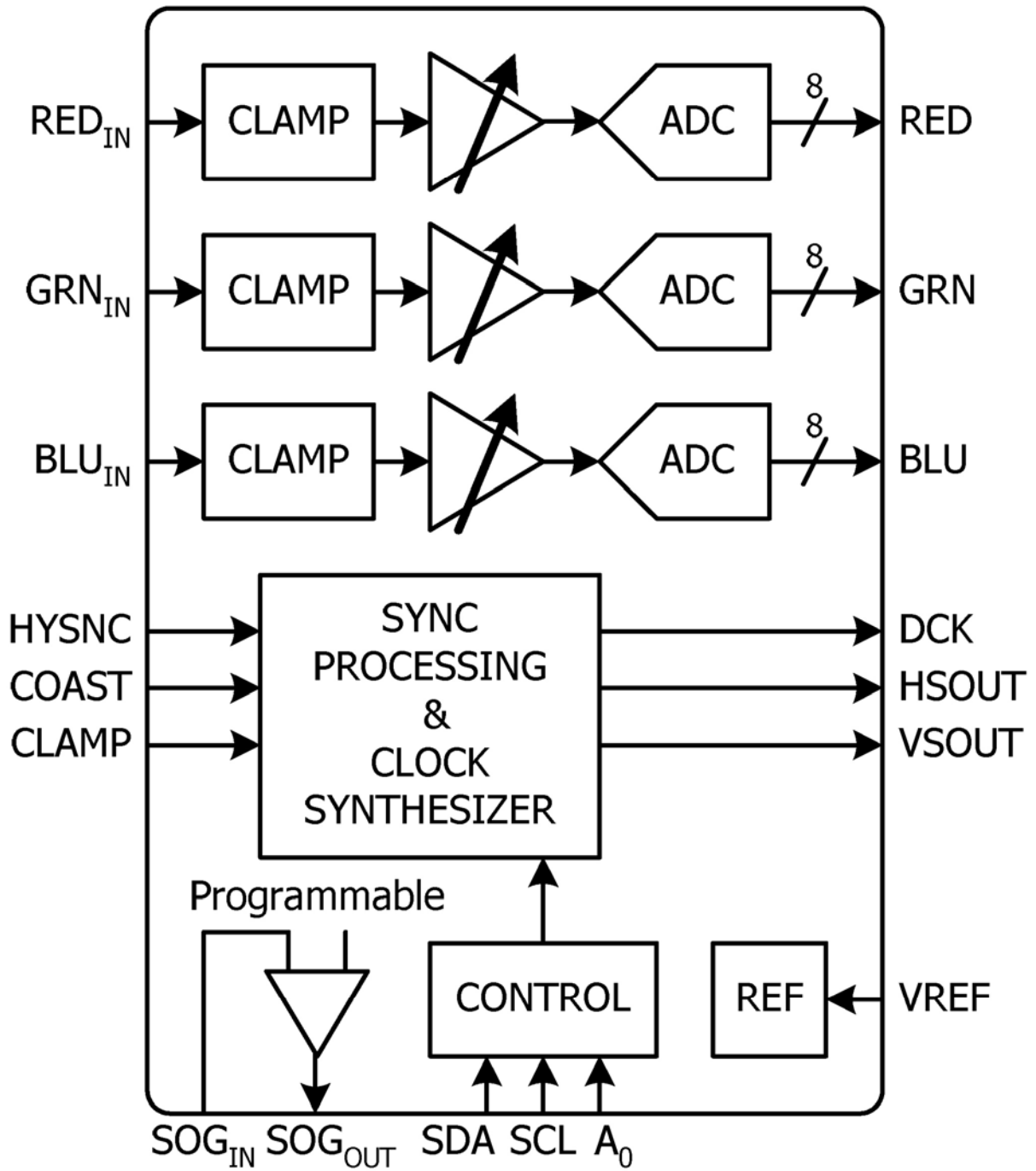


	11	12	13	14	15	16	17	18	19	20	
A	HDMI_D2_P	HDMI_D1_P	HDMI_D0_P	HDMI_CLK_P	HDMI_REXT	HDMI_ATEST	HDMI_SDA	RSVD[17]	RSVD[18]	RSVD[16]	A
B	HDMI_D2_N	HDMI_D1_N	HDMI_D0_N	HDMI_CLK_N	HDMI_HFD	HDMI_CEC	HDMI_SCL	NC_B18	RSVD[19]	NC_B20	B
C	NC_C11	NC_C12	RSVD[11]	RSVD[12]	RSVD[15]	NC_C16	RSVD[2]	NC_C18	SBS[1]	NC_C20	C
D	TDI	HDMI_VDD	PARAM[2]	HDMI_VDD	RSVD[23]	RSVD[22]	RSVD[5]	SADR[13]	SADR[0]	SDATA[5]	D
E	HDMI_VSS	VDD_3V3	VDD_3V3	HDMI_VSS	RSVD[1]	RSVD[3]	RSVD[4]	SADR[2]	SDATA[7]	SDATA[0]	E
F	VDD_1V8	VDD_1V8	VDD_1V8	VDD_1V8	VDD_3V3	VDD_2V5	SRAS_N	SWE_N	SDATA[1]	SDATA[3]	F
G	GND	GND	GND	GND	VDD_1V8	VDD_2V5	SDGM[0]	SDATA[2]	SDATA[4]	SDGS[0]	G
H	GND	GND	GND	GND	VDD_1V8	VDD_2V5	SDGM[1]	SDATA[6]	SDATA[9]	SDATA[15]	H
J	GND	GND	GND	GND	VDD_1V8	VDD_3V3	SDGS[1]	SDATA[11]	SDATA[13]	SDATA[14]	J
K	GND	GND	GND	GND	VDD_1V8	VDD_2V5	SADR[12]	SDATA[12]	SDATA[10]	SDATA[6]	K
L	GND	GND	GND	GND	VDD_1V8	VDD_2V5	SADR[6]	SADR[11]	SADR[8]	SADR[4]	L
M	GND	GND	GND	GND	VDD_1V8	VDD_2V5	SVREF	SADR[10]	SADR[1]	SADR[3]	M
N	GND	GND	GND	GND	VDD_1V8	VDD_3V3	SADR[7]	SCAS_N	SBS[0]	SCLK	N
P	GND	GND	GND	GND	VDD_1V8	VDD_2V5	SADR[5]	SADR[9]	SCKE	SCLK_N	P
R	VDD_1V8	VDD_1V8	VDD_1V8	VDD_1V8	VDD_2V5	VDD_2V5	RSVD[7]	RSVD[8]	RSVD[25]	RSVD[24]	R
T	RSVD[34]	VDD_3V3	VDD_3V3	LVDS_VSS[2]	DEMCD_LOCK	RSVD[27]	RSVD[20]	RSVD[26]	NC_T19	RSVD[6]	T
U	PX[2]	RSVD[26]	LVDS_VDD[1]	LVDS_VSS[1]	LVDS_CLK_P	LVDS_CLK_N	LVDS_REXT	LVDS_ATEST	NC_U19	LVDS_VDD[0]	U
V	PX[0]	PX_HSYNC_OUT	LVDS_VDD[2]	LVDS_D4_P	LVDS_D4_N	LVDS_D2_P	LVDS_D2_N	LVDS_VSS[0]	LVDS_D0_N	LVDS_D0_P	V
W	PX[5]	PIX[1]	PIX_PCLK	PIX_VSYNC_OUT	NC_W15	LVDS_D7_N	LVDS_D6_N	LVDS_D5_N	LVDS_D3_N	LVDS_D1_N	W
Y	RSVD[30]	PIX[6]	PIX[3]	RSVD[29]	NC_Y15	LVDS_D7_P	LVDS_D6_P	LVDS_D5_P	LVDS_D3_P	LVDS_D1_P	Y
	11	12	13	14	15	16	17	18	19	20	

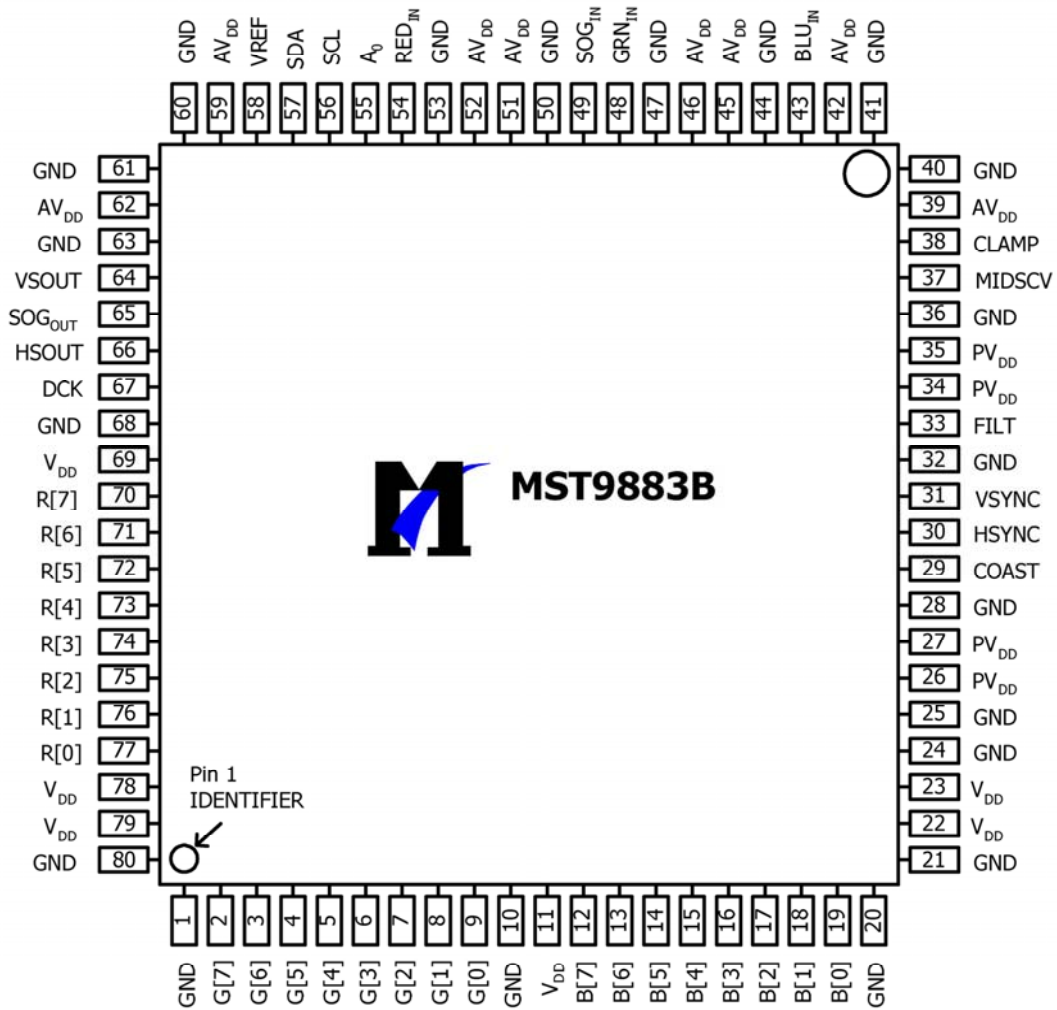
2. MST9883

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. Its 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

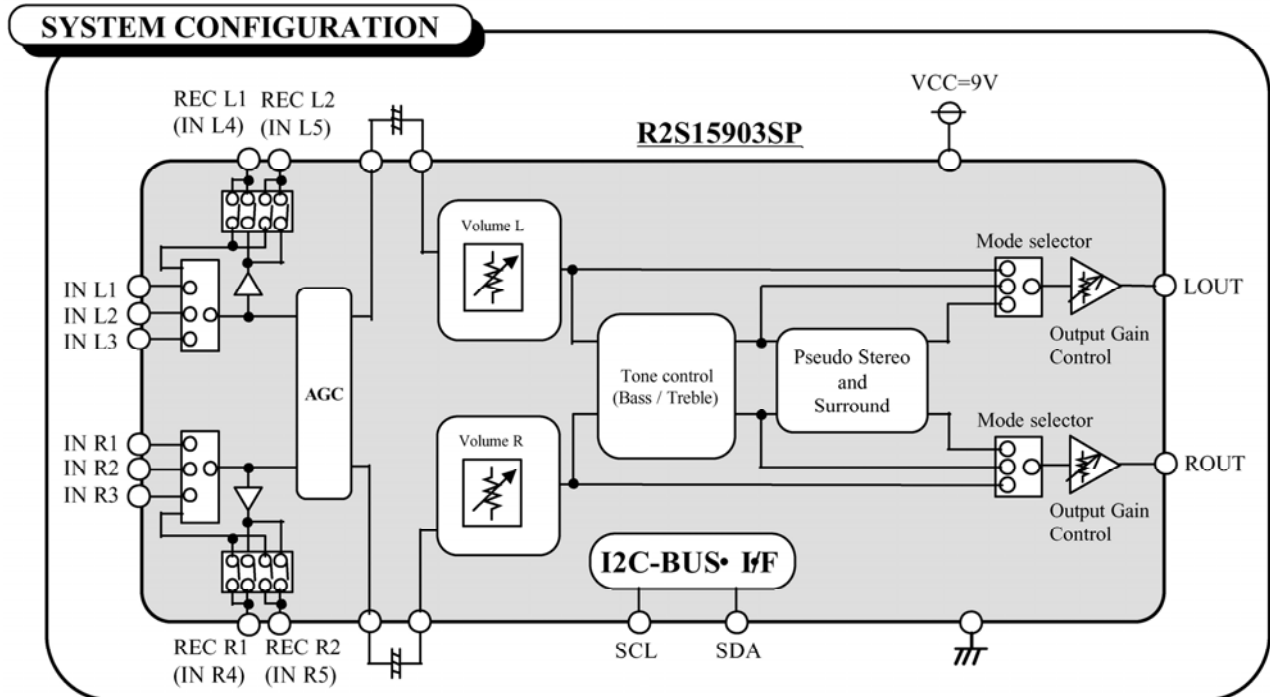
26,27,34,35: PLL Power

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

3. R2S15903SP

R2S15903SP is an audio signal processor. It has MUTE and Volume/Tone control. It can support 5 input selector.



Pin descriptions of R2S15903SP:

5, 28: AV OUT INPUT L/R

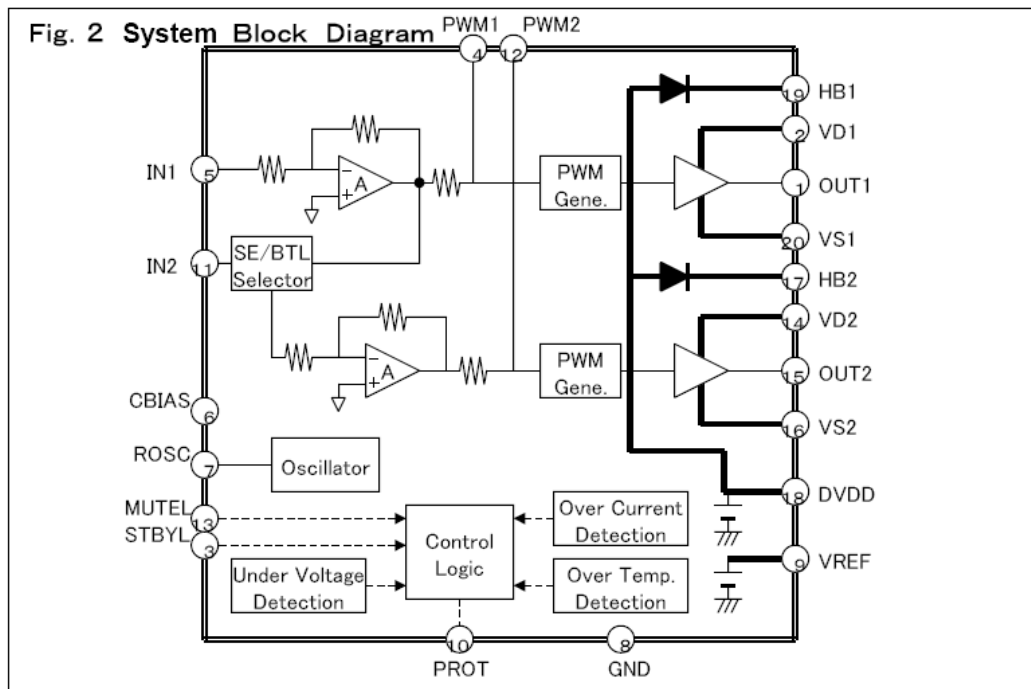
2, 31: other channels

17, 18:I2C SDA/SCL

32: Power Supply

4. RS15102

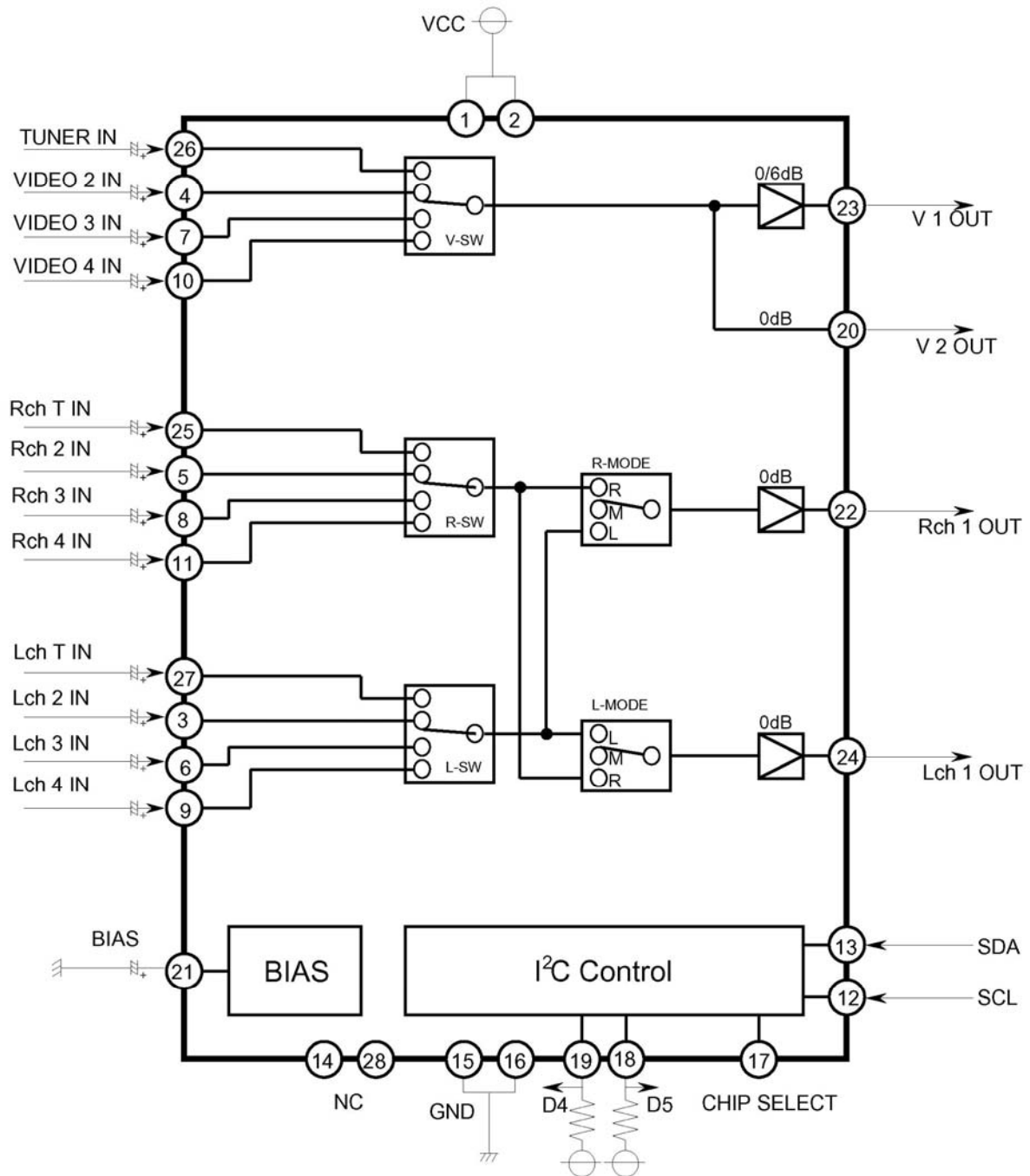
RS15102 is the high effective D type of power amplifier. The output power can reach 20W (10% THD+N) with 8-Ω speakers, +18V power supply, eliminating the need for heat sinks.



Pin description:

- 1: audio-out, left audio output
- 15: audio-out, right audio output
- 11: audio-in, left audio input
- 5: audio-in, right audio input
- 14: mute1

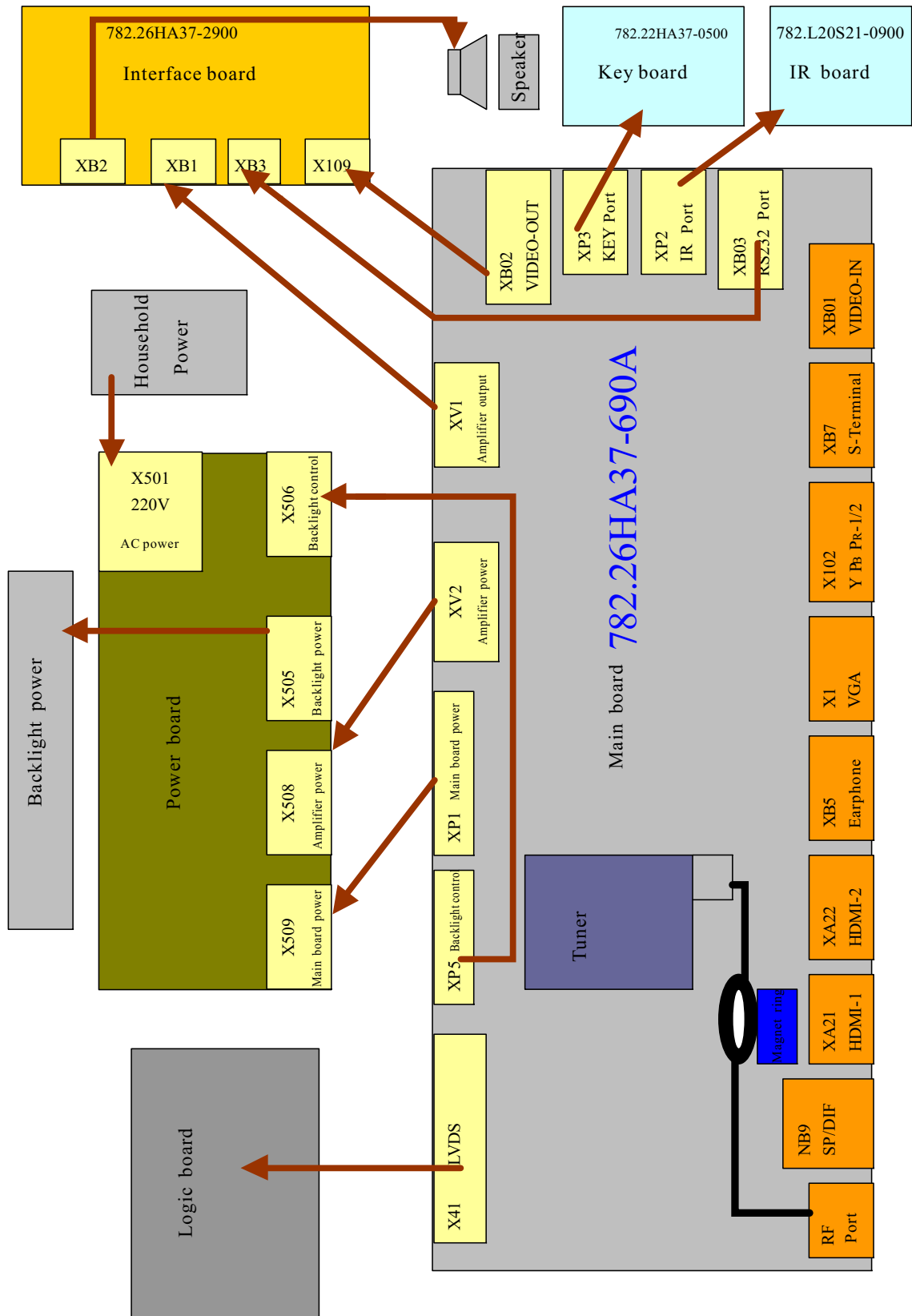
5. M52797SP AV switch with I2C bus control



Pin description:

1	VCC 9V	17	VIDEO OUT
2, 4	AV2 L R IN	19, 21	L R OUT
2	AV2 VIDEO IN	20	AV CVBS OUT
6	TV-CVBS IN	23	TUNER_IN
5, 7	Y Pr Pb1 L R IN	22, 24	TV L R IN
8, 10	Y Pr Pb2 L R IN	11, 12	SCL, SDA

Wiring diagram



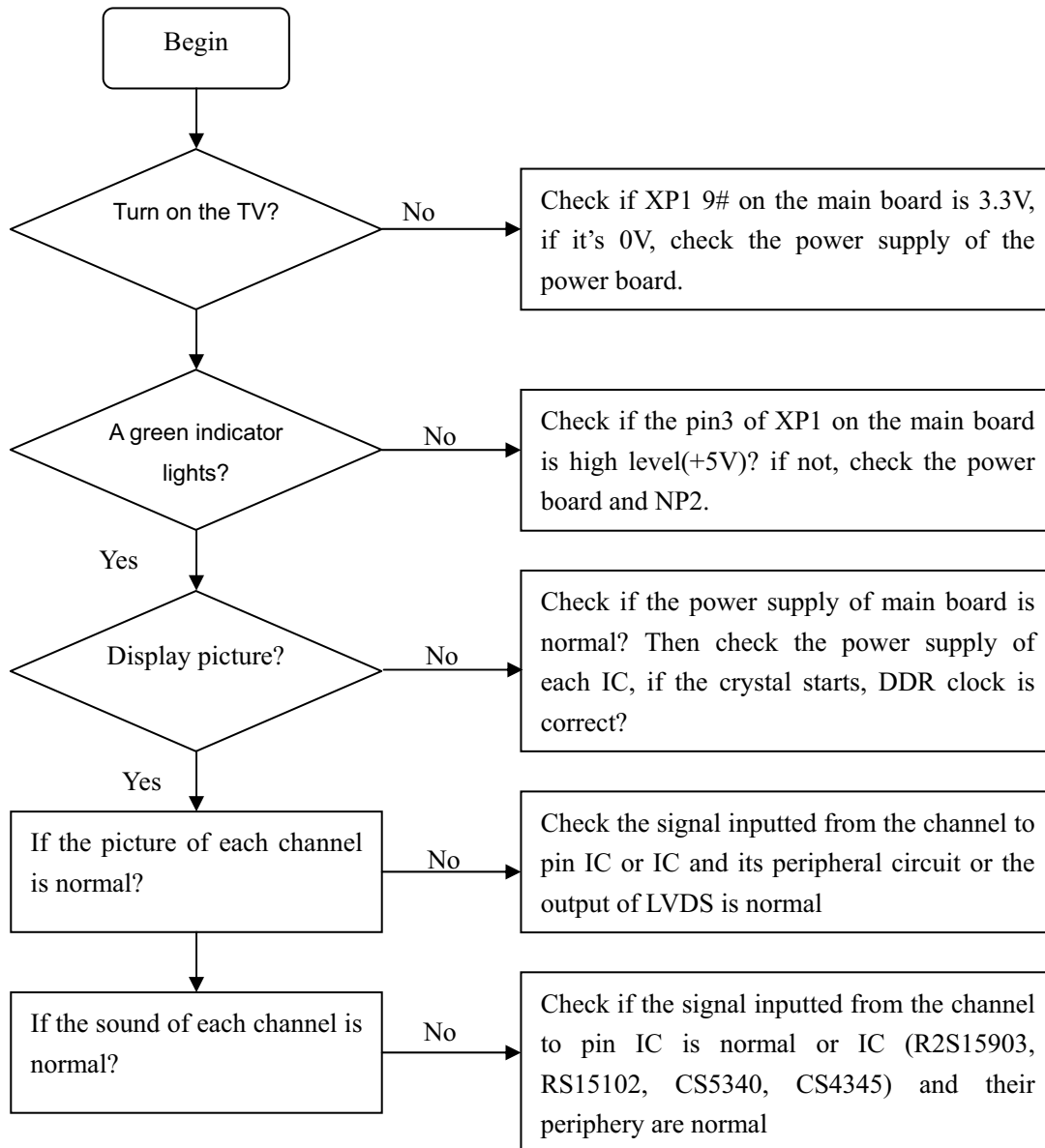
Identification criteria for the bright spot and dark spot of the LCD screen

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

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).

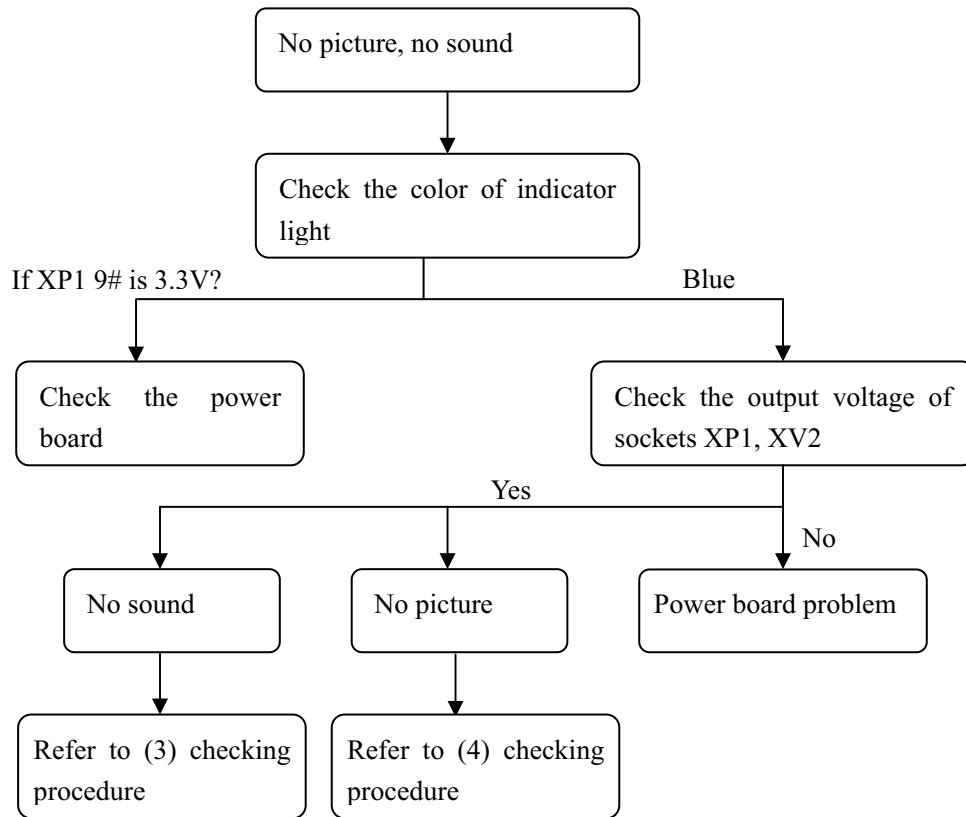
Troubleshooting guide



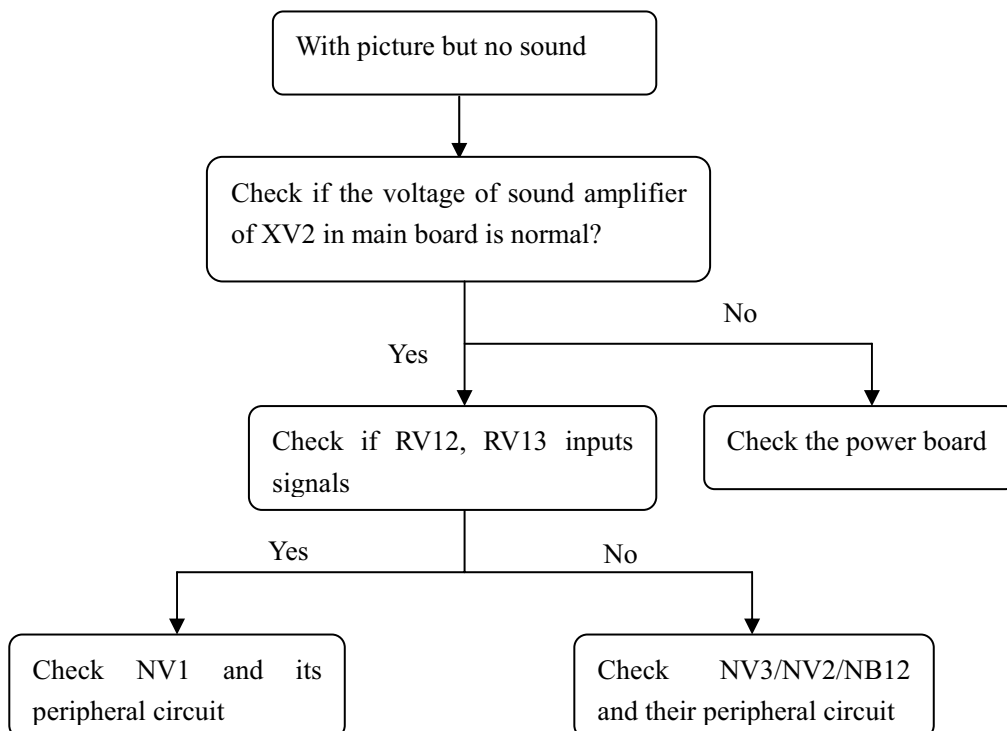
(1) abnormal picture

- a) Failure with RA125, RA124 on the main board, which may lead to panel abnormal
- b) A certain differential wire pair of LVDS of X41(RX0+/-, RX1+/-, RX2+/-, RX3+/-) is abnormal, which may lead to lack of color or color splash.,
- c) Failure with NA25, which may lead to loss of corresponding color from the gray degree corresponding to the picture of channel HDMI.
- d) Failure with NA102,NB21 and their peripheral circuit, which may lead to picture abnormal of PC, YPbPr and YCbCr.
- e) Failure with N100 on the image processing board, which may lead to picture abnormal in all channels.

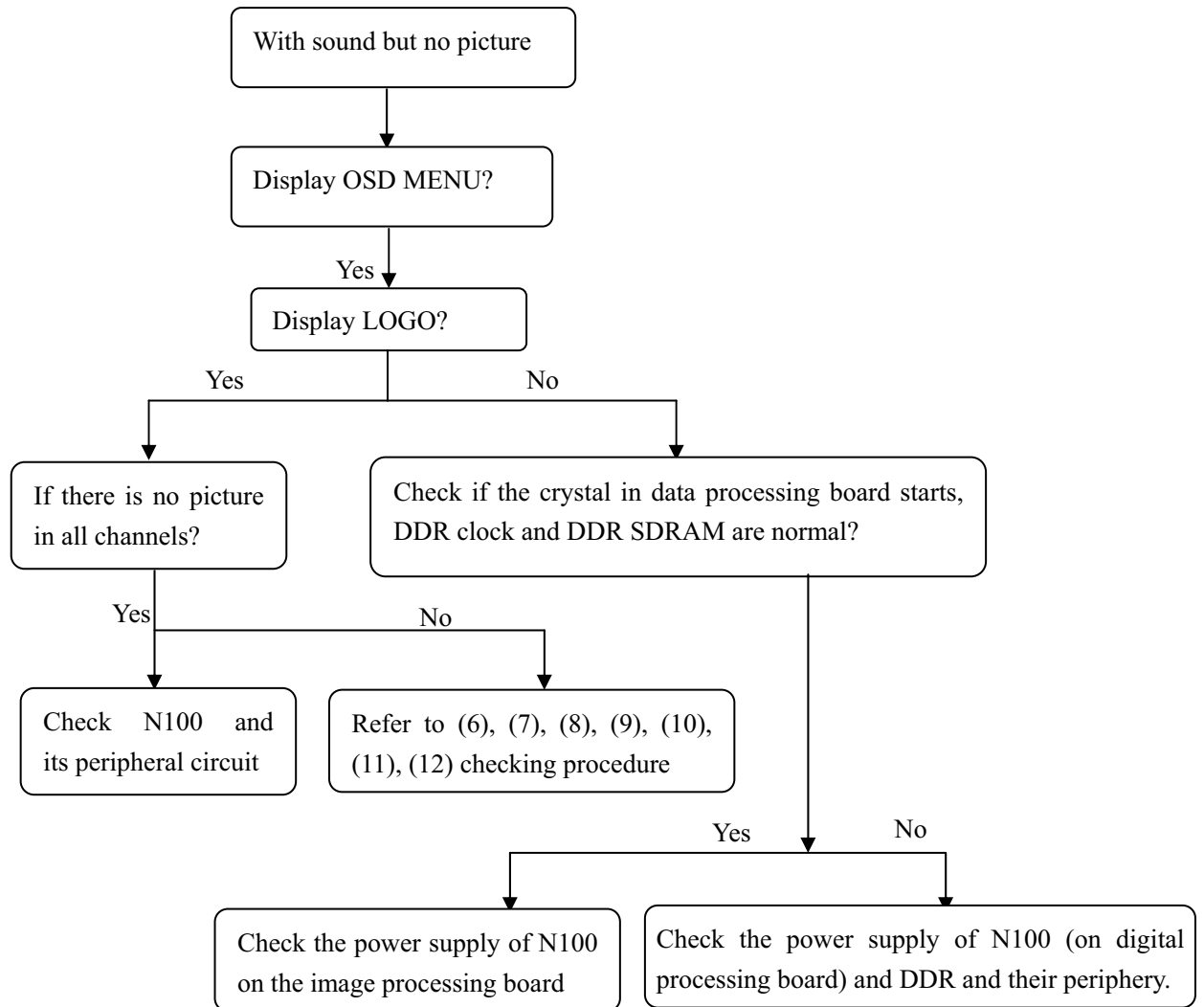
(2) no picture, no sound



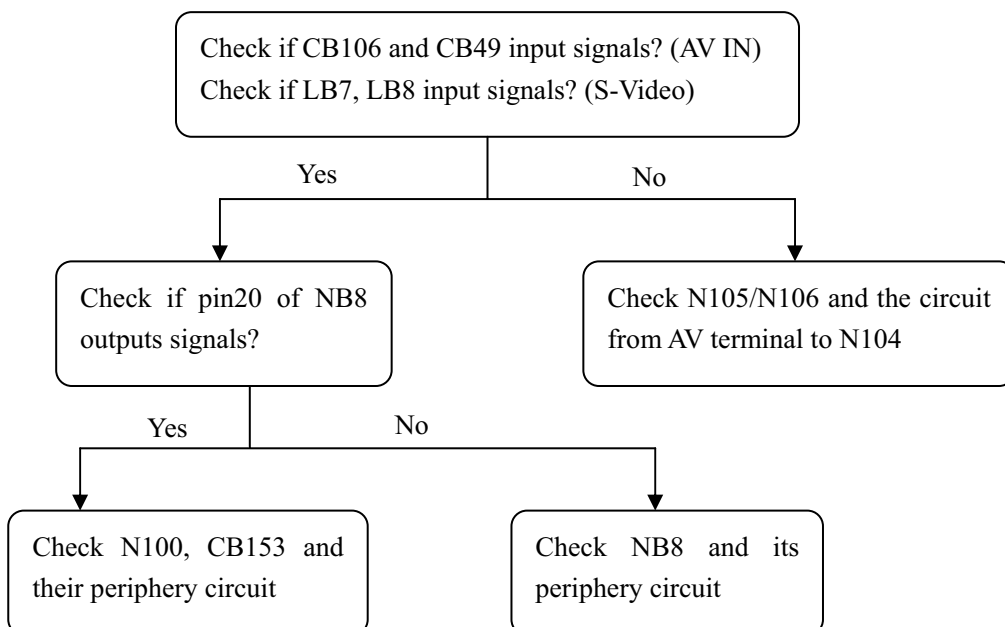
(3) with picture but no sound



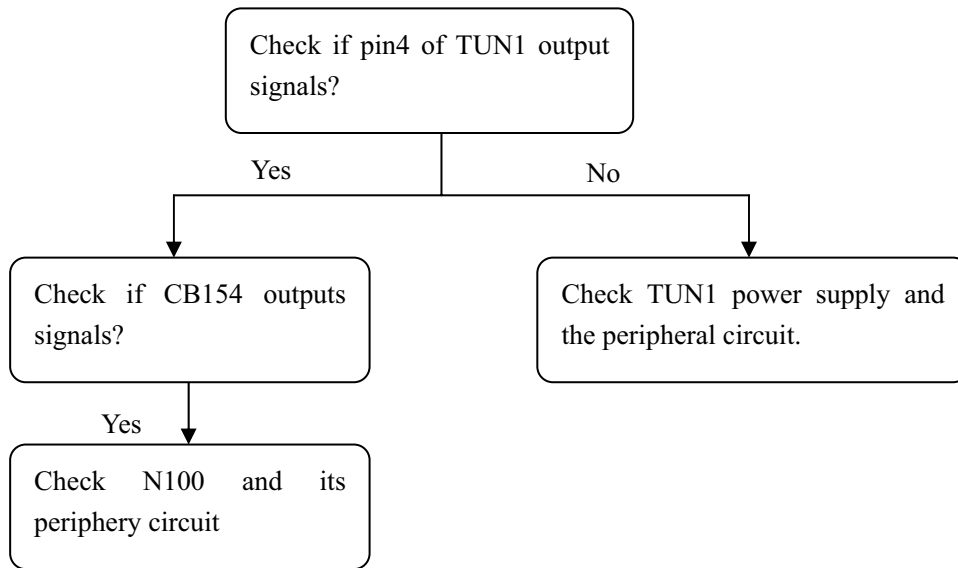
(4) with sound but no picture



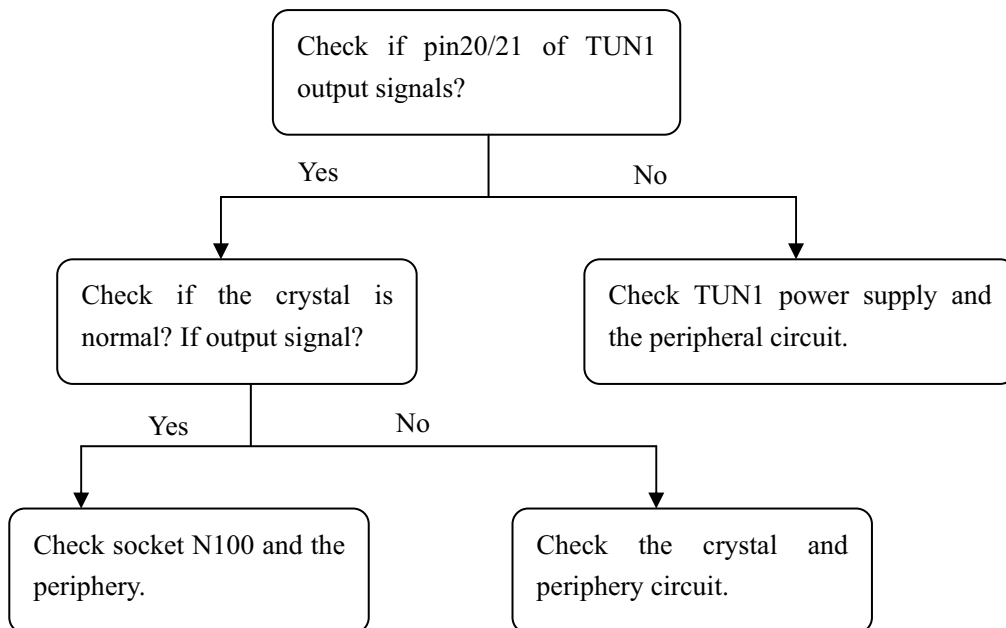
(5) S-Video or AV no picture



(6) NTSC channel no picture



(7) ATSC channel no picture

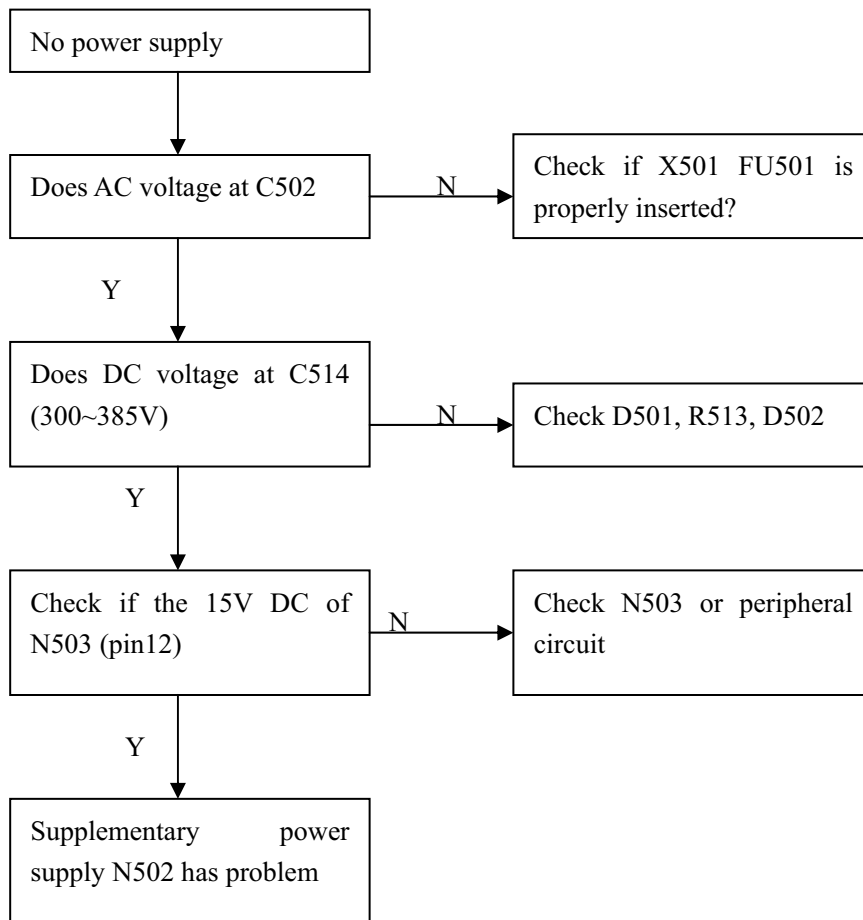


Note :

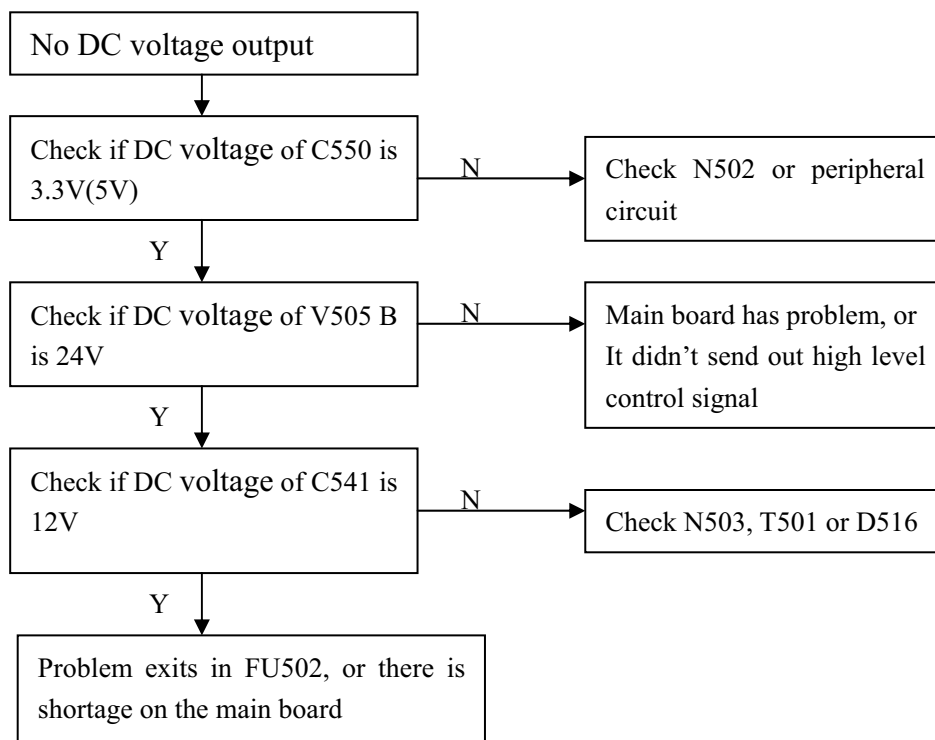
The I2C bus line control of TUNER is switch through the bus line of N228, so after checking the power supply and peripheral circuit of TUNER226, it is still no picture in NTSC and ATSC channel, please check N228 emphatically.

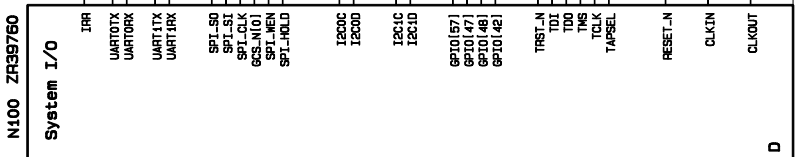
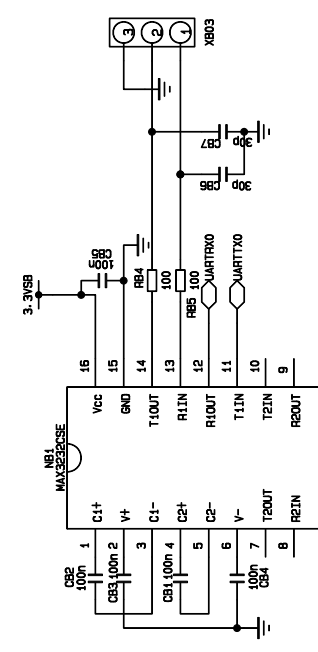
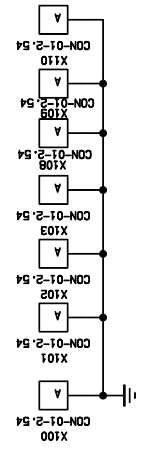
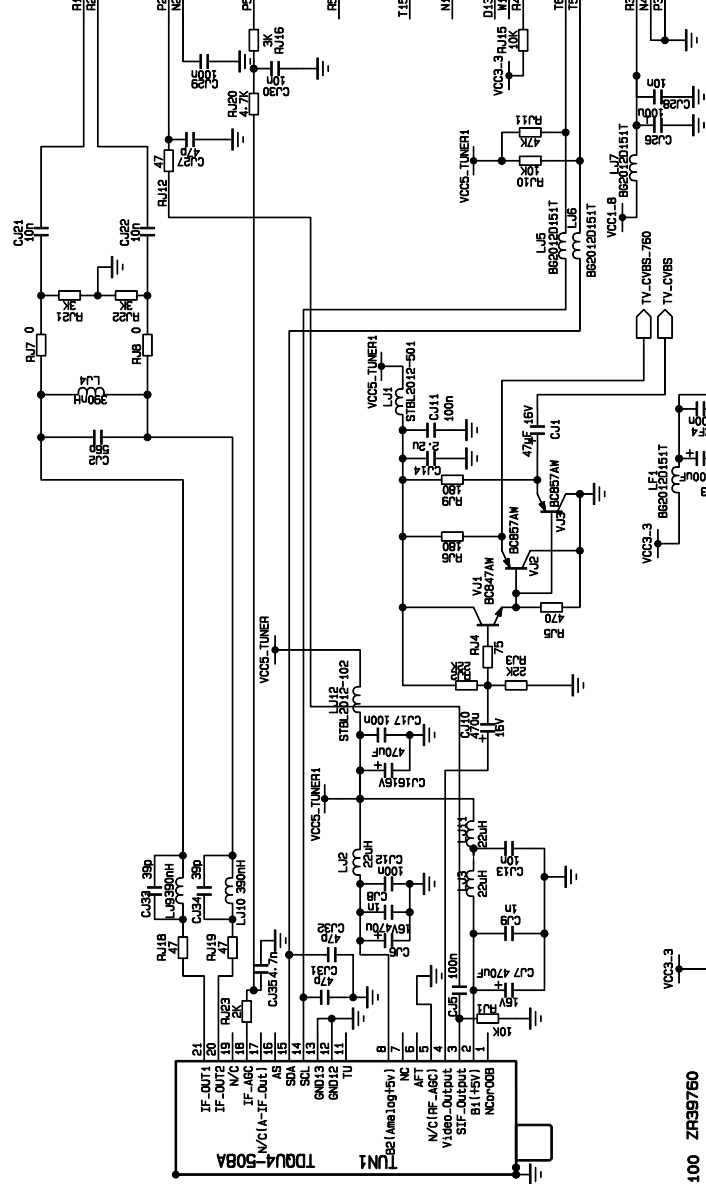
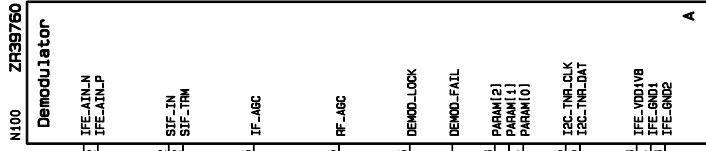
(8) Troubleshooting guide of power supply board

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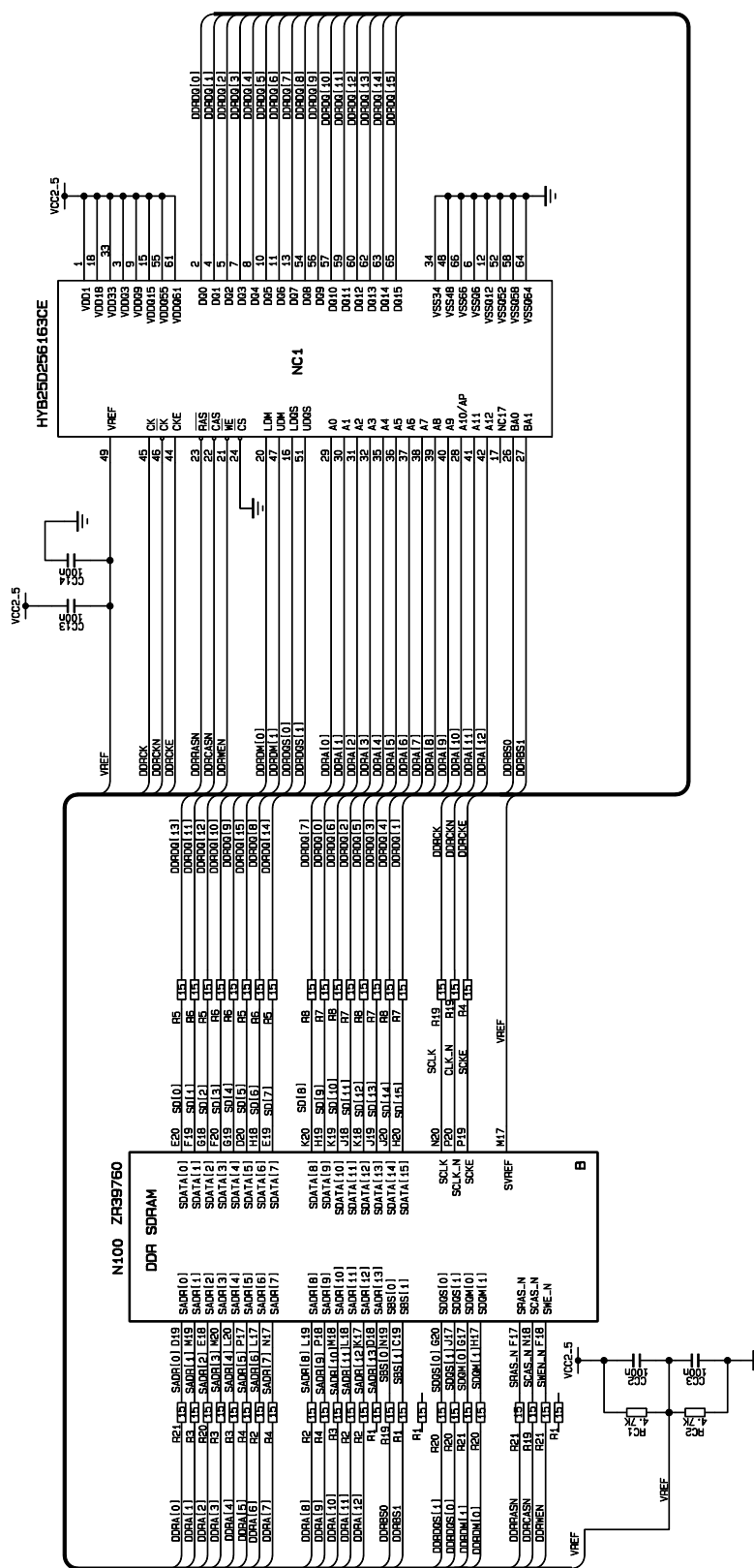
b. No DC voltage output



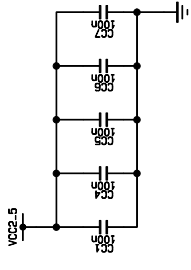
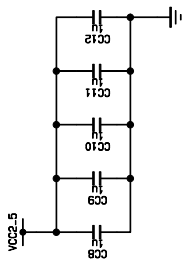


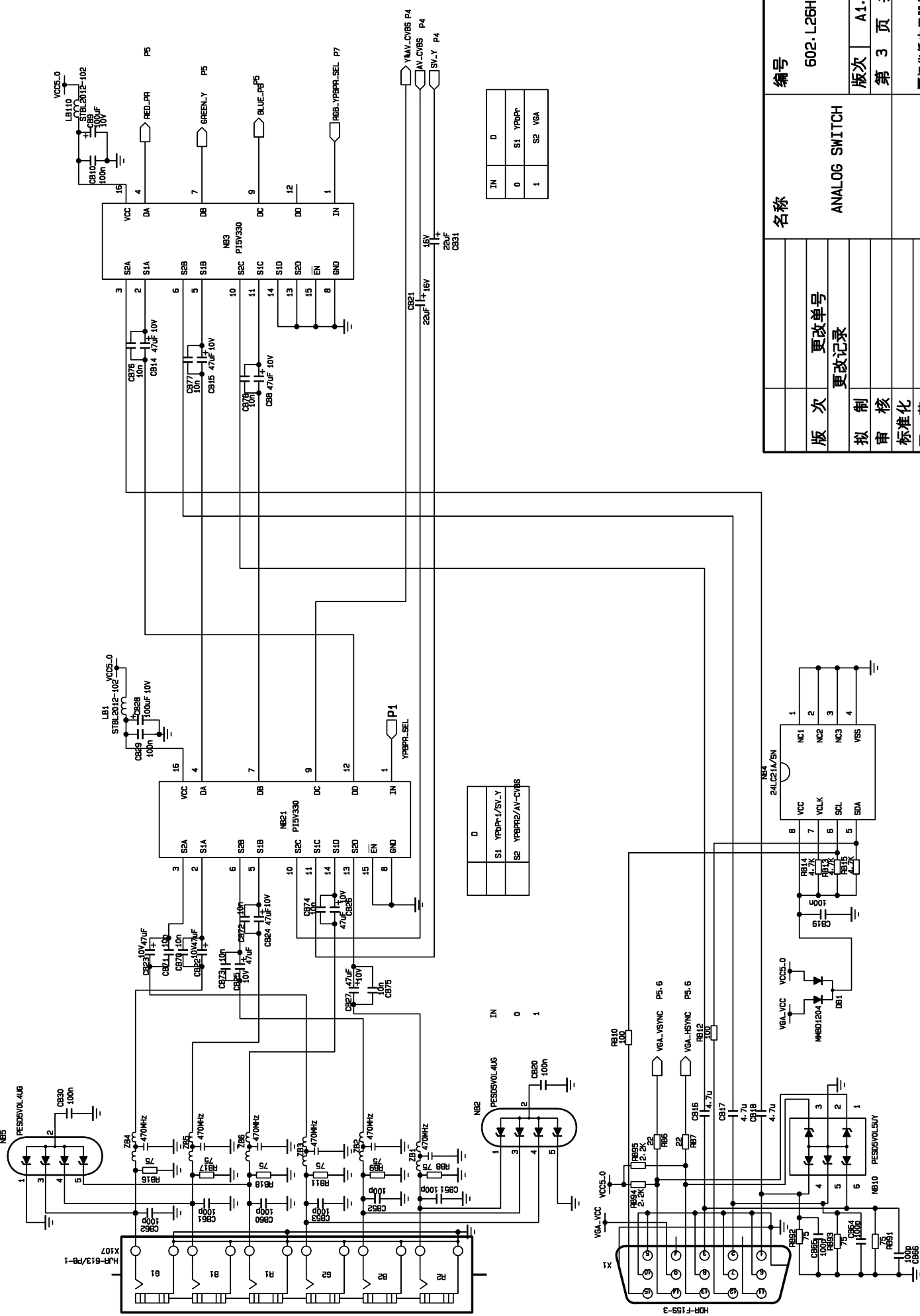
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第 1 页	共 10 页
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D



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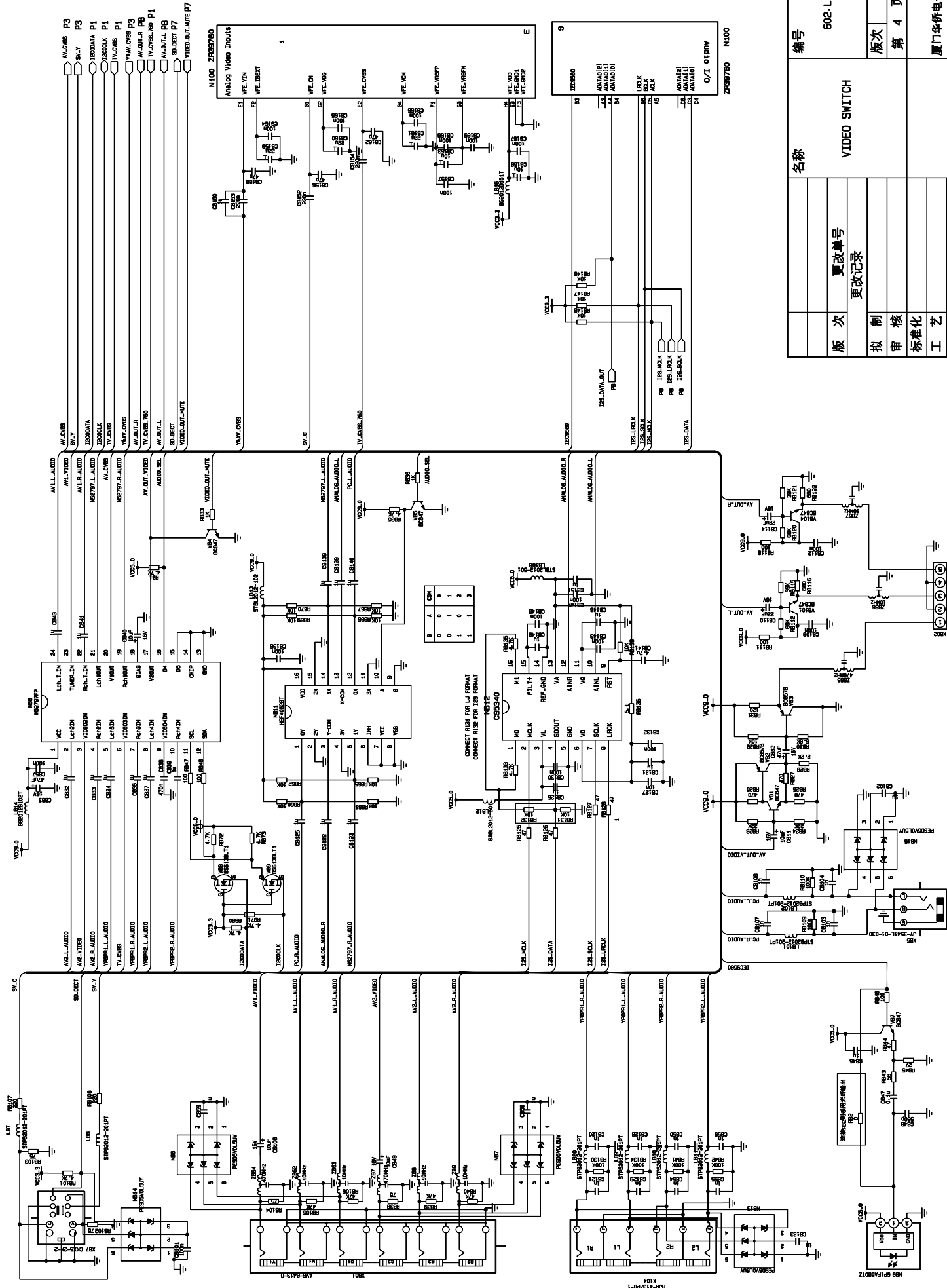




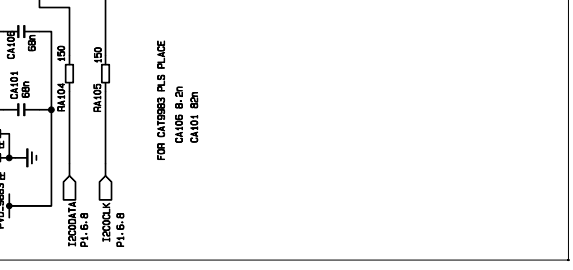
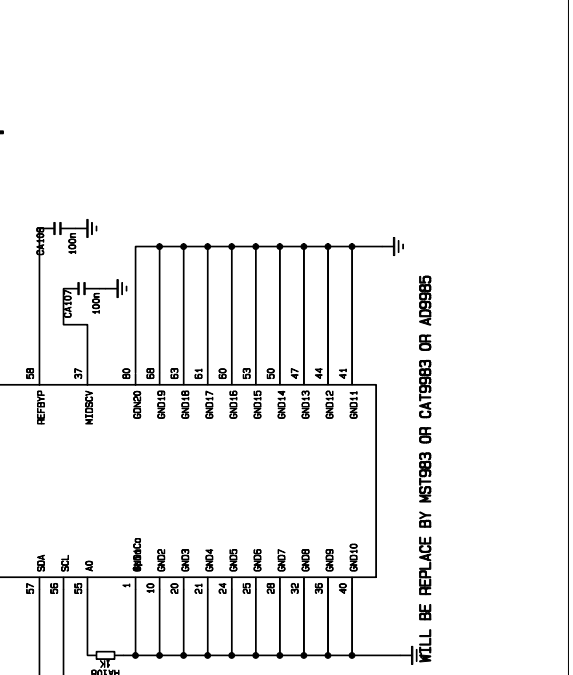
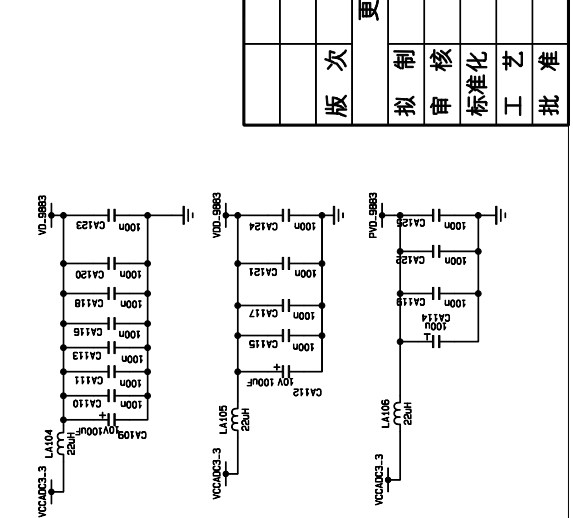
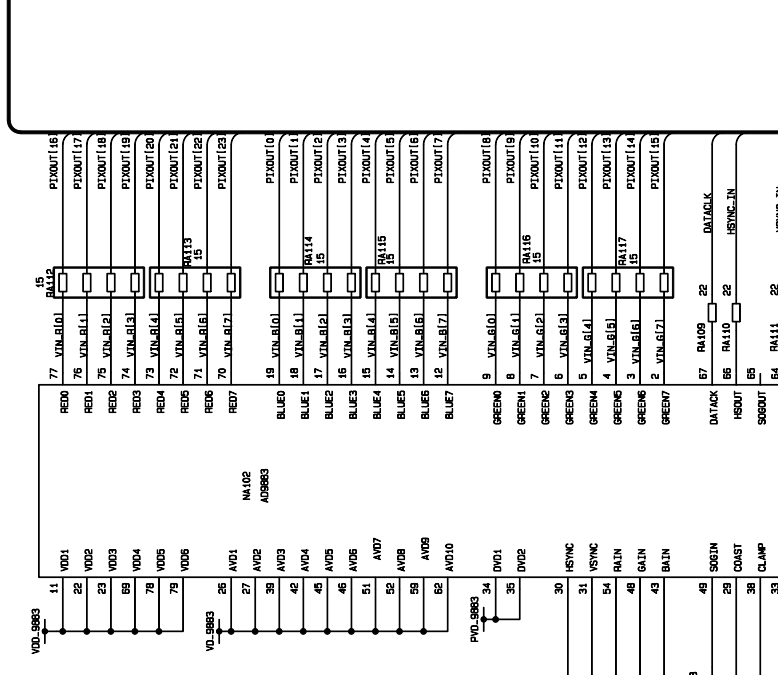
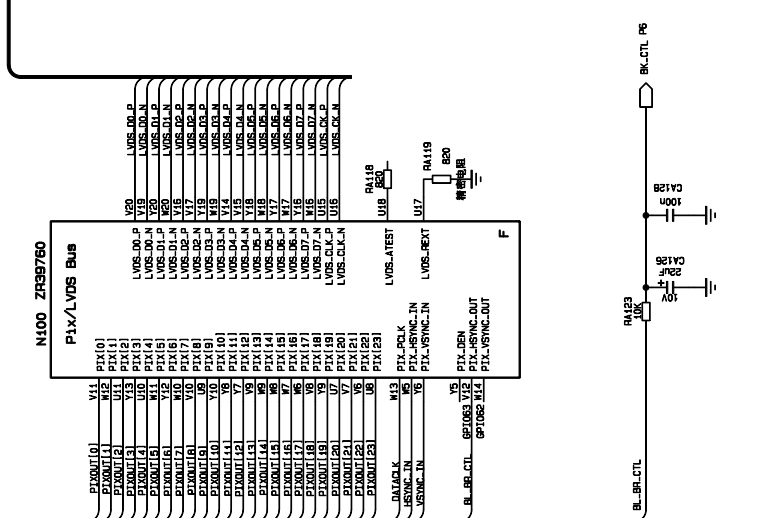
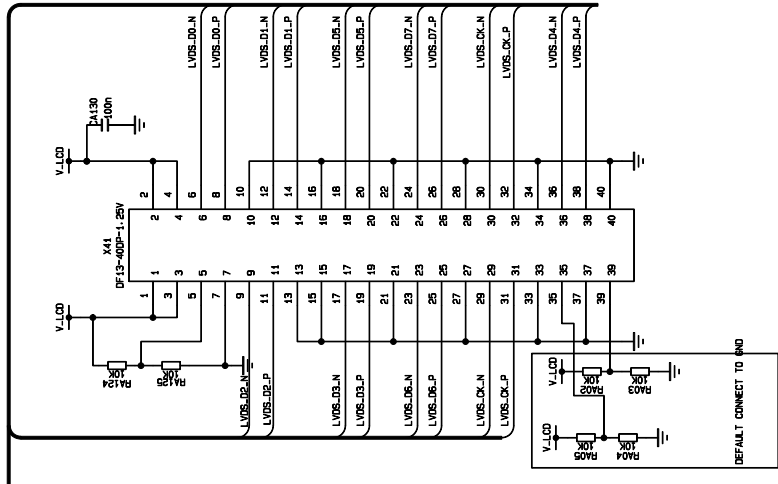
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1	S2 YPBP2/AV-CVBS

IN	D
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1	S2 YPBP2/AV-CVBS

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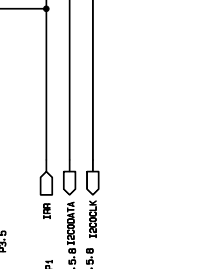
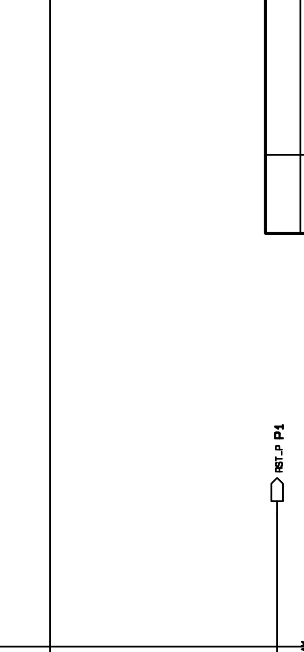
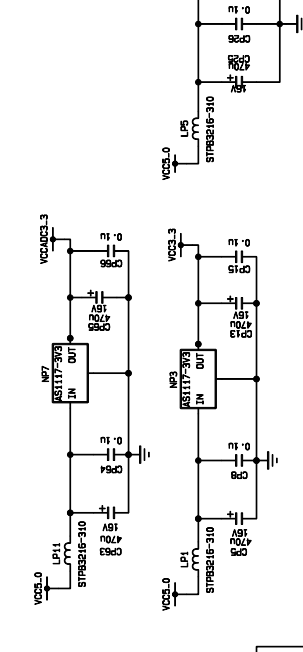
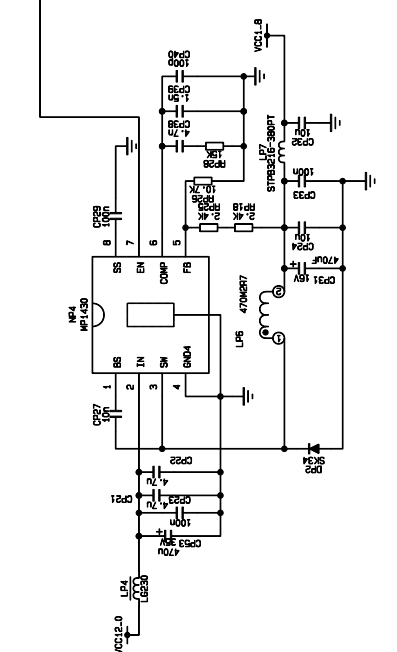
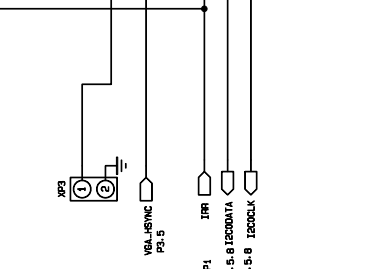
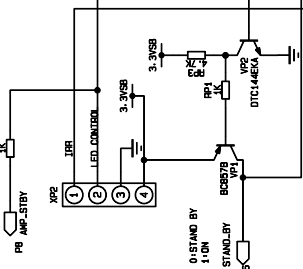
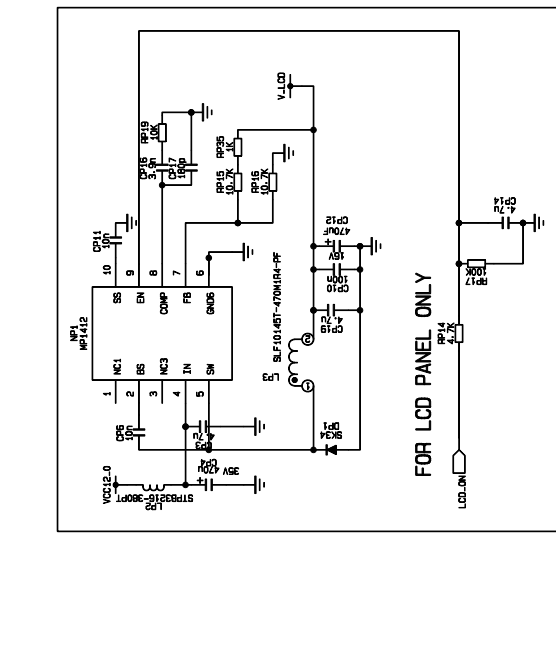
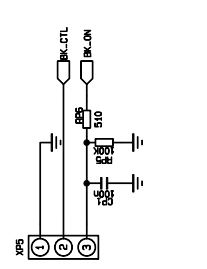
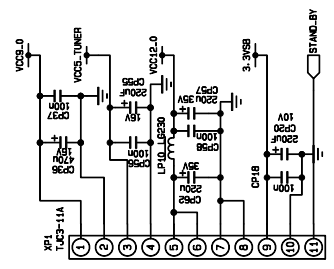
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WILL BE REPLACE BY MST983 OR CAT983 OR ADS985

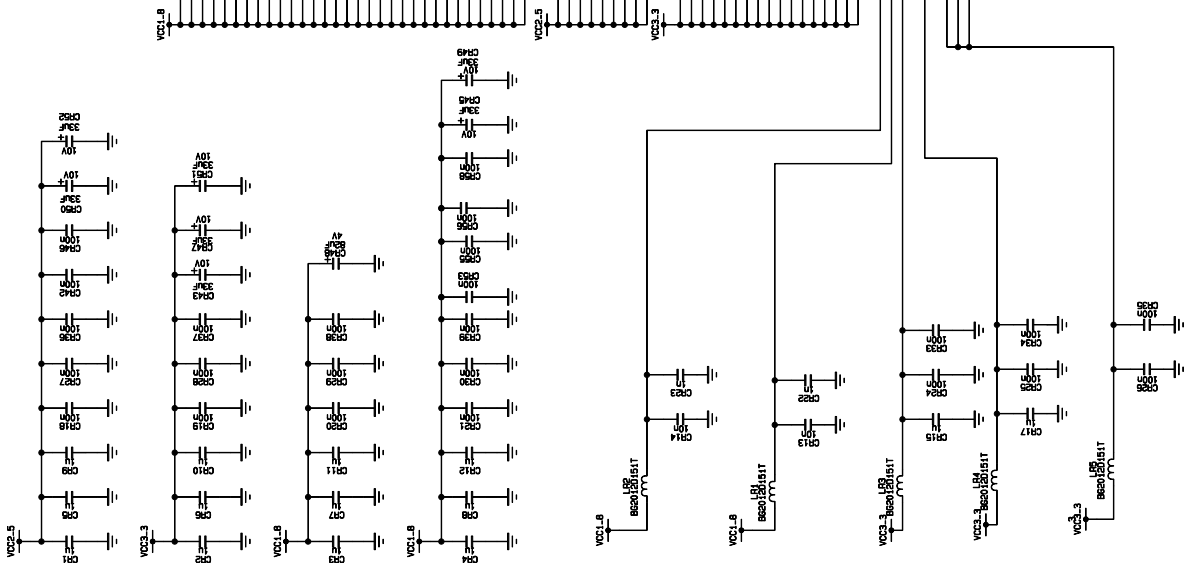
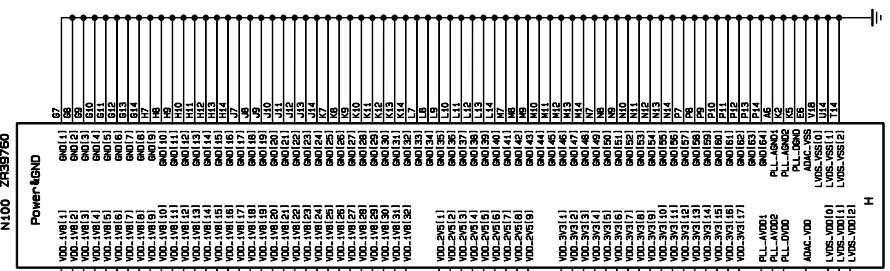
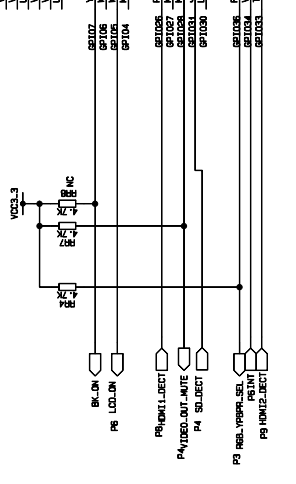
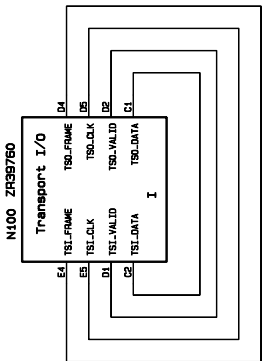
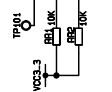
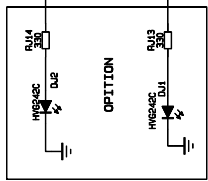
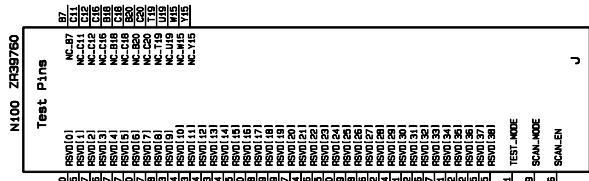
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CA101 15n



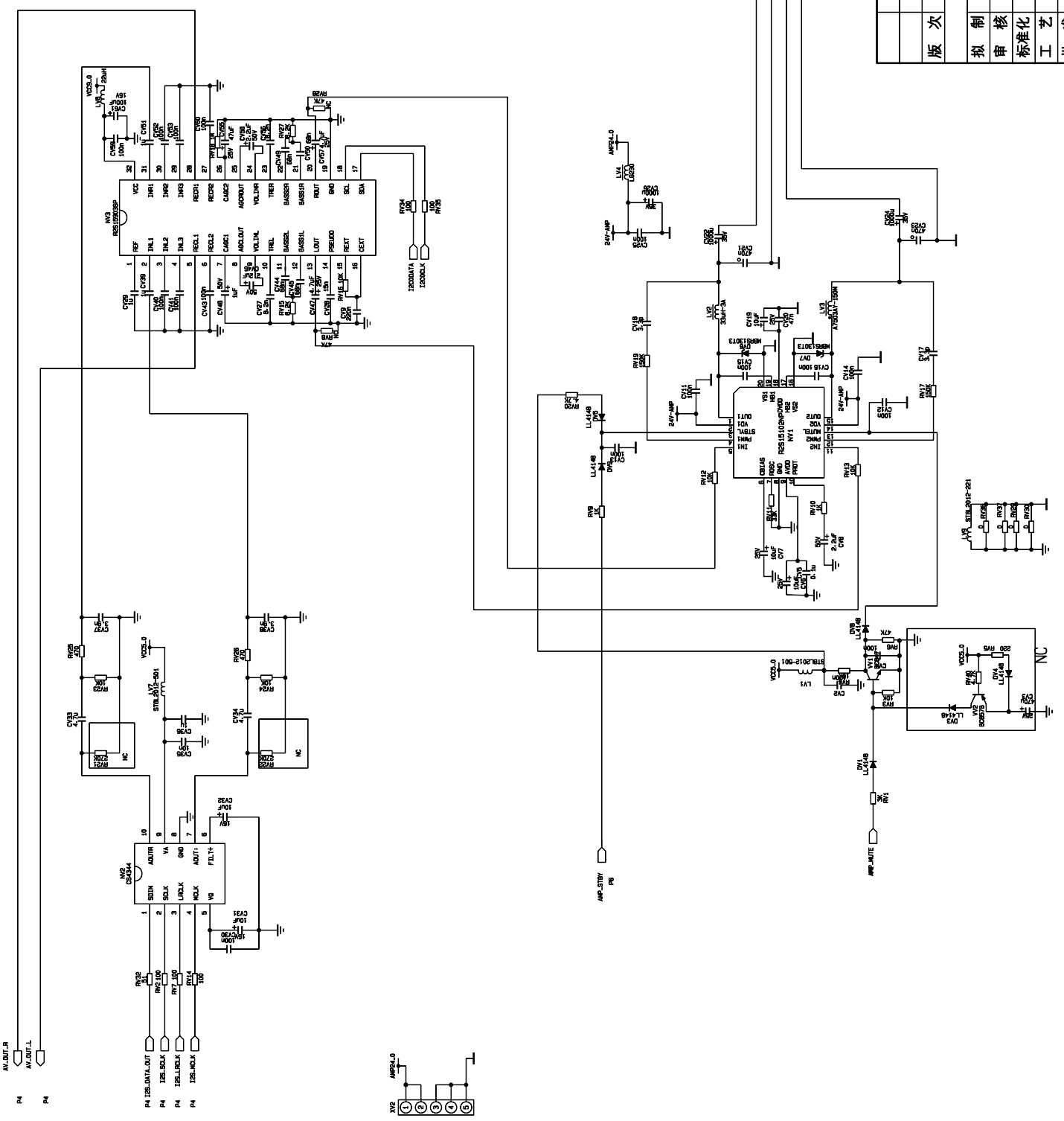
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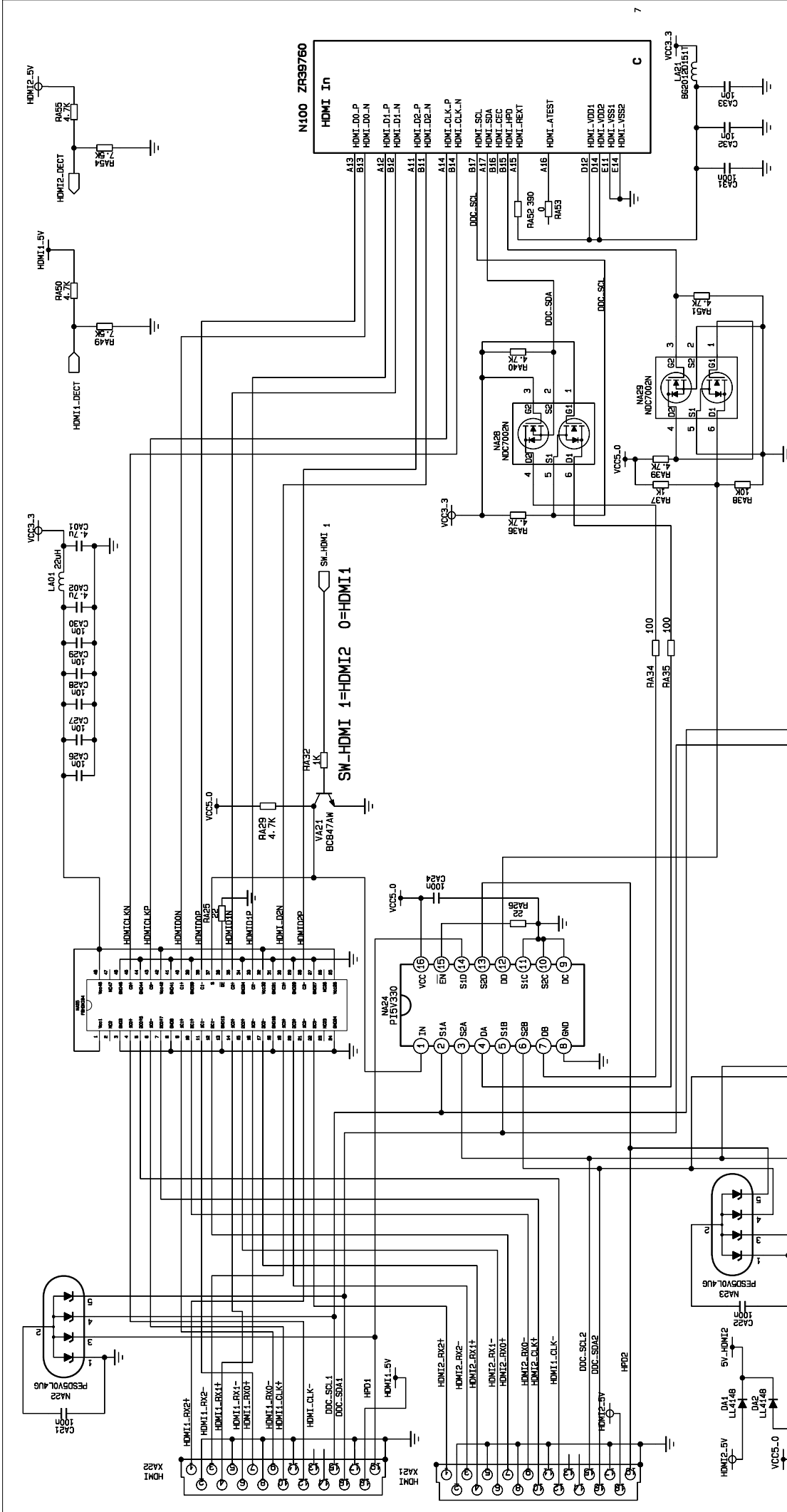
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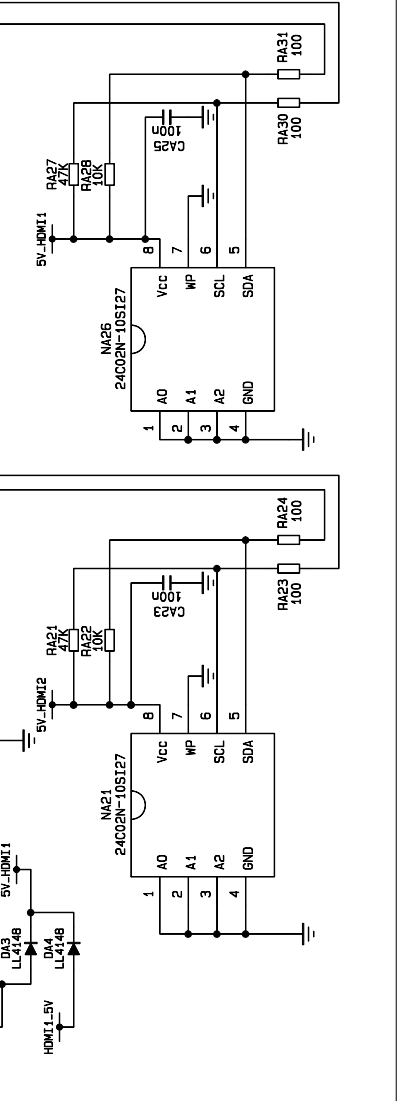
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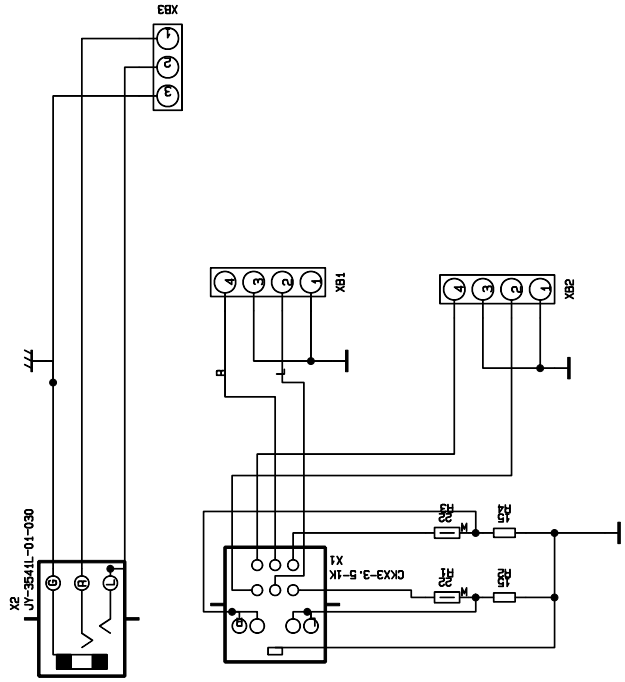
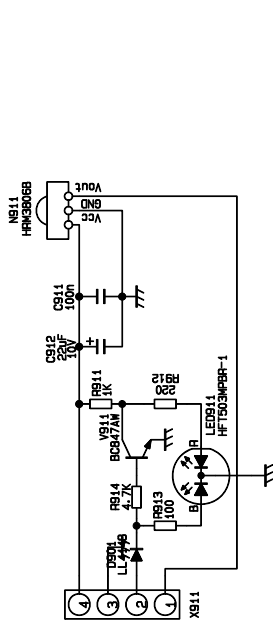
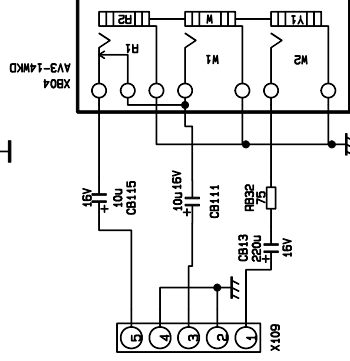
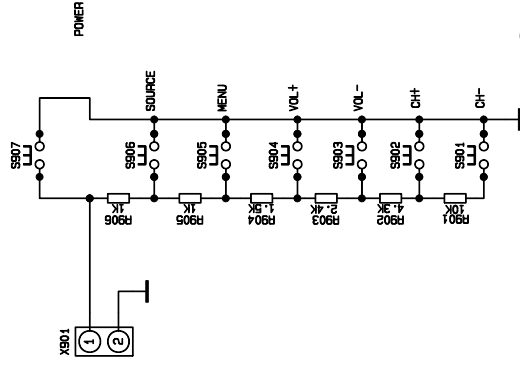


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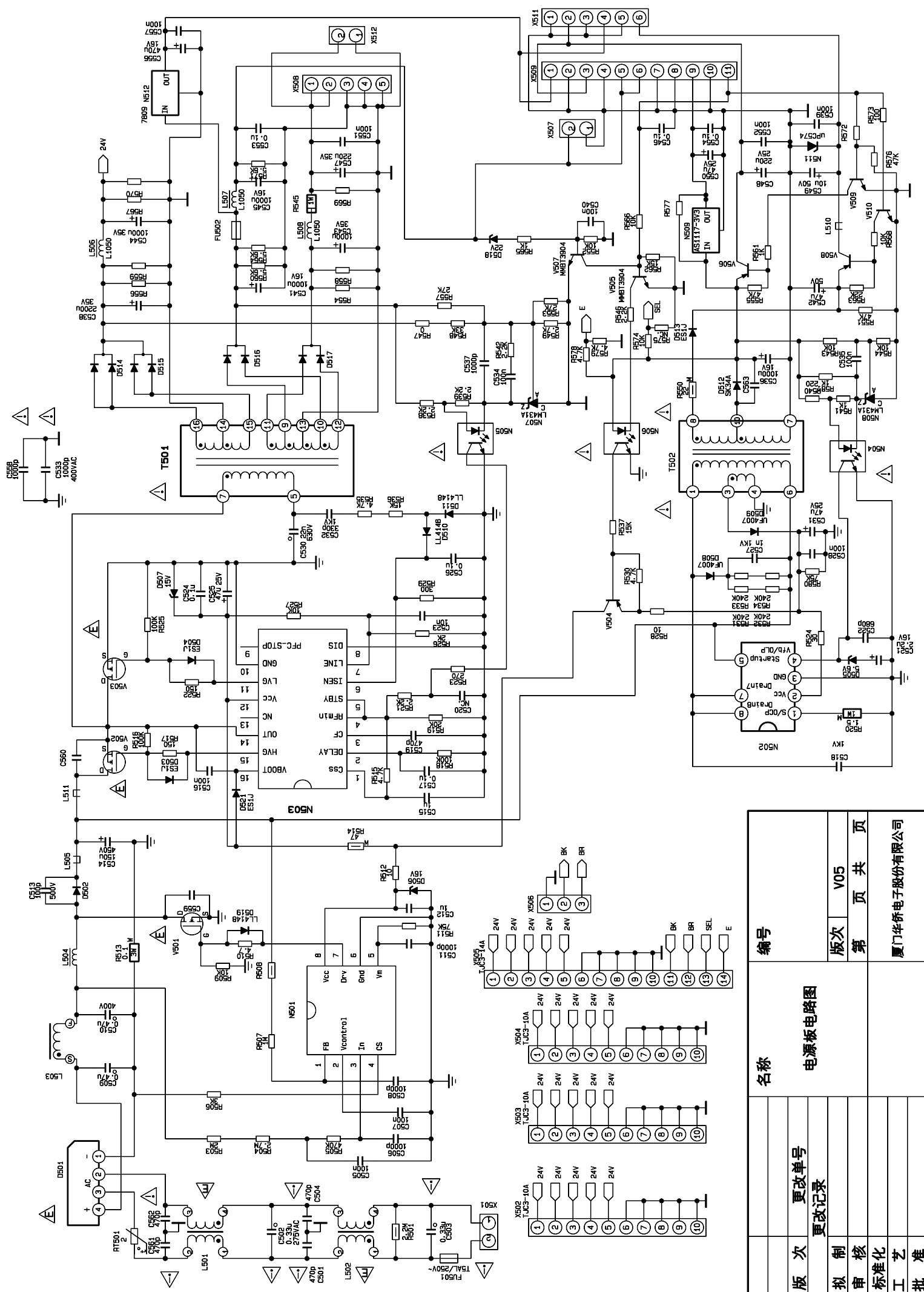


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标准化			
工艺			
批准			



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批准		厦门华桥电子股份有限公司	

APPENDIX-A: Main assembly

Model	Part name	No.
LC-37HA37	Key board	667.37HA37-05
	IR receiver board	667.26HA37-09
	Interface board	667.26HA37-29
	Digital processing board	667.37HA37-69
	Power board	667.37HA37-20
	Remote control	301.D26HA37-12A
	Panel	335.37019-00

