

DK1020S service manual

first draft

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Chapter One About Maintenance

1.1 Safety precautions

1.1.1 Power supply

When maintenance personnel are repairing DVD players, they should pay special attention to the power board with 220VAC and 330VDC which will cause hurt and damage to persons!

1.1.2 Precautions for anti-static

Movement and friction will both bring static electricity which causes serious damage to integrated IC. Though static charge is little, when a limited quantity of electric charge is added to large-scale integrated IC, as the capacitance is very small in the meantime, now the integrated IC is very much easy to be struck through by static electricity or the performance will decrease. Thus static electricity prevention is of extraordinary importance. The following are several measures to prevent static electricity:

1. Use a piece of electric conduction metal with the length of about 2 metres to insert into the earth, and fetch the lead wire from the top of the surplus metal and connect to the required static electricity device. The length and depth of the metal embedded under the earth should be determined according to the wettablity of the local soil. For humid places, it may be shorter, and longer and deeper for dry places. If possible, it can be distributed and layed in terms of “#” shape.

2. On operating table-board, the anti-static table cushion should be covered and grounded.

3. All devices and equipments should be placed on the anti-static table cushion and grounded.

4. Maintenance personnel should wear anti-static wristing which should be grounded.

5. Places around the operating positions should also be covered with electric conduction cushion or painted with anti-static paint.

1.1.3 Precautions for laser head

1. Do not stare at laser head directly, for laser emission will occur when laser head is working, which will hurt your eyes!

2. Do not use wiping water or alcohol to clean laser head, and you may use cotton swab.

1.1.4 About placement position

1. Never place DVD player in positions with high temperature and humidity.
2. Avoid placing near high magnetic fields, such as loud speaker or magnet.
3. Positions for placement should be stable and secure.

1.2 Maintenance method

1.2.1 Visualized method

Directly view whether abnormalities of collision, lack of element, joint welding, shedding welding, rosin joint, copper foil turning up, lead wire disconnection and elements burning up among pins of elements appear. Check power supply of the machine and then use hand to touch the casing of part of elements and check whether they are hot to judge the trouble spot. You should pay more attention when using this method to check in high voltage parts.

1.2.2 Electric resistance method

Set the multimeter in resistance position and test whether the numerical value of resistance of each point in the circuit has difference from the normal value to judge the trouble spot. But in the circuit the tested numerical value of resistance is not accurate, and the tested numerical value of integrated IC's pins can only be used for reference, so the elements should be broken down for test.

1.2.3 Voltage method

Voltage method is relatively convenient, quick and accurate. Set the multimeter in voltage position and test power supply voltage of the player and voltage of a certain point to judge the trouble spot according to the tested voltage variation.

1.2.4 Current method

Set the multimeter in current position and test current of the player of a certain point to judge the trouble spot. But when testing in current method, the multimeter should be series connected in the circuit, which makes this method too trivial and troublesome, so it is less frequently used in reality.

1.2.5 Cutting method

Cutting method should be combined with electric resistance method and voltage method to use. This method is mainly used in phenomena of short circuit and current leakage of the circuit. When cutting the input terminal voltage of a certain level, if voltage of the player rises again, it means that the trouble lies in this level.

1.2.6 Element substitution method

When some elements cannot be judged good or bad, substitution method may be adopted directly.

1.2.7 Comparison method

A same good PC board is usually used to test the correct voltage and waveform. Compared these data with those tested through fault PC board, the cause of troubles may be found. Through the above maintenance method, theoretical knowledge and maintenance experience, all difficulties and troubles will be readily solved.

1.3 Required device for maintenance

Digital oscilloscope (100MHz)

TV set

SMD rework station

Multimeter

Soldering iron

Pointed-nose pliers

Cutting pliers

Forceps

Electric screwdriver

Terminal connecting cord

Headphone

Microphone

Chapter Two Functions and Operation Instructions

2.1 Features

This player has employed the new generation DVD decode chip with built-in Dolby Digital decoder and which will bring you to a brand-new AV entertainment world. The 2-laser super error-correction mechanism supports CD-R/CD-RW.

2.1.1 Brand-new AV Effects

1. Progressive-scan video output to eliminate the flickers hardly overcome by interlaced scan and therefore your eyesight will be well-protected. At the same time, the picture definition is sharply enhanced and the pictures will be finer, smoother and stabler.
2. Channel audio power amplifier output.
3. Composite video, S-Video, Component video outputs.
4. Built-in Dolby Digital decoder.
5. Dolby output for 2 channel (DOWNMIX).
6. Digital karaoke enables singing easier.
7. DVD-Audio decoding output to reproduce original and realistic sound effects.
8. Compatible with DIVX MPEG4 discs to produce wonderful pictures.

2.1.2 High Quality Digital Audio

1. Optical and coaxial outputs for Digital/DTS audio.
2. DTS, Dolby Digital, PCM Digital audio outputs to satisfy the Fans' acoustic requirements.

2.1.3 Many Convenient Features

1. Screensaver protects your TV set carefully.
2. The novel MP3 playback window GUI provides you a new way to appreciate MP3 music.
3. Multi-angle playback function makes it possible for you to view a scene from different camera angles.
4. Direct entry into desired scenes (title/chapter/time/track search).
5. Multi-step zoom-in/zoom-out function providing you with brand-new enjoying means.
6. Capable of playing PAL/NTSC discs.

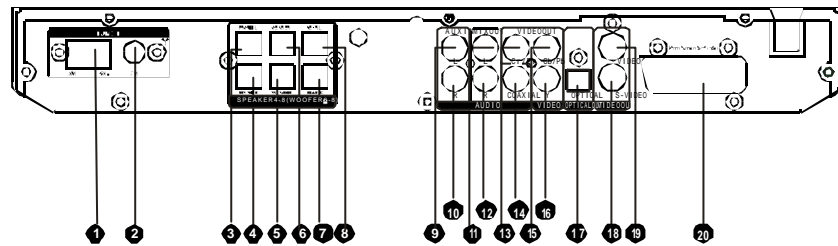
- 7. Multiple aspect ratios to fit TV sets of various screen ratios.
- 8. Parental lock function to prevent children from watching unsuitable discs.
- 9. Multiple dubbing languages and subtitle languages bring you the best entertainment status all the time.
- 10. FM/AM radio tuning function
- 11. AUX audio amplifying function to satisfy your demands.
- 12. Sleep timer function.

2.1.4 Super Compatibility with SVCD, VCD, CD, MP3, HDCD, KODAK PICTURE ECK etc.

NOTE: DivX version is still upgrading continuously and the latest version of this unit is DivX 5.1. Some discs are incompatible. Please take care when buying discs.

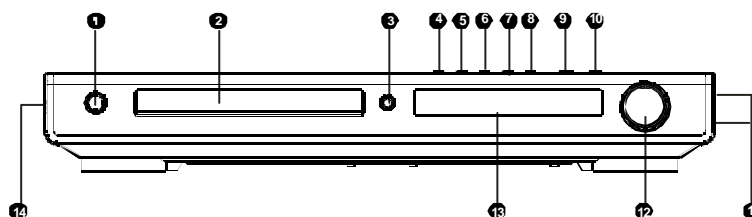
2.2 Control Button Locations and Explanations

2.2.1 Rear Panel Illustration



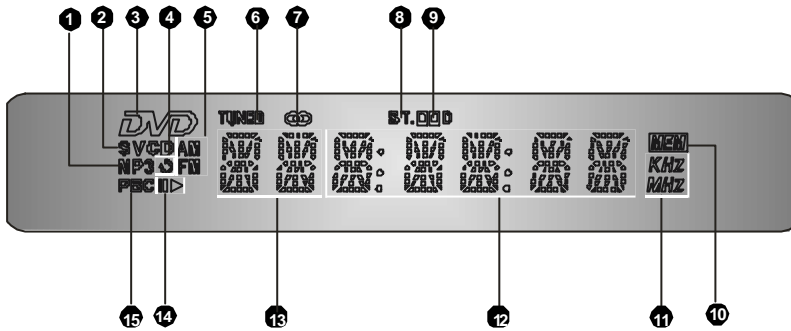
- | | | |
|---|--|--|
| <ul style="list-style-type: none"> ❶ AM Antenna jack ❷ FM Antenna jack ❸ FRONT Left speaker out jack ❹ FRONT Right speaker out jack ❺ SUBWOOFER Speaker out jack ❻ CENTER Speaker out jack ❼ SURROUND Right speaker out jack | <ul style="list-style-type: none"> ❽ SURROUND Left speaker out jack ❾ AUX In jack (L) ❿ AUX In jack (R) ⓫ Mixed Audio Out jack (L) ⓬ Mixed Audio Out jack (R) ⓭ Video Out jack (Cr/Pr) ⓮ Digital Audio Coaxial Out jack | <ul style="list-style-type: none"> ⓯ Video Out jack (Cb/Pb) ⓰ Video Out jack (Y) ⓱ Digital Audio Optical Out jack ⓲ Video Out jack (S-VIDEO) ⓳ Component Video jack ⓴ SCART out jack |
|---|--|--|

2.2.2 Front Panel Illustration



- ❶ POWER switch
- ❷ Disc tray
- ❸ OPEN/CLOSE button
- ❹ DVD mode: prev button
Tuner mode: preset "-"
- ❺ DVD mode: next button
Tuner mode: preset "+"
- ❻ DVD mode: REW button
Tuner mode: TUNING "-"
- ❼ DVD mode: FWD button
Tuner mode: TUNING "+"
- ❽ FUNCTION button
- ❾ PLAY/PAUSE button
- ❿ STOP button
- ⓫ KARAOKE jack 1.2
- ⓬ VOLUME knob
- ⓭ VFD display window
- ⓮ EARPHONE jack

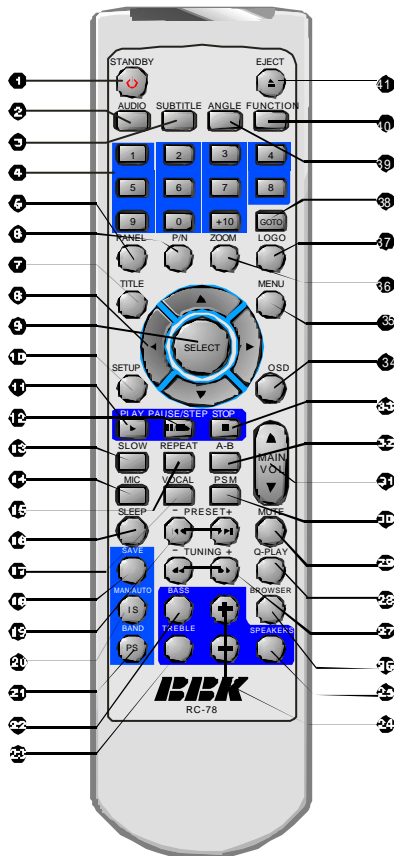
2.2.3 VFD Display Window Illustration



- ❶ MP3 disc
- ❷ CD, VCD or SVCD
- ❸ DVD disc
- ❹ Repeat
- ❺ AM/FM indicator
- ❻ Radio status indicator
- ❼ Tuning status indicator
- ❽ Stereo indicator
- ❾ Dolby digital

- ⓫ Station-memorizing indicator
- ⓬ Playback time
- ⓭ Play or Pause
- ⓮ Radio frequency unit indicator
- ⓯ Chapter or Track
- ⓰ PBC

2.2.4 Remote Control Illustration



- ❶ STANDBY button
Enter or exit the standby mode.
- ❷ AUDIO button
Change the audio language.
- ❸ SUBTITLE button
Change subtitle languages/Switch JPEG display modes
- ❹ NUMBER button (0 ~ 9, +10)
- ❺ PANEL button
Open/close the languages/Switch JPEG display modes.
P/N button
- ❻ Switch the TV system between PAL, NTSC and AUTO.
- ❼ TITLE button DVD titles
- ❽ DIRECTION ARROWS
UP/DOWN/LEFT/RIGHT DIRECTION ARROW
- ❾ SELECT button
- ❿ SETUP button
Function setup
- ⓫ PLAY button
Normal playback
- ⓬ PAUSE/STEP button
Pause playback/Step forward playback
- ⓭ SLOW button
Slow playback
- ⓮ MIC button
Karaoke operation menu.
- ⓯ REPEAT button
Repeat playback

- 16 SLEEP button
Sleep timer
- 17 VOCAL Button
Select the karaoke singing-along mode
- 18 SAVE button
Station saving button, up to 20 FM/AM stations can be saved respectively
- 19 PRESET +/- button
Select the preset channels
PREVIOUS/NEXT button
Select previous/next chapter or track when playing
- 20 MAN/AUTO button / IS button
Auto Manual switch / Switch video to the interlacing mode
- 21 BAND button / PS button
FM/AM switch / Switch video to the progressive Y/Pb/Pr
- 22 BASS button
Select bass
- 23 TREBLE button
Select treble
- 24 +/- Button
Increase/decrease power amplifier's bass/treble/channel volume
- 25 SPEAKERS button
Select power amplifier's channel volume
- 26 BROWSER button
Switch new user interface

- 27 TUNING +/- buttons
Tuning up/down stations
- 28 Q-PLAY Button
Skip the advertisement/warning and play the DVD directly
- 29 MUTE button
Turn off/on audio outputs
- 30 PSM button
Power Spectrum Meter on/off
- 31 MAIN VOL +/- button
Increase/decrease power amplifier's main volume.
- 32 LOGO button
Set the played image as the power-on logo
- 33 A-B button
Repeat the selected section A-B
- 34 GOTO button
Play from the desired point
- 35 STOP button
Stop playback
- 36 ANGLE button
Camera angles switch, MP3/JPEG playback modes switch
- 37 OSD button
Display the disc information
- 38 FUNCTION button
DISC/RADIO/AUX IN switch
- 39 MENU button
Display the disc menu, PC ON/OFF
- 40 EJECT button
Open/Close the disc tray
- 41 ZOOM button
Zoom in/out the playing frame

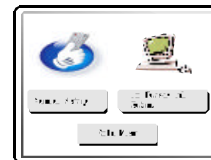
2.2.5 Accessories

Audio/Video Cord	1 pcs
AM Antenna	1 set
FM Antenna	1 set
Remote Control	1 pcs
7 "AAA" Size Batteries	2 pcs
Warranty Card	1 pcs
User Manual	1 pcs
Audio Cords for phone jack	1 pcs
2ms speaker cords	4 pcs

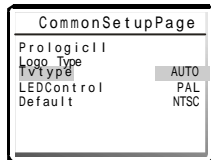
2.3 FUNCTION SETUP

2.3.1 Basic Steps of Function Setup

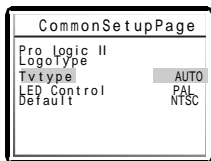
1. Press the SETUP button and the screen displays the selection menu of function setup.



2. Press the CURSOR button to select the menu to be entered and press the SELECT button to confirm; or press the CURSOR button to "exit the setup menu" and then press the SELECT button to exit. If you just need general setup, please select "Common Setup". If you need professional setup, please select "Professional Setup".
3. Press UP/DOWN Arrow to select the desired item you want to set and press SELECT. For example, press UP/DOWN Arrow to select TVTYPE and press SELECT.

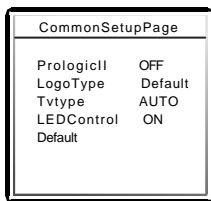


4. Press UP/DOWN arrow to select the desired value. Press SELECT to confirm it.
 For example: Press UP/DOWN arrow to select "AUTO", then press select, the TV screen displays:



5. Press SETUP to exit the setup menu.

2.3.2 Common Setup



1. PRO Logic 11: This item is used to setup the CyberLogic. If the disc does not support this function, the effect will be worse after processed like this and it is suggested to be OFF.
 Optional settings: ON, OFF, AUTO.
 Default: OFF.

2. Logo Type: This item is used to setup the sort of Power-in Logo.
 Optional settings: Default, Captured.
 Default: Default

NOTE:

The Screen Logo refers that use the image selected by pressing the LOGO button as the power-on logo. When in the operation of changing screen, if the power-on logo has not set in Screen Logo, the unit will automatically set the power-on logo as Screen Logo.

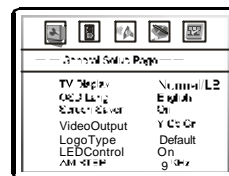
3. TV Type: This item is used to set the video output system of this unit.
 Optional settings: AUTO, PAL, NTSC
 Default: AUTO

4. LED Control: Setup item applied to control On/Off playback LED on the front panel.
 Optional settings: OFF, ON
 Default: ON

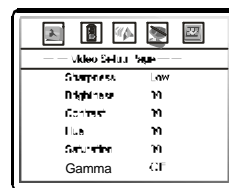
5. Default: To restore all settings to the default value except for the parental control and password settings.

2.3.3 General Function Setup Steps

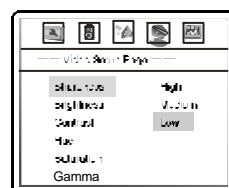
1. Press SETUP button, The TV sets screen displays:



2. Press LEFT/RIGHT arrow to select the desired channel to be changed. For example, if you want to set this player's video, please press LEFT/RIGHT arrows to select VIDEO SETUP PAGE. Press SELECT for verification. The video setup page displays on the screen.



3. Press UP/DOWN arrow to select the desired item you want to set and press SELECT.
 For example, press UP/DOWN arrow to select SHARPNESS and press SELECT. The sharpness appears on the screen.



4. Press UP/DOWN Arrow to select the desired value. Press SELECT to confirm it.

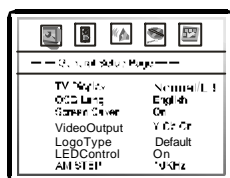
For example: Press UP/DOWN Arrow to select "Medium", then press select, the TV screen display:



5. Press SETUP to exit the setup menu.



2.3.4 General Settings



1. TV Display: To set the aspect ratio of this player's output image.

Optional

settings: NORMAL/PANSCAN, NORMAL/LETTER BOX, WIDE.

Default: NORMAL/LETTERBOX.

NOTES

The playing effects are contingent upon the disc's recording aspect ratio. Some discs may not be played according to your selected aspect ratio.

WIDE is only applicable to the WIDE TV.

Please select the aspect ratio in accordance with that of your TV.

2. OSD Lang: This item is used to set the prompt language of the screen.

Optional settings: ENGLISH, RUSSIAN

Default: ENGLISH

3. Screen Saver: Open or close the screen saver function.

Optional settings: OFF, ON.

Default: ON.

4. Video Output: To set the types of the SCART output connector.

Optional settings: YCbCr, RGB.

Default: YCbCr.

When using RGB outputs from the SCART interface, please select RGB. OTHERWISE, PLEASE SELECT YCbCr.

5. Logo Type: This item is used to set the sort of Power-in Logo.

Optional settings: Default, Captured.

Default: Default

NOTE:

The Screen Logo refers to the image selected by pressing the LOGO button as the power-on logo. When in the operation of changing screen, if the power-on logo has not set in Screen Logo, the unit will automatically set the power-on logo as Screen Logo.

6. LED Control: Setup item applied to control On/Off playback LED on the front

Optional settings: OFF, ON

Default: ON

2.3.5 Speaker Setup



1. Downmix Mode: To set this player's

DOWNMIX mode to change multi-channel audio into two channel audio.

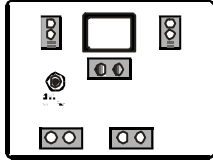
Optional settings: LT/RT, STEREO, V

SURR, 5.1CH MODE

Default: 5.1CH

NOTES

The 5.1CH mode needs disc ' s support. The number of actual output channels depends on the played disc.



2. Channel Delay: To set delay time of the Center/Surround/Subwoofer Speaker.

A. Press UP/DOWN navigation keys to select the delay setting item. Press the SELECT navigation key to enter the setting box.

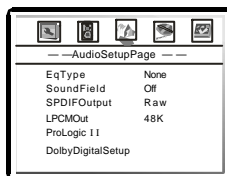
B. Press UP/DOWN navigation keys to select the desired item, then press LEFT/RIGHT navigation keys to set the distance between the speaker and listener.

C. After finishing setting, please press SELECT to exit.

NOTE

The center/surround/subwoofer delay is effective only for the corresponding speakers when the delay is not set to OFF.

2.3.6 Audio Setup



1. EQ type: To set EQ modes.

Optional settings: None, ROCK, Pop, Live, Dance, Techno, Classic, Soft.

Default: None.

2. SoundField: To set different soundfield effects.

Optional settings: Off, Concert, Livingroom, Hall, Bathroom, Cave, Arena, Church

Default: Off.

SoundField is void when playing DVDAUDIO discs.

3. SPDIF Output: To set the bitstream type of the digital output.

Optional settings: SPDIF/RAW, SPDIF/PCM.

Default: SPDIF/RAW.

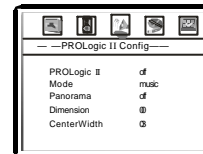
4. LPCM Out: To set the output frequency of the 96K LPCM audio data to fit for different power amplifiers.

Optional settings: 48K, 96K, 192K.

Default: 48K.

5. PROLogic II: To set 2CH music into the virtual 5CH music which can be played by multi-channel speakers. Press UP/DOWN navigation keys in the AUDIO SETUP PAGE to select PROLogic II, then press the SELECT navigation key to enter the PROLogic II SETUP page.

PROLogic II is effective only when the DOWN MIX mode is set to OFF and SPDIF is set to RAW.



A. PROLogic II: To set PROLogic II to ON or OFF. If the TITLE does not support this function, we recommend that you set this item to AUTO because it would become worse if the processing effects were added forcibly.

Optional settings: ON, OFF, AUTO.

Default: OFF.

B. Mode: To set the modes of PROLogic II. The music mode means that the sound from all speakers arrives at the same time without delay. The movie mode means that delay of 10ms is added to the surround channel. The

PROLOGIC mode virtualizes PROLOGIC I (utilizing PRO Logic II). The AUTO mode means a mode is selected automatically according to the disc.

Optional settings: MUSIC, MOVIE, PRO Logic, AUTO.

Default: MUSIC.

C. Panorama: To set the panorama mode to ON or OFF. This mode is to extend the front stereo to the two sides in order to achieve excellent surround effects.

Optional settings: ON, OFF.

Default: OFF.

D. Dimension: To set the size. It is similar to the balance control of the front and surround speakers which gradually adjust the front and rear sound fields. There are 7 steps to adjust.

Optional settings: SIZE-3, SIZE-2, SIZE-1, SIZE0, SIZE1, SIZE2, SIZE3

Default: SIZE0.

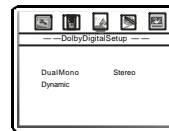
E. Central Width: To set the central width. It is to divide the center channel signals to the left and right channels. Therefore, the signals are sent out from the front speakers in different degrees.

Optional settings: LEVEL0, LEVEL1, LEVEL2, LEVEL3, LEVEL4, LEVEL5, LEVEL6, LEVEL7.

Default: LEVEL3.

6. Dolby Digital Setup: Press UP/DOWN navigation keys to select DOLBY DIGITAL SETUP, then press the SELECT navigation key to enter the DOLBY DIGITAL SETUP page.

A. Dual Mono: To set the output means of the left or right audio when playing a Dolby disc with separate two-channel audio



Optional settings: Stereo, L-Mono, R-Mono, Mix-Mono.

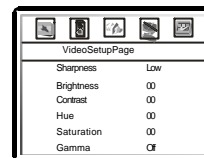
Default: Stereo

B. Dynamic Compression: To set the linear compression ratio to get different compression result.

Optional settings: OFF, 1/8, 1/4, 3/8, 1/2, 5/8, 3/4, 7/8, FULL.

Default: OFF.

2.3.7 VIDEO Setup



1. Sharpness: Used to set the sharpness of video outputs.

Optional settings: High, Medium, Low.

Default: Low.

2. Brightness: Used to set the brightness of video outputs

3. Contrast: Used to set the contrast of video outputs.

4. Hue: Used to set the hue of video outputs.

5. Saturation: Used to set the saturation of video outputs.

Brightness, contrast, hue and saturation adjusting means:

A. Press UP/DOWN arrow in the video setup menu to select the desired item you want to adjust. Press SELECT button to enter the item's adjustment.

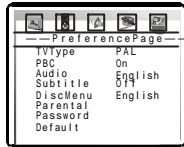
B. Press LEFT/RIGHT arrow to adjust the setting value.

C. After finishing adjustment, press SELECT

arrow to return to the video setup menu.

6. Gamma recommendation: This item is used to set up the Gamma value of video output. Selectable setup values: High, Medium, Low, Off.
Default: Off

2.3.8 Initial Setup



1. TV Type: To set the output video system of this player.
Optional settings: AUTO, NTSC, PAL.
Default: AUTO
2. PBC : To set the PBC status.
When playing SVCD or VCD 2.0 discs, if the PBC is ON, the menu image displays on the screen and this player enters the PBC mode; if the PBC is OFF, this player plays the disc by its sequence.
Optional settings: On, Off.
Default: On.
3. Audio: To set the preference audio language when playing.
4. Subtitle: To set the preference subtitle language when playing.
Optional settings: English, French, Spanish, Chinese, Japanese, Korean, Russian, Thai, OFF
subtitle default: OFF
5. Disc Menu Language: To set the preference disc menu language when playing.
Optional audio/disc menu languages: English, French, Spanish, Chinese, Japanese, Korean, Russian, Thai, others
Audio/disc menu language default: English

Audio/subtitle/disc menu languages are effective to DVD only.

If the disc does not record your desired language, the player will select the disc-specified languages to play.

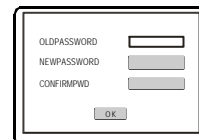
Selecting other languages: Press UP/DOWN ARROW to move the cursor to OTHER item, press SELECT. Press NUMBER buttons to enter your desired language codes, then press SELECT.

6. Parental: To set the parental control ratings to prevent children from watching the restricted contents. (In case the disc supports this function.)
Optional settings: KIDSAFE, G, PG, PG-13, PGR, R, NC17, ADULT, OFF.
Default: OFF.

NOTE

When changing the parental control ratings, a password is needed. Refer to the following password item for detailed settings.

7. Password: To set a four digit password to enable you to change the parental control ratings.
Default: 7890.



8. Default: To restore all settings to the default value except for the parental control and password settings

NOTES

2.3.9 Useful notes

In order to prolong the service life of your player, it is recommended to wait at least 30 seconds before you turn it on again after switching it off.

Turn off power after operation.

Only use the power supply of the nominal voltage, otherwise the player will not be operational or even be damaged.

Some functions of the player may not be applicable to some discs.

In case of occasional player halt, please turn it off and turn it on again.

This player cannot play some SVCD discs with the CVD format.

To cancel bass effects, you may disconnect the subwoofer speaker.

All the audio output signal may be covered by noise if the machine suffers great disturbance, but it will just recover by switching on again.

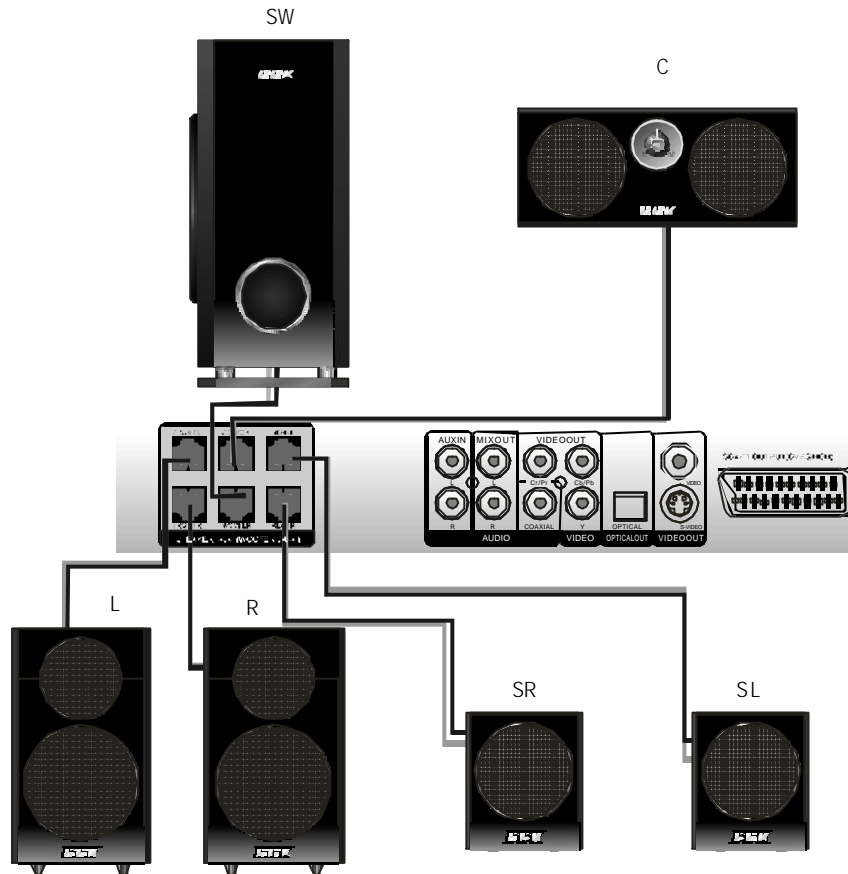
2.3.10 Specifications

DVD receiver	Playable discs	DVD-Video, Super VCD, VCD, DivX 3.11, DivX 4, DivX 5, DivX Pro, XviD, DVD-Audio, CD-DA, CD+G, HDCD, MP3, WMA, Kodak Picture CD, JPEG		
	input	2 MIC jacks FM antenna input AM antenna input Stereo audio input (AUX)		
	Output	Audio output	Analog audio output: Stereo Digital audio output: Coaxial, Optical	
		Video output	Composite, S-Video, component Y Cb Cr, Progressive scan output Y Pb Pr, RGB/SCART	
		Headphones output		
	Video characteristics	Video amplitude:	1.0Vp-p(75°)	
		S-Video amplitude:	Y: 1.0Vp-p(75°) C: 0.286Vp-p(75°)	
	Audio characteristics	Component video Amplitude:	1.0Vp-p((75°) Cb/Cr: 0.7Vp-p(75°)	
		Frequency response	20-20000 Hz(±1 dB)	
Operating Voltage	Signal-to-noise ratio	>90(dB)		
	THD	<0.05%		
Power consumption	~ 110-220V, 50Hz/60Hz			
FM Tuner	Frequency range	87.5 MHz-108 MHz	Channel separation	> 35dB
Am Tuner	Frequency range	522 KHz-1611KHz		
Amplifier system	Output power RMS, 10% THD, 1kHz			
	Subwoofer (40 Hz)	50W	Front channel	25W
Speaker system	Rear channel	25W	Center channel	25W
	Maximum power			
Subwoofer (40 Hz)	80W	Front channel	40W	
	Rear channel	40W	Center channel	40W
Operating temperature	5 -35			
Operating humidity	15-75%(no condensation)			

Design and specifications are subject to change without notice.

We do not guarantee that all discs can be played smoothly due to the disc quality, disc recording quality and recording format.

2.4 Speaker SYSTEM CONNECTIONS



2.4.1 NOTE:

Keep the power cord unplugged and switch power off before the system connection, then connect one end of the accessory speaker cord to the terminal of the satellite speakers, and the other end to the output jack for 5CH speakers power output on the rear panel of the DVD receiver. Please make sure the red cord is connected to the red jack, and the black cord is connected to the black jack. Please check it carefully after connection in order to prevent inside circuit damage from short-circuited or connecting cords.

Make sure that all cords are reconnected properly and securely. Loose or incorrect connections may result in noise or no sound.

2.4.2 SPECIFICATIONS

SubwooferUnit :	6.5 " Dynamic Paper ConeSpeaker
Max.OutputPower:	80W
NominalImpedance :	6
FrequencyResponse :	50Hz~250Hz
Satellite SpeakerUnit :	
Frontspeaker:	4 " WooferSpeaker(Magnetic-shielded) /0.75 " Tweeter speaker
Centrespeaker :	3 " x2WideFrequencyBand(Magnetic- shielded)/0.75 " Tweeterspeaker
Surroundspeaker :	3 " WideFrequencyBand (Magnetic-shielded)ConeSpeaker
Max.OutputPower:	40W
NominalImpedance :	4
FrequencyResponse :	200Hz~20000Hz
SubwooferSpeaker	
Dimensions(WxDxH) :	175 x286 x391mm
Satellite Speaker	
Dimensions(WxDxH) :	
Frontspeaker:	154 x194 x273mm
Centre speaker :	307 x127 x132mm
Surroundspeaker :	129 x147 x153mm
PackageDimensions:	521 x470 x481mm(W x D x H)
NetWeight:	20.3kg
GrossWeight:	22.1kg

Specifications are subject to change without prior notice.

Chapter Three Principle and Servicing

Section One DK1020S Principle Block Diagram

3.1.1 DK1020S principle block diagram

1. Brief introduction to DK1020S

This model adopts new generation DVD decode chip, with built-in Dolby decoder and realistic surround system, which brings you vivid and real movie effect. It has the following features:

- ◆ Progressive scanning output to produce steadier and clearer pictures without flickering.
- ◆ 5.1CH output.
- ◆ Composite video, S-video, component video output..
- ◆ Digital picture adjustment to the sharpness, brightness, contrast, chroma and saturation of pictures, gamma correction.
- ◆ Built-in Dolby digital decoder.
- ◆ Karaoke function.
- ◆ Hi-Fi stereo headphone output.
- ◆ FM/AM digital tuning function, capable of storing 20 FM/AM broadcasting stations respectively.
- ◆ Power amplifier adopts high performance large power IC with complete protection function and perfect sound quality.
- ◆ Compatible with DIVX, MPEG4 format disc.
- ◆ Subwoofer adopts large diameter bass unit matched with large capacity speaker body.

Its internal structure is mainly composed of decode & servo board, power amplifier board, input/output board, panel, headphone board, tuner, power board and loader. The principle block diagram is shown as the figure 3.1.1.1. All other signal flow is shown in figure except power board. The function of loader is to read disc information and transmit it to Mt1389, which performs servo function through D5954 on decode board and other supplementary circuit, and ensures the normal working of loader. FLASH on decode board is to store system program, SDRAM is to store program and sound/image information read from disc when the player is working to ensure their smooth output. The main function of power amplifier board is to perform audio D/A conversion, amplify analog signal and output 5.1CH to ensure the normal working of external speakers. The main function of AV board is to output various audio signals. This player is also with headphone and microphone to meet customers' demand. Further more, it also has external sound input, which may amplify power by use of power amplifier board of this player to output to speaker. Tuner in this player makes it have tuning function. It is also equipped with SAA6558 chip to realize RDS function of Europe and RBDS function of US.

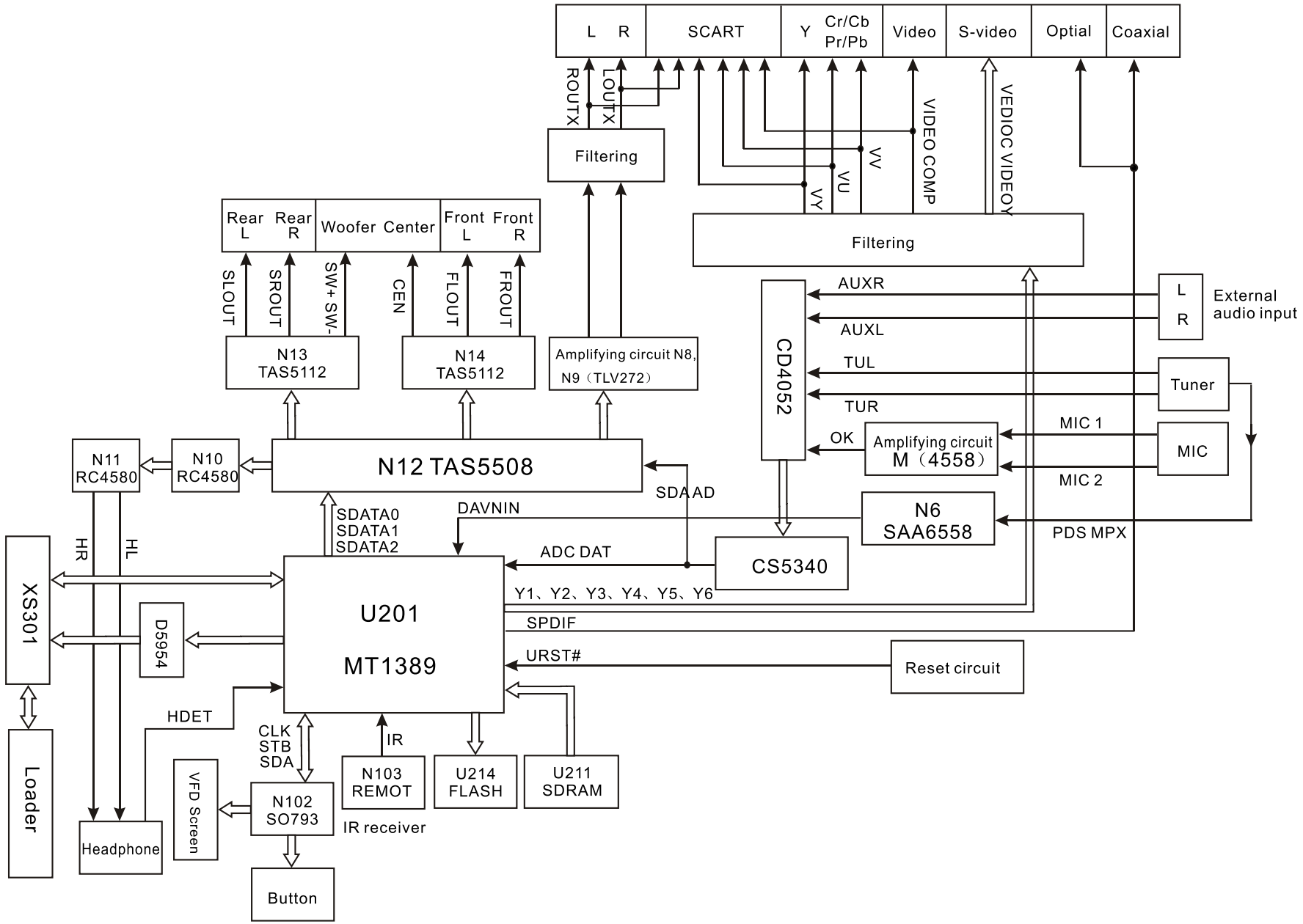


Figure 3.1.1.1 DK1020S principle block diagram

2. DK1020S principle block diagram is shown as the following figure 3.1.1.1:

Note: signals are converted out by CS5340. If converted by analog signal of MIC board, it is processed by MT1389; if it is other signal, for instance, other externally inputted analog signals, such as tuner, directly input to N12 TAS5508 for processing through CS5340 conversion, which is controlled by M0, M1.

3.1.2 Voltage flow chart

1. D+3V voltage flow is shown as the figure 3.1.2.1:

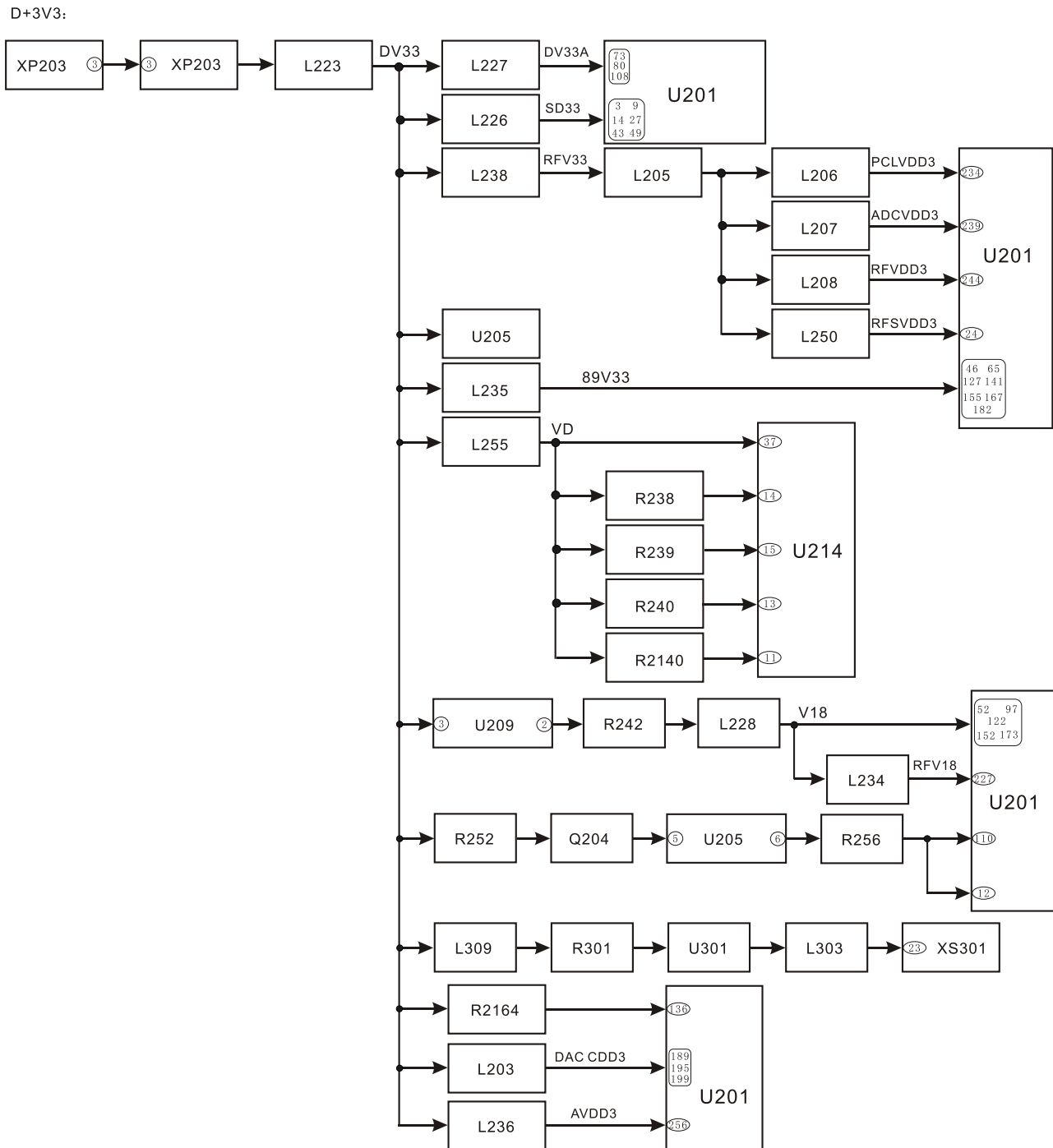


Figure 3.1.2.1 D+3V voltage flow chart

2. FL+ voltage flow is shown as the following figure 3.1.2.2:

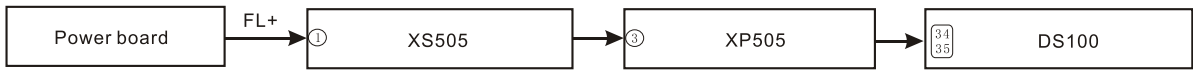


Figure 3.1.2.2 FL+ voltage flow chart

3. FL- voltage flow is shown as the following figure 3.1.2.3:

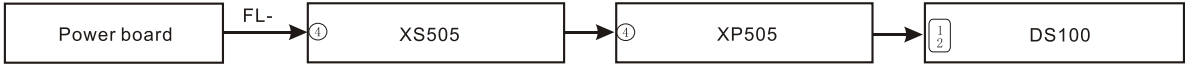


Figure 3.1.2.3 FL- voltage flow chart

4. 21V voltage flow is shown as the following figure 3.1.2.4:

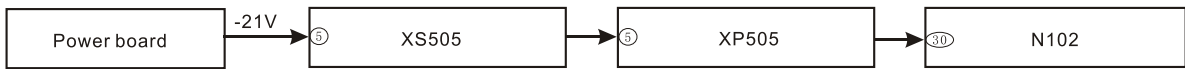


Figure 3.1.2.4 -21V voltage flow chart

5. D+5V voltage flow is shown as the following figure 3.1.2.5:

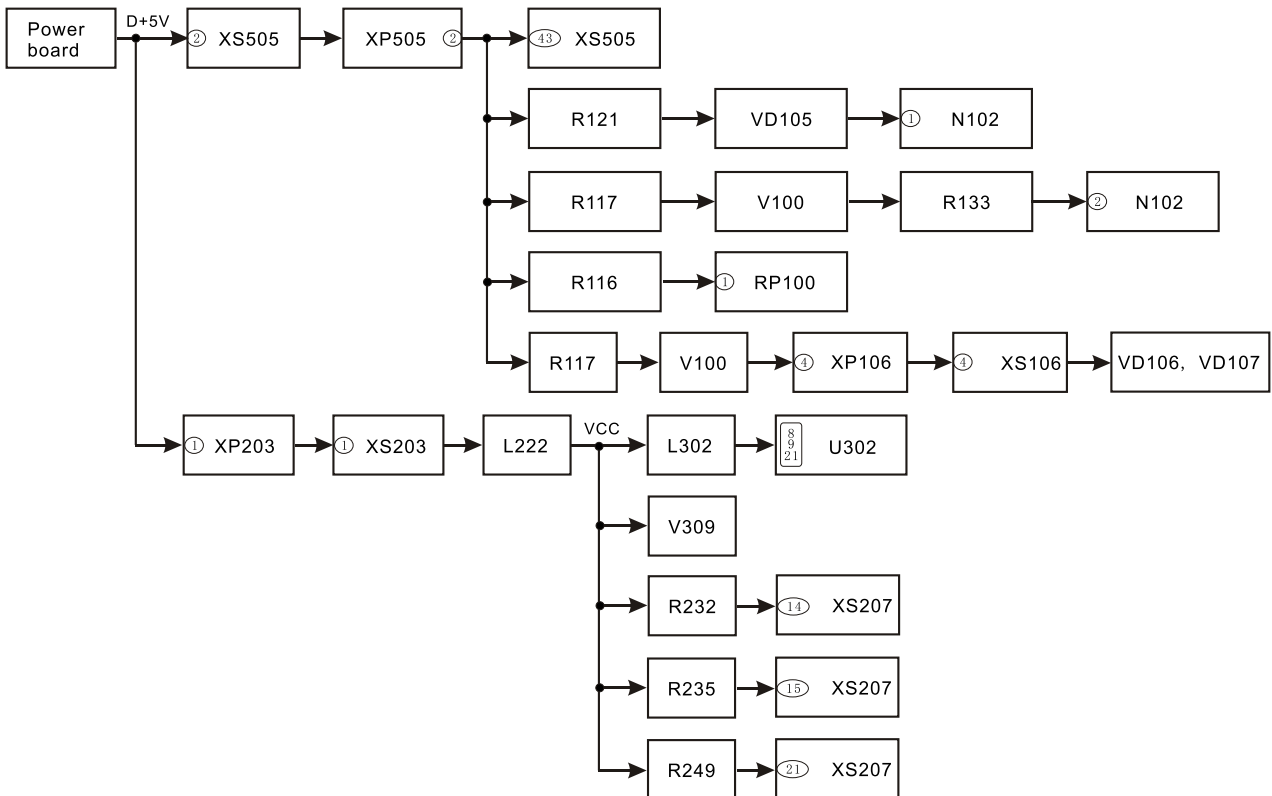


Figure 3.1.2.5 D+5V voltage flow chart

6. P+28V voltage flow is shown as the following figure 3.1.2.6:

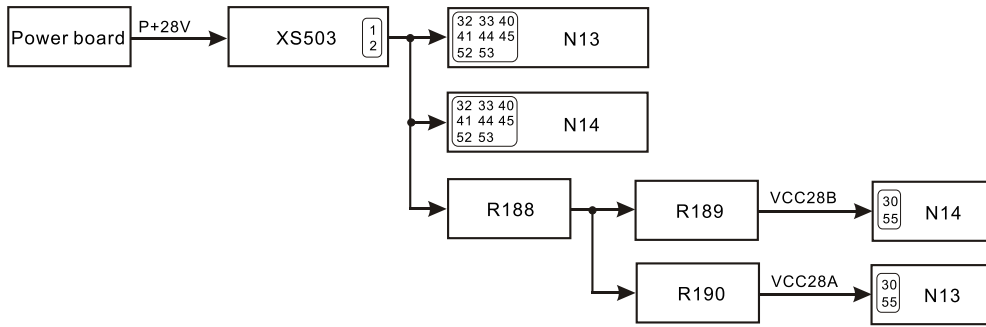


Figure 3.1.2.6 P+28V voltage flow chart

7. A-12V voltage flow is shown as the following figure 3.1.2.7:

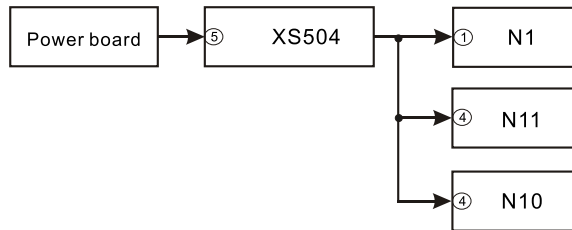


Figure 3.1.2.7 A-12V voltage flow chart

8. A+12V voltage flow is shown as the following figure 3.1.2.8:

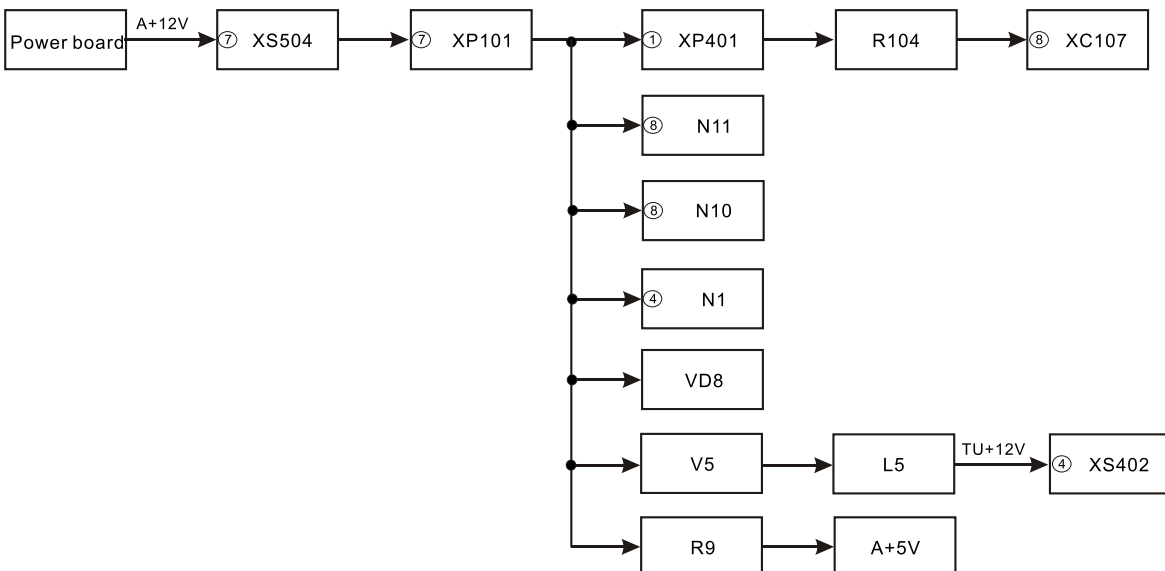


Figure 3.1.2.8 A+12V voltage flow chart

9. A+5V voltage flow is shown as the following figure 3.1.2.9:

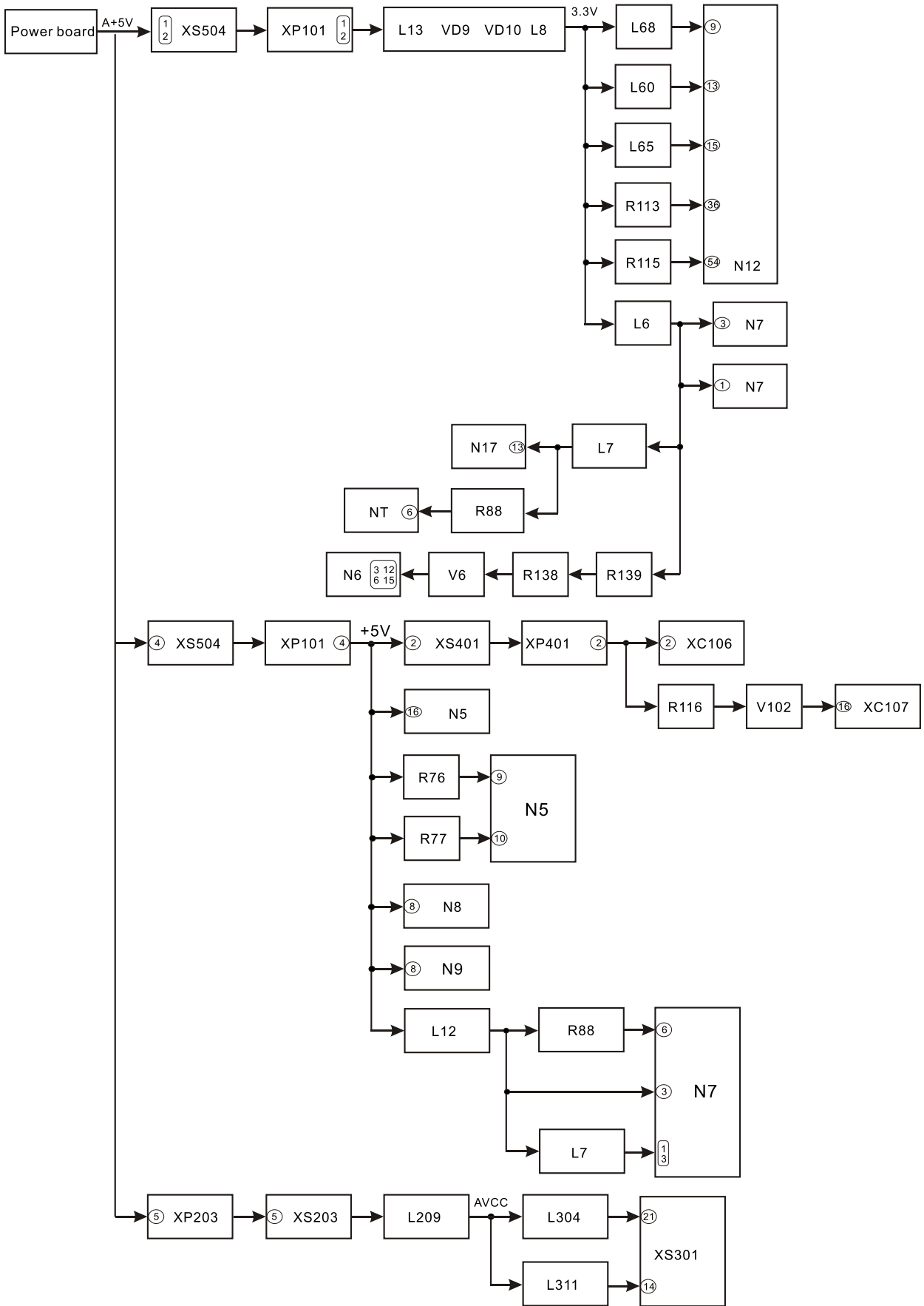


Figure 3.1.2.9 A+5V voltage flow chart

3.1.3 D+3V3 voltage distribution diagram

D+3V3 distribution diagram is shown as the following figure 3.1.3.1:

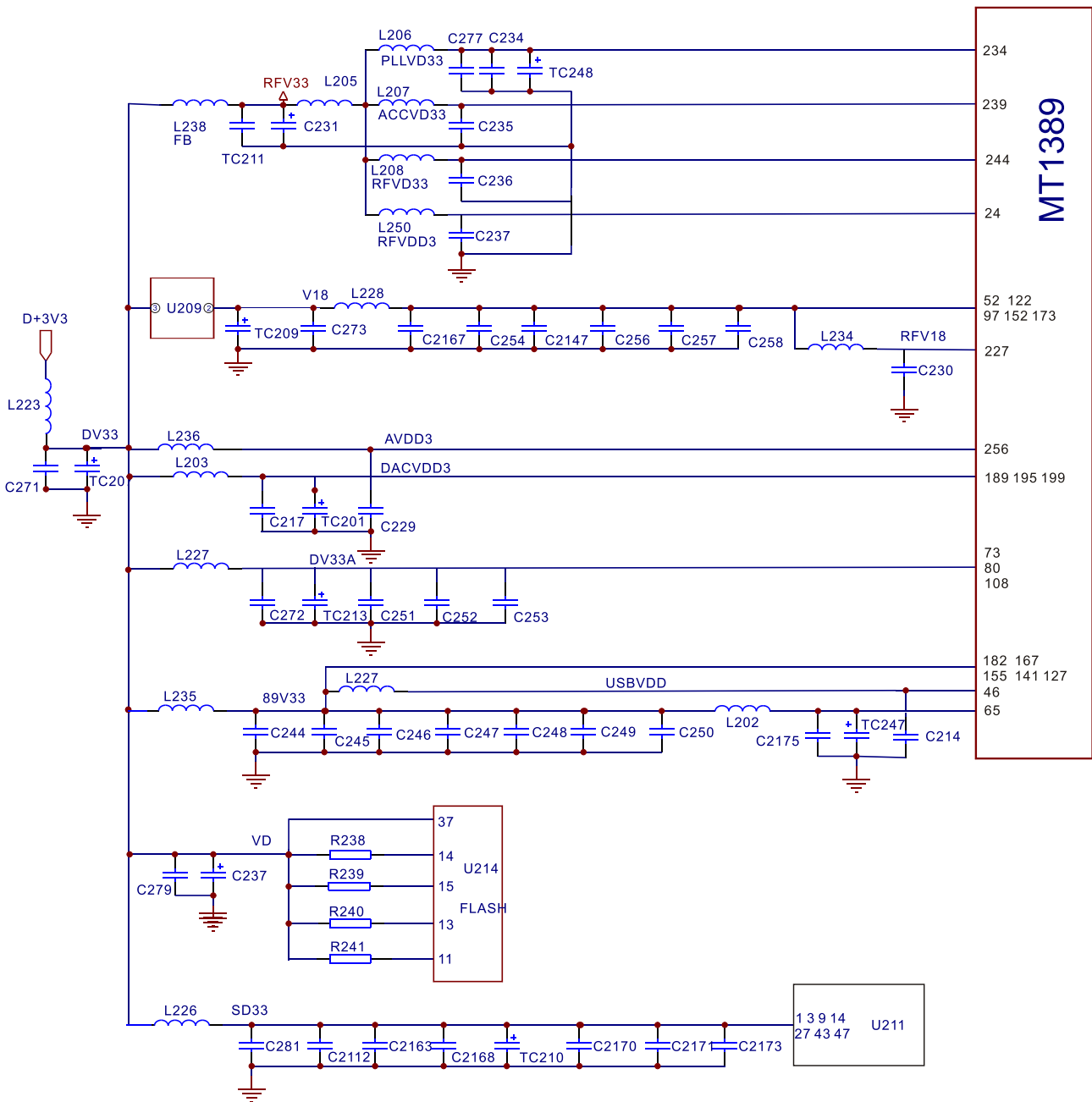


figure 3.1.3.1 D+3V3 voltage distribution diagram

Section Two DK1020S Element Circuit Principle and Servicing

3.2.1 Power supply circuit

1. Power supply circuit block diagram is shown as the following figure 3.2.1.1:

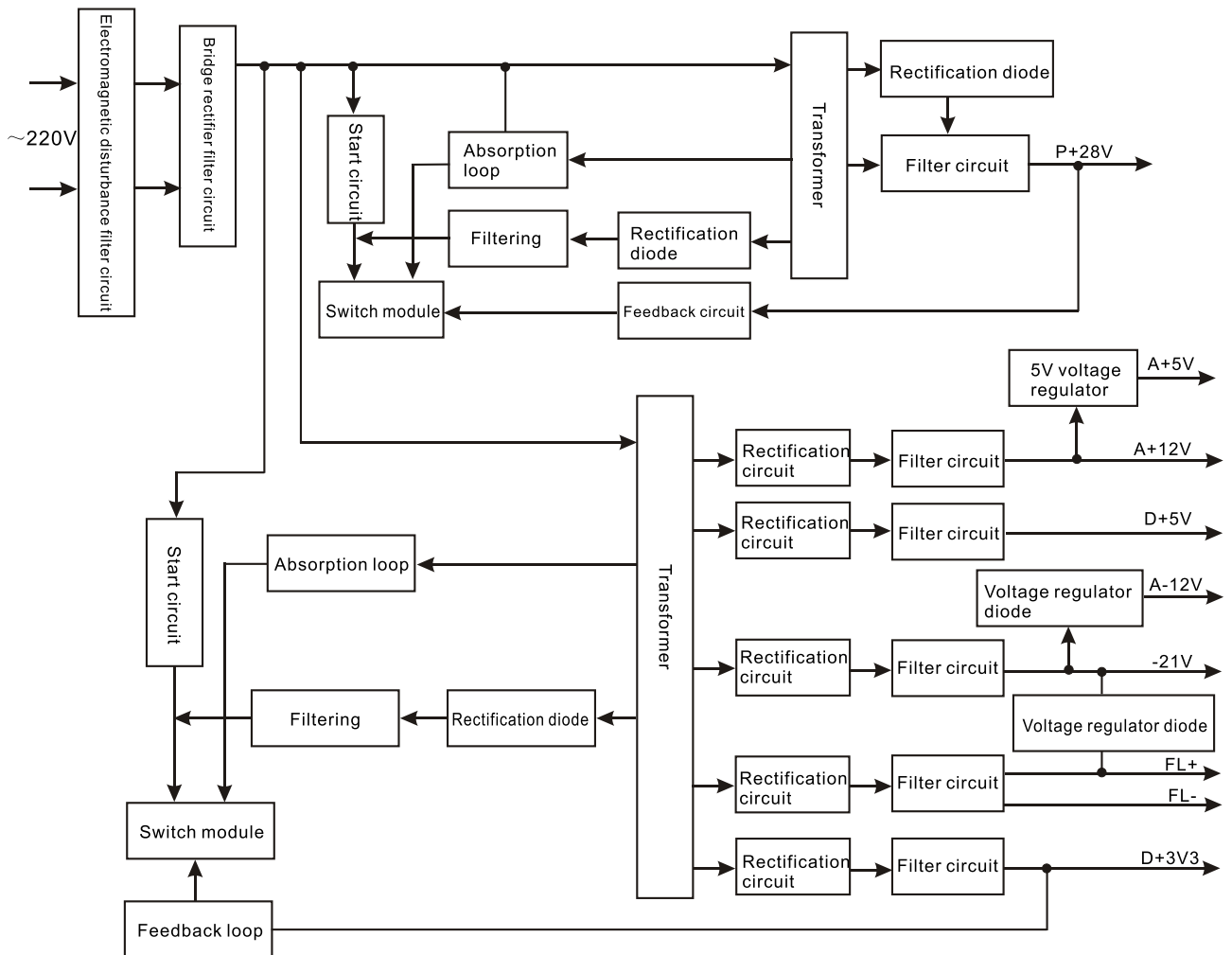


Figure 3.2.1.1 Power supply circuit block diagram

2. Working principle: this power supply circuit is composed of two parts that use electromagnetic disturbance filter circuit, bridge rectification circuit and other module circuit commonly. The first part circuit generates P+28V DC voltage used for power amplifier circuit power supply; the other part is responsible for power supply of other module circuit of this player. Working principle of each composed part is shown as follows:

(1) Electromagnetic disturbance filter circuit: for various electromagnetic radiation exist outside, the input AC will be affected. The function of electromagnetic disturbance filter capacitor is to filter these disturbance to make those that enter bridge rectification circuit are pure 220V AC.

(2) Bridge rectification and filter circuit: the function of this circuit is to generate a 310V DC to supply usage for back stage circuit.

(3) Start circuit: when power on and transformer has not started to work, start circuit provides a power supply voltage for switch module to make it work. When transformer begins to work, the voltage provided by power supply circuit for switch module is used to maintenance the working of switch module.

(4) Absorption loop: switch module performs on/off action in a very high frequency, so a very strong self induction voltage in the preliminary coil of transformer, which may probably cause the damage of switching module. The function of absorption is to form a loop for this self induction to ensure the normal working of circuit.

(5) Switch module: the input from transformer is 310V DC. To make transformer work, AC shape voltage must be presented. The function of switch module is to control this 310V DC to make it on for a while and off for another while to make the input terminal of transformer generate high and low change, thus the transformer can work.

(6) Power supply circuit: provides a power supply voltage for switch module.

(7) Rectification diode: the voltage outputted from transformer just now is pulse DC. The function of rectification diode is to change pulse DC into DC together with the back filter circuit.

(8) Feedback loop: the on time of switch module depends on feedback loop. Feedback loop samples output level voltage. When output level voltage is too high, the sampled voltage is on high side, which decreases the on time of switch module through feedback loop to make coupling quantity of transformer decrease and output voltage decrease. When output voltage is too low, the sampled voltage is on low side, which makes the on time of switch module increase through feedback loop to increase coupling quantity of transformer and raise output voltage. Thus, power board outputs stable voltage through the auto control function of feedback loop.

(9) Filter circuit: the function of it is to generate a stable and small ripple DC voltage. "II" filter is mostly used in filter circuit. The feature of capacitor filtering is that when load resistance is high and current is small, the filtering is obvious; for inductor filtering, when load resistance is small and current is big, filtering is obvious. Form capacitor to "II" filter and it can exert better filtering effect.

3. Main function of power board output voltage:

(1) -21V: supply power for panel main chip N102.

(2) FL+, FL-: supply power for filament of panel display screen.

(3) D+5V: supply power for N102, servo drive chip U302 (D5954) and disc in/out circuit.

(4) P+28V: supply power for audio power amplifying chip N13, N14 (TAS5112).

(5) A-12V , A+12V: used to supply power for audio power amplifying chip N1 (F4558), N10 (RC4580), N11 (RC4580) on power amplifier board. A+12V: supply power for tuning data processing chip N6 (SAA6558), tuner.

(6) D+3V3: supply power for U201 (MT1389), U214 (FLASH), U211 (SDRAM) and U205 (74HCU04).

(7) A+5V (pin 3 of XP203): supply power for loader.

(8) A+5V (pin 1, 2 of XS504): supply power for power amplifier board A/D conversion ship N7 (CS5340), digital audio pulse width demodulation chip N12 (TAS5508).

(4) A+5V (pin 4 of XS504): supply power for power amplifier board data selection chip N5 (CD4052), audio power amplifying chip N8, N9 (TLV272).

4. Troubleshooting process for power supply voltage

(1) Troubleshooting process for power supply output power not enough is shown as the following figure 3.2.1.2:

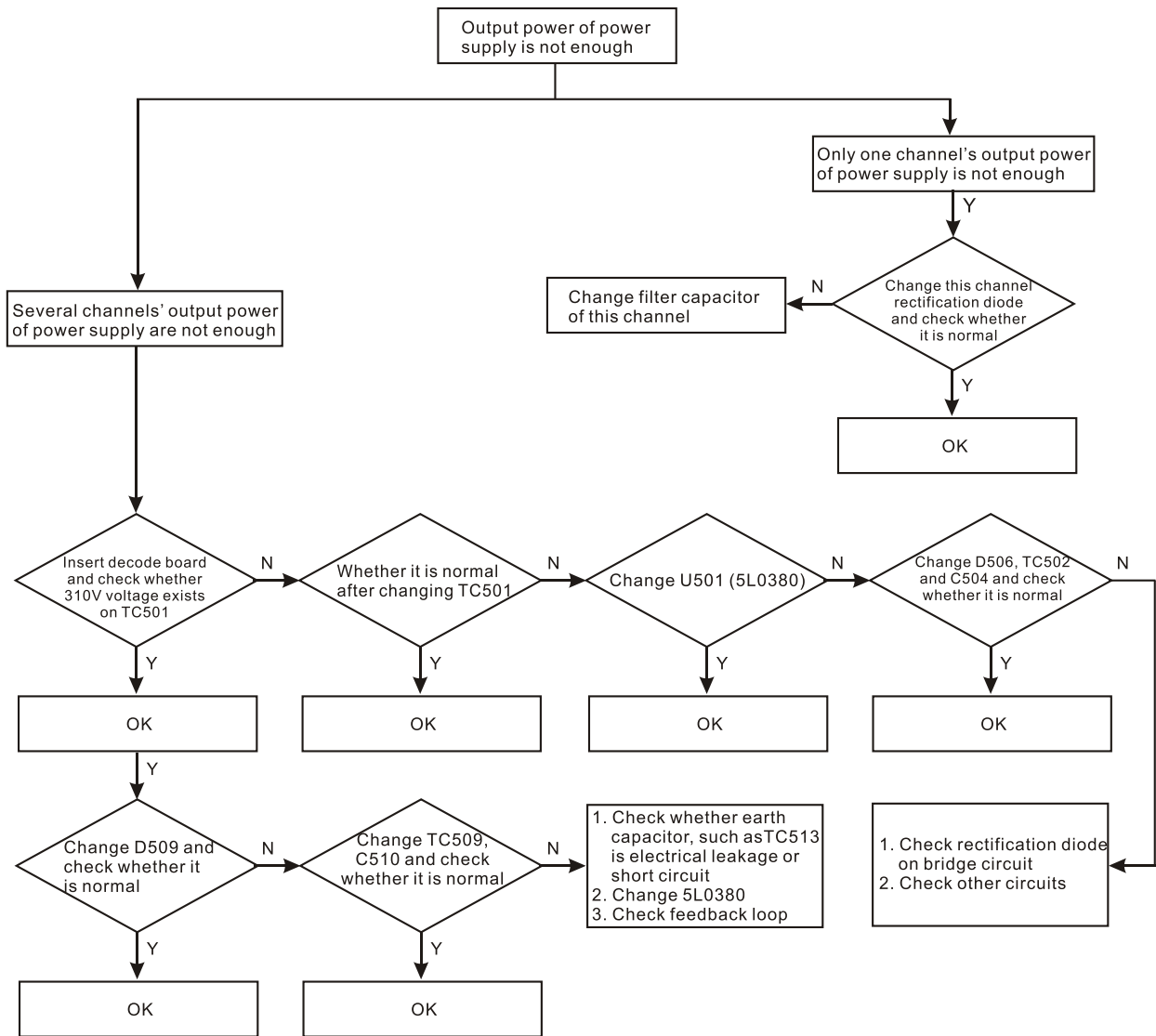


Figure 3.2.1.2 Troubleshooting flow chart for “Output power of power supply is not enough”

(2) Troubleshooting process for no voltage output is shown as the following figure 3.2.1.3:

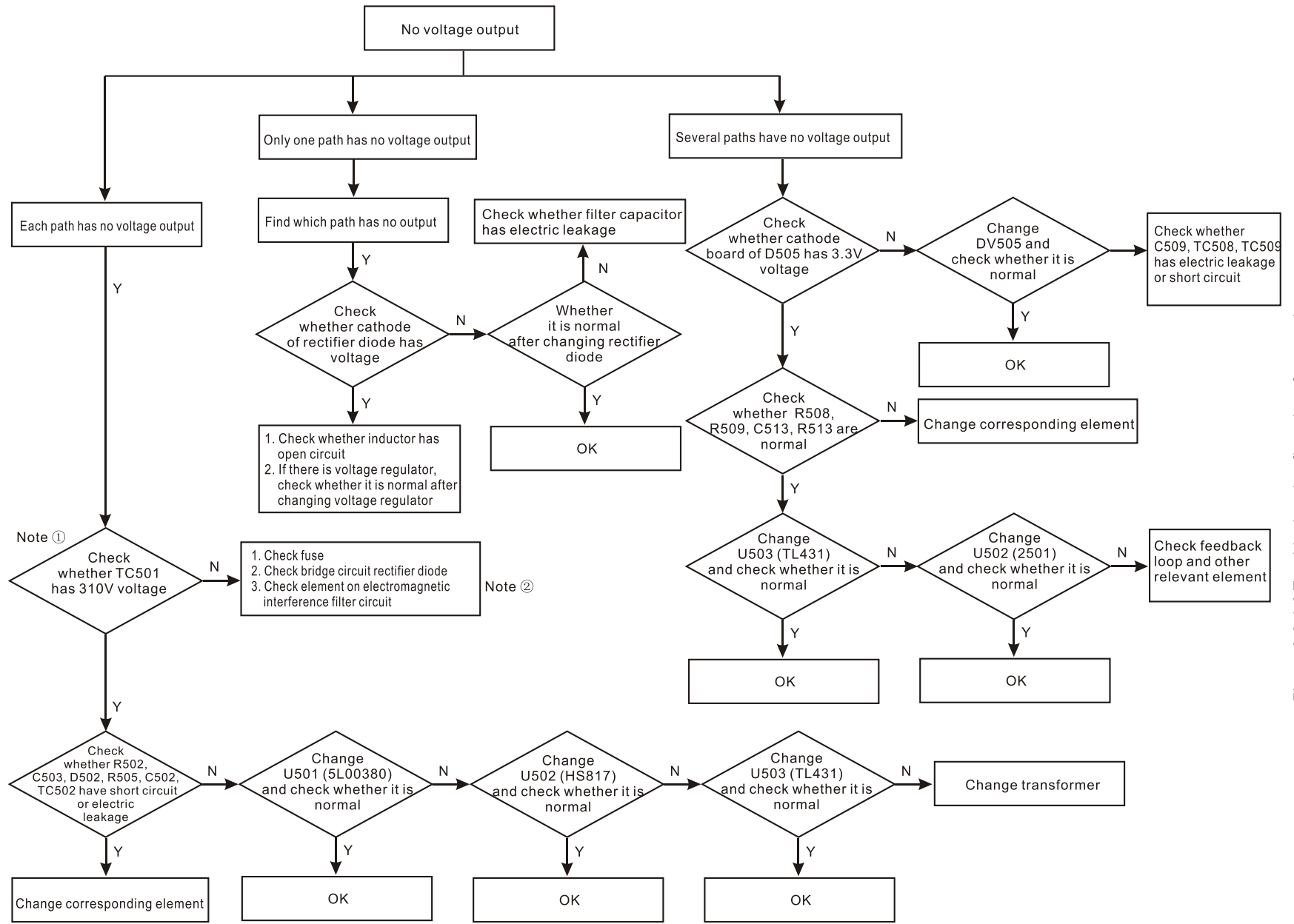


Figure 3.2.1.3 Troubleshooting flow chart for no voltage output

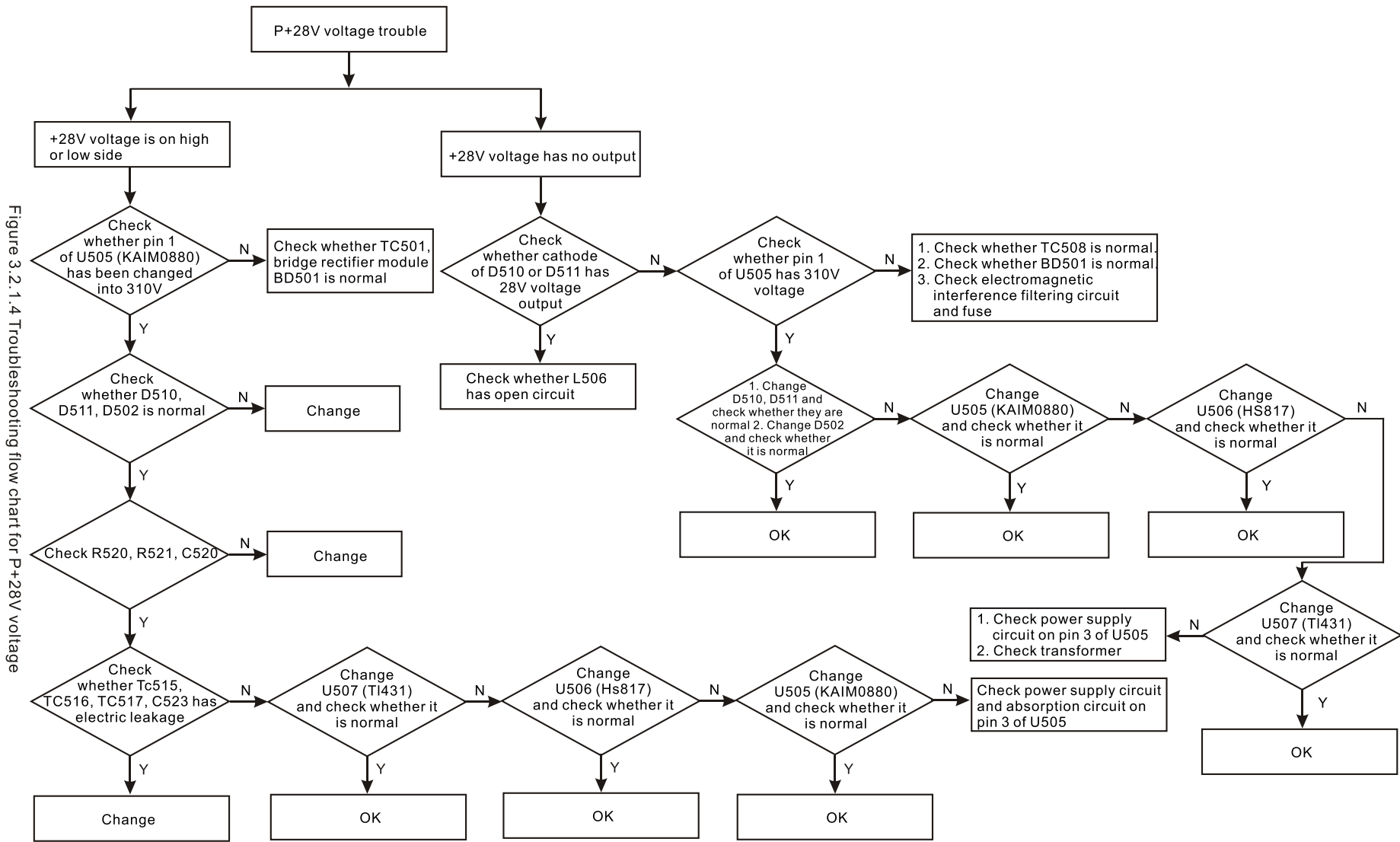


Figure 3.2.1.4 Troubleshooting flow chart for P+28V voltage

(3) Troubleshooting process for P+28V voltage is shown as the following figure 3.2.1.4:

Note: 1. This process is tested with 220V, 50HZ AC after disconnecting XS503.

2. Voltage on pin 1 of U505 and that on cathode of D510, D511 are not easy to test, so the voltage on heat emission piece of them may be tested directly. This voltage is similar with that in those places.

3. When testing voltage in high voltage zone, use “ground” and pay more regard to safety.

(4) Troubleshooting process for voltage too high or too low is shown as the following figure 3.2.1.5:

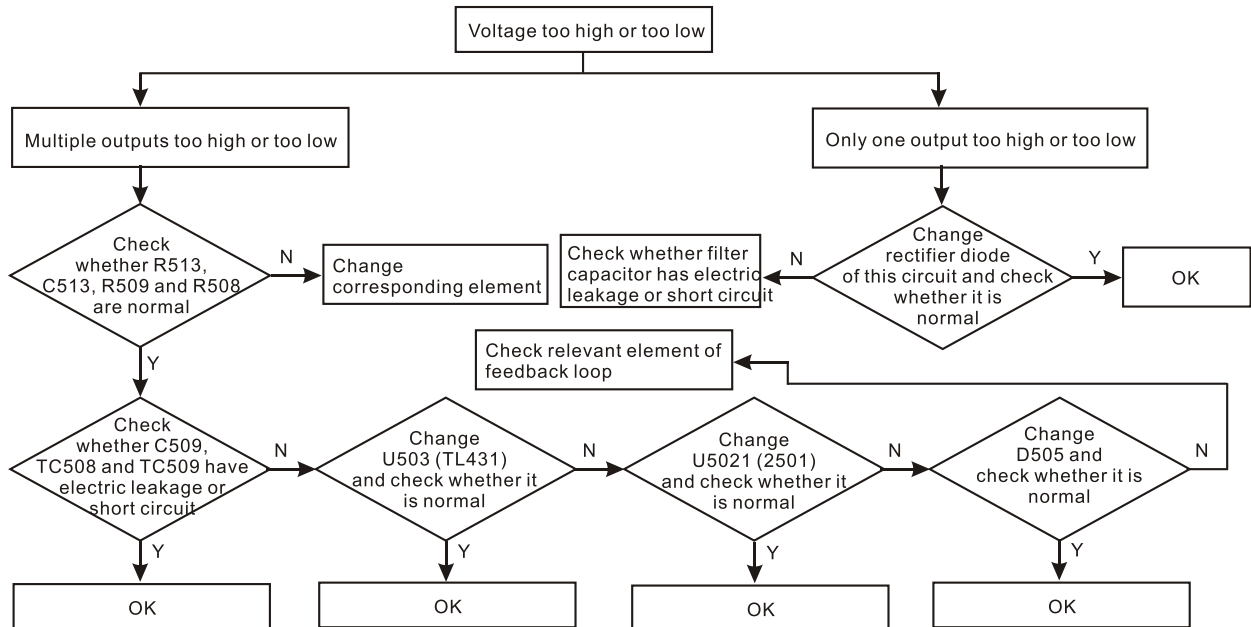


Figure 3.2.1.5 Troubleshooting flow chart for voltage too high or too low

3.2.2 Loader signal explanation

Loader signal explanation is shown as the following figure:

Pin Number	Pin Name	Flow Direction	DC Voltage			Function Description
			Read DVD disc	Read CD disc	No disc	
1	F-	Input loader	2.52	2.34	0.46	Focus error signal is added to the two ends of pick-up focusing coil.
2	F+	Input loader	2.49	2.49	0.93	
3	T+	Input loader	2.53	2.51	0.94	Trace error signal is added to the two ends of pick-up trace coil.
4	T-	Input loader	2.58	2.51	0.93	
5	C	Input MT1389	2.2	2.25	2.04	Disc data signal
6	D	Input MT1389	2.2	3.2	2.04	Disc data signal
7	IOA	Input MT1389	0.01	3.2	3.21	Disc identification signal, CD is high level 3.3V; and DVD is 0V.
8	RF	Input MT1389	2.21	2.53	1.28	Total sum of disc data signals. This signal is not used by this player.
9	A	Input MT1389	2.17	2.22	2.04	Disc data signal

Pin Number	Pin Name	Flow Direction	DC Voltage			Function Description
			Read DVD disc	Read CD disc	No disc	
10	B	Input MT1389	2.19	2.27	2.04	Disc data signal
11	F	Input MT1389	2.07	2.44	2.03	Auxiliary signal used for trace
12	GND	Grounding	0.01	0.01	0	Grounding
13	V20	Input loader	2.04	2.06	2.03	Reference voltage
14	Vcc	Input loader	5.04	5.04	5.02	Supply voltage for loader
15	E	Input MT1389	2.06	2.45	2.03	Disc data signal
16	NC	Hang in the air	0.01	0	0	Not used
17	VR-CD	Input loader	0.21	0.01	0	After being processed inside loader, ensure MD is 180mV when reading CD disc.
18	VR-DVD	Input loader	0.01	0.2	0	After being processed inside loader, ensure MD is 181mV when reading DVD disc.
19	LD-CD	Input loader	0.09	2.1	0	CD laser power control signal
20	MDII	Input MT1389	0.21	0.2	0	Laser power monitoring signal of CD and DVD
21	HFM	Input loader	5.04	5.04	5.02	High frequency overlap signal. Generate laser with different wavelength inside loader.
22	NC	Unused	0.01	0.1	0	
23	LD-DVD	Input loader	2.21	0.1	0	DVD laser power control signal
24	GND	Grounding	0.01	0.01	0	Grounding

Note: 1. When reading DVD disc, there are only four signals of A, B, C and D.

2. When reading CD disc, there are only six signals of A, B, C, D, E and F.

3. $RFO = A + B + C + D$.

4. Focus error signal = $(A+C) - (B+D)$; Trace error signal = $E-F$

3.2.3 Servo circuit

1. DK1020S adopts SANYO 62 decoder and MTK decode solution (MT1389+FLASH (16M)+SDRAM (64M)).

The servo circuit is mainly composed of front signal processing, digital servo processing, signal processing IC T1389 and drive circuit D5954, in which MT1389 is the main component of decode circuit at the same time, shown as the figure 3.2.3.1..

2. Working principle: after powering on or disc in, according to IOA signal, disc identification circuit decides through which path of variable resistor the laser detecting diode gets path to the ground, meanwhile MT1389 decides whether DVD laser or VCD laser is emitted according to IOA signal, which can be fulfilled through laser power control circuit. When IOA is high level (3.3V), Mt1389 pulls LOD1 of V302 base electrode in laser tube power control connected to VCD down to about 2.2V to make V302 on and to make VCD laser tube emit beam; then decides whether to pull up or pull down LOD1 according to voltage after the feedback from MDI1 to control the power of light emission diode. Similarly, when IOA is low level (0V), MT1389 pulls LOD2 of V301 base electrode in laser tube power control connected to DVD down to about 2.2V to make V301 on and to make DVD laser tube emit beam; then decides whether to pull up or down LOD2 according to the voltage after the feedback from MDI

1. After loader reading disc information, A, B, C, D, E, F signals are sent out to Mt1389 (DVD only has A, B, C, D

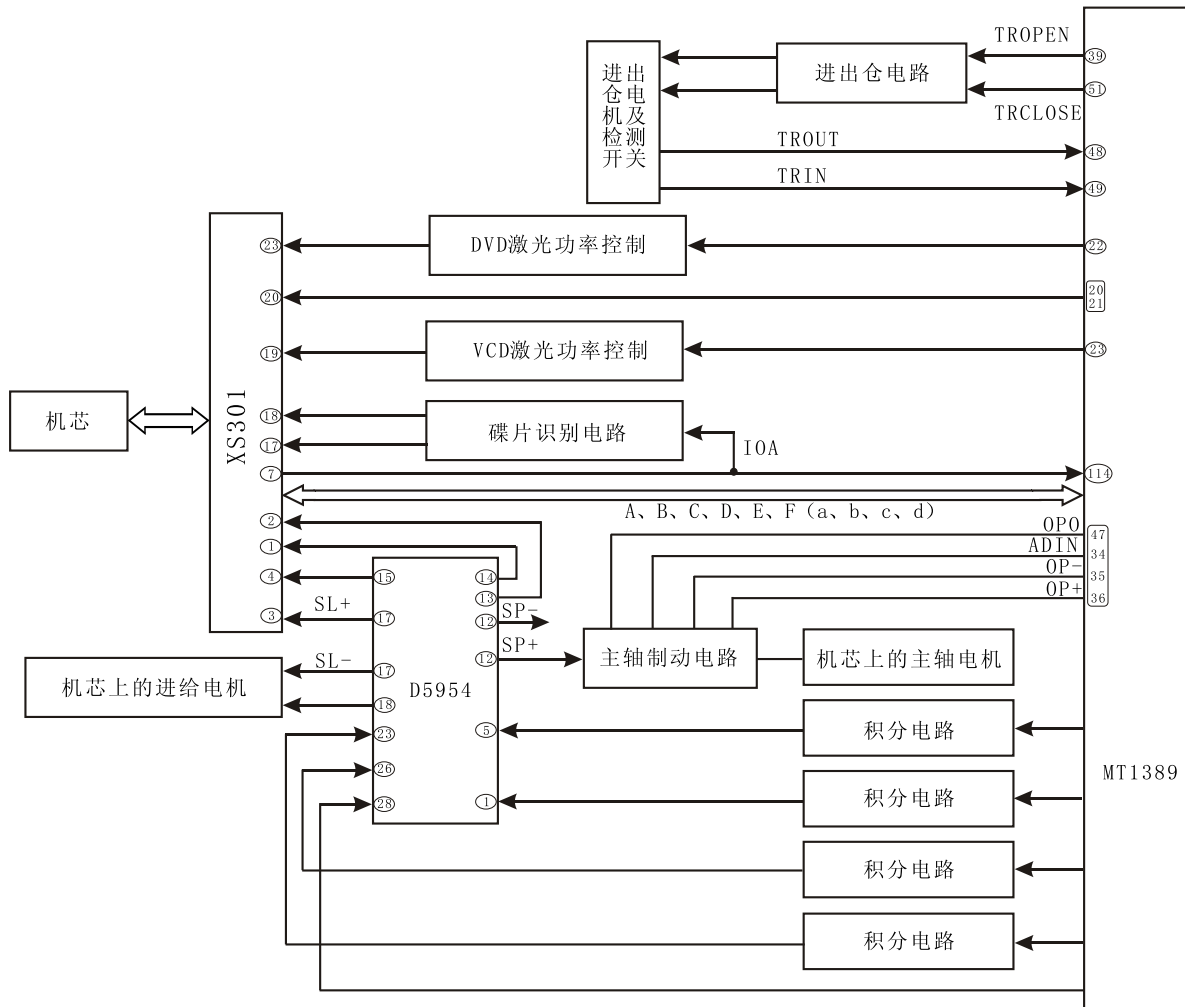


图3. 2. 3. 1 伺服方框图

signals), and then inputted from pin 2~11, 18, 19 of MT1389. After being amplified and processed by the pre-amplifier inside MT1389, now signals are separated to two parts for processing inside Mt1389.

After being processed by digital servo signal circuit inside MT1389, one part of signal form corresponding servo control signals and output FOO, TRO, DMO, FMO digital servo control signals from pin 42, pin 41, pin 37, pin 38 of Mt1389 respectively, then change into analog servo control signal FOSO, TRSO, DMSO, FMSO through integration circuit composed by resistor capacitor, and send to driver circuit BA5954 for amplification to bring along focus coil, trace coil, main axis electric machine and feed electric machine after drive amplification. Among these, focus and trace servo are used to correct objective position accurately; feed servo is used to bring along laser head to make radial large-scale move which belongs to the preliminary adjustment to pick-up position; and main axis servo is used to control main axis electric machine to make it read signals in means of constant linear velocity and bring along disc to rotate.

After processing of amplification by VGA voltage control amplifier and equalization frequency compensation inside MT1389, another part of signals are changed into digital signals through internal A/D converter. When loader is reading CD/VCD signals, these signals are conducted EFM demodulation inside MT1389, and then outputted to latter stage for AV decoding after finishing CIRC (Cross-Interleaved Reed-Solomon Code) error correction inside. When loader is readingDVD signals, these signals are conducted ESM demodulation inside MT1389, and then sent to latter stage for decoding after finishing RSPC error correction inside.

The other part of servo is open/close disc tray circuit. After panel or remote controller emits open/close disc tray signal to MT1389, in usual conditions, TROPEN and TRCLOSE sent out by pin 39, 51 of Mt1389 are both low level, when signal of "open" comes, after Mt1389 makes disc stop rotating through main axis braking circuit, TRCLOSE is set high to make open/close electric machine on loader frame run to bring along disc tray to eject. After disc tray ejecting to proper position (TR_OUT) is set high level (0V) through the detecting switch on loader frame, MT1389 pulls down TRCLOSE and open/close electric machine stop running. When MT1389 receiving "close" signal, TROPEN is set high level by MT1389, open/close electric machine runs conversely to bring along disc tray to close. After disc tray closing to proper position, signal of closing to proper position (TR_IN) is set low level through the detecting switch on loader frame, MT1389 pulls down TROPEN and electric machine stops running to finish "close" process.

3. Explanation to servo terms

FOO: when rotating, disc may probably move upwards or downwards slightly to make the focus of laser emitted by pick-up cannot justly fall on data pit of disc, so pick-up is required to move upwards or downwards to make focus aim at data pit justly. When pick-up is moving upwards or downwards, it means that pick-up is making focus acts.

TRO: data information is save in disc in form of tracks. The process when pick-up moves from one track to another one to read data is trace. In this process, it is objective, but the entire pick-up, that moves forwards or backwards, and the moving range is very small.

FMO: similar to acts of trace, the acts of feed are larger than those of trace. Feed conducts a large scale movement firstly, and then trace moves slightly in this range. Feed moves for a while, and does not move for another while; but trace moves all the time. Feed is rough adjustment and trace is fine.

DMO: it is the top that holds up disc. Its rotation speed decides that of disc. Its rotation is generated by an individual DC electric machine, in which rotation speed of DVD is twice over that of CD.

Hint: In order to observe these processes, you may take down upper cover of the machine, and then the loader cover board. When power on with no disc in or disc in after disc out, you may observe that pick-up returns to inner ring firstly and then springs back for a little distance, which is feed process. Then pick-up will emit light and you may notice the objective moves upwards and downwards, which is focus process. In face, in the same time of focus, the objective also moves upwards and backwards to make trace acts. Because the range is small, it is not easy to observe, and meanwhile DEMO disc tray also rotates slightly, which is DEMO acts.

4. Voltage of key point is shown as follows:

Name	When reading disc normally	When disc out	When disc in	When no disc in
TROPEN	0	There is about 1 second 3.3V pulse when at the moment of disc out	0	0
TRCLOSE	0	0V	There is about 1 second 3.3V pulse when at the moment of disc out	0
TROUT	3.41V	3.3V→0V	0V→3.3V	3.3V
TRIN	0	0V→3.3V	3.3V→0V	0
OPO	2.61V	2.75V	2.64V	2.61V
ADIN	2.61V	2.76V	2.61V	2.61V
OP+	1.66V	1.81V	1.27V	1.81V
OP-	1.85V	2.12V	1.47V	2.04V

3.2.4 Mute circuit

As shown in the figure 3.2.4.1, this model dose not set special mute circuit and SCMUTE signal outputted from pin 176 o f Mt1389 changes into MUTE signal through flat cable X207 to control As5508. In normal times, it is kept in high level, but after pressing MUTE button, MUTE signal changes to low level to control TAS5508 and make it not output sound.

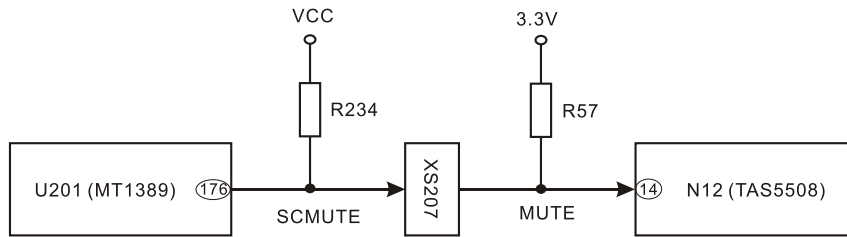


Figure 3.2.4.1 MT1389 SCMUTE signal block diagram

The other factor that causes mute in this model is that after inserting headphone, power amplifier board has no output. As shown in figure 3.2.4.2, this player has two HDET signals, in which one is outputted from headphone terminal and sent to Mt1389, and the other is sent to TAS5508 after Mt1389 receives HDET signal outputted from headphone. When headphone is not inserted, HDET signal outputted from headphone keeps in high level, after headphone being inserted, it changes into 0V and transmits to pin 184 of U201 (MT1389). Pin 174 of MT1389 also outputs RDSID signal, and signal name changes into HDET through flat cable XS201. In normal times, it is also high level, after U201 (MT1389) receives HDET outputted from headphone, it changes into low level, and HDET signal outputted from headphone also changes from high level into low level to inform N12 (TAS5508) of mute. MUTE, HDET signal change is shown as the following figure:

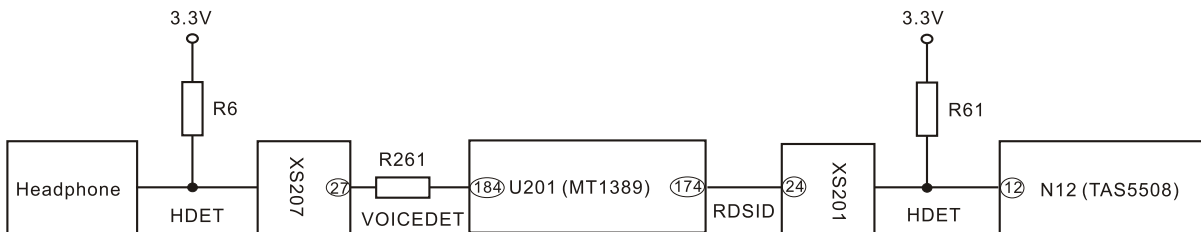


Figure 3.2.4.2 Headphone mute block diagram

Note: when inserting headphone, only mixed left/right channel on AV board have output, and audio signal on power amplifier board has no output; when in mute state, all have no output.

3.2.5 Disc in/out circuit

1. Disc in/out circuit is shown as the following figure 3.2.5.1:

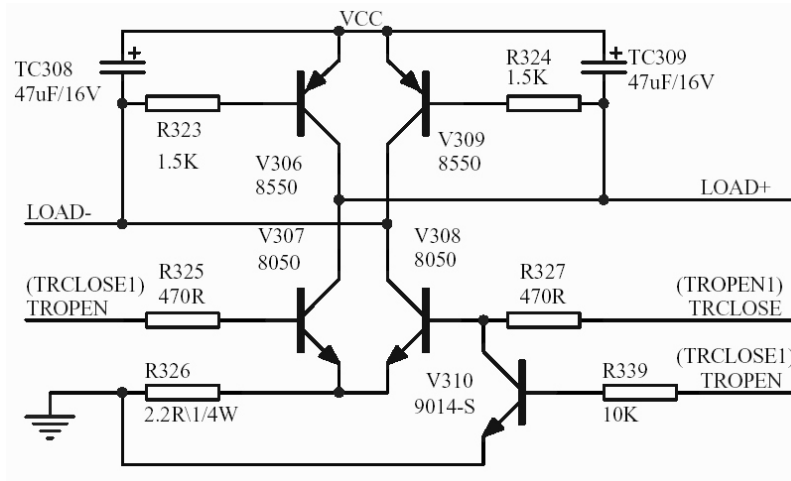


Figure 3.2.5.1 Disc in/out circuit diagram

2. Electric current when disc in/out

Open disc tray: VCC→V306CE electrode on→LOAD+→Electric machine→LOAD- →V308CE electrode on→R326→Ground

When not opening disc tray, pin 51 and 39 of MT1389 are low level. When opening disc tray, pin 51 of MT1389 sends a high level; V308 is on; V308 collector electrode changes into low level; LOAD- changes into low level; V306 base electrode changes into low level; V306 is on. V306 collector electrode changes into high level and LOAD+ changes into high level.

Close disc tray: VCC→V309CE electrode on→LOAD- →Electric machine→LOAD+ →V307CE electrode on→R326→Ground

when closing disc tray, pin 39 of MT1389 sends a high level; V307 is on; collector electrode changes into low level; LOAD+ is low level; base electrode through R324 and V309 is low level; V309 is on; V309 collector electrode changes into high level; LOAD- changes into high level.

The function of V310 is interlock TRCLOSE and TROPEN signal to ensure the two are not high level at the same time. When the two are high level input, base electrode of V308 is made to low level through V310 on to ensure the normal working of disc in/out circuit. The function of electrolytic capacitor TC309 and Tc308 is to avoid the sudden change of the voltage on two ends of disc in/out electric machine to make disc in/out acts smooth.

3. Troubleshooting process is shown as the following figure 3.2.5.2:

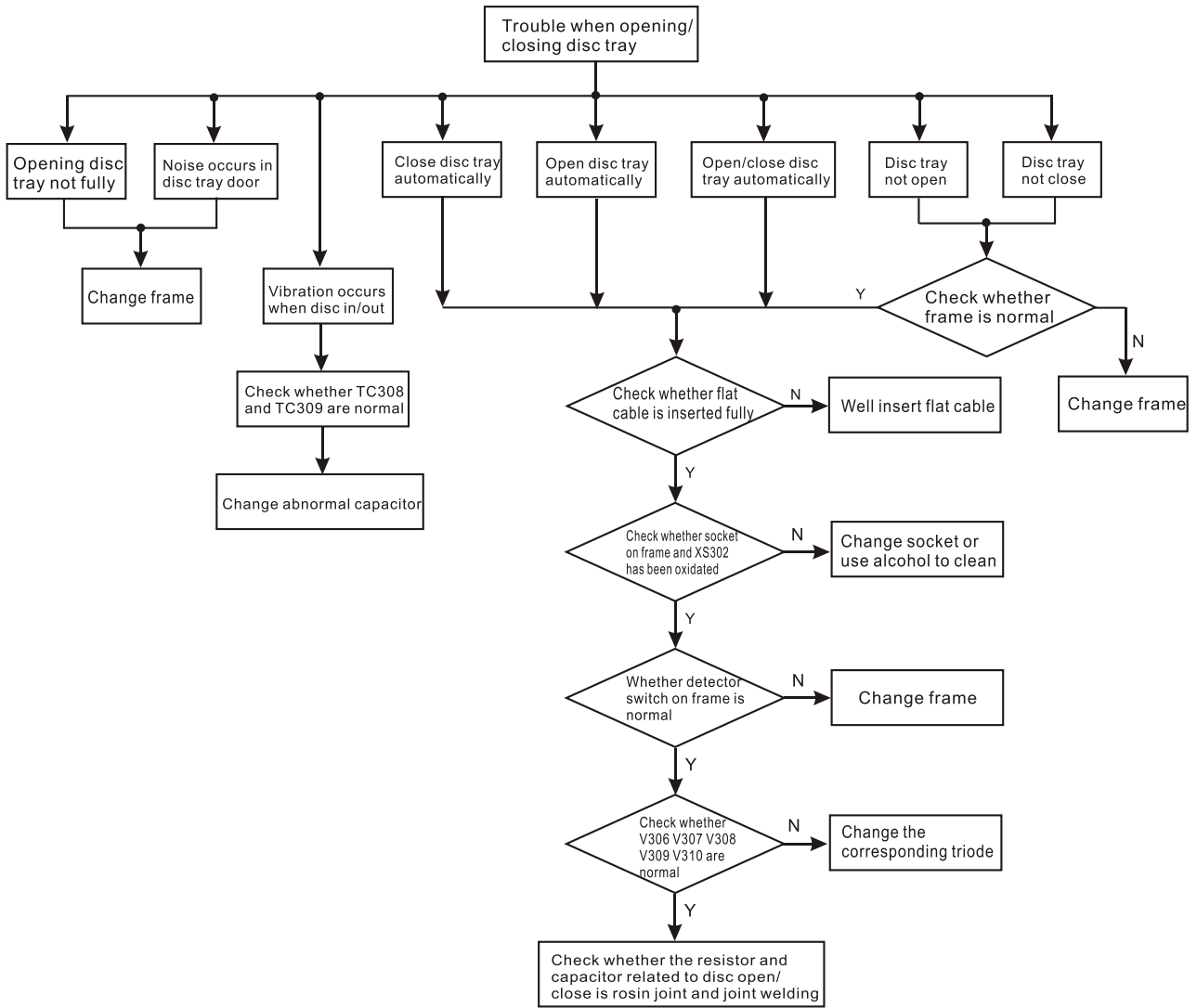


Figure 3.2.5.2 Troubleshooting flow chart when opening/closing disc tray

3.2.6 Reset circuit

1. Reset circuit is shown as the following figure 3.2.6.1:

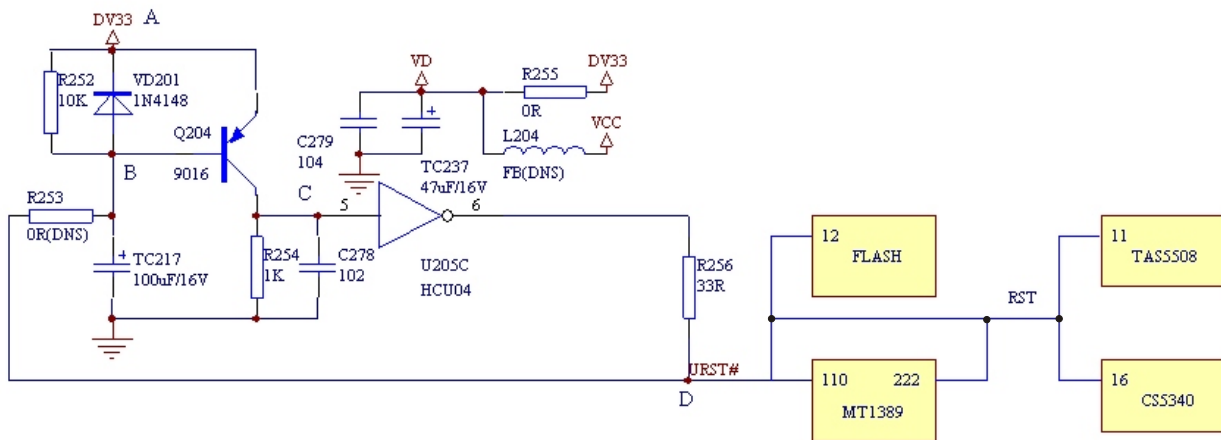


Figure 3.2.6.1 Reset circuit diagram

2. Working principle: The two ends voltage of capacitor T217 cannot change suddenly, anode of the capacitor begins charging from 0V and now triode Q204 is on. Pin 5 of phase inverter U205 (HCU04) output port is high voltage and pin 6 of it is low voltage to reset chip MT1389 FLASH, TAS5508 and Cs5340. When charge of the capacitor is close to 3.3V, triode Q204 cut off; pin 5 of phase inverter input port is low level; phase inverter outputs high voltage from pin 6 and MT1389 reset finishes. After reset of MT1389, reset signal is also given to sound D/A conversion chip CS4360 and sound A/D conversion chip CS5340V for their resetting. In the course of system working, pin 222 of MT1389 outputs reset signal to reset TAS5508 and CS5340 on power amplifier board.

3. Key point voltage is shown as the following table:

Key point	Position	Voltage	Remark
DV33 (point A)	Diode VD201 cathode	3.3V	TC217 may sends out current from this point after power failure
Point B	Diode VD201 anode	3.3V after reset finishes	After reset finishes, voltage increases from 0V to 3.3V
Point C	Pin 5 of reverter	0V after reset finishes	After reset finishes, voltage decreases from 3.3V to 0V
URST# (point D)	Connection place of R256 and R253	3.3V after reset finishes	After reset finishes, voltage increases from 0V to 3.3V

4. Troubleshooting process flow chart

URST# is always low level troubleshooting process, shown in the figure 3.2.6.2; URST# is always high level troubleshooting process, shown in the figure 3.2.6.3:

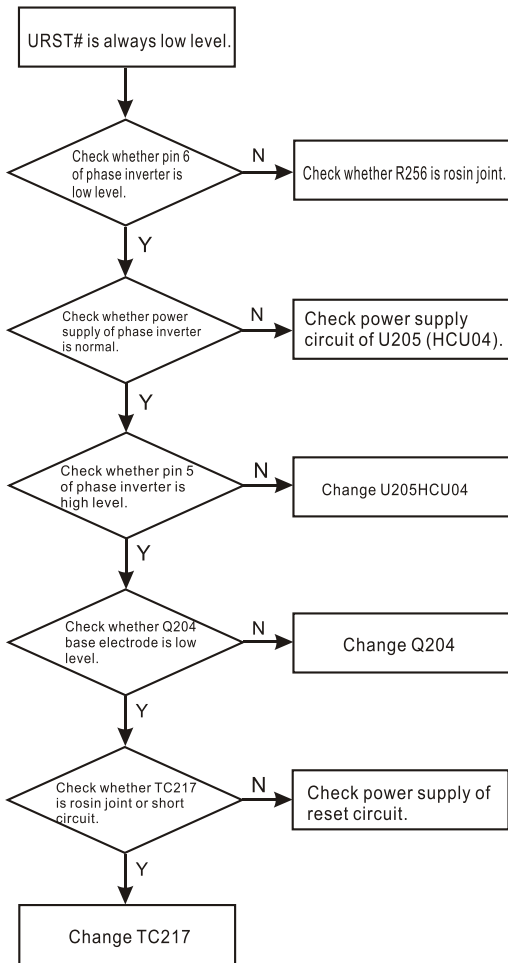


Figure 3.2.6.2 Troubleshooting flow chart when URST# is always low level

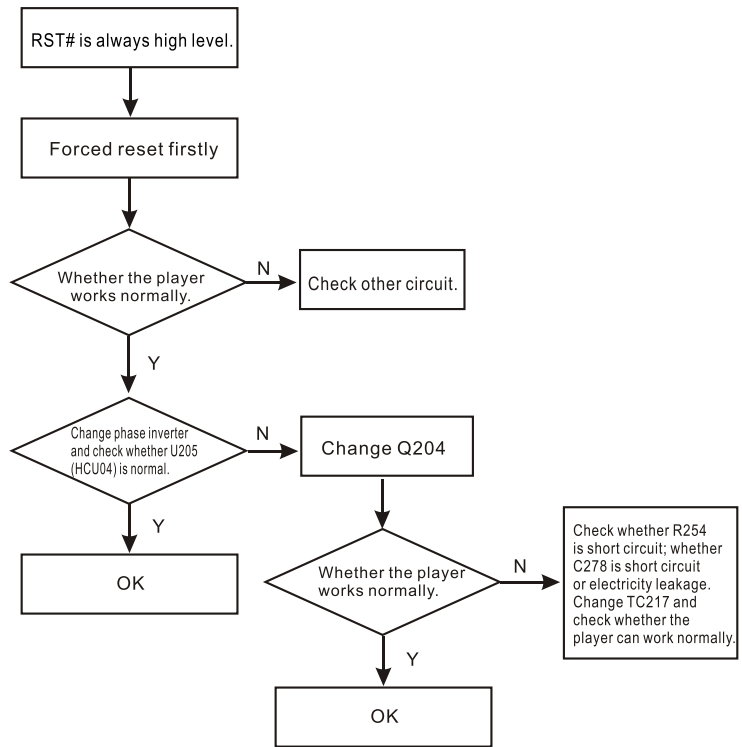


Figure 3.2.6.3 Troubleshooting flow chart when URST# is always high level

3.2.7 Disc identification circuit

1. Disc identification circuit is shown as the following figure 3.2.7.1:

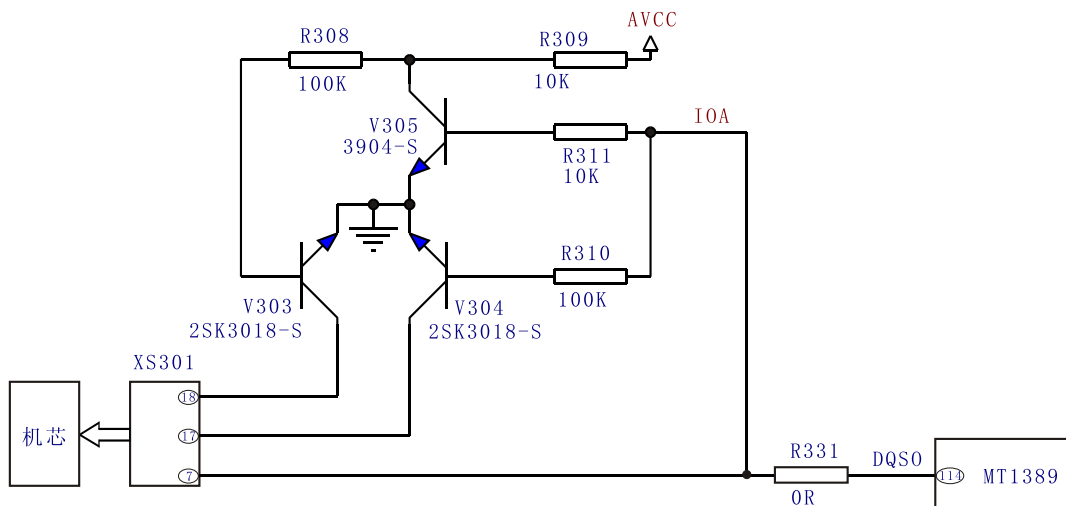


Figure 3.2.7.1 Disc identification circuit diagram

2. Working principle: the function of disc identification circuit is to identify the disc inserted to loader and judge whether the disc is VCD or DVD to perform the corresponding control acts. When disc is inserted in, decode servo control IC MT1389 defaults disc to DVD. Pin 114 of MT1389 outputs a low voltage signal, V305 and V304 are cut off, V303 is on, laser receiver tube inside loader selects DVD channel, now IOA is low level input loader to make loader in the state of reading DVD, through detecting laser power feedback signal, MT1389 analyses whether the preliminary judgment is correct (disc is defaulted DVD). When detecting correct preliminary judgment, loader runs in the state of reading DVD; when detecting incorrect preliminary judgment, MT1389 outputs a high voltage signal from its pin 114, V305 and V304 are on, V303 is cut off, laser receiver tube inside loader selects VCD channel, now IOA is high level input loader to make loader in the state of reading VCD. Whether the preliminarily defaulted disc is VCD or DVD is set by MT1389 internal software.

Note: V303 and V304 are MOS tube.

3.2.8 Main axis braking control circuit

1. Main axis braking control circuit is shown as the following figure 3.2.8.1:

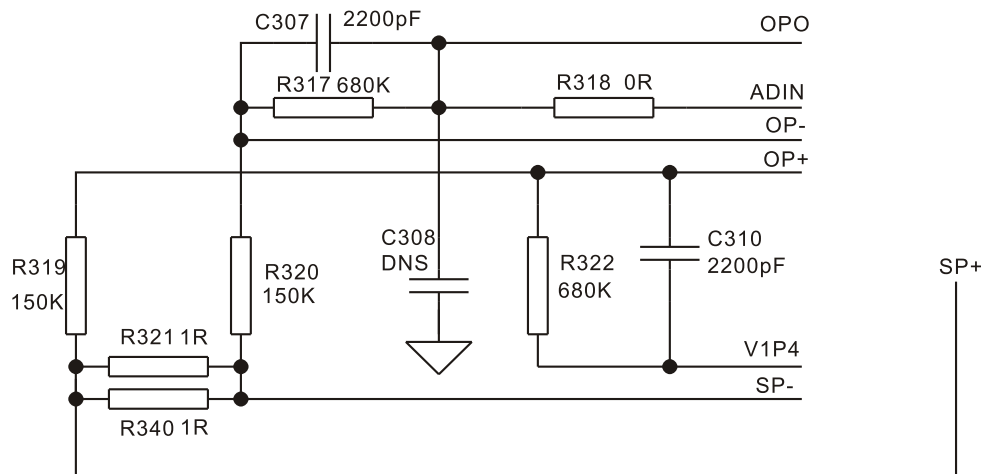


Figure 3.2.8.1 Main axis braking control circuit diagram

The equivalent circuit is shown as the following figure:

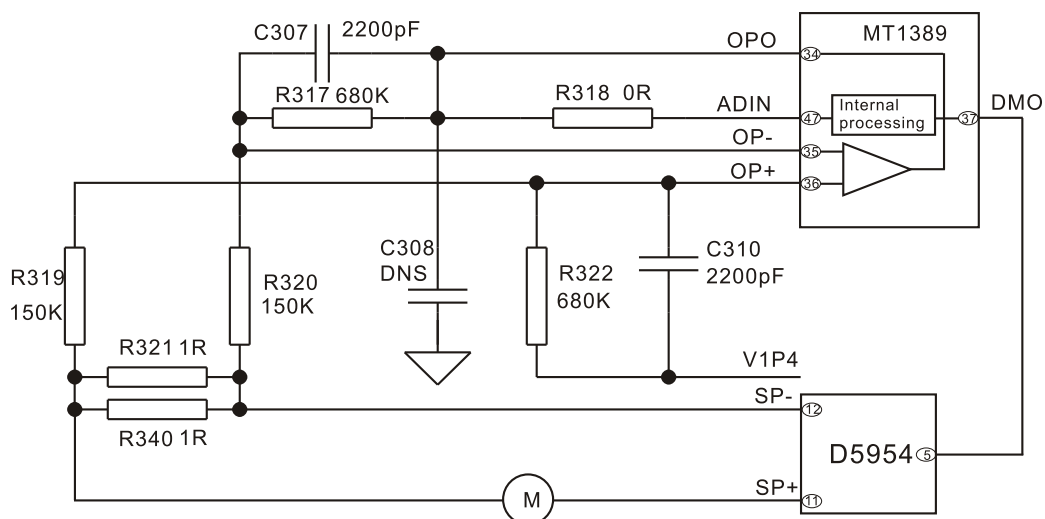


Figure 3.2.8.2 Main axis braking control equivalent circuit diagram

2. Working principle: To prolong the service life of electric machine and decrease the influence of start-up concussion current to the machine, when there is disc in, the development personnel design the main axis electric machine in running state always. Even though "STOP" button is pressed, disc will not stop running immediately. Thus when pressing "OPEN" button, a braking signal is required to make the main axis electric machine stop running to fulfill the completion of opening disc tray in a short period. In the course of playback, press "OPEN" button and main axis drive signal disappears. For the reason of inertia, the main axis electric machine is still in running state, and now the induced voltage achieved by the induced electromotive force which is generated by electric machine's running on sampling resistor R321 and R340 outputs from pin 34 through resistor R319, R320 and pin 35, 36 of MT1389 after being processed inside MT1389 and magnified, then sends to pin 47 of MT1389 through R13; after A/D conversion and the corresponding processing inside MT1389, an instant electric machine reversal braking signal is outputted from pin 37 of MT1389 to make the main axis electric machine decrease speed. When MT1389 detects the disc stops running, disc tray will open to ensure that disc will not run when disc tray opens.

3. Key point voltage (unit: V), shown as the following table:

Key point	Position	Normal working voltage (V)	Voltage change when disc out (V)
SP+	Pin 11 of D5954, pin 5 of XS303	3.79	3.79→0.70→1.80
SP-	Pin 12 of D5954, pin 6 of XS303	1.38	1.38→3.40→1.80
OP+	Pin 36 of MT1389/B	1.38	1.38→3.10→1.80
OP-	Pin 35 of MT1389/A	1.53	1.53→3.08→1.98
OPO	Pin 34 of MT1389/C	2.44	2.44→0.40→2.50
ADIN	Pin 47 of MT1389/D	2.44	2.41→0.41→2.44
DMSO	Pin 5 of D5954	1.42	1.42
VIP4	Pin 30 of MT1389	1.41	1.41

3.2.9 Control panel components

1. Control panel components block diagram is shown as the following figure 3.2.9.1:

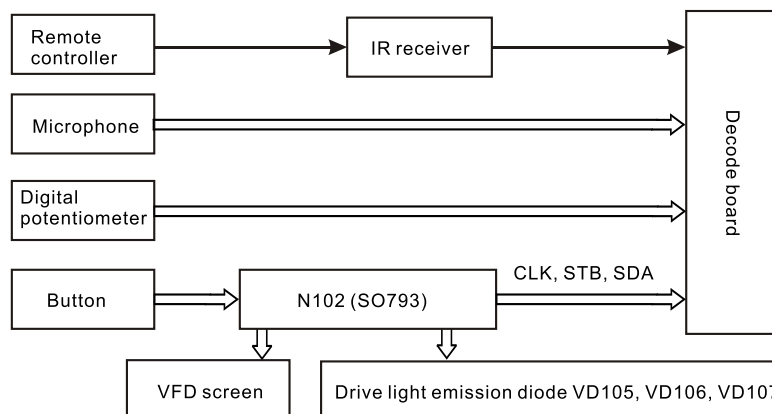


Figure 3.2.9.1 Control panel components block diagram

2. Working principle: panel is mainly composed of VFD screen, drive chip S0793, remote controller IR receiver, digital potentiometer, MIC jack, button and indicator light.

VFD is a vacuum fluorescence display screen and the working principle is the same with that of CRT TV set, that is, emit light and display through electron bombarding fluorescent powder. Pin 1, 2, 34 and 35 of VFD are filament power supply pin, GRID1GRID8 is segment control equal to grid, which speeds up electro emission and is responsible for display selection within reticular scope in display screen. SEG1SEG16 is bit control connected to single character with fluorescent powder on it. When electro is bombarding it, it emits light and displays character or strokes.

The function of N102 (S0793) is to drive display to display the corresponding state after processing data signal sent from decode board, meanwhile scan panel buttons matrix and sends it to CPU in digital signal means after processing button information to control the player and perform the corresponding acts.

Pin 3 of remote control IR receiver is 5V power supply pin, pin 2 grounds, and pin 1 is output pin. After processing remote controller buttons information, remote control receiver outputs from pin 1 and then sends to decode board directly.

VD105 is indicator light for no disc in. When no disc is in, this light is in flickering state; when playing disc, this light does not emit light if you select other function.

Digital potentiometer is used to adjust volume, which uses the phase difference of pulse send out from pin 1 and 3 of it to realize the adjustment of volume.

3.2.10 Video circuit

1. Video circuit block diagram is shown as the following figure 3.2.10.1:

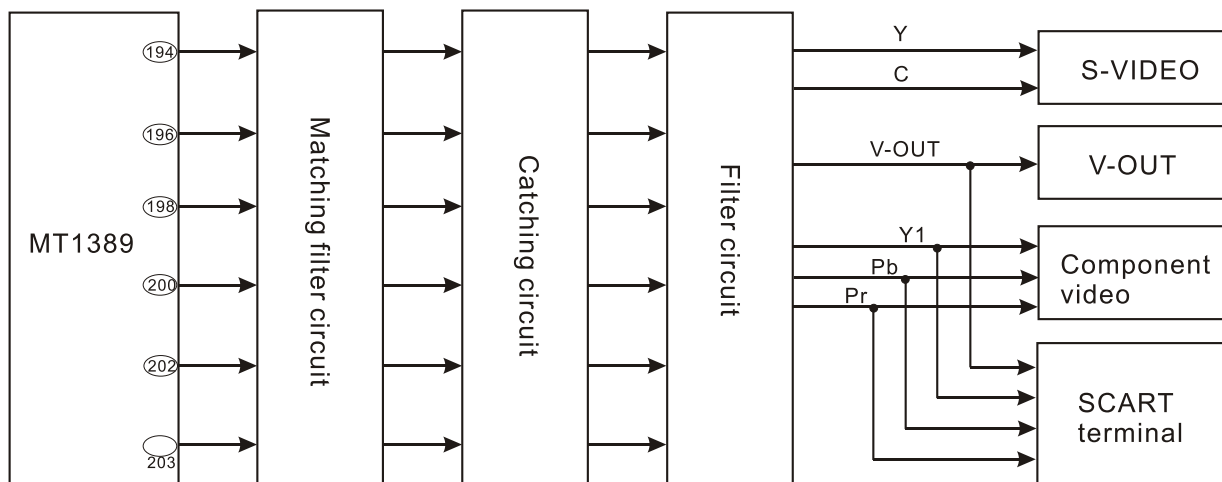


Figure 3.2.10.1 Video circuit block diagram

Brightness signal, colour difference signal, CVBS signal and component video signal after being decoded by U201 (MT1389) are sent out to the corresponding terminal for output after lowpass filtering and clipping. Take Y1 signal as an instance, the following figure 3.2.10.2 shows the working principle of filtering limiter circuit.

This circuit is very simple. R261 is a matched resistor, which makes the signal achieve the maximum power on load. Capacitor C106, C108 and inductor L106 compose a lowpass filter which filters the high frequency interference signals beside useful ones; diode VD108 and VD109 compose a limiter circuit. It is known from features of diode that the maximum amplitude of colour difference signal Y cannot exceed 5.7V and the minimum one cannot be under -0.7V, thus the high voltage signal from TV set can be avoided burning down the player.

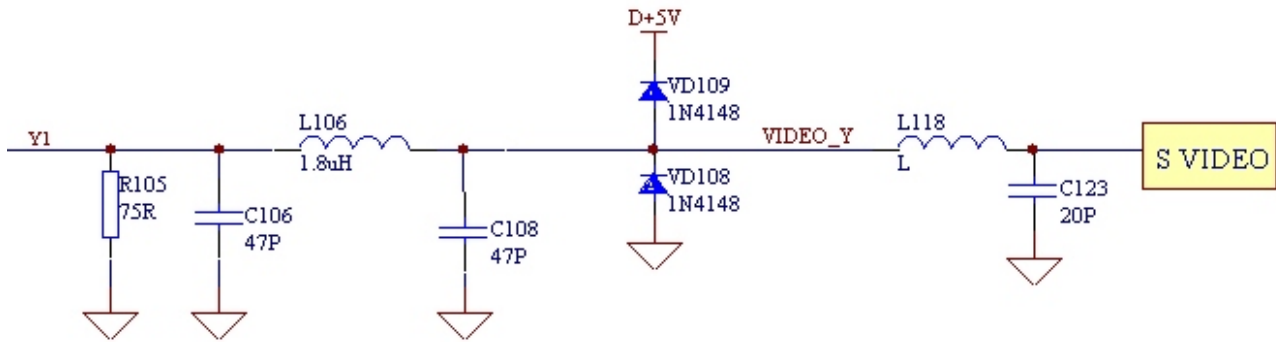


Figure 3.2.10.2 S-VIDEO output circuit diagram

2. Key point test point voltage (V) is shown as the following table:

Signal	Function	Troubles	DC voltage when no disc in (V)
Y	Brightness of S-VIDEO	S-video without picture/picture bright/picture dark	0.74
C	Chroma of S-VIDEO	S-video without color/color distortion	1.48
VIDEO	Component video composite signal	Composite video without picture/picture bright/picture dark	0.74
Y1	Component video brightness signal	Component video without picture/picture bright/picture dark	0.76
Pb	Component video chroma signal	Component video color distortion	1.46
Pr			1.75

Note: in actual test, voltage of the above several signals Y, C, VIDEO, Y1, Pb and Pr will have some changes between two several tenths of a volt and one volt and above, so the main method to test is to test waveform of each signal in the course of playback.

3. Troubleshooting process

(1) Troubleshooting process for “On-screen-mosaic when playing” is shown as the following figure 3.2.10.3:

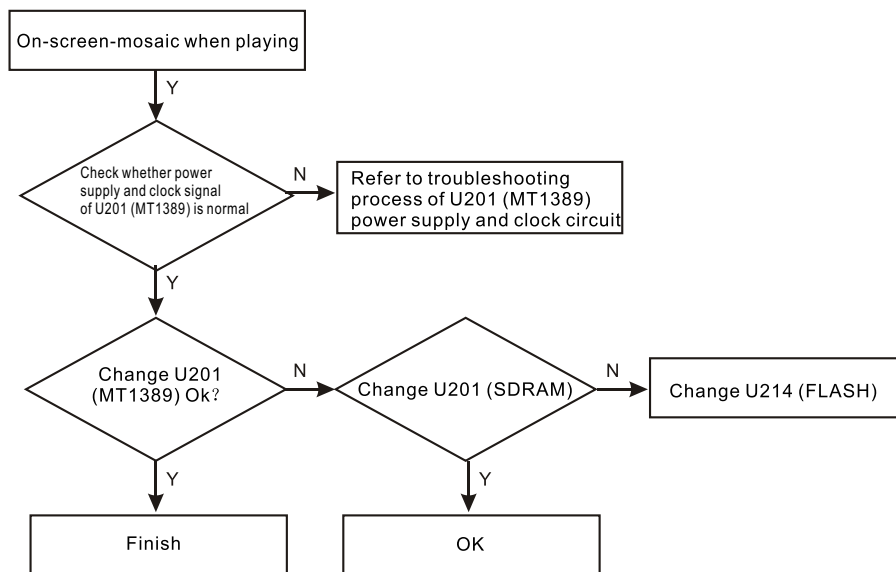


Figure 3.2.10.3 Troubleshooting flow chart of “On-screen-mosaic when playing”

(2) Troubleshooting process for "No output for composite video" is shown as the following figure 3.2.10.4:

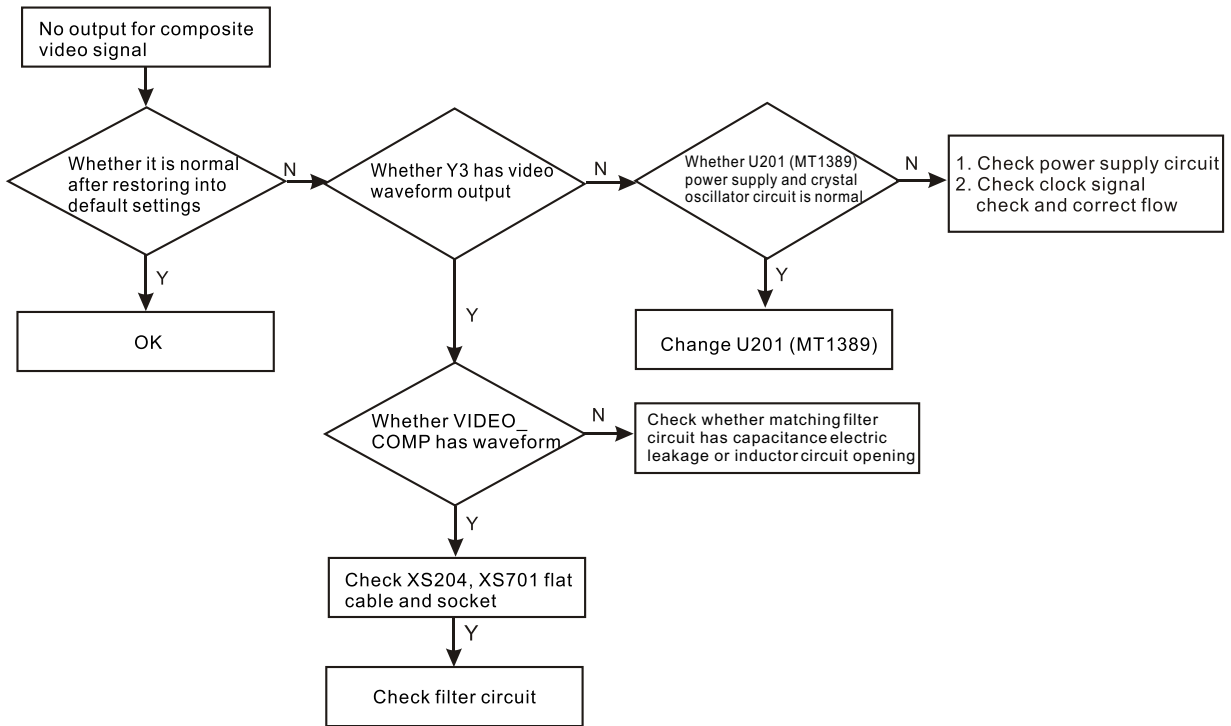


Figure 3.2.10.4 Troubleshooting flow chart of "No output for composite video"

(3) Troubleshooting process for "No colour of picture" is shown as the following figure 3.2.10.5:

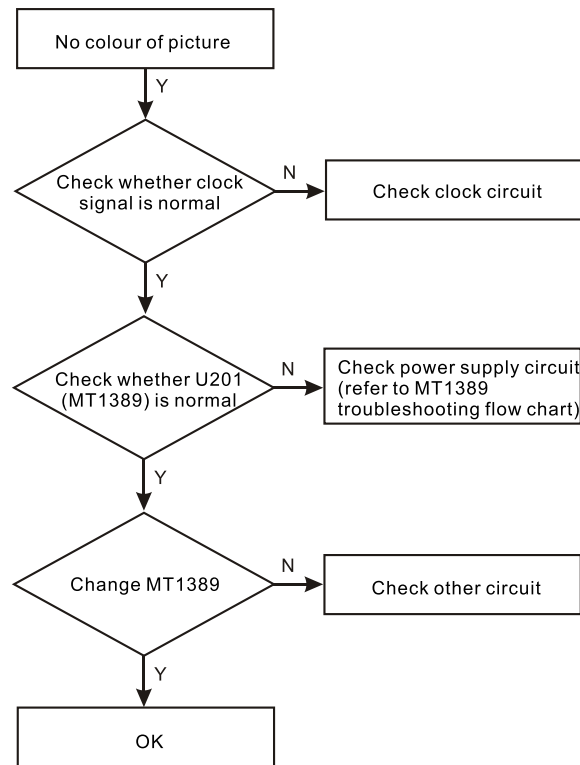
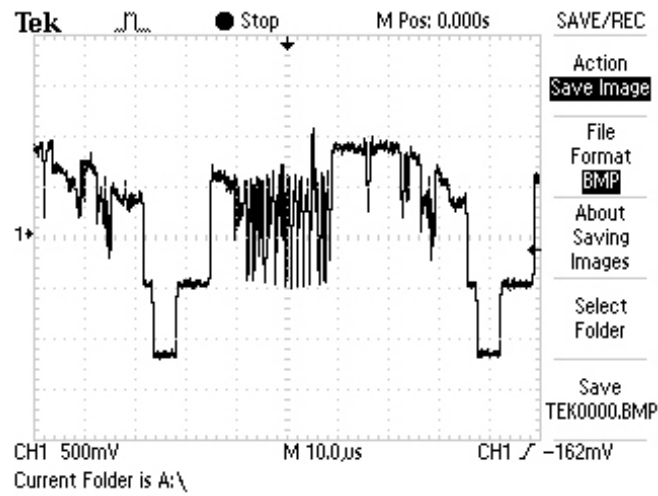


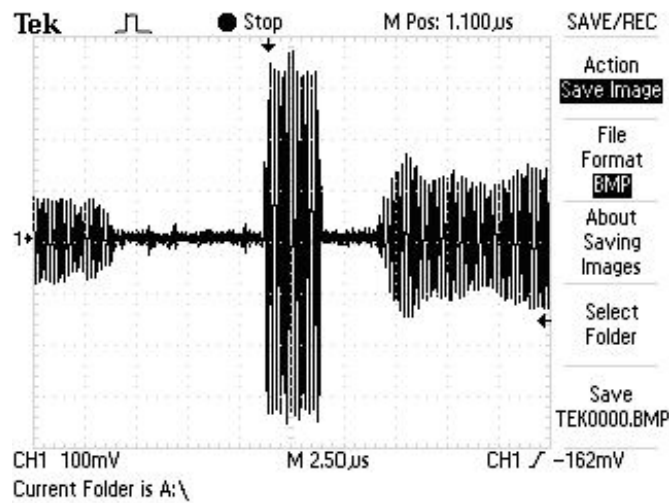
Figure 3.2.10.5 Troubleshooting flow chart of "No colour of picture"

4. Video signal waveform diagram is shown as the following figure 3.2.10.6:

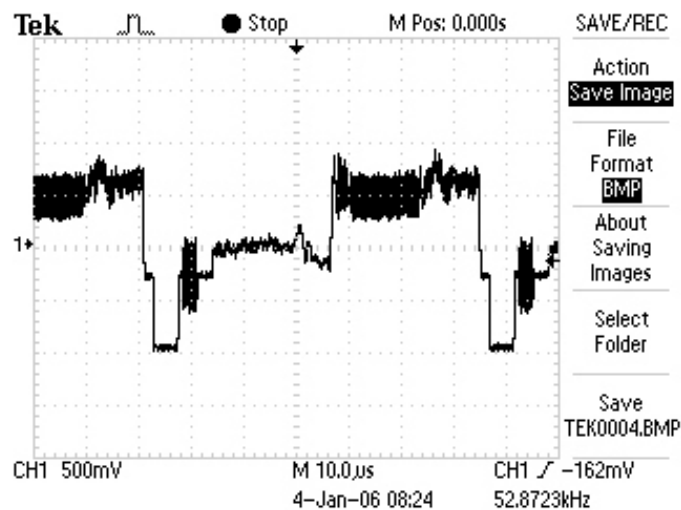
(1) Y1: waveform of brightness signal in S-video terminal



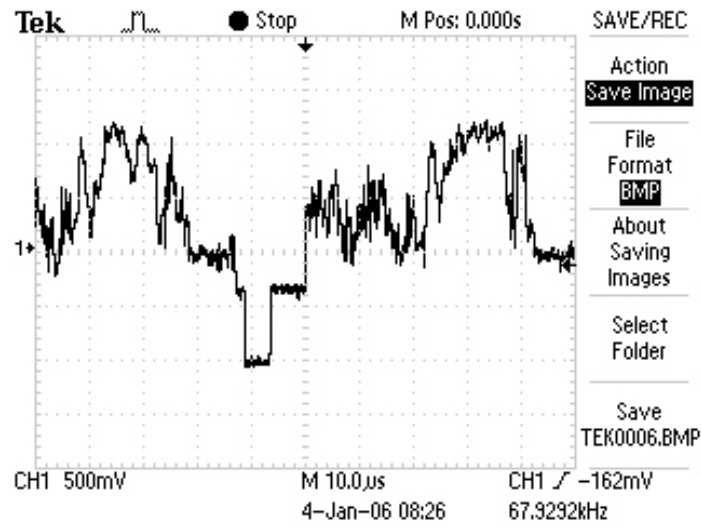
(2) Y2: waveform of colour difference signal in S-video terminal



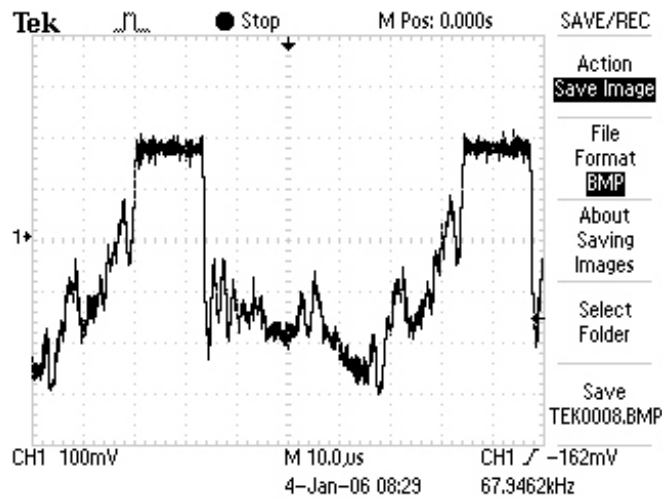
(3) Y3: composite video signal waveform



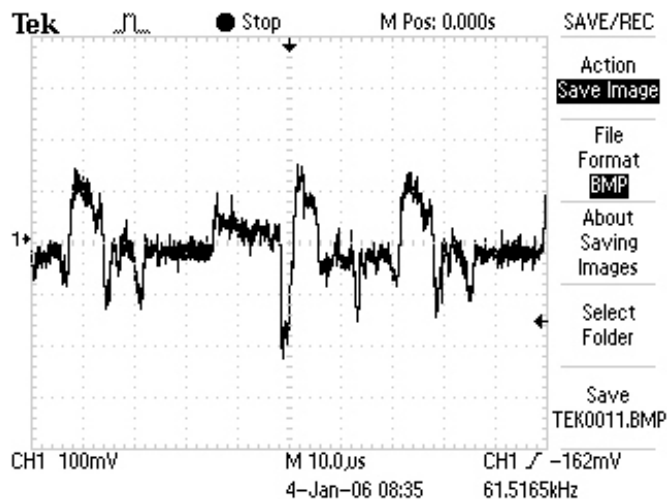
(4) Y4: component video brightness signal waveform



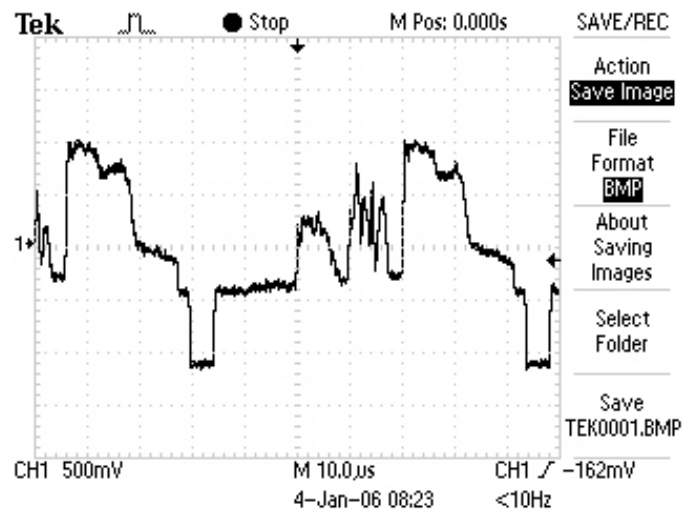
(5) Y5: component video blue colour difference signal (Y-B) waveform



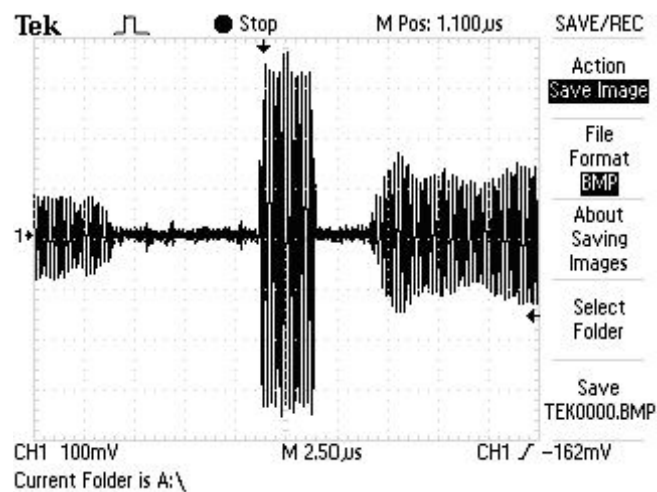
(6) Y6: component video red colour difference signal (Y-R) waveform



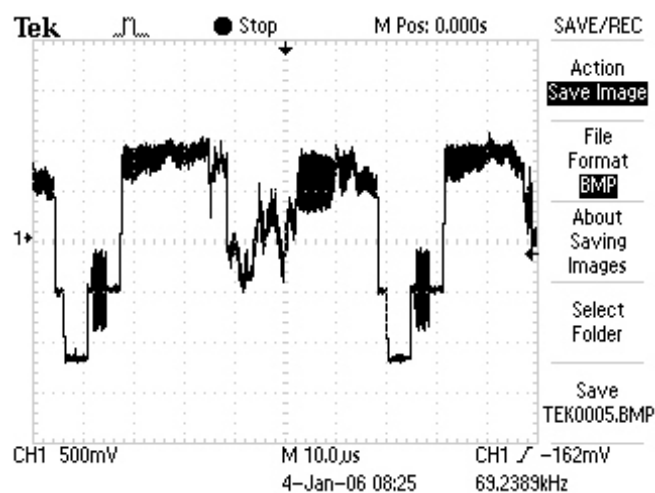
(7) VIDEO-C: S-video terminal colour difference signal waveform after filtering



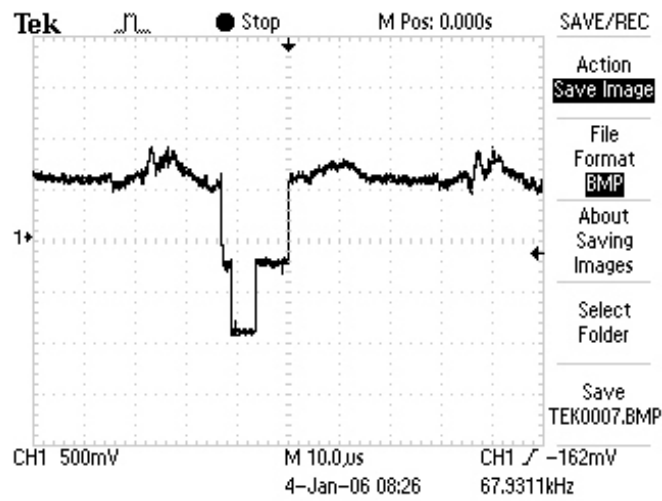
(8) VIDEO-Y: S-video terminal brightness signal waveform after filtering



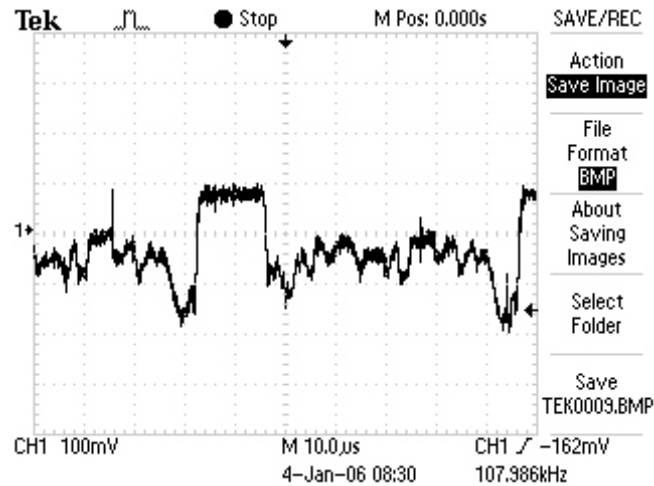
(9) VIDEO-COMP: composite video signal waveform after filtering



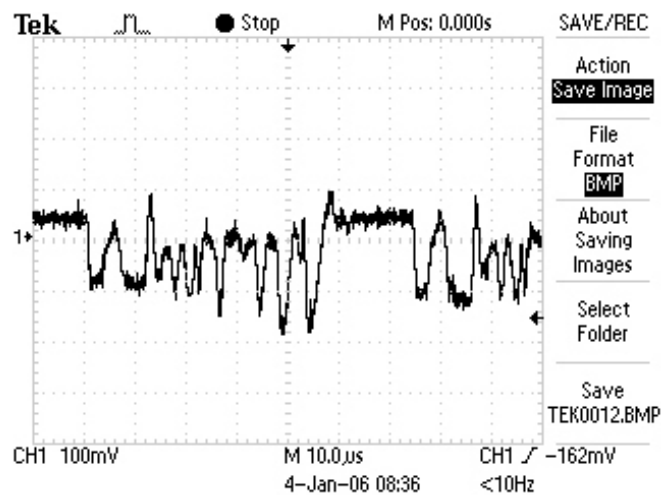
(10) VIDEO-Y1: component video brightness signal waveform after filtering



(11) VIDEO-U: component video blue colour difference signal (Y-b) waveform after filtering



(12) VIDEO-V: component video red colour difference signal (Y-r) waveform after filtering



Series figure 3.2.10.6 Video signal waveform diagram

3.2.11 Input/output circuit

Input/output circuit is also called AV board. AV board outputs video and audio signals sent from decode board and power amplifier board from the corresponding terminal after coupling and filter circuit processing. Externally inputted audio signal is sent to power amplifier board and decode board for processing also through AV board. DK1020SAV board video output (refer to 3.2.10) circuit includes composite video output terminal, S-video terminal and component video output terminal; audio circuit includes mixed left/right channel output terminal, digital and optical output terminal, coaxial cable output terminal, SCART terminal, and also one path input terminal, that is left/right channel input terminal.

1. SCART terminal

SCART is a terminal that integrates video and audio together, which can transmit video and audio signals at the same time and operation is very convenient. It has 21 pins in all and lies in the middle part at rear side of the player. Pin function is shown as the following table:

Pin	Name	Signal direction	Function description	Pin	Name	Signal direction	Function description
1	A(B)OUT	I	Audio right channel input	12	NC		Network communication data line 2
2	A(B)IN	O	Audio right channel output	13	RETURN		Pr signal ground
3	A(A)OUT	I	Audio left channel input	14	RETURN		Blanking signal ground
4	A-COM		Audio signal ground	15	RED I/O	I/O	Pr signal I/O interface
5	RETURN		Pb signal ground	16	BLK I/O	I/O	Blanking signal I/O interface
6	A(A)IN	O	Audio left channel output	17	RETURN		Blanking signal ground
7	BLUE I/O	I/O	Pb signal I/O interface	18	TRTURN		Composite video signal ground
8	FUNCSW	I	Function selection interface	19	V-OUT	I	Composite video signal input
9	RETURN		Y1 signal ground	20	V-IN	O	Composite video signal output
10	CONT	I/O	Network communication data line 2	21	GND		Common
11	GREEN I/O	I/O	Y1 signal I/O interface				

Note: Blanking signal of pin 16 is used to select RGB or CVBS mode. I means inout, O means output and I/O means input/output.

2. SCART terminal function selection is shown as the following figure:

PDAT0	PDAT1	PDAT2	pin 8 of SCART terminal	Function
0	<input type="checkbox"/>	0	10V	AV4:3()
0	<input type="checkbox"/>	1	7.5V	AV16:9
1	<input type="checkbox"/>	0	0.90V	TV
1	<input type="checkbox"/>	1	0.85V	TV
<input type="checkbox"/>	0	<input type="checkbox"/>	<input type="checkbox"/>	CVBS MODE
<input type="checkbox"/>	1	<input type="checkbox"/>	<input type="checkbox"/>	RGB MODE

Note: PDAT0 and PDAT2 are used to control the input voltage on pin 8 of SCART terminal. PDAT1 is used to control the voltage change on pin 16 of SCART terminal. The voltage on pin 16 controls and decides SCART selects whether RGB or CVBS mode.

3.2.12 Tuner

The range of receiving AM of tuner (DTS-44K (CE)) is 531KHZ1602KHZ, step frequency is 9KHZ. The range of receiving FM is 87.50MHZ108.0MHZ, step frequency is 50KHZ. The used temperature range is -5°C+80°C. Pin function is shown as the following table:

Pin	Name	Function	Signal flow	Standby voltage (V)	AM receiving voltage (V)	FM receiving voltage (V)
1	GND	Ground		0	0	0
2	CE	Select	I	0	0	0
3	DI	Data	I	0	3.46	0
4	CL	Clock	I	3.38	3.46	3.45
5	DO	Data	O	0.41	0.04	4.16
6	FM DET	FM detecting wave	O	0	0	0
7	VCC	Power supply	I	0.69	11.42	11.46
8	Rch	Right channel	O	0	0	0
9	GND	Ground		0	0	0
10	Lch	Left channel	O	0	0	0

Section Three DK1020S Audio Power Amplifying Circuit Principle and Servicing

3.3.1 Audio power amplifying circuit block diagram

1. Audio power amplifying circuit block diagram is shown as the following figure 3.3.1.1:

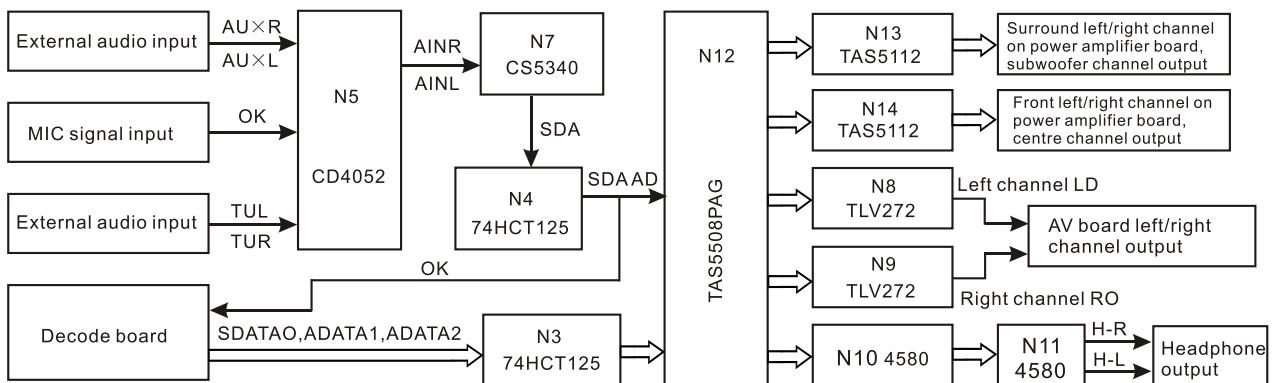


Figure 3.3.1.1 Audio power amplifying circuit block diagram

2. Working principle:

N5 (CD4052): CD4052 is a switch for selection, which is used to select externally inputted tuning signal, MIC signal and left/right channel audio signal. When the player is in the state of playing disc, MIC signal may be on. MIC changes to digital signal after conversion of CS5340, and this digital signal outputs from pin 217 of MT1389 (SDATA0) to power amplifier board after outputting to decode for processing. Note: MIC signal through Cs5340 does not pass through N4 (74HCT125).

N7 (CS5340): converse analog signal sent out from CD4052 to digital signal for processing by back stage circuit.

N3, N4 (74HCT125): 74HCT125 is a gating IC with 4 paths in it, which can perform gating to 4 paths signals. N3 performs gating to MCLK, audio signal SDATA0, SDATA1 and SDATA2.

N12 (TAS5508): after the processing of pulse width demodulation to SDA, SDATA0, SDATA1, SDATA2 digital audio signals, 10 channel outputs generate, that is, left/right channel output on input/output board, headphone left/right channel output, front left/right channel on power amplifier board, surround left/right channel output, subwoofer channel and centre channel output.

N13, N14 (TAS5112): is a high performance amplifying IC, which demodulates and amplifies front left/right channel, surround left/right channel, centre and subwoofer after PWM of N12 (TAS5508).

N9 (TLV272): is a integrated operational amplifying IC, which amplifies left/right channel signals on AV board.

N10 (4580): amplifies headphone signal.

3.3.2 Output circuit block diagram

1. Power amplifier surround left/right channel block diagram is shown as the following figure 3.3.2.1:

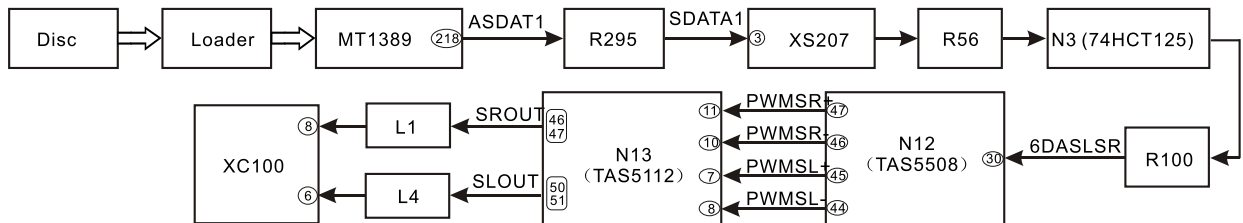


Figure 3.3.2.1 Power amplifier surround left/right channel block diagram

2. Power amplifier left/right channel output and non power amplifier left/right channel output block diagram is shown as the following figure 3.3.2.2:

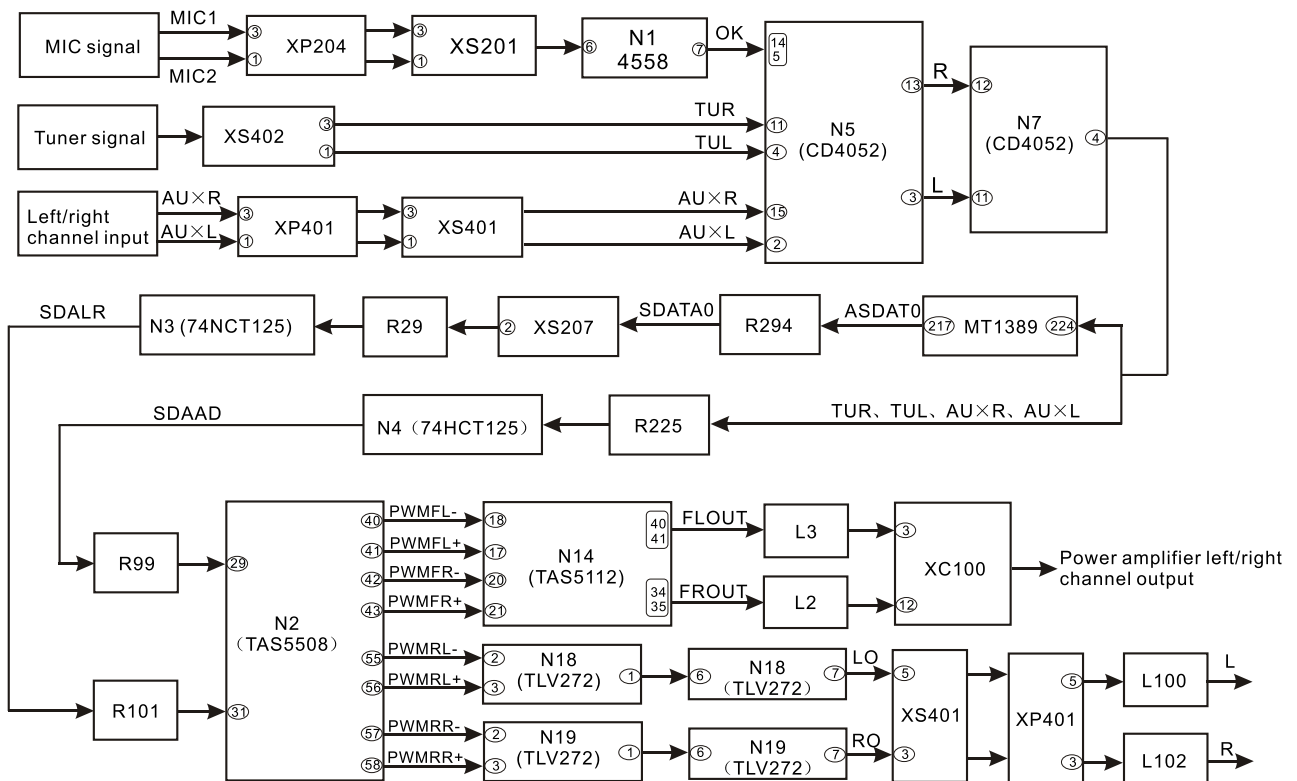


Figure 3.3.2.2 Power amplifier left/right channel output and non power amplifier left/right channel output block diagram

3. Power amplifier subwoofer, centre channel block diagram is shown as the figure 3.3.2.3:

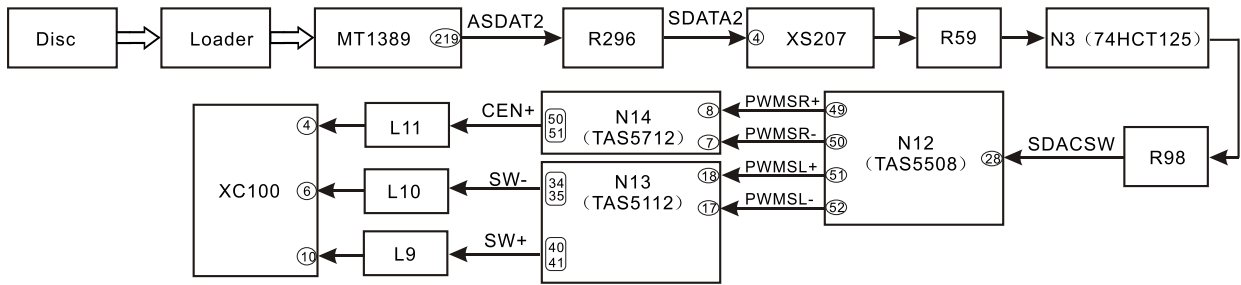


Figure 3.3.2.3 Power amplifier subwoofer, centre channel block diagram

3.3.3 Unit circuit block diagram

1. MIC circuit block diagram is shown as the following figure 3.3.3.1:

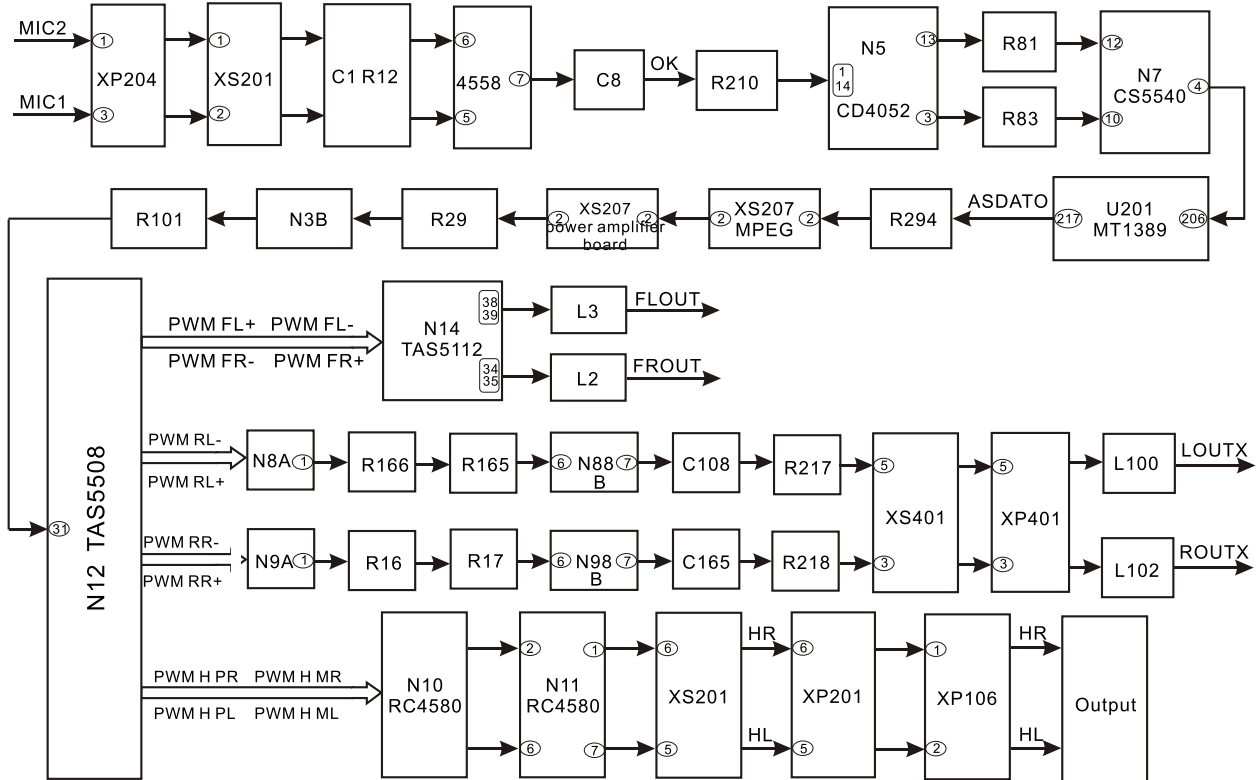


Figure 3.3.3.1 MIC circuit block diagram

2. External input circuit block diagram is shown as the following figure 3.3.3.2:

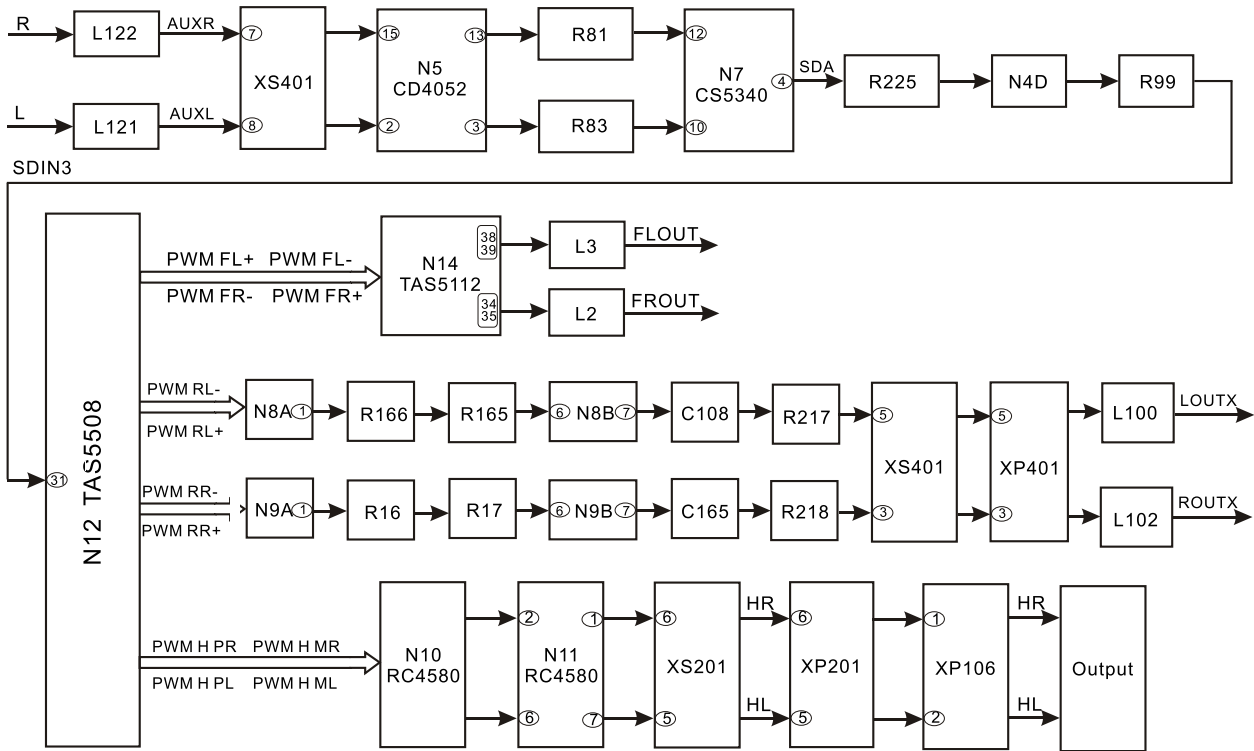


Figure 3.3.3.2 External input circuit block diagram

2. Headphone output circuit block diagram is shown as the following figure 3.3.3.3:

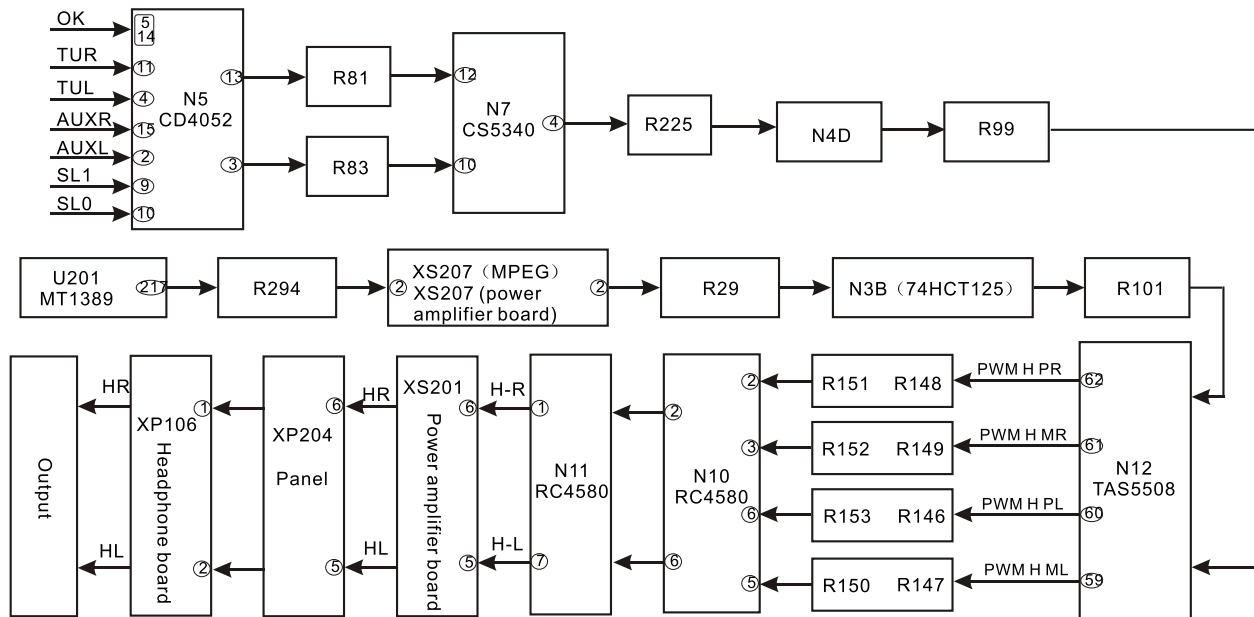
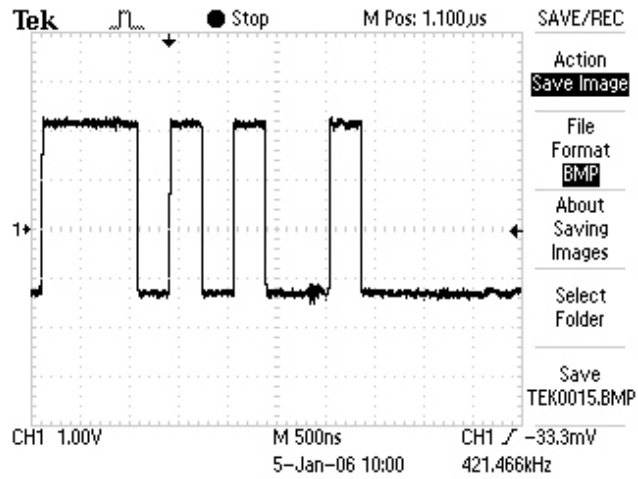


Figure 3.3.3.3 Headphone output circuit block diagram

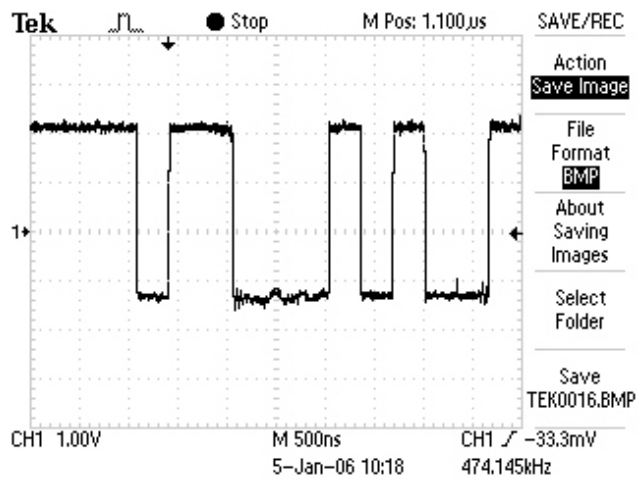
3.3.4 Audio signal waveform

Audio signal waveform is shown as the following series figure 3.3.4.1:

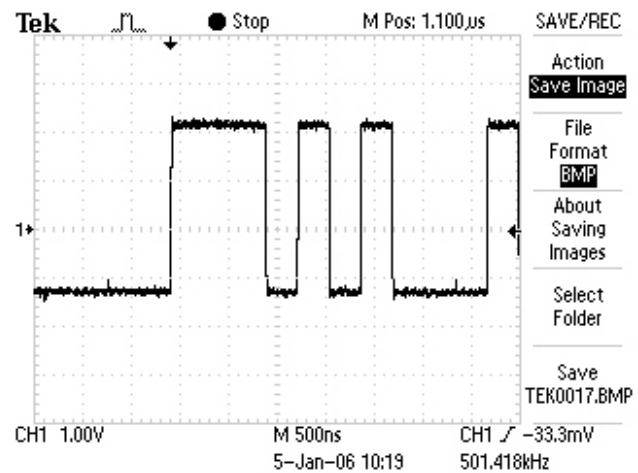
1. SDATA0 (mixed left/right channel digital signal) waveform



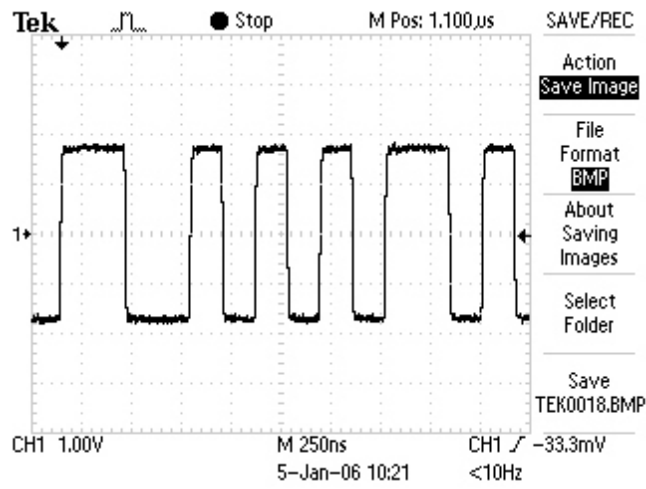
2. SDATA1 (surround left/right channel digital signal) waveform



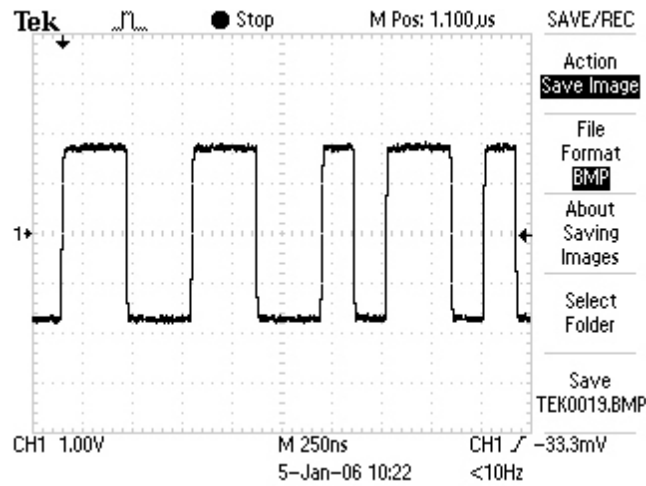
3. SDATA2 (centre subwoofer digital signal) waveform



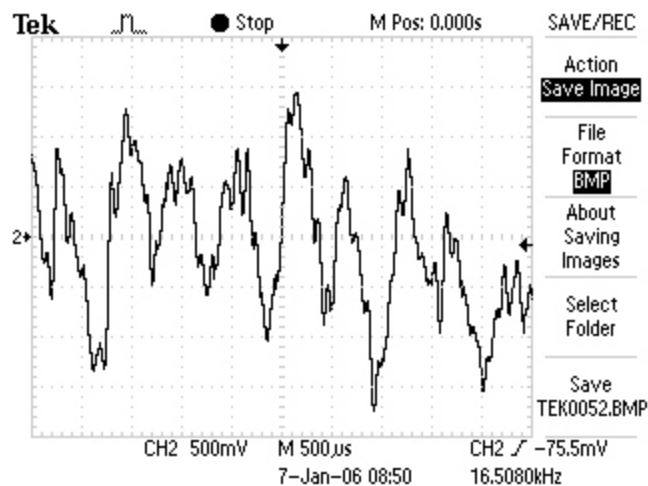
4. IEC958 (optical and coaxial digital audio signal) waveform on pin 13 of XS206



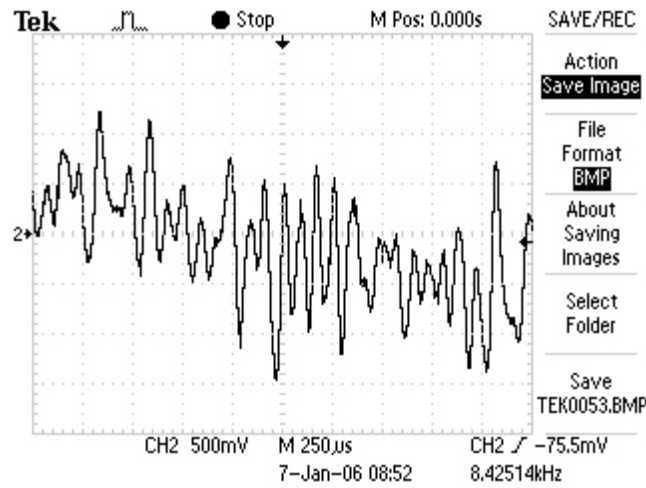
5. SPDIF (optical and coaxial digital audio signal) waveform on pin 13 of XP206



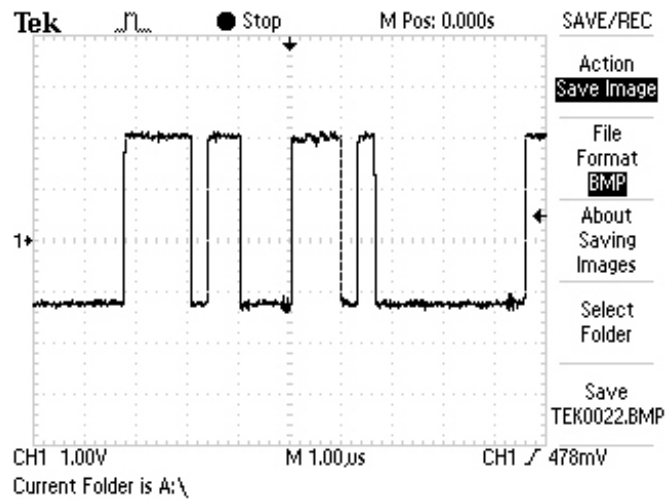
6. RO signal waveform on pin 3 of XP401



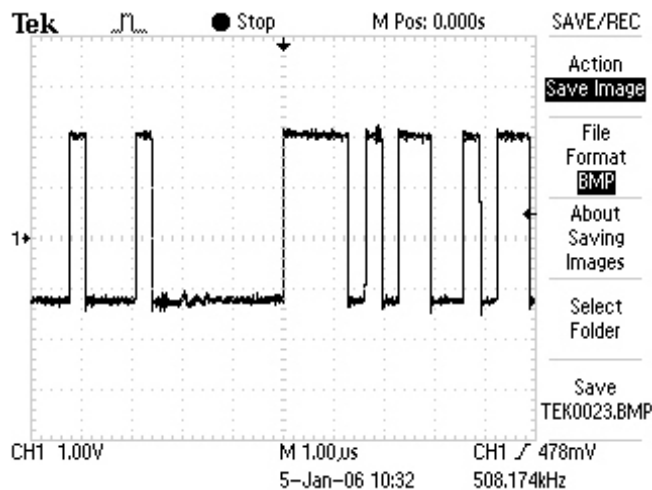
7. LO signal waveform on pin 5 of XP401



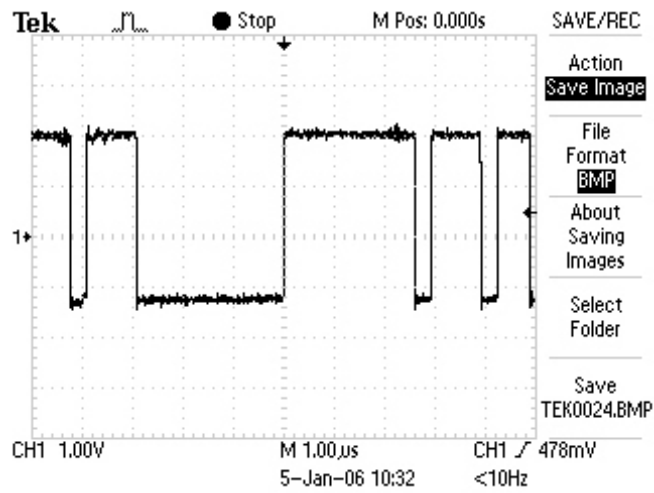
8. SDA LR waveform on pin 6 of N3



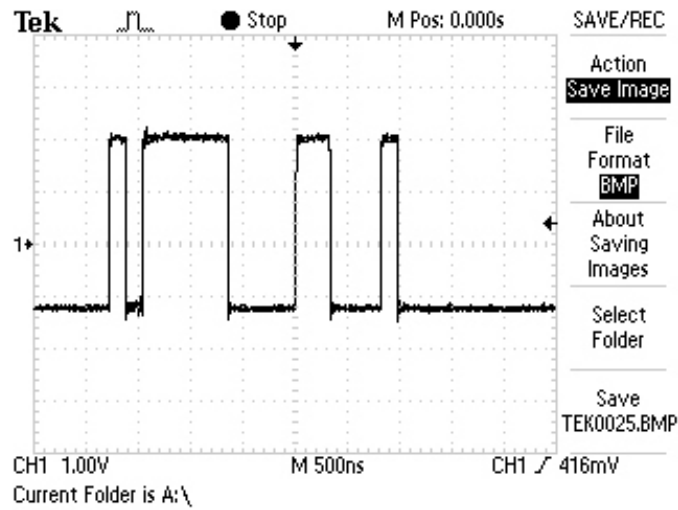
9. SDA SLRS waveform on pin 8 of N3



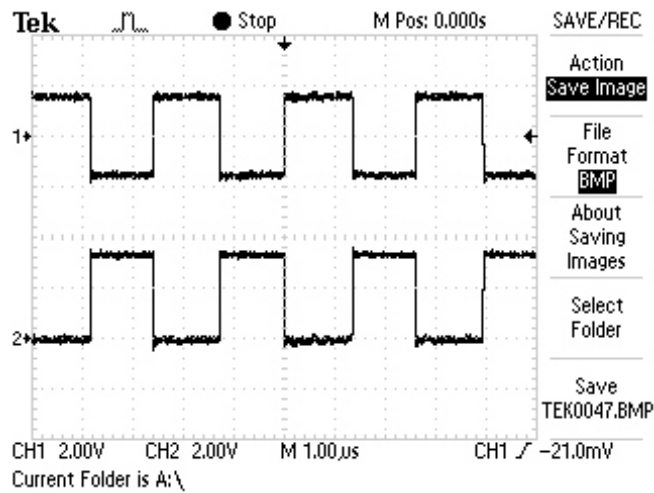
10. SDA CSW waveform on pin 11 of N3



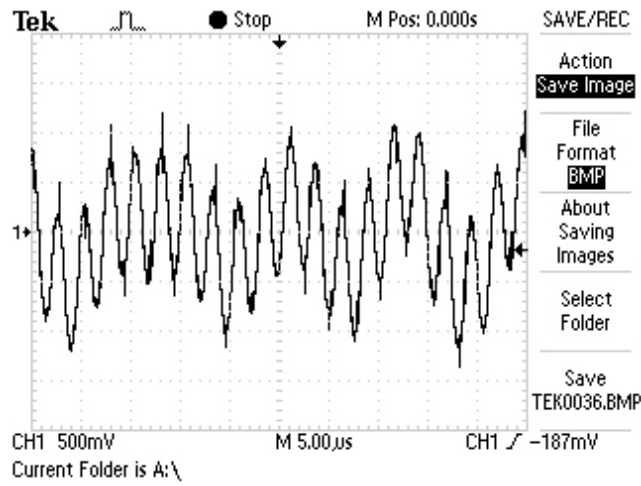
11. SDAAd waveform on pin 11 of N4



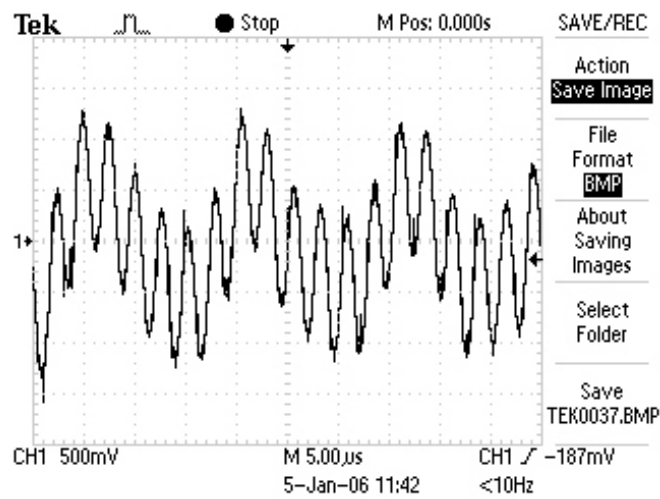
12. Waveform of PWM FR+ and PWM FR- signal outputted by N12 (5508)



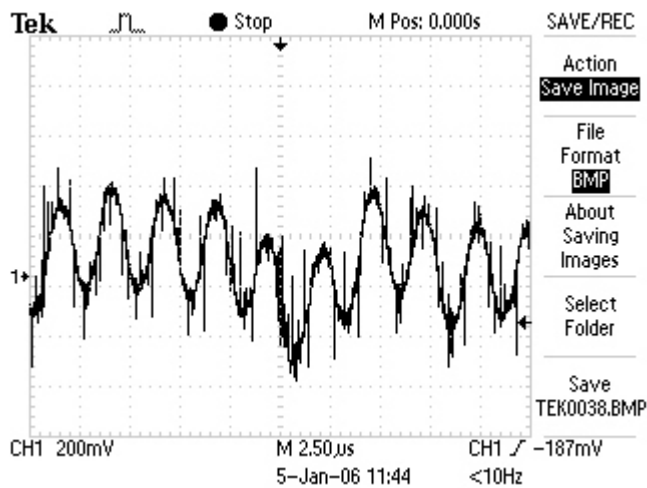
13. SLOUT waveform



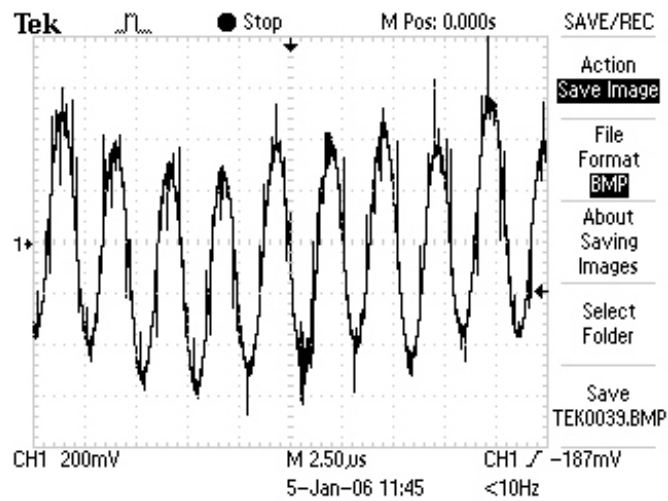
14. SROUT waveform



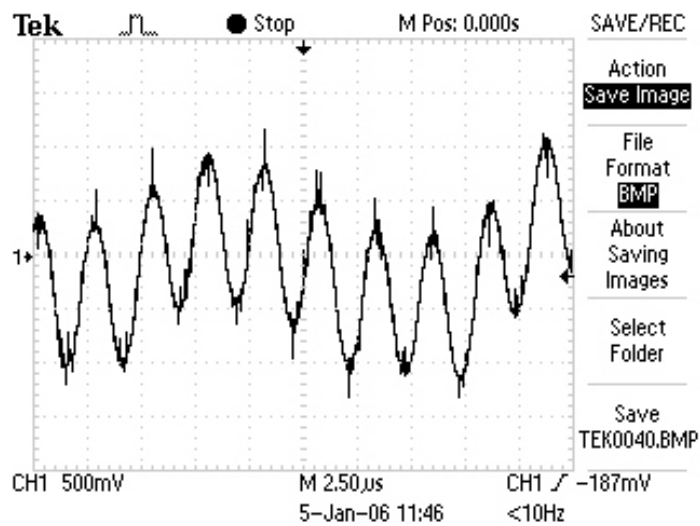
15. SW+ waveform



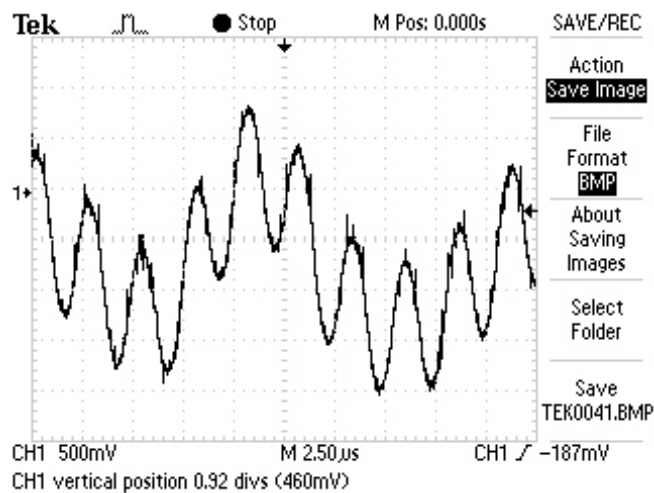
16. SW- waveform



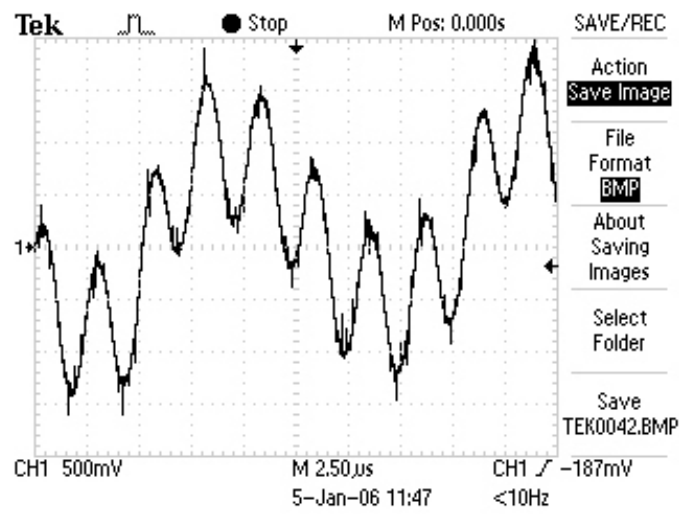
17. CEN+ waveform



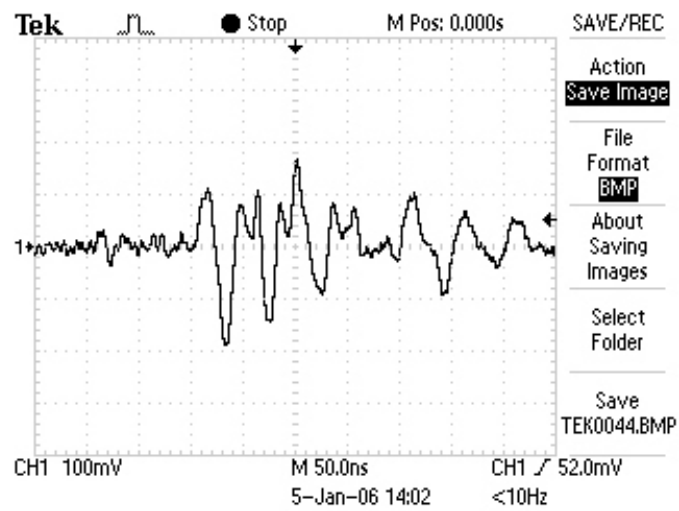
18. FLOUT waveform



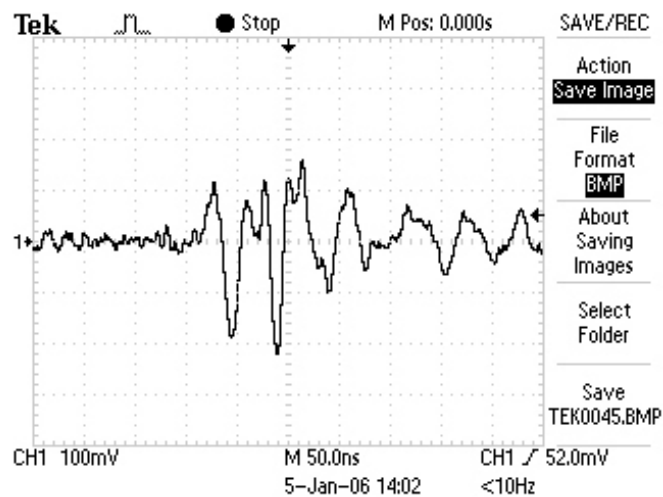
19. FROUT waveform



20. H-L waveform



21. H-R waveform



22. MIC signal waveform on pin 1 of XS201

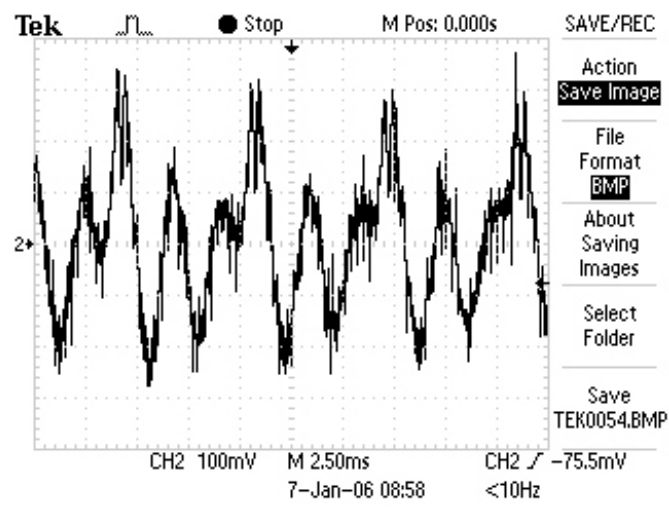


Figure 3.3.4.1 Audio signal waveform figure

Section Four Introduction to IC

3.4.1 Function introduction to Mt1389

1. MT1389 (U201) adopts LQFP pin 256 casing and 3.3V/1.8V dual voltage working mode, which is a good performance large-scale CDROM front-end processing CMOS integrated circuit, and CD/VCD/DVD player special-used single chip. It includes focus servo error magnification, trace servo error magnification and horizontal output servo control. The main function are narrated as follows:

(1) The main function of front-end RF small signal processing is to process and amplify signals A, B, C, D, E and F transmitted from pick-up, and automatically adjust laser output power, meanwhile fulfil the identification of VCD disc and DVD disc.

(2) Digital servo processing may produce focus, trace, feed, main axis servo control signal processing and digital signal processing to realize modulating EFM/EFM+ of Therefore signal.

(3) MPEG1/MPEG2/MPEG4/JPEG Video decoder. This chip can decode VCD, DVD, MPEG 4 network video, compatible with “network movie” disc, and also can read JPEG picture to fulfil digital album playback.

(4) In audio aspect, AC-3/DTS dual decoding, actively read MP3, compatible with DVD Audio decode, to reach high resolution sound quality restore 1000 times higher than that of CD.

(5) By using the built-in 8032 micro-processor of chip, MT1389 may also fulfil the control of the player system to simplify circuit design greatly.

(6) Deal with data transferred from tuner and control the tuner.

2. Pin function of MT1389 is shown as the following table:

Pin	Name	Function	Data direction	DC voltage	Remark
1	AGND	Analog		0	
2	DVDA	DVD-RF high frequency AC coupling signal A	I	1.72	Signals A, B, C and D from loader are coupled by capacitor C201, C202, C203 and respectively
3	DVDB	DVD-RF high frequency AC coupling signal B	I	1.72	
4	DVDC	DVD-RF high frequency AC coupling signal C	I	1.72	
5	DVDD	DVD-RF high frequency AC coupling signal D	I	1.72	
6	DVDRFIP	DVD-RF high frequency AC coupling signal RFIP input	I	1.2	unused
7	DVDRFIN	DVD-RF high frequency AC coupling signal RFIN input	I	1.38	
8	MA	DVD-RAM main beam RF DC signal input A	I	2	Signals A, B, C and D from loader are coupled by resistor R201, R202, R203 and R204 respectively
9	MB	DVD-RAM main beam RF DC signal input B	I	2	
10	MC	DVD-RAM main beam RF DC signal input C	I	2	

Pin	Name	Function	Data direction	DC voltage	Remark
11	MD	DVD-RAM main beam RF DC signal input D	I	2	
12	SA	DVD-RAM assistant beam RF DC signal input A	I	1.4	unused
13	SB	DVD-RAM assistant beam RF DC signal input B	I	1.33	
14	SC	DVD-RAM assistant beam RF DC signal input C	I	1.35	
15	SD	DVD-RAM assistant beam RF DC signal input D	I	1.31	
16	CDFON	CD focus error inverted input	I	1.33	
17	CDFOP	CD focus error noninverted input	I	1.3	
18	TNI	3 beam assistant PD signal inverted input	I	2	E, F signal input directly
19	TPI	4 beam assistant PD signal noninverted input	I	2	
20	MDI1	Laser power monitoring input 1	I	0	
21	MDI2	Laser power monitoring input 2	I	0	
22	LDO2	Laser power output 2	O	3.18	
23	LDO1	Laser power output 1	O	3.18	
24	SVDD3	Servo 3.3V power supply		3.2	
25	CSO/RFOP	Main servo signal output/RF noninverted output	O	1.3	R2165 is unused, so these two pins are unused.
26	RFLVL/RFO N	RF level output/RF inverted output	O	1.33	
27	SGND	Servo ground		0	
28	V2REFO	Reference voltage 2.8V	O	2.74	
29	V20	Reference voltage 2.0V	O	2.18	
30	VREFO	Reference voltage 1.4V	O	1.5	
31	FEO	Focus error signal output	O	1.5	R2166 is unused
32	TEO	Trace error signal output	O	1.16	
33	TEZISLV	Trace zero passage error input	I	1.32	Joint welding with capacitor C207 connected with this position will cause disc not reading
34	OP_OUT	Sensing signal magnifying output	O	2.55	Input/output of main axis braking circuit
35	OP_INN	Sensing signal inverted output	I	2	
36	OP_INP	Sensing signal noninverted output	I	1.74	
37	DMO	Main axis control signal output	O	1.37	
38	FMO	Feed control signal output	O	1.38	
39	TROPEN PWM	Close signal output	O	0	
40	PWMOUT1/A DIN9	the first path PWM signal output/AD universal input	I	1.38	unused

Pin	Name	Function	Data direction	DC voltage	Remark
41	TRO	Trace control signal output	O	1.38	
42	FOO	Focus control signal output	O	1.38	
43	USB_VSS	USB ground		0	
44	USBP	USB data	I/O	0	unused
45	USBM	USB data	I/O	0	
46	USB_VDD3	USB 3.3V power supply		3.2	
47	FG/ADIN8	Sensing signal input/AD universal input	I	2.69	
48	TDI/ADIN4	Open-to-position checking signal input/AD universal input	I	3.2	
49	TMS/ADIN5	Open-to-position checking signal input/AD universal input	I	0	
50	TCK/ADIN6	BA5954 signal output/AD universal input	O	0	
51	TDO/ADIN7	Open signal output/AD universal input	O	0	
52	DVDD18	Digital 1.8V power supply		1.8	
53	IOA2	Microcontroller address bit 2	O	1.96	FLASH address signal
54	IOA3	Microcontroller address bit 3	O	1.98	
55	IOA4	Microcontroller address bit 4	O	1.96	
56	IOA5	Microcontroller address bit 5	O	1.69	
57	IOA6	Microcontroller address bit 6	O	3.23	
58	IOA7	Microcontroller address bit 7	O	3.23	
59	HIGHA0	Microcontroller address bit 0	O	1.01	
60	IOA18	Microcontroller address bit 18	O	0.05	
61	IOA19	Microcontroller address bit 19	O	0	
62	DVSS	Digital		0	
63	APLLCAP	Analog phase-locked loop external capacitor		1.8	
64	APLLVSS	Analog phase-locked loop		0	
65	APLLVDD3	Analog phase-locked loop 3.3V power supply		3.1	
66	IOWR	FLASH read-write control signal	O	3.23	output PWR# and change into DWR# signal to control FLASH through 0 ohm resistor R297
67	A16	FLASH address bit 16	O	1.3	FLASH address signal
68	HIGHA7	Microcontroller address bit 7	O	1.18	
69	HIGHA6	Microcontroller address bit 6	O	1.99	
70	HIGHA5	Microcontroller address bit 5	O	2.9	
71	HIGHA4	Microcontroller address bit 4	O	2	

Pin	Name	Function	Data direction	DC voltage	Remark
72	HIGHA3	Microcontroller address bit 3	O	1.11	FLASH address signal
73	DVDD3	Digital 3.3V power supply		3.24	
74	HIGHA2	Microcontroller address bit 2	O	1.81	
75	HIGHA1	Microcontroller address bit 1	O	1.55	FLASH address signal
76	IOA20	Microcontroller address bit 20	O	0	
77	IOCS	FLASH chip selection	O	0	Output PCE# signal and change into DCE# signal to control FLASH through 0 ohm resistor R298
78	IOA1	Microcontroller address bit 1	O	2.03	FLASH address signal
79	IOOE	FLASH output enable	O	0	Output PRD# signal and change into DRD# signal to control FLASH output through 0 ohm resistor R299
80	DVDD3	Power supply		3.23	
81	AD0	Microcontroller address/data bit 0	I/O	1.32	FLASH data signal
82	AD1	Microcontroller address/data bit 1	I/O	1.52	
83	AD2	Microcontroller address/data bit 2	I/O	1.16	
84	AD3	Microcontroller address/data bit 3	I/O	0.9	
85	DVSS	Ground		0	
86	AD4	Microcontroller address/data bit 4	I/O	1.57	FLASH data signal
87	AD5	Microcontroller address/data bit 5	I/O	1.57	
88	AD6	Microcontroller address/data bit 6	I/O	1.57	
89	IOA21/ADIN0	Microcontroller address bit 21/AD universal input	O	0.03	FLASH address signal
90	ALE	Microcontroller address enable	O	1.18	unused
91	AD7	Microcontroller address/data bit 7	I/O	1.6	FLASH data signal
92	A17	FLASH address bit 17	O	0	FLASH address signal
93	IOA0	Microcontroller address bit 0	O	2.04	
94	DVSS	Digital		0	
95	UWR	Microcontroller write operation		3.22	unused
96	URD	Microcontroller read operation		3.26	
97	DVDD18	Digital 1.8V power supply		1.92	
98	UP1_2	Microcontroller port		0	unused
99	UP1_3	Microcontroller port	O	5.15	Panel communication-used clock
100	UP1_4	Microcontroller port	I/O	5.2	Panel communication-used data

Pin	Name	Function	Data direction	DC voltage	Remark
101	UP1_5	Microcontroller port	O	5.2	Panel communication-enable
102	UP1_6	Microcontroller port	O	0.3	I2C clock
103	UP1_7	Microcontroller port	I/O	3.22	I2C data
104	UP3_0	Microcontroller port	O	0	Tuning signal after being managed from SAA6588
105	UP3_1	Microcontroller port	O	0.68	
106	UP3_4	Microcontroller port	I/O	3.8	Serial communication port
107	UP3_5	Microcontroller port	I/O	3.23	Serial communication port
108	DVDD3	Power supply		3.24	
109	ICE	Microcontroller correction mode enable		0	Ground through 1K resistor R213
110	PRST	Reset input	I	3.3	
111	IR	Remote control signal input	I	5.03	
112	INT0	Microcontroller interrupt 0	I	3.6	unused
113	DQM0	DRAM input/output screen-shielded signal	O	2.2	
114	DQS0	DRAM input/output screen-shielded signal	O	3.22	
115	RD7	DRAM data	I/O	0.9	SDRAM data line
116	DVSS	Ground		0	
117	RD6	DRAM data	I/O	0.4	SDRAM data line
118	RD5	DRAM data	I/O	0.85	
119	DVSS	Ground		0.02	
120	RD4	DRAM data	I/O	1.62	SDRAM data line
121	RD3	DRAM data	I/O	1	
122	DVDD18	Digital 1.8V power supply		1.9	
123	RD2	DRAM data	I/O	1.15	SDRAM data line
124	RD1	DRAM data	I/O	0.92	
125	RD0	DRAM data	I/O	0.92	
126	RD15	DRAM data	I/O	0.66	
127	DVDD3	Digital 3.3V power supply		3.21	
128	RD14	DRAM data	I/O	1.2	SDRAM data line
129	RD13	DRAM data	I/O	1.2	
130	RD12	DRAM data	I/O	1.42	
131	RD11	DRAM data	I/O	0.85	
132	RD10	DRAM data	I/O	0.87	

Pin	Name	Function	Data direction	DC voltage	Remark
133	RD9	DRAM data	I/O	0.98	SDRAM data line
134	DVSS	Ground		0.01	
135	RD8	DRAM data	I/O	0.67	SDRAM data line
136	DQS1	DRAM input/output screen-shielded signal	O	3.24	
137	DQM1	DRAM input/output screen-shielded signal	O	2.6	
138	RWE	DRAM write enable	O	3.17	Output WE# signal and change into DWE# to control the write of SDRAM through 33 ohm resistor
139	CAS	DRAM line address selection	O	3.11	Output RAS# and change into DCAS# to control line address selection of SDRAM through 33 ohm resistor R267
140	RAS	DRAM row address selection	O	3.15	Output RAS# and change into DRAS# to control row address selection of SDRAM through 33 ohm resistor R266
141	DVDD3	Digital 3.3V power supply		3.22	
142	RCS	DRAM chip selection	O	2.7	Output CS# and change into DCS# to control chip selection of SDRAM through 33 ohm resistor 265
143	BA0	DRAM section address 0	O	1.75	SDRAM address line
144	DVSS	Ground		0	
145	BA1	DRAM section address 1	O	1.95	
146	RA10	DRAM address	O	0.04	
147	RA0	DRAM address	O	0.4	
148	DVSS	Ground		0	
149	RA1	DRAM address	O	2.2	SDRAM address line
150	RA2	DRAM address	O	2.25	
151	RA3	DRAM address	O	1.57	
152	DVDD18	Digital 1.8V power supply		1.91	
153	RVREF/ADIN ₃	Reference voltage/AD universal input	I	0.01	unused
154	RCLKB	DRAM clock	O	0.01	
155	DVDD3	Digital 3.3V power supply		3.21	
156	RCLK	DRAM clock	O	1.66	
157	CKE	DRAM clock enable	O	1.2	

Pin	Name	Function	Data direction	DC voltage	Remark
158	RA11	DRAM address	O	0.03	SDRAM address line
159	RA9	DRAM address	O	0.07	
160	RA8	DRAM address	O	0.04	
161	DVSS	Digital		0	
162	RA7	DRAM address	O	1.4	SDRAM address line
163	DVSS	Digital		0	
164	RA6	DRAM address	O	1.44	SDRAM address line
165	RA5	DRAM address	O	1.74	
166	RA4	DRAM address	O	1.63	
167	DVDD3	Digital 3.3V power supply	O	3.21	
168	RD13/ASDA TA5	DRAM data/audio serial data	I	5.04/3.0 3	Digital potentiometer input (J3)
169	RD30	DRAM data	I/O	0.01	Digital potentiometer input (J4)
170	RD29	DRAM data	O	0.01	CD4052 select signal (AUNIN SL0)
171	RD28	DRAM data		0.01	CD4052 select signal (AUNIN SL1)
172	RD27	DRAM data		0.01	select signal of N4 74HCT125
173	DVDD18	Digital 1.8V power supply		1.91	
174	RD26	DRAM data	I/O	3.6	Output to N12. When headphone is not inserted, output 3.3V, and now the output to headphone from N12 has no waveform. When headphone is inserted, this pin outputs 0v, and now only the output to headphone and to left/right channel of AV board of N12 output have waveform, which is headphone select signal.
175	DVSS	Digital	I/O	0	Ground
176	RD25	DRAM data	I/O	3.6	Mute signal
177	RD24	DRAM data	I/O	1.68	
178	DQM3	DRAM input/output screen-shielded signal	O	0.04	Resistor R225 is unused, so this signal is unused in this model.
179	DQM2	DRAM input/output screen-shielded signal	O	0.01	Field sync signal
180	RD23	DRAM data	I/O	0.01	unused

Pin	Name	Function	Data direction	DC voltage	Remark
181	RD22	DRAM data	I/O	0.01	Whether headphone is inserted to detecting signal
182	DVDD3	Digital 3.3V power supply		3.21	
183	RD21	DRAM data		0.02	When selecting tuning function, open power supply loop of tuner.
184	RD20	DRAM data		0.01	unused
185	RD19	DRAM data		0.02	control signal of tuner
186	RD18	DRAM data		0.02	tuner data
187	RD17	DRAM data		0.02	tuner clock
188	RD16	DRAM data		0.01	tuner data
189	DACVDDC	D/A conversion 3.3V power supply		3.5	
190	VREF	Reference voltage		1.32	
191	FS			1.32	
192	YUV0/CIN			1.8	unused
193	DACVSSC	D/A conversion		0.01	
194	YUV1/Y	Video signal YUV1 output/Y signal output	O	0.74	Supply Y signal for S-video
195	DACVddb	D/A conversion 3.3V power supply		3.19	
196	YUV2/C	Video signal YUV2 output/C signal output	O	1.47	Supply C signal for S-video
197	DACVSSB	D/A conversion		0.01	
198	YUV3/CVBS	Video signal YUV3 output/CVBS signal output	O	0.74	Provide for video output port (VIDEO)
199	DACVDDA	D/A conversion 3.3V power supply		3.17	
200	YUV4/G	Video signal YUV4 output/G signal output	O	0.5	Supply Y1 signal for component video output port
201	DACVSSA	D/A conversion		0.01	
202	TUV5/B	Video signal YUV5 output/B signal output	O	0.01	Supply Pb signal for component video output port
203	YUV6/R	Video signal YUV6 output/R signal output	O	0	Supply Pr signal for component video output port
204	DVDD3	Digital 3.3V power supply		3.21	
205	VSYNC/ADIN1	Field sync signal output/AD universal input	O	0.04	Supply for SCART
206	YUV7/ASDATA5	Video signal YUV7 output/audio serial data		3.79	unused
207	HSYNC/ADIN2	Line sync signal output/AD universal input	O	0.2	Supply for SCART
208	SPMCLK		I	0.01	unused

Pin	Name	Function	Data direction	DC voltage	Remark
209	SPDATA			0.14	unused
210	SPLRCK			3.78	unused
211	SPBCK/ASD ATA5			3.86	unused
212	DVDD3	Digital 3.3V power supply		3.21	
213	ALRCK	Audio left/right channel clock	O	1.52	
214	ABCK	Audio bit clock	O	1.6	
215	ACLK	Audio DAC external clock	O	1.59	
216	DVSS	Digital		0	
217	ASDATA0	Audio serial data	O	0.01	
218	ASDATA1	Audio serial data	O	0.01	
219	ASDATA2	Audio serial data	O	0.01	
220	ASDATA3	Audio serial data		0.01	unused
221	DVDD18	Digital 1.8V power supply		1.93	
222	ASDATA4	Audio serial data	O	3.22	Give audio IC reset signal
223	DVSS	Digital		0.01	
224	MC_DATA	MIC digital audio input	I	1.24	
225	SPDIF	Digital audio signal output	O	1.61	
226	RFGND18	RF signal		0.01	
227	RFVDD18	RF signal 1.8V power supply		0.64	
228	XTALO	Clock output	O	3.18	
229	XTALI	Clock input	I	3.04	
230	JITFO	RF small signal output	O	0.04	
231	JITFN	RF small signal reversely amplifying input	I	2.23	
232	PLLVSS	Phase-locked loop		0.06	
233	IDACEXP			3.22	
234	PLLVDD3	Phase-locked loop 3.3V power supply		0.01	
235	LPFON	Amplifier loop filter output	O	0.01	
236	LPFIP	Amplifier loop filter input	I	0.01	
237	LPFIN	Amplifier loop filter input	I	0.09	
238	LPFOP	Amplifier loop filter output	O	2.24	
239	ADCVDD3	D/A conversion 3.3V power supply		3.22	
240	S_VCM			0	

Pin	Name	Function	Data direction	DC voltage	Remark
241	ADCVSS	D/A conversion		0	
242	S_VREFP			0	
243	S_VREFN			0.03	
244	RFVDD3	RF 3.3V power supply		3.22	
245	RFRPDC	DC RF error signal input		0.73	
246	RFRPAC	AC RF error signal input		1.37	
247	HRFZC	High frequency RF signal zero passage detect		3.2	
248	CRTPLP			1.53	
249	RFGND	RF ground		0.01	
250	CEQP			0.05	
251	CEQN			0.02	
252	OSP			1.68	
253	OSN			1.68	
254	RFGC			1.06	
255	IREF	Reference current		0.92	
256	AVDD3	Analog 3.3V power supply		3.22	

3.4.2 Function introduction to SDRAM

The function of SDRAM (U211) in the player is to save program taken out by MT1389 from FLASH and information of picture and sound taken out from disc when the player is working to form damping, add the stability of information output and add anti-vibration of the player. The pin function and real voltage are shown as the following table:

Pin	Name	Data direction	Function	Voltage (V)	Pin	Name	Data direction	Function	Voltage (V)
1	VDD		3.3V power supply	3.18	28	VSS		Ground	0.01
2	DQ0	I/O	Data bus	0.94	29	MA4	I	Address bus	1.65
3	VDDQ	I/O	3.3V power supply	3.19	30	MA5	I	Address bus	1.74
4	DQ1	I/O	Data bus	0.9	31	MA6	I	Address bus	1.49
5	DQ2	I/O	Data bus	1.3	32	MA7	I	Address bus	1.22
6	VSSQ		Ground	0	33	MA8	I	Address bus	0.05
7	DQ3	I/O	Data bus	1.2	34	MA9	I	Address bus	0.04
8	DQ4	I/O	Data bus	1.5	35	MA11	I	Address bus	0.04
9	VDDQ		3.3V power supply	3.18	36	NC		Blank pin	0.01

Pin	Name	Data direction	Function	Voltage (V)	Pin	Name	Data direction	Function	Voltage (V)
10	DQ5	I/O	Data bus	0.7	37	CKE	I	Clock enable signal	1.22
11	DQ6	I/O	Data bus	0.45	38	CLK	I	System clock input	1.68
12	VSSQ		Ground	0	39	UDQM	I	Data in/out screen-shielded signal	2.42
13	DQ7	I/O	Data bus	0.8	40	NC		Blank pin	0.01
14	VDD		3.3V power supply	3.14	41	VSS		Ground	0.01
15	LDQM	I	Data in/out screen-shielded signal	2.46	42	DQ8	I/O	Data bus	0.6
16	WE	I	Write control signal	3.17	43	VDDQ		3.3V power supply	3.19
17	CAS	I	Line address gating signal	3.01	44	DQ9	I/O	Data bus	0.91
18	RAS	I	Row address gating signal	3.13	45	DQ10	I/O	Data bus	0.8
19	CS	I	Chip selection signal	2.95	46	VSSQ		Ground	0.01
20	SD-BS0	I	Section address 0 gating signal	1.8	47	DQ11	I/O	Data bus	0.79
21	SD-BS1	I	Section address 1 gating signal	2	48	DQ12	I/O	Data bus	1.16
22	MA10	I	Address bus	0.04	49	VDDQ		3.3V power supply	3.19
23	MA0	I	Address bus	0.36	50	DQ13	I/O	Data bus	1.15
24	MA1	I	Address bus	0.35	51	DQ14	I/O	Data bus	1.24
25	MA2	I	Address bus	2.38	52	VSSQ		Ground	0.01
26	MA3	I	Address bus	1.59	53	DQ15	I/O	Data bus	0.68
27	VDD		3.3V power supply	3.19	54	VSS		Ground	0.01

3.4.3 Function introduction to FLASH

FLASH (U214) is a 16Mbit FLASH memorizer, and the damage of U214 may cause troubles, such as power not on, no disc reading and power on picture mosaic. Pin function is shown as the following table:

Pin	Name	Function	Voltage (when no disc)	Data direction
1-9、16-25、48	AO-A19	20 bit address bus		I
11	WE	Write enable signal, low level is effective	3.23V	I
12	RESET	Reset, low level is effective	3.23V	I
10、13、14	NC	Blank pin		
15	RY/BY	Ready/system busy	3.23V	O
26	CE	Chip enable, low level effective	0V	I
27、46	VSS	Ground		

Pin	Name	Function	Voltage (when no disc)	Data direction
28	OE	Output enable signal , low level is effective	0V	I
29-3、6、38-44	DQ0-DQ14	15 bit data bus		O
37	VCC	5V power supply	+5V	
45	DQ15/A-1	Take word extend mode as data line, and bit extend mode as address line		I/O
47	BYTE	Select 8-bit or 16-bit output mode. High level is 16-bit output and low level is 8-bit output		I

3.4.4 Function introduction to D5954

D5954 is a servo drive IC with built-in 4-channel drive circuit. Digital focus, trace, feed and main axis drive signal outputted by MT1389 is sent to D5954 for amplifying through RC integration circuit. The focus, trace, feed and main axis drive signal being amplified by D5954 is sent to MT1389 to fulfil the corresponding servo work.

The introduction to function pin is shown as the following table:

Pin	Name	Function	Voltage when no disc (V)	DVD disc voltage (V)	CD disc voltage (V)
1	VINFC	Focus control signal input	1.41	1.4	1.45
2	CF1	External feedback loop	2.3	2.54	2.43
3	CF2	External feedback loop	2.01	2.56	2.43
4	VINSL+	Forward control input, connected to reference voltage	1.41	1.42	1.42
5	VINSL-	Main axis control signal input	1.4	1.42	1.42
6	VOSL	External feedback resistor	1.4	1.17	1.21
7	VINFFC	Focus feedback signal input	1.92	2.59	2.36
8	VCC	5V power supply	5.38	5.04	5.01
9	PVCC1	5V power supply	5.38	5.04	5.03
10	PGND	Ground	0.01	0.01	0.01
11	VOSL-	Main axis drive reverse voltage output	1.87	3.71	3.54
12	VO2+	Main axis drive forward direction voltage output	1.87	1.24	1.4
13	VOFC-	Focus drive reverse voltage output	3.3	2.6	2.33
14	VOFC+	Focus drive forward voltage output	3.3	2.46	2.68
15	VOTK+	Trace drive forward direction voltage output	3.39	2.56	2.51
16	VOTK-	Trace drive reverse voltage output	3.52	2.48	2.51
17	VOLD+	Feed drive forward direction voltage output	0.93	2.56	2.5
18	VOLD-	Feed drive reverse voltage output	0.93	2.59	2.62
19	PGND	Ground	0.01	0.01	0.01
20	VINFTK	Trace feedback signal input	3.73	2.5	2.53

Pin	Name	Function	Voltage when no disc (V)	DVD disc voltage (V)	CD disc voltage (V)
21	PVCC2	5V power supply	5.38	5.08	5.07
22	PREGND	Ground	0	0.01	0.01
23	VINLD	Feed control signal input	1.4	1.41	1.4
24	CTK2	External feedback loop	2.41	2.52	2.53
25	CTK1	External feedback loop	2.51	2.52	2.53
26	VINTK	Trace control signal input	1.42	1.42	1.41
27	BIAS	1.4V reference voltage input	1.41	1.42	1.42
28	STBY	Enable control signal	0	3.18	3.19

3.4.5 Function introduction to 24LLC020

1. State memorizer 24LLC02 (U202) is a writable and programmable read-only memorizer, with its casing and pin function shown as the following figure 3.4.5.1:

in the following figure .4.10.1:

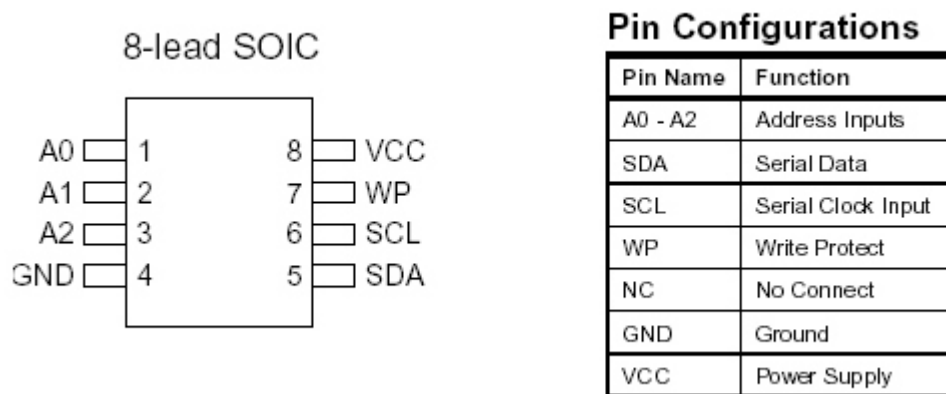


Figure 3.4.5.1 Casing and pin function introduction

2. The function of 24LLC02 in this model is to keep some setup status of machine, such as system information of sound and language selection, not losing after power on and still keeping the information set last time when power on the next time. The circuit schematic diagram is shown as the figure3.4.5.2:

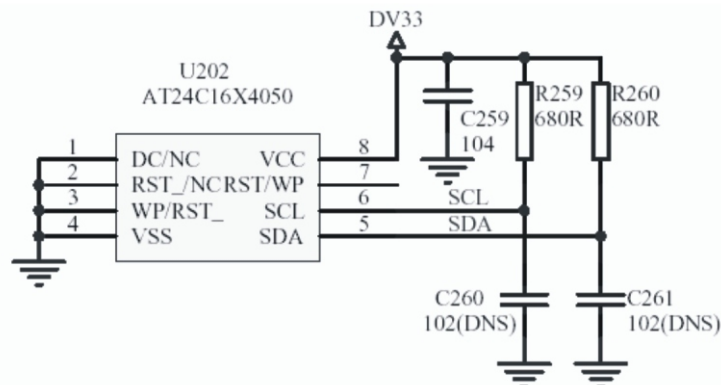


Figure 3.4.5.2 Circuit schematic diagram

3. Pin function is shown as the following table:

Pin	Name	Voltage in actual test	Pin	Name	Voltage in actual test
1	DC/NC	0	5	SDA	3.21
2	RST_/NC	0	6	SCL	0
3	WP/RST	0	7	WP	0.29
4	VSS	0	8	VCC	3.21

Note: when playing DVD, CD disc and no disc in, the measured voltage are all the same, in which pin 7 is protection-write pin, unused.

3.4.6 Function introduction to 74HCT125

1. 74HCT125 (N3, N4) is a 4-channel gating switch, and each channel has its own gating signal, in which pin 1, 4, 10 and 13 are gating control pins, gating when in low level and off when in high level. 74HCT125 truth value table and function module structure is shown as the figure 3.4.6.1:

INPUTS		OUTPUTS
NA	NOE	NY
H	L	H
L	L	L
X	H	Z

H: means high level (3.3V) L: means low level (0V)
 X: means any state Z: means that is off and cannot be selected

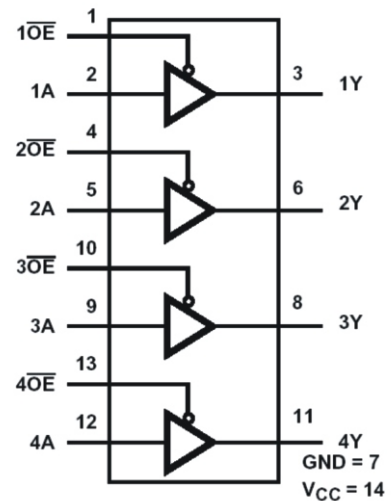


Figure 3.4.6.1 Truth value table and 74HCT125 function module structure

2. Pin function of N3 (74HCT125) is shown as the following table:

Pin	Contiguous signal name	Data direction	Function description	Directly contiguous element or signal
1	M1	I	Clock gating signal	M1
2	MCLK	I	Clock signal input	Pin 4 of N2 (SN74LVC2G04DBVR)
3	MCLK	O	Clock signal output	R70
4	M0	I	Left/right channel digital audio gating signal	M0
5	SDATA0	I	Left/right channel digital audio signal input	R29
6	SDA LR	O	Left/right channel digital audio signal output	R101
7	GND	P	Ground	Ground
8	SDA SLSR	O	Surround left/right channel digital audio signal output	R100
9	SDATA1	I	Surround left/right channel digital audio signal input	R56
10	M0	I	Surround left/right channel digital audio gating signal	M0
11	SDA CSW	O	Centre subwoofer digital audio signal output	R98
12	SDATA2	I	Centre subwoofer digital audio signal input	R59
13	M0	I	Centre subwoofer digital audio gating signal	M0
14	VCC	P	3.3V power supply	Power supply

3. Pin function of N4 (74HCT125) is shown as the following table:

Pin	Contiguous signal name	Data direction	Function description	Directly contiguous element or signal
1	M0	I	External clock gating signal	M0
2	SACLK	I	External clock signal input	SACLK
3	MCLK	O	External clock signal output	R70
4	M0	I	Bit clock gating signal	M0
5	SBCLK	I	Bit clock signal input	SBCLK
6	SCLK	O	Bit clock signal output	R97
7	GND	P	Ground	Ground
8	LRCK	O	Left/right channel clock signal output	R96
9	SLRCK	I	Left/right channel clock signal input	SLRCK
10	M0	I	Left/right channel clock gating signal	M0
11	SDA AD	O	External digital audio signal output	R99
12	SDA	I	External digital audio signal input	R225
13	M1	I	External digital audio gating signal	M1
14	VCC	P	3.3V power supply	Power supply

4. Through the gating to 74HCT125, M0, M1 signal outputted from MT1389 realize the selection to internal and external signal. The function table is shown as follows:

M1	M0	Function	Remark
1 (3.3V)	0	Internal signal	Disc signal, MIC signal
0	1 (3.3V)	External signal	Tuner, external input
1	1	unused	
0	0	unused	

3.4.7 Function introduction to CD4052

Cd4052 is a 2-group 4-channel data selector used to select external input audio signal, microphone signal or tuner audio signal.

1. Pin function is shown as the following table:

Pin	Name	Function	Data direction
1, 2, 4, 5	Y0-Y3	Y signal input	I
11, 12, 14, 15	X0-X3	X signal input	I
3, 13	Y	Y signal output	O
6	INH	Two groups both have no output when forbidden end his high level	I
7	VEE	(minus) 12V power supply	
8	VSS	Ground	
16	VDD	5V power supply	
9, 10	B, A	Gating signal	I
13	X	X signal output	O

2. Signal A, B gating conditions are shown as the following table:

A	B	OUTPUT
0	0	unused
0	1	MIC (microphone)
1	0	AUX (external audio input)
1	1	TUNER headphone

3.4.8 Function introduction to SAA6588

SAA6588 tuning data processing chip and pin function are shown as the following table:

Pin	Name	Data direction	Function	Remark	Pin	Name	Data direction	Function	Remark
1	MPO	O	Multi-path rectifier output	unused	11	PSWN	O	Pause switch output	unused
2	MPTH	O	Multi-path detector output	unused	12	MAD		Attached address input	Ground
3	TCON	I	Detect control signal	Ground	13	AFIN		Audio signal input	unused
4	OSCO	I	Clock signal input		14	VDDA		Analog power supply voltage	
5	OSCI	O	Clock signal output		15	VSSA		Analog	
6	VSSD		Digital		16	MPX	I	Multiple signal input	
7	VDDD		Digital power supply voltage		17	VREF		Reference voltage output	
8	DAVN	O	Data effective output		18	SCOUT	O	Wave path filtering output	
9	SDA	I/O	Series control data input/output		19	CIN	I	Comparator input	
10	SCL	I	Series control clock input		20	LVIN	I	Standard input terminal	unused

3.4.9 Function introduction to CS5340

CS5340 is a kind of complete A/D converter used in digital audio system. It has sampling, A/D conversion and anti-aliasing filtering function, and can generate 24-bit sampling frequency to left and right channels with serial value of each channel up to 2000 KHz. A 5-step multi-bit DELTA-SIGMA modulator is adopted, with digital filtering and simplification function, so external anti-aliasing filter is not needed. It is specially applicable for audio system required wide dynamic range, Hi-Fi and low noise.

1. The main features are shown as follows:

- ◆ Support all sampling frequency including 192 KHZ
- ◆ Dynamic range is 101dB when voltage is 5V
- ◆ -94 dB THD+N
- ◆ Highpass filter may remove DC offset
- ◆ Low delay digital filter
- ◆ Power consumption is 90 milliwatt under 3.3V power supply
- ◆ A/D inner core power supply voltage is 3.3V ~ 5V
- ◆ Support 1.8V ~ 5V logic level
- ◆ Auto mode selection
- ◆ Compatible with CS5341 pin

2. Pin function of CS5340 is shown as the following table:

Pin	Name	Data direction	Function	Remark
1	M0	I	Mode selection	Decide the operation mode of element
2	MCLK	I	Main clock	$\Delta - \delta$ clock source of adjustor and digital filter
3	VL	I	Logic power supply	Forward power supply of digital input/output
4	SDOUT	O	Series audio data output	Two's complement of output series audio data
5	GND		Analog	
6	VD	I	Digital power supply	Provide forward power supply for digital part

Pin	Name	Data direction	Function	Remark
7	SCLK	I/O	Series clock	Provide series clock for series audio interface
8	LRCK	I/O	Left/right clock	Left/right audio time sequence control clock
9	RST	I	Reset	Element enters a low-consumption state when in low level
10	AINL	I	Analog input	
11	VQ	O	Static voltage	
12	AINR	I	Analog input	
13	VA	I	Analog power supply	Provide forward power supply for analog part
14	REF_GND		Reference	Provide reference ground for internal sampling circuit
15	FILT+	I	Forward reference voltage	
16	M1	I	Mode selection	Decide the operation mode of element

3.4.10 Function introduction to 4558/4580

4558/4580 includes two integrated operational amplifiers inside, with pin function shown as follows:

Pin	Data direction	Function	Pin	Data direction	Function
1	O	Output of operational amplifier A	5	O	Output of operational amplifier B
2	I	Negative input terminal of operational amplifier A	6	I	Negative input terminal of operational amplifier B
3	I	Positive input terminal of operational amplifier A	7	I	Positive input terminal of operational amplifier B
4	I	(minus) 12V voltage input	8	I	12V voltage input

3.4.11 Function introduction to TLV272

TLV272 includes two integrated operational amplifiers inside, with pin function shown as follows:

Pin	Name	Data direction	Function	Pin	Name	Data direction	Function
1	1OUT	O	Output of operational amplifier A	5	2IN+	O	Output of operational amplifier B
2	1IN-	I	Negative input terminal of operational amplifier A	6	2IN-	I	Negative input terminal of operational amplifier B
3	1IN+	I	Positive input terminal of operational amplifier A	7	2OUT	I	Positive input terminal of operational amplifier B
4	GND	I	Common	8	VDD	I	5V voltage input

3.4.12 Function introduction to TAS5508

TAS5508 is a digital pulse width modulator (PWM) developed by TI Company, which performs PWM modulation to audio digital signal (SDATA0, SDATA1, SDATA2) outputted by Mt1389 to modulates audio signal onto load wave. This player generates 10-path audio signal output in all, that is headphone left/right channel, AV board mixed left/right channel, surround left/right channel, front left/right channel, centre channel and subwoofer channel. The sound volume is bigger, space occupation ratio is smaller; and sound volume is smaller, space occupation ratio is bigger. It can realize self-protection function. If voltage and current of the back stage circuit is too high, it will close automatically to avoid damaging element. Function of each pin is shown as follows:

Pin	Name	Data direction	Function
1	VRA-PLL		Reference voltage of PLL analog power supply 1.8V
2	PLL	AO	PLL-FLT-RET.PLL external filtering loop
3	PLL-FLTM	AO	PLL negative input
4	PLL-FLTP	AI	PLL positive input
5	AVSS		Analog ground
6	AVSS		Analog ground
7	VRD-PLL		Reference voltage of PLL digital power supply 1.8V
8	AVSS-PLL		PLL analog ground
9	AVDD-PLL		PLL3.3V power supply
10	VBGAP		Bandwidth gap reference voltage
11	RESET	DI	TAS5508 reset signal
12	HP-SEL	DI	Headphone/microphone selection bit
13	PDN	DI	Power failure control bit
14	MUTE	DI	Mute control bit
15	DVDD		Digital 3.3V power supply
16	DVSS		Digital ground
17	VR-DPLL		Reference voltage of digital PLL power supply 1.8V
18	OSC-CAP	AO	Oscillator capacitor connection end
19	XTL-OUT	AO	Clock signal output
20	XTL-IN	AI	Clock signal input
21	RESERVED		Connect digital signal ground
22	RESERVED		Connect digital signal ground
23	RESERVED		Connect digital signal ground
24	SDA	DI/DO	Series control data input/output
25	SCL	DI	Series control clock
26	LRCLK	DI	Left/right audio control clock

Pin	Name	Data direction	Function
27	SCLK	DI	Series audio control clock
28	SDIN4	DI	Left/right channel audio data input
29	SDIN3	DI	Surround left/right channel audio data input
30	SDIN2	DI	Microphone/external left/right channel audio data input
31	SDIN1	DI	Centre/subwoofer audio data input
32	PSVC		Power supply controlled by bandwidth modulation volume
33	VR-DIG		Reference voltage of digital kernel power supply 1.8V
34	DVSS		Digital ground
35	DVSS		Digital ground
36	DVDD		Digital 3.3V power supply
37	BKND-ERR	DI	External chip TAS5512 correction signal input
38	DVSS		Digital ground
39	VALID	DO	Output external chip TAS5512 reset signal
40	PWM-M-1	DO	Power amplifier left channel PWM output (negative end)
41	PWM-P-1	DO	Power amplifier left channel PWM output (positive end)
42	PWM-M-2	DO	Power amplifier right channel PWM output (negative end)
43	PWM-P-2	DO	Power amplifier right channel PWM output (positive end)
44	PWM-M-3	DO	Power amplifier surround left channel PWM output (negative end)
45	PWM-P-3	DO	Power amplifier surround left channel PWM output (positive end)
46	PWM-M-4	DO	Power amplifier surround right channel PWM output (negative end)
47	PWM-P-4	DO	Power amplifier surround right channel PWM output (positive end)
48	VR-PWM		Reference voltage of digital bandwidth modulation 1.8V
49	PWM-M-7	DO	Power amplifier centre PWM output (negative end)
50	PWM-P-7	DO	Power amplifier centre PWM output (positive end)
51	PWM-M-8	DO	Power amplifier subwoofer PWM output (negative end)
52	PWM-P-8	DO	Power amplifier subwoofer PWM output (positive end)
53	DVSS-PWM		Bandwidth modulation digital ground
54	DVDD-PWM		Bandwidth modulation digital 3.3V power supply
55	PWM-M-5	DO	Mixed left channel PWM output (negative end)
56	PWM-P-5	DO	Mixed left channel PWM output (positive end)
57	PWM-M-6	DO	Mixed right channel PWM output (negative end)
58	PWM-P-6	DO	Mixed right channel PWM output (positive end)
59	PWM-HPML	DO	PWM output (negative end)

Pin	Name	Data direction	Function
60	PWM-HPPL	DO	PWM output (positive end)
61	PWM-HPMR	DO	PWM output (negative end)
62	PWM-HPPR	DO	PWM output (positive end)
63	MCLK	DI	
64	RESERVED		

3.4.13 Function introduction to TAS5112

TAS5112 is a high performance digital amplifier designed by TI Company. In model DK1020S, two TAS5112 are used to demodulate and amplify digital audio signal after pulse width demodulation and outputted by TAS5508. Each generates 3-channel outputs, that is surround left/right channel, subwoofer channel and front left/right/centre channel. TAS5112 is usually used together with TAS5508. If TSA5508 has trouble, it will provide a feedback signal for TAS5508 to make TAS5508 close and not output signal any more to avoid damaging element.

1. Function of each pin of N3 (TAS5112) is shown as follows:

Pin	Name	Data direction	Function	Remark
1	GND		Common	
2	GND		Common	
3	GREG		Door drive voltage regulator decoupling pin	
4	OTW	O	Chip over heat alarm output	
5	SD-CD	O	Off label position of surround left/right channel	Refer to table 3
6	SD-AB	O	Off label position of subwoofer power amplifier	Refer to table 3
7	PWM-DP	I	Surround left channel PWM positive signal input	
8	PWM-DM	I	Surround left channel PWM negative signal input	
9	RESET-CD	I	Surround left/right channel power amplifier reset signal	Refer to table 3
10	PWM-CM	I	Surround right channel PWM negative signal input	
11	PWM-CP	I	Surround right channel PWM positive signal input	
12	DREG-RIN		Digital power supply regulator decoupling loop pin	
13	M3	I	Output mode selection bit	Refer to table 2
14	M2	I	Protection mode selection bit	Refer to table 1
15	M1	I	Protection mode selection bit	Refer to table 1
16	DREG		Digital power supply regulator decoupling loop pin	
17	PWM-BP	I	Subwoofer PWM positive signal input	
18	PWM-BM	I	Subwoofer PWM negative signal input	
19	RESET-AB	I	Subwoofer power amplifier reset signal	Refer to table 3

Pin	Name	Data direction	Function	Remark
20	PWM-AM	I	Subwoofer PWM positive signal input	
21	PWM-AP	I	Subwoofer PWM negative signal input	
22	GND		Common	
23	DGND		Digital input/output reference ground	
24	GND		Common	
25	DVDD		Input/output power supply voltage 3.3V	
26	GREG		Door drive voltage regulator decoupling pin	
27	GND		Common	
28	GND		Common	
29	GND		Common	
30	GVDD		Door drive and digital regulator power supply end	
31	BST-A		High-side bootstrap supply(BST)	
32	PVDD-A		Subwoofer negative end power supply	
33	PVDD-A		Subwoofer negative end power supply	
34	OUT-A	O	Subwoofer negative end output	
35	OUT-A	O	Subwoofer negative end output	
36	GND		Common	
37	GND		Common	
38	OUT-B	O	Subwoofer power amplifier positive output	
39	OUT-B	O	Subwoofer power amplifier positive output	
40	PVDD-B		Subwoofer power amplifier positive power supply	
41	PVDD-B		Subwoofer power amplifier positive power supply	
42	BST-B		High-side bootstrap supply(BST)	
43	BST-C		HS bootstrap supply (BST)	
44	PVDD-C		Surround right channel power supply	
45	PVDD-C		Surround right channel power supply	
46	OUT-C	O	Surround right channel output	
47	OUT-C	O	Surround right channel output	
48	GND		Common	
49	GND		Common	
50	OUT-D	O	Surround left channel output	
51	OUT-D	O	Surround left channel output	
52	PVDD-D		Surround left channel power supply	

Pin	Name	Data direction	Function	Remark
53	PVDD-D		Surround left channel power supply	
54	BST-D		HS bootstrap supply (BST)	
55	GVDD		Door drive and digital regulator power supply end	
56	GND		Common	

2. Each function pin of N4 (TAS5112) is shown as follows:

Pin	Name	Data direction	Function	Remark
1	GND		Common	
2	GND		Common	
3	GREG		Door drive voltage regulator decoupling pin	
4	OTW	O	Chip over heat alarm output	
5	SD-CD	O	Off label position of centre power amplifier	Refer to table 3
6	SD-AB	O	Off label position of left/right channel power amplifier	Refer to table 3
7	PWM-DP	I	Centre PWM positive signal input	
8	PWM-DM	I	Centre PWM negative signal input	
9	RESET-CD	I	Centre power amplifier reset signal	Refer to table 3
10	PWM-CM		unused	
11	PWM-CP		unused	
12	DREG-RIN		Digital power supply regulator decoupling loop pin	
13	M3	I	Output mode selection bit	Refer to table 2
14	M2	I	Protection mode selection bit	Refer to table 1
15	M1	I	Protection mode selection bit	Refer to table 1
16	DREG		Digital power supply regulator decoupling pin	
17	PWM-BP	I	Left channel PWM positive signal input	
18	PWM-BM	I	Left channel PWM negative signal input	
19	RESET-AB	I	Left/right channel power amplifier reset signal	Refer to table 3
20	PWM-AM	I	Right channel PWM positive signal input	
21	PWM-AP	I	Right channel PWM negative signal input	
22	GND		Common	
23	DGND		Digital input/output reference ground	
24	GND		Common	

Pin	Name	Data direction	Function	Remark
25	DVDD		Input.output power supply voltage 3.3V	
26	GREG		Door drive voltage regulator decoupling pin	
27	GND		Common	
28	GND		Common	
29	GND		Common	
30	GVDD		Door drive and digital regulator power supply end	
31	BST-A		High-side bootstrap supply (BST)	
32	PVDD-A		Right channel power amplifier power supply	
33	PVDD-A		Right channel power amplifier power supply	
34	OUT-A	O	Right channel power amplifier output	
35	OUT-A	O	Right channel power amplifier output	
36	GND		Common	
37	GND		Common	
38	OUT-B	O	Left channel power amplifier output	
39	OUT-B	O	Left channel power amplifier output	
40	PVDD-B		Left channel power amplifier power supply	
41	PVDD-B		Left channel power amplifier power supply	
42	BST-B		High-side bootstrap supply (BST)	
43	BST-C		HS bootstrap supply (BST)	
44	PVDD-C		28.5V power supply	
45	PVDD-C		28.5V power supply	
46	OUT-C		unused	
47	OUT-C		unused	
48	GND		Common	
49	GND		Common	
50	OUT-D	O	Centre power amplifier output	
51	OUT-D	O	Centre power amplifier output	
52	PVDD-D		Centre power amplifier power supply	
53	PVDD-D		Centre power amplifier power supply	
54	BST-D		HS bootstrap supply (BST)	
55	GVDD		Door drive and digital regulator power supply end	
56	GND		Common	

3. Table 1 is shown as follows:

M1	M2	Protection mode selection
0	0	Auto error correction mode
0	1	Error detection off mode
1	0	Protection system ineffective mode
1	1	none

4. Table 2 is shown as follows:

M3	Output mode selection
0	Bridge binding load output mode
1	none

5. Table 3 is shown as follows:

SD	RESET	Function description
0	0	none
0	1	Device in protection mode
1	0	Device set in high impedance state
1	1	normal working

3.4.14 Function introduction to 5L0380

Pin 3 of 5L0380 is controlled by feedback pin 4 to make it on for a while and off for another while to form pulse DC to control coupling quantity of transformer. When secondary output voltage of transformer is on the high side, under the control of pin 4, disconnection time of pin 3 gets longer and coupling quantity of transformer decreases to make output voltage get lower gradually; when secondary output voltage of transformer is on the low side, disconnection time of pin 3 gets shorter, connection time gets longer (connect inside 5L0380), coupling quantity of transformer decreases and secondary output voltage gets larger gradually. Pin function is shown as the following table:

Pin	Function	Voltage	Remark
1	Grounding	0	
2	Voltage supply	16V	supply voltage for 5L0380 after starting up
3	310V power supply input	310V	
4	Control of space occupation ratio to pulse width		

3.4.15 function introduction to LM431A

U503 (LM431A) is a 2.5V comparator, shown as the figure 3.4.12.1. Compared the inputted voltage of R end with 2.5V, when voltage of R end is more than 2.5V, KA end is on and photoelectric coupler starts to send out photocurrent; when voltage of R end is less than 2.5V, KA end is cutoff and photoelectric coupler does not send out photocurrent. CPU+3.3V in power board circuit must be kept in 3.3V, for the function of comparator. No matter more than or less than 3.3V, through on and off status of comparator, it will control the on state of the output end of photoelectric coupler LM431A to adjust the output space occupation ratio of switch module to control the output voltage of transformer and masthead the power supply of the whole system.

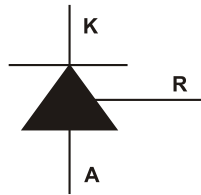


Figure 3.4.15.1 LM431A outside drawing

3.4.16 Function introduction to HS817

U502 (HS817) is a photoelectric coupler, shown as the figure 3.4.16. The right side is a light emitting diode, which sends out light of different intensity according to the strength of voltage inputted from the right side, generates photocurrent of different intensity on the left side according to light of different intensity, and outputs from position D. The higher of the voltage inputted from the right side, the stronger of the light emitted from light emitting diode and the larger of the photocurrent produced from position D. The lower of the voltage inputted from the right side of photoelectric coupler, the weaker of the light emitted from light emitting diode and the weaker of the current outputted from position D.

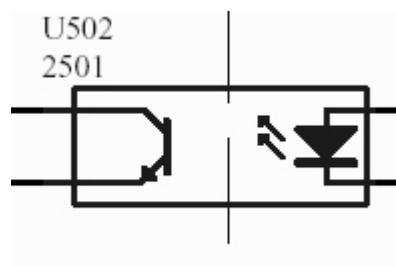


Figure 3.4.16 Hs817 outside drawing

Section Five Troubleshooting Process

3.5.1 Mt1389 troubleshooting process

1. MT1389 has many pins, so it is very difficult to test the power supply pin voltage directly. To make readers easy to test, we make the following troubleshooting process and the explanation to the corresponding element, shown as the following figure 3.5.1.1:

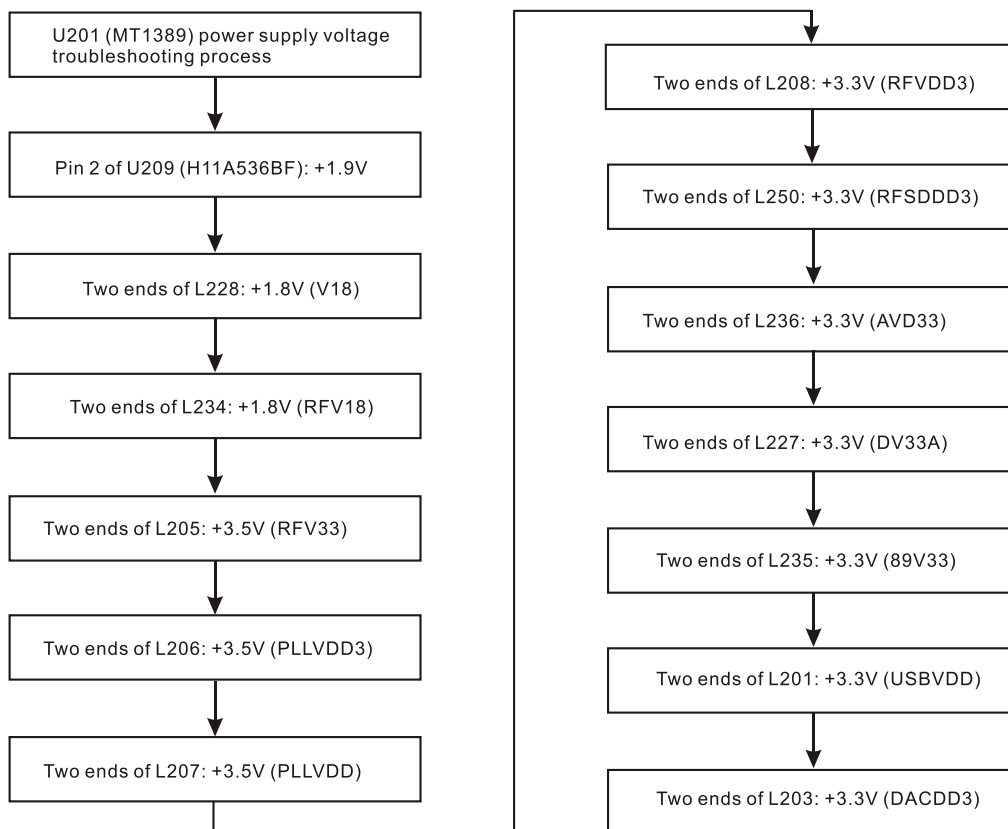


Figure 3.5.1.1 Troubleshooting process

2. Test point of MT1389 power supply voltage is shown as the following figure 2.5.1.2:

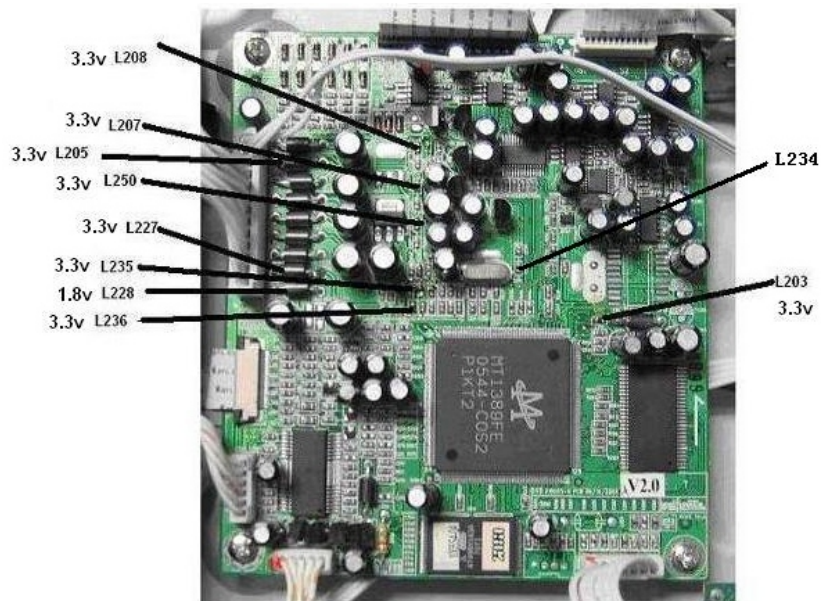
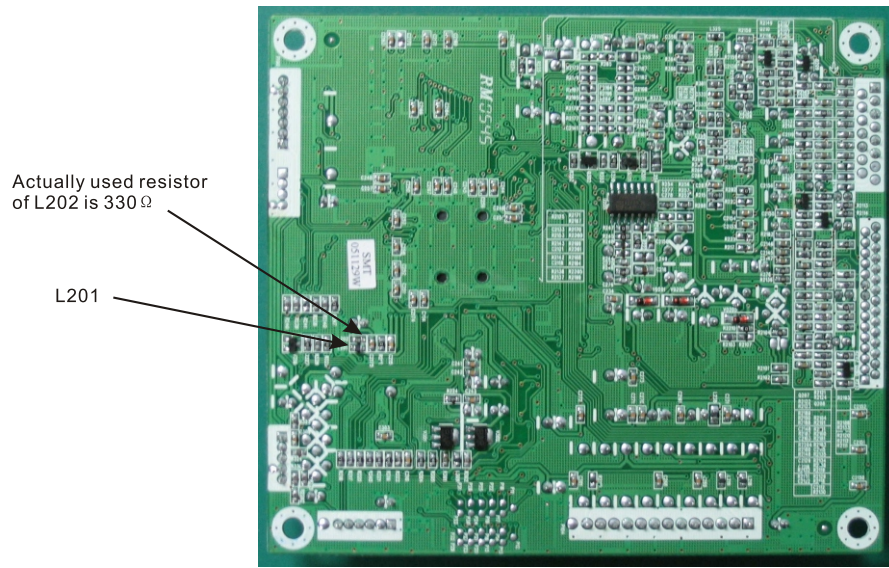


Figure 3.5.1.2 Illustration of test pinot of MT1389 power supply voltage

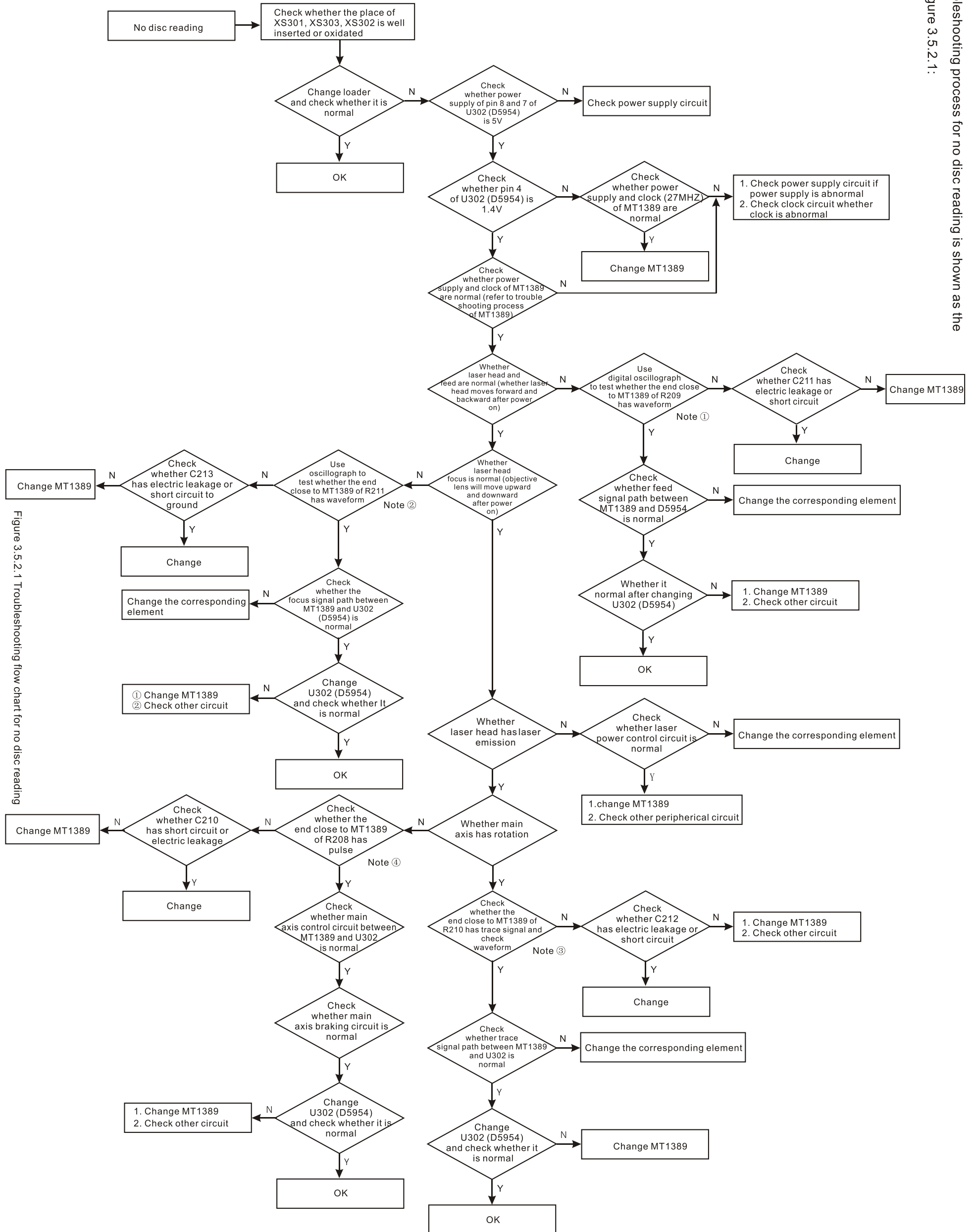


Figure 3.5.2.1 Troubleshooting flow chart for no disc reading

Note①, ②, ③ and ④ are tested when no disc in, disc in and laser head performs default focus and feed acts.

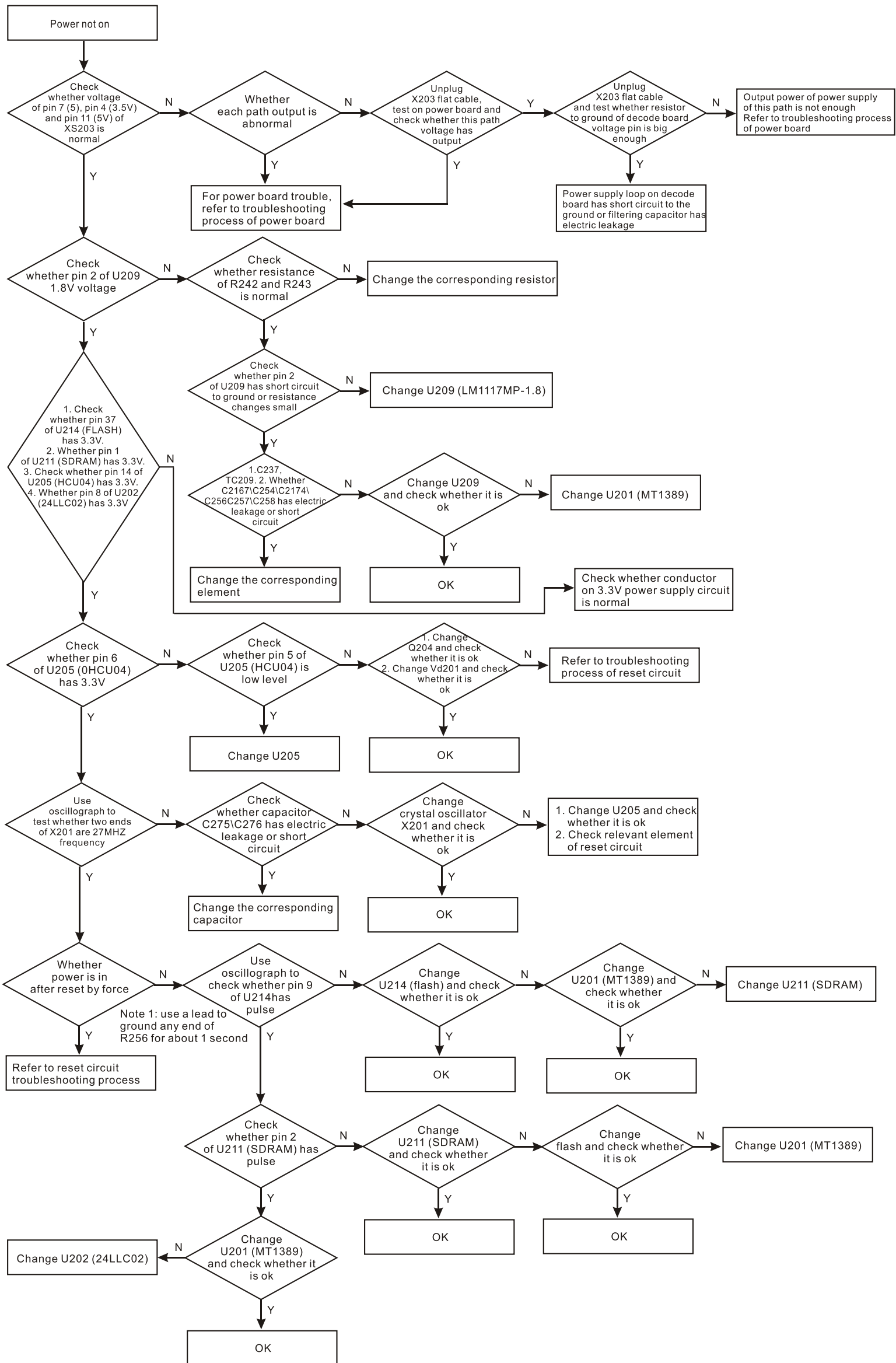


Figure 3.5.3.1 Troubleshooting process for power not on

3.5.4 Troubleshooting for no sound of external input is shown as the following figure 3.5.4.1:

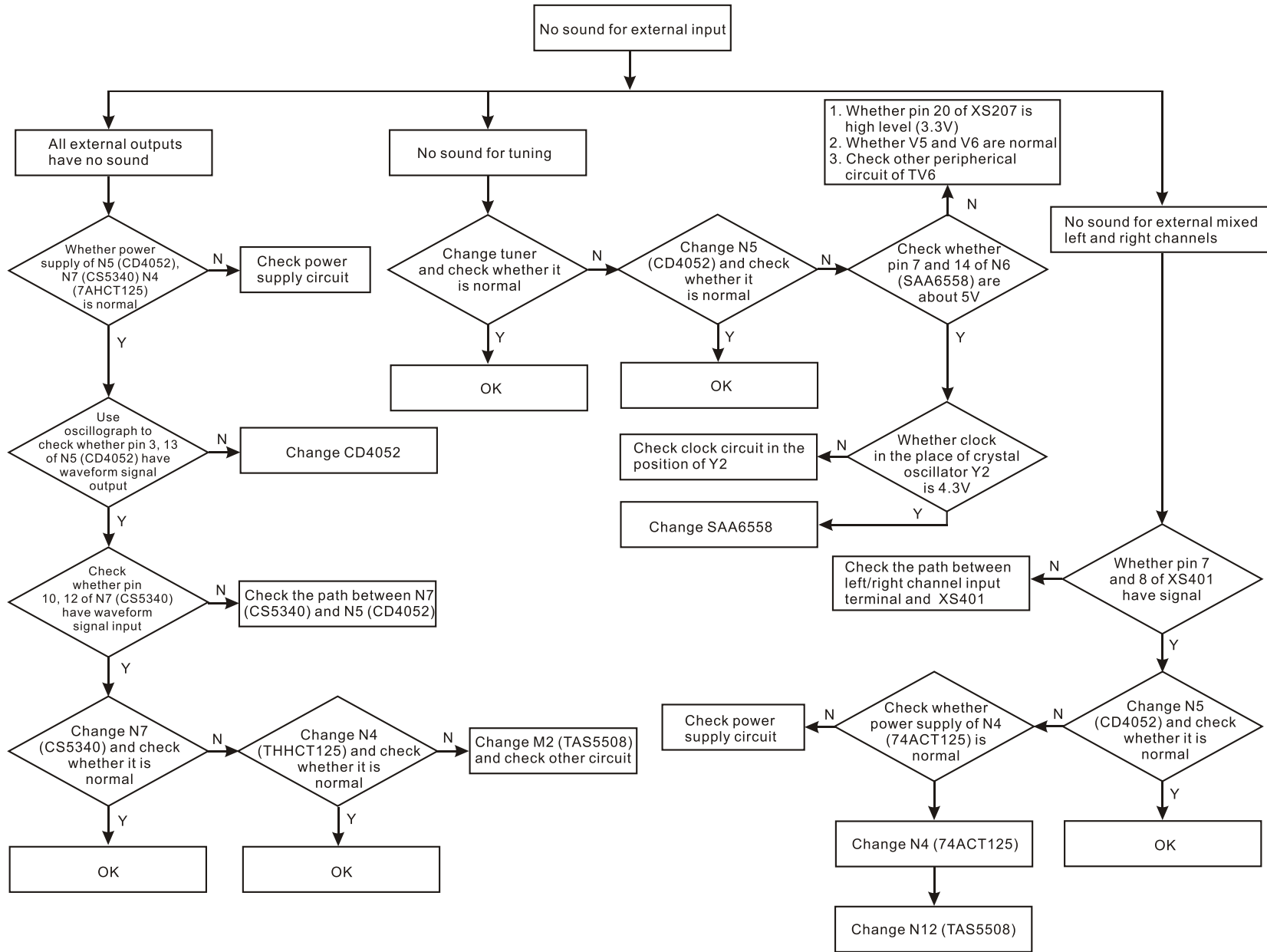


Figure 3.5.4.1 Troubleshooting flow chart for no sound of external input

3.5.5 Troubleshooting process for no sound of power amplifier board when playing is shown as the following figure 3.5.5.1:

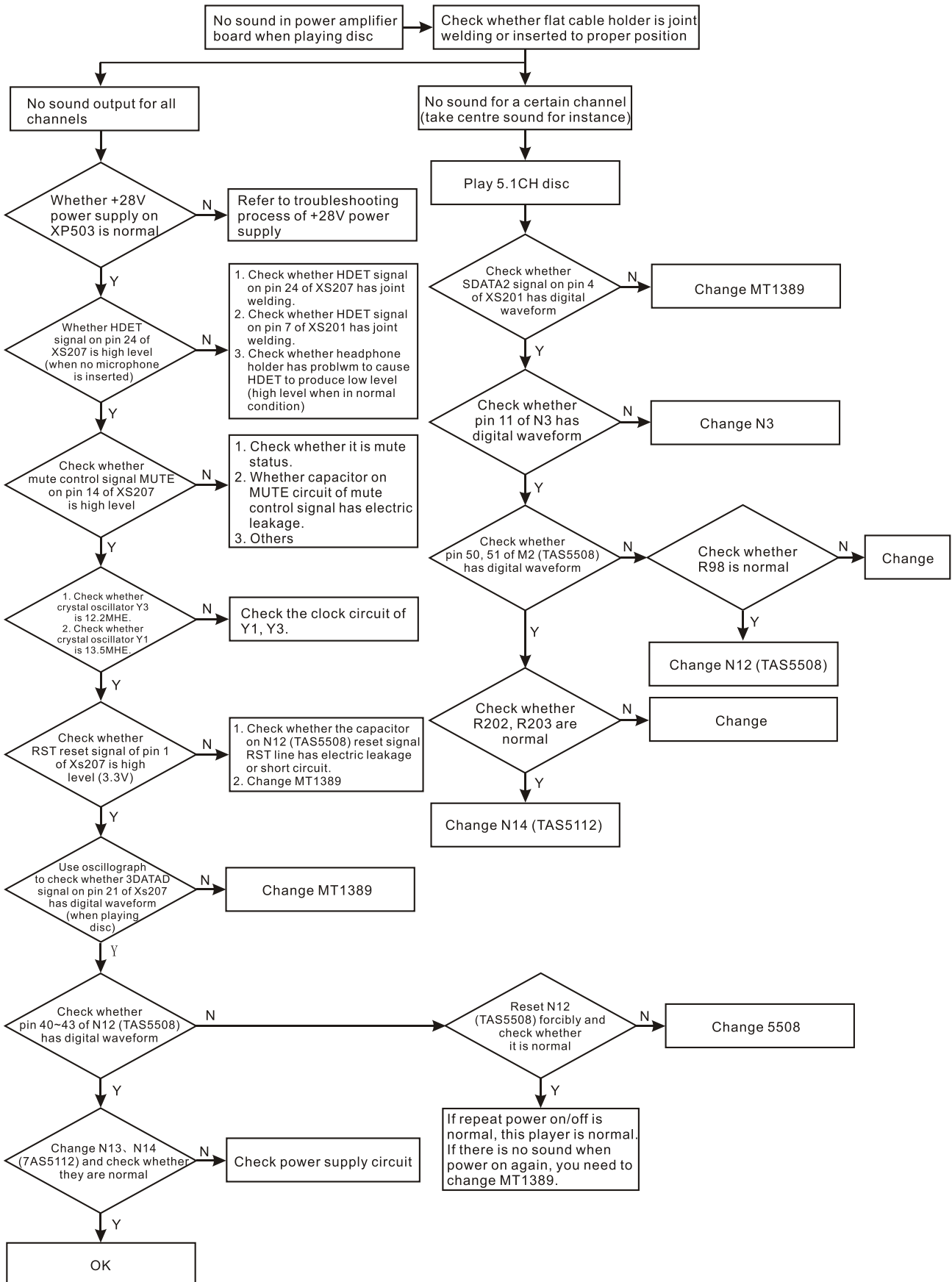


Figure 3.5.5.1 Troubleshooting process for no sound of power amplifier board when playing

3.5.6 Troubleshooting process for no sound of MIC is shown as the following figure 3.5.6.1:

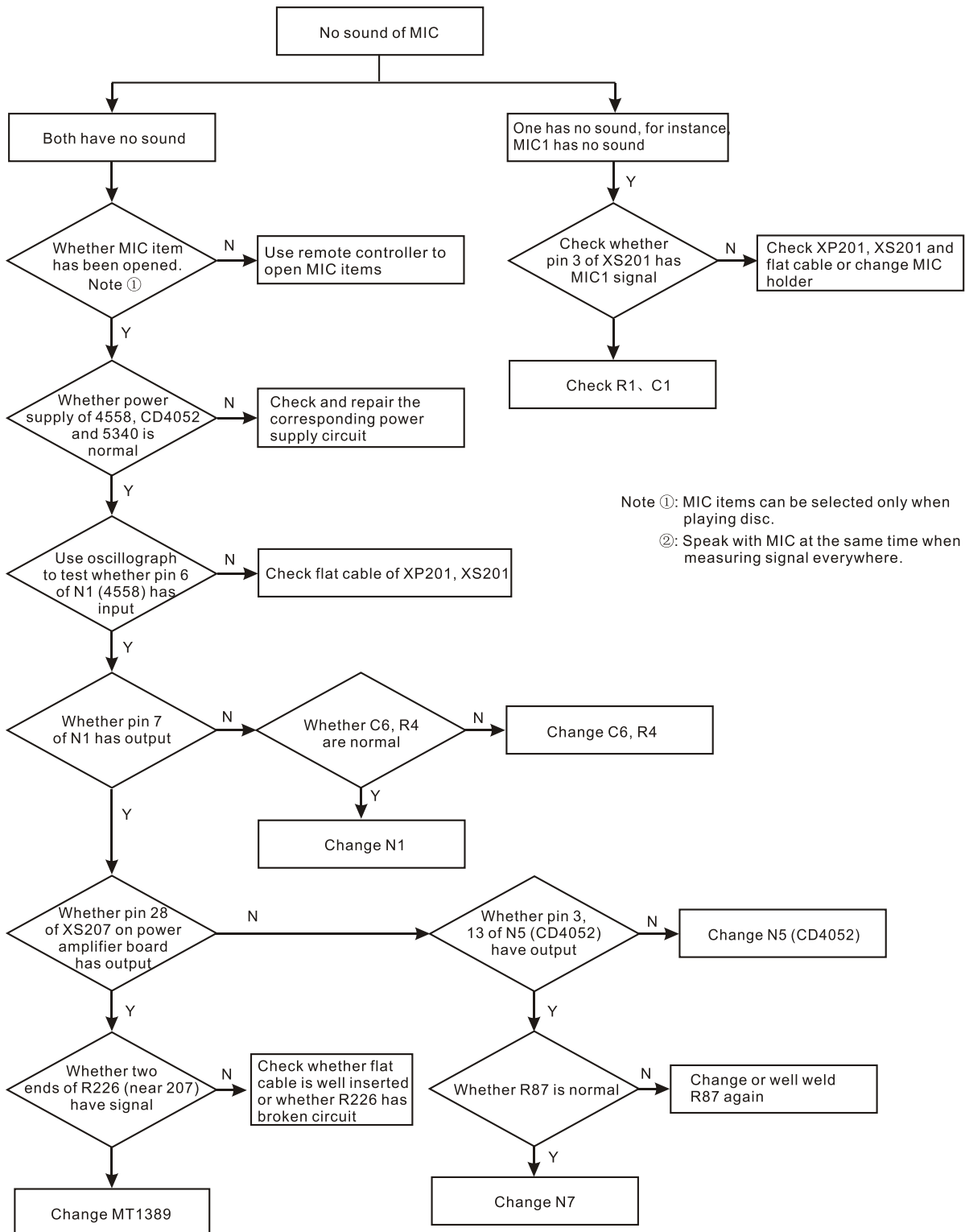


Figure 3.5.6.1 Troubleshooting flow chart for no sound of MIC

3.5.7 Troubleshooting process for no sound of headphone is shown as the following figure 3.5.7.1:

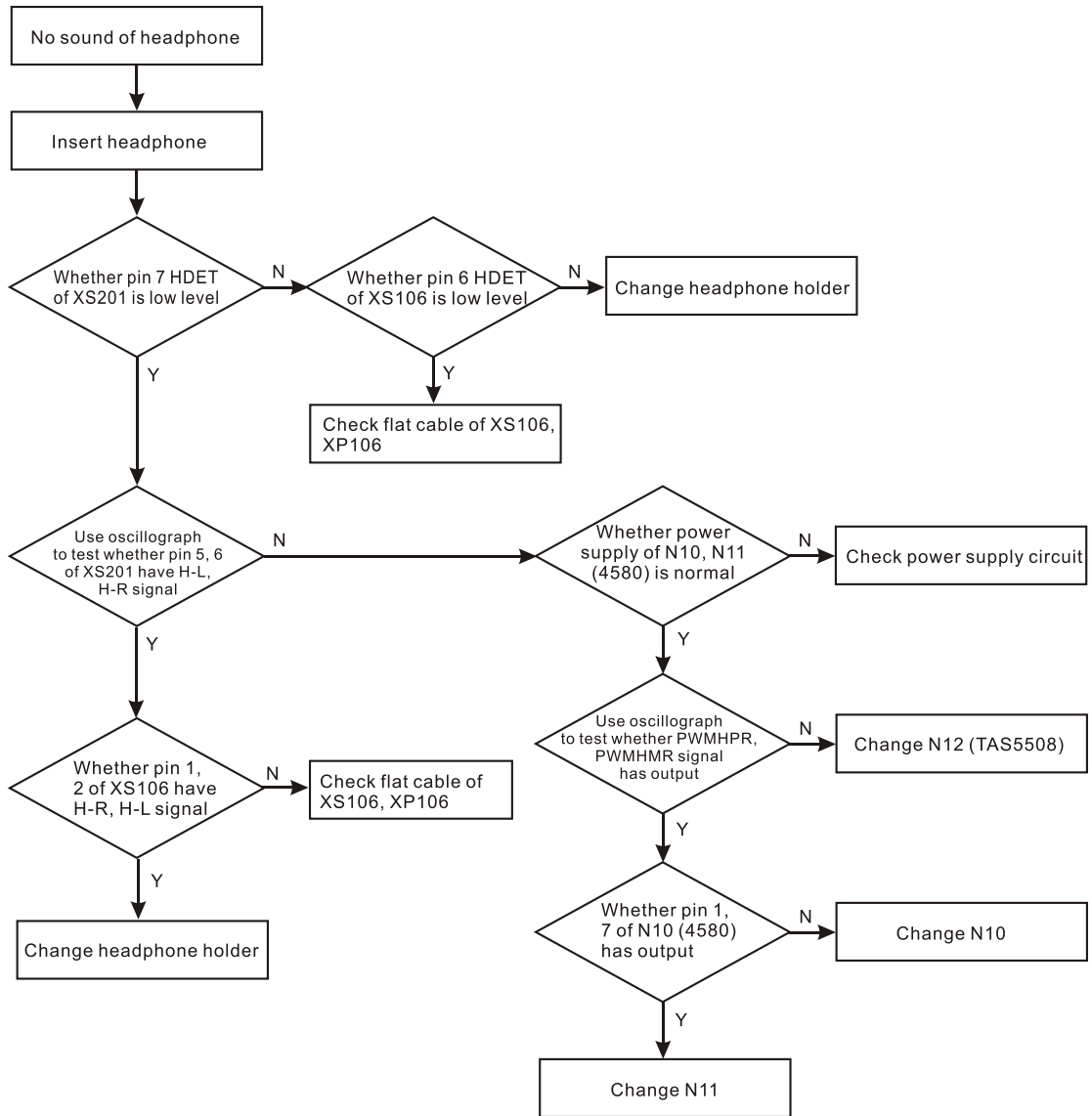


Figure 3.5.7.1 Troubleshooting flow chart for no sound of headphone

3.5.8 Troubleshooting process for image distortion is shown as the following figure 3.5.8.1:

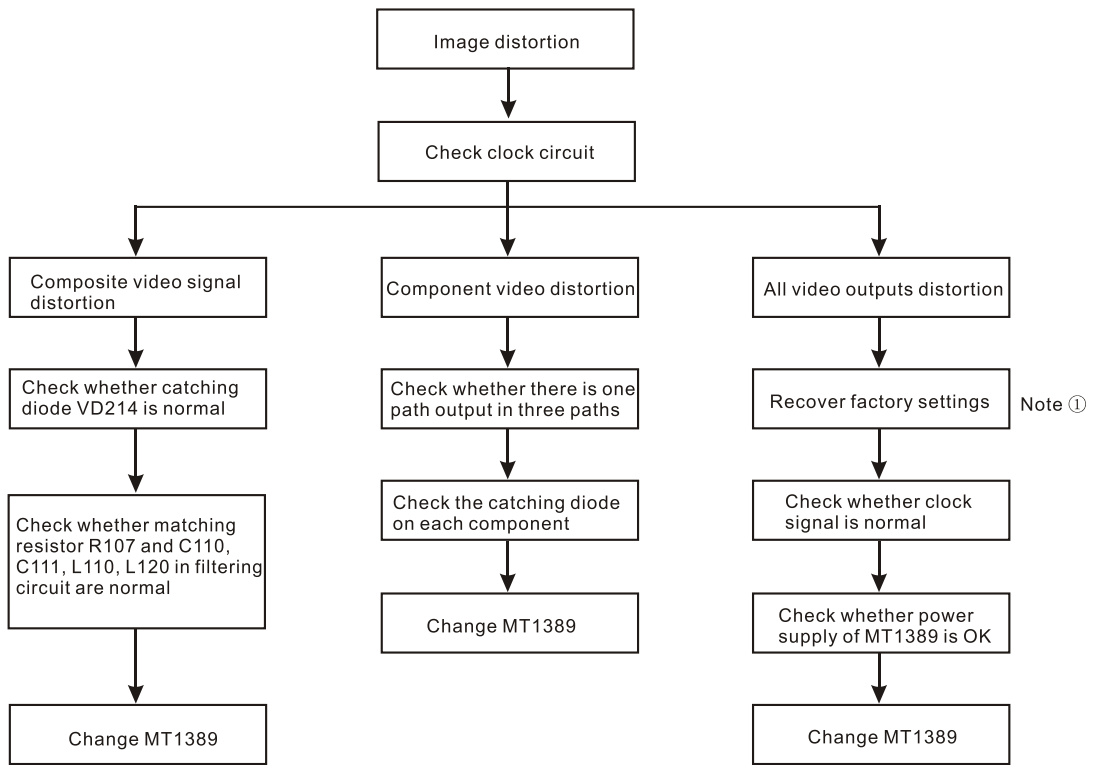


Figure 3.5.8.1 Troubleshooting flow chart for image distortion

Note ①: the process of restoring factory settings is shown as the following figure 3.5.8.2:



Figure 3.5.8.2 Operation flow chart of restoring factory settings

3.5.9 Troubleshooting process for noise in channel is shown as the following figure 3.5.9.1:

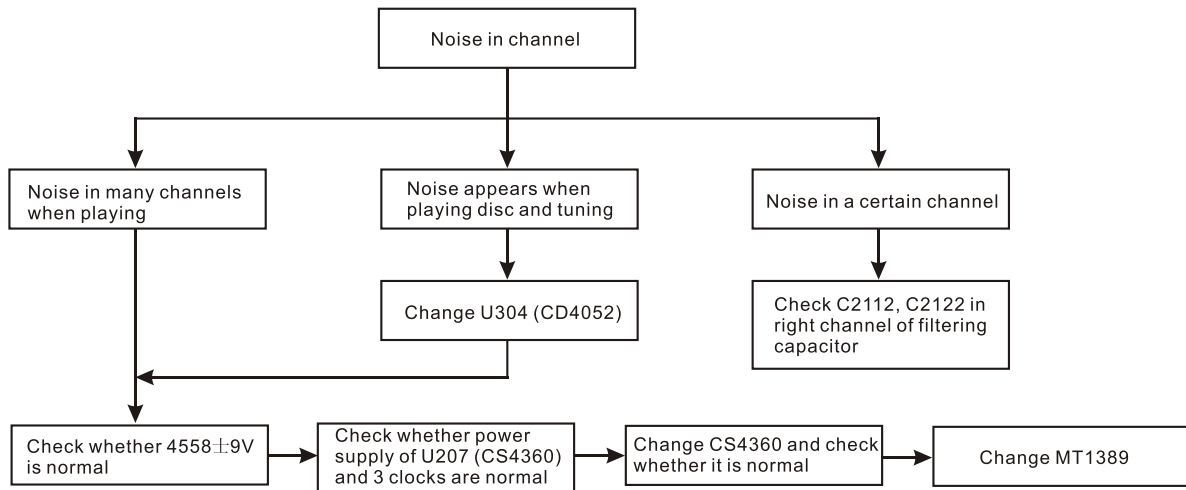


Figure 3.5.9.1 Troubleshooting flow chart for noise in channel

3.5.10 Troubleshooting process for no echo of microphone is shown as the following figure 3.5.10.1:

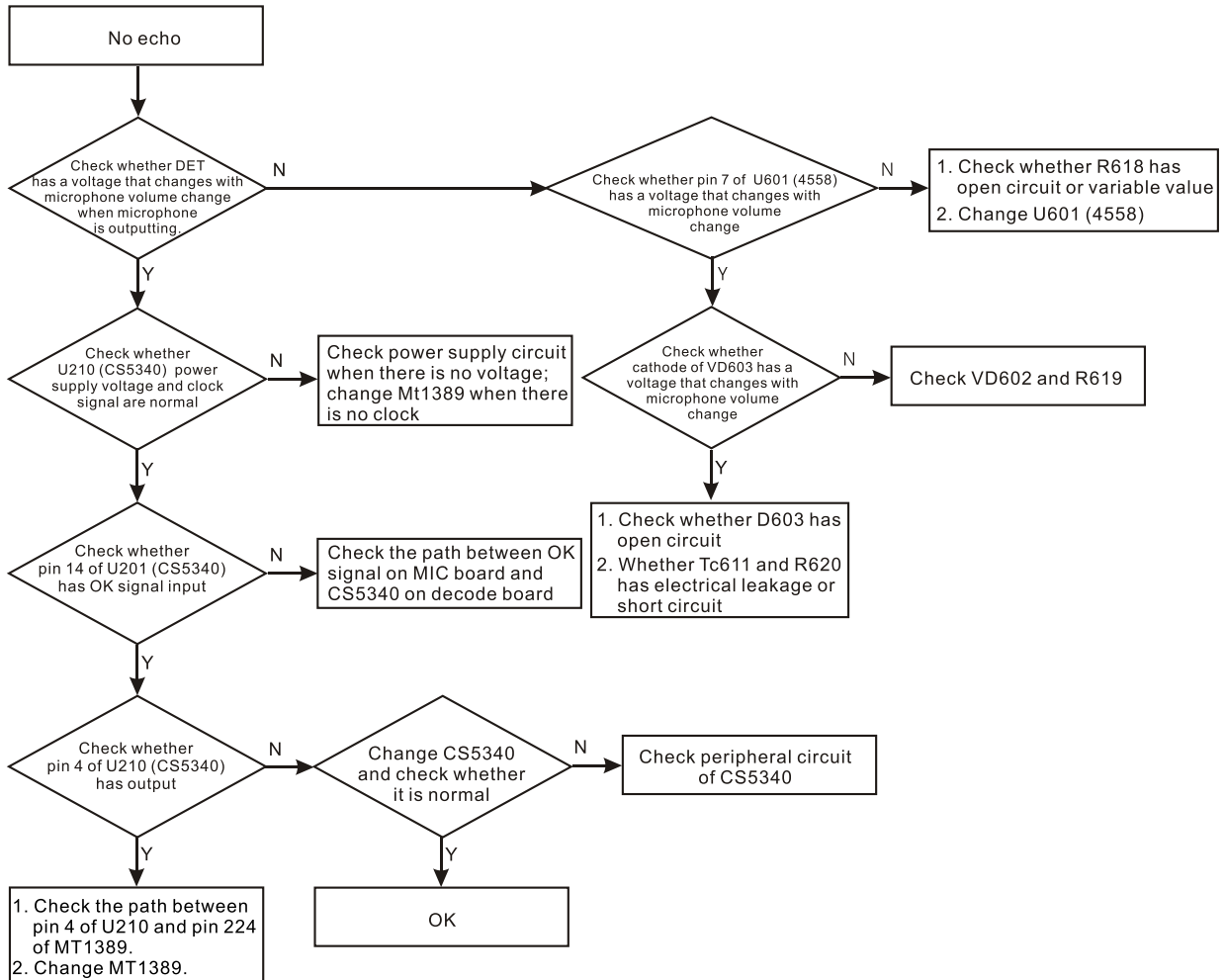


Figure 3.5.10.1 Troubleshooting flow chart for no echo in microphone

3.5.11 Troubleshooting process for no remote control function is shown as the following figure

3.5.11.1:

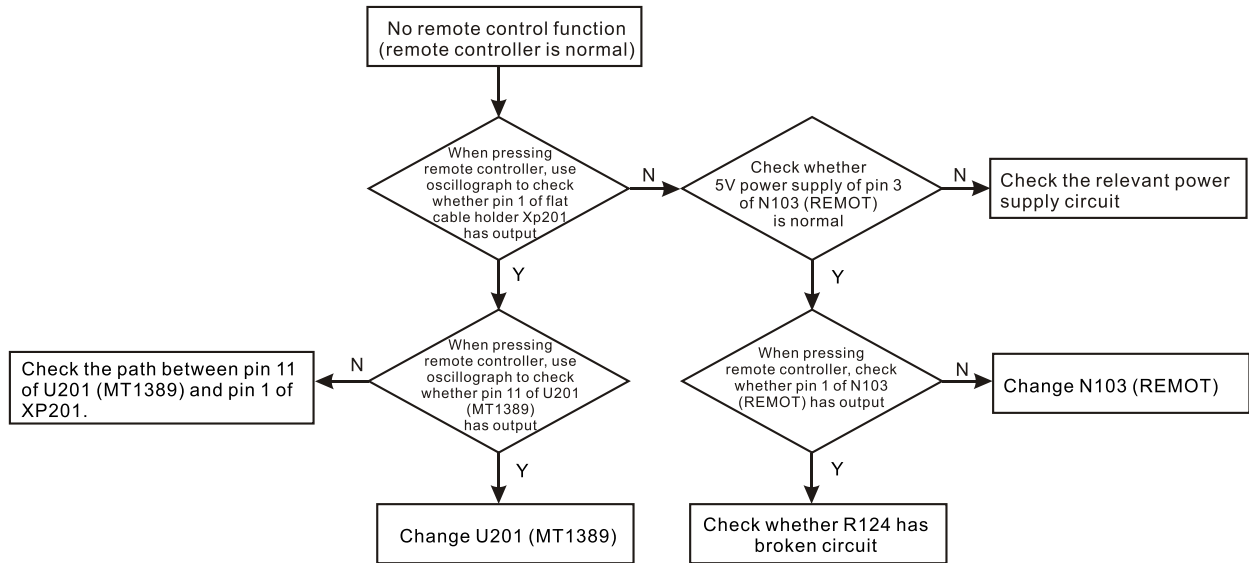


Figure 3.5.11.1 Troubleshooting flow chart for no remote control function

3.5.12 Troubleshooting process for there is sound but no image is shown as the following figure

3.5.12.1:

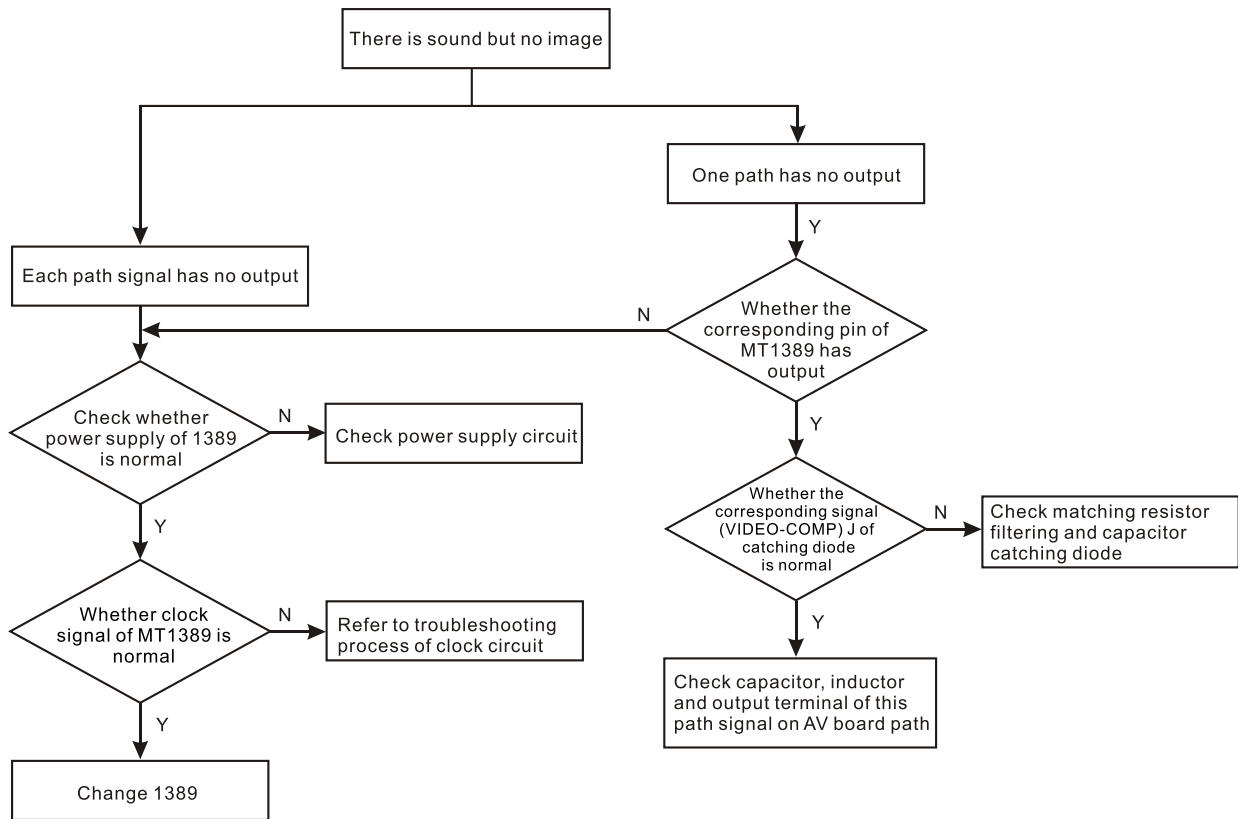


Figure 3.5.12.1 Troubleshooting flow chart for there is sound but no image

3.5.13 Troubleshooting process for no screen display is shown as the following figure 3.5.13.1:

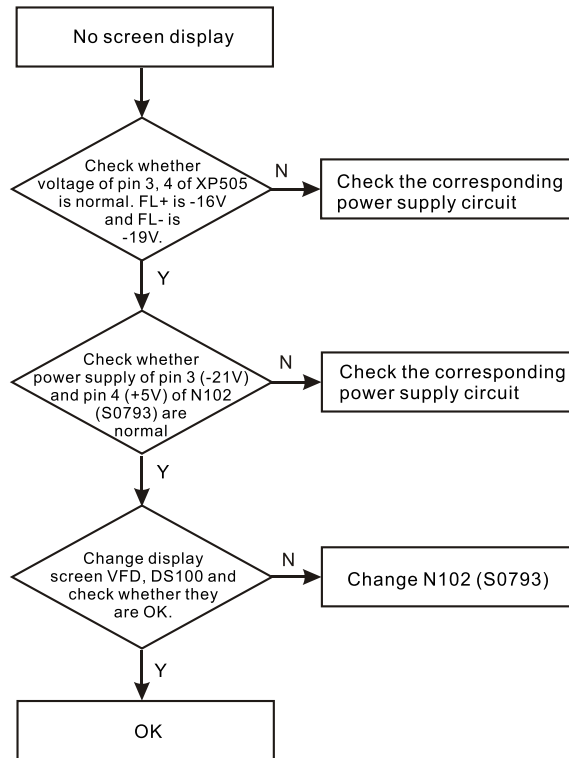


Figure 3.5.13.1 Troubleshooting flow chart for no screen display

Chapter Six Servicing Examples

3.6.1 Servicing examples

【Example 1】 Mixed left channel on AV board has no sound

Analysis and checking: Step 1: use oscillograph to check LO signal on pin 5 of Xs401 on power amplifier board and find that there is no signal. After unplugging the flat cable on XS401, LO still has no signal output. So we can confirm that the trouble lies in power amplifier board.

Step 2: use multimeter to test power supply of N8 (TLV272) and it is normal.

Step 3: use oscillograph to test pin 55 and 56 of N12 (TAS5508) and find that there is digital waveform output, so we can judge that the trouble lies in the circuit between N12 (TAS5508) and XS401,

Step 4: use oscillograph to test pin 2 and 3 of N8 (TLV272) and finds that there is waveform input. But when testing pin 7 of N8, there is no waveform output, so we preliminarily decide that N8 has trouble. After changing N8, the trouble is removed.

note: even though N12 has waveform output, it is not necessarily correct, for N12 may probably output carrier signal only but no modulation signal.

【Example 2】 Headphone has no sound

Analysis and checking: insert headphone, test DET signal on pin 7 of XS201 on power amplifier board and it is low level. Use oscillograph to test pin 5 and 6 of XS201 and there is no HR, HL signal. Test pin 61 and 62 of TAS5508 and there is output. Check power supply of N10, N11 (4580) and it is normal. Test pin 1 and 7 of N10 and there is no output. So we doubt that N10 has trouble, and the trouble is removed after changing N10.

【Example 3】 External input has no sound

Analysis and troubleshooting: set DVD player in AV IN status and find that there is sound output when playing disc, so we preliminarily confirm that the common part of external input and audio output when playing disc is normal, shown as the following figure 3.6.1.1; that is elements after N4 are all normal, and now we only consider N5, N7, N4 and the circuit between them. Use multimeter to test power supply of N5, N7, N4 and they are all normal. Use oscillograph to test the output pin (pin 13 and 3) of N5 and they all have signal output. When checking pin 4 of N7, we find that there is no signal output. Use multimeter to test whether the circuit between N5 and N7 is connected, and there is no trouble yet. After changing N7 (CS5340), the trouble is removed.

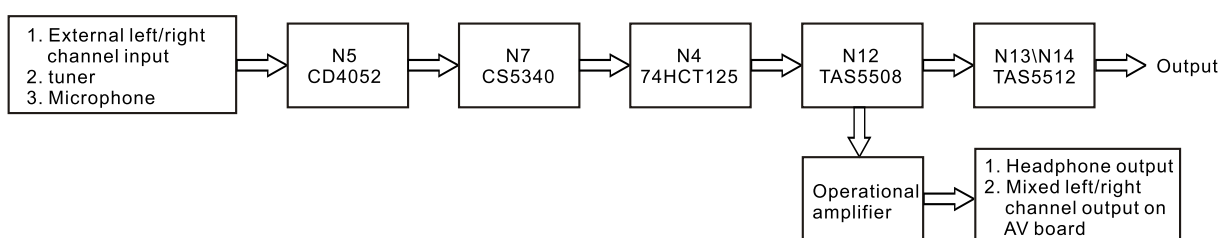


Figure 3.6.1.1 signal flow chart

【Example 4】 Sound distortion

Analysis and troubleshooting: check +28V power supply of power amplifier board and +5V, +3.3V, +12V, 12V, and they are all normal. Check clock on power amplifier board and its also normal.

Step 2: check waveform and find that all waveform has output, and no trouble if s found.

Step 3: after changing decode board, sound becomes normal, so we can confirm that the trouble lies in decode board.

Step 4: check clock of MT1389 and it is 26.999MHZ, which is normal; check output of pin 2 of +1.8V voltage regulator and it is +1.9V, which is normal; check DV33 on pin 3 of XS203 and it is +3.4V, which is also normal.

Step 5: the trouble is not removed after the checking of above procedure. Check power supply of Mt1389 carefully according to power supply troubleshooting process in Mt1389 (section 2.6.1), and find that L235 is burnt out. The trouble is removed after changing L235.

Summary: if the trouble is not be found after some preliminary checking finishes, you may change circuit board to confirm which board has trouble to facilitate the next operation. For sound trouble, if power supply and clock are both normal, you need to consider changing IC.

【Example 5】 Power amplifier has no sound

Analysis and troubleshooting: as shown in the figure 3.6.1.2; step 1: check +28V power supply on power amplifier board and power supply on XP101 and they are both normal. Check clock and its is normal.

Step 2: check SDATA0, SDATA1, SDATA2 on pin 2, 3, 4 of XS207 and they all have output, which is normal.

Step 3: check pin 49 (PWM CEN-) of N12 (TAS5508) and there is no output (may also check other output pin); check pin 28, 29, 31 of N12 (TAS5508) and all signals have input, so we preliminarily decide that TAS5508 has trouble.

Step 4: check power supply of TAS5508 and it is normal. The trouble is not removed after changing TAS5508.

Step 5: use DC level of multimeter to test voltage on output terminal and find that voltage of SW+ and SW- is 6.09V and that of other outputs are all 14.02V, which is +14V in normal condition, so we can consider that the capacitor on the circuit between N13 (TAS5112) and output part has electric leakage. Change C139, C140, C141, C142, C143, C66, C71, but the trouble is not removed still.

Step 6: after removing resistor R142, R143, voltage output of SW+ and SW- are both +14V, which is normal. We consider that one of R142 and R143 has trouble. After changing, voltage of SW+ and SW- changes into +6.02V again, and the trouble is still not removed.

Step 7: after changing N13 (TAS5112) directly, the trouble is removed.

Summary: for N13 is damaged inside, after connecting R142, R143, a loop will appear between ground to lead the abnormal working of N13 to make SD signal of pin 6 output low level. This signal controls TAS5508 to perform self-protection function and cannot output signal, which makes us falsely consider that the trouble lies in TAS5508 .

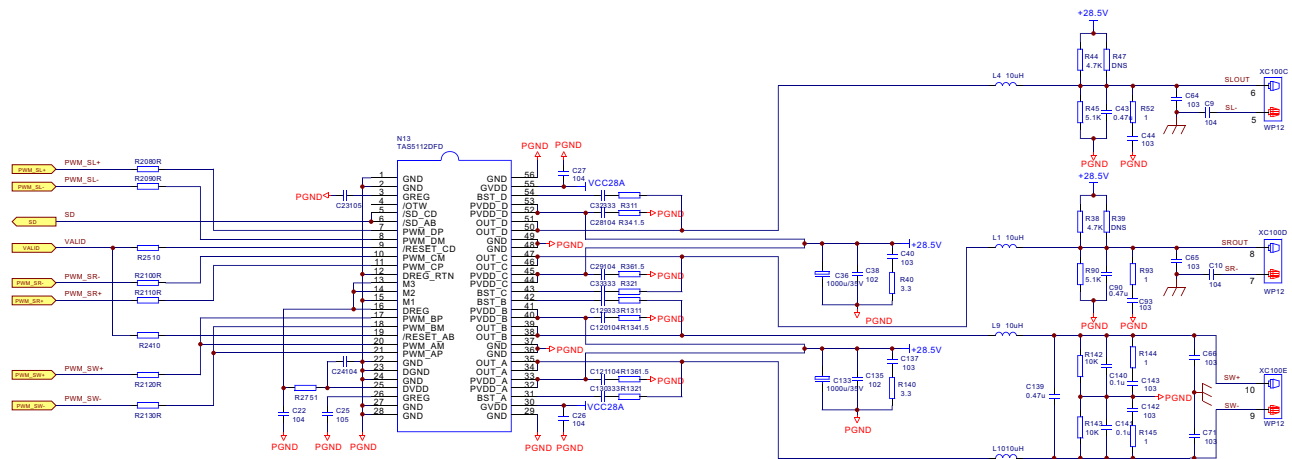


Figure 3.6.1.2 power amplifier circuit

【Example 6】 MIC has no sound

Analysis and troubleshooting: when playing disc, use remote control to open MIC items and there is still no sound. Check power supply o 4558, CD4052, CS5340 and they are all normal. Use oscillograph to check input of pin 6 of 4558, which is normal, and pin 7 has no output. Check R4, C6 and they are both normal, so we doubt that 4558 has trouble. MIC becomes normal after changing 4558.

【Example 7】 Power amplifier has no sound

Analysis and troubleshooting: use multimeter to test power supply on power amplifier board XP503 and it is +29.6V, which is normal. Test power supply on XP101 and it is also normal. Test HDET signal on pin 24 of XS207 on power amplifier board and it is 0V. When in normal working, if headphone is not inserted, voltage on HDET should be about +3.3V. Test HDET signal on pin 7 of XS201 on power amplifier board and it is 0V, which is abnormal. In normal condition, if headphone is not inserted, voltage of this place should be +2.9V. Turn off power and do not insert headphone; use multimeter to test the resistance to ground of HDET signal on pin 7 of XS207 and it is 0 ohm, which should be infinite in normal condition. So we preliminarily confirm that it is HDET signal shorted to earth. Unplug flat cable on XS201, test the resistance to ground of pin 7 of socket XS201 and it is infinite, which is normal. But now test the resistance to ground of pin 7 (HDET) on panel XP204 and it is also 0 ohm, so we can confirm that the trouble lies in main panel, headphone or flat cable. Unplug flat cable between panel and headphone, check the resistance to ground of pin 7 on panel XP204 and it is infinite, so we can confirm that the trouble lies in headphone board. Joint welding has not been found on headphone board, so the trouble can only lies in socket. After changing headphone socket, the trouble is removed.

Summary: The spring strip inside headphone socket has trouble to make HDET signal connected with ground. The flow direction of HDET signal is shown in the following figure 3.6.1.3:

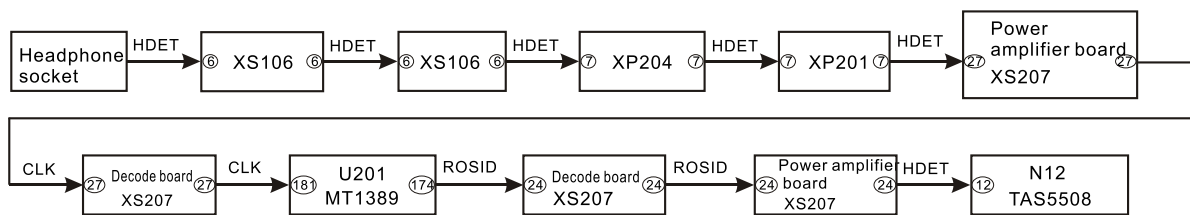


Figure 3.6.1.3 Flow direction figure of HDET signal

【Example 8】 Power not on

Analysis and troubleshooting: step 1: check each path power supply of power board and they are normal. Step 2: check clock circuit and it is normal (frequency is 27MHZ, VPP=1.8V, DC voltage of two ends is 0.75V). When checking good machine, test directly on two ends of R244 and R248, which is convenient. When testing, down or beep sound may be caused but the test result will not be affected basically. If the influence is great when testing on one end of resistor, you may test the other end. Certainly, for defective machine that power is not on, the above phenomenon cannot be found. Step 3: check voltage of reset circuit and it is 3.3V, which is normal. When resetting by force (use a lead to ground pin 6 of U205 (HCU04) for one second), if the power is still not on, we can preliminarily consider that it has nothing with reset circuit. Step 4: check power supply of MT1389 according to the power supply troubleshooting process and it is normal. Check power supply of U214 (FLASH), U211 (SDRAM) and it is normal. Check pin 5 and 6 of I2C (U202) and they are both about +2.5V, which is also normal.

Step 5: the trouble is removed after changing FLASH.

Summary: if there is digital oscillograph, you may firstly check whether pin 29 of FLASH has waveform. If there is no waveform, one of MT1389 and FLASH may probably have trouble. If there is no digital oscillograph, we firstly consider changing FLASH and then SDRAM. If the trouble is still not removed, consider changing MT1389.

【Example 9】 Power not on

Analysis and troubleshooting: step 1: check power supply of power board and find that power has no voltage output. Unplug flat cable on power board and power board still has no voltage output, so we can confirm that the trouble lies in power board.

Step 2: observe elements on power board and find that U505 (KAIM0880) has been scorched. Then check fuse and find that the fuse has been burnt out.

Step 3: use multimeter to test bridge circuit Bd501 and find no abnormalities (pay attention to pin sequence of Bd501).

Step 4: change fuse and U505 (KAIM0880), and trouble is removed.

Summary: when servicing power board, if you find that fuse and switching module have been burnt out, please check whether the diode on bridge circuit has been burnt out.

【Example 10】 Power amplifier has no sound

Analysis and troubleshooting: check HDET signal of pin 24 of XS207 on power amplifier and it is +3.3V. Voltage on XP101 and +28.5V voltage on XP503 are both normal.

Step 2: check output of SDATA0, SDATA1, SDATA2 (R294, R295, R296) on decode board and they are all normal.

Step 3: check SDACSW (R98), SDASLSR (R100), SDALR (R101) signal on power amplifier board and they are all normal.

Step 4: check each output pin of TAS5508 and they all have no output.

Step 5: check power supply of TAS5508 and MUTE signal and they are both normal.

Step 6: check pin 63 MCLK of TAS5508 and it is 3MHZ; pin 26 LRCK and it is 48KHZ, pin 27 SCLK and its is 12.3MHZ, crystal oscillator clock signal outside chip and it is 13.5MHZ, which are all normal.

Step 6: after changing TAS5508, power amplifier still has no output.

Step 8: after changing N13 (TAS5112), output is normal.

Summary: Each input signal, power supply and clock signal of N12 (TAS5508) are normal and have no output, so change N12 directly. But the trouble is still not removed after changing, so it may be the reason that back stage circuit causes no output for N12. Try changing N13 and it restores to normality. The inside trouble of N13 leads to the short circuit of the output pin of N12, which has self-protection function to stop outputting signal. The flow direction of audio signal of power amplifier board is shown as the following figure 3.6.1.4:

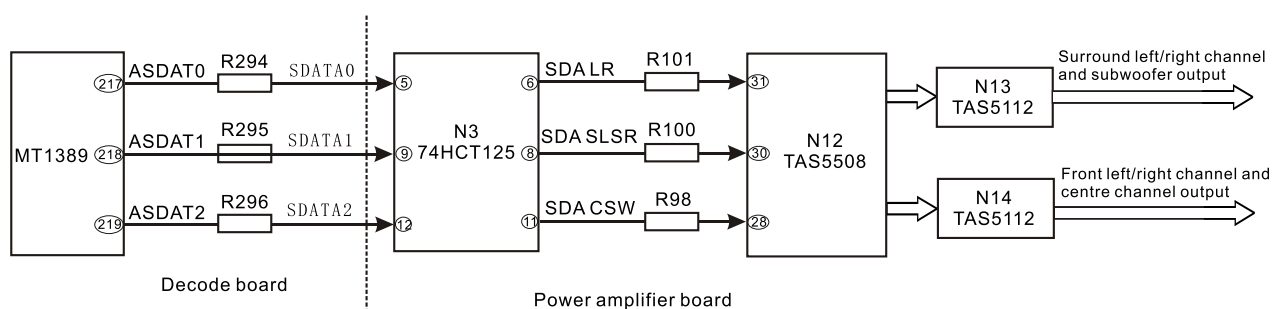


Figure 3.6.1.4 Flow direction figure for audio signal

【Example 11】 component color distortion

Analysis and troubleshooting: step 1: check MT1389 clock, 26.999MHZ, VPP=1.72V, normal (27KHZ when in normal condition).

Step 2: check power supply of MT1389 and it is normal (refer to MT1389 power supply circuit.)

Step 3: use oscillograph to check the three component signals of pin 6 (Y4), pin 7 (Y5), pin 8 (Y6) of XP206 on AV board and they all have output. But when using multimeter to check DC voltage of the three signal, we find that Y5 has

+4.7V, which should only have two several tenths of a volt with one volt and a little above at maximum. Known from the circuit, only that when catching diode has trouble is mostly like to lead to the increase of voltage. When using multimeter to test diode, we find that VD100 has been struck through and the trouble is removed after changing it.

Note: for the trouble of colour distortion, if problems, such as capacitor has electric leakage, inductor has open circuit, catching diode is struck through or has short circuit, have not been found, please consider changing MT1389 firstly.

【Example 12】 Component video has no output

Analysis and checking: use oscillograph to test VIDEOY1, VIDEOU, VIDEOV (Vd103, Vd101, Vd111 anode), VIDEO Y1 has no output and VIDEOU, VIDEOV have output. Test pin 6 of Xp206 and pin 6 of Xs206 on decode board, and there is no waveform output basically. Disconnect flat cable between Xp206 and Xs206, and waveform of pin 6 of Xs206 restores to normality. It is estimated that the trouble lies in AV board. Check R108, C112, C114, Vd102, Vd103 and find that Vd102 is struck through. After changing Vd102, component video output is normal.

【Example 13】 Power not on

Analysis and troubleshooting: step 1: check power supply of power board and all outputs are normal.

Step 2: check the output of 1.8V voltage regulator and it is +1.9V, which is normal.

Step 3: check clock frequency at the two ends of X201 in clock circuit, and it is normal.

Step 4: check the output of pin 6 of reset circuit U205 (HCU04) and it is +3.4V, which is normal.

Step 5: reset by force (use a lead to ground U205 (HCU04) for one second), and find that power is on, and that the player may work normally. Switch on the player again after cutting off power, and find that power is on. But after switching on the players for several times repeatedly, power will not be on again, and power may be on after resetting by force.

Step 6: change U205 (HCU04) and switch on the player repeatedly (above ten times), the phenomenon that power is not on does not appear and the trouble is removed.

Summary: when reset circuit has trouble, sometimes power is on and sometimes power is not on, which causes random trouble. Now you need to test repeatedly to confirm whether reset circuit has trouble.

【Example 14】 Not read DVD

Analysis and troubleshooting: check Xs301 socket and flat cable and abnormalities have not been found. (May observe directly. If you find that flat cable is loose, insert it well again.)

Step 2: change loader and trouble is removed.

Summary: during the actual servicing, when you find the trouble such as not read disc, it is always difficult to judge which element has trouble. So you may try changing loader to judge which place the trouble appears.

【Example 15】 Not read disc

Analysis and troubleshooting: as shown in figure 3.6.1.5; step 1: check each flat cable and find no abnormality.

Step 2: still not read disc after changing loader.

Step 3: observe pick-up and find that there is no focus action (after disc out), and other acts are normal, so we preliminarily judge that it is servo circuit that has trouble.

Step 4: check and find that power supply on pin 8, 9 of U302 (D5954) and power supply on pin 21 is also normal.

Reference voltage on pin 4 of U302 is 1.4V and its also normal.

Step 5: observe U302, R211 and C213, and there is no abnormality.

Step 6: after changing U302 (D5954), the trouble is removed.

Summary: in actual servicing, to judge whether a IC is good or not accurately is very difficult. Sometimes you may consider trying changing IC to see whether the trouble is removed. If there is digital oscillograph, firstly check the end near to MT1389 of R211. If there is waveform (refer to waveform collection in attachment) during a small period (about 5 seconds) after disc in, the possibility that MT1389 has trouble is small, D5954 is mor likely to have trouble.

【Example 16】 Not read disc

Analysis and troubleshooting: as shown in the figure 3.6.1.5; step 1: check each flat cable and find no abnormality.

Step 2: still not read disc after changing loader, and the trouble is still not removed.

Step 3: observe and find focus, feed and main axis all have no acts, even the laser head does no emit laser.

Step 4: check power supply (refer to 2.6.1) and clock circuit of MT1389 and find that all are normal.

Step 5: use digital oscillograph to test the end near to MT1389 of R208, R209, R210, R211 (test in a small period after disc in), and do not find obvious waveform output, so we preliminarily judge that it is MT1389 that has trouble. After changing MT1389, the trouble is removed.

【Example 17】 Not read disc

Step 1: as shown in the figure 3.6.1.5; check nerve flat cable socket on Xs301 and find no abnormalities.

Step 2: change loader, disc reading is normal and trouble is removed.

【Example 18】 Not read disc

Step 1: check XS301 flat cable and socket and they are both normal.

Step 2: change loader and trouble is still in.

Step 3: check power supply, observe leaser head main axis and feed are normal, nut no focus.

Step 4: check BA5954 power supply and reference voltage, and they are both normal.

Step 5: check power supply of MT1389. Refer to “MT1389 power supply checking method” for details.

Step 6: check the path between pin 42 of MT1389 (focus error signal output) and pin 1 of BA5954, and find that capacitor has electric leakage in C210, C211, C212 and C213. Change one by one and find that the trouble is removed after changing C213, which means C213 has electric leakage.

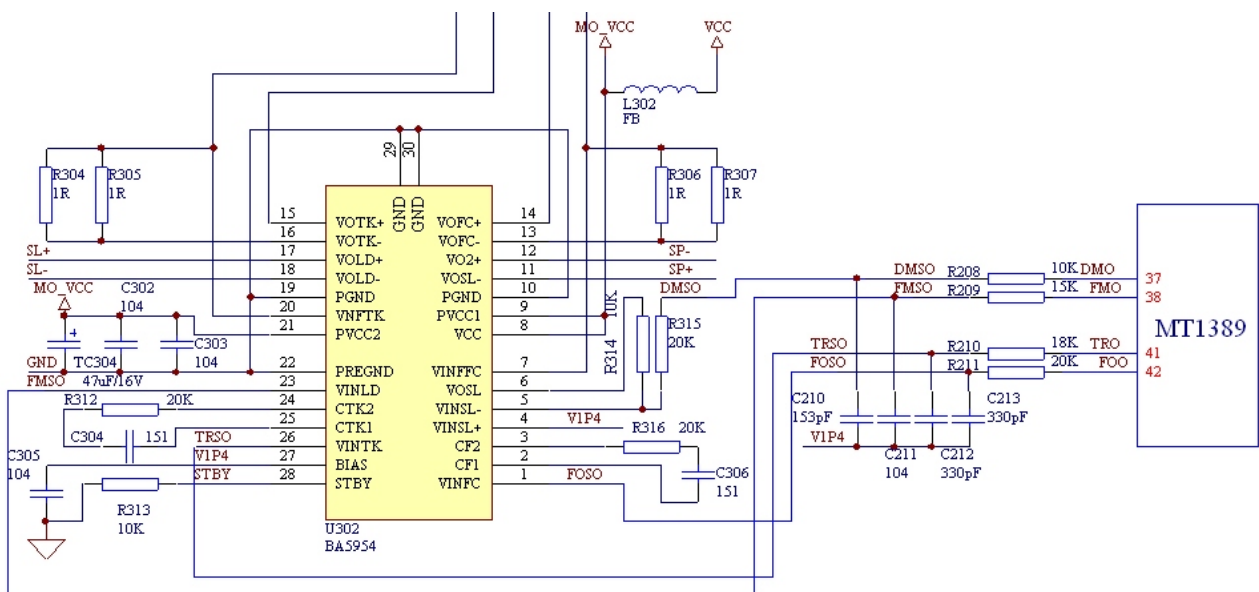


Figure 3.6.1.5 Servo drive circuit diagram

3.6.2 Trouble list

Symptom	Causes	Symptom	Causes			
Not read disc	Laser head not good	Not read CD or	Decode board: U302 not good			
	Nerve line not good	halt when rading CD				
	Frame not good	Not read CD or	Decode board: V304 rosin joint			
	Decode board: XS301 not good	halt when rading CD				
	Decode board: XS203 not good	Not read CD or	Decode board: V302 shedding welding			
	Decode board: XS303 not good	halt when rading CD				
	Decode board: L223 rosin joint	Not read CD or	Decode board: V301 joint welding			
	Decode board: L308 rosin joint	halt when rading CD				
	Decode board: U302 not good (D5954)	Disc rotation speed too fast	Laser head not good			
	Decode board: U201 not good (MT1389)		Decode board: D5954 mot good			
	Power board: D506 not good	Absorb disc	Loader cover board not good			
Power board: IC not good	Power not on	Power switch not good				
Not read DVD or		Power not on	Decode board: U219 not good (MT1389)			
			Decode board: U214 not good (flash)			
Halt when reading DVD			Power not on	Decode board: C276 not good		
				Power board: U501 not good 5L0380R		
Not read CD or				Power not on	Power board: XS505 joint welding	
					Power board: X502 shedding welding	
halt when rading CD					Power not on	Decode board: U214 not good (flash)
						Panel: N102 not good (S0793)
Not read CD or						Power on automatically
	halt when rading CD					
Not read CD or		Decode board: R302 mistakenly used				Decode board: U201 not good (MT1389)
	halt when rading CD					
No sound for power amplifier		Power amplifier board: N13, N14 not good (TAS5112)	No sound for power amplifier			Panel: N102 not good (S0793)
	Power amplifier board: L4, L3 not good	AV: joint welding for S-video terminal				
	Power amplifier board: XS207 not good	Power amplifier board: R115 not good				
	Panel: joint welding for headphone	No sound for surround left	Power amplifier board: L13 not good			
	Decode board: C2162, C2171 joint welding		Power amplifier board: XS207 not good			
	Power board: U507 not good		Decode board: R296 rosin joint			

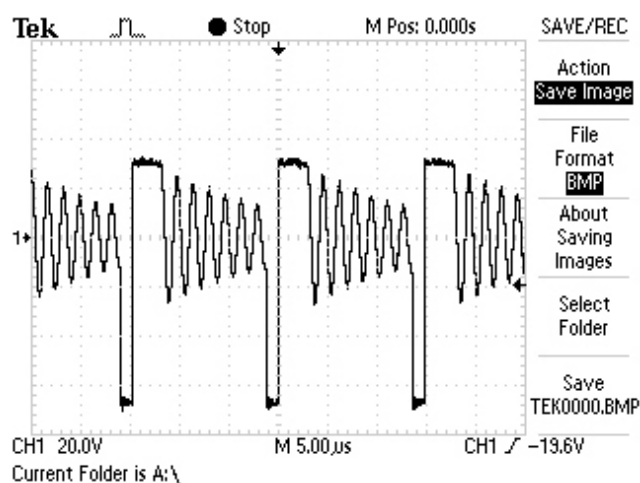
Symptom	Causes	Symptom	Causes
No sound for power amplifier	Power amplifier board: R6 not good	No sound for mixed left	AV: X401 joint welding
	Decode board: U201 not good (MT1389)	No sound for mixed right	AV: C102 short circuit
	Joint welding for panel light emitting diode	No sound for centre	Power amplifier board: N12 not good (TAS5508)
		No sound front left	Power amplifier board: N4 not good (74HCT125)
Volume of mixed right is small	Power amplifier board: R161 not good	Volume of mixed right is large	Power amplifier board: R157 quality changes
	Power amplifier board: R157 rosin joint		Power amplifier board: R162 not good
	Power amplifier board: N9 not good (TLV272)	Sound is noisy	Decode board: joint welding of flat cable holder
	Power amplifier board: R157 rosin joint		Power amplifier board: L1、L4 not good
	Power amplifier board: R161 not good		Power amplifier board: R107 not good
Surround sound is noisy	Decode board: U201 not good (MT1389)	Volume of mixed left is large	Power amplifier board: R106 not good
No sound for headphone	Power amplifier board: XS207 not good	No MIC	Microphone terminal not good
One line of headphones has no sound	Power amplifier board: XS201 not good		Power amplifier board: XS207 not good
	Panel headphone holder not good		Power amplifier board: N5 not good (CD4052)
	Power amplifier board: C163 not good		Power amplifier board: N7 rosin joint (CS5340)
Rotate headphone noise	Headphone terminal not good		Power amplifier board: N4 joint welding (74HCT125)
No sound for headphone	Decode board: U214 not good (flash)		Decode board: U201 not good (MT1389)
	Power amplifier board: N1 not good (4558)		
No optical and coaxial output	Decode board: U201 not good (MT1389)	No optical and coaxial output	Power amplifier board: N5 not good (CD4052)
	Decode board: XS206 not good	No sound for mixed left of external input	Power amplifier board: N5 joint welding (CD4052)
	Decode board: C215 lack of element	No AV output	Decode board: U201 not good (MT1389)
	AV: R103 not good	No sound for external signal	Power amplifier board: XS207 not good
	AV: XP206 shedding welding		Decode board: U201 not good (MT1389)
No sound for tuning	Power amplifier board: N3 not good (74HCT125)	No sound for tuning	Power amplifier board: C85 not good
	Power amplifier board: N5 not good (CD4052)		Power amplifier board: N6 not good (SAA6588)
	Tuner not good		Decode board: XS207 not good

Symptom	Causes	Symptom	Causes
No sound for tuning	Decode board: U201 not good (MT1389)	No sound for tuning	Power amplifier board: XS402 rosin joint for flat cable holder
	Decode board: U302 not good (D5954)	No sound for tuning surround right	Power amplifier board: C92 not good
	Power amplifier board: N14 not good (TAS5112)	No sound for tuning surround left	Power board: R525 quality change
No output for Cr	AV: XP206 joint welding	Component picture mosaic when beating machine	Decode board: XS201 not good
No output for Cb	Decode board: U201 not good (MT1389)	Component picture mosaic	Decode board: U201 not good (MT1389)
No output for Cr	AV: L116 not good	No output for component	AV: VD103 not good
	AV: L104 shedding welding	Component color distortion	AV: VD100 reversely welding
	AV: VD101 not good	RGB has no character	Decode board: 1389 rosin joint
	Decode board: U201 not good (MT1389)	RGB has no conversion	Decode board: 1389 not good
No color for S	Power amplifier board: N14 not good (TAS5112)	RGB has no character	AV: XP401 shedding welding
	Decode board: XS206 not good	SCART distortion	AV: 107 lack of element
	S-video terminal not good	SCART color distortion	AV: 102 incorrectly used
S color distortion	AV: R105 not good	SCART disturbance when beating machine	Decode board: U201 not good (MT1389)
Component disturbance	Decode board: 1389 not good		
Knob out of control	Decode board: XS208 flat cable not good	Knob button has no function	Decode board: 1389 not good
	Panel: potentiometer not good	Knob has no function	Decode board: XS201 shedding welding
		PLAY button has no function	Panel: light touch switch not good
Door open automatically	Frame not good	Door not open	Decode board: R240 open circuit
	Decode board: XS302 shedding welding		Decode board: R329 not good
Door not open	Frame not good	Disc not in	Decode board: C343 short circuit
Door open/close slowly	Frame not good		
Screen dark	Panel: display screen not good	No screen display	Decode board: U214 not good (FLASH)
Display more	Panel: N102 (S0793) joint welding		Decode board: L230 not good
Display less	Panel: display screen not good		Panel flat cable joint welding
	Panel: display screen not good		Decode board: U214 not good (FLASH)

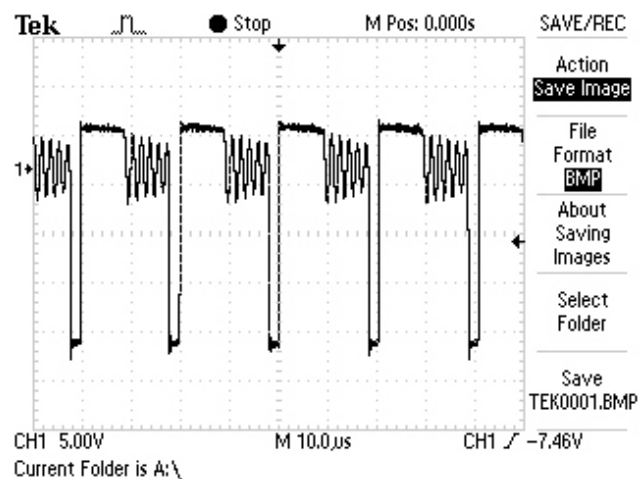
Symptom	Causes	Symptom	Causes
Screen dark	Panel: display screen not good	No screen display	Decode board: L232 not good
No spectrum	Decode board: L231 not good		
Noise when playing CD	Decode board: U201 not good (MT1389)	Down when beating machine	Decode board: XS201 not good
Noise when playing DVD	Decode board: U214 not good (FLASH)	Power not on	AV :V101 joint welding
	Power amplifier board: N2 not good (SN74LVC2G04DB)	Light flashes	Power board: U503 not good (TL431)
OPEN button has no function	Panel: R118 lack of element	No progressive output	Decode board: U201 not good (MT1389)
No sound for subwoofer	Power amplifier board: R59 joint welding	Down when reading disc	Decode board: U211 not good (SDRAM)
No sound when power on for the first time	Power amplifier board: R83 false welding	Door not open, picture mosaic	Decode board: U211 not good (SDRAM)
DVD has no character	Decode board: U214 not good (FLASH)	Display more when pressing SWITCH button	Panel: R125 not good
Down when reading disc	Decode board: U211 not good (SDRAM)		

Appendix One Signal Waveform Illustration

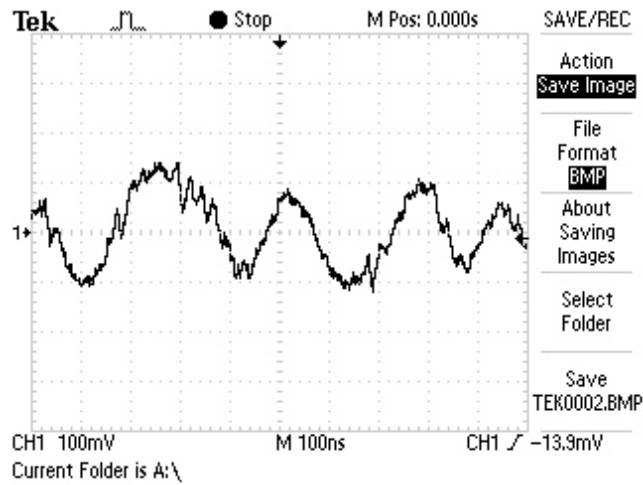
1. Pulse DC waveform on power board R519



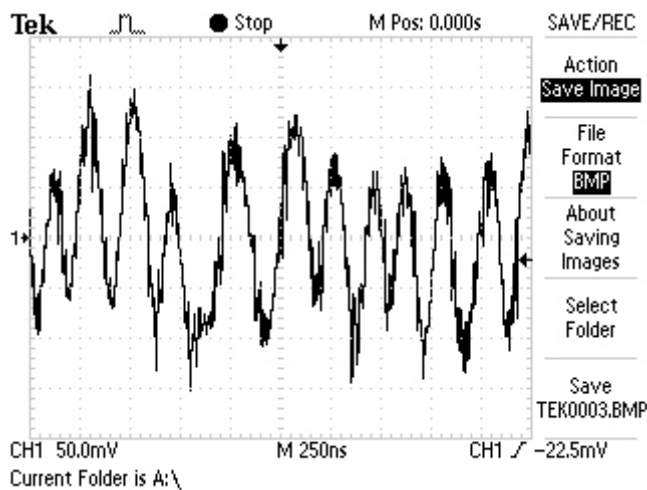
2. Pulse DC waveform on anode of power board D505



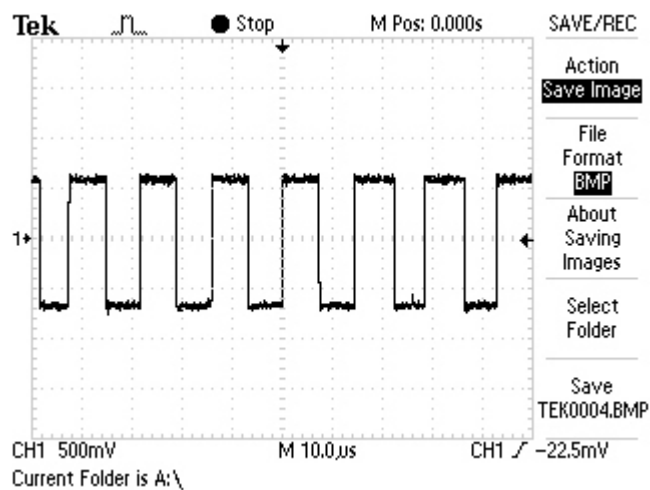
3. RFO signal waveform of pin 8 of XS301



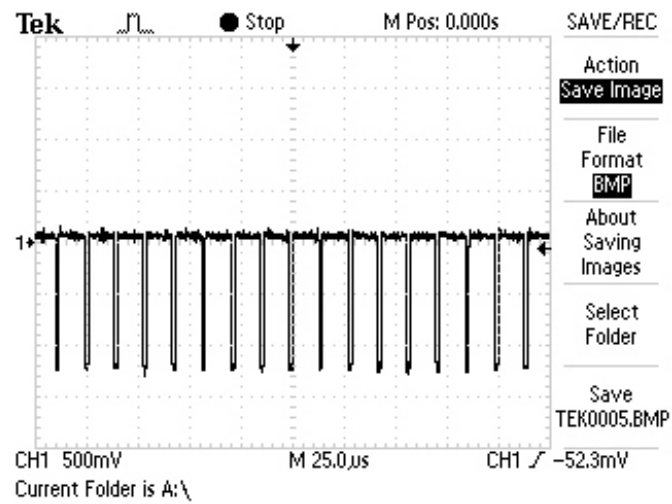
4. A signal waveform of pin 9 of XS301



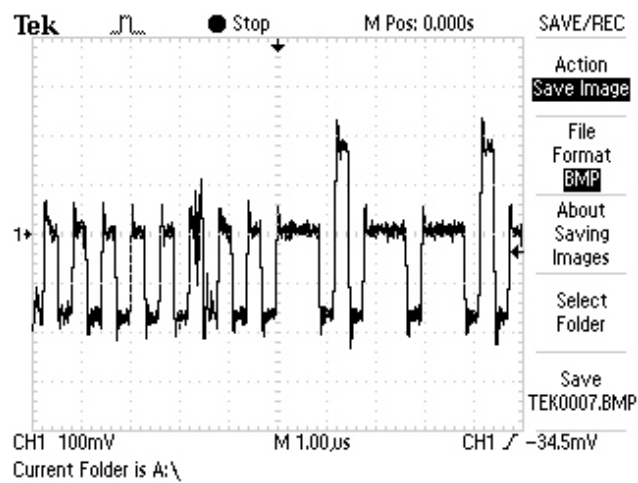
5. DMO signal (when there is main axis rotation) waveform of pin 37 of U201 (MT1389)



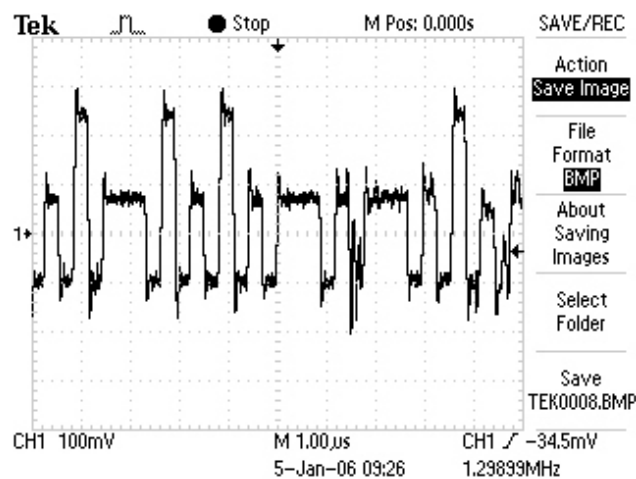
6. FMO (when there is feed acts) waveform of pin 38 of U201 (MT1389)



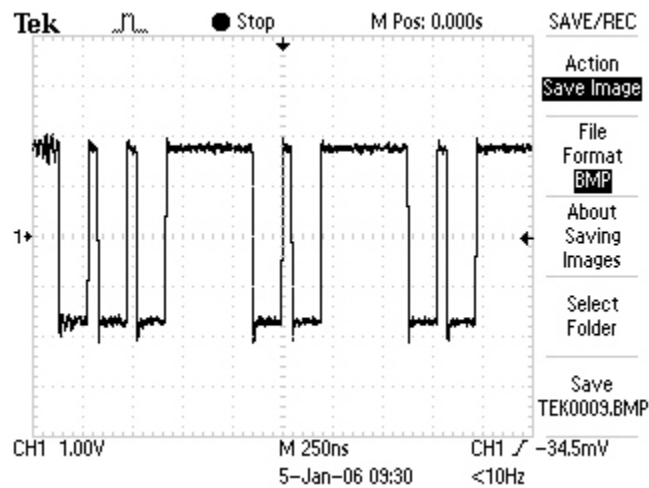
7. FMO (when there is feed acts) waveform of pin 38 of U201 (MT1389)



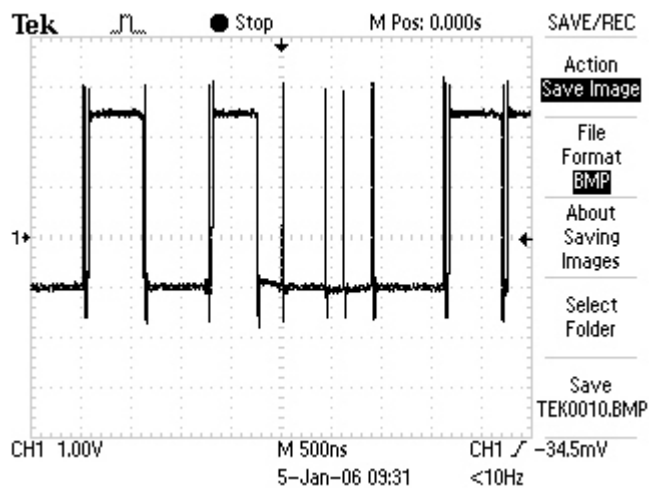
8. FOO (when there is focus acts) waveform of pin 42 of U201 (MT1389)



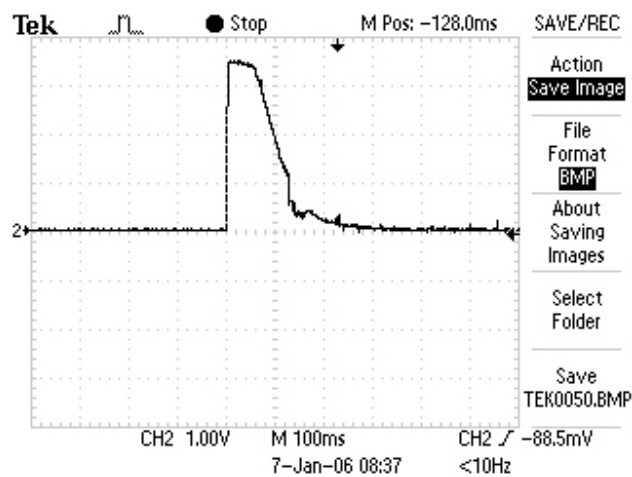
9. Waveform of pin 29 (without disc in) of U214 (FLASH)



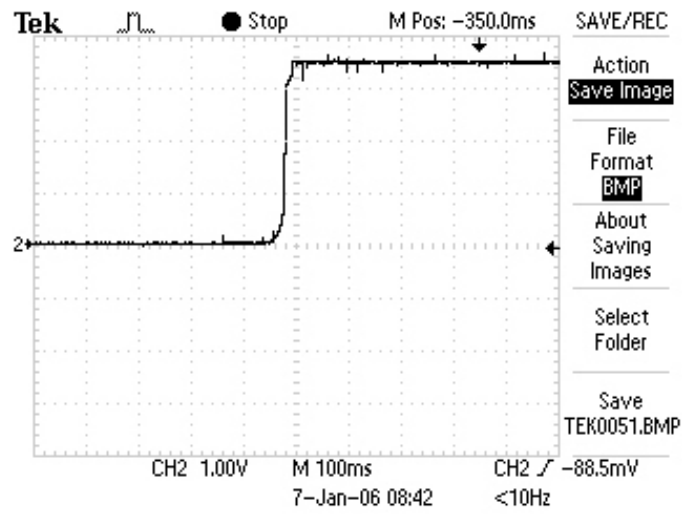
10. Waveform of pin 2 (without disc in) of U211 (SDRAM)



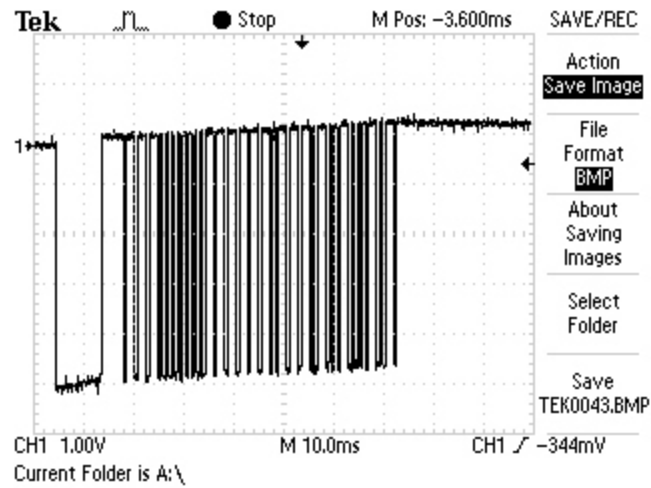
11. Waveform of pin 5 (at the moment of power on) of U205 (HCU04)



12. URST# waveform on pin 6 of U205 (HCU04)

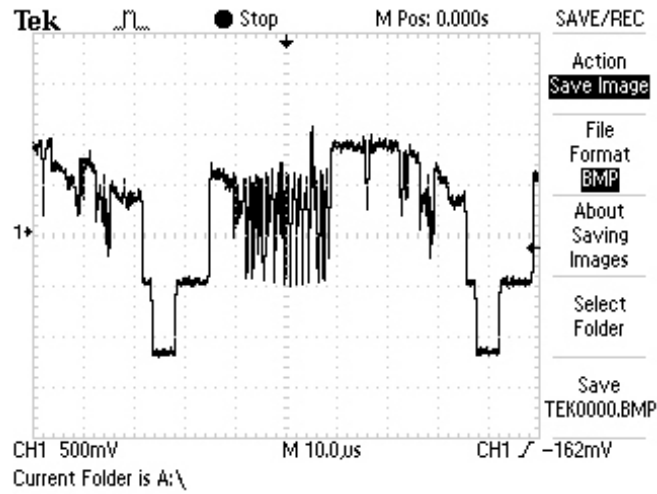


13. IR waveform

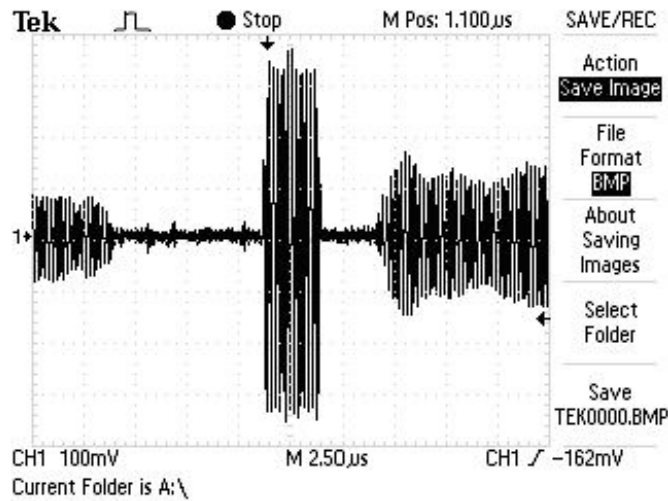


14. Video signal waveform

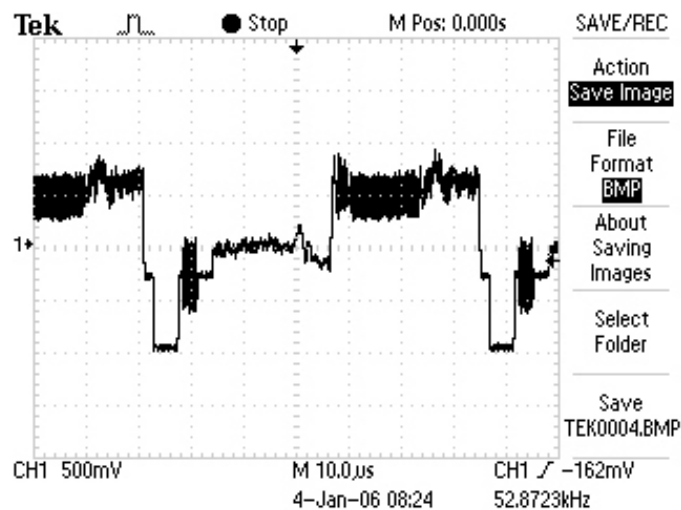
(1) Y1: brightness signal waveform in S-Video terminal.



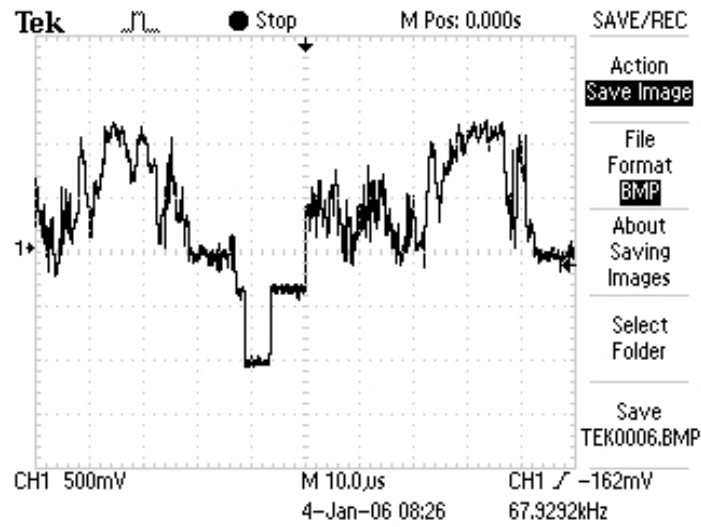
(2) Y2: chromatic aberration signal waveform in S-Video terminal



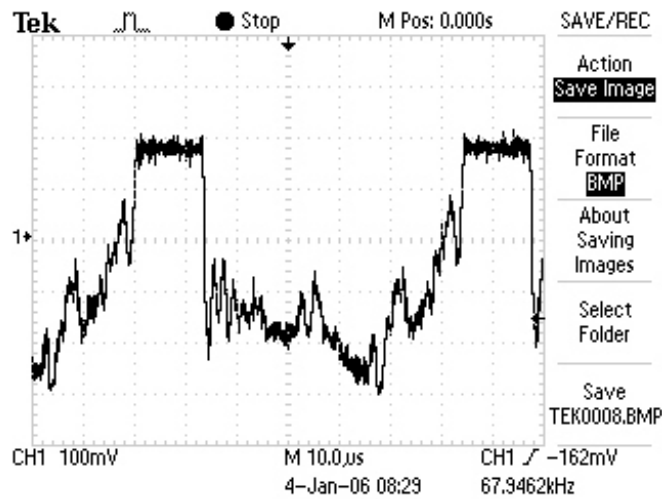
(3) Y3: composite video signal waveform



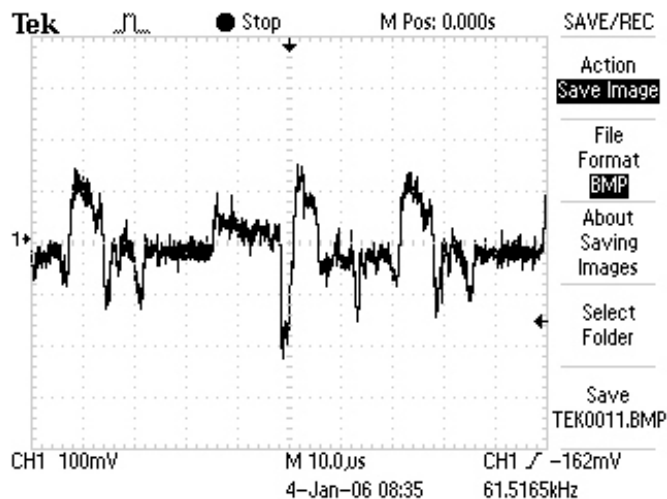
(4) Y4: component video brightness signal waveform



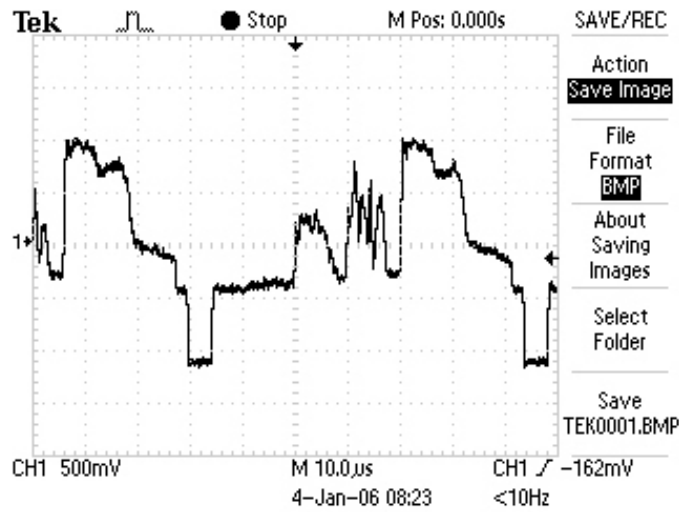
(5) Y5: component video blue chromatic aberration signal (Y-B) waveform



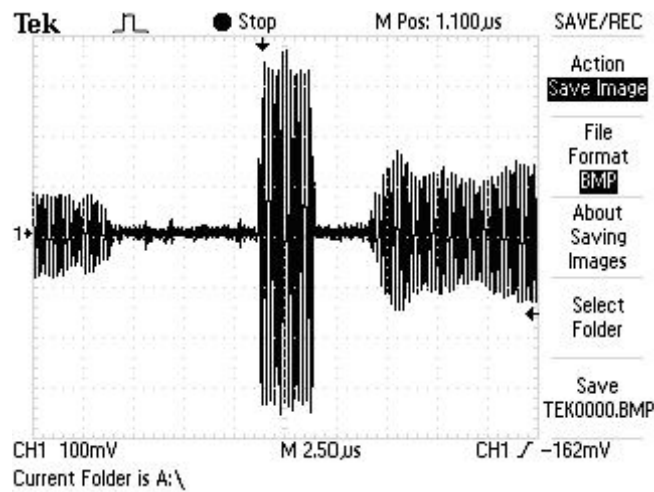
(6) Y6: component video red chromatic aberration signal (Y-R) waveform



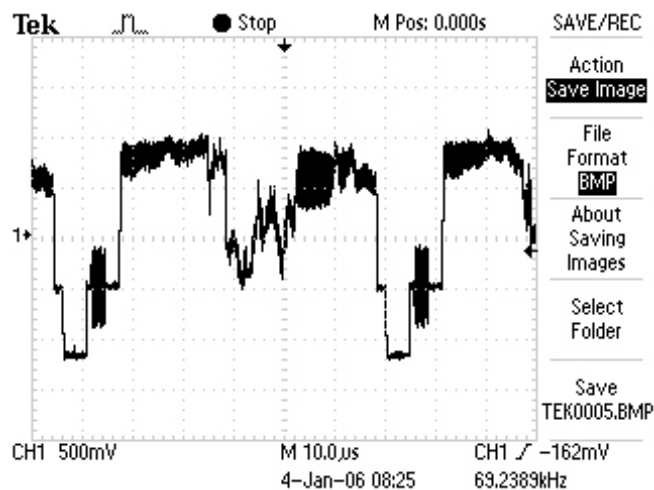
(7) VIDEO-C: S-Video chromatic aberration signal waveform after filtering



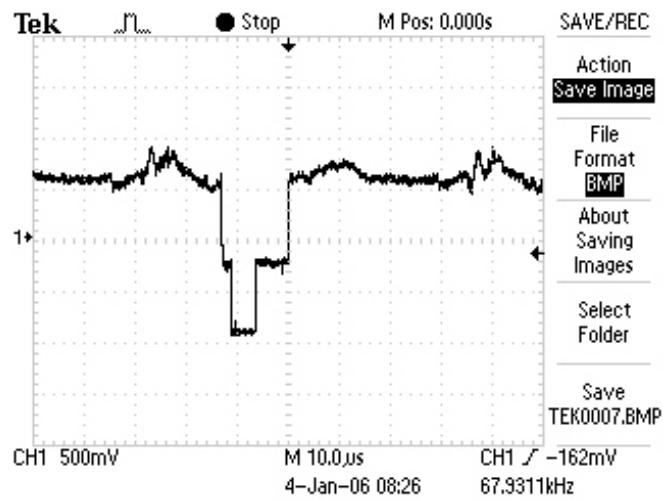
(8) VIDEO-Y: S-Video brightness signal waveform after filtering



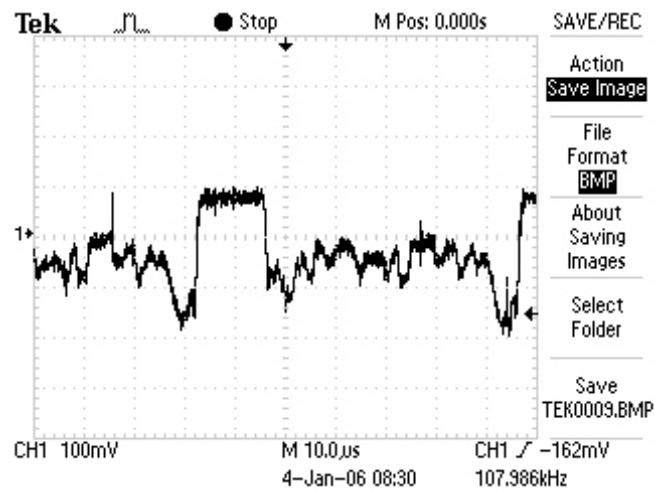
(9) VIDEO-COMP: composite video signal waveform after filtering



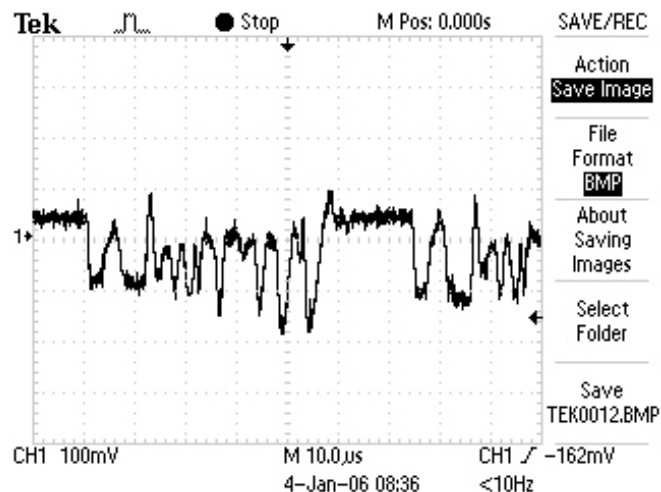
(10) VIDEO-Y1: component video brightness signal waveform after filtering



(11) VIDEO-U: component video blue chromatic aberration signal (Y-b) waveform after filtering

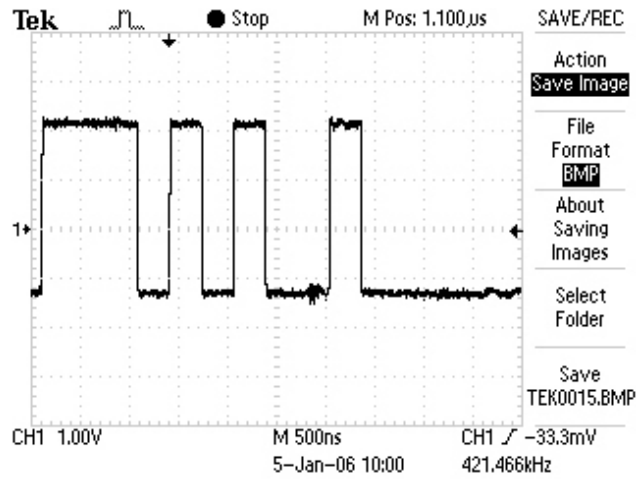


(12) VIDEO-V: component video red chromatic aberration signal (Y-r) waveform after filtering

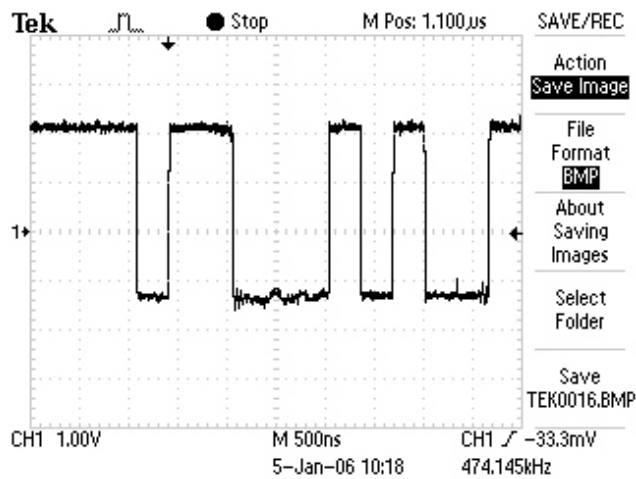


15. Audio signal waveform

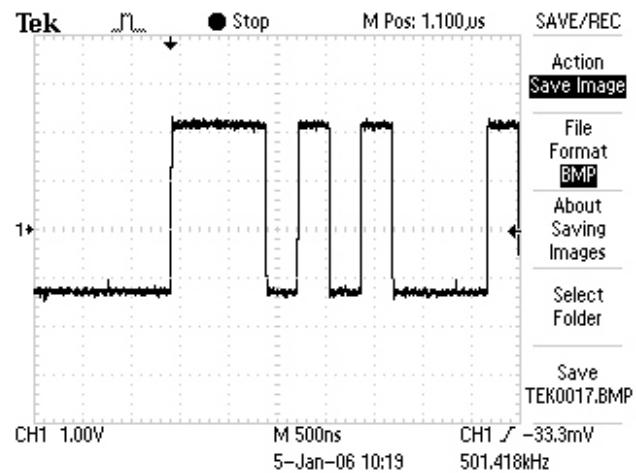
(1) SDATA0 (mixed left/right channel digital signal) waveform



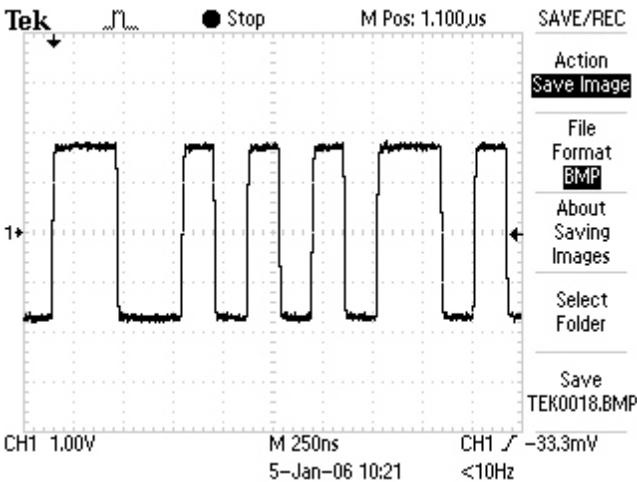
(2) SDATA1 (surround left/right channel digital signal) waveform.



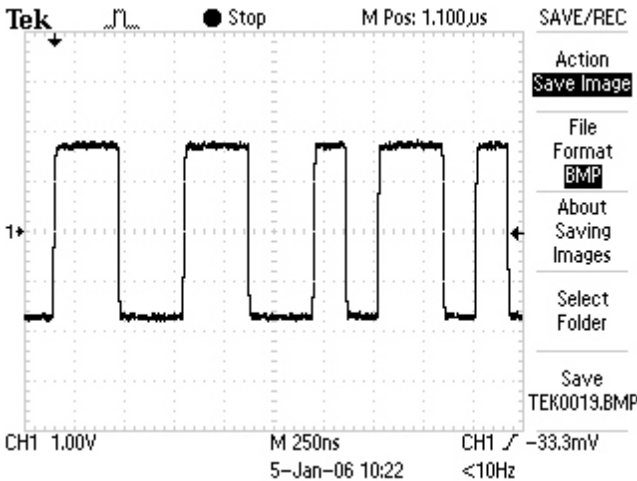
(3) SDATA2 (centre subwoofer digital signal) waveform



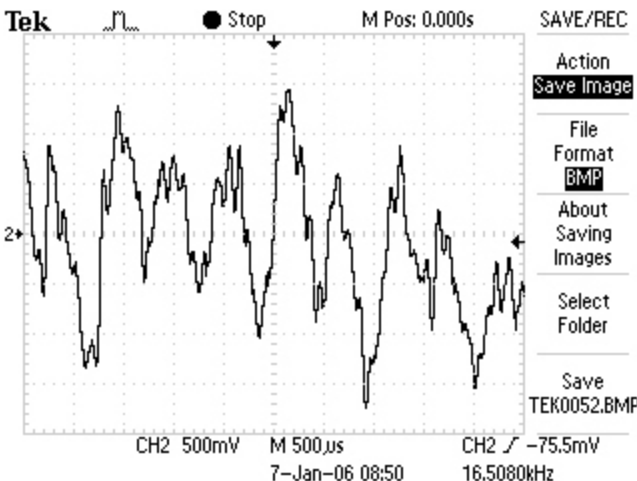
(4) XS206 Pin 13 IEC958 (optical and coaxial digital audio signal) waveform



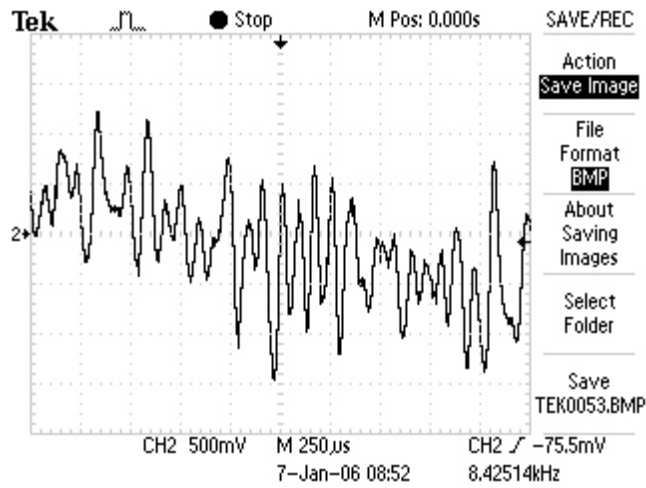
(5) XP206 pin 13 SPDIF (optical and coaxial digital audio signal) waveform



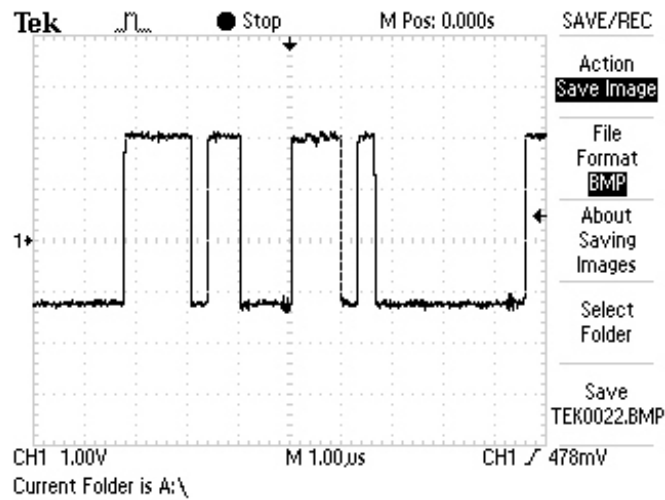
(6) RO signal waveform on pin 3 of XP401



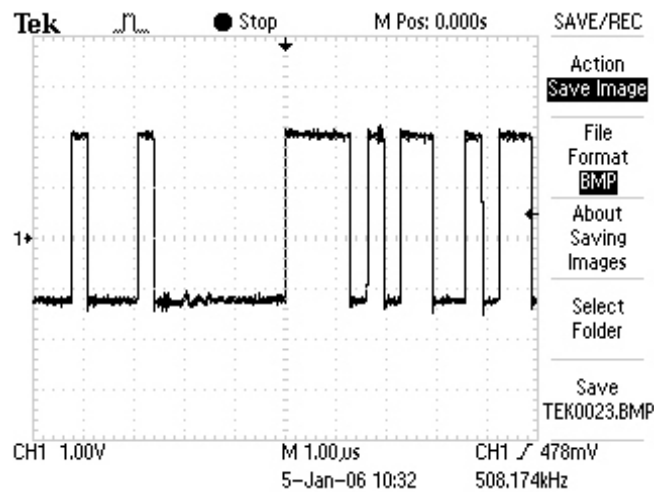
(7) LO signal waveform on pin 5 of of XP401



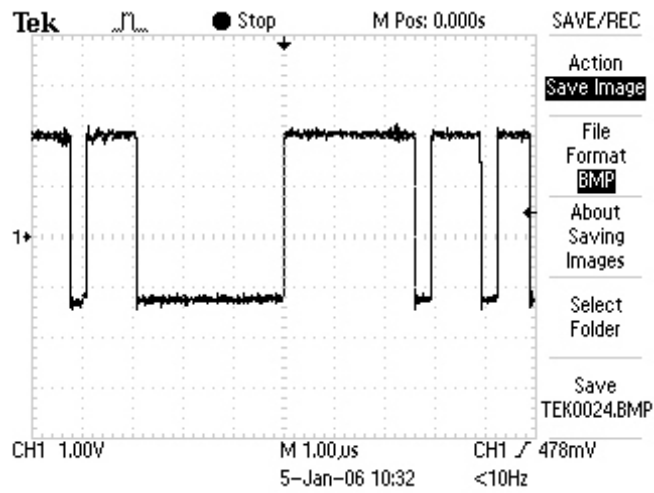
(8) SDA LR waveform on pin 6 of N3



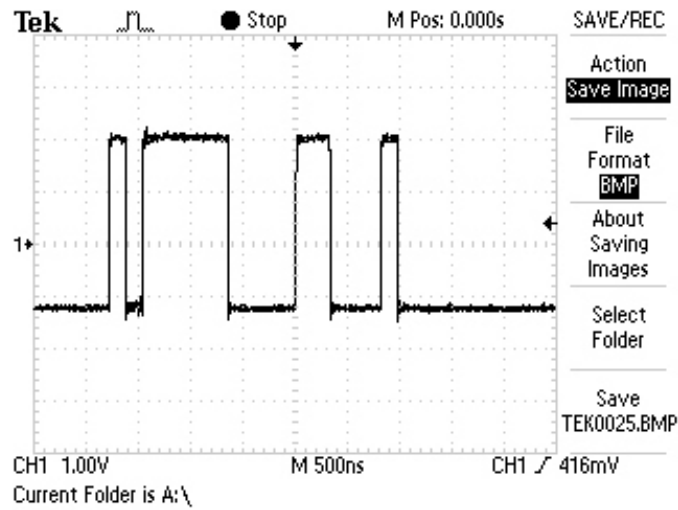
(9) SDA SLSR waveform on pin 8 of N3



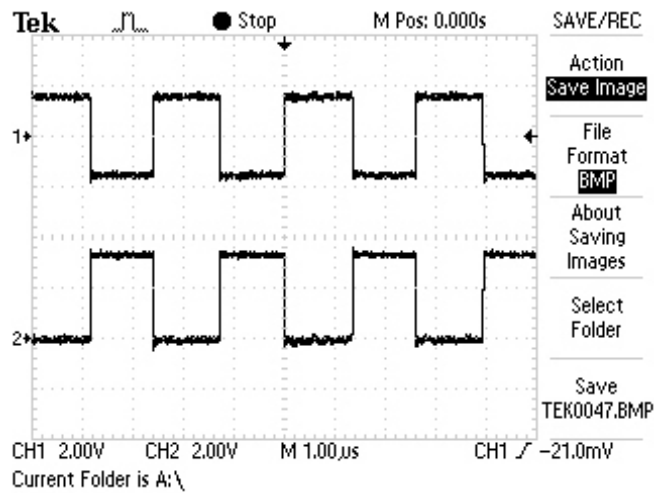
(10) SDA CSW waveform on pin 11 of N3



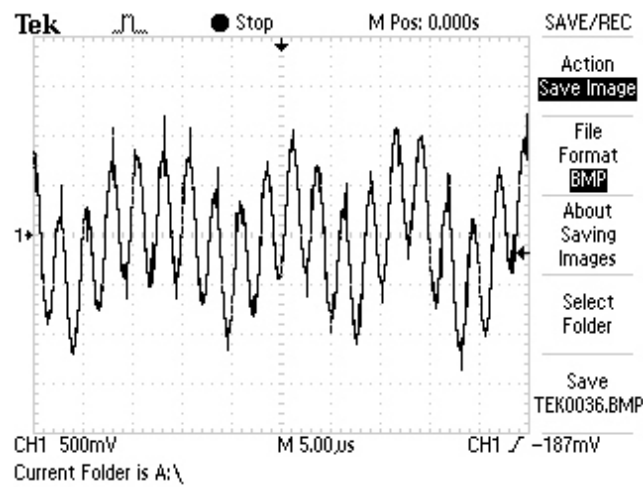
(11) SDAAd waveform on pin 4 of N4



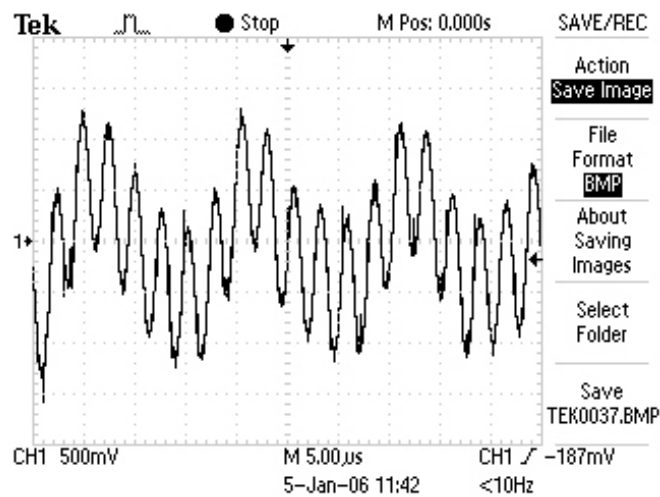
(12) PWM FR+ outputted by N12 (5508) and PWM FR- signal waveform



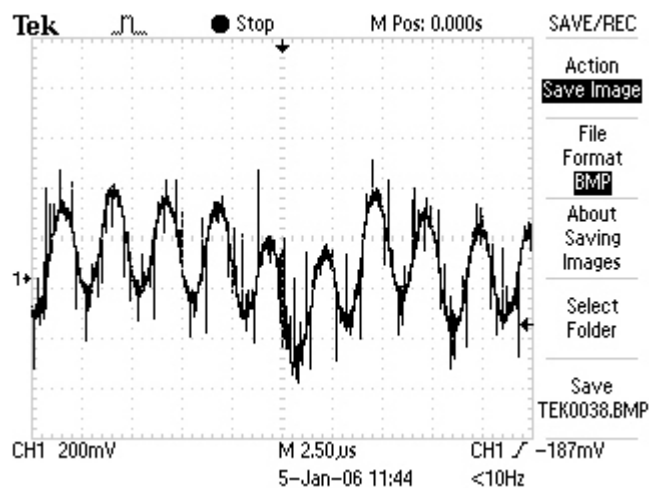
(13) SLOUT waveform



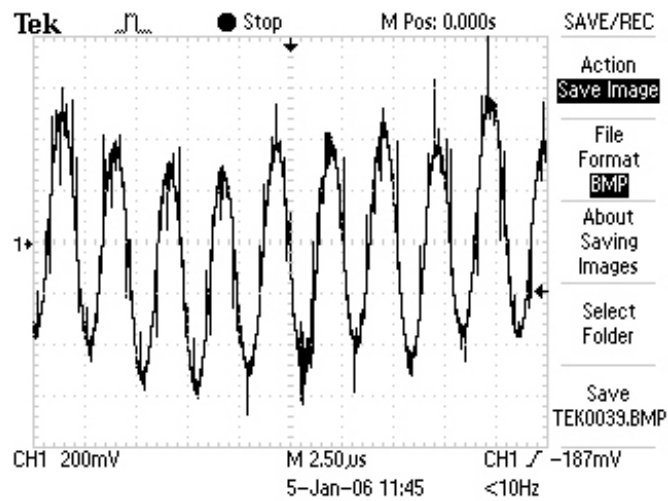
(14) SROUT waveform



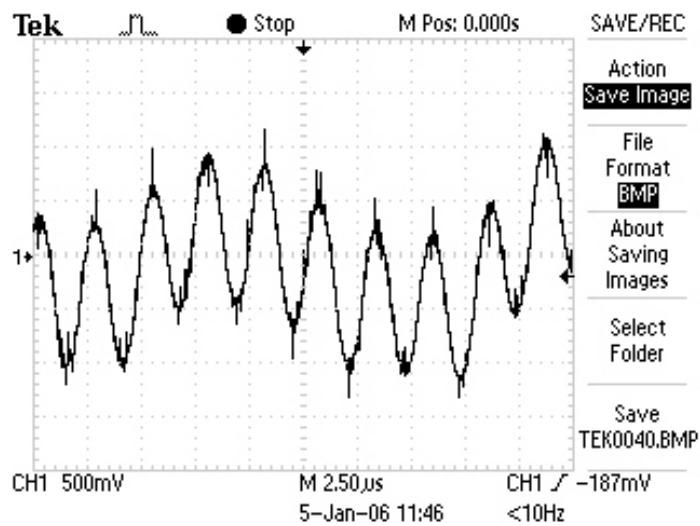
(15) SW+ waveform



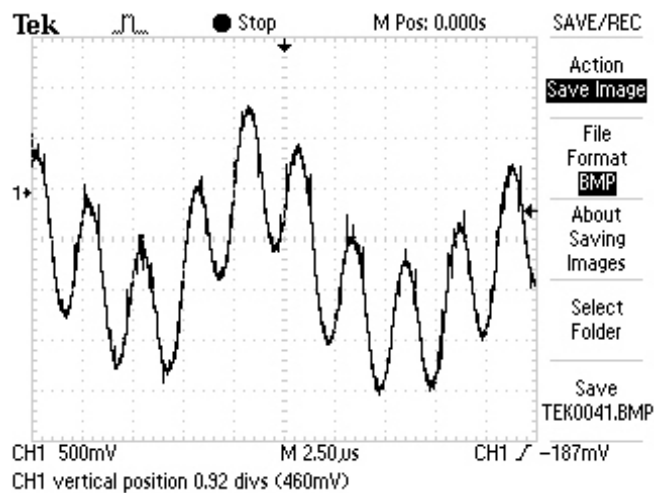
(16) SW- waveform



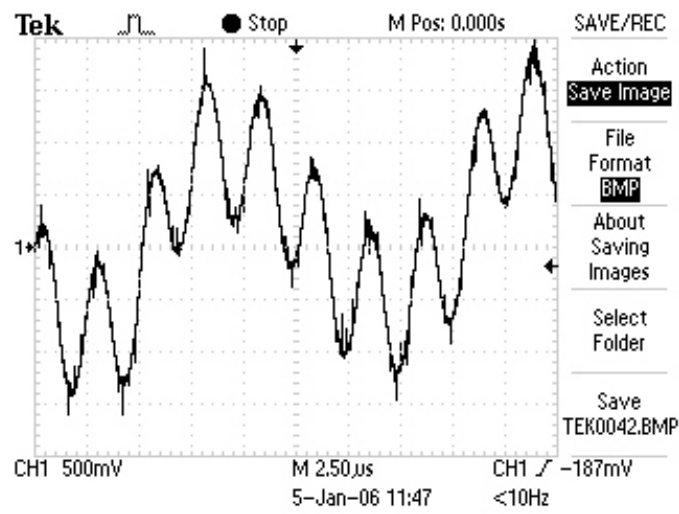
(17) CEN+ waveform



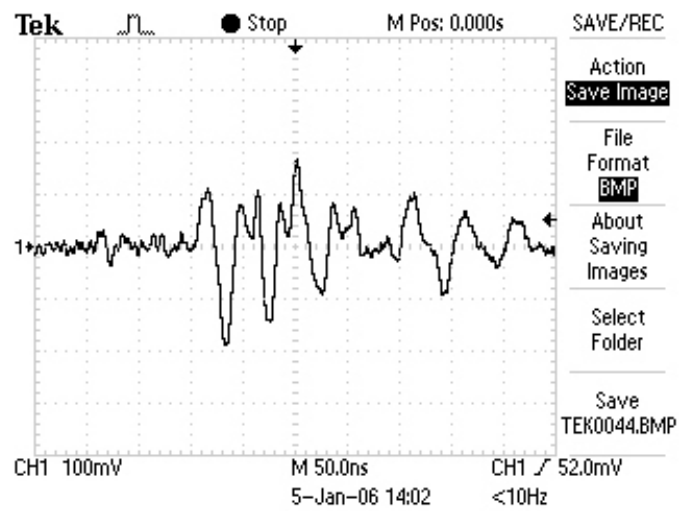
(18) FLOUT waveform



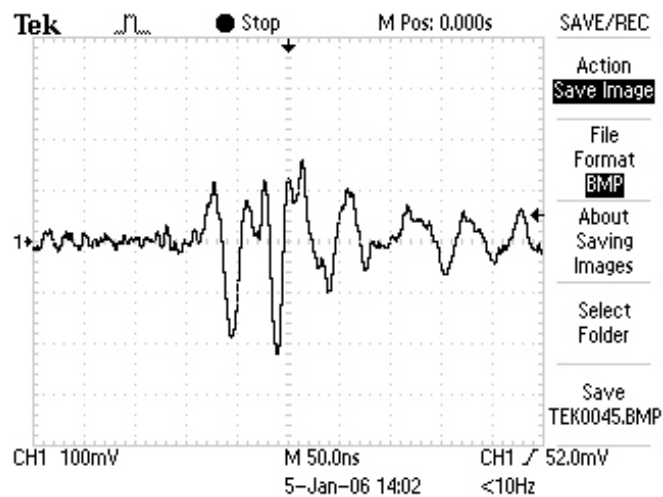
(19) FROUT waveform



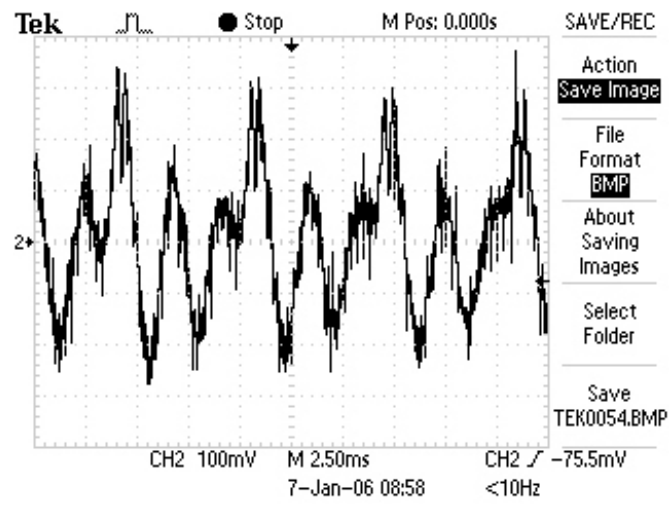
(20) H-L waveform



(21) H-R waveform



(22) MIC signal waveform on pin 1 of XS201



Appendix Two Key Point Voltage

1. Power board

- ◆ Pin 2 of U501 (5L0380): +310V (input AC voltage is 220V)
- ◆ Pin 3 of U501: +16V
- ◆ Pin 1 of U505 (KAIM0880): +310V; pin 3: +12V
- ◆ Pin R31 of U503 (TL431): +2.5V
- ◆ Pin R31 of U507 (TL431): +2.5V
- ◆ Cathode of D510 or D511: +28V
- ◆ Cathode of D505: +3.3V

2. Decode board

- ◆ Pin 2 of XS203: +5V; pin 3: +3.3V
- ◆ Pin 2 of U209 (LM1117MP_1.8V): +1.9V
- ◆ Pin 2 of U211 (SDRAM): +3.3V
- ◆ Pin 37 of U214 (FLASH): +3.3V; pin 12: +3.3V
- ◆ Pin 4 of U302 (D5954): +1.4V; pin 21: +5V
- ◆ Pin 20 of XS301: 0.18V
- ◆ Pin 8 of U202 (24CC02): +3.3V; pin 5 (SDA): $\pm 2.5V$
- ◆ Pin 6 (SCL) of U202: +2.5V
- ◆ Pin 14 of U205 (HCU04): +3.3V; pin 6: +3.3V
- ◆ MT1389 power supply: refer to 2.6.1, MT1389 power supply troubleshooting process

3. Power amplifier board

- ◆ Pin 5 of N2 (SN74LVC2G04DBVR): $\pm 3.3V$
- ◆ Pin 14 of N3 (74HCT125): +3.3V
- ◆ Pin 14 of N4 (74HC7125): +3.3V
- ◆ Pin 1 of XP101: +3.3V; pin 2: +3.3V
- ◆ Pin 4 of XP101: +5V; pin 5: -12V
- ◆ XP101第7脚: +12V
- ◆ XP503第1脚: +28V

◆ Pin 2 of XP503: +28V

◆ SLOUT, SL-; SROUT, SR-; SW+, SW-; CEN+, CEN-; FLOUT, FL-; FROUT, FR-: their DC voltage are all +14V.

4. Main panel

◆ Pin 2 of XP505: +5V; pin 3: -16V; pin 4: -19V; pin 5: -23V

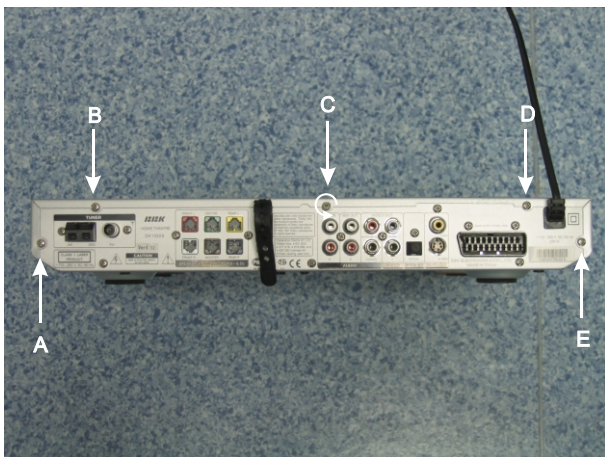
◆ Pin 1 (IR) of N103 (remote control receiver): +5V; pin 3: +5V

Chapter Four Disassembly and Assembly Process

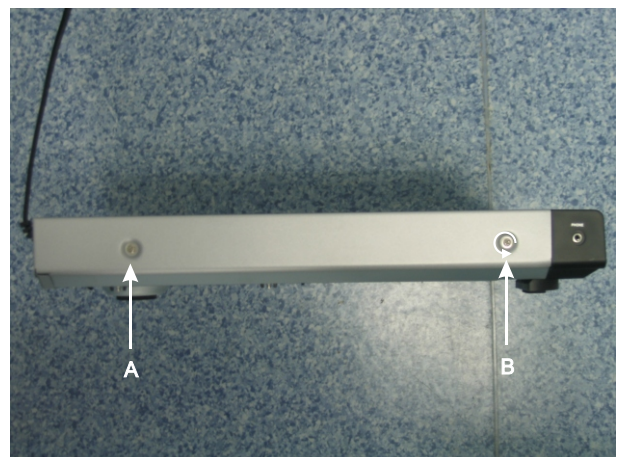
In order to know the structure of DVD player DK1005S easily, visibly and quickly, now each key link of the disassembly and assembly process of the player is presented in means of pictures to prevent users from incorrect operating and damaging elements. This player is divided into: the unit, loader, loader components, control panel components, decode control components, power board components, AV board components, MIC board components and remote controller. You are suggested to operate according to illustrations strictly. This chapter will introduce the former 5 elements, and refer to “DK1005S Service Manual” for details of the latter four elements.

4.1 The unit

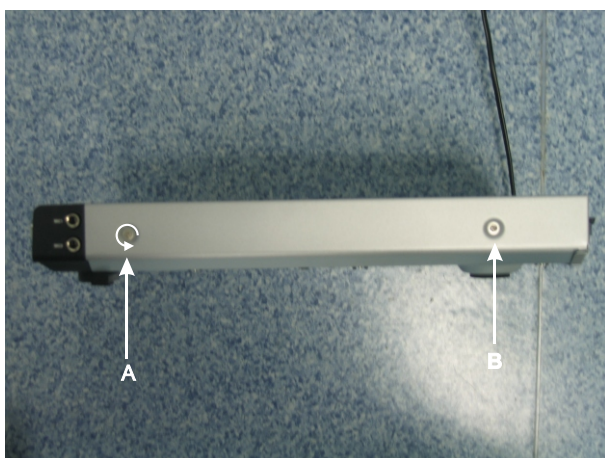
4.1.1 Disassembly process for the unit



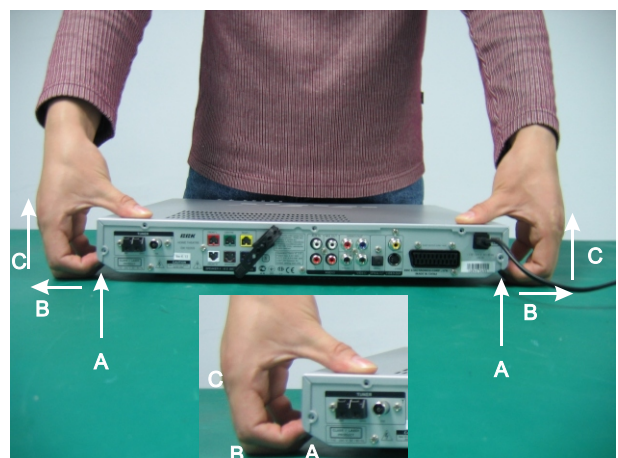
(1) Use electric screwdriver or “+”-shaped screwdriver to fix 5 screws (A, B, C, D, E) in the joint of upper cover and rear cover.



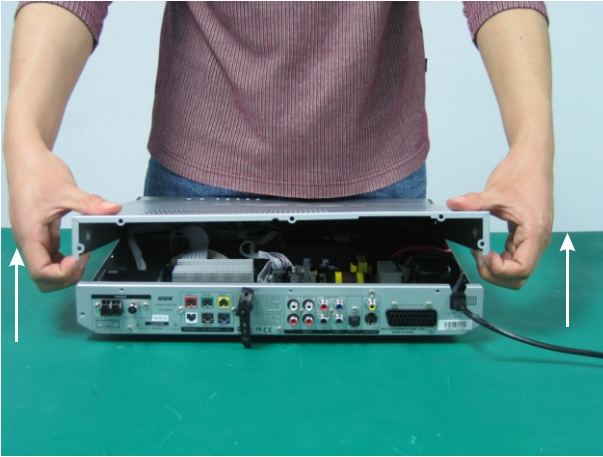
(2) Use electric screwdriver or “+”-shaped screwdriver to unfix screw (A, B) in upper cover on left hand side.



(3) Use electric screwdriver or “+”-shaped screwdriver to unfix screw (A, B) in upper cover on right hand side.



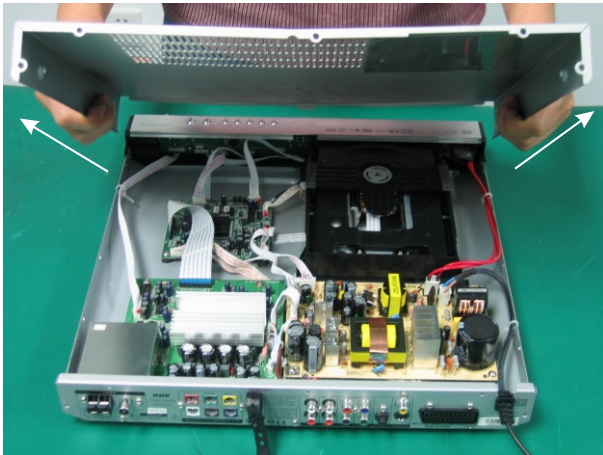
(4) Put four fingers into the gap of the upper cover (Position A), exert strength towards direction of arrow B (outwards), and meanwhile towards direction of arrow C (upwards), and then the upper cover is upraised certainly.



(5) Exert strength continuously by two hands towards the arrow direction (upwards) to lift up the upper cover.



(6) After uplifting upper cover, move two hands to the middle part of upper cover and hold it with thumb unchanged and exert strength towards arrow direction by the other four fingers until the front edge of two sides of upper cover falls off from the joint of panel.

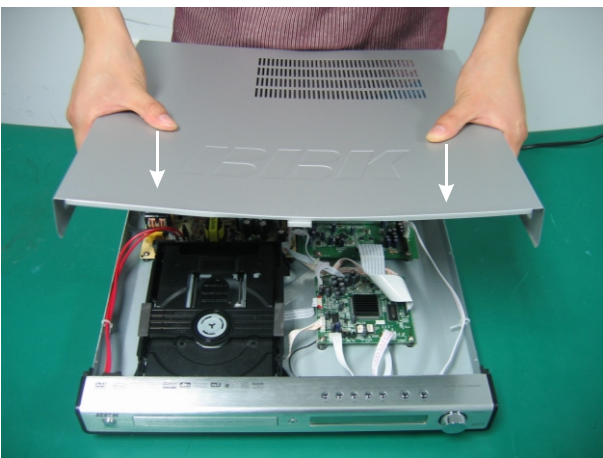


(7) After the front edge of two sides of upper cover falls off from joint of panel, uplift upper cover by two hands towards arrow direction.



(8) Take down the upper cover.

4.1.2 Assembly process for the unit



(1) Take hold of the middle part of upper cover by two hands with their four fingers unmoved, and press down towards the arrow direction (downwards) with two thumbs until the upper cover has concave.



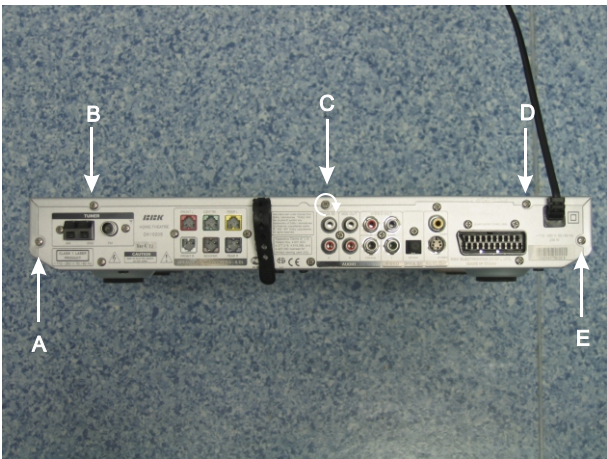
(2) After taking hold of the upper cover with its concave, aiming at the slot, push the middle part of the front edge of upper cover slightly at an angle of mote than 45-degree to its proper position.



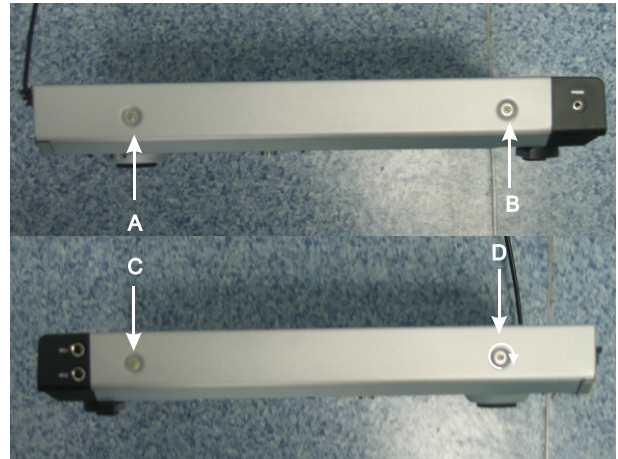
(3) After the middle part of front edge of upper cover reaches the proper position, exert strength to press down towards arrow direction (downwards) by two hands until the two sides of front edge of upper cover fasten the button of panel.



(4) After the front edge of upper cover fastens fully, put down upper cover by two hands until the back edge of upper cover joints with bottom casing automatically. Check whether the entire upper cover has reached the proper position.



(5) Use electric screwdriver or "+"-shaped screwdriver to fix 5 screws (A, B, C, D, E) in the joint of upper cover and rear cover.



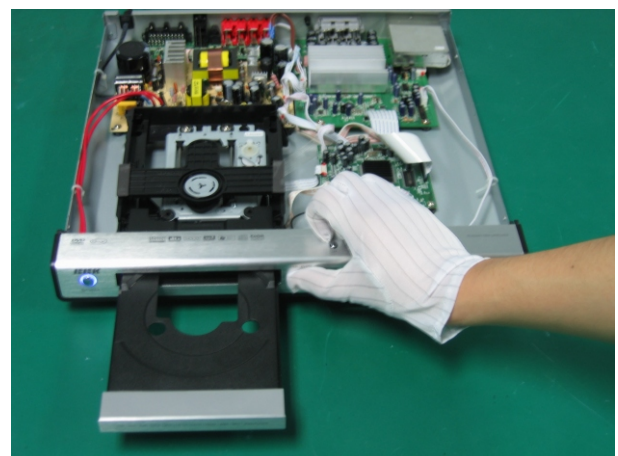
(6) Use electric screwdriver or "+"-shaped screwdriver to fix 4 screw (A, B, C, D) on left and right hand side of the upper cover.

4.2 Loader

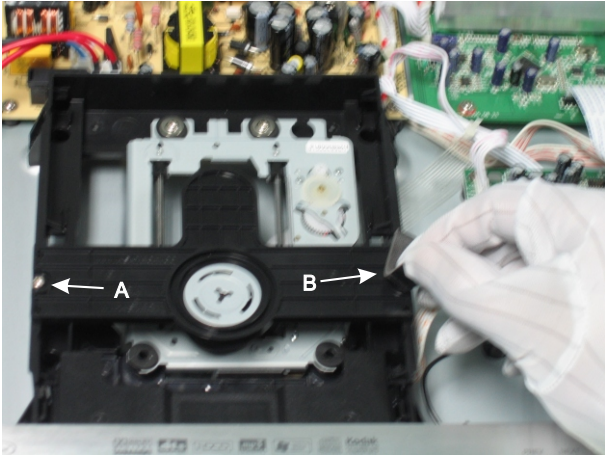
4.2.1 Disassembly process for loader



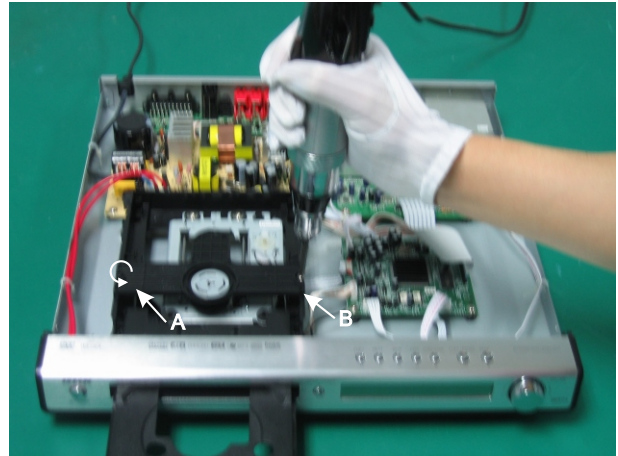
(1) Take out upper cover and prepare to change loader.



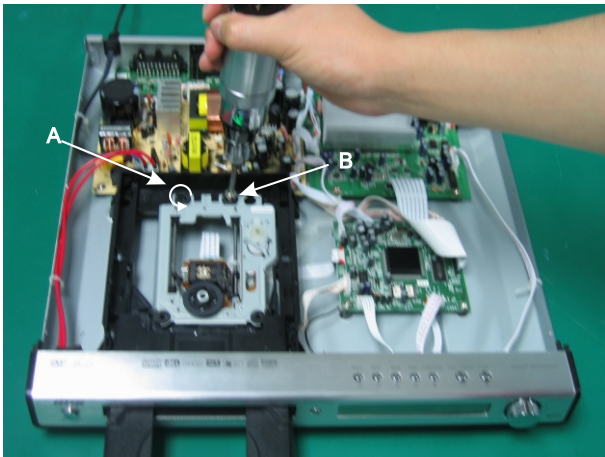
(2) Turn on power, press OPEN/CLOSE button and disc tray ejects. Turn off power and unplug power cord.



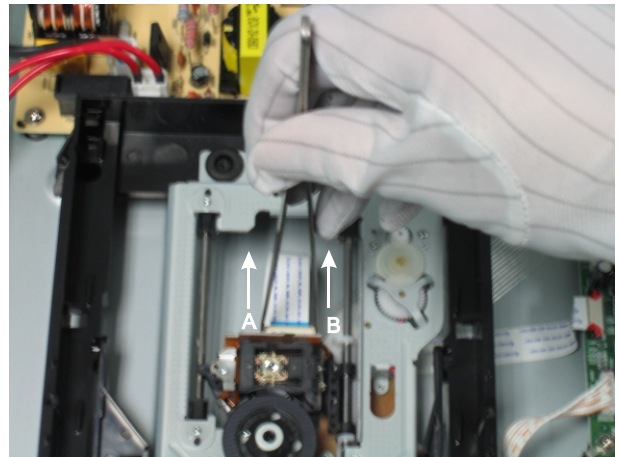
(3) Take down the 2 rubber cushions A and B loader cover board.



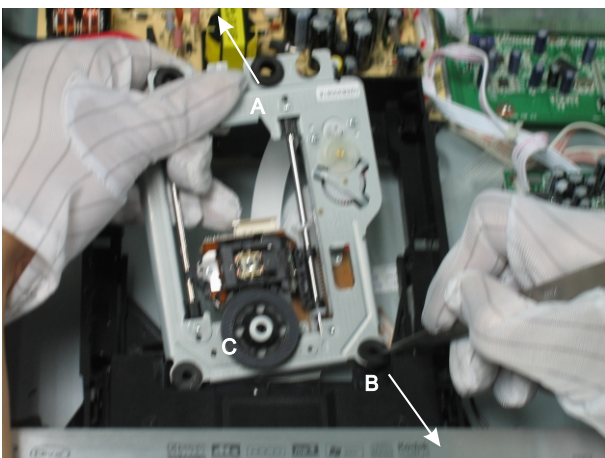
(4) Use electric screwdriver or "+"-shaped screwdriver to unfix the two screws (A, B) of loader cover board, and then take down loader cover board..



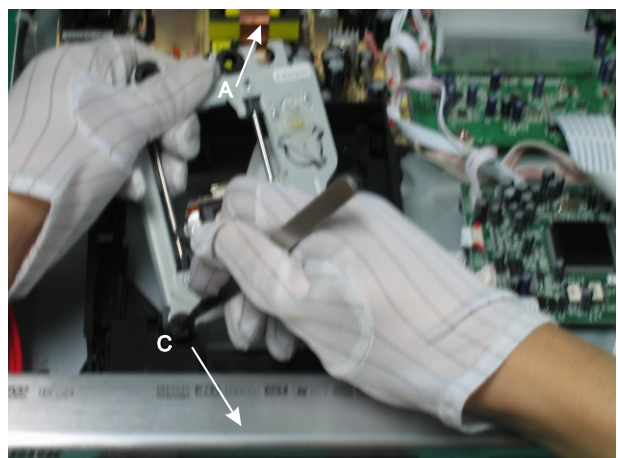
(5) Use electric screwdriver or "+"-shaped screwdriver to unfix the two screws (A, B) of loader.



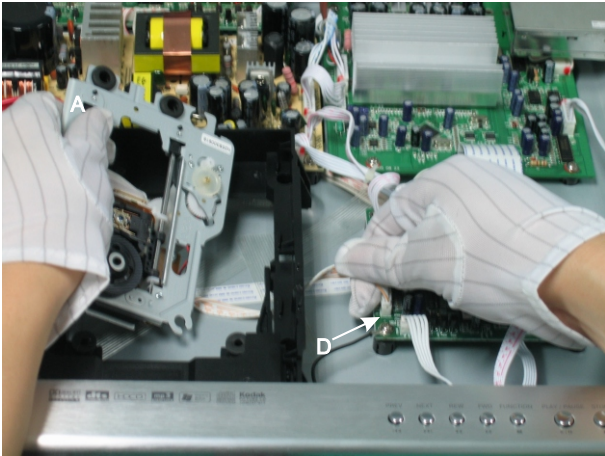
(6) Use forceps to grasp flat cable holder of laser head (B is point of support), and exert strength towards direction of arrow A. After flat cable holder A become loose, exert strength towards direction of arrow B. Do not take down flat cable until the whole flat cable holder become loose.



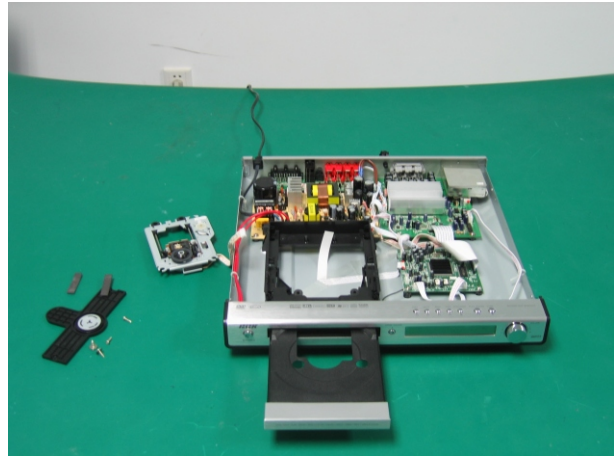
(7) Take hold of loader A by left hand, and exert strength towards arrow direction. Hold forceps by right hand and insert into the hole of buffer cushion B. Exert strength towards arrow direction until the loader falls off from buffer cushion B.



(8) Take hold of loader A by left hand, and exert strength towards arrow direction. Hold forceps by right hand and insert into the hole of buffer cushion C. Exert strength towards arrow direction until the loader falls off from buffer cushion C.

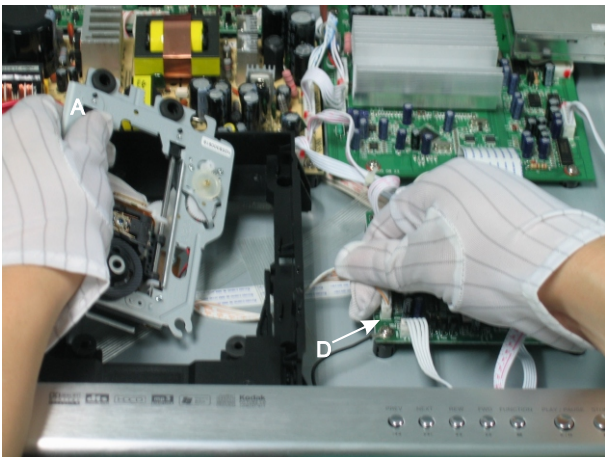


(9) Take hold of loader A by left hand, then take flat cable D between thumb and forefinger of right hand and exert strength until flat cable comes off from loader.

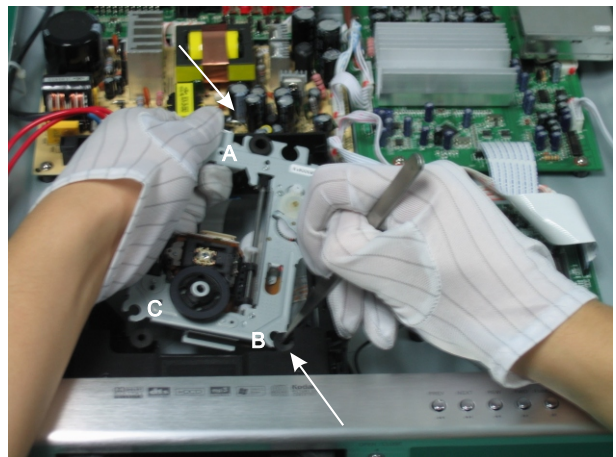


(10) Take out loader.

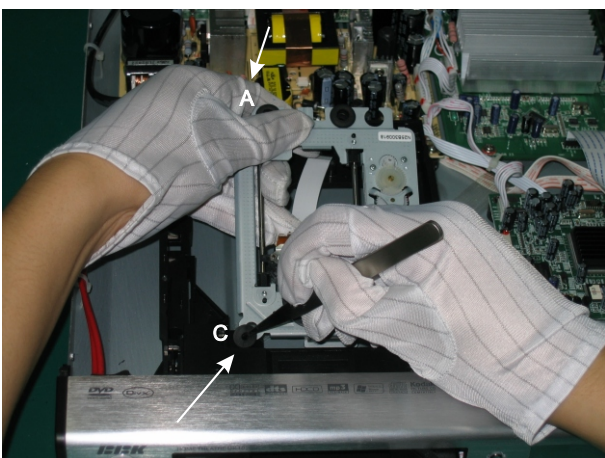
4.2.2 Assembly process for loader



(1) Take hold of loader A by left hand, then take flat cable D between thumb and forefinger of right hand and then insert it.



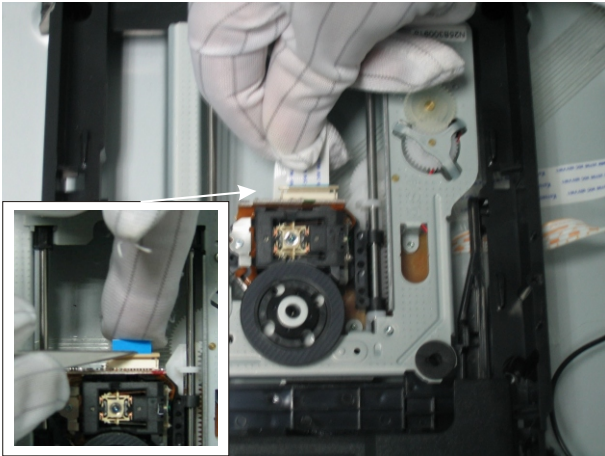
(2) Take hold of loader A by left hand and exert strength towards arrow direction. Hold forceps by right hand and insert into the hole of buffer cushion B. Exert strength towards arrow direction until buffer cushion B and loader reach proper position.



(3) Take hold of loader A by left hand and exert strength towards arrow direction. Hold forceps by right hand and insert into the hole of buffer cushion C. Exert strength towards arrow direction until buffer cushion C and loader reach proper position.



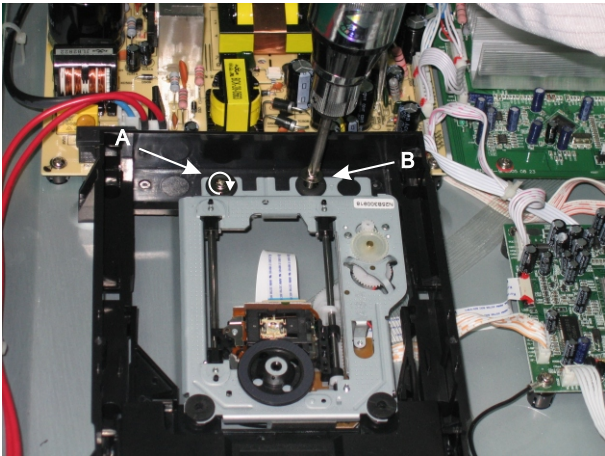
(4) Take flat cable between forefinger and middle finger of right hand, then thumb and forefinger of left hand take the flat cable and place loader to proper position by right hand.



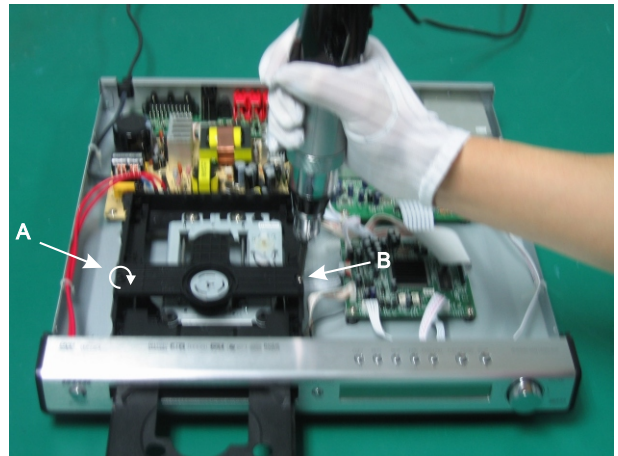
(5) Take flat cable between thumb and forefinger of right finger, send it to the holder slot and press against the slot with forefinger. Hold forceps by left hand and push the middle part of flat cable until it is locked.



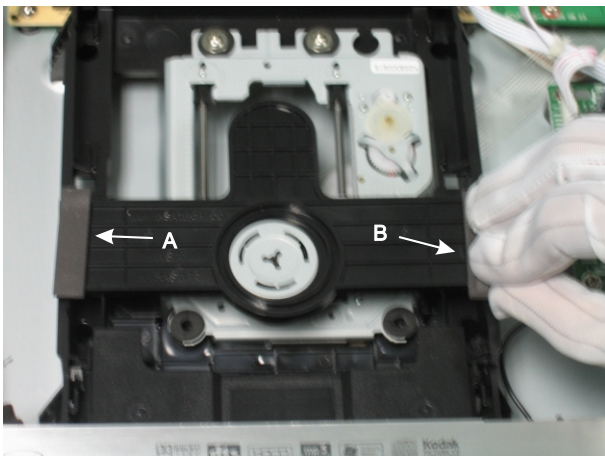
(6) Check whether flat cable has reached the proper position to make sure the good contact.



(7) Use electric screwdriver or "+"-shaped screwdriver to fix two screws (A, B) of loader.



(8) Use electric screwdriver or "+"-shaped screwdriver to fix two screws of loader cover board.



(9) Stick rubber cushions A and B.



(10) Power on and test. It is OK.

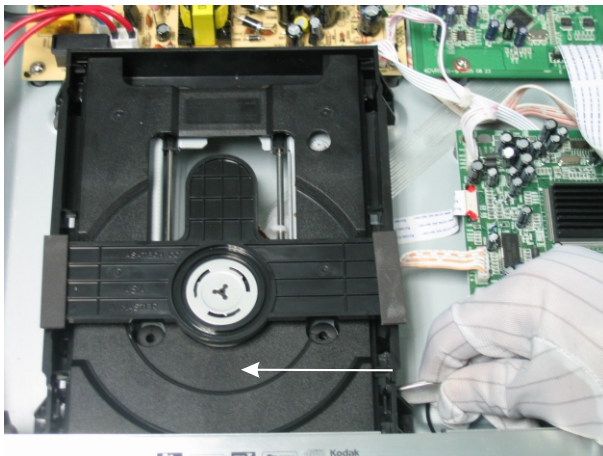
4.2.3 Disassembly and assembly process if "Disc tray not eject"



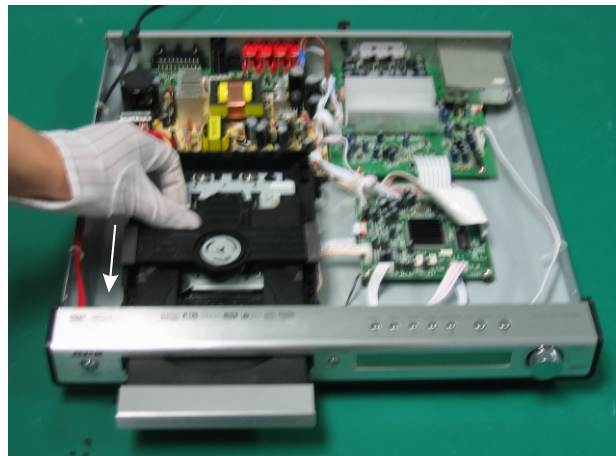
(1) For some reason, disc tray cannot eject, and loader cannot be taken out.



(2) Take hold of tweezers by right hand and insert into the bottom part of loader components. After holding towards arrow direction (upwards) to top part, keep the height and then slide towards direction of arrow B until point C.



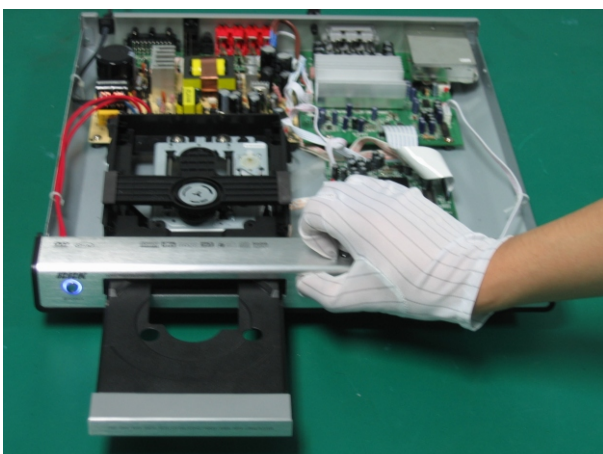
(3) After reaching point C, push tweezers by right hand and insert into the position of about 3.5cm. Loader falls automatically and disc tray ejects automatically.



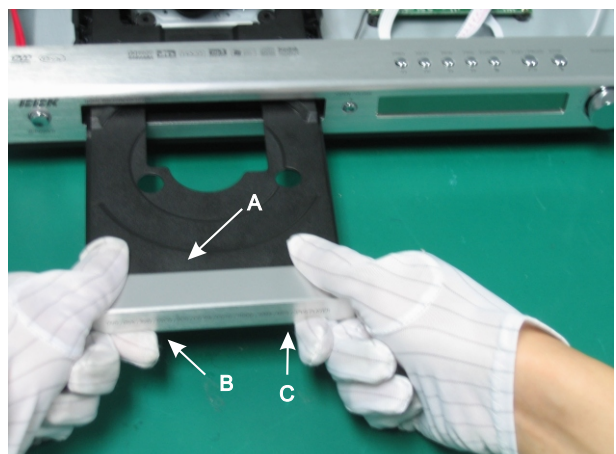
(4) Press the rear edge of disc tray, push towards arrow direction and disc tray ejects.

4.3 Loader components

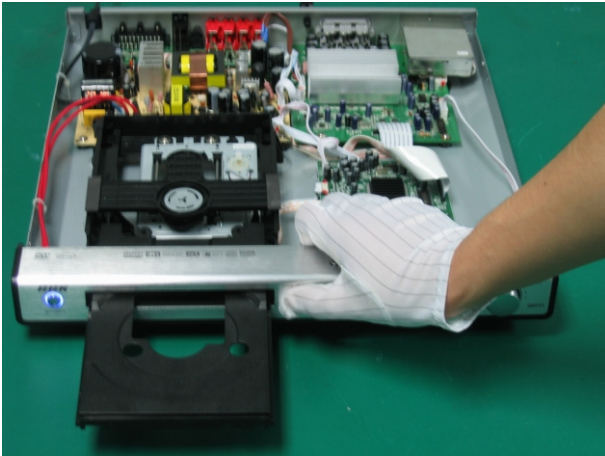
4.3.1 Disassembly and assembly process for loader components



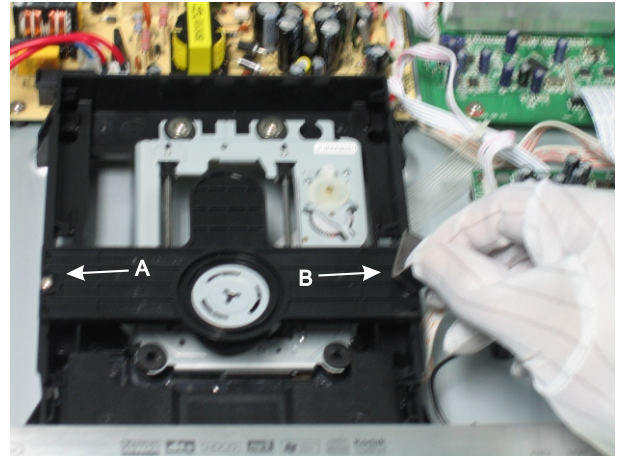
(1) Connect to power supply, switch on power, press OPEN/CLOSE button, disc tray ejects and the turn off power..



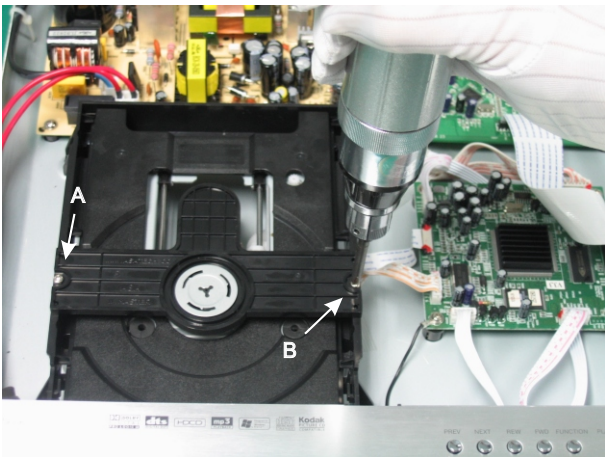
(2) Hold on to joint A of disc tray door and disc tray with two thumbs, the crooked two forefingers hold the front edge (B) of door and exert strength towards direction of arrow C (upwards) until you will hear a click sound, and the door falls off..



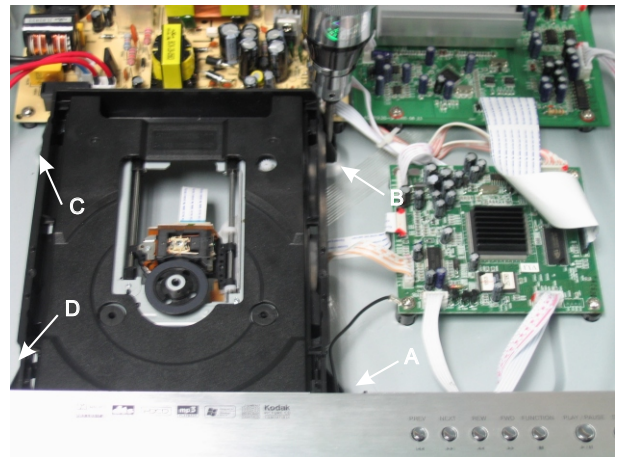
(3) Press OPEN button, and disc tray rebounds or use hand to push disc tray in.



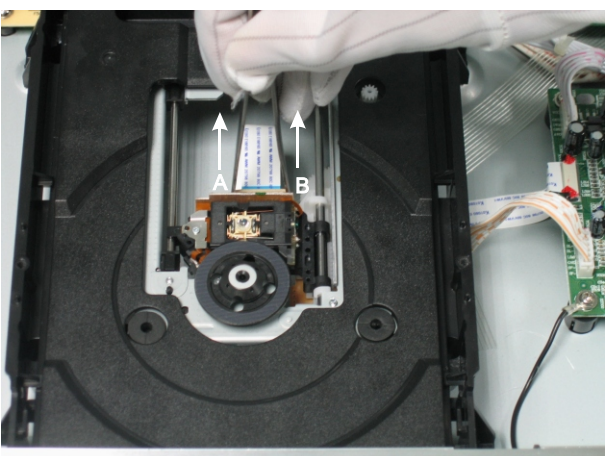
(4) Take down rubber piece A and B.



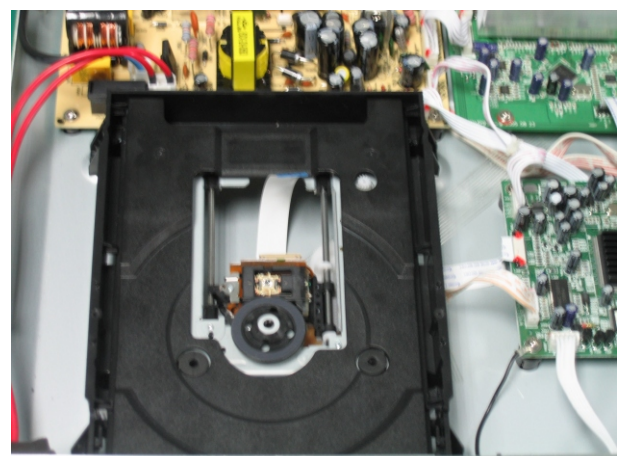
(5) Use electric screwdriver or "+"-shaped driver to unfix 2 screws (A, B) of loader cover board.



(6) Use electric screwdriver or "+"-shaped driver to unfix 4 screws (A, B, C, D) of loader components.



(7) Use forceps to take flat cable holder of laser head (B is point of support) and exert strength towards direction of arrow A. After flat cable holder A become loose, exert strength towards direction of arrow B. Do not take down flat cable until the whole flat cable holder become loose.



(8) Laser head flat cable falls off.

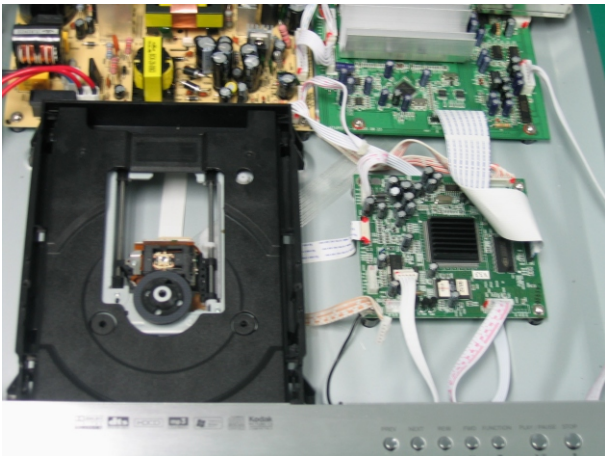


(9) Take hold of loader components by left hand and unplug flat cable A, B by right hand.



(10) Take out loader components. If you still want to separate loader with frame, please refer to section 4.2 -- Loader, shown as small figure.

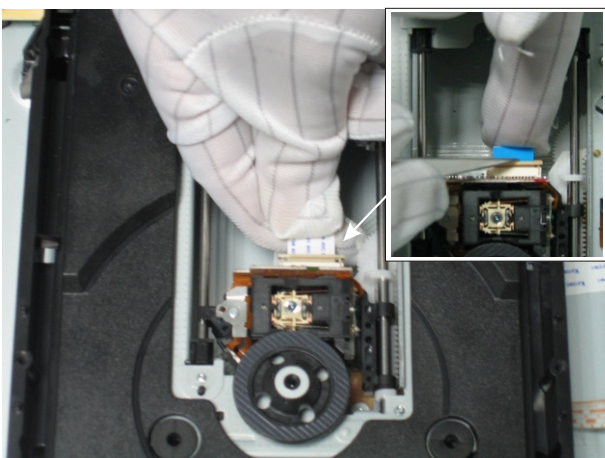
4.3.2 Assembly process for loader components



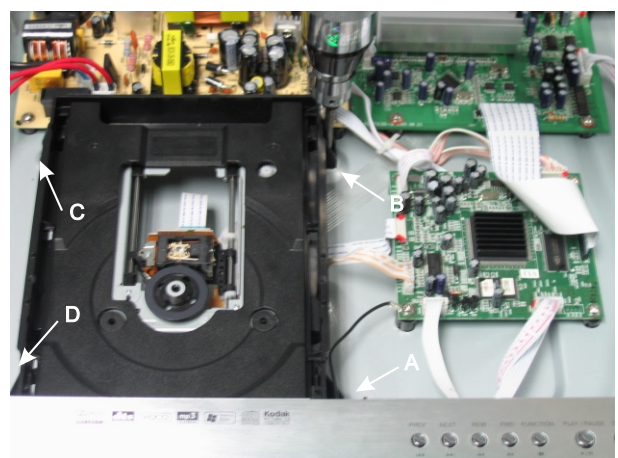
(1) Put loader into slot.



(2) Take hold of forceps by right hand and then wiggle out laser head flat cable.



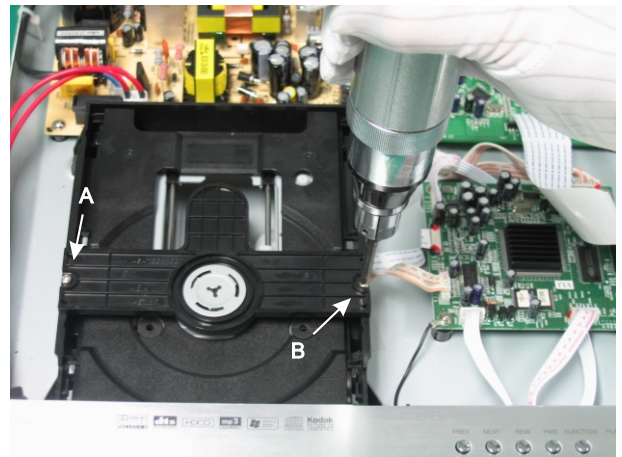
(3) Take flat cable between thumb and forefinger of right hand and send it to flat cable holder slot. Hold forceps by left hand and push the middle part of flat cable to the proper position to make sure the good contact.



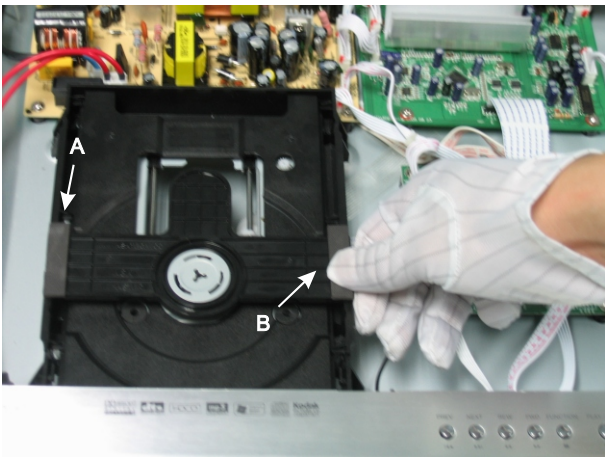
(4) Use electric screwdriver or "+"-shaped driver to fix four screws (A, B, C, D) of loader components.



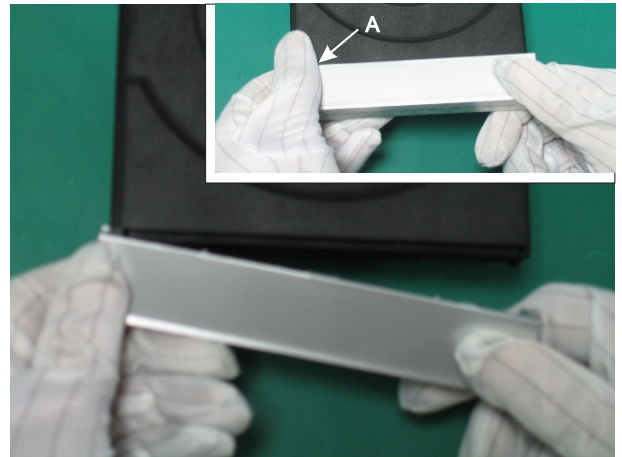
(5) Insert loader components flat cable A and B.



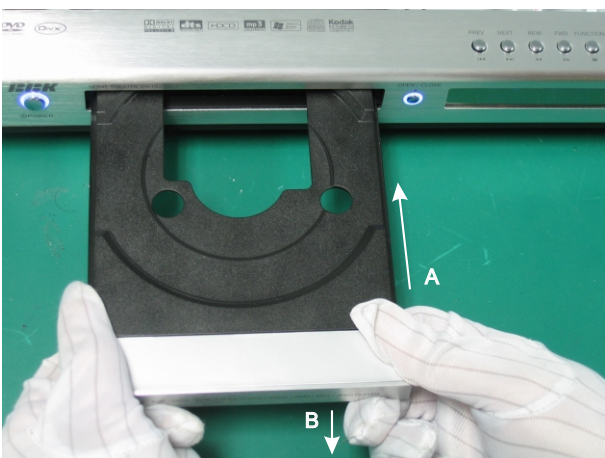
(6) Use electric screwdriver or "+"-shaped driver to fix 2 screws (A, B) of loader cover board.



(7) Stick rubber piece A and B, turn on power and disc tray door opens.



(8) Take disc tray door between thumbs and forefingers of two hands. Aim the door on left hand side at the button on left side of disc tray by left hand firstly, after fastening into button, press down the joint position A of disc tray and door with thumb of left hand.



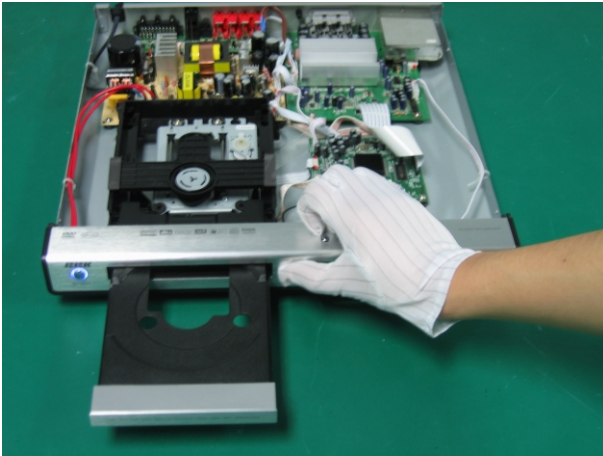
(9) Keep left hand unmoved, exert strength towards direction of arrow A (inside player) by right hand to take door to bottom, then exert strength towards direction of arrow B (downwards) until hearing a click sound, which means the door has reached the proper position.



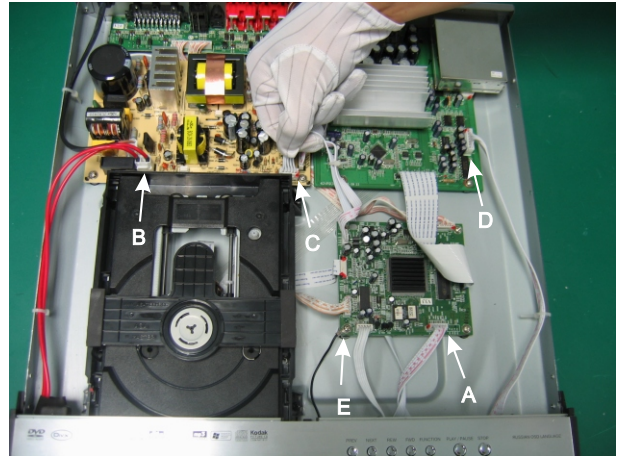
(10) Power on and test, which is OK.

4.4 Control panel components

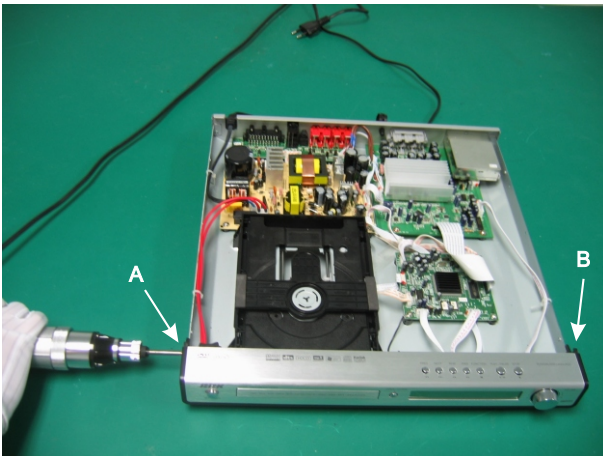
4.4.1 Disassembly process for control panel components



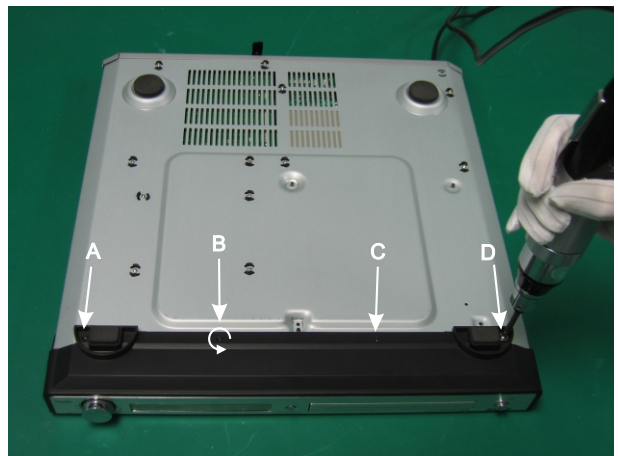
(1) Turn on power, press OPEN/CLOSE button and disc tray ejects. Take down disc tray door, press OPEN/CLOSE button and disc tray ejects in. Turn off power and unplug power cord.



(2) Unplug flat cable A, B, C and D, and use electric screwdriver or "+"-shaped screwdriver to unfix panel grounding wire E.



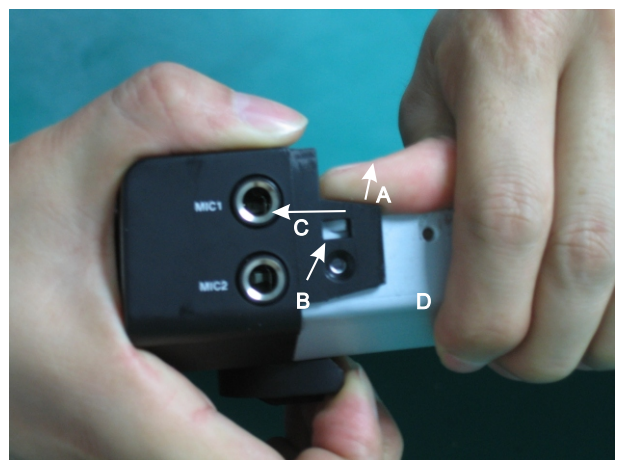
(3) Use electric screwdriver or "+"-shaped screwdriver to unfix 2 screws (A, B) of panel.



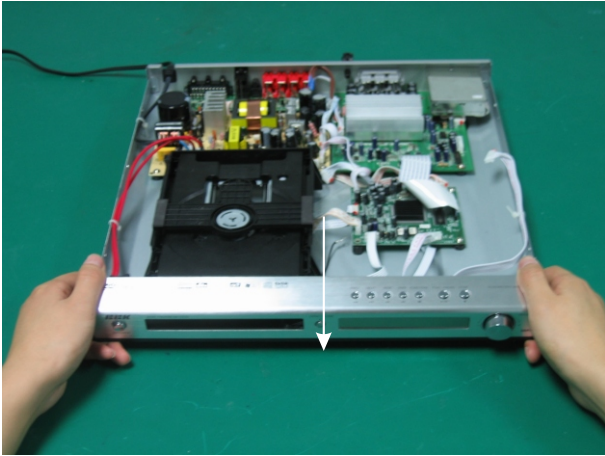
(4) Use electric screwdriver or "+"-shaped screwdriver to unfix 4 screws (A, B, C, D) of panel bottom casing.



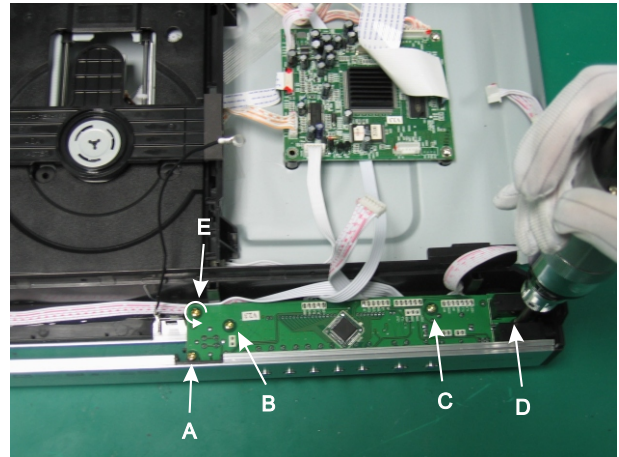
(5) Take hold of panel by left hand, and press bottom casing D by four fingers of right hand. Use thumb to hold panel button bracket and exert strength towards direction of arrow A (outwards) until panel falls off from bottom casing button B, then exert strength towards direction of arrow C, and panel on left hand side falls off from bottom casing.



(5) Take hold of panel by right hand, and press bottom casing D by four fingers of left hand. Use thumb to hold panel button bracket and exert strength towards direction of arrow A (outwards) until panel falls off from bottom casing button B, then exert strength towards direction of arrow C, and panel on right hand side falls off from bottom casing.



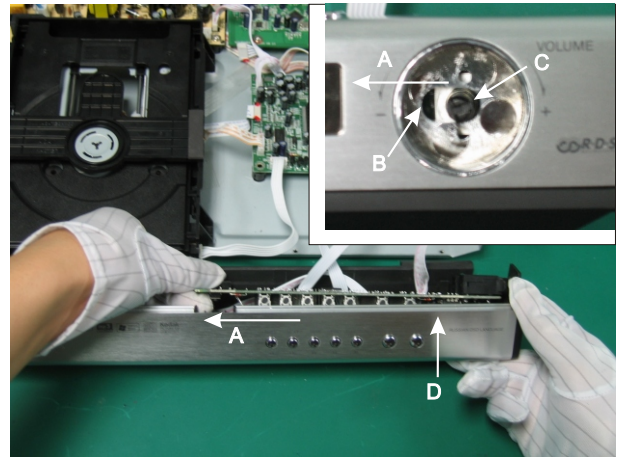
(7) Take hold of panel components by two hands and then take out towards arrow direction.



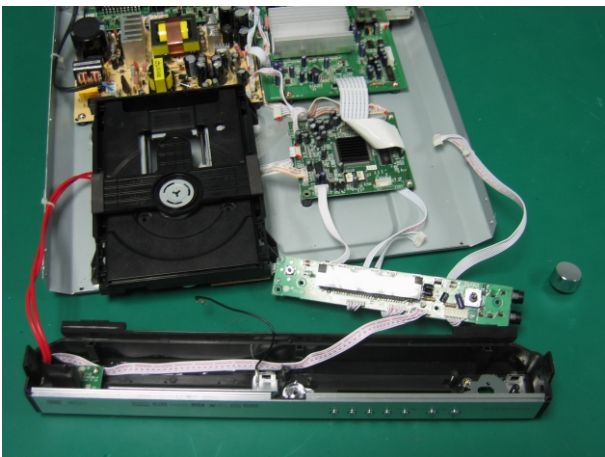
(8) Use electric screwdriver or "+"-shaped screwdriver to unfix screws A, B, C, D, E of panel.



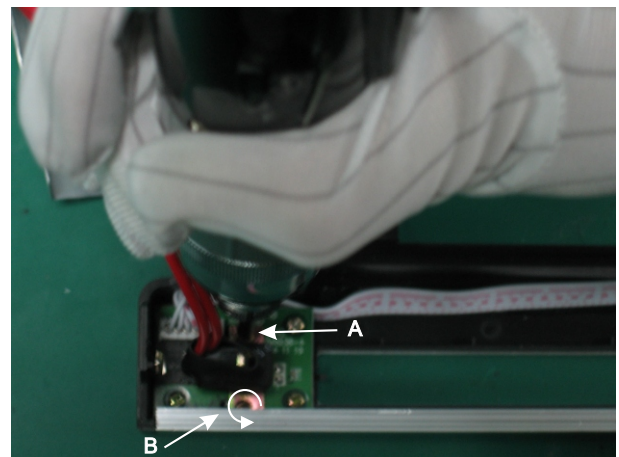
(9) Take hold panel by left hand, take volume button between thumb and forefinger of right hand and pull out outside decoration knob.



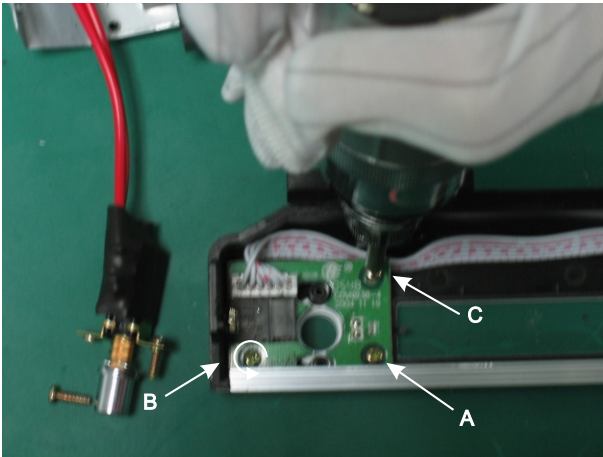
(10) Take hold of edge of PC board, exert strength towards direction of arrow A and PC board slides to point B. Press "volume" potentiometer C with forefinger of right hand and exert strength towards direction of arrow D (upwards). Meanwhile, uplift by left hand until PC board falls off from panel.



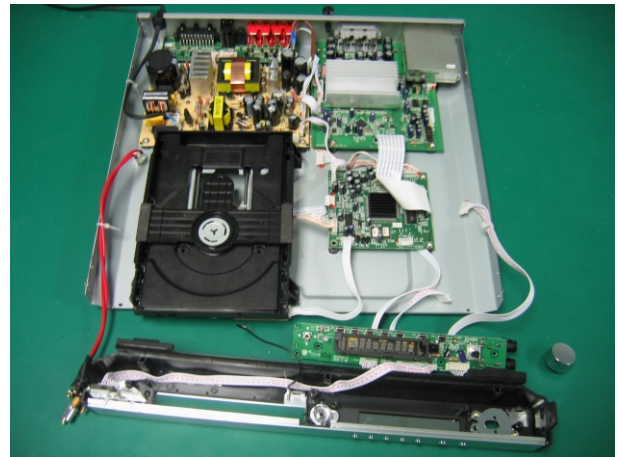
(11) PC board falls off from panel.



(12) Use electric screwdriver or "+"-shaped screwdriver to unfix screws A and B of POWER button.

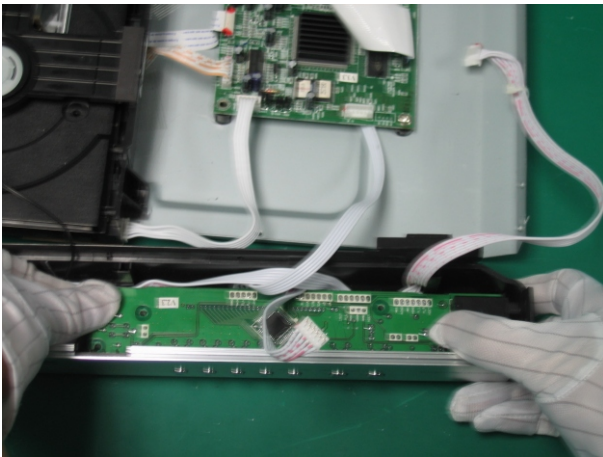


(13) Use electric screwdriver or "+"-shaped screwdriver to unfix screws A, B and C of headphone PC board.

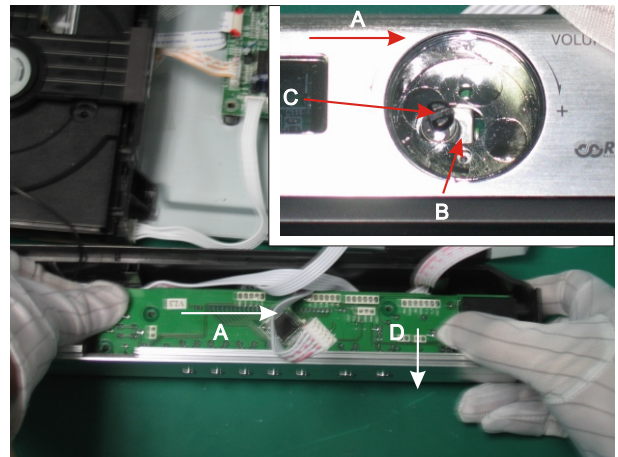


(14) The whole panel components is splitted.

4.4.2 Assembly process for control panel components



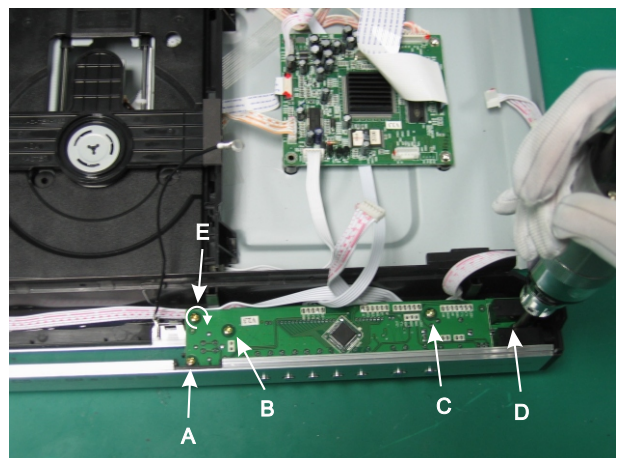
(1) Install PC board of panel.



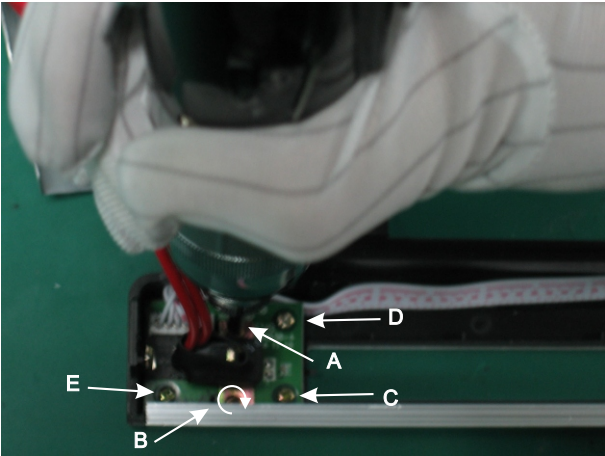
(2) Take hold of edge of PC board by left hand. Aim "volume" potentiometer C at panel hole B firstly, and press down towards direction of arrow D to bottom with two thumbs, and then slide towards direction of arrow A to bottom.



(3) Take hold of panel by left hand and press PC board with the left four fingers. Take the outside decoration knob of "volume" knob between thumb and forefinger of right hand, and then exert strength to push in to reach proper position. The rotation should not have obstruction.

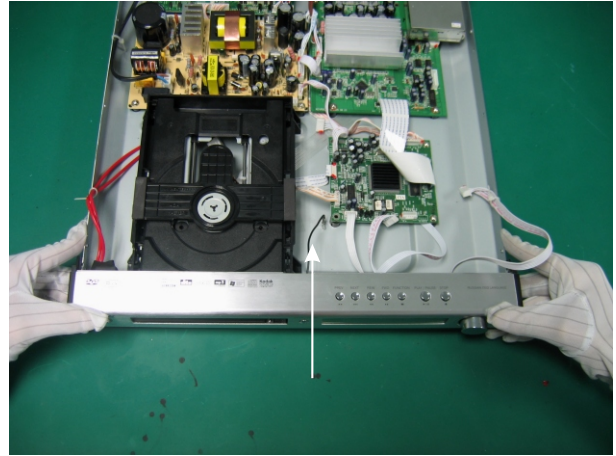


(4) Use electric screwdriver or "+"-shaped screwdriver to fix six screws (A, B, C, D, E) of panel.



(5) Use electric screwdriver or "+"-shaped screwdriver to fix screws A and B of ON/OFF button. Press OPEN/CLOSE button many times to ensure the sensitivity of the switch.

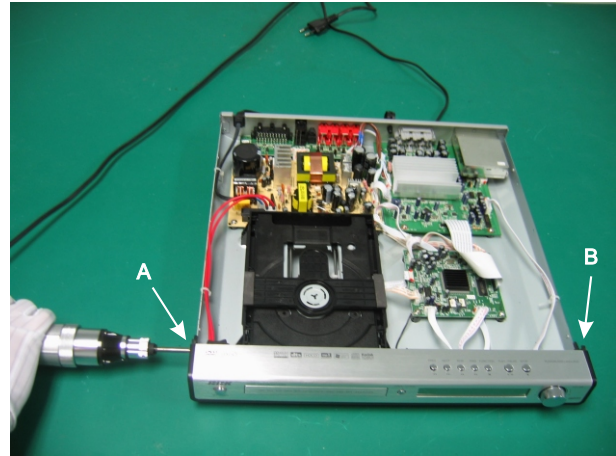
Note: Make sure the power is not connected.



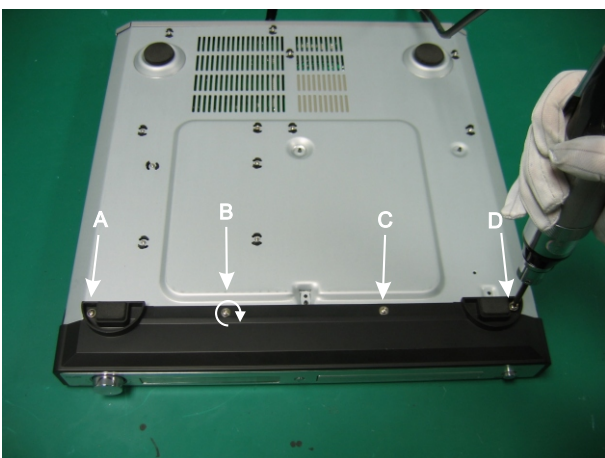
(6) Take hold of panel components by two hands and exert strength towards arrow direction to push. Panels on left and right sides fasten the button automatically.



(7) Insert flat cable A, B, C and D. Use electric screwdriver or "+"-shaped screwdriver to fix panel grounding wire E.



(8) Use electric screwdriver or "+"-shaped screwdriver to fix screws A and B of two sides of panel.



(9) Use electric screwdriver or "+"-shaped screwdriver to fix screws A, B, C and D of panel bottom casing.



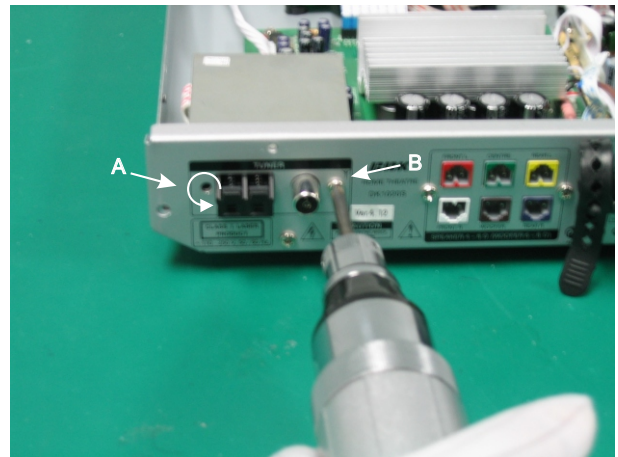
(10) Connect to power supply, switch on power and test functions, which are all normal.

4.5 Power amplifier board

4.5.1 Disassembly process for amplifier board



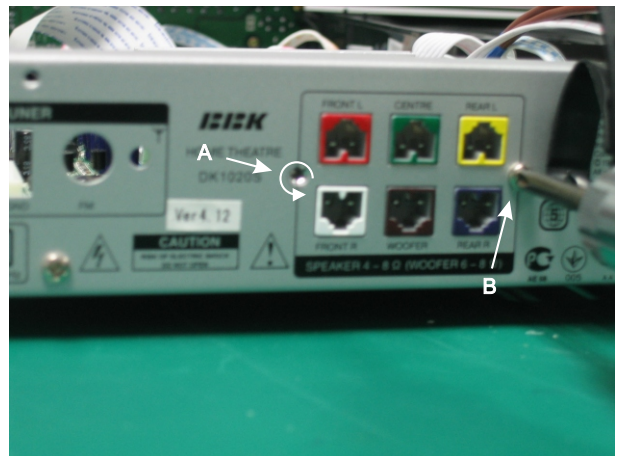
(1) Before disassembling power amplifier board, disassemble tuner firstly.



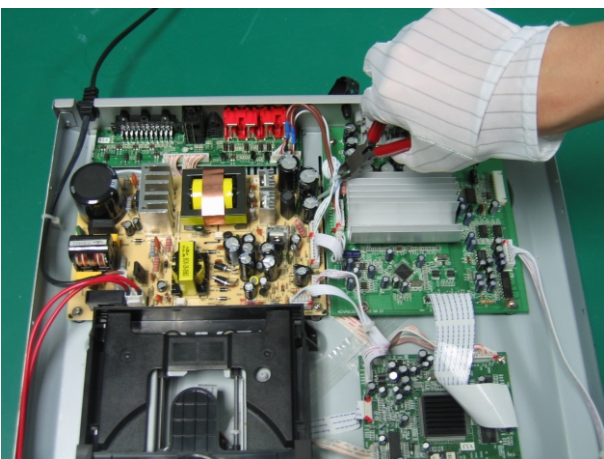
(2) Use electric screwdriver or "+"-shaped screwdriver to unfix screws A and B of rear cover tuner.



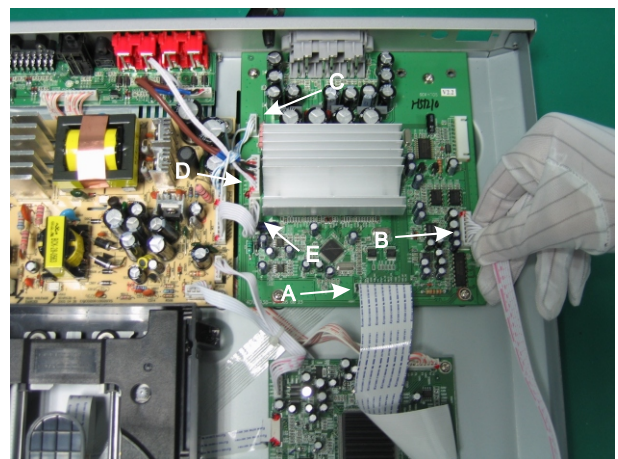
(3) Unplug flat cable of tuner.



(4) Use electric screwdriver or "+"-shaped screwdriver to unfix screws A and B of power amplifier board of rear cover.



(5) Use wire cutter to cut off binding wire.



(6) Unplug flat cable A, B, C, D and E on power amplifier board.



(7) Use electric screwdriver or "+"-shaped screwdriver to unfix screws A, B and C of power amplifier board.



(8) Take out power amplifier board.

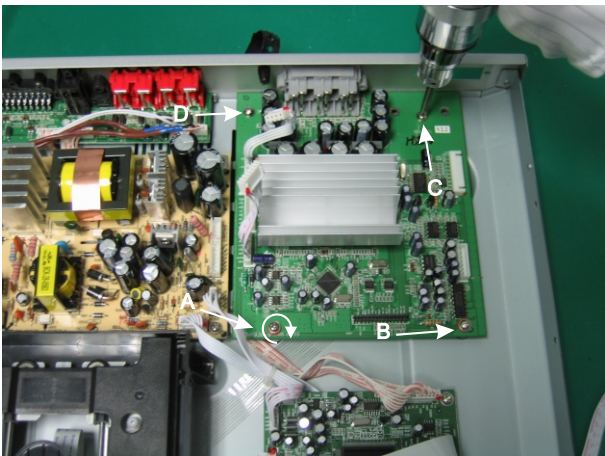
4.5.2 Assembly process for power amplifier board



(1) Before assembling power amplifier board, place the power amplifier board to proper position.



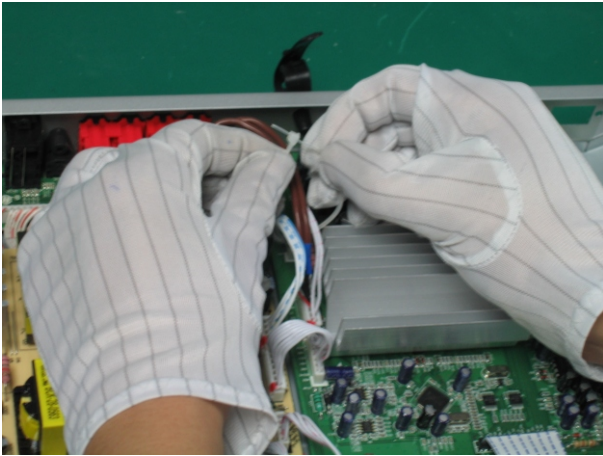
(2) Use electric screwdriver or "+"-shaped screwdriver to fix screws A and B of rear cover of power amplifier board.



(3) Use electric screwdriver or "+"-shaped screwdriver to fix screws A, B, C and D of power amplifier board.



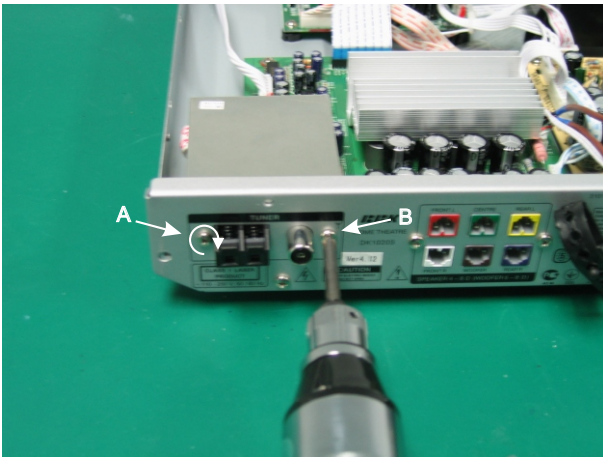
(4) Insert flat cable A, B, C and D on power amplifier board.



(5) Well bind the binding wire.



(6) Insert flat cable of tuner.



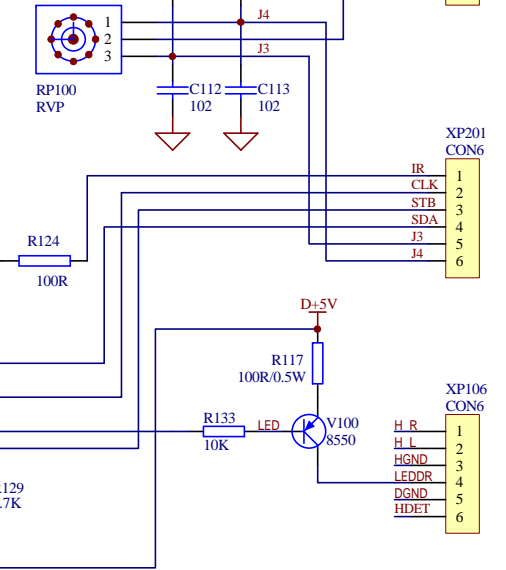
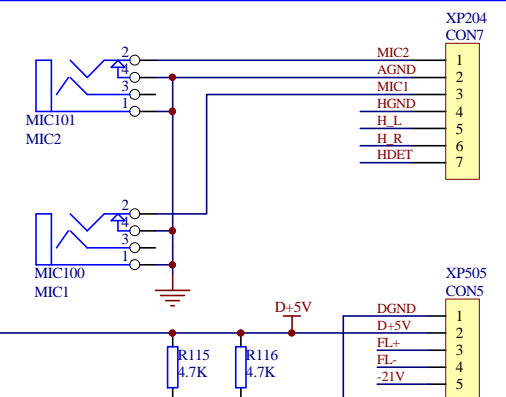
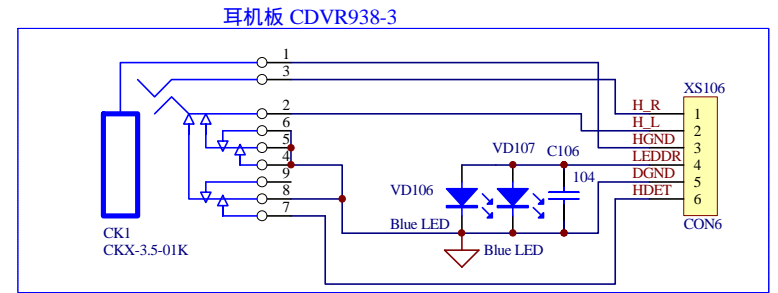
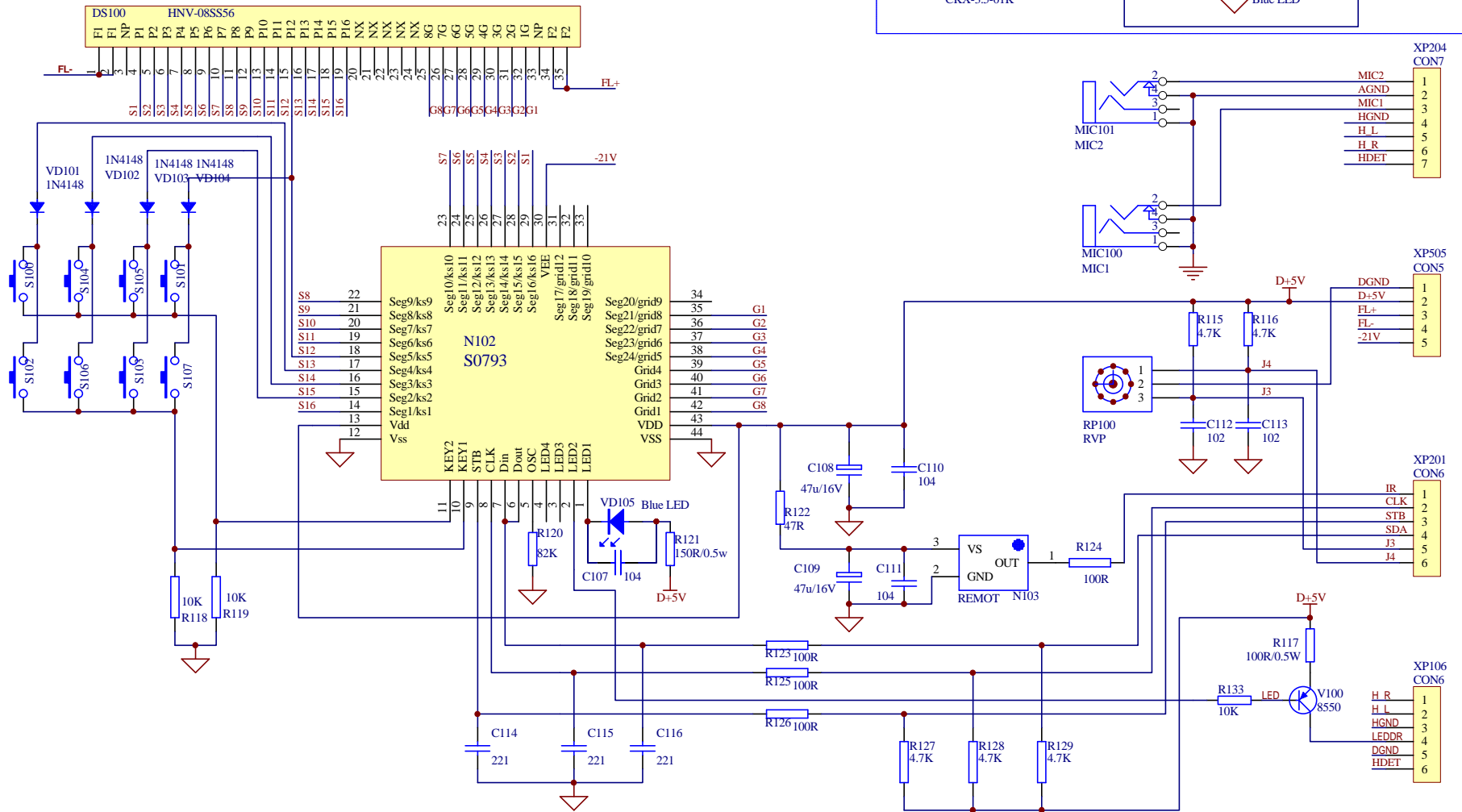
(7) Use electric screwdriver or "+"-shaped screwdriver to fix screws A and B of rear cover of tuner.



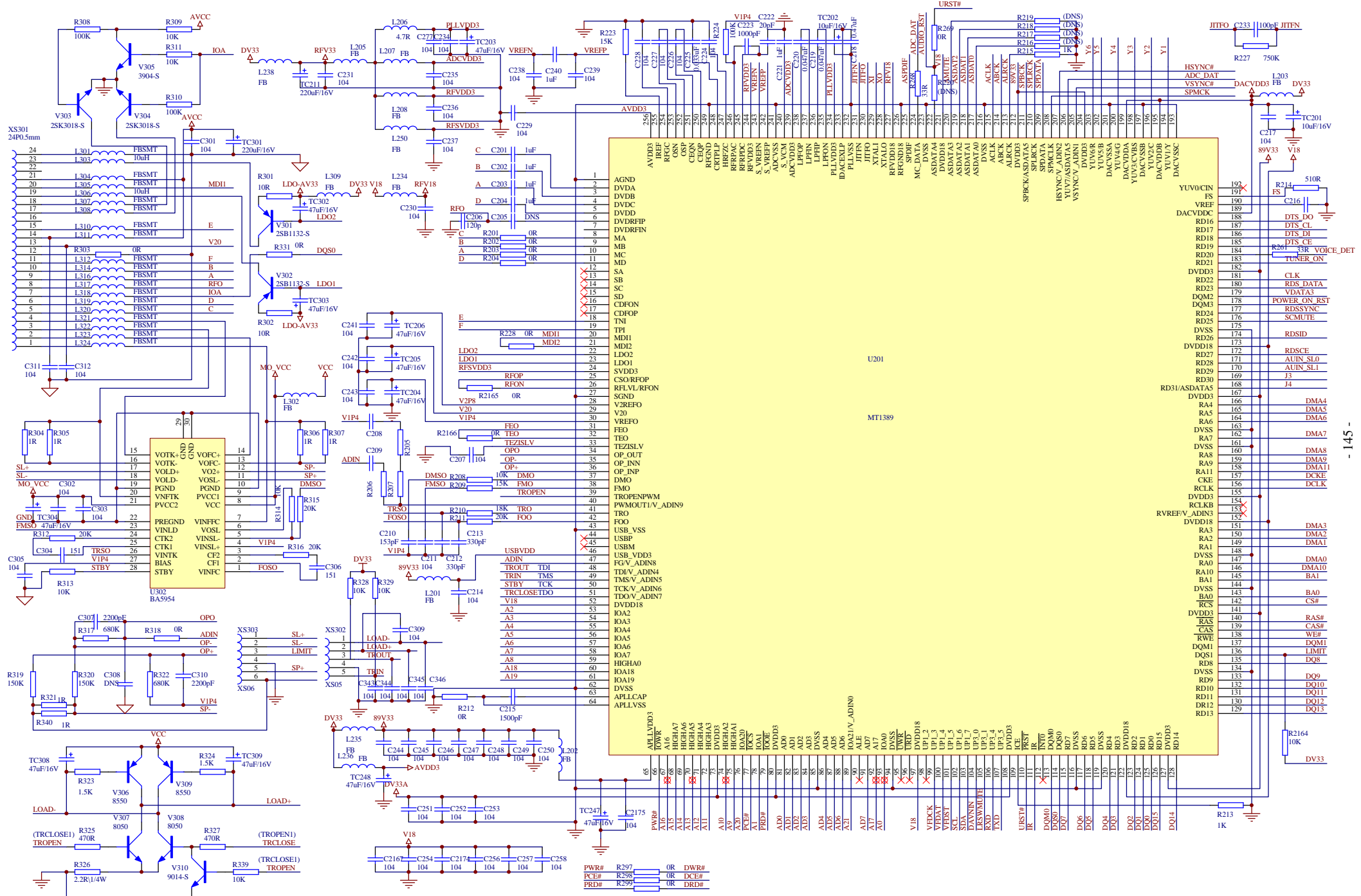
(8) Connect to power supply, switch on power and test function, which are all normal.

5.1 CIRCUIT DIAGRAM

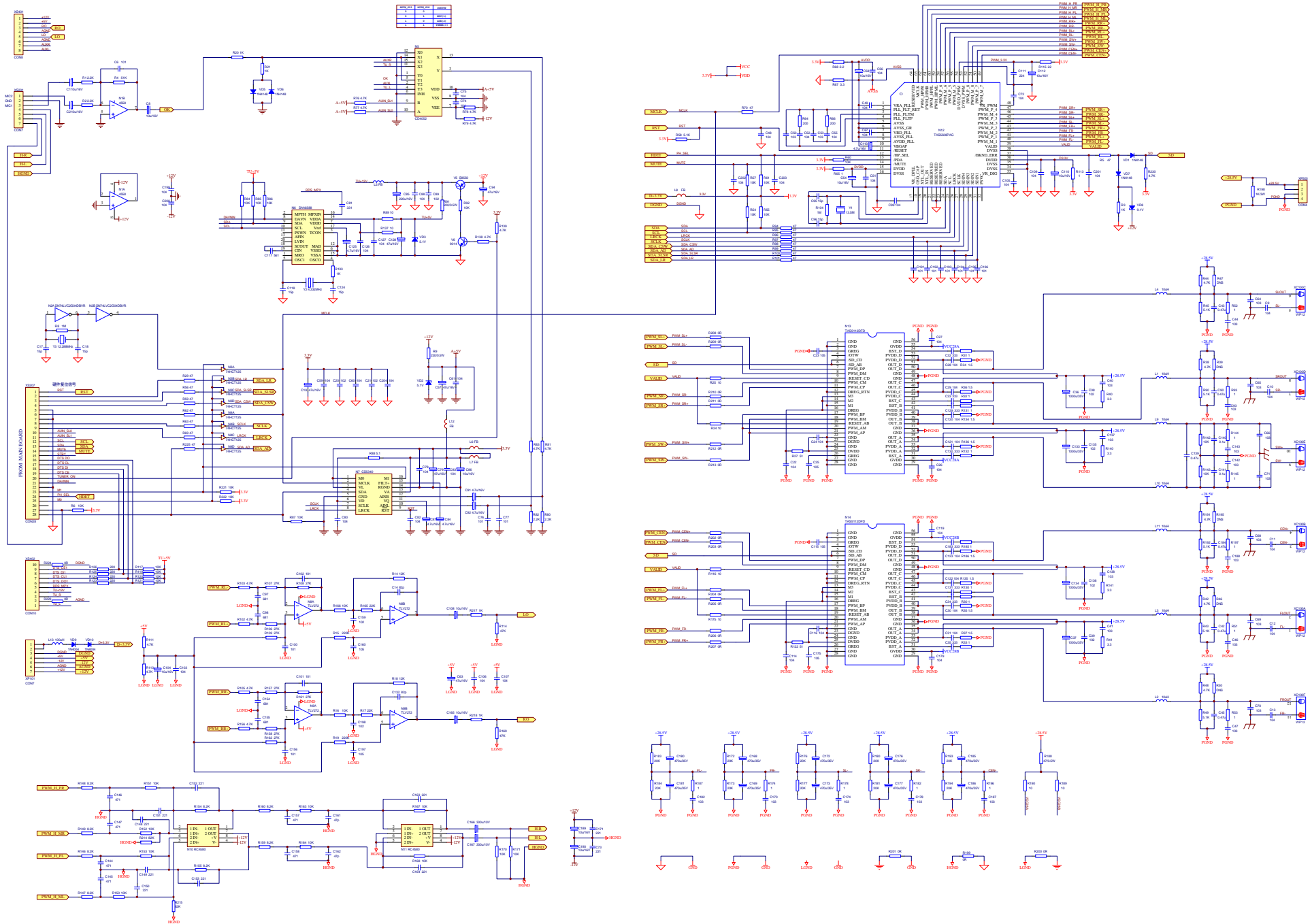
5.1.1 KEYSKAN BOARD



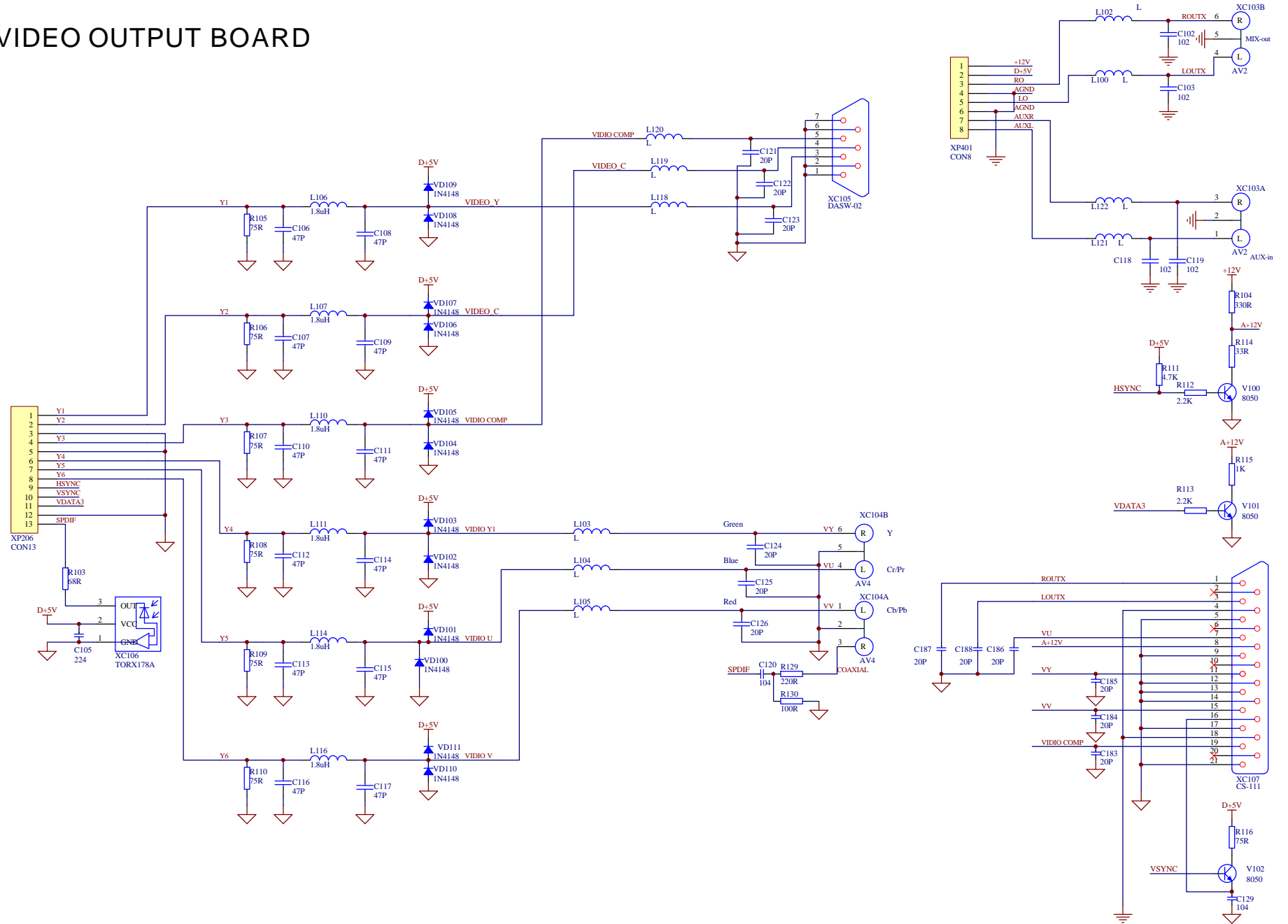
5.1.2 MPEG&SERVO BOARD



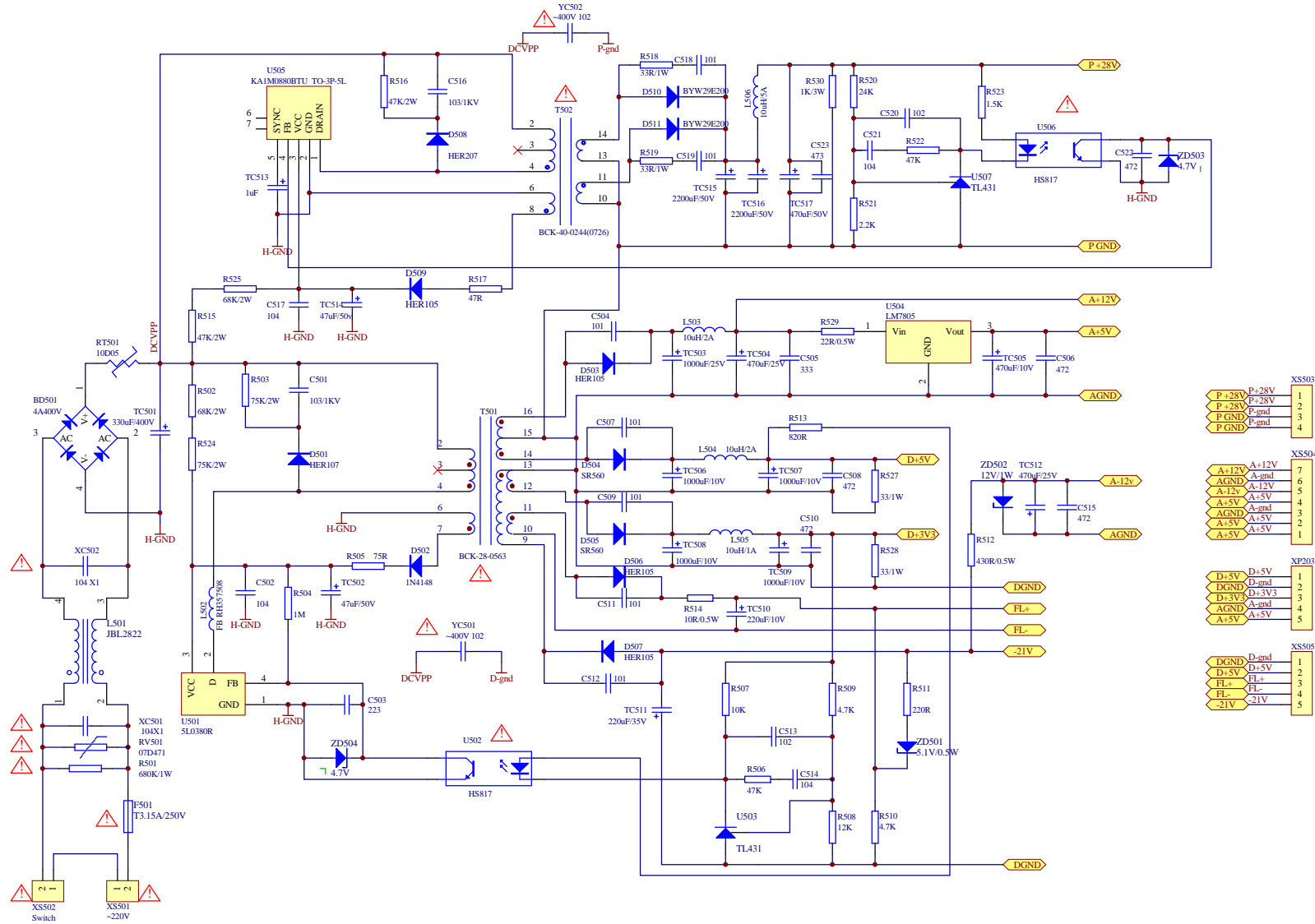
5.1.3 AUDIO MAGNIFY BOARD



5.1.4 VIDEO OUTPUT BOARD

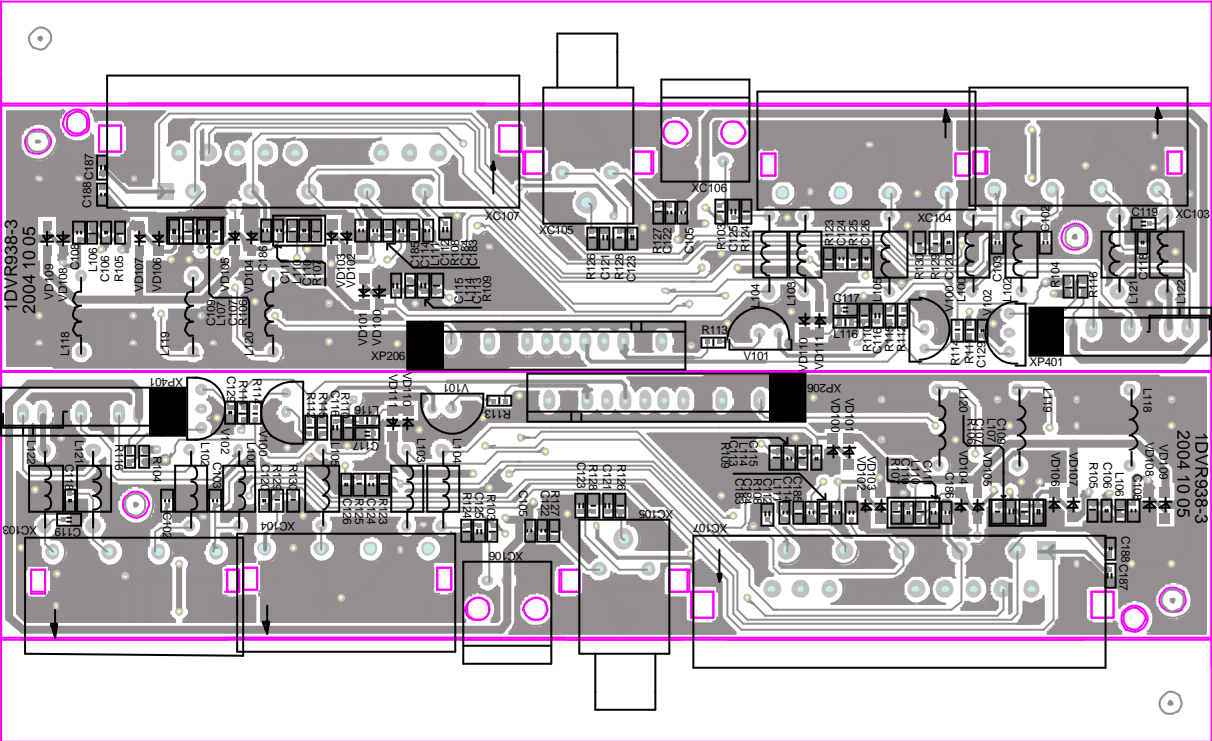


5.1.5 POWER BOARD

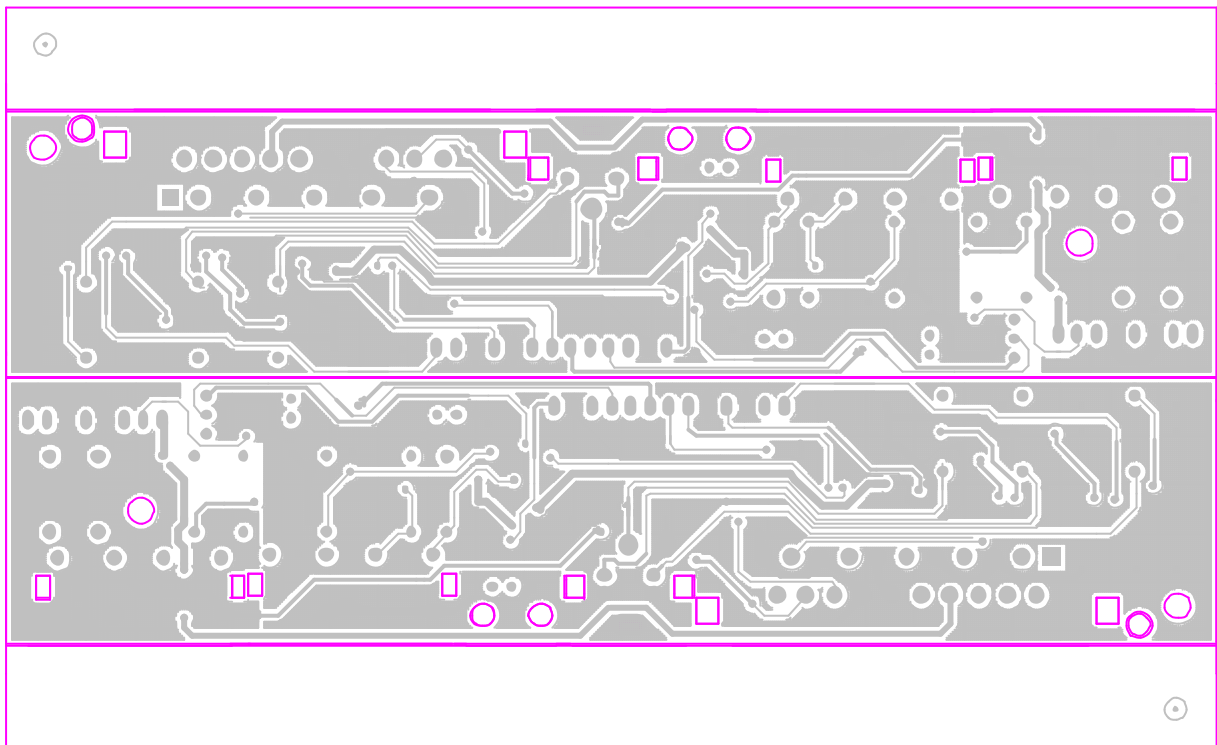


5.2 PCB

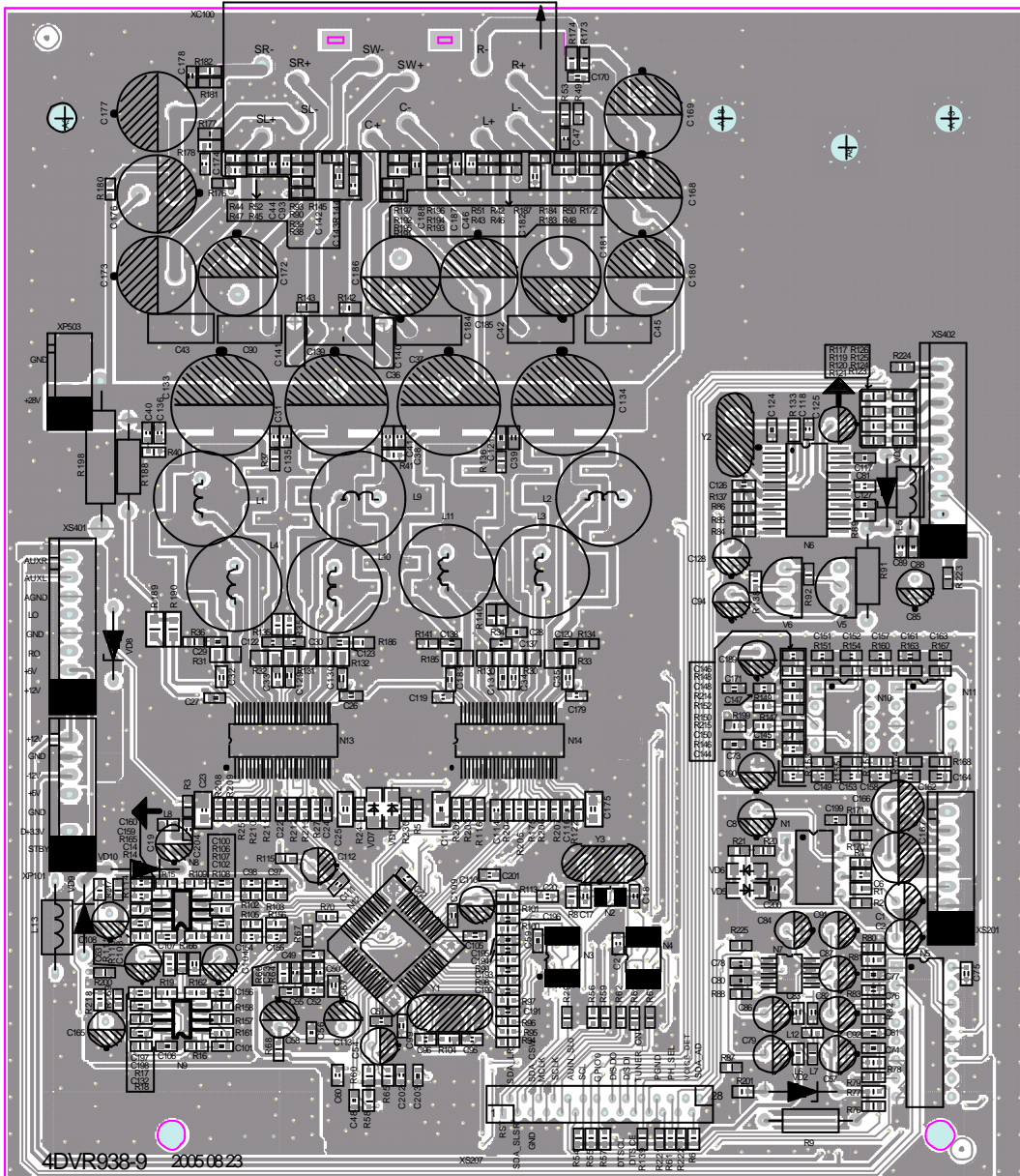
5.2.1 AUDIO OUTPUT 1 BOARD



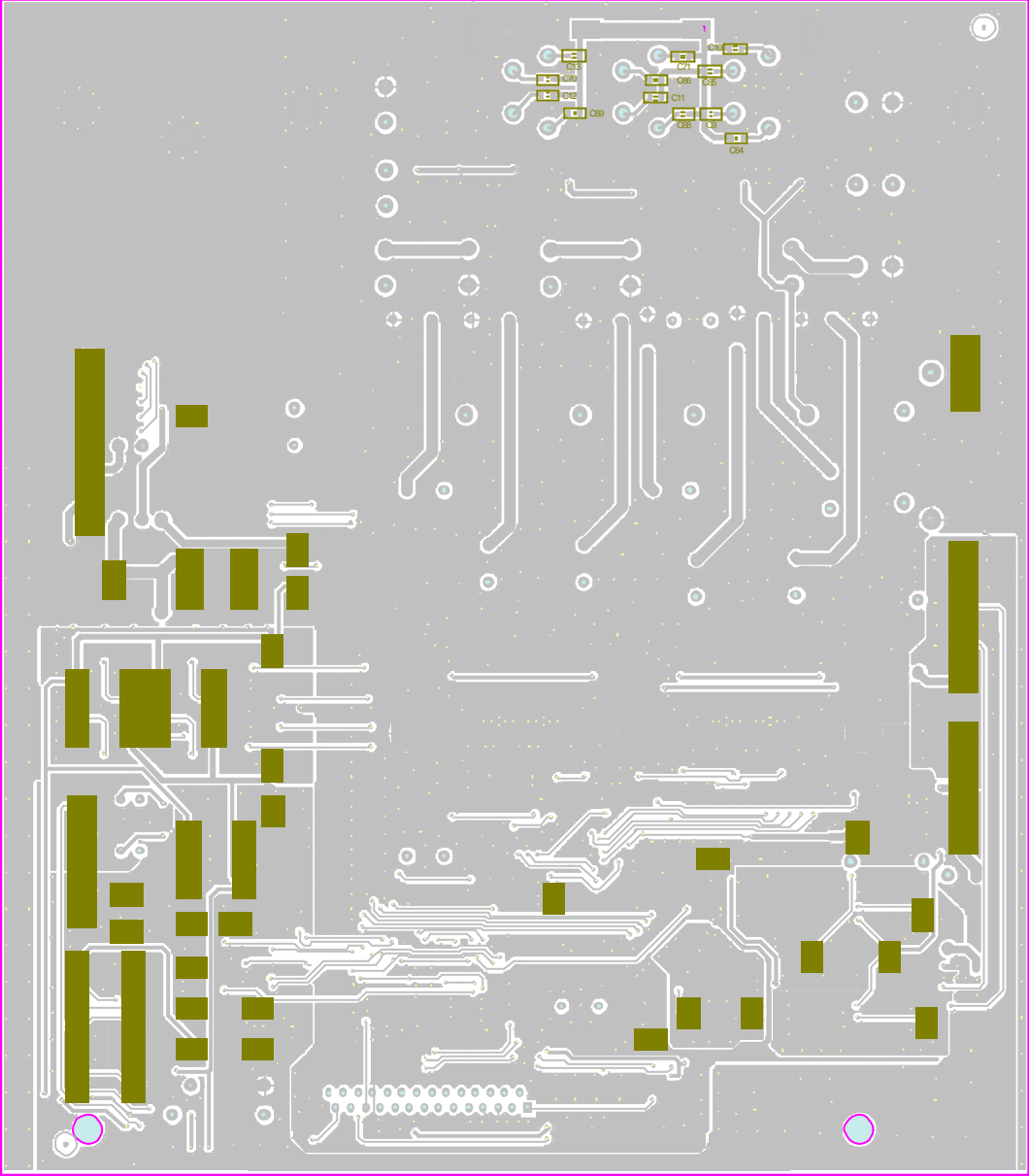
5.2.2 AUDIO OUTPUT 2 BOARD



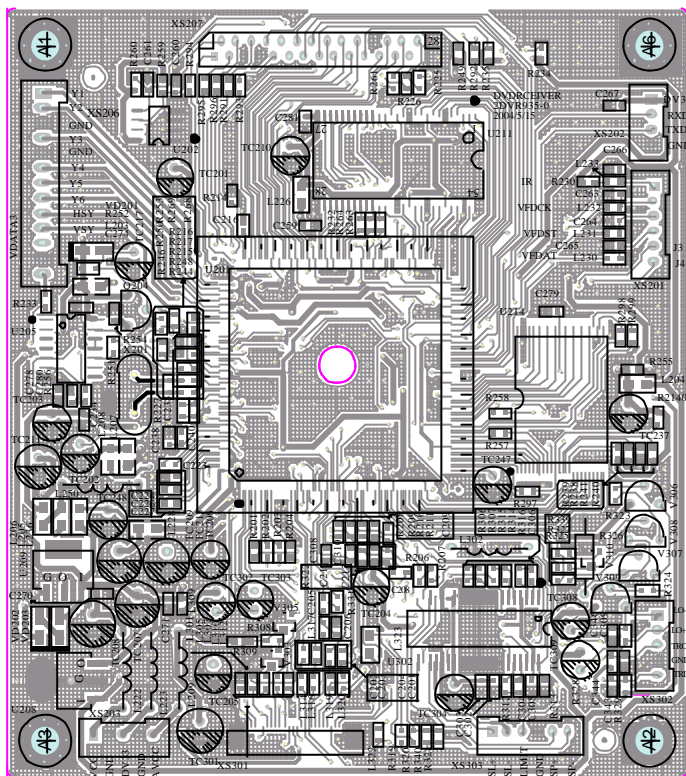
5.2.3 AUDIO MAGNIFY 1 BOARD



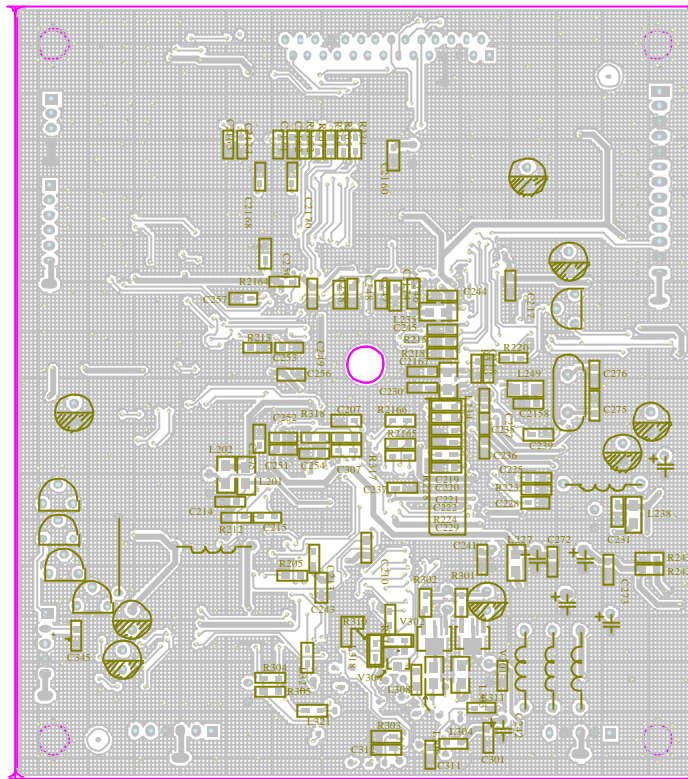
5.2.4 AUDIO MAGNIFY 2 BOARD



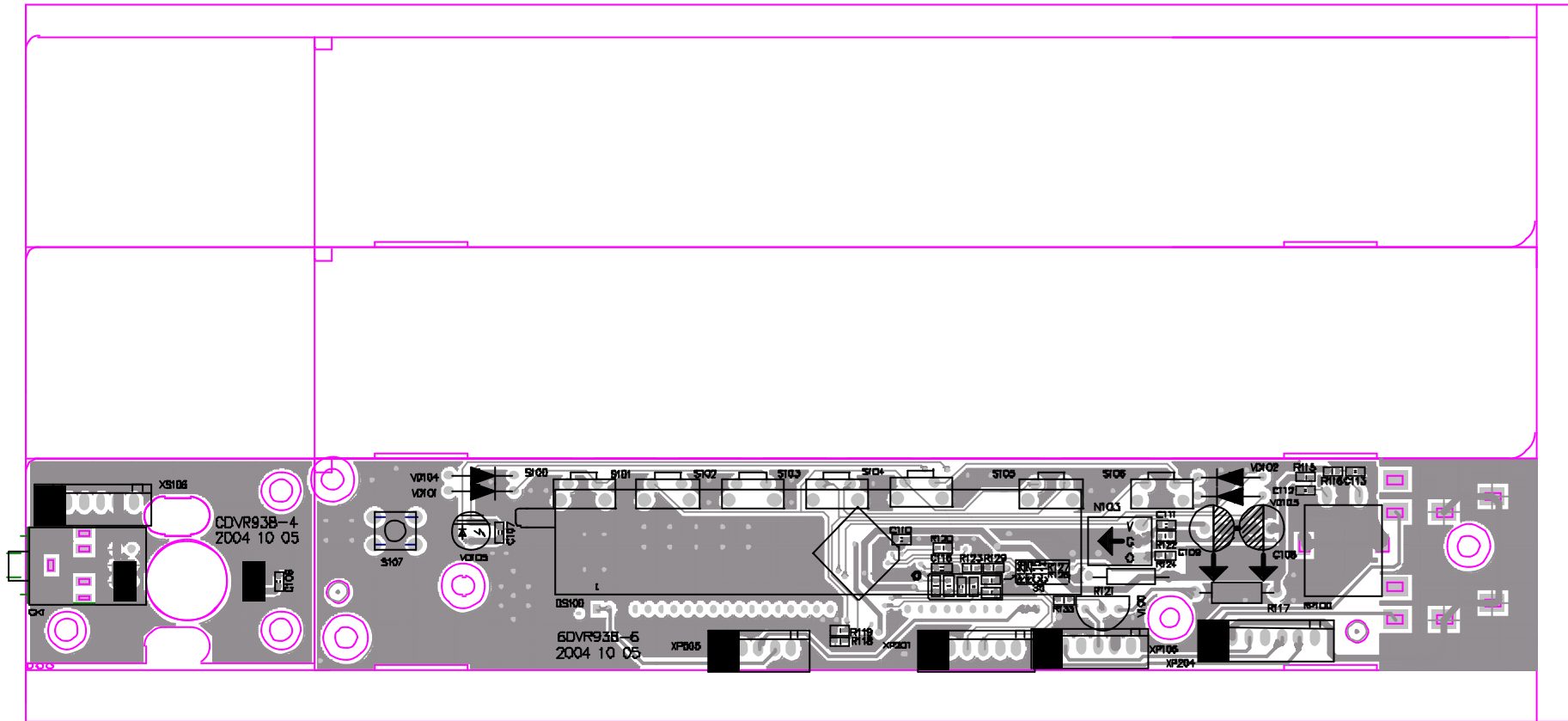
5.2.5 MPEG&SERVO 1 BOARD



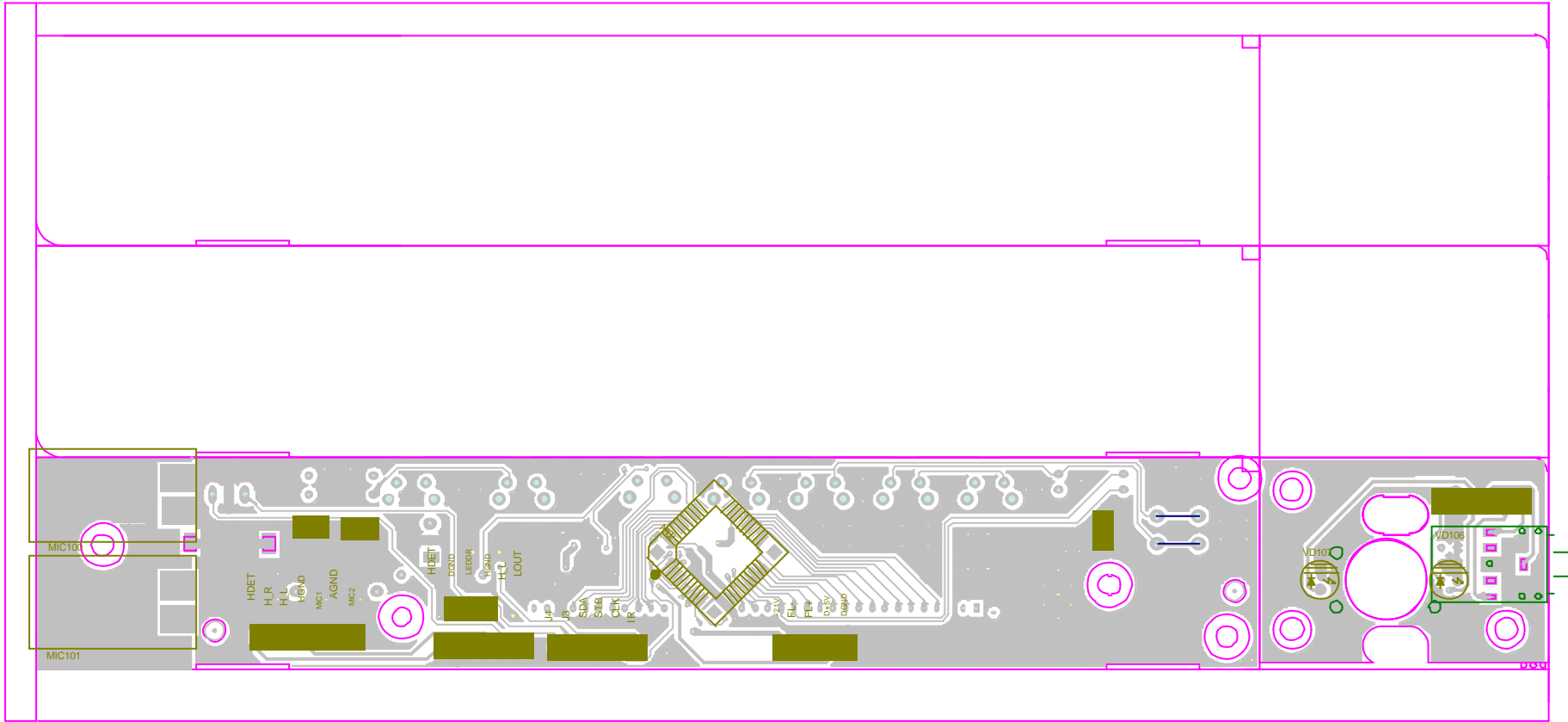
5.2.6 MPEG&SERVO 2 BOARD



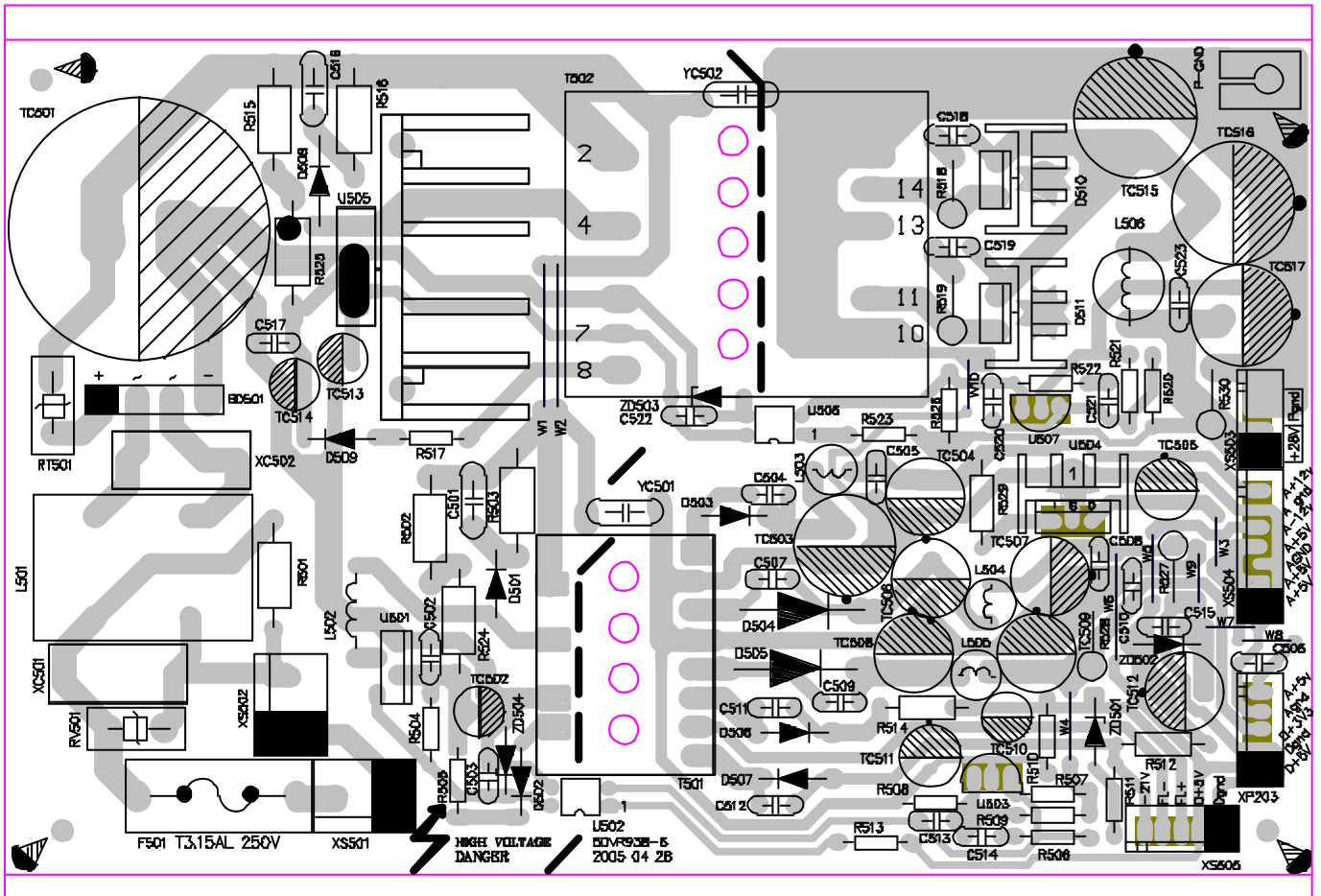
5.2.7 KEYSKAN 1 BOARD



5.2.8 KEYSKAN 2 BOARD



5.2.9 POWER BOARD



Chapter six BOM List

material code	material name	Spec	Location
6.1 power board			
DK1020S (RU) -2 5445680			
2100017	CONNECTED CORDS	F 0.6 SHAPED 20mm	W1,W2
2100003	CONNECTED CORDS	F 0.6 SHAPED 7.5mm	W3,W7,W8,W9,W10
2100004	CONNECTED CORDS	F 0.6 SHAPED 10mm	W4,W5,R514
2100007	CONNECTION CORDS	F 0.6 SHAPEN 15mm	W6
0000274	CARBON FILM RESISTOR	1/4W470±5% SHAPED 10	R517
0000431	CARBON FILM RESISTOR	1/4W750±5% SHAPED 10	R505
0000362	CARBON FILM RESISTOR	1/4W220O±5% SHAPED 10	R511
0000282	CARBON FILM RESISTOR	1/4W820O±5% SHAPED 10	R513
0000284	CARBON FILM RESISTOR	1/4W1.5K±5% SHAPED 10	R523
0000289	CARBON FILM RESISTOR	1/6W2.7K±5% BELT	R510
0000294	CARBON FILM RESISTOR	1/4W10K±5% SHAPED 10	R507
0000301	CARBON FILM RESISTOR	1/4W47K±5% SHAPED 10	R506,R522
0000310	CARBON FILM RESISTOR	1/4W1MO±5% SHAPED 10	R504
0000651	CARBON FILM RESISTOR	1/2W 430O±5% SHAPED 12.5	R512
0010062	METAL FILM RESISTOR	1/4W2.2K±1% SHAPED 10	R521
0010063	METAL FILM RESISTOR	1/4W4.7K±1% SHAPED 10	R509
0010101	METAL FILM RESISTOR	1/4W12K±1% SHAPED 10	R508
0010273	METAL FILM RESISTOR	1/4W24K±1% SHAPED 10	R520
0010279	METAL OXIDE FILM RESISTOR	1W680K±5% SHAPED 15	R501
0010226	METAL OXIDE FILM RESISTOR	1/2W22O±5% SHAPED 12.5	R529
0010275	METAL OXIDE FILM RESISTOR	1W33O±5% SHAPED VERTICAL 7.5	R518,R519
0010147	METAL OXIDE FILM RESISTOR	2W47K±5% SHAPED FLAT 15×7	R516,R515
0010157	METAL OXIDE FILM RESISTOR	2W68K±5% SHAPED FLAT 15×7	R502,R525
0010263	METAL OXIDE FILM RESISTOR	2W75K±5% SHAPED FLAT 15×7	R503,R524
0010281	METAL OXIDE FILM RESISTOR	3W1K±5% SHAPED VERTICAL 7.5	R530
0010288	METAL OXIDE FILM RESISTOR	1W100O±5% SHAPED VERTICAL 7.5	R527

material code	material name	Spec	Location
0200105	PORCELAIN CAPACITOR	50V 100P ±10% 5mm	C504,C507,C509,C511,C512,C518,C519
0200123	PORCELAIN CAPACITOR	50V 102 ±10% 5mm	C513,C520
0200134	PORCELAIN CAPACITOR	50V 223 ±20% 5mm	C503
0200138	PORCELAIN CAPACITOR	50V 104 ±20% 5mm	C502,514,517,521
0200224	PORCELAIN CAPACITOR	1000V 103 +80%-20% 7.5mm	C501,C516
0210158	TERYLENE CAPACITOR	100V 472±10% SHAPED 5mm	C506,C508,C510,C515
0210024	TERYLENE CAPACITOR	100V 333 ±10% 5mm	C505
0210148	TERYLENE CAPACITOR	100V 473 ±10% SHAPED 5mm	C523,C522
0210116	anti-jamming CAPACITOR	MKP61 X2 275VAC 104±20%15	XC501,XC502
0200343	CERAMIC CAPACITOR	Y1 400VAC 102±10% 10mm	YC501,YC502
0260614	CD	EZ 400V330U±20% 35×35 10	TC501
0260664	CD	CD11K 16V220U±20% 6.3×11 2.5	TC510
0260653	CD	CD11K 16V470U±20%8×14 3.5	TC505
0260597	CD	CD11 105 16V1000U±20%10×20 5	TC506,TC507
0260654	CD	CD11K 16V2200U±20% 10×25 5	TC508,TC509
0260558	CD	CD11T 25V470u±20%10×16 5	TC504,TC512
0260665	CD	CD11K 25V1000U±20% 13×20 5	TC503
0260667	CD	CD11K 50V1U±20% 5×11 2	TC513
0260663	CD	CD11K 35V220U±20% 8×12 3.5	TC511
0260666	CD	CD11K 50V47U±20% 6.3×11 2.5	TC514
0260601	CD	CD11C 105 50V22U±20%6×7 2.5	TC502
0260668	CD	CD11K 50V470U±20% 13×20 5	TC517
0260751	CD	CD11K 50V1000U±20%16×25 7.5	TC515,TC516
0390154	MAGNETIC BEADS INDUCTOR	RH-357508	L502
0390340	VERTICAL INDUCTOR	10uH ±10% 5A 12.5×26.5 10mm	L506
0410010	CHOKE COIL	VERTICAL 10UH 1A 5mm	L505
0410011	CHOKE COIL	VERTICAL 10UH 2A 5mm	L503,L504
1000010	FILTER OF POWER NET	JBL2822 30mH±20%	L501
0460466	SWITCH POWER TRANSFORMER	BCK-28-0563	T501
0460454	SWITCH POWER TRANSFORMER	BCK-40-0244	T502
0460441	SWITCH POWER TRANSFORMER	BCK-40-0726	T502
0680065	SCHOTTKY DIODE	SR560 DO-27 SHAPED 20mm	D504,D505

material code	material name	Spec	Location
0570006	DIODE	1N4148	D502
0570013	DIODE	HER105	D503,D506,D507,D509
0570014	DIODE	HER107	D501
0570042	DIODE	HER207 SHAPED 12.5mm	D508
0570045	DIODE	BYW29E-200 TO-220	D510,D511
05800069	VOLTAGE REGULATOR DIODE	5.1V \pm 5% 1/2W BELT	ZD501
0580022	VOLTAGE REGULATOR DIODE	12V \pm 5% 1W	ZD502
0670013	SILICON BRIDGE	KBL04	BD501
0880379	IC	LM7805 GOLD SEALED TO-220	U504
0880247	IC	MC7805CT GOLD SEALED TO-220	U504
0880499	IC	L7805CV GOLD SEALED TO-220	U504
0880863	IC	HA17431VP TO-92	U503
0882041	IC	MIK431C TO-92	U503
0880553	IC	LM431ACZ TO-92	U507
0880765	IC	5L0380R YDTU	U501
0881500	IC	KA1M0880BTU TO-3P-5L	U505
1030007	PRESS SENSITIVITY RESISTOR	7D 471 \pm 10% 5mm	RV501
1050002	HEAT SENSITIVITY RESISTOR	NTC SCK-104MS \pm 20%	RT501
1080011	PHOTOELECTRIC COUPLER	HS817	U502,U506
0580005	VOLTAGE REGULATOR DIODE	4.7V \pm 5% 1/2W	ZD503,ZD504
1563761	PCB	@5DVR938-6 UL	
1940003	SOCKET	4P 2.5mm	XS503
1940004	SOCKET	5P 2.5mm	XS505
1940007	SOCKET	7P 2.5mm	XS504
1940074	SOCKET	2P 7.92mm	XS501,XS502
2121530	FLAT CABLE	5P130 2.5/2.0 2 PIN,WITH NEEDLE,THE SAME DIRECTION	XP203
2300004	FUSE	T3.15AL 250V	F501
3020402	FUSE HOLDER	BLX-2	F501
3580195	HEAT RADIATION BOARD	11 \times 15 \times 25 SINGLE HOLE,NOT OXIDATION	D510,D511,U504
3580194	HEAT RADIATION BOARD	40 \times 20 \times 35 DVR938-2 NOT OXIDATION	U505

material code	material name	Spec	Location
3870591	GROUNDING PIECE	AV100	
4000453	SELF-TAPPING SCREW	BT 3x8H WHITE NICKEL	
4000564	SELF-TAPPING SCREW	PWT 3x12x7H WHITE NICKEL	
4000627	SELF-TAPPING SCREW	PWT 2.6x6x5H BLACK ZINC	
6.2 EARPHONE board			
DK1020S (RU) -2 5445680			
0310207	SMD CAPACITOR	50V 104 ±20% X7R 0603	
0310543	SMD CAPACITOR	50V 104 ±10% X7R 0603	
1980061	EARPHONE SOCKET	CKX-3.5-01K	
1940006	SOCKET	6P 2.5mm	
0620040	RADIATION DIODE	3B 4SC 白发蓝	
1631900	PCB	CDVR938-4	
6.3 AMPLIFIER board			
DK1020S (RU) -2 5445679			
0000466	CARBON FILM RESISTOR	1/2W220O±5% SHAPED 12.5	R91
0000540	CARBON FILM RESISTOR	1/2W150O±5% SHAPED 12.5	R9
0010233	METAL OXIDE FILM RESISTOR	1/2W47O±5% SHAPED 12.5	R188
0010282	METAL OXIDE FILM RESISTOR	3W1K±5% SHAPED R 20x8	R198
0210145	METAL POLYESTER FILM CAPACITOR	CL21X 100V 104K C5	C140,C141
0210165	METAL POLYESTER FILM CAPACITOR	CL23X 63V 474 ±5% 5	C42,C43,C45,C90,C139,C184
0260127	CD	CD11 16V4.7U±20%5x11 2	C84,C87,C91,C92,C113,C125
0260019	CD	CD11 16V10U±20%5x11 2	C1,C2,C8,C54,C58,C86,C104,C108,C110,C112,C165,C189,C190
0260025	CD	CD11 16V47U±20%5x11 2	C19,C57,C63,C79,C94,C128
0260028	CD	CD11 16V220U±20%6x12 2.5	C85
0260618	CD	CD11 10V330U±20%6.3x11 2.5	C166,C167
0260048	CD	CD11 35V470U±20%10x20 5	C168,C169,C172,C173,C176,C177,C180,C181,C185,C186
0260491	CD	CD11K 35V680U±20% 13x20 5	C36,C37,C133,C134
0390057	MAGNETIC BEADS INDUCTOR	RH354708	L5
0390168	INDUCTOR	100UH±10% 0410 SHAPED 12.5mm	L13

material code	material name	Spec	Location
0410176	VERTICAL SCREEN SHIELD FILTERING INDUCTOR	10uH ±10% 4A 5mm	L1~L4,L9~L11
0570004	DIODE	1N4004	VD9,VD10
05800069	VOLTAGE REGULATOR DIODE	5.1V ±5% 1/2W BELT	VD2,VD3
05800099	VOLTAGE REGULATOR DIODE	9.1V ±5% 1/2W BELT	VD8
0780032	TRIODE	9014C	V6
0780030	TRIODE	8550C	V5
0960226	CRYSTAL OSCILLATOR	4.332MHz 49-s	Y2
0960182	CRYSTAL OSCILLATOR	12.288MHz 49-S	Y3
0960171	CRYSTAL OSCILLATOR	13.50MHZ 49-S	Y1
0881227	IC	RC4558P DIP	N1
0880445	IC	4558C DIP	N1
0880124	IC	NJM4558D DIP	N1
0881393	IC	IL4558N DIP	N1
0881429	IC	CD4052BE DIP	N5
0880443	IC	CD4052BCN DIP	N5
0882375	IC	RC4580 DIP	N10,N11
0882351	IC	NE4580 DIP	N10,N11
1940007	SOCKET	7P 2.5mm	XS201
1940009	SOCKET	8P 2.5mm	XS401
1940140	CABLE SOCKET	14P 1.0mm STRAIGHT DUAL LINE PLUG	XS207
1940239	SOCKET	10P 2.5mm STRAIGHT FLEX	XS402
1990025	EXTERNAL SOURCES SOCKET	6PZ-7	XC100
2120174	FLAT CABLE	7P60 2.5 2 SOCKET WITH NEEDLE TOGETHER DIRECTION	XP101
2121621	FLAT CABLE	4P90 2.5 2 PIN,WITH NEEDLE,THE SAME DIRECTION	XP503
3580186	RADIATOR	78x49x30 DVR938 NOT OXIDATION	
4210005	MACHINE-TAPPING SCREW	PM 3x8 BLACK	
4450012	BOLT PAD	F 3x7.2x0.5	
4490001	SPRING PAD	F 3	
5230707	SOFT SPONGE SPACER	10x10x2 SINGLE-FACED,HARD	
5233174	RUBBER SPACER	9x9x1 SINGLE-FACED WITH GLUE IN REAR SIDE,CENTER HOLE f 3	
5445678	PCB SEMI-FINISHED PRODUCT	4DVR938-6-SMD DK1010S-2	

material code	material name	Spec	Location
6.4 decode board			
DK1020S (RU) -2 5445770 (VER3.3)			
0000375	CARBON FILM RESISTOR	1/4W2.20±5%	R326
0260019	CD	CD11 16V10U±20%5×11 2	TC201,TC202
0260028	CD	CD11 16V220U±20%6×12 2.5	TC207~TC209,TC211,TC213,TC301
0260025	CD	CD11 16V47U±20%5×11 2	TC203~TC206,TC210,TC247,TC248,TC237,TC302~TC304,TC308,TC309
0260027	CD	CD11 16V100U±20%6×12 2.5	TC217
0390057	MAGNETIC BEADS INDUCTOR	RH354708	L209,L222,L223,L302,L250
0780029	TRIODE	C8050	V307,V308
0780138	TRIODE	8050D	V307,V308
0780030	TRIODE	8550C	V306,V309
0780151	TRIODE	8550D	V306,V309
0780033	TRIODE	9015C	Q204
0960020	CRYSTAL OSCILLATOR	27.00MHz 49-S	X201
1940140	CABLE SOCKET	14P 1.0mm STRAIGHT DUAL LINE PLUG	XS207
1940065	SOCKET	13P 2.0mm	XS206
1940005	SOCKET	6P 2.0mm	XS303,XS201
1940024	SOCKET	5P 2.0mm	XS302,XS203
0090001	SMD RESISTOR	1/16W 00 ±5% 0603	R201~R204,R244,R248,R251,R255,R297,R298,R299,R331,R212,R228,R303,R318,R2165,R2166,R226,R257,R258,R2159
0090006	SMD RESISTOR	1/16W 750 ±5% 0603	R233
0090272	SMD RESISTOR	1/16W10±5% 0603	R304~R307,R321,R340
0090003	SMD RESISTOR	1/16W 100 ±5% 0603	R301,R302
0090005	SMD RESISTOR	1/16W 330 ±5% 0603	R220,R232,R256,R261,R263,R264,R268,R292~R296,R231,R265~R267,R2162
0090181	SMD RESISTOR	1/16W 1000 ±5% 0603	R291
0090011	SMD RESISTOR	1/16W 4700 ±5% 0603	R325,R327

material code	material name	Spec	Location
0090014	SMD RESISTOR	1/16W 1K ±5% 0603	R213,R215,R254
0090016	SMD RESISTOR	1/16W 1.5K ±5% 0603	R323,R324,R243
0090123	SMD RESISTOR	1/10W 33O ±5% 0805	L202
0090249	SMD RESISTOR	1/16W 510O ±5% 0603	R214
0090018	SMD RESISTOR	1/16W 3.3K ±5% 0603	R242
0090019	SMD RESISTOR	1/16W 4.7K ±5% 0603	R238~R240,R234,R235,R249,R230,R2140
0090023	SMD RESISTOR	1/16W 10K ±5% 0603	R208,R252,R309,R311,R313,R314,R339,R2164,R328,R329,R259,R260
0090024	SMD RESISTOR	1/16W 15K ±5% 0603	R209,R223
0090025	SMD RESISTOR	1/16W 20K ±5% 0603	R211,R312,R315,R316
0090188	SMD RESISTOR	1/16W 18K ±5% 0603	R210
0090197	SMD RESISTOR	1/16W 150K ±5% 0603	R319,R320
0090231	PRECISION SMD RESISTOR	1/16W 680K ±1% 0603	R317,R322
0090319	PRECISION SMD RESISTOR	1/16W 750K ±1% 0603	R227
0090034	SMD RESISTOR	1/16W 100K ±5% 0603	R224,R308,R310,R246
0090111	SMD RESISTOR	1/10W 4.7O ±5% 0805	L206
0310085	SMD CAPACITOR	50V 20P ±5% NPO 0603	C222
0310190	SMD CAPACITOR	50V 27P ±5% NPO 0603	C275,C276
0310045	SMD CAPACITOR	50V 47P ±5% NPO 0603	C263~C266
0310051	SMD CAPACITOR	50V 331 ±5% NPO 0603	C212,C213
0310048	SMD CAPACITOR	50V 151 ±5% NPO 0603	C304,C306
0310222	SMD CAPACITOR	25V 104 ±20% X7R 0603	C207,C211,C214,C216,C217,C224,C226~C231,C234~C239,C241~C254,C256~C259,C267,C270~C274,C279,C281,C301~C303,C305,C309,C311,C312,C2160,C2162,C2163,C2167,C2168,C2170,C2171,C2173~C2175,C277,C343~C345,C280

material code	material name	Spec	Location
0310207	SMD CAPACITOR	50V104 ±20% 0603	C207,C211,C214,C216,C217,C224,C226~C231,C234~C239,C241~C254,C256~C259,C267,C270~C274,C279,C281,C301~C303,C305,C309,C311,C312,C2160,C2162,C2163,C2167,C2168,C2170,C2171,C2173~C2175,C277,C343~C345,C280
0310543	SMD CAPACITOR	50V 104 ±10% X7R 0603	C207,C211,C214,C216,C217,C224,C226~C231,C234~C239,C241~C254,C256~C259,C267,C270~C274,C279,C281,C301~C303,C305,C309,C311,C312,C2160,C2162,C2163,C2167,C2168,C2170,C2171,C2173~C2175,C277,C343~C345,C280
0310234	SMD CAPACITOR	16V 105 +80%-20% 0603	C201~C204,C221,C240
0310066	SMD CAPACITOR	50V 102 ±10% 0603	C278,C223
0310067	SMD CAPACITOR	50V 152 ±10% 0603	C215
0310068	SMD CAPACITOR	50V 222 ±10% 0603	C307,C310
0310201	SMD CAPACITOR	50V 153 ±10% 0603	C210
0310047	SMD CAPACITOR	50V 101 ±5% NPO 0603	C233
0310055	SMD CAPACITOR	16V 333 ±10% 0603	C225
0310056	SMD CAPACITOR	16V 473 ±10% 0603	C219,C220
0310362	SMD CAPACITOR	16V474 +80%-20% 0603	C218
0390044	SMD INDUCTOR	10UH ±10% 2012	L303,L306
0310245	SMD CAPACITOR	50V 121 ±10% X7R 0603	C206
0390087	SMD MAGNETIC BEADS	FCM2012V-221T07	L201,L203,L205,L207,L208,L226,L227,L234,L235,L238
0390095	SMD MAGNETIC BEADS	FCM1608K-221T05	L309,L228,L236,L230~L233,L301,L305,L307,L310,L312,L314,L316,L317,L319,L320,L304,L308,L318,L322,L324,L311,L321,L323
0700001	SMD DIODE	LS4148	VD201

material code	material name	Spec	Location
0700002	SMD DIODE	LL4148	VD201
0780062	SMD TRIODE	9014C	V310
0780040	SMD TRIODE	0	V305
0780193	SMD TRIODE	2SK3018	V303,V304
0780115	SMD TRIODE	2SB1132	V301,V302
0880165	IC	74HCU04D SOP	U205
0880322	IC	MM74HCU04M SOP	U205
0880513	IC	HCU04 SOP	U205
0881157	IC	HY57V641620HGT-H TSOP	U211
0881661	IC	IC42S16400-7T TSOP	U211
0881969	IC	IP1117-ADJ SOT-223	U209
0881182	IC	LM1117MP-ADJ SOT-223	U209
0881031	IC	24C02N SOP	U202
0881754	IC	29LV160BE-70NC TSOP	U214
0881998	IC	AT49BV162A 70TI TSOP	U214
0881990	IC	MT1389FE/B (B) QFP	U201
0881897	IC	MT1389EE QFP	U201
0881459	IC	D5954 SOP	U302
0881378	IC	BA5954FP HSOP	U302
1940094	CABLE SOCKET	24P 0.5mm SMD WITH CLASP	XS301
1631576	PCB	2DAV935-0	
6.5 SURFACE CONTROL BOARD			
DK1020S (RU) -2 5445684			
0000540	CARBON FILM RESISTOR	1/2W150O±5% SHAPED 12.5	R121,R117
0260025	CD	CD11 16V47U±20%5×11 2	C108
0260200	CD	CD11C 16V47U±20%5×7 2	C109
0570006	DIODE	1N4148	VD101~VD104
0620040	RADIATION DIODE	3B 4SC WHITE ISSUE BLUE	VD105
0780030	TRIODE	8550C	V100
0882131	IC	S0793GB QFP	N102
0882364	IC	PT6315 LQFP	N102
0160201	DIGITAL POTENTIOMETER	EC12P24L25F12	RP100
1200653	DISPLAY SCREEN	HL-D593	DS100

material code	material name	Spec	Location
1200531	DISPLAY SCREEN	VFD16-0801	DS100
1200532	DISPLAY SCREEN	HNV-08SS56	DS100
1340064	LIGHT TOUCH RESTORE SWITCH	KFC-A06-2WB L3.8	S100~S106
1340003	LIGHT TOUCH RESTORE SWITCH	HORIZONTAL 6x6x1	S107
1980030	MICROPHONE SOCKET	CK3-6.35-19	MC100,MC101
2121911	FLAT CABLE	6P120 2.5/2.0 2 PIN,WITH NEEDLE,THE SAME DIRECTION	XP201
2121913	FLAT CABLE	5P320 2.5 2 PIN,WITH NEEDLE,THE SAME DIRECTION	XP505
2121912	FLAT CABLE	6P330 2.5 2 PIN,WITH NEEDLE,THE SAME DIRECTION	XP106
2121615	FLAT CABLE	7P280 2.5 2 PIN,WITH L NEEDLE,THE SAME DIRECTION	XP204
2360024	IR SENSOR	LTOP-4338	N103
2360021	IR SENSOR	AT138BV3	N103
5233065	SOFT SPONGE SPACER	8x8x10 DOUBLE-FACED, HARD	
5232691	SOFT SPONGE SPACER	15x10x9 DOUBLE-FACED, HARD	
5445683	PCB SEMI-FINISHED PRODUCT	6DVR938-5-SMD DK1010S-2	
0090149	SMD RESISTOR	1/10W 470 \pm 5% 0805	R122
0090193	SMD RESISTOR	1/16W 82K \pm 5% 0603	R120
0090181	SMD RESISTOR	1/16W 1000 \pm 5% 0603	R123~R126
0090019	SMD RESISTOR	1/16W 4.7K \pm 5% 0603	R115,R116,R127,R128 ,R129
0090023	SMD RESISTOR	1/16W 10K \pm 5% 0603	R118,R119,R133
0310066	SMD CAPACITOR	50V 102 \pm 10% 0603	C112,C113
0310207	SMD CAPACITOR	50V104 \pm 20% 0603	C111,C110,C107
0310543	SMD CAPACITOR	50V 104 \pm 10% X7R 0603	C111,C110,C107
0310195	SMD CAPACITOR	50V 221 \pm 10% X7R 0603	C114,C115,C116
1632035	PCB	6DVR938-8	
6.6 INPUT OUTPUT BOARD			
DK1020S (RU) -2 5445682			
0390057	MAGNETIC BEADS INDUCTOR	RH354708	L100,L102~L105,L118~L122
0780028	TRIODE	8050C(120-200) TO-92	V100~V102
1910158	TERMINAL SOCKET	AV4-8.4-13	XC103
1910182	TERMINAL SOCKET	AV4-8.4-13/PB-25	XC104

material code	material name	Spec	Location
1860059	SCART SOCKET	CS-111	XC107
1910159	TERMINAL SOCKET	CS TERMINAL DASW-02	XC105
1090024	ELECTRO-OPTIC TRANSFORMER	TX179AT	XC106
1090045	ELECTRO-OPTIC TRANSFORMER	TX179ATW	XC106
2150202	FLAT CABLE	8P140 2.5 T2 2x2P SHIELD,WITH NEEDLE,THE SAME DIRECTION	XP401
2121533	SOFT FLAT CABLE	13P300 2.5/2.0 2 PIN,WITH NEEDLE,THE SAME DIRECTION	XP206
5445681	PCB SEMI-FINISHED PRODUCT	1DVR938-2-SMD DK1010S-2	
0090005	SMD RESISTOR	1/16W 330 ±5% 0603	R114
0090006	SMD RESISTOR	1/16W 750 ±5% 0603	R105~R110,R116
0090008	SMD RESISTOR	1/16W 2200 ±5%	R129
0090009	SMD RESISTOR	1/16W 3300 ±5% 0603	R104
0090014	SMD RESISTOR	1/16W 1K ±5% 0603	R115
0090017	SMD RESISTOR	1/16W 2.2K ±5% 0603	R112,R113
0090019	SMD RESISTOR	1/16W 4.7K ±5% 0603	R111
0090034	SMD RESISTOR	1/16W 100K ±5% 0603	R130
0090238	SMD RESISTOR	1/16W 680 ±5% 0603	R103
0310045	SMD CAPACITOR	50V 47P ±5% NPO 0603	C106~C117
0310066	SMD CAPACITOR	50V 102 ±10% 0603	C102,C103,C118,C119
0310085	SMD CAPACITOR	50V 20P ±5% NPO 0603	C121~C126,C183~C188
0310207	SMD CAPACITOR	50V104 ±20% 0603	C120,C129 (21)
0310543	SMD CAPACITOR	50V 104 ±10% X7R 0603	C120,C129 (21)
0310112	SMD CAPACITOR	16V 224 ±10% 0603	C105
0390096	SMD INDUCTOR	1.8UH ±10% 1608	L106,L107,L110,L111,L114,L116
0700007	SMD DIODE	1N4148	VD100~VD111
1631897	PCB	1DVR938-3	
6.8 remote control			
DK1020S (RU) -2 5470973			
0000599	CARBON FILM RESISTOR	1/6W100K±5% BELT	
0200062	PORCELAIN CAPACITOR	50V 151 ±10% 2.5mm	
0570006	DIODE	1N4148	

material code	material name	Spec	Location
0630003	EMISSION PIPE	TSAL6200	
0780138	TRIODE	8050D	
0880220	IC	PT2222 SOP	
0970003	CERAMIC RESONATOR	455E	
1561684	PCB	8219-1	
2100003	CONNECTED CORDS	F 0.6 SHAPED 7.5mm	
3031194	SURFACE CASING OF REMOTE CONTROL	RC-109 SILVER WHITE	
3040873	ROMOTE CONTROL BOTTOM CASING	RC-109 SILVER WHITE	
3050750	BATTERY CASE DOOR OF REMOTE CONTROL	RC-109 SILVER WHITE	
3050603	GLASS OF REMOTE CONTROLLER	YK10 BRIGHT PURPLE	
3850068	ANODE CATHODE SPRING	RC-109	
3850066	ANODE SPRING	RC-109	
3850067	CATHODE SPRING	RC-109	
4000258	SELF-TAPPING SCREW	BB 2.3x8 BLACK	
4630796	CONDUCT GLUE OF REMOTE CONTROL	DK1010S(RU)-2 [TI]	
5070698	GLUE BAG FOR ENVIRONMENTAL PROTECTION (WITHOUT HOLE)	90x255x0.05 PE	
5154138	SURFACE STICKER OF REMOTE CONTROL	RC-78	