

**AV321T**

**service manual**

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# **Chapter One About Maintenance**

## **1.1 Safety precautions**

### **1.1.1 Power supply**

When servicing audio power amplifier, the servicing personnel pay special attention to the power board with 220V AC, or else the improper operation will lead to body damage. The alternate current which outputs to power amplifier board through power board is also up to voltage with about 50V; when servicing, short-circuit and joint welding cannot occur, or else the elements will be burnt out and trouble range will be enlarged.

### **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 About placement position**

1. Audio power amplifier cannot be installed in places with high temperature and humidity.
2. Positions for placement should be stable and secure.

## **1.2 Maintenance method**

### **1.2.1 Visualized method**

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

### **1.2.2 Electric resistance method**

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

### **1.2.3 Voltage method**

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

### **1.2.4 Current method**

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

### **1.2.5 Cutting method**

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

### **1.2.6 Element substitution method**

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

### **1.2.7 Comparison method**

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

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

## **1.3 Required device for maintenance**

Audio Generator

Digital oscillograph ( 100MHE)

SMD rework station

Multimeter

Soldering iron

Pointed-month pincers

Cutting nippers

Forceps

Electric screw driver

Terminals connecting cord

Headphone

Microphone

# Chapter Two

## Functions and Operation Instructions

### 2.1 FEATURES

2-way coaxial digital signal input, 1-way optical digital signal input

With 5.1CH input terminal, capable of connecting with external multi-channel advanced decode output signals such as DOLBY DIGITAL, DTS

With subwoofer output terminal, capable of connecting with active subwoofer speaker

Built-in FM/AM tuner

With headphone output jack

6CH digital volume control

Separate level adjustment to left, right, centre, surround and subwoofer channel

Dolby Digital ,DTS,Dolby Pro Logic II,DSP, STEREO decode

Automatically recognize input signal format and select the corresponding decode mode

Decode mode manual selection

Main channel high/low tone adjustment

Video and S-Video selected function

Centre, surround delay adjustmen

Noise testingt

5 preset EQ modes

Digital tuning function

Capable of storing 36 FM and 12 AM radio stations

Automatically/Manually searching radio stations

Auto mute if there is no signal

High-performance digital Karaoke, with MIC volume, tone and echo adjustment

Separate 5CH power amplification

Specially automatic protection of short-circuit,over-voltage and over-current

Full remote control operation

Complete unit interface

## 2.2 Control button Locations and Exp Lanations

### 2.2.1 Front panel functions and illustrations



**❶ POWER switch**

Switch on/off the AC power of the unit

**❷ MENU button**

MENU button, please refer to the related chapters for details

**❸ Multi-Function Knob**

In normal working mode, synchronously adjust 6-channel level. In addition, by using this knob and MENU button, you may fulfil multiple functions. Please refer to the related chapters for details...

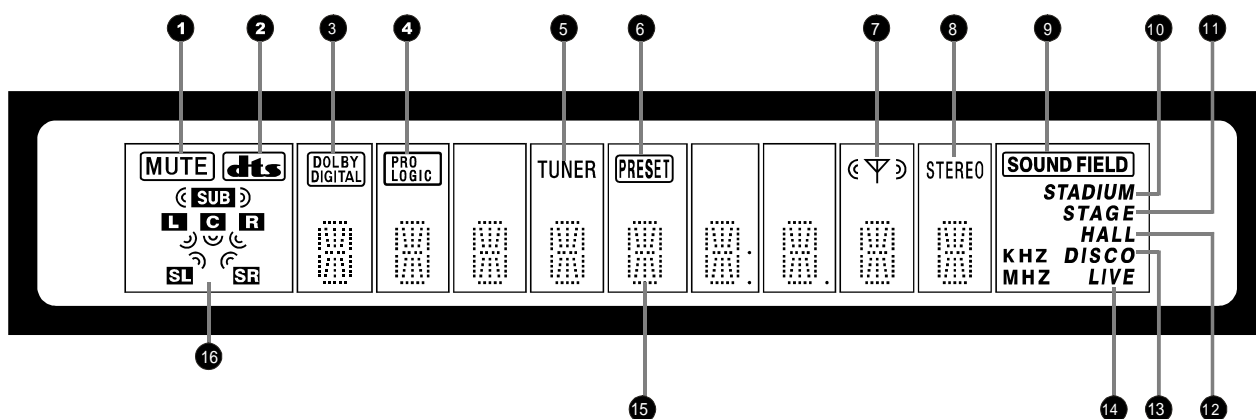
**❹ Headphone jack**

**❺ MIC jack**

**❻ IR sensor window**

Receive the remote control signals.

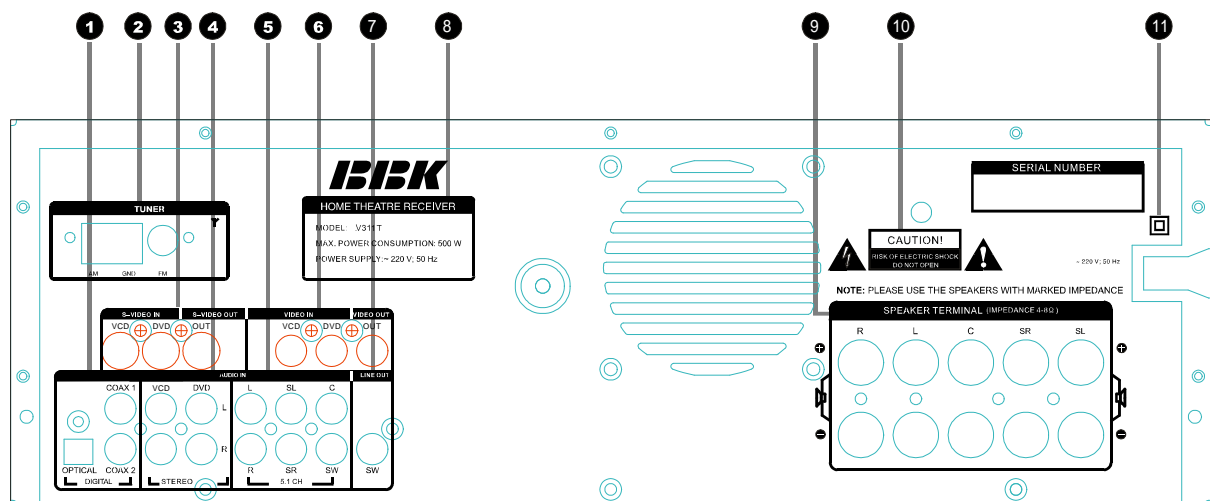
### 2.2.2 VFD DISPLAY



- ❶ MUTE symbol
- ❷ DTS decode mode symbol
- ❸ Dolby Digital decode mode symbol
- ❹ Dolby Pro Logic decode mode symbol
- ❺ TUNER symbol, its flicker shows the tuner is in signal searching state
- ❻ Call the preset saved radio station, or has saved the currently tuning channel
- ❼ The tuner has received signal
- ❽ Stereo decode mode or the currently received FM radio station is stereo output signal

- ❾ DSP decode mode symbol
- ❿ In DSP decode mode, stimulate STADIUM sound field
- ⓫ In DSP decode mode, stimulate STAGE sound field
- ⓬ In DSP decode mode, stimulate HALL sound field
- ⓭ In DSP decode mode, stimulate DISCO sound field
- ⓮ In DSP decode mode, stimulate LIVE sound field
- ⓯ Connect channel, data format display area
- ⓰ Effective channel display area

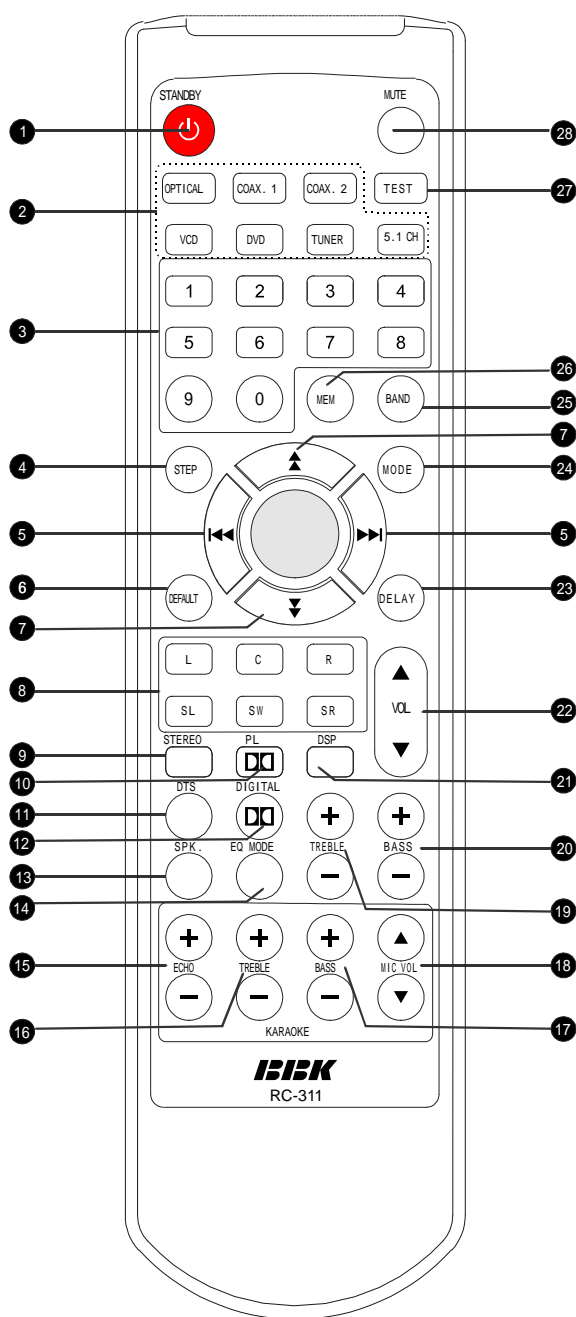
## 2.2.3 REAR PANEL ILLUSTRATIONS



- ❶ DIGITAL  
Coaxial digital sound source input jack 1,2;  
optical digital sound source input jack
- ❷ AM/FM antenna terminal  
Connect AM/FM antenna outside
- ❸ S-VIDEO  
VCD、DVD S-Video Selected Jacks
- ❹ STEREO  
VCD、DVD stereo audio signal input jack
- ❺ 5.1 CH  
5.1CH audio signal input jack
- ❻ VIDEO  
VCD、DVD Video Selected Jacks

- ❼ LINE OUT  
Subwoofer signal line output jack
- ❽ Data  
Model data plate
- ❾ Speaker jack  
Connect with speaker terminals
- ❿ CAUTION mark  
Remind the user of dangerous voltage  
Inside
- ⓫ Dual square symbol  
Class II electric shock protection product

## 2.2.4 ILLUSTRATIONS TO THE REMOTE CONTROL



- 26 MEMORY button: Save tuning stations
- 27 NOISE TESTING button
- 28 MUTE button

- 1 STANDBY button: Enter or exit standby state
- 2 SOUND/VIDEO SOURCE button: Select input signal sources manually
- 3 NUMBER buttons: For saving and calling saved radio stations
- 4 AM STEP button: Pressing this button for long (above 3 seconds) may switch step value 9KHz or 10KHz in the AM wave band
- 5 FORWARD/AFTERWARD button: Call the saved radio stations forward/backward
- 6 DEFAULT button: Press this button for long (above 3 seconds), the unit automatically restores system parameter to default value
- 7 MULTI-FUNCTION buttons
- 8 CHANNEL buttons: Using with multi-function buttons may separately adjust channel level
- 9 STEREO MODE button
- 10 DOLBY PRO LOGIC DECODE MODE button
- 11 DTS DECODE MODE button
- 12 DOLBY DIGITAL DECODE MODE button
- 13 SPEAKER MODE SETUP button: Pressing this button may circularly select main speaker mode and subwoofer on/off mode
- 14 EQ MODE button: Press this button to circularly select EQ mode
- 15 KARAOKE ECHO (+, -) button: Adjust Karaoke echo
- 16 KARAOKE TREBLE (+, -) button: Adjust Karaoke treble
- 17 KARAOKE BASS (+, -) button: Adjust Karaoke bass
- 18 KARAOKE VOLUME (▲, ▼) button: Adjust Karaoke volume
- 19 MAIN CHANNEL TREBLE (+, -) button: Adjust main channel treble
- 20 MAIN CHANNEL BASS (+, -) button: Adjust main channel bass
- 21 DSP DECODE MODE button
- 22 MAIN VOLUME button: Capable of synchronously adjusting 6-channel volume
- 23 DELAY button: Using with multi-function adjustment buttons may adjust centre, surround channel delay
- 24 FM STEREO MODE button: Manually/automatically select FM stereo mode
- 25 WAVE BAND button: Used to switch FM/AM wave band



## 2.3 BASIC OPERATIONS

### 2.3.1 Turn On/Off the Unit

#### 1. Power On

Before power on, please check whether the power accords with the marked specs of the unit, whether the power socket accords with the power plug of the unit and whether the sound source connection cords, output cords are correctly connected. Then you may connect the power;

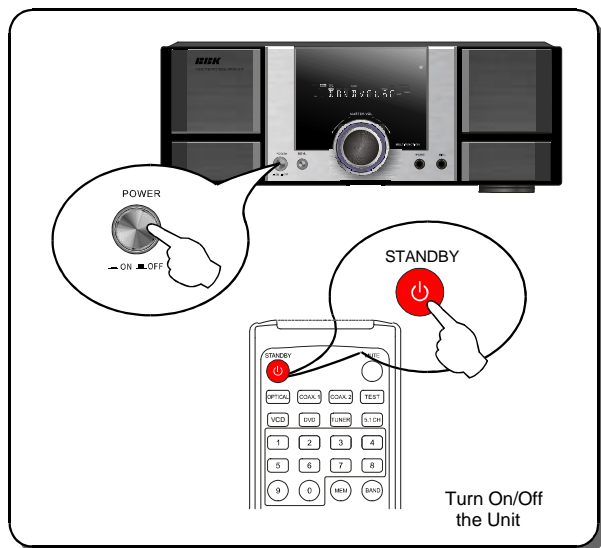
Press POWER switch on the front panel of the unit and the indicator light on the panel flickers. The unit automatically connect with the input sound source before power-off last time, and automatically select decode mode according to the input sound source format.

#### 2. Standby

If the user wants to finishing operating in a short time, you may press STANDBY button on the remote control to enter standby state. If you want to operate it again, press STANDBY button again to exit standby state.

#### 3. Power Off

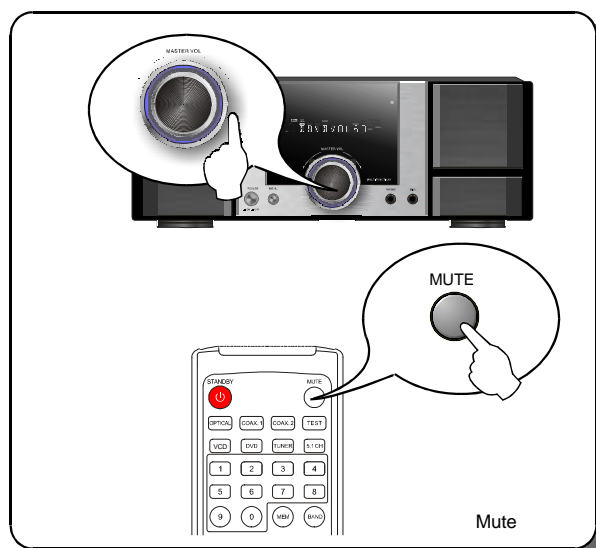
If not going to use for a long period, press POWER switch on the front panel to turn off the power, and the indicator light turns out.



### 2.3.2 Mute

In normal working state, press MUTE button on the remote control, the unit is silent and the "MUTE" symbol on the top left corner of

the VFD screen is lightened. In mute state, press MUTE button on the remote control, the unit restores to output sound and the "MUTE" symbol turns out. Using the MULTIFUNCTION knob on the front panel or pressing MAIN VOLUME button on the remote control may also cancel mute.



### 2.3.3 Select Input Sound Source and Video Source

This unit has 1-way optical input terminal, 2-way coaxial input terminal, 1-way VCD input terminal, 1-way DVD input terminal and 5.1CH input terminal. You may use the remote control to directly select input sound source, or use MENU button and MULTI-FUNCTION knob on the front panel to select input sound source through menu. You are recommended to use remote control means.

Press the SOUND SOURCE button on the remote control to separately select the sound source of optical, coaxial1, coaxial2, VCD and DVD as the working sound source of this unit. Press TUNER button to select the built-in tuner of this unit as the working sound source.

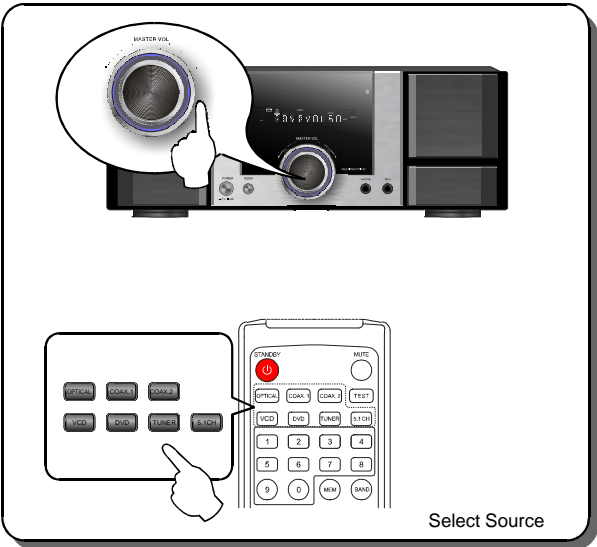
Press MENU button on the front panel of the unit and VFD screen displays "SOURCE".

S O U R C E

Rotate the MULTI-FUNCTION knob, VFD screen will display "OPTICAL", "COAX1", "COAX2", "DVD", "VCD", "EXT 5.1CH", "AM" and "FM" symbols which respectively stands for the sound sources on optical, coaxial1, coaxial2, DVD, VCD and external 5.1CH terminals, and the built-in AM, FM wave band signals. Press MULTI-FUNCTION knob to select this sound source.

Select video

When Tuner in, No video out; When VCD Audio in, the VCD video is selected; When DVD audio, 5.1CH, COAXIAL and Optical in, The DVD video is selected.



2.3.4 Select Decode Mode

This unit has Dolby Digital, Dolby Pro II, DTS, DSP and STEREO decode modes, but not every input channel has all the decode modes. When the user switches the input channel or changes the input signal format, the unit may automatically select the default decode mode according to the input signal format. Certainly, the user may also select the decode mode manually, and please refer to the following table for the selected decode mode of each channel and the default decode mode.

Table 1: Relation between input channel and decode mode

Input channel		Stereo	PLII	Dolby Digital	DTS	DSP	Default Decode
Analog Signal	DVD	Yes	Yes	No	No	Yes	Stereo
	VCD	Yes	Yes	No	No	Yes	Stereo
Digital Signal (from Optical, Coax1, Coax2)	PCM	Yes	Yes	No	No	Yes	Stereo
	2/0 AC-3	Yes	Yes	Yes	No	No	Dolby Digital
	AC-3	Yes	No	Yes	No	No	Dolby Digital
	DTS	Yes	No	No	Yes	No	DTS

NOTE: In Dolby Pro Logic decode mode ,it is effective only when sampling rate less than 96KHz.

This unit can only receive PCM signals with sampling rate less than 96KHz. There are two means of manually selecting decode mode: Remote control and menu.

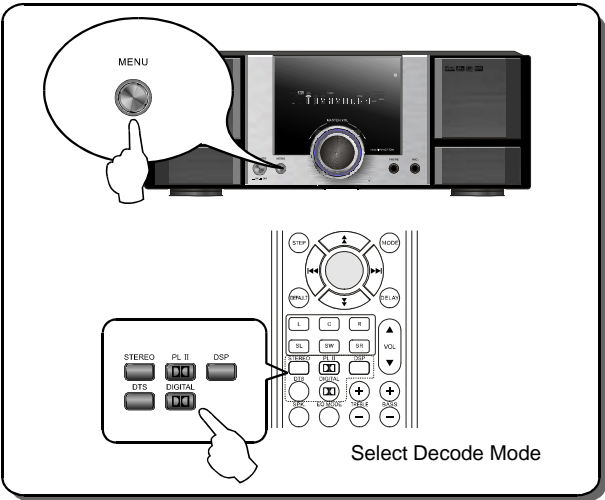
Remote Control Means

Press STEREO, II, DSP, DTS, DIGITAL buttons on the remote control, if the decode mode that you selected cannot be realized to input signal, the system still remains the Original decode mode.

Menu Means

Press MENU button on the front panel continuously until DECODE appears. Rotate the MULTI-FUNCTION knob, and VFD screen will display "STEREO, DSP, DOLBY, PRO II, Dolby Digital, DTS", which stands for STEREO, DSP, Dolby Pro Logic II, Dolby Digital and DTS decode mode respectively. You need to press the MULTI-FUNCTION knob to confirm to enter new decode mode.

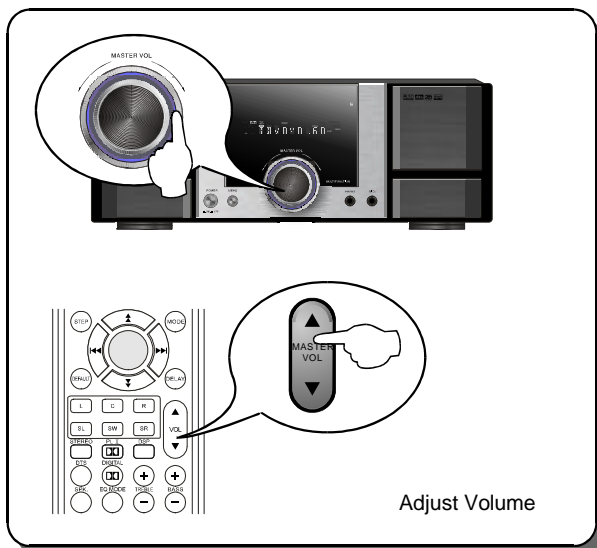
Note: As for a certain input channel, if some decode modes do not exist, the operation is invalid.



### 2.3.5 Adjust Volume

Rotating the MULTI-FUNCTION knob on the front panel or pressing the MAIN VOLUME button on the remote control may synchronously adjust 6-channel level and the screen displays "VOL XX" adjustment range 0~60.

Note: The main volume automatically sets in 20 each time when power on.

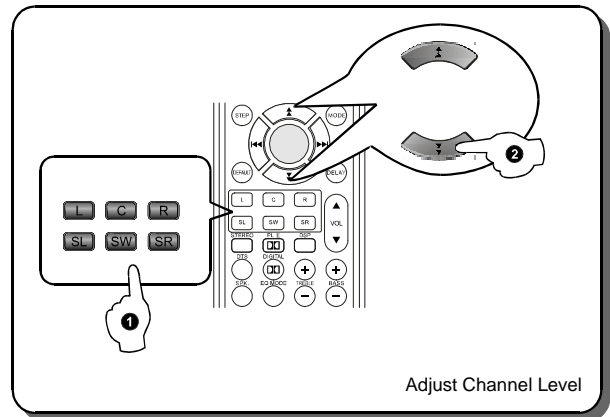
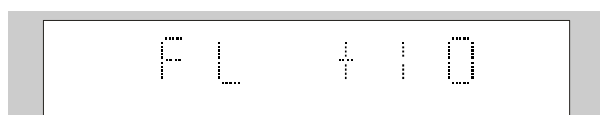


### 2.3.6 Adjust Channel Level

Press CHANNEL button on the remote control and the VFD screen displays the corresponding channel symbol: "FL XXX, FR XXX, FC XXX, SL XXX, SR XXX, SW XXX", which means left channel, right channel, centre channel, surround left channel, right surround channel and subwoofer channel respectively.

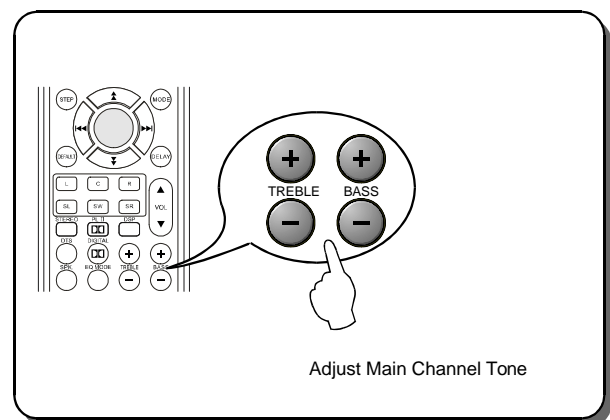
Press the MULTI-FUNCTION adjustment button on the remote control to adjust channel level. The adjustment range of channel level is -60~+60

Figure: The design of channel level on the screen



### 2.3.7 Adjust Main Channel Tone

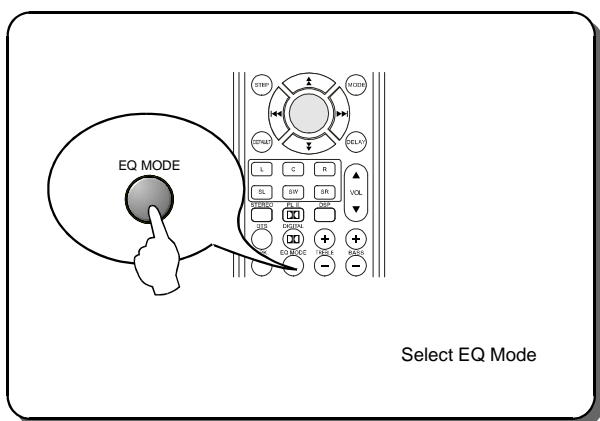
Press TREBLE and BASS button of main channel on the remote control to adjust the main channel treble and bass respectively.



### 2.3.8 Select EQ Mode

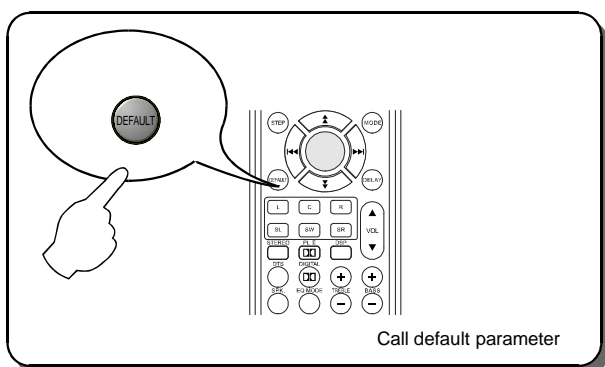
Pressing EQ button on the remote control may select FLAT, DISCO, POP, ROCK and JAZZ mode respectively. Figure: EQ mode display





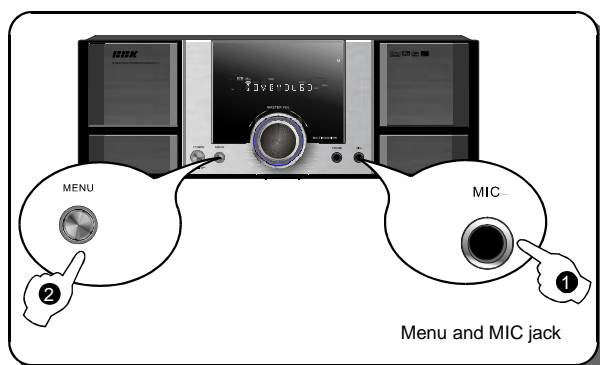
### 2.3.9 DEFAULT

Press DEFAULT button for long (above 3 seconds) , and the unit restores the channel level and Karaoke volume parameters to default Parameters.



### 2.3.10 Karaoke

Insert the microphone into the MIC jack on the front panel and push the MIC switch to ON (if there is switch). Keep an appropriate distance With speaker to avoid whistle.



#### 1. Karaoke volume

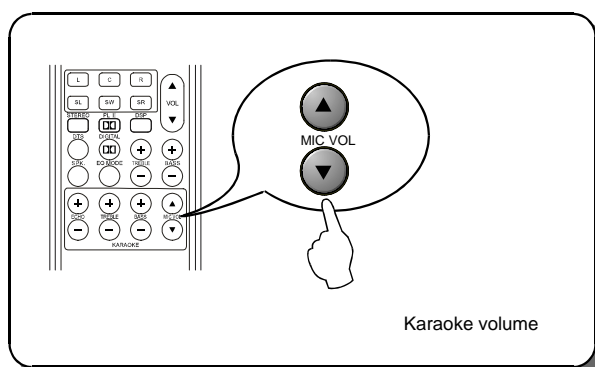
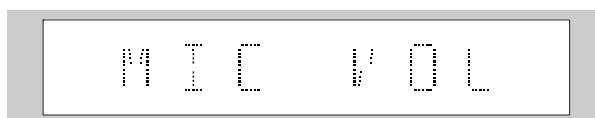
There are two means to adjust Karaoke volume: remote control and menu.

##### Remote Control Means

Press KARAOKE VOLUME button on the Remote control

##### Menu Means

Press MENU button on the front panel until MIC VOL appears, and then rotate the MULTI-FUNCTION knob.



#### 2. Karaoke echo

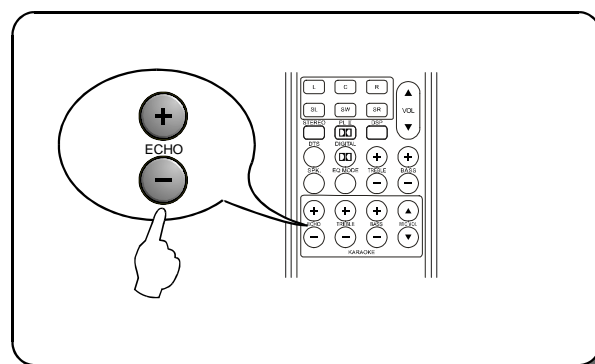
There are two means to adjust Karaoke echo: remote control and menu.

##### Remote Control Means

Press KARAOKE ECHO button on the remote control.

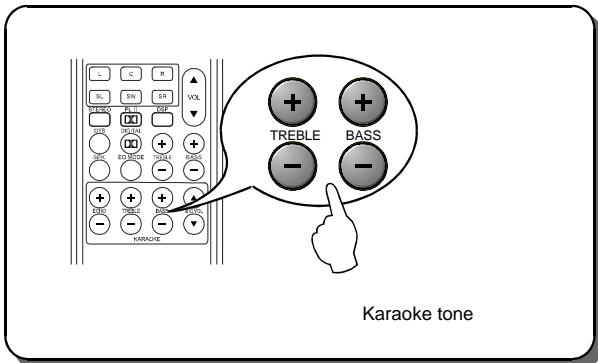
##### Menu Means

Press MENU button on the front panel until MIC ECHO appears, and then rotate the MULTI-FUNCTION knob.

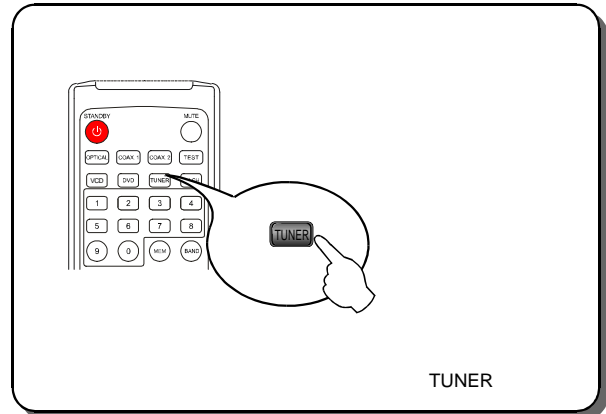


### 3. Karaoke tone

Press TREBLE and BASS button of Karaoke on the remote control to adjust Karaoke treble and bass.



After 3 seconds searching radio station, you may rotate the MULTI-FUNCTION knob to Adjust volume.



### 2.3.11 Tuning

Before tuning operation, please select appropriate wave band according to the Following steps.

Press TUNER button of sound source selection on the remote control;

Press BAND button on the remote control to select wave band or directly enter the tuning FM, AM wave band through menu.1. Auto search

#### Remote Control Means

Press the MULTI-FUNCTION button for long (above 1 second), and the unit will automatically search radio stations forward or afterward.Until radio station with strong signal is searched, it will automatically stop. Press the MULTI-FUNCTION button to fine adjust if necessary.

#### Menu Means

Press MENU button on the front panel until VFD screen displays "TUN SEEK".

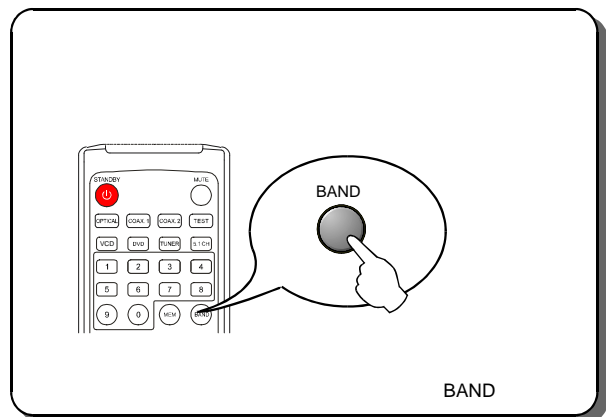
TUN SEEK

Rotate the MULTI-FUNCTION knob and the unit will automatically stop after searching the radio station with enough strong signal. Within about 3 seconds, you may continue rotating the knob and searching radio station.

### 2. Auto search and save radio station

Press MEMORY button on the remote control until VFD screen displays "MEMORY".

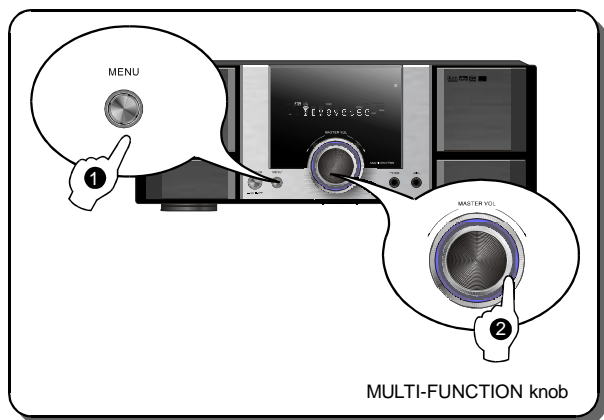
Press MULTI-FUNCTION button for long (above 1 seconds),the unit will automatically search radio station forward or backward and then automatically save it. This unit may automatically save 36 FM and 12 AM radio stations.



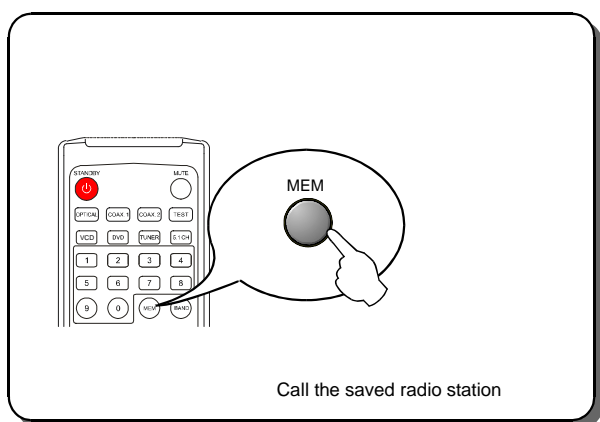
### 3. Save radio station manually

Press MEMORY button on the remote control and then NUMBER buttons to save radio station. If the saved radio station number is over 9, please press 2 numbers continuously.

After completely saving, PRESET symbol on the screen is lightened.



4. Call the saved radio station  
Press NUMBER buttons to call the saved radio station directly.  
Press FORWARD/BACKWARD buttons to call the saved radio station. Call the former or behind one of the saved radio station.  
After completely calling, "PRESET" symbol on the VFD screen is lightened.
5. Select AM step value  
Pressing AM STEP button for long (above 3 seconds) may switch the AM step frequency value, that is, when tuning the step value each time is 9KHz or 10KHz.



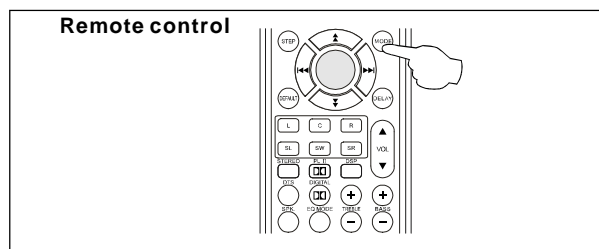
## 2.3.12 Tuning (Continued)

### The Explanation of MODE button

This unit has two working modes in the Receiving status:

#### AUTO/MANUAL

- 1、 In AUTO working mode, if you select FM Wave band, this unit will automatically recognize the radio station program is mono signal or stereo signal and keep the mono or stereo Receiving status.
- 2、 If the received radio station program has Louder noise or cacophony in stereo status, you may switch to MANUAL working mode. In this way, the unit is in mono receiving status to decrease noise and cacophony generally. You may switch the two working modes through MODE button on the remote control.

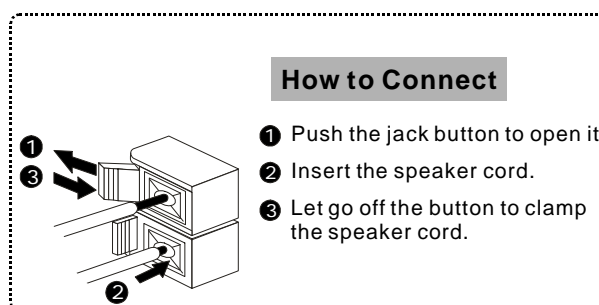


### Antenna Connection

You may use our accessional AM and FM indoor antenna when in bad receiving effect. Generally speaking, these antennae can supply enough signal strength.

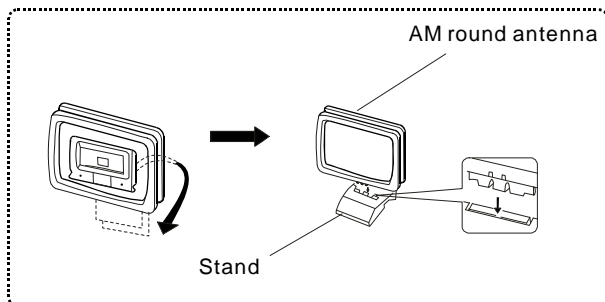
#### Connect to AM Round Antenna

- 1、 Push the jack button to open it.
- 2、 Connect the AM round antenna cord to AM ANT and GND terminals.
- 3、 Let go off the button to clamp the speaker cord. Pull the cord lightly to check the connection Is right or not.



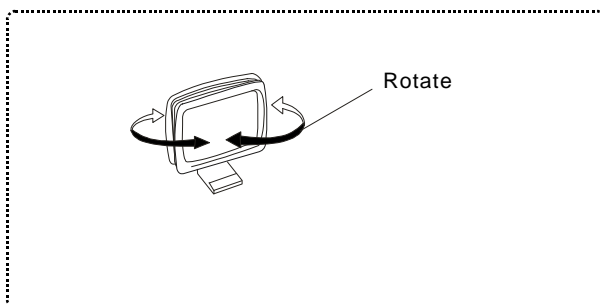
- 4、 Connect the AM round antenna to the stand.

4



5

- 5、 Adjust the direction of AM round antenna to get the best receiving effect.



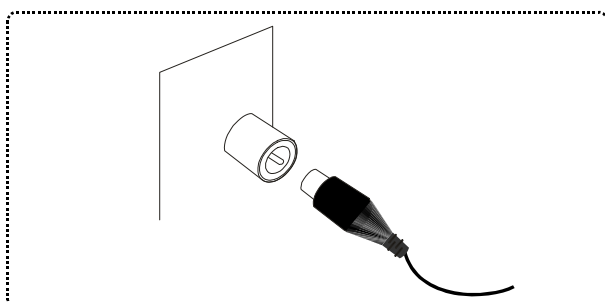
#### NOTE:

- 1、 AM round antenna should be placed far away from the equipment. You may put up on the wall or on the bookshelf.
- 2、 AM round antenna and outdoor antenna can be used at the same time.

#### Connect to FM Antenna

Connect to the indoor FM antenna

Connect the accessional indoor FM antenna to 75 UNBAL.FM ANT terminal.



#### NOTE:

Do not use the outdoor and indoor FM Antennae at the same time.

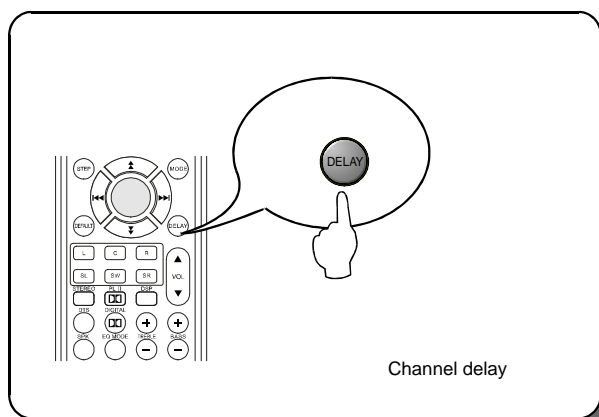
#### GND (Grounding) terminal

In order to ensure the safety and decrease the interference, please well connect the GND terminal. The better grounding method is insert the metal pole into wet ground.

### 2.3.13 Channel Delay

Channel delay operation is only available in Dolby Digital, DTS and Dolby Pro Logic II modes.

Press DELAY button on the remote control. When VFD screen displays "C XXMS", use MULTI-FUNCTION button to adjust the centre channel delay. The adjustment range is 0~5ms Press DELAY button on the remote control again. When VFD screen displays "S XXMS", use MULTI-FUNCTION button to adjust the surround channel delay. The adjustment range is 0~15ms in DTS and Dolby Digital decode modes, and 15~30ms in Dolby Pro Logic II decode mode.

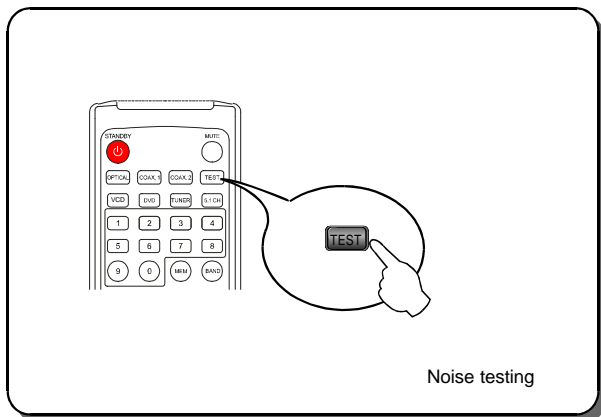


### 2.3.14 Noise Testing



During system working, it is used for users to adjust level balance between channels in multi-channel state.

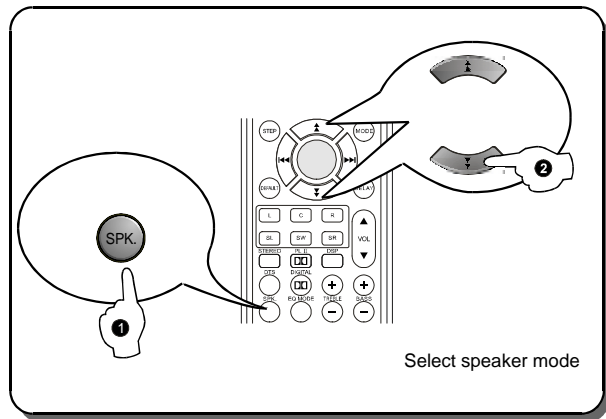
In non-STEREO decode mode, press TEST button on the remote control to enter noise testing mode. The unit will output noise according to the sequence of left, centre, right, surround right and surround left. The lasting period of each channel is 2s, during which time users may press the MAIN VOLUME button on the remote control to synchronously adjust 6-channel level, and may also press MULTI-FUNCTION button to adjust each channel's level. To exit noise testing mode, please press TEST button again.



### 2.3.15 Select Speaker Mode

Press SPEAKER MODE SETUP button on the remote control, when "SP SMALL" or "SP LARGE" appears, pressing MULTI-FUNCTION button again may change the left/right speaker mode. Press speaker mode button on the remote control, when "SUB ON" or "SUB OFF" appears, pressing MULTI-FUNCTION button again may set whether there is subwoofer speaker mode.

Note: The selection of "Large" or "Small" is set by speaker calibrator and bass playing ability. When subwoofer speaker and subwoofer output terminal are connected, you may set "SUB ON", or else, "SUB OFF". When speaker mode is set in "SMALL", subwoofer speaker must be set in "ON".



### 2.3.16 Headphone

This unit is with individual headphone amplifier. If necessary, please insert the headphone plug into the headphone jack on the front panel. In this state, changing decode mode is invalid.





## 2.4 ACCESSORIES

User Manual .....	1pcs
Remote Control .....	1pcs
AV Cord .....	1pcs
Jack to mini-jack adapter .....	1pcs
7#AAA battery .....	2pcs
Warranty card .....	1pcs
FM/AM antenna .....	1suit

## 2.5 SPECIFICATIONS

### 1、Rated Output Power

Main Channel(1kHz/4 ,RMS,Total Harmonic Distortion 1%):	80W+80W
Centre Channel(1kHz/4 ,RMS,Total Harmonic Distortion 1%):	15W
Surround Channel(1kHz/4 ,RMS,Total Harmonic Distortion 1%):	15W+15W

### 2、Separability(1kHz,Rated Condition): 40dB

### 3、Total Harmonic Distortion(1kHz,Rated Condition): 0.7%

### 4、Effective Frequency Range under Limited Gains(Normal Working Condition):

Main Channel	20Hz~20kHz <sup>+1</sup> <sub>-3</sub> dB
Centre/Surround Channel	20Hz~20kHz <sup>+1</sup> <sub>-3</sub> dB

### 5、Signal-to-Noise Ratio

Main Channel(Input 600 Short-Circuit,A weighted):	80dB
Centre Channel(Input 600 Shout-Circuit,A weighted):	73dB
Surround Channel(Input 600 Shout-Ciucuit,A weighted):	73dB

### 6、TUNER

Frequency range:	FM:65-74MHz,87-108MHz
	AM:500-1611KHz(9K STEP)
	520-1710KHz(10K STEP)

### 7、Input Sensitivity(Rated Condition)

100mV

### 8、Load Impedance

A11 4~8

### POWER

1、Power Supply:	~220V ± 10%50Hz
2、Maximum Power Consumption:	500W

### OTHERS

1、Net Weight:	About 8kg
2、Dimensions:	420 × 337 × 135mm

# Chapter Three Unit Circuit Principle

## Section One Principle of the player

AV311T (RU) is an advanced power amplifier launched into market recently. It is with DTS/AC-3 digital decode function, which makes sound processing more perfect to effectively control the distortion and noise in the course of audio signal.

### 3.1.1 Composition of the player

1. Signal processing board: gating, front stage amplifying of signal and front stage processing of Karaoke signal.
3. Control panel: VFD display, menu button and main volume control.
4. Power board: provide voltage required by each unit circuit, and perform the player protection function.
5. Power amplifier board: power amplifying of 5.2CH signal or analog signal.
6. Headphone board: Karaoke input and headphone output signal amplifying.
7. Vide board: input/output switch of two-channel composite video and S-video video signal.

### 3.1.2 Function and features

Simple operation panel interface; the panel of the player has only one power switch button, menu button and a large knob, simple and clear;

Wirh DTS/AC-3 decode function;

Optical, coaxial signal decode function;

Built-in 5-channel power amplifying, adaptable to AC-3/DTS and stereo music replay. Main channel 110W. Centre/surround 22W with powerful power;

With 6-channel volume control and separate level control, and also with 7-band electronic equalization;

With multiple electronic EQ modes, adaptable to different musical styles;

Digital sound field delay function;

With tuning function;

With intelligent protection of over-current and over-voltage

Karaoke function and headphone output;

Block diagram of the player is shown as the following figure 3.1.3.1:



### 3.1.4 Signal flow chart of the player

signal flow chart of he player is shown as in the following figure 3.1.4.1:

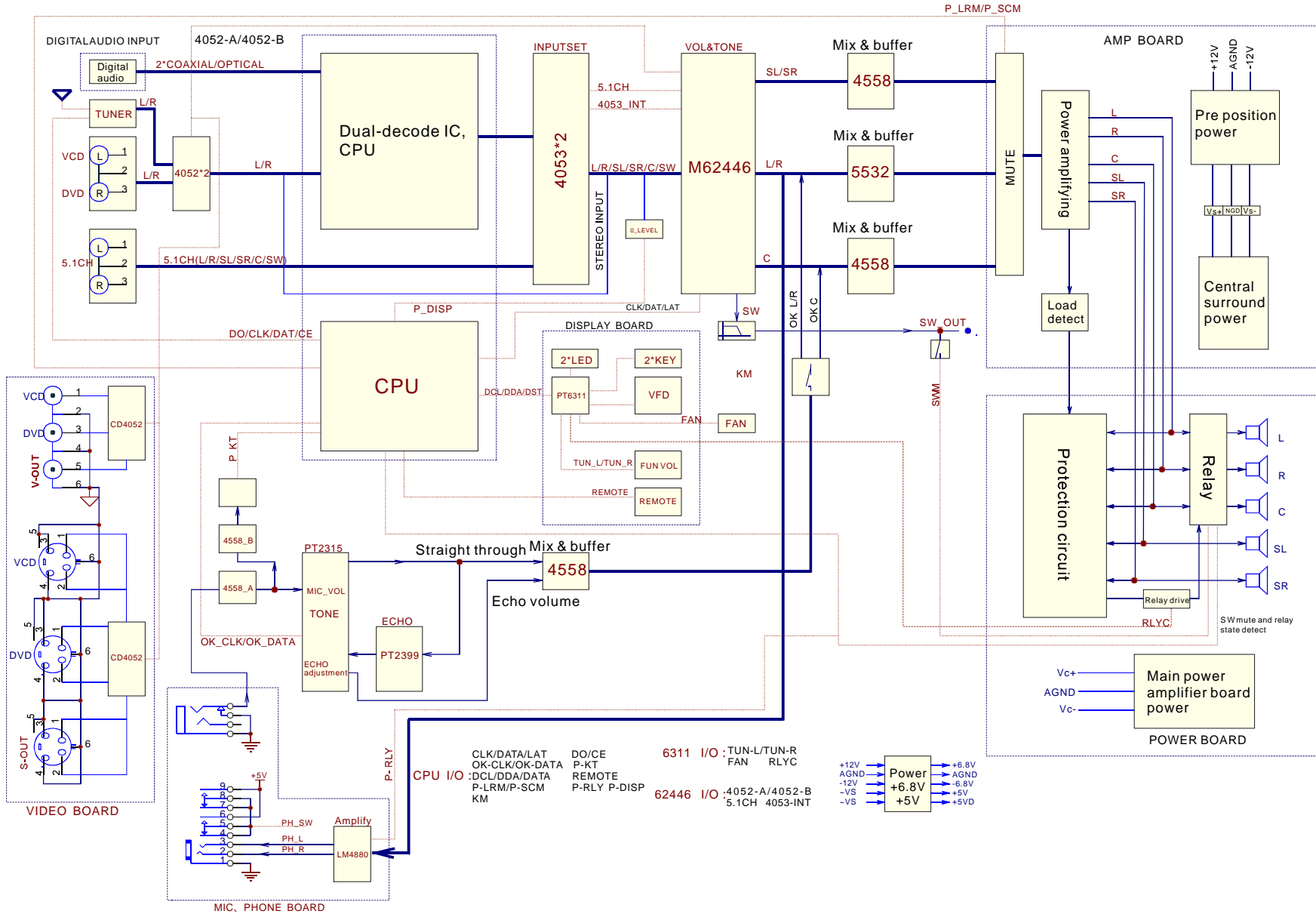


Figure 3.1.4.1 Signal flow chart of the player

## Section Two Unit Circuit Principle

### 3.2.1 Signal processing board

#### 1. Input selection circuit

AV321T(RU) has 6 kinds of input means in all: optical input, coaxial input, CD, DVD, 5.1CH and tuning input. Digital signals of optical, coaxial input of this player are directly sent to power amplifier board for processing through flat cable. Analog input selection of AV321T(RU) is fulfilled through an electronic switch Cd4052 (N101) and its truth value table is shown as the following:

<div>Estate PIN</div>	VCD	Tuning	DVD
A	1	0	1
B	1	1	0

AV321T (RU) has 3 kinds of input states: tuning, VCD, DVD, and they are controlled through 4052-A, 4052-B signal respectively (refer to truth value for details). Signals after being gated output from pin 3 and pin 13 of N101, and then output left/right main channel signal from its pin1, 12 through N111 CD 4052 to decode board for signal processing.

Analog signal input in 5.1 state: the gating of 5.1 analog signal input of AV321T(RU) is controlled by two IC CD 4053 (N102, N103), control pin 9, 10, 11 of CD 4053 are all controlled by the 5.1CH signal outputted from pin 4 of M62446 (N104), when 5.1CH signal is high level, the gating is analog signal input of 5.1 state; in this state, there is no digital sound field, all signals are straight through; when 5.1CH is low level, the gating is the synthesized signal after decoding.

Straight through and digital sound field switch control: AV321T (RU) has two different modes of straight through and digital sound field, and its gating input is controlled by N111/CD4052 and N102/CD. When control signal 4053-INT is high level, for it is connected to the enabled end of N102, this IC is in non working state, main channel signals output through pin 5, 11 of N111 and directly send to M62446 for processing to output Hi-Fi musical signals. When 4053-INT is low level, main channel signals are sent to decode board for digital sound field processing through Xp17, and N102 is also in working state.

#### 2. Karaoke signal processing circuit

For karaoke signals sent from MIC base board, after coupling and amplifying, one path is sent to volume and tone adjustment IC PT 2315 (N203) for processing, then after echo and delay adjustment

through PT 2399 (N204), it is sent to power amplifier board for small signal amplifying through band-Pass filter. PT 2315 is controlled by MCU, so users may adjust his desired Karaoke effect at will through remote controller.

Another path signal, after amplifying rectification, controls a switch triode V201 9014 to control the high/low level of detect signal P-KT to fulfil the detecting of Karaoke signals. When the inputted Karaoke signal is large enough, the DC after being rectified makes triode V201 on and then pulls down P-KT signal, which means that there is Karaoke signal input. Now, KM control signal is low level, triode V101 2N5401, V102 S8050 both cut off, Karaoke signals enter IC N107 NE5532 for amplifying through coupling capacitor C147, C149, then they are sent to left/right channel; when CPU cannot detect signals in a certain period, P-KT is high level, now KM control signal of CPU changes into high level, triode V101, V102 are both on to make Karaoke signal short circuit to ground, system mutes Karaoke part automatically to prevent the influence to sound effect caused by noise.

### 3. Fan starting circuit

When power amplifier is with load, for power is large and temperature rise is high, this player adopts fan to perform heat radiation. When volume is more than 45dB, FAN signal sent out from control pane N101 changes into high level, V103 9014 and V105 S8050 are on to form power supply loop of fan. When the connected load is headphone, control line PH-SW is high level, V104 9014 is on to pull down FAN signal, so no matter how is the volume of system, fan will not start up.

## 3.2.2 Decode board

Main element function of decode board is shown as follows:

IC SM8958AC25P (N116): control core of MCU system

IC 493264 (N105): high performance digital audio decoder, including DOLBY decode, DTS decode and DSP processing

IC CS8415 (N106): serial digital audio signal receiver

IC CS5340 (N108): 2-channel A/D converter

IC CS 4360 (N107): 6-channel D/A converter

IC 24C02 (N115): state memorizer

IC 74HC04 (N101): 6-channel phase inverter

IC BM1117-3.3 (N109): 3.3V voltage regulating IC, which provides power for CS8415, Cs4923

Working principle: for optical and coaxial signals, after being filtered by inductor, capacitor, reshaped by phase inverter 74HC04 (N101), they are sent to serial audio digital signal to receive signal input pin 4, 12 14 of IC Cs8415 (N106), then converse serial digital audio signal to PCM signal through this IC, and output from pin 16 (sampling speed signal), 17 (main channel clock signal), 18 (audio data signal) of this IC to pin 25 (sampling speed control signal), pin 26 (clock signal), 22 (PCM data input port

1) of digital audio decode IC Cs493264 (N105) for data processing.

Analog signals of left/right channel are sent to decode board through flat cable Xs17, after front stage small signal processing, then sent to pin 10, 12 of IC Cs5340 (N108) for A/D conversion to change analog audio signal into PCM signal, then sent from pin 4 (audio PCM signal), 17 (sampling speed signal), 18 (clock signal) of N108 to pin 27, 28, 29 of N105, that is, input from another PCM input port of N105 for data processing.

Therefore, digital sound field processing of analog signal and processing of coaxial, optical audio digital signal are separate, if only one path works abnormally, the possibility that problem appears before N105 is large.

CS493264 (N105) is with powerful digital sound field processing function, all DSP processing, Pro. Logic II processing and DOBLY/AC-3 processing are all performed inside under the control of MCU/SM8958AC25P (N116).

Audio PCM signal after being processed by CS493264 (N105) is sent to CS 4360 (N107) for D/A conversion to restore PCM signal into 6-channel analog signal, then filter high frequency signal outside the range of audio frequency through a band-pass filter, then sent to input gating part for selection input.

Acted as the core of the whole system, MCU/SM8958AC25P (N116) has important function. All control signals are sent out by it, and it will detect each different signal and user order at any time to control action of each part of machine. If this IC has trouble, the player will be not able to work normally.

In addition, this player has no auto search function, but it can automatically save and memorize the working state last time, and enter the previous working state when power on next time.

This player is with tuning function, which provides a good function selection for users. It directly controls digital tuner receiving (AM/FM) signal through MCU N116, and then outputs through power amplifier. Clock and data line of digital tuner is used together with LM62446 (N104), another two control lines are directly connected to N116, TUNER L, TUNER R signal after being processed by digital tuner is directly sent to CD4052 (N101) for gating input.

### **3.2.3 Control panel**

Control panel is mainly composed by VFD display screen, drive IC PT6311 (N101), infrared remote controller HSO038A2 (N102) and indicator light display circuit. It completes man-machine conversation and working state display mainly. The composed block diagram is shown as the following figure 3.2.3.1:

Under the control of MCU, through DST state, DCK clock, DDA data, control PT6311 (N101), display working state of the player and fan state, and receive user control order sent out by PT6311 (N101), control the controlled circuit of the player to make the player work in indicated working state. When user are operating panel buttons, control order is sent to PT6311 (N101) through keyboard scanning circuit, PT6311 (N101) outputs control data to MCU through coding drive inside and realizes the control of controlled circuit through MCU, and controls VFD through PT6311 (N101).

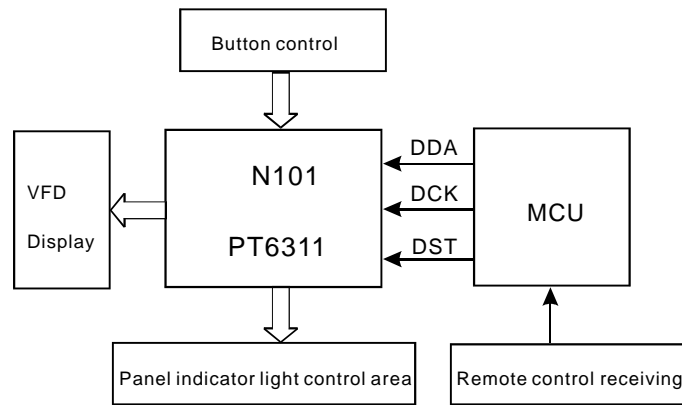


Figure 3.2.3.1 Control panel circuit block diagram

VFD101 is vacuum flourescent display screen and the most distinct feature is high brightness. The working principle is similar with that of kinescope of TV set. Pin 1, 2, 46, 47 are filament power supply, MCU controls SEG electrode through the control of PT6311 (N101) to make characters of corresponding working state display on screen.

Remote control receiving circuit is mainly composed of remote control receiver HS0038A2 (N102), in which pin 1 is grounded, pin 2 power supply end, pin 3 is signal receiving output pin and sent to MCU directly to control corresponding circuit.

### 3.2.4 Power board

The function of power board is to provide all kinds of working voltage required by each unit circuit. Shown as in the figure 3.2.4.1 AV321T (RU) adopts large-power round transformer. Centre and surround channel of AV321T (RU) adopt CD1875 and 2 × TDA2052 respectively, TDA2052 is mono channel power amplifying and adopts separate positive/negative power supply.

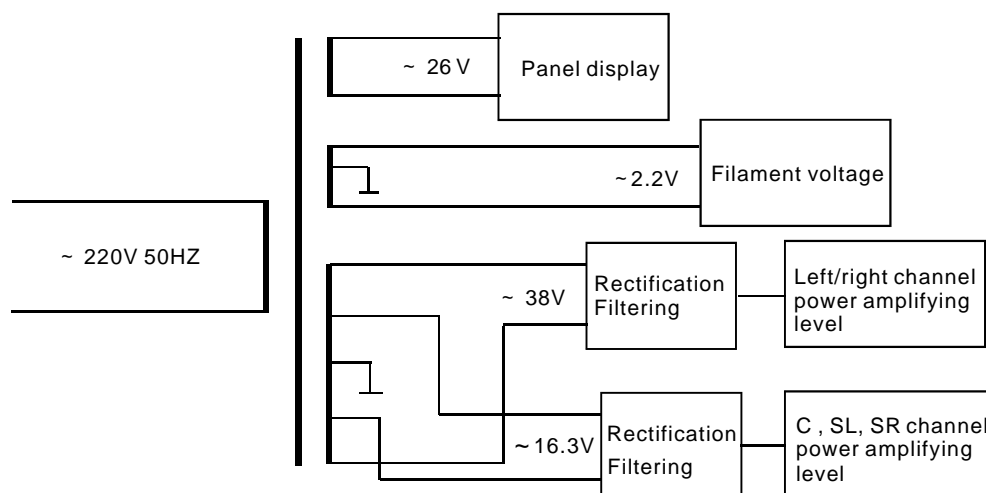


Figure 3.2.4.1 Power block diagram



The two groups AC 35V voltage outputted from the first sublevel winding of transformer, after rectification and filtering of 8 1N5404 (VD100 ~ VD107) diode and 2 electrolytic capacitor (15000uF/63V, C108, C109), positive/negative 53V power is achieved to supply power for left/right channel.

The two groups AC 17V voltage outputted from the second sublevel winding of transformer, after rectification and filtering of 4 1N5404 (VD111~VD114) diode and 2 electrolytic capacitor (4700uF/35V, C141, C142), positive/negative 23V power is achieved to supply power for SL/SR/C channel. For other IC and operational amplifiers, after voltage regulating of 3-end voltage regulator L7812 (N101), L7912 (N102), positive/negative 12V power is achieved to supply power for other IC.

### 3.2.5 Power amplifier board and protection circuit

#### 1, L, R channel power amplifying circuit

L, R channel power amplifying circuit: L, R main power amplifying circuit of AV321T (RU) is composed of discrete component, the composed block diagram is shown as the following figure 3.2.5.1 (take L channel for instance):

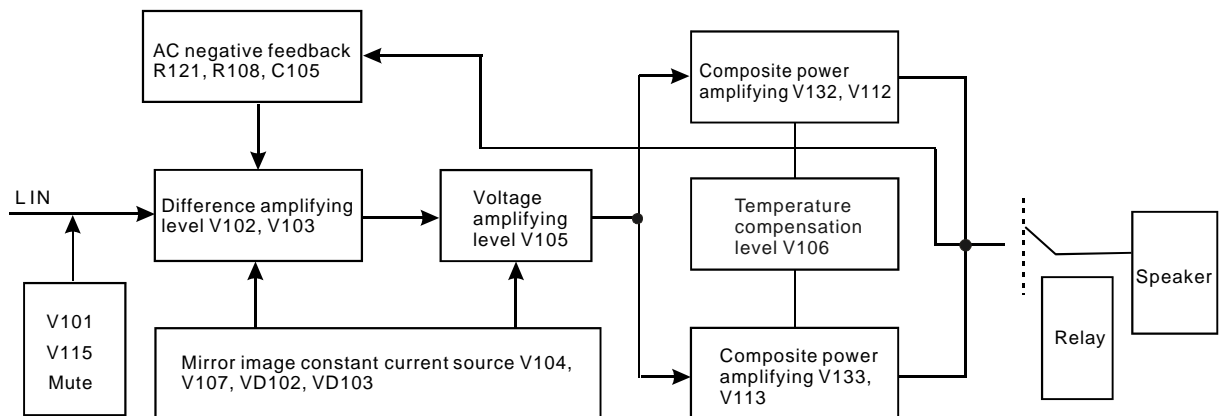


Figure 3.2.5.1 Power amplifier and protection circuit diagram

L channel signal, through R101, R103, C101 coupling, is sent to B electrode of differential amplifying stage V102, V102 and V103 compose the differential amplifying circuit of single-end input and single-end output. Audio signal is outputted from C electrode of V102 to B electrode of voltage amplifying stage, then to composite power amplifying stage after voltage amplifying. V104, V107, VD102 and Vd103 compose mirror constant current circuit. VD102, VD103 provide V104, V107 with constant base electrode current. Emitter electrode resistance of V104 decides working current of differential amplifying stage, emitter electrode resistance of V107 decides working current of voltage amplifying stage. V132 and V112 compose multiple unit tube amplifying to make final stage of power amplifier have powerful current amplifying ability, and they compose positive half cycle amplifying waveform. V133 and V113 compose negative half cycle amplifying waveform. The function of

Temperature compensation tube in circuit has two: firstly, it is the base electrode bias of upper/lower geminate transistor and its working state decides static working current of composite power amplifying stage, that is, through adjusting the on state of V106, static working point of composite power amplifying stage may be set. The common means is change base electrode resistance of V107; it may also automatically adjust working state of composite power amplifying stage after temperature increases. The adjustment process is as follows:

$$\text{Total current of output level} = \text{working current} + \text{leakage current}$$

When temperature becomes high, leakage current increases to lead to static working point drift (unfavourable).

At the same time, the leakage current of V106 increases,  $U_{ce}$  decreases to make bias current of output level decrease, working state changes, working current of back stage decrease, and temperature compensation function is realized.

In power amplifying circuit of AV321T (RU), voltage negative feedback is introduced and composed by R121, R109, C105, which may stabilize static working point of differential level. AV321T (RU) adopts direct output means, R111 and C116 connected on output end compose Zobel network, which may prevent high frequency self-excitation caused by AC inductive reactance of speaker sound coil.

## 2. Mute circuit

When pressing MUTE button on remote controller, after optical-electric conversion of signal conducted by infrared receiver, a mute signal is achieved and sent to MCU, P\_LRM high level and P\_CSM low level mute order is sent out from MCU at the same time, P\_LRM high level makes 2N5401 (V115), S8050 (V101), S8050 (V116) on, left and right channel signal are short-circuited to ground, and mute control function of left/right channel finishes; P\_CSM low level makes 9014 (V150) cut off, 2N5401 (V130) and S8050 (V131) are on, center channel signal is short-circuited to ground, and mute control function of center channel finishes; at the same time, P\_CSM low level makes 9014 (V151) cut off, voltage of pin 5 of TDA7265 is power voltage, TDA7265 internal mute circuit works to reach surround channel mute effect.

## 3. C, SR, SL power amplifying circuit

Compared with the former models, the three channels of AV311T (RU) adopt special audio power amplifying IC CD1875CZ (N104) and TDA7265 (N106). As for TDA7265 (N106), it has 11 pins in all, pin 3, 1 and 6 are its positive/negative power pin; pin 11 and 7 are its in-phase input terminal; pin 10 and 8 are its reverse input end, the rated output power of each channel of this power IC may be up to 15W, with auto mute function when power on; as for CD1875CZ (N104), it has 5 pins in all and is a good performance power amplifying IC with 15W power output in rated state. pin 5 and 3 are positive and negative power pin.

#### 4. Protection circuit

Protection circuit of power amplifier of AV321T (RU) is designed on power board. The protection means of L, R, C channel is fulfilled through disconnecting delay Y100 when starting up to disconnect the output. SR, SL channel achieves protection function through mute. AV321T (RU) is with power-on delay protection, central point over-voltage and over-current protection, standby protection.

(1) Power-on delay attracting protection circuit: the working of circuit is unstable when power on, and the produced impulse current does great harm to speaker and power amplifying circuit, so delay attracting protection circuit is set. Power-on delay attracting protection circuit is divided into 2 steps: the first step: C, L, R channel and its working process is as follows: for AC outputted from transformer, after rectification and filtering of Vd113, C110, +22V voltage is achieved, charges C115 through R108 to make Vd111 struck through reversely and to make V105, V104 forwards on, relay Y100 is made attracting finally to reach delay attracting effect. The second step: SR, SL channel performs power-on anti-impulse protection through the following means: when power on, reset of machine system has not finished, P\_CMS may probably be high level to make triode V137 on to cause power-on impulse sound, now a +VS level is added on B electrode of triode V137 through resistor R163 to make it in cutoff state at the moment of power-on; a -VS level is added on pin 3 of TDA2052 through resistor R189 to make TDA2052 in mute state to avoid the impulse to loudspeaker; after machine system resets, MCU outputs a P\_CMS low level signal to still make V137 cut off, pin 3 of TDA2052 is still -VS, TDA2052 outputs mute. After delay start up of machine is successful, output signal P\_CMS of MCU switches into high level immediately, now relay has attracted, RLY0 is grounded through relay to make V137 on, voltage of pin 3 of TDA2052 is about 5V higher than negative power voltage, SL/SR channel restores normal output. TDA2052 chip, under the condition that load is not connected, will appear component DC, so false load R121, R122 is added in power board surround channel.

(2) Over-voltage protection: on output end of each channel, an over-voltage sampling resistor is connected, L channel is R116, R channel is R117, C is R118, SR and SL are R120 and R119 respectively, only one channel's central point voltage is more than +3.5V or less than -3.5V, V101 or V102 is on to make their C electrode voltage decrease, B electrode V103 is pulled down to make V103 on, relay disconnects finally, and over-voltage protection finishes. The working process is shown in the figure 3.2.5.2:

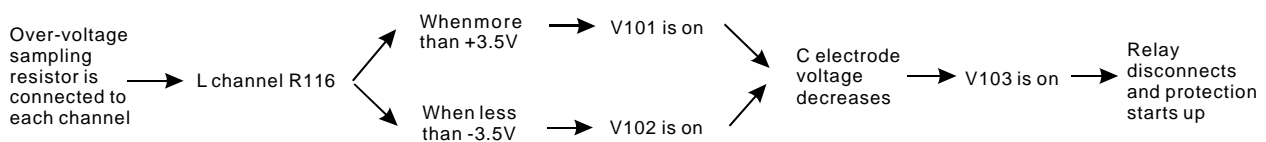


Figure 3.2.5.2 Over-voltage protection flow chart

(3) Short-circuit protection: an over-current sampling triode is connected to output load resistor of L, R channel, sampling triode of L channel is V114 (on power amplifier board), load resistor is R126, R127(on power amplifier board). C, SR, SL channel power amplifying IC has been with over-current protection inside. Only over-current appears in L channel, the pressure drop produced on R126, R127 will increase, once the pressure drop of R129 (on power amplifier board) is more than 0.7, V114 will be on, V103 will also be on, relay disconnects finally, and short-circuit protection completes. The working process is shown in the figure 3.2.5.3:

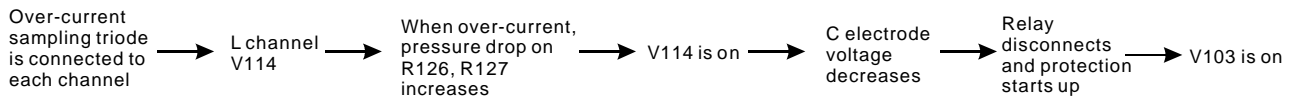


Figure 3.2.5.3 Short-circuit protection flow chart

Similarly, when R channel has over-current, voltage on R159 (on power amplifier board) will be more than 0.7V to make (on power amplifier board) V129 on, also to make V103 on, and relay disconnect finally to achieve the purpose of protecting loudspeaker.

### 3.2.6 Video input/output board

AV321T (RU) is with two-channel composite video input (VCD, DVD or 5.1CH); two-channel S-video video input (VCD, DVD or 5.1CH); 1-channel composite video output (VCD, DVD or 5.1CH); 1-channel S-video video output (VCD, DVD or 5.1CH).

Input/output switch of video signal is realized through two electronic switch Cd4052 (N100,N101). When VCD channel is selected, pin 1 and 2 of N104 (M62446) of signal processing board send out A and B high level control signal, according to working principle of signal processing board in section 2, now A and B also control gating of CD4052 of audio part, that is, audio channel also selects VCD channel, thus, the synchronous switch of audio and video of VCD channel is realized.

Similarly, for synchronous switch of audio and video of DVD channel, pin 1 and 2 of N104 (M62446) of signal processing board send out 1 and 0 control signal of A and B to finish the corresponding switch. When 5.1CH is selected, it is equal to selecting DVD channel.

Composite video signal is outputted through triode V100 (1015), V101 (1015) and V102 (1015) output S-video signal.

### 3.2.7 MIC, headphone board

Working principle of microphone part has been shown in section 2 of chapter 2, so we will not repeat here.

Headphone part: L and R channel signal is outputted from pin 31 and 32 of signal processing board

N104 (M62446), through coupling capacitor C103, C104, then sent to pin 2 and 6 of two operational Amplifiers of N100 (LM4880), after amplifying, headphone signal is outputted from pin 1 and 7 of N100 respectively.

When headphone is inserted, MCU detects that PH\_SW signal is high level, the corresponding control signal P\_LRM is high level, main channel is muted; P\_RC controlled by CPU changes into high level, relay on power board disconnects, RLY0 of power board is pulled up to +5V, P\_RLY control signal changes into high level, triode V101 (S8050) is on, pin 5 of headphone amplifier N100 has +2.5V voltage input, headphone amplifier is in working state to make V104 of signal processing board on at the same time, V103 and V105 cut off, power supply loop of fan is cut off, when volume is over 45dB, fan rotation is forbidden to facilitate to listen with headphone.

When no headphone is inserted, MCU detects that PH\_SW signal is low level, the corresponding control signal P\_LRM is low level, P\_RC controlled by CPU changes into low level, relay on power board attracting, RLY0 of power board is pulled down to 0V, P\_RLY control signal changes into low level, triode V101 (S8050) cuts off, pin 5 of headphone amplifier N100 has 0V voltage input, headphone amplifier is in standby state. Central and surround channel of signal board volume adjustment IC N104 (M62446) is opened to make power amplifier output signal and drive loudspeaker.

## Section Three Servicing Cases

### 3.3.1 Servicing cases

[ Example 1 ] Symptom: power-on protection

Description: after power on, relay does not attract and "system abnormal, auto protection" displays.

Analysis and troubleshooting: after power on, system protects, relay does not attract, shown as in the figure 3.3.1.1; test L, R, C, SL, SR of power board flat cable holder XP8 and there is no DC output, test pin 1 of power board flat cable holder XS7 and it is high level, pin 2 is low level, C electrode of triode V101 is high level; it is known from the above test that the protection is not caused by over-current and over voltage (you may also unplug flat cable holder XP7 and XP8 and check whether it has protection). Test positive voltage of diode VD112 and it is 0. We judge that relay has trouble. After changing relay, trouble is removed.

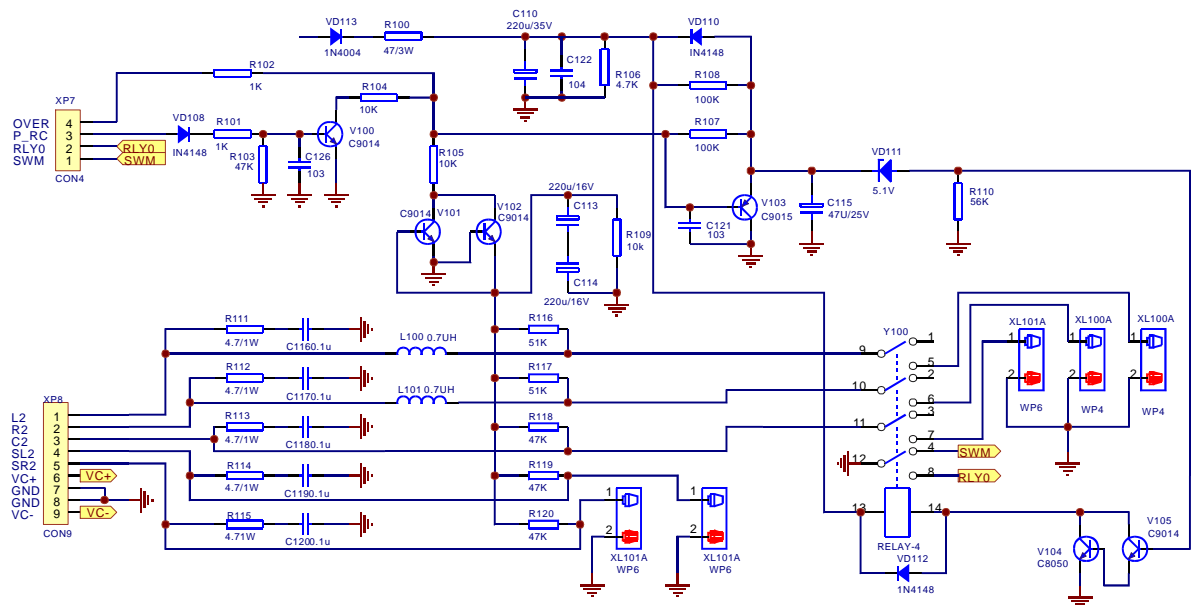


Figure 3.3.1.1 Protection circuit diagram

Note: 1. After relay is used for a period, working state may be unstable and some abnormalities may appear: relay does not attract after power on sometimes; each contact point does not touch fully after relay attracting sometimes; CPU cannot detect RLY0 signal (after relay attracting this signal is low level), auto protection.

2. Causes of power-on protection: over-current protection, over-voltage protection and CPU cannot detect RLY0 signal; test whether each output channel has DC output; when power-on protection trouble appears, make clear which reason caused it. Centre or surround power IC have trouble, which cause that output signal has DC in it.

**[ Example 2 ] Symptom: no sound output**

Description: power on, after system resets normally, switch each sound source and there is no output, select decode and there is no output.

Analysis and troubleshooting: after power on, select VCD channel, input sine wave signal, shown as in the figure 3.3.1.2; test volume board capacitor C119, C121 and there is no signal, test signal board capacitor C122, C124 and there is still no signal, pin 4, 11 of N101 has signal, test power voltage of pin 7, 16 of N101 and it is normal, pin 3, 13 of N101 has no signal, so we preliminarily judge that N101 has input but has no output, we judge that N101 has no trouble, test pin 9 of N111 and it is high level, we judge that this channel is not gated, signal A, B of N104 has trouble. Change N104, after changing, output is normal and trouble is removed.

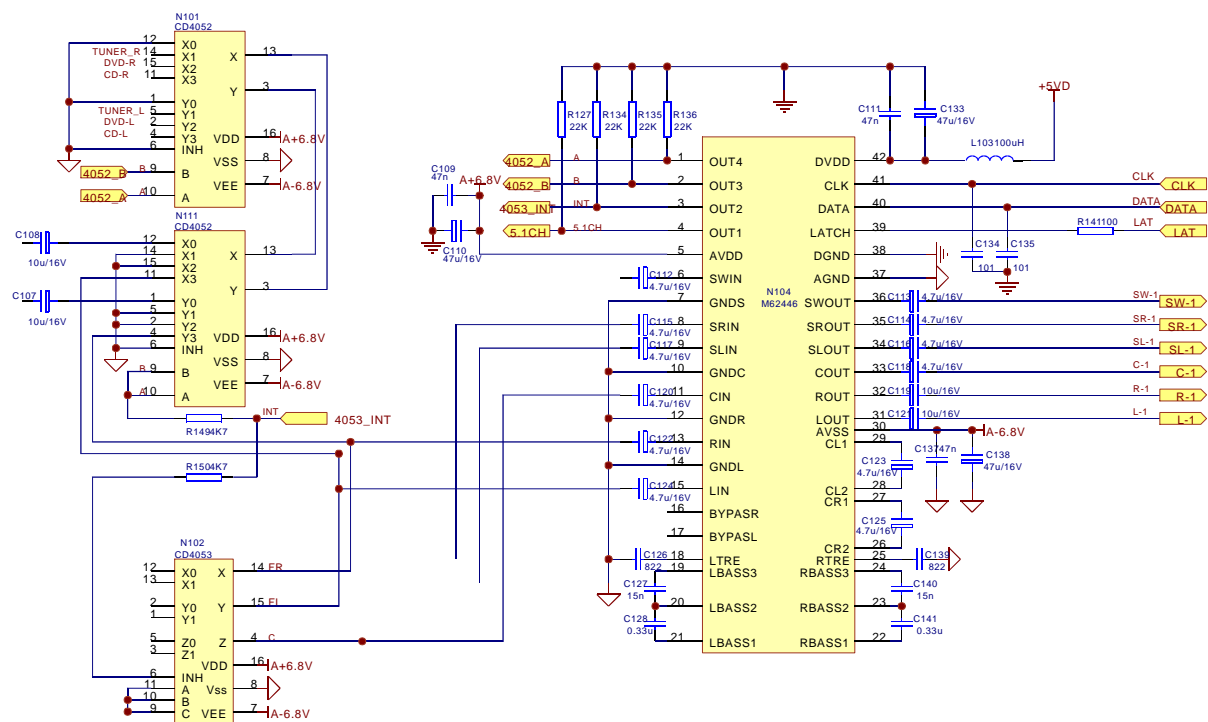


Figure 3.3.1.2 Volume circuit diagram

Note: when there is no output, firstly make sure that it is a certain channel has no output or all channels have no output; that all channels have no output may be caused by abnormal power supply of a certain part, or abnormal mute signal; then make clear whether it is decode has no output or signals without being decoded have no output; that decode has no output is caused by abnormal working of decode part, please refer to cases of “decode has no output”. CD4052 and CD4053 belong to electronic switch with high switch frequency easy to damage and may pull down +6.8V and -6.8V voltage after damage, or pull down the gating signals A, B of 62446, and trouble of no output appears.

[ Example 3 ] Symptom: decode has no function

Description: when in analog input, decode has no output, input digital signals have no output

Analysis and troubleshooting: analog signals with decoding have output, so we can judge that power amplifier circuit working is normal, and trouble is preliminarily decided on decode board. Shown as in the figure 3.3.1.3, input digital signal, test pin OSCLK, OLRCK, SDOUT of N106 CS8415 and there is pulse waveform output, test AD2, AD1, AD0, WCK, BCK, MCLK of N105 CS4923 and they all have signal output, test AOUTA1, AOUTB1, AOUTA2, AOUTB2, AOUT3, AOUTB3 of N107 CS4360 and they all have no waveform output, test voltage of power supply pin of N107 and it is normal, test SDIN1, SDIN2, SDIN3, LRCK, MCLK of N107 CS5340 and they all have signal, so we judge that N107 CS4360 has input but has no output. After changing N107, output is normal and trouble is removed.

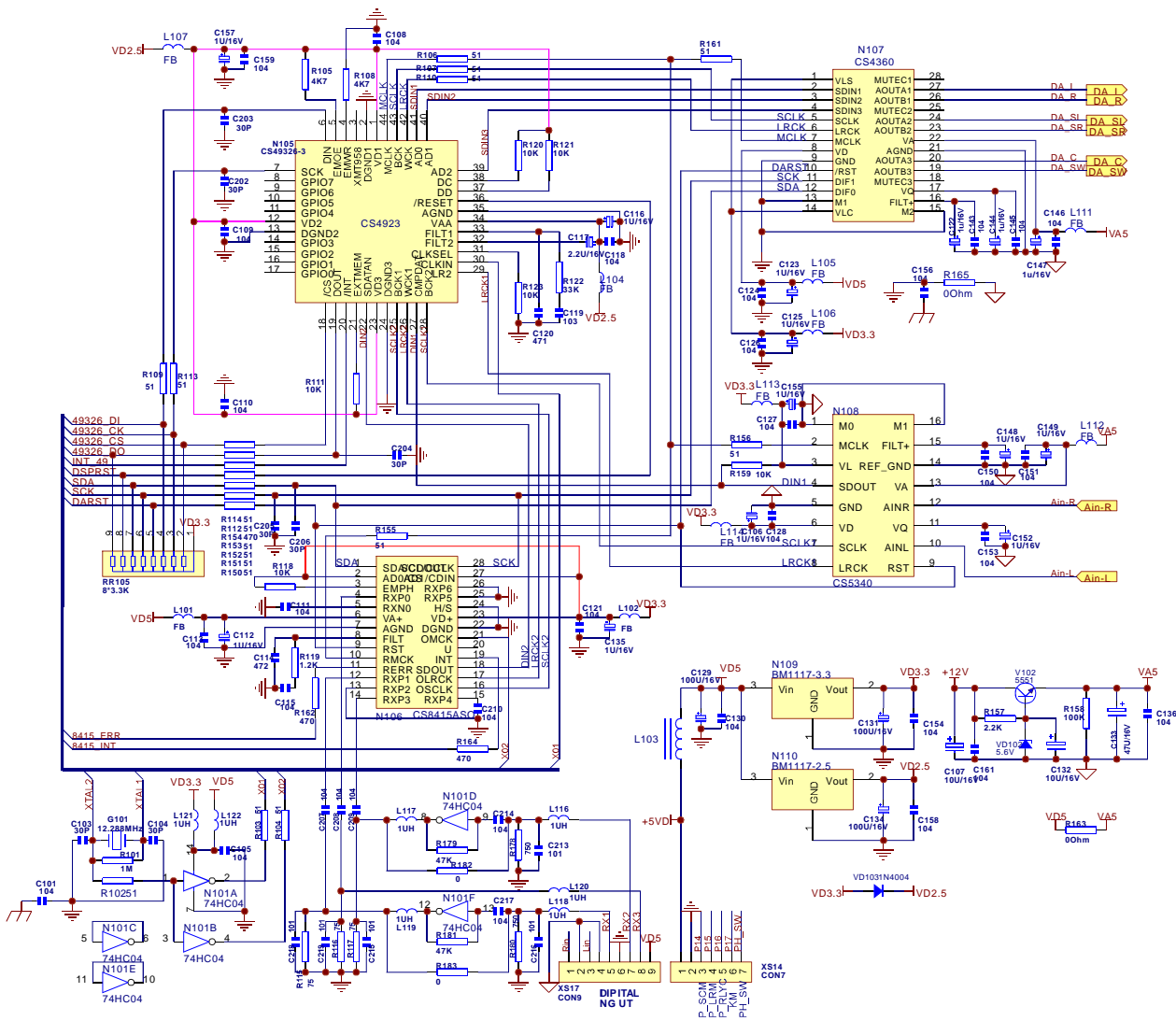


Figure 3.3.1.3 Decode circuit diagram

Note: if decode has no output, firstly make clear whether digital audio signal has no output; if it is only analog signal decode has no output, firstly consider whether N108 CS5340 and peripheral circuit work normally, after getting rid of it, you may consider that whether it is a certain input channel of N105



### [ Example 4 ] Symptom: microphone has no output

Analysis and troubleshooting: after power on, insert microphone, microphone inputs sine wave signal, shown as on the figure 3.3.1.4, test base electrode of signal board triode V101 and it is low level, Mic mute signal is normal, test signal board capacitor C244 and there is no signal, test signal board capacitor C224 and there is no signal. Considering that MIC input can be detected, test signal board capacitor C202 and there is signal, power supply voltage of N203 is normal, so we preliminarily judge that trouble lies in N203 PT2315. After changing PT2315, trouble is removed.



Description: after power on, power amplifier has output, headphone has no output.

- 32 -

Note: when headphone has no output, firstly make clear whether relay is disconnected, then test whether SHUTDOWN pin voltage of LM4880 is normal ( 2.5V when in normal condition), and finally judge whether headphone has trouble or LM4880 has trouble.

**[ Example 6 ] Symptom: no sound output**

Description: after power on, connect to 5.1CH, main channel has no output, centre and surround have output, power board FL101, FL102 fuse is burnt down.

Analysis and troubleshooting: change FL101, FL102 fuse, power on again, fuse is burnt down, power off, shown as in the figure 3.3.1.5, test resistance to ground of power board Vc+, Vc- and resistance is zero ohm, unplug power board flat cable holder XS8, test resistance to ground of power amplifier board Vc+, Vc- and it also zero, so we preliminarily judge that trouble lies on power amplifier board. Test resistance between each pin of power pipe V112 of power amplifier board and they are all 0, resistance between each pin of power pipe V113 is 0, V112, V113 have been stricken through, change V112, V113, change fuse, after power on again, output is normal and trouble is removed.

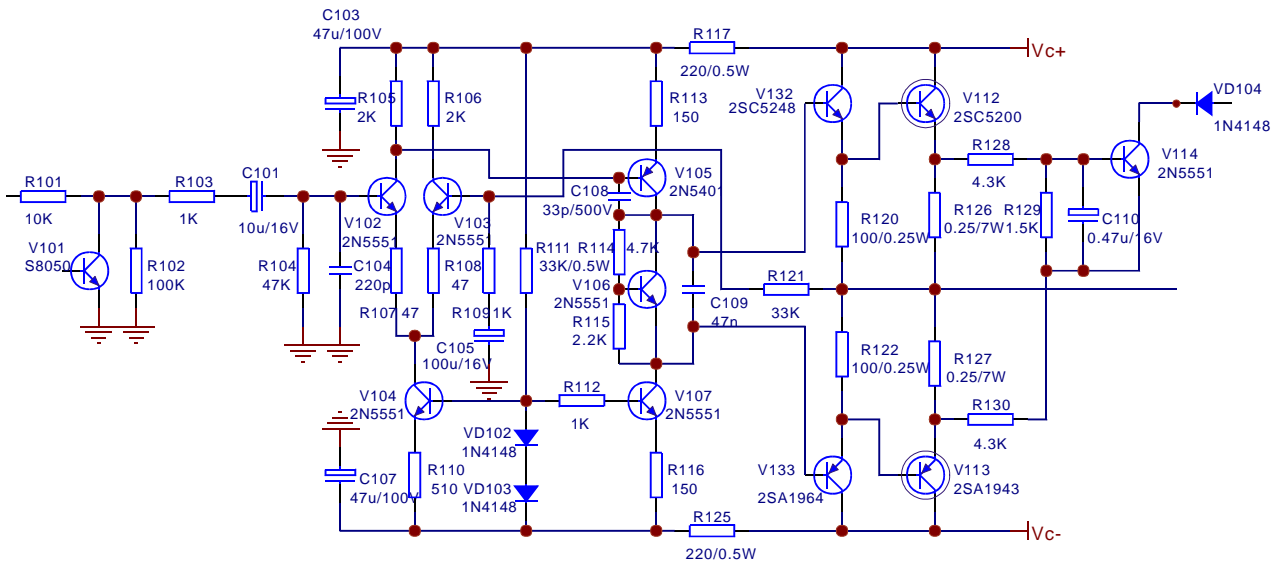


Figure 3.3.1.5 Power amplifier circuit diagram

Note: when a certain channel has no output, firstly make sure voltage of each channel power amplifying circuit is normal. Generally, test stage by stage from final stage of signal output and analyse the reasons. For voltage is unstable, power IC is easy to burn down; machine vibrates in the course of con, which may break the line of PCB board of signal board, or make copper piece of element pin fall off. When analysing questions, we should consider.

**[ Example 7 ] Symptom: no screen display**

Description: after power on, relay attracts, output signal is normal, VFD has no display.

Analysis and troubleshooting: connect to power, test voltage of panel XS10 and it is normal, change VFD display screen, display is normal and trouble is removed.

Note: when no screen display appears, firstly make clear whether voltage of display screen is normal, whether display drive IC is normal; VFD screen is vacuum packaged and it is easy to damage, so in most conditions it is the screen that has been damaged.

**[ Example 8 ]** Symptom: power not on

Description: no action after power on, relay does not attract, no screen display.

Analysis and troubleshooting: power on, observe each fuse and it is normal, test secondary stage voltage of transformer and it is 0, test primary stage voltage of transformer and it is normal, test primary resistance of transformer and it is infinite, so we judge that transformer has been burnt down. Change transformer and trouble is removed.

Note: when power not on, firstly make clear that it is power not on or has no screen display, whether it is part of voltage is abnormal or all voltage is abnormal; if it is power not on, test stage by stage from power socket until the trouble is found.

### 3.3.2 Troubleshooting flow chart

1. Troubleshooting process for “Power-on protection” is shown as in the following figure 3.3.2.1:

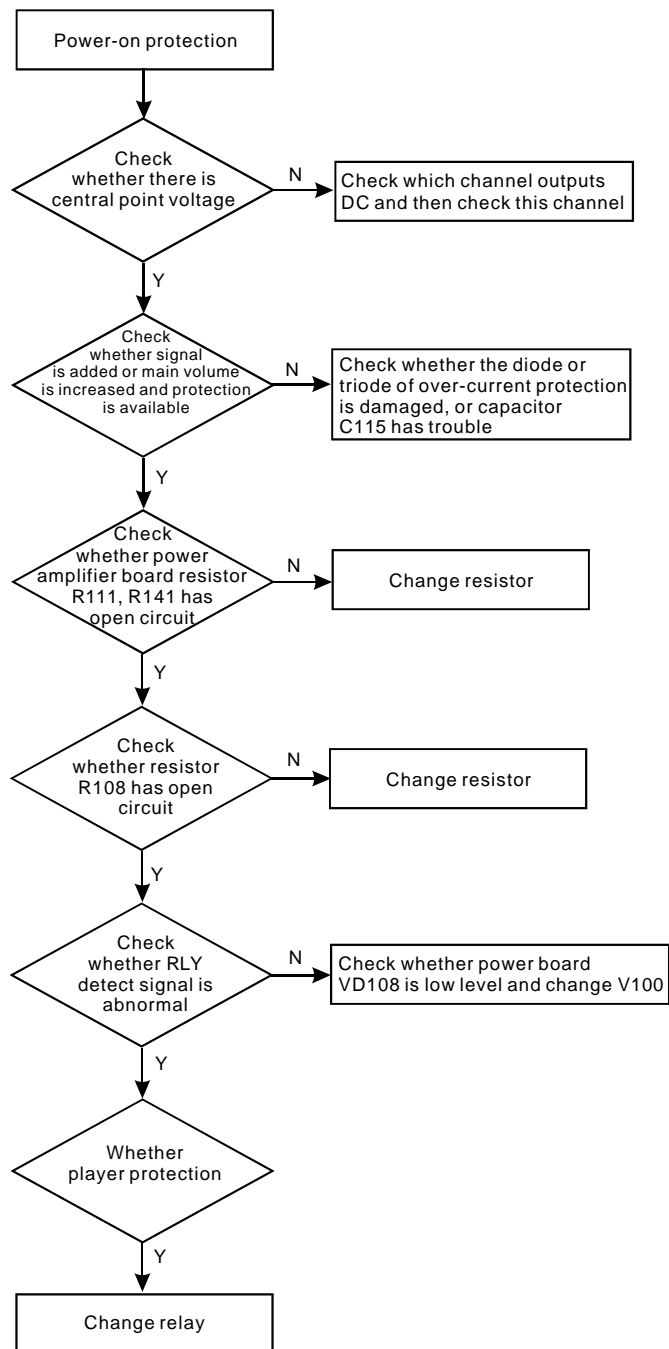


Figure 3.3.2.1 Troubleshooting flow chart for “Power-on protection”

2. Troubleshooting flow chart for “Karaoke has no sound” is shown as in the following figure 3.3.2.2:

Analysis: this kind of trouble may adopt signal input method. Test stage by stage, when a certain stage does not have disturbance sound in loudspeaker, this stage has trouble; when using this method, check from back stage to front stage. Another method is signal control method, check stage by stage from front to back stage, if a stage has no sound, it means that this stage has trouble.

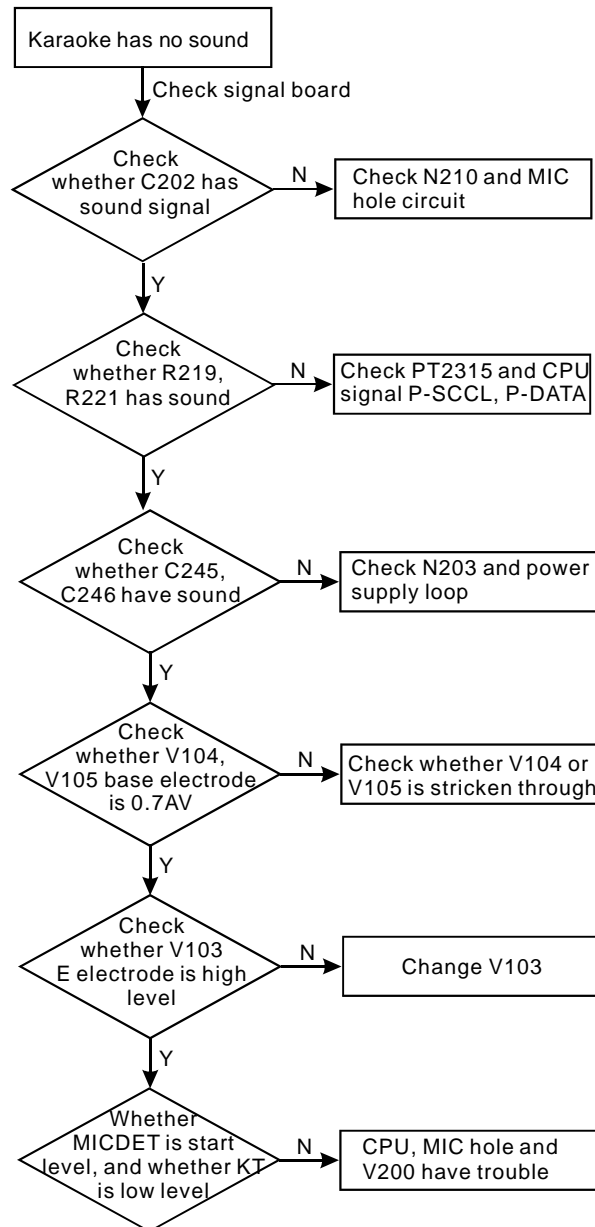


Figure 3.3.2.2 Troubleshooting flow chart for “Karaoke has no sound”

3. Troubleshooting process for “No output (2 channels)” is shown as in the figure 3.3.2.3:

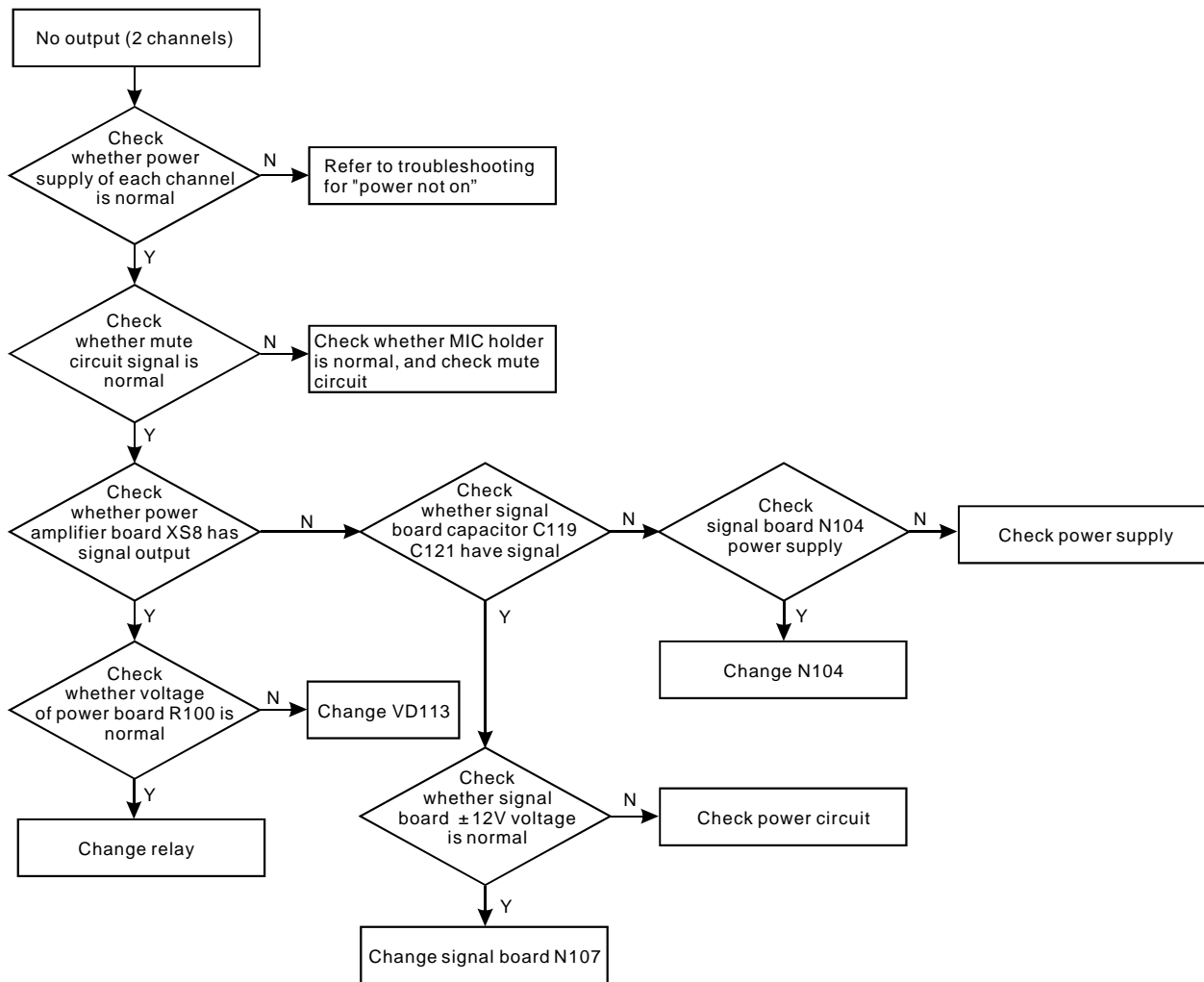


Figure 3.3.2.3 Troubleshooting flow chart for “No output (2 channels)”

4. Troubleshooting process for “VCD channel has no output” is shown as in the following Figure 3.3.2.4:

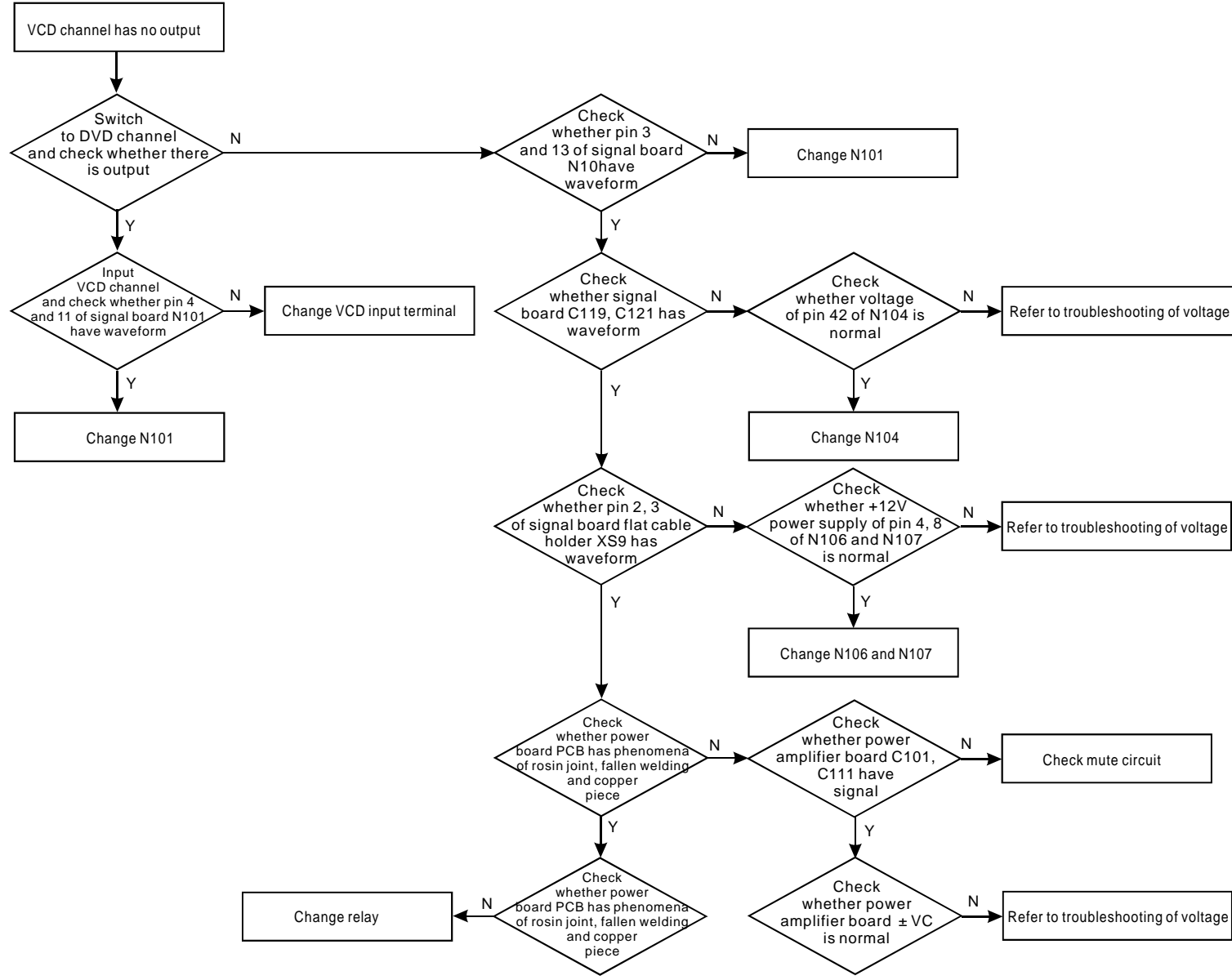


Figure 3.3.2.4 Troubleshooting flow chart for “VCD channel has no output”

5. Troubleshooting process for "DSP has no output" is shown as in the following figure 3.3.2.5:

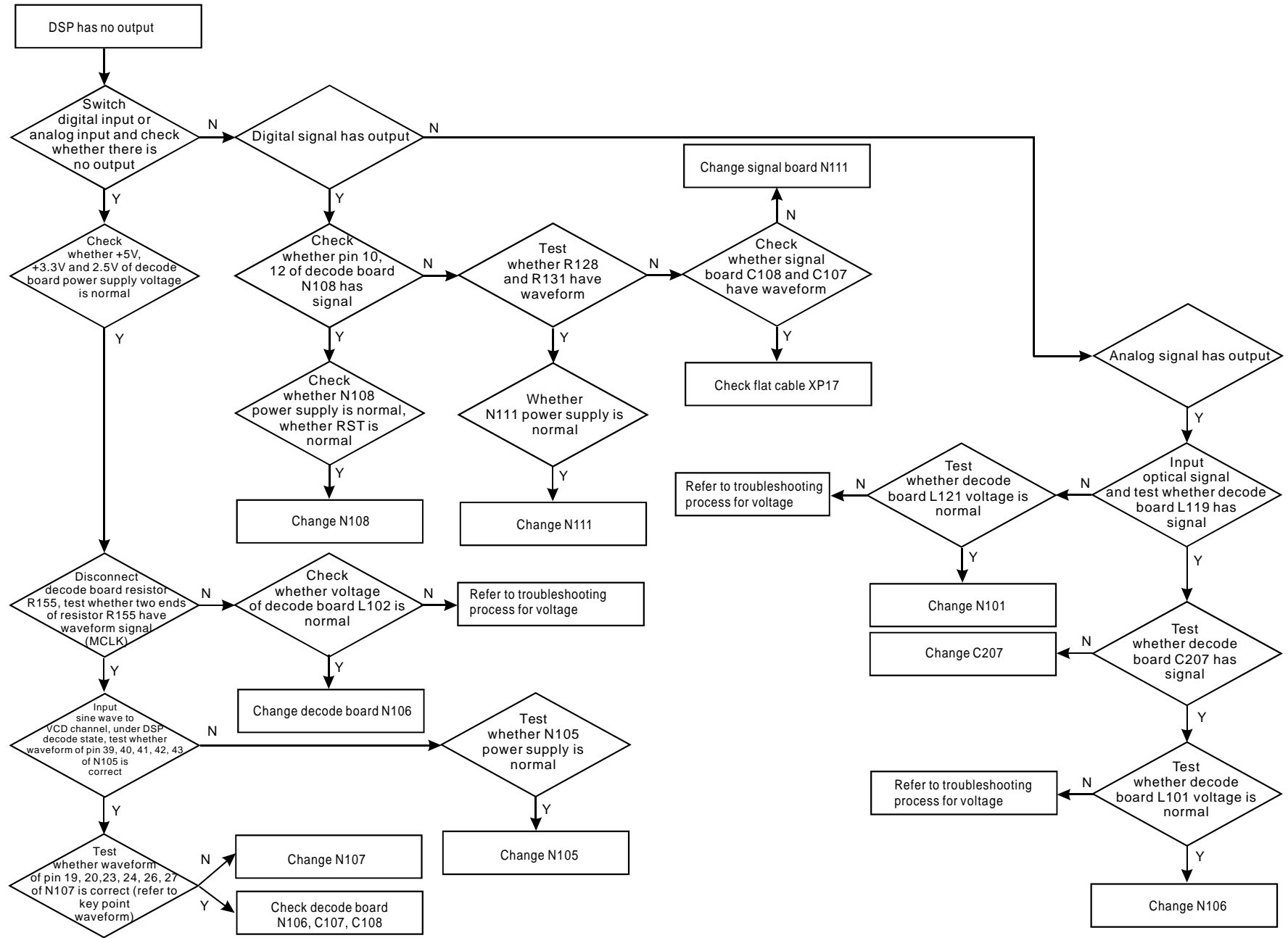


Figure 3.3.2.5 Troubleshooting flow chart for "DSP has no output"

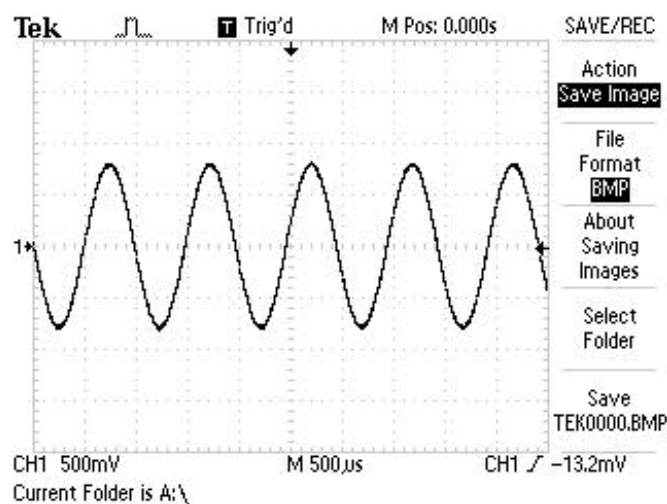


## Section Four Servicing Parameter

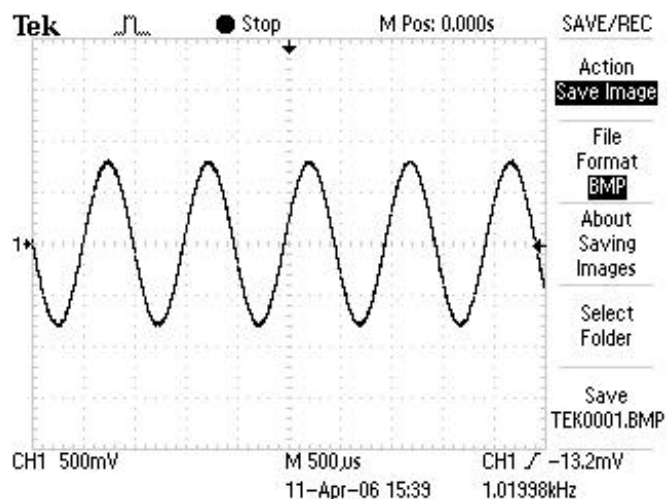
### 3.4.1 Signal waveform diagram

This section collects signal waveform diagram of audio, video and each unit circuit and the purpose is to help servicing people accurately and quickly judge where trouble lies to better servicing skills for servicing personnel. Because of the difference in brand, model and tuning of oscilloscope, some difference may exist, so servicing people should pay more attention in daily work.

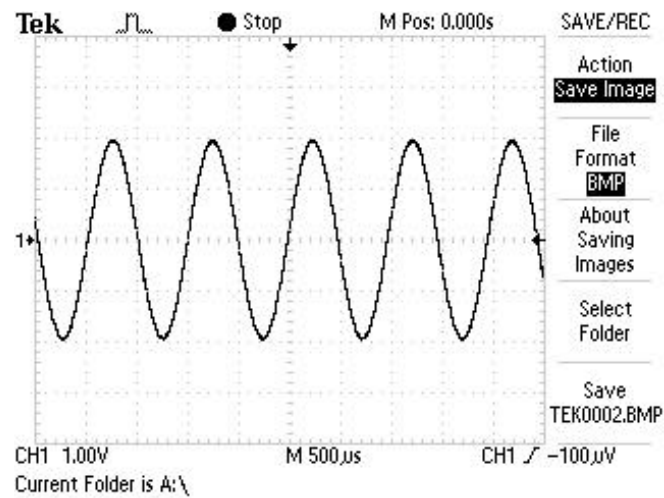
1. Waveform diagram of pin 13 of N101



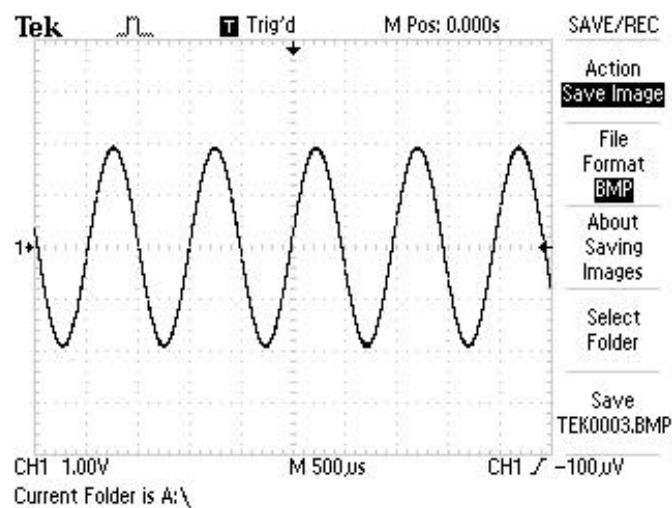
2. Waveform diagram of pion 3 of N101



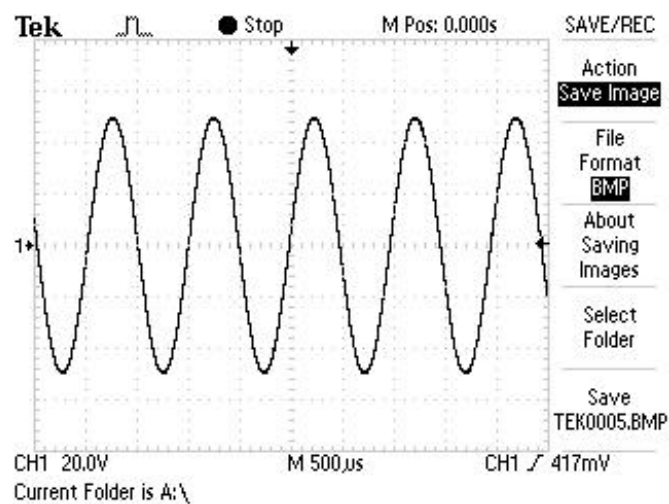
3. Waveform diagram of pin 2 of XS9



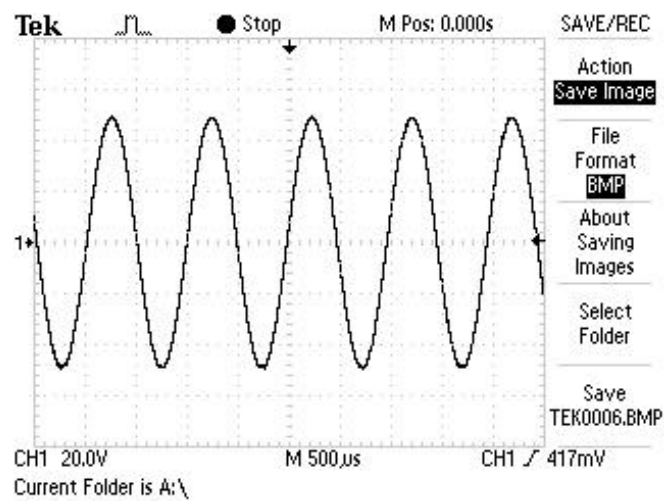
4. Waveform diagram of pin 3 of XS9



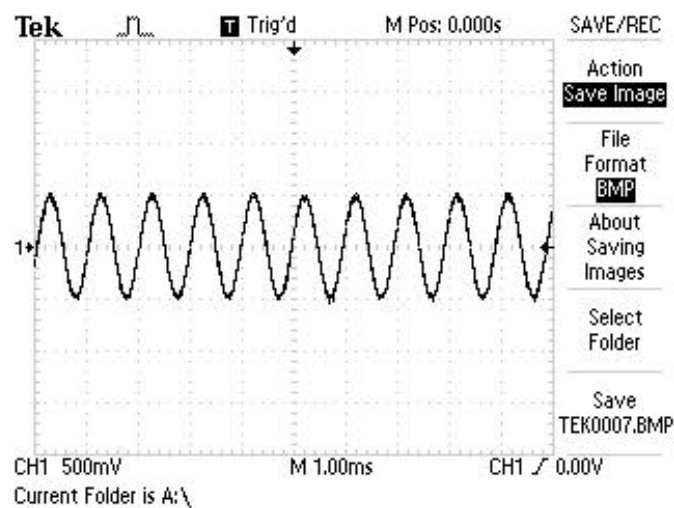
5. Waveform diagram of pin 1 of XS8



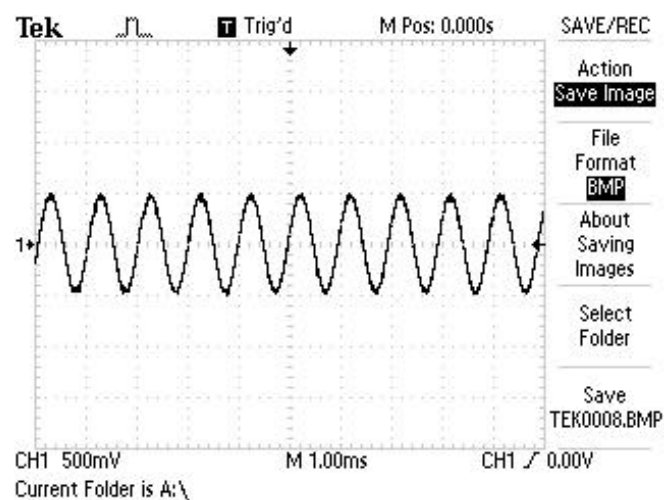
6. Waveform diagram of pin 2 of XS8



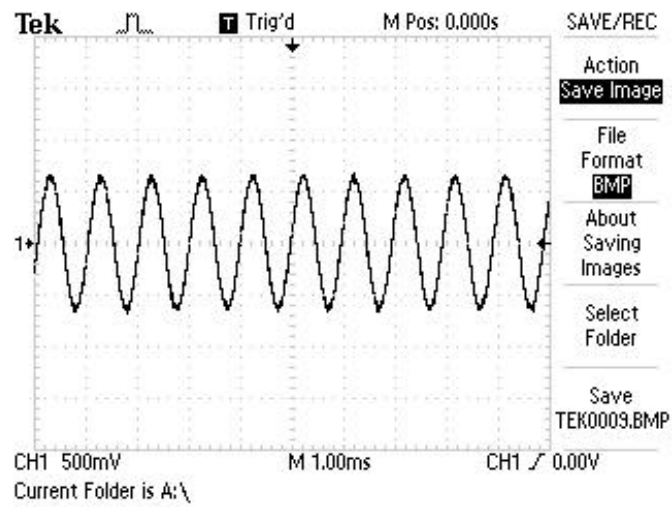
7. FL waveform diagram n DSP decode state



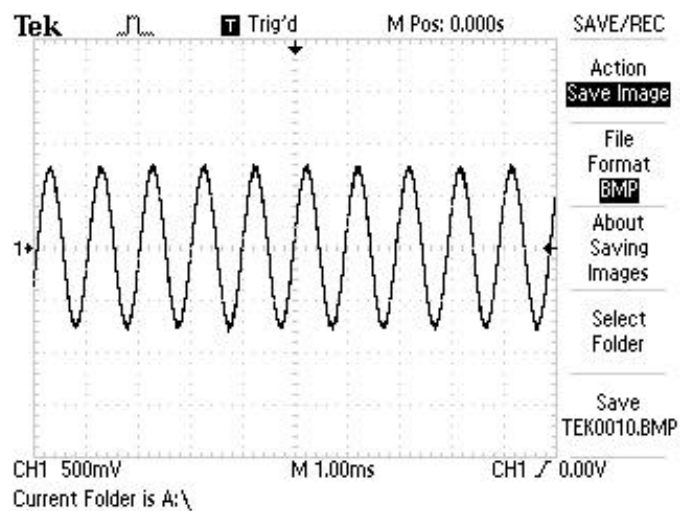
8. FR waveform diagram in DSP decode state



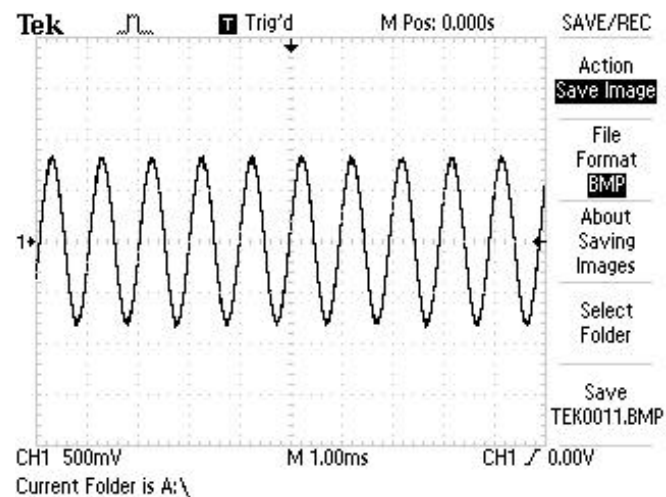
### 9. C waveform diagram in DSP decode state



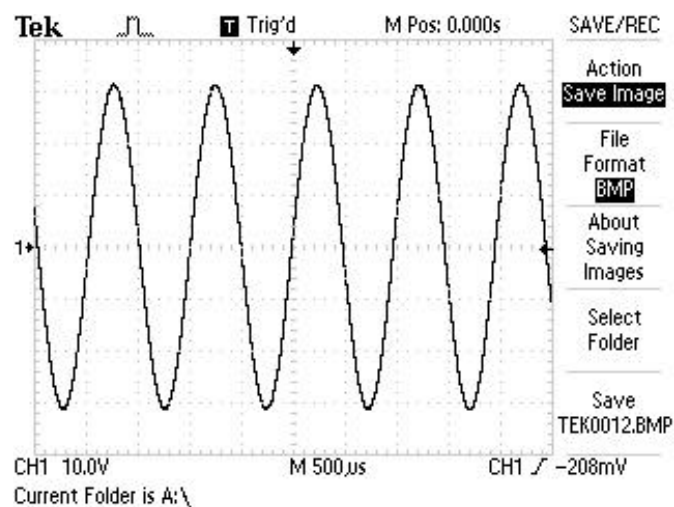
### 10. SL waveform diagram in DSP decode state



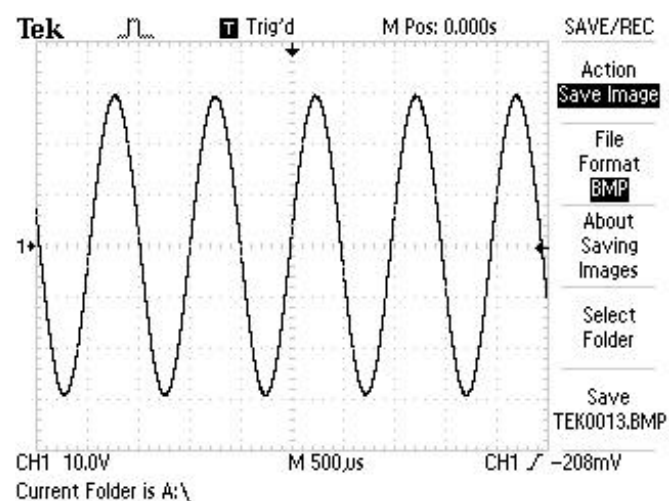
### 11. SR waveform diagram in DSP decode state



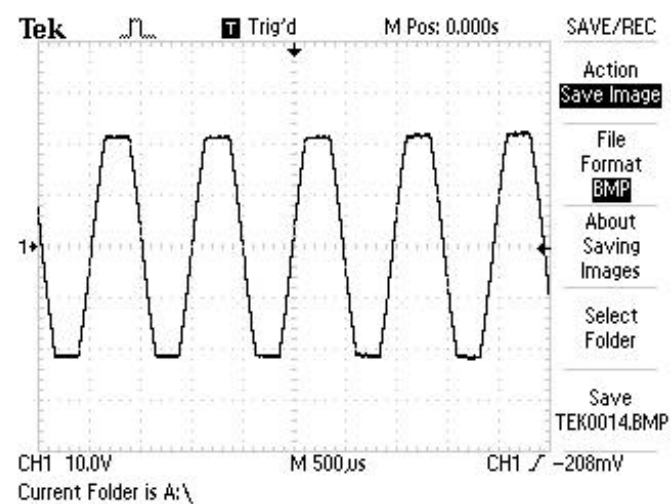
12. FL output waveform diagram after decoding and power amplifier board amplifying



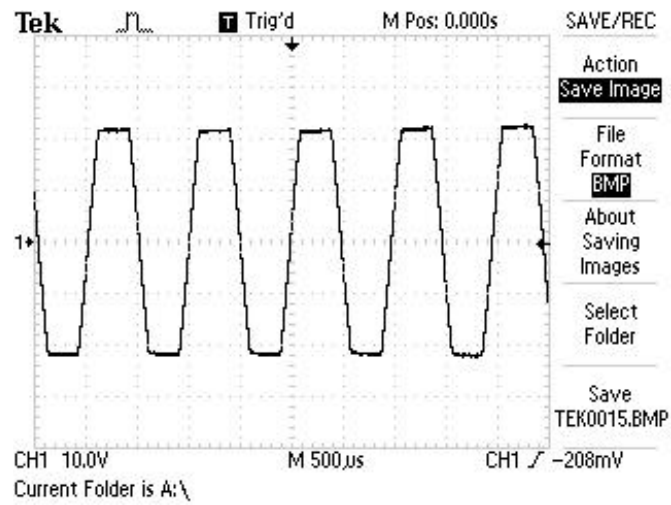
13. FR output waveform diagram after decoding and power amplifier board amplifying



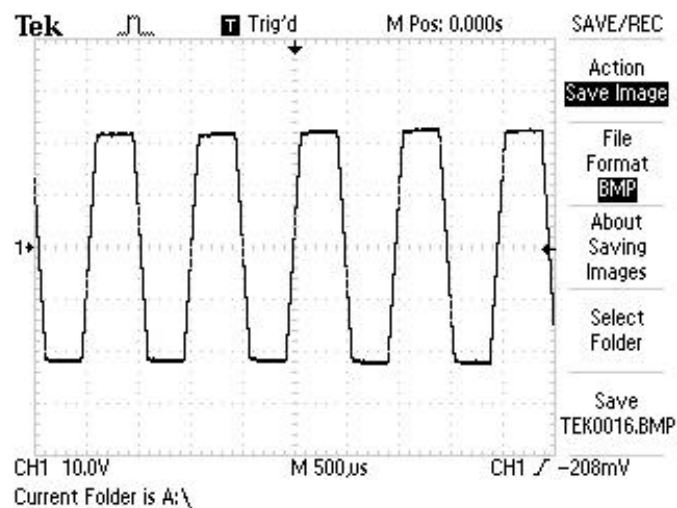
14. C output waveform diagram after decoding and power amplifier board amplifying



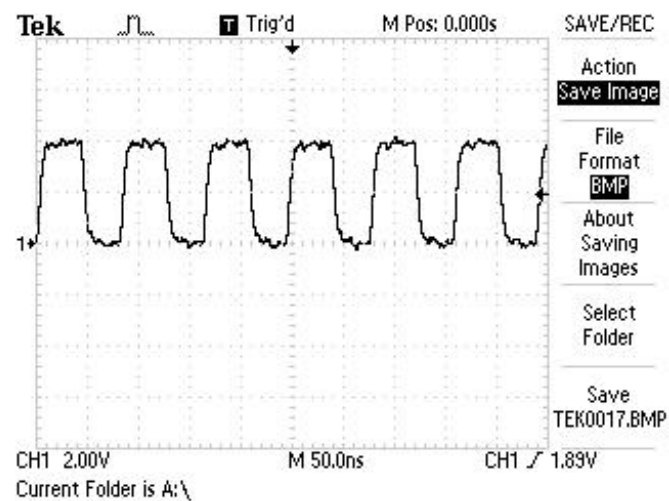
15. SL output waveform diagram after decoding and power amplifier board amplifying



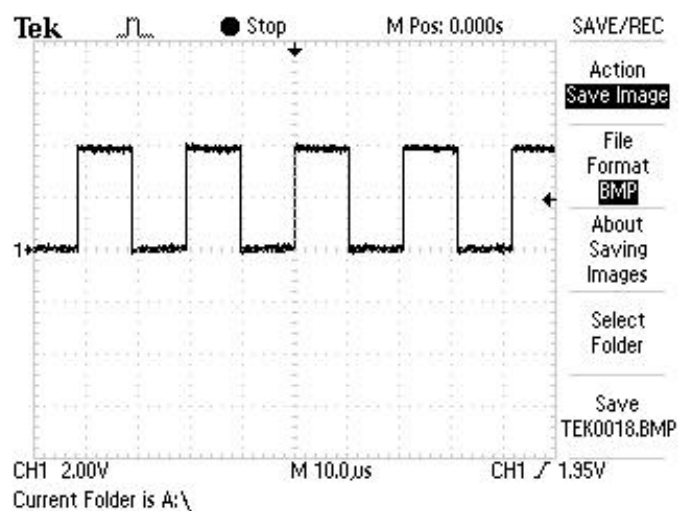
16. SR output waveform diagram after decoding and power amplifier board amplifying



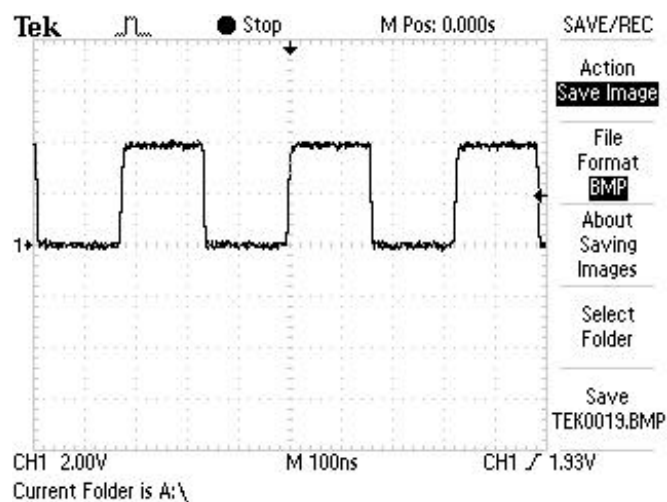
17. Waveform about "CS5340 outputs MCLK"



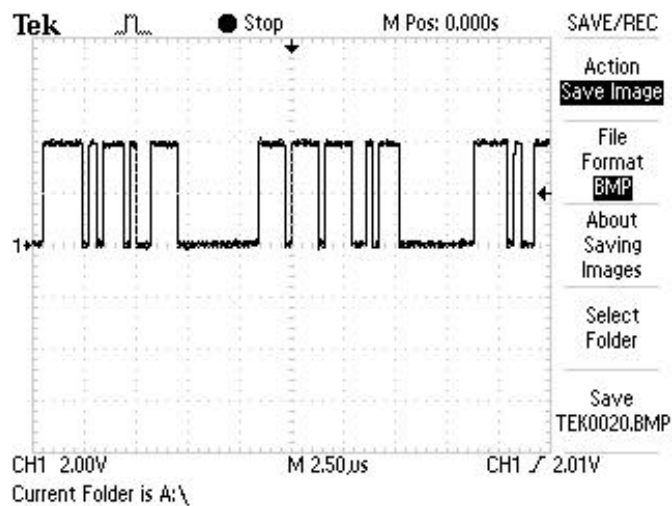
18. Waveform diagram about “CS5340 outputs LRCK”



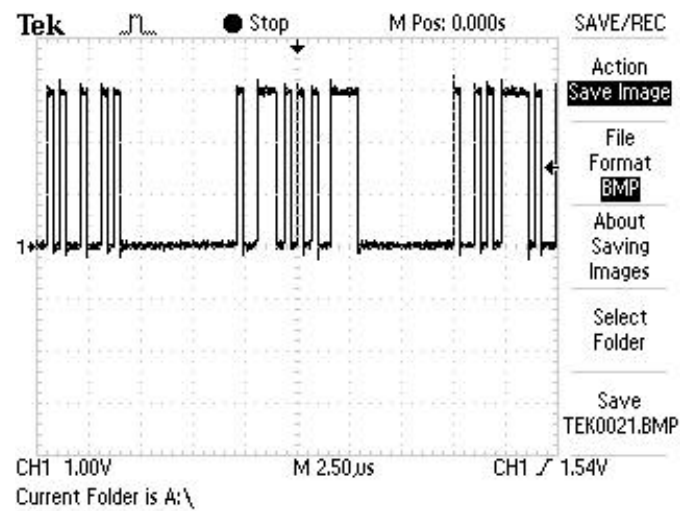
19. Waveform diagram about “CS5340 outputs SCLK”



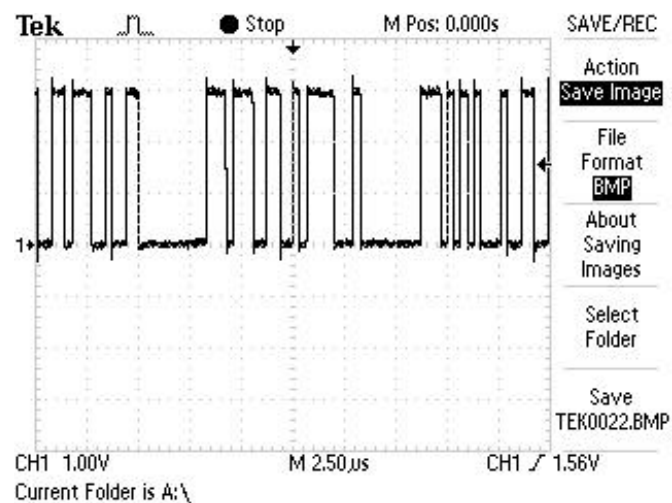
20. Waveform diagram about “CS5340 outputs SDOUT”



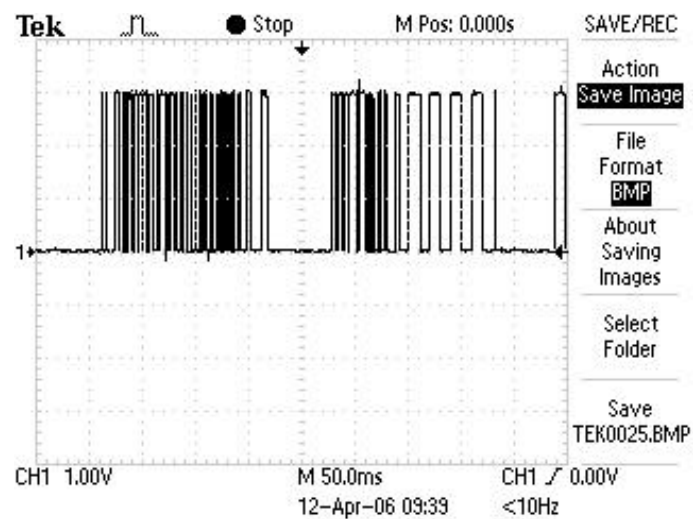
21. Waveform diagram about "CS49326 outputs SDIN1"



22. Waveform diagram about "CS49326 outputs SDIN2"

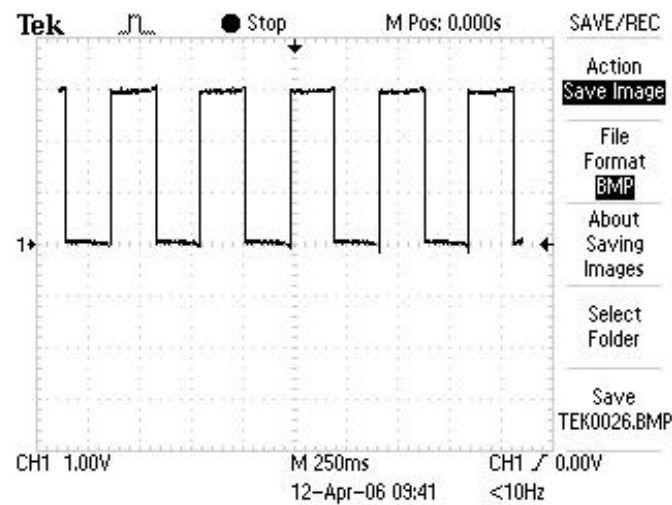


23. Waveform diagram about "CS49326 outputs SDIN3"

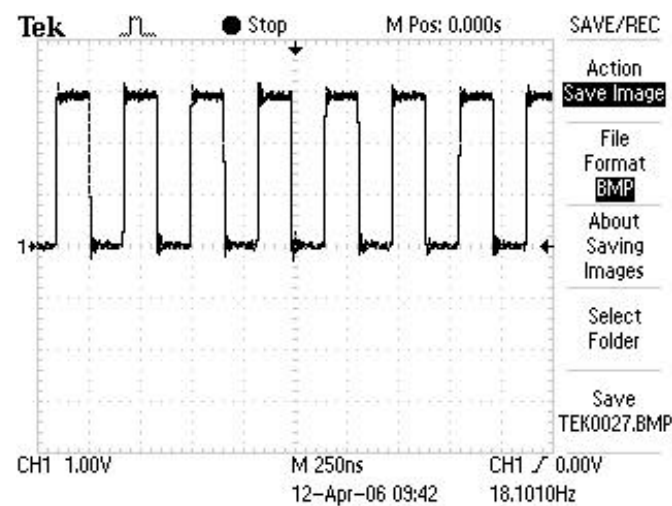




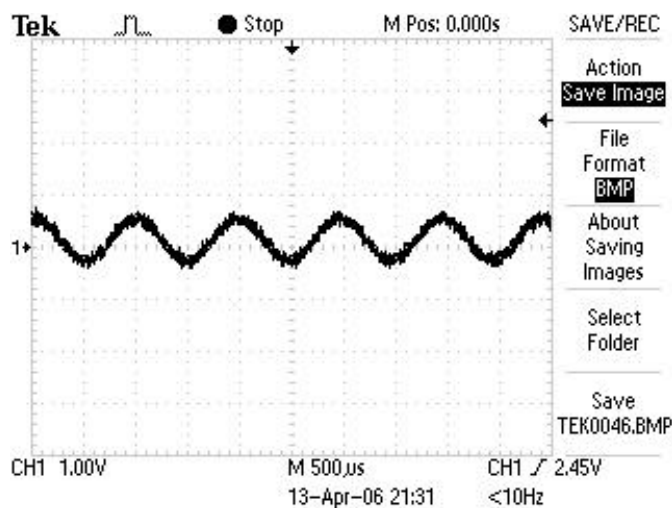
24. Waveform diagram about “CS49326 outputs left/right clock”



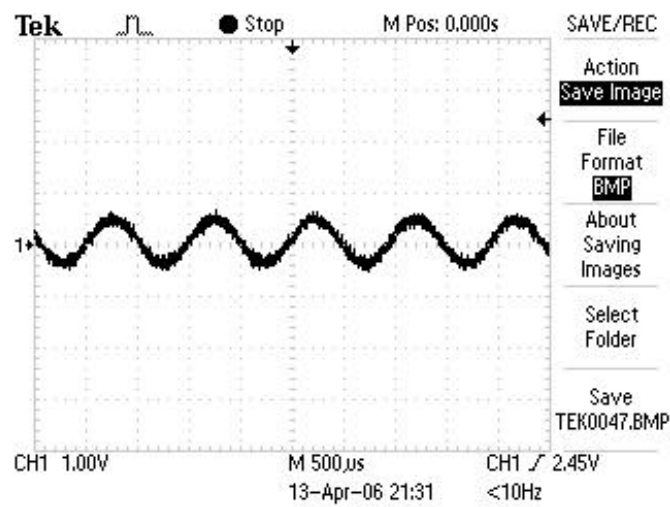
25. Waveform diagram about “CS49326 outputs SCLK”



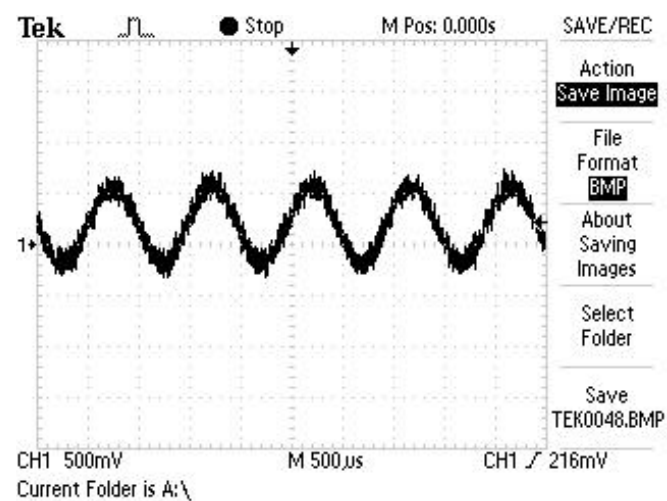
26. C175 waveform diagram in DSP decode state



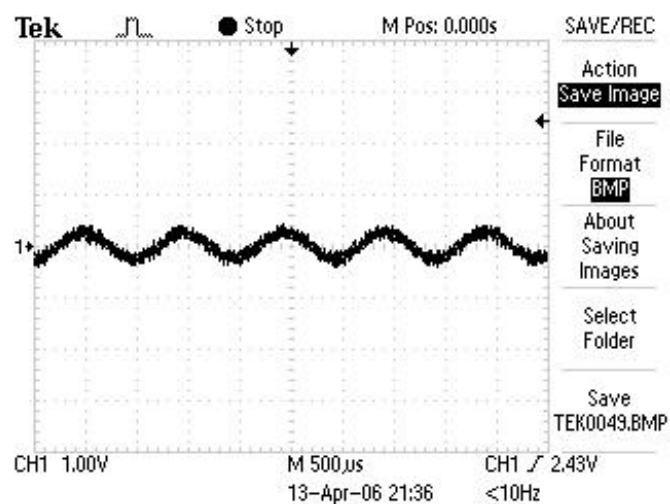
27. C178 waveform diagram in DSP decode state



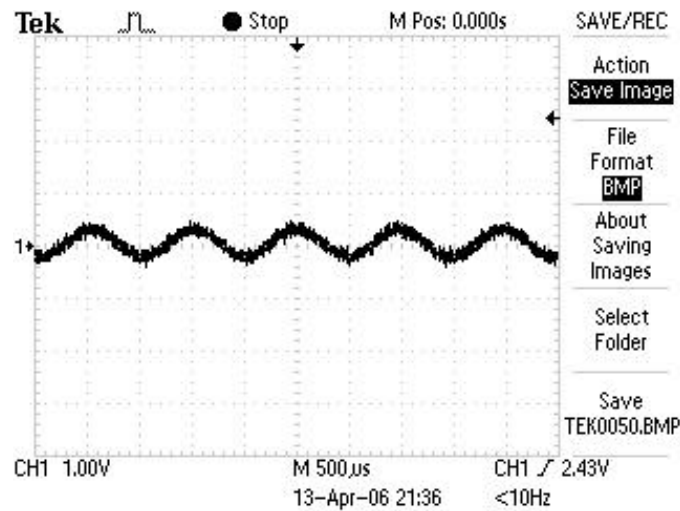
28. C184 waveform diagram in DSP decode state



29. C187 waveform diagram in DSP decode state



### 30. C190 waveform diagram in DSP decode state



### 3.4.2 Key point voltage

1. Power board: +Vc voltage of flat cable holder XS8 is +53V, and -Vc voltage is -53V; negative voltage of diode VD113 is +14.6V;
2. Power amplifier board: negative voltage of diode VD111 is +22.3V, positive voltage of diode is -22.3V, pin 3 of N105 mute signal voltage: -19.0V when mute is off, -22.4V when mute is on (main channel mute signal P\_LRM and central surround mute signal P\_CSM are separate, central surround channel in stereo state is always muted);
3. Control panel: ~V3 of flat cable holder XS10 is 26.5 AC; F1, F2 is 2.1V AC each;
4. Video board: pin 1 of XS100 is +12V, pin 3 is -12V;
5. MIC board: before inserting headphone, P\_RLY is low level, PH\_SW is low level; after inserting headphone, P\_RLY is high level, PH\_SW is high level;
6. Decode board: voltage of pin 3 of N109 is 5V, voltage of pin 2 is 2 3.3V, negative voltage of diode VD103 is 2.5V.

## Section Five Function Introduction to IC

### 3.5.1 function introduction to 4558

#### 1. Description

The RC4558 and RM4558 devices are dual general-purpose operational amplifiers with each half electrically similar to the  $\mu$ A741 except that offset null capability is not provided.

The high common-mode input voltage range and the absence of latch-up make these amplifiers ideal for voltage-follower applications. The devices are short-circuit protected and the internal frequency compensation ensures stability without external components.

The RC4558 is characterized for operation from 0° C to 70° C, and the RM4558 is characterized for operation over the full military temperature range of –55 C to 125 C.

#### 2. FEATURES

Continuous-Short-Circuit Protection

Wide Common-Mode and Differential

Voltage Ranges

No Frequency Compensation Required

Low Power Consumption

No Latch-Up

Unity-Gain Bandwidth . . . 3 MHz Typ

Gain and Phase Match Between Amplifiers

Low Noise . . . 8 nV/√Hz Typ at 1 kHz

Designed To Be Interchangeable With

Raytheon RC4558 and RM4558 Devices

#### 3. PIN CONFIGURATION

PIN No.	Symbol	I/O	Description
1	1OUT	O	Output 1
2	1IN–	I	Inverting Input Pin 1
3	1IN+	I	Non-Inverting Input Pin 1

PIN No.	Symbol	I/O	Description
4	VCC–	I	Negative Power Supply
5	2IN+	I	Non-Inverting Input Pin 2
6	2IN–	I	Inverting Input Pin 2
7	2OUT	O	Output 2
8	VCC+	I	Positive Power Supply

## 3.5.2 function introduction to PT2399

### 1. DESCRIPTION

PT2399 is an echo audio processor IC utilizing CMOS Technology which is equipped with ADC and DAC, high sampling frequency and an internal memory of 44K digital processing is used to generate the delay time, it also feature an internal VCO circuit in the system clock, thereby , making the frequency easily adjustable. PT2399 boast of very low distortion (THD<0.5%) and very low noise (No<-90dBV), thus producing high quality audio output .The pin assignments and application circuit are optimized for easy PCB layout and cost saving advantage.

### 2. FEATURES

CMOS Technology

Least External component

Auto Reset Function

Low Noise, No<-90dBV Typical

Low Distortion, THD<0.5% Typical

External Adjustable VCO

Available in 16 pins DIP or SOP package

### 3. PIN CONFIGURATION

PIN No.	Symbol	I/O	Description
1	VCC	I	Positive Power Supply
2	REF	I	Reference Power Supply
3	AGND	I	Simulative Ground
4	DGND	I	Digital Ground
5	CLK_O	O	NC
6	VCO	O	Voltage Controlled Oscillator
7	CC1	O	External capacitor

PIN No.	Symbol	I/O	Description
8	CC0	O	External capacitor
9	OP1-OUT	O	External capacitor 1 output
10	OP1-IN	I	External capacitor 1 input
11	OP2-OUT	O	External capacitor 2 output
12	OP2-IN	I	External capacitor 2 input
13	LPF2-IN	I	Low pass filter 2 input
14	LPF2-OUT	O	Low pass filter 2 output
15	LPF1-OUT	O	Low pass filter 1 input
16	LPF1-IN	I	Low pass filter 1 output

### 3.5.3 function introduction to CD4051

#### 1. DESCRIPTION

The CD4051 is a single 8-channel multiplexer with three binary control inputs and inhibit input.

The three binary control input signals select 1 of 8 channels to be turned on and connect it to the single out.

The operating voltage is as 3 to 18V and quiescent current is as low as 5  $\mu$ A max. (at  $V_{pp}=5V$  ).

#### 2. PIN CONFIGURATION

PIN No.	Symbol	I/O	Description
1	X4	I/O	Channel selection port 4
2	X6	I/O	Channel selection port 6
3	X	I/O	Channel selection output
4	X7	I/O	Channel selection port 7
5	X5	I/O	Channel selection port 5
6	INH	I	Inhibit
7	VEE	I/O	Negative Power Supply
8	GND	I	GND
9	C	I	Channel selection binary bit C
10	B	I	Channel selection binary bit B
11	A	I	Channel selection binary bit A
12	X3	I/O	Channel selection port
13	X0	I/O	Channel selection port 0

PIN No.	Symbol	I/O	Description
14	X1	I/O	Channel selection port 1
15	X2	I/O	Channel selection port 2
16	VCC	I	Positive Power Supply

### 3. TRUTH TABLE

INH	C	B	A	ON SWITCH
0	0	0	0	X0
0	0	0	1	X1
0	0	1	0	X2
0	0	1	1	X3
0	1	0	0	X4
0	1	0	1	X5
0	1	1	0	X6
0	1	1	1	X7
1	X	X	X	NONE

## 3.5.4 function introduction to CD4052

### 1. DESCRIPTION

The CD4052 is a dual 4-channel multiplexer with two binary control inputs and inhibit input.

The two binary control input signals select 1 of 4 pairs of channels to be turned on and connect it to the two outputs.

The operating voltage is as 3 to 18V and quiescent current is as low as 5  $\mu$ A max. (at  $V_{pp}=5V$  ).

### 2. PIN CONFIGURATION

PIN No	Symbol	I/O	Description
1	Y0	I/O	Y channel selection port 0
2	Y2	I/O	Y channel selection port 2
3	Y	I/O	Y channel selection output
4	Y3	I/O	Y channel selection port 3
5	Y1	I/O	Y channel selection port 1
6	INH	I	Inhibit
7	VEE	I/O	Negative Power Supply

PIN No	Symbol	I/O	Description
8	GND	I	GND
9	A	I	Channel selection binary bit A
10	B	I	Channel selection binary bit B
11	X3	I	X channel selection port 3
12	X0	I/O	X channel selection port 0
13	X	I/O	X channel selection output
14	X1	I/O	X channel selection port 1
15	X2	I/O	X channel selection port 2
16	VCC	I	Positive Power Supply

### 3. TRUTH TABLE

INH	B	A	ON SWITCH	
0	0	0	X0	Y0
0	0	1	X1	Y1
0	1	0	X2	Y2
0	1	1	X3	Y3
1	X	X	NONE	

## 3.5.5 function introduction to CD4053

### 1. DESCRIPTION

The CD4053 is a triple 2-channel multiplexer having three separate digital control inputs, A, B, and C and an inhibit input. Each control input selects one of a pair of channels which are connected in a single-pole double-throw configuration

The three binary control input signals select 1 of 2 pairs of channels to be turned on and connect it to the three outputs.

### 2. Features

The operating voltage is as 3 to 18V and quiescent current is as low as 5  $\mu$ A max. (at  $V_{pp}=5V$  ).

### 3. PIN CONFIGURATION

PIN No.	Symbol	I/O	Description
1	by	I	Y1
2	bx	I	Y0



PIN No.	Symbol	I/O	Description
3	cy	I	Z1
4	c	O	Z
5	cx	I	Z0
6	INH	I	Enable
7	Vee	I	Negative Power Supply
8	Vss	I	GND
9	C	I	Select C
10	B	I	Select B
11	A	I	Select A
12	ax	I	X0
13	ay	I	X1
14	a	O	X
15	b	O	Y
16	Vdd	I	Positive Power Supply

#### 4. TRUTH TABLE

INH	B	A	ON SWITH	
0	0	0	X0	Y0
0	0	1	X1	Y1
0	1	0	X2	Y2
0	1	1	X3	Y3
1	X	X	NONE	

### 3.5.6 function introduction to PT6311

#### 1. DESCRIPTION

PT6311 is a Vacuum Fluorescent Display (VFD) Controller driven on a 1/8 to 1/16 duty factor housed in 52-pin plastic QFP Package. Twelve segment output lines, 8 grid output lines,

8 segment/grid output drive lines, one display memory, control circuit, key scan circuit are all incorporated into a single chip to build a highly reliable peripheral device for a single chip micro computer. Serial data is fed to PT6311 via a three-line serial interface.

#### 2. FEATURES

CMOS Technology

Low Power Consumption

Key Scanning (12 x 4 matrix)

Multiple Display Modes: (12 segments, 16 digits to 20 segments, 8 digits)

8-Step Dimming Circuitry

LED Ports Provided (5 channels, 20 mA max.)

4- Bits General Purpose Input Ports Provided

Serial Interface for Clock, Data Input, Data Output, Strobe Pins

No External Resistors Needed for Driver Outputs

Available in 52-pin QFP Package

### 3. PIN DESCRIPTION

PN No.	Symbol	I/O	Description
1	SW1	I	General Purpose Input Pins
2	SW2	I	
3	SW3	I	
4	SW4	I	
5	DOUT	O	Data Output Pin
6	DIN	I	Data Input Pin
7	NC		NC
8	CLK	O	Clock Input Pin
9	STB	O	Serial Interface Strobe Pin
10	K1	I	Key Data Input Pins
11	K2	I	
12	K3	I	
13	K4	I	
14	VDD	I	Logic Power Supply
15	SG1/KS1	O	High-Voltage Segment Output Pins Also acts as the Key Source
16	SG2/KS2	O	
17	SG3/KS3	O	
18	SG4/KS4	O	
19	SG5/KS5	O	
20	SG6/KS6	O	
21	SG7/KS7	O	
22	SG8/KS8	O	

PN No.	Symbol	I/O	Description
23	SG9/KS9	O	High-Voltage Segment Output Pins Also acts as the Key Source
24	SG10/KS10	O	
25	SG211KS11	O	
26	SG12/KS12	O	
27	SG13/KS13	O	
28	SG14/KS14	O	
29	SG15/KS15	O	
30	SG16/KS16	O	
31	SG17/KS17	O	
32	SG18/KS18	O	
33	VDD	I	Logic Power Supply
34	VEE	I	Pull-Down Level
35	SG19/GR10	O	High Voltage Segment/Grid Output Pins
36	SG20/GR9	O	
37	GR8	O	High-Voltage Grid Output Pins
38	GR7	O	
39	GR6	O	
40	GR5	O	
41	GR4	O	
42	GR3	O	
43	GR2	O	High-Voltage Grid Output Pins
44	GR1	O	
45	VDD	I	Logic Power Supply
46	LED5	O	LED Output Pin
47	LED4	O	
48	LED3	O	
49	LED2	O	
50	LED1	O	
51	GND	I	GND
52	OSC	I	Oscillator Input Pin

### 3.5.7 function introduction to UTCLM4880

#### 1. DESCRIPTION

The UTC LM4880 is a dual audio power amplifier capable of delivering typically 250mW per channel of continuous average power to an 8Ω load with 0.1% THD+N using a 5V power supply.

The UTC LM4880 features an externally controlled, low-power consumption shutdown mode, as well as an internal thermal shutdown protection mechanism. The unity-gain stable UTC LM4880 can be configured by external gain-setting resistors.

#### 2. FEATURES

No bootstrap capacitors or snubber circuits are necessary

Unity-gain stable

External gain configuration capability

#### 3. PIN DESCRIPTION

PIN No.	Symbol	I/O	Description
1	Out A	O	R Output
2	In A	I	R Input
3	Bypass	O	Bypass capacitor
4	GND	I	GND
5	Shutdown	I	Shutdown control
6	In B	I	L Input
7	Out B	O	L Output
8	Vdd	I	VDD

### 3.5.8 function introduction to 74HC04

#### 1. DESCRIPTION

The MC74HC04A is identical in pinout to the LS04 and the MC14069. The device inputs are compatible with Standard CMOS outputs; with pullup resistors, they are compatible with LSTTL outputs.

The device consists of six three-stage inverters.

#### 2. FEATURES

? Output Drive Capability: 10 LSTTL Loads

Outputs Directly Interface to CMOS, NMOS and TTL

? Operating Voltage Range: 2 to 6V

Low Input Current: 1? A

High Noise Immunity Characteristic of CMOS Devices

In Compliance With the JEDEC Standard No. 7A Requirements

Chip Complexity: 36 FETs or 9 Equivalent Gates

### 3. PIN DESCRIPTION

PIN No.	Symbol	I/O	Description
1	A1	I	Signal input
2	Y1	O	Signal output
3	A2	I	Signal input
4	Y2	O	Signal output
5	A3	I	Signal input
6	Y3	O	Signal output
7	GND	I	Ground
8	Y4	O	Signal output
9	A4	I	Signal input
10	Y5	O	Signal output
11	A5	I	Signal input
12	Y6	O	Signal output
13	A6	I	Signal input
14	Vcc	I	Voltage input

## 3.5.9 function introduction to LM1875

### 1. Description

The LM1875 is a monolithic power amplifier offering very low distortion and high quality performance for consumer audio applications.

The LM1875 delivers 20 watts into a 4 $\Omega$  or 8 $\Omega$  load on  $\pm 25V$  supplies. Using an 8 $\Omega$  load and  $\pm 30V$  supplies, over 30 watts of power may be delivered. The amplifier is designed to operate with a minimum of external components. Device overload protection consists of both internal current limit and thermal shutdown.

The LM1875 design takes advantage of advanced circuit techniques and processing to achieve extremely low distortion levels even at high output power levels. Other outstanding features include high gain, fast slew rate and a wide power bandwidth, large output voltage swing, high current capability, and a very wide supply range. The amplifier is internally compensated and stable for gains of 10 or greater.

### 2. Features

Up to 30 watts output power

AVO typically 90 dB  
 Low distortion: 0.015%, 1 kHz, 20 W  
 Wide power bandwidth: 70 kHz  
 Protection for AC and DC short circuits to ground  
 Thermal protection with parole circuit  
 High current capability: 4A  
 Wide supply range 16V-60V  
 Internal output protection diodes  
 94 dB ripple rejection  
 Plastic power package TO-220

### 3. PIN DESCRIPTION

PIN No.	Symbol	I/O	Description
1	+IN	I	Non-Inverting Input Pin C
PIN No.	Symbol	I/O	Description
2	-IN	I	Inverting Input Pin C
3	-VEE	I	Negative Power Supply
4	OUTPUT	O	Signal out C
5	VCC	I	Positive Power Supply

## 3.5.10 function introduction to TDA7265

### 1. DESCRIPTION

The TDA7265 is class AB dual Audio power amplifier assembled in the Multiwatt package, specially designed for high quality sound application as Hi-Fi music centers and stereo TV sets.

### 2. Features

WIDE SUPPLY VOLTAGE RANGE (UP TO ? 25V ABS MAX.)  
 SPLIT SUPPLY  
 HIGH OUTPUT POWER 25 + 25W @THD =10%, RL = 8? , VS = +20V  
 NO POPAT TURN-ON/OFF  
 MUTE (POP FREE)  
 STAND-BY FEATURE (LOW Iq)  
 SHORT CIRCUIT PROTECTION  
 THERMAL OVERLOAD PROTECTION

### 3. PIN DESCRIPTION

PIN No.	Symbol	I/O	Description
1	-Vs	I	Negative Power Supply
2	OUT1	O	Signal out SL
3	+Vs	I	Positive Power Supply
4	OUT2	O	Signal out SR
5	MUTE	I	Mute control
6	-Vs	I	Negative Power Supply
7	IN2+	I	Non-Inverting Input Pin SR
8	IN2-	I	Inverting Input Pin SR
9	GND	I	GND
10	IN1+	I	Non-Inverting Input Pin SL
11	IN1-	I	Inverting Input Pin SL

## 3.5.11 function introduction to M62446

### 1. DESCRIPTION

The M62446FP is 6 channels electric volume controlled 3-wire serial data.

The IC is suitable for use in home-use audio systems and TV sets.

### 2. Features

Electric volume: Volume level 0dB ~ -79dB, - 1 dB (1dB / step)

Tone control: Bass / Treble, 0dB ~ ±10dB(2dB / step)

4 Output ports: Built-in microcomputer interface circuit controlled by 16-bit serial data.

### 3. PIN DESCRIPTION

PIN No.	Symbol	I/O	Description
1	Out 4	O	Source select control 4
2	Out3	O	Source select control 3
3	Out2	O	Source select control 2
4	Out1	O	Source select control 1
5	AVdd	I	Positive Power Supply
6	SWin	I	SW Input
7	GNDS	I	SW GND

PIN No.	Symbol	I/O	Description
8	SRin	I	SR Input
9	SLin	I	SL Input
10	GNDC	I	C GND
11	Cin	I	C Input
12	GNDR	I	R GND
13	Rin	I	R Input
14	GNDL	I	L GND
15	Lin	I	L Input
16	BYPASSR	O	R bypass capacitance
17	BYPASSL	O	L bypass capacitance
18	LTRE	O	L treble capacitance
19	LBASS3	O	L bass capacitance
20	LBASS2	O	L bass capacitance
21	LBASS1	O	L bass capacitance
22	RBASS1	O	R bass capacitance
23	RBASS2	O	R bass capacitance
24	RBASS3	O	R bass capacitance
25	RTRE	O	R treble capacitance
26	CR2	O	R capacitance
27	CR1	I	R capacitance
28	CL2	O	L capacitance
29	CL1	I	L capacitance
30	AVSS	I	Negative Power Supply
31	Lout	O	L out
32	Rout	O	R out
33	Cout	O	C out
34	SLout	O	SL out
35	SRout	O	SR out
36	SWout	O	SW out
37	AGND	I	AGND
38	DGND	I	DGND
39	LATCH	I	Description



PIN No.	Symbol	I/O	Select control
40	DATA	I	Serial Data input
41	CLK	I	Serial CLK input
42	DVDD	I	Digital Power Supply

### 3.5.12 function introduction to AT24C02

#### 1. Description

The AT24C02 provides 2048 bits of serial electrically erasable and programmable read-only memory (EEPROM) organized as 256 words of 8 bits each. The device is optimized for use in many industrial and commercial applications where low-power and low-voltage operations are essential. The AT24C02 is available in space-saving 8-lead PDIP,

8-lead MAP, 8 lead TSSOP and 8-ball dBGA2 packages and is accessed via a 2-wire serial interface. In addition, the entire family is available in 2.7V (2.7V to 5.5V) and 1.8V (1.8V to 5.5V) versions.

#### 2. Features

Low-voltage and Standard-voltage Operation

– 2.7 (VCC = 2.7V to 5.5V)

– 1.8 (VCC = 1.8V to 5.5V)

Internally Organized, 256 x 8 (2K),

2-wire Serial Interface

Schmitt Trigger, Filtered Inputs for Noise Suppression

Bi-directional Data Transfer Protocol

100 kHz (1.8V) and 400 kHz (2.5V, 2.7V, 5V) Compatibility

Write Protect Pin for Hardware Data Protection

8-byte Page (1K, 2K), Write Modes

Partial Page Writes are Allowed

Self-timed Write Cycle (5 ms max)

High-reliability

– Endurance: 1 Million Write Cycles

– Data Retention: 100 Years

Automotive Grade, Extended Temperature and Lead-Free Devices Available

8-lead PDIP, 8-lead JEDEC SOIC, 8-lead MAP, 5-lead SOT23,

8-lead TSSOP and 8-ball dBGA2™ Packages

### 3. PIN DESCRIPTION

PIN No.	Symbol	I/O	Description
1	A0	I	To Ground
2	A1	I	To Ground
3	A2	I	To Ground
4	VSS	I	To Ground
5	SDA	I/O	Serial Data input
6	SCL	I/O	Serial SCL input
7	TEST	I/O	Test port
8	VDD	I	Positive Power Supply

## 3.5.13 function introduction to L7805

### 1. Description

LM7805 is 5V voltage regulator, locates on power board in this player and is used to generate 5V stable voltage.

### 2. Features

Suitable for CMOS ,TTL, the other digital IC's power supply

Internal thermal overload protection

Internal short circuit current limiting

Output current in excess of 1 A

Metal Fin is fully covered with Mold Resin

### 3. PIN DESCRIPTION

PIN No.	Symbol	I/O	Description
1	Input	I	Input +18V
2	Common	I	Ground
3	Output	O	Output +12V

## 3.5.14 function introduction to 7812

### 1. Description

LM7812 is +12V voltage regulator, locates on power board in this player and is used to generate +12 stable voltage.

## 2. Features

Suitable for CMOS ,TTL, the other digital IC's power supply

Internal thermal overload protection

Internal short circuit current limiting

Output current in excess of 1 A

Metal Fin is fully covered with Mold Resin

## 3. PIN DESCRIPTION

PIN No.	Symbol	I/O	Description
1	Input	I	Input +18V
2	Common	I	Ground
3	Output	O	Output +12V

## 3.5.15 function introduction to 7912

### 1. Description

LM7812 is +12V voltage regulator, locates on power board in this player and is used to generate +12 stable voltage.

## 2. Features

Suitable for CMOS ,TTL, the other digital IC's power supply

Internal thermal overload protection

Internal short circuit current limiting

Output current in excess of 1 A

Metal Fin is fully covered with Mold Resin

## 3. PIN DESCRIPTION

PIN No.	Symbol	I/O	Description
1	Input	I	Input -18V
2	Output	O	Output -12V
3	Common	I	Ground

## 3.5.16 function introduction to NE5532

### 1. DESCRIPTION

The NE5532 is high-performance operational amplifiers combining excellent DC and AC characteristics. It

is low noise, high output-drive capability, high unity-gain and maximum-out-swing bandwidths, low distortion ,high slew rate, input-protect diodes, and output short-circuit protection. The operational amplifier is compensated internally for unity-gain operation. The device has specified maximum limits for equivalent input noise voltage.

## 2. FEATURES

Unity-gain bandwidth ...100MHz Typ

Common-mode rejection ratio ...100dB Typ

High dc voltage gain ...100V/mV Typ

Peak-to-peak output voltage swing 32 V Typ with  $V_{cc} = \pm 18V$  and  $R_L = 600$

High slew rate ...9V/us Typ

Wide supply-voltage range ...  $\pm 3V$  to  $\pm 20V$

## 3. PIN DESCRIPTION

PIN No.	Symbol	I/O	Description
1	1OUT	O	Output 1
2	1IN–	I	Inverting Input Pin 1
3	1IN+	I	Non-Inverting Input Pin 1
4	VCC–	I	Negative Power Supply
5	2IN+	I	Non-Inverting Input Pin 2
6	2IN–	I	Inverting Input Pin 2
7	2OUT	O	Output 2
8	VCC+	I	Positive Power Supply

### 3.5.17 function introduction to PT2315

#### 1. Description

PT2315 is a two-channel digital audio processor utilizing CMOS Technology . Volume, Bass, Treble and balance controls are incorporated into a single chip. Loudness Function is also provided to build a highly effective electronic audio processor having the highest performance and reliability with the least external components. All functions are programmable using the IIC Bus. The pin assignments and application circuit are optimized for easy PCB layout and cost saving advantage for audio application. Housed in a 20-pin DIP/SO Package, PT2315is pin-to-pin compatible with TDA7315 and is very similar in performance with performance with the later.

## 2. Features

CMOS Technology

Least External Components

Treble and Bass Control

Loudness Function

Input/Output External Noise Reduction System/Equalizer

2 Independent Speaker Controls for Balance Function

Independent Mute Function

Volume Control in 1.25 dB/step

Low Distortion

Low Noise and DC Stepping

Controlled by IIC BUS Micro-Processor Interface

Pin-to-Pin Compatible with TDA7315

## 3. PIN DESCRIPTION

PIN No.	Symbol	I/O	Description
1	REF	O	Reference Power Supply
2	VDD	I	Power Supply
3	AGND	I	AGND
4	TREB_L	O	L treble adjust capacitance
5	TREB_R	O	R treble adjust capacitance
6	RIN	I	R input
7	LOUD_R	O	R Loud adjust
8	NC		NC
9	LOUD_L	O	R Loud adjust
10	NC		NC
11	LIN	I	L input
12	BIN_L	I	L adjust capacitance input
13	BOUT_L	O	L adjust capacitance output
14	BIN_R	I	R adjust capacitance input
15	BOUT_R	O	R adjust capacitance output
16	ROUT	O	R output
17	LOUT	O	L output
18	DGND	I	DGND
19	DATA	I	Serial Data input

PIN No.	Symbol	I/O	Description
20	CLK	I	Serial CLK input

### 3.5.18 function introduction to CS4360

#### 1. DESCRIPTION

The CS4360 is a complete 6-channel digital-to-analog system include digital interpolation, fourth-order delta-sigma digital-to-analog conversion, digital de-emphasis, volume control, channel mixing and analog filtering. The advantages of this architecture include: ideal differential linearity, no distortion mechanism due to resistor matching error, no linearity drift over time and temperature and a high tolerance to clock jitter.

The CS4360 accepts data at audio sample rates from 4 kHz to 200 kHz, consumes very little power and operates over a wide power supply range. These features are ideal for cost-sensitive, multi-channel audio systems including DVD players, A/V receivers, set-top boxes, digital TVs and VCRs, mini-component systems, and mixing consoles.

#### 2. FEATURES

24-Bit Conversion

102 dB Dynamic Range

-90 dB THD+N

+3 V to +5V Power Supply

Digital volume Control with Soft Ramp:

-119 dB Attenuation

-1 dB Step Size

Low Power Consumption

-105 m W with 3 V Supply

Low Clock Jitter Sensitivity

ATAPI Mixing

Popguard Technology for Control of Clicks and pops

#### 3. PIN DESCRIPTION

PIN No.	Symbol	I/O	Description
1	VLS	I	Serial Audio Interface Power
2	SDIN1	I	Serial Audio Data Input 1
3	SDIN2	I	Serial Audio Data Input 2
4	SDIN3	I	Serial Audio Data Input 3
5	SCLK	I	Serial Clock

PIN No.	S ymbol	I/O	Description
6	LRCK	I	Left/Right Clock
7	MCLK	I	Master Clock
8	VD	I	Digital Power
9	GND	I	GND
10	/RST	I	Reset
11	DIF1/SCL/CCLK	I	Digital Interface Format 1
12	DIF0/SDA/CDIN	I	Digital Interface Format 0
13	M1/AD0/CS/	I	Mode Selection 1
14	VLC	I	Control Port Power
15	M2	I	Mode Selection 2
16	FILT+	O	Positive Voltage Reference
17	VQ	O	Quiescent Voltage
18	MUTE3	O	Mute Control 3
19	AOUTB3	O	Analog Output B3
20	AOUTA3	O	Analog Output A3
21	GND	I	GND
22	VA	I	Analog Power
23	AOUTB2	O	Analog Output B2
24	AOUTA2	O	Analog Output A2
25	MUTE2	O	Mute Control 2
26	AOUTB1	O	Analog Output B1
27	AOUTA1	O	Analog Output A1
28	MUTE1	O	Mute Control 1

### 3.5.19 function introduction to CD4094

#### 1. Description

The CD4094BC consists of an 8-bit shift register and a 3-STATE 8-bit latch. Data is shifted serially through the shift register on the positive transition of the clock. The output of the last stage (QS) can be used to cascade several devices. Data on the QS output is transferred to a second output, Q<sub>S</sub>, on the following negative clock edge.

The output of each stage of the shift register feeds a latch, which latches data on the negative edge of the STROBE input. When STROBE is HIGH, data propagates through the latch to 3-STATE output gates. These

gates are enabled when OUTPUT ENABLE is taken HIGH.

## 2. Features

Wide supply voltage range: 3.0V to 18V

High noise immunity: 0.45 VDD (typ.)

Low power TTL compatibility: Fan out of 2 driving 74L or 1 driving 74LS 3-STATE outputs

## 3. PIN DESCRIPTION

PIN No.	Symbol	I/O	Description
1	STROBE	I	Store control
2	DATA	I	Serial data
3	CLOCK	I	Serial clock
4	Q1	O	Bit 1 output
5	Q2	O	Bit 2 output
6	Q3	O	Bit 3 output
7	Q4	O	Bit 4 output
8	Vss	I	GND
9	Qs	O	Top Bit output
10	Qs'	O	Non-Qs
11	Q8	O	Bit 8 output
12	Q7	O	Bit 7 output
13	Q6	O	Bit 6 output
14	Q5	O	Bit 5 output
15	Output enable	I	Output enable
16	Vdd	I	Positive Power Supply

## 3.5.20 function introduction to CS5340

### 1. DESCRIPTION

The CS5340 is complete analog-to-digital converter for digital audio systems. It performs sampling, analog-to-digital conversion and anti-alias filtering ,generating 24-bit values for both left and right inputs in serial form at sample rates up to 200 kHz per channel.

The CS5340 uses a 5<sup>th</sup>-order,multi-bit delta-sigma modulator followed by digital filtering and decimation, which removes the need for an external anti-alias filter.

The CS5340 is ideal for audio systems requiring wide dynamic range, negligible distortion and low noise,



such as set-top boxes, DVD-karaoke players, DVD recorders, A/V receivers, and automotive applications.

## 2. FEATURES

Advanced multi-bit Delta-Sigma architecture

24-bit conversion.

Supports all audio sample rates including 192kHz.

101dB Dynamic Range at 5V.

-94 dB THD+N.

High pass filter to remove DC offsets.

Analog/digital core supplies from 3.3V to 5V..

Linear phase digital anti-alias filtering.

Auto-mode selection.

Pin compatible with the cs5341

## 3. PIN DESCRIPTION

PIN No.	Symbol	I/O	Description
1	M0	I	Mode selection 0
2	MCLK	I	Master clock
3	VL	I	Logic power
4	SDOUT	O	Serial audio data output
5	GND	I	GND
6	VD	I	Digital power
7	SCLK	I	Serial clock
8	LRCK	I	Left right clock
9	/RST	I	Reset
10	AINL	I	Analog input L
11	VQ	O	Quiescent voltage
12	AINR	I	Analog input R
13	VA	I	Analog power
14	REF_GND	I	GND
15	FILT+	I	Positive voltage reference
16	M1	I	Mode selection 1

## 3.5.21 function introduction to CS8415

### 1. DESCRIPTION

The CS 8415A is a monolithic CMOS device which receives and decodes one of 7 channels of audio data according to the IEC60958, S/PDIF and EIAJ CP 1201 interface standards or one channel of AES3 data. The CS8415A has a serial digital audio output port and comprehensive control ability via a 4-wire microcontroller port. Channel status and user data are assembled in block sized buffers, making reading access easy.

A low jitter clock recovery mechanism yields a very clean recovered clock from the incoming AES3 stream.

Stand-alone operation allows system with no microcontroller to operate the CS8415A with dedicated output pins for channel status data.

Target applications include AVR, CD-R, DAT, DVD, Multimedia Speakers, MD and VTR equipment, mixing consoles, digital audio transmission equipment, high quality D/A and A/D converters, effects processors, set-top box and computer audio systems.

### 2. FEATURES

+3V to +5V Digital supply.

Complete EIAJ CP 1201, IEC-60958, AES3, S/PDIF compatible receiver.

7: 1 S/PDIF input MUX.

Flexible 3-wire serial digital output port .

8 kHz to 96 kHz sample frequency rang .

Low jitter clock recovery

Pin and conrocontroller read access to channel statue and user data

Microcontroller and stand-alone mode

Differential cable receiver

On-chip channel statue and User data buffer memory

Auto-detection of compressed audio input streams

Decodes Q CD sub-code

OMCK System clock mode

### 3. PIN DESCRIPTION

PIN No.	Symbol	I/O	Description
1	SDA/CDOUT	I/O	Serial control data I/O
2	AD0/CS/	I	Address bit 0
3	/EMPH	O	Pre-emphasis
4	RXP0	I	AES3/SPDIF receiver port
5	RXN0	I	AES3/SPDIF receiver port

PIN No.	Symbol	I/O	Description
6	VA+	I	Positive analog power
7	AGND	I	Analog ground
8	FILT	O	PLL loop filter
9	/RST	O	Reset
10	RMCK	I	Input section recovered master clock
11	RERR	O	Receiver error
12	RXP1	I	AES3/SPDIF receiver port 1
13	RXP2	I	AES3/SPDIF receiver port 2
14	RXP3	I	AES3/SPDIF receiver port 3
15	RXP4	I	AES3/SPDIF receiver port 4
16	OSCLK	O	Serial audio output bit clock
17	OLRCK	O	Serial audio output left/right clock
18	SDOUT	O	Serial audio output data
19	INT	O	Interrupt
20	U	O	User data
21	OMCK	I	System clock
22	DGND	I	Digital ground
23	VD+	I	Positive digital power
24	H/S/	I	Hardware mode control
25	RXP5	I	AES3/SPDIF receiver port 5
26	RXP6	I	AES3/SPDIF receiver port 6
27	AD1/CDIN	I	Address bit 1
28	SCL/CCLK	I	Control port clock

### 3.5.22 function introduction to CS49326

#### 1. DESCRIPTION

By the CS49236, compressed data can delivered in IEC61937 format via the S/PDIF port and in burst mode via the PC interface. PCM data can be accept through digital input connectors or from the on-board ADC. Six channels of audio are provided on the six analog outputs and on three optical S/PDIF transmitters. CLKIN for the DSP can be derived either from the on-board oscillator or the external PLL. MCLK can be extracted from incoming S/PDIF streams, generated with the external PLL , or mastered by audio decoder.

## 2. FEATURES

CDB49236 demonstrates 5.1channel decode capability of the CS4923 family .

6 discrete analog outputs driven by CS4340 DAC

4 S/PDIF optical outputs.

Accepts analog input, s/PDIF digital input, burst compressed data.

Discrete PLL which can provide multiple sampling frequencies

Interfaces to a personal computer through the parallel port.

Stake headers provide convenient location for direct writing control signals from off-board microcontroller.

Interface for external memory card.

Digital and analog patch areas

## 3. PIN DESCRIPTION

PIN No.	Symbol	I/O	Description
1	VD1	I	Digital power supply 1
2	DGND1	I	Digital ground 1
3	XMT958		Nc
4	XMWR	I	Connect down-pull resistance
5	EMOE	I	Connect up-pull resistance
6	DIN	I	Data input
7	SCK	I	Serial clock
8	GPIO 7		Nc
9	GPIO 6		Nc
10	GPIO 5		Nc
11	GPIO 4		Nc
12	VD2	I	Digital power supply 2
13	DGND2	I	Digital ground 2
14	GPIO 3		Nc
15	GPIO 2		Nc
16	GPIO 1		Nc
17	GPIO 0		Nc
18	/CS	I	Select control
19	DOUT	O	Data output
20	/INT	O	Interrupt

PIN No.	Symbol	I/O	Description
21	EXTMEM	I	Connect up-pull resistance
22	SDATAN	I	Data input 2
23	VDD3	I	Digital ground 3
24	DGND3	I	Digital ground 3
25	BCK1	I	SCLK
26	WCK1	I	LRCK
27	CMPDAT	I	Data input 1
28	BCK2	I	SCLK 1
29	LR2	I	LRCK 1
30	CLKIN	I	Clock input
31	CLKSEL	I	CLK select
32	FILT2	O	PLL loop filter 2
33	FILT1	O	PLL loop filter 1
34	VAA	I	Analog power input
35	AGND	I	Analog ground
36	/RESET	I	Reset
37	DD	O	Connect up-pull resistance
38	DC	O	Connect up-pull resistance
39	AD2	O	Serial data input 2
40	AD1	O	Serial data input 1
41	AD0	O	Serial data input 0
42	WCK	O	SCLK output
43	BCK	O	LRCK output
44	MCLK	I	Master clock

## Chapter Four Disassembly and Assembly Process

Audio power amplifiers manufactured in BBK are largely identical but with minor differences and are mainly composed of decode board components, power board components, control panel components, CPU control board components, power amplifier board components, MIC board components and signal board components. In order to speed up the compilation of “Service Manual”, we shall not give repeat explanation to model with minor differences in chapter four “Disassembly and Assembly Process” for the later compiled service manuals. For disassembly and assembly process in this chapter, please refer to chapter 4 of “AV225T Service Manual”.

The pictures of this model are shown as follows:

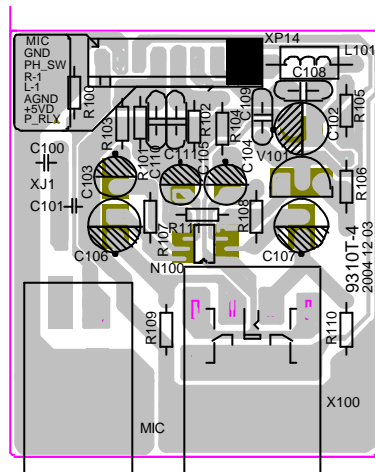


# Chapter Cinque

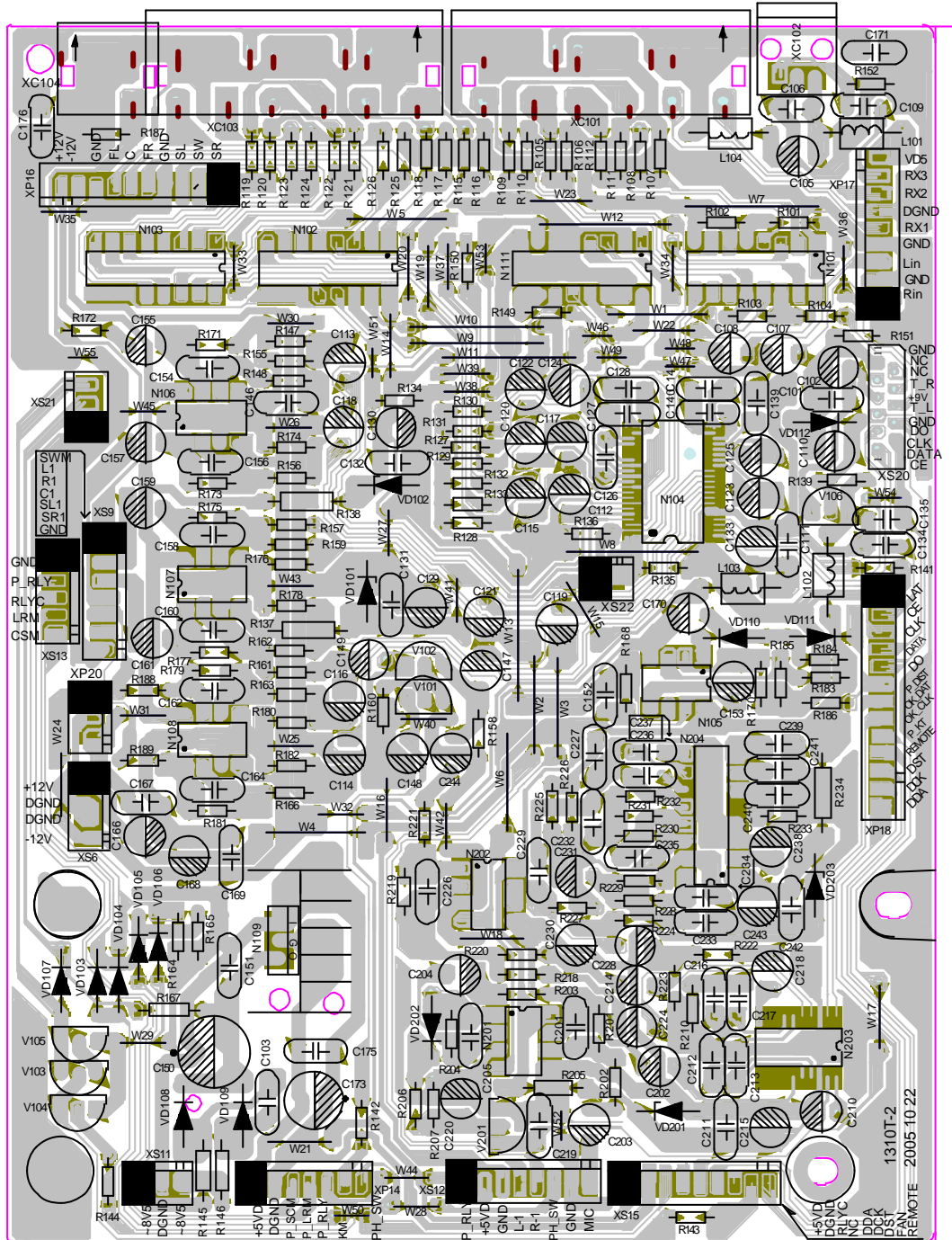
## PCB board & Circuit diagram

### Section One PCB board

#### 5.1.1 MIC Board

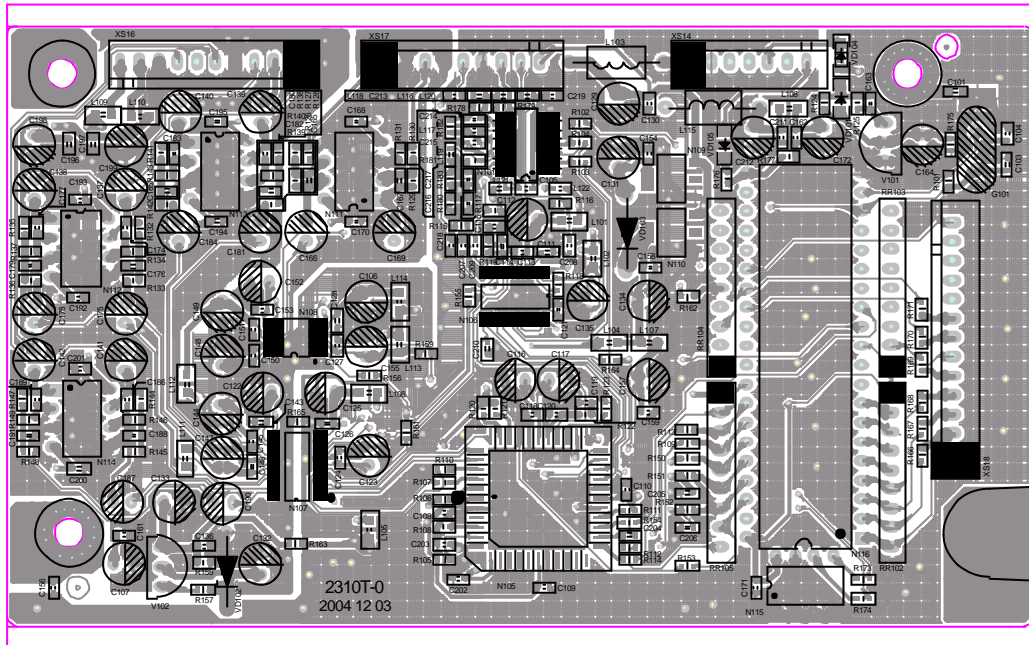


## 5.1.2 SIGNAL Board

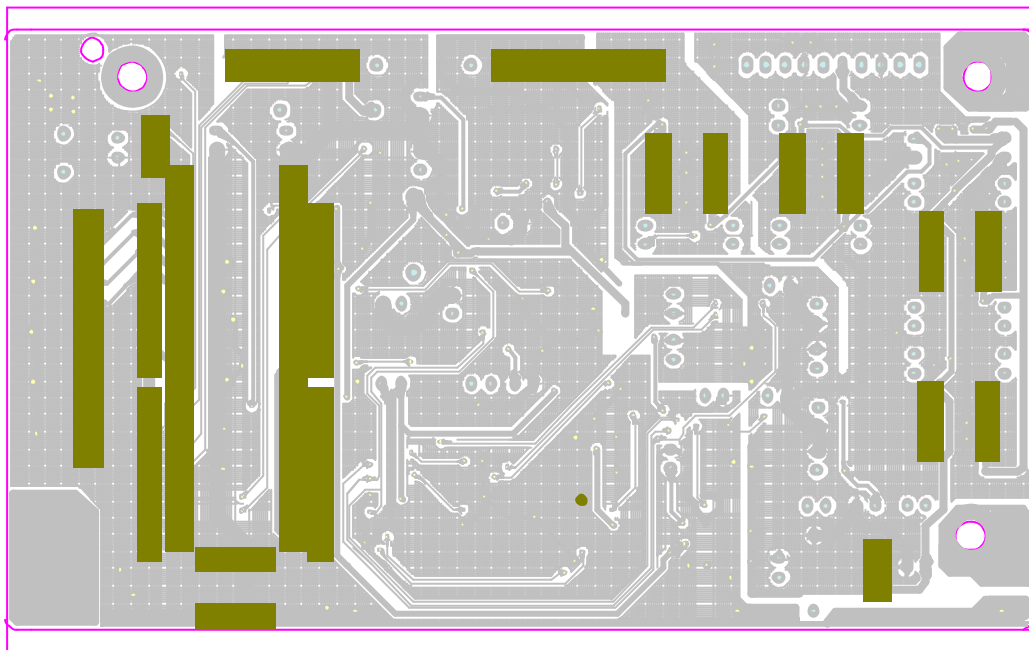




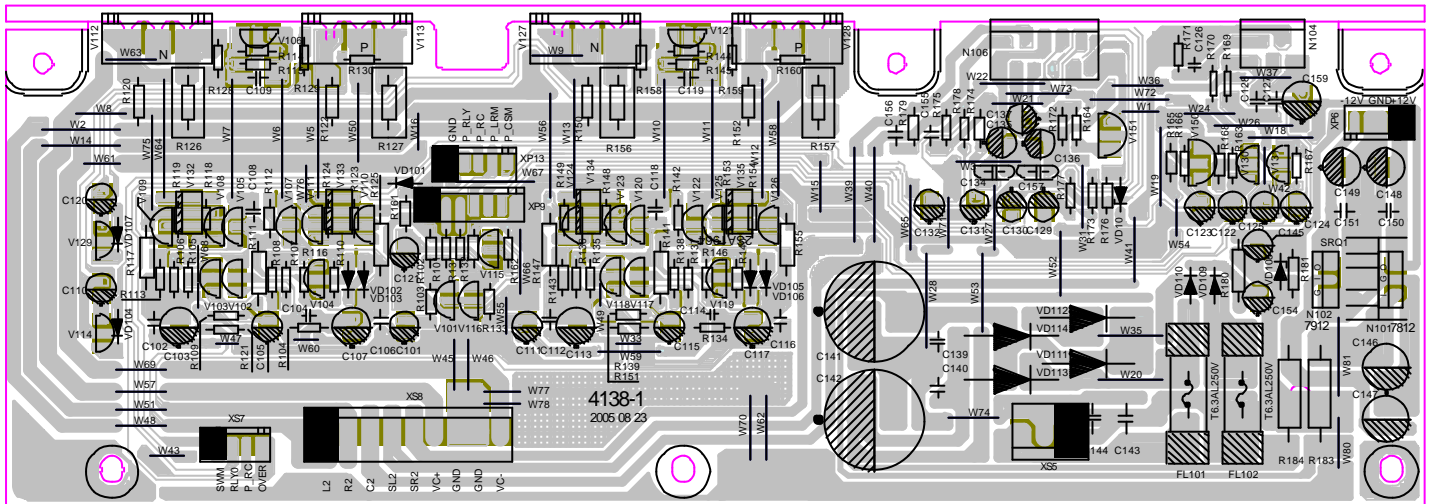
### 5.1.3 Surface layer of DECODE Board



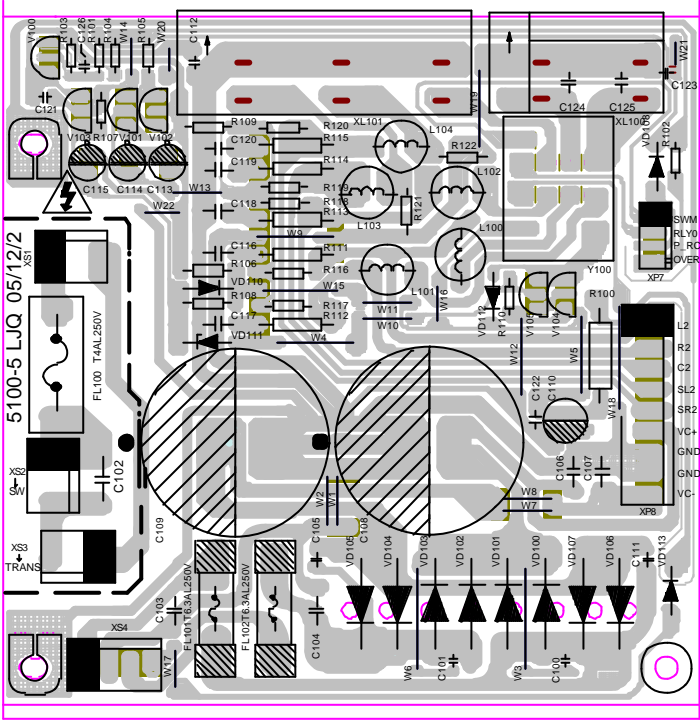
### 5.1.4 Bottom layer of DECODE Board



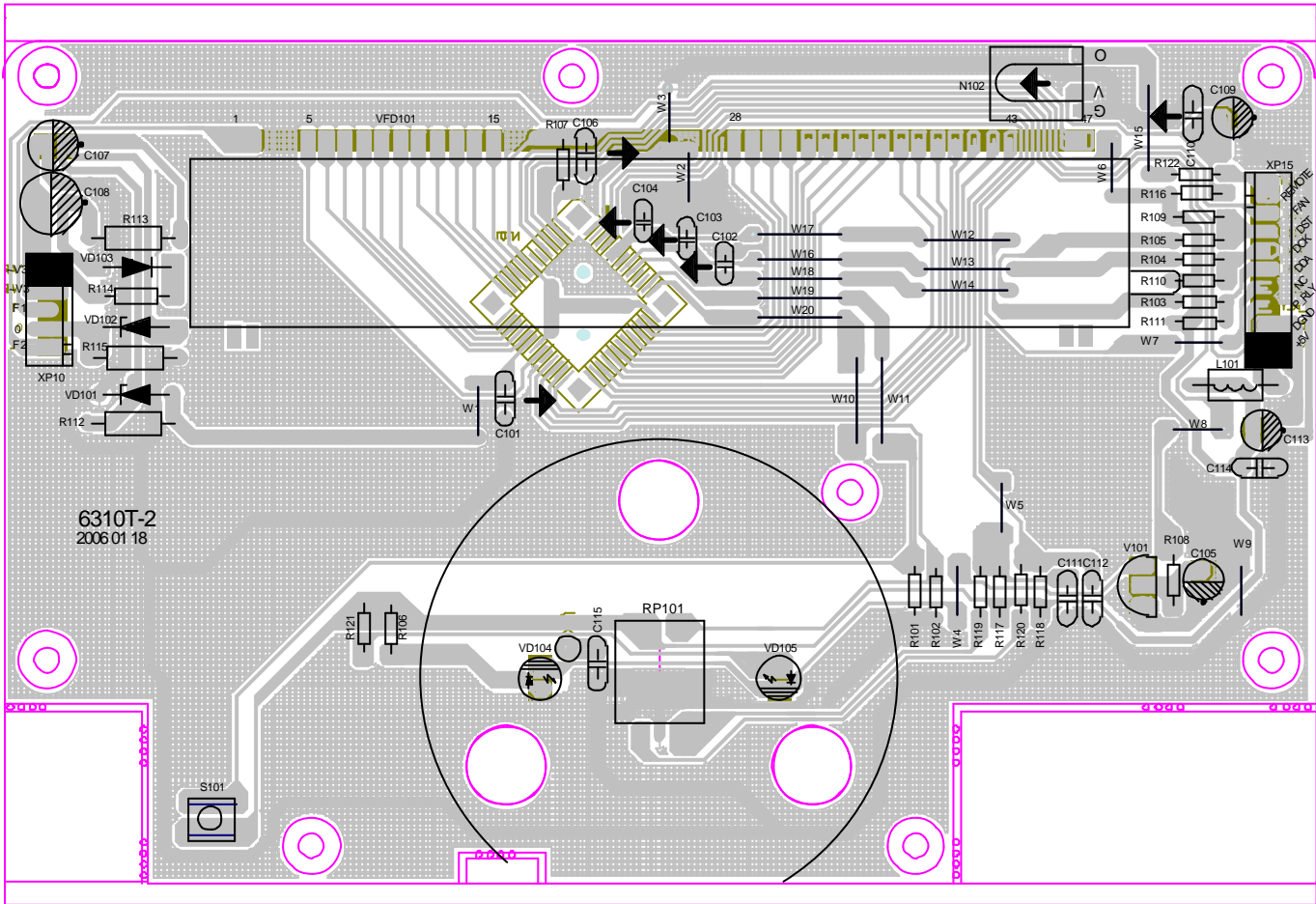
### 5.1.5 AMPLIFIER POWER Board



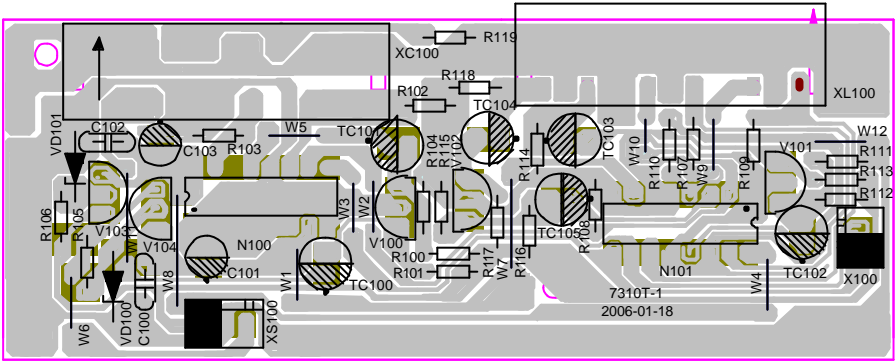
5.1.6 POWER Board



5.1.7 Key Scan Board

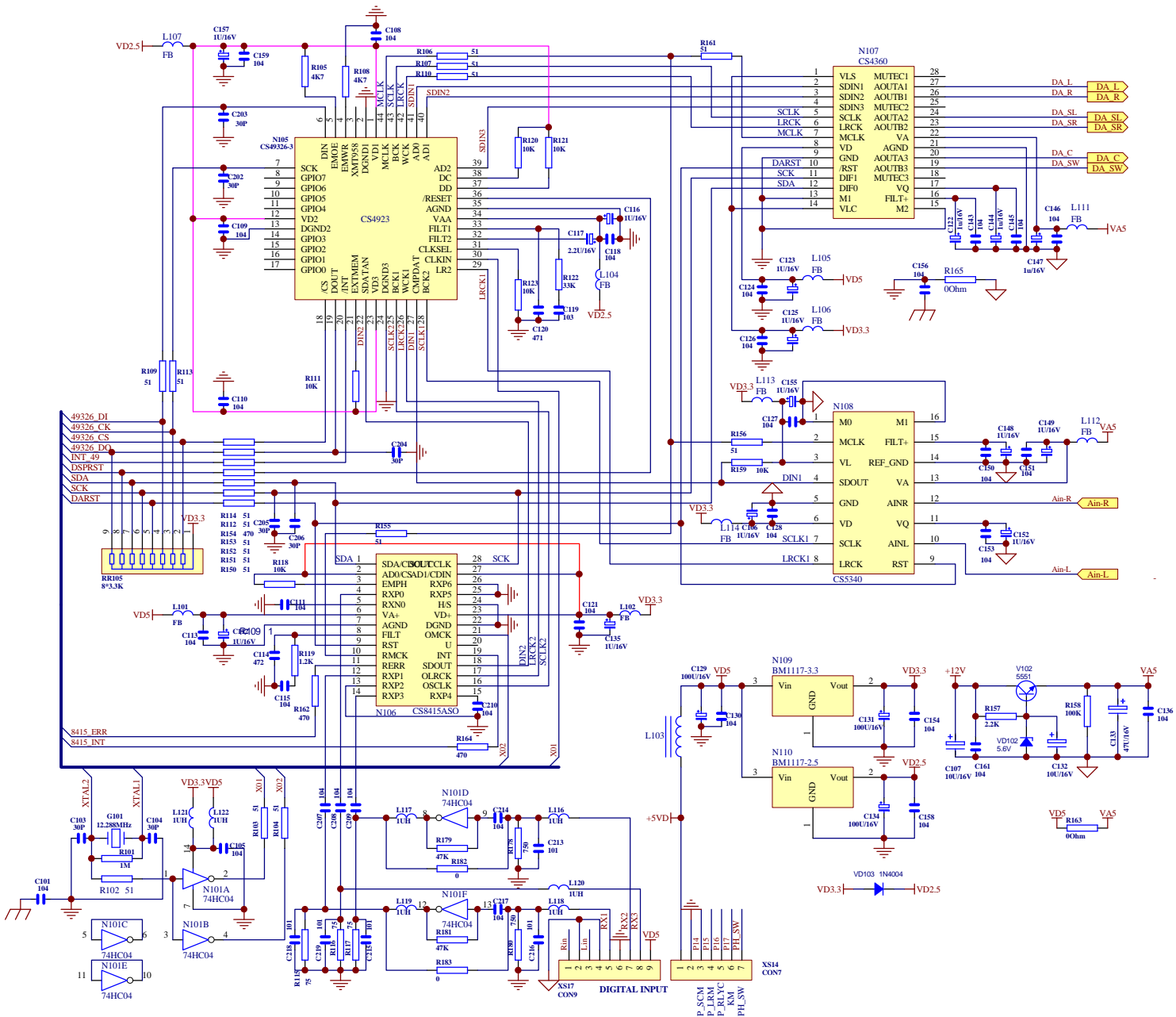


5.1.8 VIDEO Board



# Section Two circuit diagram

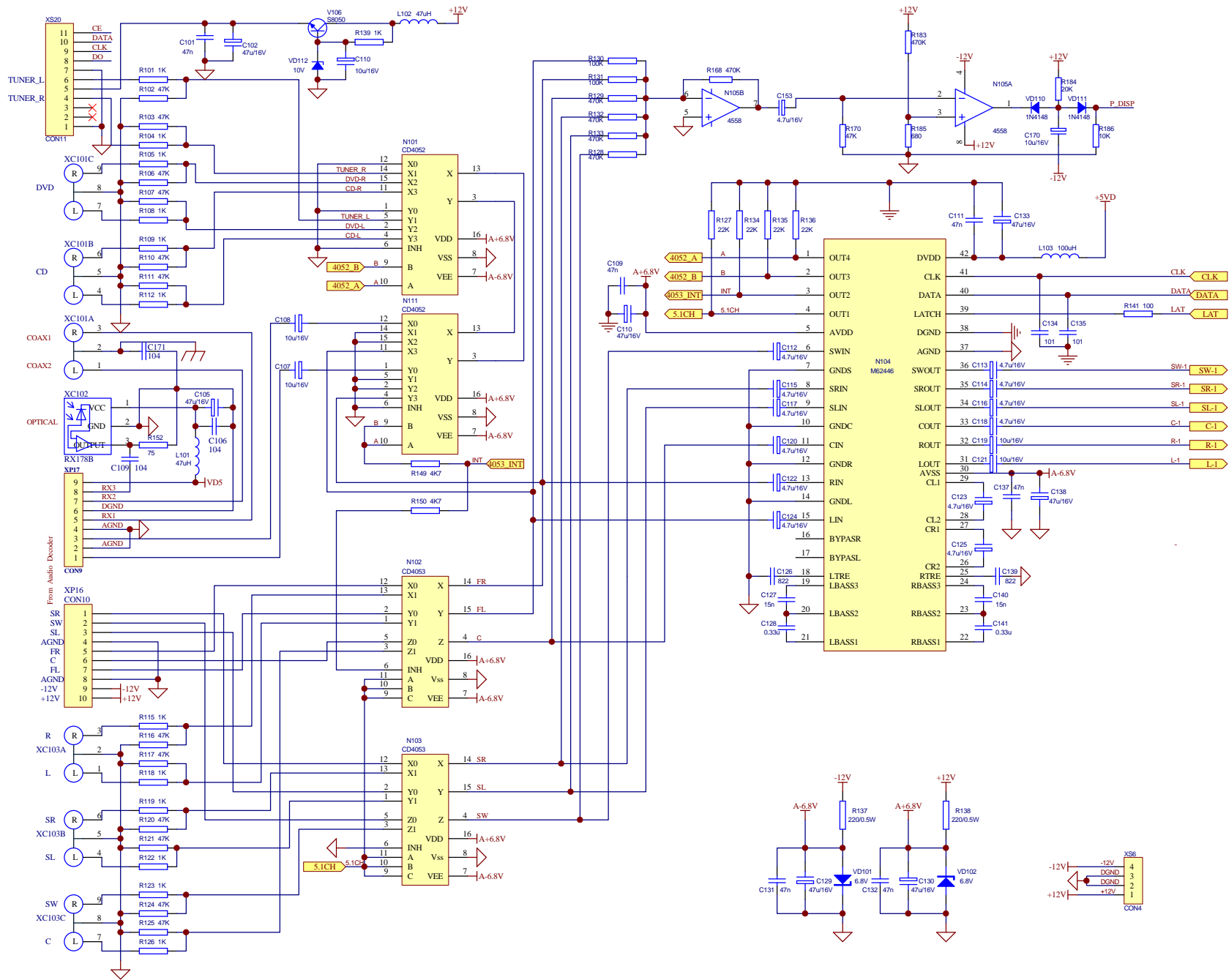
## 5.2.1 DECODE Bard 1



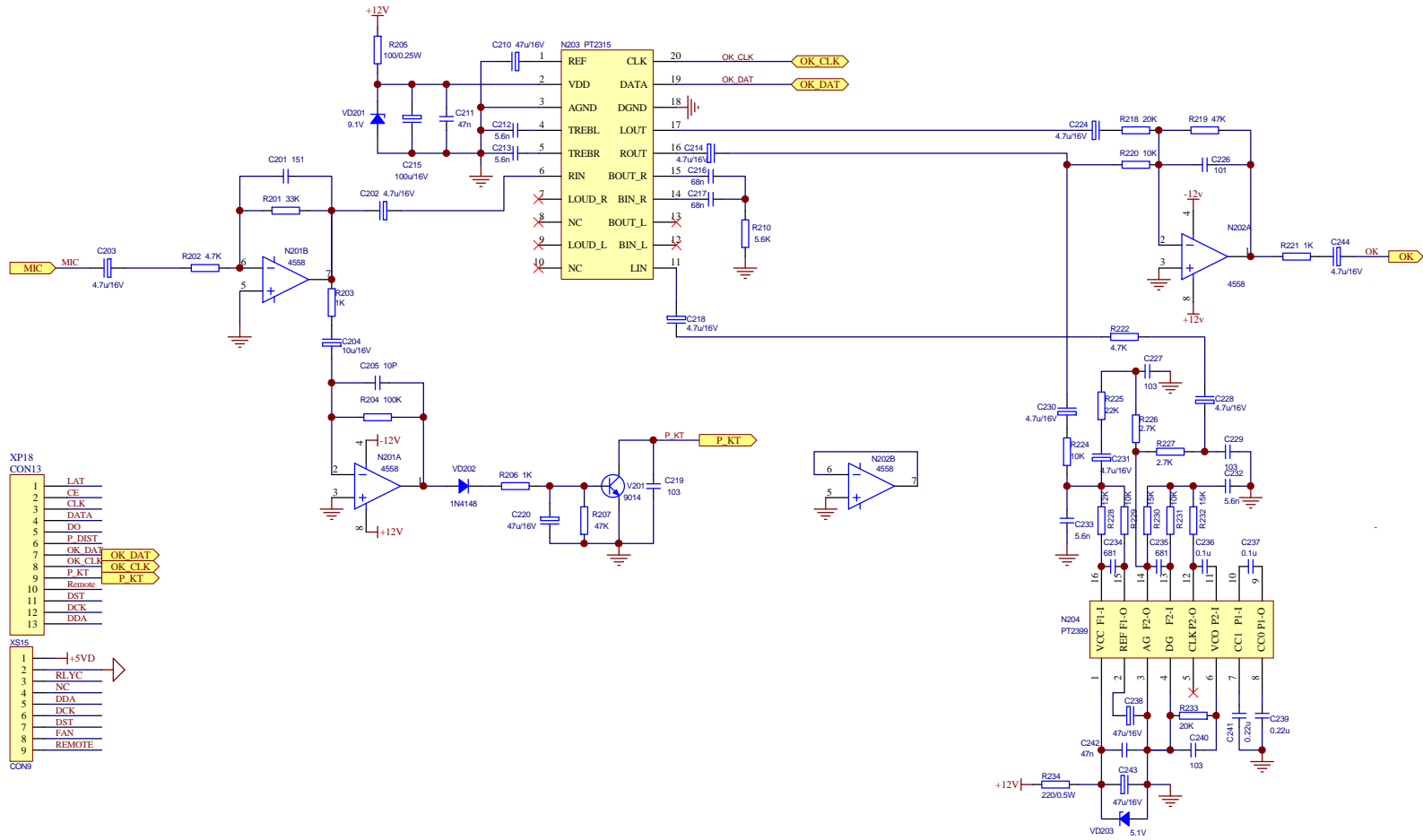




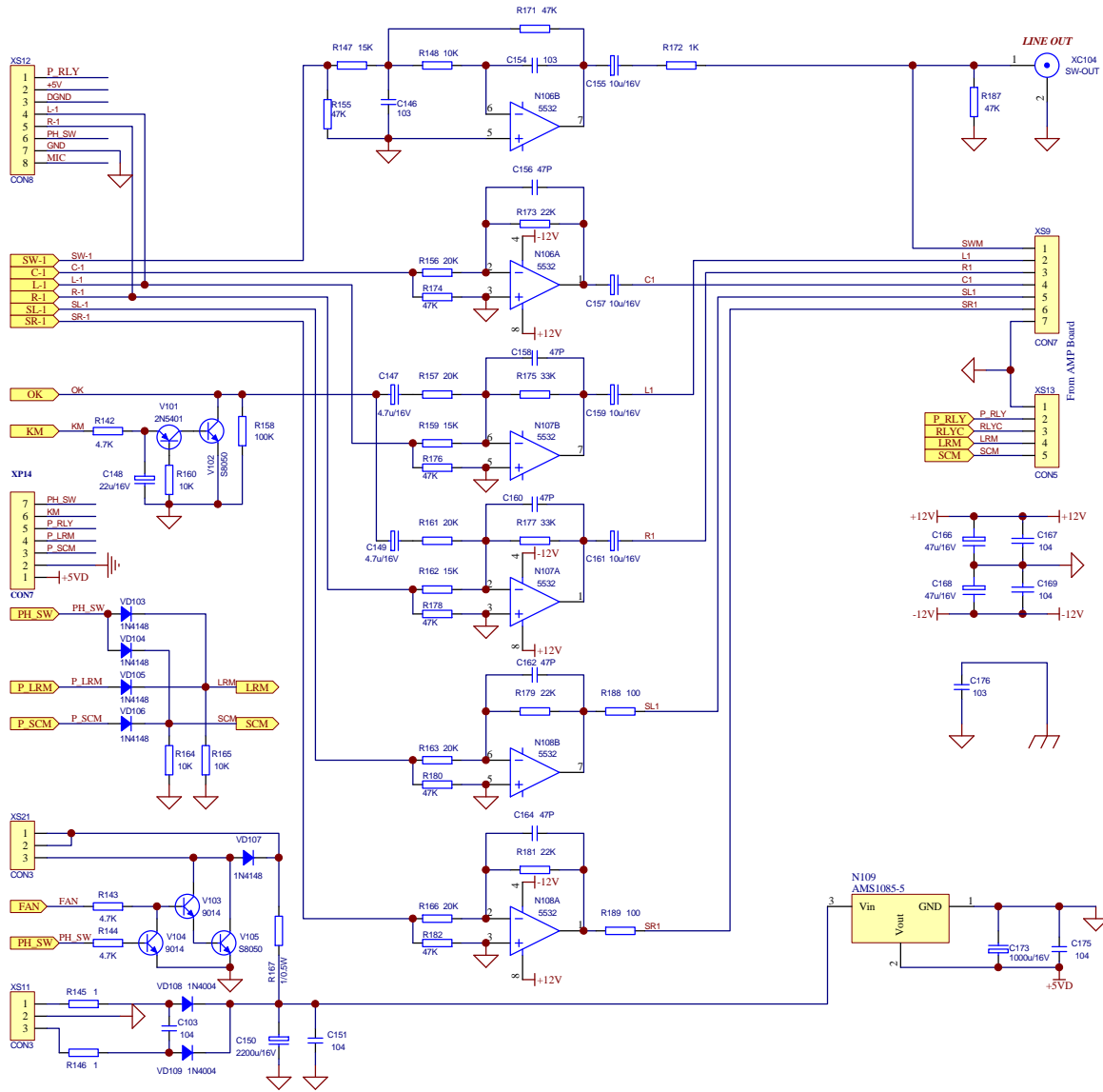
## 5.2.3 SIGNAL Board 1



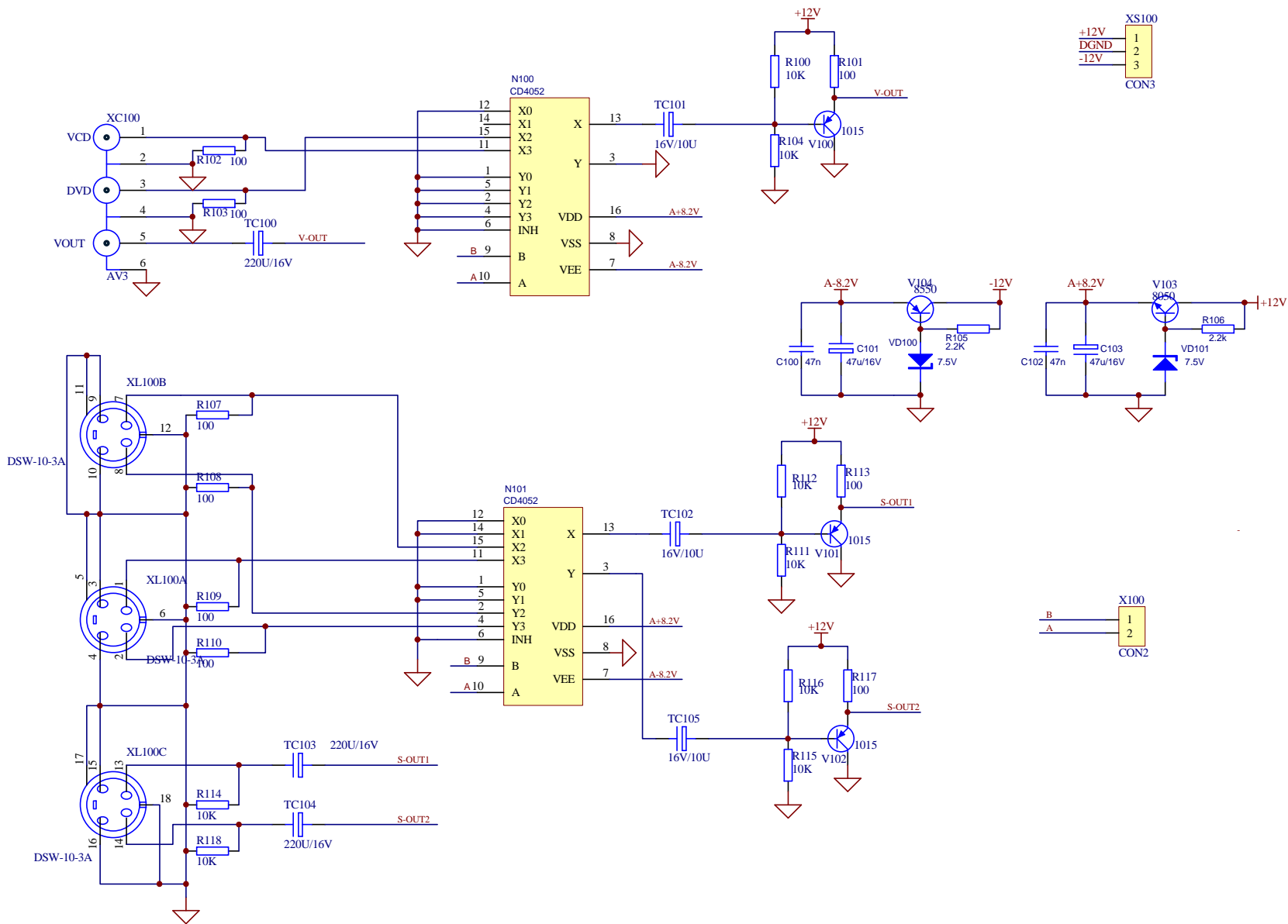
## 5.2.4 SIGNAL Board 2



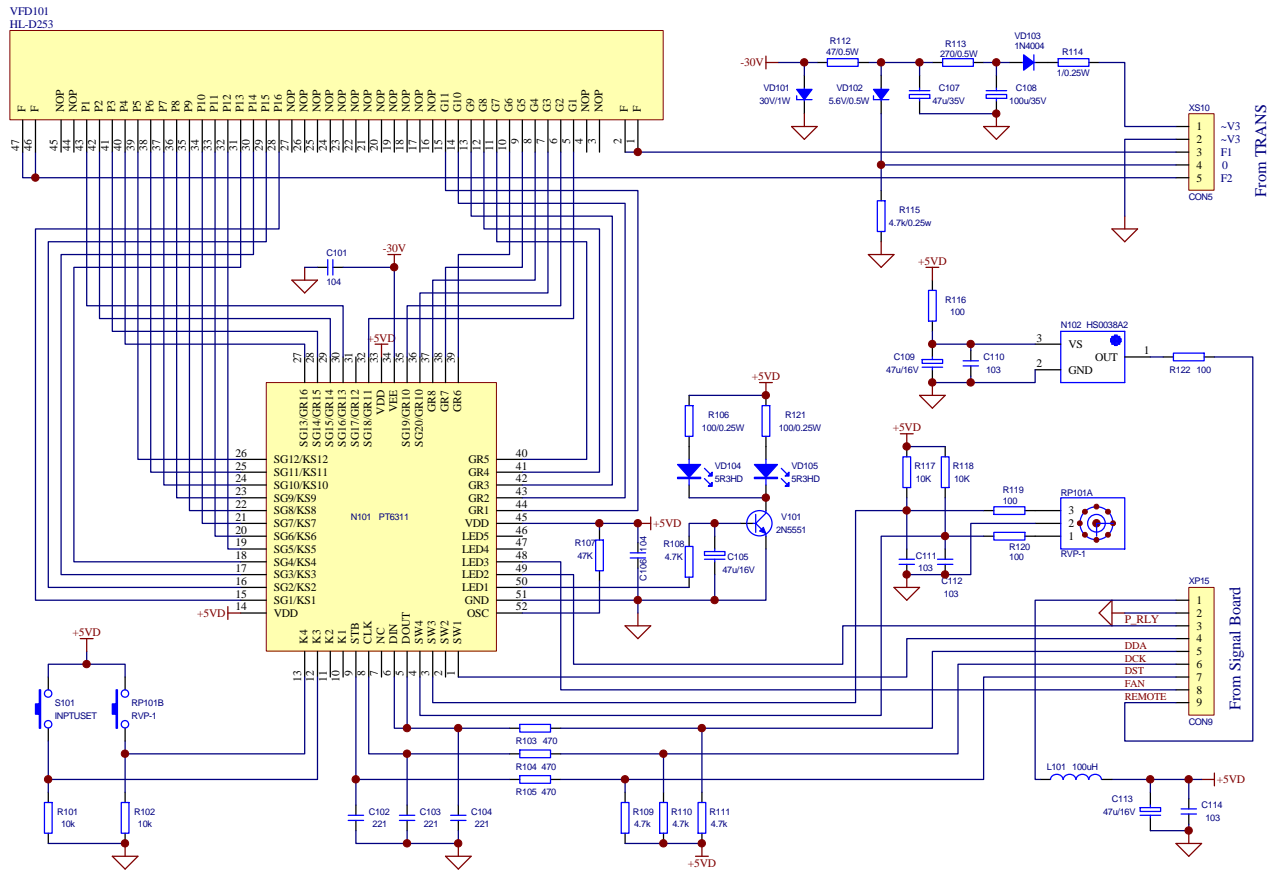
## 5.2.5 SIGNAL Board 3



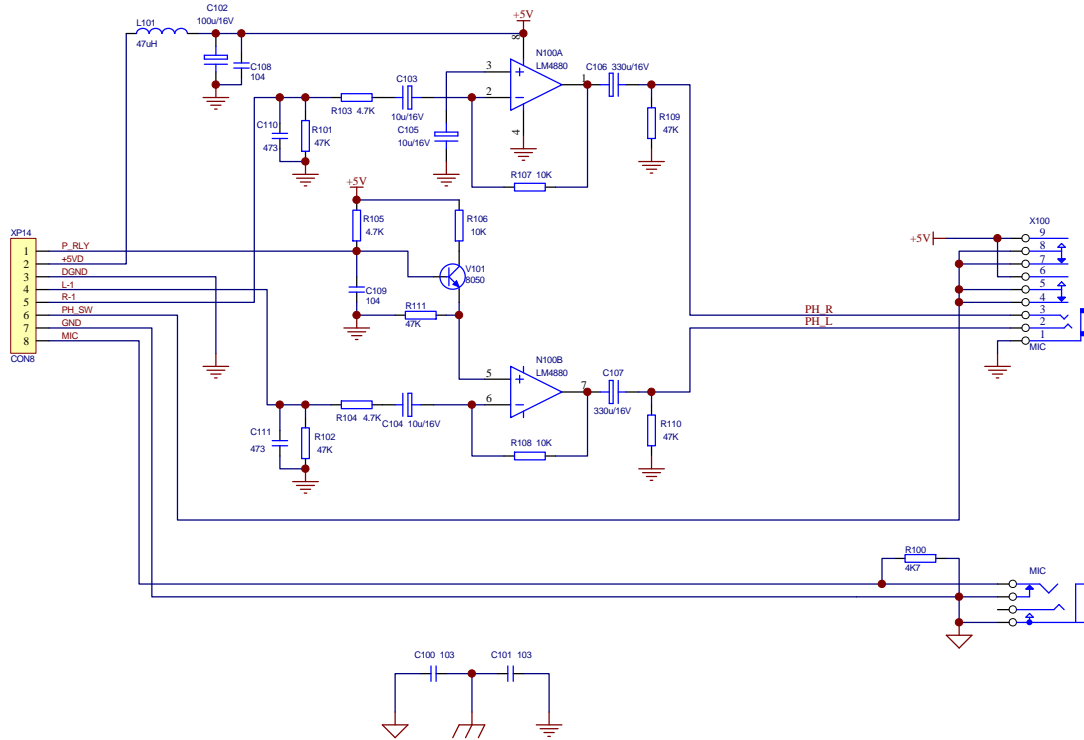
## 5.2.6 VIDEO Board



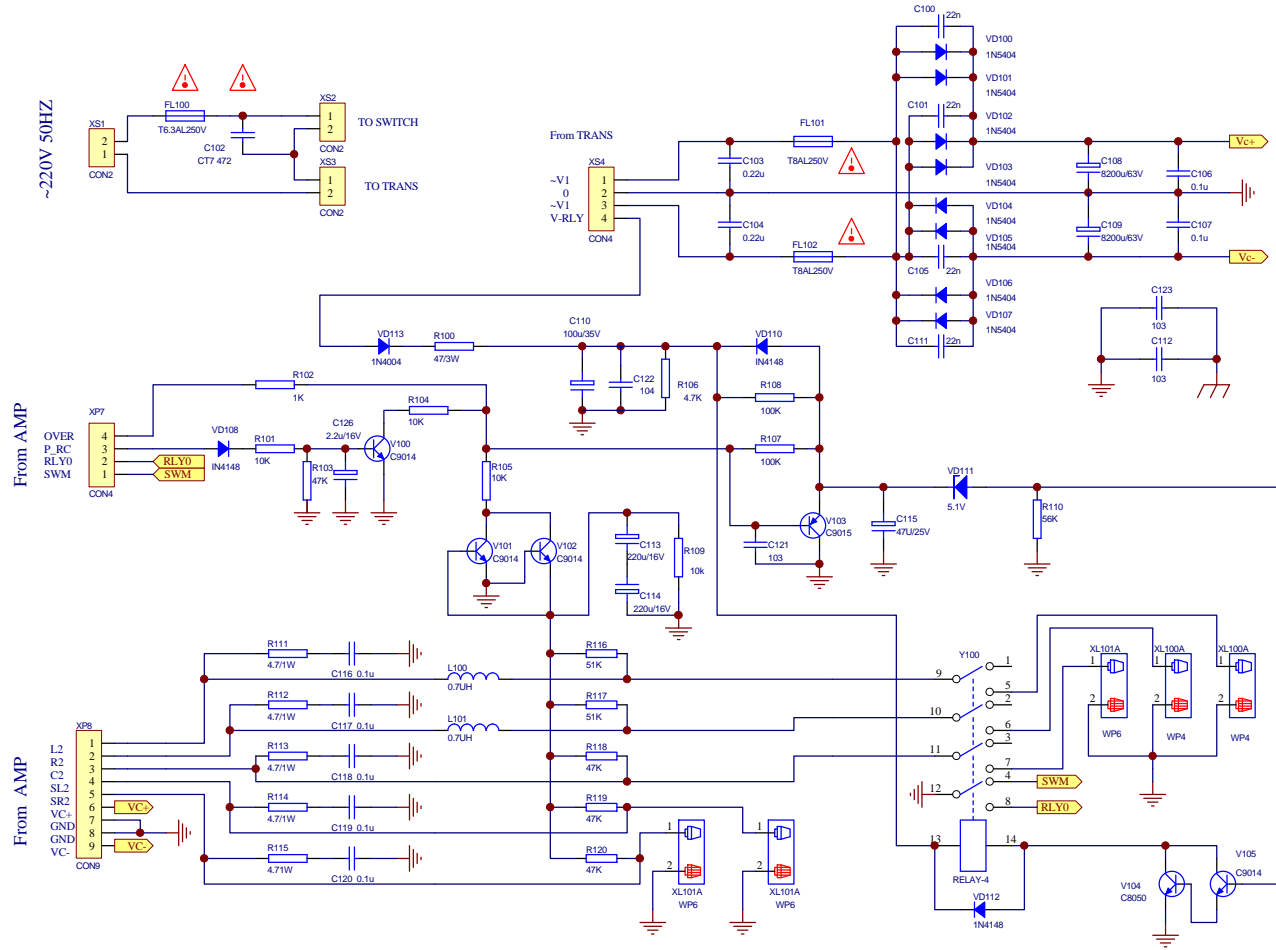
## 5.2.7 Key Scan Board



## 5.2.8 MIC Board



## 5.2.9 POWER Board 1







## Chapter six BOM List

MATERIAL CODE	MATERIAL NAME	SPECIFICATIONS	LOCATION
6.1 SIGNAL DISPOSAL BOARD			
AV311T(RU) 5447861			
0881743	IC	F4558 DIP	N105,N201,N202
0882161	IC	AZ4558 DIP	N105,N201,N202
0880445	IC	4558C DIP	N105,N201,N202
0880230	IC	PT2399 DIP	N204
0880417	IC	CD4053BCN DIP	N102,N103
0881430	IC	CD4053BE DIP	N102,N103
0881429	IC	CD4052BE DIP	N101,N111
0880443	IC	CD4052BCN DIP	N101,N111
0882223	IC	NE5532 DIP	N106,N107,N108
0880807	IC	PT2315 SOP	N203
0881380	IC	M62446AFP SOP	N104
0882154	IC	UZ1085-5 GOLD SEALED TO-220	N109
0260015	CD	CD11 10V1000U±20%8×16 3.5	C173
0260303	CD	CD11 16V2200u±20%10×30 5	C150
0390425	INDUCTOR	100UH±10% 0307 SHAPED 12.5	L101
0200310	POLYPROPYLENECAPACITOR	50V 103±10% SHAPED 5mm	C176
2120709	FLAT CABLE	7P90 2.5 2 SOCKET WITH NEEDLE	XP14
2121674	FLAT CABLE	9P260 2.5 2 PIN,WITH NEEDLE, TOGETHER DIRECTION	XP17
2121676	FLAT CABLE	10P260 2.5 2 PIN,WITH NEEDLE, TOGETHER DIRECTION	XP16
2120622	FLAT CABLE	2P140 2.5 2 SOCKET WITH NEEDLE	XS22
2122009	FLAT CABLE	3P140 2.5 2 PIN,WITH NEEDLE, REVERSE	XP20
2121675	SOFT FLAT CABLE	13P180 2.5 2 PIN,WITH NEEDLE, TOGETHER DIRECTION	XP18
1940002	SOCKET	3P 2.5mm	XS11,XS21
1940003	SOCKET	4P 2.5mm	XS6
1940004	SOCKET	5P 2.5mm	XS13
1940007	SOCKET	7P 2.5mm	XS9
1940009	SOCKET	8P 2.5mm	XS12

MATERIAL CODE	MATERIAL NAME	SPECIFICATIONS	LOCATION
1940029	SOCKET	9P 2.5mm	XS15
1910034	TERMINAL SOCKET	AV1-8.4-5G BLACK	XC104
1910102	TERMINAL SOCKET	AV6-8.4-13	XC103
1910193	TERMINAL SOCKET	AV6-8.4-13/ES-3	XC101
1940033	CABLE SOCKET	11P 1.25mm STRAIGHT DUAL LINE PLUG	XS20
1090071	OPTIC-ELECTRO CONVERTOR	RX179AT	XC102
1090085	OPTIC-ELECTRO CONVERTOR	HKRX178A	XC102
3580159	HEAT RADIATION BOARD	20×14×40 BLACK,SINGLE HOLE AV310T	配UZ1085-5
4000453	SELF-TAPPING SCREW	BT 3×8H WHITE NICKEL	IC
5447420	PCB SEMI-FINISHED PRODUCT	1310T-2 AV310T(RU)-2 AI SEGMENT	
6.2 SIGNAL DISPOSAL BOARD AI SEGMENT			
AV311T(RU) 5447420			
2100003	CONNECTED CORDS	F 0.6 SHAPED 7.5mm	W25~W45
2100004	CONNECTED CORDS	F 0.6 SHAPED 10mm	W14~W24
2100007	CONNECTION CORDS	F 0.6 SHAPEN 15mm	W1~W6
2100010	CONNECTED CORDS	F 0.6 SHAPED 5mm	W46~W54
2100017	CONNECTED CORDS	F 0.6 SHAPED 20mm	W7~W13
00000029	CARBON FILM RESISTOR	1/6W10±5% BELT	R151
00000099	CARBON FILM RESISTOR	1/6W100O±5% BELT	R141,R188,R189,R152
00000199	CARBON FILM RESISTOR	1/6W680O±5% BELT	R185
00000229	CARBON FILM RESISTOR	1/6W1K±5% BELT	R101,R104,R105,R108,R109,R112,R115,R118,R119,R122,R123,R126,R172,R203,R206,R221,R139
00000289	CARBON FILM RESISTOR	1/6W2.7K±5% BELT	R226,R227
00000349	CARBON FILM RESISTOR	1/6W4.7K±5% BELT	R142,R143,R144,R202,R149,R150,R222
00000369	CARBON FILM RESISTOR	1/6W5.6K±5% BELT	R210
00000409	CARBON FILM RESISTOR	1/6W10K±5% BELT	R160,R164,R165,R220,R224,R229,R231,R186,R148
00000419	CARBON FILM RESISTOR	1/6W12K±5% BELT	R228
00000439	CARBON FILM RESISTOR	1/6W15K±5% BELT	R159,R162,R230,R232,R147
00000459	CARBON FILM RESISTOR	1/6W20K±5% BELT	R156,R157,R161,R163,R166,R184,R233,R218
00000469	CARBON FILM RESISTOR	1/6W22K±5% BELT	R127,R134,R135,R136,R225,R179,R181,R173
00000509	CARBON FILM RESISTOR	1/6W33K±5% BELT	R175,R177,R201
00000599	CARBON FILM RESISTOR	1/6W100K±5% BELT	R130,R131,R158,R204

MATERIAL CODE	MATERIAL NAME	SPECIFICATIONS	LOCATION
00000529	CARBON FILM RESISTOR	1/6W47K±5% BELT	R102,R103,R106,R107,R110,R111,R116,R117,R120,R121,R124,R125,R155,R170,R174,R176,R178,R180,R182,R187,R207,R219,R171
00000729	CARBON FILM RESISTOR	1/6W470K±5% BELT	R128,R129,R132,R133,R168, R183
00001759	CARBON FILM RESISTOR	1/4W100O±5% BELT	R205
00006239	CARBON FILM RESISTOR	1/2W220O±5% BELT	R137,R138,R234
00102289	METAL OXIDE FILM RESISTOR	1/4W10±5% BELT	R145,R146,R167
02003069	POLYPROPYLENECAPACITOR	50V 47P±10% SHAPED 5mm BELT	C156,C158,C160,C162,C164,C205
02003079	POLYPROPYLENECAPACITOR	50V 101±10% SHAPED 5mm BELT	C134,C135,C226
02003109	POLYPROPYLENECAPACITOR	50V 103±10% SHAPED 5mm BELT	C219,C227,C229,C240,C146,C154
02003149	POLYPROPYLENECAPACITOR	50V 822±10% SHAPED 5mm BELT	C126,C139
02003169	POLYPROPYLENECAPACITOR	50V 562±10% SHAPED 5mm BELT	C212,C213,C232,C233
02003299	POLYPROPYLENECAPACITOR	50V561±10% SHAPED 5mm BELT	C234,C235
02003309	POLYPROPYLENECAPACITOR	50V151±10% SHAPED 5mm BELT	C201
02100689	TEMETAL OXIDE FILM RESISTORLENECAPACITOR	100V 683 ±10% SHAPED 5mm BELT	C216,C217
02101489	TEMETAL OXIDE FILM RESISTORLENECAPACITOR	100V 473±10% SHAPED 5mm BELT	C101,C111,C131,C132,C211,C242,C151,C167,C169,C175
02102209	TEMETAL OXIDE FILM RESISTORLENECAPACITOR	100V 473±5% SHAPED 5mm BELT	C101,C111,C131,C132,C211,C242,C151,C167,C169,C175
02101049	METAL POLYESTER FILMCAPACITOR	CL21X100V224 K C5BD	C239,C241
02101409	METAL POLYESTER FILMCAPACITOR	CL21X63V153±5%C5 BELT	C127,C140
02101419	METAL POLYESTER FILMCAPACITOR	CL21X100V334K C5 BELT	C128,C141
02101459	METAL POLYESTER FILMCAPACITOR	CL21X 100V 104K C5 BELT	C103,C106,C236,C237,C109,C171
02600019	CD	CD11 16V22U±20%5×11 C5 BELT	C148
02600029	CD	CD11 16V47U±20%5×11 C5 BELT	C102,C105,C129,C130,C133,C166,C168,C210,C220,C238,C243,C215
02604379	CD	CD11 16V10U±20%5×11C5 BELT	C107,C108,C119,C121,C155,C157,C159,C161,C204,C170,C110
02604389	CD	CD11 16V4.7U±20%5×11C5 BELT	C112,C113,C114,C115,C116,C117,C118,C120,C122,C123,C124,C125,C147,C149,C202,C203,C214,C218,C224,C228,C230,C231,C244,C153
03901979	INDUCTOR	100UH±10% 0410 BELT	L102,L103
05700049	DIODE	1N4004 BELT	VD108,VD109
0570006	DIODE	1N4148	VD104,VD107,VD110,VD111,VD202,VD103,VD105,VD106
05800069	VOLTAGE REGULATOR DIODE	5.1V±5% 1/2W BELT	VD203
05800099	VOLTAGE REGULATOR DIODE	9.1V±5% 1/2W BELT	VD201

MATERIAL CODE	MATERIAL NAME	SPECIFICATIONS	LOCATION
05800329	VOLTAGE REGULATOR DIODE	10V±5% 1/2W BELT	VD112
05800459	VOLTAGE REGULATOR DIODE	6.8V±5% 1/2W BELT	VD101,VD102
07800259	TRIODE	2N5401 BELT	V101
07800329	TRIODE	9014C BELT	V103,V104,V201
07800509	TRIODE	S8050D BELT	V102,V105,V106
1564008	PCB	1310T-2	

#### 6.3 DECODE BOARD

AV321T(RU) 5448412

0880664	IC	24C02 DIP	N115
0882223	IC	NE5532 DIP	N111,N112,N113,N114
0260027	CD	CD11 16V100U±20%6×12 2.5	C129,C131,C134
0260019	CD	CD11 16V10U±20%5×11 2	C137,C138,C139,C140,C141,C142,C164,C166,C169,C175,C178,C181,C184,C187,C190
0260025	CD	CD11 16V47U±20%5×11 2	C172,C198,C199,C212
0260067	CD	CD11 50V2.2U±20%5×11 2	C117
0260126	CD	CD11 16V1U±20%5×11 2	C106,C112,C116,C122,C123,C125,C135,C144,C147,C148,C149,C152,C155,C157
0100008	RESISTANCE NETWORK	1/6W 4.7K±5% 9P	RR102,RR103,RR104,RR105
0390353	SMDMAGNETIC BEADS	RH-357508 SHAPED 12.5mm	L103,L115
0570004	DIODE	1N4004	VD103
0780032	TRIODE	9014C	V101
0960182	CRYSTAL OSCILLATOR	12.288MHz 49-S	G101
1940007	SOCKET	7P 2.5mm	XS14
1940029	SOCKET	9P 2.5mm	XS17
1940030	SOCKET	10P 2.5mm	XS16
1940171	SOCKET	11P 2.5mm	XS18
1850005	DUAL RANKIC SOCKET	40P DIP	N116
0890284	PROGRAM CPU	CPU311TRU-0	N116
5446068	PCB SEMI-FINISHED PRODUCT	2310T-0-SMD AV310T ( RU )	

#### 6.4 DECODE BOARD-SMD

AV321T(RU) 5446068

0090001	SMD RESISTOR	1/16W 00±5% 0603	R165,R163
0090006	SMD RESISTOR	1/16W 750±5% 0603	R115,R116,R117

MATERIAL CODE	MATERIAL NAME	SPECIFICATIONS	LOCATION
0090181	SMD RESISTOR	1/16W 100O±5% 0603	R109,R112,R113,R114,R150,R151,R152,R153
0090011	SMD RESISTOR	1/16W 470O±5% 0603	R154,R162,R164,R166,R167,R168,R169,R170,R171,R173,R174,R178,R180
0090014	SMD RESISTOR	1/16W 1K±5% 0603	R176
0090015	SMD RESISTOR	1/16W 1.2K±5% 0603	R119
0090019	SMD RESISTOR	1/16W 4.7K±5% 0603	R105,R108
0090023	SMD RESISTOR	1/16W 10K±5% 0603	R111,R118,R120,R121,R123,R126,R129,R132,R135,R140,R141,R144,R147,R159,R177
0090026	SMD RESISTOR	1/16W 22K±5% 0603	R127,R130,R139,R124
0090028	SMD RESISTOR	1/16W 33K±5% 0603	R122
0090029	SMD RESISTOR	1/16W 47K±5% 0603	R138,R125,R179,R181
0090034	SMD RESISTOR	1/16W 100K±5% 0603	R128,R131
0090109	SMD RESISTOR	1/16W 1MO±5% 0603	R101
0090184	SMD RESISTOR	1/16W 4.3K±5% 0603	R175
0090220	SMD RESISTOR	1/16W 51O±5% 0603	R102,R103,R104,R106,R107,R110,R155,R156,R161
0090224	SMD RESISTOR	1/16W 3.9K±5% 0603	R134,R137,R143,R146,R149
0090225	SMD RESISTOR	1/16W 5.6K±5% 0603	R133,R136,R142,R145,R148
0310047	SMD CAPACITOR	50V 101±5% NPO 0603	C213,C216,C215,C218,C219
0310051	SMD CAPACITOR	50V 331±5% NPO 0603	C165,C167
0310053	SMD CAPACITOR	50V 471±5% NPO 0603	C120,C174,C177,C183,C186,C189
0310057	SMD CAPACITOR	16V 104±10% 0603	C105,C108,C109,C110,C111,C113,C115,C118,C121,C124,C126,C127,C128,C130,C143,C145,C146,C150,C151,C153,C154,C158,C159,C162,C163,C168,C170,C171,C182,C192,C193,C194,C195,C196,C197,C200,C201,C207,C208,C209,C101,C211,C210,C214,C217,C156
0310069	SMD CAPACITOR	50V 272±10% 0603	C176,C179,C185,C188,C191
0310072	SMD CAPACITOR	50V 103±10% 0603	C119
0310191	SMD CAPACITOR	50V 30P±5% NPO 0603	C103,C104,C202,C203,C204,C205,C206
0310198	SMD CAPACITOR	50V 472±10% X7R 0603	C114
0310201	SMD CAPACITOR	50V 153±10% 0603	C180
0390096	SMD INDUCTOR	1.8UH±10% 1608	L116,L117,L118,L119,L120,L121
0390044	SMD INDUCTOR	10UH±10% 2012	L101,L102,L104,L105,L106,L107,L108,L109,L110,L111,L112,L113,L114
0700007	SMD DIODE	1N4148	VD101,VD104,VD105
0880165	IC	74HCU04D SOP	N101

MATERIAL CODE	MATERIAL NAME	SPECIFICATIONS	LOCATION
0881057	IC	CS4360 SSOP	N107
0882353	IC	CS5340 TSSOP	N108
0882413	IC	CS8415A TSSOP	N106
0882446	IC	CS493264 PLCC	N105
0882114	IC	AMS1117-3.3 SOT-223	N109
0882505	IC	VS1117-3.3 SOT-223	N109
0882485	IC	AZ1117H-3.3 SOT-223	N109
1632000	PCB	2310T-0	
6.5 AMPLIFIER BOARD			
AV321T(RU) 5447863			
2100003	CONNECTED CORDS	F 0.6 SHAPED 7.5mm	W1,W16,W42,W43,W54,W55,W61,W76,W77,W78
2100004	CONNECTED CORDS	F 0.6 SHAPED 10mm	W8,W9,W15,W21,W24,W36,W37,W45,W46,W48,W51,W57,W63,W69,W71,W74,W80
2100006	CONNECTION CORDS	F 0.6 SHAPED 12.5mm	W3,W18,W20,W22,W27,W31,W35,W41,W52,W59,W62,W65,W66,W70,W73
2100007	CONNECTION CORDS	F 0.6 SHAPEN 15mm	W2,W14,W19,W26,W50,W53,W67,W72,W81
2100010	CONNECTED CORDS	F 0.6 SHAPED 5mm	W33,W47,W49,W60,W68
2100016	CONNECTION CORDS	F 0.6 SHAPEN 18mm	W28,W39,W40,W58,W75
2100017	CONNECTED CORDS	F 0.6 SHAPED 20mm	W56,R183,R184
2100024	CONNECTION CORDS	F 0.6 SHAPEN 22mm	W5,W6,W7,W10,W11,W12,W13,W64
0040069	CEMENT RESISTOR	7W0.25O±5%SQM SHAPED R 10×5	R126,R127,R156,R157
0000128	CARBON FILM RESISTOR	1/6W820O±5% SHAPED 7.5	R170,R174,R178
0000129	CARBON FILM RESISTOR	1/6W1K±5% SHAPED 7.5	R103,R109,R112,R133,R139,R142,R173,R177
0000130	CARBON FILM RESISTOR	1/6W1.2K±5% SHAPED 7.5	R115,R145
0000133	CARBON FILM RESISTOR	1/6W4.7K±5% SHAPED 7.5	R161,R166,R167
0000137	CARBON FILM RESISTOR	1/6W10K±5% SHAPED 7.5	R101,R131,R162,R163,R168
0000139	CARBON FILM RESISTOR	1/6W20K±5% SHAPED 7.5	R164
0000141	CARBON FILM RESISTOR	1/6W27K±5% SHAPED 7.5	R176,R171
0000144	CARBON FILM RESISTOR	1/6W47K±5% SHAPED 7.5	R104,R134,R165,R169,R172
0000146	CARBON FILM RESISTOR	1/6W100K±5% SHAPED 7.5	R102,R132
0000276	CARBON FILM RESISTOR	1/4W100O±5% SHAPED 10	R120,R122,R150,R152
0000475	CARBON FILM RESISTOR	1/6W2.7K±5% SHAPED 7.5	R105,R106,R135,R136,R114,R144,R129,R159
0000495	CARBON FILM RESISTOR	1/6W4.3K±5% SHAPED 7.5	R128,R130,R158,R160

MATERIAL CODE	MATERIAL NAME	SPECIFICATIONS	LOCATION
0000466	CARBON FILM RESISTOR	1/2W220O±5% SHAPED 12.5	R117,R125,R147,R155
0000489	CARBON FILM RESISTOR	1/6W24K±5% SHAPED 7.5	R175,R179
0000556	CARBON FILM RESISTOR	1/6W47O±5% SHAPED 7.5	R107,R108,R137,R138
0000562	CARBON FILM RESISTOR	1/6W620O±5% SHAPED 7.5	R110,R140
0000610	CARBON FILM RESISTOR	1/6W200O±5% SHAPED 7.5	R113,R116,R143,R146
0010321	METAL OXIDE FILM RESISTOR	1/2W33K±5% SHAPED 12.5	R111,R141
0010322	METAL OXIDE FILM RESISTOR	1/4W33K±5%	R121,R151
0200306	POLYPROPYLENECAPACITOR	50V 47P±10% SHAPED 5mm	C155,C156
0200066	PORCELAINCAPACITOR	50V 221±10% 2.5mm	C104,C114
0200333	POLYPROPYLENECAPACITOR	500V33P±10% NPO SHAPED 5mm	C108,C118
0210030	TERYLENECAPACITOR	100V 104±10% 7mm	C143,C144
0210029	TERYLENECAPACITOR	100V 104±5% 7mm	C143,C144
0210147	TERYLENECAPACITOR	100V 473±10% 5mm	C102,C106,C109,C112,C116,C119,C127,C128,C139,C140,C150,C151,C134,C157
0210025	TERYLENECAPACITOR	100V 473±5% 6mm	C102,C106,C109,C112,C116,C119,C127,C128,C139,C140,C150,C151,C134,C157
0260039	CD	CD11 25V47U±20%5×11 2	C135,C136
0260465	CD	CD11 100V10U±20%6.3×11 2.5	C159
0260019	CD	CD11 16V10U±20%5×11 2	C101,C111,C124
0260021	CD	CD11 16V22U±20%5×11 2	C121,C122,C123,C125,C131,C132
0260027	CD	CD11 16V100U±20%6×12 2.5	C105,C115,C148,C149
0260063	CD	CD11 50V1U±20%5×11 2	C110,C120,C129,C130,C137
0260163	CD	CD11 50V47U±20%6×12 2.5	C103,C107,C113,C117
0260134	CD	CD11 25V4700U±20%16×35 7.5	C141,C142
0260135	CD	CD11 25V4700U±20%16×40 7.5	C141,C142
0570006	DIODE	1N4148	VD101~VD107
0570020	DIODE	1N5404	VD111,VD112,VD113,VD114
0780025	TRIODE	2N5401	V105,V115,V120,V130
0780026	TRIODE	2N5551	V102~V104,V106~V107,V114,V117~V119,V121~V122,V129
0780032	TRIODE	9014C	V150,V151
0780070	TRIODE	2SA1964E	V133,V135
0780255	TRIODE	2SA940	V133,V135
0780257	TRIODE	KSA940	V133,V135

MATERIAL CODE	MATERIAL NAME	SPECIFICATIONS	LOCATION
0780072	TRIODE	2SC5248E	V132,V134
0780021	TRIODE	2SC2073	V132,V134
0780258	TRIODE	KSC2073	V132,V134
0780138	TRIODE	8050D	V101,V116,V131
0780050	TRIODE	S8050D	V101,V116,V131
0780275	TRIODE	2SD1047C	V112,V127
0780274	TRIODE	2SB817C	V113,V128
0580080	VOLTAGE REGULATOR DIODE	3.3V±5% 1/2W SHAPED 7.5	VD10
0882646	IC	CW7812CS TO-220	N101
0880131	IC	L7812CV GOLD SEALED TO-220	N101
0880380	IC	LM7812 GOLD SEALED TO-220	N101
0881418	IC	UA7812C GOLD SEALED TO - 220	N101
0880381	IC	LM7912CT GOLD SEALED TO-220	N102
0882618	IC	CD1875CZ TO-220	N104
0881102	IC	TDA7265 Multiwatt11	N106
1940003	SOCKET	4P 2.5mm	XS7
1940040	SOCKET	3P 3.96mm	XS5
1940155	SOCKET	9P 3.96mm	XS8
2120280	FLAT CABLE	5P120 2.5 2 SOCKET WITH NEEDLE	XP13
2121677	FLAT CABLE	4P250 2.5 2 PIN,WITH NEEDLE, TOGETHER DIRECTION	XP6
2120499	FLAT CABLE	7P140 2.5 2 SOCKET WITH NEEDLE	XP9
4000516	SELF-TAPPING SCREW	PT 3x12H WHITE NICKEL	DA2050/TDA7265
4000453	SELF-TAPPING SCREW	BT 3x8H WHITE NICKEL	7812
4000462	SELF-TAPPING SCREW	BT 3x6H WHITE NICKEL	7912
3580085	HEAT RADIATION BOARD	15.4x10.7x45 AV220	SRQ1
3580092	HEAT RADIATION BOARD	14x8x16 AV130	7912
3580118	BIG HEAT RADIATION BOARD	261x50x100 AV228	
2300005	FUSE	T6.3AL 250V	FL101,FL102
3870057	FUSE HOLDER	0000000	FL101,FL102
3870631	IC PRESSING PIECE	AV130	TDA7265
3870603	PCB BRACKET	AV130	
5230454	MICA PAD	22x19x0.1	



MATERIAL CODE	MATERIAL NAME	SPECIFICATIONS	LOCATION
5230928	MICA PAD	18×13×0.1	
5231418	MICA PAD	22×22×0.1	
4450012	BOLT PAD	F 3×7.2×0.5	
4490001	SPRING PAD	F 3	
5230395	INSULATED SPACER SET	F 3×6×3	TDA2050
5232281	INSULATED SPACER SET	F 3×6×3.2	TDA7265
5231816	SOFT SPONGE SPACER	60×12×1.5 SINGLE-FACED,SOFT	XP9,XP13
1564254	PCB	4138-2	
6.6 SURFACE CONTROL BOARD			
AV311T(RU) 5448413			
2100003	CONNECTED CORDS	F 0.6 SHAPED 7.5mm	W1~W9
2100006	CONNECTION CORDS	F 0.6 SHAPED 12.5mm	W10~W20
0000122	CARBON FILM RESISTOR	1/6W100O±5% SHAPED 7.5	R116,R119,R120,R122,R106,R121
0000133	CARBON FILM RESISTOR	1/6W4.7K±5% SHAPED 7.5	R108~R111
0000137	CARBON FILM RESISTOR	1/6W10K±5% SHAPED 7.5	R101,R102,R117,R118
0000144	CARBON FILM RESISTOR	1/6W47K±5% SHAPED 7.5	R107
0000608	CARBON FILM RESISTOR	1/2W4.7K±5% SHAPED 12.5	R115
0000588	CARBON FILM RESISTOR	1/2W 47O±5% SHAPED 12.5	R112
0000673	CARBON FILM RESISTOR	1/2W270O±5% SHAPED 12.5	R113
0000124	CARBON FILM RESISTOR	1/6W470O±5% SHAPED 7.5	R103,R104,R105
0010224	METAL OXIDE FILM RESISTOR	1/4W10±5% SHAPED 10	R114
0160193	DIGITAL POTENTIOMETER	EC11P20L20F6.5M7V1S	RP101
0200066	PORCELAINCAPACITOR	50V 221±10% 2.5mm	C102,C103,C104
0200138	PORCELAINCAPACITOR	50V 104±20% 5mm	C101,C106,C115
0200131	PORCELAINCAPACITOR	50V 103±10% 5mm	C110,C111,C112,C114
0260025	CD	CD11 16V47U±20%5×11 2	C105,C109,C113
0260232	CD	CD11 35V47U±20%6×12 2.5	C107
0260233	CD	CD11 35V100U±20%8×12 3.5	C108
0390168	INDUCTOR	100UH±10% 0410 SHAPED 12.5mm	L101
0570004	DIODE	1N4004	VD103
0580026	VOLTAGE REGULATOR DIODE	30V±5% 1W	VD101
0580073	VOLTAGE REGULATOR DIODE	5.1V±5% 1/2W SHAPED 10mm	VD102

MATERIAL CODE	MATERIAL NAME	SPECIFICATIONS	LOCATION
0620040	RADIATION DIODE	3B 4SC WHITE ISSUE BLUE	VD104,VD105

0780026	TRIODE	2N5551	V101
0880275	IC	PT6311 QFP	N101
0881563	IC	S0791GC QFP	N101
0880251	IC	D16311GC QFP	N101
0881409	IC	TP6311Q QFP	N101
0882463	IC	CS16311EN QFP	N101
2110484	LEAD	22# 140mm BLACK,WITH 3 WELD PIECE	XJ/机壳
2121589	FLAT CABLE	5P50 2.5 2 PIN, WITH L NEEDLE/SM HEAD TOGETHER DIRECTION	XP10
2121590	FLAT CABLE	2P340 7.92 1 PIN	
2121673	SOFT FLAT CABLE	9P250 2.5 2 PIN,WITH NEEDLE, TOGETHER DIRECTION	XP15
1200646	DISPLAY SCREEN	HL-D253	VFD101
2360011	IR SENSOR	HS0038A2	N102
1350090	POWER SUPPLY SWITCH	@PS4D-A-062 VDE	
1340003	LIGHT TOUCH RESTORE SWITCH	HORIZONTAL 6x6x1	S101
5230074	SOFT SPONGE SPACER	25x12x5 DOUBLE-FACED,HARD	VFD/PCB
5231493	SOFT SPONGE SPACER	12x10x9 DOUBLE-FACED,HARD	
5233838	PYROCONDENSATION SLEEVE	@F 22 UL	
1564154	PCB	6310T-2	

#### 6.7 POWER BOARD

AV311T(RU)		5448414	
2100003	CONNECTED CORDS	F 0.6 SHAPED 7.5mm	W14,W16,W17,W22
2100004	CONNECTED CORDS	F 0.6 SHAPED 10mm	W7,W8,W10,W11,W1,W2,L102,L103,L104,W13
2100007	CONNECTION CORDS	F 0.6 SHAPEN 15mm	W5,W12,W15,W4,W9,W19
2100008	CONNECTION CORDS	F 0.6 SHAPEN 6mm	W20,W21
2100017	CONNECTED CORDS	F 0.6 SHAPED 20mm	W18,W3,W6
0260067	CD	CD11 50V2.2U±20%5x11 2	C126
0260028	CD	CD11 16V220U±20%6x12 2.5	C113,C114
0260039	CD	CD11 25V47U±20%5x11 2	C115
0260233	CD	CD11 35V100U±20%8x12 3.5	C110
0260572	CD	CD293 63V15000u±20%35x70 10	C108,C109

MATERIAL CODE	MATERIAL NAME	SPECIFICATIONS	LOCATION
0200138	PORCELAINCAPACITOR	50V 104±20% 5mm	C122
0620040	RADIATION DIODE	3B 4SC WHITE ISSUE BLUE	VD104,VD105
0200174	PORCELAINCAPACITOR	50V 103±10% 2.5mm	C121,C112,C123
0210022	TERYLENECAPACITOR	100V 223±5% 5mm	C100,C101,C105,C111
0210029	TERYLENECAPACITOR	100V 104±5% 7mm	C106,C107,C116~C120
0210031	TERYLENECAPACITOR	100V 224±10% 8mm	C103,C104
0210213	TERYLENECAPACITOR	100V 224±5% 8mm	C103,C104
0200378	CERAMIC CAPACITOR	@400VAC 472±10% 10mm VDE	C102
0000129	CARBON FILM RESISTOR	1/6W1K±5% SHAPED 7.5	R102
0000137	CARBON FILM RESISTOR	1/6W10K±5% SHAPED 7.5	R104,R105,R101
0000144	CARBON FILM RESISTOR	1/6W47K±5% SHAPED 7.5	R103
0000146	CARBON FILM RESISTOR	1/6W100K±5% SHAPED 7.5	R107
0000289	CARBON FILM RESISTOR	1/4W4.7K±5% SHAPED 10	R106
0000294	CARBON FILM RESISTOR	1/4W10K±5% SHAPED 10	R109
0000301	CARBON FILM RESISTOR	1/4W47K±5% SHAPED 10	R118~R120
0000302	CARBON FILM RESISTOR	1/4W51K±5% SHAPED 10	R116,R117
0000305	CARBON FILM RESISTOR	1/4W100K±5% SHAPED 10	R108
0000476	CARBON FILM RESISTOR	1/6W56K±5% SHAPED 7.5	R110
0000499	CARBON FILM RESISTOR	1W4.7O±5% SHAPED R 15×9	R111~R115
0000622	CARBON FILM RESISTOR	2W22O±5% SHAPED R 20×8	R100
0410007	INDUCTOR COIL	0.7UH SC-0.8×8.0×11.5	L100,L101
0570004	DIODE	1N4004	VD113
0570006	DIODE	1N4148	VD112,VD108,VD110
0570020	DIODE	1N5404	VD100~VD107
05800069	VOLTAGE REGULATOR DIODE	5.1V±5% 1/2W BELT	VD111
0780032	TRIODE	9014C	V100,V101,V102,V105
0780033	TRIODE	9015C	V103
0780138	TRIODE	8050D	V104
1250025	RELAY	JH1806-012-(3H1 + 1Z1) DC12V	Y100
2120535	FLAT CABLE	4P60 2.5 2 SOCKET WITH NEEDLE	XP7
2121040	FLAT CABLE	9P60 3.96 1 PIN	XP8
1940037	SOCKET	4P 3.96mm	XS4

MATERIAL CODE	MATERIAL NAME	SPECIFICATIONS	LOCATION
1940074	SOCKET	2P 7.92mm	XS1~XS3
2010003	CONNECTION POLE SOCKET	WP4-10A	XL100
2010004	CONNECTION POLE SOCKET	WP6-10A	XL101
0620040	RADIATION DIODE	3B 4SC WHITE ISSUE BLUE	VD104,VD105
2300051	FUSE	@T6.3AL 250V VDE	FL100
2300008	FUSE	T8AL 250V	FL101,FL102
3020402	FUSE HOLDER	BLX-2	FL100
3540076	SCREEN-SHIELDED PIECE	AV100 OUTPUT SOCKET	
3870591	GROUNDING PIECE	AV100	
3870057	FUSE HOLDER		FL101,FL102
5180388	NOT DMETAL OXIDE FILM RESISTOR GLUE LABELL	T6.3AL250V 18×3	AL250V
5180263	NOT DMETAL OXIDE FILM RESISTOR GLUE LABELL	T8AL 250V	FL101,FL102
1564105	PCB	@5100-5 CQC	
6.8 MICROPHONE HOLDER BOARD			
AV311T(RU) 5448415			
0882398	IC	LM4880M SOP	N100
0260019	CD	CD11 16V10U±20%5×11 2	C103,C104,C105
0260027	CD	CD11 16V100U±20%6×12 2.5	C102
0260214	CD	CD11 16V330U±20%8×12 3.5	C106,C107
0200077	PORCELAINCAPACITOR	50V 102±10% 2.5mm	C110,C111
0200138	PORCELAINCAPACITOR	50V 104±20% 5mm	C108,C109
0200174	PORCELAINCAPACITOR	50V 103±10% 2.5mm	C100,C101
0000133	CARBON FILM RESISTOR	1/6W4.7K±5% SHAPED 7.5	R103,R104,R100,R105
0000137	CARBON FILM RESISTOR	1/6W10K±5% SHAPED 7.5	R107,R108,R106
0000144	CARBON FILM RESISTOR	1/6W47K±5% SHAPED 7.5	R101,R102,R109,R110,R111
0390168	INDUCTOR	100UH±10% 0410 SHAPED 12.5mm	L101
2110484	LEAD	22# 140mm BLACK,WITHf 3 WELD PIECE	XJ1/机壳
2121672	FLAT CABLE	8P170 2.5 2 PIN,WITH NEEDLE, TOGETHER DIRECTION	XP14
0780050	TRIODE	S8050D	V101
1980006	MICROPHONE SOCKET	CK3-6.35-106	X100
1980030	MICROPHONE SOCKET	CK3-6.35-19	MIC
1563524	PCB	9310T-0	

MATERIAL CODE	MATERIAL NAME	SPECIFICATIONS	LOCATION
6.9 VIDEO FREQUENCY BOARD			
AV311T(RU) 5448416			
2100003	CONNECTED CORDS	F 0.6 SHAPED 7.5mm	W1,W2,W3,W4,W5,W6,W9,W12
2100006	CONNECTION CORDS	F 0.6 SHAPED 12.5mm	W7,W11
2100007	CONNECTION CORDS	F 0.6 SHAPEN 15mm	W8
2100010	CONNECTED CORDS	F 0.6 SHAPED 5mm	W10
0260019	CD	CD11 16V10U±20%5×11 2	TC101,TC102,TC105
0260028	CD	CD11 16V220U±20%6×12 2.5	TC100,TC103,TC104
0260163	CD	CD11 50V47U±20%6×12 2.5	C101,C103
0881429	IC	CD4052BE DIP	N100,N101
0880443	IC	CD4052BCN DIP	N100,N101
0780043	TRIODE	2SA1015	V100,V101,V102
0780138	TRIODE	8050D	V103
0780050	TRIODE	S8050D	V103
0780049	TRIODE	S8550D	V104
0580047	VOLTAGE REGULATOR DIODE	7.5V±5% 1/2W	VD100, VD101
0000137	CARBON FILM RESISTOR	1/6W10K±5% SHAPED 7.5	R100,R104,R111,R112,R114,R115,R116 ,R118
0000132	CARBON FILM RESISTOR	1/6W2.2K±5% SHAPED 7.5	R105,R106
0000599	CARBON FILM RESISTOR	1/6W10±5% SHAPED 7.5	R119,R120
0000122	CARBON FILM RESISTOR	1/6W1000±5% SHAPED 7.5	R101,R102,R103,R107,R108,R109,R110 ,R113,R117
0210147	TERYLENECAPACITOR	100V 473±10% 5mm	C100,C102
0210025	TERYLENECAPACITOR	100V 473±5% 6mm	C100,C102
1940001	SOCKET	2P 2.5mm	X100
1940002	SOCKET	3P 2.5mm	XS100
1910239	TERMINAL SOCKET	AV3-8.4-14/ES-10	XC100
1910240	TERMINAL SOCKET	DSW-10-3A	XL100
1564307	PCB	7310T-2	
6.10 REMOTE CONEROLLER			
AV311T(RU) 5471645			
0880220	IC	PT2222 SOP	N800
0000599	CARBON FILM RESISTOR	1/6W10±5% SHAPED 7.5	R800

MATERIAL CODE	MATERIAL NAME	SPECIFICATIONS	LOCATION
0200062	PORCELAINCAPACITOR	50V 151±10% 2.5mm	C801,C802
0630003	EMISSION PIPE	TSAL6200	LED800
0570006	DIODE	1N4148	VD800~VD802
0780138	TRIODE	8050D	V800
0970003	CERAMIC RESONATOR	455E	G800
4000258	SELF-TAPPING SCREW	BB 2.3x8 BLACK	
4630958	CONDUCT GLUE OF REMOTE CONTROL	AV310T(RU)-2	
5070698	GLUE BAG FOR ENVIRONMENTAL PROTECTION (WITHOUT HOLE)	90x255x0.05 PE	
5154818	BOTTOMCASING LABELL	AV310T(RU)	
5156243	SURFACE STICKER OF REMOTE CONTROL	AV311T(RU)	
1561893	PCB	8213-0	
6.11 PANEL UNITS			
AV311T(RU) 5462353			
3003076	PANEL	AV138 IRON GREY	
3029795	DECORATIVE BOARD ( MIDDLE )	AV310T(RU) SILVER WHITE,BRONZING	
3072239	DECORATIVE BOARD(RIGHT)	AV311T(RU) IRON GREY	
3072001	DECORATIVE BOARD(LEFT)	AV311T(RU) IRON GREY	
3060396	PLASTIC DECORATIVE LOOP	AV138 SILVER WHITE	
3072240	FILTER	AV310T ( RU ) LENS COVER	
3029208	GUIDING LIGHT RING	AV138 TRANSPARENCE	
3024848	BIG KNOB	AV227 SILVER WHITE	
3029205	POWER BUTTON	AV138	
3029206	SELECT PRESS-BUTTON	AV138	
3110381	SELECT BUTTON SET	AV138 SILVER WHITE	
3110380	POWER BUTTON DECORATE SET	AV138 SILVER WHITE	
5231765	DOUBLE-FACED GLUE	3M LENGTH:50m WIDTH:10mm	
5233841	3M DOUBLE-FACE GLUE	Y-9448 105x22x0.15	
5233014	DOUBLE-FACED GLUE LABELL	30x12x0.15 3M-Y9448	
3871295	MICROPHONE PRESSING PIECE	AV310T(RU) T=0.8	
4000048	SELF-TAPPING SCREW	PB 3x8 COLOR ZINC	

MATERIAL CODE	MATERIAL NAME	SPECIFICATIONS	LOCATION
4000120	SELF-TAPPING SCREW	PB 3x10 COLOR ZINC	
4400028	NUT OF POTENTIOMETER	M7	
5448413	PCB SEMI-FINISHED PRODUCT	6310T-2 AV311T(RU)	
5448415	PCB SEMI-FINISHED PRODUCT	9310T-0 AV311T(RU)	
6.12 PROGRAM CPU			
AV311T(RU) 0890284			
0881591	IC	SM8958AC25P DIP	N116
5156402	SIGN STICKER	CPU311TRU-0	
6.13 SN LABEL			
AV311T(RU) 5142076			
5142067	SN LABEL	RUSSIA WITHOUT BAR CODE NUMBER	
6.14 SUPPLEMENT MODULE			
2100002	CONNECTION CORDS	F 0.6	
5110002	ELECTRO WELDING WIRE	F 1.0	
5110018	ELECTRO WELDING WIRE	f 2.0	
5110004	ADHESIVE TAPE		
5110003	ELECTRO WELDING WIRE		
5120096	PEANUT OIL		
5120001	THINNER		
5120004	SOLDERING FLUX		
5120013	YELLOW GLUEWATER		
5120007	BLACK GLUE	3M4799#	
5120011	WIPING WATER		
5120012	RED GLUEWATER		
5120332	SILICONE GREASE HEAT CONDUCT OIL	GB-304	
5120067	GLUEWATER	502	
5230021	SCOTCH TAPE	12mm	
5230022	SEALING PAPER	COLORLESS	
5230020	MASKING PAPER	24mm	
5231514	HIGH TEMPERATURE MASKING PAPER	LENGTH:15 YARD WIDTH:20mm	
5231454	HIGH TEMPERATURE MASKING PAPER	LENGTH:15 YARD WIDTH:6mm	
5231455	HIGH TEMPERATURE MASKING PAPER	LENGTH:15 YARD WIDTH:12mm	

MATERIAL CODE	MATERIAL NAME	SPECIFICATIONS	LOCATION
5231456	HIGH TEMPERATURE MASKING PAPER	LENGTH:15 YARD WIDTH:24mm	
5180452	QA ENVELOPCASE STICKER	QA PASS 110x45	