

Dk3510

service manual

Catalog

Chapter One About Maintenance	1
1.1 Safety precautions	1
1.1.1 Power supply	1
1.1.2 Precautions for antistatic	1
1.1.3 About placement position	1
1.1.3 Precautions for laser head	1
1.1.4 About placement position	2
1.2 Maintenance method	2
1.2.1 Visualized method	2
1.2.2 Electric resistance method	2
1.2.3 Voltage method	2
1.2.4 Current method	2
1.2.5 Cutting method	2
1.2.6 Element substitution method	3
1.2.7 Comparison method	3
1.3 Required device for maintenance	3
Chapter Two Functions and Operation Instructions	4
2.1 Features	4
2.2 Control Button Locations and Explanations	4
2.2.1 Front Panel Illustration 1	4
2.2.2 Rear Panel Illustration	5
2.2.3 VFD Display Window Illustration	5
2.2.4 Remote Control illustration	5
2.3 Accessories	7
2.4 Function setup	7
2.4.1 Basic Steps of Function Setup	7
2.4.2 General Setup	7
2.4.3 Display Control	7
2.4.4 Sound	8

2.4.5 Languages	9
2.4.6 KVD Setup	9
2.5 Specifications	9
2.6 Operation Instructions for Audio Power Amplifie	10
2.6.1 Featuresr	10
2.6.2 Accessories	10
2.6.3 illustrations to the panel	11
2.6.4 Howto use the remote	11
2.6.5 illustrations to the remote	12
2.6.6 Operating instructions	12
2.6.7 Specifications	13
Chapter Three Principle and Servicing	15
Section One Principle of the Player	15
3.1.1 Principle of the player	15
3.1.2 Whole set block diagram	16
3.1.3 Collection of IC used by the player	17
Section Two Principle Analysis to Unit Circuit	18
3.2.1 Power circuit	18
3.2.2 Decode circuit	22
3.2.3 Servo circuit	23
3.2.4 Laser power control circuitt	26
3.2.5 CD/DVD mode switch circuit	27
3.2.6 Main axis diversion judgement circuit	28
3.2.7 Disc in/out circuit	29
3.2.8 Reset circuit	31
3.2.9 Mute circuit	32
3.2.10 MIC circuit	33
3.2.11 Scoring detect circuit	34
3.2.12 Panel control circuit	35
3.2.13 MIDI signal processing circuit	36
3.2.14 Video circuit	38
3.2.15 Audio circuit	39
3.2.16 Introduction to SCART terminal	40
Section Three Servicing Cases	42

3.3.1 Servicing instances	42
3.3.2 Servicing flow chart	45
Section Four Servicing Parameters	64
3.4.1 Signal waveform diagram	64
3.4.2 Key point voltage	72
Section Five IC Function Introduction	75
3.5.1 Function introduction to AML3298	75
3.5.2 Function introduction to Vt7208	78
3.5.3 Function introduction to EN29LV800AB	83
3.5.4 Function introduction to SDRAM	84
3.5.5 Function introduction to MK6000B	85
3.5.6 Function introduction to SAM2133B	87
3.5.7 Function introduction to Cs4340	87
3.5.8 Function introduction to 4558	88
3.5.9 Function introduction to D5954	88
Chapter Four Disassembly and Assembly Process	89
Chapter Cinque PCB board & Circuit diagram	90
Section One PCB board	98
Section Two circuit diagram	105
Chart 6 BOM List	110
6.1AV BOARD	110
6.2 OK BOARD	111
6.3 POWER BOARD	113
6.4 SUBSIDIARY PANE	115
6.5 DECODE BOARD	115
6.6 OUTPUT BOARD	120
6.7 INPUT BOARD	120
6.8 REMOTE CONEROLLER	120
6.9 MAIN PANEL	121
6.10 SURFACE CONTROL BOARD	122
6.11 AMPLIFIER BOARD	122
6.12 AMPLIFIER BOARD AI SEGMENT	123

Chapter One About Maintenance

1.1 Safety precautions

1.1.1 Power supply

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

1.1.2 Precautions for antistatic

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

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

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

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

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

5. Places around the operating position should also be covered with electric conduction cushion or Painted with antistatic paint.

1.1.3 Precautions for laser head

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

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

1.1.4 About placement position

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

1.2 Maintenance method

1.2.1 Visualized method

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

1.2.2 Electric resistance method

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

1.2.3 Voltage method

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

1.2.4 Current method

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

1.2.5 Cutting method

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

1.2.6 Element substitution method

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

1.2.7 Comparison method

A same good PC board is usually used to test the correct voltage and waveform. Compared these data with those tested through fault PC board, the cause of troubles may be found.

Through the above maintenance method, theoretical knowledge and maintenance experience, all difficulties and troubles will be readily solved.

1.3 Required device for maintenance

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

Chapter Two Functions and Operation Instructions

2.1 Features

Song dedication by singers, words or numbers to full enjoy the pleasure of personalized operations.*

All kinds of singing methods such as song dedication, open challenge and dual meet to offer you wider performance stage.*

Automatic scoring function to serve as an entertainment co-worker.

Compatible MPEG 4 format discs to produce wonderful pictures.

Realsonic super sound effect.

Progressive scanning output to produce steadier and clearer pictures without flicker.

Built-in Dolby Digital decoder, separate 5.1CH outputs.

Optical and coaxial output for Dolby Digital, DTS and LPCM digital audio.

Computer-style pop-up menu to make tour operating more convenient and comfortable.

Component video output to produce clearer pictures.

Fully compatible with DVD, SVCD, VCD and CD, smoothly read MP3, CD-R/RW and Kodak Picture CD.

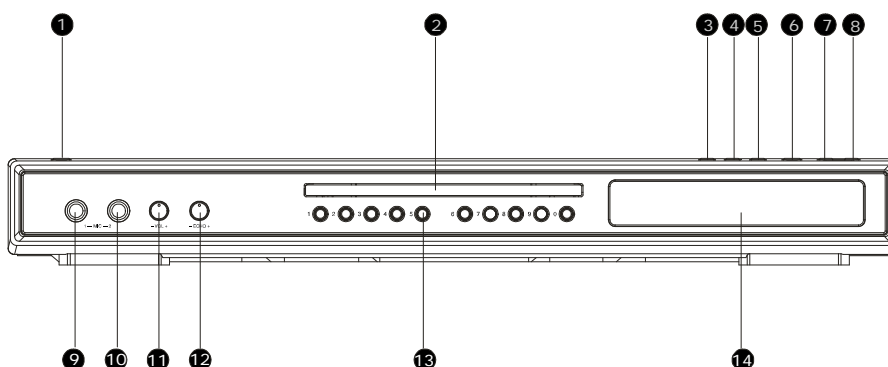
Multiple dubbings, angles and subtitles for selection.

Parental lock function to prevent children from watching discs with unsuitable contents.

Dust-shielded design.

2.2 Control Button Locations and Explanations

2.2.1 Front Panel Illustration 1



❶ Power switch

❷ Disc tray

❸ OPEN/CLOSE button

❹ STOP button

❺ CLEAR button

❻ PLAY/PAUSE button

❼ PREV button

❽ NEXT button

❾ MIC 1 jack

❿ MIC 2 jack

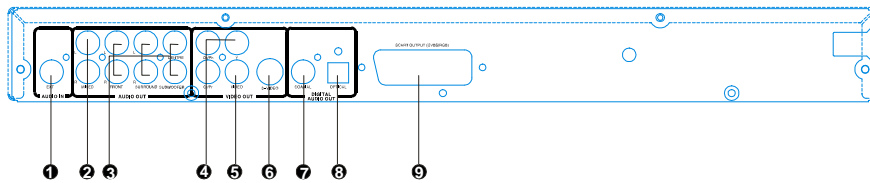
⓫ VOL +/- button

⓬ Echo button

⓭ Number buttons

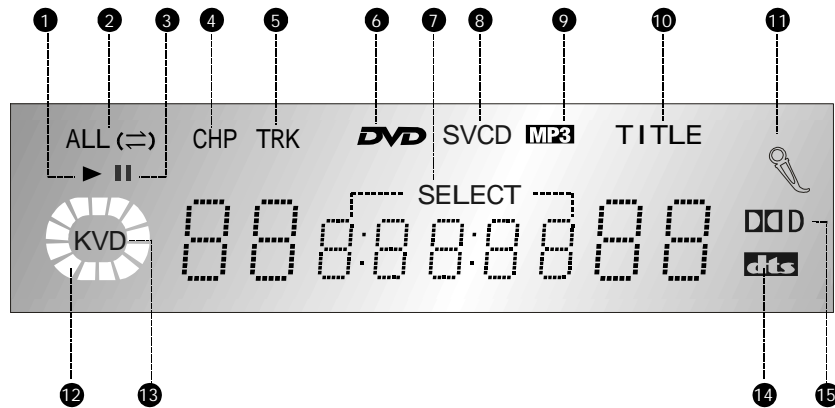
⓮ Display window

2.2.2 Rear Panel Illustration



- | | |
|-------------------------------------|----------------------------------|
| ❶ Scoring input Terminal | ❺ Video Out jack |
| ❷ Mixed Audio Out jack | ❻ S-Video |
| ❸ 5.1CH Audio Out jack | ❼ Digital Audio Coaxial Out jack |
| ❹ Video Component/Y Pb Pr Out jacks | ❽ Digital Audio Optical Out jack |
| | ❾ SCART out jack |

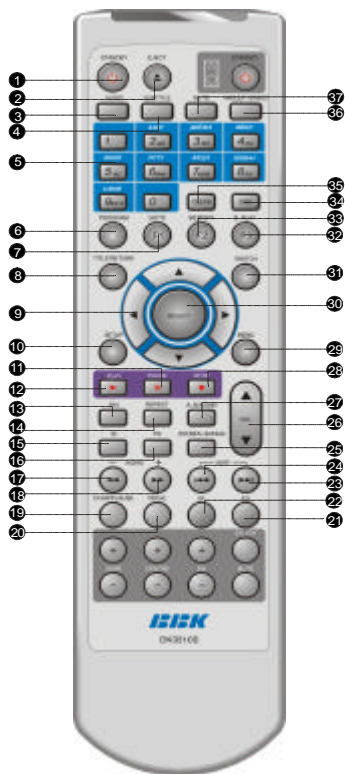
2.2.3 VFD Display Window Illustration



- | | | |
|---------------------|---|-----------------------------|
| ❶ Play | ❷ Playback time/KVD disc
song-selection disc | ❸ Playback status indicator |
| ❹ Repeat | ❹ CD/VCD/SVCD disc indicator | ❹ KVD disc |
| ❺ Pause | ❺ MP3 disc | ❹ DTS |
| ❻ Chapter indicator | ❻ Title indicator | ❹ DOLBY DIGITAL |
| ❼ Track indicator | ❼ Microphone | |
| ❽ DVD disc | | |

2.2.4 Remote Control illustration

- | | |
|--|---|
| ❶ STANDBY Button
Press once to stand by, Press twice to play. | ❺ NUMBER Button
Input numbers.
Input letters when playing KVD disc. |
| ❷ EJECT Button
Disc in or out. | ❻ PROGRAM Button
Program playback. |
| ❸ AUDIO Button
Change the audio language or audio channel. | ❼ GOTO Button
Play from the desired location.
Function Button F1. |
| ❹ SUBTITLE Button
Change subtitle language. | |



- ⑳ STOP Button
Stop playback.
- ㉑ MENU Button
Display DVD/KVD menu or open/close PBC.
- ㉒ SELECT Button
- ㉓ SWITCH Button
Switch volume, rhythm, speed, tone and original vocal singing when playing KVD disc .
- ㉔ Q-PLAY Button
Skip the advertisement/warning and play DVD directly.
Function Button F3.
- ㉕ MEMORY Button
Save the playing point or jump to the saved point.
Function Button F2.
- ㉖ OSD Button
Display or hide disc information.
- ㉗ CLEAR Button
- ㉘ ANGLE/F- SONGS Button
 1. When playing specially-made KVD disc songs, the currently played song may be collected into the favourite ones.
 2. Switch angles when playing DVD disc and rotate pictures when playing JPEG disc.
- ㉙ MUTE Button
Press once to mute, twice to unmute.

- ㉚ TITLE/RETURN Button
DVD title menu/Return to the previous menu when playing VCD or KVD disc.
- ㉛ CURSOR Buttons
- ㉜ SETUP Button
Function setup.
- ㉝ PAUSE Button
Pause play.
- ㉞ PLAY Button
Normal playback.
- ㉟ P/N Button
Switch the TV system between PAL,NTSC and AUTO.
- ㊱ REPEAT Button
Repeat play.
- ㊲ IS Button
Switch video output to the interlacing mode.
- ㊳ PS Button
Switch video to the progressive mode.
- ㊴ Word - button
Press to move down according the alphabet of the song name when playing KVD disc.
REW Button
Fast backward play.
- ㊵ Word + button
Press to move up according the alphabet of the song name when playing KVD disc.
FWD Button
Fast forward play.
- ㊶ CH/APPLAUSE Button
Switch channels of VCD disc/Capable of simulating applause when playing KVD disc.
- ㊷ VOCAL Button
Switch auto partner when playing DVD, VCD discs/Turn off or turn on the voice singing when playing KVD songs with voice singing.
- ㊸ EQ Button
Adjusting equalization effects.
- ㊹ SF Button
Adjusting sound field effects.
- ㊺ NEXT Button
Skip forward.
- ㊻ PREV Button
Skip backward.
- ㊼ ZOOM/S-SONGS Button
Zoom in the displayed frame/Selected songs When playing KVD disc.
- ㊽ VOLUME+/- Button
Increase/decrease volume level.
- ㊾ A-B/AGAIN Button
Restart the select when playing KVD disc.

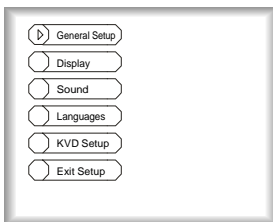
2.3 Accessories

AUDIO/VIDEO CORD	1PCS
REMOTE CONTROL	1PCS
AAA SIZE BATTERIES	2PCS
WARRANTY CARD	1PCS
USER MANUAL	1PCS
SONGBOOK	1PCS

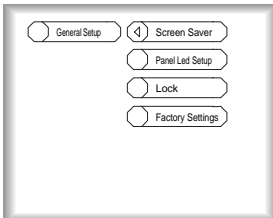
2.4 FUNCTION SETUP

2.4.1 Basic Steps of Function Setup

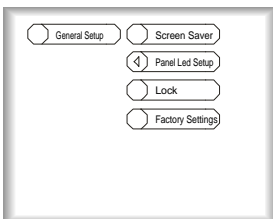
1. Press SETUP button and the screen displays Function setup menu.



2. Press direction button to select the desired menu and press SELECT button to confirm. If you select "Exit Setup" menu, pressing SELECT button may exit the setup menu. For instance, you may select "General Setup" to start general settings and TV screen displays general setup page.



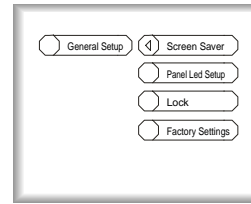
3. Press up/down direction button to select the Desired setup items. For instance, press up/down direction button to select "Panel Led Setup". Press SELECT button to confirm and TV screen displays panel led setup items.



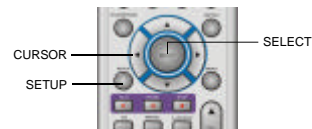
4. Press left direction button to exit the current item group, or press SETUP button to exit setup menu

Pressing SETUP button is invalid when in disc reading.

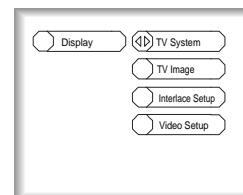
2.4.2 General Setup



1. Screen Saver: this item is used to set whether screensaver is allowed.
Optional settings: ON, OFF
Default: ON
2. Panel Led Setup: this item is used to set whether the door indicator on the front panel is turned on.
Optional settings: ON, OFF
Default: ON
3. LOCK: this item is used to set the age controlling rate to prevent children from watching unsuitable contents (need disc support).
After inputting default password 7890, you may change the password or set the controlling rate which has 8 rates for selection.
Default: Lv8
4. Factory Settings: this item is used to restore the default value of all other setup items in the setup menu, except "Ratings Limits" and "PSD".



2.4.3 Display Control



1. TV System: this item is used to set the video output system of the player.
Optional settings: AUTO, NTSC, PAL
Default: AUTO
2. TV Image: this item is used to set the output image ration of the player.

Optional settings: 4:3 Letterbox, 4:3 Standard, 16:9 Wide screen

Default: 4:3 Letterbox

NOTE

The playback effect is related to the disc recording ratio. Some discs cannot play according to your selected picture ratio.

16:9 is only applicable to 16:9 wide screen TV set.

The picture ratio selection should be related to the actually-used TV screen ratio.

3. Interlace Setup: this item is used to set the interlacing video output mode of the player.

Optional settings: S-VIDEO, YUV, RGB.

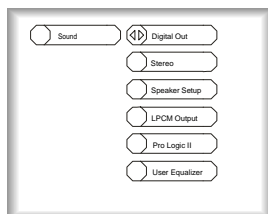
Default: S-VIDEO

4. Video Setup: in this item, you may set to strengthen or weaken the brightness, contrast, chroma and saturation of image according to your own likes.

Enter the video setup adjustment menu, and press left/right direction button to select the video parameter that you desire to adjust. Press up/down direction button again to increase or decrease this parameter.

After the adjustment finishes, press SELECT button to exit this setup item.

2.4.4 Sound



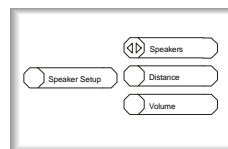
1. Digital Out: this item is used to set the stream form of digital output. After press direction buttons to select Dolby Digital or DTS, press SELECT button to change the player whether Dolby Digital or DTS digital raw code signal is outputted. If selected, it means the digital raw code signal is outputted; if not selected, it means PCM signal is outputted.

Default: Selected

2. Stereo: this item is used to set the audio output mode of the player. When stereo is on, this player will output stereo signal; when stereo is off, this player will output multi-channel signal.

Default: OFF.

3. Speaker setup: this item is used to adjust Volume and delay of speaker.



Speakers: this item may be set according to Your used speaker system.

A. Optional settings of front : large, Small.

Default: Large

B. Optional settings of centre : Large, Small, None. Default: Large

C. Optional settings of surround : Large, Small, None. Default: Large

D. Optional settings of subwoofer : Exist, None.

Default: Exist

Distance: this item may be used to set the speaker's delay time according to the distance between speaker and listener.

Volume: this item may be used to adjust the Speaker's volume.

NOTE

Speaker setup may be performed when stereo is off.

4. LPCM Output: this item may be used to set the output frequency of LPCM audio data to match with different power amplifier.

Optional settings : 48K, 96K

Default : 48K

The outputted frequency is related to the Actual frequency of signal. The signal of 48K cannot output 96K.

5. Pro Logic II: this item is used to change 2-channel music into multi-channel music.

Optional settings: ON, OFF

Default: OFF

NOTE

If the disc does not support this function, perform it by force and the effect will be bad on the contrary.

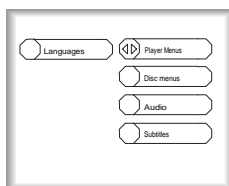
6. User Equalizer: in this item you may set to strengthen or weaken the treble, mediant and bass according to your own likes.

Enter user EQ setup menu, press left/right direction button to select the sound frequency you desire to adjust and press up/down direction to increase or decrease the sound strength of this frequency.

After the adjustment finishes, press SELECT button to exit this setup item.

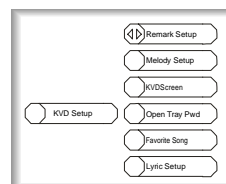
After exiting setup, press EQ button to select the EQ mode in "PERSONAL" to enjoy the effect that you adjusted just now.

2.4.5 Languages



1. **Player Menus:** this item is used to set the Indication information language that the player displays during the course of playing.
Optional settings: English, Russian.
Default: English.
2. **Disc Menus:** this item is used to set disc menu language adopted in priority during the course of playback.
Optional settings: English, Russian.
Default: English.
3. **Audio:** this item is used to set the audio language adopted in priority during the course of playing.
Optional settings: English, Russian.
Default: English.
4. **Subtitles:** this item is used to set the subtitle language adopted in priority during the course of playing.
Optional settings: English, Russian, Off.
Default: Off.

2.4.6 KVD Setup



1. **Remark SetupP:** this item is used to set the Scoring parameter of the player.
Optional settings of max score: 100, 99, 98, 97, 96 ; default : 100
Optional settings of min score: 0, 60, 70, 80, 90 ; default : 0
Optional settings of scoring rate: Easiest, Easy, Normal, Hard, Hardest.
2. **Melody Setup:** this item is used to set KVD Music melody.
Optional settings: ON, OFF
Default: ON
3. **KVD Screen:** this item is used to the background image when the player is playing KVD disc.
Optional settings : DVD Screen, Blue screen
Default: DVD Screen.
4. **Open Tray Pwd:** this item is used to set the password needed in open operation when the player is playing KVD disc.
Default : 7890
5. **Favorite Song:** this item is used to edit favorite songs. Please refer to the favorite songs editing in KVD disc operation for details.
6. **Lyric Setup:** this item is used to set Lyrics Mode.
Optional settings : Normal , Ahead, Off
Default: Normal .

2.5 Specifications

DVD-player	
Disk Type	CD-R/CK-RW,DVD-R/DVD-RW,DVD+R/DVD+RW
Format	DVD-Video,KVD,MPEG-4,SVCD,VCD1.0,VCD1.1,VCD2.0,CD-DA,MP3
Input	Microphone in 2 Scoring 1
Outputs(Audio)	Line stereo 1+1(SCART) 5.1Channel Output 1 Digital Optical output 1 Digital Coaxial output

Outputs(Video)	Composite video output	1+1(SCART)
	S-Video	1
	Component video output Y Cb/Pb Cr/Pr	1
	RGB/SCART	1
Video Characteristics	Composite Video Output Amplitude:	1.0Vp-p(75Û)
	S-Video Output Amplitude:	Y 1.0Vp-p(75Û),C 0.286Vp-p(75Û)
	Component video output Y Cb Cr:	Y 1.0Vp-p(75Û),
Audio Characteristics	Frequency range	20-20 000 HZ
	SNR	90dB
	Total harmonic distortion	0.1%
Operating Temperature	+5...+35	
Operating Humidity	15-75%	
Power Supply	~220 V AC,50/60 Hz	
Dimension	420x266x45mm	
Weight	2.4kg	
Speaker systems		
RMS Output Power (THD 10%,1kHz)	L,R,C,SR Channel 10W SW Channel 25W	
Max.Output Power	L,R,C,SL,SR Channel 20W SW Channel 40W	
SW	Speaker	165mm
	Dimension	00x310x325mm
Surround	Speaker	76mm
	Dimension	100x86x112mm
Others	Power supply	220V;50Hz
	Max.power consumption	160W
	Frequency range	20-20000Hz

2.6 Operation Instructions for Audio Power Amplifier

2.6.1 FEATURES

- 5.1CH audio input, capable of connecting Dolby AC-3 and DTS decoding output signals
- Simultaneous 5.1CH volume adjustment
- Center, surround and subwoofer channel level separate adjustment
- Standby function
- Mute function
- Full function remote control
- Powerful and high performance amplifier
- Complete protection function
- Full magnetic-shielded design for satellite speakers
- Unique reflective bass structure
- Novel appearance, soft color

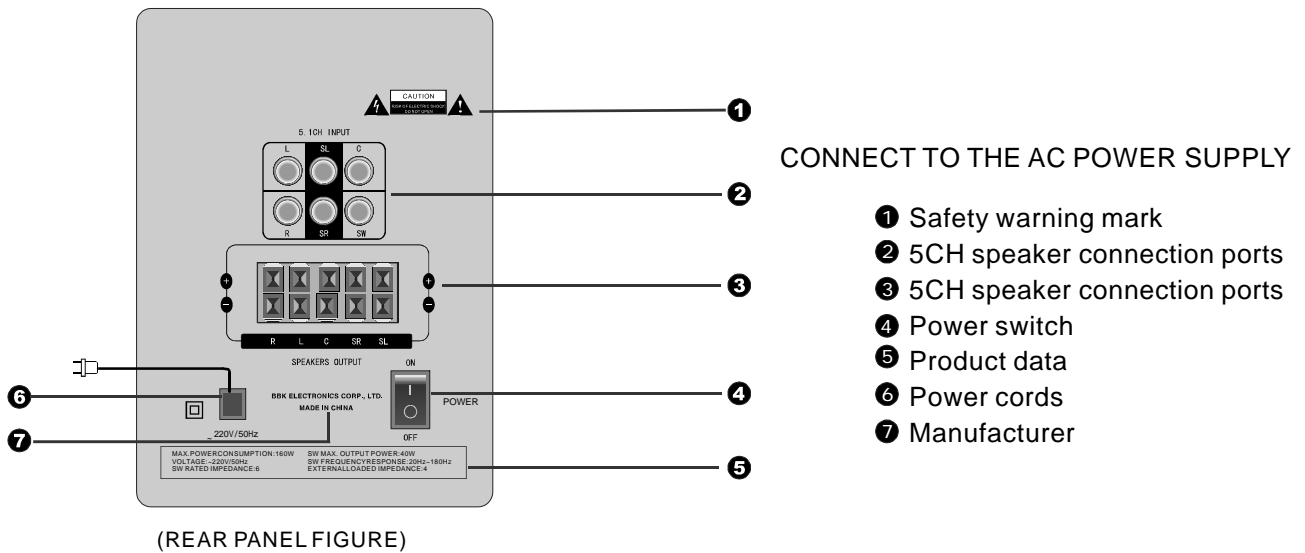
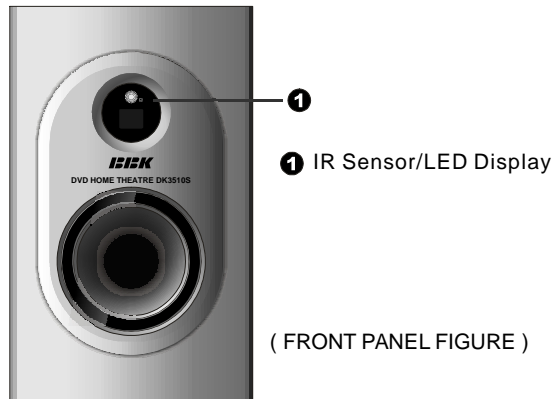
2.6.2 ACCESSORIES

Please open the carton box and check your speaker system. If the model and quantity do not conform to the following list, please contact the dealer.

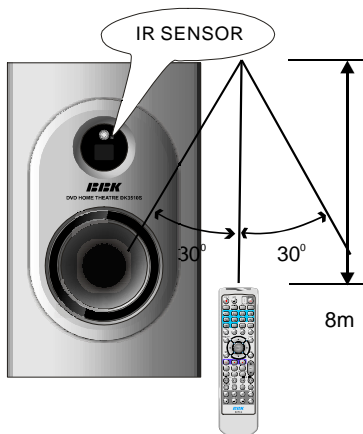
- Satellite Speakers.....5 pcs
- Dual-RCA Plug Audio Cord..... 2 pcs

- Audio Cords for Phones Jac 3 pcs
- Left, Right and Center Speaker Cords (ca. 2m) k 3 pcs
- Surround Speaker Cords (ca. 5m) 2 pcs

2.6.3 ILLUSTRATIONS TO THE PANEL

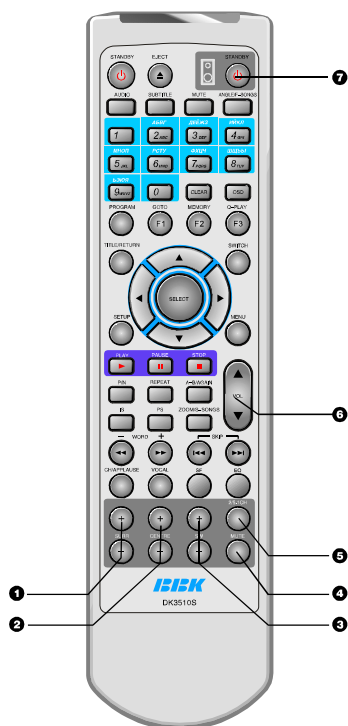


2.6.4 HOW TO USE THE REMOTE



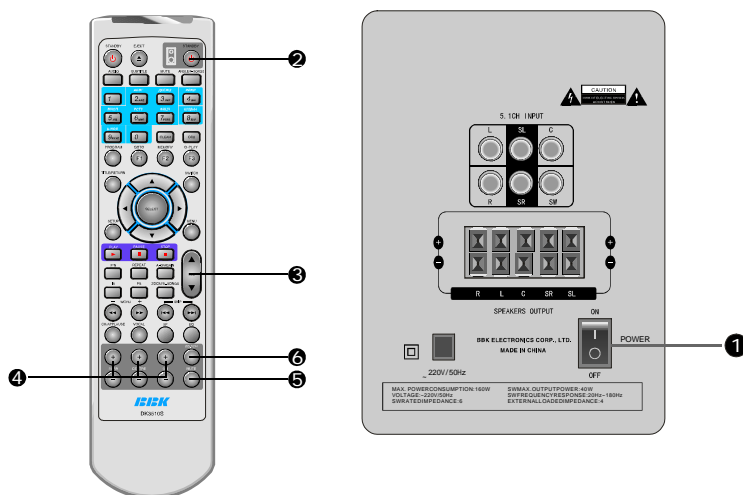
Point the emitter of the remote control at the infrared sensor on the subwoofer speaker. Use the remote control within a distance of 8 meters from the subwoofer speaker. Use the remote control within an angle of 30 degrees from the center.

2.6.5 ILLUSTRATIONS TO THE REMOTE



- ❶ STANDBY channel level adjustment
Used to adjust the surround channel level compared with the master volume.
- ❷ CENTRE channel level adjustment
Used to adjust the centre channel level compared with the master volume.
- ❸ SW channel level adjustment
Used to adjust the subwoofer channel level compared with the master volume.
- ❹ MUTE
Press the MUTE button to terminate audio signal outputs. Press it again to cancel MUTE and restore audio outputs.
- ❺ 2/5.1 CH
Select between 2.1 sound field and 5.1 sound field
- ❻ VOLUME
Adjust the 5.1CH volume simultaneously.
- ❼ STANDBY
Press this button to enter or leave the standby mode. The power is not cut off in the standby mode. Therefore, please turn off the power switch on the subwoofer speaker when you do not intend to use it for an extended period of time.

2.6.6 OPERATING INSTRUCTIONS



GETTING STARTED

1. Insert the plug into the power supply socket, turn on the POWER button on the rear panel of the subwoofer speaker, the CPU comes into initialization and the unit enters the standby mode, the LED displays "--".

USING THE STANDBY BUTTON

2. Press the STANDBY button to enter the work mode. The master volume rises up from "0" to "4" (DEFAULT VALUE) gradually and the LED displays the corresponding level. Press the STANDBY button again, this unit will enter the STANDBY mode. In this mode, this unit is not powered off. Therefore, please turn off the POWER button on the rear panel of the subwoofer speaker if you do not intend to use this unit for an extended period of time.

ADJUSTING THE VOLUME

3. Press the VOLUME ▲/▼ buttons on the remote control to adjust the 5.1CH volume simultaneously, the displayed range: 0~16.
Press the VOLUME ▲ to increase the volume, the maximum displaying volume is 16.
Press the VOLUME ▼ to decrease the volume, the minimum displaying volume is 0.

ADJUSTING THE SURROUND/CENTRE/SUBWOOFER CHANNEL LEVEL

4. Press the SURR/CENTRE/SW +/- buttons on the remote control to adjust the corresponding channel levels separately compared with the master volume.
Adjustment range: The Volume \pm 5
Press the + button to increase the level. The maximum displaying level is 5.
Press the - button to decrease the level. The minimum displaying level is -5.

ADJUSTING THE SURROUND/CENTRE/SUBWOOFER CHANNEL LEVEL (CONTINUED)

Adjust each channel level compared with the master volume to compensate sound imbalance due to poor listening circumstances or awkward location of the speakers.
You can also adjust each channel according to your personal favorites and the characteristics of the program in order to obtain a satisfactory effect.
The master volume level will reappear on the LED about 3 seconds after the above operations stop.

USING THE MUTE BUTTON

5. Press the MUTE button on the remote control to mute the sound.
Press the MUTE button in the playback mode to terminate the audio signal output.
Press the MUTE button again to restore the normal audio. The LED displays a flashing "0" in the mute mode.

SOUND FIELD SELECTION:

6. To adapt to different program signals, this unit utilizes 2/5.1CH select function. When you enjoy 2CH program of CD disc, you are suggested to use 2.1CH mode and "2.1" displays on the screen; centre and surround haven't sound output at this time. When you enjoy 5.1CH program, you may press 2/5.1CH button. This unit enters 5.1CH mode, "5.1" displays on the screen and the unit is in 5.1 working mode at this time.

NOTE: The unit defaults 5.1CH mode when power on. RMS Output Power:

2.6.7 SPECIFICATIONS

RMS Output Power:

L,R,C,SL,SR Channel Output Power: 10W_iÅ5 (RMS,Load=4 ,f=1kHz)

SW Output Power: 25W (RMS,Load=6 ,f=40Hz)

Total Harmonic Distortion: < 1% (at 1kHz,1W)

Amplifier Frequency Response: 180Hz~20kHz_iÅ3dB(D,R,C,SL,SR) 20Hz~180Hz_iÅ3dB(SW)

5.1CH Input Jacks: RCA Socket Line In

Input Impedance: > 10K

Control,Adjustment Means:	Remote Controlled
Subwoofer Unit:	6.5"Dynamic Paper Cone Speaker
Max.Output Power:	40W
Nominal Impedance:	6
Frequency Response:	50Hz~250Hz
Satellite Speaker Unit:	3"Wide Frequency Band (Magnetic-shielded)Cone Speaker
Max.Output Power:	20W
Nominal Impedance:	4
Frequency Response:	50Hz~250Hz
Input Power Supply:	~220V;±10%50Hz
MAX.Power Consumption:	160W
Subwoofer Speaker Dimensions:	200;±310;±325mm(L;±W;±H)
Satellite Speaker Dimensions:	100;±86;±112mm(L;±W;±H)
Package Dimensions:	525;±475;±385mm(L;±W;±H)
Net Weight:	12.5kg
Gross Weight:	14.2kg

Chapter Three Principle and Servicing

Section One Principle of the Player

3.1.1 Principle of the player

1. DVD player DK3510S is composed by the following PCB components, whole set PCB components compose block diagram, shown as the following figure 3.1.1.1:

(1) Power board: supply power for each circuit of the player, composed by TNY268P, PC817, TL431C.

(2) Main panel: operate function of the player and display working state of the player, composed of UPD16312, 12C508A (516B) and display screen.

(3) Decode board: process information transmitted by loader and restore into audio, video signals, loader drive, panel display control MIDI signal processing.

(4) AV output board: output audio, video signals sent out from decode board completely.

(5) MIC board: after amplifying and echo processing of signal inputted from microphone, overlap to audio output to realize Karaoke function.

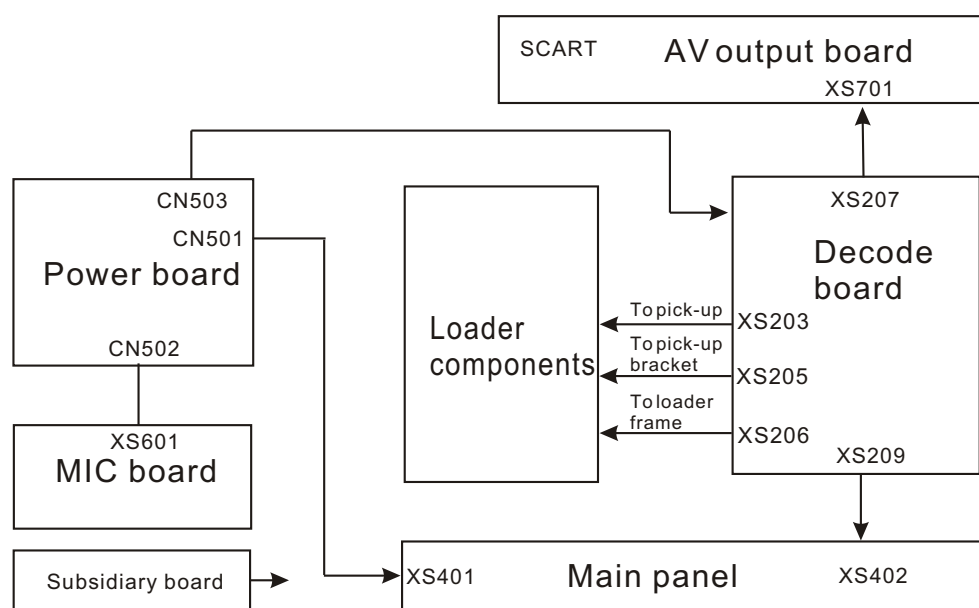


Figure 3.1.1.1 PCB components compose block diagram

2. As shown in the figure 3.1.1.2, it is pin description of the block diagram composed by whole set

PCB components:

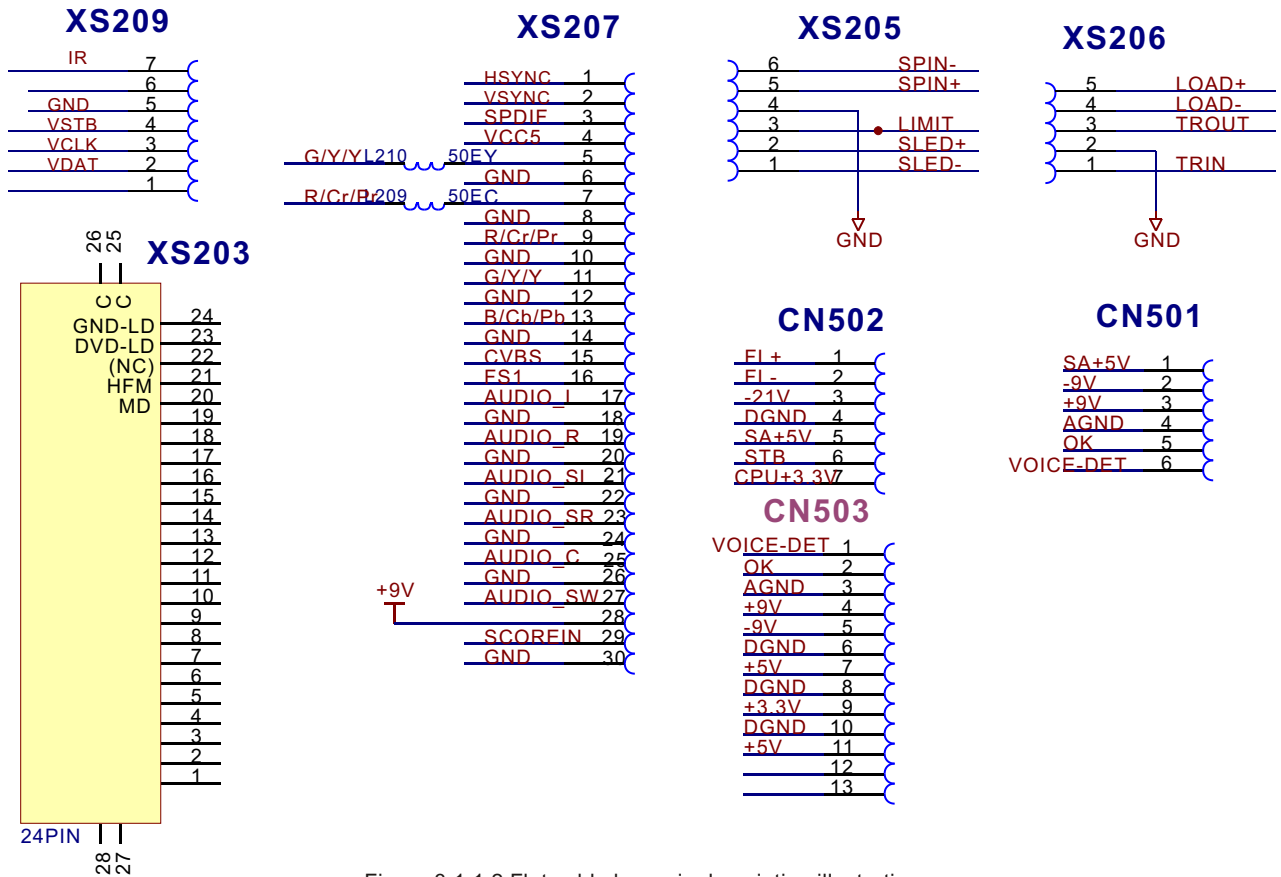


Figure 3.1.1.2 Flat cable base pin description illustration

3.1.2 Whole set block diagram

The whole set block diagram is shown as the following figure 3.1.2.1:

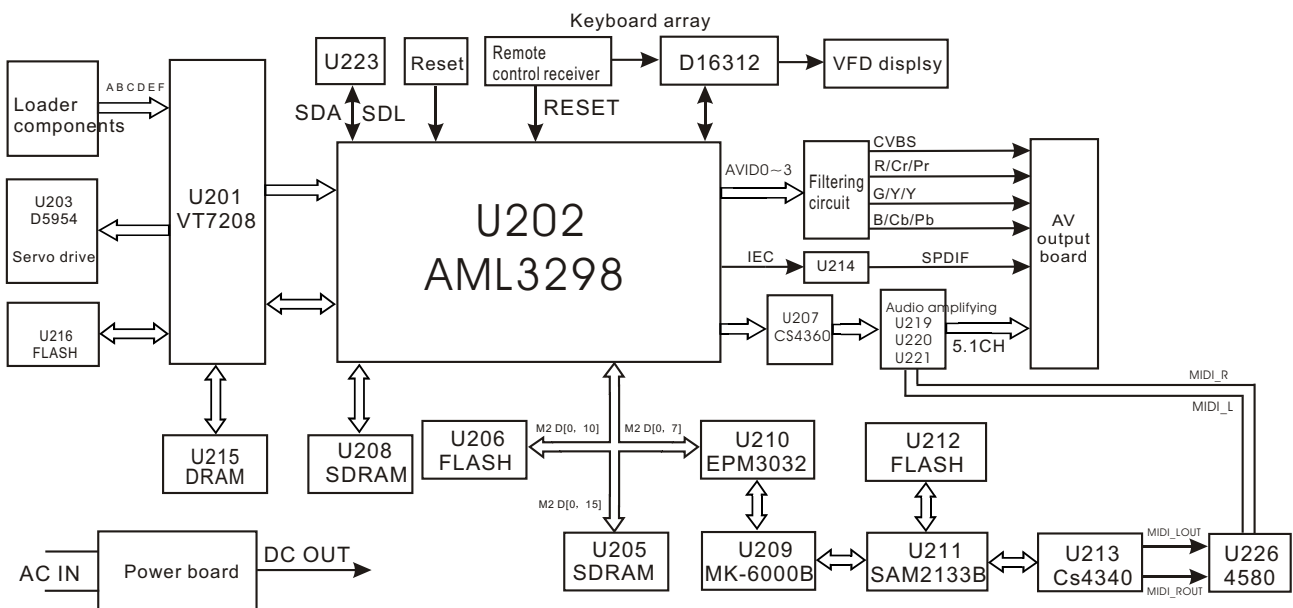


Figure 3.1.2.1 The player block diagram

3.1.3 Collection of IC used by the player

Collection of IC used by player DK3510S is shown as the following table:

PCB board	Location number	IC model	Function
Decode board	U223	AT24C16	EEPROM(16K): save user-set information and order
	U213	CS4340A	D/A inverter: switch MIDI data outputted by U211 into analog audio signal
	U205,U208	IS42SI6400	SDRAM (64M)
	U222	LM393	Operational amplifier: main axis detecting
	U215	MIIB416256A	DRAM(4M): data save of servo circuit
	U209	MK-6000B	MIDI signal decode and MIDI processing circuit MPU
	U207	CS4360	5.1CH D/A converter
	U219,U220,U221,U226	4558	Operational amplifier: audio amplifying
	U214	HCU04	Inverter: reset and digital audio output usage
	U224	LA1117MP	1.8V voltage regulating IC: output 1.8V voltage and supply for decode chip
	U202	AML3298	Decode chip: audio, video decode
	U203	D5954	Servo drive
	U212	R27V3202	MASK ROM(32M)
	U211	SAM2133B	MIDI signal synthesizer
	U201	VT7208	Servo RF amplifying, DSP
	U206	EN29LV800AB	FLASH(16M): DVD firmware
	U211	EPM3032A	MIDI signal processing firmware
	U216	A290021TL	ROM(2M): servo firmware
	Panel	U401	D16312
U403		12C508A	Power management
Power board	U504	LM7805	5V voltage
	U501	TNY268P	Switch module
	U503	TLV431	3-end adjustable splitflow reference source
	U506	MCR100-6	Controllable silicon
	U502	PC817	Photoelectric coupler
MIC board	U601,U602	4558	Operational amplifier
	U603	M65831AP	Echo processing

Section Two Principle Analysis to Unit Circuit

3.2.1 Power circuit

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

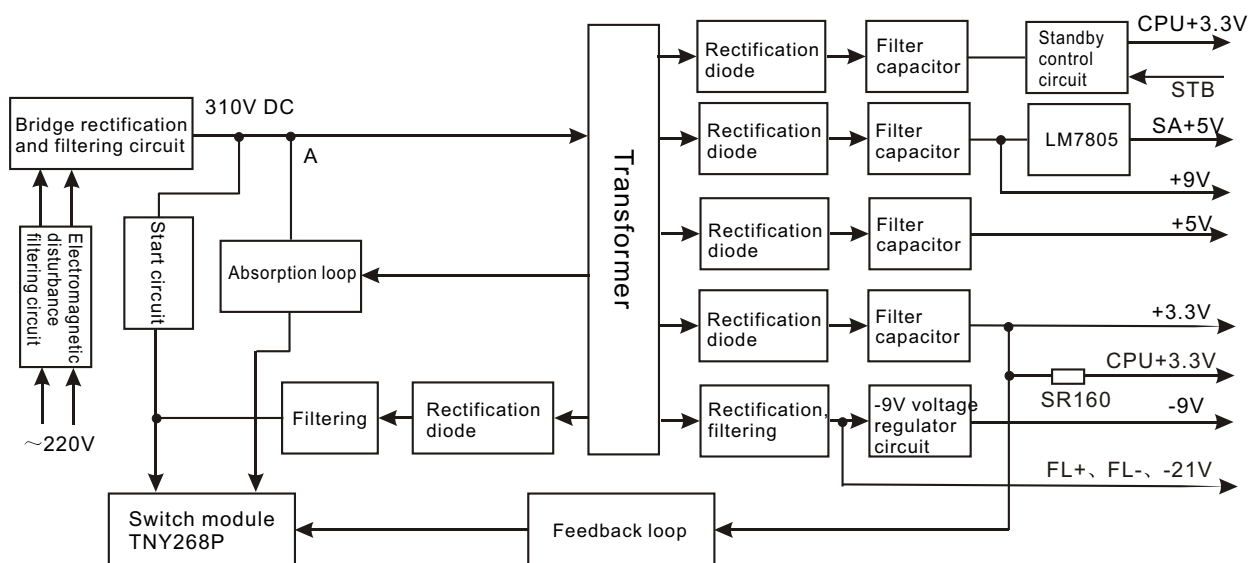


Figure 3.2.1.1 Power circuit block diagram

2. Working principle

(1) Power-on standby working process: through protector tube, power grid filter, rectification and filtering to AC power, DC power on two ends of Tc501 is 300v, DC power is provided for IC TNY268P through switch transformer, TNY268P produces 132KHz frequency square wave for starting up, and controls built-in MOS field effect tube to carry out on/off action. When MOS tube is on, primary coil current of transformer linearly increases and begins to save energy. When MOS tube is off, for magnetic flux of transformer (ϕ) cannot change suddenly, energy discharge begins, transformer primary coil current begins to become small, each secondary coil voltage begins to increase, transformer finishes a process of energy save and energy discharge, each ground output voltage of secondary stage increases step by step. In each group secondary stage of transformer, 14, 11 winding turn ratio is much larger (10 times of 3.3V sampling winding), output voltage is very high. When power-on fir the first time, STB is low level, controllable silicon MCR100 is on, now sampling winding is 14-11, when output makes "CPU+3.3V" line increase to 3.3V, "CPU+3.3V" is kept in 3.3V without change through optical coupling. Now standby IC

12C508A has 3.3V power supply, for turn ration of other winding of transformer is small, output voltage is very low, the whole set does not work. Pin 3 of 12C508A outputs control signal to make panel red light drive and lighted to indicate the standby state.

In this standby state, the on time of photoelectric coupler is long, TNY268P is in intermission working state and limits the max current of primary coil of each energy storing process in a small range to decrease the energy conversed in each energy change cycle of transformer. In this standby state, pin 5 "STB" of 12C508A outputs low level, triode 2N5551 keeps in cutoff, MCR100 maintains on state of controllable silicon.

(2) Power-on working process: at the moment of pressing power button, pin 2 of standby IC (12C508A) on panel changes into low level from high level, pin 5 "STB" turns into high level from low level state. 2N5551 is saturation on and pulls down "G" voltage of MCR100 control end to about 2.7V to make MCR100 cannot be touched off, 1411 winding cannot supply power for "CPU+3.3V" line through MCR100, now transformer sampling winding switches into 10, each winding begins to set up voltage, in order to keep "CPU+3.3V" voltage stable, the on time of MOS pipe becomes lone.

(3) When in standby state, after pressing power button on remote controller, power on/off working process is as follows:

A. After pressing power button on remote controller, receiver on panel outputs remote control code to pin 7 of 12C508A.

B. 12C508A decode the remote control code received, if it is power button value, level of pin 5 is made to change into high level from low level, and the player begins to work normally.

(4) Press power button on the panel to make the player switch into standby state from working state

A. At the moment of pressing power button, pin 2 of 12C508A changes into low level from high level, after 12C508 detects this change, pin 5 "STB" turns into low level state from high level state.

B. 2N5551 changes into cutoff state, MCR100 restores into controllable and on state.

C. MCR100 output makes "CPU+3.3V" line voltage increases, LM431A, photoelectric coupler, TNY268P quickly controls transformer to pause power output. Now 1613 winding achieves switch power control right.

D. When "CPU+3.3V" reduces voltage, transformer outputs power again, now other winding cannot keep the working of the player because turn ration is small and output voltage is small, the player enters standby state.

3. Standby control circuit

(1) IC 12C508A is programmable CPU, and its pin function is decided by the burnt program. Shown as in the figure 3.2.1.2, pin 1 is power pin, pin 8 is ground; pin 2 and 7 are input end; pin 3, 4, 5 and 6 are output end. When power on, pin 3, 4 outputs high level, pin 6 outputs low level. When pin 2 level changes into low level once, each output pin level turns once. Pin 7 is connected to remote control code, when remote control code is inputted, the corresponding action is performed according to the

Corresponding code value.

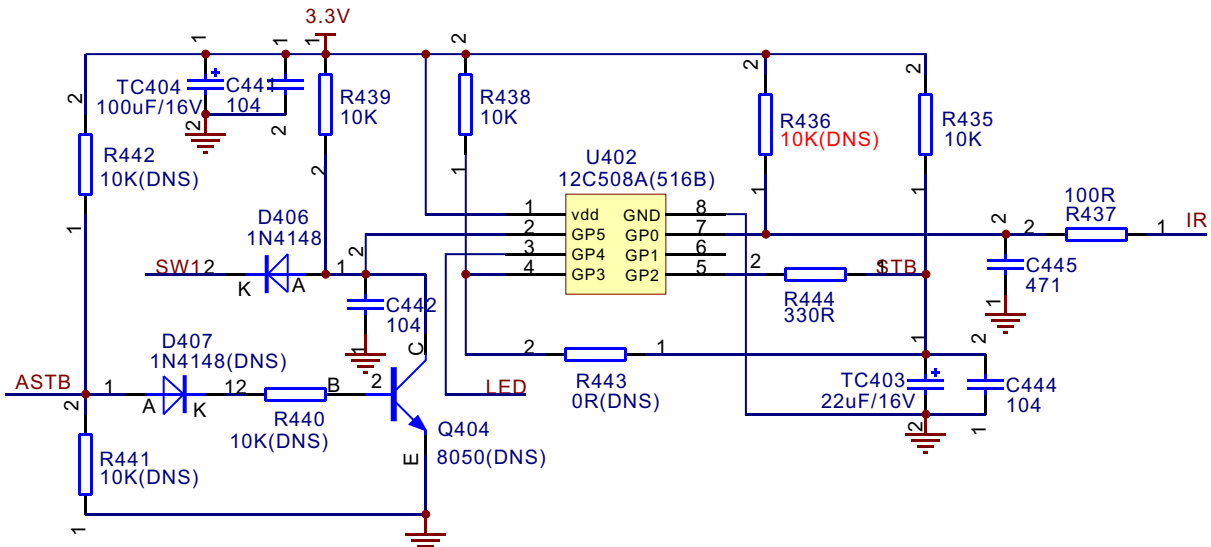


Figure 3.2.1.2 12C508A circuit diagram

(2) Standby control circuit is shown as the following figure 3.2.1.3:

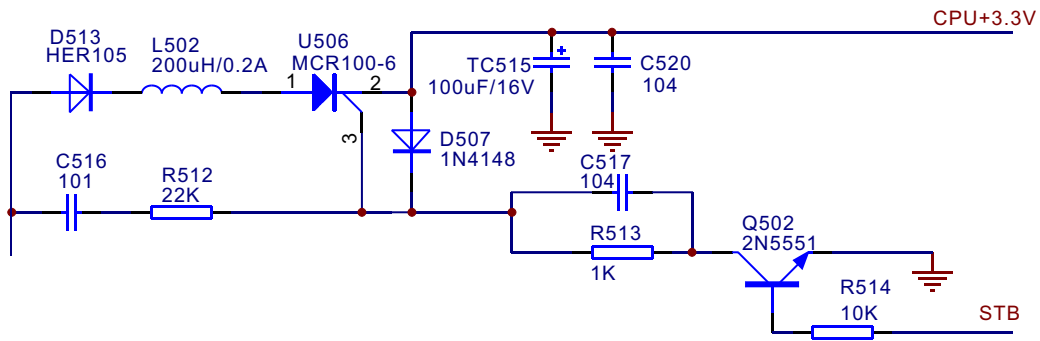


Figure 3.2.1.3 Standby control circuit diagram

1) Working process of controllable silicon after inserting power cord:

- A. After switch IC starting, transformer secondary outputs high frequency pulse, with amplitude above 70V.
- B. One path of positive pulse, after D513 high frequency rectification and L509 frequency division, reaches anode of controllable silicon; the other path, after C516 coupling and R512 damping, reaches gate electrode of controllable silicon.
- C. Gate electrode positive pulse makes controllable silicon on, anode positive voltage charges TC515 through controllable silicon.
- D. After a positive pulse finishes, for anode has no power, controllable silicon cuts off.
- E. When next positive pulse is coming, controllable silicon is on again. Repeat the process like this, TC515 voltage increases to 3.3V gradually.

2) Power on, the working process of controllable silicon after “STB” turns into high level from low level:

A. “STB” changes to high level from level, triode 2N5551 is saturation on to form stable DC working state, gate electrode voltage of controllable silicon is stabilized about 2.7V.

B. When positive pulse reaches controllable silicon gate electrode through R512, voltage of two ends of C517 cannot change suddenly, value of C517 is large, positive pulse is absorbed by C517, gate electrode voltage of controllable silicon cannot reach 4V in a pulse cycle, so controllable silicon cannot be touched off.

C. After positive pulse finishes, C517 discharges through R513 to recover 2.7V voltage of gate electrode.

D. So, though anode of controllable silicon exists pulse all the time, but controllable silicon cannot be touched off, controllable stops charging to TC515.

3) Power off, working process of controllable silicon after “STB” turns into low level from high level:

A. “STB” turns into low from high, triode 2N5551 cuts off, C517 finishes discharging through R513. Now, gate electrode is void, controllable silicon turns into controllable state sensitive to positive pulse.

B. When positives pulse comes, for C517 is in hanging state, cannot charge, cannot perform clamping to gate electrode, so gate electrode can be over 4V easily to trigger controllable silicon on, controllable silicon has current through to charge Tc515.

4. Secondary output voltage

(1) L+, FL-: display screen filament power, its two ends have AC voltage with about 3.5V, use DC level to test that -25V DC voltage is between FL+ over the ground.

(2) SA+5V: decode board servo power supply and loader power supply.

(3) +9V, -9V: for audio amplifying IC4558 usage, MIC board microphone signal amplifying, power supply processing.

(4) +5V, +3.3V decode part and MIDI signal processing part power supply, panel power supply.

(5) CPU+3.3V panel standby control IC U402 power supply.

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

Key point position	Standby voltage (V)	Working voltage (V)	Key point position	Standby voltage (V)	Working voltage (V)
TC501 anode	300	300	STB	0.1	5
Pin 5 of U501	300	300	+3.3V	0	3.3
Pin 4 of U501	0.2	0.7	U503 pin K	1.8	1.8
Pin 1 of U501	6	6.1	U503 pin R	1.25	1.25
CPU+3.3V	3.3	3.3			

3.2.2 Decode circuit

1. Decode circuit block diagram is shown as the following figure 3.2.2.1:

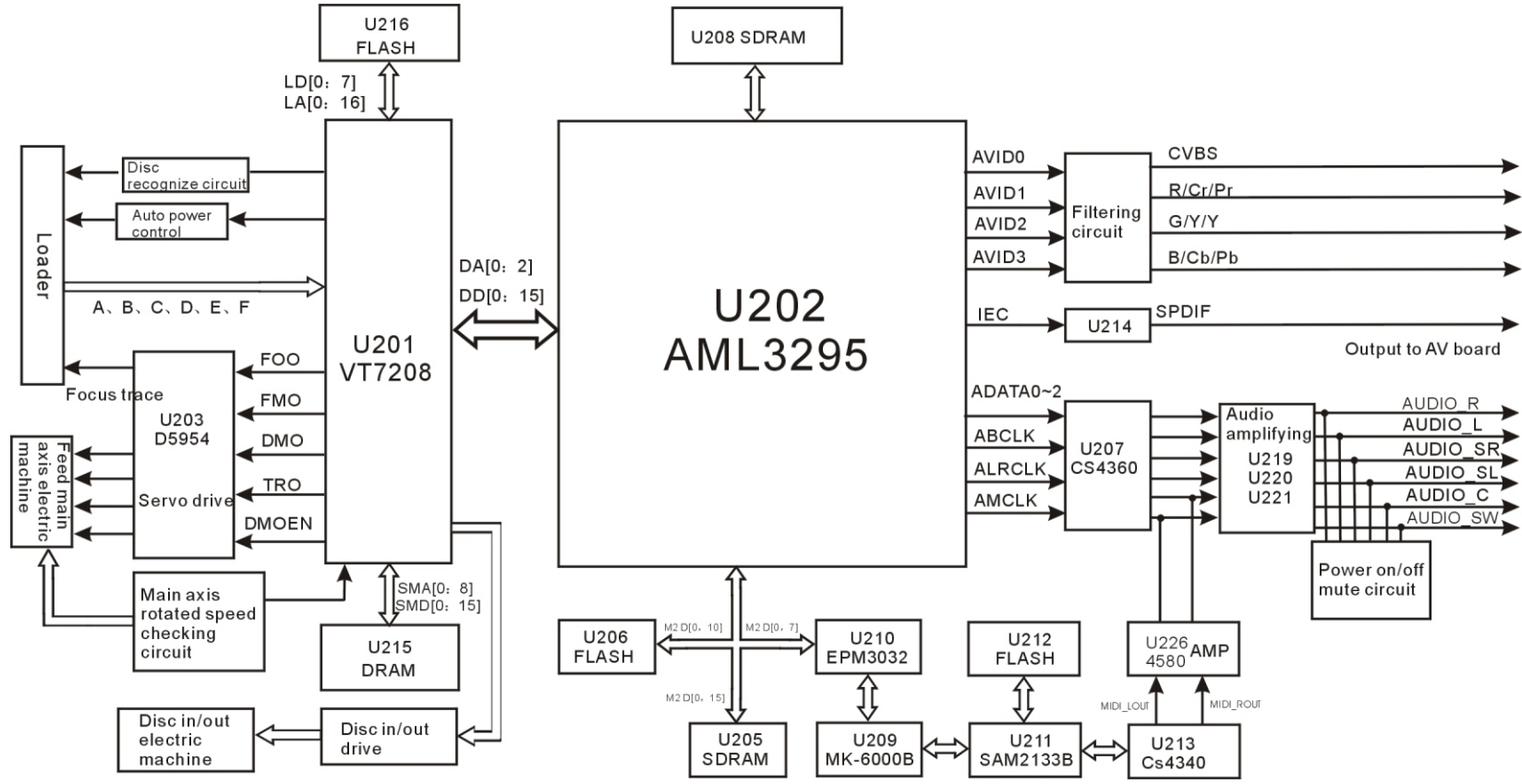


Figure 3.2.2.1 Decode circuit block diagram

2. Working principle: when power supply switches from standby to power-on, reset circuit provides decode chip a reset signal with effective low level to pin 171 of decode chip and pin 12 of FLASH to reset chip. After decode chip resets, reset signals are outputted from IO port (software defined) to other subsidiary circuit required reset (MIDI processing circuit, servo, etc), 27M clock produces clock signal required by each circuit through PLL circuit inside decode chip, the power-on working process is:

Power on→reset→servo and other reset circuit→output read, write order to SDRAM and FLASH→display power-on image→VFD display→check whether door has been to proper position→power-on finishes

Signal after being audio/video decoded are processed inside decode chip, video signals are analog output, audio signals are digital output.

3.2.3 Servo circuit

1. DK3510 adopts SANYO 62 loader and VT7208+ROM (1M) + DRAM (4M), and its servo circuit is mainly composed of front signal processing and digital servo processing, digital signal processing IC Vt7208 and drive circuit D5954, shown as in the following figure 3.2.3.1:

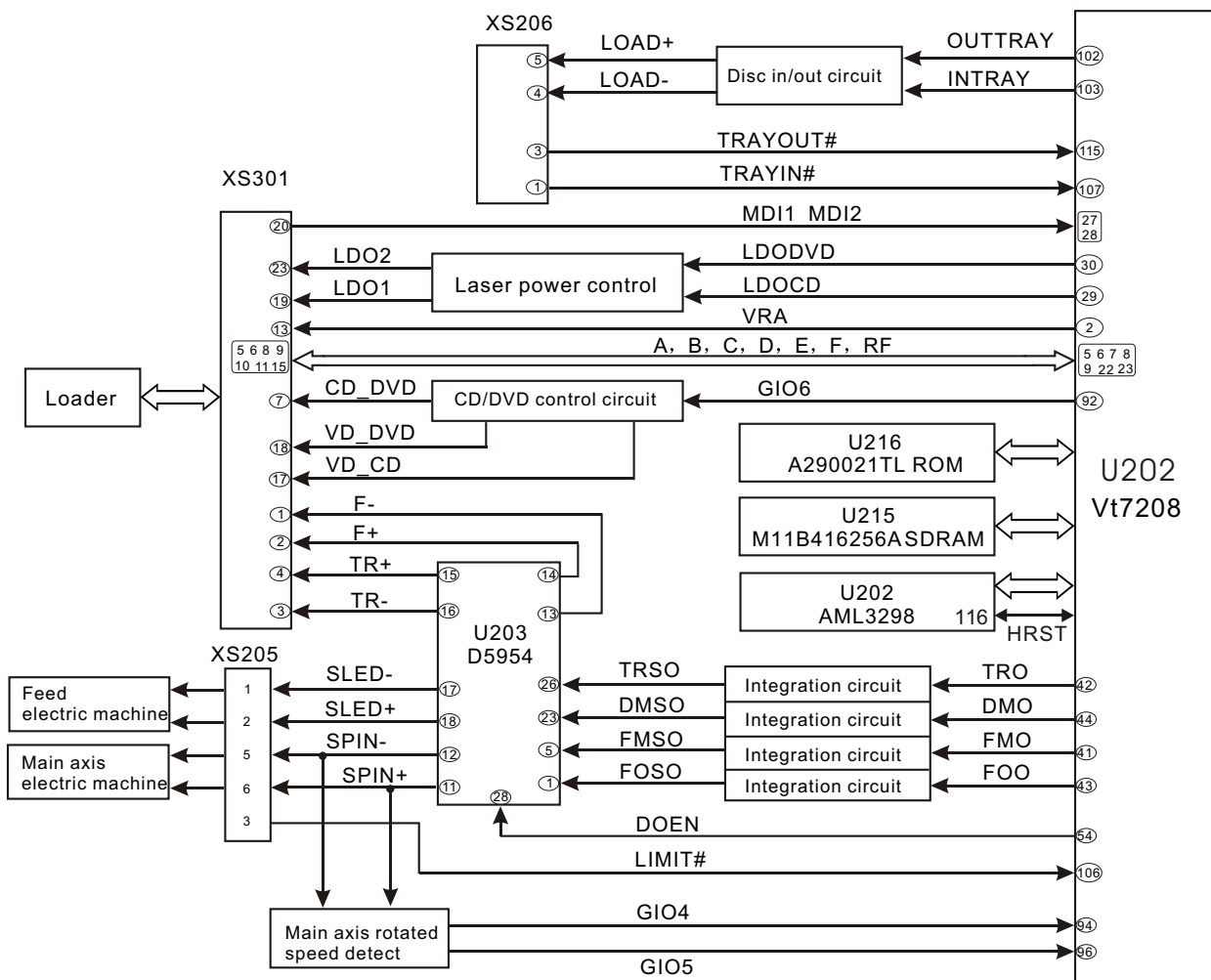


Figure 3.2.3.1 Servo circuit block diagram

2. Working principle: after power-on of the whole set, reset circuit performs reset to decode chip, then decode chip performs reset to servo control chip U201 (VT7208) (refer to unit circuit analysis for reset circuit principle); VT7208, U216 software program compose servo control system, which mainly fulfils tasks of servo control, pick-up collect disc signal processing. After system resets, through door on loader frame to proper position, detect switch begins to detect whether loader tray reaches to proper position. If the door does not close to proper position, order of disc in is sent out to disc in/out circuit to perform disc in/out action. When VT7208 detects that door reaches to proper position, VT7208 sends out feed order and makes pick-up components begin to carry out feed, focus and light emitting action. If the detector (PD) does not detect any information, the machine will display no disc. When disc is in machine, main axis electric machine begins to rotate, the laser sent out by LD is transmitted by disc to detector (PD) to converse signals into electric signals (A, B, C, D, E, F signals DVD only has A, B, C, D signals), RF signal inputs from pin 5~9, 21, 22 of VT7208 separately and then divides into two parts after amplifying processing by pre amplifier inside VT7208: one part, after VT7208 internal digital servo signal circuit processing, forms the corresponding servo control signals and output FOO, TRO, DMO, FMO digital servo control signal from pin 44, 41, 42, 43 of VT7208 and change into analog servo control signals FOSO, TRSO, DMSO, FMSO

Through integration circuit composed by resistance capacitor and then send to drive circuit D5954 for drive amplifying, after drive amplifying, drive focus coil, trace coil, main axis electric machine and feed electric machine separately. Focus and trace servo are used to accurately correct objective position; feed and servo are used to bring along laser head to make radial large-scale move which belongs to the preliminary adjustment to pick-up position; and main axis servo is used to control main axis electric machine to make it read signals in means of constant linear velocity and bring along disc to rotate. After processing of amplification by VGA voltage control amplifier and equalization frequency compensation inside VT7208, 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 VT7208, 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 VT7208, and then sent to AML3298 for decoding after finishing RSPC error correction inside.

3. Explanation to servo terms

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

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

Moves forwards or backwards, and the moving range is very small.

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

DMO: its main function is to bring along disc to rotate in constant linear velocity.

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

Disc	U222 (LM393)								Main axis signal	
	1	2	3	4	5	6	7	8	SPIN+	SPIN-
VCD disc	0.04	1	2.42	0.01	0.93	2.58	0.02	5.08	3.7	1.48
DVD disc	0.04	0.7	2.69	0.01	0.65	2.86	0.02	5.08	4.1	1.03

5. Loader signal function explanation 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

Pin	Name	Signal flow direction	DVD disc	CD disc	No disc	Function description
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: A. When reading DVD, there are only A, B, C, D signals.

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

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

3.2.4 Laser power control circuit

1. Laser power control circuit is shown as the following figure 3.2.4.1:

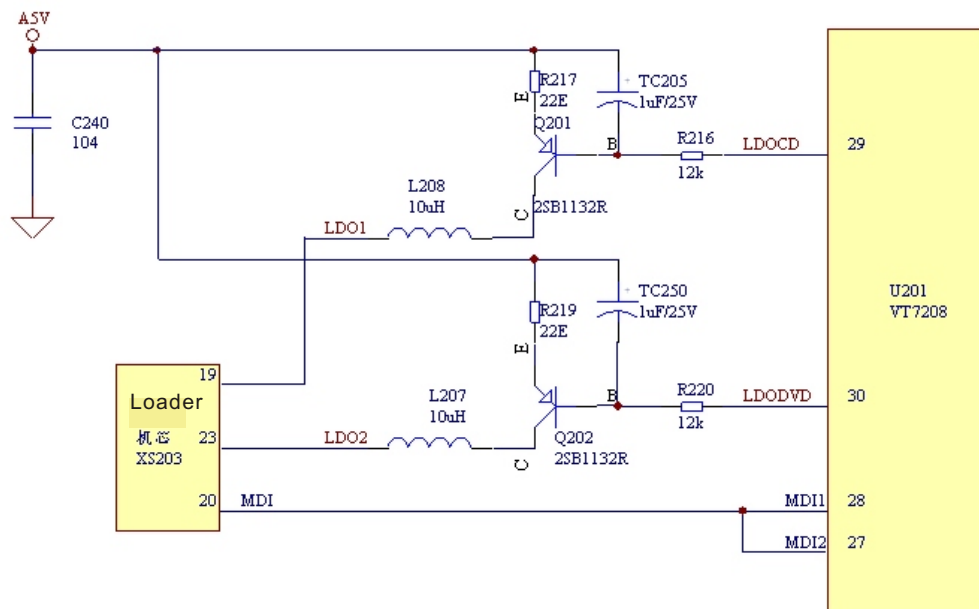


Figure 3.2.4.1 Laser power control circuit diagram

2. Working principle: pin 28 of VT7208 is VCD laser power detecting signal input pin, pin 27 is DVD laser power detecting signal input pin, pin 29 is VCD laser power drive control output pin and pin 30 is DVD laser power drive control output pin.

When reading VCD disc, if pin 28 detects that laser output power is too strong, through VT7208 internal circuit handling, pin 29 output voltage increases, “on” degree of Q201 decrease to make the voltage supplied to laser head decrease and light emitting of laser head become weak; if pin 28 detects that the power is too low, output voltage of pin 29 decreases, “on” degree of Q201 increases and light emitting of laser head become strong to reach the purpose of auto adjusting laser head output power.

When reading DVD disc, pin 27 is detecting signal input pin, pin 30 is drive control output pin and the working principle is the same with that when playing VCD disc.

3.2.5 CD/DVD mode switch circuit

1. CD/DVD mode switch circuit is shown as the following figure 3.2.5.1:

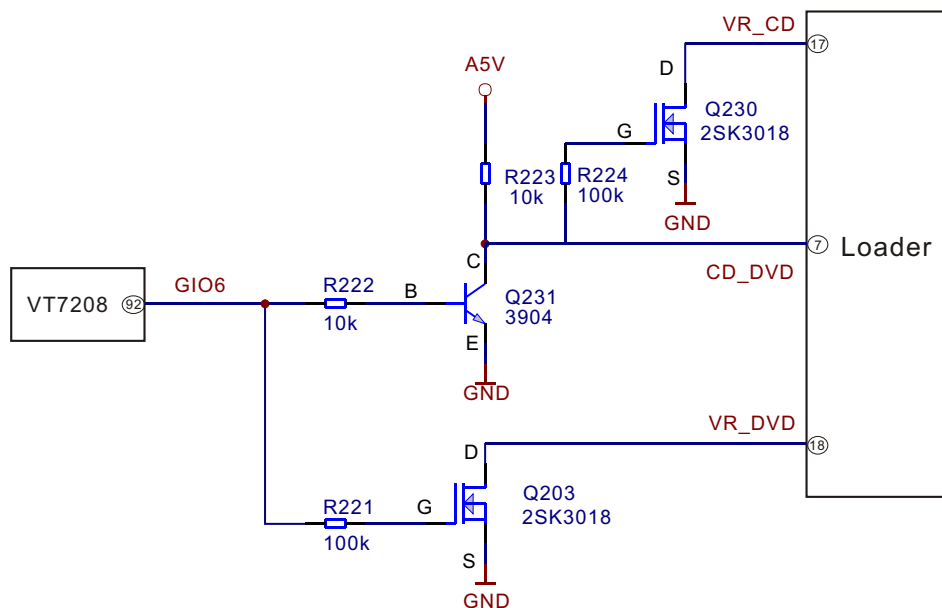


Figure 3.2.5.1 CD/DVD mode switch circuit diagram

2. Working principle: the function of disc identification circuit is to identify the disc inserted to loader and judge whether the disc is CD or DVD to perform the corresponding control acts. When disc is inserted in, decode servo control IC (U201) VT7208 defaults disc to CD. Pin 92 of U201 (VT7208) outputs a low voltage signal, Q231 and Q203 are cut off, Q230 is on, laser receiver tube inside loader selects CD channel, now CD-DVD is high level input loader to make loader in the state of reading CD, through detecting laser power feedback signal, U201 (VT7208) analyses whether the preliminary judgment is correct (disc is defaulted CD). When detecting correct preliminary judgment, loader runs in the state of reading CD; when detecting incorrect preliminary judgment, U201 (VT7208) outputs a high voltage signal from its pin 92, Q231 and Q203 are on, Q230 is cut off, laser receiver tube inside loader selects DVD channel, now CD-DVD is low level input loader to make loader in the state of reading DVD. Whether the preliminarily defaulted disc is CD or DVD is set by U201 (VT7208) internal software.

Note: V303 and V304 are MOS tube.

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

State	Q231			Q230			Q203			GIO6
	Base electrode B	Collector C	Emitter E	Grid electrode G	Drain electrode D	Source electrode S	G	D	S	
VCD disc	0	3.86	0	3.81	0	0	0	0.18	0	0
DVD disc	0.64	0	0	0	0.18	0	3.27	0	0	3.3
No disc	0	3.86	0	3.84	0	0	0	0	0	0

3.2.6 Main axis diversion judgement circuit

1. Main axis diversion judgement circuit is shown as the following figure 3.2.6.1:

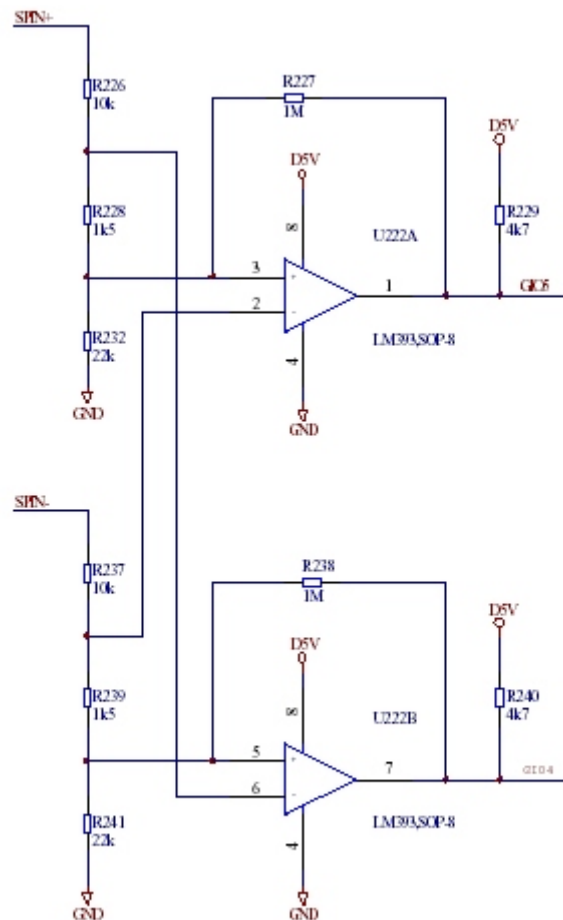


Figure 3.2.6.1 Main axis diversion judgement circuit diagram

2. Working principle: the main function of this circuit is to make judgement to main axis diversion: when voltage of SPIN+ is more than that of SPIN-, and the voltage difference reaches a certain value, GIO5 is high level and GIO4 is low level; when voltage of SPIN- is more than that of SPIN+, and the

voltage difference reaches a certain value, GIO5 is low level and GIO4 is high level. U201 (VT7208) makes judgement to main axis diversion according to GIO4 and GIO5.

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

disc	U222 (LM393)								SPIN	
	1	2	3	4	5	6	7	8	SPIN+	SPIN-
VCD disc	0.04	1	2.42	0.01	0.93	2.58	0.02	5.08	3.7	1.48
DVD disc	0.04	0.7	2.69	0.01	0.65	2.86	0.02	5.08	4.1	1.03

3.2.7 Disc in/out circuit

1. Disc in/out circuit is shown as the following figure 3.2.7.1:

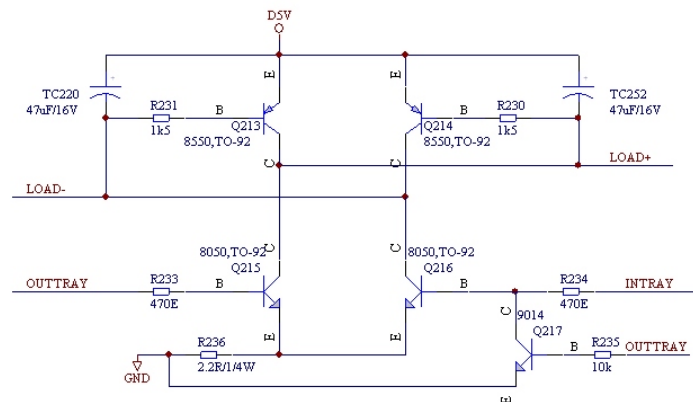


Figure 3.2.7.1 Disc in/out circuit diagram

2. Working principle: INTRAY, OUTTRAY are disc in/out control signals and are connected to pin 102, 103 of U201 (VT7208) respectively. LOAD+, LOAD- connect with two ends of electric machine to control. When users are performing disc out operation, servo control chip U201 (VT7208) sends out control signal through pin 102, 103 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:

Open disc tray: VCC→ Q213CE electrode on→ LOAD+ → Electric machine→ LOAD- → Q216CE electrode on→R236→Ground

When not opening disc tray, pin 102 and 103 of U201 (VT7208) are low level. When opening disc tray, pin102 of U201 (VT7208) sends a high level; Q216 is on; Q216 collector electrode changes into low level; LOAD- changes into low level; Q213 base electrode changes into low level; Q213 is on. Q213 collector electrode changes into high level and LOAD+ changes into high level.

Close disc tray: VCC→ Q214CE electrode on→ LOAD- → Electric machine→ LOAD+ → Q215CE electrode on→R236→Ground

When closing disc tray, pin 103 of U201 (VT7208) sends a high level; Q215 is on; collector electrode changes into low level; LOAD+ is low level; base electrode through R230 and Q214 is low level; Q214 is on; Q214 collector electrode changes into high level; LOAD- changes into high level.

The function of Q217 is interlock INTRAY and OUTTRAY signal to ensure the two are not high level at the same time. When the two are high level input, base electrode of Q216 is made to low level through Q217 on to ensure the normal working of disc in/out circuit. The function of electrolytic capacitor TC220 and TC252 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	Q213			Q214		
	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	Q215			Q216		
	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	Q217			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	

3.2.8 Reset circuit

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

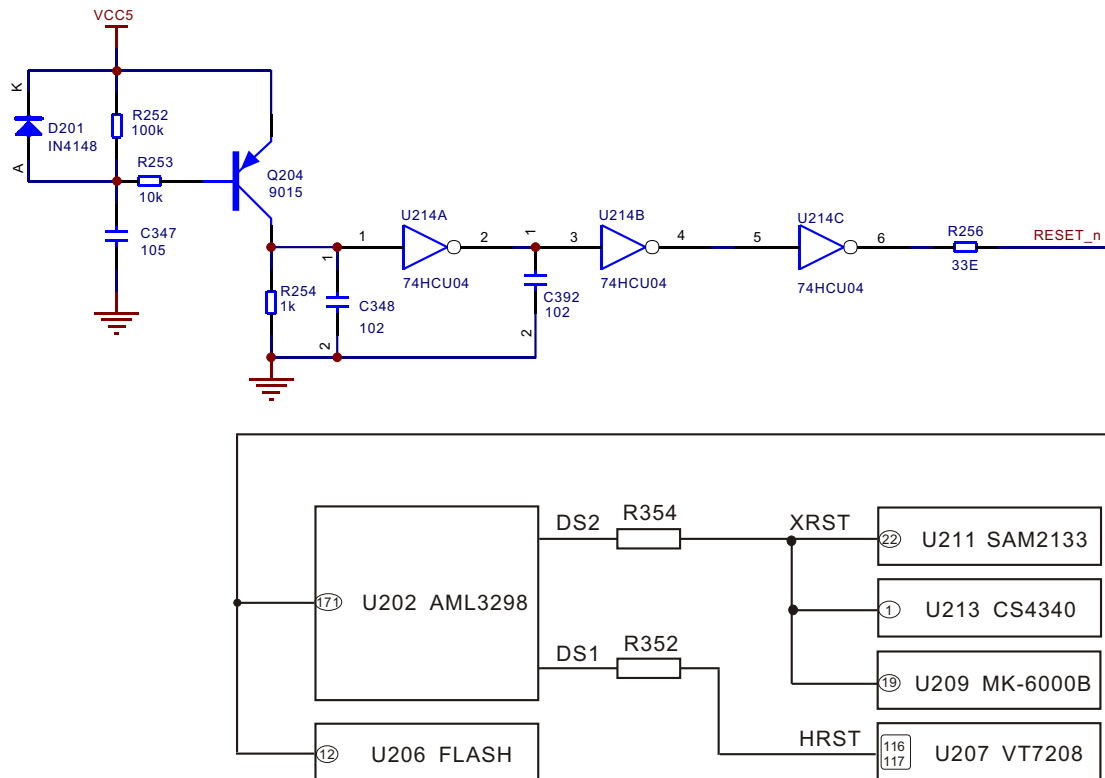


Figure 3.2.8.1 Reset circuit diagram

2. Working principle: when power on, the two ends voltage of capacitor TC216 cannot change suddenly, anode of the capacitor begins charging from 0V. Now triode Q204 is on and performs reset to chip U202 and U206 after inverter U214 (HCU04) reversion and reformation; when charge of the capacitor is close to 3.3V, triode Q204 cuts off, inverter outputs high voltage from pin 6, system reset finishes. In the course of system working, U202 may output reset signal to perform reset processing to U211, U213, U209. Change system into low level effective reset.

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

State	Q204			U214						one end of R354	Two ends of R352
	Base electrode B	Emitter electrode E	Collector electrode C	1	2	3	4	5	6		
Normal working	3.26	3.27	0	0	3.3	3.3	0	0	3.4	3.28	3.28/3.32
Standby	5.17	5.18	0								

3.2.9 Mute circuit

1. Mute circuit is shown as the following figure 3.2.9.1:

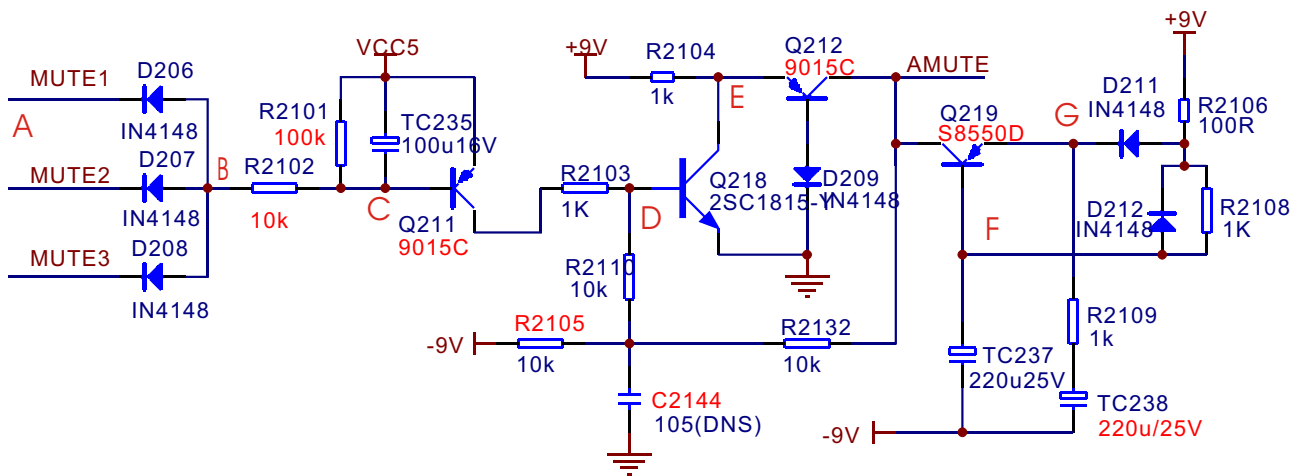


Figure 3.2.9.1 Mute circuit diagram

2. Quieting circuit working principle: when the player is playing normally, chip outputs digital audio signal (SDATA0, SDATA1, SDATA2) to CS4360, now the three channel mute control signals of Cs4360 (MUTE1, MUTE2, MUTE3) are low level and they are added to the cathode of the three diodes VD207, VD208、VD209 of quieting circuit. Seen from the figure, now VD206, VD207, VD208 are all on, voltage of R2102 left end is about 0.7V, Q211 is on, voltage of C point is about 4.3V, voltage of Q211 collector electrode is about 5V, so Q218 is also on, voltage of B point is about 0.7V, voltage of A point is close to zero, Q212 cuts off, AMUTE is negative voltage, which is added to the base electrode of switch pipe Q205-Q210 of audio output end to make switch pipe cut off; audio signals outputted by CS4360 are normally sent to loudspeaker after 4558 amplifying to give sound. When playing stops (or pauses), in fast forward, mute, no disc, chip has no digital audio signal (SDATA0, SDATA1, SDATA2) that outputs to CS4360, that is, CS4360 has no audio output, now MUTE1, MUTE2, MUTE3 are all high level, so audio output end of the player should have no audio output; for electronic elements and IC in circuit will produce some noise that transmits to audio output end of the player, in order to remove these noise, now the three channel mute control signals of CS4360 (MUTE1, MUTE2, MUTE3) make VD206, VD207, VD208 cut off, so the base electrode voltage and emitter electrode voltage of Q211 are equal to each other, Q211 cuts off, now base electrode of Q218 is negative voltage and also in cutoff state; for emitter electrode of Q212 connects with high level, Q212 is on, now voltage of VD209 anode (that is Q212 base electrode) is about 0.7V, so voltage of Q212 collector electrode (that is MUTE-1) should be about 1.4V, the voltage outputted from MUTE-1 is added to the base electrode of switch pipe Q205-Q209 of audio output end to make switch pipe saturate, noise is bypassed to ground, that is quieting function is realized. The function of VD209 is to make AMUTE have high enough voltage to ensure Q205-Q210 can enter saturation state securely.

3. Power-off quieting: seen from the figure, when the player is working normally, VD211 is on, +9V charges capacitor TC238 through VD211, R2109, now Q219 emitter electrode voltage is less than base electrode voltage, Q219 cuts off. When power off, +9V disappears, Q219 base electrode changes into low level, its emitter electrode changes into high level because of TC235 discharge, now Q219 is on, Q219 collector electrode (AMUTE) outputs high level to add to the base electrode of switch pipe Q205-Q210, switch pipe saturates, the noise produces in power-off process is bypassed to ground, and power-off quieting function is realized.

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

State	Q211			Q218			Q212			Q219		
	B	C	E	B	C	E	B	C	E	B	C	E
Unmute	4.46	5.14	5.10	0.74	0.02	0.00	-0.16	-4.30	0.02	8.85	-4.30	8.70
Mute	5.08	-3.98	5.16	-3.98	1.37	0.00	0.63	1.37	1.36	8.87	1.35	8.68

3.2.10 MIC circuit

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

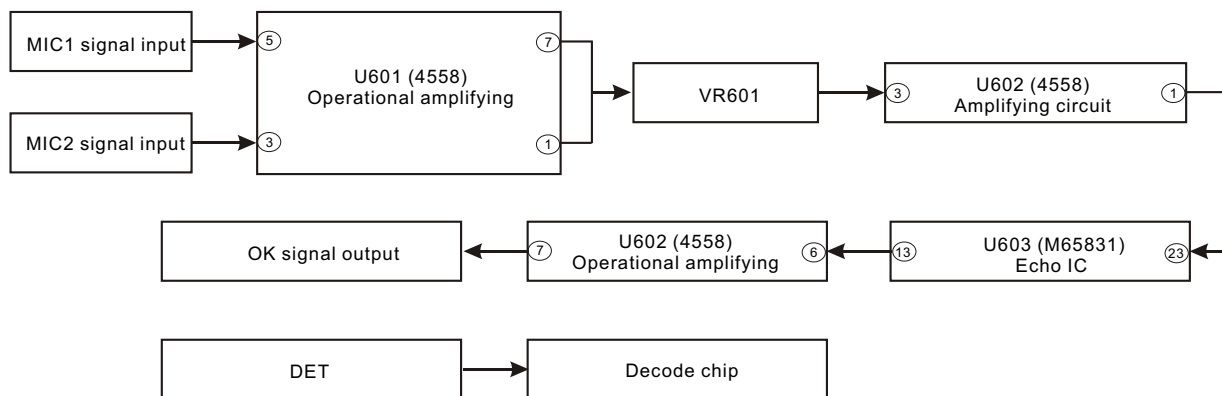


Figure 3.2.10.1 MIC circuit block diagram

2. Working principle: microphone signals MIC1 and MIC2 are superposed together after being amplified by U601 (4558) for volume adjustment through potentiometer VR601, then the operational amplifier U602 (4558) amplifies the signal after being mixed to input it into pin 23 of U603 (M65831) to form circuit through the echo composed by M65831 and the peripheral to produce echo output, then sends out OKA signal to decode board through being amplified by U602 (4558). DET signal is connected with pin 200 of decode chip U202. When microphone is inserted, DET signal is short connected to ground; after decode chip detects the level of this pin, DVD player needs mute, which mutes by not adopting mute circuit, but makes decode chip stop outputting audio signal, when MIC input signal may output normally.

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

Key point position	Function description	Voltage when microphone is inserted	Voltage when microphone is not inserted
Pin 4 of U601, U602	Operational amplifier cathode power supply	-9V	-9V
Pin 8 of U601, U602	Operational amplifier anode power supply	9V	9V
Pin 1, 9, 24 of U603	U603 power supply pin	5V	5V
Pin 2, 3 OF U603	U603 clock pin	1.2V	1.2V
DET	MIC detect pin	0	5V
Pin 1 OF VR601	MIC signal inputs to potentiometer	relevant to signal input	
Pin 7 OF U601	MIC1 signal output	relevant to signal input	
Pin 1 OF U601	MIC2 signal output	relevant to signal input	
Pin 1 OF U602	MIC signal amplifying output	relevant to signal input	
Pin 6 of U602	Signal input after echo processing	relevant to signal input	
Pin 7 of U602	Amplified OK signal output	relevant to signal input	

3.2.11 Scoring detect circuit

1. Scoring detect circuit is shown as the following figure 3.2.11.1:

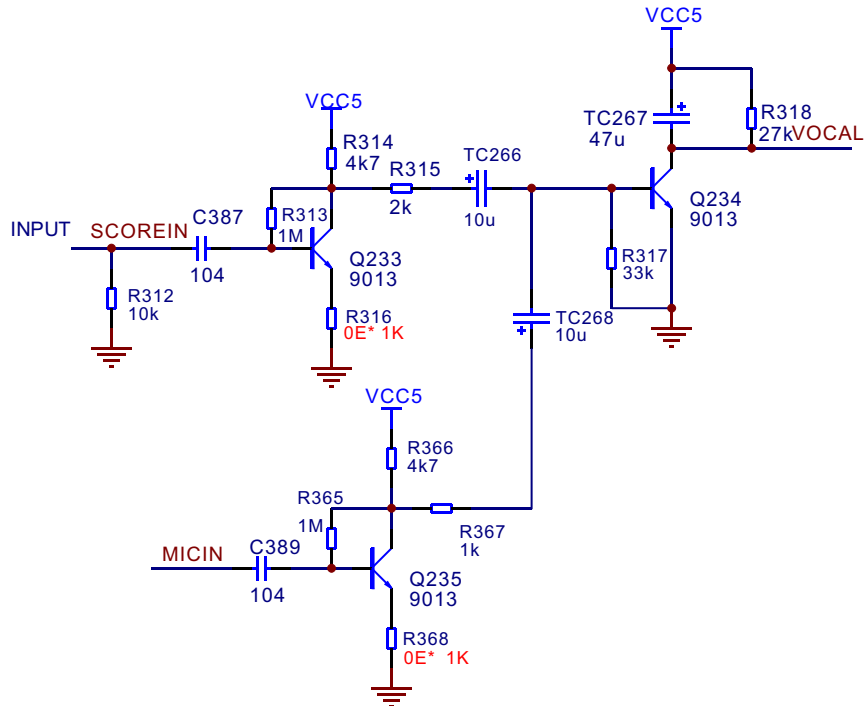


Figure 3.2.11.1 Scoring circuit diagram

2. Working principle: external scoring signal, through being amplified by Q233 firstly, controls on and cutoff of triode Q234. When there is no external scoring signal input, that is, there is no SCOREIN signal input, triode Q234 is not on, VOCAL signal is high level for being affected by VCC5. When there is MIC signal input, SCOREIN has signal input to make triode Q234 on, then will make VOCAL connect with ground after being on to make VOCAL signal turn into low level. Tc266 is isolation DC capacitor with its function of avoid scoring mistakenly. Scoring signal VOCAL low level is effective. VOCAL signal high level is 3.65V, low level is 0V.

The principle of circuit composed of Q235 and its peripheral is the same with that of external input scoring detect circuit, and this circuit is Karaoke scoring detect circuit.

The main performance after this circuit has trouble is that Karaoke cannot score, external scoring input cannot score. If the two scoring modes cannot score, the trouble is mainly Q234, decode chip is not good.

3.2.12 Panel control circuit

1. Panel control circuit block diagram is shown as the following figure 3.2.12.1:

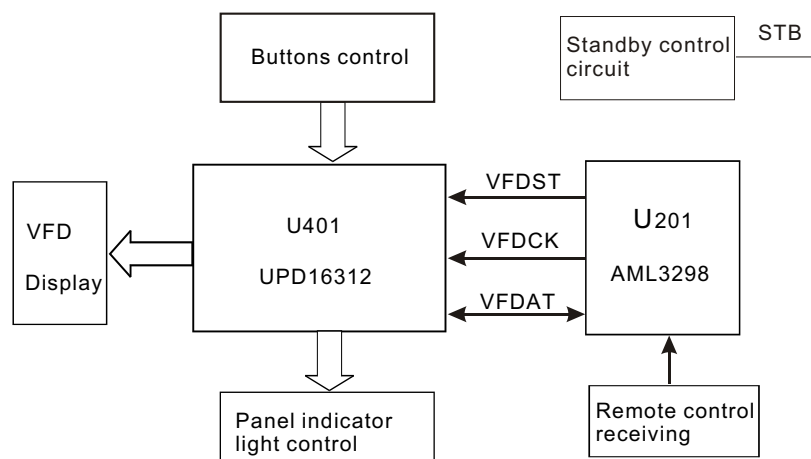


Figure 3.2.12.1 Panel control circuit block diagram

2. Working principle: U201 (HS0038A2) is IR receiver and it may receive remote control signal sent out by remote controller and send it into AML3298 for identification to control the realization of relevant function. When users are operating panel buttons, control order is sent to UPD16312 through keyboard scanning circuit, UPD16312, through coding drive inside, outputs control data from pin 5, 6 (VFDAT) to AML3298 inside CPU to realize the control of controlled circuit by CPU and controls VFD through UPD16312.

VFD401 is vacuum fluorescence screen and the feature is high height, with its working principle similar with that of Tv's kinescope. Pin 1, 2, 34 and 35 are filament power supply; pin 27-32 is GRID

Electrode, and each GRID has 16 different kinds of character for display inside; pin 4-19 is SEG electrode, CPU, through the control of UPD16312, controls SEG electrode finally to make the character of the relevant working state display on screen.

Panel indication control circuit: when LED401 standby indicator light is in standby, pin 3 of U402 outputs low level to make Q403 on and standby red light is on; when power on, pin 3 of U402 outputs high level to make Q403 cutoff and standby red light is not on; pin 42 of UPD16312 is low level and it is added to base electrode of Q402, Q402 is on, VCC 5V, through LED402/LED403/ Q402, makes door indicator light display in blue.

In whole unit setup menu, CPU may control UPD16312 pin 39-42 through VFDAT signal to fulfil function of door indicator light on/off.

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

Key point	Standby voltage	Working voltage	Key point	Standby voltage	Working voltage
U402_1	3.3	3.3	VCC	0	5
U402_5	0	3	VFDAT	0.7	2.2
U402_7	1.8	3.3	VFDCK	0.7	2.6
U403_3	3.3	3.3	VFDST	0.7	1
VFD401_1	0	-20	U402_3	0	3.1
VFD401_35	0	-16	U401_27	0	-21
VDD5	0	5			

3.2.13 MIDI signal processing circuit

1. MIDI signal processing block diagram is shown as the following figure 3.2.13.1:

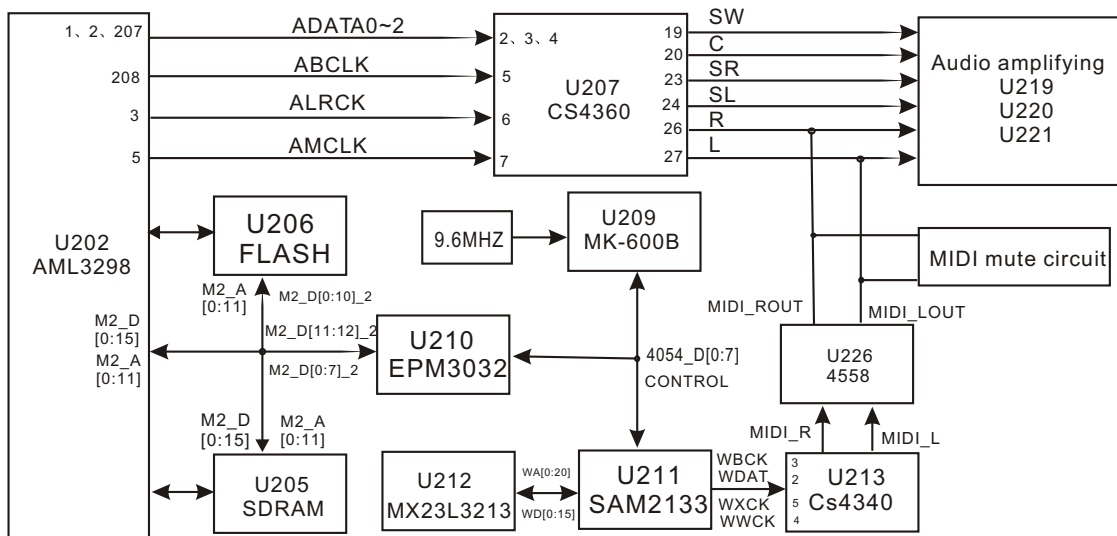


Figure 3.2.13.1 MIDI signal processing circuit block diagram

2. Working principle: MIDI signal synthesize and decode: when power is on and machine reads out KVD disc, decode chip sends out a reset signal with effective high level to pin 19 of U209, pin 22 of U211, pin 1 of U213 to make MIDI signal processing control system begin entering standby state. When machine recognises that disc includes MIDI signal, it will save the read MIDI signal in U205 of SDRAM temporarily; when machines needs to play MIDI signal, U202 (AML3298) makes data in SDRAM output to CPLD through D0~D7, at the same time fulfils the chip selection to DATD BUS, U209 (MK6000B), chip selection of U206 (EN29LV800AB) and CPLD truth value read and write through the control of output A22, A21 signal to pin 15, 18 of CPLD, shown as the following table:

A22	A21	OUT
0	0	ROMCS
0	1	CPLD REG
1	0	MK—6000B CS
1	1	DATABUS

U209 is the main control MPU of MIDI signal, and compose MIDI signal decode and synthesis circuit together with U211 (MIDI signal synthesis) and U212 (mask ROM) to decode MIDI signal transmitted from decode chip. MIDI signal after being decoded synthesizes into serial audio signal through U211 (MIDI signal synthesis), U212 (mask ROM) and output from pin 93 of U211 to D/A converter (CS4340) to recover analog dual-channel MIDI signal and then overlap to L/R main channel for output after being amplified by U226. D/A conversion and amplification of MIDI signal is the same with audio output principle of general DVD player, and its main signal flow chart is shown as the following figure 3.2.13.2:

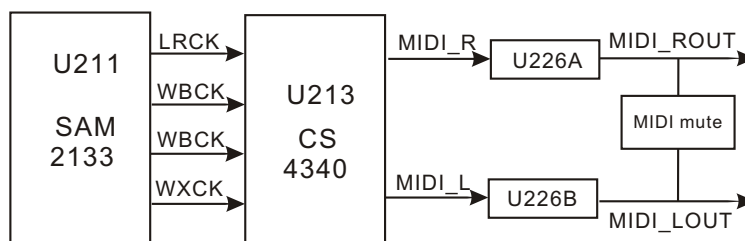


Figure 3.2.13.2 D/A conversion circuit

3. MIDI signal mute circuit

(1) MIDI signal mute circuit is shown as the following figure 3.2.13.3:

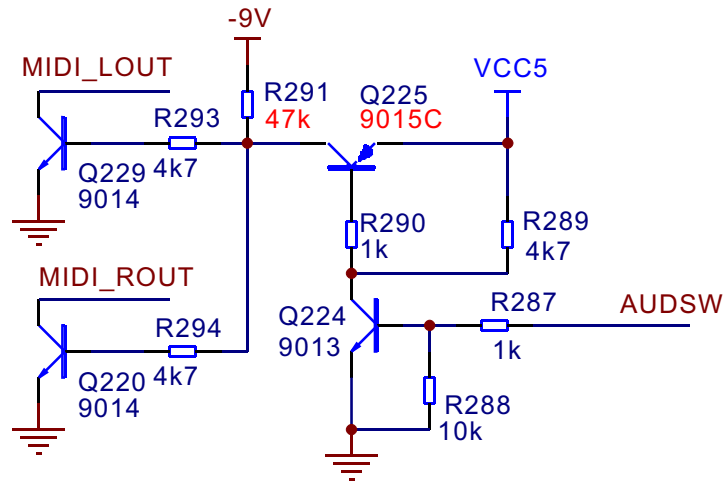


Figure 3.2.13.3 MIDI signal mute circuit diagram

(2) Working principle: when playing discs with MIDI signal included, AUDSW signal controlled and sent out from MK-6000B is low level, Q224 and Q225 are cutoff, and now base electrode of Q229 and Q220 is negative voltage, Q220 and Q229 are cutoff, MIDI_LOUT and MIDI_ROUT output normally; when playing common DVD, CD, AUDSW is high level, Q224 and Q225 are on, now base electrode of Q229 is high voltage on, MIDI_L and MIDI_R are caught to about 0.3V to fulfil the mute to MIDI signal to prevent the noise disturbance and audio output produced by MIDI signal processing circuit when playing DVD, CD. When playing MIDI signal, press MUTE button and this circuit does not function but only shuts off SDAT output (only when playing KVD disc, AUDSW is low level).

3.2.14 Video circuit

1. Video circuit block diagram is shown as the following figure 3.2.14.1:

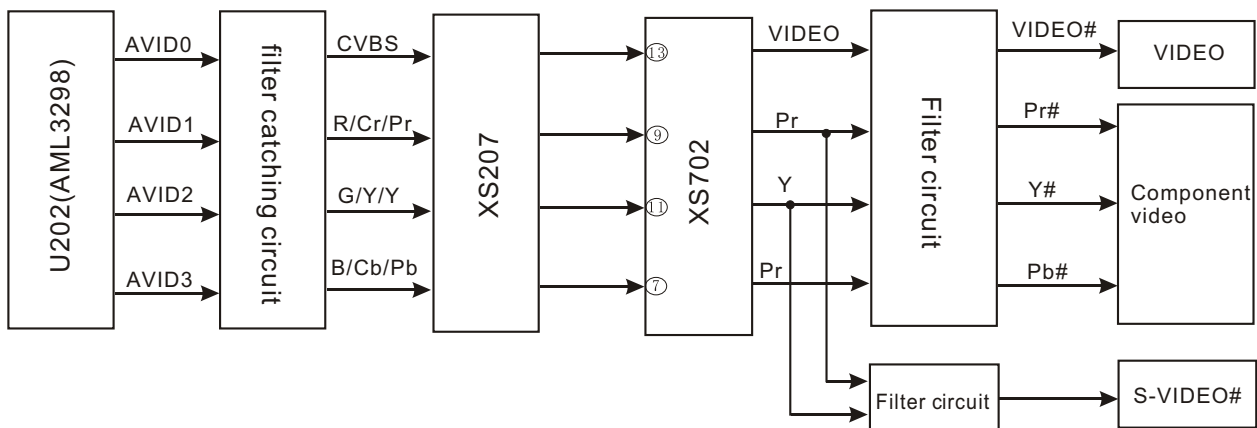


Figure 3.2.14.1 Video circuit block diagram

Video signals decoded by U202 (AML3298) are sent to the corresponding terminal through lowpass filtering and amplitude limiting to output. Take CVBS signal as an instance to explain the working principle of limiting circuit.

2. Video circuit is shown as the following figure 3.2.14.2:

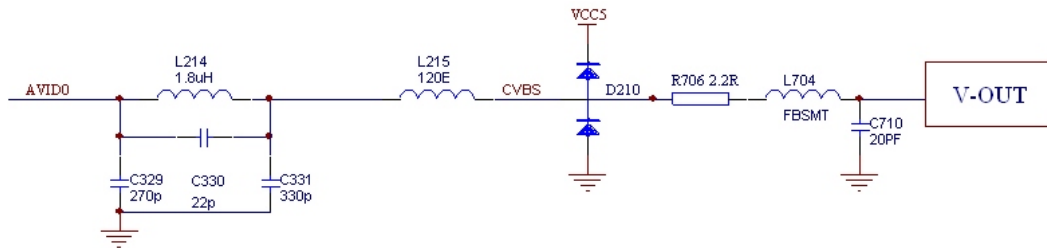


Figure 3.2.14.2 Video circuit diagram

3. Working principle: capacitors C329, C331, C330 and inductor L214 compose a lowpass filter to filter high frequency signal apart from useful signal; dual diode D210 composes a limiting circuit. Through features of diode, we know that the max amplitude limitation of composite video signal CVBS cannot exceed 5.7, and the min one cannot be less than -0.7, thus the high voltage signal from TV set can be prevented from burning down the player.

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

Signal	Function	Causes	Voltage when no disc in
CVBS	Compound signal of component video	Composite video has no picture/picture is bright/picture is dark	0.74
Y1	Brightness signal of component video	Component video has no picture/picture is bright/picture is dark	0.76
Pb	Chroma signal of component video	Component video color distortion	1.46
Pr			1.75

Note: in actual measurement, voltage of CVBS, Y1, Pb, Pr will have a certain change, which is between two several tenths of a volt and one volte plus a bit generally, so the main troubleshooting method is to measure waveform of each signal during the course of playback.

3.2.15 Audio circuit

1. Audio circuit is shown as the following figure 3.2.15.1:

2. Working principle: power on, after reset of decode chip, it sends out low level to CS4360 to perform reset. Audio signals after being decoded output to D/A conversion circuit in serial output means, in which ADATA0 is L/R channel serial data signal, ADATA1 is LS/RS channel serial data signal and ADATA3 is C/SW channel serial data signal. Serial data signals input from pin 2, 3 4 of CS4360 respectively, after D/A conversion, output analog 5.1CH audio signal from CS4360 and send to the

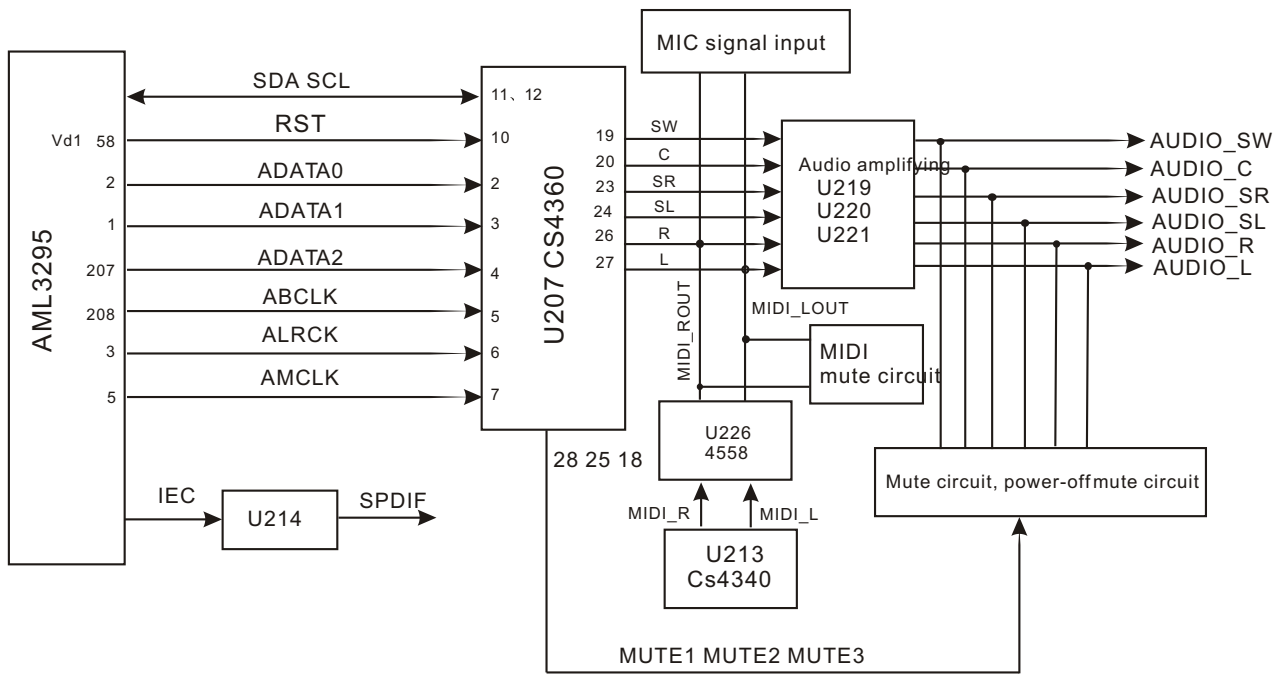


Figure 3.2.15.1 Audio circuit diagram

Active filter composed by U220, U221, U219 to output after filtering and amplification to send to audio output terminal and SCART terminal. Only when playing 5.1CH discs or when “Cyber logic” function is on, ADATA1 ADATA2 has signal output. When playing KVD disc, MIDI signal in disc recovers to original audio signal after “Cyber logic” and overlap to L, R channel for output. Voice in KVD disc outputs in PCM means and then overlaps to L, R channel after D/A conversion of CS4360 for output. MIC outputs in the same means.

3. Mute mode: when playing DVD, CD disc, press MUTE button on remote controller, IC CS4360 MUTE pin outputs low level to make mute circuit carry out mute, and decode chip ADATA pin stops output. After microphone is inserted into machine, MIC board DET signal turns into high level, press MUTE button to realize mute function, decode chip controls CS4360 MUTE pin to output high level, mute circuit does not work, but ADATA pin stops output, so Karaoke function outputs normally after mute.

3.2.16 Introduction to SCART terminal

1. Working principle: SCART terminal integrates video and audio all together and it may transmit video and audio signals at the same time. The operation is convenient, 21 pins in all and lies in the central part on the rear side of the player.

2. SCART terminal pin function is shown as the following table:

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

★ Used for RGB and CVBS mode selection.

3. SCART terminal function selection is shown as the following table:

PDAT0	PDAT1	PDAT2	Pin 8 of SCART terminal	Function
0	x	0	10V	AV4:3
0	x	1	7.5V	AV16:9
1	x	0	0.90V	TV
1	x	1	0.85V	TV
x	0	x	x	CVBS MODE
x	1	x	x	RGB MODE

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

Section Three Servicing Cases

3.3.1 Servicing instances

【Example 1】 Symptom: no disc reading

Analysis and troubleshooting: take out loader cover board, observe action of loader after power on and find out that the machine does not have feed acts. Test pin 26 of U203 and there is feed signal input, test pin 11, 12 of U203, the output voltage is equal on the whole, after power on again, there is still not any change. Test pin 28 of U203, and it is high level, power supply of pin 21, 8, 9 is normal, so we judge that U203 is not good, but trouble disappears after changing it.

【Example 2】 Symptom: picture output is normal, but left and right channels have no sound output

Analysis and troubleshooting: test pin 5, 7, 2 of CS4360, and there is signal input; test audio output pin and there is signal output; test pin 1 of U219 and there is no sound output; test pin 2 and there is signal input; so we preliminarily judge that U219 is not good, after changing U219, trouble disappears.

【Example 3】 Symptom: not read KVD disc, other discs are played normally

Analysis and troubleshooting: playback of other discs is normal, which means that servo circuit of machine is normal, after changing decode chip, trouble still lies in. According to the principle, KVD disc content is firstly saved inside SDRAM for decoding and playing. After changing U205, trouble disappears.

【Example 4】 Symptom: Karaoke has no scoring function

Analysis and troubleshooting: external scoring input function is tested ok, which means that scoring function of decode chip is normal. When using microphone to sing, C electrode of Q234 is still high level, test B electrode of Q234, and there is no MIC input signal. For Karaoke function of the machine is normal, it means MIC board is normal, and we need not to check MIC board. Test B electrode of Q235B and there is signal input, test C electrode of Q235 and there is signal output, so we doubt TC268 is not good. After changing it, trouble is removed.

【Example 5】 Symptom: no sound when playing KVD disc

Analysis and troubleshooting: sound output is normal when playing DVD, CD disc and it means that trouble lies in MIDI signal processing circuit. Test pin 2 of U213 and there is signal input, test pin 15, 12 of U213 and there is signal output, test power supply and it is normal, test pin 1, 7 of U226 and there is no signal output, so we doubt U226 is not good. After changing U226, trouble disappears.

【Example 6】 Symptom: no output

Analysis and troubleshooting: test and find that the machine cannot read disc and there is no picture output, so we judge the trouble mainly lies in decode position. Test decode chip power supply and it is normal, and 27M clock is normal. Make R256 short circuit to ground instantly, then disconnect immediately and the machine appears power-on picture, it means trouble lies in reset circuit. After cutting off power, power on again and trouble still lies in. Make CE electrode of Q204 short circuit instantly, trouble disappears, so we can judge that trouble lies between Q204 and C347. After changing C347, trouble disappears.

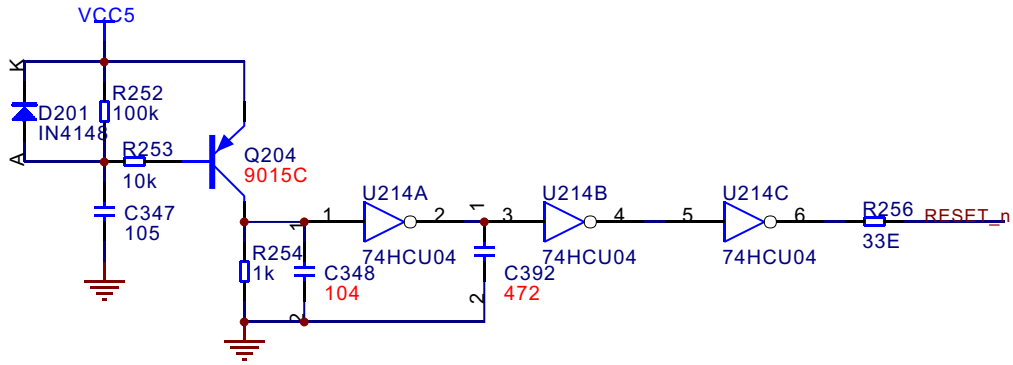


Figure 3.3.1.1 Reset circuit

【Example 7】 Symptom: power not on

Analysis and troubleshooting: standby indicator light is not on, test and there is no CPU+3.3V, test between TC501 anode and cathode and there is no 300V DC current. Observe and find that protector tube is burnt down, change the protector tube, power on again and protector tube is burnt down again. Test two ends of TC501, and they are short circuited, and find that D501 D502 D503 D504 are all struck through. After changing, test two ends of TC501, they are still short circuited. So we doubt it is caused by short circuit of U501, after taking apart U501, resistor of two ends of TC501 restores to be normal. After changing U501, install protector tube, and the machine is normal. Summary: when protector tube is burnt down, you should firstly test whether load circuit has short circuit.

【Example 8】 Symptom: power cannot on when in standby

Analysis and troubleshooting: after power on, standby indicator light is on normally, but when pressing standby button, the standby indicator light cannot turn out and the machine cannot normally enter working state. According to trouble causes, we judge that trouble lies in power standby circuit. Standby circuit of this machine is in panel part. The principle diagram is shown as follows:

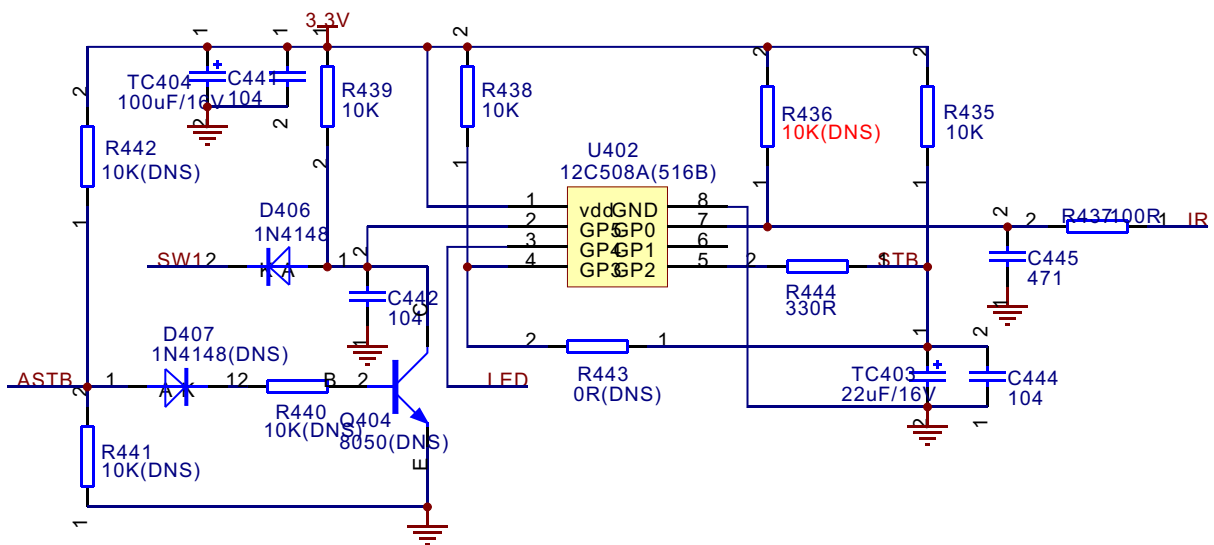


Figure 3.3.1.2 Standby control circuit

Firstly use remote controller to power on, the machine cannot work, so we may confirm trouble does not lie in button board, but mainly lies in standby circuit of panel. Press SW button on panel, pin 1 has level change, test pin 5 of U402 and it is always low level, so we doubt that U402 is not good. Trouble disappears after changing.

【Example 9】 Symptom: not read VCD disc

Analysis and troubleshooting: through confirmation, DVD disc reading is normal, but CD disc reading is not available. When reading discs, CD disc and VCD disc use the same laser head, according to trouble causes, we can judge that trouble lies in CD disc reading. After changing loader, trouble disappears.

【Example 10】 Symptom: mosaic appears in picture when playing

Analysis and troubleshooting: mosaic appears in picture when playing DVD and VCD discs. Trouble still exists after changing laser head, so we doubt that trouble lies in decode part, but trouble still exists after changing decode chip. According to decode principle, data is firstly saved inside SDRAM for playing, after changing SDRAM U208 and trouble is removed.

【Example 10】 Symptom: no disc reading

Analysis and troubleshooting: after power on, reset, focus and light emission of laser head are all normal. Load disc and play, DVD and VCD disc reading are not available, after disc rotates for a while, no disc displays, when disc is rotating, use hand to touch drive IC BA5954 and its is so hot, so we doubt that BA5954 may probably be damaged (now use multimeter to test power supply of IC, and it is normal). After changing BA5954, trouble is removed.

【Example 12】 Symptom: disc reading is slow and not available sometimes

Analysis and troubleshooting: observe when disc is not in, and find that laser head does not feed inwards, but moved outwards at intervals. After loading disc, laser head moves outwards in normal conditions, and will move inwards after detecting disc is in and then read disc. Use multimeter to test feed output control signal of VT7208, and find that when feeding, voltage of this pin will move downwards from 1.5, but it should move upwards when in normal conditions, power supply of servo IC VT7208 is normal, clock frequency is 33.8688MHZ. After changing serv IC, trouble is removed.

【Example 13】 Symptom: no screen display, image output is normal and remote controller has function

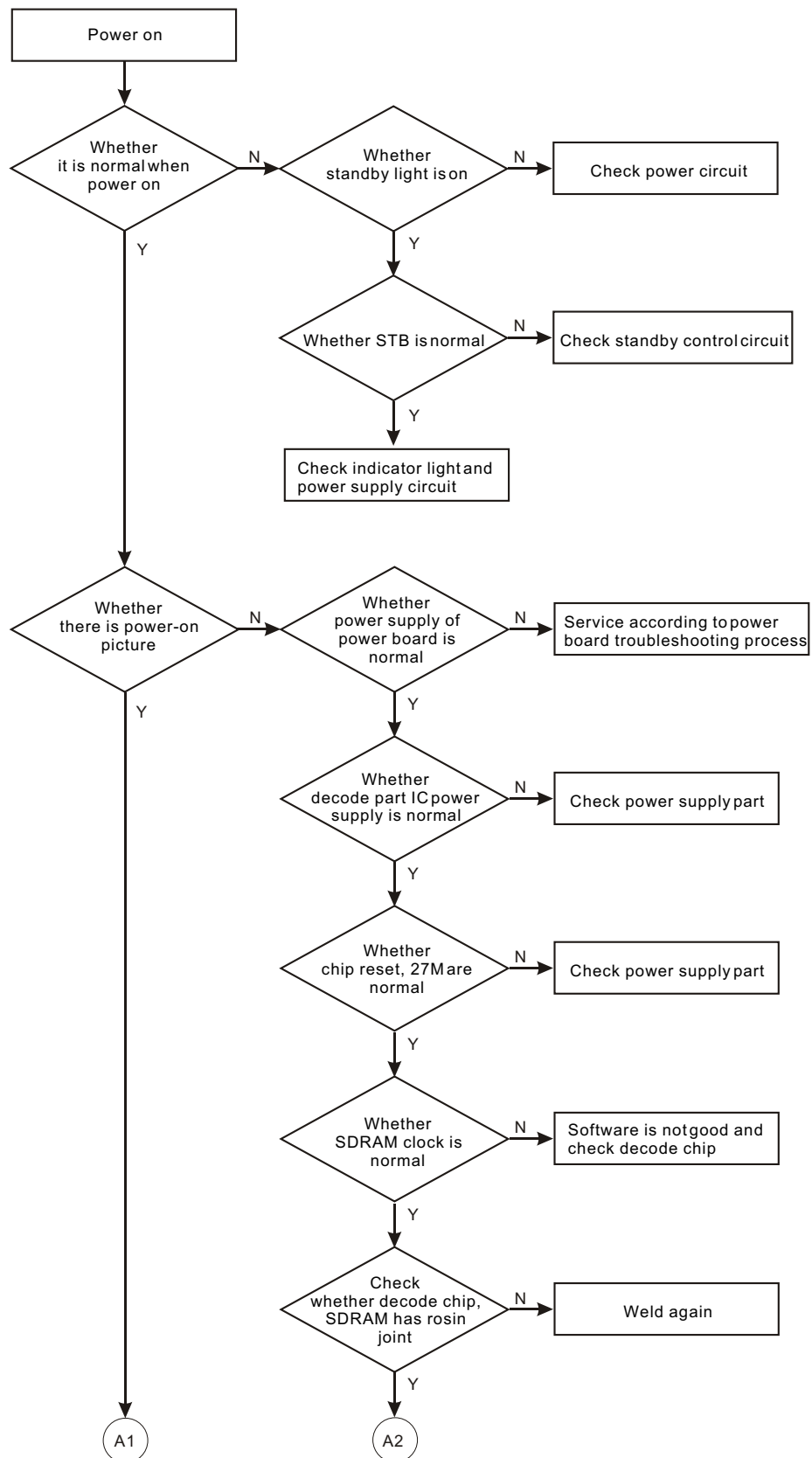
Analysis and troubleshooting: after power on, observe screen filament brightness and it is normal, so we can judge that screen power supply is normal. Test XS401 flat cable socket VCC on main panel and it is 5V; test pin 1, 2, 3 signal of XS402 and no abnormalities appear; test power supply of U401, IC16312 and it is normal; test each pin signal voltage of display screen, they are all close to display screen filament voltage. Change 16312 and IC trouble is removed.

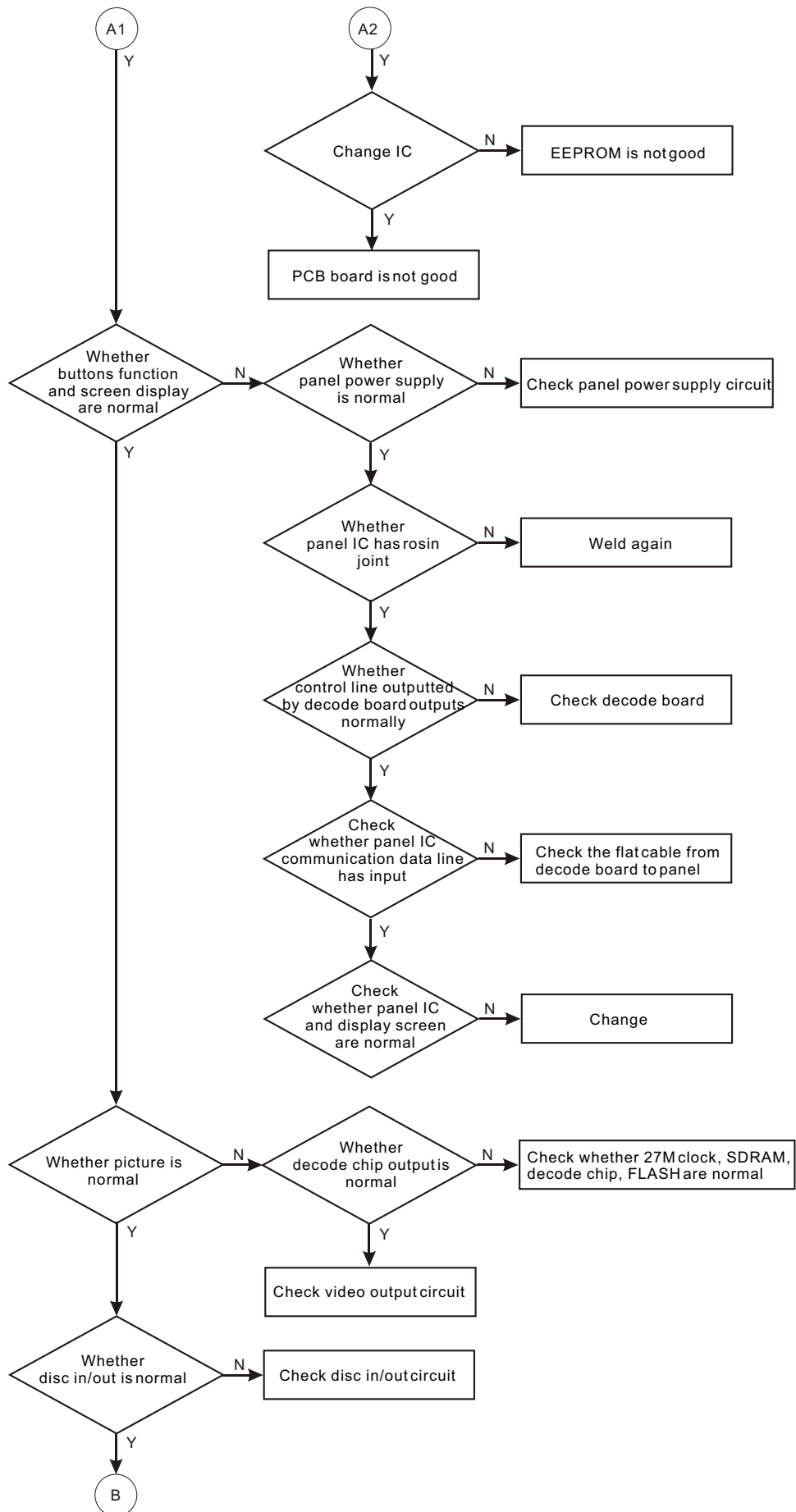
【Example 14】 Symptom: disc tray door not open

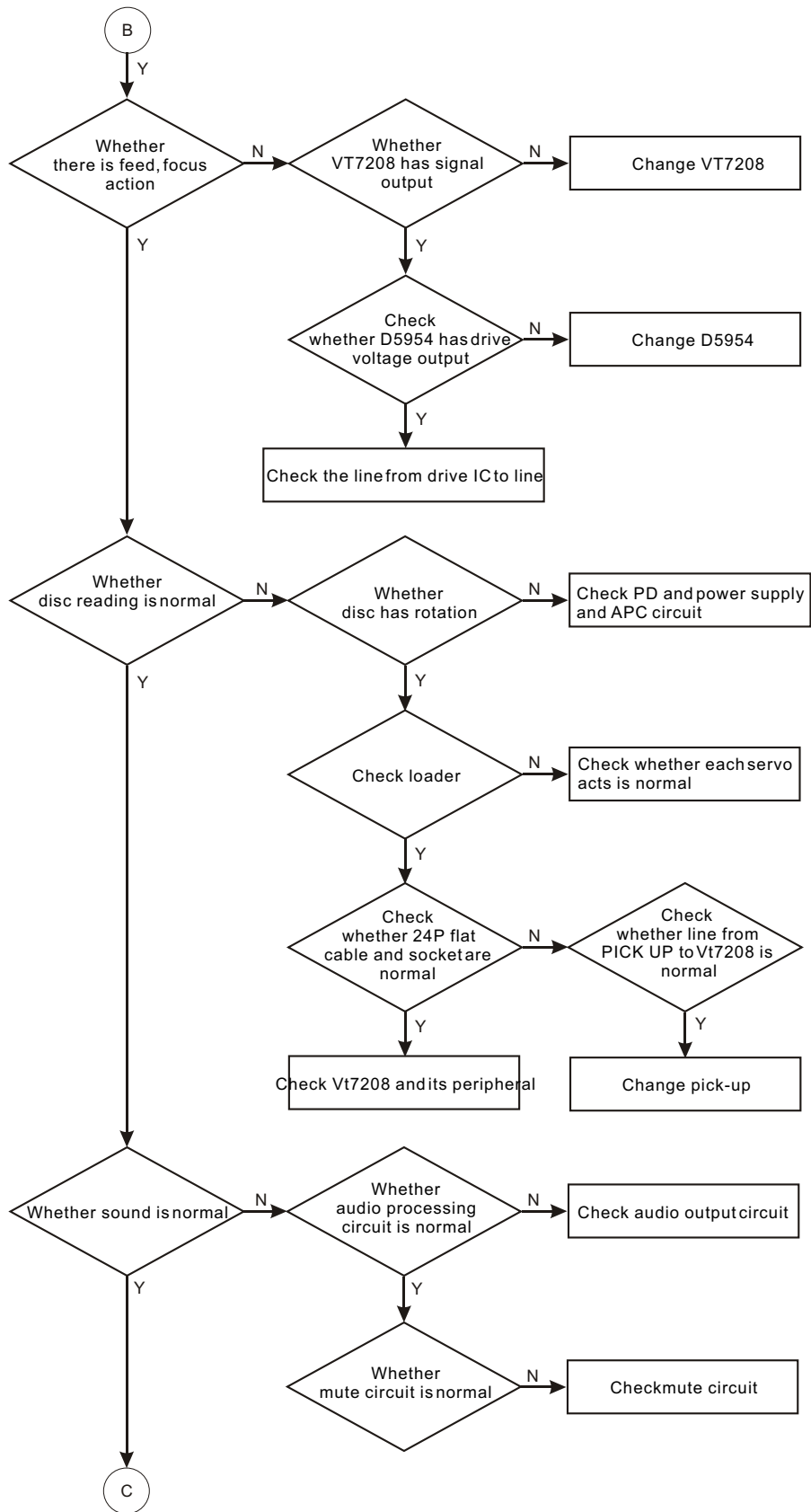
Analysis and troubleshooting: after power on, screen display is normal, image output is normal, no action when opening disc tray door, but screen displays OPEN/CLOSE changes, use multimeter to test loader in/out electric machine and flat cable and no abnormalities appear; test voltage of pin 4 and pin 5 of decode board Xs206 flat cable base, and operate OPEN/CLOSE at the same time, pin 4 and pin 5 voltage are both 3.5V without change, so the trouble caused by CPU is removed; test Q215, Q216 base electrode voltage when in disc in and out switch, voltage change range is 0~0.67V, which is normal; test Q215, Q216 triode and they are both normal; test Q214 and find it has been damaged, positive and negative resistance are infinite. After changing Q214, trouble is removed.

3.3.2 Servicing flow chart

1. Flow chart for whole player troubleshooting is shown as the following figure 3.3.2.1:







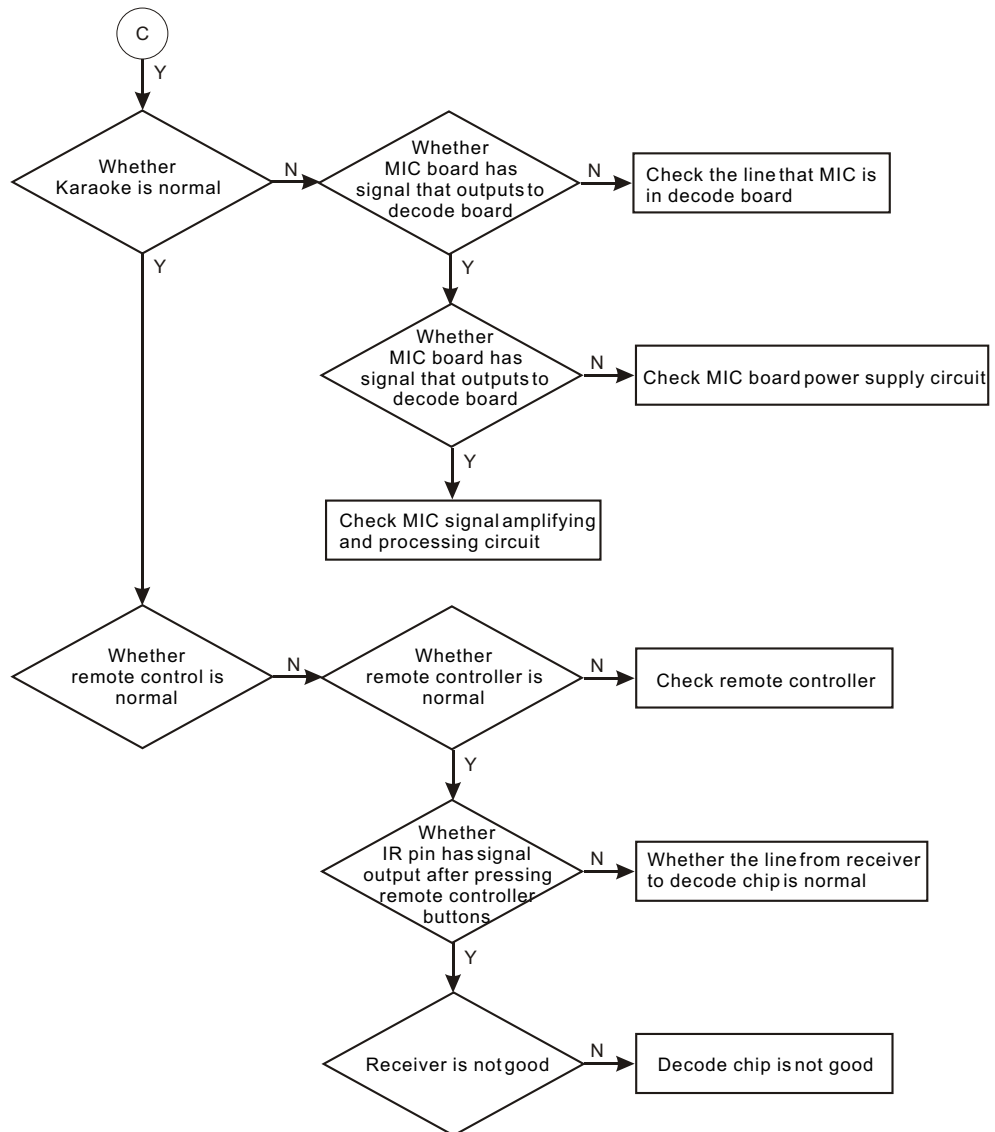


figure 3.3.2.1 Flow chart for whole player troubleshooting

2. Power circuit Troubleshooting process

(1) Troubleshooting process for “No SA+5V” is shown as the following figure 3.3.2.2:

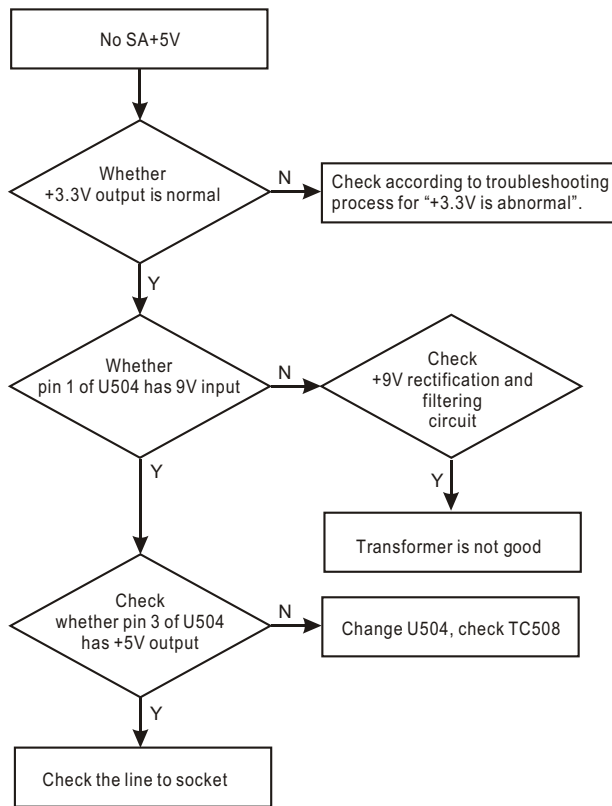


Figure 3.3.2.2 Troubleshooting process for “No SA+5V”

(2) Troubleshooting process for “CPU+3.3V is abnormal” is shown as the following figure 3.3.2.3:

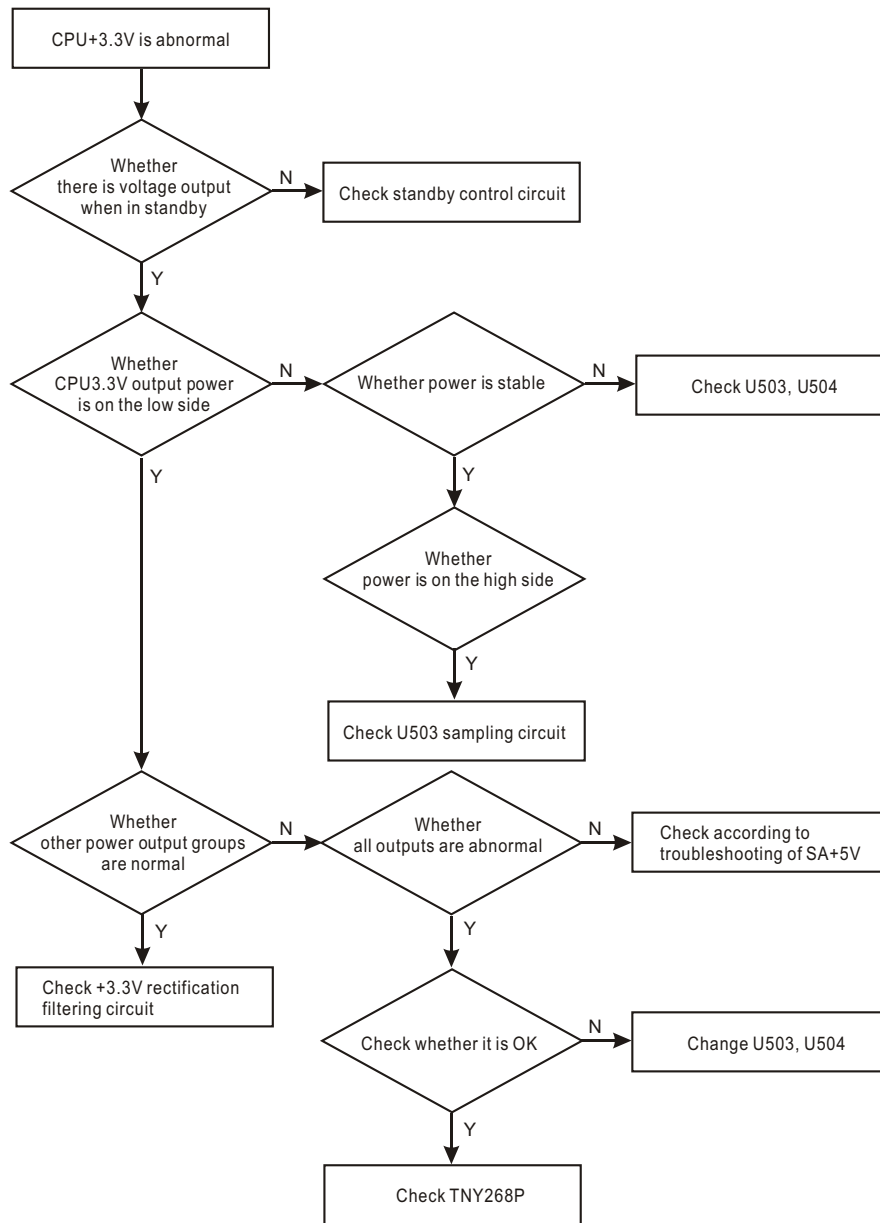


Figure 3.3.2.3 Troubleshooting flow chart for “CPU+3.3V is abnormal”

(3) Troubleshooting process for “No power trouble” is shown as the following figure 3.3.2.4:

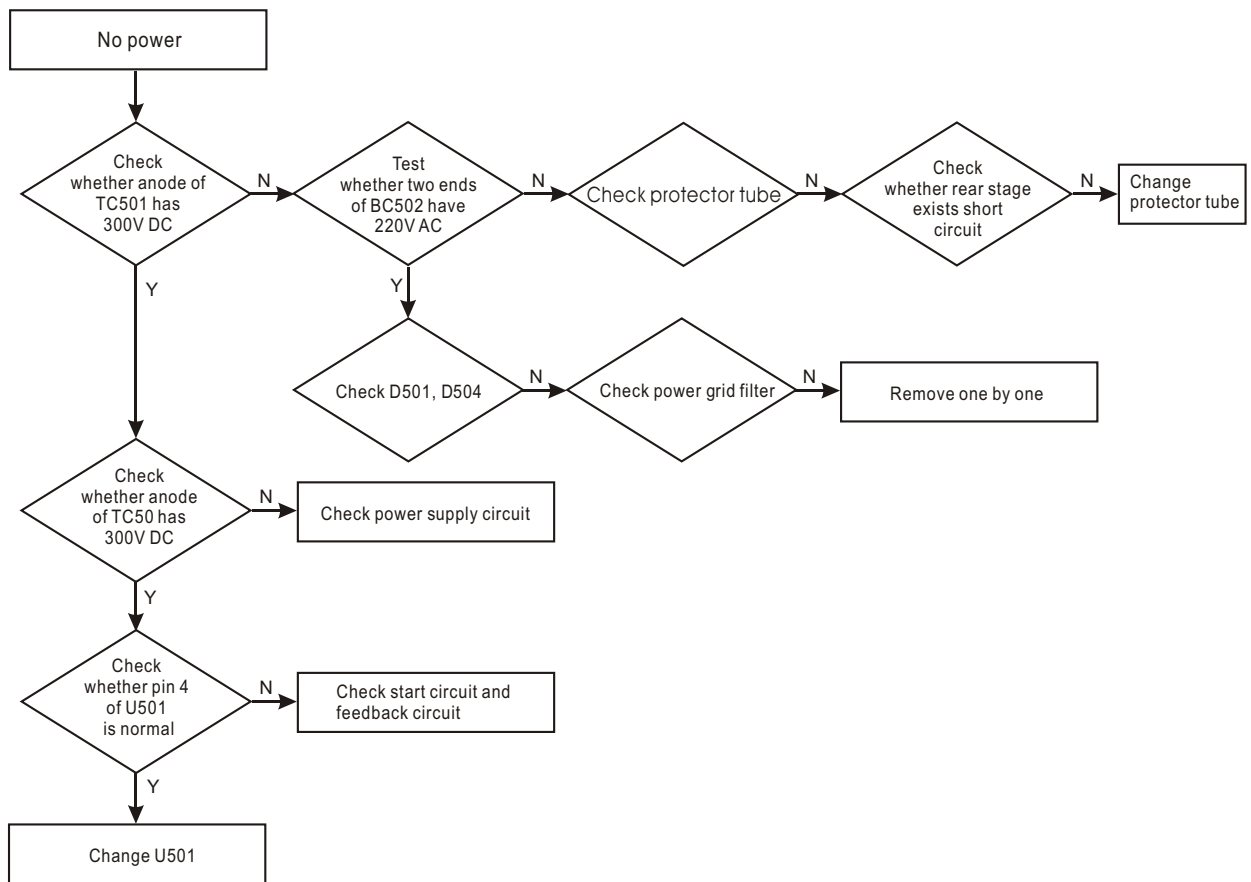


Figure 3.3.2.4 Troubleshooting flow chart for “No power”

3. Troubleshooting process for “Disc in/out” is shown as the following figure 3.3.2.5:

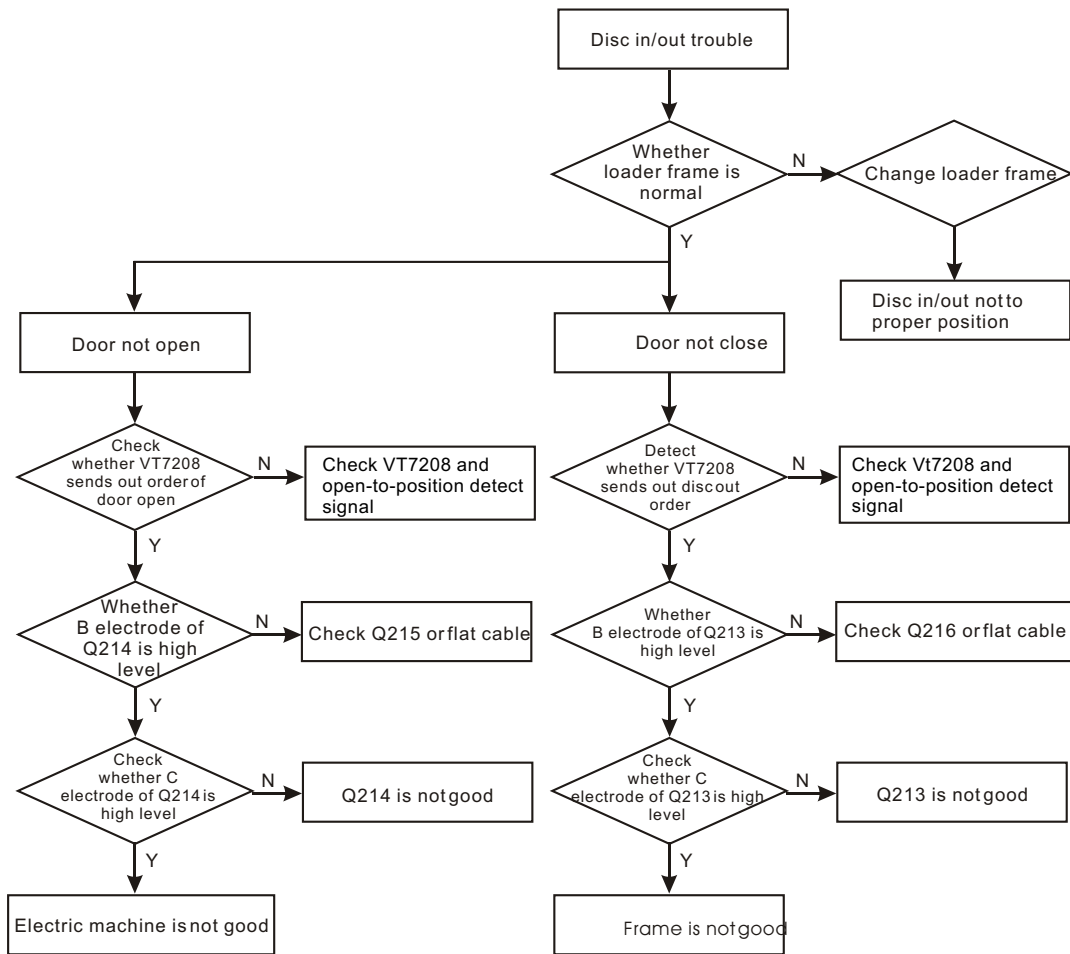


Figure 3.3.2.5 Troubleshooting flow chart for “Disc in/out”

4. Reset circuit Troubleshooting process

(1) Troubleshooting process for "URST# is always low level" is shown as the following figure 3.3.2.6:

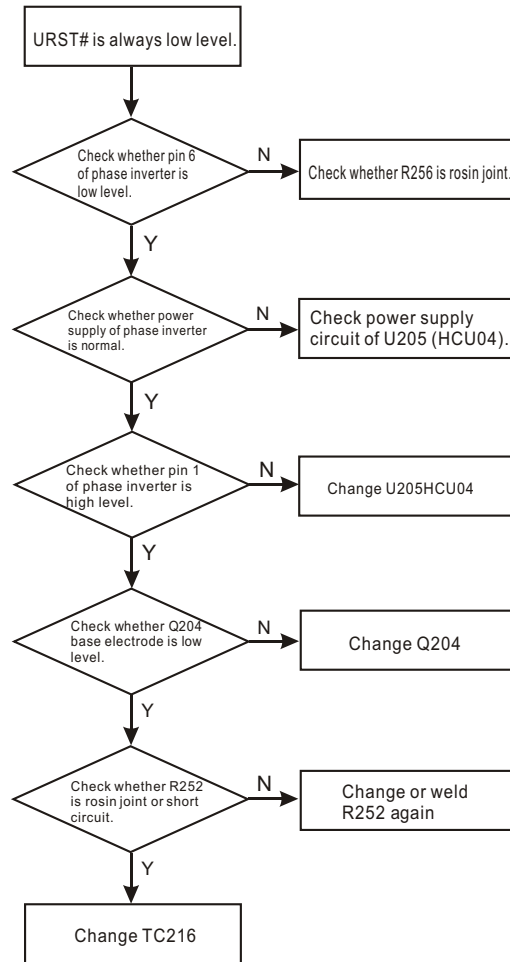


Figure 3.3.2.6 Troubleshooting flow chart for "URST# is always low level"

(2) Troubleshooting process for “URST# is always high level” is shown as the following figure

3.3.2.7:

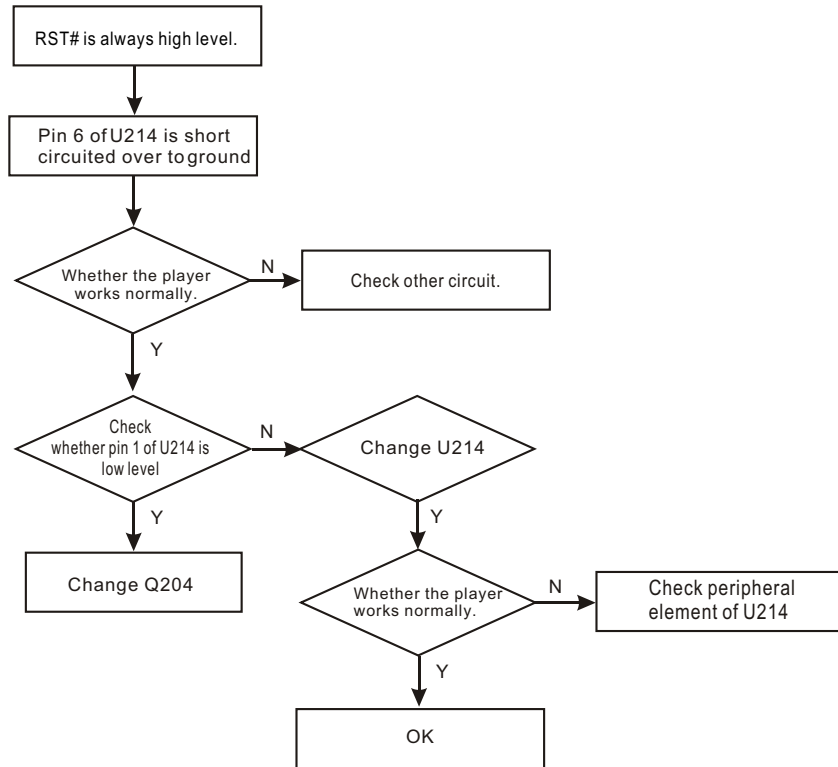


Figure 3.3.2.7 Troubleshooting flow chart for "URST# is always high level"

5. Mute circuit Troubleshooting process

(1) Troubleshooting process for “Loud noise is in 5.1 channel” is shown as the following figure 3.3.2.8:



Figure 3.3.2.8 Troubleshooting flow chart for “Loud noise is in 5.1 channel”

(2) Troubleshooting process for "Noise appears when power off" is shown as the following figure

3.3.2.9:

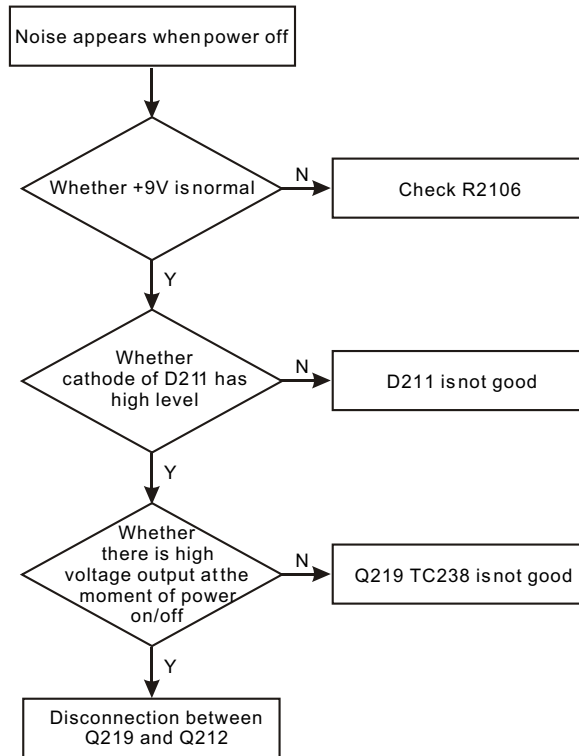


Figure 3.3.2.9 Troubleshooting flow chart for "Noise appears when power off"

6. MIC circuit Troubleshooting process

(1) Troubleshooting process for “MIC-1 signal has no output” is shown as the following figure

3.3.2.10:

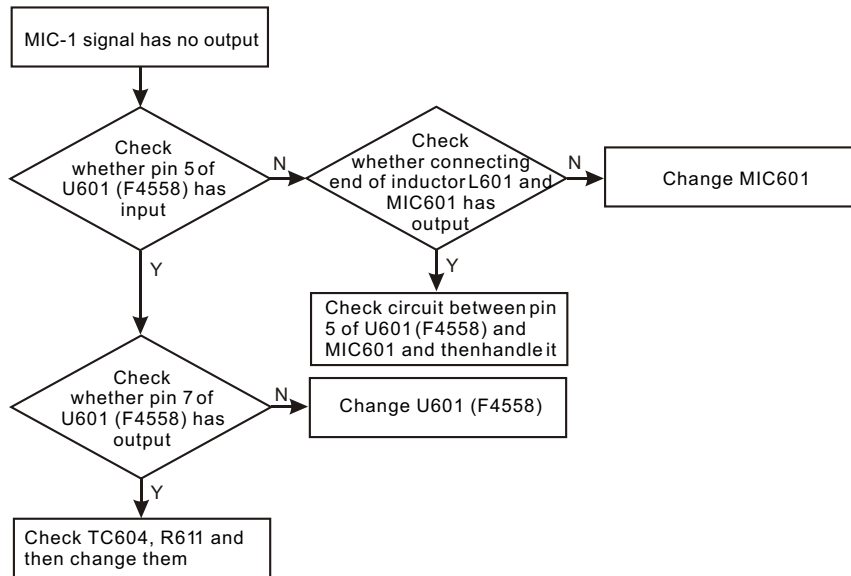


Figure 3.3.2.10 Troubleshooting flow chart for “MIC-1 signal has no output”

Note: for troubleshooting process for “MIC-2 signal has no output”, please refer to this.

(2) Troubleshooting process for “Echo is abnormal” is shown as the following figure 3.3.2.11:

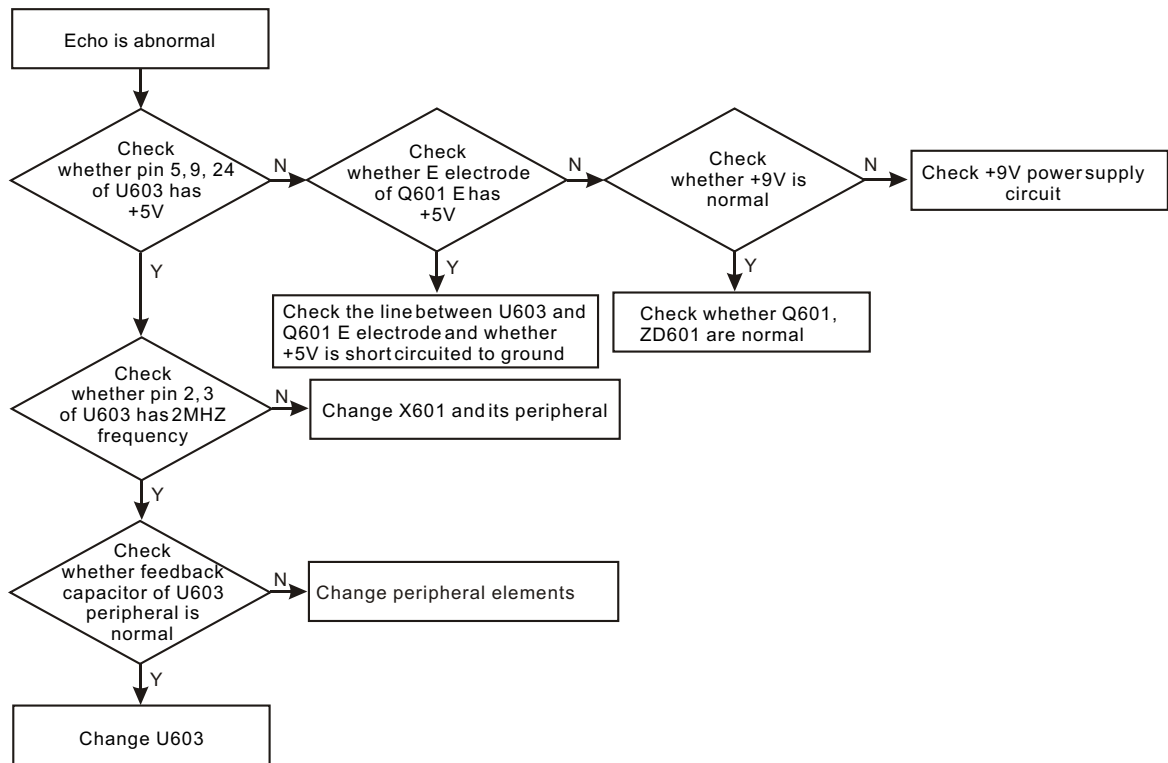
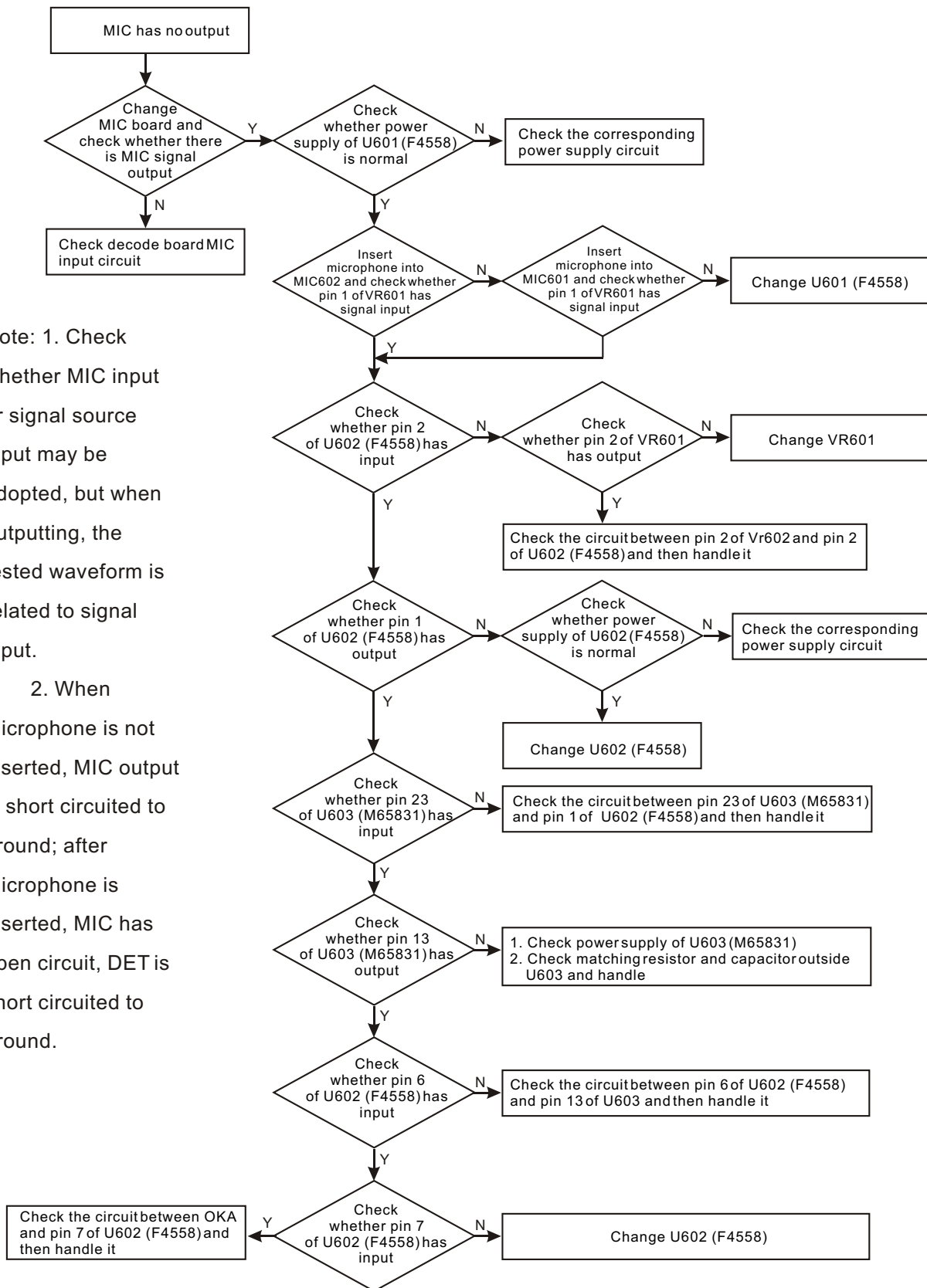


Figure 3.3.2.11 Troubleshooting flow chart for “Echo is abnormal”

(3) Troubleshooting process for “MIC has no output” is shown as the following figure 3.3.2.12:



Note: 1. Check whether MIC input or signal source input may be adopted, but when outputting, the tested waveform is related to signal input.

2. When microphone is not inserted, MIC output is short circuited to ground; after microphone is inserted, MIC has open circuit, DET is short circuited to ground.

Figure 3.3.2.12 Troubleshooting flow chart for “MIC has no output”

7. Troubleshooting process for “MIDI has no sound” is shown as the following figure 3.3.2.13:

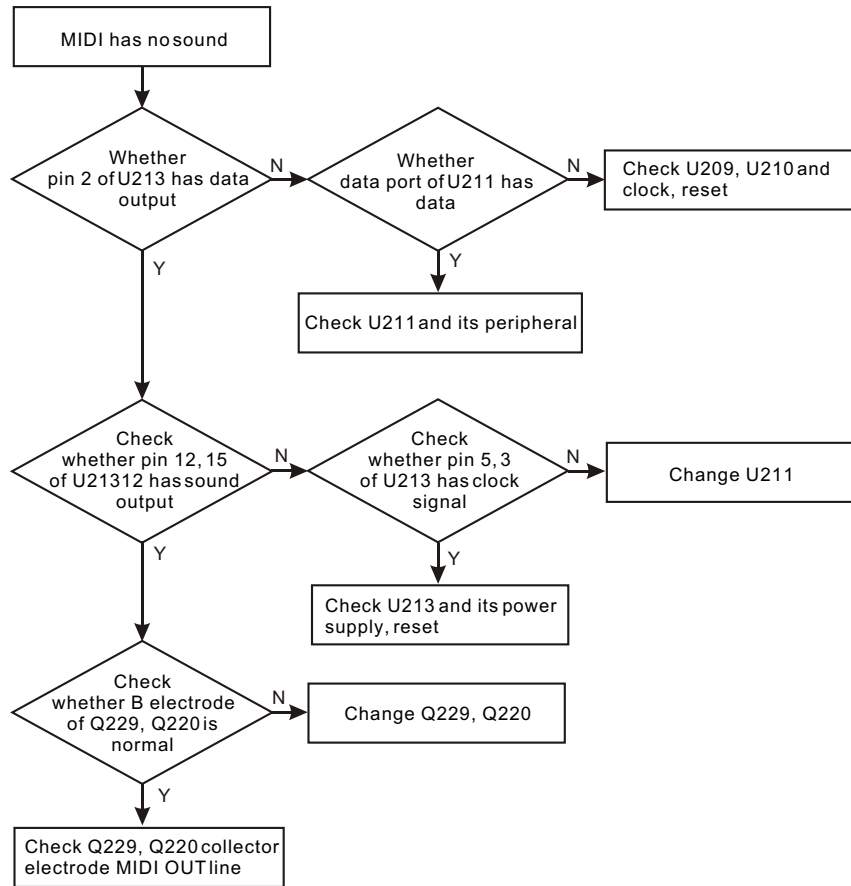


Figure 3.3.2.13 Troubleshooting flow chart for “MIDI has no sound”

8. Video circuit Troubleshooting process

(1) Troubleshooting flow of “no output for composite video” is shown as the following figure 3.3.2.14:

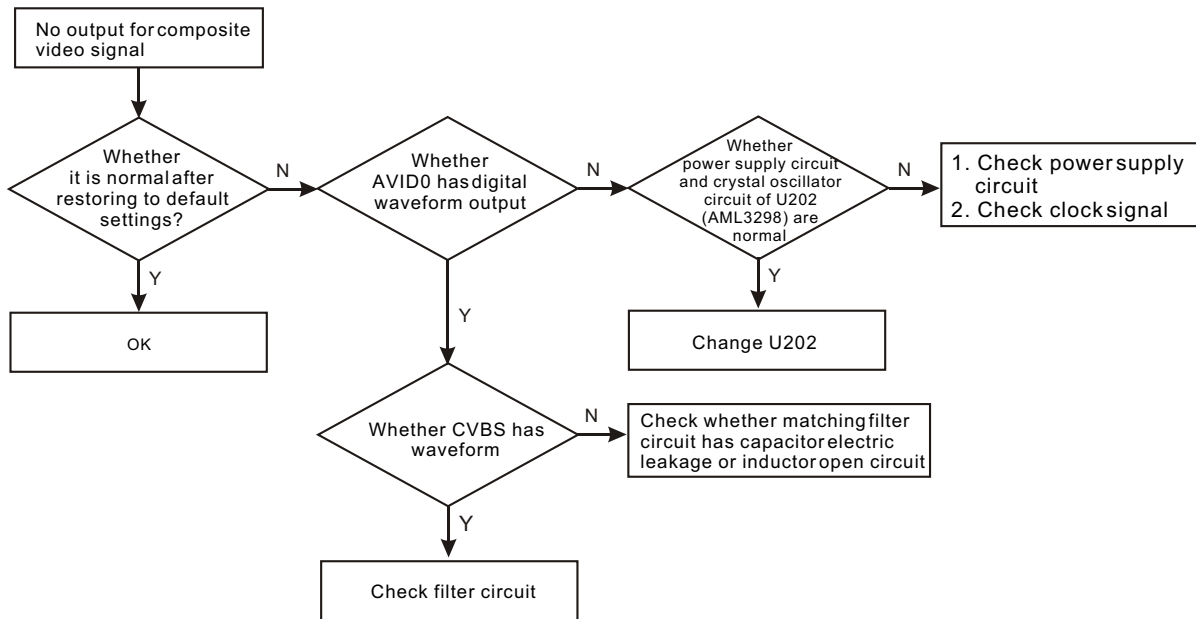


Figure 3.2.14.3 Troubleshooting flow chart for “No output for composite video”

(2) Troubleshooting flow chart for “picture mosaic when playing” is shown as the following figure

3.3.2.15:

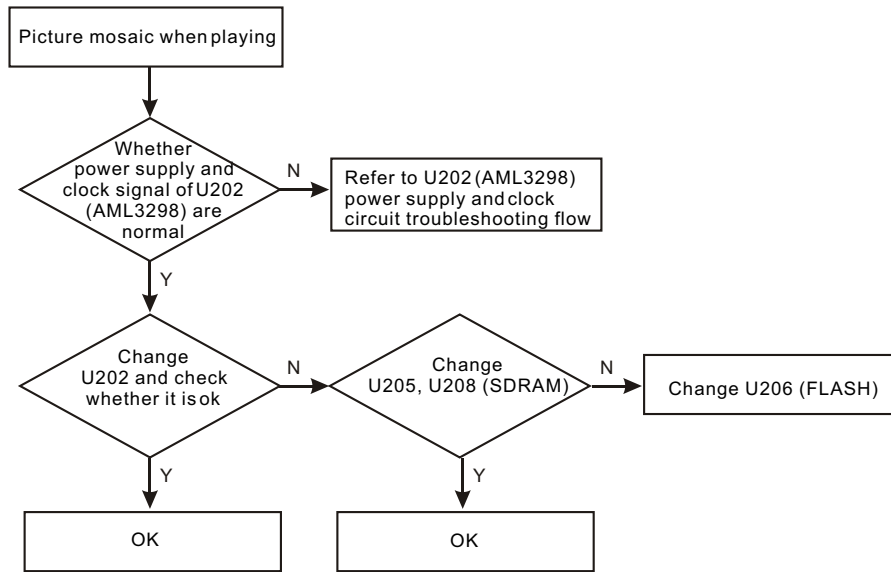


Figure 3.3.2.15 Troubleshooting flow chart for “picture mosaic when playing”

(3) Troubleshooting flow for “no colour for image” is shown as the following figure 3.3.2.16:

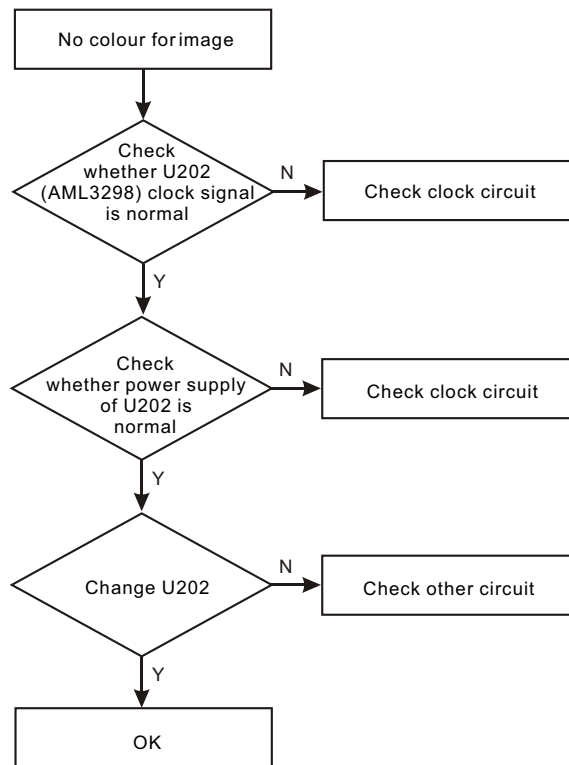


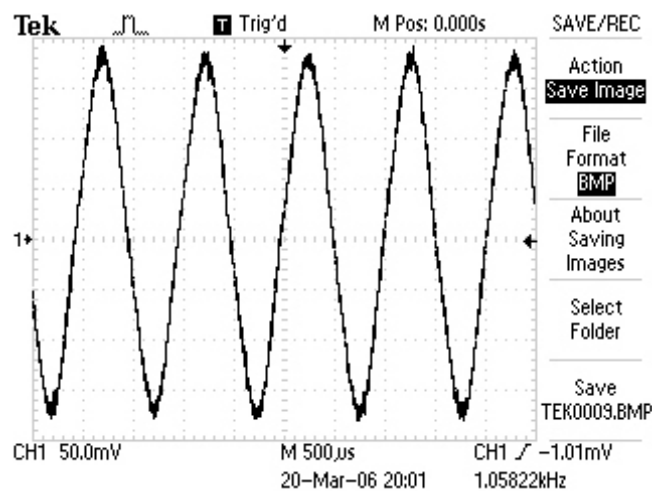
Figure 3.3.2.16 Troubleshooting flow chart for "no colour for image"

Section Four Servicing Parameters

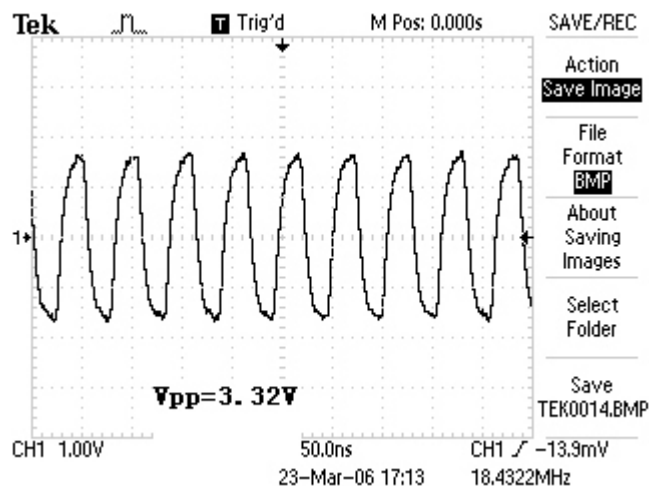
3.4.1 Signal waveform diagram

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

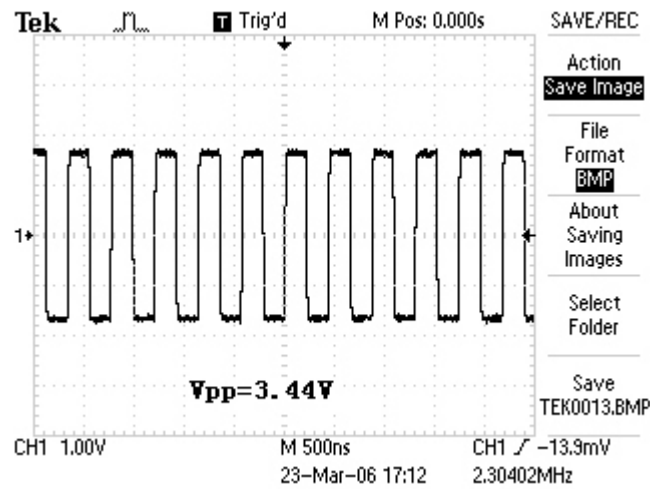
1. 1K audio waveform diagram



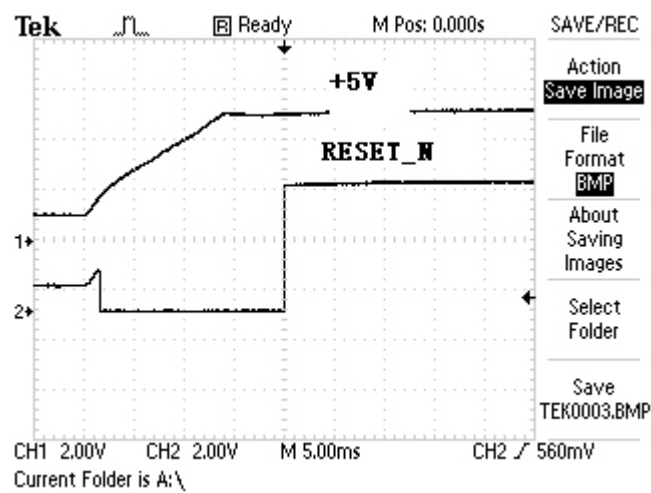
2. MCLK waveform diagram



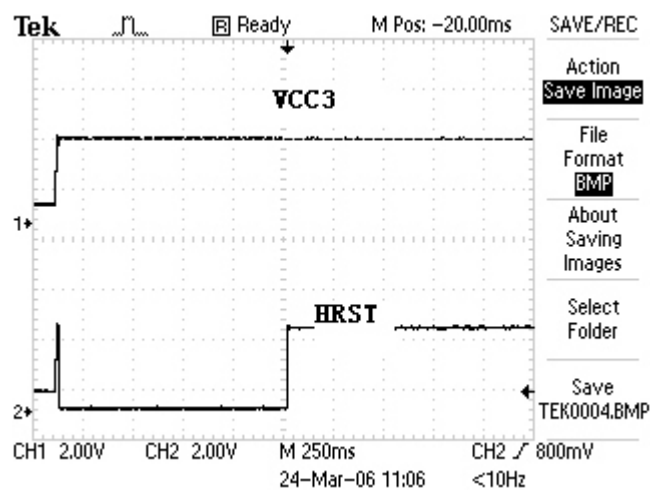
3. ABCLK waveform diagram



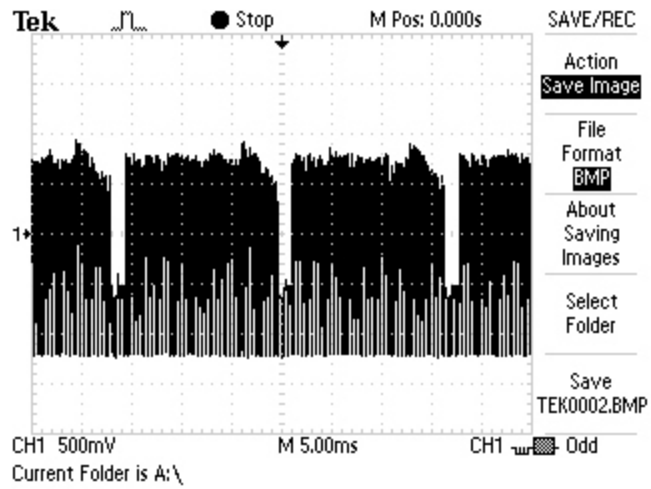
4. AML3295 reset waveform diagram



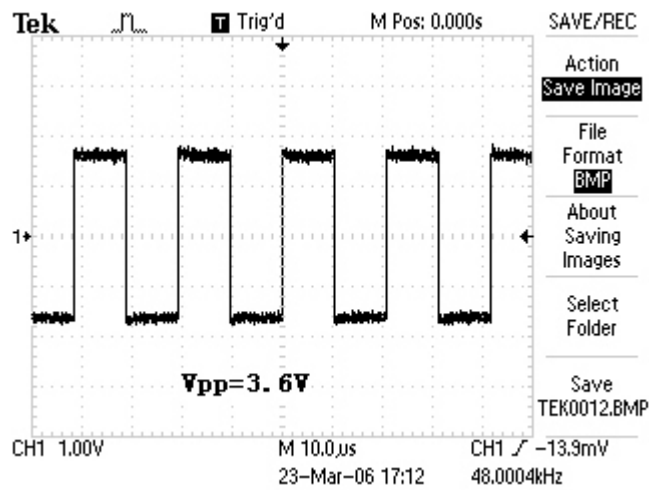
5. VT7208 reset waveform diagram



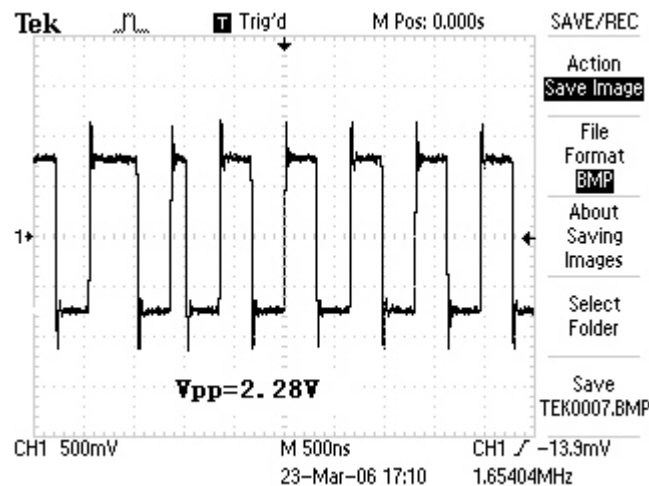
6. CVBS waveform diagram



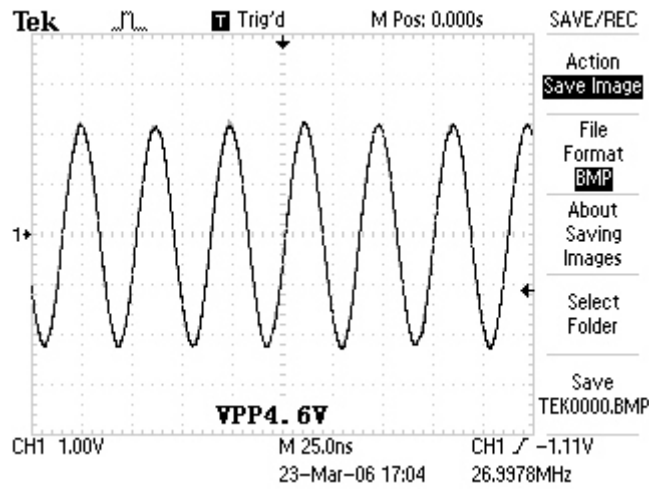
7. LRCK waveform diagram



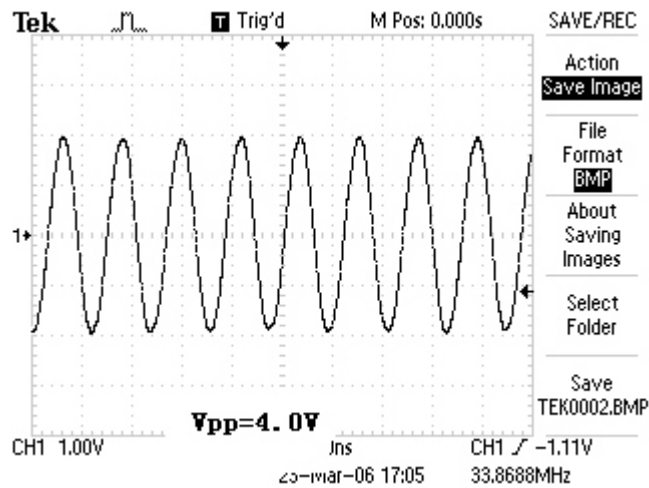
8. Optical waveform diagram



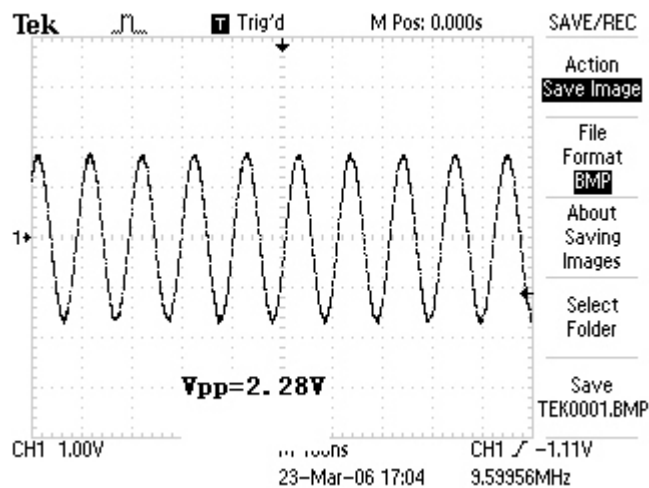
9. 27M clock waveform diagram



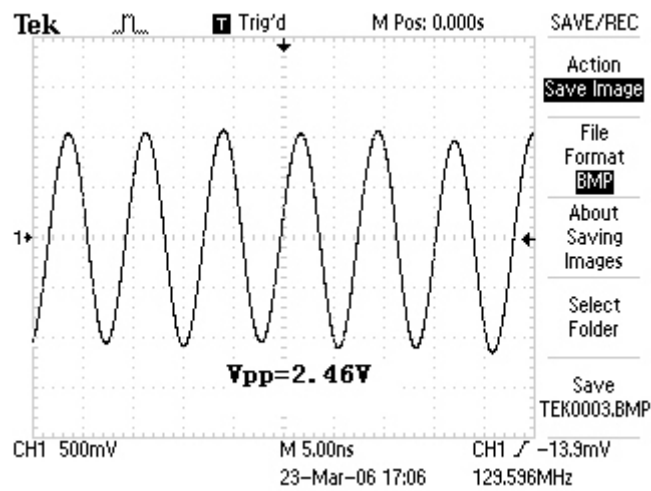
10. 33.8688 clock waveform diagram



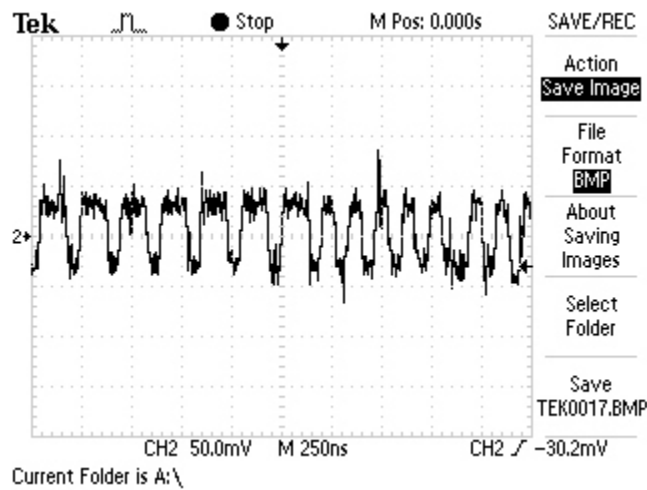
11. 9.6M clock waveform diagram



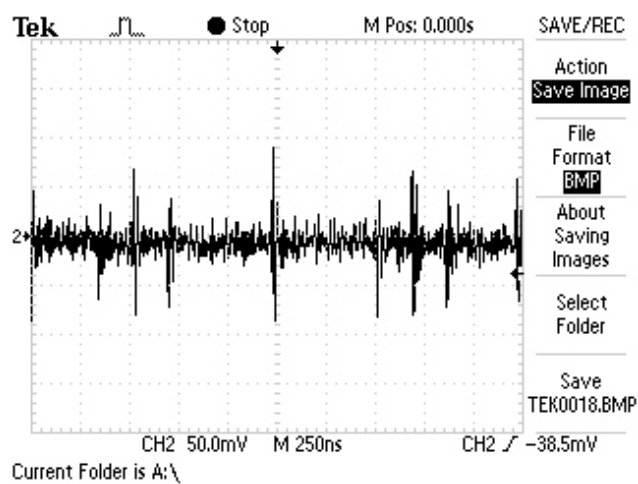
12. SDRAM clock waveform diagram



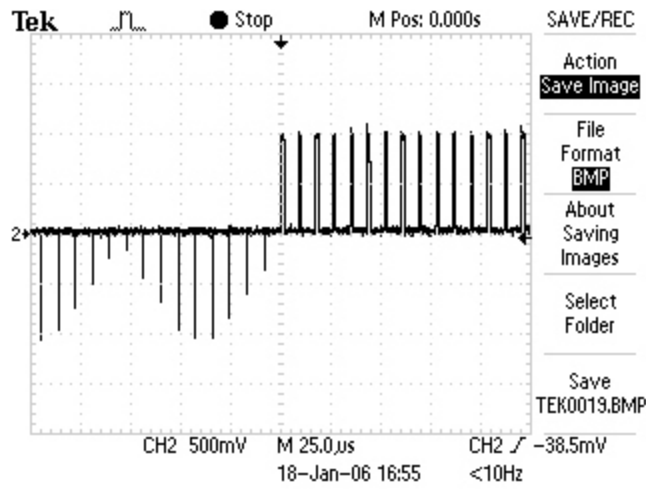
13. Focus FOO waveform diagram



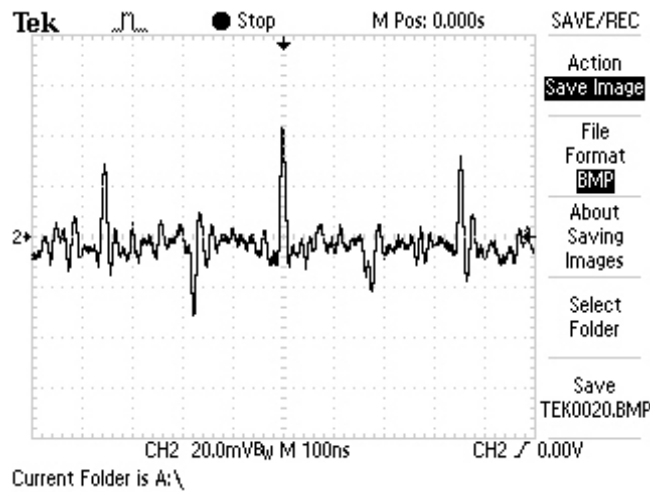
14. Focus FOSO waveform diagram



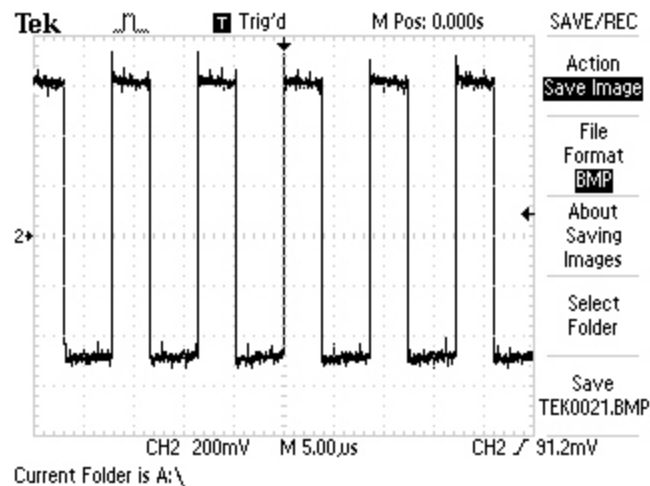
15. Main axis FMO waveform diagram



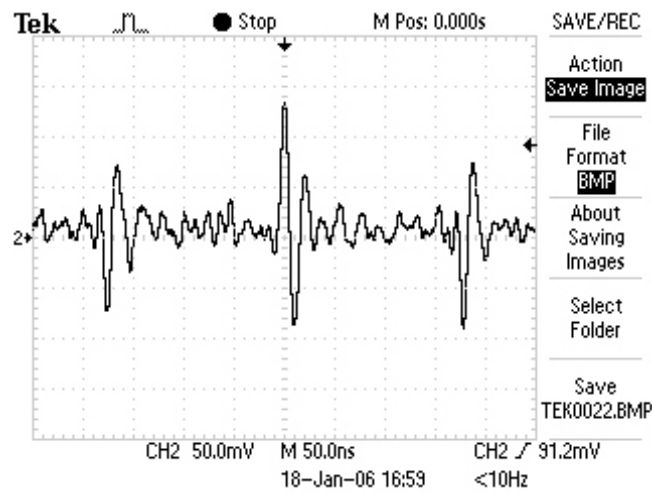
16. Main axis FMSO waveform diagram



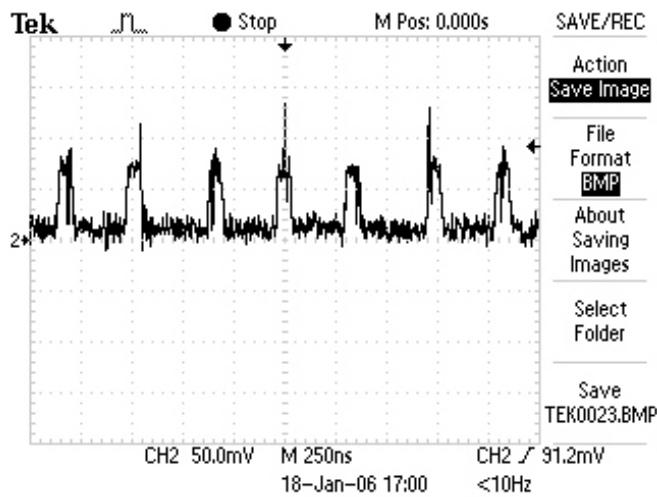
17. Feed DMO waveform diagram



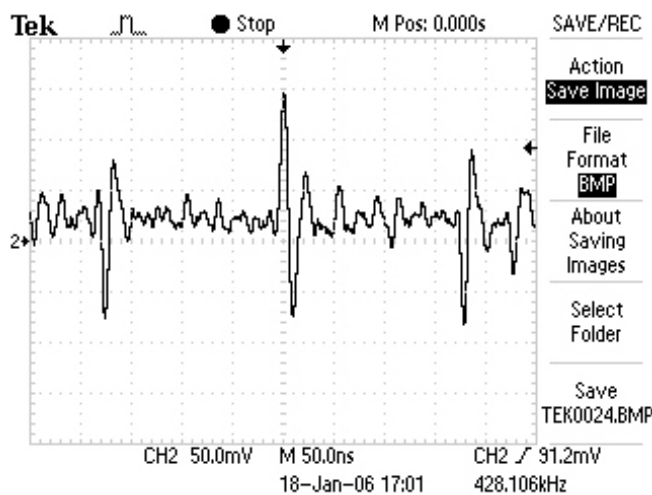
18. Feed DMSO waveform diagram



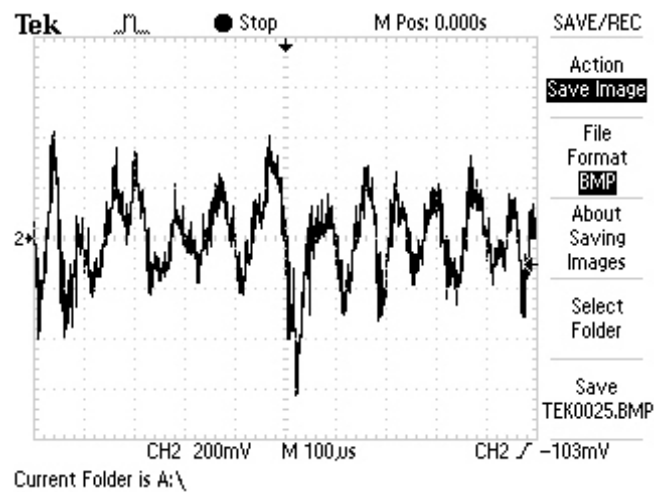
19. Trace RO waveform diagram



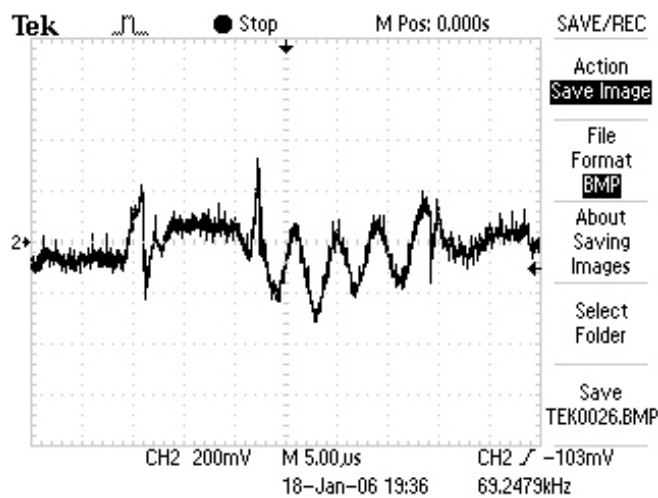
20. Trace TOSO waveform diagram



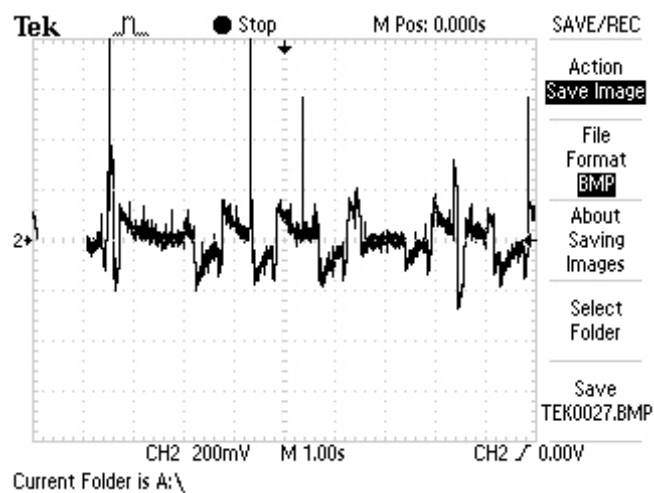
21. Focus F+ waveform diagram



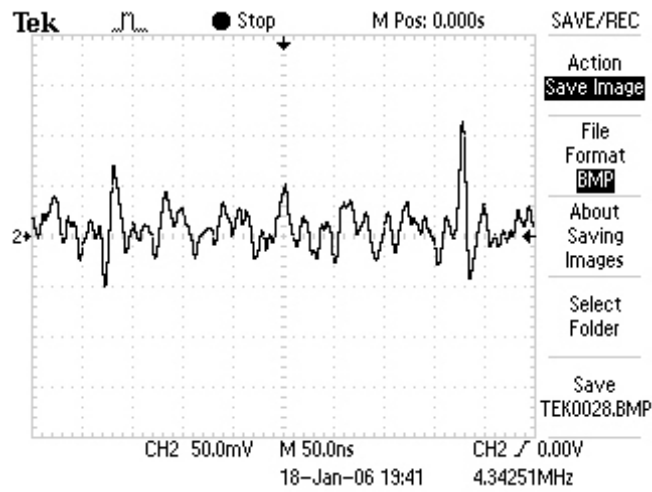
22. Trace TR+ waveform diagram



23. Feed SLED+ waveform diagram



24.main axis SPIN+ waveform diagram



3.4.2 Key point voltage

1. APC circuit key point voltage (unit: V) is shown as the following table:

Key point	Read DVD disc	Read VCD disc	No disc	Key point	Read DVD disc	Read VCD disc	No disc
Q201_B	0.07	2.19	0.01	Q202_C	3.74	4.62	5.03
Q201_C	4.63	3.74	5.03	Q202_E	4.40	5.13	5.55
Q201_E	5.15	4.39	5.55	MDI	0.19	0.18	0.00
Q202_B	2.32	0.07	0.01				

2. MIDI circuit key point voltage (unit:V) is shown as the following table:

key point	Read KVD disc	No disc	key point	Read KVD disc	No disc
U210_33	1.80	1.15~2.40	U210_39	3.20	3.20
U210_34	1.85	1.85	U210_40	3.20	3.21
U210_35	3.20	3.20	U210_41	3.20	3.21
U210_36	0.00	0.00	U210_42	0.00	0.00
U210_37	1.65	1.66	U210_43	0.00	0.00
U210_38	3.20	3.20	U210_44	3.21	3.21
U209_14	1.47	1.48	U209_4	3.20	3.20
U209_15	1.53	1.55	U209_6	0.00	2.52

key point	Read KVD disc	No disc	key point	Read KVD disc	No disc
U209_19	0.00	3.22	U209_8	3.20	3.20
U209_3	1.85	1.85			
U226_1	0.00	0.00	U226_5	0.00	0.00
U226_2	0.00	0.00	U226_6	0.00	0.00
U226_3	0.00	0.00	U226_7	0.00	0.00
U226_4	-9.40	-9.40	U226_8	8.83	8.83
U211_2	3.20	3.20	U211_54	2.56	2.60
U211_3	3.20	1.85	U211_58	1.90	1.37
U211_4	3.20	3.20	U211_81	1.48	1.48
U211_5	0.00	0.99	U211_88	1.65	1.65
U211_6	1.93	1.52	U211_93	0.40	0.00
U211_22	3.20	3.22	U211_94	1.60	1.60
U211_24	0.86	0.87	U211_95	0.00	1.60
U211_53	2.08	2.09			
U213_1	3.21	3.22	U213_9	4.68	4.71
U213_2	0.40	0.00	U213_10	2.18	2.18
U213_3	1.60	1.60	U213_15	2.20	2.15
U213_4	1.60	1.60	U213_12	2.17	2.08
U213_5	1.60	1.64	U213_16	0.00	4.95
Q225_E	5.14	5.58			

3. Power circuit key point voltage (unit:V) is shown as the following table:

key point	Standby voltage	Working voltage	key point	Standby voltage	Working voltage
TC501anode	300.00	300.00	STB	0.10	2.99
Pin 5 of U501	302.00	304.00	+3.3V	0.73	3.29
Pin 4 of U501	0.20	0.77	Pin k of U503 K	1.77	1.88
CPU+3.3V	3.09	3.09	Pin R of U503 R	1.23	1.23

4. Mute circuit key point voltage (unit: V) is shown as the following table:

State	Q211			Q218			Q212			Q219		
	B	C	E	B	C	E	B	C	E	B	C	E
Unmute	4.46	5.14	5.10	0.74	0.02	0.00	-0.16	-4.30	0.02	8.85	-4.30	8.70
Mute	5.08	-3.98	5.16	-3.98	1.37	0.00	0.63	1.37	1.36	8.87	1.35	8.68

5. Control panel circuit key point voltage (unit: V) is shown as the following table:

Key point	Standby voltage	Working voltage	Key point	Standby voltage	Working voltage
U402_1	3.09	3.08	VFDAT	0.77	1.88
ASTB	1.16	5.00	VFDCK	0.77	2.24
U403_3	1.92	3.17	VFDST	0.77	0.56
VFD401_1	-0.66	-16.90	U402_3	0.00	3.08
VFD401_35	-0.67	-20.60	U402_5	0.00	3.06
VDD5	/	/	U401_27	-5.10	-20.60
VCC	0.93	5.50			

6. Servo circuit key point voltage (unit: V) is shown as your following table:

Key point	Read CD disc	DVD	No disc	Key point	Read CD disc	DVD	No disc
U201_1	1.54	1.54	1.54	U201_50	1.32	1.29	1.28
U201_2	2.08	2.08	2.08	U201_80	0~3.24	0~3.2	0.00
U201_3	3.24	3.24	3.24	U201_139	0~0.3	0.8~3.0	0.00
U201_5	1.66	1.66	1.66	U201_140	3.22	3.20	3.22
U201_41	1.53	1.55	1.55	U201_141	3.15~3.20	3.20	3.22
U201_42	1.54	0.00	1.53	U201_144	3.05~3.20	2.8~3.1	3.22
U201_43	1.58	1.52	1.54	U201_146	0.00	0.00	0.00
U201_44	2.18	2.39	1.54	U201_204	1.54	1.51	1.52
U201_54	3.24	3.23	0.00	U201_216	1.24	1.24	1.24
U201_49	1.11	1.16	1.19				
U203_1	1.57	1.53	1.54	U203_15	2.57	2.55	3.92
U203_2	2.50	2.57	3.80	U203_16	2.57	2.55	3.87
U203_3	2.48	2.58	3.85	U203_17	2.40	3.90	0.00
U203_4	1.55	1.54	1.54	U203_18	1.77	0.17	0.00
U203_5	1.55	1.55	1.54	U203_20	2.55	2.55	3.87
U203_6	1.56	1.55	1.54	U203_21	5.14	5.12	5.53
U203_7	2.42	2.60	3.96	U203_23	1.92	0.90	1.54
U203_8	5.13	5.12	5.53	U203_24	2.55	2.56	2.87
U203_9	5.14	5.13	5.53	U203_25	2.50	2.43	3.50
U203_11	2.52	2.53	4.14	U203_26	1.55	1.54	1.54
U203_12	2.60	2.55	4.10	U203_27	1.55	1.55	1.54
U203_13	2.40	2.61	3.90	U203_28	3.24	3.23	0.00
U203_14	2.73	2.50	3.92				

Section Five IC Function Introduction

3.5.1 Function introduction to AML3298

AML3298 is a audio/video decode chip and it supports MPEG1/2/4, VX3.X/4.X/5.X, DVD, VCD, SUPER VCD decoding with built-in 24bit RISC CPU, DOLBY AC3, 5.1CH, 2CH, DTS, HDCD, WAM audio playback. In this player, AML3298 is used for audio and video decoding to disc signals. It achieves disc signal from servo chip VT7208, after decoding, the outputted video signal has AVID0, AVID1, AVID2, AVID3, and outputted audio signal has IEC958 (optical and coaxial outputted digital audio signal), ADATA0.

When the disc signal after reading includes MIDI format musical signal, through the 8 pins of M2 D0M2 D7, AML3298 transmits MIDI musical signal to EPM3032 and is processed by EPM3032, MK6000B. SAM2133. Pin function introduction is shown as the following table:

Module	Pin	Name	Signal flow	Function	Remark
POWER	14\40\83\ 109\140\187	VDD_18	P		
	13\41\82\ 108\139\186	VSS_18	G		
	6\48\61\74\92\106\ 123\141\154\184	VDD_33			
	4\47\60\73\91\105\ 122\136\153\185	VSS_33			
AUDIO	205	IEC958	O	Audio IEC958 signal output	Used as optical/coaxial signal in this player
	5	AMCLK	O	Audio main clock	
	3	ALRCLK	O	Audio left/right clock	
	208	AOCLK	O	Audio bit clock	
	206\207\1\2	ADATA0— ADATA3	I/O	Audio data input/output	
GPIO	52—59	VD_0—VD_7	I/O	Common input/output interface	VD_1 connects with pin 1 RST of U207(CS4340); VD_4 is connected with pin 6 SDL of U223(24C16); VD_5 is connected with pin 5 SDA of U223; others are unused

Module	Pin	Name	Signal flow	Function	Remark
GPIO	15\16\37\38\39\51	NGP0—NGP5	I/O	Common input/output interface	Pin 16\38 is connected with pin 32/33 of U204 (W78E58), others are unused
	49	UART_RX	I/O	Serial input	
	50	UART_TX	I/O	Serial output	
	17	VDD_DAC18	P	Video DAC power (1.8V)	
	18	VSS_DAC18	G	Video DAC ground	
VIDEO_DAC	20\23\26\29\36	AVDD_DAC33	P	Video DAC power (3.3V)	
	21\24\27\30\35	AVSS_DAC33	G	Video DAC ground	
	31	COMP	I	Video DAC compensation	
	32	RSET	I	Video DAC current setup	
	33	VREF_OUT	O	Video DAC reference	
	34	VREF_IN	I	Video DAC reference	
	19, 28	IOX, IOR	O	Video DAC output	
25, 22	IOG, IOB	O	Video DAC output		
ATAPI	7\8\9\180—183\188—196	DD0—DD15	I/O	Data transmission data pin	Connected with servo chip U201(VT7208)
	10\11\12	DA0, DA1, DA2	O	Data transmission address pin	Connected with U201
	137	IRQ14	I	Video transmission intermit	unused
	138	DIORDY	I	Video transmission detecting	Used to detect MIC signal
	173	CSEL	O	Video transmission control	Used to control servo chip U201
	174	DMARQ	I	Video transmission control	
	175	CS1_n	O	Video transmission control	
	176	CS0_n	O	Video transmission control	
	177	DIOR_n	I/O	Video transmission control	
	178	DIOW_n	I/O	Video transmission control	
	179	DMACK_n	O	Video transmission control	
AV BUS/GPIO	203	IIS_1	I/O	Common input/output interface	Connected with pin 116, 117 of U201
	202	IIS_2	I/O	Common input/output interface	Reset for U211 (SAM2133), U213(CS4340), U209 (MK-6000B)
	201	IIS_3	I/O	Common input/output interface	PDAT0, SCART output mode selection
	198	IIS_4	I/O	Common input/output interface	Connected with pin 32 of U204

Module	Pin	Name	Signal flow	Function	Remark
AV BUS/G PIO	204\200	IIS_0, ISS_4	I/O	Common input/output interface	unused
	199\197	IIS_5, ISS_7	I/O	Common input/output interface	unused
CLOCK S	155	AVDD_PLL0	P	Phase-locked loop power	
	159	AVDD_PLL1	P	(1.8V)	
	158	DVDD_PLL0	P		
	161	DVDD_PLL1	P		
	156	AVSS_PLL0	G	Phase-locked loop grounding end	
	157	DVSS_PLL0	G		
	160	VSS_PLL0	G		
	162	SCLK_XIN	I	Clock signal input	
	163	SCLK_XOUT	O	Clock signal output	
	164	ALCLK_XIN	I	Clock signal input	Grounding in this player
	165	ALCLK_XOUT	O	Clock signal output	Grounding in this player
TEST	166	TMS	I/O	Test pin	
	167	TD1	I/O	Test pin	
	168	TCK	I/O	Test pin	
	169	TRST_n	I	Power allocation	
	170	TEST_n	I	Power allocation	
	171	RESET_n	I	Reset pin	
	172	TD0	I/O	Test pin	
MEMO RY#2	68—71\75\ 76\78\127—135	M2 D0—M2 D15	I/O	Data line	M2 D0—M2 D15 is connected to U205\M2 D0 —M2 D10 to U206\M2 D0 —M2 D7\M2 D11\M2 D12 to U210
	62\63\64\77, 79\80\119— 121\124—126	M2 A0—M2 A11	O	Address line	Connected to U205, U206
	46	M2_SCS_N	O	Control pin	Control U205
	65	M2_RAS_N	O	Control pin	Connected to U205, U206
	66	M2_CAS_N	O	Control pin	Connected to U205, U206
	72	M2_WE_N	O	Control pin	Connected to U205, U206, U210
	44	M2_BA1	O	Control pin	Connected to U205, U206
	45	M2_BA0	O	Control pin	Connected to U205, U206

Module	Pin	Name	Signal flow	Function	Remark
MEMO RY#2	43	M2_DQM1	O	Control pin	Connected to U205, U206
	67	M2_DQM0	O	Control pin	Connected to U205, U206
	81	M2_ECS_N	O	Control pin	Connected to U210
	118	M2_EOE_N	O	Control pin	Connected to U206, U210
	42	M2_CLKO	I/O	SDRAM clock signal	Connected to U205
MEMO RY#1	93—102	M1 D0—M1 D15	I/O	Data line	Connected to U208
	85—90				
	110—115	M1 A0—M1 A11	O	Address line	Connected to U208
	147—152				
	117	M1_EOE_N	O	Control pin	PDAT2, that is SCART output mode selection
	84	M1_ECS_N	O	Control pin	PDAT1, that is SCART output mode selection
	104	M1_DQM0	O	Control pin	Connected to U208
	103	M1_DQM1	O	Control pin	Connected to U208
	107	M1_CLKO	I/O	SDRAM clock signal	Connected to U208
	145	M1_BA0	O	Control pin	Connected to U208
	146	M1_BA1	O	Control pin	Connected to U208
	116	M1_WE_N	O	Control pin	Connected to U208
	142	M1_CAS_N	O	Control pin	Connected to U208
	143	M1_RAS_N	O	Control pin	Connected to U208
	144	M1_SCS_N	O	Control pin	Connected to U208

3.5.2 Function introduction to Vt7208

VT7208 is a chip with strong function, which includes therefore preposition amplifying, SSP and DSP processing, etc. Pin function introduction is shown as the following table:

Pin	Name	Signal flow	Function	Remark
Main unit interface (IDE)				
118, 119	IDE [15; 0]	I/O	IDE data bus [15: 0]/MPEG program flow	Connect to U202 (AML3298) ATAPI data pin
121, 126				
128, 130				
132, 135				
137, 138				

Pin	Name	Signal flow	Function	Remark
181	AH13/ROMA13	I/O	Micro processor port 2.5/ROM address 13	U216 (A290011L) address 13
180	AH14/ROMA14	I/O	Micro processor port 2.6/ROM address 14	U216 (A290011L) address 14
176	AH15/ROMA15	I/O	Micro processor port 2.7/ROM address 15	U216 (A290011L) address 15
166	P10/ROMAO	I/O	Micro processor port 1.0/ROM address 0	U216 (A290011L) address 0
167	P11/ROMA1	I/O	Micro processor port 1.1/ROM address 1	U216 (A290011L) address 1
168	P12/ROMA2	I/O	Micro processor port 1.2/ROM address 2	U216 (A290011L) address 2
169	P13/ROMA3	I/O	Micro processor port 1.3/ROM address 3	U216 (A290011L) address 3
171	P14/ROMA4	I/O	Micro processor port 1.4/ROM address 4	U216 (A290011L) address 4
172	P15/ROMA5	I/O	Micro processor port 1.5/ROM address 5	U216 (A290011L) address 5
173	P16/ROMA6	I/O	Micro processor port 1.6/ROM address 6	U216 (A290011L) address 6
174	P17/ROMA7	I/O	Micro processor port 1.7/ROM address 7	U216 (A290011L) address 7
159	P30	I/O	Micro processor port 3.0	Blank pin
160	P31	I/O	Micro processor port 3.1	Blank pin
164	P34	I/O	Micro processor port 3.4/ROM address 16	U216 (A290011L) address 16
178	P35/ROMA16	I/O	Micro processor port 3.5	Blank pin
187	PSEN#	I/O	Micro processor ROM read order	Connect to U216 (A290011L) chip enable end
165	RD#	I/O	Micro processor I/O bus read allowable	Blank pin
158	WR#	I/O	Micro processor I/O bus write allowable	Blank pin
162	INT0#	I/O	Micro processor external intermit signal input 0	Through 10K resistor R207 connects to VCC3
163	INT1#	I/O	Micro processor external intermit signal input 1	Through 10K resistor R206 connects to VCC3
177	ROMWE#	I/O	Flash ROM write allowable	Blank pin
Dynamic memorizer interface (SDRAM)				
79, 80, 81	MA [8: 0]	O	Dynamic memorizer address bus [8: 0]	U215 (M11 B416 256A) address bus [8: 0]
83, 88				
74	CASH#	O	Dynamic memorizer line high position address U215 (M11B416256A) line high position gating	U215 (M11 B416 256A) line high position gating
73	CASL#	O	Dynamic memorizer line low position address	U215 (M11 B416 256A) line low position gating
55, 60	MD [15: 0]	I/O	Dynamic memorizer data bus [15: 0]	U215 (M11 B416 256A) data bus [15: 0]
62, 67				
69				
70,73				
76	WE#	O	Dynamic memorizer write allowable	U215 (M11 B416 256A) write allowable

Pin	Name	Signal flow	Function	Remark
77	OE#	O	Dynamic memorizer read allowable	U215 (M11 B416 256A) read allowable
78	RAS#	O	Dynamic memorizer row address	U215 (M11 B416 256A) row address gating
Common debug output interface				
49	XTALO	O	33.868MHZ crystal oscillator signal output	
50	XTALI	I	33.686MHZ crystal oscillator signal input	
90	GIO0	I/O	Common input/output interface 0/debug output	Through 10K resistor R208 grounding
91	GIO1	I/O	Common input/output interface 1/debug output	Through 330 Ω resistor grounding
92	GIO6	I/O	Common input/output interface 6/debug output	Connect with disc identification circuit
93	GIO7	I/O	Common input/output interface 7/debug output	Through 330 Ω resistor grounding
94	GIO4/MA9	I/O	Common input/output interface 4/debug output/DRAM address 9	Main axis electric machine rotation checking
96	GIO5	I/O	Common input/output interface 5/debug output	Main axis electric machine rotation checking
98	GIO2	I/O	Common input/output interface 2/debug output	Grounding
100	GIO3	I/O	Common input/output interface 3/debug output	Blank pin
116	PRST	I	RC power-on reset signal input	HRST
Other interfaces				
101	LED	O	Indicator light signal output	Blank pin
102	INTRAY	O	Disc in control signal output	Connect to disc in/out control circuit
103	OUTTRAY	O	Disc out control signal output	Connect to disc in/out control circuit
104	PLAY#	I	Playback signal input	Blank pin
105	EJECT#	I	Disc out signal input	Blank pin
106	LIMIT	I	Most inner position of laser head signal input	Connect to feed to position detect signal
107	TRAYIN#	I	Disc in to position signal input	
115	TRYAOUT#	I	Disc out to position signal input	
Auto laser power control interface				
28	MDI1	I	Laser power monitoring signal input 1	Connect to laser power control circuit
27	MDI2	I	Laser power monitoring signal input 2	Connect to laser power control circuit
29	LDO1	O	Laser diode current control output	Control VCD laser power
30	LDO2	O	Laser diode current control output	Control DVD laser power

Pin	Name	Signal flow	Function	Remark
Servo control interface				
25	CSO	O	Centre servo signal output	Blank pin
22	TNI	I	Tri beam trace reverse input	Loader F signal
21	TPI	I	Tri beam trace in-phase input	Loader E signal
23	FEO	O	Focus error signal output	Blank pin
33	TEO	O	Trace error signal output	Blank pin
15	RFPSLV	O	RF signal zero passage cross talk clipping output	Blank pin
PDM/PWM control				
45	ADBG1	O	Pulse width modulate DAC output 1	Blank pin
46	ADBG2	O	Pulse width modulate DAC output 2	Blank pin
43	FOO	O	Focus servo PDM modulate signal output	
42	TRO	O	Trace servo PDM modulate signal output	
41	FMO	O	Feed servo PWM modulate signal output	
44	DMO	O	Main axis servo PWM modulate signal output	
RF data path interface				
201	JITFO	O	RF signal jitter checking	Grounding through 1000PF capacitor
204	RFDSL	O	RF signal clipping output	Grounding through 10MF capacitor
205	SCO	O	Analog clipping current output	Grounding through 200PF capacitor
213	RFOP	O	In-phase RF signal output	Blank pin
214	RFON	O	Reverse RF signal output	Blank pin
4	DVDRFIN	I	DVD RF signal reverse input	Grounding through 1MF capacitor
5	DVDRFIP	I	DVD RF signal in-phase input	
6	DVDINA	I	DVD photoelectric detector A input	
7	DVDINB	I	DVD photoelectric detector B input	
8	DVDINC	I	DVD photoelectric detector C input	
9	DVDIND	I	DVD photoelectric detector D input	
10	CDC/SC/T1	I	CD photoelectric detector C/supplementary light detector C/trace T1 input	Blank pin
11	CDD/SD/T2	I	CD photoelectric detector C/supplementary light detector C/trace T2 input	Blank pin
12	CDA/SA/F1	I	CD photoelectric detector A/supplementary light detector A/focus F1 input	Blank pin

Pin	Name	Signal flow	Function	Remark
13	CDB/SB/F2	I	CD photoelectric detector B/supplementary light detector B/focus F2 input	Blank pin
14	PEAKS	O	RF peak value hold signal output	Blank pin
16	RFRPDC	O	RF ripple signal DC output	
17	RFRPAC	I	RF ripple signal AC input	
24	FLVL	O	RF non invert signal output	Blank pin
Analog test unterface				
36	DPD1	I/O	Phase difference analog test input 1	Blank pin
35	DPD2	I/O	Phase difference analog test input 2	Blank pin
Capacitor filter interface				
26	CEC	O	Centre servo error low pass filter capacitor	Connect to VRD through 3300PF capacitor
202	LPFO	O	Digital PLL ring circuit filter capacitor	Grounding through 10MF capacitor
210	OSP	I/O	Ocular lens offset compensation capacitor	
211	OSN	I/O	Ocular lens offset compensation capacitor	
Reference voltage interface				
216	IREF	I	Reference current input	Grounding through resistor
2	VRA	I/O	Reference voltage output 1	
1	VRD	I/O	Reference voltage output 2	
111	DACVREF	O	DAC reference voltage output	Blank pin
Analog power interface				
3, 31	AVCC [6: 1]	—	Analog circuit power	Connect to 3.3V analog power
37, 47				
203, 212				
20, 34	AVSS [6: 1]	—	Analog circuit power ground	
40, 200				
209, 215				
39	DPDVCC	—	DPD circuit power	Connect to 3.3V analog power
38	DPDVSS	—	DPD circuit power ground	
199	PLLVCC	—	Digital PLL circuit power	Connect to 1.8V analog power
198	PLLVSS	—	Digital PLL circuit power ground	
113	DACVCC	—	Audio DAC circuit power	Connect to 3.3V analog power
109	DACVSS	—	Audio DAC circuit power ground	Blank pin

Pin	Name	Signal flow	Function	Remark
Digital circuit power interface				
68, 82	VCC [8: 1]	—	Digital circuit 3.3V power	
99, 120				
136, 152				
170, 190				
61, 75	VSS [8: 1]	—	Digital circuit 3.3V power	
89, 108				
127, 413				
161, 179				
97, 129	VDD [4: 1]	—	Inner core 2.0V power	Provide by voltage regulator U224 through L226
145, 182				
95, 131	GND [4: 1]	—	Inner core 2.1V power	
147, 184				
48	XTALVSS	—	Crystal oscillator circuit power ground	
51	XTALVCC	—	Crystal oscillator circuit power ground	Connect to 3.3V power

3.5.3 Function introduction to EN29LV800AB

EN29LV800AB is a 16M FLASH memorizer with working voltage range from 2.7V to 3.6V. In this player, U206 (FLASH), U205 (SDRAM) adopt time sharing multiplexing means and connect with U202 (AML3298) through address bus M2A [0, 11]. The internal memory of FLASH memorizer has U202 (AML3298) control program. After power-on, firstly reset circuit sends reset signal RESET n to pin 12 RESET n of PLASH to reset FLASH so that the program may carry out from the initial position. U202 performs addressing to FLASH through address line M2A[0, 11] to select the corresponding program to implement. The pin 11 write gating signal of U210 is provided by the pin 72 M2 WE n signal of U202 (AML3298) through RN201, R303 conversion. The pin 28 output gating signal is provided by pin 118 of U202 (AML3298), and pin 26 chip selection signal is provided by pin 14 of U210. Pin function introduction is shown as the following table:

Pin	Name	Signal flow	Function	Pin	Name	Function
1—8				47	BYTE/	8-bit/16-bit mode selection
9, 48	A0—A19	I	Address intreface	12	RESET/	Reset signal
16—25				28	OE/	Output gating signal
29—36	Q0—Q14	I/O	Data interface	15	RY/BY/	Ready/busy signal
38—44				37	VCC	Power
45	Q15/A—1	I/O	Interface for data/address	27, 6	GND	Grounding
26	CE/		Chip selection signal	10, 13, 14	NC	Blank pin
11	WE/		Write gating signal			

3.5.4 Function introduction to SDRAM

U205, U208 are 64M 16-bit memorizer SDRAM with the player and the working clock frequency is 166/143MHZ. The function of 16SDRAM in DVD players is to memorizer the program of AML3298 taken out from FLASH and information of image and sound taken out from disc to form buffer, add the stability of information output and add anti-shaking effect of player. Pin function introduction is shown as the following table:

Pin	Name	Function	Signal flow	Pin	Name	Function	Signal flow
1	VDD	3.3V power supply		28	VSS	Ground	
2	DQ0	Data bus	I/O	29	MA4	Address bus	I
3	VDDQ	3.3V power supply	I/O	30	MA5	Address bus	I
4	DQ1	Data bus	I/O	31	MA6	Address bus	I
5	DQ2	Data bus	I/O	32	MA7	Address bus	I
6	VSSQ	Ground		33	MA8	Address bus	I
7	DQ3	Data bus	I/O	34	MA9	Address bus	I
8	DQ4	Data bus	I/O	35	MA11	Address bus	I
9	VDDQ	3.3V power supply		36	NC	Blank	
10	DQ5	Data bus	I/O	37	CKE	Clock enable signal	I
11	DQ6	Data bus	I/O	38	CLK	System clock input	I
12	VSSQ	Ground		39	UDQM	Data input/output screen-shielded signal	I
13	DQ7	Data bus	I/O	40	NC	Blank	
14	VDD	3.3V power supply		41	VSS	Ground	
15	LDQM	Data input/output screen-shielded signal	I	42	DQ8	Data bus	I/O
16	WE	Write control signal	I	43	VDDQ	3.3V power supply	
17	CAS	Line address gating signal	I	44	DQ9	Data bus	I/O
18	RAS	Row address gating signal	I	45	DQ10	Data bus	I/O
19	CS	Chip selection signal	I	46	VSSQ	Ground	
20	SD-BS0	Segmanr address 0 gating signal	I	47	DQ11	Data bus	I/O
21	SD-BS1	Segmanr address 1 gating signal	I	48	DQ12	Data bus	I/O
22	MA10	Address bus	I	49	VDDQ	3.3V power supply	
23	MA0	Address bus	I	50	DQ13	Data bus	I/O
24	MA1	Address bus	I	51	DQ14	Data bus	I/O
25	MA2	Address bus	I	52	VSSQ	Ground	
26	MA3	Address bus	I	53	DQ15	Data bus	I/O
27	VDD	3.3V power supply		54	VSS	Ground	

3.5.5 Function introduction to MK6000B

MK6000B chip is MIDI signal circuit main control chip. The MIDI signal decode circuit composed by U210 (EPM3032), U209 (MK6000B), U211 (SAM2133B) realizes the decode processing to MIDI signal, while U209 (MK6000B) is core of MIDI decode circuit, which controls the realization of the whole decode process. Pin function introduction is shown as the following table:

Pin	Name	Signal flow	Function description	Pin	Name	Signal flow	Function description
5	VLD		Power supply voltage 3.3V	31	P2.6	I	AML3298 busy signal input
53	VDD2		Power supply voltage 3.3V	3	RD	O	Read EPM3032 control
12	VDD1		Power supply voltage 3.3V	4	WR	O	Write EPM3032 control
50	AVREF		Analog reference voltage 3.3V	8	P4.7	I	Chip selection signal input
13	GND		Common	11	P4.4	O	Chip selection SAM2133 output
Pin	Name	Signal flow	Function description	Pin	Name	Signal flow	Function description
52	GND		Common	73	A8	O	SAM2133 register selection bit
16	EA			6	P5.1	O	MIDI signal mute control bit
19	RES	I	Reset signal input	57—64	D0—D7	I/O	MK—6000B data bus
15	XIN	I	Clock signal input	55	P0.1		Grounding
14	XOUT	O	Clock signal output	56	P0.0		Grounding
32	P2.5	O	MK—6000B busy signal output	43	P1.2		Grounding

Note: other pins are blank.

3.5.6 Function introduction to SAM2133B

SAM2133B is audio signal synthesizer. In the model ABS730X, it makes the externally inputted 8-path MIDI signal output 1 path digital audio signal WDAT after internal synthesis processing this players also attaches a U212 (MX23L3213) to act as the external extension of ROM. Pin function introduction is shown as the following table:

Pin	Name	Signal flow	Function description	Remark
10, 16, 31, 36	GND	I	Common	
45, 56, 68, 76	GND	I	Common	
80, 84, 96	GND	I	Common	

Pin	Name	Signal flow	Function description	Remark
11, 37, 83	VC2	I	Inner core power supply +2.5V□10%	
86, 87	VC2	I	Inner core power supply +2.5V□10%	
17, 30, 44	VC3	I	Peripheral power supply +2.25V□ 3.7V	
57, 69, 97	VC3	I	Peripheral power supply +2.25V□ 3.7V	
77	PWRIN	I	Power switch input 2.25V□ 2.95V	
78	PWROUT	I	Power switch outputs 2.5V to VC2	
6—9, 12—15	D0—D7	I/O	8-bit data bus	
2	/CS	I	Chip selection signal input	Low level effective
4	/WR	I	Write control signal input	
3	/RD	I	Read control signal input	
5	A0	I	Internal register selection bit	
1	IRQ	O	Tri-state gate output high level effective	unused
22	/RESET	I	Reset signal input	Low level effective
81, 82	X1、X2	I/O	Supply clock signal	
88	CKOUT	O	Audio data main clock output	
93	DABD0	O	Serial audio data output interface 0	
92	DABD1	O	Serial audio data output interface 1	unused
94	CLBD	O	Audio data bit clock output	
95	WSBD	O	Audio data main control clock output	
98	DAAD	I	Serial audio data input	unused
18—21	P0—P3	I/O	Common programmable I/O interface	unused
90	DBCLK	I	Debug clock is often connected to VC3	
91	DBDATA	I/O	Debug data signal	unused
89	DBACK	O	Debug to confirm output	unused
100	MIDI IN	I	MIDI IN input	unused
99	MIDI OUT	O	MIDI OUT output	unused
24—29, 32—35	WA0—WA9	O	External ROM/FLASH address interface	
38—43, 46—52	WA10—WA20	O	External ROM/FLASH address interface	51, 52 unused
58—67, 70—75	WD0—WD15	I/O	External ROM/FLASH data interface	
53	/WCS	O	External ROM/FLASH chip selection bit	
55	/WWE	O	External ROM/FLASH write enable bit	unused
54	/WOE	O	External ROM/FLASH output enable bit	

Pin	Name	Signal flow	Function description	Remark
85	LFT	I/O	PLL low pass filtering pin	
23	TEST	I	Test pin	unused
79	/PDWN	I	Power failure control pin	

3.5.7 Function introduction to Cs4340

CS4340 is audio signal D/A conversion chip, which converses digital audio signal input into analog audio signal output. In the model ABS730X, CS4340 has two places to realize D/A conversion function: 1. U213 (CS4340) converses MIDI digital audio signal outputted by SAM2133 into MIDI analog audio signal output; 2. U207 (CS4340) converses the digital audio signal ADATA decoded by decode chip AML3298 into L/R channel analog audio signal. Pin function introduction is shown as the following table:

Pin	Name	Signal flow	Function description
1	RST/	I	Reset signal input end
2	SDATA	I	Serial audio data input end
3	SCLK/DEM1	I	Serial clock control input end
4	LRCK	I	Left/right clock control input end
5	MCLK	I	Main clock control input end
6	DIF1	I	Digital interface format selection bit
7	DIF0	I	Digital interface format selection bit
8	DEM0	I	Function selection bit
9	FILT+		Internal positive direction reference voltage
10	VQ		Internal static reference filtering voltage
11	REF_GND		Reference ground
12	AOUTR	0	Right channel analog signal output
13	AGND		Analog ground
14	VA		Analog power supply input end
15	AOUTL	0	Left channel analog signal output
16	MUTEC	0	Mute control output

3.5.8 Function introduction to 4558

4558 has two integrated operational amplifiers inside. Pin function introduction 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 end of operational amplifier A	I	6	Cathode input end of operational amplifier B	I
3	Anode input end of operational amplifier A	I	7	Anode input end of operational amplifier B	I
4	Cathode voltage input	I	8	Anode voltage input	I

3.5.9 Function introduction to D5954

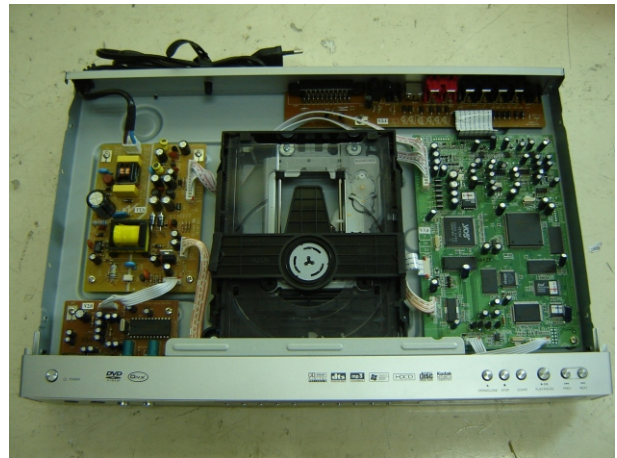
D5954 is a servo drive IC with 4-path drive circuit inside. The digital focus, trace, feed and main drive signals outputted by Vt7208 form analog signal through RC integration circuit, and then send to D5954 for amplification. The focus, trace, feed and main axis drive signals after being amplified through D5954 are sent to loader to complete the corresponding servo working. Pin function introduction is shown as the following table:

SN	Name	Function	SN	Name	Function
1	VINFC	Focus control signal input	15	VOTK+	Trace drive in-phase voltage output
2	CF1	External feedback loop	16	VOTK-	Trace drive reverse voltage output
3	CF2	External feedback loop	17	VOLD+	Feed drive in-phase voltage output
4	VINSL+	In=phase control input, connect to reference voltage	18	VOLD-	Feed drive reverse voltage output
5	VINSL-	Main axis control signal input	19	PGND	Ground
6	VOSL	External feedback resistor	20	VINFTK	Trace feedback signal input
7	VINFFC	Focus feedback signal input	21	PVCC2	5V power
8	VCC	5V power	22	PREGND	Ground
9	PVCC1	5V power	23	VINLD	Feed control signal input
10	PGND	Ground	24	CTK2	External feedback loop
11	VOSL-	Main axis drive reverse voltage output	25	CTK1	External feedback loop
12	VO2+	Main axis drive in-phase voltage output	26	VINTK	Trace control signal input
13	VOFC-	Focus drive reverse voltage output	27	BIAS	1.4V reference voltage input
14	VOFC+	Focus drive in-phase voltage output	28	STBY	Enable control signal

Chapter Four Disassembly and Assembly Process

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

The pictures of this model are shown as follows:

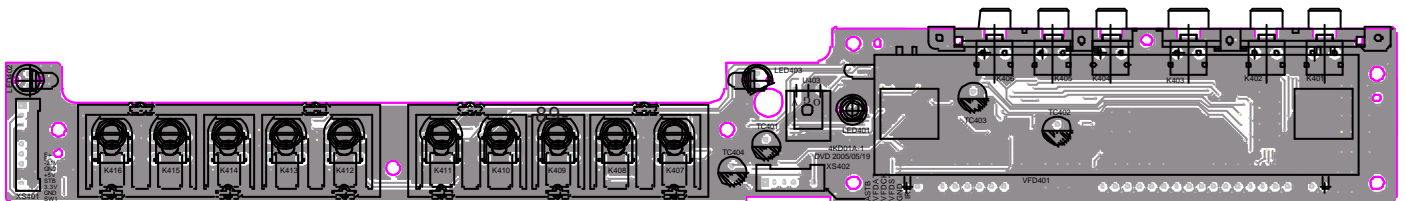


Chapter Cinque

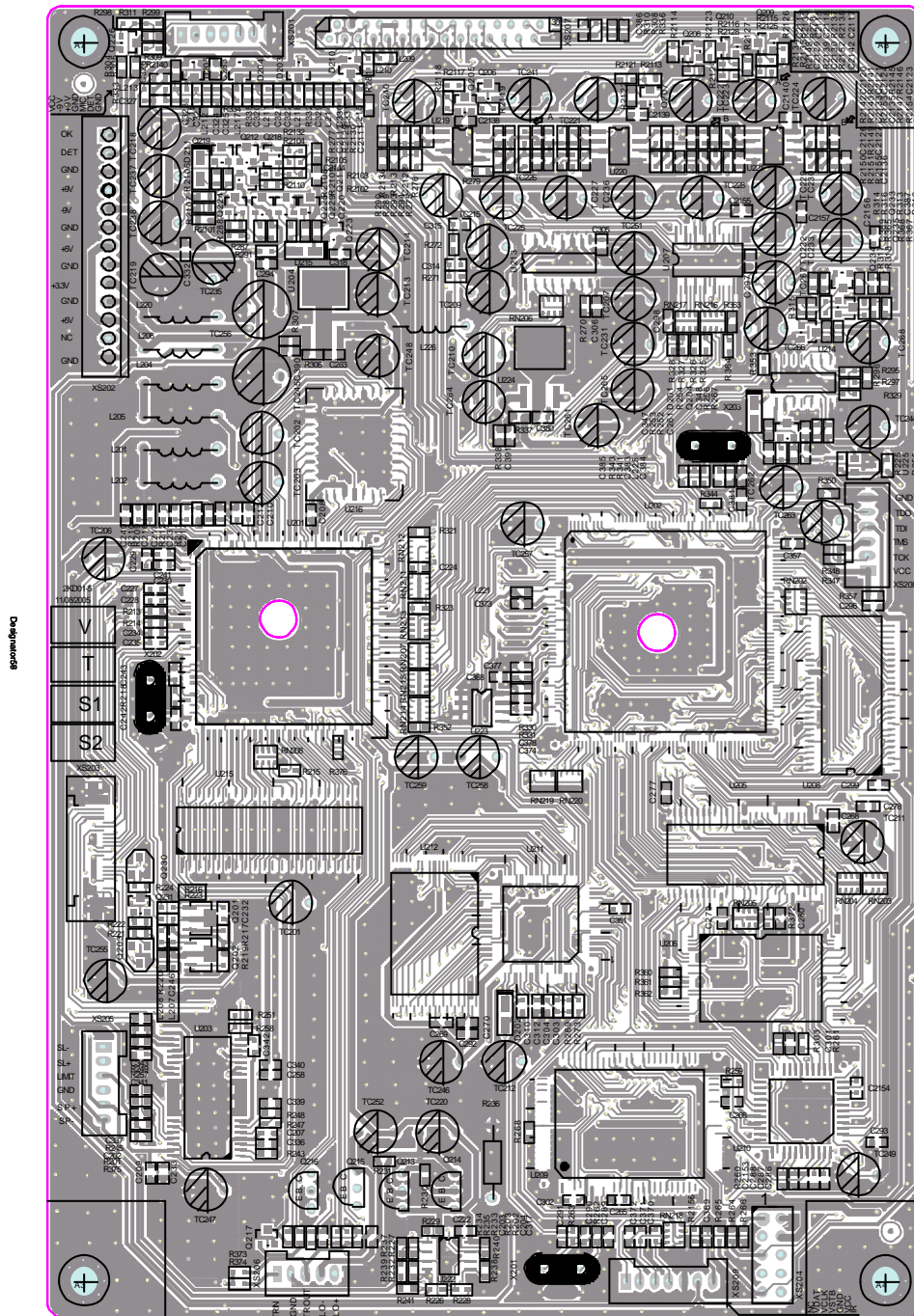
PCB board & Circuit diagram

Section One PCB board

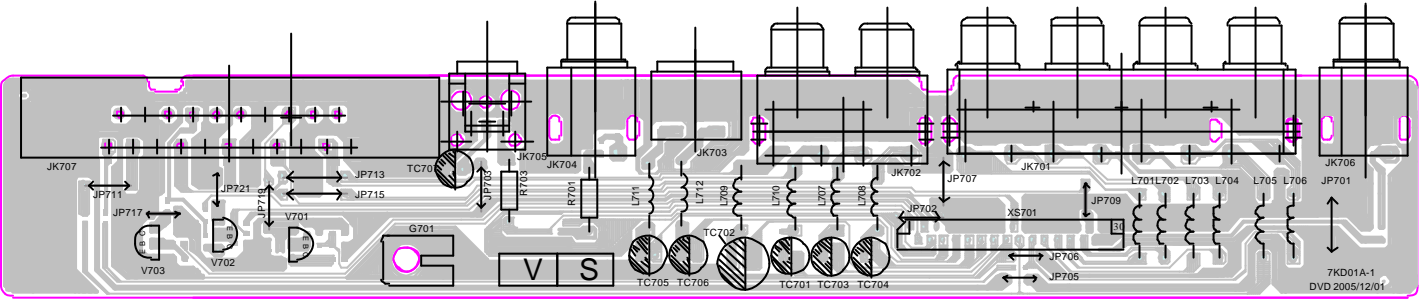
5.1.1 Surface layer of KEY SCAN Board



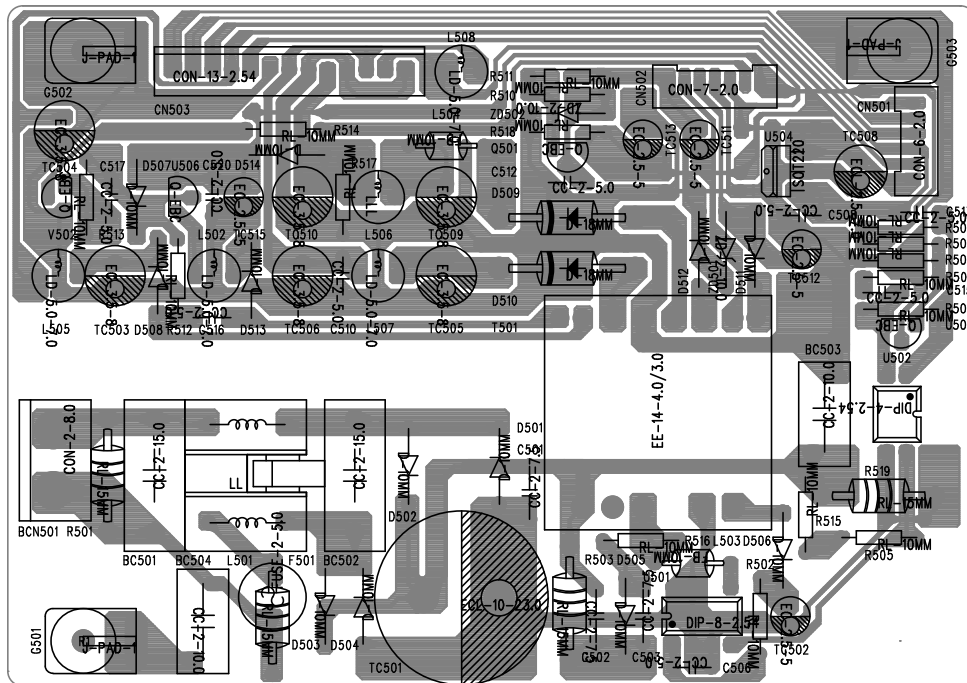
5.1.3 Surface layer of MPEG&SERVO Board



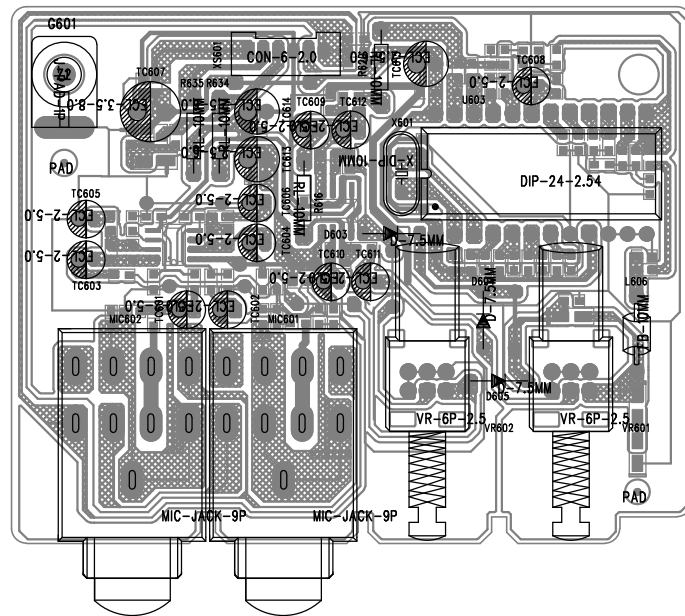
5.1.5 Surface layer of AV OUT Board



5.1.7 POWER Board

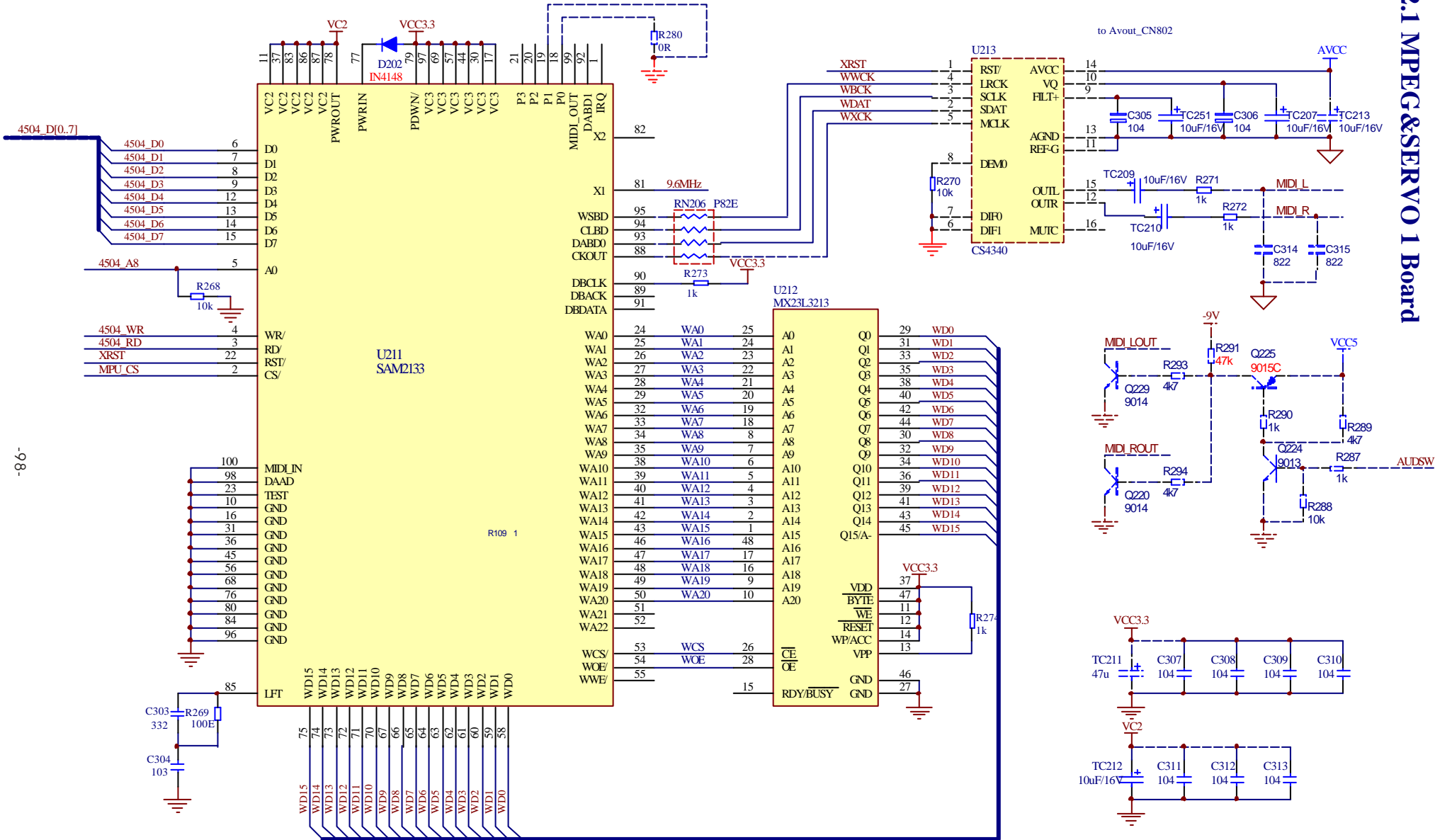


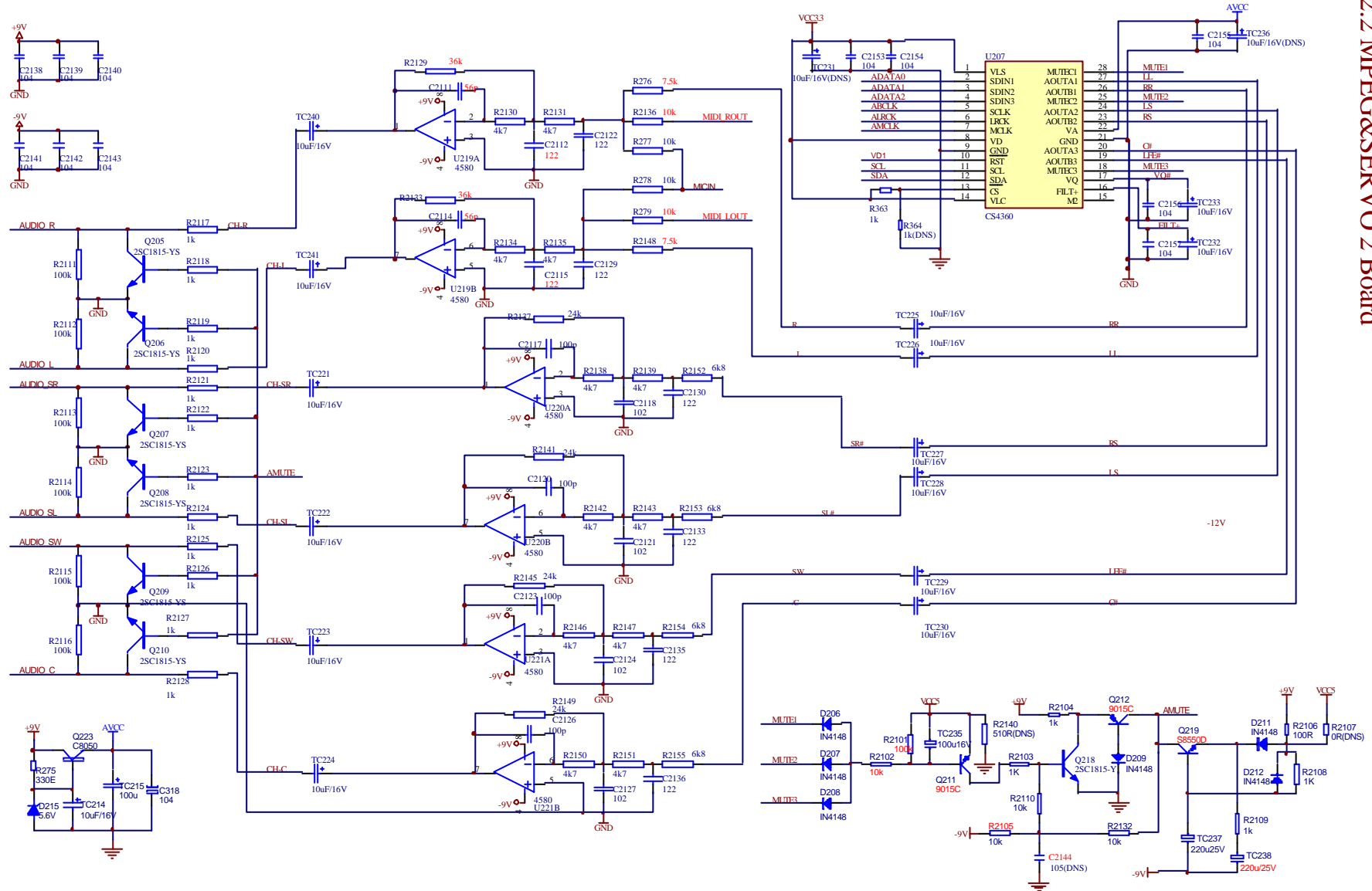
5.1.8 MIC Board

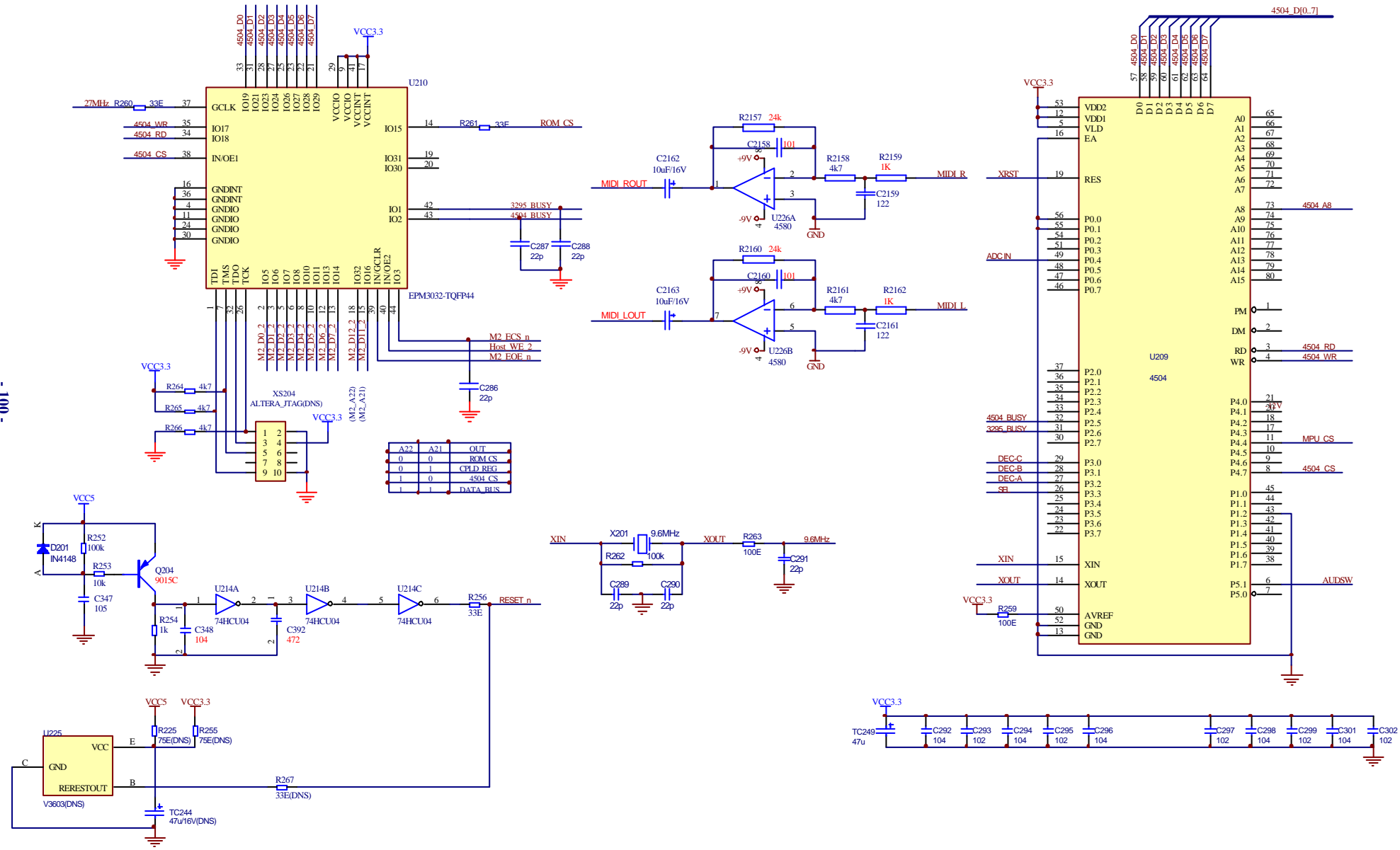


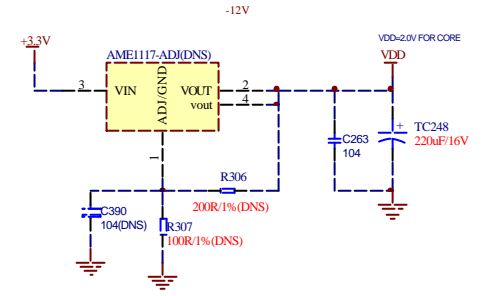
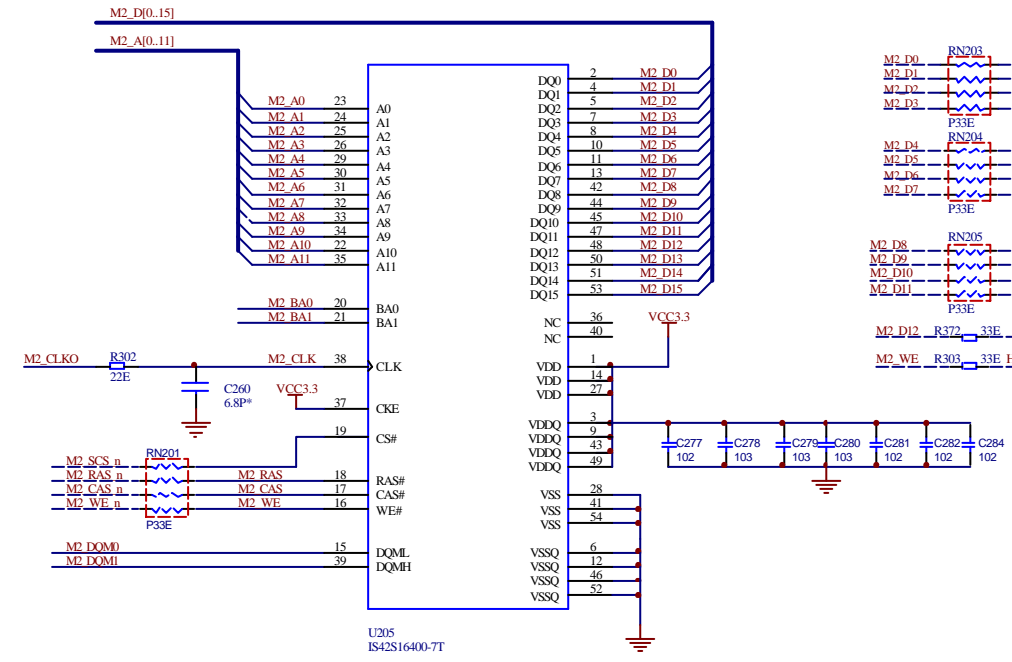
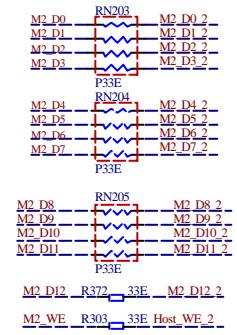
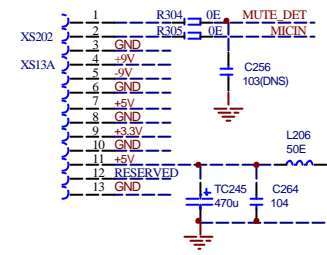
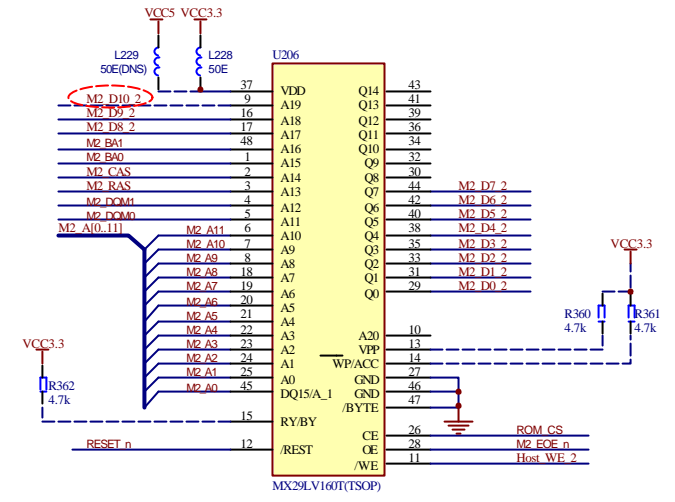
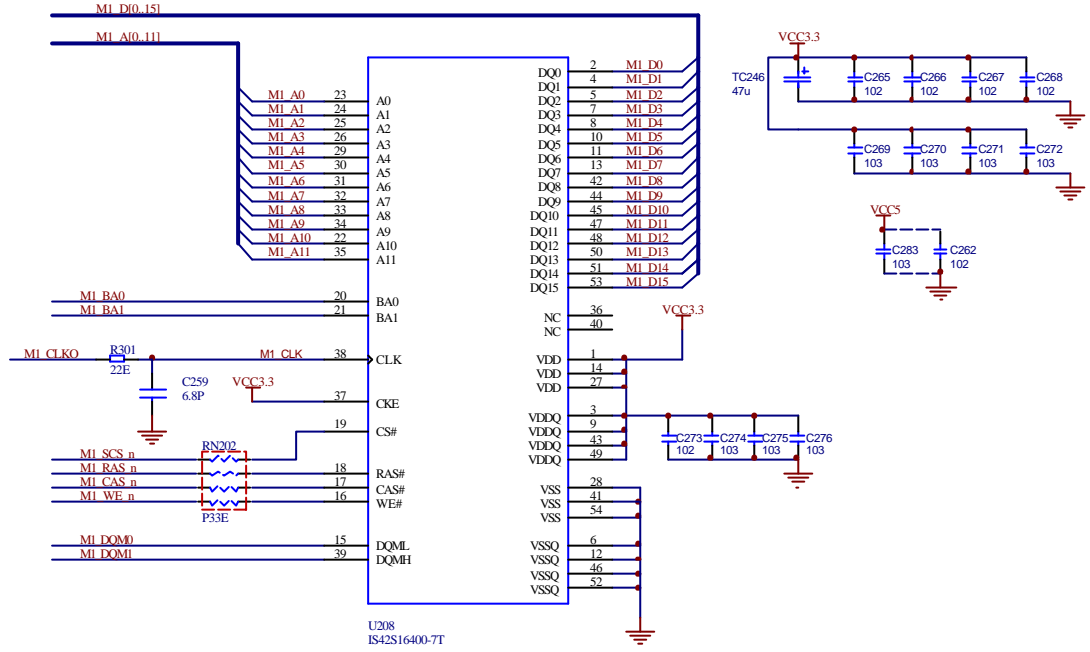
Section Two circuit diagram

5.2.1 MPEG&SERVO 1 Board

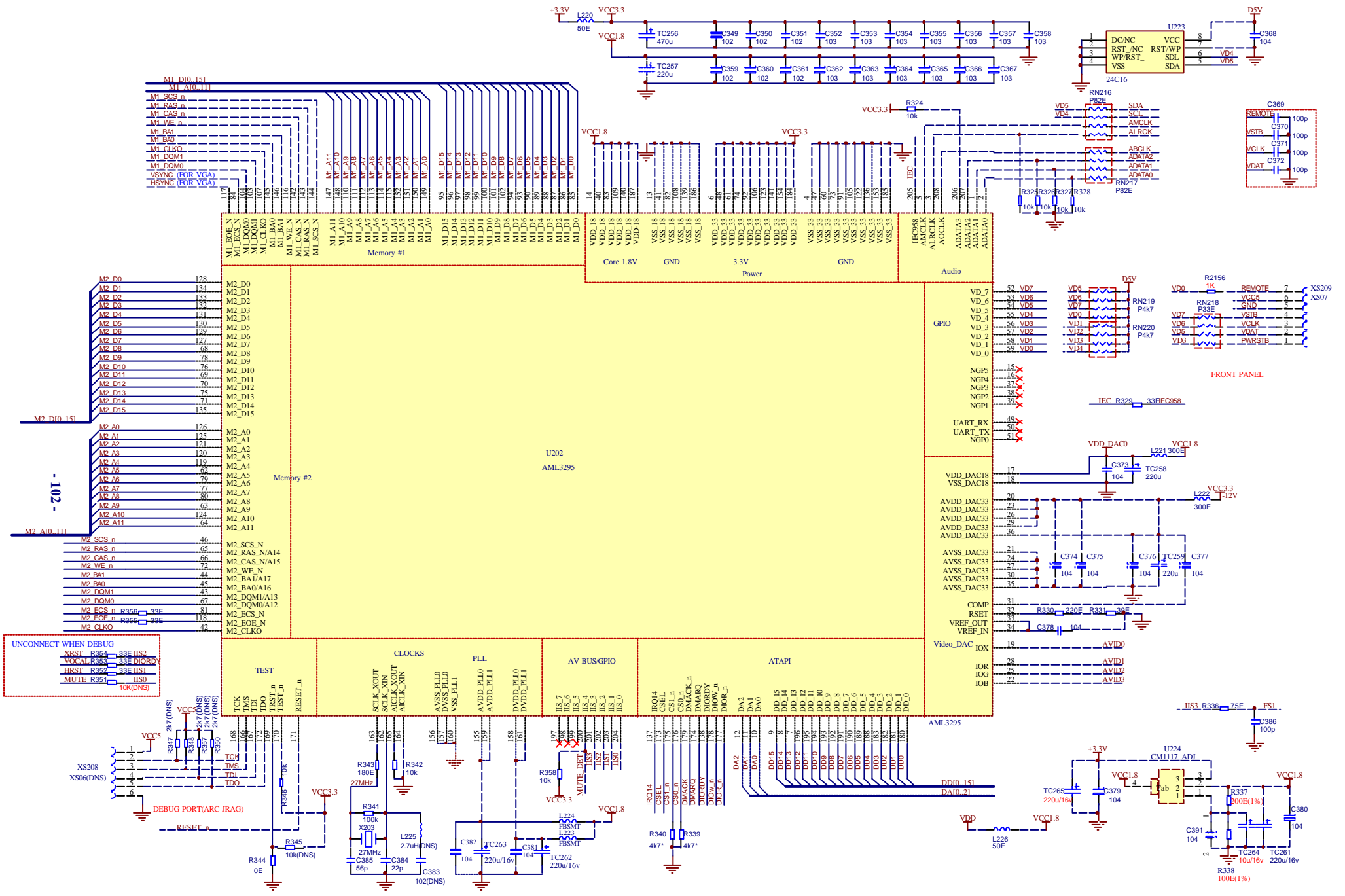








5.2.5 MPEG&SERVO 5 Board

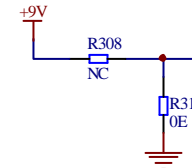
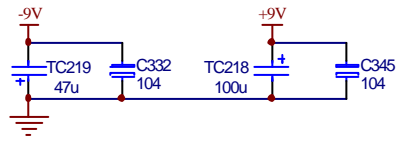
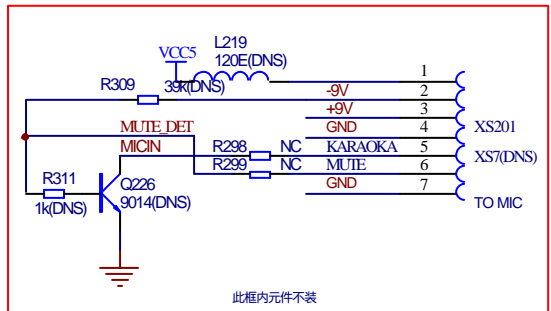
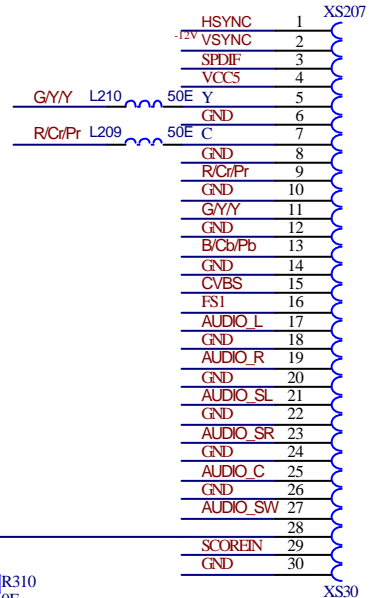
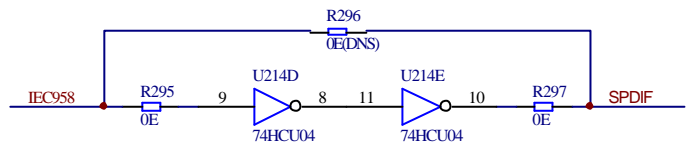
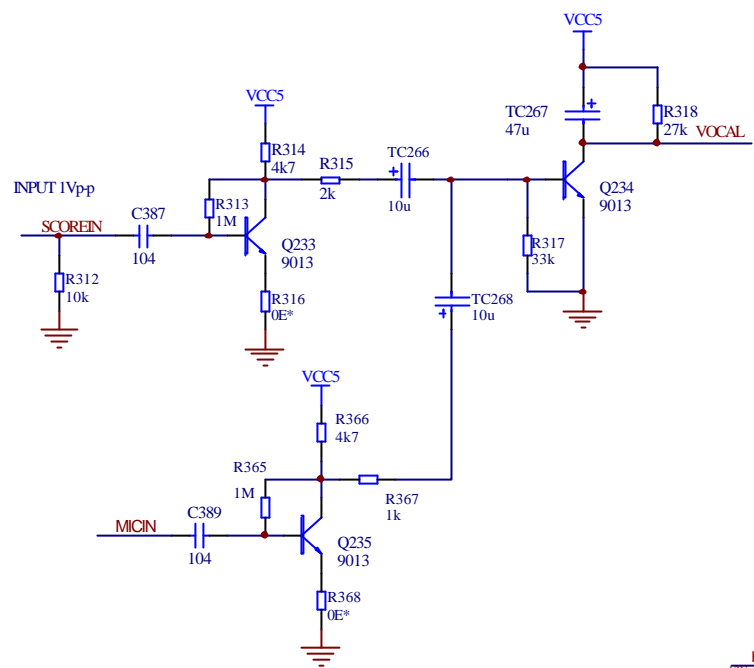
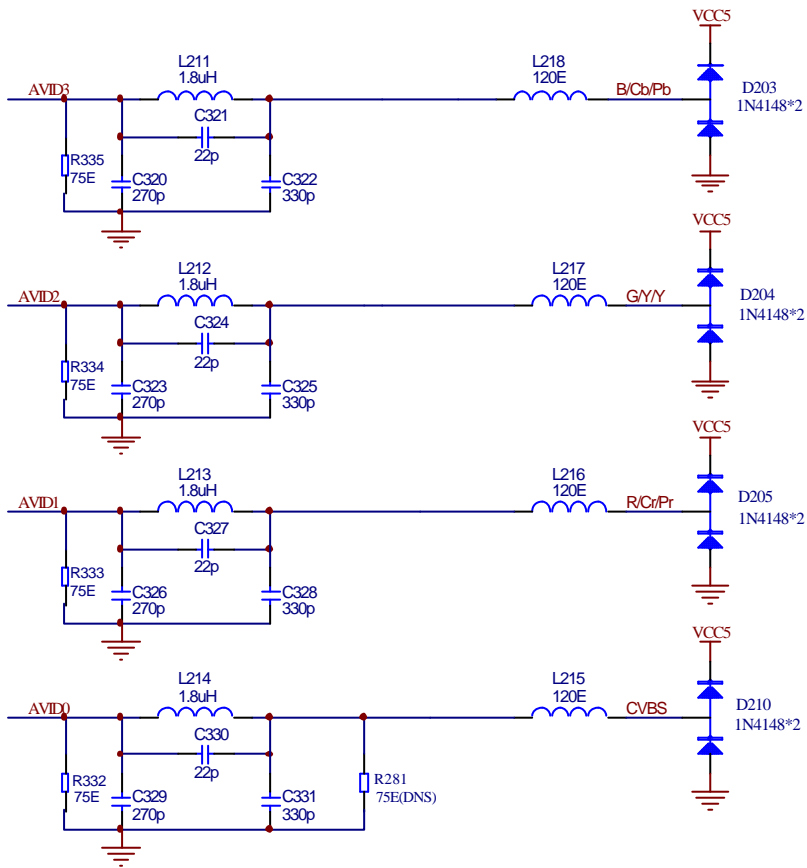


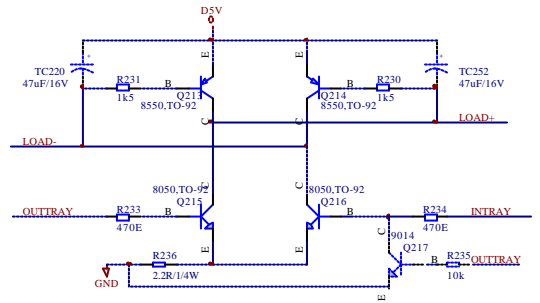
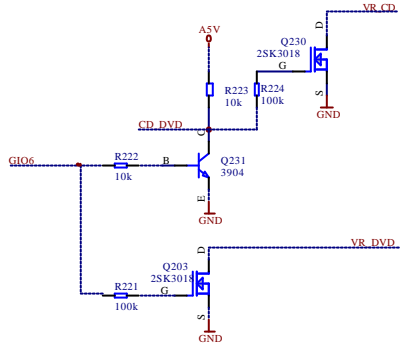
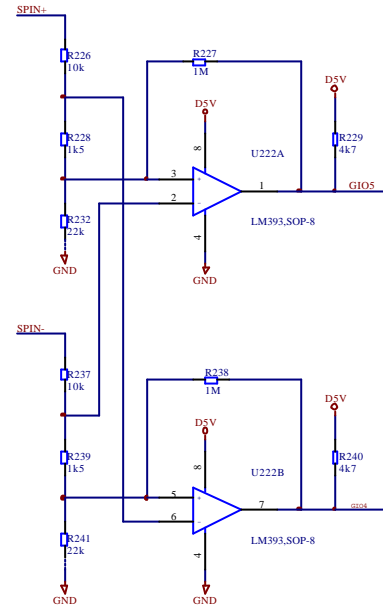
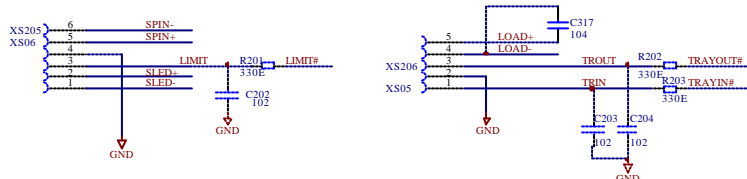
- 102 -

UNCONNECT WHEN DEBUG
 XRST R364 33E IIS2
 VOCAL R363 33E DIORDV
 HRST R352 33E IIS1
 MUTE R351 IIS0
 10k(DNS)

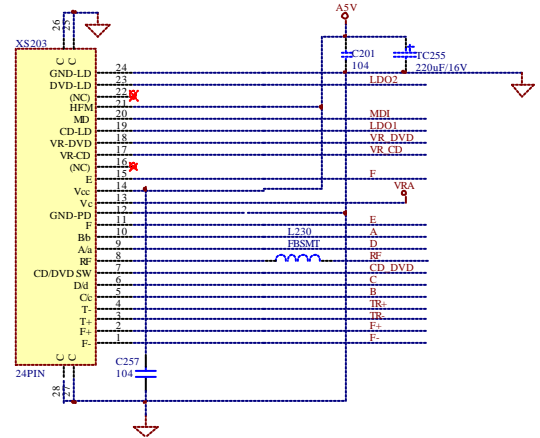
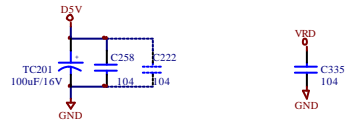
FRONT PANEL

IIS3 R336 75E FSL

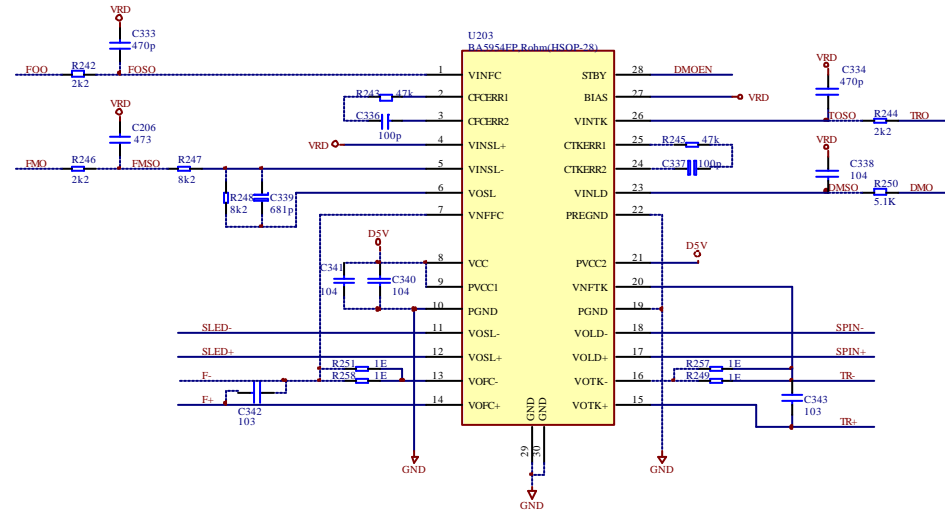




GPIO6	0	1
CD_DVD	CD	DVD
VR	VR_CD	VR_DVD

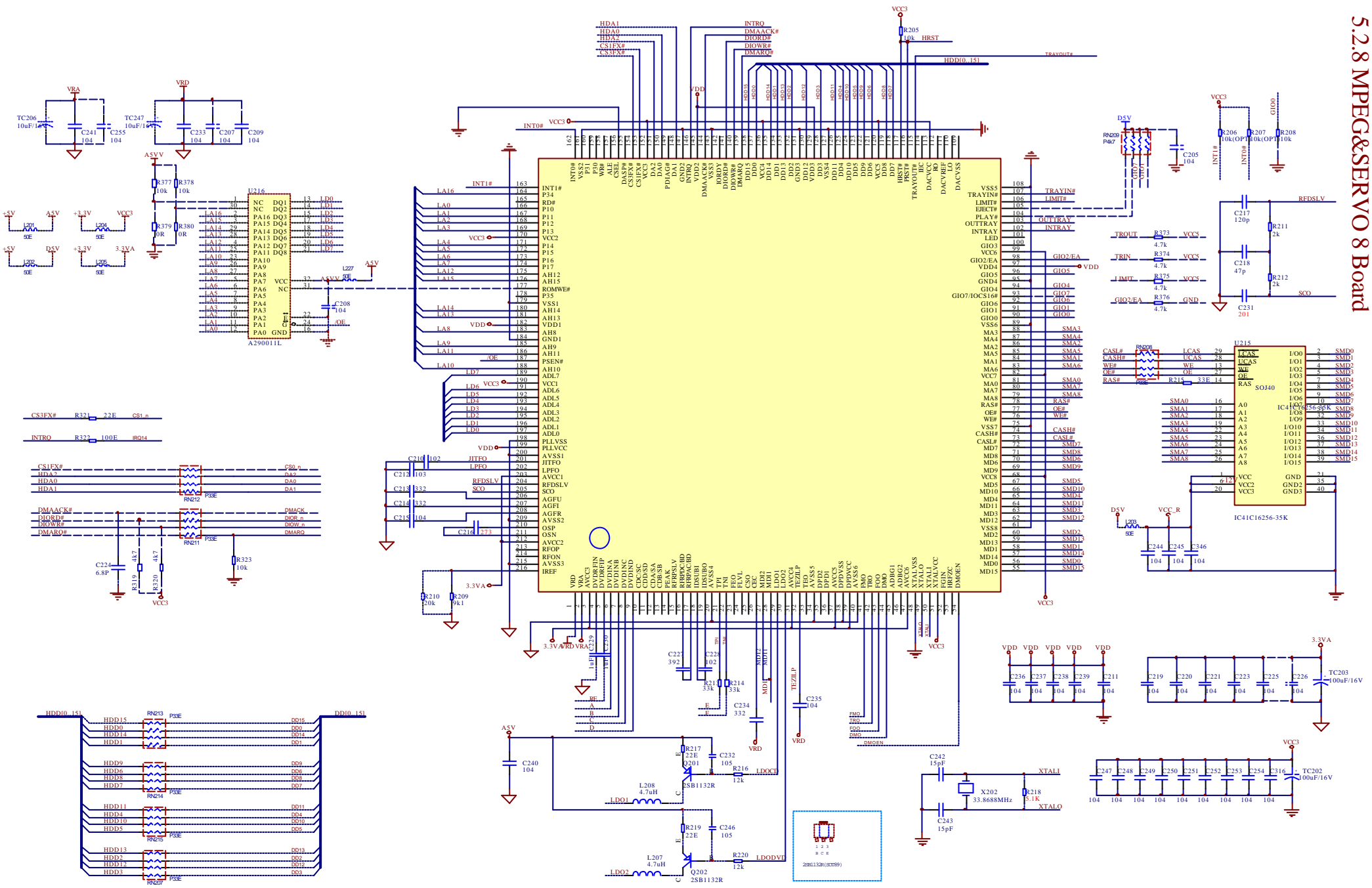


This connector (CN2) support DV34

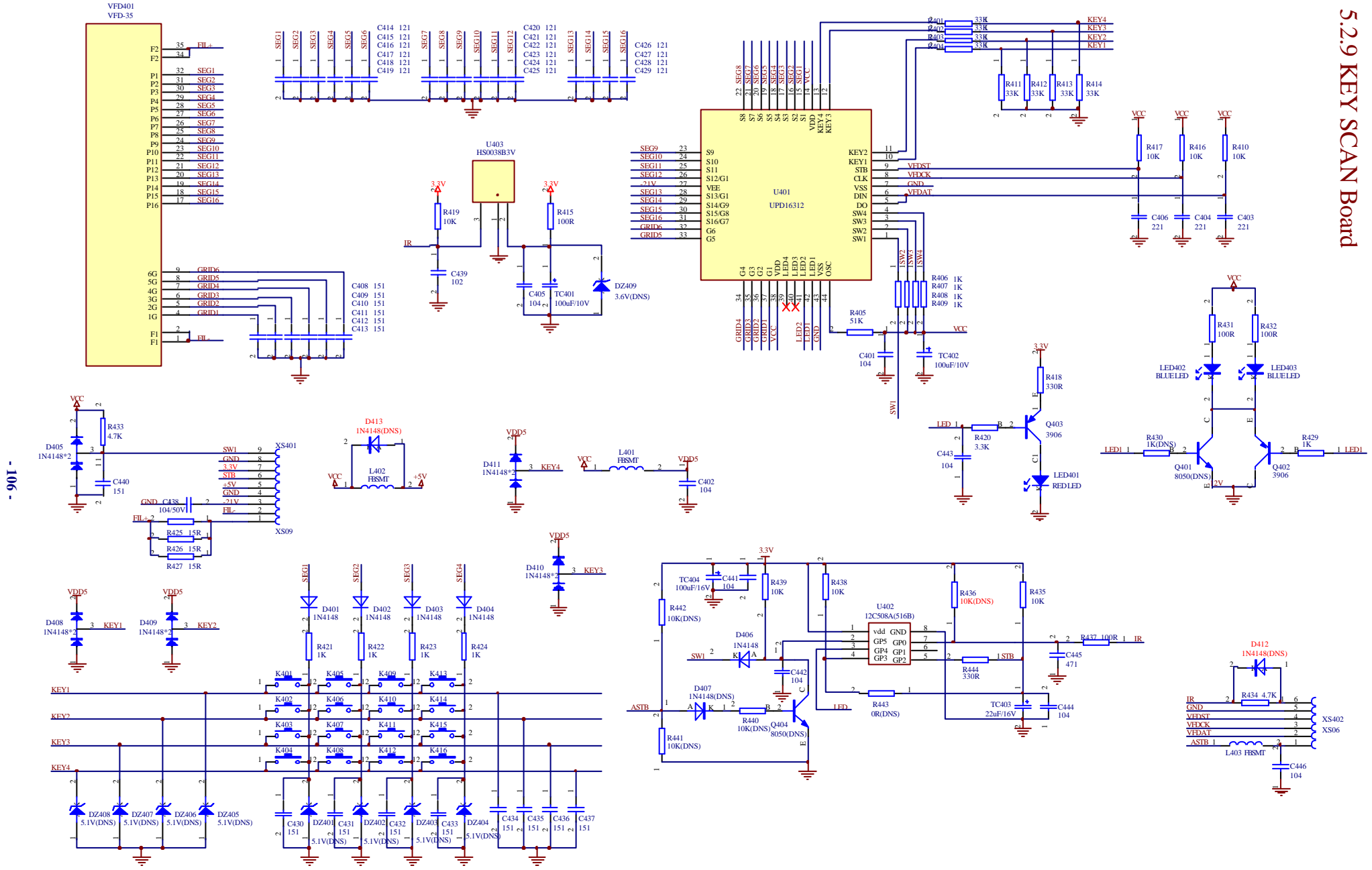


5.2.8 MPEG&SERVO 8 Board

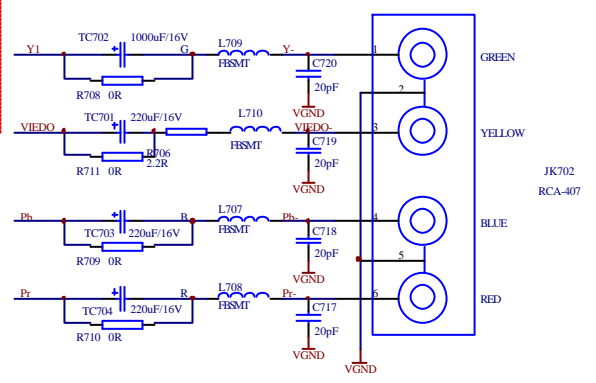
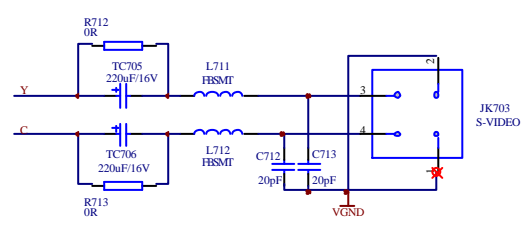
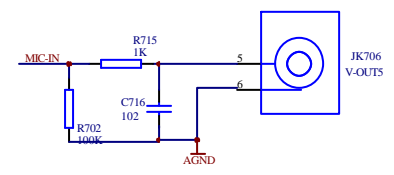
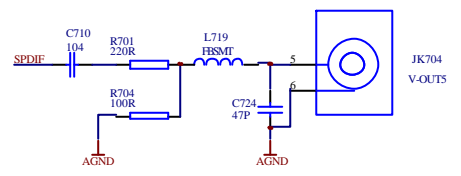
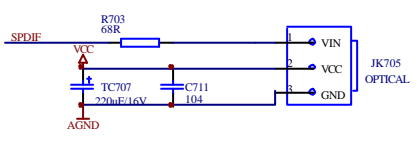
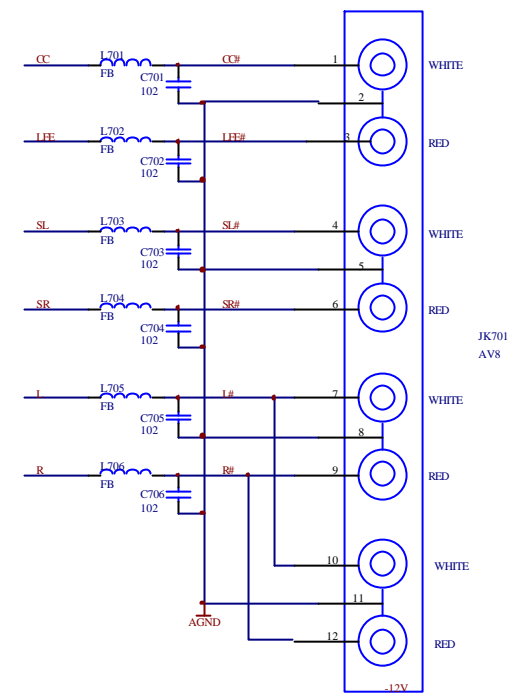
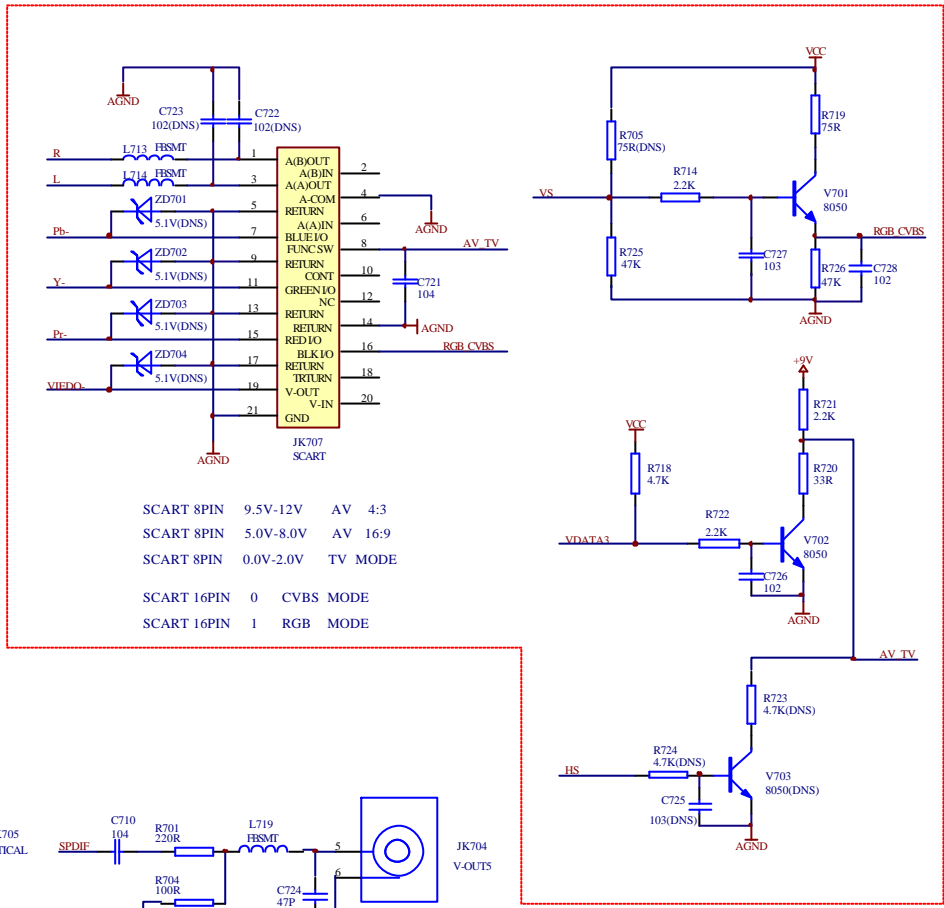
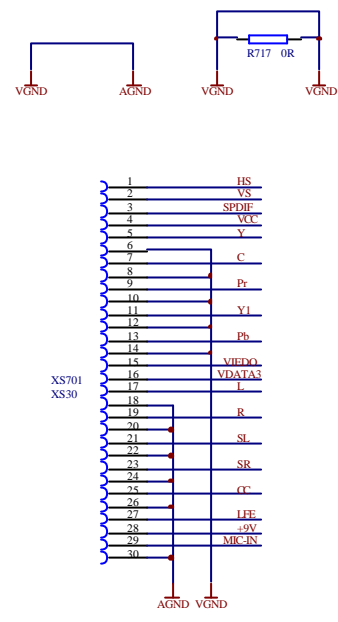
- 105 -

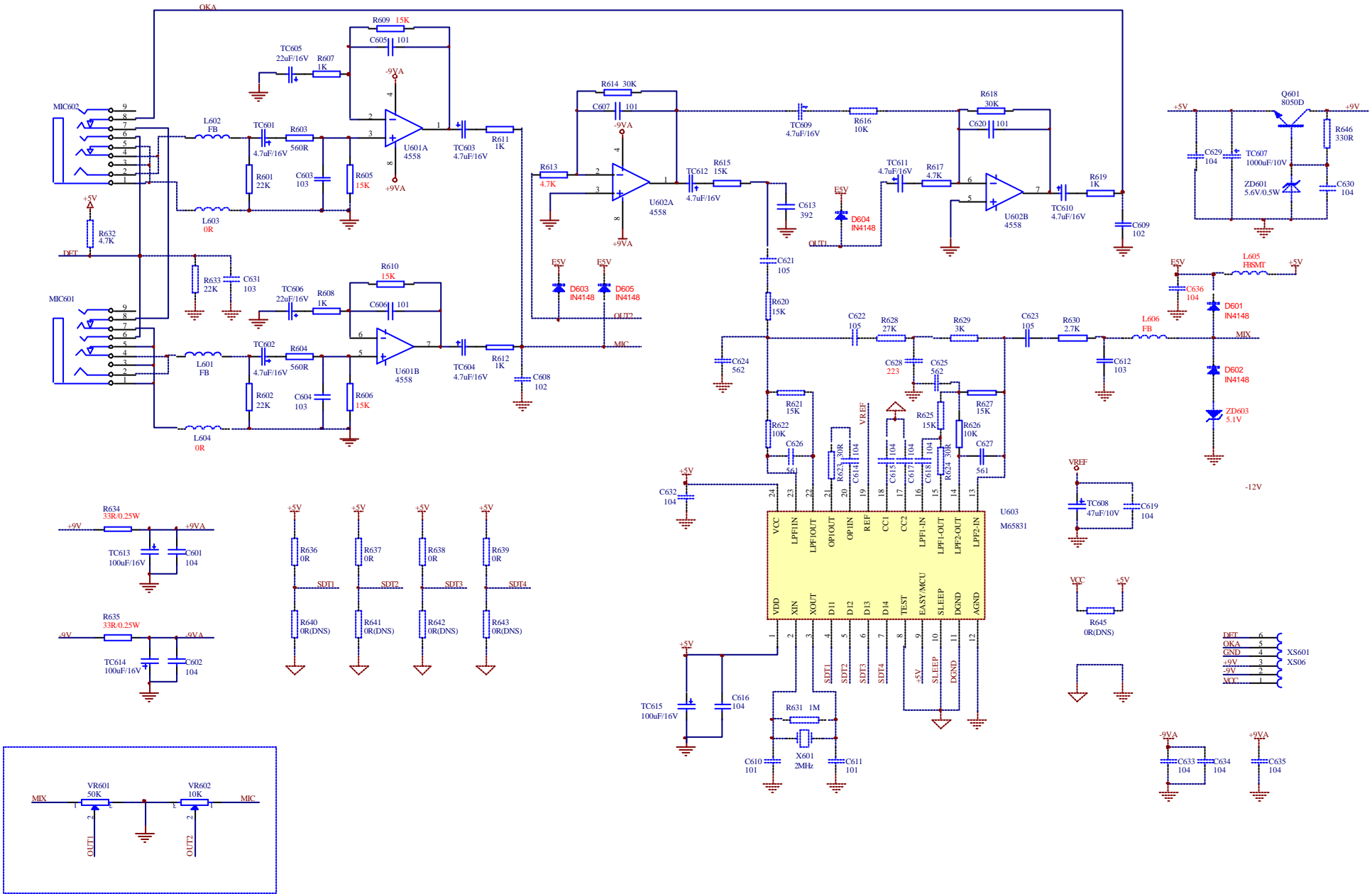


5.2.9 KEY SCAN Board



5.2.10 AV OUT Board





5.2.12 POWER Board

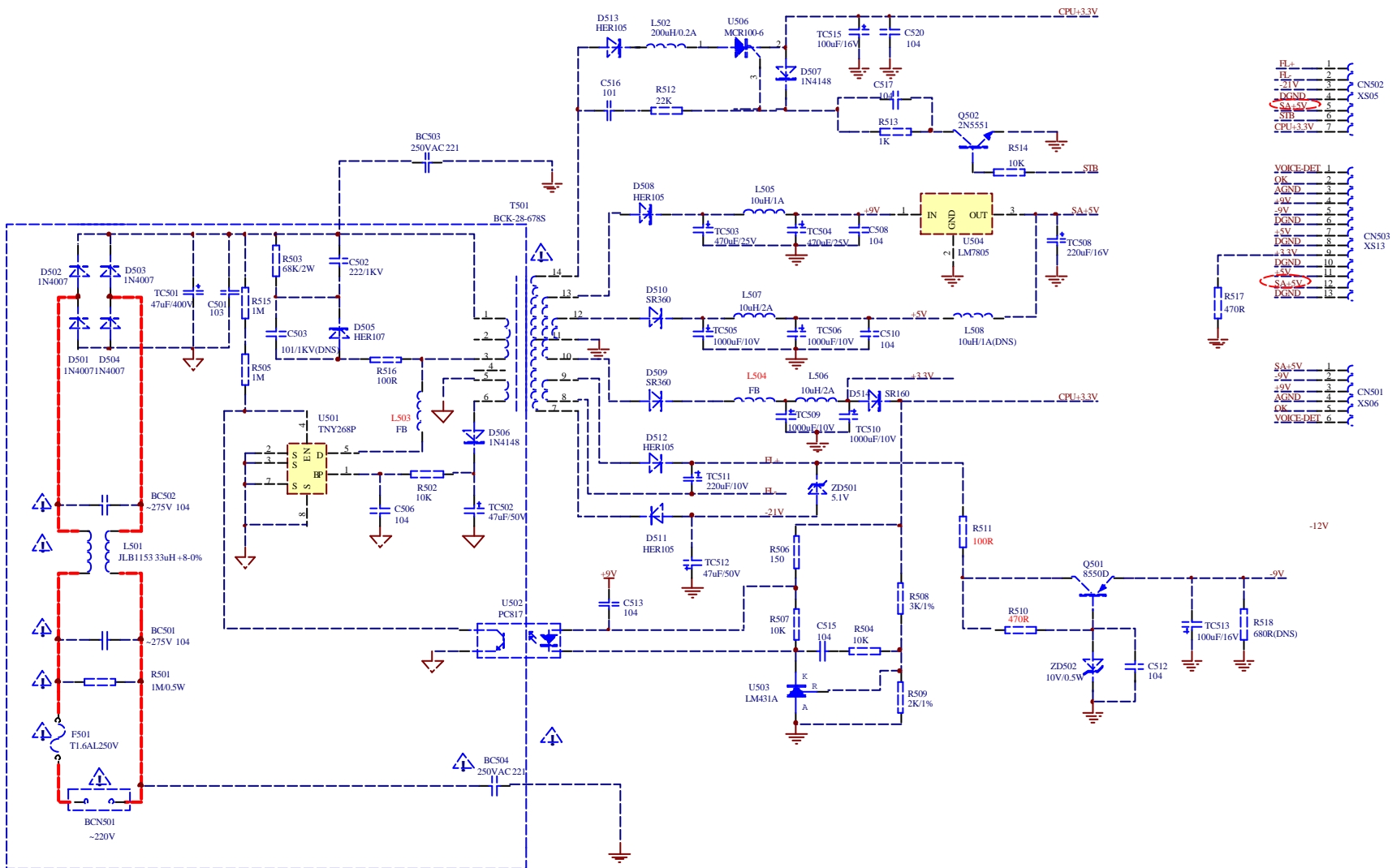


Chart 6 BOM List

6.1 AV BOARD			
DK3510S (RU) SILVER		5447353	
MATERIAL CODE	MATERIAL NAME	SPECIFICATIONS	LOCATION
0090001	SMD RESISTOR	1/16W 00 ±5% 0603	R708~R713,R727
0090002	SMD RESISTOR	1/16W 2.2O ±5%	R706
0090005	SMD RESISTOR	1/16W 33O ±5% 0603	R720
0090006	SMD RESISTOR	1/16W 75O ±5% 0603	R719
0090181	SMD RESISTOR	1/16W 100O ±5% 0603	R704
0090014	SMD RESISTOR	1/16W 1K ±5% 0603	R715
0090017	SMD RESISTOR	1/16W 2.2K ±5% 0603	R714,R721,R722
0090019	SMD RESISTOR	1/16W 4.7K ±5% 0603	R718
0090029	SMD RESISTOR	1/16W 47K ±5% 0603	R725,R726
0090034	SMD RESISTOR	1/16W 100K ±5% 0603	R702
0310085	SMD CAPACITOR	50V 20P ±5% NPO 0603	C712,C713,C717~C720
0310066	SMD CAPACITOR	50V 102 ±10% 0603	C701~C706,C716,C722~C723, C726,C728
0310072	SMD CAPACITOR	50V 103 ±10% 0603	C727
0310207	SMD CAPACITOR	50V104 ±20% 0603	C710,C711,C721
0310543	SMD CAPACITOR	50V 104 ±10% X7R 0603	C710,C711,C721
0310222	SMD CAPACITOR	25V 104 ±20% X7R 0603	C710,C711,C721
0390095	SMD MAGNETIC BEADS	FCM1608K-221T05	L713,L714,L719
0310045	SMD CAPACITOR	50V 47P ±5% NPO 0603	C724
0000431	CARBON FILM RESISTOR	1/4W75O±5% SHAPED 10	R703
0000362	CARBON FILM RESISTOR	1/4W220O±5% SHAPED 10	R701
0390057	MAGNETIC BEADS INDUCTOR	RH354708	L701~L712
0260028	CD	CD11 16V220U±20%6×12 2.5	TC707
0780050	TRIODE	S8050D	V701,V702
1090045	ELECTRO-OPTIC TRANSFORMER	TX179ATW	JK705
1090024	ELECTRO-OPTIC TRANSFORMER	TX179AT	JK705
1910094	TERMINAL SOCKET	AV4-8.4-6G-5	JK702
1910095	TERMINAL SOCKET	AV1-8.4-5G-2 BLACK	JK704, JK706

MATERIAL CODE	MATERIAL NAME	SPECIFICATIONS	LOCATION
1910006	TERMINAL SOCKET	S-VIDEO	JK703
1910079	TERMINAL SOCKET	AV8-8.4-6G-3	JK701
1860029	SCART SOCKET	SCART-01	JK707
1940193	CABLE SOCKET	15P 1.0mm STRAIGHT CONTACT DUAL LINE PLUG	XS701
2100010	CONNECTED CORDS	F 0.6 SHAPED 5mm	JP705,JP706,JP709,JP717,JP 721
2100003	CONNECTED CORDS	F 0.6 SHAPED 7.5mm	JP702,JP703,JP707,JP711,JP 719
2100004	CONNECTED CORDS	F 0.6 SHAPED 10mm	JP701,JP713,JP715
3870115	GROUND CHIP OF POWER BOARD	AB903	G701
1564100	PCB	7KD01A-1	
6.2 OK BOARD			
DK3510S (RU) SILVER 5446220			
0090001	SMD RESISTOR	1/16W 00 ±5% 0603	R636~R639,L603,L604
0090180	SMD RESISTOR	1/16W 300 ±5% 0603	R623,R624
0090009	SMD RESISTOR	1/16W 3300 ±5% 0603	R646
0090012	SMD RESISTOR	1/16W 5600 ±5% 0603	R603,R604
0090014	SMD RESISTOR	1/16W 1K ±5% 0603	R607,R608,R611,R612,R619
0090104	SMD RESISTOR	1/16W 2.7K ±5% 0603	R630
3870115	GROUND CHIP OF POWER BOARD	AB903	G601
0090183	SMD RESISTOR	1/16W 3K ±5% 0603	R629
0090019	SMD RESISTOR	1/16W 4.7K ±5% 0603	R613,R617, R632
0090023	SMD RESISTOR	1/16W 10K ±5% 0603	R622,R626
0090024	SMD RESISTOR	1/16W 15K ±5% 0603	R605,R606,R609,R610,R615, R621,R625,R627,R614
0090026	SMD RESISTOR	1/16W 22K ±5% 0603	R601,R602,R633
0090027	SMD RESISTOR	1/16W 27K ±5% 0603	R628
0090189	SMD RESISTOR	1/16W 30K ±5% 0603	R618
0090109	SMD RESISTOR	1/16W 1MO ±5% 0603	R631
0310047	SMD CAPACITOR	50V 101 ±5% NPO 0603	C605~C607, C610, C611,C620
0310197	SMD CAPACITOR	50V 561 ±10% X7R 0603	C626, C627
0310066	SMD CAPACITOR	50V 102 ±10% 0603	C608,C609
0310323	SMD CAPACITOR	50V 392 ±10% X7R 0603	C613
0310199	SMD CAPACITOR	50V 562 ±10% X7R 0603	C624,C625

MATERIAL CODE	MATERIAL NAME	SPECIFICATIONS	LOCATION
0310072	SMD CAPACITOR	50V 103 ±10% 0603	C603,C604,C612,C631
0310202	SMD CAPACITOR	50V 223 ±10% 0603	C628
0310207	SMD CAPACITOR	50V104 ±20% 0603	C601,C602,C614~C619,C629, C630,C632,C633~C635,C636
0310543	SMD CAPACITOR	50V 104 ±10% X7R 0603	C601,C602,C614~C619,C629, C630,C632,C633~C635,C636
0310222	SMD CAPACITOR	25V 104 ±20% X7R 0603	C601,C602,C614~C619,C629, C630,C632,C633~C635,C636
0310234	SMD CAPACITOR	16V 105 +80%-20% 0603	C621,C622,C623
0390095	SMD MAGNETIC BEADS	FCM1608K-221T05	L601,L602,L605
0700008	SMD VOLTAGE REGULATOR DIODE	5.6V ±5% 1/2W	ZD601
0700004	SMD VOLTAGE REGULATOR DIODE	5.1V ±5% 1/2W	ZD603
0700007	SMD DIODE	1N4148	D601,D602
0700001	SMD DIODE	LS4148	D601,D602
0700002	SMD DIODE	LL4148	D601,D602
0780085	SMD TRIODE	8050D	Q601
1563613	PCB	6KD01-2	
0000167	CARBON FILM RESISTOR	1/4W330±5%	R634, R635
0000294	CARBON FILM RESISTOR	1/4W10K±5% SHAPED 10	R616
0000296	CARBON FILM RESISTOR	1/4W15K±5% SHAPED 10	R620
0390057	MAGNETIC BEADS INDUCTOR	RH354708	L606
0570052	DIODE	1N4148 SHAPED 7.5mm	D603~D605
0260140	CD	CD110 16V4.7U±20%5×11 2	TC601~TC604,TC609~TC612
0260025	CD	CD11 16V47U±20%5×11 2	TC608
0260027	CD	CD11 16V100U±20%6×12 2.5	TC613, TC614, TC615
0260021	CD	CD11 16V22U±20%5×11 2	TC605,TC606
0260237	CD	CD11 10V1000U±20%8×14 3.5	TC607
0960027	CRYSTAL OSCILLATOR	2.00MHz 49-U	X601
0960272	CRYSTAL OSCILLATOR	2.0MHz ±20PPM 49-S 100P	X601
0880361	IC	4558 SOP	U601,U602
0880185	IC	NJM4558M SOP	U601,U602
0880562	IC	4580 SOP	U601,U602

MATERIAL CODE	MATERIAL NAME	SPECIFICATIONS	LOCATION
0880457	IC	M65831AP DIP	U603
1980006	MICROPHONE SOCKET	CK3-6.35-106	MIC601,MIC602
2121754	FLAT CABLE	6P70 2.0 2 PIN,WITH NEEDLE,TOGETHER DIRECTION	XS601
0160147	ROTATED POTENTIOMETER	WH09NTX-1C-A10K-F30	VR602
0160146	ROTATED POTENTIOMETER	WH09NTX-1C-A50K-F30	VR601
2100003	CONNECTED CORDS	F 0.6 SHAPED 7.5mm	JP607,JP606,JP605
2100004	CONNECTED CORDS	F 0.6 SHAPED 10mm	JP601~JP604
6.3 POWER BOARD			
DK3510S (RU) SILVER 5447352			
0000276	CARBON FILM RESISTOR	1/4W100O±5% SHAPED 10	R511,R516
0000278	CARBON FILM RESISTOR	1/4W330O±5% SHAPED 10	R506
0000283	CARBON FILM RESISTOR	1/4W1K±5% SHAPED 10	R513
0010209	METAL FILM RESISTOR	1/6W2K±1%	R509
0010248	METAL FILM RESISTOR	1/6W3K±1%	R508
0000294	CARBON FILM RESISTOR	1/4W10K±5% SHAPED 10	R502,R504,R507,R514
0000279	CARBON FILM RESISTOR	1/4W470O±5% SHAPED 10	R510
0000299	CARBON FILM RESISTOR	1/4W22K±5% SHAPED 10	R512
0010157	METAL OXIDE FILM RESISTOR	2W68K±5%SHAPED FLAT 15×7	R503
0880379	IC	LM7805 GOLD SEALED TO-220	U504
0780049	TRIODE	S8550D	Q501
0070006	HIGH PRESSURE RESISTOR	1/2W 1MO±5%	R501
0000257	CARBON FILM RESISTOR	1/4W1MO±5%	R505,R515
0200303	PORCELAIN CAPACITOR	1000V 222±20% NPO7.5mm	C502
0200304	CERAMIC CAPACITOR	1000V 103±20% NPO10mm	C501
0200138	PORCELAIN CAPACITOR	50V 104 ±20% 5mm	C506,C508,C510,C512,C515,C517,C520
0200228	PORCELAIN CAPACITOR	1000V 101 ±10% 7.5mm	C516
0200267	CERAMIC CAPACITOR	CT81 250VAC221±20% 10mm	BC503,BC504
0200268	CERAMIC CAPACITOR	CT81 250VAC221±10% 10mm	BC503,BC504
0210066	TERYLENE CAPACITOR	275V 104 ±20% 15mm	BC501,BC502
0210070	TERYLENE CAPACITOR	275V 104 ±10% 15mm	BC501,BC502
0260557	CD	CD11T 16V100u±20%6×12 2.5	TC513,TC515
0260583	CD	CD11T 16V220U±20%6×12 2.5	TC511,TC508

MATERIAL CODE	MATERIAL NAME	SPECIFICATIONS	LOCATION
0260594	CD	CD11T 25V220U±20%8×12 3.5	TC503,TC504
0260559	CD	CD11T 50V47u±20%6×12 2.5	TC502,TC512
0260560	CD	CD11T 10V1000u±20%8×16 3.5	TC506,TC510
0260690	CD	CD288H 10V1000U±20%8×16 3.5	TC505,TC509
0260642	CD	CD288H 400V47U±20% 16×25 7.5	TC501
0410010	CHOKE COIL	VERTICAL 10UH 1A 5mm	L502,L505
0410011	CHOKE COIL	VERTICAL 10UH 2A 5mm	L506,L507
0460518	SWITCH POWER TRANSFORMER	@BCK-28-678S 3C	T501
0570013	DIODE	HER105	D508,D511,D512,D513
0680007	SCHOTTKY DIODE	SR360	D509,D510
0680026	SCHOTTKY DIODE	SR160	D514
0570014	DIODE	HER107	D505
0580006	VOLTAGE REGULATOR DIODE	5.1V 1/2W	ZD501
0580032	VOLTAGE REGULATOR DIODE	10V ±5% 1/2W	ZD502
0570006	DIODE	1N4148	D506,D507
0570005	DIODE	1N4007	D501~D504
0780026	TRIODE	2N5551	V502
0881611	IC	TNY268P DIP	U501
0881515	IC	TLV431 TO-92	U503
0390057	MAGNETIC BEADS INDUCTOR	RH354708	L503,L504
1000022	POWER GRID FILTER	JLB1153 33uH + -0%	L501
1080011	PHOTOELECTRIC COUPLER	HS817	U502
1080006	PHOTOELECTRIC COUPLER	PC817	U502
0690001	CONTROLLABLE SILICON	MCR100-6	U506
0690003	CONTROLLABLE SILICON	NCR169D TO-92	U506
1563762	PCB	5KD01A-0	
1940005	SOCKET	6P 2.0mm	CN501
1940023	SOCKET	7P 2.0mm	CN502
1940171	SOCKET	11P 2.5mm	CN503
1940045	SOCKET	2P 8.0mm 2#	BCN501
2100004	CONNECTED CORDS	F 0.6 SHAPED 10mm	JP501~JP504,JP505
2300021	FUSE	T1.6AL 250V	F501

MATERIAL CODE	MATERIAL NAME	SPECIFICATIONS	LOCATION
3870115	GROUND CHIP OF POWER BOARD	AB903	G501,G502
6.4 SUBSIDIARY PANE			
DK3510S (RU) SILVER		5446221	
1340064	LIGHT TOUCH RESTORE SWITCH	KFC-A06-2WB L3.8	K901
1940027	SOCKET	2P 2.0mm	CN901
1631995	PCB	9KD01-0	
6.5 DECODE BOARD			
DK3510S (RU) SILVER		2KD01-5	
0090001	SMD RESISTOR	1/16W 0O ±5% 0603	R280,R295,R297,R305,R308, R344,R379,R380
0090272	SMD RESISTOR	1/16W1O±5% 0603	R249,R251,R257,R258
0090004	SMD RESISTOR	1/16W 22O ±5% 0603	R217,R219,R301,R302,R321
0090005	SMD RESISTOR	1/16W 33O ±5% 0603	R215,R256,R260,R261,R303, R329,R352~R356,R372
0090237	SMD RESISTOR	1/16W 39O ±5% 0603	R331
0090006	SMD RESISTOR	1/16W 75O ±5% 0603	R332~R336
0090181	SMD RESISTOR	1/16W 100O ±5% 0603	R259,R263,R269,R322,R2106, R2108
0090007	SMD RESISTOR	1/16W 180O ±5% 0603	R343
0090008	SMD RESISTOR	1/16W 220O ±5%	R330
0090009	SMD RESISTOR	1/16W 330O ±5% 0603	R201~R203,R275,R304
0090011	SMD RESISTOR	1/16W 470O ±5% 0603	R233,R234
0090014	SMD RESISTOR	1/16W 1K ±5% 0603	R254,R271~R274,R287,R290, R363,R367,R2103,R2104,R21 17~R2128,R2156,R316,R368, R2109,R2159,R2162
0090016	SMD RESISTOR	1/16W 1.5K ±5% 0603	R228,R230,R231,R239
0090223	SMD RESISTOR	1/16W 2K ±5%	R211,R212,R315
0090017	SMD RESISTOR	1/16W 2.2K ±5% 0603	R242,R244,R246
0090019	SMD RESISTOR	1/16W 4.7K ±5% 0603	R360~R362,R373~R376,R339, R340,R2130,R2131,R2134,R2 135,R2138,R2139,R2142,R21 43,R2146,R2147,R2150,R215 1,R229,R240,R264~R266,R28 9,R293,R294,R314,R319,R320 ,R366,R2158,R2161
0090020	SMD RESISTOR	1/16W 5.1K ±5% 0603	R218,R250
0090021	SMD RESISTOR	1/16W 6.8K ±5% 0603	R2152~R2155
0090186	SMD RESISTOR	1/16W 7.5K ±5% 0603	R2148,R276,R279,R2136

MATERIAL CODE	MATERIAL NAME	SPECIFICATIONS	LOCATION
0090022	SMD RESISTOR	1/16W 8.2K ±5%	R247,R248
0090254	SMD RESISTOR	1/16W 9.1K ±5% 0603	R209
0090023	SMD RESISTOR	1/16W 10K ±5% 0603	R205~R208,R222,R223,R226, R235,R237,R253,R268,R270, R277,R278,R288,R312,R323~ R328,R342,R346,R2102,R210 5,R2110,R2132,R358
0090187	SMD RESISTOR	1/16W 12K ±5%	R216,R220,R2157,R2160
0090025	SMD RESISTOR	1/16W 20K ±5% 0603	R210
0090026	SMD RESISTOR	1/16W 22K ±5% 0603	R232,R241
0090255	SMD RESISTOR	1/16W24K±5% 0603	R2137,R2141,R2145,R2149
0090027	SMD RESISTOR	1/16W 27K ±5% 0603	R318
0090028	SMD RESISTOR	1/16W 33K ±5% 0603	R213,R214,R317
0090190	SMD RESISTOR	1/16W 36K ±5% 0603	R2129,R2133
0090029	SMD RESISTOR	1/16W 47K ±5% 0603	R243,R245,R291
0090034	SMD RESISTOR	1/16W 100K ±5% 0603	R221,R224,R252,R262,R341, R2101,R2111~R2116
0090109	SMD RESISTOR	1/16W 1MO ±5% 0603	R227,R238,R313,R365
0100019	SMD RESISTOR NETWORKS	1/16W33O ±5% 8P	RN201~RN205,RN207,RN208, RN211~RN215,RN218
0090623	SMD RESISTOR NETWORK	1/16W75O±5% 0603x4 8P	RN206,RN216,RN217
0100031	SMD RESISTOR NETWORK	1/16W 4.7K±5% 0603 8P	RN209,RN220
0090609	PRECISION SMD RESISTOR	1/16W 100O ±1% 0603	R338
0090626	PRECISION SMD RESISTOR	1/16W 200O±1% 0603	R337
00003759	CARBON FILM RESISTOR	1/4W2.2O±5% BELT	R236
02604379	CD	CD11 16V10U±20%5×11C5 BELT	TC266,TC268,TC206,TC207,T C209,TC210,TC212~TC214,T C221~TC230,TC232,TC233,T C240,TC241,TC247,TC251,TC 264
02600029	CD	CD11 16V47U±20%5×11 C5 BELT	TC211,TC219,TC220,TC246,T C249,TC252,TC267
02601889	CD	CD11 16V100U±20%6×12 C5 BELT	TC215,TC218,TC235,TC201~T C203
02601819	CD	CD11 16V220U±20%6×12 C5 BELT	TC248,TC255,TC257~TC259,T C261~TC263,TC265
02603859	CD	CD11 16V470U±20%8×12 C5 BELT	TC245,TC256
02601829	CD	CD11 25V100U±20%6×12 C5 BELT	TC237,TC238
0310186	SMD CAPACITOR	50V 7P ±0.5P NPO 0603	C224,C259,C260

MATERIAL CODE	MATERIAL NAME	SPECIFICATIONS	LOCATION
0310219	SMD CAPACITOR	16V 106 +80%-20% 1206	C2162,C2163
0310042	SMD CAPACITOR	50V 15P ±5% NPO 0603	C242,C243
0310043	SMD CAPACITOR	50V 22P ±5% NPO 0603	C286~C291,C321,C324,C327, C330,C384
0310045	SMD CAPACITOR	50V 47P ±5% NPO 0603	C218,C369~C372
0310192	SMD CAPACITOR	50V 56P ±5% NPO 0603	C385,C2111,C2114
0310047	SMD CAPACITOR	50V 101 ±5% NPO 0603	C336,C337,C386,C2117,C2120,C2123,C2126,C2158,C2160
0310326	SMD CAPACITOR	50V 121 ±5% NPO 0603	C217
0310656	SMD CAPACITOR	50V 201 ±5% NPO 0603	C231
0310050	SMD CAPACITOR	50V 271 ±5% NPO 0603	C320,C323,C326,C329
0310051	SMD CAPACITOR	50V 331 ±5% NPO 0603	C322,C325,C328,C331
0310053	SMD CAPACITOR	50V 471 ±5% NPO 0603	C333,C334
0310054	SMD CAPACITOR	50V 681 ±5% NPO 0603	C339
0310066	SMD CAPACITOR	50V 102 ±10% 0603	C202~C204,C210,C228,C262, C265~C268,C273,C277,C281, C282,C284,C293,C295,C297, C299,C302,C349~C351,C359~ C361,C2118,C2121,C2124,C2127
0310231	SMD CAPACITOR	50V 122 ±10% 0603	C2122,C2129,C2130,C2133,C2135,C2136,C2112,C2115,C2159,C2161
0310070	SMD CAPACITOR	50V 332 ±10% X7R 0603	C213,C214,C234,C303
0310323	SMD CAPACITOR	50V 392 ±10% X7R 0603	C227
0310198	SMD CAPACITOR	50V 472 ±10% X7R 0603	C392
0310200	SMD CAPACITOR	50V 822 ±10% X7R 0603	C314,C315
0310072	SMD CAPACITOR	50V 103 ±10% 0603	C212,C269~C272,C274~C276, C278~C280,C283,C304
0310203	SMD CAPACITOR	50V 273 ±10% X7R 0603	C216
0310056	SMD CAPACITOR	16V 473 ±10% 0603	C206
0310207	SMD CAPACITOR	50V104 ±20% 0603	C201,C205,C207~C209,C211, C215,C219~C223,C225,C226, C233,C235~C241,C244,C245, C247~C255,C257,C258,C261, C263,C264,C292,C294,C296, C298,C301,C305~C313,C316~ C318,C332,C335,C338,C340, C341,C345,C346,C348,C368, C373~C382,C387,C389,C391, C2138~C2143,C2153~C2157

MATERIAL CODE	MATERIAL NAME	SPECIFICATIONS	LOCATION
0310543	SMD CAPACITOR	50V 104 ±10% X7R 0603	C201,C205,C207~C209,C211,C215,C219~C223,C225,C226,C233,C235~C241,C244,C245,C247~C255,C257,C258,C261,C263,C264,C292,C294,C296,C298,C301,C305~C313,C316~C318,C332,C335,C338,C340,C341,C345,C346,C348,C368,C373~C382,C387,C389,C391,C2138~C2143,C2153~C2157
0310222	SMD CAPACITOR	25V 104 ±20% X7R 0603	C201,C205,C207~C209,C211,C215,C219~C223,C225,C226,C233,C235~C241,C244,C245,C247~C255,C257,C258,C261,C263,C264,C292,C294,C296,C298,C301,C305~C313,C316~C318,C332,C335,C338,C340,C341,C345,C346,C348,C368,C373~C382,C387,C389,C391,C2138~C2143,C2153~C2157
0310234	SMD CAPACITOR	16V 105 +80%-20% 0603	C229,C230,C232,C246,C347
0390096	SMD INDUCTOR	1.8UH ±10% 1608	L211~L214
0390355	SMD INDUCTOR	4.7UH ±10% 1608	L207, L208
0390095	SMD MAGNETIC BEADS	FCM1608K-221T05	L203,L209,L210,L215~L218,L221,L222,L223,L224,L227,L228,L230
3900579	MAGNETIC BEADS INDUCTOR	RH354708 BELT	L201,L202,L204~L206,L220,L226
0700007	SMD DIODE	1N4148	D201,D202,D206~D209,D211,D212
0700001	SMD DIODE	LS4148	D201,D202,D206~D209,D211,D212
0700002	SMD DIODE	LL4148	D201,D202,D206~D209,D211,D212
0700056	SMD DOUBLE DIODE	MMBD4148SE SOT-23	D203~D205,D210
0700008	SMD VOLTAGE REGULATOR DIODE	5.6V ±5% 1/2W	D215
07800509	TRIODE	S8050D BELT	Q215,Q216
07800499	TRIODE	S8550D BELT	Q213,Q214
0780063	SMD TRIODE	9015C	Q204,Q211,Q212,Q219,Q225
0780276	SMD TRIODE	GS9013 SOT-23	Q224,Q233~Q235
0780062	SMD TRIODE	9014C	Q217,Q220,Q229
0780197	SMD TRIODE	C1815	Q205~Q210,Q218

MATERIAL CODE	MATERIAL NAME	SPECIFICATIONS	LOCATION
0780085	SMD TRIODE	8050D	Q223
0780040	SMD TRIODE	3904(100-300) SOT-23	Q231
0780193	SMD TRIODE	2SK3018	Q203,Q230
0780115	SMD TRIODE	2SB1132	Q201,Q202
0881604	IC	AT24C16 SOP	U223
0882022	IC	CS4340A SOP	U213
0881035	IC	IS42S16400-7T SOP	U205,U208
0881674	IC	LM393D SO8	U222
0882105	IC	LM393 SO8	U222
0882359	IC	AAI393 SO8	U222
0880300	IC	M11B416256A-25 SOJ	U215
0882502	IC	MK-6000B(4504) PQFP	U209
0881057	IC	CS4360 SSOP	U207
0880185	IC	NJM4558M SOP	U219,U220,U221,U226
0880562	IC	4580 SOP	U219,U220,U221,U226
0880361	IC	4558 SOP	U219,U220,U221,U226
0880322	IC	MM74HCU04M SOP	U214
0880513	IC	HCU04 SOP	U214
0881182	IC	LM1117MP-ADJ SOT-223	U224
0881969	IC	IP1117-ADJ SOT-223	U224
0882461	IC	AZ1117H-ADJ SOT-223	U224
0882500	IC	AML3298 QFP	U202
0881378	IC	BA5954FP HSOP	U203
0882504	IC	R27V3202F TSOP	U212
0882503	IC	SAM2133B TQFP	U211
0882501	IC	VT7208 LQFP	U201
0960271	CRYSTAL OSCILLATOR	9.6MHz±20PPM 49-S 20P	X201
0960020	CRYSTAL OSCILLATOR	27.00MHz 49-S	X203
0960022	CRYSTAL OSCILLATOR	33.8688MHz 49-S	X202
1940193	CABLE SOCKET	15P 1.0mm STRAIGHT CONTACT DUAL LINE PLUG	XS207
1940171	SOCKET	11P 2.5mm	XS202

MATERIAL CODE	MATERIAL NAME	SPECIFICATIONS	LOCATION
1940094	CABLE SOCKET	24P 0.5mm SMD WITH CLASP	XS203
1940024	SOCKET	5P 2.0mm	XS206
1940005	SOCKET	6P 2.0mm	XS205
1940023	SOCKET	7P 2.0mm	XS209
1632902	PCB	2KD01-5	
6.6 OUTPUT BOARD			
DK3510S (RU) SILVER		5444833	
1563061	PCB	7MA700-0	
0000466	CARBON FILM RESISTOR	1/2W220O±5% SHAPED 12.5	R100~R104
1990018	EXTERNAL SOURCES SOCKET	WP10-11	XC100
2121406	FLAT CABLE	7P120 2.5 2 PIN, WITH NEEDLE, REVERSE	XP107
6.7 INPUT BOARD			
DK3510S (RU) SILVER		5444831	
1563060	PCB	1MA700-0	
1910102	TERMINAL SOCKET	AV6-8.4-13	XC100
2150163	FLAT CABLE	7P90 2.5 2 PIN , 6P SHIELD , WITH NEEDLE , TOGETHER DIRECTION	XP106
6.8 REMOTE CONEROLLER			
DK3510S (RU) SILVER		5471694	
0000599	CARBON FILM RESISTOR	1/6W10±5% SHAPED 7.5	R800
0200062	PORCELAINCAPACITOR	50V 151±10% 2.5mm	C801,C802
0570006	DIODE	1N4148	VD800,VD801,VD802
0630003	EMISSION PIPE	TSAL6200	LED800
0780050	TRIODE	S8050D	V800
0880220	IC	PT2222 SOP	N800
0970003	CERAMIC RESONATOR	455E	G800
1561684	PCB	8219-1	
2100003	CONNECTED CORDS	F 0.6 SHAPED 7.5mm	
4000258	SELF-TAPPING SCREW	BB 2.3x8 BLACK	
4631026	CONDUCT GLUE OF REMOTE CONTROL	DK3510S(RU)	
5156417	SURFACE STICKER OF REMOTE CONTROL	DK3510S(RU)	
5070698	GLUE BAG FOR ENVIRONMENTAL PROTECTION (WITHOUT HOLE)	90x255x0.05 PE	

MATERIAL CODE	MATERIAL NAME	SPECIFICATIONS	LOCATION
3031194	SURFACE CASING OF REMOTE CONTROL	RC-109 SILVER WHITE	
3040873	ROM OTE CONTROL BOTTOMCASING	RC-109 SILVER WHITE	
3050750	BATTEMETAL OXIDE FILM RESISTORCASE DOOR OF REMOTE CONTROL	RC-109 SILVER WHITE	
3050603	GLASS OF REMOTE CONTROLLER	YK10 BRIGHT PURPLE	
3850068	ANODECATHODE SPRING	RC-109	
3850066	ANODE SPRING	RC-109	
3850067	CATHODE SPRING	RC-109	
6.9 MAIN PANEL			
DK3510S (RU) SILVER 5448125			
5232929	SOFT SPONGE SPACER	8x8x11 DOUBLE-FACED, HARD	
5233552	SOFT SPONGE SPACER	15x15x8.5 DOUBLE-FACED,HARD	
3070118	LED BRACKET	KD-01 GREY	
3070240	LED BRACKET	KD-01 GREY 2#	
0880146	IC	D16312GB QFP	U401
0880440	IC	PT6312LQ QFP	U401
1200680	DISPLAY SCREEN	VFD25-0640 RED/BLUE	VFD401
1340003	LIGHT TOUCH RESTORE SWITCH	HORIZONTAL 6x6x1	K407~K416
1340064	LIGHT TOUCH RESTORE SWITCH	KFC-A06-2WB L3.8	K401~K406
2121851	SOFT FLAT CABLE	9-7/2P130/150 2.0 T3 WITH L NEEDLE , TOGETHER DIRECTION	XS401
2121850	FLAT CABLE	7-6P120 2.0 T2 WITH L NEEDLE , TOGETHER DIRECTION , 5 LINE	XS402
2360016	IR SENSOR	HS0038B3V	U403
0260201	CD	CD11C 16V100U±20%6x7 2.5	TC401,TC402,TC404
0620025	RADIATION DIODE	3R 4SD RED	LED401
0620076	RADIATION DIODE	3B3HC COLORLESS WITH BLUE	LED402,LED403
0900427	PROGRAM EPROM	ROMDK3510S-0A(522)	U403
0260199	CD	CD11C 16V22U±20%4x7 1.5	TC403
0090001	SMD RESISTOR	1/16W 00 ±5% 0603	R437
0090298	SMD RESISTOR	1/16W 8.20 ±5% 0603	R425~R427
0090181	SMD RESISTOR	1/16W 1000 ±5% 0603	R415,R431,R432
0090009	SMD RESISTOR	1/16W 3300 ±5% 0603	R418,R444

MATERIAL CODE	MATERIAL NAME	SPECIFICATIONS	LOCATION
0090014	SMD RESISTOR	1/16W 1K ±5% 0603	R406~R409,R421~R424,R429,R439
0090018	SMD RESISTOR	1/16W 3.3K ±5% 0603	R420
0090019	SMD RESISTOR	1/16W 4.7K ±5% 0603	R410,R416,R417,R433,R434
0090023	SMD RESISTOR	1/16W 10K ±5% 0603	R419,R435,R438
0090028	SMD RESISTOR	1/16W 33K ±5% 0603	R401~R404,R411~R414
0090192	SMD RESISTOR	1/16W 51K ±5% 0603	R405
0310596	SMD CAPACITOR	50V 121 ±20% X7R 0603	C414~C429
0310597	SMD CAPACITOR	50V 151 ±20% X7R 0603	C408~C413,C430~C437,C440
0310598	SMD CAPACITOR	50V 102 ±20% X7R 0603	C439
0310047	SMD CAPACITOR	50V 101 ±5% NPO 0603	C403,C404,C406
0310207	SMD CAPACITOR	50V104 ±20% 0603	C401,C402,C405,C438,C441,C442
0310543	SMD CAPACITOR	50V 104 ±10% X7R 0603	C401,C402,C405,C438,C441,C442
0700007	SMD DIODE	1N4148	D401~D404,D406
0780041	SMD TRIODE	3906(100-300) SOT-23	Q402,Q403
0700056	SMD DOUBLE DIODE	MMBD4148SE SOT-23	D405,D408~D411
0390095	SMD MAGNETIC BEADS	FCM1608K-221T05	L401,L402
1632319	PCB	4KD01A-0	

6.10 SURFACE CONTROL BOARD

DK3510S (RU) SILVER 5445446

0230047	ALONE STONE CAPACITOR	50V 824 ±20% 5mm	C100
0230048	ALONE STONE CAPACITOR	50V 105 ±20% 5mm	C100
2121834	FLAT CABLE	12P 160 2.5 2 PIN , WITH NEEDLE , TOGETHER DIRECTION	
1631766	PCB	6DK1005S-0	
2360002	IR SENSOR	HS0038B	N100
0620146	LED DIGITAL TUBE	TOD-4201PFH-B	DS100
5232960	SOFT SPONGE SPACER	10x10x2 SINGLE-FACED,SOFT	N100

6.11 AMPLIFIER BOARD

DK3510S (RU) SILVER 5448152

0200338	CERAMIC CAPACITOR	CT7 400VAC 472 ±20% 2E4 10mm	C126
0210030	TERYLENE CAPACITOR	100V 104 ±10% 7mm	C101,C158~C162,C128

MATERIAL CODE	MATERIAL NAME	SPECIFICATIONS	LOCATION
0260041	CD	CD11 25V220U±20%8×12 3.5	C153-C157
0260098	CD	CD110 16V220U±20%8×11 3.5	C102
0260130	CD	CD110 16V10U±20%5×11 C5	C164
0260447	CD	LUA 35V4700U±20%18×35 7.5	C100
0570020	DIODE	1N5404	VD100-VD103
0890286	PROGRAM CPU	CPUDK3510SRU-0	N100
0881227	IC	RC4558P DIP	N105
0880445	IC	4558C DIP	N105
0880124	IC	NJM4558D DIP	N105
0881393	IC	IL4558N DIP	N105
0881939	IC	TDA7448 SOP	N103
0000675	CARBON FILM RESISTOR	1/2W 10±5% SHAPED 12.5	R158-R162
0000499	CARBON FILM RESISTOR	1/6W30K±5% BELT	R157
0010216	METAL FILM RESISTOR	1W 6200±1% SHAPED R 15×8	R101
0010164	METAL OXIDE FILM RESISTOR	3W 2700±5% SHAPED R 20×8	R100
1940007	SOCKET	7P 2.5mm	XS107, XS106
1940074	SOCKET	2P 7.92mm	XS100-XS103
1940110	SOCKET	12P 2.5mm	XS105
1940167	SOCKET	2P 3.96mm	XS104
0970014	CERAMIC RESONATOR	ZTA 4.00MG(4.0MHZ)	G100
0000441	CARBON FILM RESISTOR	1/4W2.7K±5% SHAPED 10	R106
3870057	FUSE HOLDER		FL100
3020402	FUSE HOLDER	BLX-2	FL101
5444830	PCB SEMI-FINISHED PRODUCT	4MA700-0 DK929S(RU) AI SEGMENT	
6.12 AMPLIFIER BOARD AI SEGMENT			
DK3510S (RU) SILVER 5444830			
1563190	PCB	4MA700-1	
2100017	CONNECTED CORDS	F 0.6 SHAPED 20mm	W6, W18, W23, W31
2100003	CONNECTED CORDS	F 0.6 SHAPED 7.5mm	W30 , W28, W25, W14, W2 , W4, W10, W13, JP104, R171, W36
2100004	CONNECTED CORDS	F 0.6 SHAPED 10mm	W37, W5, W27, W32, W24, W15, W39, W8, W7 , W3, W1, W34, W29

MATERIAL CODE	MATERIAL NAME	SPECIFICATIONS	LOCATION
2100006	CONNECTION CORDS	F 0.6 SHAPED 12.5mm	W9 , W17,W16,W26,W33,W38
2100016	CONNECTION CORDS	F 0.6 SHAPEN 18mm	W21,W19,W22
2100007	CONNECTION CORDS	F 0.6 SHAPEN 15mm	W35, W20, W11,W12
00000039	CARBON FILM RESISTOR	1/6W9.1K±5%	R132,R140
00000099	CARBON FILM RESISTOR	1/6W3.3K±5% SHAPED 5	R131, R130
00000139	CARBON FILM RESISTOR	1/6W20K±5% SHAPED 7.5	R133~R136
00000229	CARBON FILM RESISTOR	1/4W43K±5%	R111,R128,R142,R145,R170, R139 ,R141 ,R144
00000349	CARBON FILM RESISTOR	1/6W1.1K±5%	R114~R127,R177
00000409	CARBON FILM RESISTOR	1/6W6.2K±5%	R169,R129,R146,R167,R173, R174
00000449	CARBON FILM RESISTOR	1/4W8.2K±5% SHAPED 10	R102
00000469	CARBON FILM RESISTOR	1W220±5% SHAPED R 15×6	R103,R104,R105,R107,R108, R109,R110,R113 ,R175,R176
00000529	CARBON FILM RESISTOR	1/6W47K±5% BELT	R165,R138,R153,R154
00000599	CARBON FILM RESISTOR	1/6W100K±5% BELT	R147,R112,R152,R155,R168, R143 ,R148,R149,R150,R151, R166 ,R172
00000629	CARBON FILM RESISTOR	1/6W150K±5% BELT	R156
00000659	CARBON FILM RESISTOR	1/6W200K±5% BELT	R164,R163
02002889	POLYPROPYLENE CAPACITOR	50V30P±10% SHAPED 5mm BELT	C124,C125
02003139	POLYPROPYLENE CAPACITOR	50V 104±10% SHAPED 5mm BELT	C131,C133
02003109	POLYPROPYLENE CAPACITOR	50V 103±10% SHAPED 5mm BELT	C165, C123,C127
02001999	POLYPROPYLENE CAPACITOR	50V 472 ±20% 5mm BELT	C138~C140,C142,C170
02100229	TEMETAL OXIDE FILM RESISTORLENE CAPACITOR	100V 223 ±5% 5mm BELT	C151
02101489	TEMETAL OXIDE FILM RESISTORLENE CAPACITOR	100V 473 ±10% SHAPED 5mm BELT	C103~C107
02101809	TEMETAL OXIDE FILM RESISTORLENE CAPACITOR	100V 182 ±10% SHAPED 5mm BELT	C152
02600019	CD	CD11 16V22U±20%5×11 C5 BELT	C173,C163,C146
02600029	CD	CD11 16V47U±20%5×11 C5 BELT	C122,C108
02605389	CD	CD11 35V47U±20%6×12 C5 BELT	C147~C149
02603909	CD	CD11 50V0.47U±20%5×11C5 BELT	C137,C172
02600059	CD	CD11 50V1U±20%5×11 C5 BELT	C121,C136 , C169
02604939	CD	CD11 50V0.1U±20% 5×11 C5 BELT	C129 ,C132,C150,C134,C135
02601369	CD	CD11 50V4.7U±20%5×11 C5 BELT	C109

MATERIAL CODE	MATERIAL NAME	SPECIFICATIONS	LOCATION
02601829	CD	CD11 25V100U±20%6×12 C5 BELT	C143~C145
02604379	CD	CD11 16V10U±20%5×11C5 BELT	C110~C120,C130,C166,C167,C174
02601379	CD	CD11 50V22U±20%5×11 C5 BELT	C168
05700049	DIODE	1N4004 BELT	VD111
00570006	DIODE	1N4148	VD106~108,VD110,VD112~VD115
05800069	VOLTAGE REGULATOR DIODE	5.1V ±5% 1/2W BELT	VD105,VD109
05800019	VOLTAGE REGULATOR DIODE	3.3V ±5% 1/2W BELT	VD116
05800099	VOLTAGE REGULATOR DIODE	9.1V ±5% 1/2W BELT	VD104
07800329	TRIODE	9014C BELT	V100,V106,V107,V108
07801389	TRIODE	8050D BELT	V105,V110
07800259	TRIODE	2N5401 BELT	V109
07800339	TRIODE	9015C(200-600) TO-92 BELT	V101~V104
PROGRAM FLASH ROMDK3510SRU-0A(8M) 0911646			
0881991	IC	EN29LV800AB-70TC TSOP	U206
PROGRAM CPLD CPLDKD01-0 0911147			
0881238	IC	EPM3032A TC44-10 QFP	U210
PROGRAM FLASH SRVKD01-0A(1M) 0911146			
0882471	IC	A290021TL-70 PLCC	U216
PROGRAM EPROM ROMDK3510S-0A(522) 0900427			
0881473	IC	12C508A SOP	U403