BBK

V3N V3H

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service manual

Catalog

Chapter One About Maintenance

1.1 Safety precautions

1.1.1 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-scaleintegrated 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.

1.1.2 About placement position

1. Audio power amplifier cannot be installed in places with high temperature and humidity.

2. Positions for placement should be stable and secure.

1.2 Maintenance method

1.2.1 Visualized method

Directly view whether abnormalities of collision, lack of element, joint welding, shedding welding, rosin joint, copper foil turning up, lead wire disconnection and elements burning up among pins of

Elements appear. Check power supply of the machine and then use hands to touch the casing of part of elements and check whether they are hot to judge the trouble spot. You should pay more attention when using this method to check in high voltage parts.

1.2.2 Electric resistance method

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

1.2.3 Voltage method

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

1.2.4 Current method

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

1.2.5 Cutting method

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

1.2.6 Element substitution method

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

1.2.7 Comparison method

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

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

1.3 Required device for maintenance

◆ Audio Generator

◆ Digital oscillograph (≥100MHE)

◆ SMD rework station

◆ Multimeter

◆ Soldering iron

◆ Pointed-month pincers

◆ Cutting nippers

◆ Forceps

◆ Electric screw driver

◆ Terminals connecting cord

◆ Headphone

◆ Microphone

Chapter Two

Functions and Operation Instructions

2.1 QUICK OPERATION

2.1.1 BUTTONS AND JACKS ILLUSTRATION

V3 video:
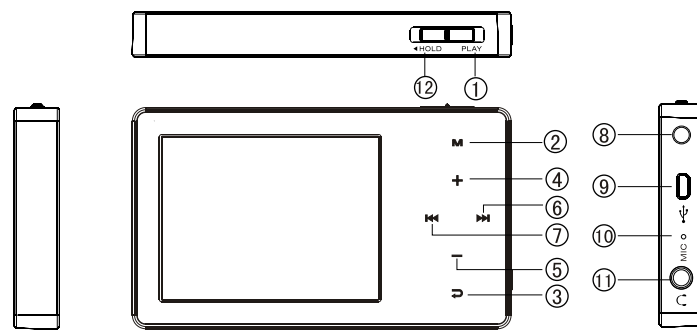
① ▶ll :
#Push in power-off state ——————————→ power on
#Push for long in power-on state ——————→ power off
#Push in playing interface ————————→ pause/play switch
#Push when recording ————————————→ pause recording
#Push when tuning ——————————————→ mute
#Push when timing with stopwatch ————→ record time

② M : #Press when in menu operation ————→ enter the item or confirm the setting
#Press when recording ————————————→ save record files
#Press when in stopwatch timing interface ——→ Time/pause timing
#Press when in music playing interface ———→ Exit and enter into main menu interface
#Press when in music playing, tuning, e-book browsing, picture browsing and recording preparation interface ————→ On-line menu pops up

⑤ ➖ ④ ➕ : #Press when playing or tuning ————→ adjust volume
#Press when in "My sound effect setting" ———→ Adjust dB value
#Press when setting clock ————————→ set time
#Press when browsing e-book ———————→ turn lines
#Press when in menu operation ——————→ Move cursor

⑦ I◀◀ · ⑥ ▶▶I : #Press when playing ——————→ the previous/next track
#Press for long when playing ——————→ fast backward/forward
#Press when in tuning preset state —————→ Select channel

#Press when in tuning search state ──────────→ auto search

#Press for long when in tuning search state ───────→ Automanual search

#Press when in "My sound effect setting" ────────→ select the frequency that you want to set

#Press when browsing picture ─────────→ switch pictures

#Press when browsing e-book ─────────→ turn pages

#Press when in menu operation ─────────→ move cursor

③ ⊃ : #Press for long when in music playing interface ─────────────→ A-B repeat

#Press for long when in file browsing interface ─────────────→ Delete file

#Press when in file browsing interface ─────────→ return to the previous directory

#Press when in menu operation ─────────→ not save the setting and then exit from menu

⑧   Hanging rope hole

⑨   USB jack

⑩   MIC: microphone

⑪   Headphone jack

⑫   HOLD button: lock buttons when pushing towards arrow direction and unlock when push towards the opposite direction.

2.1.2 POWER ON/OFF

#Power on

Press ▶ⅠⅠ button to power on, the power-on motion picture displays and system enters main menu.

#Power off

Push ▶ⅠⅠ button for long to power off.

NOTE:

If functions of playing, tuning or recording are not used during a specified period, this player will power off automatically.

2.1.3 PLAY MUSIC

#Play/Pause

When playing music, pushing this button may switch between "Play" and "Pause".

#NEXT and PREV

When playing music, press this button to skip to the previous or next track.

#FF and FB

When playing music, press this button for long and you may enter fast forward or backward playback.

#Adjust volume

When playing music, press this button or for long and you may adjust volume.

#Play music

In "Music playing" menu, press ▦ button to enter Interface of browsing musical files. Press ▦/▦ button to select songs and press ▦ button to begin playing this song. When playing music, pushing ▦ button may pause music playing, press ⊃ button to return to the previous directory and press ▦ button to exit and enter main menu interface.

CAUTION:

#When the length of song's full path name is too long, this song may probably not be played.
#When playing music, use picture browsing functions and music will
stop playing.

2.1.4 VIDEO

In main interface, select "Video" item and press ⓜ button to enter.
After selecting movie files through pressing⊞/⊞ button, press ⓜ button to play movie and push⊞ button to pause. When playing, pressing ⊞/⊞ button may skip to the previous or next movie, pressing ⊞/⊞ button to enter fast forward/backward; pressing ⊟/⊞ button to adjust volume and pressing ⊇ button may return to the previous directory.

NOTE:

As for movie files with large capacity, you need wait for several seconds to enter playing after pressing ⓜ button.

2.1.5 PICTURE BROWSING

After selecting picture file, press ⓜ button to enter picture browsing, press ⊞/⊞ button to switch pictures and press ⊇ button to return to the previous directory.

When browsing picture, press ⓜ button to enter "On-line menu". In on-line menu, you may set slide, rotate leftwards, rotate rightwards and rotate 180 . Press ⓜ button to enter "Slide"; after pressing ⊞/⊞ button to select your desired slide interval time, press ⓜ button to confirm.

After pressing ⊇ button to exit from on-line menu, pictures will be played in the means of slide.

2.1.6 E-BOOK BROWSING

After entering "E-book" item, press ⊞/⊞ button to select text file and press ⓜ button to browse e-book. Pressing ⊞/⊞ button may turn pages; pressing ⊟/⊞ button may turn lines and pressing ⓜ button may enter on-line menu. When browsing e-book, press ⊇ button to return to the previous directory.

NOTE:

If some e-book format is not supportable, please switch to TXT file with ANSI encoding format

#Switch of ANSI encoding format

1. Select "Save" in "File" item.

2. After dialogue box pops up, select "ANSI" in the pop-up options of encoding and then click "Save".
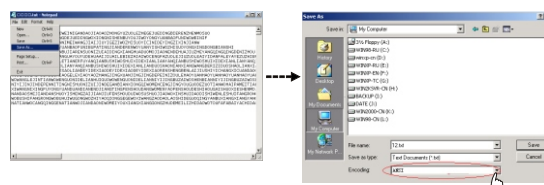
2.1.7 RECORDING

In main menu, select "Record" item and press ⓜ button to enter recording preparation stage. Press ⓜ button to enter recording/ pause recording. When recording, pressing ⓜ button may generate recording files and exit to recording preparation state. Press ⊇ button to save recording files and exit to main menu. Recording files are saved in "RECORDER" file folder of "Music Playing" menu.

CAUTION:

#In order to avoid sudden power-off in the course of recording, you cannot record when battery is low and when disc is fully written; if recording is in process, it indicates "FULL DISC" and exits from recording.

#When recording with microphone, if you press buttons and the sound of pressing may probably be recorded.

In main menu, select "Radio set" item and press ⓜ button to enter tuning mode. Now, insert headphone and you may listen to radio program. After entering tuning mode, pressing ⓜ button may enter "On-line menu". Press ⊇ button to exit from tuning interface and enter main menu, but tuning still proceeds.

2.1.9 RESUME PLAYING

In main menu, after selecting "Resume playing" item, press ⓜ button to enter. In this menu, you may select "Music resume", "Movie resume" and "E-book resume". For instance, select "Music resume" option, after pressing ⓜ button, this song begins playing from the position where playing stopped last time.
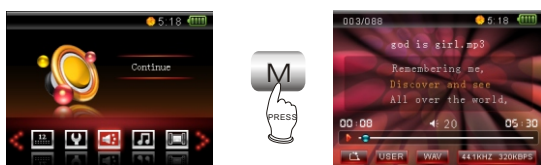
2.1.10 CALENDAR

In "Calendar" menu, you may set "Clock", "Calendar" and Stopwatch".
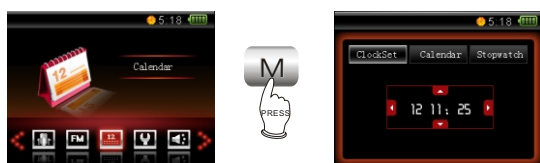
2.1.11 CHARGE
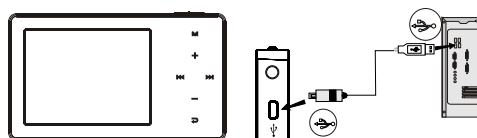
This player adopts lithium-ion battery to supply power. In any case, connect MP4 player to computer with USB line, it will power on and begin to charge automatically. After fully charged, the player will stop charging automatically.

CAUTION:

#When charging, the player body is slightly hot, and this belongs to normal phenomenon, so please take it easy to use it.

#When electric charge of battery is too low, and when USB power supply is less than 100mA, it begins to charge, screen may probably have no display, and even battery charge is unavailable.

#It takes 3 hours to charge battery with computer .

#Before unplugging USB line, please stop using USB memory function firstly. Data may be lost or the player may be damaged if you unplug it directly.

2.1.12 RESET

When this player cannot be operated, please reset it.

Method for reset:

Push ⓜ button for about 10 seconds. After reset finishes, power on again and you may use it normally.

2.2 USAGE INTRODUCTION

2.2.1 MAIN MENU ILLUSTRATION

#Play music
Save audio files.
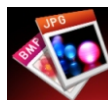
#Browse picture
Save picture files.

#Record
Select "Record" to enter recording mode.

#Calendar
Select "Calendar" item to enter this mode.

#Resume playing
Play from the position where the music, movie and e-book stopped last time.

#Video
Save video files.

#E-book
 Save text files.

#FM Radio
 Select to enter radio
 mode.

#Setup
 Select "Setup" item
 to set system options.

2.2.2 PLAYING INTERFACE ILLUSTRATION
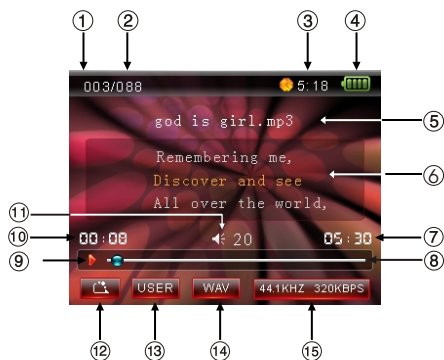
1. Current track serial number	9. Playback state
2. total track number	10. Current playback time
3.Clock	11. Volume
4. Battery capacity	12. Playback mode
5. Song name	13. EQ mode
6. Song name/singer/lyrics display	14. Music file format
7. Total track time	15. Sampling rate\Bit rate
8. Playback progress bar	

2.2.3 RECORDING INTERFACE ILLUSTRATION
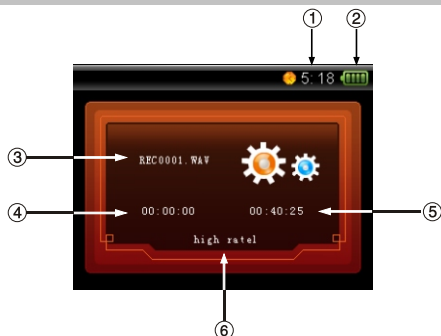
1.Clock	4. Time that has been recorded
2. Battery capacity	5. The left recordable time
3. Name of recorded file	6. Recording quality

As for the name of recorded file "REC0001.wav": 0001 is serial number of the current recorded track and arranged according to sequence; WAV is the file format after recording.

2.2.4 TUNING INTERFACE ILLUSTRATION
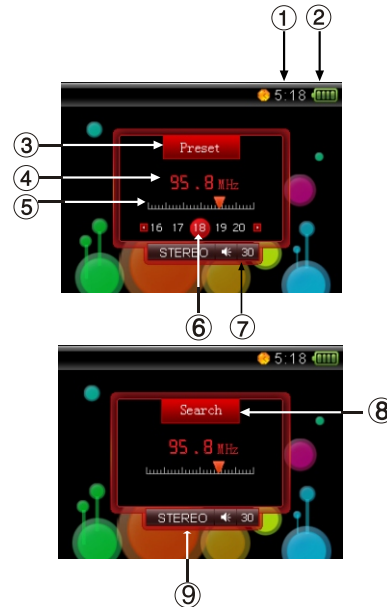
1.Clock	6. Radio station serial number
2. Battery capacity	7. Volume
3. Preset mode	8. Scanning mode
4. Frequency of the current radio station	9.Mono channel
5. Scanning progress bar	

2.3 BASIC OPERATION

2.3.1 USE MOBILE STORAGE FUNCTION

    This player may be used as mobile storage in Windows ME/2000/XP operating system. Under Windows 98SE operating system, the player may be used as mobile storage after drive program is being installed (please download it from BBK official website).
Connect MP3 player and computer with USB transmission line. After the bottom right corner of desktop appears " 🖳 "symbol, the mobile storage function of MP3 player may be used normally.
NOTES:
 #To avoid abnormality of the player appears, you are suggested to power off firstly before connecting MP4 player with computer, and then use USB transmission line to connect Mp4 player, then connect computer.
 #In Windows 98 system, there is no " 🖳 " symbol.

2.3.2 DISCONNECT USB SAFELY

After operation finishes, click " 🖳 " symbol on bottom right corner of Windows desktop with right button of mouse, and disconnect USB safely according to the computer prompt.
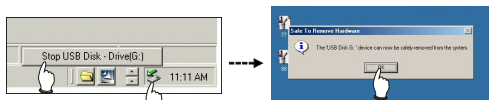
2.3.3 VIDEO CONVERSION TOOL

1. Brief introduction

before use, please download video conversion tool and installation program "BBK MINIMP4 conversion tool" from BBK website and then install to computer.

2. Basic operation

1) After program runs, click "Add conversion file" button on the bottom left corner and a dialogue box pops up, shown in the following figure:
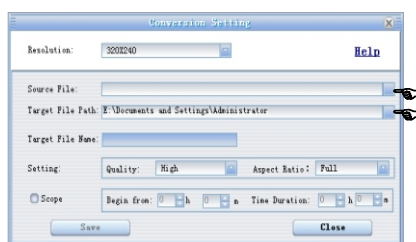
2) According to the position indicated by finger, click to select the source file required to converse and the saving target path of new file after conversing. Click "Save" button to add this conversion into

conversion list. Multiple conversion tasks may be added.

3) Click "Begin to converse file" button to start conversing, shown in the above figure:

2.3.4 BROWSE/CANCEL FILE

#Browse file

In main menu, audio files are saved in "Music playing" item.

Press ◄◄/►► or ➖/➕ button to select files to browse upwards or downwards.

#Cancel file

When browsing files, press ⤶ button for long and the cancel dialogue box will pop up. Press ◄◄/►► button to select "YES" and then press ▸ button to cancel the file.
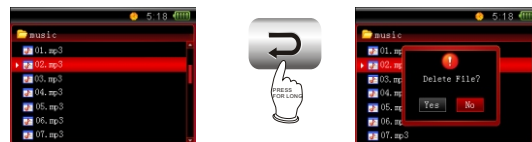
NOTE:

When in playing state, files cannot be cancelled.

2.3.5 PLAY MUSIC

#PLAY MUSIC

In "music", press ➖/➕ button to select song, press ►ıı button to begin playing music, and the playback interface displays at the same time.

#Pause music

When playing music, press ►ıı button to switch to pause playing state, and press ►ıı button again to continue playing.

#NEXT and PREV

When playing, pressing ►► button may skip to the next track to play; and pressing ◄◄ button may skip to the previous track to play.

FF and FB

When playing, pressing ►► button for long without loose may realize fast forward.
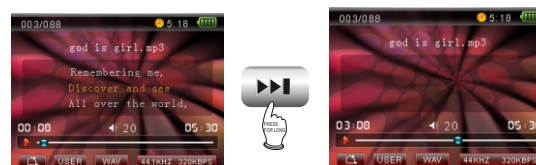
When playing, pressing ◄◄ button for long without loose may realize fast backward.

#ADJUST VOLUME

When in playback interface or listening to radio set, pressing ➖/➕ button or for long may both adjust volume.

NOTE:

#In some operating system (such as complex font Windows), the operation of copying lyrics/song file and changing song's name may

Probably lead to incorrect display. When playing non-standard songs or songs with special format, noise may probably occur.

2.3.6 A-B REPEAT FUNCTION

When playing, if you want to listen to content of a certain segment repeatedly, please use A-B repeat function. Press ⊇ button for long for the first time to select the beginning point that you want to play repeatedly and screen displays "A"; press ⊇ button for long for the second time to select the end point that you want to play repeatedly and screen displays "A-B" and system begins to repeat during "A-B" period; press ⊇ button for long for the third time to cancel A-B repeat and playing continues.
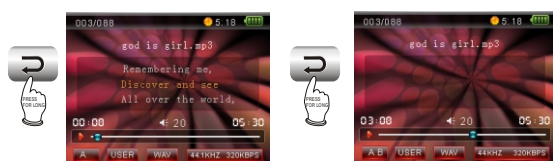
2.3.7 PLAYING MODE
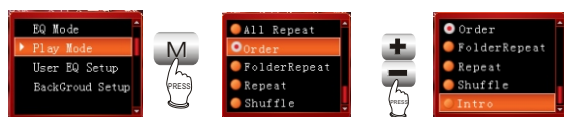
The playback mode icons displayed on playback interface are shown as follows:

: Repeat playing all tracks.

: Play according to track sequence.

: Repeat file folder.

: Repeat playing single track.

: Play any track at random.

: Browse play each track for 10 seconds.

2.3.8 EQ MODE

When playing music, press M button to enter "On-line" menu, press M button to enter "EQ Select", and then move cursor through pressing ⊪/⊫ button to select proper EQ mode.

2.3.9 EQ MODE

The corresponding icons of each EQ mode in playback interface are shown as follows:

NOR NORMAL   POP POP   JAZZ JAZZ

3D 3D   CLAS CLASSIC   USER MY EQ

ROCK ROCK   BASS DBASS
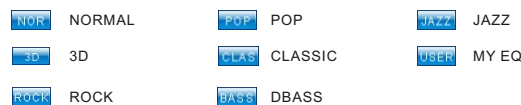
Select "MY EQ", and correspond with the sound effect that you have preset in "On-line menu" in playback mode. If you have not set "MY EQ", it is defaulted "NORMAL" sound effect,

When cursor moves to a certain sound effect, press M button to confirm the selection of this EQ mode.

2.3.10 MY EQ SETUP

In "My EQ setup" interface, the range value (dB) of each frequency range may be increased or decreased.

If you want to adjust the range of mediant (1K), you may operate according to the following diagram:

Press ⊪/⊫ button to select the frequency range that you want to adjust, and press ⊟/⊞ button to adjust the range value. When adjusting the range, take 2dB as a step, and the max adjustable scope is ±6dB. After setup finishes, press ⊪/⊫ button to confirm and exit; press M button not to save and then exit.

2.3.11 WALLPAPER SELECT

When playing music, you may select wallpaper in "On-line" menu. Press M button to enter "On-line" menu and press ⊪/⊫ button to move cursor to "Wallpaper select" item. Select your favourite wallpaper and then press M button to confirm.

2.3.12 RECORD

In main menu, after selecting "REC", press M button to enter recording ready state. In recording ready state, press M button to pop up on-line menu.

Recording quality

If recording quality is higher, sound quality is better and space occupied is more. The two kinds of recording quality both adopt ADPCM format encoding, which is only effective to MIC recording.

2.3.13 TUNING

#Enter radio set mode

Select "Radio set" in main menu and press M button to listen to radio program.

#Quit radio set mode

When listening to radio program, press button to exit and enter main menu.

#Search

When listening to radio program, press M button to enter on-line menu.

There are two kinds of scanning mode of "Manual" and "Auto".

1. Manual scanning

Pressing button may add 0.1MHZ each time and pressing button may decrease 0.1MHz each time.

Pressing / button for long may increase or decrease frequency continuously and will stop until radio station is searched.
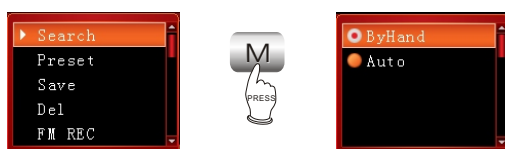
2. Auto scanning

In on-line menu, after selecting "Auto" item, full auto scanning starts and all radio stations searched will be saved automatically.

NOTE:

During the course of (full-auto/automanual) scanning, pres / button and scanning will be stopped.

#Preset

In preset mode, pressing button may adjust to the next channel and pressing button may adjust to the previous channel.

#Save

In manual or automanual scanning mode, after radio station is searched, press M button to enter on-line menu. After selecting "Save", press M button to confirm.

#Delete

In tuning interface, press M button to enter on-lin menu, select "Delete" item, move cursor to the frequency point that you want to delete and press M button to confirm.

#FM recording

When listening to radio set, press M button to pop up "On-line" menu and select "Record" item to enter FM recording. Press M button to generate recording file and exit to tuning state. Format of file generated from FM recording is WAV format and this file is saved in "FM REC" file folder of "Music playing".

2.3.14 E-BOOK

When browsing e-book, pressing button may enter "On-line" menu.

In on-line menu, you may set jump pages, save bookmark, extract bookmark, delete bookmark, auto page down, music playing, style select and font size.

#Jump pages

You may press / and / button to set page by using this function, shown in the figure:

After setup finishes, press ⓜ button to confirm.
#Save bookmark

In on-line menu, select "Save bookmark" item and press ⓜ button to enter. Pressing ⓜ button may select th position to save and pressing ⏮/⏭ button may set the current page as bookmark.

#Extract bookmark

In on-line menu, select Extract book "mark" item and press ⓜ button to enter. Press ⏮/⏭ button to select your desired bookmark and then press ⓜ button to confirm.
#Delete bookmark

After selecting "Delete bookmark" item, press ⓜ button to make dialogue box pop up. Select "OK" item and then press ⓜ button to delete bookmark.
#Auto page down

After pressing ⓜ button to enter on-line menu, select "Auto page down" item and press ⓜ button to enter interval time setup of page down. After selecting your desired interval time, press ⓜ button and the E-book will turn pages Automatically.
#Music playing

After setting "Music playing" item in "ON", you may browse E-book while listening to music.
#Style select

In "Style display" item, you may set your favourite style according to your own likes.

2.3.15 CALENDAR
#Clock

In "Calendar" menu, press ⓜ button to enter "Clock" item and you may set the current time.

Press ▬/➕ button to select time format: 12-hour or 24-hour system.

Use ⏮/⏭ and ▬/➕ button to set the current time and then press ⓜ button to confirm.

#Calendar

Press ⓜ button to enter "Calendar" setup. Use ⏮/⏭ and ▬/➕ button to set date.
#Stopwatch

In "Stopwatch" menu, press ⓜ button to start Timing. When timing,
Push ⓜ button to save record and press ⓜ button to stop timing

2.4 SYSTEM SETUP
2.4.1 LANGUAGE
#Language

Press ⓜ button to enter the setup, press ⏮/⏭ button to select language and press ⓜ button to confirm. After setup is ok, press ◄ button to return to the previous content.

2.4.2 TIMING POWER-OFF
#Timing power-off

Press ⏮/⏭ button to adjust timing power-off time. After setup is ok, press ⓜ button to confirm. If the timing power-ff time is set in 15-min, after 15 minutes this player will power off automatically.

CAUTION:
#Invalid is defaulted each time when power on.
#Timing power-off time is rough time and it may probably have deviation.
#When recording, please do not set timing power-ff, otherwise the recording files cannot be played normally.

2.4.3 SCREEN SAVER TIME
#Screen saver time

After pressing ⏮/⏭ button to select screen saver time, press ⓜ button to confirm. If screen saver time is set in 15 seconds and no operation happens within 15 seconds, this player will enter screen saver state automatically.

CAUTION:

#Screen saver time is rough time and it may have difference when playing songs with different formats.

#Screen saver function is not available when in video playing, stopwatch, Ebook and pictures.

2.4.4 BRIGHTNESS

#Brightness

Press ⏮/⏭ button to select proper brightness and then press M button to confirm.
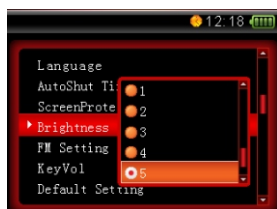
2.4.5 FM CHANNEL

FM Channel

You can select the FM channel in settings. When select Auto, it changes the channel Automatically. When select Mono, it tunes atMono channel all the time.

CAUTION:

"General radio station" is the default value each time when power on.

2.4.6 SOUND OF PRESSING BUTTON

#Sound of pressing button

After entering this menu, you may set "On" or "Off" for the sound of pressing buttons. When dialogue box pops up, press ⏮/⏭ button to move cursor to "On" and then press M button to confirm.
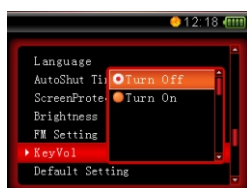
2.4.7 DEFAULT SETTINGS

#Default settings

If you want to restore this player in factory settings state (material and song file will not be deleted), you may select "Default settings". Press M button to enter this menu, after dialogue box pops up, select "Yes" and then press M button to restore in "Default settings".

2.4.8 FIRMWARE UPGRADING

Firmware upgrading

This player supports firmware upgrading. Please refer to the description on BBK website for details.

CAUTION:

After upgrading, disk will be formatted, so please pay attention to backup materials before upgrading.

2.4.9 SYSTEM INFORMATION

#System information

In this item, you may check information of memory, remained memory and version number.

CAUTION:

Because firmware will use some space, the displayed content capacity may probably be different from the actual capacity.

2.4.10 FORMAT

#Format

When using computer to format this player, please select FAT32 file system, otherwise this player will work abnormally.

2.5 SPECIFICATION

Model	V3 video	V5 video
Audio decode chip	WOLFSON WM 8750	WOLFSON WM 8750
Lithium battery	3.7V 650mAh	3.7V 900mAh
Continuous playback time	Longest continuous playing time for MP3 is 11 hours	Longest continuous playing time for MP3 is 15 hours
Size/weight	Size: 85.5mm× 50mm×10mm weight: 66.2g	Size: 87mm× 54mm ×11mm weight: 76g
Audio SNR	≥90dB	
Headphone output	12mW+12mW 32 ohm (25mW+25mW when headphone impedance is 16-ohm)	
Frequency range	18Hz~20kHz	
FM tuning range	76MHz~108MHz	
Working temperature	0℃~35℃	
Audio file	MPEG 1/2 Layer 3(32kbps~320kbps), WMA(32kbps ~ 320kbps), WAV	
Picture file	Support DCF standard JPEG format, 6~8 million pixel at most is supportable, BMP	

#Design and specifications of product are subject to change without notice.

Chapter Three Principle and Servicing

Section One Principle of the Player

3.1.1 Block diagram of the player

Block diagram of the player is shown in the picture 3.1.1.1:
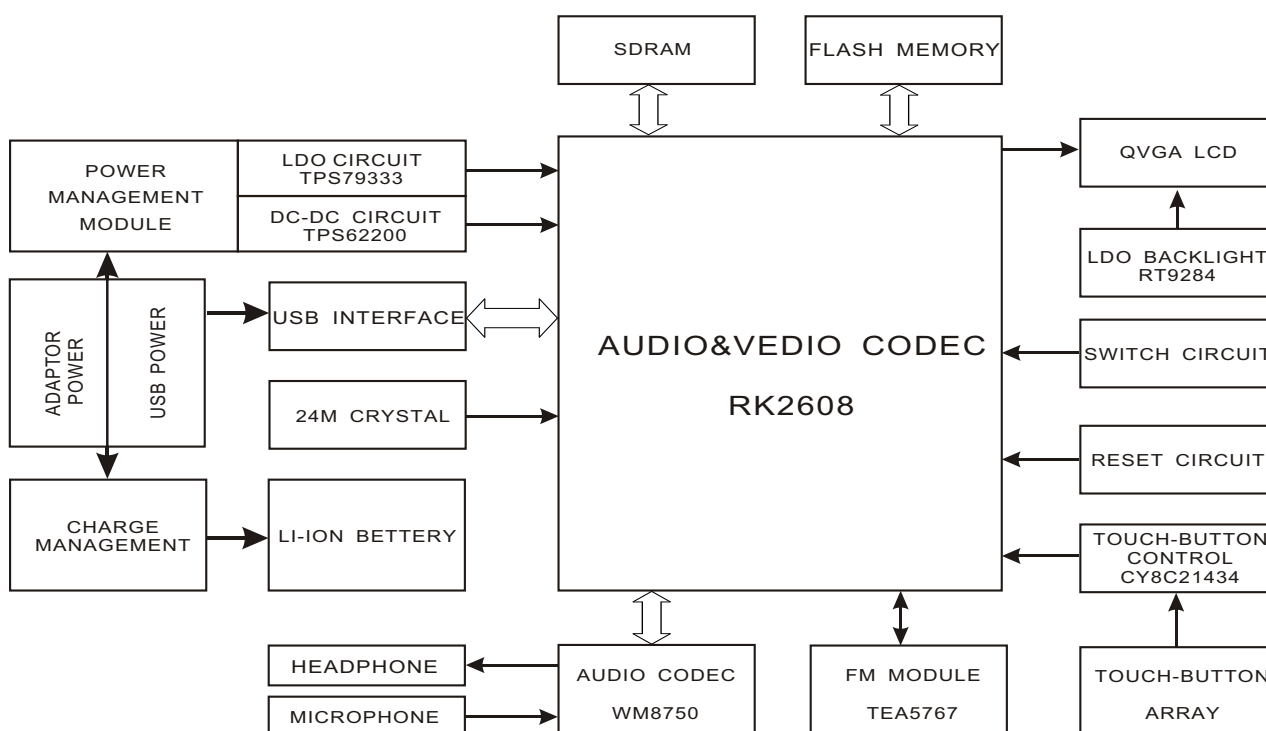
Figure 3.1.2.1 Block diagram of the player

3.1.2 Principle of the player

V3/V5 portable Mp4 player is mainly composed of the following functional modules:

1. Decode part: main video decode chip adopts Rk2608 decode chip of Rockchip Company with built-in ROM and RAM, which may directly drive TFT LCD screen. Main audio decode chip adopts Wm8750 decode chip of Wolfson Company.

2. Power supply part: composed of lithium battery, TPS79333, TPS62200 and XC6206, which is responsible for power supply circuit of each part of the entire MP3.

3. Peripheral jack" composed of headphone output port, MIC input port and USB jack. Headphone jack is the audio output jack of the player, MIC is the audio input jack of external recording and USB jack fulfills internal and external data exchange of the machine to realize charge function. 。

4. Data storage module: composed of Flash and peripheral circuit to fulfill data storage of the player.

5. Display module: V3 adopts 2.4" high-bright QVGA screen and V5 adopts 3" high-bright 16:9 LCD screen.

6. Tuning module: FM tuning.

3.1.3 Introduction to IC used by the player

1. IC used by the main board of V3 is shown in the following picture:

Location number	Chip	Function
U1	HY57V641620ETP-7	SDRAM
U2	RK2608	Main video decode board
U3	RT9284B	12V voltage DC-DC conversion
U4, U5	K9G8G08U0M	FLASH
U6	TPS62200	1.8V voltage DC-DC conversion
U8	MCP73832	Charge management
U9	TEA5767HN	Tuning chip
U10	M41T62	Real-time clock
U11	WM8750BL	Audio encode/decode
U14	XC6206P152MR	1.8V voltage stabilizing
U15	CY8C21534	Touch button control
U16	TPS79333DBVR	3.3V voltage DC-DC conversion

2. IC used by the main board of V5 is shown in the following picture:

Location number	Chip	Function
U1	WM8750BL	Audio encode/decode
U2	HY57V641620ETP-7	SDRAM
U3	RK2608	Main video decode
U4, U5	K9G8G08U0M	FLASH
U6	M41T62	Real-time clock
U7	TEA5767HN	Tuning chip

U8	SSD1928QL9	LCD drive
U10	RT9284B	12V voltage DC-DC conversion
U11	TPS79333DBVR	3.3V voltage DC-DC conversion
U12	TPS62200	1.8V voltage DC-DC conversion
U13	MCP73832	Charge management
U14	XC6206P152MR	1.8V voltage stabilizing
U15	CSTCR4M00G55	SMD ceramic resonance
U1	CY8C21534	Touch button control

Section Two Unit Circuit Principle

3.2.1 Video decode circuit principle

1. Video decode circuit is mainly composed of main decode chip Rk2608, SDRAM and peripheral circuit. Rk2608 may realize video file decode playing of MPEG-4 format in low frequency and power consumption with clear and smooth picture quality, meanwhile, Rk2608 integrates large amount of I/O control jacks which may provide the max flexibility. The internal principle block diagram of Rk2608 is shown in the picture 3.2.1.1. Low power consumption function of Rk2608 may prolong battery usage time for portable player and its integrated intelligent lithium battery charger supports voltage control (AVC) and its integrated power management unit includes a DC-DC converter on high effective plate, which supports multiple battery configuration, such as 1×AA, 1×AAA and Li-ion battery. What's more, compared with the traditional voltage control system, AVC enables chip to operate with higher peak value CPU working frequency to make the highest running speed up to 100 MIPS. Rk2608 supports DRM10 digital copyright management technology based on SOFTWARE. Rk2608 with multi-function management function, which may realize the function that listening to music while viewing e-book or playing e-games. Rk2608 chip integrates USB 2.0 High Speed/Full Speed PHY with hugher transmission speed and integrates the controller that supports TFT/CSTN/OLED colorful screen.
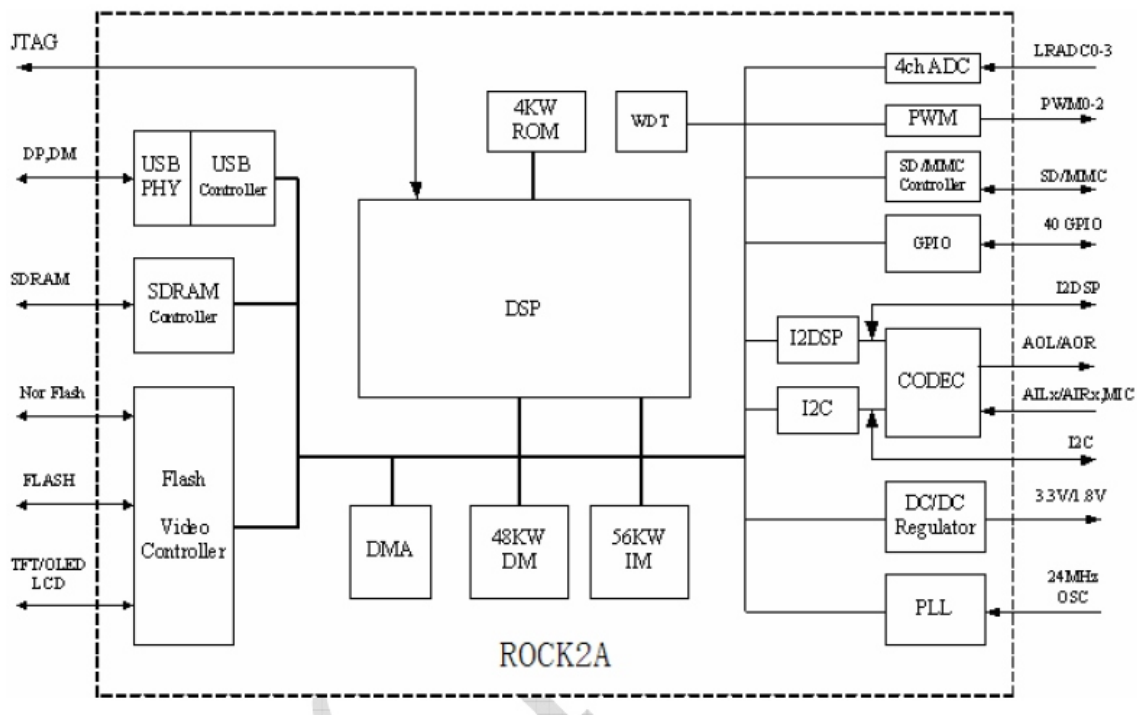
Figure 3.2.1.1 Internal principle block diagram of Rk2608

2. Working principle: when the machine power on, reset circuit keeps high level reset signal. After RK2608 completes reset through reset pin 113, reset signals output from pin 56 to pin 42 of SSD1928 to enable SSD1928 to finish reset (V3 screen need no SSD1928 drive, so there is no this reset process), at the same time reset signals are sent to enable end of RT9284, boost circuit begins to work and screen is lightened. Meanwhile, 1.8V and 3.3V power circuit begins to supply power for RK2608, 24M crystal oscillator Y1 oscillates and decode chip begins to work and read data saved in Flash. After RK2608 decoding, video signals are sent to SSD1928 to drive LCD screen to display through SSD1928.

3.2.2 Audio decode circuit principle

1. Audio decode circuit is mainly composed of decode chip WM8750 and peripheral circuit. WM8750 is a stereo coder/decoder with low power consumption and high quality, specially designed for portable digital audio application. WM8750 adopts I2C bus mastering means and its internal principle block diagram is shown in the picture 3.2.2.1.
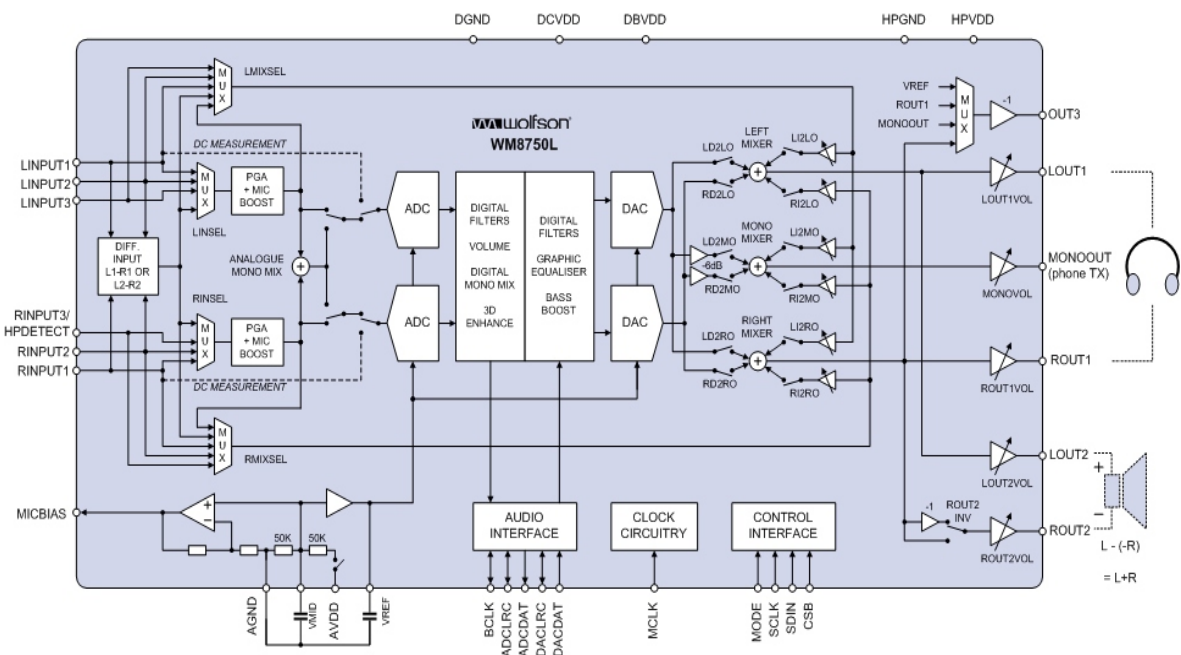
Figure 3.2.2.1 WM8750 internal principle block diagram

2. Working principle: the digital audio signals that output after being decoded by the internal decode circuit of RK2608 are sent to WM8750 inside for DA conversion through pin 6 of WM8750 and the analog audio signals after conversion are sent to headphone jack for output through HP_OUTR and HP_OUTL.

When the machine is recording, external analog audio signals pass through microphone and an INPUT pin (pin 24) of WM8750 and then are sent to AD conversion unit of WM8750 for AD conversion and then for digital filtering, volume control and echo processing inside. The digital audio signals after being processed are sent to main decode chip RK2608 for processing and then saved in Flash.

When machine is in FM state, FM digital audio signals input from INPUT pin (pin 27, 28) of WM8750, after digital filtering and echo processing inside WM8750, and then output to headphone jack directly.

3.2.3 FLASH circuit

1. FLASH circuit schematic diagram is shown in the figure 3.2.3.1:
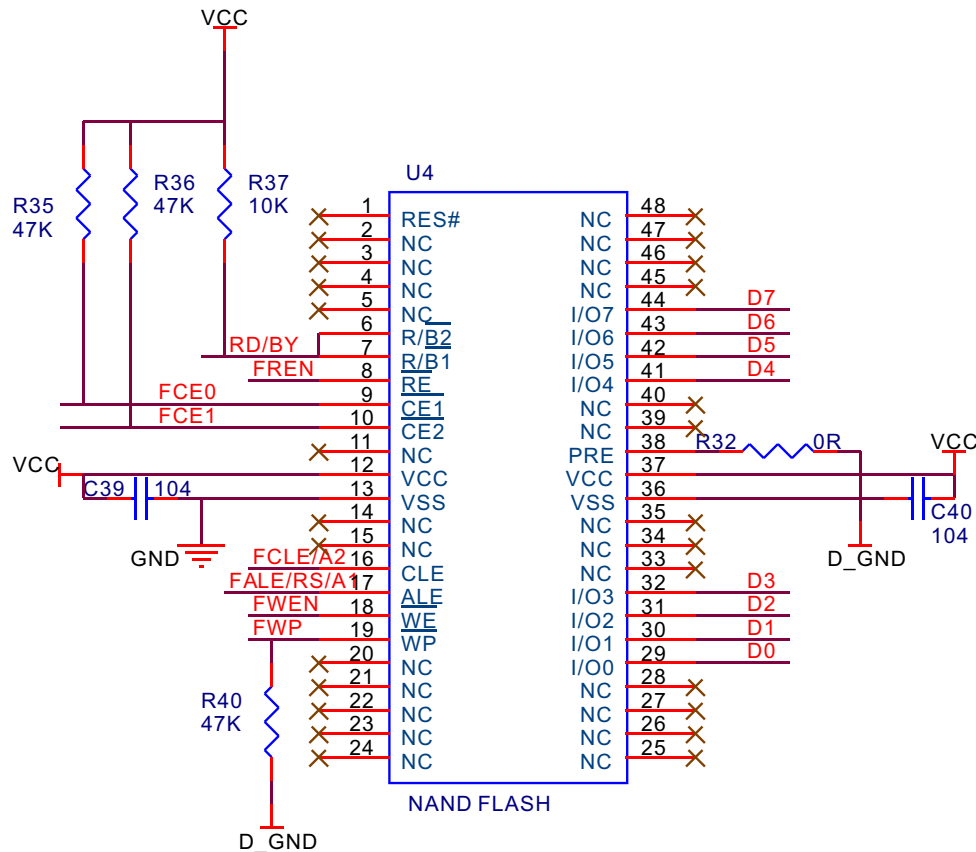
Figure 3.2.3.1 Flash circuit schematic diagram

2. Working principle: Flash Memory is the storage unit of the player and all AV and image files must be stored in FLASH. Flash module is composed of two groups of FLASH chip K9G8G08U0M with the specification 2G (H model is 4G). Flash chip and main decode RK2608 are connected through 8 data lines to complete the read, write and delete of inside files. VCC provides 3.3V voltage for FLASH working. R35, R36 are pull-up resistor of /CE and R40 is pull-down resistor of /WP. VCC is power supply pin of FLASH. /CE is chip-selection signal, effective when in high level. VCC supplies 3.3V voltage and FLASH begins working. /RE, /WE are read-effective and write-ettective signal ports to control rear and write function of FLASH. I/O1～I/O8 are 8 data lines to fulfill the exchange of FLASH and outside data to realize the function of write, delete and edit of Mp3.

There is firmware of the player's working inside Flash and all tasks are completed by CPU to send out relevant order after the data exchange between CPU and Flash. When the player power on, 3.3V voltage supplies power for Flash through VCC, /CE inputs 3.3V high level signal and Flash begins to work effectively. When playing video files, /RE is high level, Flash performs the operation of read out. When files are written in through USB data line or recording through microphone, /WE is high level and Flash performs the operation of writing in. The operation of read out and writing in is performed through I/O1~I/O8 dateladdress lines.

3.2.4 FM tuning circuit

1. FM tuning circuit diagram is shown in the figure 3.2.4.1
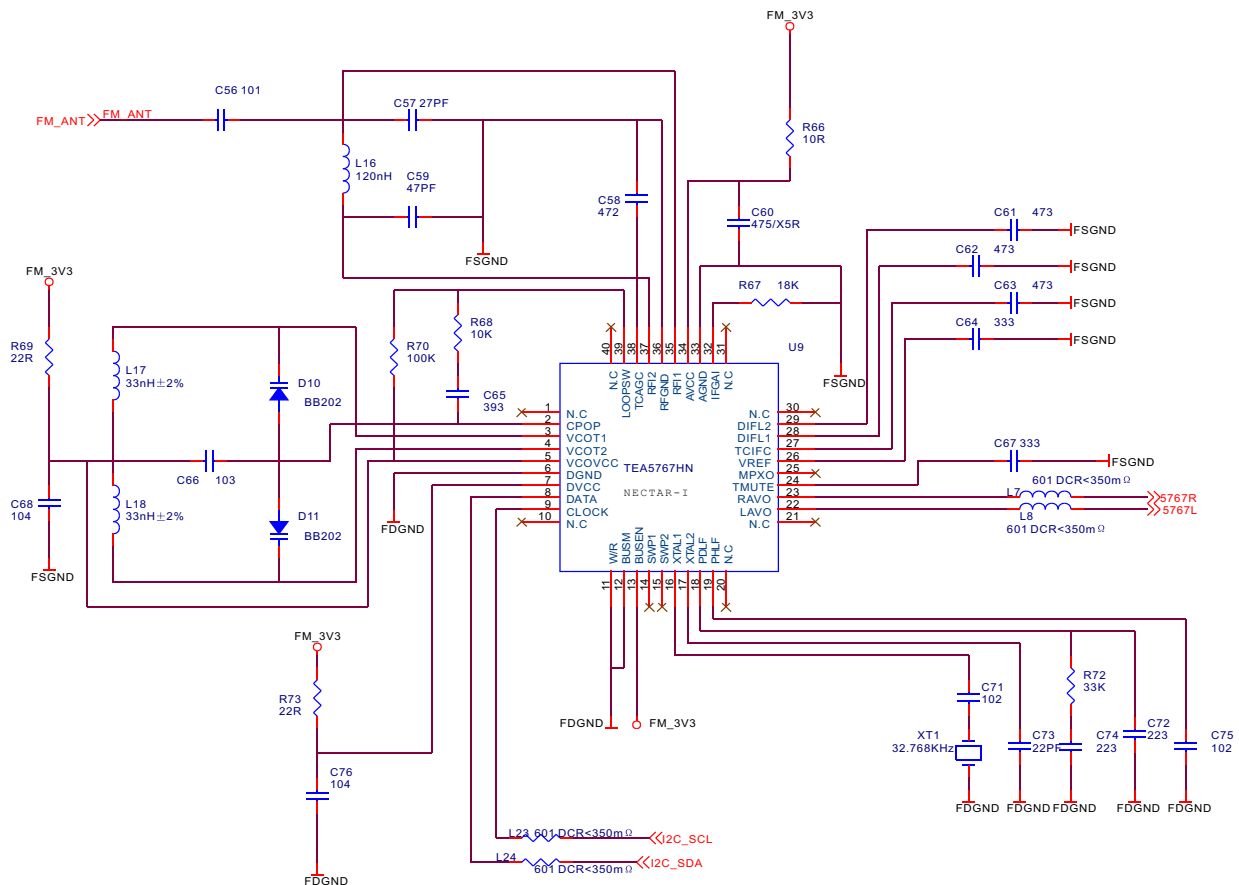
Figure 3.2.4.1 FM tuning circuit diagram

2. Working principle: tuning circuit is composed of the micro digital tuning IC TEA5767 of Philips Company and peripheral circuit. C56, C57, C58, C59, L16 is the antenna input matching circuit of FM module; variant diode D10, D11 and winding inductor L17, L18 is frequency selection tuning circuit in FM module. The control of FM adopts IIC bus control means and 9, 10 of TEA5767 are data and control lines.

When MP3 player switches in FM tuning state, antenna is sent to the RF band-pass filter (87.6MHz~108MHz and 76MHz～87.5MHz) composed of Li6, C57 and C59 through C56 coupling and then to pin 35, 37 of TEA5767 for amplifying through TEA5767 inside. Pin 2, 3, 4 of TEA5767 is connected with the internal VCO and with variant diode D10, D11 externally. Pin 2 id tuning voltage output pin and voltage changes within 1V when in auto search. VCO power supply is sent to pin 5 of TEA5767 by FM 3V3 through 69 limit and C68 filtering. The built-in I2C jack is controlled through pin 8, 9 of TEA5767 and CPU performs operation of channel search and selection through I2C bus. Digital power is sent to pin 7 of TEA5767 by FM 3V3 through R73 limit and C76 filtering. XT1 (32.768) produces basic clock of 32.768 and inputs to TEA5767 from pin 17. Analog audio signals after being processed by TEA5767 output to rear stage power amplifying circuit from 23 (right channel), 22 (left channel) for amplifying and then output through headphone jack.

3.2.5 Display screen boost circuit

1. Display screen boost circuit diagram is shown in the picture 3.2.5.1:
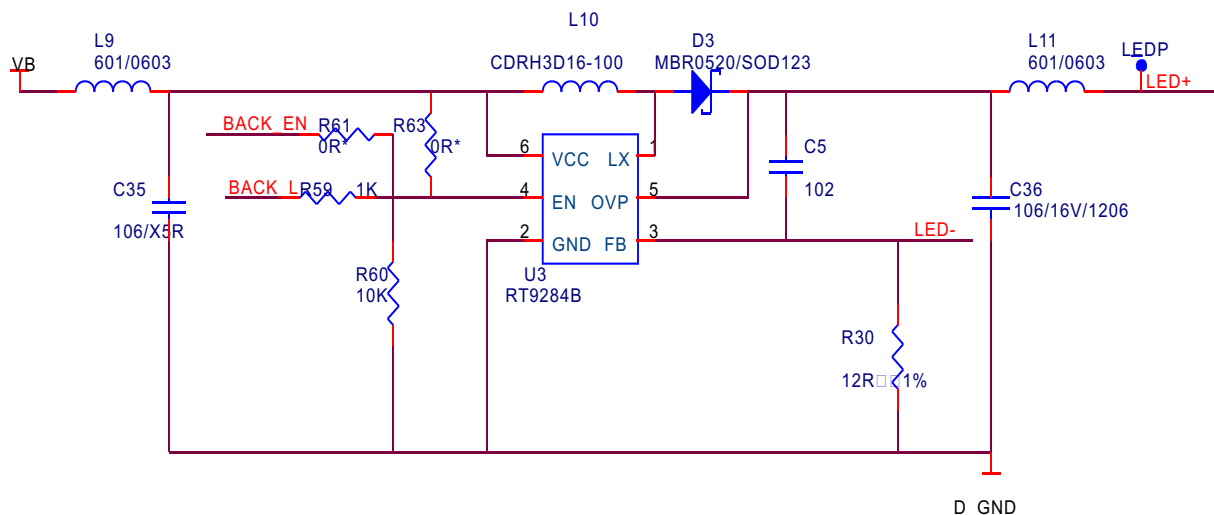
Figure 3.2.5.1 Display screen boost circuit

2. Working principle: 12V high voltage is needed for lightening display screen, so the boost circuit must be matched to fulfill. This circuit includes two parts: boost circuit and display screen jack circuit. Boost circuit is composed of DC-DC control IC Rt9284 and peripheral circuit; VIN is power input; EN is enable end of Rt9284, effective when in high level; SW is high voltage output pin and FB is feedback pin.

After power on, the internal boost circuit of L10 and Rt9284 begins to boost and storage energy. When current of L10 reaches 750mA, RT9284 internal switch turns off, and supplies power for the rear circuit through external diode D3 at the same time when the switch is off. Voltage divide detect circuit sends the detected voltage in pin 3 of RT9284. When detect voltage of pin 3 is lower than 1.235V reference voltage (this IC has a 1.235V reference voltage comparator inside), the internal switch is on, the internal boost circuit of L10 and RT9284 begins to boost and store energy. When current of L10

reaches 750mA, the internal switch of RT9284 turns off, and supplies power for the rear circuit through external diode D3 at the same time when switch is off until feedback voltage is lower than reference voltage again. As for this PFM peak current control scheme adopted by convertor and discontinuous conduction means (DCM), the frequency depends on output current and makes the frequency of entire load very high. Pin 4 of RT9284 is working enable pin and connected with pin 56 of RK2608 to control level change through software and control RT9284 to realize screen-save function.

When machine power on, display screen perform data communication through rear CPU and restores the drive current signals sent from CPU on display screen. Signals sent from CPU are different and display screen makes different displays, so we may see different displays and CPU also controls screen-save function through software setup.

3.2.6 USB jack circuit

1. USB jack circuit is shown in the picture 3.2.6.1.
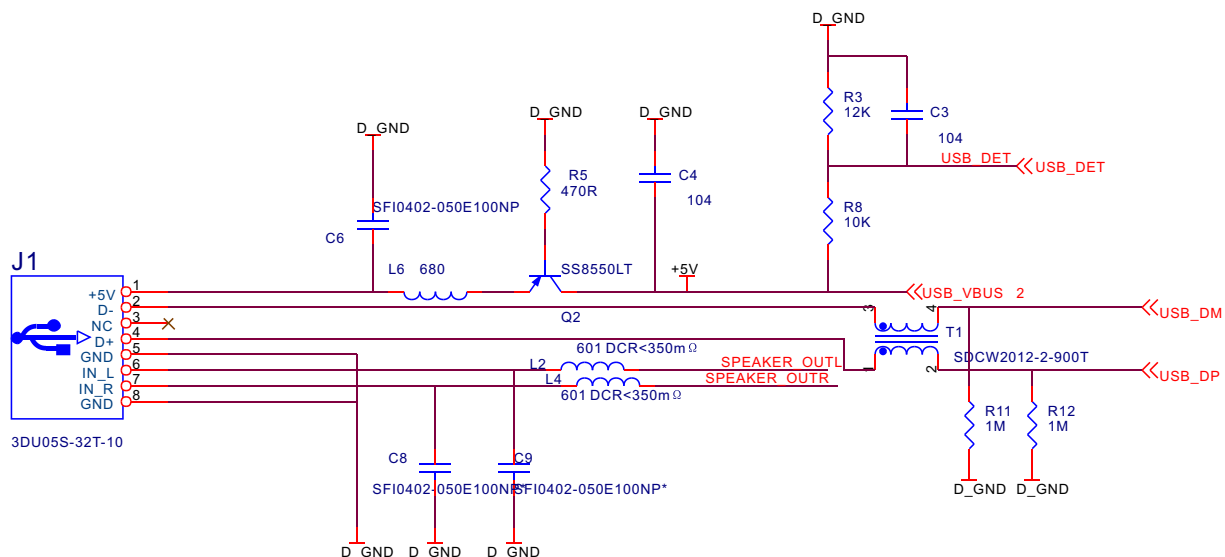
Figure 3.2.6.1USB jack circuit diagram

2. Working principle: USB data jack is composed of USB_DM, USB_DP and GND (ground wire). When the player is connected with computer or is charging through USB line, USB_VBUS is power supply pin of USB jack, and also power input pin of USB jack charge at the same time. When he player is charging through USB, the internal 5V power of PC charges Li battery through USB.

Meanwhile, IN_L and IN_R pin of USB jack is also audio output pin of the player. One channel of audio signals after being processed by Wm8750 outputs to headphone through HP_OUT and one channel performs external output through SPEAKER_OUT of USB jack.

3.2.7 Headphone output jack circuit

1. Headphone output jack circuit principle diagram is shown in the picture 3.2.7.1:
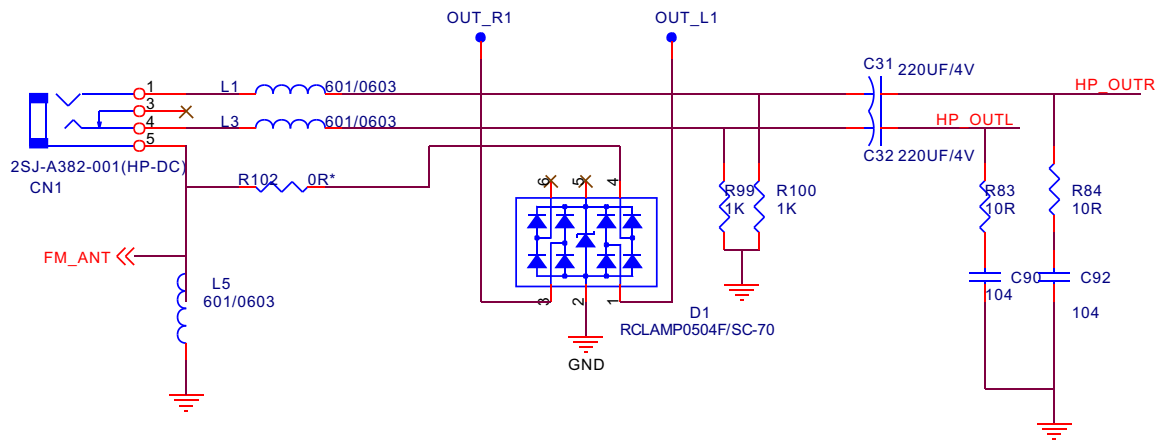
Figure 3.2.7.1 Headphone output jack circuit

2. Working principle: left/right channel audio signals that output from Wm8750 output through 220uF capacitor coupling. D1 in the circuit is TVS diode array used for ESD protection. Ground wire of headphone is also used as antenna input of FM module.

3.2.8 Button circuit

1. Button circuit diagram is shown in the picture 3.2.8.1:
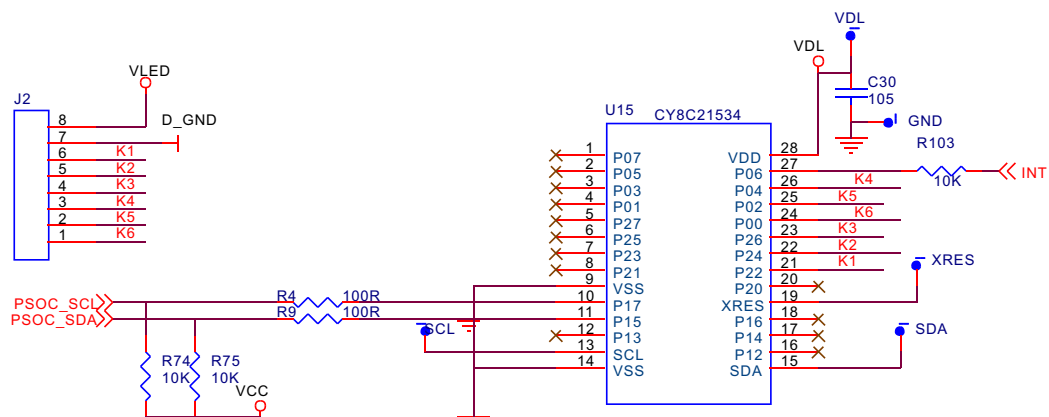
Figure 3.2.8.1 Button circuit diagram

2. Working principle: V3/V5 adopts touch button and button control IC is CY8C21434. CY8C21434 integrates the programmable digital and analog system inside, which may configure various functional modules needed by users flexibly, and it is a really system (SoC) with mixed signals processing ability. CY8C21434 chip belongs to capacitor touch mode, which adopts I2C bus control.

Each button is actually a capacitor. When pressing this flat capacitor, it means two capacitors are connected parallel on two ends of this capacitor to make the capacitance of this capacitor become large，charge/discharge cycle become long and the counting number for recording charge process become large. Counting numbers of many charge cycle form a group of original data named as rawdate and a new group of numbers, baseline, is formed through rawdate×4. In theory, change of rawdate and baseline is accordant. After touching buttons, rawdate becomes large quickly. When more than noise level (V3 is set as 30) set by us, baseline will not change any more. Now, we may judge whether some buttons are pressed and confirm which buttons are pressed through calculating the difference between rawdate and baseline. And button function is realized through software.

3.2.9 Charge management circuit

1. Charge management circuit is mainly responsible for Li battery's charge function and its circuit diagram is shown in the picture 3.2.9.1:

Figure 3.2.9.1 Charge management circuit diagram

2. Working principle: seen from the circuit, charge circuit is mainly composed of charge control IC MCP73862 and peripheral circuit. VIN is power input pin of MCP73862, that is, 5V power input end of USB jack; VBAT is output pin of MCP73862, that is, input end of Li-ion battery; STAT means that charge is in process when in low level, whereas means that charge finishes; PROG is charge current setup end and MCP73862 uses this reference current to charge Li battery. Relationship between charge current $I_{REG\ and}$ R53 is shown as the following:

$$I_{REG}=\frac{1000V}{R_{PROG}} \quad (A)$$

From the above, charge current is 400mA.

When power adapter or USB is connected externally, input voltage is 5V; internal oscillator begins to oscillate; internal timer begins to time; charger begins to charge and IC automatically fulfills a complete charge process. During the process of charge, indication of STAT pin is shown in the following table:

charge cycle state	STAT1
	MCP73832
Shutdown	Hi-Z
No Battery Present	Hi-Z
Preconditioning	L
Constant-Current Fast Charge	L
Constant Voltage	L
Charge Complete-Standby	Hi-Z

3.2.10 Battery voltage detect circuit

1. Low voltage detect circuit diagram is shown in the picture 3.2.10.1:
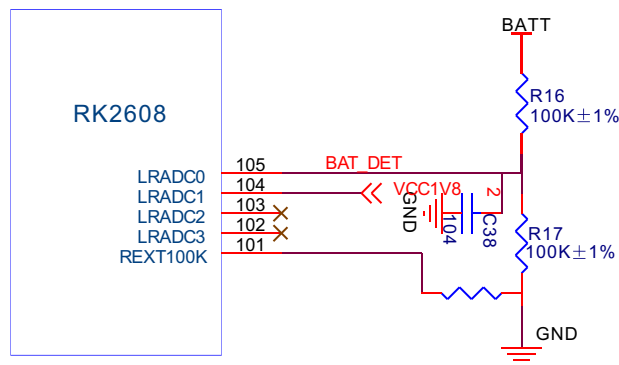
Figure 3.2.10.1 Low voltage detect circuit

2. Working principle: as for the function of battery voltage detect circuit, when we detects that input voltage of the player is lower than a certain voltage, the player switches off. Battery vltage detect is fulfilled by Rk2608 and firmware of the player. Pin 105 of Rk2608 is connected with the voltage divide circuit composed of R16 and R17. The voltage value after battery electric charge is divided through voltage divide circuit is processed by Rk2608 and then displays on screen to indicate voltage value.

3.2.11 Battery protection circuit

1. Battery protection board is installed on Li battery and used to prevent Li battery from being damaged by short-circuit, over-charge and over-discharge. Li battery and battery protection board are called as Li battery components. Battery protection board principle diagram is shown in the picture 3.2.11.1:
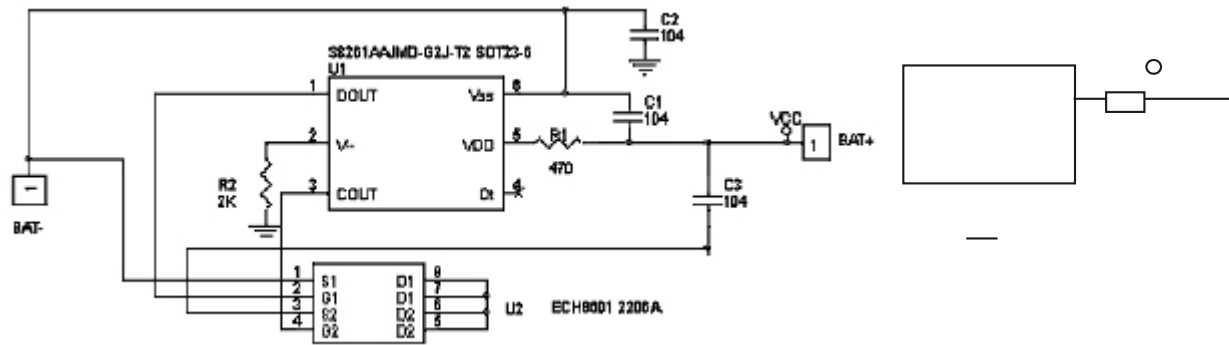
Figure 3.2.11.1 Battery protection circuit

2. Working principle: battery protection circuit is mainly composed of battery protection IC S8261 and built-in dual N-channel MOSFET ECH8601. S8261 is the protection IC of Li-ion polymer changeable battery of built-in high-precision voltage detect circuit and delay circuit. DOUT and COUT are over-discharge (when Li battery voltage is lower than 2.4V) protection output end and over-charge (when Li battery voltage is higher than 4.2V) protection output pin. When working normally, the two pins are high level. MOSFET opens and Li battery voltage outputs to the player through protection board. When in protection, the 2 pins output low level to control MOSFET to cut off power. Over-current detect (short-circuit protection) is fulfilled by V- pin through detecting short-circuit state and controlling DOUT and COUT output.

3.2.12 Power management module

1. Function of power management module is to provide 3.3V and 1.8V voltage for the player's normal working, shown in the picture 3.2.12.1, 3.2.12.2:
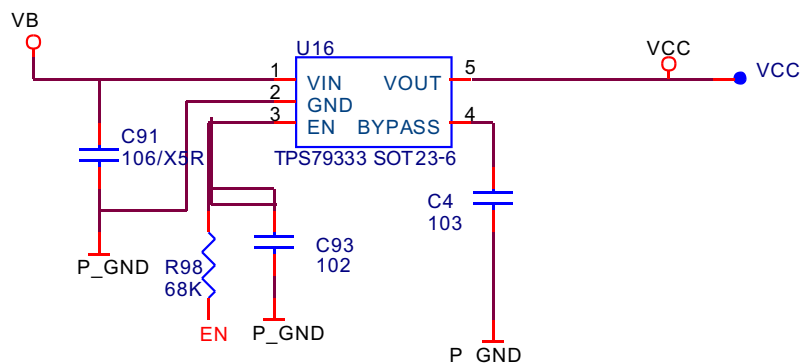
Figure 3.2.12.1 3.3V power circuit diagram
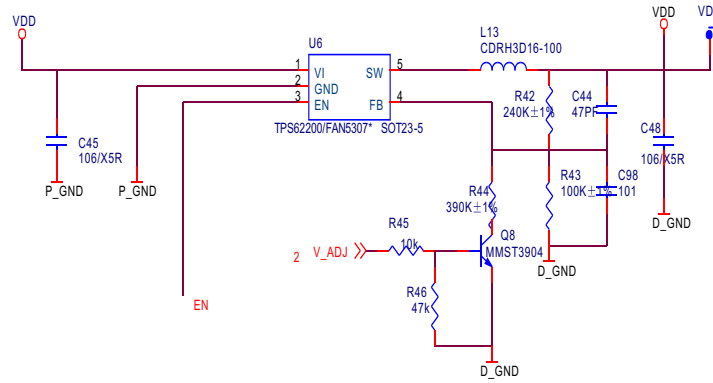
Figure 3.2.12.2   1.8V power circuit diagram

2. Working principle: seen from the circuit diagram, 3.3V power is supplied by IC TPS79333 and peripheral circuit. TPS79333 is a linear volatge stabilizing module (also called as LDO) and its EN pin is the enable pin that controls normal working, effective when in high level; BYPASS pin has a resistor inside, which may constitute low-pass filter together with external 103 capacitor C4 to decrease output noise.

1.8V power of the player's working is supplied by TPS62200 and peripheral circuit. TPS62200 is high-efficiency voltage drop DC-DC convertor and EN pin is enable pin, effective when in high. The relationship between TPS62200 output voltage and FB pin feedback resistance is:

$$VOUT = 0.5 \times \left(1 + \frac{R42}{R43}\right)$$

From the above, output voltage is about 1.75V.

3.2.13 Reset circuit

1. Reset circuit supplies reset signals for the player. Reset circuit diagram is shown in the picture 3.2.13.1:
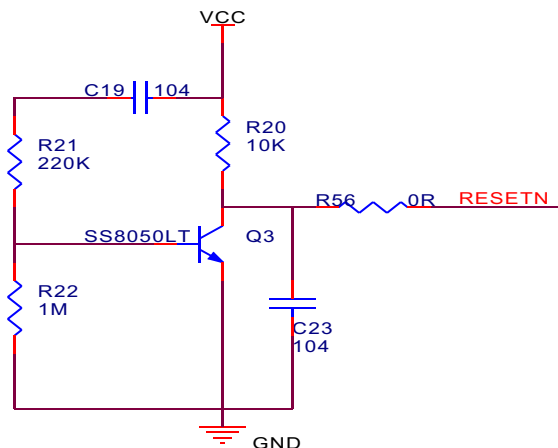
Figure 3.2.13.1 Reset circuit diagram

2. Working principle: when the player power on, voltage stabilizing circuit begins to work and 3.3V voltage VCC outputs. Voltage on two sends of capacitor C19 cannot change suddenly, so B electrode of triode Q3 is low level, Q3 is in cutoff state, RESETN is high level to reset for Rk2608 and display screen. Meanwhile, VCC charges capacitor C19. When B electrode voltage of Q3 reaches connected voltage, Q3 is on, VCC is on to ground, RESETN becomes low level and reset of the player finishes. Reset time is decided by C19 and parameters of resistor R21 and R22.

3.2.14 Power on/off control circuit

1. Power on/off control circuit diagram is shown in the picture 3.2.14.1:
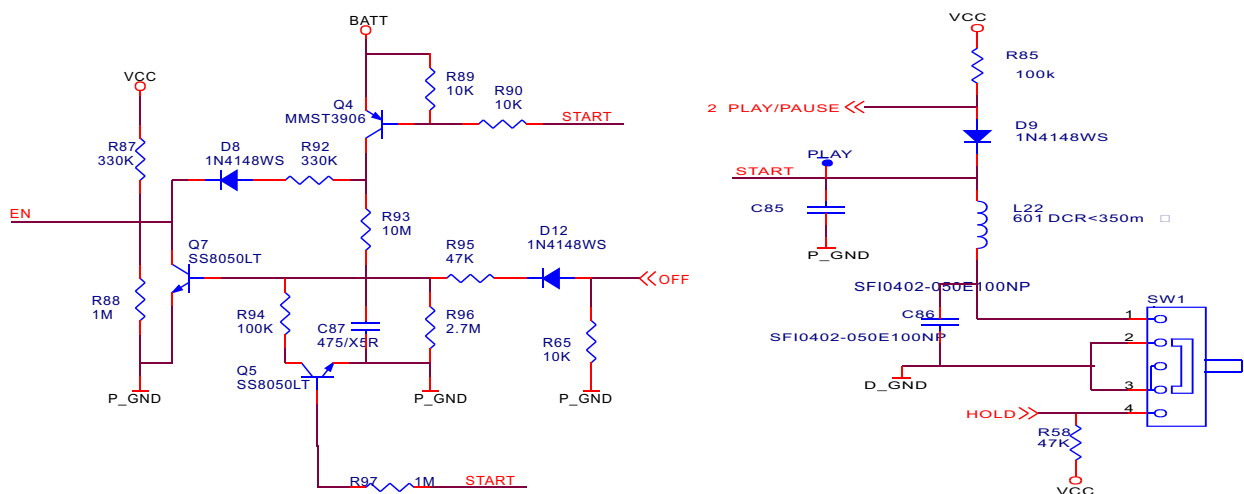
Figure 3.2.14.1 Power on/off control circuit diagram

2. Working principle: START/PLAY/PAUSE is a group of combination buttons and functions are different in different working times, decided by software. When the player is in power-off state without connecting with USB, Q4 is in cutoff state. When power-on button Sw1 is in ON position, START is pulled down to ground to output low level, Q4 is on, diode D8 is also on, BATT pulls EN up through Q4 and D8, TPS62200 and TPS79333 begin to enter working state to output 1.75V and 3.3V voltage to suppl power for the entire system. System voltage VCC, VDD and OLED (13V) begin to output, crystal oscillator Y1 oscillates, reset circuit works, main chip and display screen initialize, OSD appears and machine begins to work.

When in power-on state, press START/PLAY/PAUSE, Q4 is on and BATT produces a voltage drop through CE electrode of Q4. Because VCC voltage is normal, the circuit composed through R92, R93, C87 makes N electrode of D12 keeps 3.3V voltage. D12 cannot be on and it in cutoff state, but after pressing button, voltage of PLAY/PAUSE pin changes and then inputs to pin 57 of Rk2608 to realize different functions in different operation interfaces.

When the time of pressing PLAY button is more than 1 second but less than 4 seconds, pin 57 of Rk2608 detects he change of voltage; software decides this signal is power-off signal and then saves contents of machine; pin 58 outputs high level, D12 is on to make Q7 on, VCC is grounded through CE electrode of Q7, enable end EN is low level, TPS62200 and TPS79333 stop voltage output and the player realizes software power-off.

When machine down because of software problem, pressing START/PLAY/PAUSE button more than 4 seconds may realize firmware power-off. The process is: after pressing button, B electrode of Q4 becomes low level, Q4 is on, BATT charges C87 through CE electrode of Q4 and R93, voltage on capacitor increases gradually to make Q7 on, VCC is grounded through CE electrode of Q7, enable end EN is low level, TPS62200 and TPS79333 stop voltage output and the player power off. When loosening button, BATT makes START pin keeps in high level through R89, R90 to make Q5 on, electric charge saved in C87 discharges quickly through CE electrode of Q5, R22 and R94 to ensure normal power-on when pressing START/PLAY/PAUSE button next time.

3.2.15 MIC circuit

1. MIC circuit diagram is shown in the picture 3.2.15.1:
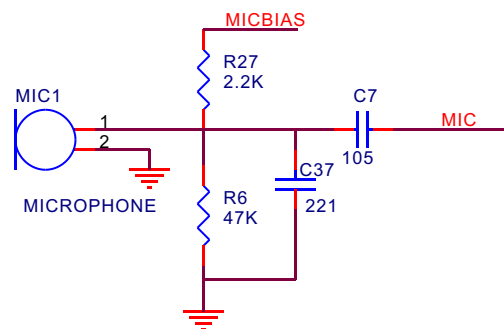
Figure 3.2.15.1 MIC circuit diagram

2. Working principle: MIC circuit is mainly composed of microphone and MIC bias circuit. MIC1 switches the recorded external voice signals into electric signals to input to ADC circuit of Wm8750 and switches analog signals into digital signals to form WAV file through software encoding to save inside FLASH. R27 in circuit is bias resistor of microphone, R6 and C37 constitute filtering circuit to filter the clutter of audio signals.

Section Three Servicing Cases

3.3.1 Servicing cases

[Example 1] Symptom: power not on.

Description: no OSD and no output.

Analysis and troubleshooting: firstly confirm whether it is caused by battery or power circuit. Connect with computer and check whether display screen has display. Power on, connect and there is no display. Take the player apart and check. Firstly test power supply voltage and it cannot be lower than 3.2V. Use multimeter to test between anode and cathode of battery and then check VCC3.3V and 1.8V that output through BGA. During the checking, we find that 3.3V is normal and 1.8V is normal. When pressing ON button in normal working, after testing actually, VCC1.8V should be pulled down to about 1.7V, which is normal. When working normally, VCC3.3V should be slightly lower to 3.1--3.2V, which is normal. Then test crystal oscillator X1 and oscillation is normal. The frequency is 12MHZ and it is 11.999MHZ after testing actually. Reset is also normal, so we finally judge that main decode chip has trouble. Change chip Rk2608 and upgrade software again. Power on and trouble is removed.

[Example 2] Symptom: power not on.

Description: no OSD and no output.

Analysis and troubleshooting: firstly confirm whether it is caused by battery or power circuit. Connect with power adapter and check whether charge is available and whether screen has display. After power on and connecting, there is no display. After taking machine apart, firstly test power supply 3.3V and 1.8V and we find 3.3V is normal. Then test 1.8V and voltage on two ends of L13 and find that 1.8V only has 0.7V. Observe DC-DC switch IC U6 carefully and find that pin 4 feedback has rosin joint. After welding again, trouble is removed.

[Example 3] Symptom: machine not power on.

Description: after pressing ON button, screen has no display and headphone has no output.

Analysis and troubleshooting: connect Mp4 player with computer and there is no display. Test charge current and find that current is large. Open machine casing to test and current is normal. Power on again and it is normal, so we preliminarily judge that short-circuit in a certain position causes the trouble. Observe carefully and find that two lead wires of buzzer have been damaged to cause the inner part show outside and short-circuit with bottom casing, which makes working current of the player large. After installing battery, machine cannot power on. Change buzzer lead wire, test and trouble is removed.

[Example 4] Symptom: noise when tuning.

Description: radio station has noise when tuning.

Analysis and troubleshooting: firstly judge whether the tuning components or common part has trouble. Listen to radio station by using headphone and check whether only one side of headphone has sound and the result is normal. Then switch in tuning state to search radio station automatically and the result is normal, which means power supply, data and clock are normal. To remove interferences from outside, we receiver the nearest radio station to listen and check whether it is clear, and it has noise in result. The circuit that causes noise is mainly high frequency tuning and mixed frequency part. Check carefully and find that pin 37 of U1 (TEA5767HN) has false welding. After welding again, trouble is removed.

[Example 5] Symptom: no sound when pressing button.

Description: no click sound when pressing buttons.

Analysis and troubleshooting: if no click sound when pressing buttons, firstly check whether sound of pressing button has been opened. After confirming it is opened, check whether buzzer is normal. Use resistance level of multmeter to test and the resistance is ten-ohm and more, which is normal. Check J3 end voltage 1.6V and it is normal. When pressing buttons, test DIDI signals and find there is no change. Check whether crystal oscillator U10 oscillates normally and there is no oscillation. After changing U10, trouble is removed.

[Example 6] Symptom: no OSD.

Description: screen has no display.

Analysis and troubleshooting: firstly confirm whether power or display screen itself has trouble. Power on, listen to playing sound and it is normal, so we preliminarily decide power supply 3.3V and 1.8V are normally basically. Test voltage on two ends of L10 and it is about 4.3V, which is normal. Then test voltage on two ends of D8 and find the anode does not form 13V. Take out display screen and there is still no 13V. Check input end voltage and EN enable end is normal. Then check feedback pin FB end voltage and it is low obviously and EN enable end has false welding. After welding again, trouble is removed.

[Example 7] Symptom: machine down when playing MP4.

Description: machine down when playing video files.

Analysis and troubleshooting: firstly confirm whether machine is normal when playing Mp3. If it is normal, we can decide power supply, reset and oscillation are normal. Check data and image processing IC and we preliminarily judge that it is not related to image processing but related to data and address. Picture information buffers and it is mainly processed through U1. Test power supply 3.3V voltage of U1 and it is normal. Change SDRAM directly and trouble is removed.

[Example 8] Symptom: machien down when power on.

Description: after power on, machine down before entering menu operation.

Analysis and troubleshooting: when power on, machine down before entering main menu. Press PLAY button to power on, when screen appears BBK picture justly, image of the player halts and button has no function. Firstly test power supply 3.3V, 3.8V and it normal. Then test crystal oscillator oscillation frequency and it is normal, so we judge that data has abnormality. Because machine down, data cannot be tested normally. Change main chip and trouble still exists. After changing Flash U4, trouble is Removed.

[Example 9] Symptom: machine down when tuning.

Description: machine is normal when playing Mp3, Mp4. Machine down when entering tuning state.

Analysis and troubleshooting: firstly check tuning IC power supply 3.3V, and SCL, SDA are normal. Test whether 32.768 crystal oscillator oscillates normally and whether it has false welding. This crystal oscillator has direction when changing it, so it cannot be stuck reversely, otherwise machine down will happen. Test crystal oscillator and we find it has false welding. After welding again, trouble is removed.

Example 10] Symptom: computer cannot be connected.

Description: after connecting with computer, no display and disk cannot be found.

Analysis and troubleshooting: firstly confirm whether charge is available and it is normal after power on. Use diode level of multimeter to test the resistance value to ground of D+, D- data signals in USB terminal position and it should be close to several hundred ohm. Then test between D+ and D- and it should not have short-circuit. Test DP and DM and they are normal. Test power supply 3.3V, 1.8V and it is normal. Crystal oscillator oscillates normally. Change chip Rk2608, upgrade software again, connect with computer and trouble is removed.

3.3.2 Troubleshooting diagram

1. Troubleshooting flow chart for "No OSD" is shown in the picture 3.3.2.1:

```
                    ┌──────────────────┐
                    │     No OSD       │
                    └──────────────────┘
                             │
                             ▼
                         ╱───────╲              ┌──────────────────────────┐
                    Whether        N            │ Check DC-DC boost circuit │
                 D3 anode 12V voltage ────────► │ and peripheral elements   │
                     is normal                  └──────────────────────────┘
                         ╲───────╱
                             │ Y
                             ▼
                         ╱───────╲              ┌──────────────────────────┐
                   Whether there is 12V  N      │ Check whether display screen│
                   voltage on display ────────► │ flat cable holderhas false  │
                    screensocket                │ welding                     │
                         ╲───────╱              └──────────────────────────┘
                             │ Y
                             ▼
                         ╱───────╲              ┌──────────────────────────┐
                     Whether 3.3V     N         │ Display screen flat cable │
                   power supply is normal ────► │ holder has false welding  │
                         ╲───────╱              └──────────────────────────┘
                             │ Y
                             ▼
                         ╱───────╲              ┌──────────────────────────┐
                     Whether it is    N         │ Display screen flat cable │
                   normal after changing ─────► │ holder has trouble        │
                     display screen             └──────────────────────────┘
                      components
                         ╲───────╱
                             │ Y
                             ▼
                         ╱───────╲              ┌──────────────────────────┐
                   Whether 8-digit number  N    │ Change decode chip        │
                    of screen is normal ──────► │                           │
                         ╲───────╱              └──────────────────────────┘
                             │ Y
                             ▼
                    ┌──────────────────┐
                    │ Change display screen │
                    │ components       │
                    └──────────────────┘
```

Figure 3.3.2.1 Troubleshooting diagram for "No OSD"

2. Troubleshooting flow chart for "USB is not connected" is shown in the picture 3.3.2.2:

```
                    ┌─────────────────────┐
                    │ USB is not connected│
                    └─────────────────────┘
                               │
                               ▼
                         ╱───────────╲        N   ┌──────────────────────┐
                        ╱ Check whether╲──────────▶│ Q2 has trouble or USB│
                        ╲ 5V of Q2 is   ╱          │ socket has rosin joint│
                        ╲ grounded     ╱           └──────────────────────┘
                         ╲ normally   ╱
                          ╲─────────╱
                               │ Y
                               ▼
                         ╱───────────╲        N   ┌──────────────────────┐
                        ╱ Check whether╲──────────▶│ Check each DC-DC switch│
                        ╲ 3.3V and 1.8V ╱          │ circuit and peripheral │
                        ╲ are normal   ╱           │ elements             │
                          ╲─────────╱              └──────────────────────┘
                               │ Y
                               ▼
                         ╱───────────╲        N   ┌──────────────────────┐
                        ╱ Check whether╲──────────▶│ Change crystal oscillator│
                        ╲ oscillation of╱          │ or capacitor n two sides│
                        ╲ 12M crystal  ╱           └──────────────────────┘
                        ╲ oscillator  ╱
                        ╲ is normal  ╱
                          ╲─────────╱
                               │ Y
                               ▼
                         ╱───────────╲        N   ┌──────────────────────┐
                        ╱ Check D+, D- ╲──────────▶│ Check whether T1 or USB│
                        ╲ resistance   ╱           │ socket has rosin joint │
                        ╲ to ground   ╱            └──────────────────────┘
                          ╲─────────╱
                               │ Y
                               ▼
                         ╱───────────╲        N   ┌──────────────────────┐
                        ╱ Whether     ╲──────────▶│ Change the main decode│
                        ╲ software      ╱          │ chip                 │
                        ╲ upgrading is ╱           └──────────────────────┘
                        ╲ available  ╱
                          ╲─────────╱
                               │ Y
                               ▼
                    ┌─────────────────────┐
                    │  Upgrade software   │
                    └─────────────────────┘
```

Figure 3.3.2.2 Troubleshooting diagram for "USB is not

3. Troubleshooting fow chart for "Do not charge" is shown in the picture 3.3.2.3:

```
┌─────────────────┐
│  Do not charge  │
└─────────────────┘
         │
         ▼
    ╱─────────╲                    ╱─────────╲
   ╱  Whether   ╲        N        ╱   Check    ╲        N     ┌──────────────────────────┐
  ╱ battery is fully╲────────────▶╱ whether USB_VBUS╲───────▶│ Check power supply circuit │
  ╲charge with voltage╱           ╲  has 5V voltage ╱         └──────────────────────────┘
   ╲  4.2V-4.3V ╱                  ╲─────────╱
    ╲─────────╱                         │ Y
         │ Y                            ▼
         ▼                         ╱─────────╲
    ╱─────────╲                   ╱  Whether   ╲       N     ┌──────────────────────┐
   ╱   Battery  ╲                ╱ BAT voltage has╲─────────▶│  Change IC ISL6294    │
  ╱ is fully charged,╲           ╲    change    ╱            └──────────────────────┘
  ╲ then protection ╱             ╲─────────╱
   ╲─────────╱                         │ Y
         │ Y                            ▼
         ▼                    ┌──────────────────────────┐
┌──────────────────────┐     │ Battery components have  │
│ Normal after discharge│     │ trouble change battery or│
└──────────────────────┘     │ battery holder           │
                             └──────────────────────────┘
```
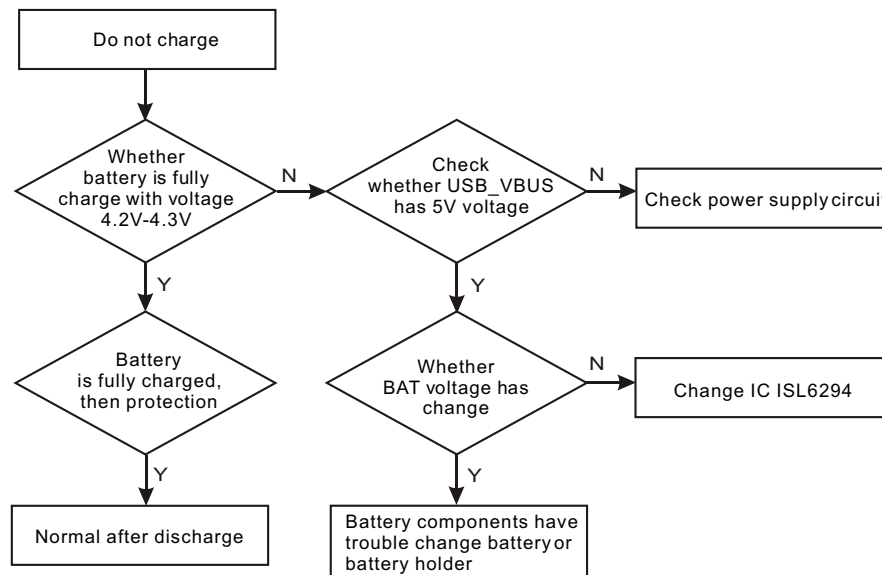
Figure 3.3.2.3 Troubleshooting diagram for "Do not charge"

4. Troubleshooting flow chart for "Power not on" is shown in the picture 3.3.2.4:

```
                    ┌─────────────────┐
                    │  Power not on   │
                    └─────────────────┘
                             │
                             ▼
              ╱─────────────────────╲        N      ╱─────────────────────╲      N   ┌──────────────────────────┐
             ╱  Whether battery      ╲─────────────▶╱ Whether there is OSD  ╲───────▶│ Change battery components│
             ╲  voltage is lower than ╱             ╲ after connecting with ╱         └──────────────────────────┘
              ╲       3.4V           ╱               ╲     computer        ╱
               ╲───────────────────╱                 ╲──────────────────╱
                        │ Y                                   │ Y
                        ▼                                     ▼
┌─────────────────────┐  N   ╱─────────────────╲    ╱─────────────────╲   N   ┌──────────────────┐
│ Check charge circuit│◀────╱ Whether battery   ╲   ╱ Whether U16 input ╲────▶│ Check D5 and Q2  │
└─────────────────────┘     ╲ voltage is up to 3.6V╱ ╲ pin voltage is up to╱   └──────────────────┘
                             ╲ after charge     ╱    ╲      5V         ╱
                              ╲───────────────╱       ╲──────────────╱
                                     │ Y                     │ Y
                                     ▼                       ▼
┌─────────────────────┐  N   ╱─────────────────╲    ┌──────────────────┐
│ Check U16 and       │◀────╱  Check            ╲   │  BGA has trouble │
│ peripheral circuit  │     ╲ whether U16 outputs╱  └──────────────────┘
└─────────────────────┘     ╲  3.3V normally   ╱
                              ╲───────────────╱
                                     │ Y
                                     ▼
┌─────────────────────┐  N   ╱─────────────────╲
│ Check U6 and        │◀────╱  Check            ╲
│ peripheral circuit  │     ╲ whether U6 outputs 1.8V╱
└─────────────────────┘     ╲  normally        ╱
                              ╲───────────────╱
                                     │ Y
                                     ▼
                          ┌─────────────────────┐
                          │ Refer to troubleshooting│
                          │ process for "Machine not│
                          │ power on"           │
                          └─────────────────────┘
```

Figure 3.3.2.4 Troubleshooting diagram for "Power not on"

5. Troubleshooting flow chart for "Machine not power on" is shown in the picture 3.3.2.5:
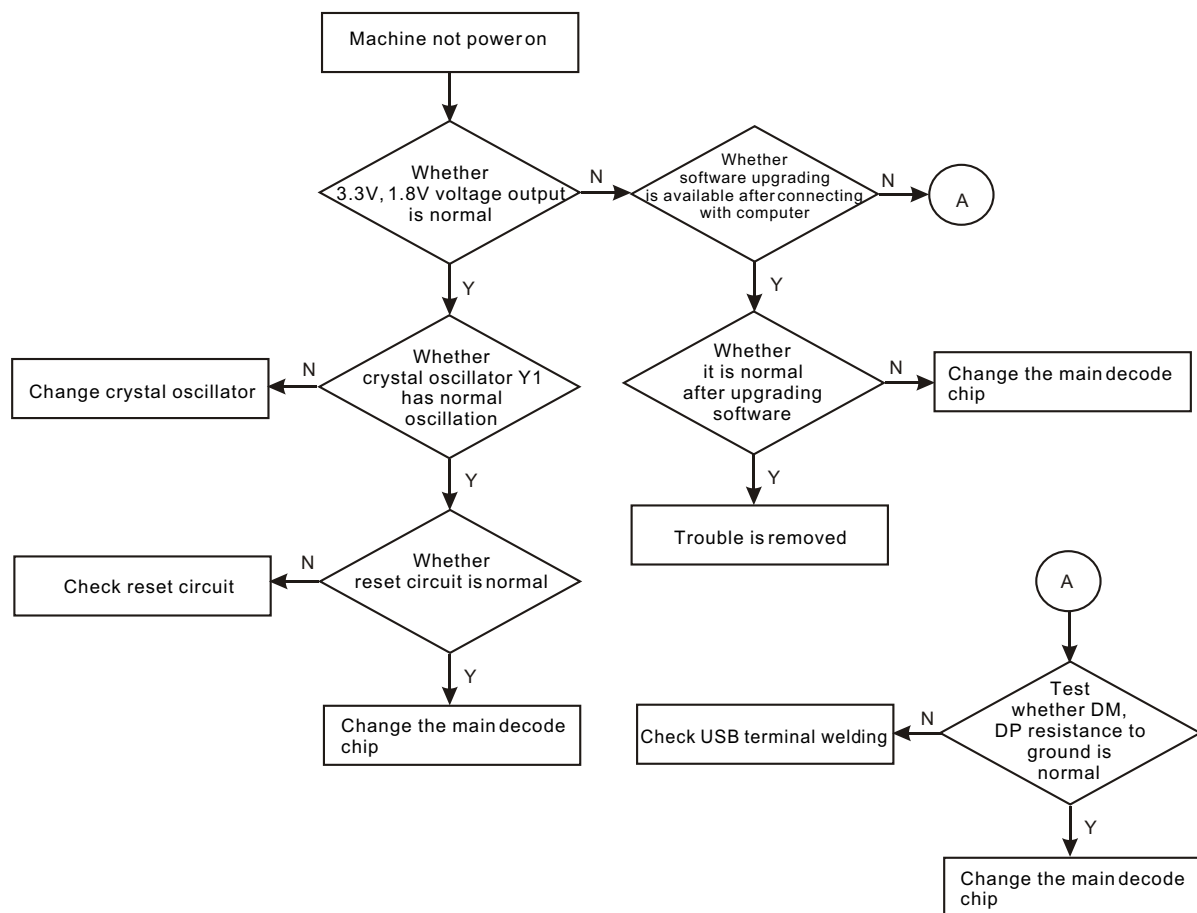
Figure 3.3.2.5 Troubleshooting diagram for "Machine not

Section Four Signal waveform diagram

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

1. Battery voltage BAT1 waveform diagram.
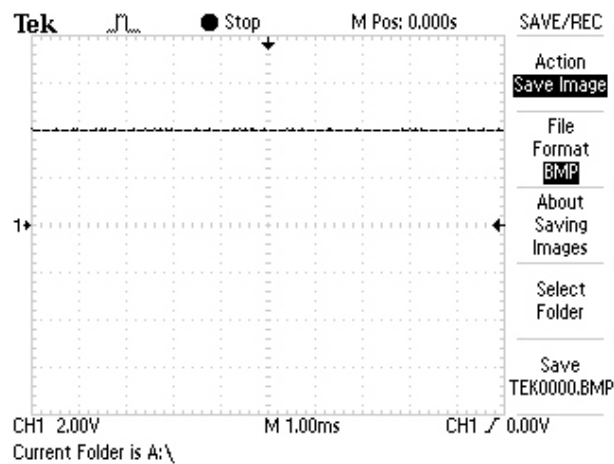
2. VDD waveform diagram
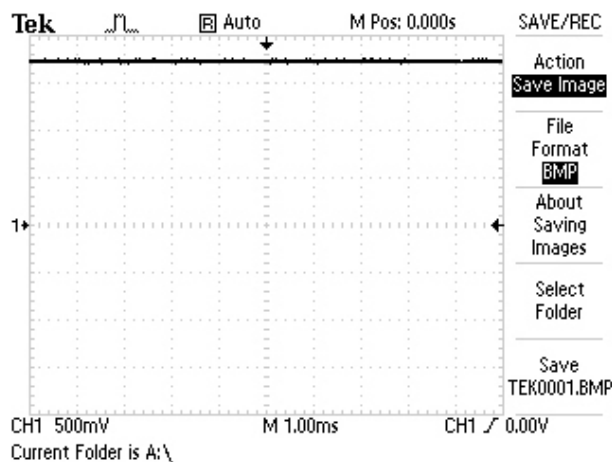
3. VCC waveform diagram
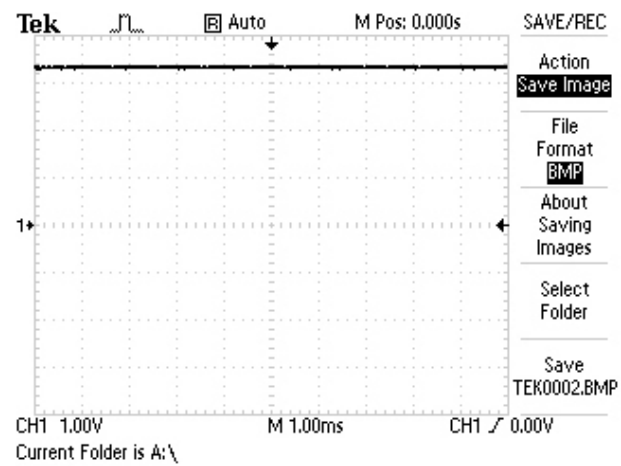
4. Display screen background light BCLK waveform diagram
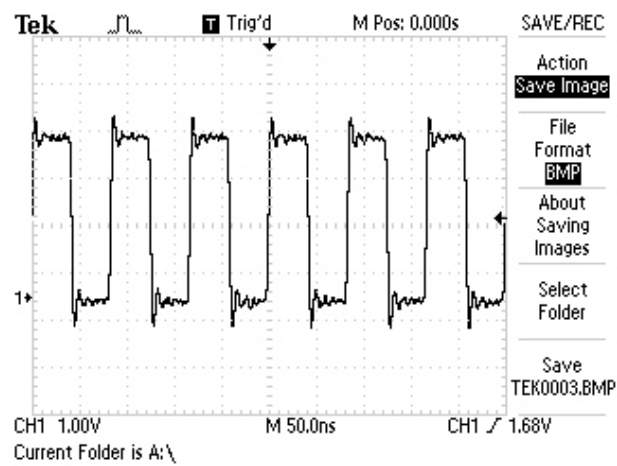
5. PLAY1 waveform diagram when playing.
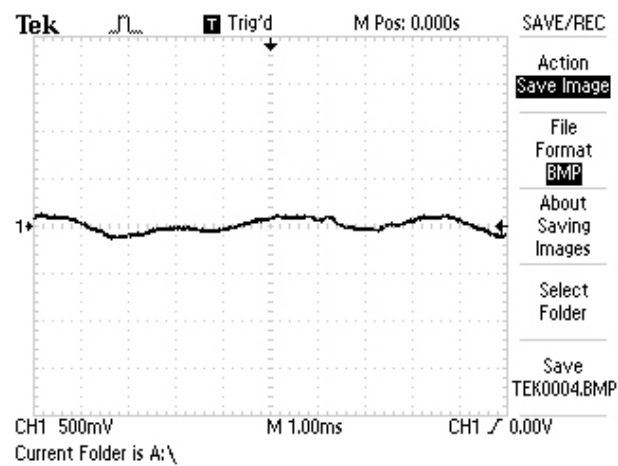
6. OUT_R waveform diagram when playing musical files.
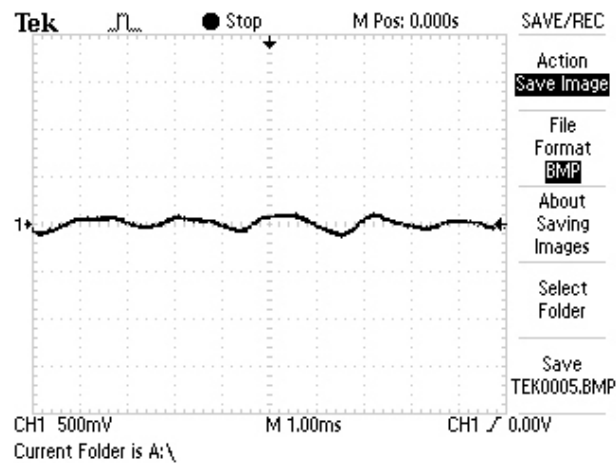
7. OUT_L waveform diagram when playing musical files.
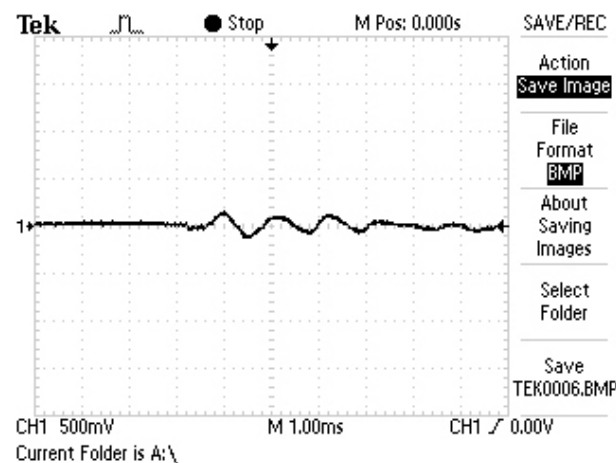
8. Crystal oscillator Y1 waveform diagram
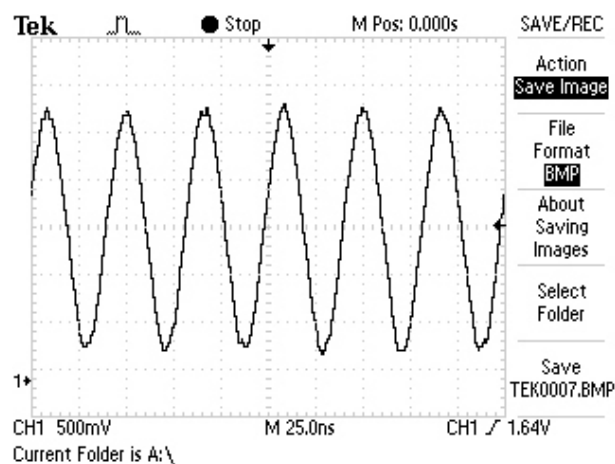
9. U6 DC-DC switch waveform diagram
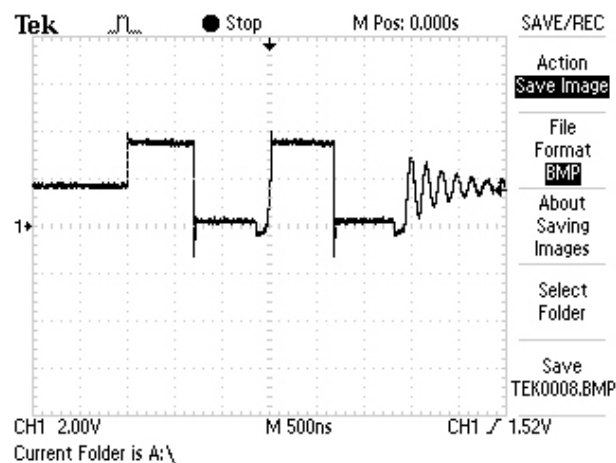
10. Power-on reset RESETN waveform diagram
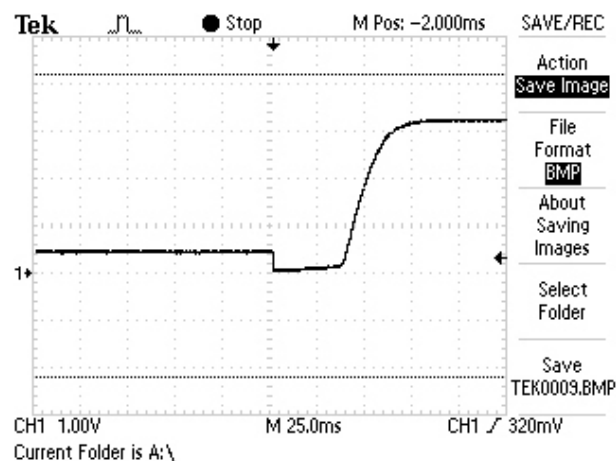
11. Crystal oscillator XT1 waveform diagram
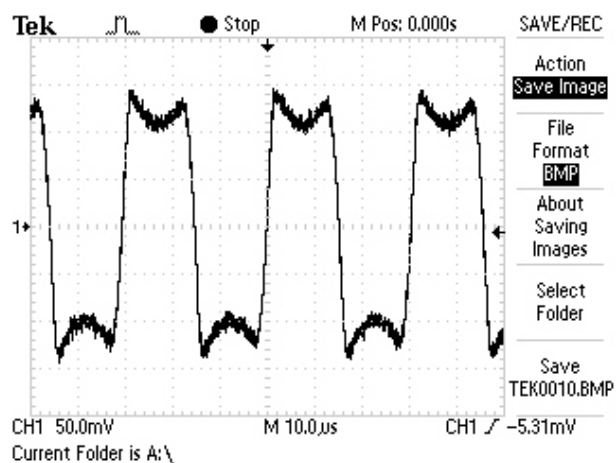
Section Five Function Introduction to IC

3.5.1 Function introduction to HY57V641620E

1. Description

The Hynix HY57V641620E(L/S)T(P) series is a 67,108,864bit CMOS Synchronous DRAM, ideally suited for the memory applications which require wide data I/O and high bandwidth. HY57V641620E (L/S)T(P) is organized as 4banks of 1,048,576x16.

HY57V641620E(L/S)T(P) is offering fully synchronous operation referenced to a positive edge of the clock. All inputs and outputs are synchronized with the rising edge of the clock input. The data paths are internally pipelined to achieve very high bandwidth. All input and output voltage levels are compatible with LVTTL.

Programmable options include the length of pipeline (Read latency of 2 or 3), the number of consecutive read or write cycles initiated by a single control command (Burst length of 1,2,4,8 or full page), and the burst count sequence(sequential or interleave). A burst of read or write cycles in progress can be terminated by a burst terminate command or can be interrupted and replaced by a new burst read or write command on any cycle. (This pipelined design is not restricted by a '2N' rule).

2. Features

Voltage : VDD, VDDQ 3.3V supply voltage

All device pins are compatible with LVTTL interface

54 Pin TSOPII (Lead or Lead Free Package)

All inputs and outputs referenced to positive edge of system clock

Data mask function by UDQM, LDQM

Internal four banks operation

Auto refresh and self refresh

4096 Refresh cycles / 64ms

Programmable Burst Length and Burst Type

- 1, 2, 4, 8 or full page for Sequential Burst

- 1, 2, 4 or 8 for Interleave Burst

Programmable /CAS Latency ; 2, 3 Clocks

Burst Read Single Write operation

3. PIN Description

SYMBOL	TYPE	DESCRIPTION
CLK	Clock	The system clock input. All other inputs are registered to the SDRAM on the rising edge of CLK
CKE	Clock Enable	Controls internal clock signal and when deactivated, the SDRAM will be one of the states among power down, suspend or self refresh
CS	Chip Select	Enables or disables all inputs except CLK, CKE, UDQM and LDQM
BA0, BA1	Bank Address	Selects bank to be activated during RAS activity Selects bank to be read/written during CAS activity
A0 ~ A11	Address	Row Address : RA0 ~ RA11, Column Address : CA0 ~ CA7 Auto-precharge flag : A10
RAS, CAS, WE	Row Address Strobe, Column Address Strobe, Write Enable	RAS, CAS and WE define the operation Refer function truth table for details
UDQM, LDQM	Data Input/Output Mask	Controls output buffers in read mode and masks input data in write mode
DQ0 ~ DQ15	Data Input/Output	Multiplexed data input / output pin
VDD/VSS	Power Supply/Ground	Power supply for internal circuits and input buffers
VDDQ/VSSQ	Data Output Power/Ground	Power supply for output buffers
NC	No Connection	No connection

3.5.2 Function introduction to RK2608

1. Features

128 pins LQFP package

Typical power voltage 3.3V(IO), 1.8V(Core)

Use one 24MHz crystal oscillator

38 GPIO (8bits P0,P1,P3,14bits P2)

10-bit low resolution ADC with 4-channel Analog Input

Build in Stereo 24-bit Delta-Sigma DAC with on-chip headphone amplifier

Build in Stereo 16-bit Sigma-Delta ADC (Line-in /FM Input/ Microphone with analog mixer)

40 levels digital volume control

Support external CODEC through I2DSP interface

Support I2C interface

Support USB 2.0 high speed and full speed

Integrated 3 Channel DMA

Embedded DSP Core:

·   4K words Boot Sync ROM

- 56K words Program Sync SRAM

- 48K words Data Sync SRAM

- 2K words Register Space for Peripherals

- Upgradable firmware through USB/Flash interface

Memory interface:

- External up to 4(cs) x 64M-4G bytes Nand type Flash accessed by DMA

- Support both 8-bit (X8 device) and 16-bit (X16 device) IO bus

- support Toshiba/ Hynix/ Infineon/ Micron/ ST Nand flash memory

- Support 2048+64 / 512+16 bytes per page

- Support various Samsung SmartMedia Cards and their listed commands

- Support SDRAM

- Support SD/MMC

Video Driver: Support TFT LCD/ OLED Interface

Pulse Width Modulators for EL backlights

Support watchdog timer

DSP-based Software:

- MPEG1/2/2.5 Audio Layer 1, 2, 3 decoding, Layer3 encoding

- WMA 9 decoding (RK2608A only)

- G.729 based voice recording and playback

- Equalizer (RK2608A only)

- MPEG-4 @QVGA decoding

- Digital photo frame application software (RK2609A only)

Headphone driver output 2x9mW @32 Ohm(TYP) ; SNR: 90dB (DAC TYP)

- Low Power Consumption, <100mW at typical MP3 decoder solution

2. PIN Description

PIN No.	Symbol	I/O	Description
1	RREF	I	Reference Resistor input
2	AGND	P	Analog GND
3	DM	A I/O	USB data minus
4	DP	A I/O	USB data plus
5	VCCA	P	Analog 3.3V power input
6	D0	I/O Pull up	Flash/ LCD/ SDRAM data bus bit 0
7	D1	I/O Pull up	Flash/ LCD/ SDRAM data bus bit 1
8	D2	I/O Pull up	Flash/ LCD/ SDRAM data bus bit 2
9	D3	I/O Pull up	Flash/ LCD/ SDRAM data bus bit 3

10	D4	I/O Pull up	Flash/ LCD/ SDRAM data bus bit 4
11	D5	I/O Pull up	Flash/ LCD/ SDRAM data bus bit 5
12	D6	I/O Pull up	Flash/ LCD/ SDRAM data bus bit 6
13	D7	I/O Pull up	Flash/ LCD/ SDRAM data bus bit 7
14	RD/BY	I, Pull up	Flash ready/busy signal
15	FREN	O	Flash read enable
16	FWEN	O	Flash write enable
17	FWP	O	Flash write protect
18	VDD	P	Digital Core power(1.8V)
19	VSSD	P	Digital Core Ground
20	VCC	P	I/O POWER(3.3V)
21	P2.4/A0	I/O	SDRAM/ SRAM Address Bit 0 GPIO
22	P2.5/A1	I/O	SDRAM/ SRAM Address Bit 1 GPIO; FALE/LCDRS
23	P2.6/A2	I/O	SDRAM/ SRAM Address Bit 2 GPIO; FCLE
24	P2.7/A3	I/O	SDRAM/ SRAM Address Bit 3 GPIO
25	A4	O	SDRAM/ SRAM Address Bit 4
26	A5	O	SDRAM/ SRAM Address Bit 5
27	A6	O	SDRAM/ SRAM Address Bit 6
28	A7	O	SDRAM/ SRAM Address Bit 7
29	A8	O	SDRAM/ SRAM Address Bit 8
30	A9	O	SDRAM/ SRAM Address Bit 9
31	A10	O	SDRAM Address Bit 10
32	A11	O	SDRAM Address Bit 11 SRAM Address Bit 10
33	A12	O	SDRAM Address Bit 12 SRAM Address Bit 11
34	BA0	O	SDRAM Bank Address 0 SRAM Address Bit 12
35	BA1	O	SDRAM Bank Address 1 SRAM Address Bit 13
36	CKE	O	SDRAM clock enable to SDRAM
37	CLK	O	system clock to SDRAM
38	P2.8/WEN	I/O	SDRAM write enable GPIO
39	P2.9/CASN	I/O	SDRAM column address strobe GPIO
40	P2.10/RASN	I/O	SDRAM row address strobe GPIO
41	P2.11/CSN	I/O	SDRAM chip strobe GPIO
42	VSSD	P	Digital Ground

43	P2.13/PWM0	I/O	GPIO/ PWM output0
44	P2.0/SDDO	I/O	SD/MMC Data output, Rock2 as input Connect to SD/MMC SDDO
45	P2.1/SDDI	I/O	SD/MMC Data input, Rock2 as output Connect to SD/MMC SDDI
46	P2.2/SDCLK	I/O	SD/MMC Clock output
47	P2.3/SDCS	I/O	SD/MMC chip select output
48	VCC	P	I/O POWER(3.3V)
49	VSSD	P	Digital Ground
50	VDD	P	Digital Core power(1.8V)
51	P0.0	I/O Pull up	GPIO, External int0
52	P0.1	I/O Pull up	GPIO, External int1
53	P0.2	I/O Pull up	GPIO, External int2
54	P0.3	I/O Pull up	GPIO, External int3
55	P0.4	I/O Pull up & EN	GPIO
56	P0.5	I/O Pull up & EN	GPIO
57	P0.6	I/O Pull up & EN	GPIO
58	P0.7	I/O Pull up & EN	GPIO
59	P1.1/ I2C_SDA	I/O Pull up & EN	GPIO, External SDA of I2C
60	P1.2/ I2C_SCL	I/O Pull up & EN	GPIO, External SCL of I2C
61	P1.3/ I2SMCLK	I/O Pull up & EN	GPIO, I2SMCLK of External CODEC
62	P1.4 DAC_LRCK	I/O Pull up & EN	GPIO, DAC LRCK of External CODEC
63	P1.5/ ADC_LRCK	I/O Pull up & EN	GPIO, ADC LRCK of External CODEC
64	P1.6/ SDI	I/O Pull up & EN	GPIO, SDI Data input Connect to SDO of External CODEC
65	P1.7/ SDO	I/O Pull up & EN	GPIO, SDO Data output Connect to SDI of External CODEC
66	AIL1	I	L-channel single-end input 1
67	AIR1	I	R-channel single-end input 1
68	AIL2	I	L-channel single-end input 2
69	AIR2	I	R-channel single-end input 2
70	MIC	I	Mic single-end analog input
71	IREF	O	Bias current reference of CODEC
72	VCOM	O	Internal biasing voltage for CODEC
73	VSSA	P	Negative power supply for CODEC
74	VDDA	P	Positive power supply for CODEC

75	AOL	O	L-channel single ended analog output	
76	VSSAO	P	Negative power supply to output amplifiers	
77	AOM	O	Common mode analog output	
78	AOMS	I	Common mode sense input	
79	VDDAO	P	Positive power supply to output amplifiers	
80	AOR	O	R-channel single ended analog output	
81	HP_SENSE	I	Sense of jack insertion	
82	VDD	P	Digital Core power(1.8V)	
83	VCC	P	I/O POWER(3.3V)	
84	VSSD	P	Digital Ground	
85	IBOOT	I, Pull up	Boot select,	(Internal 100K pull up)
86	A16	O	SRAM Address Bit 16	
87	A17	O	SRAM Address Bit 17	
88	A18	O	SRAM Address Bit 18	
89	A19	O	SRAM Address Bit 19	
90	A20	O	SRAM Address Bit 20	
91	DQM0	O	SDRAM DQM0	
92	DQM1	O	SDRAM DQM1	
93	A14	O	SRAM Address Bit 14	
94	A15	O	SRAM Address Bit 15	
95	VSSD	P	LDO33 ground	
96	VCC33	P	LDO33 3.3V power rail	
97	VBAT42	P	LDO33 Power input	
98	VCC33	P	Voltage output	
99	VSSD	G	LDO33 ground	
100	VCCA	P	ADC 3.3V power input ADC reference	
101	REXT100K	I	ADC reference Resistor input	
102	LRADC3	I	Low resolution ADC input3	
103	LRADC2	I	Low resolution ADC input2	
104	LRADC1	I	Low resolution ADC input1	
105	LRADC0	I	Low resolution ADC input0	
106	VDDPLL	P	Analog power of PLL	
107	VSSPLL	P	Analog GND of PLL	

108	XIN	I, OSC	Crystal 24MHz OSC input PAD	
109	XOUT	O, OSC	Crystal 24MHz OSC output PAD	
110	VDD	P	Digital Core power(1.8V)	
111	VSSD	G	Digital Ground	
112	VCC	P	I/O POWER(3.3V)	
113	RESET	I, Pull up	System reset pin, low enable	
114	TEST	I, Pull down	Test mode,	(Internal 100K pull down)
115	P1.0/ NORCSN	I/O Pull up & EN	GPIO, NOR FLASH Chip select	
116	D8/P3.0	I/O	Flash/ LCD/ SDRAM data bus bit 8 GPIO	
117	D9/P3.1	I/O	Flash/ LCD/ SDRAM data bus bit 9 GPIO	
118	D10/P3.2	I/O	Flash/ LCD/ SDRAM data bus bit 10 GPIO	
119	D11/P3.3	I/O	Flash/ LCD/ SDRAM data bus bit 11 GPIO	
120	D12/P3.4	I/O	Flash/ LCD/ SDRAM data bus bit 12 GPIO	
121	D13/P3.5	I/O	Flash/ LCD/ SDRAM data bus bit 13 GPIO	
122	D14/P3.6	I/O	Flash/ LCD/ SDRAM data bus bit 14 GPIO	
123	D15/P3.7	I/O	Flash/ LCD/ SDRAM data bus bit 15 GPIO	
124	LCDRDN	O	LCD Read execution pin	
125	LCDWRN	O	LCD Write execution pin	
126	LCDCSN	O	LCD driver chip select	
127	FCE0	O	Flash chip select 0	
128	VDDA	P	Analog 1.8V power output, Connect one external 10uF CAP	

3.5.3 Function introduction to RT9284B

1. Description

The RT9284A/B is a compact, high efficient and high integration LED driver. Internal 22V MOSFET can support 2 to 5 White LEDs for backlighting and camera flashing.

Highly integration and internal compensation network minimizes as 5 external component counts. Optimized operation frequency can meet the requirement of small LC filters value and low operation current with high efficiency. Internal soft start function can reduce the inrush current. Tiny package type of TSOT-23-5 and TSOT-23-6 packages provide the best solution for PCB space saving and total BOM cost.

2. Features

VIN Operating Range : 2.7V to 5.5V

Maximum Output Voltage up to 20V

Dimming with Zero-inrush and Wide Frequency Range of 100 to 100kHz

Over Voltage Protection

Output Current up to 100mA at VOUT = 12V.

Zero Shutdown Supply Current

Minimize the External Component

Small LC Filter

Internal Soft Start

RoHS Compliant and 100% Lead (Pb)-Free

3. PIN Description

PIN No.	Symbol	I/O	Description
1	LX	O	Switch Pin
2	GND		Ground Pin
3	FB	I	Feedback Reference Voltage Pin
4	EN	I	Chip Enable (Active High)
5	OVP	I	over voltage protection
6	VDD	I	Supply Input Voltage Pin

3.5.4 Function introduction to TPS62200

1. Description

The TPS6220x devices are a family of high-efficiency synchronous step-down converters ideally suited for portable systems powered by 1-cell Li-Ion or 3-cell NiMH/NiCd batteries. The devices are also suitable to operate from a standard 3.3-V or 5-V voltage rail.

With an output voltage range of 6.0 V down to 0.7 V and up to 300 mA output current, the devices are ideal to power low voltage DSPs and processors used in PDAs, pocket PCs, and smart phones. Under nominal load current, the devices operate with a fixed switching frequency of typically 1 MHz. At light load currents, the part enters the power save mode operation; the switching frequency is reduced and the quiescent current is typically only 15 μA; therefore it achieves the highest efficiency over the entire load current range. The TPS6220x needs only three small external components. Together with the tiny SOT23 package, a minimum system solution size can be achieved. An advanced fast response voltage mode control scheme achieves superior line and load regulation with small ceramic input and output capacitors.

2. Features

High Efficiency Synchronous Step-Down Converter With up to 95% Efficiency

2.5 V to 6.0 V Input Voltage Range

Adjustable Output Voltage Range From 0.7 V to VI

Fixed Output Voltage Options Available

Up to 300 mA Output Current

1 MHz Fixed Frequency PWM Operation

Highest Efficiency Over Wide Load Current Range Due to Power Save Mode

15-µA Typical Quiescent Current

Soft Start

100% Duty Cycle Low-Dropout Operation

Dynamic Output-Voltage Positioning

Available in a Tiny 5-Pin SOT23 Package

3. PIN Description

PIN No.	Symbol	I/O	Description
1	VI	I	Supply voltage pin
2	GND		Ground
3	EN	I	The enable pin of the device
4	FB	I	The feedback pin of the device
5	SW	I/O	The switch pin

3.5.5 Function introduction to MCP73832

1. Description

The MCP73831/2 devices are highly advanced linear charge management controllers for use in space-limited, cost-sensitive applications. The MCP73831/2 are available in an 8-Lead, 2 mm x 3 mm DFN package or a 5-Lead, SOT23 package. Along with their small physical size, the low number of external components required make the MCP73831/2 ideally suited for portable applications. For applications charging from a USB port, the MCP73831/2 adhere to all the specifications governing the USB power bus.

The MCP73831/2 employ a constant-current/constantvoltage charge algorithm with selectable preconditioning and charge termination. The constant voltage regulation is fixed with four available options: 4.20V, 4.35V, 4.40V or 4.50V, to accommodate new, emerging battery charging requirements. The constant current value is set with one external resistor. The MCP73831/2 devices limit the charge current based on die temperature during high power or high ambient conditions. This thermal regulation optimizes the charge cycle time while maintaining device reliability.

2. Features

Linear Charge Management Controller:

·   Integrated Pass Transistor

·   Integrated Current Sense

·   Reverse Discharge Protection

High Accuracy Preset Voltage Regulation: + 0.75%

Four Voltage Regulation Options:

·   4.20V, 4.35V, 4.40V, 4.50V

Programmable Charge Current

Selectable Preconditioning

Selectable End-of-Charge Control

Charge Status Output

·   Tri-State Output - MCP73831

·   Open-Drain Output - MCP73832

Automatic Power-Down

Thermal Regulation

Temperature Range: -40°C to +85°C

Packaging:

·   8-Lead, 2 mm x 3 mm DFN

·   5-Lead, SOT23

3.5.6 Function introduction to TEA5767HN

1. Description

The TEA5767HN is a single-chip electronically tuned FM stereo radio for low-voltage application with fully integrated IF selectivity and demodulation. The radio is completely adjustment-free and only requires a minimum of small and low cost external components. The radio can be tuned to the European, US and Japanese FM bands.

2. Features

High sensitivity due to integrated low-noise RF input amplifier

FM mixer for conversion to IF of the US/Europe (87.5 to 108 MHz) and Japanese (76 to 91MHz)

FM band

Preset tuning to receive Japanese TV audio up to 108 MHz

RF Automatic Gain Control (AGC) circuit

LC tuner oscillator operating with low cost fixed chip inductors

FM IF selectivity performed internally

No external discriminator needed due to fully integrated FM demodulator

Crystal reference frequency oscillator; the oscillator operates with a 32.768 kHz clock crystal or with a 13 MHz crystal and with an externally applied 6.5 MHz reference frequency

PLL synthesizer tuning system

I2C-bus and 3-wire bus, selectable via pin BUSMODE

7-bit IF counter output via the bus

4-bit level information output via the bus

Soft mute

Signal dependent mono to stereo blend [Stereo Noise Cancelling (SNC)]

Signal dependent High Cut Control (HCC)

Soft mute, SNC and HCC can be switched off via the bus

Adjustment-free stereo decoder

Autonomous search tuning function

Standby mode

Two software programmable ports

Bus enable line to switch the bus input and output lines into 3-state mode

Automotive temperature range (at VCCA, VCC(VCO) and VCCD = 5 V).

3. PIN Description

PIN No.	Symbol	I/O	Description
1	n.c.		not connected
2	CPOUT	O	charge pump output of synthesizer PLL
3	VCOTANK1	O	voltage controlled oscillator tuned circuit output 1
4	VCOTANK2	O	voltage controlled oscillator tuned circuit output 2
5	VCC(VCO)	P	voltage controlled oscillator supply voltage
6	DGND		digital ground
7	VCCD	P	digital supply voltage
8	DATA	I/O	bus data line input/output
9	CLOCK	I	bus clock line input
10	n.c.		not connected
11	WRITE/READ	I	write/read control input for the 3-wire bus
12	BUSMODE	I	bus mode select input
13	BUSENABLE	I	bus enable input
14	SWPORT1		software programmable port 1
15	SWPORT2		software programmable port 2
16	XTAL1	I	crystal oscillator input 1

17	XTAL2	I	crystal oscillator input 2
18	PHASEFIL		phase detector loop filter
19	PILFIL		pilot detector low-pass filter
20	n.c.		not connected
21	n.c.		not connected
22	VAFL	O	left audio frequency output voltage
23	VAFR	O	right audio frequency output voltage
24	TMUTE	I	time constant for soft mute
25	MPXO	O	FM demodulator MPX signal output
26	Vref	P	reference voltage
27	TIFC	I	time constant for IF centre adjust
28	LIMDEC1	I	decoupling IF limiter 1
29	LIMDEC2	I	decoupling IF limiter 2
30	n.c.		not connected
31	n.c.		not connected
32	Igain	I	gain control current for IF filter
33	AGND		analog ground
34	VCCA	P	analog supply voltage
35	RFI1	I	RF input 1
36	RFGND		RF ground
37	RFI2	I	RF input 2
38	TAGC		time constant RF AGC
39	LOOPSW		switch output of synthesizer PLL loop filter
40	n.c.		not connected

3.5.7 Function introduction to M41T62

1. Description

The M41T6x Serial Access TIMEKEEPER® is a low power Serial RTC with a built-in 32.768kHz oscillator (external crystal controlled). Eight registers are used for the clock/calendar function and are configured in binary coded decimal (BCD) format. An additional 8 registers provide status/control of Alarm, 32KHz output, Calibration, and Watchdog functions. Addresses and data are transferred serially via a two line, bi-dire ctional I²C interface. The built-in address register is incremented automatically after each WRITE or READ data byte.

Functions available to the user include a time-of-day clock/calendar, Alarm interrupts (M41T62/65), 32KHz output (M41T64), programmable Square Wave output (M41T62/63/64), and Watchdog output (M41T63/65). The eight clock address locations contain the century, year, month, date, day, hour, minute, second and tenths/hundredths of a second in 24 hour BCD format. Corrections for 28-, 29- (leap year), 30- and 31-day months are made automatically.

The M41T6x is supplied in a 16-pin QFN.

2. Features

Counters for tenths/hundredths of seconds, seconds, minutes, hours, day, date, month, year, and century

32 KHz crystal oscillator integrating load capacitance and high crystal series resistance operation

Oscillator stop detection monitors clock operation

Serial interface supports I2C bus (400kHz)

350nA timekeeping current @ 3V

Low operating current of 35µA (@400kHz)

Timekeeping down to 1.0V

1.3V to 4.4V I2C bus operating voltage

32KHz square wave on power-up to drive a microcontroller in low power mode

Programmable alarm with interrupt function

Accurate programmable watchdog (from 62.5ms to 31 min)

Software clock calibration to compensate deviation of crystal due to temperature

Automatic leap year compensati

Operating temperature of –40 to 85°C

Lead-free 16-pin QFN package

Lithium ion rechargeable operation

3. PIN Description

PIN No.	Symbol	I/O	Description
1	XI	I	Oscillator input
2	XO	O	Oscillator output
3, 5	GND		
4	SQW	I	Programmable square wave
6, 7, 8, 12, 13, 15 ,16	NC		Not Used
9	SDA	I/O	Serial data input/output
10	SCL	I	Serial clock input
11	IRQ/OUT	O	Interrupt or OUT output (open drain)

14	VCC	P	Supply voltage

3.5.8 Function introduction to WM8750BL

1. Description

The WM8750L is a low power, high quality stereo CODEC designed for portable digital audio applications.

The device integrates complete interfaces to stereo or mono microphones and a stereo headphone. External component requirements are drastically reduced as no separate microphone or headphone amplifiers are required. Advanced on-chip digital signal processing performs graphic equaliser, 3-D sound enhancement and automatic level control for the microphone or line input.

The WM8750L can operate as a master or a slave, with various master clock frequencies including 12 or 24MHz for USB devices, or standard 256fs rates like 12.288MHz and 24.576MHz. Different audio sample rates such as 96kHz, 48kHz, 44.1kHz are generated directly from the master clock without the need for an external PLL.

The WM8750L operates at supply voltages down to 1.8V, although the digital core can operate at voltages down to 1.42V to save power, and the maximum for all supplies is 3.6 Volts. Different sections of the chip can also be powered down under software control.

The WM8750L is supplied in a very small and thin 5x5mm QFN package, ideal for use in hand-held and portable systems.

2. Features

DAC SNR 98dB ('A' weighted), THD –84dB at 48kHz, 3.3V

ADC SNR 95dB ('A' weighted), THD -82dB at 48kHz, 3.3V

Complete Stereo / Mono Microphone Interface

· Programmable ALC / Noise Gate

On-chip 400mW BTL Speaker Driver (mono)

On-chip Headphone Driver

· >40mW output power on 16O / 3.3V

· THD –80dB at 20mW, SNR 90dB with 16O load

· No DC blocking capacitors required (capless mode)

Separately mixed mono output

Digital Graphic Equaliser

Low Power

· 7mW stereo playback (1.8V / 1.5V supplies)

· 14mW record & playback (1.8V / 1.5V supplies)

Low Supply Voltages

- Analogue 1.8V to 3.6V
- Digital core: 1.42V to 3.6V
- Digital I/O: 1.8V to 3.6V

256fs / 384fs or USB master clock rates: 12MHz, 24MHz

Audio sample rates: 8, 11.025, 16, 22.05, 24, 32, 44.1, 48, 88.2, 96kHz generated internally from master clock

5x5x0.9mm QFN package

3. PIN Description

PIN NO	NAME	TYPE	DESCRIPTION
1	MCLK	Digital Input	Master Clock
2	DCVDD	Supply	Digital Core Supply
3	DBVDD	Supply	Digital Buffer (I/O) Supply
4	DGND	Supply	Digital Ground (return path for both DCVDD and DBVDD)
5	BCLK	Digital Input / Output	Audio Interface Bit Clock
6	DACDAT	Digital Input	DAC Digital Audio Data
7	DACLRC	Digital Input / Output	Audio Interface Left / Right Clock/Clock Out
8	ADCDAT	Digital Output	ADC Digital Audio Data
9	ADCLRC	Digital Input / Output	Audio Interface Left / Right Clock
10	MONOOUT	Analogue Output	Mono Output
11	OUT3	Analogue Output	Analogue Output 3 (can be used as Headphone Pseudo Ground)
12	ROUT1	Analogue Output	Right Output 1 (Line or Headphone)
13	LOUT1	Analogue Output	Left Output 1 (Line or Headphone)
14	HPGND	Supply	Supply for Analogue Output Drivers (LOUT1/2, ROUT1/2)
15	ROUT2	Analogue Output	Right Output 1 (Line or Headphone or Speaker)
16	LOUT2	Analogue Output	Left Output 1 (Line or Headphone or Speaker)
17	HPVDD	Supply	Supply for Analogue Output Drivers (LOUT1/2, ROUT1/2, MONOUT)
18	AVDD	Supply	Analogue Supply
19	AGND	Supply	Analogue Ground (return path for AVDD)
20	VREF	Analogue Output	Reference Voltage Decoupling Capacitor
21	VMID	Analogue Output	Midrail Voltage Decoupling Capacitor
22	MICBIAS	Analogue Output	Microphone Bias
23	RINPUT3 / HPDETECT	Analogue Input	Right Channel Input 3 or Headphone Plug-in Detection
24	LINPUT3	Analogue Input	Left Channel Input 3
25	RINPUT2	Analogue Input	Right Channel Input 2

26	LINPUT2	Analogue Input	Left Channel Input 2
27	RINPUT1	Analogue Input	Right Channel Input 1
28	LINPUT1	Analogue Input	Left Channel Input 1
29	MODE	Digital Input	Control Interface Selection
30	CSB	Digital Input	Chip Select / Device Address Selection
31	SDIN	Digital Input/Output	Control Interface Data Input / 2-wire Acknowledge output
32	SCLK	Digital Input	Control Interface Clock Input

3.5.9 Function introduction to XC6206P152MR

1. Description

The XC6206 series are highly precise, low power consumption, high voltage, positive voltage regulators manufactured using CMOS and laser trimming technologies. The series provides large currents with a significantly small dropout voltage.

The XC6206 consists of a current limiter circuit, a driver transistor, a precision reference voltage and an error correction circuit.

The series is compatible with low ESR ceramic capacitors. The current limiter's foldback circuit also operates as a short protect for the output current limiter and the output pin.

Output voltage can be set internally by laser trimming technologies. It is selectable in 0.1V increments within a range of 1.2V to 5.0V.

SOT-23 (250mW) and SOT-89 (500mW) packages are available.

2. Features

Maximum Output Current : 250mA (5.0V type)

Dropout Voltage : 160mV @ 100mA (5.0V type)

Maximum Operating Voltage : 6.0V

Output Voltage Range : 1.2V ~ 5.0V (selectable in 0.1V steps)

Highly Accurate : ± 2%

Low Power Consumption : Typ. 1.0μA

Operational Temperature Range : -40OC ~ 85OC

Ultra Small Packages : SOT-23 (250mW), SOT-89 (500mW)

Low ESR Capacitor : Ceramic compatible

Chapter Four

Assembly and Disassembly Process

In order to get to know the structure of V3more easily and directly, now we use pictures to present each key point of disassembly and assembly process before all users to prevent users from operating blindly and to damage elements, so we hope you can operate according to the instructions strictly.

Note: all operations must be with strict anti-static measures. Operators must wear anti-static gloves or wrist ring; electric screwdriver must be grounded effectively and articles, such as nippers must be removed static before using!

4.1 Disassembly process of the player

1. Use cuspidal forceps to take out the LOCK button.

2. Insert the forceps into the lock hole and then prize up one corner of the glass.

3. Use a slice with thickness about 0.1mm to insert into the gap of the glass prized up and then peel off glue of the glass slowly to tale out the glass. Pay attention   not to damage touch button FPC.

4. After peeling off glue of the glass, use nails to take out the glass.

5. Insert the 4 special slice clasp instruments into the relevant position of the 4 clasps.

6. Use the special hook tool, shown in the picture,to remove the middle casing.
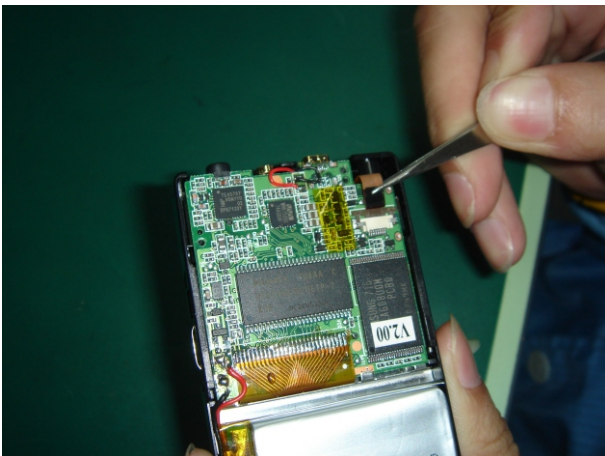
7. Remove FPC flat cable clasp and then use forceps   to take out FPC flat cable.

8. Use electric screwdriver or "+"-shaped screwdriver to take out 2 screws of main board.

9. Use iron to weld to separate the batter and buzzer lead wire on main board.

10. Take out main board components.

11. Take out battery components.
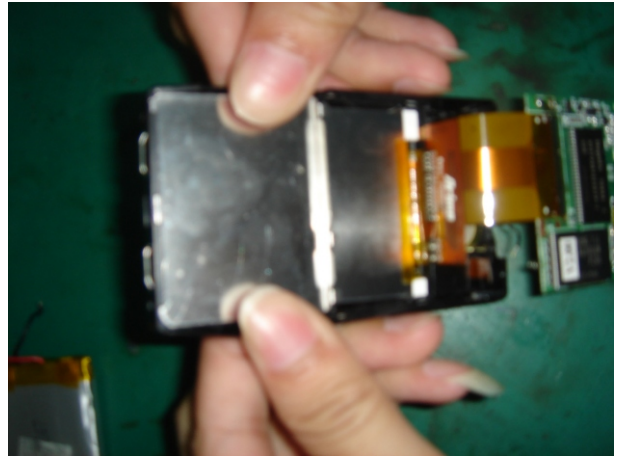
12. Take out the stainless steel cover board on rear side of display screen.

13. Take out display screen components from the direction shown in the picture

4.2 Assembly process of the player

Assembly process of the player is similar with the disassembly process, and only the sequence is reverse.

Chapter Cinque
PCB board & Circuit diagram

Section One PCB board

5.1.1 Surface layer of Main Board

5.1.2 Bottom layer of Main Board

Section Two Circuit diagram

- 63 -

OUT_R1 OUT_L1

1 L1 601/0603
3 L3 601/0603
4
5
2SJ-A-382-001(HP-DC)
CN1

C31 220UF/4V HP_OUTR
C32 220UF/4V HP_OUTL

R99 1K R100 1K R83 10R R84 10R

RCLAMP0504F/SC-70 6L D1

C90 104 C92 104

GND

R102 0R*
2 FM_ANT
L5 601/0603

VCC DBVDD C89 106/X5R C97 104 U11 WM8750
601 DCR<350mΩ L20
C84 104 VCC
3 DBVDD LINPUT2 26
2 DCVDD RINPUT2 25
18 AVDD LINPUT3 24 MIC
17 HPVDD RINPUT3 23
D_GND
MCLK 1 MCLK DGND 4 C52 105 C53 105 C54 105
BCLK 5 BCLK HPGND 14
BCLK 9 ADCLRC AGND 19 D_GND
ADCLRC 7 DACLRC
DACLRC 6 DACDAT LOUT2 16 SPEAKER_OUTL
DACDAT 8 ADCDAT ROUT2 15 SPEAKER_OUTR
ADCDAT
R23 4.7K 29 MODE MONOOUT 10
D_GND 30 CSB OUT3 11
I2C_SDA 31 SDIN LOUT1 13 HP_OUTL R79 4.7K VREF
I2C_SCL 32 SCLK ROUT1 12 HP_OUTR R91 4.7K
C1 105
5767L R1 100R 28 LINPUT1 MICBIAS 22 MICBIAS
5767R R2 100R 27 RINPUT1 VREF 20 VREF
C2 105 VMID 21 C78 104 C79 106/X5R
R41 4.7K* R80 4.7K*
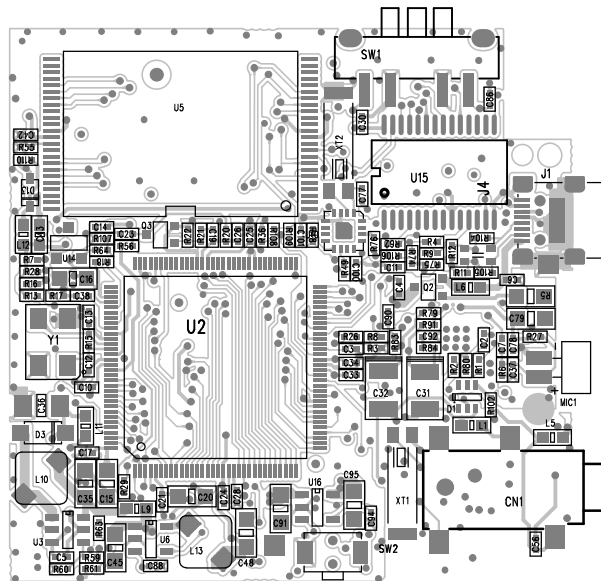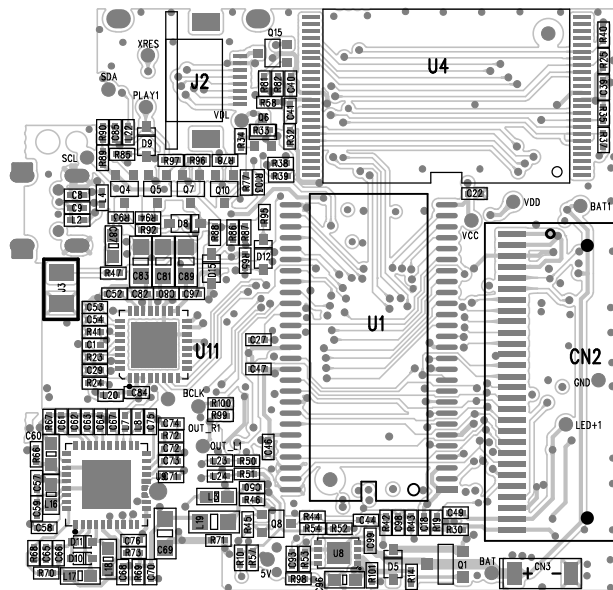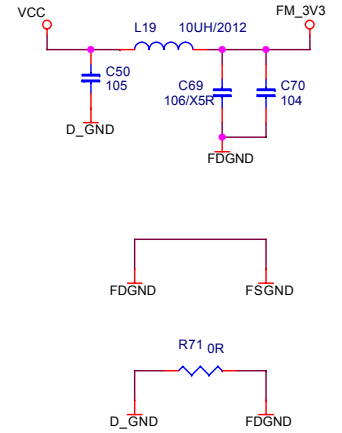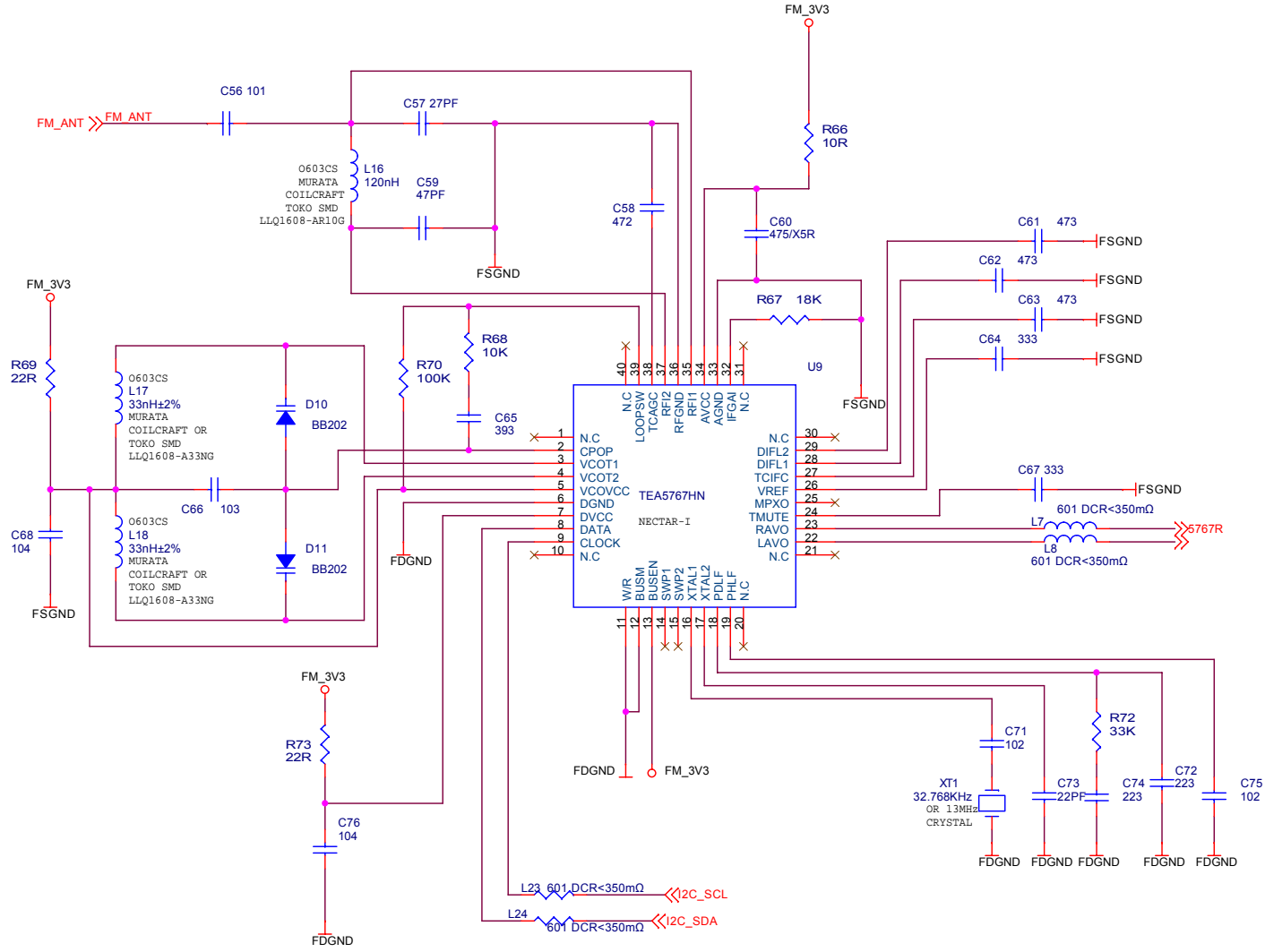C82 104 C83 106/X5R C80 104 C81 106/X5R

D_GND R3 12K C3 104
USB_DET USB_DET 2
R5 470R C4 104
SFI0402-050E100NP R8 10K
C6 L6 680 SS8550LT +5V USB_VBUS 2 USB_DM 2
Q2 T1
J1 601 DCR<350mΩ L2 SPEAKER_OUTL
1 +5V L4 SPEAKER_OUTR SDCW2012-2-900T
2 D- 601 DCR<350mΩ USB_DP 2
3 NC
4 D+ R11 1M R12 1M
5 GND
6 IN_L D_GND D_GND
7 IN_R
8 GND
3DU05S-32T-10
C8 C9
SFI0402-050E100NP SFI0402-050E100NP*
D_GND D_GND D_GND

MICBIAS
MIC1 R27 2.2K C7 105 MIC
1
2 C37 221
MICROPHONE R6 47K

VLED Q15 VCC VDL VDL
SS8550LT C30 105
R82 47K GND R103
R81 10K LED_CON 10K INT
VCC R33 0R* VDL
Q6 SS8550LT
R34 10K*
R77 4.7K
J2 U15 CY8C21534
8 1 P07 VDD 28
7 2 P05 P06 27 K4
6 K1 3 P03 P04 26 K5
5 K2 4 P01 P02 25 K6
4 K3 5 P27 P00 24 K3
3 K4 6 P25 P26 23 K2
2 K5 7 P23 P24 22 K1
1 K6 8 P21 P22 21
9 VSS P20 20
PSOC_SCL R4 100R 10 P17 XRES 19 XRES
PSOC_SDA R9 100R 11 P15 P16 18
SCL 12 P13 P14 17 SDA
R74 10K R75 10K 13 SCL P12 16
VCC 14 VSS SDA 15

HOLD R78 100K Q10 MMST3904 D_GND

VCC R49 0R
C51 105
D_GND J3 R31 1K
DIDI R47 10K Q9 MMST3904
R48 47K D_GND

P1 P2 P3 P4 P5 P6 P7 P8 P9 P10 P11 P12 P13 P14

VB

U16
VIN VOUT
GND
EN BYPASS
TPS79333DBVR SOT23-5
VCC VCC

C91 106/X5R
C95 106/X5R
C94 103
C93 102
R98 68K
P_GND
EN

VDD VDD

U6
VI SW
GND
EN FB
TPS62200/FAN5307* SOT23-5

L13 CDRH3D16-100
R42 240K±1%
C44 47PF
C48 106/X5R
C45 106/X5R
R43 100K±1%
C98 101
D_GND
R44 390K±1%
Q8 MMST3904
R45 10k
R46 47k
V_ADJ 2
D_GND

VCC
R85 100k
D9 1N4148WS
PLAY/PAUSE 2
PLAY
START
C85 SFI0402-050E100NP
P_GND
L22 601 DCR<350mΩ
C86 SFI0402-050E100NP
D_GND
SW1
HOLD
R58 47K
VCC
SK??

5V
USB_VBUS 3
USB_VBUS
D5 BAT43WS
R14 100R
Q1 SI2305DS SOT23
R101 1K
P_GND
BAT
BAT1

D15 1N4148WS
USB_VBUS 3
R86 330K
C88 SFI0402-050E100NP
P_GND
EN

VCC
R87 330K
D8 1N4148WS
R92 330K
BATT
R89 10K
Q4 MMST3906
R90 10K
START
R93 10M
R95 47K
D12 1N4148WS
OFF 2
R65 10K
Q7 SS8050LT
R88 1M
R94 100K
C87 475/X5R
R96 2.7M
Q5 SS8050LT
P_GND
P_GND
R97 1M
START

D_GND
C96 475
CHG_OK 2
R52 0R
R54 10K
VCC
U8
VDD VBAT
VDD PROG
START VBAT
NC VSS
MCP73832T
VIN
BAT
R53 2.7K±1%
C99 105
BATT
CN3 BAT
D_GND
D_GND
D_GND

VCC
R57 47K
DFU
R10 1K
SW2 DFU
P_GND

VCC
XC6206P152
VI VOUT
GND
U14
R64 100K
VCC1V8 2
P_GND
D_GND
P_GND
A_GND

Chapter six BOM List

MATERIAL CODE	MATERIAL NAME	SPECIFICATIONS	LOCATION
BATTERY PROTECT BOARD 5448893			
0090354	SMD RESISTOR	1/16W 470O±5% 0402	R1
0090368	SMD RESISTOR	1/16W 2K±5% 0402	R2
0310480	SMD CAPACITOR	10V 104±10% 5R 0402	C1,C2,C3
0790065	SMD FIELD EFFECT TRANSISTOR	ECH8601 TSSOP	U2
0790090	SMD FIELD EFFECT TRANSISTOR	ECH8601R TSSOP	U2
0882570	IC	S-8261AANMG22 SO23-6	
1633305	PCB	E29-0	
V3N video(RU)B SILVER			
FPC BOARD 5449972			
1633812	FPC	9 3-1	
0700186	SMD RADIATION DIODE	1SB0602V22D0CA01	D1,D3
0700187	SMD RADIATION DIODE	LTST-S270KRKT RED	D1,D3
0090346	SMD RESISTOR	1/16W 220O±5% 0402	R1,R3
V3N video(RU)B SILVER			
MAINBOARD 2V3-1 1.0/Ver3.00 4940141			
0090001	SMD RESISTOR	1/16W 0O±5% 0603	L11
0090324	SMD RESISTOR	1/16W 0O±5% 0402	R29,R32,R38,R39,R49,R52,R55,R56,R71,R76
0090326	SMD RESISTOR	1/16W 10O±5% 0402	R66,R83,R84
0090830	PRECISION SMD RESISTOR	1/1612O±1% 0402	R30
0090046	SMD RESISTOR	1/10W 470O±5% 0805	R5
0090447	SMD RESISTOR	1/16W 22O±5% 0402	R73,R69
0090330	SMD RESISTOR	1/16W 33O±5% 0402	R24,R26
0090339	SMD RESISTOR	1/16W 100O±5% 0402	R1,R2,R4,R9,R14
0090362	SMD RESISTOR	1/16W 1K±5% 0402	R10,R31,R59,R99,R100,R101
0090369	SMD RESISTOR	1/16W 2.2K±5% 0402	R27
0090839	PRECISION SMD RESISTOR	1/16W3K±1% 0402	R53
0090377	SMD RESISTOR	1/16W 4.7K±5% 0402	R23,R50,R51,R79,R91
0090385	SMD RESISTOR	1/16W 10K±5% 0402	R7,R8,R13,R19,R20,R25,R28,R37,R45,R47,R54,R60,R65,R68,R74,R75,R77,R81,R89,R90,R103
0090387	SMD RESISTOR	1/1612K±5% 0402	R3

MATERIAL CODE	MATERIAL NAME	SPECIFICATIONS	LOCATION
0090390	SMD RESISTOR	1/16W 18K±5% 0402	R67
0090396	SMD RESISTOR	1/16W 33K±5% 0402	R72
0090400	SMD RESISTOR	1/16W 47K±5% 0402	R6,R35,R36,R40,R46,R48,R57,R58,R82,R95
0090404	SMD RESISTOR	1/16W 68K±5% 0402	R98
0090408	SMD RESISTOR	1/16W 100K±5% 0402	R18,R64,R70,R85,R94,R78
0090421	SMD RESISTOR	1/16W 330K±5% 0402	R86,R87,R92
0090433	SMD RESISTOR	1/16W 1MO±5% 0402	R11,R12,R15,R22,R88,R97
0090509	PRECISION SMD RESISTOR	1/16W 100K±1% 0402	R16,R17,R43
0090417	SMD RESISTOR	1/16W 220K±5% 0402	R21
0090687	PRECISION SMD RESISTOR	1/16W 240K±1% 0402	R42
0090831	PRECISION SMD RESISTOR	1/16390K±1% 0402	R44
0090444	SMD RESISTOR	1/16W 10MO±5% 0402	R93
0090438	SMD RESISTOR	1/162.7MO±5% 0402	R96
1030029	SMD PRESS SENSITIVITY RESISTOR	SFI0402-050E100NP	C6,C85,C86,C88
1030033	SMD PRESS SENSITIVITY RESISTOR	S1005H180C100GPT 0402	C6,C85,C86,C88
0310503	SMD CAPACITOR	50V 6P±0.25P NPO 0402	C27,C29
0310416	SMD CAPACITOR	50V 22P±5% NPO 0402	C73
0310418	SMD CAPACITOR	50V 27P±5% NPO 0402	C57
0310424	SMD CAPACITOR	50V 47P±5% NPO 0402	C44,C59
0310432	SMD CAPACITOR	50V 101±5% NPO 0402	C56,C98
0310435	SMD CAPACITOR	50V 221±5% NPO 0402	C37
0310704	SMD CAPACITOR	25V 102±10% 7R 0402	C5,C71,C75,C93
0310706	SMD CAPACITOR	25V 472±10% 7R 0402	C58
0310453	SMD CAPACITOR	25V 103±10% 7R 0402	C94,C66
0310834	SMD CAPACITOR	16V 106±20% 5R 1206	C36
0310455	SMD CAPACITOR	16V 223±10% 7R 0402	C72,C74
0310710	SMD CAPACITOR	16V 333±10% 5R 0402	C64,C67
0310711	SMD CAPACITOR	10V 393±10% 5R 0402	C65
0310712	SMD CAPACITOR	10V 473±10% 5R 0402	C61,C62,C63
0310480	SMD CAPACITOR	10V 104±10% 5R 0402	C3,C4,C10,C17,C18,C19,C21,C22,C23,C24,C25,C26,C28,C33,C34,C38,C39,C40,C41,C42,C43,C46,C47,C68,C70,C76,C78,C80,C82,C84,C90,C92,C97
0310415	SMD CAPACITOR	50V 20P±5% NPO 0402	C12,C13

MATERIAL CODE	MATERIAL NAME	SPECIFICATIONS	LOCATION
0310776	SMD CAPACITOR	6.3V 105±20% 5R 0402 ? ?	C1,C2,C7,C14,C30,C50,C51,C52,C53,C54,C99
0310662	SMD CAPACITOR	6.3V 105±10% 5R 0402	C1,C2,C7,C14,C30,C50,C51,C52,C53,C54,C99
0310753	SMD CAPACITOR	16V 104±20% 5R 0402	C49
0310717	SMD CAPACITOR	6.3V 475±20% 5R 0603	C60,C87,C96
0310827	SMD CAPACITOR	6.3V106±20% 5R 0805 T 0.85	C15,C16,C20,C35,C45,C48,C69,C79,C81,C83,C89,C91,C95
0310831	SMD CAPACITOR	6.3V106±10%5R 0805 T 0.85	C15,C16,C20,C35,C45,C48,C69,C79,C81,C83,C89,C91,C95
0310736	SMD TANTALUMCAPACITOR	4V 220uF±20% 3528(B)	C31,C32
0390354	SMD MAGNETIC BEADS	68O/100MHz±25% 1608	L6
0390388	SMD MAGNETIC BEADS	600O/100MHZ±25% 1005	L2,L4,L7,L8,L20,L22,L23,L24
0390142	SMD MAGNETIC BEADS	FC1608-60102	L1,L3,L5,L9,L12
0390221	SMD COIL THREAD INDUCTOR	33nH±2% 1608	L18,L17
0390398	SMD COIL THREAD INDUCTOR	120nH±2% 1608	L16
0390386	SMD CORES INDUCTOR	10uH±20% CDRH3D16/HP	L10,L13
0390044	SMD INDUCTOR	10UH±10% 2012	L19
0960278	SMD CRYSTAL OSCILLATOR	24MHz±30ppm 5032/4 20P	Y1
0960279	SMD CRYSTAL OSCILLATOR	32.768KHz±20ppm SS6 12.5P	XT1,XT2
0680077	SMD SCHOTTKY DIODE	MBR0520 SOD123	D3
0680074	SMD SCHOTTKY DIODE	B43WS SO323	D5
0700115	SMD TRANSFIGURATION DIODE	BB202	D10,D11
0700154	SMD TRIODE	14148WS SO323	D8,D9,D12,D15
0780300	SMD TRIODE	SS8550LT SO323	Q2,Q6,Q15
0780299	SMD TRIODE	SS8050LT SO323	Q3,Q5,Q7
0780298	SMD TRIODE	MMS3904 SO323	Q8,Q9,Q10
0780293	SMD TRIODE	MMS3906 SO323	Q4
0790041	SMD FIELD EFFECT TRANSISTOR	SI2305DS SO23	Q1
0883456	IC	K9LAG08U0M-PCBO TSOP	U4,U5
0883217	IC	RT9284B-20PJ6E SOT23-6	U3
0883083	IC	CY8C21534 SSOP	U15
0882668	IC	79333DBVR SO23-5	U16
0883370	IC	MCP73832 DFN	U8
0883384	IC	XC6206P152MR SOT-23	U14

MATERIAL CODE	MATERIAL NAME	SPECIFICATIONS	LOCATION
0882850	IC	4162 QFN	U10
0883330	IC	WM8750BL QFN	U11
0883403	IC	WM8750L QFN	U11
0883193	IC	R2608 LQFP	U2
0883442	IC	RK2608A LQFP	U2
08825598	IC	HY57V641620ETP-7 TSOP$	U1
0882388	IC	TE5767HN HVQFN	U9
0882476	IC	TP62200 SO23-5	U6
1090080	ESD ELEMENT	RCL0504 SC70-6L	D1
1090084	ESD ELEMENT	PLR0504P SC70-6L	D1
1310096	SMD STIR SWITCH	SSSS70101	SW1
1310095	SMD STIR SWITCH	1370R	SW1
1340099	SMD LIGHT TOUCH SWITCH	SKRELGE010	SW2
1000053	COMMON MODE FILTER	SDCW2012-2-371T NT2012	T1
1980050	EARPHONE SOCKET	2S382-001	CN1
1140082	MICROPHONE	44dB±3dB 4×1.2 WITH NEEDLE	MIC1
1140105	MICROPHONE	42dB±2dB 4×1.5 WITH NEEDLE	MIC1
1860140	USB SOCKET	3DG08S-30G-P	J1
1940405	CABLE SOCKET	8P 0.5mm SMD,NEXT MEET WITH CLASP	J2
1633811	PCB	2 3-1	

Chapter Four V5

Assembly and Disassembly Process

In order to get to know the structure of V5more easily and directly, now we use pictures to present each key point of disassembly and assembly process before all users to prevent users from operating blindly and to damage elements, so we hope you can operate according to the instructions strictly.

Note: all operations must be with strict anti-static measures. Operators must wear anti-static gloves or wrist ring; electric screwdriver must be grounded effectively and articles, such as nippers must be removed static before using!

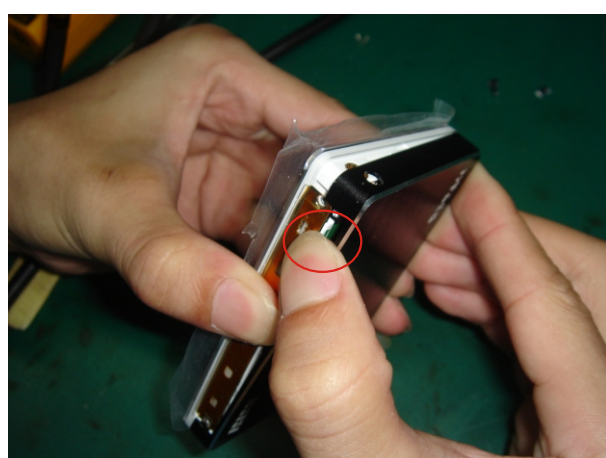## 4.1 Disassembly process of the player

1. Use cuspidal forceps to take out the LOCK button;

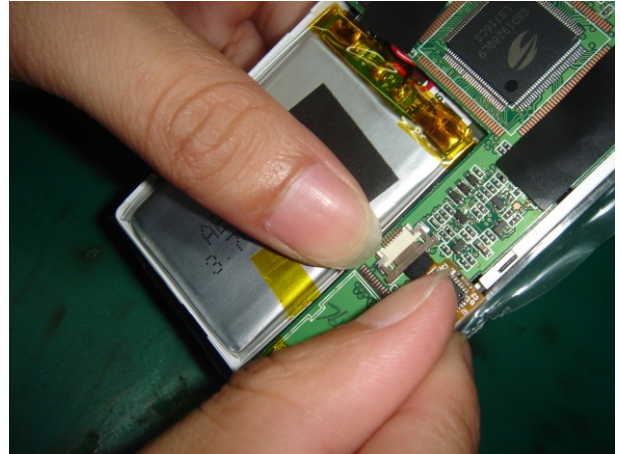2. Use blade to remove the glass from the gap on one side of the glass.
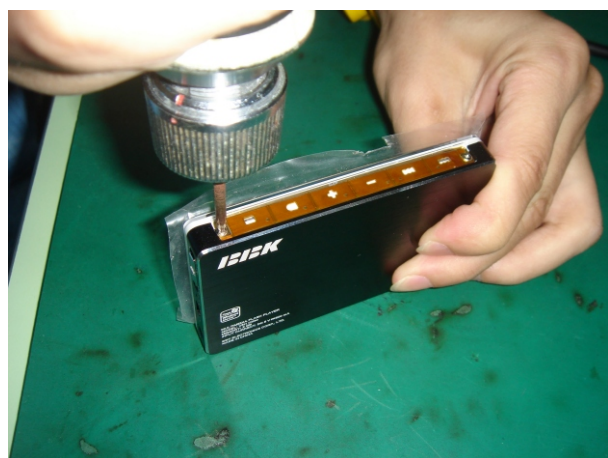
3. Take out the two screws of button board.

4. Push out one corner of bottom casing from the hole of hanging rope and then separate the bottom casing from button position.

5. Separate the bottom casing and the middle casing.

6. Remove the clasp of button flat cable and then pull out button flat cable.

7. Take out 2 screws of main board.

8. Take out the main board from middle casing.

9. Use forceps to pull out display screen flat cable and then take out main board.

10. Use electric screwdriver or "+"-shaped screwdriver to take out 6 screws of cover board, take out display screen cover board and then the display screen components.
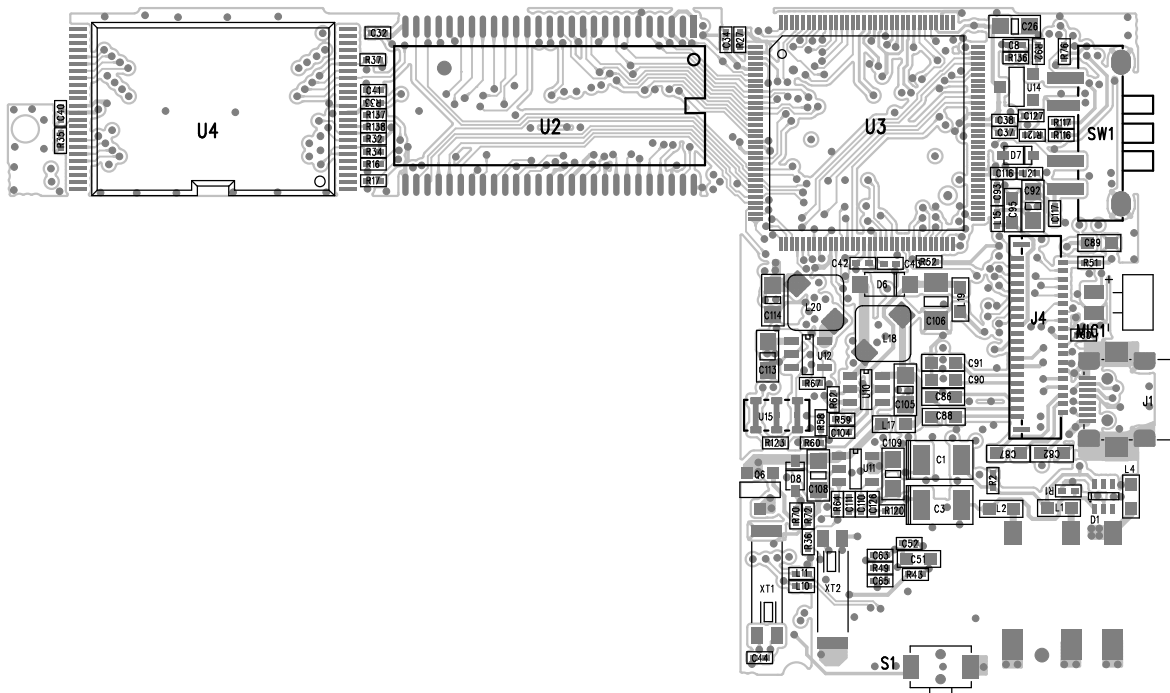
4.2 Assembly process of the player

Assembly process of the player is similar with the disassembly process, and only the sequence is reverse.
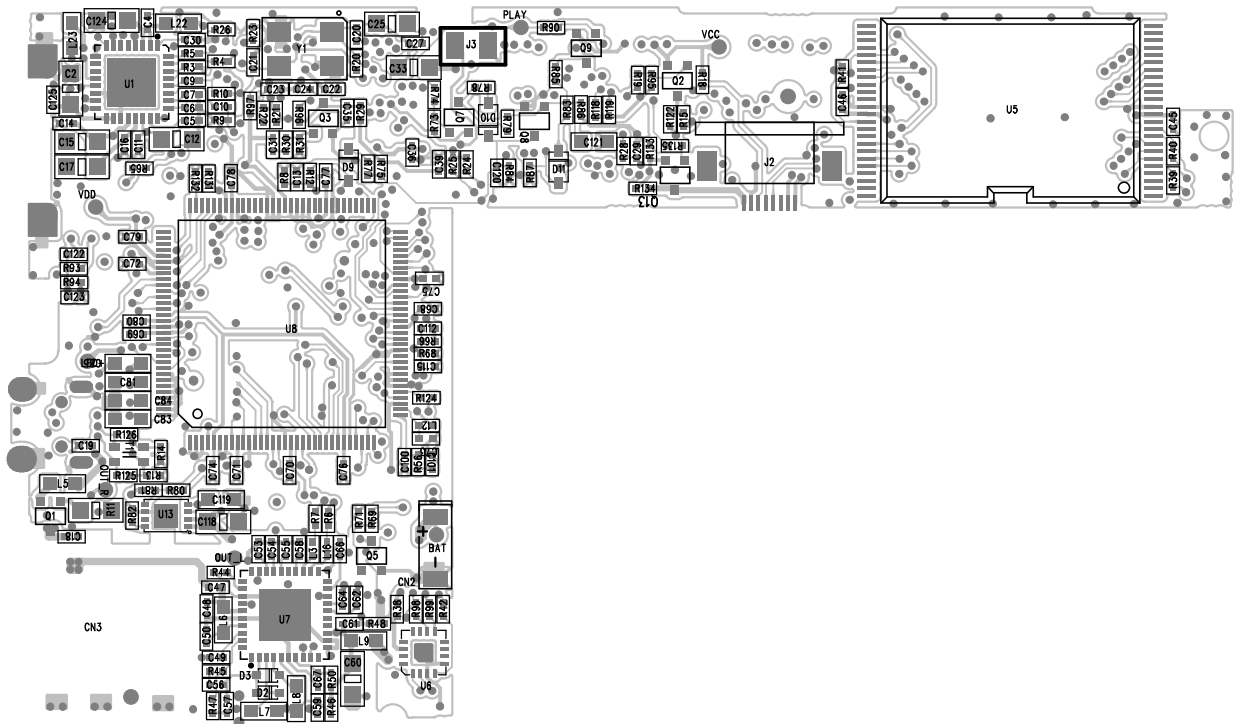
Chapter Eight V5

PCB board & Circuit diagram

Section One PCB board

8.1.1 Surface layer of Main Board

8.1.2 Bottom layer of Main Board

Section Two Circuit diagram

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RK2608
128-Pin TQFP

SDRAM
U2 HY57V641620ETP

NAND Flash
U4 NAND FLASH

NAND Flash
U5 NAND FLASH

U3

Y1 24MHz

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