

***IBB*K**

DL377SI

service manual



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Chapter One About Maintenance

1.1 Safety precautions

1.1.1 Power Safety Warning

Voltage of Portable DVD is safe low voltage, but there is 220V AC high voltage on Power Adapter, it can cause damage to body ! Maintenance personnel should take extra care.

1.1.2 Precautions for antistatic

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

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

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

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

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

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

1.1.3 Precautions for display screen

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

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

1.1.4 Precautions for laser head

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

1.1.5 About placement position

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

1.2 Maintenance method

1.2.1 Electric resistance method

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

1.2.2 Voltage method

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

1.2.3 Current method

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

1.2.4 Element substitution method

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

1.2.5 Cutting method

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

1.2.6 Visualized method

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

1.2.7 Comparison method

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

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

1.3 Required device for maintenance

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

Chapter Two

Functions and Operation Instructions

2.1 Features

This portable DVD player has a color large-format TFT LCD and the newest decoding processor, and due to this fact enables you to enjoy high-quality picture and sound. The reading discs mechanism has the latest error protection, so it can work in difficult conditions of shaking and vibration.

Compatible Disc Types:

#Digital video playback: DVD-Video, Super VCD, VCD compatibility

#MPEG-4 standard support: compatibility with Divx3.11, Divx4, Divx5, Divx Pro, XviD compressed video files

#Digital audio playback: CD-DA and HDCD compatibility

#Fully compatible with compressed audio files such as Mp3 and WMA

#Digital graphic albums playback: Kodak Picture CD, JPEG compatibility

Video:

#Color TFT LCD

#Composite video output for TV connection

#Composite video inputs for external signal source

Audio:

#Stereo signal input for external signal connection

#Digital decoders, providing Dolby Digital/DTS audio stream playing

#Built-in stereo audio system

#Headphones output

Storage battery

Working time	MP3 playback (closed lid)	DL370SI	DL372SI	DL375SI	DL377SI	DL385SI	DL387SI	DL3103SI
		5h.	5h.	6h.	4h.	6h.	4h.	5h.
	MP3+JPEG playback	2.5h.	2.5h.	3h.	2h.	4h.	2h.	2.5h.
	DVD playback	3h.	3h.	3.5h.	2.5h.	4.5h.	2.5h.	3h.

Others:

#Compatible disc types: CD-R/CD-RW, DVD-R/DVD-RW, DVD+R/DVD+RW

#Russia, CIS and Baltic States adaptation interface and filenames, ID3-tags and CD-Text support simplifies device operation

#"Memory" function enables to save the last point after stop playback

#"Source" function enables to select video signal source

#"Q-Play" function provides direct playback and allows to skip commercial that is not possible to rewind

#"Virtual Keyboard" function provides more convenient DVD playback control

#"Browser" function provides easy access to playback control

#Parental control function to protect children from watching inappropriate discs

#Large capacity battery enables to watch movies outdoors

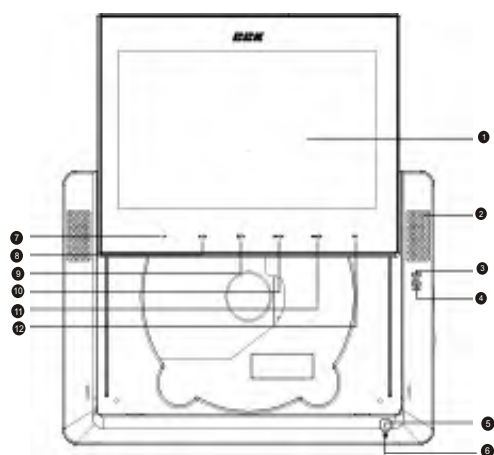
#Electrical connector for external equipment(5V)

#Modern shaking and vibration protection technology

#Good transportation bag

2.2 Set list

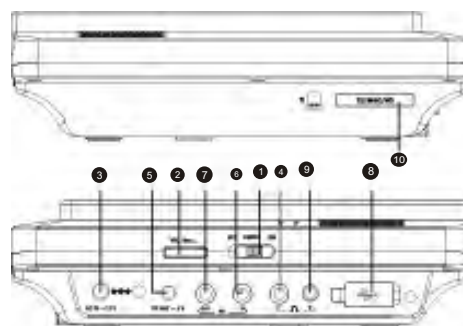
Portable DVD player.....	1pcs
Battery	1pcs
Charger/adaptor	1pcs
Adapter cable	1pcs
Auto charger/adaptor	1pcs
AV cable	1pcs
Remote control	1pcs
Batteries for remote control(AAA size)	2pcs
Transportation bag	1pcs
Headrest bracket	1pcs
Soft cover bag	1pcs
Warranty card	1pcs
User manual	1pcs
Headphones	1pcs
Screw for headrest bracket	4pcs



- ❶ TFT LCD
- ❷ Built-in loud-speaker
- ❸ DVD mode indicator
- ❹ AV mode indicator
- ❺ Sensor of infrared beams
- ❻ Operation mode indicator
- ❼ PLAY/SELECT button
Press to playback/confirm selection
- ❽ STOP/UP button
- ❾ PAUSE/DOWN button
- ❿ PREV/LEFT button
Press to play from previous mark/left.
- ⓫ NEXT/RIGHT button
Press to play next/right.

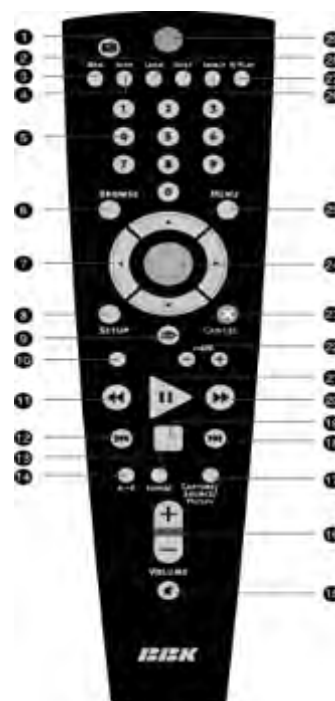
❿ M button(for DL377SI)

Press to switch DVD players menu.



- ❶ Power button
Press to switch off the player.
- ❷ VOLUME adjuster
- ❸ Power socket
- ❹ Headphones output-1
- ❺ External devices socket
- ❻ AV IN
- ❼ AV OUT
- ❽ USB-port
- ❾ Headphones output-2
- ❿ SD/MMC/MS

2.3 Remote control general view



1 Screensaver button

Activation of screensaver function.

2 LANG button

Press to change language.

3 MEM button

Press to memorize the point where playback was stopped/playback from the previously memorized point.

4 DISP button

Press to display the disc information.

5 Numeric buttons

6 BROWSE button

Press to turn on/off the browser function.

7 CURSOR buttons

8 SETUP button

Press to switch to setup mode.

**9 Button **

Press to turn on/off the virtual control panel.

10 /SOURCE button

 Button(for all models except DL387SI)

Press to change image setting.

SOURCE button (for DL387SI)

Press to change DVD/USB/CARD READER mode.

**11 Button **

Press to start rewind/rewind scanning.

**12 Button **

Press to skip backward.

13 REPEAT button

Press to repeat playback.

14 A-B button

Press to repeat the selected portion.

**15 Button **

Press to turn on/off the sound.

16 VOLUME+/- button

Press to adjust the volume.

17 CAPTURE/SOURCE/PICTURE button

CAPTURE button (for DL370SI,DL372SI)

Press to save picture as a screensaver.

SOURCE button(DL375SI,DL385SI, DL3103SI)

Press to change DVD/USB/CARD READER mode.

PICTURE button (DL377SI,DL387SI)

Press to change picture mode.

**18 Button **

Press to skip forward.

**19 Button **

Press to stop the playback.

**20 Button **

Press to start forward/forward scanning.

**21 Button **

Press to normal playback/pause.

22 ZOOM+/- button

Press to zoom in/out.

23 CANCEL button

Press to go one level back/cancel current operation.

24 OK button

25 MENU button

DVD disc menu/PBC function.

26 ANGEL button

Press to change the camera angel.

27 Q-PLAY button

Press to turn the Q-Play mode on.

28 SUBT button

Press to change the subtitles language.

29 / Button

Button  (for

DL370SI,DL372SI,DL385SI,DL3103SI)

Press to switch into standby.

Button  (for DL375SI,DL387SI)

Press to switch the device on.

2.4 FUNCTION SETTINGS

2.4.1 Function selection and change

#Press the SETUP button to show the setup menu. You will see the following image on the screen, as shown on the figure:

#Select the desired menu item using the UP/DOWN buttons; press the OK button for confirmation.



1. For example, if you wish to change the image settings, You have to select the image item and press the OK or RIGHT key.
2. Using the UP/DOWN buttons, select the desired item and press OK or RIGHT button. For example, select the TV format item. Settings will appear on the screen. Then select the desired TV 16:9 and press OK for confirmation.



3. Press LEFT for exit to previous menu level.
4. Press SETUP to exit setup menu.

2.4.2 Language settings

1. Menu: interface language set-up

#Options: Russian, English, Ukrainian, Romanian.

#Default option: Russian.



2. DVD menu: selection of disc menu language
 3. Sound: selection of translation language
- #Disc menu/translation language options: Russian, English, Estonian, Lithuanian, Kazakh, Romanian, Belarusian, Ukrainian, Chinese.

#Default menu/translation language option: English.

#Selection of other languages: select the OTHERS item using the wheel and press OK. Enter the language code using the numeric buttons and press OK.

#If the language you selected is not recorded on the DVD disc, another available language will be used.

4. 5. DVD/MP4 Subtitles: selection of subtitles language

#Options: Off, Russian, English, Estonian, Lithuanian, Kazakh, Romanian, Belarusian, Ukrainian, and Chinese.

#Default option: Off.

#Selection of other languages: select the OTHERS item using the wheel and press OK. Enter the language code using numeric buttons and press OK.

#If the language you selected is not recorded on the DVD/MP4 disc, another available language will be displayed.

2.4.3 Sound settings menu

1. Mixer

a) Configuration: setting of the mode for conversion

Of L+R to L or R.

#Options: L+R, R, L.



2. Tuning

A) Max volume: max volume limiting

#Using the cursor buttons, adjust the max volume level.

#Press the LEFT key to return to sound correction set-up menu.

B) Equalizer: equalizer modes

#Options: Off, rock, pop, live dance, techno, classics, soft.

#Default option: Off.

C) Echo: echo effects

#Options: Off, concert, living room, hall, bathroom, cave, arena, church.

#Default option: Off.

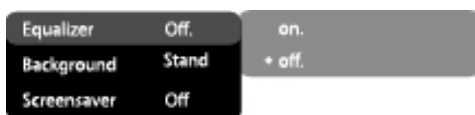
- D)Tone balance: adjustment of tone balance level.
 #Adjust the tone balance level using the cursor buttons.
 #Press the LEFT button to return to sound correction set-up menu.

2.4.4 Playback settings



- 1.DVD
 Advertisement skip: skip the unskippable block while playing a DVD disc.
 #Options: Yes, No.
 #Default option: No.
- 2.VCD/SVCD
 PBS menu: PBS menu on/off
 #Options: On, Off.
 #Default option: On.
 #If On option is set , while reproducing discs, a menu will appear, in which you can select the order of playing the disc content. If the Off option is set, the reproducing of content is performed in the order, in which it is recorded on the disc.
- 3.Files: selection of reproduced files on the disc
 #Options: Audio, Pictures, Video.
 #Default option: A. P. V
- 4.Repeat: file repeat mode
 #Options: Off, Single, All.
 #Default option: Off.

2.4.5 Preference settings



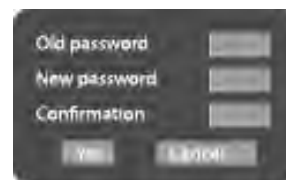
- 1.Equalizer: spectrum analyzer
 #Options: On, Off.
 #Default option: Off.
- 2.Screensaver: screen saver on/off
 #Options: On, Off.
 #Default option: On.

2.4.6 Family filter settings

- 1.Category: set-up of age restrictions to prevent children from seeing undesirable discs.
 #Options: Any, Kid, G, PG, PG-13, PGR, R, NC-17
 #Default option: Any.

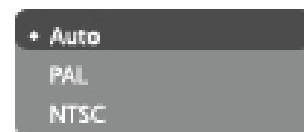


- 2.Change password: set-up of a four-digit password to change the level of age restrictions.
 Default option:7890.



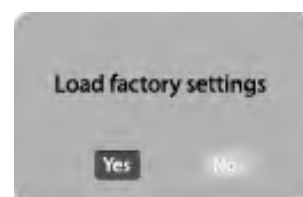
2.4.7 Initial settings menu

- #Press the RIGHT key to enter the initial settings menu, then select the desired item using the cursor buttons and press OK key for confirmation.
- #While being in this menu section, you cannot return to the previous level by pressing the LEFT key.



2.4.8 Reset settings to default

- #Resetting all settings and restoring default options, except age restrictions level and password.



2.4.9 Exit settings menu

#Select the exit item using the UPP/DOWN buttons and press the OK key to exit the menu.



2.5 OTHERS

2.5.1 Useful notes

- #To extend the service life of your DVD player make pauses of not less than 30 seconds between switching off and repeatedly switching on the DVD player.
- #Disconnect the DVD player from the wall outlet after shutdown.
- #Some DVD player's functions may not be applied to some discs.
- #Use supply sources of rated voltage, otherwise the DVD player may not function or be damaged.
- #In case of the DVD player's occasional stops, please switch the power supply off and then on again.

2.5.2 Trouble shooting

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

Sign of trouble	Cause of trouble	Actions to eliminate the trouble
No sound	1.Poor audio cable connection. 2.Disc dirty or damaged. 3.Sound disabled by the MUTE button.	1.Make proper connection. 2.Clean the disc. 3.Press the MUTE button.
No image	1.Poor video cable connection.	1.Make proper connection.
Black and white image	1.Color level adjusted incorrectly.	1.Readjust the color system.
Discs cannot be read	1.Disc not inserted. 2.Disc inserted incorrectly. 3.Condensate on the DVD player's laser head.	1.Insert the disc. 2.Install the disc with the label side facing up. 3.Switch the DVD player on without disc for an hour.
Remote control does not operate	1.Remote control is incorrectly directed at the DVD player's screen. 2.Distance to the DVD player is in excess of 8 meters. 3.Run out batteries.	1.Use the remote control according to the manual. 2.Decrease the distance to the DVD player. 3.Replace both batteries.
Some functions do not work	1.Disc is recorded incorrectly. 2.Incorrect key sequence. 3.Static voltage on the DVD player's housing.	1.Wait 5-10 seconds and the DVD player will automatically return to normal state. 2.Repeat the operation one more time. 3.Switch the DVD player off for 1-2 minutes and the
Image fault	1.Battery charge is consumed.	1.Charge your battery or connect adapter.
Errors in normal disc playback	1.Defective disc. 2.Wrong button is pressed. 3.Static discharge.	1.Check the disc. 2.Press the right button. 3.Switch off the player for 1-2 minutes.

2.5.3 Technical characteristics

		DL370SI	DL372SI	DL375SI	DL377SI	DL385SI	DL387SI	DL3103SI
Disc types	DVD-Video, DivX3.11, DivX4, DivX5, DivX Pro, XviD, Super VCS, VCD 1.0, 2.0, CD-DA, HDCD, MP3, WMA, Kodak Picture CD, JPEG							
Medium types	CD-R, CD-RW, DVD-R, DVD+R, DVD-RW, DVD+RW							
	SD, MMC, MS Cards	-	-	+	+	+	+	+
Outputs	Headphone output	1	2	2	2	2	2	2
	Analogue stereophonic audio output	-	+	+	+	+	+	+
	Optical digital audio output	-	-	-	-	+	-	-
	Composite video outputs	-	+	+	+	+	+	+
	S-Video output	-	-	-	-	+	-	+
	Coaxial digital audio output	-	-	+	-	-	+	+
Inputs	Stereo audio input	1						
	Composite video input	1						
Video characteristics	Video amplitude	1.0Vp-p(75H)						
	Amplitude of video signal no S-Video output	Y:1.0Vp-p(75H) C:0,286 Vp-p(75H)						
Audio characteristics	Frequency	20-20000 Hz(1 db)						
	Signal-to-noise Ratio	>100 db						
	Total harmonic distortion	< 0.01%						
General Specifications	TFT color display	7"	7"	7"	7"	8"	8"	10"
		~100-250; 50/60	~100-250; 50/60	~100-250; 50/60	~100-250; 50/60	~100-250; 50/60	~100-250; 50/60	~100-250; 50/60
	Power supply							
	Power consumption, w	12	16	16	13	16	15	37
	Dimensions, mm	205*149*39.5	190*163*38.2	219*151.2*29.6	220*149*41.7	220*166*28	245.5*167.8*30.7	266*183*28
	Mass, kg	0.735	0.835	0.759	0.775	0.877	0.88	1.2
Operating temperature	5-35°C							
Operating Humidity	15-75%(no condensation)							

#Specifications are subject to change without notice.

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

Chapter Three Principle and Servicing

Section One Principle of the Player

3.1.1 Block diagram of the player

DL377SI is composed of decode circuit, servo circuit, audio circuit, video circuit, MIC circuit and power circuit. Block diagram is shown as in the following figure 3.1.1.1:

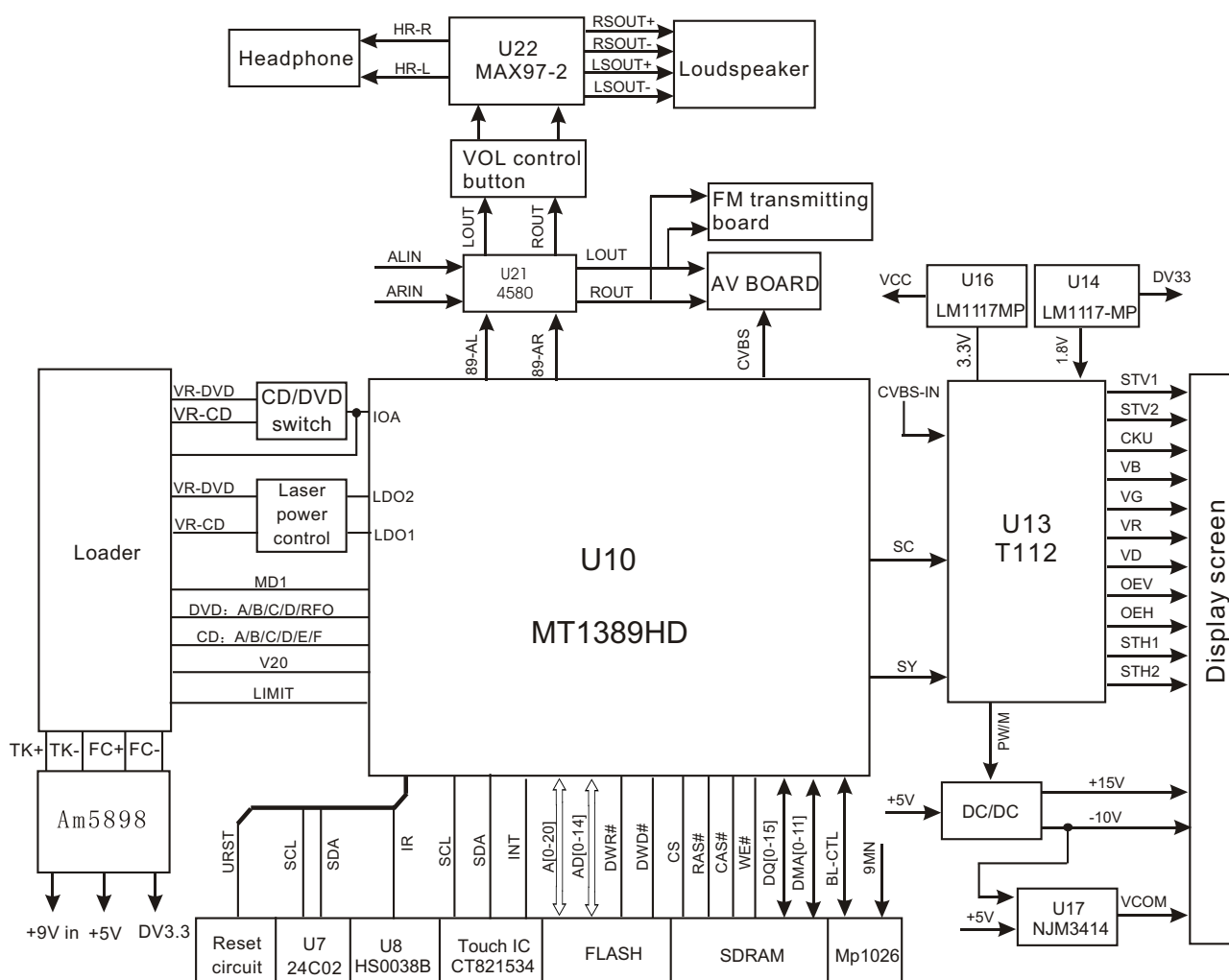


Figure 3.1.1.1 DV522SI-2 block diagram

3.1.2 Function introduction to IC of the player

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

PCB semi-finished product name	IC model	Location	Function
Decode board 2DL339-4	U7	24C02N	EEPROM
	U8	HS0038B3V	Receiver
	U9	LM393	Battery electrical charge detect (operational amplifier)
	U10	MT1389FE/HD	Decode chip
	U11	HY57V641620HGT	64M SDRAM
	U12	29LV160BE	16M FLASH
	U13	T112	Video coding, LCD drive
	U14, U15	LM1117MP-ADJ	Voltage regulating
	U16	AMS1117-3.3	Voltage regulating
	U17	NJM3414AM	VCOM signal amplifying
	U18	AM5898N	Servo drive, DC-DC control
	U21	NJM4558	Audio amplifying (operational amplifier)
	U22	MAX9702	Headphone amplifying
	U23	AZ2940	Voltage regulating
FM transmit board FDL339-4	U3	BH1417FV	FM modulation
Main panel 4DL339A-1	U1	CY8C21534-PVXI	Touch-button control
charging board BDL339-2	U603	AZ431	Three-end adjustable distributary reference source
	U604	S3F9454	8-bit single chip, charge control
	U605	LM358M	operational amplifier
	U606	S8241AAAMC	Battery protection
Power Adapter	IC1	TOP246Y	Power Switch
	IC2	HS817	Photoelectric coupler
	IC3	AZ431	Three-end adjustable distributary reference source
telecontroller	U801	PT2222A	Buttons coding control

Section Two Unit Circuit Principle

3.2.1 Servo processing circuit

1. DL377SI adopts SANYO 62 loader and MTK decode solution (MT1389+FLASH (16M)+SDRAM (64M)). The servo circuit is composed of front end signal processing, digital signal processing IC MT1389 and drive circuit Am5898, in which MT1389 is also the main composition of decode circuit. Servo processing circuit block diagram is shown as in the following figure 3.2.1.1:

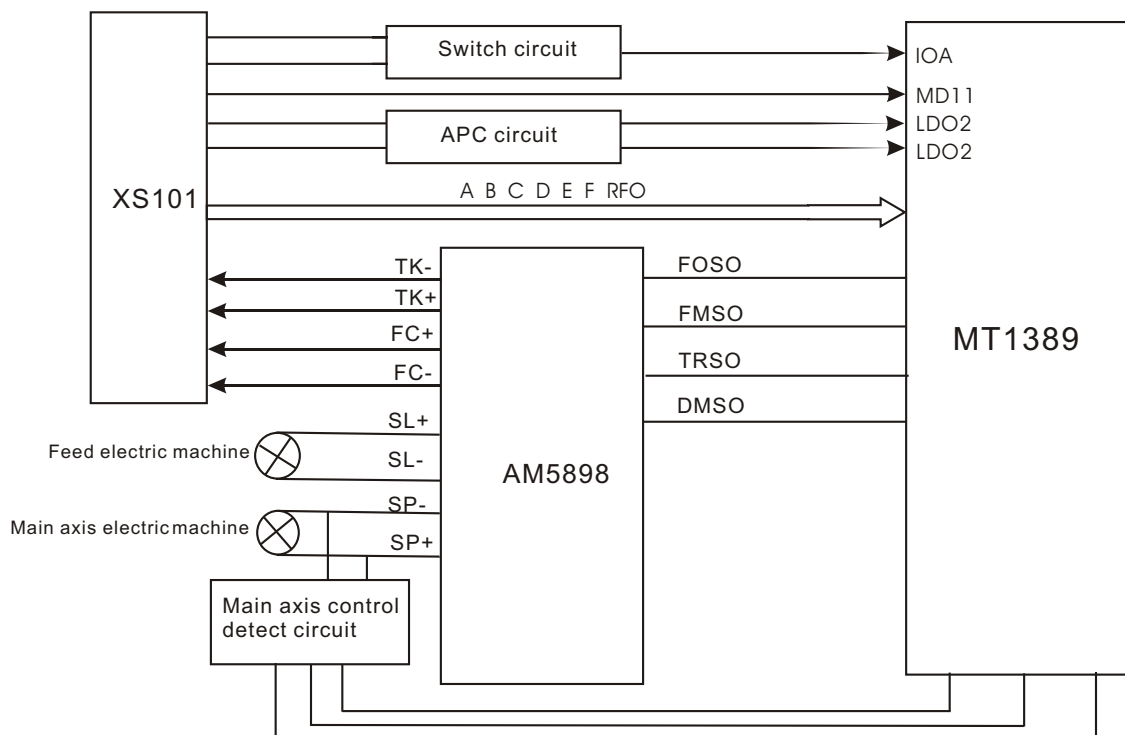


Figure 3.2.2.1 Servo processing circuit block diagram

2. Working principle: after power on and door closes (door switch is detected by the spring switch SW2 on volume knob and indicator light board), loader laser head begins to reset, focus and main axis begin to rotate, laser head begins to identify disc information to judge the disc is CD or DVD to facilitate to make the corresponding acts. At the same time, MT1389 also adjusts laser output power through

Laser power control circuit. When loader reads disc information, after photoelectric conversion, A, B, C, D, E, F signals are formed to give to MT1389 (DVD has A, B, C, D signals only) and Therefore signal and the input from pin 2~11, 18, 19 of MT1389. After MT1389 internal pre-amplifying processing, now signal are divided into two parts inside MT1389:

After being processed by digital servo signal circuit inside MT1389, one part of signal form corresponding servo control signals and output FOO, TRO, DMO, FMO digital servo control signals from pin 42, pin 41, pin 37, pin 38 of Mt1389 respectively, then change into analog servo control signal FOSO, TRSO, DMSO, FMSO through integration circuit composed by resistor capacitor, and send to driver circuit D5898 for amplification to bring along focus coil, trace coil, main axis electric machine and feed electric machine after drive amplification. Among these, focus and trace servo are used to correct objective position accurately; feed servo is used to bring along laser head to make radial large-scale move which belongs to the preliminary adjustment to pick-up position; and main axis servo is used to control main axis electric machine to make it read signals in means of constant linear velocity and bring along disc to rotate. After processing of amplification by VGA voltage control amplifier and equalization frequency compensation inside MT1389, another part of signals are changed into digital signals through internal A/D converter. When loader is reading CD/VCD signals, these signals are conducted EFM demodulation inside MT1389, after CIRC (Cross-Interleaved Reed-Solomon Code) error correction is finished inside, it outputs to rear state for audio/video decoding; when loader is reading DVD signals, these signals are conducted ESM demodulation inside MT1389, and then sent to latter stage for decoding after finishing RSPC error correction inside. Compared with general DVD players, this machine has no disc in/out circuit and manual opening method is adopted. When pin 52 of MT1389E is high level, system recognises that the door has been opened, when it is low level, the machine recognizes that the door has been closed.

3. Loader signals introduction is shown as follows:

Pin	Name	Signal flow direction	DVD disc	CD disc	No disc	Function description
1	F-	Input loader	2.52	2.34	0.46	Focus error signal is added to two sides of pick-up focus coil
2	F+	Input loader	2.49	2.49	0.93	
3	T+	Input loader	2.53	2.51	0.94	Trace error signal is added to two sides of pick-up trace coil
4	T-	Input loader	2.58	2.51	0.93	
5	C	Input MT1389	2.2	2.25	2.04	Disc data signal
6	D	Input MT1389	2.2	3.2	2.04	Disc data signal
7	IOA	Input MT1389	0.01	3.2	3.21	Disc identification signal, CD is 3.3V, DVD is 0V
8	RF	Input MT1389	2.21	2.53	1.28	The sum of disc data signal
9	A	Input MT1389	2.17	2.22	2.04	Disc data signal

2. Working principle: after disc is loaded in machine, IOA port is defaulted high level to make Vd7 saturation on and form loop with CD laser power control circuit on loader, at the same time IOA also reaches loader PD IC for switch, disc begins to rotate; when servo processing system recognises that The disc inside machine is not CD, IQA pin outputs low level to make Vd7 cut off, Vd6 on and form loop with DVD laser power control circuit on loader to carry out the action of reading DVD disc. After door is opened, IOA still keeps the state before door is opened. If machine cannot recognises which the disc is , IQA pin will switch always until no disc is read out or judged by system.

Note: VD6, Vd7 are MOS pipes (pressure drop is small when saturation on).

3.2.3 Laser power control circuit

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

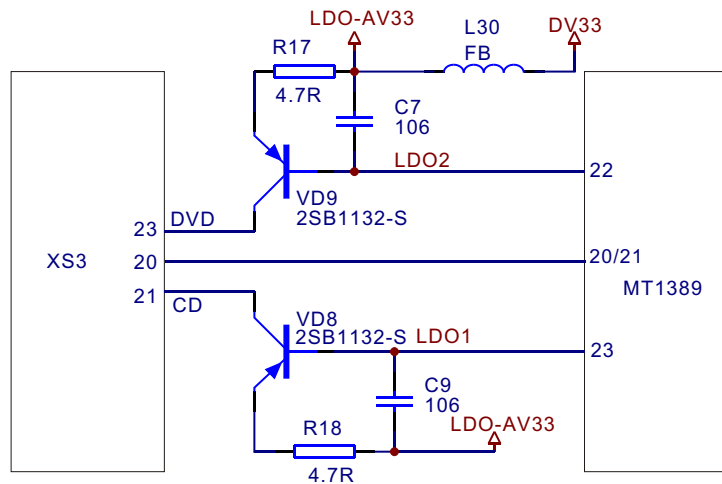


Figure 3.2.3.1 Laser power control circuit diagram

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

When reading VCD disc, laser power becomes weak, voltage of MDII pin decreases; when voltage of MT1389 decreases, voltage of pin 19 of XS3 increases to reach the function of boost laser power; when laser power is too strong, voltage of MDI pin increases to make voltage of MT1389 increase and voltage of pin 19 of Xs3 decrease to reach the purpose of lowering laser power to form a automatic power control circuit. When reading DVD disc, pin 21 is detect signal input pin, pin 22 is drive control output pin and the working principle is the same with that when playing VCD disc.

3.2.4 Main axis control circuit

1. Main axis control circuit is shown as in the following figure 3.2.4.1:

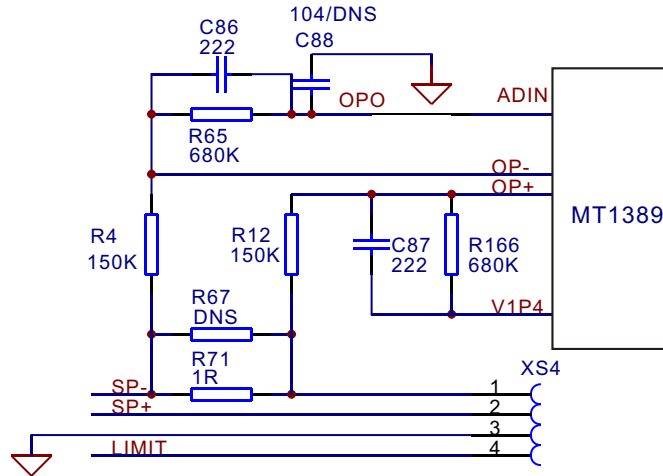


Figure 3.2.4.1 Main axis control circuit diagram

2. Working principle: MT1389 has a comparator composed of operational amplifier inside. When door is opened, disc is always rotating, so a braking signal is required to make main axis electric machine stop rotating immediately to realize the purpose that disc can stop rotating during a short period after door is opened. In the course of playing, if “OPEN” button is pressed, main axis drive signal disappears, but main axis electric machine is still in rotating state because of inertia function. The induced voltage achieved by induced electromotive force produced by electric machine running on sampling resistor R67, R71, after sampling through resistor R3, R12, input to pin 35, 36 of MT1389, and output from pin 34 after Mt1389 amplifying processing inside, after D/A conversion and relevant processing inside Mt1389, an instant electric machine reverse braking signal is outputted to make main axis electric machine speed down. This machine is manual open/close means, so disc is still rotating after door is opened but it will stop very soon.

3.2.5 DC-DC switch circuit

1. DC-DC switch circuit is shown as in the following figure 3.2.5.1:

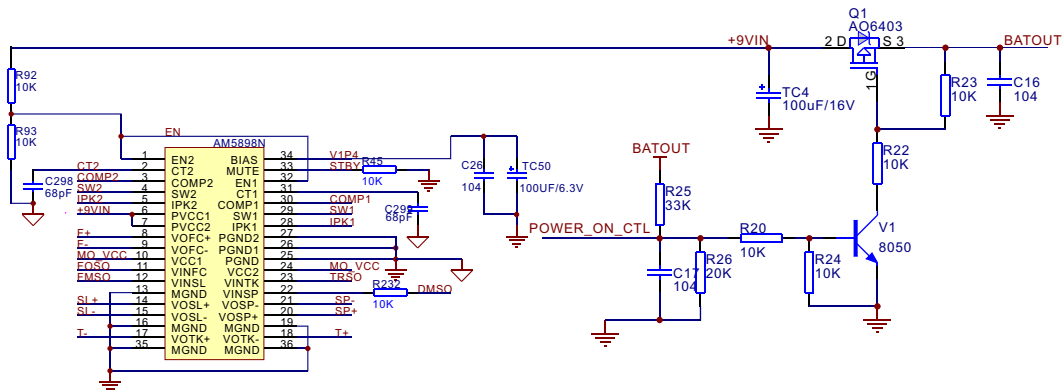


Figure 3.2.5.1 Power on/off circuit schematic diagram

2. Working principle: as shown in the figure 3.2.5.1, when machine power off, MOS tube Q1 cuts off, the player has no +9VIN input, EN1 and EN2 of AM5898 are low level, DC-DC circuit does not function. When power switch SW1 closes, POWER_ON_CTL pulls down to ground and it is low level, triode V1 cuts off, MOS tube Q1 is connected, +9VIN begins to supply power, EN1 and EN2 of AM5898 are high level, DC-DC circuit begins to work. Take +5V as an example to make explanation to circuit voltage stabilizing, shown in the figure 3.2.5.2:

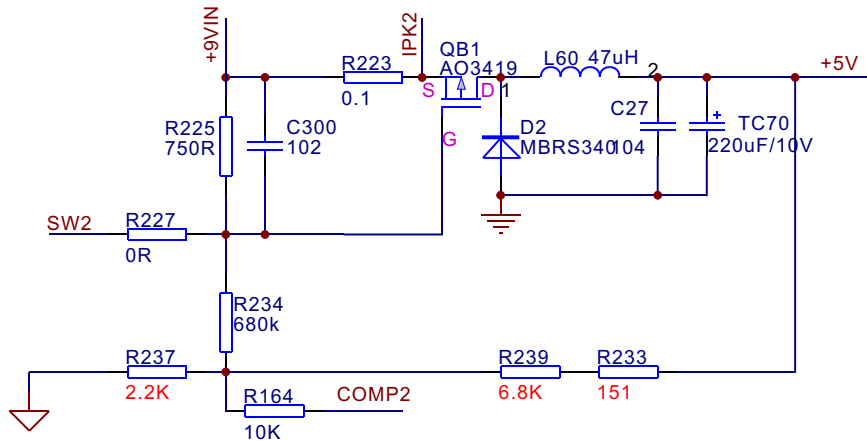


Figure 3.2.5.2 DC-DC switch circuit

DC-DC circuit begins to oscillate and its working frequency is 240khz and pin SW2 outputs switch signals. When QB1 grid electrode is high level, MOS tube is connected, +9V power reaches L60 through MOS tube, TC70 saves energy of inductor and charge capacitor, D2 is freewheeling diode. When MOS tube cuts off, L60 discharges energy and its inductance electromotive force makes diode on, at the same time TC70 discharges load and its current direction keeps unchanged to form a serial switch voltage stabilizing circuit. When output voltage is high, there is the following change: +5V increases, COMP2 increases, SW2 switch frequency becomes low, +5V decreases. When voltage is low, the process is contrary to that of increase. R223 is over-current protection circuit sampling resistor (DV33 circuit principle is the same with that of +5V)

3. Relationship of each pin of AM5898

AM5898 has built-in DC— DC power manager and cooperates with peripheral circuit to supply voltage required by load. This circuit is with over-voltage, over-current and stabilizing protection function, in which AM5898 is also with servo drive function which has been introduced in servo circuit. Relationship of each pin of Am5898 is shown in the following table:

Truth table (○ : active × : inactive — : don' t care)

MUTE	EN1	EN2	MOTOR CHANNEL	DC-DCCTRL1	DC-DCCTRL2
H	—	—	○	—	—
—	H	—	—	○	—
—	—	H	—	—	○
L	L	L	×	×	×

3.2.6 Battery voltage detecting circuit

1. Battery voltage detecting circuit is shown as in the following figure 3.2.6.1:

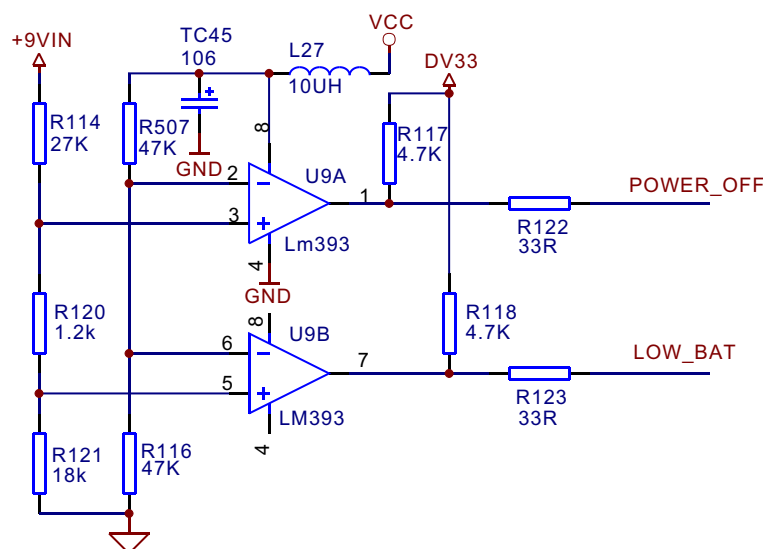


Figure 3.2.6.1 Battery voltage detecting circuit

2. Working principle: U9 is an operational amplifier and used as a comparator in circuit. Reverse input terminal inputs a VCC5V, through two resistors partial pressure, the reference voltage (2.5V) is achieved; through partial pressure by R114 R120 R121 of +9VIN, two groups of voltage are achieved to supply for the in-phase input end of operational amplifier; when voltage of in-phase input end is less than 2.5V, the output pin of operational amplifier outputs a low level to decode chip to perform the corresponding acts. In this machine, after calculation, we conclude that when input voltage is less than 6.5V, pin 7 of operational amplifier outputs low level and machine screen displays low battery; when input voltage is less than 6.1V, pin 1 of operational amplifier outputs low level and machines carries out power-off action.

3.2.7 Audio output circuit

1. Audio output circuit block diagram is shown as in the following figure 3.2.7.1:

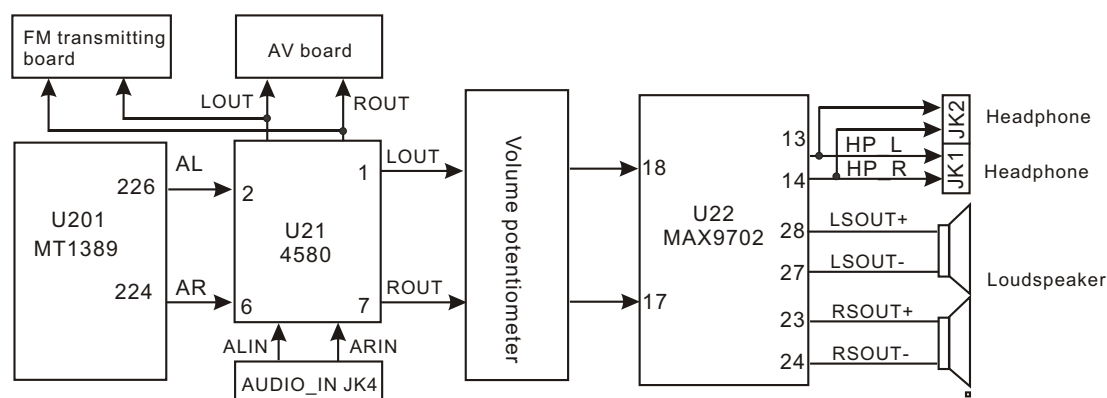


Figure 3.2.7.1 Audio output circuit block diagram

2. Working principle: signal read out by disc, through audio and video decoding, converse audio signal in MT1389 built-in DAC circuit to analog audio signal and output left and right channel analog signals from pin 226, 224 of MT1389, through TC35, TC36, coupled to pin 6, 2 of U21 and then output from pin 1, 7 of U21 through being filtering and amplifying by the active filter composed of U21 and send to audio output terminal and headphone amplifying output circuit.

As shown in the figure 3.2.7.2, after volume adjustment of the audio signals outputted from U21 through VR7P, input from pin 17, 18 of U22 respectively; audio signals after being amplified output from pin 13, 14 of U22 to headphone jack Jk1 and Jk2 and audio signals output from pin 27, 28, 23, 24 of U22 to left and right channel speakers.

Figure 3.2.7.2 Headphone amplifying output circuit diagram

(2) Headphone and loudspeaker output mode switch

Headphone and loudspeaker output mode switch is realized by U22 MAX9702. Shown in the figure 3.2.7.2r, U22 switched headphone output through detecting high or low level of pin 20 HPS. When JK1 and JK2 have no headphone inserted to the jack, HP_V1 and HP_V2 grounded and are low level. Diode VD11, VD12 are in cut-off state, triode V6 cuts off, V5 is connected to pull HPS down to ground, MAX9702 outputs audio signals to loudspeaker. When one of JK1 or JK2 inserts into headphone jack, HP_V1 or HP_V2 is grounded and cut off to become high level, only one of diode VD11 and VD12 is connected, V6 collector electrode becomes high level and then is saturated on, V5 collector electrode level pulls down to cut off, HPS voltage is 5V high level, MAX9702 switched to headphone output state.

3.2.8 Boost detect and control circuit

1. Boost detect and control circuit is shown in the figure 3.2.8.1:

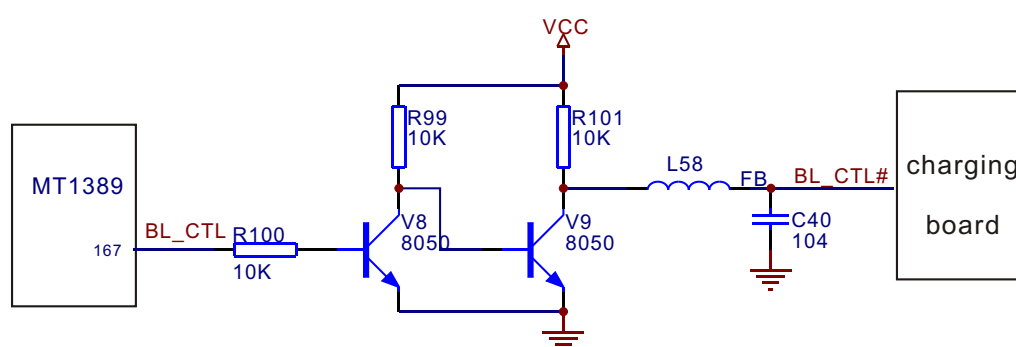


Figure 3.2.8.1 Boost detect and control circuit

2. Working principle: when switch is cut off, the player is in power-off state. Pin 167 of MT1389 outputs low level to make BL_CTL become low level, boost board does not work. When switch closes, the player power on, pin 167 of MT1389 outputs high level to make BL_CTL is high level, boost board begins to work to lighten back light board.

3.2.9 Video coding and LCD—TFT drive circuit

1. Video coding and LCD—TFT drive circuit block diagram is shown as in the following figure 3.2.9.1:

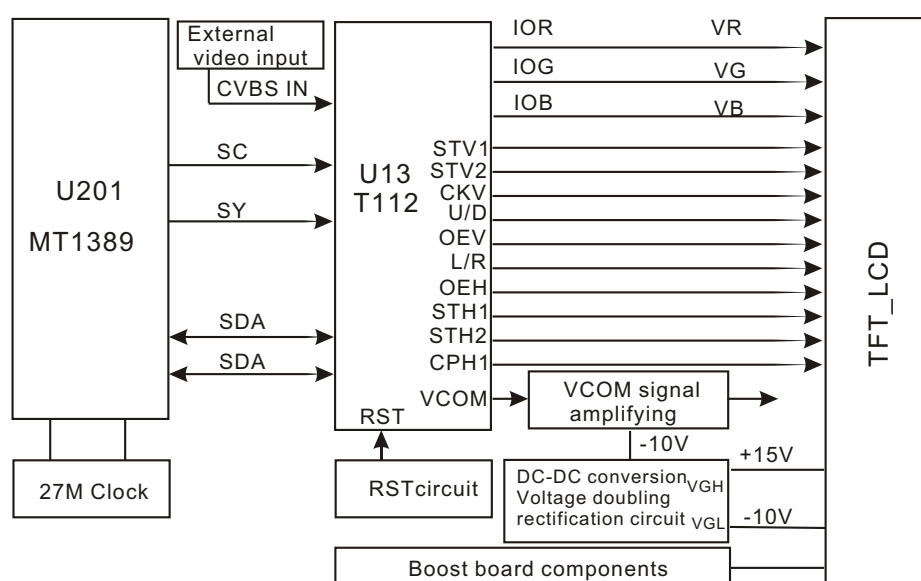


Figure 3.2.9.1 Video coding and LCD—TFT drive circuit block diagram

2. Working principle: decode chip outputs digital video signals and inputs to T112 directly in the means of parallel data (8-digit) for encoding, through internal DAC circuit, to revert digital signals to 3 base colour signals, outputted by pin 1, 3 5, pull-up resistor pull up the voltage to drive LCD screen to display.

VCOM signal amplifying circuit: VCOM, after U17 (NJM3414) amplifying, outputs from pin 6, 7 to display screen and is used as the colourful filtering plate of display screen.

3. Voltage doubling circuit

Working of display drive circuit requires high voltage, so +5V voltage is voltage doubled, shown as in the following figure 3.2.9.2:

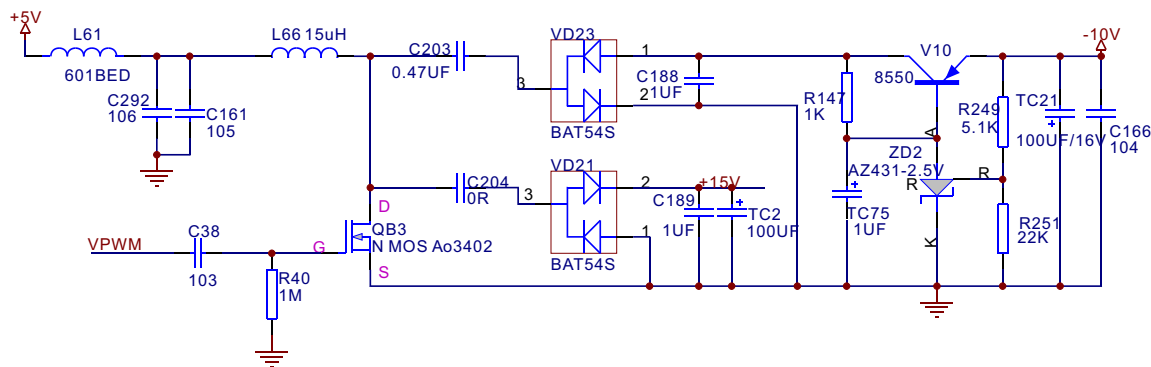


Figure 3.2.9.2 Voltage doubling rectification circuit

+5V power is transmitted to the doubling rectifying circuit composed by VD23 and VD21 to rectify +5V power. Pulse VPWM controls the on and off MOS tube QB3. When QB3 cuts off, +5V voltage forms +15V DC power in VD21 pin 2 through doubling and then outputs to drive display screen through socket and inductor L66 saved energy at the same time. When QB3 is connected, inductor L66 discharges electricity and forms -14V DC voltage at V10 collector electrode and then outputs -10 voltage through ZD2 voltage stabilizing to supply for VCOM signal amplifying circuit and display screen.

4. Boost board (if this PCB board is damaged, it will not be serviced but change it directly): how to judge the boost board: 1) Make detecting head of oscillograph close to high voltage output line (pay attention not to touch the line), a sine wave with about 60K will be viewed from oscillograph, which means that boost board has AC output. The main fault of boost board is that there is no back light or back light is dark.

5. Function introduction to display screen pin is shown as in the following table:

Pin	Symbol	I/O	description
1	GND	-	Ground
2	VCC	P	Power line for logic
3	VGL	P	Gate driver negative voltage
4	VGH	P	Gate driver positive voltage
5	STV1	I/O	Gate driver START PULSE 1
6	STV2	I/O	Gate driver START PULSE 2
7	CKV	I	Gate driver scanning clock
8	U/D	I	Up/Down scanning change
9	OEV	I	Gate driver output enable
10	Vcom	I	HORIZONTAL SYNCHRONIZATION SIGNAL(Voltage applied to color filter substrate)
11	Vcom	I	Voltage applied to color filter substrate
12	L/R	I	Right / Left scanning change
13	MOD	I	Sampling mode change (H: Simultaneous, L: Sequential)
14	OEH	I	LATCH PULSE FOR COLUMN DRIVER
15	STH2	I/O	Source scanning start signal 2
16	STH1	I/O	Source scanning start signal 1
17	CPH1	I	INPUT DATA CLOCK
18	CPH1	I	INPUT DATA CLOCK
19	CPH1	I	INPUT DATA CLOCK
20	Vcc	P	Power line for logic
21	GND	P	Ground
22	VR	I	Red video signal
23	VG	I	Green video signal
24	VB	I	Blue video signal
25	AVdd	P	Power
26	AVss	P	Ground

6. Scanning mode selection is shown as in the following table:

Scan control input setup		Start up pulse I/O state				Scan mode
U/D	L/R	STVR	STVL	STHR	STHL	
GND	Vcc	O	I	O	I	Up→down Left→right
Vcc	GND	I	O	I	O	Down→up Right→left
GND	GND	O	I	I	O	Up→down Right→left
Vcc	Vcc	I	O	O	I	Up→down Left→right

3.2.10 Charge circuit and protection circuit

1. Battery: Lithium-ion polymer chargeable battery always follows the method of constant current firstly and then constant voltage, and then charge in constant voltage state.

2. Lithium battery protection part (this PCB board will not be serviced inside battery components) is divided into three types: A) Over-voltage protection, that is charge protection; B) Under voltage protection, that is discharge protection; C) Current protection (short circuit protection included). The protection delay and delay time of the above 3 items are different, from 1 second to 0.1 second and to 10ms with delay adjustable. Two lithium batteries protection, no matter over voltage protection or under voltage protection, they are the relationship of "or". Only one of the two cores has the condition, the protection is available, which requires that the two cores of a group of battery are balanced on the whole, or else the whole capacity will be severely damaged (when in over voltage protection, the core of high voltage causes over voltage protection firstly; when in under voltage protection, the core of low voltage causes protection firstly).

3. Charge part (charge board is a individual PCB inside main unit): core of charge part is single chip that adopts A/D conversion with 10-bit. 8-bit single chip (S3F9454) of PWM (12bits) SAMSUNG company has the following features:

(1) Single chip is with 10-bit A/D conversion itself, the precision of A/D conversion is 1/1024, the negative voltage of general NI-MH is 3-6mv ($6\text{mv}/1500\text{mv}=1/250$), which can meet the demands greatly.

The precision of lithium battery may be up to 5mv. Considering the test error, it may be up to $\pm 20\text{mv}$, that is $4.2\text{V} \pm 0.02\text{v}$. The high precision and strong point are obvious.

(2) Use PWM (pulse width modulator) of single chip itself to directly control DC/DC conversion. The control method is provided by software to achieve different constant current and constant voltage curve (different charge means may be designed according to clients' requirements), so the whole line is simple, with low cost, high reliability, high efficiency power conversion and less heat radiation.

(3) May charge NI-MH, NI-CD, LI-ION battery well. How to judge whether it is fully charged: A) max voltage; B) max temperature increase; C) negative voltage; D) longest charge time. It can be tested quickly after battery is fully charged and loaded again (within 15 minutes) and stop charging (this point is very important to NIMH and NICD, which can prevent over charge to damage battery), when battery voltage is low, use small current to charge to resume the damaged battery.

4. Working principle: when external power adapter is adopted to supply power, power arrives at VIN pin through socket board and is divided into two ways: A) arrive at decode board (VOUT+) directly through VD2; B) provided for charge circuit. After voltage regulating, the voltage regulating circuit composed by Q601, Q603 provides working voltage for U604. U604 is charge management control single chip.

Power supply of CPU adopts TI431 and an NPN triode. There are many elements, but precision is high, easy to correct and up to 1%, and test work is less. The power supply circuit is composed of U603 and Q601, etc.

Q605, Q604, Q603, QB602 compose switch DC/DC circuit; Q605 and Q604 compose standard push pull circuit to drive QB602 to make QB602 has good switch waveform to decrease heat radiation.

QB602, L601, TC603 and VD602 compose classic STEP DOWN circuit. When QB602 is on, current supplies power for battery on one hand and save energy for inductor on the other hand. When is QB1 cut off, the electric energy in inductor discharges through VD602 to charge battery.

LM358 is classic in-phase amplifying circuit. The reason of adding amplifying circuit is to decrease resistance test and heat radiation.

The function of QB603 is the external power supply control end. When VIN is low level, QB603 is on, battery supplies power for load; when VIN is high level, adapter supplies power for load.

QB601 and Q602 compose protection circuit. When charge circuit or battery has trouble, MOS_SW outputs high level, QB601 cuts off, 9V stops supplying power for battery.222

3.2.11 Panel control circuit and remote control circuit

DL377SI panel buttons adopt touch-style buttons, CY8C21534 is adopted to control circuit main chip. This IC may program and define function of each button and I2C control means is adopted. Only two data lines are require to fulfill the communication with MT1389. After we input button information, through CY8C21534 internal processing, output to decode board through I2C bus pin and MT1389 controls the player to make the corresponding action.

3.2.12 Decode circuit

1. Decode circuit block diagram is shown as in the following figure 3.2.12.1:

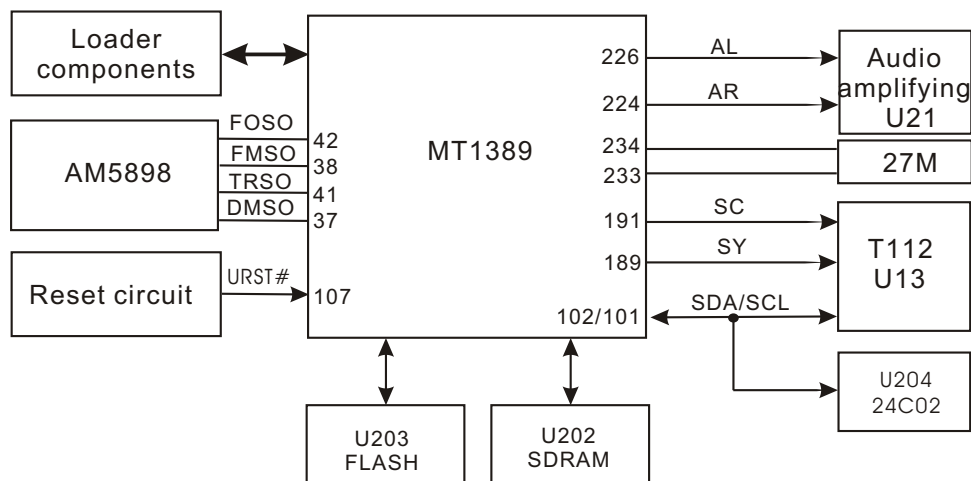


Figure 3.2.12.1 Decode circuit block diagram

2. Working principle:

(1) Power: MT1389 is with two groups of power supply: one group achieves 1.8V voltage after LM1117MP(U15) voltage regulating to supply for the logic circuit inside IC; the other group achieves 3.3V voltage after DC-DC conversion and QB2 voltage regulating. At the same time, FLASH and SDRAM must also meet the requirements of power.

(2) System clock: clock signal is an important factor of machine's working, that whether there is clock signal or whether it is normal will affect the normal working of the player. This machine adopts external clock (27M) that inputs to pin 234 of MT1389, clock is produced by X2 and its peripheral circuit.

(3) Data communication

1) Communication of Mt1389 and SDRAM: the communication of MT1389 and SDRAM is mainly to temporarily save the large quantities of data after MT1389 decoding to prepare for saving at any time. Shown as in the figure, DMA0~DMA10 is address signal, DQ0~DQ15 is data signal, DCLK is synchronous clock, DCKE is enabled end, CS is chip selection signal, WE is write enabled signal, RAS and CAS are row and line gating signals.

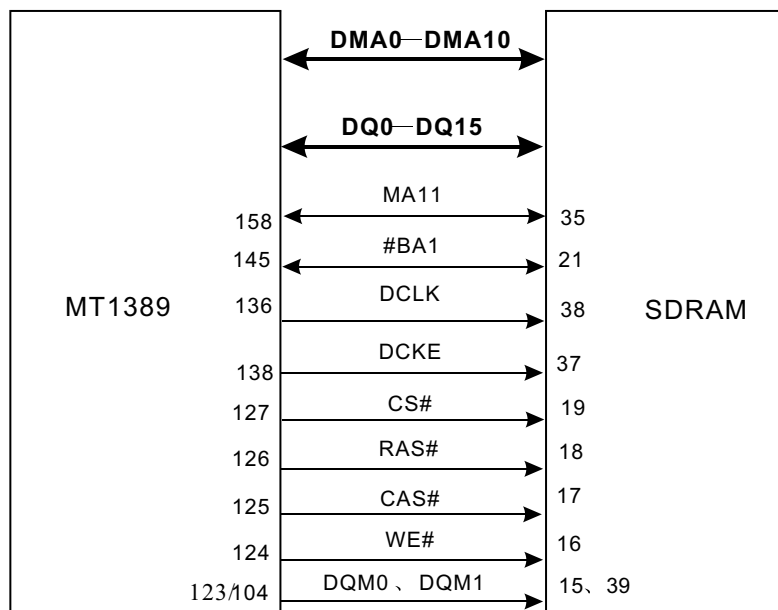


Figure 3.2.12.2 Communication block diagram of MT1389 and SDRAM

2) Communication of MT1389 and FLASH

The communication of Mt1389 and FLASH is mainly to call the program and working directions saved inside FLASH when power on. Shown as in the figure, A0~A19 is address line, A20 and 21 are address line, AD0~AD14 is data line, DWR# is read-write control, DCE# is chip selection and DRD# is

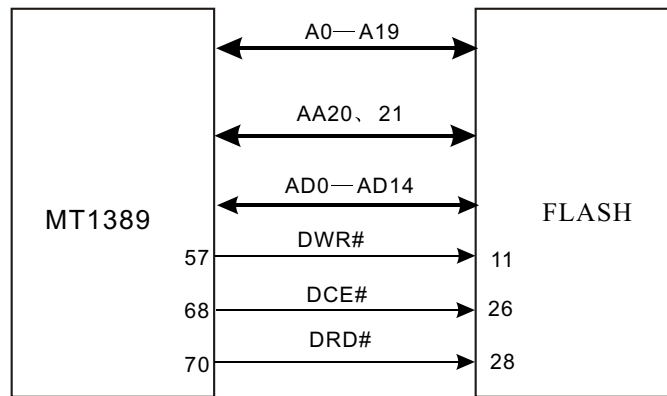


Figure 3.2.12.3 Communication block diagram of Mt1389 and FLASH

3. Audio, video output

(1) Video: MT1389 integrates video encoder inside, so analog video signals can output from Mt1389 inside directly; but DL370D only need to output digital signal, and its digital signal output is as follows:

◆ P187: CVBS ◆ P189: SC ◆ P191: SY

(2) Audio: Mt1389 integrates D/A conversion inside, so analog audio signal output from MT1389 inside directly, and digital signal may also output directly and be conversed by the externally connected D/A conversion IC, which is also with optical output function. DL370D adopts analog audio output and the output signals are as follows:

◆ P225: AR ◆ P227: AL

3.2.13 Reset circuit

1. Reset circuit is shown as in the following figure 3.2.13.1:

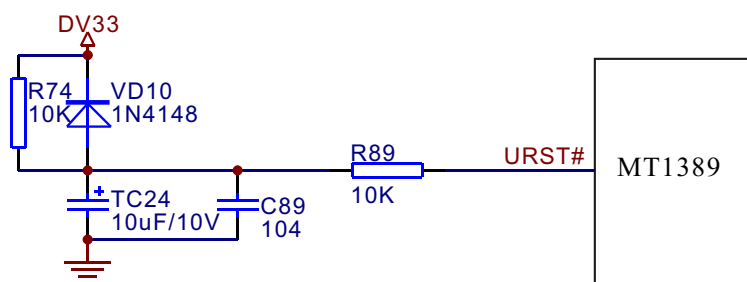


Figure 3.2.13.1 Reset circuit diagram

2. Working principle: after power on, DV33 charges TC24 through R74. Voltage on two ends of capacitor cannot change suddenly, so positive voltage of TC24 increases gradually and its increase time is related with R74, TC24. When machine is working normally, this voltage is the same with power voltage basically. After machine power off, electric charge saved by TC24 discharges through VD10 to ensure the reliable reset when power o next time.

3.2.14 Mute circuit

1. Mute circuit is shown as in the following figure 3.2.14.1:

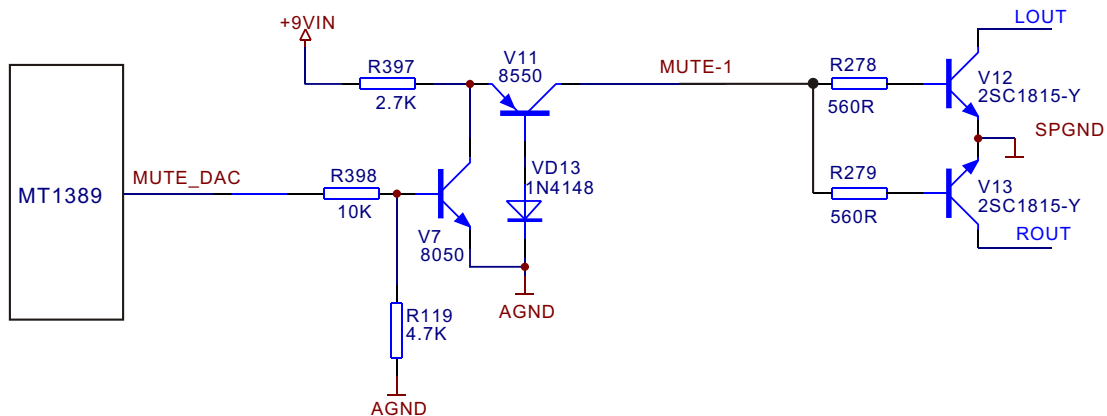


Figure 3.2.14.1 Mute circuit diagram

2. Working principle: after power on, +9V arrives at the base electrode of V12, V13 through CE of V11 to make triode saturated on, audio signal output and headphone output are short circuited to ground to remove noise that produces when power on. After machine resets and begins to read disc, pin 172 of Mt1389 outputs a high level to make pin MUTE-1 change from high level to low level, V12, V13 are cut off because the base electrode

3.2.15 USB and 3-in-1 card reader

DL377SI has built-in USB jack and 3-in-1 card reader to facilitate to read USB mobile storage device and media content in memory card. When machine switches in USB or card read state, USB or content in memory card inputs to MT1389 directly for decoding to output to display screen.

3.2.16 FM transmitting device

To facilitate the usage of card kits, DL377SI has no FM transmitting device, audio signals output to FM transmitting board, through IC BH1471FV modulating, transmit through antenna and adjust FM transmitting frequency to make it accordant with the receiving device frequency inside car to make DL377SI audio output to AV system inside car to enjoy HI-FI music. e is low level , audio signal can output normally.

Section Three Servicing Cases

3.3.1 Servicing cases

[Example 1] Symptom: do not read disc.

Description: do not read any disc.

Analysis and troubleshooting: firstly, put a magnet on right bottom corner of door (door switch of this model uses clarinet to control), which equals to pressing door switch, and then check whether loader pick-up can reset and return to the most inner circle; then we observe that pick-up has infrared ray emission, but light emission is weak; load disc, check rotation speed of disc and disc rotation is basically normal at beginning and then stops slowly at last and “NO DISC” display. Thus, we firstly consider that laser power of pick-up maybe not enough or pick-up may be aging. Change loader components and trouble is removed.

[Example 2] Symptom: no output

Description: no picture and indicator light is on.

Analysis and troubleshooting: firstly use the above method to check whether pick-up has action and there is none. Then check whether there is video output and there is also none. When this case happens, we doubt that decode board maybe not work. Open machine casing and check 5V, 3.3V, 1.8V power supply and it is normal; test crystal oscillator of 1389 and it has oscillation. Test whether SDCLK signal of SDRAM has 80M~100M and the result is 27M. According to experience, we judge that this case is caused by that software has not worked. Check software and find that the welding plate has oxidated. Weld software again and trouble is removed.

[Example 3] Symptom: colour distortion

Description: picture has fringes around.

Analysis and troubleshooting: when this case happens, you need to confirm whether display drive part or decode part has trouble; check video output and find that video output has the same trouble, which means that trouble lies in decode part, and SDRAM and 1389 have the most possibility to have trouble. Substitute SDRAM and trouble appears again. Change chip and trouble is removed.

[Example 4] Symptom: white screen

Description: disc read and sound are normal, but screen cannot display picture and white screen appears.

Analysis and troubleshooting: white screen appears and it means that boost board works normally. If there is sound, it means that decode board has started to work. Check working of drive part T112 and VDD33/AVDD33/VDD25/VCC and clock are all normal. Check VCOM voltage and waveform outputted by U17 and they are both normal; then check the -10V+15V voltage output and -10 has no voltage; check V10/ZD2 and it is normal; check VD23 and find that VD23 has been damaged. Change it and trouble is removed.

[Example 5] Symptom: white screen

Description: screen appears white screen, but the grounding of screen can display BBK.

Analysis and troubleshooting: check drive part according to Example 4: VDD33/AVDD33/VDD25/VCC working of T112 and clock are normal, but use multimeter to test VCOM voltage outputted by U17 and there is only 0.3V (1.6V in normal cases); then test VCOM voltage outputted by T112 and it is abnormal; check working of T112 and there is no trouble; change T112 but trouble still exists. Now consider whether software control has problem, upgrade software and trouble still exists. Next please suppose whether the setup storage IC:E²PROM has trouble? Change E²PROM and trouble is removed.

[Example 6] Symptom: no external output sound

Description: speaker has no sound, but headphone sound is normal.

Analysis and troubleshooting: firstly, headphone has sound, but speaker has no sound, which means that front stage of audio is normal and trouble maybe lie in headphone power amplifier circuit. If headphone output is inserted, external sound output is shut off, and whether trouble will lie in headphone external sound output detect circuit? Headphone external sound identifying circuit is composed of headphone terminal and VD11/VD12/V5/V6. When there is headphone in, HP V1 or HP V2 end disconnects with headphone terminal outer casing (ground), HP V1 or HP V2 outputs high level, V6 is connected, V5 cuts off, pin 20 of U22 inputs high level, U22 detects headphone, sound is outputted by pin 13, 14 and speaker cuts off, and vice versa. Check C electrode of V5 and it is high level, check anode of Vd11 and it is high, check headphone terminal and find that HP V1 has open-circuit with ground. Change headphone terminal and trouble is removed. Headphone terminal is inserted and unplugged all the time, so it is easy to damage.

[Example 7] Symptom: picture mosaic

Description: when door closes, picture has mosaic; when opens door, picture restores to be normal.

Analysis and troubleshooting: when in this cases, trouble changes with door opening or closing. After analysing internal structure, we know that our display screen moves with the action of opening or closing door. Only one 30P flat cable cord is used to connect the player with display screen components and whether this flat cable has problem. Open machine casing, observe 30P flat cable and there is a little crack. Change it and it is ok.

[Example 8] Symptom: power not on

Description: after power on, machine has no response.

Analysis and troubleshooting: check whether 9V voltage comes from charge board and it is normal. Check whether TC70 and TC64 have 3.3V/5V output and there is no 5V output. 5V of the player is composed of PWM wave outputted by AM5898 and DC-DC variation circuit composed by QB1. Check whether AM5898 has PWM wave output, but the outputted waveform is abnormal when compared with the normal. Check working of AM5898 and there is 9V input, so we doubt whether it has trouble, after changing it trouble still exists. As for this case, load may be too heavy or feedback circuit has trouble. Use multimeter to test 5V to ground and resistance is normal. When checking feedback circuit, we find that R233 has trouble. Change it and trouble is removed.

[Example 9] Symptom: do not read disc

Description: do not read any disc

Analysis and troubleshooting: press detect switch for opening door and observe focus and light emission of pick-up and they are normal. Load disc and disc can rotate normally, but cannot read disc out. Use oscilloscope to test Therefore signal of pin 8 of Xs3 and there is normal signal; check the path between them and there is no problem; each capacitor has no rosin welding and joint welding. In this case, if disc can rotate normally but disc read cannot display, and it means that 1389 has detected disc information, but its signal processing part has problem, so we doubt that 1389 has trouble. Check 1389 and find that the last several pins seem to have rosin joint. Weld pin of 1389 and trouble is removed.

[Example 10] Symptom: do not read disc

Description: do not read any disc

Analysis and troubleshooting: press door switch, observe loader working and find that loader pick-up will go to one side when door switch is pressed, and will skip upwards. In this case, firstly consider V20/V1P4 used as reference level. Test V20 of loader and it is normal. Test V1P4 and find that V1P4 only has 0.4V. The trouble is found out and this 1.4V reference voltage is outputted by pin 30 of 1389HD. Change 1389HD and TV trouble still exists. So we think that trouble may be caused by short-circuit of load; while AM5898 is power element. Change 5898 and trouble still exists. Check C26 and find that C26 has resistance value. Change C26 and trouble is removed.

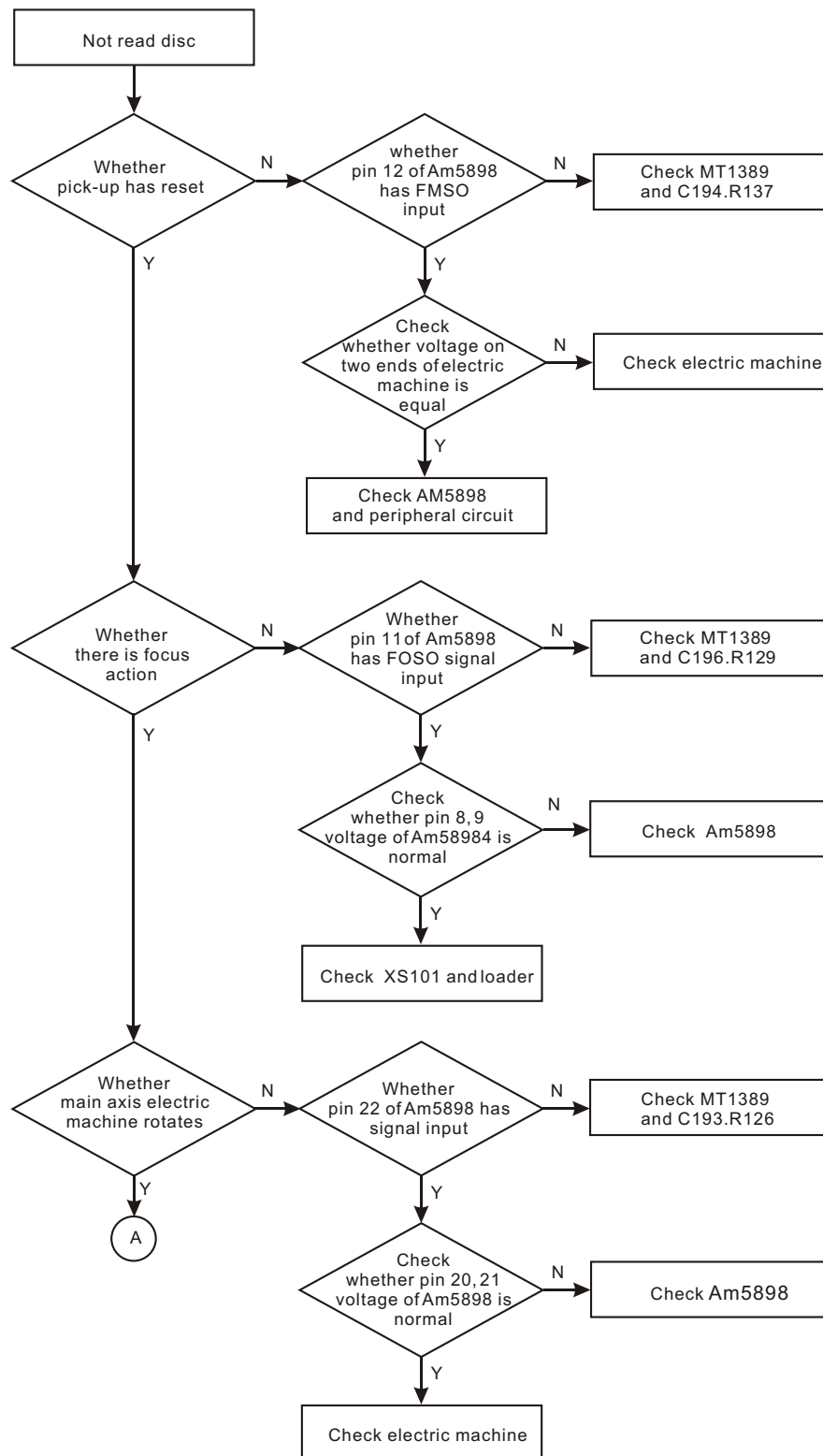
[Example 11] Symptom: button has no function

Description: button light can be on, but button has no function.

Analysis and troubleshooting: this machine uses touch screen. Button function is sent to 139 through I²C after CY8C21534 SSOP. We repair from button board firstly. Install buttons of button board (if buttons are not installed well, it will not be sensible), burn button program and there is no effect. Use oscilloscope to test pin 29, 30 of Xs6 (scl key/sda key) and there is waveform output, but button function cannot be realized, thus the chip control may probably have problem. Change 1389 and trouble is removed.

3.3.2 Troubleshooting flow chart

1. Troubleshooting process for “Not read sic” is shown in the figure 3.3.2.1:



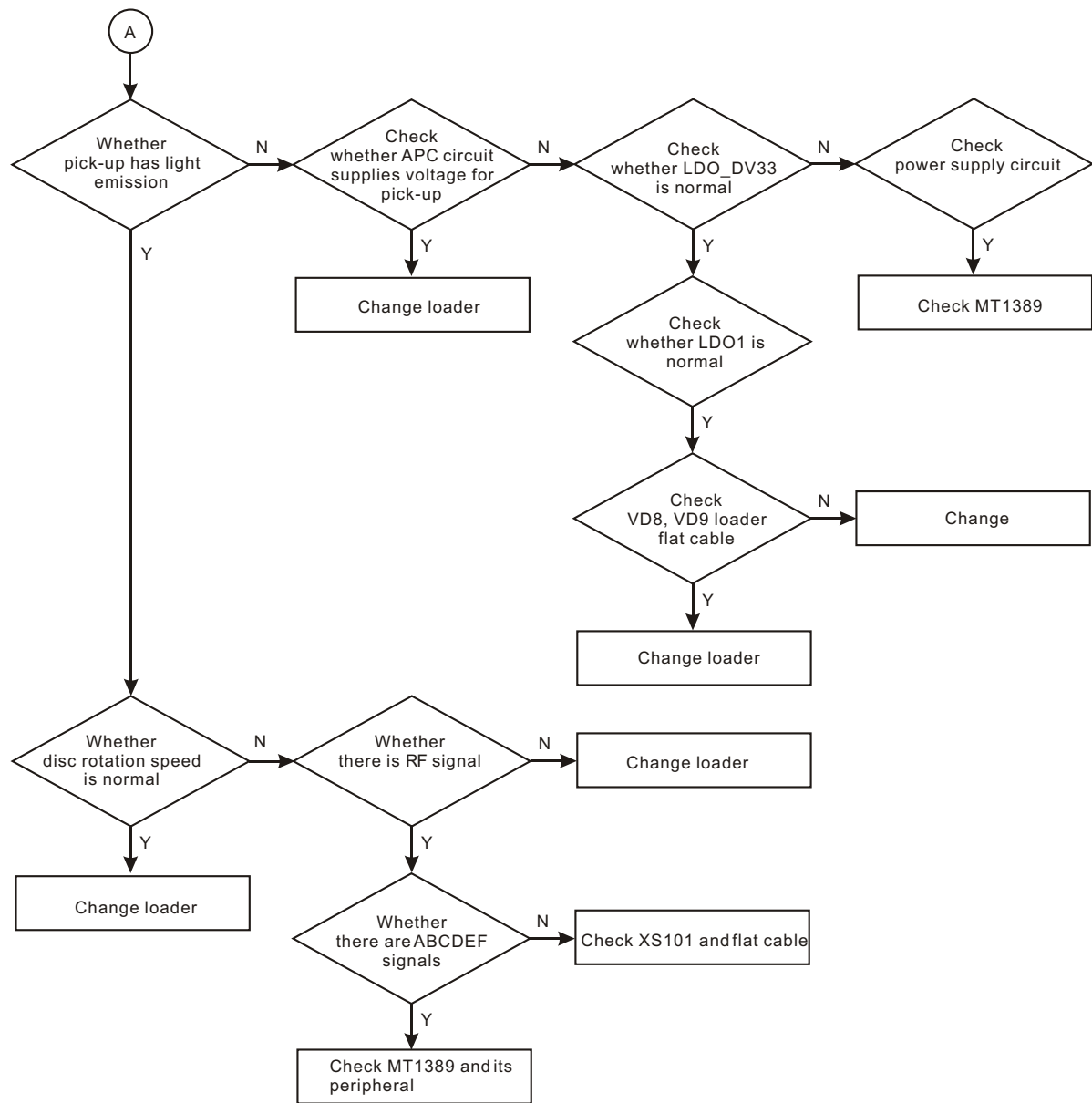
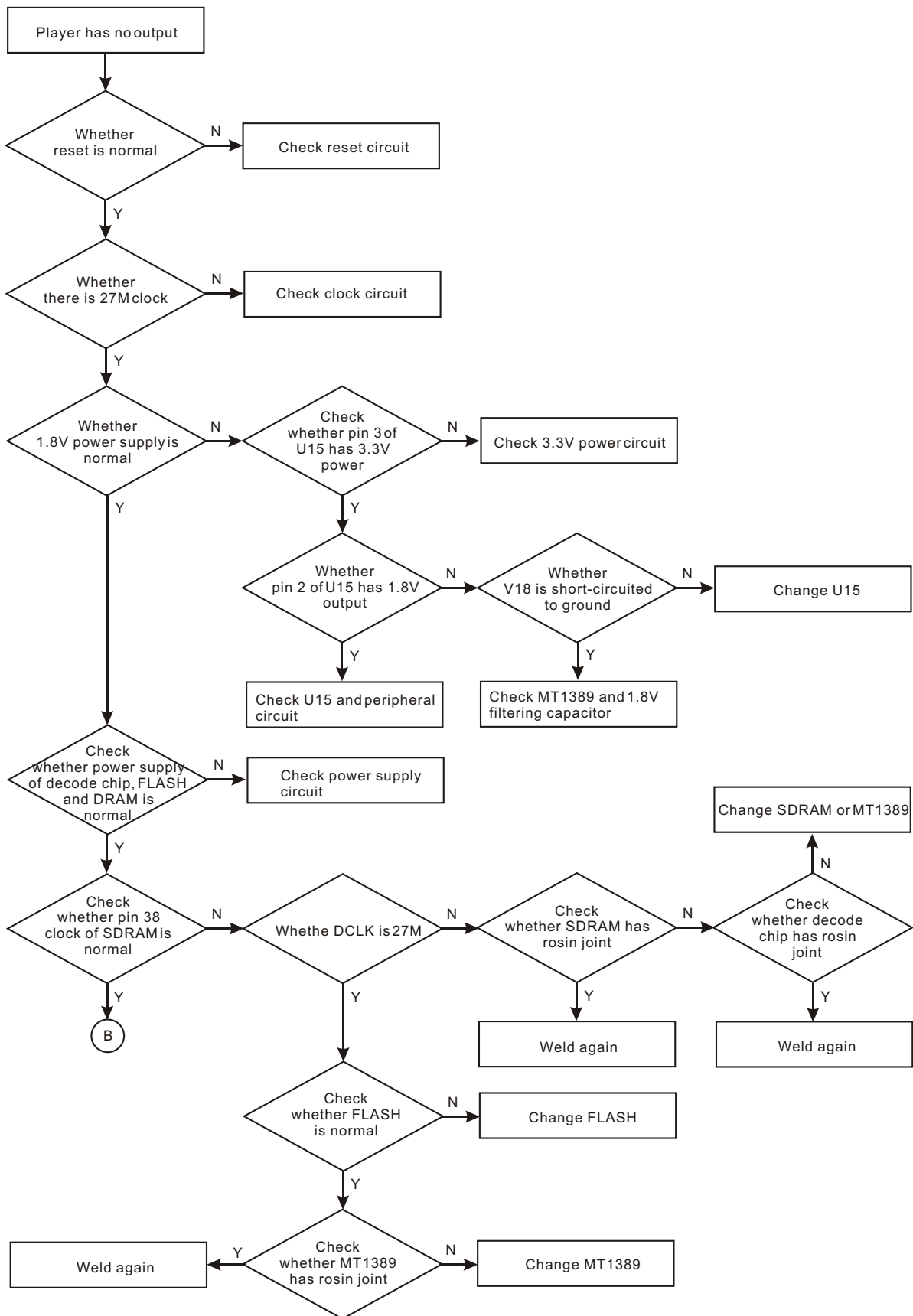


Figure 3.3.2.1 Troubleshooting flow chart for "Not read disc"

2. Troubleshooting process for “Player has no output” is shown in the figure 3.3.2.2:



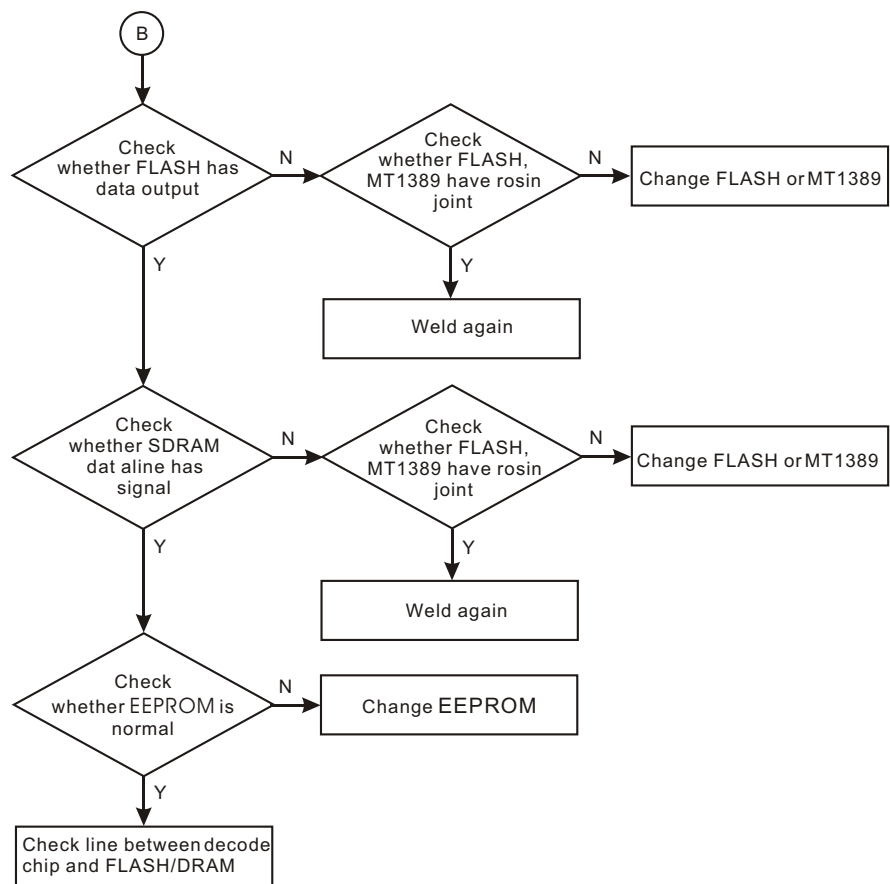


Figure 3.3.2.2 Troubleshooting flow chart for "Player has no output"

3. Troubleshooting flow chart for “No 5V voltage” is shown as in the following figure 3.3.2.3:

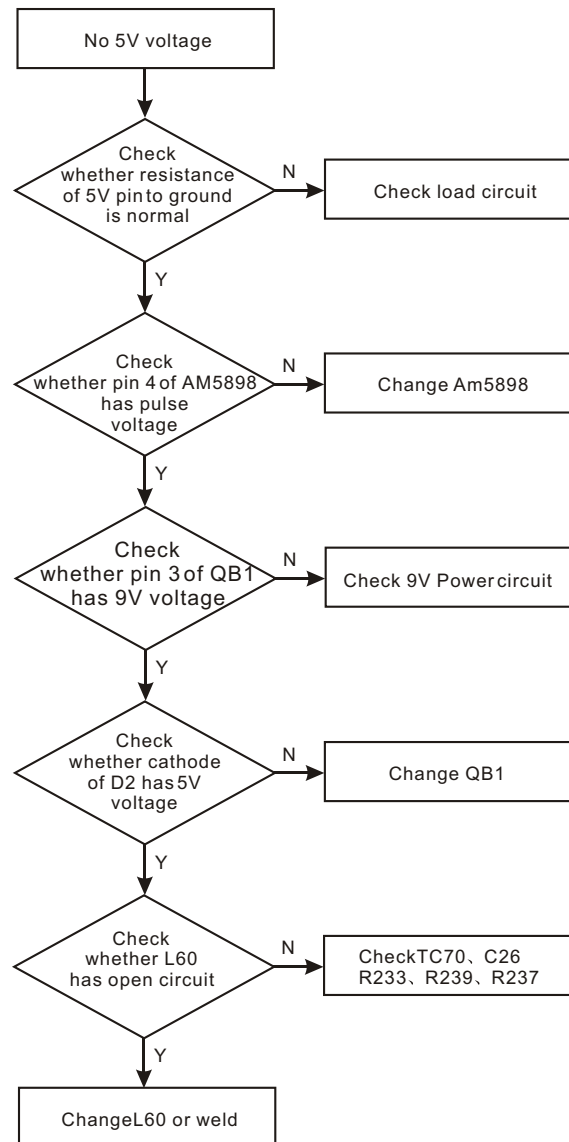


Figure 3.3.2.3 Troubleshooting flow chart for “No 5V voltage”

4. Troubleshooting flow chart for “No DV33V voltage” is shown as in the following figure 3.3.2.4:

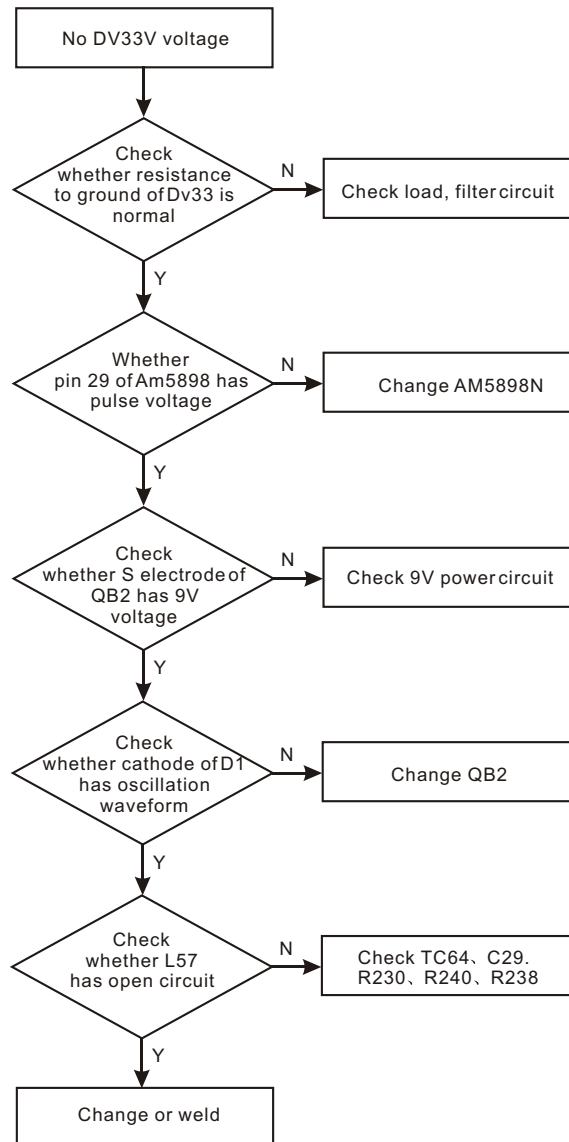
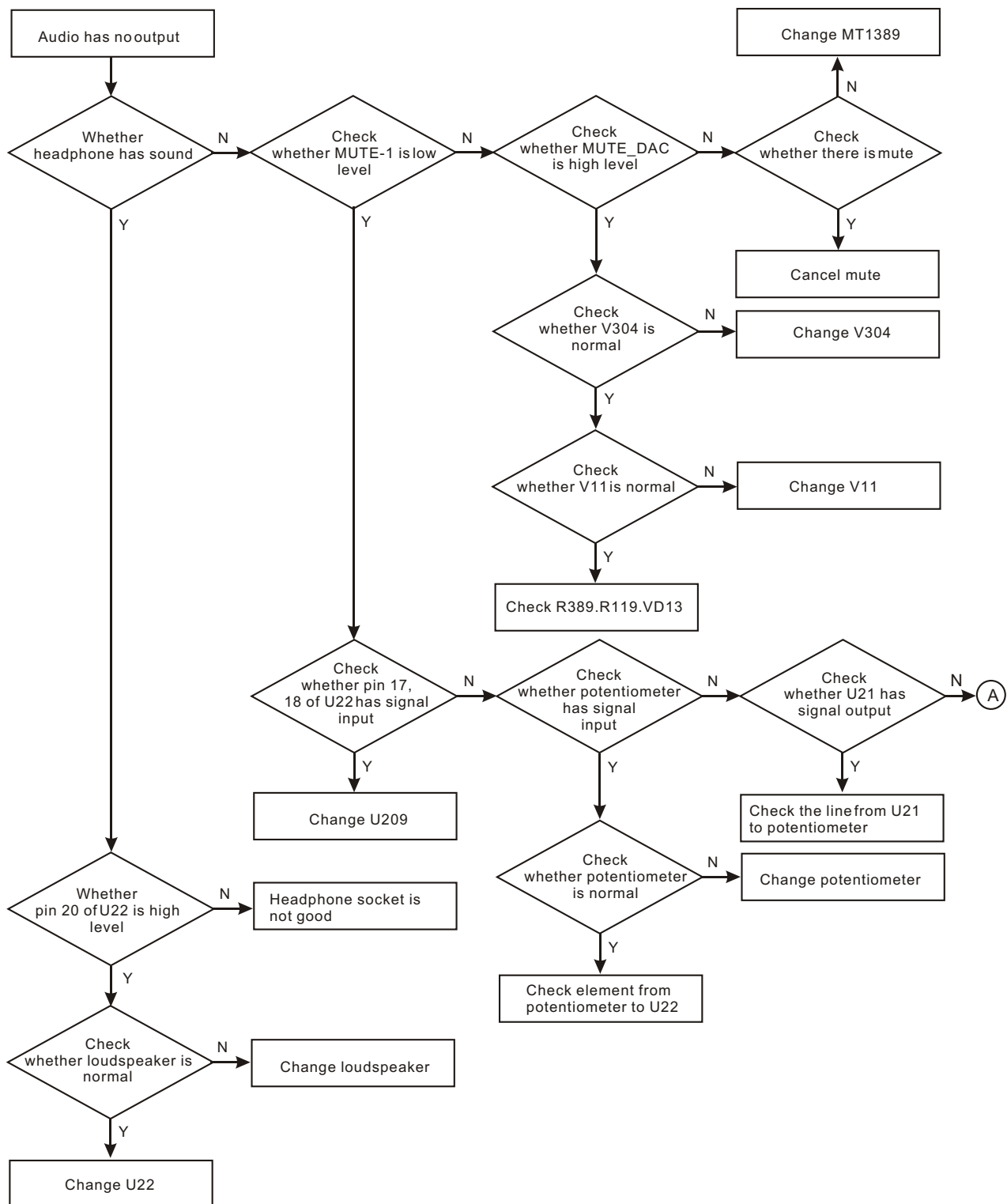


Figure 3.3.2.4 Troubleshooting flow chart for “No DV33V voltage”

5. Troubleshooting flow chart for “Audio has no output” is shown as in the following figure 3.3.2.5:



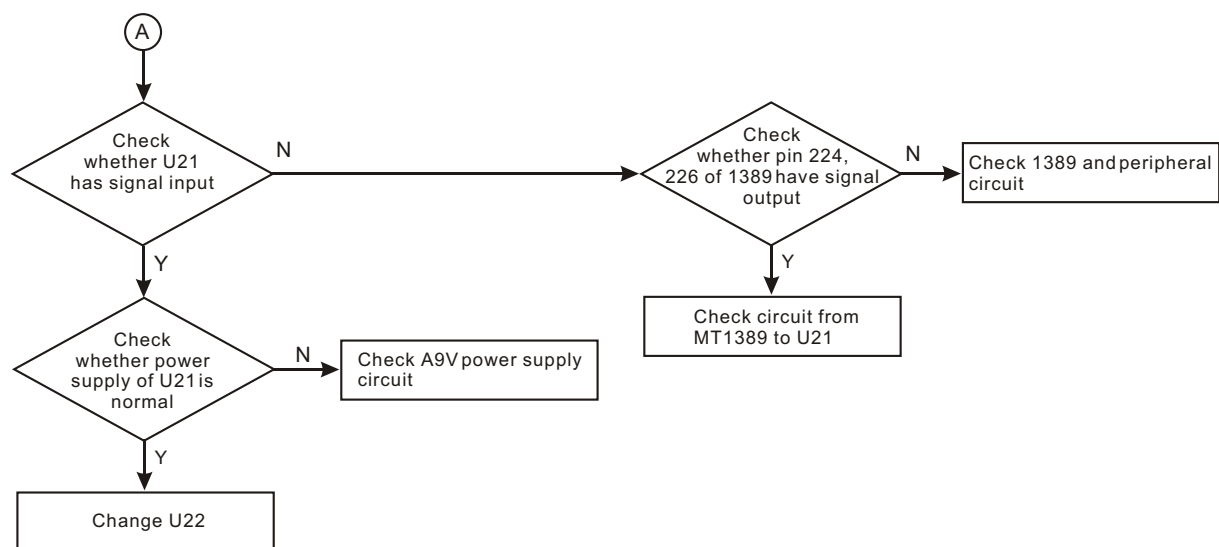
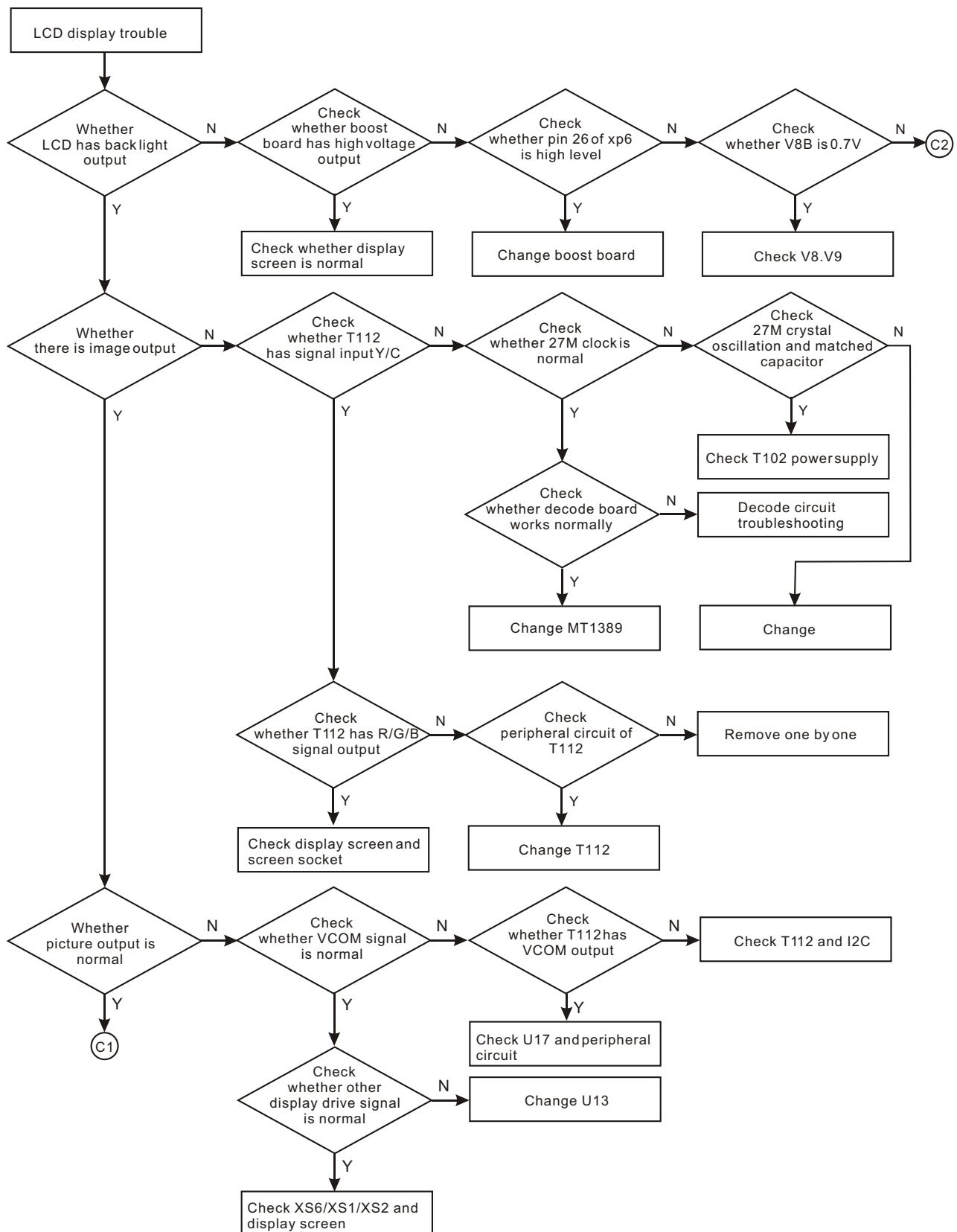


Figure 3.3.2.5 Troubleshooting flow chart for “No audio output”

6. Troubleshooting flow chart for “LCD display trouble” is shown as in the following figure 3.3.2.6:



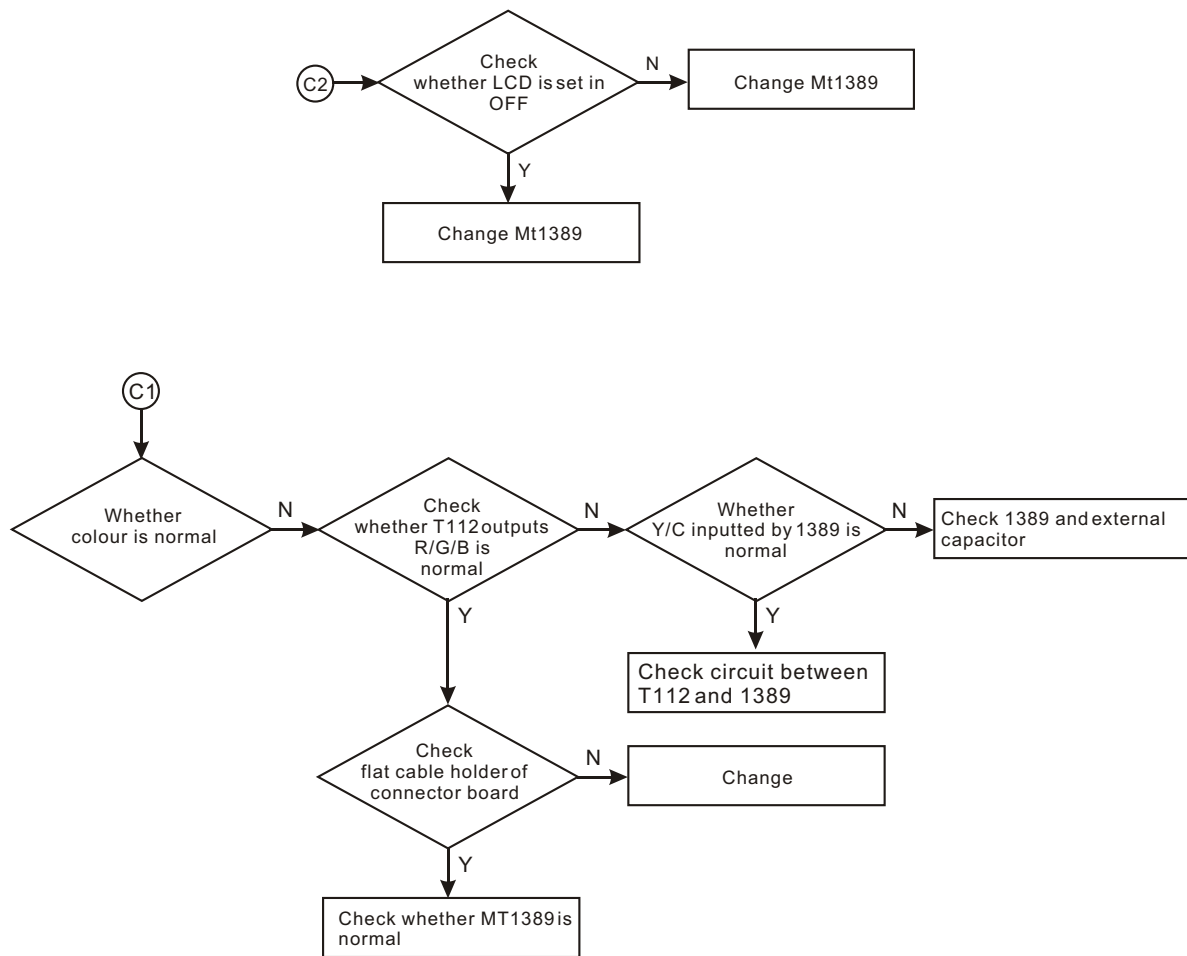
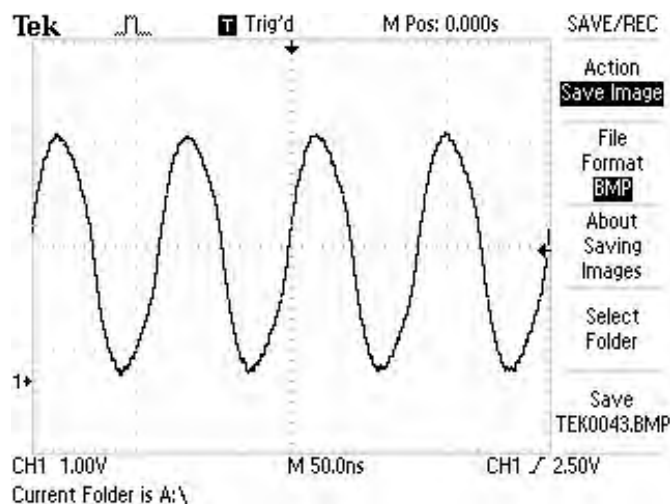


Figure 3.3.2.6 Troubleshooting flow chart for "LCD display trouble"

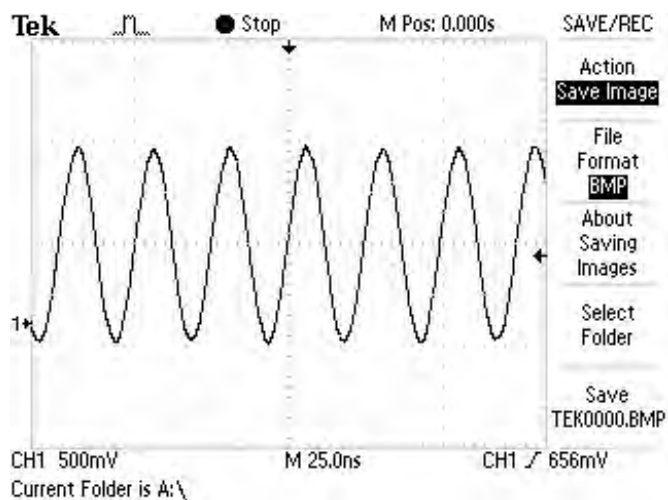
Section Four waveform Diagram

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

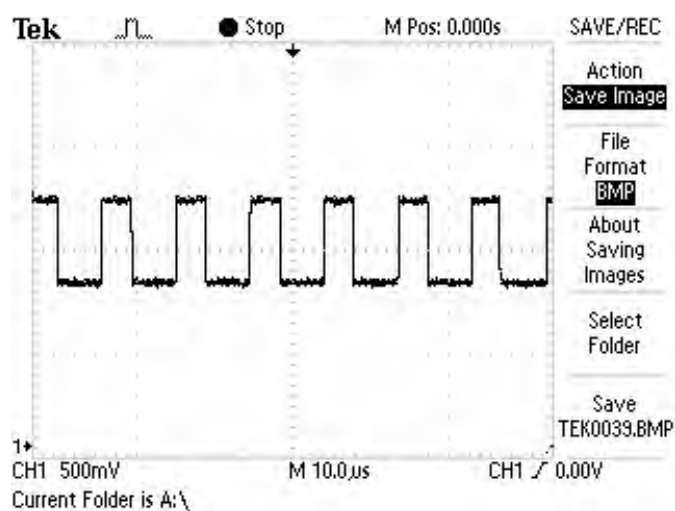
1. 8M waveform diagram of pin 2 of charge board U604.



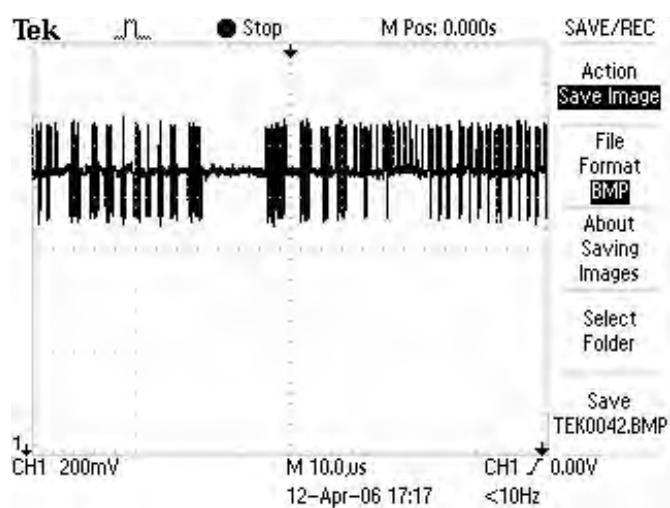
2. 27M waveform diagram of pin 235 of decode chip MT1389



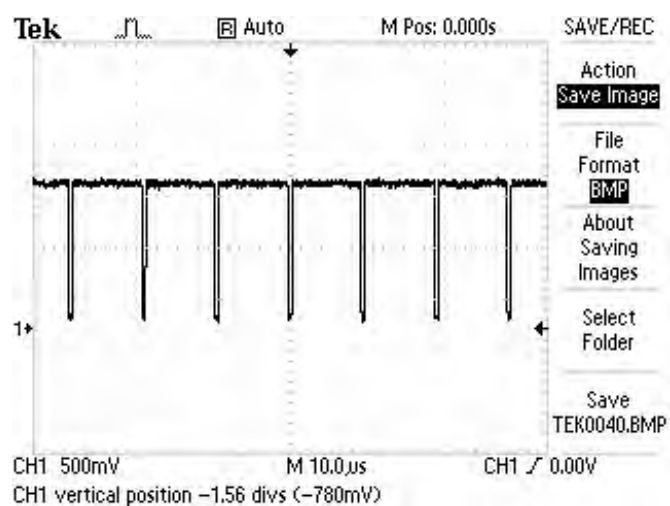
3. DMO waveform diagram of main axis outputted by decode chip MT1389.



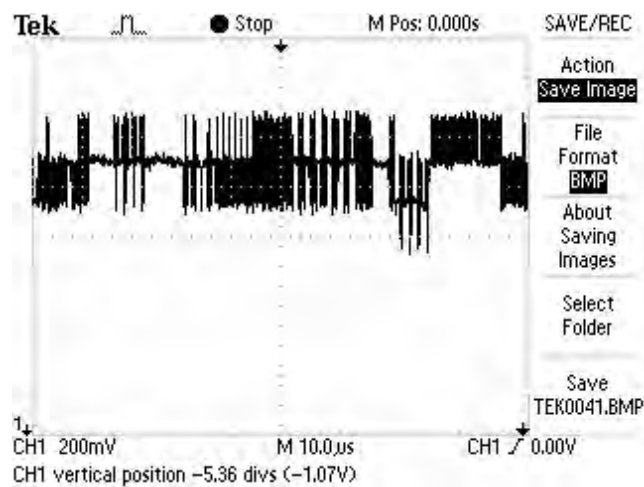
4. FOO waveform diagram outputted by decode chip MT1389.



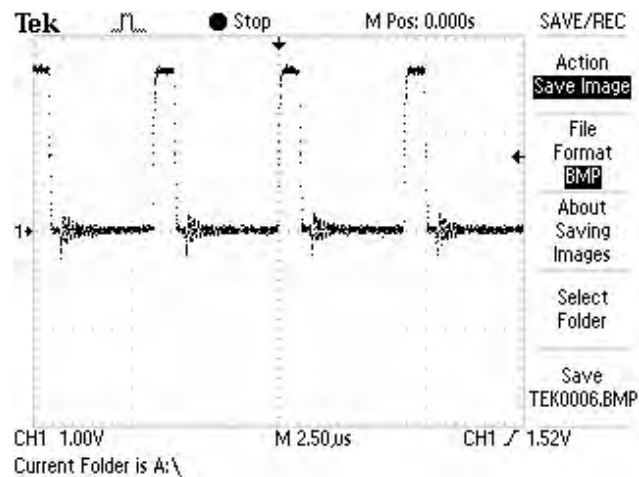
5. FMO waveform diagram outputted by decode chip MT1389.



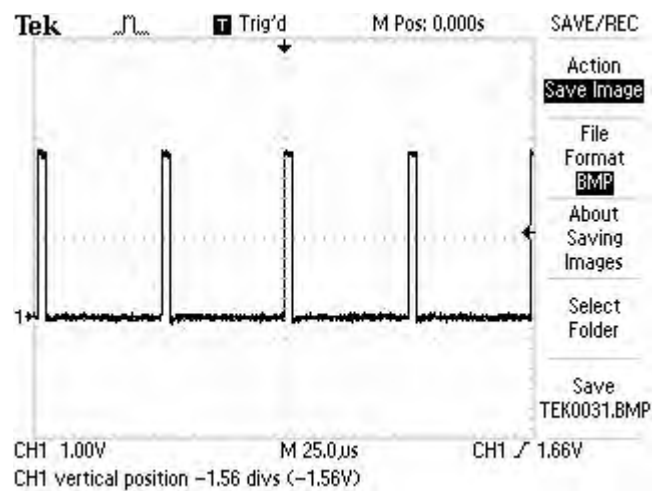
6. TRO waveform diagram outputted by decode chip MT1389.



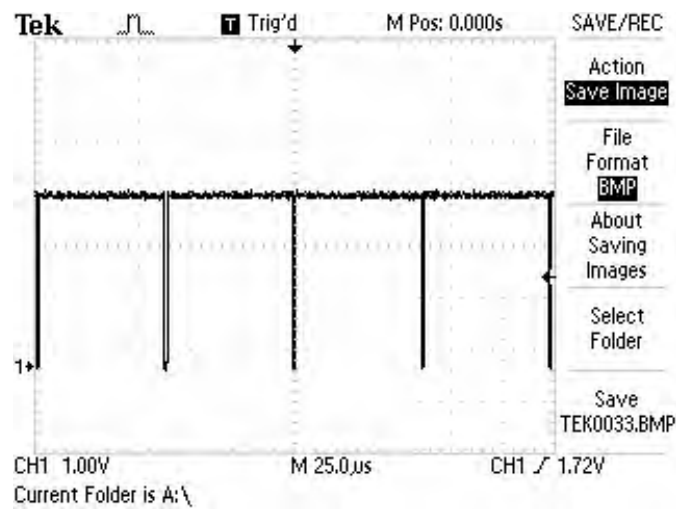
7. Doubling circuitVPWM signal waveform diagram.



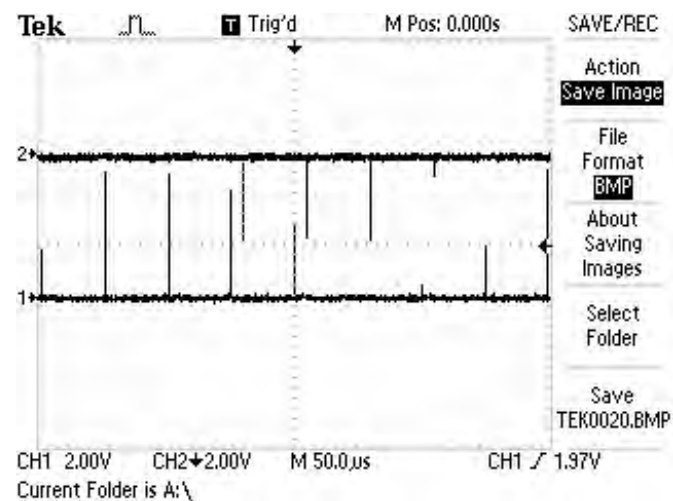
8. CKV waveform diagram of pin6 of XS6.



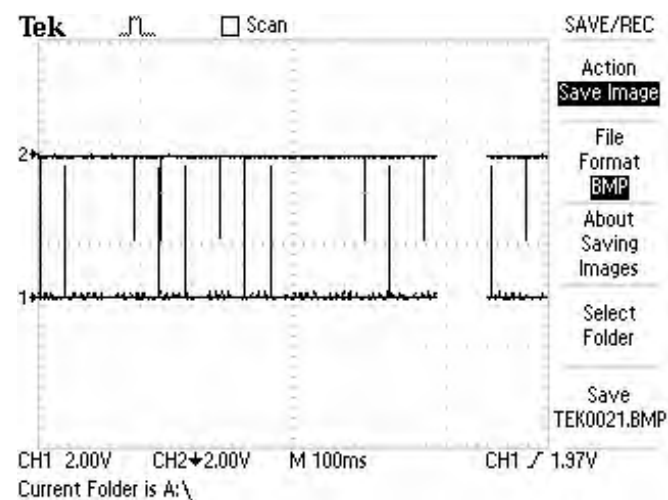
9. OEH waveform diagram of pin 13 of XS6.



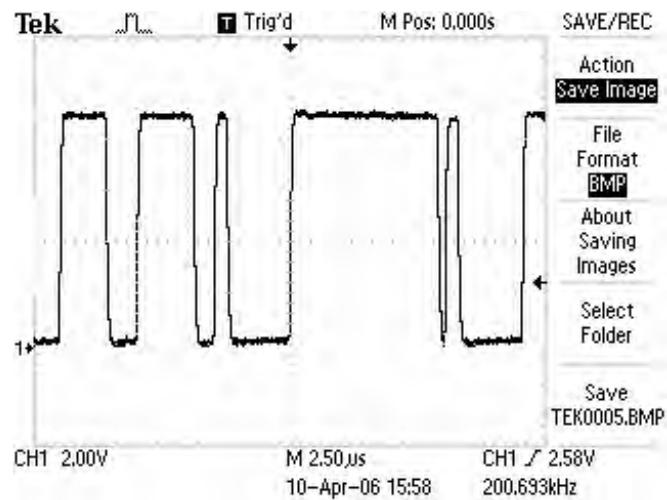
10. STH1, STH2 waveform diagram of pin 15, 14 of XS6.



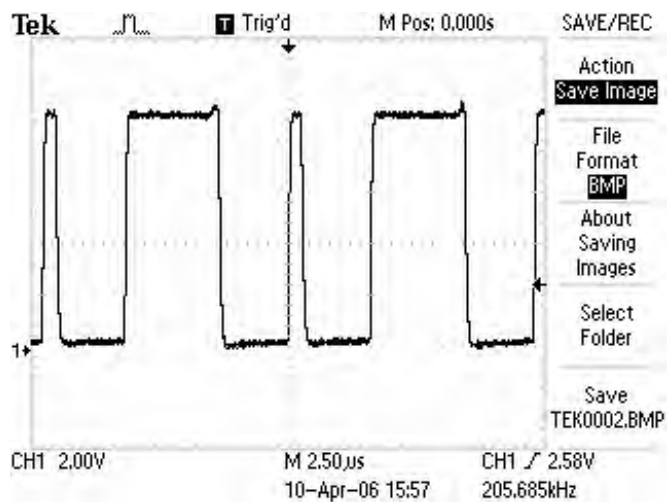
11. STV1, STV2 waveform diagram of pin 4, 5 of XS6.



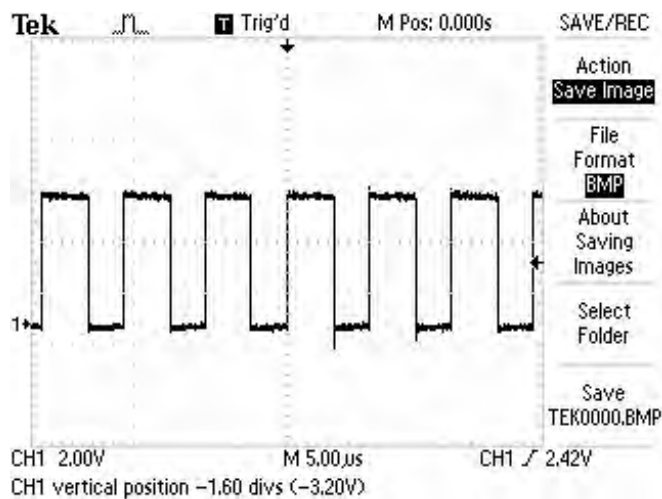
12. SW1 waveform diagram of pin 29 of AM5898.



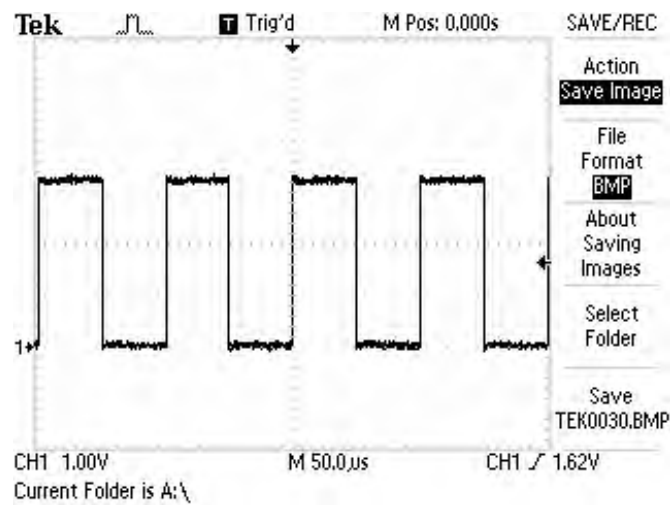
13. SW2 waveform diagram of pin 4 of Am5898.



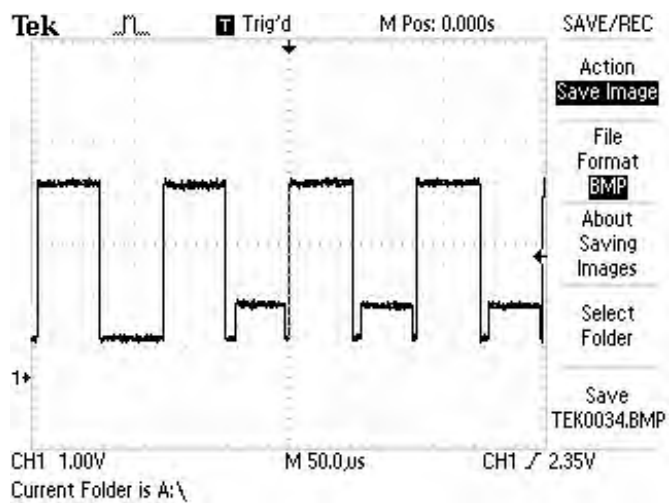
14. Waveform diagram of pin 13 of U604.



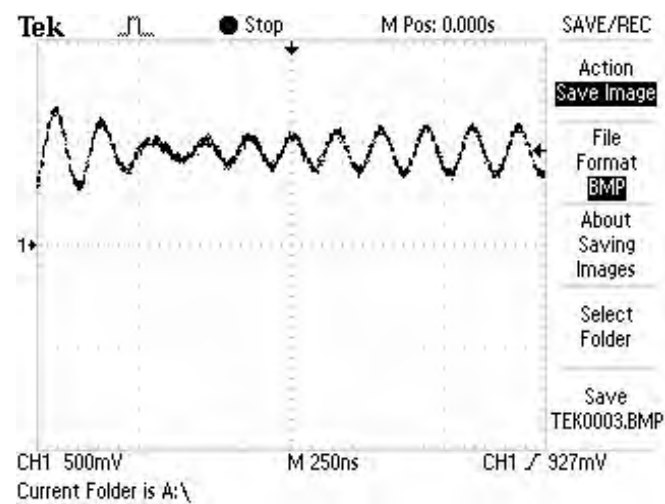
15. VCOMO waveform diagram of pin 10 of XS6.



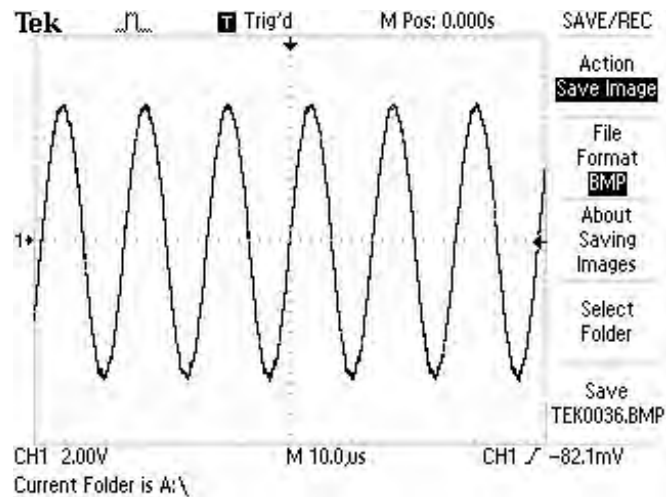
16. VR waveform diagram of pin 19 of XS6.



17. SC waveform diagram of pin 189 of decode chip MT1389.

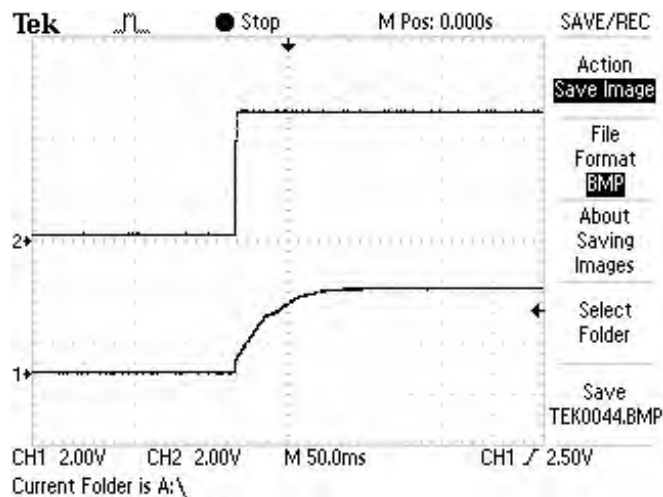


18. Back light drive voltage waveform diagram.

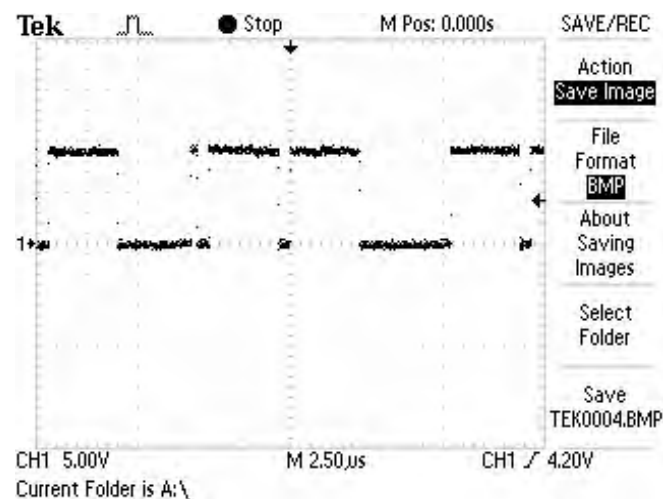


Note: back light drive voltage is a bot high, do not contact detecting head of oscillator with output terminal directly when testing. Waveform diagram may be tested only close to output terminal.

19. URST waveform diagram



20. QB1 Delectrode waveform diagram of DC-DC circuit.



Section Five Function Introduction to IC

3.5.1 Function introduction to MT1389HD

1. Description

MT1389HD is a cost-effective DVD system-on-chip (SOC) which incorporates advanced features like MPEG-4 video decoder, high quality TV encoder and state-of-art de-interlace processing.

Based on MediaTek's world-leading DVD player SOC architecture, the MT1389HD is the 3rd generation of the DVD player SOC. It integrates the MediaTek 2nd generation front-end analog RF amplifier and the Servo/MPEG AV decoder.

To enrich the feature of DVD player, the MT1389HD equips a simplified MPEG-4 advanced simple profile (ASP) video decoder to fully support the DivX1 Home Theater profile. It makes the MT1389-based DVD player be capable of playback MPEG-4 content which become more and more popular.

The progressive scan of the MT1389HD utilized advanced motion-adaptive de-interlace algorithm to achieve the best movie/video playback. It also supports a 3:2 pull down algorithm to give the best film effect. The 108MHz/12-bit video DAC provides users a whole new viewing experience.

2. General Feature lists

(1)Integration DVD player single chip

High performance analog RF amplifier

Servo controller and data channel processing

MPEG-1/MPEG-2/JPEG video

Dolby AC-3/DTS Decoder

Unified memory architecture

Versatile video scaling & quality enhancement

OSD & Sub-picture

Built-in clock generator

Built-in high quality TV encoder

Built-in progressive video processor

Audio effect post-processor

Built-in 5.1-ch Audio DAC

(2)High Performance Analog RF Amplifier

Programmable fc

Dual automatic laser power control

Defect and blank detection

RF level signal generator

(3)Speed Performance on Servo/Channel Decoding

DVD-ROM up to 4XS

CD-ROM up to 24XS

(4)Channel Data Processor

Digital data slicer for small jitter capability

Built-in high performance data PLL for channel data demodulation

EFM/EFM+ data demodulation

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

(5)Servo Control and Spindle Motor Control

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

Built-in ADCs and DACs for digital servo control

Provide 2 general PWM

Tray control can be PWM output or digital output

(6)Embedded Micro controller

Built-in 8032 micro controller

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

1024-bytes on-chip RAM

Up to 2M bytes FLASH-programming interface

Supports 5/3.3-Volt. FLASH interface

Supports power-down mode

Supports additional serial port

(7)DVD-ROM/CD-ROM Decoding Logic

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

Automatic sector Mode and Form detection

Automatic sector Header verification

Decoder Error Notification Interrupt that signals various decoder errors

Provide error correction acceleration

(8)Buffer Memory Controller

Supports 16Mb/32Mb/64Mb SDRAM

Supports 16-bit SDRAM data bus

Provides the self-refresh mode SDRAM

Block-based sector addressing

(9)Video Decode

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

MPEG-4 Advanced Simple Profile

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

Support Nero-Digital

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

Baseline, extended-sequential and progressive JPEG image decoding

Support CD-G titles

(10)Video/OSD/SPU/HLI Processor

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

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

256/16 color RLC format OSD

Automatic scrolling of OSD image

(11)Audio Effect Processing

Dolby Digital (AC-3)/EX decoding

DTS/DTS-ES decoding

MPEG-1 layer 1/layer 2 audio decoding

MPEG-2 layer1/layer2 2-channel audio

High Definition Compatible Digital (HDCD)

Windows Media Audio (WMA)

Dolby ProLogic II

Concurrent multi-channel and downmix out

IEC 60958/61937 output

PCM / bit stream / mute mode

Custom IEC latency up to 2 frames

Pink noise and white noise generator

Karaoke functions

Microphone echo

Microphone tone control

Vocal mute/vocal assistant

Key shift up to +/- 8 keys

Chorus/Flanger/Harmony/Reverb

Channel equalizer

3D surround processing include virtual surround and speaker separation

(12)TV Encoder

Four 108MHz/12bit DACs

Support NTSC, PAL-BDGHINM, PAL-60

Support 525p, 625p progressive TV format

Automatically turn off unconnected channels

Support PC monitor (VGA)

Support Macrovision 7.1 L1, Macrovision 525P and 625P

CGMS-AWSS

Closed Caption

(13)Progressive Scan Video

Automatic detect film or video source

3:2 pull down source detection

Advanced Motion adaptive de-interlace

Minimum external memory requirement

(14)Outline

216-pin LQFP package

3.3/1.8-Volt. Dual operating voltages

3. Pin Definitions

PIN	Main	Alt	Type	Description
RF interface (26)				
231	RFGND18		Ground	Analog ground
132	RFVDD 18		Power	Analog power 1.8V
252	OSP		Analog output	RF Offset cancellation capacitor connecting
253	OSN		Analog output	RF Offset cancellation capacitor connecting
254	RFGC		Analog output	RF AGC loop capacitor connecting for DVD-ROM
255	IREF		Analog input	Current reference input. It generates reference current for RF path. Connect an external 15K resistor to this pin and AVSS
256	AVDD3		Power	Analog power 3.3V
1	AGND		Ground	Analog ground
2	DVDA		Analog input	AC couple input path A
3	DVDB		Analog input	AC couple input path B
4	DVDC		Analog input	AC couple input path C
5	DVDD		Analog input	AC couple input path D
6	DVDRFIP		Analog input	AC coupled DVD RF signal input RFIP

7	DVDRFIN		Analog input	AC coupled DVD RF signal input RFIN
8	MA		Analog input	DC coupled main beam RF signal input A
9	MB		Analog input	DC coupled main beam RF signal input B
10	MC		Analog input	DC coupled main beam RF signal input C
11	MD		Analog input	DC coupled main beam RF signal input D
12	SA		Analog input	DC coupled sub-beam RF signal output A
13	SB		Analog input	DC coupled sub-beam RF signal output B
14	SC		Analog input	DC coupled sub-beam RF signal output C
15	SD		Analog input	DC coupled sub-beam RF signal output D
16	CDFON		Analog input	CD focusing error negative input
17	CDFOP		Analog input	CD focusing error positive input
18	TNI		Analog input	3 beam satellite PD signal negative input
19	TPI		Analog input	3 beam satellite PD signal positive input
ALPC (4)				
20	MIDI1		Analog input	Laser power monitor input
21	MIDI2		Analog input	Laser power monitor input
22	LDO2		Analog output	Laser driver output
23	LDO1		Analog output	Laser driver output
ADC Power (2)				
244	ADCVDD3		Power	Analog 3.3V Power for ADC
245	ADCVSS		Ground	Analog ground for ADC
VPLL (3)				
43	VPLLVSS		Ground	Analog ground for VPLL
44	CAPPAD		Analog In/Out	VPLL External Capacitance connection
45	VPLLVDD3		Power	Analog 3.3V Power for VPLL
Reference voltage (3)				
28	V2REFO		Analog output	Reference voltage 2.8V
29	V20		Analog output	Reference voltage 2.0V
30	VREFO		Analog output	Reference voltage 1.4V
Analog monitor output (7)				
24	SVDD3		Power	Analog power 3.3V
25	CSO	RFOP	Analog output	1) Central servo 2) Positive main beam summing output
26	RFLVL	RFON	Analog output	1) RFRP low pass, or

				2) Negative main beam summing output
27	SGND		Ground	Analog ground
31	FEO		Analog output	Focus error monitor output
32	TEO		Analog output	Tracking error monitor output
33	TEZISLV		Analog output	TE slicing Level
Analog monitor output (6)				
246	RFVDD3		Analog output	Analog Power
247	RFRPDC		Analog Input	RF ripple detect output
248	RFRPAC		Analog output	RF ripple detect input(through AC-coupling)
249	HRFZC		Analog output	High frequency RF ripple zero crossing
250	CRTPLP		Analog output	Defect level filter capacitor connecting
251	RFGND		Ground	Analog Power
RF Data PLL Interface (9)				
235	JITFO		Analog output	Output terminal of RF jitter meter
236	JITFN		Analog Input	Input terminal of RF jitter meter
237	PLLVSS		Ground	Ground pin for data PLL and related analog circuitry
238	IDACEXLP		Analog output	Data PLL DAC Low-pass filter
239	PLLVDD3		Power	Power pin for data PLL and related analog circuitry
240	LPFON		Analog Output	Negative output of loop filter amplifier
241	LPFIP		Analog input	Positive input terminal of loop filter amplifier
242	LPFIN		Analog input	Negative input terminal of loop filter amplifier
243	LPFOP		Analog output	Positive output of loop filter amplifier
Motor and Actuator Driver Interface (10)				
34	OP_OUT		Analog output	Op amp output
35	OP_INN		Analog input	Op amp negative input
36	OP_INP		Analog input	Op amp positive input
37	DMO		Analog output	Disk motor control output. PWM output
38	FMO		Analog output	Feed motor control. PWM output
39	TROPENPW M		Analog output	Tray PWM output/Tray open output
40	PWMOUT1	ADIN0	Analog output	1) 1st General PWM output 2) AD input 0
41	TRO		Analog output	Tracking servo output. PDM output of tracking servo compensator

42	FOO		Analog output	Focus servo output. PDM output of focus servo compensator
50	FG (Digital pin)	ADIN1 GPIO	LVTTL3.3 Input, Schmitt input, pull up, with analog input path for ADIN1	1) Monitor hall sensor input 2) AD input 1 3) GPIO
General Power/Ground (18)				
55 93 142 160 174 213	DVDD18		Power	1.8V power pin for internal digital circuitry
81 178	DVSS		Ground	1.8V ground pin for internal digital circuitry
65 96 118 131 145 156 170 208	DVDD3		Power	3.3V power pin for internal digital circuitry
90 148	DVSS		Ground	3.3V ground pin for internal digital circuitry
Micro Controller and Flash Interface (48)				
62	HIGHA0		In/Out 4~16mA,SRPU	Microcontroller address 8
74	HIGHA1		In/Out 4~16mA,SRPU	Microcontroller address 9
73	HIGHA2		In/Out 4~16mA,SRPU	Microcontroller address 10
72	HIGHA3		In/Out 4~16mA,SRPU	Microcontroller address 11
71	HIGHA4		In/Out 4~16mA,SRPU	Microcontroller address 12
70	HIGHA5		In/Out 4~16mA,SRPU	Microcontroller address 13
69	HIGHA6		In/Out 4~16mA,SRPU	Microcontroller address 14
68	HIGHA7		In/Out 4~16mA,SRPU	Microcontroller address 15
89	AD7		In/Out 4~16mA,SRPU	Microcontroller address/data 7

86	AD6		In/Out 4~16mA,SRPU	Microcontroller address/data 6
85	AD5		In/Out 4~16mA,SRPU	Microcontroller address/data 5
84	AD4		In/Out 4~16mA,SRPU	Microcontroller address/data 4
83	AD3		In/Out 4~16mA,SRPU	Microcontroller address/data 3
82	AD2		In/Out 4~16mA,SRPU	Microcontroller address/data 2
80	AD1		In/Out 4~16mA,SRPU	Microcontroller address/data 1
79	AD0		In/Out 4~16mA,SRPU	Microcontroller address/data 0
92	IOA 0		In/Out 4~16mA,SRPU	Microcontroller address
77	IOA 1		In/Out 4~16mA,SRPU	Microcontroller address 1/ IO
56	IOA 2		In/Out 4~16mA,SRPU	Microcontroller address 2/ IO
57	IOA 3		In/Out 4~16mA,SRPU	Microcontroller address 3/ IO
58	IOA 4		In/Out 4~16mA,SRPU	Microcontroller address 4/ IO
59	IOA 5		In/Out 4~16mA,SRPU	Microcontroller address 5/ IO
60	IOA 6		In/Out 4~16mA,SRPU	Microcontroller address 6/ IO
61	IOA 7		In/Out 4~16mA,SRPU	Microcontroller address 7/ IO
67	A16		In/Out 4~16mA,SRPU	Flash address 16
91	A17		In/Out 4~16mA,SRPU	Flash address 17
63	A18		In/Out 4~16mA, SRPD,SMT	Flash address 18 /IO
64	A19		In/Out 4~16mA, SRPD,SMT	Flash address 19 /IO
75	A20	YUV0	In/Out 4~16mA, SRPD,SMT	5) Flash address 20 /IO 6) While External Flash size <= 1MB: I) Alternate digital video YUV output 0
87	A21	YUV7 GPIO	In/Out 4~16mA, SRPD,SMT	7) Flash address 21 /IO 8) While External Flash size <= 2MB: I) Digital video YUV output 7 II) GPIO
88	ALE		In/Out 4~16mA, SRPD,SMT	Microcontroller address latch enable
78	IOOE#		In/Out 4~16mA, SRPD,SMT	Flash output enable, active low / IO
66	IOWR#		In/Out 4~16mA, SRPD,SMT	Flash write enable, active low / IO
76	IOCS#		In/Out 4~16mA, SRPD,SMT	Flash chip select, active low / IO

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

				I) Serial interface port 0 data-in II) GPIO
206	SPLRCK	SDO0	In/Out	1) Audio left/right channel clock of SPDIF input 2) While SPDIF input is not used: I) Serial interface port 0 data-out II) GPIO
207	SPBCK	SDCS0 ASDATA 5	In/Out	1) Audio bit clock of SPDIF input 2) While SPDIF input is not used: I) Serial interface port 0 chip select II) Audio serial data 5 part I : DSD data sub-woofer Channel or Microphone output III) GPIO
209	ALRCK		In/Out 4mA, PD,SMT	1) Audio left/right channel clock 2) Trap value in power-on reset: I) 1: use external 373 II) 0: use internal 373
210	ABCK	Fs64	In/Out 4mA, SMT	1) Audio bit clock 2) Phase de-modulation
211	ACLK		In/Out 4mA, SMT	Audio DAC master clock
197	ASDATA0		In/Out 4mA, PD,SMT	1) Audio serial data 0 (Front-Left/Front-Right) 2) DSD data left channel 3) Trap value in power-on reset: I) 1: manufactory test mode II) 0: normal operation 4) While using external channels:) GPO_2
202	ASDATA1		In/Out 4mA, PD,SMT	2) Audio serial data 0 (Front-Left/Front-Right) 2) DSD data right channel 3) Trap value in power-on reset: I) 1: manufactory test mode II) 0: normal operation 4) While using external channels: I) GPO_2
203	ASDATA2		In/Out 4mA, PD,SMT	1) Audio serial data 1 (Left-Surround/Right-Surround) 2) DSD data left surround channel 3) Trap value in power-on reset: I) 1: manufactory test mode II) 0: normal operation

				4) While using external channels: I) GPO_1
212	ASDATA3		In/Out 4mA, PD,SMT	1) Audio serial data 2 (Center/LFE) 2) DSD data right surround channel 3) Trap value in power-on reset: I) 1: manufactory test mode II) 0: normal operation 4) While only 2 channels output: I) GPO_0
214	ASDATA4	INT1#	In/Out 4mA, PD,SMT	1) Audio serial data 3 (Center-back/ Center-left-back/Center-right-back, in 6.1 or 7.1 mode) 2) DSD data center channel 18) While only 2 channels output: I) Digital video YUV output 6 II) GPIO
215	MC_DATA	INT2#	In/Out 2mA, PD,SMT	1) Microphone serial input 2) While not support Microphone: I) Microcontroller external interrupt 2 II) GPIO
216	SPDIF		Output 4~16mA, SR: ON/OFF	S/PDIF output
217	APLLVDD3		Power	3.3V Power pin for audio clock circuitry
218	APLLCAP		Analog In/Out	APLL External Capacitance connection
219	APLLVSS		Ground	Ground pin for audio clock circuitry
220	ADACVSS2		Ground	Ground pin for AUDIO DAC circuitry
221	ADACVSS1		Ground	Ground pin for AUDIO DAC circuitry
222	ARF		Output	1) AUDIO DAC Sub-woofer channel output 2) While internal AUDIO DAC not used: GPIO
223	ARS	GPIO	Output	1) AUDIO DAC Right Surround channel output 2) While internal AUDIO DAC not used: a. SDATA3 b. GPIO
224	AR	GPIO	Output	1) AUDIO DAC Right channel output 2) While internal AUDIO DAC not used: a. SDATA1

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

182	YUV6	R/Cr/Pr	Output 4mA, SR	1) Video data output bit 6 2) Red or CR
181	VSYN	V_ADIN1	Output 4mA, SR	1) Vertical sync input/output 2) While no External TV-encoder: I) Vertical sync for video-input II) Version AD input port 1 III) GPIO
180	YUV7	INT3# ASDATA 5	Output 4mA, SR	1) Video data output bit 7 2) While no External TV-encoder: I) Microcontroller external interrupt 3 II) Audio serial data 5 part II : DSD data sub-woofer channel or Microphone output III) GPIO
179	HSYN	INT4# V_ADIN2	Output 4mA, SR	1) Horizontal sync input/output 2) While no External TV-encoder: I) Horizontal sync for video-input II) Version AD input port 2 III) GPIO IV) Microcontroller external interrupt 4
Video Interface (12)				
160	DACVDDC		Power	3.3V power pin for video DAC circuitry
161	VREF		Analog	Bandgap reference voltage
162	FS		Analog	Full scale adjustment
163	DACVSSC		Ground	Ground pin for video DAC circuitry
164	CVBS		In/Out 4mA, SR	Analog composite output
165	DACVDDDB		Power	3.3V power pin for video DAC circuitry
166	DACVSSB		Ground	Ground pin for video DAC circuitry
167	DACVDDA		Power	3.3V power pin for video DAC circuitry
168	Y/G		In/Out 4mA, SR	Green, Y, SY, or CVBS
169	DACVSSA		Ground	Ground pin for video DAC circuitry
170	B/CB/PB		In/Out 4mA, SR	Blue, CB/PB, or SC
171	R/CR/PR		In/Out 4mA,	Red, CR/PR, CVBS, or SY

			SR	
MISC (12)				
108	PRST#		In/Out PD,SMT	Power on reset input, active low
107	ICE		In/Out PD,SMT	Microcontroller ICE mode enable
233	XTALO		Output	27MHz crystal output
234	XTALI		Input	27MHz crystal input
46	USB_VSS		USB Ground	USB ground pin
47	USBP		Analog In/Out	USB port DPLUS analog pin
48	USBM		Analog In/Out	USB port DMINUS analog pin
49	USB_VDD3		Analog In/Out	USB Power pin 3.3V
201	GPIO3		In/Out Pull-Down	GPIO
200	GPIO4		In/Out Pull-Down	GPIO
199	RCLKB	GPIO5	In/Out Pull-Down	GPIO
198	RVREF	GPIO6	In/Out Pull-Down	GPIO
Dram Interface (58) (Sorted by position)				
176	C_0	IO_0(RD1 6)	In/Out Non-pull	1) Digital Video output C bit 0 2) GPIO
175	C_1	IO_1(RD1 7)	In/Out Non-pull	1) Digital Video output C bit 1 2) GPIO
173	C_2	IO_2(RD1 8)	In/Out Non-pull	1) Digital Video output C bit 2 2) GPIO
172	C_3	IO_3(RD1 9)	In/Out Non-pull	1) Digital Video output C bit 3 2) GPIO
171	C_4	IO_4(RD2 0)	In/Out Non-pull	1) Digital Video output C bit 4 2) GPIO
169	C_5	IO_5(RD2 1)	In/Out Non-pull	1) Digital Video output C bit 5 2) GPIO
168	C_6	IO_6(RD2 2)	In/Out Non-pull	1) Digital Video output C bit 6 2) GPIO
167	C_7	IO_7(RD2 3)	In/Out Non-pull	1) Digital Video output C bit 7 2) GPIO
177	IO_17	(DQM2)	In/Out Pull- Up	GPIO
166	YUVCLK	IO_8(DQ M3)	In/Out Pull- Up	1) Digital Video output Clock 2) GPIO

165	Y_0	IO_9(RD2 4)	In/Out Non-pull	1) Digital Video output Y bit 0 2) GPIO
164	Y_1	IO_10(RD 25)	In/Out Non-pull	1) Digital Video output Y bit 1 2) GPIO
163	Y_2	IO_11(RD 26)	In/Out Non-pull	1) Digital Video output Y bit 2 2) GPIO
162	Y_3	IO_12(RD 27)	In/Out Non-pull	1) Digital Video output Y bit 3 2) GPIO
161	Y_4	IO_13(RD 28)	In/Out Non-pull	1) Digital Video output Y bit 4 2) GPIO
159	Y_5	IO_14(RD 29)	In/Out Non-pull	1) Digital Video output Y bit 5 2) GPIO
158	Y_6	IO_15(RD 30)	In/Out Non-pull	1) Digital Video output Y bit 6 2) GPIO
157	Y_7	IO_16(RD 31)	In/Out Non-pull	1) Digital Video output Y bit 7 2) GPIO
155	RA4		In/Out	DRAM address 4
154	RA5		In/Out	DRAM address 5
153	RA6		In/Out	DRAM address 6
152	RA7		In/Out	DRAM address 7
151	RA8		In/Out	DRAM address 8
150	RA9		In/Out	DRAM address 9
149	RA11		In/Out	DRAM address bit 11
147	CKE		In/Out Pull-Down	DRAM clock enable
146	RCLK		In/Out	Dram clock
144	RA3		In/Out	DRAM address 3
143	RA2		In/Out	DRAM address 2
141	RA1		In/Out	DRAM address 1
140	RA0		In/Out	DRAM address 0
139	RA10		In/Out	DRAM address 10
138	BA1		In/Out	DRAM bank address 1
137	BA0		In/Out	DRAM bank address 0
136	RCS#		output	DRAM chip select, active low
135	RAS#		output	DRAM row address strobe, active low
134	CAS#		output	DRAM column address strobe, active low

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

3.5.2 Function introduction to AM5898

1. DESCRIPTION

The AM5898N is a 4-channel BTL driver IC for driving the motors and actuators such as used in DVD player and consists of two DC-DC Step Down Converters. It is pretty fit for portable DVD player application. Package material is Pb Free for environmental protection.

2. PIN DESCRIPTION

PIN No	Pin Name	Function	PIN No	Pin Name	Function
1	EN2	Enable pin for buck converter 2	18	VOTK-	Tracking driver output (-)
2	CT2	Timing capacitor input 2	19	MGND	Ground for motor driver
3	COMP2	Comparator inverting input 2	20	VOSP+	Spindle driver output (+)
4	SW2	Switching output 2	21	VOSP-	Spindle driver output (-)
5	IPK2	Current sense 2	22	VINSP	Input for spindle driver
6	PVcc1	Vcc for step down converter 1	23	VINTK	Input for tracking driver
7	PVcc2	Vcc for step down converter 2	24	Vcc2	Vcc for power block of spindle , tracking and focus
8	VOFC+	Focus driver output (+)	25	PGND	Ground for analog ground
9	VOFC-	Focus driver output (-)	26	PGND1	Ground for step down converter 1
10	Vcc1	Vcc for power block of sled	27	PGND2	Ground for step down converter 2
11	VINFC	Input for focus driver	28	IPK1	Current sense 1
12	VINSL+	Input for the sled driver	29	SW1	Switching output 1
13	MGND	Ground for motor driver	30	COMP1	Comparator inverting input 1
14	VOSL+	Sled driver output (+)	31	CT1	Timing capacitor input 1
15	VOSL-	Sled driver output (-)	32	EN1	Enable pin for buck converter 1
16	MGND	Ground for motor driver	33	MUTE	Input for mute control
17	VOTK+	Tracking driver output (+)	34	BIAS	Input for reference voltage

3.5.3 Function introduction to NJM4580

1. Description

NJM4580 is the dual operational amplifier, specially designed for improving the tone control, which is most suitable for the audio application.

Featuring noiseless, higher gain bandwidth, high output current and low distortion ratio, and it is most suitable not only for acoustic electronic parts of audio pre-amp and active filter, but also for the

industrial measurement tools. It is also suitable for the head phone amp at higher output current, and further more, it can be applied for the handy type set operational amplifier of general purpose in application of low voltage single supply type which is properly biased of the low voltage source.

2. FEATURES

Operating Voltage ($\pm 2V \sim \pm 18V$)

Low Input Noise Voltage ($0.8\mu V_{rms}$ typ.)

Wide Gain Bandwidth Product ($15MHz$ typ.)

Low Distortion (0.0005% typ.)

Slew Rate ($5V/\mu s$ typ.)

Package Outline DIP8,SIP8,EMP8,SSOP8,DMP8

Bipolar Technology

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

3.5.4 Function introduction to SDRAM

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

Pin	Name	Function	Signal flow	Pin	Name	Function	Signal flow
1	VDD	3.3V power supply	P	28	VSS	Ground	P
2	DQ0	Data bus	I/O	29	MA4	Address bus	I
3	VDDQ	3.3V power supply	I/O	30	MA5	Address bus	I
4	DQ1	Data bus	I/O	31	MA6	Address bus	I

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

3.5.5 Function introduction to FLASH

29LV160BE is a 16Mbit FLASH memorizer, and the damage of U214 may cause troubles, such as power not on, no disc reading and power on picture mosaic. Pin function is shown as the following table:

Pin	Name	Function	Voltage (when no disc)	Data direction
1-9, 16-25, 48	AO-A19	20 bit address bus		I
11	WE	Write enable signal, low level is effective	3.23V	I

12	RESET	Reset, low level is effective	3.23V	I
10、 13、 14	NC	Blank pin		
15	RY/BY	Ready/system busy	3.23V	O
26	CE	Chip enable, low level effective	0V	I
27、 46	VSS	Ground		P
28	OE	Output enable signal , low level is effective	0V	I
29-3、 6、 38-44	DQ0-DQ14	15 bit data bus		O
37	VCC	5V power supply	+5V	P
45	DQ15/A-1	Take word extend mode as data line, and bit extend mode as address line		I/O
47	BYTE	Select 8-bit or 16-bit output mode. High level is 16-bit output and low level is 8-bit output		I

3.5.6 Function introduction to T112

1. DESCRIPTION

The T112 is a highly integrated All-in-one Visual Processor that provides major cost saving solution for the portable applications. T112 has built-in high performance dual ADCs, TCON, Triple DACs, Scaling Machine with sophisticated upscaling and downscaling algorithms. The Innovative integrated “Frame-Buffer-Less” De-interlacer can significantly reduce system cost. The T112 also integrates On Screen Display engine with 1K-word of font RAM. The device can interface to an external micro-controller through 2-wire serial bus interface.

2. FEATURES

(1) Cost Effective Highly Integrated Triple ADC + + 2D Video Decoder + OSD + Scaler + TCON

- Integrates 9-bit Analog to Digital Converters (ADC) & Phase Locked Loop (PLL)
- Scaler supports 2-D adaptive intra-field de-interlacer and non-linear 16:9 aspect ratio.
- Requires no external Frame Buffer Memory for deinterlacer.
- Advanced On Screen Display (OSD) function
- Programmable Timing Controller (Tcon) for Car TV applications
- Multi-standard color decoder with 2D adaptive comb filter
- Innovative and flexible design to reduce total system cost

(2) Triple 9-bit Analog to Digital Converters (ADC)

27 MSPS Conversion Rate

- Built-in Pre-amp, mid-level & ground clamp circuit
- Automatic Clamp Control for CVBS, Y and C

- Programmable Static Gain Control or Automatic Gain Control for CVBS or Y/C
- Max Input configuration up to 4xCVBS or 2xS-video

(3) Digital Video Enhancement

Separate Luminance and Chroma Enhancer

- Y Supports Luminance Peaking, DLTI, Black Level Expansion, Contrast and Brightness adjustment
- C Supports DCTI, Saturation and Hue adjustment.

(4) Advanced Scaling Engine

Two Dimensions FIR Scaler

- Coefficient based sharpness filters
- 2-D edge enhancement
- Independent vertical and horizontal scaling ratio
- 16:9 Non-linear Aspect ratio

LCD Interface

- Provides Gamma correction for panel compensation
- Supports image pan functions
- Programmable Timing Controller
- RGB Triple DAC output

Color Management

- Coef Programmable YCbCr-to-RGB Color Space Converter
- RGB Gamma Correction

Built-in On Screen Display Engine

- 1K-word OSD SRAM memory
- Supports font or bitmap modes
- Supports character blinking, overlay, shadow and border functions
- Fully programmable character mapping
- Supports alpha blending & Zoom-in/Zoom-out function
- Optional fonts can be stored in off-chip serial EEPROM

Versatile VBI Data Decoder

- Supports Close Caption, Wide Screen Signalling and Teletext

Crystal Oscillator Circuit

- Direct interface to a (27.0MHz) Crystal
- Also provide a buffered clock output for external Micro-controller

Digital Test Pattern Generator

- Programmable standard & special panel burn-in test patterns
- Support special border frame blocking mode

Independent Display Phase Lock Loop

- Generates pixel clock output to panel
- Supports free run OSD mode

Serial Bus Interface

- Supports 2-wire (normal speed)

Pulse Width Modulation Outputs

Design For Testability

- Scan chain insertion
- Separated analog & digital test modes

3. PIN DESCRIPTION

Symbol	Pin No.	Type	Description
Power Supplies			
VDD18	8,18,29,39	PWR	+1.8V digital core power supply
VDD33	6,19,31	PWR	+3.3V digital output power supply
AVDDG	49	PWR	+3.3V analog power supply for ADC channel 1
AVDDR	45	PWR	+3.3V analog power supply for ADC channel 0
GND	7,15,21,28, 40	GND	Digital ground
AGNDG	52	GND	Analog ground for ADC channel 1
AGNDR	48	GND	Analog ground for ADC channel 0
VD5V	4	PWR	+5.0V analog power supply for DAC
VD3V	64	PWR	+3.3V analog power supply for VCOM and DAC
AVDD	59	PWR	+1.8V Analog Power Supply for DAC
VS3V	2	GND	Analog ground for DAC
AVSS	58	GND	Analog ground for DAC
Output Interface Signals			
RSET	63	AO	DAC reference current adjustment
VBFG	62	AO	Voltage reference output
IOR	1	AO	Channel R current output
IOG	3	AO	Channel G current output
IOB	5	AO	Channel B current output
CPH1	20	DO	Output data clock
CPH2/sD0	17	DO	Output data clock/the bit 0 of serial interfaced panel

CPH3/sD1	16	DO	Output data clock/the bit 1 of serial interfaced panel
VSO/STH1	23	DO	Vertical synchronization output signal.
HSO/POL	24	DO	Horizontal synchronization output signal.
DEN/STH2	22	DO	Horizontal data enable
Timing Controller Interface Signals			
Q1H/sD2	14	DO	Source Driver Q1H/the bit 2 of serial interfaced panel
LP/sD3	13	DO	Latch pulse for source driver/the bit 3 of serial interfaced panel
GCLK/sD4	12	DO	Gate driver clock/the bit 4 of serial interfaced panel
GOE/sD5	11	DO	Gate driver output enable/the bit 5 of serial interfaced panel
STV1/sD6	10	DO	Gate Driver start pulse/the bit 6 of serial interfaced panel
STV2/sD7	9	DO	Gate Driver start pulse/the bit 7 of serial interfaced panel
VCOMAMP	61	DO	Analog VCOM amplitude
VCOMDC	60	DO	Analog VCOM DC offset
2-wire serial bus Interface Signals			
SCL	36	DI	2-wire serial bus clock. Power down does not affect SCL.
SDA/IICA3	37	I/O	2-wire serial bus data. Power down does not affect SDA.
Configuration interface Signals			
CPUINT	35	I/O	Internal Interrupt.
RSTB	38	DI	Whole chip reset. (Internal Pull-up)
ADC Interface			
AY1	51	AI	Analog input 1 of channel 1
AY0	50	AI	Analog input 0 of channel 1
ACR1	47	AI	Analog input 1 of channel 0
ACR0	46	AI	Analog input 0 of channel 0
PLL Reference Clock			
XTALI	34	DI	Output PLL reference clock input
XTALO	33	DO	Output PLL reference clock output
XCLK2MC	32	DO	Buffered XTALI for external microprocessor.
Power Management Interface Signals			
PWM1	30	DO	Pulse Width Modulation for volume/backlight control.
PWM2	27	DO	Pulse Width Modulation for volume/backlight control.

3.5.7 Function introduction to NJM3414A

1. DESCRIPTION

The NJM3414A integrated circuit is a high gain, high output current, high output voltage swing dual operational amplifier capable of driving 70mA.

2. FEATURES

- Single Supply
- Operating Voltage (+3V~+15V)
- High Output Current (70mA typ.)
- Slew Rate (1.0V/ μ s typ.)
- Package Outline DIP8,DMP8,SIP8,SSOP8
- Bipolar Technology

3.5.8 Function introduction to MAX9702

1. DESCRIPTION

The MAX9702 combines a highly efficient Class D speaker amplifier with a high-linearity Class AB headphone amplifier. This ensures maximum battery life in speaker mode and maximum performance in headphone mode. The MAX9702 delivers up to 1.8W per channel into an 8 Ω load from a 5V power supply. Maxim's 2nd-generation, spread-spectrum modulation scheme renders the traditional Class D output filter unnecessary.

The MAX9702 speaker amplifier offers two modulation schemes: a fixed-frequency (FFM) mode and a spread spectrum (SSM) mode that reduces EMI-radiated emissions.

The MAX9702 speaker amplifier features a fully differential architecture, full-bridged (BTL) output, and comprehensive click-and-pop suppression. The MAX9702 speaker amplifier features high 75dB PSRR, low 0.07% THD+N, and SNR in excess of 97dB. Short circuit and thermal-overload protection prevent the device from being damaged during a fault condition.

The headphone amplifier uses Maxim's patented Direct Drive™ architecture that produces a ground-referenced output from a single supply, eliminating the need for large DC-blocking capacitors, saving cost, board space, and component height. A high 80dB PSRR and low 0.02% THD+N ensures clean, low-distortion amplification of the audio signal.

An I²C interface sets the speaker and headphone gain, mono, stereo, and mute functions. The MAX9702 is available in 28-pin, thin QFN-EP (5mm x 5mm x 0.8mm) and 28-pin TSSOP packages. The MAX9702 is specified over the extended -40°C to +85°C temperature range.

2. FEATURES

- Patented Spread-Spectrum Modulation Reduces EMI Emissions
- Programmable Mono, Stereo, Mute, and Mix Functions

1.1W Stereo Output (8 Ω , VDD = 5V)
 48mW Headphone Output (32 Ω , VDD = 3.3V)
 95% Efficiency (RL = 8 Ω , PO = 1.1W)
 High 73dB PSRR (f = 217Hz)
 I2C Programmable Gain Up to +21dB
 Integrated Click-and-Pop Suppression
 Low-Power Shutdown Mode (0.1 μ A)
 Short-Circuit and Thermal-Overload Protection
 $\pm$ 8kV (HBM) ESD-Protected Headphone Driver Outputs

3. PIN DESCRIPTION

PIN No	Symbol	Description
4, 25	PVDD	H-Bridge Power Supply. Connect to VDD and bypass each PVDD with a 0.1 μ F capacitor to PGND.
5	SYNC_OUT	Clock Signal Output. Float SYNC_OUT if not used.
6	SCL	I2C Serial Clock. Connect a pullup resistor to VDD (see I2C Interface section).
7	SDA	I2C Serial Data. Connect a pullup resistor to VDD (see I2C Interface section).
8	BIAS	Common-Mode Voltage. Bypass to GND with a 1 μ F capacitor.
9	SYNC	Frequency Mode Select: SYNC = GND: Fixed-frequency mode with fS = 1100kHz. SYNC = Float: Fixed-frequency mode with fS = 1340kHz. SYNC = VDD: Spread-spectrum mode with fS = 1150kHz $\pm$ 50kHz. SYNC = Clocked: Fixed-frequency mode with fS = external clock frequency.
10	CPVDD	Charge-Pump Power Supply. Connect to VDD and bypass to CPGND with a 1 μ F capacitor.
11	C1P	Charge-Pump Flying-Capacitor Positive Terminal. Connect a 1 μ F capacitor from C1P to C1N.
12	CPGND	Charge-Pump Power Ground. Connect to PGND.
13	C1N	Charge-Pump Flying-Capacitor Negative Terminal. Connect a 1 μ F capacitor from C1N to C1P.
14	CPVSS	Charge-Pump Negative Output. Bypass with a 1 μ F capacitor to CPGND.
15	VSS	Headphone Amplifier Negative Supply. Connect to CPVSS.
16	HPL	Left-Channel Headphone Output
17	HPR	Right-Channel Headphone Output
18	VDD	Analog Power Supply. Bypass with a 1 μ F capacitor to GND.
19	GND	Analog Ground. Connect to PGND.

20	INR	Right-Channel Audio Input
21	INL	Left-Channel Audio Input
22	INM	Mono Audio Input
23	HPS	Headphone Sense: HPS = VDD: Headphone mode. HPS = GND: Speaker mode.
24	SHDN	Active-Low Shutdown. Connect to VDD for normal operation.
26	OUTR+	Right-Channel Positive Amplifier Output
27	OUTR-	Right-Channel Negative Amplifier Output
1, 28	PGND	Power Ground. Connect to GND.
2	OUTL-	Left-Channel Negative Amplifier Output
3	OUTL+	Left-Channel Positive Amplifier Output
—	EP	Exposed Pad. The external pad lowers the package's thermal impedance by providing a direct heat conduction path from the die to the printed circuit board. The exposed pad is internally connected to VSS. Connect the exposed thermal pad to an isolated plane if possible or VSS.

3.5.9 Function introduction to RT9701CB

1. DESCRIPTION

The RT9701 is an integrated 100mΩ power switch for self-powered and bus-powered Universal Series Bus (USB) applications. A built-in charge pump is used to drive the N-channel NMOSFET that is free of parasitic body diode to eliminate any reversed current flow across the switch when it is powered off. Its low quiescent supply current (23 μA) and small package (SOT-25) is particularly suitable in battery-powered portable equipment.

Several protection functions include soft start to limit inrush current during plug-in, current limiting at 1.5A to meet USB power requirement, and thermal shutdown to protect damage under over current conditions.

2. FEATURES

100mΩ Typ. High-Side NMOSFET (SOT- 25)

Guaranteed 1.1A Continuous Current

1.5A Current Limit

Small SOT- 25 Package Minimizes Board Space

Soft Start

Thermal Protection

Low 23 μA Supply Current

Wide Input Voltage Range: 2.2V ~ 6V

UL Approved - #E219878

3. PIN DESCRIPTION

PIN No	Symbol	I/O	Description
1 , 5	VOUT	O	Output Voltage
2	GND	P	Ground
3	VIN	I	Power Input
4	CE	I	Chip Enable

3.5.10 Function introduction to LM1117

1. Description

The LM1117 series of adjustable and fixed voltage regulators are designed to provide 1A output current and to operate down to 1V input-to-output differential. The dropout voltage of the device is guaranteed maximum 1.3V at maximum output current, decreasing at lower load currents.

On-chip trimming adjusts the reference voltage to within 1% accuracy. Current limit is also trimmed, minimizing the stress under overload conditions on both the regulator and power source circuitry.

The LM1117 devices are pin compatible with other three-terminal SCSI regulators and are offered in the low profile surface mount SOT-223 package and in the TO-252 (DPAK) plastic package.

2. Features

Three Terminal Adjustable or Fixed Voltages 1.5V, 1.8V, 2.5V, 2.85V, 3.3V and 5.0V

Output Current of 1A

Operates Down to 1V Dropout

Line Regulation: 0.2% Max.

Load Regulation: 0.4% Max.

SOT-223 and TO-252 package available

3. PIN DESCRIPTION

PIN No.	Symbol	I/O	Description
1	GND/adjust	I	Ground (fixed)/adjust (adjustable)
2	Vout	O	Voltage output
3	Vin	I	Voltage input

3.5.11 Function introduction to AMS1117

1. DESCRIPTION

The AMS1117 series of adjustable and fixed voltage regulators are designed to provide 1A output current

and to operate down to 1V input-to-output differential. The dropout voltage of the device is guaranteed maximum 1.3V at maximum output current, decreasing at lower load currents.

On-chip trimming adjusts the reference voltage to 1%. Current limit is also trimmed, minimizing the stress under overload conditions on both the regulator and power source circuitry. The AMS1117 devices are pin compatible with other three-terminal SCSII regulators and are offered in the low profile surface mount SOT-223 package and in the TO-252 (DPAK) plastic package.

2. FEATURES

Three Terminal Adjustable or Fixed Voltages 1.5V, 1.8V, 2.5V, 2.85V, 3.3V and 5.0V

Output Current of 1A

Operates Down to 1V Dropout

Line Regulation: 0.2% Max.

Load Regulation: 0.4% Max.

SOT-223 and TO-252 package available

3. PIN DESCRIPTION

PIN No.	Symbol	I/O	Description
1	GND/adjust	I	Ground (fixed)/adjust (adjustable)
2	Vout	O	Voltage output
3	Vin	I	Voltage input

3.5.12 Function introduction to

1. PSoC™ Functional Overview

The PSoC™ family consists of many *Mixed-Signal Array with On-Chip Controller* devices. These devices are designed to replace multiple traditional MCU-based system components with one, low cost single-chip programmable component. A PSoC device includes configurable blocks of analog and digital logic, as well as programmable interconnect. This architecture allows the user to create customized peripheral configurations, to match the requirements of each individual application. Additionally, a fast CPU, Flash program memory, SRAM data memory, and configurable IO are included in a range of convenient pinouts.

The PSoC architecture, as illustrated on the left, is comprised of four main areas: the Core, the System Resources, the Digital System, and the Analog System. Configurable global bus resources allow all the device resources to be combined into a complete custom system. Each CY8C21x34 PSoC device includes four digital blocks and four analog blocks. Depending on the PSoC package, up to 28 general purpose IO (GPIO) are also included. The GPIO provide access to the global digital and analog interconnects.

2. PIN DESCRIPTION

PIN NO.	Type		Name	Description
	Digital	Analog		
1	IO	I, M	P0[7]	Analog column mux input.
2	IO	I, M	P0[5]	Analog column mux input and column output.
3	IO	I, M	P0[3]	Analog column mux input and column output, integrating input.
4	IO	I, M	P0[1]	Analog column mux input, integrating input.
5	IO	M	P2[7]	
6	IO	M	P2[5]	
7	IO	I, M	P2[3]	Direct switched capacitor block input.
8	IO	I, M	P2[1]	Direct switched capacitor block input.
9	Power		Vss	Ground connection.
10	IO	M	P1[7]	I2C Serial Clock (SCL).
11	IO	M	P1[5]	I2C Serial Data (SDA).
12	IO	M	P1[3]	
13	IO	M	P1[1]	I2C Serial Clock (SCL), ISSP-SCLK.
14	Power		Vss	Ground connection.
15	IO	M	P1[0]	I2C Serial Data (SDA), ISSP-SDATA.
16	IO	M	P1[2]	
17	IO	M	P1[4]	Optional External Clock Input (EXT-CLK).
18	IO	M	P1[6]	
19	Input		XRES	Active high external reset with internal pull down.
20	IO	I, M	P2[0]	Direct switched capacitor block input.
21	IO	I, M	P2[2]	Direct switched capacitor block input.
22	IO	M	P2[4]	
23	IO	M	P2[6]	
24	IO	I, M	P0[0]	Analog column mux input.
25	IO	I, M	P0[2]	Analog column mux input.
26	IO	I, M	P0[4]	Analog column mux input
27	IO	I, M	P0[6]	Analog column mux input.
28	Power		Vdd	Supply voltage.

3.5.13 Function introduction to BH1417F

1. DESCRIPTION

The BH1417F is a FM stereo transmitter IC that transmits simple configuration. The IC consists of a

stereo modulator for generating stereo composite signals and a FM transmitter for broadcasting a FM signal on the air. The stereo modulator generates a composite signal which consists of the MAIN, SUB, and pilot signal from a 38kHz oscillator. The FM transmitter radiates FM wave on the air by modulating the carrier signal with a composite signal. Frequency is set for North America.

2. FEATURES

It is possible to improve the timbre because it has the pre-emphasis circuit, limiter circuit, and the low-pass filter circuit.

Built-in pilot-tone system FM stereo modulator circuit.

The transmission frequency is stable because it has a PLL system FM transmitter circuit.

PLL controls data input in parallel (4bits, 14ch for North America).

3.5.14 Function introduction to LM393

1. DESCRIPTION

The LM193 series consists of two independent precision voltage comparators with an offset voltage specification as low as 2.0 mV max for two comparators which were designed specifically to operate from a single power supply over a wide range of voltages. Operation from split power supplies is also possible and the low power supply current drain is independent of the magnitude of the power supply voltage. These comparators also have a unique characteristic in that the input common-mode voltage range includes ground, even though operated from a single power supply voltage.

Application areas include limit comparators, simple analog to digital converters; pulse, square wave and time delay generators; wide range VCO; MOS clock timers; multi vibrators and high voltage digital logic gates. The LM193 series was designed to directly interface with TTL and CMOS. When operated from both plus and minus power supplies, the LM193 series will directly interface with MOS logic where their low power drain is a distinct advantage over standard comparators.

2. FEATURES

Wide supply

— Voltage range: 2.0V to 36V

— single or dual supplies: $\pm 1.0\text{V}$ to $\pm 18\text{V}$

Very low supply current drain (0.4 mA) — independent of supply voltage

Low input biasing current: 25 nA

Low input offset current: $\pm 5\text{ nA}$

Maximum offset voltage: $\pm 3\text{ mV}$

Input common-mode voltage range includes ground

Differential input voltage range equal to the power supply voltage

Low output saturation voltage,: 250 mV at 4 mA

Output voltage compatible with TTL, DTL, ECL, MOS and CMOS logic systems

3.5.15 Function introduction to 24C02

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 operation are essential. The AT24C02 is available in space-saving 8-lead PDIP,

8-lead MAP, 8 lead TSSOP and 8-ball dBG2 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 dBG2™ Packages

3. PIN DESCRIPTION

PIN No.	Symbol	I/O	Description
1	A0		To Ground

2	A1		To Ground
3	A2		To Ground
4	VSS	P	To Ground
5	SDA	I/O	Serial Data input
6	SCL	I/O	Serial SCL input
7	TEST	I/O	Test port
8	VDD	P	Positive Power Supply

3.5.16 Function introduction to AZ431

AZ431 is a 2.5V comparator, shown as the figure 3.5.16.1. Compared the inputted voltage of R end with 2.5V, when voltage of R end is more than 2.5V, KA end is on and photoelectric coupler starts to send out photocurrent; when voltage of R end is less than 2.5V, KA end is cutoff and photoelectric coupler does not send out photocurrent. CPU+3.3V in power board circuit must be kept in 3.3V, for the function of comparator. No matter more than or less than 3.3V, through on and off status of comparator, it will control the on state of the output end of photoelectric coupler LM431A to adjust the output space occupation ratio of switch module to control the output voltage of transformer and masthead the power.

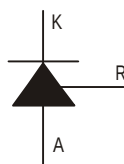


Figure 3.5.16.1 LM431A outside drawing

3.5.17 Function introduction to S3F9454

1. DESCRIPTION

Samsung's SAM88RCRI family of 8-bit single-chip CMOS micro controllers offers a fast and efficient CPU, a wide range of integrated peripherals, and various mask-programmable ROM sizes.

A address/data bus architecture and a large number of bit-configurable I/O ports provide a flexible programming environment for applications with varied memory and I/O requirements. Timer/counters with selectable operating modes are included to support real-time operations.

2. FEATURES

CPU

- SAM88RCRI CPU core

- The SAM88RCRI core is low-end version of the current SAM87 core.

Memory

- 2/4-Kbyte internal program memory
- 208-byte general purpose register area

Instruction Set

- 41 instructions
- The SAM88RCRI core provides all the SAM87 core instruction except the word-oriented instruction,

multiplication, division, and some one-byte instruction.

Instruction Execution Time

- 400 ns at 10 MHz fOSC (minimum)

Interrupts

- 4 interrupt sources with one vector
- One interrupt level

General I/O

- Three I/O ports (Max 18 pins)
- Bit programmable ports

8-bit High-speed PWM

- 8-bit PWM 1-ch (Max: 156 kHz)
- 6-bit base + 2-bit extension

Built-in reset Circuit

- Low voltage detector for safe reset

Timer/Counters

- One 8-bit basic timer for watchdog function
- One 8-bit timer/counter with time interval modes

A/D Converter

- Nine analog input pins
- 10-bit conversion resolution

Oscillation Frequency

- 1 MHz to 10 MHz external crystal oscillator
- Maximum 10 MHz CPU clock
- Internal RC: 3.2 MHz (typ.), 0.5 MHz (typ.) in

V_{DD} = 5 V

Operating Temperature Range

- – 40°C to + 85°C

Operating Voltage Range

- 2.0 V (LVR Level) to 5.5 V

Smart Option

Package Types

- S3C9452/C9454:
 - 20-DIP-300A
 - 20-SOP-375
 - 16-DIP-300A
- S3C9442/C9444
 - 8-DIP-300
 - 8-SOP-225

3. PIN DESCRIPTION

Pin Name	In/Out	Pin Description	Pin Type	Share Pins
P0.0–P0.7	I/O	Bit-programmable I/O port for Schmitt trigger input or push-pull output. Pull-up resistors are assignable by software. Port0 pins can also be used as A/D converter input, PWM output or external interrupt input.	E-1	ADC0–ADC7 INT0/INT1 PWM
P1.0–P1.1	I/O	Bit-programmable I/O port for Schmitt trigger input or push-pull, open-drain output. Pull-up resistors or pull-down resistors are assignable by software.	E-2	XIN, XOUT
P1.2	I	Schmitt trigger input port	B	RESET
P2.0–P2.6	I/O	Bit-programmable I/O port for Schmitt trigger input or push-pull, open-drain output. Pull-up resistors are assignable by software.	E E-1	– ADC8/CLO T0
XIN, XOUT	–	Crystal/Ceramic, or RC oscillator signal for system clock.		P1.0–P1.1
RESET	I	Internal LVR or External RESET	B	P1.2
VDD, VSS	–	Voltage input pin and ground		–
CLO	O	System clock output port	E-1	P2.6
INT0–INT1	I	External interrupt input port	E-1	P0.0, P0.1
PWM	O	8-Bit high speed PWM output	E-1	P0.6
T0	O	Timer0 match output	E-1	P2.0
ADC0–ADC8	I	A/D converter input	E-1 E	P0.0–P0.7 P2.6

Chapter Four

Assembly and Disassembly Process

In order to know the structure of DVD player DL377SI easily, visibly and quickly, now each key link of the disassembly and assembly process of the player is presented in means of pictures to prevent users from incorrect operating and damaging elements. This player is divided into: the unit, loader, loader components, control panel components, decode control components, power board components, AV board components, MIC board components and remote controller. You are suggested to operate according to illustrations strictly.

4.1 Disassembly process for the player



1.Remove battery: take down battery case cover and then close the bracket.



2. Remove bottom casing screws: use electric screwdriver to remove the 10 screws shown in the picture. Pay attention to adjust the torsion of electric screwdriver and do not damage panel and screws.



3.Remove bottom casing: use nails to take down bottom casing slightly from the slot of bottom casing and front casing. Pay attention not to damage the clasp on front casing.



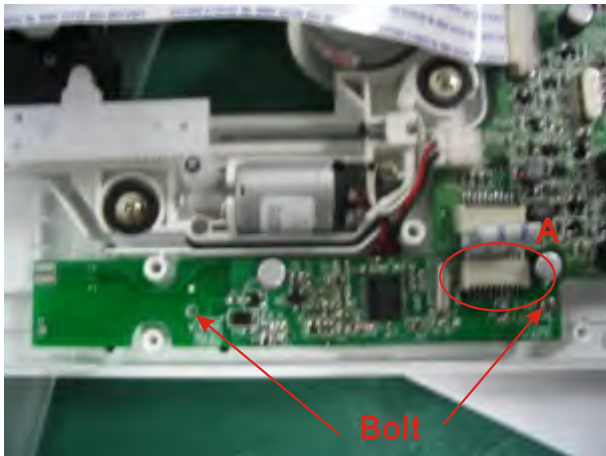
4.Remove bottom casing: pull out power flat cable in position A and B in the picture and then use iron to weld down the ground wire in position C.



5. Overturn the bottom casing, unplug flat cable in position A of the picture and take down bottom casing.



6. Remove FM board flat cable: use iron to take down FM antenna and loudspeaker flat cable in position A of the picture.



7. Remove FM board: use electric screwdriver to remove the 2 screws shown in the picture, unplug flat cable in position A and take down FM board.



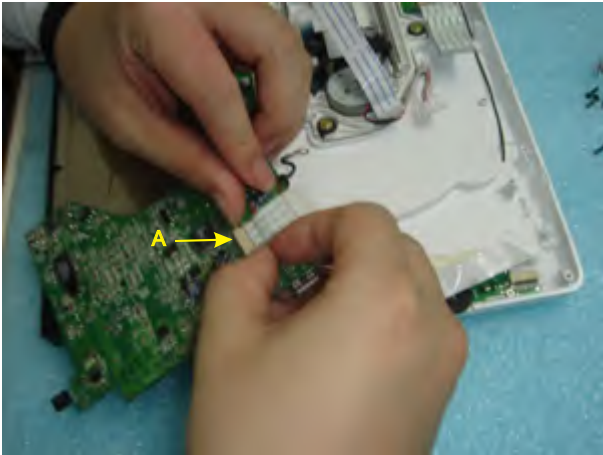
8. Remove decode board flat cable: use iron to take down the loudspeaker line in position A and ground wire in position B and then unplug flat cable in position C and D.



9. Remove decode board flat cable: unplug flat cable in position A and B of the picture. When removing flat cable in position A, open flat cable clasp according to the arrow direction shown in the picture firstly and then unplug flat cable slightly.



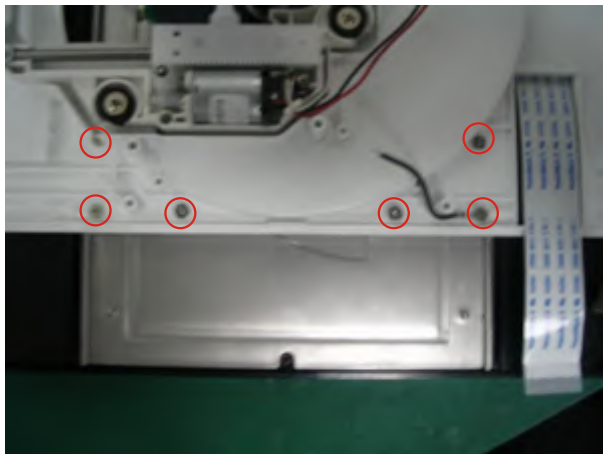
10. Remove decode board: use electric screwdriver to take down 4 screws shown in the picture, take down decode board and overturn it.



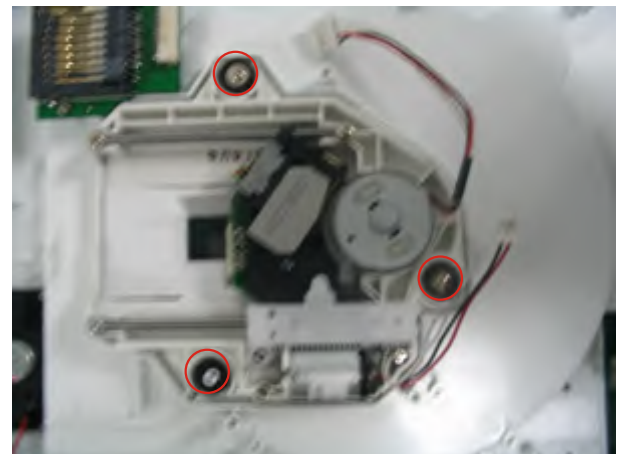
11. Remove display screen flat cable: overturn decode board, take down display screen flat cable in position A and pay attention to the clasp on socket. Take down flat cable in position B and C and then take down the flat cable.



12. Remove volume control board: use electric screwdriver to take down 2 screws shown in the picture and then take down volume control board.



13. Remove display components: use electric screwdriver to take down 6 screws shown in the picture and then take down display screen.



14. Remove loader: use electric screwdriver to remove the 3 screws shown in the picture and then remove display screen. Pay attention to the anti-static measures.

4.1 Assembly process for the player

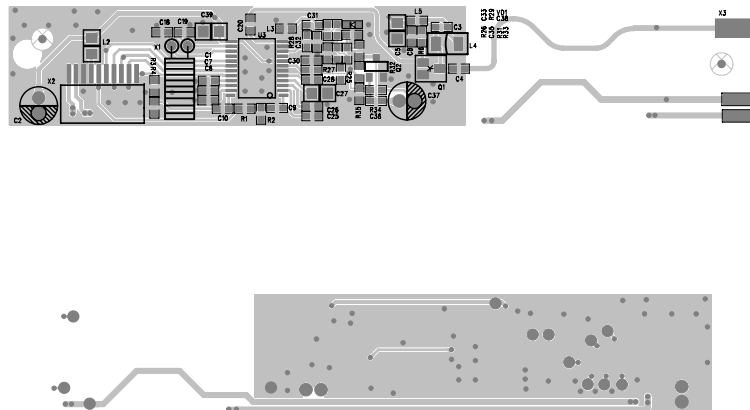
The assembly process of the player is similar to that of disassembly, only the sequence is reverse.

Chapter Cinque

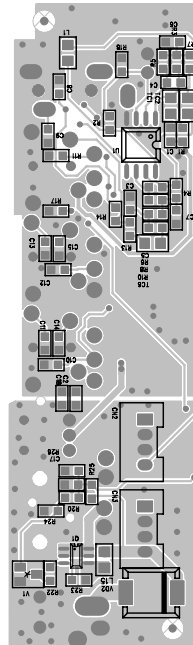
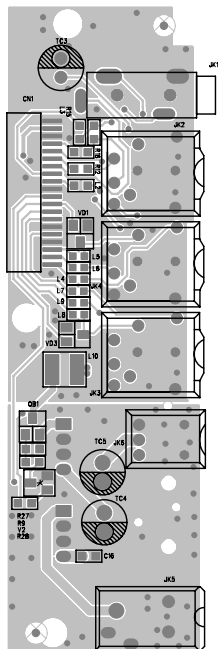
PCB board & Circuit diagram

Section One PCB board

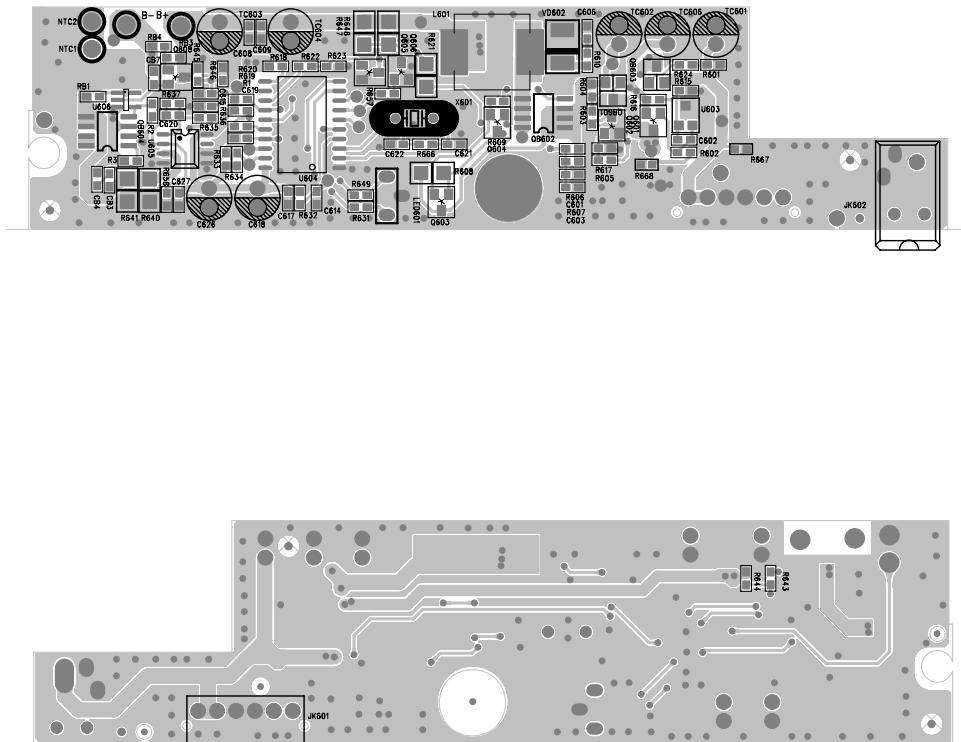
5.1.1 FM transmit Board



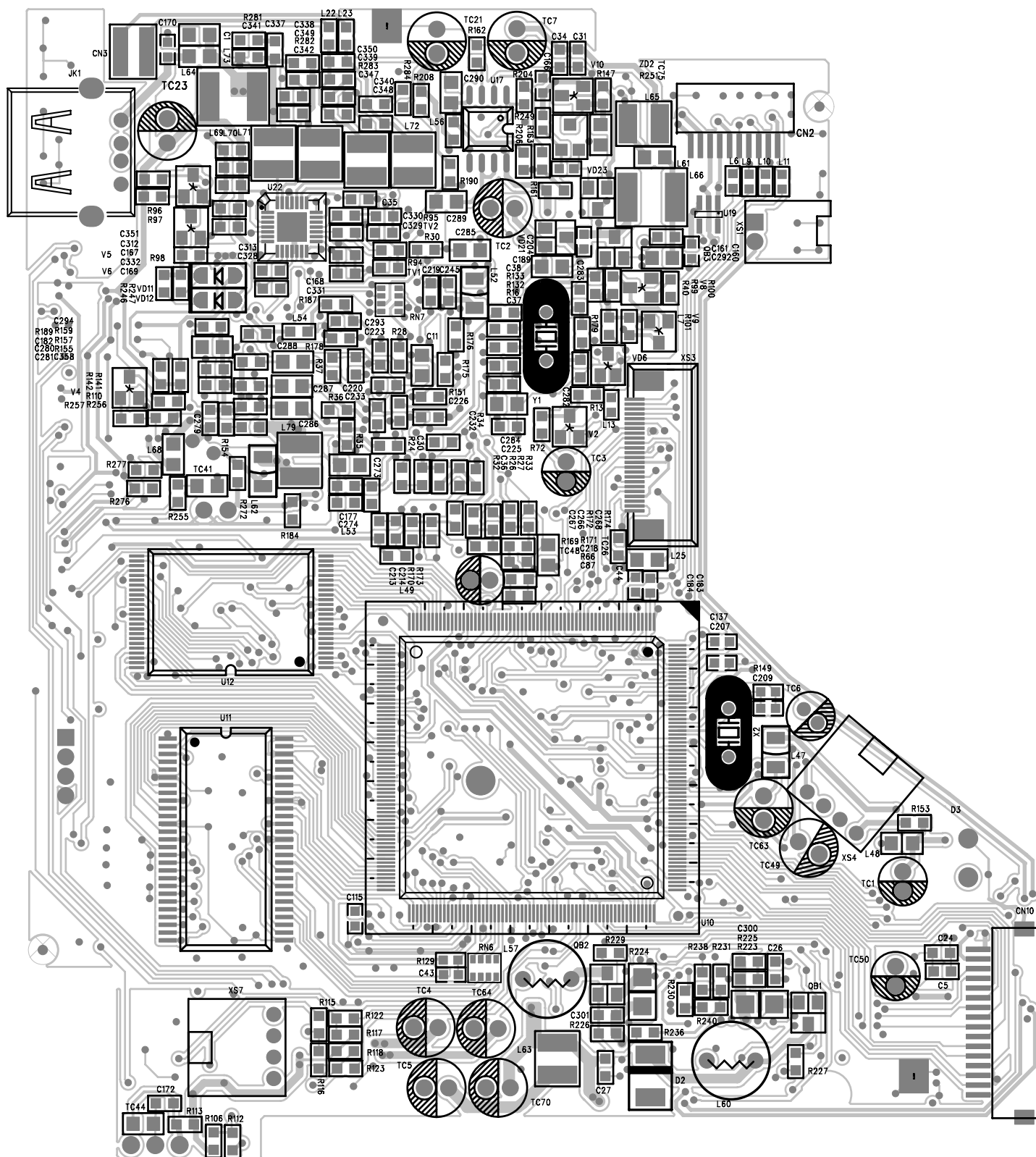
5.1.2 audio Board



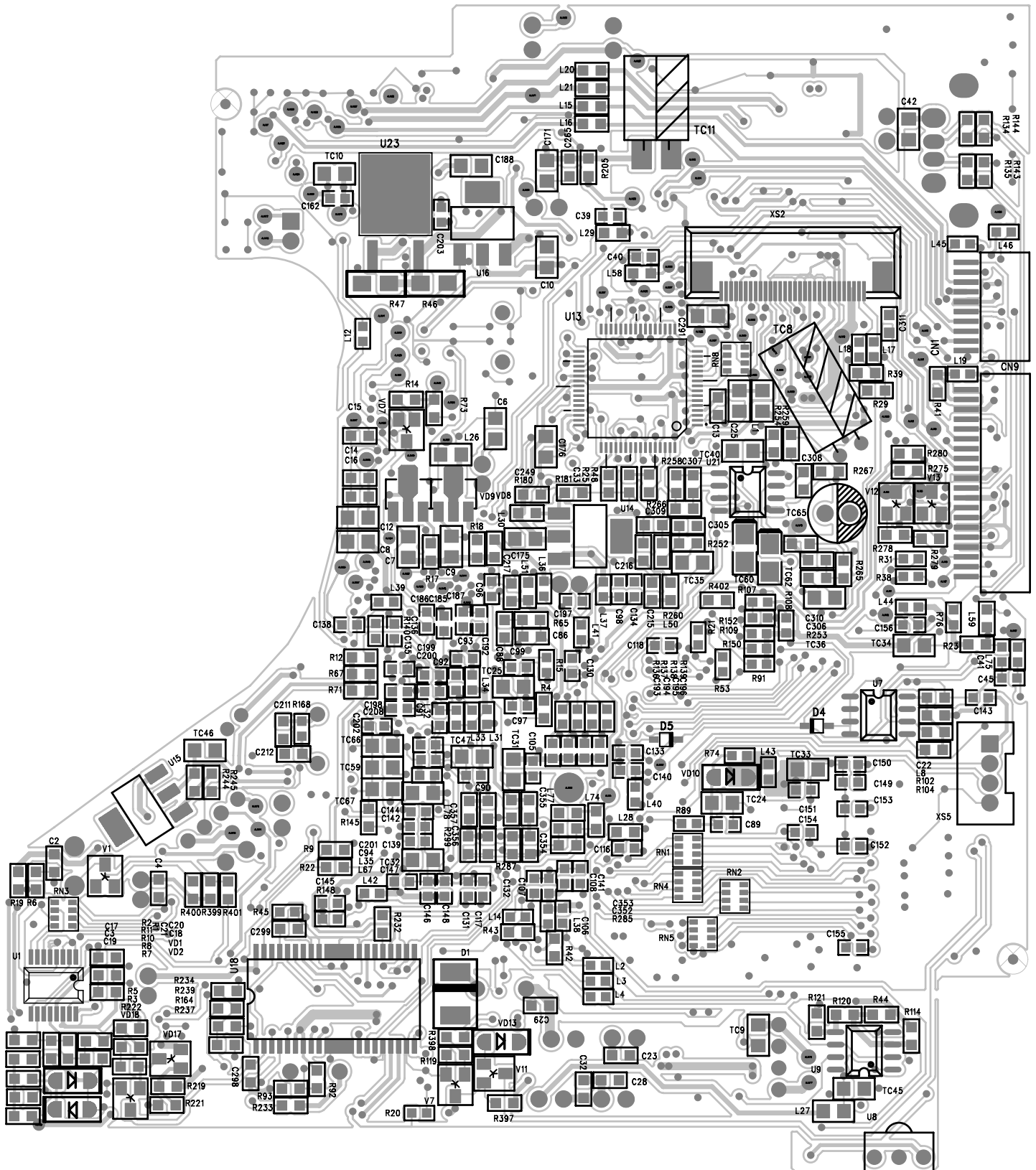
5.1.3 charging Board



5.1.4 Surface layer of Decode Board

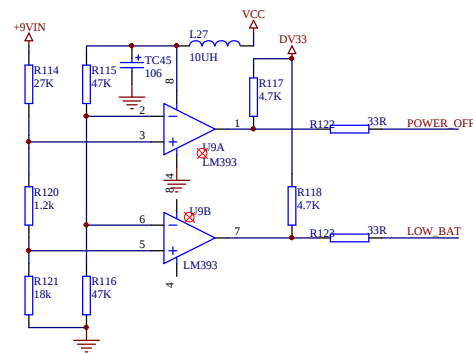
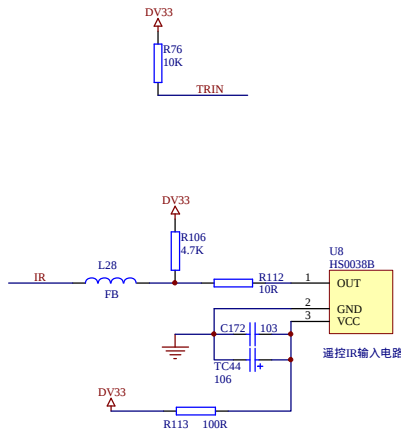
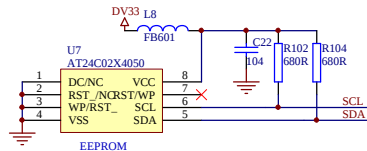
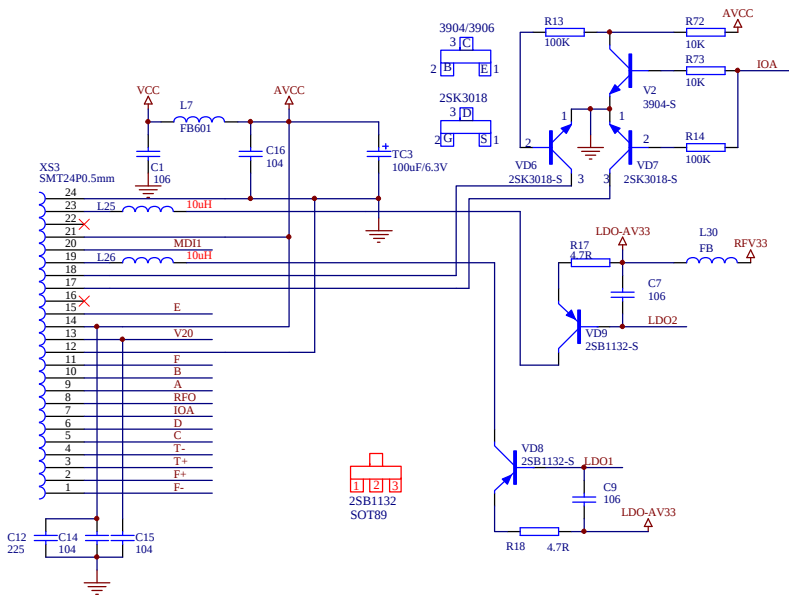


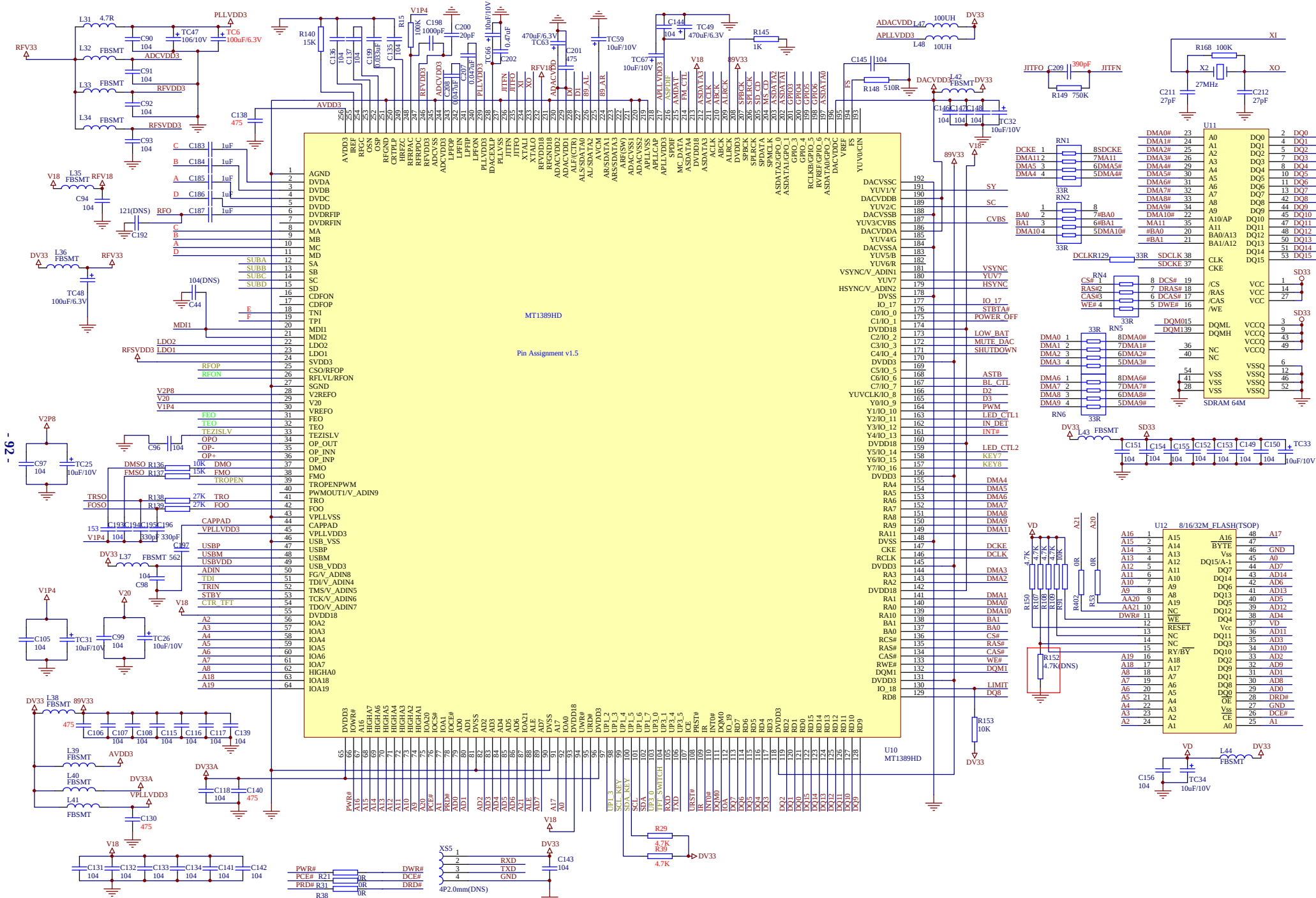
5.1.5 Bottom layer of Decode Board

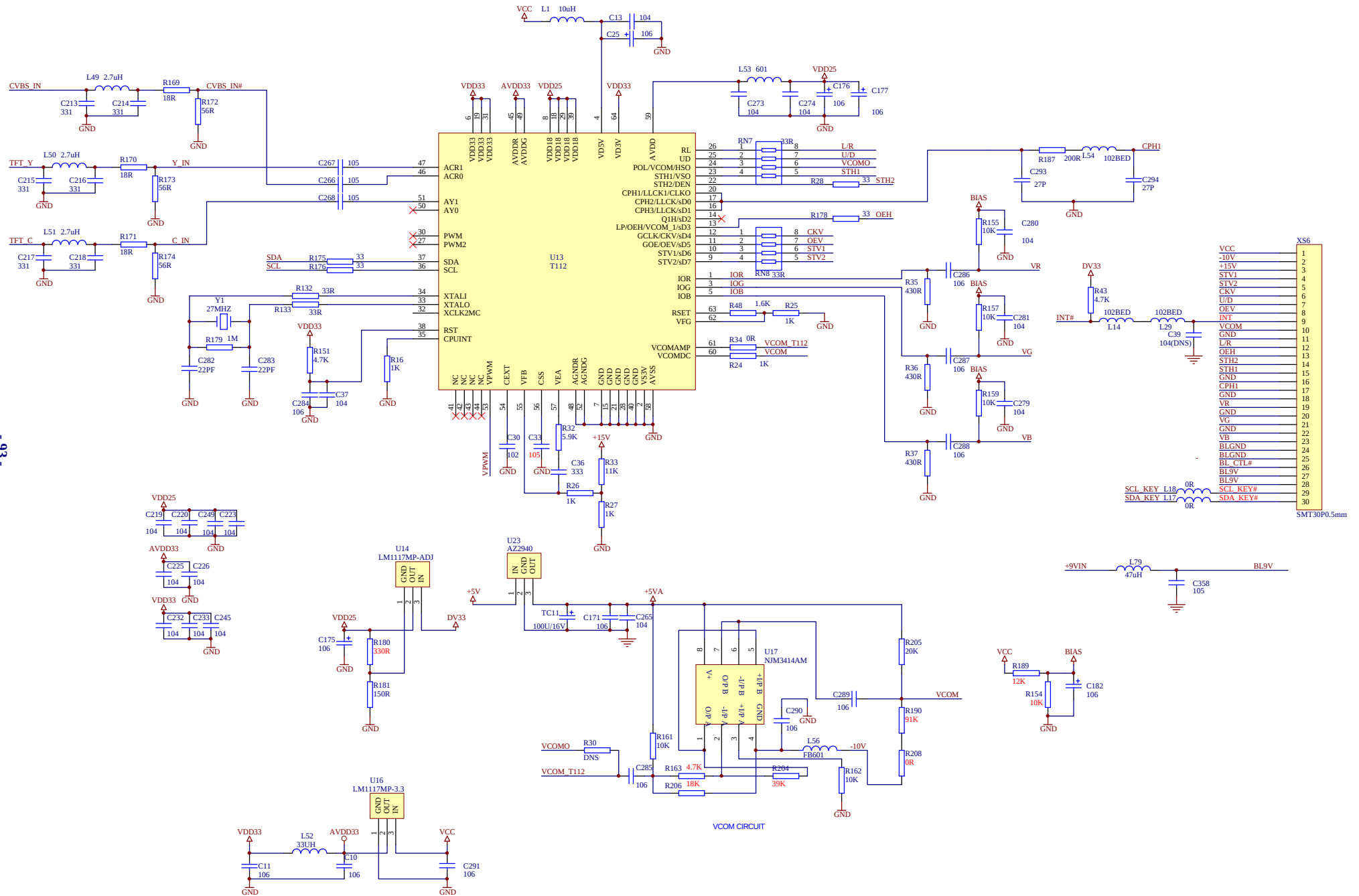


Section Two circuit diagram

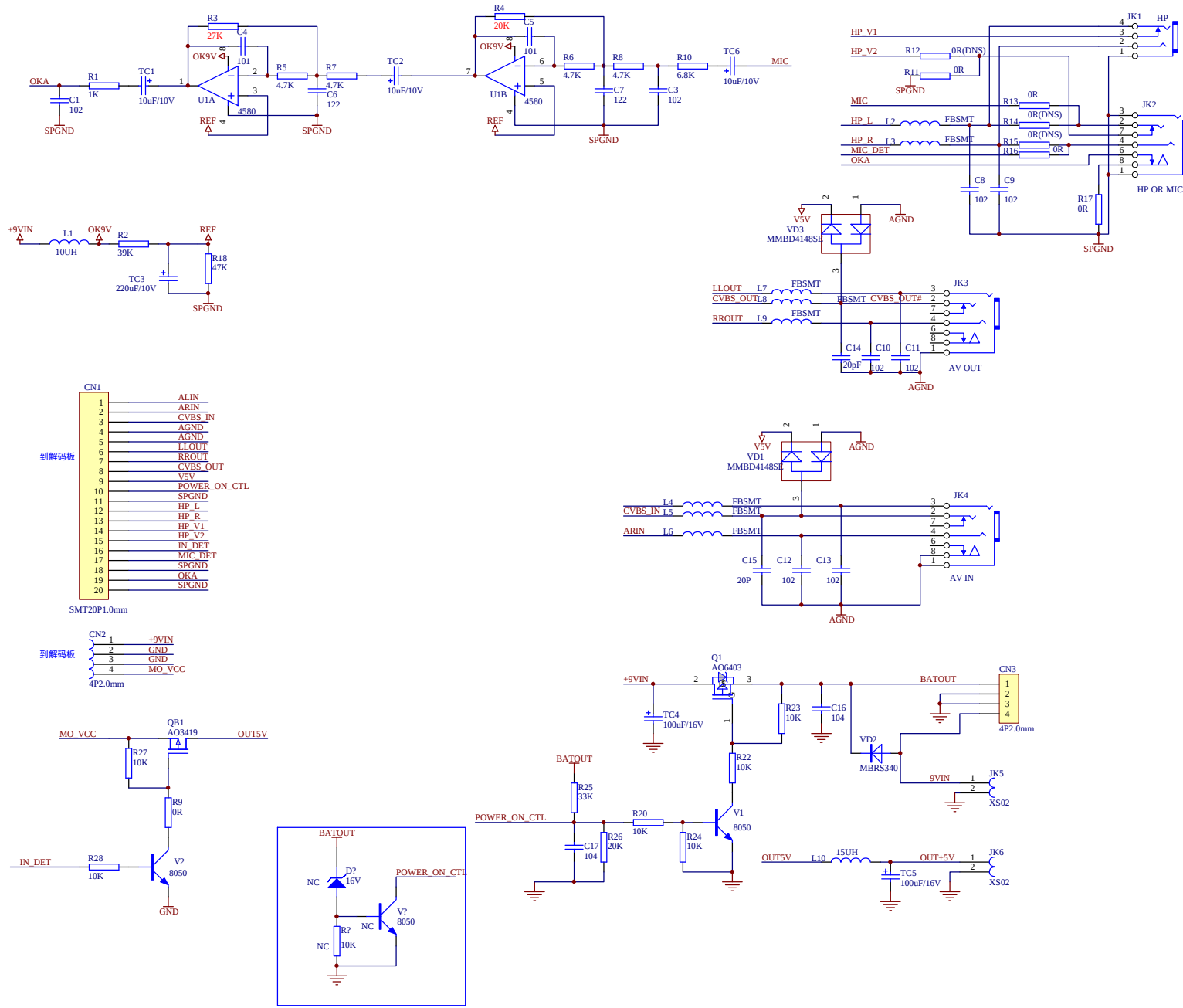
5.2.1 Decode Board

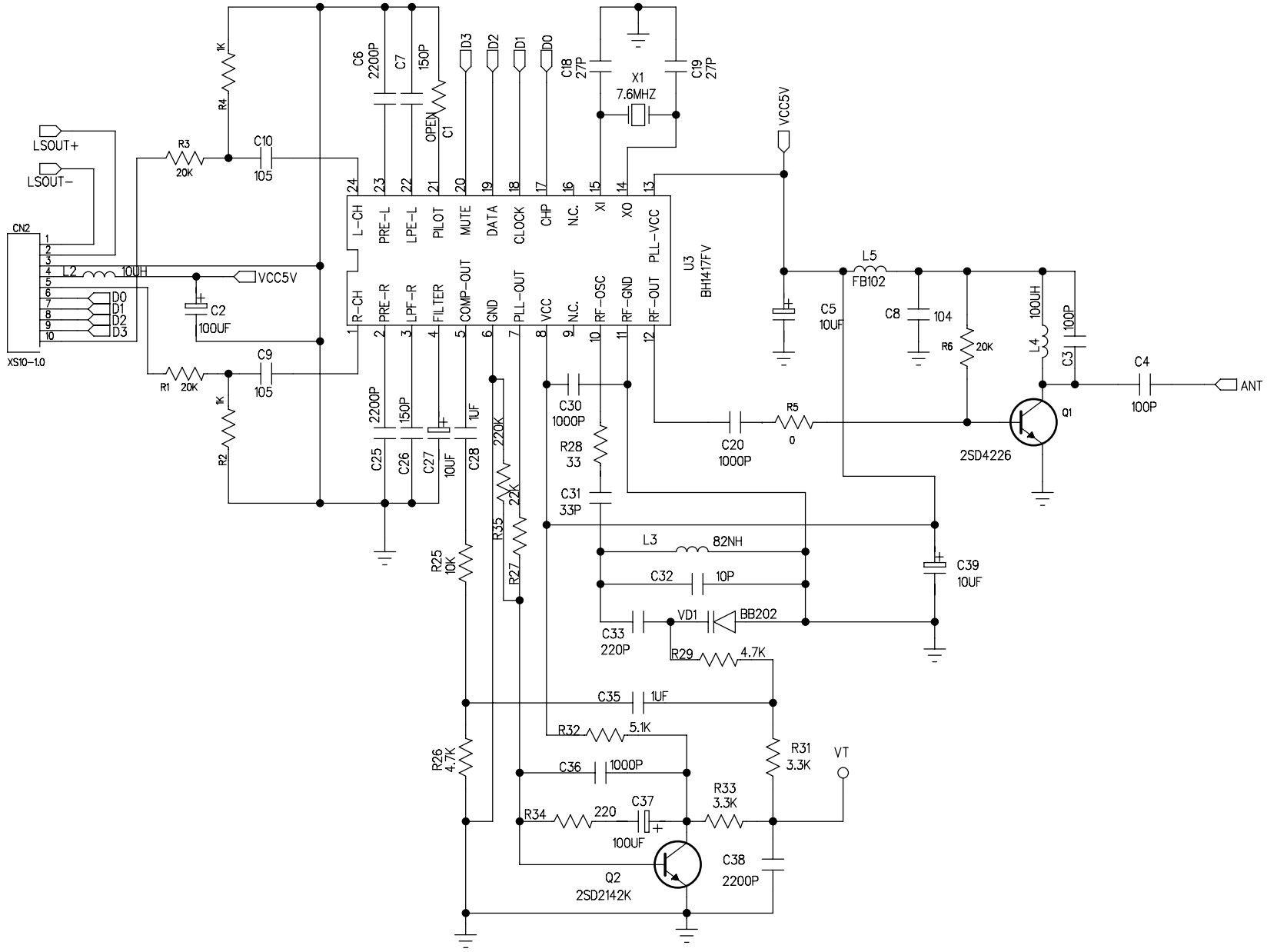




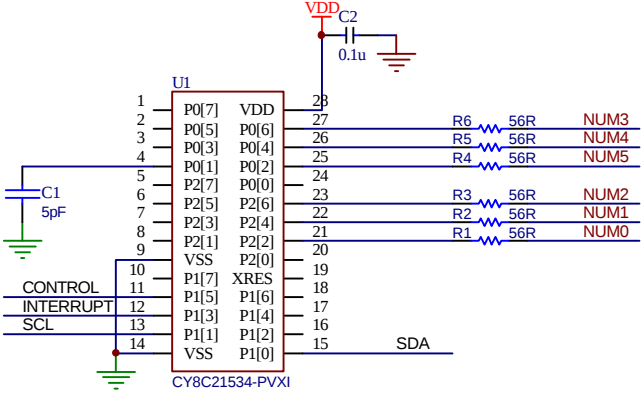


5.2.2 audio Board

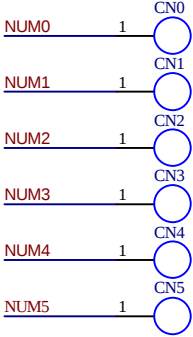




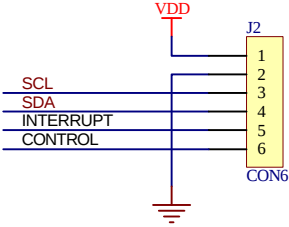
5.2.3 FM transmit Board



MCU

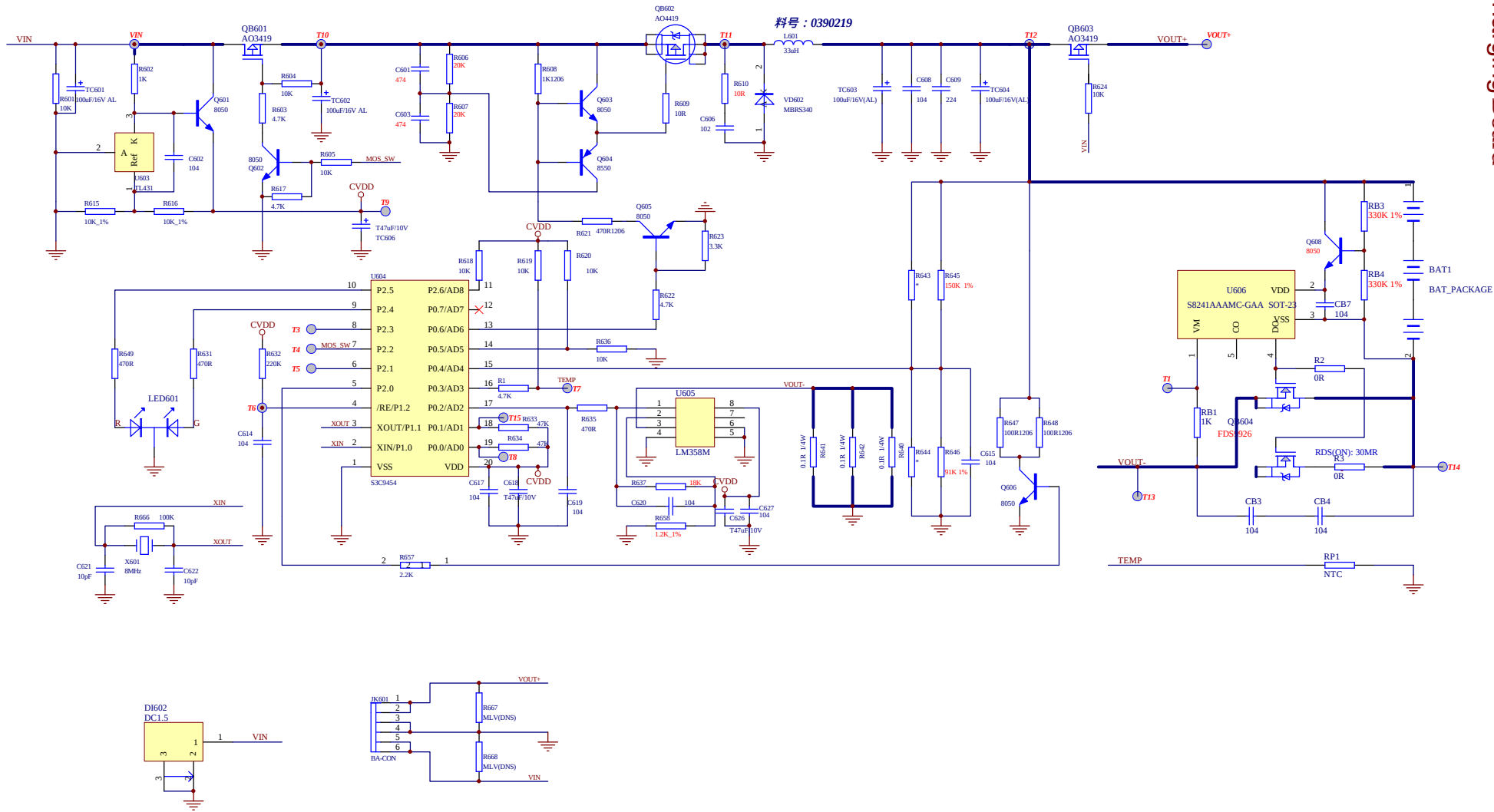


Input: Touch Buttons

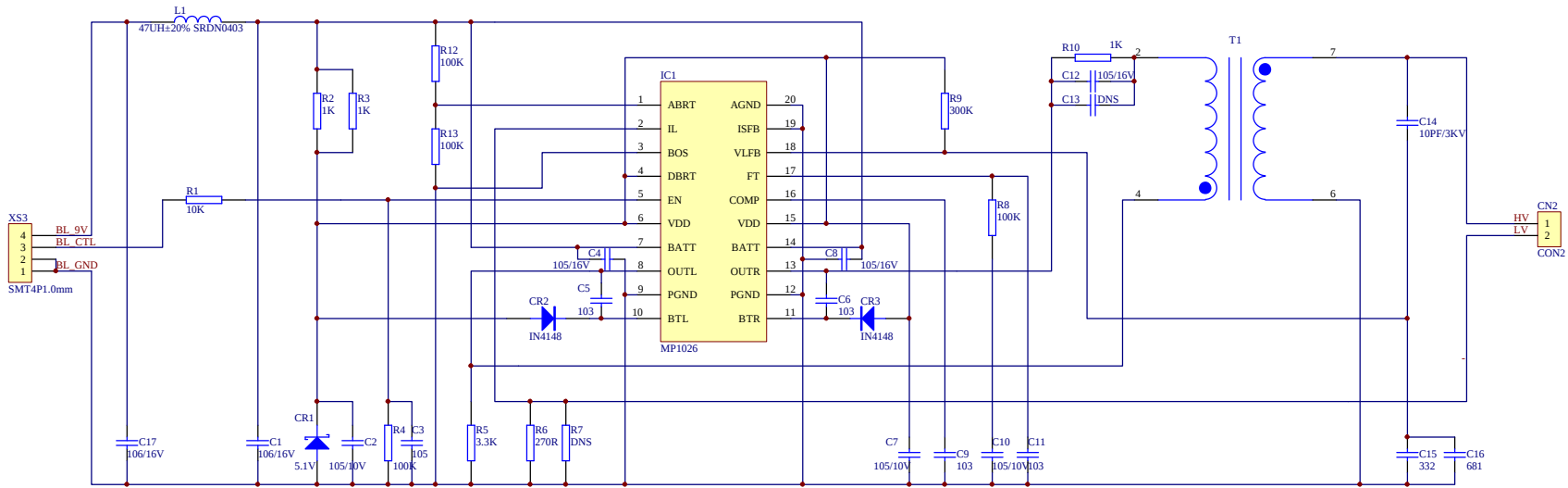


User I2C Interface

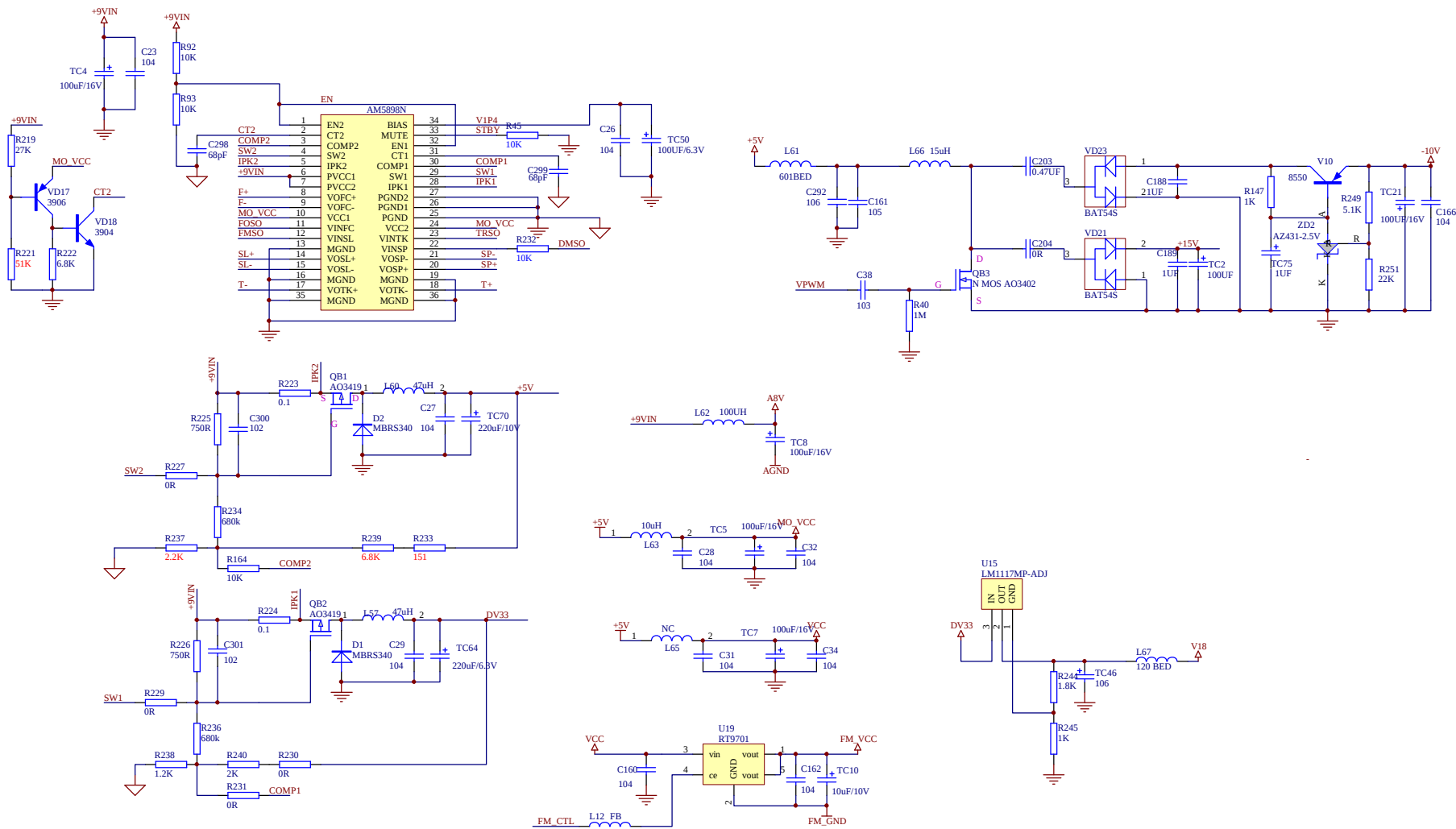
5.2.5 charging Board



5.2.6 Boost Board



5.2.7 POWER&MOTOR Board



Chapter six BOM List

MATERIAL CODE	MATERIAL NAME	SPECIFICATIONS	LOCATION
DL377SI(RU)BLACK			
3-IN-1 CARD BOARD 5449431			
1633650	PCB	A339-2	
1940235	CABLE SOCKET	16P 1.0mm DUAL RANK TOUCH POINT,SMD,HORIZONTAL	CN1
0390302	SMD MAGNETIC BEADS	MGHB1608S102	L1
0310085	SMD CAPACITOR	50V 20P±5% NPO 0603	C1~C4
0310594	SMD CAPACITOR	25V 104±10% 0603	C5
0090023	SMD RESISTOR	1/16W 10K±5% 0603	R1~R11
1990049	3-IN-1 CARD HOLDER	SD/MS/MMC R009-120	JK1
DL377SI(RU)BLACK			
AV BOARD 5449472			
1870021	POWER SOCKET	DC-023	JK5
1870050	POWER SUPPLY SOCKET	DS-0341D00-130-110	JK6
0260568	CD	CD11E 16V100U±20%6.3×5 2.5	TC4,TC5
1980076	EARPHONE SOCKET	S0250D00-077-110	JK2~JK4
1980098	EARPHONE SOCKET	S0290D00-040-100	JK1
2122228	SOFT FLAT CABLE	4P70 2.0 2 PIN,WITH L NEEDLE,REVERSE	CN2
2150302	FLAT CABLE	4P220 2.0 2 4PB WITH L NEEDLE/WELD PIECE REVERSE	CN3
DL377SI(RU)BLACK			
AV BOARD -SMD 5449472			
0090001	SMD RESISTOR	1/16W 0Ω±5% 0603	R9,R12,R14,R15,C1
1633651	PCB	7 339-3	
0390259	SMD MAGNETIC BEADS	FC2012-1202A	L15
0790082	SMD FIELD EFFECT TRANSISTOR	AO3419 SO23	QB1
0780085	SMD TRIODE	8050D	V1,V2
0680094	SMD SCHOTTKY DIODE	SB360 DO-214AB	VD2
0700056	SMD DOUBLE DIODE	MMBD4148SE SO23	VD1,VD3
0390302	SMD MAGNETIC BEADS	MGHB1608S102	L2~L9
0310594	SMD CAPACITOR	25V 104±10% 0603	C16,C17

MATERIAL CODE	MATERIAL NAME	SPECIFICATIONS	LOCATION
0310066	SMD CAPACITOR	50V 102±10% 7R 0603	C8~C13,C2
0310085	SMD CAPACITOR	50V 20P±5% NPO 0603	C14,C15
0090028	SMD RESISTOR	1/16W 33K±5% 0603	R25
0090025	SMD RESISTOR	1/16W 20K±5% 0603	R26
1940362	CABLE SOCKET	20P 1.0MM DUAL RANK TOUCH POINT SMD HORIZONTAL	CN1
0790075	FIELD EFFECT TRANSISTOR	AO6401 TSO6	Q1
0090023	SMD RESISTOR	1/16W 10K±5% 0603	R20,R22~R24,R27,R28
0390456	SMD CORES INDUCTOR	15UH±20% SRD0403	L10
DL377SI(RU)BLACK			
BATTERY CASE ASSEMBLY 5471930			
3872000	ROTATED AXIS	339	
3072583	HANDLE	339 DEEP GREY	
3872001	IRON	42×10×1 339	
3027820	LIGHT GLASS	383	
2122486	FLAT CABLE	3P 90MM RED BLUE BLACK 30# CORD	FROM INDICATOR LIGHT TO LED601
5235418	SOFT SPONGE SPACER	140×12×2 SINGLE-FACED,HARD	STICK ON TWO SIDE FACES OF
5235419	SOFT SPONGE SPACER	140×35×1 DOUBLE-FACED,HARD	STICK ON BATTERY CELL
5235256	FOOT SPACER	022 DEEP GREY SILICA GEL	
3073821	TOP COVER OF BATTERY CASE	377SI(RU) DEEP GREY	
3073822	BOTTOM COVER OF BATTERY CASE	377SI(RU) DEEP GREY	
3073823	UPPER COVER OF BATTERY SUPPORT BRACKET	377SI(RU) DEEP GREY	
3073824	LOWER COVER OF BATTERY SUPPORT BRACKET	377SI(RU) DEEP GREY	
4000522	SELTAPPING SCREW	CB 2×6H WHITE NICKEL	
4210179	MACHINE-TAPPING SCREW	PM 2.3×6 WHITE NICKEL	
4000710	SELTAPPING SCREW	CB 1.7×4 WHITE NICKEL	
1510213	RECHARGEABLE BATTERY	2800MAH 9V NI-MH 173×55×15	
5449429	PCB SEMI-FINISHED PRODUCT	B 339-2 7007(TH)	
0620032	DUAL COLOR RADIATION DIODE	2RG 59SW RED GREEN 2×5×7	LED601
5235212	FOOT SPACER	Φ10×1.5 DEEP GREY,SILICA GEL	
DL377SI(RU)BLACK			
BATTERY CHARGE BOARD 5449429			

MATERIAL CODE	MATERIAL NAME	SPECIFICATIONS	LOCATION
1860129	BATTERY LINKER	6P 2.5MM LI0408D00	JK601
1870021	POWER SOCKET	DC-023	JK602
0260568	CD	CD11E 16V100U±20%6.3×5 2.5	TC601,TC602,TC603,TC604
0260636	CD	CD11E 16V47U±20%5×5 2	C618,C626,TC606
0960314	CRYSTAL OSCILLATOR	8.00MHZ ±20PPM 49-S 20P	X601
DL377SI(RU)BLACK			
BATTERY CHARGE BOARD-SMD		5449429	
0310066	SMD CAPACITOR	50V 102±10% 7R 0603	C606
0310188	SMD CAPACITOR	50V 10P±5% NPO 0603	C621,C622
1633520	PCB	B 339-2	
0790082	SMD FIELD EFFECT TRANSISTOR	AO3419 SO23	QB601,QB603
0680028	SMD SCHOTTKY DIODE	MBRS340	VD602
0780129	SMD TRIODE	8550D	Q604
0780085	SMD TRIODE	8050D	Q601,Q602,Q603,Q605,Q606,Q608
0390481	SMD CORES INDUCTOR	33UH±30% CDRH104R	L601
0310542	SMD CAPACITOR	16V 474±10% 0603	C601,C603
0310112	SMD CAPACITOR	16V 224±10% 0603	C609
0310207	SMD CAPACITOR	50V 104 ±20% 7R 0603	C602,C608,C614,C615,C617,C619,C620,C627, CB3,CB4,CB7,R667,R668
0090229	PRECISION SMD RESISTOR	1/16W 330K±1%	RB4
0090270	PRECISION SMD RESISTOR	1/16W 390K±1% 0603	RB3
0090771	PRECISION SMD RESISTOR	1/1691K±1% 0603	R646
0090532	PRECISION SMD RESISTOR	1/16W150K±1% 0603	R645
0090034	SMD RESISTOR	1/16W 100K±5% 0603	R666
0090201	SMD RESISTOR	1/16W 220K±5% 0603	R632
0090029	SMD RESISTOR	1/16W 47K±5% 0603	R634
0090025	SMD RESISTOR	1/16W 20K±5% 0603	R606,R607
0090188	SMD RESISTOR	1/16W 18K±5% 0603	R637
0090023	SMD RESISTOR	1/16W 10K±5% 0603	R601,R604,R605,R618,R619,R620,R624,R636
0090019	SMD RESISTOR	1/16W 4.7K±5% 0603	R1,R603,R617,R622
0090304	PRECISION SMD RESISTOR	1/16W 10K±1% 0603	R615,R616
0090549	PRECISION SMD RESISTOR	1/16W 3k±1% 0603	R623
0090017	SMD RESISTOR	1/16W 2.2K±5% 0603	R657

MATERIAL CODE	MATERIAL NAME	SPECIFICATIONS	LOCATION
0882322	IC	AZ431-2.5V SO23	U603
0880176	IC	L358M SOP	U605
0883081	IC	S8241AAAGAA SO23	U606
0883103	IC	S39454 SOP(339R/G)	U604
0881901	IC	FDS9926A SOP	QB604
0790097	FIELD EFFECT TRANSISTOR	AO4419 SO8	QB602
0090015	SMD RESISTOR	1/16W 1.2K±5% 0603	R658
0090014	SMD RESISTOR	1/16W 1K±5% 0603	R602,RB1
0090488	SMD RESISTOR	1/8W 470Ω±5% 1206	R621
0090011	SMD RESISTOR	1/16W 470Ω±5% 0603	R631,R633,R635,R649
0090135	SMD RESISTOR	1/8W 100Ω±5% 1206	R647,R648
0090171	SMD RESISTOR	1/8W 1K±5% 1206	R608
0090003	SMD RESISTOR	1/16W 10Ω±5% 0603	R609,R610
0090735	SMD RESISTOR	1/4W 0.1Ω±5% 1206	R640,R641
DL377SI(RU)BLACK			
BATTERY CONNECTING BOARD 5449430			
1564639	PCB	G 339-2	
1860130	BATTERY LINKER	6P 2.5MM LI0407D00	JK1
0200138	PORCELAIN CAPACITOR	50V 104±20% 5mm	C1,C2
1940022	SOCKET	4P 2.0mm	JK2
DL377SI(RU)BLACK			
CAR POWER LINKER 5471546			
0680065	SCHOTTKY DIODE	SR560 DO-27 SHAPED 20mm	VD1,VD3
0000283	CARBON FILM RESISTOR	1/41K±5% SHAPED 10	R1
0620184	RADIATION DIODE	3O 3PD ORANGE	VD2
1632718	PCB	D333S-0	
5071052	DOUBLE-FACE GAS BEAD BAG	120×350	
2140367	POWER SUPPLY WIRE	2P 2m WITH Φ4.0DC CURVE PLUG	P+,P-
5232167	FIBRE SLEEVE	Φ1 WHITE	
3031156	UPPER COVER OF CAR POWER CONNECTING CASE	008 BLACK	
3040843	LOWER COVER OF CAR POWER CONNECTING CASE	008 BLACK	
3870754	SPACER	8	

MATERIAL CODE	MATERIAL NAME	SPECIFICATIONS	LOCATION
3870755	TOUCH HEAD	8	
3630186	SHRAPNEL	8	
3810034	SPRING	8	
3870756	FUSE HOLDER	8	
3060299	TOUCH HEAD COVER	008 BLACK	
2110002	LEAD	24# 30mm RED	
2110004	LEAD	24# 40mm BLACK	
2300018	FUSE	3.15AL 250V (VDE/UL)	
5232168	DUST-PROOF NET	AK008 BLACK	
DL377SI(RU)BLACK			
DECODE BOARD 2DL339-5 1.2/Ver3.00			
0090296	SMD RESISTOR	1/16W 18Ω±5% 0603	R170,R171
0090003	SMD RESISTOR	1/16W 10Ω±5% 0603	R112
0090106	SMD RESISTOR	1/16W 4.7Ω±5% 0603	R17,R18,L31
0090272	SMD RESISTOR	1/16W 1Ω±5% 0603	R71
1030027	SMD PRESS SENSITIVITY RESISTOR	SFI0603ML080C	TV1,TV2
0090001	SMD RESISTOR	1/16W 0Ω±5% 0603	R41,R208,R227,R229~R231,R21,R31,R38,R53,R402,R34,C204,R400,R20,C41,L17,L18,R169
0090019	SMD RESISTOR	1/16W 4.7K±5% 0603	R106~R109,R110,R117~R119,R150,R151,R260,R265~R267,R163,R29,R39,R42,R43
0090020	SMD RESISTOR	1/16W 5.1K±5% 0603	R249
0090104	SMD RESISTOR	1/16W 2.7K±5% 0603	R397
0090541	PRECISION SMD RESISTOR	1/16W 2.2K±1% 0603	R237
0090223	SMD RESISTOR	1/16W 2K±5%	R240
0090239	SMD RESISTOR	1/16W 200Ω±5% 0603	R187
0090232	SMD RESISTOR	1/16W 150Ω±5% 0603	R181,R287,R299
0090802	PRECISION SMD RESISTOR	1/16W 150Ω±1% 0603	R233
0090181	SMD RESISTOR	1/16W 100Ω±5% 0603	R113
0090291	SMD RESISTOR	1/16W 56Ω±5% 0603	R173,R174
0090006	SMD RESISTOR	1/16W 75Ω±5% 0603	R285,R172
0090236	SMD RESISTOR	1/16W 1.8K±5% 0603	R244
0090014	SMD RESISTOR	1/16W 1K±5% 0603	R145,R147,R245~R247,R24~R27,R16,R401
0090015	SMD RESISTOR	1/16W 1.2K±5% 0603	R120,R238

MATERIAL CODE	MATERIAL NAME	SPECIFICATIONS	LOCATION
0090005	SMD RESISTOR	1/16W 33Ω±5% 0603	R175,R176,R178,R122,R123,R132~R135,R129,R28
0090004	SMD RESISTOR	1/16W 22Ω±5% 0603	R281~R284
1860047	USB SOCKET	CAB85-4Pin	JK1
1120023	BUZZER	5V Φ9×5.5 4mm	D3
0090259	SMD RESISTOR	1/16W 820K±5% 0603	R44
0090127	SMD RESISTOR	1/8W 330Ω±5% 1206	R46,R47
1940094	CABLE SOCKET	24P 0.5mm SMD SUBMIT MEET WITH CLASP	XS3
1940208	CABLE SOCKET	30P 0.5mm SMD WITH CLASP	XS2
1940362	CABLE SOCKET	20P 1.0MM DUAL RANK TOUCH POINT SMD HORIZONTAL	CN9
1940235	CABLE SOCKET	16P 1.0mm DUAL RANK TOUCH POINT,SMD,HORIZONTAL	CN10
1940294	CABLE SOCKET	10P 1.0mm DUAL RANK TOUCH POINT,SMD,HORIZONTAL	CN1,CN2
1940141	SOCKET	4P 2.0mm STRAIGHT FLEX	XS4,XS7
1940170	SOCKET	2P 2.0mm STRAIGHT CURVING	XS1
0960020	CMETAL OXIDE FILM RESISTORSTAL OSCILLATOR	27.00MHz 49-S	Y1,X2
2360016	IR SENSOR	HS0038B3V	U8
0882114	IC	AMS1117-3.3 SO223	U16
0881182	IC	L1117ADJ SO223	U14,U15
0882105	IC	L393 SO8	U9
0882322	IC	AZ431-2.5V SO23	ZD2
0882634	IC	9702 TQFN	U22
0882886	IC	5898N HSOP	U18
0882644	IC	1389FE/H(HD) QFP	U10
0881539	IC	NJ3414AM SOP	U17
0883082	IC	112 LQFP	U13
0881031	IC	24C02N SOP	U7
0881415	IC	HY57V641620HG7 TSOP	U11
0880185	IC	NJ4558M SOP	U21
0790102	SMD FIELD EFFECT TRANSISTOR	AO3402 SO23	QB3
0790095	SMD FIELD EFFECT TRANSISTOR	AO3409 SO23	QB1,QB2
0780041	SMD TRIODE	3906(100-300) SO23	VD17
0780040	SMD TRIODE	3904(100-300) SO23	VD18,V2

MATERIAL CODE	MATERIAL NAME	SPECIFICATIONS	LOCATION
0780115	SMD TRIODE	2SB1132	VD8,VD9
0780193	SMD TRIODE	2S3018	VD6,VD7
0780197	SMD TRIODE	C1815	V12,V13
0780129	SMD TRIODE	8550D	V10,V11,V1
0780085	SMD TRIODE	8050D	V4~V9
0680042	SMD SCHOTTKY DIODE	B54S SO23	VD21,VD23
0680027	SMD SCHOTTKY DIODE	SS34	D1,D2
0700007	SMD DIODE	14148	VD10~VD13
0390259	SMD MAGNETIC BEADS	FC2012-1202A	L67,L61,L73
0390302	SMD MAGNETIC BEADS	MGHB1608S102	L53,L54,L56,L32~L46,L30,L2~L4,L7,L8,L13,L14,L20~L23,L75,L58,L28,L29
0390433	VERTICAL INDUCTOR	47uH±10% 8×5 5mm	L57,L60
0390456	SMD CORES INDUCTOR	15UH±20% SRD0403	L69~L72
0390455	SMD CORES INDUCTOR	10UH±20% SRD0403	L63
0390457	SMD CORES INDUCTOR	47UH±20% SRD0504	L64
0390524	SMD CORES INDUCTOR	15UH±20% SRD0504	L66
0390215	SMD RESISTOR	33uH±10% 3225	L52
0390279	SMD COIL THREAD INDUCTOR	100uH±10% 3225	L47,L62
0390044	SMD INDUCTOR	10UH±10% 2012	L1,L25~L27,L48,L68
0390189	SMD INDUCTOR	2.7UH±10% 1608	L49~L51
0390096	SMD INDUCTOR	1.8UH±10% 1608	L74,L77,L78
0260222	CD	CD11C 10V220U±20%6×7 2.5	TC70,TC65
0260255	CD	CD11C 6.3V220U±20%6×5 2.5	TC64
0260376	CD	CD11C 25V47U±20% 6×7 2.5	TC2
0260568	CD	CD11E 16V100U±20%6.3×5 2.5	TC4,TC5,TC7,TC21
0260440	CD	CD11E 6.3V100U±20%5×5 2	TC3,TC48,TC50,TC6
0310389	SMD CAPACITOR	10V 106 +80%-20% Y5V 0805	TC9,TC24~TC26,TC31~TC36,TC40,TC41,TC59,TC66,TC67,C1,C7,C9~C11,C171,C175~C177,C182,C284~C292,TC44~TC47,C25,C42
0260811	CD	CD11C 6.3V330U±20%6.3×7 2.5	TC63,TC49
0260028	CD	CD11 16V220U±20%6×12 2.5	TC8
0883212	IC	AZ2940 TO-252	U23
0260206	CD	CD11C 10V100U±20%5×7 2	T11
0260829	CD	CD11C 10V330U±20%8×7 3.5	TC23

MATERIAL CODE	MATERIAL NAME	SPECIFICATIONS	LOCATION
0310717	SMD CAPACITOR	6.3V 475±20% 5R 0603	C201,C106,C130,C138,C140
0310659	SMD CAPACITOR	25V 225±10% 7R 0805	C12
0310658	SMD CAPACITOR	25V 105±10% 7R 0805	C188,C189,TC75
0310483	SMD CAPACITOR	10V 105±10% 5R 0603	C33,C183~C187,C266~C268,C311~C313,C328~C332,C351
0310379	SMD CAPACITOR	25V 474 +80%-20% Y5V 0603	C202,C203
0310634	SMD CAPACITOR	25V 154±10% 7R 0603	C349,C350
0310594	SMD CAPACITOR	25V 104±10% 0603	C13~C16,C22,C23,C26~C29,C31,C32,C34,C35,C161,C167~C169,C219,C220,C225,C226,C232,C233,C245,C249,C265,C273,C274,C279~C281,C89~C94,C96~C99,C105,C107~C108,C115~C118,C131~C137,C139,C141~C156,C166,C170,C194,C37,C40,C45
0310206	SMD CAPACITOR	50V 683±10% 0603	C337~C340
0310056	SMD CAPACITOR	16V 473±10% 7R 0603	C207,C208
0310204	SMD CAPACITOR	50V 333±10% 0603	C199,C341,C342,C347,C348,C36
0310201	SMD CAPACITOR	50V 153±10% 7R 0603	C193
0310072	SMD CAPACITOR	50V 103±10% 7R 0603	C172,C38
0310199	SMD CAPACITOR	50V 562±10% 7R 0603	C197
0310068	SMD CAPACITOR	50V 222±10% 7R 0603	C86,C87
0310231	SMD CAPACITOR	50V 122±10% 0603	C309,C310
0310066	SMD CAPACITOR	50V 102±10% 7R 0603	C300,C301,C305,C306,C198,C30
0310052	SMD CAPACITOR	50V 391±5% NPO 0603	C209
0310051	SMD CAPACITOR	50V 331±5% NPO 0603	C195,C196,C213~C218
0310047	SMD CAPACITOR	50V 101±5% NPO 0603	C307,C308
0310193	SMD CAPACITOR	50V 68P±5% NPO 0603	C298,C299
0310045	SMD CAPACITOR	50V 47P±5% NPO 0603	C352~C357
0310190	SMD CAPACITOR	50V 27P±5% NPO 0603	C293,C294
0310043	SMD CAPACITOR	50V 22P±5% NPO 0603	C282,C283
0310085	SMD CAPACITOR	50V 20P±5% NPO 0603	C200
0100019	SMD RESISTOR NETWORKS	1/16W 33Ω±5% 8P	RN1,RN2,RN4~RN8
0090502	PRECISION SMD RESISTOR	1/16W 11K±1% 0603	R33
0090735	SMD RESISTOR	1/4W 0.1Ω±5% 1206	R223,R224
0090109	SMD RESISTOR	1/16W 1MΩ±5% 0603	R179,R40
0090212	SMD RESISTOR	1/16W 750K±5% 0603	R149

MATERIAL CODE	MATERIAL NAME	SPECIFICATIONS	LOCATION
0090211	SMD RESISTOR	1/16W 680K±5% 0603	R65,R66,R234,R236
0090012	SMD RESISTOR	1/16W 560Ω±5% 0603	R278,R279,R148
0090197	SMD RESISTOR	1/16W 150K±5% 0603	R4,R12
0090034	SMD RESISTOR	1/16W 100K±5% 0603	R13~R15,R276,R277,R168
0310191	SMD CAPACITOR	50V 30P±5% NPO 0603	C211,C212
0090192	SMD RESISTOR	1/16W 51K±5% 0603	R221
0090029	SMD RESISTOR	1/16W 47K±5% 0603	R115,R116,R184,R254,R255
0090191	SMD RESISTOR	1/16W 39K±5% 0603	R272,R204
0090028	SMD RESISTOR	1/16W 33K±5% 0603	R258,R259
0090027	SMD RESISTOR	1/16W 27K±5% 0603	R114,R219,R138,R139
0090026	SMD RESISTOR	1/16W 22K±5% 0603	R251
0090025	SMD RESISTOR	1/16W 20K±5% 0603	R205,R94,R95
0090188	SMD RESISTOR	1/16W 18K±5% 0603	R121,R206
0090024	SMD RESISTOR	1/16W 15K±5% 0603	R141~R144,R137,R140
0090023	SMD RESISTOR	1/16W 10K±5% 0603	R72~R74,R76,R89,R91~R93,R96~R101,R153, R155,R157,R159,R161,R162,R164,R232,R256, R257,R398,R399,R136,R154,R45
0090776	SMD RESISTOR	1/161.6K±5% 0603	R48
0090182	SMD RESISTOR	1/16W 750Ω±5% 0603	R225,R226
0090013	SMD RESISTOR	1/16W 680Ω±5% 0603	R102,R104
0090248	SMD RESISTOR	1/16W 430Ω±5% 0603	R35~R37
0090187	SMD RESISTOR	1/16W 12K±5% 0603	R189
0090009	SMD RESISTOR	1/16W 330Ω±5% 0603	R275,R280,R180
0090021	SMD RESISTOR	1/16W 6.8K±5% 0603	R222,R252,R253
0090526	PRECISION SMD RESISTOR	1/16W 6.8K±1% 0603	R239
0090779	SMD RESISTOR	1/165.9K±5% 0603	R32
0090033	SMD RESISTOR	1/16W 91K±5% 0603	R190
0390473	SMD CORES INDUCTOR	47UH±20% SRD0403	L79
0310390	SMD TANTALUMCAPACITOR	16V10U±20% 3216	TC60,TC62
1633717	PCB	2 339-5	
DL377SI(RU)BLACK			
FM EMISSION BOARD: 5449485			
1633649	PCB	339-4	

MATERIAL CODE	MATERIAL NAME	SPECIFICATIONS	LOCATION
1940294	CABLE SOCKET	10P 1.0mm DUAL RANK TOUCH POINT,SMD,HORIZONTAL	X2
DL377SI(RU)BLACK			
HEADREST BRACKET 5471745			
4000061	SELTAPPING SCREW	BB 2.6×7 COLOR ZINC	CONNECT HEADREST LOCK BOARD AND HEADREST HANGING BOARD
5235199	MAGIC ROPE	339	
5235200	SOFT SPONGE SPACER	174×116×17 WITHOUT GLUE IN REAR SIDE,SOFT	
3060546	BACKBOARD O HOST MACHINE	339 BLACK	
3060547	HEADREST LOCK BOARD	339 BLACK	
3060548	HEADREST HANG BOARD	339 BLACK	
DL377SI(RU)BLACK			
MAIN PANEL 5449427			
1633457	PCB	4 3391	
0310594	SMD CAPACITOR	25V 104±10% 0603	C2
1940300	CABLE SOCKET	6P 1.0mm DUAL RANK TOUCH POINT,SMD,HORIZONTAL	XS1
0310185	SMD CAPACITOR	50V 5P±0.25P NPO 0603	C1
0090796	SMD RESISTOR	1/1656Ω±5% 0402	R1~R6
0890294	PROGRAM CPU	CPU339-0	
DL377SI(RU)BLACK			
POWER ADAPTER ASSEMBLY 5471931			
5449705	PCB SEMI-FINISHED PRODUCT	5 021-2 377SI(RU)	
2140350	POWER SUPPLY WIRE	2P1.2m Φ4.0DC FLEX INSERT	
4000119	SELTAPPING SCREW	PB 3×8 WHITE	
5231264	FOOT SPACER	φ 7×1 RUBBER	
3032041	UPPER COVER OF POWER CASE	021 BLACK	
3041506	BOTTOM COVER OF POWER CASE	021 BLACK	
3051356	INDICATOR LIGHT MANTLE O POWER CASE	021 TRANSPARENCE	
5235873	PVC PIECE	20×15×0.2 WHITE SINGLE-FACED WITH GLUE IN REAR SIDE	
DL377SI(RU)BLACK			
POWER BOARD 5449705			
4400001	NUT	3	1PCS FOR LEFT AND RIGHT HEAT RADIATION PLATE EACH

MATERIAL CODE	MATERIAL NAME	SPECIFICATIONS	LOCATION
4230014	MACHINE-TAPPING SCREW	FM 3×8 WHITE NICKEL	1PCS FOR LEFT AND RIGHT HEAT RADIATION PLATE EACH
3580229	HEAT RADIATION PIECE	90×19×2	
3580230	HEAT RADIATION PIECE	21	
5235224	INSULATION PLATISC BAND	PZ-281 LENGTH:60M WIDTH:65MM DEEP YELLOW	TWIST 3 LAYERS IN THE CORRESPONDING POSITION OF LEFT HEAT RADIATOR
5235791	INSULATION PLATISC BAND	PZ-281 LENGTH:60M WIDTH:18MM DEEP YELLOW	TWIST 3 LAYERS AROUND SWITCH POWER TRANSFORMER
1870029	POWER SUPPLY SOCKET	S2S (UL)	JK1
0390052	MAGNETIC BEADS INDUCTOR	FB	J2
0390273	COMMON MODE INDUCTOR	75uH±25%3A ϕ9×ϕ5×3 4mm	LF2
2100062	LEAD	Φ0.8 SHAPED 5MM	L2
0200341	CERAMIC CAPACITOR	C81 250VAC 102±20% 10mm	C17,C2
0210066	TERYLENE CAPACITOR	275V 104±20% 15mm	C1
1000060	POWER GRID FILTER	@JLB1020 30MH +∞-0% SJ	LF1
0881934	IC	F0565R TO-2206L	IC1
2300058	FUSE	@1.6AL 250V WITH CANNULA CQC	F1
0880553	IC	L431ACZ TO-92	IC3
0620025	RADIATION DIODE	3R 4SD RED	LED
1080037	PHOTOELECTRIC COUPLER	@HS817 CQC	IC2
0570014	DIODE	HER107	D5
0680093	SCHOTTKY DIODE	SB10100CT PLASTIC SEALED TO-220	D10
0460603	SWITCH POWER TRANSFORMER	@BC25-0106 SJ	TR1
0200232	PORCELAIN CAPACITOR	500V 101±10% 5mm	C10
0200166	PORCELAIN CAPACITOR	500V 103±20% 5mm	C3
0200277	CERAMIC CAPACITOR	1000V222±20% SHAPED 7.5mm	C5
0260792	CD	GS 105 400V47U M 16×25 7.5	C4
0260794	CD	CD288H 25V1000U±20%10×16 5	C11,C12
0260790	CD	CD11 105 50V47U M 6×12 2.5	C8
0570005	DIODE	1N4007	D1~D4
DL377SI(RU)BLACK			
POWER BOARD -SMD 5449705			
0090050	SMD RESISTOR	1/10W 1K±5% 0805	R16
0090778	PRECISION SMD RESISTOR	1/10430Ω±1% 0805	R14

MATERIAL CODE	MATERIAL NAME	SPECIFICATIONS	LOCATION
1564487	PCB	@5021-2 CQC	
0700007	SMD DIODE	14148	D6
0310037	SMD CAPACITOR	50V 104±20% 0805	C13,C15
0310182	SMD CAPACITOR	50V 473±20% 7R 0805	C6,C7
0310092	SMD CAPACITOR	50V 103±20% 7R 0805	C14
0090770	SMD RESISTOR	1/8240K±5% 1206	R5A,R5B,R6A,R6B
0090750	SMD RESISTOR	1/8W 680K±5% 1206	R1,R2
0090817	SMD RESISTOR	1/439K±5% 1206	R3
0090816	SMD RESISTOR	1/447K±5% 1206	R4
0090125	SMD RESISTOR	1/8W 22Ω±5% 1206	R10,R11
0090781	PRECISION SMD RESISTOR	1/101.5K±1% 0805	R13
0090040	SMD RESISTOR	1/10W 15Ω±5% 0805	R7
0090653	SMD RESISTOR	1/8W 2K±5% 1206	R6,R9
0090063	SMD RESISTOR	1/10W 10K±5% 0805	R15
0090057	SMD RESISTOR	1/10W 4.7K±5% 0805	R18
0090054	SMD RESISTOR	1/10W 3K±5% 0805	R5
0090052	SMD RESISTOR	1/10W 2.2K±5% 0805	R8,R17
DL377SI(RU)BLACK			
REMOTE CONTROL ASSEMBLY		5471929	
0310048	SMD CAPACITOR	50V 151±5% NPO 0603	C802,C803
0630009	EMISSION PIPE	TSAL4400	LED801
0700007	SMD DIODE	14148	D801~D803
0700001	SMD DIODE	LS4148	D801~D803
0700002	SMD DIODE	LL4148	D801~D803
0780130	SMD TRIODE	STC3265	Q801
0880220	IC	P2222 SOP	U801
0882379	IC	S0102B SOP	U801
0970003	CERAMIC RESONATOR	455E	X801
4000038	SELTAPPING SCREW	PB 2.3×6 COLOR ZINC	FOR CONNECTING UPPER AND LOWER COVER
0090272	SMD RESISTOR	1/16W 1Ω±5% 0603	R801
1564324	PCB	8516SI-3	
3032040	SURFACE CASING OF REMOTE CONTROL	RC026-13R BLACK	

MATERIAL CODE	MATERIAL NAME	SPECIFICATIONS	LOCATION
3041399	BOTTOM CASING OF REMOTE CONTROL	026 BLACK 2#	
3051319	BATTERY CASE DOOR OF REMOTE CONTROL	026 BLACK 2#	
3051273	GLASS OF REMOTE CONTROLLER	026 MING PURPLE	
3850124	ANODE SPRING	RC026	
3850125	CATHODE SPRING	RC026	
3850126	ANODE/CATHODE SPRING	RC026	
4631081	CONDUCT GLUE O REMOTE CONTROL	RC026-09R	
5070070	PLASTIC BAG	85×250	
DL377SI(RU)BLACK			
RISE PRESS BOARD 5449426			
1633522	PCB	H 339-3	
0460571	SWITCH POWER TRANSFORMER	002P502	T1
0882914	IC	1026E TSSOP	IC1
0700163	SMD VOLTAGE REGULATOR DIODE	5.1V±5% 0.2W SO323	CR1
0700154	SMD TRIODE	14148WS SO323	CR2,CR3
1940280	SOCKET	S02B-BHSS-1-TB	CN2
1940368	CABLE SOCKET	5P 1.0MM DUAL RANK TOUCH POINT SMD HORIZONTAL	CN1
0310778	SMD CERAMIC CAPACITOR	3000V 10P±5% NPO 1808	C14
0310549	SMD CERAMIC CAPACITOR	25V 106+80%-20% 1210	C1,C17
0310483	SMD CAPACITOR	10V 105±10% 5R 0603	C3,C2,C7,C10
0310658	SMD CAPACITOR	25V 105±10% 7R 0805	C4,C8,C12
0310072	SMD CAPACITOR	50V 103±10% 7R 0603	C5,C6,C9
0310594	SMD CAPACITOR	25V 104±10% 0603	C11
0310065	SMD CAPACITOR	50V 681±10% 7R 0603	C16
0310070	SMD CAPACITOR	50V 332±10% 7R 0603	C15
0090204	SMD RESISTOR	1/16W 300K±5% 0603	R9
0090034	SMD RESISTOR	1/16W 100K±5% 0603	R4,R8,R12,R13
0090023	SMD RESISTOR	1/16W 10K±5% 0603	R1
0090227	SMD RESISTOR	1/16W 270Ω±5%	R6
0090018	SMD RESISTOR	1/16W 3.3K±5% 0603	R5
0090014	SMD RESISTOR	1/16W 1K±5% 0603	R2,R3,R10

MATERIAL CODE	MATERIAL NAME	SPECIFICATIONS	LOCATION
0390473	SMD CORES INDUCTOR	47UH±20% SRD0403	L1
DL377SI(RU)BLACK			
TELESCOPIC BRACKET UNIT 5462350			
4040114	SELF-TAPPING SCREW	FB 1.4×3 BLACK ZINC(HEAD PATHWAY 2.5)	FIX UPPER COVER AND LOWER COVER OF RETRACTABLE BRACKET
3810094	BUTTON PRESS REED	339	
3072518	TELESCOPIC BRACKET LOWER COVER	339 DEEP GREY	
3072519	TELESCOPIC BRACKET UPPER COVER	339 DEEP GREY	
3072520	TELESCOPIC BRACKET	339 DEEP GREY	
3072521	TELESCOPIC BRACKET BUTTON	339 DEEP GREY	
DL377SI(RU)BLACK			
TRANSFER BOARD 5449428			
1633576	PCB	T 339-3	
1940194	CABLE SOCKET	26P 0.5mm SMD,SUBMIT MEET WITH CLASP	XS2
0390302	SMD MAGNETIC BEADS	MGHB1608S102	L1,L2,L3
0090181	SMD RESISTOR	1/16W 100Ω±5% 0603	R2,R3
0700154	SMD TRIODE	14148WS SO323	D1,D2
0310389	SMD CAPACITOR	10V 106 +80%-20% Y5V 0805	C6,C7,C10,C12
0310594	SMD CAPACITOR	25V 104±10% 0603	C1~C5,C9 , C8,C11,C13,C14
0090023	SMD RESISTOR	1/16W 10K±5% 0603	R1
1940300	CABLE SOCKET	6P 1.0mm DUAL RANK TOUCH POINT,SMD,HORIZONTAL	XS4
0881914	IC	R9701CB SO25	U1
1940208	CABLE SOCKET	30P 0.5mm SMD WITH CLASP	XS1
1940368	CABLE SOCKET	5P 1.0MM DUAL RANK TOUCH POINT SMD HORIZONTAL	XS3
DL377SI(RU)BLACK			
VOLUME KNOB BOARD 5449433			
1310083	STIR SWITCH	S12D06-D2	SW1
0160157	ROTATED POTENTIOMETER	WHE101GB-2B5016	JK1
1250046	REED RELAY	RI-01C SOB	SW2
DL377SI(RU)BLACK			
VOLUME KNOB BOARD-SMD 5449433			
1633647	PCB	9 339-4	

MATERIAL CODE	MATERIAL NAME	SPECIFICATIONS	LOCATION
1940294	CABLE SOCKET	10P 1.0mm DUAL RANK TOUCH POINT,SMD,HORIZONTAL	CN1
0780085	SMD TRIODE	8050D	V1,V2
0310594	SMD CAPACITOR	25V 104±10% 0603	C1,C2,C5
0090034	SMD RESISTOR	1/16W 100K±5% 0603	R9
0090016	SMD RESISTOR	1/16W 1.5K±5% 0603	R5
0090227	SMD RESISTOR	1/16W 270Ω±5%	R6
0090014	SMD RESISTOR	1/16W 1K±5% 0603	R3,R4
0090023	SMD RESISTOR	1/16W 10K±5% 0603	R1,R2
0700171	SMD RADIATION DIODE	PEAK LIGHTING 0603 ORANGE	D2
0700036	SMD RADIATION DIODE	PEAK LIGHTING 0603 EMERALD GREEN	D1
DL377SI(RU)BLACK			
PROGRAM FLASH			
0881650	IC	29LV160BE-70PFTN TSOP	U12
PROGRAM CPU CPUDL339-0 0890294			
0883083	IC	CY8C21534 SSOP	U1