

DK1410SI DK1440SI

DK1470SI DK1480SI

service manual

Catalog

Chapter One About Maintenance	1
1.1 Safety precautions	1
1.1.1 Power supply	1
1.1.2 Precautions for antistatic	1
1.1.3 Precautions for laser head	1
1.1.4 About placement position	2
1.2 Maintenance method	2
1.2.1 Visualized method	2
1.2.2 Electric resistance method	2
1.2.3 Voltage method	2
1.2.4 Current method	2
1.2.5 Cutting method	2
1.2.6 Element substitution method	3
1.2.7 Comparison method	3
1.3 Required device for maintenance	3
 Chapter Two Functions and Operation Instructions	4
2.1 Features	4
2.2 Controls and functions	5
2.2.1 Front panel controls	5
2.2.2 Rear panel connections	5
2.2.3 VFD display general view	6
2.2.4 Remote control general view	6
2.3 FUNCTION SETTINGS	8
2.3.1 Function selection and change	8
2.3.2 Language settings	8
2.3.3 Image settings menu	8
2.3.4 Sound settings menu	9
2.3.5 Playback settings	10
2.3.6 Karaoke settings menu	10

2.3.7 Preference settings	10
2.3.8 Parental control	11
2.3.9 Initial setup menu	11
2.3.10 Reset to defaults	11
2.3.11 Exit settings menu	11
2.3.12 Channel delay set-up	11
 Chapter Three Principle and Servicing	14
Section One Principle of the Player	14
3.1.1 Function introduction	14
3.1.2 Block diagram principle of the player	14
Section Two Unit Circuit Principle	16
3.2.1 Decode circuit	16
3.2.2 Servo circuit	17
3.2.3 Laser power control circuit	19
3.2.4 Main axis control circuit	20
3.2.5 Control panel circuit	21
3.2.6 Power circuit	22
3.2.7 Audio power amplifying circuit	24
3.2.8 Output circuit	26
3.2.9 Video circuit	28
Section Three Servicing Cases	30
3.3.1 Servicing cases	30
3.3.2 Troubleshooting flow chart	38
Section Four Servicing Parameters	58
3.4.1 Signal waveform diagram	58
3.4.2 Key point voltage	61
Section Five Function Introduction to IC	63
3.5.1 function introduction to MT1389E	63
3.5.2 Function introduction to SDRAM	77
3.5.3 Function introduction to FLASH	78
3.5.4 Function introduction to D5954	79
3.5.5 Function introduction to 24LLC020	80
3.5.6 Function introduction to 74HCT125	81
3.5.7 Function introduction to Cd4052	83

3.5.8 Function introduction to SAA6588	84
3.5.9 Function introduction to Cs5340	84
3.5.10 Function introduction to 4558/4580	85
3.5.11 Function introduction to TLV272	86
3.5.12 Function introduction to TAS5508	86
3.5.13 Function introduction to TAS5112	88
3.5.14 Function introduction to 5L0380	93
3.5.15 function introduction to LM431A	93
3.5.16 Function introduction to Hs817	94
3.5.17 Function introduction to Pt2579	94
 Chapter Four Disassembly and Assembly Proces	 96
 Chapter Cinque PCB board & Circuit diagram	 97
Section One PCB board	97
Section Two circuit diagram.....	106
 Chapter six BOM List	 112

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-nose pincers
- ◆ Cutting nippers
- ◆ Forceps
- ◆ Electric screw driver
- ◆ Terminal 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.

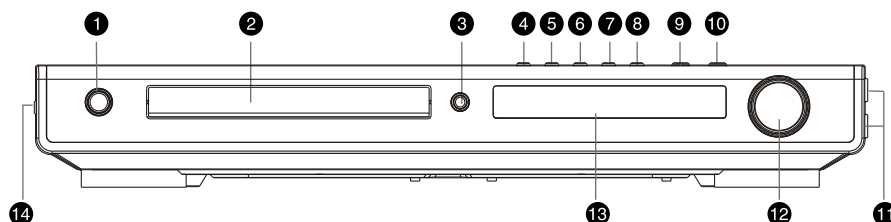
Auto protection of TV screen.

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

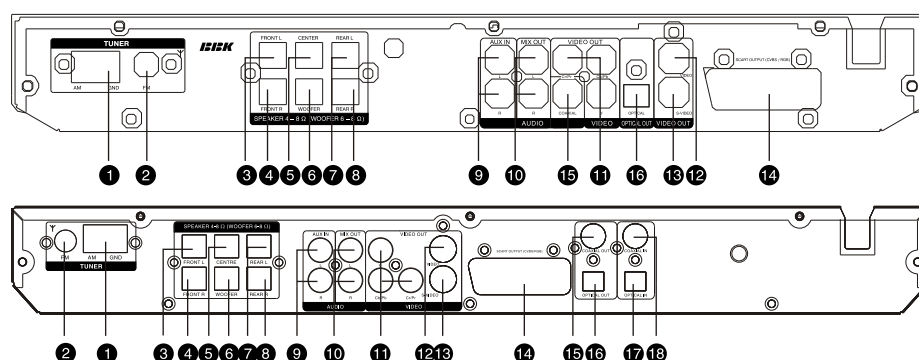
Press to adjust volume.

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

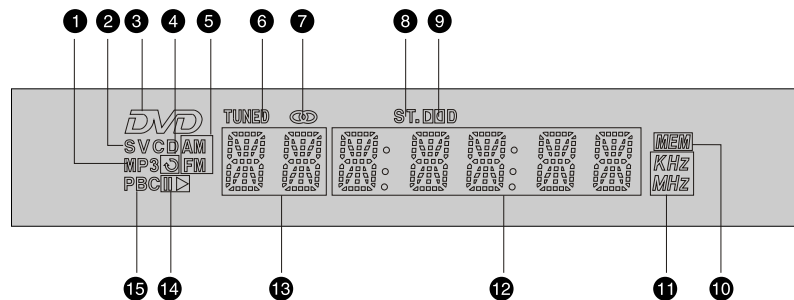
11 Component video output Y Cb (Pb) Cr (Pr)

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

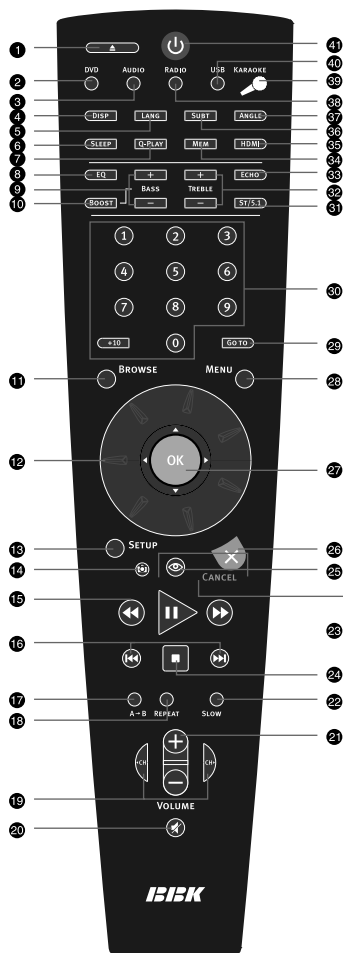
2.2.3 VFD display general view



- 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
- 15 Button



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 angle

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/5.1CH

32 TREBLE +/- button

Press to adjust the tone

33 ECHO button

Press to adjust the echo function of the microphone

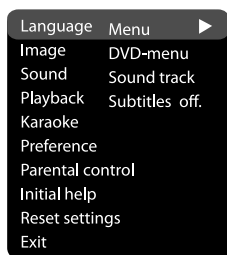
34 MEM button

Press to memorize the point where playback was

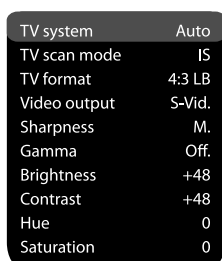
2.3 FUNCTION SETTINGS

2.3.1 Function selection and change

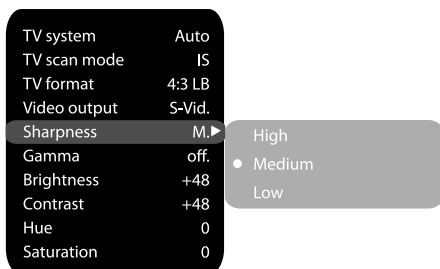
Press the SETUP key to show the setup menu. You will see the following image on the screen, as shown on the figure: Select the desired menu item using the jog Dial; Press OK confirmation.



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



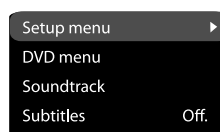
2. Using the jog Dial, select the desired item and press OK or RIGHT key of the cursor joystick. For example, select the Sharpness item. Settings will appear on the screen. Then select the desired sharpness level and press OK for confirmation.
3. Press LEFT key of the cursor joystick for exit to previous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

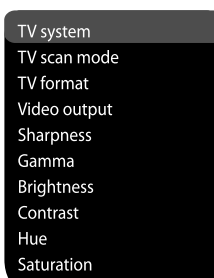
2. TV scan mode: scan mode selection

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 ratio 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.

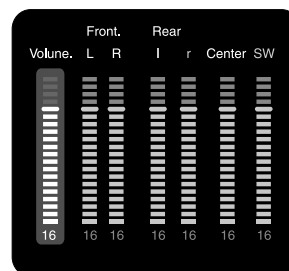


e) Channel settings: separate adjusting of volume by channels.

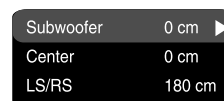
Select the channel you want.

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(decided 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.

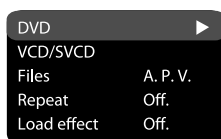
2.Digital audio output.

- 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



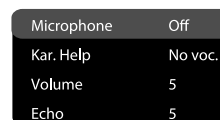
2.VCD/SVCD

- 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.



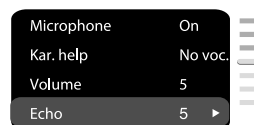
3.Volume:

- 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.

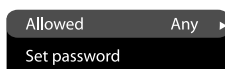
Gr. Equalizer	Off.
Background	Standard
Screensaver	Standard
Jog Dial	Zoom

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.

Old password	
New password	
Verify	
Ok Cancel	

2.3.9 Initial setup menu

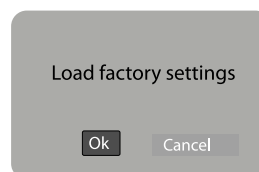
Press the RIGHT key of the cursor joystick to enter the initial setup menu, then select the desired item using the jog Dial and press OK key for confirmation.

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

• Auto

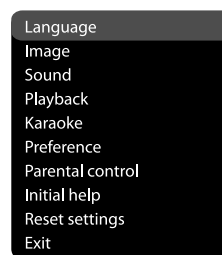
2.3.10 Reset to defaults

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.

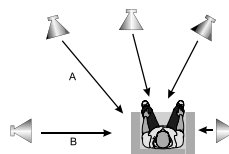


Fig.1. Take into account the A-B distance; use both figures for setting the desired time delay.

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.

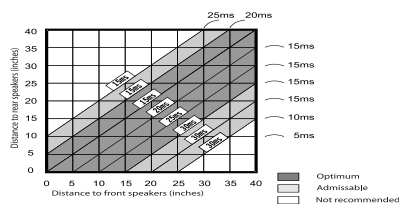


Fig. 2. Determine delay value as to Dolby Pro Logic mode.

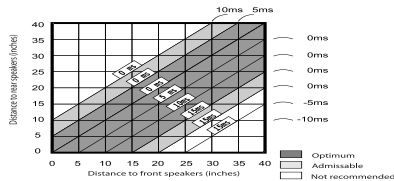


Fig. 3. Determine delay value as to Dolby Digital mode.

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".

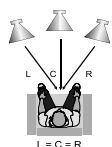


Fig. 1. Delay of central channel = 0
 $L=R=C$

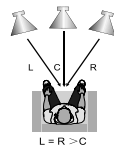


Fig. 2. Small area
Delay of central channel = $L=(\text{or } R) - C$
 $L=R>C$

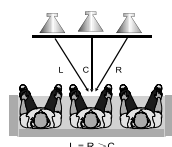
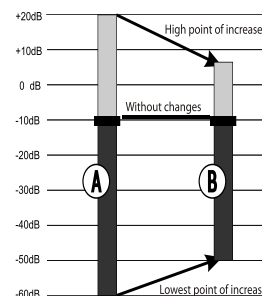
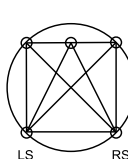
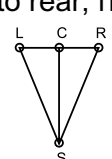


Fig. 3 Small area
Delay of central channel = 0
 $L=R>C$



Principle of compressing the acoustic signal's dynamic range.

	Dolby Digital	Dolby Por Logic surround
Rear channel	Stereo 20 Hz-20kHz	mone 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.

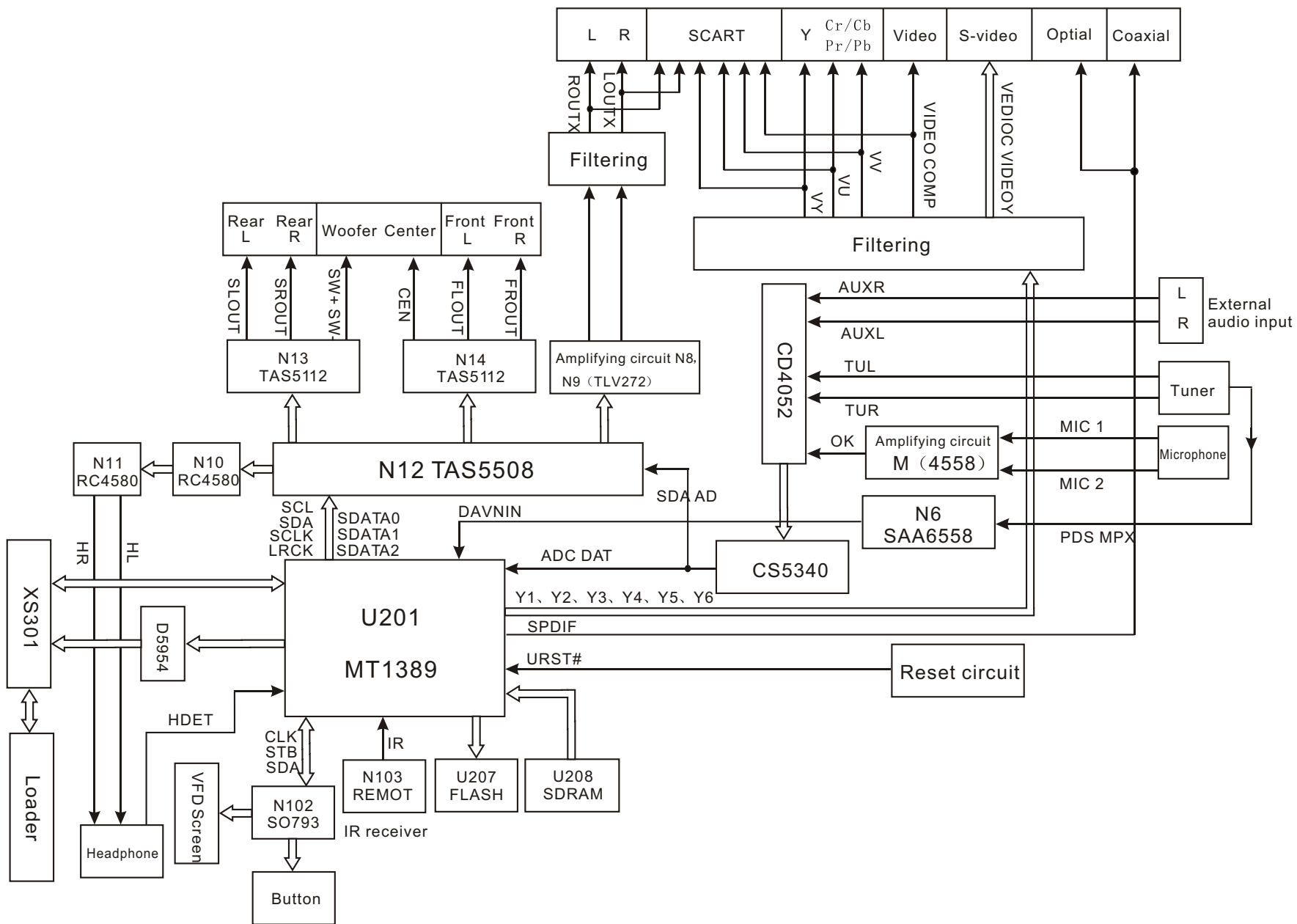


Figure 3.1.2.1 Block diagram of the player

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:

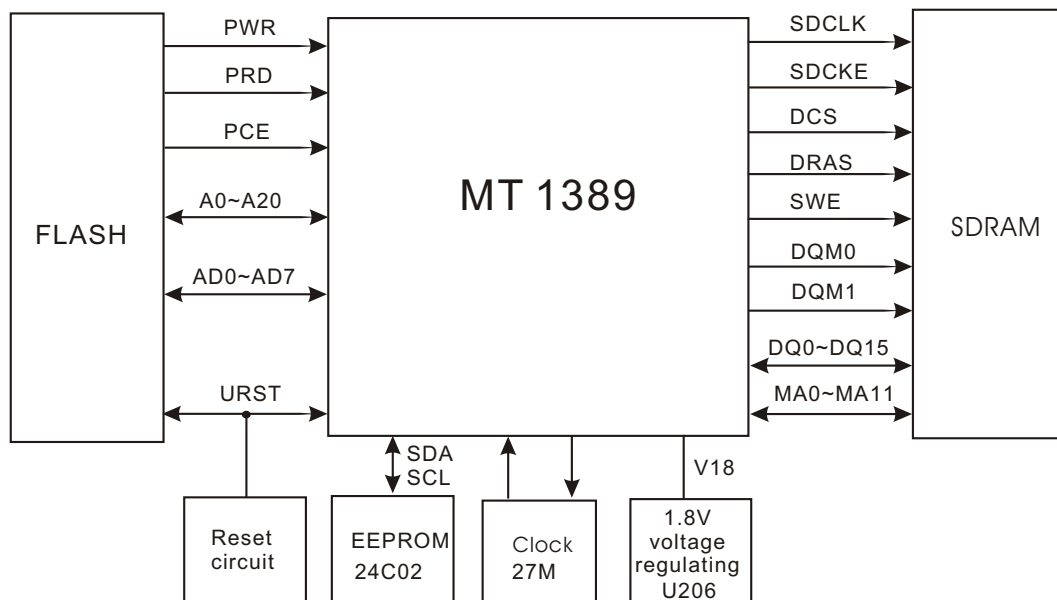


Figure 3.2.1.1 Decode circuit block diagram

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:

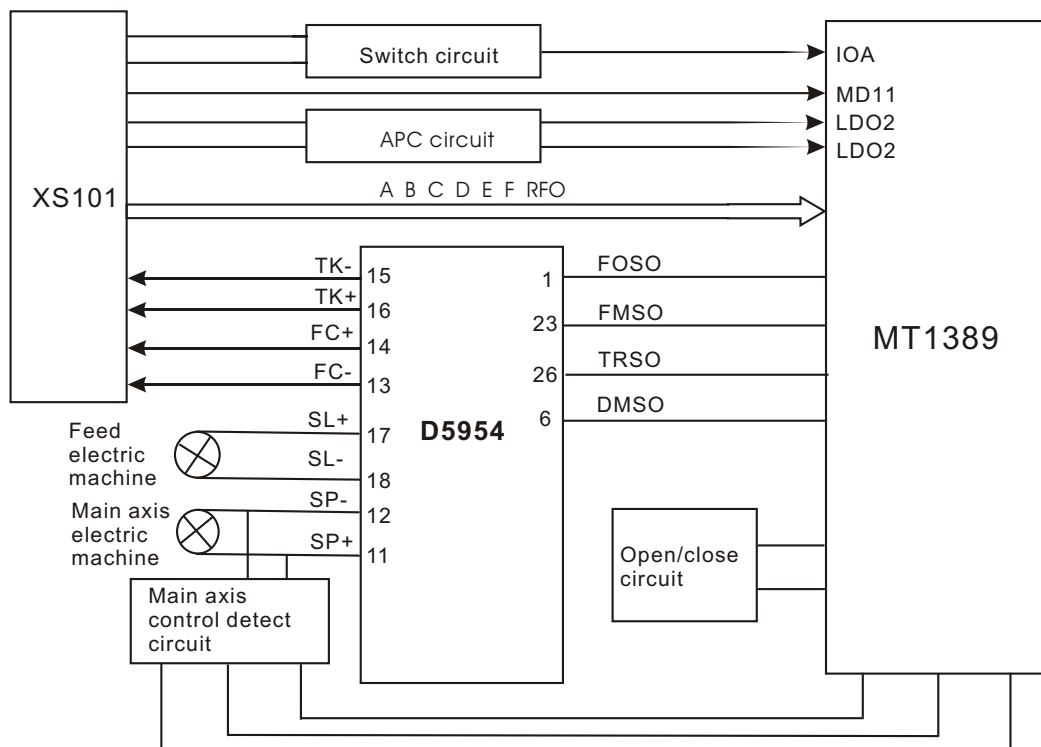


Figure 3.2.2.1 Servo circuit block diagram

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:

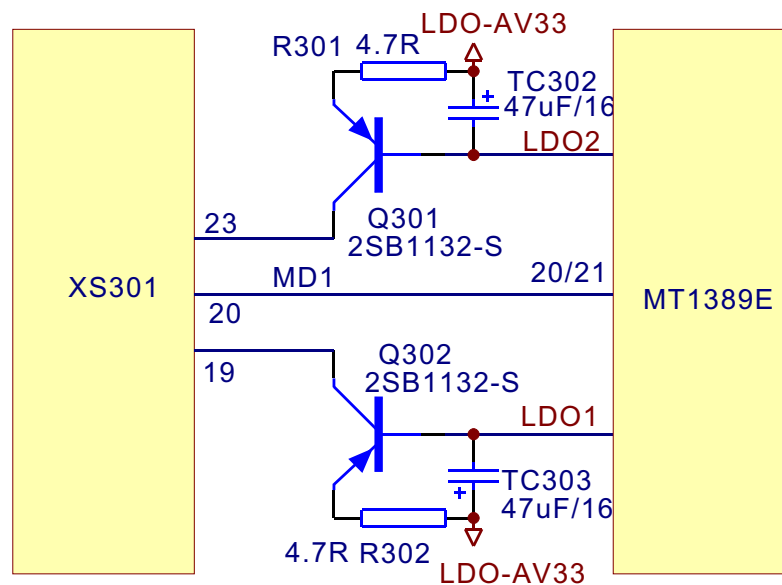


Figure 3.2.3.1 Laser power control circuit diagram

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:

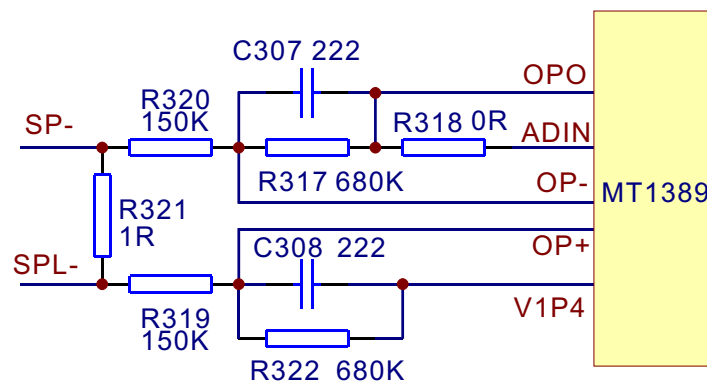


Figure 3.2.4.1 Main axis control circuit diagram

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:

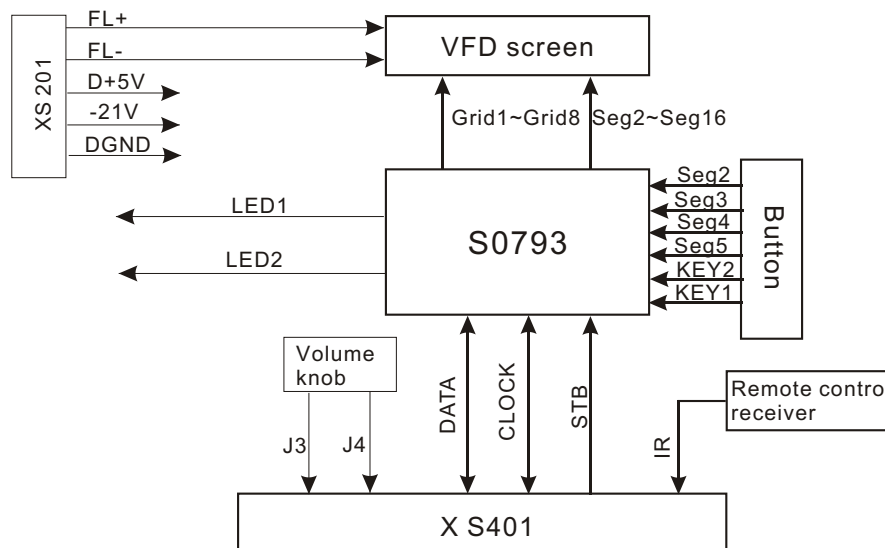


Figure 3.2.5.1 Control panel circuit block diagram

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:

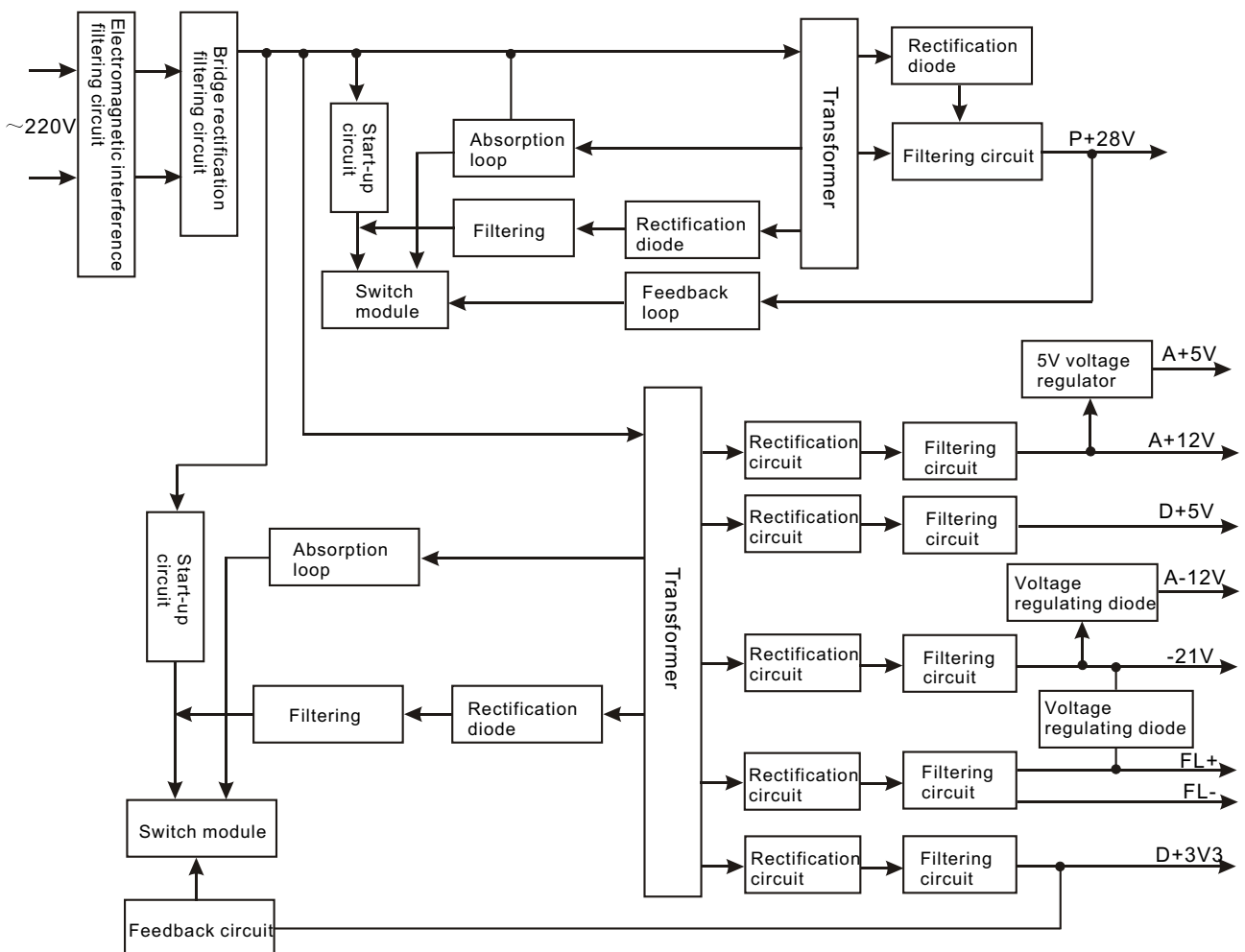


Figure 3.2.6.1 Power circuit block diagram

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+;FL-: 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:

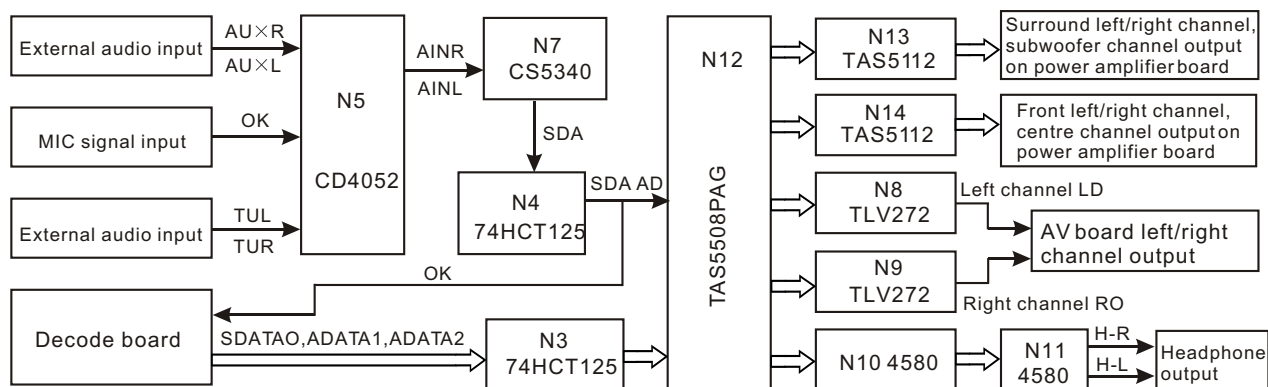


Figure 3.2.7.1 Audio power amplifying circuit block diagram

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:

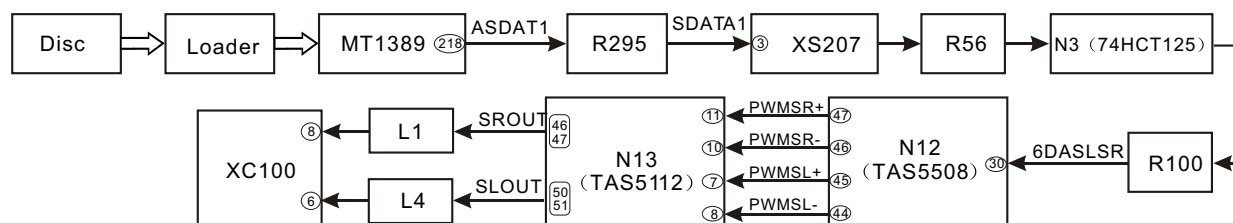


Figure 3.2.8.1 Power amplifier surround left and right channel block diagram

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:

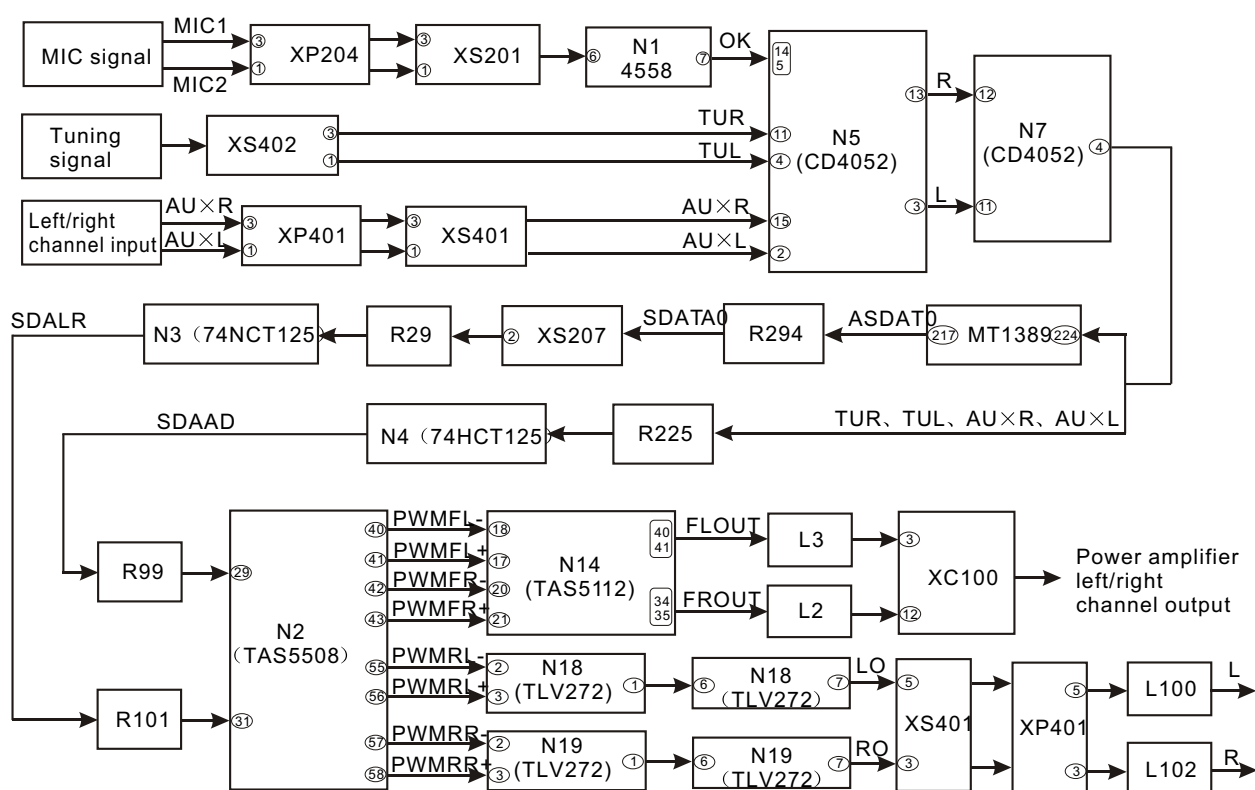


Figure 3.2.8.2 Power amplifier L/R channel output and non power amplifier L/R channel output block diagram

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

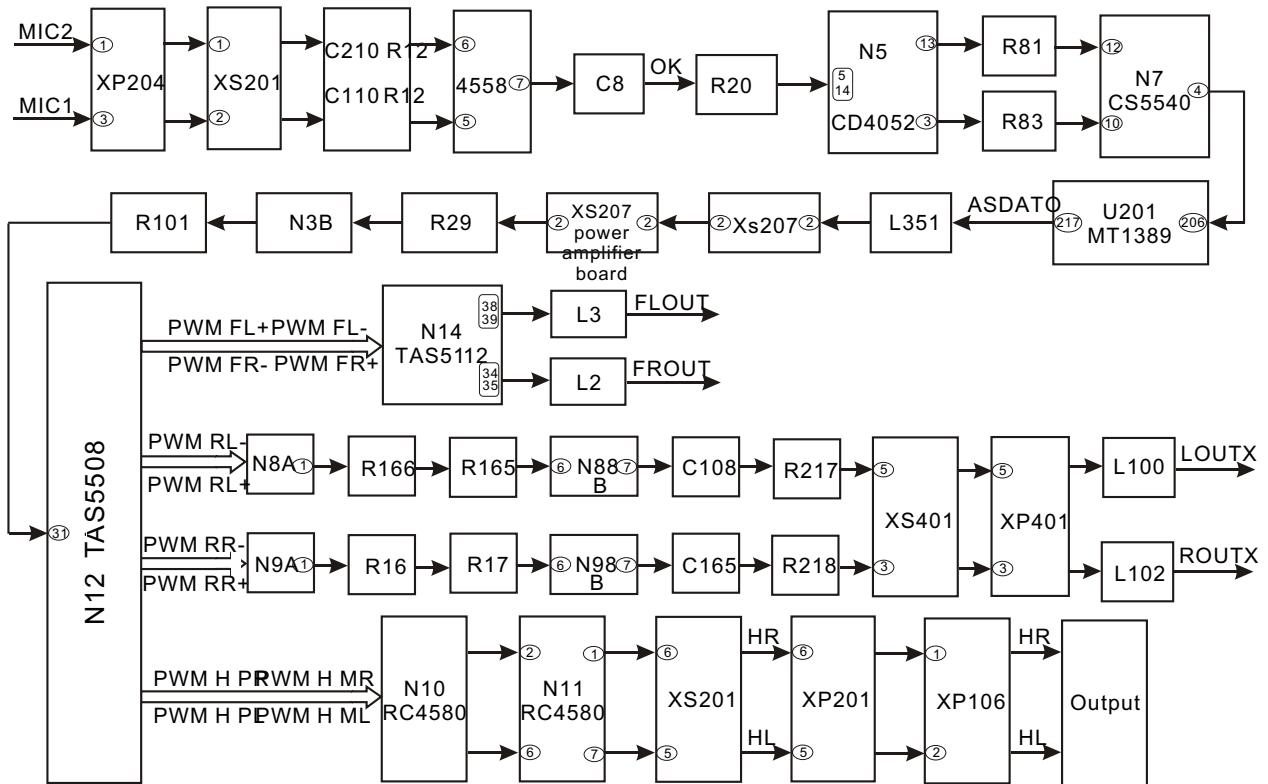


Figure 3.2.8.3 Microphone circuit block diagram

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

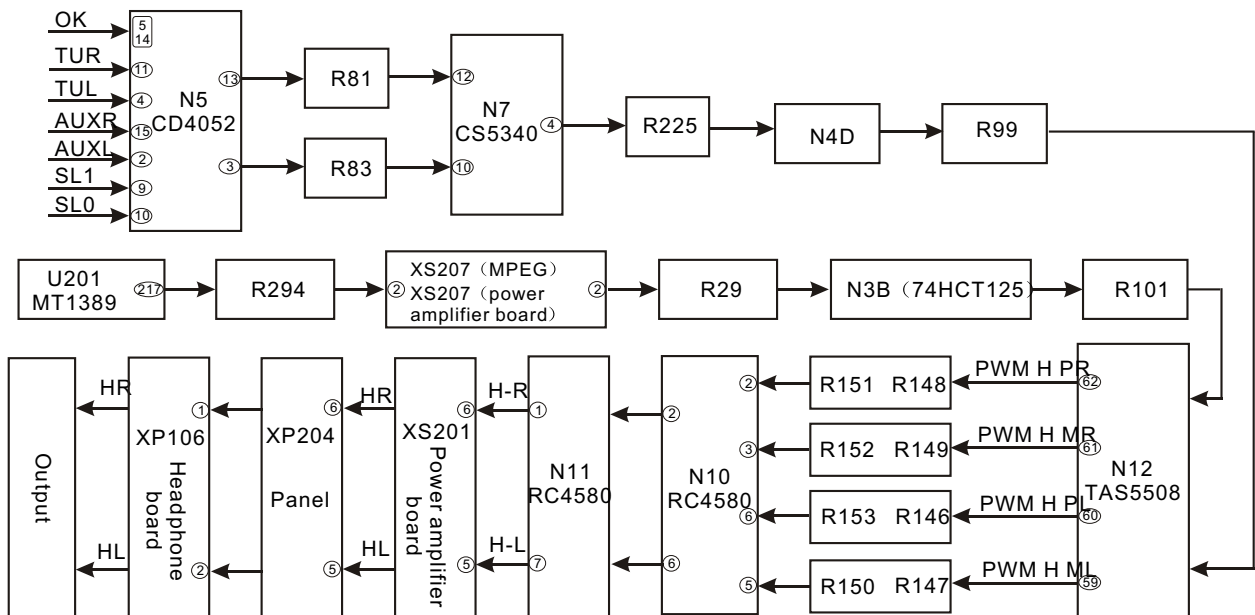


Figure 3.2.8.4 Headphone output circuit block diagram

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

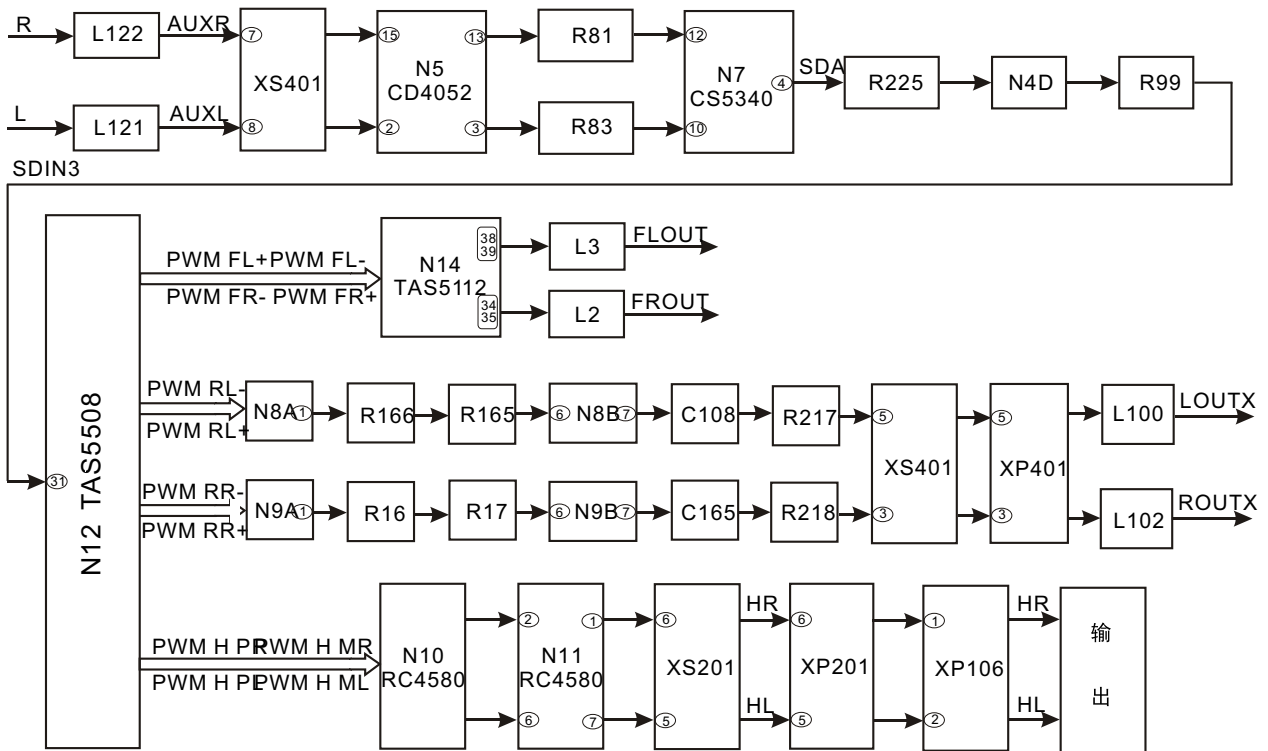


Figure 3.2.8.5 External input circuit block diagram

3.2.9 Video circuit

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

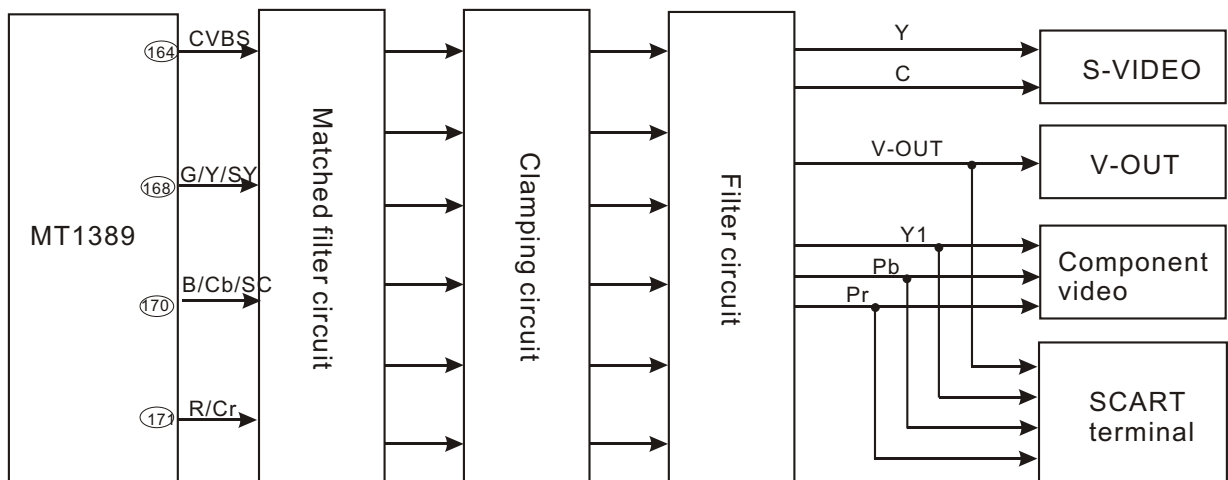


figure 3.2.9.1 Video circuit block diagram

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:

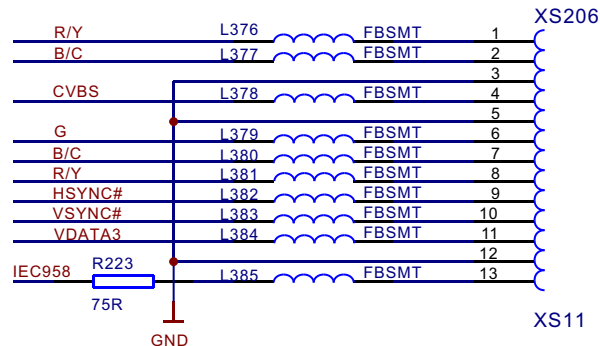


figure 3.2.9.2 Video circuit diagram

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.

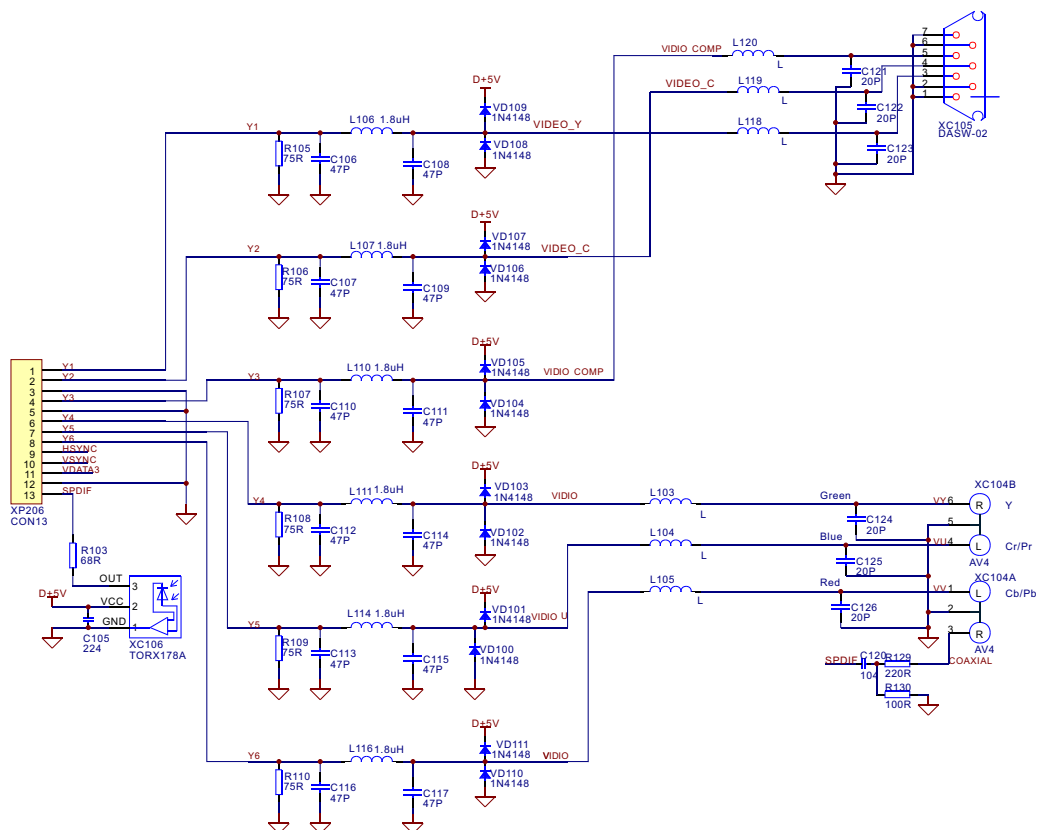


figure 3.2.9.3 Video circuit diagram

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.

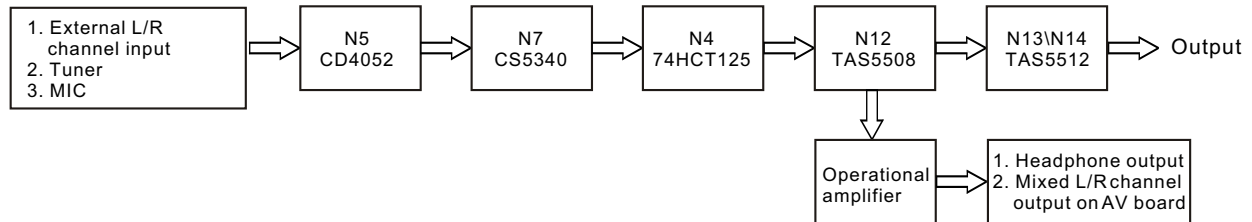


Figure 3.3.1.1 Signal flow chart

【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.

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:

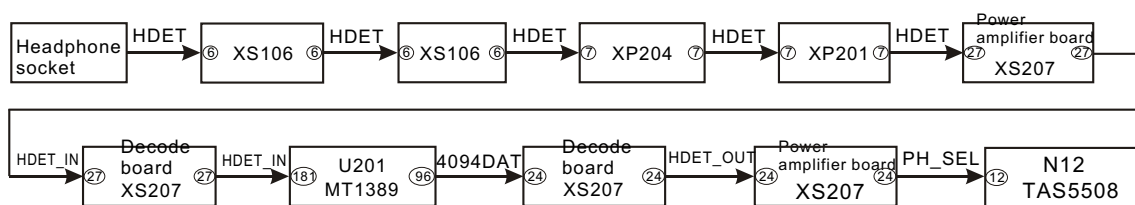


Figure 3.3.1.3 HDET signal flow chart

【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:

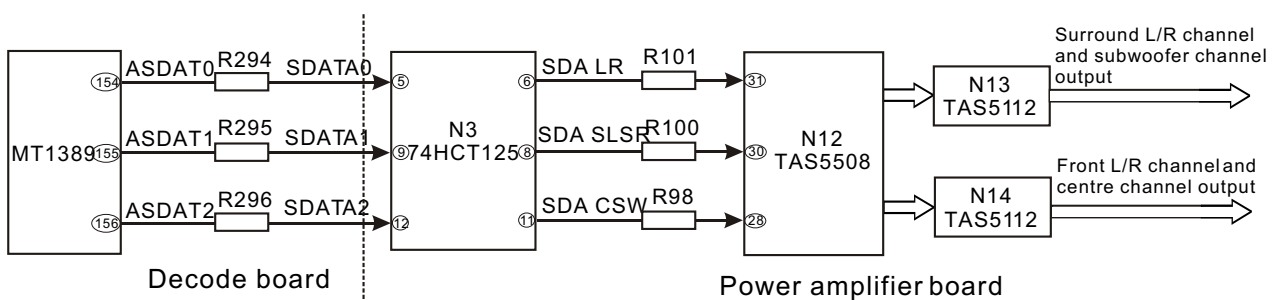


Figure 3.3.1.4 Audio signal flow chart

【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.

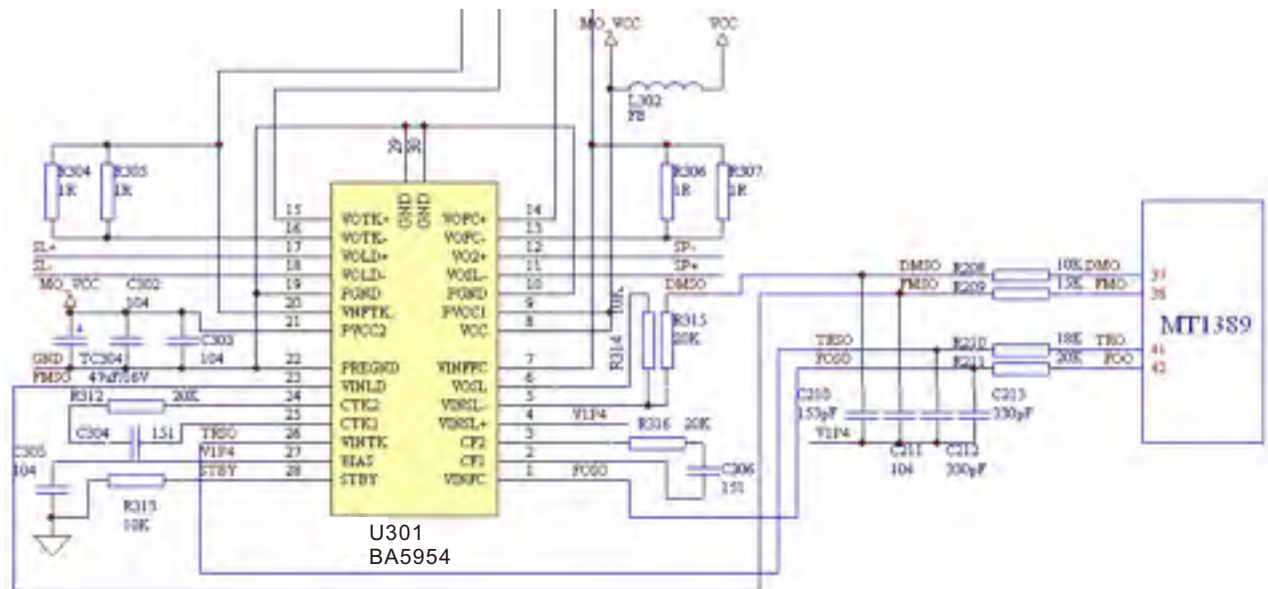


Figure 3.3.1.5 Servo drive circuit diagram

【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:

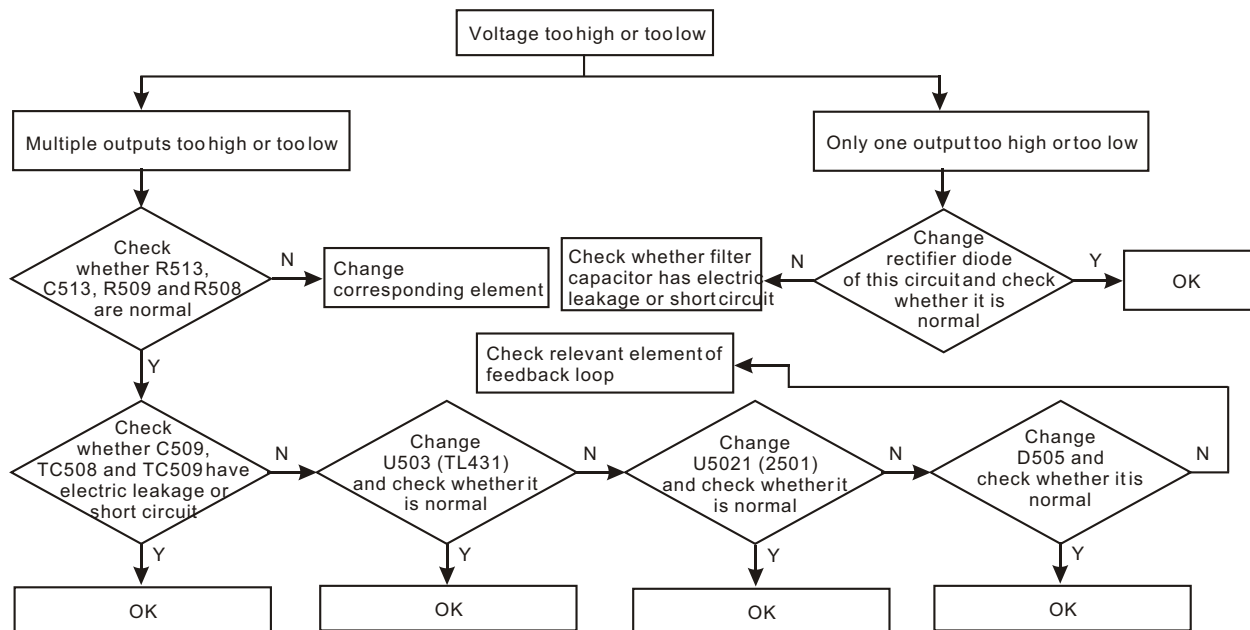


Figure 3.3.2.1 Troubleshooting flow chart for voltage too high or too low

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

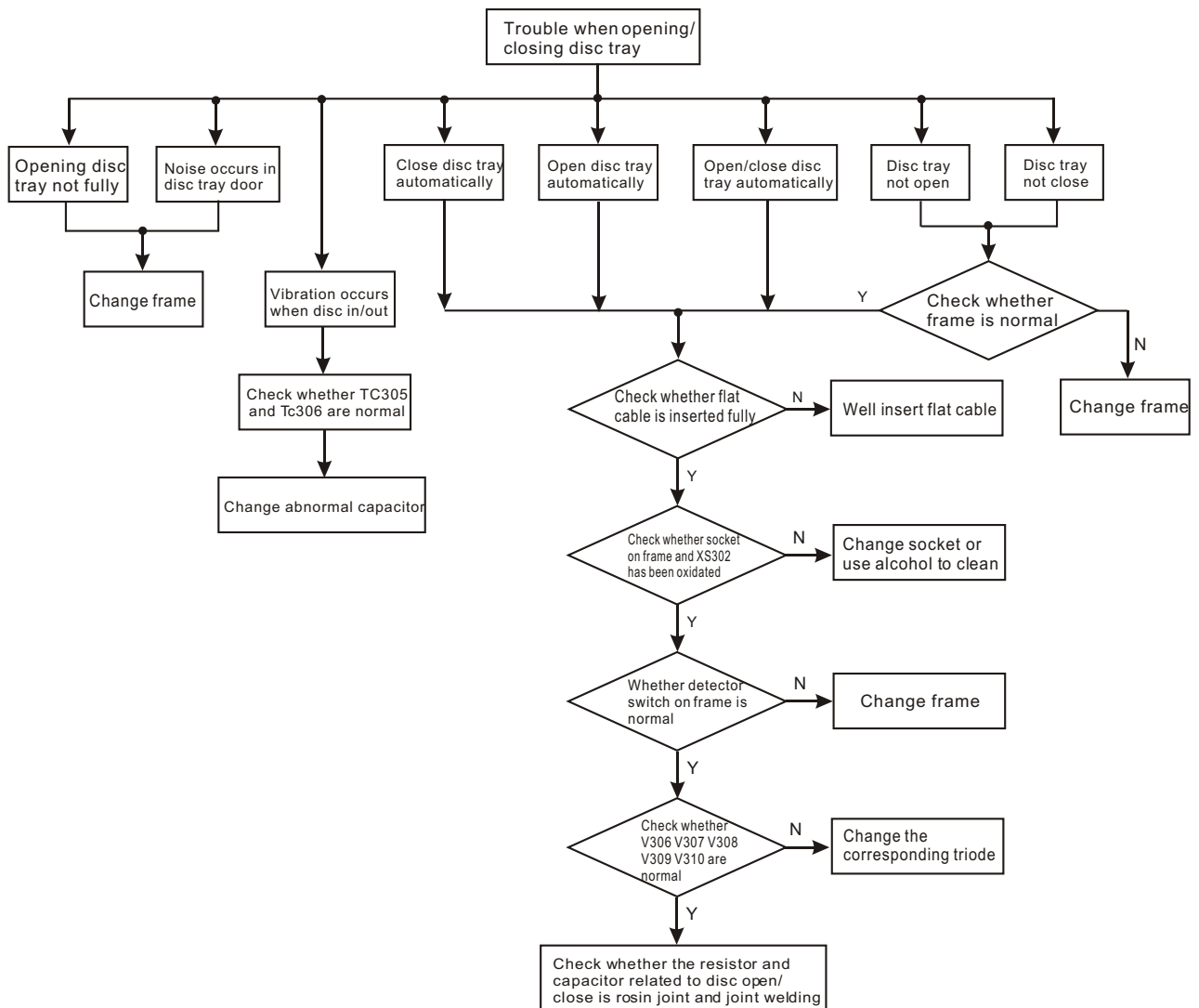


Figure 3.3.2.2 Troubleshooting flow chart when opening/closing disc tray

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

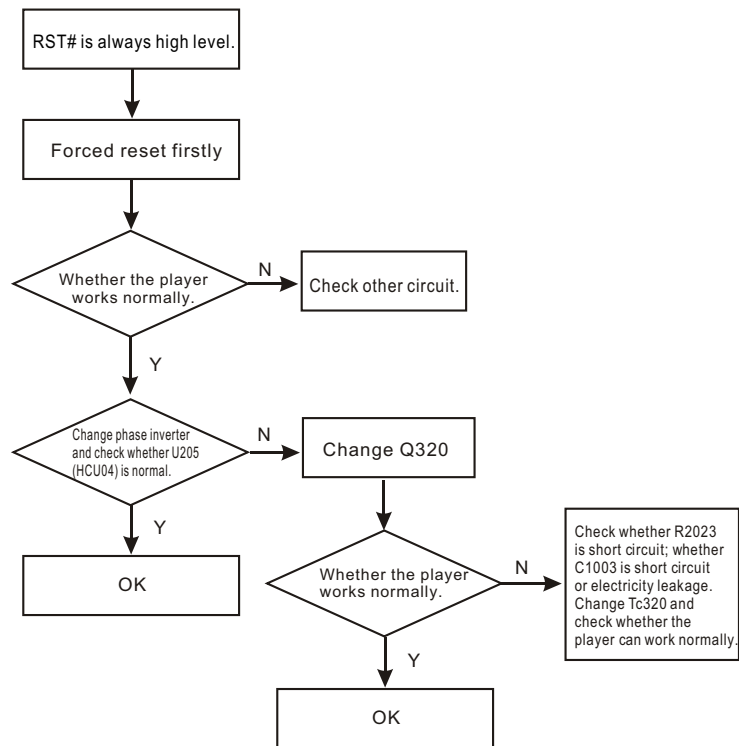


Figure 3.3.2.3 Troubleshooting flow chart when URST# is always high level

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

3.3.2.4:

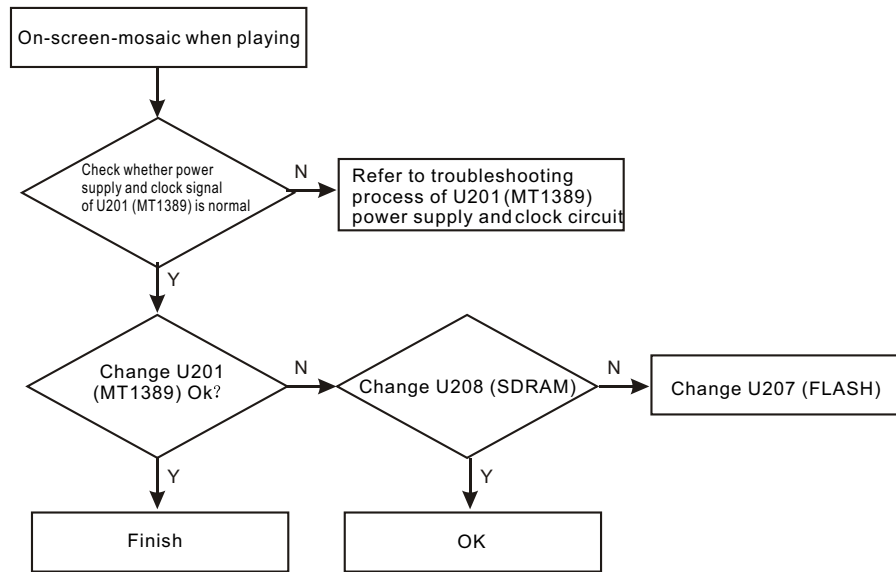


Figure 3.3.2.4 Troubleshooting flow chart of “On-screen-mosaic when playing”

5. Troubleshooting process for “No output for composite video” is shown as the following figure 3.3.2.5:

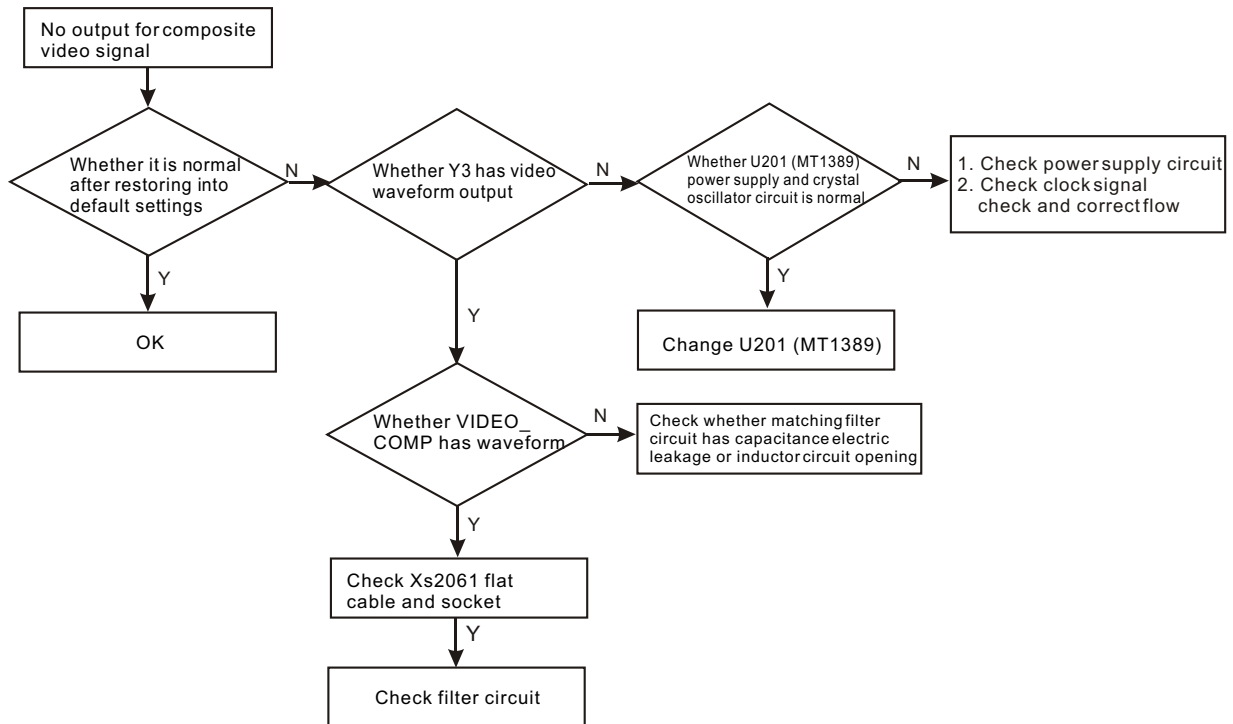


Figure 3.3.2.5 Troubleshooting flow chart of “No output for composite video”

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

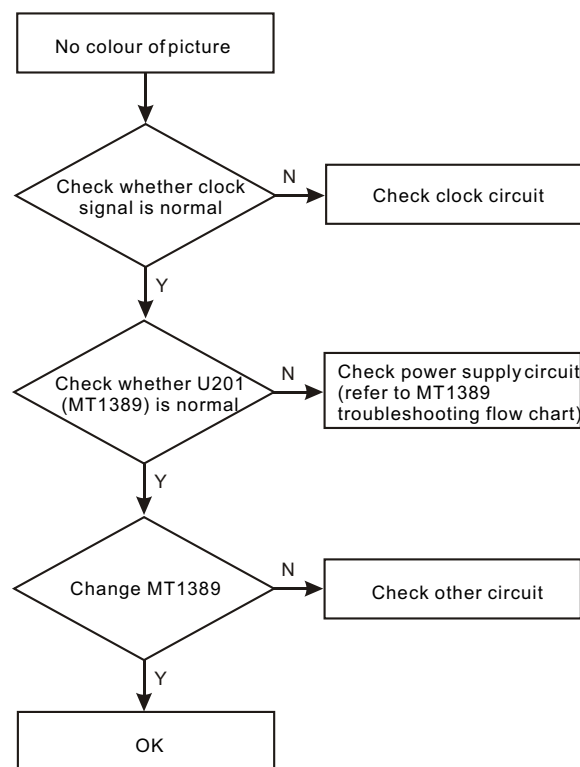


Figure 3.3.2.6 Troubleshooting flow chart of "No colour of picture"

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

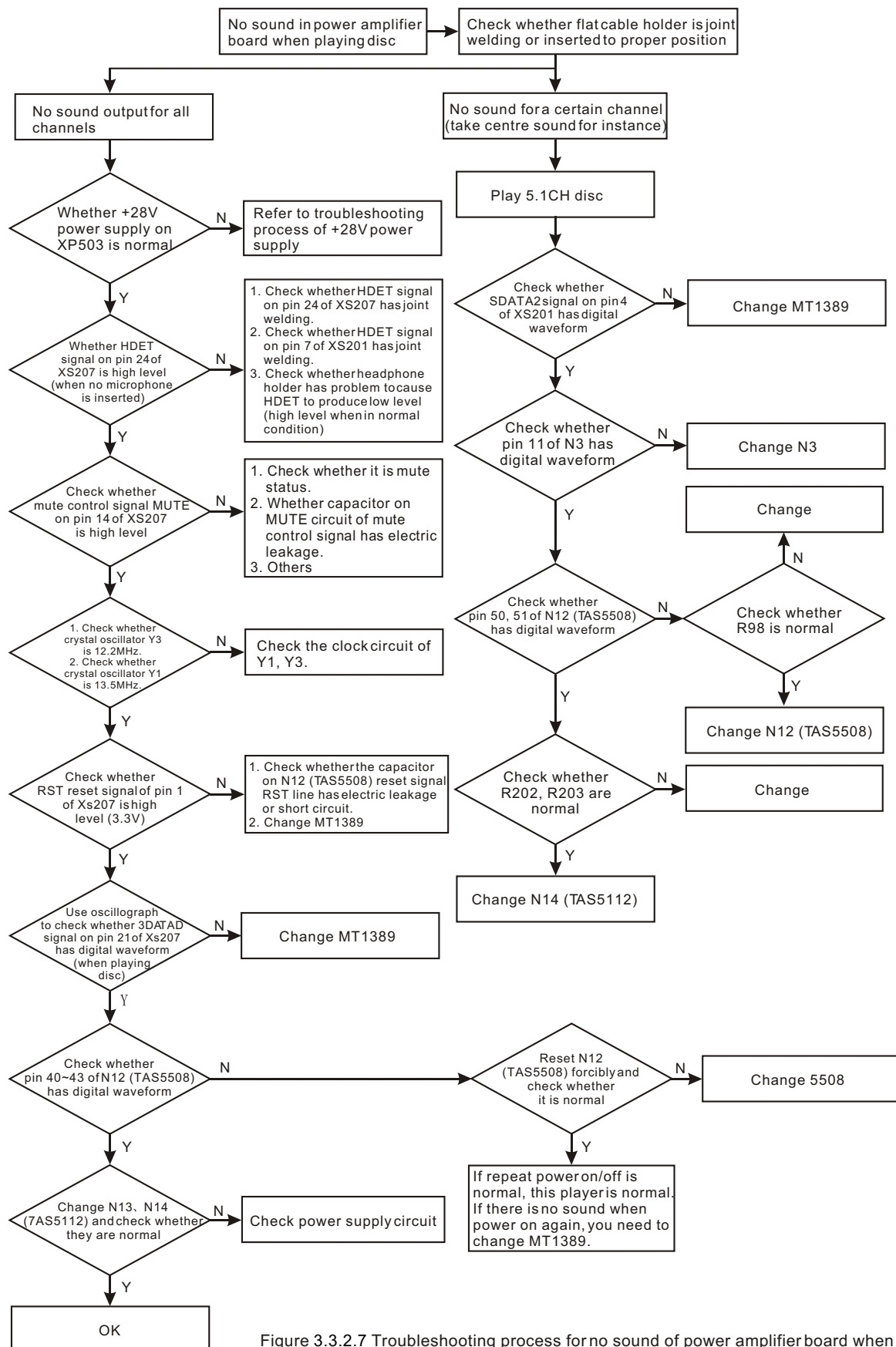


Figure 3.3.2.7 Troubleshooting process for no sound of power amplifier board when playing

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

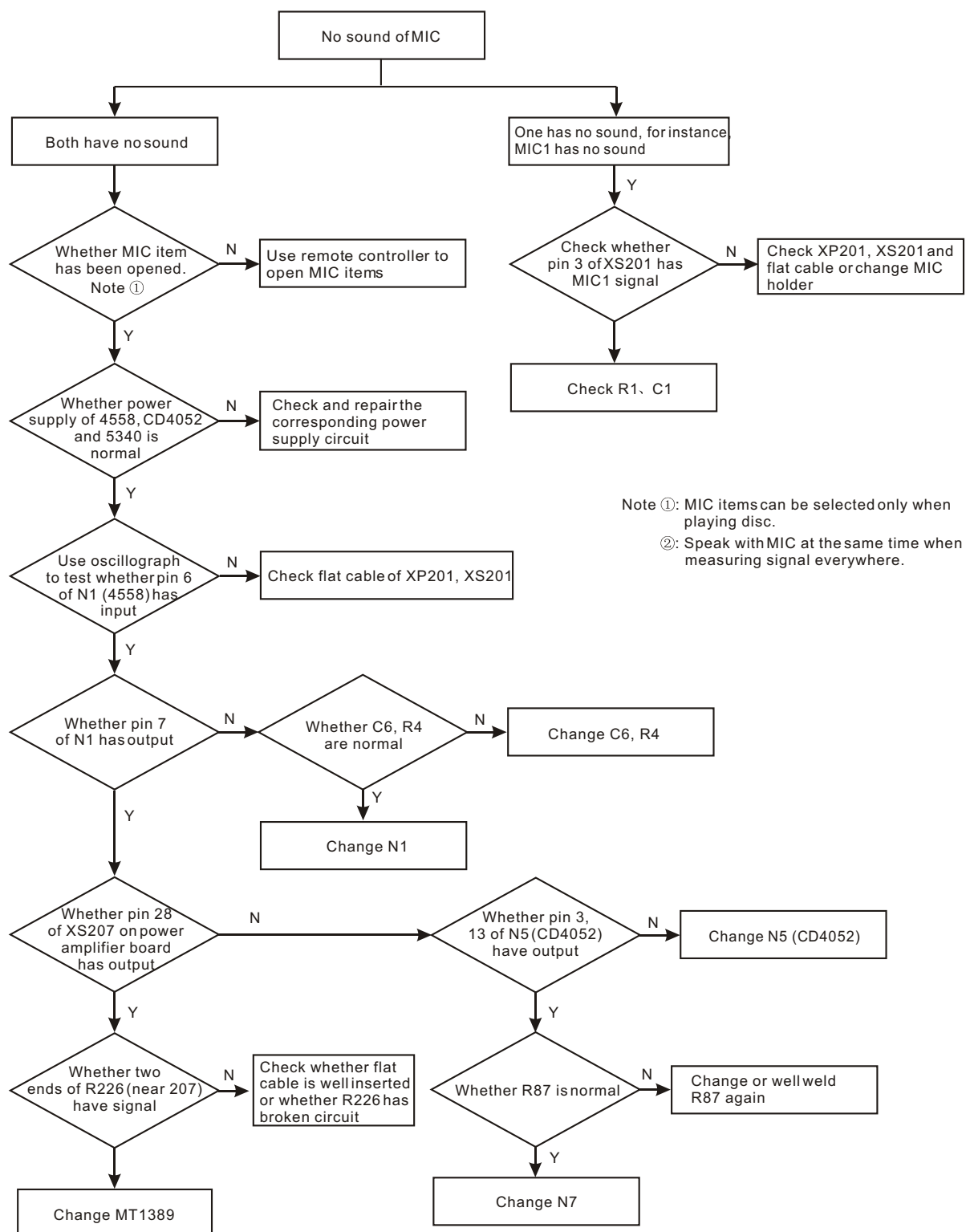


Figure 3.3.2.8 Troubleshooting flow chart for no sound of MIC

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

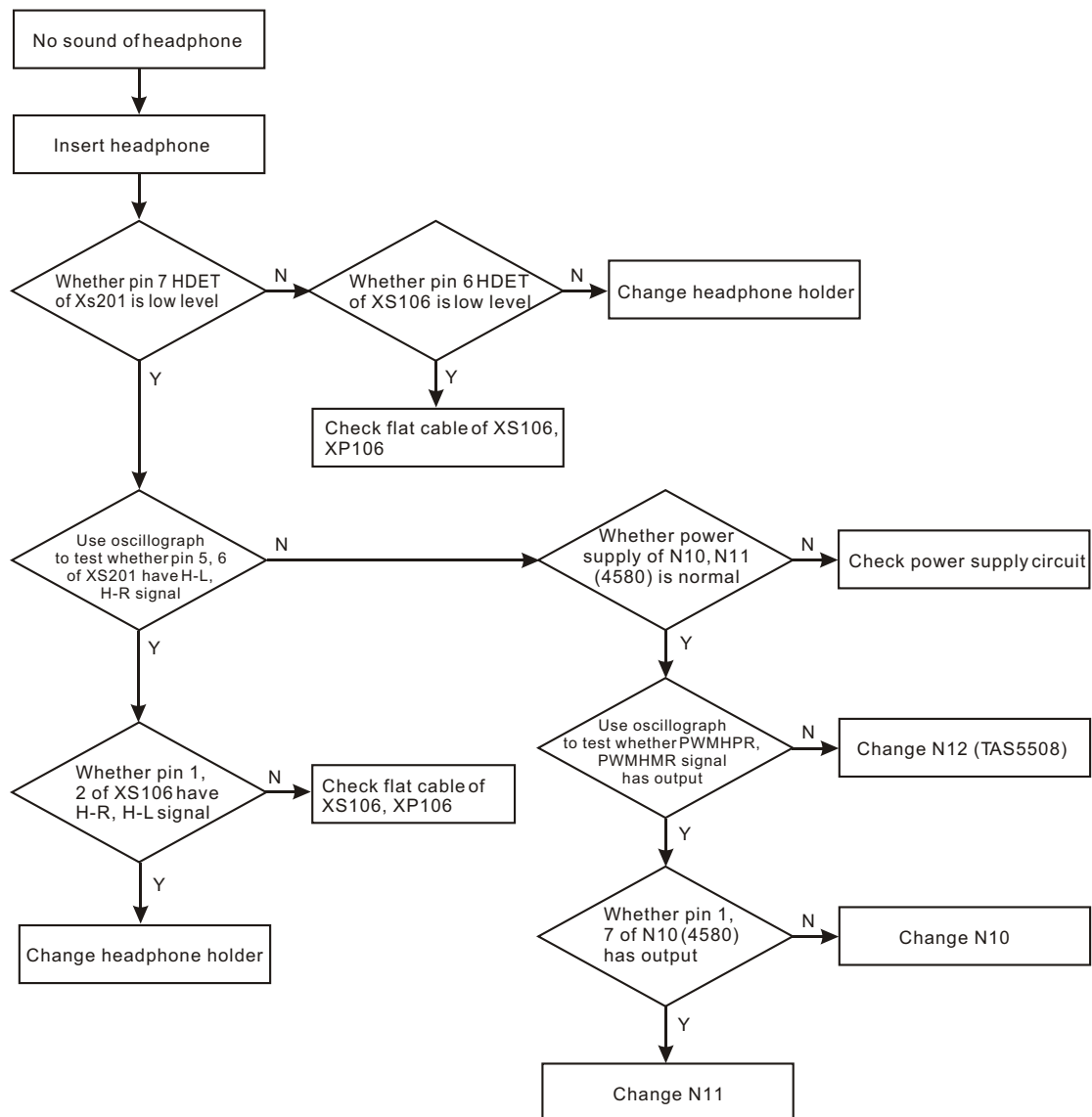


Figure 3.3.2.9 Troubleshooting flow chart for no sound of headphone

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

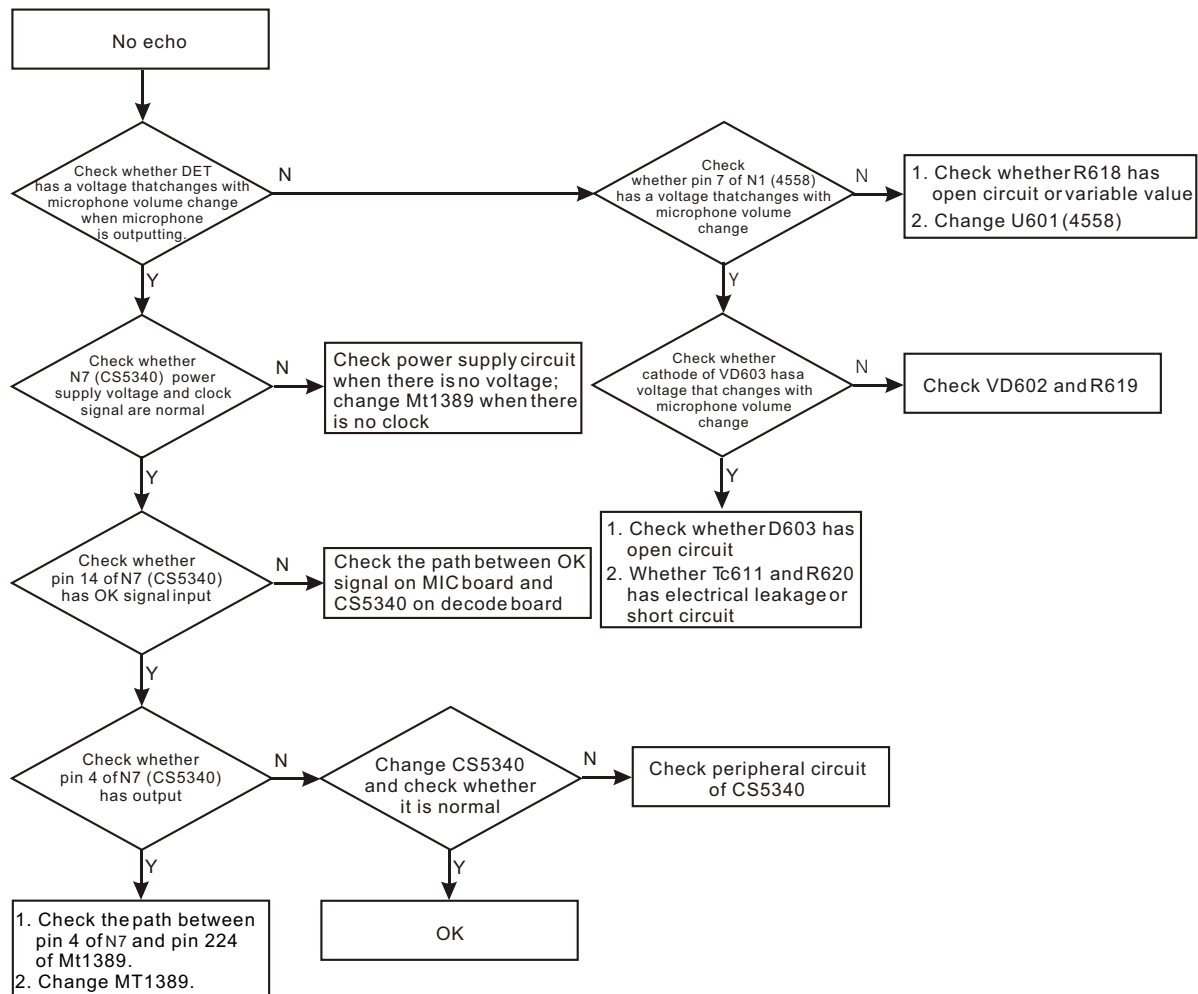


Figure 3.3.2.10 Troubleshooting flow chart for no echo in microphone

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

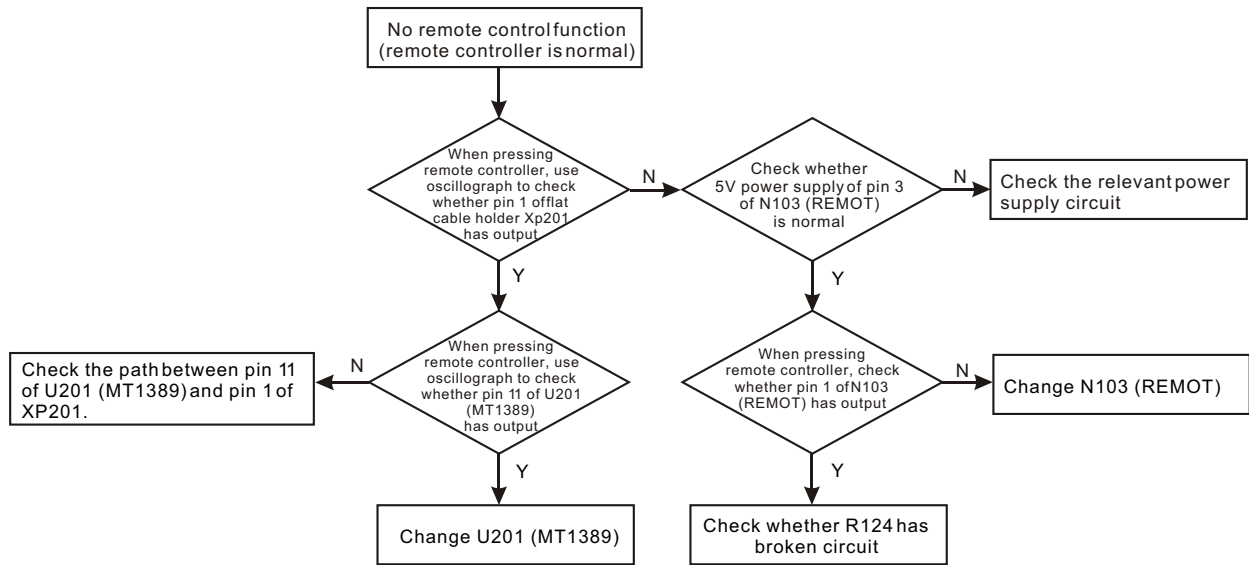


Figure 3.3.2.11 Troubleshooting flow chart for no remote control function

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

3.3.2.12:

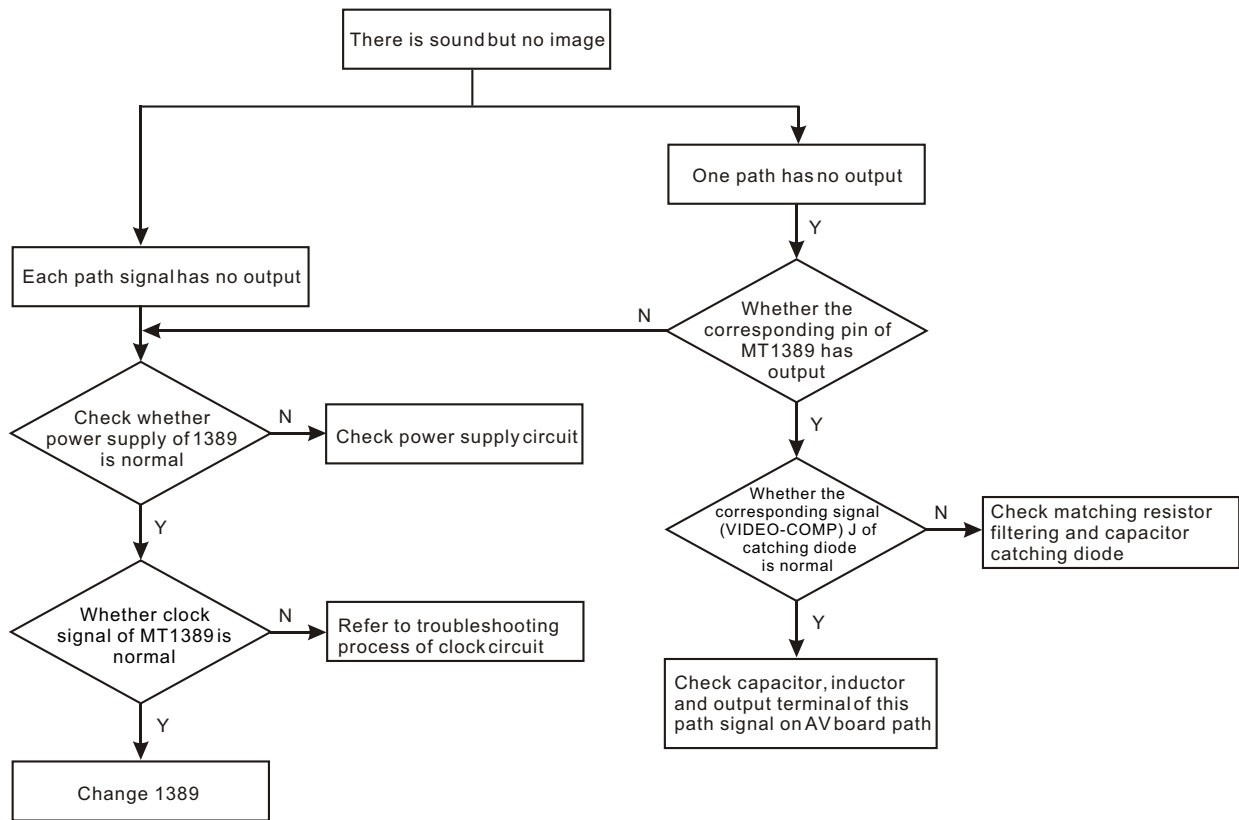


Figure 3.3.2.12 Troubleshooting flow chart for there is sound but no image

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

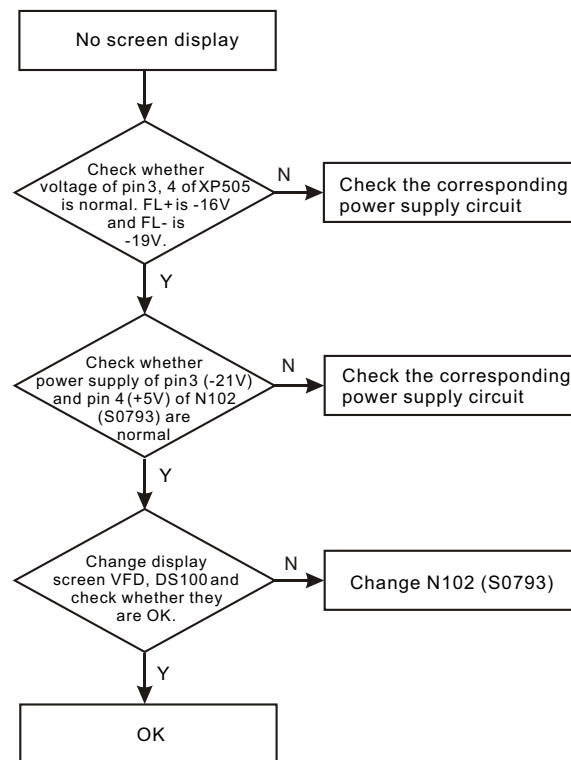


Figure 3.3.2.13 Troubleshooting flow chart for no screen display

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

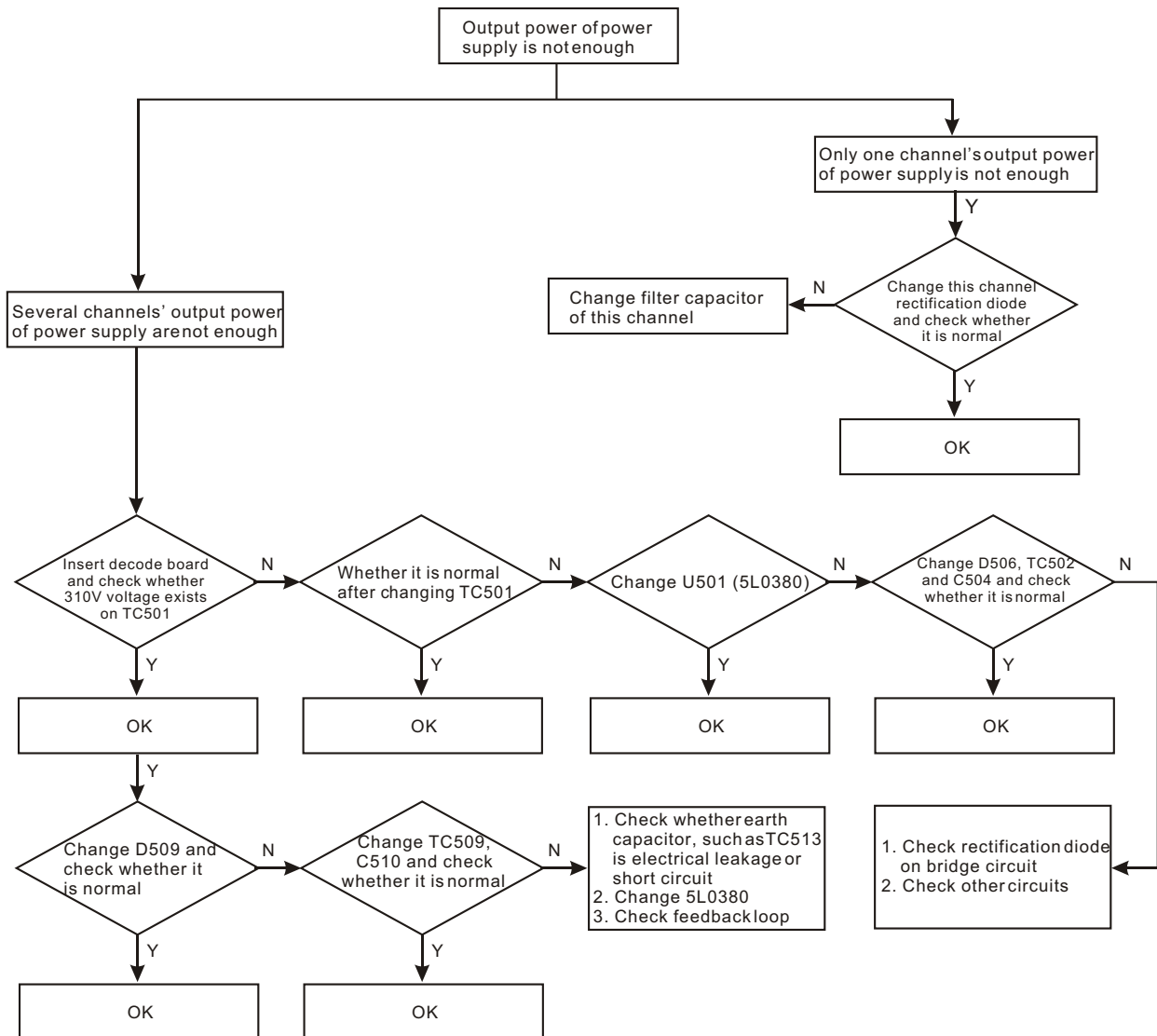


Figure 3.3.2.14 Troubleshooting flow chart for “Output power of power supply is not enough”

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

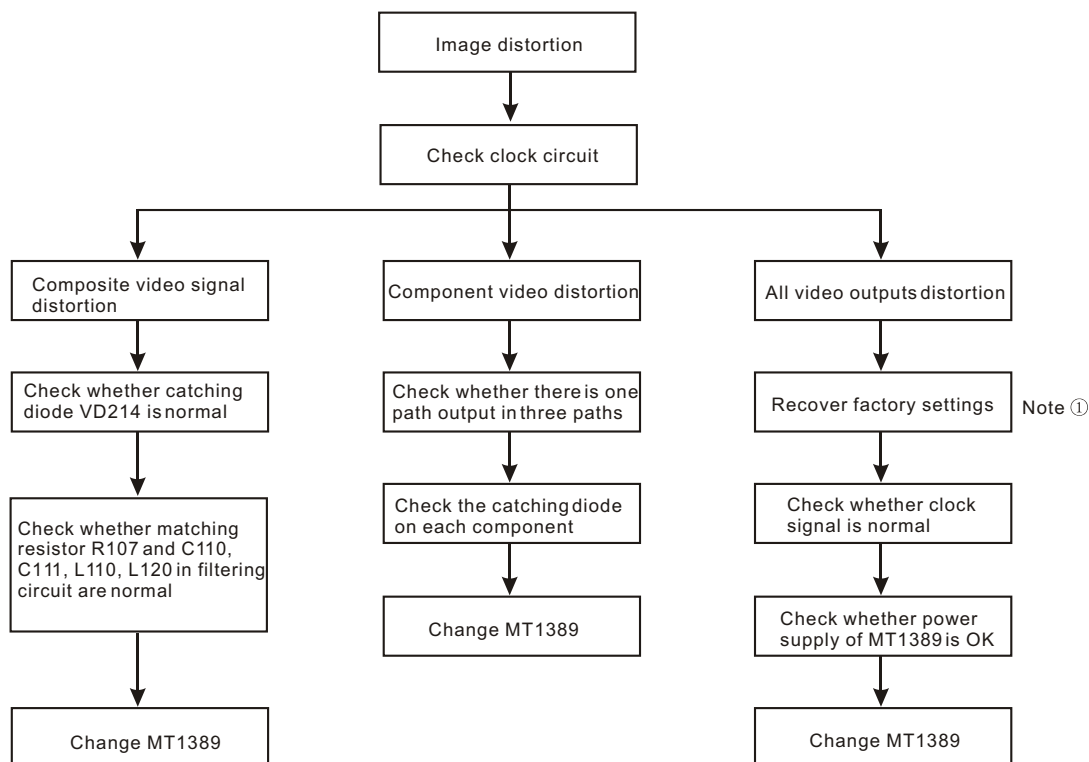


Figure 3.3.2.15 Troubleshooting flow chart for image distortion

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:

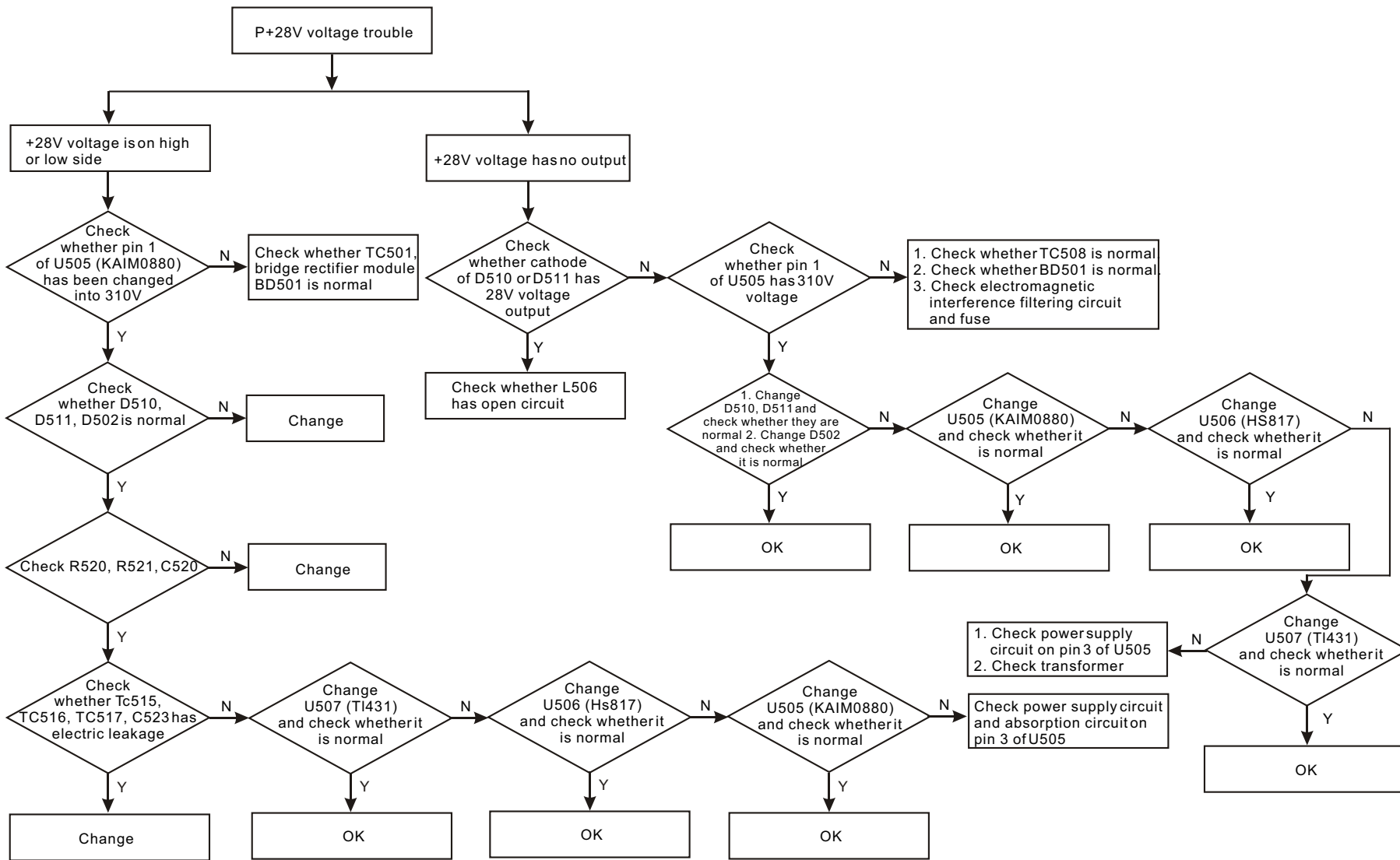


Figure 3.3.2.17 Troubleshooting flow chart for P+28V voltage

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

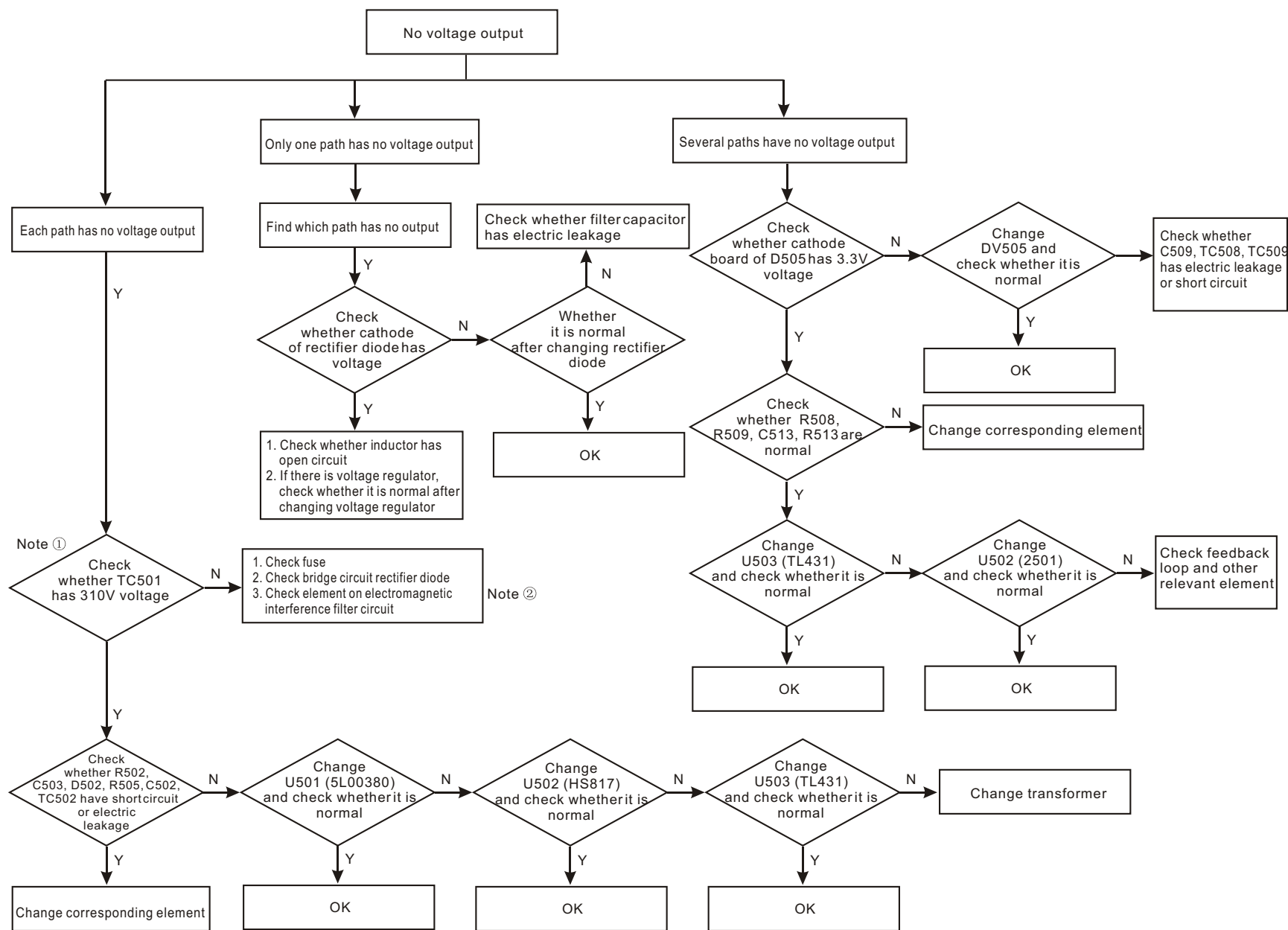


Figure 3.3.2.18 Troubleshooting flow chart for no voltage output

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

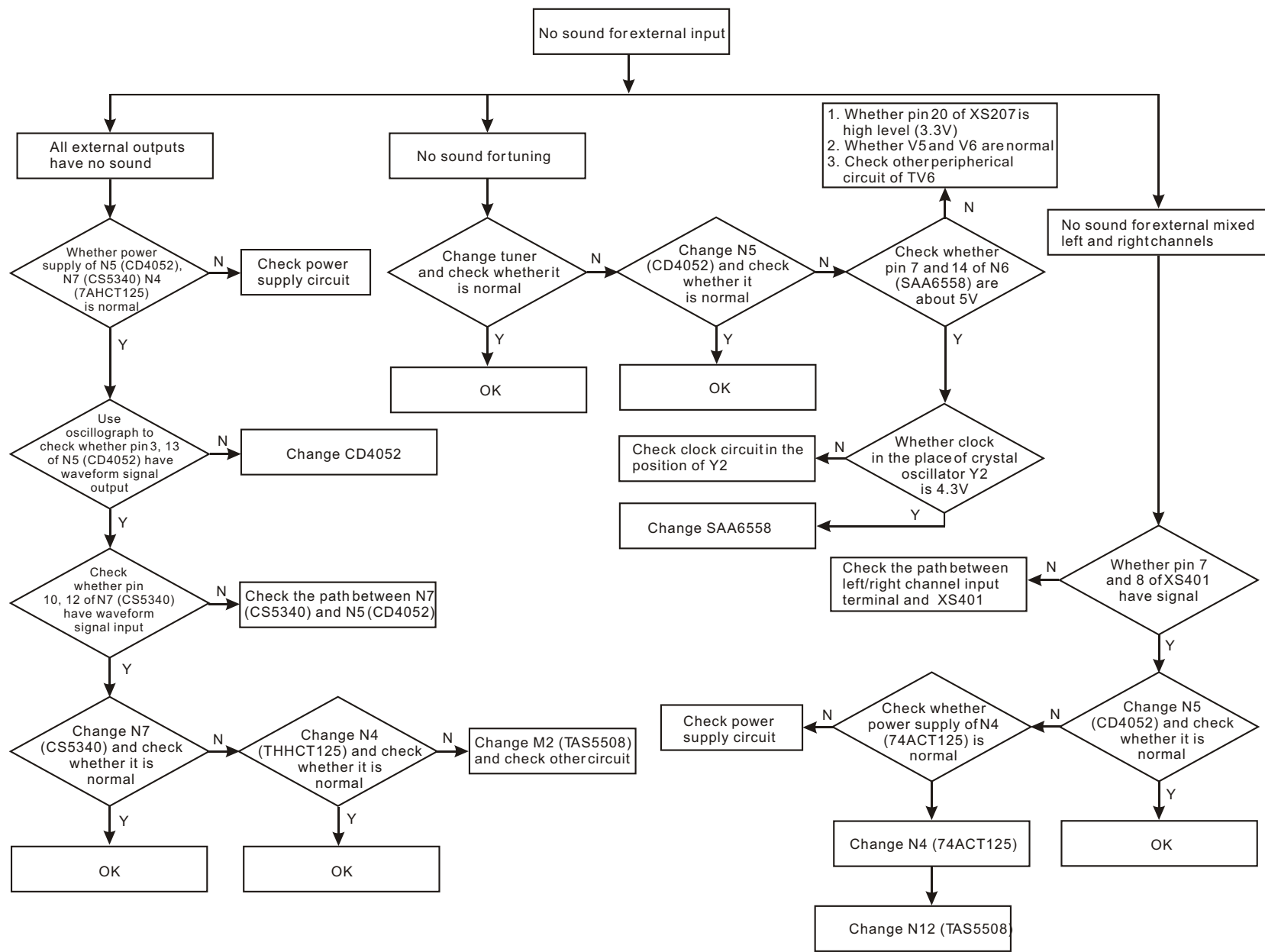


Figure 3.3.2.19 Troubleshooting flow chart for no sound of external input

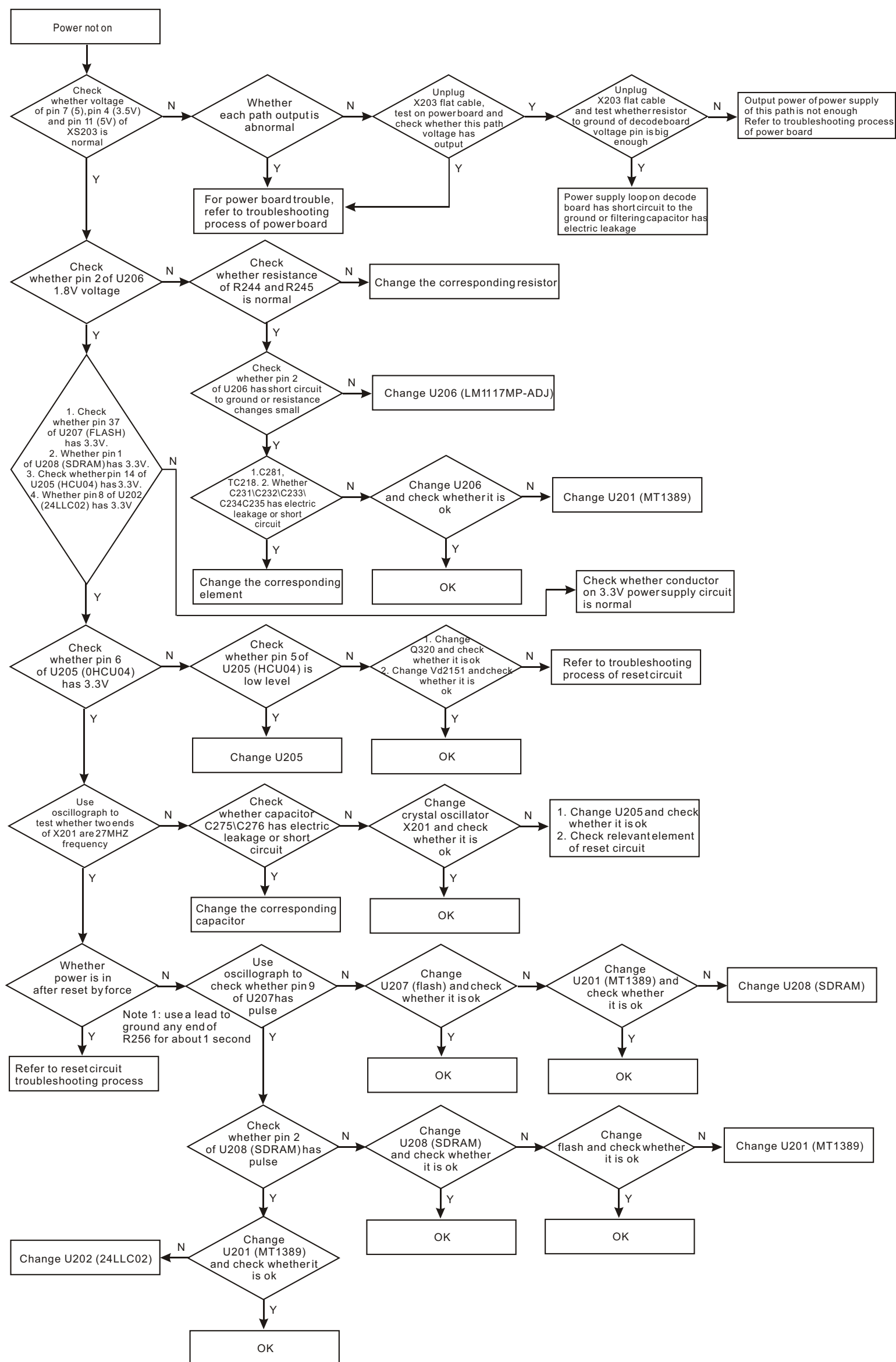
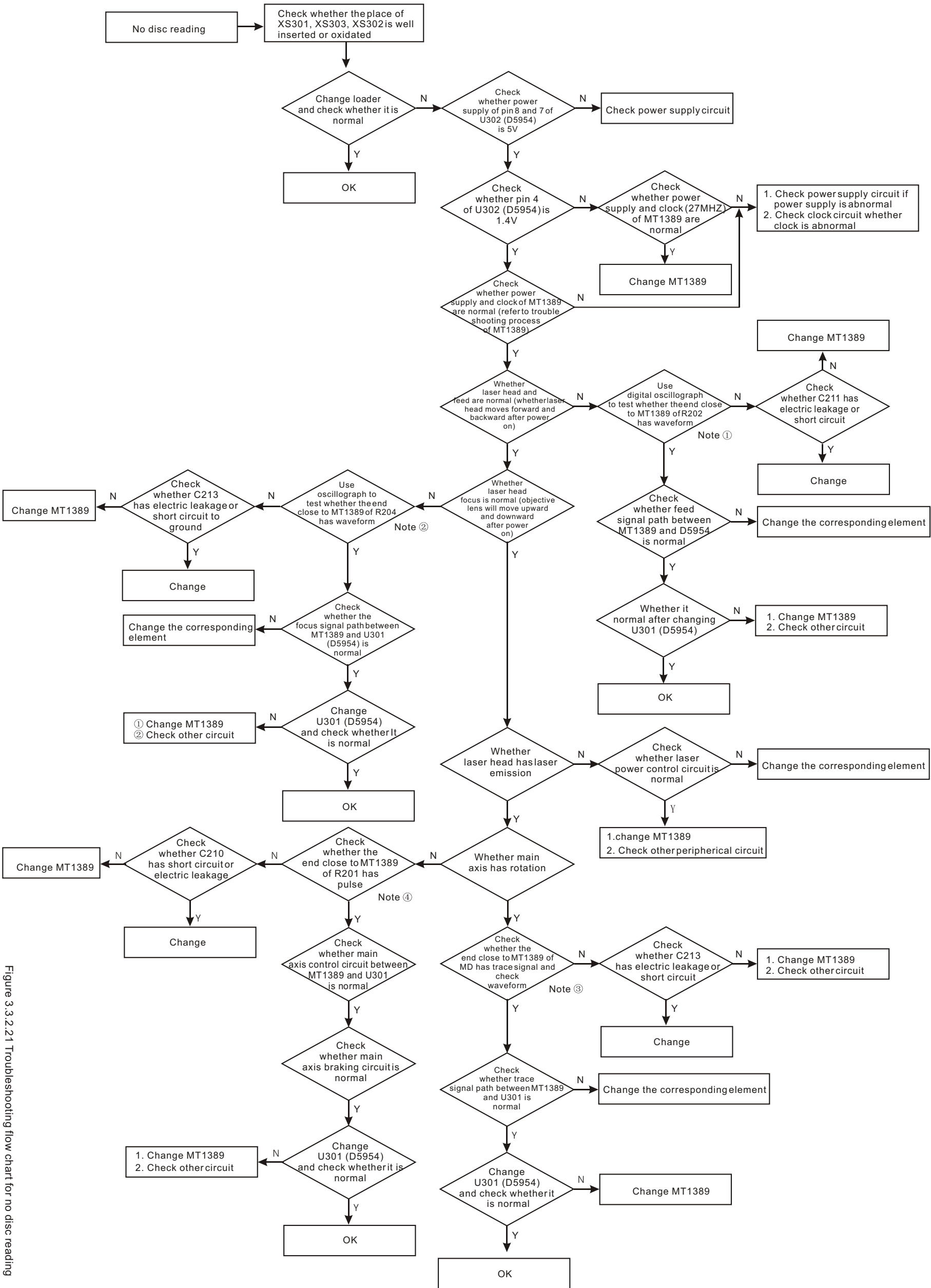


Figure 3.3.2.20 Troubleshooting process for power not on



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

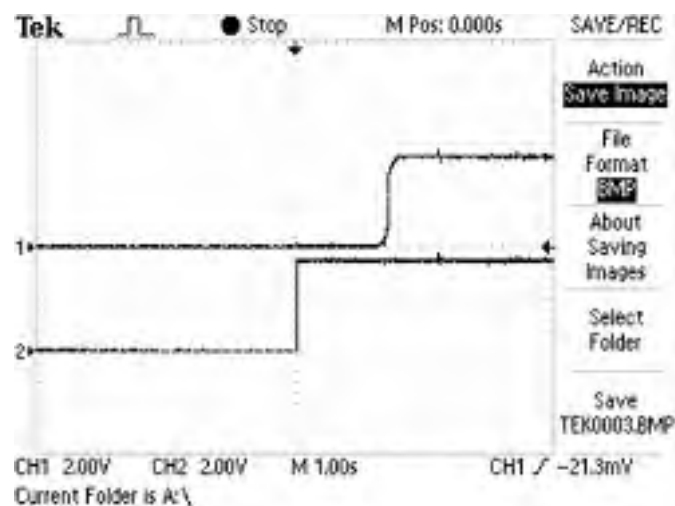
Figure 3.3.2.21 Troubleshooting flow chart for no disc reading

Section Four Servicing Parameters

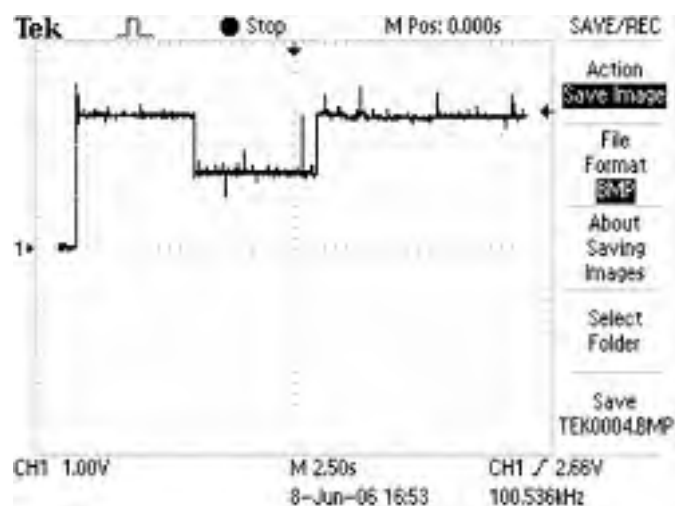
3.4.1 Signal waveform diagram

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.

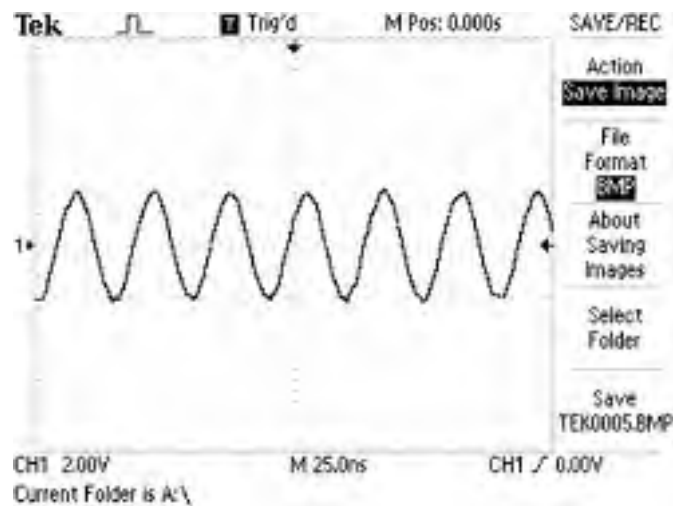
1. Contrast figure (R2024) of main reset signal VRST# and 3.3V voltage



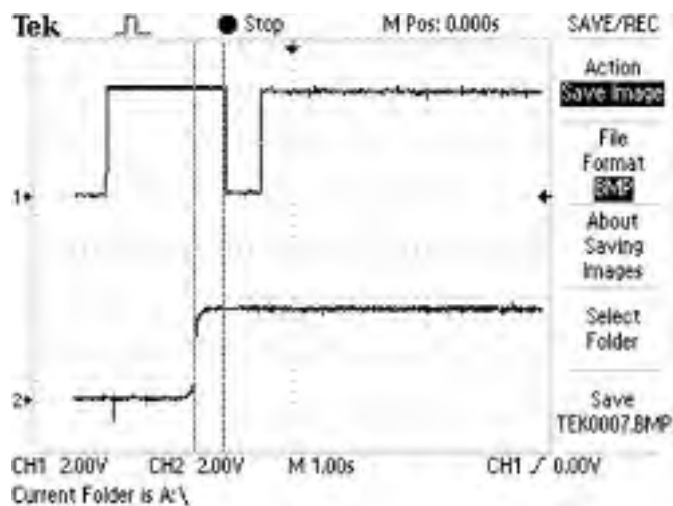
2. Decode board ADIN waveform diagram



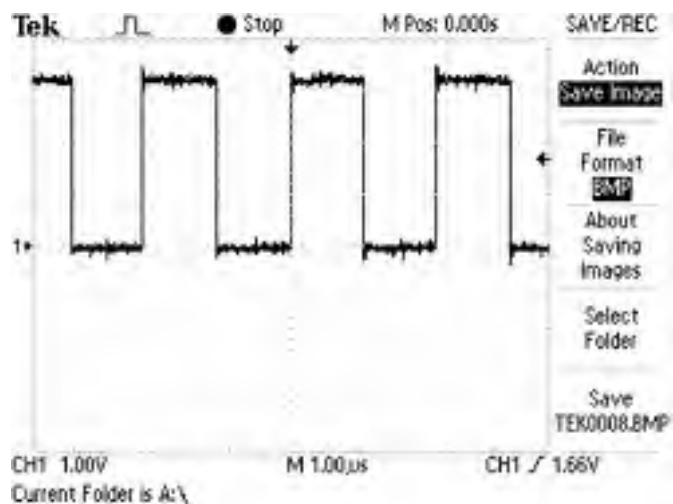
3. 1389 main clock signal waveform diagram



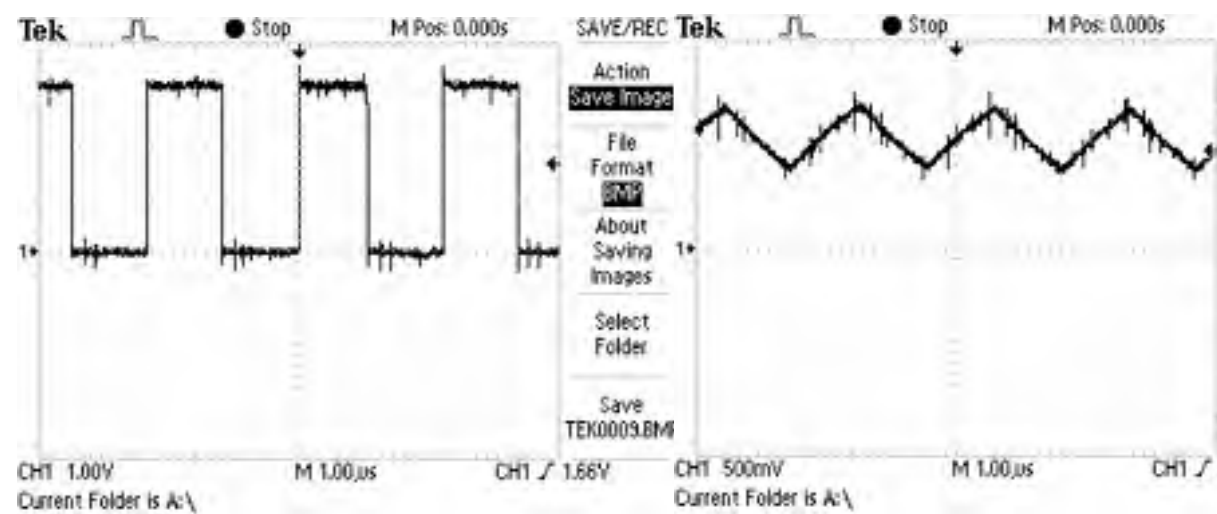
4. Contrast figure of TAS5508 reset signal RST and main reset signal URST#, USRT# means the time required to finish reset is 600ms, RST means reset begins and time is 680ms



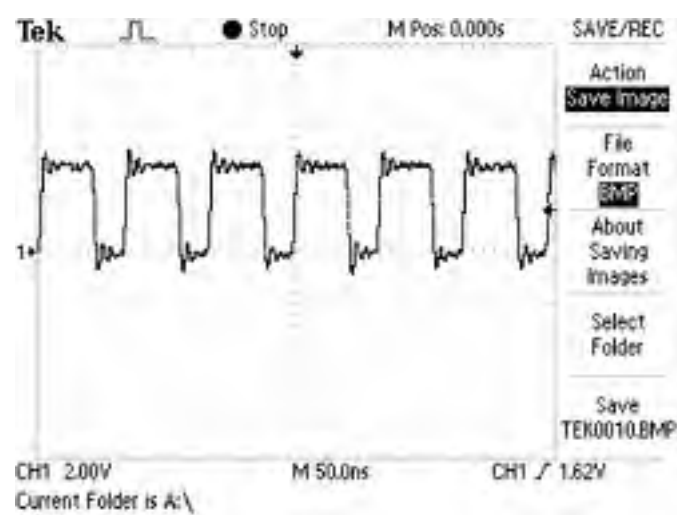
5. Waveform of PWM signal outputted by TAS5508 when playing: $f=352.78\text{KHZ}$



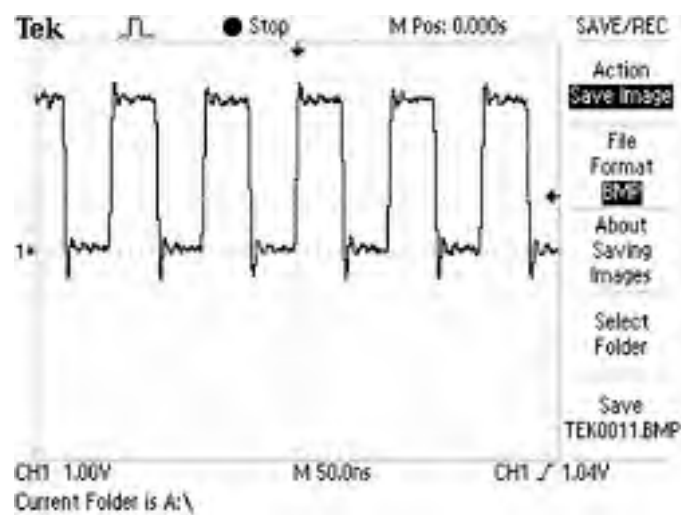
6. PWM_RL signal, output range is 4.0V, frequency is 384.0KHZ (fixed output does not change with volume adjustment), waveform of two ends of R103



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 (HD CD)
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	RFVDD3		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	PLLSS		Ground	Ground pin for data PLL and related analog circuitry
198	IDACEXLP		Analog output	Data PLL DAC Low-pass filter
199	PLLDD3		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	DACVDDDB		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	VOSC+	Focus drive forward voltage 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:

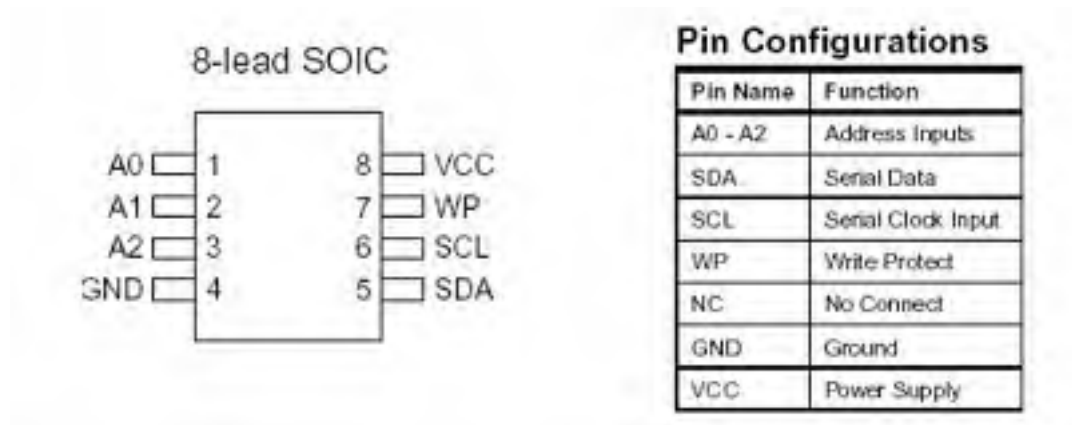


Figure 3.5.5.1 Casing and pin function introduction

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:

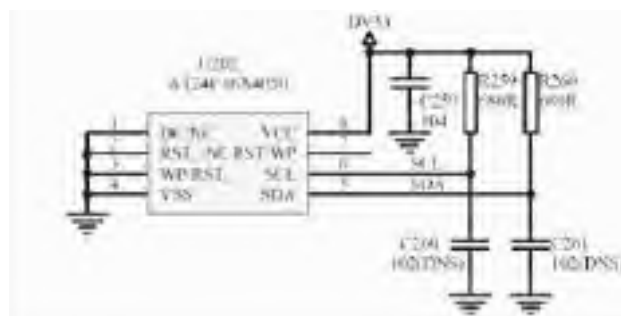


Figure 3.5.5.2 Circuit schematic diagram

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

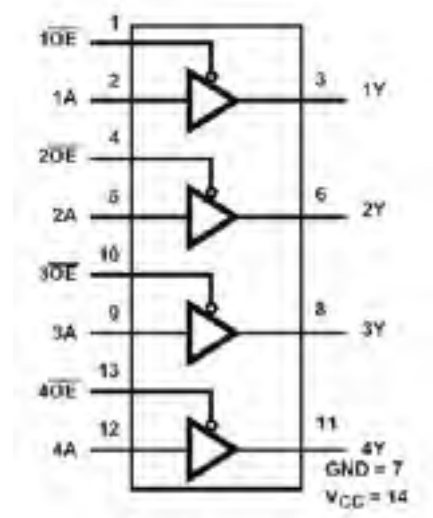


Figure 3.5.6.1 Truth value table and 74HCT125 function module structure

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

3.5.10 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.

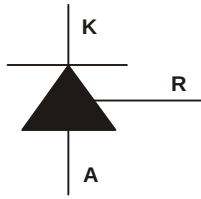


Figure 3.5.15.1 LM431A outside drawing

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.

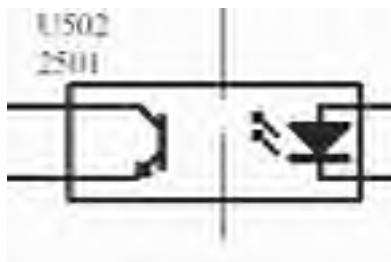


Figure 3.5.16.1 Hs817 outside drawing

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, biphasic 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

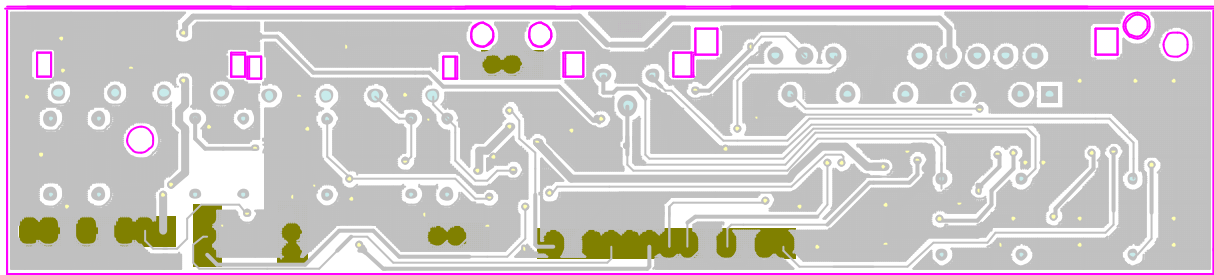
DVD players manufactured in BBK are largely identical but with minor differences and are mainly composed of loader components, control panel components, decode and servo board components, power board components, power amplifier board components, MIC board components and AV board components. In order 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:

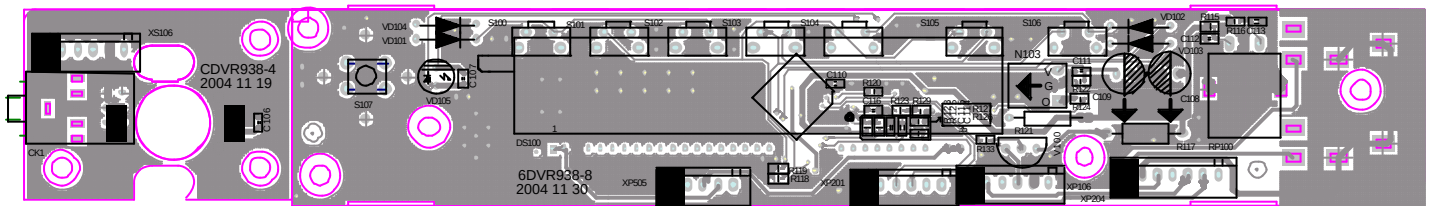


Section One PCB board

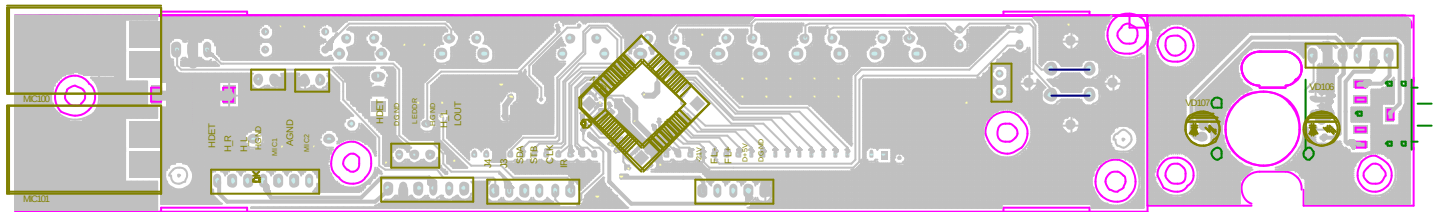
5.1.2 Bottom layer of AV OUT Board



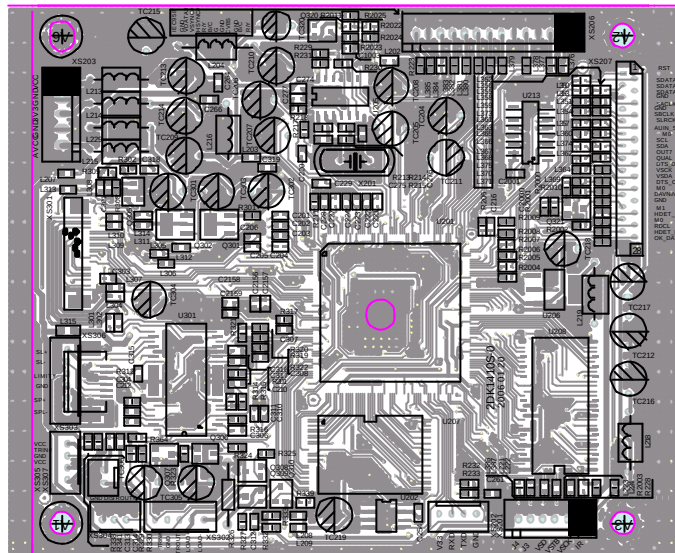
5.1.3 Surface layer of KEY SCAN Board



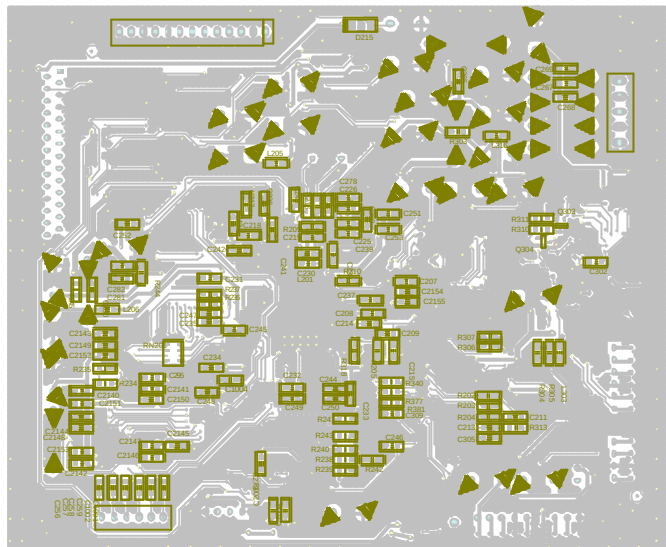
5.1.4 Bottom layer of KEY SCAN Board



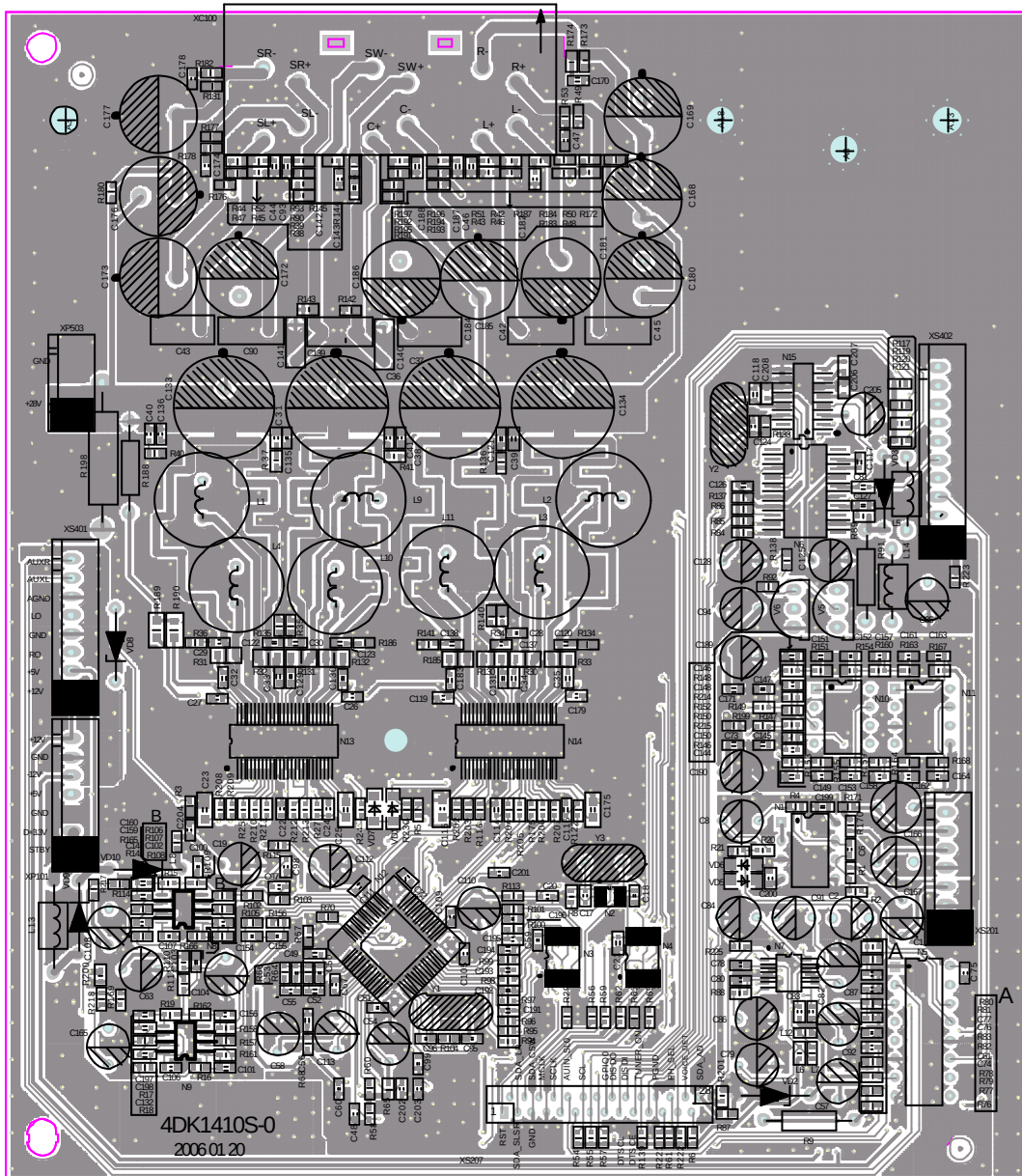
5.1.5 Surface layer of DECODE&SERVO Board



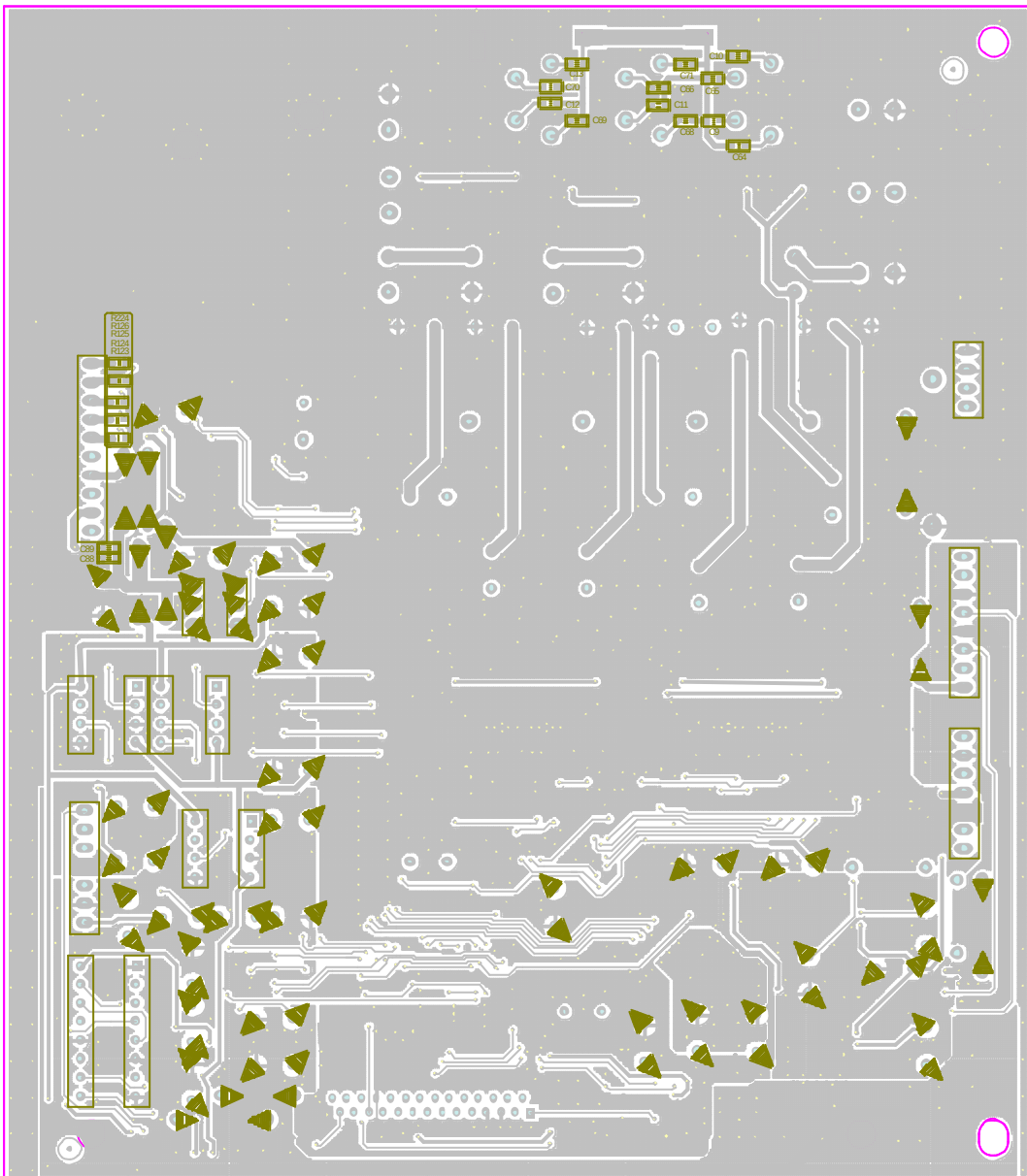
5.1.6 Bottom layer of DECODE&SERVO Board



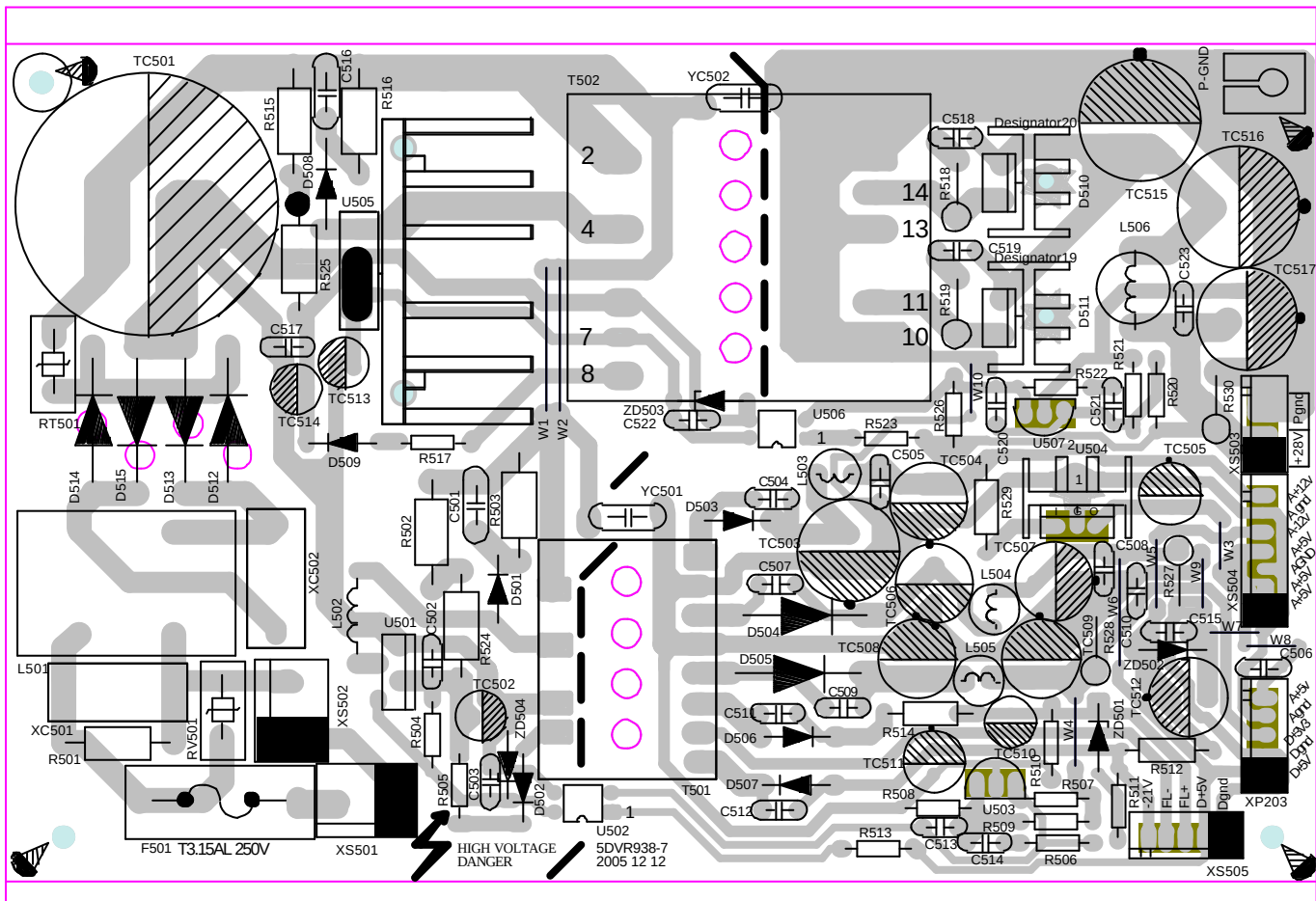
5.1.7 Surface layer of audio power amplifying Board



5.1.8 Bottom layer of audio power amplifying Board

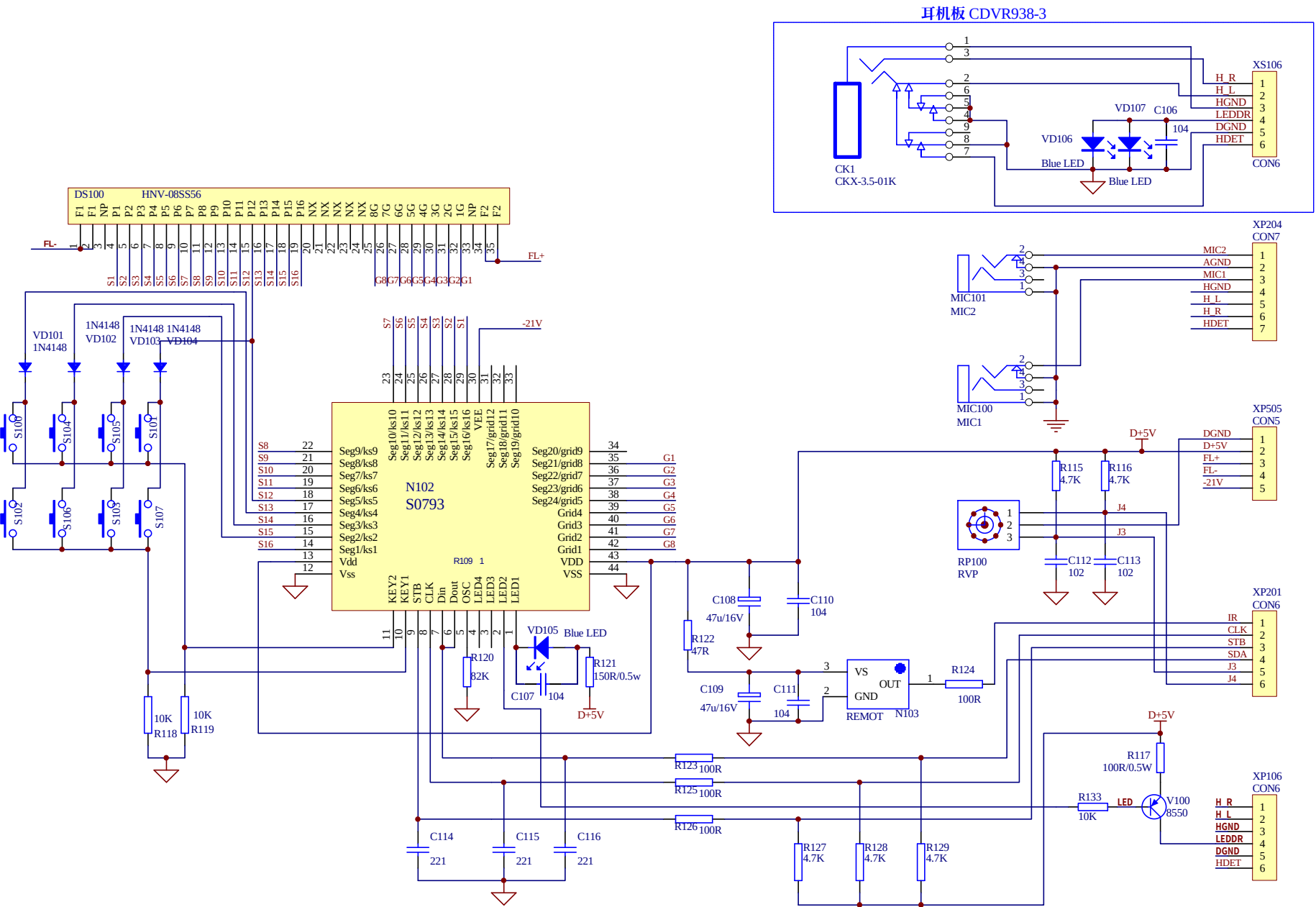


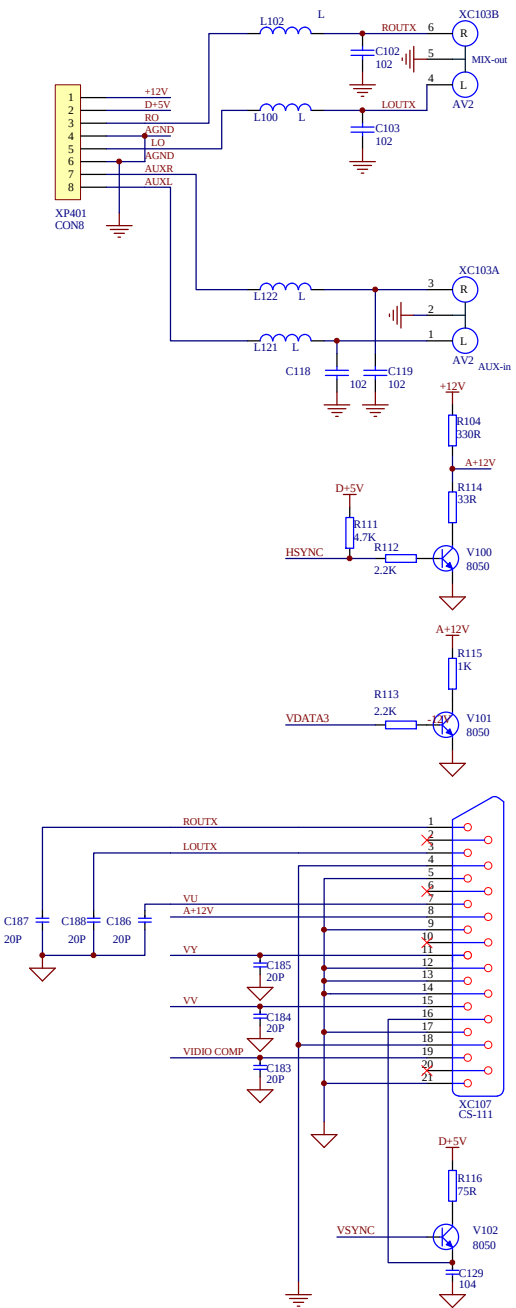
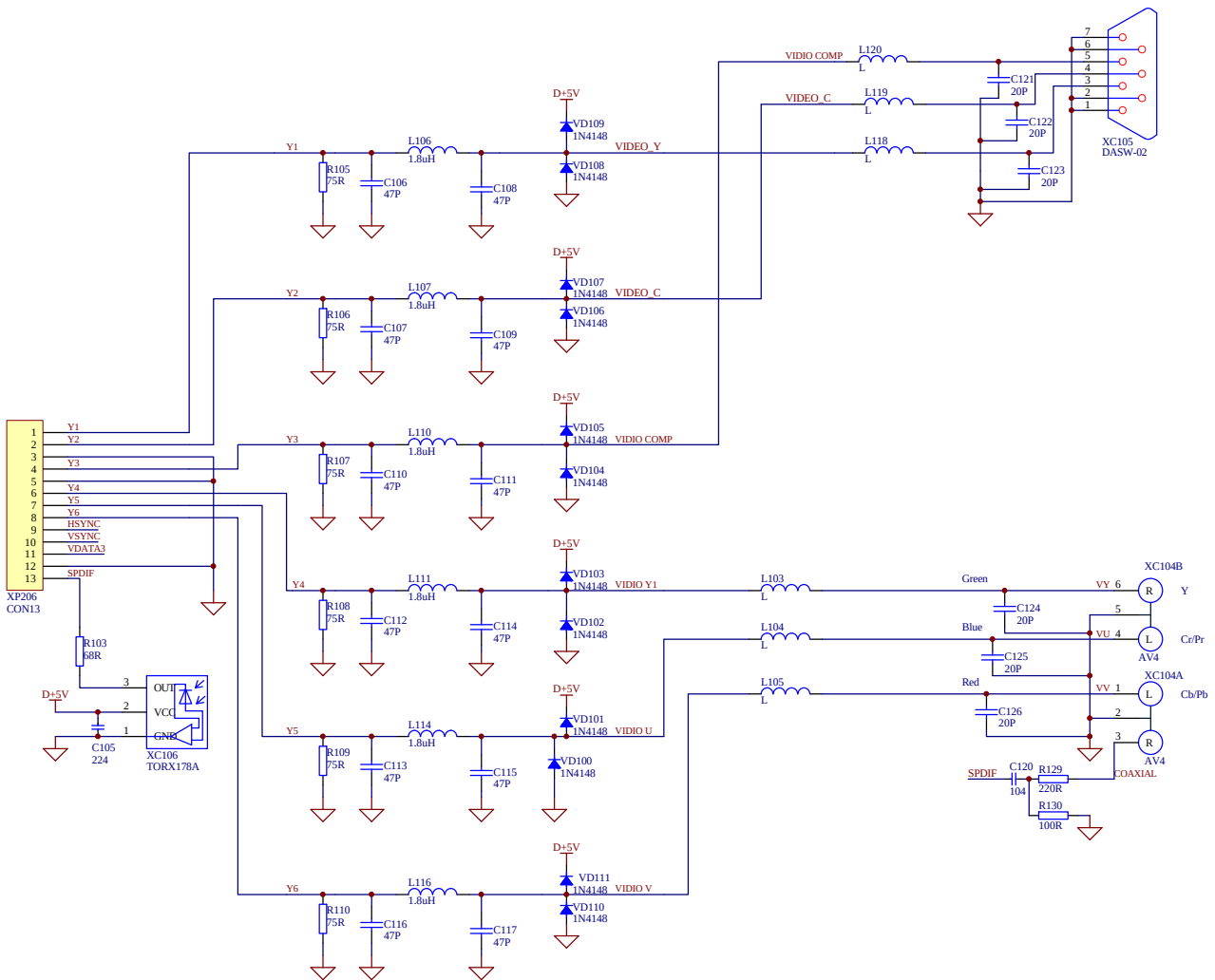
5.1.9 Power Board



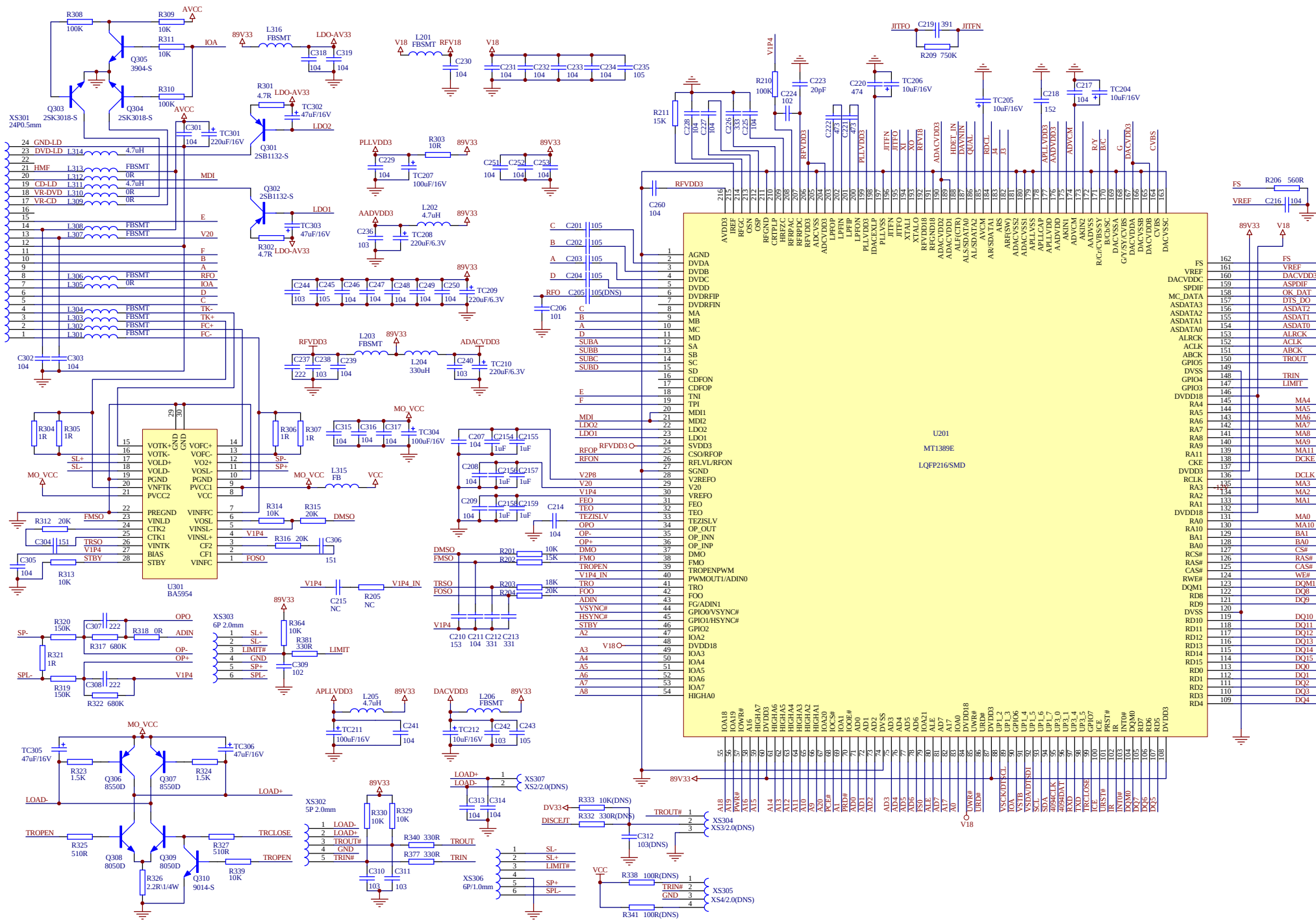
Section Two circuit diagram

5.2.1 KEY SCAN Board



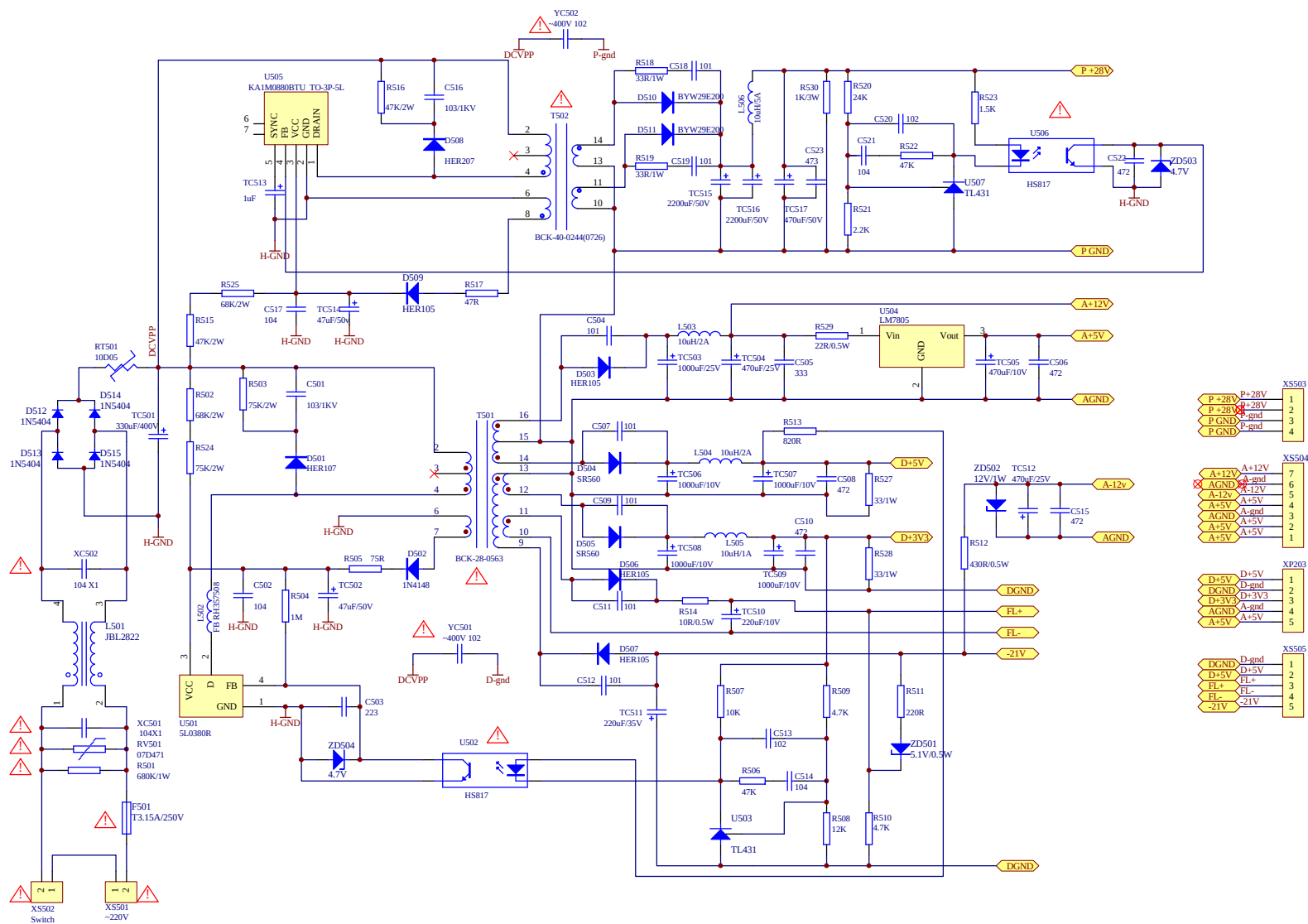


5.2.2 audio IN OUT Board





5.2.6 POWER Board



XS503
P+28V
P+28V
P GND
P GND

XS504
A+12V
A+12V
A+12V
A+12V
A+12V
A+12V
A+12V
A+12V
A+12V
A+12V

XP203
D+5V
D+5V
D+5V
D+5V
D+5V
D+5V
D+5V
D+5V
D+5V
D+5V

XS505
D+5V
D+5V
D+5V
D+5V
D+5V
D+5V
D+5V
D+5V
D+5V
D+5V

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 15×7	R516,R515
0010157	METAL OXIDE FILM RESISTOR	2W68K±5%SHAPED FLAT 15×7	R502,R525
0010263	METAL OXIDE FILM RESISTOR	2W75K±5% SHAPED FLAT 15×7	R503,R524
0010281	METAL OXIDE FILM RESISTOR	3W1K±5% SHAPED VERTICAL 7.5	R530
0010288	METAL OXIDE FILM RESISTOR	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°C 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°C 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 ①
0460515	SWITCH POWER TRANSFORMER	@BCK-40-0726 UL	T502 ①
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 ②
0880247	IC	MC7805CT GOLD SEALED TO-220	U504 ②
0880499	IC	L7805CV GOLD SEALED TO-220	U504 ②
0880863	IC	HA17431VP TO-92	U503 ③
0882041	IC	MIK431C TO-92	U503 ③
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 RESISTOR	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,C2140~C2153 ④
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,C2140~C2153 ④
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,C311
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~L304,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 ⑤
0880322	IC	MM74HCU04M SOP	U205 ⑤
0880513	IC	HCU04 SOP	U205 ⑤
0882262	IC	K4S641632H-TC60 TSOP	U208 ⑥
0882559	IC	HY57V641620ET-7 TSOP	U208 ⑥
0881182	IC	LM1117MP-ADJ SOT-223	U206 ⑦
0881969	IC	IP1117-ADJ SOT-223	U206 ⑦
0882461	IC	AZ1117H-ADJ SOT-223	U206 ⑦
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,l219
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 ⑧
0310543	SMD CAPACITOR	50V 104±10% X7R 0603	EARPHONE ⑧
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	1/2W1500±5% SHAPED 12.5	R121,R117
0260025	CD	CD11 16V47U±20%5×11 2	C108
0260200	CD	CD11C 16V47U±20%5×7 2	C109
0570006	DIODE	1N4148	VD101~VD104
0620040	RADIATION DIODE	3B 4SC WHITE ISSUE BLUE	VD105
0780030	TRIODE	8550C	V100
0882131	IC	S0793GB QFP	N102 ⑨
0882364	IC	PT6315 LQFP	N102 ⑨
0160201	DIGITAL POTENTIOMETER	EC12P24L25F12	RP100
1200653	DISPLAY SCREEN	HL-D593	DS100 ⑩
1200531	ISPLAY SCREEN	VFD16-0801	DS100 ⑩
1200532	DISPLAY SCREEN	HNV-08SS56	DS100 ⑩
1340064	LIGHT TOUCH RESTORE SWITCH	KFC-A06-2WB L3.8	S100~S106
1340003	LIGHT TOUCH RESTORE SWITCH	HORIZONTAL 6×6×1	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 (11)
2360021	IR SENSOR	AT138BV3	N103 (11)
5233065	SOFT SPONGE SPACER	8×8×10 DOUBLE-FACED,HARD	SURFACE CONTROL BOARD
5232691	SOFT SPONGE SPACER	15×10×9 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) (12)
0310543	SMD CAPACITOR	50V 104±10% X7R 0603	(SURFACE CONTROL BOARD C111,C110,C107) (12)
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 (13)
1090077	ELECTRO-OPTIC TRANSFORMER	TX179AT-2	XC106 (13)
1090045	ELECTRO-OPTIC TRANSFORMER	TX179ATW	XC106 (13)
2150286	FLAT CABLE	8P120 2.5 T2 2×2P 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 (14)
0310543	SMD CAPACITOR	50V 104±10% X7R 0603	C120,C129 (14)
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 20×8	R198
0260048	CD	CD11 35V470U±20%10×20 5	C168,C169,C172,C173,C176,C177,C180,C181,C185,C186
0260491	CD	CD11K 35V680U±20% 13×20 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 (15)
0880445	IC	4558C DIP	N1 (15)
0880124	IC	NJM4558D DIP	N1 (15)
0881393	IC	IL4558N DIP	N1 (15)
0881429	IC	CD4052BE DIP	N5 (16)
0880443	IC	CD4052BCN DIP	N5 (16)
0882375	IC	RC4580 DIP	N10,N11 (17)
0882351	IC	NE4580 DIP	N10,N11 (17)
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	78×49×30 DVR938 NOT OXIDATION	
4210005	MACHINE-TAPPING SCREW	PM 3×8 BLACK	
4450012	BOLT PAD	F 3×7.2×0.5	
4490001	SPRING PAD	F 3	
5230707	SOFT SPONGE SPACER	10×10×2 SINGLE-FACED,HARD	
5233174	RUBBER SPACER	9×9×1 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 2.2O ±5% 0603	R68
0090616	SMD RESISTOR	1/16W 3.3O±5% 0603	R40,R41,R67,R140,R141
0090314	SMD RESISTOR	1/16W 5.1O±5% 0603	R88
0090003	SMD RESISTOR	1/16W 10O±5% 0603	R24,R25,R89,R116,R137,R175
0090004	SMD RESISTOR	1/16W 22O±5% 0603	R115
0090230	SMD RESISTOR	1/16W 47O±5% 0603	R5,R29,R56,R59,R62,R63,R69,R70,R94~R101,R225
0090220	SMD RESISTOR	1/16W 51O±5% 0603	R27,R122
0090017	SMD RESISTOR	1/16W 2.2K±5% 0603	R1,R2,R80,R82
0090239	SMD RESISTOR	1/16W 200O±5% 0603	R64,R66
0090008	SMD RESISTOR	1/16W 220O±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 (18)
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 (18)
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 (19)

MATERIAL CODE	MATERIAL NAME	SPECIFICATIONS	LOCATION
0882947	IC	BU1924F SOP	N15 (19)
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 (20)
0881998	IC	AT49BV162A 70TI TSOP	U214 (20)
PROGRAM CPU RCO73RU-0 0890292			
0883034	IC	M37544G2AGP LQFP	N1
5156608	SIGN STICKER	CPURC073RU-0	