

DK1410SI DK1440SI

DK1470SI DK1480SI

service manual

Catalog

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Chapter One About Maintenance

1.1 Safety precautions

1.1.1 Power supply

When maintenance personnel are repairing DVD players, he should pay special attention to the power board with 220V AC and 330V DC which will cause hurt and damage to persons!

1.1.2 Precautions for antistatic

Movement and friction will both bring static electricity which causes serious damages 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 wettability 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 antistatic table cushion should be covered and grounded.

3. All devices and equipments should be placed on the antistatic table cushion and grounded.

4. Maintenance personnel should wear antistatic wrist ring which should be grounded.

5. Places around the operating position should also be covered with electric conduction cushion or Painted with antistatic 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 loudspeaker 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 hands 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 oscillograph ($\geq 100\text{MHz}$)
- ◆ TV set
- ◆ SMD rework station
- ◆ Multimeter
- ◆ Soldering iron
- ◆ Pointed-month pincers
- ◆ Cutting nippers
- ◆ Forceps
- ◆ Electric screw driver
- ◆ Terminals connecting cord
- ◆ Headphone
- ◆ Microphone

Chapter Two

Functions and Operation Instructions

2.1 Features

Formats:

- # Digital video playback of DVD-Video, Super VCD and VCD formats.
- # MPEG-4 compatibility: Playback of Divx 3.11, Divx 4, Divx 5, Divx pro and XviD formats.
- # Playback of music discs in DVD-Audio format.
- # Playback of musical compositions in DC-DA and HDCD formats.
- # Playback of compressed musical files in Mp3 and WMA formats.
- # Playback of Karaoke-discs in DVD, VCD and CD+G formats.
- # Playback of photo albums, recorded in Kodak Picture CD and JPEG digital formats.

Audio:

- # 192 kHz/24 bit audio D/A converter.
- # Coaxial and optical audio outputs, providing digital sound playback in Dolby Digital/LPCM formats.
- # Coaxial and optical audio inputs, providing connection of external digital signal sources.
- # Stereophonic audio outputs for connection to TV and amplifier.
- # Integrated digital multi-channel sound decoders, providing playback of Dolby Digital and DTS audio tracks.
- # Integrated Dolby Pro Logic II decoder, providing transformation of stereophonic signal to multi-channel one.
- # Microphone input providing karaoke functions.
- # Headphones output.

Video:

- # 108 kHz/12 bit video D/A converter.
- # Progressive scan(Y Pb Pr)video signal output, securing high resolution and absence of image flicker.
- # Composite and component(Y Cb Cr)S-video and RGB/SCART video outputs, providing advanced switching capabilities.
- # NTSC/PAL transcoder.
- # Support of many camera angles, dubbed languages and subtitles.
- # Sharpness, Gamma, Brightness, Contrast, Hue and Saturation adjustment.

Miscellaneous:

- # Support of CD-R/CD-RO, DVD-R/DVD-RW, DVD+R/DVD+RW
- # FM/AM tuner with RDS support.
- # USB port, providing playback of files of supported formats from external flash-memory devices.
- # KARAOKE+, providing extended karaoke features.
- # Easy to use on-screen menu in Russian.
- # Support of Russian file names, ID3 tags and CD-text.
- # "Memory" function which can load the last disc position on stop.
- # "Capture" function, auto loading selected bookmarked image as the wallpaper.
- # Q-Play function that will bring you to the main movie title and skip unskippable commercials.
- # Virtual control panel function makes your control of the device much easier when playing the movie.

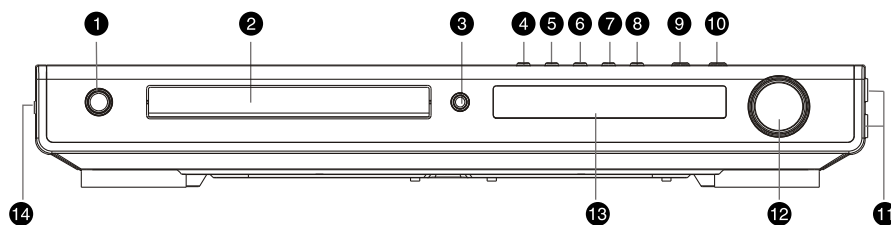
Auto protection of TV screen.

Child lock, parental control(protection against playing undesirable discs)

Auto voltage selection(~110-250V)and short-circuit protection.

2.2 Controls and functions

2.2.1 Front panel controls



1 STANDBY/POWER button

Press to switch the device on/into standby.

2 Disc tray

3 OPEN/CLOSE button

Press to open/close the disc tray.

4 PREV button

Press to playback from the previous bookmark

5 NEXT button

Press to playback from the next bookmark

6 REW button

Press to playback fast reverse/radio station tuning

7 FWD Button

Press to playback fast reverse/radio station tuning

8 SOURCE button

Press to switch between DVD-receiver/Audio input/Tuner/Digital audio input.

9 PLAY/PAUSE button

Press to playback/pause

10 STOP button

Press to stop the playback

11 Microphone input

12 VOLUME adjuster

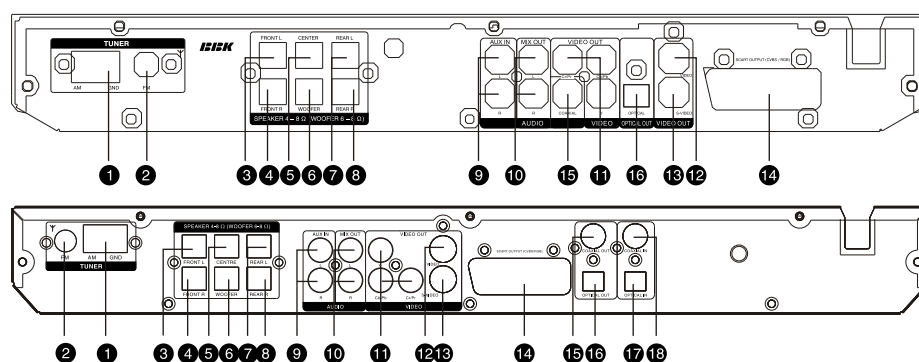
Press to adjust volume.

13 VFD display window

14 Headphones input

15 USB port

2.2.2 Rear panel connections



1 AM Antenna input

2 FM Antenna input

3 Left front speaker input (output from the build in amplifier)

4 Right front speaker input (output from the build-in amplifier)

8 Right Surround speaker input (output from the build-in amplifier)

9 Audio input

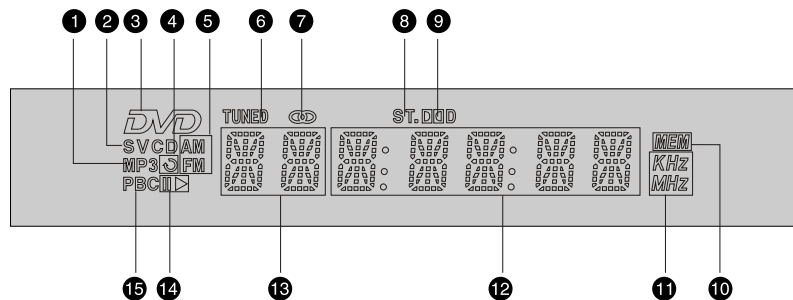
10 Stereophonic audio output

11 Component video output YCb (Pb) Cr (Pr)

12 Composite video output

- 5 Center speaker input (output from the build-in amplifier)
- 6 Subwoofer input (output from the build-in amplifier)
- 7 Left Surround speaker input (output from the build-in amplifier)
- 13 S-Video output
- 14 SCART-type AV connector
- 15 Coaxial digital audio output
- 16 Optical digital audio output
- 17 Optical digital audio input
- 18 Coaxial digital audio input

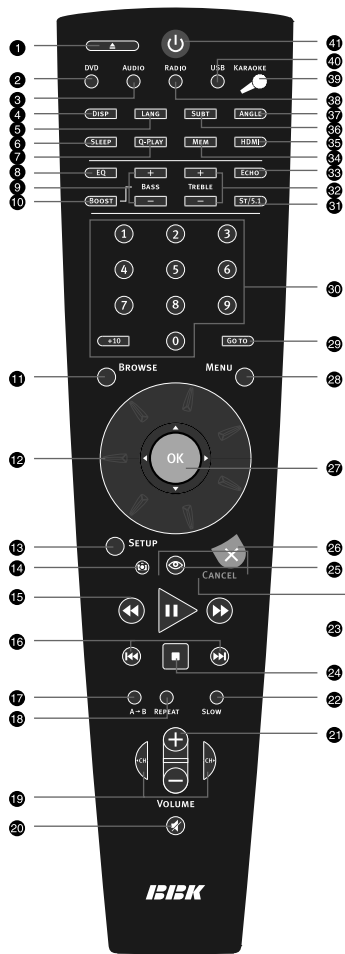
2.2.3 VFD display general view



- 1 MP3-disc
- 2 CD-, VCD-or SVCD-disc
- 3 DVD-disc
- 4 Repeat
- 5 AM/FM
- 6 Radio tuning mode
- 7 Tuner tuning mode
- 8 Stereo
- 9 Dolby Digital
- 10 Programmed radio station
- 11 Frequency
- 12 Playback time
- 13 Chapters or tracks
- 14 Playback or pause
- 15 PBC

2.2.4 Remote control general view

- 1 EJECT button
Press to open/close the disc tray.
- 2 DVD button
Press to switch to DVD mode
- 3 AUDIO button
Press to switch to audio input mode
- 4 DISP button
Press to display the disc information
- 5 LANG button
Press to change the language
- 6 SLEEP button
Press to turn the sleep mode on
- 7 Q-PLAY button
Press to turn the Q-play mode on
- 8 EQ button
Press to adjust the equalizer
- 9 BASS+/- button
Press to adjust subwoofer
- 10 BOOST button
Press to bass boosting
- 11 BROWSER button
Press to turn on/off browser function
- 12 JOG DIAL wheel
Functions are set manually. Default function: zoom
- 13 SETUP button
Press to switch to setup mode.
- 14 Button
Press to capture and bookmark image for the wallpaper
- 15 Button
Press to start reverse or forward scanning



stopped/playback from the previously memorized point.

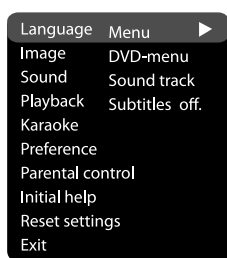
- 35 HDMI button
Press to switch to HDMI mode.
- 36 SUBT button
Press to change the subtitles language
- 37 ANGLE button
Press to change the camera angel
- 38 RADIO button
Press to switch to radio mode
- 39 KARAOKE button
Press to set the karaoke functions
- 40 USB button
Press to switch to USB mode
- 41 Button
Press to switch the device on/into standby

- 16 SKIP/RESET +/-
Press to switch between files on disc/tuned radio stations
- 17 A-B buttons
Press to repeat the selected portion
- 18 REPEAT button
Press to repeat playback
- 19 CH+/CH- button
Press to change the acoustic channel
- 20 MUTE button
Press to change the acoustic channel
- 21 VOLUME+/- button
Press to adjust the volume
- 22 SLOW button
Press to switch to slow down the playback
- 23 PLAY/PAUSE button
Press to play/pause the playback
- 24 STOP button
Press to stop the playback
- 25 Button
Press to turn on/off the virtual control panel
- 26 CANCEL button
Press to go one level back/cancel current operation
- 27 OK button
Press OK for confirmation of use it like joystick during navigating in MENU
- 28 MENU button
DVD-disc menu/PBC function
- 29 GOTO button
Press to playback from the target place
- 30 Numeric buttons
- 31 ST/5.1 button
Press to switch between STEREO/5.11CH
- 32 TREBLE +/- button
Press to adjust the tone
- 33 ECHO button
Press to adjust the echo function of the microphone
- 34 MEM button
Press to memorize the point where playback was

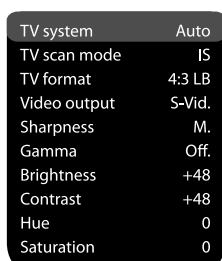
2.3 FUNCTION SETTINGS

2.3.1 Function selection and change

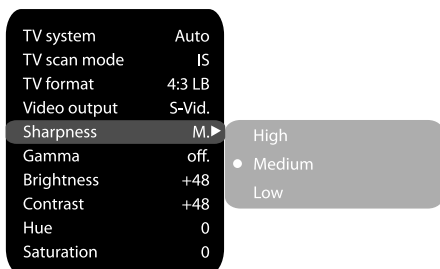
Press the SETUP key to show the setup menu. You will see the following image on the screen, as shown on the figure: Select the desired menu item using the jog Dial; Press OK confirmation.



1. For example, if you wish to change the image settings, you have to select the Image item and press the OK or GIGHT key of the cursor joystick.



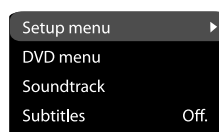
2. Using the jog Dial, select the desired item and press OK or RIGHT key of the cursor joystick. For example, select the Sharpness item. Settings will appear on the screen. Then select the desired sharpness level and press OK for confirmation.
3. Press LEFT key of the cursor joystick for exit to previous menu level.
4. Press SETUP to exit setup menu.



2.3.2 Language settings

1. Menu: interface language setup
Options: Russian, English, Ukrainian.

Default option: English



2. DVD-menu: Selection of disc menu language.
3. Soundtrack selection of translation language
Options: Russian, English, Estonian, Lithuanian, Kazakh, Romanian, Belarusian, Ukrainian, Chinese.

Default: English.

Selection of other languages: Select the OTHERS item using the jog Dial and press OK. Enter the language code using the number buttons and press OK.

If the language you select is not recorded on the DVD disc, another available language will be used.

4. Subtitles: Selection of subtitles language

Options: Off, Russian, English, Estonian, Lithuanian, Kazakh, Romanian, Ukrainian and Chinese.

Default option: Off.

Selection of other languages: Select the OTHERS item using the jog Dial and press OK. Enter the language code using numeric buttons and press OK.

If the language you selected is not recorded on the DVD disc, another available language will be displayed.

2.3.3 Image settings menu

1. TV system: TV system selection.

Options: Auto, PAL, NTSC.

Default option Auto.

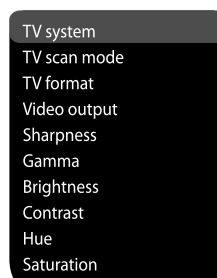
2. TV scan mode: scan mode selection

Options: Progressive, interlaced.

Default option: interlaced

Progressive scan is transferred only via a component video output.

Before switching to progressive scan, make sure that your TV set supports this operation mode.



- 3. TV Format: image ratio settings
 - # Options: 4:3 pan&scan, 4:3 letterbox and 16:9 TV.
 - # Default option: 4:3 pan & scan.
 - # some discs are recorded with support of only one ratio. The selected radio must comply with the TV screen.
- 4. Video output: selection of video signal.
 - # Options: S-Video, Comp, RGB
 - # Default option: Comp.
- 6. Gamma: adjustment of image color temperature.
 - # Options: High, Medium, Low, Off.
 - # Default option: Off.
- 7. Brightness: adjustment of image brightness.
- 8. Contrast adjustment of image contrast.
- 9. Hues: adjustment of image hues.
- 10. Saturation: adjustment of image saturation.
 - Adjustment of image brightness; contrast, hues and saturation.
- # Select the desired item of the image adjustment section using the jog Dial. Press OK or RIGHT key to start adjusting the relevant option.
- # Change the option value using the jog Dial.
- # Upon completion press the LEFT of the cursor joystick to return to image setup menu.

2.3.4 Sound settings menu

- 1. Mixer
 - a) Configuration: setting of the mode for conversion of the 5-channel signal.

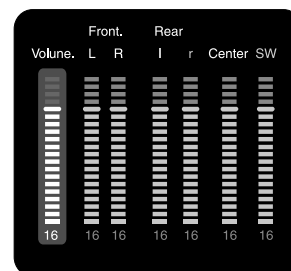


- # Options: Stereo, 5.1.
- # Default option: Stereo
- # 5.1 mode must be supported by the disc.
 - Number of music accompaniment channels depends on the specific disc.
- # Adjustment of the central speaker and surround speakers is available only if the Configuration option is set to 5.1 position.
- b) Stereo mix: playback set-up while playing the disc with two independent audio channels.
 - # Options: L+R, L, R.
 - # Default options: L+R.
- c) Surr. mix: set-up of surround options while playing the stereo disc.
 - # Options: Off, Sum, L+R, Virt, Surr.
- d) Low band: distribution of low frequencies through channels.

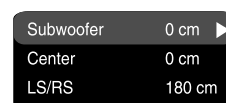
- # Options: Front F, Center C, Surround Sr, Subwoofer SW.
- # Default options: Front F, Subwoofer SW.
- # If you want the low-frequency component of the sound signal enter only the subwoofer channel, select and confirm the parameter Subwoofer SW.



- e) Channel settings: separate adjusting of volume by channels.
 - # Select the channel you want.
 - # Adjust the sound volume of each channel using the wheel.
 - # Press the OK to return to sound settings menu.



- f) Delay of the channel: Set-up of signal delay in speaker channels (central, rear and subwoofer)

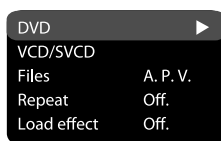


- # Using the jog Dial, select the channel, for which you want to set up the delay and press OK for confirmation.
- # Using the jog Dial set up the desired distance from the listener to each speaker (detailed description of this operation see on page 32)
- g) PRO Logic II: function of stereo sound conversion to 5-channel sound.
 - # Options: On, Off, Auto.
 - # Default option: Audio.
 - # In Auto position, the DVD receiver determines itself, when to use the PRO Logic II decoder. Some discs do not support this function.
- 2. Digital audio output.

- a) SPDIF format: set-up of digital audio output options.
 - # Options: RAW, PCM
 - # When you select the RAW option, the not decoded signal is transferred to the DVD receivers digital outputs, the decode signal is transferred to analog outputs. Decoding is performed by the built-in decoder of the DVD receiver. This feature is meant to ensure that signal decoding at digital outputs is performed by an external device(e.g.an amplifier)
 - # If you select the PCM option, a PCM coded signal will be transferred to the DVD receivers digital outputs.
- b) LPCM: Set-up of digital audio output options to comply with different amplifiers and receivers.
 - # Options: 48 kHz 16 bit, 96kHz 24 bit.
 - # Defacelt option: 48kHz 16bit.
- 3.Sound correction
 - a) Max volume: max volume limiting.
 - # Using the jog Dial, adjust the max volume level.
 - # Press the LEFT key of the cursor joystick to return to sound correction setup menu.
 - b) Equalizer: equalizer modes.
 - # Options: Rock, Pop, Live, Dance, Techno, Classic, Soft.
 - # Default option: Off.
 - c) Echo: echo effects
 - # Options: Off, Concert, Living room, Hall, Bathroom, Cave, Arena, Church.
 - # Default option: Off.
 - d) Tone balance: adjustment of tone balance level.
 - # Adjust the tone balance level using the jog Dial.
 - # Press the LEFT key of the cursor joystick to return to sound correction setup menu.

2.3.5 Playback settings

- 1.DVD
 - Advertisement skip: skip the unskippable block while playing a DVD disc.
 - # Options: Yes, number
 - # Edfault option: number



- 2.VCD/SVCD
 - PBS menu: PBC menu on/off
 - # Options: On, Off.
 - # Default option: On.

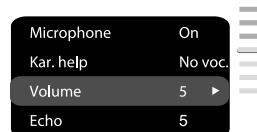
- # If on option is set, while reproducing discs, a menu will appear, in which you can select the or order of playing the disc content. If the off option is wet, the reproducing of content is performed is the order, in which it is recorded of the disc.
- 3.Flids” Selection of reproduced files on the disc.
 - # Options: Audio, Pictures, Video, All types.
 - # Default option: All types.
- 4.Repeat: file repeat mode.
 - # Options: Off, Single, All
 - # Default option: Off.
- 5.Load effect: type of transition from one JPEG file to another.
 - # Options: Off, from top, from bottom.
 - # Default option: Off.

2.3.6 Karaoke settings menu.

- 1.Microphone: MICROPHONE ON/OFF.
 - # Options: On, Off.
 - # Default option: Off.
- 2.Kar. Help: karaoke-disc playback mode
 - # Options: L channel, R Channel, No ast, NO vol.
 - # Default option: No vocal mode.



- 3.Volume:
 - Microphone: microphone sound volume level.
 - # Using the jog Dial adjust the microphone volume level.
 - # Press LEFT key to the cursor joystick to return to karaoke settings menu.



- 4.Echo: echo level while playing the karaoke-disc.
 - # Adjust the echo level Using the jog Dial.
 - # Press LEFT key of the cursor joystick to return to karaoke settings menu.



2.3.7 Preference settings

- 1.Gr.Equalizer: Spectrum analyzer.
 - # Options: On, Off.

Default option: Off.

| | |
|---------------|----------|
| Gr. Equalizer | Off. |
| Background | Standard |
| Screensaver | Standard |
| Jog Dial | Zoom |

Default option: Off.

2. Background: selection of an image as TV screen wallpaper.

Options: Standard, Saved

Default option: Standard.

3. Screen saver: Screen saver on/off.

Options: On, Off.

Default option: On.

4. Jog Dial

Options: Zoom, Step, Skip, Volume.

Default: Zoom.

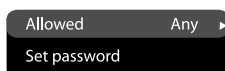
| | |
|---------------|----------|
| Gr. Equalizer | Off. |
| Background | Standard |
| Screensaver | Standard |
| Jog Dial | Zoom |

2.3.8 Parental control

1. Category: Setup of age restrictions to prevent children from seeing undesirable discs.

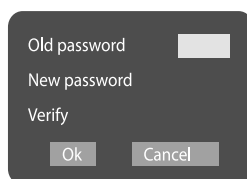
Options: Any, Kid, G, PG, PG-B, PGR, R, NC-17

Default option: Any.



2. Set password: Setup of a four-digit password to change the level of age restrictions.

Default option: 7890.



2.3.9 Initial setup menu

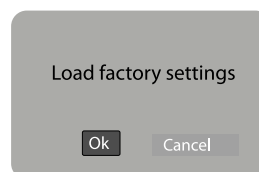
Press the RIGHT key of the cursor joystick to enter the initial setup menu, then select the desired item using the jog Dial and press OK key for confirmation.

While being in this menu section, you cannot return to the previous level by pressing the LEFT key of the cursor joystick.



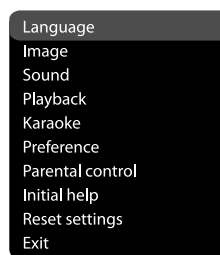
2.3.10 Reset to defaults

Resetting all settings and restoring default options, except age restrictions level and password.



2.3.11 Exit settings menu

Select the item using the jog Dial and press the OK to exit the menu.



2.3.12 Channel delay set-up

Set-up of time delay in the surround channel

Usually, time delay in the Dolby Digital decoding system is preset to ensure best effect while installing the Hone Theater. However, in case you wish to adjust your system more precisely, please consult instructions given in this manual. Set up of time delay for this device is possible in both Dolby Digital and Dolby Pro Logic modes.

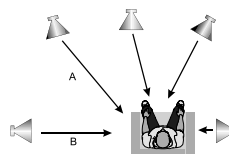


Fig. 1. Take into account the A-B distance; use both figures for setting the desired time delay.

To set the desired delay you have to know the distance from the place where you are to the front speakers and surround speakers as shown in Fig. 1: Consult Fig. 2 (Dolby Pro Logic mode) and 3 (Dolby Digital mode) in order to determine the distance to Surround Speakers (axis Y in the figure) and the distance to the front speakers (axis X in the figure). Crossing point of those two lines on the chart will give the recommended delay value.

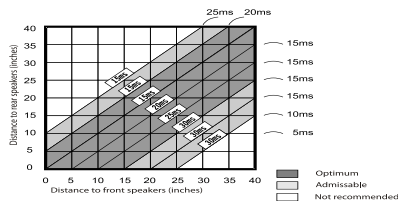


Fig. 2. Determine delay value as to Dolby Pro Logic mode.

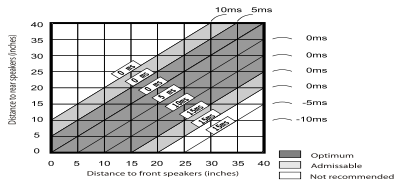


Fig. 3. Determine delay value as to Dolby Digital mode.

Set-up of time delay in the central channel

Sometimes several people are listening to the music, and the space is limited. In this case, you can install three speakers (two front ones and a central one) as shown in Fig.1. With the distance to the listener being approximately the same. The central channel delay is to be set at "0".

Should the central speaker be in close proximity to left and right front speakers as shown in Fig.2, or the central speakers in one line, as shown on Fig.3 with the delay value of the central to be set at "0".

Finally, if it will be necessary to install the central speaker behind the left and right front speakers, the delay value shall be set at "0".

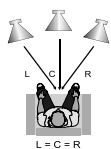


Fig. 1. Delay of central channel = 0
L=R=C

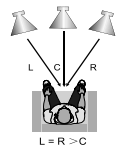


Fig. 2. Small area
Delay of central channel = L=(or R) - C

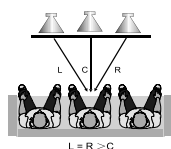
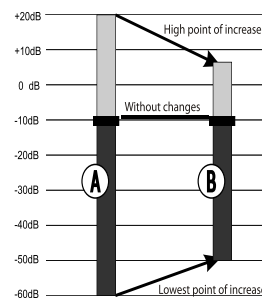


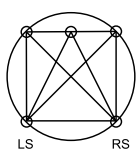
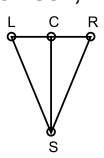
Fig. 3 Small area
Delay of central channel = 0
L=R > C

"Night" mode

The Dolby Digital system provides an extremely broad dynamic range of playback sound—from gentle to roaring. It creates the presence effect, especially while seeing motion pictures. However, at night a powerful sound with a broad dynamic range may give pleasure to you, but disturb and annoy your family and neighbors. If you just decrease the volume, you will immediately notice that you ceased to hear, e.g., dialogues as clear as you do at normal volume, and such sound effects as rustle, whisper etc have merely disappeared. To avoid this, you just have to decrease the volume of "soft" sounds with the volume of "average" sounds left unchanged, i.e. Just decrease the dynamic range of sound accompaniment. Only Dolby Digital system provides for such a method of sound control. It uses the principle of compressing the acoustic signals dynamic range while recording; therefore, while playing an inverse transformation (volume expansion) takes place. This is called "night" mode. The regulation limits are restricted; however, to avoid distortions of resultant signal.



Principle of compressing the acoustic signal's dynamic range.

| | Dolby Digital | Dolby Por Logic surround |
|----------------------------------|-----------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Rear channel | Stereo 20 Hz-20kHz | mono channel with limited frequency range(100Hz-7khz) |
| Low-frequency channel(subowwfer) | Autilable, 20-120Hz | N/a |
| Sound field distribution | Multivariate  | From left to right from right to left, from front to rear, from rear to front  |
| Channels | 6 independent channels, each reproducing its own signal at a time | 4 segmented channels. Only one channel is decoded at a time. |

| | | |
|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|
| Miscellaneous | Creates an optimum sound field with illusion of an equal distance from listener to each speaker | The most cost-efficient way to ensure high-quality surround effect |
| | Allows adjusting the decompression degree of sound information("night" mode) | Surround sound may be received from any signal source. |
| | Possibility of program mable control of the decoder to transfer basses into low-frequency channel in systems equipped broad-band speakers and a subwoofer | Compatible with existing and future two-channel(stereo) formats |
| | Undoubted progress in sound recording technology, especially important for program directors, film directors, sound engineers and actors | Big progress in comparison whti conventional stereo, the worol's mosst popular surround format. |

Chapter Three Principle and Servicing

Section One Principle of the Player

3.1.1 Function introduction

This player adopts new-generation DVD decode chip with built-in Dolby decoder, and the vivid surround system brings you to taste the living cinema effect. It has the following features:

- ◆ Progressive scanning output to produce steadier and clearer pictures without flickering
- ◆ Composite video, S-video and component video output
- ◆ Digital picture adjustment to sharpness, brightness, contrast, chroma and saturation of pictures, gamma correction
- ◆ Built-in Dolby digital decoder
- ◆ Hi-Fi stereo headphone output
- ◆ FM/AM digital tuning function, capable of storing (memorizing) 20 FM/AM radio stations respectively
- ◆ Compatible with DIVX, MPEG4 format movie

3.1.2 Block diagram principle of the player

The player is composed of decode & servo board, power amplifier board, input/output board, panel, headphone board, tuner, power board and loader. Shown in the figure 3.1.2.1, except that power board is not shown, other signal flow is basically shown in the figure. The main function of loader is to read disc information and send to MT1389, MT1389 finishes servo function through D5954 on decode board and other supplementary circuit, other circuits are used to guarantee the normal working of loader. FLASH on decode board is to store system program, SDRAM is to store program and information of sound and picture read from disc when the machine is working and guarantee their normal output. The main function of power amplifier board is to perform audio DA conversion and amplification of analog signal to output 5.1CH to guarantee the normal working of external speaker. The main function of AV board is to output various audio and video signals. This player is attached with headphone and microphone to meet requirements from customers. In addition, there is external sound input, and you may use the power amplifier board of this player to perform power amplifying to it to facilitate to output to speaker. The tuner of this player also makes it have tuning function, and it also equipped with SAA6558 chip, so it may realize RDS function of Europe and RBDS function of US.

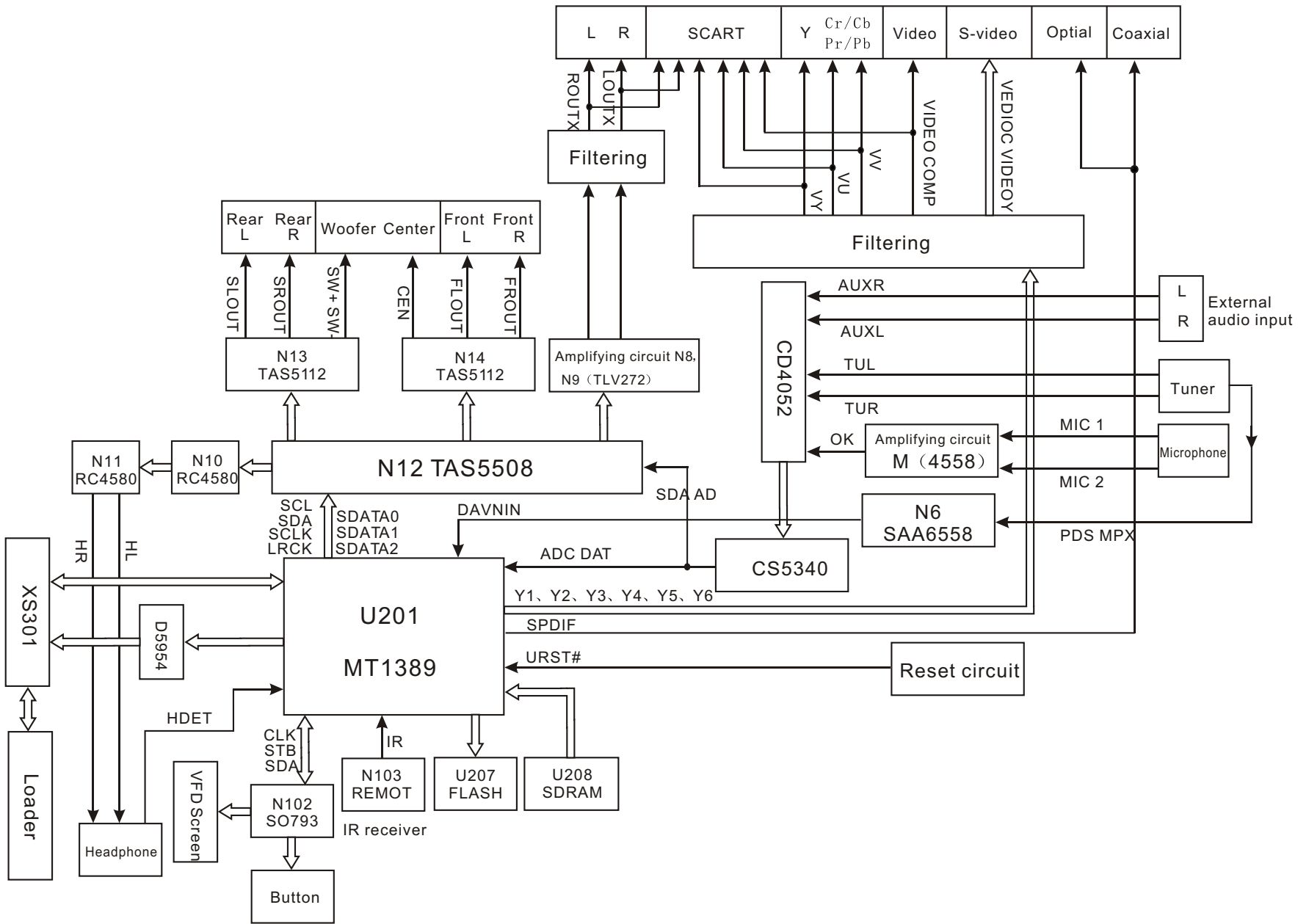


Figure 3.1.2.1 Block diagram of the player

Section Two Unit Circuit Principle

3.2.1 Decode circuit

1. Decode circuit block diagram is shown as in the following figure 3.2.1.1:

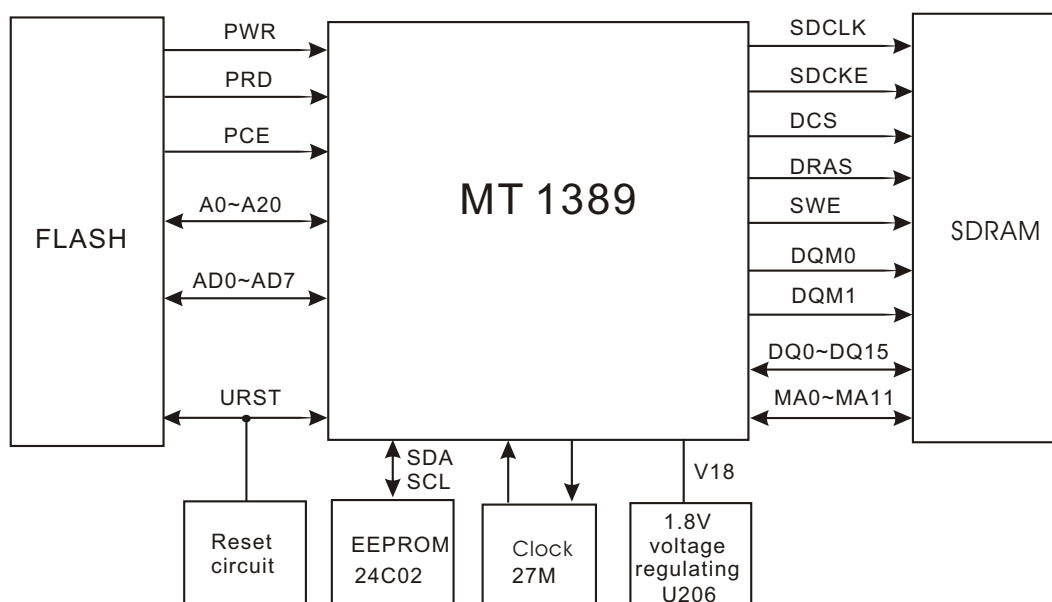


Figure 3.2.1.1 Decode circuit block diagram

2. Working principle: this decode circuit is mainly composed of MT1389, SDRAM and FLASH.

Working condition of decode circuit has:

(1) Reset: refer to reset circuit working principle for details.

(2) Clock: this system adopts 27M external clock input, and produces clock signal required by system inside through internal frequency doubling circuit.

(3) Power: decode chip adopts two groups power supply of 3.3V and 1.8V, in which 1.8V mainly supply power for internal logic control circuit and we call it core voltage.

After power on, reset circuit performs reset to MT1389 built-in CPU (8032) and FLASH, decode chip outputs reset signal at the same time and performs reset to other circuit. After system reset, it firstly sends out read signal to FLASH to read out information saved in FLASH, the machine displays power-on picture, servo system begins to work to check whether machine closes door to proper position and

Whether detect switch has been closed, if not, the door close action is performed. After detect switch of door is closed, the machine begins to perform preparations of disc reading and performs panel display at the same time of working.

Playback process: laser head picks up disc signal from disc, after servo system processing, then send to decode circuit for decoding, signal after being decoded is saved in SDRAM for the moment. When machine needs to replay signal, decode circuit calls information inside SDRAM to perform D/A conversion and then output.

User information storage: information content set by user is saved inside EEPROM, if user does not refresh or reset this information, it will saved in IC permanently.

Audio, video output circuit: at present, MT1389 all integrates video D/A converter, MT1389E inside integrates audio D/A converter, manufactures select according to their own needs. Please refer to circuit principle diagram and audio circuit explanation for details.

3.2.2 Servo circuit

Servo system of this player adopts SANYO loader + MTK decode solution (MT1389E+FLASH (16M)+SDRAM (64M)), and its servo circuit is mainly composed of front stage signal processing and digital servo processing, digital signal processing IC MT1389E and drive circuit D5954, in which MT1389E is also the main composition of decode circuit at the same time, shown in the figure 3.2.2.1:

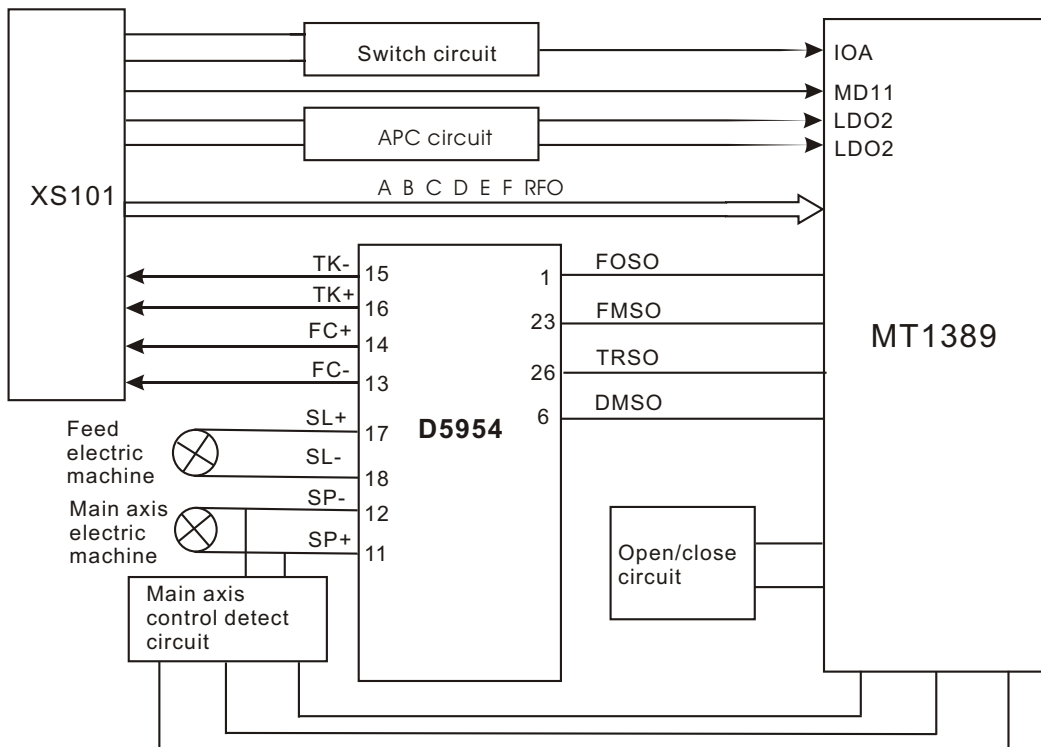


Figure 3.2.2.1 Servo circuit block diagram

2. Working principle:

After powering on or closing to proper position (on loader frame for general DVD player, on PCB board of below part of card door for PDVD player), loader lens begins to reset; after laser head is on proper position, detect switch will give a signal to MT1389, MT1389 begins to output focus, main axis and light emission signals, disc begins to rotate, laser head begins to recognise disc information, and judges whether disc is CD or DVD according to disc information to facilitate to output level from IOA pin to control disc switch circuit and laser head PDIC to make the corresponding control acts. At the same time, Mt1389 adjusts laser output power through laser power control circuit.

After loader reading disc information, through photoelectric conversion, A, B, C, D, E, F signals are formed to give to MT1389 (DVD only has A, B, C, D 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 added amplifying and through subtraction circuit, one part of signals produce servo error signals and form the corresponding servo control signal after being processed by digital servo signal circuit and output FOO, TRO, DMO, FMO servo control signals from pin 42, pin 41, pin 37, pin 38 of MT1389 respectively, through the integration circuit composed by resistor and capacitor, FOSO, TRSO, DMSO, FMSO signals are sent to servo drive circuit for amplifying and then brings along focus coil, trace coil, main axis electric machine and feed electric machine after drive amplifying. 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 reading DVD signals, these signals are conducted ESM demodulation inside MT1389, and then sent to latter stage for decoding after finishing RSPC error correction inside. General DVD player has a open/close circuit, which controls the in/out action of door to reach the purpose of conveying discs. PDVD player adopts manual means to open the door, and you may judge whether door closes to proper position through detect switch.

3. Explanation to servo terms

(1) FOO: because of the error in disc make, 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. The main act is to make object lens move upwards and downwards.

(2) TRO: data information is saved in disc in form of tracks. When disc is rotating, there will be track

Deviation, now laser head is required to adjust. In this process, the object lens moves forwards or Backwards, and the moving range is very small.

(3) 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. The acts are obvious when opening and selecting track.

(4) DMO: it is the performance agency for main axis disc rotation. 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.

3.2.3 Laser power control circuit

1. Laser power control circuit is shown as in the following figure 3.2.3.1:

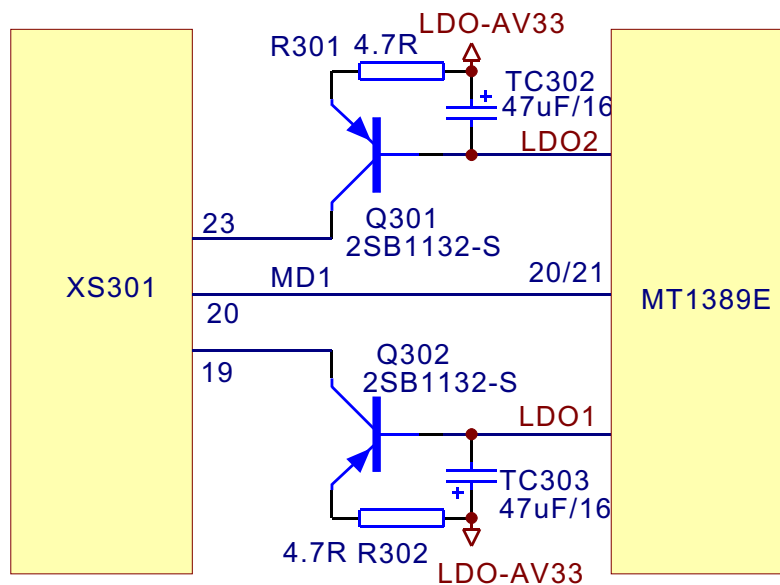


Figure 3.2.3.1 Laser power control circuit diagram

2. Working principle

Pin 20/21 of MT1389 is laser power detect signal input pin, pin 21 is DVD laser power strong/weak detect signal input pin, pin 23 is VCD laser power drive control output pin, pin 22 is DVD laser power drive control output pin.

When reading VCD disc, laser power becomes weak, voltage of MDII pin decreases, voltage decrease of pin 23 of MT1389 makes voltage of pin 19 of XS301 increase to reach the purpose of raising laser power. When laser power is too strong, voltage of MDII pin increases to lead to voltage of pin 23 of MT1389 increase to make voltage of pin 19 of XS301 decrease to reach the purpose of reducing laser power to form an auto power control circuit.

When reading DVD disc, pin 21 is detect signal input pin, pin 22 is drive control input pin, and the working principle is the same with that when playing VCD disc.

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

| 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 Main axis control circuit

1. Main axis control circuit is shown as in the following figure 3.2.4.1:

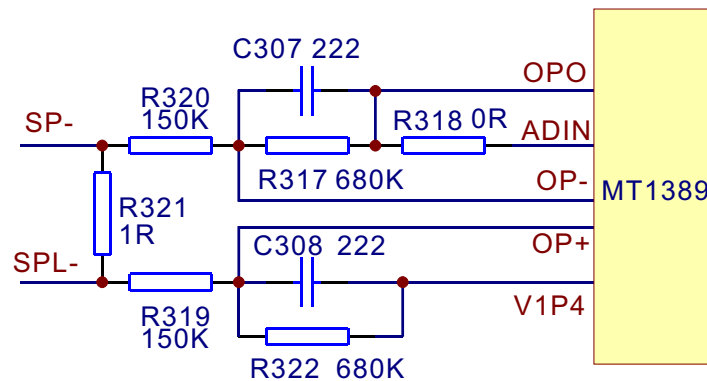


Figure 3.2.4.1 Main axis control circuit diagram

2. Function: disc is always in high speed rotation in the course of disc reading, when you need to open the door to change disc, MT1389 stops the positive direction drive signal which is given to main axis drive circuit, for the function of inertia disc is still rotating. If disc out order is performed at this time, disc will be abrasively damaged. Therefore, machine must be baking to main axis, that whether disc has stopped rotating and whether disc is reversing, decode chip of the machine cannot recognize. So a main axis control circuit is added to make decode chip can effective monitor that whether disc has stopped rotating.

3. Working principle: MT1389 has a comparator inside composed of operational amplifier, in which OP+ is the in-phase input end of operational amplifier, OP- is reverse input end, OPO is output end, when playing disc normally, for electric machine is positive direction rotating, voltage of OP+ is higher than that of OP-, voltage of OPO is more than 1.4V. When disc out is needed, main axis drive signal stops, for electric machine is permanent magnetic, when in rotating, induced electromotive force produces in two ends to give to decode chip through R320, R319 sampling to make OPO output less than 1.4V voltage and transmit to input pin of MT1389 ADIN through R318. When ADIN is high level, main axis drive output end has not any drive signal output, when ADIN is low level, MT1389 outputs a reversing drive signal to main axis drive circuit to make main axis electric machine speed down. Thus circular working goes on until main axis stops rotating. PDVD is manual disc out means, so after disc out, disc is still rotating, but will stop very son.

4. Key point voltage (unit: V) 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 |

3.2.5 Control panel circuit

1. Control panel circuit block diagram is shown in the following figure 3.2.5.1:

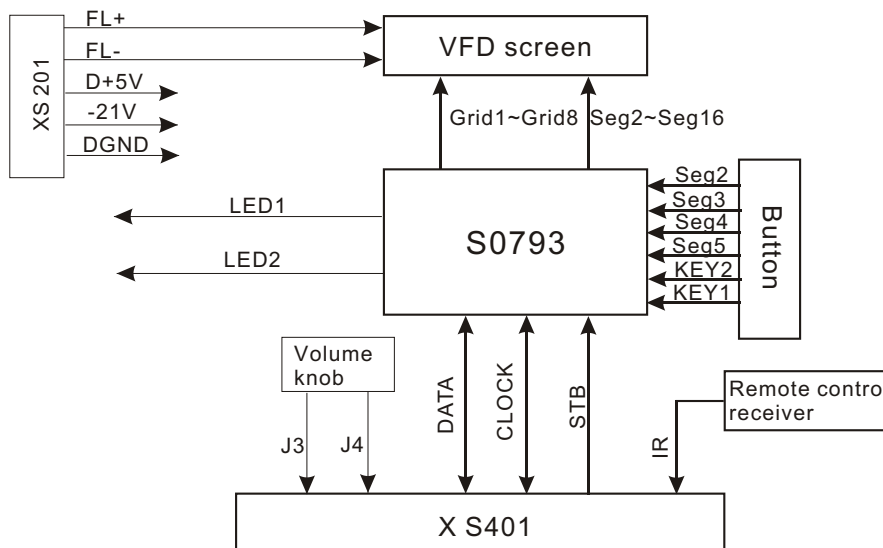


Figure 3.2.5.1 Control panel circuit block diagram

2. Working principle

(1) Realization of button function: when users are operating machine, button matrix circuit will produce a button information, and recognise button through S0793 to produce button function code to transmit to the main CPU inside decode chip, CPU performs the corresponding switch to the function module inside system, and a signal will produce to control OSD and panel display part to make the corresponding display.

(2) Panel display drive: when the serial data signals conveyed by decode chip is transmitting to panel IC (S0793), IC performs VFD drive according to the information conveyed by decode and displays the corresponding content (controlled by software).

(3) Panel light control light: LED2 controls power switch indicator light, and it is high level after power on; LED1 controls open/close button indicator light, after power on, low level is outputted to lighten VD105, square wave signal is outputted when disc out and disc reading, VD105 flashes, it is high level when playing normally, VD105 turns out.

3.2.6 Power circuit

1. Power circuit block diagram is shown in the following figure 3.2.6.1:

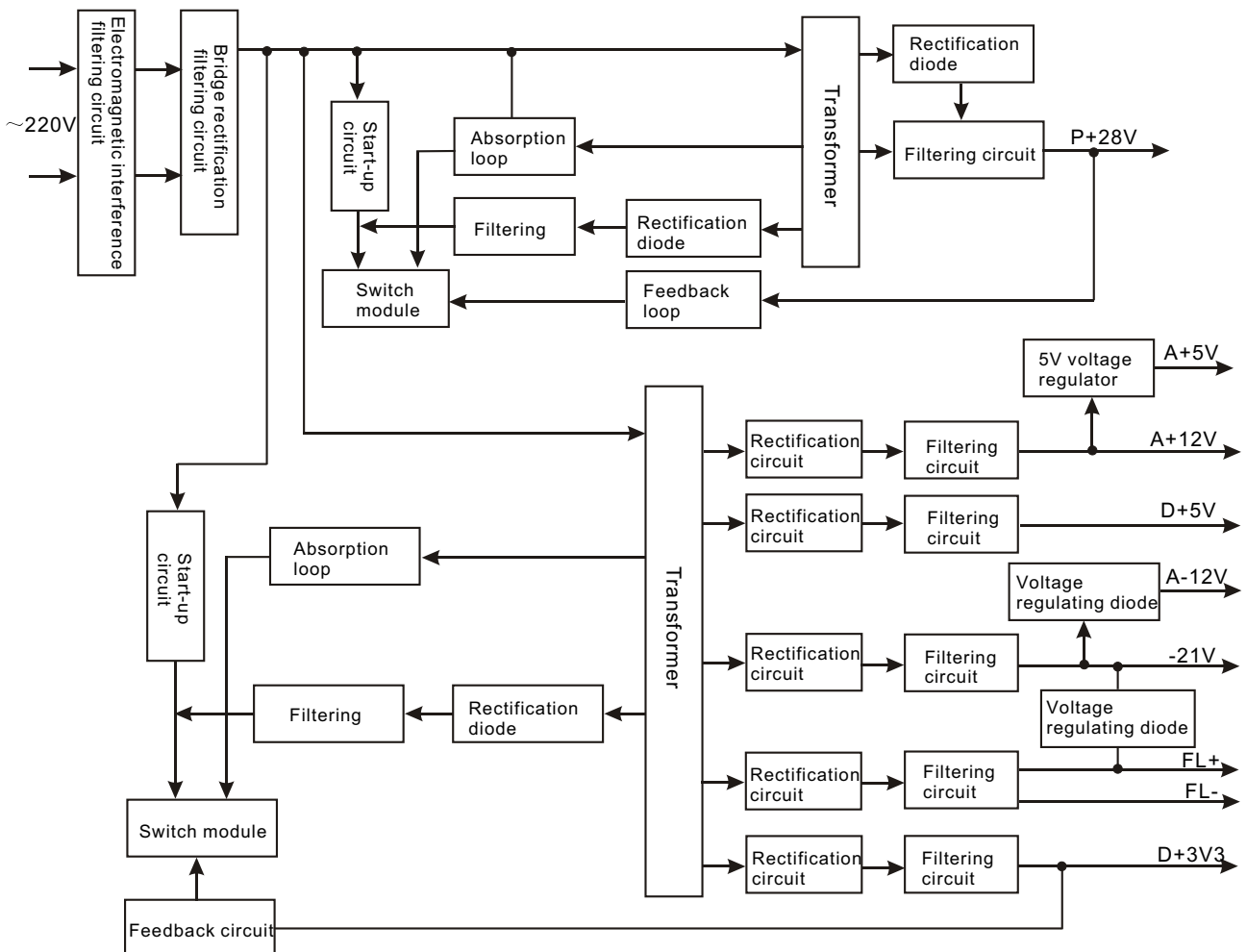


Figure 3.2.6.1 Powercircuit block diagram

2. Working principle: this power circuit is composed of two parts, which use the common electromagnetic interference filtering circuit and bridge rectification circuit and filtering circuit. The first part circuit produces P+28V DC used to supply power for power amplifier circuit; the other part is responsible for the power supply of other module circuit of the player. The working principle of each composed part is shown as follows:

(1) Electromagnetic interference filtering circuit: various electromagnetic radiation exists in the surrounding environment, so it will affect the inputted AC, and the function of electromagnetic interference filtering circuit is to filter these interference to make those that enter bridge rectification circuit is pure 220V AC.

(2) Bridge rectification and filtering circuit: the function of this circuit is to produce a 310V DC used for rear stage.

(3) Start-up circuit: when power on, transformer does not begin to work, now the start-up circuit provides switch module with a power supply voltage to make it work, after transformer begins to work normally, the voltage provided for switch module by power supply circuit maintains the working of switch module.

(4) Absorption loop: the switch module performs on/off action in a high frequency, so a strong self-inductance voltage will produce in transformer primary coil and switch module will probably be damaged. The function of absorption loop is to form a loop for this self inductance to ensure the normal working of circuit.

(5) Switch module: that inputted 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 then off for a while to produce a high/low voltage change in the primary stage of transformer, thus the transformer can work.

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

(7) Rectification diode: the voltage that outputs from transformer is pulse DC, the function of rectification diode is to change pulse DC to DC together with the filtering circuit behind.

(8) Feedback loop: the time of "on" and "Off" in the same cycle inside switch module 5L0380R is decided by feedback loop. Feedback loop perform sampling to +3.3V output voltage, when output voltage is too high, through feedback loop, the space occupation ratio of pin 4 signal of 5L0380R is changed, the "on" time decreases, and output voltage begins to decrease. When output voltage is too low, the voltage sampled is on low side, through feedback loop, space occupation ratio of 5L0380R increases, output voltage increases to make power board output stable voltage through the function of feedback loop. LM431 used in this power is a 2.5V comparator, compare sampling voltage with this 2.5V voltage, when sampling voltage is more than 2.5V (means output voltage is on high side), LM431 is on, light emission diode in photoelectric coupler begins to emit light to make the other end of photoelectric coupler begin to be on, the light emission is stronger, the "on" degree is large, the "on" time of switch module 5L0380R decreases, output voltage begins to decrease. When sampling voltage is less than

2.5V (means output voltage is on low side), LM431 cuts off, the “on” time of VEPR22 increases, output voltage increases, thus power board outputs stable voltage through the auto control function of feedback loop.

(9) Filtering circuit: the function is to produce a stable and small-ripple DC voltage. “Π”-style filter is often adopted in filtering circuit. The features of capacitor filtering are: when load resistance is high and current is small, filtering function is obvious; for inductor filtering, when load resistance is small and current is large, filtering function is obvious. Constitute capacitor to “Π”-type filter, it may have better filtering effect.

3. Main functions of various voltage outputted by power board:

- (1) -21V: supply power for panel main chip N102.
- (2) FL+;ϕFL-: supply power for filament of panel display screen.
- (3) D+5V: supply power for N102, servo drive chip U302 (D5954) and open/close circuit.
- (4) P+28V: supply power for audio power amplifying chip N13, N14 (TAS5112).
- (5) A-12V, +12V: 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) and tuner.
- (6) D+3V3: supply power for U201 (MT1389), U214 (FLASH), U211 (SDRAM) and U205 (74HCU04).
- (7) A+5V (pin 5 of XP203): supply power for loader.
- (8) A+5V (pin 1, 2 of XS504): supply power for power amplifier board ADC chip N7 (CS5340), and digital audio pulse modulating chip N12 (TAS5508).
- (9) A+5V (pin 4 of XS504): supply power for power amplifier board data selection chip N5 (CD4052), and audio power amplifying chip N8, N9 (TLV272).

3.2.7 Audio power amplifying circuit

1. Audio power amplifying circuit block diagram is shown in the following figure 3.2.7.1:

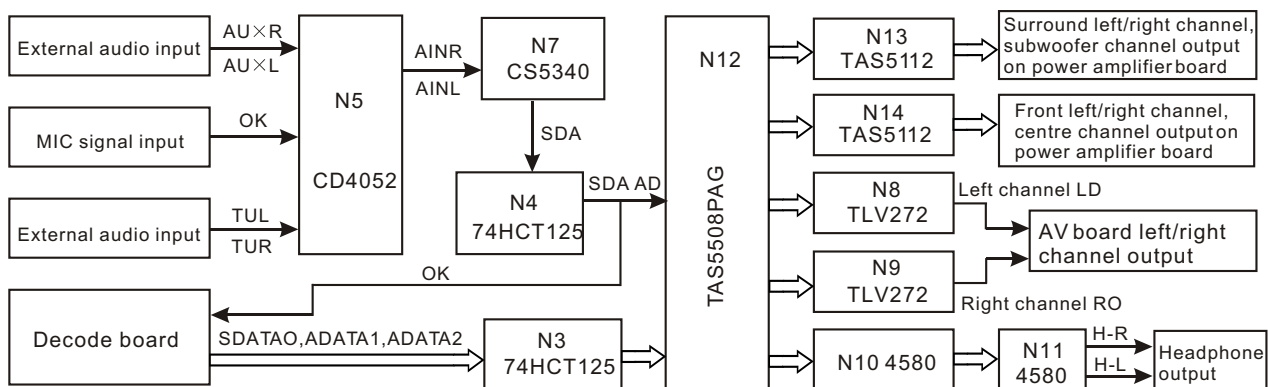


Figure 3.2.7.1 Audio power amplifying circuit block diagram

2. Working principle: the system switches DVD signal and external input signal through the control of N3, N4 by M0, M1. When M0, M1 is 0, 1, through the selection of DVD signal bu system, N3B, N3C, N3D, N4A, N4B, N4C of tri state gate buffer open, N3A and N4D close, 1389 sends the digital audio signals SDA_LR, SDA_SLSR, SDA_SCW, SCLK, LRCK to 5508 directly for formatting, and the system clock MCLK of power amplifier board is provided by 1389 through pin 6 of XP207, after being converted by CS5340 AD , MIC signals are directly sent inside 1389 for processing, and overlapped to left/right channel to output together after processing; when M0, M1 is 1, 0, through the selection of external input signal (radio set and external audio input) by the system, N3B, N3C, N3D, N4A, N4B, N4C, N3A of tri state gate buffer close, N4D opens, after being converted by CS5340 AD , external audio signals are connected to SCLK, LRCK, SDA_AD and sent to 5508 for format conversion, and the system clock MCLK of power amplifier board is generated by external crystal oscillation Y3.

N5 (CD4052): CD4052 is a select switch, which selects is the three-path signals of external input tuning signal, MIC signal and left/right channel audio signal. When the player is selecting the state of playing disc, MIC signal can be gated. Through CS5340, MIC signal converts to digital signal, which inputs to decode board for processing and then output from pin 217 (ASDATO) of Mt1389 to power amplifier board. Note: the MIC signal through CS5340 does not pass through N4 (74HCT125).

N7 (CS5340): convert the analog signal sent out from CD4052 into digital signal for processing in rear stage circuit.

N3, N4 (74HCT125): 74HCT125 is a gating IC with 4-channel in it, which can select the 4-path signals. N3 carries out the gating for the 4-path signals of clock signal MCLK, audio signal SDATA0, SDATA1, SDATA2.

N12 (TAS5508): after performing pulse width modulating processing to the 4-path digital audio signals of SDA, SDATA0, SDATA1, SDATA2, 10-channel output produces: left/right channel output on input/output board, headphone left/right channel output, front left/right channel output on power amplifier board, surround left/right channel output, subwoofer channel and centre channel output.

N13, N14 (TAS5112): it is a high-performance amplifying IC, which modulates and amplifies the front left/right channel, surround left/right channel, centre and subwoofer after being PWM modulated by N12 (TAS5508).

3.2.8 Output circuit

1. Power amplifier surround left and right channel block diagram is shown in the following figure 3.2.8.1:

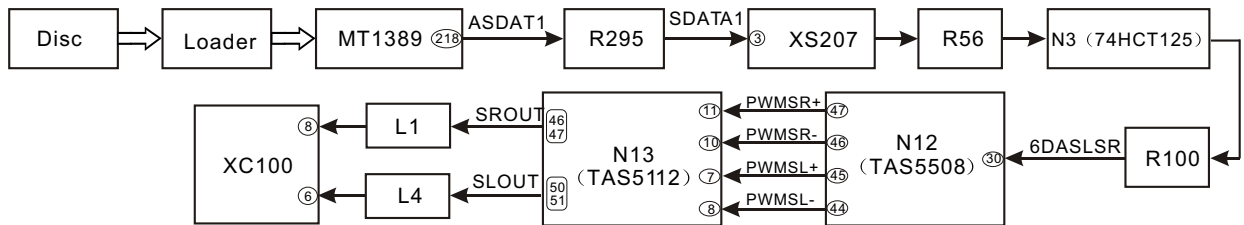


Figure 3.2.8.1 Power amplifier surround left and right channel block diagram

2. Power amplifier left/right channel output and non power amplifier left/right channel output block diagram are shown in the following figure 3.2.8.2:

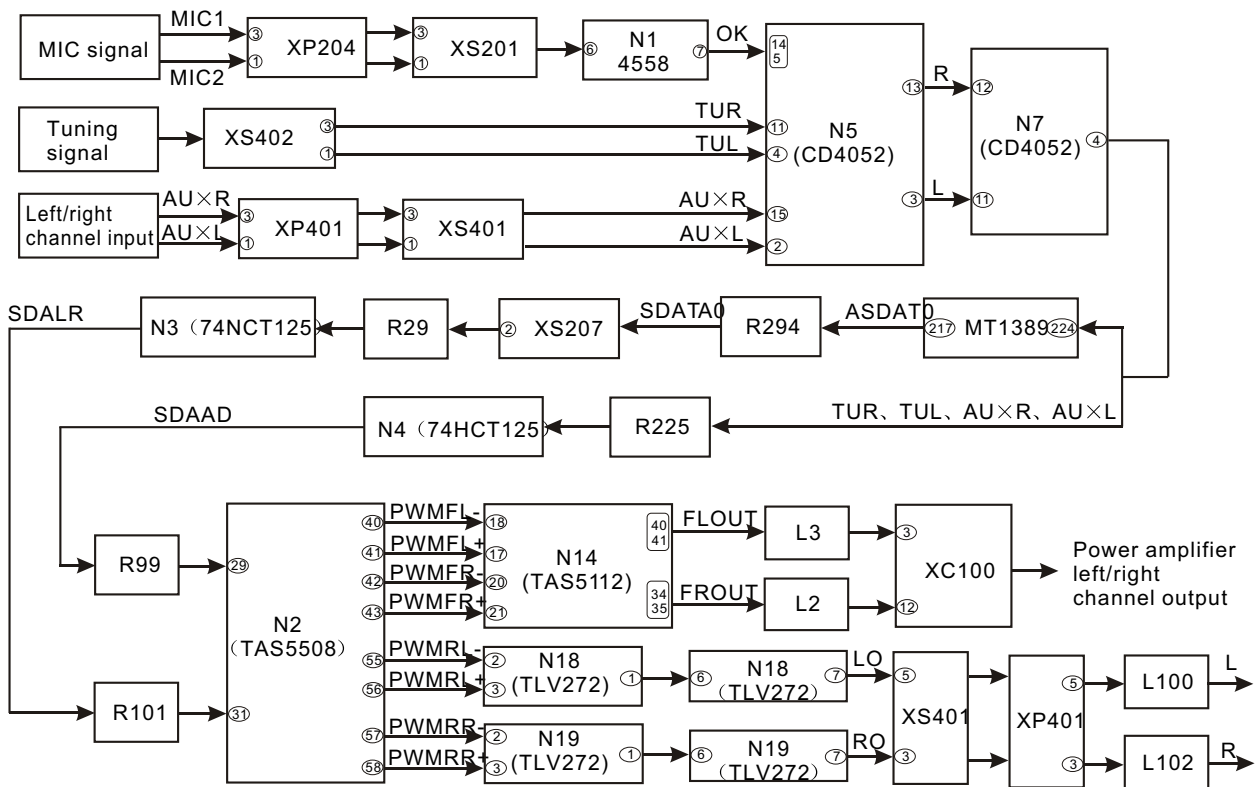


Figure 3.2.8.2 Power amplifier L/R channel output and non power amplifier L/R channel output block diagram

3. Microphone circuit block diagram is shown in the following figure 3.2.8.3:

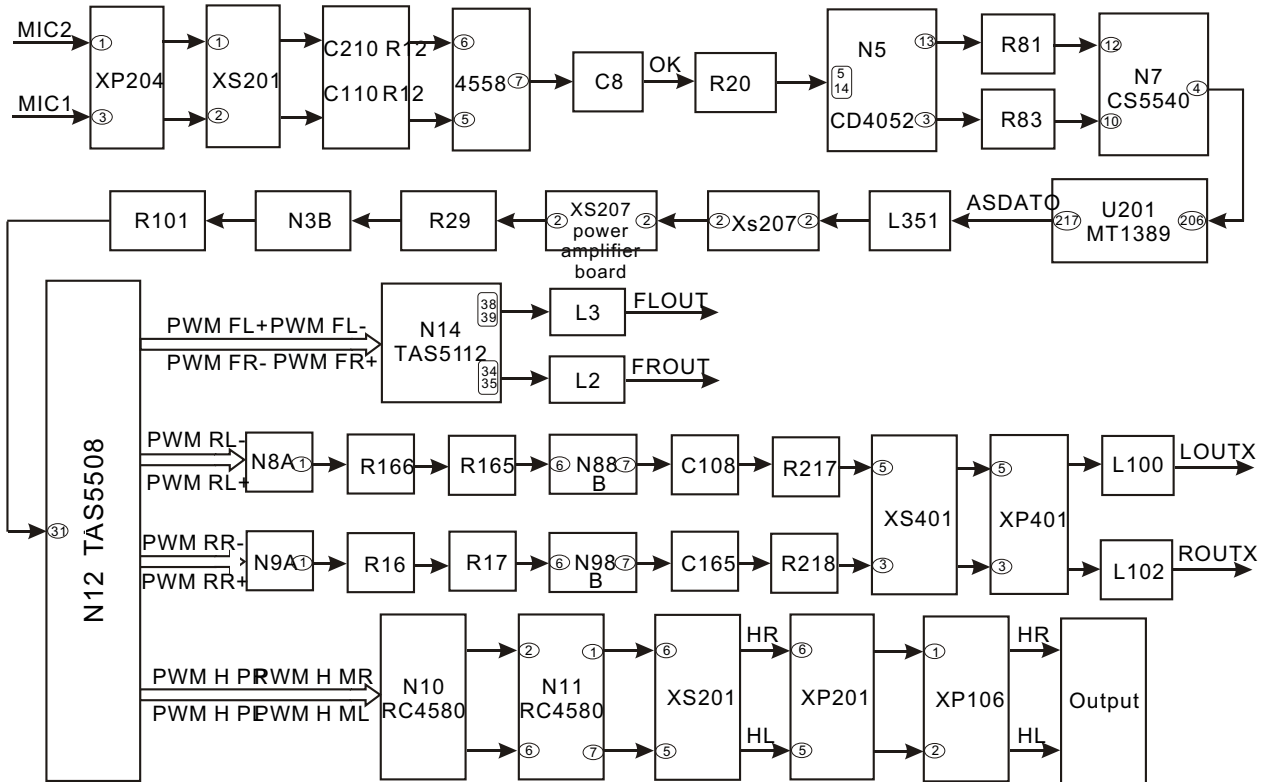


Figure 3.2.8.3 Microphone circuit block diagram

4. Headphone output circuit block diagram is shown in the following figure 3.2.8.4:

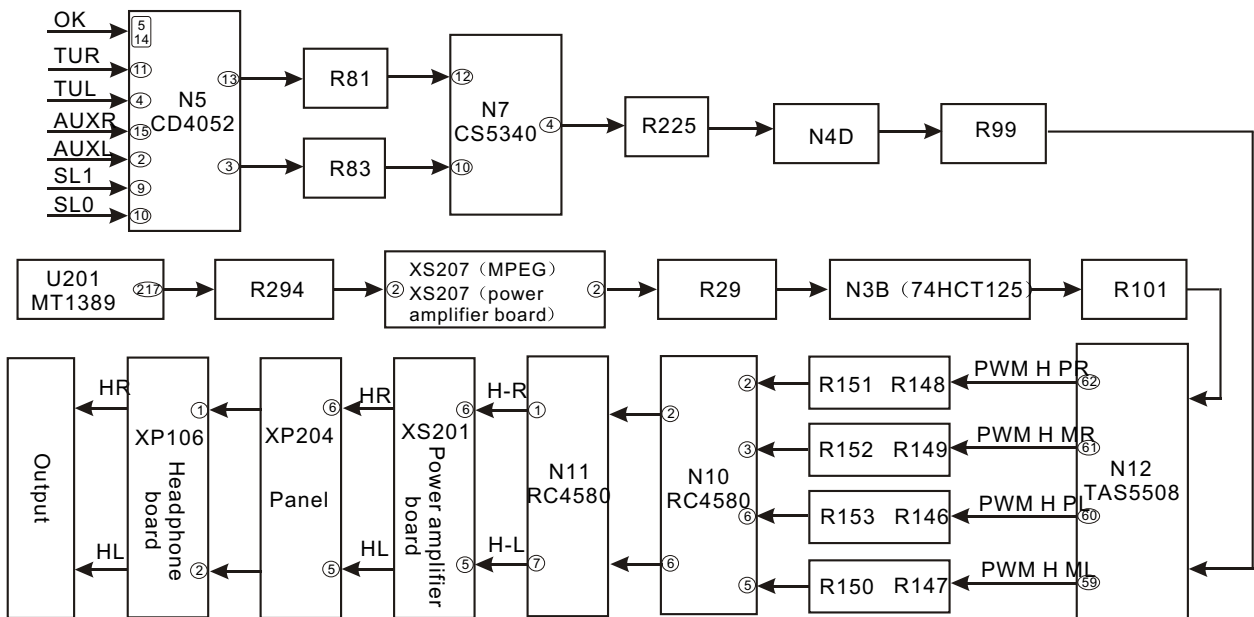


Figure 3.2.8.4 Headphone output circuit block diagram

5. External input circuit block diagram is shown in the following figure 3.2.8.5:

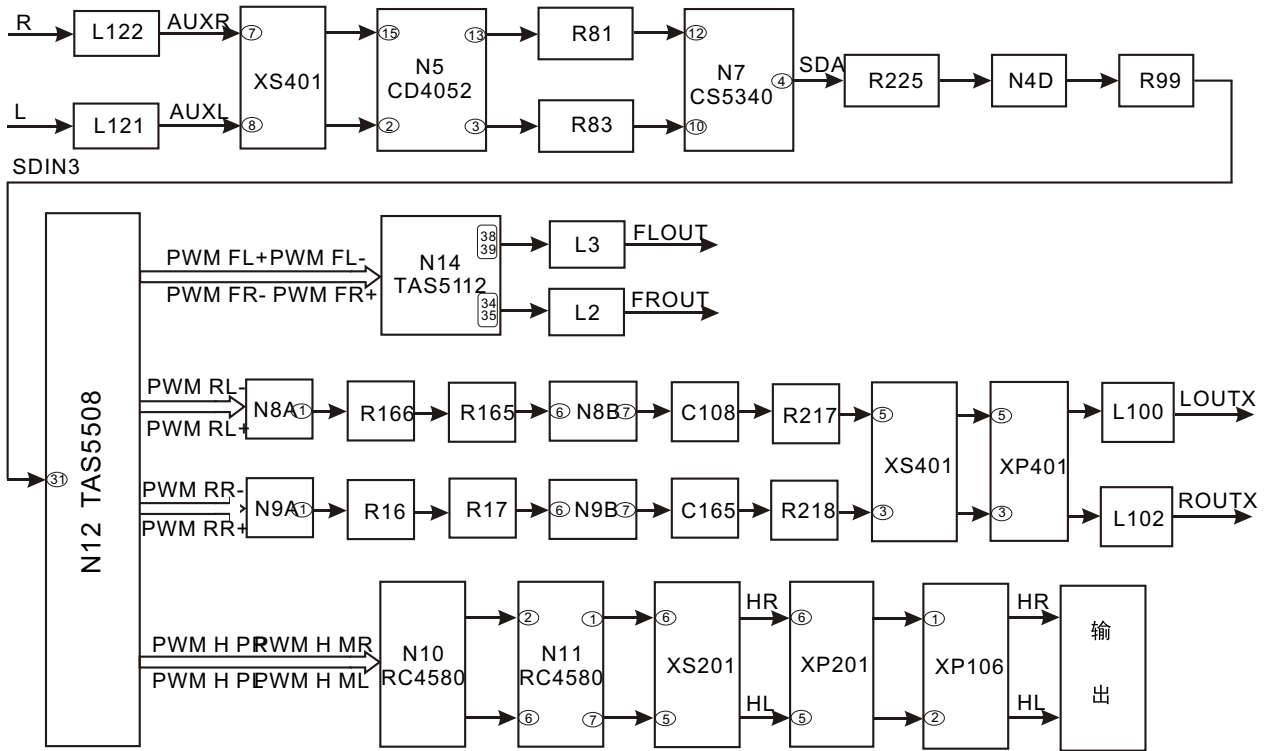


Figure 3.2.8.5 External input circuit block diagram

3.2.9 Video circuit

Video circuit block diagram is shown in the following figure 3.2.9.1:

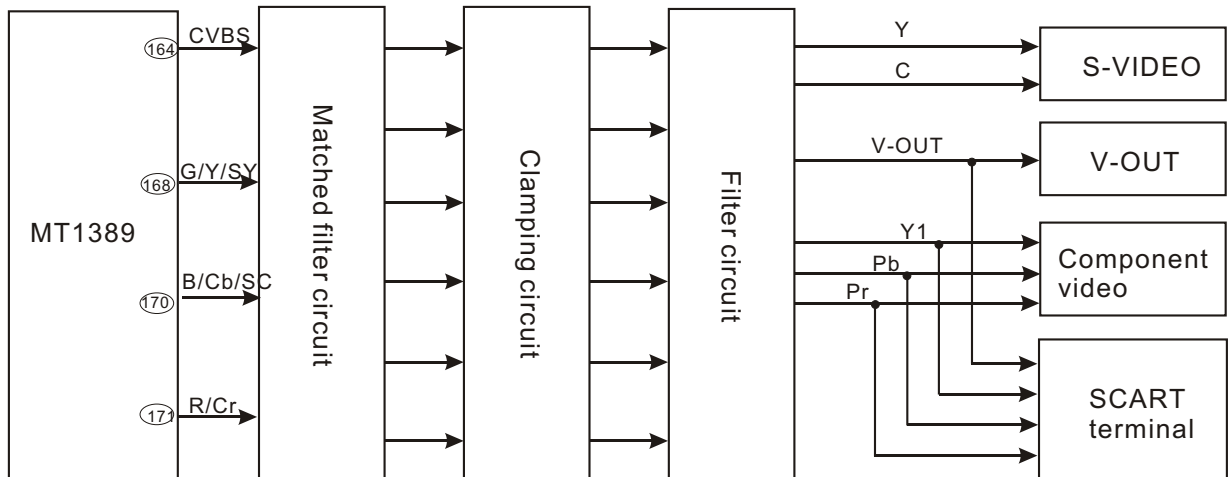


figure 3.2.9.1 Video circuit block diagram

2. On the basis of 1389B, 1389E uses some pin functions again, and reduces USB function, so it shows concise, video output pin is used again, the brightness signal, chroma signal, CVBS signal and component video signal decoded through U201 (MT1389), through low pass filtering and clipping, are sent to the corresponding terminal for output, shown in the figure 3.2.9.2:

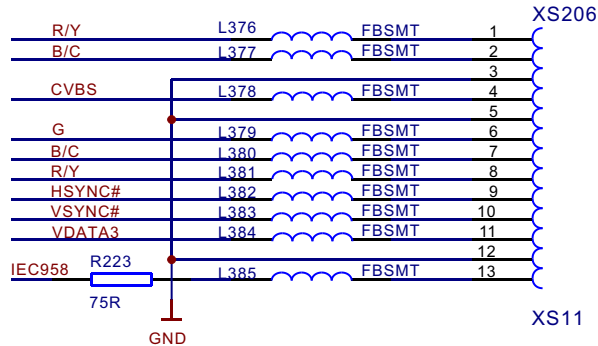


figure 3.2.9.2 Video circuit diagram

3. is shown in the following figure 3.2.9.3. This circuit is very simple, R106 is a matched resistor, which makes signal achieve the max power on load; capacitor C106, C108 and inductor L106 compose a low pass filter to filter high frequency interference signal except for useful signals; diode VD108, VD109 compose a limiting circuit; we know from features of diode that the max limitation of chroma signal Y cannot be more than 5.7V, and the min cannot be less than -0.7V, thus the high voltage signals from TV set can be prevented from burning down the player.

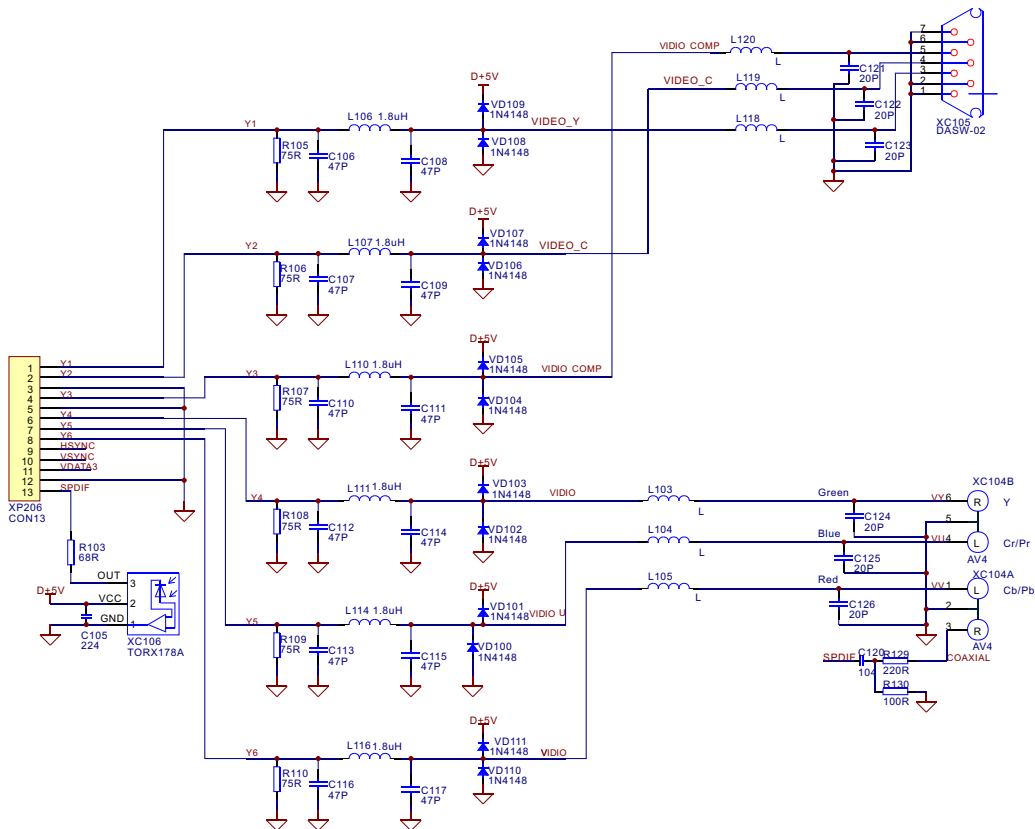


figure 3.2.9.3 Video circuit diagram

Section Three Servicing Cases

3.3.1 Servicing cases

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

Analysis and troubleshooting: Step 1: use oscillograph to test LO signal on pin 5 of XS401 on power amplifier board and find that there is no signal, after unplugging flat cable on XS401, LO still has no signal output, so we can confirm that 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 trouble lies in the circuit between N12 (TAS5508) and XS401.

Step 4: use oscillograph to test pin 2 and pin 3 of N8 (TLV272) and find 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, trouble is removed.

Note: N12 has waveform output but it is certain to be correct, because N12 may probably only output carrier signal but no modulating signal.

【Example 2】 Headphone has no sound

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

【Example 3】 External input has no sound

Analysis and troubleshooting: adjust DVD plauer in AV IN state, and find that there is sound when playing disc, so we can preliminarily confirm that the common part of external input and audio output when playing disc is normal, shown in the figure 3.3.1.1, that is, elements behind N4 are all normal, and now we only consider N5, N7, N4 and circuit among them. Use multimeter to test power supply of N5, N7, N4 and it is normal, use oscillograph to test output pin of N5 pin 13 and 3) and they both have signal

Output, then when checking pin 4 of N7, there is no signal output, use multimeter to test whether circuit between N5 and N7 is connected and also no trouble is found. After changing N7 (CS5340), trouble is removed.

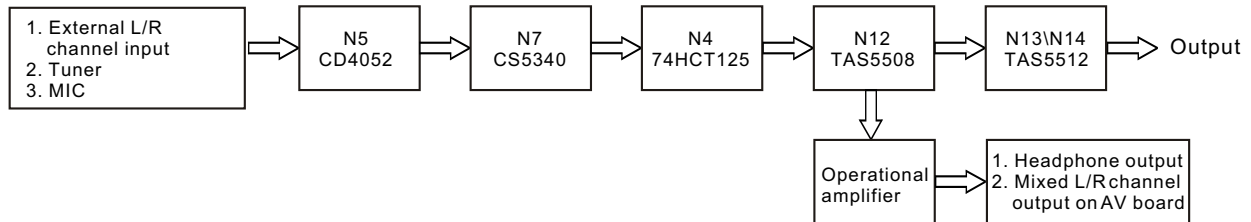


Figure 3.3.1.1 Signal flow chart

【Example 4】 Sound distortion

Analysis and troubleshooting: Step 1: check power amplifier board +28V power supply and +5V, +3.3V, +12V, -12V and they are all normal, check clock on power board and it is also normal.

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

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

Step 4: check clock of MT1389 and it is 26.999MHZ, which is normal. Check the output of pin 2 of +1.8V voltage regulator U202 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: through the above steps, carefully check power supply of MT1389, and find that L235 is burnt down, resistance value becomes large, after changing L235, trouble is removed.

Conclusion: after some preliminary checking, if trouble is not found, you may change circuit board to make sure which board trouble lies in to facilitate the next operation. As for sound trouble, if power supply and clock is both normal, you may consider changing IC.

【Example 5】 Power amplifier has no sound

Analysis and troubleshooting: shown in the figure 3.3.1.2; Step 1: check power amplifier board +28V power supply and that on XP101 and they are both normal, check clock and it is also 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 it has no output (you may also check other output pin), check pin 28, 29, 31 (audio signal input pin) of N12 (TAS5508) and all signals have input, so we preliminarily judge that TAS5508 has trouble.

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

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

Step 6: after removing resistor R142, R143, voltage output of SW+ and SW- is +14V, which is normal. We judge that one of R142 and R143 has trouble, after changing it, voltage of SW+ and SW- changes to +6.02V, and trouble is still not removed.

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

Conclusion: N13 is damaged inside, after connecting R142, R143, it will form loop with ground, which will lead to abnormal working of N13 to make SD signal of pin 6 output low level, this signal controls TAS5508 and performs self-protection function and cannot output signal, which makes us consider that TAS5508 is damaged.

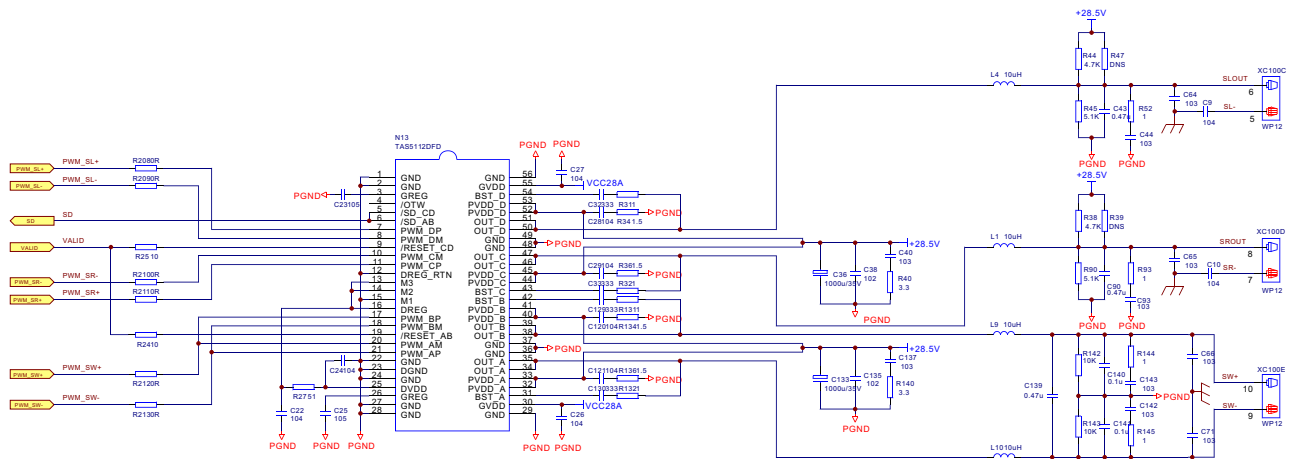


Figure 3.3.1.2 Power amplifying circuit diagram

【Example 6】 MIC has no sound

Analysis and troubleshooting: when playing discs, use remote controller to open MIC item and there is still no sound. Check power supply of 4558, CD4052, CS5340 and they are all normal. Use oscillograph to test pin 6 input of 4558 and it is normal, pin 7 has no input, check R4, C6 and they are both normal, so it is doubted that 4558 is damaged, after changing 4558, MIC is normal.

【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 working normally, 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 conditions, if headphone is not inserted, voltage in this place should be +2.9V; when power off and headphone is not inserted, use multimeter to

Test the resistance to ground of HDET signal of pin 7 of XS207 and it is 0 ohm, and it should be infinite in normal conditions, so we preliminarily confirm that HDET signal is short-circuited to ground, unplug flat cable on XS201, test the resistance to ground of pin 7 of XS201 and it is infinite, which is normal, and now test the resistance to ground of pin 7 (HDET) of XP204 on panel and it is still 0 ohm, so we can consider that problem lies in main panel, headphone board or flat cable, unplug the flat cable between panel and headphone, test the resistance to ground of pin 7 of XP204 on panel and it is infinite, so we can confirm that problem lies in headphone board, but joint welding has not been found in headphone board, so only socket has trouble, after changing headphone socket, trouble is removed.

Conclusion: that the spring plate inside headphone socket has trouble makes HDET signal and ground connected together, HDET signal flow is shown in the figure 3.3.1.3:

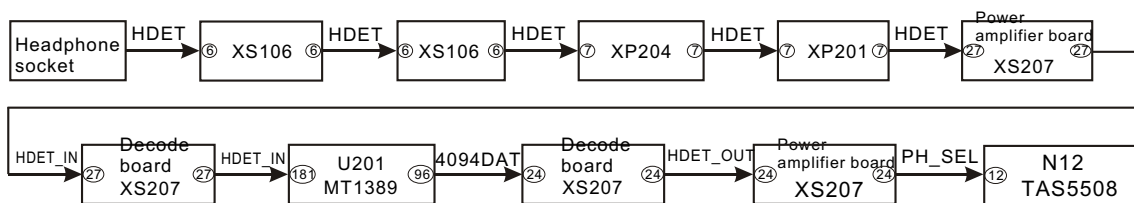


Figure 3.3.1.3 HDET signal flow chart

【Example 8】 Power not on

Analysis and troubleshooting: Step 1: check each circuit power supply of power board and it is normal.

Step 2: check clock circuit and it is normal (frequency is 27MHZ, VPP=1.8V, DC voltage on two ends is 0.75V), during the course of checking machine, you may directly test on two ends of R244 and R248, thus it is convenient, but the machine will be down or give whistle sound during test, but the test result will not be affected basically, if the influence is obvious when testing on one end of resistor, you may test the other end. Of course, as for the defective machine that power not on, the above phenomenon will not be noticed.

Step 3: check reset circuit and voltage is 3.3V, which is normal; reset by force (use a lead to make pin 6 of U205 (HCU04) grounding for about one second), nut power is still not on, so we can preliminarily decide that it has nothing to do with reset circuit.

Step 4: check power supply of MT1389 according to the troubleshooting process and it is normal; check power supply of U214 (FLASH), U211 (SDRAM) and it is normal; check pin 5 and pin 6 of I2C (U202) and they are both at +2.5V, which is also normal.

Step 5: after changing FLASH, trouble is removed.

Conclusion if there is oscillograph, firstly check whether pin 29 of FLASH has waveform, if not, a trouble may exist between MT1389 and FLASH. If there is no oscillograph, firstly consider changing FLASH, then changing SDRAM, if trouble is still not removed, then 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 there is still no voltage output on power board, so we can confirm that trouble lies in power board.

Step 2: observe element on power board and find that U505 (KAIM0880) is burnt down, then check fuse and find that fuse has been burnt down.

Step 3: use multimeter to test bridge circuit BD501 and find no abnormality (pay attention to the pin sequence of BD501).

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

Conclusion: when servicing power board, if you find that fuse and switch module have been burnt down, please check whether diode on bridge circuit has been burnt down.

【Example 10】 Power amplifier has no sound

Analysis and troubleshooting: Step 1: check HDET signal of pin 24 of XS207 on power amplifier board and it is +3.3V, voltage on XP101 and +28.5V voltage on XP503 are both normal.

Step 2: check SDATA0, SDATA1, SDATA2 (R294, R295, R296) output on decode board and it is normal.

Step 3: check SDACSW (R98), SDASLSR (R100), SDALR (R101) signals 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 TAS5508 power supply and MUTE signal and they are both normal.

Step 6: check pin 63 MCLK of TAS5508 and it is about 3MHZ, pin 26 LRCK is 48KHZ, pin 27 SCLK is about 12.3MHZ, the external crystal oscillation clock of chip is about 13.5MHZ, which are all normal.

Step 7: after changing TAS5508, power amplifier still has no sound output.

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

Conclusion: each input signal, power supply and clock signal of N12 (TAS5508) are all normal but there is no output, so directly change N12; but trouble is still not removed after changing, so the rear stage circuit may probably cause that N12 has no output, after changing N13, it resumes normal; the internal trouble of N13 leads to the short circuit of N12 output pin, N12 is with self-protection function to stop outputting signal. Power amplifier board audio signal flow chart is shown in the figure 3.3.1.4:

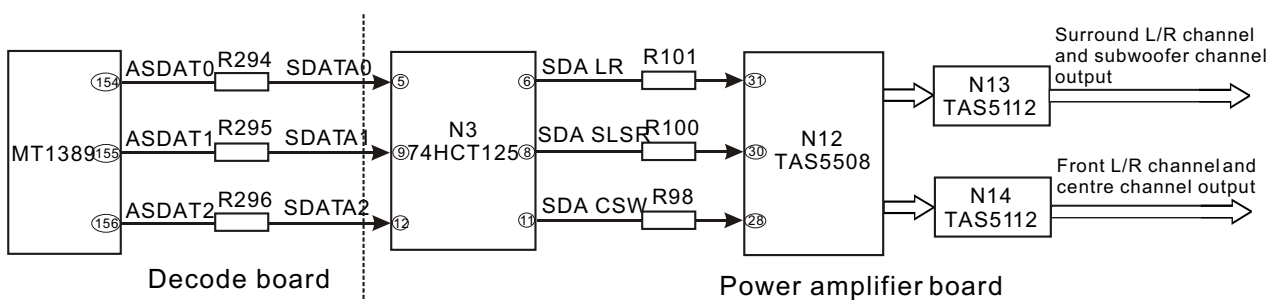


Figure 3.3.1.4 Audio signal flow chart

【Example 11】 Component color distortion

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

Step 2: check MT1389 power supply and it is normal.

Step 3: use oscillograph to test the 3 component signals of pin 6 (Y4), pin 7 (Y5) and pin 8 (Y6) of XP206 on AV board and they all have output, but when using multimeter to test DC voltage of the 3 signals, we find that Y5 has +4.7V, in normal conditions, this voltage should be two several tenths of a volt and one volt plus a little at most.

Known from the circuit, only when damping diode has trouble, it has the most possibility to make this voltage increase; when using multimeter to test diode, we find that VD100 has been stricken through, after changing it, trouble is removed.

Note: as for colour distortion problem, if problem of capacity has electric leakage, inductor has open circuit, damping diode is stricken through and or short circuit is found, please firstly consider changing Mt1389.

【Example 12】 Component video has no output

Analysis and troubleshooting: use oscillograph to test VIDEOY1, VIDEOU, VIDEOV (VD103, VD101, VD111 anode), VIDEO Y1 has no output; VIDEOU and VIDEOV have output. Test pin 6 of XP206 and pin 6 of XS206 on decode board, there is no waveform output basically. Disconnect the flat cable between XP206 and XS206, waveform of pin 6 of XS206 resumes normal, so we estimate that trouble lies in filtering circuit on AV board. Check R108, C112, C114, VD102, VD103 and find that VD102 is stricken 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 output all normal.

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

Step 3: check clock frequency of 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 bu force (use a lead to make U205 (HCU04) grounding for about one second) and find that power may be on, and the player may work normally; power of again after power off, and find that power may be on, but after power on and off repeatedly for several times, power will be off again, after reset by force, it may power on freely.

Step 6: after changing U205 (HCU04) and power on repeatedly (above ten times), there is no abnormality that power not on, so trouble is removed.

Conclusion: power also may be on when reset circuit has trouble, but it is not on sometimes, which may be caused by random trouble, now you need to test repeatedly to confirm whether reset circuit has trouble.

【Example 14】 Not read DVD

Analysis and troubleshooting: Step 1: check XS301 socket and flat cable and no abnormality is found (you may observe directly, and you need to insert it again when you find that flat cable is loose).

Step 2: change loader and trouble is removed.

Conclusion: in actual servicing, when you meet the trouble such as no disc reading, it is always difficult to judge which element has trouble, so you may try changing loader to judge where the trouble is in.

【Example 15】 No disc reading

Analysis and troubleshooting: shown in the figure 3.3.1.5; Step 1: check each flat cable and no abnormality is found.

Step 2: after changing loader, disc reading is still unavailable.

Step 3: observe laser head and find no focus acts (after opening door), other acts are normal, so it is preliminarily judged that servo circuit has trouble.

Step 4: check and find that power supply on pin 8, 9 of U301 (D5954) is normal, and that on pin 21 is also normal, check reference voltage on pin 4 of U301 and it is 1.4V, which is also normal.

Step 5: check U302, R211 and C213 and no abnormality is found.

Step 6: after changing U301 (D5954), trouble is removed.

Conclusion: in actual servicing, it is difficult to judge whether an IC has trouble or not; sometimes you may try considering changing IC and check whether trouble is removed. If there is digital oscilloscope, firstly check the end close to MT1389 of R211, if there is waveform (waveform diagram in section 4) within a small period (about 5 seconds) after disc in, the possibility that MT1389 has trouble is small, and D5954 may probably have trouble.

【Example 16】 No disc reading

Analysis and troubleshooting: shown in the figure 3.3.1.5; Step 1: check each flat cable and no abnormality is found.

Step 2: after changing loader, still no disc reading, and trouble is still not removed.

Step 3: observe laser head and find that focus, feed and main axis have no acts, even that laser head does not emit laser light.

Step 4: check power supply and clock circuit of MT1389 and some abnormalities are found.

Step 5: use oscilloscope to test the end close to MT1389 of R208, R209, R210, R211 (test within a small period after disc in), and find no obvious waveform output, so we preliminarily judge that MT1389 has trouble, after changing MT1389, trouble is removed.

【Example 17】 No disc reading

Analysis and troubleshooting: shown in the figure 3.3.1.5, Step 1: check the nerve flat cable socket on XS301 and find no abnormality.

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

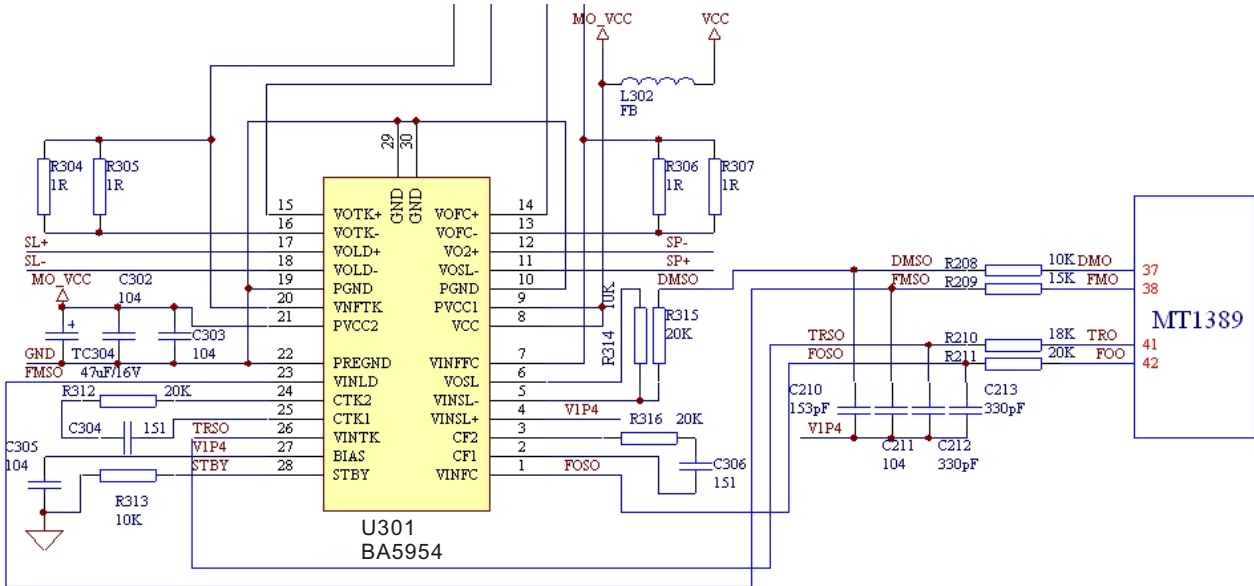


Figure 3.3.1.5 Servo drive circuit diagram

【Example 18】 No disc reading

Analysis and troubleshooting: Step 1: check XS301 flat cable and socket and there is no abnormality.

Step 2: change loader and trouble still exists.

Step 3: check power supply, observe laser head, main axis and they are both normal, but bu fucus.

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

Step 5: check MT1389 power supply and it is normal.

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

3.3.2 Troubleshooting flow chart

1. Troubleshooting process for voltage too high or too low is shown as the following figure 3.3.2.1:

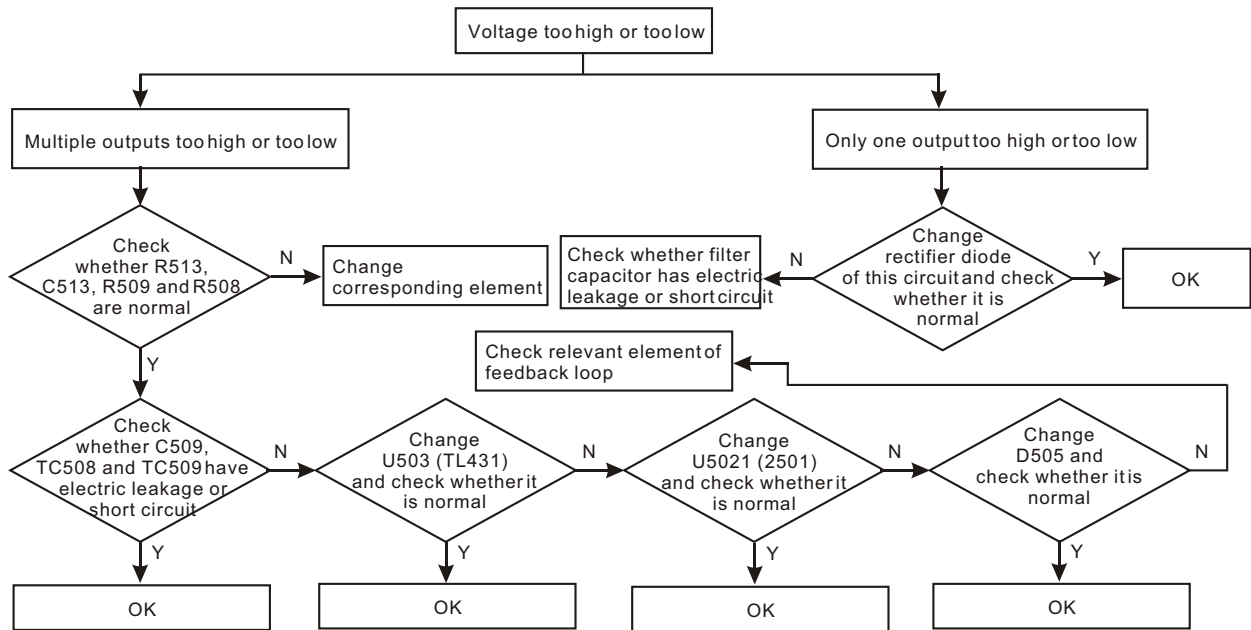


Figure 3.3.2.1 Troubleshooting flow chart for voltage too high or too low

2. Troubleshooting process is shown as the following figure 3.3.2.2:

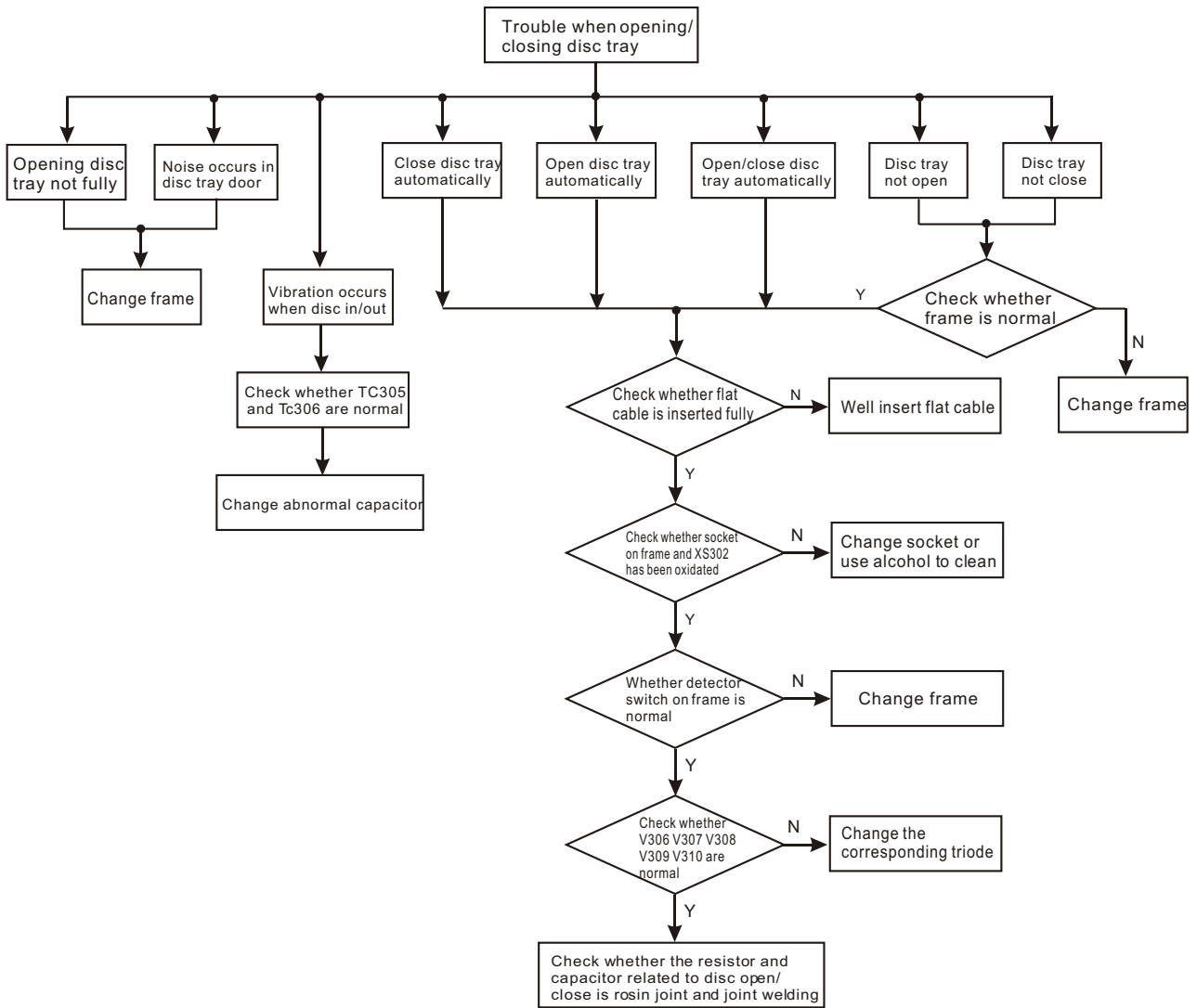


Figure 3.3.2.2 Troubleshooting flow chart when opening/closing disc tray

3. URST# is always high level troubleshooting process, shown in the figure 3.3.2.3:

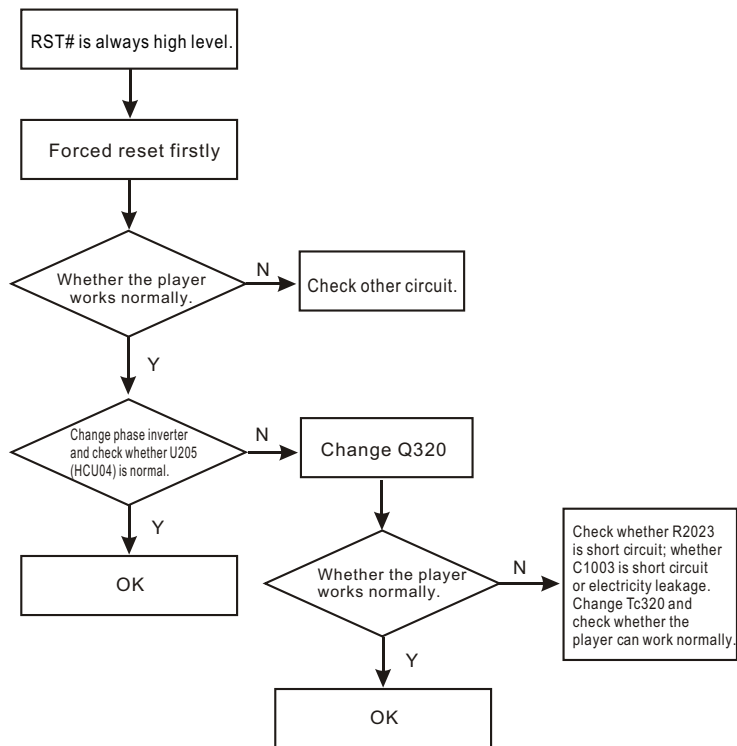


Figure 3.3.2.3 Troubleshooting flow chart when URST# is always high level

4. Troubleshooting process for “On-screen-mosaic when playing” is shown as the following figure

3.3.2.4:

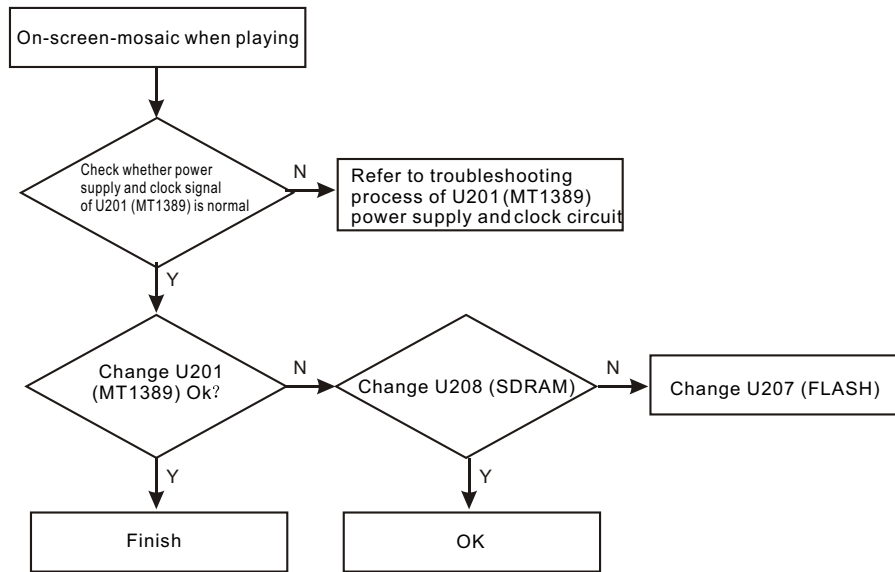


Figure 3.3.2.4 Troubleshooting flow chart of “On-screen-mosaic when playing”

5. Troubleshooting process for “No output for composite video” is shown as the following figure

3.3.2.5:

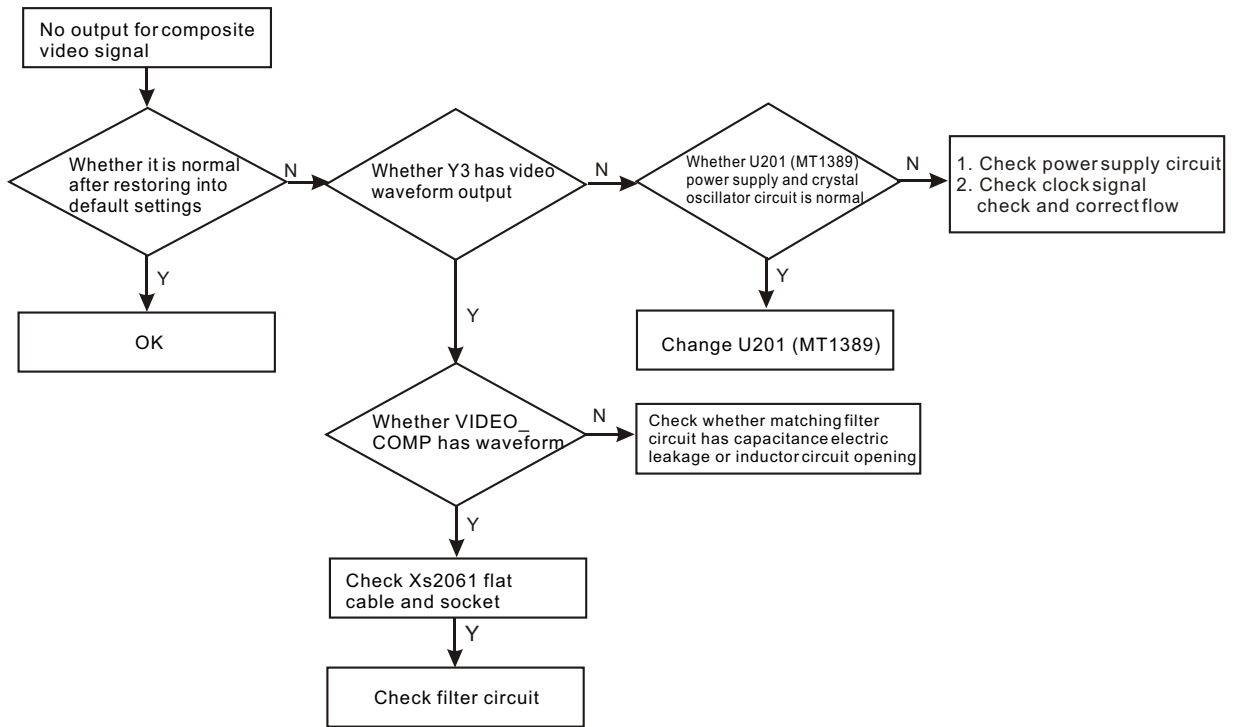


Figure 3.3.2.5 Troubleshooting flow chart of “No output for composite video”

6. Troubleshooting process for "No colour of picture" is shown as the following figure 3.3.2.6:

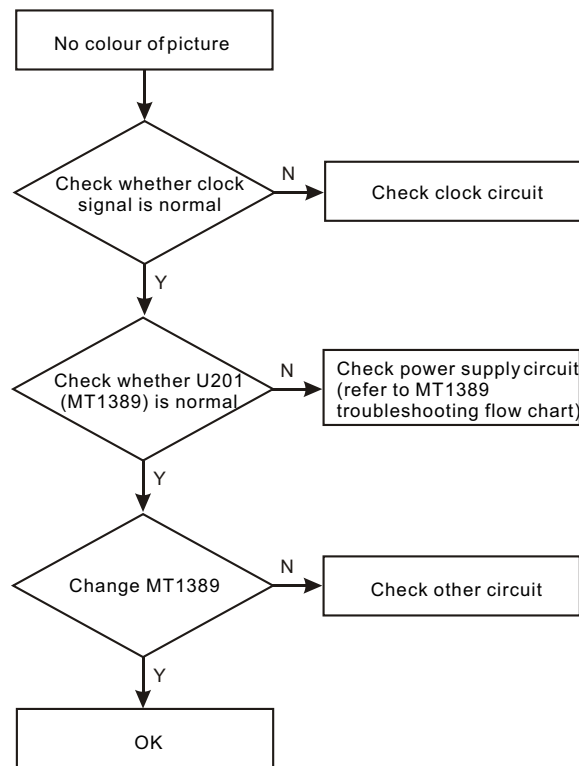


Figure 3.3.2.6 Troubleshooting flow chart of "No colour of picture"

7. Troubleshooting process for no sound of power amplifier board when playing is shown as the following figure 3.3.2.7:

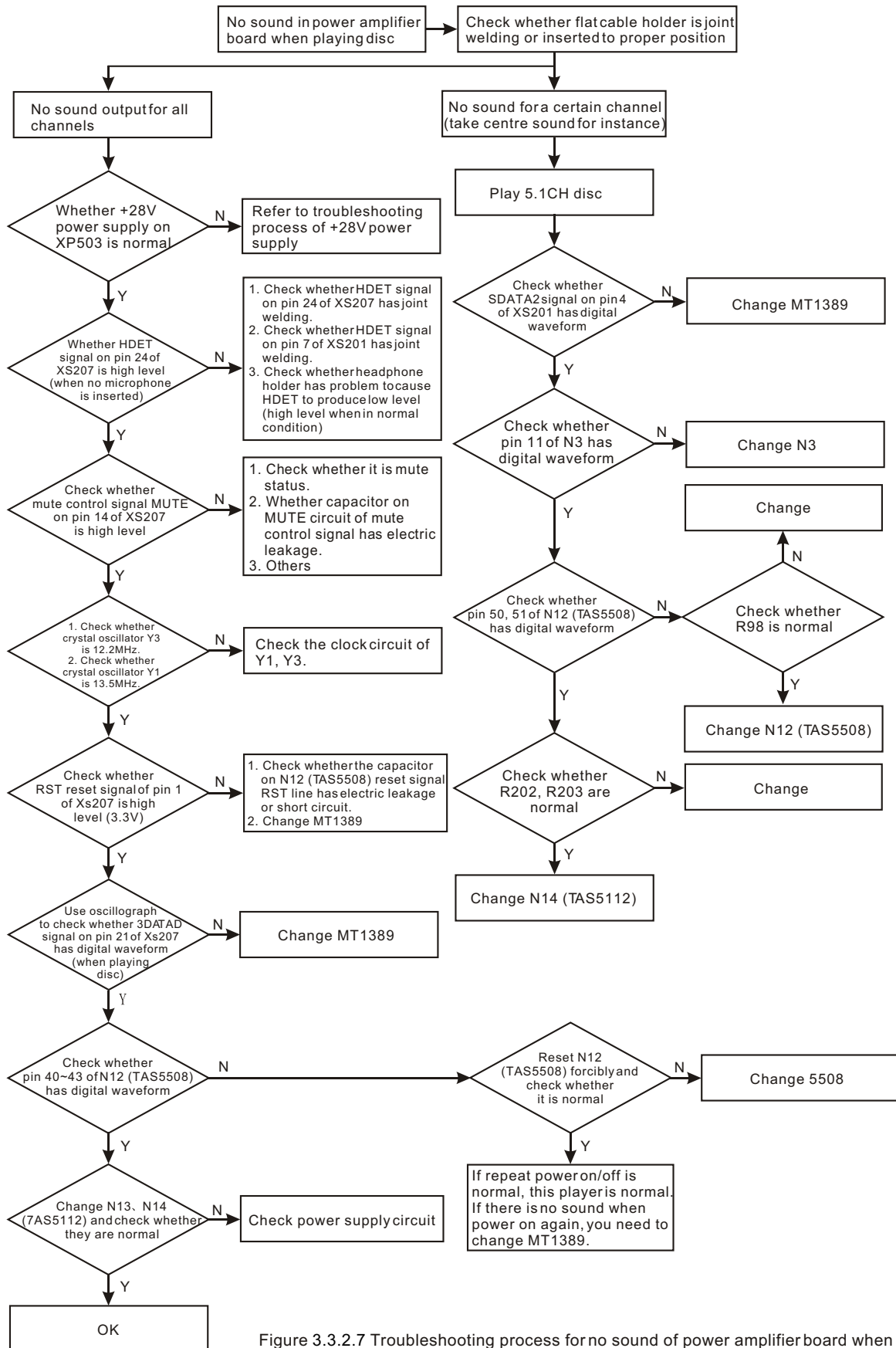


Figure 3.3.2.7 Troubleshooting process for no sound of power amplifier board when playing

8. Troubleshooting process for no sound of MIC is shown as the following figure 3.3.2.8:



Figure 3.3.2.8 Troubleshooting flow chart for no sound of MIC

9. Troubleshooting process for no sound of headphone is shown as the following figure 3.3.2.9:

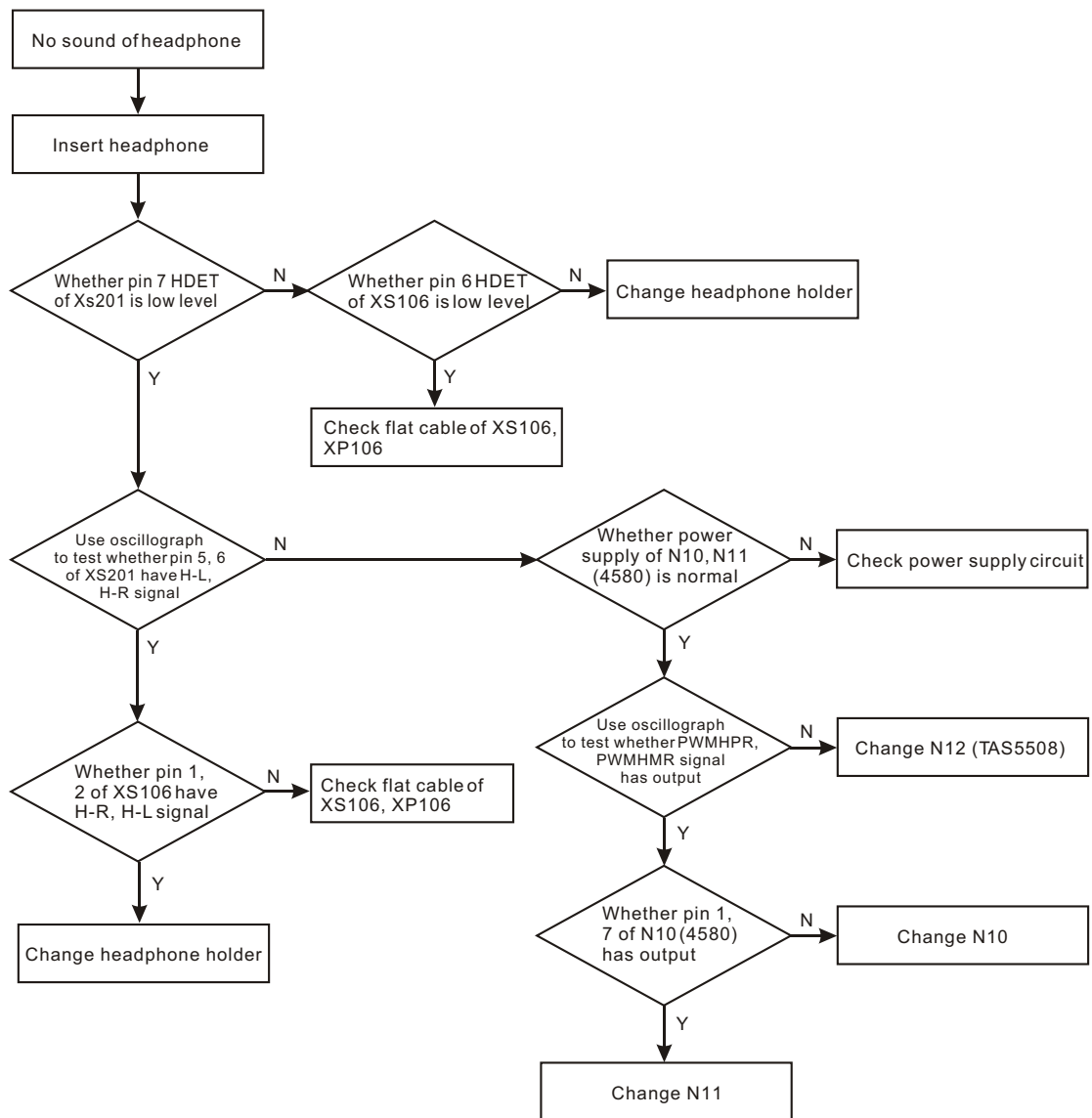


Figure 3.3.2.9 Troubleshooting flow chart for no sound of headphone

10. Troubleshooting process for no echo of microphone is shown as the following figure 3.3.2.10:

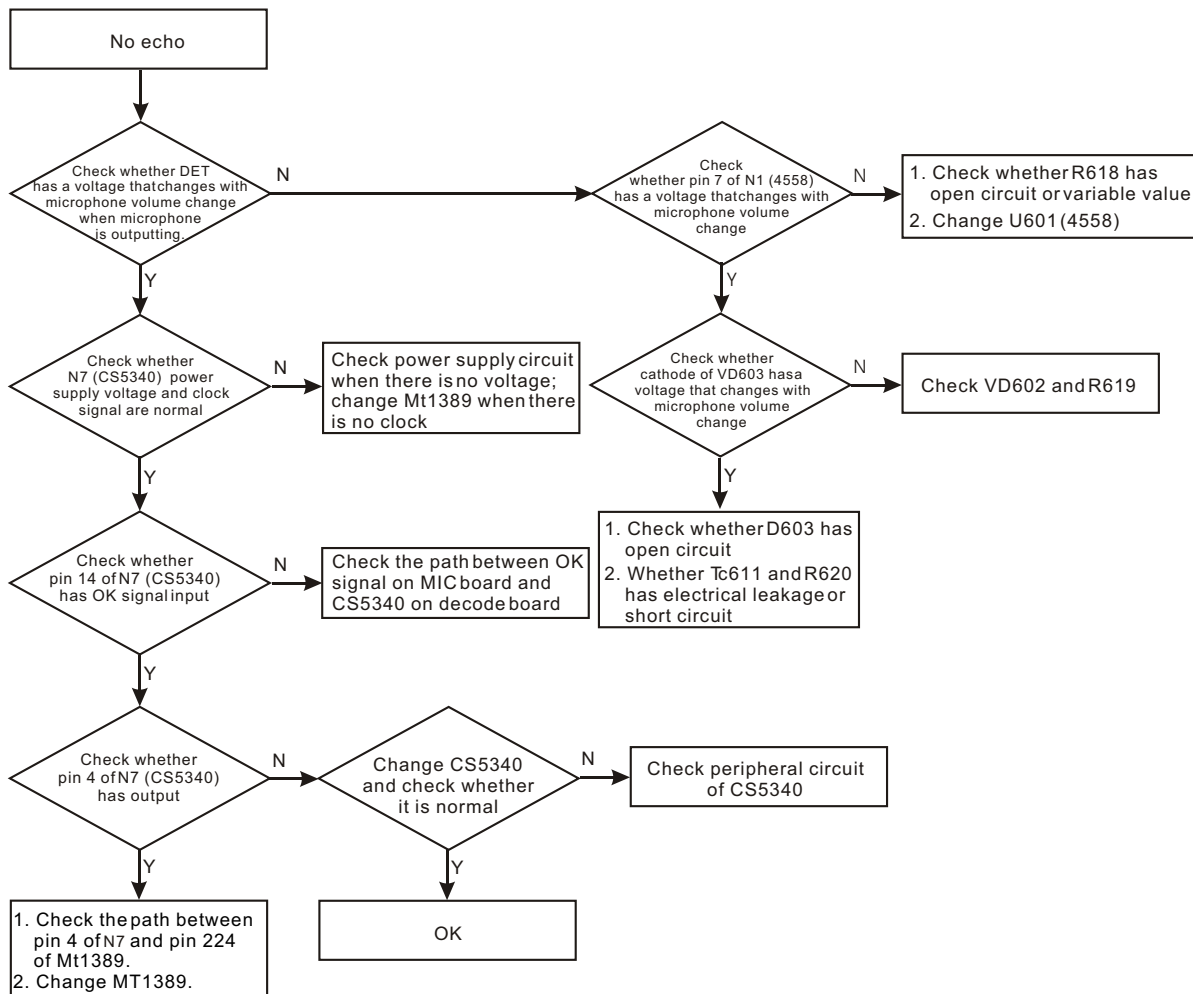


Figure 3.3.2.10 Troubleshooting flow chart for no echo in microphone

11. Troubleshooting process for no remote control function is shown as the following figure 3.3.2.11:

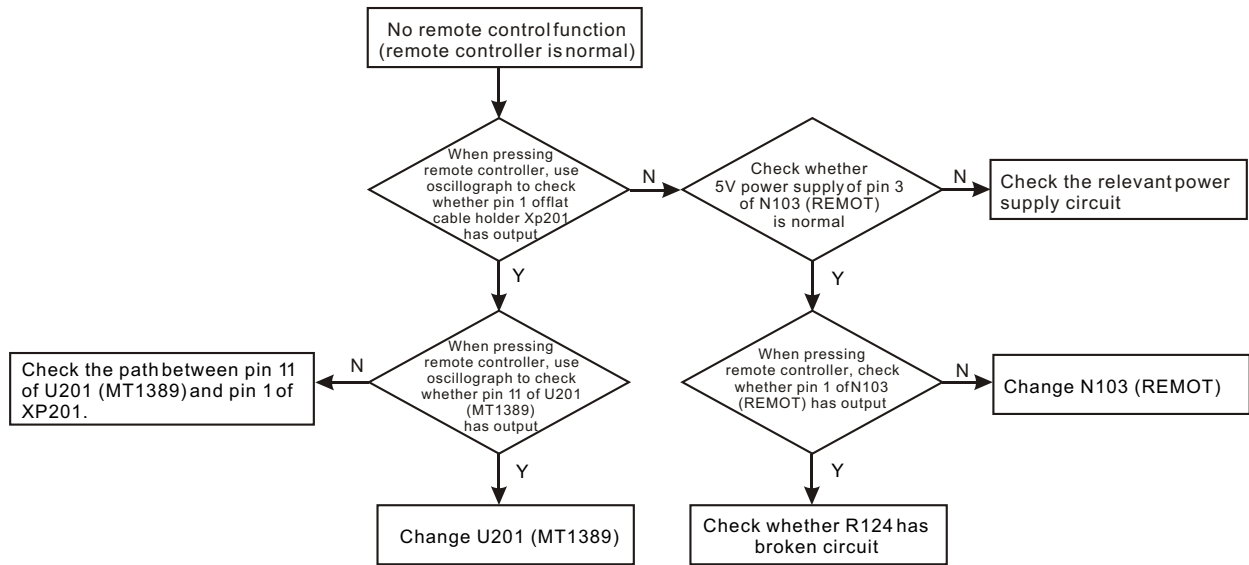


Figure 3.3.2.11 Troubleshooting flow chart for no remote control function

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

3.3.2.12:

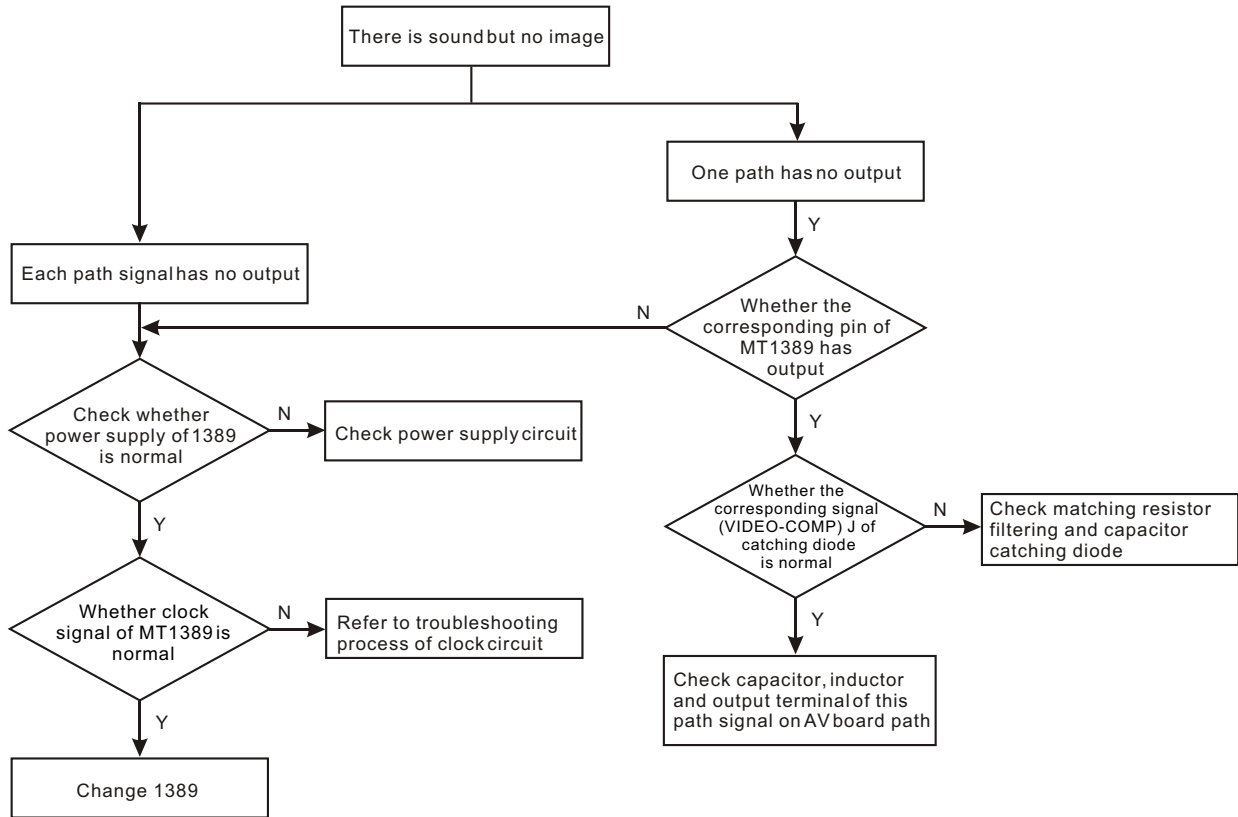


Figure 3.3.2.12 Troubleshooting flow chart for there is sound but no image

13. Troubleshooting process for no screen display is shown as the following figure 3.3.2.13:

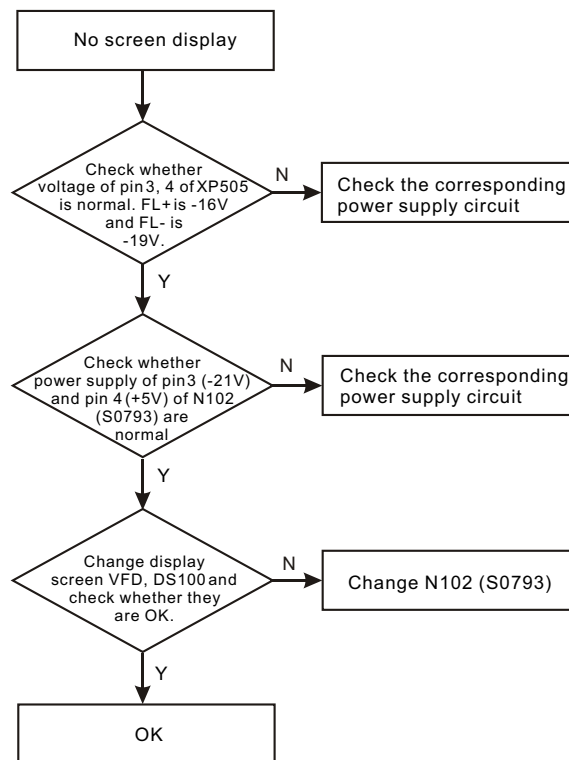


Figure 3.3.2.13 Troubleshooting flow chart for no screen display

14. Troubleshooting process for power supply output power not enough is shown as the following figure 3.3.2.14:

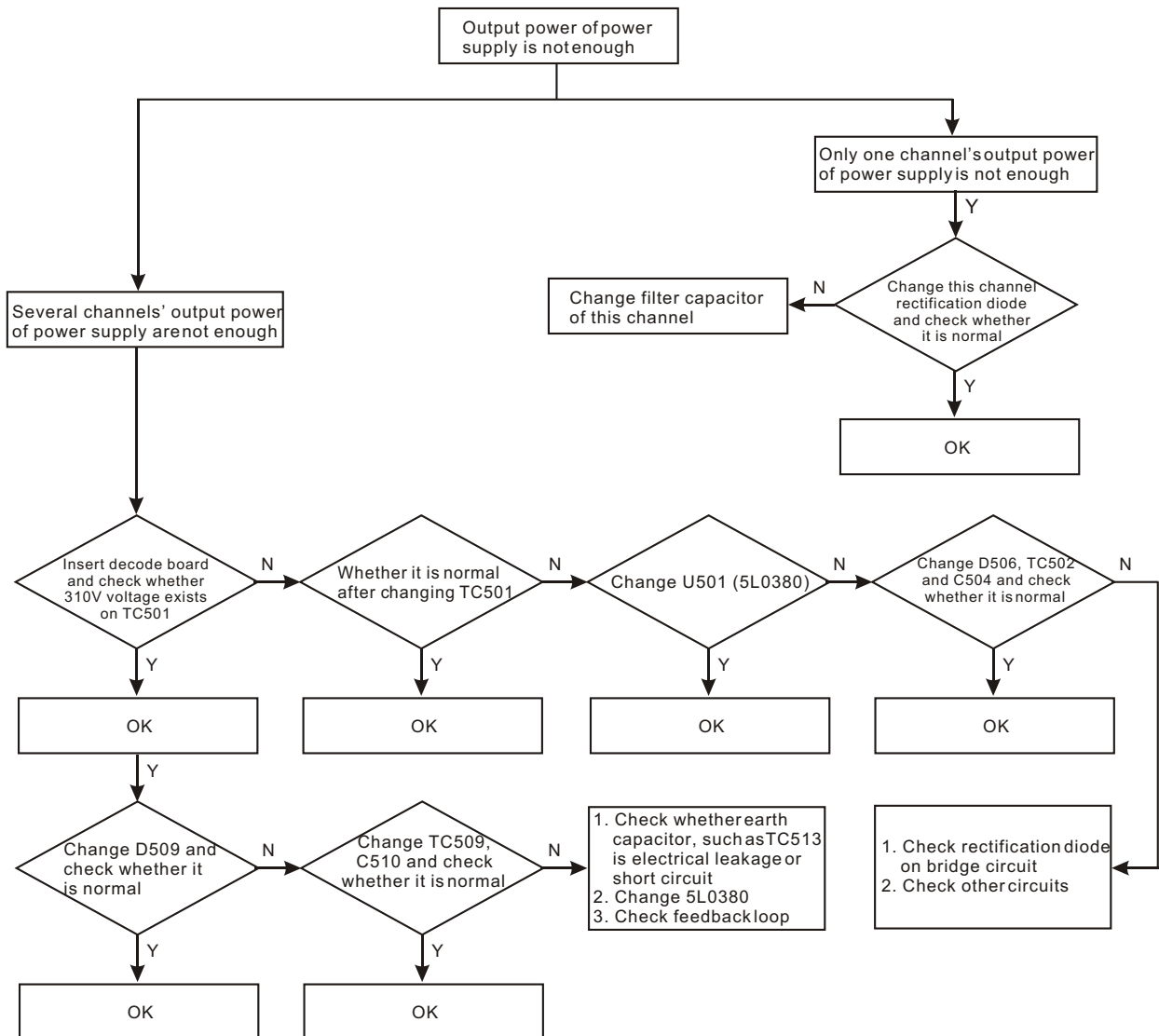


Figure 3.3.2.14 Troubleshooting flow chart for “Output power of power supply is not enough”

15. Troubleshooting process for image distortion is shown as the following figure 3.3.2.15:

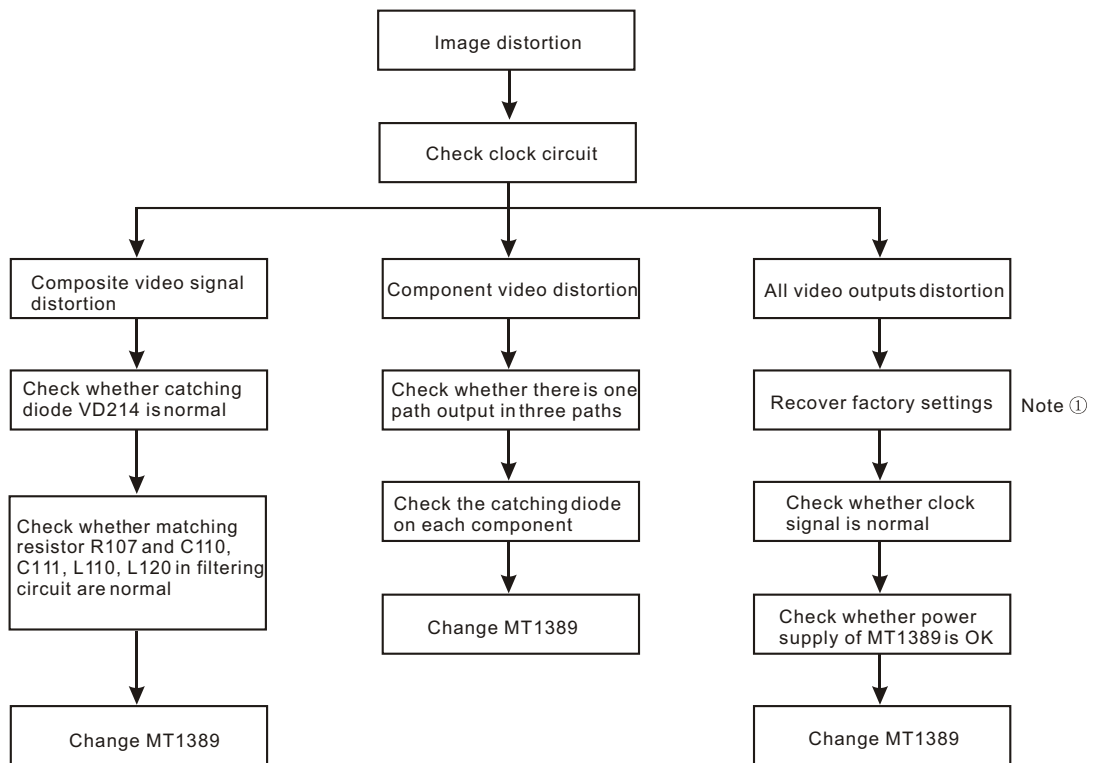


Figure 3.3.2.15 Troubleshooting flow chart for image distortion

Note ①: the process of restoring factory settings is shown as the following figure 3.3.2.16:



Figure 3.3.2.16 Operation flow chart of restoring factory settings

16. Troubleshooting process for P+28V voltage is shown as the following figure 3.3.2.17:

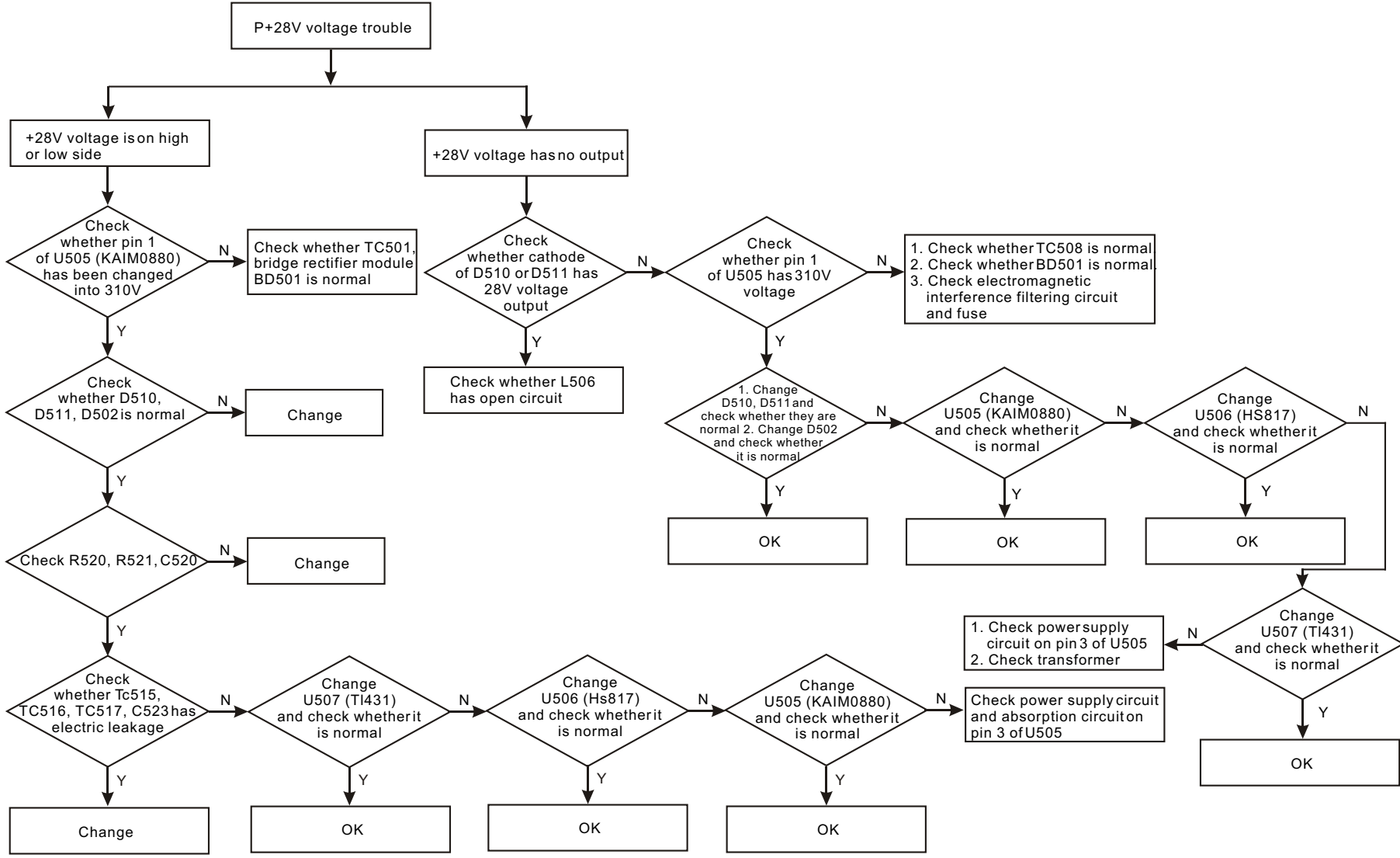


Figure 3.3.2.17 Troubleshooting flow chart for P+28V voltage

17. Troubleshooting process for no voltage output is shown as the following figure 3.3.2.18:

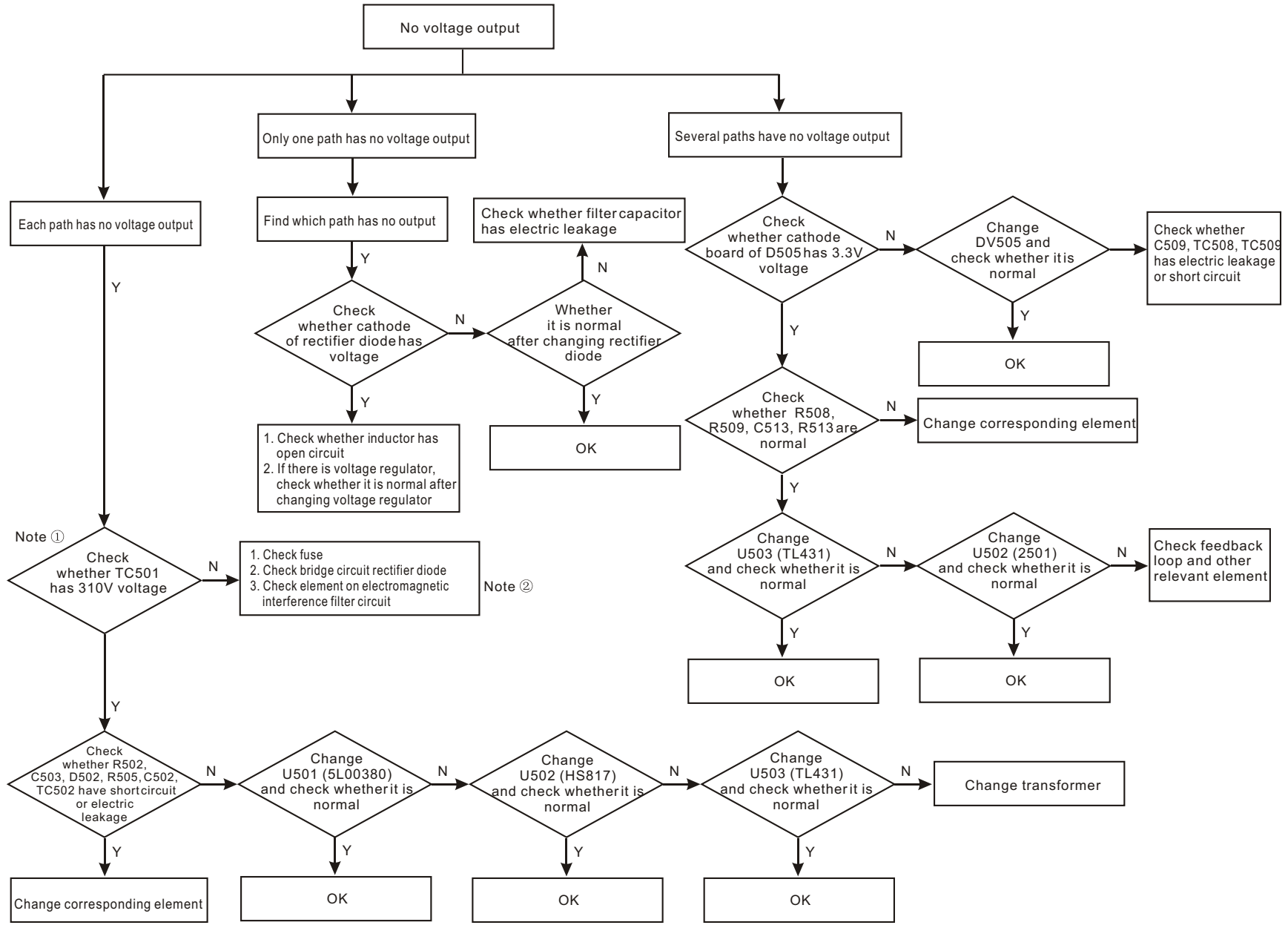


Figure 3.3.2.18 Troubleshooting flow chart for no voltage output

18. Trouble shooting for no sound of external input is shown as the following figure 3.3.2.19:

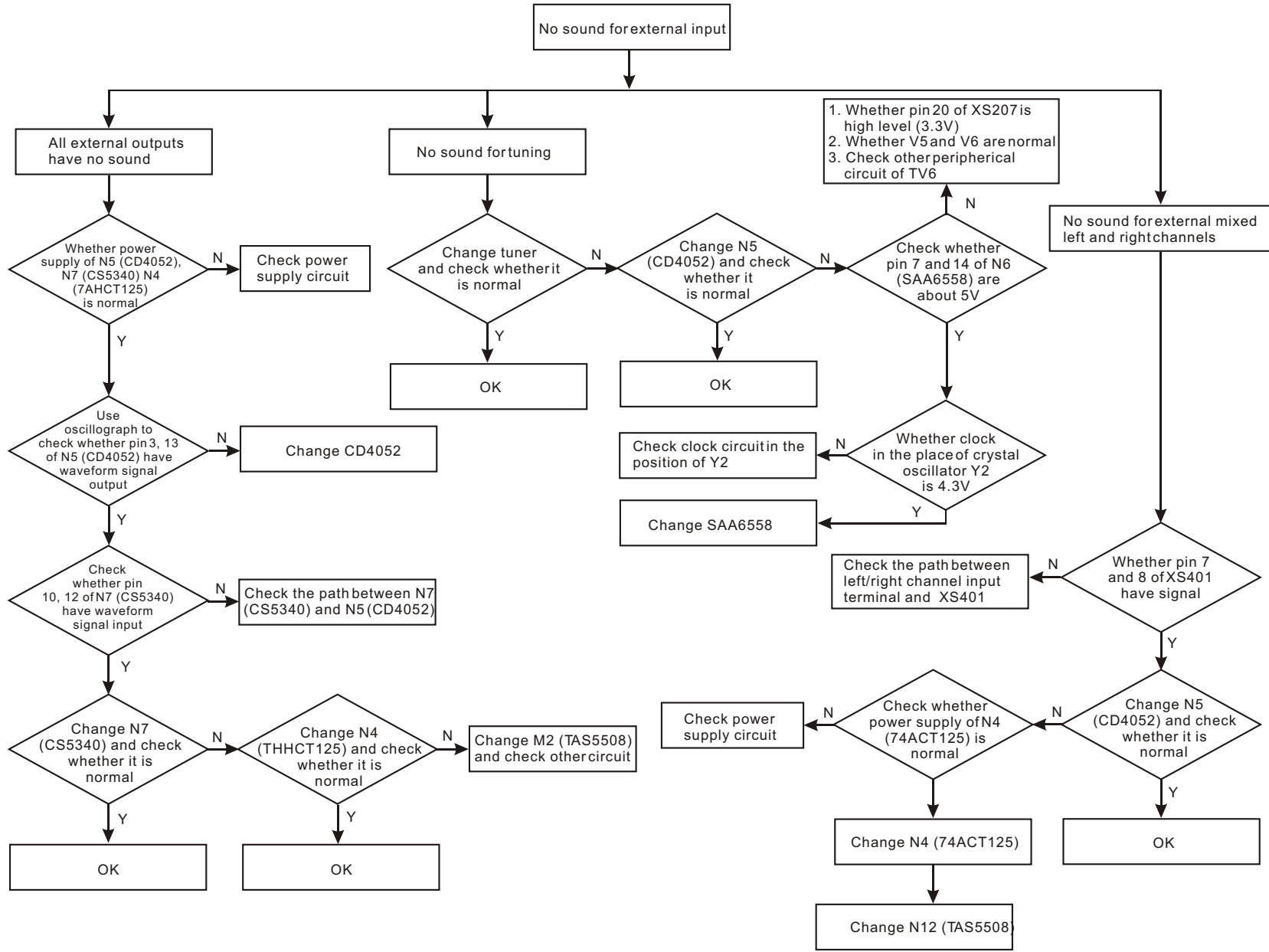


Figure 3.3.2.19 Troubleshooting flow chart for no sound of external input

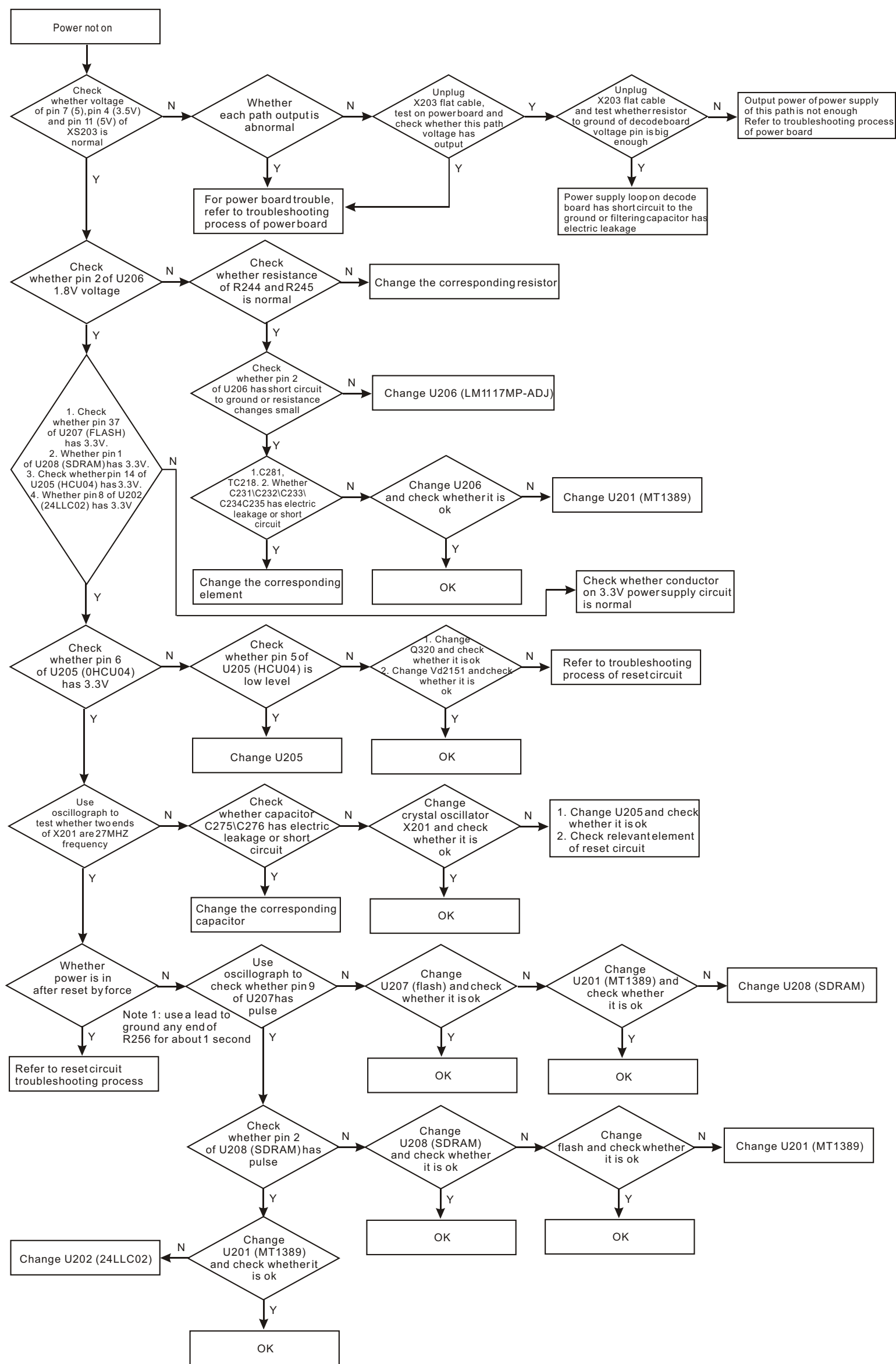


Figure 3.3.2.20 Troubleshooting process for power not on

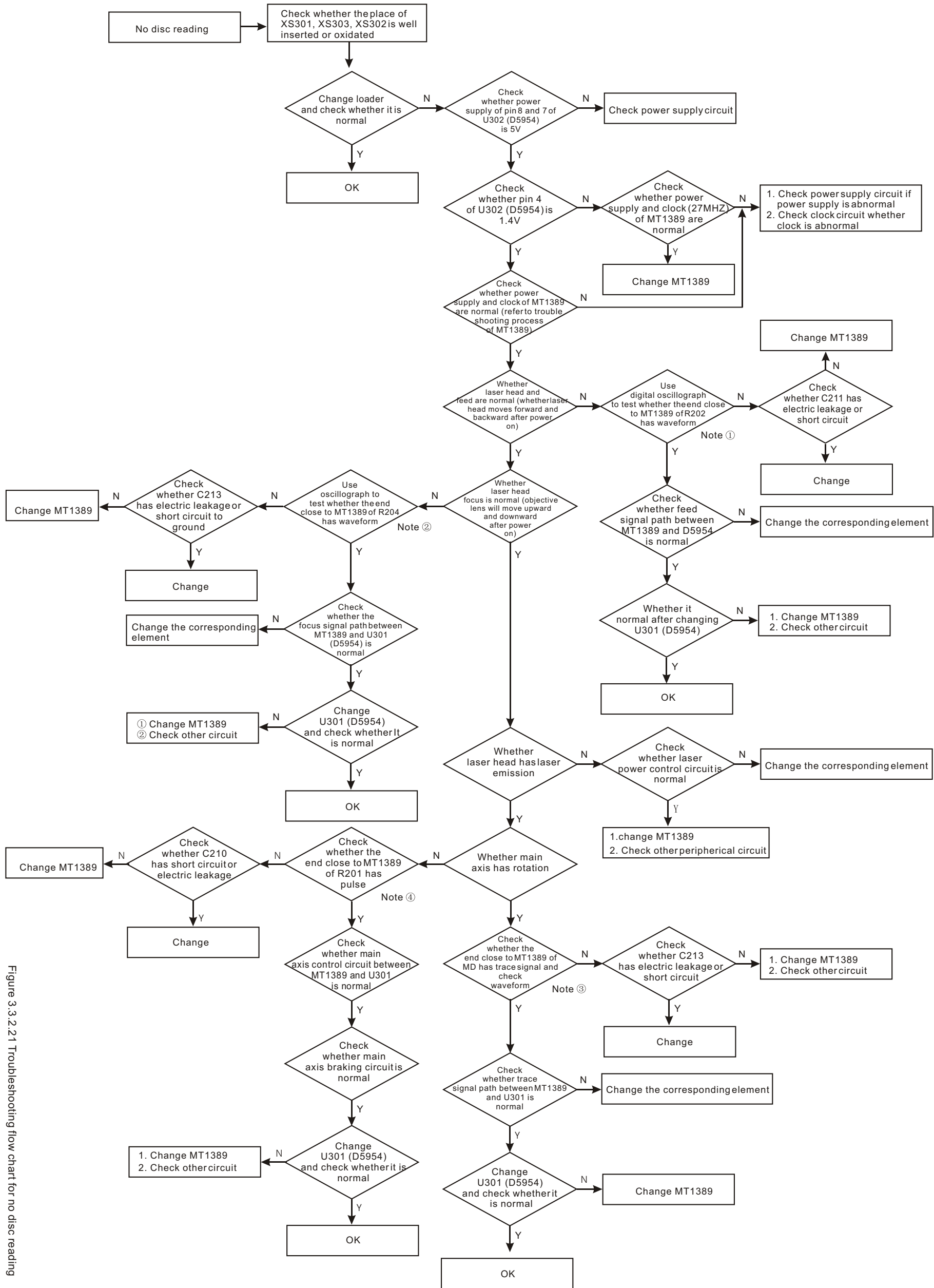


Figure 3.3.2.21 Troubleshooting flow chart for no disc reading

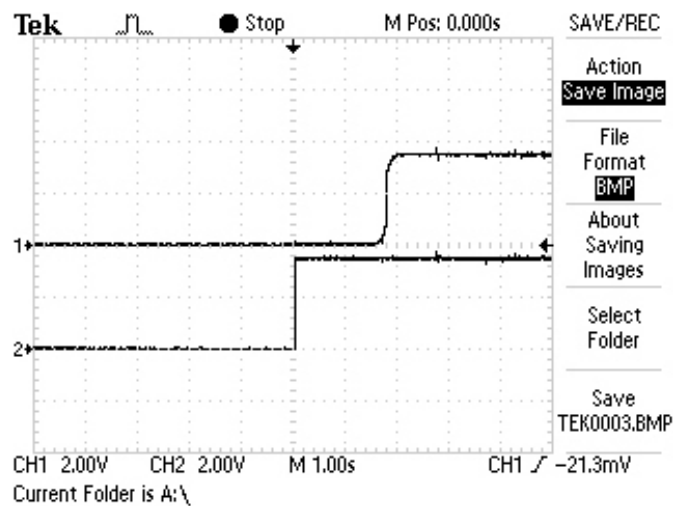
Note ①, ②, ③ and ④ are tested when no disc in, disc in and laser head performs default focus and feed acts.

Section Four Servicing Parameters

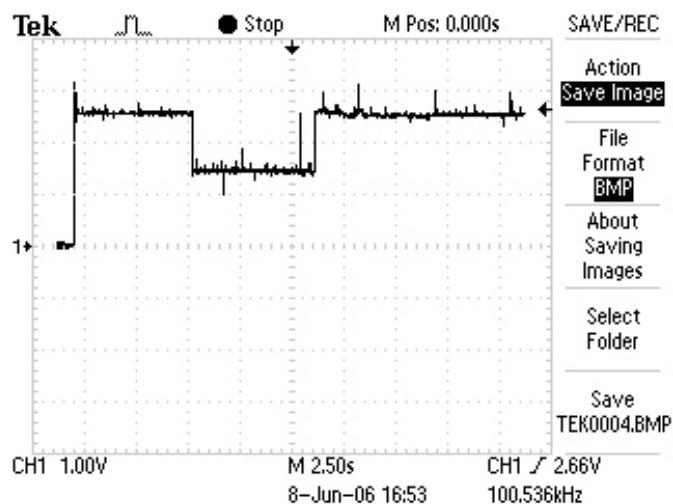
3.4.1 Signal waveform diagram

This section collects signal waveform diagram of audio, video and each unit circuit with the purpose to help servicing personnel to judge where trouble lies in accurately and quickly to improve servicing skills. For the difference of oscillograph's type, model and tuner, a certain difference may exist, so the servicing personnel are expected to pay more attention to check in daily operation.

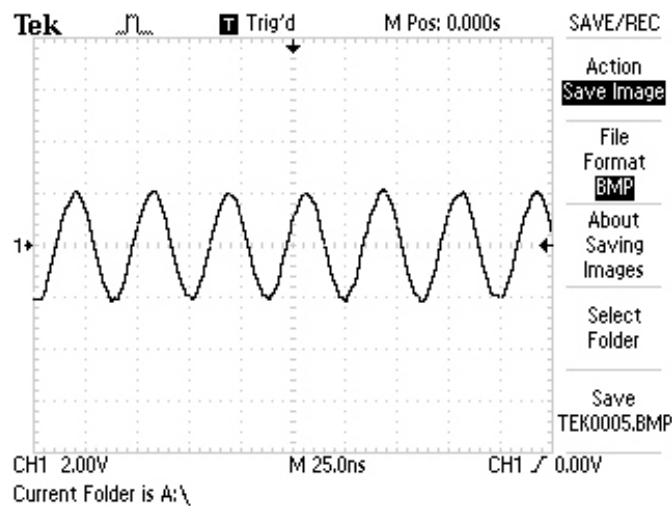
1. Contrast figure (R2024) of main reset signal VRST# and 3.3V voltage



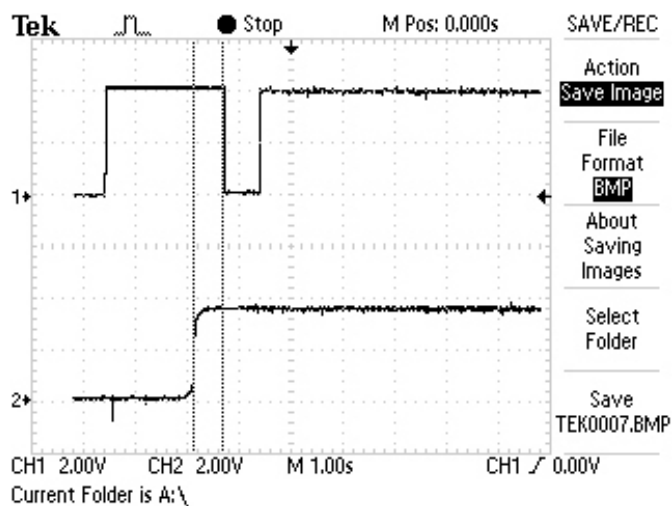
2. Decode board ADIN waveform diagram



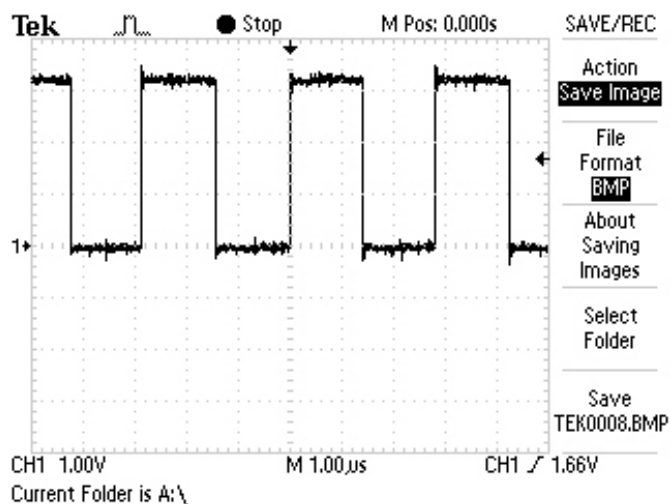
3. 1389 main clock signal waveform diagram



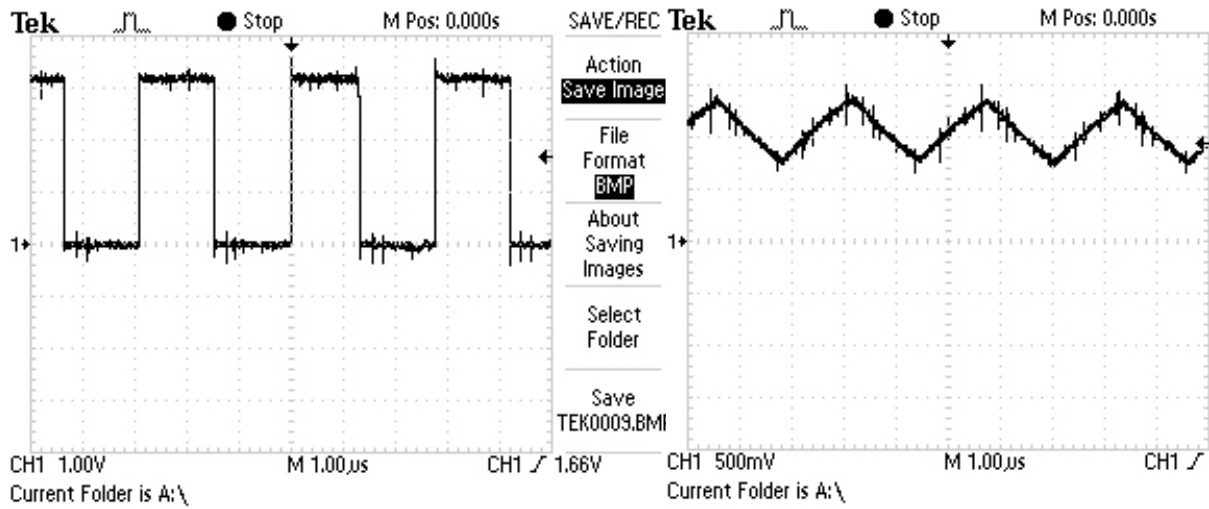
4. Contrast figure of TAS5508 reset signal RST and main reset signal URST#, USRT# means the time required to finish reset is 600ms, RST means reset begins and time is 680ms



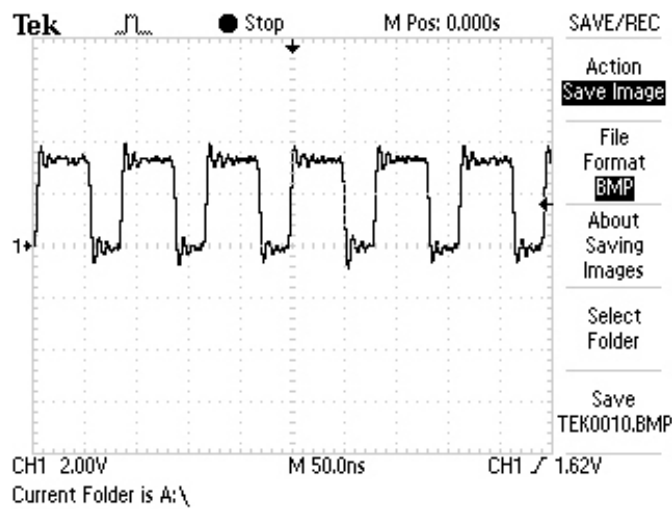
5. Waveform of PWM signal outputted by TAS5508 when playing: $f=352.78\text{KHZ}$



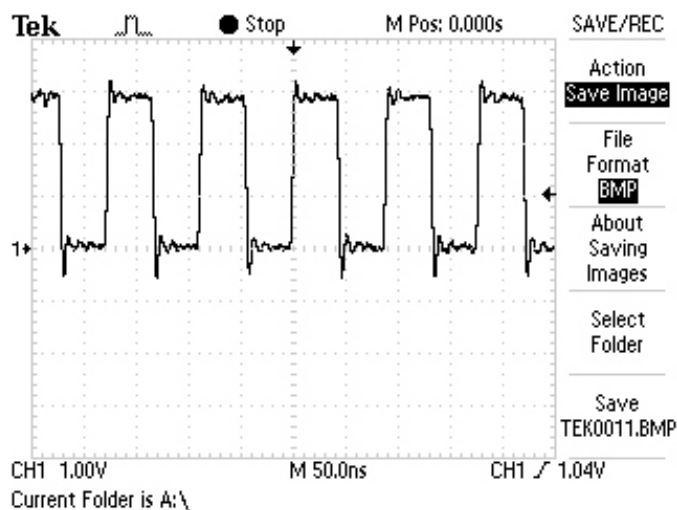
6. PWM_RL signal, output range is 4.0V, frequency is 384.0KHZ (fixed output does not change with volume adjustment), waveform of two ends of R103



7. When in external input, main clock of TAS5508 (waveform diagram of pin 4 of N2)



8. Clock of 1389: when playing DVD, waveform of main clock of TAS5508



3.4.2 Key point voltage

1. 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 |

2. 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 |

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 |

4. 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 |

Section Five Function Introduction to IC

3.5.1 function introduction to MT1389E

1. DESCRIPTION

MT1389E is a cost-effective DVD system-on-chip (SOC) which incorporates advanced features like MPEG-4 video decoder, high quality TV encoder and state-of-art de-interlace processing.

Based on MediaTek's world-leading DVD player SOC architecture, the MT1389E is the 3rd generation of the DVD player SOC. It integrates the MediaTek 2nd generation front-end analog RF amplifier and the Servo/MPEG AV decoder.

To enrich the feature of DVD player, the MT1389 equips a simplified MPEG-4 advanced simple profile (ASP) video decoder to fully support the DivX1 Home Theater profile. It makes the MT1389-based DVD player be capable of playback MPEG-4 content which become more and more popular.

The progressive scan of the MT1389E utilized advanced motion-adaptive de-interlace algorithm to achieve the best movie/video playback. It also supports a 3:2 pull down algorithm to give the best film effect. The 108MHz/12-bit video DAC provides users a whole new viewing experience.

2. Key Features

RF/Servo/MPEG Integration

Embedded 6ch Audio DAC

Embedded 2ch Audio ADC for Karaoke

High Performance Audio Processor

High Performance Progressive Video Processor

Support Nero-Digital

High Quality 108MHz/12-bit, 4 CH TV Encoder

3. General Feature lists

(1)Integration DVD player single chip

High performance analog RF amplifier

Servo controller and data channel processing

MPEG-1/MPEG-2/JPEG video

Dolby AC-3/DTS Decoder

Unified memory architecture

Versatile video scaling & quality enhancement

OSD & Sub-picture

Built-in clock generator

Built-in high quality TV encoder

Built-in progressive video processor

Audio effect post-processor

Built-in 5.1-ch Audio DAC

Built-in 2-ch Audio ADC for Karaoke

(2)High Performance Analog RF Amplifier

Programmable fc

Dual automatic laser power control

Defect and blank detection

RF level signal generator

(3)Speed Performance on Servo/Channel Decoding

DVD-ROM up to 4XS

CD-ROM up to 24XS

(4)Channel Data Processor

Digital data slicer for small jitter capability

Built-in high performance data PLL for channel data demodulation

EFM/EFM+ data demodulation

Enhanced channel data frame sync protection & DVD-ROM sector sync protection

(5)Servo Control and Spindle Motor Control

Programmable frequency error gain and phase error gain of spindle PLL to control spindle motor on CLV and CAV mode

Built-in ADCs and DACs for digital servo control

Provide 2 general PWM

Tray control can be PWM output or digital output

(6)Embedded Micro controller

Built-in 8032 micro controller

Built-in internal 373 and 8-bit programmable lower address port

1024-bytes on-chip RAM

Up to 2M bytes FLASH-programming interface

Supports 5/3.3-Volt. FLASH interface

Supports power-down mode

Supports additional serial port

(7)DVD-ROM/CD-ROM Decoding Logic

High-speed ECC logic capable of correcting one error per each P-codeword or Q-codeword

Automatic sector Mode and Form detection

Automatic sector Header verification

Decoder Error Notification Interrupt that signals various decoder errors

Provide error correction acceleration

(8)Buffer Memory Controller

Supports 16Mb/32Mb/64Mb SDRAM

Supports 16-bit SDRAM data bus

Provides the self-refresh mode SDRAM

Block-based sector addressing

(9)Video Decode

Decodes MPEG1 video and MPEG2 main level, main profile video (720/480 and 720x576)

Decodes MPEG-4 Advanced Simple Profile

Support DivX 3.11/4.x/5.x Home Theater Profile

Support Nero-Digital

Smooth digest view function with I, P and B picture decoding

Baseline, extended-sequential and progressive JPEG image decoding

Support CD-G titles

(10)Video/OSD/SPU/HLI Processor

Arbitrary ratio vertical/horizontal scaling of video, from 0.25X to 256X

65535/256/16/4/2-color bitmap format OSD,

256/16 color RLC format OSD

Automatic scrolling of OSD image

(11)Audio Effect Processing

Dolby Digital (AC-3)/EX decoding

DTS/DTS-ES decoding

MPEG-1 layer 1/layer 2 audio decoding

MPEG-2 layer1/layer2 2-channel audio

High Definition Compatible Digital (HDCCD)
Windows Media Audio (WMA)
Dolby ProLogic II
Concurrent multi-channel and downmix out
IEC 60958/61937 output
PCM / bit stream / mute mode
Custom IEC latency up to 2 frames
Pink noise and white noise generator
Karaoke functions
Microphone echo
Microphone tone control
Vocal mute/vocal assistant
Key shift up to +/- 8 keys
Chorus/Flanger/Harmony/Reverb
Channel equalizer
3D surround processing include virtual surround and speaker separation

(12)TV Encoder

Four 108MHz/12bit DACs
Support NTSC, PAL-BDGHINM, PAL-60
Support 525p, 625p progressive TV format
Automatically turn off unconnected channels
Support PC monitor (VGA)
Support Macrovision 7.1 L1, Macrovision 525P and 625P
CGMS-A/WSS
Closed Caption

(13)Progressive Scan Video

Automatic detect film or video source
3:2 pull down source detection
Advanced Motion adaptive de-interlace
Minimum external memory requirement

(14)Outline

216-pin LQFP package
3.3/1.8-Volt. Dual operating voltages

4. PIN DESCRIPTION

| PIN | Main | Alt | Type | Description |
|--------------------------|---------|-----|---------------|----------------------------------------------------------------------------------------------------------------------------|
| RF interface (26) | | | | |
| 191 | RFGND18 | | Ground | Analog ground |
| 192 | RFVDD | | Power | Analog power 1.8V |
| 212 | OSP | | Analog output | RF Offset cancellation capacitor connecting |
| 213 | OSN | | Analog output | RF Offset cancellation capacitor connecting |
| 214 | RFGC | | Analog output | RF AGC loop capacitor connecting for DVD-ROM |
| 215 | IREF | | Analog input | Current reference input. It generates reference current for RF path. Connect an external 15K resistor to this pin and AVSS |
| 216 | AVDD3 | | Power | Analog power 3.3V |
| 1 | AGND | | Ground | Analog ground |
| 2 | DVDA | | Analog input | AC couple input path A |
| 3 | DVDB | | Analog input | AC couple input path B |
| 4 | DVDC | | Analog input | AC couple input path C |
| 5 | DVDD | | Analog input | AC couple input path D |
| 6 | DVDRFIP | | Analog input | AC coupled DVD RF signal input RFIP |
| 7 | DVDRFIN | | Analog input | AC coupled DVD RF signal input RFIN |
| 8 | MA | | Analog input | DC coupled main beam RF signal input A |
| 9 | MB | | Analog input | DC coupled main beam RF signal input B |
| 10 | MC | | Analog input | DC coupled main beam RF signal input C |
| 11 | MD | | Analog input | DC coupled main beam RF signal input D |
| 12 | SA | | Analog input | DC coupled sub-beam RF signal output A |
| 13 | SB | | Analog input | DC coupled sub-beam RF signal output B |
| 14 | SC | | Analog input | DC coupled sub-beam RF signal output C |
| 15 | SD | | Analog input | DC coupled sub-beam RF signal output D |
| 16 | CDFON | | Analog input | CD focusing error negative input |
| 17 | CDFOP | | Analog input | CD focusing error positive input |
| 18 | TNI | | Analog input | 3 beam satellite PD signal negative input |
| 19 | TPI | | Analog input | 3 beam satellite PD signal positive input |
| ALPC (4) | | | | |
| 20 | MIDI1 | | Analog input | Laser power monitor input |
| 21 | MIDI2 | | Analog input | Laser power monitor input |

| | | | | |
|-----------------------------------|---------|------|---------------|--------------------------------------------------------------|
| 22 | LDO2 | | Analog output | Laser driver output |
| 23 | LDO1 | | Analog output | Laser driver output |
| Reference voltage (3) | | | | |
| 28 | V2REFO | | Analog output | Reference voltage 2.8V |
| 29 | V20 | | Analog output | Reference voltage 2.0V |
| 30 | VREFO | | Analog output | Reference voltage 1.4V |
| Analog monitor output (7) | | | | |
| 24 | SVDD3 | | Power | Analog power 3.3V |
| 25 | CSO | RFOP | Analog output | 1) Central servo 2) Positive main beam summing output |
| 26 | RFLVL | RFON | Analog output | 1) RFRP low pass, or 2) Negative main beam summing output |
| 27 | SGND | | Ground | Analog ground |
| 31 | FEO | | Analog output | Focus error monitor output |
| 32 | TEO | | Analog output | Tracking error monitor output |
| 33 | TEZISLV | | Analog output | TE slicing Level |
| Analog Servo Interface (8) | | | | |
| 204 | ADCVDD3 | | Power | Analog 3.3V power for ADC |
| 205 | ADCVSS | | Ground | Analog ground for ADC |
| 206 | RFVDD3 | | Power | Analog power |
| 207 | RFRPDC | | Analog output | RF ripple detect output |
| 208 | RFRPAC | | Analog input | RF ripple detect input (through AC-coupling) |
| 209 | HRFZC | | Analog input | High frequency RF ripple zero crossing |
| 210 | CRTPLP | | Analog output | Defect level filter capacitor connecting |
| 211 | RFVSS | | Ground | Analog power |
| RF Data PLL Interface (9) | | | | |
| 195 | JITFO | | Analog output | Output terminal of RF jitter meter |
| 196 | JITFN | | Analog Input | Input terminal of RF jitter meter |
| 197 | PLLVSS | | Ground | Ground pin for data PLL and related analog circuitry |
| 198 | IDACEXP | | Analog output | Data PLL DAC Low-pass filter |
| 199 | PLLVDD3 | | Power | Power pin for data PLL and related analog circuitry |
| 200 | LPFON | | Analog Output | Negative output of loop filter amplifier |
| 201 | LPFIP | | Analog input | Positive input terminal of loop filter amplifier |

| | | | | |
|--------------------------------------------------|---------------------|---------------|------------------------------------------------------------------------------------|-----------------------------------------------------------------|
| 202 | LPFIN | | Analog input | Negative input terminal of loop filter amplifier |
| 203 | LPFOP | | Analog output | Positive output of loop filter amplifier |
| Motor and Actuator Driver Interface (10) | | | | |
| 34 | OP_OUT | | Analog output | Op amp output |
| 35 | OP_INN | | Analog input | Op amp negative input |
| 36 | OP_INP | | Analog input | Op amp positive input |
| 37 | DMO | | Analog output | Disk motor control output. PWM output |
| 38 | FMO | | Analog output | Feed motor control. PWM output |
| 39 | TROPENPW M | | Analog output | Tray PWM output/Tray open output |
| 40 | PWMOUT1 | ADIN0 | Analog output | 3) 1st General PWM output 4) AD input 0 |
| 41 | TRO | | Analog output | Tracking servo output. PDM output of tracking servo compensator |
| 42 | FOO | | Analog output | Focus servo output. PDM output of focus servo compensator |
| 43 | FG (Digital pin) | ADIN1 GPIO | LVTTTL3.3 Input, Schmitt input, pull up, with analog input path for ADIN1 | 1) Monitor hall sensor input 2) AD input 1 3) GPIO |
| General Power/Ground (11) | | | | |
| 48 84 132 146 | DVDD18 | | Power | 1.8V power pin for internal digital circuitry |
| 74 120 | DVSS | | Ground | 1.8V ground pin for internal digital circuitry |
| 60 87 108 137 | DVDD3 | | Power | 3.3V power pin for internal digital circuitry |
| 149 | DVSS | | Ground | 3.3V ground pin for internal digital circuitry |
| Micro Controller and Flash Interface (48) | | | | |
| 54 | HIGHA0 | | InOut 4-16mA, SRPU | Microcontroller address 8 |
| 66 | HIGHA1 | | InOut 4-16mA, | Microcontroller address 9 |

| | | | | |
|----|--------|--|-----------------------|--------------------------------|
| | | | SRPU | |
| 65 | HIGHA2 | | InOut 4~16mA, SRPU | Microcontroller address 10 |
| 64 | HIGHA3 | | InOut 4~16mA, SRPU | Microcontroller address 11 |
| 63 | HIGHA4 | | InOut 4~16mA, SRPU | Microcontroller address 12 |
| 62 | HIGHA5 | | InOut 4~16mA, SRPU | Microcontroller address 13 |
| 61 | HIGHA6 | | InOut 4~16mA, SRPU | Microcontroller address 14 |
| 59 | HIGHA7 | | InOut 4~16mA, SRPU | Microcontroller address 15 |
| 81 | AD7 | | InOut 4~16mA, SRPU | Microcontroller address/data 7 |
| 78 | AD6 | | InOut 4~16mA, SRPU | Microcontroller address/data 6 |
| 77 | AD5 | | InOut 4~16mA, SRPU | Microcontroller address/data 5 |
| 76 | AD4 | | InOut 4~16mA, SRPU | Microcontroller address/data 4 |
| 75 | AD3 | | InOut 4~16mA, SRPU | Microcontroller address/data 3 |
| 73 | AD2 | | InOut 4~16mA, SRPU | Microcontroller address/data 2 |
| 72 | AD1 | | InOut 4~16mA, SRPU | Microcontroller address/data 1 |
| 71 | AD0 | | InOut 4~16mA, SRPU | Microcontroller address/data 0 |
| 83 | IOA 0 | | InOut 4~16mA, SRPU | Microcontroller address |
| 69 | IOA 1 | | InOut 4~16mA, SRPU | Microcontroller address 1/ IO |
| 47 | IOA 2 | | InOut 4~16mA, SRPU | Microcontroller address 2/ IO |
| 49 | IOA 3 | | InOut 4~16mA, SRPU | Microcontroller address 3/ IO |

| | | | | |
|----|-------|--------------|---------------------------|------------------------------------------------------------------------------------------------------------|
| 50 | IOA 4 | | InOut 4~16mA, SRPU | Microcontroller address 4/ IO |
| 51 | IOA 5 | | InOut 4~16mA, SRPU | Microcontroller address 5/ IO |
| 52 | IOA 6 | | InOut 4~16mA, SRPU | Microcontroller address 6/ IO |
| 53 | IOA 7 | | InOut 4~16mA, SRPU | Microcontroller address 7/ IO |
| 58 | A16 | | InOut 4~16mA, SRPU | Flash address 16 |
| 82 | A17 | | InOut 4~16mA, SRPU | Flash address 17 |
| 55 | A18 | | InOut 4~16mA, SRPD,SMT | Flash address 18 /IO |
| 56 | A19 | | InOut 4~16mA, SRPD,SMT | Flash address 19 /IO |
| 67 | A20 | YUV0 | InOut 4~16mA, SRPD,SMT | 5) Flash address 20 /IO 6) While External Flash size <= 1MB: I) Alternate digital video YUV output 0 |
| 79 | A21 | YUV7 GPIO | InOut 4~16mA, SRPD,SMT | 7) Flash address 21 /IO 8) While External Flash size <= 2MB: I) Digital video YUV output 7 II) GPIO |
| 80 | ALE | | InOut 4~16mA, SRPD,SMT | Microcontroller address latch enable |
| 70 | IOOE# | | InOut 4~16mA, SRPD,SMT | Flash output enable, active low / IO |
| 57 | IOER# | | InOut 4~16mA, SRPD,SMT | Flash write enable, active low / IO |
| 68 | IOCS# | | InOut 4~16mA, SRPD,SMT | Flash chip select, active low / IO |
| 85 | UWR# | | InOut 4~16mA, SRPD,SMT | Microcontroller write strobe, active low |
| 86 | URD# | | InOut 4mA, SRPD,SMT | Microcontroller read strobe, active low |
| 88 | UP1_2 | | InOut 4~16mA, SRPD,SMT | Microcontroller port 1-2 |

| | | | | |
|-----|-------|--------------|---------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 89 | UP1_3 | | InOut 4mA, SRPD,SMT | Microcontroller port 1-3 |
| 91 | UP1_4 | | InOut 4mA, SRPD,SMT | Microcontroller port 1-4 |
| 92 | UP1_5 | | InOut 4mA, SRPD,SMT | Microcontroller port 1-5 |
| 93 | UP1_6 | SCL | InOut 4mA, SRPD,SMT | 9) Microcontroller port 1-6 10) I2C clock pin |
| 94 | UP1_7 | SDA | InOut 4mA, SRPD,SMT | 11) Microcontroller port 1-7 12) I2C data pin |
| 95 | UP3_0 | RXD | InOut 4mA, SRPD,SMT | 13) Microcontroller port 3-0 14) 8032 RS232 RxD |
| 96 | UP3_1 | TXD | InOut 4mA, SRPD,SMT | 15) Microcontroller port 3-1 16) 8032 RS232 TxD |
| 97 | UP3_4 | RXD SCL | InOut 4mA, SRPD,SMT | 17) Microcontroller port 3-4 18) Hardwired RD232 RxD 19) I2C clock pin |
| 98 | UP3_5 | RXD SDA | InOut 4-16mA, SRPD,SMT | 20) Microcontroller port 3-5 21) Hardwired RD232 TxD 22) I2C data pin |
| 102 | IR | | Input SMT | IR control signal input |
| 103 | INT0# | | InOut 4-16mA, SRPD,SMT | Microcontroller external interrupt 0, active low |
| 153 | ALRCK | YUV1 GPO | InOut 4mA, PD,SMT | 1) Audio left/right channel clock 2) Trap value in power-on reset: I) 1: use external 373 II) 0: use internal 373 3) While internal audio DAC used: I) Digital video YUV output 1 II) GPO |
| 151 | ABCK | YUV0 GPIO | InOut 4mA, SMT | 4) Audio bit clock 5) While internal audio DAC used: I) Digital video YUV output 0 II) GPIO |
| 152 | ACLK | YUV0 GPIO | InOut 4mA, SMT | 6) Audio DAC master clock 7) While internal audio DAC used: |

| | | | | |
|-----|---------|---------------|---------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | | | | I) Alternate digital video YUV output 0 II) GPIO |
| 154 | ASDATA0 | YUV2 GPO | InOut 4mA, PD,SMT | 8) Audio serial data 0 (Front-Left/Front-Right) 9) Trap value in power-on reset: I) 1: manufactory test mode II) 0: normal operation 10) While internal audio DAC used: I) Digital video YUV output 2 II) GPO |
| 155 | ASDATA1 | YUV4 GPO | InOut 4mA, PD,SMT | 11) Audio serial data 1 (Left-Surround/Right-Surround) 12) Trap value in power-on reset: I) 1: manufactory test mode II) 0: normal operation 13) While only 2 channels output: I) Digital video YUV output 4 II) GPO |
| 156 | ASDATA2 | YUV5 GPO | InOut 4mA, PD,SMT | 14) Audio serial data 2 (Center/LFE) 15) Trap value in power-on reset: I) 1: manufactory test mode II) 0: normal operation 16) While only 2 channels output: I) Digital video YUV output 5 II) GPO |
| 157 | ASDATA3 | YUV6 GPIO | InOut 4mA, PD,SMT | 17) Audio serial data 3 (Center-back/ Center-left-back/Center-right-back, in 6.1 or 7.1 mode) 18) While only 2 channels output: I) Digital video YUV output 6 II) GPIO |
| 158 | MC_DATA | INT2# YUV0 | InOut 2mA, | 19) Microphone serial input 20) While not support Microphone: I) Microcontroller external interrupt 2 II) Digital video YUV output 0 III) GPIO |
| 159 | SPDIF | | Output 4~16mA, SR: ON/OFF | S/PDIF output |
| 172 | AADVSS | | Ground | Ground pin for 2ch audio ADC circuitry |

| | | | | |
|-----------------------------|----------|------|------------------|-----------------------------------------------------------------------------------------------------------|
| 173 | AKIN2 | | Analog | Audio ADC input 2 |
| 174 | ADVCM | | Analog | 2ch audio ADC reference voltage |
| 175 | AKIN1 | | Analog | Audio ADC input 1 |
| 176 | AADVDD | | Power | 3.3V power pin for 2ch audio ADC circuitry |
| 177 | APLLVDD3 | | Power | 3.3V Power pin for audio clock circuitry |
| 178 | APLLCAP | | Analog InOut | APLL external capacitance connection |
| 179 | APLLVSS | | Ground | Ground pin for audio clock circuitry |
| 180 | ADACVSS2 | | Ground | Ground pin for audio DAC circuitry |
| 181 | ADACVSS1 | | Ground | Ground pin for audio DAC circuitry |
| 182 | ARF | GPIO | Output | 21) Audio DAC sub-woofer channel output 22) While internal audio DAC not used: GPIO |
| 183 | ARS | GPIO | Output | 23) Audio DAC right Surround channel output 24) While internal audio DAC not used: GPIO |
| 184 | AR | GPIO | Output | 25) Audio DAC right channel output 26) While internal audio DAC not used: a. SDATA1 b. GPIO |
| 185 | AVCM | | Analog | Audio DAC reference voltage |
| 186 | AL | | Output | 27) Audio DAC left channel output 28) While internal audio DAC not used: a. SDATA2 b. GPIO |
| 187 | ALS | | Output | 29) Audio DAC left Surround channel output 30) While internal audio DAC not used: c. SDATA0 d. GPIO |
| 188 | ALF | | Output | 31) Audio DAC center channel output 32) While internal audio DAC not used: GPIO |
| 189 | ADACVDD1 | | Power | 3.3V power pin for audio DAC circuitry |
| 190 | ADACVDD2 | | Power | 3.3V power pin for audio DAC circuitry |
| Video Interface (12) | | | | |
| 160 | DACVDDC | | Power | 3.3V power pin for video DAC circuitry |
| 161 | VREF | | Analog | Bandgap reference voltage |
| 162 | FS | | Analog | Full scale adjustment |
| 163 | DACVSSC | | Ground | Ground pin for video DAC circuitry |
| 164 | CVBS | | InOut 4mA, SR | Analog composite output |

| | | | | |
|------------------|---------|-----------------------|----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| 165 | DACVDDB | | Power | 3.3V power pin for video DAC circuitry |
| 166 | DACVSSB | | Ground | Ground pin for video DAC circuitry |
| 167 | DACVDDA | | Power | 3.3V power pin for video DAC circuitry |
| 168 | Y/G | | InOut 4mA, SR | Green, Y, SY, or CVBS |
| 169 | DACVSSA | | Ground | Ground pin for video DAC circuitry |
| 170 | B/CB/PB | | InOut 4mA, SR | Blue, CB/PB, or SC |
| 171 | R/CR/PR | | InOut 4mA, SR | Red, CR/PR, CVBS, or SY |
| MISC (12) | | | | |
| 101 | PRST# | | InOut PD,SMT | Power on reset input, active low |
| 100 | ICE | | InOut PD,SMT | Microcontroller ICE mode enable |
| 193 | XTALO | | Output | 27MHz crystal output |
| 194 | XTALI | | Input | 27MHz crystal input |
| 44 | GPIO0 | VSYN YUV1 | InOut 4mA, SR,SMT | 33) General purpose IO 0 34) Vertical sync for video input 35) Digital video YUV output 1 |
| 45 | GPIO1 | HSYN INT4# YUV2 | InOut 4mA, SR,SMT | 36) General purpose IO 1 37) Horizontal sync for video input 38) Microcontroller external interrupt 4 39) Digital video YUV output 2 |
| 46 | GPIO2 | SPMCLK | InOut 2mA | 40) General purpose IO 2 41) Audio S/PDIF SPMCLK input |
| 147 | GPIO3 | INT1# SPDATA | InOut 2mA | 42) General purpose IO 3 43) Microcontroller external interrupt 1 44) Audio S/PDIF SPDATA input |
| 148 | GPIO4 | SPLRCK | InOut 2mA | 45) General purpose IO 4 46) Audio S/PDIF SPLRCK input |
| 150 | GPIO5 | INT3# SPBCK | InOut 2mA | 47) General purpose IO 5 48) Microcontroller external interrupt 3 49) Audio S/PDIF SPBCK input |
| 90 | GPIO6 | YUVCLK | InOut 4mA, SR,SMT | 50) General purpose IO 6 51) Digital video clock output |

| | | | | |
|-------------------------------------------------|-------|------|----------------------|------------------------------------------------------------|
| 99 | GPIO7 | YUV3 | InOut 4mA, SR,SMT | 52) General purpose IO 7 53) Digital video YUV output 3 |
| Dram Interface (38) (Sorted by position) | | | | |
| 145 | RA4 | | InOut | DRAM address 4 |
| 144 | RA5 | | InOut | DRAM address 5 |
| 143 | RA6 | | InOut | DRAM address 6 |
| 142 | RA7 | | InOut | DRAM address 7 |
| 141 | RA8 | | InOu | DRAM address 8 |
| 140 | RA9 | | InOut | DRAM address 9 |
| 139 | RA11 | | InOut Pull-Down | DRAM address bit 11 |
| 138 | CKE | | Output | DRAM clock enable |
| 136 | RCLK | | InOut | Dram clock |
| 135 | RA3 | | InOut | DRAM address 3 |
| 134 | RA2 | | InOut | DRAM address 2 |
| 133 | RA1 | | InOut | DRAM address 1 |
| 131 | RA0 | | InOut | DRAM address 0 |
| 130 | RA10 | | InOut | DRAM address 10 |
| 129 | BA1 | | InOut | DRAM bank address 1 |
| 128 | BA0 | | InOut | DRAM bank address 0 |
| 127 | RCS# | | Output | DRAM chip select, active low |
| 126 | RAS# | | Output | DRAM row address strobe, active low |
| 125 | CAS# | | Output | DRAM column address strobe, active low |
| 124 | RWE# | | Output | DRAM Write enable, active low |
| 123 | DQM1 | | InOut | Data mask 1 |
| 122 | RD8 | | InOut | DRAM data 8 |
| 121 | RD9 | | InOut | DRAM data 9 |
| 119 | RD10 | | InOut | DRAM data 10 |
| 118 | RD11 | | InOut | DRAM data 11 |
| 117 | RD12 | | InOut | DRAM data 12 |
| 116 | RD13 | | InOut | DRAM data 13 |
| 115 | RD14 | | InOut | DRAM data 14 |
| 114 | RD15 | | InOut | DRAM data 15 |
| 113 | RD0 | | InOut | DRAM data 0 |

| | | | | |
|-----|------|--|-------|-------------|
| 112 | RD1 | | InOut | DRAM data 1 |
| 111 | RD2 | | InOut | DRAM data 2 |
| 110 | RD3 | | InOut | DRAM data 3 |
| 109 | RD4 | | InOut | DRAM data 4 |
| 107 | RD5 | | InOut | DRAM data 5 |
| 106 | RD6 | | InOut | DRAM data 6 |
| 105 | RD7 | | InOut | DRAM data 7 |
| 104 | DQM0 | | InOut | Data mask 0 |

3.5.2 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 |
| 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 |

3.5.3 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 | | |
| 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 |

3.5.4 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

| 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 |

| | | | | | |
|----|--------|------------------------------|------|------|------|
| 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 |

3.5.5 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 3.5.5.1:

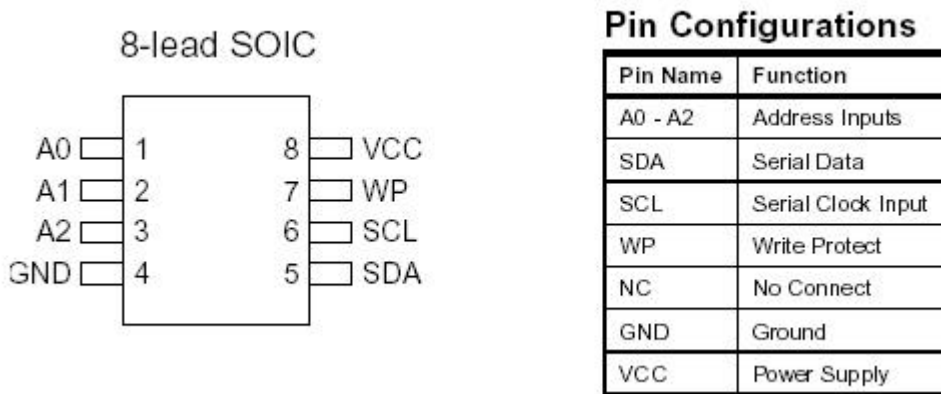


Figure 3.5.5.1 Casing and pin function introduction

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 figure 3.5.5.2:

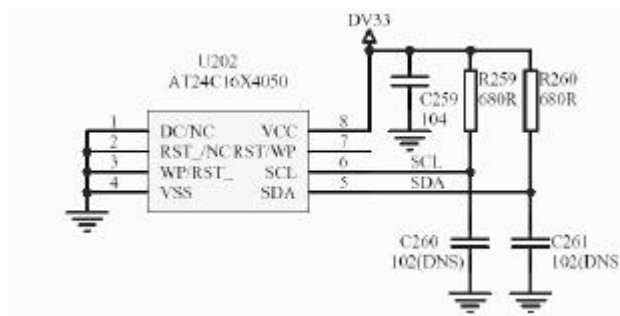


Figure 3.5.5.2 Circuit schematic diagram

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.

3.5.6 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 3.5.6.1:

| 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

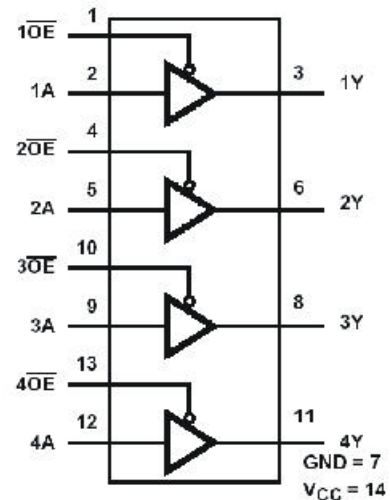


Figure 3.5.6.1 Truth value table and 74HCT125 function module structure

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:

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

3.5.7 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 |

3.5.8 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 |

3.5.9 Function introduction to CS5340

1. Description

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.

2. Features

- # 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

3.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 | - 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 |
| 7 | SCLK | I/O | Series clock | Provide series clock for series audio interface |
| 8 | LRCK | I/O | Left/right clocl | 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 |

3.5.10 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 |

3.5.11 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 |

3.5.12 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 |
| 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) |
| 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 | | |

3.5.13 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 |
| 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 | |
| 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 | |
| 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 |

3.5.14 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 | | |

3.5.15 function introduction to LM431A

U503 (LM431A) is a 2.5V comparator, shown as the figure 3.5.15.1. 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.

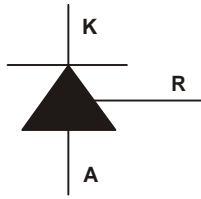


Figure 3.5.15.1 LM431A outside drawing

3.5.16 Function introduction to HS817

U502 (HS817) is a photoelectric coupler, shown as the figure 3.5.16.1. 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.

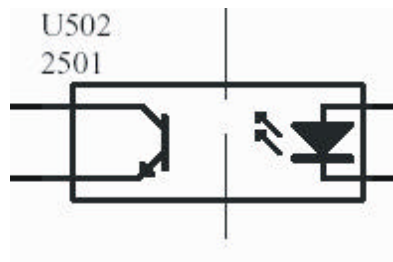


Figure 3.5.16.1 Hs817 outside drawing

3.5.17 Function introduction to Pt2579

1. Description

PT2579 is a Radio Data System Demodulator IC utilizing CMOS Technology specially designed for radio data system applications. The RDS data signal (RDDA) and the RDS clock signal (RDCL) are provided as outputs for further processing by an ideal decoder / microcontroller. Anti-aliasing Filter (2nd order), 57kHz band pass filter (8th order), reconstruction filter (2nd order), clocked comparator with automatic offset compensation, biphase symbol decoder, differential decoder, signal quality detector are all built into a single chip having the highest performance and reliability. Pin assignments and application circuit are optimized for easy PCB layout and cost saving advantages.

.2. Features

CMOS Technology

- # Low Power Consumption
- # Anti-Aliasing Filter (2nd Order)
- # Reconstruction Filter (2nd Order)
- # 57kHz Band-Pass Filter (8th Order)
- # 57kHz Carrier Regeneration
- # Differential Decoder
- # Signal Quality Detector
- # Subcarrier Output
- # Selectable 4.332 / 8.664 MHz Crystal Oscillator with Variable Dividers
- # Synchronous Demodulator for 57kHz Modulated RDS Signals
- # Clocked Comparator with Automatic Offset Compensation
- # Clock Generation with Lock on Biphase Data Rate
- # Biphase Symbol Decoder with Integrate and Dump Functions
- # Available in 16 pins, DIP or SOP Package

3. PIN DESCRIPTION

| PIN | Symbol | I/O | Description |
|-----|--------|-----|---------------------------------------------|
| 1 | QUAL | O | Quality indicator output pin |
| 2 | RDDA | O | RDS data output pin |
| 3 | VREF | I | Reference voltage |
| 4 | MUX | I | Multiplex signal input pin |
| 5 | AVDD | I | Analog supply voltage |
| 6 | AVSS | I | Analog ground pin |
| 7 | CIN | I | Subcarrier input to the comparator |
| 8 | SCOUT | O | Reconstruction filter subcarrier output pin |
| 9 | MODE | I | Oscillator mode/test control input pin |
| 10 | TEST | I | Test pin |
| 11 | DVSS | I | Digital ground pin |
| 12 | DVDD | I | Digital supply voltage |
| 13 | OSC1 | O1 | Oscillator input pin |
| 14 | OSC2 | O | Oscillator output pin |
| 15 | T57 | O | 57kHz clock signal output pin |
| 16 | RDCL | O | RDS clock output pin |

Chapter Four

Disassembly and Assembly Process

DVD players manufactured in BBK are largely identical but with minor differences and are mainly composed of loader components, control panel components, decode and servo board components, power board components, power amplifier board components, MIC board components and AV board components. In order to speed up the compilation of “Service Manual”, we shall not give repeat explanation to model with minor differences in chapter four “Disassembly and Assembly Process” for the later compiled service manuals. For disassembly and assembly process in this chapter, please refer to chapter 4 of “DK1005S Service Manual” or “DK1020S Service” .

The pictures of this model are shown as follows:

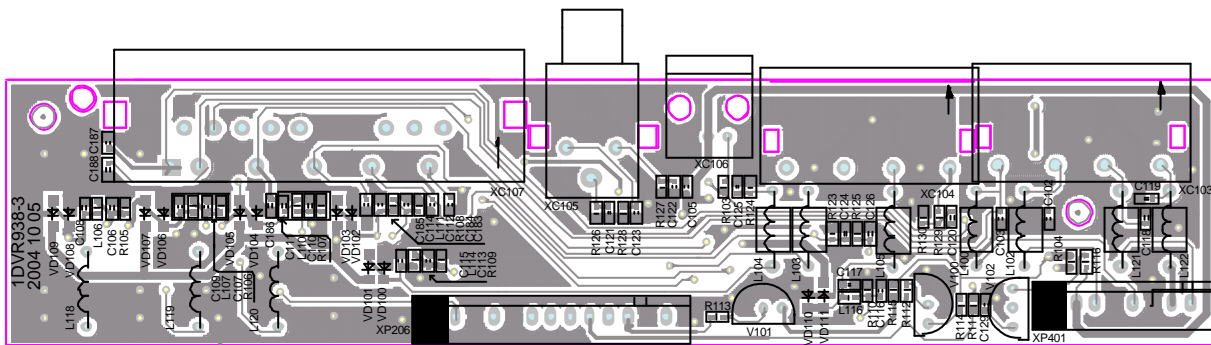


Chapter Cinque

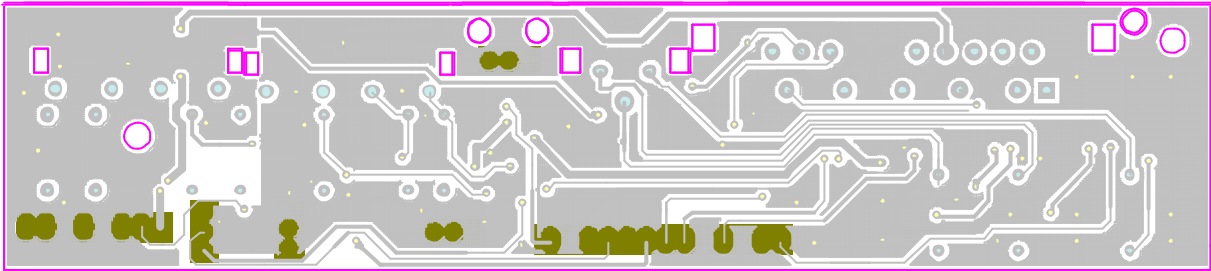
PCB board & Circuit diagram

Section One PCB board

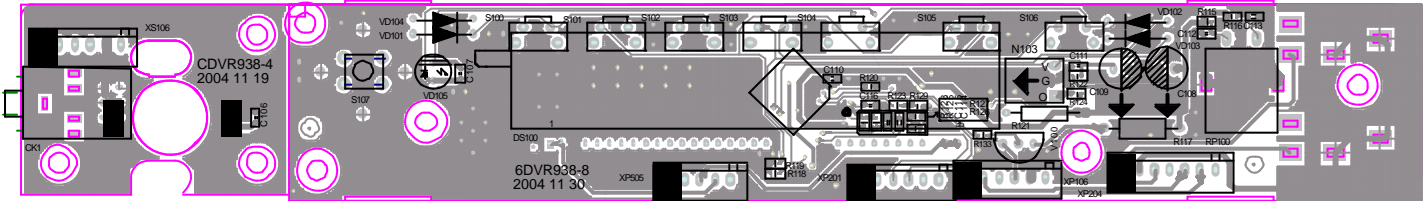
5.1.1 Surface layer of AV OUT Board



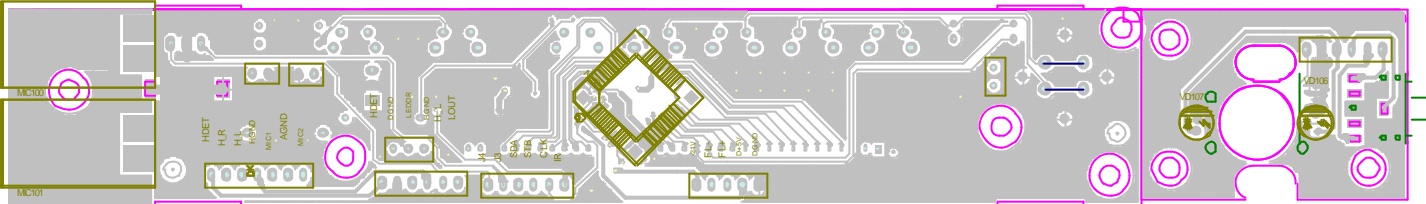
5.1.2 Bottom layer of AV OUT Board



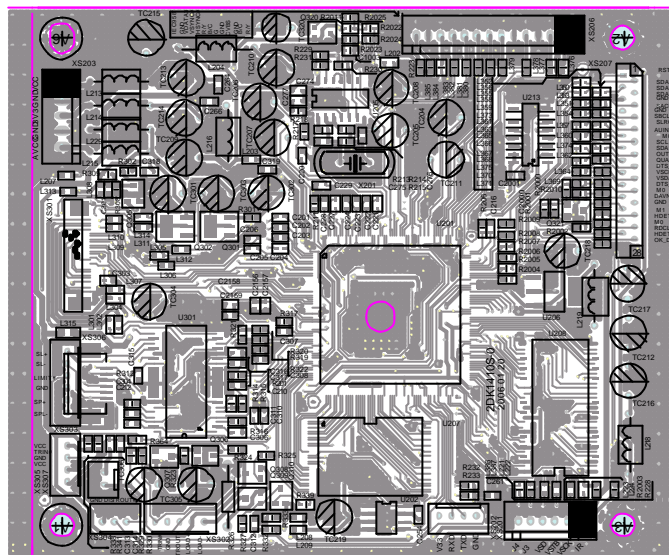
5.1.3 Surface layer of KEY SCAN Board



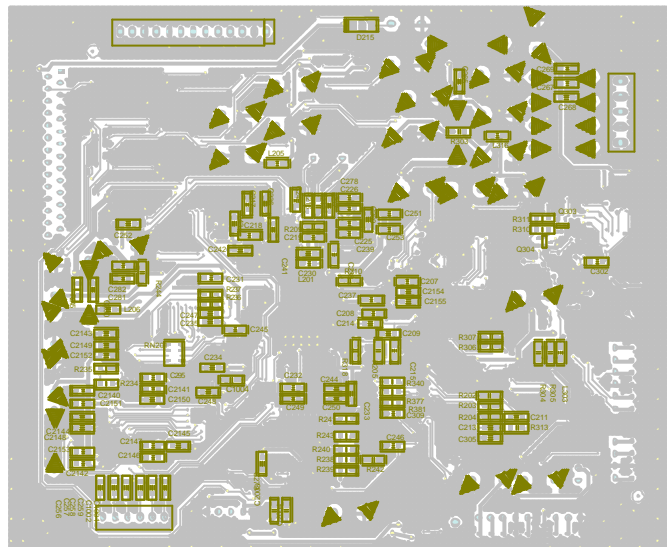
5.1.4 Bottom layer of KEY SCAN Board



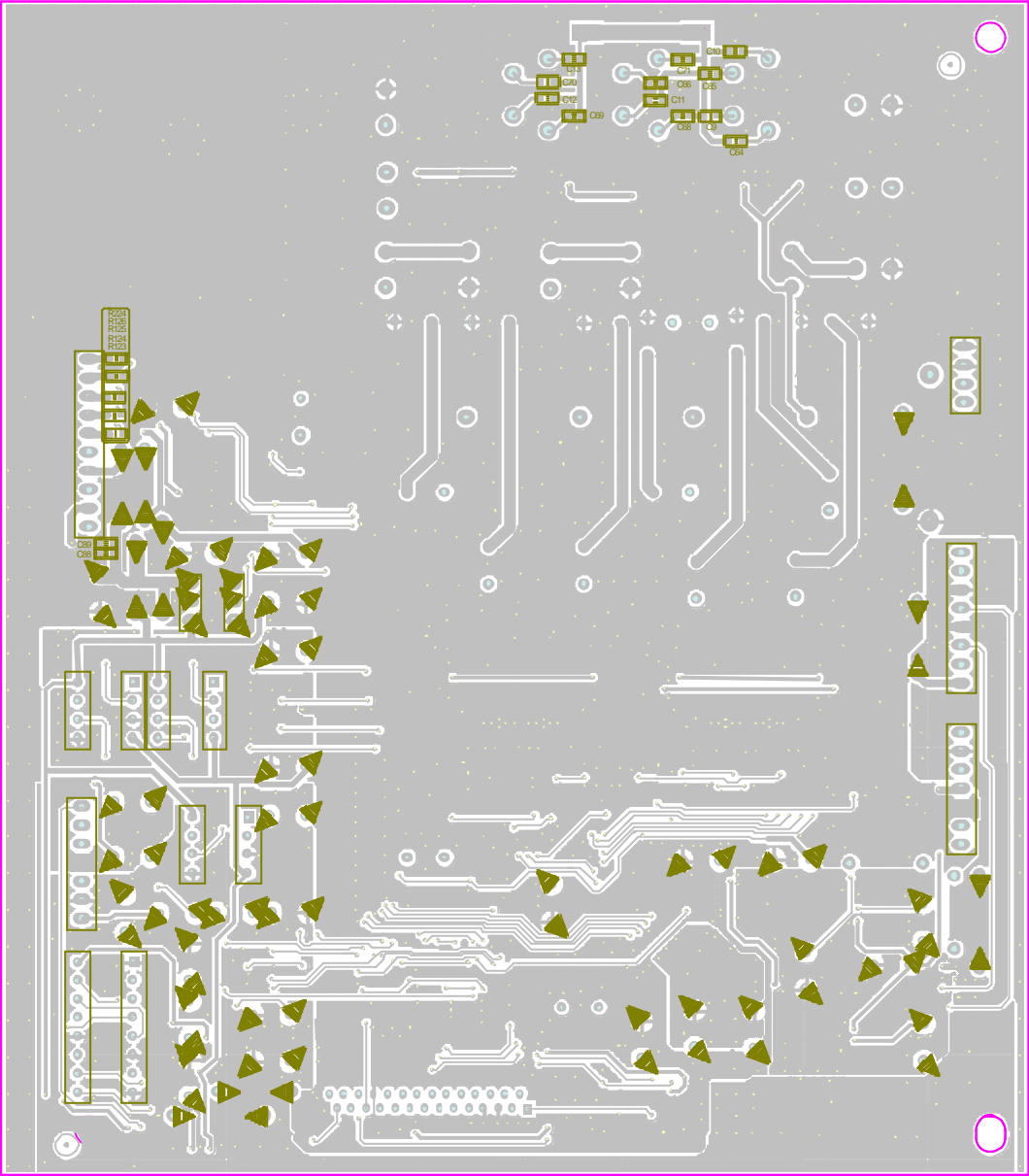
5.1.5 Surface layer of DECODE&SERVO Board



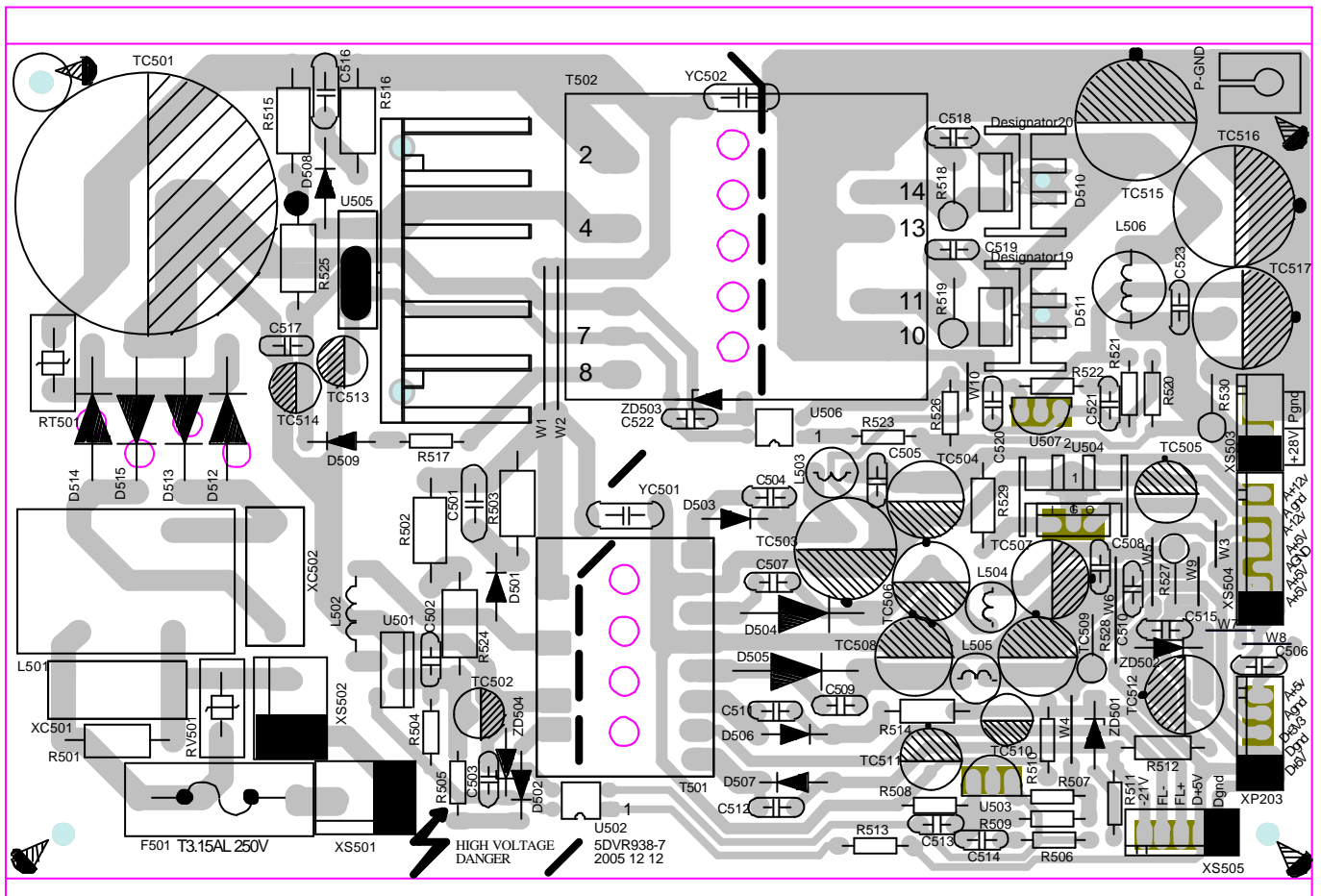
5.1.6 Bottom layer of DECODE&SERVO Board



5.1.8 Bottom layer of audio power amplifying Board



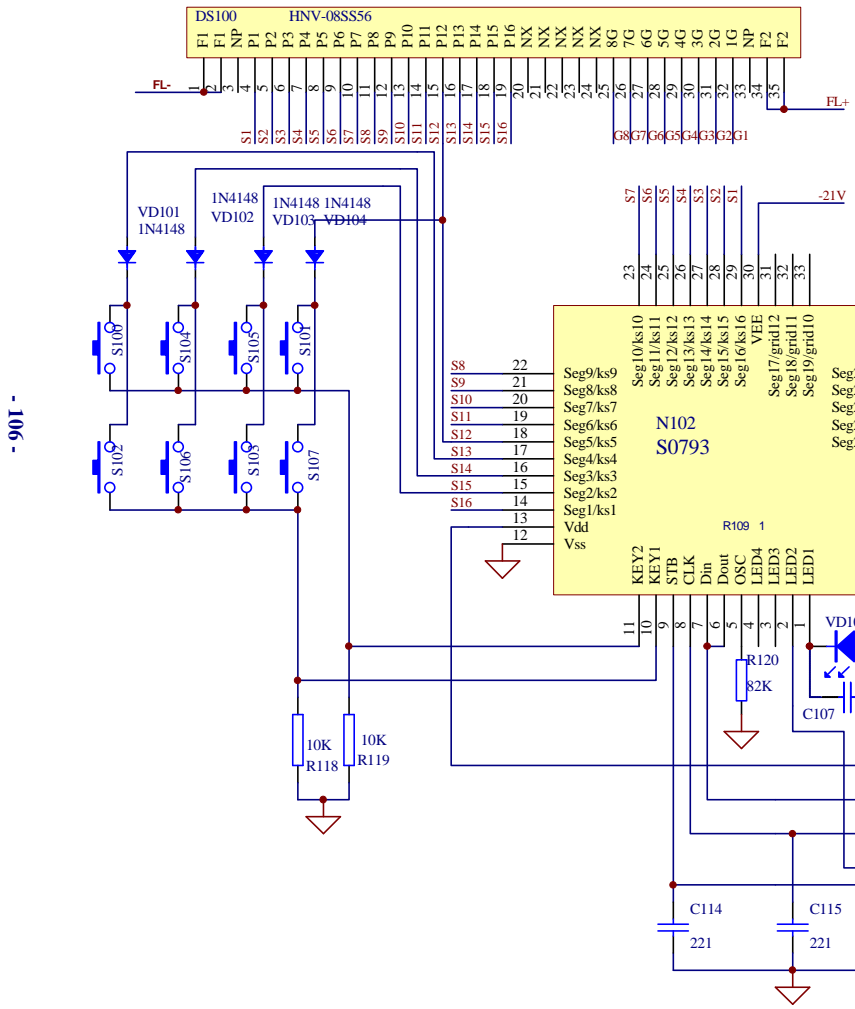
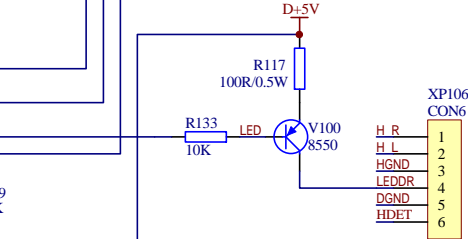
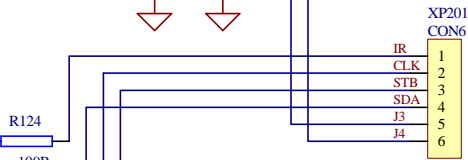
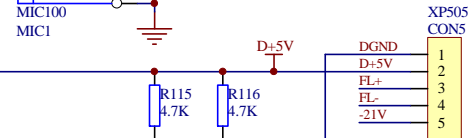
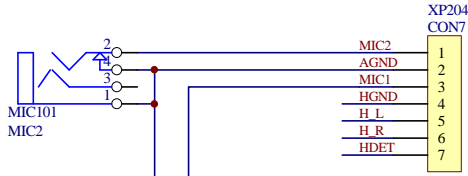
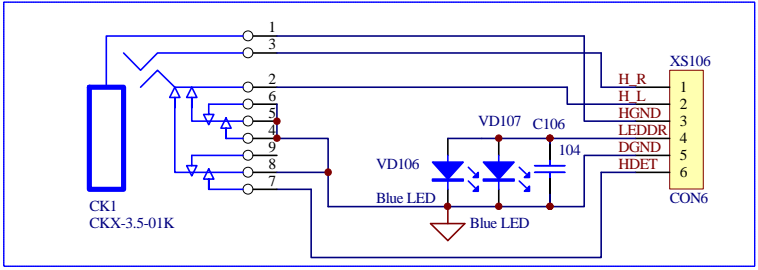
5.1.9 Power Board

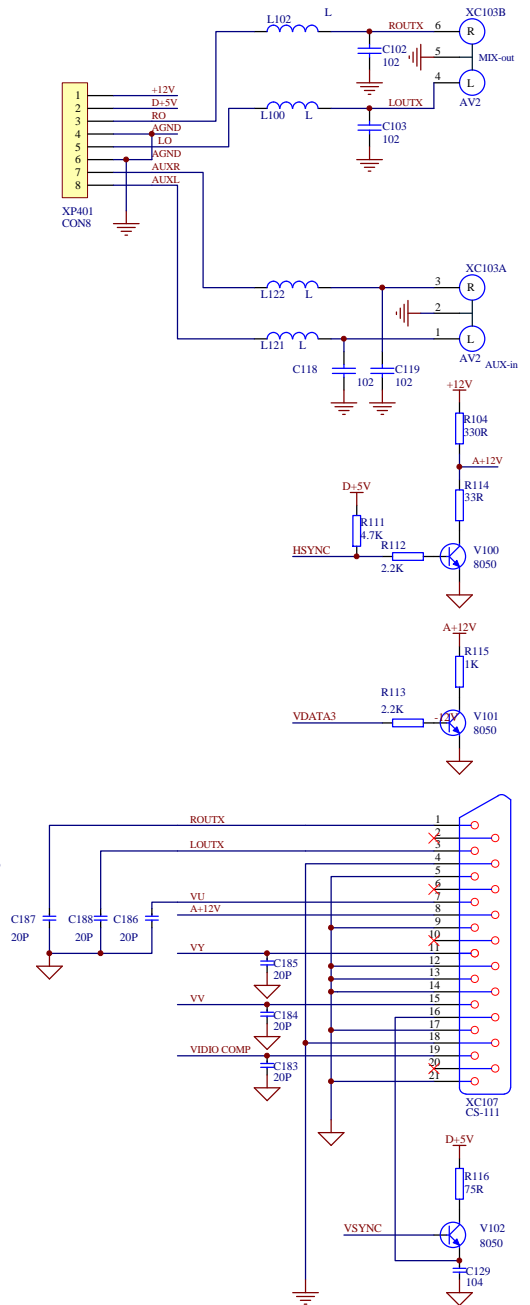
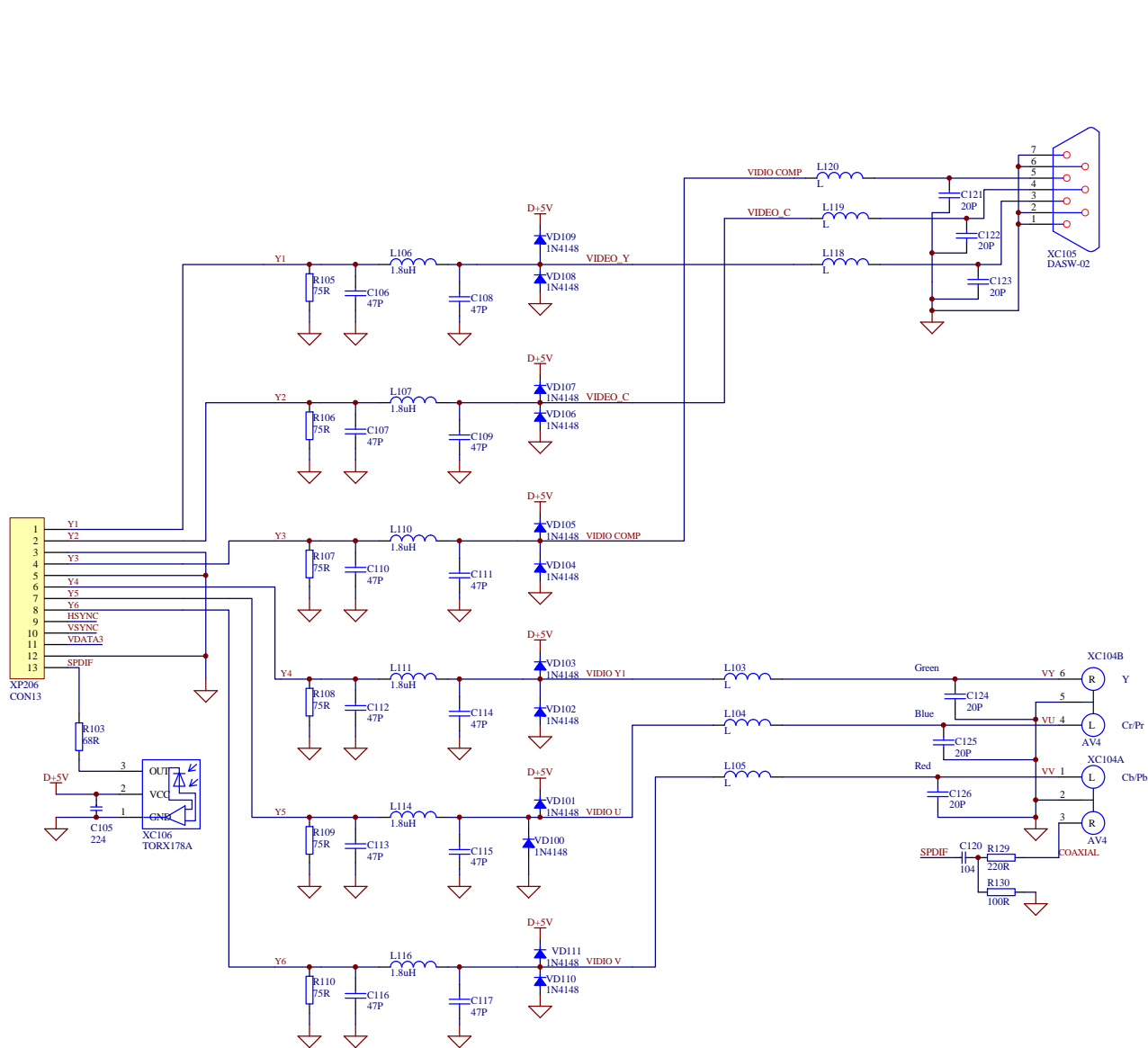


Section Two circuit diagram

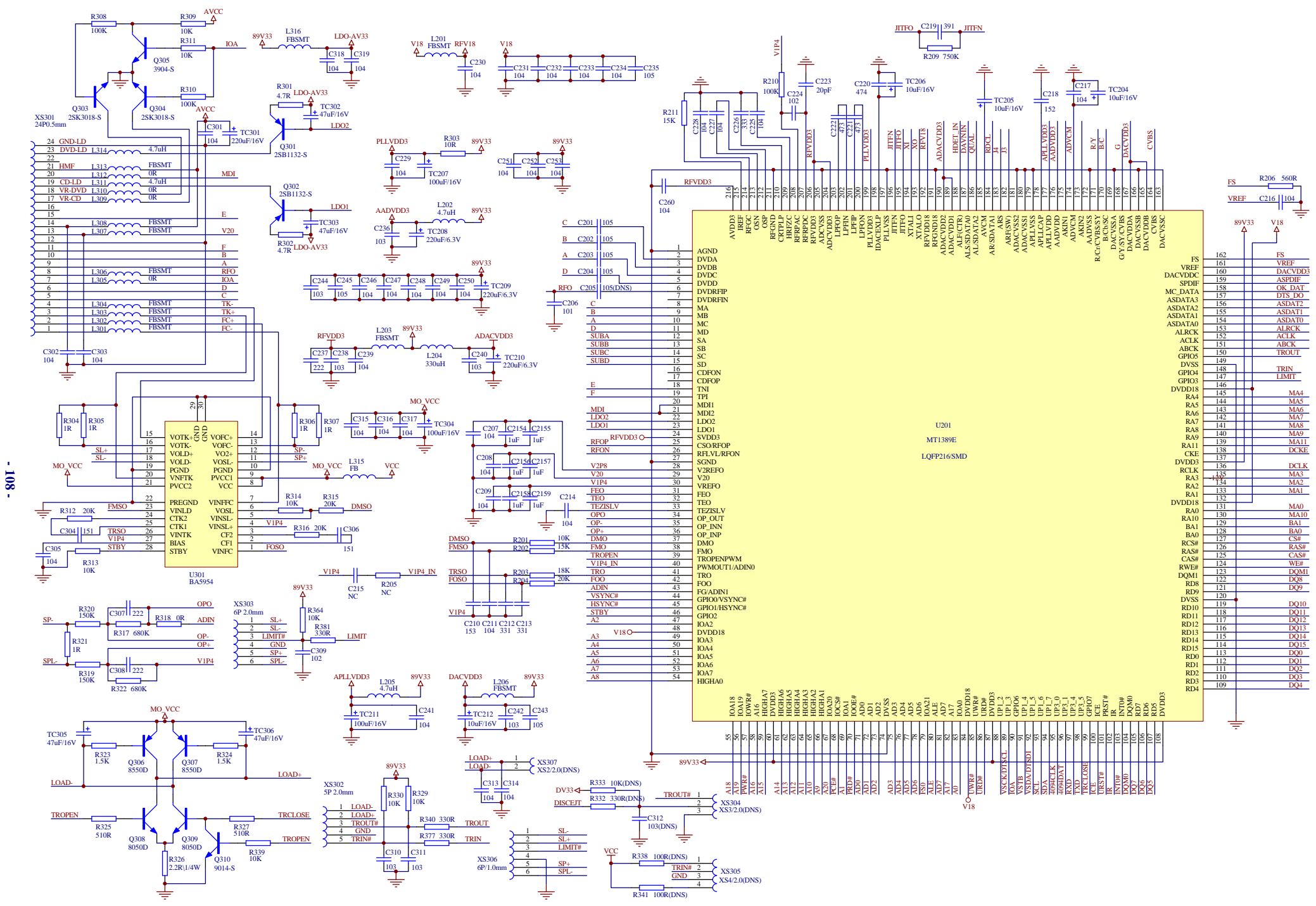
5.2.1 KEY SCAN Board

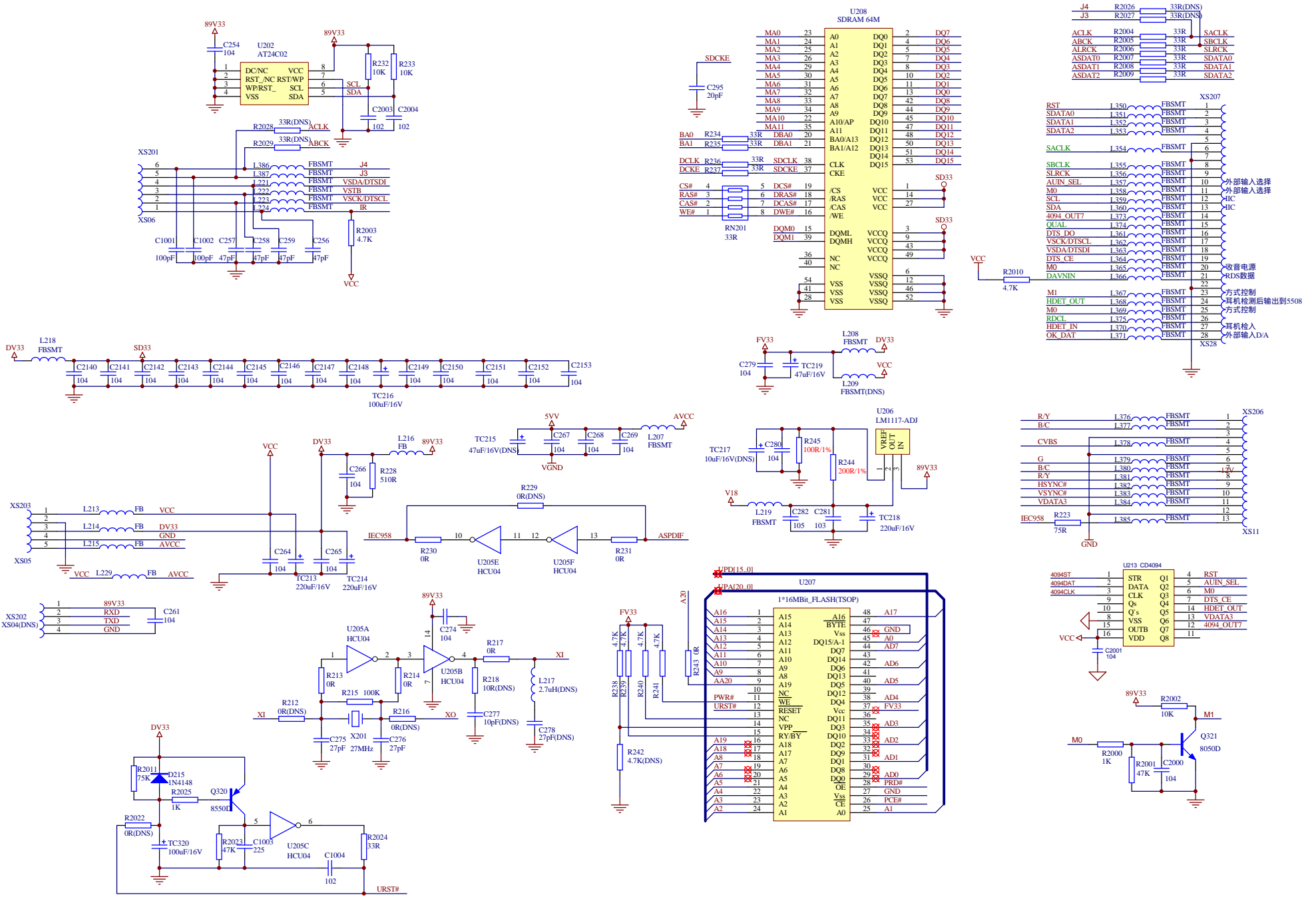
耳机板 CDVR938-3



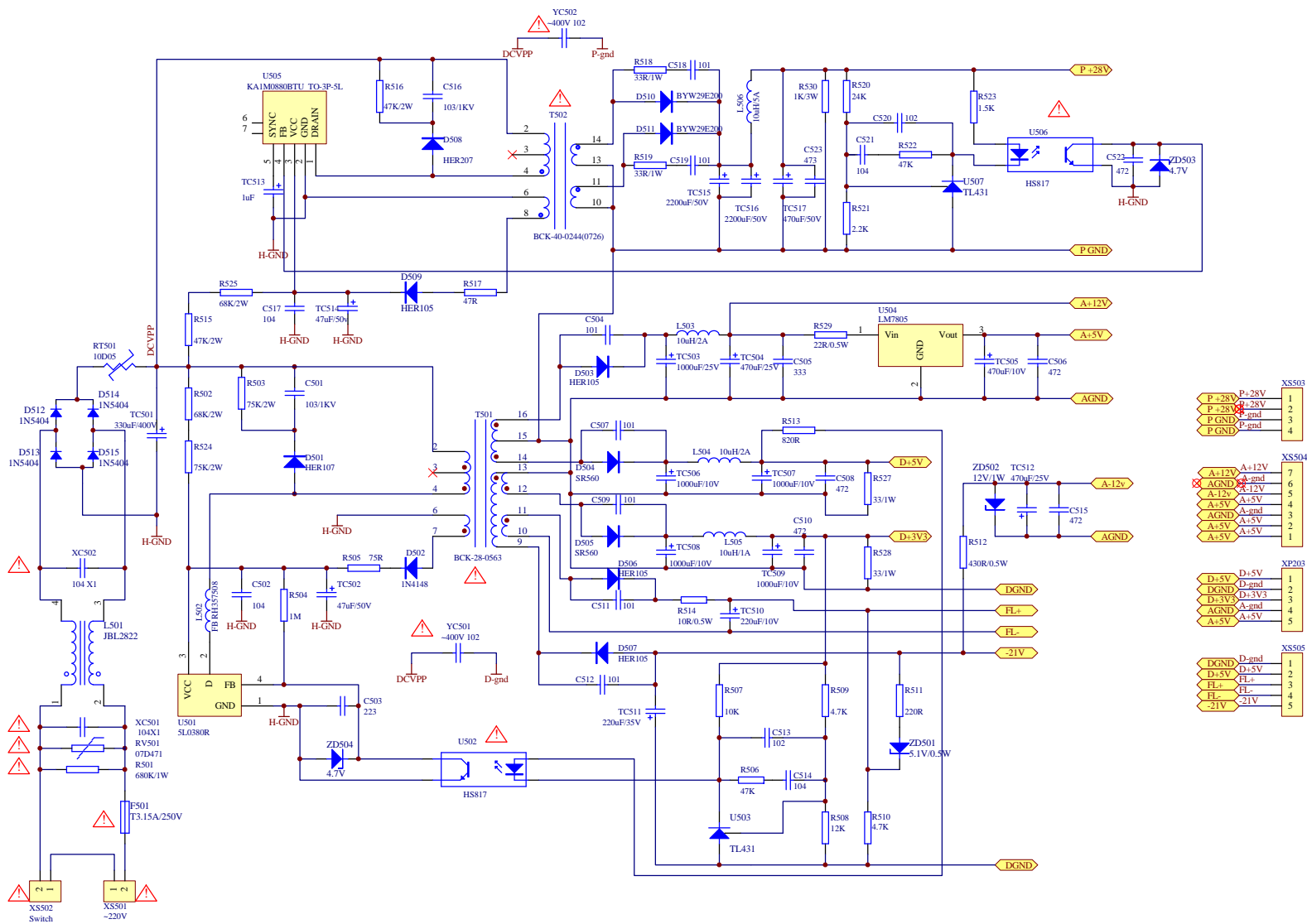


5.2.2 audio IN OUT Board





5.2.6 POWER Board



| XS503 | 1 | P +28V | P+28V |
|-------|---|--------|-------|
| | 2 | P +28V | P-gnd |
| | 3 | P GND | P-gnd |
| | 4 | P GND | P-gnd |

| XS504 | 7 | A+12V | A+12V |
|-------|---------------------------------|-------|-------|
| | 6 <th>AGND</th> <th>A-gnd</th> | AGND | A-gnd |
| | 5 <th>A+12V</th> <th>A-gnd</th> | A+12V | A-gnd |
| | 4 <th>A+5V</th> <th>A+5V</th> | A+5V | A+5V |
| | 3 <th>AGND</th> <th>A-gnd</th> | AGND | A-gnd |
| | 2 <th>A+5V</th> <th>A+5V</th> | A+5V | A+5V |
| | 1 <th>A+5V</th> <th>A+5V</th> | A+5V | A+5V |

| XP203 | 1 | D+5V | D+5V |
|-------|---------------------------------|-------|-------|
| | 2 <th>DGND</th> <th>D+3V3</th> | DGND | D+3V3 |
| | 3 <th>D+3V3</th> <th>A-gnd</th> | D+3V3 | A-gnd |
| | 4 <th>AGND</th> <th>A-gnd</th> | AGND | A-gnd |
| | 5 <th>A+5V</th> <th>A+5V</th> | A+5V | A+5V |

| XS505 | 1 | DGND | D-and |
|-------|-------------------------------|------|-------|
| | 2 <th>D+5V</th> <th>D+5V</th> | D+5V | D+5V |
| | 3 <th>FL+</th> <th>FL+</th> | FL+ | FL+ |
| | 4 <th>FL-</th> <th>FL-</th> | FL- | FL- |
| | 5 <th>-21V</th> <th>-21V</th> | -21V | -21V |

Chapter six BOM List

| MATERIAL CODE | MATERIAL NAME | SPECIFICATIONS | LOCATION |
|-------------------------------|---------------------------|-------------------------------|------------------------------------|
| DVD HOME THEATER DK1410SI(RU) | | | |
| POWER BOARD 5447883 | | | |
| 2100017 | LEAD | F 0.6 SHAPED 20mm | W1,W2 |
| 2100003 | LEAD | F 0.6 SHAPED 7.5mm | W3,W7,W8,W9,W10 |
| 2100004 | LEAD | F 0.6 SHAPED 10mm | W4,W5,R514 |
| 2100007 | LEAD | 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 | 1/4W2200±5% SHAPED 10 | R511 |
| 0000282 | CARBON FILM RESISTOR | 1/4W8200±5% SHAPED 10 | R513 |
| 0000284 | CARBON FILM RESISTOR | 1/4W1.5K±5% SHAPED 10 | R523 |
| 0000289 | CARBON FILM RESISTOR | 1/4W4.7K±5% SHAPED 10 | 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 | 1/4W1M0±5% SHAPED 10 | R504 |
| 0000651 | CARBON FILM RESISTOR | 1/2W 4300±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 | 1/2W220±5% SHAPED 12.5 | R529 |
| 0010275 | METAL OXIDE FILM RESISTOR | 1W330±5% SHAPED VERTICAL 7.5 | R518,R519 |
| 0010147 | METAL OXIDE FILM RESISTOR | 2W47K±5% SHAPED FLAT 15x7 | R516,R515 |
| 0010157 | METAL OXIDE FILM RESISTOR | 2W68K±5%SHAPED FLAT 15x7 | R502,R525 |
| 0010263 | METAL OXIDE FILM RESISTOR | 2W75K±5% SHAPED FLAT 15x7 | R503,R524 |
| 0010281 | METAL OXIDE FILM RESISTOR | 3W1K±5% SHAPED VERTICAL 7.5 | R530 |
| 0010288 | METAL OXIDE FILM RESISTOR | 1W1000±5% SHAPED VERTICAL 7.5 | R527 |
| 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 |

| MATERIAL CODE | MATERIAL NAME | SPECIFICATIONS | LOCATION |
|---------------|-------------------------------------------|------------------------------|---------------------|
| 0200138 | PORCELAIN CAPACITOR | 50V 104±20% 5mm | C502,C514,C517,C521 |
| 0200224 | PORCELAIN CAPACITOR | 1000V 103 +80%-20% 7.5mm | C501,C516 |
| 0210158 | TEMETAL OXIDE FILM RESISTORLENE CAPACITOR | 100V 472±10% SHAPED 5mm | C506,C508,C510,C515 |
| 0210024 | TEMETAL OXIDE FILM RESISTORLENE CAPACITOR | 100V 333±10% 5mm | C505 |
| 0210148 | TEMETAL OXIDE FILM RESISTORLENE CAPACITOR | 100V 473±10% SHAPED 5mm | C523,C522 |
| 0210204 | ANTI-JAMMING CAPACITOR | @MKP61 X2 275VAC 104M 15 UL | XC501,XC502 |
| 0200353 | CERAMIC CAPACITOR | @Y1 400VAC 102±10% 10mm UL | YC501,YC502 |
| 0260749 | CD | EZ 400V220U±20% 30×30 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 | POWER GRID FILTER | JBL2822 30mH±20% | L501 |
| 0460513 | SWITCH POWER TRANSFORMER | @BCK-28-0563 VDE | T501 |
| 0460514 | SWITCH POWER TRANSFORMER | @BCK-40-0244 VDE | T502 |
| 0460515 | SWITCH POWER TRANSFORMER | @BCK-40-0726 UL | T502 |
| 0680065 | SCHOTTKY DIODE | SR560 DO-27 SHAPED 20mm | D504,D505 |
| 0570006 | DIODE | 1N4148 | D502 |
| 0570013 | DIODE | HER105 | D503,D506,D507,D509 |

| MATERIAL CODE | MATERIAL NAME | SPECIFICATIONS | LOCATION |
|---------------|-------------------------------|---------------------------------------------------|----------------|
| 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±5% 1/2W BELT | ZD501 |
| 0580022 | VOLTAGE REGULATOR DIODE | 12V±5% 1W | ZD502 |
| 0570032 | DIODE | 1N5408 | D512~D515 |
| 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±10% 5mm | RV501 |
| 1050002 | HEAT SENSITIVITY RESISTOR | NTC SCK-104MS±20% | RT501 |
| 1080032 | PHOTOELECTRIC COUPLER | @HS817 VDE | U502,U506 |
| 0580005 | VOLTAGE REGULATOR DIODE | 4.7V±5% 1/2W | ZD503,ZD504 |
| 1570163 | PCB | @5DVR938-7 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 |
| 2122114 | FLAT CABLE | 5P130 2.5 2 PIN,WITH NEEDLE,TOGETHER DIRECTION | XP203 |
| 2300033 | FUSE | @T3.15AL 250V VDE | F501 |
| 3020402 | FUSE HOLDER | BLX-2 | F501 |
| 3580195 | HEAT RADIATION BOARD | 11×15×25 SINGLE HOLE,NOT OXIDATION | D510,D511,U504 |
| 3580194 | HEAT RADIATION BOARD | 40×20×35 DVR938-2 NOT OXIDATION | U505 |
| 3870591 | GROUNDING PIECE | AV100 | |
| 4000453 | SELF-TAPPING SCREW | BT 3×8H WHITE NICKEL | |
| 4000564 | SELF-TAPPING SCREW | PWT 3×12×7H WHITE NICKEL | |
| 4000627 | SELF-TAPPING SCREW | PWT 2.6×6×5H BLACK ZINC | |

| MATERIAL CODE | MATERIAL NAME | SPECIFICATIONS | LOCATION |
|-------------------------------------------------|-------------------------------------------|--------------------------------------|--------------------------------------------------------|
| DVD HOME THEATER DK1410SI(RU) | | | |
| DECODE BOARD 2DK1410S-0 1.2Ver2.1 | | | |
| 0960020 | CMETAL OXIDE FILM RESISTORSTAL OSCILLATOR | 27.00MHz 49-S | X201 |
| 1940140 | CABLE SOCKET | 14P 1.0mm DUAL RANK STRAIGHT INSERT | XS207 |
| 1940065 | SOCKET | 13P 2.0mm | XS206 |
| 1940005 | SOCKET | 6P 2.0mm | XS303,XS201 |
| 1940024 | SOCKET | 5P 2.0mm | XS302 |
| 1940004 | SOCKET | 5P 2.5mm | XS203 |
| 0090001 | SMD RESISTOR | 1/16W 00±5% 0603 | L305,L309,L310,L312,R213,R214,R217,R230,R231,R243,R318 |
| 0090272 | SMD RESISTOR | 1/16W 10±5% 0603 | R304~R307,R321 |
| 0090106 | SMD RESISTOR | 1/16W 4.70±5% 0603 | R301,R302 |
| 0090003 | SMD RESISTOR | 1/16W 100±5% 0603 | R303 |
| 0090005 | SMD RESISTOR | 1/16W 330±5% 0603 | R234~R237,R2004~R2009,R2024 |
| 0090006 | SMD RESISTOR | 1/16W 750±5% 0603 | R223 |
| 0090016 | SMD RESISTOR | 1/16W 1.5K±5% 0603 | R323,R324 |
| 0090009 | SMD RESISTOR | 1/16W 3300±5% 0603 | R340,R377,R381 |
| 0090249 | SMD RESISTOR | 1/16W 5100±5% 0603 | R228,R325,R327 |
| 0090012 | SMD RESISTOR | 1/16W 5600±5% 0603 | R206 |
| 0090014 | SMD RESISTOR | 1/16W 1K±5% 0603 | R232,R233,R2025 |
| 0090019 | SMD RESISTOR | 1/16W 4.7K±5% 0603 | R238~R241,R2010,R2003,R2000 |
| 0090023 | SMD RESISTOR | 1/16W 10K±5% 0603 | R201,R309,R311,R313,R314,R329,R330,R339,R364,R2002 |
| 0090024 | SMD RESISTOR | 1/16W 15K±5% 0603 | R202,R211 |
| 1940094 | CABLE SOCKET | 24P 0.5mm SMD SUBMIT MEET WITH CLASP | XS301 |
| 0090188 | SMD RESISTOR | 1/16W 18K±5% 0603 | R203 |
| 0090025 | SMD RESISTOR | 1/16W 20K±5% 0603 | R204,R312,R315,R316 |
| 0090029 | SMD RESISTOR | 1/16W 47K±5% 0603 | R2001,R2023 |
| 0090030 | SMD RESISTOR | 1/16W 56K±5% 0603 | R2011 |
| 0090197 | SMD RESISTOR | 1/16W 150K±5% 0603 | R319,R320 |
| 0090211 | SMD RESISTOR | 1/16W 680K±5% 0603 | R317,R322 |
| 0090212 | SMD RESISTOR | 1/16W 750K±5% 0603 | R209 |
| 0090609 | PRECISION SMD RESISTOR | 1/16W 1000±1% 0603 | R245 |
| 0090626 | PRECISION SMD RESISTOR | 1/16W 2000±1% 0603 | R244 |

| MATERIAL CODE | MATERIAL NAME | SPECIFICATIONS | LOCATION |
|---------------|-----------------------|---------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 0090034 | SMD RESISTOR | 1/16W 100K±5% 0603 | R210,R215,R308,R310 |
| 0100019 | SMD RESISTOR NETWORKS | 1/16W 330±5% 8P | RN201 |
| 0310085 | SMD CAPACITOR | 50V 20P±5% NPO 0603 | C223,C295 |
| 0310190 | SMD CAPACITOR | 50V 27P±5% NPO 0603 | C275,C276 |
| 0310045 | SMD CAPACITOR | 50V 47P±5% NPO 0603 | C257~C259 |
| 0310047 | SMD CAPACITOR | 50V 101±5% NPO 0603 | C206,C256,C1001,C1002 |
| 0310051 | SMD CAPACITOR | 50V 331±5% NPO 0603 | C212,C213 |
| 0310048 | SMD CAPACITOR | 50V 151±5% NPO 0603 | C304,C306 |
| 0310052 | SMD CAPACITOR | 50V 391±5% NPO 0603 | C219 |
| 0310207 | SMD CAPACITOR | 50V 104 ±20% X7R 0603 | C207~C209,C211,C214,C216,C217,C225, C227~C234,C239,C241,C246~C254,C260~ C261,C264~C269,C274,C279,C280,C301~ C303,C305,C313~C319,C2000,C2001,C21 40~C2153 |
| 0310543 | SMD CAPACITOR | 50V 104±10% X7R 0603 | C207~C209,C211,C214,C216,C217,C225, C227~C234,C239,C241,C246~C254,C260~ C261,C264~C269,C274,C279,C280,C301~ C303,C305,C313~C319,C2000,C2001,C21 40~C2153 |
| 0310234 | SMD CAPACITOR | 16V 105 +80%-20% Y5V 0603 | C201~C204,C235,C243,C245,C282,C2154 ~C2159 |
| 0310066 | SMD CAPACITOR | 50V 102±10% X7R 0603 | C224,C309,C1004,C2003,C2004 |
| 0310067 | SMD CAPACITOR | 50V 152±10% X7R 0603 | C218 |
| 0310068 | SMD CAPACITOR | 50V 222±10% X7R 0603 | C237,C307,C308 |
| 0310072 | SMD CAPACITOR | 50V 103±10% X7R 0603 | C236,C238,C240,C242,C244,C281,C310,C 311 |
| 0310201 | SMD CAPACITOR | 50V 153±10% X7R 0603 | C210 |
| 0310055 | SMD CAPACITOR | 16V 333±10% X7R 0603 | C226 |
| 0310056 | SMD CAPACITOR | 16V 473±10% X7R 0603 | C221,C222 |
| 0310362 | SMD CAPACITOR | 16V474 +80%-20% Y5V 0603 | C220 |
| 0310566 | SMD CAPACITOR | 10V 225 +80%-20% Y5V 0603 | C1003 |
| 0390355 | SMD INDUCTOR | 4.7UH±10% 1608 | L202,L205,L311,L314 |
| 0390095 | SMD MAGNETIC BEADS | FCM1608K-221T05 | L201,L203,L206~L208,L221~L224,L301~L3 04,L306~L308,L313,L315,L316,L350~L371, L373~L387 |
| 0700007 | SMD DIODE | 1N4148 | D215 |
| 0780085 | SMD TRIODE | 8050D | Q308,Q309 |
| 0780129 | SMD TRIODE | 8550D | Q306,Q307,Q320 |
| 0780062 | SMD TRIODE | 9014C | Q310,Q321 |

| MATERIAL CODE | MATERIAL NAME | SPECIFICATIONS | LOCATION |
|-------------------------------|----------------------------|------------------------------|-------------------------------------------|
| 0780040 | SMD TRIODE | 3904(100-300) SOT-23 | Q305 |
| 0780193 | SMD TRIODE | 2SK3018 | Q303,Q304 |
| 0780115 | SMD TRIODE | 2SB1132 | Q301,Q302 |
| 0882756 | IC | HEF4094BT SOP | U213 |
| 0880165 | IC | 74HCU04D SOP | U205 |
| 0880322 | IC | MM74HCU04M SOP | U205 |
| 0880513 | IC | HCU04 SOP | U205 |
| 0882262 | IC | K4S641632H-TC60 TSOP | U208 |
| 0882559 | IC | HY57V641620ET-7 TSOP | U208 |
| 0881182 | IC | LM1117MP-ADJ SOT-223 | U206 |
| 0881969 | IC | IP1117-ADJ SOT-223 | U206 |
| 0882461 | IC | AZ1117H-ADJ SOT-223 | U206 |
| 0881031 | IC | 24C02N SOP | U202 |
| 0882643 | IC | MT1389FE/E(E) QFP | U201 |
| 0881378 | IC | BA5954FP HSOP | U301 |
| 1633019 | PCB | 2DK1410S-0 | |
| 00003759 | CARBON FILM RESISTOR | 1/4W2.20±5% BELT | R326 |
| 02604379 | CD | CD11 16V10U±20%5×11C5 BELT | TC204~TC206,TC212,TC217 |
| 02600029 | CD | CD11 16V47U±20%5×11 C5 BELT | TC219,TC302,TC303,TC305,TC306,TC215 |
| 02601889 | CD | CD11 16V100U±20%6×12 C5 BELT | TC207,TC211,TC216,TC304,TC320 |
| 02601819 | CD | CD11 16V220U±20%6×12 C5 BELT | TC208,TC209,TC210,TC213,TC214,TC218,TC301 |
| 03900579 | MAGNETIC BEADS INDUCTOR | RH354708 BELT | L213~L216,L218,I219 |
| 03904299 | INDUCTOR | 330UH±10% 0410 BELT | L204 |
| DVD HOME THEATER DK1410SI(RU) | | | |
| REMOTE CONEROL 5471746 | | | |
| 0310222 | SMD CAPACITOR | 25V 104±20% X7R 0603 | C3 ,C5 |
| 0310191 | SMD CAPACITOR | 50V 30P±5% NPO 0603 | C1, C2 |
| 0090029 | SMD RESISTOR | 1/16W 47K±5% 0603 | R2 |
| 0090233 | SMD RESISTOR | 1/16W 4.7MO±5% 0603 | R3, R4 |
| 0090002 | SMD RESISTOR | 1/16W 2.2O ±5% 0603 | R5 |
| 0700007 | SMD DIODE | 1N4148 | VD2 |
| 0970008 | CERAMIC RESONATOR | 2.0MHz | G1 |

| MATERIAL CODE | MATERIAL NAME | SPECIFICATIONS | LOCATION |
|-------------------------------|--------------------------------------------------------|-------------------------|----------------------|
| 0090008 | SMD RESISTOR | 1/16W 220O±5% 0603 | R6 |
| 0260008 | CD | CD11C 10V47U±20%4×7 1.5 | TC1 |
| 0630003 | EMISSION PIPE | TSAL6200 | LED1 |
| 0160217 | DIGITAL POTENTIOMETER | EC30P16 | RP1 |
| 1340190 | LIGHT TOUCH SWITCH(FIVE DIRECTION) | SKQUCAA010 | RP2 |
| 0780085 | SMD TRIODE | 8050D | V1 |
| 1564312 | PCB | 81910SI-0 | |
| 3031855 | SURFACE CASING OF REMOTE CONTROL | RC-073 BLACK | |
| 3041406 | BOTTOM CASING OF REMOTE CONTROL | RC-073 BLACK | |
| 3051348 | BATTERY CASE DOOR OF REMOTE CONTROL | RC-073 BLACK | |
| 3051349 | GLASS OF REMOTE CONTROL | RC-073 MING PURPLE | |
| 3850124 | ANODE SPRING | RC026 | |
| 3850125 | CATHODE SPRING | RC026 | |
| 3850126 | ANODE/CATHODE SPRING | RC026 | |
| 3072572 | 5-DIRECTION BUTTON | RC-073 GREEN | |
| 3072570 | VOLUME KNOB | RC-073 BLACK | |
| 4000179 | SELF-TAPPING SCREW | PB 2×8 BLACK | |
| 0890292 | PROGRAM CPU | CPURC073RU-0 | |
| 4631058 | CONDUCT GLUE OF REMOTE CONTROL(UPPER) | RC-073 | |
| 4631059 | CONDUCT GLUE OF REMOTE CONTROL(LOWER) | RC-073 | |
| 5071274 | GLUE BAG FOR ENVIRONMENTAL PROTECTION (WITHOUT HOLE) | 85×290×0.05 PE | |
| DVD HOME THEATER DK1410SI(RU) | | | |
| EARPHONE BOARD 5446196 | | | |
| 0310207 | SMD CAPACITOR | 50V 104 ±20% X7R 0603 | EARPHONE |
| 0310543 | SMD CAPACITOR | 50V 104±10% X7R 0603 | EARPHONE |
| 1980061 | EARPHONE SOCKET | CKX-3.5-01K | CK1EARPHONE |
| 1940006 | SOCKET | 6P 2.5mm | XS106 EARPHONE |
| 0620040 | RADIATION DIODE | 3B 4SC WHITE ISSUE BLUE | VD106,VD107 EARPHONE |
| 1631900 | PCB | CDVR938-4 | EARPHONE |
| DVD HOME THEATER DK1410SI(RU) | | | |

| MATERIAL CODE | MATERIAL NAME | SPECIFICATIONS | LOCATION |
|-------------------------------|----------------------------|----------------------------------------------------|--------------------------|
| SURFACE CONTROL BOARD | | 5445684 | |
| 0000540 | CARBON FILM RESISTOR | 1/2W150O±5% SHAPED 12.5 | R121,R117 |
| 0260025 | CD | CD11 16V47U±20%5x11 2 | C108 |
| 0260200 | CD | CD11C 16V47U±20%5x7 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 |
| 1200531 | ISPLAY 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,TOGETHER DIRECTION | XP201 |
| 2121913 | FLAT CABLE | 5P320 2.5 2 PIN,WITH NEEDLE,TOGETHER DIRECTION | XP505 |
| 2121912 | FLAT CABLE | 6P330 2.5 2 PIN,WITH NEEDLE,TOGETHER DIRECTION | XP106 |
| 2121615 | FLAT CABLE | 7P280 2.5 2 PIN,WITH L NEEDLE,TOGETHER DIRECTION | XP204 |
| 2360024 | IR SENSOR | LTOP-4338 | N103 |
| 2360021 | IR SENSOR | AT138BV3 | N103 |
| 5233065 | SOFT SPONGE SPACER | 8x8x10 DOUBLE-FACED,HARD | SURFACE CONTROL BOARD |
| 5232691 | SOFT SPONGE SPACER | 15x10x9 DOUBLE-FACED,HARD | SURFACE CONTROL BOARD |
| 5445683 | PCB SEMI-FINISHED PRODUCT | 6DVR938-5-SMD DK1010S-2 | |
| DVD HOME THEATER DK1410SI(RU) | | | |
| SURFACE CONTROL BOARD SMD | | 5445683 | |
| 0090149 | SMD RESISTOR | 1/10W 47O±5% 0805 | R122 |
| 0090193 | SMD RESISTOR | 1/16W 82K±5% 0603 | R120 |
| 0090181 | SMD RESISTOR | 1/16W 100O±5% 0603 | R123~R126 |
| 0090019 | SMD RESISTOR | 1/16W 4.7K±5% 0603 | R115,R116,R127,R128,R129 |

| MATERIAL CODE | MATERIAL NAME | SPECIFICATIONS | LOCATION |
|-------------------------------|---------------------------|---------------------------------------------------------|------------------------------------------|
| 0090023 | SMD RESISTOR | 1/16W 10K±5% 0603 | R118,R119,R133 |
| 0310066 | SMD CAPACITOR | 50V 102±10% X7R 0603 | C112,C113 |
| 0310207 | SMD CAPACITOR | 50V 104 ±20% X7R 0603 | (SURFACE CONTROL BOARD C111,C110,C107) |
| 0310543 | SMD CAPACITOR | 50V 104±10% X7R 0603 | (SURFACE CONTROL BOARD C111,C110,C107) |
| 0310195 | SMD CAPACITOR | 50V 221±10% X7R 0603 | C114,C115,C116 |
| 1632035 | PCB | 6DVR938-8 | |
| DVD HOME THEATER DK1410SI(RU) | | | |
| INPUT OUTPUT BOARD 5447889 | | | |
| 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 |
| 1860059 | SCART SOCKET | CS-111 | XC107 |
| 1910159 | TERMINAL SOCKET | CS TERMINAL DASW-02 | XC105 |
| 1090024 | ELECTRO-OPTIC TRANSFORMER | TX179AT | XC106 |
| 1090077 | ELECTRO-OPTIC TRANSFORMER | TX179AT-2 | XC106 |
| 1090045 | ELECTRO-OPTIC TRANSFORMER | TX179ATW | XC106 |
| 2150286 | FLAT CABLE | 8P120 2.5 T2 2x2P SHIELD WITH NEEDLE,TOGETHER DIRECTION | XP401 |
| 2121533 | SOFT FLAT CABLE | 13P300 2.5/2.0 2 PIN,WITH NEEDLE,TOGETHER DIRECTION | XP206 |
| 0090005 | SMD RESISTOR | 1/16W 330±5% 0603 | R114 |
| 0090006 | SMD RESISTOR | 1/16W 750±5% 0603 | R107~R110,R116 |
| 0090008 | SMD RESISTOR | 1/16W 2200±5% 0603 | 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 | C108~C117 |
| 0310066 | SMD CAPACITOR | 50V 102±10% X7R 0603 | C102,C103,C118,C119 |
| 0310085 | SMD CAPACITOR | 50V 20P±5% NPO 0603 | C121~C126,C183~C188 |

| MATERIAL CODE | MATERIAL NAME | SPECIFICATIONS | LOCATION |
|-------------------------------|-------------------------------------------|--------------------------------------------------|---------------------------------------------------|
| 0310207 | SMD CAPACITOR | 50V 104 ±20% X7R 0603 | C120,C129 |
| 0310543 | SMD CAPACITOR | 50V 104±10% X7R 0603 | C120,C129 |
| 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 | |
| DVD HOME THEATER DK1410SI(RU) | | | |
| AMPLIFIER BOARD 5447884 | | | |
| 0010282 | METAL OXIDE FILM RESISTOR | 3W1K±5% SHAPED R 20x8 | R198 |
| 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 |
| 0410176 | VERTICAL SCREEN SHIELD FILTERING INDUCTOR | 10uH±10% 4A 5mm | L1~L4,L9~L11 |
| 05800069 | VOLTAGE REGULATOR DIODE | 5.1V±5% 1/2W BELT | VD2,VD3 |
| 05800099 | VOLTAGE REGULATOR DIODE | 9.1V±5% 1/2W BELT | VD8 |
| 0960226 | CMETAL OXIDE FILM RESISTORSTAL OSCILLATOR | 4.332MHz 49-s | Y2 |
| 0960182 | CMETAL OXIDE FILM RESISTORSTAL OSCILLATOR | 12.288MHz 49-S | Y3 |
| 0960171 | CMETAL OXIDE FILM RESISTORSTAL 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 DUAL RANK STRAIGHT INSERT | 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 |

| MATERIAL CODE | MATERIAL NAME | SPECIFICATIONS | LOCATION |
|---------------|-----------------------|-----------------------------------------------------------|---------------------------------------------------------------------------------------------------------|
| 2121621 | FLAT CABLE | 4P90 2.5 2 PIN,WITH NEEDLE,TOGETHER 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 | |
| 0090001 | SMD RESISTOR | 1/16W 00±5% 0603 | R199~R213,R223 |
| 0090272 | SMD RESISTOR | 1/16W 10±5% 0603 | R51~R53,R65,R93,R113,R144,R145,R174,R178,R182,R187,R196,R197 |
| 0090540 | SMD RESISTOR | 1/16W1.50±5% 0603 | R34~R37,R134~R136,R186 |
| 0090002 | SMD RESISTOR | 1/16W 2.20 ±5% 0603 | R68 |
| 0090616 | SMD RESISTOR | 1/16W 3.30±5% 0603 | R40,R41,R67,R140,R141 |
| 0090314 | SMD RESISTOR | 1/16W 5.10±5% 0603 | R88 |
| 0090003 | SMD RESISTOR | 1/16W 100±5% 0603 | R24,R25,R89,R116,R137,R175 |
| 0090004 | SMD RESISTOR | 1/16W 220±5% 0603 | R115 |
| 0090230 | SMD RESISTOR | 1/16W 470±5% 0603 | R5,R29,R56,R59,R62,R63,R69,R70,R94~R101,R225 |
| 0090220 | SMD RESISTOR | 1/16W 510±5% 0603 | R27,R122 |
| 0090017 | SMD RESISTOR | 1/16W 2.2K±5% 0603 | R1,R2,R80,R82 |
| 0090239 | SMD RESISTOR | 1/16W 2000±5% 0603 | R64,R66 |
| 0090008 | SMD RESISTOR | 1/16W 2200±5% 0603 | R123~R126 |
| 0090014 | SMD RESISTOR | 1/16W 1K±5% 0603 | R3,R20,R133,R217,R218 |
| 0090019 | SMD RESISTOR | 1/16W 4.7K±5% 0603 | R76~R79,R81,R83,R102,R103,R105,R110,R111,R138,R139,R156,R230,R38,R42,R44,R48,R191,R21 |
| 0090020 | SMD RESISTOR | 1/16W 5.1K±5% 0603 | R43,R45,R49,R90,R58,R192 |
| 0090022 | SMD RESISTOR | 1/16W 8.2K±5% | R214,R215,R146~R149,R154,R155,R159,R160 |
| 0090023 | SMD RESISTOR | 1/16W 10K±5% 0603 | R6,R16,R54,R55,R57,R60,R61,R84~R87,R92,R117,R119~R121,R142,R143,R150~R153,R163,R164,R166~R168,R170,R171 |
| 0090187 | SMD RESISTOR | 1/16W 12K±5% 0603 | R14,R18 |
| 0090025 | SMD RESISTOR | 1/16W 20K±5% 0603 | R172,R176,R180,R183,R193,R173,R177,R181,R184,R194 |
| 0090026 | SMD RESISTOR | 1/16W 22K±5% 0603 | R17,R165 |
| 0090027 | SMD RESISTOR | 1/16W 27K±5% 0603 | R106~R109,R157,R158,R161,R162 |
| 0090192 | SMD RESISTOR | 1/16W 51K±5% 0603 | R4 |

| MATERIAL CODE | MATERIAL NAME | SPECIFICATIONS | LOCATION |
|---------------|--------------------|---------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 0090029 | SMD RESISTOR | 1/16W 47K±5% 0603 | R114,R169 |
| 0090201 | SMD RESISTOR | 1/16W 220K±5% 0603 | R15,R19 |
| 0090109 | SMD RESISTOR | 1/16W 1M0±5% 0603 | R8,R104 |
| 0090147 | SMD RESISTOR | 1/10W 10±5% 0805 | R30,R31,R32,R33,R130,R131,R132,R185 |
| 0090039 | SMD RESISTOR | 1/10W 100±5% 0805 | R189,R190 |
| 0310046 | SMD CAPACITOR | 50V 82P±5% NPO 0603 | C14,C132 |
| 0310042 | SMD CAPACITOR | 50V 15P±5% NPO 0603 | C17,C18,C95,C96,C118,C124 |
| 0310045 | SMD CAPACITOR | 50V 47P±5% NPO 0603 | C161,C162 |
| 0310047 | SMD CAPACITOR | 50V 101±5% NPO 0603 | C6,C76,C77,C100-C102,C156,C191-C196 |
| 0310049 | SMD CAPACITOR | 50V 221±5% NPO 0603 | C73,C148-C153,C163,C164,C171 |
| 0310051 | SMD CAPACITOR | 50V 331±5% NPO 0603 | C81 |
| 0310196 | SMD CAPACITOR | 50V 471±10% 0603 | C144-C147,C157,C158 |
| 0310471 | SMD CAPACITOR | 50V 561±5% NPO 0603 | C207 |
| 0310054 | SMD CAPACITOR | 50V 681±5% NPO 0603 | C97,C98,C154,C155 |
| 0310066 | SMD CAPACITOR | 50V 102±10% X7R 0603 | C20,C21,C38,C39,C89,C135,C136,C159,C198 |
| 0310072 | SMD CAPACITOR | 50V 103±10% X7R 0603 | C40,C41,C44,C46,C47,C50,C53,C64-C66,C68-C71,C93,C137,C138,C142,C143,C170,C174,C178,C182,C187,C188 |
| 0310207 | SMD CAPACITOR | 50V 104 ±20% X7R 0603 | C9-C13,C22,C24,C26-C31,C48,C49,C51,C52,C55,C56,C59-C61,C67,C72,C74,C75,C78,C80,C82,C83,C88,C99,C103,C105-C107,C109,C114,C116,C119-C123,C126,C127,C179,C199,C200,C201,C202,C203,C204,C206,C208 |
| 0310543 | SMD CAPACITOR | 50V 104±10% X7R 0603 | C9-C13,C22,C24,C26-C31,C48,C49,C51,C52,C55,C56,C59-C61,C67,C72,C74,C75,C78,C80,C82,C83,C88,C99,C103,C105-C107,C109,C114,C116,C119-C123,C126,C127,C179,C199,C200,C201,C202,C203,C204,C206,C208 |
| 0310112 | SMD CAPACITOR | 16V 224±10% 0603 | C111 |
| 0310234 | SMD CAPACITOR | 16V 105 +80%-20% Y5V 0603 | C160,C197 |
| 0310673 | SMD CAPACITOR | 50V 333±5% X7R 0603 | C32-C35,C129,C130,C131,C183 |
| 0310169 | SMD CAPACITOR | 50V 105 +80%-20% 0805 | C23,C25,C115,C175 |
| 0390095 | SMD MAGNETIC BEADS | FCM1608K-221T05 | L6,L8,L12 |
| 0700007 | SMD DIODE | 1N4148 | VD1,VD5,VD6,VD7 |
| 0882353 | IC | CS5340 TSSOP | N7 |
| 0882946 | IC | PT2579-SN SOP | N15 |

| MATERIAL CODE | MATERIAL NAME | SPECIFICATIONS | LOCATION |
|-------------------------------------------|-------------------------------|------------------------------|---------------------------------------------------------|
| 0882947 | IC | BU1924F SOP | N15 |
| 0882349 | IC | TAS5112 TSSOP | N13,N14 |
| 0882350 | IC | TAS5508 TQFP | N12 |
| 0882352 | IC | TLV272 SOP | N8,N9 |
| 0882920 | IC | SN74LVC125APWR TSSOP | N3,N4 |
| 0882373 | IC | SN74LVC2G04DBVR SOT-23 | N2 |
| 1633020 | PCB | 4DK1410S-0 | |
| 00006239 | CARBON FILM RESISTOR | 1/2W220O±5% BELT | R91 |
| 00003239 | CARBON FILM RESISTOR | 1/2W150O±5% BELT | R9 |
| 00003219 | CARBON FILM RESISTOR | 1/2W47O±5% BELT | R188 |
| 02101459 | METAL POLYESTER FILMCAPACITOR | CL21X 100V 104K C5 BELT | C140,C141 |
| 02101659 | METAL POLYESTER FILMCAPACITOR | CL23X 63V 474±5% 5 BELT | C42,C43,C45,C90,C139,C184 |
| 02604389 | CD | CD11 16V4.7U±20%5×11C5 BELT | C84,C87,C91,C92,C113,C205 |
| 02604379 | CD | CD11 16V10U±20%5×11C5 BELT | C1,C2,C8,C54,C58,C86,C104,C108,C110,C112,C165,C189,C190 |
| 02600029 | CD | CD11 16V47U±20%5×11 C5 BELT | C19,C57,C63,C79,C94,C128 |
| 02601819 | CD | CD11 16V220U±20%6×12 C5 BELT | C85 |
| 02607369 | CD | CD11 16V330U±20%8×12 C5 BELT | C166,C167 |
| 03900579 | MAGNETIC BEADS INDUCTOR | RH354708 BELT | L5 |
| 03901979 | INDUCTOR | 100UH±10% 0410 BELT | L13 |
| 05700049 | DIODE | 1N4004 BELT | VD9,VD10 |
| 07800329 | TRIODE | 9014C BELT | V6 |
| 07800309 | TRIODE | 8550C BELT | V5 |
| DVD HOME THEATER DK1410SI(RU) | | | |
| PROGRAM FLASH ROMDK1410SI-OA(16M) 0911597 | | | |
| 0881754 | IC | 29LV160BE-70NC TSOP | U214 |
| 0881998 | IC | AT49BV162A 70TI TSOP | U214 |
| PROGRAM CPU RCO73RU-0 0890292 | | | |
| 0883034 | IC | M37544G2AGP LQFP | N1 |
| 5156608 | SIGN STICKER | CPURC073RU-0 | |