

IBBK

Tv1006

service manual



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Chapter One About Maintenance

1.1 Safety precautions

1.1.1 Power supply

When maintenance personnel are repairing DVD TV, he should pay special attention to the power with 220V 800V AC and 330V DC which will cause hurt and damage to persons!

1.1.2 Precautions for antistatic

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

1. Use a piece of electric conduction metal with the length of about 2 metres to insert into the earth, and Fetch the lead wire from the top of the surplus metal and connect to the required static electricity device. The length and depth of the metal embedded under the earth should be determined according to the wettability of the local soil. For humid places, it may be shorter, and longer and deeper for dry places. If possible, it can be distributed and layed in terms of “#” shape.
2. On operating table-board, the antistatic table cushion should be covered and grounded.
3. All devices and equipments should be placed on the antistatic table cushion and grounded.
4. Maintenance personnel should wear antistatic wrist ring which should be grounded.
5. Places around the operating position should also be covered with electric conduction cushion or Painted with antistatic paint.

1.1.3 Precautions for display screen

1. Display screen is breakable article, so please protect carefully when carrying and prevent fingers or hard objects striking the screen to damage structure of the screen.
2. When cleaning screen, do not use organic chemicals. You should use cloth and use small amount of special cleaning liquid in places difficult to clean.

1.1.4 Precautions for laser head

1. Do not stare at laser head directly, for laser emission will occur when laser head is working, which will Hurt your eyes!
2. Do not use wiping water or alcohol to clean laser head, and you may use cotton swab.

1.1.5 About placement position

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

1.2 Maintenance method

1.2.1 Electric resistance method

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

1.2.2 Voltage method

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

1.2.3 Current method

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

1.2.4 Element substitution method

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

1.2.5 Cutting method

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

1.2.6 Visualized method

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

1.2.7 Comparison method

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

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

1.3 Required device for maintenance

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

Chapter Two

Functions and Operation Instructions

2.1 Section One TV SEGMENT

2.1.1 Features

Miscellaneous

- #High- quality color TFT LCD with size 10
- #Maximum mode 800X480
- #Built-in DVD player with Slot-in mechanism
- #Built - in stereo audio system
- #USB port to playback compatible files stored on flash memory of external devices
- #Card Reader
- #Composite and audio input/output
- #2 headphone outputs
- #Kickstand
- #Headrest bracket for car

TV Channels Receiving and External Signal Playback

- #Automatic and fine tuning functions with 100 channels memory
- #Adjustable brightness, contrast, saturation, hue and 4 preset image settings
- #Tone and sound balance adjustment

Disc playback mode

- #Digital video playback: DVD-Video, Super VCD, VCD compatibility
- #MPEG-4 standard support
- #Digital audio playback: CD-DA, HDCD and Mp3 compatibility
- #Digital graphic albums playback: Kodak Picture CD and JPEG
- #Compatible disc types: CD-R/CD-RW, DVD-R,/DVD-RW, DVD+R/DVD+RW
- #Russia, CIs and Baltic States adaptation interface and filenames CD-Text support simplifies device operation
- #"Q-Play" function provides direct playback and allows to skip commercial that is not possible to rewind
- #Automatic screensaver function
- #Parental control function to protect children from watching inappropriate discs
- #Super wide range of operating power supplies(~100-240v) automatic short circuit protection

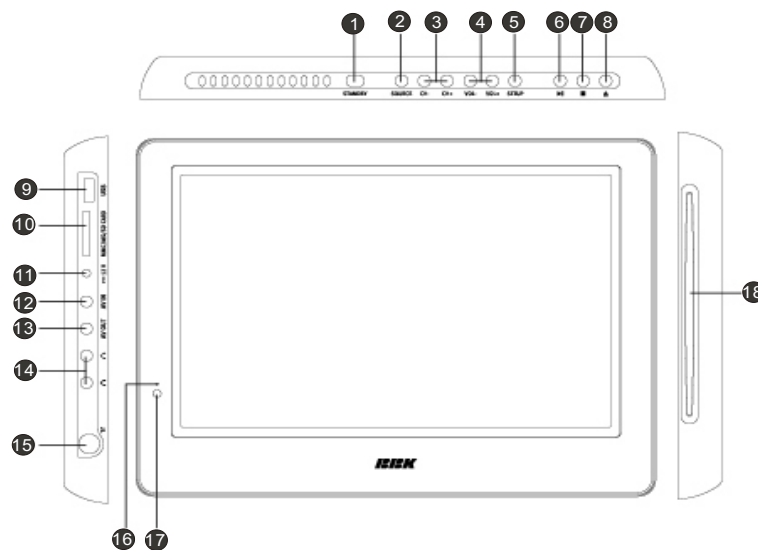
2.1.2 Set list

LCD TV	1pcs
Remote Control	1pcs
AAA Battery	2pcs
Power adapter	1pcs
Power cord	1pcs




AV cord	1pcs
Car adapter	1pcs
Wall mount holder	1pcs
Antenna	1pcs
Headrest bracket	1pcs
Bag	1pcs
Headphones	1pcs
M4X5	8pcs
M4X25	4pcs
Expadable pipes	4pcs
User Manual	1pcs
Warranty card	1pcs

2.1.3 CONTROLS AND FUNCTIONS

(1) Overview panels control and switching interface



Upper panel

- ① STANDBY button**
To switch in standby mode and power-on mode.
- ② SOURCE button**
Select input source.
- ③ CH-/++ buttons**
To switch TV channels/to move in the menu.
- ④ VOL-/++ buttons**
Increase or decrease Volume/ characteristics.
- ⑤ SETUP button**
TV function setup.
- ⑥  button**
Press to playback/pause.
- ⑦  button**
Press to stop the playback.
- ⑧  Button**
Press to open or close the disc tray.

Left panel

- ⑨ USB port**
- ⑩ MMC/MS/SD CARD READER**
- ⑪ DC input terminal**
- ⑫ AV IN**
- ⑬ AV OUT**
- ⑭ Headphones outputs**
- ⑮ RF input terminal**

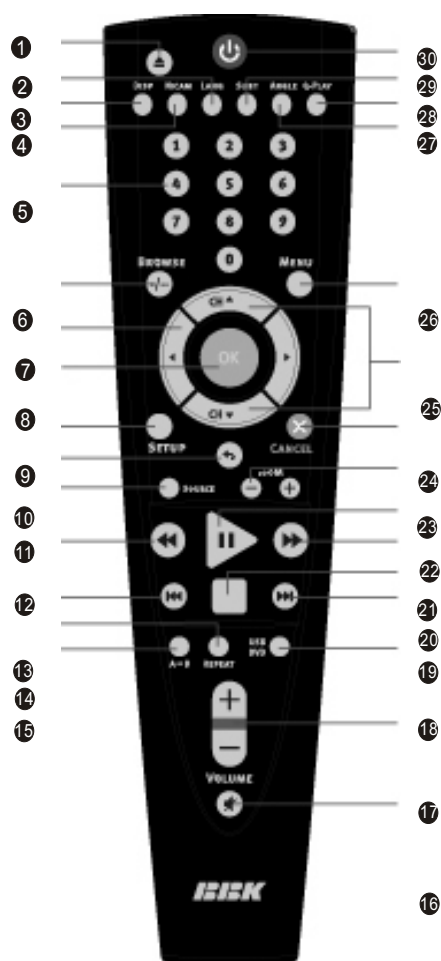
Front panel

- ⑯ Standby LED**
- ⑰ Sensor or infrared beams**

Right panel

- ⑱ Slot-in mechanism**

(2) Remote control general view



- 22 **Button / TV/R**
Press to playback/pause/Switch between TV and radio modes, valid in DVB mode.
- 23 **ZOOM+/-button**
Press to zoom in/out.
- 24 **FAV button**
In DVB mode, open favourite channel list.
- 25 **CH / buttons**
Press to switch between channels /to choose menu item.
- 26 **MENU/EPG button**
DVD disk menu/PBC function/To display the program guide valid in DVB mode.
- 27 **ANGLE button**
Press to change the camera angle.
- 28 **Q-PLAY button**
Press to turn the Q-PLAY mode on.
- 29 **SUBT button**
Press to change the subtitles language.
- 30 **Button**
Press to switch the device on/into standby mode.

- 1 **EJECT button**
Press to open/close the disc tray.
- 2 **LANG button**
In DVD and DVB mode. Press to change language.
- 3 **DISP button**
Press to display the disc and the current source information.
- 4 **RADIO button**
Press to switch to picture mode.
- 5 **Numeric buttons**
- 6 **-/-- button**
Press to switch one or two-digit program number.
- 7 **CURSOR buttons**
- 8 **OK button**
- 9 **SETUP button**
Press to enter setup mode.
- 10 **Button /GOTO**
Press to return to the previous channel in TV and DVB mode/To play from a certain time point in DVD mode.
- 11 **SOURCE button**
Press to change the mode.
- 12 **Button /INFO**
Press to start rewind/rewind scanning/To display the information about channel and program in DVB mode.
- 13 **Button**
Press to skip backward.
- 14 **REPEAT button**
Press to repeat.
- 15 **A-B button**
Press to repeat the selected section.
- 16 **Button**
Press to turn on/off the sound.
- 17 **VOLUME+/-button**
Press to adjust the volume.
- 18 **USB/DVD/CARD button**
Press to switch between USB/DVD/CARD modes.
- 19 **Button**
Press to skip forward.
- 20 **Button**
Press to stop the playback.
- 21 **Button AUDIO**
Press to forward/forward scanning/In DVB mode, to change sound track between left, right and stereo.

2.1.4 TV MODE

This LCD TV can store up to 100 channels and enables to scan channels automatically, manually and by fine tuning.

(1) Adjusted channels selection

#Press **CH ▲/▼** buttons on the remote control or +CH- buttons on the upper panel to switch to another TV channel.

#Use numeric buttons and -/-- button to enter the number of the channel.

#Press **↶** button to return to the previous channel.

(2) Default picture settings selection

#You may select one of the default picture settings: USER, STANDARD, DYNAMIC and SOFT.



#You may adjust necessary parameters in the device menu.

(3) TV settings

#Press **SETUP** button to display the menu.

#Use cursor buttons on the remote control or +CH-buttons on the upper panel to select the item. Use ◀/▶ buttons to adjust selected parameter. Use **OK** button for confirmation. Press **SETUP** button again to return to the main menu or to exit TV SETUP.



(4) Picture settings

#Select **PICTURE** item to adjust picture parameters.

#You may adjust **BRIGHTNESS**, **CONTRAST**, **SATURATION**, **SHARPNESS**, **TINT** for **USER** mode.

NOTE

#You can't adjust **TINT** while watching TV channels.

(5) TV setting

Select **TV SETUP** item to adjust channels. You may select **CHANNEL**, **COLOR SYSTEM**, **SOUND SYSTEM**, **FINE**, **MANUAL SEARCH**, **AUTO SEARCH** and **CHANNEL EDIT**.

#**CHANNEL** item enables to select the number of adjustable channel.

#**COLOR SYSTEM** item can be changed between: **AUTO**, **PAL** and **SECAM**. We recommend to set this item to **AUTO**.



#**SOUND SYSTEM** item can be changed between **B/G**, **D/K**, **L** and **I**.

#**FINE** item enables to adjust the channel frequency accurately.

#**MANUAL SEARCH** item enables to change channel settings.

#**AUTO SEARCH** item enables to adjust channel setting automatically.

#**CHANNEL EDIT** submenu enables to select, skip and swap the channel.

#**CHANNEL** parameter enables to select current channel.

#**SKIP** function enables to make current channel inaccessible while using +CH- button to browse channels.

#**SWAP** function enables to select the channel number to swap with current channel.



(6) system

You may select **LANGUAGE**, **TRANSPARENCY**, **SLEEP**, **RATIO** and **RESET**.

#**LANGUAGE** item enables to select the OSD language.

#**TRANSPARENCY** item enables to adjust transparency of OSD.

#**SLEEP** item enables to set the sleep timer.

#**RATIO** item can be changed between **16:9** and **4:3**.

#**RESET** item enables to reset all values to default.

(7) Video settings

#Press **SETUP** button to display the menu.

#In external video signal playback mode the menu is the same.

NOTE

#In external video signal playback mode **TV SETUP** item is inaccessible.

2.2 Section Two DVD SEGMENT

2.2.1 DVD FUNCTION SETTINGS

(1) General setup

1. TV Display: This item is used to set the output picture ratio of this unit.

#Optional settings: Normal/PS, Normal/LB, Wide, Wide Spueeze: Default: Wide.

2. OSD language: This item is used to set the OSD language.

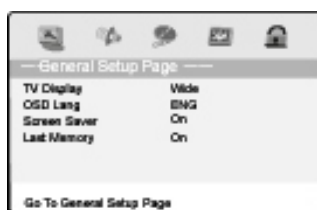
#Optional settings: English, Russian; Default: English

3. Screen Saver: Open or close the screen saver.

#Optional settings: On, off; Default: On

4. Last Memory: This player can save the currently played time point automatically when you leave the current DVD disc playback (switch from DVD signal source to other signal source, enter standby state in DVD mode).

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



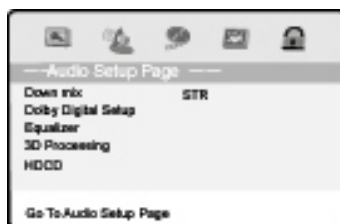
NOTE:

When switching to DVD playback state again, this player can automatically search the time point saved last time to continue playing. If you want to play from the beginning, please press [STOP] button twice and then press [PLAY] button.

(2) Audio setup

1. Down mix mode: this item is used to set this unit's DOWN MiX mode to change multi channel audio into 2-channel audio output.

#Optional settings: LT/RT, Stereo; Default: Stereo



2. Dolby Digital Setup:

Dual Mono:

#Optional settings: Stereo, L-Mono, R-Mono, Mix-Mono;

Default: Stereo.

Dynamic:

#Set Dolby digital sound dynamic level, Default: Off



3.Equalizer:

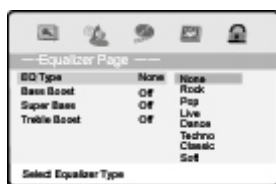
#EQ Type: Set equalizer type, optional settings:

None, Rock, Pop, Live, Dance, Techno, Classic, Soft; Default: None.

#Bass Boost: Enhance low frequency sound level, optional settings: On, Off; default: Off.

#Super Bass: Enhance very low frequency sound level, optional settings: On, Off; default: Off.

#Treble Boost: Enhance high frequency sound level, optional settings: On, Off; default: Off.



4.3D Processing: Set reverberation mode.

#Optional settings: Off, Concert, Living Room, Hall, Bathroom, Cave, Arena, Church; Default: Off.

5.HDCD: Set filter mode.

#Optional settings: Off, 1x,2x; Default:1x.

(3) Video setup

1.Hue:This item is used to set the hue of video outputs.

2.Saturation: This item is used to set the saturation of video outputs.



(4) Preference setup

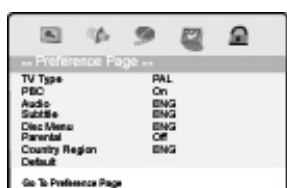
1.TV Type: To set the output video system of this player.

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

2.PBC: To set the PBC status.

#When playing SVCD,VCD2.0 discs, if PBC is set On, this unit enters PBC playback mode; if PBC is set Off, the unit will play the disc according to track sequence.

Optional settings: On, Off; Default: On



3.Audio: This item is used to set the preference audio language when playing.

4.Subtitle: This item is used to set the preference subtitle language when playing.

5. Disc menu: This item is used to set the preference disc menu language when playing.

#Default of disc menu language: English

NOTE:

#Audio, subtitle and disc menu language are only effective in DVD mode.

#If the disc is not recorded with the language you appointed, the unit will apply the language that the disc appointed to play.

#Select other languages: press [▲/▼] button to move cursor to "OTHER" item, press [OK] button and then number buttons to input the language code you desired. After input finishes, press [OK] button again.

6.Parental: this item is used to set the parental control ratings to prevent children from watching restricted contents.(In the event the disc supports this function)

#Optional settings: KID SAFE, G, PG, PG 13, PGR, R,NC17, ADULT, Off; Default: Off

NOTE:

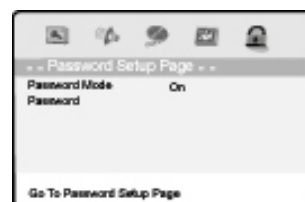
#When changing the parental control ratings, a password is needed. Please refer to the following password item for details.

7.Country Region: Set the country region according to your country.

8.Default: This item is used to restore all settings to the default value except "Parental control" and "Password" in the setup menu.

(5) Password setup

Password: This item is used to set a six digit password to enable you to change the parental control ratings.



Password Mode:

To set whether parental control function needs a password, optional setting: On, Off; Default: On.

Password:

To change the password of the parental control function, default:000000.

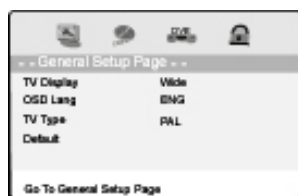
2.2.2 DVB FUNCTION SETTINGS

Turn on the TV, press [SOURCE] button to change source to DVB, then you can enjoy the rich and colorful contents of Digital Video Broadcast!

In DVB mode, press [SETUP] button, then press [◀/▶] button to choose DVB item, the DVB setup menu will be displayed as follow:

(1) General setup

1. TV Display: This item is used to set the output picture ratio of this unit.
#Optional settings: Normal/PS, Normal/LB, Wide, Wide Squeeze; Default: Wide.
2. OSD language: This item is used to set the OSD language.
#Optional settings: English, Russian; Default: English
3. TV Type: To set the output video system of this player.
#Optional settings: PAL, Auto, NTSC; Default: PAL.
4. Default: This item is used to restore all settings to the default value except "Parental control" and "Password" in the setup menu.



(2) Video setup

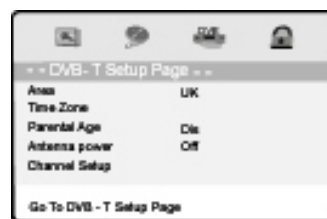
1. Hue: This item is used to set the hue of video outputs.
2. Saturation: This item is used to set the saturation of video outputs.



(3) DVB-T setup

The DVB-T Setup Page is composed of five parts: Area, Time Zone, parental Age, Antenna Power, Channel Setup.

Note: press [▲/▼] button to select different item, and press [OK] or [▶] button to enter it. Press [◀] button to return to the previous menu or to exit the current menu.

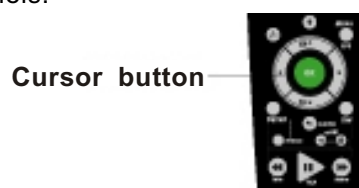


1. Area

You can choose the area of your country. Optional settings: Australia, Austria, Belgium, Russian, Denmark, Estonia, Germany, Spain, France, Italy, Netherland, Taiwan, Others; Default: Russian.

Note:

You must set the correct area before searching channels.



2. Time zone

To choose your time zone, it is set depending on your country. If you don't know the exact time, please ask local time manage department, Default: 03:00

3. Parental age

This item is used to set the parental control ratings. To prevent your children watching undesired programmes.

#Optional

settings: 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, Disable

Default: Disable

4. Antenna power

Turn on/off antenna power supply. Optional settings: On, Off; Default: Off

5. Channel setup

This item is used to search channels, edit the channel list or your favourite channel list, view program guide information, etc.





#Auto Scan

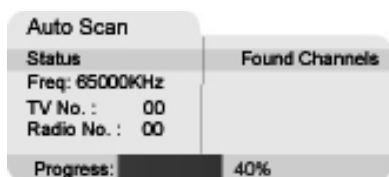
Connect the antenna to the RF socket on the TV, if the antenna needs a power supply. Turn on/off antenna power supply in the menu.

Then you can automatically search channels without entering any other information. In the scan process, the scan result will be displayed in the Auto Scan window.

Press [SETUP] button to enter setup menu, then choose the DVB item;

Using the  button to select the Auto Scan item, and press [OK] or  button to select Start item, then press [OK] button;

A prompting message will be displayed to request that you confirm, select "OK" and press the [OK] button to confirm.



Note:

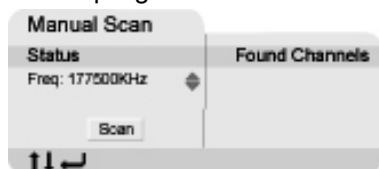
If you press the [SETUP] button during scanning, the operation is stopped and a prompting message will be displayed at the bottom of Auto Scan window. Select "OK" and press [OK] button to abort auto scan operation, and the channels found until then will be saved. And select "Cancel" and press [OK] button to return to auto scan process. Wait while the TV searches for the channels, this may take a few minutes.

Once you press [OK] button to start auto search operation, all the saved channels will be cleared.

Please don't press any button during the course of default operation.




#Manual scan

1. In setup menu, select "Manual Scan", a manual scan will be shown as follows:
2. Enter the frequency you want to scan by the number buttons, then press "OK", the scan button seems to be pressed, press "OK" again to scan, a scan sign: scanning... Will be shown on the window.
3. The scan result will be displayed on the right half of the manual scan window, you can save the found channels or delete them if the TV has the same program.



#Adjust channel

You can set your favorite channel, set parental control age for some channels or delete channel in Adjust Channel window.

1. Select channel using  button, Press number button[1] to set this channel as one of your favorite channels.
2. Select channel using  button, if you don't like this channel press number button[2] to skip it.
3. Select channel using  button, press number button[3] to set this channel as a protected one, to prevent children from watching the undesired program.

Note: If you set a channel protected, a password will need to be inputted in the Protect Channel window.

The default password is 000000.

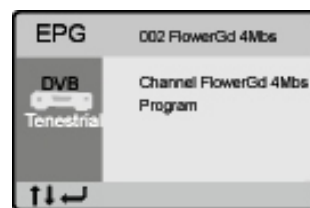
#Channel remap

You can change every channel position as you like in channel remap window.

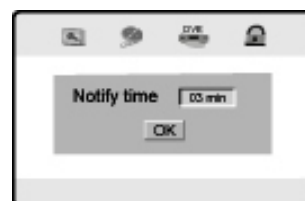
#Reserve channel

If you want to watch a special program on a channel at a later time, you can reserve it. Then a reminding signal will be displayed on screen several minutes before it starts.

When playing a program on a channel, press [EPG] button, then a program information list of current channel will be displayed in a window, move the cursor to PROGRAM, then press [OK] button, a more detailed program list will be displayed, move the cursor to the program which you want to watch, then press [OK] button on remote control as shown in the window. The program is saved in your reserved channel.

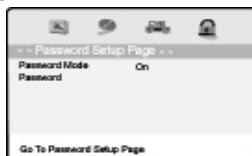


You can set the time when the reminding signal should be displayed before the program starts.



(4) Password setup

Password: This item is used to set a six digit password to enable you to change the parental control ratings.



Password Mode:

To set whether parental control function needs a password, optional setting: On, Off; Default: On.

Password:

To change the password of the parental control function, default:000000.

2.2.3 OTHERS

(1) Useful notes

#To extend the service life of your LCD TV make pauses of not less than 30 seconds between switching off and repeatedly switching on the LCD TV.

#Disconnect the LCD TV from the wall outlet after shutdown.



#Some LCD Tv's functions may not be applied to some discs.

#Use supply sources of rated voltage, otherwise the LCD TV may not function or be damaged.


#In case of the LCD Tv's occasional stops, please switch the power supply off and then on again.

(2)Trouble shooting

Please check probable causes of malfunction before addressing the service center.

Sign of trouble	Cause of trouble	Actions to eliminate the trouble
No sound	1.Poor antenna connection. 2.Disc dirty or damaged. 3.Sound disabled by the  button.	1.Make proper connection. 2.Clean the disc. 3.Press the  button.
No image	1.Poor antenna connection. 2.Incorrect settings of your TV set. 3.The TV is in the progressive scan mode while your TV set does not support this mode.	1.Make proper connection. 2.Correct the settings of your TV set. 3.Place the TV in the interlaced scan mode through the TV's menu.
Black and white image	1.incorrect TV color system selected. 2.Color level on the TV set adjusted incorrectly.	1.Set the appropriate color system via the menu: SETUP>Image>TV scan. 2.Readjust the color system of your TV set.
Discs cannot be read	1.Disc not inserted. 2.Disc inserted incorrectly. 3.Condensate on the DVD player's laser head.	1.Insert the disc. 2.Install the disc with the label side facing up. 3.Switch the TV on without disc for an hour.
Remote control does not operate	1.Remote control is incorrectly directed at the TV's screen. 2.Distance to the TV is in excess of 8 meters. 3.Batteries are empty.	1.Use the remote control according to the manual. 2.Decrease the distance to the TV. 3.Replace both batteries.
some functions do not work	1.Disc is recorded incorrectly. 2.Incorrect key sequence. 3.Static voltage on the housing.	1.Wait 5-10 seconds and the device will automatically return to normal state. 2.Repeat the operation one more time. 3.Switch the device off for 1-2 minutes and then switch it on again.
Unstable image	1.Incorrect TV set settings.	1.Correct the TV set settings.

(3) Technical characteristics

Display	Type class	TFT,colored II(ISO 13406-2)
	Size(Height(mm) Width(mm) Dot Pitch (H mm × V mm) Viewing Angle(H) Display color	10 133.2 222 0.275×0.275 130° 16 700 000
Inputs	Video	
	Composite	1
Audio Stereo	Others	1
	USB	1
RF	MMC/MS/SD CARD	1
		1
Outputs	Headphone	2
	Composite video output	1
Audio output		1
Color system	TV tuner	PAL,SECAM
	Video inputs	PAL, SECAM, NTSC 3.58, NTSC 4.43,PAL60
Sound system	TV tuner	DK,I,BG,L
Built-in DVD player	Disc types	CD-R/RW,DVD-R/RW,DVD+R/RW
	Formats	DVD-Video,DivX,XviD,SVCD,VCD,CD-DA,OGG,HDCD,MP3,WMA,Kodak Picture CD,JPEG
Power adapter	Voltage and frequency(V, Hz)	~100-240,50/60
	Voltage of external(V,A)	 +12,4.5
Power supply	Power Consumption (Maximum)(w)	≤33
	Power Consumption	<1
Environmental consideration	Operating temperature(°,C)	+5...+35
	Operating humidity(%)	10-80
Storing temperature (°,C)	Storing humidity(%)	0...+50
DVB	Input connector	IEC-Type, IEC 169-2, Female
	Frequency range(VHF/UHF)	174 MHz~858MHz
Channel range(VHF/UHF)		7&8 MHz
Dimensions(mm)		281×210×37
Weight	Net weight(kg)	1.25

#We are permanently improving the quality of our products; hence the product's design, functionality and technical characteristics may be modified without prior notice.

#We do not guarantee that all discs can be played smoothly due to the disc quality, disc recording quality and recording format.

Chapter Three Principle and Servicing

Section One Flow chart of the player

3.1.1 scheme composing of the player and features of function

LD1006TI is a multi-function 10-inch LCD_TV with DVD playing function and disc reading/USB/DVB functions. Electronic scheme of TV parts adopt: AUO 10 inch TFT display screen+inverter components (TDKXAD245NR) +MST717+APA2068 +tuner,etc.MST717 consists MCU/videoA/Dtransformer/LCD image process circuit, etc. Electronic scheme of DVD part adopt MT1389HD+64M SDRAM+16M FLASH+D5954/BA6849 with a slot-in mechanism adoption to smoothly readMPEG4/MP3/CD/DVD and other disc format. Decode loader MT1389HD can directly support external connecting USB and card reading function. DVB part is composed by MT8606+DVP3000P and other elements to receive DVB signal and input to Mt1389 for decode resume.

Function features:

- ◆ Digital image adjust technic to the sharpness, brightness, contrast, chroma, and saturation of pictures, gamma correction.
- ◆ Built-in Dolby DTS Digital decode.
- ◆ Adopt slot-in steel loader.
- ◆ Video circuit support PAL/NTSC/SECAM/PAL60 multi-system video signal
- ◆ Support USB/ card reading function
- ◆ Compatible with DIVX, MPEG4 format disc
- ◆ Support DVB function
- ◆ Support demodulation of PAL BG/DK/I, SECAM BG/DK/L/L' radio frequency signal

3.1.2 Player composing and diagram

3.1.2.1 Account for eachPCB component function

1. Video main board (K1006-*) : the PCB semi-finished product is main composing part of the player. Video main board composed of audio/video input circuit, audio choosing and amplified circuit, video selection,DVD decode, servo circuit, DVB process circuit, etc. Its main function is to finish audio/vedio signals' process and realization of DVD/DVB function.

2. Adapter (AK083-4) : Power adapter is mainly composed of rectifier circuit and filter circuit and the main function of this PCB semi-finished product is to provide power for the player.

3. Inverter component (TDKXAD245NR): inverter component is mainly composed of voltage rising circuit and protection circuit. The main function of this PCB semi-product is to provide light tube working voltage for display screen component.

4. Remote control receiving board (B1006SI-1) : this semi-finished product is only composed by one tuner and working indicator light. The main function of the PCB semi-finished product is to receive controlling order sent by remote control and then send it to video main board MCU part to control and indicate machine working state.

3.1.3 Account for player key IC function:

SN	Material Number	Material Name	Specification Type	Number Instruction	Function Instruction	Remark
1	0883272	IC	AZ78L05 TO-92	U111	5V voltage stabilization IC:CPU5V	Standby Voltage
2	0881604	IC	AT24C16 SOP	U303	DVD EEPROM: store information set by users	DVD
3	0880768	IC	C4558 SOP	U406	operational amplifier: DVD audio signal amplify	DVD
4	0880839	IC	CD4053 SOP	U703	electronic switch:DVB/CARD change-over switch	DVB
5	0881378	IC	BA5954FP HSOP	U402	driving IC:DVD servo driving	DVD
6	0881513	IC	BA6849FM HSOP	U403	driving IC: main axis driving	DVD
7	0881674	IC	LM393D SO8	U2	operational amplify: power detect	
8	0882262	IC	K4S641632H-TC60 TSOP	U301	SDRAM:DVD SDRAM	DVD
9	0882644	IC	MT1389FE/H(HD version) QFP	U401	DVD decode chip	DVD
10	0882843	IC	AZ1084-ADJ TO-252	U405,U610,U611	voltage stabilization IC	
11	0882483	IC	AZ1085S-3.3 TO-263	U404	voltage stabilization IC	DVD
12	0882515	IC	HEF4052BT SOP	U114,U608,U701	electronic switch:DVB/CARD switch ueberschall switch	DVB
13	0882945	IC	MP1430DN SOP	U115,U116	5V voltage stabilization IC:ATV5V,DTV5V	
14	0790126	SMD field effect transistor	FDS9435A SOP	U113	power switch control: standby control circuit	
15	0883277	IC	BA7644AN SIP	U702	video electronic switch: video output circuit	
16	0883168	IC	DIB3000P LQFP	U603	DVB core chip	for LD1006TI
17	0883260	IC	APA2068 SOP	U1	audio amplifier: driving loudhailer	
18	0883166	IC	MT8606 LQFP	U501	DVB signal process chip	for LD1006TI
19	0883167	IC	TDA9886 SOT340-1	U601	middle frequency amplify and AV separation circuit	for analog TV
20	0880165	IC	74HCU04D SOP	U502	inverter: for clock circuit	
21	1000069	surface acoustic wave filter	VF389A1D SIP5K	U607	surface acoustic wave filter: for separating sound and image	for analog TV
22	1000068	surface acoustic wave filter	AF389A1D SIP5K	U606	surface acoustic wave filter:for separating sound and image	for analog TV
23	1020081	tuner	TD1316AF/IHP-3	U602	change high frequency signals into middle frequency signals	different between common TV and DVB
24	0880504	IC	24C32N SOP	U203	TV EEPROM: store information set by users	on driving board
25	0882485	IC	AZ1117H-3.3 SOT-223	U204	voltage stabilization IC	on driving board
26	0883143	IC	AZ1117H-2.5 SOT-223	U206	voltage stabilization IC	on driving board
27	0883269	IC	AIC1899 SOT-23-6	U207	DC-AC invert circuit	on driving board
28	0883164	IC	MST717A PQFP	U201	MCU&LCD drive	on driving board
29	0882923	IC	EN29LV160AB-70TCP TSOP	U302	DVD FLASH store DVD soft ware	software needed to be burned
30	0883190	IC	PM25LV020 SOP	U202	TV ROM store TV software	software needed to be burned
31	0881473	IC	12C508A SOP	U112	standby control IC	software needed to be burned

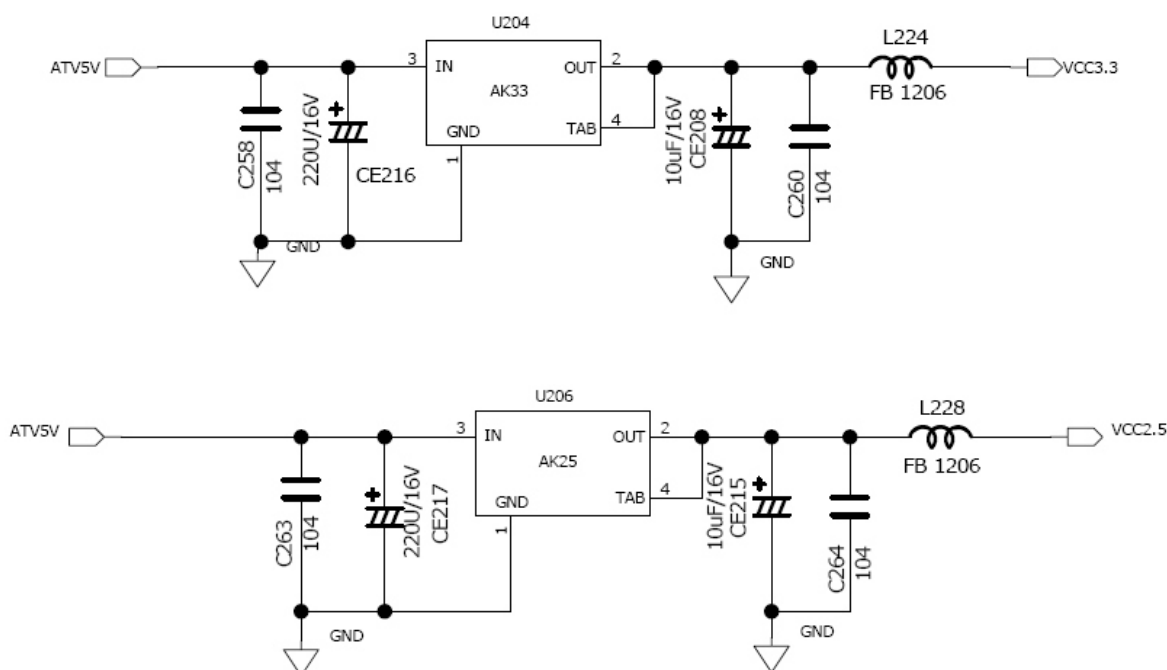
Section Two Principle of TV part unit circuit

3.2.1 System control circuit

System control circuit is mainly composed of clock circuit, software program, EEROM and MCU (MST717 built in). MST717 with built-in MCU is mainly responsible for coordination and controlling of the player system, MCU externally connecting with a 2M ROM is used to store programme control function of the player, MST717 externally connecting with a 16k EEPROM is used to store information set by users. The system control circuit of the player is on driving board, meanwhile driving board also consists LCD driving circuit.

1. System power supply circuit

(1) system power supply circuit is shown in picture 3.2.1.1:

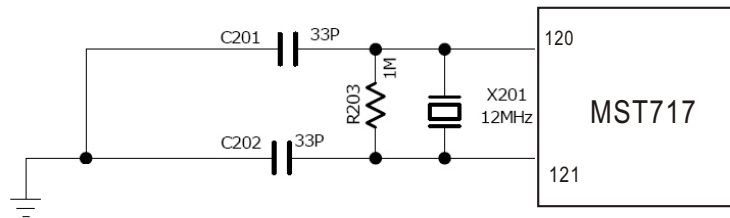


Picture 3.2.1.1 system power supply circuit

Working principle: when standby state of the player enters into power on, power supply outputs ATV5V voltage through switch (U113) on main board and voltage stabilization (U116 and its peripheral elements) to U204, U206 on driving board for separately voltage stabilization. Output voltage of +3.3V +2.5V provide power for MST717. U204 and U206 is a 3-ended voltage stabilization IC.

2. System clock circuit

(1) system clock circuit is shown in picture 3.2.1.2:

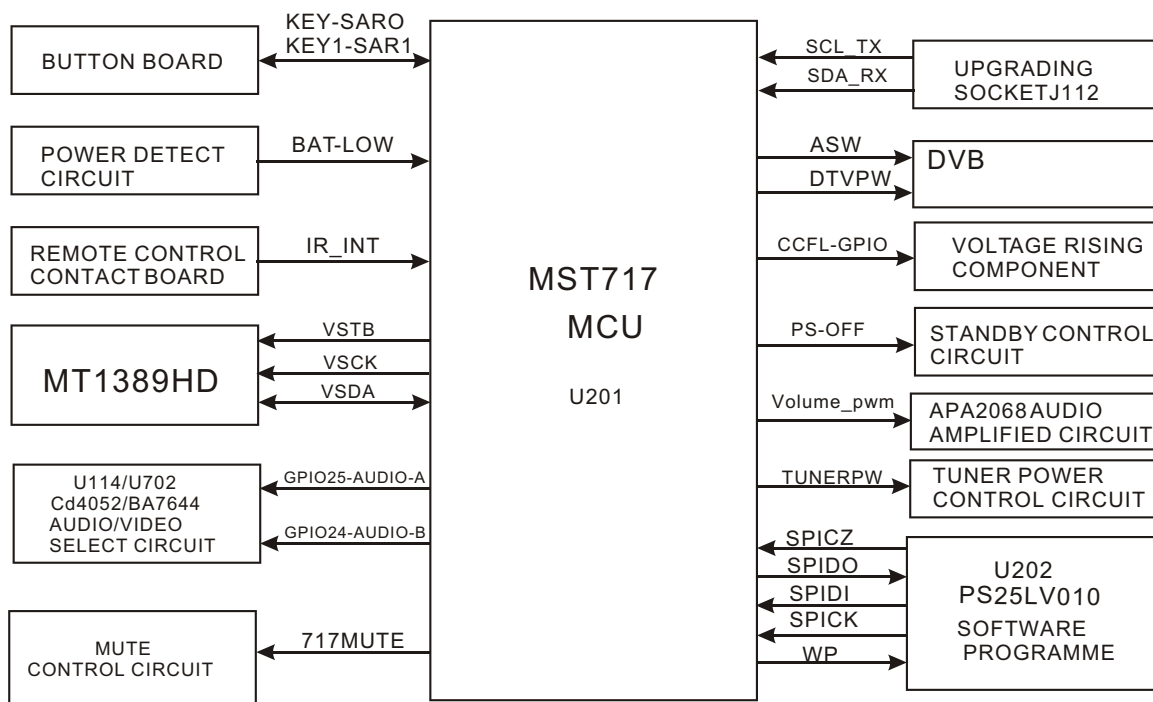


Picture3.2.1.2 system clock circuit diagram

(2) working principle: the clock circuit is mainly composed of X201 and C201 C202. X201 is a crystal 12MHZ oscillator, C201 C202 are two externally connecting resonance capacitance which produce a 12MHZ clock signal to provide clock signal needed by the signal for MST717. And the clock signal is produced by internal multi-frequency circuit and used as working clock.

3. System control circuit

(1) system control circuit diagram is shown in picture 3.2.1.3:



Picture 3.2.1.3 system control circuit diagram

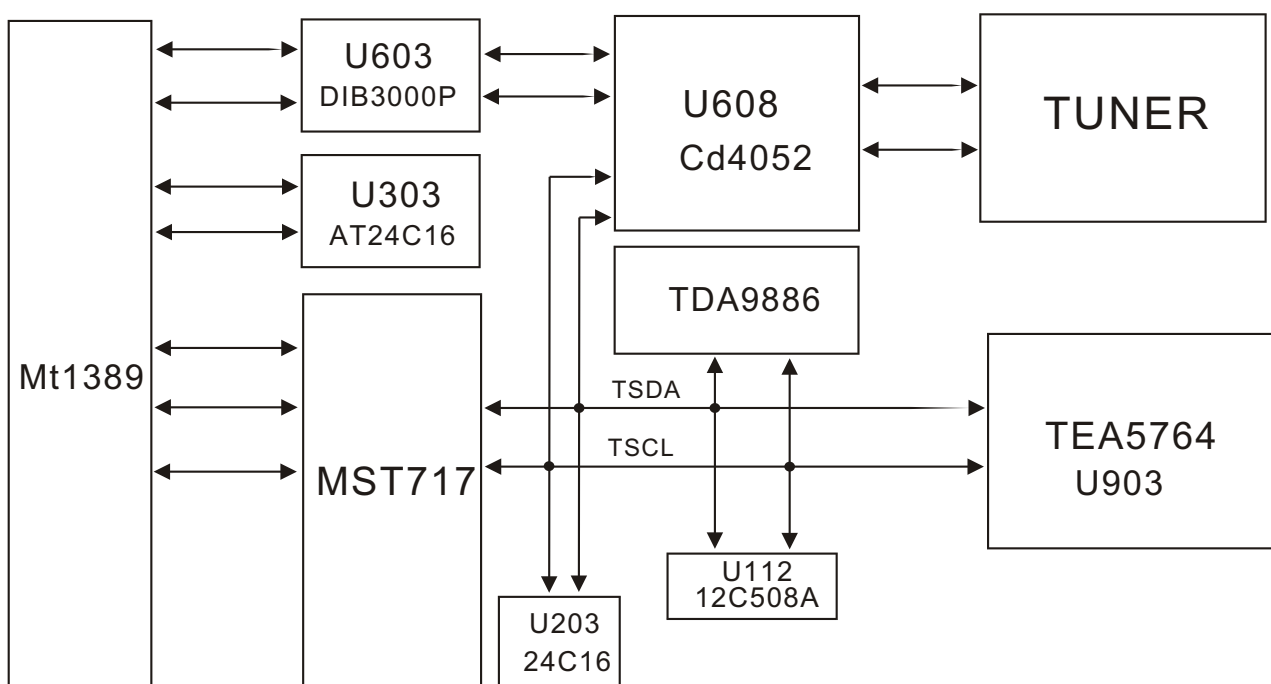
(2) Working principle

System control circuit of the player is composed of MST717 built-in MCU and software programme and other elements

Machine power on: Power supply provides 12V power through adapter and output +5V power to standby control circuit after U111 voltage stabilization. After receiving instruction from panel or remote control, standby control circuit outputs POWER_ON signal, which controls power control switch U113. Then system control circuit of machine starts MST717 to work. All module circuits in diagram is controlled by MCU, which is responsible for function control of the player.

4.IIC bus control circuit

(1) Diagram of IIC bus control is shown in picture 3.2.1.4:



Picture 3.2.1.4 IC bus control circuit diagram

(2) . Working principle

IIC bus is a simple bidirectional two-wire developed by PHILIPS company, which is synchronous serial bus. It only needs two wire (serial clock wire and serial data wire) to transmit information between elements connecting with bus. The bus is high performance serial bus, which compatible with judgement needed by multi-mainframe and super low speed facility synchronization functions, which is broadly used. As is shown in picture 3.2.1.4, U203 is a 16K storage and is mainly used to store information from users.

3.2.2 Audio circuit

Audio processing circuit is mainly responsibility for audio switch, amplifying, and restoring analog audio. It is mainly composed of audio input selection, audio amplify circuit and mute control circuit, shown in figure 3.2.2.1:

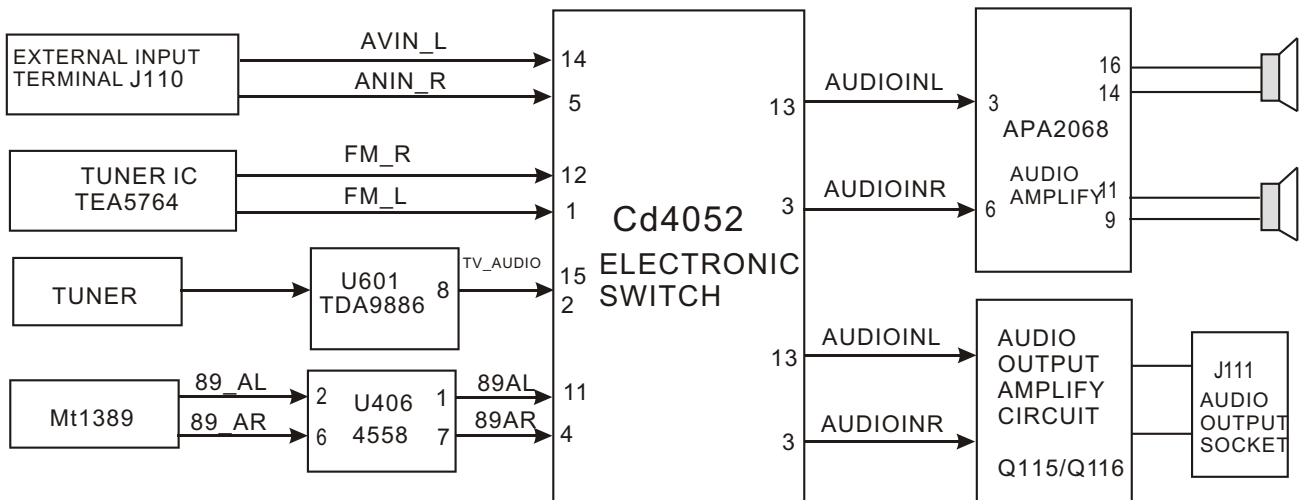


Figure 3.2.2.1 audio processing block diagram

1.TV audio processing circuit

Working principle: when player is set in TV or DVB state, tuner transfers received high frequency TV signals into middle frequency signals and amplify signals outputted by tuner through amplified circuit composed by Q603. The amplified signals input to TDA9886 for processing through U607 and separate audio/video signals. Audio signals outputted from pin8 of TDA9886 input to Cd4052 and output after Cd4052 selection and then input to amplify circuit composed by APA2068 and Q115/Q116. Audio signals amplified by APA2068 directly drive loudhailer to sound. Audio signals amplified by Q115/Q116 output to external facilities to use.

2 “ Line-in selection” processing circuit: ueberschall selection circuit is composed of U114 and its peripheral elements. When machine is set in DVD state,CPIO24 AUDIO B/GPIO25 AUDIO A output low level. Pin 9/10 of U114 is transformed into high level after changed by Q119/Q118. According to truth table of Cd4052, it can be estimated that pin 13/3 of U114 separately output audio signals input fromX3/Y3 ports to finish audio input selection function, which is shown in figure 3.2.2.2:

GPIO24_AUDIO_B	GPIO25_AUDIO_A	FUNCTION
0	0	DVD
0	1	TV
1	0	AVIN
1	1	FM

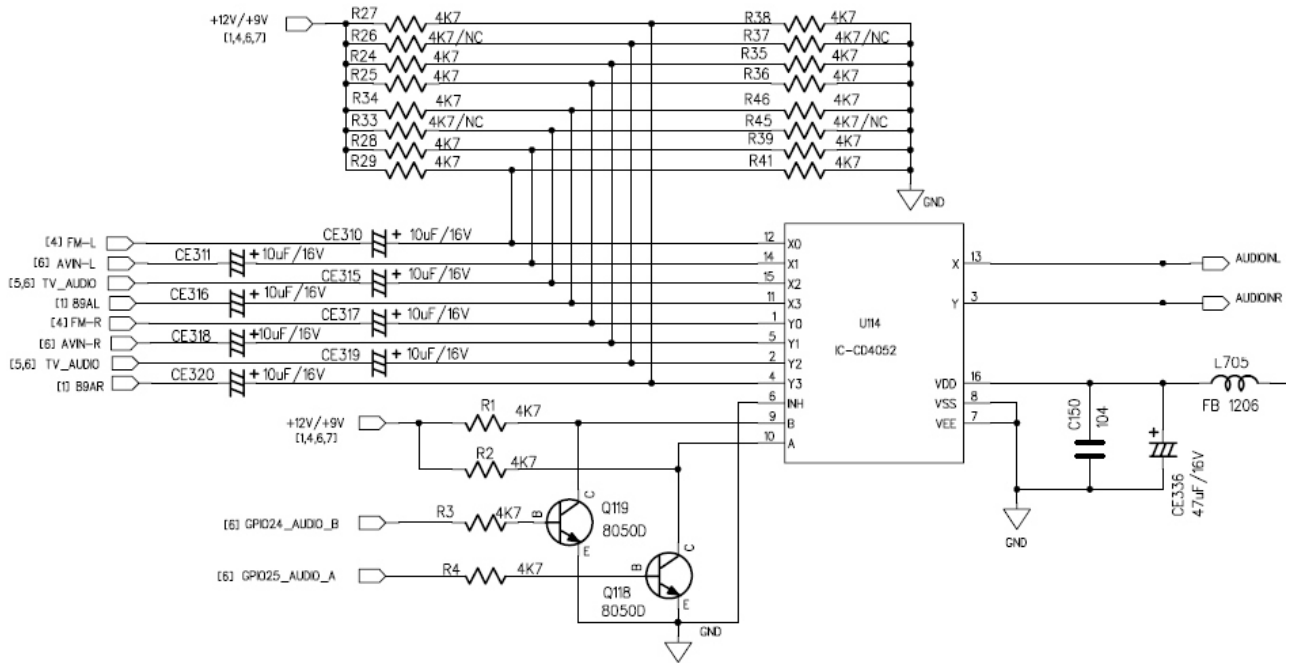


Figure 3.2.2.2 ueberschallselection circuit

3.Audio amplifying circuit

(1) Audio amplifying circuit is shown in figure3.2.2.3:

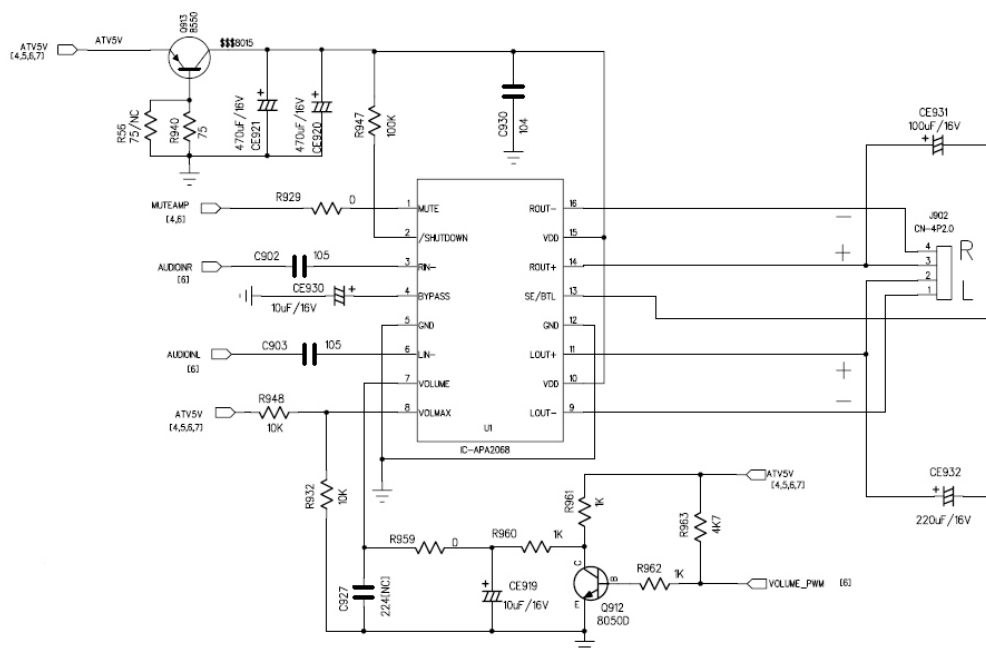


Figure 3.2.2.3Audio amplifying circuit

(2) Working principle: APA2068 is a Stereo 2.6W Audio Power Amplifier. Audio signals input through pin3,pin6 of APA2068 and output from pin 9,13,14,15 of APA2068 after amplified by internal audio to drive loudhailer to sound. This IC adopts +5V to provide power. Pin 1 is mute control pin, high level is effective. For more details, please reference to mute circuit working principle. Pin 7 is PWM volume control pin. The lead feet control signals are directly controlled by MST717. PIN 13 IS Output mode control input, high for SE output mode and low for BTL mode. SE output mode directly drive earphone to output.

4. Mute control circuit

(1) Mute control circuit block diagram is shown in figure3.2.2.4:

(2) working principle: power-on mute:when machine is on from standby mode into power-on, CPU+5V saturated on Q909 and cut off Q1 through R941 function. MUTEAMP is high level, and IC-APA2068 enters into mute state to realize power-on mute function. When machine is power on normally, ATV5V normally output and Q907 is saturated on. HW-MUTE is low level, and machine sound is normally outputted. Mute is needed in normal working, MST717 outputs a high level signal, then Q909 is saturated on/Q1 is cut off. MUTEAMP is high level. IC-APA2068 enters into mute state. When user cancels mute, 717-MUTE becomes low level and sound output is normal.

Power-off mute: when machine is power off, as Ce914 is fully charged when machine is on,CE914 discharges through Q908/D904 to saturate on Q909. At this time pin 1 of IC-APA2068 keeps a high level to realize power-off mute function. Mute circuit of DVD part is controlled by MT1389.

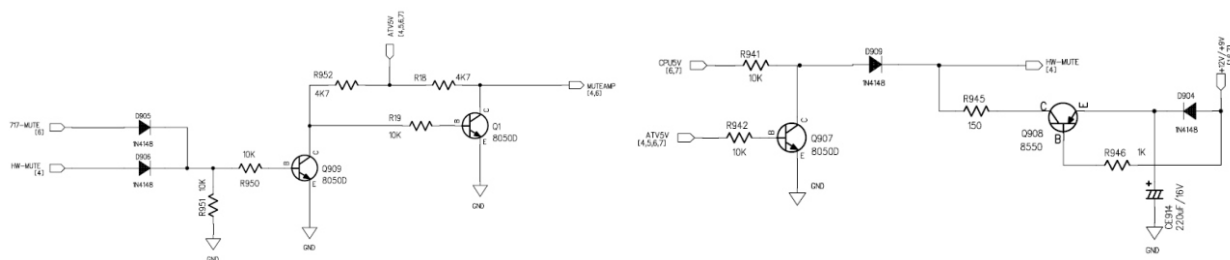


Figure 3.2.2.4 mute control circuit

(3) Block diagram of audio output amplifying circuit is shown in figure 3.2.2.5: Working principle: As it is shown in figure, it is a single tube amplifying circuit composed by triodes. which is mainly used for audio output amplify. As it is shown in figure, Q116/Q115 are amplifying tube, CE303/CE305 is blocking capacitor, Q120/Q121 are mute tubes with a main function of power-on/off mute. Audio signals outputted by the circuit is used for audio output.

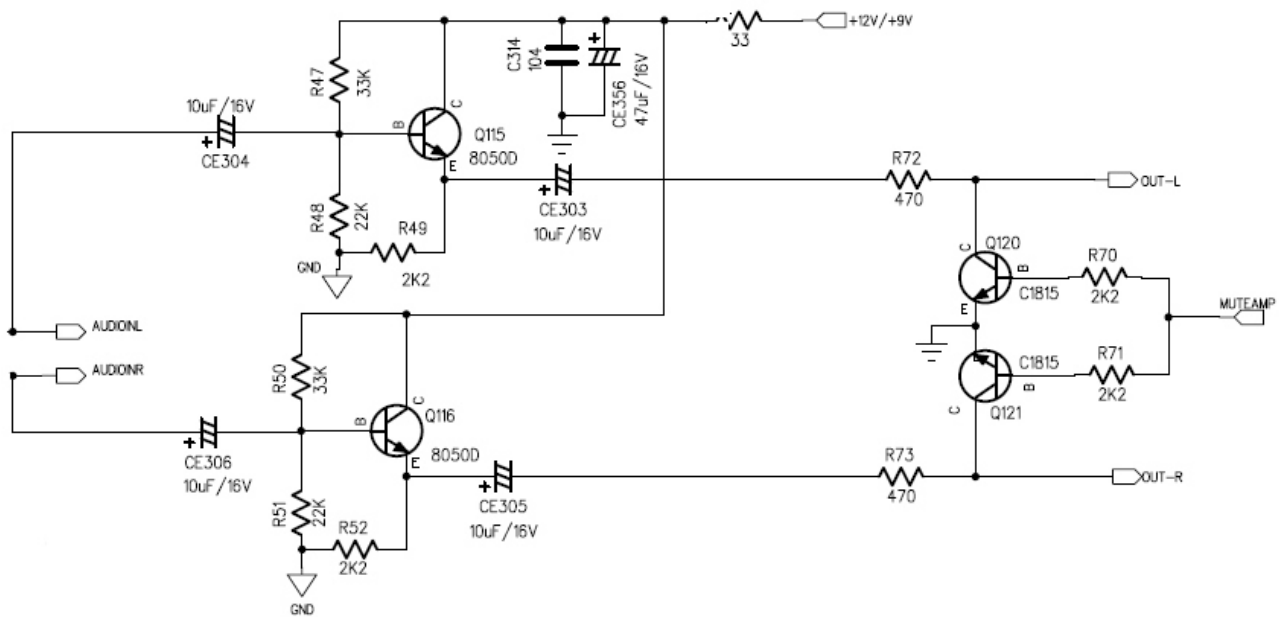


Figure3.2.2.5 Audio output amplifying circuit

3.2.3 Video circuit

Video circuit consists video amplifying/ filter circuit, video output switch circuit, LCD image processing circuit. Video circuit block diagram is shown in figure 3.2.3.1:

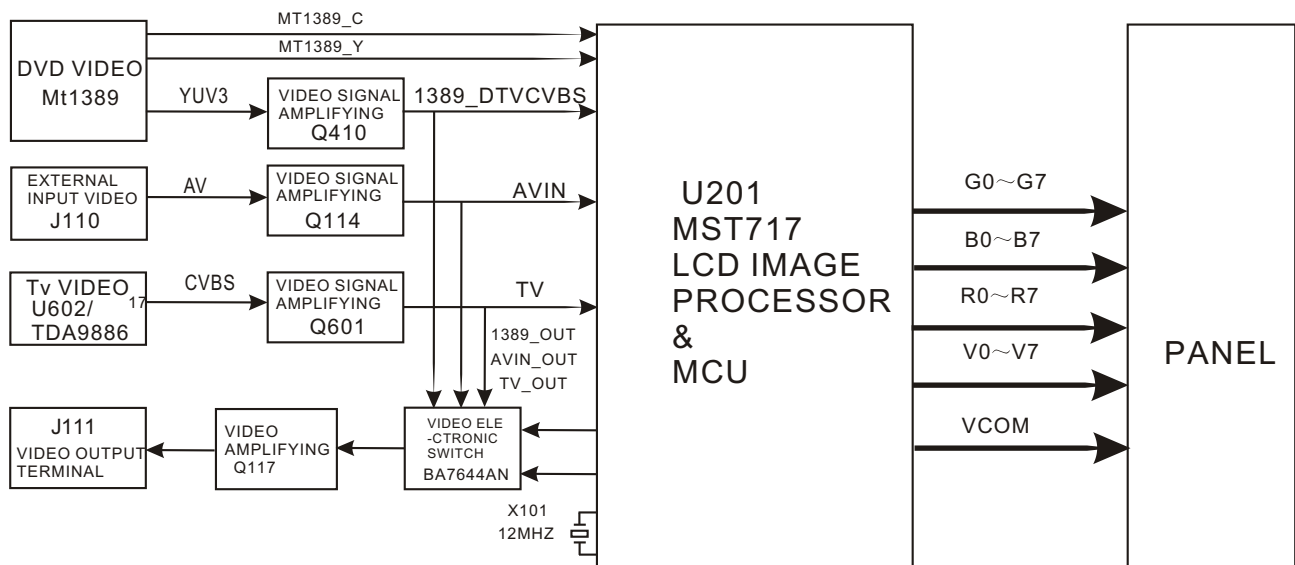


Figure 3.2.3.1 Video circuit block diagram

1. Video input and video processing circuit

This circuit is mainly composed of BA7644AN , MST717 and other elements, MST717 supports NTSC, PAL, and SECAM three modes video signal. And its supporting video signal formats are RGB, YPbPr, CVBS, or S-video video, built-in A/D convertor, which can realize many formats switching function. MST717 is built in MCU, and MST718 also has video output function. Output interface consists TTL, LVDS, TCON multi-modes. When machine is set in DVD or DVB state, Y C signals input into internal A/D converting circuit of MST717. Multiple video signals input into pin 1 of Ba7644 and output from pin 19 after selected by electric switch (Ba7644) and output to external facilities through output terminal after amplified by amplifying circuit, which is composed by Q117.

2. LCD image processing circuit

LCD image processing circuit is composed of MST717 and its peripheral elements. It is mainly responsible for transforming analog video signals inputted from external into signals needed by LCD driving. MST717 is a high performance, high integrity image processing loader designed for LCD, which can support SVGA format, multi-output display interface (supporting TTL、LVDS、RSDS) . This machine adopts analog signal input, MST717 built-in MCU, MST717 has multi-format output display interface. TTL output format is adopted in this machine, and output method can be adjusted through software according to driving way of screen. MST717 outputs R0~R7/G0~G7/B0~B7 separately to drive display screen.

3. Block diagram of video output circuit is shown in figure 3.2.3.2:

Working principle: external input video signals and machine built-in DVD/TV signals separately input to MST717 and video output circuit after amplifying. Signals inputted to MST717 are transformed into digital video signals through A/D converting circuit inside MST717 and transformed into LCD driving signals through internal processing circuit. Meanwhile each channel video signals input into output selection circuit, which is composed of U702 and its peripheral elements. The controlling signals of the circuit are from MCU ,and are controlled by MCU with audio electronic switch. Video output amplifying circuit is composed of Q117 and its peripheral circuit, which is a fixed biased circuit to upgrade driving ability of video signals. Other working principle of video amplifying circuit is almost the same, we do not describe in details.

3.2.4 Input circuit

1. Block diagram of external input circuit is shown in figure 3.2.4.1: this TV version has multiple input ways because of its multiple performance. External input of this machine has multiple video, and built-in function input has DVD/TV and other ways.

2. Working principle: this circuit is a typical fixed biased amplifying circuit with a main function of current amplifying and upgrading load carry ability of circuit. Q114 is an amplifying tube, R21 is carrying impedance resistor, Ce309 is coupling capacitor with a blocking function. External inputted multiple video signals input into MST717 after amplifying.

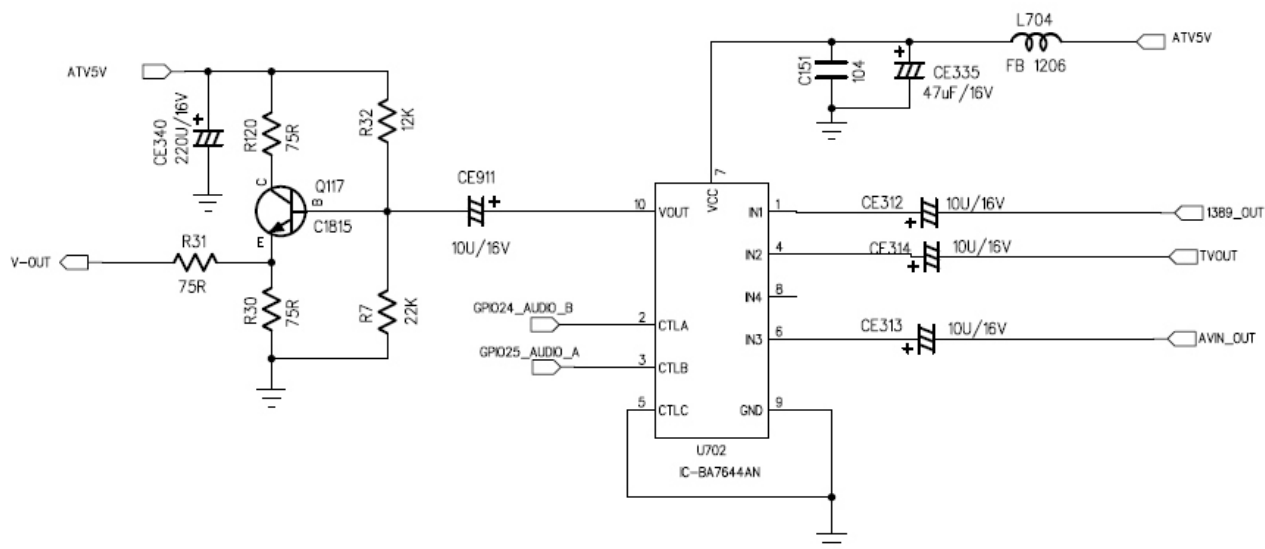


Figure 3.2.3.2 Video output circuit

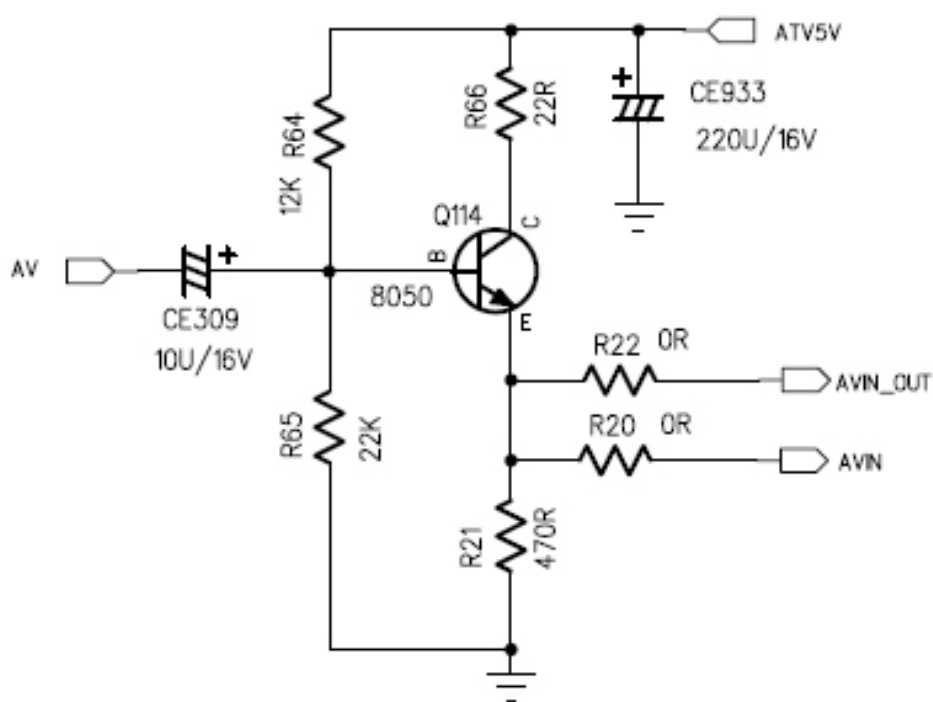


Figure 3.2.4.1 External input amplifying circuit

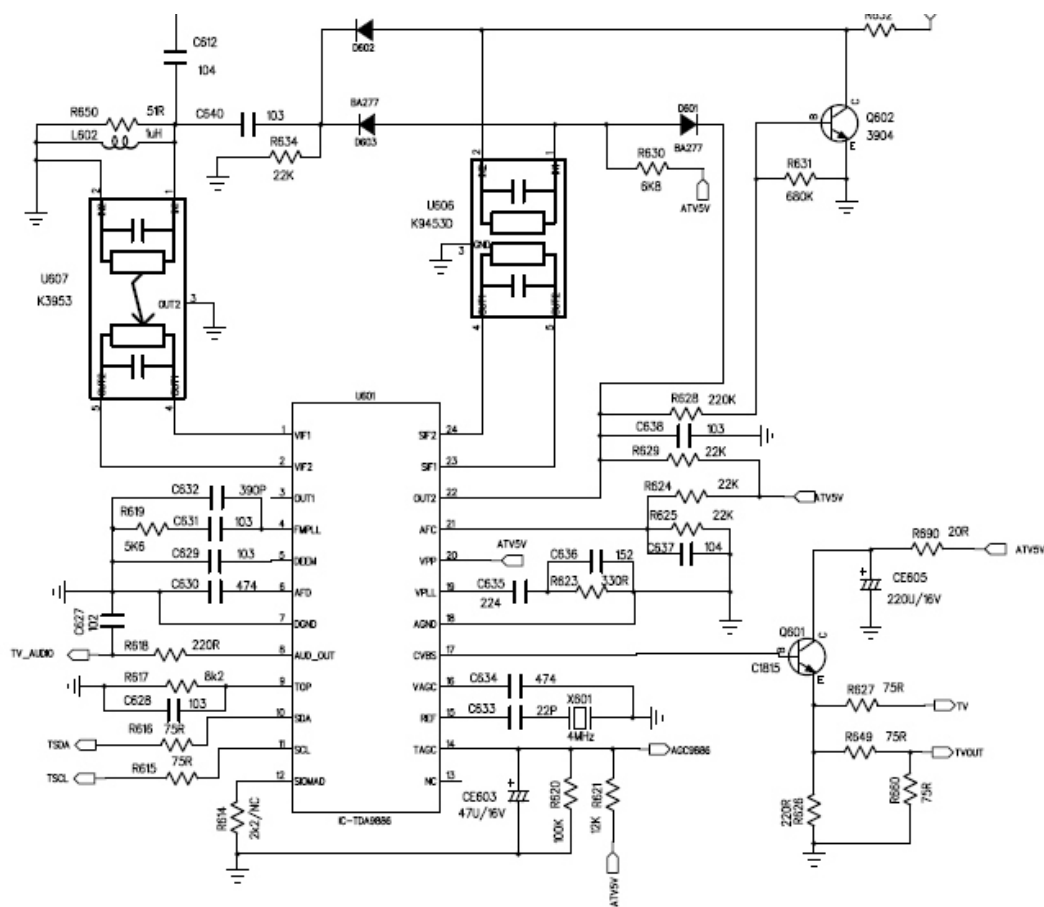


Figure 3.2.4.3 TV signal processing circuit

5.function of tuner lead feet:

Terminal	Function	Remark
1	DC-power option for tuners with P-extension	Max. permissible current: 100mA
2	External RF-gain control voltage (0.5V - 4.0V)	Source impedance limited to 1kohms
3	PLL chip address select (I ² C / tuner)	see application notes
4	SCL (I ² C / tuner)	
5	SDA (I ² C / tuner)	
6	4MHz reference frequency output;	AC coupled
7	+5V \pm 5% supply tuner (V _{TU})	
8	'broadband' IF - output	AC coupled
9	IF-gain control voltage	max. gain at 3V min. gain at 0V (see application notes)
10	'narrowband' IF - output	AC coupled
11	'narrowband' IF - output	AC coupled

3.2.5 Power circuit

1. Power circuit provide stable power for each unit circuit to ensure a normal working of the player. Block diagram of power circuit is shown in figure 3.2.5.1:

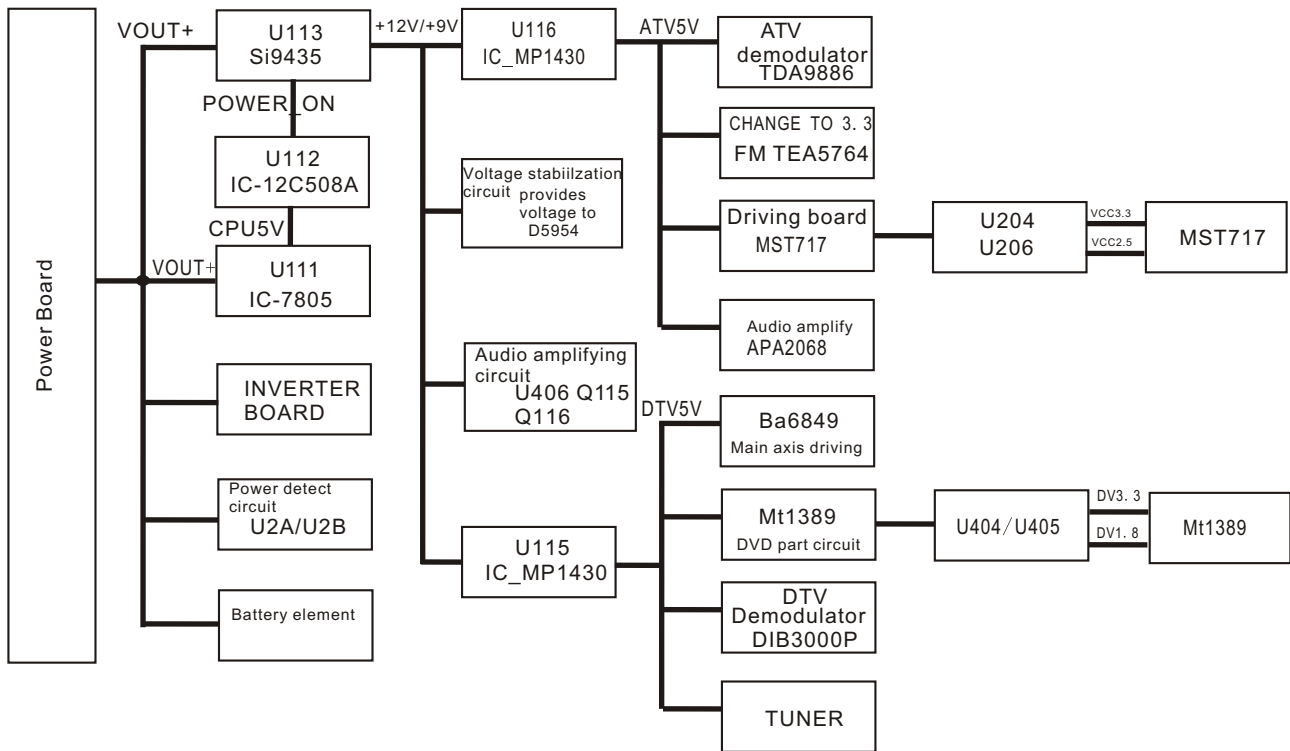


Figure 3.2.5.1 Power circuit block diagram

(1) working principle: AC power supply output +12V power through power adaptor rectifier/filter. +12V power input into socket (J106) through connecting line. 12v power input into DC voltage stabilization circuit of video main board through J106. The power voltage stabilization circuit also support power input modes of external connecting battery and vehicle connector. When machine is power on, 12V power input into MOS tube U113_S(performs function of switch controlling). As function of R194 U113 is cut off and rear electrode circuit has no power provided. Meanwhile 12V output CPU5V to standby control circuit and remote control receiving circuit through U111 voltage stabilization. Machine enters into standby state. When machine is on, U113 conducts, power supply provide power to load circuit through U113. Machine power supply is normal and enters into power-on state.

(2) Instruction of each module function in diagram: U116 is a 5V voltage stabilization IC, which mainly provides ATV5V power to MST717 and audio amplifying circuit to use. U115 is also a 5V voltage stabilization IC, which provides a DTV5V power to DVD/DVB circuit to use.

2、+12V11 power control circuit

(1) Principle shceme of +12V power control circuit is shown in figure 3.2.5.2 :

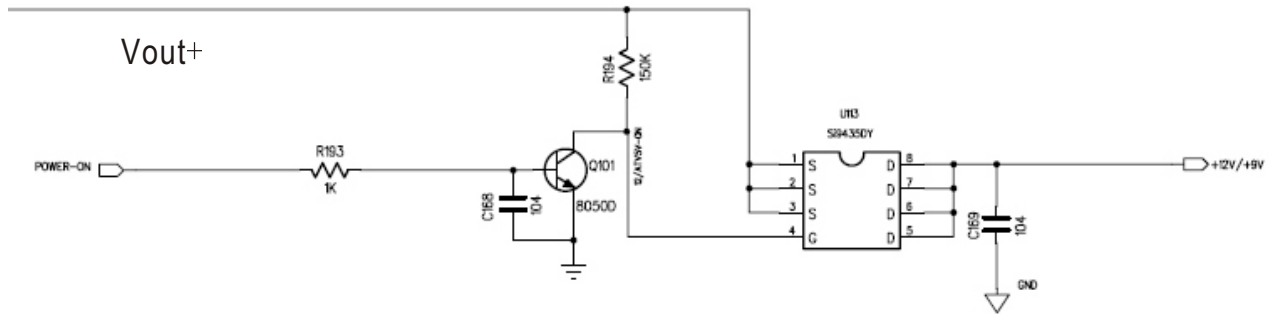
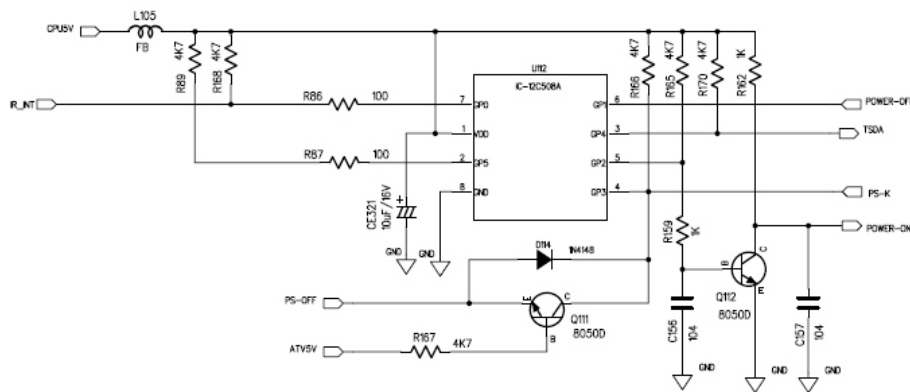


Figure 3.2.5.2 +12v power control circuit

(2) working principle: figure 3.2.5.3 shows a switch control circuit, which is controlled by standby control circuit. As most circuits do not need to enter into working state when machine is in standby state, a switch control circuit is added in main power port during designing. When POWER_ON of standby control circuit output a high level power-on signal, Q101 is saturated on. So U113 is conducted, and power supply input into rear electrode circuit through U113 to make each circuit power supply enter into power-on state.

3. standby control circuit

(1) Principle scheme of standby control circuit is shown in figure 3.2.5.3 :



4、ATV5V power stabilization circuit

(1) Block diagram of ATV5V power stabilization is shown in figure 3.2.5.4 :

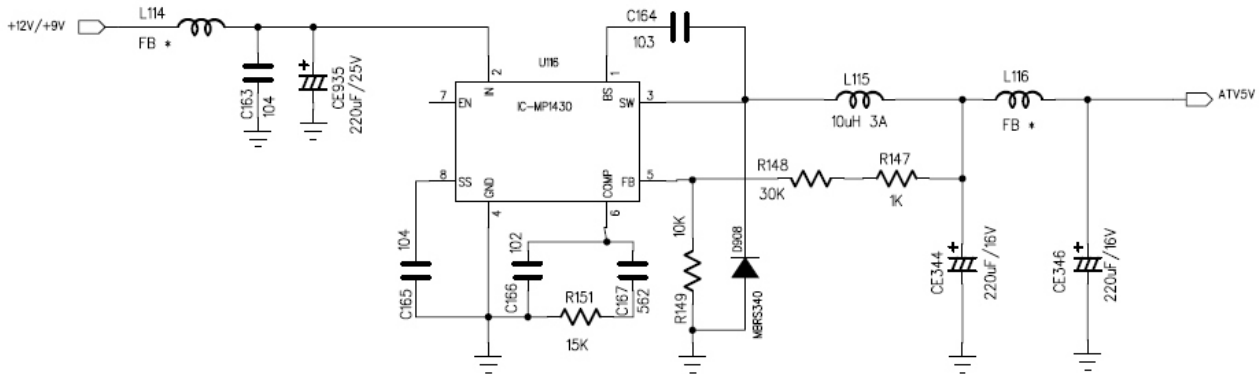


Figure 3.2.5.4 ATV5V Voltage stabilization principle scheme

(2) working principle: 12v power supply output +5V power after U116 voltage stabilization. The power mainly provides audio amplify for TV part, ATV processing circuit, display screen driving circuit and other processing circuit of TV parts. As is shown in figure, U116 is a 5V voltage stabilization circuit, D908 is freewheeling diode. Voltage of the output port could be influenced because of external reason s or load changing, so R147/R148/R149 are designed to sample output circuit and feedback to feedback input pin of IC Mp1430 to make IC adjust internal circuits to finally realize a stable +5V voltage outputted from pin 3, so it is can be used by load circuit.

5. DTV5V power voltage stabilization circuit

(1) Block diagram of DTV5V power stabilization is shown in figure 3.2.5.5:

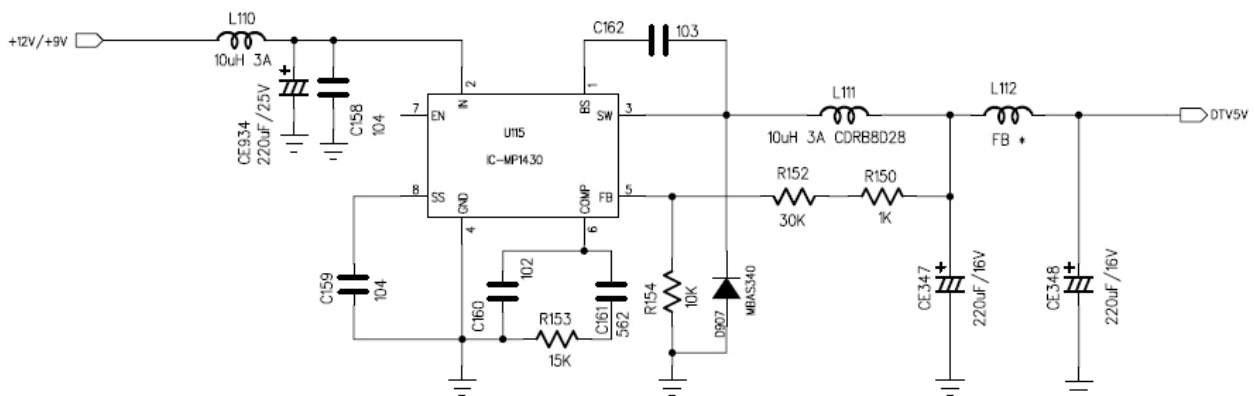


Figure 3.2.5.5 DTV5V voltage stabilization principle scheme

(2) working principle: 12v power supply outputs +5V power after voltage stabilized by U115, this power mainly provides for circuits of DVD and DVB parts. As is shown in figure, U115 is a 5V voltage stabilization circuit, D907 is freewheeling diode. As external or load changing reasons, output-end voltage can be influenced. So, R152/R150/R154 is designed to sample output circuit and feedback to feedback pin of IC Mp1430 to make IC adjust inside circuit and realize that pin 3 output stable +5V power for DVD/DVB circuits to use.

6、MST717 working power voltage stabilization circuit

(1) Principle scheme of VCC3.3V/VCC2.5V voltage stabilization circuit is shown in figure 3.2.5.6

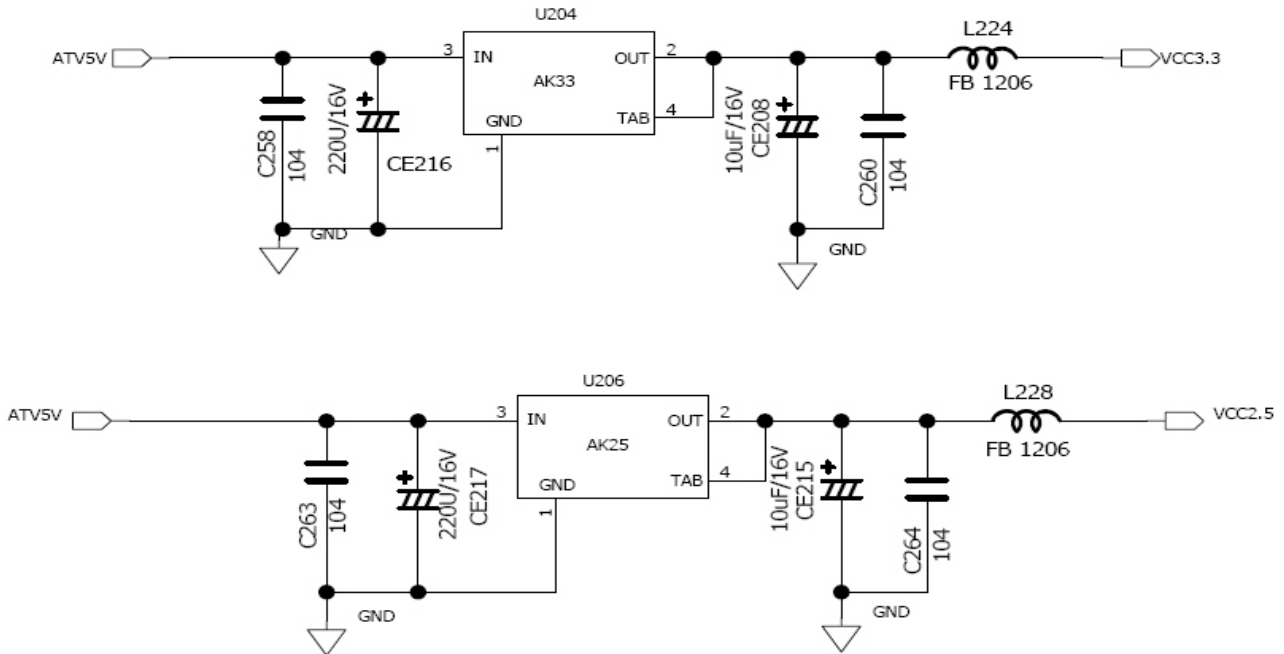


Figure 3.2.5.6 +3.3v/+2.5v voltage stabilization circuit

(2) Working principle: MST717 is a multi-functional loader with built-in MCU, A/D converter and other circuits. So power supply adopts multi-group power supply. ATV5V which we introduced before mainly provides its built-in MCU working, we do not explain in details. The figure mainly shows voltage stabilization circuits of +2.5V and 3.3V power supply, which mainly provides for ADC circuit of MST718 and LCD image processing circuit to use. As is shown in above figure, U206 is a 3-ended voltage stabilization, which mainly provide 2.5V power for MST717 to use, U204 is a 3-ended voltage stabilization, IC mainly provides a 3.3V power for MST717 to use. Circuit working principle is the same

7、DVD working power voltage stabilization circuit

(1) Principle scheme of DV33v/1.8v voltage stabilization is shown in figure 3.2.5.7 :

(2) working principle: This circuit mainly provide power for circuits of DVD parts. As is shown in figure, +5V power input into pin 3 of U404 and output +3.3V voltage through pin 2 of U1 for decode loader Mt1389 after voltage stabilization by U404. At the same time, 3.3v power input into pin 3 of U405 and output 1.8V power from pin 2 of U521 to provide power for DVD system circuits. U404/U405 is 3-ended voltage stabilization IC.

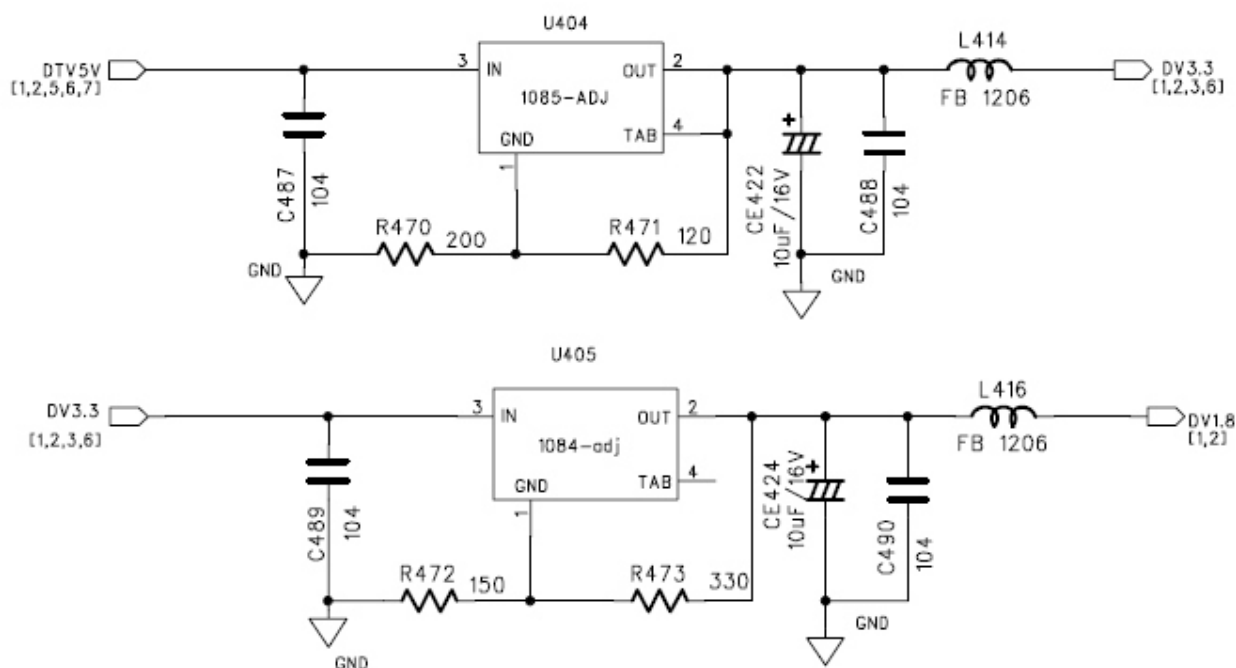


Figure 3.2.5.7 DV33v/1.8v Voltage stabilization circuit

8. Inverter components control circuit

(1) Block diagram of inverter components control circuit is shown in figure3.2.5.8 :

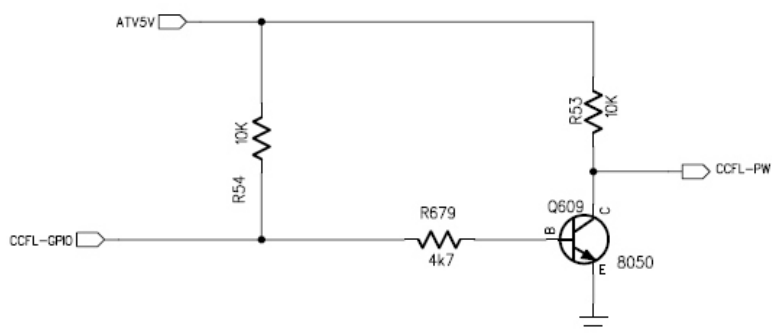


Figure 3.2.5.8 Inverter components control circuit

(2) working principle: when machine is on, +12V power is normal, machine is in standby state, and rise-pressure board component do not work. When machine is power-on, pin CCFL-CPO of mst717 (output a low level signal), Q609 is cut off, CCFL-PW outputs high level signal, and rise-pressure board enters into working state. This signal is sent out after system starting.

9. Power detect circuit

(1) Block diagram of power detect circuit is shown in figure 3.2.5.9 :

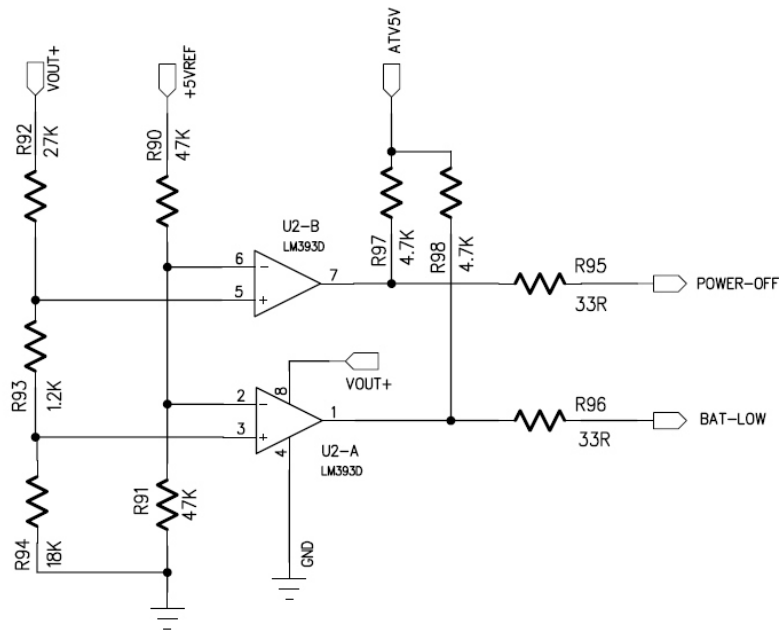


Figure 3.2.5.9 Powerdetect circuit

(2) Working principle: The above figure shows a power detect circuit, which is a comparator composed by operational amplifier. Pin 6 and pin 2 are reference voltage input pin, which provides a 2.5V reference voltage for comparator. According to resistance of R92 R93 R94, it is calculated that when 12V voltage drops down to 6.4V, pin 1 of U2 output low level, BAT-LOW is low level, MST717 controls display screen and shows low power. When 12V voltage drops down to 6V, pin 7 of U2 also output low level signal. POWER-OFF output a low level for standby control circuit and pin 6 of U112. U112 outputs power-off signal and machine enters into working state to realize function of power-off in low voltage.

10、 VGH/VGL forming circuit

(1) DC-AC converting circuit is shown in figure 3.2.5.10.1 :

Working principle: DC voltage of ATV5V inputs to U207 and changes DC level into AC through U207 and its peripheral elements and outputs to rear electrode rise-pression circuit. Meanwhile, there's another channel outputs +8.8V DC voltage after rectified through D1001 and forms a working power need by display screen GAMA adjustment circuit through voltage divide circuit.

(2) VGL VGH rise-impression circuit is shown in figure 3.2.5.10.2 :

Working principle: As is shown in figure, VGL voltage is a double voltage rectifier circuit, which produces a -10V DC voltage to provide for display screen to use. VGH voltage is a voltage tripler and produces a +15V DC voltage for display screen to use.

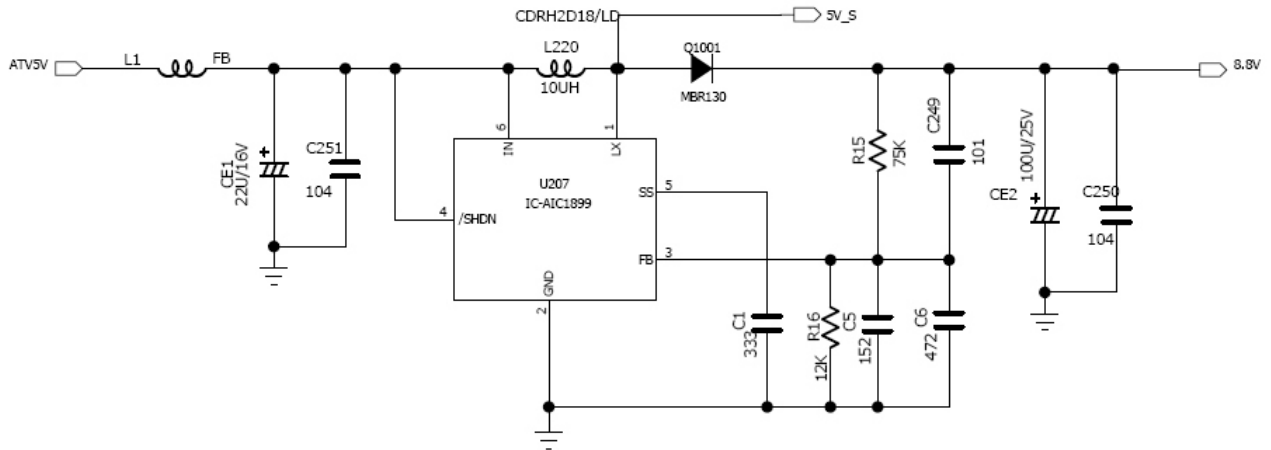


Figure 3.2.5.10.1 DC-AC converting circuit

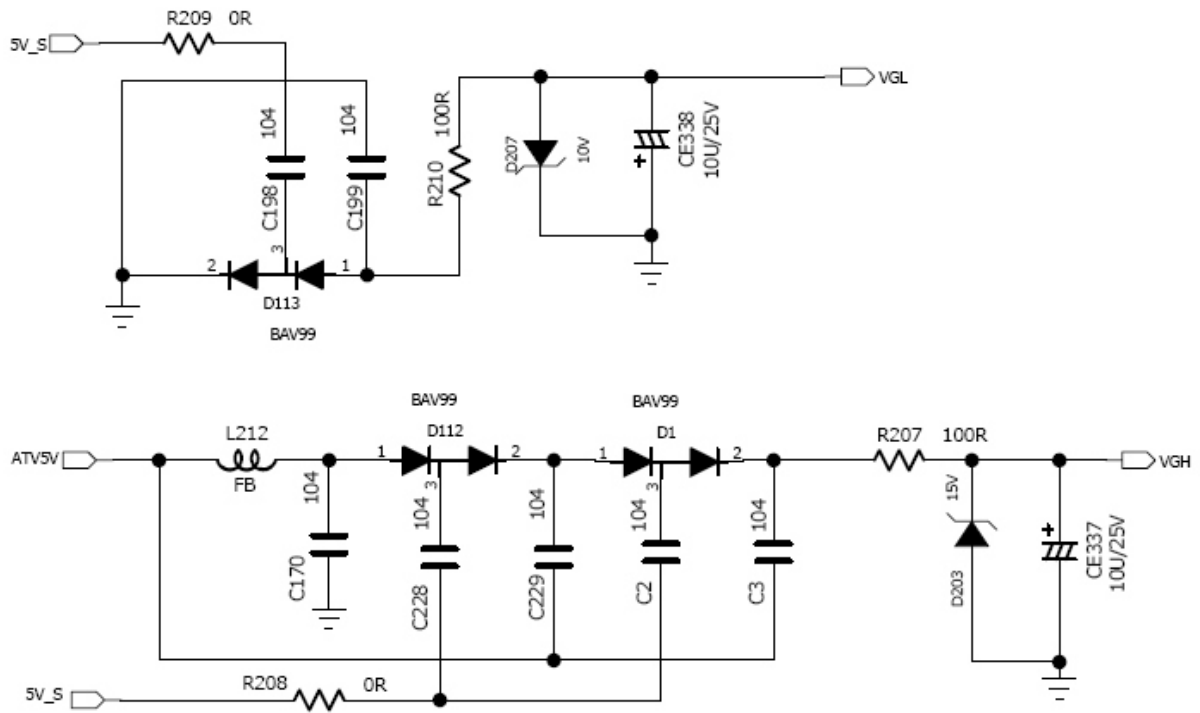


Figure 3.2.5.10.2 -10V +15V Voltage-rise circuit block diagram

Section Two Unit circuit principle of DVD part

3.2.6 Introduction to laser head

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

Pin	Name	Signal flow direction	Function description
1	LOAD+	Input loader	door-open electrin motor driving+
2	LOAD+	Input loader	door-open electrin motor driving+
3	LOAD-	Input loader	door-open electrin motor driving-
4	LOAD-	Input loader	door-open electrin motor driving-
5	CLOSE1-SW3	Input loader	disc in-place detect switch
6	DGND	Ground	Grounding
7	CLOSE2-SW4	Input loader	detect switch of loader-rise in-place
8	OPEN1-SW1	Input loader	12CM disc detect switch
9	DGND	Ground	Grounding
10	OPEN2-SW2	Input loader	8CM disc detect switch
11	F+	Input loader	Focus error signal is added to two sides of pick-up focus coil
12	T+	Input loader	Trace error signal is added to two sides of pick-up trace coil
13	T-	Input loader	Trace error signal is added to two sides of pick-up trace coil
14	F-	Input loader	Focus error signal is added to two sides of pick-up focus coil
15	NC	unused	unused
16	GND(OEIC)	Ground	Grounding
17	VREF V20	Input loader	Reference voltage
18	VCC	Input loader	Supply voltage for loader
19	F	Input MT1389	Supplementary signal used in trace
20	E	Input MT1389	Disc data signal
21	SW	GND	Grounding
22	NC	unused	unused
23	LD-CD	Input loader	CD laser power control signal
24	LD/HFM GND	GND	Grounding
25	LD-DVD	Input loader	DVD laser power control signal
26	NC	unused	unused
27	HFM	Input loader	High frequency overlapping signal produces laser with different wave length inside loader

28	GND(shield plate)	GND	Grounding
29	RF	Input MT1389	The sum of disc data signal
30	GND(guard)	GND	Grounding
31	B	Input MT1389	Disc data signal
32	A	Input MT1389	Disc data signal
33	C	Input MT1389	Disc data signal
34	D	Input MT1389	Disc data signal
35	F1(SUBA)	Input MT1389	A assistant signal input
36	F2(SUBB)	Input MT1389	B assistant signal input
37	MDII	Input MT1389	CD and DVD laser power monitoring signal
38	NC	unused	unused
39	VR-CD	Input loader	Through the handling inside loader, make sure MD11 is 180mV when reading CD
40	VR-DVD	Input loader	Through the handling inside loader, make sure MD11 is 180mV when reading DVD

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

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

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

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

2. Working principle

(1) Laser etub: With DVD/CD-compatible 2wave-length Laser-PD unit built-in optical pickup

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

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

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

3.2.7 Servo circuit

1. Servo system of this player adopts PANASONIC loader+MTK decode solution (MT1389HD+FLASH (16M) + SDRAM (64M)), and its servo circuit is mainly composed of front end signal processing, digital servo processing, digital signal processing IC MT1389HD and drive circuit D5954/BA6849, in which MT1389HD is also the main composed part of decode circuit. Servo circuit block diagram is shown as in the following figure 3.2.7.1:

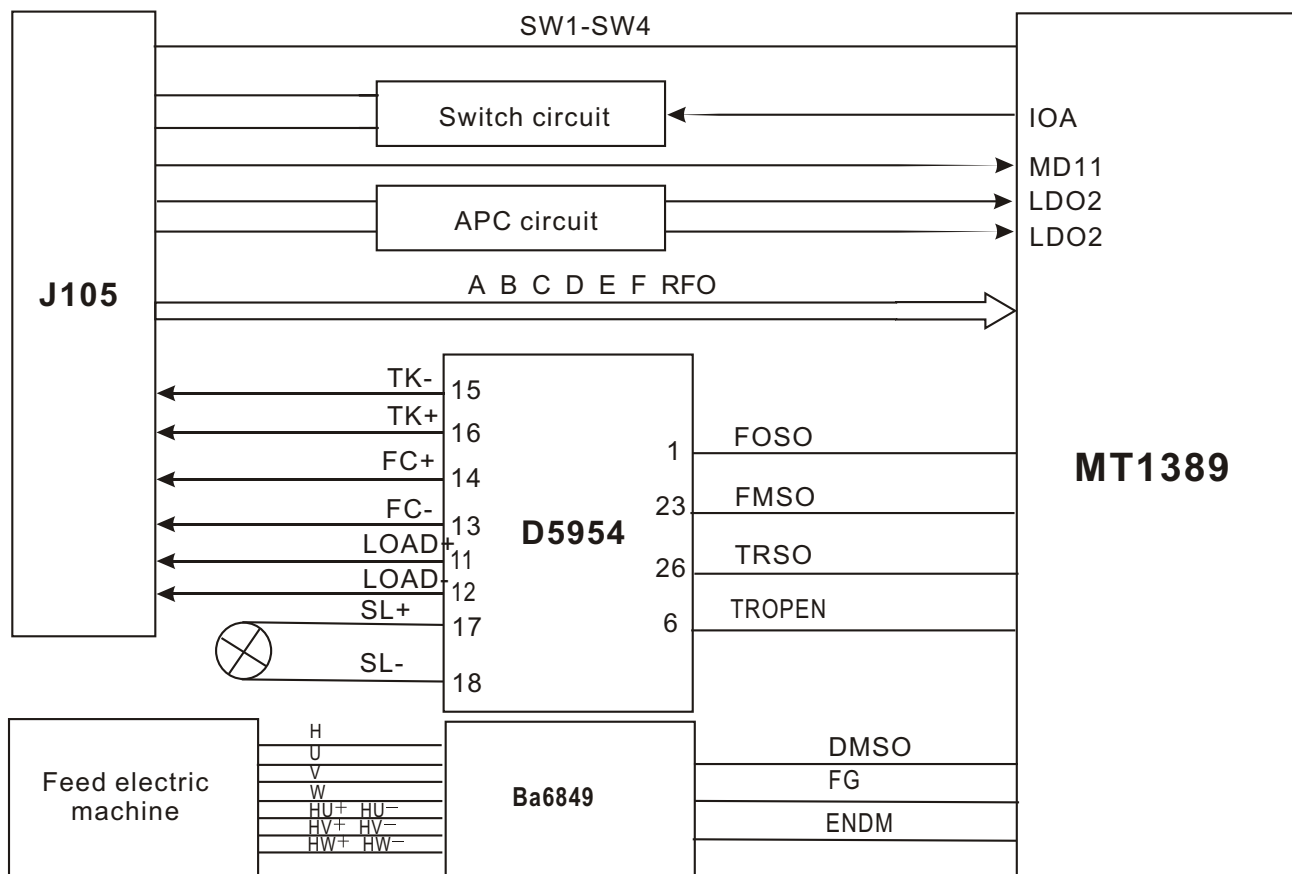


Figure 3.2.7.1 Servo circuit block diagram

2. Working principle

(1) This machine adopts PANASONIC pick up. And its structure adopts HUYANG slot-in loader. Its working principle please reference to(loader working principle). This servo system adopts double IC driving. D5954 is mainly responsible for driving of traction/focus/feed/door open and close. Door open and close circuit of this machine adopts D5954 direct driving. Loader part main axial driving electric motor adopts brushless motor. Ba6849 is special circuit designed for driving main axial motor.

(2) After loader reads disc information, A, B, C, D, E and F signal are formed through photoelectric conversion to MT1389 (DVD only has A, B, C, D signals) and RF signal and output from pin 2~11, 18, 19 of MT1389 respectively, after amplifying processing of pre-amplifier inside MT1389, now signals are divided into 2 ways inside MT1389: one part, through summation amplifying and subtraction circuit inside MT1389, produces servo error signal, after digital servo signal circuit processing, forms corresponding servo control signals, outputs FOO, TRO, DMO and FMSO servo control signal from pin 42, 41, 37 and 38 of MT1389 respectively and then send to servo drive circuit for drive amplifying through the integration circuit composed by resistor and capacitor and bring along focus coil, trace coil, main axis electric machine and feed electric machine after drive amplifying. Among these, focus and trace servo are used to correct objective position accurately; feed servo is used to bring along laser head to make radial large-scale move which belongs to the preliminary adjustment to laser head position; and main axis servo is used to control main axis electric machine to make it read signals in means of constant linear velocity and bring along disc to rotate. After processing of amplification by VGA voltage control amplifier and equalization frequency compensation inside MT1389, another part of signals are changed into digital signals through internal A/D converter. When loader is reading CD/VCD signals, these signals are conducted EFM demodulation inside MT1389, and then outputted to latter stage for AV decoding after finishing CIRC (Cross-Interleaved Reed-Solomon Code) error correction inside. When loader is reading DVD signals, these signals are conducted ESM demodulation inside MT1389, and then sent to latter stage for decoding after finishing RSPC error correction inside. General DVD players have a disc in/out circuit to control disc tray door in/out acts to reach the purpose of making disc in and out. For PDVD, we adopt manual disc in/out means and we can judge whether disc in to proper position through detect switch.

3. Explanation to servo terms

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

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

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

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

3.2.8 Disc in/out circuit

1. Disc in/out circuit is shown as the following figure 3.2.8.1:

2. Working principle: INDISC, OUTDISI are disc in/out control signals and are connected to pin 39 of U401 (MT1389) respectively. LOAD+, LOAD- connect with two ends of electric machine to control. When users are performing disc out operation, servo control chip U401 (MT1389) sends out control signal through pin 39 and changes level of LOAD+, LOAD- to change the rotation direction of electric machine to realize disc in/out function. The working process of disc in/out circuit is shown as follows:

OUT disc : When user opens door, TROPEN outputs opposite phase driving signals. Pin of D5954_11 outputs high level. Door open and close electric motor of DVD LOAD realizes door open reversely. When disc out placed, detect switch of disc out place closes. SW1 outputs low level, door open motion halts and finishes. IN DISC: when user presses door close, TROPEN outputs active driving signal. Pin of D5954_12 outputs high level, door open and close electric motor of DVD LOAD positively turn to realize disc in. When door open placed, door close place detect switch closes. Sw3 outputs low level and door open motion finishes.

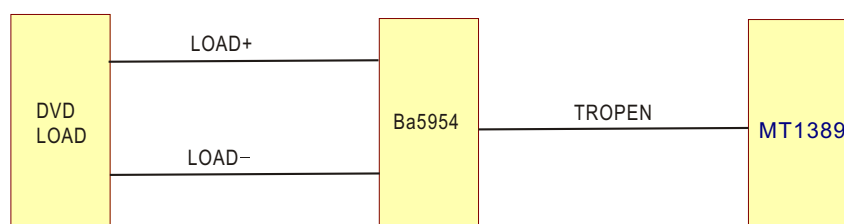


Figure 3.2.8.1 Disc in/out circuit diagram

3. Main axis driving working principle is shown in figure 3.2.8.2:

Working principle: Main axis driving of machine adopts brushless electric motor, which have performance of quick response, big starting torque, available torque from zero rotate speed to rated rotate speed. W/V/U three channel signals in figure are PWM driving signals. HU+ HU-,HV+ HV-,HW+ HW- are detect output pin of HALL SINGNAL. HU+ HU-,Hv+ Hv- signals input to detect signals input pin of BA6849. After a inside gain control circuit , a contrast control is processed to realize rotate speed control function. DMSO is main axis driving signal outputted from decode chip ,ENDM is BA6849 enable

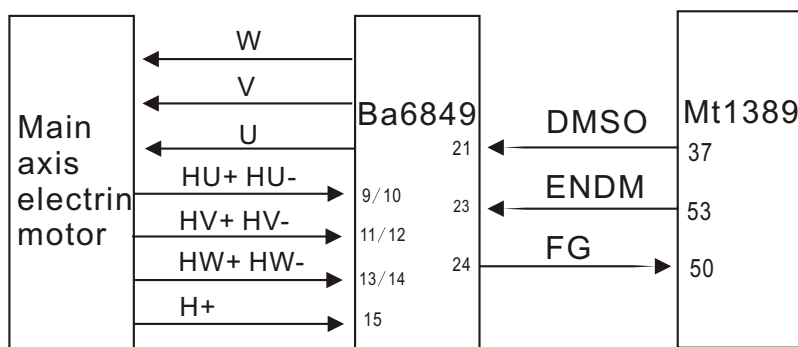


Figure 3.2.8.2 Mainaxis driving circuit

3.2.9 CD/DVD conversion circuit

State	Q405			Q403			Q404			IOA
	Base electrode B	Collector C	Emitter E	Grid electrode G	Drain electrode D	Source electrode S	G	D	S	
DVD disc	0	3.86	0	3.81	0.18	0	0	0	0	0
VCD disc	0.64	0.1	0	0	0	0	3.27	0.18	0	3.3

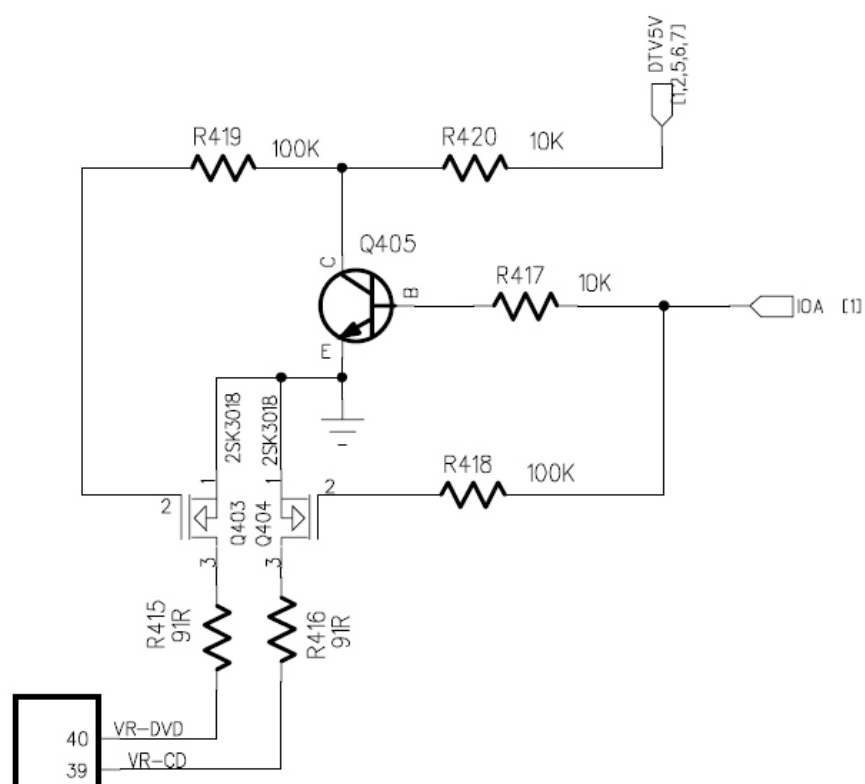


Figure 3.2.9.1 CD/DVD conversion circuit diagram

2. Working principle

After loading disc in the player, IOA port of MT1389 is defaulted high level to make Q405 saturation on and form loop together with CD laser power control circuit on CD. At the same time, IOA also goes to loader PD IC to switch, disc begins to rotate, when servo management system recognizes that the disc in player is not CD disc, IQA pin outputs low level to make Q405 cut off and make Q403 on, and form loop together with DVD laser power control circuit on loader to perform disc reading acts. After disc tray door opens, IOA keeps the state before opening disc tray door. If the player cannot recognize which disc it is, IQA pin will switch continuously until reading disc or system judges that there is no disc. Note: Q403 and Q402 are MOS tube

3.2.10 Laser power control circuit

1. Laser power control circuit is shown as in the following figure 3.2.10.1:

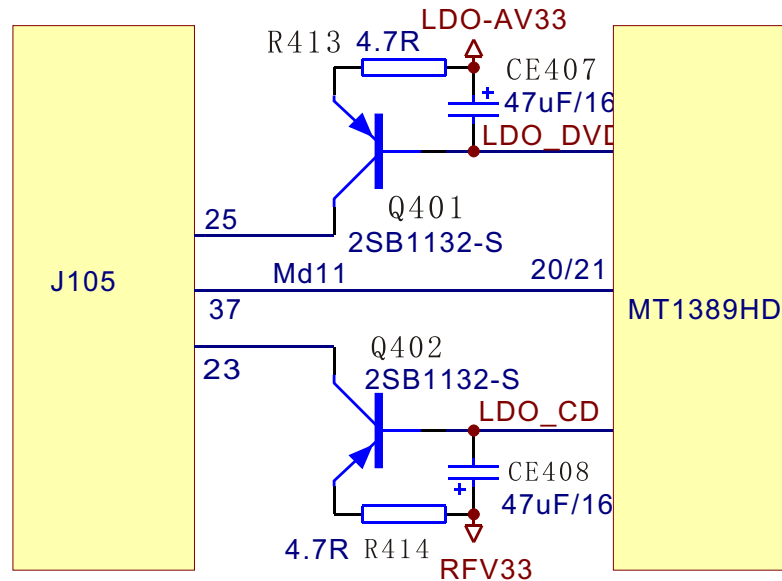


Figure 3.2.3.10.1 Laser power control circuit diagram

Location number	Read DVD disc	Read VCD disc	Location number	Read DVD disc	Read VCD disc
Q401_E	2.9V	3.2V	Q402_B	3.2V	2.2V
Q401_B	2.2V	3.2V	Q402_E	3.2V	2.9V
Q401_C	2.2V	0	MT1389_20	0.2V	0.2V
Q402_C	0	2.2V			

2. Working principle

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

When reading VCD disc, laser power becomes weak, voltage of MDII pin decreases, voltage decrease of pin 23 of MT1389 makes voltage of pin 23 of J105 increase to reach the purpose of raising laser power. When laser power is too strong, voltage of MDII pin increases to lead to voltage of pin 23 of MT1389 increase to make voltage of pin 23 of J105 decrease to reach the purpose of reducing laser power to form an auto power control circuit.

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

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

3.2.11 Decode circuit

1. Decode circuit block diagram is shown as in the following figure 3.2.11.1:

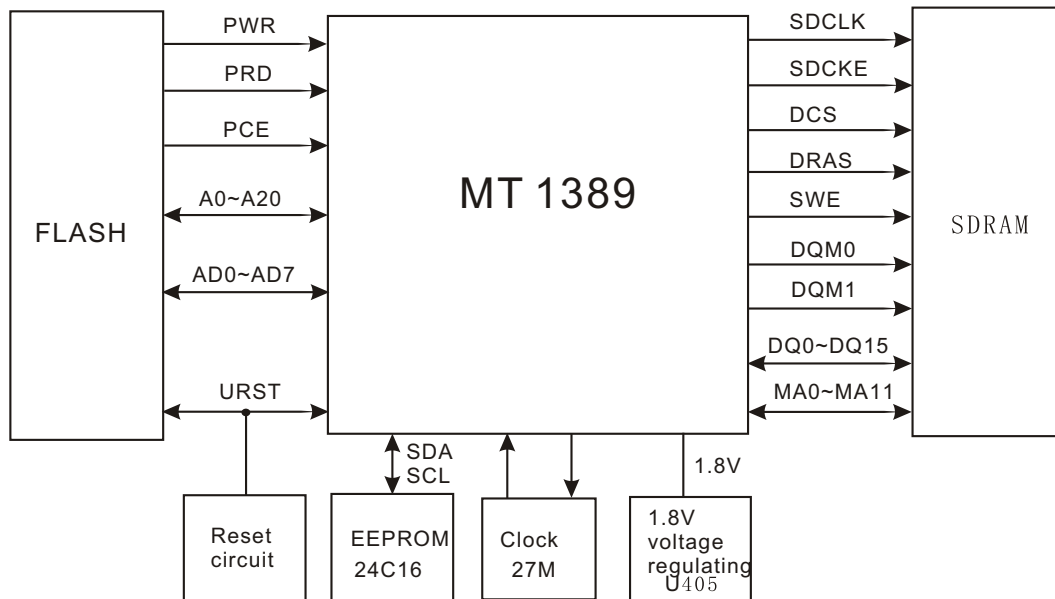


Figure 3.2.11.1 Decode circuit block diagram

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

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

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

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

After power on, reset circuit performs reset to MT1389 built-in CPU (8032) and FLASH, decode chip outputs reset signal at the same time and performs reset to other circuit. After system reset, it firstly sends out read signal to FLASH to read out information saved in FLASH, the machine displays power-on picture, servo system begins to work to check whether machine closes door to proper position and whether detect switch has been closed, if not, the door close action is performed. After detect switch of door is closed, the machine begins to perform preparations of disc reading and performs panel display at the same time of working.

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

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

Audio, video output circuit: at present, MT1389 all integrates video D/A converter, MT1389HD inside integrates audio D/A converter, manufacturers select according to their own needs. Please refer to circuit principle diagram and audio circuit explanation for details.

3.2.12 Reset circuit

1. Reset circuit is shown as in the following figure 3.2.12.1:

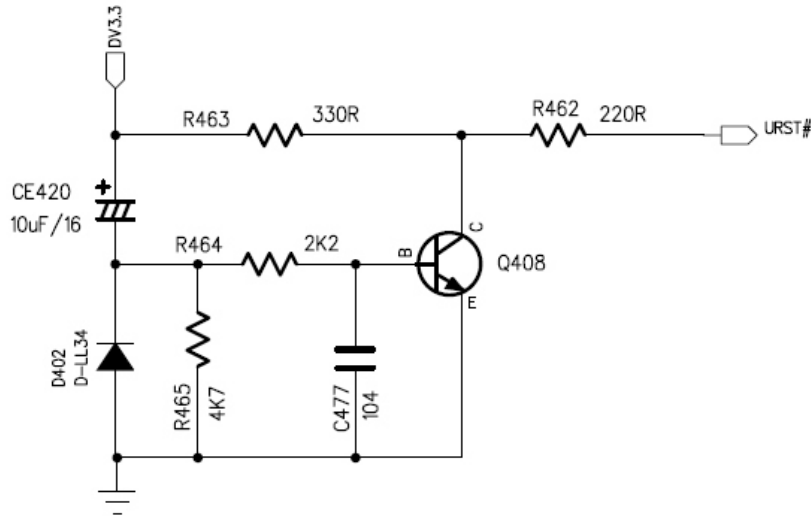


Figure 3.2.12.1 Reset circuit diagram

2. Working principle: after power on, voltage of DV3.3 increases to 5V, main chip power supply is normal. Now, voltage of CE420 to DV3.3 cannot change suddenly to make base electrode of Q408 has current flow in, Q408 is saturation on, URST is low level. DV3.3 charges CE420 in two paths through emitter junction of R465 and Q408 make negative pole voltage of CE420 decrease slowly. When this voltage decreases below 0.7V, Q408 cuts off, URST changes into high level, the process for URST from low to high is called effective reset signal of low level by us. After power off, voltage of DV3.3 decreases, CE420 decreases together with DV3.3 voltage, D402 performs surge discharge and clamping to CE420.

3. Key point voltage (unit: V)

Q408_B is low level when in normal condition, at the moment of power on, it decreased to 0V from 5V gradually. Q408_C is high level when in normal condition, at the moment of power on, it increases to 5V from 0V.

3.2.13 Video circuit

1. Video signal flow chart diagram is shown as in the following figure 3.2.13.1 :

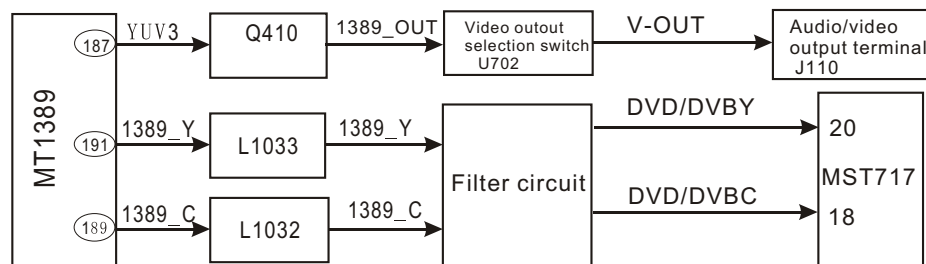


Figure 3.2.13.1 Video signal flow chart

2. Working principle: MT1389HD has built-in video D/A conversion circuit, video output has Y/Pb/Pr Y/Cb/Cr CVBS Y/C output mode. This machine adopts video Y/C signal modes to output. Y/C signal output to MST717 of driving board for format switch driving display screen. Multiple video signals output after amplifying/filter and video output selection circuit U702 to peripheral facilities directly through audio and video output port. Other channel video output modes are not used in this machine

3. Shown as in the figure 3.2.13.2, it is a amplifying circuit outputted from eject electro, which is responsible for amplifying function of video output signal. Q410 is amplify tube, R88 is load resistor. This channel video signal outputs to peripheral video facilities to use after amplified. Y/C two channel signals output to driving board after filtered and output image signal through MST717 processing driving display screen.

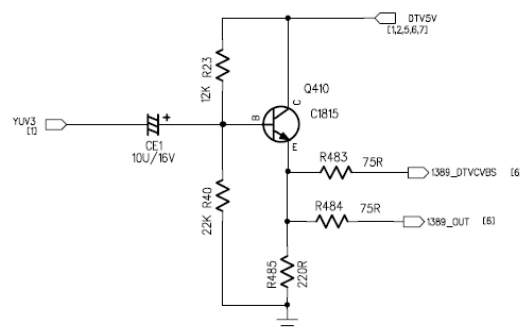


Figure 3.2.13.2 Video output amplify circuit

3.2.14 Audio circuit

1. Audio signal process block diagram is shown in the figure 3.2.14.1:

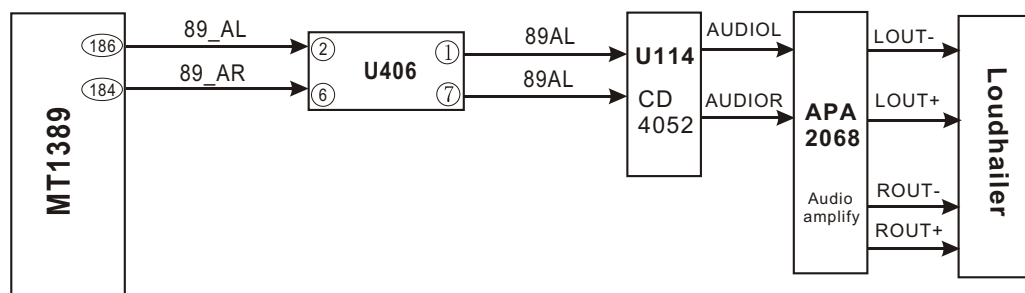


Figure 3.2.14.1 Audio signal flow chart block diagram

2. Working principle: MT1389HD has built-in audio DAC conversion circuit, analog audio signals output from decode chip directly, through audio amplifying and filtering circuit, directly output audio signals to Cd4052 through audio switch circuit and output after ueberschall switching. Then they are sent to APA2068 for audio amplify circuit and output. Ueberschall selection and amplifying circuit are explained in TV part.

3.2.15 USB/CARD circuit

1. USB/CARD circuit is shown as in the following figure 3.2.15.1:

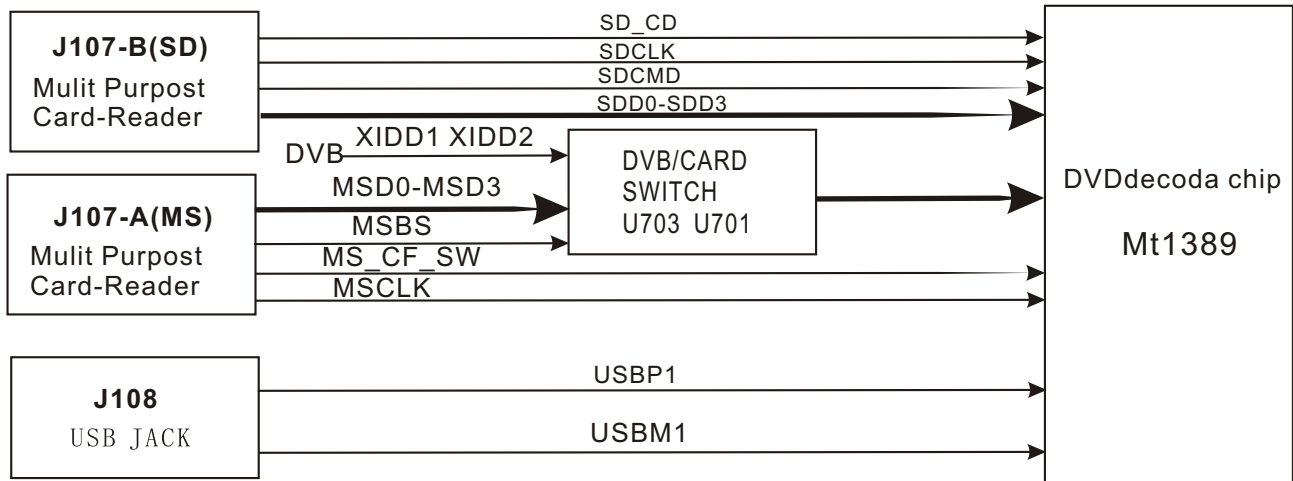
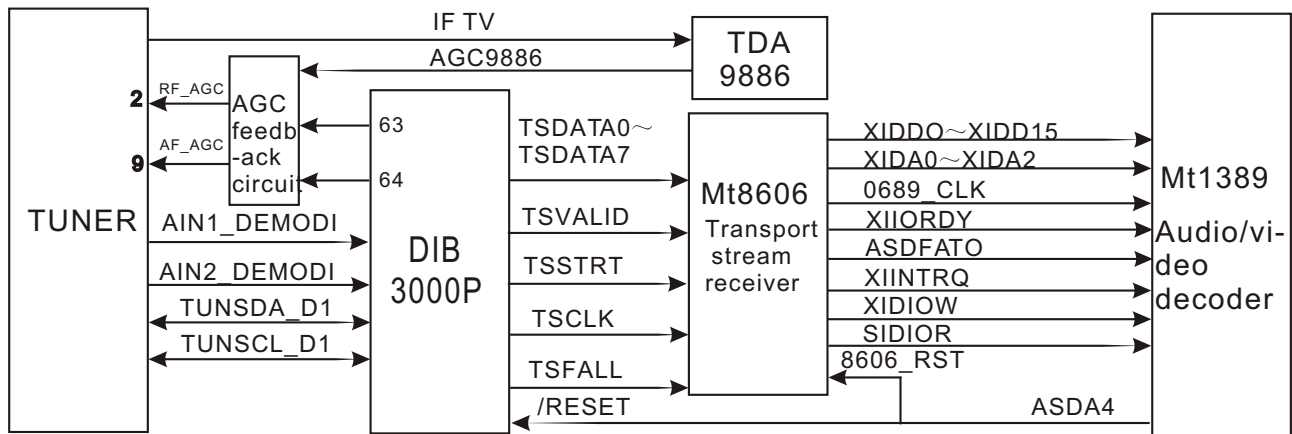


Figure 3.2.15.1 usb/card circuit diagram

2. Working principle: J107 is a 3-in-1 card seat which can read SD/MS cards. When machine switches from DVD working mode into card-reading mode, CARD_DVDSEL outputs high level, switch U703/U701 switches to CARD channel to input. Insert a SD card to card seat, detect switch on card seat closes and SDCD signals change into low level. MT1389HD begins to read content of SD card and transfers to Mt1389 for decode through data wire SDD0-SDD3. Audio/ video signals are restored. Working principle of MS card is same with SD card. When machine switches into DVB state, CARD_DVDSEL outputs low level, machines switches to control signal (XIDD1 XIDD2) of DVB and enters into working state. When user switches machine into USB working, machine begins to read data signals inputted from J108(USB port).

Seciton Two Unit Circuit Principle of DVB Part

3.2.16.LD1006TI machine consists DVB function and can demodulate DVB-T signals. LD1006SI does not consist this circuit. DVB part of this machine adopts DIB3000P+MT8606 and other elements. Block diagram of DVB part is shown as follows:



1. Basic concept of DVB: DVB is abbreviation of Digital Video Broadcasting. As an innovative technic in late 90s, it is a new TV broadcast system and has a reputation of broadcast technic revolution facing 21st century. It adopts digital compressing technic to transfers video information and make different TV programmes digital. It uses radio, fiber-optic, coaxial cable and satellite to broadcast. So that it can eliminate multiple image and snow in transmitting process and greatly improves transmitting quality and efficiency of TV programme. It can also integrate image, sound, words and all kinds of information to broadcast, which is available for radio, cable TV and satellite TV. Lots of value added operation are brought for TV broadcast which happens never before.

2. Working principle of DVB: Tuner receives eject signal from cable net and changes into middle frequency signal and output audio, video and other data information transport stream after demodulated by QAM. Transport stream generally consists multiple audio, video stream and some other data information. TS stream demultiplexer is used to distinguish different kinds of programmes to extract corresponding AV stream and data stream and send them to MPEG-2 decoder and corresponding analysis software to finish restoration of digital information. High frequency signals sent from tuner in this machine input to DIB3000P to have a A/D switch and demodulation and change high frequency signals into TS stream signals. TS stream signals input to TS stream demultiplexer inside MT8606 to extract programme source signals. Extracted AV data is sent to Mt1389 to have a AV decoding. Process method of rear electrode is same with DVD parts.

3.DVB TUNER circuit and AGC circuit diagram is shown in figure 3.2.16.1:

Working principle: When machine switches to DVB state, TUNER receiving circuit begins to receive DVB signals. High frequency signals outputted from pin 10/11 of tuner input to pin 76/75 of DIB3000P, which will firstly have a A/D switch through A/D convertor inside DIB3000P and then a QAM demodulation. Demodulated signals input to MT8606 to be processed.

AGC circuit has two parts, one channel is AGC circuit of DTV part, the other is AGC circuit of ATV. Pin 63/64 of DIB3000P is signal input pin of AGC circuit. TUNER is feedback through feed back net to realize automatic gain control function. It is TUNER that receives analog video signals in TV working state. ASW outputs high level signal, AGC signals outputted by pin 14 of TDA9886 feedback to tuner circuit through Q605/Q610 to realize automatic gain control function.

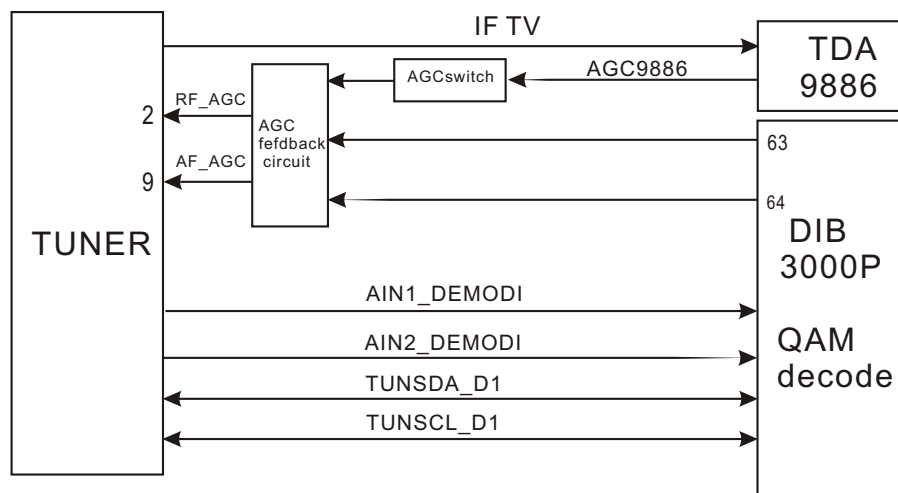


Figure 3.2.16.1 TUNER control circuit/AGC control circuit

4.DVB power supply and switch control circuit is shown in figure 3.2.16.2 :

Working principle: 12V power inputted from external outputs +5V power after voltage stabilization of U115. 5V power which is voltage stabilized inputs to switch tube Q607 and Q606. And the two MOS tube is controlled by MCU. When machine switches into DVD state, TUNERPW/DTVPW both output high level, the two MOS tubes are cut off, tuner and circuits of DVB part do not work. When machine switches to TV state, TUNERPW outputs low level signals and Q607 is saturated on, tuner power supply is normal. At the same time, ANT-POW is low level, Q608 is saturated on, +5VANT power supply is normal.

When machine switches to DVB state, DTVPW outputs low level, Q606 is saturated on, DIB5V power supply is normal. And the power has no output in other working state. This working power separately output +3.3V+1.8V power to DIB3000P through U610/U611(3-ended voltage stabilization IC) for power supply.

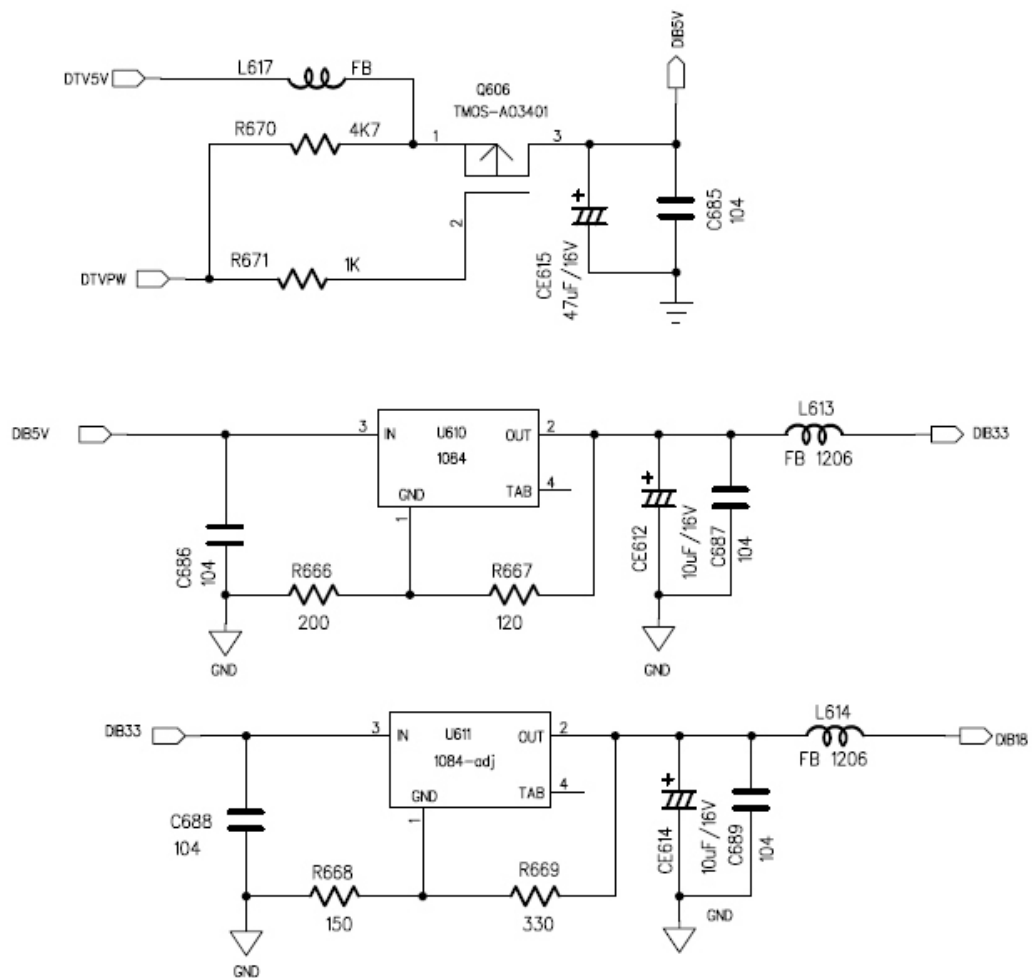


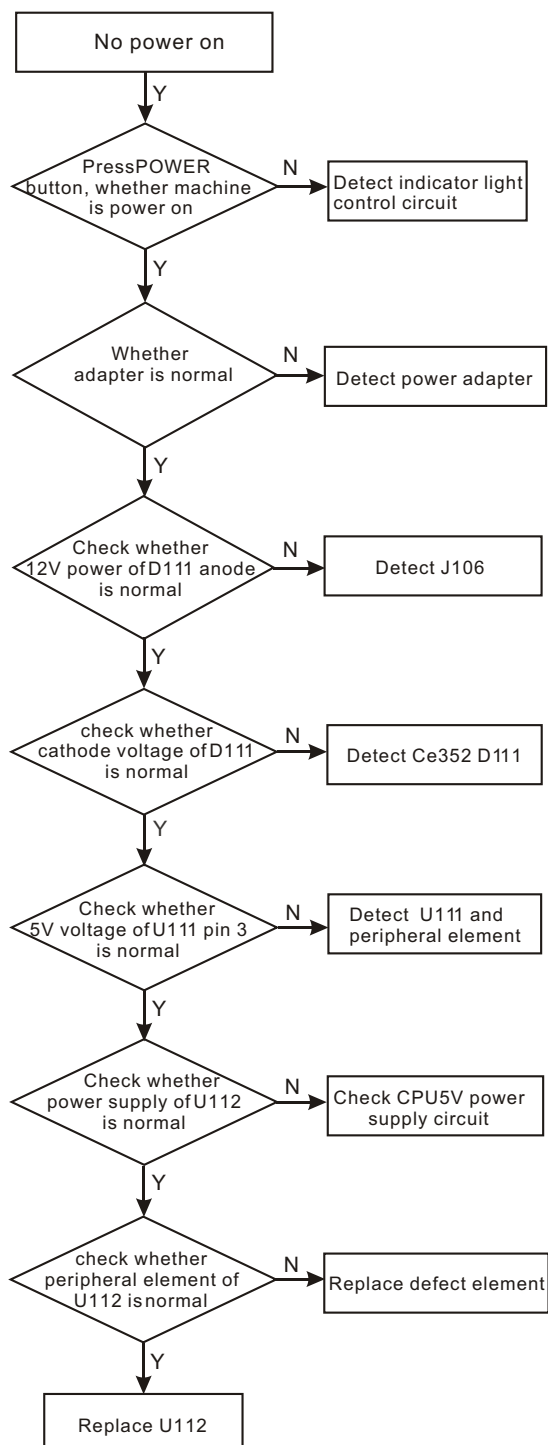
Figure 3.2.16.2DVB power supply and powerswitch control circuit

Section Three Troubleshooting Cases

3.3.1 TV troubleshooting flow chart

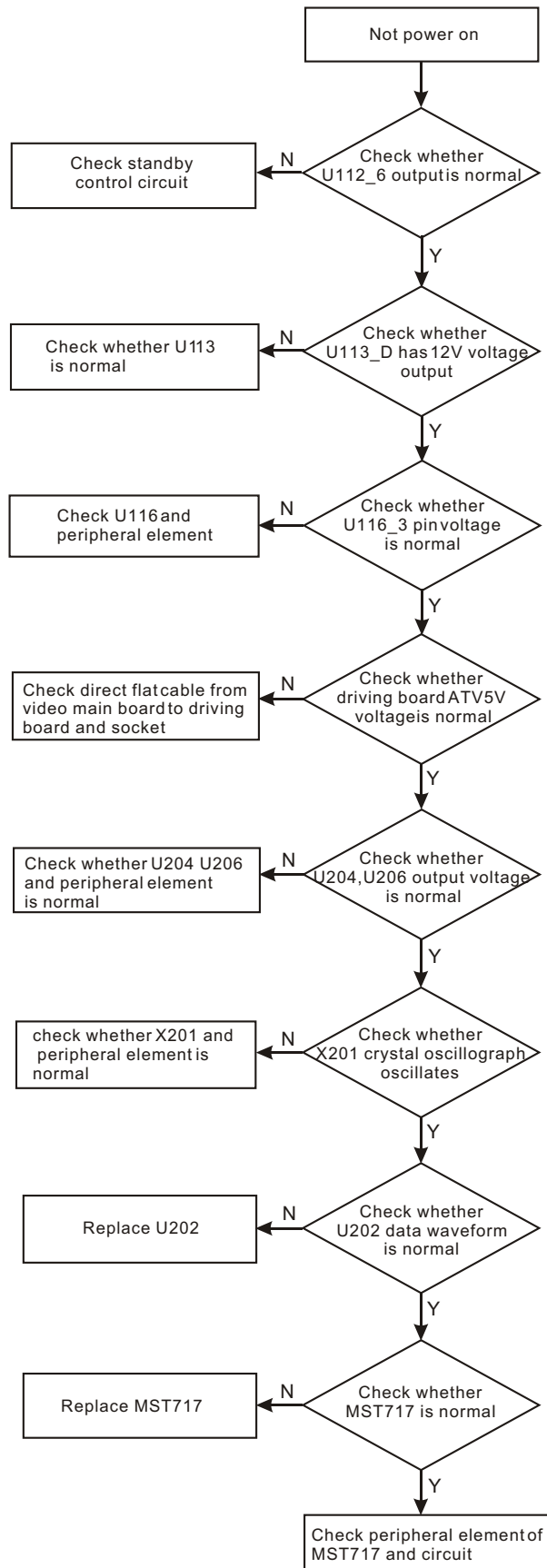
[Flow chart1] Symptom: standby indicator light is not on.

Description: When power on, indication light is not on, machine has no response and button has no function.



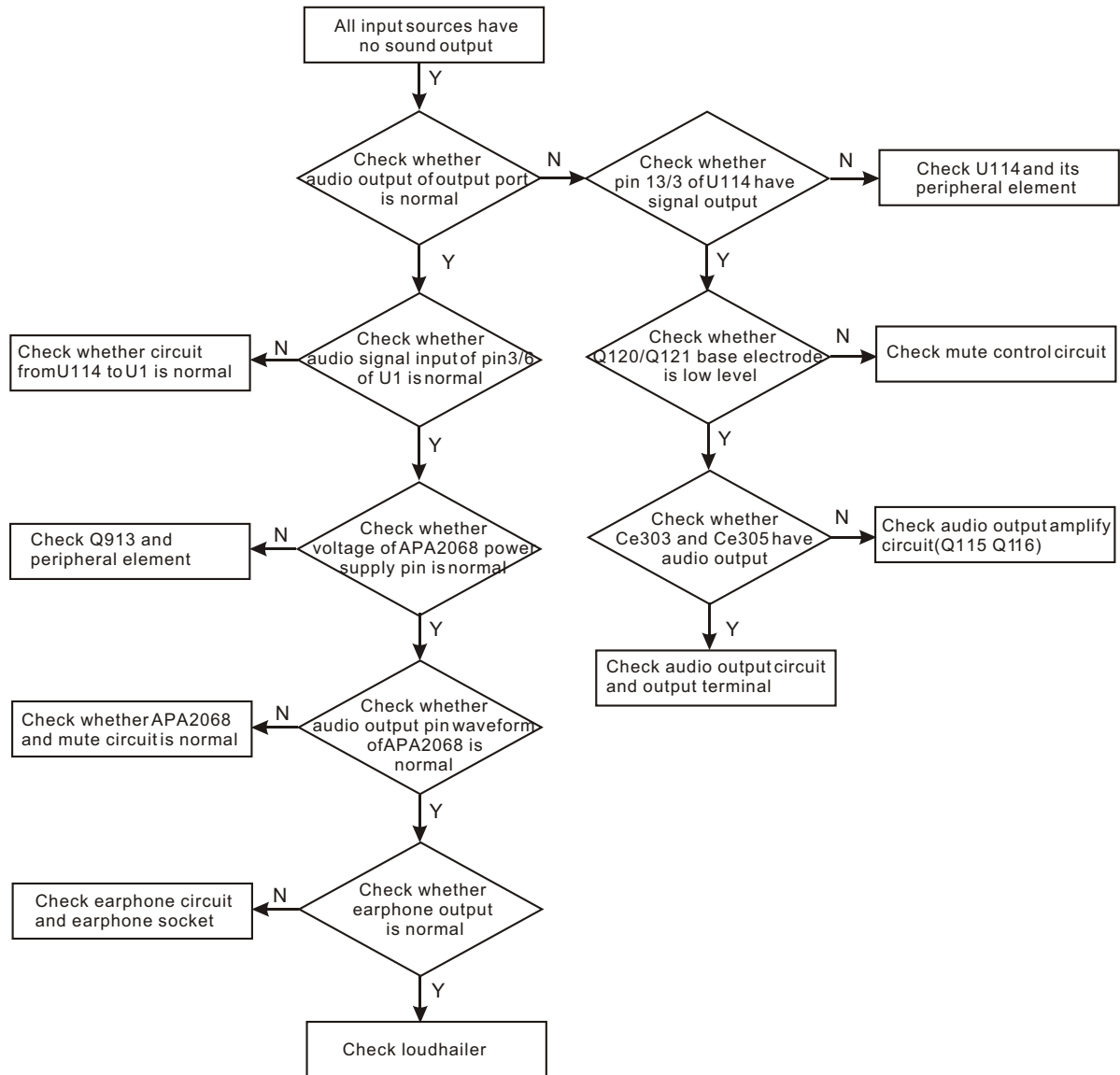
[Flow chart 2] Symptom: not power on

Description: Test when machine power on, indicator light is on, press POWER button, power on is not available.



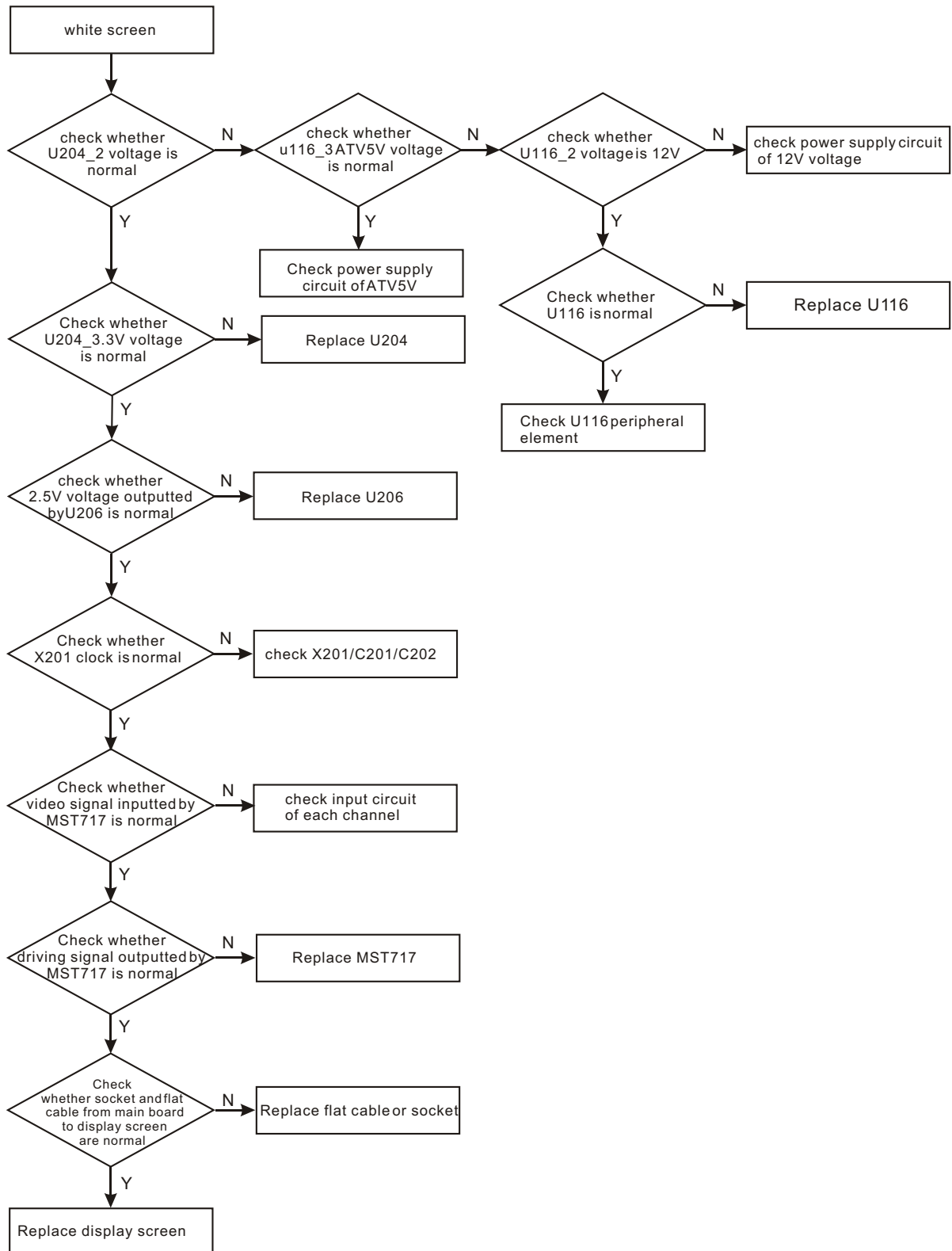
[Flow chart3] Symptom: no sound

Description: there is image but no audio output



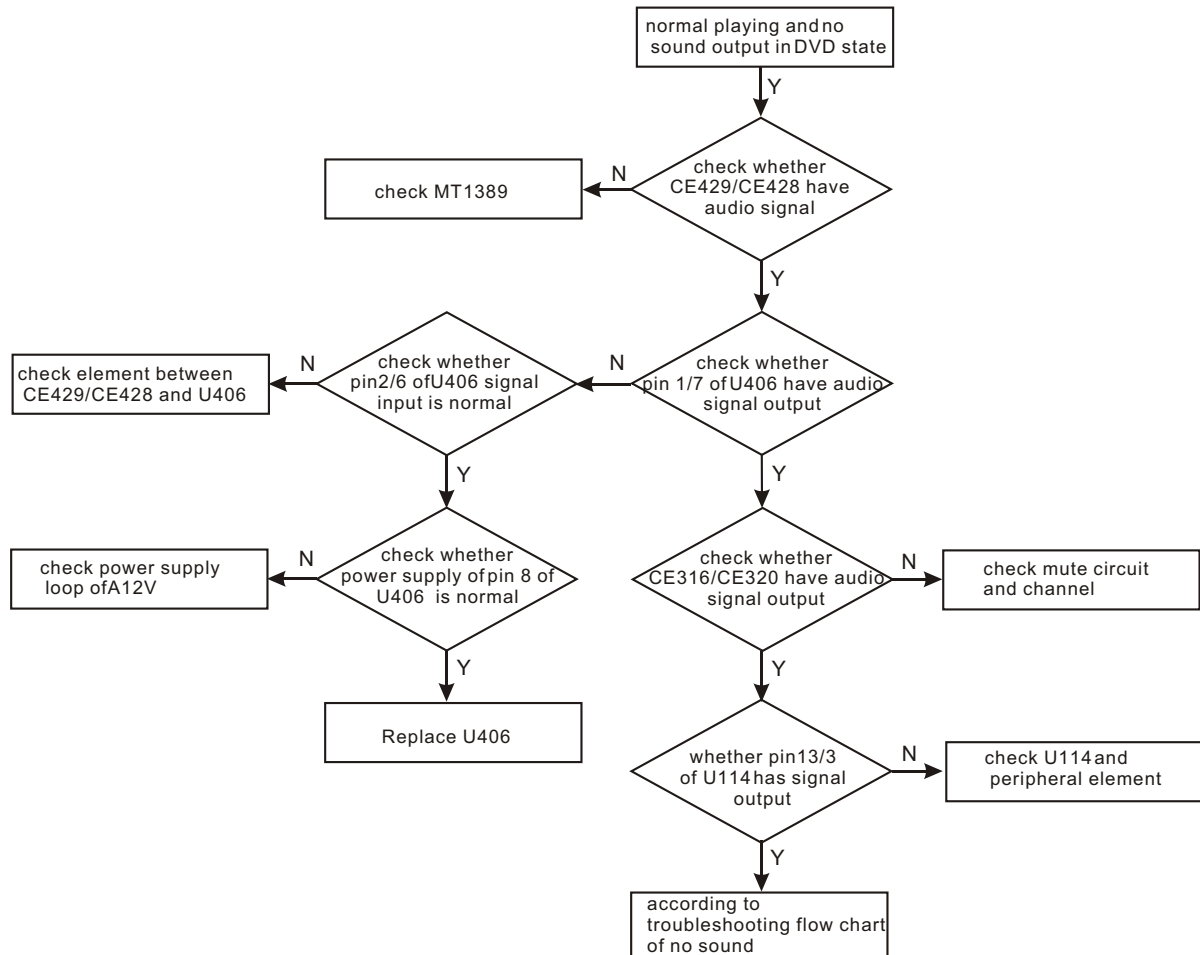
[Flow chart4] Symptom: White screen

Description: white screen is displayed and indicator light is normal



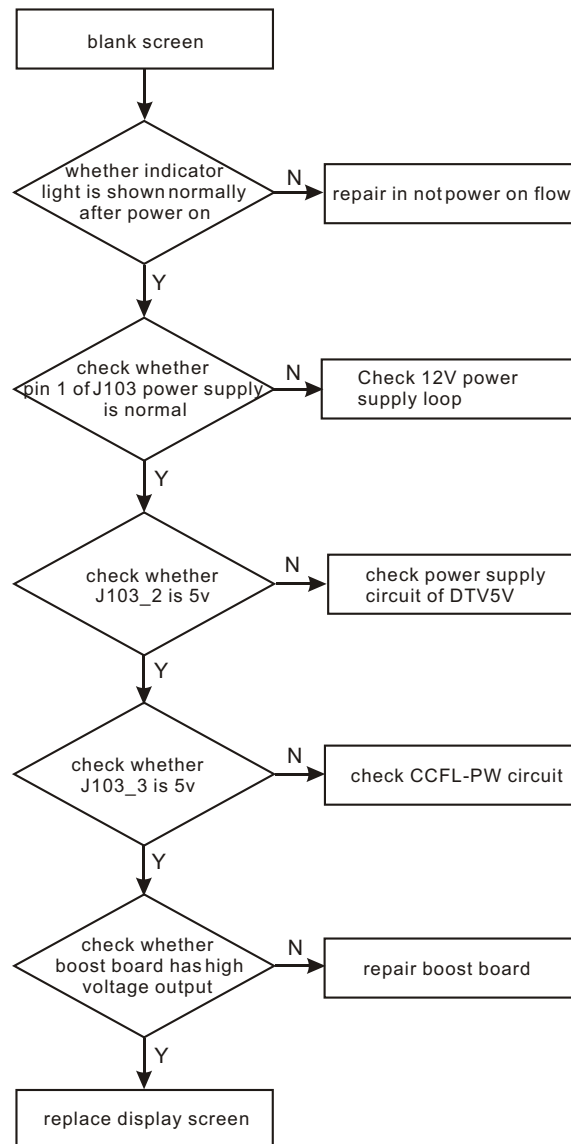
[Flow chart5] Symptom: DVD has no sound

Description: in machine setting DVD state, there is image but no sound .External input and TV sound is normal.



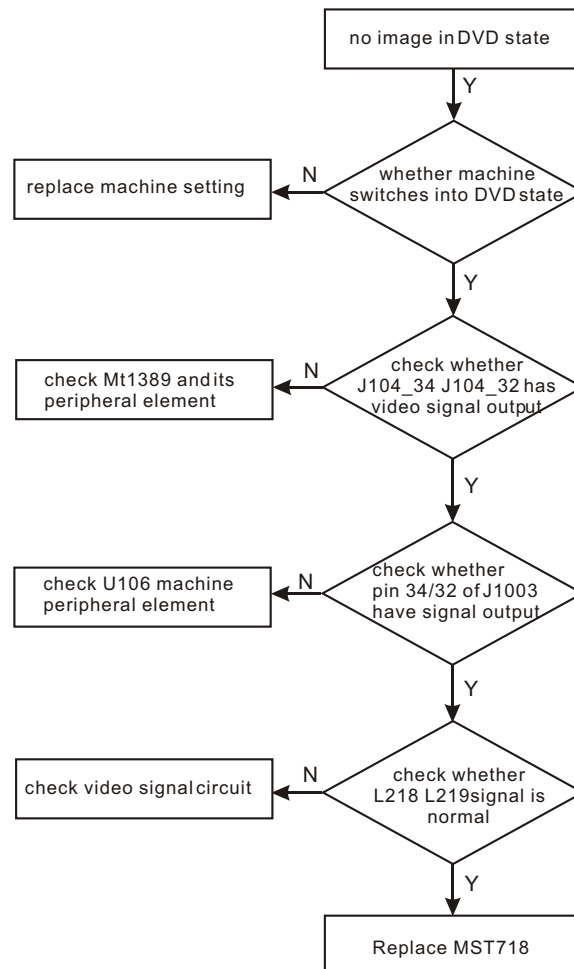
[Flow chart 6] Symptom: blank screen

Description: screen has no display after power on and back light is not on



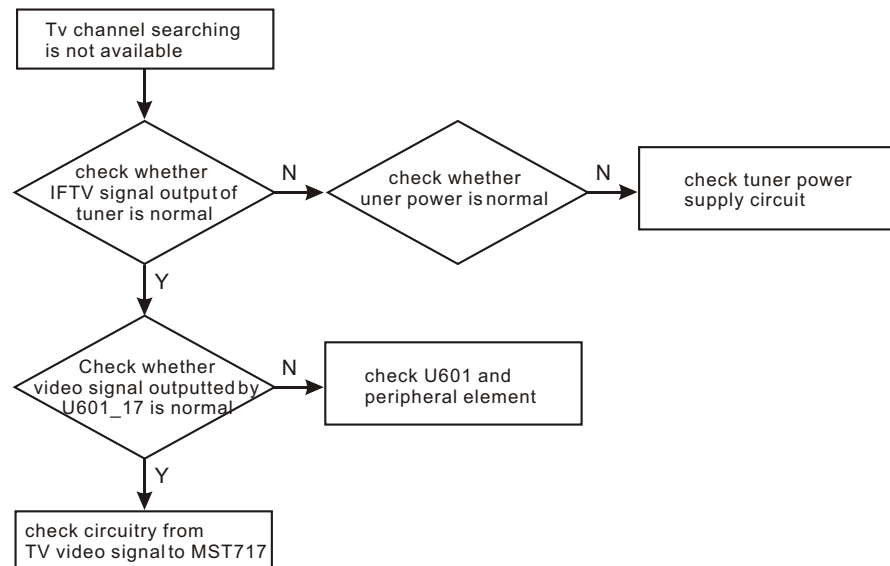
[Flow chart 7] Symptom: DVD has no image

Description: there is sound but no image in DVD state, other working state is normal



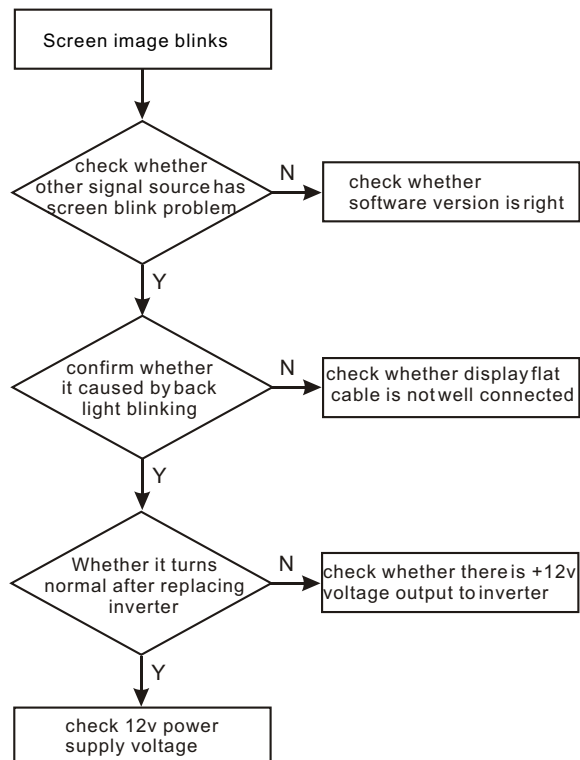
[Flow chart 8] Symptom: TV channel searching is not available

Description: channel can not be searched



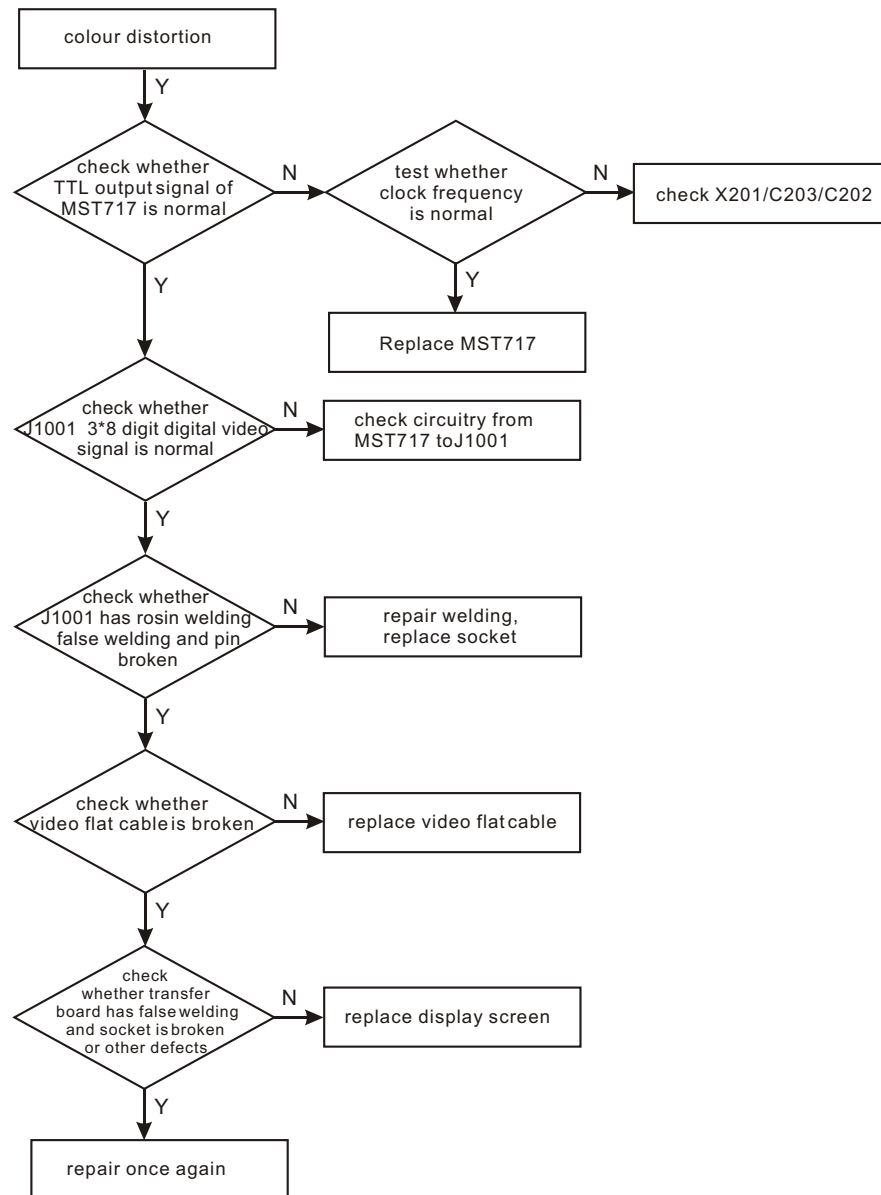
[Flow chart9] Symptom: Screen image blinks

Description: screen images blinks and sound is normal



[Flow chart10] Symptom: colour distortion

Description: image colour distortion



3. 3.2 Troubleshooting flow chart of DVD parts circuit

1、Troubleshooting flow chart of “DVD has no output” is shown in figure 3.3.2.1:

Description: there is no DVD image when switching into DVD state and loader has no disc-in motion.

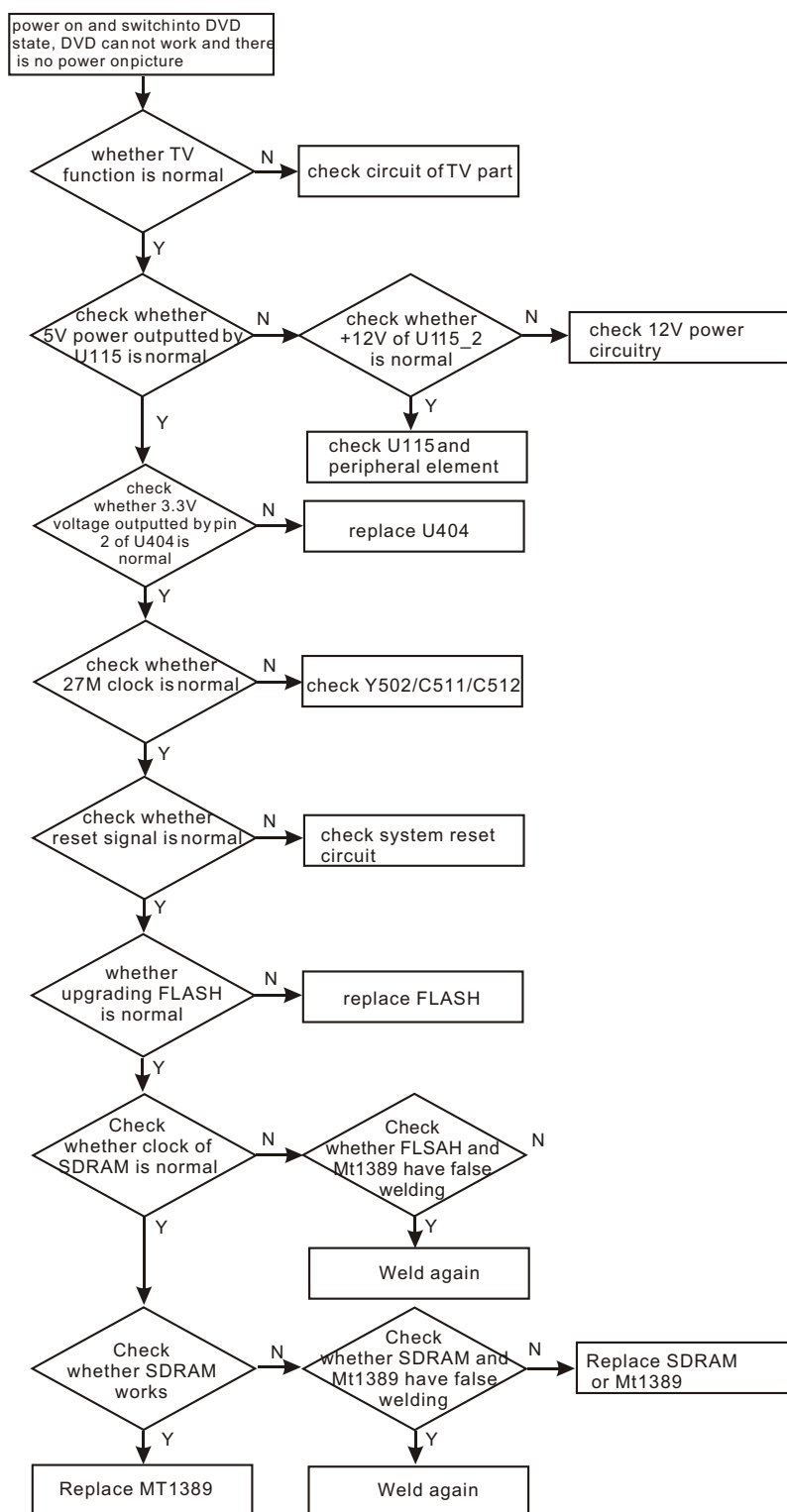
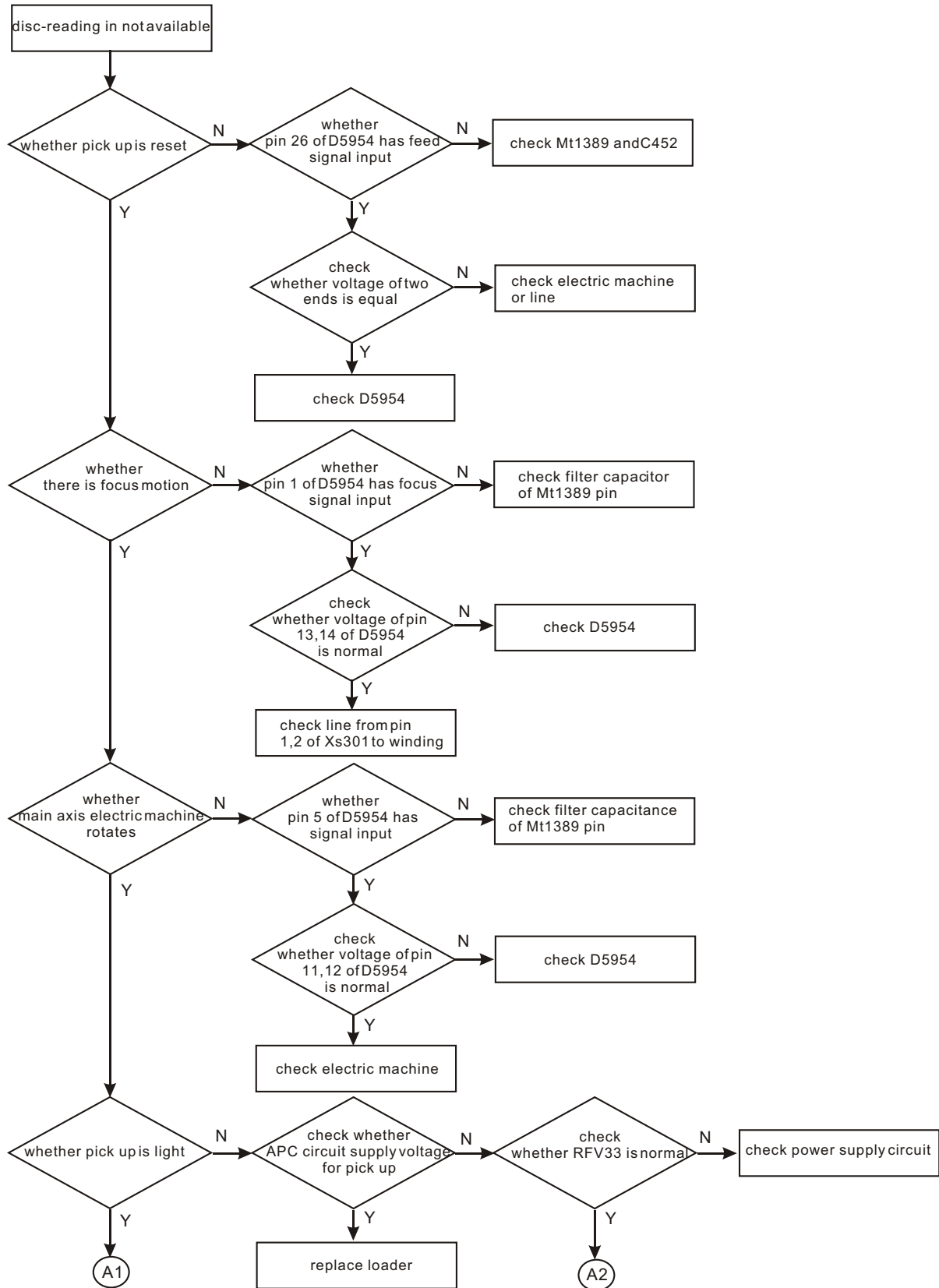


Figure 3.3.2.1 Flow chart of detect of no output of DVD

2. Troubleshooting flow chart of “disc-reading is not available” is shown in figure 3.3.2.2:

Description: when machine switches into DVD state, put in disc, machine displays no disc or disc can not be read in a long time.



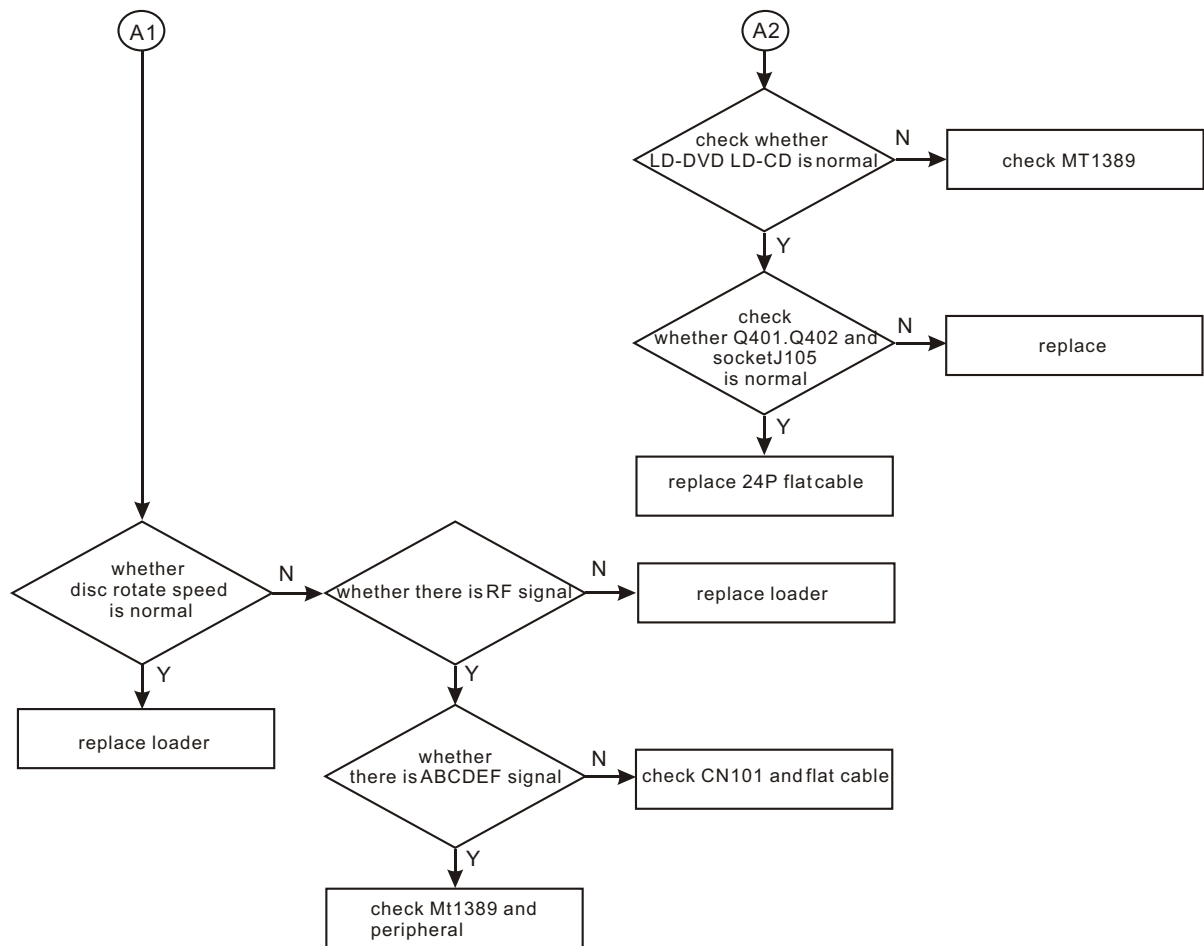


Figure 3.3.2.2 Troubleshooting flowchart of “disc-reading is not available

4、Troubleshooting flow chart of “DVB has no function” is shown in figure 3.3.2.3:

Description: when machine switches into DVB state, DVB does not work and other working modes are normal.

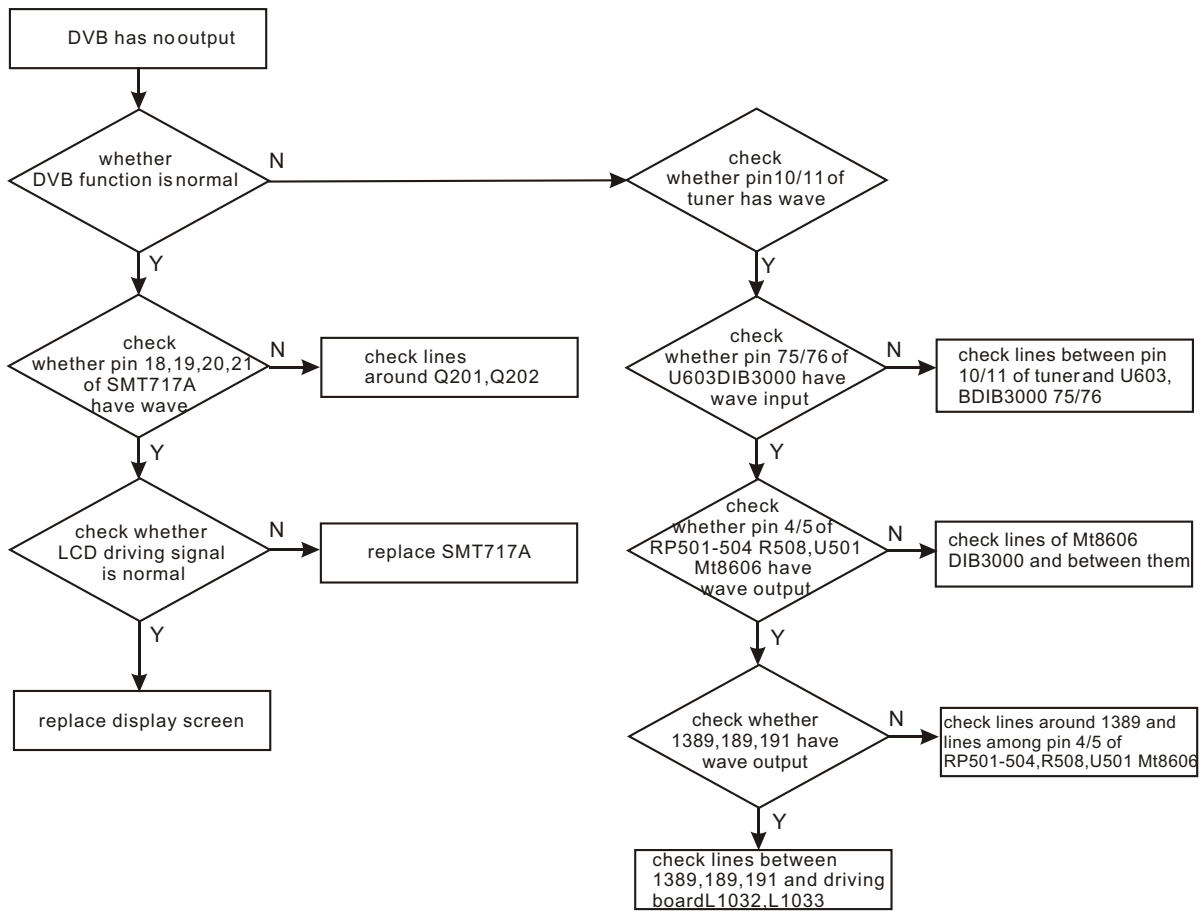


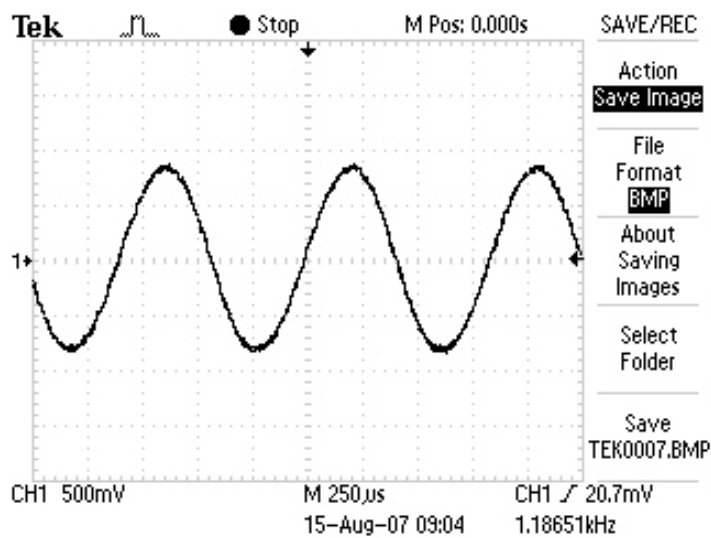
Figure 3.3.2.3 Flowchart of "DVB has no function"

Section Four Waveform diagram

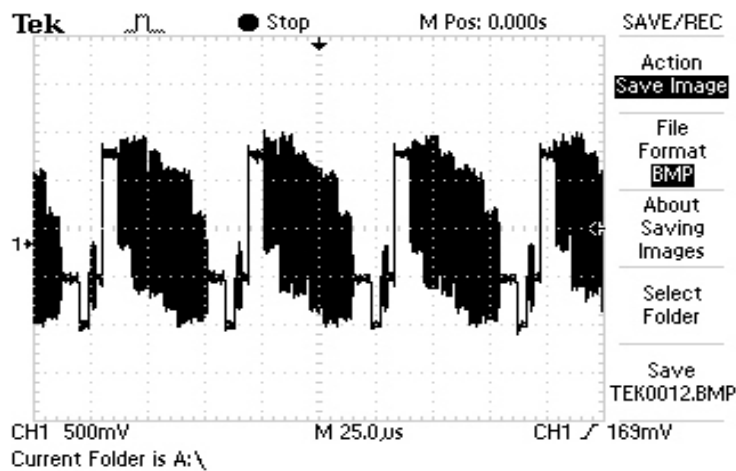
This section collects signal waveform diagram of audio, video and each unit circuit with the purpose to help servicing personnel to judge where trouble lies in accurately and quickly to improve servicing skills. For the difference of oscillograph's type, model and tuner, a certain difference may exist,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

3.4.1 waveform diagram of TV part

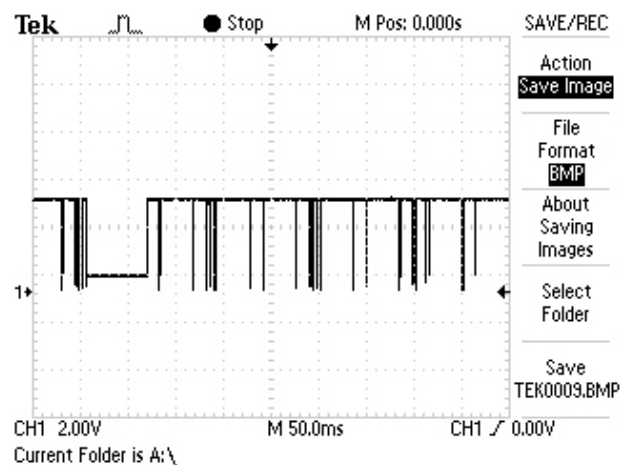
1. Audio waveform outputted by U601_8 when receiving standard signal source



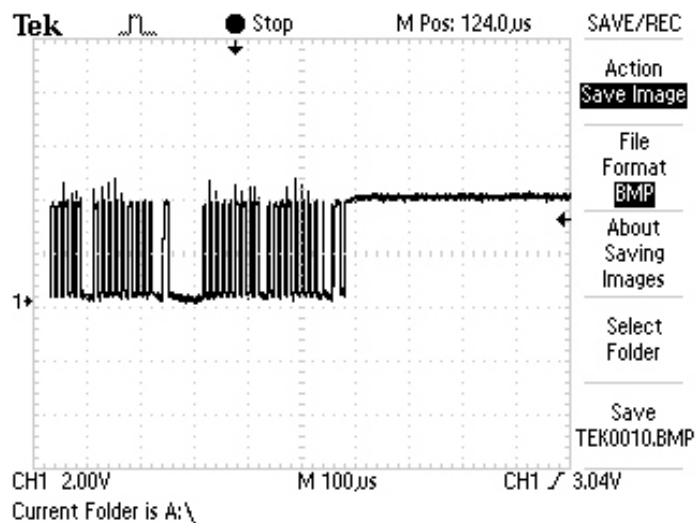
2. Video waveform outputted by U601_17 when receiving standard signal source



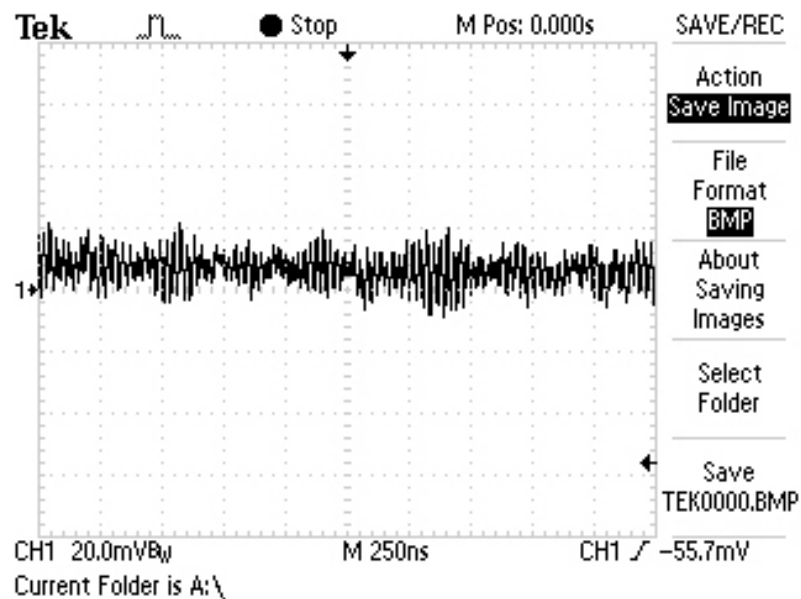
3. U602_4 IIC bus SCL waveform diagram



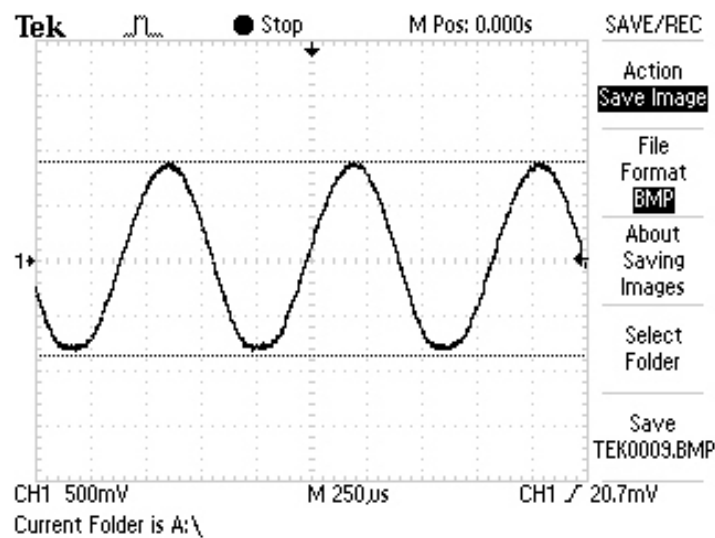
4. U602_5 IIC bus SDA waveform diagram



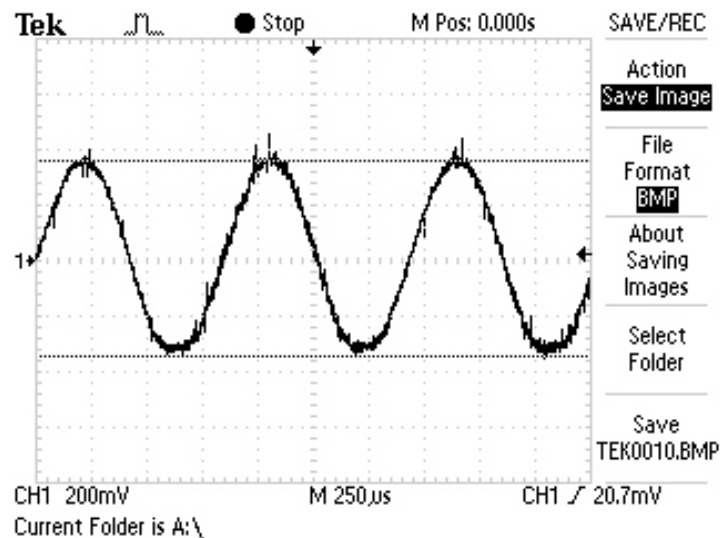
5. Waveform diagram when U602_8 is receiving TV signal



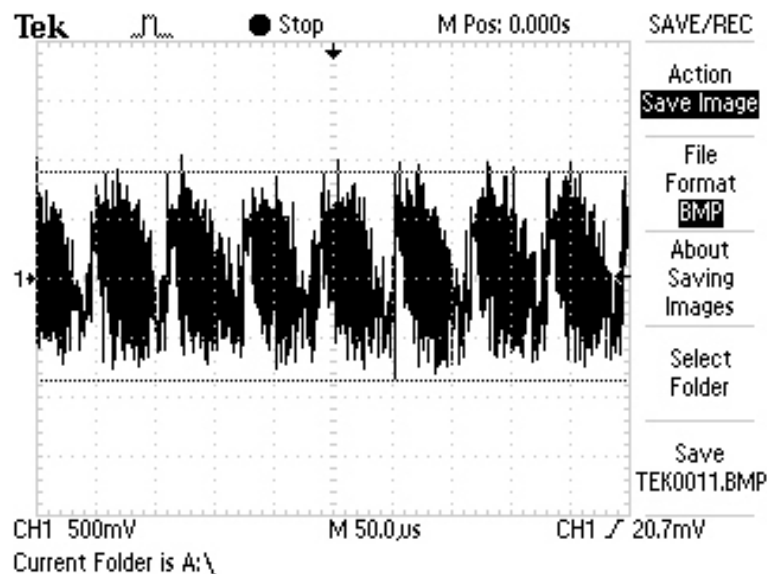
6. Waveform diagram of U114_3 audio output



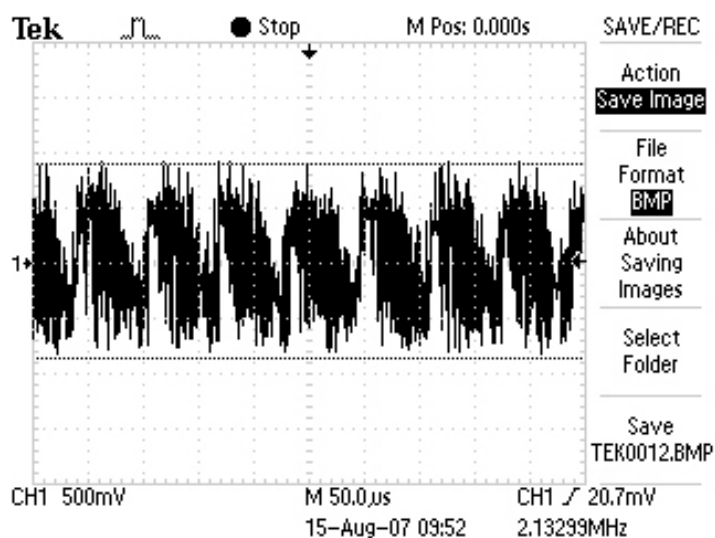
7. Test point J902 of waveform diagram of audio output



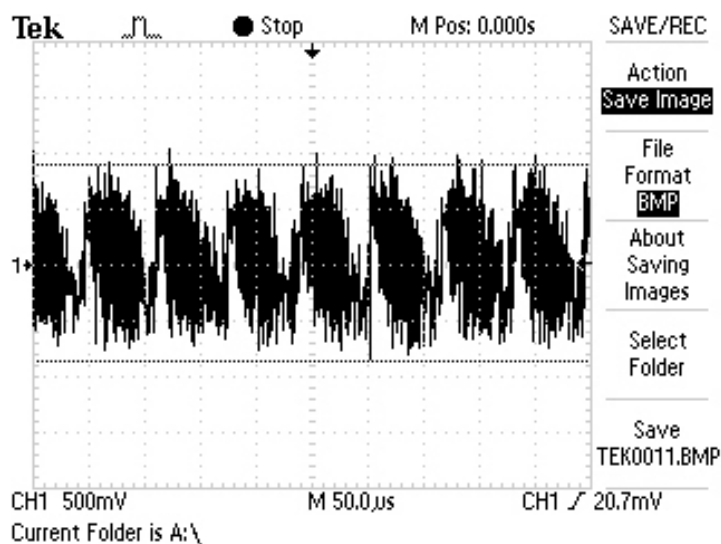
8. Waveform diagram of U702_4 video signal



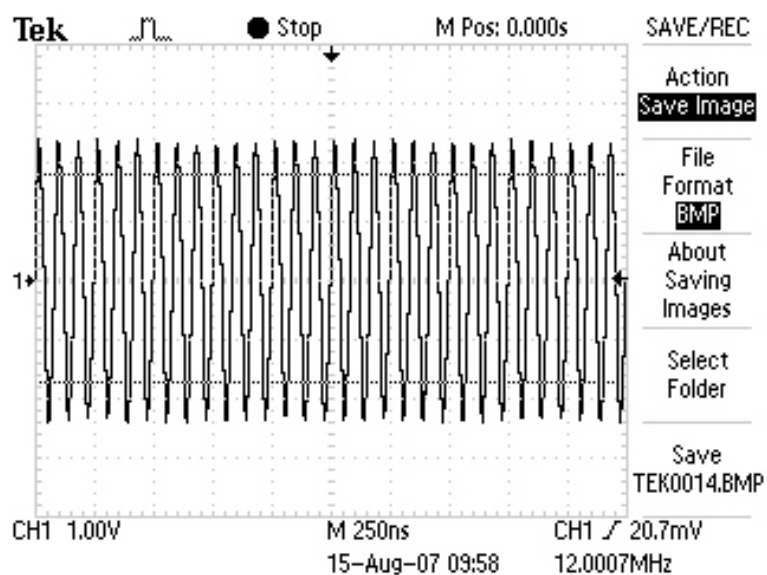
9. Waveform diagram of U702_10 video output



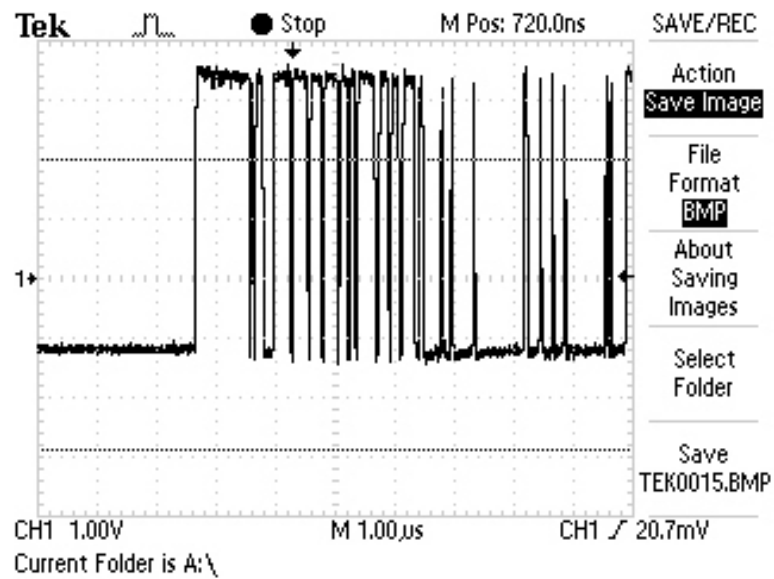
10. Video waveform diagram outputted by J104-40



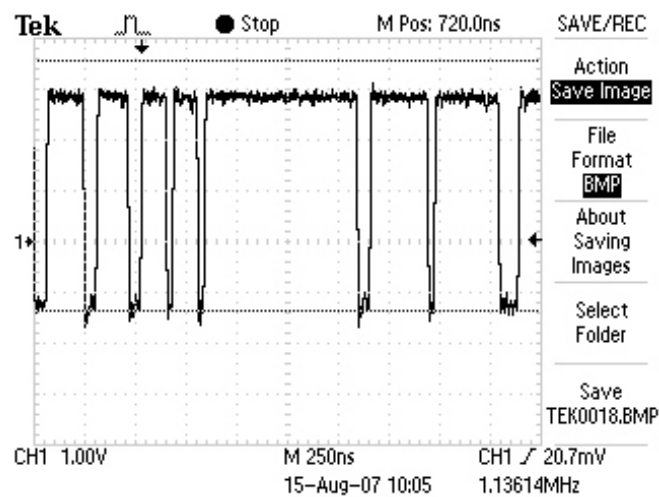
11. Waveform diagram of X201 12MHZ frequency



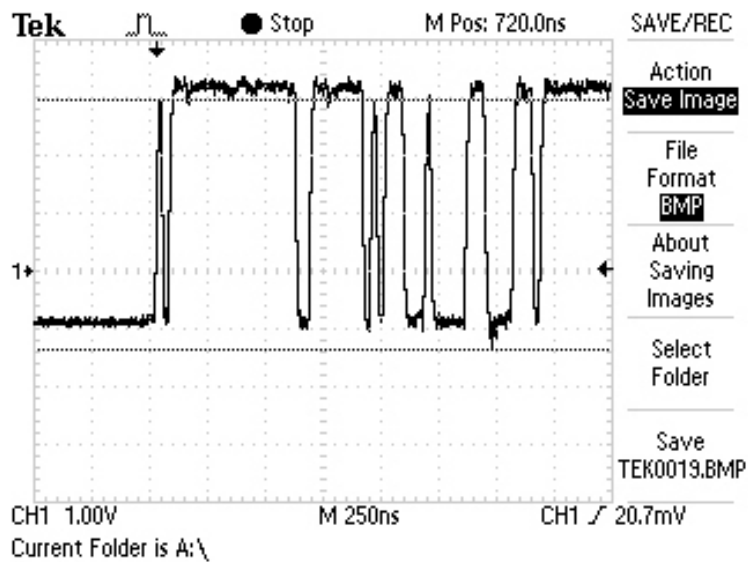
12. Waveform (Rp205) diagram of LCD driving B signal outputted by MST717



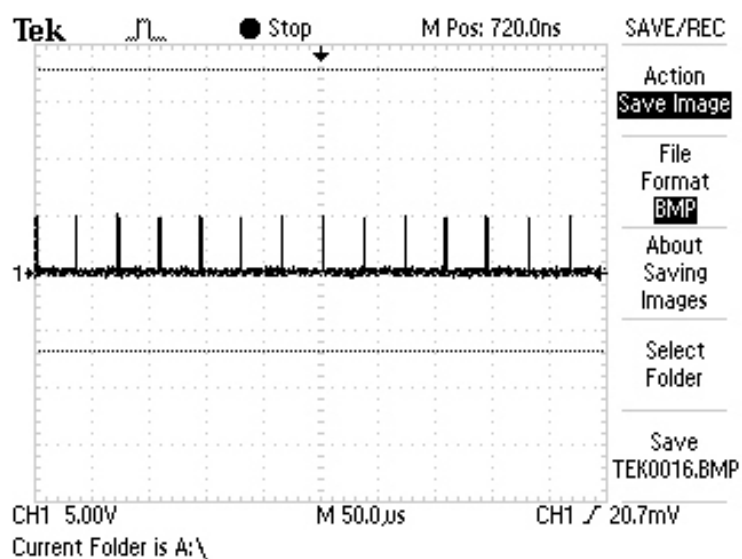
13. Waveform (Rp201) diagram of LCD driving R signal outputted by MST717



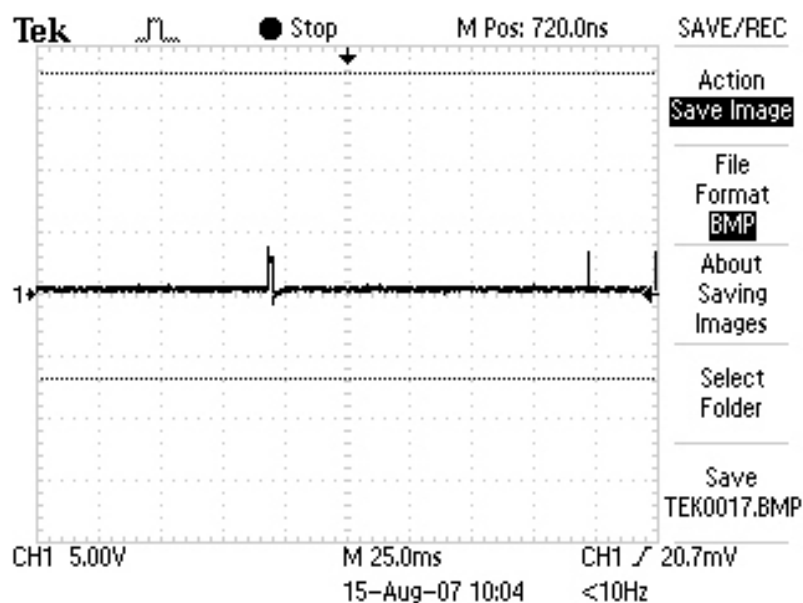
14. Waveform (RP204) diagram of LCD driving G signal outputted by MST717



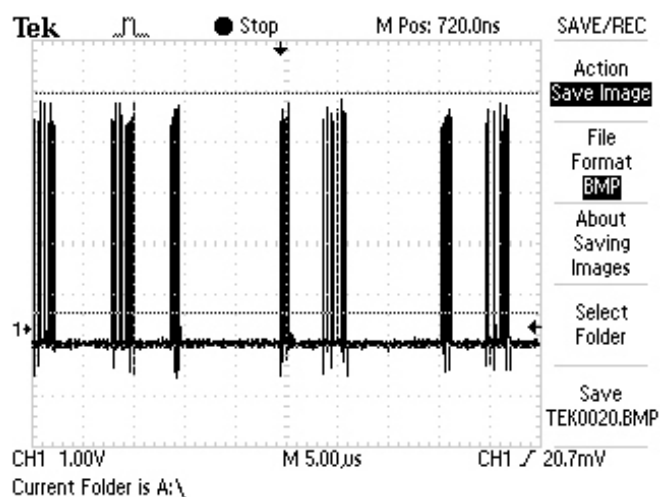
15. Waveform diagram of HSYNCO outputted by MST717 test point R8



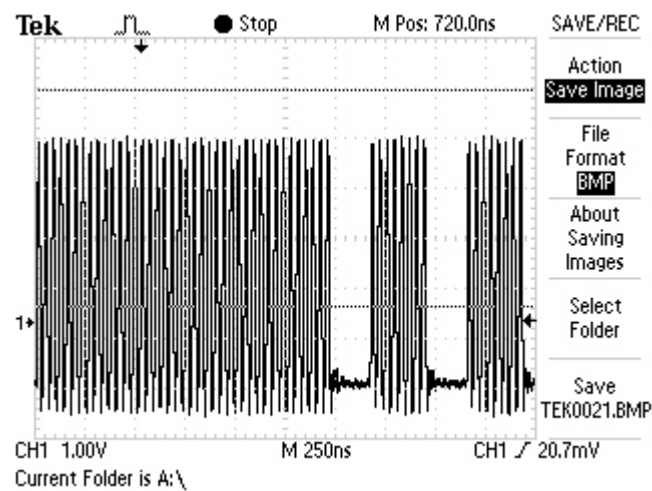
16. Waveform diagram of VSYNCO signal outputted by MST717



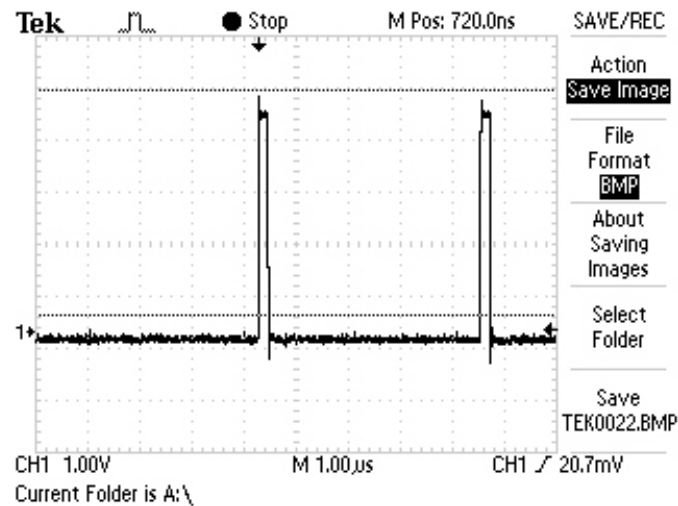
17. Waveform diagram when FLASH U202_1 is normal working



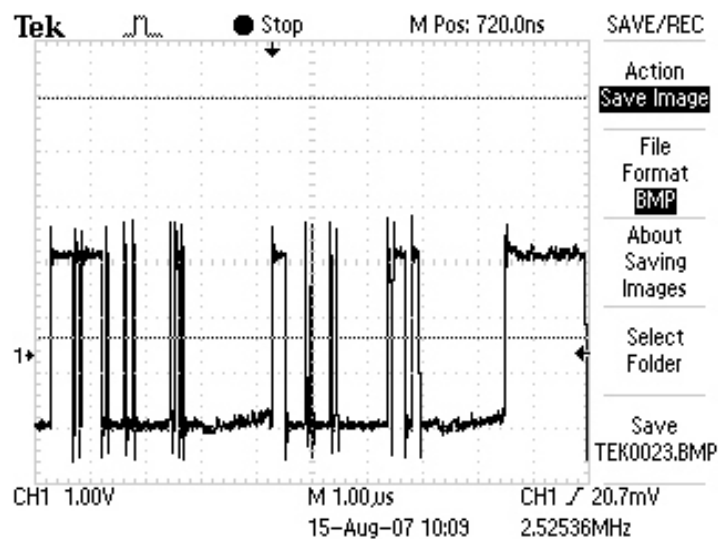
18. Waveform diagram when FLASH U202_2 is normal working



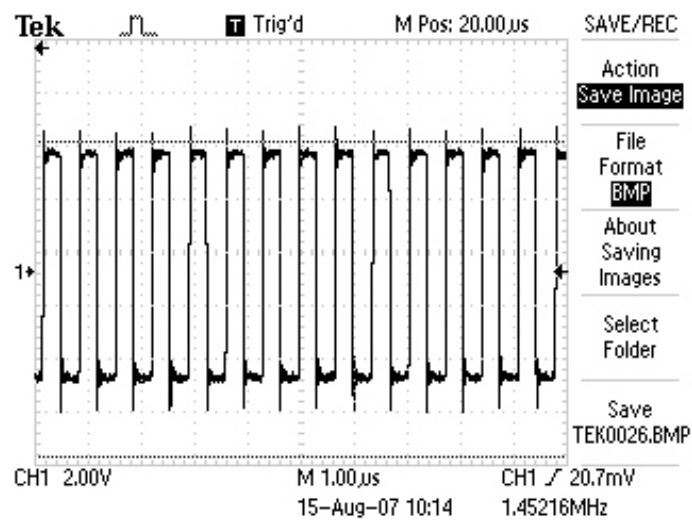
19. Waveform diagram when FLASH U202_5 is normal working



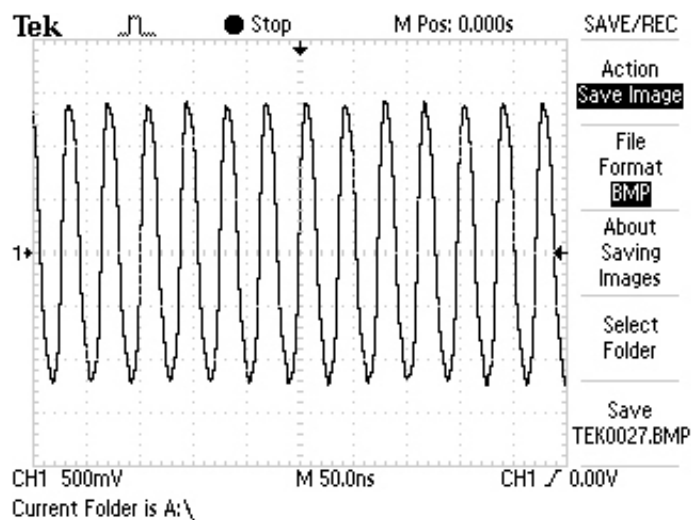
20. Waveform diagram when FLASH U202_6 is normal working



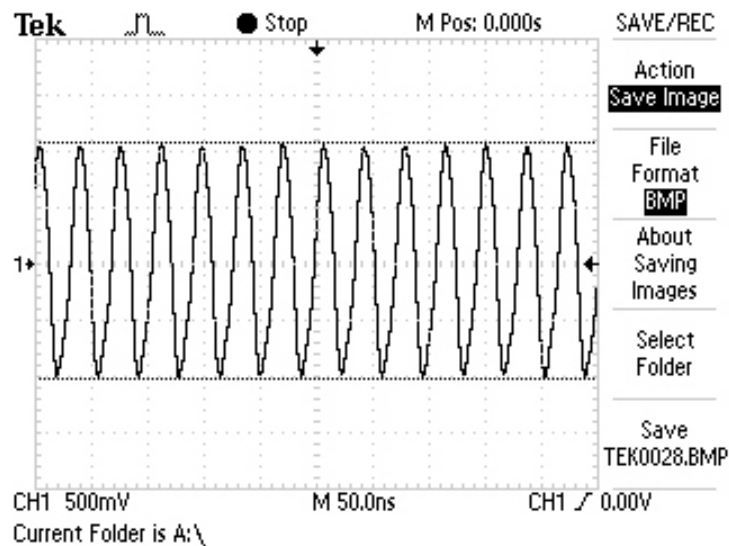
21. U207_1 waveform diagram VP-P11.8V F=1.45MHZ



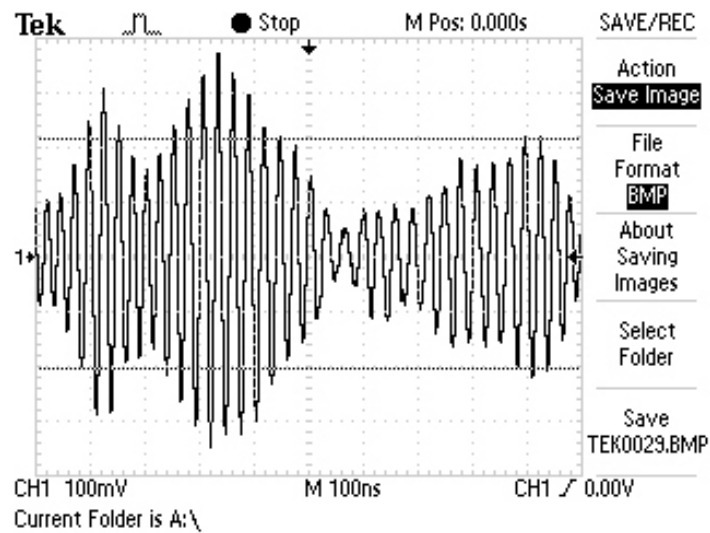
22. 27M waveform diagram outputted by Y502 crystal oscillate



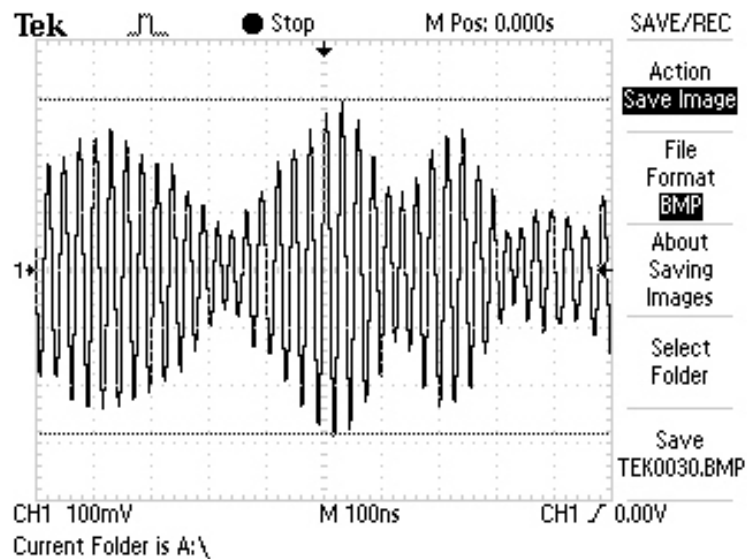
23. DVB circuit 27.7MHZ clock signal waveform(X602)diagram



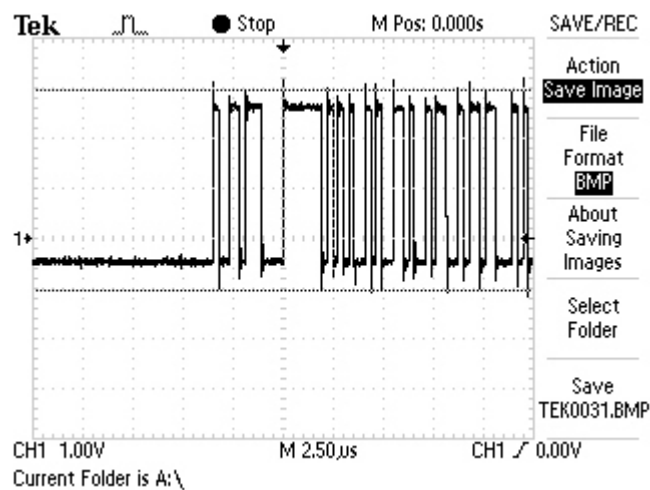
24. U602_11 waveform diagram VP-P=0.7 F=33MHZ



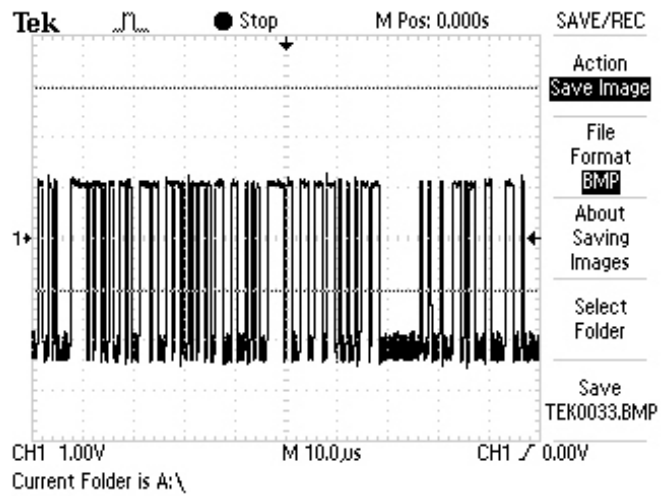
25. U602_10 waveform diagram VP-P=0.7 F=33MHZ



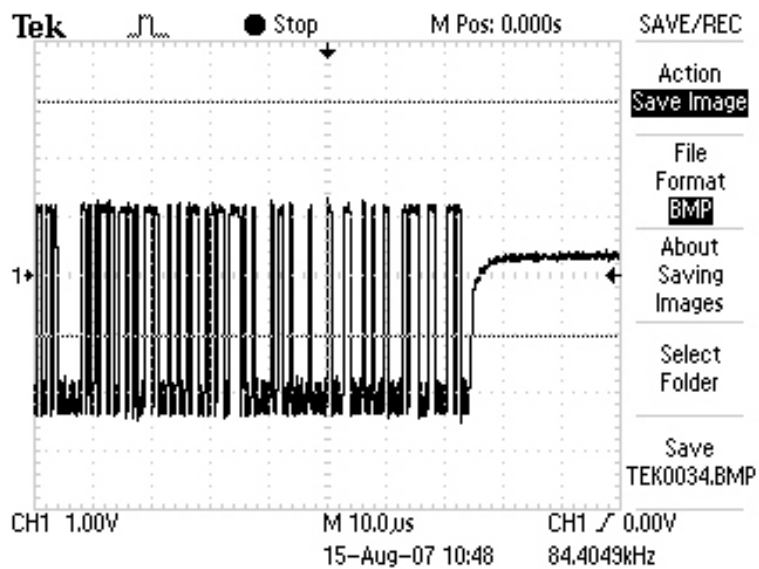
26. Date signal waveform (Rp601) diagram outputted by U603 in DVB state



27. Waveform diagram outputted by U501, test pointRp501



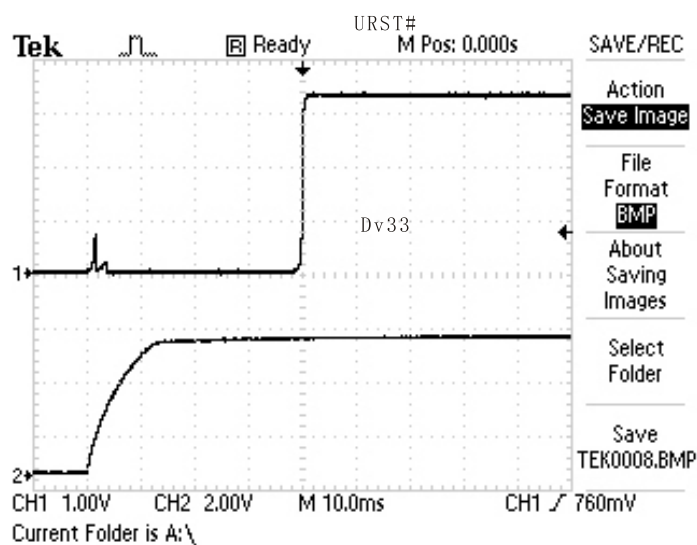
28. Waveform diagram outputted by U501, test pointRp502



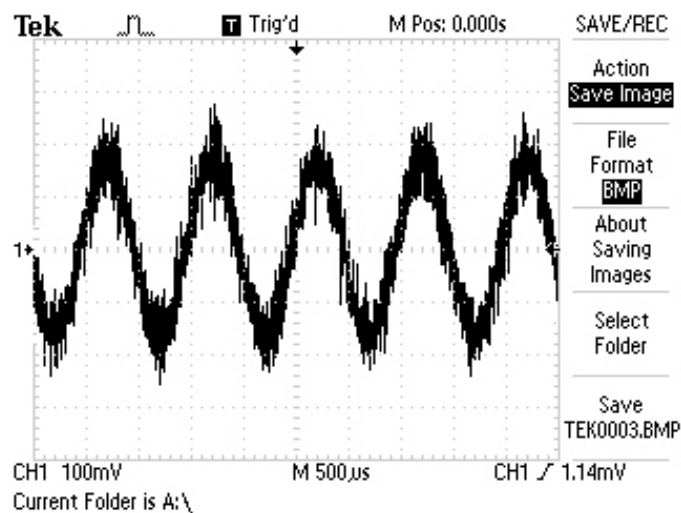
Section Four Waveform diagram

3.4.2 Waveform diagram of DVD part

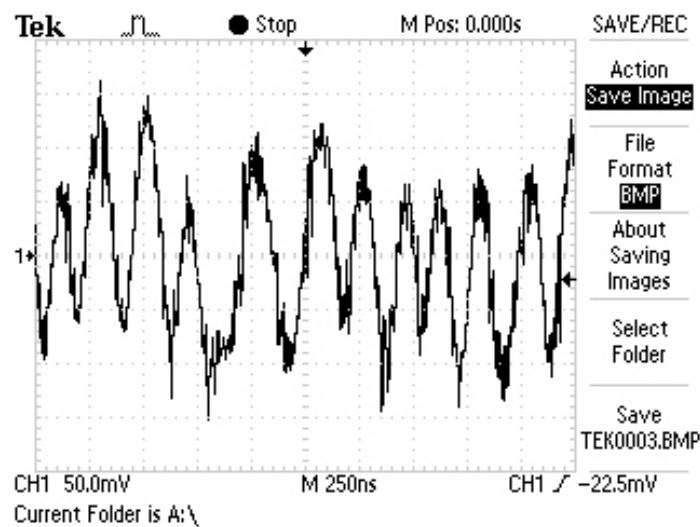
1.MT1389 rest circuit,detect pont R642.



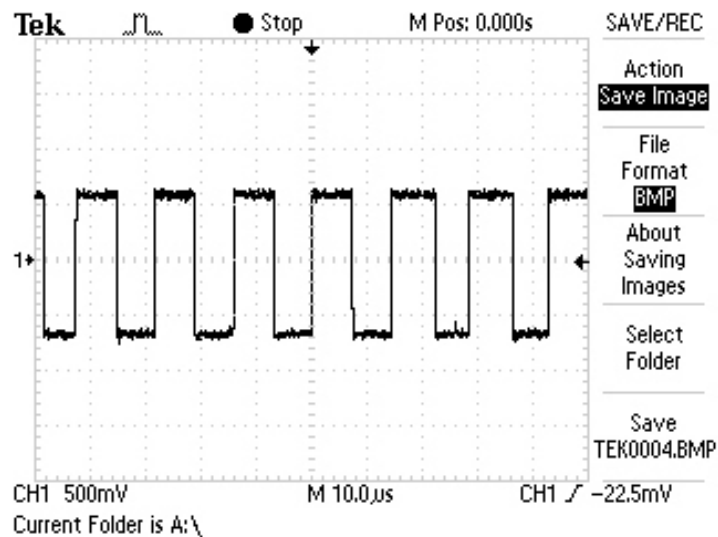
2.Audio signalad wave form without being filtered of amplified,audio signal amplify input port of detect point.



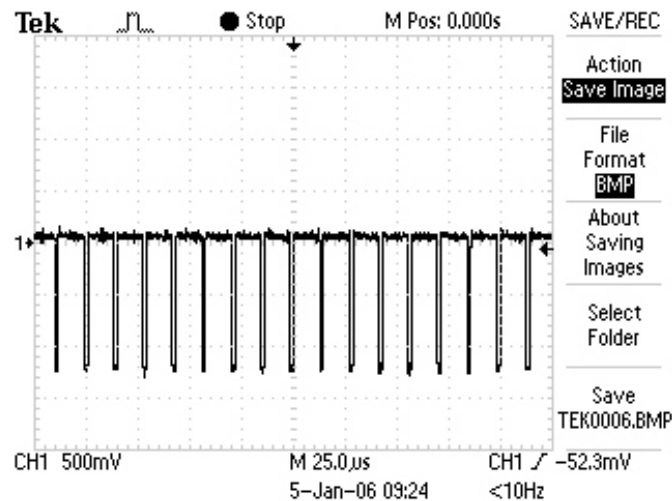
3. A signal waveform diagram of pin 34 of J105



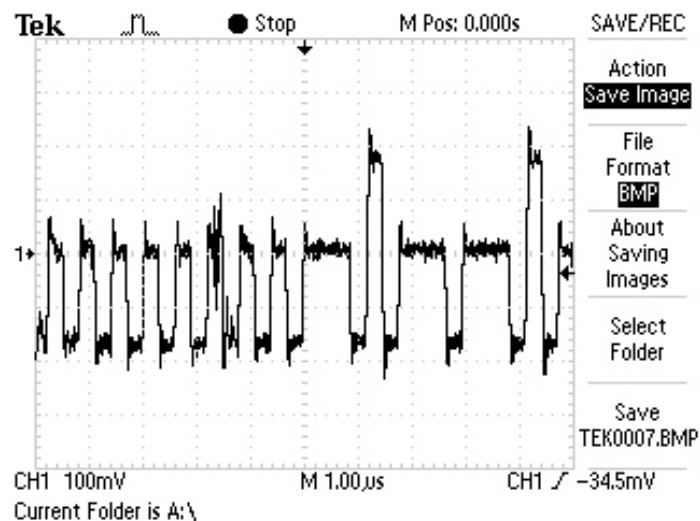
4. DMO signal (when there is main axis rotation) waveform diagram of pin 37 of MT(MT1389)



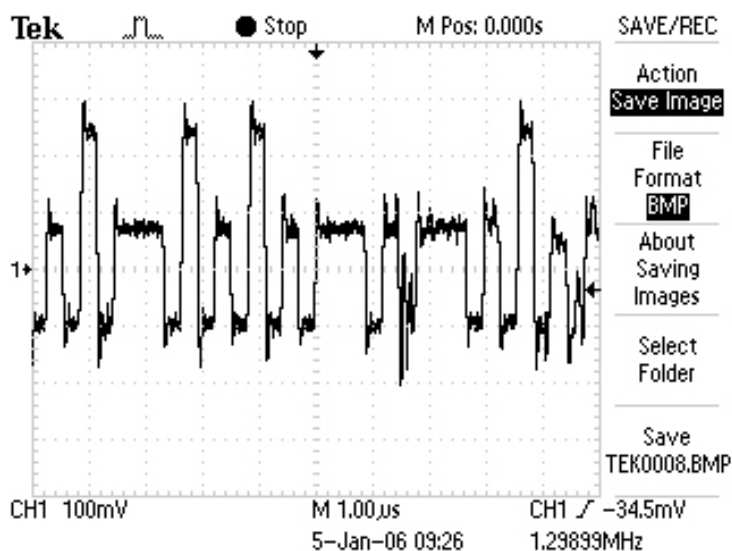
5.FMO signal (when there is feed) waveform diagram of pin 38 of U401 (MT1389)



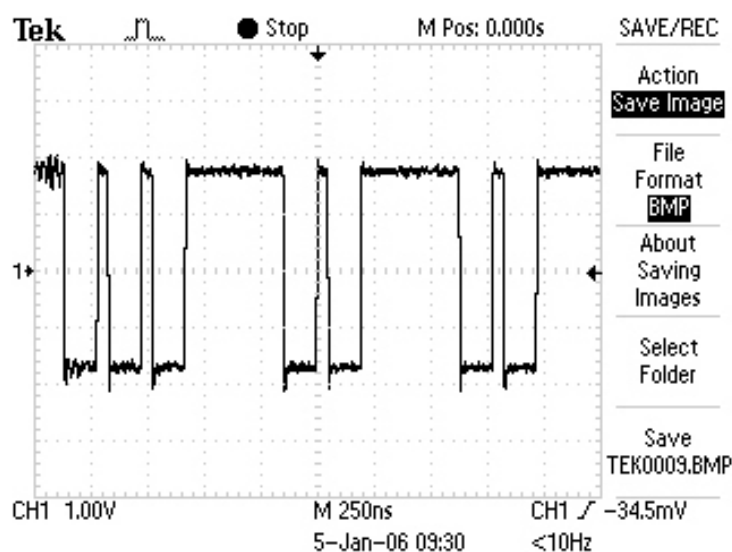
6. TRO signal (when there is trace) waveform diagram of pin 41 of U401 (MT1389)



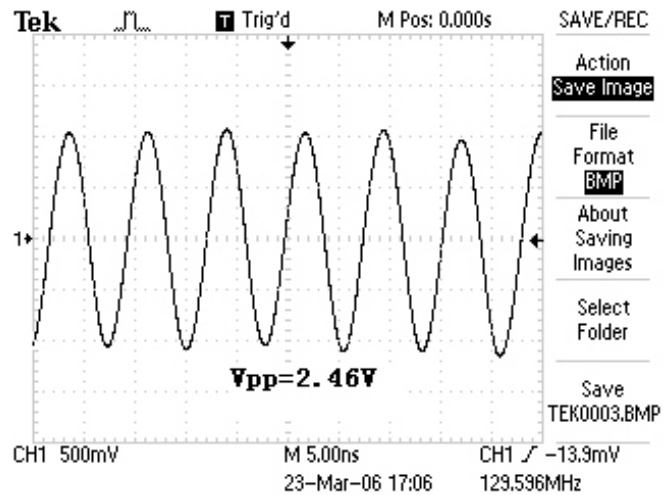
7. FOO signal (when there is focus) waveform diagram of pin 42 of U201 (MT1389)



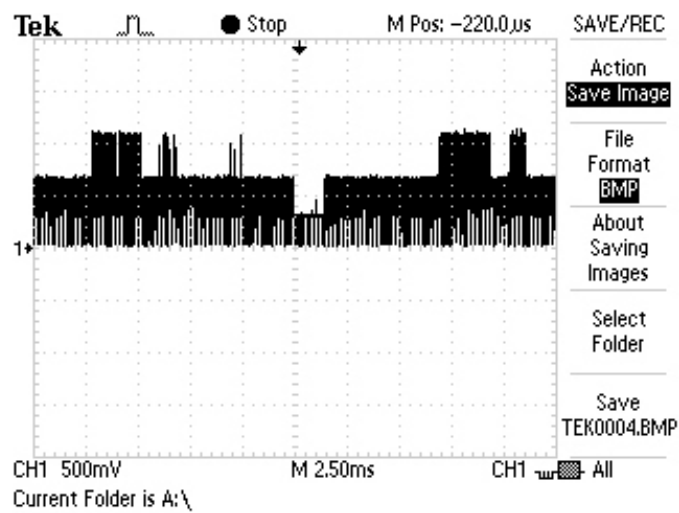
8. Waveform diagram of pin 29 (when no disc in) of U302(FLASH)



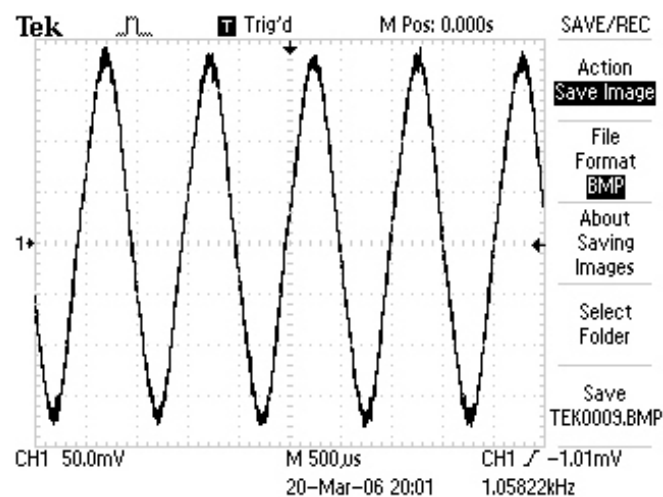
9 .Waveform diagram of pin 38of U301(SDRAM)



10. Video signal waveform diagram of R482



11. 1KHZ analog audio signal waveform diagram of R74



Section Five Function Introduction to IC

3.5.1 function introduction to MT1389HD

Description

MT1389hd is a cost-effective DVD system-on-chip (SOC) which incorporates advanced features like MPEG-4 video decoder, high quality TV encoder and state-of-art de-interlace processing.

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

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

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

Key Features

- RF/Servo/MPEG Integration
- Embedded 6ch Audio DAC
- Embedded 2ch Audio ADC for Karaoke
- High Performance Audio Processor
- High Performance Progressive Video Processor
- Support Nero-Digital
- High Quality 108MHz/12-bit, 4 CH TV Encoder

General Feature lists

Integration DVD player single chip

- High performance analog RF amplifier
- Servo controller and data channel processing
- MPEG-1/MPEG-2/JPEG video
- Dolby AC-3/DTS Decoder
- Unified memory architecture

Versatile video scaling & quality enhancement

OSD & Sub-picture

Built-in clock generator

Built-in high quality TV encoder

Built-in progressive video processor

Audio effect post-processor

Built-in 5.1-ch Audio DAC

Built-in 2-ch Audio ADC for Karaoke

High Performance Analog RF Amplifier

Programmable fc

Dual automatic laser power control

Defect and blank detection

RF level signal generator

Speed Performance on Servo/Channel Decoding

DVD-ROM up to 4XS

CD-ROM up to 24XS

Channel Data Processor

Digital data slicer for small jitter capability

Built-in high performance data PLL for channel data demodulation

EFM/EFM+ data demodulation

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

Servo Control and Spindle Motor Control

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

Built-in ADCs and DACs for digital servo control

Provide 2 general PWM

Tray control can be PWM output or digital output

Embedded Micro controller

Built-in 8032 micro controller

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

1024-bytes on-chip RAM

Up to 2M bytes FLASH-programming interface

Supports 5/3.3-Volt. FLASH interface

Supports power-down mode

Supports additional serial port

DVD-ROM/CD-ROM Decoding Logic

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

Automatic sector Mode and Form detection

Automatic sector Header verification

Decoder Error Notification Interrupt that signals various decoder errors

Provide error correction acceleration

Buffer Memory Controller

Supports 16Mb/32Mb/64Mb SDRAM

Supports 16-bit SDRAM data bus

Provides the self-refresh mode SDRAM

Block-based sector addressing

Video Decode

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

Decodes MPEG-4 Advanced Simple Profile

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

Support Nero-Digital

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

Baseline, extended-sequential and progressive JPEG image decoding

Support CD-G titles

Video/OSD/SPU/HLI Processor

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

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

256/16 color RLC format OSD

Automatic scrolling of OSD image

Audio Effect Processing

Dolby Digital (AC-3)/EX decoding

DTS/DTS-ES decoding

MPEG-1 layer 1/layer 2 audio decoding

MPEG-2 layer1/layer2 2-channel audio

High Definition Compatible Digital (HDCD)

Windows Media Audio (WMA)

Dolby ProLogic II

Concurrent multi-channel and downmix out

IEC 60958/61937 output

PCM / bit stream / mute mode

Custom IEC latency up to 2 frames

Pink noise and white noise generator

Karaoke functions

Microphone echo

Microphone tone control

Vocal mute/vocal assistant

Key shift up to +/- 8 keys

Chorus/Flanger/Harmony/Reverb

Channel equalizer

3D surround processing include virtual surround and speaker separation

TV Encoder

Four 108MHz/12bit DACs

Support NTSC, PAL-BDGHINM, PAL-60

Support 525p, 625p progressive TV format

Automatically turn off unconnected channels

Support PC monitor (VGA)

Support Macrovision 7.1 L1, Macrovision 525P and 625P

CGMS-A/WSS

Closed Caption

Progressive Scan Video

Automatic detect film or video source

3:2 pull down source detection

Advanced Motion adaptive de-interlace

Minimum external memory requirement

Outline

216-pin LQFP package

3.3/1.8-Volt. Dual operating voltages

Pin Definitions

PIN	Main	Alt	Type	Description
1	AGND		Ground	Analog ground
2	DVDA		Analog input	DVD signal input path A
3	DVDB		Analog input	DVD signal input path B
4	DVDC		Analog input	DVD signal input path C
5	DVDD		Analog input	DVD signal input path D
6	DVDRFIP		Analog input	Nc.
7	DVDRFIN		Analog input	AC coupled DVD RF signal input RFIN
8	MA		Analog input	CD/VCD main beam RF signal input A
9	MB		Analog input	CD/VCD main beam RF signal input B
10	MC		Analog input	CD/VCD main beam RF signal input C

11	MD		Analog input	CD/VCD main beam RF signal input D
12	SA		Analog input	Nc.
13	SB		Analog input	Nc.
14	SC		Analog input	Nc.
15	SD		Analog input	Nc.
16	CDFON		Analog input	Nc.
17	CDFOP		Analog input	Nc.
18	TNI		Analog input	CD/VCD focusing adjust negative input
19	TPI		Analog input	CD/VCD focusing adjust positive input
20	MIDI1		Analog input	Laser power monitor input
21	MIDI2		Analog input	Laser power monitor input
22	LDO2		Analog output	DVD Laser driver output
23	LDO1		Analog output	VCD Laser driver output
24	SVDD3		Power	Analog power 3.3V
25	RFOP		Analog output	Positive main beam summing output
26	RFON		Analog output	Negative main beam summing output
27	SGND		Ground	Analog ground
28	V2REFO		Analog output	Reference voltage 2.8V
29	V20		Analog output	Reference voltage 2.0V
30	VREFO		Analog output	Reference voltage 1.4V
31	FEO		Analog output	Focus error monitor output
32	TEO		Analog output	Tracking error monitor output
33	TEZISLV		Analog output	TE slicing Level
34	OP_OUT		Analog output	Op amp output
35	OP_INN		Analog input	Op amp negative input
36	OP_INP		Analog input	Op amp positive input
37	DMO		Analog output	Disk motor control output. PWM output
38	FMO		Analog output	Feed motor control. PWM output
39	TROPEN		Analog output	Tray PWM output/Tray open output
40	V1P4	ADIN0	Analog output	AD input 0
41	TRO		Analog output	Tracking servo output. PDM output of tracking servo compensator
42	FOO		Analog output	Focus servo output. PDM output of focus servo compensator
43	VPLLSS		Ground	Analog ground for VPLL

44	CAPPAD		Analog I/O	VPLL External Capacitance connection
45	VPLLVD3		Power	Analog 3.3V Power for VPLL
46	USB_VSS		USB Ground	USB ground pin
47	USBP		Analog I/O	USB port DPLUS analog pin
48	USBM		Analog I/O	USB port DMINUS analog pin
49	USB_VDD3		Analog I/O	USB Power pin 3.3V
50	ADIN1(Digital pin)	ADIN1GPIO	input path for ADIN1	AD input 1
51	TROUT	V_ADIN4	I/O	1) Serial interface port 3 data-out 2) Version AD input port 4 3) GPIO
52	TRIN	V_ADIN5	I/O	1) Serial interface port 3 data-out 2) Version AD input port 5 3) GPIO
53	STBY	V_ADIN6	I/O	Stand-by
54	TRCLOSSE	V_ADIN7	Out	Close disc signal
56	IOA2		I/O	Flash address
57	IOA3		I/O	Flash address
58	IOA4		I/O	Flash address
59	IOA5		I/O	Flash address
60	IOA6		I/O	Flash address
61	IOA7		I/O	Flash address
62	HIGHA0		I/O	Flash address
63	IOA18		I/O	Flash address 18 /IO
64	IOA19		I/O	Flash address 19 /IO
66	PWR#		I/O	Flash write enable, active low / IO
67	A16		I/O	Flash address 16
68	HIGHA7		I/O	Flash address
69	HIGHA6		I/O	Flash address
70	HIGHA5		I/O	Flash address
71	HIGHA4		I/O	Flash address
72	HIGHA3		I/O	Flash address
73	HIGHA2		I/O	Flash address
74	HIGHA1		I/O	Flash address
75	IOA20		I/O,	Flash address 20 /IO

76	PCE#		I/O	Flash chip select, active low / IO
77	IOA1		I/O	Flash address
78	PRD#		I/O	Flash output enable, active low / IO
79	AD0		I/O	Flash address/data 0
80	AD1		I/O	Flash address/data 1
82	AD2		I/O	Flash address/data 2
83	AD3		I/O	Flash address/data 3
84	AD4		I/O	Flash address/data 4
85	AD5		I/O	Flash address/data 5
86	AD6		I/O	Flash address/data 6
87	IOA21		I/O	ATN power control
88	ALE		I/O	Microcontroller address latch enable
89	AD7		I/O	Flash address/data 7
91	A17		I/O	Flash address 17
92	IOA0		I/O	Flash address
94	UWR#		I/O	Microcontroller write strobe, active low
95	URD#		I/O	Microcontroller read strobe, active low
97	UP1_2		I/O	Microcontroller port 1-2
98	UP1_3	DVSCK	I/O	Serial clock interface connected
99	UP1_4	RESET	I/O	
100	UP1_5	DVSDA	I/O	Serial data interface connected
101	UP1_6	DSCL	I/O	I2C clock pin
102	UP1_7	DSDA	I/O	I2C data pin
103	UP3_0	SW1	I/O	DVB IIC bus DVBSCL
104	UP3_1	SW2	I/O	DVB IIC bus DVBSDA
105	UP3_4	DRXD	I/O	Hardwired RD232 RXD
106	UP3_5	DTXD	I/O	Hardwired RD232 TXD
107	ICE		I/O PD,SMT	Microcontroller ICE mode enable
108	URST#		I/O	Power on reset input, active low
109	IR	DVSTB	Input	DVD Loader standby control signal input
110	INT0#		I/O	NC
111	DQM0		I/O	Data mask 0
112	IOA	(DQS0)	Out	GPIO
113	RD7		I/O	DRAM data 7
114	RD6		I/O	DRAM data 6

115	RD5		I/O	DRAM data 5
116	RD4		I/O	DRAM data 4
117	RD3		I/O	DRAM data 3
119	RD2		I/O	DRAM data 2
120	RD1		I/O	DRAM data 1
121	RD0		I/O	DRAM data 0
123	RD14		I/O	DRAM data 14
124	RD13		I/O	DRAM data 13
125	RD12		I/O	DRAM data 12
125	RD15		I/O	DRAM data 15
126	RD11		I/O	DRAM data 11
127	RD10		I/O	DRAM data 10
128	RD9		I/O	DRAM data 9
129	RD8		I/O	DRAM data 8
130	LIMIT	(DQS1)	I/O Non-pull	Focus error monitor detection
132	RFVDD 18		Power	Analog power 1.8V
132	DQM1		I/O	Data mask 1
133	RWE#		output	DRAM Write enable, active low
134	CAS#		output	DRAM column address strobe, active low
135	RAS#		output	DRAM row address strobe, active low
136	RCS#		output	DRAM chip select, active low
137	BA0		I/O	DRAM bank address 0
138	BA1		I/O	DRAM bank address 1
139	RA10		I/O	DRAM address 10
140	RA0		I/O	DRAM address 0
141	RA1		I/O	DRAM address 1
143	RA2		I/O	DRAM address 2
144	RA3		I/O	DRAM address 3
146	RCLK		I/O	Dram clock
147	CKE		I/O	DRAM clock enable
149	DNA11		I/O	DRAM address bit 11
150	DMA9		I/O	DRAM address 9
151	DMA8		I/O	DRAM address 8
152	DMA7		I/O	DRAM address 7
153	DMA6		I/O	DRAM address 6

154	DMA5		I/O	DRAM address 5
155	DMA4		I/O	DRAM address 4
157	Y_7	XIDD3	I/O	DVB data interface
158	Y_6	XIDD11	I/O	DVB data interface
159	Y_5	XIDD4	I/O	DVB data interface
161	Y_4	XIDD12	I/O	DVB data interface
162	Y_3	XIDD5	I/O	DVB data interface
163	Y_2	XIDD13	I/O	DVB data interface
164	Y_1	XIDD6	I/O	DVB data interface
165	Y_0	XIDD14	I/O	DVB data interface
166	YUVCLK	XIDD7	I/O	DVB data interface
167	C_7	XIDD15	I/O	DVB data interface
168	C_6	XICSO	I/O	DVB interface
169	C_5	NC	I/O	NC
171	C_4	DIDIOR	I/O	DVB interface
172	C_3	XIDIOW	I/O	DVB interface
173	C_2	XIINTRQ	I/O	MT8606 interrupt signal
175	C_1	XIRESET	I/O	MT8606 reset signal
176	C_0	IO_0(RD16)	I/O	1) Digital Video output C bit 0 2) GPIO
177	IO_17	SDD3	I/O	DVB/CARD data interface
179	HSYN	SDD2	IN put	DVB/CARD data input
180	YUV7	SDD1		DVB/CARD data input
181	VSYN	SDD0		DVB/CARD data input
182	YUV6	Yuv6		1) Video data output bit 6 2) Red or CR
183	YUV5	Yuv5		1) Video data output bit 5 2) Blue or CB
184	DACVSSA		Ground	Ground pin for VIDEO DAC circuitry
185	YUV4	Yuv4		1) Video data output bit 4 2) Green or Y
186	DACVDDA			3.3V power pin for VIDEO DAC circuitry
187	YUV3	Yuv3		1) Video data output bit 3 2) Analog composite output
188	DACVSSB			Ground pin for VIDEO DAC circuitry

189	YUV2	NC		1) Video data output bit 2 2) Analog chroma output
190	DACVDD3	Power		3.3V power pin for VIDEO DAC circuitry
191	YUV1	NC	Output	1) Video data output bit 1 2) Analog Y output
192	DACVSSC		Ground	Ground pin for VIDEO DAC circuitry
193	YUV0	NC	Output	1) Video data output bit 0 2) Compensation capacitor
194	FS		Analog	Full scale adjustment
195	VREF		Analog	Bandgap reference voltage
196	DACVDDC		Power	3.3V power pin for VIDEO DAC circuitry
197	ASDATA0	SDCLK	I/O	Clock signal of SD card
198	RVREF	GPIO6	I/O	DVB/CARD interface
199	RCLKB	GPIO5	I/O	DVB/CARD interface
200	GPIO4		I/O	DVB/CARD interface
201	GPIO3		I/O	DVB/CARD interface
202	ASDATA1	MSBS	I/O	DVB/CARD interface
203	ASDATA2	MSCLK	I/O	Clock signal of MS card
204	SPMCLK	MSINS	I/O	MS card detect input
205	SPDATA	VMUTE	I/O	SD_CD
206	SPLRCK	MS_CF_SW	I/O	SPLRCK
207	SPBCK	NC	I/O	SPBCK
209	ALRCK		I/O	ALRCK
210	ABCK		I/O	ABCK
211	ACLK		I/O	ACLK
212	ASDATA3	SDCMD	I/O	XDDD10
214	ASDATA4	USB_SWITCH	I/O	ASDATA4
215	MC_DATA	NC	I/O	89MUTE
216	SPDIF		Output	S/PDIF output
217	APLLVDD3		Power	3.3V Power pin for audio clock circuitry
218	APLLCAP		Analog I/O	APLL External Capacitance connection
219	APLLVSS		Ground	Ground pin for audio clock circuitry
220	ADACVSS2		Ground	Ground pin for AUDIO DAC circuitry
221	ADACVSS1		Ground	Ground pin for AUDIO DAC circuitry
222	ARF		Output	AUDIO DAC Sub-woofer channel output

223	ARS	GPIO	Output	AUDIO DAC Right Surround channel output
224	AR	89AR	Output	AUDIO DAC Right channel output
225	AVCM		Analog	AUDIO DAC reference voltage
226	AL	89AL	Output	AUDIO DAC Left Surround channel output
227	ALS	DWP	Output	AUDIO DAC Left Surround channel output
228	ALF	SDCD	IN put	
229	ADACVDD1		Power	3.3V power pin for AUDIO DAC circuitry
230	ADACVDD2	Power		3.3V power pin for AUDIO DAC circuitry
231	RFGND18		Ground	Analog ground
233	XTALO		Output	27MHz crystal output
234	XTALI		Input	27MHz crystal input
235	JITFO		Analog output	Output terminal of RF jitter meter
236	JITFN		Analog Input	Input terminal of RF jitter meter
237	PLLSS		Ground	Ground pin for data PLL and related analog circuitry
238	IDACEXLP		Analog output	Data PLL DAC Low-pass filter
239	PLLVD3		Power	Power pin for data PLL and related analog circuitry
240	LPFON		Analog Output	Negative output of loop filter amplifier
241	LPFIP		Analog input	Positive input terminal of loop filter amplifier
242	LPFIN		Analog input	Negative input terminal of loop filter amplifier
243	LPFOP		Analog output	Positive output of loop filter amplifier
244	ADCVD3		Power	Analog 3.3V Power for ADC
245	ADCVSS		Ground	Analog ground for ADC
246	RFVD3		Analog output	Analog Power
247	RFRPDC		Analog Input	RF ripple detect output
248	RFRPAC		Analog output	RF ripple detect input(through AC-coupling)
249	HRFZC		Analog output	High frequency RF ripple zero crossing
250	CRTPLP		Analog output	Defect level filter capacitor connecting
251	RFGND		Ground	Analog Power
252	OSP		Analog output	RF Offset cancellation capacitor connecting
253	OSN		Analog output	RF Offset cancellation capacitor connecting
254	RFGC		Analog output	RF AGC loop capacitor connecting for

				DVD-ROM
255	IREF		Analog input	Current reference input. It generates reference current for RF path. Connect an external 15K resistor to this pin and AVSS
256	AVDD3		Power	Analog power 3.3V
55、93、 142、160、 174、213	DVDD18		Power	1.8V power pin for internal digital circuitry
65、96、 118、131、 145、156、 170、208	DVDD3		Power	3.3V power pin for internal digital circuitry
81、178	DVSS		Ground	1.8V ground pin for internal digital circuitry
90/148	DVSS		Ground	3.3V ground pin for internal digital circuitry

3.5.2 function introduction to FLASH

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

Pin	Name	Function	Voltage (when no disc)	Data direction
1-9, 16-25, 48	AO-A19	20 bit address bus		I
11	WE	Write enable signal, low level is effective	3.23V	I
12	RESET	Reset, low level is effective	3.23V	I
10, 13, 14	NC	Blank pin		
15	RY/BY	Ready/system busy	3.23V	O
26	CE	Chip enable, low level effective	0V	I
27、46	VSS	Ground		
28	OE	Output enable signal , low level is effective	0V	I
29-3, 6, 38-44	DQ0-DQ14	15 bit data bus		O
37	VCC	5V power supply	+5V	
45	DQ15/A-1	Take word extend mode as data line, and bit extend mode as address line		I/O
47	BYTE	Select 8-bit or 16-bit output mode. High level is 16-bit output and low level is 8-bit output		I

3.5.3 function introduction to SDRAM

The function of SDRAM (U301) in the player is to save program taken out by Mt1389 from FLASH and information of picture and sound taken out from disc when the player is working to form damping, add the stability of information output and add anti-vibration of the player. The pin function and real voltage are shown as the following table:

Pin	Name	Function	Data direction	Voltage when no disc	Pin	Name	Function	Data direction	Voltage when no disc
1	VDD	3.3V power supply		3.18	28	VSS	Ground		0.01
2	DQ0	Data bus	I/O	0.94	29	MA4	Address bus	I	1.65
3	VDDQ	3.3V power supply	I/O	3.19	30	MA5	Address bus	I	1.74
4	DQ1	Data bus	I/O	0.9	31	MA6	Address bus	I	1.49
5	DQ2	Data bus	I/O	1.3	32	MA7	Address bus	I	1.22
6	VSSQ	Ground		0	33	MA8	Address bus	I	0.05
7	DQ3	Data bus	I/O	1.2	34	MA9	Address bus	I	0.04
8	DQ4	Data bus	I/O	1.5	35	MA11	Address bus	I	0.04
9	VDDQ	3.3V power supply		3.18	36	NC	Blank pin		0.01
10	DQ5	Data bus	I/O	0.7	37	CKE	Clock enable signal	I	1.22
11	DQ6	Data bus	I/O	0.45	38	CLK	System clock input	I	1.68
12	VSSQ	Ground		0	39	UDQM	Data in/out screen-shielded signal	I	2.42
13	DQ7	Data bus	I/O	0.8	40	NC	Blank pin		0.01
14	VDD	3.3V power supply		3.14	41	VSS	Ground		0.01
15	LDQM	Data in/out screen-shielded signal	I	2.46	42	DQ8	Data bus	I/O	0.6
16	WE	Write control signal	I	3.17	43	VDDQ	3.3V power supply		3.19
17	CAS	Line address gating signal	I	3.01	44	DQ9	Data bus	I/O	0.91
18	RAS	Row address gating signal	I	3.13	45	DQ10	Data bus	I/O	0.8
19	CS	Chip selection signal	I	2.95	46	VSSQ	Ground		0.01
20	SD-BS0	Section address 0 gating signal	I	1.8	47	DQ11	Data bus	I/O	0.79
21	SD-BS1	Section address 1 gating signal	I	2	48	DQ12	Data bus	I/O	1.16
22	MA10	Address bus	I	0.04	49	VDDQ	3.3V power supply		3.19
23	MA0	Address bus	I	0.36	50	DQ13	Data bus	I/O	1.15

24	MA1	Address bus	I	0.35	51	DQ14	Data bus	I/O	1.24
25	MA2	Address bus	I	2.38	52	VSSQ	Ground		0.01
26	MA3	Address bus	I	1.59	53	DQ15	Data bus	I/O	0.68
27	VDD	3.3V power supply		3.19	54	VSS	Ground		0.01

3.5.4 function introduction to D5954

D5954 is a servo drive IC with built-in 4-channel drive circuit. Digital focus, trace, feed and main axis drive signal outputted by MT1389 is sent to D5954 for amplifying through RC integration circuit. The focus, trace, feed and main axis drive signal being amplified by D5954 is sent to loader to fulfil the corresponding servo work. The introduction to function pin is shown as the following table:

SN	Name	Function	Voltage when no disc (V)	DVD disc voltage (V)	CD disc voltage (V)
1	VINFC	Focus control signal input	1.41	1.4	1.45
2	CF1	External feedback loop	2.3	2.54	2.43
3	CF2	External feedback loop	2.01	2.56	2.43
4	VINSL+	Forward control input, connected to reference	1.41	1.42	1.42
5	VINSL-	Open/close control signal input	1.4	1.42	1.42
6	VOSL	External feedback resistor	1.4	1.17	1.21
7	VINFFC	Focus feedback signal input	1.92	2.59	2.36
8	VCC	5V power supply	5.38	5.04	5.01
9	PVCC1	5V power supply	5.38	5.04	5.03
10	PGND	Ground	0.01	0.01	0.01
11	VOSL-	LOAD- voltage output	\	\	\
12	VO2+	LOAD+ voltage output	\	\	\
13	VOFC-	Focus drive reverse voltage output	3.3	2.6	2.33
14	VOSC+	Focus drive forward voltage voltage output	3.3	2.46	2.68
15	VOTK+	Trace drive forward direction voltage output	3.39	2.56	2.51
16	VOTK-	Trace drive reverse voltage output	3.52	2.48	2.51
17	VOLD+	Feed drive forward direction voltage output	0.93	2.56	2.5
18	VOLD-	Feed drive reverse voltage output	0.93	2.59	2.62
19	PGND	Ground	0.01	0.01	0.01
20	VINFTK	Trace feedback signal input	3.73	2.5	2.53

21	PVCC2	5V power supply	5.38	5.08	5.07
22	PREGND	Ground	0	0.01	0.01
23	VINLD	Feed control signal input	1.4	1.41	1.4
24	CTK2	External feedback loop	2.41	2.52	2.53
25	CTK1	External feedback loop	2.51	2.52	2.53
26	VINTK	Trace control signal input	1.42	1.42	1.41
27	BIAS	1.4V reference voltage input	1.41	1.42	1.42
28	STBY	Enable control signal	0	3.18	3.19

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

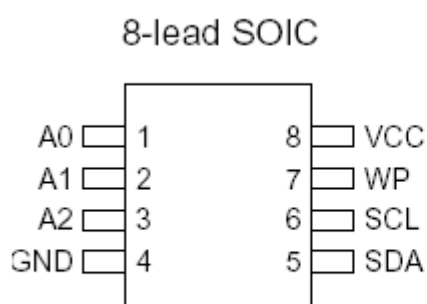
3.5.5 function introduction to 4558/4580

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

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

3.5.6 function introduction to 24C16 SOP

1. 24C16 is a writable and programmable read-only memorizer, with its casing and pin function shown in the following figure 3.5.6.1:



Pin Configurations

Pin Name	Function
A0 - A2	Address Inputs
SDA	Serial Data
SCL	Serial Clock Input
WP	Write Protect
NC	No Connect
GND	Ground
VCC	Power Supply

Figure 3.5.6.1 Casing and pin function explanation

2. The function of 24C16 is to keep some setup status of machine, such as system information of sound and language selection, not losing after power on and still keeping the information set last time when power on the next time. The circuit schematic diagram is shown as the figure3.5.6.2:

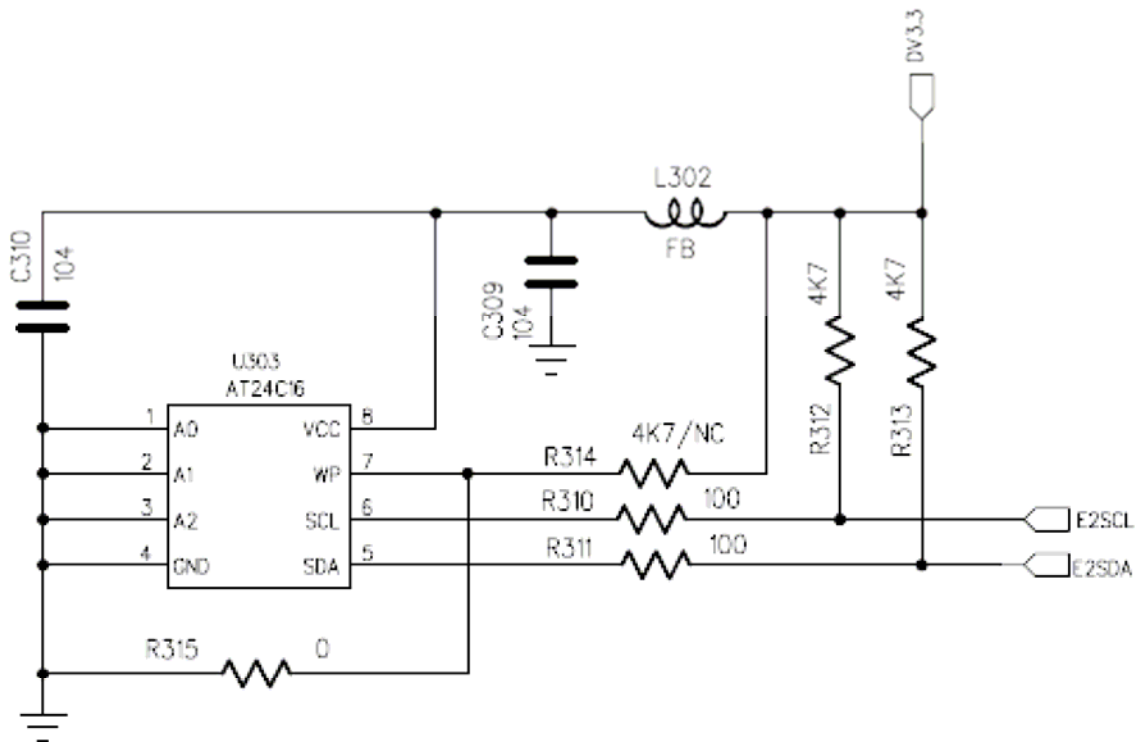


Figure 3.5.6.2 Circuit schematic diagram

3.5.7 function introduction to BA6849FM HSOP

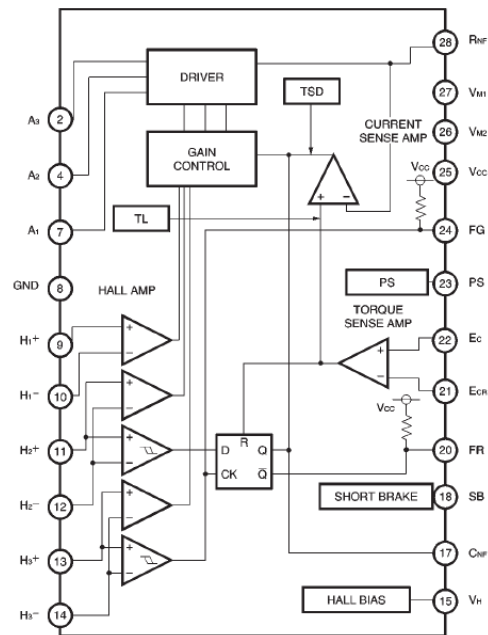
The BA6849 series are ICs developed for CD-ROM spindle motor drives. These ICs possess a short brake and reverserotation brake for two types of brake functions, and also contain FG output and rotation direction detection (FR) circuits, making them high-functionality and high-performance ICs.

Features

- 1) Three-phase, full-wave, pseudo-linear drive system.
- 2) Built-in power save and thermal shutdown functions.
- 3) Built-in current limiter and Hall bias circuits.
- 4) Built-in FG output.
- 5) Built-in rotation direction detector.
- 6) Built-in reverse rotation prevention circuit.

7) Built-in short brake pin.

Block diagram




Pin descriptions


Pin No.	Pin Name	Function
2	A ₃	Output
4	A ₂	Output
7	A ₁	Output
8	GND	GND
9	H ₁ ⁺	Hall signal input
10	H ₁ ⁻	Hall signal input
11	H ₂ ⁺	Hall signal input
12	H ₂ ⁻	Hall signal input
13	H ₃ ⁺	Hall signal input
14	H ₃ ⁻	Hall signal input
15	V _H	Hall bias
17	C _{NF}	For connection of phase compensation capacitor
18	SB	Short brake
20	FR	Rotation direction detection
21	E _{CR}	Output voltage control reference
22	E _c	Output voltage control
23	PS	Power save
24	FG	FG signal output
25	V _{CC}	Power supply
26	V _{M2}	Motor power supply 2
27	V _{M1}	Motor power supply 1
28	R _{NF}	For connection of output current detection resistor
FIN	—	SUB GND


3.5.8 function introduction to MST717


FEATURES

Video Decoder

 Supports NTSC, PAL and SECAM video input formats


 2D NTSC and PAL comb-filter for Y/C separation of CVBS input


 Multiple CVBS and S-video inputs

 Supports Closed-caption and V-chip

 ACC, AGC, and DCGC (Digital Chroma Gain Control)

■ Analog Input

 Supports RGB input format from PC, camcorders and GPS

 Supports video input 480i, 480p, 576i, 576p, 720p, 1080i; RGB input resolution in 640x480,

800x480, and 800x600 (SVGA)

📖 3-channel low-power 10-bit ADCs integration for RGB

📖 Supports RGB composite sync input (CSYNC), SOG, HSYNC, and VSYNC

📖 On-chip clock synthesizer and PLL

📖 Auto-position adjustment, auto-phase adjustment, auto-gain adjustment, and auto-mode detection

■ Color Engine

📖 Brightness, contrast, saturation, and hue adjustment

📖 9-tap programmable multi-purpose FIR (Finite Impulse Response) filter

📖 Differential 3-band peaking engine

📖 Luminance Transient Improvement (LTI)

📖 Chrominance Transient Improvement (CTI)

📖 Black Level Extension (BLE)

📖 White Level Extension (WLE)

📖 Favor Color Compensation (FCC)

📖 3-channel gamma curve adjustment

■ Scaling Engine/Panel Interface

📖 Supports digital panels up to 1366x768

📖 Supports single 8-bit TTL panel outputs

📖 Supports various displaying modes

📖 Supports horizontal panorama scaling


■ Digital PWM Controller

📖 Integrated general purpose digital PWM control loop


📖 Programmable startup operating frequency and period with output voltage regulation


📖 Programmable output current regulation; 40KHz~70KHz switching frequency, sync. to HSYNC possible

📖 Burst-mode or continuous-mode for output current regulation; 150Hz~300Hz burst-mode frequency, sync. to VSYNC possible

 Programmable protection level for input voltage and fault detection


■ Miscellaneous

 Built-in MCU

 3-wire serial bus interface for configuration setup


 Built-in step-down PWM circuit for input 2.5V

 Built-in VCOM DC level adjusting circuits

 Built-in internal OSD with 256 programmable fonts, 16-color palettes, and 12-bit color resolution

 Supports external OSD

 Spread spectrum clocks

 Optional 3.3V / 5V output pads with programmable driving current

 128-pin PQFP package

GENERAL DESCRIPTION

The MST717A is a high quality ASIC for NTSC/PAL/SECAM car TV application. It receives analog NTSC/PAL/SECAM CVBS and S-Video inputs from TV tuners, DVD or VCR sources, including weak and distorted signals, as well as analog RGB input from GPS systems. Automatic gain control (AGC) and 8-bit 3-channel A/D converters provide high resolution video quantization. With automatic video source and mode detection, users can easily switch and adjust variety of signal sources. Multiple internal adaptive PLLs precisely extract pixel clock from video source and perform sharp color demodulation. Built-in line-buffer supports adaptive 2-D comb-filter, 2-D sharpening, and synchronization stabler in a condense manner. The output format of MST717A supports 6-bit or 8-bit TTL digital TFT-LCD modules.

PIN DESCRIPTION

Analog Interface

Pin Name	Pin Type	Function	Pin
VCLAMP		CVBS/YC Mode Clamp Voltage Bypass	2
REFM		Internal ADC Bottom De-coupling Pin	3

REFP		Internal ADC Top De-coupling Pin	4
SOGIN	Analog Input	Sync-on-Green slicer input	6
BINP	Analog Input	Analog B Input of VGA	7
BINM	Analog Input	Reference Ground for Analog B Input of VGA	8
GINP	Analog Input	Analog G Input of VGA	9
GINM	Analog Input	Reference Ground for Analog G Input of VGA	10
RINP	Analog Input	Analog R Input of VGA	11
RINM	Analog Input	Reference Ground for Analog R Input of VGA	12
C1INP	Analog Input	Analog Chroma Input for TV S-Video1 / Analog Composite Input of TV CVBS4	14
C1INM	Analog Input	Reference Ground for Analog Chroma Input of TV S-Video1 / Analog Composite Input of TV CVBS4	15
YS1INP	Analog Input	Analog Luma Input of TV S-Video1 / Analog Composite Input of TV CVBS3	16
YS1INM	Analog Input	Reference Ground for Analog Luma Input of TV S-Video1 / Analog Composite Input of TV CVBS3	17
C2INP	Analog Input	Analog Chroma Input for TV S-Video2	18
C2INM	Analog Input	Reference Ground for Analog Chroma Input of TV S-Video2	19
YS2INP	Analog Input	Analog Luma Input of TV S-Video2	20
YS2INM	Analog Input	Reference Ground for Analog Luma Input of TV S-Video2	21
CVBS1P	Analog Input	Analog Composite Input for TV CVBS1	22
CVBS1M	Analog Input	Reference Ground for Analog Composite Input of TV CVBS1	23
CVBS2P	Analog Input	Analog Composite Input for TV CVBS2	24
CVBS2M	Analog Input	Reference Ground for Analog Composite Input of TV CVBS2	25
VREXT_CDAC	Analog Input	Reference Current Generator, 820 ohm to Ground	117
HSYNCIN	Schmitt Trigger Input w/ 5V-tolerant	HSYNC / Composite Sync for VGA Input	125
VSYNCIN	Schmitt Trigger Input w/ 5V-tolerant	VSYNC for VGA Input	124

Digital Panel Output Interface

Pin Name	Pin Type	Function	Pin
CLKO	Output	Display Clock Output	77

ROUT[5:0]	Output	Red channel Output [5:0]	89-84
GOUT[5:0]	Output	Green channel Output [5:0]	97-92
BOUT[5:0]	Output	Blue channel Output [5:0]	108-103
DTCON[10:1]	Output	TCON Output	78-80, 90, 91, 98, 99, 109-111

VCOM Interface

Pin Name	Pin Type	Function	Pin
VCOMDC	Analog Output	Reference DC voltage output for common amplifier.	118

Switching Power and PWM Interface

Pin Name	Pin Type	Function	Pin
PWMOUT	Output	Switching Pulse Output for DC-DC Converter	39
FB2	Analog Input	Error Voltage Feedback Input Pin for PWM2; voltage = 1.2V	40
SENSE2	Analog Input	Sense Circuit Connection for PWM2	41
PWMOUT1	Output	Switching Pulse Output for DC-DC Converter	42
FB1	Analog Input	Error Voltage Feedback Input Pin for PWM1; voltage = 1.2V	43
SENSE1	Analog Input	Sense Circuit Connection for PWM1	44
PGOOD	Output	Power Good Indicator	45

Internal MCU Interface with Serial Flash Memory

Pin Name	Pin Type	Function	Pin
SAR2	Analog Input	SAR Low Speed ADC Input 2	49
SAR1	Analog Input	SAR Low Speed ADC Input 1	48
SAR0	Analog Input	SAR Low Speed ADC Input 0	47
SCK	Output	SPI Interface Sampling Clock	52
SDI	Output	SPI Interface Data-In	53
SDO	Input w/ 5V-tolerant	SPI Interface Data-Out	54
CSN	Output	SPI Interface Chip Select	55
GPIO_P00-GPIO_P06	I/O w/ 5V-tolerant	General Purpose Input/Output; 4mA driving	58-64

Pin Name	Pin Type	Function	Pin
		strength	

GPIO_P10-GPIO_P13	I/O w/ 5V-tolerant	General Purpose Input/Output; 4mA driving strength	73-76
INT	Input	Interrupt Input for IR Receiver	65
SDA	I/O w/ 5V-tolerant	3-Wire Serial Bus Data	66
SCL	Input w/ 5V-tolerant	3-Wire Serial Bus Clock	67
POWER_ON_RSTN/ CS	Input w/ 5V-tolerant	Power On Reset Signal/Chip Selection for 3-wire Serial	68
GPIO_P07	I/O w/ 5V-tolerant	General Purpose Input/Output; 4mA driving strength	83

Digital PWM Interface

Pin Name	Pin Type	Function	Pin
Q1	Output	DPWM Output 1	36
Q2	Output	DPWM Output 2	35
FB1_DPWM	Analog Input	Input for 1st Feedback Loop	30
FB2_DPWM	Analog Input	Input for 2nd Feedback Loop	29
FAULTZ	Analog Input	Fault Detection (Low Enable)	28
VIN	Analog Input	System Input Voltage Detection	27

Misc. Interface

Pin Name	Pin Type	Function	Pin
RESET	Schmitt Trigger Input w/ 5V-tolerant	Hardware Reset; active high	72
XIN	Analog Input	Crystal Oscillator Input	123
XOUT	Analog Output	Crystal Oscillator Output	122
GPIO_P24/PWMD3	Output	General Purpose Input/Output; 4mA driving strength/ Pulse Width Modulation Output; 4mA driving strength	56
GPIO_P25/PWMD4	Output	General Purpose Input/Output; 4mA driving strength/ Pulse Width Modulation Output; 4mA driving strength	57
PWMD2	Output	Pulse Width Modulation Output; 4mA driving strength	70
PWMD1	Output	Pulse Width Modulation Output; 4mA driving strength	71
INT_OUT	Output	Mode Detection Interrupt Output	102

ROM_EN	Input	Internal ROM Enable. 0: Disable. 1: Enable.	112
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Power Pins

Pin Name	Pin Type	Function	Pin
AVDD_ADC	2.5V Power	ADC Power	5, 13
AVDD_GMC	5V Power	GMC Power	26
AVDD_SAR	2.5V/5V Power	SAR Power	31
AVDD_DPWM	5V Power	DPWM Power	34
AVDD_PWM	5V Power	PWM Power	38
AVDD_OPLL	2.5V Power	OPLL Power	116
AVDD_DAC	5V Power	Voltage DAC Power	119
AVDD_XTAL	5V Power	XTAL Power	120
AVDD_MPLL	2.5V Power	MPLL Power	127
VDDC	2.5V Power	Digital Core Power	50, 113
VDDP	3.3V/5V Power	Digital Input/Output Power	46, 82, 100
AVSS_SAR	Ground	SAR Ground	32
AVSS_DPWM	Ground	DPWM Ground	33
GND	Ground	Ground	1, 37, 51, 69, 81, 101, 114, 115, 121, 126, 128

3.5.9 function introduction to CD4052

1. Description

The CD4052B analog multiplexers is digitally-controlled analog switches having low ON impedance and very low OFF leakage current. Control of analog signals up to 20VP-P can be achieved by digital signal amplitudes of 4.5V to 20V (if VDD-VSS = 3V, a VDD-VEE of up to 13V can be controlled; for VDD-VEE level differences above 13V, a VDD-VSS of at least 4.5V is required). For example, if VDD = +4.5V, VSS = 0V, and VEE = -13.5V, analog signals from -13.5V to +4.5V can be controlled by digital inputs of 0V to 5V. These multiplexer circuits dissipate extremely low quiescent power over the full VDD-VSS and VDD-VEE supply-voltage ranges, independent of the logic state of the control signals. When a logic “1” is present at the inhibit input terminal, all channels are off.

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

analog inputs to the outputs.

2. FEATURES

- ◆ Wide Range of Digital and Analog Signal Levels

Digital : 3V to 20V

Analog: $\leq 20V_{P-P}$

- ◆ Low ON Resistance, 125 Ω (Typ) Over 15V $_{P-P}$ Signal Input Range for $V_{DD}-V_{EE} = 18V$
- ◆ High OFF Resistance, Channel Leakage of $\pm 100pA$ (Typ) at $V_{DD}-V_{EE} = 18V$
- ◆ Logic-Level Conversion for Digital Addressing Signals of 3V to 20V ($V_{DD}-V_{SS} = 3V$ to 20V) to Switch Analog Signals to 20V $_{P-P}$ ($V_{DD}-V_{EE} = 20V$)
- ◆ Matched Switch Characteristics, $r_{ON} = 5\Omega$ (Typ) for $V_{DD}-V_{EE} = 15V$
- ◆ Very Low Quiescent Power Dissipation Under All Digital-Control Input and Supply Conditions, 0.2mW (Typ) at $V_{DD}-V_{SS} = V_{DD}-V_{EE} = 10V$
- ◆ Binary Address Decoding on Chip
- ◆ 5V, 10V and 15V Parametric Ratings
- ◆ 10% Tested for Quiescent Current at 20V
- ◆ Maximum Input Current of 1mA at 18V Over Full Package Temperature Range, 100nA at 18V and 25 $^{\circ}C$
- ◆ Break-Before-Make Switching Eliminates Channel Overlap

3. Pin Definitions

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

3.5.10 function introduction to BA7644

The BA7644AN is a four-channel analog multiplexer with mute, designed for use in video cassette recorders. It features a wide dynamic range, and wide operating frequency range, and is suitable for switching audio and video signals.

Features

- 1) 4-input / 1-output switches.
- 2) Built-in mute.
- 3) Wide operating supply voltage range (4.5V to 13.0V).
- 4) Low power consumption (48mW Typ.).
- 5) Excellent frequency characteristics(10MHz, 0dB Typ.).
- 6) Wide dynamic range (3.5VP-P Typ.).
- 7) High input impedance (20k Ω Typ.).
- 8) Low interchannel crosstalk(– 65dB Typ., f = 4.43MHz).

Truth table

CTL(PIN2)	CTL(PIN3)	CTL(PIN5)	OUT(PIN10)
L	L	L	IN1(PIN1)
L	H	L	IN2(PIN4)
H	L	L	IN3(PIN6)
H	H	L	IN4(PIN8)
*	*	H	MUTE

3.5.11 function introduction to APA2068

General Description

APA2068 is a monolithic integrated circuit, which provides precise DC volume control, and a stereo bridged audio power amplifiers capable of producing 2.6W (1.8W) into 4 Ω with less than 10% (1.0%)THD+N. The attenuator range of the volume control in APA2068 is from 20dB (DC_Vol=0V) to -80dB (DC_Vol=3.54V) with 32 steps. The advantage of internal gain setting can be less components and PCB area. Both of the depop circuitry and the thermal shutdown protection circuitry are integrated in APA2068, that reduce pops and clicks noise during power up or shutdown mode operation. It also improves the power off pop noise and protects the chip from being destroyed by over temperature and short current failure. To simplify the audio system design, APA2068 combines a stereo bridge-tied loads (BTL) mode for speaker drive and a stereo single-end (SE) mode for headphone drive into a single chip, where both modes are easily switched by the SE/BTL input control pin signal.

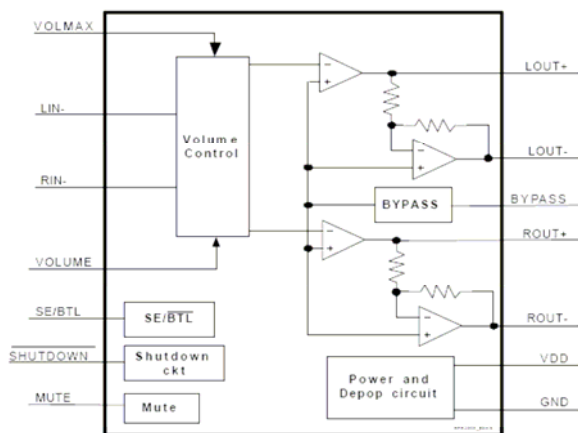
Features

- Low Operating Current with 9mA
- Improved Depop Circuitry to Eliminate Turn-on and Turn-off Transients in Outputs
- High PSRR
- 32 Steps Volume Adjustable by DC Voltage with

Hysteresis

- 2.6W per Channel Output Power into 4Ω Load at 5V,BTL Mode
- Two Output Modes Allowable with BTL and SE Modes Selected by SE/BTL pin
- Low Current Consumption in Shutdown Mode (1μA)
- Short Circuit Protection
- Thermal shutdown protection and over current protection circuitry
- Maximum Output Swing Clamping Function
- SOP-16-P Packages with Thermal Pad Package
- Lead Free Available (RoHS Compliant)

Block Diagram



Pin		Config	Function Description
No.	Name		
1	MUTE	I	Mute control signal input, hold low for normal operation, hold high to mute.
2	SHUTDOWN	I	It will be into shutdown mode when pull low. ISD = 1mA
3	RIN-	I	Right channel input terminal
4	BYPASS	I	Bias voltage generator
5,12	GND	-	Ground connection, Connected to thermal pad.
6	LIN-	I	Left channel input terminal
7	VOLUME	I	Input signal for internal volume gain setting.
8	VOLMAX	I	Setting the maximum output swing. Input a non-zero voltage

			(VC) to this pin, the output voltage swing will be clamped between VOH (the maximum positive value) -VC & VOL (the minimum negative value) + VC. Disable this function when tie this pin to GND. Maximum input voltage $\leq 1/2 VDD$.
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9	LOUT-	O	Left channel positive output in BTL mode and SE mode.
10,15	VDD	-	Supply voltage
11	LOUT+	O	Left channel negative output in BTL mode and high impedance in SE mode.
13	SE/BTL	I	Output mode control input, high for SE output mode and low for BTL mode.
14	ROUT+	O	Right channel negative output in BTL mode and high impedance in SE mode.
16	ROUT-	O	Right channel positive output in BTL mode and SE mode.

3.5.12 function introduction to AIC1899

FEATURES

- ☞ Fixed Frequency 1.2MHz Current-Mode PWM Operation.
- ☞ Adjustable Output Voltage up to 30V.
- ☞ 2.5V to 5.5V Input Range.
- ☞ Maximum 0.1μA Shutdown Current.
- ☞ Programmable Soft-Start.
- ☞ Tiny Inductor and Capacitors are allowed.
- ☞ Space-Saving SOT-23-6 Package.

DESCRIPTION The current-mode pulse-width modulation, AIC1899, step up converter is designed for MP3 player. The built-in high voltage N-channel MOSFET allows AIC1899 for step-up applications with up to 30V output voltage, and other low-side switching DC/DC converter.

The high switching frequency allows the use of small external components. The Soft-Start function is programmable with an external capacitor, which sets the input current ramp rate.

3.5.13 function introduction to Pm25LV020

PIN DESCRIPTIONS

SYMBOL	TYPE	DESCRIPTION
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CE#	INPUT	Chip Enable: CE# goes low activates the devices internal circuitries for device operation. CE# goes high deselects the devices and switches into standby mode to reduce the power consumption. When the devices are not selected, data will not be accepted via the serial input pin (SI), and the serial output pin (SO) will remain in a high impedance state.
SCK	INPUT	Serial Data Clock
SI	INPUT	Serial Data Input
SO	OUTPUT	Serial Data Output
GND		Ground
Vcc		Device Power Supply
WP#	INPUT	Write Protect: A hardware program/erase protection for all or partial of memory array. When the WP# pin is pulled to low, whole or partial of memory array is write protected depends on the setting of BP2, BP1 and BP0 bits in the Status Register. When the WP# is pulled high, the devices are not write protected.
HOLD#	INPUT	Hold: Pause serial communication with the master device without resetting the serial sequence.

3.5.14 function introduction to TDA9886

FEATURES

5 V supply voltage

- Gain controlled wide-band Vision Intermediate

Frequency (VIF) amplifier, AC-coupled

- Multistandard true synchronous demodulation with active carrier regeneration: very linear demodulation, good intermodulation figures, reduced harmonics, and excellent pulse response
- Gated phase detector for L and L-accent standard
- Fully integrated VIF Voltage Controlled Oscillator (VCO), alignment-free, frequencies switchable for all negative and positive modulated standards via I2C-bus
- Digital acquisition help, VIF frequencies of 33.4, 33.9, 38.0, 38.9, 45.75, and 58.75 MHz
- 4 MHz reference frequency input: signal from Phase-Locked Loop (PLL) tuning system or operating as crystal oscillator

- VIF Automatic Gain Control (AGC) detector for gain control, operating as peak sync detector for negative modulated signals and as a peak white detector for positive modulated signals
- External AGC setting via pin OP1
- Precise fully digital Automatic Frequency Control (AFC) detector with 4-bit digital-to-analog converter, AFC bits readable via I2C-bus
- TakeOver Point (TOP) adjustable via I2C-bus or alternatively with potentiometer
- Fully integrated sound carrier trap for 4.5, 5.5, 6.0, and 6.5 MHz, controlled by FM-PLL oscillator
- Sound IF (SIF) input for single reference Quasi Split Sound (QSS) mode, PLL controlled
- SIF-AGC for gain controlled SIF amplifier, single reference QSS mixer able to operate in high performance single reference QSS mode and in intercarrier mode, switchable via I2C-bus
- AM demodulator without extra reference circuit
- Alignment-free selective FM-PLL demodulator with high linearity and low noise
- Four selectable I2C-bus addresses
- I2C-bus control for all functions
- I2C-bus transceiver with pin programmable Module Address (MAD).

2 GENERAL DESCRIPTION

The TDA9885 is an alignment-free multistandard (PAL and NTSC) vision and sound IF signal PLL demodulator for negative modulation only and FM processing. The TDA9886 is an alignment-free multistandard (PAL, SECAM and NTSC) vision and sound IF signal PLL demodulator for positive and negative modulation, including sound AM and FM processing.

SYMBOL	PIN	DESCRIPTION
VIF1	1	VIF differential input 1
VIF2	2	VIF differential input 2
n.c.	-	not connected
OP1	3	output port 1; open-collector

FMPLL	4	FM-PLL for loop filter
DEEM	5	de-emphasis output for capacitor
AFD	6	AF decoupling input for capacitor
DGND	7	digital ground
n.c.	-	not connected
AUD	8	audio output
TOP	9	tuner AGC TakeOver Point (TOP) for resistor adjustment
SDA	10	I2C-bus data input and output
SCL	11	I2C-bus clock input
SIOMAD	12	sound intercarrier output and MAD select with resistor
n.c.	-	not connected
n.c.	13	not connected
n.c.	-	not connected
TAGC	14	tuner AGC output
REF	15	4 MHz crystal or reference signal input
VAGC	16	VIF-AGC for capacitor
n.c.	-	not connected
CVBS	17	composite video output
n.c.	-	not connected
AGND	18	analog ground
VPLL	19	VIF-PLL for loop filter
VP	20	supply voltage
AFC	21	AFC output
OP2	22	output port 2; open-collector
n.c.	-	not connected
SIF1	23	SIF differential input 1 and MAD select with resistor
SIF2	24	SIF differential input 2 and MAD select with resistor
n.c.	-	not connected
n.c.	-	not connected

3.5.15 function introduction to MT8606

MediaTek MT8606 is a high performance transport stream receiver and provides flexible and various interface to connect with MediaTek existing product. The MT8606 can easily companion with

DVD player/recorder (MT1389/MT8108) single chip to extend the player/recorder system to player/recorder + STB or DTV receiver combo system.

The MT8606 can receive all kinds of transport interface such as DVB, ATSC and ISDN, and perform PID filtering. By simple transport interface translation, the STB + DVD player/recorder solution has the flexibility to get any PID packets as your requirement, including PSI, audio, video bit stream, etc.

Key Features

Support 1 transport stream input

Support parallel or serial transport interface

Support DVB, ATSC, ISDN and MPEG2 transport stream

Flexible sync detection

Flexible PID filters

Flexible section filters

Support PWM output with VCXO for clock recovery

Flexible transport packet DMA interface (Card Interface)

Embedded RTC

Pin Definitions

Pin	Main	Alt.	Type	Description
General Power/Ground (9)				
19, 43, 51	DVDD18		Power	1.8V power pin for internal digital circuitry
1, 32	DVSS		Ground	1.8V ground pin for internal digital circuitry
12, 40	DVDD33		Power	3.3V power pin for internal digital circuitry
26, 58	DVSS		Ground	3.3V ground pin for internal digital circuitry
Compact Flash Interface (23)				
20	CFIDD15	GPIO15	Inout 2MA~8MA, SR PPU, SMT	1) CF data bus bit 15 2) General purpose IO 15
22	CFIDD14	GPIO14 GSIDVALID1	Inout 2MA~8MA, SR PPU, SMT	1) CF data bus bit 14 2) General purpose IO 14 3) General serial interface port 1 data valid
24	CFIDD13	GPIO13	Inout 2MA~8MA, SR	1) CF data bus bit 13 2) General purpose IO 13

			PPU, SMT	
27	CFIDD12	GPIO12	Inout 2MA~8MA, SR PPU, SMT	1) CF data bus bit 12 2) General purpose IO 12
29	CFIDD11	GPIO11	Inout 2MA~8MA, SR PPU, SMT	1) CF data bus bit 11 2) General purpose IO 11
2	CFIDD10	GPIO10	Inout 2MA~8MA, SR PPU, SMT	1) CF data bus bit 10 2) General purpose IO 10

9	CFIDD9	GPIO9 GSIDATA3	Inout 2MA~8MA, SR PPU, SMT	1) CF data bus bit 9 2) General purpose IO 9 3) General serial interface port 3 data
4	CFIDD8	GPIO8	Inout 2MA~8MA, SR PPU, SMT	1) CF data bus bit 8 2) General purpose IO 8
21	CFIDD7	GPIO7 GSICLK1	Inout 2MA~8MA, SR SMT	1) CF data bus bit 7 2) General purpose IO 7 3) General serial interface port 1 clock
23	CFIDD6	GPIO6 GSIDATA1	Inout 2MA~8MA, SR PPU, SMT	1) CF data bus bit 6 2) General purpose IO 6 3) General serial interface port 1 data
25	CFIDD5	GPIO5	Inout 2MA~8MA, SR PPU, SMT	1) CF data bus bit 5 2) General purpose IO 5
28	CFIDD4	GPIO4	Inout 2MA~8MA, SR PPU, SMT	1) CF data bus bit 4 2) General purpose IO 4
30	CFIDD3	GPIO3	Inout 2MA~8MA, SR PPU, SMT	1) CF data bus bit 3 2) General purpose IO 3

10	CFIDD2	GPIO2	Inout 2MA~8MA, SR PPU, SMT	1) CF data bus bit 2 2) General purpose IO 2
8	CFIDD1	GPIO1 GSIDVALID3	Inout 2MA~8MA, SR PPU, SMT	1) CF data bus bit 1 2) General purpose IO 1 3) General serial interface port 3 data valid
5	CFIDD0	GPIO0	Inout 2MA~8MA, SR PPU, SMT	1) CF data bus bit 0 2) General purpose IO 0
18	CFICS0#	GPIO16	Inout 2MA, SR PP, SMT	1) CF chip select 0 2) General purpose IO 16
7	CFIDA2	GPIO20 GSICLK3	Inout 2MA, SR PP, SMT	1) CF device address bit 2 2) General purpose IO 20 3) General serial interface port 3 clock
6	CFIDA1	GPIO19	Inout 2MA, SR PP, SMT	1) CF device address bit 1 2) General purpose IO 19
3	CFIDA0	GPIO18	Inout 2MA, SR PP, SMT	1) CF device address bit 0 2) General purpose IO 18

16	CFIDIOR#	GPIO21	Inout 2MA, SR	1) CF I/O read 2) General purpose IO 17
15	CFIDIOW#	GPIO22	Inout 2MA, SR	1) CF I/O write 2) General purpose IO 22
11	CFIORDY	GPIO25	Inout 2MA~8MA, SR	1) CF I/O ready 2) General purpose IO 25
TS Interface (12)				

57	TSDATA7		Input SR	Transport interface data bit 7
59	TSDATA6		Input SR	Transport interface data bit 6
56	TSDATA5		Input SR	Transport interface data bit 5
60	TSDATA4		Input SR	Transport interface data bit 4
55	TSDATA3		Input SR	Transport interface data bit 3
61	TSDATA2		Input SR	Transport interface data bit 2
54	TSDATA1		Input SR	Transport interface data bit 1
62	TSDATA0		Input SR	Transport interface data bit 0
52	TSPSYNC		Input SR	Transport interface sync signal
63	TSDVALID		Input SR	Transport interface data valid
53	TSCLK		Input SR SMT	Transport interface clock
64	TSERROR	GPIO23	Inout 2MA, SR	1) Transport interface error flag 2) General purpose IO 23
Security Digital Interface (6)				
47	SDICLK	GPIO31	Inout 2MA, SR SMT	1) SD clock 2) General purpose IO 31
49	SDIDAT3	GPIO30	Inout 2MA~8MA, SR PPU, SMT	1) SD data line bit 3 2) General purpose IO 30

50	SDIDAT2	GPIO29	Inout 2MA~8MA, SR PPU, SMT	1) SD data line bit 2 2) General purpose IO 29

45	SDIDAT1	GPIO28	Inout 2MA~8MA, SR PPU, SMT	1) SD data line bit 1 2) General purpose IO 28
46	SDIDAT0	GPIO27	Inout 2MA~8MA, SR PPU, SMT	1) SD data line bit 0 2) General purpose IO 27
48	SDICMD	GPIO26	Inout 2MA~8MA, SR PPU, SMT	1) SD Command/Response 2) General purpose IO 26
MISC (10)				
38	PRST#		Input SR PU, SMT	Power on reset input, active low
39	XCLK27		Input SR SMT	27MHz clock in
13	IRESET#		Input SR SMT	CFI/SDI reset
14	INTRQ		Output 2MA~8MA, SR SMT	CFI/SDI interrupt request
44	PWM	GPIO32	Inout 2MA~4MA, SR	1) PWM output

				2) General purpose IO 32
17	GPIO17		Inout 2MA, SR	General purpose IO 17
41	GPIO33	GSIDVALID2	Inout 2MA~4MA, SR	1) General purpose IO 33 2) General serial interface port 2 data valid
42	GPIO34	GSICLK2	Inout 2MA~4MA, SR	1) General purpose IO 34 2) General serial interface port 2 clock
31	GPO35	TRAP0	Inout 2MA, SR	1) General purpose output 35 2) Power on: Hardware trap bit 0
37	GPO36	TRAP1 GSIDATA2	Inout 2MA, SR	1) General purpose output 36 2) Power on: Hardware trap bit 1 3) General serial interface port 2 data

RTC (4)				
33	VSSAUX		Ground	1.8V ground pin for RTC circuitry
36	VDDAUX		Power	1.8V power pin for RTC circuitry
34	RTCXI		Input	RTC crystal in
35	RTCXO		Output	RTC crystal out

3.5.16 function introduction to DIB3000P

Description

The DiBcom *DIB3000-P* 2k/8k COFDM demodulator Integrated Circuit (IC) uses the most recent state of the art in Signal Processing to offer high performance for portable and fixed reception of Digital Terrestrial Television signals compliant The *DIB3000-P* performs all the processing from sampling analog IF input signal to MPEG2output. It offers very robust algorithms that allows the demodulator to synchronize and extract the TPS parameters even with $aC/N(dB) = 0$ dB. (usage for antenna positioning) Dual AGC control IF/RF is implemented in order to offer very high dynamic range control through digital. In addition the gain slopes of IF and RF amplifiers are digitally compensated to ensure an AGC loop linear behavior. (usage for portability and mobility) A digital filter with high rejection capability is added to cope with adjacent channels. Combined with the interpolation function it allows the circuit to demodulate 8, 7 or 6 MHz channels without changing the analog front-end(same tuner, crystal and 8 MHz Saw filter). The *DIB3000-P* is able to recover up to +/- 350 KHz frequency offset which contributes to reduce the scanning time. A special fast hardware control is implemented for scanning. Specific functionalities are implemented to give optimized performance in portable

environments: Dynamic FFT window positioning gives the circuit the ability to track any change in the channel profile (with post or pre echoes) on a symbol per symbol basis. The positioning is optimal even with echoes with a delay higher than guard interval. Accurate channel estimation for low Doppler frequency; up to 20 Hz for 8K modes. Diversity combining of several circuits is offered by the *DIB3000-P*. A proprietary patent makes the connection of the different circuits together very simple. Configuration and monitoring of the circuit is done using a serial bus. The high monitoring capability provides: channel profile, MER, C/N after demodulation per carrier or global, the channel complex transfer function, Co-Channel Interference Power Spectrum Density, BER and PER (Packet Error Rate), . Designed in advanced 0.18 μm and packaged in 80pin LQFP, the DIB3000-P operates at ,commercial temperatures.

[DIB3000P.pdf](#)

Pins Description

The table hereafter describes the different pins of the circuit. Some of the pins have two or three different outputs depending on the selected (by I2C) configuration. For this reason some of the pin numbers may appear at different places in the table.

Name	Pin N°	Function	Type	Voltage	I/O	Load	Drive
Clock generation							
VDDAPLL	79	PLL Analog power supply	Analog Power Supply	1,8V	Power		
VSSAPLL	80	PLL Analog power supply	Analog Power Supply	0V	Power		
VDDPLL	1	PLL Digital Core power supply	Power Supply	1,8V	Power		
VSSPLL	2	PLL Digital power supply	Power Supply	0V	Power		
VSSXO	3	Crystal Oscillator Power	IO Power Supply	0V	Power		
VSSXI	4	Crystal Oscillator Power	Core Power Supply	0V	Power		
XOUT	5	Crystal Oscillator Output	1.8V Crystal oscillator	1,8 V to VDDI max	Output	Cin = 6,11 pF	
XIN	6	Crystal Oscillator Input. A fundamental crystal oscillator (20-30 MHz) is connected between XIN and XOUT	1.8V Crystal oscillator	1,8 V to VDDO max	Input	Cin = 6,7 pF	
VDDXO	7	Crystal Oscillator Power	IO Power Supply	3.3V	Power		
VDDXI	8	Crystal Oscillator Power	Core Power Supply	1,8V	Power		
I_CLKSEL	12	External XO Clock select. When set to '1' it selects the IO_CLK as a clock input, otherwise the Crystal oscillator is used.	CMOS / LVTTTL	3,3V/5V Tolerant	Input	Cin = 5.38 pF	
IO_CLK	14	<ul style="list-style-type: none"> When I_CLKSEL = '1' this pin inputs the clock fed by an external oscillator When I_CLKSEL='0' this pin outputs the Crystal clock or the reference clock of the circuit. 	CMOS / LVTTTL	3,3V/5V Tolerant	Input / Output / High Z	Cin = 5,80 pF	Ioh = -20 mA Iol = 16 mA

Name	Pin N°	Function	Type	Voltage	I/O	Load	Drive
Internal ADC							
AD_DVDD18	67	ADC Digital Core power supply	Core Power Supply	1.8V	Power		
AD_DVSS	68	ADC Digital Core power supply	Core Power Supply	0V	Power		
AD_DVDD33	69	ADC Digital Core power supply	Core Power Supply	3.3V	Power		
AD_VDD33	70	ADC PAD (IO) power supply	IO Power Supply	3.3V	Power		
AD_VREFP	71	Differential voltage reference - positive	Analog internal reference		Output	Capacitance for noise Decoupling	
AD_VCM	72	Voltage command mode - Voltage Pull Up to AD_VINN – AD_VINP	Analog	Typical AD_VDD3.3/2	Output	Capacitance for noise Decoupling	
AD_VREFN	73	Differential voltage reference - negative	Analog internal reference		Output	Capacitance for noise Decoupling	
AD_VDD18	74	ADC PAD (IO) power supply	IO Power Supply	1.8V	Power		
AD_VINP	75	Differential analog input - positive	Analog signal BW=50 MHz	1 Vpp Max	Input	Cin = 5 pF	
AD_VINN	76	Differential analog input - negative	Analog signal BW=50 MHz	1 Vpp Max	Input	Cin = 5 pF	
AD_AVDD33	77	ADC ANALOG power supply	Analog Power Supply	3.3V	Power		
AD_AVSS	78	ADC ANALOG power supply	Analog Power Supply	0V	Power		
AGC Interface							
O_AGC1	63	Pulse Width Modulation AGC control signal. A tristate signal to accommodate the AGC voltage control range	CMOS / LVTLL tristate	3,3V / 5V tolerant	Output		Ioh = -20 mA Iol = 16 mA
O_AGC2	64	Pulse Width Modulation AGC control signal. A tristate signal to accommodate the AGC voltage control range	CMOS / LVTLL tristate	3,3V / 5V tolerant	Output		Ioh = -20 mA Iol = 16 mA

Name	Pin N°	Function	Type	Voltage	I/O	Load	Drive
Configuration / Monitoring							
I_RESETN	31	Asynchronous reset (active low)	CMOS / LVTTTL	3,3V / 5V tolerant	Input	Cin = 5.38 pF	
I_PWRDW	32	Power down activation (active when set to '1'). Must be set to 0 for normal operation	CMOS / LVTTTL	3,3V / 5V tolerant	Input	Cin = 5.38 pF	
IO_SDA ^e	33	I2C data	CMOS / LVTTTL tristate	3,3V / 5V tolerant	Input / Output / high Z	Cin = 5.80 pF	Ioh = -20 mA Iol = 16 mA
I_SCL	34	I2C clock	CMOS / LVTTTL	3,3V / 5V tolerant	Input	Cin = 5.38 pF	
I_TESTMODE	35	Test mode. Must be set to 0 for normal operation.	CMOS / LVTTTL	3,3V / 5V tolerant	Input	Cin = 5.38 pF	
O_TUNSCL	57	Tuner I2C SCL	CMOS / LVTTTL tristate	3,3V / 5V tolerant	Output		Ioh = -20 mA Iol = 16 mA
IO_TUNSDA	58	Tuner I2C SDA	CMOS / LVTTTL tristate	3,3V / 5V tolerant	Input / Output / High Z	Cin = 5.80 pF	Ioh = -20 mA Iol = 16 mA
IRQN	53 or 56	Interrupt Request (configured by I2C). This signal can be mapped to pin 53 or 56. The selection is done by I2C.	CMOS / LVTTTL tristate	3,3V / 5V tolerant	Output/ High Z		Ioh = -20 mA Iol = 16 mA
PWM	53 or 56	Provides a PWM signal based on value controlled by I2C. This signal can be mapped mapped to pin 53 or 56. The selection is done by I2C.	CMOS / LVTTTL tristate	3,3V / 5V tolerant	Output/ High Z		Ioh = -20 mA Iol = 16 mA
MPLOCK	53	Signal processing lock indicator (mask to be configured via I2C)	CMOS / LVTTTL tristate	3,3V / 5V tolerant	Output/ High Z		Ioh = -20 mA Iol = 16 mA
Slave Interface							
I_FRD	52	Request for MPEG byte active at 0.	CMOS / LVTTTL tristate	3,3V / 5V tolerant	Input	Cin = 5.80 pF	
O_MPDATA[0,7]	36, 37, 40, 41, 42, 43, 46, 47	MPEG2-TS data output	CMOS / LVTTTL tristate	3,3V / 5V tolerant	Output/ High Z		Ioh = -20 mA Iol = 16 mA
O_FF	56	Full flag: indicates that the DIB3000-M internal buffer is full	CMOS / LVTTTL tristate	3,3V / 5V tolerant	Output/ High Z		Ioh = -20 mA Iol = 16 mA
O_EF	53	Empty flag: indicates that the DIB3000-M internal buffer is empty	CMOS / LVTTTL tristate	3,3V / 5V tolerant	Output/ High Z		Ioh = -20 mA Iol = 16 mA
O_MF	50	Meduim Full: indicates that the DIB3000-M internal buffer is half full	CMOS / LVTTTL tristate	3,3V / 5V tolerant	Output/ High Z		Ioh = -20 mA Iol = 16 mA

Name	Pin N°	Function	Type	Voltage	I/O	Load	Drive
MPEG2 Output Interface							
O_MPDATA [0,7]	36, 37, 40, 41, 42, 43, 46, 47	MPEG2-TS data	CMOS / LVTTL tristate	3,3V / 5V tolerant	Output/ High Z		Ioh = -20 mA Iol = 16 mA
O_MPFRM	50	MPEG2 Frame Valid	CMOS / LVTTL tristate	3,3V / 5V tolerant	Output/ High Z		Ioh = -20 mA Iol = 16 mA
O_MPSTRT	51	MPEG2 Start	CMOS / LVTTL tristate	3,3V / 5V tolerant	Output/ High Z		Ioh = -20 mA Iol = 16 mA
O_MPCLK	52	MPEG2 Clock	CMOS / LVTTL tristate	3,3V / 5V tolerant	Output/ High Z		Ioh = -20 mA Iol = 16 mA
O_MPFAIL	56	MPEG2 frame uncorrectable	CMOS / LVTTL tristate	3,3V / 5V tolerant	Output/ High Z		Ioh = -20 mA Iol = 16 mA
Diversity Input Interface							
I_DIV_ICLK	17	Clock signal associated with I_DIV_I[0,4]	CMOS / LVTTL	3,3V / 5V tolerant	Input	Cin = 5.38 pF	
I_DIV_ISTR	18	Start signal associated with I_DIV_I[0,4]	CMOS / LVTTL	3,3V / 5V tolerant	Input	Cin = 5.38 pF	
I_DIV_IENA	19	Enable signal associated with I_DIV_I[0,4]	CMOS / LVTTL	3,3V / 5V tolerant	Input	Cin = 5.38 pF	
I_DIV_I4	22	Data Diversity Input - Bit 4	CMOS / LVTTL	3,3V / 5V tolerant	Input	Cin = 5.38 pF	
I_DIV_I3	23	Data Diversity Input - Bit 3	CMOS / LVTTL	3,3V / 5V tolerant	Input	Cin = 5.38 pF	
I_DIV_I2	24	Data Diversity Input - Bit 2	CMOS / LVTTL	3,3V / 5V tolerant	Input	Cin = 5.38 pF	
I_DIV_I1	27	Data Diversity Input - Bit 1	CMOS / LVTTL	3,3V / 5V tolerant	Input	Cin = 5.38 pF	
I_DIV_I0	28	Data Diversity Input - Bit 0	CMOS / LVTTL	3,3V / 5V tolerant	Input	Cin = 5.38 pF	

Name	Pin N°	Function	Type	Voltage	I/O	Load	Drive
Diversity Output Interface							
O_DIV_OCLK	52	Clock signal associated with O_DIV_O[0,4]	CMOS / LVTTL tristate	3,3V / 5V tolerant	Output/ High Z		Ioh = -20 mA Iol = 16 mA
O_DIV_OSTR	51	Start signal associated with O_DIV_O[0,4]	CMOS / LVTTL tristate	3,3V / 5V tolerant	Output/ High Z		Ioh = -20 mA Iol = 16 mA
O_DIV_OENA	50	Enable signal associated with O_DIV_O[0,4]	CMOS / LVTTL tristate	3,3V / 5V tolerant	Output/ High Z		Ioh = -20 mA Iol = 16 mA
O_DIV_O4	42	Data Diversity Output - Bit 4	CMOS / LVTTL tristate	3,3V / 5V tolerant	Output/ High Z		Ioh = -20 mA Iol = 16 mA
O_DIV_O3	41	Data Diversity Output - Bit 3	CMOS / LVTTL tristate	3,3V / 5V tolerant	Output/ High Z		Ioh = -20 mA Iol = 16 mA
O_DIV_O2	40	Data Diversity Output - Bit 2	CMOS / LVTTL tristate	3,3V / 5V tolerant	Output/ High Z		Ioh = -20 mA Iol = 16 mA
O_DIV_O1	37	Data Diversity Output - Bit 1	CMOS / LVTTL tristate	3,3V / 5V tolerant	Output/ High Z		Ioh = -20 mA Iol = 16 mA
O_DIV_O0	36	Data Diversity Output - Bit 0	CMOS / LVTTL tristate	3,3V / 5V tolerant	Output/ High Z		Ioh = -20 mA Iol = 16 mA
Core Power Supply VDD							
VDDI	9, 15, 20, 29, 38, 48, 54, 59, 65	+1.8 V Core Supply	Power Supply	1,8 V	Power		
Core Power Supply VSS							
VSSI	10, 16, 21, 30, 39, 49, 55, 60, 66	Ground	Power Supply	0 V	Power		
I/O Power Supply-VDD							
VDDO	11, 25, 44, 61	+ 3.3 V I/O Supply	Power Supply	3,3 V	Power		
I/O Power Supply-VSS							
VSSO	13, 26, 45, 62	Ground	Power Supply	0 V	Power		

Chapter Four

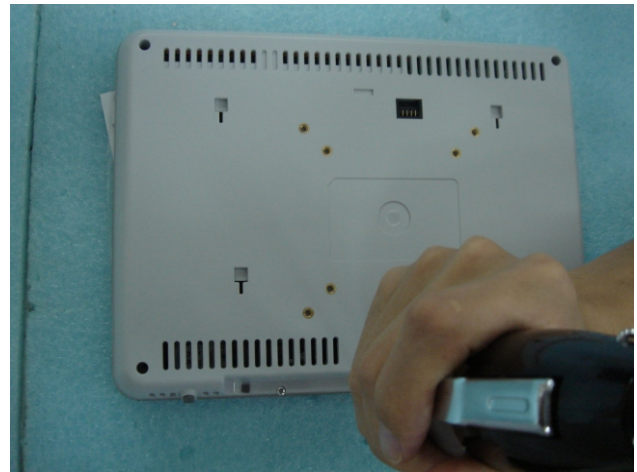
Disassembly and Assembly Process

In order to know structure of TV set LD1006TI easily, directly and quickly, pictures are adopted here to present each link of assembly and disassembly process of the player to avoid operating blindly to damage elements. Structure design of this TV set is reasonable, so please avoid striking with hard objects in actual operation to ensure each parts is not damaged.

4.1 Player disassembly process



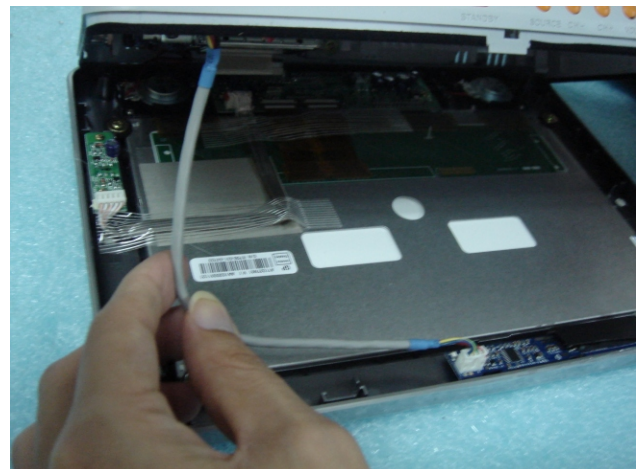
1. Put machine flatly on operation table with well protection of machine appearance.



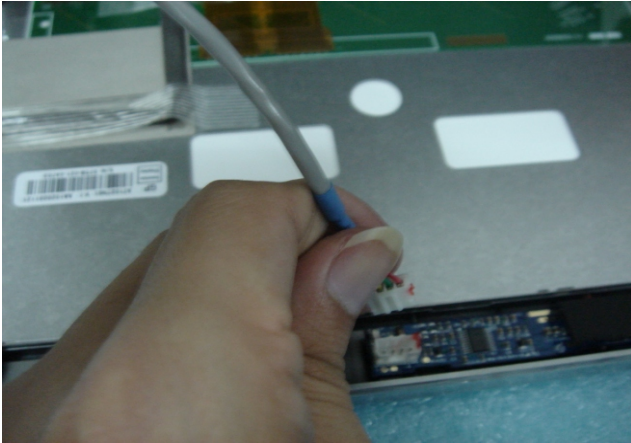
2. Use electric screwdriver to take out 6 screws for fixing machine rear cover.



3. Disassemble machine rear cover without too much force to prevent from damaging machine cover.



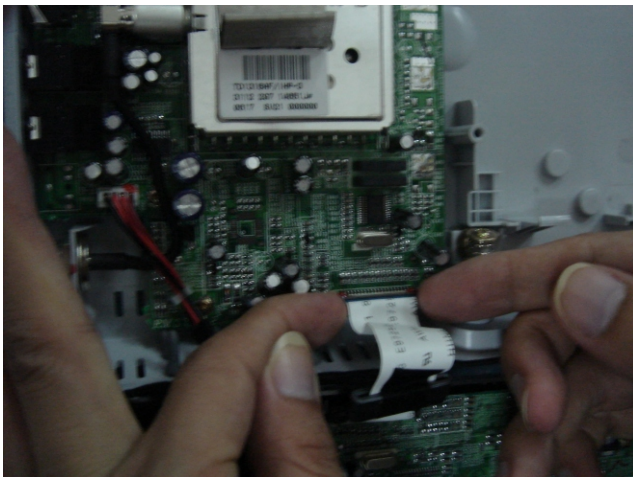
4. Tidy flat cable of boost board and take out flat cable from clasp before disassemble.



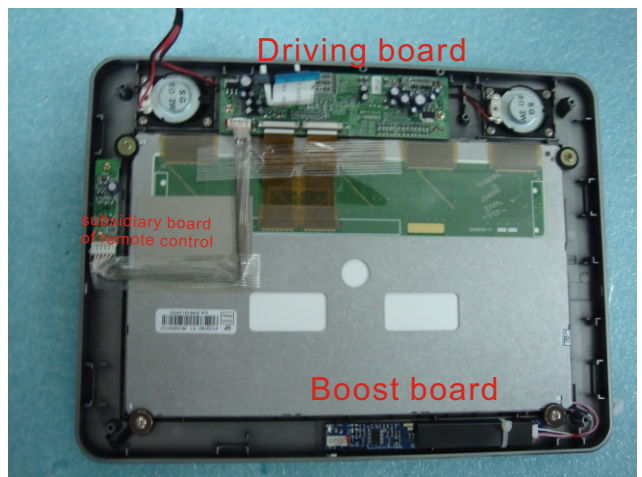
5. Take out flat cable of boost board



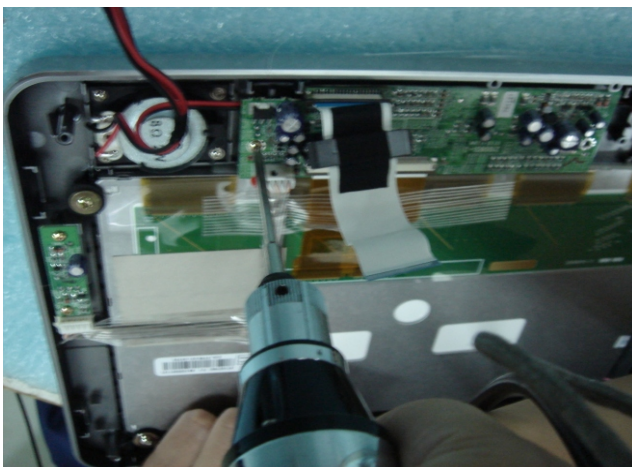
6. Put machine flatly on operation table as the picture shows
Remark.:LT1000S machine has no loader components.
LD1006SI & LD1006Ti machines have loader components.



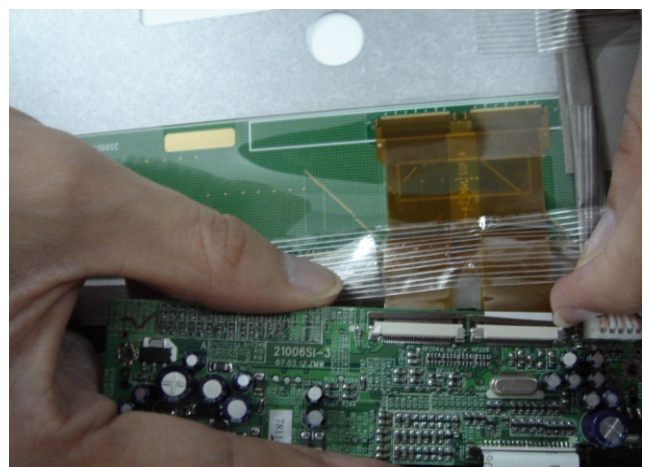
7. Take out soft cable from driving board to video main board (removed glue before taking out flat cable)



8. Plane chart of display screen component



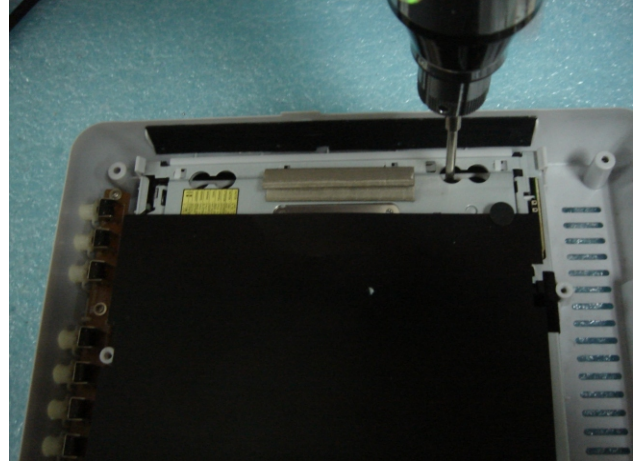
9. Disassemble screw of driving board



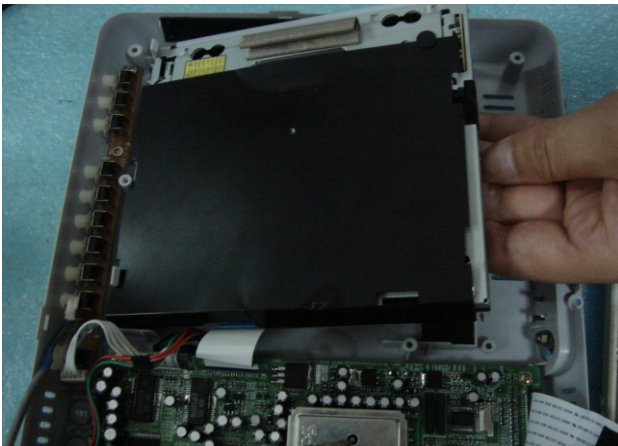
10. Take out soft flat cable of display screen component without breaking.



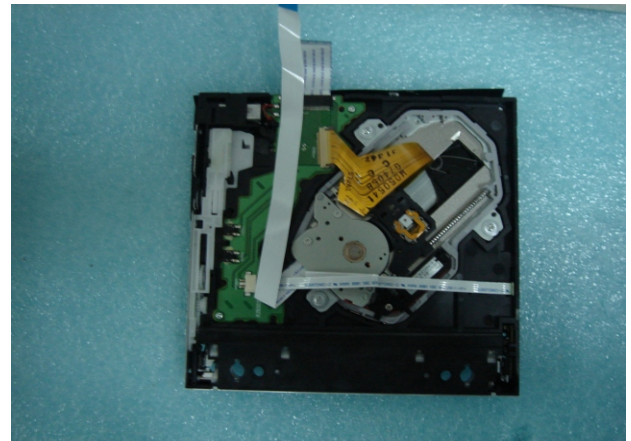
11. Disassemble display screen and other subsidiary board after remove flat cable.



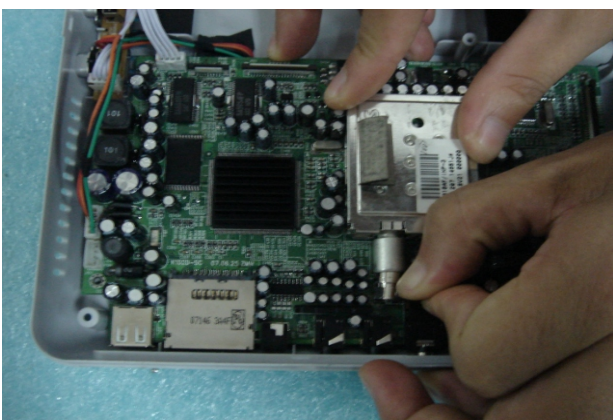
12. 5 screws of fixing loader needs to be removed if machine has DVD function. Be aware that there are two screws inside loader to fix.



13. Take out loader component (clasp should be pulled out to take out loader)



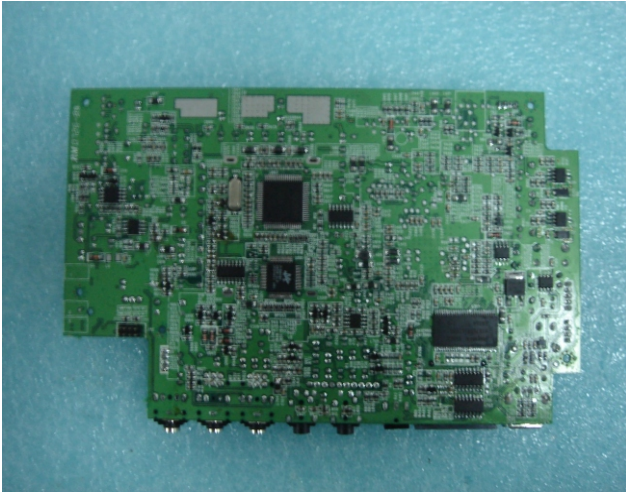
14. When replacing loader, cabling of new loader flat cable should in accordance with cabling way of taking out old loader.



14. Take out tuner antenna extending wire of video main board.



15. Take out main board screw and take out video main board.

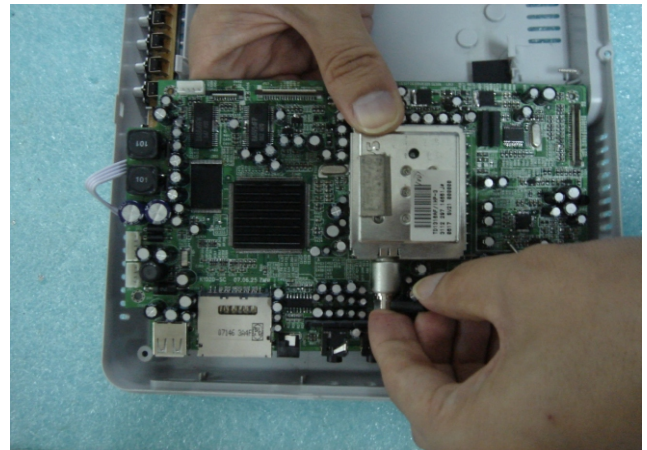


16. Bottom chart of video main board , pay attention to anti-static when taking out video main board.

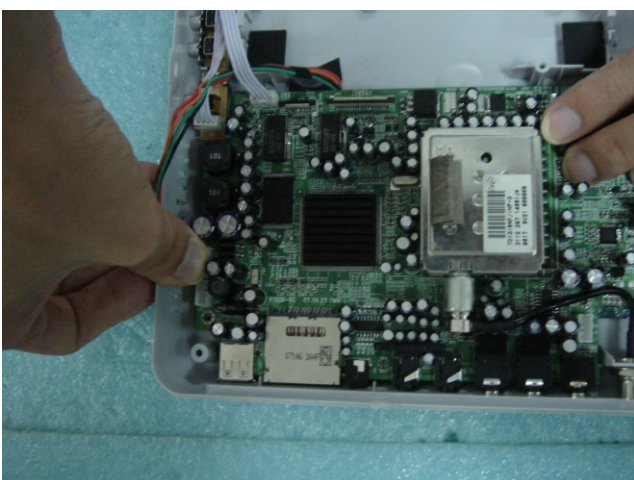
4.2 Flow chart of player assembly



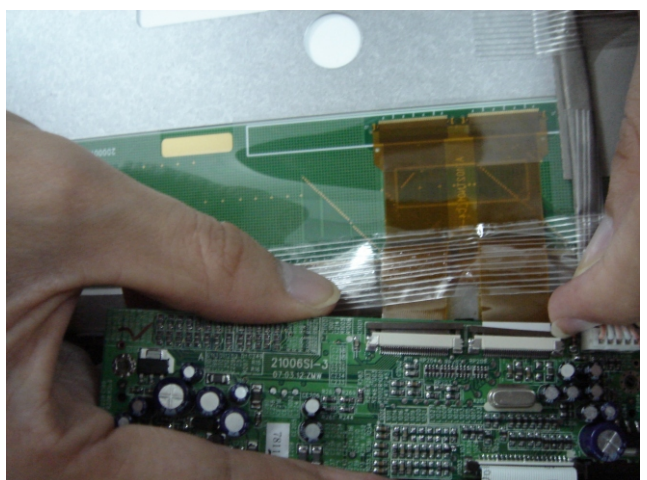
1. Install buttonboard/battery socket/antenna extending wire to bottom casing without scrap bottom casing.



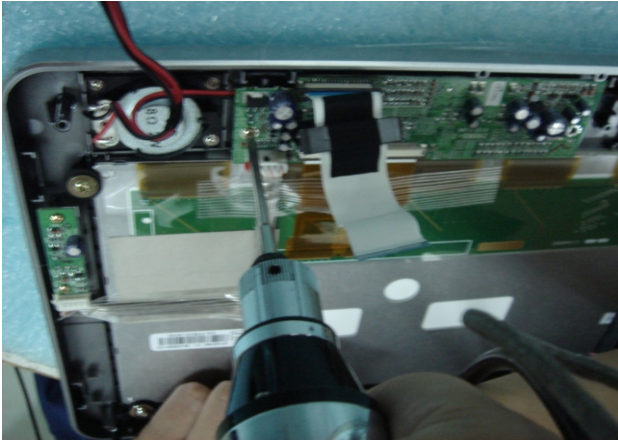
2. Fix video main board onto bottom casing, and install antenna.



3. Insert panel flat cable and battery socket flat cable, bottom component is installed.



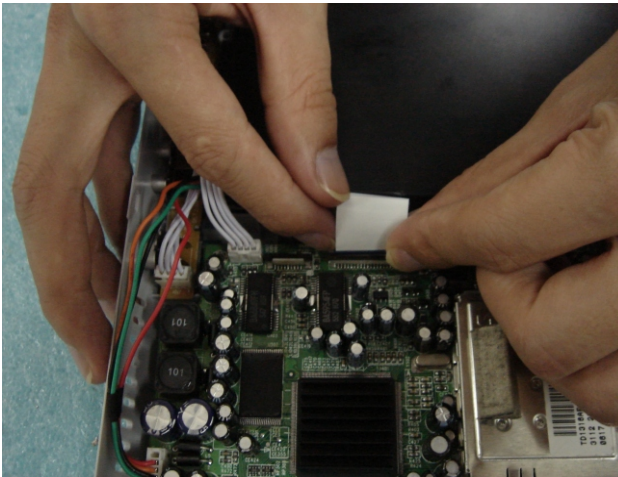
4. Insert flat cable from driving board to display screen without deflection.



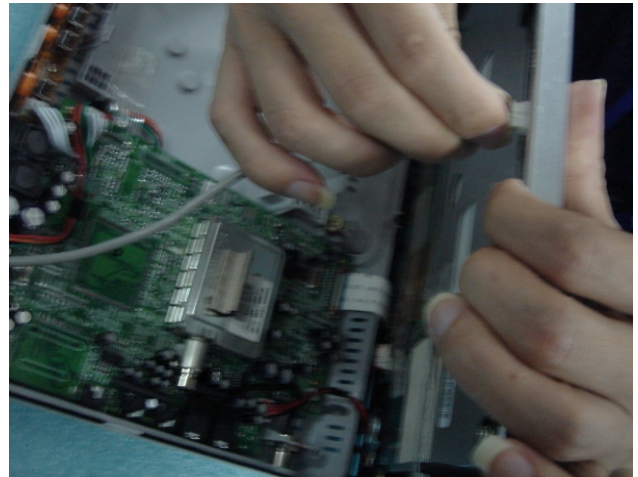
5. Use screw to fix driving board, and insert soft flat cable into extension socket (J1003) of driving board.



6. Install boost board and remote control subsidiary board in order. stick PVC piece to flat cable from driving board to remote control subsidiary board. Prevent conductive shield cloth covered outside flat cable and video main board short-circuit.



7. Insert soft flat cable on driving board to video main board J104 without deflection to prevent from damaging flat cable.



8. Insert boost board power supply flat cable, and block flat cable to slot of panel to prevent from cable trouble machine devices.



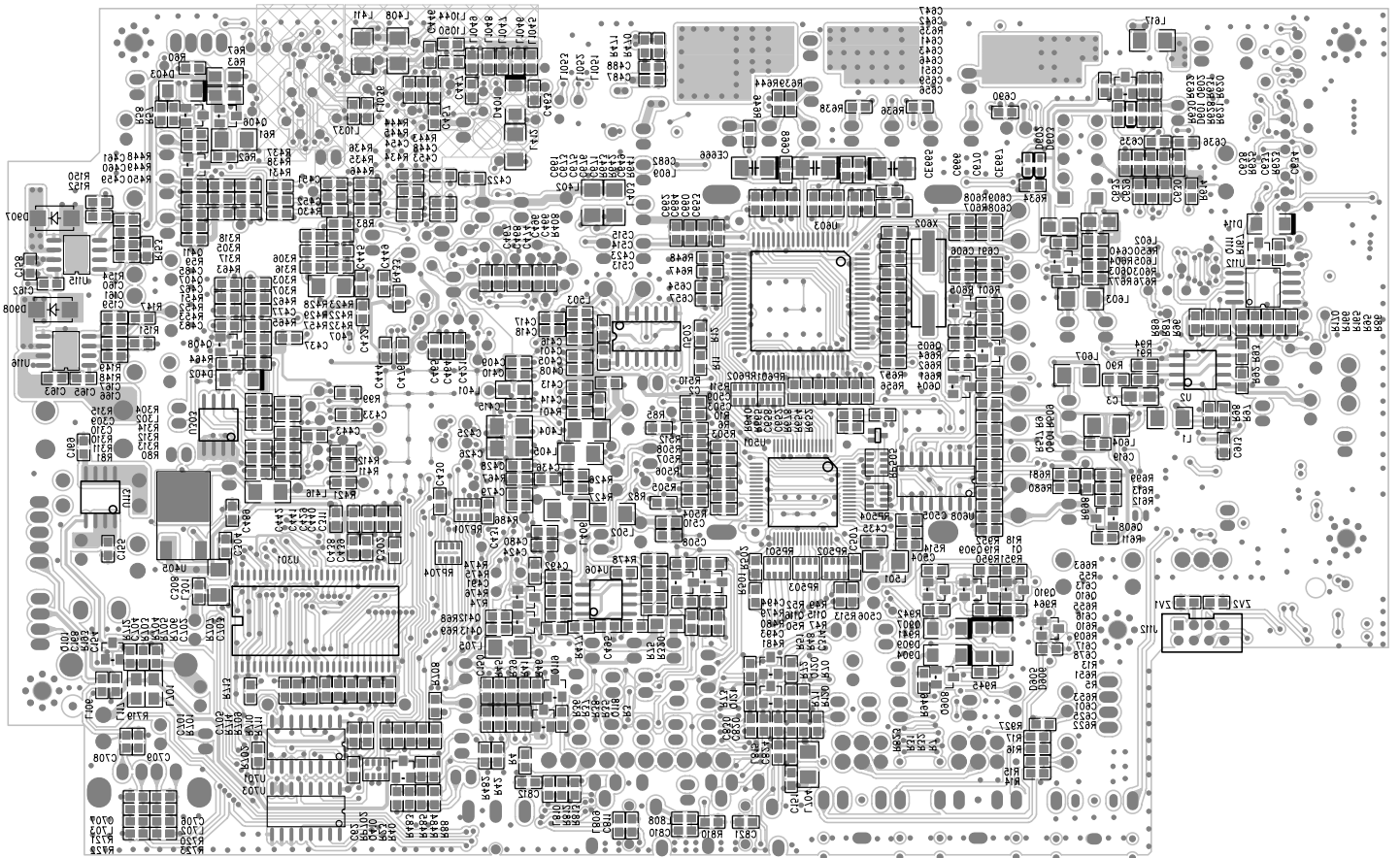
9. Close outside cover of machine, install to the just position, otherwise screws can't be fixed.

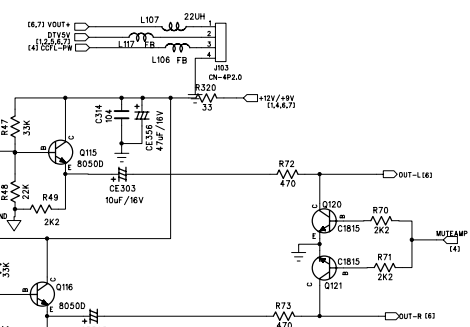
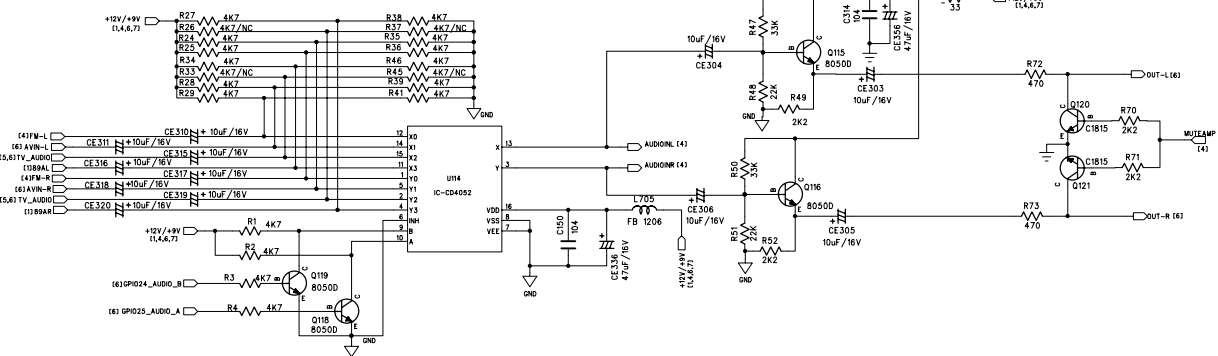


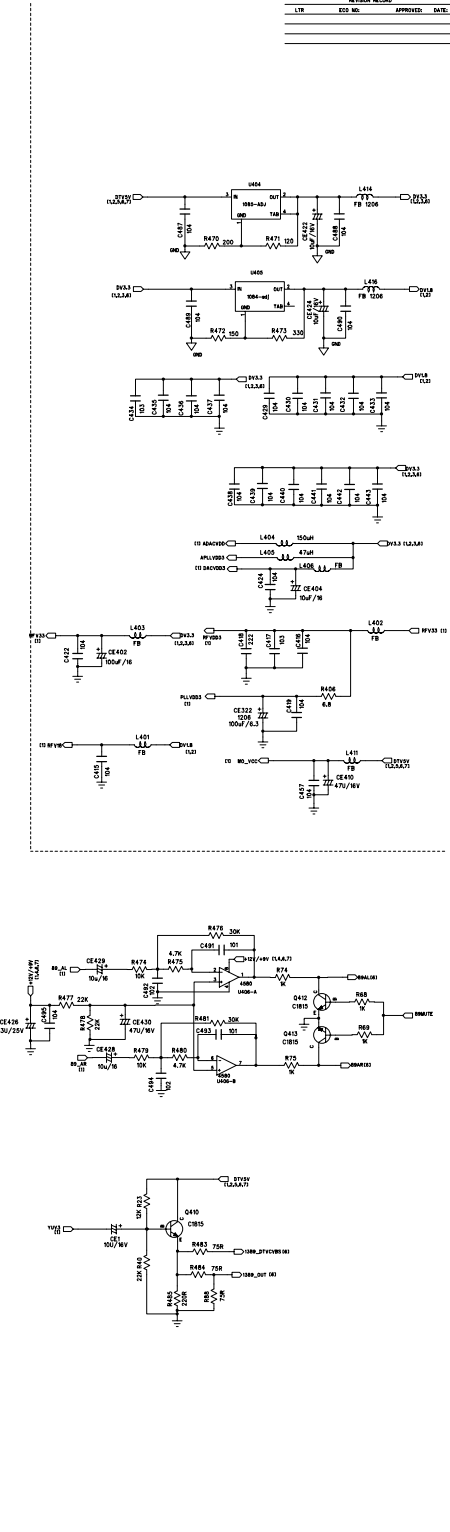
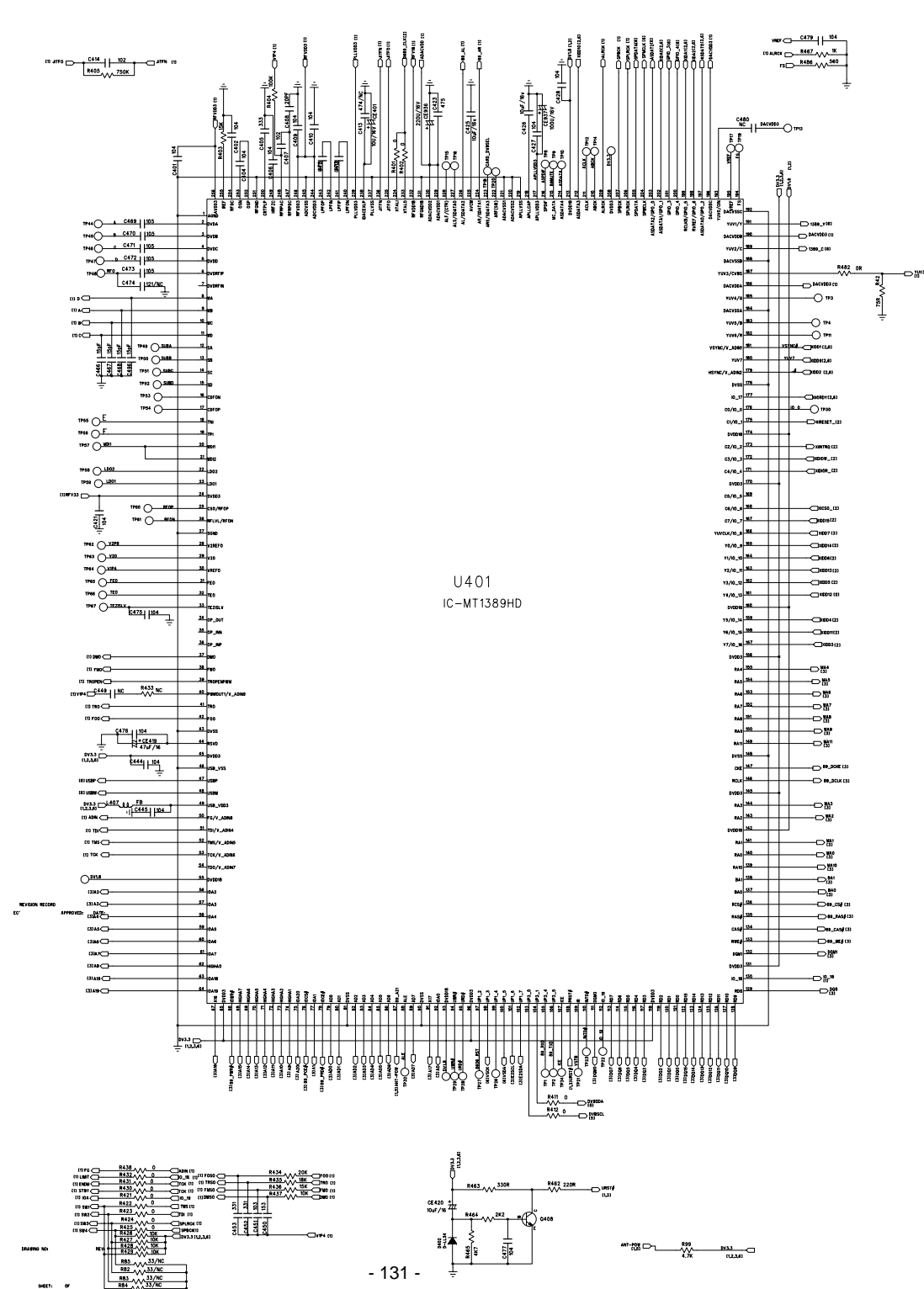
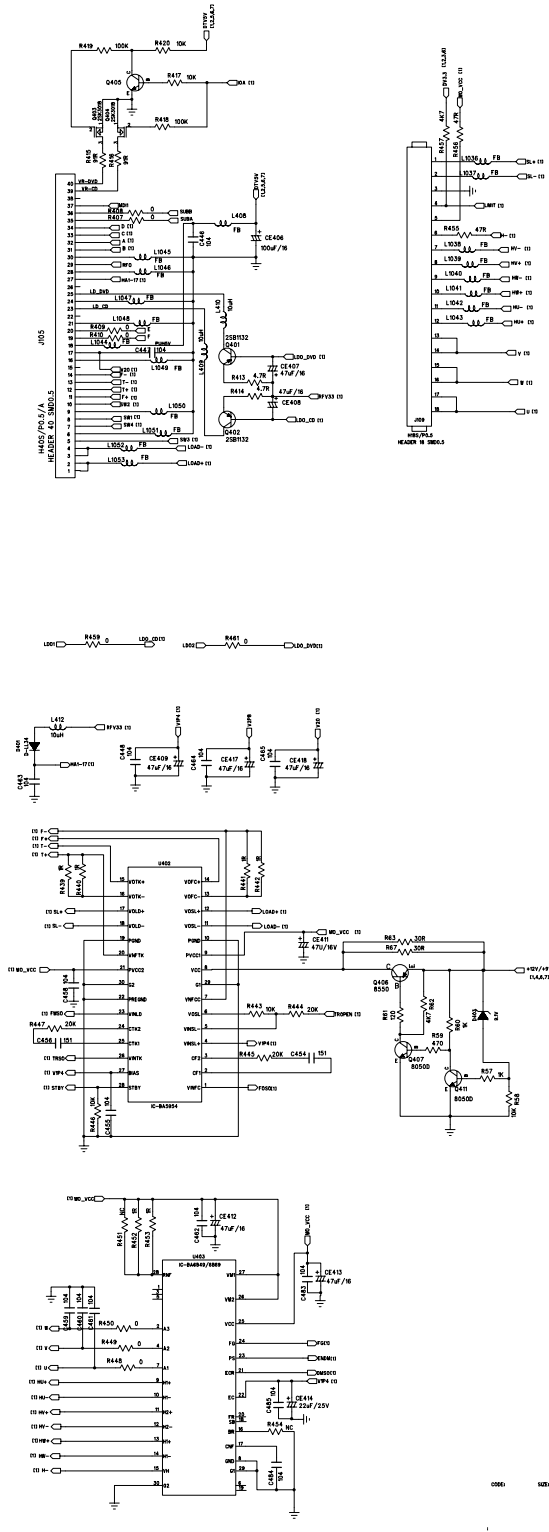
10. Fix 6 screws of machine rear cover and machine assembly is finished.

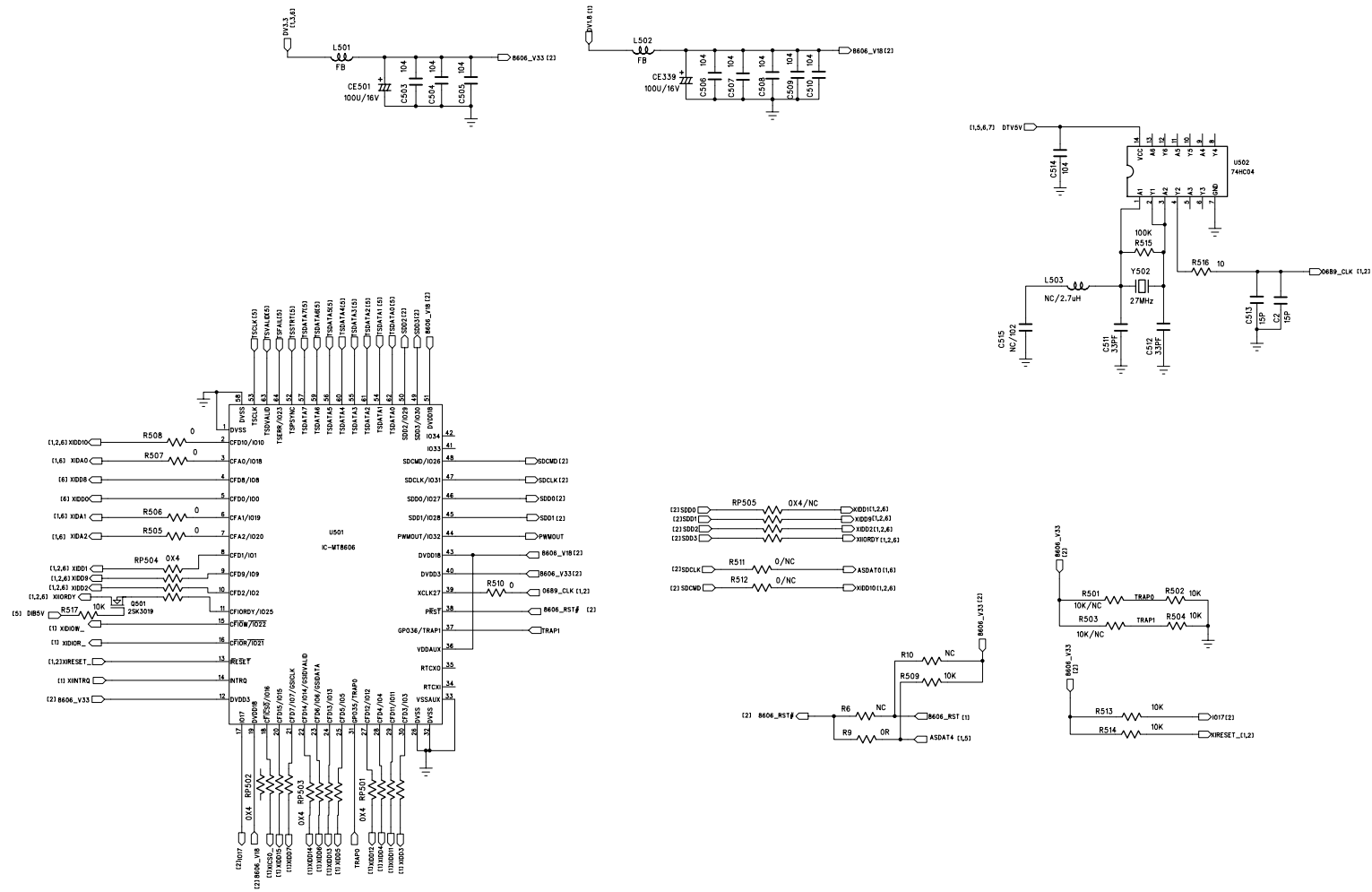
Section One PCB board

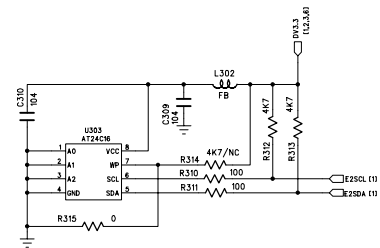
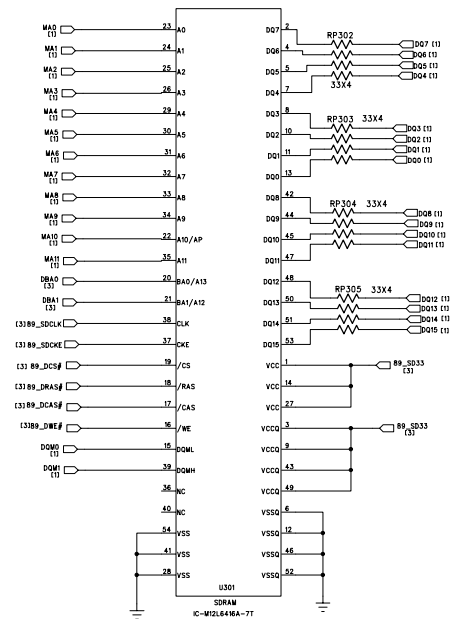
5.1.2 Bottom layer of Main Board

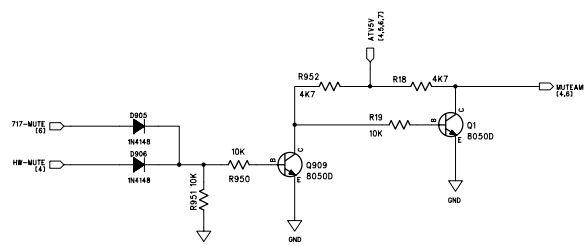
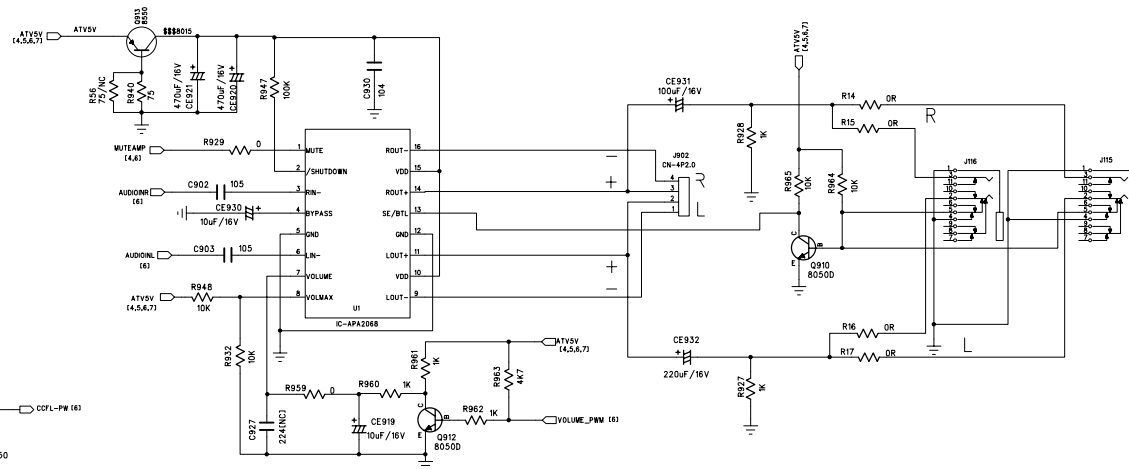
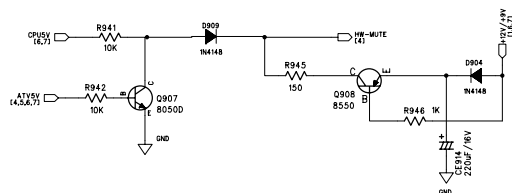
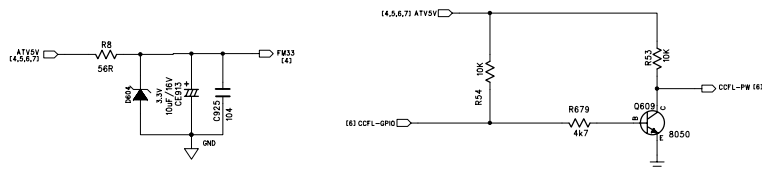
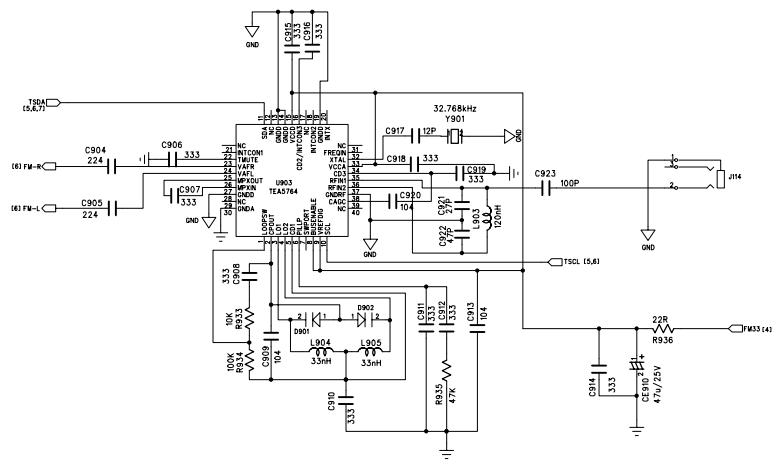




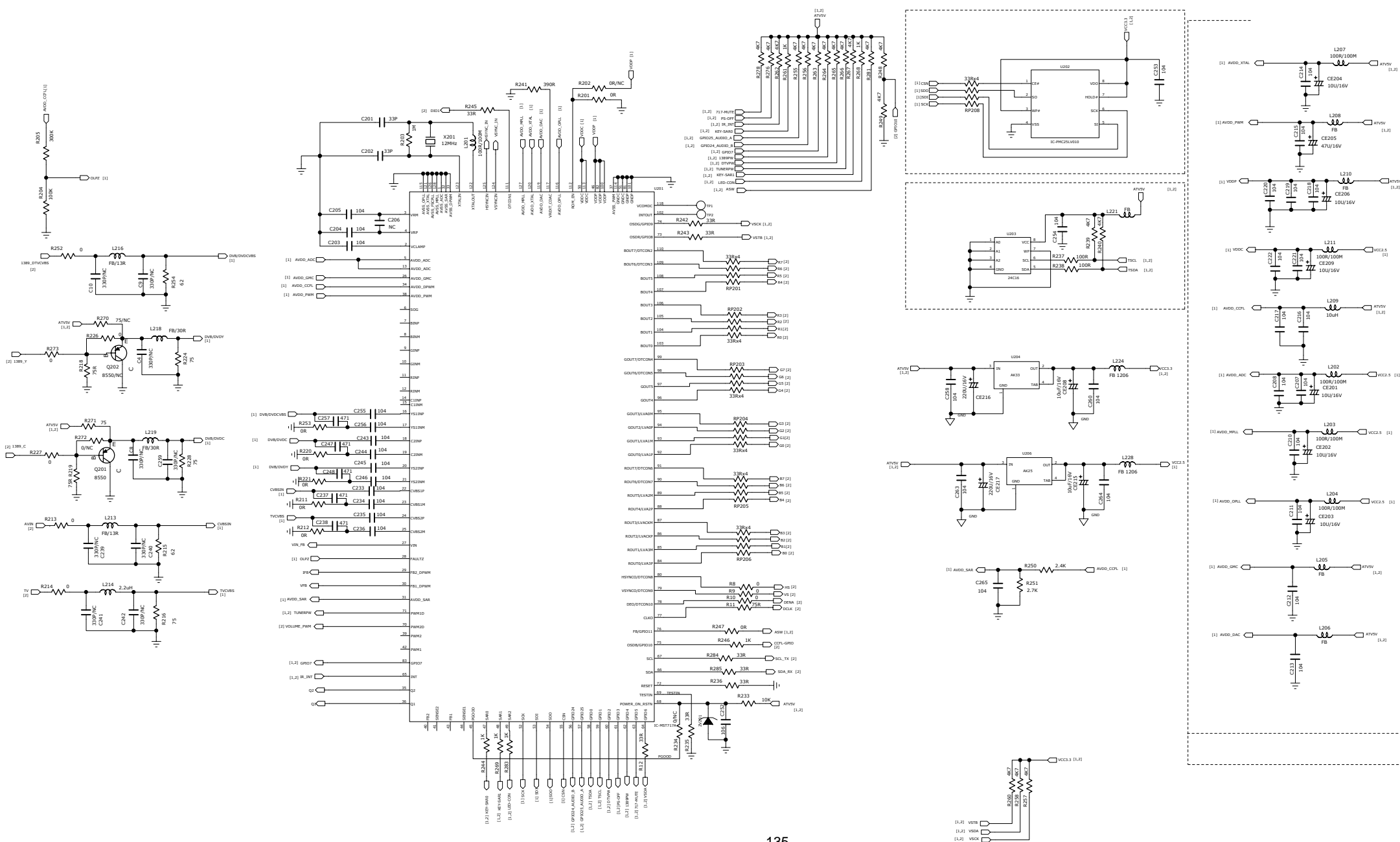


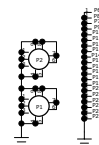
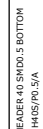
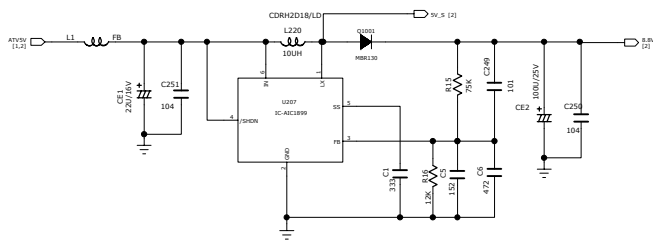




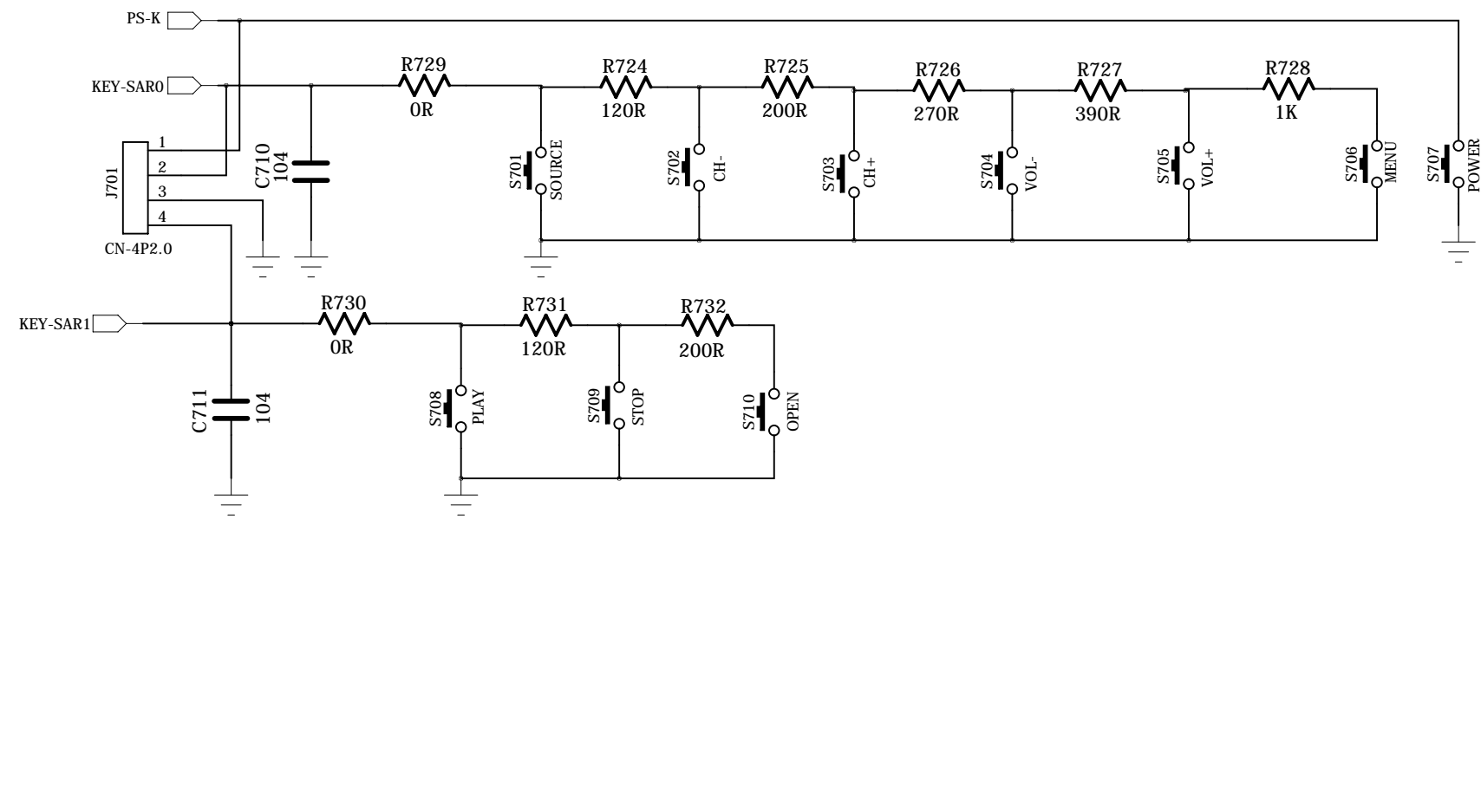


5.2.2 Drive Board





5.2.3 Keystoke Board



Chapter Six BOM List

6.1 AUDIO BOARD

ATERIAL CODE		SPECIFICATIONS	LOCATION
0090001	SMD RESISTOR	1/16W 0Ω±5% 0603	R9,R20,R22,R31,R86,R303,R307,R315,R401,R402,R407~R412,R421~R425,R430,R431,R432,R438,R448~R450,R459,R461,R470,R482,R505~R508,R510,R640,R641,R651~R654,R657,R665,R678,R680,R708,R714,R959,R929,R932,R76~R79,R100,R105
0090002	SMD RESISTOR	1/16W 2.2Ω ±5% 0603	R611
0090272	SMD RESISTOR	1/16W 1Ω±5% 0603	R439~R442,R452,R453
0090106	SMD RESISTOR	1/16W 4.7Ω±5% 0603	R413,R414
0090313	SMD RESISTOR	1/16W 6.8Ω±5% 0603	R406
0090003	SMD RESISTOR	1/16W 10Ω±5% 0603	R516
0090004	SMD RESISTOR	1/16W 22Ω±5% 0603	R66,R638,R639,R644,R645,R646,R690
0090005	SMD RESISTOR	1/16W 33Ω±5% 0603	R120,R301,R302,R308,R309,R720,R721,R96
0090237	SMD RESISTOR	1/16W 39Ω±5% 0603	R42
0090230	SMD RESISTOR	1/16W 47Ω±5% 0603	R455,R456
0090220	SMD RESISTOR	1/16W 51Ω±5% 0603	R650
0090286	SMD RESISTOR	1/16W 62Ω±5% 0603	R627,R649
0090006	SMD RESISTOR	1/16W 75Ω±5% 0603	R30,R483,R484,R607,R608,R615,R616,R660,R810
0090244	SMD RESISTOR	1/16W 91Ω±5% 0603	R415,R416
0090181	SMD RESISTOR	1/16W 100Ω±5% 0603	R87,R193,R310,R311,R636,R637,R613,R699
0090221	SMD RESISTOR	1/16W 120Ω±5% 0603	R667
0090232	SMD RESISTOR	1/16W 150Ω±5% 0603	R472,R668,R945
0090239	SMD RESISTOR	1/16W 200Ω±5% 0603	R666
0090008	SMD RESISTOR	1/16W 220Ω±5% 0603	R462,R485,R618,R626,R14~R17,R698
0090227	SMD RESISTOR	1/16W 270Ω±5%	R473
0090009	SMD RESISTOR	1/16W 330Ω±5% 0603	R463,R623,R669,R102
0090011	SMD RESISTOR	1/16W 470Ω±5% 0603	R21,R59,R72,R73
0090012	SMD RESISTOR	1/16W 560Ω±5% 0603	R162,R486,R93
0090014	SMD RESISTOR	1/16W 1K±5% 0603	R57,R60,R68,R69,R70,R71,R74,R75,R147,R150,R159,R467,R605,R642,R643,R671,R673,R927,R928,R946,R960~R962,R101,R104

0090017	SMD RESISTOR	1/16W 2.2K±5% 0603	R49,R52,R464,R811,R812
0090019	SMD RESISTOR	1/16W 4.7K±5% 0603	R1~R4,R11,R12,R18,R43,R44,R62,R165~R168,R170,R305,R306,R312,R313,R318,R457,R465,R475,R480,R609,R610,R647,R648,R670,R672,R679,R952,R963,R80,R81,R98,R109
0090225	SMD RESISTOR	1/16W 5.6K±5% 0603	R619
0090021	SMD RESISTOR	1/16W 6.8K±5% 0603	R630,R632
0090023	SMD RESISTOR	1/16W 10K±5% 0603	R19,R53,R54,R55,R58,R149,R154,R417,R420,R426~R429,R437,R443,R446,R474,R479,R502,R504,R509,R513,R514,R517,R601,R661~R664,R701,R707,R709,R710,R712,R713,R821,R822,R941,R942,R948,R950,R951,R964,R965,R103
0090538	SMD RESISTOR	1/4W 120Ω±5% 1206	R61
0090187	SMD RESISTOR	1/16W 12K±5% 0603	R23,R32,R64,R621
0090024	SMD RESISTOR	1/16W 15K±5% 0603	R151,R153,R403,R436,R722,R723
0090188	SMD RESISTOR	1/16W 18K±5% 0603	R435,R94
0090025	SMD RESISTOR	1/16W 20K±5% 0603	R434,R444,R445,R447
0090026	SMD RESISTOR	1/16W 22K±5% 0603	R7,R40,R48,R51,R65,R477,R478,R612,R624,R625,R629,R634
0090027	SMD RESISTOR	1/16W 27K±5% 0603	R92
0090029	SMD RESISTOR	1/16W 47K±5% 0603	R90,R91
0090189	SMD RESISTOR	1/16W 30K±5% 0603	R148,R152,R476,R481
0090028	SMD RESISTOR	1/16W 33K±5% 0603	R47,R50,R622
0090034	SMD RESISTOR	1/16W 100K±5% 0603	R404,R418,R419,R515,R620,R947,R813,R814
0090081	SMD RESISTOR	1/10W 150K±5% 0805	R194
0090201	SMD RESISTOR	1/16W 220K±5% 0603	R628
0090211	SMD RESISTOR	1/16W 680K±5% 0603	R631
0090212	SMD RESISTOR	1/16W 750K±5% 0603	R405
0090109	SMD RESISTOR	1/16W 1MΩ±5% 0603	R635
0090036	SMD RESISTOR	1/10W 0Ω±5% 0805	R674,R675
0090783	SMD RESISTOR	1/81.8Ω±5% 0805	R719
0090042	SMD RESISTOR	1/10W 30Ω±5% 0805	R63,R67,R320
0090620	SMD RESISTOR	1/8W 75Ω±5% 1206	R940
0100034	SMD RESISTOR NETWORKS	1/16W 0Ω±5% 0603×4 8P	RP501~RP504,RP601,RP602,RP701,RP704

0100019	SMD RESISTOR NETWORKS	1/16W 33Ω±5% 8P	RP301~RP305
0310188	SMD CAPACITOR	50V 10P±5% NPO 0603	C616,C617,C810,C824
0310042	SMD CAPACITOR	50V 15P±5% NPO 0603	C1,C2,C466~C468,C496,C513,C311
0310189	SMD CAPACITOR	50V 18P±5% NPO 0603	C704
0310085	SMD CAPACITOR	50V 20P±5% NPO 0603	C408
0310043	SMD CAPACITOR	50V 22P±5% NPO 0603	C633
0310044	SMD CAPACITOR	50V 33P±5% NPO 0603	C511,C512,C641,C642
0310047	SMD CAPACITOR	50V 101±5% NPO 0603	C491,C493
0310066	SMD CAPACITOR	50V 102±10% 7R 0603	C160,C166,C407,C414,C492,C494,C627,C822,C823
0310072	SMD CAPACITOR	50V 103±10% 7R 0603	C162,C164,C417,C434,C451,C629,C631,C638
0310543	SMD CAPACITOR	50V 104±10% 7R 0603	C150~C155,C157,C158,C159,C163,C165,C168,C169,C301~C310,C314,C401,C402,C404,C406,C409,C410,C415,C416,C419,C421,C422,C424,C427~C433,C435~C448,C455,C457~C465,C475~C477,C479,C483~C485,C487~C490,C495,C503~C510,C514,C613,C619,C637,C678,C682,C685~C690,C701,C703,C705,C708,C709,C930,C62
0310597	SMD CAPACITOR	50V 151±20% 7R 0603	C454,C456
0310201	SMD CAPACITOR	50V 153±10% 7R 0603	C450
0310063	SMD CAPACITOR	50V 331±10% 7R 0603	C452,C453,C811,C812,C820,C821
0310052	SMD CAPACITOR	50V 391±5% NPO 0603	C632
0310067	SMD CAPACITOR	50V 152±10% 7R 0603	C636
0310068	SMD CAPACITOR	50V 222±10% 7R 0603	C418
0310205	SMD CAPACITOR	50V 473±10% 0603	C411,C412,C601,C606,C643,C646,C647,C649,C651~C654,C656~C662,C666,C668,C670,C671,C673,C675,C676,C683,C684,C691
0310199	SMD CAPACITOR	50V 562±10% 7R 0603	C161,C167
0310643	SMD CAPACITOR	16V 105±20% Y5V 0603	C469~C473,C608,C609,C625,C902,C903,C830,C831
0310723	SMD CAPACITOR	16V 224±10% 7R 0603	C635
0310055	SMD CAPACITOR	16V 333±10% 7R 0603	C405
0310593	SMD CAPACITOR	10V 474±10% 5R 0603	C630,C634
0310679	SMD CAPACITOR	6.3V 475±20% 5R 0603	C423
0310033	SMD CAPACITOR	50V 103±10% 7R 0805	C640
0310020	SMD CAPACITOR	25V 104+80%-20% Y5V 0805	C612

0310178	SMD TANTALUMCAPACITOR	6.3V 10UF±20% 3216	CE665,CE666,CE667
0310390	SMD TANTALUMCAPACITOR	16V10U±20% 3216	C425,C426
0260515	CD	CD11K 16V10U±20%5×11 2	CE307,CE321,CE325~CE328,CE330,CE332,CE333,CE334,CE420,CE422,CE424,CE612,CE614,CE919
0260818	CD	CD11K 16V47U±20%5×11 2	CE323,CE336,CE356,CE407~CE413,CE417~CE419,CE426,CE430,CE603,CE607,CE609,CE610,CE615,CE616,CE701,CE703
0260817	CD	CD11K 16V100U±20%5×11 2	CE322,CE324,CE329,CE339,CE342,CE343,CE354,CE355,CE402,CE406,CE501,CE601,CE605,CE931,CE932,CE933,CE937
0260583	CD	CD11T 16V220U±20%6×12 2.5	CE340,CE344,CE346,CE347,CE348,CE352,CE914,CE936,CE938
0260029	CD	CD11 16V470U±20%8×123.5	CE920,CE921
0260127	CD	CD11 16V4.7U±20%5×11 2	CE930
0260569	CD	CD11E 16V10U±20%4×5 1.5	CE1,CE303~CE306,CE309,CE311~CE316,CE318~CE320,CE401,CE404,CE429,CE911,CE428
0260801	CD	CD11ET 25V22U±20%5×5 2	CE414,CE335
0260671	CD	CD288H 25V100U±20%6.3×11 2.5	CE350,CE351,CE353
0260810	CD	KLE 25V330U±20%10×12 5	CE934,CE935
0310389	SMD CAPACITOR	10V 106 +80%-20% Y5V 0805	C3
0390095	SMD MAGNETIC BEADS	FC160822105	L105,L106,L117,L302,L303,L702,L703,L808~L810,L813~L815
0390300	SMD MAGNETIC BEADS	600Ω/100MHZ±25% 1608	L1004,L1006~L1054
0390170	SMD INDUCTOR	10UH±10% 1608	L409,L410
0390259	SMD MAGNETIC BEADS	FC2012-1202A	L103,L104,L401,L609,L701
0390042	SMD INDUCTOR	1.2UH±10% 2012	L602
0390044	SMD INDUCTOR	10UH±10% 2012	L610,L611
0390301	SMD MAGNETIC BEADS	600Ω/100MHZ±25% 3216	L301,L402,L403,L406~L408,L411,L414,L416,L501,L502,L603,L614,L607,L613,L616,L617,L704,L705
0390021	SMD INDUCTOR	10UH±10% 3216	L412,L405,L601,L604,L1
0390198	SMD CORES INDUCTOR	150uH±10% CR32	L404
0410154	VERTICAL SCREEN SHIELD FILTERING INDUCTOR	100uH±20% 3A SMD	L111,L115
0780193	SMD TRIODE	2S3018	Q403,Q404
0790002	SMD FIELD EFFECT TRANSISTOR	2S3019F	Q501

0780115	SMD TRIODE	2SB1132	Q401,Q402
0780197	SMD TRIODE	C1815	Q120,Q121,Q410,Q601
0780085	SMD TRIODE	8050D	Q1,Q101,Q111,Q112,Q114,Q115,Q116,Q117,Q118,Q119,Q405,Q407,Q408,Q411,Q412,Q413,Q604,Q605,Q609,Q907,Q909,Q910,Q912,Q102,Q103
0780129	SMD TRIODE	8550D	Q406,Q608,Q610,Q908
0780040	SMD TRIODE	3904(100-300) SO23	Q602
0790094	SMD FIELD EFFECT TRANSISTOR	AO3401 SO23	Q606,Q607
0700007	SMD DIODE	14148	D114,D401,D402,D905,D906,D909
0700174	SMD DIODE	B277 SOD523	D601,D602,D603
0680006	SCHOTTKY DIODE	15822	D111
0680028	SMD SCHOTTKY DIODE	MBRS340	D907,D908
0700004	SMD VOLTAGE REGULATOR DIODE	5.1V±5% 1/2W	D101
0700113	SMD VOLTAGE REGULATOR DIODE	9.1V±5% 1/2W	D403
2300030	SMD FUSE	3A 125V	F101
0780319	TRIODE	SS8550 TO-92	Q913
0390052	MAGNETIC BEADS INDUCTOR	FB	L110,L112,L114,L116
0410236	CHOKE COIL	VERTICAL 22UH 3A 5mm	L107
0883272	IC	AZ78L05 TO-92	U111
0881604	IC	24C16 SOP	U303 ①
0883303	IC	24C16 SOP	U303 ①
0880768	IC	C4558 SOP	U406
0880839	IC	CD4053 SOP	U703
0881378	IC	B5954FP HSOP	U402
0881513	IC	B6849FM HSOP	U403
0881674	IC	L393D SO8	U2
0882262	IC	4641632TC60 TSOP	U301
0882644	IC	MT1389FE/HD(HD EDITION) QFP	U401
0882843	IC	AZ1084-ADJ TO-252	U405,U610,U611
0882483	IC	AZ1085S-3.3 TO-263	U404
0882515	IC	HE4052BT SOP	U114,U608,U701
0882945	IC	1430DN SOP	U115,U116

0790126	SMD FIELD EFFECT TRANSISTOR	FDS9435A SOP	U113
0883277	IC	B7644AN SIP	U702
0883168	IC	DIB3000P LQFP	U603
0883260	IC	AP2068 SOP	U1
0883166	IC	8606 LQFP	U501
0883167	IC	9886 SO340-1	U601
0880165	IC	74HCU04D SOP	U502
1000069	SOUND FILTER	V3891D SIP5K	U607
1000068	SOUND FILTER	3891D SIP5K	U606
0960320	SMD CRYSTAL OSCILLATOR	27.700MHz±20PPM 49-S 33P	X602
0960002	CRYSTAL OSCILLATOR	4.0MHz±20PPM 49-S 30PF	X601
0960020	CRYSTAL OSCILLATOR	27.00MHz 49-S	Y502
1020081	TUNER	TD1316AF/IHP-3	U602
1030036	SMD PRESS SENSITIVITY RESISTOR	S1608E180C600NPT 0603	ZV1,ZV2,ZV3,ZV4,ZV5
1940022	SOCKET	4P 2.0mm	J103,J902,J1006
1970100	DULE FLAT NEEDLE	2×4 8.7mm 2.0mm STRINGHT INSERT	J112
1940024	SOCKET	5P 2.0mm	J1
1980113	EARPHONE SOCKET	S0250D00-047-110	J110,J111
1980102	EARPHONE SOCKET	S212-050-100-D	J115,J116
1870075	POWER SUPPLY SOCKET	DS-0335D00-107-110	J106
1940398	CABLE SOCKET	RANK,SMD,OBVERSE MEET WITH	J109
1940397	CABLE SOCKET	RANK,SMD,OBVERSE MEET WITH	J104,J105
1990035	3-I1CARD HOLDER	SD/MS/MMC R009-020-L3	J107
1860074	USB SOCKET	2UB-0001000	J108
5232755	HEAT CONDUCT DOUBLE-FACE GLUE	24×24×0.25 38810	FIX 3580130 BETWEEN U401 AND 3580130
3580130	HEAT RADIATION BOARD	25×25×5 BLACK 935	ON U401
1634148	PCB	1006SI-6 FR4 D1.2×4 PX	

6.2 CAR POWER LINKER

MATERIAL CODE	MATERIAL NAME	SPECIFICATIONS	LOCATION
3870754	SPACER	8	
3870755	TOUCH HEAD	8	

3040843	COVER OF CAR POWER CONNECTOR	008 BLACK	
3031156	COVER OF CAR POWER CONNECTOR	008 BLACK	
3060299	TOUCH HEAD COVER	008 BLACK	
2300018	FUSE	3.15A 250V (VDE/UL)	
3870756	FUSE HOLDER	8	
3810034	SPRING	8	
3630186	SHRAPNEL	8	
5157412	WIRE OF CAR POWER CONNECTING	12V 2A 100×32	
5232168	DUST-PROOF NET	008 BLACK	
2140409	CAR POWER SUPPLY WIRE	2P 1.2m Φ3.5DC FLEX HEAD/80	
5071052	DOUBLE-FACE GAS BEAD BAG	120×350	

6.3 DRIVE BOARD

MATERIAL CODE	MATERIAL NAME	SPECIFICATIONS	LOCATION
0090001	SMD RESISTOR	1/16W 0Ω±5% 0603	R201,R208,R209,R211,R212,R213,R214,R220,R221,R226,R227,R247,R252,R253,R8,R9,R10,R273,R283,R1012,R1016,R1020,R1024,R1028,R1029,R1031,R1034,R1002
0090005	SMD RESISTOR	1/16W 33Ω±5% 0603	R235,R242,R243,R245,R284,R285,R12
0090180	SMD RESISTOR	1/16W 30Ω±5% 0603	R1008,R1018,R1022,R236
0090230	SMD RESISTOR	1/16W 47Ω±5% 0603	R219
0090220	SMD RESISTOR	1/16W 51Ω±5% 0603	R1032
0090286	SMD RESISTOR	1/16W 62Ω±5% 0603	R215,R228,R254
0090238	SMD RESISTOR	1/16W 68Ω±5% 0603	R11
0090006	SMD RESISTOR	1/16W 75Ω±5% 0603	R216,R218,R224,R271
0090181	SMD RESISTOR	1/16W 100Ω±5% 0603	R207,R210,R237,R238,R246,R1014,R1026,R1033
0090234	SMD RESISTOR	1/16W 390Ω±5% 0603	R241
0090248	SMD RESISTOR	1/16W 430Ω±5% 0603	R1010,R1030
0090235	SMD RESISTOR	1/16W 820Ω±5% 0603	R1007,R1017,R1021
0090014	SMD RESISTOR	1/16W 1K±5% 0603	R244,R261,R268,R269
0090776	SMD RESISTOR	1/16 1.6K±5% 0603	R1013,R1025
0090017	SMD RESISTOR	1/16W 2.2K±5% 0603	R1019,R263
0090253	SMD RESISTOR	1/16W 2.4K±5% 0603	R250

0090104	SMD RESISTOR	1/16W 2.7K±5% 0603	R251
0090183	SMD RESISTOR	1/16W 3K±5% 0603	R1011,R1015,R1023,R1027
0090019	SMD RESISTOR	1/16W 4.7K±5% 0603	R239,R240,R248,R249,R255~R258,R260,R262,R264~R267,R276,R278,R281
0090186	SMD RESISTOR	1/16W 7.5K±5% 0603	R1009
0090187	SMD RESISTOR	1/16W 12K±5% 0603	R16
0090242	SMD RESISTOR	1/16W 75K±5% 0603	R15
0090034	SMD RESISTOR	1/16W 100K±5% 0603	R204
0090204	SMD RESISTOR	1/16W 300K±5% 0603	R205
0090109	SMD RESISTOR	1/16W 1MΩ±5% 0603	R203
0090063	SMD RESISTOR	1/10W 10K±5% 0805	R233
0090123	SMD RESISTOR	1/10W 33Ω±5% 0805	R1006
0100019	SMD RESISTOR NETWORKS	1/16W 33Ω±5% 8P	RP201~RP206,RP208
0260569	CD	CD11E 16V10U±20%4×5 1.5	CE201~CE204,CE206,CE209,CE1001
0260636	CD	CD11E 16V47U±20%5×5 2	CE205
0260819	CD	CD11ET 16V100U±20%6.3×5 2.5	CE1,CE2
0260800	CD	CD11ET 25V10U±20%4×5 1.5	CE1002,CE208,CE215,CE337,CE338
0260613	CD	CD11C 16V220U±20% 8×7 3.5	CE216,CE217
0310188	SMD CAPACITOR	50V 10P±5% NPO 0603	C1002
0310044	SMD CAPACITOR	50V 33P±5% NPO 0603	C201,C202
0310047	SMD CAPACITOR	50V 101±5% NPO 0603	C249
0310543	SMD CAPACITOR	50V 104±10% 7R 0603	C2,C3,C170,C198,C199,C203,C204,C205,C207,C208,C210~C222,C228,C229,C233,C234,C235,C236,C243~246,C250,C251,C253~C256,C258,C260,C263~C265,C1001,C1003~C1018,C1100
0310067	SMD CAPACITOR	50V 152±10% 7R 0603	C5
0310196	SMD CAPACITOR	50V 471±10% 0603	C237,C238,C247,C248,C257
0310198	SMD CAPACITOR	50V 472±10% 7R 0603	C6
0310389	SMD CAPACITOR	10V 106 +80%-20% Y5V 0805	C252
0310055	SMD CAPACITOR	16V 333±10% 7R 0603	C1
0310063	SMD CAPACITOR	50V 331±10% 7R 0603	C241
0310195	SMD CAPACITOR	50V 221±10% 7R 0603	C242
0390095	SMD MAGNETIC BEADS	FC160822105	L205,L206,L208,L213,L216,L218,L219,L221

0390300	SMD MAGNETIC BEADS	600Ω/100MHZ±25% 1608	L201~L204,L207,L211,L212,L1020,L1021,L1022,L1008~L1019,L1023~L1028,L1030~L1035,L1029,L1036~L1041
0390044	SMD INDUCTOR	10UH±10% 2012	L1001
0390021	SMD INDUCTOR	10UH±10% 3216	L209,L210,L224,L228,L1002
0390288	SMD MAGNETIC BEADS	19Ω/100mHZ±25% 3216	L1
0390235	SMD INDUCTOR	8.2uH±10% 1608	L214
0390471	SMD CORES INDUCTOR	10uH±10% CD32	L220
0680028	SMD SCHOTTKY DIODE	MBRS340	Q1001
0700007	SMD DIODE	14148	D1001
0700064	SMD TRIODE	B991 SO23	D1,D112,D113
0700121	SMD VOLTAGE REGULATOR DIODE	10V±5% 1/2W	D207
0700123	SMD VOLTAGE REGULATOR DIODE	15V±5% 1/2W	D203
0780129	SMD TRIODE	8550D	Q201
0880504	IC	24C32N SOP	U203
0882485	IC	AZ11173.3 SO223	U204
0883143	IC	AZ11172.5 SO223	U206
0883269	IC	AIC1899 SO23-6	U207
0883164	IC	MS717A PQFP	U201
0960019	CRYSTAL OSCILLATOR	12.00MHz 49-S	X201
1940024	SOCKET	5P 2.0mm	J1005
1940397	CABLE SOCKET	DUAL RANK,SMD,OBVERSE MEET WITH CLAMP	J1003
1940138	CABLE SOCKET	5P 0.5mm SMD,NEXT MEET WITH CLAMP	J1001,J1002
1633934	PCB	21006SI-3 VO D1.2×4 PX	

6.4 HEADREST BRACKET

MATERIAL CODE	MATERIAL NAME	SPECIFICATIONS	LOCATION
4000061	SELF-TAPPING SCREW	BB 2.6×7 COLOR ZINC	CONNECT HEADREST CLIP AND HEADREST PANEL
5235199	MAGIC ROPE	339	
5235200	SOFT SPONGE SPACER	174×116×17 WITHOUT GLUE IN REAR SIDE,SOFT	
5206698	CAR HEADREST BRACKET	1006SI(RU) BLACK	
3060548	HEADREST HANG BOARD	339 BLACK	
3060547	HEADREST LOCK BOARD	339 BLACK	

6.5 KEY-PRESS BOARD

MATERIAL CODE	MATERIAL NAME	SPECIFICATIONS	LOCATION
0090001	SMD RESISTOR	1/16W 0Ω±5% 0603	R729,R730
0090012	SMD RESISTOR	1/16W 560Ω±5% 0603	R733
0090221	SMD RESISTOR	1/16W 120Ω±5% 0603	R724
0090239	SMD RESISTOR	1/16W 200Ω±5% 0603	R725
0090227	SMD RESISTOR	1/16W 270Ω±5%	R726
0090234	SMD RESISTOR	1/16W 390Ω±5% 0603	R727
0090014	SMD RESISTOR	1/16W 1K±5% 0603	R728,R731
0090183	SMD RESISTOR	1/16W 3K±5% 0603	R732
0310543	SMD CAPACITOR	50V 104±10% 7R 0603	C710,C711
0700007	SMD DIODE	14148	D700
1940022	SOCKET	4P 2.0mm	J701
1340205	LIGHT TOUCH RESTORE SWITCH	VERTICAL I1102VL	S701~S710
1564713	PCB	41006SI-1	

LCD TV LD1006TI(RU)

POWER ADAPTER 5471924

MATERIAL CODE	MATERIAL NAME	SPECIFICATIONS	LOCATION
3031818	UPPER COVER OF POWER AD	@083 BLACK UL	
3041389	LOWER COVER OF POWER AD	@ 083 BLACK UL	
5449645	PCB SEMI-FINISHED PRODUCT	5 0833-0 083-4	

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RECEIVING BOARD OF REMOTE CONTROL 5449967

MATERIAL CODE	MATERIAL NAME	SPECIFICATIONS	LOCATION
0090181	SMD RESISTOR	1/16W 100Ω±5% 0603	R23
0090034	SMD RESISTOR	1/16W 100K±5% 0603	R43
0090043	SMD RESISTOR	1/10W 100Ω±5% 0805	R44
0090100	SMD RESISTOR	1/10W 2K±5% 0805	R40,R42
0310543	SMD CAPACITOR	50V 104±10% 7R 0603	C28,C29
0260568	CD	CD11E 16V100U±20%6.3×5 2.5	CE27
0390095	SMD MAGNETIC BEADS	FC160822105	L914~L917

0780085	SMD TRIODE	8050D	Q9
0780129	SMD TRIODE	8550D	Q7
0700007	SMD DIODE	14148	D903,D904
0620086	DUAL COLOR RADIATION DIODE	2.5RG59HW-A×5 RED GREEN	D4
2360002	IR SENSOR	HS0038B	IR901
5234646	SOFT SPONGE SPACER	6×6×2 BLACK,SINGLE-FACED SOFT	UNDER REMOTE CONTROL RECEIVER
2122636	FLAT CABLE	PH L NEEDLE, TOGETHER DIRECT	FROM DRIVING BOARD J1005 TO REMOTE CONTROL RECEIVING BOARD J901
1633794	PCB	B1006SI-1	

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PROGRAM FLASH ROMLD1006TI-0A(16M) 0911993

MATERIAL CODE	MATERIAL NAME	SPECIFICATIONS	LOCATION
0882923	IC	EN29LV160AB-70TCP TSOP	U302

SOFTWARE PROGRAM EPROM ROMLD1006TI-0A(2M) 0900471

MATERIAL CODE	MATERIAL NAME	SPECIFICATIONS	LOCATION
0883190	IC	P25LV020 SOP	U202

SOFTWARE PROGRAM EPROM ROMLD1006SI-0A(512B) 0900451

MATERIAL CODE	MATERIAL NAME	SPECIFICATIONS	LOCATION
0881473	IC	12C508A SOP	U112 ②
0882925	IC	PIC12508 SOP	U112 ②