

IBBK

LD1506SI

service manual



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Chapter One About Maintenance

1.1 Safety precautions

1.1.1 Power supply

When maintenance personnel are repairing DVD TV, he should pay special attention to the power with 220V 800V 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 display screen

1. Display screen is breakable article, so please protect carefully when carrying and prevent fingers or hard objects striking the screen to damage structure of the screen.

2. When cleaning screen, do not use organic chemicals. You should use cloth and use small amount of special cleaning liquid in places difficult to clean.

1.1.4 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.

1.1.5 About placement position

1. Never place TV 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 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.

1.2.2 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.

1.2.3 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.

1.2.4 Element substitution method

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

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 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.

1.2.7 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

- ◆ Audio Generator
- ◆ Digital oscillograph ($\geq 100\text{MHE}$)
- ◆ SMD rework station
- ◆ Multimeter
- ◆ Soldering iron
- ◆ Pointed-month pincers
- ◆ Cutting nippers
- ◆ Forceps
- ◆ Electric screw driver
- ◆ Terminals connecting cord
- ◆ Headphone
- ◆ Microphone

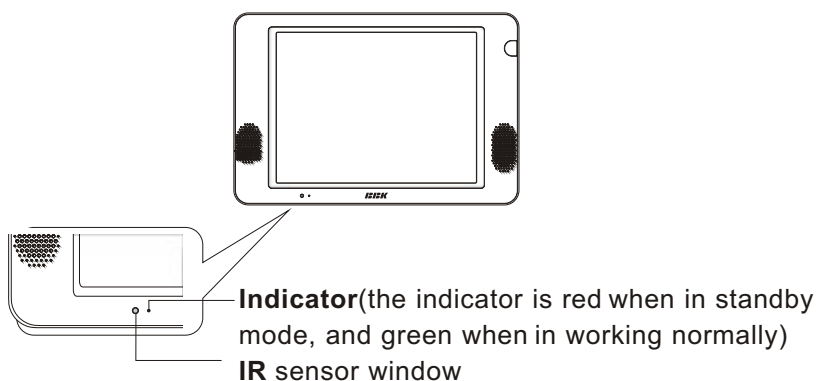
Chapter Two

Functions and Operation Instructions

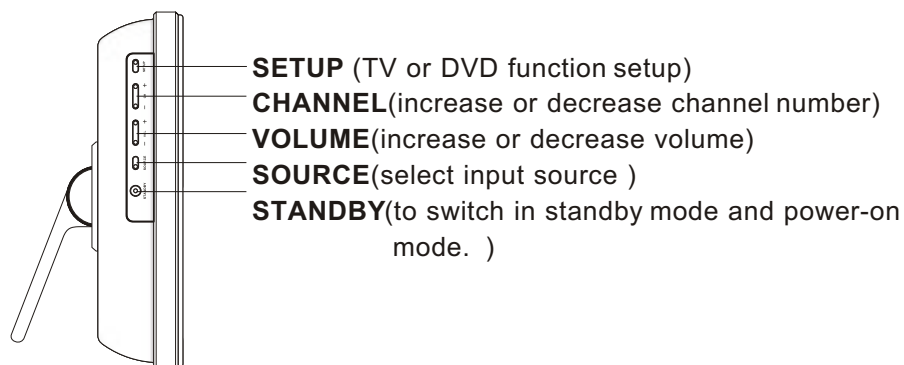
Section One TV SEGMENT

2.1.1 PANEL BUTTON FUNCTIONS

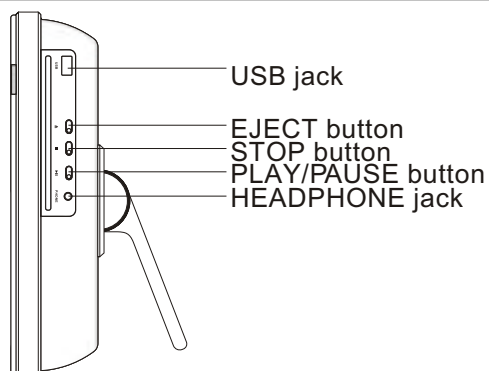
(1) FRONT PANEL



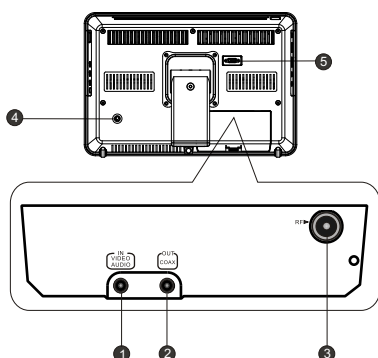
(2) LEFT PANEL



(3) RIGHT PANEL



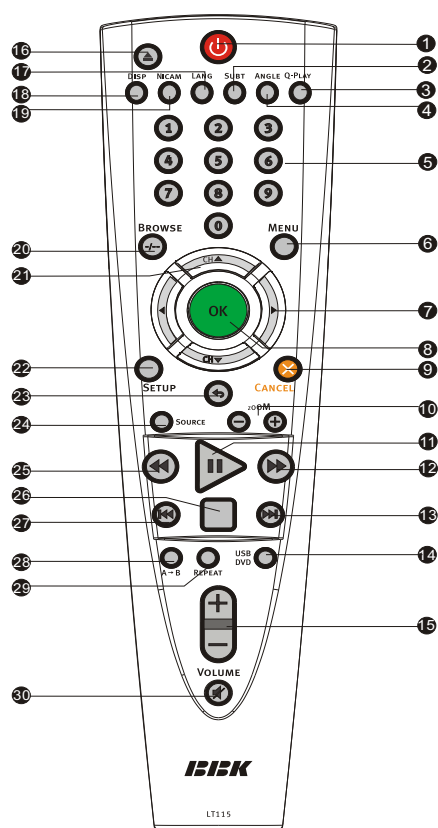
(4) REAR PANEL



- ① Composite video/audio input
- ② Coaxial digital audio output
- ③ RF input terminal
- ④ 12V DC input terminal
- ⑤ UPGRADE

2.1.2 REMOTE CONTROLLER

(1) REMOTE BUTTONS



- ⑭ **USB/DVD**
To switch between USB mode and DVD mode.
- ⑮ **VOLUME+/-**
To increase or decrease sound volume.
- ⑯ **EJECT**
Disc in /out ,valid in DVD mode.
- ⑰ **LANG**
To switch the output language or channel, valid in DVD mode.

- ① **STANDBY**
To switch between standby mode and power-on mode.
- ② **SUBT**
To select subtitle language or switch JPEG display mode, valid in DVD mode.
- ③ **Q-PLAY**
Play DVD directly in DVD mode.
- ④ **ANGLE**
Enjoy DVD from different angles.
- ⑤ **Number buttons**
To select program number.
- ⑥ **MENU**
To go to the menu of DVD disc, valid in DVD mode.
- ⑦ **Left/Right cursor(menu adjustment)**
To move leftward/ rightward or adjust the selected item in the menu, or adjust sound volume(not in DVD mode).
- ⑧ **OK button**
To confirm the selections.
- ⑨ **CANCEL**
To cancel the current selections, valid in DVD mode.
- ⑩ **ZOOM-/+**
To zoom in and zoom out to the picture, valid in DVD mode.
- ⑪ **[▶] button**
Play or pause playback.
- ⑫ **[⏩] button**
To fast forward play, valid in DVD mode.
- ⑬ **[⏮] button**
To select the next chapter or track.

- 18 **DISP**
To display information.
- 19 **NICAM**
Switch in NICAM, A2 and mono channel (it is effective in TV signal input with NICAM or A2 function).
- 20 **BROWSE**
Switch new user interface / Select program in one or two digital number.
- 21 **UP/DOWN cursor**
To select upward/downward in the menu or change the channel.
- 22 **SETUP**
TV and DVD function setup.
- 23 **RETURN**
To exchange channel between the previous program and the current program/return the previous menu in DVD mode.
- 24 **SOURCE**
To select input source: TV, DVD, AV.
- 25 **[◀◀] button**
To fast backward playback, valid in DVD mode.
- 26 **[□] button**
To stop playing, valid in DVD mode.
- 27 **[◀◀] button**
To select the previous chapter or track, valid in DVD mode.
- 28 **A-B**
To segment repeat, valid in DVD mode.
- 29 **REPEAT**
To repeat playback, valid in DVD mode.
- 30 **MUTE**
Sound mute switch.

2.1.3 TV MENU SETUP

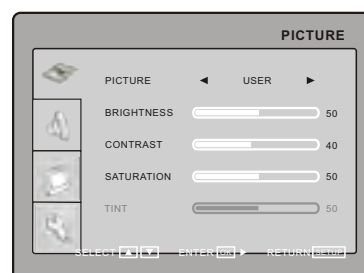
This product can store up to 100-channel programs (0~99). You can select your favorite channel through [CH+/-] or number buttons, and you can scan and store all of the channels through manual or automatic mode.

In TV mode, press [SETUP] button into the main menu and the main menu will show as follows:

#Through pressing [▲/▼] button on the remote control, you can select main menu sections (main menu sections consist of "PICTURE", "SOUND", "TV SETTING", "SYSTEM SETTING").

Press [▶] or [OK] button to enter this menu section.

#Press [▲/▼] button on the remote control to select the item, and then press [◀/▶] button to adjust parameter value. Press [SETUP] button to return to main menu sections.



(1) PICTURE

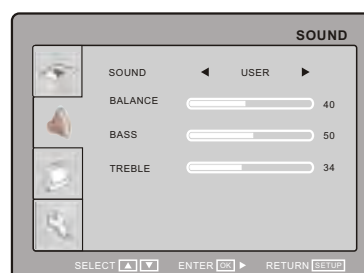
Select "🖼️" and menu will show as follows:
Press [▲/▼] button to select items and [◀/▶] button to adjust.



Item	Description
PICTURE	Can be change between : "USER", "STANDARD", "DYNAMIC" and "SOFT".
BRIGHTNESS	To adjust brightness.
CONTRAST	To adjust contrast.
SATURATION	To adjust color saturation.
TINT	To adjust picture tint, only valid in N 3.58/N 4.43/PAL60 and display mode with V-scanning frequency equal 59.94 (please refer to P45).

(2) SOUND

Select "🔊" and menu will show as follows:

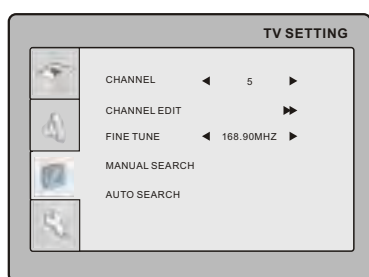


Press [▲/▼] button to select item and press [◀/▶] button to adjust . The following is sound item description.

Item	Description
SOUND	Can be change between "USER", "NEWS", "FILM" and "MUSIC".
BALANCE	To adjust balance of left and right channels.
BASS	To adjust bass.
TREBLE	To adjust treble.

(3) TV SETTING

Select "TV" and tuning menu will show as follows:

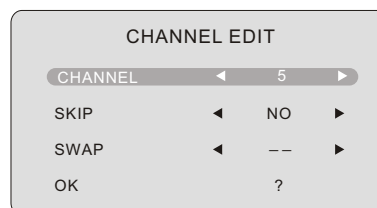


Press [▲/▼] button to select item and press [◀/▶] button to adjust or activate.

Item	Description
CHANNEL	To change the channel number.
CHANNEL EDIT	To enter a submenu to set channel skip and channel swap. Please refer the next page.
FINE TUNE	To adjust the channel frequency accurately to make the sound and picture effect better.
MANUAL SEARCH	To scan programs by manual.
AUTO SEARCH	To scan programs and store all of them automatically.

NOTE

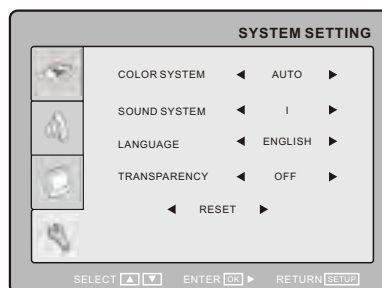
During the searching, you can press [SETUP] button to stop.



Item	Description
CHANNEL	To select current channel here.
SKIP	To select "Yes " or "No ", you can select "Yes " to make current channel inaccessible while using [CH+/-] button to browse channels.
SWAP	Select or enter the channel number directly to swap with current channel.
OK	Highlight this option and press the [OK] button to confirm the swap function.

(4) SYSTEM SETTING

You can setup some system configuration here. Press [▲/▼] to select "SYSTEM" item and press [▶] button to enter the following section:



Press [▲/▼] button to select item and press [◀/▶] button to adjust or activate.

Item	Description
COLOR SYSTEM	Can be changed between: "Auto", "PAL" and "SECAM".
SOUND SYSTEM	Can be changed between: "BG", "DK", "I" and "L" .

LANGUAGE	Can be changed between: "ENGLISH", "RUSSIAN".
TRANSPARENCY	To change transparency of OSD.
RESET	To reset all value to default.

NOTES

- # Which "COLOR SYSTEM" mode and "SOUND SYSTEM" mode to use is related to your local TV broadcasting system.
- # SECAM system is only used by some European countries and districts, such as France.
- # If the local system is SECAM L, the color system must be selected as "SECAM" and sound system must be selected as "L".

(5) NICAM/BILINGUAL RECEIVING

- If you can receive Nicam/bilingual signal, you can operate as follows to enjoy that.
- # You can select Nicam stereo, mono channel or bilingual through NICAM button on the remote control. If stereo signal is too weak, this unit will switch into mono channel automatically.
 - # When selecting mono channel, "MONO" will show on screen; when selecting bilingual, "DUAL1" will show on screen; when selecting bilingual II, "DUAL 2" will show on screen and when selecting stereo, "STEREO" will show on screen.

NOTE

Nicam/bilingual function is only effective in TV mode while program coming with Nicam/bilingual.

2.1.4 AV, S-VIDEO, SCART AND YPBPR SETUP

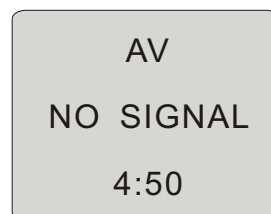
(1) VIDEO SETTING MENU

- # When in AV input mode, there are 6 color system modes for selection: "Auto", "PAL", "N 3.58", "N 4.43", "PAL60" and "SECAM". Select the right system for your video program. If you do not know which mode your video playback devices and video media is using, you should select the auto mode or you should check and confirm this with your supplier.
- # The menu setup of AV modes is much the same as that of TV mode, except the " " section is invalid and a little difference in color and sound modes. In order to make this manual pithy and concise, it is not repeated here. You can find it in preceding pages.

NOTE

If no signal input in TV, AV, the screen will show like the following figure.

This unit will go into standby mode automatically with no signal input for more than 5 minutes.



Section Two DVD SEGMENT

2.2.1 DVD OPERATION

(1) Features

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

Brand-new AV Effects

- ❶ Compatible with DivX, MPEG4 discs to produce wonderful pictures.
- ❷ 108MHz/12bit video DAC, with more vivid and brilliant pictures.
- ❸ Progressive-scan video outputs to eliminate the flickers hardly overcome by interlacing scan and therefore your eyesight will be well-protected. At the same time, the pictures definition is sharply enhanced and the pictures will be finer, smoother and stabler
- ❹ Brightness, chroma and contrast adjustment functions to render your eyes more comfortable.
- ❺ Dolby output for 2channel(DOWNMIX).
- ❻ DVD-Audio decoding output to reproduce original and realistic sound effects.

High Quality Digital Audio

- ❶ Coaxial outputs for Digital audio.
- ❷ DTS,Dolby Digital, PCM Digital audio outputs to satisfy the Fans'Ss acoustic requirements.

Many Convenient Features

- ❶ The novel Mp3 playback window GUI provides you a new way to appreciate Mp3 music.
- ❷ It's possible to select the desired beginning, development and ending of a story.
- ❸ Direct entry into desired scenes(title/chapter/track search).
- ❹ Zooming function to zoom up any playing picture.
- ❺ Capable of playing PAL/NTSC discs.
- ❻ Parental lock function to prevent children from watching unsuitable discs.
- ❼ Multiple dubbing languages and subtitle languages bring you the best entertainment status all the time.

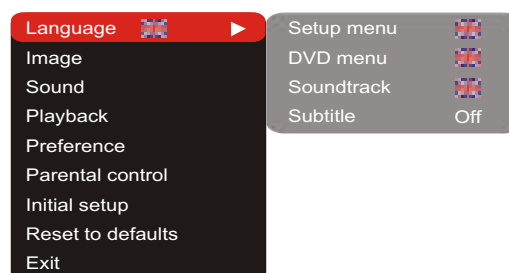
Super Compatibility with super VCD, VCD, CD , CD-R ,Mp3,HD CD,KODAK PICTURE CD etc.

NOTE: DivX version is still upgrading continuously and the latest version of this unit is DivX 5.1. Some discs labelled with MPEG4 on the market actually are others, with which are incompatible . Please take care when buying discs.

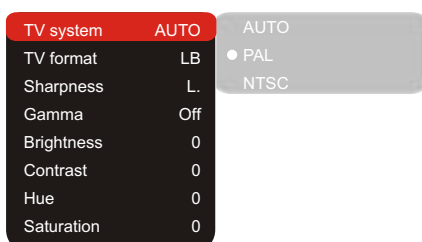
2.2.2 DVD FUNCTION SETUP

(1) Function Setup

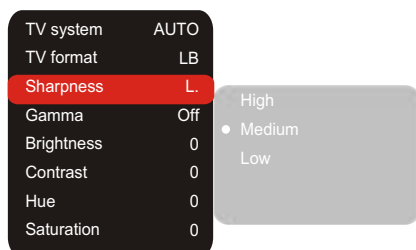
1.Press the [SETUP] button and the screen displays the selection menu of function setup.



2. Press the [CURSOR] button to select the menu to be entered and press the [OK] or button to confirm. Or press the [CURSOR] button to Exit item and then press the [OK] button to exit .
3. Press [▲ /▼] arrow to select the desired item you want to set and press [OK].
For example, press [▲ /▼] arrows to select IMAGE and press [OK]. The Image setting page appears on the screen.

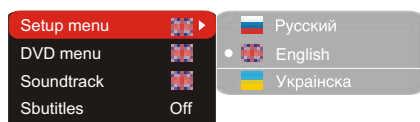


4. Press [▲ /▼] arrow to select the SHARPNESS item. Press [OK] to confirm it.
And then press [▲ /▼] arrow to select the desired value. For example: Press [▲ /▼] arrow to select "Medium", then press [OK], the TV screen display.



5. Press [◀] button if you want to return to the previous setup page.
6. Press [SETUP] to exit the setup menu.

(2) Language



1. **Setup menu:** This item is used to set the prompts language on the screen.
#Optional setting: Русский , English, Українська ;
Default: English.
2. **DVD menu:** To set the preference disc menu lang when playing.
#Optional setting: Russian, English, Estonian ,Latvian, Kazakh, Romanian, Byelorussian, Ukrainian, Chinese, Others; Default: English.

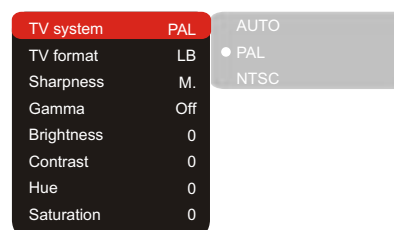
3. **Sountrack:** To set the preference audio language when playing.

#Optional setting: Russian, English, Estonian ,Latvian, Kazakh, Romanian, Byelorussian, Ukrainian, Chinese, Others; Default: English.

4. **Subtitles:** To set the preference subtitle language when playing.

#Optional setting: Off, Russian, English, Estonian, Latvian, Kazakh, Romanian, Byelorussian Ukrainian, Chinese, Others; Default: Off.

(3) Image



1. **TV system:** This item is used to the video output system of this unit.

#Optional setting: Auto, PAL, NTSC; Default: PAL.

2. **TV format:** To set the aspect ratio of this player s output image.

#Optional setting: 4:3 Pan-scan, 16:9 letterb., 16:9 TV; Default: 16:9 letterb..

3. **Sharpness:** Used to set the sharpness of video outputs.

#Optional setting: High, Medium, Low; Default: Medium.

4. **Gamma emendation:** This item is used to setup the Gamma value of video output.

#Optional setting: High, Medium, Low, Off; Default: Off.

5. **Brightness:** Used to set the brightness of video outputs.

6. **Contrast:** Used to set the contrast of video outputs.

7. **Hue:** Used to set the hue of video outputs.

8. **Saturation:** Used to set the saturation of video outputs.

#Brightness, contrast, hue and saturation adjusting means:

- A. Press [▲ /▼] arrow in the video setup menu to select the desired item you want to adjust. Press [OK] or [▶] button to enter the item's adjustment.
- B. Press [▲ /▼] arrow to adjust the setting value.

(4) Sound



1. Digital output: select to set the format and stream form of digital audio output.

A. SPDIF format:

#Optional setting: RAW format, SPDIF/PCM;
Default: RAW format.

B. LPCM

#Optional setting: 48 kHz 16 bit, 96 KHz 24 bit. 192kHz 24bit; Default: 48 kHz 16 bit.

2. Tuning:

A. Equalizer: To set Equalizer modes.

#Optional setting: Off, Rock, Pop, Live, Dance, Techno, Classic, Soft; Default: Off.

B. Echo: To set different sound field effects.

#Optional setting: Off, Concert, Living room, Hall, Bathroom, Cave, Arena, Church; Default: Off.

C. Tone balance: to set the tone level .

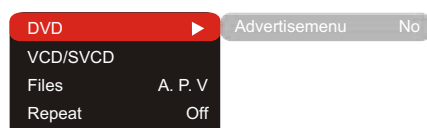
Method to adjust tone control:

a. Press [▲/▼] cursor buttons to select "tone" item in Audio Setting page, and then press [OK] or [►] button to enter Adjustment Menu.

b. Press [▲/▼] cursor button to adjust setting value.

c. Press [OK] or [◀] button to return to Audio Setting page after adjustments are done.

(5) Playback



1. DVD: set whether information of advertisement and warnings at the beginning of DVD disc is skipped to play the movie directly.

Always skip ads

#Optional setting: Yes, No; Default: No .

2.VCD/SVCD: To set the PCB status.

#When playing Super VCD or VCD2.0 discs, if the PCB is ON, the menu image displays.

#Optional setting: On, Off; Default: On.

3.Files:data disc may probably includes Mp3, JPEG and MPG format files in which you may select DVD player to read the file type.

#Optional setting: Audio, Picture, Video; Default: Audio, Picture, Video.

4. Repeat : select the repeat playback mode.

#Optional setting: Off, Single, all; Default: Off.

(6) Preference



1.Screen saver: Open or close the screen saver function.

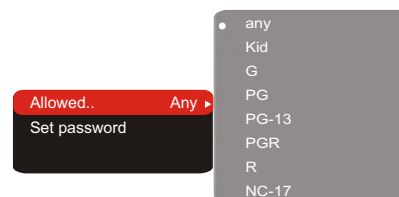
#Optional setting: On, Off; Default: On.

2.Gr. equalizer: This item is used to set whether the Dynamic Spectrum is allowed.

#Optional setting: On, Off; Default: Off.

#Dynamic Spectrum display is invalid in Data disc、DVD AUDIO playback.

(7) Parental control

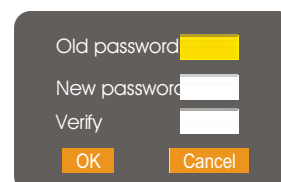


1.Allowed..: To set the parental control ratings to prevent children from watching the restricted contents.(In case the disc supports this function.)

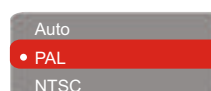
#Optional setting: any, Kid, G, PG, PG-13, PGR, R, NC-17; Default: any.

2. Set password: To set four digit password to enable you to change the parental control ratings.

#Default: 7890.



(8) Initial setup

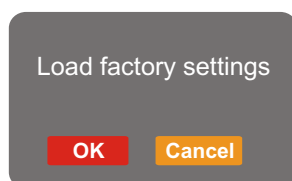


Press [▲/▼] arrow to select the desired option and Press [OK] button to confirm it.

NOTE

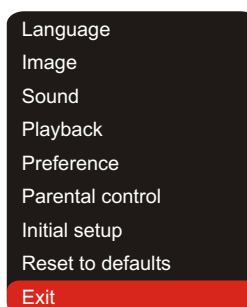
In this setup state, you may not press [◀] button to return to the previous menu.

(9) Rest to defaults



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

(10) Exit



Press [▲/▼] arrow to select the Exit item. Press [OK] button to exit the setup menu.

2.2.3 SPECIFICATIONS

Panel	Type Class Size Display Size Pixel Pitch Response time (ms) Brightness (Cd/m ²) Contrast ratio Viewing Angle (H) Viewing Angle (V) Panel Life (Hours)	TFT color II (ISO 13406–2) 15" 304.1 (H) x 228 (V) 0.297 (H) x 0.297 (V) 16 250 450:1 120 100 50 000
Frequency	Vertical Horizontal Display Color	50 Hz – 75 Hz 30kHz– 75 kHz 16 700 000
Display Mode	Optimum Mode	1024x768; 75 Hz
Inputs	Video Composite UPGRADE Audio Stereo Other interface USB	1 1 1 1
Outputs	Audio Headphone Digital Coaxial	1 1
Color Systems	TV tuner Video inputs	PAL, SECAM PAL, SECAM, NTSC 3.58, NTSC 4.43, PAL60
Sound Systems	TV tuner	DK, I, BG, L
DVD	Disc type	CD–R/RW, DVD–R/RW, DVD+R/RW
	Formats	DVD–Video, DivX, XviD, SVCD, VCD, CD–DA, HDCD, MP3, WMA, Kodak Picture CD, JPEG

Power adaptor	Input	~ 100 V – 240 V; 50/60 Hz; 1.5 A
	Output	12 V 4.5 A 54 W
Environmental Consideration	Operating Temperature Operating Humidity Storage Temperature Storage Humidity	+5°C...+35 °C 10% – 80% –20°C...+45 °C 5% – 95%
Dimensions	438.7 mm x 163.1 mm x 295.7 mm	
Net Weight	7.4 kg	

These items are depended on the TFT panel, Design and specification are subject to change without notice.

#Because of disc quality and format difference, we cannot make sure smoothly read discs; some functions cannot be fulfilled for the disc speciality, but not machine trouble.

2.2.4 DISPLAY MODE

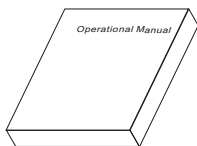
SUPPORTED VIDEO INPUT MODE			
Format	Hor scanning frequency	Ver scanning frequency	Vert scan type
720X480	31.47	59.94	480P
720X480	15.734	59.94	480i
720X576	31.25	50	576P
720X576	15.625	50	576i

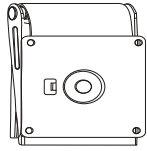
NOTE

Specifications and design are subject to change without notice.

2.2.5 ACCESSORIES

Please check the following accessories.

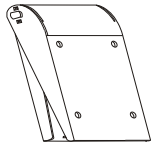
 Operational Manual User manual	 Remote control and battery
--	--



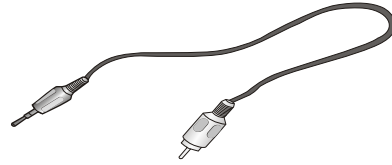
Wall Mount Holder Kit AK556(optional)



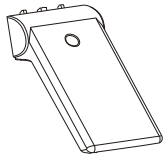
Power adaptor



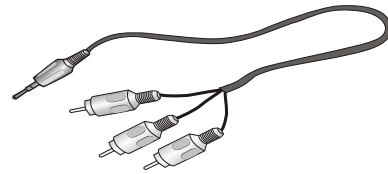
Wall Mount Holder Kit AK558(optional)



Coaxial digital audio cord



Kickstand Kit



AV cord

Chapter Three Principle and Servicing

Section One Working Principle

3.1.1 Brief introduction to the player

LD1506SI is a 15" LCD TV with multiple functions, such as DVD playing and USB reading function. Electronic scheme of TV part adopts SVA150XG04TB 15" TFT + inverter components (INV203) + MST518VA + TVP5147 + STV8216 + TDA7266P + tuner JS-6B2/121 + CPU (W79E632A40PNA40PN), which supports PAL BG/DK/I, SECAM BG/DK/L/L' RF signal demodulation and PAL/NTSC/SECAM/PAL60 multiple-system; support BG/DK/I/LL/L' sound accompanying system FM, NICAM and A2 Stereo signals' demodulation and sound accompanying restore; support multiple input modes of external input and SCART S-VIDEO composite video input. DVD part adopts MT1389HD + 64M (SDRAM) + 16M FLASH + D5954. HD62 loader may smoothly read MPEG4/MP3/CD/DVD format discs and support to connect USB externally.

Our company adopts TFT (Thin Film Transistor) screen, that is each LCD pixel spot is driven by the thin film transistor integrated behind the pixel spot to display information in high speed, high brightness and high contrast. TFT-LCD is one of the best LCD colourful display device at present and its effect is close to CRT display. Each pixel spot of TFT-LCD is controlled by the TFT integrated on itself, which is active pixel spot. Therefore, the speed may be enhanced greatly and also the contrast and brightness, meanwhile resolution can be up to high level. The main merits of TFT-LCD is that screen response speed is fast; contrast and brightness are high; observing angle of screen is large; colour is rich and resolution is high.

3.1.2 Block diagram of the player

1. TV part block diagram

This player is composed of TV function and DVD player function. Let us introduce TV part firstly, shown in the figure 3.1.2.1, as for external multi-channel AV input mode and built-in DVD mode, users select one input mode, through internal processing, output audio signals and sound is restored by loudspeaker; video signals are processed by LCD picture processor and picture is outputted by LCD screen directly. The function module marked with gray in the block diagram is not used by this player and VGA terminal is used as the software upgrading jack. This player's basic circuit is the same with that of LT1500S on the whole, so please refer to "LT1500S Service Manual" and we will not introduce here.

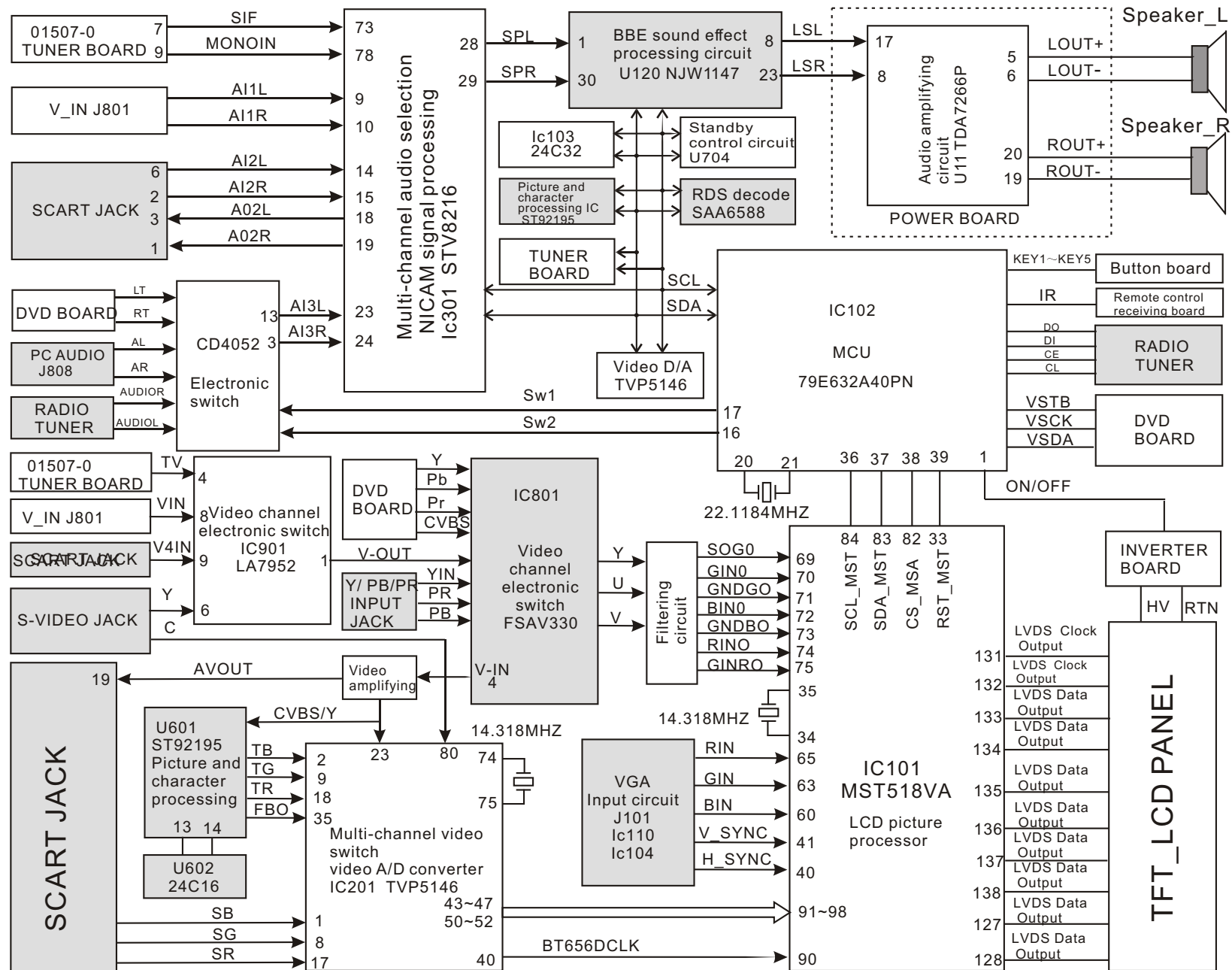


Figure 3.1.2.1 TV part block diagram

2. DVD part block diagram

DVD part block diagram is shown in the figure 3.1.2.2:

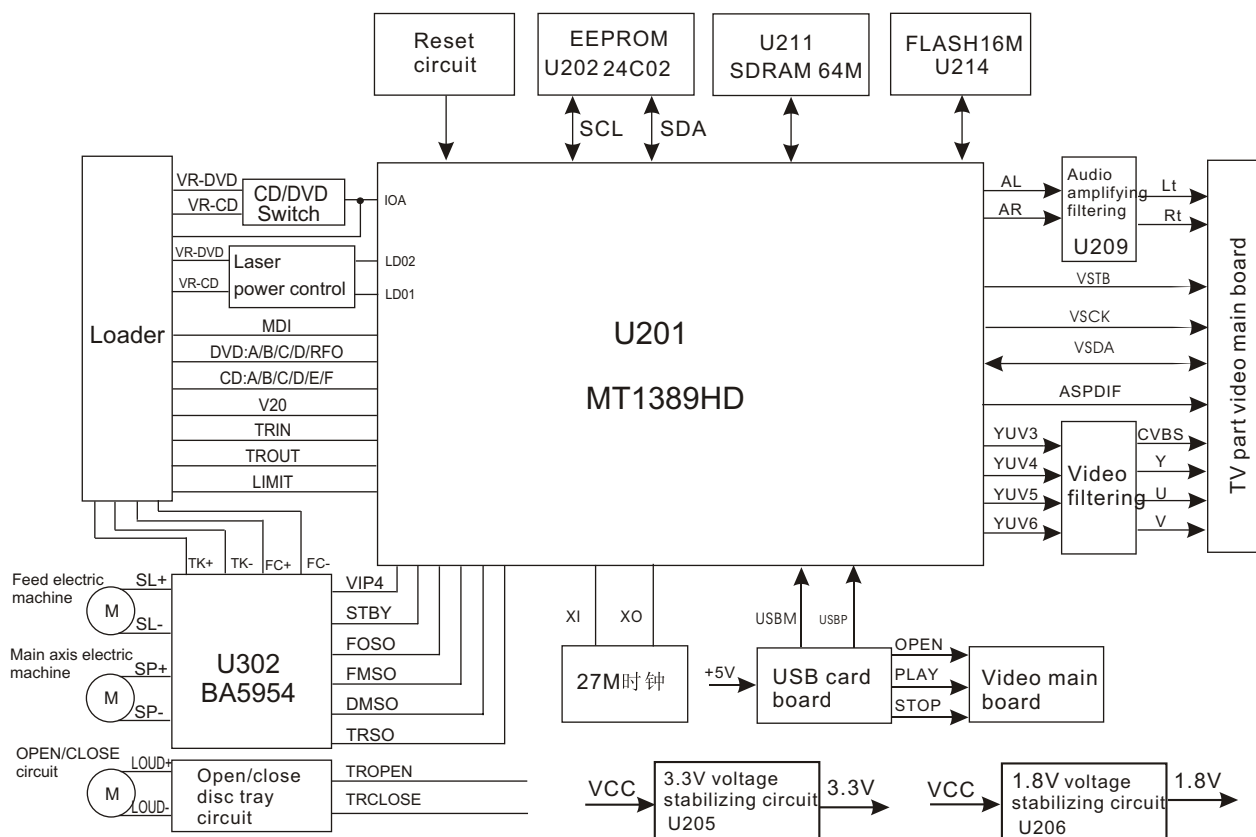


Figure 3.1.2.2 DVD part block diagram

3.1.3 Audio circuit of the player

Working principle of this circuit is the same as that of LT1500S, only deleting SCART terminal input/output function and PC-AUDIO input function on the basis of LT1500S, and adding DVD audio. Audio block diagram of the player is shown in the figure 3.1.3.1:

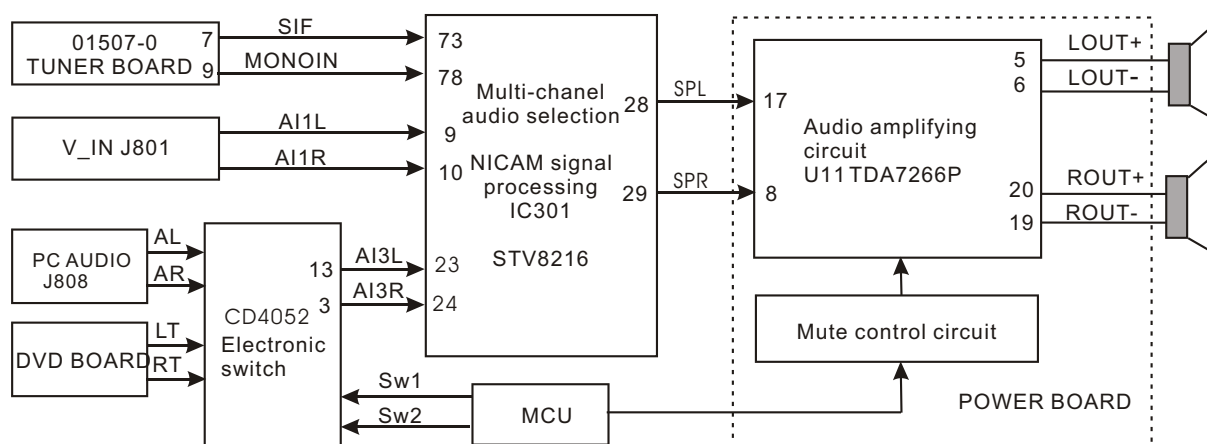


Figure 3.1.3.1 Audio block diagram of the player

3.1.4 Video circuit of the player

Working principle of this circuit is the same with that of LT1500S video processing circuit, only deleting SCART terminal, S-VIDEO, component video input and video output function on the basis of LT1500S, and adding video input function of DVD board, in which DVD inputs according to components video means. Based on LT1500S, switch components video port to DVD input port (add R7/R8/R9). Video A/D conversion circuit is changed to TVP5147, which cannot substitute TVP5146, because TVP5147 cannot support RGB input switch function. Video block diagram of the player is shown in the figure 3.1.4.1:

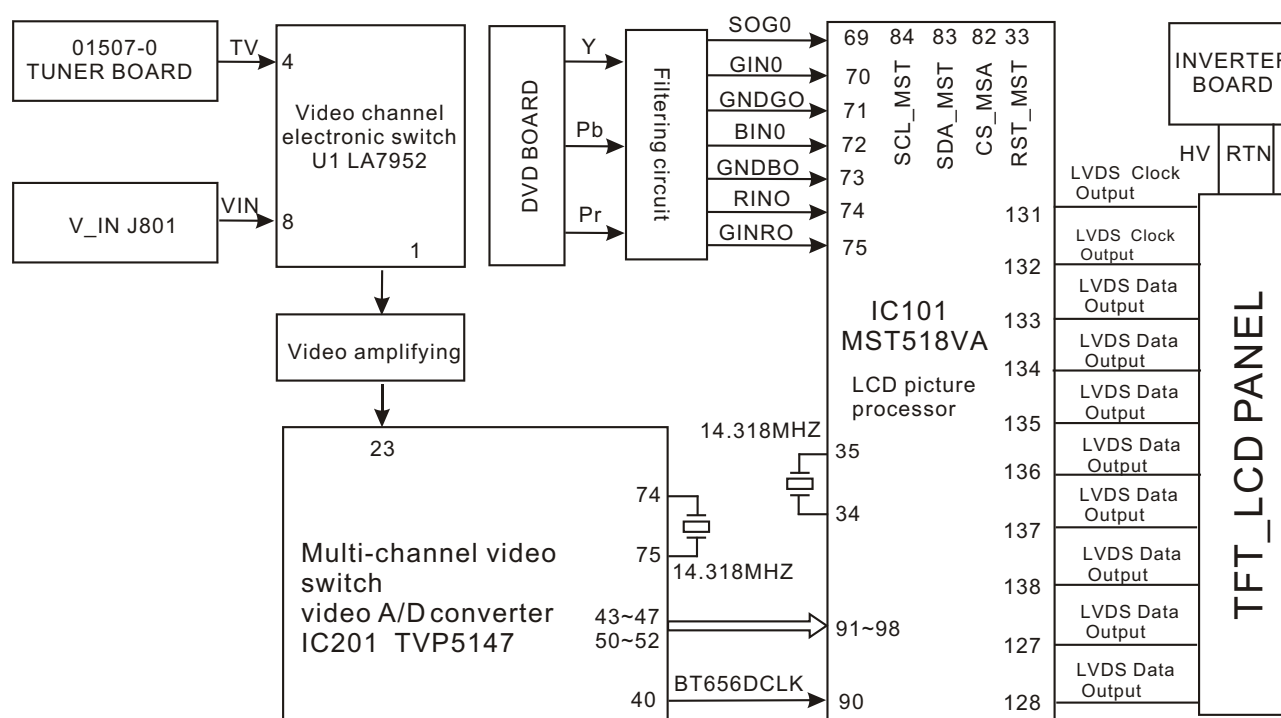


Figure 3.1.4.1 Video block diagram of the player

3.1.5 Introduction to IC of the player

Introduction to IC of the player is shown as in the following table:

SN	Material code	Material name	Specs & model	Qty	Location	Function description
TV part						
1	882030	IC	STV8216 TQFP	1	IC301	Video A/D converter
2	882485	IC	AZ1117H-3.3 SOT-223	4	IC106, IC111, IC202, IC303	Voltage stabilizing IC
3	883247	IC	AZ1084S-ADJ TO-263-3L	1	IC702	3.3V voltage stabilizing IC
4	790126	SMD FET	FDS9435A SOP	1	Q709	MOS tube (power switch control)

5	882112	IC	LA7952 SIP	1	IC901	Video electronic switch (video output selection)
6	882121	IC	AK18 SOT-223	2	IC203,IC105	Voltage stabilizing IC
7	882376	IC	TVP5146M1 PQFP	1	IC201	Multi-channel sound source selection NICAM processing
8	882515	IC	HEF4052BT SOP	1	U111	Audio input selection electronic switch
9	882638	IC	MST518VA PQFP	1	IC101	LCD picture processor
10	880504	IC	24C32N SOP	1	IC103	Save user information (32K memorizer)
11	1020028	Tuner	JS-6B2/121	1	T1	Receive high frequency signal and switch into audio/video signal
12	882637	IC	W79E632A40PN PLCC	1	U15	MCU (programmable)
13	900442	Software program EPROM	ROMLT1500S-0A(512B)	1	U704	Standby control IC
14	883149	IC	TDA7266P SSO24	1	U1	Audio amplifying circuit
15	882945	IC	MP1430DN SOP	2	IC1/IC3	5V voltage stabilizing IC
Battery case AK083						
16	8824629	IC	AZ431AZ-A TO-92	1	U3	3-end precision voltage stabilizer
17	883304	IC	NCP1337 SOP\$	1	U1	Power IC
18	10800118	Photoelectric coupler	HS817\$	1	U2	Photoelectric coupler
DVD part						
19	882644	IC	MT1389FE/H (HD version) QFP	1	U201	Decode chip
20	882149	IC	IS24C02-3 SOP	1	U202	Save information set by users
21	881459	IC	D5954 SOP	1	U302	Servi drive
22	882262	IC	K4S641632H-TC60 T SOP	1	U208	SDRAM
23	880361	IC	4558 SOP	1	U209	Audio amplifying
24	882114	IC	AMS1117-3.3 SOT-223	1	U205	3.3V voltage stabilizing IC
25	882121	IC	AK18 SOT-223	1	U206	1.8V voltage stabilizing IC
26	881651	IC	M29W160EB 70N6 TSOP	1	U207	DVD software

Section Two Unit Circuit Principle

3.2.1 Introduction to laser head

Function introduction to laser head flat cable is shown as the following table:

Pin	Name	Signal flow direction	DVD disc	CD disc	No disc	Function description
1	F-	Input loader	2.52	2.34	0.46	Focus error signal is added to two sides of pick-up focus coil
2	F+	Input loader	2.49	2.49	0.93	
3	T+	Input loader	2.53	2.51	0.94	Trace error signal is added to two sides of pick-up trace coil
4	T-	Input loader	2.58	2.51	0.93	
5	C	Input MT1389	2.2	2.25	2.04	Disc data signal
6	D	Input MT1389	2.2	3.2	2.04	Disc data signal
7	IOA	Input MT1389	0.01	3.2	3.21	Disc identification signal, CD is 3.3V, DVD is 0V
8	RF	Input MT1389	2.21	2.53	1.28	The sum of disc data signal
9	A	Input MT1389	2.17	2.22	2.04	Disc data signal
10	B	Input MT1389	2.19	2.27	2.04	Disc data signal
11	F	Input MT1389	2.07	2.44	2.03	Supplementary signal used in trace
12	GND	Ground	0.01	0.01	0	Grounding
13	V20	Input loader	2.04	2.06	2.03	Reference voltage
14	Vcc	Input loader	5.04	5.04	5.02	Supply voltage for loader
15	E	Input MT1389	2.06	2.45	2.03	Disc data signal
16	Blanking	hanging in air	0.01	0	0	unused
17	VR-CD	Input loader	0.21	0.01	0	Through the handling inside loader, make sure MD11 is 180mV when reading CD
18	VR-DVD	Input loader	0.01	0.2	0	Through the handling inside loader, make sure MD11 is 180mV when reading DVD
19	LD-CD	Input loader	0.09	2.1	0	CD laser power control signal
20	MDII	Input MT1389	0.21	0.2	0	CD and DVD laser power monitoring signal

21	HFM	Input loader	5.04	5.04	5.02	High frequency overlapping signal produces laser with different wave length inside loader
22	Blanking	unused	0.01	0.1	0	
23	LD-DVD	Input loader	2.21	0.1	0	DVD laser power control signal
24	GND	unused	0.01	0.01	0	Grounding

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

2. When reading CD, there are A, B, C, D, E, F signals.

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

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

2. Working principle

(1) Laser tube: wave length of loader DVD laser diode is 650nm, wave length of CD laser diode is 790nm, the wave length which is within 370nm and 750nm is visible light, the laser in the course of reading DVD disc is visible light, and that when reading CD disc is infrared light.

(2) Principle about laser head picks up signal: laser beam projects onto disc, when laser beam focus projects onto disc vertically, laser beam will produce reflection, reach on light sensor through reflection loop and converse into electronic signal through photoelectric cell. For the reflection loop produced in non pit information area and pit information area in disc has difference and reflects into different position of light sensor, photoelectric diode in different positions on light sensor will produce different signals to process all signals on light sensor and then produce digital signals.

(3) Focus, trace coil: when laser head is reading signals normally, information side should be in the focus of laser beam, because of factors of disc error, high speed rotation and machine error, it is unavoidable that laser beam focus deviates from information face to produce phenomena of orbit boas and refocusing. Focus , trace coil is added on loader to adjust laser beam to make it correctly focus in information area.

(4) Formation of RF signal: when disc reading is normal, light sensor will have 160MV, vague and eye pattern waveform which is added on A, B, C, D respectively, and output RF signal from FRO pin after being overlapped by adder inside light sensor, the frequency when reading DVD disc is much higher than that when reading CD disc, output amplitude is about 1.4V.

3.2.2 Servo circuit

1. 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 end signal processing, digital servo processing, digital signal processing IC MT1389E and drive circuit D5954, in which MT1389E is also the main composed part of decode circuit. Servo circuit block diagram is shown as in the following figure 3.2.2.1:

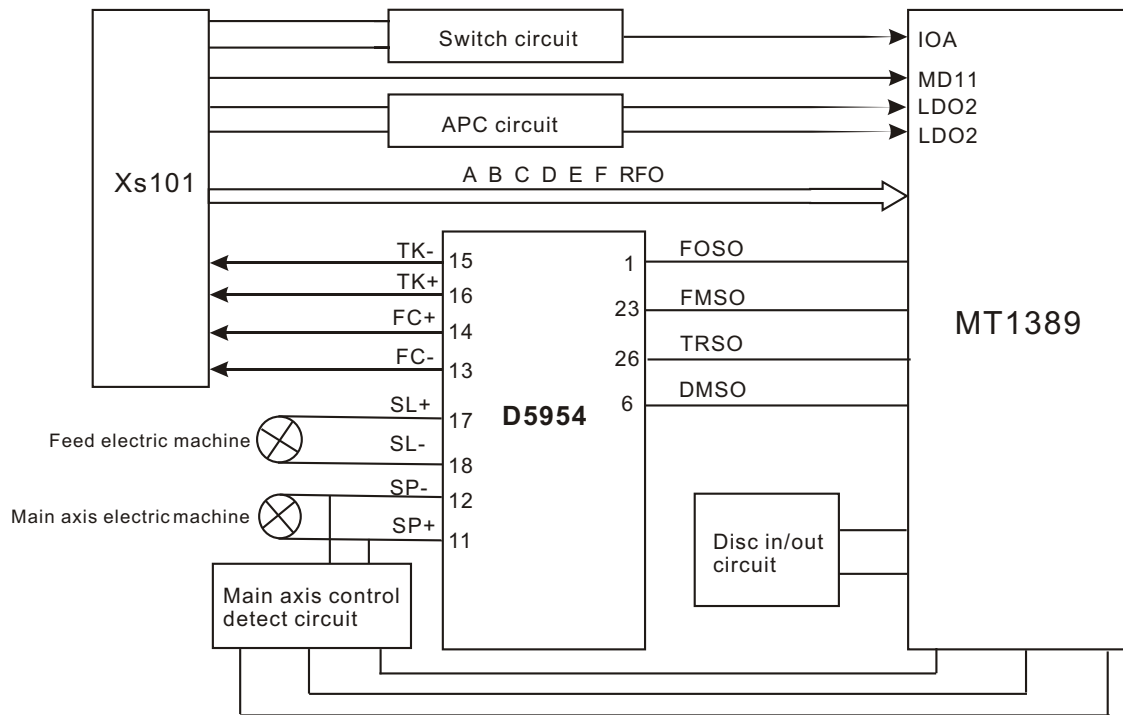


Figure 3.2.2.1 Servo circuit block diagram

2. Working principle

After power on, machine displays "OPEN". After loading disc, loader pick-up begins to reset. After pick-up goes to the proper position, detect switch will give a signal to MT1389, MT1389 begins to output focus, main axis and laser signals, disc begins rotating and pick-up begins to identify disc information and judge whether disk is CD disc or DVD disc according to disc information in order to output level from pin IOA and control disc switch circuit and pick-up PD IC to make the corresponding action, meanwhile Mt1389 adjusts laser output power through laser power control circuit.

After loader reads disc information, A, B, C, D, E and F signal are formed through photoelectric conversion to MT1389 (DVD only has A, B, C, D signals) and RF signal and output from pin 2~11, 18, 19 of MT1389 respectively, after amplifying processing of pre-amplifier inside MT1389, now signals are divided into 2 ways inside MT1389: one part, through summation amplifying and subtraction circuit inside MT1389, produces servo error signal, after digital servo signal circuit processing, forms corresponding servo control signals, outputs FOO, TRO, DMO and FMSO servo control signal from pin 42, 41, 37 and 38 of MT1389 respectively and then send to servo drive circuit for drive amplifying through the integration circuit composed by resistor and capacitor and bring 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 laser head 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 players have a disc in/out circuit to control disc tray door in/out acts to reach the purpose of making disc in and out. For PDVD, we adopt manual disc in/out means and we can judge whether disc in to proper position through detect switch.

3. Explanation to servo terms:(1) FOO: for disc make differences, and when rotating disc may probably move upwards or downwards slightly to make the focus of laser emitted by laser head cannot justly fall on data pit of disc, now focus point of objective lens is required to adjust to make focus aim at data pit exactly. The acts are mainly to make objective lens move upwards and downwards.

(2) TRO: data information is saved in disc in form of tracks. When disc is rotating, disc deviation will produce, now laser head is required to adjust. In this process, objective lens makes forward and backward movement with small moving range.

(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. And acts are obvious when power on and selecting track.

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

3.2.3 Laser power control circuit

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

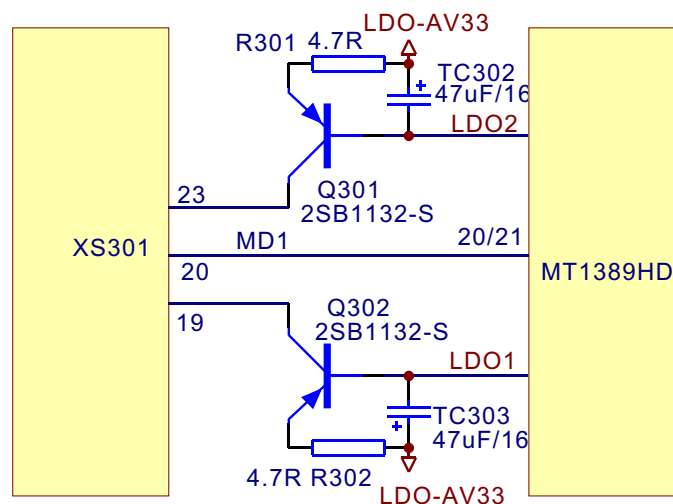


Figure 3.2.3.1 Laser power control circuit diagram

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:

Location number	Read DVD disc	Read VCD disc	Location number	Read DVD disc	Read VCD disc
V103_E	2.9V	3.2V	V104_B	3.2V	2.2V
V103_B	2.2V	3.2V	V104_E	3.2V	2.9V
V103_C	2.2V	0	MT1389_20	0.2V	0.2V
V104_C	0	2.2V			

3.2.4 CD/DVD conversion circuit

1. CD/DVD conversion circuit is shown as in the following figure 3.2.4.1:

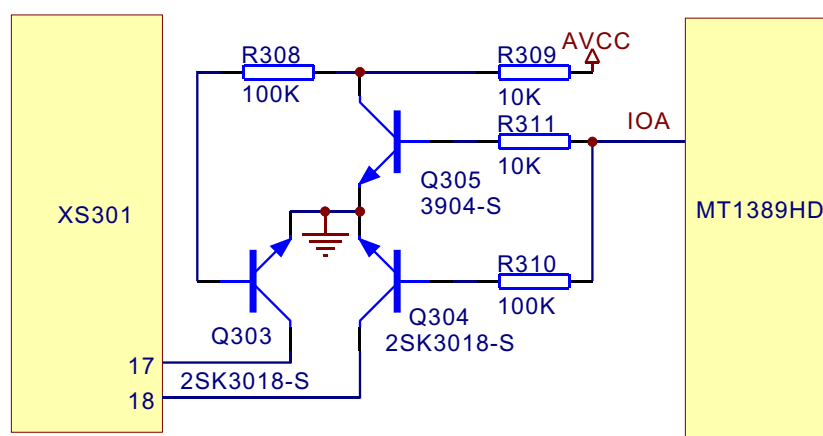


Figure 3.2.4.1 CD/DVD conversion circuit diagram

2. Working principle

After loading disc in the player, IOA port of MT1389 is defaulted high level to make Q305 saturation on and form loop together with CD laser power control circuit on CD. At the same time, IOA also goes to

Loader PD IC to switch, disc begins to rotate, when servo management system recognizes that the disc in player is not CD disc, IQA pin outputs low level to make Q305 cut off and make Q303 on, and form loop together with DVD laser power control circuit on loader to perform disc reading acts. After disc tray door opens, IOA keeps the state before opening disc tray door. If the player cannot recognize which disc it is, IQA pin will switch continuously until reading disc or system judges that there is no disc.

Note: Q303 and Q304 are MOS tube

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

State	Q305			Q303			Q304			IOA
	Base electrode B	Collector C	Emitter E	Grid electrode G	Drain electrode D	Source electrode S	G	D	S	
DVD disc	0	3.86	0	3.81	0.18	0	0	0	0	0
VCD disc	0.64	0.1	0	0	0	0	3.27	0.18	0	3.3

3.2.5 Slot-in circuit

LD1506S adopts dual slot-in and sealed-style all-steel with compact structure. There is a all-steel disc pressing system, in which disc is tightly pressed through 3 small steel plates, thus it is applicable to those discs with problem. It is really full-compatible with reading 12cm large disk and also 8cm small disk. The player adopts light induction style to read disk. As long as you place the disc on the door, the loader will absorb it in automatically.

1. Slot-in circuit is shown in the figure 3.2.5.1:

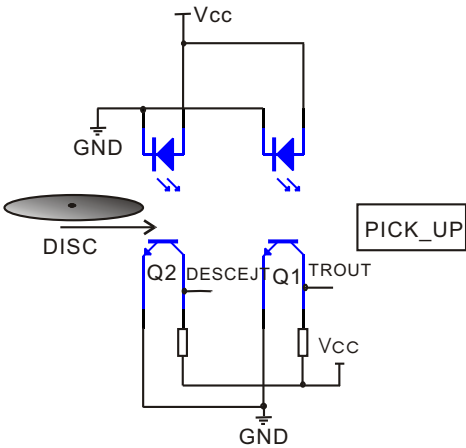


Figure 3.2.5.1 Slot-in circuit diagram

2. Working principle: there are two light emission fluorescent tubes on top of the opening of slot-in loader disk and there are two photoelectric tubes at bottom on two ends of disc opening. After loading a disk, the disk holds up the light emitted from light emission tube to make the corresponding photoelectric diode (Q2) of this light emission tube cannot receive lights. Detect signal DISCEJT on loader outputs

High level to decode board. When DISCEJT pin of Mt1389 detects that DISCEJT signal is high level, output disc tray in control signal. After disc tray enters to proper position, mechanical structure of loader touches disc tray in switch, TRIN becomes high level from low level, decode chip stops outputting disc tray in signals and machine begins to read disc. When disc tray is out, transmission structure conveys disc outwards. When disc passes through the detecting of the photoelectric tube (Q1) inside loader, after disc is out to the appointed position, TROUT becomes low level and disc tray out stops.

Note: in order to understand more simply, this schematic diagram has some difference from real circuit, so please note.

3.2.6 Disc in/out circuit

1. Disc in/out circuit is shown as the following figure 3.2.6.1:

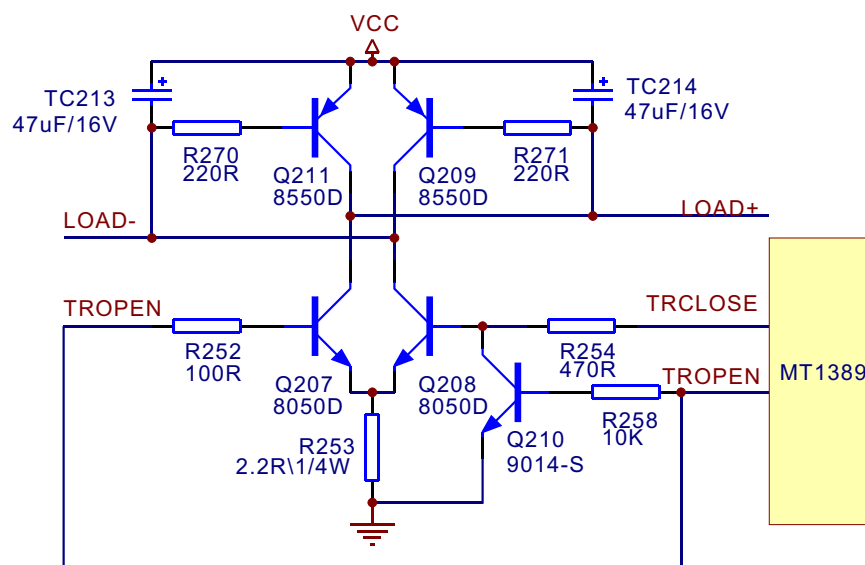


Figure 3.2.6.1 Disc in/out circuit diagram

2. Working principle: INDISC, OUTDISI are disc in/out control signals and are connected to pin 39, 54 of U201 (MT1389) respectively. LOAD+, LOAD- connect with two ends of electric machine to control. When users are performing disc out operation, servo control chip U201 (MT1389) sends out control signal through pin 39, 54 and changes level of LOAD+, LOAD- to change the rotation direction of electric machine to realize disc in/out function. The working process of disc in/out circuit is shown as follows:

OUT disc : VCC?Q211CE electrode on?LOAD+ ?Electric machine?LOAD- ?Q208CE electrode on?R253?Ground

When not opening disc tray, pin 39 and 54 of U201 (MT1389) are low level. When opening disc tray, pin39 of U201 (MT1389) sends a high level; Q208 is on; Q208 collector electrode changes into low level; LOAD- changes into low level; Q211 base electrode changes into low level; Q211 is on. Q211 collector electrode changes into high level and LOAD+ changes into high level.

IN disc: VCC?Q209CE electrode on?LOAD- ?Electric machine?LOAD+ ?Q207CE electrode on?R253?Ground

When closing disc tray, pin 54 of U201 (MT1389) sends a high level; Q207 is on; collector electrode changes into low level; LOAD+ is low level; base electrode through R230 and Q209 is low level; Q209 is on; Q209 collector electrode changes into high level; LOAD- changes into high level.

The function of Q210 is interlock IN DISC and OUT DISC signal to ensure the two are not high level at the same time. When the two are high level input, base electrode of Q208 is made to low level through Q210 on to ensure the normal working of disc in/out circuit. The function of electrolytic capacitor TC213 and TC307 is to avoid the sudden change of the voltage on two ends of disc in/out electric machine to make disc in/out acts smooth.

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

State	Q211			Q209		
	Base electrode B	Collector C	Emittor E	Base electrode B	Collector C	Emittor E
Read disc	5.06	5	5.06	5.01	5.03	5.06
Open disc tray to proper position	4.79	4.77	5.06	4.77	4.79	5.06
Open disc tray	4.74→5.05→4.74	4.76→0.2→4.76	5.06	4.76→4.33→4.76	4.76→5.02→4.76	5.06
Close disc tray	4.74→4.33→4.74	4.76→5.05→4.76	5.06	4.76→5.03→4.76	4.79→0.2→4.79	5.06
State	Q207			Q208		
	Base electrode B	Collector C	Emittor E	Base electrode B	Collector C	Emittor E
Read disc	0	5	0	0	5.03	0
Open disc tray to proper position	0	4.77	0	0	4.79	0
Open disc tray	0→0.93→0	4.76→0.2→4.76	0	0	4.79→5.02→4.79	0
Close disc tray	0	4.76→5.05→4.76	0	0→0.93→0	4.79→0.2→4.79	0
State	Q210			OUT	IN	
	Base electrode B	Collector C	Emittor E			
Read disc	0	0	0	0	0	
Open disc tray to proper position	0	0	0	0	0	
Open disc tray	0→0.63→0	0	0	0→3.12→0	0	
Close disc tray	0	0→0.93→0	0	0	0→3.12→0	

3.2.7 Main axis control circuit

1. Main axis control circuit is shown as in the following figure 3.2.7.1:

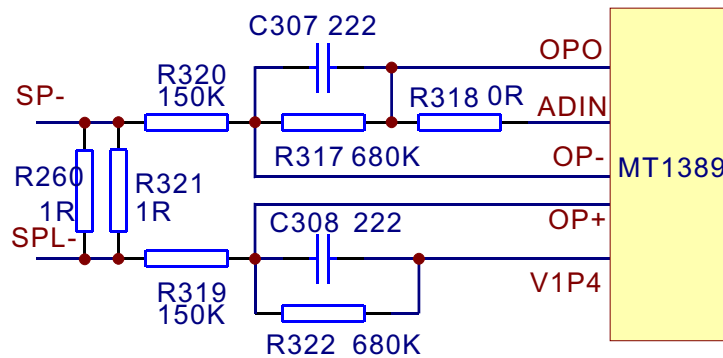


Figure 3.2.7.1 Main axis control circuit diagram

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	Normal working voltage (V)	Volateg change when disc out (V)
SP+	Pin 11 of D5954, pin 5 of XS203	3.79	3.79→0.70→1.80
SP-	Pin 12 of D5954, pin 6 of XS203	1.38	1.38→3.40→1.80

OP+	Pin 36 of MT1389	1.38	1.38→3.10→1.80
OP-	Pin 35 of MT1389	1.53	1.53→3.08→1.98
OPO	Pin 34 of MT1389	2.44	2.44→0.40→2.50
ADIN	Pin 50 of MT1389	2.44	2.41→0.41→2.44
DMSO	Pin 5 of D5954	1.42	1.42
VIP4	Pin 30 of MT1389	1.41	1.41

3.2.8 Decode circuit

1. Decode circuit block diagram is shown as in the following figure 3.2.8.1:

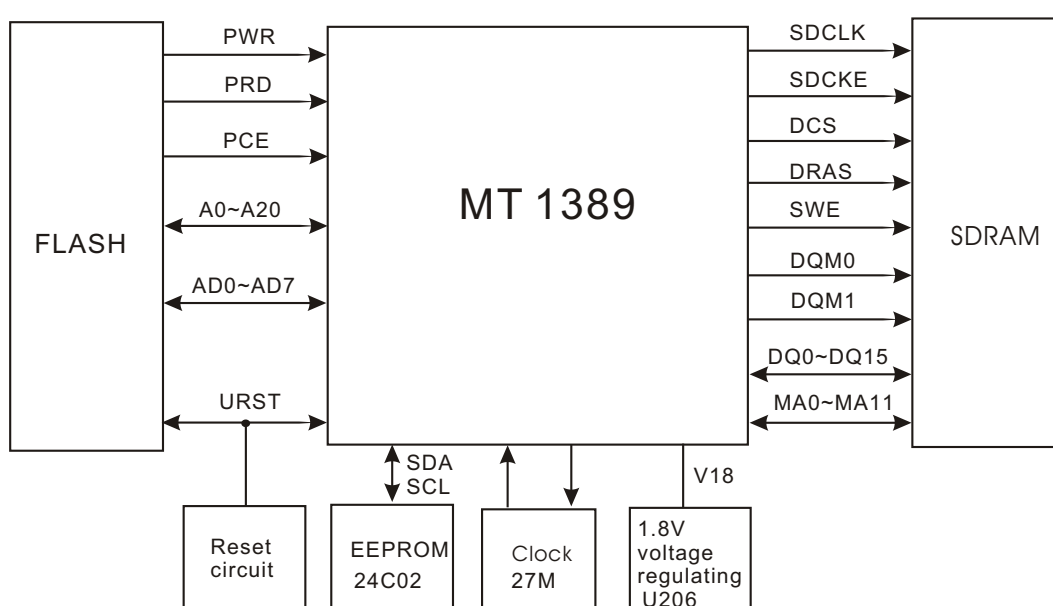


Figure 3.2.8.1 Decode circuit block diagram

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.

3.2.9 Reset circuit

1. Reset circuit is shown as in the following figure 3.2.9.1:

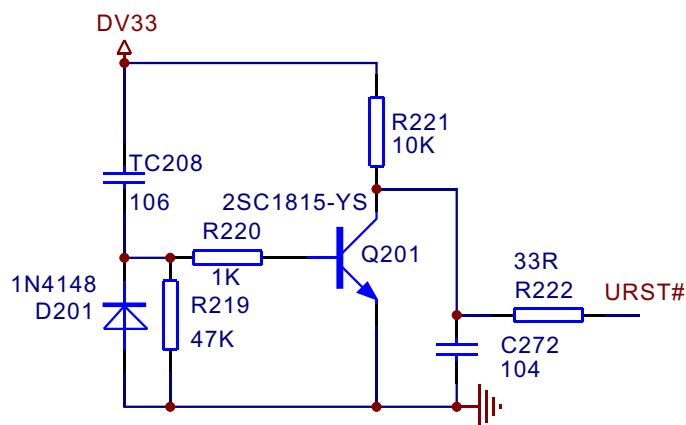


Figure 3.2.9.1 Reset circuit diagram

2. Working principle: after power on, voltage of DV33 increases to 3.3V, main chip power supply is normal. Now, voltage of TC208 to DV33 cannot change suddenly to make base electrode of Q201 has current flow in, Q201 is saturation on, URST is low level. DV33 charges TC208 in two paths through emitter junction of R219 and Q201 make negative pole voltage of TC208 decrease slowly. When this voltage decreases below 0.7V, Q201 cuts off, URST changes into high level, the process for URST from low to high is called effective reset signal of low level by us. After power off, voltage of DV33 decreases, TC208 decreases together with DV33 voltage, D201 performs surge discharge and clamping to TC208.

3. Key point voltage (unit: V)

Q201_B is low level when in normal condition, at the moment of power on, it decreased to 0V from 3.3V gradually.

Q201_C is high level when in normal condition, at the moment of power on, it increases to 3.3V from 0V.

3.2.10 Audio circuit

1. Audio signal process block diagram is shown in the figure 3.2.10.1:

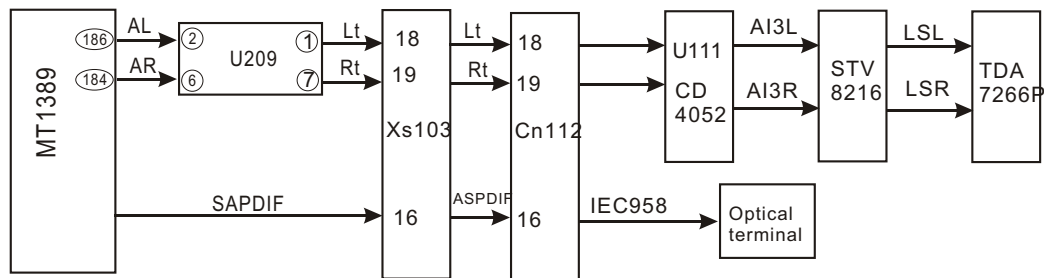


Figure 3.2.10.1 Audio signal flow chart block diagram

2. Working principle: MT1389E has built-in audio DAC conversion circuit, analog audio signals output from decode chip directly, through audio amplifying and filtering circuit, directly output audio signals to video main board to perform sound source switch through audio switch circuit on video board and then send to power board for audio amplifying output.

3.2.11 Video circuit

1. Video signal flow chart diagram is shown as in the following figure 3.2.11.1 :

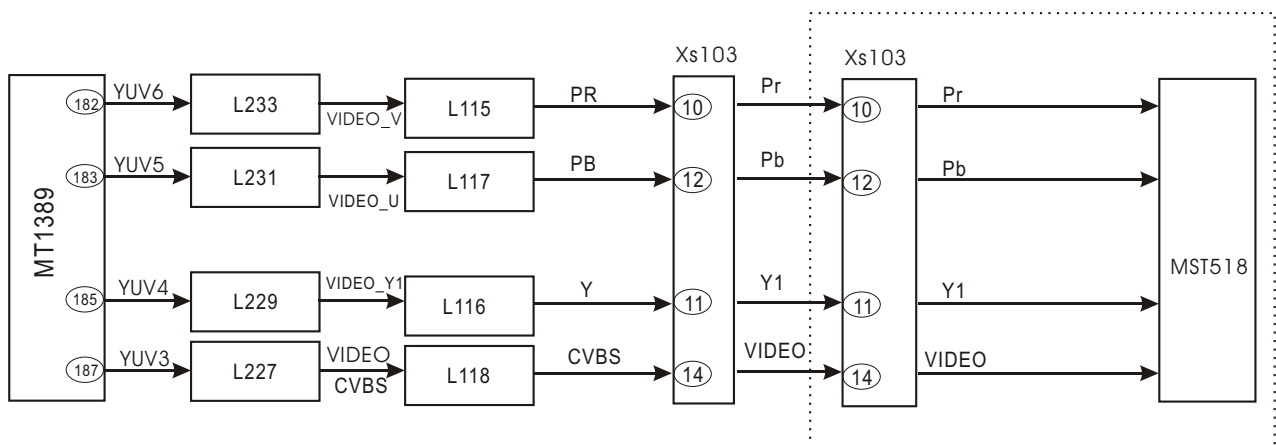


Figure 3.2.11.1 Video signal flow chart

2. Working principle: MT1389HD has built-in video D/A conversion circuit, video output has Y/Pb/Pr Y/Cb/Cr CVBS Y/C output mode, this player adopts component video output mode to video board of TV

Part. Other vide output mode is not used.

Shown as in the figure 3.2.11.2, capacitor C295, C290 and inductor L229 compose a low-pass filter to filter high frequency disturbance signal except useful signal; TC121 is a blocking capacitor and R249 is load resistor.

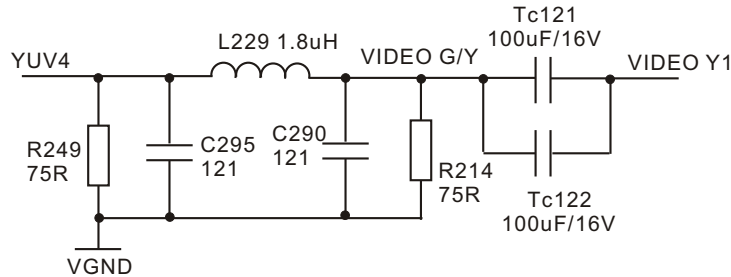


Figure 3.2.11.2 Video output circuit

3.2.12 Mute circuit

1. The circuit schematic diagram is shown as the following figure 3.2.12.1:

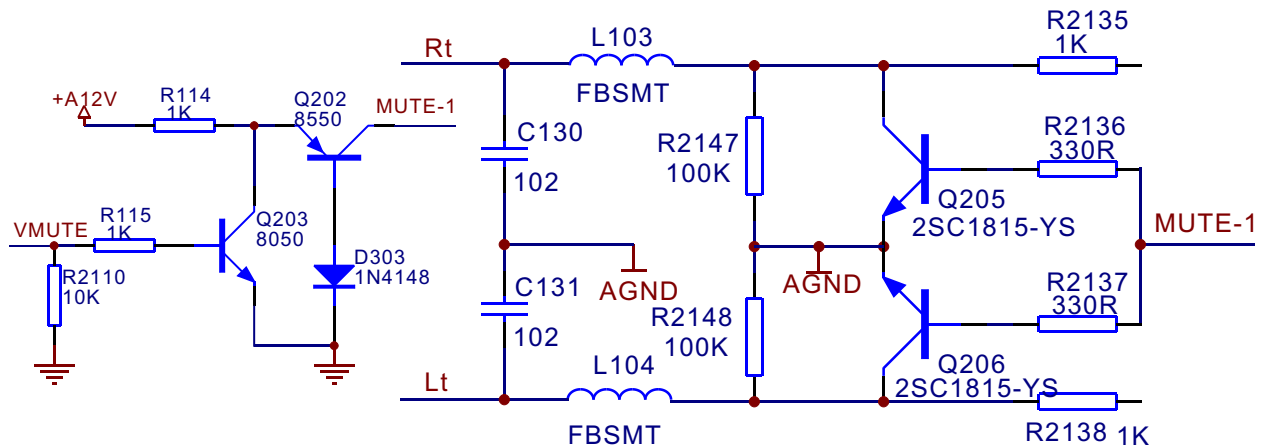


Figure 3.2.12.1 Mute circuit

2. Working principle:

Power-on mute working principle: after machine power on, power supply starts. +A12V makes Q205, Q206 saturated on through R114, Q202 C-E electrode and audio signals are short-circuited to ground to realize power-on mute function. After machine reads out disc, VMUTE pin outputs high level, Q203 is saturated to make E electrode voltage of Q202 become low level, Q202 and Q206 cut off, sound outputs normally, mute is off and machine enters normal working state.

Section Three Servicing Cases

3.3.1 Servicing cases

[Example 1] Symptom: DVD has no sound output

Description: disc reading is normal, picture output is normal, DVD playing has no sound output and other external input is normal.

Analysis and troubleshooting: according to trouble symptom, trouble lies in DVD board and audio jack part. Firstly check pin 18/19 audio waveform of audio main board Cn112 and we can judge that trouble lies in DVD board. Check DVD board Xs103 pin 18/19 and find that there is no audio signal waveform. Test TC240/TC241 audio waveform and it is normal, so we judge that trouble lies in U209 and peripheral elements. Firstly check power supply of U209 and find that there is no +12V power supply. According to the line, test pin 2 of Xs101 and there is still no +12V power supply. Check subsidiary power amplifier board J3 pin 5 and find +12V power is normal, so we doubt that the flat cable from power amplifier board to video main board is abnormal. After changing flat cable, trouble is removed.

[Example 2] Symptom: disc tray ejects out automatically

Description: power on , load disc and disc tray ejects out automatically.

Analysis and troubleshooting: connect with vide terminal, power on, load disc, disc tray is in and TV screen displays "Loading" and "Eject" displays after 9 seconds, disc tray ejects out. Use DVD, CD, VCD disc to test and this phenomenon exists, so we doubt that pick-up has trouble because of aging. After changing loader, trouble is removed. (Disc will eject out automatically when slot-in loader does not read sic)

[Example 3] Symptom: not read DVD

Description: CD disc reading is normal, disc tray ejects out automatically after loading DVD disc.

Analysis and troubleshooting: use multimeter to check Q302 emitter electrode voltage and it is 3.3V, which is normal and collector electrode voltage is 2.2V, which is normal; check inductor L312 between collector electrode and pin 23 of XS301 and find that inductor has open circuit. After changing inductor, trouble is removed.

[Example 4] Symptom: not read USB

Description: switch in USB state, do not read USB but other functions are normal.

Analysis and troubleshooting: use multimeter to test USB terminal and find that grounding and +5V voltage are both normal. Use multimeter to test the line from USB card board to DVD board and it is normal, so we doubt 1389HD has trouble. After changing 1389HD, trouble is removed.

[Example 5] Symptom: DVD has no output

Description: DVD has no output but other functions are normal

Analysis and troubleshooting: check power amplifier board input voltage and it is normal. Check decode board reset circuit and it is normal. Check 27M clock circuit and it is normal. Check U206 output voltage and there is only 1.4V and core voltage is abnormal (1.9V when in normal cases). After changing U206, voltage is normal and trouble is removed.

[Example 6] Symptom: DVD has no picture

Description: DVD disc reading is normal, but there is no picture output. When switching in TV state, picture output is normal.

Analysis and troubleshooting: according to trouble symptom, trouble should lie in DVD part. Test component video signal on DVD board XS103 and find that brightness signal in the 3 channels signals has no output, shown in the figure 3.3.1.1. Test L229 and find there is no signal output on inductor. Test resistance to ground of this circuit and it is close to zero, so we doubt C295 has electricity leakage. After changing it, trouble is removed.

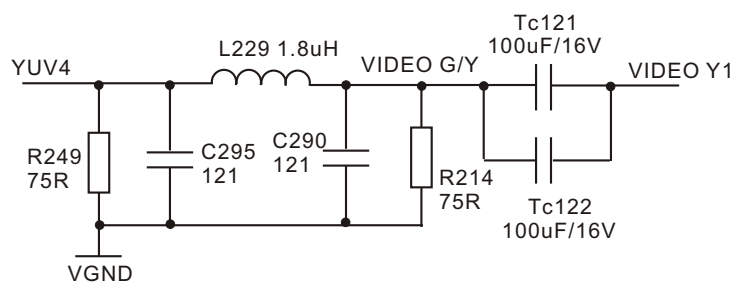
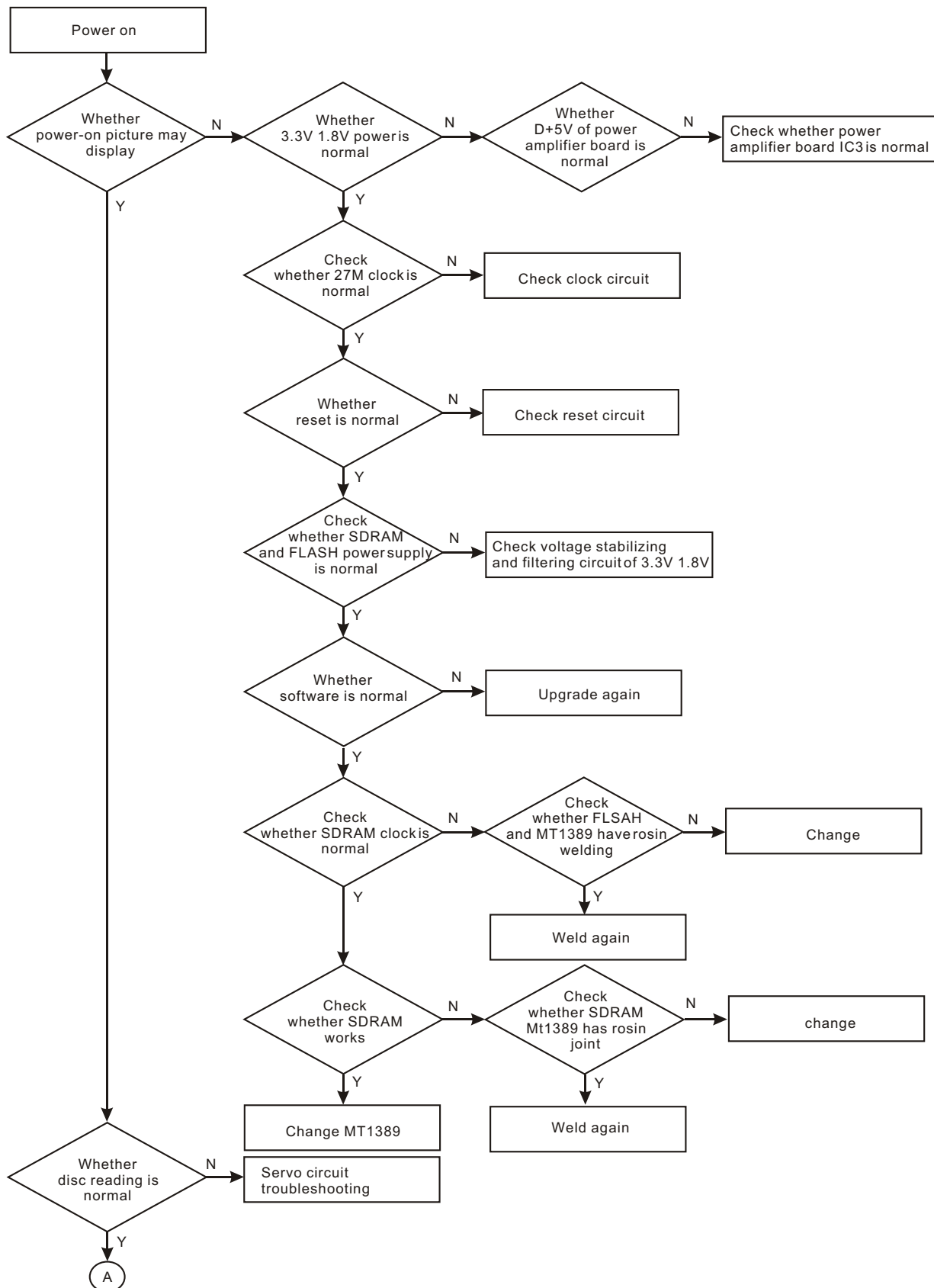


Figure 3.3.1.1 Video output circuit

3.3.2 Troubleshooting flow chart

1. Troubleshooting process for the player is shown in the figure 3.3.2.1:



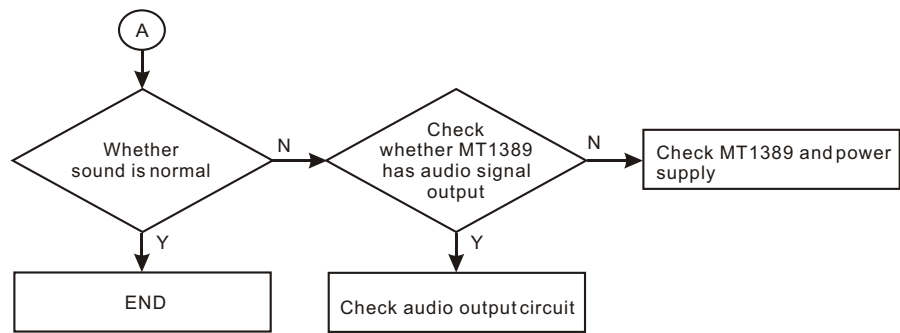
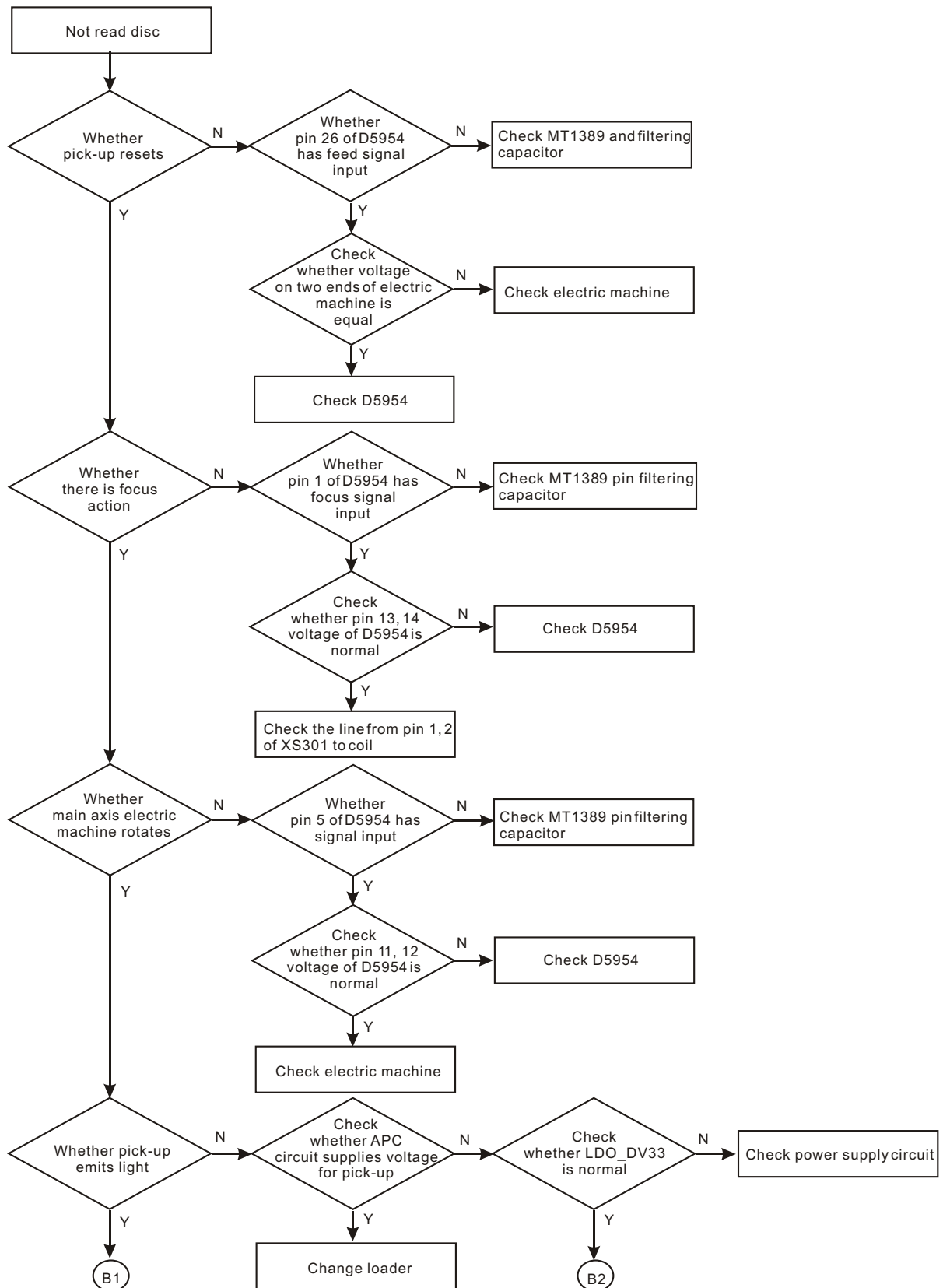


Figure 3.3.2.1 Troubleshooting flow chart for the player

2. Troubleshooting process for “Not read disc” is shown in the figure 3.3.2.2:



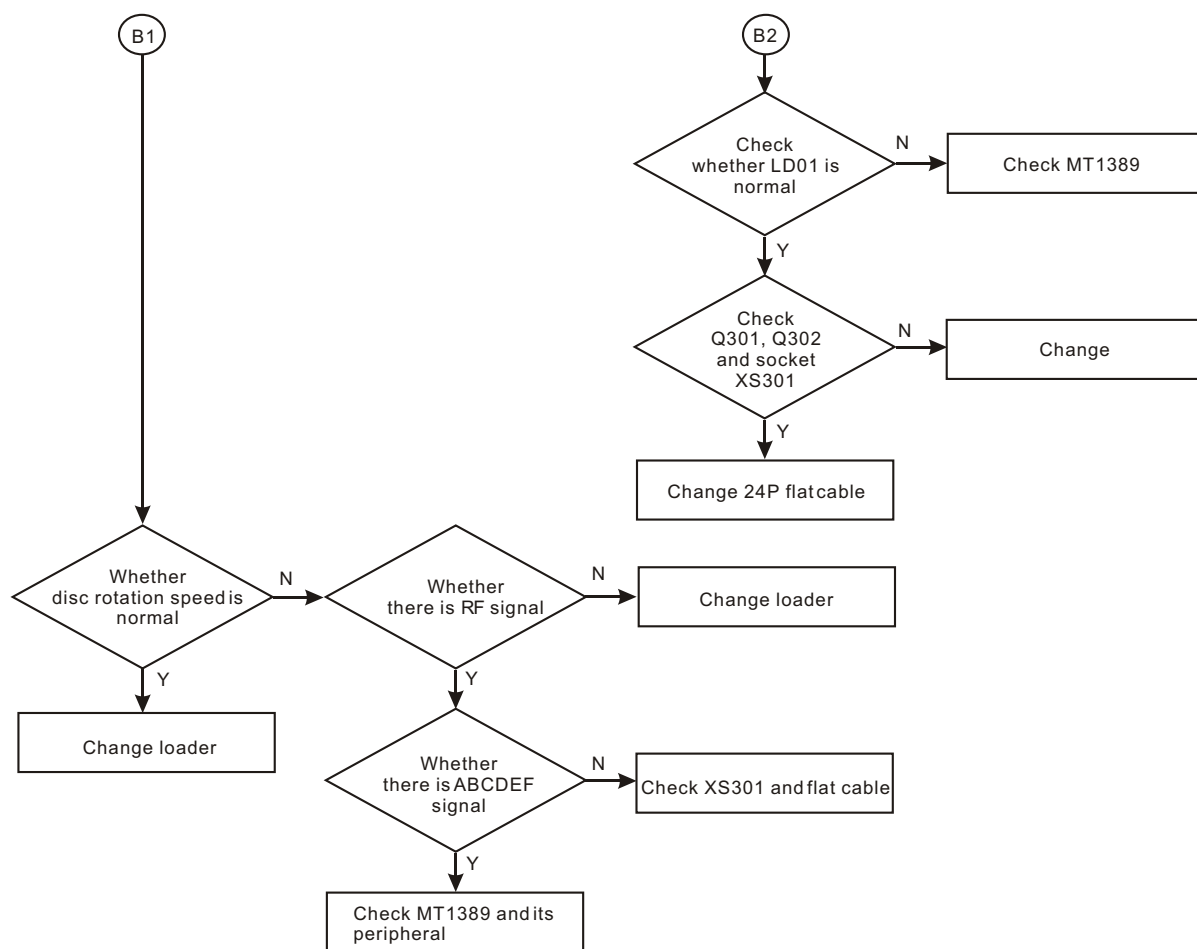


Figure 3.3.2.2 “Troubleshooting flow chart for “Not read disc”

3. Troubleshooting process for “DVD has no video output” is shown in the figure 3.3.2.3:

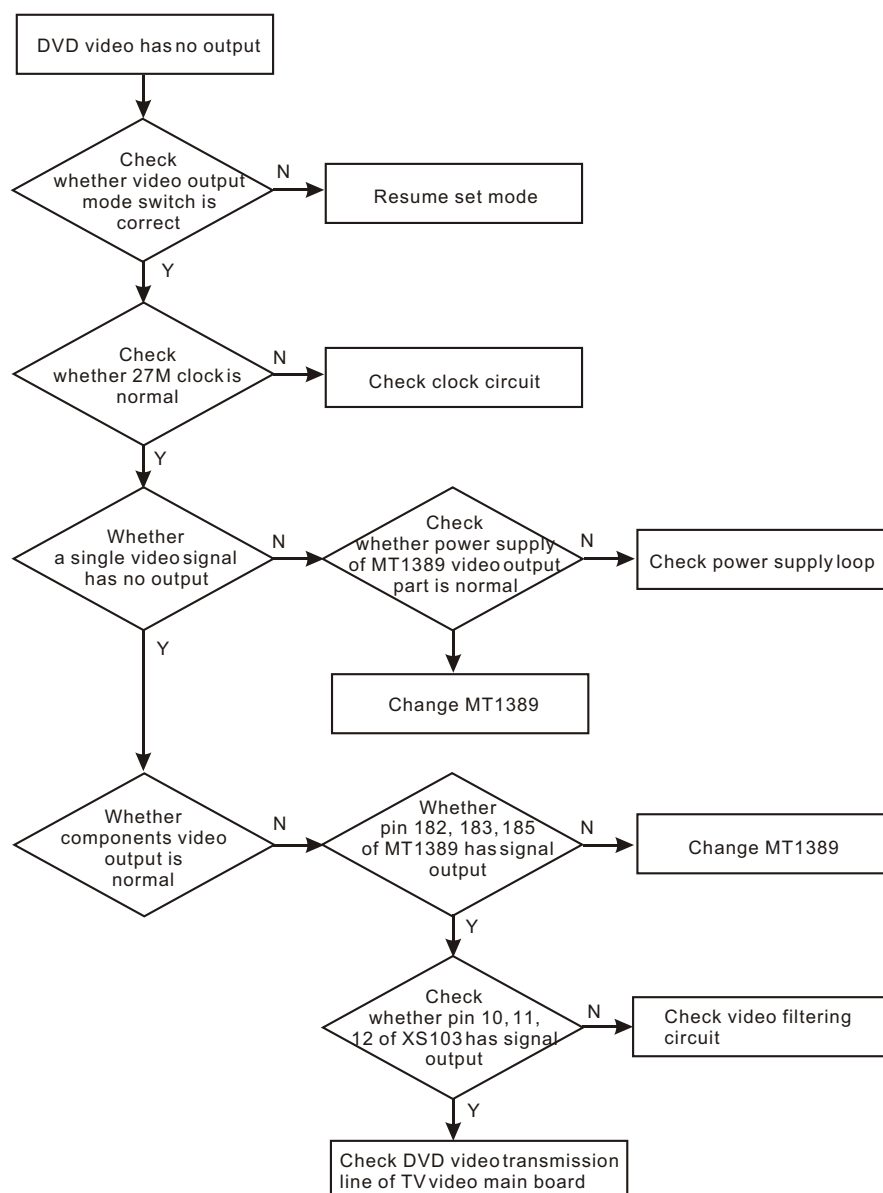


Figure 3.3.2.3 Troubleshooting flow chart for “DVD has no video output”

4. Troubleshooting process for “DVD has no sound output” is shown in the figure 3.3.2.4:

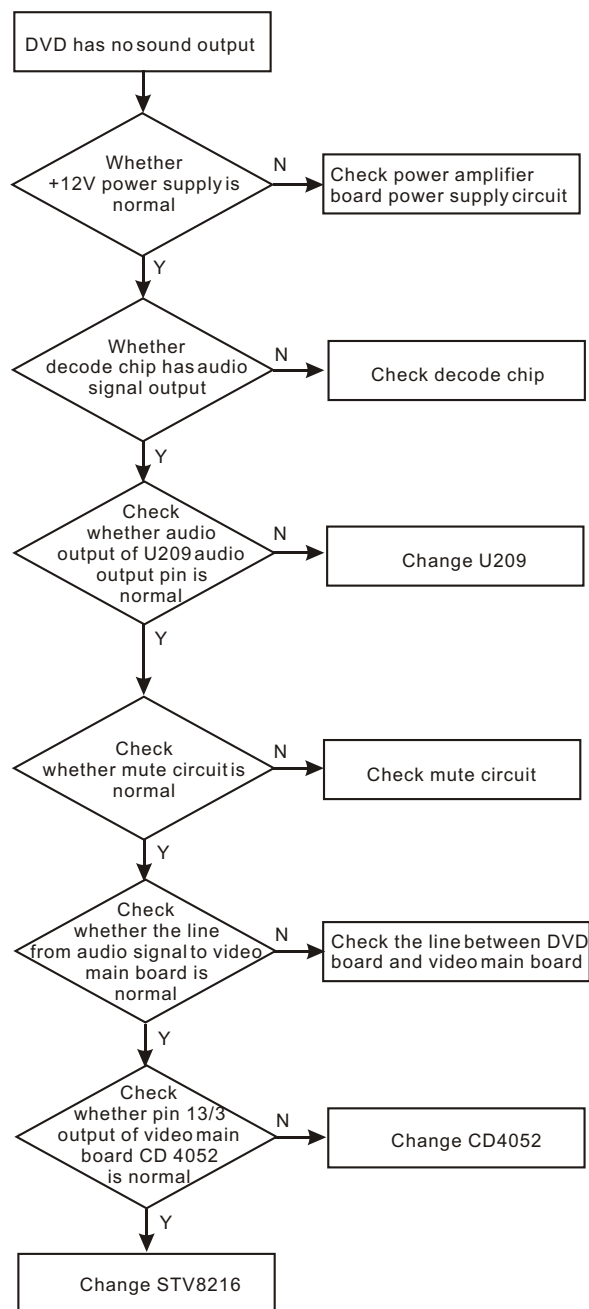


Figure 3.3.2.4 Troubleshooting flow chart for “DVD has no sound output”

5. Troubleshooting process for “DVD left channel has no sound” is shown in the figure 3.3.2.5:

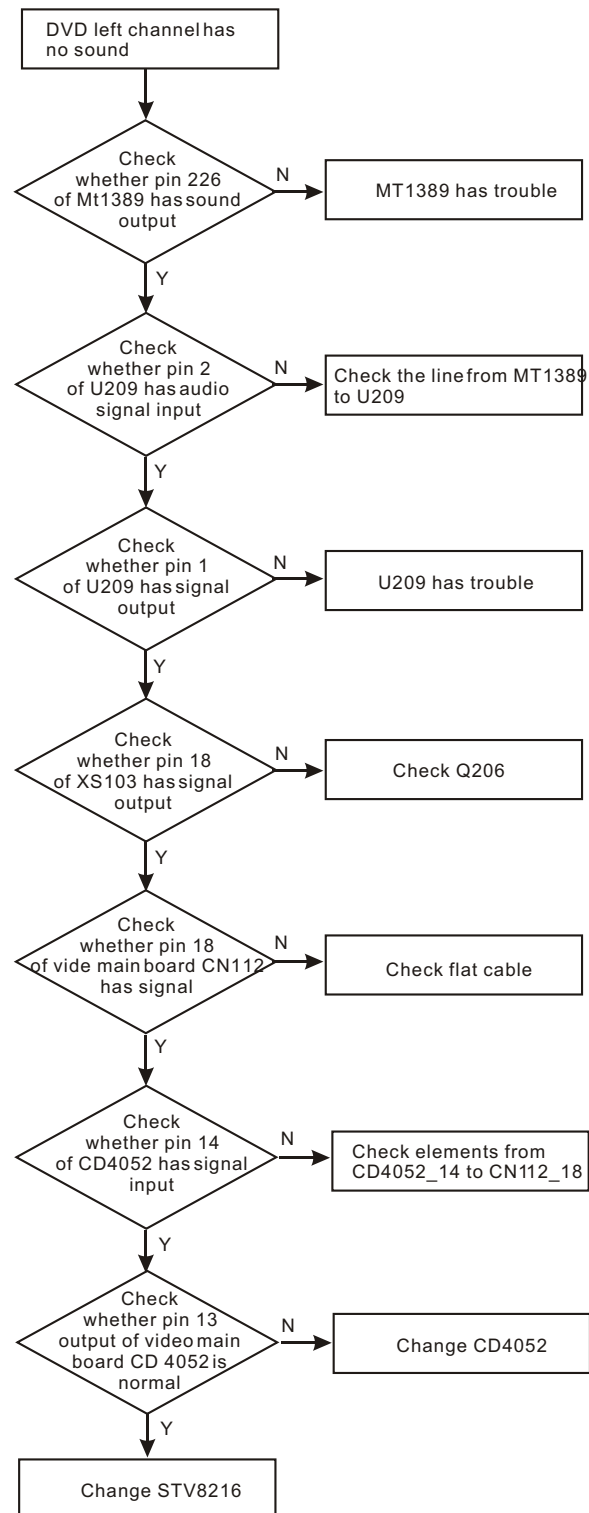
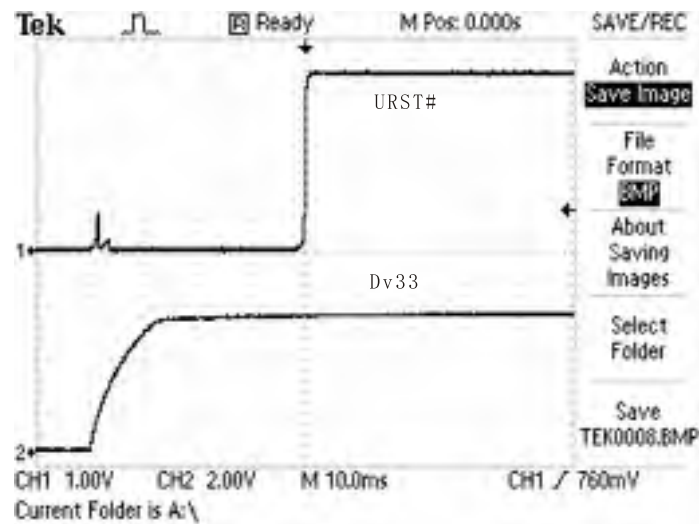


Figure 3.3.2.5 Troubleshooting flow chart for “DVD left channel has no sound”

Section Four Waveform diagram

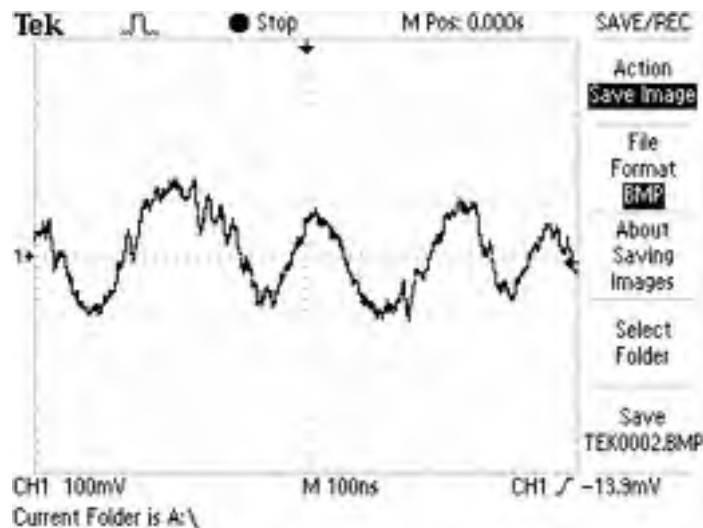
This section collects signal waveform diagram of audio, video and each unit circuit with the purpose to help servicing personnel to judge where trouble lies in accurately and quickly to improve servicing skills. For the difference of oscillograph's type, model and tuner, a certain difference may exist,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

1. Reset signal waveform diagram

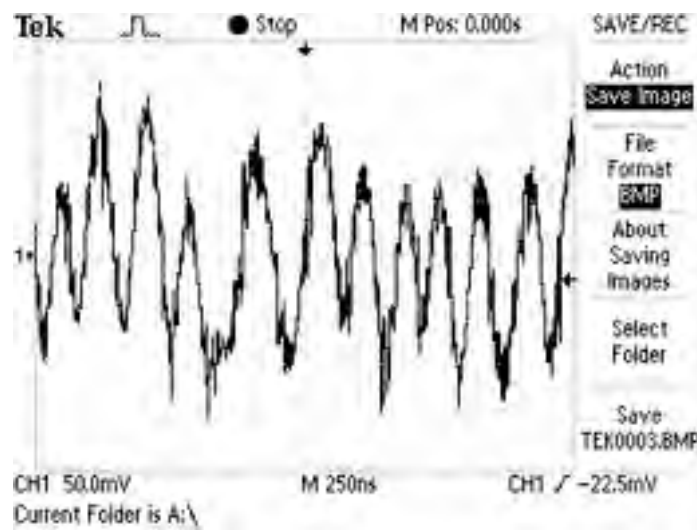


2. Decode board

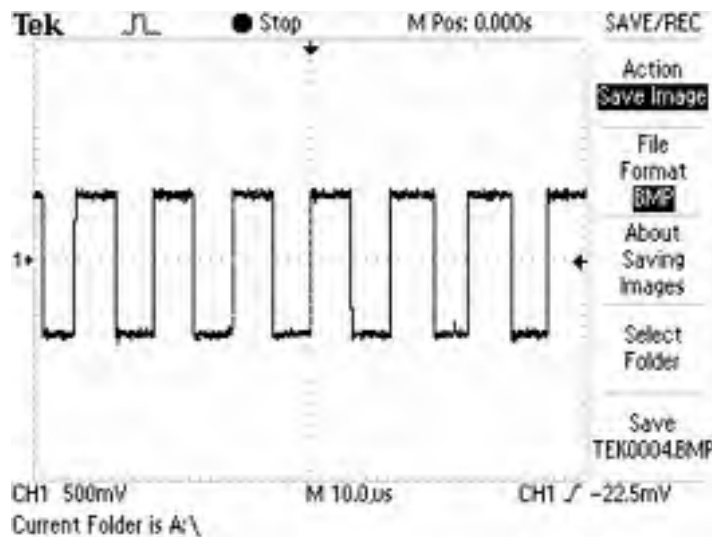
(1) RFO signal waveform diagram of pin 8 of XS301



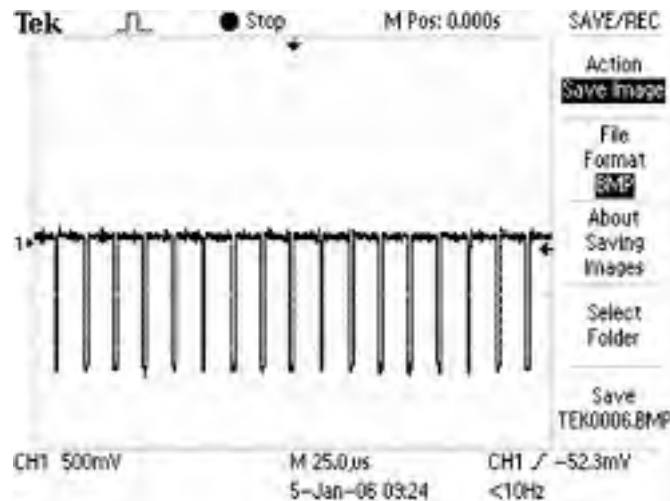
(2) A signal waveform diagram of pin 9 of Xs301(B、C、D、E、F)



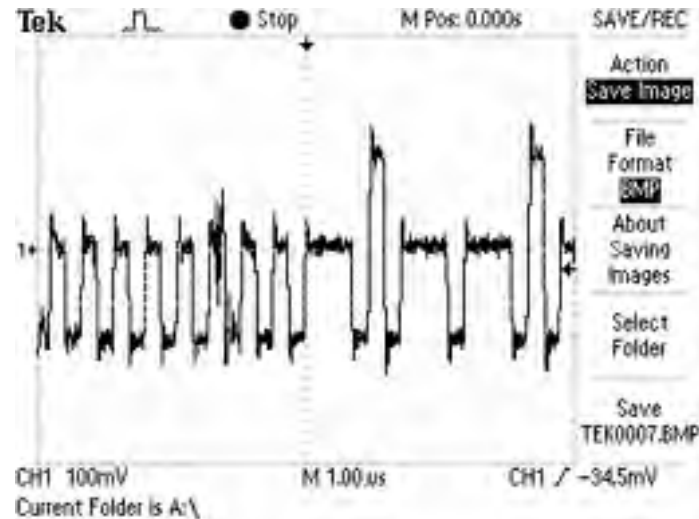
(3) DMO signal (when there is main axis rotation) waveform diagram of pin 37 of U201 (MT1389)



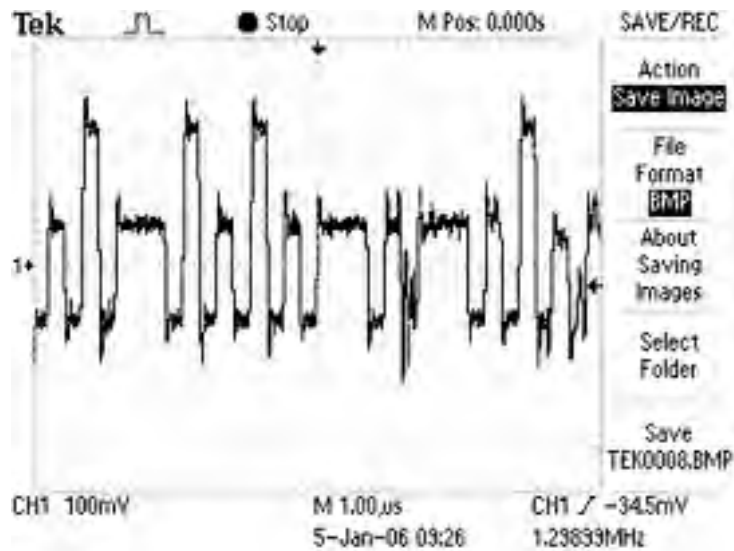
(4) FMO signal (when there is feed) waveform diagram of pin 38 of U201 (MT1389)



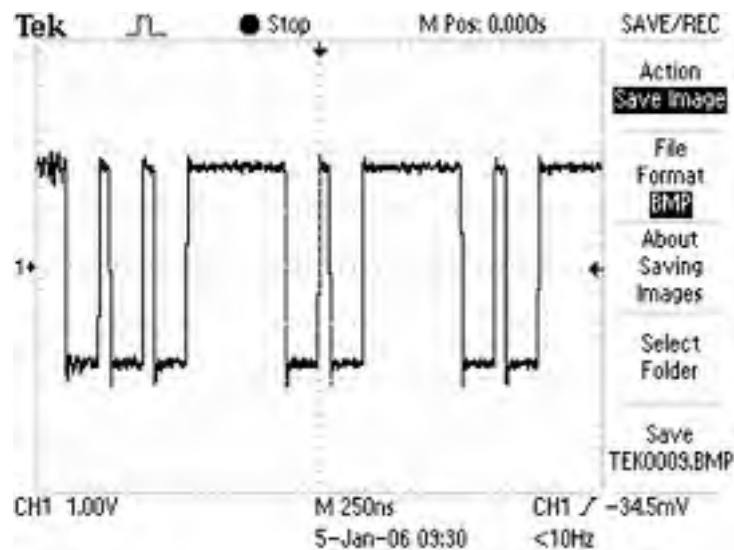
(5) TRO signal (when there is trace) waveform diagram of pin 41 of U201 (MT1389)



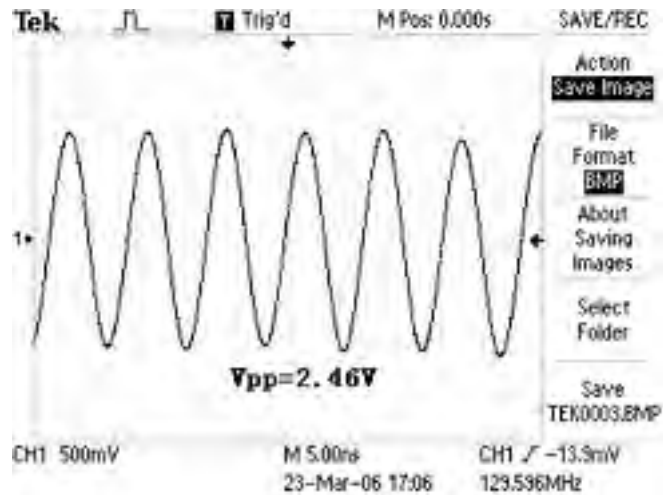
(6) FOO signal (when there is focus) waveform diagram of pin 42 of U201 (MT1389)



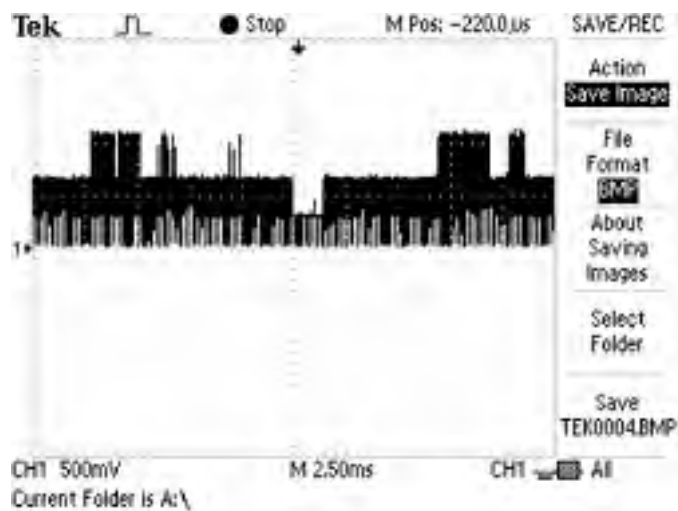
(7) Waveform diagram of pin 29 (when no disc in) of U214 (FLASH)



(8) Waveform diagram of pin 38 of U211 (SDRAM)

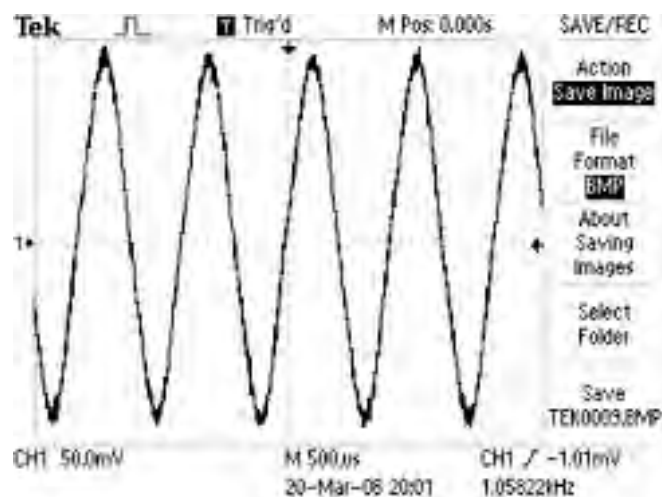


3. Video signal waveform diagram of L229

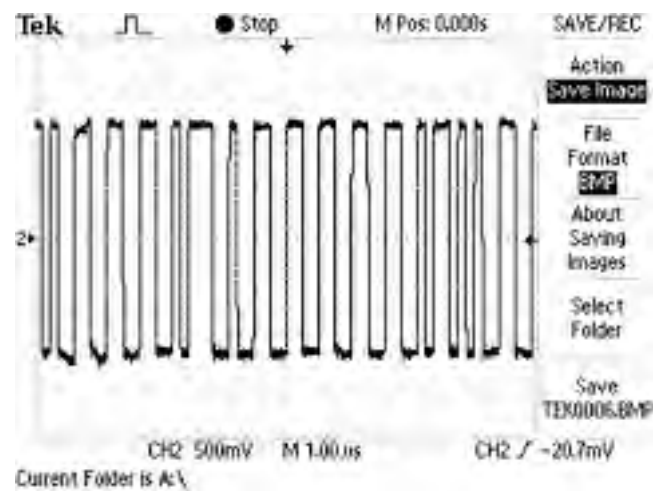


4. Waveform diagram for audio signal

(1) 1KHZ analog audio output waveform diagram. (You are recommended to use test disk, if not, the tested waveform will change at any time to affect your judgment)

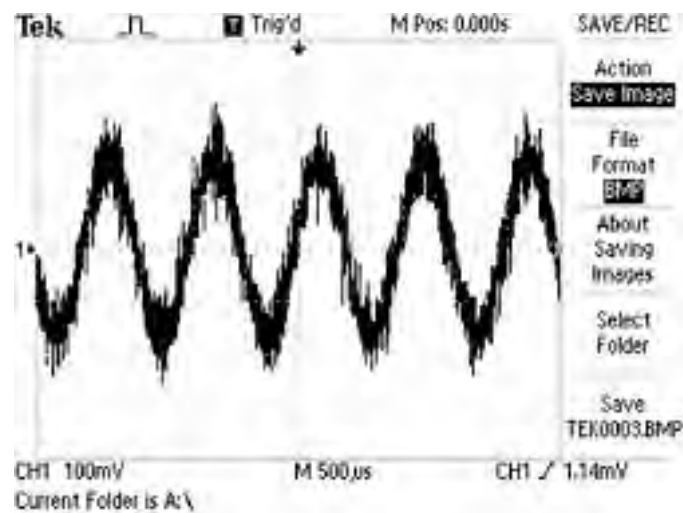


(2) SPDIF: waveform diagram for optical/coaxial digital audio signal

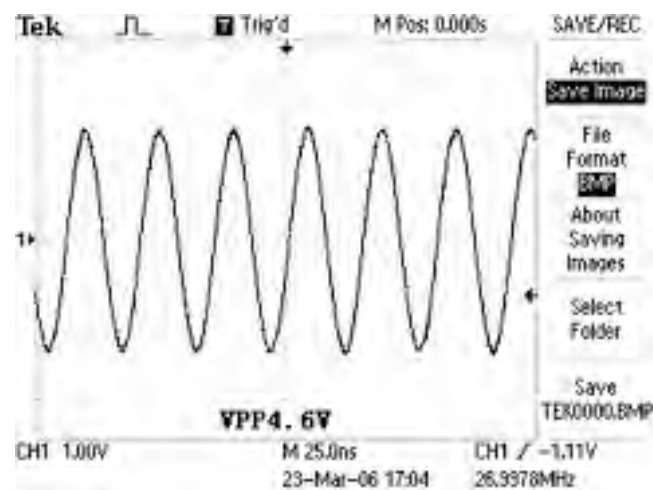


5. Waveform diagram of the audio signals which have not been amplified and filtered (audio signal input amplifying end Tc241)

4



6. 27M clock signal waveform diagram



Section Five Function Introduction to IC

3.5.1 function introduction to MT1389HD

1. Description

MT1389HD 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 MT1389HD 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. 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

(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 (HDCD)

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-AWSS

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

3. Pin Definitions

PIN	Main	Alt	Type	Description
RF interface (26)				
231	RFGND18		Ground	Analog ground
132	RFVDD 18		Power	Analog power 1.8V
252	OSP		Analog output	RF Offset cancellation capacitor connecting
253	OSN		Analog output	RF Offset cancellation capacitor connecting
254	RFGC		Analog output	RF AGC loop capacitor connecting for DVD-ROM
255	IREF		Analog input	Current reference input. It generates reference current for RF path. Connect an external 15K resistor to this pin and AVSS
256	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
ADC Power (2)				
244	ADCVDD3		Power	Analog 3.3V Power for ADC
245	ADCVSS		Ground	Analog ground for ADC
VPLL (3)				
43	VPLLVSS		Ground	Analog ground for VPLL
44	CAPPAD		Analog Inout	VPLL External Capacitance connection
45	VPLLVDD3		Power	Analog 3.3V Power for VPLL
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 monitor output (6)				
246	RFVDD3		Analog output	Analog Power
247	RFRPDC		Analog Input	RF ripple detect output
248	RFRPAC		Analog output	RF ripple detect input(through AC-coupling)
249	HRFZC		Analog output	High frequency RF ripple zero crossing
250	CRTPLP		Analog output	Defect level filter capacitor connecting
251	RFGND		Ground	Analog Power
RF Data PLL Interface (9)				
235	JITFO		Analog output	Output terminal of RF jitter meter
236	JITFN		Analog Input	Input terminal of RF jitter meter
237	PLLVS		Ground	Ground pin for data PLL and related analog circuitry
238	IDACEXLP		Analog output	Data PLL DAC Low-pass filter
239	PLLVD3		Power	Power pin for data PLL and related analog circuitry
240	LPFON		Analog Output	Negative output of loop filter amplifier
241	LPFIP		Analog input	Positive input terminal of loop filter amplifier
242	LPFIN		Analog input	Negative input terminal of loop filter amplifier
243	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	1) 1st General PWM output 2) 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

50	FG (Digital pin)	ADIN1 GPIO	LVTTL3.3 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 (18)				
55 93 142 160 174 213	DVDD18		Power	1.8V power pin for internal digital circuitry
81 178	DVSS		Ground	1.8V ground pin for internal digital circuitry
65 96 118 131 145 156 170 208	DVDD3		Power	3.3V power pin for internal digital circuitry
90 148	DVSS		Ground	3.3V ground pin for internal digital circuitry
Micro Controller and Flash Interface (48)				
62	HIGHA0		InOut 4~16mA,SRPU	Microcontroller address 8
74	HIGHA1		InOut 4~16mA,SRPU	Microcontroller address 9
73	HIGHA2		InOut 4~16mA,SRPU	Microcontroller address 10
72	HIGHA3		InOut 4~16mA,SRPU	Microcontroller address 11
71	HIGHA4		InOut 4~16mA,SRPU	Microcontroller address 12
70	HIGHA5		InOut 4~16mA,SRPU	Microcontroller address 13
69	HIGHA6		InOut 4~16mA,SRPU	Microcontroller address 14
68	HIGHA7		InOut 4~16mA,SRPU	Microcontroller address 15
89	AD7		InOut 4~16mA,SRPU	Microcontroller address/data 7
86	AD6		InOut 4~16mA,SRPU	Microcontroller address/data 6
85	AD5		InOut 4~16mA,SRPU	Microcontroller address/data 5

84	AD4		InOut 4~16mA,SRPU	Microcontroller address/data 4
83	AD3		InOut 4~16mA,SRPU	Microcontroller address/data 3
82	AD2		InOut 4~16mA,SRPU	Microcontroller address/data 2
80	AD1		InOut 4~16mA,SRPU	Microcontroller address/data 1
79	AD0		InOut 4~16mA,SRPU	Microcontroller address/data 0
92	IOA 0		InOut 4~16mA,SRPU	Microcontroller address
77	IOA 1		InOut 4~16mA,SRPU	Microcontroller address 1/ IO
56	IOA 2		InOut 4~16mA,SRPU	Microcontroller address 2/ IO
57	IOA 3		InOut 4~16mA,SRPU	Microcontroller address 3/ IO
58	IOA 4		InOut 4~16mA,SRPU	Microcontroller address 4/ IO
59	IOA 5		InOut 4~16mA,SRPU	Microcontroller address 5/ IO
60	IOA 6		InOut 4~16mA,SRPU	Microcontroller address 6/ IO
61	IOA 7		InOut 4~16mA,SRPU	Microcontroller address 7/ IO
67	A16		InOut 4~16mA,SRPU	Flash address 16
91	A17		InOut 4~16mA,SRPU	Flash address 17
63	A18		InOut 4~16mA, SRPD,SMT	Flash address 18 /IO
64	A19		InOut 4~16mA, SRPD,SMT	Flash address 19 /IO
75	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
87	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
88	ALE		InOut 4~16mA, SRPD,SMT	Microcontroller address latch enable
78	IOOE#		InOut 4~16mA, SRPD,SMT	Flash output enable, active low / IO
66	IOWR#		InOut 4~16mA, SRPD,SMT	Flash write enable, active low / IO
76	IOCS#		InOut 4~16mA, SRPD,SMT	Flash chip select, active low / IO
94	UWR#		InOut 4~16mA, SRPD,SMT	Microcontroller write strobe, active low

95	URD#		InOut 4mA, SRPD,SMT	Microcontroller read strobe, active low
97	UP1_2		InOut 4~16mA, SRPD,SMT	Microcontroller port 1-2
98	UP1_3		InOut 4mA, SRPD,SMT	Microcontroller port 1-3
99	UP1_4		InOut 4mA, SRPD,SMT	Microcontroller port 1-4
100	UP1_5		InOut 4mA, SRPD,SMT	Microcontroller port 1-5
101	UP1_6	SCL	InOut 4mA, SRPD,SMT	1) Microcontroller port 1-6 2) I2C clock pin
102	UP1_7	SDA	InOut 4mA, SRPD,SMT	1) Microcontroller port 1-7 1) I2C data pin
103	UP3_0	RXD	InOut 4mA, SRPD,SMT	1) Microcontroller port 3-0 2) 8032 RS232 RxD
104	UP3_1	TXD	InOut 4mA, SRPD,SMT	1) Microcontroller port 3-1 2) 8032 RS232 TxD
105	UP3_4	RXD SCL	InOut 4mA, SRPD,SMT	1) Microcontroller port 3-4 2) Hardwired RD232 RxD 3) I2C clock pin
106	UP3_5	RXD SDA	InOut 4~16mA, SRPD,SMT	1) Microcontroller port 3-5 2) Hardwired RD232 TxD 3) I2C data pin
109	IR		Input SMT	IR control signal input
110	INT0#		InOut 4~16mA, SRPD,SMT	Microcontroller external interrupt 0, active low
Audio interface (28)				
204	SPMCLK	SCLK0	Inout	1) Audio DAC master clock of SPDIF input 2) While SPDIF input is not used: I) Serial interface port 0 clock pin II) GPIO
205	SPDATA	SDIN0	Inout	1) Audio data of SPDIF input 2) While SPDIF input is not used: I) Serial interface port 0 data-in II) GPIO

206	SPLRCK	SDO0	Inout	1) Audio left/right channel clock of SPDIF input 2) While SPDIF input is not used: I) Serial interface port 0 data-out II) GPIO
207	SPBCK	SDCS0 ASDATA 5	Inout	1) Audio bit clock of SPDIF input 2) While SPDIF input is not used: I) Serial interface port 0 chip select II) Audio serial data 5 part I : DSD data sub-woofer Channel or Microphone output III) GPIO
209	ALRCK		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
210	ABCK	Fs64	InOut 4mA, SMT	1) Audio bit clock 2) Phase de-modulation
211	ACLK		InOut 4mA, SMT	Audio DAC master clock
197	ASDATA0		InOut 4mA, PD,SMT	1) Audio serial data 0 (Front-Left/Front-Right) 2) DSD data left channel 3) Trap value in power-on reset: I) 1: manufactory test mode II) 0: normal operation 4) While using external channels:) GPO_2
202	ASDATA1		InOut 4mA, PD,SMT	2) Audio serial data 0 (Front-Left/Front-Right) 2) DSD data right channel 3) Trap value in power-on reset: I) 1: manufactory test mode II) 0: normal operation 4) While using external channels: I) GPO_2
203	ASDATA2		InOut 4mA, PD,SMT	1) Audio serial data 1 (Left-Surround/Right-Surround) 2) DSD data left surround channel 3) Trap value in power-on reset: I) 1: manufactory test mode II) 0: normal operation 4) While using external channels: I) GPO_1

212	ASDATA3		InOut 4mA, PD,SMT	1) Audio serial data 2 (Center/LFE) 2) DSD data right surround channel 3) Trap value in power-on reset: I) 1: manufactory test mode II) 0: normal operation 4) While only 2 channels output: I) GPO_0
214	ASDATA4	INT1#	InOut 4mA, PD,SMT	1) Audio serial data 3 (Center-back/ Center-left-back/Center-right-back, in 6.1 or 7.1 mode) 2) DSD data center channel 18) While only 2 channels output: I) Digital video YUV output 6 II) GPIO
215	MC_DATA	INT2#	InOut 2mA, PD,SMT	1) Microphone serial input 2) While not support Microphone: I) Microcontroller external interrupt 2 II) GPIO
216	SPDIF		Output 4~16mA, SR: ON/OFF	S/PDIF output
217	APLLVDD3		Power	3.3V Power pin for audio clock circuitry
218	APLLCAP		Analog inout	APLL External Capacitance connection
219	APLLVSS		Ground	Ground pin for audio clock circuitry
220	ADACVSS2		Ground	Ground pin for AUDIO DAC circuitry
221	ADACVSS1		Ground	Ground pin for AUDIO DAC circuitry
222	ARF		Output	1) AUDIO DAC Sub-woofer channel output 2) While internal AUDIO DAC not used: GPIO
223	ARS	GPIO	Output	1) AUDIO DAC Right Surround channel output 2) While internal AUDIO DAC not used: a. SDATA3 b. GPIO
224	AR	GPIO	Output	1) AUDIO DAC Right channel output 2) While internal AUDIO DAC not used: a. SDATA1 b. GPIO
225	AVCM		Analog	AUDIO DAC reference voltage

226	AL	GPIO	Output	1) AUDIO DAC Left Surround channel output 2) While internal AUDIO DAC not used: a. SDATA2 b. GPIO
227	ALS	GPIO	Output	1) AUDIO DAC Left Surround channel output 2) While internal AUDIO DAC not used: a. SDATA0 b. GPIO
228	ALF	GPIO	Output	1) AUDIO DAC Center channel output 2) While internal AUDIO DAC not used: GPIO
229	ADACVDD1		Power	3.3V power pin for AUDIO DAC circuitry
230	ADACVDD2		Power	3.3V power pin for AUDIO DAC circuitry
Video Interface (18)				
196	DACVDDC		Power	3.3V power pin for VIDEO DAC circuitry
195	VREF		Analog	Bandgap reference voltage
194	FS		Analog	Full scale adjustment
193	YUV0	CIN	Output 4mA, SR	1) Video data output bit 0 2) Compensation capacitor
192	DACVSSC		Ground	Ground pin for VIDEO DAC circuitry
191	YUV1	Y	Output 4mA, SR	1) Video data output bit 1 2) Analog Y output
190	DACVddb		Power	3.3V power pin for VIDEO DAC circuitry
189	YUV2	C	Output 4mA, SR	1) Video data output bit 2 2) Analog chroma output
188	DACVSSB		Ground	Ground pin for VIDEO DAC circuitry
187	YUV3	CVBS	Output 4mA, SR	1) Video data output bit 3 2) Analog composite output
186	DACVDDA		Power	3.3V power pin for VIDEO DAC circuitry
185	YUV4	Y/G	Output 4mA, SR	1) Video data output bit 4 2) Green or Y
184	DACVSSA		Ground	Ground pin for VIDEO DAC circuitry
183	YUV5	B/Cb/Pb	Output 4mA, SR	1) Video data output bit 5 2) Blue or CB
182	YUV6	R/Cr/Pr	Output 4mA, SR	1) Video data output bit 6 2) Red or CR

181	VSYN	V_ADIN1	Output 4mA, SR	1) Vertical sync input/output 2) While no External TV-encoder: I) Vertical sync for video-input II) Version AD input port 1 III) GPIO
180	YUV7	INT3# ASDATA 5	Output 4mA, SR	1) Video data output bit 7 2) While no External TV-encoder: I) Microcontroller external interrupt 3 II) Audio serial data 5 part II : DSD data sub-woofer channel or Microphone output III) GPIO
179	HSYN	INT4# V_ADIN2	Output 4mA, SR	1) Horizontal sync input/output 2) While no External TV-encoder: I) Horizontal sync for video-input II) Version AD input port 2 III) GPIO IV) Microcontroller external interrupt 4
Video Interface (12)				
160	DACVDDC		Power	3.3V power pin for video DAC circuitry
161	VREF		Analog	Bandgap reference voltage
162	FS		Analog	Full scale adjustment
163	DACVSSC		Ground	Ground pin for video DAC circuitry
164	CVBS		InOut 4mA, SR	Analog composite output
165	DACVDDB		Power	3.3V power pin for video DAC circuitry
166	DACVSSB		Ground	Ground pin for video DAC circuitry
167	DACVDDA		Power	3.3V power pin for video DAC circuitry
168	Y/G		InOut 4mA, SR	Green, Y, SY, or CVBS
169	DACVSSA		Ground	Ground pin for video DAC circuitry
170	B/CB/PB		InOut 4mA, SR	Blue, CB/PB, or SC
171	R/CR/PR		InOut 4mA, SR	Red, CR/PR, CVBS, or SY
MISC (12)				

108	PRST#		InOut PD,SMT	Power on reset input, active low
107	ICE		InOut PD,SMT	Microcontroller ICE mode enable
233	XTALO		Output	27MHz crystal output
234	XTALI		Input	27MHz crystal input
46	USB_VSS		USB Ground	USB ground pin
47	USBP		Analog Inout	USB port DPLUS analog pin
48	USBM		Analog Inout	USB port DMINUS analog pin
49	USB_VDD3		Analog Inout	USB Power pin 3.3V
201	GPIO3		InOut Pull-Down	GPIO
200	GPIO4		InOut Pull-Down	GPIO
199	RCLKB	GPIO5	InOut Pull-Down	GPIO
198	RVREF	GPIO6	InOut Pull-Down	GPIO
Dram Interface (58) (Sorted by position)				
176	C_0	IO_0(RD1 6)	InOut Non-pull	1) Digital Video output C bit 0 2) GPIO
175	C_1	IO_1(RD1 7)	InOut Non-pull	1) Digital Video output C bit 1 2) GPIO
173	C_2	IO_2(RD1 8)	InOut Non-pull	1) Digital Video output C bit 2 2) GPIO
172	C_3	IO_3(RD1 9)	InOut Non-pull	1) Digital Video output C bit 3 2) GPIO
171	C_4	IO_4(RD2 0)	InOut Non-pull	1) Digital Video output C bit 4 2) GPIO
169	C_5	IO_5(RD2 1)	InOut Non-pull	1) Digital Video output C bit 5 2) GPIO
168	C_6	IO_6(RD2 2)	InOut Non-pull	1) Digital Video output C bit 6 2) GPIO
167	C_7	IO_7(RD2 3)	InOut Non-pull	1) Digital Video output C bit 7 2) GPIO
177	IO_17	(DQM2)	InOut Pull- Up	GPIO
166	YUVCLK	IO_8(DQ M3)	InOut Pull- Up	1) Digital Video output Clock 2) GPIO
165	Y_0	IO_9(RD2 4)	InOut Non-pull	1) Digital Video output Y bit 0 2) GPIO

164	Y_1	IO_10(RD 25)	InOut Non-pull	1) Digital Video output Y bit 1 2) GPIO
163	Y_2	IO_11(RD 26)	InOut Non-pull	1) Digital Video output Y bit 2 2) GPIO
162	Y_3	IO_12(RD 27)	InOut Non-pull	1) Digital Video output Y bit 3 2) GPIO
161	Y_4	IO_13(RD 28)	InOut Non-pull	1) Digital Video output Y bit 4 2) GPIO
159	Y_5	IO_14(RD 29)	InOut Non-pull	1) Digital Video output Y bit 5 2) GPIO
158	Y_6	IO_15(RD 30)	InOut Non-pull	1) Digital Video output Y bit 6 2) GPIO
157	Y_7	IO_16(RD 31)	InOut Non-pull	1) Digital Video output Y bit 7 2) GPIO
155	RA4		InOut	DRAM address 4
154	RA5		InOut	DRAM address 5
153	RA6		InOut	DRAM address 6
152	RA7		InOut	DRAM address 7
151	RA8		InOut	DRAM address 8
150	RA9		InOut	DRAM address 9
149	RA11		InOut	DRAM address bit 11
147	CKE		InOut Pull-Down	DRAM clock enable
146	RCLK		InOut	Dram clock
144	RA3		InOut	DRAM address 3
143	RA2		InOut	DRAM address 2
141	RA1		InOut	DRAM address 1
140	RA0		InOut	DRAM address 0
139	RA10		InOut	DRAM address 10
138	BA1		InOut	DRAM bank address 1
137	BA0		InOut	DRAM bank address 0
136	RCS#		output	DRAM chip select, active low
135	RAS#		output	DRAM row address strobe, active low
134	CAS#		output	DRAM column address strobe, active low
133	RWE#		output	DRAM Write enable, active low

132	DQM1		InOut	Data mask 1
130	IO_18	(DQS1)	InOut Non-pull	GPIO
129	RD8		InOut	DRAM data 8
128	RD9		InOut	DRAM data 9
127	RD10		InOut	DRAM data 10
126	RD11		InOut	DRAM data 11
125	RD12		InOut	DRAM data 12
124	RD13		InOut	DRAM data 13
123	RD14		InOut	DRAM data 14
125	RD15		InOut	DRAM data 15
121	RD0		InOut	DRAM data 0
120	RD1		InOut	DRAM data 1
119	RD2		InOut	DRAM data 2
117	RD3		InOut	DRAM data 3
116	RD4		InOut	DRAM data 4
115	RD5		InOut	DRAM data 5
114	RD6		InOut	DRAM data 6
113	RD7		InOut	DRAM data 7
112	IO_19	(DQS0)	InOut	GPIO
111	DQM0		InOut Non-pull	Data mask 0
JTAG Interface(4)				
51	TDI	V_ADIN4	InOut Non-pull	1) Serial interface port 3 data-out 2) Version AD input port 4 3) GPIO
52	TMS	V_ADIN5	InOut Non-pull	1) Serial interface port 3 data-out 2) Version AD input port 5 3) GPIO
53	TCK	V_ADIN6	InOut Non-pull	1) Serial interface port 3 data-out 2) Version AD input port 6 3) GPIO
54	TDO	V_ADIN7	InOut Non-pull	1) Serial interface port 3 data-out 2) Version AD input port 7 3) GPIO

3.5.2 function introduction to FLASH

FLASH 16Mbit memorizer, FLASH function pin are shown as follows:

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

3.5.3 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	Function	Data direction	Voltage when no disc	Pin	Name	Function	Data direction	Voltage when no disc
1	VDD	3.3V power supply		3.18	28	VSS	Ground		0.01
2	DQ0	Data bus	I/O	0.94	29	MA4	Address bus	I	1.65
3	VDDQ	3.3V power supply	I/O	3.19	30	MA5	Address bus	I	1.74
4	DQ1	Data bus	I/O	0.9	31	MA6	Address bus	I	1.49
5	DQ2	Data bus	I/O	1.3	32	MA7	Address bus	I	1.22
6	VSSQ	Ground		0	33	MA8	Address bus	I	0.05
7	DQ3	Data bus	I/O	1.2	34	MA9	Address bus	I	0.04

8	DQ4	Data bus	I/O	1.5	35	MA11	Address bus	I	0.04
9	VDDQ	3.3V power supply		3.18	36	NC	Blank pin		0.01
10	DQ5	Data bus	I/O	0.7	37	CKE	Clock enable signal	I	1.22
11	DQ6	Data bus	I/O	0.45	38	CLK	System clock input	I	1.68
12	VSSQ	Ground		0	39	UDQM	Data in/out screen-shielded signal	I	2.42
13	DQ7	Data bus	I/O	0.8	40	NC	Blank pin		0.01
14	VDD	3.3V power supply		3.14	41	VSS	Ground		0.01
15	LDQM	Data in/out screen-shielded signal	I	2.46	42	DQ8	Data bus	I/O	0.6
16	WE	Write control signal	I	3.17	43	VDDQ	3.3V power supply		3.19
17	CAS	Line address gating signal	I	3.01	44	DQ9	Data bus	I/O	0.91
18	RAS	Row address gating signal	I	3.13	45	DQ10	Data bus	I/O	0.8
19	CS	Chip selection signal	I	2.95	46	VSSQ	Ground		0.01
20	SD-BS0	Section address 0 gating signal	I	1.8	47	DQ11	Data bus	I/O	0.79
21	SD-BS1	Section address 1 gating signal	I	2	48	DQ12	Data bus	I/O	1.16
22	MA10	Address bus	I	0.04	49	VDDQ	3.3V power supply		3.19
23	MA0	Address bus	I	0.36	50	DQ13	Data bus	I/O	1.15
24	MA1	Address bus	I	0.35	51	DQ14	Data bus	I/O	1.24
25	MA2	Address bus	I	2.38	52	VSSQ	Ground		0.01
26	MA3	Address bus	I	1.59	53	DQ15	Data bus	I/O	0.68
27	VDD	3.3V power supply		3.19	54	VSS	Ground		0.01

3.5.4 function introduction to D5954

D5954 (U302) 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 loader to fulfil the corresponding servo work. The introduction to function pin is shown as the following table:

SN	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	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

Note: pin 28 is enable restrain pin, and U302 (D5954) is high level when starting up, low level when not starting up, and pin 4 is 1.4V reference voltage.

3.5.5 function introduction to 4558/4580

4558/4580 includes two integrated operational amplifiers inside, and pin function is shown as the following table:

Pin	Function	Signal flow	Pin	Function	Signal flow
-----	----------	-------------	-----	----------	-------------

1	Output of operational amplifier A	O	5	Output of operational amplifier B	O
2	Cathode input of port operational amplifier A	I	6	Cathode input of port operational amplifier B	I
3	Anode input port of operational amplifier A	I	7	Anode input of port operational amplifier B	I
4	minus 9V voltage input	I	8	(+) 9V voltage input	I

3.5.6 function introduction to IS24C02

1. IS24C02 is a writable and programmable read-only memorizer, with its casing and pin function shown in the following figure 3.5.6.1:

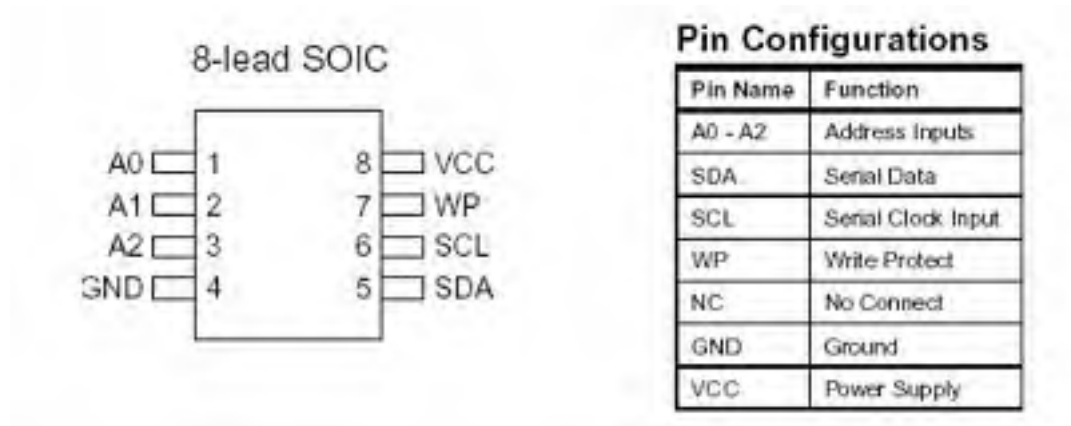


Figure 3.5.6.1 Casing and pin function explanation

2. The function of 24LLC02 is to keep some setup status of machine, such as system information of sound and language selection, not losing after power on and still keeping the information set last time when power on the next time. The circuit schematic diagram is shown as the figure3.5.6.2:

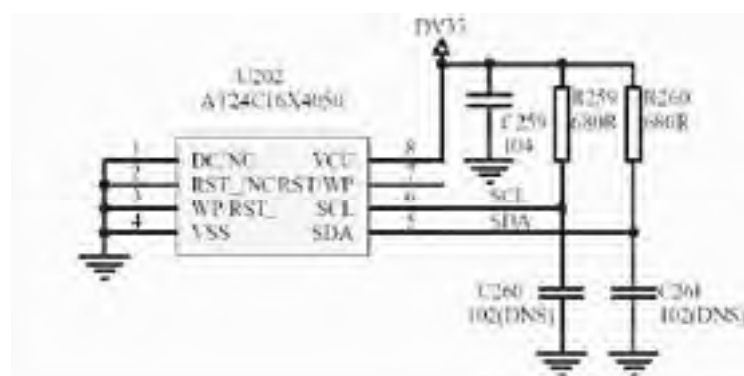


Figure 3.5.6.2 Circuit schematic diagram

3.5.7 function introduction to STV8216

1. Description

TV Sound Demodulator: provides all the necessary circuitry for the demodulation of audio transmissions of European and Asian terrestrial TV broadcasts. The various transmission standards are automatically detected and demodulated without user intervention.

Audio Processor: based on DSP technology, independently controls loudspeaker, subwoofer and headphone signals. It offers basic and advanced features, such as a ST WideSurround, Equalizer, Automatic Loudness and Smart Volume Control for television viewer comfort. The STV8226/36 versions can perform additionally the SRS 3D Surround for stereo and mono signals.

Audio Matrix: 3 stereo and 1 mono external analog audio inputs to loudspeakers and headphone, with 2 stereo external analog audio outputs (SCART compatible).

2. Feature

- # NICAM, AM, FM Mono and FM 2 Carrier Stereo Demodulators for all sound carriers between 4.5 and 7 MHz
- # Spatial Sound Effects (ST Wide Surround and Pseudo-Stereo)
- # Mono input provided for optimum AM Demodulation performances
- # Subwoofer output with Volume Control and Programmable Bandwidth
- # Demodulation controlled by Automatic Standard Recognition System
- # Loudspeaker and Headphone outputs with Volume/Balance Controls and Beeper
- # Sound IF AGC with wide range
- # Overmodulation and Carrier Offset recovery
- # Smart Volume Control
- # 5-band Equalizer & Bass/Treble Control
- # SRS® 3D Surround
- # 3-to-2 Analog Stereo Audio I/Os (SCART compatible) with Audio Matrix
- # Low-noise Audio Mutes and Switches
- # I²S Output to interface with Dolby® ProLogic® Decoder
- # Automatic Loudness Control
- # I²C Bus-controlled
- # Single and standard 27 MHz Crystal Oscillator
- # Embedded 3.3 V Regulators
- # Power supplies: 3.3 V Digital, 5 V or 8 V Analog
- # I = Input
- # O = Output
- # OD = Open Drain
- # B = Bidirectional

A = Analog

AP = Analog Power Supply

DP = Digital Power Supply

3. Pin Definitions

PIN	Name	Type	Function
1	AO1L	A	Left SCART1 Audio Output
2	AO1R	A	Right SCART1 Audio Output
3	NC		Not Used
4	NC		Not Used
5	NC		Not Used
6	NC		Not Used
7	VDDC	AP	3.3 V Power Supply for Audio DAC/ADC
8	GNDC	AP	0 V Power Supply for DAC/ADC
9	AI1L	A	Left SCART1 Audio Input
10	AI1R	A	Right SCART1 Audio Input
11	VMC1	A	Switched VREF Decoupling Pin for Audio Converters (VMCP)
13	VMC2	A	VREF Decoupling Pin for Audio Converters (VMC)
14	AI2L	A	Left SCART2 Audio Input
15	AI2R	A	Right SCART2 Audio Input
16	VDDA	AP	3.3 V Power Supply for Audio Buffers, Matrix & Bias
17	GNDAH	AP	0 V Power Supply for Audio Buffers & SCART
18	AO2L	A	Left SCART2 Audio Output
19	AO2R	A	Right SCART2 Audio Output
20	VDDH	AP	8 V / 5 V Power Supply for SCART & Audio Buffers
21	NC		Not Used
22	VREFA	A	Voltage Reference for Audio Buffers
23	AI3L	A	Left SCART3 Audio Input
24	AI3R	A	Right SCART3 Audio Input
25	N/C		Not Used
26	BGAP	A	Bandgap Voltage Source Decoupling
27	N/C		Not Used
28	LSL	A	Left Loudspeaker Output
29	LSR	A	Right Loudspeaker Output

30	SW	A	Subwoofer Output
31	HPL	A	Left Headphone Output
32	HPR	A	Right Headphone Output
33	GNDSA	AP	Substrate Analog/Digital Shield
34	N/C		Not Used
35	HPD	B	Headphone Detection Input (Active Low)
36	ADR	I	Hardware I ² C Chip Address Control
37	N/C		Not Used
38	N/C		Not Used
39	SCL	OD	I ² C Serial Clock
40	SDA	OD	I ² C Serial Data
41	N/C		Not Used
42	REG	A	5 V Power Regulator Control
43	RESET	I	Hardware Reset (Active Low)
44	SYSCK	B	System Clock Output
45	MCK	B	I ² S Master Clock Output
46	VDD1	DP	3.3V Power Supply for Digital Core & IO Cells
47	GND1	DP	0V Power Supply for Digital Core & IO Cells
48	N/C		Not Used
49	GNDSP	AP	Substrate Analog/Digital Shield for Clock-PLL
50	N/C		Not Used
51	N/C		Not Used
52	XTI	I	Crystal Oscillator Input
53	XTO	O	Crystal Oscillator Output
54	VDDP	AP	3.3 V Power Supply for Analog PLL Clock
55	GNDP	AP	0 V Power Supply for Analog PLL Clock
56	GND2	DP	0 V Power Supply for Digital Core, DSPs & IO Cells
57	VDD2	DP	3.3 V Power Supply for Digital Core, DSPs & IO Cells
58	CKTST	I	Must be Connected to 0 V
59	N/C		Not Used
60	N/C		Not Used
61	SDO	B	I ² S Bus Data Output
62	ST/SDI	B	Stereo Detection Output / I ² S Bus Data Input

63	WS	B	I ² S Bus Word Select Output
64	SCK	B	I ² S Bus Clock Output
65	BUS1	B	I ² C Bus Expander Output 1
66	N/C		Not Used
67	N/C		Not Used
68	BUS0	B	I ² C Bus Expander Output 2
69	IRQ	B	I ² C Status Read Request
70	N/C		Not Used
71	N/C		Not Used
72	N/C		Not Used
73	SIF	A	Sound IF Input
74	VTOP	A	ADC VTOP Decoupling Pin
75	VREFIF	A	AGC Voltage Reference Decoupling Pin
76	VDDIF	AP	3.3 V Power Supply for IF AGC & ADC
77	GNDIF	AP	0 V Power Supply for IF AGC & ADC
78	MONOIN	A	Mono Input
79	NC		Not Used
80	NC		Not Used

3.5.8 function introduction to MST518

1. Description

The MST518V is a high performance, and fully integrated graphics processing IC solution for LCD monitors with resolutions up to SXGA. It is configured with an integrated triple-ADC/PLL, a high quality scaling engine, an on-screen display controller, a built-in output clock generator, and a multi-purpose output display interface.

To further reduce system costs, the MST518V also integrates intelligent power management control capability for green-mode requirements and spread-spectrum support for EMI management.

2. Feature

- # High-quality zoom and shrink scaling engine (Compatible with VGA thru SXGA)
- # Integrated 8-bit triple-ADC/PLL
- # On-screen display controller (OSD)
- # Supports dual-RGB inputs
- # Supports sRGB

- # Supports composite sync and SOG separator
- # Programmable 10-bit gamma correction
- # Integrated brightness & contrast control adjustment
- # Supports peaking function for video sharpness enhancement
- # Supports coring function for low level noise reduction
- # Supports multi-purpose output display interface driver
- # Supports copy protection
- # Supports PWM backlight intensity control
- # Green PC and low EMI features
- # Low standby power mode (< 16mA)
- # Supports 8-bit video decoder input (ITU 656)

3. Pin Definitions

PIN	Pin Name	Pin Type	Function
33	HWRESET	Schmitt Trigger Input w/ 5V-tolerant	Hardware reset; active high
82	CS	Input w/ 5V-tolerant	3 Wire Serial Bus Chip Select; active high
83	SDA	I/O w/ 5V-tolerant	3 Wire Serial Bus Data; 4mA driving strength
84	SCL	Input w/ 5V-tolerant	3 Wire Serial Bus Clock
Analog Interface			
38	HSYNC0	Schmitt Trigger Input w/ 5V-tolerant	Analog HSYNC Input from Channel 0
39	VSINC0	Schmitt Trigger Input w/ 5V-tolerant	Analog VSYNC Input from Channel 0
40	HSYNC1	Schmitt Trigger Input w/ 5V-tolerant	Analog HSYNC Input from Channel 1
41	VSINC1	Schmitt Trigger Input w/ 5V-tolerant	Analog VSYNC Input from Channel 1
55	REXT		External resistor 390 ohm to AVDD
60	BIN1	Analog Input	Analog Blue Input from Channel 1
61	BIN1M	Analog Input	Reference Ground for Analog Blue Input from Channel 1
62	SOGIN1	Analog Input	Sync-On-Green Input from Channel 1
63	GIN1	Analog Input	Analog Green Input from Channel 1
64	GIN1M	Analog Input	Reference Ground for Analog Green Input from Channel 1
65	RIN1	Analog Input	Analog Red Input from Channel 1

66	RIN1M	Analog Input	Reference Ground for Analog Red Input from Channel 1
69	BIN0M	Analog Input	Reference Ground for Analog Blue Input from Channel 0
70	BIN0	Analog Input	Analog Blue Input from Channel 0
71	GIN0M	Analog Input	Reference Ground for Analog Green Input from Channel 0
72	GIN0	Analog Input	Analog Green Input from Channel 0
73	SOGIN0	Analog Input	Sync-On-Green Input from Channel 0
74	RIN0M	Analog Input	Reference Ground for Analog Red Input from Channel 0
75	RIN0	Analog Input	Analog Red Input from Channel 0
78	RMID		Mid-Scale Voltage Bypass
79	REFP		Internal ADC Top De-coupling Pin
80	REFM		Internal ADC Bottom De-coupling Pin
Video Interface			
90	VCLK	Input w/ 5V-tolerant	Video Decoder Clock
98-91	VD[7:0]	Input w/ 5V-tolerant	Video Decoder Data[7:0]
LCD Interface			
143	LHSYNC	Output w/ Pull-down Resistor	LCD HSYNC; 4~12mA driving strength programmable
144	LVSYNC	Output w/ Pull-down Resistor	LCD VSYNC; 4~12mA driving strength programmable
145	OCLK	Output w/ Pull-down Resistor	LCD Output Clock; 4~12mA driving strength programmable
146	LDE	Output w/ Pull-down Resistor	LCD Display Enable; 4~12mA driving strength programmable
138-131	RA[7:0]	Output w/ Pull-down Resistor	Port A Red Channel Bit[7:0]; 4~12mA driving strength programmable
128, 127, 120-115	GA[7:0]	Output w/ Pull-down Resistor	Port A Green Channel Bit[7:0]; 4~12mA driving strength programmable
110-103	BA[7:0]	Output w/ Pull-down Resistor	Port A Blue Channel Bit[7:0]; 4~12mA driving strength programmable
26-23, 18-15	RB[7:0]	I/O w/ Pull-down Resistor	Port B Red Channel Bit[7:0]; 4~12mA driving strength programmable
14-11, 8-5	GB[7:0]	I/O w/ Pull-down Resistor	Port B Green Channel Bit[7:0]; 4~12mA driving strength programmable
4, 3, 154, 153, 150-147	BB[7:0]	I/O w/ Pull-down Resistor	Port B Blue Channel Bit[7:0]; 4~12mA driving strength programmable
126, 155-160	GPO[6:0]	Output w/ Pull-down Resistor	TCON GPO[6:0]; 4~12mA driving strength programmable
124	OINV	Output w/ Pull-down Resistor	TCON "Odd" Channel Inversion; 4~12mA driving strength programmable
123	EINV	Output w/ Pull-down Resistor	TCON "Even" Channel Inversion; 4~12mA driving strength programmable

122	OSP	Output w/ Pull-down Resistor	TCON "Odd" Channel Start Pulse; 4~12mA driving strength programmable
121	ESP	Output w/ Pull-down Resistor	TCON "Even" Channel Start Pulse; 4~12mA driving strength programmable
LVDS Interface			
138	LVA0M	Output	A-Link Negative LVDS Differential Data Output
137	LVA0P	Output	A-Link Positive LVDS Differential Data Output
136	LVA1M	Output	A-Link Negative LVDS Differential Data Output
135	LVA1P	Output	A-Link Positive LVDS Differential Data Output
134	LVA2M	Output	A-Link Negative LVDS Differential Data Output
133	LVA2P	Output	A-Link Positive LVDS Differential Data Output
128	LVA3M	Output	A-Link Negative LVDS Differential Data Output
127	LVA3P	Output	A-Link Positive LVDS Differential Data Output
132	LVACKM	Output	A-Link Negative LVDS Differential Clock Output
131	LVACKP	Output	A-Link Positive LVDS Differential Clock Output
154	LVB0M	Output	B-Link Negative LVDS Differential Data Output
153	LVB0P	Output	B-Link Positive LVDS Differential Data Output
150	LVB1M	Output	B-Link Negative LVDS Differential Data Output
149	LVB1P	Output	B-Link Positive LVDS Differential Data Output
148	LVB2M	Output	B-Link Negative LVDS Differential Data Output
147	LVB2P	Output	B-Link Positive LVDS Differential Data Output
144	LVB3M	Output	B-Link Negative LVDS Differential Data Output
143	LVB3P	Output	B-Link Positive LVDS Differential Data Output
146	LVBCKM	Output	B-Link Negative LVDS Differential Clock Output
145	LVBCKP	Output	B-Link Positive LVDS Differential Clock Output
RSDS Interface			
143	CLKAP	Output	A-Link Positive RSDS Differential Clock Output from "Odd" Channel
144	CLKAN	Output	A-Link Negative RSDS Differential Clock Output from "Odd" Channel
145	CLKBP	Output	B-Link Positive RSDS Differential Clock Output from "Even" Channel
146	CLKBN	Output	B-Link Negative RSDS Differential Clock Output from "Even" Channel
109, 107, 105, 103	BA[3:0]P	Output	A-Link Positive RSDS Differential Data Output from "Odd" Channel

110, 108, 106, 104	BA[3:0]N	Output	A-Link Negative RSDS Differential Data Output from “Odd” Channel
127, 119, 117, 115	GA[3:0]P	Output	A-Link Positive RSDS Differential Data Output from “Odd” Channel
128, 120, 118, 116	GA[3:0]N	Output	A-Link Negative RSDS Differential Data Output from “Odd” Channel
137, 135, 133, 131	RA[3:0]P	Output	A-Link Positive RSDS Differential Data Output from “Odd” Channel
138, 136, 134, 132	RA[3:0]N	Output	A-Link Negative RSDS Differential Data Output from “Odd” Channel
3, 153, 149, 147	BB[3:0]P	Output	B-Link Positive RSDS Differential Data Output from “Even” Channel
4 154, 150, 148	BB[3:0]N	Output	B-Link Negative RSDS Differential Data Output from “Even” Channel
13, 11, 7, 5	GB[3:0]P	Output	B-Link Positive RSDS Differential Data Output from “Even” Channel
14, 12, 8, 6	GB[3:0]N	Output	B-Link Negative RSDS Differential Data Output from “Even” Channel
25, 23, 17, 15	RB[3:0]P	Output	B-Link Positive RSDS Differential Data Output from “Even” Channel
26, 24, 18, 16	RB[3:0]N	Output	B-Link Negative RSDS Differential Data Output from “Even” Channel
126, 155-160	GPO[6:0]	Output w/ Pull-down Resistor	TCON GPO[6:0]; 4~12mA driving strength programmable
122	OSP	Output w/ Pull-down Resistor	TCON “Odd” Channel Start Pulse; 4~12mA driving strength programmable
121	ESP	Output w/ Pull-down Resistor	TCON “Even” Channel Start Pulse; 4~12mA driving strength programmable
GPIO Interface			
87	GOUT1/PWM1	Output	GOUT1/PWM1; 4mA driving strength
86	GOUT1/PWM0	Output	GOUT0/PWM0; 4mA driving strength
Misc. Interface			
2	BYPASS		For External Bypass Capacitor
29	DDC_DAT	I/O w/ 5V-tolerant	DDC Data for Analog Interface; 4mA driving strength
30	DDC_CLK	Input w/ 5V-Tolerant	DDC Clock for Analog Interface
31	DDCROM_CLK	Input w/ 5V-Tolerant	DDC ROM Clock
32	DDCROM_DAT	I/O w/ 5V-tolerant	DDC ROM Data; 4mA driving strength

34	XIN	Crystal Oscillator Input	Xin
35	XOUT	Crystal Oscillator Output	Xout
Power Pins			
48, 54, 58, 77	AVDD	3.3V Power	ADC Power
56	AVDD_PLL	3.3V Power	PLL Power
36	AVDD_MPLL	3.3V Power	MPLL Power
10, 22, 88, 99, 111, 129, 139, 151	VDDP	3.3V Power	Digital Output Power
19, 102, 114, 142	VDDC	2.5V Power	Digital Core Power
1, 9, 20, 21, 37, 42, 45, 51, 57, 59, 76, 81, 89, 100, 101, 112, 113, 125, 130, 140, 141, 152	GND	Ground	Digital Core Ground
27, 28, 43, 44, 46, 47, 49, 50, 52, 53, 67, 68, 90	NC		No Connect. Leave These Pins Floating.

3.5.9 function introduction to MP1430

1. Description

The MP1430 is a step-down regulator with an internal Power MOSFET. It achieves 3A continuous output current over a wide input supply range with excellent load and line regulation.

Current mode operation provides fast transient response and eases loop stabilization.

Fault condition protection includes cycle-by-cycle current limiting and thermal shutdown. Adjustable

soft-start reduces the stress on the input source at turn-on. In shutdown mode the regulator draws 20 μ A of supply current.

The MP1430 requires a minimum number of readily available external components to complete a 3A step down DC to DC converter solution.

2. Feature

- # 3A Output Current
- # Programmable Soft-Start
- # 110m Ω Internal Power MOSFET Switch
- # Stable with Low ESR Output Ceramic Capacitors
- # Up to 95% Efficiency
- # 20 μ A Shutdown Mode
- # Fixed 385KHz Frequency
- # Thermal Shutdown
- # Cycle-by-Cycle Over Current Protection
- # Wide 6V to 28V Operating Input Range
- # Output Adjustable from 1.22V
- # Under Voltage Lockout
- # Available in 8-Pin SOIC Package

3. Pin Definitions

Pin	Pin Name	Function
1	BS	High-Side Gate Drive Boost Input. BS supplies the drive for the high-side N-Channel MOSFET switch. Connect a 10nF or greater capacitor from SW to BS to power the high side switch.
2	IN	Power Input. IN supplies the power to the IC, as well as the step-down converter switches. Drive IN with a 6V to 28V power source. Bypass IN to GND with a suitably large capacitor to eliminate noise on the input to the IC. See Input Capacitor section.
3	SW	Power Switching Output. SW is the switching node that supplies power to the output. Connect the output LC filter from SW to the output load. Note that a capacitor is required from SW to BS to power the high-side switch.
4	GND	Ground. (Note: Connect the exposed pad on backside to Pin 4).
5	FB	Feedback Input. FB senses the output voltage to regulate that voltage. Drive FB with a resistive voltage divider from the output voltage. The feedback threshold is 1.222V. See Setting the Output Voltage section.
6	COMP	Compensation Node. COMP is used to compensate the regulation control loop. Connect a series RC network from COMP to GND to compensate the regulation control loop. In some cases, an additional capacitor from COMP to GND is required. See Compensation section.
7	EN	Enable Input. EN is a digital input that turns the regulator on or off. Drive EN high to turn on the regulator, drive EN

		low to turn it off. An Under Voltage Lockout (UVLO) function can be implemented by the addition of a resistor divider from VIN to GND. For complete low current shutdown its needs to be less than 0.7V. For automatic startup, leave EN unconnected.
8	SS	Soft-Start Control Input. SS controls the soft-start period. Connect a capacitor from SS to GND to set the soft-start period. A 0.1 μ F capacitor sets the soft-start period to 10ms. To disable the soft-start feature, leave SS unconnected.

3.5.10 function introduction to W79E632

1. Description

The W79E632 is a fast 8051 compatible microcontroller with a redesigned processor core without wasted clock and memory cycles. As a result, it executes every 8051 instruction faster than the original 8051 for the same crystal speed. Typically, the instruction executing time of W79E632 is 1.5 to 3 times faster than that of traditional 8051, depending on the type of instruction. In general, the overall performance is about 2.5 times better than the original for the same crystal speed. Giving the same throughput with lower clock speed, power consumption has been improved. Consequently, the W79E632 is a fully static CMOS design; it can also be operated at a lower crystal clock. The W79E632 contains In-System Programmable (ISP) 128 KB bank-addressed Flash EPROM; 4KB auxiliary Flash EPROM for loader program; on-chip 1 KB MOVX SRAM; power saving modes.

2. Feature

- # 8-bit CMOS microcontroller
- # High speed architecture of 4 clocks/machine cycle runs up to 40 MHz
- # Pin compatible with standard 80C52
- # Instruction-set compatible with MCS-51
- # Four 8-bit I/O Ports
- # One extra 4-bit I/O port, chip select
- # Three 16-bit Timers
- # 7 interrupt sources with two levels of priority
- # On-chip oscillator and clock circuitry
- # One enhanced full duplex serial port
- # Dual 64KB In-System Programmable Flash EPROM banks (APFlash0 and APFlash1)
- # 4KB Auxiliary Flash EPROM for loader program (LDFlash)
- # 256 bytes scratch-pad RAM
- # 1 KB on-chip SRAM for MOVX instruction
- # Programmable Watchdog Timer
- # 6 channels of 8 bit PWM

Software Reset

Software programmable access cycle to external RAM/peripherals

Code protection

3. Pin Definitions

PIN	PIN NAME	Function
1	NC	
2	KEY1	panel key1
3	KEY2	panel key2
4	KEY3	panel key3
5	KEY4	panel key4
6	FBI	CVBS/RGB switch
7	/RST	TVP5146 out Reset
8	NC	
9	NC	
10	RST	RESET: A high on this pin for two machine cycles while the oscillator is running resets the device.
11	RXD	upgrade port
12	KEY2	panel key2
13	TXD	upgrade port
14	IR	remote input
15	NC	
16	ON/OFF_INVERTER	Higher voltage switch
17	POWER	power control
18	NC	
19	NC	
20	XTAL2	CRYSTAL2: This is the crystal oscillator output. It is the inversion of XTAL1.
21	XTAL1	CRYSTAL1: This is the crystal oscillator input. This pin may be driven by an external clock.
22	GND	GROUND: Ground potential
23	NC	
24	SS	Screen proportion switch
25	SW1	Video Output Switch1
26	SW2	Video Output Switch2
27	SCL	IIC clock
28	SDA	IIC data

29	SEL_I/P	Progressive/Interlaced Scanning Switch
30	AMP_MUTE	Audio Amplifier Mute
31	AMP_STB	Audio Amplifier Standby
32	PSEN	PROGRAM STORE ENABLE: PSEN enables the external ROM data onto the Port 0 address/data bus during fetch and MOVX operations. When internal ROM access is performed, no PSEN strobe signal outputs from this pin.
33	ALE	ADDRESS LATCH ENABLE: ALE is used to enable the address latch that separates the address from the data on Port 0.
35	EA	EXTERNAL ACCESS ENABLE: This pin forces the processor to execute out of external ROM. It should be kept high to access internal ROM. The ROM address and data will not be present on the bus if EA pin is high and the program counter is within 128 KB area. Otherwise they will be present on the bus.
34	NC	
36	NC	
37	PANEL_ON	Screen power switch
38	8216_RST	STV8216 Reset output
39	WP	Protect 24C32
40	RST_MST	MST518 Reset
41	CS_MST	MST518 Chip Enable
42	SDA_MST	IIC Clock to CPU
43	SCL_MST	IIC Data to CPU
44	VDD	POWER SUPPLY: Supply voltage for operation.

3.5.11 function introduction to TVP5146

1. Description

TVP5146 is a high quality, single-chip digital video decoder that digitizes and decodes all popular base-band analog video formats into digital component video. TVP5146 supports the A/D conversion of component RGB and YPbPr signals, as well as the A/D conversion and decoding of NTSC, PAL and SECAM composite and S-Video into component YCbCr. This chip includes four 10-bit 30-MSPS A/D converters. Prior to each A/D converter, each analog channel contains an analog circuit, which clamps the input to a reference voltage and applies a programmable gain and offset. A total of 10 video input terminals can be configured to any combination of RGB, YPbPr, CVBS, S-Video video inputs.

Component, Composite or S-Video signals are sampled at 2x the square-pixel or ITU-R BT.601 clock frequency (27 MHz), linelocked for correct pixel alignment, and are then decimated to the 1x pixel rate. CVBS

decoding utilizes 2-dimensional complementary 5-line adaptive comb filtering for both the luma and chroma data paths, to reduce both cross-luma and cross-chroma artifacts. A chroma trap filter is also available. On CVBS and Y/C inputs, the user can control video characteristics such as contrast, brightness, saturation and hue via an I2C host port interface. Furthermore, luma peaking with programmable gain is included, as well as a patented chroma transient improvement (CTI) circuit.

2. Feature

- # Four 30-MSPS, 10-bit A/D Channels with programmable clamp and gain control
- # Supports NTSC (J, M, 4.43), PAL (B, D, G, H, I, M, N, Nc, 60) and SECAM (B, D, G, K, K1, L) CVBS, S-video
- # Supports analog component YPbPr /RGB video formats with embedded sync
- # 10 analog video input terminals for multi-source connection
- # User-programmable video output formats
- # HSYNC/VSYNC outputs with programmable position, polarity and width and FID (Field ID) output
- # Component video processing
- # Vertical Blank Interval Data Processor
- # I²C host port interface #
- # Reduced power consumption: 1.8V digital core, 3.3V and 1.8V analog core with power-save and power-down modes
- # Embedded RAM to allow user-downloadable configuration micro code (feature upgrade)
- # 80-pin TQFP PowerPAD™ package

3. Pin Definitions

Name	No.	I/O	Description
Analog Video			
VI_1_A	80	I	VI_1_x: Analog video input for CVBS/Pb/B/C VI_2_x: Analog video input for CVBS/Y/G VI_3_x: Analog video input for CVBS/Pr/R/C VI_4_A: Analog video input for CVBS/Y Up to ten composite, 4 S-video and two composite or three component video inputs (or a combination thereof) can be supported. The inputs must be AC coupled. The recommended coupling capacitor is 0.1 μ F. The possible input configurations are listed in the input select register 00h.
VI_1_B	1		
VI_1_C	2		
VI_2_A	7		
VI_2_B	8		
VI_2_C	9		
VI_3_A	16		
VI_3_B	17		
VI_3_C	18		
VI_4_A	23		

Clock Signals			
XTAL1	74	I	External clock reference input.
XTAL2	75	O	External clock reference output.
DATACLK	40	O	Line-locked data output clock.
Digital Video			
Y[9:0]	43-47,50-54	O	Digital video output of Y/YCbCr, Y[9] is MSB and Y[0] is LSB.
C[9:0]/GPIO[9:0]	57-60,63-66,69,70	I/O	Digital video output of CbCr, C[9] is MSB and C[0] is LSB. Unused outputs can be left unconnected. Also these terminals can be programmable general purpose I/O. Fast-Switch Overlay between Digital RGB and component RGB/YPbPr Digital BLUE input from Closed Caption decoder (Overlay device) Digital GREEN input from Closed Caption decoder (Overlay device) Digital RED input from Closed Caption decoder (Overlay device)
FSO	57	I	Fast-Switch Overlay between Digital RGB and component RGB/YPbPr
D_BLUE	58	I	Digital BLUE input from Closed Caption decoder (Overlay device)
D_GREEN	59	I	Digital GREEN input from Closed Caption decoder (Overlay device)
D_RED	60	I	Digital RED input from Closed Caption decoder (Overlay device)
Miscellaneous Signals			
RESETB	34	I	Reset input, active low.
PWDN	33	I	Power down input. 1: Power down 0: Normal mode
GLCO/I2CA	37	I/O	Genlock Control Output (GLCO). Two Genlock data formats are available: T1 formats and Real Time Control (RTC) format. During reset, this terminal is an input, used to program the I2C address LSB.
FSS/GPIO	35	I/O	Fast-switch (Blanking) input. Switching signal between synchronous component video (YPbPr/RGB) and composite video input. Programmable general purpose I/O
TMS	27	I	This terminal should be connected to a ground.
INTREQ	30	O	Interrupt request.
Host Interface			
SDA	29	I/O	I2C Data bus.
SCL	28	I	I2C Clock input.
Power Supplies			
NSUB	26	I	Substrate ground. Connect to analog ground.
CH1_A33GND CH2_A33GND CH3_A33GND	3 6 19 22	I	Analog 3.3V return.

CH4_A33GND			
CH1_A33VDD	4 5 20 21	I	Analog power. Connect to 3.3V.
CH2_A33VDD			
CH3_A33VDD			
CH4_A33VDD			
CH1_A18GND	79 10 15 24	I	Analog 1.8V return.
CH2_A18GND			
CH3_A18GND			
CH4_A18GND			
CH1_A18VDD	78 11 14 25	I	Analog power. Connect to 1.8V.
CH2_A18VDD			
CH3_A18VDD			
CH4_A18VDD			
A18GND_REF	13	I	Analog 1.8V return.
A18VDD_REF	12	I	Analog power for reference 1.8V.
PLL_A18GND	77	I	Analog power return.
PLL_A18VDD	76	I	Analog power. Connect to 1.8V.
DGND	32,42,56,68	I	Digital return.
DVDD	31,41,55,67	I	Digital power. Connect to 1.8V.
IOGND	39,49,62	I	Digital power return.
IOVDD	38,48,61	I	Digital power. Connect to 3.3V or less for reduced noise.
Sync Signals			
HS/CS/GPIO	72	I/O	Horizontal sync output or digital composite sync output Programmable general purpose I/O
VS/VBLK/GPIO	73	I/O	Vertical sync output. (for modes with dedicated VSYNC) or VBLK output Programmable general purpose I/O
FID/GPIO	71	I/O	Odd/even field indicator output Programmable general purpose I/O
AVID/GPIO	36	I/O	Active Video indicator output Programmable general purpose I/O

3.5.12 function introduction to NCP1377

1. Description

The NCP1377 combines a true current mode modulator and a demagnetization detector which ensures full borderline/critical Conduction Mode in any load/line conditions together with minimum drain voltage switching (Quasi- Resonant operation). Due to its inherent skip cycle capability, the controller enters burst

mode as soon as the power demand falls below a predetermined level. As this happens at low peak current, no audible noise can be heard. For NCP1377, an internal 8.0 μ s timer prevents the free-run frequency to exceed the 150 kHz CISPR- 22 EMI starting limit while the skip adjustment capability lets the user select the frequency at which the burst foldback takes place. For NCP1377B, the internal timer duration is reduced to 3.0 μ s to allow operation at higher frequencies.

The transformer core reset detection is done through an auxiliary winding which, brought via a dedicated pin, also enables fast Over Voltage Protection (OVP). Once an OVP has been detected, the IC permanently latches- off. The 1377 features a sampling time of 4.5 μ s whereas it is 1.5 μ s for the B version.

The NCP1377 also features an efficient protective circuitries which, in presence of an overcurrent condition, disables the output pulses and enters a safe burst mode, trying to restart. Once the default has gone, the device auto- recovers. Finally an internal 1.0 ms soft- start eliminates the traditional startup stress.

2. Feature

- # Free- Running Borderline/Critical Mode Quasi- Resonant Operation
- # Latched Over Voltage Protection
- # Auto- Recovery Short- Circuit Protection Via UVLO Crossover
- # External Latch Triggering, e.g. Via Overtemperature Signal
- # Current- Mode with Adjustable Skip- Cycle Capability
- # Internal 1.0 ms Soft- Start
- # Internal Temperature Shutdown
- # Internal Leading Edge Blanking
- # 500 mA Peak Current Source/Sink Capability
- # Under Voltage Lockout Level of 12.5 V (On) and 7.5 V (Min)
- # Direct Optocoupler Connection
- # SPICE Models Available for TRANSient Analysis
- # Internal Minimum TOFF

3. Pin Definitions

Pin	Symbol	Function	Description
1	Demag	Core reset detection and OVP	The auxiliary FLYBACK signal ensures discontinuous operation and offers a fixed over voltage detection level of 7.2 V.
2	FB	Sets the peak current setpoint	By connecting an optocoupler to this pin, the peak current setpoint is adjusted accordingly to the output power demand. By bringing this pin below the internal skip level, you shut off the device.
3	CS	Current sense input and skip cycle level selection	This pin senses the primary current and routes it to the internal comparator via an L.E.B. By inserting a resistor in series with the pin, you

			control the level at which the skip operation takes place.
4	Gnd	The IC ground	-
5	Drv	Driving pulses	The driver's output to an external MOSFET.
6	VCC	Supplies the IC	This pin is connected to an external bulk capacitor of typically 10 μ F.
7	NC	-	This unconnected pin ensures adequate creepage distance.
8	HV	High- voltage pin	Connected to the high- voltage rail, this pin injects a constant current into the VCC bulk capacitor and ensures a clean lossless startup sequence.

3.5.13 function introduction to TDA7266P

1. Description

The TDA7266P is a dual bridge amplifier specially designed for LCD TV/Monitor, PC Motherboard, TV and Portable Audio applications.

2. Feature

TECHNOLOGY BI20II

WIDE SUPPLY VOLTAGE RANGE (3.5 - 12V)

OUTPUT POWER:

– 3+3W @THD = 10%, RL = 8 Ω , VCC = 7.5V

– 4+4W Music Power @THD = 10%, RL = 8 Ω ,
VCC = 8.5V

SINGLE SUPPLY

MINIMUM EXTERNAL COMPONENTS:

– NO SVR CAPACITOR

– NO BOOTSTRAP

– NO BOUCHEROT CELLS

– INTERNALLY FIXED GAIN

STAND-BY & MUTE FUNCTIONS

SHORT CIRCUIT PROTECTION

THERMAL OVERLOAD PROTECTION

3. Pin Definitions

PIN	Pin Name	Pin Type	Function
1	PW_GND	GND	GND
2	NC		NC
3	NC		NC

4	NC		NC
5	OUT1+	Output	LOUT+ OUTPUT
6	OUT1-	Output	LOUT- OUTPUT
7	+VS	10V POWER	Power
8	IN1	AUDIO INPUT	AUDIO_L_INPUT
9	NC		NC
10	MUTE	MUTE	
11	STBY	AMP_STBY	
12	NC		NC
13	NC		NC
14	SGND	GND	GND
15	NC		NC
16	NC		NC
17	IN2	AUDIO INPUT	AUDIO_R_INPUT
18	+VS	10V POWER	Power
19	OUT2+	Output	ROUT+ OUTPUT
20	OUT2-	Output	ROUT- OUTPUT
21	NC		NC
22	NC		NC
23	NC		NC
24	PW_GND	GND	GND

3.5.14 function introduction to LA7952

1. Feature

- # On-chip driver with 4 inputs, 1 output, 75W termination.
- # On-chip 6dB amplifier.
- # Excellent crosstalk characteristic.
- # Wide band.
- # Input with DC restoration circuit.

2. Pin Definitions

Pin	Pin Name	Pin Type	Function
-----	----------	----------	----------

1	VIDEO OUT	OUTPUT	VIDEO OUTPUT
2	A		SWITCH
3	B		SWITCH
4	VIN1	INPUT	VIDEO INPUT
5	GND	GND	GND
6	VIN2	INPUT	VIDEO INPUT
7	VCC	POWER	12V
8	VIN3	INPUT	VIDEO INPUT
9	VIN4	INPUT	VIDEO INPUT

3.5.15 function introduction to Mp1008

1. Description

The MP1008 is a fixed operating frequency inverter controller that controls two external N-Channel power MOSFETs in a half-bridge configuration. The inverter is designed to power one or more cold cathode fluorescent lamps (CCFL) to backlight liquid crystal displays. Its half-bridge architecture converts unregulated DC input voltages to nearly pure sine waves. Burst mode dimming is controlled with either an external analog or digital signal. Built-in fault management features include an open lamp regulator, short circuit protection and a dualmode fault timer. The MP1008 is available in 16-pin SOIC and DIP packages.

2. General Feature lists

- # Controls Two External, Low Cost, N-Channel MOSFETs
- # Fixed Operating Frequency
- # Input Voltage Range of 10V to 30V
- # Lamp Current and Voltage Regulation
- # Full-Wave Sense Amp for Lamp Current Feedbacks
- # Burst Mode Dimming Control
- # Integrated Burst Mode Oscillator and Modulator
- # Soft-On and Soft-Off Burst Envelope
- # Open Lamp Protection
- # Fault Timer
- # Thermal Shutdown with Hysteresis
- # Available in SOIC 16 and DIP16 Packages

3. Pin Definitions

Pin #	Name	Description
-------	------	-------------

1	LV	Open Lamp Voltage Feedback Input. Connect a capacitive voltage divider from the first end of the lamp to ground. Connect this pin to the tap on the divider and shunt a bias resistor to ground. If the voltage at LV exceeds +1.2V, the controller will treat this as an open lamp condition. A pulse of current will pull down on the COMP pin to regulate the lamp voltage and the Fault Timer will be started.
2	LI	Lamp Current Feedback. The error amplifier will regulate the RMS LI voltage to 1.33VRMS.
3	COMP	Feedback Compensation Node. Connect a compensation capacitor from this pin to ground.
4	FT	Fault Timing. Connect a timing capacitor from this pin to AG to set the fault timeout period.
5	SWSET	Switching Frequency Set. Connect a resistor from this pin to AG. This resistor sets the operating frequency of the MP1008.
6	BRSET	Burst Repetition Rate Setting. If the burst repetition rate is to be synchronized to an external clock, connect a capacitor from BRS to AG. If the burst is to be controlled by an external logic signal, connect BRS to VCC and apply the logic signal to the DBRT pin.
7	DBRT	Burst-Mode (Digital) Brightness Control Input. The voltage range of 0V to 1.2V at DBRT linearly sets the burst-mode duty cycle from minimum 10% to 100%. If burst dimming is not used, connect DBRT to VCC.
8	EN	Enable Input. Pull EN high to turn on the IC; low to turn it off.
9	VIN	Input Power Rail. Decouple this pin to power ground with >1 μ F ceramic capacitor. It is desirable to add a 1000 resistor between VIN pin and the input bus.
10	BT	Output Bootstrap. BT provides gate bias for the high-side MOSFET. Connect a capacitor from BT to OUT.
11	UG	High-Side MOSFET Gate Output. Connect UG to the gate of the high-side, external power MOSFET.
12	OUT	Bridge Output. Connect OUT to the source of the high-side MOSFET and the drain of the low-side MOSFET.
13	VCC	Voltage Rail Output. VCC allows bypassing the bias supply for the control circuitry. Bypass VCC with a ceramic capacitor.
14	LG	Low-Side MOSFET Gate Output. Connect LG to the gate of the low-side MOSFET.
15	PG	Power Ground. Connect PG to the source of the low-side MOSFET.
16	AGND	Analog Ground.

3.5.16 function introduction to CD4052

1. Description

The CD4052B (N5) analog multiplexers is digitally-controlled analog switches having low ON impedance and very low OFF leakage current. Control of analog signals up to 20VP-P can be achieved by digital signal amplitudes of 4.5V to 20V (if VDD-VSS = 3V, a VDD-VEE of up to 13V can be controlled; for VDD-VEE level differences above 13V, a VDD-VSS of at least 4.5V is required). For example, if VDD = +4.5V, VSS = 0V, and VEE = -13.5V, analog signals from -13.5V to +4.5V can be controlled by digital inputs of 0V to 5V. These multiplexer circuits dissipate extremely low quiescent power over the full VDD-VSS and VDD-VEE

supply-voltage ranges, independent of the logic state of the control signals. When a logic “1” is present at the inhibit input terminal, all channels are off.

The CD4052B is a differential 4-Channel multiplexer having two binary control inputs, A and B, and an inhibit input. The two binary input signals select 1 of 4 pairs of channels to be turned on and connect the analog inputs to the outputs.

2. FEATURES

Wide Range of Digital and Analog Signal Levels

Digital : 3V to 20V

Analog: $\leq 20\text{VP-P}$

Low ON Resistance, 125W (Typ) Over 15VP-P Signal Input Range for $V_{DD}-V_{EE} = 18\text{V}$

High OFF Resistance, Channel Leakage of $\pm 100\text{pA}$ (Typ) at $V_{DD}-V_{EE} = 18\text{V}$

Logic-Level Conversion for Digital Addressing Signals of 3V to 20V ($V_{DD}-V_{SS} = 3\text{V}$ to 20V) to Switch Analog Signals to 20VP-P ($V_{DD}-V_{EE} = 20\text{V}$)

Matched Switch Characteristics, $r_{ON} = 5\text{W}$ (Typ) for $V_{DD}-V_{EE} = 15\text{V}$

Very Low Quiescent Power Dissipation Under All Digital-Control Input and Supply Conditions, 0.2mW (Typ) at $V_{DD}-V_{SS} = V_{DD}-V_{EE} = 10\text{V}$

Binary Address Decoding on Chip

5V, 10V and 15V Parametric Ratings

10% Tested for Quiescent Current at 20V

Maximum Input Current of 1mA at 18V Over Full Package Temperature Range, 100nA at 18V and 25

Break-Before-Make Switching Eliminates Channel Overlap

3. Pin Definitions

Pin	Name	Function	I/O
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 have no output when two ends are high level	I
7	VEE	-12V power (grounding)	
8	VSS	ground	
16	VDD	+5V power	
9、 10	B、 A	Strobe signal	I
13	X	X signal output	O

Chapter Four

Disassembly and Assembly Process

In order to know structure of TV set LD1506SI easily, directly and quickly, pictures are adopted here to present each link of assembly and disassembly process of the player to avoid operating blindly to damage elements. Structure design of this TV set is reasonable, so please avoid striking with hard objects in actual operation to ensure each parts is not damaged.

4.1 Disassembly process for the player



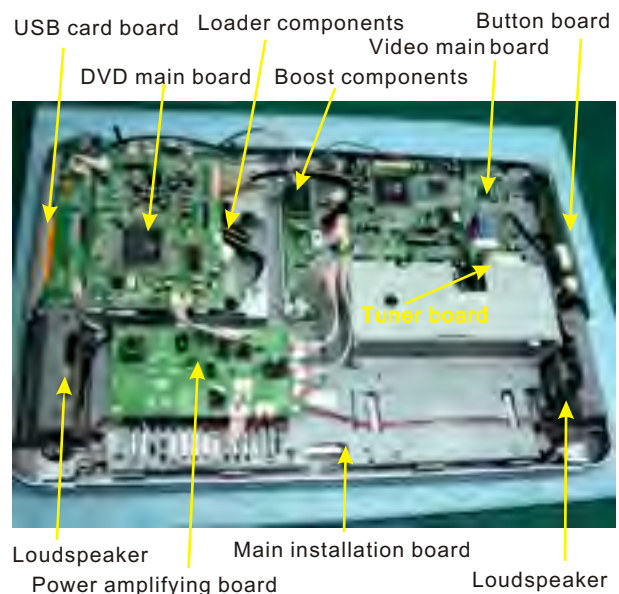
1. Place the machine on tableboard and pay attention to add a soft sponge spacer to protect the display screen of the machine.



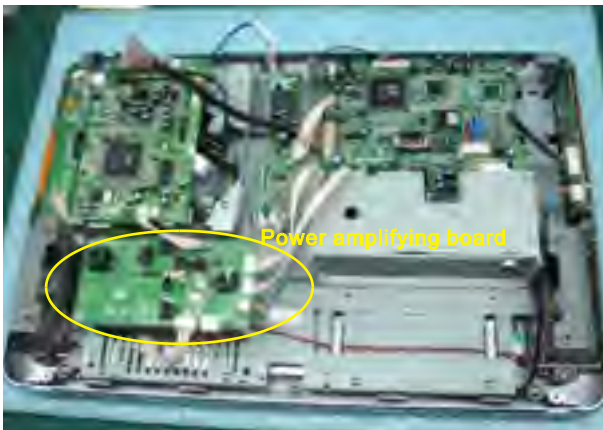
2. Use electronic screwdriver to take down the 11 screws marked in the figure.



3. Take down rear casing components and pay attention not to damage the clasp.



4. Distribution picture of each components inside the machine.



5. Take out poweramplifying board screw, remove the corresponding flat cable and get rid of power amplifying board components.



6. Take out outputboard components and button board.



7. Unplug video board flat cable, take out the screw that fixes video board and then the video board.



8. Take out the screw and flat cable that fix boost board components and the remove the boost board.



9. Remove DVDloader components.



10. Remove screws on main installation board and then take out the main installation board.



11. Take out main installation board.



12. Remove the 4 fixing screws in 4 corners of display screen components.



13. Take out display screen components and now the disassembly process finishes.

4.2 Assembly process for the player



1. Place the well-processed surface casing on the table board (if it is servicing, need not to process).



2. Use 6 screws in the position shown in the figure to fix middle casing and front casing.



3. Place display screen on tableboard and then stick soft sponge spacers on 4 corners.



4. Stick 12pcs soft sponge spacers in the picture of screen components.



5. Insert one end of 20P flat cable to display screen, shown in the figure.



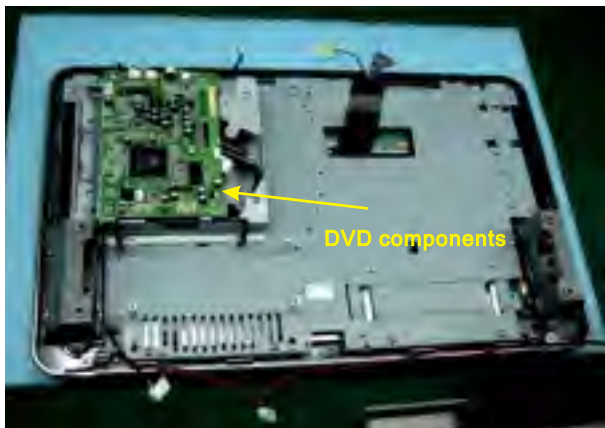
6. Install display screen onto the middle casing to the proper position. Install 4 pressing plates around the screen in the corresponding position, shown in the figure, and then use 4 screws to fix the 4 pressing plates onto the middle casing.



7. Assemble the main installation board onto the middle casing and lead display screen flat cable out from the hole.



8. Use 12pcs TB3*10 screws and a PB3*10 screw to fix the lower part of main installation board onto the middle casing.



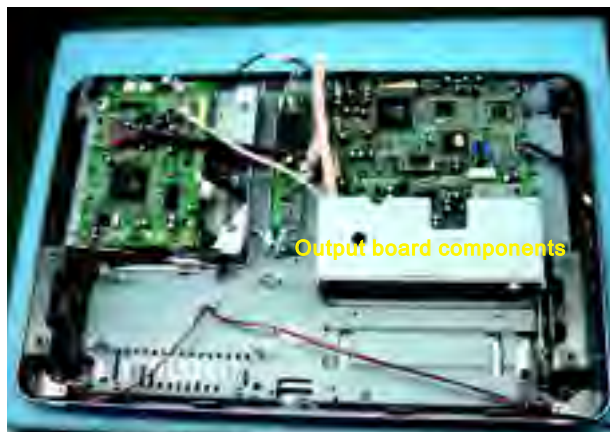
9. Firstly install DVD loader components into the corresponding position of main installation board. Cover 4 antenna fixing plates and use 4 screws to fix the 4 shock-absorbing spacers of DVD components and DVD loader onto main installation board.



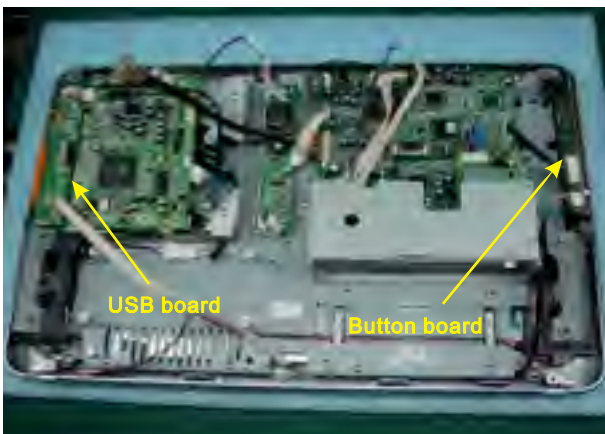
10. Install inverter components onto the appointed position of main installation board and then use 2 PM3×6 white nickel screws to fix inverter components.



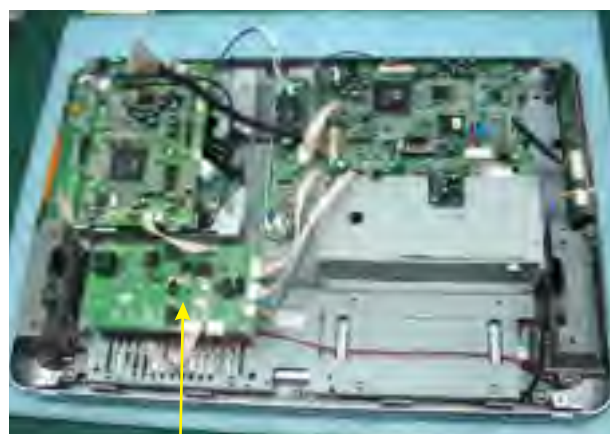
11. Install video board onto main installation board, use 4 screws to fix decode board onto main installation board and lock grounding wire. Insert the flat cable from display screen into CN111 socket of decode board and insert the flat cable from inverter components into CN103 of decode board.



12. Insert flat cable on output board components and then install onto main installation board. Use 2 BT3×3 white nickel screws to fix.



13. Install button board and USB board and then use screw to fix.



14. Install power amplifying board, use screw to fix and then insert all flat cable.



15. Arrange flat cable and check technique inside machine.



16. Close rear cover components and install to proper position.



17. Use screw to fix rear cover and install support bracket.



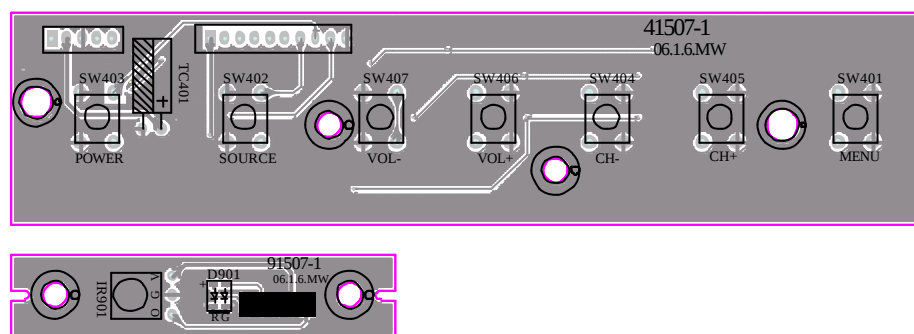
18. Use screw to fix support bracket and machine assembly finishes.

Chapter Cinque

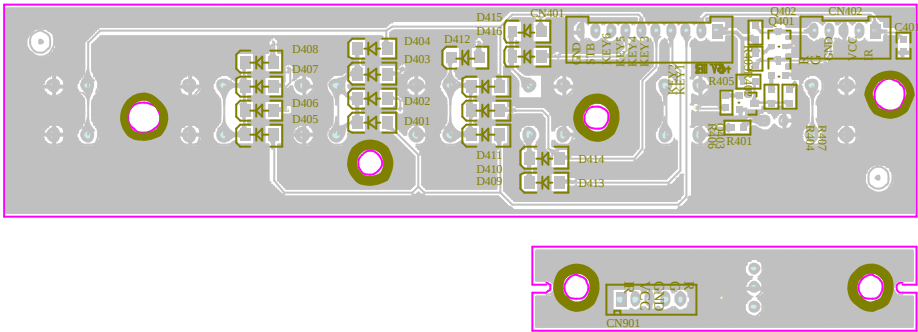
PCB board & Circuit diagram

Section One PCB board

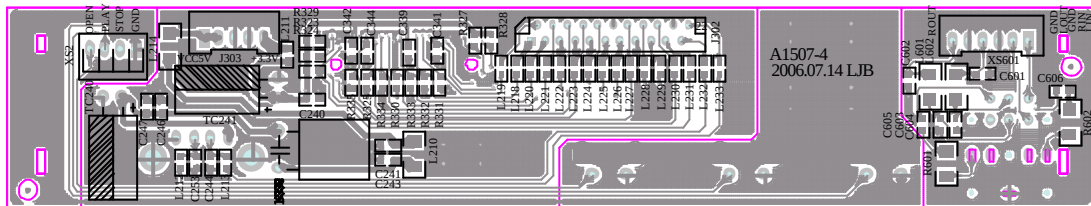
5.1.1 Surface layer of KEY SCAN Board



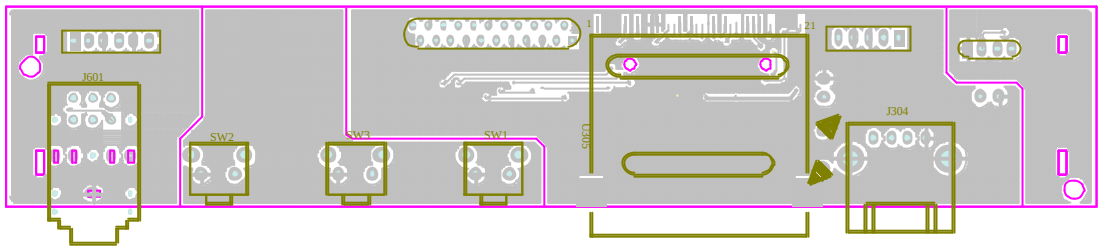
5.1.2 Bottom layer of KEY SCAN Board



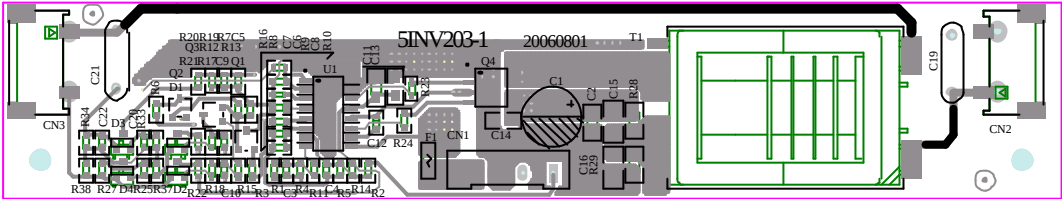
5.1.3 Surface layer of USB&CARD Board



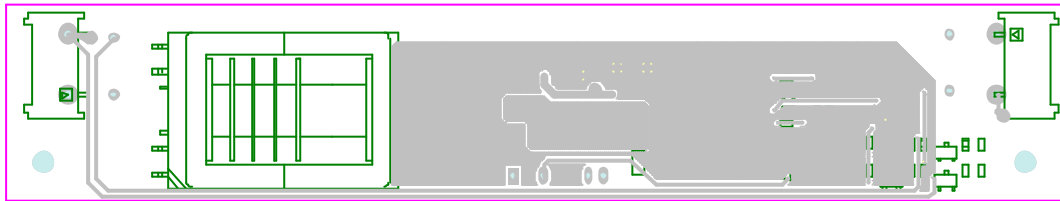
5.1.4 Bottom layer of USB&CARD Board



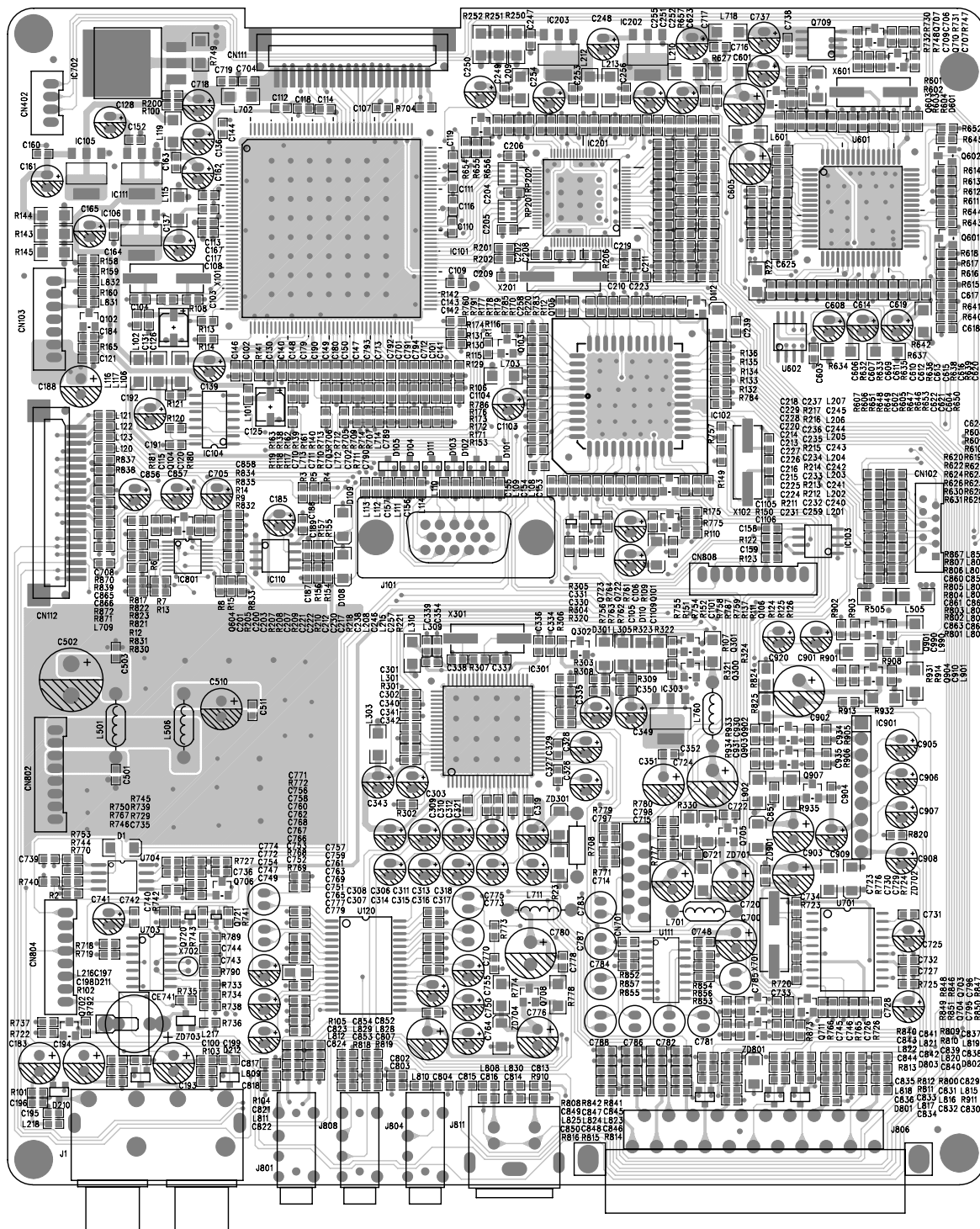
5.1.5 Surface layer of Boost Board



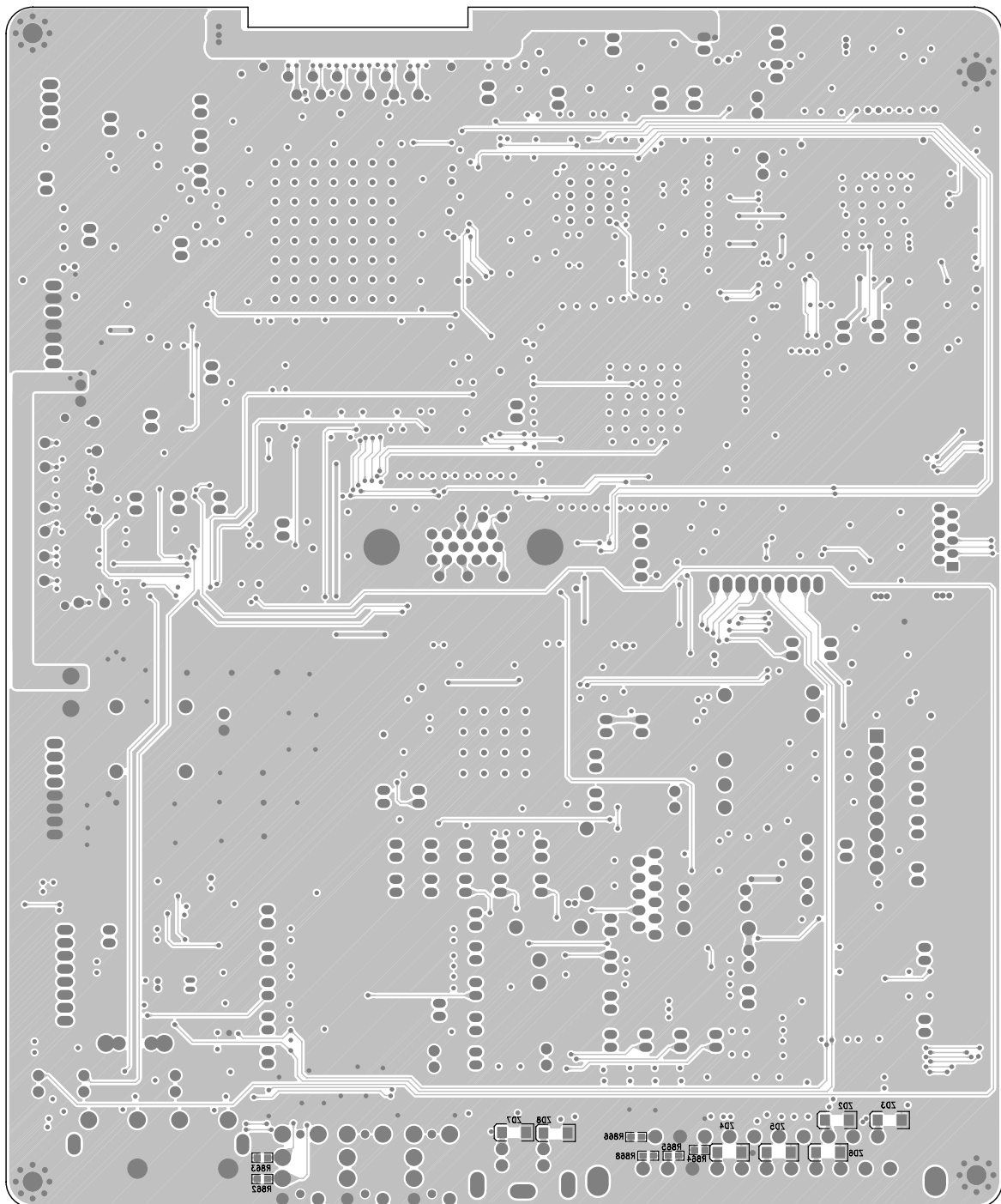
5.1.6 Bottom layer of Boost Board



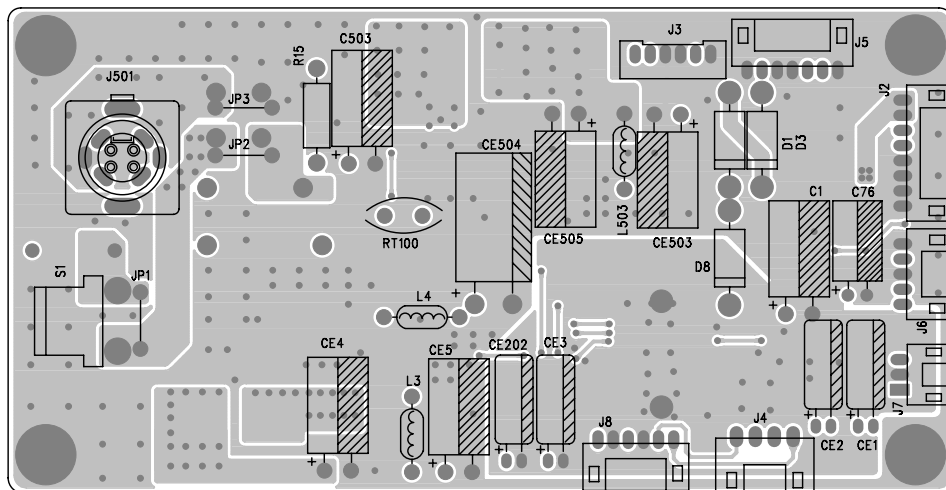
5.1.7 Surface layer of Video Board



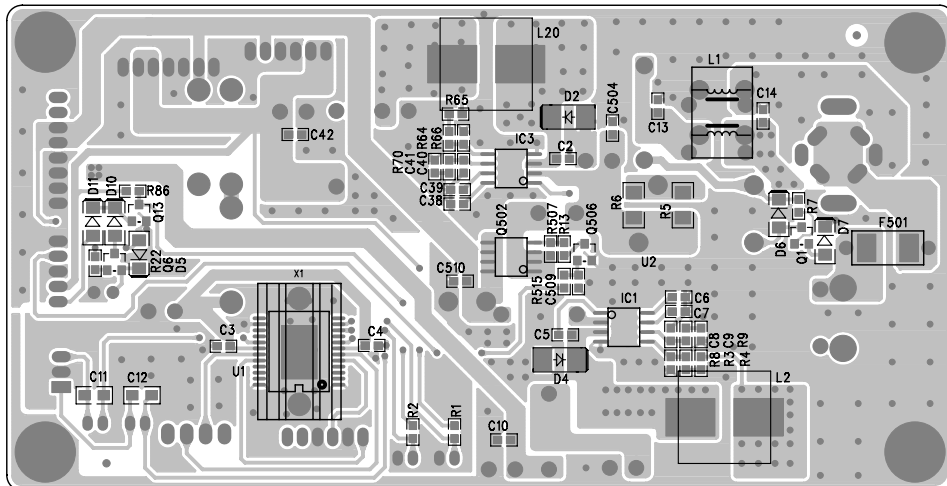
5.1.8 Bottom layer of Video Board



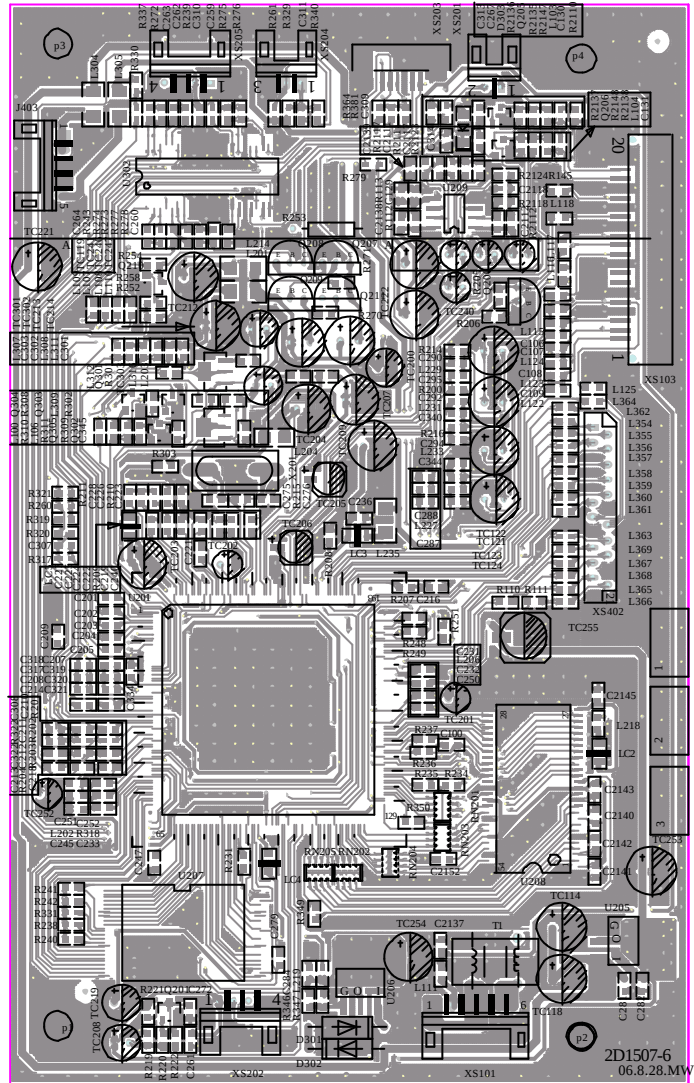
5.1.9 Surface layer of Audio Board



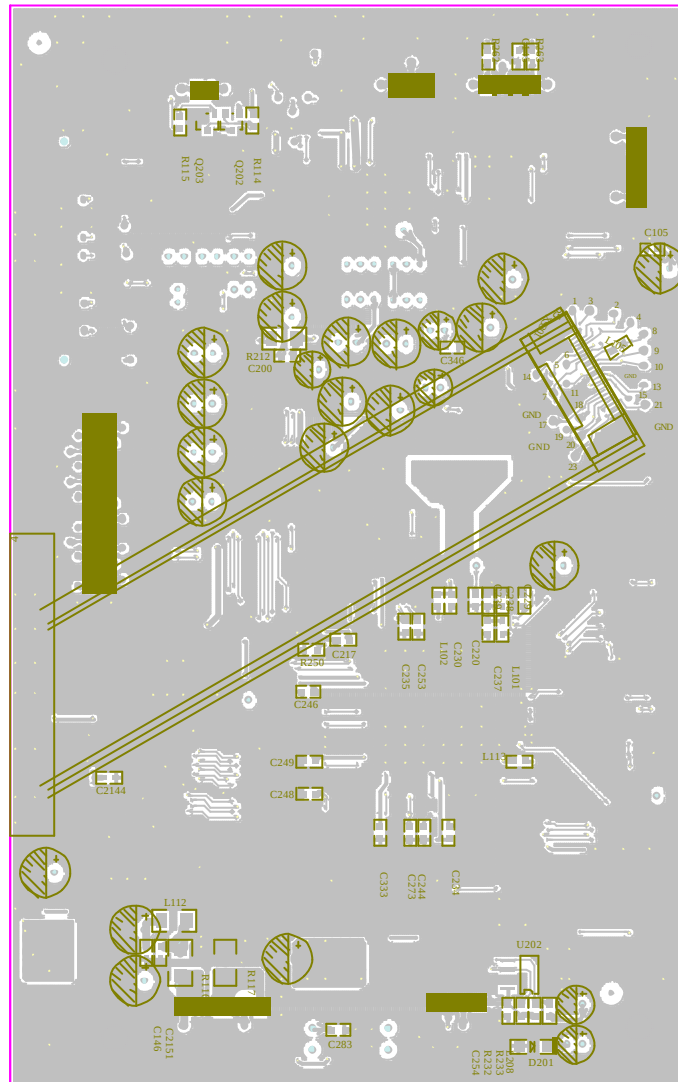
5.1.10 Bottom layer of Audio Board



5.1.11 Surface layer of DVD Board

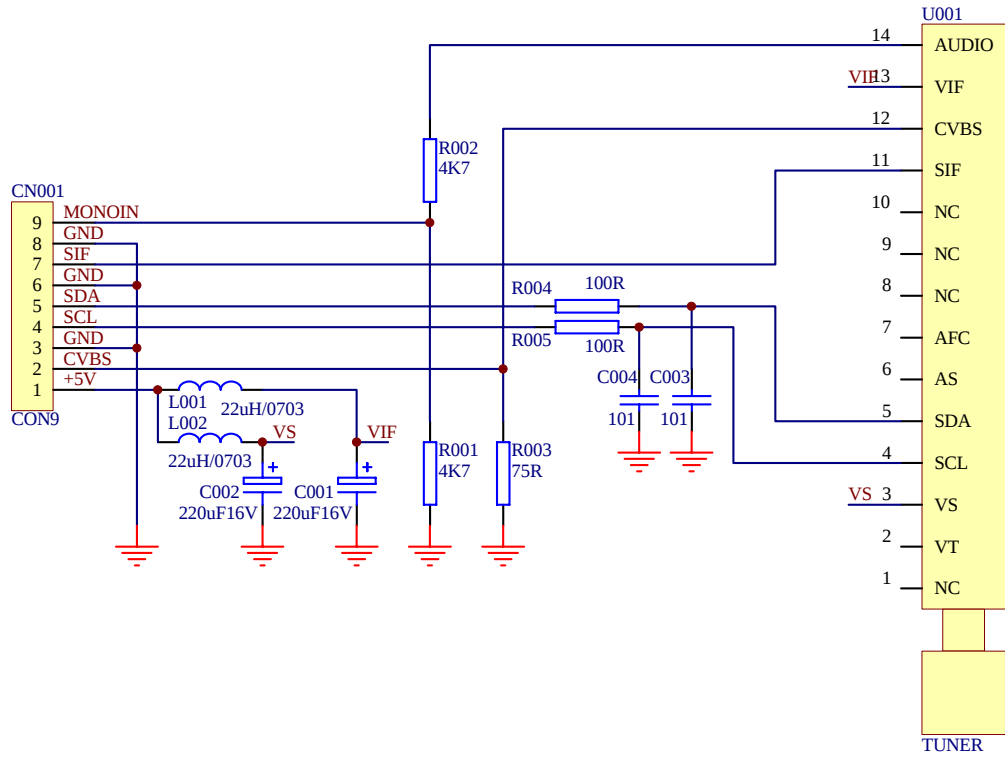


5.1.12 Bottom layer of DVD Board

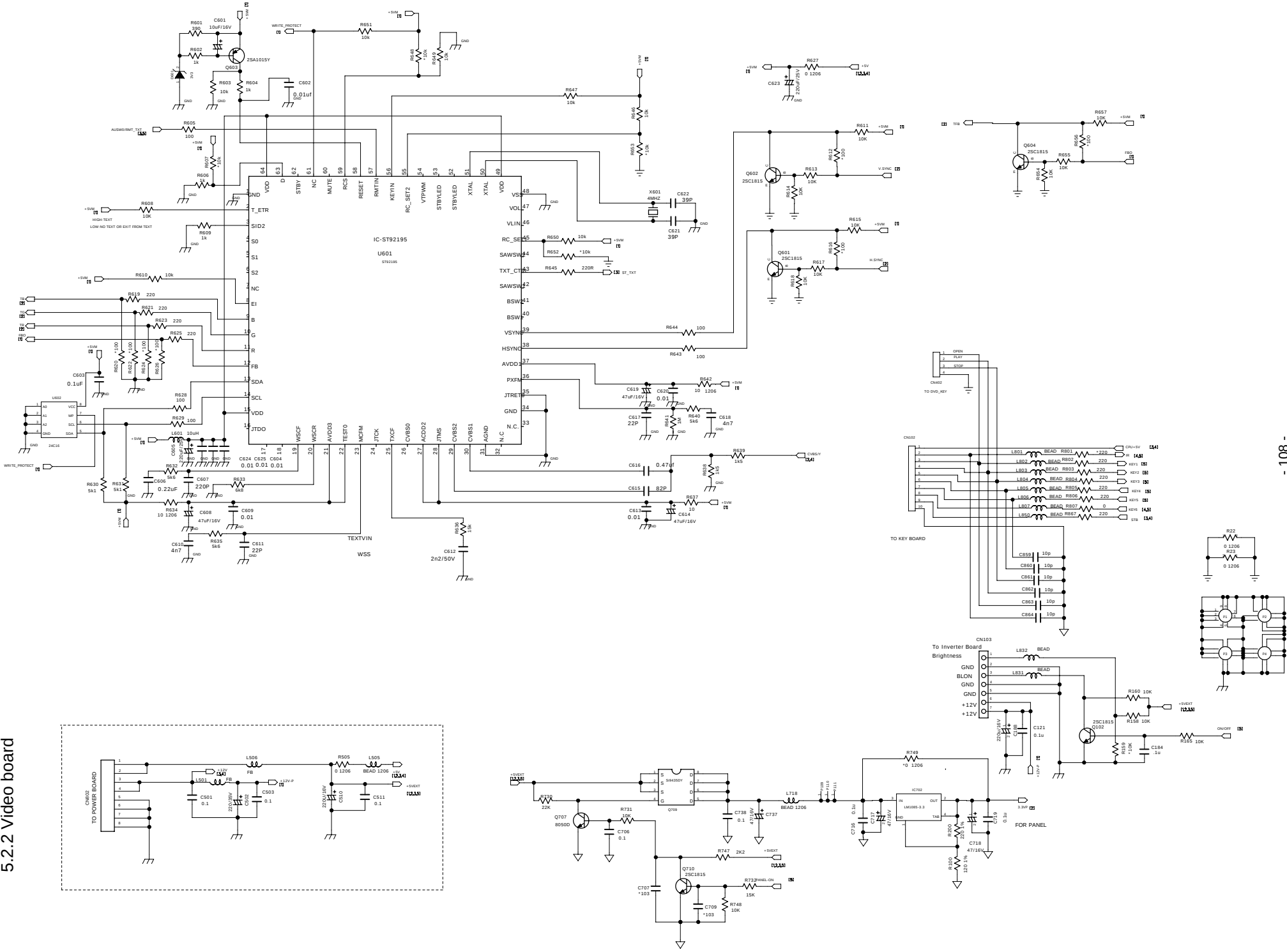


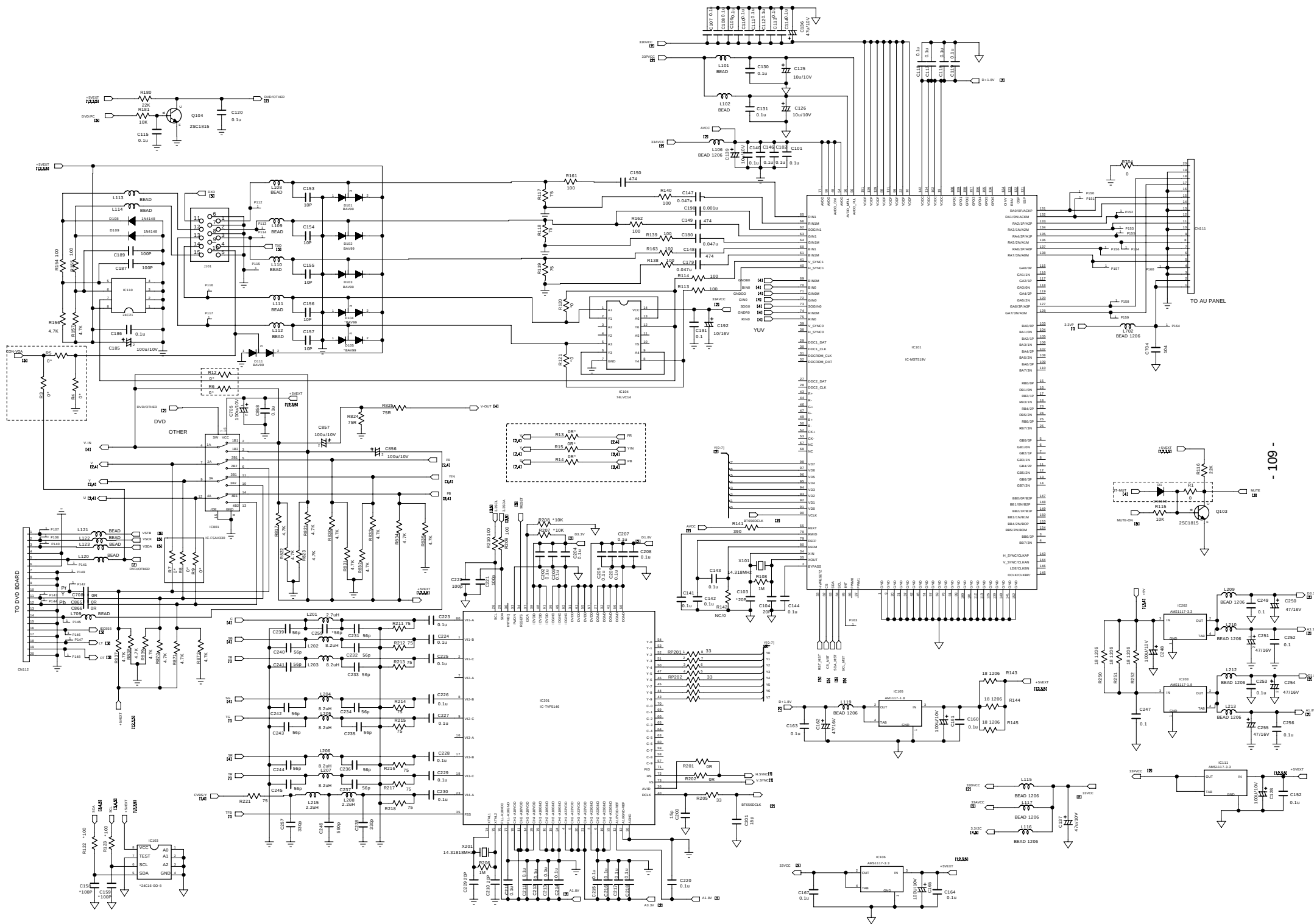
Section Two Circuit diagram

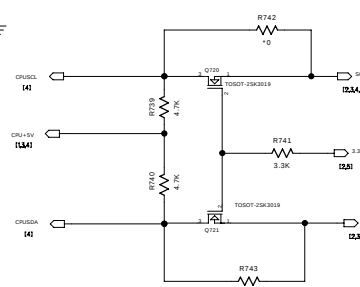
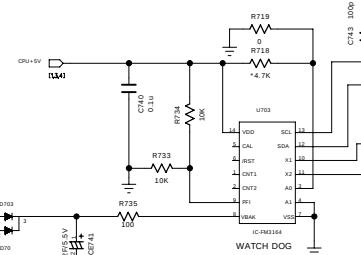
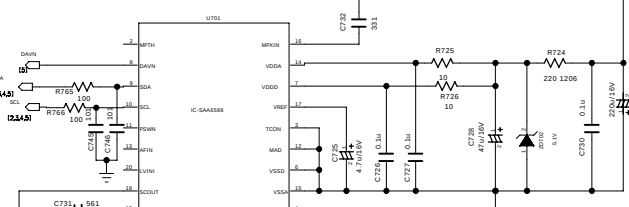
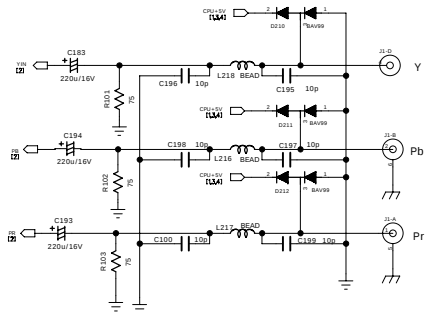
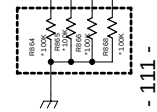
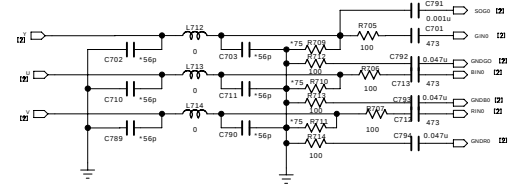
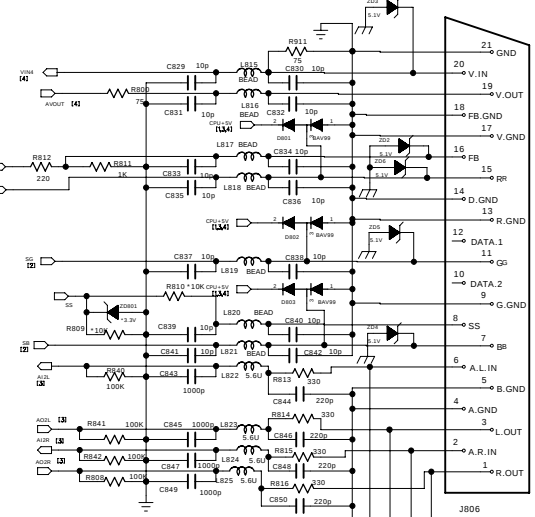
5.2.1 Tuner circuit

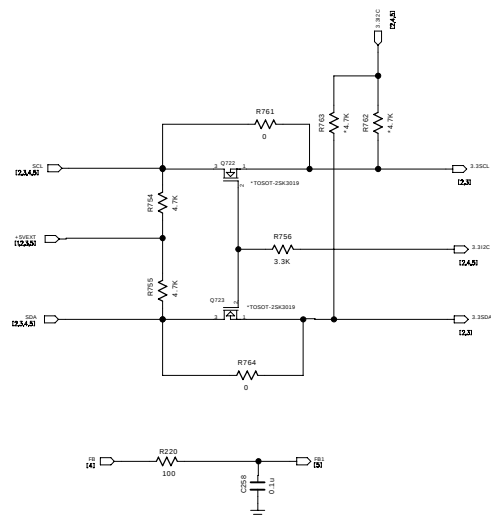


5.2.2 Video board

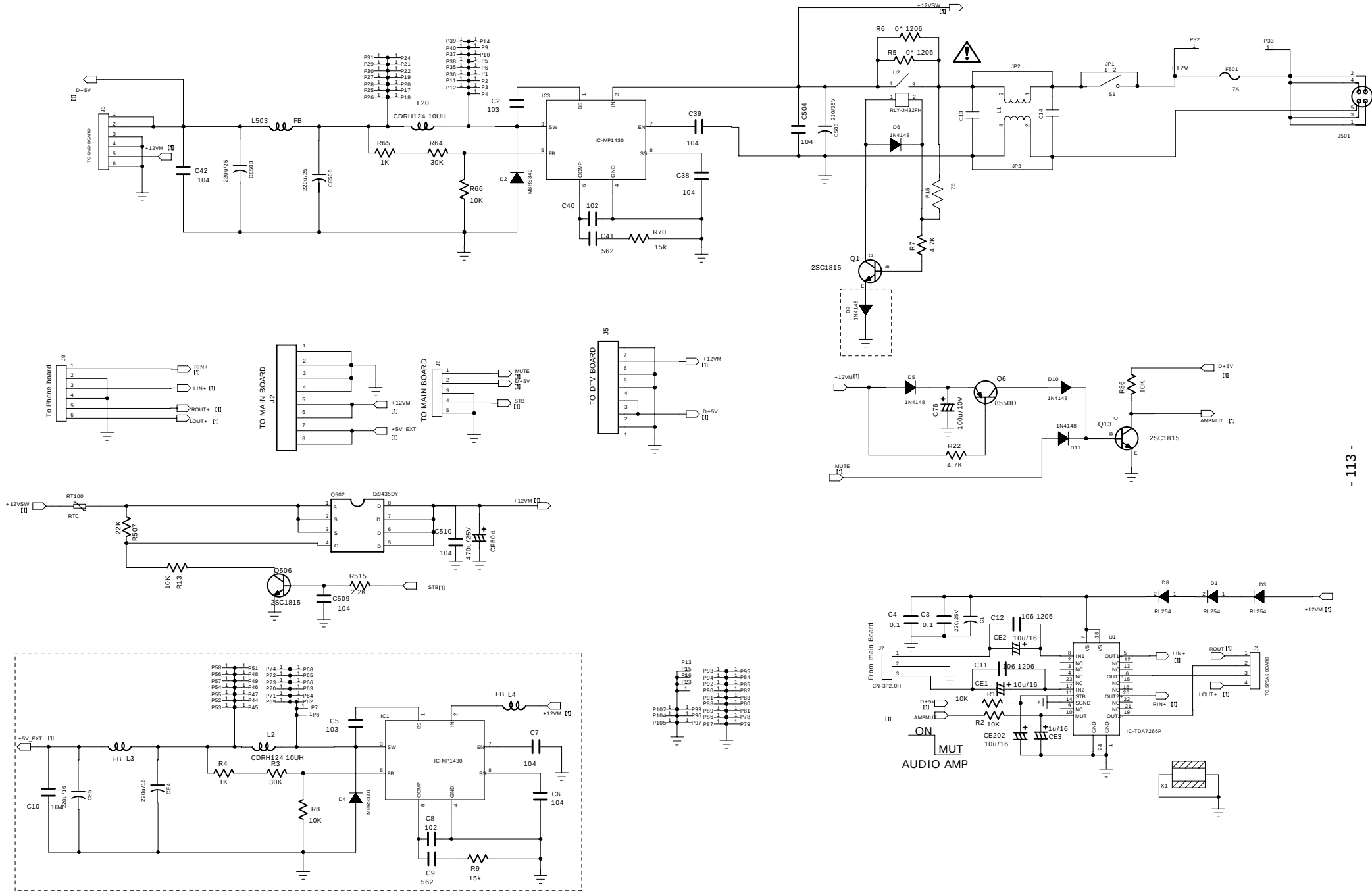




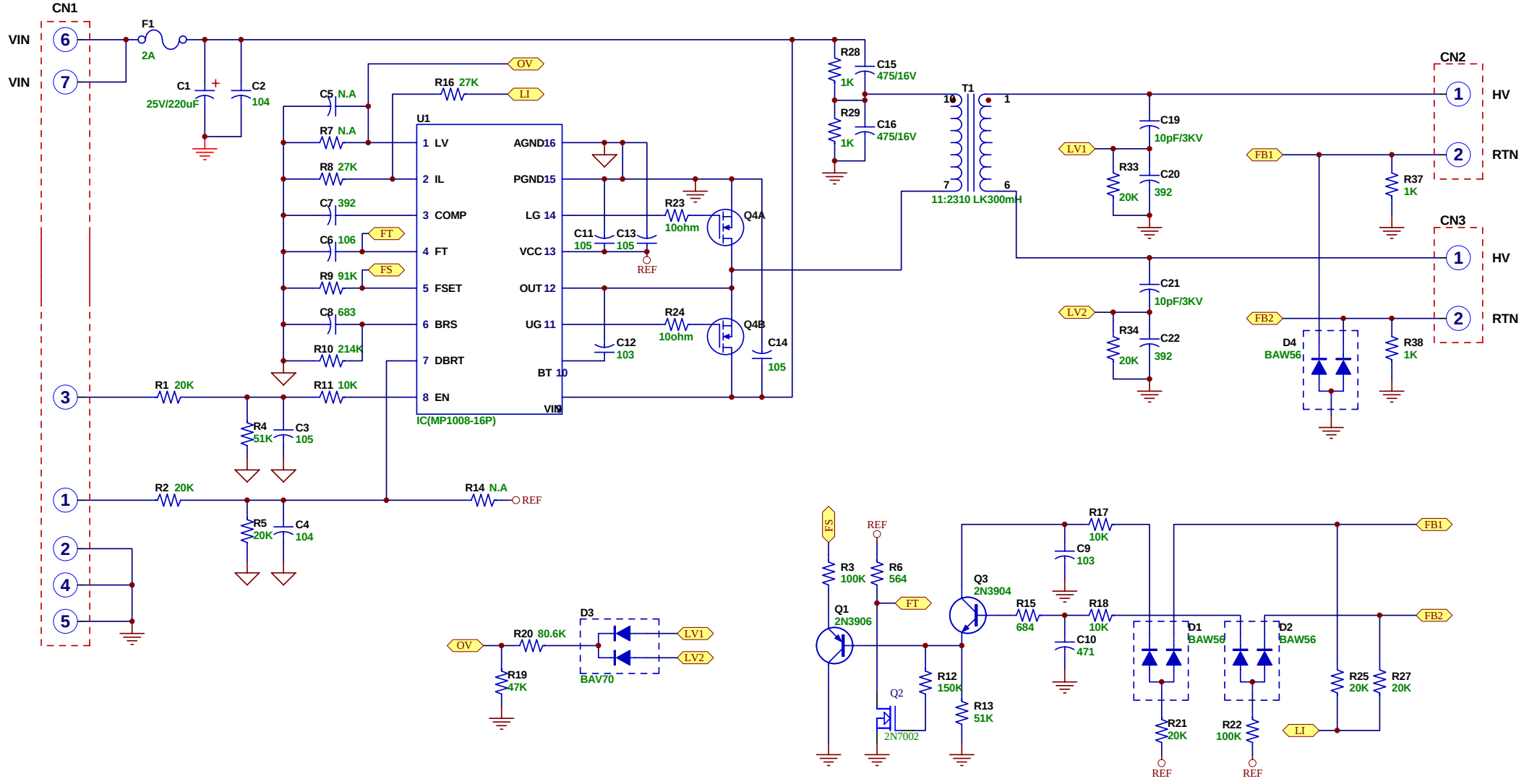




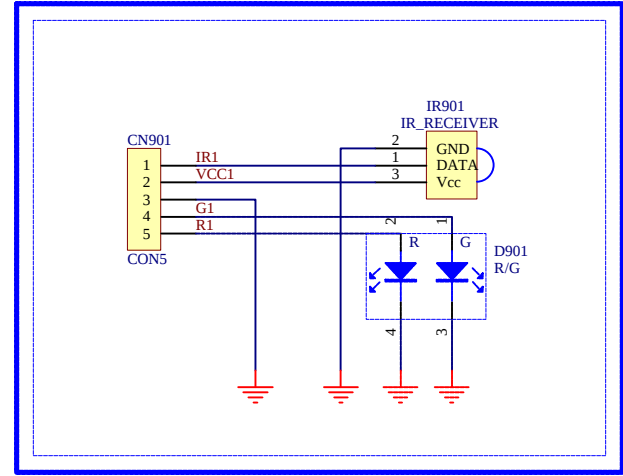
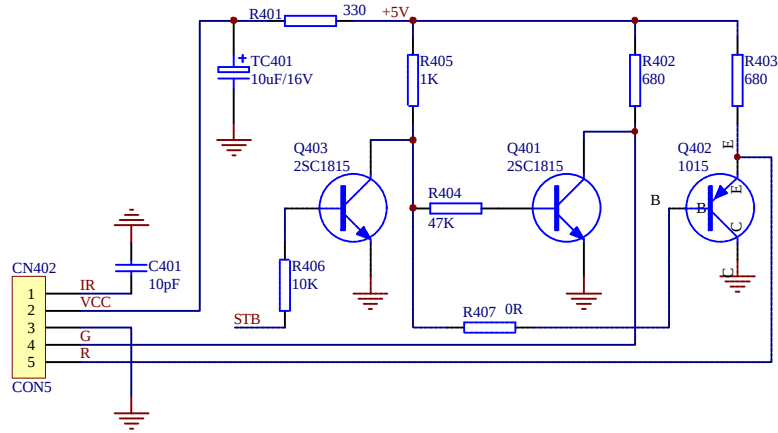
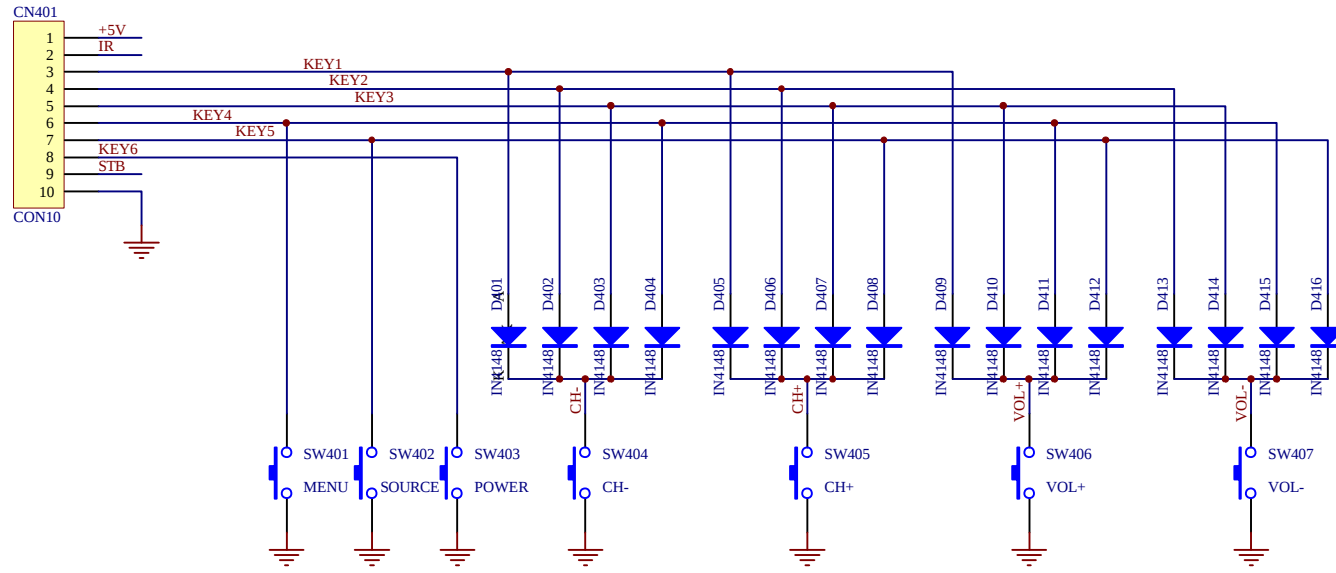
5.2.3 POWER&Audio board



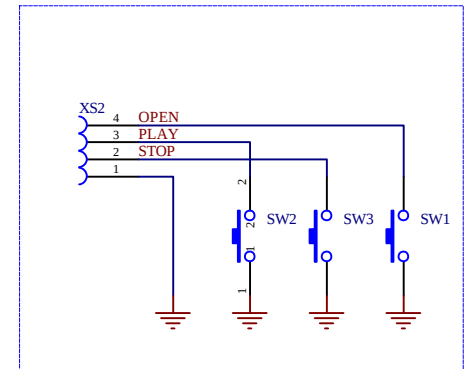
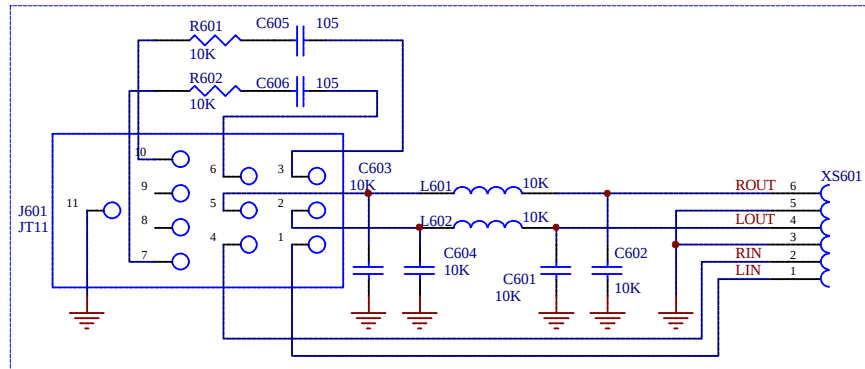
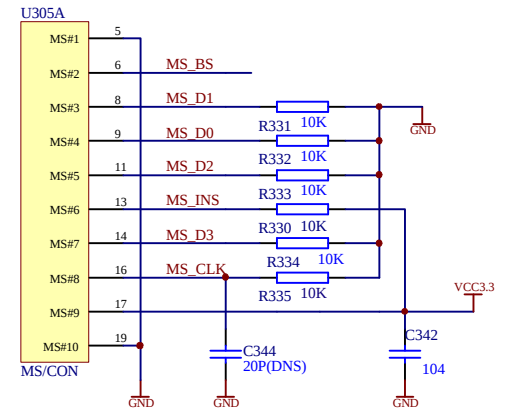
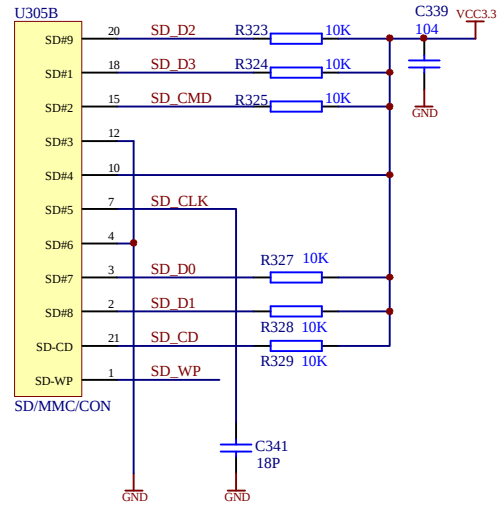
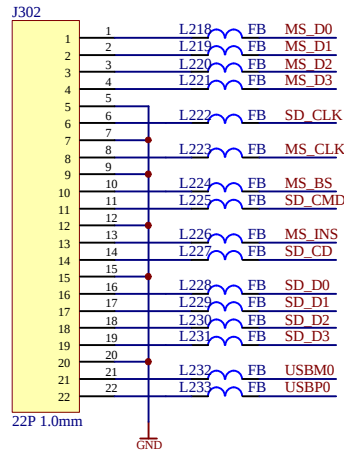
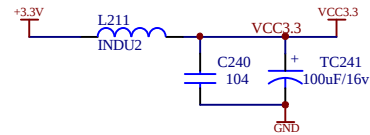
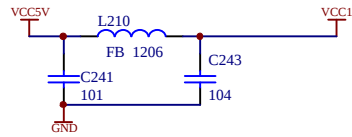
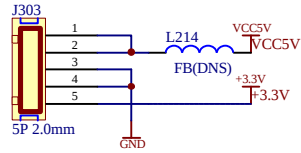
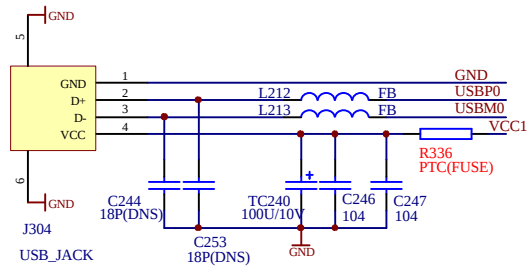
5.2.4 Boost board



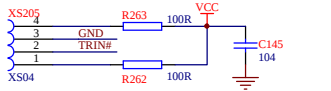
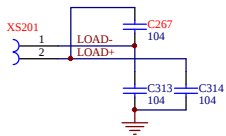
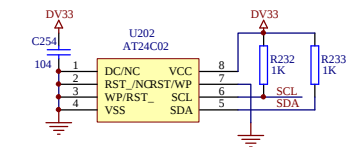
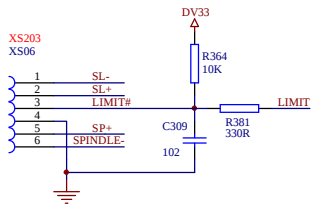
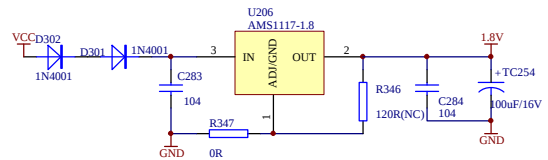
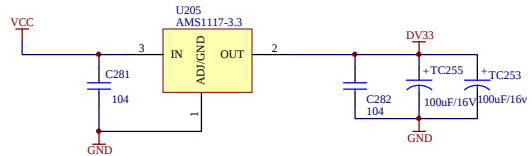
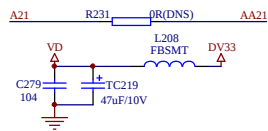
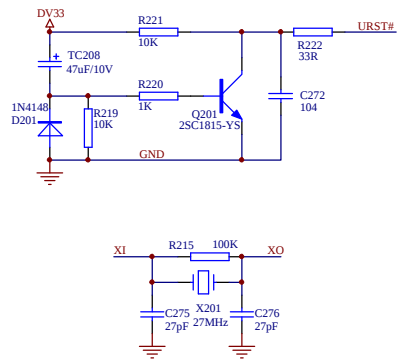
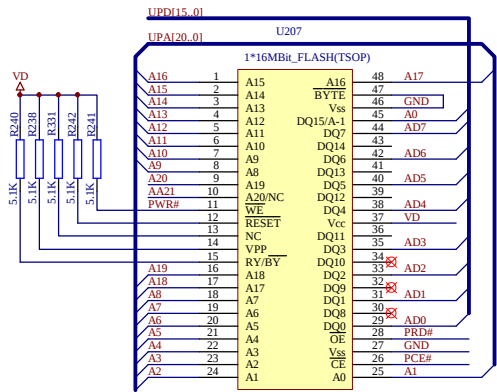
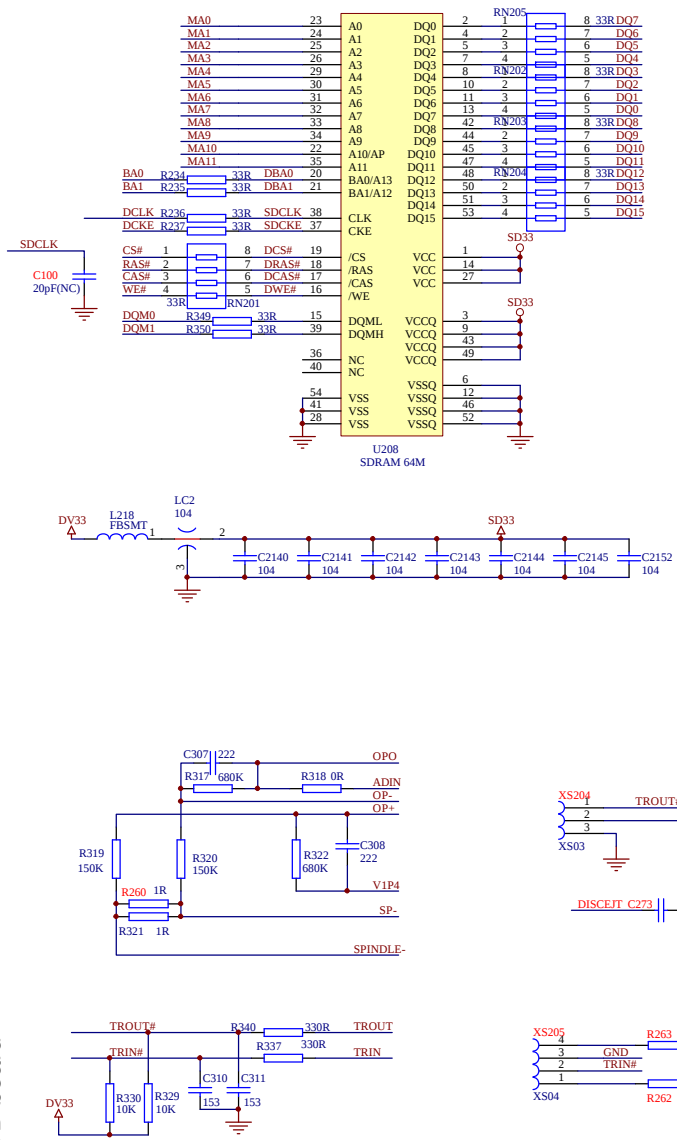
5.2.5 KEY SCAN board

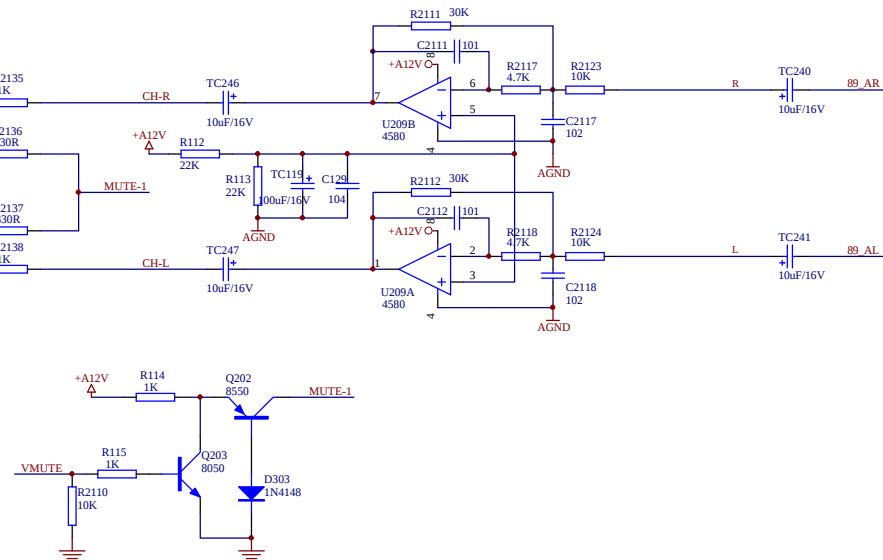
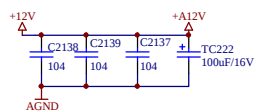
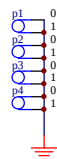


5.2.6 USB&CARD board



5.2.7 DVD board





Chapter six BOM List

MATERIAL CODE	MATERIAL NAME	SPECIFICATIONS	LOCATION
LCD TV LD1506SI (RU) SILVER			
AMPLIFIER BOARD: 5448779			
0090189	SMD RESISTOR	1/16W 30K±5% 0603	R64,R3
0090001	SMD RESISTOR	1/16W 00±5% 0603	R13
2100059	CONNENTION CORDS	F 1.0 SHAPED 7.5mm	JP1,S1
0090014	SMD RESISTOR	1/16W 1K±5% 0603	R65,R4
0090026	SMD RESISTOR	1/16W 22K±5% 0603	R507
0090017	SMD RESISTOR	1/16W 2.2K±5% 0603	R515
0090019	SMD RESISTOR	1/16W 4.7K±5% 0603	R22
0090023	SMD RESISTOR	1/16W 10K±5% 0603	R1,R2,R66,R86,R8
0090024	SMD RESISTOR	1/16W 15K±5% 0603	R70,R9
0310072	SMD CAPACITOR	50V 103±10% 7R 0603	C2,C5
0310066	SMD CAPACITOR	50V 102±10% 7R 0603	C8
0310207	SMD CAPACITOR	50V 104 ±20% 7R 0603	C3,C4,C38,C39,C42,C504,C509,C510,C6,C7,C10
0310199	SMD CAPACITOR	50V 562±10% 7R 0603	C41,C9
0260655	CD	CD288H 16V220U±20% 8×12 3.5	CE4,CE5
0310598	SMD CAPACITOR	50V 102±20% 7R 0603	C40
0310150	SMD CAPACITOR	50V 683±10% 7R 0805	C11,C12
0390424	SMD CORES INDUCTOR	10uH±20% 5.4A CDRH127	L2
0700001	SMD DIODE	LS4148	D5,D10,D11
0680028	SMD SCHOTTKY DIODE	MBRS340	D2,D4
0570019	DIODE	0000254	D1,D3,D8
2300044	FUSE	7A 125V	F501
0780129	SMD TRIODE	8550D	Q6
0780197	SMD TRIODE	C1815	Q13,Q506
0260583	CD	CD11T 16V220U±20%6×12 2.5	CE202
0260774	CD	CD11K 16V100U±20%6.3×11 2.5	C76
0260595	CD	CD110 105 50V1U±20%5×11 2	CE3
0260765	CD	CD288Z 25V470U±20%10×16 5	CE504
0260593	CD	CD112 105 25V220U±20% 8×12 3.5	CE503,CE505,C1,C503

MATERIAL CODE	MATERIAL NAME	SPECIFICATIONS	LOCATION
0390404	SMD CORES INDUCTOR	10uH±20% 4.5A CDRH124	L20
1050017	HEAT SENSITIVITY RESISTOR	NTC 10(5A)±20% 10D 5	RT100
0390052	MAGNETIC BEADS INDUCTOR	FB	L503,L3,L4
0790021	FIELD EFFECT TRANSISTOR	IR7416 SOP	Q502
0790097	FIELD EFFECT TRANSISTOR	AO4419 SO8	Q502
0882945	IC	1430DN SOP	IC3,IC1
1910163	TERMINAL SOCKET	S TERMINAL D34 STRAIGHT INSERT	J501
1940135	SOCKET	6P 2.0mm STRAIGHT FLEX	J8
1940042	SOCKET	8P 2.0mm STRAIGHT CURVING	J2
2121876	SOFT FLAT CABLE	6P70 2.0 2 PIN,WITH NEEDLE,REVERSE	J3
1940160	SOCKET	5P 2.0mm STRAIGHT FLEX	J6
1940012	SOCKET	4P 2.5mm STRAIGHT CURVING	J4
0090555	SMD RESISTOR	1/40O±5% 1206	R5,R6
0410160	COMMON MODE CHOKE	VERTICAL 90UH 5A F9×F5×4	L1
0310068	SMD CAPACITOR	50V 222±10% 7R 0603	C13,C14
1633739	PCB	@31507-4 UL	
0883149	IC	7266P SSO24	U1
3580236	HEAT RADIATION PIECE	18×11×6.9 1509	U1
1940216	SOCKET	3P 2.0mm FLEX INSERT	J7
LCD TV LD1506SI (RU) SILVER			
CARD REDA DECODE BOARD: 1.5/Ver4.0			
0090001	SMD RESISTOR	1/16W 0O±5% 0603	R145,R318,R347
0090272	SMD RESISTOR	1/16W 1O±5% 0603	R260,R275~R278,R321
0090005	SMD RESISTOR	1/16W 33O±5% 0603	R110,R111,R222,R234~R237,R349,R350
0090009	SMD RESISTOR	1/16W 330O±5% 0603	R206,R337,R340,R381,R2136,R2137,R279
0090232	SMD RESISTOR	1/16W 150O±5% 0603	R248,R249,R250,R251
0090106	SMD RESISTOR	1/16W 4.7O±5% 0603	R301,R302,R303
0090017	SMD RESISTOR	1/16W 2.2K±5% 0603	R207
0090181	SMD RESISTOR	1/16W 100O±5% 0603	R252,R254,R262,R263
0090014	SMD RESISTOR	1/16W 1K±5% 0603	R114,R115,R208,R220,R232,R233,R2135,R2138
0090016	SMD RESISTOR	1/16W 1.5K±5% 0603	R270,R271
0090211	SMD RESISTOR	1/16W 680K±5% 0603	R317,R322

MATERIAL CODE	MATERIAL NAME	SPECIFICATIONS	LOCATION
0090019	SMD RESISTOR	1/16W 4.7K±5% 0603	R2117,R2118
0090020	SMD RESISTOR	1/16W 5.1K±5% 0603	R238,R240,R241,R242,R331
0090023	SMD RESISTOR	1/16W 10K±5% 0603	R201,R219,R221,R258,R261,R272,R273,R309,R311,R329,R330,R364,R2110,R2123,R2124
0090024	SMD RESISTOR	1/16W 15K±5% 0603	R202,R211
0090114	SMD RESISTOR	1/8W 00±5% 1206	R116,R117
0090188	SMD RESISTOR	1/16W 18K±5% 0603	R203
0090025	SMD RESISTOR	1/16W 20K±5% 0603	R204,R239,R243,R274
0090026	SMD RESISTOR	1/16W 22K±5% 0603	R112,R113
0090197	SMD RESISTOR	1/16W 150K±5% 0603	R319,R320
0090189	SMD RESISTOR	1/16W 30K±5% 0603	R2111,R2112
0090034	SMD RESISTOR	1/16W 100K±5% 0603	R210,R215,R308,R310,R2147,R2148
0090319	PRECISION SMD RESISTOR	1/16W 750K±1% 0603	R209
0000375	CARBON FILM RESISTOR	1/42.20±5%	R253
0100019	SMD RESISTOR NETWORKS	1/16W 330±5% 8P	RN201~RN205
0090537	SMD RESISTOR	1/4W 1800±5% 1206	R212
0310190	SMD CAPACITOR	50V 27P±5% NPO 0603	C275,C276
0310085	SMD CAPACITOR	50V 20P±5% NPO 0603	C223,C100
0310047	SMD CAPACITOR	50V 101±5% NPO 0603	C106~C109,C287,C288,2111,C2112
0310066	SMD CAPACITOR	50V 102±10% 7R 0603	C130,C131,C224,C309,C2117,C2118
0310055	SMD CAPACITOR	16V 333±10% 7R 0603	C226
0310207	SMD CAPACITOR	50V 104 ±20% 7R 0603	C105,C129,C145,C146,C200,C207~C209,C211,C214,C216~C218,C225,C227~C236,C244~C254,C259~C261,C263,C267,C272,C273,C279,C281~C284,C301~303,C313,C314,C333,C334,C345,C346,C2137~C2145,C2151,C2152
0310643	SMD CAPACITOR	16V 105±20% Y5V 0603	C201~C205,C239,C240,C317~C322
0310326	SMD CAPACITOR	50V 121±5% NPO 0603	C290,C292,C294,C295,C340,C344
0310048	SMD CAPACITOR	50V 151±5% NPO 0603	C262,C264
0310051	SMD CAPACITOR	50V 331±5% NPO 0603	C212,C213
0310201	SMD CAPACITOR	50V 153±10% 7R 0603	C210,C238,C310,C311
0310068	SMD CAPACITOR	50V 222±10% 7R 0603	C237,C307,C308
0310052	SMD CAPACITOR	50V 391±5% NPO 0603	C219
0310056	SMD CAPACITOR	16V 473±10% 7R 0603	C221,C222
0310362	SMD CAPACITOR	16V474 +80%-20% Y5V 0603	C220

MATERIAL CODE	MATERIAL NAME	SPECIFICATIONS	LOCATION
0390385	SMD INDUCTOR	22uH±10% 2012	L204
0390096	SMD INDUCTOR	1.8UH±10% 1608	L227,L229,L231,L233
0390355	SMD INDUCTOR	4.7UH±10% 1608	L203,L309,L312
0390095	SMD MAGNETIC BEADS	FC160822105	L103,L104,L115~L118,L122~L124,L354~L369
0390300	SMD MAGNETIC BEADS	600O/100MHZ±25% 1608	L101,L102,L111,L113,L202,L206,L208,L218,L219,L316,L307,L308,L311,L100,L105~L110
0390025	SMD MAGNETIC BEADS	BGH2012B601L	LC2~LC5
0390301	SMD MAGNETIC BEADS	600O/100MHZ±25% 3216	L112,L201,L214,L235,L304,L305
0260201	CD	CD11C 16V100U±20%6×7 2.5	TC114,TC118,TC119,TC121~TC124,TC203,TC204,TC207,TC209,TC221,TC222,TC253~TC254,TC301
0260636	CD	CD11E 16V47U±20%5×5 2	TC200,TC208,TC212~TC214,TC219,TC302,TC303
0260569	CD	CD11E 16V10U±20%4×5 1.5	TC201,TC202,TC240,TC241,TC246,TC247,TC252
0260468	SMD CD	16V100U±20% 6.3×5.4	TC255
0260428	SMD CD	16V10U±20%4×4×5.4	TC205,TC206
0700007	SMD DIODE	14148	D201,D303
0780197	SMD TRIODE	C1815	Q201,Q205,Q206
0780115	SMD TRIODE	2SB1132	Q301,Q302
0780193	SMD TRIODE	2S3018	Q303,Q304
0780040	SMD TRIODE	3904(100-300) SO23	Q305,Q203
0780129	SMD TRIODE	8550D	Q202
0780319	TRIODE	SS8550 TO-92	Q209,Q211
0780138	TRIODE	8050D	Q207,Q208
0780062	SMD TRIODE	9014C	Q210
0780024	TRIODE	23906	Q200
0570003	DIODE	1N4001	D301,D302
0882644	IC	1389FE/H(HD) QFP	U201
0882149	IC	IS24C02-3 SOP	U202
0881459	IC	D5954 SOP	U302
0882262	IC	4641632TC60 TSOP	U208
0880361	IC	4558 SOP	U209
0882114	IC	AMS1117-3.3 SO223	U205
0882121	IC	18 SO223	U206
0960236	SMD CRYSTAL OSCILLATOR	27.00MHz 49-S	X201

MATERIAL CODE	MATERIAL NAME	SPECIFICATIONS	LOCATION
1940198	CABLE SOCKET	6P 1.0mm SMD,SUBMIT MEET WITH CLASP	XS203
1940283	SOCKET	20P 1.25mm SMD,HORIZONTAL	XS103
1940094	CABLE SOCKET	24P 0.5mm SMD SUBMIT MEET WITH CLASP	XS301
1940170	SOCKET	2P 2.0mm STRAIGHT CURVING	XS201
1940141	SOCKET	4P 2.0mm STRAIGHT FLEX	XS205
1940216	SOCKET	3P 2.0mm FLEX INSERT	XS204
1940160	SOCKET	5P 2.0mm STRAIGHT FLEX	J403
1940135	SOCKET	6P 2.0mm STRAIGHT FLEX	XS101
1940067	CABLE SOCKET	11P 1.0mm DUAL RANK STRAIGHT INSERT	XS402
1633621	PCB	@2D1507-9 UL	
LCD TV LD1506SI (RU) SILVER			
KEY-PRESS BOARD: 5449313			
0090009	SMD RESISTOR	1/16W 330O±5% 0603	R401
0090013	SMD RESISTOR	1/16W 680O±5% 0603	R403,R402
0090029	SMD RESISTOR	1/16W 47K±5% 0603	R404
0090023	SMD RESISTOR	1/16W 10K±5% 0603	R406
0090014	SMD RESISTOR	1/16W 1K±5% 0603	R405
0090001	SMD RESISTOR	1/16W 0O±5% 0603	R407
0310188	SMD CAPACITOR	50V 10P±5% NPO 0603	C401
0570052	DIODE	1N4148 SHAPED 7.5mm	D407,D408,D404,D403,D402,D401,D406,D405,D410,D409,D411,D412,D415,D416,D414,D413
0780197	SMD TRIODE	C1815	Q403,Q401
0260102	CD	CD110 25V10U±20%5×11 2	TC401
1340145	LIGHT TOUCH RESTORE SWITCH	VERTICAL TSAC-2	SW401~SW407
1940393	CABLE SOCKET	5P 1.0mm DUAL RANK,STRINGHT INSERT	CN401
1940024	SOCKET	5P 2.0mm	CN402
0780198	SMD TRIODE	2S1015	Q402
1633625	PCB	41507-3	
LCD TV LD1506SI (RU) SILVER			
RECEIVING BOARD OF REMOTE CONTROL: 5446787			
0620172	BICOLOR SMD DIODE	LTST-C155KGJRK T	D901
2360002	IR SENSOR	HS0038B	IR901

MATERIAL CODE	MATERIAL NAME	SPECIFICATIONS	LOCATION
1632980	PCB	91507-1	
2150255	FLAT CABLE	5P 230 2.0 2 5P SHIELD REVERSE WITH NEEDLE	BUTTON: CN402, REMOTE CONTROL: CN901
LCD TV LD1506SI (RU) SILVER			
TUNER BOARD: 5446788			
0090001	SMD RESISTOR	1/16W 00±5% 0603	R004,R005
0090019	SMD RESISTOR	1/16W 4.7K±5% 0603	R002
0090181	SMD RESISTOR	1/16W 100O±5% 0603	R003
0310070	SMD CAPACITOR	50V 332±10% 7R 0603	R001
0390292	INDUCTOR	22uH±20% 350mA 0307	L002,L001
0260028	CD	CD11 16V220U±20%6×12 2.5	C001,C002
1020028	TUNER	JS-6B2/121	U001
1940043	SOCKET	9P 2.0mm STRAIGHT CURVING	CN001
1632352	PCB	01507-0	
LCD TV LD1506SI (RU) SILVER			
USB CARD BOARD: 5448782			
0090135	SMD RESISTOR	1/8W 100O±5% 1206	R601,R602
0310598	SMD CAPACITOR	50V 102±20% 7R 0603	C601,C602
0310049	SMD CAPACITOR	50V 221±5% NPO 0603	C603,C604
0310207	SMD CAPACITOR	50V 104 ±20% 7R 0603	C241,C243,C246,C247
0310234	SMD CAPACITOR	16V 105 +80%-20% Y5V 0603	C605,C606
0260201	CD	CD11C 16V100U±20%6×7 2.5	TC240
0390287	SMD MAGNETIC BEADS	19O/100mHZ±25% 1608	L212,L213
0390301	SMD MAGNETIC BEADS	600O/100MHZ±25% 3216	L601,L602,L210,L214
0390095	SMD MAGNETIC BEADS	FC160822105	L232,L233
0090024	SMD RESISTOR	1/16W 15K±5% 0603	C244,C253
1980061	EARPHONE SOCKET	C3.5-01K	JT11
1050016	HEAT SENSITIVITY RESISTOR	PTC FRU13530V	R336
5120013	YELLOW GLUEWATER		DROP GLUE TO FIX R336
1860074	USB SOCKET	2UB-0001000	J304
1940024	SOCKET	5P 2.0mm	J303
2150254	FLAT CABLE	4P220 2.0 2 4P SHIELD,WITH WELD PIECE/WITH L NEEDLE	XS2
1940005	SOCKET	6P 2.0mm	XS601

MATERIAL CODE	MATERIAL NAME	SPECIFICATIONS	LOCATION
1340144	LIGHT TOUCH RESTORE SWITCH	HORIZONTAL TSVB-2	SW1,SW2,SW3
1940067	CABLE SOCKET	11P 1.0mm DUAL RANK STRAIGHT INSERT	J302
1633624	PCB	1507-6	
LCD TV LD1506SI (RU) SILVER			
VIDEO FREQUENCY BOARD: 1.7/Ver2.00			
0000276	CARBON FILM RESISTOR	1/4100O±5% SHAPED 10	R708
0090001	SMD RESISTOR	1/16W 0O±5% 0603	R908,R704,R852,R853,R750,R770,R753,R767,R761,R764,L712,L713,L714,C866,C708,R801,R807,C865,R737,L202~L207,R202,R120,R121,R1,R5,R6~R9,R772,R773
0090005	SMD RESISTOR	1/16W 33O±5% 0603	R205
0090006	SMD RESISTOR	1/16W 75O±5% 0603	R212,R214,R216,R221,R820
0090008	SMD RESISTOR	1/16W 220O±5% 0603	R802,R803,R804,R805,R806,R867,L810
0090012	SMD RESISTOR	1/16W 560O±5% 0603	R301
0090112	SMD RESISTOR	1/10W 75O±5% 0805	R824,R825
0090014	SMD RESISTOR	1/16W 1K±5% 0603	R913,R727,R109,R303,R306
0090015	SMD RESISTOR	1/16W 1.2K±5% 0603	R775,R822
0090017	SMD RESISTOR	1/16W 2.2K±5% 0603	R747
0090018	SMD RESISTOR	1/16W 3.3K±5% 0603	R729,R741
0090019	SMD RESISTOR	1/16W 4.7K±5% 0603	R931,R739,R740,R744,R745,R746,R902,R125,R124,R126,R129~R137,R151,R152,R153,R170~R174,R176~R179,R757,R758,R759,R785~R787,R783,R933,R934,R850,R847,R835,R834,R833,R832,R830,R831,R817,R837,R838,R839,R870,R871,R872,R821,R823,R754,R755,R760,R873,R2
0090020	SMD RESISTOR	1/16W 5.1K±5% 0603	R175,R159
0090023	SMD RESISTOR	1/16W 10K±5% 0603	R106,R115,R160,R165,R181,R208,R320,R731,R748,R905,R906,R851,R846,R110,R180,R308
0090024	SMD RESISTOR	1/16W 15K±5% 0603	R732
0090026	SMD RESISTOR	1/16W 22K±5% 0603	R730,R849,R848
0090029	SMD RESISTOR	1/16W 47K±5% 0603	R111,R112
0090034	SMD RESISTOR	1/16W 100K±5% 0603	R104,R105,R302
0090104	SMD RESISTOR	1/16W 2.7K±5% 0603	R158
0090109	SMD RESISTOR	1/16W 1MO±5% 0603	R108,R150,R206,R307
0090114	SMD RESISTOR	1/8W 0O±5% 1206	R22,R23,L305,R505,R627
0090181	SMD RESISTOR	1/16W 100O±5% 0603	R209,R210,R220,R705~R707,R712~R714,R304,R305,C804,R656,R122,R123

MATERIAL CODE	MATERIAL NAME	SPECIFICATIONS	LOCATION
0090183	SMD RESISTOR	1/16W 3K±5% 0603	R903,R914
0090234	SMD RESISTOR	1/16W 390O±5% 0603	R141
0090538	SMD RESISTOR	1/4W 120O±5% 1206	R932,R935
0090555	SMD RESISTOR	1/40O±5% 1206	L718,L702
0090557	SMD RESISTOR	1/4W 18O±5% 1206	R250,R251,R252
0090642	SMD RESISTOR	1/4W 1.2K±5% 1206	R901
0090662	SMD RESISTOR	1/4W 47O±5% 1206	R143,R144,R145
0090745	PRECISION SMD RESISTOR	1/16W 220O±1% 0603	R100
0090766	PRECISION SMD RESISTOR	1/16W 120O±1% 0603	R200
1030036	SMD PRESS SENSITIVITY RESISTOR	S1608E180C600NPT 0603	C822,C824,C844,C846,C848,C850
0100019	SMD RESISTOR NETWORKS	1/16W 33O±5% 8P	RP201,RP202
0260067	CD	CD11 50V2.2U±20%5×11 2	C335
0260102	CD	CD110 25V10U±20%5×11 2	C139,C303,C308,C311,C313,C316,C317,C328,C343,C905,C906,C907,C908,C105
0260428	SMD CD	16V10U±20%4×4×5.4	C125,C126
0260517	CD	CD11K 10V100U±20%5×11 2	C128,C161,C165,C248,C326,C705,C856,C857,C901,C920
0260578	CD	CD11T 50V22U±20%5×11 2	C106
0260593	CD	CD112 105 25V220U±20% 8×12 3.5	C502
0260604	CD	CD112S 105 25V220U±20% 8×12 3.5	C502
0260607	CD	CD11K 25V220U±20%8×12 3.5	C502
0260653	CD	CD11K 16V470U±20%8×14 3.5	C902
0260664	CD	CD11K 16V220U±20% 6.3×11 2.5	C351,C903,C188,C623,C909
0260655	CD	CD288H 16V220U±20% 8×12 3.5	C510
0260754	CD	CD11K 25V47U±20%5×11 2	C162,C250,C251,C254,C255,C349,C717,C718,C737,C741,C136,C137,C318,C1103,C700
0260763	NPCD	CD71T 25V4.7U±20% 5×11 2	C783,C784,C781,C782,C785,C786,C787,C788
0260764	CD	CD11T 50V1U±20%5×11 2	C306,C307,C314,C315
0310042	SMD CAPACITOR	50V 15P±5% NPO 0603	C200,C201
0310047	SMD CAPACITOR	50V 101±5% NPO 0603	C187,C189,C221,C222,C301,C330,C331,C158,C159
0310051	SMD CAPACITOR	50V 331±5% NPO 0603	C238,C257
0310057	SMD CAPACITOR	16V 104±10% 0603	C224,C225,C226,C227,C228,C229,C230,C802,C795,C796,C501,C503
0310066	SMD CAPACITOR	50V 102±10% 7R 0603	C791,C821,C823,C843,C845,C847,C849
0310072	SMD CAPACITOR	50V 103±10% 7R 0603	C302

MATERIAL CODE	MATERIAL NAME	SPECIFICATIONS	LOCATION
0310085	SMD CAPACITOR	50V 20P±5% NPO 0603	C103,C104,C209,C210,C337,C338,C1105,C1106
0310188	SMD CAPACITOR	50V 10P±5% NPO 0603	C859,C860,C861,C862,C863,C864
0310197	SMD CAPACITOR	50V 561±10% 7R 0603	C246
0310205	SMD CAPACITOR	50V 473±10% 0603	C792,C793,C794,C701,C713,C712
0310207	SMD CAPACITOR	50V 104 ±20% 7R 0603	C247,C249,C252,C706,C738,C742,C748,C107,C108,C109,C110,C111,C112,C113,C114,C116,C117,C118,C119,C130,C131,C140,C141,C142,C143,C144,C146,C152,C160,C163,C164,C167,C202,C203,C204,C205,C206,C207,C208,C211,C212,C213,C214,C215,C216,C217,C218,C219,C220,C253,C256,C258,C309,C310,C312,C319,C321,C327,C329,C336,C339,C340,C341,C342,C350,C352,C354,C716,C719,C735,C736,C739,C778,C851,C858,C904,C910,C930,C931,C934,C935,C990,C101,C102,C1104,C704,C184,C115,C120,C1101,C334,C511,C121
0310234	SMD CAPACITOR	16V 105 +80%-20% Y5V 0603	C1109
0390170	SMD INDUCTOR	10UH±10% 1608	L301,L309
0390177	SMD INDUCTOR	2.2UH±10% 1608	L208,L215
0390286	SMD INDUCTOR	5.6uH±10% 1608	L811,L812
0390052	MAGNETIC BEADS INDUCTOR	FB	L501,L506
0390291	INDUCTOR	10uH±20% 350mA 0307	L701
0390292	INDUCTOR	22uH±20% 350mA 0307	L711
0390287	SMD MAGNETIC BEADS	19O/100mHZ±25% 1608	L120~L123,L709,L801~L807,L850,L809
0390300	SMD MAGNETIC BEADS	600O/100MHZ±25% 1608	L101,L102,L832,L831
0390301	SMD MAGNETIC BEADS	600O/100MHZ±25% 3216	L116,L106,L115,L117,L119,L209,L210,L212,L213,L303,L505,L703,L901,L990,L310,L902
0700001	SMD DIODE	LS4148	D110,D301,D112,D1
0700121	SMD VOLTAGE REGULATOR DIODE	10V±5% 1/2W	ZD701
0700137	SMD VOLTAGE REGULATOR DIODE	11V±5% 1/2W MINIMELF	ZD901
0700147	SMD VOLTAGE REGULATOR DIODE	8.2V±5% 1/2W	ZD301
0780150	SMD TRIODE	UTC 8050S (D9-D)	Q901,Q904
0780197	SMD TRIODE	C1815	Q102,Q104,Q706,Q707,Q710,Q902,Q903,Q907,Q704,Q703,Q105,Q106,Q302,Q711
0780198	SMD TRIODE	2S1015	Q101
0790002	SMD FIELD EFFECT TRANSISTOR	2S3019F	Q720~Q721
0882030	IC	S8216 TQFP	IC301
0882053	IC	33 SO223	IC106, IC111,IC202,IC303

MATERIAL CODE	MATERIAL NAME	SPECIFICATIONS	LOCATION
0883247	IC	AZ1084S-ADJ TO-263-3L	IC702
0790126	SMD FIELD EFFECT TRANSISTOR	FDS9435A SOP	Q709
0882112	IC	L7952 SIP	IC901
0882121	IC	18 SO223	IC203,IC105
0882603	IC	TVP5147PFP PQFP	IC201
0882515	IC	HE4052BT SOP	U111
0882638	IC	MS518VA PQFP	IC101
0880504	IC	24C32N SOP	IC103
0960234	SMD CRYSTAL OSCILLATOR	14.31818MHZ 49-S	X201,X101
0960236	SMD CRYSTAL OSCILLATOR	27.00MHz 49-S	X301
0960285	SMD CRYSTAL OSCILLATOR	22.1184MHZ±30PPM 49-S 20P	X102
2122626	FLAT CABLE	8P130 2.0 2 PIN,WITH NEEDLE,REVERSE	CN802
1940008	SOCKET	8P2.0mm	CN804
1940022	SOCKET	4P 2.0mm	CN402
1940023	SOCKET	7P 2.0mm	CN103
1940044	SOCKET	9P 2.0mm	CN808
1940393	CABLE SOCKET	5P 1.0mm DUAL RANK,STRINGHT INSERT	CN102
1940283	SOCKET	20P 1.25mm SMD,HORIZONTAL	CN111,CN112
1980077	EARPHONE SOCKET	S066-060-100 BLACK	J801,J804
3580214	HEAT RADIATION PIECE	13×13×10	IC301
1633808	PCB	21507-8	
1860054	VGA SOCKER	15P VERTICAL,WITH BOLT	J101
5234712	HEAT CONDUCT DOUBLE-FACE GLUE	12.5×12.5×0.25 38810	IC301
LCD TV LD1506SI (RU) SILVER			
PROGRAM FLASH ROMLD1506SI-0A(128K) 0911770			
0882637	IC	79E63240PN PLCC	ABOVE IC SOCKET (IC102)
SOFTWARE PROGRAM EPROM ROMLD1506SI-0A(512B) 0900435			
0881473	IC	12C508A SOP	U704
DVD PROGRAM FLASH ROMLD1506SI-0(16M) 0911774			
0881651	IC	29160EB 706 TSOP	U207
0881650	IC	29LV160BE-70PFTN TSOP	U207