

DW9952K

DW9952K-2

DW9955K

service manual

Note:

1. The scheme of DW9952K-2 is totally the same with that of DW9952K, only the model of audio A/D conversion IC is different, DW9952K-2 adopts Cs5340, but DW9952K adopts CS5333.

2. The scheme of DW9955K is totally the same with that of DW9952K-2, only that DW9955K changes hard disk into 250G.

Catalog

Chapter One About Maintenance	1
1.1 Safety precautions	1
1.1.1 Power supply	1
1.1.2 Precautions for antistatic	1
1.1.3 Precautions for laser head	1
1.1.4 About placement position	2
1.2 Maintenance method	2
1.2.1 Visualized method	2
1.2.2 Electric resistance method	2
1.2.3 Voltage method	2
1.2.4 Current method	2
1.2.5 Cutting method	2
1.2.6 Element substitution method	3
1.2.7 Comparison method	3
1.3 Required device for maintenance	3
Chapter Two Functions and Operation Instructions	4
2.1 Features	4
2.2 BASIC INFORMATION	5
2.2.1 Illustration of the Front Panel	5
2.2.2 Illustration of the Rear Panel	5
2.2.3 Illustration of the VFD	5
2.2.4 Illustration of the Remote Control	6
2.3 Accessories	7
2.4 SYSTEM SETUP	7
2.4.1 Operation Interface and General Steps	7
2.4.2 Recording Setup	8
2.4.3 Video Setup	9
2.4.4 Audio Setup	10
2.4.5 Language Setup	11

2.4.6	Date/Time Setup	12
2.4.7	Preferences Setup	12
2.4.8	Time Shift Setup	13
2.4.9	Channel Scan Setup	14
2.5	PLAYBACK MODE	16
2.5.1	DVD/VCD/CD Playback	16
2.5.2	HDD Playback	21
2.6	FILE OPERATION	21
2.6.1	File Copy Menu	21
2.6.2	Playback Control Menu	22
2.7	RECORDING MODE	23
2.7.1	Summarization	23
2.7.2	Viewing the inputted source	23
2.7.3	Recording to DVD	24
2.7.4	Record to HDD	25
2.7.5	Dubbing	26
2.8	TIME SHIFT MODE	26
2.8.1	Summarization	26
2.8.2	How to Receive the TV Program	26
2.8.3	A Time Shifting	26
2.8.4	Summarization	27
2.8.5	Operation Steps	27
2.9	Playing and processing the disc recorded by this unit	29
2.9.1	To Browse the Contents of the Disc and Select one Title to Play	29
2.9.2	Edit Title	29
2.9.3	Erasing Title	30
2.9.4	Copy	30
2.9.5	Rename Title	30
2.9.6	Overwrite Title/ Append Title/ Overwrite Disc	30
2.10	EDITING MODE	30
2.10.1	Summarization	30
2.10.2	Editing Recorded Disc	31
2.10.3	Menu Explanation	31
2.10.4	Operation Steps	31
2.10.5	Exiting the Editing Mode	32

2.10.6 Editing Hard Disc	32
2.10.7 Sorting	34
2.11 DISC OPERATION	34
2.11.1 Summarization	34
2.11.2 Entering the Disc Operation Mode	34
2.11.3 Operations	34
2.11.4 Exiting the Disc Operation Mode	35
2.12 USB MODE	35
2.12.1 Summarization	35
2.12.2 Operations	35
2.12.3 Exiting the USB mode	35
2.13 SPECIFICATIONS	37
Chapter Three Principle and Servicing	39
Section One Principle of the Player	39
3.1.1 PCB board composing figure of the player	39
3.1.2 Block diagram of the player	40
3.1.3 Function introduction to IC of the player	41
Section Two Unit Circuit Principle	42
3.2.1 Working mode introduction	42
3.2.2 Audio output circuit	43
3.2.3 Video output circuit	45
3.2.4 Audio input circuit	46
3.2.5 Video input circuit	48
3.2.6 Reset circuit	49
3.2.7 IIC bus control circuit	51
3.2.8 Voltage stabilizing circuit	53
3.2.9 USB jack circuit	54
3.2.10 DV jack circuit	54
3.2.11 IDE jack circuit	55
3.2.12 Control panel	56
3.2.13 AV circuit	57
3.2.14 MIC circuit	62
3.2.15 Power circuit	64
Section Three Servicing Cases	66

3.3.1 Servicing cases	66
3.3.2 Troubleshooting flow chart	72
Section Four Servicing Parameters	86
3.4.1 Signal waveform diagram	86
3.3.2 Key point voltage	99
Section Five Function Introduction to IC	101
Chapter Four Disassembly and Assembly Process	132
Chapter Cinque PCB board & Circuit diagram	133
Section One PCB board	133
Section Two circuit diagram	141
Chapter six BOM List	164

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

- # Utilizing MPEG-II Real-Time encoding and decoding technology, capable of directly recording TV and other external program sources on DVD+R, DVD+ RW discs and HDD
- # Capable of recording your favourite video tapes into DVD+R/RW
- # Built-in DV (i. LINK/IEEE1394) input jack enables fully digital high fidelity recording of digital video camcorder signals
- # Progressive scan outputs to produce stabler and clearer pictures without flicker
- # Built-in 5.1CH Dolby Digital surround decoder, separate 5.1CH outputs, 2CH Dolby outputs, optical and coaxial output for digital audio
- # 24bit audio DAC to produce perfect acoustic fidelity
- # With normal DVD playback function, capable of playing DVD, SVCD, VCD, CD, MP3, JPEG, DVD+R and DVD+RW discs
- # Recorded discs can be played on normal DVD players
- # Single-side discs DVD+R/DVD+RW (4.7GB) are capable of 6 hours video recording
- # Supporting 4 recording modes: HQ, SP, EP, SLP
- # OTR function enables one-touch recording, convenient to select the length of recording time
- # Manual/automatic insertion of chapter mark
- # Chapter hiding, disc locking to the recorded discs (DVD+RW) and renaming the titles are available
- # Title index pictures of recorded disc (DVD+RW) can be select freely
- # Multi-dubbing, multi-angle, multi-subtitle for selection
- # Built-in TV tuner with TV reception function enables automatically channels scanning
- # With AV terminal, S-Video, DV (i. LINK/IEEE1394) and antenna input terminals, double-SCART terminal convenient to record various program sources
- # With composite video, component/progressive-scan video output terminals and TV antenna output terminals, convenient to connect with various TV sets
- # Intelligent preset timing recording function prevent you from missing any wonderful programs
- # Recording and output system is optional between PAL/NTSC system
- # Simultaneous video recording and playback. play a previously recorded program while another program is being simultaneously recorded
- # Select program(s) from HDD and copy them to DVD+R/RW and you can catch a TV program at one time
- # Select program(s) from DVD+R/RW and copy them to HDD and you can watch a TV program at one time
- # Time shifting function allows pausing the live TV broadcast for up to 360 minutes
- # Renaming, Deleting, Splitting, Segmenting, combining and Locking program(s) on HDD are available
- # Playback MP3 music and slide show JPEG picture on the USB

Super wide range of operating power supply: ~100V -240V, 50/60Hz, standby power consumption ≤ 3W

Software intelligent upgrading function, after upgrading software, the HDD space will be emptied

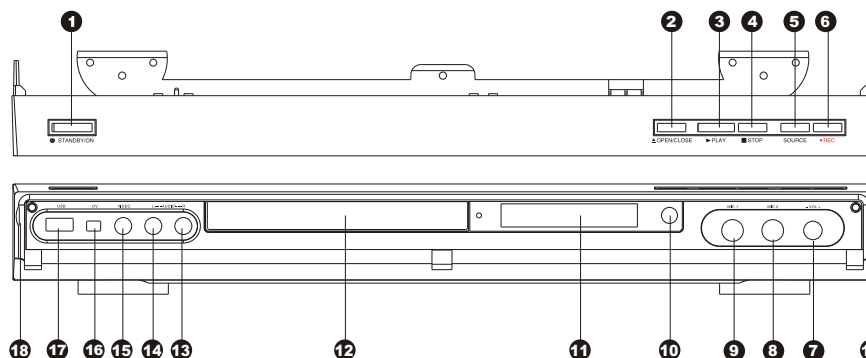
Dual SCART: one for input, another for output

Dual Kara OK function

PIP function

2.2 BASIC INFORMATION

2.2.1 Illustration of the Front Panel

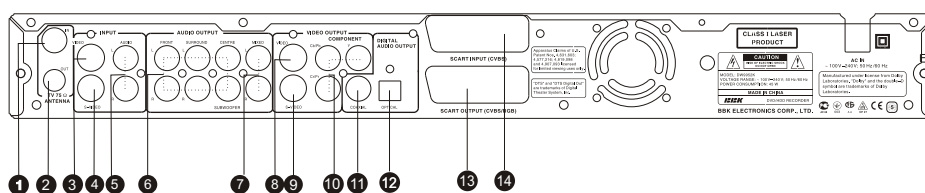


- | | | |
|---------------------|--------------------------------------|---|
| ① STANDBY/ON button | ⑧ MICPHONE 2 | ⑭ Left audio channel input terminal |
| ② OPEN/CLOSE button | ⑨ MICPHONE 1 | ⑮ Front Video input terminal |
| ③ PLAY button | ⑩ Infrared remote sensor | ⑯ DV input terminal |
| ④ STOP button | ⑪ VFD display window | ⑰ USB input terminal |
| ⑤ SOURCE button | ⑫ Disc tray | ⑱ Open the terminal protection cover here |
| ⑥ REC button | ⑬ Right audio channel input terminal | |
| ⑦ VOL KNOB | | |

The function of buttons on the front panel is the same with that of the corresponding ones on the remote control.

The input terminals on the front panel can only be seen when the protection cover is opened.

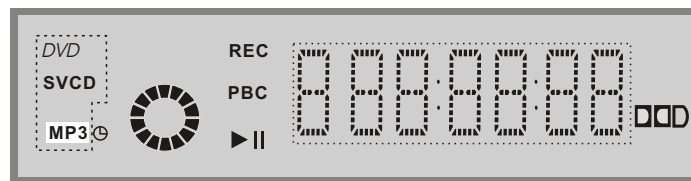
2.2.2 Illustration of the Rear Panel



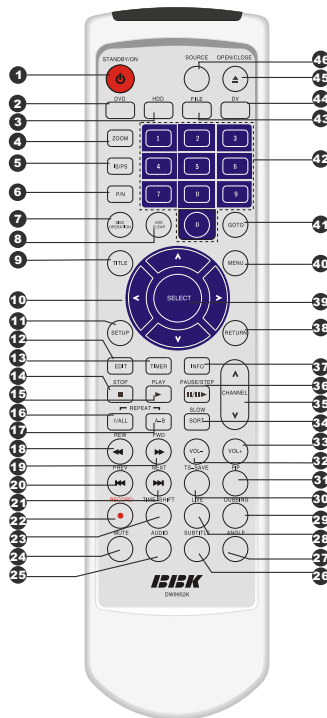
- | | |
|---|--------------------------------------|
| ① TV TUNER input terminal
The antenna cable plug is inserted here | ⑦ L/R channel audio output terminals |
| ② TV TUNER output terminal
This terminal is directly connected with the TV TUNER Input Terminal inside this unit | ⑧ COMPOSITE VIDEO output terminal |
| ③ Rear Video input terminal | ⑨ S-VIDEO output terminal |
| ④ Rear S-Video input terminal | ⑩ COMPONENT VIDEO output terminal |
| ⑤ Rear L/R channel audio input terminals | ⑪ COAXIAL output terminal |
| ⑥ 5.1CH output terminals | ⑫ OPTICAL output terminal |
| | ⑬ CVBS/RGB and Audio output terminal |
| | ⑭ CVBS and Audio input terminal |

2.2.3 Illustration of the VFD

The look of VFD is shown as the following figure:



2.2.4 Illustration of the Remote Control



①6 REPEAT 1/ALL button

Repeat playback

①7 REPEAT A-B button

Repeat A-B segment playback

①8 REW button

Fast backward play

①9 FWD button

Fast forward play

②0 PREV button

Skip backward

②1 NEXT button

Skip forward

②2 RECORD button

Record the external signals

②3 TIME-SHIFT button

Watch TV and display time shifting

① STANDBY/ON button

Switch between standby state and working state

② DVD button

Switch to DVD mode

③ HDD button

Switch to HDD mode

④ ZOOM button

Enlarge the DVD/VCD/JPEG picture

⑤ IS/PS button

The progressive scan and interlaced scan conversion

⑥ P/N button

The PAL/NTSC TV output system conversion

⑦ DISC OPERATION button

Enter the disc operate mode

⑧ ADD/CLEAR button

Add/Clear the content items in the list window
Clear the wrong input numbers

⑨ TITLE button

Display DVD titles menu

⑩ CURSOR button

Move the cursor

⑪ SETUP button

System setup

⑫ EDIT button

Enter the edit mode

⑬ TIMER button

Enter the timing record setup

⑭ STOP button

Stop playing/recording

⑮ PLAY button

Play a disc

- | | |
|--|--|
| ②4 MUTE button
Mute the sound | ③6 PAUSE/STEP button
Pause or Play frame by frame |
| ②5 AUDIO button
Switch the audio channel | ③7 INFO button
Display/hide information menu |
| ②6 SUBTITLE button
Change subtitle languages | ③8 RETURN button
Back to the previous menu |
| ②7 ANGLE button
Change camera angles | ③9 SELECT button
Confirm the selected item |
| ②8 LIVE button
From TV time shift cover to TV live | ④0 MENU button
Display the disc menu
Open/Close PBC |
| ②9 DUBBING button
Copy program(s) from HDD to recordable disc | ④1 GOTO button
Play from the desired location |
| ③0 TS-SAVE button
Save the time shift contents to HDD | ④2 NUMBER 0-9 button |
| ③1 PIP button
Switch to PIP mode | ④3 FILE button
Switch to file operation(Playback and copy file onto HDD optical drive and USB device) |
| ③2 VOL- button
Decrease volume | ④4 DV button
Switch to DV status |
| ③3 VOL+ button
Increase volume | ④5 OPEN/CLOSE button
Open or close the disc tray |
| ③4 SLOW/SORT button
Scan in slow forward or sort the HDD titles | ④6 SOURCE button
Switch external input signal sour |
| ③5 CHANNEL^ /CHANNEL v button
Change the TV channel up/down | |

2.3 Accessories

Mini-DV cable	1PCS
75Ω TV coaxial cable	1PCS
audio/video cable	1PCS
remote control	1PCS
7# batteries	2PCS
warranty card	1PCS
owner's manual	1PCS


2.4 SYSTEM SETUP

In order to satisfy different kinds of consumers and because of the outfits with different performanc, this unit is equipped with various functions. You can proceed the system setup to meet your needs and cooperate with your outfits. Certainly you may use the default settings to satisfy your basic requirements.

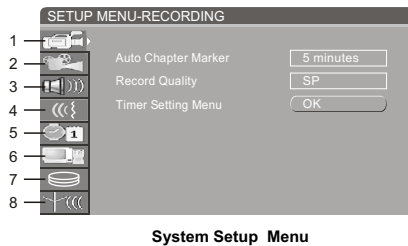
2.4.1 Operation Interface and General Steps

This section introduces the operation interface and general steps of the system setup.

1. Press [Setup] button to enter system setup mode. Then the TV screen displays the system setup control menu, which is shown in the following:

#If the system displays , it means the System Setup Mode can not be entered in current mode, so please exit this mode first.

#The meanings of the icons are as follows:



- ① Recording Setup
- ② Video Setup
- ③ Audio Setup
- ④ Language Setup
- ⑤ Date/Time Setup
- ⑥ Preferences Setup
- ⑦ Time Shift Setup
- ⑧ Channel Scan Setup

2. Select the desired item on the control bar by using [5], [6] buttons, and then press [Select] button to enter the corresponding setup submenu.
3. In the submenu, operate the relative controllers by direct buttons and the [Select] button to fulfill the corresponding setup.
4. Press the [Return] button to return to the previous menu, or press the [Setup] button to exit.

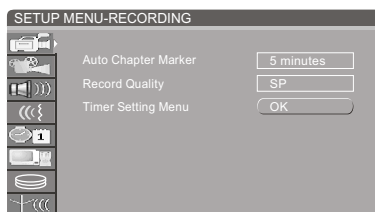
NOTES

- #The steps above are general operations. Some setup may not need a certain step, or need more steps.
- #Please proceed the system setup in tray out or no disc status, otherwise some setup may not be proceeded.

2.4.2 Recording Setup

After finishing the settings introduced in this chapter, when recording, the values you set will become the default values of the correlative items.

1. In the system setup control menu, select item " " by [5], [6] buttons and then press [Select] button to enter recording setup menu. The screen displays:



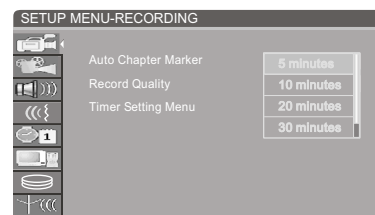
the record setup menu

NOTE

#If the TV screen displays " ", when pressing [5],[6]button, it may indicate that the current activated menu will not be the system setup control menu. Please press [Return] button once or more to activate the system setup control menu.

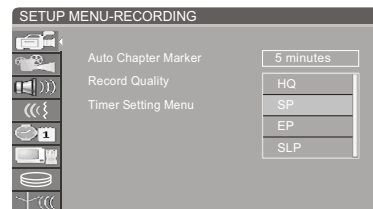
Auto Chapter Marker Setup

1. In the record setup menu, select item "Auto chapter marker" by [5], [6] buttons, press [Select] button, and then a pop-up menu will appear:
 2. Select the proper value by [5], [6] buttons, and then press [Select] button to confirm.
- #This setup is used to make sure whether insert the chapter marker automatically when recording.
- #If you don't set this item to "OFF", the recorded contents will be automatically divided into some chapters with the same length according to the interval time you've selected.



Recording Quality

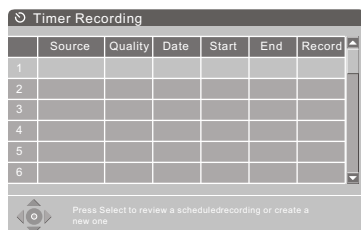
1. In the record setup menu, select item "Record quality" by [5], [6] buttons, press [Select] button, then a list menu will appear.
 2. Select the desired value by [5], [6] buttons, and then press [Select] button to confirm.
- #Please refer to the "Recording mode - Recording to DVD - Manual Recording - Quality" for the four recording qualities: HQ, SP, EP, SLP.
- #Recording time table:



Recording mode	4.7GB DVD+R/DVD+RW	160GB HDD Recording time
HQ (High Quality)	About 1H	About 21H
SP (Standard Play)	About 2H	About 67H
EP (Extended Play)	About 4H	About 133H
SLP (Super Long Play)	About 6H	About 200H

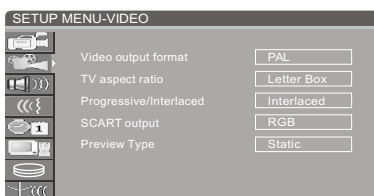
Timer Setting Menu

You can make this unit record automatically when the preset time is coming. The operation steps refer to "Timer Setting Mode", please read carefully the detailed contents of the section "Timer Setting Mode".



2.4.3 Video Setup

1. Display the system setup control menu.
2. Move the cursor by [5], [6] buttons to select " " item.
3. Press [Select] button or [4] button to enter the video setup mode.



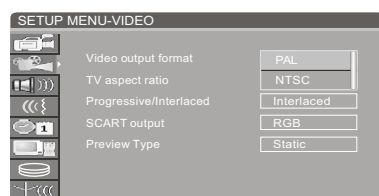
Video output format

This unit has two video output systems: PAL and NTSC. You can select one of them according to your TV set specs.

1. Highlight "Video output format" in the video menu and press [Select] button. A pop-up menu will appear which is shown as the right figure.
2. Select the proper option according to factual requirements.
3. Press [Select] button, then the system will switch the output format to what you select right now.

#You can switch the TV output format by pressing the [P/N] button on the remote control too.

#Changing the output format may cause no picture on the TV screen. If this happens, you can press [P/N] button on the remote control to restore the output format.



TV aspect ratio

1. In the Video Setup Menu, select item "TV aspect ratio" by [5], [6] buttons and press [Select] button, and then the value list will appear, which is shown as the right figure.
2. Select the suitable value by [5], [6] buttons, and then press the [Select] button.

#The meaning of each value to be selected of this item is as follows:

#16 : 9: Applicable to wide screen TV set.

#Pan Scan: Suitable for the common size TV set. When playing wide screen pictures, left and right

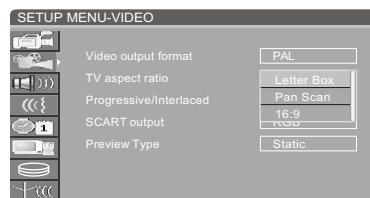
#Edges of the original pictures are cut off. The picture will be displayed to full screen.

#Letter Box: Suitable for the common size TV set. When playing wide screen pictures, black banners will appear on the top and bottom of the TV set.

Note

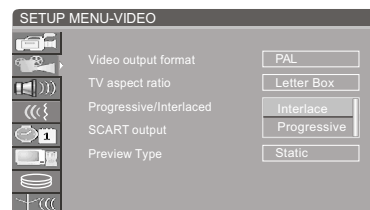
#The playback effect is related to the playing disc. If a disc is recorded in the aspect ratio of 4:3, the ratio can only be 4:3, no matter which screen setting you select.

#This setting should conform to the aspect ratio of the TV set.



Progressive/Interlaced

1. In the video setup menu, use [5], [6] buttons to select "Progressive / Interlaced" item and press [Select] button, then a list will appear.
2. Select "Progressive" or "Interlaced".
3. Press [Select] button to fulfill the Progressive / Interlaced switch.
4. You can also keep on pressing [IS/PS] button for 3 seconds to perform the Progressive/ Interlaced switching.



#The value of this setting must accord with the scanning mode of the TV, otherwise the TV screen will display nothing.

#Change the output format may cause no picture on the TV screen. If happen this, please press [IS/PS] on the remote control to restore the output format.

#To avoid instability of output signal, please don't perform "Progressive/Interlaced" function by component(Y, Cb/Pb, Cr/Pr) terminal on the rear panel when "SCART output" item is RGB.

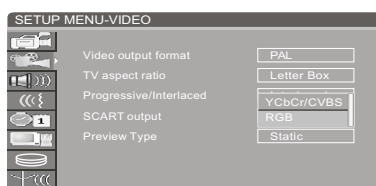
SCART Output

1. In general setup menu, highlight "SCART output", and press [Select] button, and then a list will appear.
2. Select "YCbCr / CVBS" or "RGB" in the list and press [Select] to confirm.

#When using component video output, please select "YCbCr / CVBS".

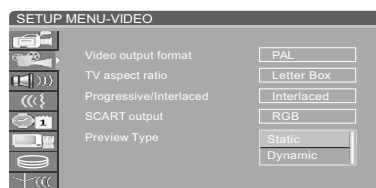
#When using SCART output, you may select according to the fact. But you had better select the "RGB".

#This setup does not affect the composite video output.



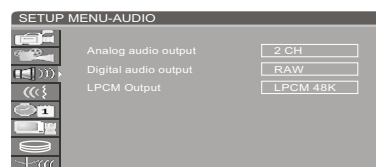
Preview Type

1. In the video setup menu, use [5/6] buttons to select "Preview Type" item and press [SELECT] button, then a list will appear.
2. Select "Static" or "Dynamic".
3. In HDD title list menu, the preview is static or dynamic.



2.4.4 Audio Setup

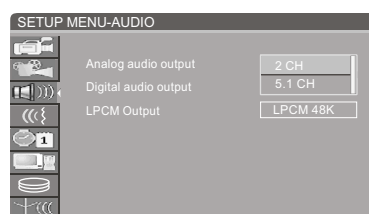
1. Display the system setup control menu.
2. Move the cursor by [5],[6] buttons to select " " item.
3. Press [Select] button or [4] button to enter the audio setup mode.



Analog audio output

This setting is used to select an analog audio output format between 2CH analog mix audio output and Dolby 5.1 CH analog output.

1. Select "Analog Audio Output" item by [5], [6] buttons, and press [Select] button, then a pop-up list will appear:
2. Select the desired value by [5],[6] buttons then press [Select] button to confirm.



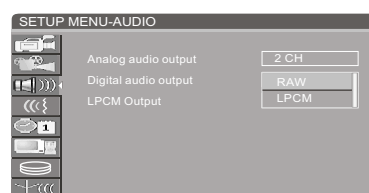
Digital audio output

This unit has digital audio output jacks. So you can enjoy the higher quality audio with an amplifier with digital audio decoders.

1. Access the Audio Setup Menu. Select item "Digital audio output" by [5],[6] buttons, and then press [Select] button. A list will pop up:
2. Select the proper value by [5],[6] buttons and then press [Select] button to confirm.

#RAW: This unit doesn't perform decoding function, but the external amplifier does.

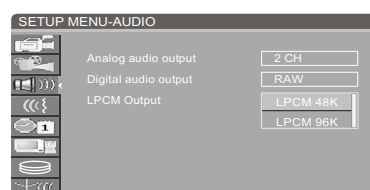
#LPCM: This unit performs decoding function and outputs the LPCM digital audio signal of 48 kHz or 96 kHz to fit different power amplifiers.



LPCM Output


You can modify the LPCM code rate by setting the item.

1. Select "LPCM Output" item by [5], [6] buttons, and press [Select] button, then a pop-up list will appear:
2. Select the desired code rate by [5], [6] buttons between LPCM 48K and LPCM 96K then press [Select] button to confirm.



2.4.5 Language Setup

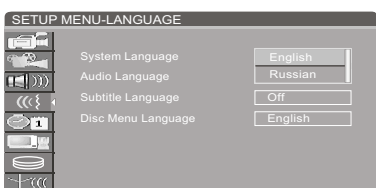
To meet the needs of consumers in different regions, this unit is equipped with many kinds of operation interface languages for your selection.

1. Enter the system setup mode.
2. In the system setup control bar, move the cursor by [5], [6] buttons. Select item "  ", and then press [Select] button to enter the language setup menu. The screen figure:



System Language Setup

1. In the Language Setup Menu, select item "System Language" by [5], [6] buttons, and press [Select] button, then a list will pop up, which is shown as the right figure:
2. Select your desired language by [5], [6] buttons, then press [Select] button to confirm, the system language will change correspondingly.



Audio Language

1. In the language setup menu, select item "Audio Language" by [5], [6] buttons, and press [Select] button, then a list menu will pop up, which is shown as the right figure.
2. Select your desired language by [5], [6] buttons, and then press [Select] button to confirm.

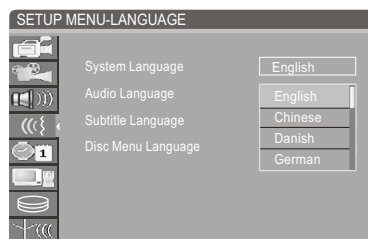
#The system will use the setup language as the DVD output language preferentially. If the disc does not support this setup, the setup is invalid.

#When playing DVD discs, you may change the output language at random. Please refer to "Playback Mode" for details.

NOTE

#About the DVD language setup introduced in this chapter, some discs have not the language you set, so the setup will be invalid. When playing, the relative languages are the corresponding ones provided by the discs.

#For some DVD discs, when playing, it will display the language selection menu. If you perform the selection in it, the corresponding setup of this unit will be invalid, and the relative languages are the ones you select.



Subtitle Language

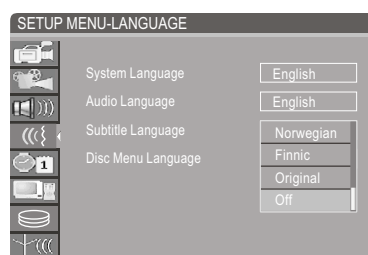
Some DVD discs have many kinds of subtitle languages and this setup is used to set the default DVD subtitle language.

1. In the language setup menu, select item "Subtitle language" by [5], [6] buttons, and press [Select] button, then a list will pop up, which is shown as the following figure:
2. Select your desired language by [5], [6] buttons, and then press [Select] .

#"OFF" means closing the subtitle output.

#The system will select this setup language as the DVD subtitle language preferentially. If the DVD discs you select do not support this language, this setup is invalid.

#You may change the subtitle language at random when playing. Please refer to "Playback mode" for details.

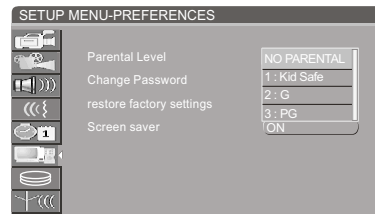
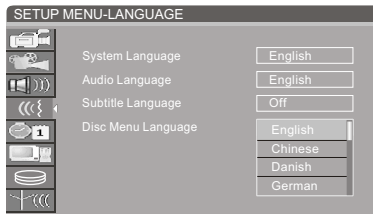


Disc Menu Language

1. In language setup menu, select item "Menu language" by [5], [6] buttons, and press [Select] button, then a list will pop up, which is shown as the right figure.
2. Select your desired language by [5], [6] buttons, and then press [Select] button.

#If you play the DVD discs that support the selected language, the system will adopt this language as the DVD menu language.

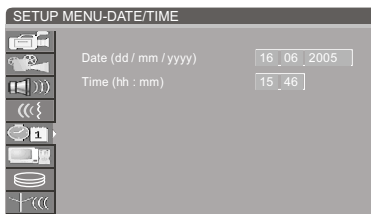
#If the disc does not support the selected language, the system will use the language supported by the disc.



2.4.6 Date/Time Setup

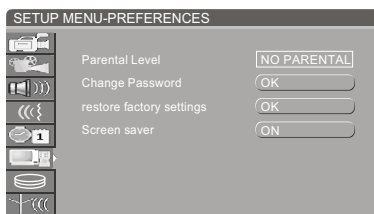
In order to record the TV program on time, you need to set the "DATE/TIME" before a timer record setting.

1. Display the system control menu.
2. Move the cursor by [5],[6] buttons to select Item.
3. Use the cursor [3],[4] button to move the highlight bar to enter the "Date" or "Time" setup menu.
4. Enter the correct date in dd/mm/yyyy format (date /month/ year) using the 0-9 keys.
5. Enter the correct time in hh : mm format (hour : minute) using the 0-9 keys.
6. After the date and time settings have been entered, press the setup button to exit.



2.4.7 Preferences Setup

1. Display the system setup control menu.
2. Move the cursor by [5],[6] buttons to select " " item.
3. Press [Select] button to enter the preferences setup mode.



Parental Level

By setting this unit's authorization rating and password, some discs with control grade cannot be played without inputting the password. In this way, you can confine the children to watch the disc unsuitable to them.

1. Select "Parental Level", and press [Select] button to display the pop-up list which is shown as the right figure.

2. Select the rating level by [5],[6] buttons and press [Select] button to confirm. Then the TV screen display:



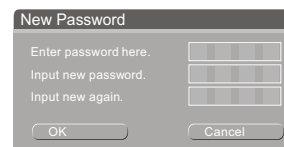
3. Input the password and press [Select] button. Highlight "OK" by cursor buttons and then press [Select] button. If the password is right, the TV Screen return the preferences menu.

Change Password

1. If you want to change the original password, highlight the "Change Password" in the menu through cursor buttons and then press [Select] button.
 2. Select "Enter password here" by the cursor buttons and input the original password by number buttons.
 3. Select "Input new password" by the cursor buttons and input the new password by number buttons.
 4. Select "Input new again" by the cursor buttons and input this password again by number button.
- #This input password in the "Input new password" must accord with that in the "Input new again".
5. Highlight "OK" by cursor buttons and then press [Select] button.

#After setting the rating level, when playing the disc with the rating level higher than what you have set, you must input the password.

#If you forget the password, you may input the super password (3308).



Restore Factory Settings

1. Select "Restore factory setting" by [5],[6] buttons in the Preferences setup menu, then press [Select] button, and the TV screen displays:

- 2.Highlight "OK " in the menu by [3],[4] buttons.
- 3.Press [Select] button to make all setup items restore the factory settings.

#When your unit is in abnormal working mode, it is probably caused by your wrong setup. Please try the "Restore Factory Settings" operation to make it work normally.



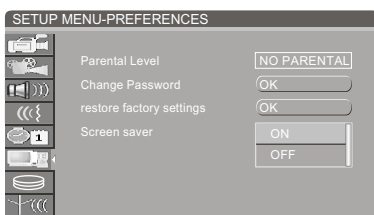
Screen saver

The screen saver function is that an interesting screen saver picture appears on the screen automatically, when this unit's video output signal has no change (that is the image on the TV screen has no change) for a certain time.

- 1.In the Preferences Menu, move the cursor to select item "Screen saver" by [5], [6] buttons.
- 2.Press [Select] button , then a pop-up list will be displayed , which is shown as the right figure.
- 3.Move the cursor up or down to select,"ON" or "OFF" by[5],[6] buttons.
- 4.Press [Select] button to turn on or turn off the screen save function.

#Pressing any button can exit the screen save mode after the screen saver picture appears.

#The screen saver function is invalid when playing MP3 and CD-DADisc.



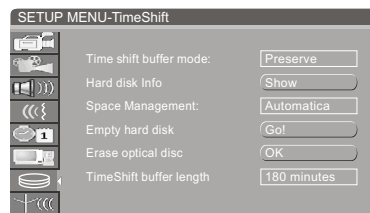
2.4.8 Time Shift Setup

- 1.Display the system setup control menu.
- 2.Move the cursor by[5],[6] buttons to select " " item.
- 3.Press [Select] button or [4] button to enter the time shift setup mode.

When the unit is turn on or you press [Time-Shift] button from other menus, the last TV channel viewed will be tuned in and Time shifting starts automatically. Time shifting allows "Pausing" the live TV broadcast for up to 360 minutes. At any time, the viewing can resume. Press [Pause/Step] to pause the broadcast, press [Play] to resume TV viewing.

NOTE

#If the system is paused for 360 minutes, it will automatically resume TV viewing.



Time shift buffer mode:

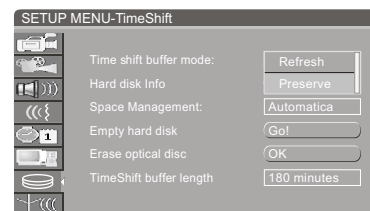
You can refresh or preserve the Time shifting buffer data when changing channels by setting the item.

- 1.Press the [5],[6] to select the "Time shift buffer mode" and the pop-up list will display as the right figure.
- 2.Move the cursor to select buffer mode by [5],[6] buttons and press [Select] button to confirm.

NOTE

#If you set refresh, and change channels or change source, the time shifting buffer data will be lost. No message will be provided prior to doing so.

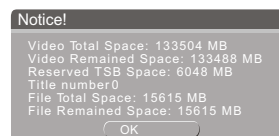
#If you set preserve, and change channels or change source, the time shifting buffer data will be maintained.



Hard disk Info

Showing information on HDD size in Gbyte, HDD available space in Gbyte and percentage.

#File total space occupies ten percent of the total space of HDD.



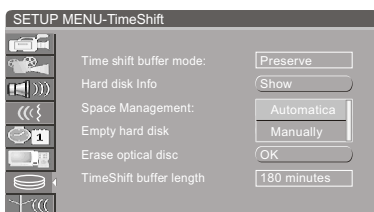
Space Management:

There are two space management mode.

- 1.Press the [5],[6] to select the "Space management" item and the pop-up list will display as the right figure.
- 2.Move the cursor to select buffer mode by [],[] buttons and press [Select] button to confirm.

NOTE

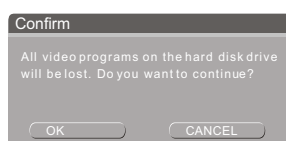
- #When the title is selected being dubbed-in which case, the title shall be kept until dubbing is over.
- #Automatic: When the HDD is full, the system should overwrite unprotected title in FIFO scheme.
- #Manual: When the HDD is full, pop up message "The hard disc drive is full, Please erase some programs to allow further recording".



Empty hard disk

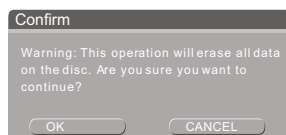
Erase all programs on HDD. A message will be shown as the right figure.

- #During the course of emptying hard disc, power cannot be off. In case power off, please empty the hard disc again immediately after power on.



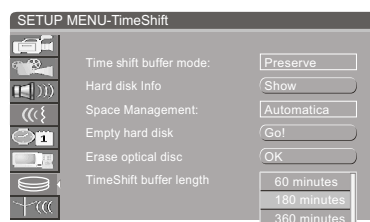
Erase optical disc

This operation is only available for DVD+RW disc. Highlight item "Erase disc" and press [Select] button, then the system will start erasing disc contents. This operation will occupy many time. When erasing, any other operations can not be proceeded, including standby. Once the operation starts, it cannot be cancelled midway. Please do not unplug the unit midway. Otherwise, the disc will be probably damaged.



TimeShift buffer length

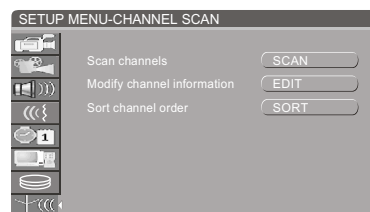
1. In the timeshift setup menu, select item "TimeShift buffer length" by [5/6] button, press [SELECT] button, then a list menu will appear.
 2. Select the desired value by [5/6] buttons, and then press [SELECT] button to confirm.
- #There are 3 timeshift buffer length: 60 minutes, 180 minutes, 360 minutes.



2.4.9 Channel Scan Setup

This unit is equipped with a TV tuner, by which you can receive TV signals. Before receiving TV signals, you must proceed tuning operation. The result of the operation will be saved and will not be lost after this unit is switched off.

1. In the System Setup Control Menu, highlight item " " by [5],[6] button.
2. Press [Select] button, then the System Menu - Channel Scan menu will appear, as shown in the right figure.



Scan channels

1. Highlight item "Scan channels", and press [Select] button to start channel scanning.
- #You can press [Stop] button to stop the scanning during the operation. If do so, the channel information #have been obtained during scanning can also be saved. When scanning a channel, the TV will show the image of this channel's program.

Note

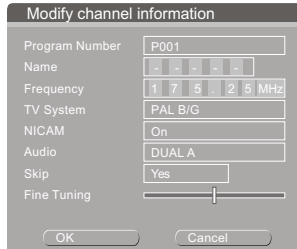
- #Before the channel scan operation, you must connect the system properly to ensure the TV signals can enter the system through the "TV TUNER input" jack. Please refer to "System connection-System Connection of Recording External Signals" for the connection illustration.

Modify Channel Information

Here, you can name the channel after the corresponding program's name or any other name you like, sort the channel order to access the special channel easily, tune the channel finely and scan the channel manually. You can manage the channels more easily, and make this unit receive the TV signal better by these operations introduced in this section.

1.Highlight item "Modify Channel Information" in "Channel Scan" menu, and press [Select] button, then the "Modify Channel Information" menu will appear, as shown in the right figure:

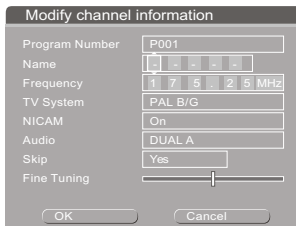
#If this unit has not scanned any programs, the "Modify channel information" menu can not be displayed.



2.Highlight item "Program Number" and select the desired channel to modify by pressing [Channel ^], [Channel v] button.

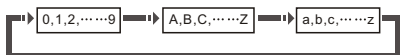
3.Change the Channel name: Highlight the "Name" item, press [Select] button, and then the right window of the same line will become input status shown as the following figure. Move the cursor to a character by [3],[4] buttons, and then change the character by [5],[6] buttons. When finishing changing all the characters, press [Select] button to confirm.

#The changing sequence of the character when pressing [5] button is as right figure:
#When pressing [6] button the sequence is reverse.



4.Change TV System: You can change the sound mode by item "TV System".

#The value of the Standard must match the received TV signal. If it is not right, the system will not receive the program's sound signal. So you should select the right value.



5.Change the Search Type: You can change the search Type. There are two search modes, frequency and channel.

a. Select a channel number by pressing [Channel ^],[Channel v] buttons.

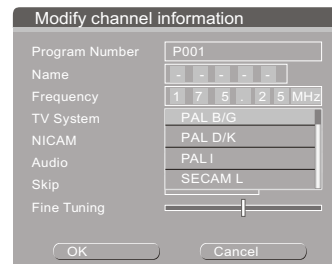
b. According to the demands of the local TV system, set item "TV system"by the methods described in step 4).

c. Highlight "Frequency" item in the "Modify channel Information" menu by [5],[6] buttons, and press [3],[4] button, then the system start scanning channels.

#If you press [4] button, the system shall scan channels forward from the current frequency.

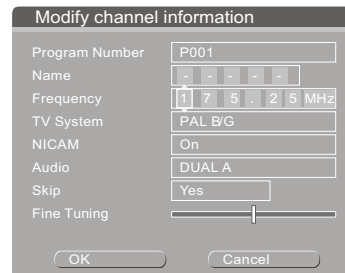
#If you press [3] button, the system shall scan channels backward from the current frequency.

#When encountering a channel with TV program, the scanning will stop.



6.Skip a channel: Highlight the item "Skip", and press [Select] button to display the drop down list.Select "YES" or "NO", and then press [Select] button to confirm.

#If you select "YES", and when receiving TV programs, this channel can not be received, as if it does not exist.



Frequency mode

7.Channel Fine Tuning: Highlight item "Fine Tune" in the "modify channel information" menu. Then you can start fine tuning the channel.

#After finishing the channel scanning, maybe some channels' frequency is not adjusted to right value. In this way, when watching these channels, the image and sound will be misty. Then you should perform channel fine tuning to right adjust these channels' frequency.

#Pressing [3] button once can decrease the frequency.

#Pressing [4] button once can increase the frequency.

#When changing the frequency, the definition of the image or sound will be changed correspondingly, then from this, you can know the effect of the fine tuning.

8. Close/Open NICAM functions: Highlight the item "NICAM", and press [Select] button to display the drop down list. Select "ON" or "OFF" from the list, and then press [Select] button to confirm.

#The so-called NICAM function include stereo function and dual dubbings function. When item "NICAM" is "ON", if the received TV program supports stereo function, this unit will output the stereo dubbing; on the other hand, if the received TV program supports dual dubbings function, you can select one of the two dubbings as output by item "System Setup - Channel Scan - modify channel information - Audio". Of course, if you set "NICAM" to "OFF" or receive TV program without NICAM function, the above functions are invalid.

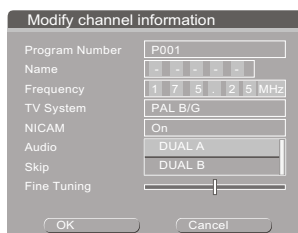
9. Switch channel audio language: when the TV programs received supporting dual dubbings functions, you can select one of the two dubbings as output by this item.

- Highlight item "Audio" in the "modify channel information" menu, and then press [Select] button to pop up a submenu list.
- Select "DUAL A" or "DUAL B" in the list, and then press [Select] button to confirm.

#You must open the NICAM function first, otherwise this function will be invalid. Please refer to the step in section "Modify Channel Information" to open the NICAM function.

#The value "DUAL A" or "DUAL B" stands for one of the two dubbings. If the received TV program can not support dual dubbing function, the above operations shall not influence the output dubbing.

#You can also select "DUAL A" or "DUAL B" by [Audio] button on the remote control.



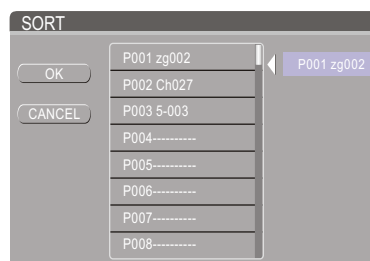
Sort Channel Order

1. Highlight item "Sort channel order", and press [Select] button.

then a corresponding menu will appear, as shown in the right figure.

#If this unit has not scanned any programs, the "Sort channel order" menu can not be displayed.

- Highlight the desired channel in the left list window by cursor buttons, and press [4] button, then the channel name will appear in the right list window, shown as the right figure.
- Move the channel name up and down by [5],[6] button to select the right position where you want to insert this channel.
- Press [3] button to insert the channel name to the selected position in the left list window, as shown in the right figure.
- Press [Return] button to return to the previous menu and proceed other settings.



Note

#When you exit the modify channel information, the system will ask you whether you want to save the setting or not.

2.5 PLAYBACK MODE

The unit has two playback mode, DVD/VCD playback and HDD playback.

2.5.1 DVD/VCD/CD Playback

Entering the Playback Mode

In the playback mode, this unit is totally the same as a high quality DVD player. The way to enter the playback mode is as following:

- Connect this unit with the TV set (Refer to "System Connection" for details), turn on the TV set and switch it to the AV input mode.
- Plug in the unit, then press [Standby / On] button to turn it on.
- Press [Open / Close] button to open the disc tray.
- Load the disc correctly as shown in the illustration.

#When loading a disc, the smooth side should face down and the side with silk-screen should face up.

5. Press [Open / Close] button to close the disc tray, then the system starts playing.

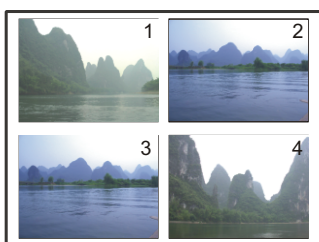
#According to different discs, the system will probably enter the Title Selecting Playback mode or Menu Playback mode. If such condition appears, the disc will not be continued playing (please refer to the following text).



6. If system is in other working mode, please press [DVD] button to enter the playback mode.
 7. If you press [Play] button, the TV screen displays " ". Please exit current working and then press [Play] button again.
- #When writing or erasing, pressing [Play] button will be invalid.
- #If there is no disc in the loader or load the disc that this unit doesn't support or has been damaged badly, pressing [Play] button will be invalid.

Playback from the Menu Displayed

1. When playing a DVD disc, it will enter menu playing mode. The menus of different discs are different. In general, you can select the playing language, set the subtitle language and so on by that menu. To perform some operations, you only need to highlight the corresponding item by cursor buttons and confirm by [Select] button.
2. When playing some VCD disc, these menus will be a list of tracks. You can select a track by number or cursor buttons, then press [Select] button to play the selected track.
3. During playing, you can open the disc menu by pressing [Menu] button. Of course, all the functions about the disc menu can be fulfilled by the corresponding control menu based on this unit.



Playback from the Titles Displayed

This operation is only available for the DVD disc. During playing, if you want to select some title to play, you can press [Title] button.

Then the screen will display the title icons list, shown as the right figure. You can highlight an icon you like, then press [Select] button to play it.

Notes

- #The title menu of different DVD discs may be different.
- #Not all DVD discs have title menu. For some DVD discs without title menu, pressing [Title] button is invalid.

Ending Playback

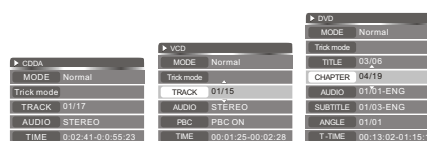
1. Press the [Stop] button.
- #This unit enters the pre-stop mode.
- #In the pre-stop mode, this unit automatically memorizes the pre-stop point. If you press [Play] button, this unit will resume the playback from the pre-stop point (Playback starts from the beginning of the pre-stopped track for MP3). If you press [Stop] button twice, this unit will enter stop mode and the memory is cleared.
2. Press [Open/Close] button to eject the tray.
 3. Take the disc out.
 4. Press [Open/Close] button to retract the disc tray.
 5. Press [Standby/On] button to end the operation.

Note

#If the disc is badly damaged or loaded incorrectly, the OSD will display "NO DISC".

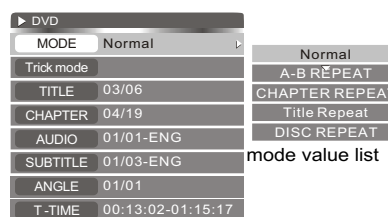
Playing Mode Control

1. Press [Info] button twice to open the main control menu.



When playing CD When playing VCD When playing DVD

2. Highlight "MODE" item by [5], [6] buttons, and press [Select],[4] button to display the drop down list window shown as the right figure.
3. Select one value in the list, then press [Select] button to confirm. The meanings of the values are as the following:



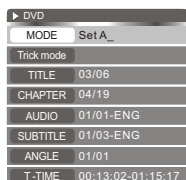
Main control menu

- ① Normal Sequence Playback
- ② A-B Repeat A-B Playback
- ③ Chapter Repeat Segment Repeat Playback
- ④ Title Repeat Title Repeat Playback
- ⑤ Disc Repeat Disc Repeat Playback
- ⑥ Program Program Playback
- ⑦ Random Random Playback
- ⑧ Track Repeat Track Repeat Playback

The list values are different when playing different discs. For most operations, if you perform step ③, things are over, but if you select "A-B Repeat" and "Program", you shall perform the following steps.

4. If you select "A-B Repeat", when pressing [Select] button, the menu becomes the style shown as the right figure. You need to set the B point. Press [Select] button to display mode value list again. Now, please wait, and when meeting your desired point, you can press [Select] button to set the B point.

#During your waiting, the main control menu will disappear. You also can press [Info] button to hide the menu.



5. If you select "Program" in step ③, the following list windows will pop up.

By this menu you can select your favorite contents from the disc to play in your pointed sequence.



, the following list

Playing Mode Control(CONTINUED)

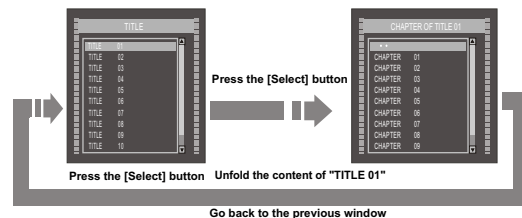
You can control the two list windows by the following points.

- #Move the cursor between left window and right window by [3], [4] buttons.
- #Move the cursor up and down in one of the windows by [5], [6] buttons.

#Highlighting an item in left window, then pressing [Add/Clear] button can add the item to right list window.

#Highlighting an item in right window, then pressing [Add/Clear] button can delete the item

#If the items of the left window is title, you can expand item by pressing [Select] button, shown as the following figure:

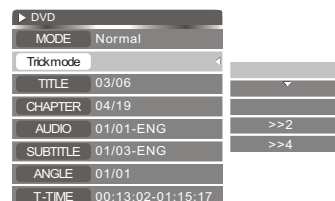


6. Add your favourite contents to right window in your desired sequence according to the above description, then move the cursor to the right window and press [Select] button to start program playback.

Playback Process Control

- ① ▲ playback
- ② ■ Stop
- ③ II Pause
- ④ >>2~32 fast playback, the number shows the speed of the playback
- ⑤ <<2~32 fast backward playback, the number shows the speed of the Backward playback
- ⑥ >>1/2~1/8 or <<1/2~1/8 slow playback, the fraction shows the Degree of slow Playback

#The list values are different when playing different disc.

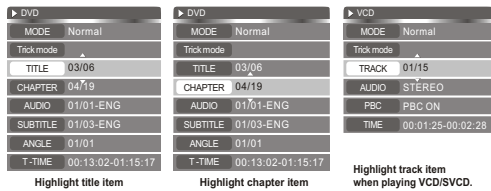


Title / Chapter / Track Selection

1. Press [Info] button twice to open the main control menu.
2. Highlight "Title"/"Chapter"/"Track" (for VCD/SVCD) item, and press [Select] button to make it in input mode.

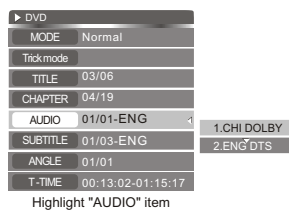
3. Enter your desired number by number buttons, and press [Select] button, then the system will start playing the selected Title/Chapter/Track.

#The left part of the item value is the number of current playing number.



Audio / Subtitle Selection

1. Press [Info] button twice to open the main control menu.
2. Highlight "AUDIO"/"SUBTITLE" item by [5], [6] buttons, then press [Select]/[4] button to open the drop down list shown as the right figure.
3. Select one value in the list, and then press [Select] button to confirm.

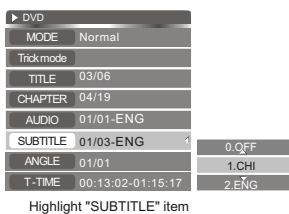


#The values of the lists are based on the played disc

#For DVD disc, the values of audio list will be DOLBY, DTS and so on.

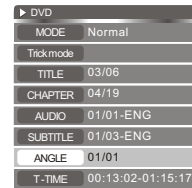
#For VCD/SVCD, the values of audio list will be STEREO, LEFT and RIGHT.

#The settings of these items also can be done in DVD menus. The initial value of the two items can be set in System Setup.



Angle Selection

1. Press [Info] button twice to open the main control menu.
 2. Highlight "ANGLE" item by [5], [6] buttons, and press [Select] button to make it in input mode.
- #The right side of the numbers beside the icon is the total angle number Of this disc ; the left is the current angle number.
3. Input the ANGLE number you need by number buttons, and press [Select] button to confirm.

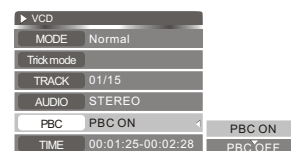


PBC ON/OFF

1. Press [Info] button twice to display the main control menu.
2. Highlight "PBC" item by [5], [6] buttons, and then press [Select]/[4] button to display the drop down list window shown as the right figure.
3. Select "ON" or "OFF" from the list, and then press [Select] button.
4. Pressing [Menu] button also can make the PBC on or off.

Notes

#The PBC function refers to the menu playback function of the VCD 2.0 disc. When the PBC is on, the TV screen displays a list of all the tracks. You can select any track by number buttons on the remote control, and press [Select] button to play from the selected track. During the playing, if you want to play the other track, you need to press [Menu] button to display the track list, and select another track by number buttons then press [Select] button to confirm. When the PBC is off, the system plays the disc contents in sequence. Not all the VCD discs can proceed PBC playback.

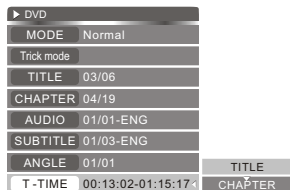


T-Time/Time Display

You can select a point to start playing.

1. Press [Info] button twice to display the main control menu.
 2. Highlight "T-Time" (For DVD) or "Time" (For VCD/SVCD) item by [5], [6] buttons, and then press [Select] button to open the drop down list shown as the right figure.
 3. Select your desired item by [5], [6] buttons, then press [Select] button to confirm.
- #In DVD+R or DVD+RW playing mode, it only display "TITLE" time.
- #In normal DVD playing mode, it includes "TITLE" and "CHAPTER", in VCD/SVCD playing mode, it includes "DISC" and "TRACK".

#The left part of the item values is the elapsed time of the title/track, the right one is the remain time.



The Operations of Function Buttons

Most of the operations in playing mode can be done by menu or function buttons, some operations only can be done by menu, and other operations only can be done by function buttons.

1.Repeat 1/all button---Repeat playback

Press [Repeat 1/all] button repeatedly, and the playing mode will be circularly switched in the following sequence:



2.Repeat A-B button---Repeat playback

Press [Repeat A-B] button repeatedly, and the playing mode will be circularly switched in the following sequence:



3.FWD button---Forward playback

Press [8] button repeatedly, and the playing speed will be changed in the following sequence:



4.REW button---backward playback

Press [7] button repeatedly, and the backward playing speed will be changed in the following sequence:



5.SKIP button

A.If you press the [:] button on the remote control, the system goes forward into the next chapter (to DVD) or track (to VCD/SVCD) and begins playback.

b.If you press the [9] button on the remote control, the system goes backward into the previous chapter (to DVD) or track (to VCD/SVCD) and begins playback.

6.Pause/Step button---Pause playback & playing frame by frame.

a.When playing the valid disc, if you press [Pause/Step] button, the playback will pause.

b.If you press [Pause/Step] button again, the picture goes forward a frame.

C.If you press [Play] button, the system will enter normal playback.

7.Vol+/Vol-/Mute button---Volume control

a.If you press [Mute] button, the system has or hasn't audio output.

b.If you press the [Vol+] button, the volume increases.

c.If you press the [Vol-] button, the volume decreases.

8.Goto button---Switching the mode of selection playing

a.In the playback mode, you can press [Goto] button to highlight different select item circularly in the playback control menu. You can input the corresponding values by using the remote control with the method aforesaid.

#The illustration below is the example of playing the DVD disc. It is similar to other discs.



#Pressing [Goto] button is invalid to some discs.

b.When play disc (as JPEG/MP3/DivX disc) with directory structure, you must press [Goto] button to confirm instead of pressing [Select] button.

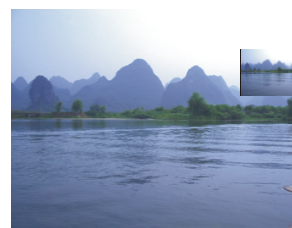
#In directory structure, to go to corresponding directory, you need press [Goto] button once and input the number of the directory then press [Goto] button again to confirm. Press [Select] button to open it.

#In file structure, press [Goto] button and input the number you desired, then press [Goto] button to go to corresponding file and start playing it.

#In playing MP3/DivX file, to go to some time position of current file and start playing, at first press [Goto] button twice, and input the number your desired, then press [Goto] button again to confirm.

PIP

When playing DVD, VCD, HDD video and TimeShift content, press [PIP] button and TV program can be played at the same time.



2.5.2 HDD Playback

The unit contains Hard Disc. You can playback programs from HDD like playback from optical drive. The way to enter the playback from HDD mode is as following:

1. Make sure there are programs which have been saved on the HDD.

The operations about how to save programs on the HDD please refer to "Recording to HDD".

2. Press [HDD] button switch to HDD mode.

The title list presents the list of all the programs you have saved on the HDD.

3. Playback from HDD

Once you have highlighted the program on the list, select the programs which you want to playback by [5],[6] button and then press [Select] button to play. You select the program which you want to playback by [5],[6] button, and press right key, will pop up a sub menu, select the "play" item by [5],[6] button, and press [Select] button to play. During HDD playback, you can control the system output by using the following remote control key (REW, FWD, PREV, NEXT, Slow, Mute, Vol+/-)

4. Return to menu

Press [HDD] button will return to the menu list.

Notes

#In play mode, if you press left cursor button, it will turn back 10 seconds, press right cursor #button, it will turn forward 30 seconds.

Press [Play] button is invalid.



2.6 FILE OPERATION MODE

2.6.1 File Copy Menu



When this player is working normally, press [FILE] button to enter file playback mode, and TV screen will display the list shown as in the right figure. In this mode, you may play and copy files with directory structure onto HDD.

optical drive and USB device. Under File Manager root directory, press [5/6] button to select your desired directory, and then press [SELECT] button to enter the subdirectory.

1. Highlight you desired file or directory by [5/6] buttons, and then press [SELECT] button.

#If the highlight item is file, the system will start playing it.

#If the highlight item is directory, the system will expand its contents.

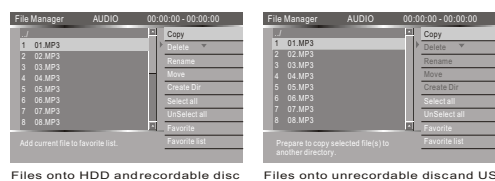
#To return to previous menu, please press [3] button.

2. Press [Add/Clear] button to mark the file or directory of the position where the cursor is (multiple files and directories may be marked) or cancel the mark.

#Return to the previous directory or enter the next directory, and mark will disappear automatically.

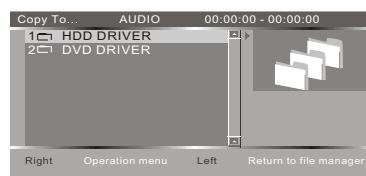
3. Press [4] button and the pulldown menu will pop up, shown as the follow figure.

#When disc is not recordable, the function of Delete, Rename and Create Dir in the menu cannot be realized.

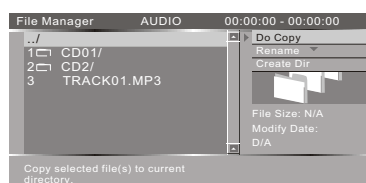


1. Copy

After well marking the file or directory that you wish to copy, this function will help to copy these files. If file is not marked, it will copy the file where the cursor is. Press [SELECT] button to enter the directory shown as in the right figure.



Under this directory, you may select to copy file to HDD, DVD+RW disc and unfinalized DVD+R disc. Press [SELECT] button to enter target disc, and then press [4] button to pop up the list shown as in the right figure.



Do Copy: Begin to copy the marked file to the current directory.

Rename: Change name of the file or directory where the cursor is.

Create Dir: Create a new subdirectory under the current directory.

#After file copy finishes, return to source directory. If you want to check the copied file, enter the target directory of the copied file.

2.Delete

Delete the current file or directory.

3.Rename

Change name of the file or directory where the cursor is.

4.Move

This function will move file to other directory on HDD, DVD+RW disc and DVD+R disc not finalized.

5.Create Dir

Create a new subdirectory under the current directory.

6.Select all

Mark all files and directory under the current directory.

7.Unselect all

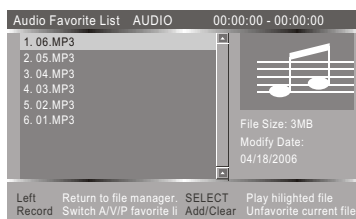
Cancel all marked files under the current directory.

8.Favorite

Place the marked file under the current directory into your favorite list.

9.Favorite list

This function may help you to enter your favorite list, or press [RECORD] button to enter the list. The favorite list is divided into 3 file folders of audio, video and picture, and you may use [RECORD] button to fulfill the switch in folders.



#In this process, press [3]button to return to the previous directory.

#When playing files, press [4] button and Invalid will display.

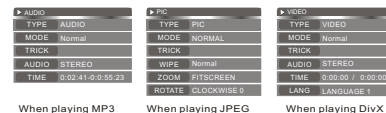
#That copy file to USB device is not supportable.

#The disc that has copied file cannot be used to record external signal source. If you want to record external signal.

Please enter Timeshift state, In "SETUP menu ---TimeShift --- Erase optical disc" item erase disc. The disc that has recorded external signal cannot copy files until disc erasing.

2.6.2 Playback Control Menu

Loading a disc with directory structure or playing a file like JPEG/MP3//DivX, you can display the playback control menu by pressing [Info] button once or twice. You can do some operation to current file by the playback control menu. The playback control menu will be different when playing different type disc.



The means of the list values are as following:

1.Type: display current playback type

2.MODE:

- | | |
|-----------------|------------------------|
| ① Normal | Sequence Playback |
| ② Track Repeat | Track Repeat Playback |
| ③ Folder Repeat | Folder Repeat Playback |
| ④ A-B Repeat | A-B Playback |
| ⑤ Disc Repeat | Disc Repeat Playback |
| ⑥ Random | Random Playback |
| ⑦ Folder Random | Folder Random Playback |
| ⑧ Disc Random | Disc Random Playback |
| ⑨ Intro Play | Introduce Playback |

3.TRICK: please refer to "File Operation Mode -- - Playback Process Control" for submenu content

4.AUDIO: you can select different audio channel output (stereo/left/right),you can also do it by press [Audio] button repeatedly.

5.TIME: you can select displaying elapsed time or remain time.

6.WIPE: please refer to "File Operation Mode --- Control Wipe Mode when Playing JPEG Disc".

7.ZOOM: please refer to "File Operation Mode --- Control Zoom Mode when Playing JPEG Disc".

8.ROTATE: please refer to "File Operation Mode ---Picture Rotating when Playing JPEG Disc".

9.LANGUAGE:if the disc include several kinds of language, you can select desired language from this item.

Notes

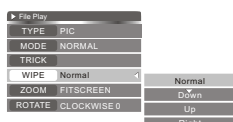
#Some discs labelled with MPEG4 on the market actually are *.rm/* .ra/* .ram/* .rmm and others.

With which are incompatible. Please take care when buying discs.

Control Wipe Mode when Playing JPEG Disc

In general, many pictures will be saved in the disc as the JPEG file format. When playing this disc, the pictures will be shown on the screen one by one. You can select the mode of the picture switching.

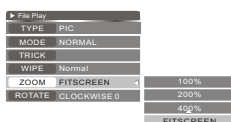
1. Playing a JPEG file, press [Info] button twice to display the playback control menu.
2. In the playback control menu, select the WIPE item by [5], [6] buttons, and then press [Select] button to display the wipe mode list shown as the right figure.
3. Select the desired mode of the picture switching from the list by [5], [6] buttons and then press [Select] button.
4. Press [Info] button to return to the previous menu.



Control Zoom Mode when Playing JPEG Disc

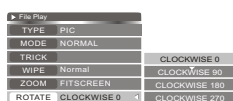
This function can zoom in or zoom out the picture to facilitate your watching.

1. Playing a JPEG file, press [Info] button twice to display the playback control menu.
 2. In the playback control menu, select the ZOOM item by [5], [6] buttons, and then press [Select] button to display the zoom mode list shown as the right figure.
 3. Select the percentage of zoom from the list by [5], [6] buttons, and then press [Select] button.
- #The value of "FITSCREEN" means the full screen display.
4. Press [Info] button to return to the previous menu.



Picture Rotating when Playing JPEG Disc

This function can change the angle of the placement of the picture on the screen to facilitate your enjoying.



1. Playing a JPEG file, press [Info] button twice to display the playback control menu.
2. Select the ROTATE item in the playback

Control menu by [5], [6] buttons, and then press [Select] button to display the rotating value list shown as the right figure.

- #There are four kinds of rotating angles: 0, 90, 180, 270.
3. Select the desired angle from the list by [5], [6] buttons and then press [Select] button.
 4. Press [Info] button to return to the previous menu.

2.7 RECORDING MODE

2.7.1 Summarization

This unit has various external input signal terminals including S-video input, composite video input, SCART input (CVBS), TV tuner input, DV input, and stereo audio input. You can record any group of these video and audio input signals. The recordable discs of this unit are DVD+RW and DVD+R. There are four recording qualities to DVD+R/RW discs with 4.7 GB (12CM single side) can be selected, including HQ (about 1H), SP (about 2H), EP (about 4H), SLP (about 6H). This unit incorporates time recording function with which you can prepare a record schedule beforehand and it will record your desired programs according to the schedule on time. With a DV camera recorder, you can also monitor and record a certain scene automatically and intelligently for a long time. You can record programs on HDD and copy the programs from HDD to recordable disc.

2.7.2 Viewing the inputted source

After entering the record mode, the source signal will be shown directly on the TV screen. By this function you can get a preview of the external signals for selecting the desired signal rightly more.

Selecting the signal to view


1. Connect the system (please refer to "System Connections-System Connection of recording external signals" for details). Make the source equipment works properly, and let it output the signal intended for recording.
2. Press [Source] to select desired source, and then the TV screen will show the corresponding picture.
3. Pressing [Source] button can expediently view the external signals one by one. The sequence of selecting the external signal is shown in the following. If you prepare to record DV, press [DV] button once.



#Please refer to "System Connections - System Connection of Recording External Signals" for the positions of the input signals sources on this unit.

4. Set quality in system setup menu prefer to "Recording mode - Recording to DVD - Manual Recording - Quality" please.

Notes

#System displays "  ", it means viewing the input source can not be realized in the current mode, so please press [Return] button once or more times to quit the current mode, then perform the corresponding operations again.

#When the unit is recording, if you want to view the external signals, you must stop the recording first.

2.7.3 Recording to DVD

Manual Recording

The following figure shows the construction of the menu in recording mode. The items can not be controlled in this mode, but you can learn some information from them. Please follow the following steps to finish a recording task.

The following figure shows the construction of the menu in recording mode.



- a. Make sure an unfinalized DVD+R or DVD+RW disc has been put in the disc tray.
- b. Press [DVD] button to display the DVD menu.
- c. Press [Source] button to select the desired external signal to be recorded according to the way in section "viewing the input source". If you prepare to record DV, press [DV] button once.
- d. Press [Record] button to start recording.
- e. Press [Stop] button to finish the recording task as you complete the program you desired. the program will be conserved in the disc.
- f. As you complete the record, select the title recorded and use [4] to display the pop-up list the logged title have seven modes in the pop-up list. The list of them are as follow.
 1. Play title: Playback this title.
 2. Edit title: Edit this title. Please refer to "Playing and processing the disc recorded by this unit".
 3. Rename title: Rename the title. Please refer to "Playing and processing the disc recorded by this unit".
 4. Erase title: Erase the title. All data in this title will be lost.

Only for the rewritable disc.

5. Overwrite title: When you perform this order by method as following, this unit will overwrite the current title from the beginning of the current title, and the recording will stop automatically when meeting the end of the current title. If you press [Stop] button before the recording stops automatically, the remanent part of the current title will turn into another new title.
6. Overwrite disc: When you perform this order by method as following, this unit will overwrite the disc from the beginning of the current title. In this situation, the recording won't stop until you press [Stop] button. If an existed title is not overwritten totally after you press [Stop] button, the remanent of the current title will turn into another new title.
7. Append title: Append the recording content to the last title, and does not add a new title, only for the last title. Select the new title, there is only one item "Record a new title" in the pop-up list. It means that add a new title when recording.

Note

#In some situations, "Overwrite title" and "Overwrite disc" may be invalid. To make it valid, there are two ways as following:

- a. When selecting the desired external source in step ② described above, make sure that the step ③ in section "Viewing the Input Source" has been done. Then please perform step ③, ④ and ⑤.
- b. After the unit has read an unempty DVD+RW disc, select an unempty title by [5],[6] button then press [4] button to display the control menu. From it, select "Overwrite title" or "Overwrite disc" item by [5],[6] button and press [Select] button to confirm. Then please perform steps ③, ④ and ⑤.

- | | |
|------------------|---|
| ① Front CVBS : | Front panel composite video and audio inputs |
| ② Rear CVBS : | Rear panel composite video and audio inputs |
| ③ Rear S-VIDEO : | Rear panel S-video and audio inputs |
| ④ DV : | Front panel DV input |
| ⑤ Tuner : | Rear panel TV tuner input, please select the TV program by [Channel^],[Channelv] buttons. |
| ⑥ SCART: | Rear Panel CVBS and audio Input. |

Note

#The source value must match the port through which the external source signal is inputted.

QUALITY

HQ:high quality, a single-side DVD disc can record about one hour program.

SP:standard play, a single-side DVD disc can record about two hours program.

EP:extend play, a single-side DVD disc can record about four hours program.

SLP:standard long play, a single-side DVD disc can record about six hours program.

TRICK

Stop : Stop the recording

Pause : Pause the recording

Record : Start recording

g.After finishing the steps described above, please press [Record] button to start recording. While recording, you can pause or stop recording by press [Pause/Step] or [Stop] button. One Touch Recording (OTR) This function can make you set the end time of the recording. When the time is up, the recording will stop automatically.

1.Enter the recording mode and start recording.

2.According to the desired time, press the [Record] button once or more.

#Pressing [Record] button once, the length of the recording time will extend for 30 minutes. If it exceeds the disc recordable time (The recordable time relate to the record quality), the system will cancel OTR function and switch to normal recording mode.

#If the OTR process is paused or stopped, the system will cancel the OTR.To Control the DV Camera Recorder by this Unit This unit may control the DV camera recorder through the 1394 serial interface, that is, when using DV as input source, you may fulfill the operations of playback ,pause, etc. to the DV through the remote control of this unit.

1.Properly connect the DV (Please refer to "System Connection of Recording External Signals" for details) and make it work normally. Then set the "Source" item in the control menu bar of this unit to "DV".

2.When pressing the [Stop] button, if this unit is in recording mode, the recording will stop and the DV can not be influenced ; on the other hand, if the unit is not in recording mode, this unit can not be influenced and the DV will stop.

#This operation can make the recording control

bar disappear.

3.Pressing the [Play] button doesn't influence this unit,but can make the DV switch to normal playback.

4.When pressing [Pause / Step] button, if this unit is in recording mode, the recording will pause and the DV can not be influenced; on the other hand, if the unit is not in recording mode, it can not be influenced and the DV will pause.

#This operation can make the recording control bar disappear.

5.When pressing the [REW] button, the DV will play fast backward. If this unit is in recording mode, the recording will pause.

#This operation can make the recording control bar disappear.

6.When pressing the [FWD] button, the DV will play fast forward. If this unit is in recording mode, the recording will pause.

#This operation can make the recording control bar disappear.

Note

#After finish the programs recording into a new DVD+R/DVD+RW disc, you need wait for a few minutes and then just capable of taking it out. Or the disc will be breaked if you switch off the electricity to take it out by compulsion.

#Do not shake this unit or unplug it when recording.

#A finalized DVD+R disc cannot be used to record.

#If you want to play the recorded disc in normal player, you should perform the operation of Finalizing or Making Compatible. Please refer to "Disc Operation" for details.

Exiting Recording Mode

1.Press the [STOP] button to end recording.

2.7.4 Record to HDD

Manual Recording

The unit contain Hard Disc(HDD), you can record the program to HDD.

1.Press [HDD] button enter HDD mode.

2.Press [Source] button to select the desired external signal to be recorded according to the way in section "Viewing the input Source", if you prepare to record DV, press [DV] button once.

3.Press [Record] button to start Recording.

4.Press [Stop] button to finish the recording task, the program will be saving in HDD.

One Touch Recording (OTR)

This function can make you set the end time of the recording . When the time is up, the recording will stop automatically.


1. Enter the recording mode and start recording.
2. According to the desired time, press the [Record] button once or more.

#Pressing [Record] button once, the length of the recording time will extend for 30 minutes. The recordable time relate to the record quality and the remain space of the HDD. In time shift status, the max recordable time is one hour.

#When exceed recordable time, the system will cancel OTR function and switch to normal recording mode.

2.7.5 Dubbing

Sometimes, you must free space to record new program(s) on HDD, but you don't want to lost the program(s) which have been recorded on HDD. May be you want to playback the program(s) which be recorded on HDD by using another DVD player. The unit can select program(s) from HDD and copy them to recordable DVD disc. The operation of dubbing as follows.

1. Insert a recordable disc into the tray. The unit will take a moment to get information from the disc.
2. Press [HDD] to display HDD Title list, you may select the program by using [5],[6] button and press [Add/Clear] to confirm. You can select one or more programs for dubbing.
3. When you select a title for dubbing, you will see the percentage available of the disc space on the top right corner of the HDD title list screen.
4. Once a program is selected, The Dubbing Icon  Will appear next to it on the front of the title list. Press [Add/Clear] button again to remove the previous selection. If the program you are about to select is determined to be copied bigger than the space available on the disc, the unit will provide the following message: "DVD disk is not enough".
5. Press [Dubbing] button to start the dubbing process. Dubbing will copy the program(s) selected with the same properties in formation over to DVD.

Note

1. If the disk is replaced or removed prior to dubbing, all dubbing selections will be cleared.
2. Once dubbing starts, the unit returns to Time

shifting mode automatically; a dubbing icon will be blinking on the top left corner of the screen. It is possible to play any title on the HDD while dubbing is in progress but editing is not allowed during dubbing.

3. If the writing to DVD fails at any point during this operation, the following message will appear: "Error when dubbing title!". All dubbing will be removed automatically.
4. If the title store in HDD is locked, this title will not be copy to DVD+R/DVD+RW, but protected title can be copy to DVD+R/ DVD+RW.

2.8 TIME SHIFT MODE

2.8.1 Summarization

Many users often lost the programs they desired to receive as some thing suddenly happen during watching. In order to ensure the user can receive the programs perfectly, we setup the "time shifting" unit to satisfy their needs. The instruction is as follow.

2.8.2 How to Receive the TV Program

1. According to the figure shown in section "System Connections - Connecting to TV set", connect the system.
 2. Connect the power plugs of the TV and this unit to the outlet.
 3. Turn on this unit by pressing the [Standby/On] button, and switch the TV set to AV mode.
 4. Press the [Setup] button to enter the System Setup mode, and then perform the Channel Scanning and Channel Fine Tuning according to the steps introduced in chapter "System Setup - Channel Scan Setup". After finishing, please press [Setup] button to exit setting mode.
- #Before receiving TV programs for the first time, you must do this step, the unit will save corresponding information after you have done it.
5. Please press [Source] button to enter the monitoring mode, and set "SOURCE" item to "TUNER".
 6. Press [Channel^]/[Channel\] to switch the TV program.

2.8.3 A Time Shifting

When the unit is turned on or you press [Time-Shift] button from other menus, the TV channel viewed last time will be turned in and Time shifting starts automatically. Time shifting allows "Pausing" the live TV broadcast for 60.

180 or 360 minutes by pressing the [Pause/Step] button and the viewing can resume at any time by pressing the [Play] button.

If the system is paused for 60,180 or 360 minutes, it will automatically resume TV viewing. If you press the [TS - Save] button, the time shifting content will be saved in hard disc.

Note

#At any moment during time shifting, you can press [info] to view help and status information. Info button can be pressed once for obtaining information about time shifting buffer. The information bar will appear:



Pressing [info] button twice to appear the information about hot keys and navigation information and pressing three times to remove all on-screen display.

You can change channel by using [Channel ^] / [Channel V] and 0-9 number or change source by means of the change source by means of the source button. And you can control the video output by using the following remote control key (REW, Forward, PREV, NEXT, Slow, Mute, VOL+/-)

Note

- 1.If you change the channel, the time shifting buffer data will be lost, too. Unless you set time shift buffer mode to "PRESERVE" (please refer to "Time Shift Buffer Mode").
- 2.Time shifting is stored in a buffer that contains 60, 180 or 360 minutes of recording: After 60, 180 or 360 minutes the buffer will be progressively overwritten. If you need to keep the video contained in this buffer for future usage, you can save all or part of the buffer (Please refer to "Record to HDD"). In time shift mode, if you press [Record], the program will be record in HDD and every title's length is one hour.
- 3.If you press [Pause/Step] key in Time shift state, after 60, 180 or 360 minutes elapsed, the unit will cancel pause state, switch to Time Shift state again.

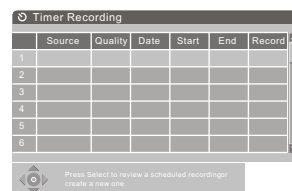
2.8.4 Summarization

This function can make this unit record automatically according to the preset requirements when the preset time is coming. And it will resume the original mode after finishing the recording.

To carry out this function. You should set up a record schedule first and then finish the configuring of the system according to the requirements on the schedule. If you are busy and unwilling to miss any wonderful program, this unit can satisfy your requirements.

2.8.5 Operation Steps

- 1.Press the [Timer] button to display function menu. The record scheduler menu show as the following figure.
 - #Highlighting an empty note by cursor buttons and pressing [Select] button to confirm, then a new note can be created.
 - #Highlighting any non-empty note by cursor buttons, and then pressing [ADD/CLEAR] button, can delete it.



- 2.Setting the input source:Press [SELECT] button to display the drop down list, then select the right item from the list by [5],[6] buttons. At last, press [SELECT] button to confirm.
 - #For example, if you want to record the Ch003 TV program, you may set the value of the Source item to Ch003.

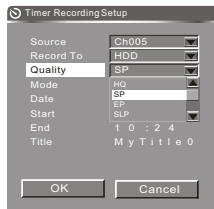


- 3.Setting the program record on HDD or DVD+R/RW. You can perform this setting at the item "Record to", move the cursor to select this row and press [SELECT] button, then a list will popup. It is shown as the right figure.



- 4.Setting the recording quality:Highlight "Quality" item by [5],[6] buttons, and press [SELECT] button to display the drop down list, select the right value from the list.

and then press [SELECT] button to confirm.
 #As for the recording quality, please refer to
 "Recording mode -Recording to DVD - Manual
 Recording - Quality" for details.

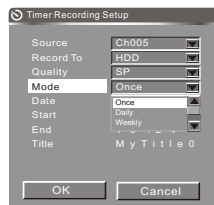


5. Setting recording date

You can perform this setting at the four row in the "Timer Recording Setup". Move the cursor to select this row and press [Select] button, then a list will pop up. It is shown as following:

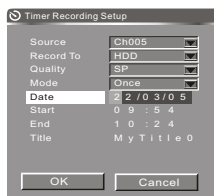
#From this illustration, we can learn that this pop up list has six options. Their meanings are as following:

- #ONCE: record at a certain time
- #DAILY: record once per day
- #WEEKLY: record once per week
- #Mon~Fri: record once per day from Monday to Friday
- #Mon~Sat: record once per day from Monday to Saturday
- #Sat~Sun: record once per day from Saturday to Sunday



a. If you select "ONCE", after confirming by [SELECT] button, move cursor by [6] button and press [SELECT] button to make the next row into input mode, then input the date in sequence of "date/ Month/year". Finally press [SELECT] button to confirm.

#When the date input window is in input mode, you can select a number by [3], [4] buttons, then press [5],[6] button to change it.



B. If you select DAILY/"Mon~Fri"/ "Mon~Sat"/ "Sat~Sun", you only need to press [Select] button to confirm.

And then the TV screen will display the right figure.



C. If you select "Weekly", after confirming by [Select] button, move cursor by [6] button and press [Select] button to display the weekday list, then select what you need from the list.



6. Setting the start time of recording.

Select the "Start" item by [5], [6] buttons in the "Time Recording Setup" and press [SELECT] button to make it in input mode, as shown in the right figure. Input the time between 00:00~23:59 by number buttons, Then press [SELECT] button to confirm.

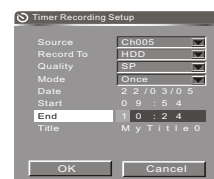
#Highlighting a number by [3], [4] buttons, and then pressing [5], [6] buttons can change the number.



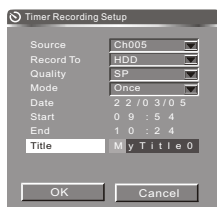
7. Setting the end time of recording. The operation is similar to that in step 6).

#The meaning of this setting is that when the finish time is up, the recording will be over and the unit will resume to the original mode before recording.

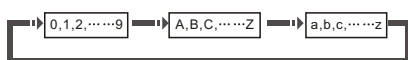
#If the record time (from the start time to the End time) is too long, an error message window will appear on the button of the screen, and you can not perform the following steps. And then you need to set the "Start" time and "End" time again.



8. Setting the recording title's name. Highlight the title item, press [SELECT] button, and then the right widow of the same line will become input status shown as the following figure. Move the cursor to a character by [3], [4], button, and then change the character by [5],[6] buttons . When finishing changing all the characters, press [SELECT] button to confirm.



#The changing sequence of the character when pressing [6] button is as following:



#When pressing [5] button the sequence is reverse.

9. After every parameter of the time recording is well set, please highlight the "OK" button in the "Timer recording setup", and press [Select] button to finish the setup.

10. Set another timer recording task or press [Timer] button to quit the record schedule menu.

11. After finishing setting the recording schedule, collocate the system according to the requirements in the recording schedule and make this unit in standby or working mode.

#In 3 minutes before recording, if the unit is working normally, a message dialogue will appear to require whether it starts to record. If the recording conditions are satisfied, please highlight the "OK" button on the dialogue and press [Select] button to confirm.

#If this dialogue is not managed, the system will think you agree to record. After a moment, it will start recording.

#If the system is in standby mode, it will automatically switch on and enter the recording mode in about 2 minutes before recording, and then start recording.

#After the recording is finished, the system automatically enters the standby mode.

Note

#This unit can't perform two or more timer record tasks at the same time.

#Before timer recording, you must set the system time & date (refer to "System Setup-

Date/Time Setup" for details) properly, otherwise, this function introduced in this chapter will not be implemented.

#The system must be properly collocated to fulfill the schedule recording task.

#Do not use the finalized DVD+R disc.

2.9 PLAYING AND PROCESSING THE DISC RECORDED BY THIS UNIT

After finishing recording a DVD+RW/ DVD+R disc, you may play it in this unit, then you can do some operations on it to make it easier to use. When loading this disc, the TV screen will display the following picture. Each little icon in the picture stands for a title, the right words and numbers indicate some information of the title. Their meanings are as following:

- Title name, and "Title" is the default name.
- The date of recording this title.
- The time of recording this title
- The record quality and length of the title



The start picture when playing DVD+R/RW disc recorded by this unit (Title list)

The following descriptions will tell you what to do when meeting this picture.

2.9.1 To Browse the Contents of the Disc and Select one Title to Play

- Roll up and down the title list picture by [5], [6] buttons to browse all the titles.
- Highlight a title icon you desire to play by [5], [6] buttons, then press [SELECT] button to play it.
- During playing, you can press [TITLE] button to switch the TV screen picture to Title List to select another title to play.

2.9.2 Edit Title

This operation can switch the system to edit mode. The functions and operations for edit mode are described at the next chapter.

- Highlight a title icon you want to edit in the title List picture and press [4] button, then a menu will pop up as shown in the right figure.
- Highlight "Edit title" item, and press [SELECT] button, then the system will enter edit mode.

- Then, refer to chapter "Editing Mode" to perform corresponding operations.
- To exit, please press [EDIT] button first and wait a few seconds until system operation is finished.



2.9.3 Erasing Title

- Highlight a title icon you want to delete in the Title List picture and press [4] button, then a menu will pop up as shown in the right figure.
- Highlight "Erase title" item, and press [SELECT] button, then the system will erase this title.



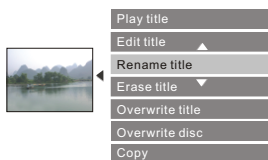
2.9.4 Copy

Copy the current title to HDD.



2.9.5 Rename Title

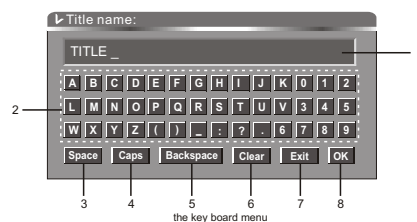
- Highlight a title icon you want to rename in the Title List and press [4] button, then a menu will pop up as shown in the right figure.
- Highlight "Rename title" item, and press [SELECT] button, then a key board menu will pop up.



The meanings and operations of the controller in the key board menu are as following:

- Title Name Editing window
- Characters area: select a certain key in this area by using cursor buttons, and then press the [SELECT] button. The letter on the key will appear in the Title Name Editing window.
- Space: blank button by which you can insert a blank to title name.

- Caps: selecting this key and pressing the [SELECT] button can make the letters in the Characters area switch between the capitalization and the common letterform.
- Backspace: selecting this key and pressing the [SELECT] button can cancel the letter before the cursor in the Title Name Editing window, meanwhile the cursor backs a space.
- Clear: selecting this key and pressing the [SELECT] button can clear all the letters in the Title Name Editing window.
- Exit: selecting this key and pressing the [SELECT] button can exit this menu and keep the Title Index name unchanged.
- OK: selecting this key and pressing the [SELECT] button can exit this menu, meanwhile change the Title Index to the one in title Name Editing window.
- Type a new title name in the Title Name Editing window by the keyboard in the menu.
- Select the "OK" key and press the [SELECT] button to fulfill the naming to the title.



2.9.6 Overwrite Title/ Append Title/ Overwrite Disc

"Overwrite title", "Append title" and "Overwrite disc" are three kinds of record mode. The meaning about them is introduced in section "Recording mode - Record to DVD - Manual Recording". If you

have connected the external signal to this unit, you can select one of them to perform recording.

- Highlight a title icon you want to overwrite and press [4] button to display the menu.
- Highlight "Overwrite title" item, "Append title" item or "Overwrite disc" item, then press [SELECT] button to confirm. Please note that you can see "Append title" item only in menu of the last title.



Highlighting the "overwrite title" item Highlighting the "overwrite disc" item Highlighting the "Append title" item

2.10 EDITING MODE

2.10.1 Summarization

For the recorded disc and Hard disc, the dividing of the title and chapter can't match your fancy. The index icon and name of each title are confirmed by the system, which are not striking, not beautiful, not convenient to skim over the disc, and not possible to meet your personalized enjoyment either.

The edit function is set for getting over the above limitations.

2.10.2 Editing Recorded Disc

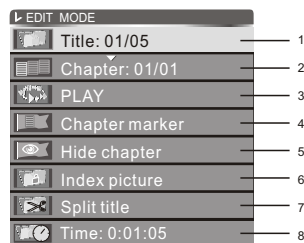
When the disc in the loader is DVD+R/RW and the system is not in the mode of writing or erasing, pressing the [EDIT] button can enter the edit mode and display the control menu. Pressing [Edit] button secondly can exit the control menu.

Note

When " " appears while you press the [EDIT] button, it may indicate that the DVD+RW disc in the loader has been written protected, or the system in current mode can not enter the editing mode. You can perform the disc operation to cancel the write-protect or exit current mode.

2.10.3 Menu Explanation

The editing control menu is shown in the following. The meaning of each item is as following:



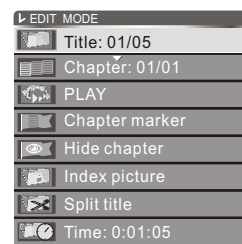
1. Title : the left of the number beside the icon is the current title number, and the right is the total of the titles in the disc.
2. Chapter : the left of the number beside the icon is the current chapter number, and the right is the total of the chapters in the disc.
3. Play : this item can perform the following functions: Play, Pause, Fast forward, Slow forward, and Step.
4. Chapter marker : separate or combine the chapters.
5. Hide/Unhide chapter: display or skip the chapter when playing it.
6. Index picture : change the index icon .
7. Split title : divide current title to 2 titles at current point.

8. T-Elapsed: can not be controlled, showing the elapsed time.

2.10.4 Operation Steps

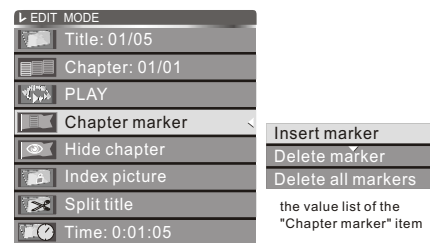
Selecting the Title/Chapter to be Edited

1. Enter the editing mode
2. Select the Title/Chapter item by using [5], [6] buttons in the editing control menu.
3. Press [SELECT] button to make the Title/Chapter item in input mode.
4. Input the number of the Title/Chapter to be edited by using number buttons, and press [SELECT] button, then the system starts to play the selected title or the one which the selected chapter belongs to repeatedly.



Insert Chapter Marker

1. In the edit control menu, move the cursor by [5], [6] buttons to highlight the "Chapter marker" item, then press [4] / [SELECT] button to display the value list shown as the following figure.



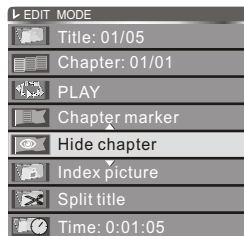
the value list of the "Chapter marker" item

2. Select proper value from the list by [5], [6] buttons, and press [SELECT] button to confirm, then the system will start separating or combining the current chapter.
 - #If you select "Delete marker", this chapter and the former chapter will be combined to one chapter.
 - #If you select "Insert marker", this chapter will be separated into two at the current location.
 - #If you select "Delete all markers", all chapters of this title will be combined into one chapter.
- #### Hiding / Unhiding Chapter
1. In the edit control menu, move the cursor by [5], [6] buttons to select the Chapter Hide/Unhide item.
 2. Press the [SELECT] button to switch the value of this item.

#If the value is "Hide chapter", this chapter will be played when playing in normal mode.
 #If the value is "Unhide chapter", this chapter will be skipped when playing in normal mode.

Note

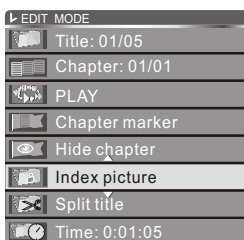
#This operation is invalid to DVD+R.



Changing the Index Picture

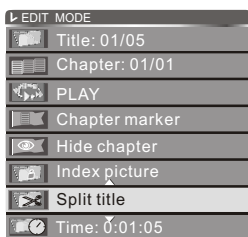
When entering the DVD title menu(Press the [TITLE] button when playing), the title index will be shown on the screen as a little icon, standing for a title (Please refer to "Playback Mode").The method of changing the title index is introduced in the following.

- 1.In the edit control menu, move the cursor by [5], [6] buttons to select the "Index picture" item.
- 2.Now, please watch the playing picture carefully, when meeting a picture you like, you can press [SELECT] button to replace that title icon by that picture.



Split Title

- 1.Highlight the "Split title" item in edit control menu, shown as the following figure, then press [SELECT] button.
- #The operation will divide current title to 2 titles at current point, and it will occupy many time, please wait for a moment.



Note

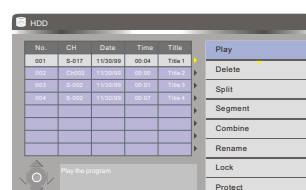
#This operation is invalid to DVD+R disc.

2.10.5 Exiting the Editing Mode

- 1.Press [EDIT] button to exit this mode.
- #When exiting, the system will write some information into the disc, so the unit will stop responding for a while.

2.10.6 Editing Hard Disc

When the unit display the HDD title list on screen by pressing "HDD" button. Use the [5],[6] to select corresponding title and press [Select] to confirm, then pressing the [4] button can enter the edit mode and display the pop-up list .Then use the [5],[6] to highlight your option and press [Select] to continue .When you edit a title, its corresponding representation on the HDD title list will bear the Edit icon to remind you.



Note

#When "x" appears while you press the [4] button, it may indicate that the system in current mode can not enter the editing mode. You can exit current mode and try again.

1.Play

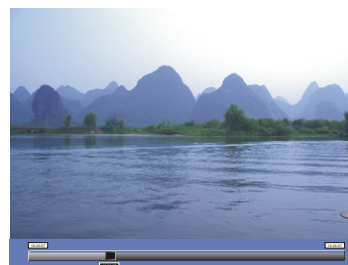
This option allows you to play the current highlighting title.

2.Delete

If a title is not Protected or Locked, you can delete it. You will be prompted to confirm the operation (as it is irreversible).

3.Split

This option brings up the Split screen. You can navigate the program (similar to Playback screen)and mark a location at which the program will be cut into 2 separate programs and registered on the HDD title list. See Figure.



You can use all navigation features, (press [Info] twice to bring up the hot keys on the bottom of the screen, pressing [Info] three times again will remove the help information).

Note

#Split is irreversible. Once the program has been split, the 2 titles can not be concatenated back.

#When a program is split, the resulting two programs will carry the same name with added index numbers 1,2; date/time of the 2nd portion will be updated according to the split point.

The Index picture of the 2nd portion is the first non-blank picture of the 2nd portion while the Index of the first portion is first non-blank picture of the 1st portion.

#If [Select] is not pressed in the Split screen, and the screen is left then the program is intact.

#Split screen can only be accessed as the title you want to split is not Protected or Locked .

- Press [Return] key will transit back to HDD title list without splitting

- If the splitting point is not chosen and the title playback comes to an end, then the system will switch to Pause

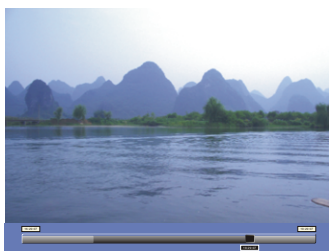
- When the operation is finished, the system will transit back to title list and the first part of the program will be highlighted Before splitting, you will be asked if you want to proceed with splitting. (The default answer is No, in order to minimize error risk).

Note:

Accuracy of Split location is within 0.5 second

4. Segment

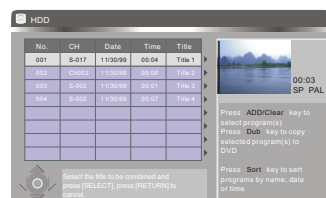
This option brings up the Segment screen. You can navigate the program (similar to Playback screen) and mark a location for the beginning of a segment followed by a location for the end of a segment, according to press the [Select] key, the marked segment is highlight in process bar. The segments will not be visible if the title is played back. Also the segments will not be copied to DVD if the segmented title is selected for Dubbing. If you re-enter the segment screen for the same title, you can see the identified segments. See Figure. If you want to cancel the marked segment, you press the [Add/Clear] key in the segment mode.



5.Combine

Select one tile of the two that you want to combine, press [4] button to enter editing mode. Select COMBINE, press [SELECT] button and TV screen displays as the following figure. Select the other title that you want to combine, and then press [SELECT] button.

This operation may combine two titles with the same quality.



6.Rename

This option brings up the on-screen keyboard. You can type in the title name for the title. Use the [5],[6] to highlight the desired key, and press [SELECT] button to select.



On-screen keyboard

Note:

This operation is allowed only if the title is not protected or locked.

7. Lock

Make sure Lock is highlighted (use Up and Down arrows to navigate if needed) and press [Select] button. When you lock a program, the parental password selected in the Setup menu will be used (default value is 3308). The user will be asked to Unlock the program before Play or any Edit or Dubbing operation. In order to Unlock, once you have highlighted the program on the HDD title list, bring up the Popup menu by pressing the [4]. Make sure Unlock is highlighted (use Up and Down arrows to navigate if needed) and press Select. You will be prompted to enter the password. A Locked title will have a Lock icon next to its index picture on HDD title list.

8. Protect

Make sure "Protect" is highlighted (use Up and Down arrows to navigate if needed) and press [Select] button. When you protect a program, the user can play the title or Dub it to DVD; but can not do any edit operation.

In order to unprotect, once you have highlighted the program on the HDD title list, bring up the popup menu by pressing the [4]. Make sure unprotect is highlighted (use up and down arrows to navigate if needed) and press [Select] button. A protected title will have a safe box icon next to its index picture on HDD title list.

2.10.7 Sorting

The function allows you to view the HDD title list in different orders. First you must in the title list screen (press [HDD]). Press the [Sort] button repeatedly for one of the following sorting options.

- #Sort by date/time descending: the most recent recording appears on top of the list.
- #Sort by name ascending: Names in order: A to Z (programs with the same name will appear in ascending time order, with the oldest one being higher than the move recent one)
- #Sort by name ascending: Names in order: Z to A (programs with he same name will appear in ascending time order, with the oldest one being higher than the move recent one)
- #Resume to default, sort by date /time ascending: most recent recording appears last on the list.

Note:

The default order is by date/time ascending and will be applied every time you enter the HDD title list.

2.11 DISC OPERATION

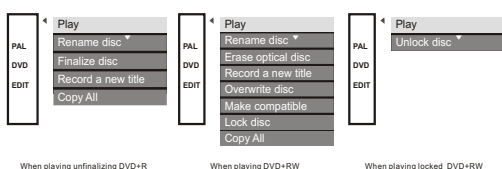
2.11.1 Summarization


The disc operations refer to some operations about the disc in the loader ,including viewing the disc information, finalizing a disc, erasing the disc content, erasing the title, lock/unlock the disc and so on.

2.11.2 Entering the Disc Operation Mode

If you load unfinalizing DVD+R or DVD+RW disc, you can enter this mode. There are two ways to enter this mode.

1. During playing, you can enter this mode by [Disc operation] button. After entering the mode, pleas press [4] button to display the control main menu, as shown in the following figures.



2. Display Title List picture by the methods introduced at chapter "Playing and Processing the Disc Recorded by this Unit", and press [5] button continuously until the icon  appears, then press [4] button.

2.11.3 Operations

Play: Highlight item "Play" in the menu, and then press [SELECT] button.

Rename disc: Highlight item "Rename disc", and press [SELECT] button, then a keyboard menu will appear. By the keyboard, you can rename the disc through the methods introduced in chapter "Playing and Processing the Disc Recorded by this Unit".



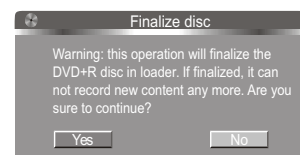
the key board menu by which you can rename the disc

Finalize disc/Make compatible :

"Finalize disc" is valid for DVD+R disc. If do this, the disc can be played in normal DVD player, but can't record new contents. "Make compatible" is valid for DVD+RW disc. These operations can make the disc able to be played in normal player. Highlight item "Finalize disc" and press [SELECT] button, then a dialogue will open shown as the right figure, please highlight "Ok" key in the dialogue, then press [SELECT] button to start this operation.

#These operations will occupy some time, please wait for a few minutes.

#"Make compatible" can appear if you make "Insert Maker" operation according to the method in section "EDIT MODE -Insert Chapter Maker".



Lock disc:

"Lock disc" is valid for DVD+RW. This operation can protect the recorded contents from being deleted. If you want to record new contents in the disc, you must unlock the disc. You can highlight item "Lock disc" and press [SELECT] button to lock or unlock the disc. If the disc is locked, this operation will unlock the disc, otherwise it will lock it.

Erase disc:

This operation is only available for DVD+RW disc. Highlight item "Erase disc" and press [SELECT] button, then the system will start erasing disc contents. This operation will occupy much time. While erasing, any other operations can not be proceeded, including standby. Once the operation starts, it cannot be cancelled midway. Please do not unplug the unit midway. Otherwise, the disc will be probably damaged.

Record a new title / Overwrite disc: These operations can perform recording function. "Record a new title" can add a new title when recording, and "overwrite disc" can overwrite all the contents in the disc as new one. You can highlight "Record a new title" or "Overwrite disc" item, and press [SELECT] button to start recording.

Copy all:

Select all programs from DVD and copy them to HDD.

2.11.4 Exiting the Disc Operation Mode

1. Press [Disc operation] again to exit.

2.12 USB MODE

2.12.1 Summarization

This unit is equipped with an USB socket, then the equipment with USB socket(e.g.DV,DC,

MP3 Player, Flash Driver,USB Hub, USB Card reader) can be connected to this unit.

#This unit only supports such file formats in USB device: JPEG,MP3 and WMA.

#Only when the other file format is translated to one supported by this unit, can it be played.

2.12.2 Operations

- 1.Insert the USB device to the USB socket in this unit.
- 2.Plug in this unit, and then turn it on by button [STANDBY/ON].
- 3.Press button [FILE] to enter the mode of reading USB.
- 4.When playing the files in USB, please perform the corresponding operations according to chapters: "File Operation Mode - Playback Control Menu", "Control Wipe Mode when playing JPEG Disc", "Control Zoom Mode when Playing JPEG Disc" and "Picture Rotating when Playing JPEG Disc".

2.12.3 Exiting the USB mode

Press button [SOURCE] to exit the USB mode.

Note:

This unit can not support all the USB devices of DV,DC,MP3 Player,Flash Driver,USB Hub, and USB Card reader in the market. We list some USB devices passing the test in this unit for your use reference.

Table 1

USB card reader model \ CARD model	CF	MD (micro Drive)	SD	MMC	MS	XD	SM
USB 2.0(NEQ ND3260)	PASS	PASS	PASS	PASS	PASS	PASS	PASS
Zynet 8 in 1 USB 2.0(NEQ ND3260)	PASS	PASS	PASS	PASS	PASS	X	PASS
PQ 7 IN1,USB flash 1.1(SI)	PASS	PASS	PASS	PASS	PASS	X	PASS
No branch 8 in 1,USB 1.1(ALCORAu9632)	PASS	N/A	PASS	PASS	N/A	PASS	PASS
Cyberhome 5 in 1,(ALIM5635)	PASS	X	N/A	N/A	PASS	N/A	N/A
BBK 8 in 1,(ALCORAu9632)	PASS	N/A	PASS	PASS	PASS	N/A	PASS
Neodio 8 in 1,(ND3060-LB)	PASS	PASS	PASS	PASS	PASS	N/A	PASS

cells marked "PASS" means these card are supported on this unit.

cells marked "N/A" means these card are not recognized on this unit.

cells marked "X" means the card reader have not corresponding slot.

Table 2

Name	Equipment	Model/Character	Details/Remarks	SQA Comments (updated on Build042)
DV	Sony	DCR-TRV 18	120×digital zoom	Can detect and play

DV	Sony	DCR-PC101E	120×digital zoom	Can detect and play
	JVC	GR-D70U	700×digital zoom	Can detect and play
	CANON	ZR65 MCA	400×digital zoom	Not support
DC	CANON	IXUS S430	4M Pixels,3X,CF card	Can detect and play
	SONY	DSC-F717,Mipitas prefer	5M Pixels,7X,MS card	Can detect and play
	Nikon	Coolpic 5000	CF Card	Can detect and play
	KODAK	LS-743	4M Pixels, 3X, SD,/MMC card	Can detect and play
	Olympus	□300	3M Pixels,3X,XD card	Can detect and play
	FUJIFILM	FinePix F420	3M Pixels,3X,XD card	Can detect and play
MP3 player	APPLE	iPod 15G	MP3(CBR/VBR)/WAV/AAC,)	Can detect and play
	SAMSUNG	Yepp YP-55V,USB 1.1	MP3/WMA	Can detect and play
	ZARVA	CA-128M	MP3/WMA	Can detect and play
	MSC	MSNHA-128F	MP3/WMA,USB interface	Can detect and play
	Sony(MD)	N10	MP3/WAV/WMA/ATRAC3	Not support
Flash Driver	Apacer	128M	128M,USB 1.1	Can detect and play
	Aigo	Mini king	128M,USB 1.1	Can detect and play
	SanDisk	Cruzer Mini USB 2.0 128M	128M,USB 2.0	Can detect and play
	Putian	U-571	128M,USB 1.1,USB 2.0	Can detect and play
	NETAC	U215	64M,USB 1.1	Can detect and play
	Longview		32M,USB 1.1	Can detect and play
	SONY	128M M/	128M,USB 2.0	Can detect and play
USB Hub	1 to 4,USB 1.1	Sprinters DX-174BP USB SLIM HUB		Can detect and play when connect more than one USB devices

Note

USB refers to Universal Serial Bus. Most of USB devices on the market are USB1.1 or USB2.0. There are some types USB 1.1 devices: Monitors, Communication devices, Audio, Human input, Mass storage.

Most FLASH MEMORY, MP3 Player, USB HDD ect. belong to MASS storage Class. Mass storage Class include 2 transport manners:

1. USB 1.1 Mass Storage Class Control/Bulk/Interrupt (CBI) Transport
2. USB 1.1 Mass Storage Class Bulk-Only Transport

This unit support USB 1.1 Mass Storage Class Bulk-Only Transport, we are not sure that other USB devices can be supported! So please find out about the features of USB equipments before buy.

When use USB 1.1 Mass Storage Class Bulk-Only Transport devices, please notice the file operation

system support Windows FAT ,not support FAT32 and NTFS ect. file system.

2.13 SPECIFICATIONS

Playable discs	DVD, SV CD,V CD,CD, MP3 ,JPE G,DV D+R, DVD+ RW		
Recordable discs	DVD+ R,DV D+RW		
Recording formats	DVED (MPEG 1 1)		
hdd Specs	160GB		
Recording quality	HQ(High Quality), S P(Standard Play),EP (Extend Play),SLP (Standard Long P lay)		
Input	Composite video input S-video input(Y/ C) DV camera jack input(IEE E1394,I-Link) USB input RF input Analog audio input SCART input MIC input		
Output	Composite video output S-video output(Y/ C) Component video output(Y Pb/Cb Pr/Cr) SCART output 2CH analog mix audio output 5.1CH analog output Digital audio coaxial output Digital audio optical output		
Video characteristics	Output	Composite video: NTSC/PAL system Video amplitude 1.0±0.2Vp-p, 75 Ω S-video: Y output amplitude 1.0Vp-p, 75 Ω C output amplitude 0.286Vp-p,75 Ω	
	Input	Composite video: NTSC/PAL SYSTEM Video amplitude 1.0±0.2Vp-p, 75 Ω S-video: Y input amplitude 1.0Vp-p, 75 Ω C input amplitude 0.286Vp-p,75 Ω	
Audio characteristics	Output	Audio amplitude 2.0 ^{+0.2} _{-1.0} Vrms, 10k Ω AF response 20Hz~ 20kHz(±1dB) Signal/ noise ratio ≥85dB Audio distortion+noise ≤-65dB(1kHz)	
	Input	Audio amplitude ≤2.0Vrms Impedance 10k Ω	
General Specifications	Power supply : ~100V-240V ,50/60Hz Power consumption: ≤45W Standby power consumption: ≤3W	Dimension: 430mm× 308mm× 48mm	Weight : Net weight: 3.9kg Gross weight: 5.0kg
Operating temperature	5℃~35℃		
Operation humidity	Relative humidity 15% ~75% (No condensation)		

General Specification	Power supply: ~100V-240V ,50/60Hz Power consumption: ≤35W Standby power consumption: ≤3W	Dimension: 430mm×296mm×48mm	Weight: Net weight: 3.4kg Gross weight: 4.5kg
Operating temperature	5°C~35°C		
Operation humidity	Relative humidity 15%~75%(No condensation)		

Chapter Three Principle and Servicing

Section One Principle of the Player

3.1.1 PCB board composing figure of the player

DW9952K is a multi-function recorder with playing, disc recording and hard disc recording all in one, which supports the record discs with DVD-R DVD-RW DVD+R DVD+RW format. The player is composed of components of decode board, loader, AV board, power board, main panel and hard disc, shown in the figure 3.1.1.1:

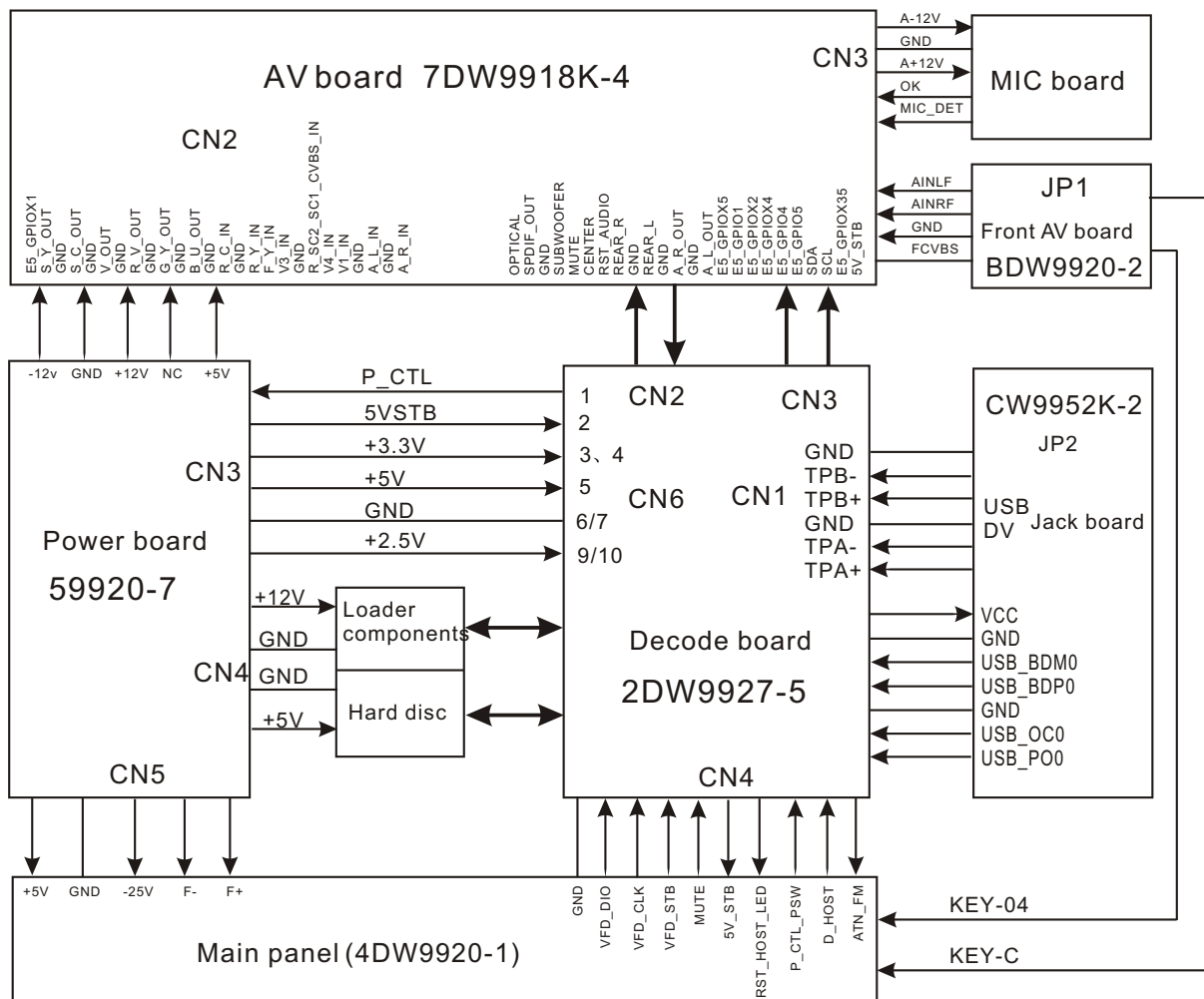


Figure 3.1.1.1 PCB board composing diagram of the player

3.1.2 Block diagram of the player

Block diagram of the player is shown in the figure 3.1.2.1:

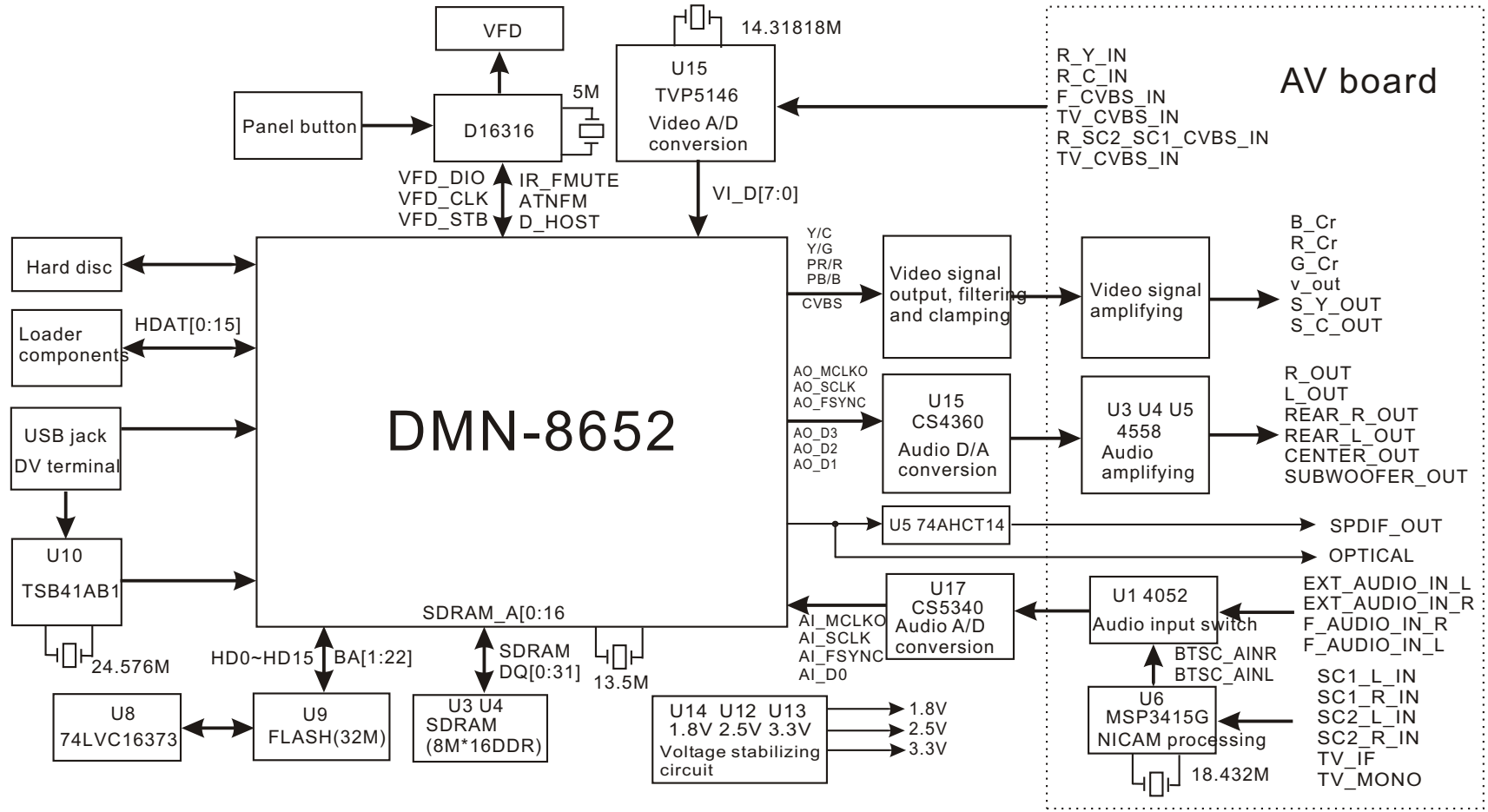


Figure 3.1.2.1 Block diagram of the player

3.1.3 Function introduction to IC of the player

Function introduction to IC of the player is shown in the following table:

Board number	SN	Material code	Model	Location number	Function description
Decode board 2DW9927-2	1	0882214	DMN-8652	U1	Main chip
	2	0882839	EM6353BX2SP3B-2.9V SOT23-3L	U6	Reset IC used by DW9952K-2
	3	0881814	LP2995 SOP	U2	DDR terminal linear voltage stabilizer (1.25V)
	4	0882300	HY5DU561622	U3,U4	SDRAM (128M)
	5	0881816	SN74HCT14PWR TSSOP	U5	Reverter
	6	0881818	SN74ALVCH16373 TSSOP	U8	Latch-unit
	7	0881819	TSB41AB1PHP QFP	U11	DV jack IC(1394)
	8	0881820	PQ018EZ02ZP	U12	1.8V v oltage stabilizing IC
	9	0881821	PQ025EZ01ZP	U14	2.5V v oltage stabilizing IC
	10	0881936	TVP5146	U15	Video A/D conv erter
	11	0881057	CS4360 SSOP	U16	Audio D/A conv ersion
	12	0882353	CS5340 TSSOP	U18	Audio A/D conv ersion DW9952K-2 use (2DW9927-5)
	13	0880159	CS5333	U18	Audio A/D conv ersion used by DW9952K
	14	0881127	RT9164-33GG SOT-223	U13	3.3V v oltage stabilizing IC
	15	0881236	39VF160-70	U9	FLA SH
4DW9920-1	1	0881013	D16316 QFP	U1	Panel VFD drive, buttons coding
5DW9920-7	1	08805819	TL431C TO-226AA(LP)	IC3	Precise voltage stabilizer
	2	0882462	AZ431A Z-A TO-92	IC4, IC5	Precise voltage stabilizer
	3	0880765	5L0380R YDTU	IC6	Power sw itch module
	4	1080032	@HS817 VDE	IC2	Photoelectric coupler
6DW9952K-2	1	0881226	RC4558D SOP	U1	Operational amplifier
79918K-4	1	0881080	PCF8563T SO8	U2	Cloc k IC
	2	0881693	TL 74HC4052D SOP	U1, U10	(channel selection) electronic sw itch
	3	0881965	MAX4052A SOP	U1, U10	(channel selection) electronic sw itch
	4	0881226	RC4558D SOP	U3, U4, U5	Operation amplfifier (audio amplifying)
	5	0881842	MSP3415G QFP	U6	NICAM IC
	6	0881992	HC4053M SOIC	U7, U8, U9	(channel selection) electronic sw itch

Section Two Unit Circuit Principle

3.2.1 Working mode introduction

1. External input: externally-inputted video signals input to U15 (TVP5146) for input source selection and A/D conversion. TVP5146 converts NTSC, PAL video signals to digital component video signals and transmit to DMN-8652 for MPEG encoding, signals after encoding are sent to DVD recorder driver for disc recording storage, or sent to hard disc for storage, meanwhile convert to analog video signals through the video decode and D/A converter inside DMN-8652 for output, and analog video signals output through filtering, clamping and amplifying. Externally-inputted audio signals firstly input to AV board (U15 MSP3415) for NICAM processing and sound source selection and then input to U1 4052 for channel selection, audio signals after selection are sent to A/D converter CS5340 of decode board, CS4360 converts analog signals to digital audio signals and input to A IN jack of DMN-8652, after DMN-8652 encode processing, input to loader and hard disc for storage. At the same time, digital audio signals output from A OUT jack of DMN-8652 to send to DA converter CS4360, CS4360 converts digital audio signals to analog signals and analog signals output after being amplified.

2. DV input: DV signals input to decode board through DV jack board, the cable transceiver (TSB41AB1) of decode board decodes the inputted DV digital signals and sends the data after being decoded to 1394 jack of DMN-8652 directly, DMN-8652 performs encoding processing to signals and sends to DVD recorder driver or hard disc for recording storage after encoding, meanwhile make signals after encoding output from DMN-8652 analog video output jack (VDENC) and AVOUT analog audio output jack and users can watch programs at the same time when recording.

3. DVD signal output: DMN-8652 communicates with DVD Recorder through ATAP jack, disc information read out by DVD Recorder is sent to DMN-8652 for decoding through ATAP jack, the data after decoding are sent to analog video output jack (VDENC) and digital audio output jack AOUT for output. The working principle of hard disc playing is the same with that of disc playing.

4. USB jack: DMN-8652 has a USB1.1 jack that supports two modes of low speed and high speed transmission. USB data is sent to USB jack of decode board DMN-8652 through jack. The working principle is the same with that of hard disc playing, and only the jack is different.

3.2.2 Audio output circuit

1. Audio output signal flow chart is shown in the figure 3.2.2.1:

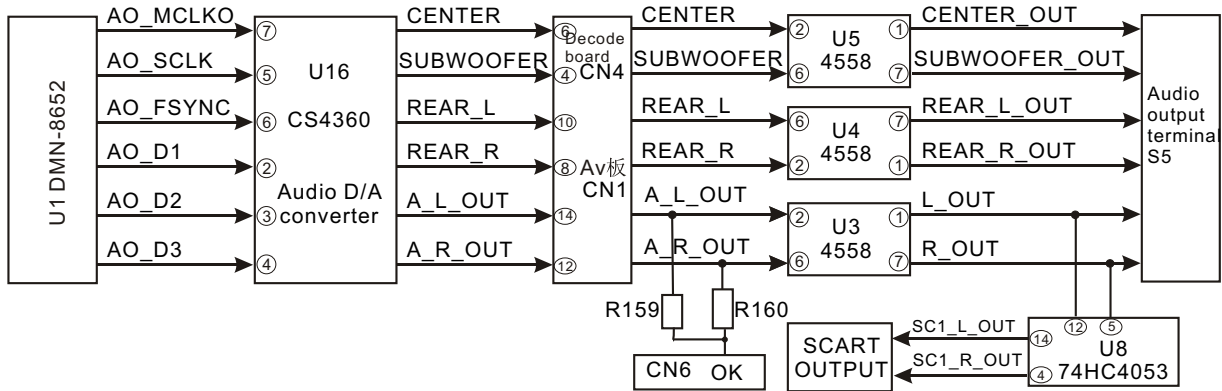


Figure 3.2.2.1 Audio output signal flow chart

2. D/A conversion circuit (decode board part)

When the player is working, decode chip U1 DMN-8652 reverts the disc information sent from loader to digital audio signal, and outputs audio data through the pin of decode chip AOUT module to send to CS4360 for D/A conversion, analog 5.1CH audio signals output, through coupling capacitor and filtering capacitor C243-C248 for filtering, audio signals are sent to socket CN4 and then to AV for amplifying and output. The outputted signals have SUBWOOFER, CENTER, REAR_R, REAR_L, A_R_OUT A_L_OUT and optical and coaxial signals (OPTICAL, APDIF_OUT) of digital audio output.

Pin function of audio D/A converter is shown as follows:

- # AO_MCLKOS: MASTERCLOCK signal
- # AO_SCLK: SERIAL CLOCK signal
- # AO_FSYNC: LEFT/RIGHT CLOCK signal
- # AO_D1, AO_D2, AO_D3: serial data jack of digital audio signal
- # AO_IEC958: digital audio output (optical, coaxial)

3. Audio amplifying circuit (AV board part)

6-channel analog audio signals outputted by decode board input to U3, U4, U5 through CN1 for amplifying. Shown in the figure 3.2.2.2, A_R_OUT A_L_OUT input to U3 for amplifying, MIC

Signals input from CN6 to AV board and superpose to the input end of U3 through R159, R160 to perform mixed amplifying with left and right channels of audio signals, through filtering R_OUT L_OUT signals are divided into two ways: one way arrives at audio output terminal S5, and the other way performs sound source selection (when LOOP_DECODER_C end is low level, R_OUT L_OUT signal is outputted) through U8 to arrive at SCART terminal (SC1). After being amplified and filtered through U5, SUBWOOFER, CENTER signals output to terminal S5. REAR_R, REAR_L signal, through being amplified and filtered by U4, output to terminal S5.

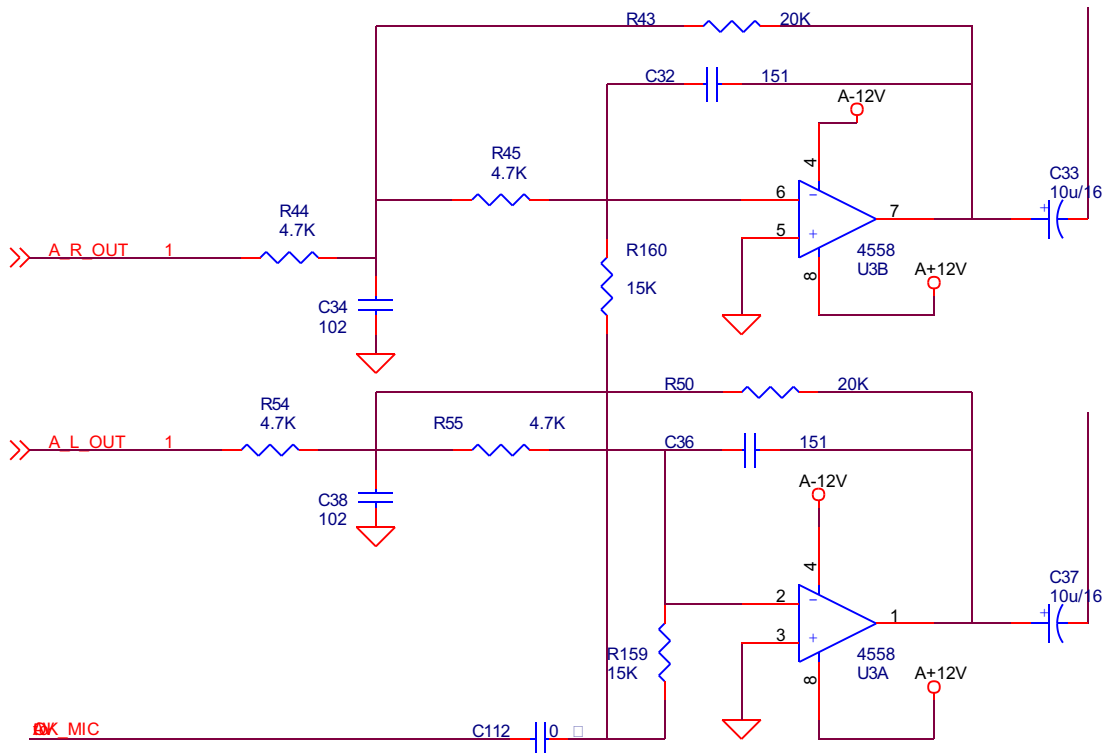


Figure 3.2.2.2 Audio amplifying circuit diagram

4. Digital audio signal output circuit

Decode chip outputs digital audio signals (AO_IEC958) to decode board socket CN4 through R84, CN4 sends signals to AV board and inputs to optical terminal OP1 directly, at the same tile AO_IEC958 sends to decode board socket CN4 through U5/R85/L5 and outputs to the coaxial terminal S4 on AV board directly.

5. Mute circuit is shown in the figure 3.2.2.3:

Power-on mute: after power on, 5V_STB output is normal, base electrode of Q4 is low level, 5V_STB transmits to mute pipe through C-E electrode of Q4 to realize mute function and charge C39 at the same time. When voltage of the two ends is more than 4.3V, Q4 cuts off, now panle

Begins to work, machine enters standby state, panel MUTE pin outputs high level signal and sends to R63 of AV board through decode to make Q8 Q5 saturated on, 5V_STB transmits to the mute pipe of each channel through C E electrode of Q5 to make audio output circuit in mute state and realize the purpose of power-on mute. When machine reads out disc or switches other working mode, MUTE changes from high level to low level, mute circuit does not work and audio output of the player is normal.

Power-off mute: when machines enters standby state from power-on, panel MUTE pin outputs high level signal and transmits to R63 of AV board through decoding to make Q8 Q5 saturated on, 5V_STB transmits to the mute pipe of each channel through C E electrode of Q5 to make audio output circuit in mute state to reach the purpose of standby mute. When power off, C47 discharges through Q7 to make mute pipe of each channel saturated on to realize power-off mute.

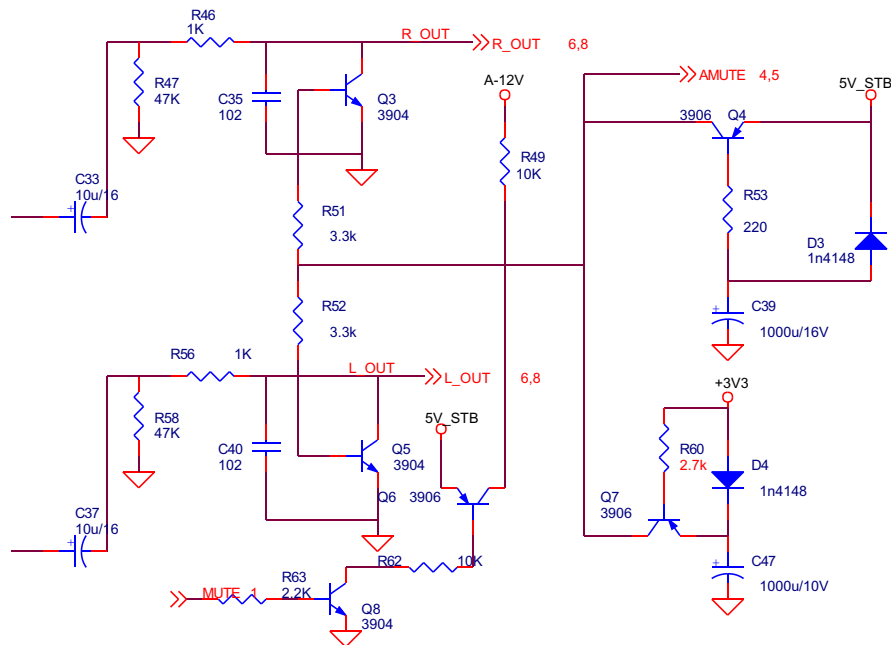


Figure 3.2.2.3 Mute circuit diagram

3.2.3 Video output circuit

Video output signal flow chart is shown in the figure 3.2.3.1:

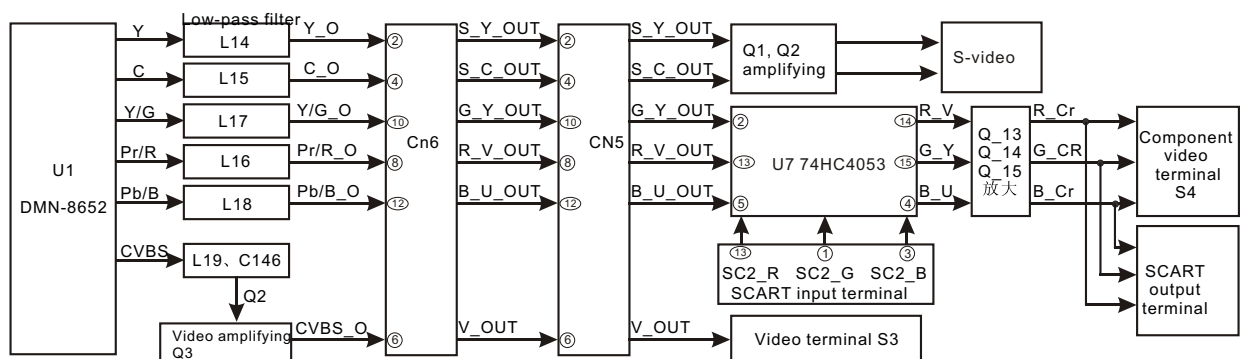


Figure 3.2.3.1 Video output circuitflow chart

3.2.4 Audio input circuit

Audio signals inputted by AV input terminal and tuner, through being selected by input switch circuit and A/D conversion by U17 Cs5340, output serial audio data stream to U1 DMN-8652 digital audio input port, DMN-8652 performs encoding to inputted audio signals and transmits signals after being encoded to loader to control loader and feed circuit through DMN-8652 to fulfill recording task.

1. Audio input flow chart is shown in the figure 3.2.4.1:

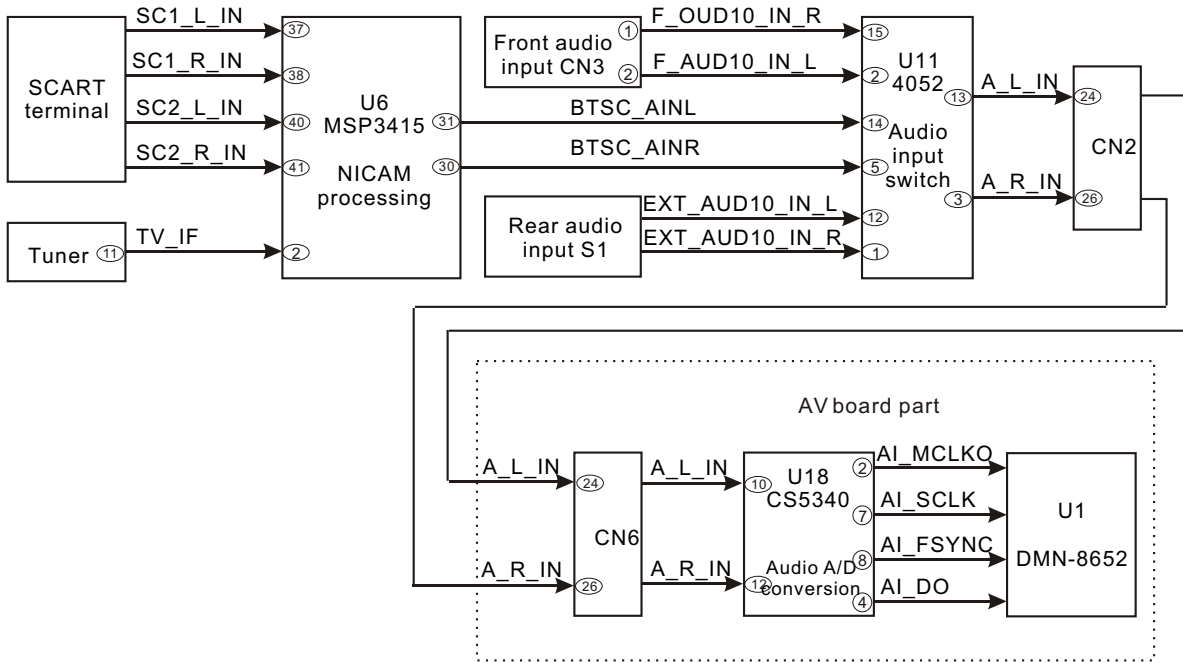


Figure 3.2.4.1 Audio input flow chart

2. Working principle of audio input: take TV signal input as instance, when machine is set in TV signal input, TUN1 receives high frequency signal, then outputs audio signal through processing and then outputs from pin 11 of TUN1.

Radioamplifier PIN of the player is shown in the following table:

PIN	Name	Function description	Working voltage (v)	PIN	Name	Function description	Working voltage (v)
1	Vcc1	Power supply pin 1	5	8、9	NC	Blank	0
2	BT	Channel selection control pin (unused)	9.4	10	AGC	AGC control pin (unused)	4.36/1.91
3	VCC2	Power supply pin 2	5	11	2ND SIF	Audio signal output	0
4	SCL	Clock signal pin of IC bus	3.63	12	VIDEO OUT	Video output	2.14/1.38
5	SDA	Data signal pin of IC bus	3.63	13	VCC3	Power supply pin 3	5
6	AS	Unused (grounding)	0	14	AUDIO OUT	MONO audb signal output	2.44
7	AFC	AFC control pin (unused)	1.42/0.9				

3. NICAM processing circuit

Audio signals output through pin 11 of TUN1, and mono channel audio signals may also output from pin 14. Now we do not use pin 14 to output mono channel audio signals. Audio signals TV_IF, through C80 C81, are coupled to NICAM decode IC U6 (MSP3415) for NICAM decode, and at the same time the audio input of SCART1 SCART2 also inputs to U6 for channel selection of audio input. Audio signals after switching are outputted by pin 30/31 of U6. When machine is set in TV signal input, BTSC_AINL and BTSC_AINR outputs audio signals of TV, and TV audio signals after being decoded output from pin 30, 31 of U6 to send to UI.

4. External audio input switch circuit

Circuit principle and truth value table are shown in the figure 3.2.4.2, U1 is inputted by 4 kinds of sound sources: front audio input (F_AUDIO), rear audio input (R_AUDIO), audio signals inputted by NICAM decode IC (BTSC_AINR BTSC_AINL), sound source or FM sound source used by LOOP function (this ground not used). Audio signals input from pin 1, 2, 4, 5, 12, 14, 15, 11 of U1, U1 has two groups of 1-in-4 electric switch, after U1 selects the input sources, outputted by pin 3, 13 to audio A/D conversion circuit. The output is controlled by the level of pin 9, 10 of U1.

Truth value table of sound source selection

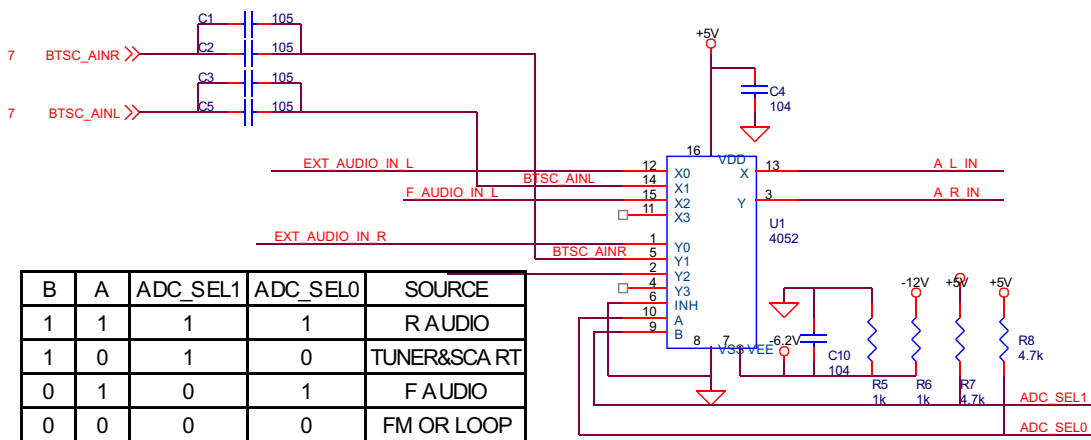


Figure 3.2.4.2 Audio input switch circuit diagram

5. Audio A/D conversion circuit

Shown in the figure 3.2.4.3, externally-inputted audio signals (A_L_IN A_R_IN) are outputted by pin 13, 3 of U1 to CN2 and transmit to decode board CN6. The inputted audio signals are directly inputted to audio A/D converter CS5340 (U18) for A/D conversion.

Analog audio signals input from pin 16, 12, digital audio signals AI_D0 after A/D conversion input to DMN8652 directly for encoding and recording. DMN8652 outputs this audio signal at the same time. Audio output circuit outputs audio signals.

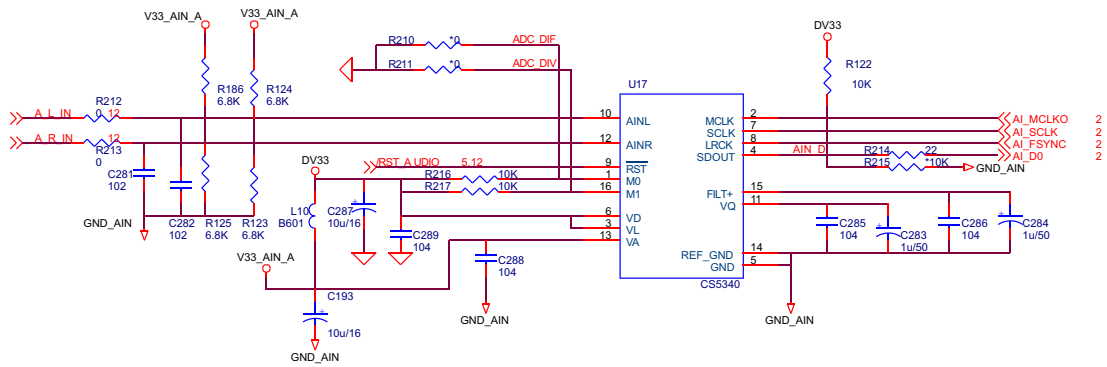


Figure 3.2.4.3 Audio A/D conversion circuit diagram

3.2.5 Video input circuit

Video signals inputted by AV input terminal, S-Video terminal and tuner input decode board socket CN6 to video input selection of decode board and A/D conversion IC TVP5150 for input source selection and A/D conversion, video data stream is outputted to U1 DMN-8652 digital video input port. DMN-8652 performs encoding to externally-inputted video signals and transmits signals after being encoded to loader, DMN-8652 controls loader and feed circuit to fulfill the recording task of disc.

1. Video input flow chart is shown in the figure 3.2.5.1:

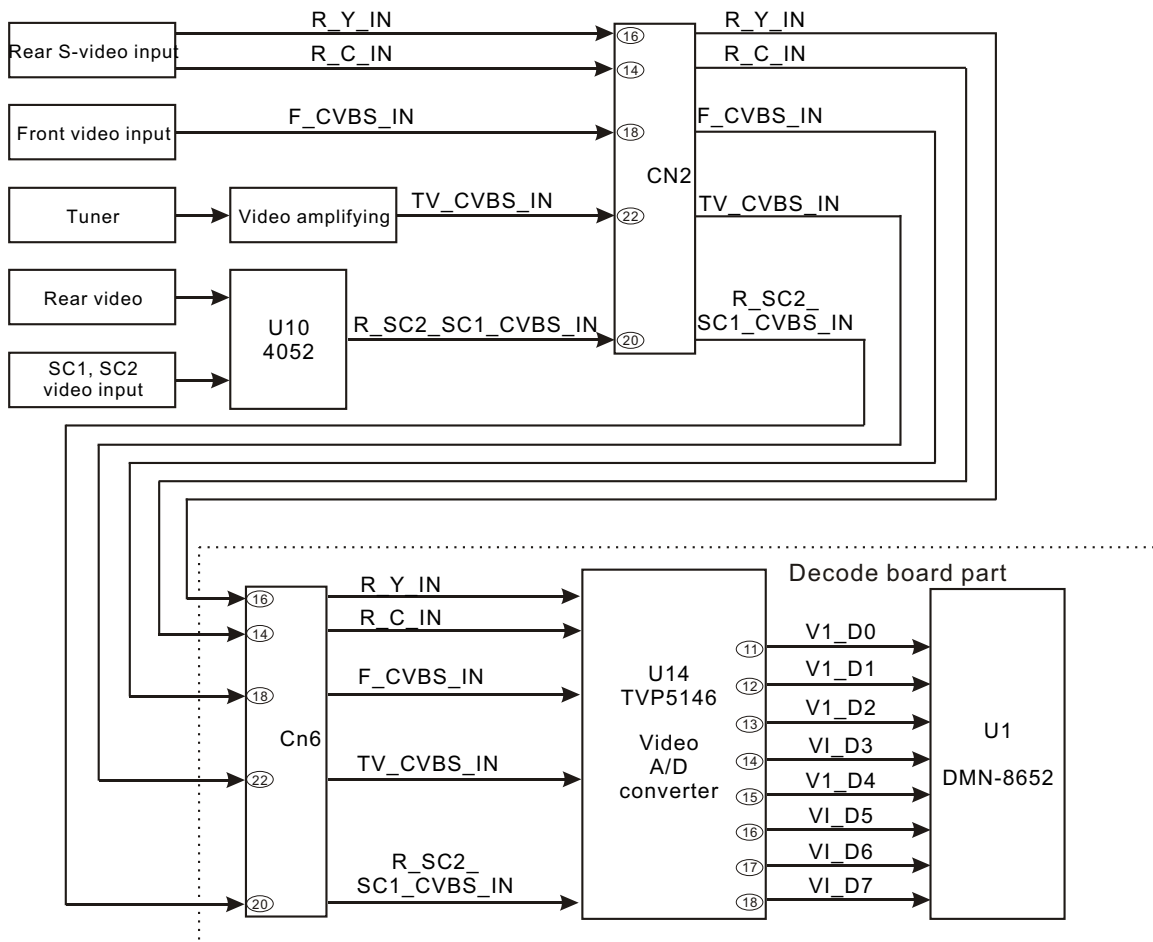


Figure 3.2.5.1 Video input flow chart

2. Video signal input: take tuner input as instance, when machine switches to TV signal input, tuner is controlled by IIC bus to perform auto channel selection and function operation through software. Video signals output through pin 12 and amplify TV video signals through the amplifying circuit composed of Q31/Q33 to input to decode board for selection. Video input signals on AV board Cn2 have TV_V1_IN (video signals transmitted from tuner), V3_IN (front composite video signal), R_Y_IN R_C_IN is chroma and brightness signals inputted by rear S-video, V2_IN is rear composite video signal input, this channel signal selects with SCART terminal and inputs to decode board through R_SC1_SC2_CVBS_IN pin (as for the switch relationship of SCART, we will introduce in SCART terminal switch).

3. Video A/D conversion circuit

Shown in the figure 3.2.5.2, U15 has built-in video input switch circuit, so externally-inputted video signals directly input to pin 17 of video encoder U15 (TVP5146), under the control of system, U15 switches analog video signal to digital video signal and adopt 8-bit parallel data means to input to UI DMN8652 for encoding and recording.

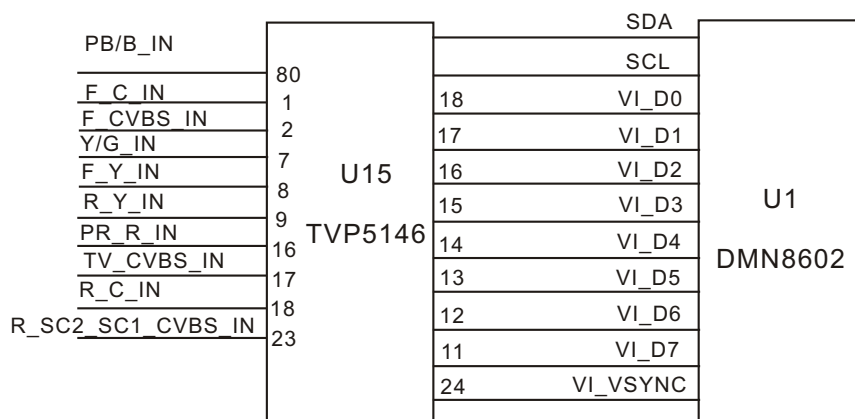
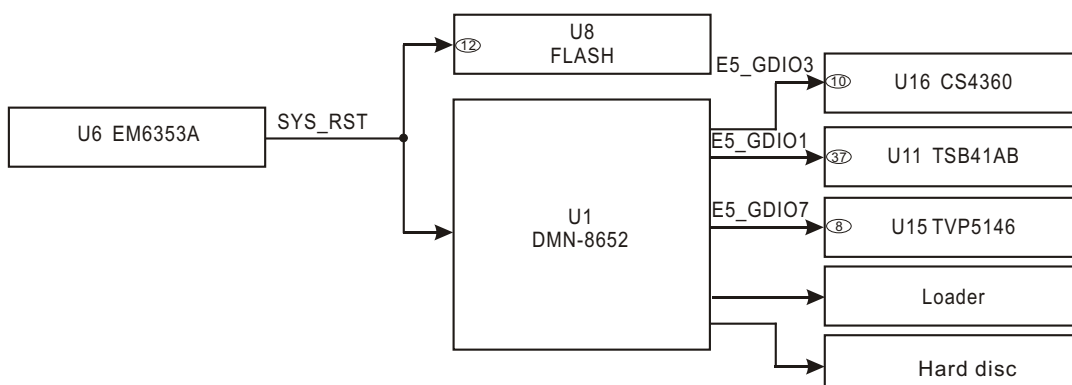


Figure 3.2.5.2 Video A/D conversion circuit diagram

3.2.6 Reset circuit

1. Reset circuit diagram is shown in the figure 3.2.6.1:



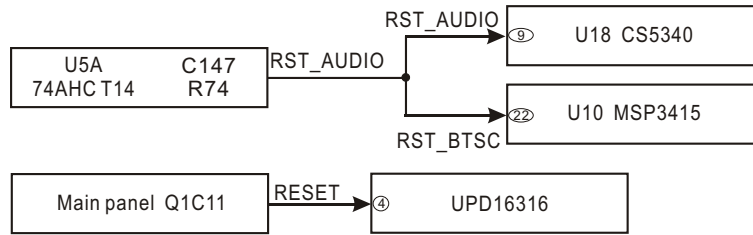


Figure 3.2.6.1 Reset circuit diagram

2. System reset circuit

Shown in the figure 3.2.6.2, when machine enters working mode from standby, voltage of V33 increases, pin 2 of U6 output a level signal that maintain 25MS to reset system and FLASH. When system reset finishes, U1 outputs multi-channel reset signal to give to other subordinate circuits for reset (loader, hard disc, CS4360, TSB41AB, TVP5146).

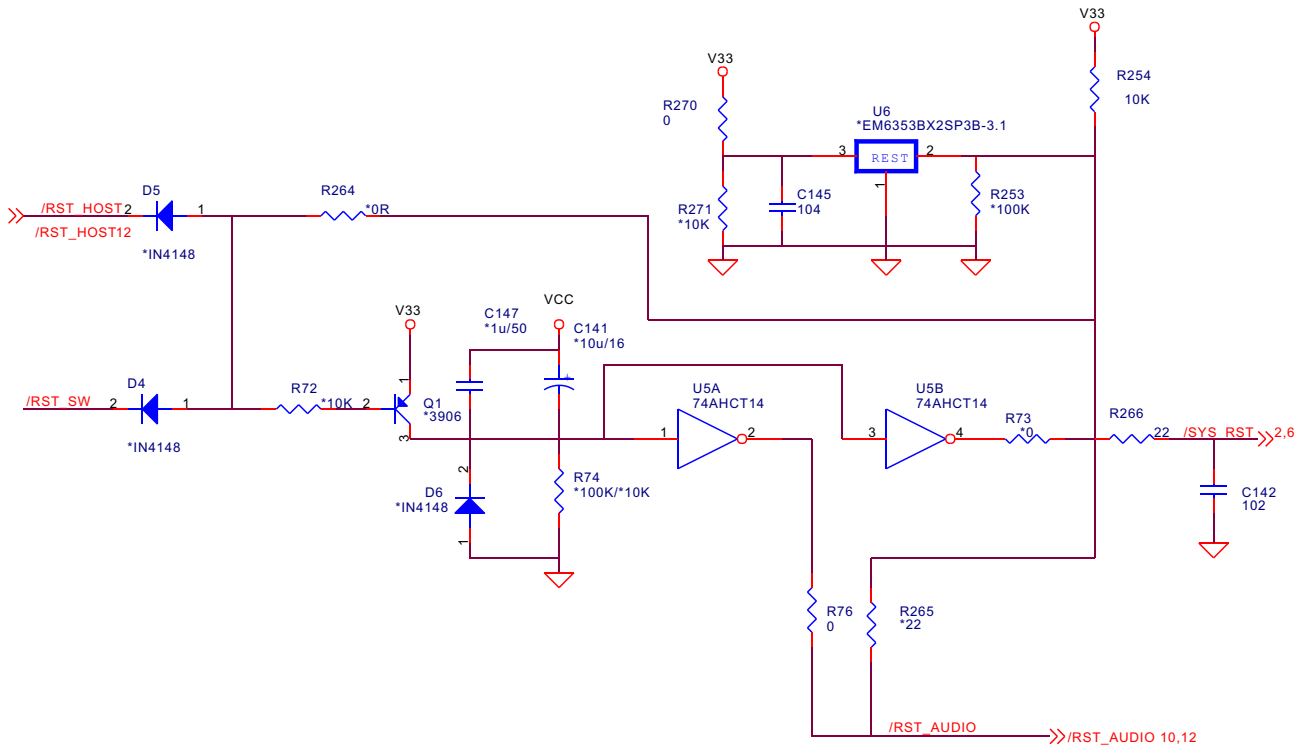


Figure 3.2.6.2 System reset circuit diagram

3. Audio reset circuit

Shown in the figure 3.2.6.2, when machines enters working mode from standby, voltage on two ends of C147 cannot change suddenly, pin 1 of U5 inputs high level when C147 is charging, so pin 2 of U5 outputs low level, when C147 is fully charged, voltage of pion 1 of U5 changes to low level, and pin 2 of U5 outputs high level continuously. Reset time of this circuit is decided by C147 and RC constant of R74.

3.2.7 IIC bus control circuit

IIC bus a kind of simple, dual-direction, two-wire system and synchronous series bus developed by PHILIPS company. Only two wires (serial clock line and serial data line) needed that information can be transmitted between elements connected on the bus. This bus is high-performance serial bus with functions of ruling required by multiple host machine system and synchronization of high/low speed device which is used widely. SDA SCL bus control and connection diagram is shown in the figure 3.2.7.1:

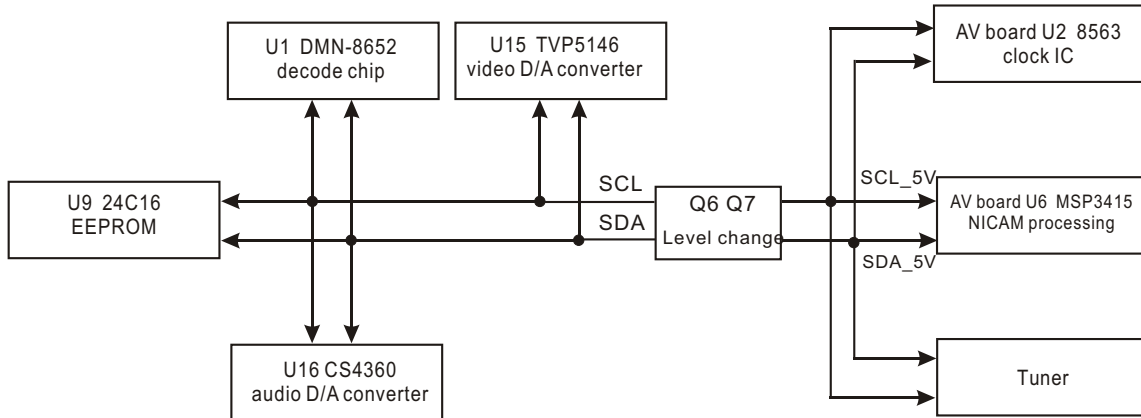


Figure 3.2.7.1 SDA SCL connection diagram

SDA SCL bus level switch circuit is shown in the figure 3.2.7.2:

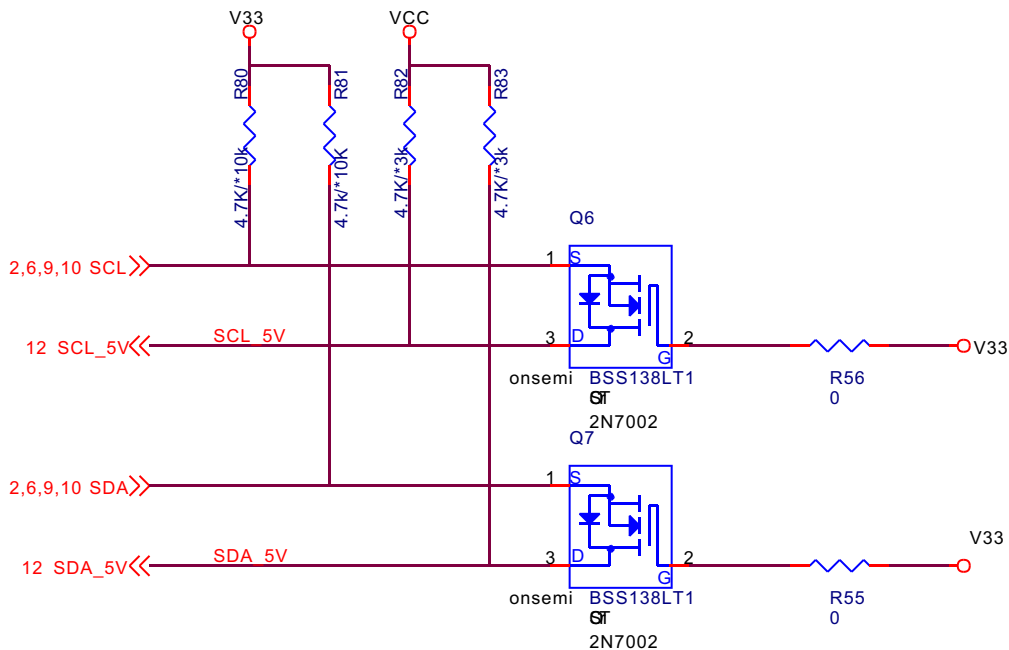


Figure 3.2.7.2 SDA SCL bus circuit diagram

2. IIC bus level switch principle

In this player, decode board IIC bus uses 3.3V level, while elements such as AV board tuner need to use IIC of 5V level, so a level conversion circuit is added on circuit. This circuit utilizes the on/off features of MOS tube, when main chip outputs 3.3V pulse, UGS is 0V, MOS pipe cuts off, under the function of pull-up resistor, D electrode of MOS tube has 5V pulse that outputs to AV board to realize level switch. When main chip is low level, UGS is 3.3V, MOS tube is on, and D electrode of MOS pipe is low level.

3. Data transmission criterion of IIC bus

Data transmission once of IIC bus from host machine is called a frame, composed of start signal, address code, several data byte, replay bit and stop signal. When communication starts up, a start signal (when high level is on SCL line, a drop edge produces on SDA line), address code (8-bit) of subordinate machine and read-write signal are sent automatically; when communication stops, host machine sends a stop signal (when high level is on SCL line, a rise edge produces on SDA line). During the course of data transmission, when high level is on SCL line, data on SDA line must be confirmed steady; when data of a byte is transmitted, a relay signal must be sent by receiver. Transmission speed of bus is 100kbps (standard) - 400kbps (high speed). When +5V power supply is adopted, input level is ruled as $V_{ILmax}=1.5V$, $V_{IHmin}=3V$; when wide power voltage is adopted, level is ruled as $V_{ILmax}=1.5V_{DD}$, $V_{IHmin}=3V_{DD}$. In this player elements controlled by two levels of 5V and 3.3V are adopted, so a level conversion circuit is added in the connecting end of AV board and IIC bus of decode board to increase the stability of system.

4. IIC bus defined by DMN8602 is used to control each function circuit in this player. To make understanding easier, we suppose DMN8602 is host machine, other chips are subordinate machine, host machine sends control information and receives state report information sent back from each subordinate machine and sends new control information according to the report information to function circuit required to control. Subordinate machine may carry out the control information sent from host machine and report the state information of this machine to host machine to realize the control function of I2C bus through dual-direction information exchange course. In which 24C16 is state memorizer that mainly saves information set by user and required to store for the usage of next time. Main functions of this player may be controlled by IIC bus (such as video A/D conversion, audio D/A conversion, tuner channel selection, user information and NICAM decode).

3.2.8 Voltage stabilizing circuit

1. 1.8V voltage stabilizing circuit is shown in the figure 3.2.8.1 and supplier for the internal logic circuit of decode chip. 2.5V power inputs through pin 1 of U12, after being voltage stabilized by voltage stabilizing IC Po018, outputted by pin 3.

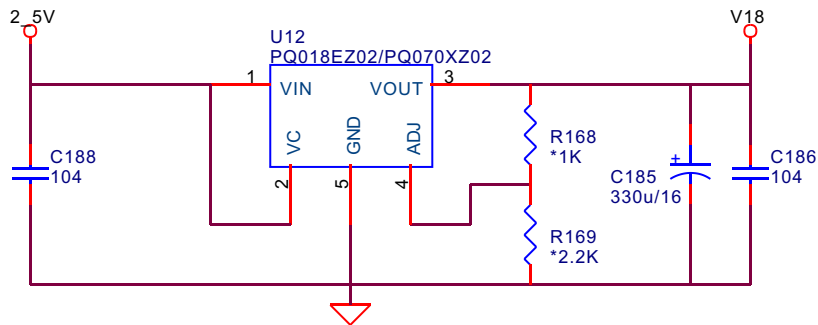


Figure 3.2.8.1 1.8V voltage stabilizing circuit diagram

2. 3.3V voltage stabilizing circuit is shown in the figure 3.2.8.2 and mainly supplied power for decode chip, FLASH and SDRAM. 5V power inputs from pin 3 of U13, after being voltage stabilizer by voltage stabilizing IC Lt1117, outputted by pin 2.

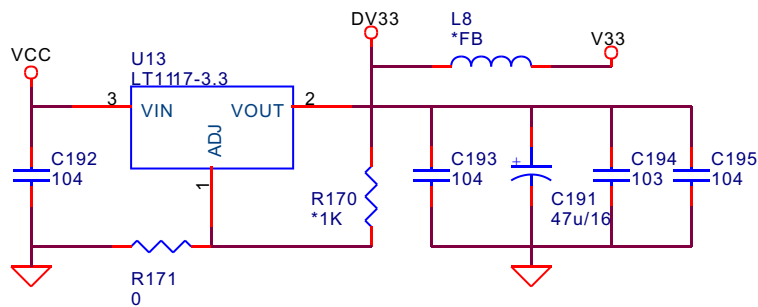


Figure 3.2.8.2 3.3V voltage stabilizing circuit diagram

3. 2.5V voltage stabilizing circuit is shown in the figure 3.2.8.3 and mainly supplied power for decode chip. 3.3V power inputs from pin 1 of U14, after being voltage stabilized by voltage stabilizing IC Pq025, outputted by pin 3.

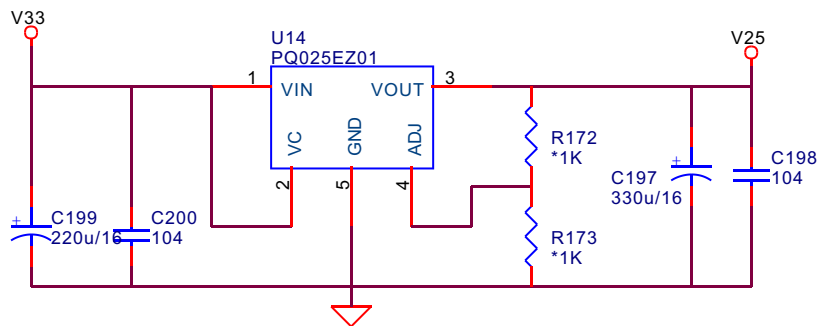


Figure 3.2.8.3 2.5V voltage stabilizing circuit diagram

3.2.9 USB jack circuit

1. DMN-8652 integrates USB module circuit inside which can directly read USB external devices. When the USB module circuit integrated inside DMN-8652 detects the external device connection, it continues to apply interruption for the control module of DMN-8652 and waits the response of DMN-8652 control module; after control module has a response, USB module circuit achieves internal bus and reads data of external device in directly. USB signal is inputted through socket CN7 directly.

2. Pin introduction of USB is shown in the following table:

Pin	Signal	Pin	Signal
1	+5V	1	+5V
2	Data-	2	Data+
3	Data+	3	Data-
4	Grounding	4	Grounding

3.2.10 DV jack circuit

In DV player and DVCAM player, a flat 4P or 6P port may be seen and this is often-called DV digital jack. Sony names it i.LINK that accords with IEEE 1394 standard. The features are as follows:

- ◆ Transmit digital data directly, so there is no picture and audio deteriorate.
- ◆ Only one cable is needed to make video, audio and control signal perform data multiplex transmission.
- ◆ With hot-plugging function, and data transmission among multiple devices is available.

Externally-connected DV signals input through DV jack board to DV jack chip TSB41AB1 through decode board socket J6 for processing.

TSB41AB1 is a DV jack IC responsible for conversing external DV signals to signals required by main chip and inputting to main chip. The internal DV monitoring circuit can automatically detect DV input. When system selects DV mode, DMN-8652 communicates with TSB41AB1; when DV jack has signal input, signals inputted by DV input to pin 27-30 of TSB41AB1, after being processed by TSB41AB1, and send to DMN-8652 for encoding and decoding.

3.2.11 IDE jack circuit

This player uses two IDE jacks connected with a “loader components” and a hard disc. Loader components include servo circuit, laser head and mechanical part, with working principle the same with that of other DVD player. We consider the hard disc as a whole in this player and the jack is totally the same with loader. The pin introduction to IDE jack is shown in the following table:

Pn	Name	Description	Pn	Name	Description
1	/RESET	Reset (reset signal)	21	n/c	Not connected
2	GND	Ground	22	GND	Ground
3	DD7	Data 7	23	/IOW	Write Strobe
4	DD8	Data 8	24	GND	Ground
5	DD6	Data 6	25	/IOR	Read Strobe
6	DD9	Data 9	26	GND	Ground
7	DD5	Data 5	27	IO_CH_RDY	I/O
8	DD10	Data 10	28	ALE	Address Latch Enable
9	DD4	Data 4	29	n/c	Not connected
10	DD11	Data 11	30	GND	Ground
11	DD3	Data 3	31	IRQR	Interrupt Request
12	DD12	Data 12	32	/IOCS16	IO ChipSelect 16
13	DD2	Data 2	33	DA1	Address 1
14	DD13	Data 13	34	n/c	Not connected
15	DD1	Data 1	35	DA0	Address 0
16	DD14	Data 14	36	DA2	Address 2
17	DD0	Data 0	37	/IDE_CS0	(1F0-1F7)
18	DD15	Data 15	38	/IDE_CS1	(3F6-3F7)
19	GND	Ground	39	/ACTIVE	Led driver
20	KEY	Key	40	GND	Ground

3.2.12 Control panel

1. Control panel block diagram is shown in the figure 3.2.12.1:

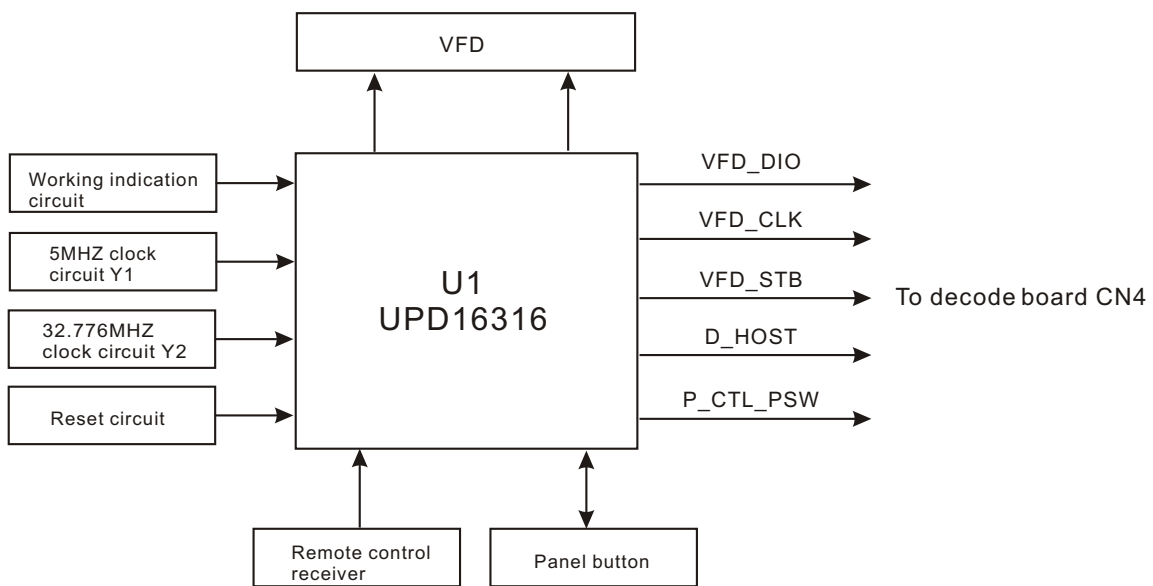


Figure 3.2.12.1 Control panel circuit block diagram

2. Reset circuit

Shown in the figure 3.2.12.2, it is a low level effective reset circuit, after power on, VDD power charges C11 through R24, the voltage on two ends of capacitor cannot change suddenly, so Q1 base electrode is high level, Q1 is saturated on, RESET end outputs low level; the charge course of capacitor makes the electric potential of Q1 base electrode decreases quickly, Q1 cuts off, RESET end outputs high level and reset finishes.

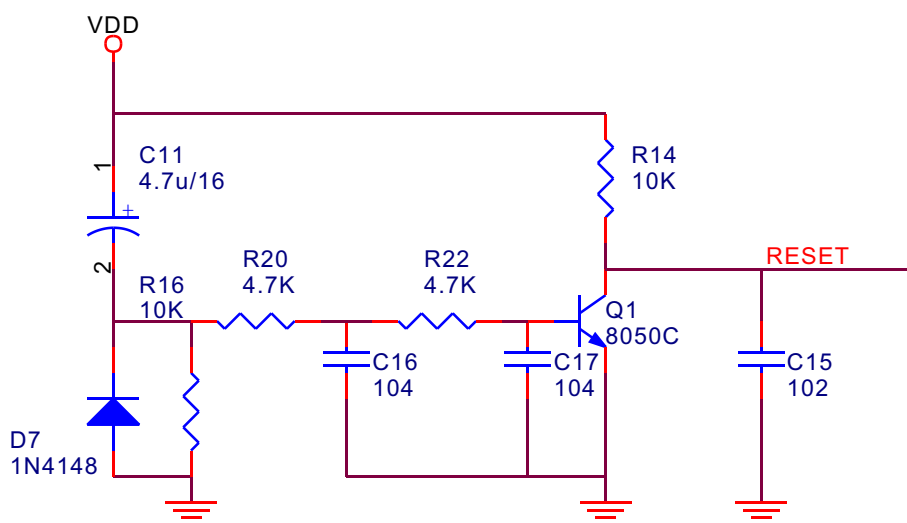


Figure 3..2.12.2 Reset circuit

3. Remote control circuit

The power supply of remote control circuit uses 5V_STB power to ensure the remote control receiver can receive the instruction transmitted from remote controller in standby status. The remote control instruction received by remote control receiver directly transmits to panel IC for remote control decode.

In standby status, panel IC only receives the wake code transmitted from remote controller.

4. Standby working status

After power on, P_CTL_PSW control end is low level, now power board main power +12V, +5V, +3.3V have no voltage output, 5V_STB and other supplementary winding power outputs normally to provide reset circuit to reset U1 (pin 4 of U1) at the same time of power on, panel IC standby module enters working status, in which Y2 and the clock circuit inside IC produce clock signal to realize the time display and timing function in standby status, Y1 is externally connected clock of D16316. In standby status, panel control IC and display screen have working power, so the display screen of machine can normally display the time in standby status.

5. Working status after power on

When users are pressing POWER button on the panel or remote controller, UPD16312 enters normal working status, P_CTL_PSW ens inputs high level, panel standby indicator light turns out, the blue light of panel receives power and is on, main power output of power board is normal, each circuit of the player begins working, machine displays power-on picture and enters working status. After power on, audio circuit will produce noise in the course of power on, to avoid noise being amplified outputted, panel IC (46PIN) outputs MUTE signal to mute circuit (working principle will be introduced in mute circuit), after decode system works, it communicates with panel IC to fulfill functions of panel display and remote control function operation.

3.2.13 AV circuit

AV circuit is mainly in charge of audio/video signal input and output, audio/video amplifying circuit, audio input switch circuit, NICAM processing circuit, clock circuit, SCART terminal input and output control circuit.

1. AV circuit block diagram is shown in the figure 3.2.13.1:

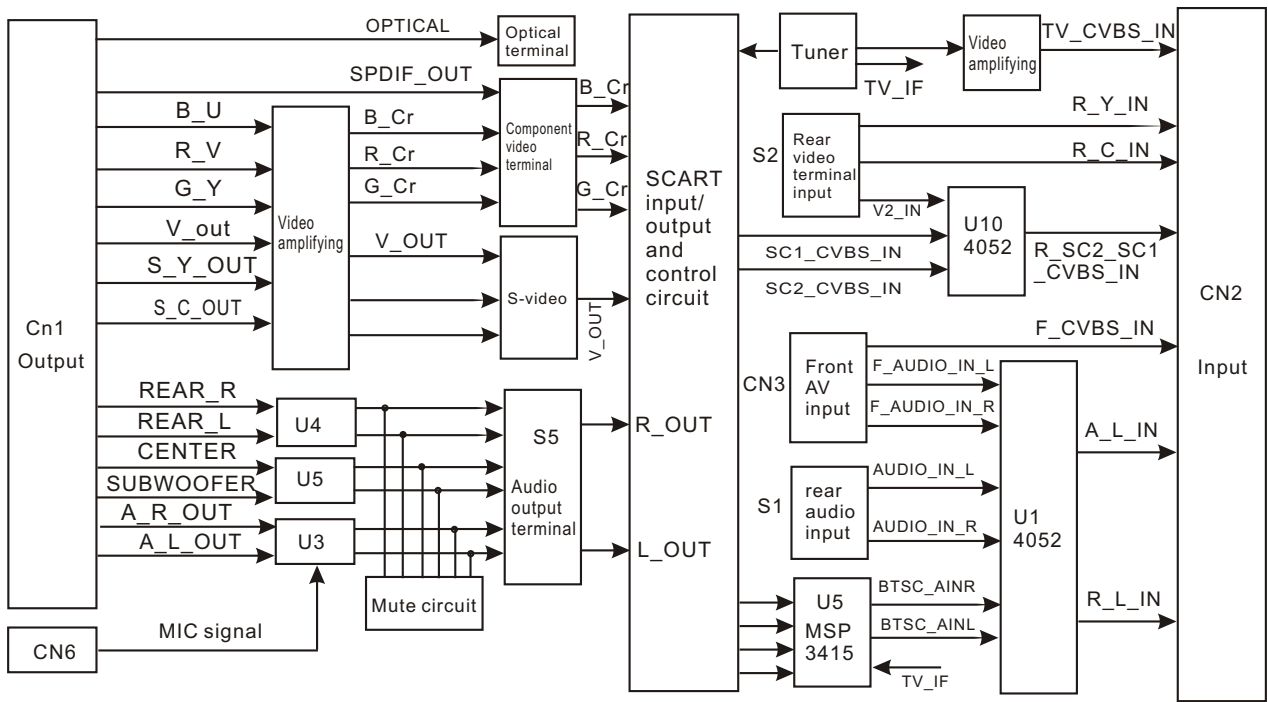


Figure 3.2.13.1 AV circuit block diagram

2. Clock circuit: shown in the figure 3.2.13.2, clock circuit mainly provides a clock signal for system, which can record year, month and date. Power supply means of External battery or standby power is adopted, U2 is clock IC with working voltage between 2.0 and 5.5V, after machine power off, battery Bt1 supplies power for U2 through D2, after the player power on or enters standby status, 5V_STB supplies power for U2 through D1. D1 D2 makes a separation function in the circuit.

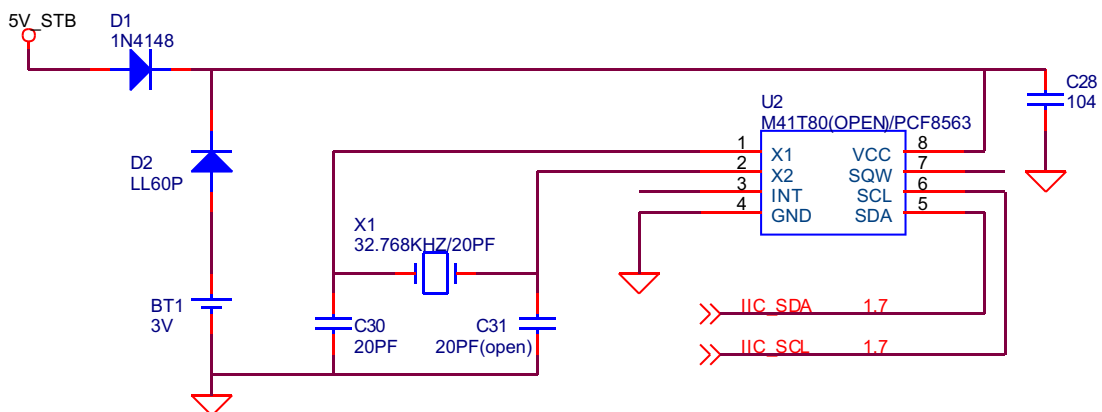


Figure 3.2.13.2 Clock circuit diagram

3. SCART output mode control circuit

(1) CVBS/RGB output control circuit: when the machine is in power-on status, SCART terminal is required to output RGB signal, we switch the output mode if machine in RGB state, shown in the

Figure 3.2.13.3, decode chip E5_GPIOX4 outputs high level to make Q28, Q26 saturated on, SC1_CVBS_RGB_SEL end outputs high level; when output mode of the machine is composite video, decode chip E5_GPIOX4 outputs low level to make Q28, Q26 cutoff, SC1_CVBS_RGB_SEL end outputs low level; when machine enters standby status (machine enters LOOP working mode), +5V power is 0V, Q29 cuts off, Q27 is controlled by VI_FSS end level of SCART input terminal, so SC1_CVBS_RGB_SEL end is controlled by VI_FSS end, now output mode is decided by external input source.

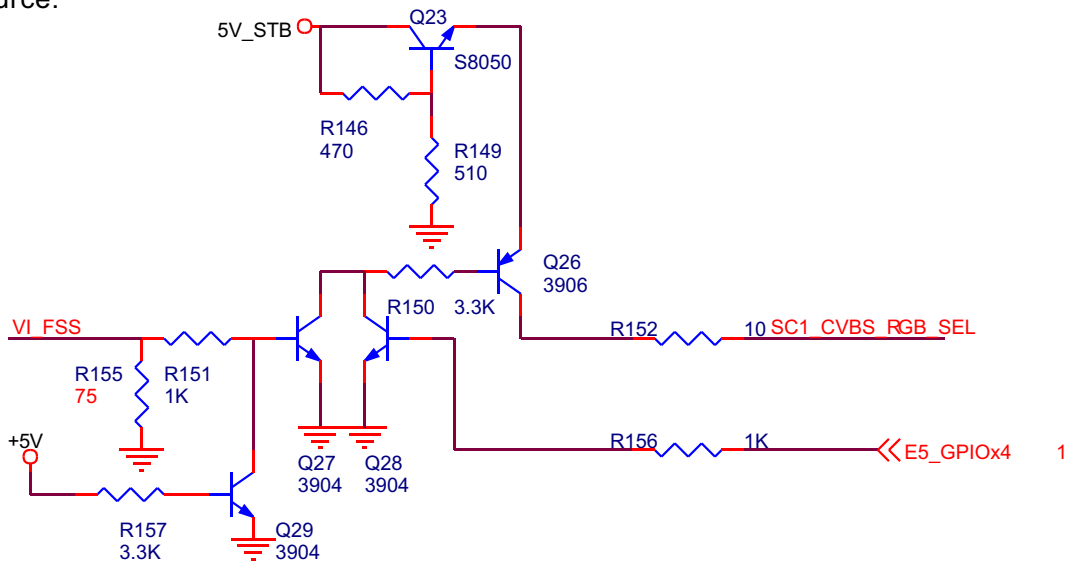


Figure 3.2.13.3 CVBS/RGB output control circuit diagram

(2) Screen display ratio control circuit

When the machine is playing discs with different ratio pictures, if SCART terminal output is needed, we set “screen ratio setup” item in machine setup page according to requirements, shown in the figure 3.2.13.4, E5_GPIOX2 end of decode chip outputs level to make Q17, Q20 on, AV_CONTROL end outputs the voltage required by screen ratio switch to TV set. When machine enters standby status (machine enters LOOP working mode), AV_CONTROL ens is controlled by pin 8 of SCART input terminal.

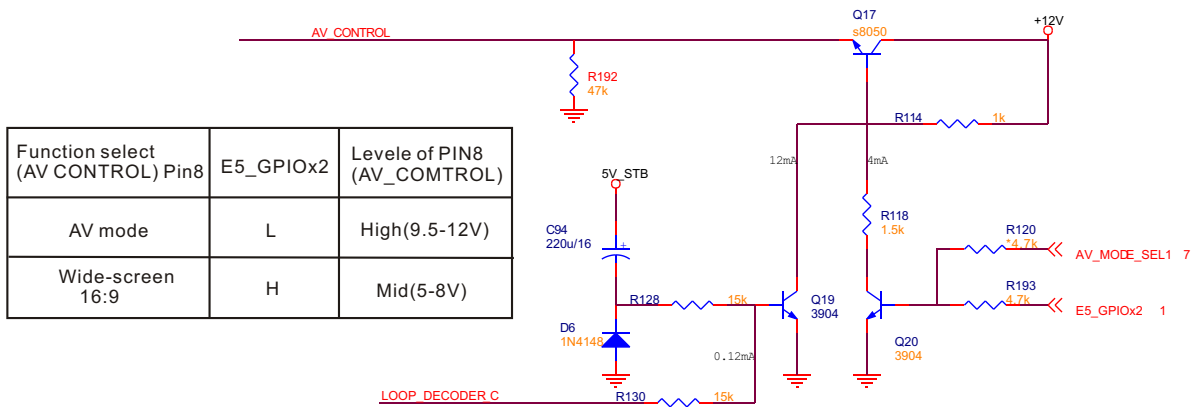


Figure 3.2.13.4 Screen display ratio control circuit

4. SCART circuit block diagram is shown in the figure 3.2.13.5:

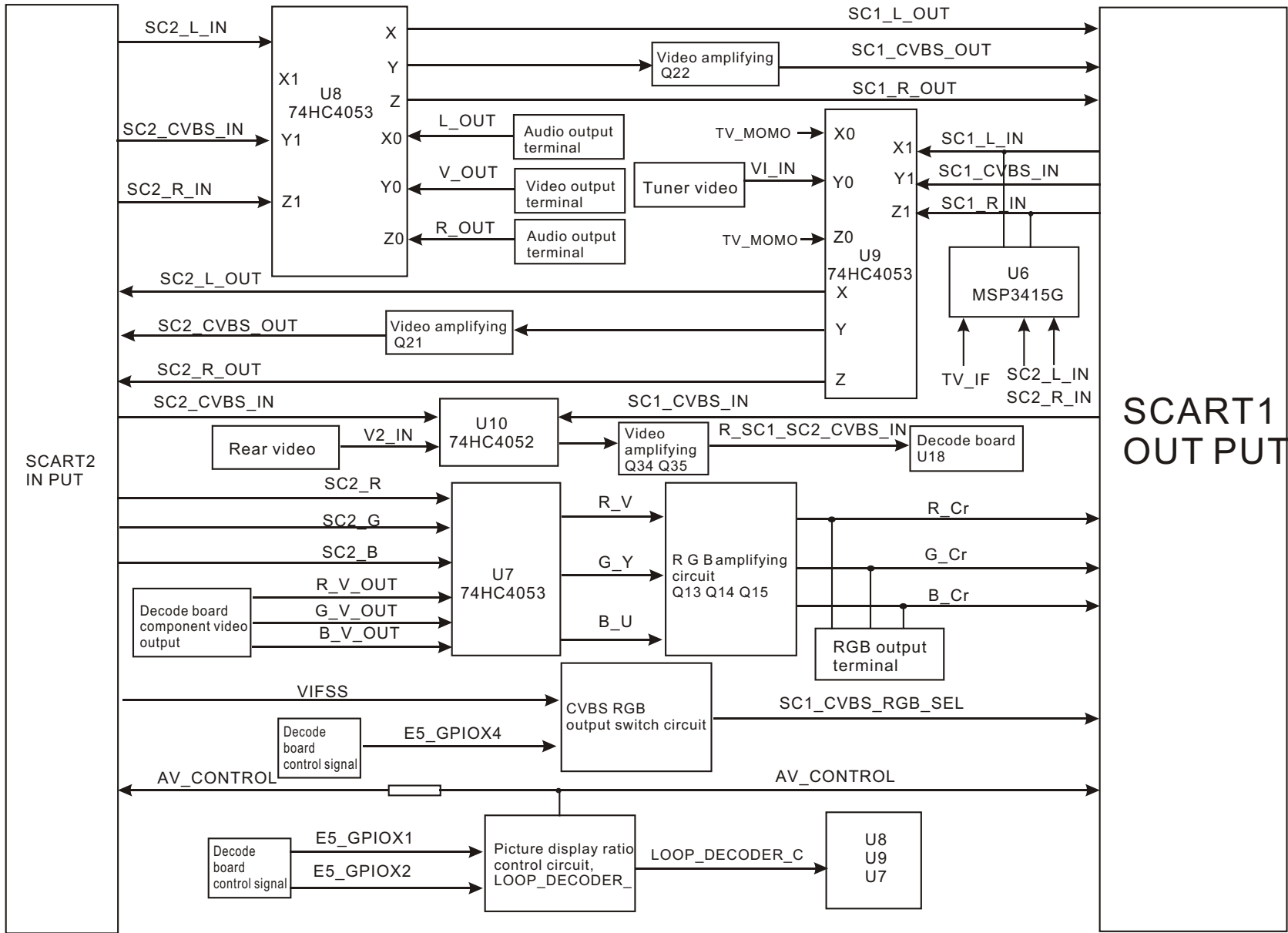


Figure 3.2.13.5 SCART circuit block diagram

(1) Audio, video signals output flow chart and working principle

When the player is in DVD playback status or external input status, LOOP_DECODER_C end is low level, CVBS/RGB switch circuit and screen display ratio control circuit are both controlled by the control signals outputted by decode. Audio/video signals input to U8 and output from pin 14, 15, 4 of U8, audio signals are directly sent to SCART output terminal for output, video signals are amplified through the amplified circuit composed of Q22 and then sent to SCART output terminal for output. There is one group of input port in output terminals. Suppose output terminal is connected with TV set, audio/video signals sent from TV set input from input port to NICAM decode IC for selection, and input to main board for record usage. Video signals select through U10, Q34/Q35 amplifies and inputs to main board for record usage. Audio/video signals sent from tuner output through U9 to the output port of SCART input terminal to connect decoder or other re record devices. Component video switches through U7 and we have introduced in video output part.

Remark: this player does not use DECODER function; to be easy to understand, we define SCART (SC2) is input terminal, and SCART (SC1) is output terminal.

(2) LOOP working mode signal flow chart and working principle

When the player is in standby status, the machine enters LOOP working mode (only when SCART input and output are inserted at the same time, there is LOOP working mode function), LOOP_DECODER_C end is high level; pin 14, 15 of U8 output the audio/video signals inputted by SCART input terminal to make signals of input terminal connect to SCART output terminal through U8 for output. There is one group of input port in output terminal. When output ens is connected with TV set, audio/video signals sent from TV set input from the input port, after selection through U9, output to the output port of "SCART input terminal" for output. The component video signals inputted by SCART input terminal output to the amplified circuit composed of Q13 Q14 Q15 through U7 for output. When LOOP is working, CVBS/RGB output control circuit and screen display ratio control circuit do not work and are totally controlled by input source.

Remark: LOOP function is a switch function, in this period, the machine has no contact with external signal, but is only used as a switch port. To be easy to understand, we define Sc1 as output terminal, and Sc2 as input terminal (different from principle diagram, only for reference).

5 SCART terminal function selection is shown as the following table:

PIN	Definition	Description	Signal direction	PIN	Definition	Description	Signal direction
1	SC1_R_OUT	right channel audio output	OUT	12	NC	unused	
2	SC1_R_IN	right channel audio input	IN	13	GND	R_Or signal ground	

3	SC1_L_OUT	left channel audio output	OUT	14	NC	unused	
4	GND	audio ground wire		15	R_Cr	component video R_Cr signal output	OUT
5	GND	B_Cr signal ground		16	SC1_CVBS_RGB_SEL	CVBS/RGB control output	OUT
6	SC1_L_IN	left channel audio input	IN	17	GND	ground wire	
7	B_Cr	component video B_Cr signal output	OUT	18	GND	CVBS ground wire	
8	AV_CONTROL	screen ratio control output	OUT	19	SC1_CVBS_OUT	video output	OUT
9	GND	G_Cr signal ground		20	SC1_CVBS_IN	video input	IN
10	NC	unused		21	GND	ground wire	
11	G_Cr	component video G_Cr signal output	OUT				

6. SCART input terminal pin function introduction is shown in the following table:

PIN	Definition	Description	Signal direction	PIN	Definition	Description	Signal direction
1	SC2_R_OUT	right channel audio output	OUT	12	NC	unused	
2	SC2_R_IN	right channel audio input	IN	13	GND	R signal ground	
3	SC2_L_OUT	left channel audio output	OUT	14	NC	unused	
4	GND	audio ground wire		15	SC2_R	R signal input	IN
5	GND	B_Cr signal ground		16	VI_FSS	screen ratio control input	IN
6	SC2_L_IN	left channel audio input	IN	17	GND	ground wire	
7	SC2_B	B signal input	IN	18	GND	video ground	
8	AV_CONTROL	screen ratio control		19	SC2_CVBS_OUT	video output	OUT
9	GND	G signal ground		20	SC2_CVBS_IN	video input	IN
10	NC	unused		21	GND	ground wire	
11	SC2_G	G signal input	IN				

3.2.14 MIC circuit

1. MIC circuit block diagram is shown in the figure 3.2.14.1:

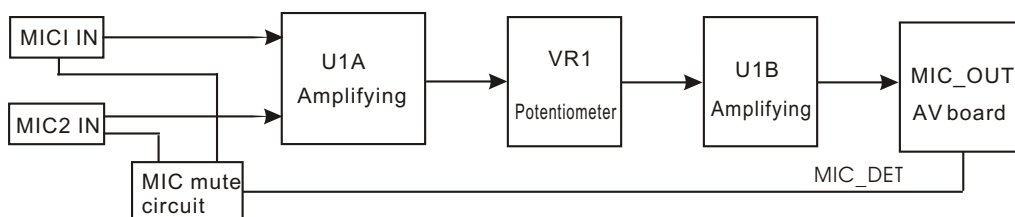


Figure 3.2.14.1 MIC circuit block diagram

2. MIC mute circuit

Shown in the figure 3.2.14.2, microphone detect is fulfilled through judging the level change of microphone socket MIC_DET pin; when microphone is inserted, MIC_DET +12V voltage suddenly decreases to 0V, C13 C14 in the circuit discharge through Q3 to make Q3 continue on, MIC_DET end keeps outputting high level to MIC signal in mute. For the electric charge of C13 C14 discharges quickly, after a period, MIC_DET end outputs negative voltage and MIC signal may output normally.

The delayed time may be changed through changing the RC constant of C14 C13 R17 R19.

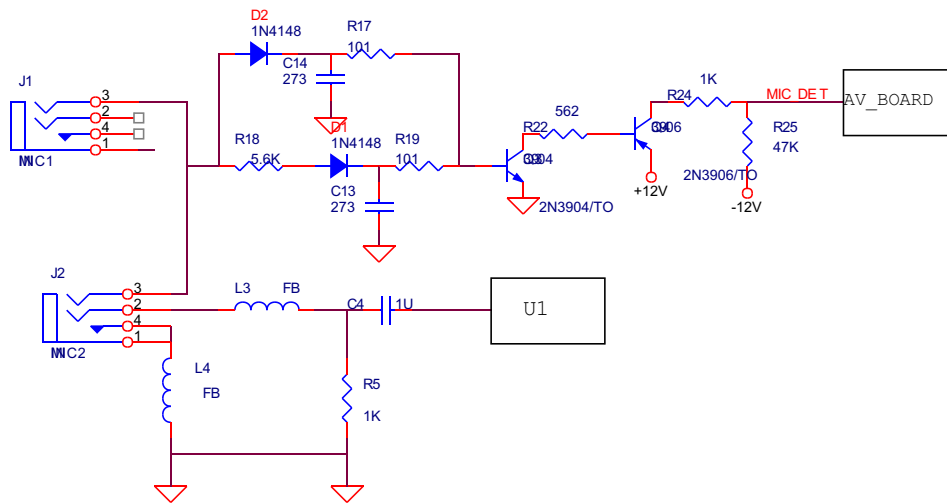


Figure 3.2.14.2 MIC mute circuit diagram

3. Amplifying circuit

Shown in the figure 3.2.14.3, the MIC signals inputted by MIC1, MIC2, through filtering circuit, input to pin 3 of U1 and then output from pin 1 after being amplified by U1A, input to potentiometer for volume adjustment, input to pin 5 of U1 for the second time amplification, R11 is feedback resistor and VR1 is potentiometer.

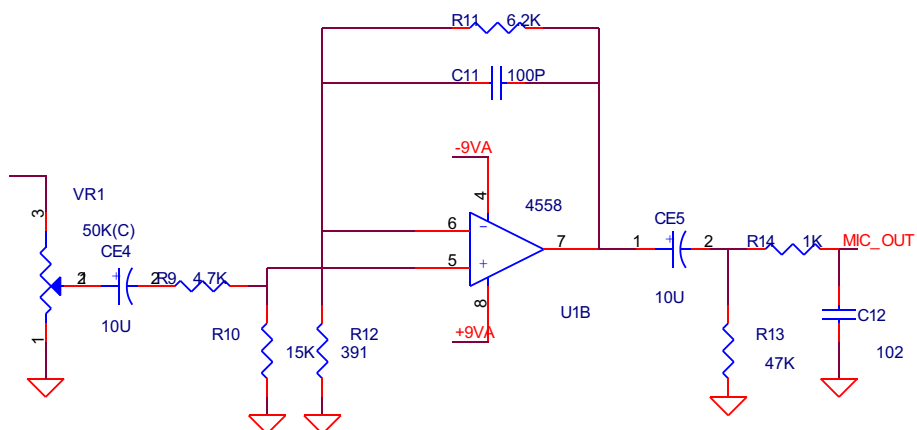


Figure 3.2.14.3 Amplifying circuit diagram

3.2.15 Power circuit

1. Power circuit block diagram is shown in the figure 3.2.15.1:

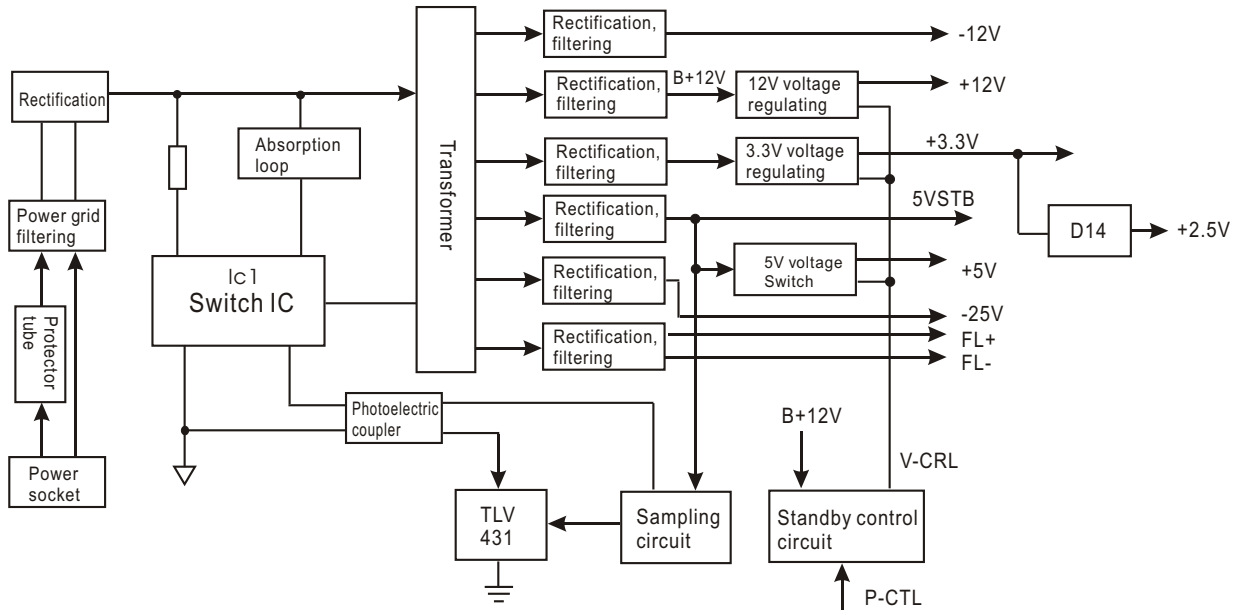


Figure 3.2.15.1 Power circuit block diagram

2. Working principle: after city power is inputted, through protection circuit and power grid filtering circuit, it directly enters the rectification circuit composed of D9~D12, in which protection circuit has over-voltage, over-current and temperature protection circuit. After being rectified, city power changes to DC current (the effective value is 1.4 times of city power, that is 300V) and is rectified by CE5. 300V power is divided into two ways: one way, through R6 voltage drop, is supplied to the start pin of switch module (IC1_6), the other way, through the 24 winding of transformer, arrives at the power pin of switch module (IC1_1) to make transformer perform the storage and discharge of energy through the internal switch pipe. When discharging energy, reverse peak voltage will produce, to prevent damaging the MOS pipe in switch module, the absorption loop protects MOS pipe. 5-6 winding is sampling winding, when the primary winding of transformer is discharging energy, the induction current forms between secondary winding and sampling winding, and induction voltage forms on the two ends of each secondary winding, after being rectified through secondary rectification diode, provides the required DC power for each circuit of the player. For power wave is large, to provide stable DC output, one winding of output end, after rectification and filtering (+5V or +3.3V generally), performs sampling, which is fulfilled by IC3 and the sampling circuit composed of the peripheral); when output voltage is on high side, IC3A K is on to make the light emission diode inside IC2 emit light to control the photo triode inside IC2, CE is on to change the space occupation ratio of switch pipe control end to make the output voltage become low, or else output voltage is on high side.

3. Working principle for standby switching to power on

Power-on standby: 5V_STB is supplied to panel IC13616 to make panel circuit begin working, display screen displays time, P_CTL pin of panel IC outputs low level to V_CRL end output low level, power of +3.3V +12V +5V cannot output (other power is normally supplied during this period), and machine enters standby status. After panel or remote controller inputs power-on instruction, P_CTL pin of UPD16316 outputs high level to make B+12V arrive at the switch control circuit of +3.3V, +12V, +5V through C-E electrode of Q9. Q2/Q7/IC4 is on, +3.3V +12V +5V output is normal, and the player enters working status.

4. Working principle

Shown in the figure 3.2.15.2, B+12V voltage after being rectified by D2, through being filtered by the filter composed of L2/CE3/CE4, inputs to pin 1 of power board IC4, IC4 is a +12V voltage stabilizing IC with on/off control function, when machine is in standby, state is P_CTL which is low level, Q6/Q9 cuts off, V_VRL end outputs low level, when control end of IC4 is low level, pin 2 of IC4 has no voltage output. When machine switches from standby to power on, P_CTL outputs high level, Q6/Q9 is saturated on, V_VRL end outputs 12V level, IC4 is on, pin 2 of IC4 outputs +12V voltage and machine enters working state.

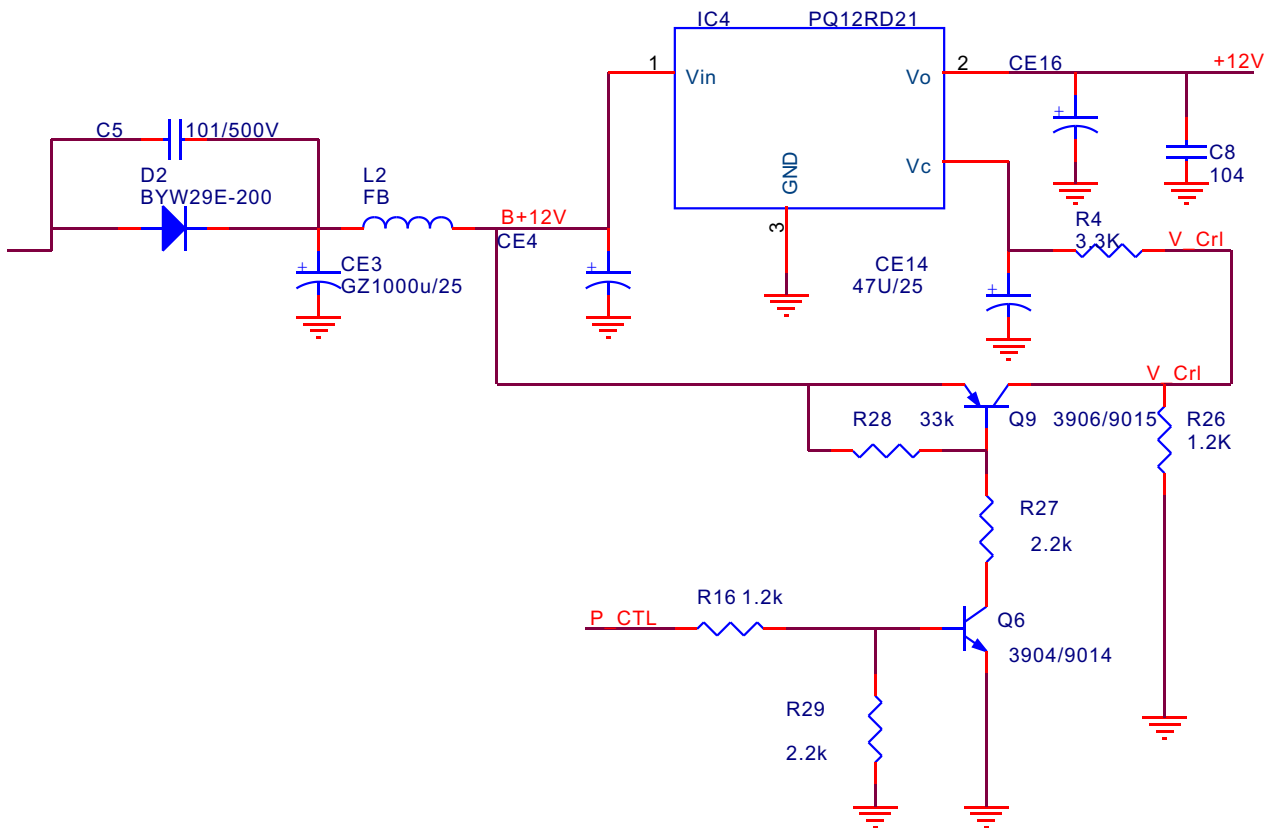


Figure 3.2.15.2 Switch control, voltage regulating circuit diagram

Section Three Servicing Cases

3.3.1 Servicing cases

【Example 1】 Description: power not on

Symptom: after connecting to power, power indicator light is not on, panel has no screen display, and panel buttons have no function.

Analysis and troubleshooting: according to trouble symptom, we can judge that trouble lies in power part. Firstly observe fuse, and it is not burnt down; use DC level of multimeter to test voltage on two ends of Ce5 and it is normal, which should be 300V in normal conditions, so we preliminarily doubt that power switch IC does not work normally, shown in the figure 3.3.1.1, test voltage of each pin of Ic1 in turn and find that pin 3 is 0V, pin 3 is start pin and it should be 22V, power off the machine, use multimeter the resistance of R6 and it is normal, then test and find that resistance to ground of pin 3 of Ic1 is 0 ohm, adopt disconnection method to disconnect CE11 D17, and resistance to ground of pin 3 of Ic1 is still 0 ohm, so we doubt that IC1 FSDM07652R has trouble, after changing IC with the same specification trouble is removed.

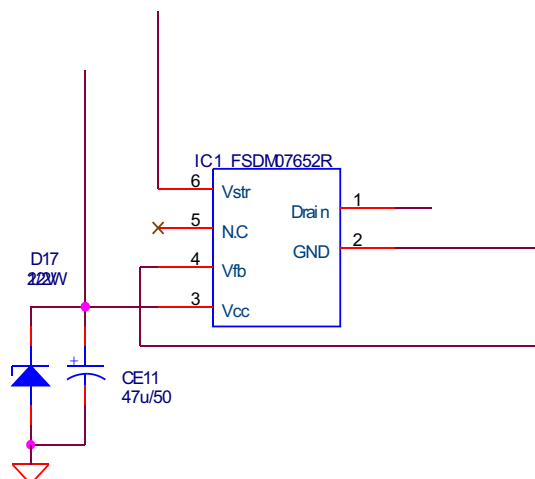


Figure 3.3.1.1 Power circuit diagram

【Example 2】 Description: machine failure after power on

Symptom: after connecting with power, power indicator light is on, picture of the player has output, but after pressing POWER button, HELLO displays all the time, panel buttons have no function.

Analysis and troubleshooting: this kind of trouble may lie in many places: loader, decode board, AV board, I2C bus and abnormal voltage. "Replace" method is often adopted to repair this kind of trouble machine. Firstly judge which semi-finished components caused this trouble, then repair the defective semi-finished products. Firstly use multimeter to test loader and hard disk power supply 5V, 12V. When testing 12V voltage, it is 0V. +12V voltage is mainly supplied for small fan, loader and hard disk. Under the condition of multiple channel power supply, adopt disconnection method to decide trouble range. After disconnecting power supply of loader, test power board +12V power supply voltage and it resumes normal, which means the trouble of loader causes that there is no 12V power supply. After changing loader, trouble is removed.

【Example 3】 Description: no sound

Symptom: DVD playing, external signal switch and TV signal receiving have no sound.

Analysis and troubleshooting: according to trouble symptom, we can judge that trouble lies in audio output circuit. Firstly use multimeter to test power supply of AV board audio amplifying circuit and $\pm 12V$ voltage is normal, test input pin of AV board audio amplifying circuit U3 and there is audio signal input, use oscillograph to test C33, C37 of AV board and there is audio signal output, which means that front stage circuit is normal, so we doubt that mute circuit has trouble. Use multimeter to test mute circuit AMUET and it is high level, which means that mute circuit has started up and machine enters mute state. Use multimeter to test base electrode of Q6 and find that base electrode voltage of this triode is 4.5V, test base electrode of Q8 and find that this pin is high level, this pin voltage is sent out from panel IC UPD16316, so we doubt UPD16316 has trouble, after changing it, trouble is removed.

【Example 4】 Description: machine failure after power on

Symptom: after connecting to power, power indicator light is on, picture of the player has no output, and panel has no screen display, panel buttons have no function.

Analysis and troubleshooting: adopting troubleshooting method of example 2 we judge that the reason that leads to machine failure is the trouble of main panel, which shows in the following aspects: clock is incorrect or there is no clock, reset circuit cannot work normally, main panel U1 (UPD16316) cannot work normally. Use multimeter to test each pin of U1 (UPD16316) and the voltage and reset are normal, use oscillograph to test 5MHZ crystal oscillator and there is no

oscillation frequency, check peripheral elements and there is no abnormality. After changing the crystal oscillator with the same specification, trouble is removed.

【Example 5】 Description: clock cannot be saved

Symptom: after power off each time, panel screen does not display the local time and system time is disordered.

Analysis and troubleshooting: this player has RTC function, only local time has been set, when power on again after power off each time, the local time will be kept unchanged. If clock is not accurate, firstly check AV board RTC circuit. Shown in the figure 3.3.1.2, firstly test whether power supply of U2 is normal, if power supply is normal, then use oscillograph to test X1 32.567KHZ crystal oscillator and there should be oscillation waveform when in normal conditions, but in fact there is no waveform now. After changing the crystal oscillator with the same specification, trouble is removed.

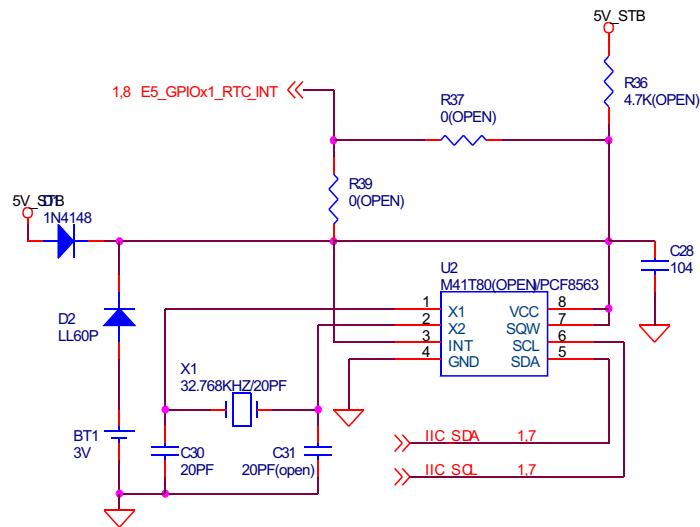


Figure 3.3.1.2 Clock circuit diagram

【Example 6】 Description: machine failure when receiving TV signal

Symptom: machine failure each time when receiving TV signal, that is, panel buttons and remote controller have no function, and other functions are normal.

Analysis and troubleshooting: according to trouble symptom, this trouble lies in AV board tuner circuit. Firstly use multimeter to test power supply of tuner and I2C bus voltage, which should be 5V for tuner power supply and 5V for IIC bus, but in fact IIC SDA voltage tested is 5V, power supply of tuner is 0V normal, after analysing through schematic diagram, tuner power supply loop, after power board +5V being filtered by FB1 inductor, is provided for tuner, test power board +5V voltage and it is normal, observe FB1 inductor carefully and it has been broken, after changing elements with the same specification, trouble is removed. (Tuner cannot work, so machine failure when receiving.)

【Example 7】 Description: cannot search TV signal

Symptom: picture has serious white dots when receiving but there is no image.

Analysis and troubleshooting: machine failure when receiving TV signals is mainly caused by AV board tuner circuit, use multimeter to test its power supply and I2C bus voltage, power supply 5V and IIC bus 5V are both normal, in the course of searching, pin 2 BT of tuner has high and low voltage variation, which means that tuner works normally,, we pay attention to check the peripheral, use multimeter to test the resistance of R16 and it is infinite, which is 0 ohm in fact, after changing resistor with the same specification, trouble is removed.

【Example 8】 Description: picture of external input had mosaic

Symptom: when switching to external signal input, TV picture has interference, there is no picture but there is sound.

Analysis and troubleshooting: according to trouble symptom, we can decide that trouble appears in external input video processing circuit, the flow of external input signal is that external video signals input to AV board, after A/D conversion by U15, digital video signals after U15 conversion input to decode chip in the means of parallel data. Firstly we test each power supply and reset circuit of decode board U15 TVP5146 and the result is normal, then use oscillograph to test clock signal of pin 74, 75 and find that clock is 14.31818MHZ and waveform is normal. So we doubt that U15 has trouble, after changing U15, trouble is removed.

【Example 9】 Description: no MIC

Symptom: no sound after inserting microphone, sound of DVD playing, TV signal receiving and external switch is normal.

Analysis and troubleshooting: according to this symptom, we can roughly judge that trouble appears in Karaoke processing circuit. Firstly use oscillograph to test OK signal input pin of AV board and find that there is no OK signal input, so we decide that trouble lies in MIC board. Use signal generator to act as signal source, the output part is connected to MIC socket of MIC board, use oscillograph to detect waveform from front stage to rear stage. Use oscillograph to test pin3 of OK signal U1 4558 and there is input signal, then test pin 1 of U1 and find that there is no signal output, which means that 4558 does not work normally, test the power supply voltage -12V, +12V and it is normal, check the peripheral elements and they are normal, so we doubt that 4558 has trouble, after changing U1, trouble is removed (if there is no signal generator, microphone can be used to replace.).

【Example 10】 Description: no image when receiving TV signals

Symptom: when playing DVD, picture, sound and external sound are all normal, only when switching TV set, there is no image but sound is normal.

Analysis and troubleshooting: working principle of the tuner used in this machine has some differences from that of the tuner used in TV set. Audio and video of the tuner used in this player have separate output, seen from the schematic diagram, pin 12 of high frequency tuner outputs video signals, which are coupled through C29 capacitor to Q31, Q33 for amplifying to send to pin 22 of AV board CN2 socket and output to decode board. Firstly use oscillograph to test pin 12 of tuner and there is video signal output, then test emitter electrode of Q33 and there is also video signal output, when testing 22 pin of decode board CN6 and there is no waveform output. Use multimeter to test the resistance between pin 22 of AV board CN2 and pin 22 of decode board CN6 and it is infinite, which should be zero in normal conditions. After changing 26P flat cable, trouble is removed.

【Example 11】 Description: no sound when watching TV program

Symptom: DVD playing, sound and image of external signals are normal, and there is no sound only when in TV signals input.

Analysis and troubleshooting: outputted by pin 14 of AV board high frequency tuner, TV signals are sent to AV board U6 for NICAM processing, then outputted to U1 through pin 30, 31 of U6 after NICAM processing, then sent to decode board for audio processing after gating. Firstly check whether audio system is normal, use oscillograph to test pin 14 of AV board tuner and audio output is normal, check U6 output pin and there is no waveform output, check pin 2 of U6 and there is audio signal input, which means that this U6 does not work normally. Firstly check power supply and reset of U6 and they are both normal, so we doubt that clock of U6 is abnormal, use oscillograph to test X2 crystal oscillator and find that there is no oscillation waveform, so we doubt that crystal oscillator has trouble, after changing 18.432MHZ crystal oscillator, trouble is removed.

【Example 12】 Description: external input has no sound

Symptom: sound and picture of DVD playing are normal, when switching external signal, there is picture but no sound.

Analysis and troubleshooting: this kind of trouble mainly appears in externally-inputted audio signal processing channel. When in troubleshooting, start from rear stage circuit of U1 of AV board. Machine is switched to external AV state. Use oscillograph to test pin 3 and pin 13 of AV board U1 and there is audio signal output, so we judge that external input circuit of AV board is normal, test pin 10, 12 of decode board U18 (CS5340) and there is also audio signal input, so we judge that AV

Board and the line from AV board to decode board U18 are normal, test pin 4 of U18 and find that there is no digital signal output, test each pin voltage of U18 (CS5340) and they are all normal, each clock signal is normal, so we doubt that CS5340 has trouble, after changing CS5340, trouble is removed.

3.3.2 Troubleshooting flow chart

1. Troubleshooting process for “DV has no output” is shown in the figure 3.3.2.1:

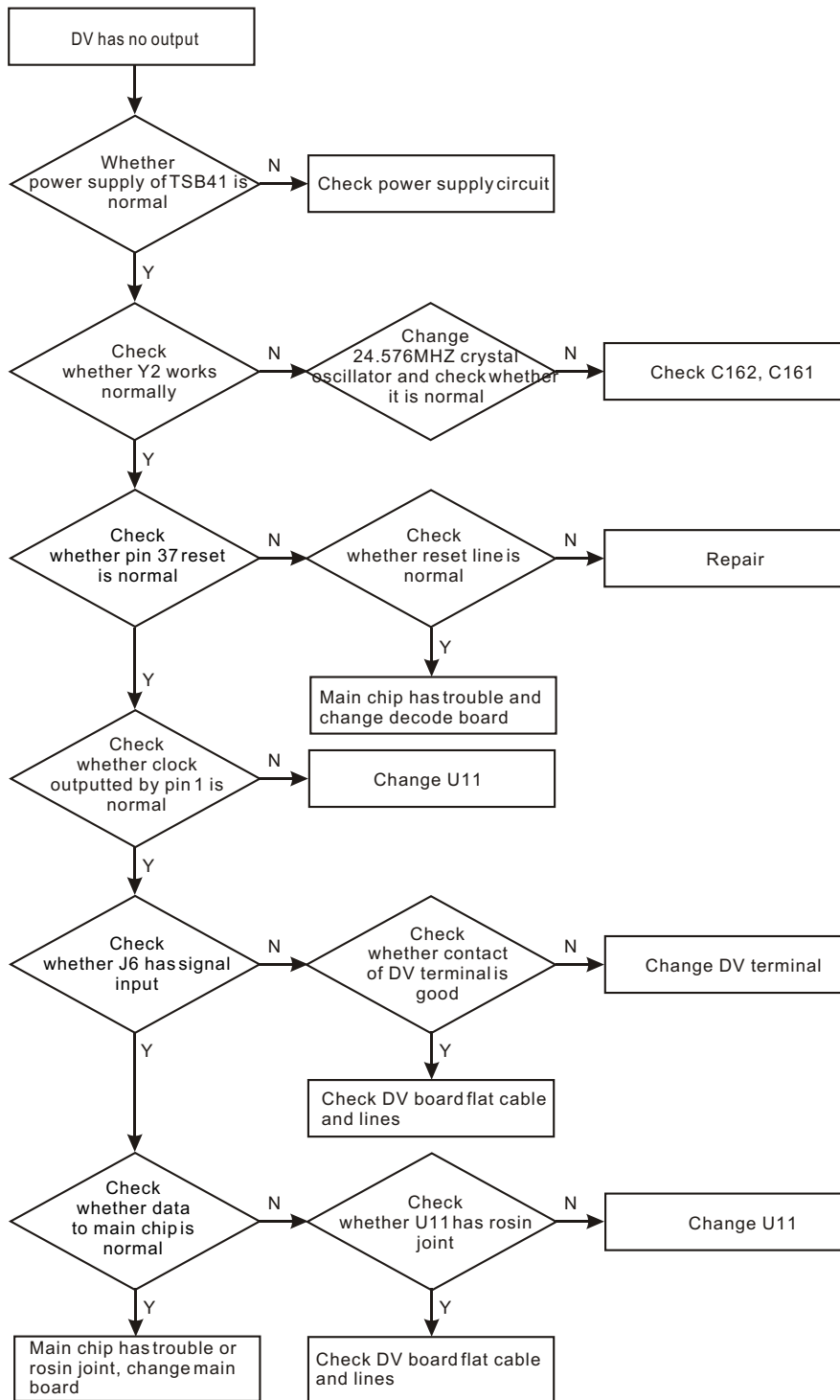


Figure 3.3.2.1 Troubleshooting flow chart for “DV has no output”

2. Troubleshooting process for “No read USB device” is shown in the figure 3.3.2.2:

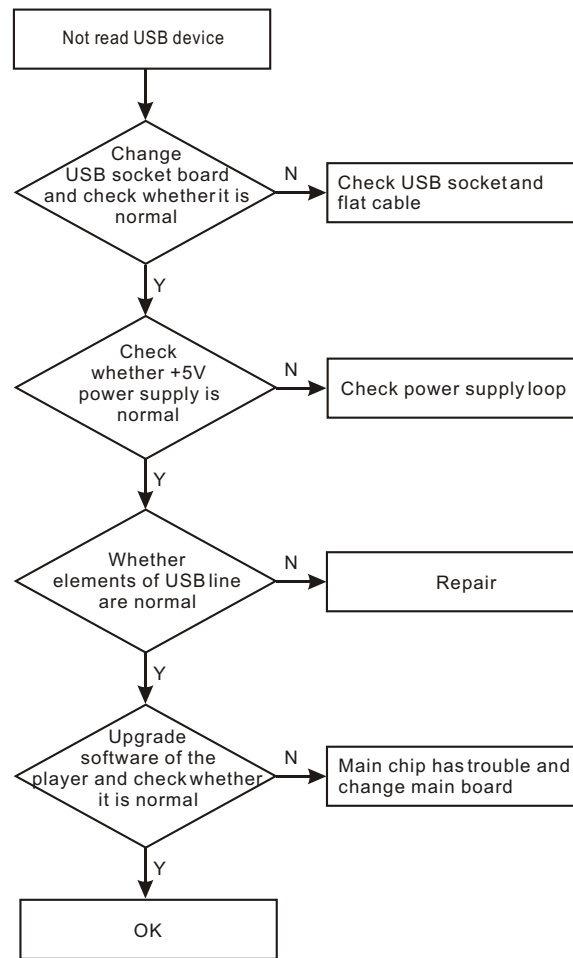


Figure 3.3.2.2 “Troubleshooting flow chart for “Not read USB device”

3. Troubleshooting process for “Power not on” is shown in the figure 3.3.2.3:

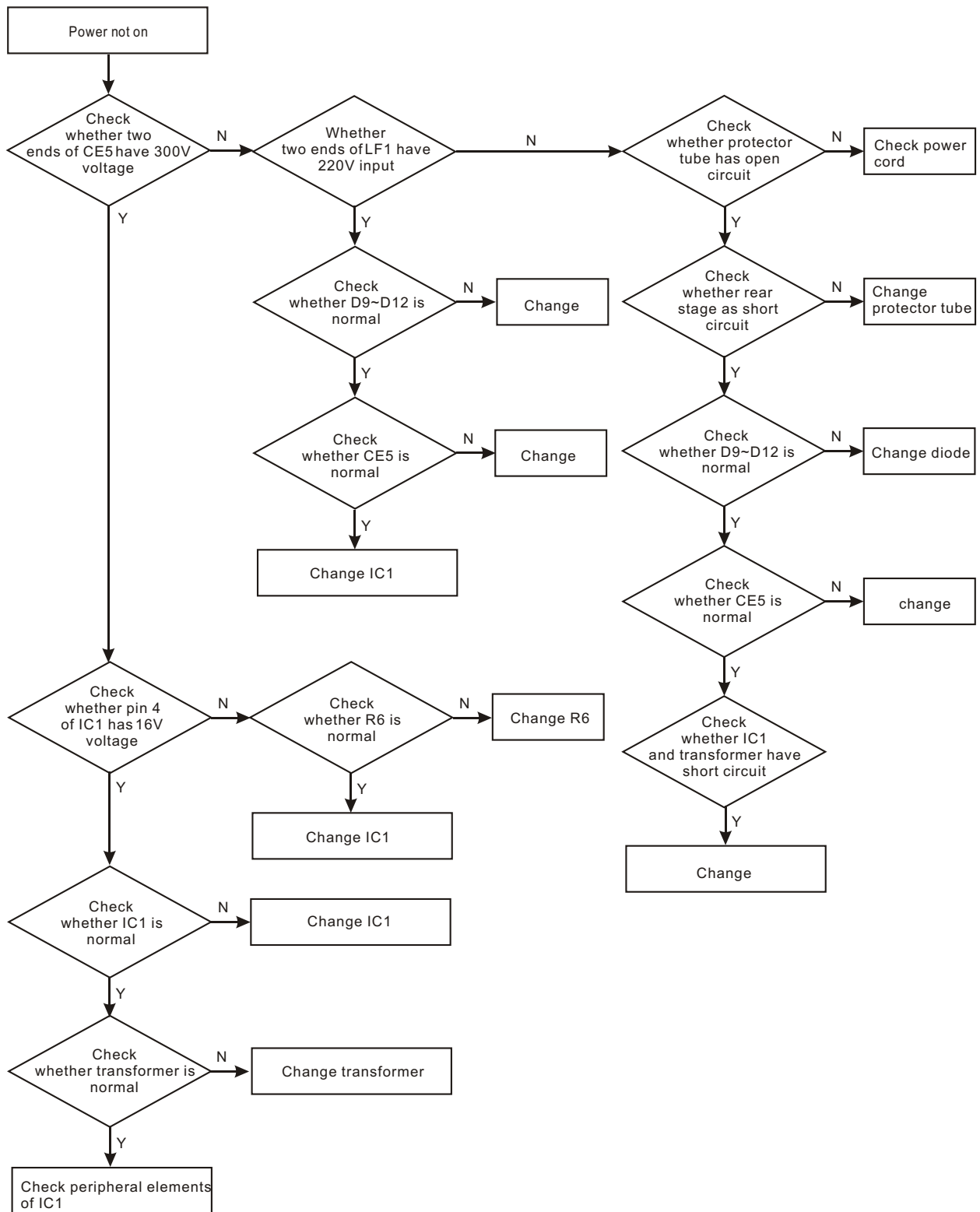


Figure 3.3.2.3 Troubleshooting flow chart for “Power not on”

4. Troubleshooting process for “Cannot enter power-on from standby” is shown in the figure 3.3.2.4:

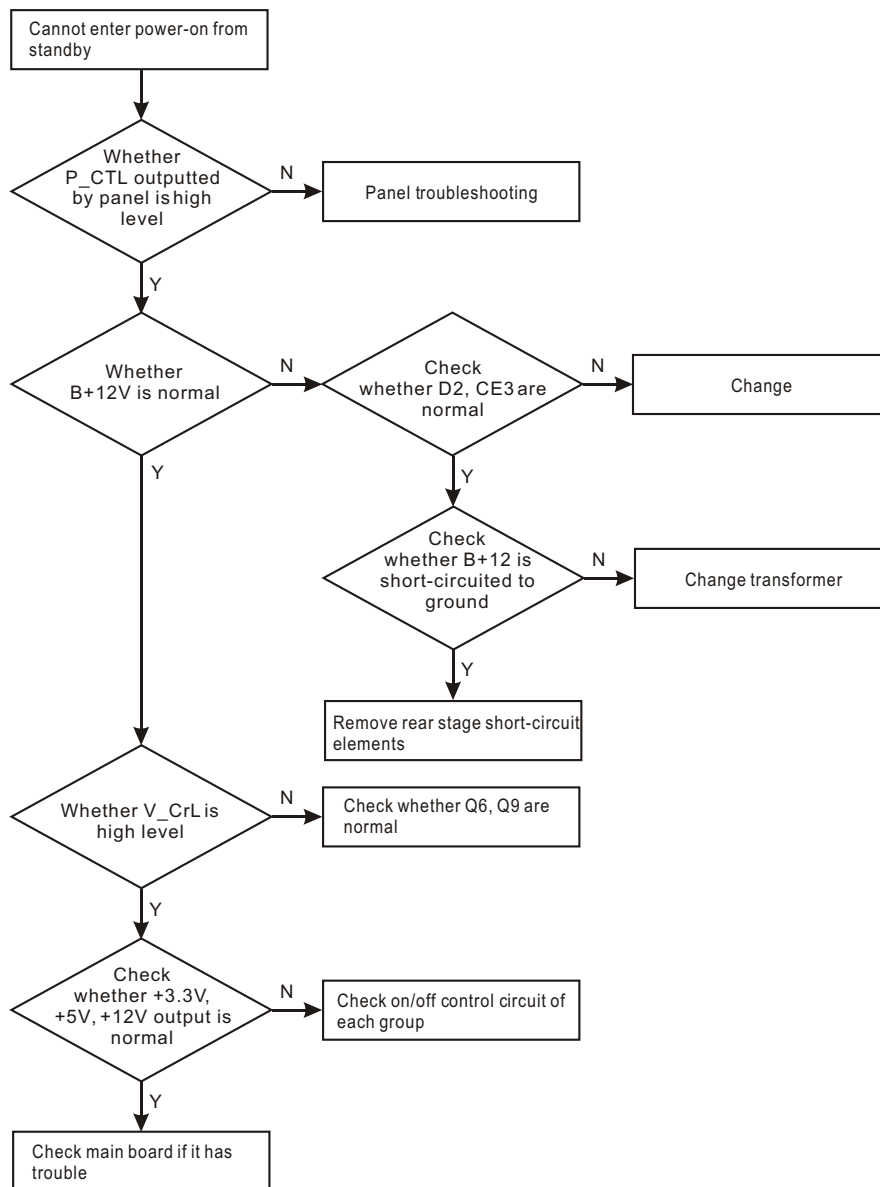


Figure 3.3.2.4 Troubleshooting floe chart for “Cannot enter power-on from standby”

5. Troubleshooting process for “No display” is shown in the figure 3.3.2.5:

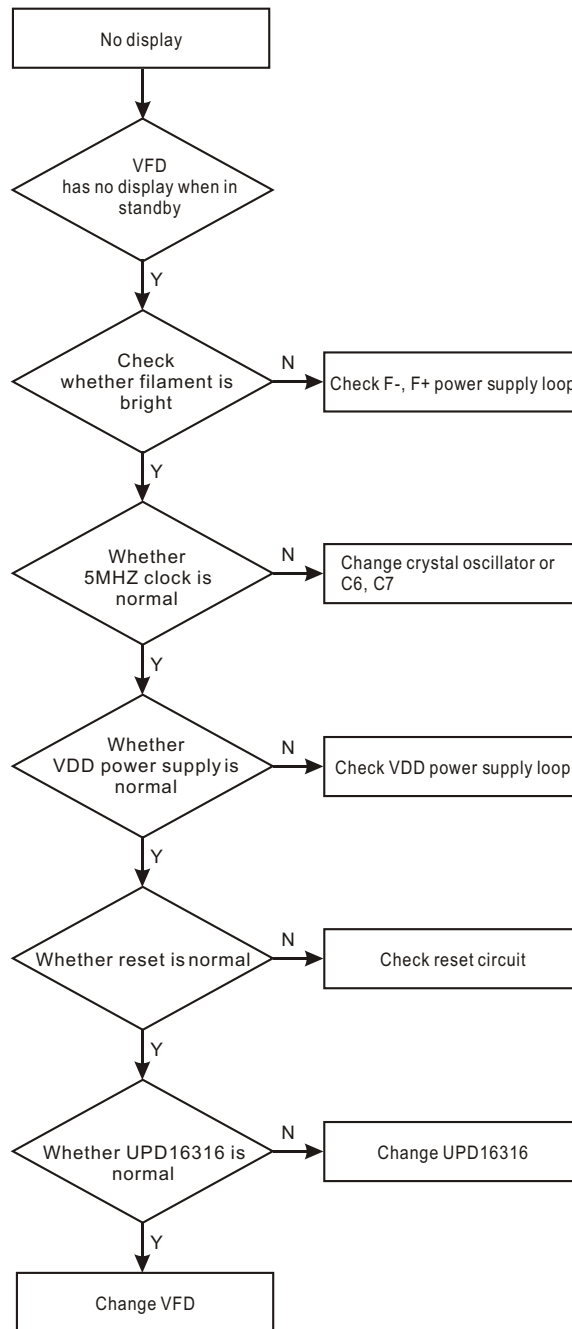


Figure 3.3.2.5 Troubleshooting flow chart for “No display”

6. Troubleshooting process for “+12V has no voltage output” is shown un the figure 3.3.2.6:

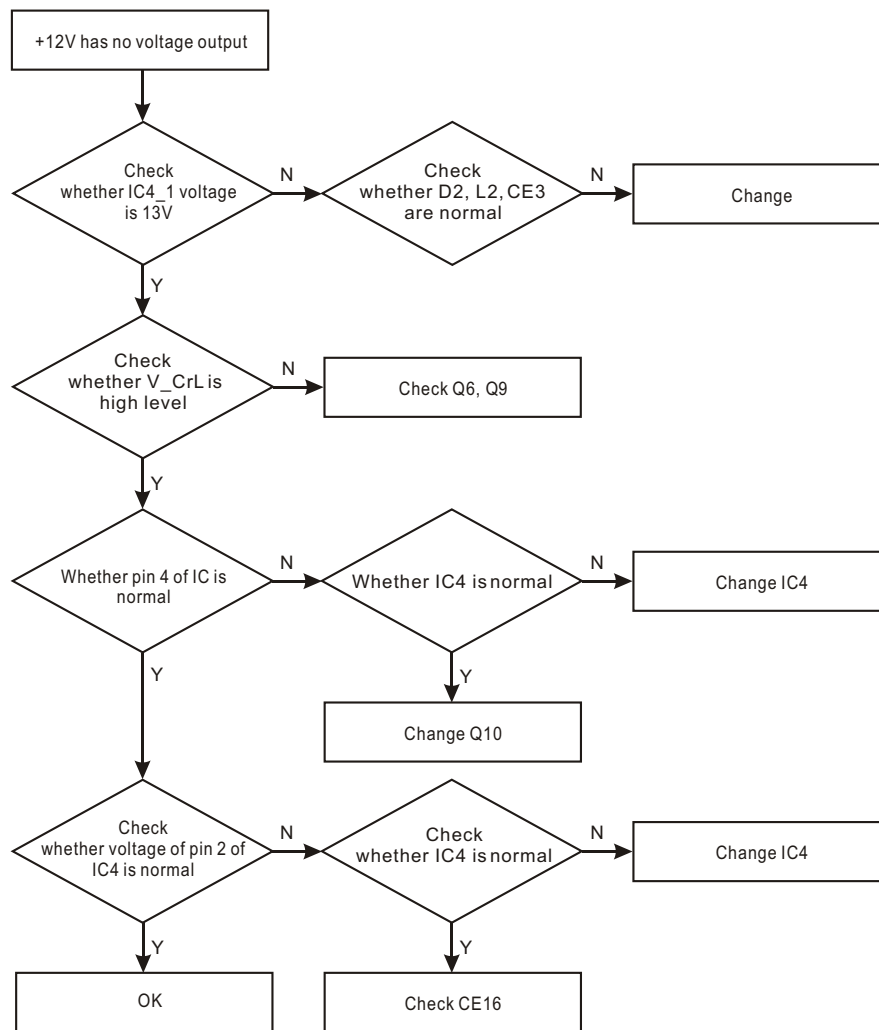


Figure 3.3.2.6 Troubleshooting flow chart for “+12V has no voltage output”

7. Troubleshooting process for “External input has no sound output” is shown in the figure

3.3.2.7:

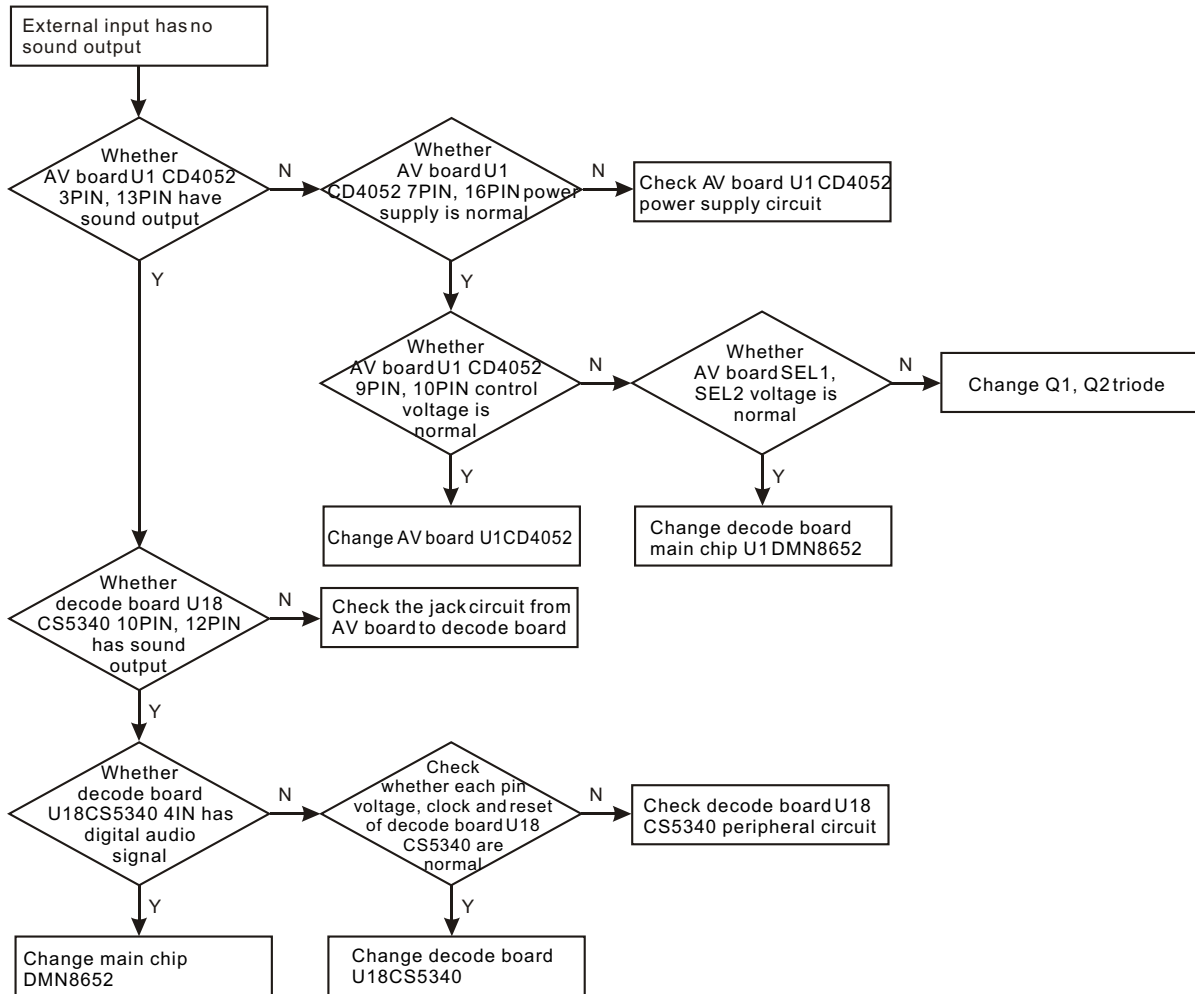


Figure 3.3.2.7 Troubleshooting flow chart for “External inputs has no sound output”

8. Troubleshooting process for “TV signal has no sound output” is shown in the figure

3.3.2.8:

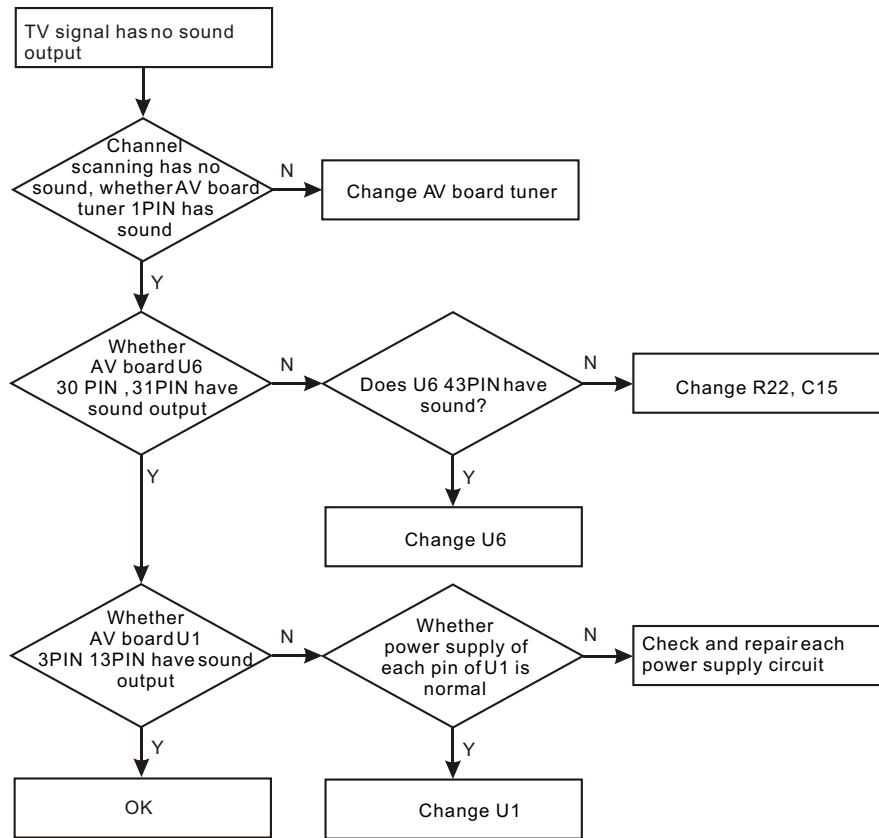


Figure 3.3.2.8 Troubleshooting flow chart for “TV signal has no sound output”

9. Troubleshooting process for “TV signal input has no image” is shown in the figure 3.3.2.9:

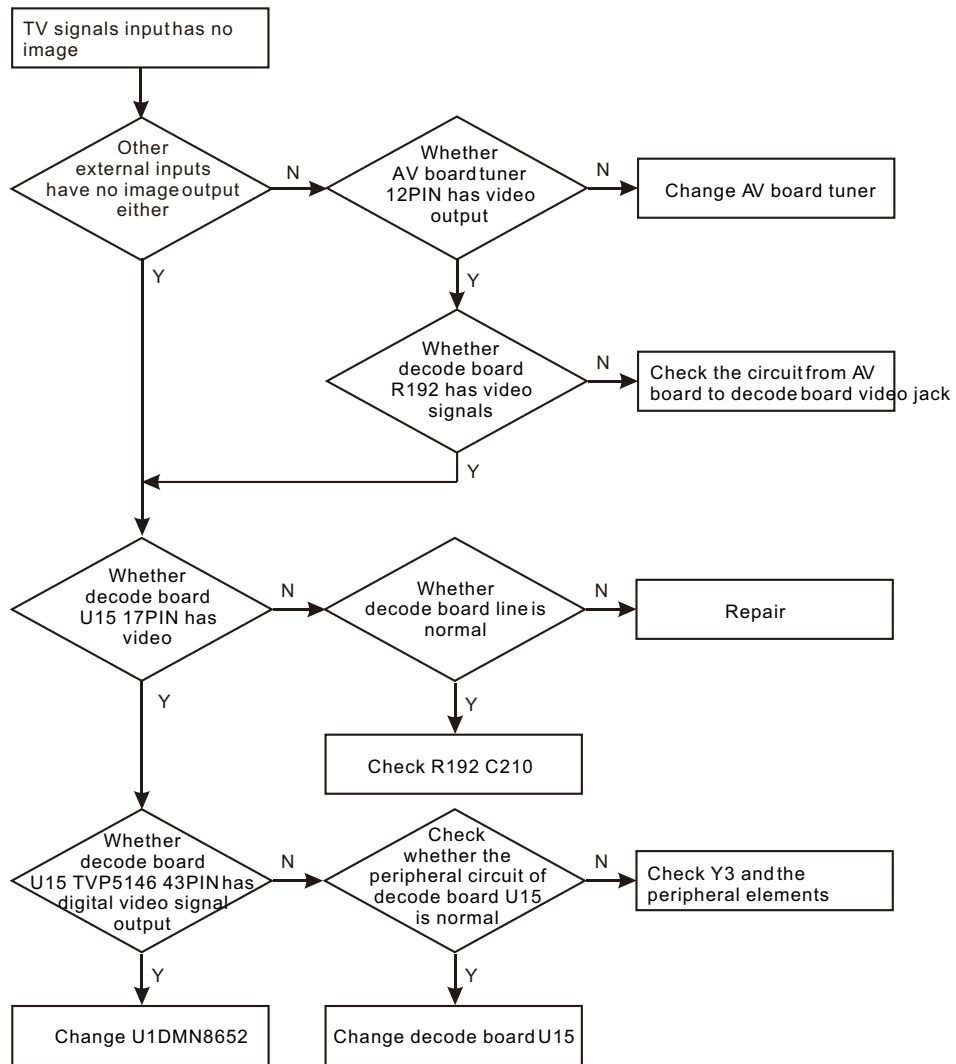


Figure 3.3.2.9 Troubleshooting flow chart for “TV signal input has no image”

10. Troubleshooting process for “Cannot receive TV signal” is shown in the figure 3.3.2.10:

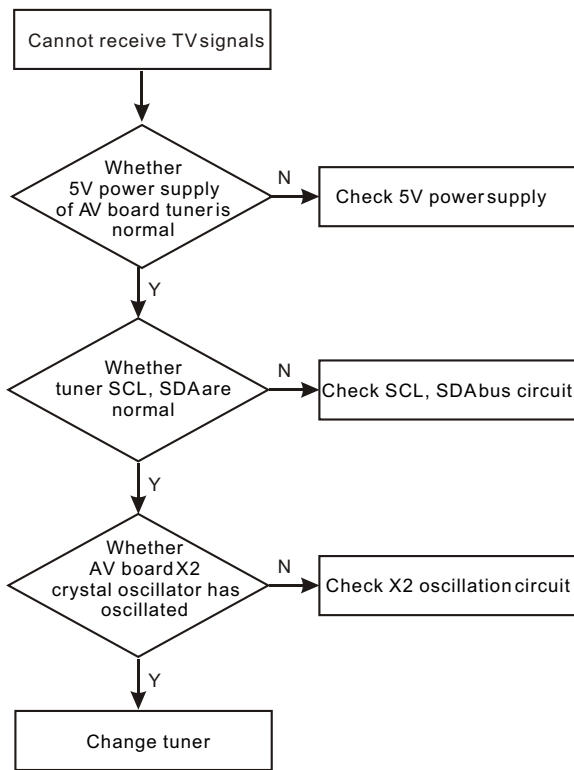


Figure 3.3.2.10 Troubleshooting flow chart for “Cannot receive TV signals”

11. Troubleshooting process for “No sound when playing discs” is shown in the figure

3.3.2.11:

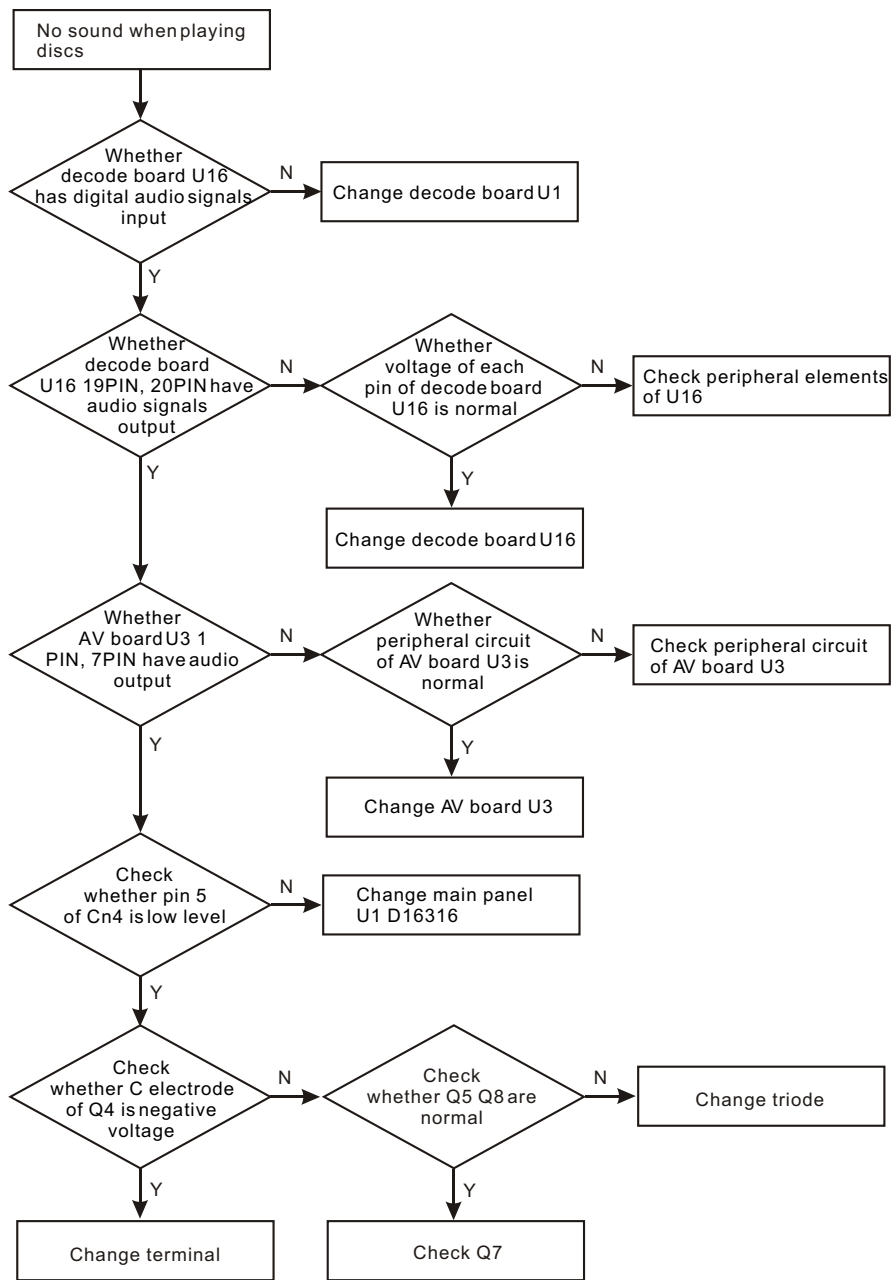


Figure 3.3.2.11 Troubleshooting flow chart for “No sound when playing discs”

12. Troubleshooting process for “Pictures of external input has mosaic” is shown in the figure 3.3.2.12:

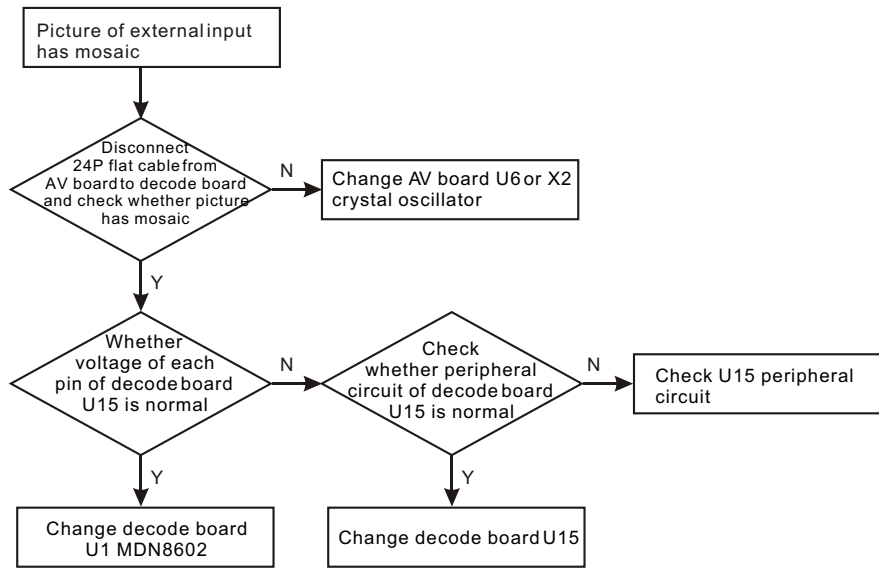


Figure 3.3.2.12 Troubleshooting flow chart for “Picture of external input has mosaic”

13. Troubleshooting process for “Machine failure after power on” (there is power-on picture but on button function) is shown in the figure 3.3.2.13:

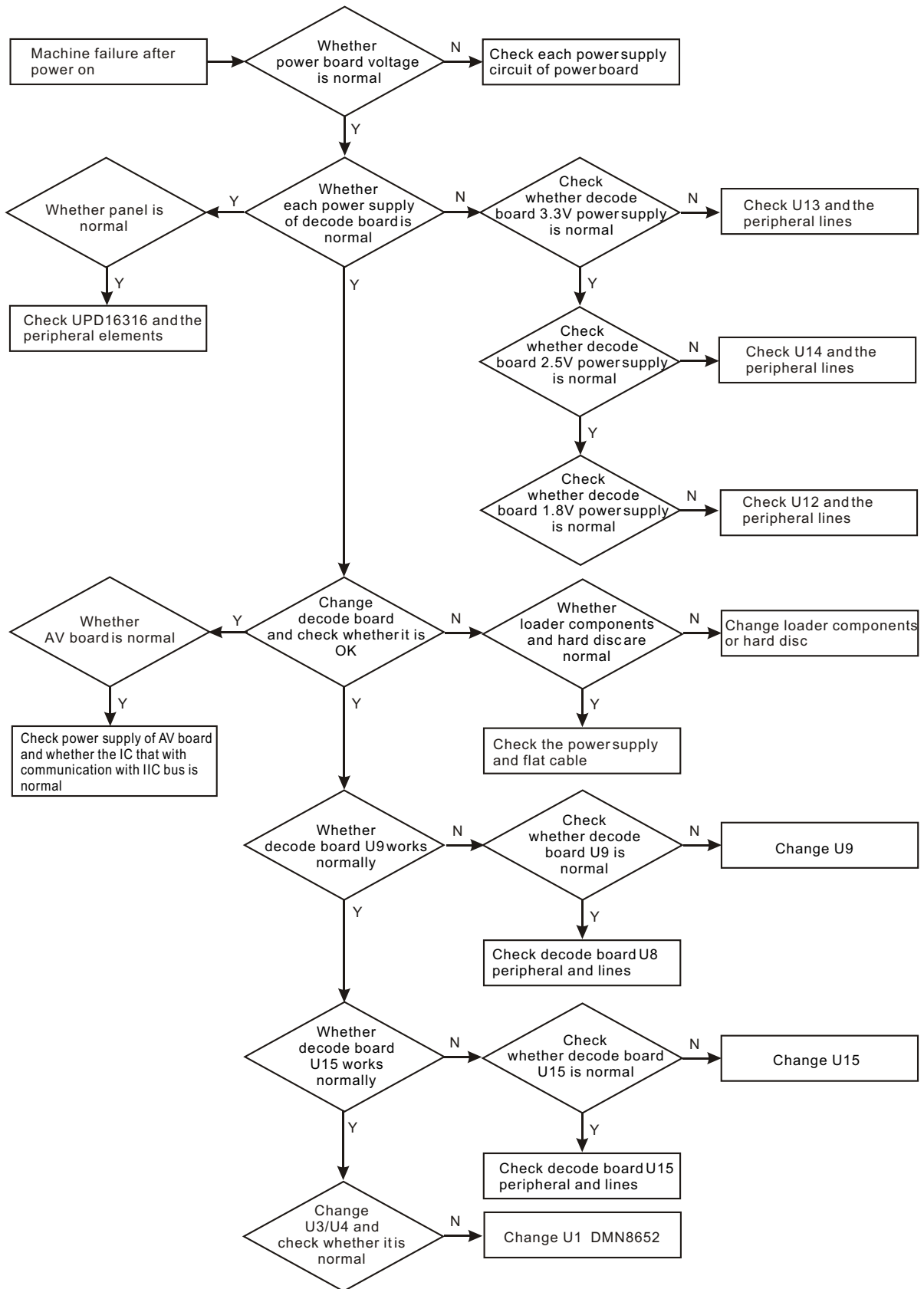


Figure 3.3.2.13 Troubleshooting flow chart for “Machine failure after power on”

14. Troubleshooting process for “Player has no output” (no power-on picture and no buttons function) is shown in the figure 3.3.2.14:

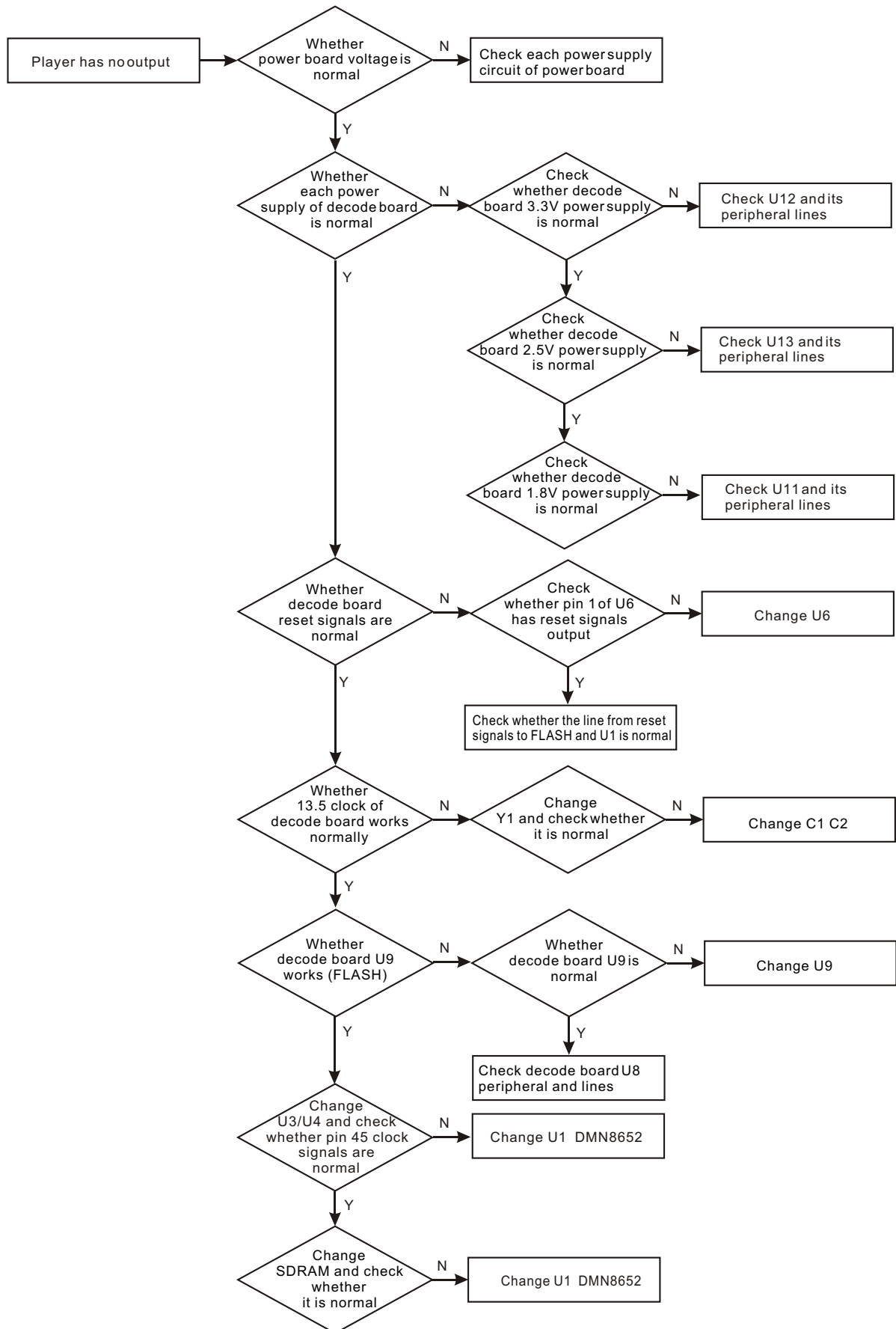


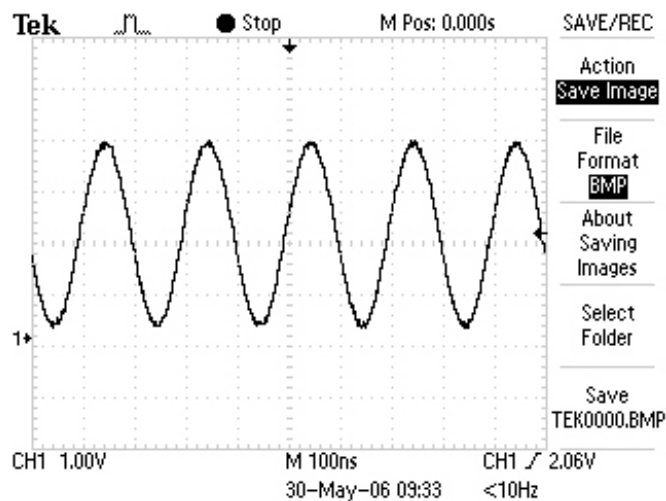
Figure 3.3.2.14 Troubleshooting flow chart for “Player has no output”

Section Four Servicing Parameters

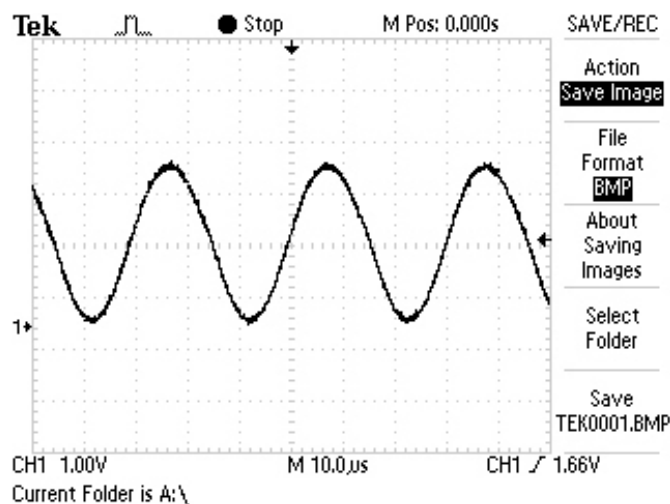
3.4.1 Signal waveform diagram

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.

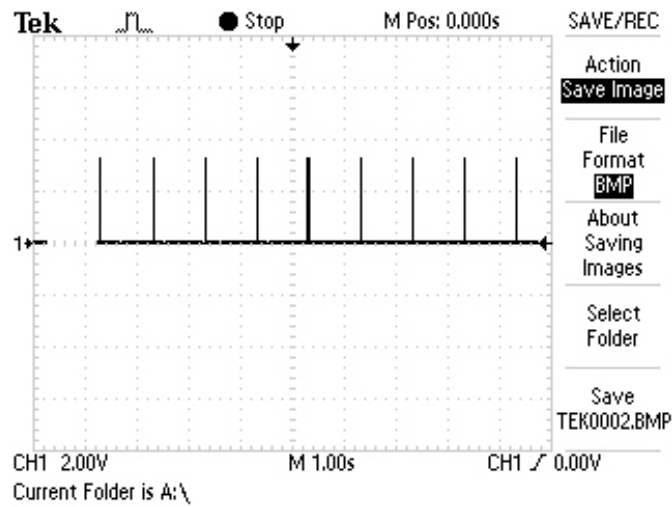
1. Main panel clock (5MHZ) waveform diagram. Test point: U1_51; peak value: 3.64V.



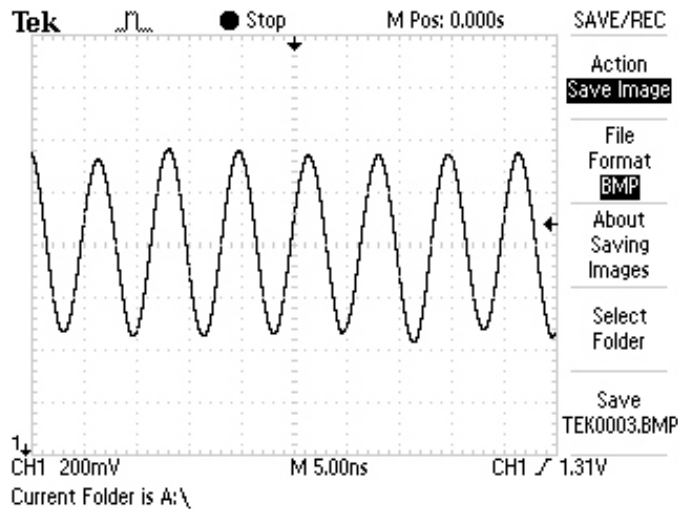
2. Waveform diagram of crystal oscillator (32.766KHZ) connected with panel clock signal externally. Test point: U1_2, peak value: 3.16V.



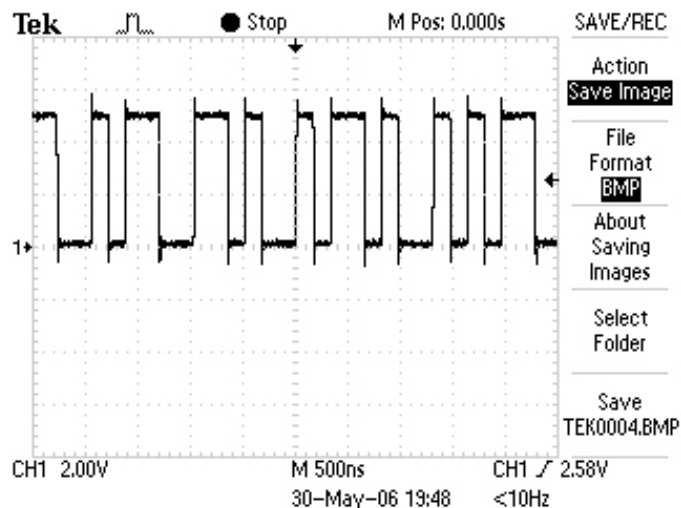
3. VFD_CLK signal waveform diagram. Test point: panel flat cable position.



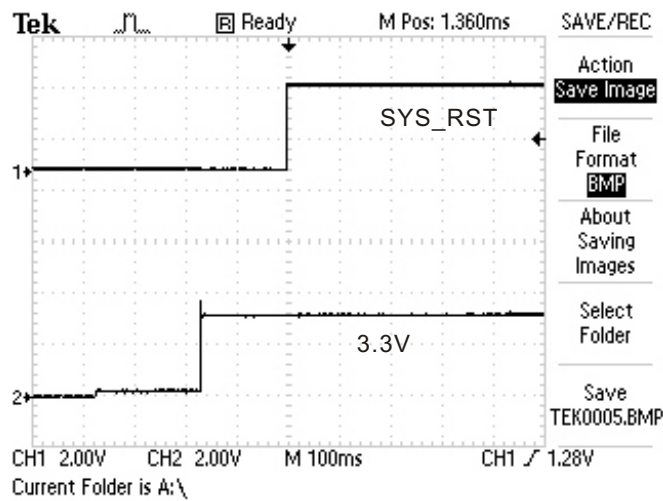
4. SDRAM clock signal waveform diagram. Test point: U3_45. U4_45; peak value: 736MV; frequency: 150MHZ.



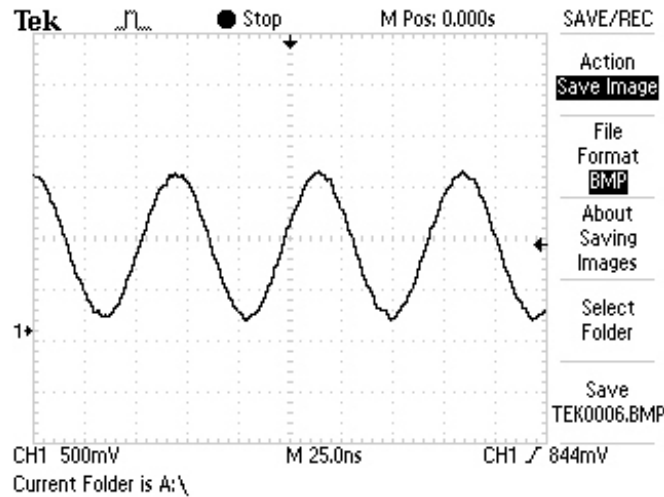
5. SPDIF_OUT signal waveform diagram. Test point: U5_12; peak value: 6.56V.



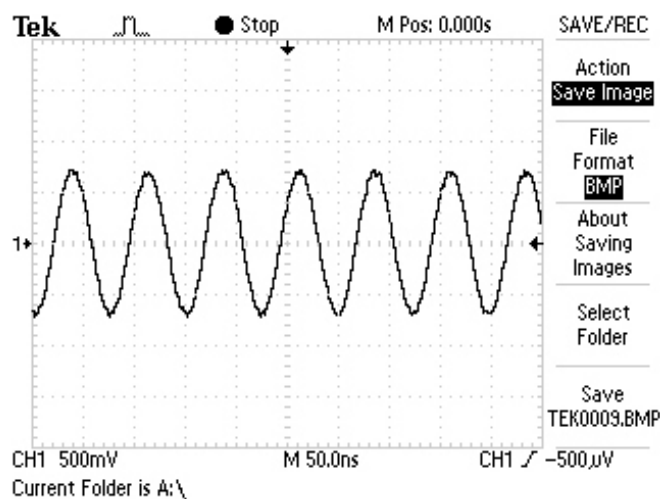
6. System reset signal waveform diagram. Test point: R266.



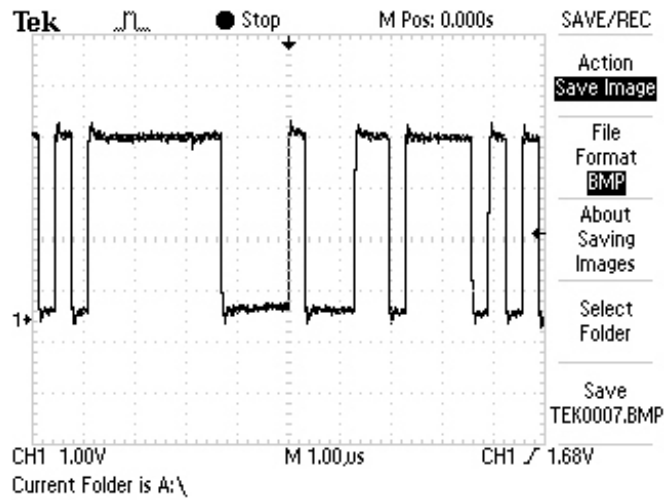
7. Video encoder clock waveform diagram. Test point: U15_75; peak value: 1.46V; frequency: 14.3MHZ.



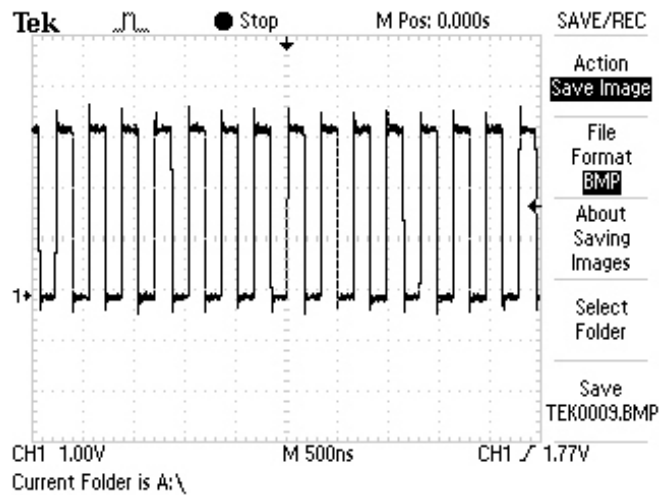
8. Main clock signal waveform diagram (13.5MHZ); test point: Y1; peak value voltage: 1.44V.



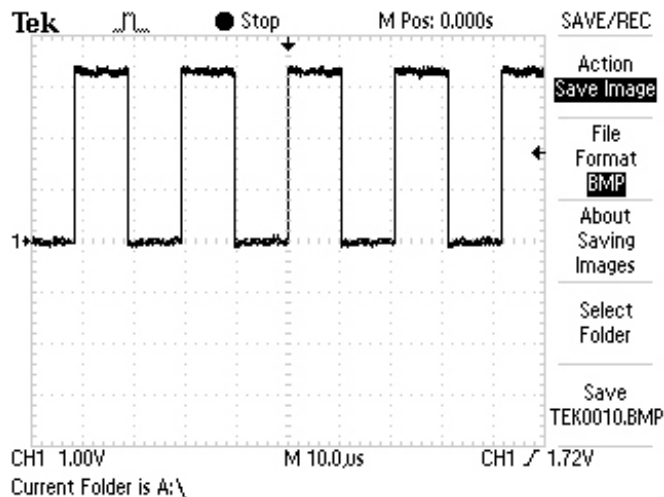
9. Waveform diagram of digital audio signal (AO D1) outputted by decode chip; test point: U16_4; peak value: 4.04V.



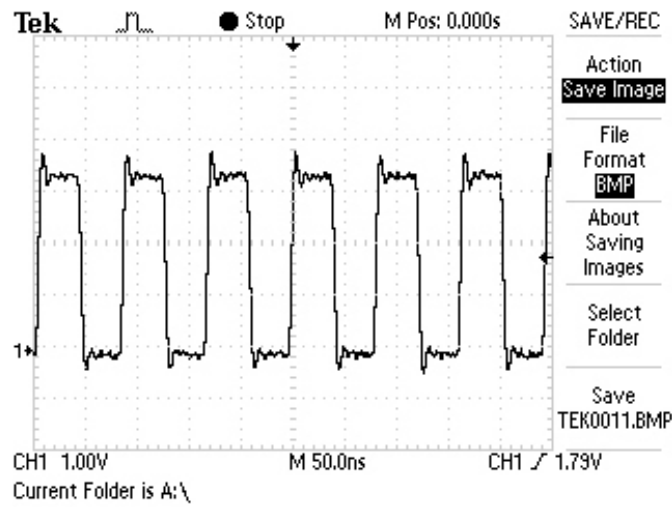
10. AO_SCLK bit clock signal waveform diagram; peak value: 4.12V; voltage: 1.64V; test point: U16_5.



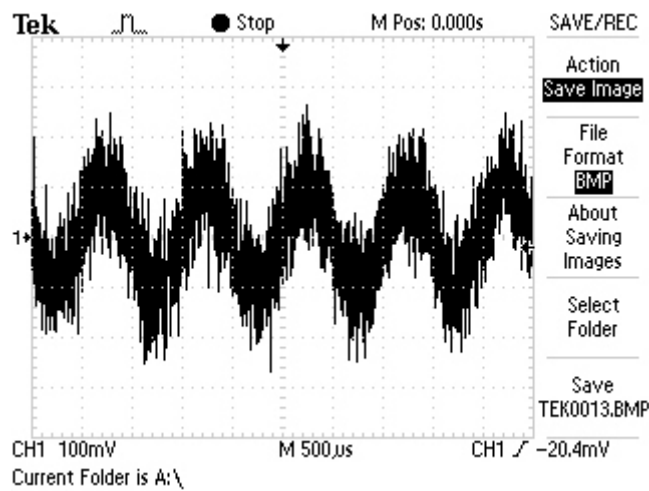
11. AO_FSYNC left/right clock signal waveform diagram; peak value: 3.52V; voltage: 1.63V; test point: U16_6.



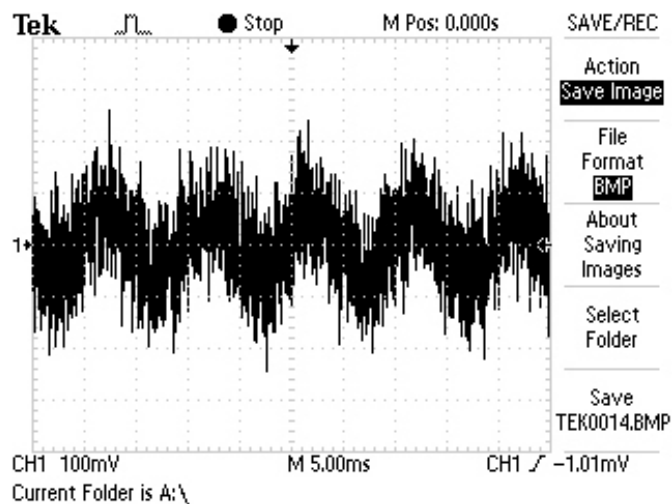
12. AO_ MCLKO main clock signal waveform diagram; peak value: 4.16V; voltage: 1.66V; test point: U16_7.



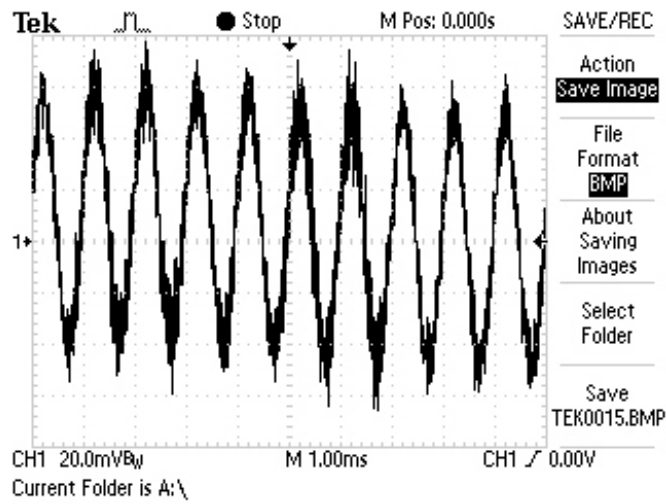
13. Waveform diagram of analog left channel outputted by Cs4360 (1K 0DB signal); test point: R210.



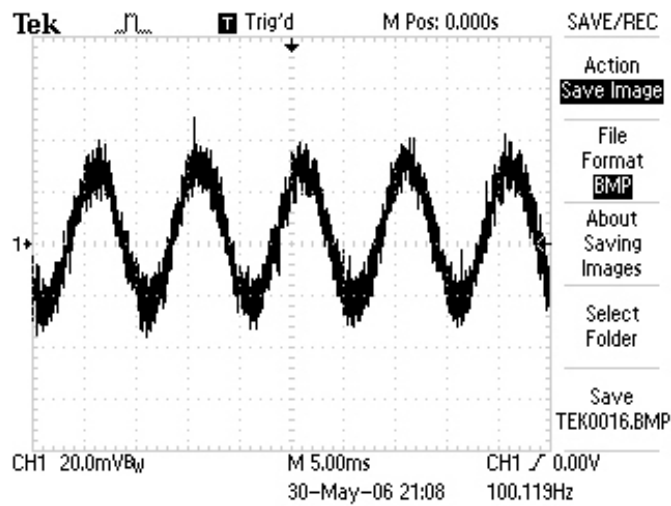
14. Waveform diagram of analog subwoofer outputted by Cs4360 (200HZ 0DB signal) ; test point: R206.



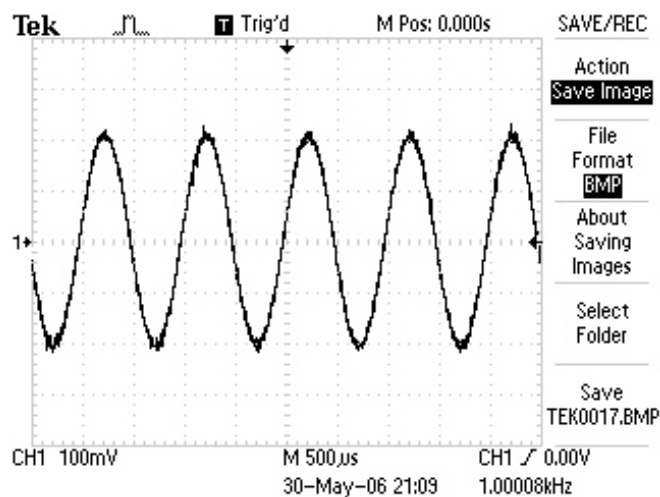
15. Waveform diagram of left channel signals after filtering; test point: CN4_14.



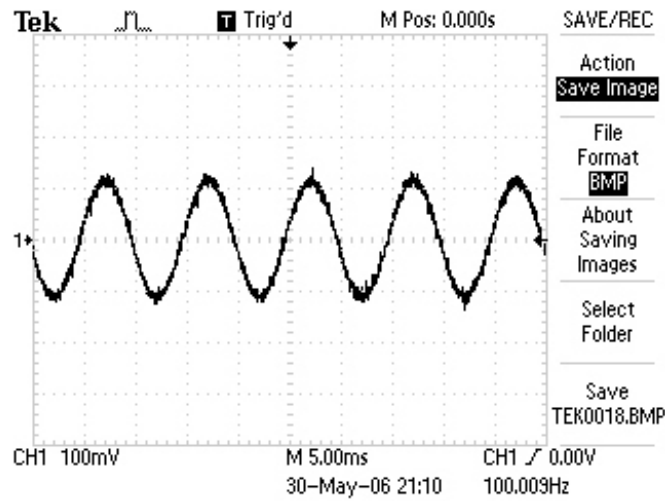
16. Waveform diagram of subwoofer signals after filtering; test point: CN4_4.



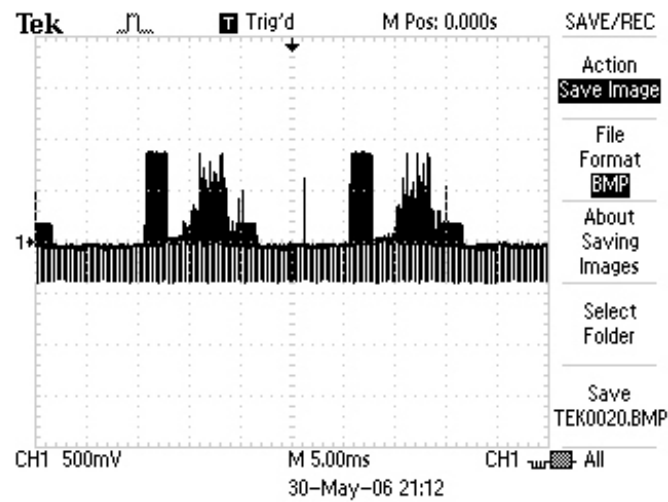
17. Waveform diagram of signals outputted by left channel; test point: audio output terminal.



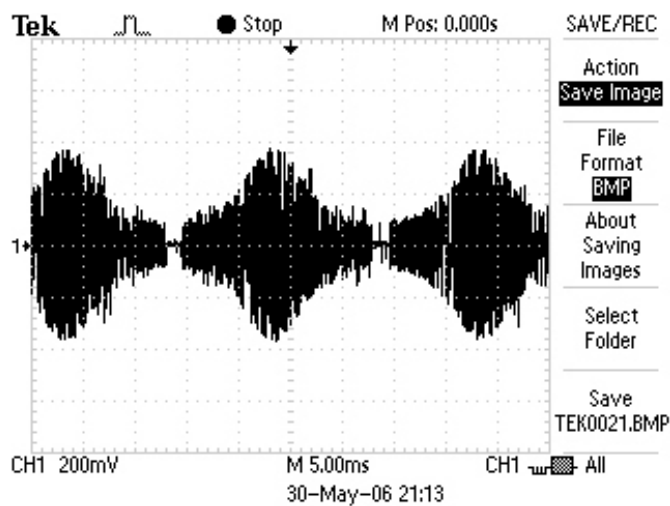
18. Subwoofer signal output waveform diagram; test point: audio output terminal.



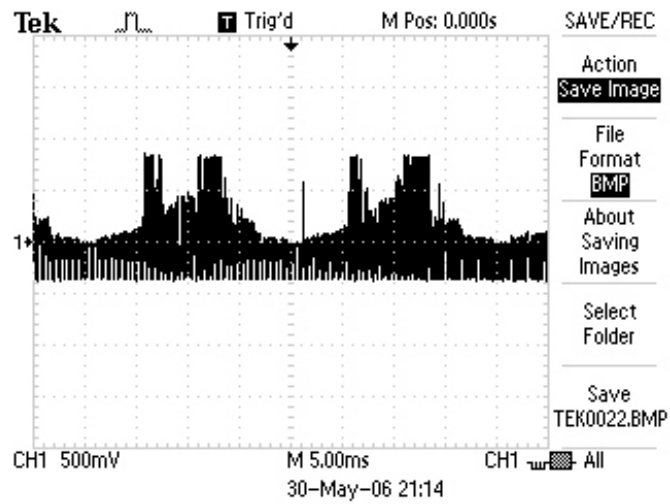
19. Y_OUT(S-Y_OUT) signal waveform diagram; test point: CN6_2.



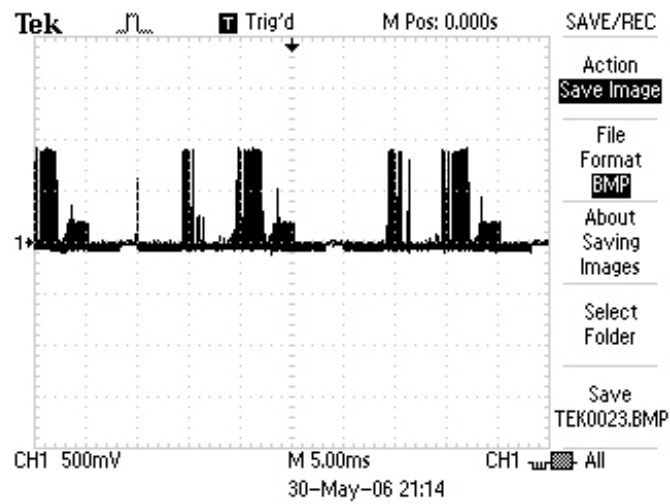
20. C_OUT(S-C_OUT) signal waveform diagram; test point: CN6_4.



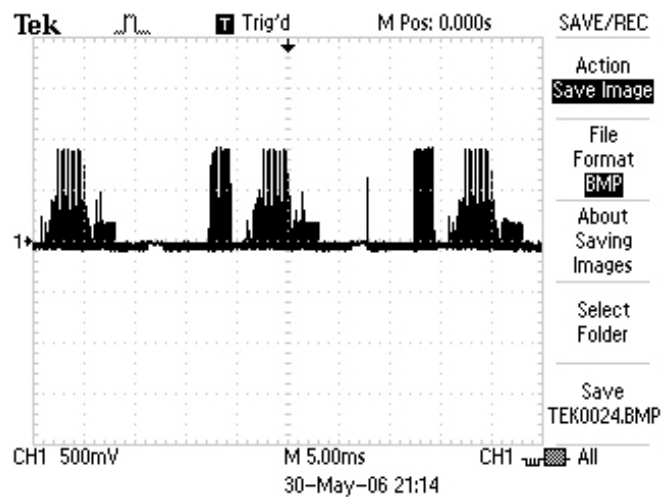
21. CVBS_OUT(V_OUT) signal waveform diagram; test point: CN6_6.



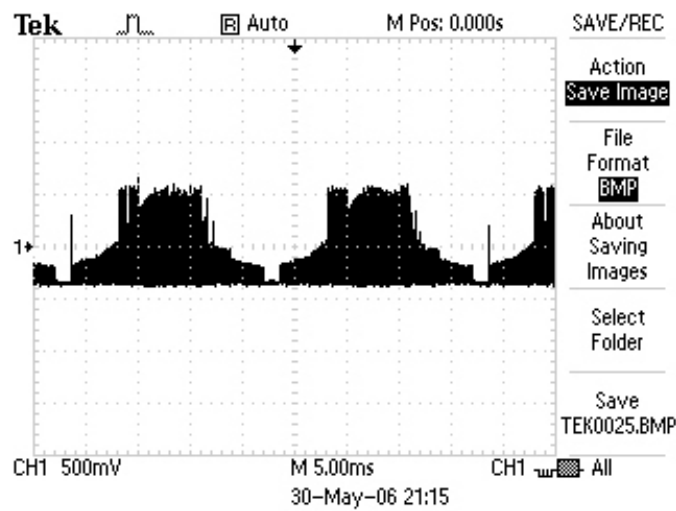
22. PR_OUT(R_V_OUT) signal waveform diagram; test point: CN6_8.



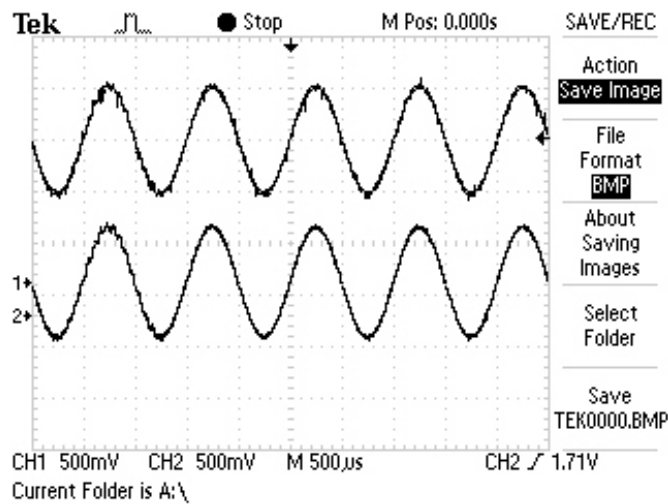
23. Y_OUT(G_Y_OUT) signal waveform diagram; test point: CN6_10.



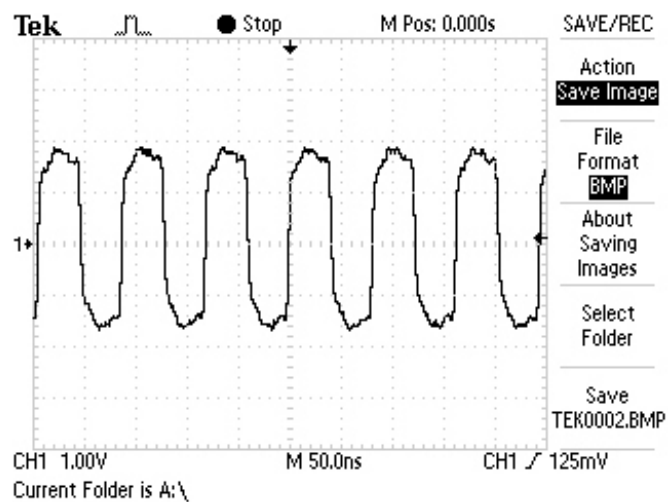
24. PB_OUT(B_U_OUT) signal waveform diagram; test point: CN6_12.



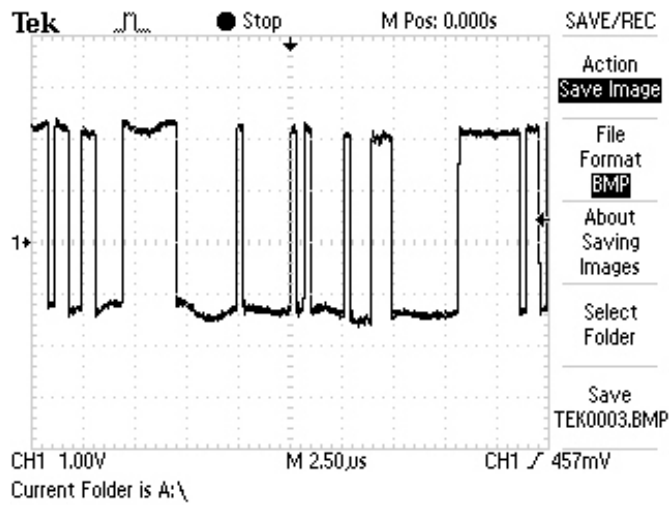
25. External analog audio input waveform diagram; test point: U18_10、U18_12.



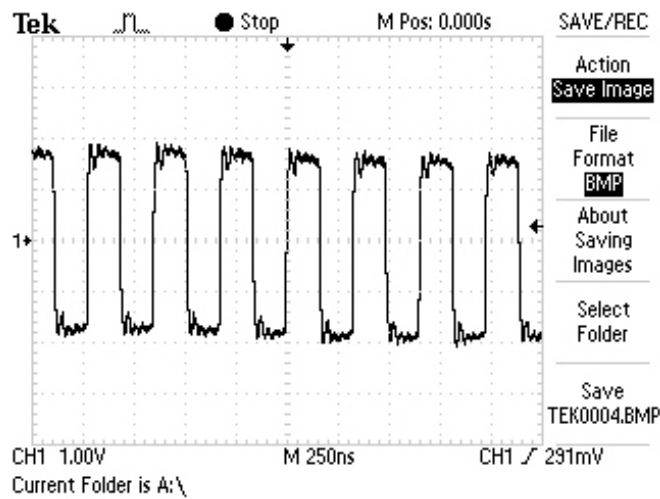
26. AI_MCLKO A/D converter main clock signal waveform diagram; test point: U18_2; peak value: 3.56V; voltage: 1.24V.



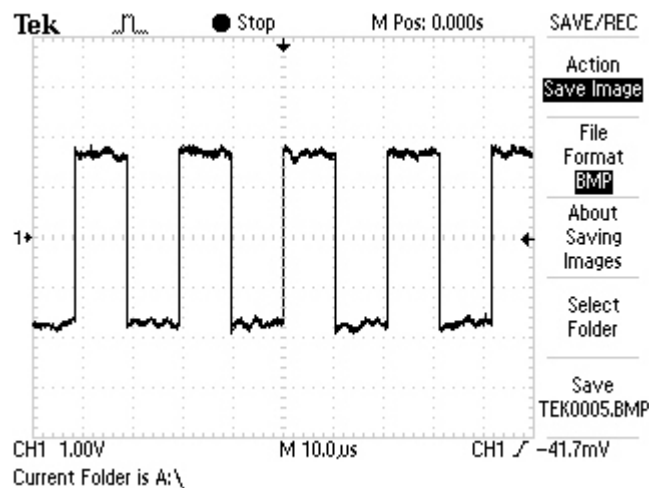
27. Waveform diagram of digital signal outputted by AI_DO A/D converter; test point: U18_4; peak value: 4.04V; voltage: 1.24V.



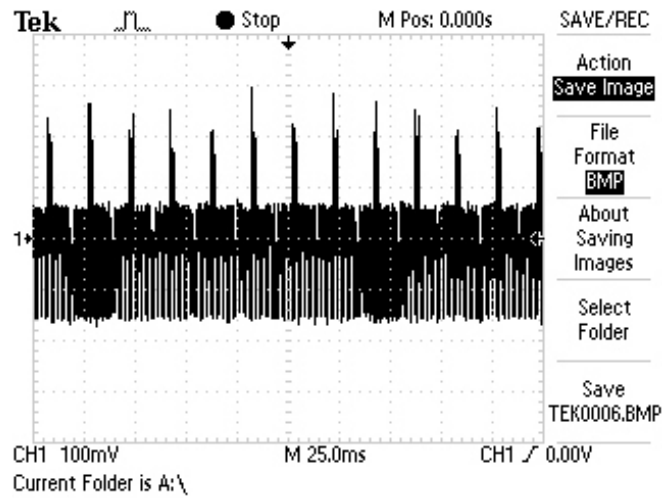
28. AI_SCLK A/D converter bit clock waveform diagram; test point: U18_7.



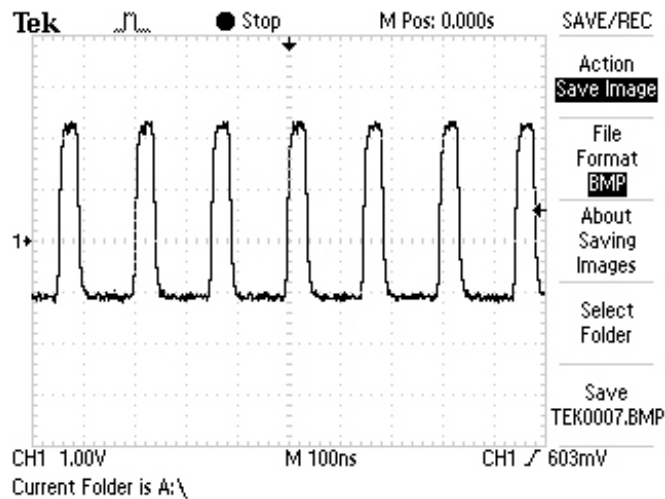
29. AI_FSYNC A/D converter left/right clock signal waveform diagram; test point: U18_8.



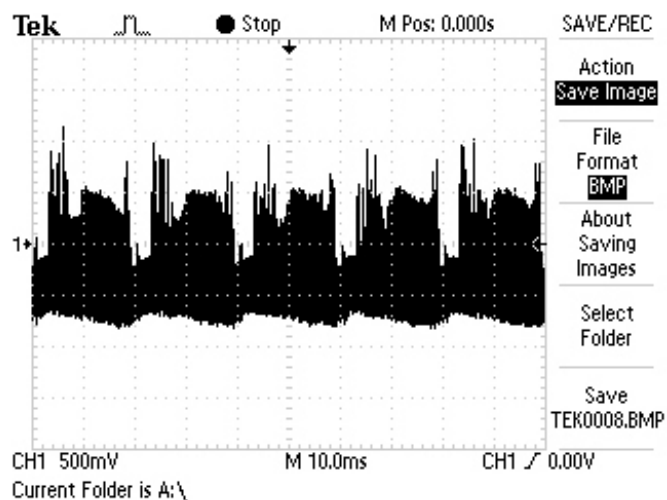
30. Waveform diagram of video signals outputted by analog; test point: U15_17, U15_17 pin (other video signals are the same).



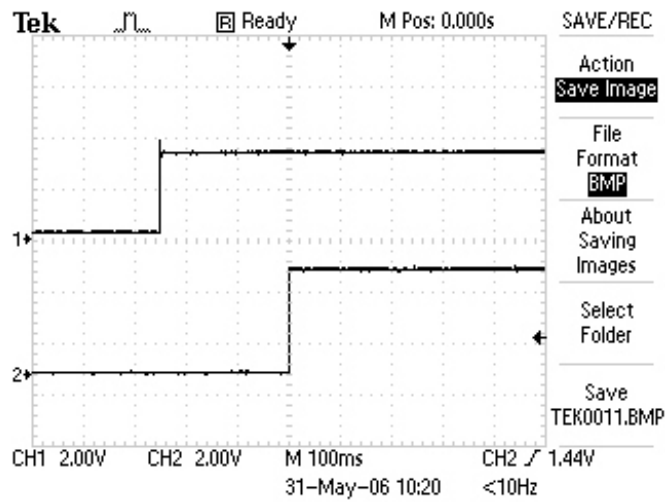
31. Waveform diagram of switching into digital signals; test point: Rp42; voltage: 1.03V.



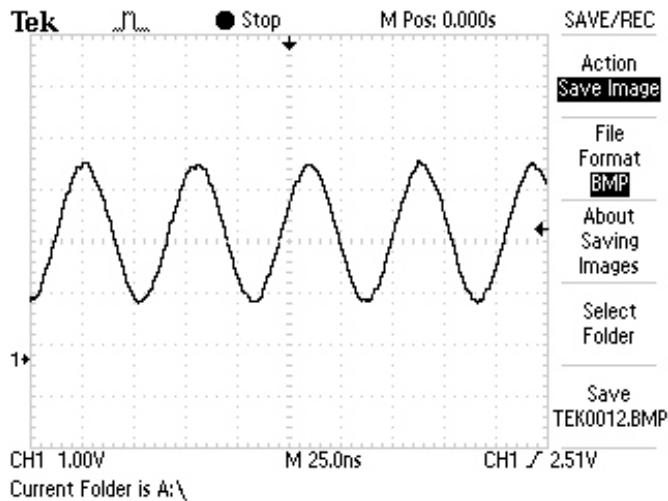
32. Waveform diagram of the video signal inputted by tuner; test point: AV board CN2_22.



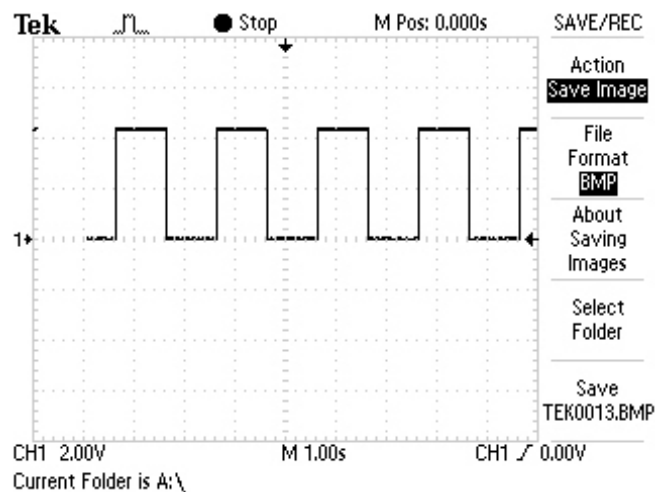
33. Audio reset signal waveform diagram; test point: 3.3V power supply end and U18_9.



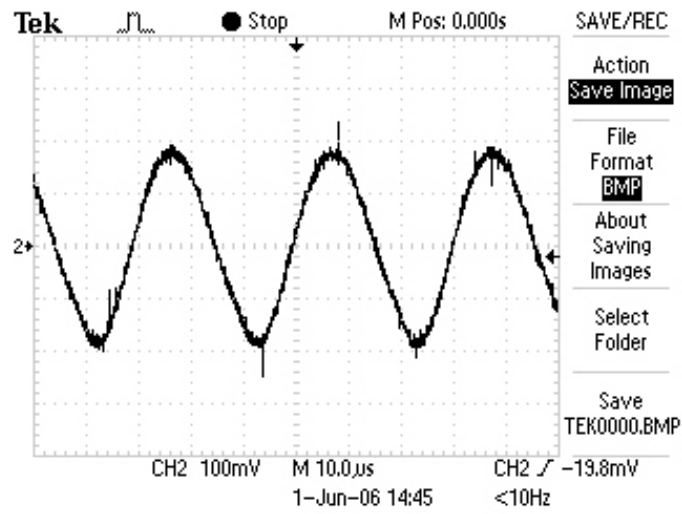
34. NICAM processing IC clock signal waveform diagram; test point: U6_5 pin; voltage: 2.76V; frequency: 18.432MHZ.



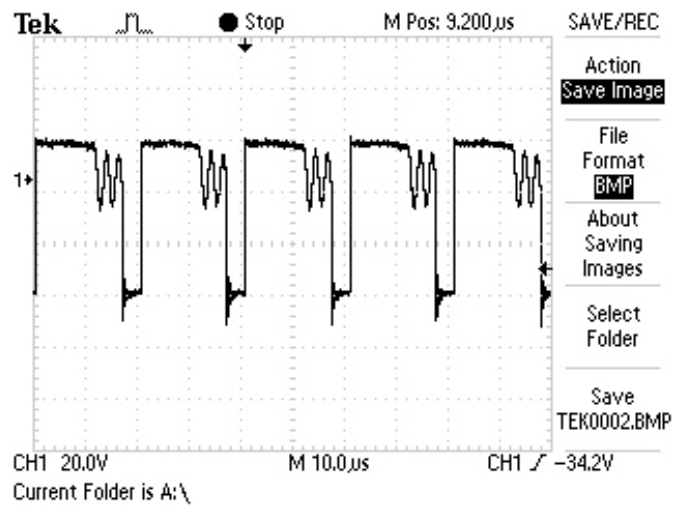
35. Panel VFD_DIO signal waveform diagram when in standby.



36. AV board clock signal waveform disarm; test point: U2_1.



37. Power board D2 anode waveform diagram.



3.3.2 Key point voltage

1. Power board key point voltage (unit: V) is shown in the following table:

Key point	Working voltage	Standby voltage	Key point	Working voltage	Standby voltage
CE5 anode	326	326	F-	-21.9	-17
D4 cathode	450	425	F+	-18.9	-14
D4 anode	340	340	B+12V	13V	12.8
D17 cathode	22	22	Q9_B	12.1	12.4
D1 anode	-12.5	-11	V_Orl	10.2	0
D2 cathode	13	12.8	P_CTL	4.1	0
IC4_2	12	0	CE15 anode	5	0
D14 cathode	3.3	0	IC3_K	2.5	0
D13 anode	-27	-22			

2. Decode board key point voltage (unit: V) is shown in the following table:

Key point	Playback state	TV external input state	Key point	Playback state	TV external input state
U2_4	1.25	1.25	CN4_23	0	0
V33_PHY_A	3.3	3.3	CN4_24	5.17	5.17
CN4_1	1.66V	1.66V	CN6_1	2.99	2.99
CN4_7	4.3V	4.3V	CN6_2	0.57	0.57
CN4_15	0.03	0.03	CN6_4	0.78	0.78
CN4_16	3.31	3.31	CN6_6	0.64	1.45
CN4_17	0	0	CN6_8	0.6	0.6
CN4_18	3.24	3.24	CN6_10	0.58	0.58
CN4_19	3.24	3.24	U6_2	3.3	3.3
CN4_20	0	0	U13_2	3.3	3.3
CN4_21	3.62	3.62	U14_3	2.5	2.5
CN4_22	3.64	3.64	U12_3	1.8	1.8

3. Panel key point voltage (unit: V) is shown in the following table:

Key point	Working voltage	Standby voltage	Key point	Working voltage	Standby voltage
U1_50	2.6	2.6	Q1_C	4.4	0---4.4
U1_51	2	2	MUTE	0	4.3
U1_2	1.6	1.6	P_CTL_PSW	4.3	0
U1_3	2.6	2.6	RST_HOST_LED	4.3	0

U1_12	4.4	4.4	VFD_DIO	4.3	0-4.3
U2_3	5	5			

4. AV board key point voltage (unit: V) is shown in the following table:

Key point	Playback state	TV input state	Key point	Playback state	TV input state
TUN1_1	5	5	Q1_C	5	5
TUN1_2	9.4	9.4	Q1_E	1.7	1.7
TUN1_3	5	5	Q2_B	2.5	2.5
TUN1_4	3.63	3.63	Q2_C	5	5
TUN1_5	3.63	3.63	Q2_E	1.7	1.7
TUN1_6	0	0	U2_1	0	0
TUN1_7	1.42	0.9	U2_2	0.4	0.4
TUN1_8	0	0	U2_5	3.5	3.5
TUN1_9	0	0	U2_6	3.5	3.5
TUN1_10	4.36	1.91	Q4_C	-8	-8
TUN1_11	0	0	U6_1	5	5
TUN1_12	2.14	1.38	U6_2	1.5	1.5
TUN1_13	5	5	U6_5	2.4	2.4
TUN1_14	2.44	2.44	U6_6	2.38	2.38
U1_7	6.2		U6_30	3.75	3.75
U1_9	0	0	U6_31	3.75	3.75
U1_10	3.25	3.25	U6_22	4.19	4.19
Q1_B	2.5	2.5			

Section Five Function Introduction to IC

3.5.1 Function introduction to MT DMN-8652

1. Description

The LSI Logic DiMeNtion 8652(DMN-8652) is the world's most highly integrated dual-drive hard (HDD) and DVD recorder processor. Based on the LSI Logic DiMeNtion architecture, the DiMeNtion family of products is intended for demanding, yet cost-sensitive, A/V code applications in consumer electronics productions. A true system-on-a-chip solution, the DMN-8652 reduces cost, design complexity, power consumption, and time-to-market.

The DMN-8652 enables consumer electronics manufacturers to offer a new category of productions that take advantage of the flexibility provided by the combination of hard disk and optical disk drives. The DMN-8652 accepts video from broadcast TV and other analog video sources and compresses and formats the video for storage on hard disk or DVD in industry –standard recordable formats (DVD-RAM,DVD-RW/R, DVD+RW/R). It permits control of DV –25 video for storage on hard disk or DVD. The SMN-8652 supports simultaneous play back of video from hard disk or DVD, and a range of background copying operations between the hard disk and optical drives.

The DMN-8652 offers DoMiNoFX a combination of industry leading video pre- and post-processing technologies to create a visibly superior viewing experience. The LSI Logic TrueView Pro motion-compensated temporal filtering algorithm provides a cleaner through substantial noise reduction. This technique is coupled with the fifth-generation LSI Logic Perfectview Pro compression technology for excellent video quality, even at very low bit rates. The LSI Logic TrueScan Pro motion-compensated de-interlacing then recreates clear images on progressive scan displays by eliminating video blurring in moving scenes.

For HDD and DVD video recording applications, the DMN-8652 supports video compression and decompression in compliance with the MPEG-1, MPEG-2 and DV-25 specifications. It also transcodes between DV-25 and MPEG-2. The product supports corresponding audio compression and decompression in compliance with the Dolby Digital CE and MPEG-1 layer 2 specifications. For audio recording applications the SMN-8652 supports transcoding between CD-DA and MP3 or WMA audio formats.

For DVD playback applications, the DMN-8652 supports the playback of DVD-video disks with Dolby Digital 5.1 and DTS audio encoding, DVD-Audio disks, VCD and SVCD disks. DMN-8652 also supports the play back of audio encoded in MP3 and WMA formats, and the display of pictures encoded in JPEG format.

The DMN-8652 is capable of a high degree of concurrency. Examples of this include DVD playback with background record to hard disk; time –shift on hard disk; DV camcorder to DVD archive from hard disk to DVD

at high compression.

The DoMiNo architecture, the foundation of the DMN-8652 product features, represents the optimal balance between a hardware and software codec implementation. Repetitively executed, computationally units. Higher-level data processing is performed on standard RISC processors permitting substantial product flexibility and use of industry-standard development tools.

The DMN-8652 integrates a RISC processor dedicated to video processing that ,coupled with a dedicated video digital signal processor and motion estimation engine, enables the handling of multiple advanced-image processing task. The DMN-8652 also integrates a RISC processor dedicated to system-level processing standard audio encoding and decoding formats, as well as audio post-processing tasks such as 3D effects and bass management functions. This combination allows the DMN-8652 to simultaneously handle multiple A/V processing functions while managing all system control tasks, eliminating the need for an external host CPU.

The DMN-8652 has an on-chip ATAPI controller that supports DVD-RAM, VD-RW/R, and DVD+RW/R recordable DVD drives. Hard disk drives are connected to a second IDE interface. The DMN-8652 integrates an analog video encoder, and there is built-in support for simultaneous progressive and interlaced video output. A 1394 link layer function is integrated, requiring only a simple external physical layer device. Two USB ports are provided.

The DMN-8652 is compatible with the LSI Logic C-Ware architecture, which provides a standardized API that is reusable across LSI logic DoMiNo- and ZiVA-based consumer digital video products. GWare is integrated with the Wind River systems vxworks RTOS and is supported by an industry-leading software development tool-chain.

With the highest level of integration, broadcast feature set, best image quality, and configurable software development environment, the LSI Logic DMN-8652 brings unprecedented features to HDD/DVD recorder applications. It also optimizes time-to market and system cost performance for consumer electronic manufacturers.

2. FEATURE

Digital	A/V Encode/Decode	Multiformat audio and video encode/decode
Video	Transcoding/rating	Multiformat transcoding, multirate transrating
	Resolutions	Horizontal: 720,704,640,544,480,352 Vertical: NTSC(480i,480p) and PAL (576I) 240 and 288(only at 352 horizontal resolution)
	Formats	NTSC,PAL,ITU-R BT.656/601,SMPTE 250M
	Input	8-or 10-bit digital video from ITU-R BT.656(parallel D1) sources at 27MHz

	Output	Simultaneous 8bitSMTPE 293M (ITU-R BT.1358) progressive video output and ITU-R BT.656 interlaced video output (for HDTV and VCR) of the same content. 16-bit YcbCr data
Analog Video	Output	Base band composite NTC or PAL analog video. Separate analog Y/C, outputs to support S-video. Separate analog component video RGB or SMPTE YpbPr output.
Audio	Inputs	Dual stream inputs, supporting common audio formats, including I2S: Four inputs channels on stream 1 Two inputs channels on stream 2
Audio	Outputs	Dual stream outputs supporting common audio formats including I2S: Eight outputs channels stream 1 Two outputs channels stream 2
	Resolutions	16 to 32 bits/sample
	Analog audio sampling frequency	32,44.1,48,and 96 kHz output
	Digital audio sampling frequency	8-to 192 kHz over IEC-958
I/O	Serial	IEEE 1394 Link, IDC, SPI, two IR blasters, dual UARTs
	Parallel	ATAPI/DVD
	USB1.1	Host low speed and full speed interface. Two host ports are available for downstream hub or device connection
System	Host	16/32-bit internal host
	Graphics	16/32-bit RGB, OSD, flicker filter, and video scaler, supporting the following color modes: CLUT4, CLUT8, ARGB4444, ARGB1555 ARGB0565, ARGB8888
	Encryption/decryption	CPRM, CPPM, CSS, 5C(via 1394), watermark detection
Memory	Memory	16-256 Mbytes of SDRAM, interface, 148.5MHz
	Controller	On-chip, 32-bit-wide SDRAM interface, 148.5MHz
	Peak bandwidth	1.2Gbytes/s
Physical	Input voltages	3.3 V I/O; 1.8V Core;2 .5/3.3V SDRAM; 3.3V Isolated analog
	Operating power	3.4W @ nominal Vdd, six VDACS enabled in full power mode
	System clock	13.5 or 27 MHz
	Package	388-pin ball grid array (BGA)
JTAG	Compliance	IEEE 1149.1 compliance for boundary scan testing and board assembly testing

3.5.2 Function introduction to CD4053

CD4053 is a 4-group 2-channel data selection device, and is mainly used in the input, output selection of SCART and the realization of LOGO function in DVD recorder. Each pin function is shown as follows:

Pin	Name	Function	Remark
1、 2	Y1、 Y0	Y signal input	I
13、 12	X1、 X0	X signal input	I
3、 5	Z1、 Z0	Z signal output	I
6	EN	Enable end: low level effective	I
7	VEE	-6.2V power	
8	GND	ground	
16	VCC	+5V power	
9、 10、 11	C、 B、 A	Gating signal control input	I
14	X	X signal output	O
15	Y	Y signal output	O
4	Z	Z signal output	O

A, B signal strobe condition:

A、 B、 C	X、 Y、 Z	Remark
0	X0、 Y0、 Z0	When A, B, C end is low level, output end X, Y, Z outputs the signals inputted by X0, Y0, Z0.
1	X1、 Y1、 Z1	When A, B, C end is high level, output end X, Y, Z outputs the signals inputted by X1, Y1, Z1.

Note: in the circuit, part of input pins are not used, A、 B、 C control end is controlled by LOOP control circuit. When in standby status, LOOP_DECODER_C is high level, when power on, LOOP_DECODER_C is low level.

3.5.3 Function introduction to TSB41AB1

1. Description

The TSB41AB1 provides the digital and analog transceiver functions needed to implement a one-port node in a cable-based IEEE 1394 network. The cable port incorporates one differential line transceiver. The transceiver includes circuitry to monitor the line conditions as needed for determining connection status, for initialization and arbitration, and for packet reception and transmission. The TSB41AB1 is designed to interface with a link layer controller (LLC).

The TSB41AB1 requires only an external 24.576-MHz crystal as a reference. An external clock may be provided instead of a crystal. An internal oscillator drives an internal phase-locked loop (PLL). This reference signal is internally divided to provide the clock signals used to control transmission of the outbound encoded strobe and data information. The power-down (PD) function, when enabled by asserting the PD terminal high, stops operation of the PLL.

The TSB41AB1 supports an optional isolation barrier between itself and its LLC. When the ISO input terminal is tied high, the LLC interface outputs behave normally. When the ISO terminal is tied low, internal differentiating logic is enabled, and the outputs are driven such that they can be coupled through a capacitive or transformer galvanic isolation barrier as described in Annex J of IEEE Std 1394-1995 and in IEEE 1394a-2000 (section 5.9.4) (hereinafter referred to as Annex J type isolation). To operate with TI bus holder isolation the ISO terminal on the PHY must be high.

Data bits to be transmitted through the cable port are received from the LLC on two, four or eight parallel paths (depending on the requested transmission speed) and are latched internally in the TSB41AB1 in synchronization with the 49.152-MHz system clock. These bits are combined serially, encoded, and transmitted at 98.304, 196.608, or 393.216 Mbits/s (referred to as S100, S200, and S400 speeds, respectively) as the outbound data-strobe information stream. During transmission, the encoded data information is transmitted differentially on the TPB cable pair, and the encoded strobe information is transmitted differentially on the TPA cable pair.

During packet reception the TPA and TPB transmitters of the receiving cable port are disabled, and the receivers for that port are enabled. The encoded data information is received on the TPA cable pair, and the encoded strobe information is received on the TPB cable pair. The received data-strobe information is decoded to recover the receive clock signal and the serial data bits. The serial data bits are split into two-, four-, or eight-bit parallel streams (depending upon the indicated receive speed), resynchronized to the local 49.152-MHz system clock and sent to the associated LLC.

Both the TPA and TPB cable interfaces incorporate differential comparators to monitor the line states during initialization and arbitration. The outputs of these comparators are used by the internal logic to determine the arbitration status. The TPA channel monitors the incoming cable common-mode voltage. The value of this common-mode voltage is used during arbitration to set the speed of the next packet transmission. In addition, the TPB channel monitors the incoming cable common-mode voltage on the TPB pair for the presence of the remotely supplied twisted-pair bias voltage.

The TSB41AB1 provides a 1.86-V nominal bias voltage at the TPBIAS terminal for port termination. This bias voltage, when seen through a cable by a remote receiver, indicates the presence of an active connection. This bias voltage source must be stabilized by an external filter capacitor of 1 μ F. TPBIAS is typically $V_{DD} - 0.2$ V when the port is not connected to another node.

The line drivers in the TSB41AB1 operate in a high-impedance current mode, and are designed to work with external 112- Ω line-termination resistor networks in order to match the 110- Ω cable impedance. One network is provided at each end of a twisted-pair cable. Each network is composed of a pair of

series-connected 56- Ω resistors. The midpoint of the pair of resistors that is directly connected to the twisted-pair-A terminals is connected to its corresponding TPBIAS voltage terminal. The midpoint of the pair of resistors that is directly connected to the twisted-pair-B terminals is coupled to ground through a parallel R-C network with recommended values of 5 k Ω and 220 pF. The values of the external line termination resistors are designed to meet IEEE Std 1394-1995 when connected in parallel with the internal receiver circuits. An external resistor connected between the R0 and R1 terminals sets the driver output current, along with other internal operating currents. This current-setting resistor has a value of 6.34 k Ω \pm 1.0%.

When the power supply of the TSB41AB1 is off while the twisted-pair cables are connected, the TSB41AB1 transmitter and receiver circuitry presents a high impedance to the cable and does not load the TPBIAS voltage at the other end of the cable. Fail-safe circuitry blocks any leakage path from the port back to the device power plane.

The TESTM, SE, and SM terminals are used to set up various manufacturing test conditions. For normal operation, the TESTM terminal should be connected to VDD through a 1-k Ω resistor, SE should be tied to ground through a 1-k Ω resistor, and SM should be connected directly to ground. Four package terminals are used as inputs to set the default value for four configuration status bits in the self-ID packet, and are tied high through a 1-k Ω resistor or hardwired low as a function of the equipment design. The PC0 \overline CPC2 terminals are used to indicate the default power-class status for the node (the need for power from the cable or the ability to supply power to the cable). See Table 9 for power-class encoding. The C/LKON terminal is used as an input to indicate that the node is a contender for either isochronous resource manager (IRM) or for bus manager (BM).

The TSB41AB1 supports suspend/resume as defined in the IEEE 1394a-2000 specification. The suspend mechanism allows pairs of directly connected ports to be placed into a low-power state (suspended state) while maintaining a port-to-port connection between bus segments. While in the suspended state, a port is unable to transmit or receive data transaction packets. However, a port in the suspended state is capable of detecting connection status changes and detecting incoming TPBIAS. When the port of the TSB41AB1 is suspended, all circuits except the band gap reference generator and bias detection circuit is powered down, resulting in significant power savings. For additional details of suspend/resume operation see IEEE 1394a-2000. The use of suspend/resume is recommended for new designs.

The port transmitter and receiver circuitry is disabled during power down (when the PD input terminal is asserted high), during reset (when the RESET input terminal is asserted low), when no active cable is connected to the port, or when controlled by the internal arbitration logic. The TPBIAS output is disabled during power down, during reset, or when the port is disabled as commanded by the LLC.

The cable-not-active (CNA) output terminal (64-terminal PAP package only) is asserted high when there are no twisted-pair cable ports receiving incoming bias (that is, they are either disconnected or suspended), and can be used along with LPS to determine when to power down the TSB41AB1. The CNA output is not debounced. When the PD terminal is asserted high, the CNA detection circuitry is enabled (regardless of the previous state of the ports) and a pulldown is activated on the RESET terminal so as to force a reset of the

TSB41AB1 internal logic.

The LPS (link power status) terminal works with the C/LKON terminal to manage the power usage in the node. The LPS signal from the LLC is used in conjunction with the LCtrl bit (see Table 1 and Table 2 in the Application Information section) to indicate the active/power status of the LLC. The LPS signal is also used to reset, disable, and initialize the PHY-LLC interface (the state of the PHY-LLC interface is controlled solely by the LPS input, regardless of the state of the LCtrl bit).

The LPS input is considered inactive if it remains low for more than 2.6 μ s and is considered active otherwise. When the TSB41AB1 detects that LPS is inactive, it places the PHY-LLC interface into a low-power reset state in which the CTL and D outputs are held in the logic zero state and the LREQ input is ignored; however, the SYSCLK output remains active. If the LPS input remains low for more than 26 μ s, the PHY-LLC interface is put into a low-power disabled state in which the SYSCLK output is also held inactive. The PHY-LLC interface is also held in the disabled state during hardware reset. The TSB41AB1 continues the necessary repeater functions required for normal network operation regardless of the state of the PHY-LLC interface. When the interface is in the reset or disabled state and LPS is again observed active, the PHY initializes the interface and returns it to normal operation.

When the PHY-LLC interface is in the low-power disabled state, the TSB41AB1 automatically enters a low-power mode if the port is inactive (disconnected, disabled, or suspended). In this low-power mode, the TSB41AB1 disables its internal clock generators and also disables various voltage and current reference circuits depending on the state of the port (some reference circuitry must remain active in order to detect new cable connections, disconnections, or incoming TPBIAS, for example). The lowest power consumption (the ultra-low-power sleep mode) is attained when the port is either disconnected, or disabled with the port interrupt enable bit cleared. The TSB41AB1 exits the low-power mode when the LPS input is asserted high or when a port event occurs which requires that the TSB41AB1 become active in order to respond to the event or to notify the LLC of the event (for example, incoming bias is detected on a suspended port, a disconnection is detected on a suspended port, a new connection is detected on a non-disabled port, etc.). The SYSCLK output becomes active (and the PHY-LLC interface is initialized and becomes operative) within 7.3 ms after LPS is asserted high when the TSB41AB1 is in the low-power mode.

The PHY uses the C/LKON terminal to notify the LLC to power up and become active. When activated, the C/LKON signal is a square wave of approximately 163-ns period. The PHY activates the C/LKON output when the LLC is inactive and a wake-up event occurs. The LLC is considered inactive when either the LPS input is inactive, as described above, or the LCtrl bit is cleared to 0. A wake-up event occurs when a link-on PHY packet addressed to this node is received, or when a PHY interrupt occurs. The PHY de-asserts the C/LKON output when the LLC becomes active (both LPS active and the LCtrl bit set to 1). The PHY also de-asserts the C/LKON output when a bus reset occurs unless a PHY interrupt condition exists which would otherwise cause C/LKON to be active.

2. FEATURE

Fully Supports Provisions of IEEE 1394-1995 Standard for High Performance Serial Bus. and IEEE 1394a-2000

Fully Interoperable With FireWire and i.LINK Implementation of IEEE Std 1394

Fully Compliant With OpenHCI Requirements

Provides One IEEE 1394a-2000 Fully Compliant Cable Port at 100/200/400 Megabits Per Second (Mbits/s)

Full IEEE 1394a-2000 Support Includes: Connection Debounce, Arbitrated Short Reset, Multispeed Concatenation, Arbitration Acceleration, Fly-By Concatenation, Port Disable/Suspend/Resume

Register Bits Give Software Control of Contender Bit, Power Class Bits, Link Active Control Bit, and IEEE 1394a-2000 Features

IEEE 1394a-2000 Compliant Common Mode Noise Filter on Incoming TPBIAS

Extended Resume Signaling for Compatibility With Legacy DV Devices, and Terminal- and Register-Compatibility With TSB41LV01, Allow Direct Isochronous Transmit to Legacy DV Devices With Any Link Layer Even When Root

Power-Down Features to Conserve Energy in Battery Powered Applications Include: Automatic Device Power Down During Suspend, Device Power-Down Terminal, Link Interface Disable via LPS, and Inactive Ports Powered Down

Failsafe Circuitry Senses Sudden Loss of Power to the Device and Disables the Port to Ensure That the Device Does Not Load TPBIAS of the Connected Device and Blocks Any Leakage Path From the Port Back to the Device Power Plane

Software Device Reset (SWR)

Industry Leading Low Power Consumption

Ultra-low-Power Sleep Mode

Cable Power Presence Monitoring

Cable Ports Monitor Line Conditions for Active Connection to Remote Node

Data Interface to Link-Layer Controller Through 2/4/8 Parallel Lines at 49.152 MHz

Interface to Link Layer Controller Supports Low Cost TI Bus-Holder Isolation and Optional Annex J Electrical Isolation

Interoperable With Link-Layer Controllers Using 3.3 V

Single 3.3-V Supply Operation

Low-Cost 24.576-MHz Crystal Provides Transmit, Receive Data at 100/200/400 Mbits/s, and Link-Layer Controller Clock at 49.152 MHz

Low-Cost High-Performance 48/64-Pin TQFP (PHP/PAP) Thermally Enhanced Packages Increase Thermal Performance by up to 210%

Meets Intel Mobile Power Guideline 2000

3 . PIN DESCRIPTION

PIN	Symbol	I/O	Description
1	SYSCLK	O	System clock output.
2	CTL0	I/O	Control I/Os.
3	CTL1		
4	D0	I/O	Data I/Os.
5	D1		
6	D2		
7	D3		
8	D4		
9	D5		
10	D6		
11	D7		
12	PD	I	Power-down input.
13	LPS	I	Link power status input.
14	DGND	I	Digital ground
15	C/LKON	I	Bus manager contender programming input and link-on output.
16	PC0	I	Power class programming inputs.
17	PC1	I	
18	PC2	I	
19	#ISO	I	Link interface isolation control input.
20	CPS	I	Cable power status input.
21	DVDD	I	Digital power
22	TESTM	I	Test control input.
23	SE	I	Test control input.
24	SM	I	Test control input.
25	AVDD	I	Analog power
26	AGND	I	Analog ground
27	TPB+	I/O	Twisted-pair cable B differential signal terminals.
28	TPB-	I/O	
29	TPA -	I/O	Twisted-pair cable A differential signal terminals.
30	TPA+	I/O	
31	TPBIAS	O	Twisted-pair bias output.

32	AGND	I	Analog ground
33	R0		Current setting resistor terminals.
34	R1		
35	AVDD	I	Analog power
36	AGND	I	Analog ground
37	#RESET		Reset input
38	FILTER0	I/O	PLL filter terminals.
39	FILTER1		
40	PLLVDD	I	PLL power
41	PLLGND	I	PLL ground
42	XI	I	Crystal oscillator inputs.
43	XO		
44	DVDD	I	Digital power
45	DVDD	I	
46	DGND	I	Digital ground
47	DGND	I	
48	LREQ	I	LLC request input.

3.5.4 Function introduction to M13S128168A

1. DESCRIPTION

2M x 16 Bit x 4 Banks

Double Data Rate SDRAM

2. FATUER

JEDEC Standard

Internal pipelined double-data-rate architecture, two data access per clock cycle

Bi-directional data strobe (DQS)

On-chip DLL

Differential clock inputs (CLK and CLK)

DLL aligns DQ and DQS transition with CLK transition

Quad bank operation

CAS Latency : 3

Burst Type : Sequential and Interleave

Burst Length : 2, 4, 8

All inputs except data & DM are sampled at the rising edge of the system clock(CLK)

Data I/O transitions on both edges of data strobe (DQS)

DQS is edge-aligned with data for reads; center-aligned with data for WRITE

Data mask (DM) for write masking only

VDD = 2.375V ~ 2.75V, VDDQ = 2.375V ~ 2.75V

Auto & Self refresh

7.8us refresh interval

SSTL-2 I/O interface

66pin TSOPII package

3 . PIN DESCRIPTION

PIN	Symbol	Description
1	VDD	Supply Voltage
2	DQ0	Data-in/Data-out
3	VDDQ	Supply Voltage for DQ
4	DQ1	Data-in/Data-out
5	DQ2	Data-in/Data-out
6	VSSQ	Ground for DQ
7	DQ3	Data-in/Data-out
8	DQ4	Data-in/Data-out
9	VDDQ	Ground for DQ
10	DQ5	Data-in/Data-out
11	DQ6	Data-in/Data-out
12	VSSQ	Ground for DQ
13	DQ7	Data-in/Data-out
14	NC	No connection
15	VDDQ	Supply Voltage for DQ
16	LDQS	LDQS corresponds to the data on DQ0~DQ7;
17	NC	No connection
18	VDD	Power supply
19	NC	No connection
20	LDM	LDM corresponds to the data on DQ0~DQ7;
21	#WE	Write enable
22	#CAS	Column address strobe

23	#RAS	Row address strobe
24	#CS	Selection input
25	NC	No connection
26	BA	Bank selects
27	BA	Bank selects
28	A10/AP	Address inputs
29	A0	Address inputs
30	A1	Address inputs
31	A2	Address inputs
32	A3	Address inputs
33	VDD	Supply Voltage
34	VSS	Ground
35	A4	Address inputs
36	A5	Address inputs
37	A6	Address inputs
38	A7	Address inputs
39	A8	Address inputs
40	A9	Address inputs
41	A11	Address inputs
42	NC	No connection
43	NC	No connection
44	CKE	Clock enable
45	CLK	Clock input
46	#CLK	Clock input
47	UDM	UDM correspond to the data on DQ8~DQ15.
48	VSS	Ground
49	VREF	Reference Voltage for SSTL-2
50	NC	No connection
51	UDQS	Ground
52	VSSQ	Ground for DQ
53	NC	No connection
54	DQ8	Data-in/Data-out
55	VDDQ	Supply Voltage for DQ

56	DQ9	Data-in/Data-out
57	DQ10	Data-in/Data-out
58	VSSQ	Ground for DQ
59	DSQ11	Data-in/Data-out
60	DQ12	Data-in/Data-out
61	VDDQ	Supply Voltage for DQ
62	DQ13	Data-in/Data-out
63	DQ14	Data-in/Data-out
64	VSSQ	Ground for DQ
65	DQ15	Data-in/Data-out
66	VSS	Ground

3.5.5 Function introduction to CD4052

CD4052 is a 2-group 4-channel data selection device and mainly used in the input selection of audio and video signals in DVD recorder. Each pin function is shown as follows:

Pin	Name	Function	I/O
1、 2、 4、 5	Y0-Y3	Y signal input	I
11、 12、 14、 15	X0-X3	X signal input	I
3、 13	Y	Y signal output	O
6	INH	Two groups have no output when two ends are high level	I
7	VEE	-12V power (grounding)	
8	VSS	ground	
16	VDD	+5V power	
9、 10	B、 A	Strobe signal	I
13	X	X signal output	O

A、 signal strobe condition:

A(10)	B(9)	X(13)	Y(3)	Remark
0	0	X0	Y0	X/Y outputs signals inputted by X0/Y0
0	1	X1	Y1	X/Y outputs signals inputted by X1/Y1
1	0	X2	Y2	X/Y outputs signals inputted by X2/Y2
1	1	X3	Y3	X/Y outputs signals inputted by X3/Y3

Note: in the circuit, part of input pins are not used, A, B control end is controlled by main chip. When main chip is switching input signal source, it will control signals to make 4052 perform input source selection.

3.5.6 Function introduction to TVP5146

1. DESCRIPTION

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

Component, composite, or S-video signals are sampled at 2x the square-pixel or ITU-R BT.601 clock frequency, line-locked, and are then decimated to the 1x pixel rate. CVBS decoding utilizes five-line adaptive comb filtering for both the luma and chroma data paths to reduce both cross-luma and cross-chroma artifacts. A chroma trap filter is also available. On CVBS and S-video inputs, the user can control video characteristics such as contrast, brightness, saturation, and hue via an I²C host port interface. Furthermore, luma peaking (sharpness) with programmable gain is included, as well as a patented chroma transient improvement (CTI) circuit.

A built-in color space converter is applied to decoded component RGB data.

The following output formats can be selected: 20-bit 4:2:2 YCbCr or 10-bit 4:2:2 YCbCr.

The TVP5146 decoder generates synchronization, blanking, field, active video window, horizontal and vertical syncs, clock, genlock (for downstream video encoder synchronization), host CPU interrupt and programmable logic I/O signals, in addition to digital video outputs.

The TVP5146 decoder includes methods for advanced vertical blanking interval (VBI) data retrieval. The VBI data processor (VDP) slices, parses, and performs error checking on teletext, closed caption (CC), and other VBI data. A built-in FIFO stores up to 11 lines of teletext data, and with proper host port synchronization, full-screen teletext retrieval is possible. The TVP5146 decoder can pass through the output formatter 2x the sampled raw luma data for host-based VBI processing. The decoder provides the option for concurrent processing of pixel-locked CVBS and RGB/YPbPr input formats. The main blocks of the TVP5146 decoder include:

- # Robust sync detection for weak and noisy signals as well as VCR trick modes

- # Y/C separation by 2-D 5-line adaptive comb or chroma trap filter

- # Fast-switch input for pixel-by-pixel switching between CVBS and YPbPr/RGB component video inputs (SCART support)

- # Fast-switch input for synchronous switching between digital RGB overlay and any video input

- # Four 10-bit, 30-MSPS A/D converters with analog preprocessors (clamp and automatic gain control (AGC))
- # Luminance processor
- # Chrominance processor
- # Component processor
- # Clock/timing processor and power-down control
- # Software controlled power saving stand-by modes
- # Output formatter
- # I²C host port interface
- # VBI data processor
- # Macrovision copy protection detection circuit (Type 1, 2, 3, and separate color stripe detection)
- # 3.3-V tolerant digital I/O ports

? Detailed Functionality

- # Four 30-MSPS, 10-bit A/D channels with programmable gain control
- # Supports NTSC (J, M, 4.43), PAL (B, D, G, H, I, M, N, Nc, 60) and SECAM (B, D, G, K, K1, L) CVBS, S-video
- # Supports analog component SD YPbPr/RGB video formats with embedded sync
- # 10 analog video input terminals for multisource connection
- # User-programmable video output formats
 - 10-bit ITU-R BT.656 4:2:2 YCbCr with embedded syncs
 - 10-bit 4:2:2 YCbCr with separate syncs
 - 20-bit 4:2:2 YCbCr with separate syncs
 - 2x sampled raw VBI data in active video during a vertical blanking period
 - Sliced VBI data during a vertical blanking period or active video period (full field mode)
- # HSYNC/VSYNC outputs with programmable position, polarity, and width, and FID (field ID) output
- # Component video processing
 - Gain (contrast) and offset (brightness) adjustments
 - Automatic component video detection (525/625)
 - Color space conversion from RGB to YCbCr
- # Composite and S-video processing
 - Adaptive 2-D 5-line adaptive comb filter for composite video inputs; chroma-trap available
 - Automatic video standard detection (NTSC/PAL/SECAM) and switching
 - Luma-peaking with programmable gain
 - Patented CTI circuit
 - Patented architecture for locking to weak, noisy, or unstable signals
 - Single 14.31818-MHz reference crystal for all standards (ITU-R.BT601 and square pixel)

- Line-locked internal pixel sampling clock generation with horizontal and vertical lock signal outputs
- Genlock output (real-time control (RTC) and genlock control output (GLCO) formats) for downstream video encoder synchronization

Certified Macrovision copy protection detection Macrovision is a trademark of Macrovision Corporation.

Other trademarks are the property of their respective owners.

VBI data processor

- Teletext (NABTS, WST)
- CC and extended data service (EDS)
- Wide screen signaling (WSS)
- Copy generation management system (CGMS)
- Video program system (VPS/PDC)
- Vertical interval time code (VITC)
- Gemstar 1x/2x electronic program guide compatible mode
- Register readback of CC, WSS (CGMS), VPS/PDC, VITC and Gemstar 1x/2x sliced data

I2C host port interface

Reduced power consumption: 1.8-V digital core, 3.3-V for digital I/O, and 1.8-V analog core with power-save and power-down modes

80-pin TQFP PowerPAD package

3. PIN DESCRIPTION

PIN	Symbol	I/O	Description
Analog Video			
80	VL1_A	I	VL1_x : Analog video input for CVBS/Pb/B/C
1	VL1_B		VL2_x : Analog video input for CVBS/Y/G
2	VL1_C		VL3_x : Analog video input for CVBS/Pr/R/C
7	VL2_A		VL4_x : Analog video input for CVBS/Y
8	VL2_B		Up to 10 composite, 4 Svideo, and 2 composite or 3 component video inputs (or a combination thereof) can be supported. The inputs must be ac-coupled. The recommended coupling capacitor is 0.1 μF. The possible input configurations are listed in the input select register at I2C subaddress 00h
9	VL2_C		
16	VL3_A		
17	VL3_B		
18	VL3_C		
23	VL4_A		
Clock Signals			
40	DATACLK	O	Line-locked data output clock.

74	XTAL1	I	External clock reference input. It may be connected to an external oscillator with a 1.8-V compatible clock signal or a 14.31818-MHz crystal oscillator.
75	XTAL2	O	External clock reference output. Not connected if XTAL1 is driven by an external single-ended oscillator.
Digital Video			
57,58	C[9:0]/ GPIO[9:0]	O	Digital video output of CbCr, C[9] is MSB and C[0] is LSB. Unused outputs can be left unconnected. Also, these terminals can be programmable general-purpose I/O. For the 8-bit mode, the two LSBs are ignored.
59,60			
63,64			
65,66			
69,70			
58	D_BLUE	I	Digital BLUE input from overlay device
59	D_GREEN		Digital GREEN input from overlay device
60	D_RED		Digital RED input from overlay device
57	FSO		Fast-switch overlay between digital RGB and any video
43,44	Y[9:0]	O	Digital video output of Y/YCbCr, Y[9] is MSB and Y[0] is LSB. For the 8-bit mode, the two LSBs are ignored. Unused outputs can be left unconnected.
45,46			
47,70			
51,52			
53,54			
Miscellaneous Signals			
35	FSS/GPIO	I/O	Fast-switch (blanking) input. Switching signal between the synchronous component video (YPbPr/RGB) and the composite video input. Programmable general-purpose I/O
37	GLCO/I2CA	I/O	Genlock control output (GLCO). Two Genlock data formats are available: TI format and real time control (RTC) format. During reset, this terminal is an input used to program the I2C address LSB.
30	INTREQ	O	Interrupt request
33	PWDN	I	Power down input: 1 = Power down 0 = Normal mode
34	RESETB	I	Reset input, active low
Host Interface			
28	SCL	I	I2C clock input
29	SDA	I/O	I2C data bus

Power Supplies			
26	AGND	I	Analog ground. Connect to analog ground.
13	A18GND_REF	I	Analog 1.8-V return
12	A18VDD_REF	I	Analog power for reference 1.8 V
79	CH1_A18GND	I	Analog 1.8-V return
10	CH2_A18GND	I	
15	CH3_A18GND	I	
24	CH4_A18GND	I	
78	CH1_A18VDD	I	Analog power. Connect to 1.8 V.
11	CH2_A18VDD	I	
14	CH3_A18VDD	I	
25	CH4_A18VDD	I	
3	CH1_A33GND	I	Analog 3.3-V return
6	CH2_A33GND	I	
19	CH3_A33GND	I	
22	CH4_A33GND	I	
4	CH1_A33VDD	I	Analog power. Connect to 3.3 V.
5	CH2_A33VDD	I	
20	CH3_A33VDD	I	
21	CH4_A33VDD	I	
27,32,42,56,68	DGND	I	Digital return
31,41,55,67	DVDD	I	Digital power. Connect to 1.8 V.
39,49,62	IOGND	I	Digital power return
38,48,61	IOVDD	I	Digital power. Connect to 3.3 V or less for reduced noise.
77	PLL_A18GND	I	Analog power return
76	PLL_A18VDD	I	Analog power. Connect to 1.8 V.
Sync Signals			
72	HS/CS/GPIO	I/O	Horizontal sync output or digital composite sync output Programmable general-purpose I/O
73	VS/VBLK/GPIO	I/O	Vertical sync output (for modes with dedicated VSYNC) or VBLK output Programmable general-purpose I/O
71	FID/GPIO	I/O	Odd/even field indicator output. This terminal needs a pulldown resistor. Programmable general-purpose I/O
36	AVID/GPIO	I/O	Active video indicator output

			Programmable general-purpose I/O
--	--	--	----------------------------------

3.5.7 Function introduction to 16316-52

1. DESCRIPTION

FRONT PANEL CONTROLLER WITH POWER CONTROL FUNCTION The 16316-52 is a FIP (Fluorescent Indicator Panel, or Vacuum Fluorescent Display) controller/driver that is driven on a 1/4 to 1/16 duty factor. It consists of 25 FIP, a display memory, a control circuit, a key scan circuit and a remote control decoder. Serial data is input to the 16316-52 through a 5-line serial interface which is fully hand-shake with the HOST. This FIP controller is ideal as a peripheral device for front panel control for DVD/VCD.

2. FEATURES

FIP controller/driver : 25 display output (1-segment and 24 digits to 24 segment and 1 digit)

Key scanning (3 X 16)

Stand-by control

Remote control code decoding with programmable custom code, support remote formats : N EC, RC5, Kaisakyo, Sony 12 bit, Sony 15 bit

User configurable wake-up code (8 key-code, 8 remote code)

Dimming control

High-voltage output

User data storage (32 bytes)

LED ports (4 chs., 20 mA max)

Serial interface

Fully compatible with C-CUBE ZIVA Font Panel (MIS) protocol.

3. PIN DESCRIPTION

PIN	Symbol	I/O	Description
1	Vdd		Logic Power
2	XT1		Oscillator Circuit input (Sub-clock)
3	XT2		Oscillator Circuit output(Sub-clock)
4	RESET		Reset
5	RDY_FM		Front Panel Microcontroller Ready
6	ATN_FM		Attention by Front Micom
7	#HOST_RST	O	The reset output to main processor
8	SCK	I	Clock input

9	D_FM	O	Data Output
10	D_HOST	I	The Host transmits 8-bit serial data with LSB first.
11	SCK1	I	Clock input
12	POWER_FAIL	I	Power control pin to control the main power
13	IR	I	Connect to IR receiver module
14	FIP0	O	FIP Driving Pins
15	FIP1		
16	FIP2		
17	FIP3		
18	FIP4		
19	FIP5		
20	FIP6		
21	FIP7		
22	FIP8		
23	FIP9		
24	FIP10		
25	FIP11		
26	FIP12		
27	Vdd	I	Logic Power
28	VLoad	I	Pull-Down level
29	FIP13	O	FIP Driving Pins
30	FIP14		
31	FIP15		
32	FIP16		
33	FIP17		
34	FIP18		
35	FIP19		
36	FIP20		
37	FIP21		
38	FIP22		
39	FIP23		
40	FIP24		
41	KEY_R1	I	Input signal for keyboard scan

42	KEY_R2		
43	KEY_R3		
44	POWER_CTL		Power control pin to control the main power
45	LED1	O	LED Output
46	LED2		
47	LED3		
48	LED4		
49	IC		
50	X1	I	Oscillator Circuit input (main clock)
51	X2	O	Oscillator Circuit output (main clock)
52	VSS	I	Ground

3.5.8 Function introduction to SN74LVC16373

1. Description

This 16-bit transparent D-type latch is designed for 2.7-V to 3.6-V VCC operation. The SN74LVC16373 is particularly suitable for implementing buffer registers, I/O ports, bidirectional bus drivers, and working registers. It can be used as two 8-bit latches or one 16-bit latch. When the latch-enable (LE) input is high, the Q outputs follow the data (D) inputs. When LE is taken low, the Q outputs are latched at the levels set up at the D inputs. A buffered output-enable (OE) input can be used to place the eight outputs in either a normal logic state (high or low logic levels) or a high-impedance state. In the high-impedance state, the outputs neither load nor drive the bus lines significantly. The high-impedance state and the increased drive provide the capability to drive bus lines without need for interface or pullup components. OE does not affect internal operations of the latch. Old data can be retained or new data can be entered while the outputs are in the high-impedance state. To ensure the high-impedance state during power up or power down, OE should be tied to VCC through a pullup resistor; the minimum value of the resistor is determined by the current-sinking capability of the driver. Active bus-hold circuitry is provided to hold unused or floating data inputs at a valid logic level.

2. Feature

Member of the Texas Instruments Widebus? Family

EPIC? (Enhanced-Performance Implanted CMOS) Submicron Process

Typical VOLP (Output Ground Bounce) < 0.8 V at VCC = 3.3 V, TA = 25? C

Typical VOHV (Output VOH Undershoot) > 2 V at VCC = 3.3 V, TA = 25? C

Latch-Up Performance Exceeds 250 mA Per JEDEC Standard JESD-17

Bus Hold on Data Inputs Eliminates the Need for External Pullup/Pulldown Resistors

Package Options Include Plastic 300-mil Shrink Small-Outline (DL) and Thin Shrink Small-Outline (DGG) Packages DGG OR DL PACKAGE

3. PIN DESCRIPTION

PIN	Symbol	I/O	Description
1	#1OE	I	Lacth1 enable input
2	1Q1	O	Latch1 output
3	1Q2	O	Latch1 output
4	GND	I	Ground
5	1Q3	O	Latch1 output
6	1Q4	O	Latch1 output
7	VCC	I	Power supply
8	1Q5	O	Latch1 output
9	1Q6	O	Latch1 output
10	GND	I	Ground
11	1Q7	O	Latch1 output
12	1Q8	O	Latch1 output
13	2Q1	O	Latch2 output
14	2Q2	O	Latch2 output
15	GND	I	Ground
16	2Q3	O	Latch2 output
17	2Q4	O	Latch2 output
18	VCC	I	Power supply
19	2Q5	O	Latch2 output
20	2Q6	O	Latch2 output
21	GND	I	Ground
22	2Q7	O	Latch2 output
23	2Q8	O	Latch2 output
24	#2OE	I	Lacth2 enable input
25	2LE	I	Clock input 2
26	2D8	I	Latch2 input
27	2D7	I	Latch2 input
28	GND	I	Ground
29	2D6	I	Latch2 input

30	2D5	I	Latch2 input
31	VCC	I	Power supply
32	2D4	I	Latch2 input
33	2D3	I	Latch2 input
34	GND	I	Ground
35	2D2	I	Latch2 input
36	2D1	I	Latch2 input
37	1D8	I	Latch1 input
38	1D7	I	Latch1 input
39	GND	I	Ground
40	1D6	I	Latch1 input
41	1D5	I	Latch1 input
42	VCC	I	Power supply
43	1D4	I	Latch1 input
44	1D3	I	Latch1 input
45	GND	I	Ground
46	1D2	I	Latch1 input
47	1D1	I	Latch1 input
48	1LE	I	Clock input 1

3.5.9 Function introduction to MSP 34x5G

1. Description

The MSP 34x5G family of single-chip Multistandard Sound Processors covers the sound processing of all analog TV standards worldwide, as well as the NICAM digital sound standards. The full TV sound processing, starting with analog sound IF signal-in, down to processed analog AF-out, is performed in a single chip. Figure 1–1 shows a simplified functional block diagram of the MSP 34x5G.

This new generation of TV sound processing ICs now includes versions for processing the multichannel television sound (MTS) signal conforming to the standard recommended by the Broadcast Television Systems Committee (BTSC). The DBX noise reduction is performed alignment-free.

Other processed standards are the Japanese FM-FM multiplex standard (EIA-J) and the FM-Stereo-Radio standard.

Current ICs have to perform adjustment procedures in order to achieve good stereo separation for BTSC and EIA-J. The MSP 34x5G has optimum stereo performances without any adjustments.

All MSP 34xxG versions are pin compatible to the MSP 34xxD. Only minor modifications are necessary

to adapt a MSP 34xxD controlling software to the MSP 34xxG. The MSP 34x5G further simplifies controlling software. Standard selection requires a single I2C transmission only.

2. PIN DESCRIPTION

PIN	Symbol	I/O	Description
1	AVSUP	I	Analog power supply +5 V
2	ANA_IN1+	I	IF input 1
3	ANA_IN-	I	IF common
4	TESTEN	I	Test pin
5	XTAL_IN	I	Crystal oscillator
6	XTAL_OUT	O	Crystal oscillator
7	TP	I	Test pin
8	D_CTR_I/O_1	I/O	D_CTR_I/O_1
9	D_CTR_I/O_0	I/O	D_CTR_I/O_0
10	ADR_SEL	I	I2C Bus address select
11	STANDBYQ	I	Standby
12	I2C_SCL	I/O	I2C clock
13	I2C_SDA	I/O	I2C data
14	I2C_CL	I	I2C clock
15	I2C_WS	I	I2C word strobe
16	I2C_DA_OUT	O	I2C data output
17	I2C_DA_IN1	I	I2C data input
18	TP_CO	I	ADR clock
19	DVSUP	I	Digital power supply +5 V
20	DVSS	I	Digital ground
21	I2C_DA_IN2	I	I2S2-data input
22	RESETQ	I	Power-on-reset
23	NC		Not connected
24	NC		Not connected
25	VREF2	I	Reference ground 2 high-voltage part
26	DACM_R	O	Loudspeaker out R
27	DACM_L	O	Loudspeaker out L
28	NC		Not connected
29	VREF1	I	Reference ground 1 high-voltage part

30	SC1_OUT_R	O	SCART 1 output R
31	SC1_OUT_L	O	SCART 1 output L
32	NC		Not connected
33	AHVSUP	I	Analog power supply 8.0 V
34	CAPL_M	I	Volume capacitor MAIN
35	AHVSS	I	Analog ground
36	AGNDC	I	Analog reference voltage high-voltage part
37	SC2_IN_L	I	SCART 1 input 2
38	SC2_IN_R	I	SCART 1 input 2
39	ASG1	I	Analog shield ground
40	SC1_IN_L	I	SCART 1 input 1
41	SC1_IN_R	I	SCART 1 input 1
42	VREFTOP	I	Reference voltage IF A/D converter
43	MONO_IN	I	Mono input
44	AVSS	I	Analog ground

3.5.10 function introduction to TPS2041A

1. Description

The TPS2041A through TPS2044A and TPS2051A through TPS2054A power-distribution switches are intended for applications where heavy capacitive loads and short circuits are likely to be encountered. These devices incorporate 80-mW N-channel MOSFET high-side power switches for power-distribution systems that require multiple power switches in a single package. Each switch is controlled by an independent logic enable input. Gate drive is provided by an internal charge pump designed to control the power-switch rise times and fall times to minimize current surges during switching. The charge pump requires no external components and allows operation from supplies as low as 2.7 V.

When the output load exceeds the current-limit threshold or a short is present, these devices limit the output current to a safe level by switching into a constant-current mode, pulling the overcurrent (OCx) logic output low. When continuous heavy overloads and short circuits increase the power dissipation in the switch, causing the junction temperature to rise, a thermal protection circuit shuts off the switch to prevent damage. Recovery from a thermal shutdown is automatic once the device has cooled sufficiently. Internal circuitry ensures the switch remains off until valid input voltage is present. These power-distribution switches are designed to current limit at 0.9 A.

2. FEATURE

80-mW High-Side MOSFET Switch

500 mA Continuous Current Per Channel

Independent Thermal and Short-Circuit Protection With Overcurrent Logic Output

Operating Range . . . 2.7 V to 5.5 V

CMOS- and TTL-Compatible Enable Inputs

2.5-ms Typical Rise Time

Undervoltage Lockout

10 mA Maximum Standby Supply Current for Single and Dual (20 mA for Triple and Quad)

Bidirectional Switch

Ambient Temperature Range, 0°C to 85°C

ESD Protection

UL Listed "C File No. E169910

3. PIN DESCRIPTION

PIN	Symbol	I/O	Description
1	GND	I	Ground
2	IN	I	Input voltage
3	IN	I	Input voltage
4	#EN	I	Enable input
5	#OC	O	Over current
6	OUT	I	Power-switch
7	OUT	I	
8	OUT	I	

3.5.11 function introduction to LP2995

1. Description

The LP2995 linear regulator is designed to meet the JEDEC STL-2 and SSTL-3 specifications for termination of DDRSDRAM. The device contains a high-speed operational amplifier to provide excellent response to load transients. The output stage prevents shoot through while delivering 1.5A continuous current and transient peaks up to 3A in the application as required for DDR-SDRAM termination. The LP2995 also incorporates a VSENSE pin to provide superior load regulation and a VREF output as a reference for the chipset and DDR DIMMS.

2. Features

- Low output voltage offset
- Works with +5v, +3.3v and 2.5v rails
- Source and sink current
- Low external component count
- No external resistors required
- Linear topology
- Available in SO-8, PSOP-8 or LLP-16 packages
- Low cost and easy to use

3. PIN DESCRIPTION

PIN	Symbol	Description
1	NC	No internal connection.
2	GND	Ground
3	VSENSE	Feedback pin for regulating VTT .
4	VREF	Buffered internal reference voltage of VDDQ/2.
5	VDD	Input for internal reference equal to VDDQ/2.
6	AVIN	Analog input pin.
7	PVIN	Power input pin.
8	VTT	Output voltage for connection to termination resistors.

3.5.12 function introduction to FSDM0565R

1. Description

The FSDM0565R is specially designed for an off-line Switched mode power supply (SMPS). This device is a current mode PWM controller combined with a high voltage power SenseFET in a single package using BCDMOS technology. The PWM controller includes integrated fixed frequency oscillator, under voltage lockout, leading edge blanking (LEB), optimized gate driver, internal soft start, temperature compensated precise current sources for a loop compensation and self protection circuitry. Compared with discrete MOSFET and PWM controller solution, it can reduce total cost, component count, size and weight simultaneously increasing efficiency, productivity, and system reliability. This device is well suited for cost effective design of LCD monitor adapter.

2. Features

- Precise fixed operating frequency (70kHz)
- Low power consumption (under 1W) at 265VAC with 0.5W load with a burst-mode operation

Pulse by pulse current limit
 Abnormal over current protection (auto restart mode)
 Over voltage protection (auto restart mode)
 Over load protection (auto restart mode)
 Thermal shutdown (auto restart mode)
 Under voltage lockout
 Fully avalanche rated and 100% tested senseFET
 Internal soft start

3. PIN DESCRIPTION

PIN	Symbol	Description
1	Drain	This pin is the high voltage power SenseFET drain.
2	Ground	This pin is the control ground and the SenseFET source.
3	Vcc	This pin is the positive supply voltage input.
4	Feedback	This pin is internally connected to the inverting input of the PWM comparator.
5	Nc	
6	Vstr	This pin is connected directly to the high voltage DC link.

3.5.13 Function introduction to M41T80

1. DESCRIPTION

M41T80 is the latest serial real-time clock chip, and used in batter power supply. M41T80 includes I2C jack and warning function of 400KHz, special 32KHz output, when in low power mode or clock generator reference input, the micro controller of 32Khz is very useful. The warning function of M41T80 includes repeat mode, from once in a year to once in a second. The programmable wave function may perform program from 1Hz to 32KHz, power classification of 2, when voltage power supply is normal, 32KHz output is continuous and may be screen-shielded by software.

2. Features

2.0 TO 5.5V CLOCK OPERATING VOLTAGE

COUNTERS FOR TENTHS/HUNDREDTHS OF SECONDS, SECONDS, MINUTES, HOURS, DAY, DATE, MONTH, YEAR, and CENTURY

SERIAL INTERFACE SUPPORTS I2C BUS (400KHz)

PROGRAMMABLE ALARM and INTERRUPT FUNCTION

LOW OPERATING CURRENT OF 200µA

OPERATING TEMPERATURE OF -40 TO 85 °C

3. PIN DESCRIPTION

PIN	Symbol	I/O	Description
1	XI	I	Crystal oscillator input
2	XO	O	Crystal oscillator output
3	F32K	O	32KHz square wave output
4	VSS	I	Ground
5	SDA	I/O	Serial data input/output
6	SCL	I	Serial clock input
7	IRQ	O	Interrupt / Output Driver / Square Wave (Open Drain)
8	VCC	I	Supply voltage

3.5.14 function introduction to EM6353

1. Description

The EM6353 is an ultra-low current reset circuit available in a large variety of configurations and very small packages for maximum flexibility in all end-applications up to 125° C and using power supplies between 1.5V and 5.5V.

This circuit monitors the supply voltage of any electronic system, and generates the appropriate reset signal after a fixed reset timeout period. The threshold defines the minimum allowed voltage which guarantees the good functionality of the system. When VDD rises above VTH, the output remains active for an additional delay time. This allows the system to stabilize before getting fully active. The EM6353 features three output types: active-low pushpull, active-low open-drain and active-high push-pull. Small SC70-5L and SOT23-3L packages as well as ultra-low supply current of 2.9 μ A make the EM6353 an ideal choice for portable and battery-operated devices.

2. Features

200ms reset timeout period (25ms on request)

Ultra-low supply current of 2.9 μ A (VDD=3.3V)

Operating temperature range: -40° C to +125°C

\pm 1.5% reset threshold accuracy

11 reset threshold voltages VTH: 4.63V, 4.4V, 3.08V, 2.93V, 2.63V, 2.2V, 1.8V, 1.66V, 1.57V, 1.38V, 1.31V

3 reset output options:

Active-low RESET push-pull

Active-low RESET open-drain

Active-high RESET push-pull

- No external components
- Immune to short negative VDD transients
- Guaranteed Reset valid down to 0.8V
- Threshold hysteresis: 2.1% of VTH
- Very small SOT23-3L and SC70-5L packages

3. PIN DESCRIPTION

PIN	Symbol	I/O	Description
1	NC		
2	VDD	I	Power supply
3	NC		
4	GND	I	Ground
5	RESET	O	Active-low RESET output.

3.5.15 function introduction to KA5H0380R

1. Description

The Fairchild Power Switch (FPS) product family is specially designed for an off-line SMPS with minimal external components. The Fairchild Power Switch (FPS) consist of high voltage power SenseFET and current mode PWM IC. Included PWM controller features integrated fixed frequency oscillator, under voltage lock-out, leading edge blanking, optimized gate turn-on/turn-off driver, thermal shutdown protection, over voltage protection, and temperature compensated precision current sources for loopcompensation and fault protection circuitry. Compared to discrete MOSFET and PWM controller or RCC solution, a Fairchild Power Switch(FPS) can reduce total component count, design size, weight and at the same time increase efficiency, productivity, and system reliability. It has a basic platform well suited for cost effective design

2. Features

- Precision fixed operating frequency (100/67/50kHz)

- Low start-up current(typ. 100uA)

- Pulse by pulse current limiting

- Over current protection

- Over voltage protecton (Min. 25V)

- Internal thermal shutdown function

- Under voltage lockout

- Internal high voltage sense FET

- Auto-restart mode

3. PIN DESCRIPTION

PIN	Symbol	I/O	Description
1	GND	I	Ground
2	DRAIN	O	Drain
3	VCC	I	Power supply
4	FB	I	Feedback

3.5.16 function introduction to 74HC/HCT14

1. Description

The 74HC/HCT14 are high-speed Si-gate CMOS devices and are pin compatible with low power Schottky TTL (LSTTL).

They are specified in compliance with JEDEC standard no. 7A.

The 74HC/HCT14 provides six inverting buffers with Schmitt-trigger action. They are capable of transforming slowly changing input signals into sharply defined, jitter-free output signals.

2. FEATURES

Output capability: standard ICC category: SSI

3. PIN DESCRIPTION

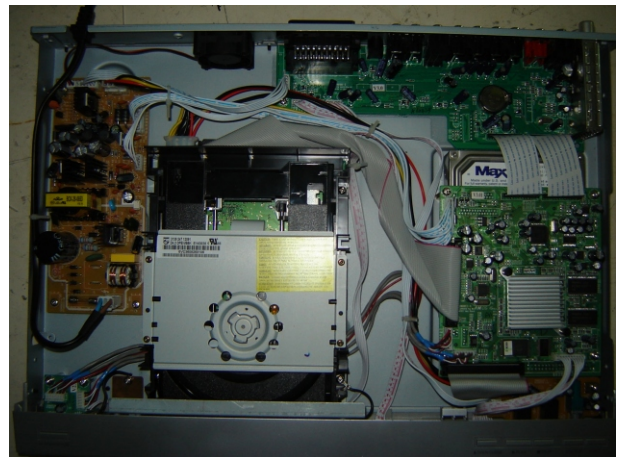
PIN	Symbol	I/O	Description
1, 3, 5, 9, 11, 13	1A to 6A	I	Data inputs
2, 4, 6, 8, 10, 12	1Y to 6Y	O	Data outputs
7	GND	I	Ground (0 V)
14	VCC	I	Positive supply voltage

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 “DW9918K Service Manual” or “.

The pictures of this model are shown as follows:

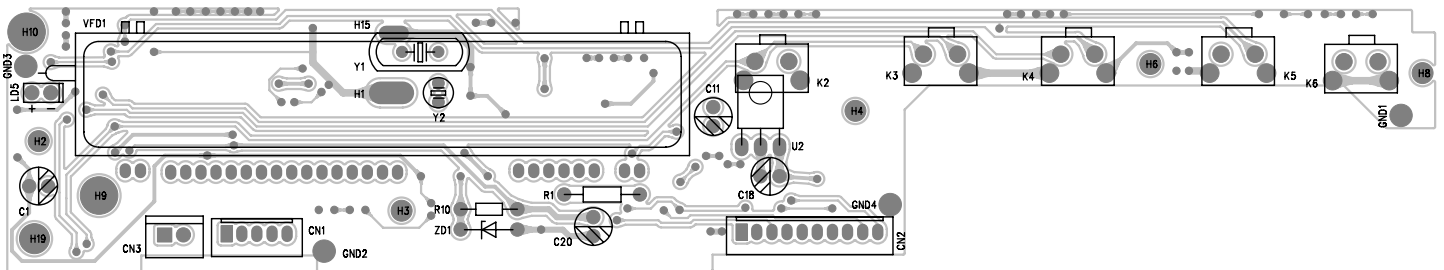


Chapter Cinque

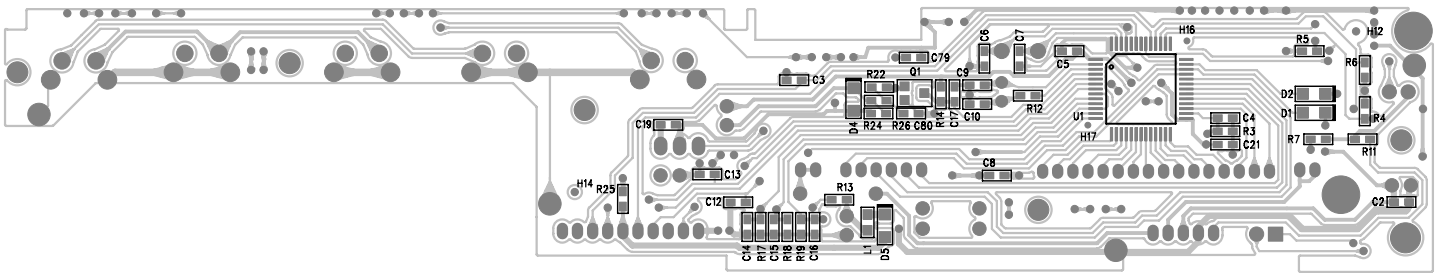
PCB board & Circuit diagram

Section One PCB board

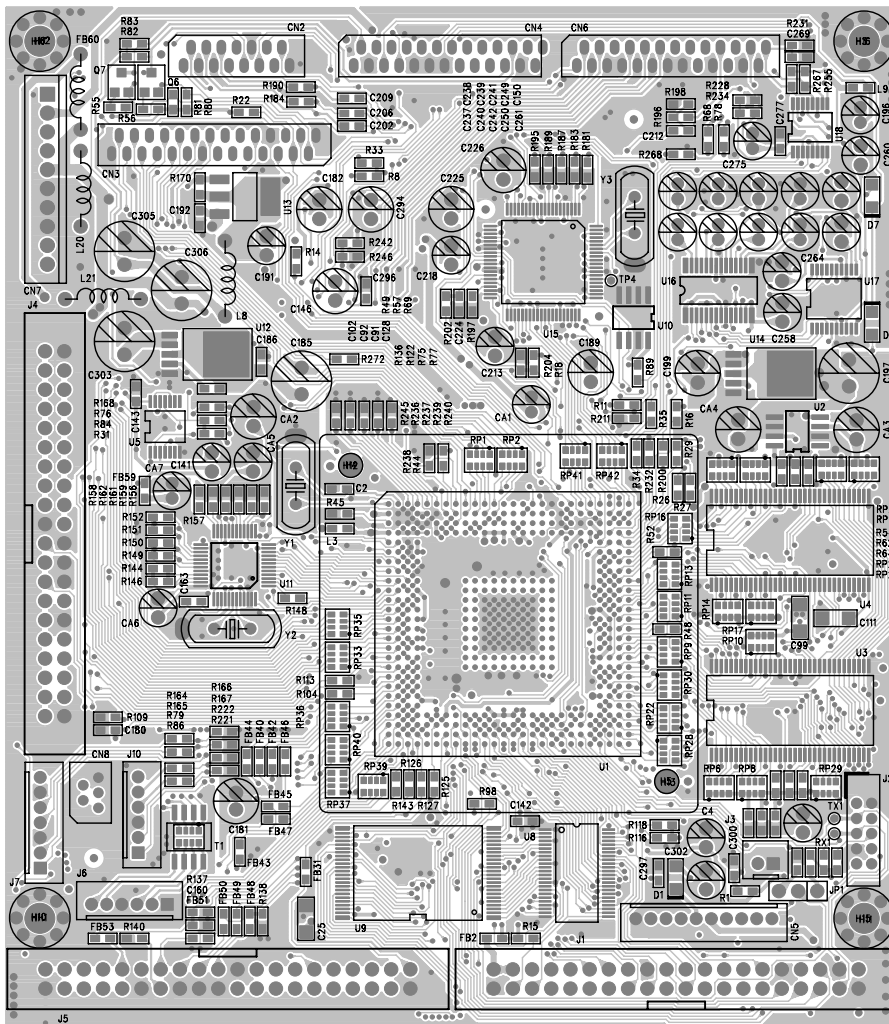
5.1.1 Surface layer of KEY SCAN Board



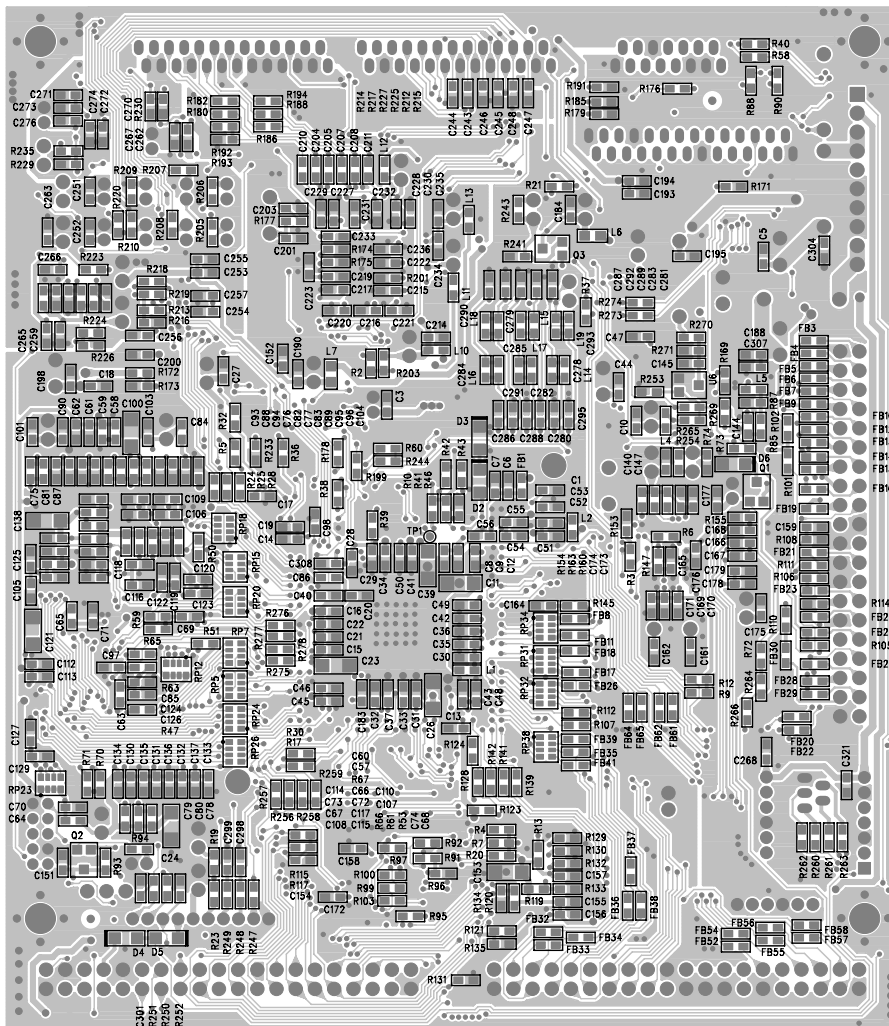
5.1.2 Bottom layer of KEY SCAN Board



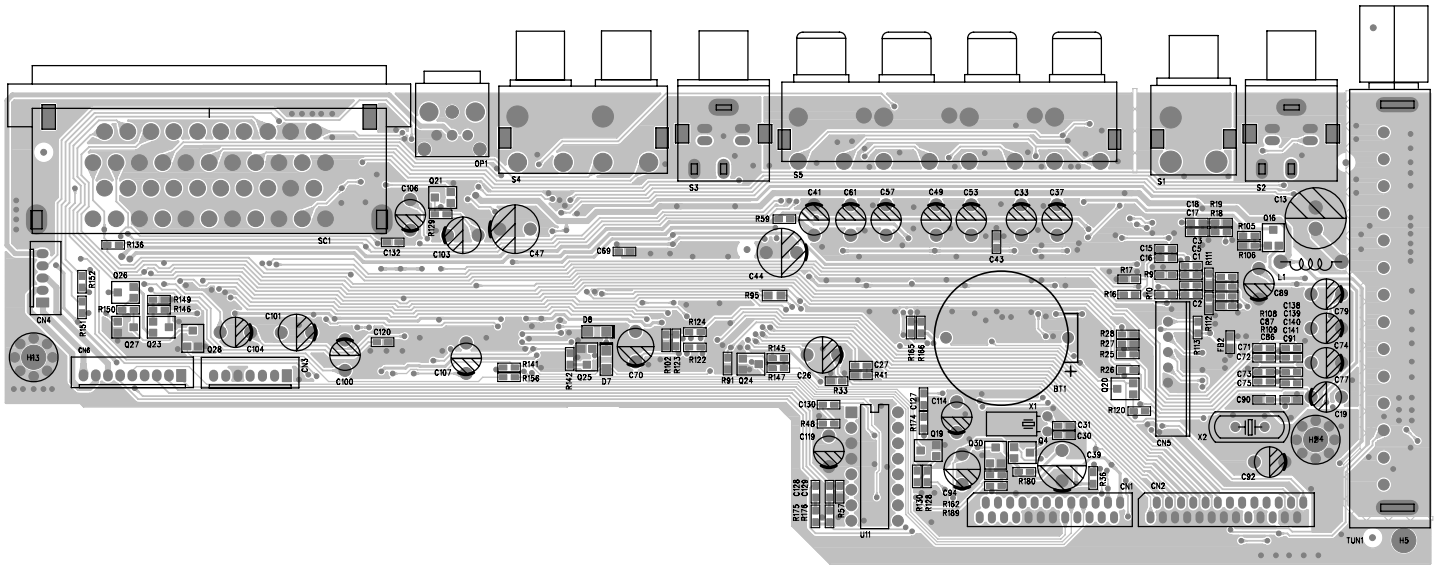
5.1.3 Surface layer of DECODE&SERVO Board



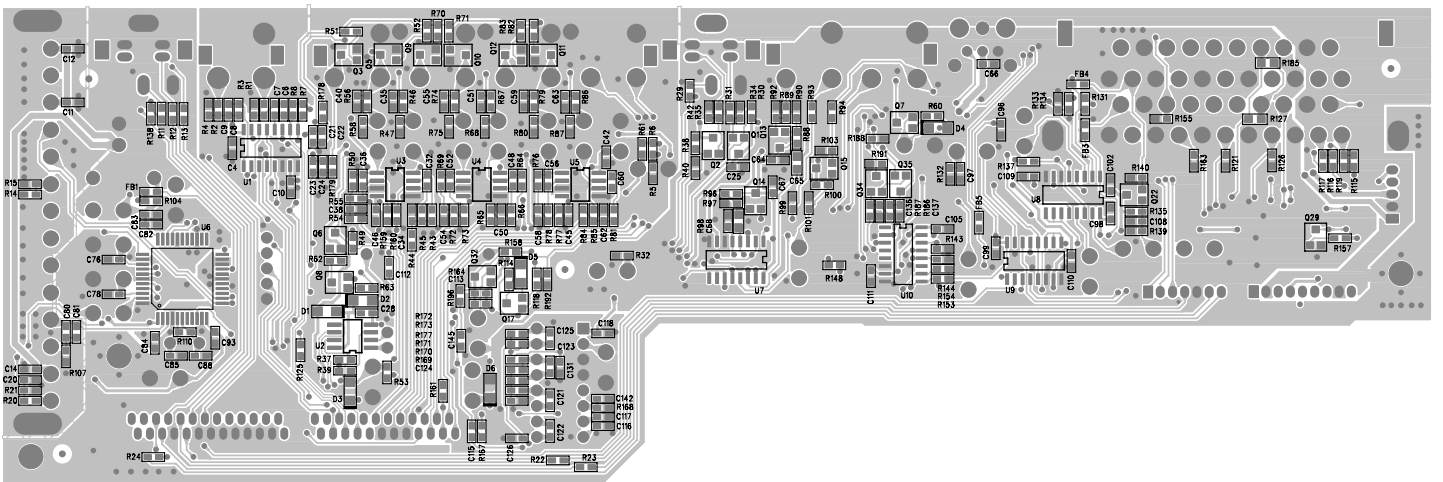
5.1.4 Bottom layer of DECODE&SERVO Board



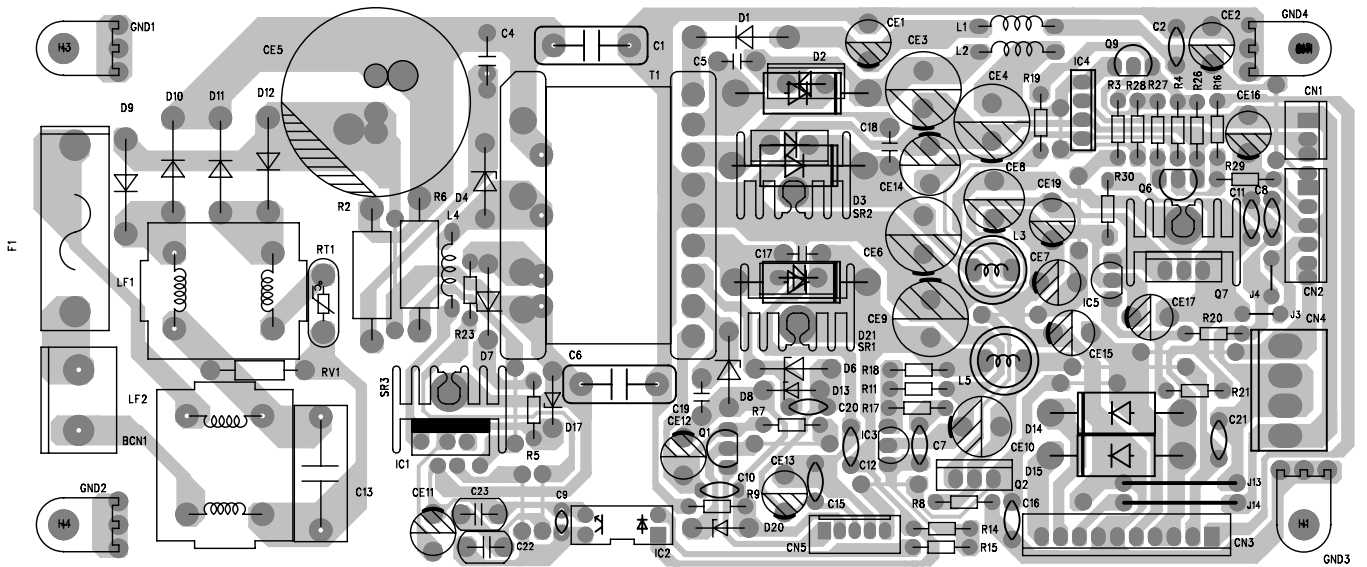
5.1.5 Surface layer of AV Board



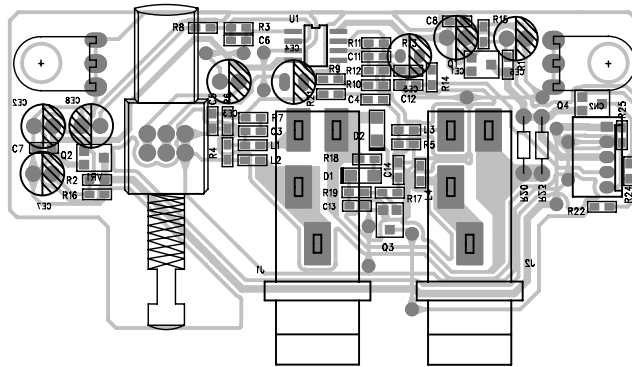
5.1.6 Bottom layer of AV Board



5.1.7 POWER Board

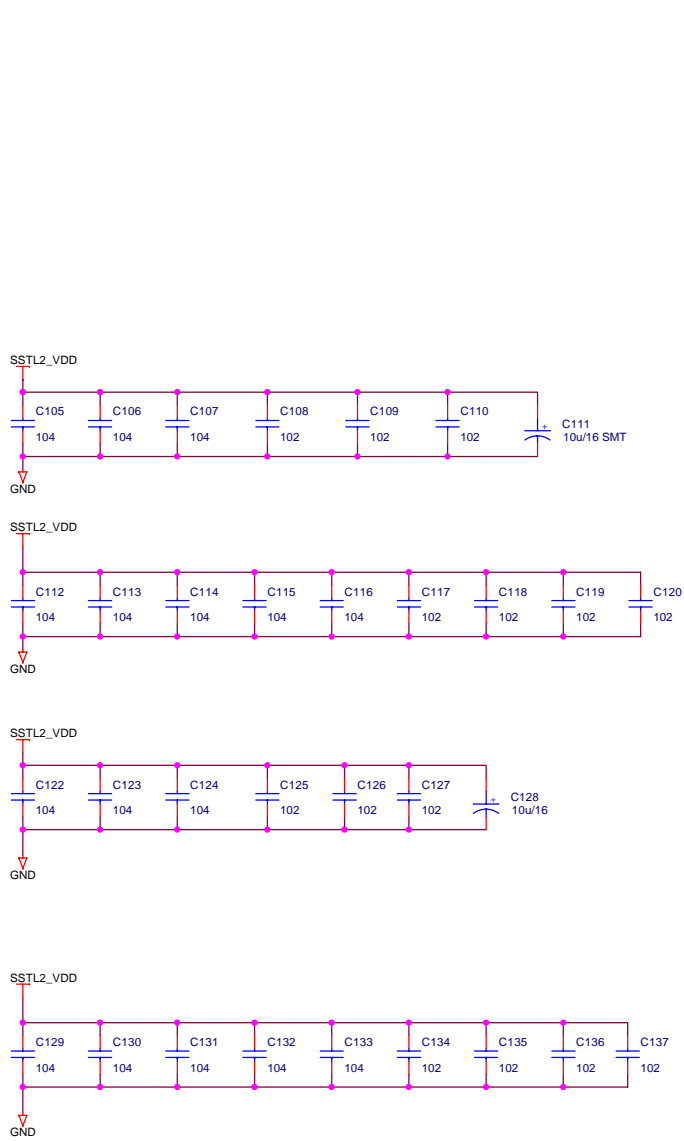
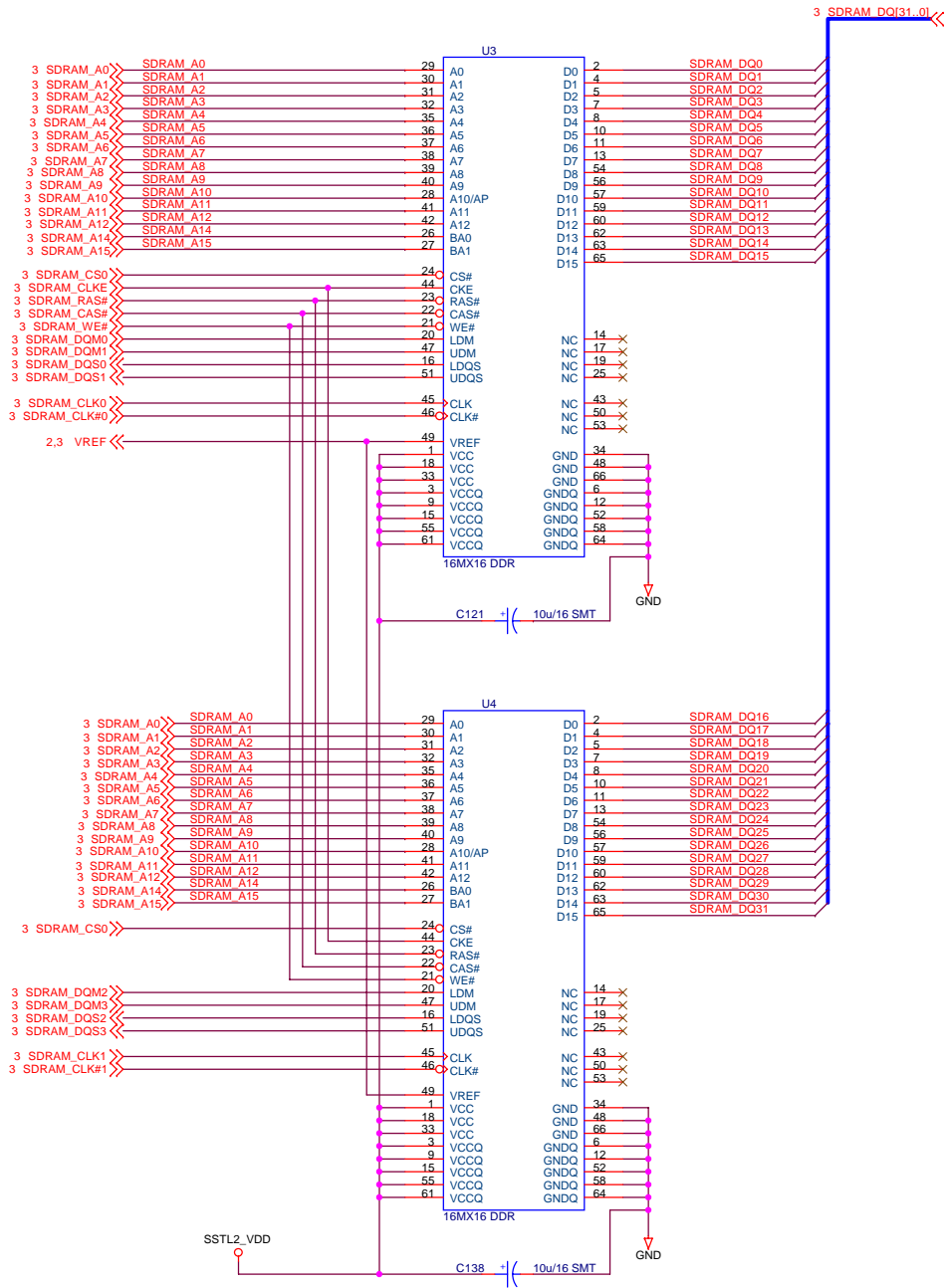


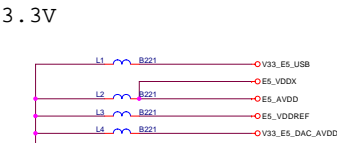
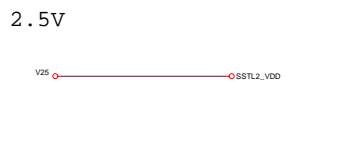
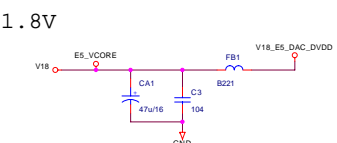
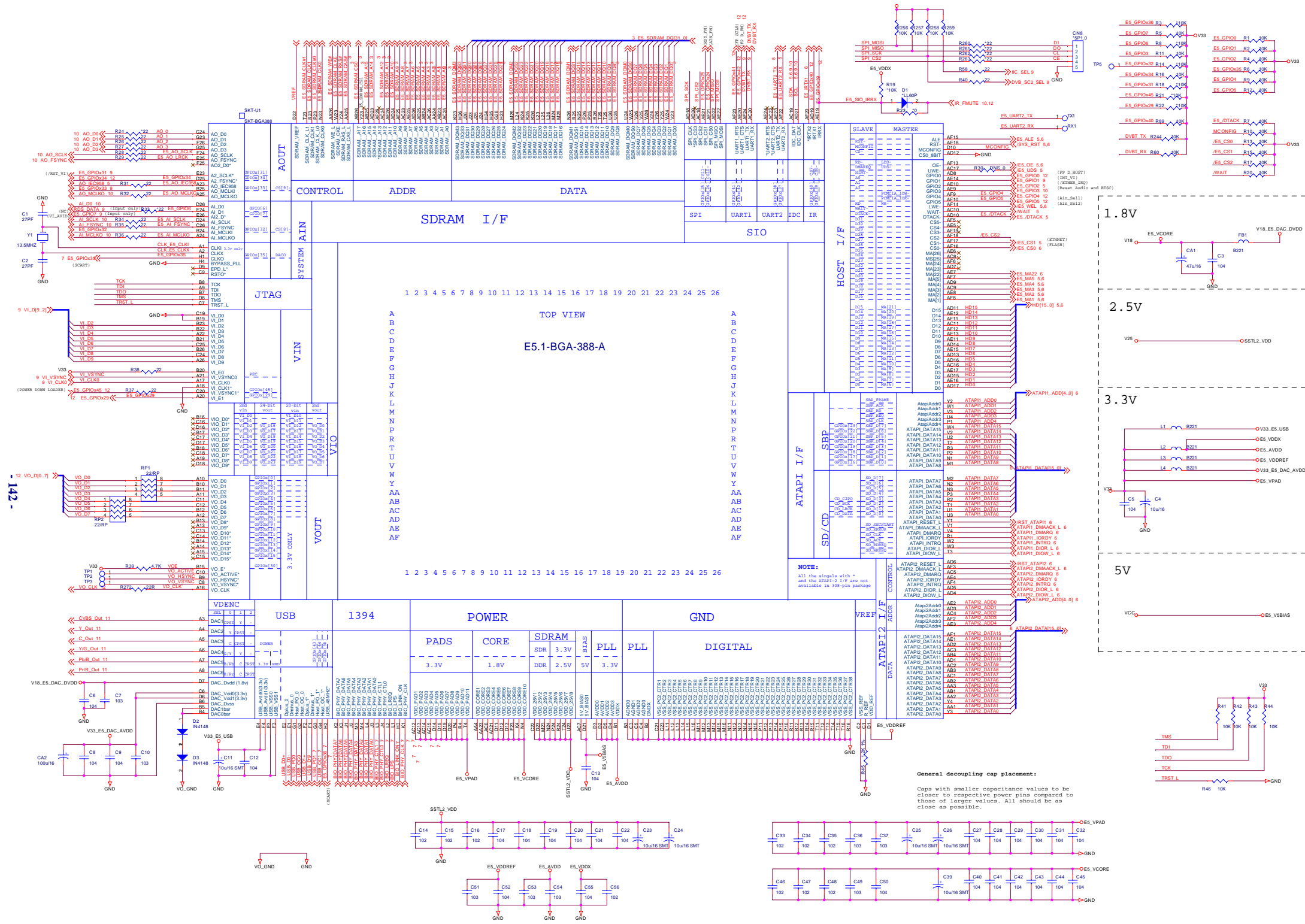
5.1.8 MIC Board



Section Two circuit diagram

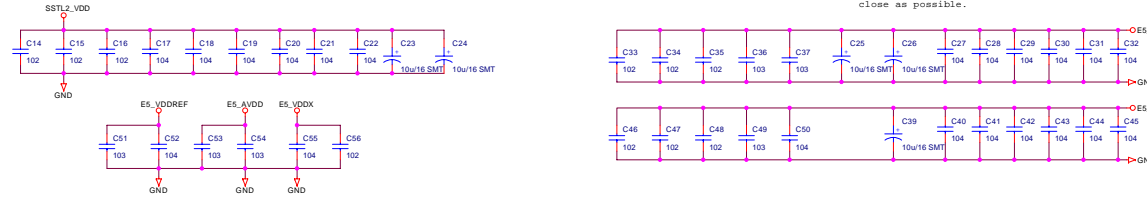
5.2.1 DECODE&SERVO Board

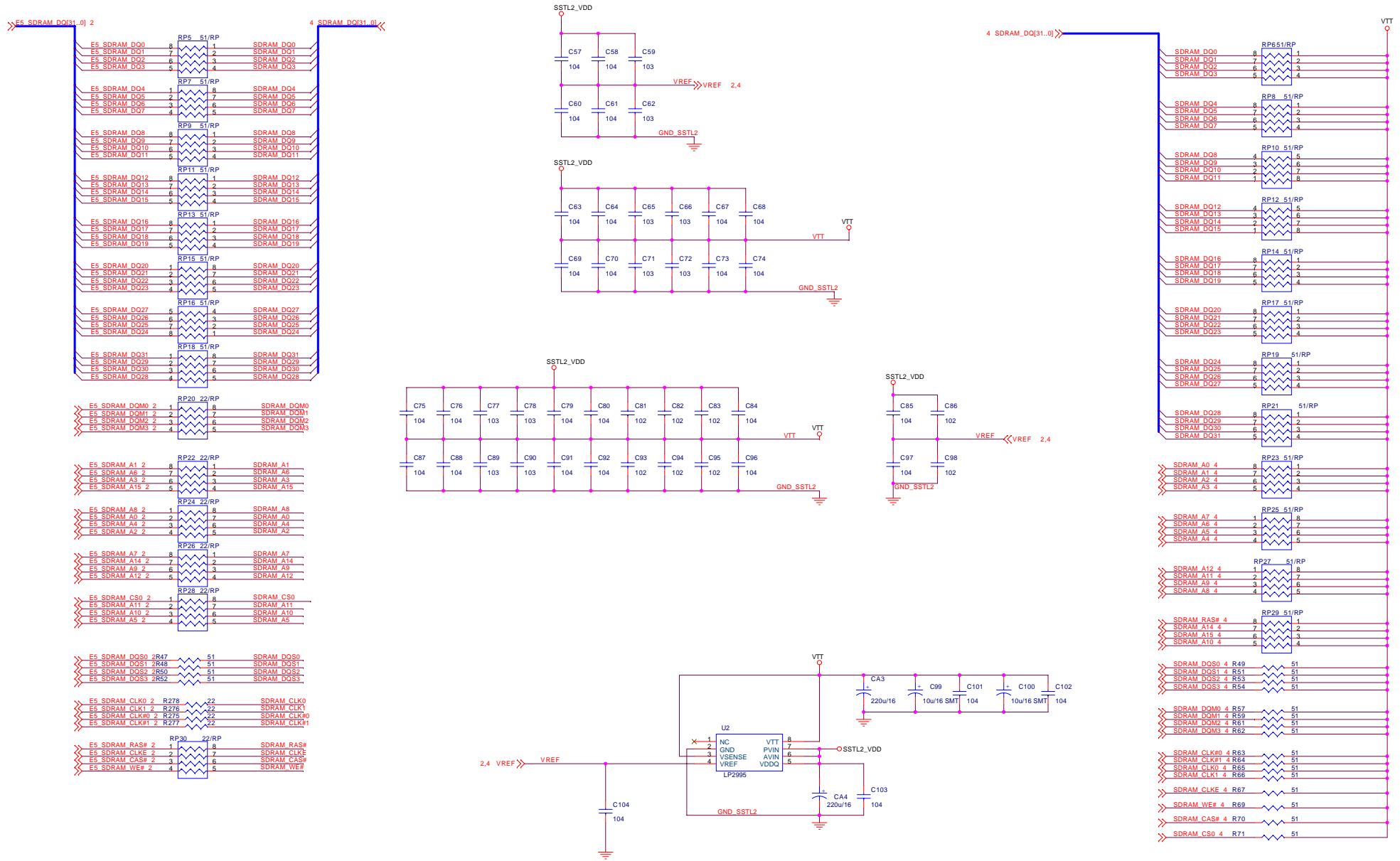


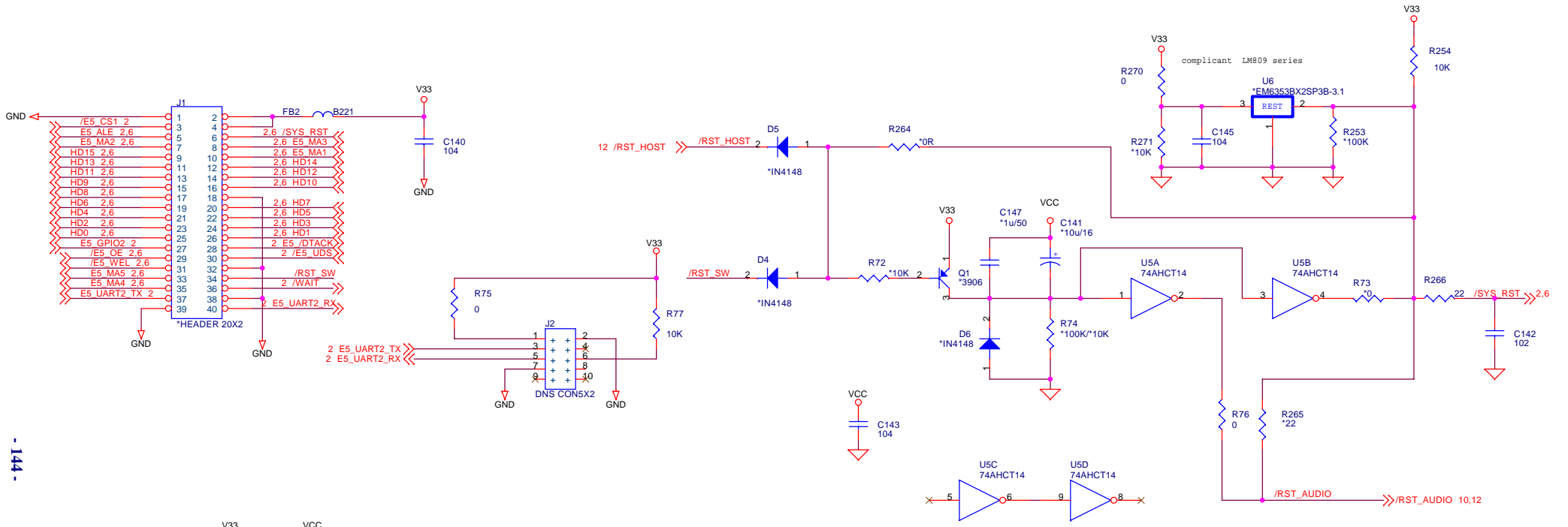


General decoupling cap placement:

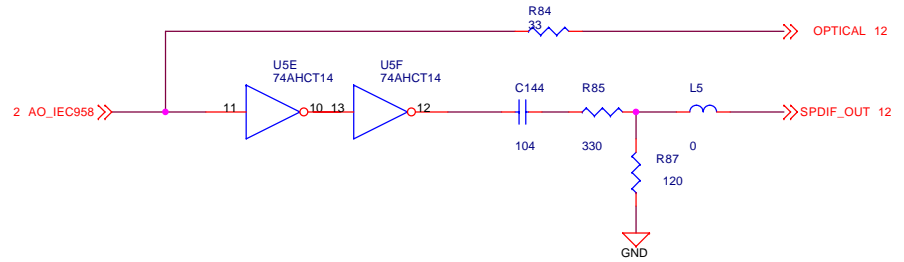
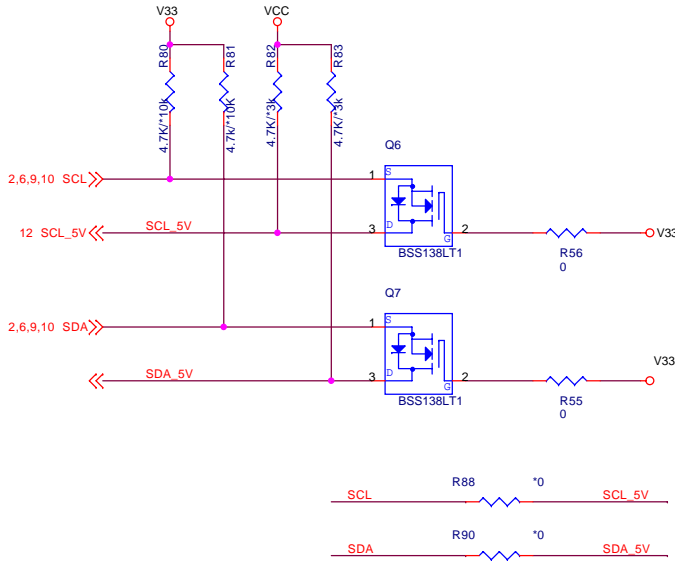
Caps with smaller capacitance values to be closer to respective power pins compared to those of larger values. All should be as close as possible.



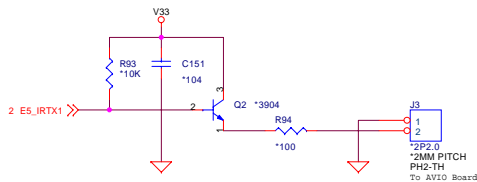




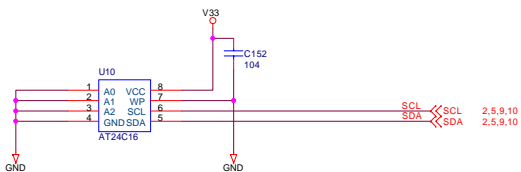
- 144 -



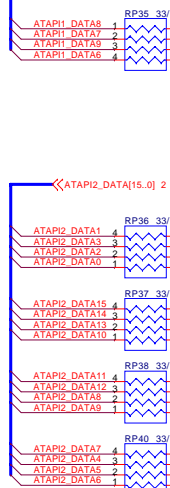
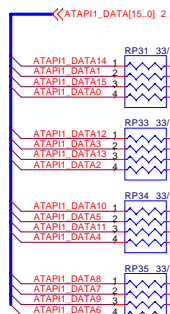
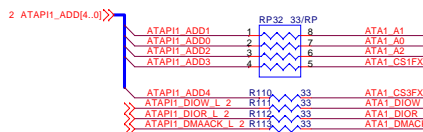
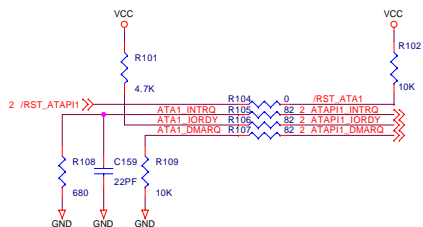
IR EMITTER



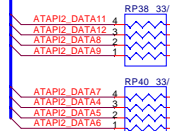
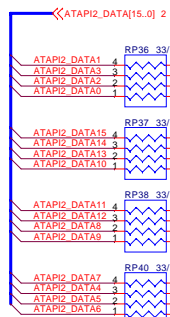
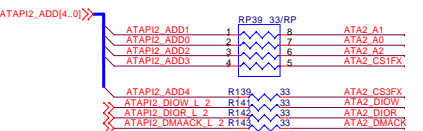
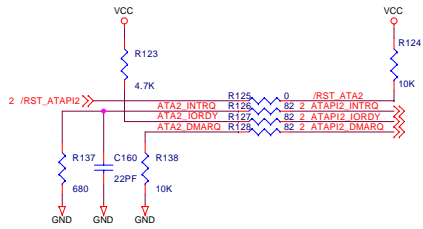
EEPROM



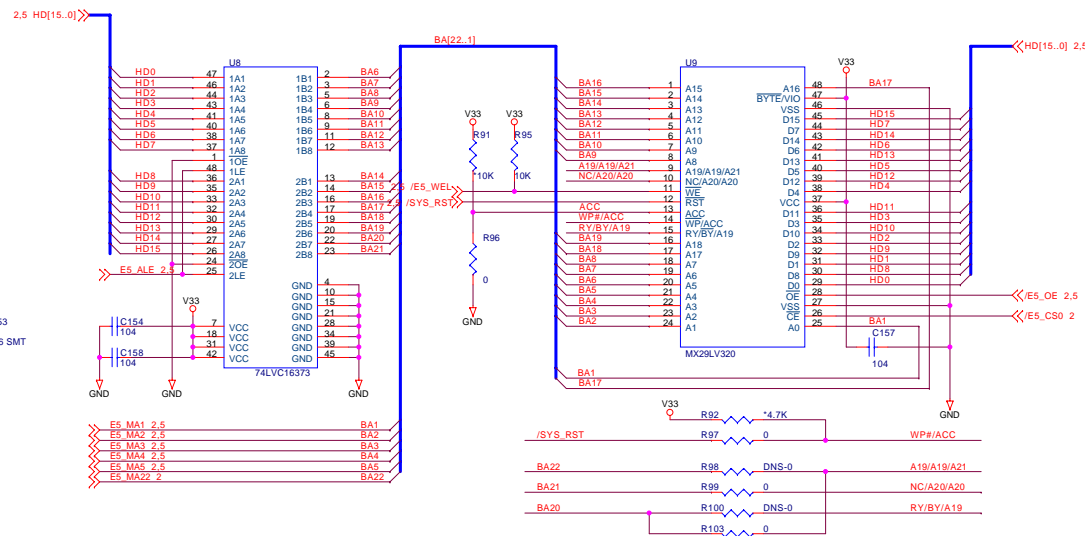
ATAPI1 (LOADER)



ATAPI2 (HD)

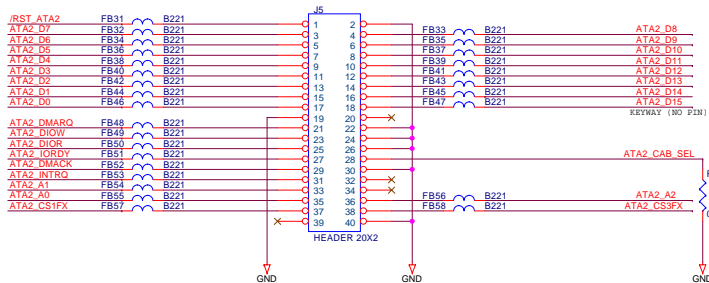
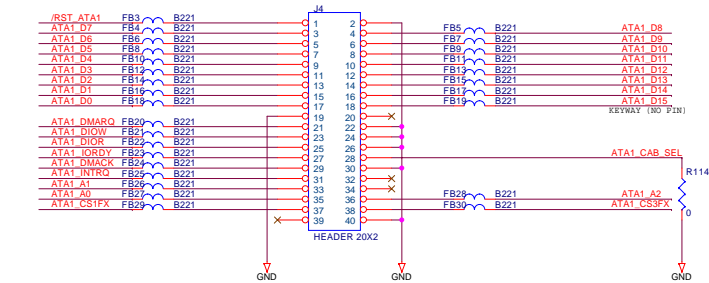
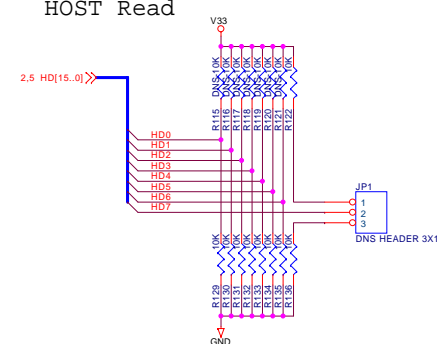


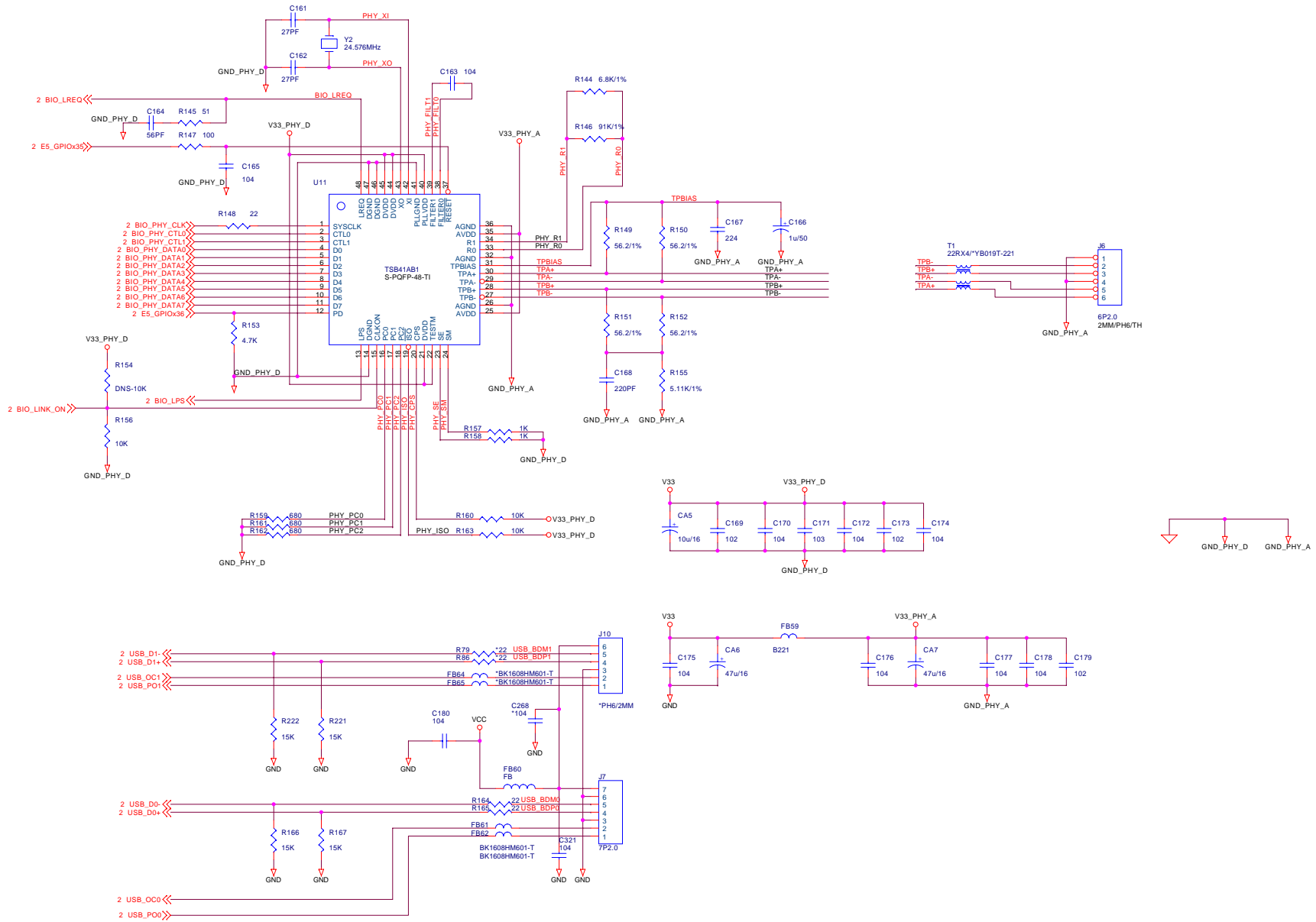
FLASH MEMORY (2 or 4 or 8 Mb)

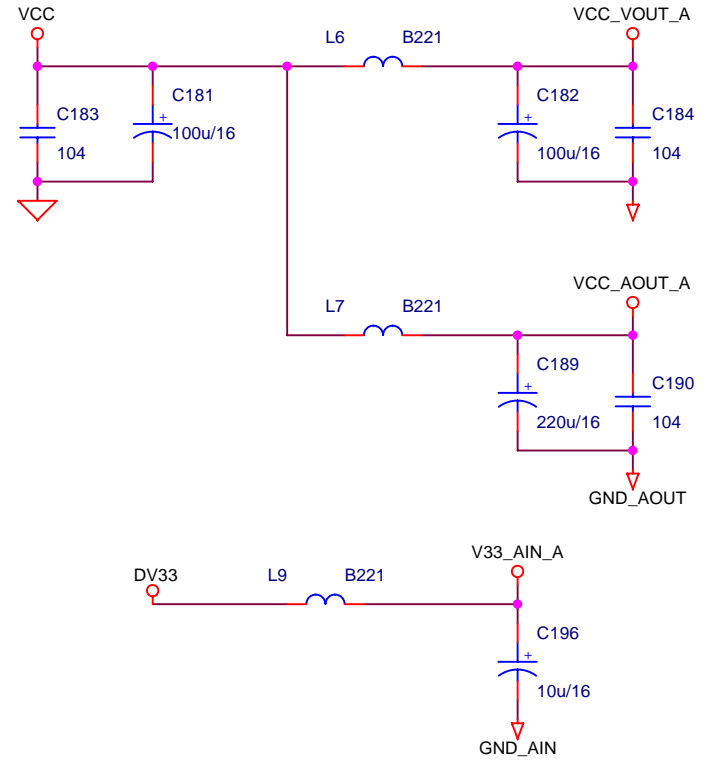
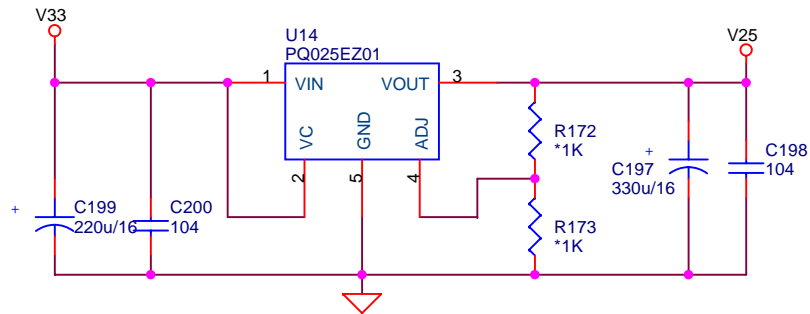
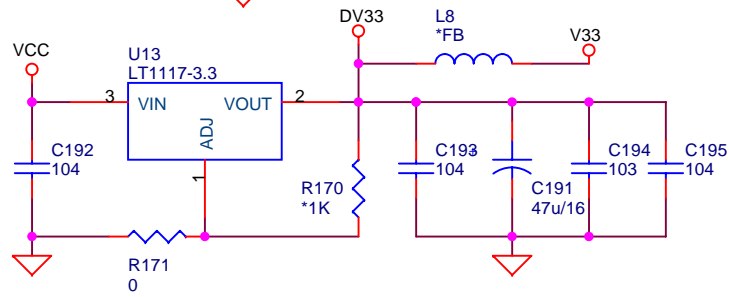
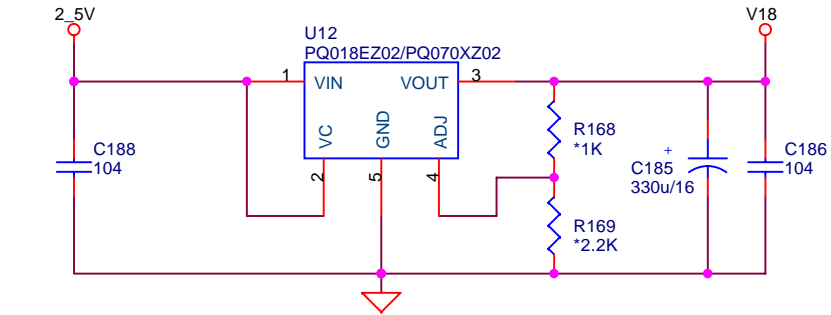


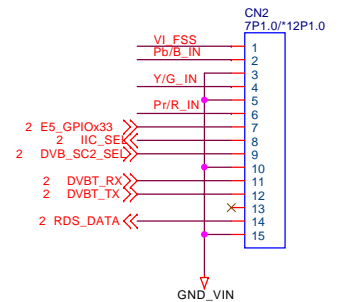
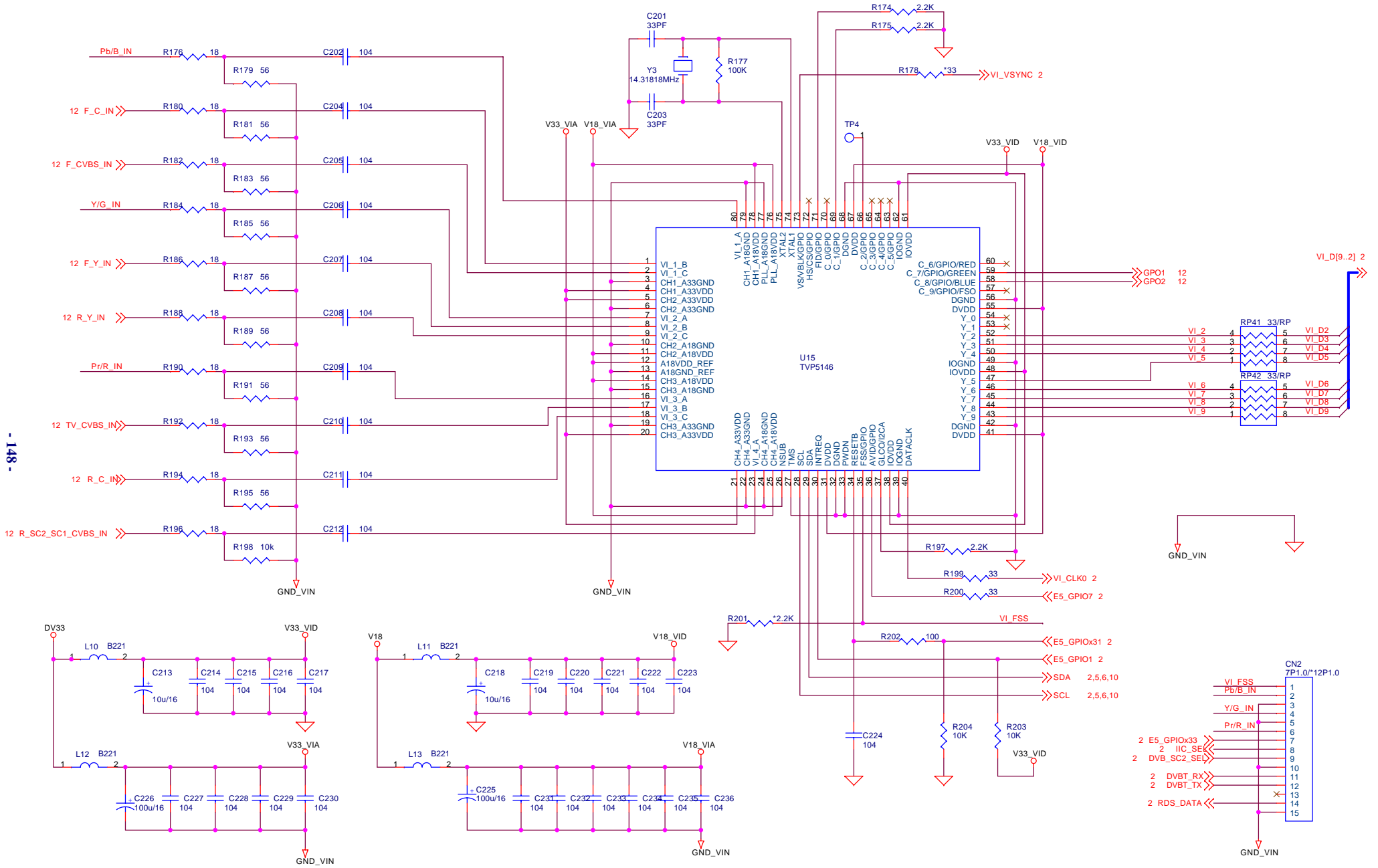
Size	Stuff	Not Stuff
1MB		R98, R99, R100, R103
2MB (Default)	R103	R98, R99, R100
4MB	R99, R103	R98, R100
8MB	R98, R99, R100	R103

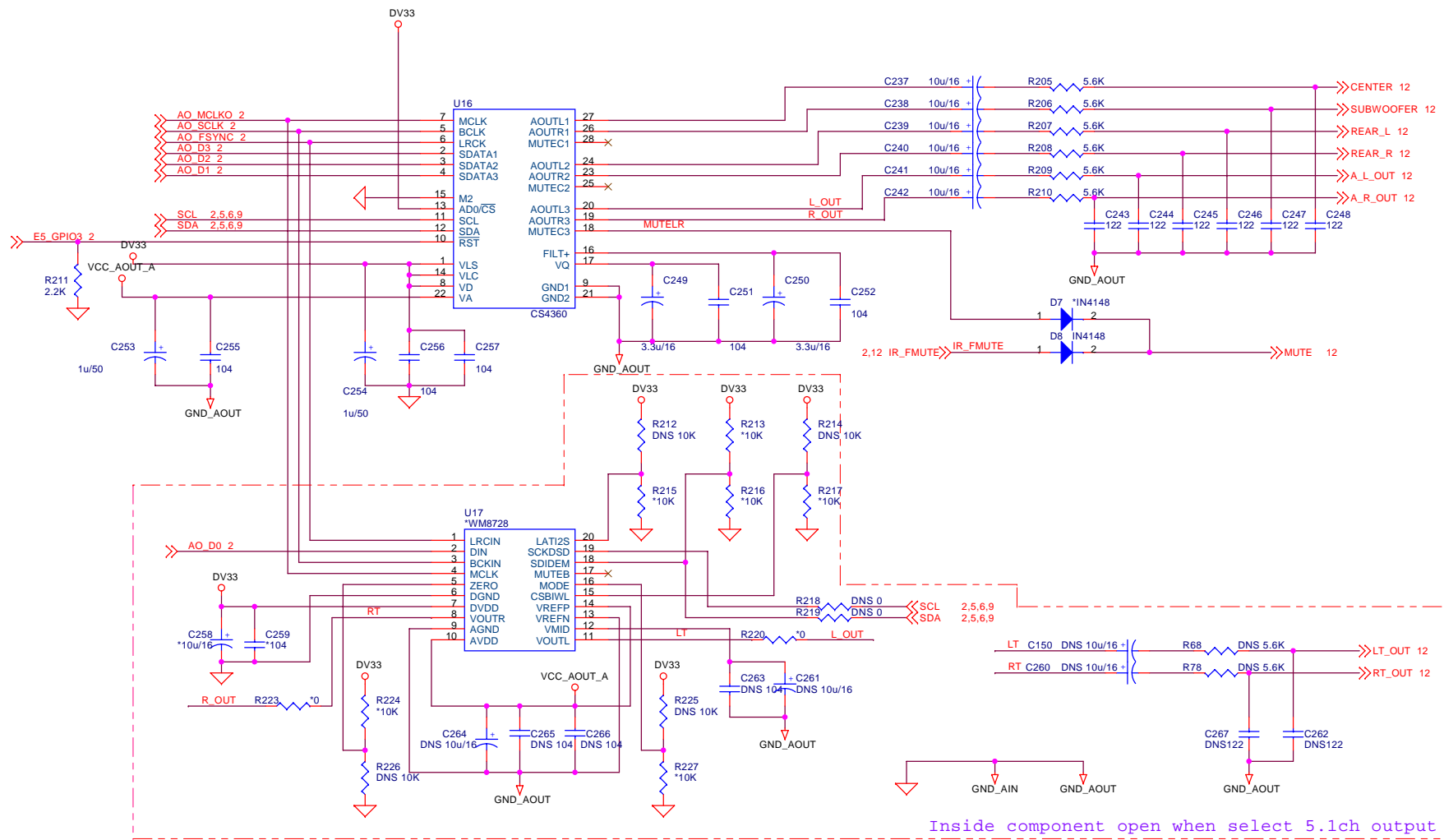
HOST Read



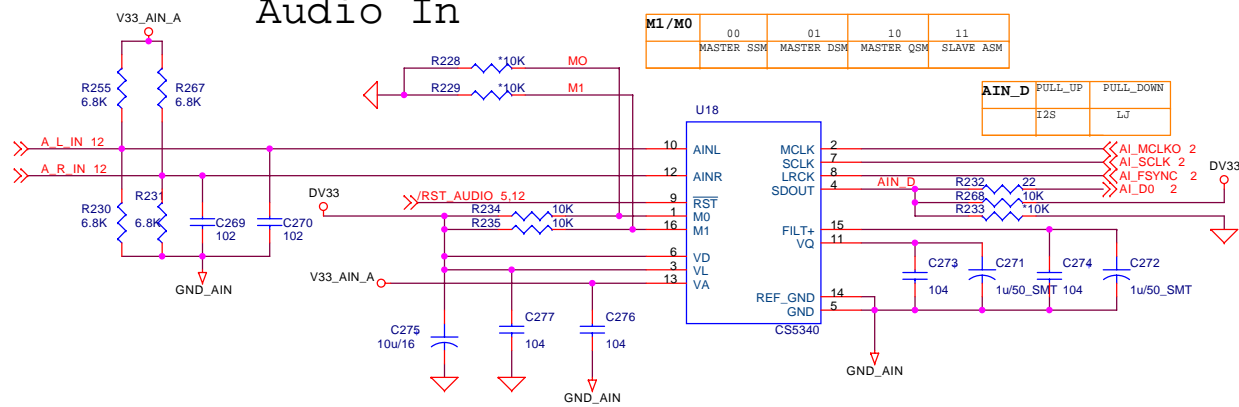


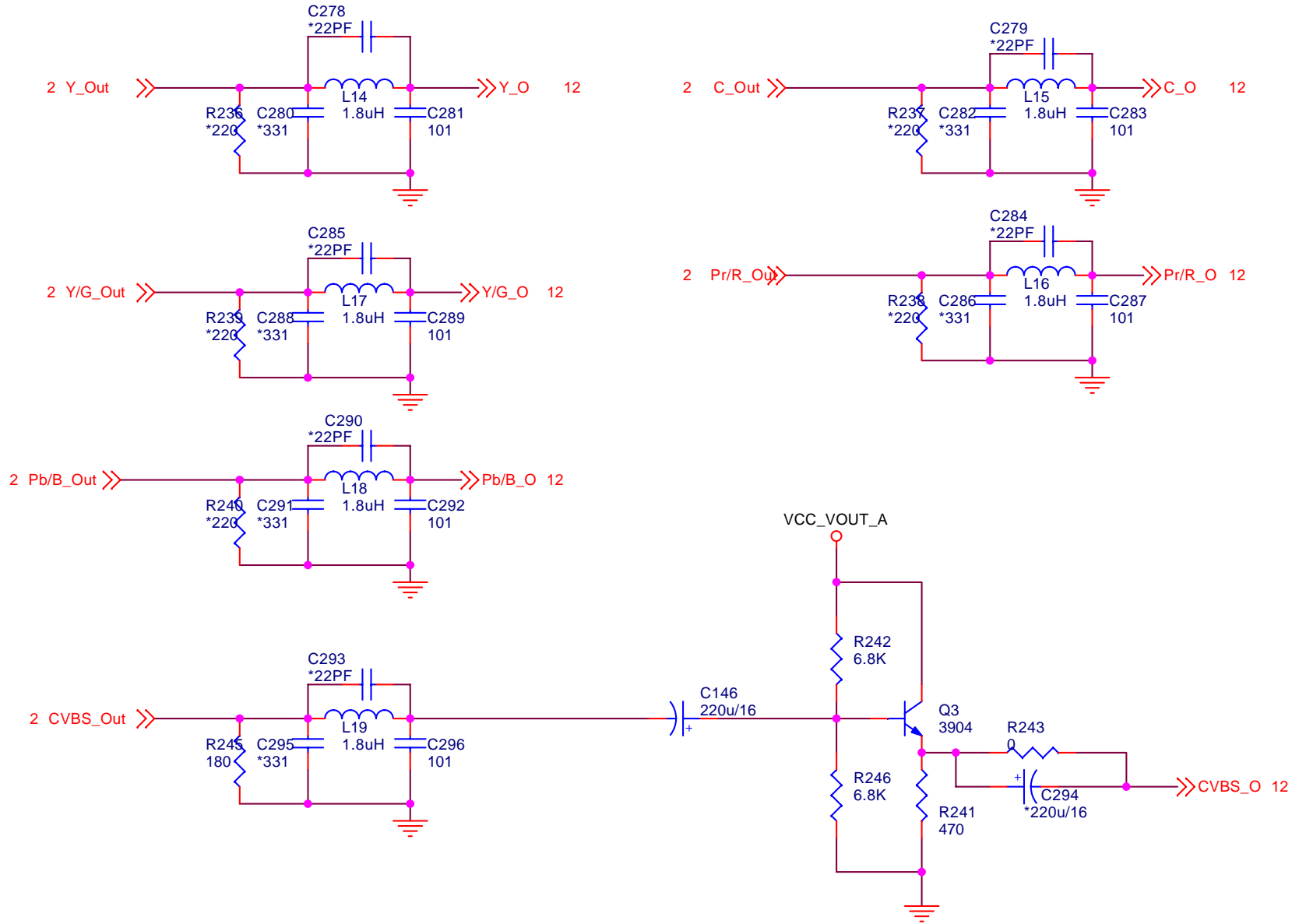


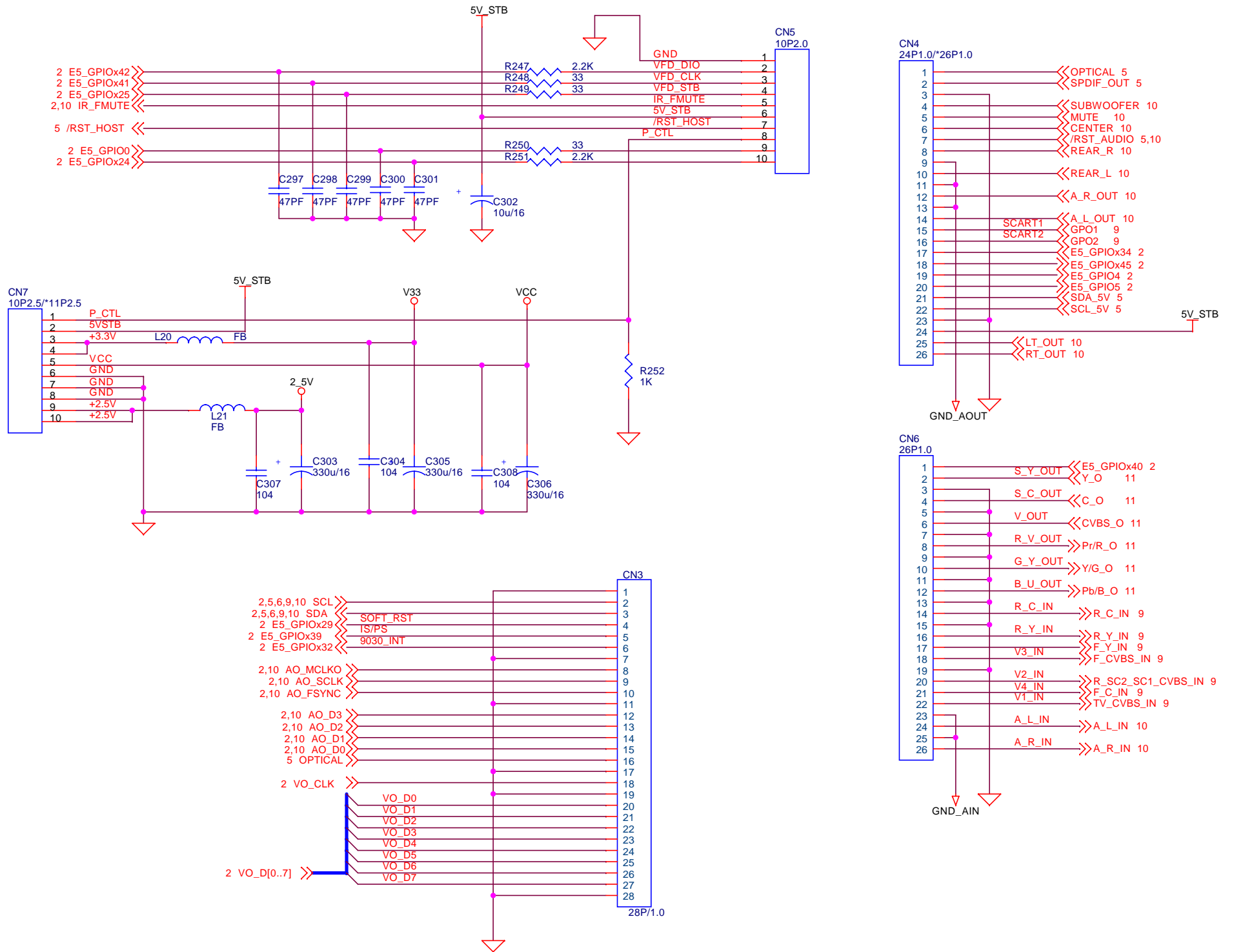


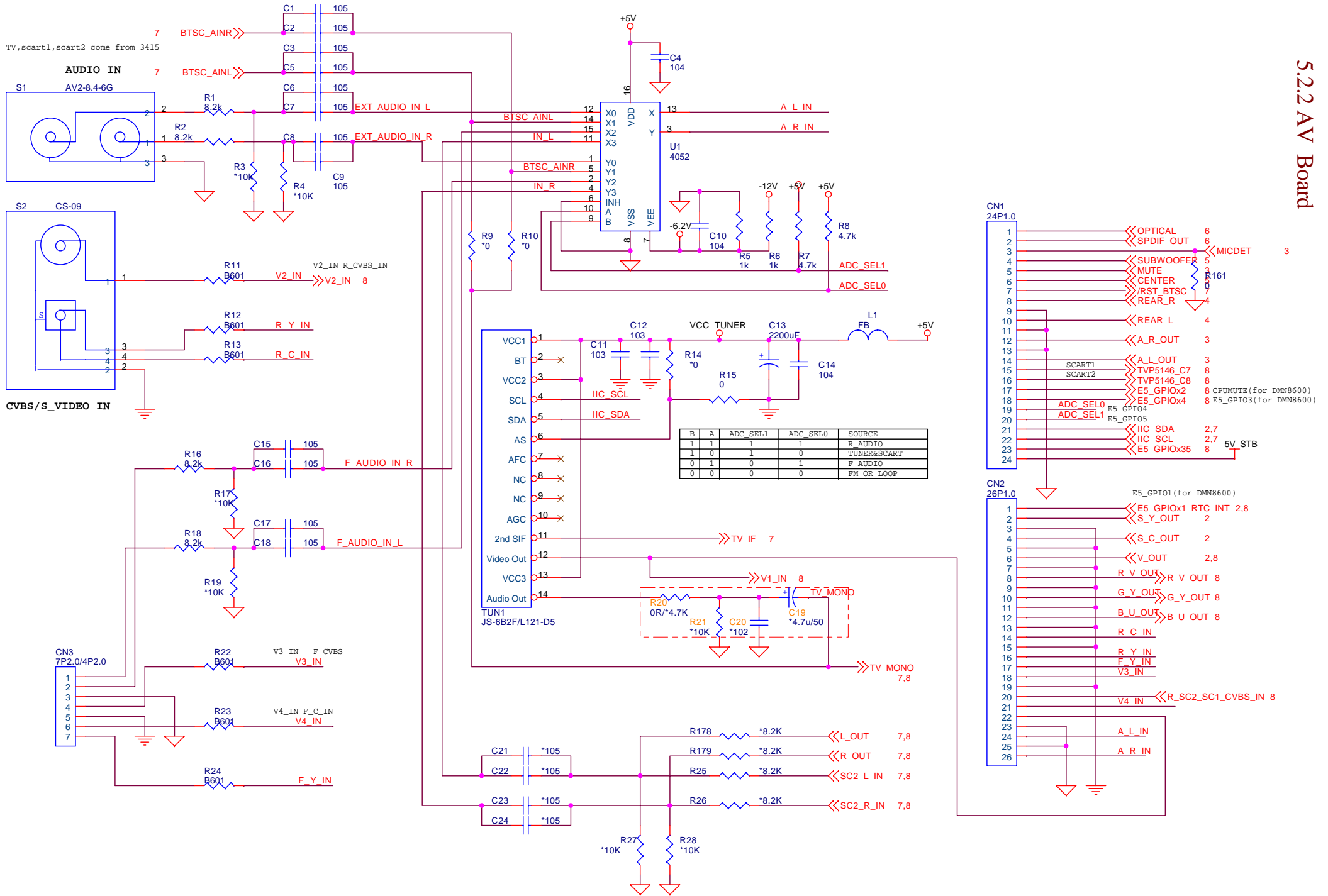


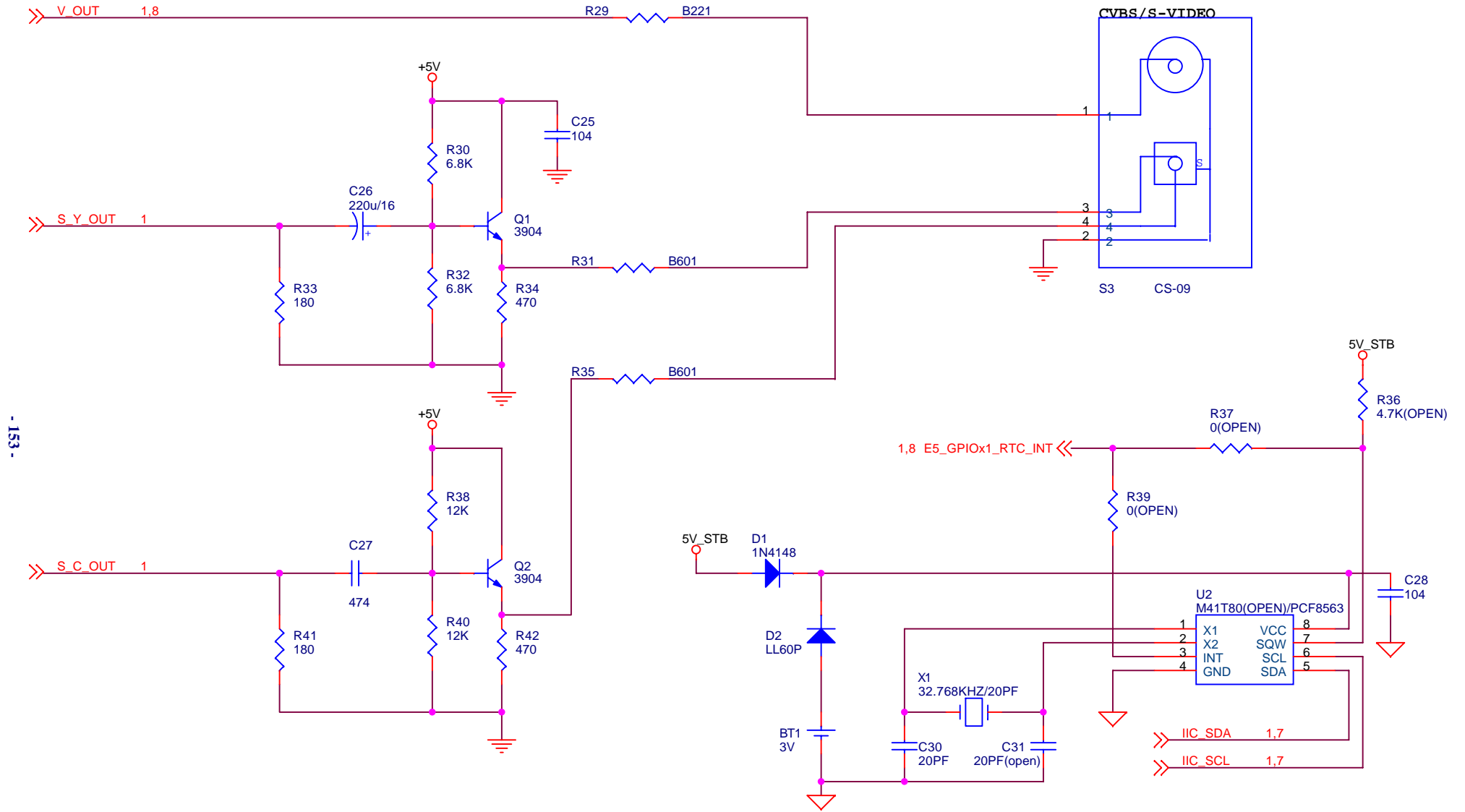
Audio In

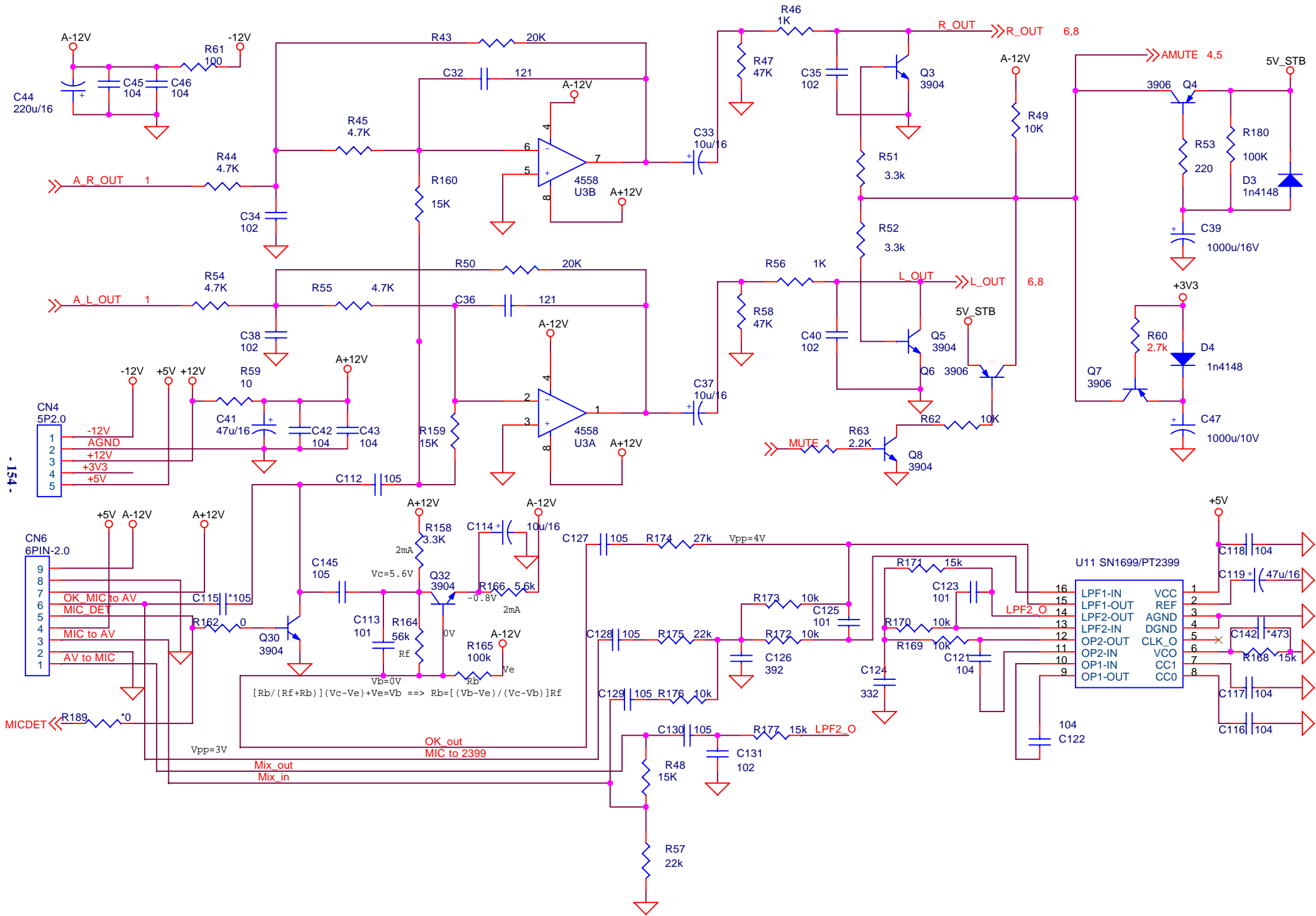








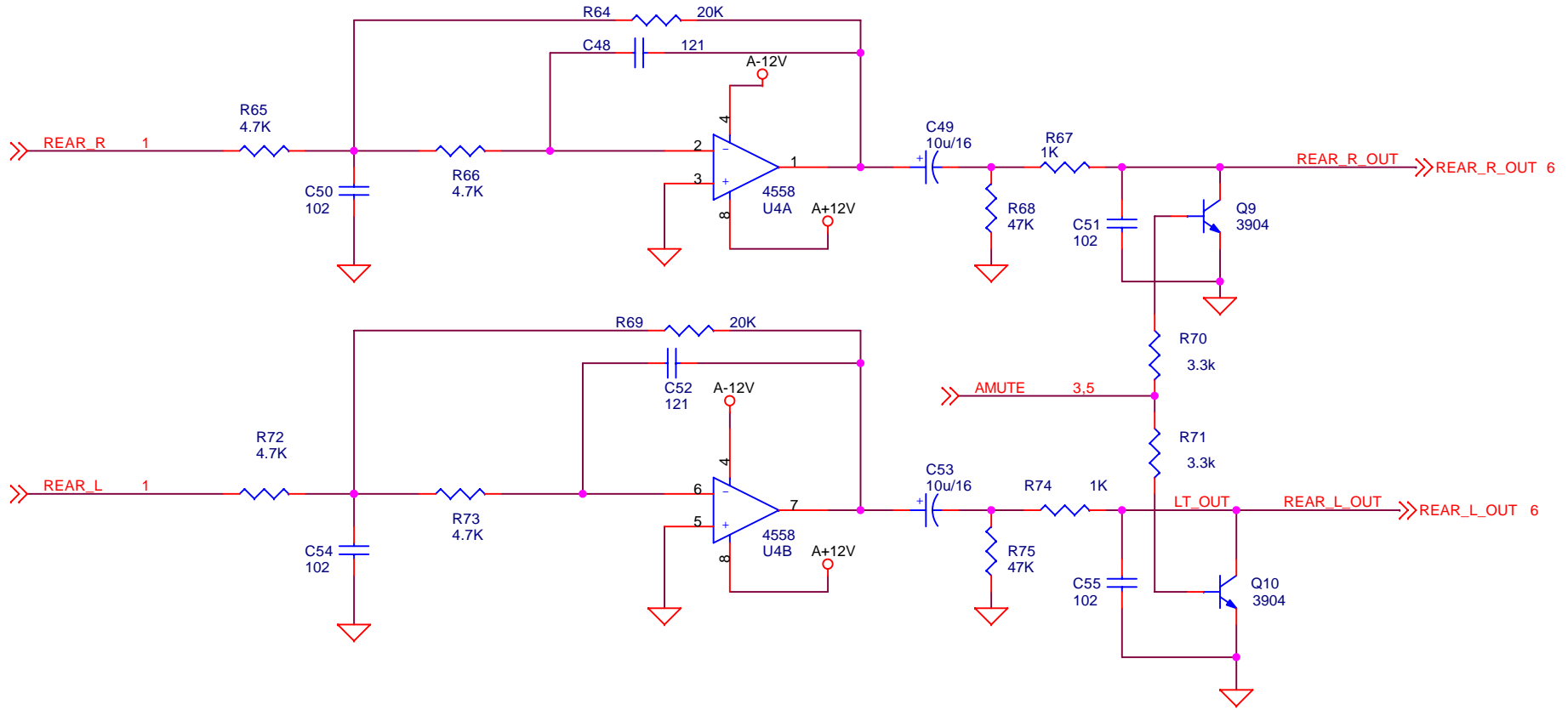


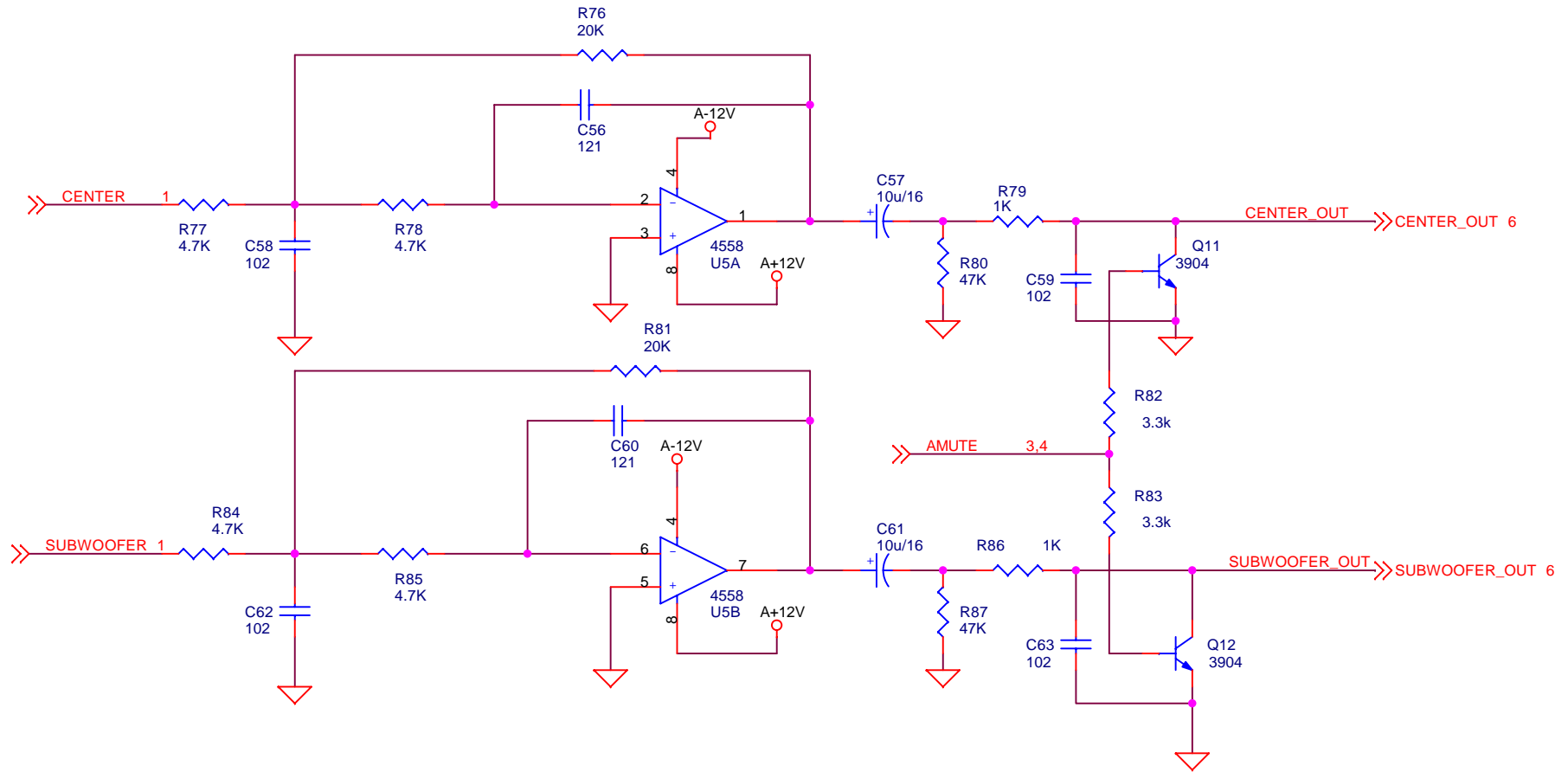


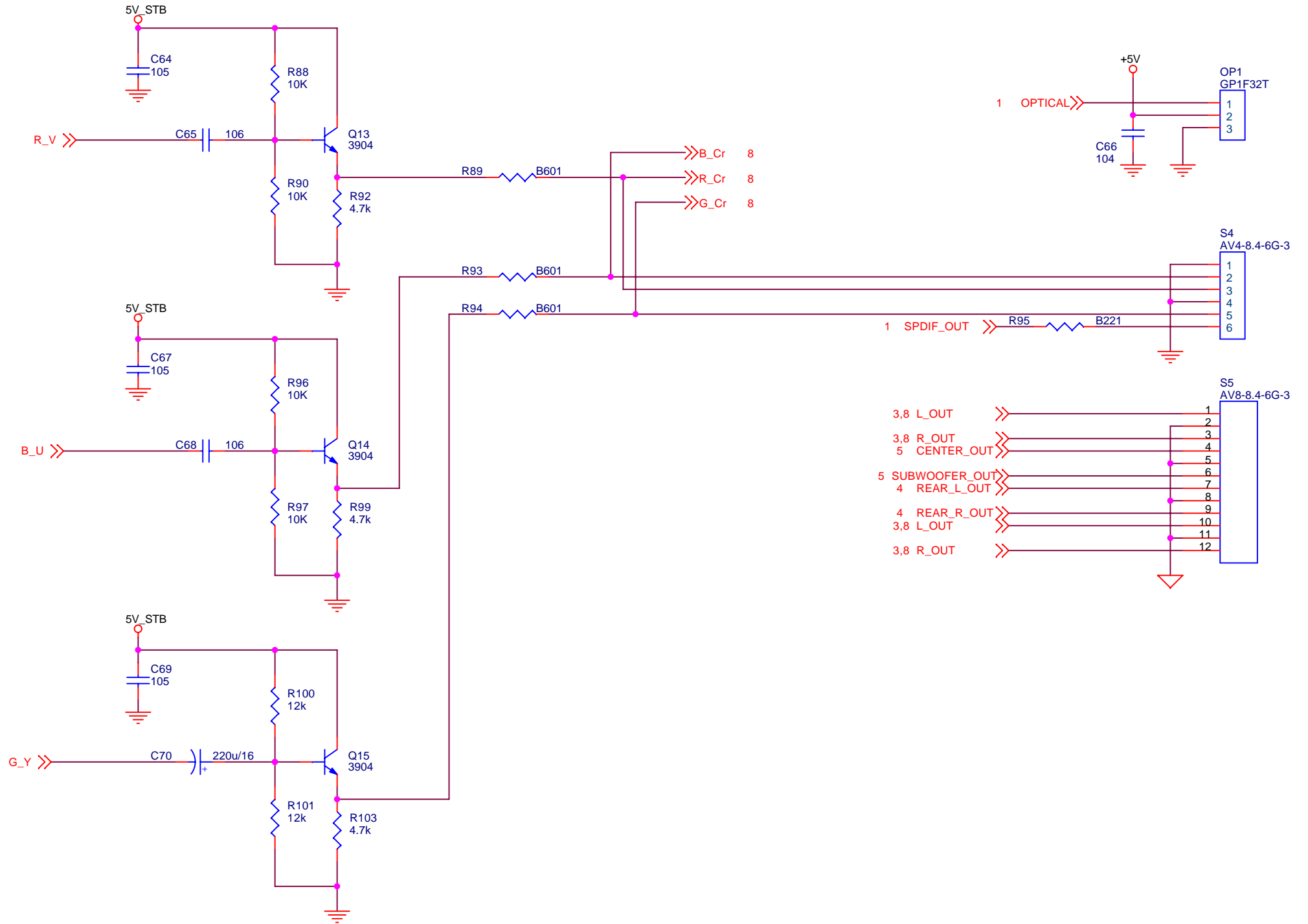
- 154 -

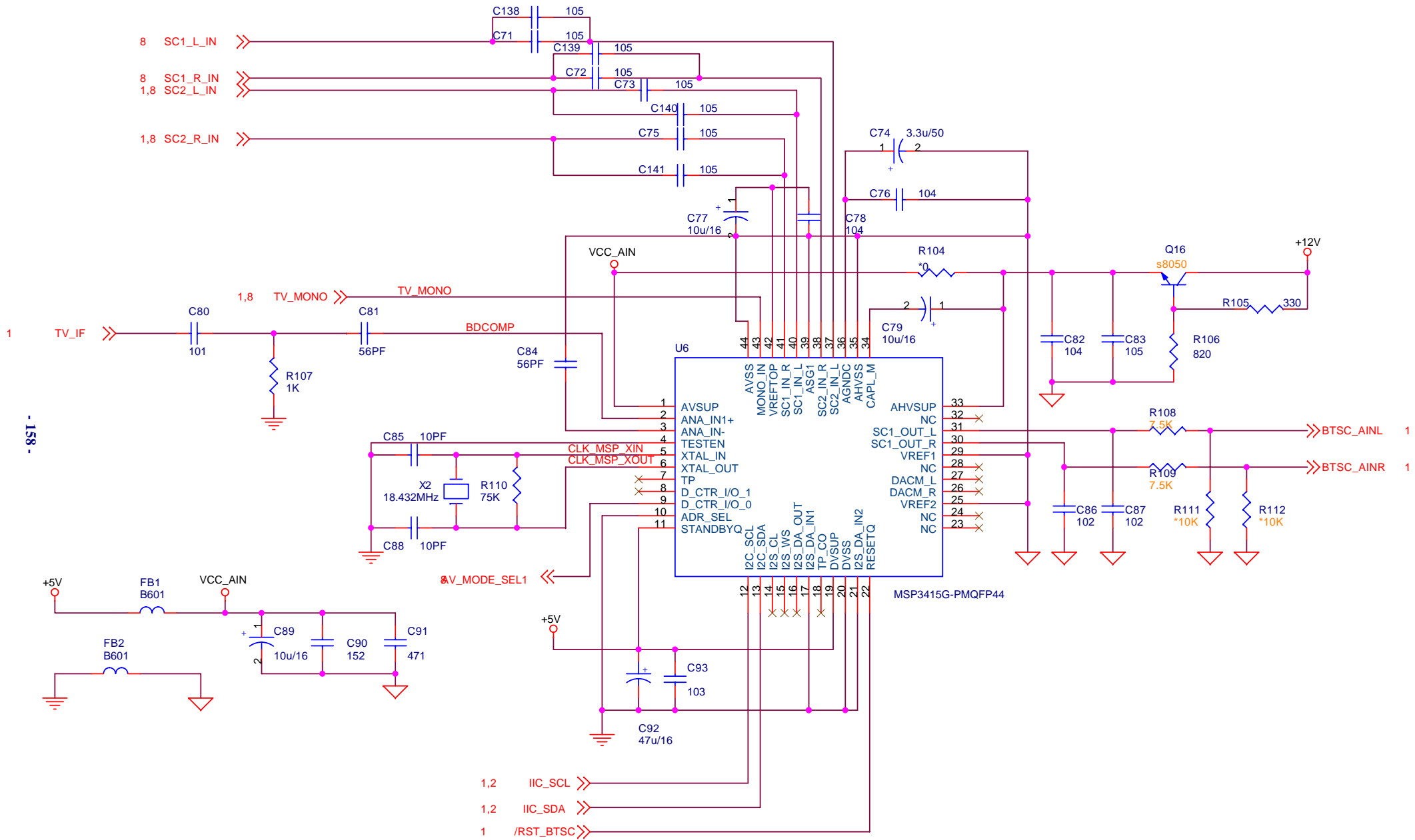
$$[R_b / (R_f + R_b)] (V_c - V_e) + V_e = V_b \implies R_b = [(V_b - V_e) / (V_c - V_b)] R_f$$

Pin	Signal
1	VCC
2	REF
3	AGND
4	DGND
5	CLK_O
6	VCO
7	CC1
8	CC0
9	OP1-IN
10	OP1-OUT
11	OP2-IN
12	OP2-OUT
13	LPF2-IN
14	LPF2-OUT
15	LPF1-OUT
16	LPF1-IN

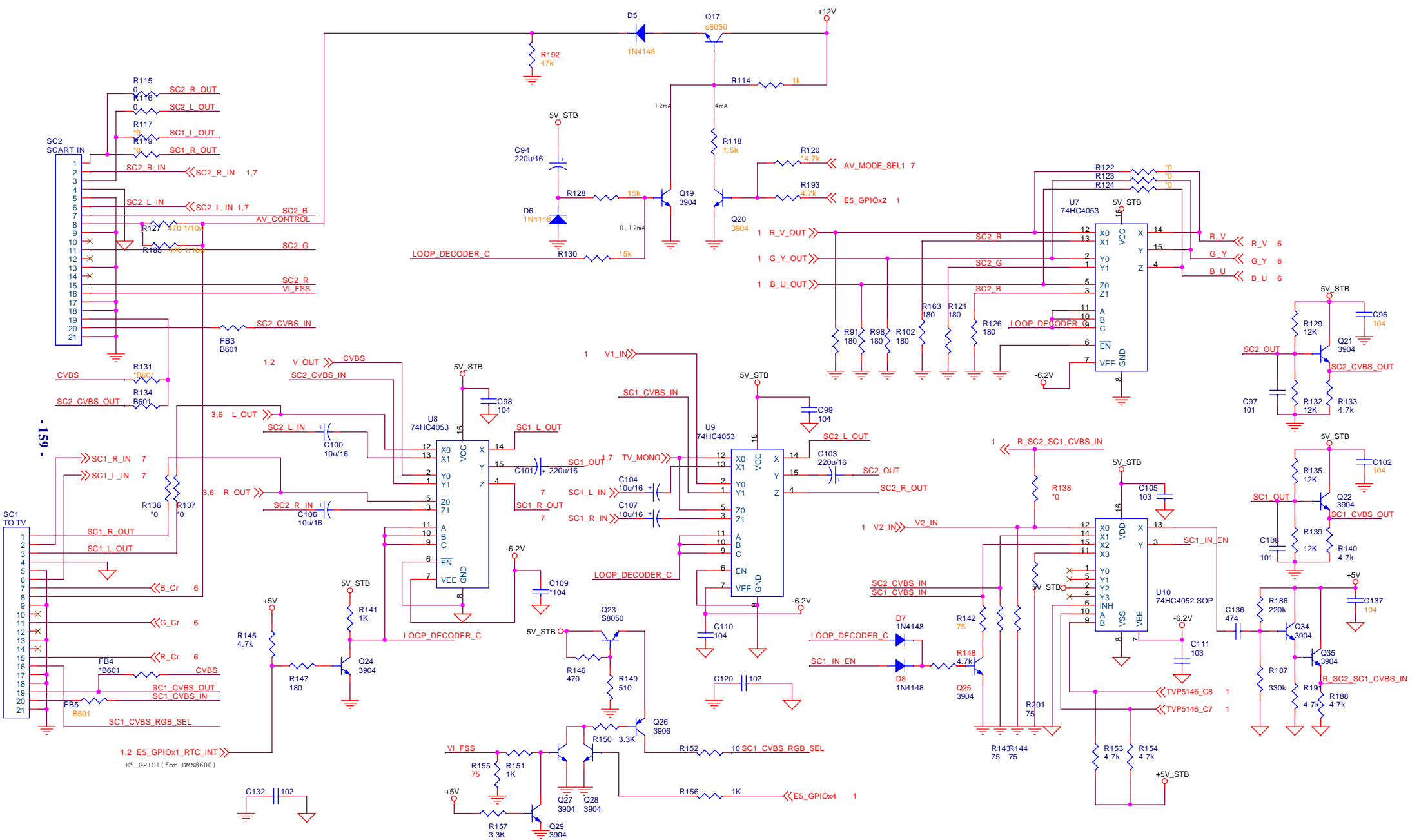








- 1,2 IIC_SCL
- 1,2 IIC_SDA
- 1 /RST_BTSC



- 159 -

SC2
SCART IN
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21

SC1
TO TV
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21

R115 0
R116 0
R117 0
R119 0
R127 470 1/10W
R195 470 1/10W

R131 B601
R134 B601

R136 0
R137 0

FB4 B601
FB5 B601

1.2 E5_GPIOx1_RTC_INT
E5_GPIO1 (for DMN8600)

SC2_R_OUT
SC2_L_OUT
SC1_L_OUT
SC1_R_OUT

SC2_R_IN
SC2_L_IN
SC2_B
AV_CONTROL
SC2_G
SC2_R
VI_FSS
SC2_CVBS_IN

CVBS
SC2_CVBS_OUT

3.6 L_OUT
SC2_L_IN
SC1_L_OUT
SC2_L_OUT

3.6 R_OUT
SC2_R_IN
SC1_R_OUT
SC2_R_OUT

B_Cr 6
G_Cr 6
R_Cr 6

CVBS
SC1_CVBS_OUT
SC1_CVBS_IN

SC1_CVBS_RGB_SEL
10 SC1_CVBS_RGB_SEL

E5_GPIOx4 1

LOOP DECODER C

5V_STB

CVBS

SC2_CVBS_IN

1.2 V_OUT

SC1_CVBS_IN

1 V1_IN

SC1_CVBS_IN

SC1_OUT 1.7 TV_MONO

SC1_L_OUT

SC1_R_OUT

SC1_R_IN

SC1_R_IN

LOOP DECODER C

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

5V_STB

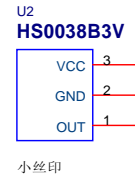
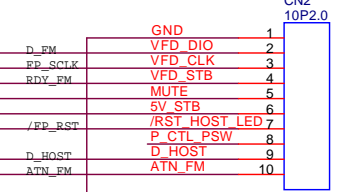
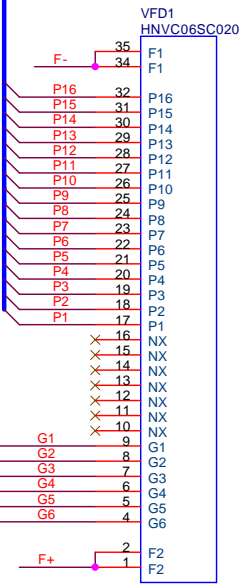
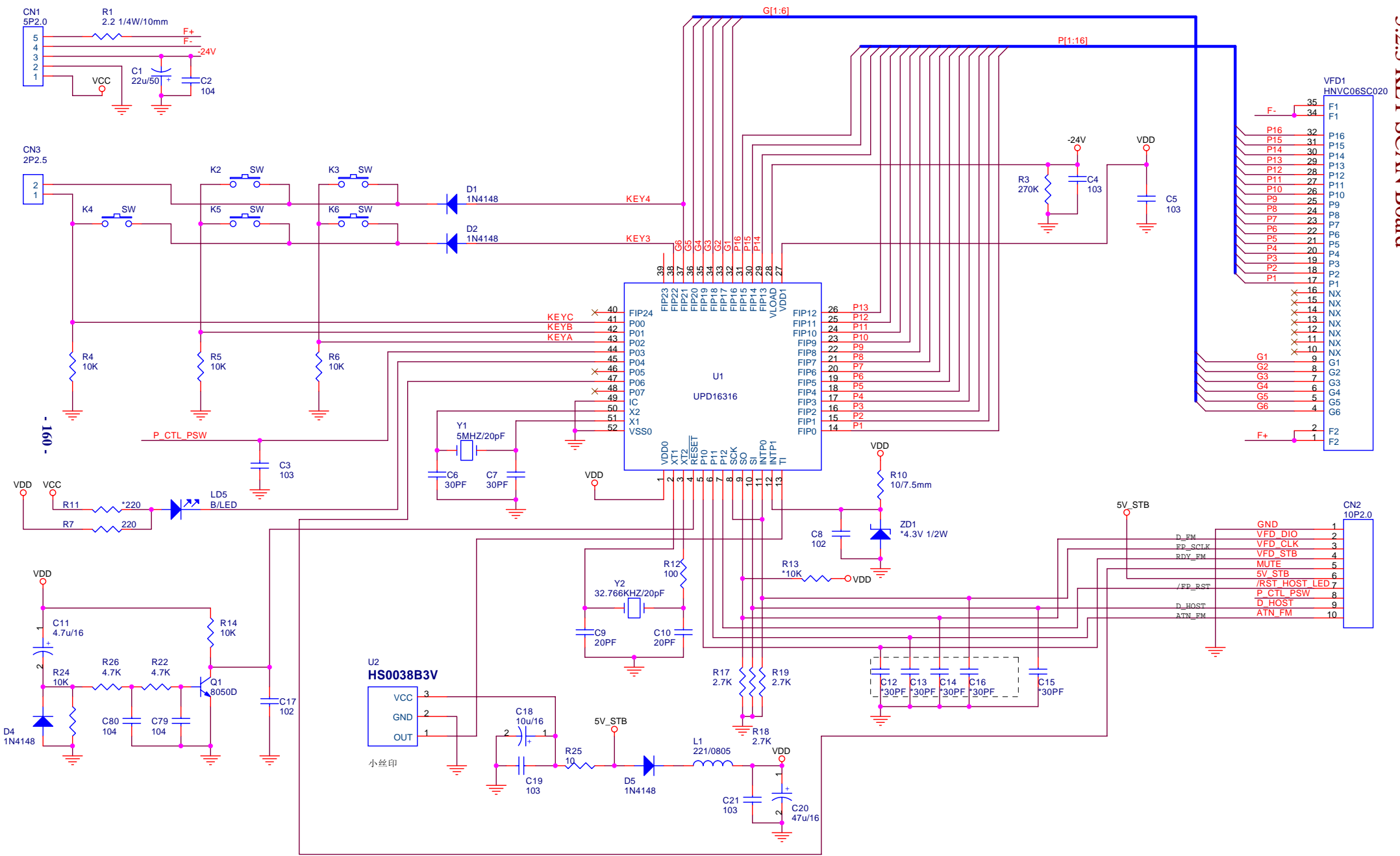
5V_STB

5V_STB

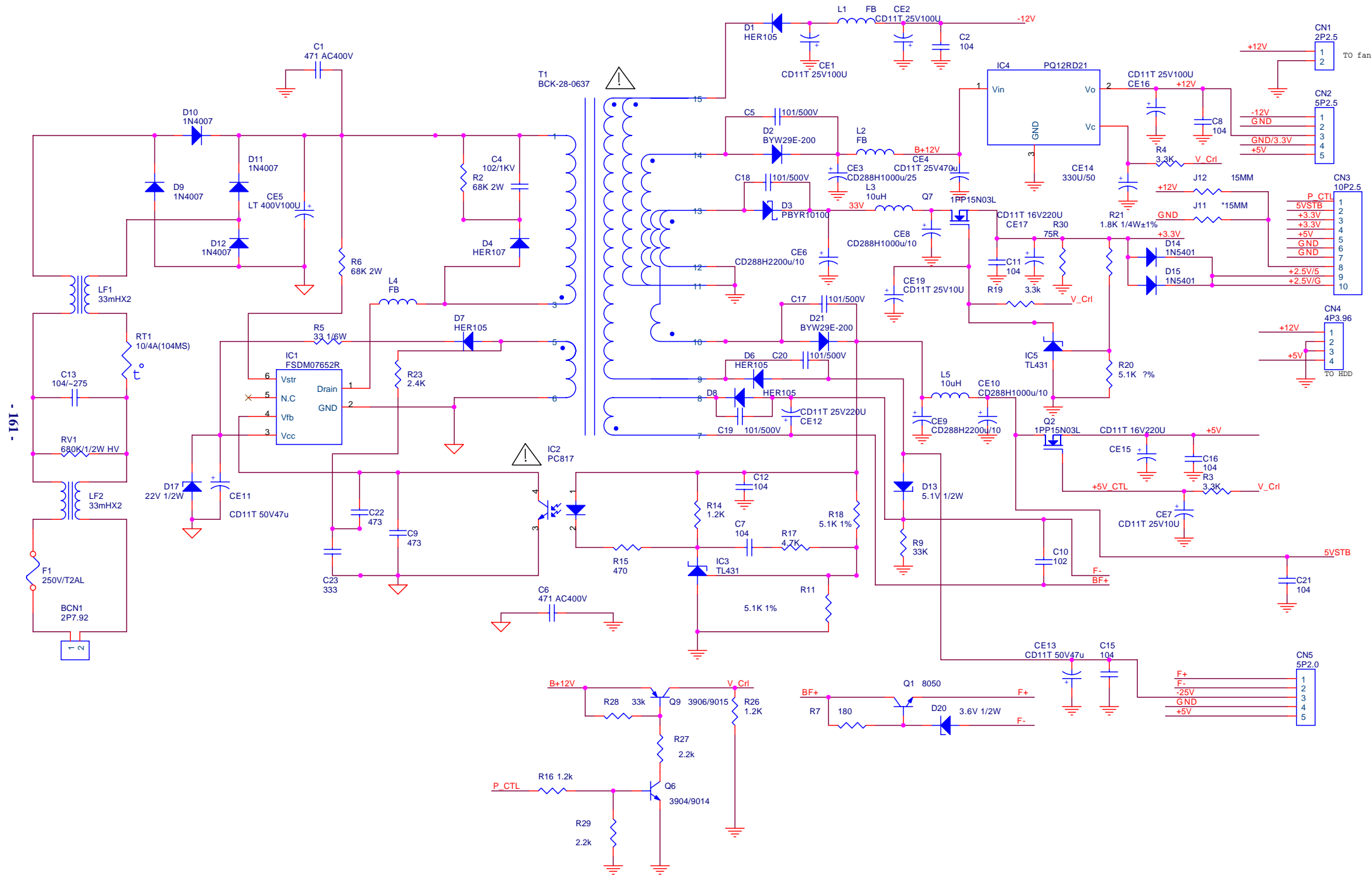
5V_STB

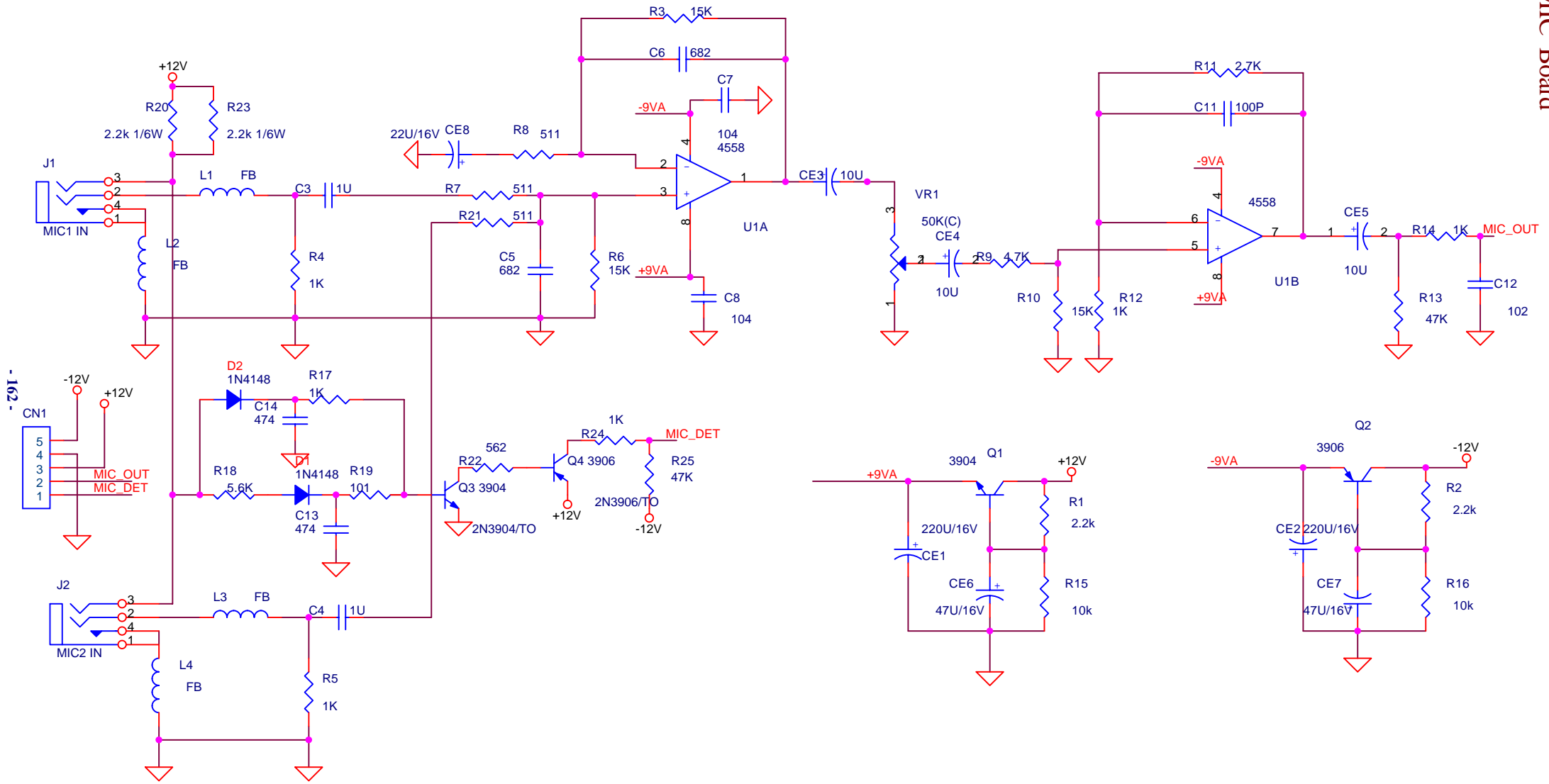
5V_STB

5.2.3 KEY SCAN Board

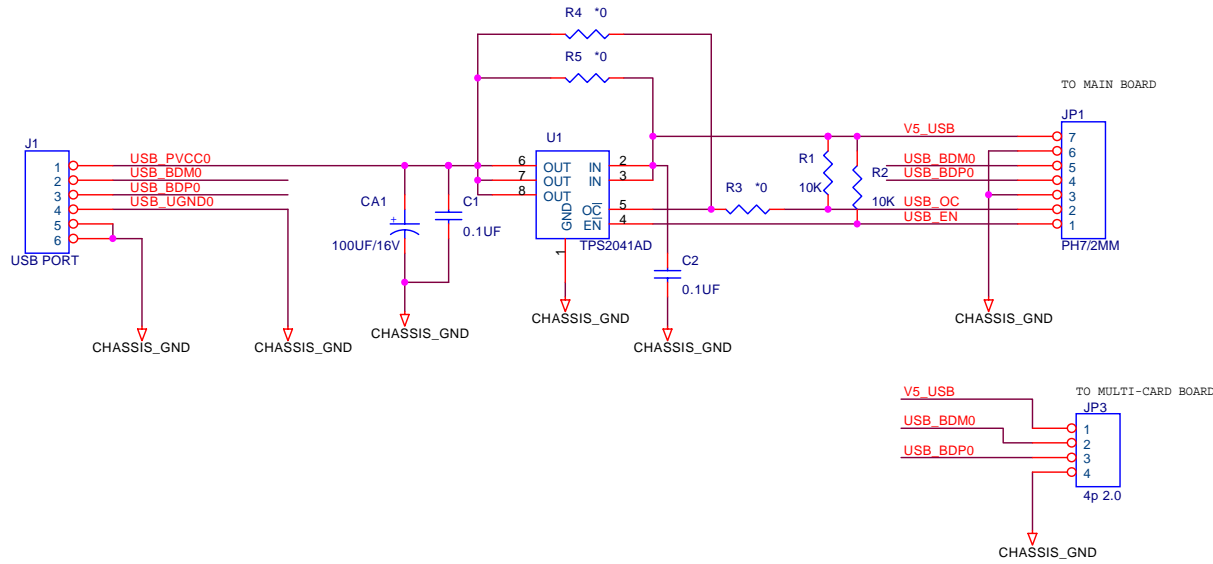


5.2.4 POWER Board

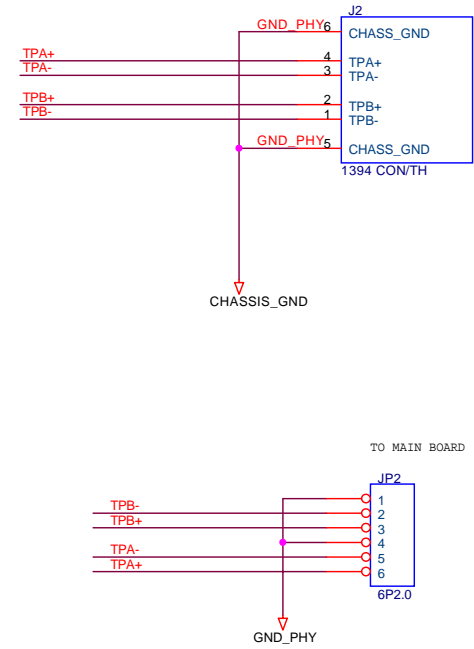




USB Interface



FIREWIRE Interface



Chapter six BOM List

MATERIAL CODE	MATERIAL NAME	SPECIFICATIONS	LOCATION
DW9952K(RU)-2 SILVER[8652]			
AV BOARD:		5448404	
0090001	SMD RESISTOR	SMD RESISTOR	R115,R116,R161,R15,R162,C112,C115
0090003	SMD RESISTOR	SMD RESISTOR	R59,R152
0090006	SMD RESISTOR	SMD RESISTOR	R142,R143,R144,R155,R163,R121,R126
0090007	SMD RESISTOR	SMD RESISTOR	R33,R41,R91,R98,R102,R147
0090008	SMD RESISTOR	SMD RESISTOR	R53
0090022	SMD RESISTOR	SMD RESISTOR	R1,R2,R16,R18
0090009	SMD RESISTOR	SMD RESISTOR	R105
0090011	SMD RESISTOR	SMD RESISTOR	R34,R42,R146
0090181	SMD RESISTOR	SMD RESISTOR	R61
0090046	SMD RESISTOR	SMD RESISTOR	R185,R127
0090249	SMD RESISTOR	SMD RESISTOR	R149
0390142	SMD MAGNETIC BEADS	SMD MAGNETIC BEADS	R11,R12,R13,R22,R23,R24,R95,R134,FB1,FB2,FB3,FB5
0390095	SMD MAGNETIC BEADS	SMD MAGNETIC BEADS	R29,R31,R35,R89,R93,R94
0090235	SMD RESISTOR	SMD RESISTOR	R106
0090014	SMD RESISTOR	SMD RESISTOR	R5,R6,R107,R114,R151,R156,R141
0090016	SMD RESISTOR	SMD RESISTOR	R118,R46,R56,R67,R74,R79,R86
0090017	SMD RESISTOR	SMD RESISTOR	R63
0090018	SMD RESISTOR	SMD RESISTOR	R157,R150,R51,R52,R70,R71,R82,R83,R60
0090019	SMD RESISTOR	SMD RESISTOR	R7,R8,R44,R45,R54,R55,R65,R66,R72,R73,R77,R78,R84,R85,R92,R99,R103,R120,R133,R140,R145,R153,R154,R188,R191,R148
0090021	SMD RESISTOR	SMD RESISTOR	R30,R32
0090186	SMD RESISTOR	SMD RESISTOR	R108,R109
0090023	SMD RESISTOR	SMD RESISTOR	R49,R62,R88,R90,R96,R97
0090187	SMD RESISTOR	SMD RESISTOR	R38,R40,R100,R101,R129,R132,R135,R139
0090024	SMD RESISTOR	SMD RESISTOR	R128,R130,R159,R160
0090025	SMD RESISTOR	SMD RESISTOR	R43,R50,R64,R69,R76,R81
0090029	SMD RESISTOR	SMD RESISTOR	R47,R58,R68,R75,R80,R87,R192
0090408	SMD RESISTOR	SMD RESISTOR	R180

MATERIAL CODE	MATERIAL NAME	SPECIFICATIONS	LOCATION
0090201	SMD RESISTOR	SMD RESISTOR	R186
0090205	SMD RESISTOR	SMD RESISTOR	R187
0090242	SMD RESISTOR	SMD RESISTOR	R110
0881080	IC	IC	U2
02607139	CD	CD	C44
02604379	CD	CD	C33,C37,C49,C53,C57,C61,C77,C79,C89,C100,C104,C106,C107
02606499	CD	CD	C47
02600029	CD	CD	C41,C92
02603859	CD	CD	C39
02601819	CD	CD	C26,C70,C94,C101,C103
02607629	CD	CD	C74
0260303	CD	CD	C13
0310047	SMD CAPACITOR	SMD CAPACITOR	C80,C97,C108
0310326	SMD CAPACITOR	SMD CAPACITOR	C32,C36,C48,C52,C56,C60
0310066	SMD CAPACITOR	SMD CAPACITOR	C34,C35,C38,C40,C50,C51,C54,C55,C58,C59,C62,C63,C86,C87,C120,C132
0310067	SMD CAPACITOR	SMD CAPACITOR	C90
0310072	SMD CAPACITOR	SMD CAPACITOR	C11,C12,C93,C105,C111
0310188	SMD CAPACITOR	SMD CAPACITOR	C88,C85
0310085	SMD CAPACITOR	SMD CAPACITOR	C30
0310192	SMD CAPACITOR	SMD CAPACITOR	C84,C81
0310196	SMD CAPACITOR	SMD CAPACITOR	C91
0310216	SMD CAPACITOR	SMD CAPACITOR	C2,C5,C7,C9,C16,C18,C64,C67,C69,C83,C1,C3,C6,C8,C15,C17,C73,C75,C71,C72,C138,C139,C140,C141
0310207	SMD CAPACITOR	SMD CAPACITOR	C4,C10,C14,C25,C28,C43,C45,C46,C66,C76,C78,C82,C109,C96,C99,C102,C110,C118,C137,C98
0310379	SMD CAPACITOR	SMD CAPACITOR	C27,C136
0310542	SMD CAPACITOR	SMD CAPACITOR	C27,C136
0780085	SMD TRIODE	SMD TRIODE	Q23,Q16,Q17
0700133	SMD TRIODE	SMD TRIODE	C42
0310389	SMD CAPACITOR	SMD CAPACITOR	C65,C68
0680057	SMD SCHOTTKY DIODE	SMD SCHOTTKY DIODE	D2
0700007	SMD DIODE	SMD DIODE	D1,D3,D4,D6,D7,D8,D5
0780040	SMD TRIODE	SMD TRIODE	Q1,Q2,Q3,Q5,Q8,Q9,Q10,Q11,Q12,Q15,Q19,Q20,Q21,Q22,Q24,Q25,Q27,Q28,Q29,Q30,Q34,Q35,Q13,Q14

MATERIAL CODE	MATERIAL NAME	SPECIFICATIONS	LOCATION
0780041	SMD TRIODE	SMD TRIODE	Q4,Q6,Q7,Q26
0881693	IC	IC	U1,U10
0881965	IC	IC	U1,U10
0881226	IC	IC	U3,U4,U5
0881842	IC	IC	U6
0881992	IC	IC	U7,U8,U9
0960238	CMETAL OXIDE FILM RESISTORSTAL OSCILLATOR	CMETAL OXIDE FILM RESISTORSTAL OSCILLATOR	X2
0960017	CMETAL OXIDE FILM RESISTORSTAL OSCILLATOR	CMETAL OXIDE FILM RESISTORSTAL OSCILLATOR	X1
1020023	TUNER	TUNER	TUN1
1090009	ELECTRO-OPTIC TRANSFORMER	ELECTRO-OPTIC TRANSFORMER	OP1
1090024	ELECTRO-OPTIC TRANSFORMER	ELECTRO-OPTIC TRANSFORMER	OP1
1633251	PCB	7DW9918K-4	
1860122	SCART SOCKET	SCART SOCKET	SC1
1910159	TERMINAL SOCKET	TERMINAL SOCKET	S3,S2
1910062	TERMINAL SOCKET	TERMINAL SOCKET	S1
1910078	TERMINAL SOCKET	TERMINAL SOCKET	S4
1910079	TERMINAL SOCKET	TERMINAL SOCKET	S5
0390052	MAGNETIC BEADS INDUCTOR	MAGNETIC BEADS INDUCTOR	L1
1940024	SOCKET	SOCKET	CN3
1940120	CABLE SOCKET	CABLE SOCKET	CN2
1940161	CABLE SOCKET	CABLE SOCKET	CN1
3630281	BATTEMETAL OXIDE FILM RESISTOR HOLDER	BATTEMETAL OXIDE FILM RESISTOR HOLDER	BT1
3630185	BATTEMETAL OXIDE FILM RESISTOR HOLDER	BATTEMETAL OXIDE FILM RESISTOR HOLDER	BT1
DW9952K(RU)-2 SILVER[8652]			
FRONT AV BOARD+SUBSIDIARY PANEL 5448411			
1340001	LIGHT TOUCH RESTORE SWITCH	VERTICAL6x7x1	K1
2122209	FLAT CABLE	5P430 2.0 2 PIN,WITH L NEEDLE REVERSE	CN3
2110198	LEAD	20# 60mm BLACK,WITH WELD PIECE	GND2
1910170	TERMINAL SOCKET	AV3-8.4-2(YELLOW、WHITE、RED)	CN1

MATERIAL CODE	MATERIAL NAME	SPECIFICATIONS	LOCATION
1563794	PCB	BDW9920-2	
DW9952K(RU)-2 SILVER[8652]			
POWER BOARD: 2DW9927-5 Ver3.11			
0090001	SMD RESISTOR	1/16W 00±5% 0603	L5,R55,R56,R76,R96,R97,R103,R104,R114,R125,R140,R171,R243,R99,R179,R185,R191,R270
0090296	SMD RESISTOR	1/16W 180±5% 0603	R180,R182,R186,R188,R194,R196
0090004	SMD RESISTOR	1/16W 220±5% 0603	R25,R26,R27,R28,R29,R31,R32,R34,R35,R36,R37,R38,R148,R164,R165,R232,R275,R276,R277,R278,R266
0090005	SMD RESISTOR	1/16W 330±5% 0603	R84,R110,R111,R112,R113,R139,R141,R142,R143,R199,R200,R248,R249,R250
0090220	SMD RESISTOR	1/16W 510±5% 0603	R47,R48,R49,R50,R51,R52,R53,R54,R57,R59,R61,R62,R63,R64,R65,R66,R67,R69,R70,R71,R145
0390403	COMMON MODE INDUCTOR	YB009T-1394A	T1
0090291	SMD RESISTOR	1/16W 560±5% 0603	R149,R150,R151,R152,R181,R183,R187,R189,R195,R198
0090006	SMD RESISTOR	1/16W 750±5% 0603	R192,R193
0090273	SMD RESISTOR	1/16W 820±5% 0603	R105,R106,R107,R126,R127,R128
0090181	SMD RESISTOR	1/16W 1000±5% 0603	R147,R202
0090221	SMD RESISTOR	1/16W 1200±5% 0603	R87
0090007	SMD RESISTOR	1/16W 1800±5% 0603	R245
0090009	SMD RESISTOR	1/16W 3300±5% 0603	R85
0090011	SMD RESISTOR	1/16W 4700±5% 0603	R241
0090013	SMD RESISTOR	1/16W 6800±5% 0603	R108,R137,R159,R161,R162
0090014	SMD RESISTOR	1/16W 1K±5% 0603	R157,R158,R252
0090491	PRECISION SMD RESISTOR	1/16W 1.2K±1% 0603	R45
0090017	SMD RESISTOR	1/16W 2.2K±5% 0603	R174,R175,R197,R211,R247,R251,R80,R81
0090019	SMD RESISTOR	1/16W 4.7K±5% 0603	R39,R82,R83,R101,R123,R153
0090020	SMD RESISTOR	1/16W 5.1K±5% 0603	R155
0090225	SMD RESISTOR	1/16W 5.6K±5% 0603	R205,R206,R207,R208,R209,R210
0090021	SMD RESISTOR	1/16W 6.8K±5% 0603	R144,R246,R242,R230,R231,R255,R267
0090023	SMD RESISTOR	1/16W 10K±5% 0603	R1,R2,R4,R5,R6,R7,R9,R10,R11,R12,R13,R15,R16,R17,R20,R41,R42,R43,R44,R46,R72,R89,R95,R102,R109,R124,R138,R156,R160,R163,R203,R204,R234,R235,R268,R254
0882839	IC	EM6353BX2SP3B-2.9V SOT23-3L	U6
0090024	SMD RESISTOR	1/16W 15K±5% 0603	R166,R167,R221,R222
0090033	SMD RESISTOR	1/16W 91K±5% 0603	R146

MATERIAL CODE	MATERIAL NAME	SPECIFICATIONS	LOCATION
0090034	SMD RESISTOR	1/16W 100K±5% 0603	R74,R177
0100019	SMD RESISTOR NETWORKS	1/16W 330±5% 8P	RP31,RP32,RP33,RP34,RP35,RP36,RP37,RP38,RP39,RP40,RP41,RP42
0100028	SMD RESISTOR NETWORK	1/16W 220±5% 8P	RP20,RP22,RP24,RP26,RP28,RP30
0100030	SMD RESISTOR NETWORK	1/16W 510±5% 8P	RP5,RP6,RP7,RP8,RP9,RP10,RP11,RP12,RP13,RP14,RP15,RP16,RP17,RP18,RP19,RP21,RP23,RP25,RP27,RP29
0260211	CD	CD11 50V3.3U±20%5×11 2	C249,C250
0260019	CD	CD11 16V10U±20%5×11 2	C4,CA5,C128,C196,C213,C218,C237,C238,C239,C240,C241,C242,C275,C302
0260025	CD	CD11 16V47U±20%5×11 2	CA1,C191,CA7,CA6
0260027	CD	CD11 16V100U±20%6×12 2.5	CA2,C181,C182,C225,C226
0260028	CD	CD11 16V220U±20%6×12 2.5	CA3,CA4,C146,C189,C199
0260214	CD	CD11 16V330U±20%8×12 3.5	C185,C197,C303,C305,C306
0310043	SMD CAPACITOR	50V 22P±5% NPO 0603	C159,C160
0310190	SMD CAPACITOR	50V 27P±5% NPO 0603	C1,C2,C161,C162
0310044	SMD CAPACITOR	50V 33P±5% NPO 0603	C203,C201
0310045	SMD CAPACITOR	50V 47P±5% NPO 0603	C297,C298,C299,C300,C301
0310192	SMD CAPACITOR	50V 56P±5% NPO 0603	C164
0310047	SMD CAPACITOR	50V 101±5% NPO 0603	C281,C283,C287,C289,C292,C296
0310049	SMD CAPACITOR	50V 221±5% NPO 0603	C168
0310066	SMD CAPACITOR	50V 102±10% X7R 0603	C14,C15,C16,C33,C34,C35,C46,C47,C48,C56,C81,C82,C83,C86,C93,C94,C95,C98,C108,C109,C110,C117,C118,C119,C120,C125,C126,C127,C134,C135,C136,C137,C142,C156,C169,C173,C179,C269,C270
0310072	SMD CAPACITOR	50V 103±10% X7R 0603	C7,C10,C36,C37,C49,C51,C53,C54,C59,C62,C65,C66,C71,C72,C77,C78,C89,C90,C171,C194
0310207	SMD CAPACITOR	50V 104 ±20% X7R 0603	C3,C5,C6,C8,C9,C12,C13,C17,C18,C19,C20,C21,C22,C27,C28,C29,C30,C31,C32,C40,C41,C42,C43,C44,C45,C50,C52,C55,C57,C58,C60,C61,C63,C64,C67,C68,C69,C70,C73,C74,C75,C76,C79,C80,C84,C85,C87,C88,C91,C92,C96,C97,C101,C102,C103,C104,C105,C106,C107,C112,C113,C114,C115,C116,C122,C123,C124,C129,C130,C131,C132,C133,C140,C143,C144,C152,C154,C155,C157,C158,C163,C165,C170,C172,C174,C175,C176,C177,C178,C180,C183,C184,C186,C188,C190,C192,C193,C195,C198,C200,C202,C204,C205,C206,C207,C208,C209,C210,C211,C212,C214,C215,C216,C217,C219,C220,C221,C222,C223,C224,C227,C228,C229,C230,C231,C232,C233,C234,C235,C236,C251,C252,C255,C256,C257,C273,C274,C276,C277,C304,C307,C308,C321,C145
0310231	SMD CAPACITOR	50V 122±10% 0603	C243,C244,C245,C246,C247,C248

MATERIAL CODE	MATERIAL NAME	SPECIFICATIONS	LOCATION
0310505	SMD CAPACITOR	25V 224 +80%-20% 0603	C167
0310112	SMD CAPACITOR	16V 224±10% 0603	C167
0310234	SMD CAPACITOR	16V 105 +80%-20% Y5V 0603	C147,C166,C253,C254,C271,C272
0310216	SMD CAPACITOR	10V 105 +80%-20% 0603	C147,C166,C253,C254,C271,C272
0310476	SMD CAPACITOR	10V 106 +80%-20% Y5V 1206	C11,C23,C24,C25,C26,C39,C99,C100,C111,C121,C138,C153
0390052	MAGNETIC BEADS INDUCTOR	FB	L20,L21,FB60
0390096	SMD INDUCTOR	1.8UH±10% 1608	L14,L15,L16,L17,L18,L19
0390095	SMD MAGNETIC BEADS	FCM1608K-221T05	L1,FB1,L2,L3,FB3,L4,FB4,FB5,L6,FB6,L7,FB7,FB8,L9,FB9,L10,FB10,L11,FB11,L12,FB12,L13,FB13,FB14,FB15,FB16,FB17,FB18,FB19,FB20,FB21,FB22,FB23,FB24,FB25,FB26,FB27,FB28,FB29,FB30,FB31,FB32,FB33,FB34,FB35,FB36,FB37,FB38,FB39,FB40,FB41,FB42,FB43,FB44,FB45,FB46,FB47,FB48,FB49,FB50,FB51,FB52,FB53,FB54,FB55,FB56,FB57,FB58,FB59
0700007	SMD DIODE	1N4148	D2,D3,D5,D6,D8
0780041	SMD TRIODE	3906(100-300) SOT-23	Q1
0780063	SMD TRIODE	9015C	Q1
0780040	SMD TRIODE	3904(100-300) SOT-23	Q3
0780062	SMD TRIODE	9014C	Q3
0790044	SMD FIELD EFFECT TRANSISTOR	2N7002E SOT-23	Q6,Q7
0881057	IC	CS4360 SSOP	U16
0882353	IC	CS5340 TSSOP	U18
0881127	IC	RT9164-33CG SOT-223	U13
0882214	IC	DMN-8652 B0 BGA	U1
0881814	IC	LP2995 SOP	U2
0883060	IC	HY5DU561622ETP-5 TSOP	U4,U3
0881816	IC	SN74HCT14PWR TSSOP	U5
0881818	IC	SN74ALVCH16373 TSSOP	U8
0881819	IC	TSB41AB1PHP QFP	U11
0881820	IC	PQ018EZ02ZP	U12
0881821	IC	PQ025EZ01ZP	U14
0881936	IC	TVP5146 PQFP	U15
0882672	IC	L2146 PQFP	U15

MATERIAL CODE	MATERIAL NAME	SPECIFICATIONS	LOCATION
0960169	CMETAL OXIDE FILM RESISTORSTAL OSCILLATOR	24.576MHz 49-S	Y2
0960171	CMETAL OXIDE FILM RESISTORSTAL OSCILLATOR	13.50MHZ 49-S	Y1
0960229	CMETAL OXIDE FILM RESISTORSTAL OSCILLATOR	14.31818MHZ 49-S	Y3
1632798	PCB	2DW9927-5	
1940005	SOCKET	6P 2.0mm	J6
1940022	SOCKET	4P 2.0mm	J7
1940030	SOCKET	10P 2.5mm	CN7
1940046	SOCKET	10P 2.0mm	CN5
1940062	CABLE SOCKET	20P 2.5mm DUAL LINE WITHOUT CLASP	J4,J5
1940120	CABLE SOCKET	13P1.0mm DUAL LINE TOUCH POINT DUAL LINE STRAIGHT PLUG	CN6
1940161	CABLE SOCKET	12P 1.0mm DUAL RANK TOUCH POINT,DUAL RANK STRAIGHT INSERT	CN4
3580134	HEAT RADIATION BOARD	38x38x10 DW9917 WITH CARD CLASP	U1
DW9952K(RU)-2 SILVER[8652]			
DV BOARD :		5448405	
0260027	CD	CD11 16V100U±20%6x12 2.5	CA1
0310207	SMD CAPACITOR	50V 104 ±20% X7R 0603	C1,C2
1860047	USB SOCKET	CAM-B85-4Pin	J1
1860040	1394 SOCKET	IEEE1394 4P/F DIP	J2
2150297	FLAT CABLE	4P380 2.0 2PIN,2P SHIELD,WITH L NEEDLE,REVERSE	JP1
2150145	FLAT CABLE	6P350 2.0T2 2x2P SHIELD WITH L NEEDLE,REVERSE	JP2
1633192	PCB	CDW9952K-2	
DW9952K(RU)-2 SILVER[8652]			
OK BOARD:		5448474	
0090181	SMD RESISTOR	1/16W 100O±5% 0603	R19
0090249	SMD RESISTOR	1/16W 510O±5% 0603	R7,R8,R21
0090014	SMD RESISTOR	1/16W 1K±5% 0603	R4,R5,R14,R17,R24
0090017	SMD RESISTOR	1/16W 2.2K±5% 0603	R1,R2
0090019	SMD RESISTOR	1/16W 4.7K±5% 0603	R9
0090185	SMD RESISTOR	1/16W 6.2K±5% 0603	R11

MATERIAL CODE	MATERIAL NAME	SPECIFICATIONS	LOCATION
0090225	SMD RESISTOR	1/16W 5.6K±5% 0603	R18,R22
0090234	SMD RESISTOR	1/16W 390O±5% 0603	R12
0090023	SMD RESISTOR	1/16W 10K±5% 0603	R15,R16
0090024	SMD RESISTOR	1/16W 15K±5% 0603	R3,R6,R10
0090029	SMD RESISTOR	1/16W 47K±5% 0603	R13,R25
0310047	SMD CAPACITOR	50V 101±5% NPO 0603	C11
0310066	SMD CAPACITOR	50V 102±10% X7R 0603	C12
0310207	SMD CAPACITOR	50V 104 ±20% X7R 0603	C7
0310256	SMD CAPACITOR	50V 683±20% X7R 0603	C13,C14
0700133	SMD TRIODE	BAS316 SOD323	C8
0310216	SMD CAPACITOR	10V 105 +80%-20% 0603	C3,C4
0310071	SMD CAPACITOR	50V 682±10% X7R 0603	C5,C6
0390142	SMD MAGNETIC BEADS	FCM1608-601T02	L1,L2,L3,L4
0700007	SMD DIODE	1N4148	D1,D2
0780040	SMD TRIODE	3904(100-300) SOT-23	Q1,Q3
0780041	SMD TRIODE	3906(100-300) SOT-23	Q2,Q4
0000132	CARBON FILM RESISTOR	1/6W2.2K±5% SHAPED 7.5	R20,R23
0260019	CD	CD11 16V10U±20%5x11 2	CE3,CE4,CE5
0260021	CD	CD11 16V22U±20%5x11 2	CE8
0260025	CD	CD11 16V47U±20%5x11 2	CE6,CE7
0260028	CD	CD11 16V220U±20%6x12 2.5	CE1,CE2
0881226	IC	RC4558D SOP	U1
0160146	ROTATED POTENTIOMETER	WH09NTX-1C-A50K-F30	VR1
1980018	MICROPHONE SOCKET	CK3-6.35-24	J1,J2
1564374	PCB	6DW9952K-1	
2120830	FLAT CABLE	5P360 2.0 2 PIN,WITH L NEEDLE,REVERSE	CN1
2100004	LEAD	F 0.6 SHAPED 10mm	J5,J7,J8
2100010	LEAD	F 0.6 SHAPED 5mm	J3,J4,J6,J9
2060002	GROUND CHIP	AB105KB	GND1,GND2
DW9952K(RU)-2 SILVER[8652]			
POWER BOARD :		5448128	
00000059	CARBON FILM RESISTOR	1/6W330±5% BELT	R5

MATERIAL CODE	MATERIAL NAME	SPECIFICATIONS	LOCATION
0000172	CARBON FILM RESISTOR	1/4W750±5%	R30
00004069	CARBON FILM RESISTOR	1/6W1800±5% BELT	R7
00000169	CARBON FILM RESISTOR	1/6W4700±5% BELT	R15
00000229	CARBON FILM RESISTOR	1/6W1K±5% BELT	R14,R16
00000279	CARBON FILM RESISTOR	1/6W2.2K±5% BELT	R29,R27,R26
00003509	CARBON FILM RESISTOR	1/6W2.4K±5% BELT	R23
00000309	CARBON FILM RESISTOR	1/6W3.3K±5% BELT	R4,R19,R3
00000349	CARBON FILM RESISTOR	1/6W4.7K±5% BELT	R17
00000509	CARBON FILM RESISTOR	1/6W33K±5% BELT	R9,R28
0070008	HIGH VOLTAGE RESISTOR	@1/2W680K±5% CQC	RV1
00100819	METAL FILM RESISTOR	1/6W1.8K±1% BELT	R21
00101299	METAL FILM RESISTOR	1/6W4.7K±1% BELT	R11
00103099	METAL FILM RESISTOR	1/6W5.1K±1% BELT	R20,R18
0010157	METAL OXIDE FILM RESISTOR	2W68K±5%SHAPED FLAT 15×7	R2,R6
02001369	PORCELAIN CAPACITOR	50V 473±20% 5mm BELT	C9
02003189	PORCELAIN CAPACITOR	50V 104±20% SHAPED 5mm BELT	C2,C7,C8,C12,C15,C16,C11,C21
0200232	PORCELAIN CAPACITOR	500V 101±10% 5mm	C18,C5,C20,C19,C17
0200365	CERAMIC CAPACITOR	@CT81 250VAC 102±10% 10 VDE	C6,C1
0200367	CERAMIC CAPACITOR	@CT7 250VAC 102±10% 10 VDE	C6,C1
02102059	TERYLENE CAPACITOR	630V 102±5% SHAPED 5MM BELT	C4
02003329	PORCELAIN CAPACITOR	50V 102±10% SHAPED 5mm BELT	C10
02100919	TERYLENE CAPACITOR	63V 473±5% 5mm BELT	C22
02100249	TERYLENE CAPACITOR	100V 333±10% 5mm BELT	C23
0210207	TERYLENE CAPACITOR	@275V 104±20% 15mm VDE	C13
0210206	TERYLENE CAPACITOR	@275V 104±10%15mm VDE	C13
02607149	CD	CD11T 25V100U±20%6×12 C5 BELT	CE1,CE2,CE16
02606869	CD	CD11T 25V220U±20%8×12 C5 BELT	CE12
02605589	CD	CD11T 25V470u±20%10×16 5 BELT	CE4
02607239	CD	CD288H 25V1000U±20% 10×20 5 BELT	CE3
02607169	CD	CD11T 50V2.2U±20%5×11 C5 BELT	CE7,CE19,CE14

MATERIAL CODE	MATERIAL NAME	SPECIFICATIONS	LOCATION
02606849	CD	CD11T 50V47u±20%6×12 C5 BELT	CE11,CE13
02607139	CD	CD11T 16V220U±20%6×12 C5 BELT	CE15,CE17
0260725	CD	CD288H 10V2200u±20% 10×25 5	CE6,CE9
02607269	CD	CD288H 10V1000U±20%8×16 C5 BELT	CE8,CE10
0260584	CD	LT 400V100U±20%22×30 10	CE5
03900529	MAGNETIC BEADS INDUCTOR	FB BELT	L1,L2,L4
0410077	CHOKER COIL	VERTICAL 10UH 3A 5mm	L3,L5
0460523	SWITCH POWER TRANSFORMER	@BCK-28-0653 VDE	T1
0570083	DIODE	ER803 TO-220AC	D21,D2
05700059	DIODE	1N4007 BELT	D9,D10,D11,D12
0570007	DIODE	1N5401	D14,D15
05700139	DIODE	HER105 BELT	D1,D6,D7,D8
05700149	DIODE	HER107 BELT	D4
05800069	VOLTAGE REGULATOR DIODE	5.1V±5% 1/2W BELT	D13
05800469	VOLTAGE REGULATOR DIODE	3.6V±5% 1/2W BELT	D20
05800489	VOLTAGE REGULATOR DIODE	22V±5% 1/2W BELT	D17
0680047	SCHOTTKY DIODE	PBYR10100 TO-220	D3
0780049	TRIODE	S8550D	Q9
07800239	TRIODE	2N3904(100-300) TO-92 BELT	Q6
07800329	TRIODE	9014C BELT	Q6
07800299	TRIODE	C8050 BELT	Q1
0790024	SMD FIELD EFFECT TRANSISTOR	1PP14N03L TO-220	Q7,Q2
0790025	SMD FIELD EFFECT TRANSISTOR	AP40N03P TO-220	Q7,Q2
0790028	SMD FIELD EFFECT TRANSISTOR	1PP15N03L TO-220	Q7,Q2
08805539	IC	LM431ACZ TO-92 BELT	IC3,IC5
08805819	IC	TL431C TO-92\$	IC3,IC5
08808009	IC	431L TO-92 BELT	IC3,IC5
0881326	IC	PQ12RD21 PLASTIC SEALED TO-220	IC4
0882680	IC	FSDM07652R TO-220F-6L	IC1
1000045	FILTER OF POWER NET	@UT-20 30mH+ -0% UL	LF2
1050012	HEAT SENSITIVITY RESISTOR	@NTC SCK-104MS±20% CQC	RT1

MATERIAL CODE	MATERIAL NAME	SPECIFICATIONS	LOCATION
1564373	PCB	@5DW9920-7 UL	
1940004	SOCKET	5P 2.5mm	CN2
1940024	SOCKET	5P 2.0mm	CN5
1940030	SOCKET	10P 2.5mm	CN3
1940037	SOCKET	4P 3.96mm	CN4
1940045	SOCKET	2P 8.0mm 2#	BCN1
1940001	SOCKET	2P 2.5mm	CN1
2060002	GROUND CHIP	AB105KB	GND3,GND4
1080032	PHOTOELECTRIC COUPLER	@HS817 VDE	IC2
2100010	LEAD	F 0.6 SHAPED 5mm	J3,J8,J18
2100007	LEAD	F 0.6 SHAPEN 15mm	J6,J12,J13
2100003	LEAD	F 0.6 SHAPED 7.5mm	J1,J5,J7,J15,J16
2100004	LEAD	F 0.6 SHAPED 10mm	J9,J10,J11,J17
2100006	LEAD	F 0.6 SHAPED 12.5mm	J2
2300048	FUSE	@T2AL 250V WITH LEAD FEETVDE#N/A	F1
3580091	HEAT RADIATION BOARD	11x15x31 LFDR9905	D3,Q7
3580143	HEAT RADIATION BOARD	11x15x31 DW9915R	IC1
4000073	TAPPING SCREW	BT 3x8 BLACK	IC1,D3,Q7
DW9952K(RU)-2 SILVER[8652]			
REMOTE CONTROL :		5471688	
0000599	CARBON FILM RESISTOR	1/6W10±5% SHAPED 7.5	R800
3031194	SURFACE CASING OF REMOTE CONTROL	RC-109 SILVER WHITE	
3040937	REMOTE CONTROL BOTTOM CASING	RC-109 BLACK	
3050850	BATTERY CASE DOOR OF REMOTE CONTROL	RC-109 BLACK	
3850068	ANODECATHODE SPRING	RC-109	
3850066	ANODE SPRING	RC-109	
3850067	CATHODE SPRING	RC-109	
0200062	PORCELAIN CAPACITOR	50V 151±10% 2.5mm	C801,C802
0570006	DIODE	1N4148	VD800,VD802
0630003	EMISSION PIPE	TSAL6200	LED800
0780050	TRIODE	S8050D	V800

MATERIAL CODE	MATERIAL NAME	SPECIFICATIONS	LOCATION
0880220	IC	PT2222 SOP	N800
0970003	CERAMIC RESONATOR	455E	G800
1561684	PCB	8219-1	
2100003	LEAD	F 0.6 SHAPED 7.5mm	R801
4000258	SELF-TAPPING SCREW	BB 2.3x8 BLACK	
3050851	GLASS OF REMOTE CONTROLLER	YK10 DEEP PURPLE	
5070070	GLUE BAG	85x250	
5156555	SURFACE STICKER OF REMOTE CONTROL	DW9952K(RU)-2	
4631057	CONDUCT GLUE OF REMOTE CONTROL	DW9952K(RU)-2	
DW9952K(RU)-2 SILVER[8652]			
MAIN PANEL:		5448129	
0000268	CARBON FILM RESISTOR	1/4W2.2O±5% SHAPED 10	R1
0000118	CARBON FILM RESISTOR	1/6W10O±5% SHAPED 7.5	R10
0090003	SMD RESISTOR	1/16W 10O±5% 0603	R25
0090181	SMD RESISTOR	1/16W 100O±5% 0603	R12
0090104	SMD RESISTOR	1/16W 2.7K±5% 0603	R17,R18,R19
0090019	SMD RESISTOR	1/16W 4.7K±5% 0603	R22,R26
0090023	SMD RESISTOR	1/16W 10K±5% 0603	R4,R5,R6,R14,R24
0090017	SMD RESISTOR	1/16W 2.2K±5% 0603	R7
0090203	SMD RESISTOR	1/16W 270K±5% 0603	R3
0310085	SMD CAPACITOR	50V 20P±5% NPO 0603	C9,C10
0310191	SMD CAPACITOR	50V 30P±5% NPO 0603	C6,C7,C12,C13,C14,C15,C16
0310072	SMD CAPACITOR	50V 103±10% X7R 0603	C3,C4,C5,C19,C21
0310207	SMD CAPACITOR	50V 104 ±20% X7R 0603	C2,C79,C80
0310066	SMD CAPACITOR	50V 102±10% X7R 0603	C8,C17
0260241	CD	CD11C 16V4.7U±20%4x7 1.5	C11
0260196	CD	CD11C 16V10U±20%4x7 1.5	C18
0620040	RADIATION DIODE	3B 4SC WHITE ISSUE BLUE	LD5
0260200	CD	CD11C 16V47U±20%5x7 2	C20
0260076	CD	CD11C 50V22U±20%6x7 2.5	C1
0390095	SMD MAGNETIC BEADS	FCM1608K-221T05	L1

MATERIAL CODE	MATERIAL NAME	SPECIFICATIONS	LOCATION
0700007	SMD DIODE	1N4148	D1,D2,D4,D5
0780040	SMD TRIODE	3904(100-300) SOT-23	Q1
0780062	SMD TRIODE	9014C	Q1
0881013	IC	D16316 QFP	U1
0960114	CMETAL OXIDE FILM RESISTORSTAL OSCILLATOR	5.00MHZ 49-S	Y1
0960017	CMETAL OXIDE FILM RESISTORSTAL OSCILLATOR	32.768KHz 3x9	Y2
1200459	DISPLAY SCREEN	HNVC06SC020	VFD1
1340001	LIGHT TOUCH RESTORE SWITCH	VERTICAL6x7x1	K2,K3,K4,K5,K6
2121626	FLAT CABLE	5P450 2.0 2 PIN,WITH L NEEDLE,REVERSE	CN1
2121514	FLAT CABLE	2P230 2.5 2 PIN,WITH DOUBLE L NEEDLE,REVERSE	CN3 、CN2 (4DW9920-0的CN3与BDW9920-1的CN2连接)
2121513	FLAT CABLE	10P120 2.0 2 PIN,WITH L NEEDLE,TOGETHER DIRECTION	CN2
2360016	IR SENSOR	HS0038B3V	U2
2360024	IR SENSOR	LTOP-4338	U2
2110176	LEAD	20# 40mm BLACK,WITH WELD PIECE	GND1
5234752	SOFT SPONGE SPACER	6x6x10 DOUBLE-FACED,HARD(70 DEGREE)	
5232797	SOFT SPONGE SPACER	10x7x8.3 DOUBLE-FACED,HARD	
1633037	PCB	4DW9920-1	
DW9952K(RU)-2 SILVER [8652]			
PROGRAM FLASH ROM9952KRU-1(32M) 0911710			
0882436	IC	SST39VF3201-70-4C-EK TSOP	U9