



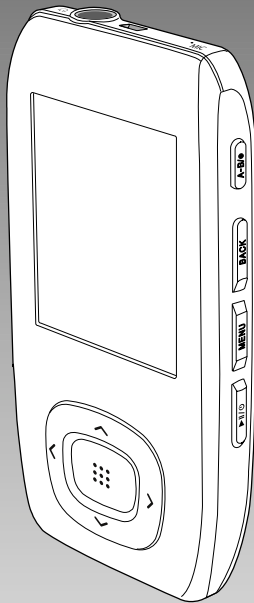
# PORTABLE DIGITAL AUDIO PLAYER

## Basic Model : YP-T9

\* Application : YP-T9BZB/ZS[1GB]  
YP-T9BQB/QS[2GB]  
YP-T9BAB/AS[4GB]

# *SERVICE Manual*

## PORTABLE DIGITAL AUDIO PLAYER



Model : YP-T9

## Features

- High-tech Multimedia Player!
- Expansion & Compatibility!
- Easy File Browser!
- Longer Play Time and Shorter Downloading!
- 3D Surround Sound!  
High-Definition Quality!
- Ergonomic Design!



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# 1. Precautions

Follow these safety, servicing and ESD precautions to prevent damage and protect against potential hazards such as electrical shock and X-rays.

## 1-1 Safety Precautions

1. Be sure that all of the built-in protective devices are replaced.
2. When reinstalling the chassis and its assemblies, be sure to restore all protective devices, including control knobs and compartment covers.
3. Make sure that there are no cabinet openings through which people--particularly children--might insert fingers and contact dangerous voltages. Such openings include the spacing between the picture tube and the cabinet mask, excessively wide cabinet ventilation slots, and improperly fitted back covers.
4. Design Alteration Warning:  
Never alter or add to the mechanical or electrical design of the unit. Example: Do not add auxiliary audio or video connectors. Such alterations might create a safety hazard. Also, any design changes or additions will void the manufacturer's warranty.
5. Leakage Current Hot Check (Figure 1-1):  
Warning: Do not use an isolation transformer during this test. Use a leakage-current tester or a metering system that complies with American National Standards Institute (ANSI C101.1, *Leakage Current for Appliances*), and Underwriters Laboratories (*UL Publication UL1410, 59.7*).

With the unit completely reassembled, plug the AC line cord directly into a 120V AC outlet. With the unit's AC switch first in the ON position and then OFF, measure the current between a known earth ground (metal water pipe, etc.) and all exposed metal parts. Examples: Handle brackets, metal cabinets, screwheads and control shafts. The current measured should not exceed 0.5 milliamp. Reverse the power-plug prongs in the AC outlet and repeat.

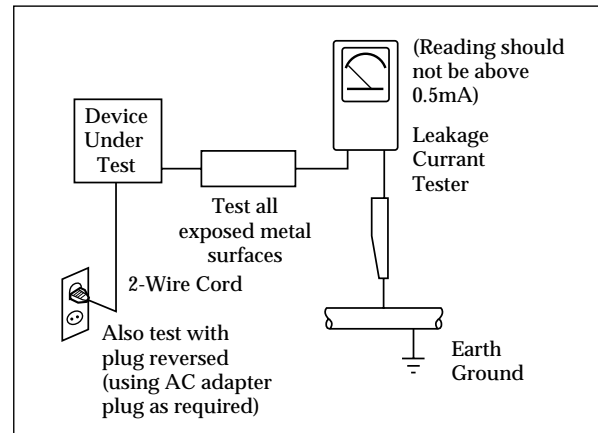


Fig. 1-1 AC Leakage Test

6. Insulation Resistance Cold Check:  
(1) With the unit's AC plug disconnected from the AC source, connect an electrical jumper across the two AC prongs. (2) Set the power switch to ON. (3) Measure the resistance between the shorted AC plug and any exposed metallic parts. Example: Screwheads, antenna, control shafts or handle brackets.

If any of the exposed metallic parts has a return path to the chassis, the measured resistance should be between 1 and 5.2 megohms. If there is no return path, the measured resistance should be "infinite." If the resistance is outside these limits, a shock hazard might exist. See Figure 1-2

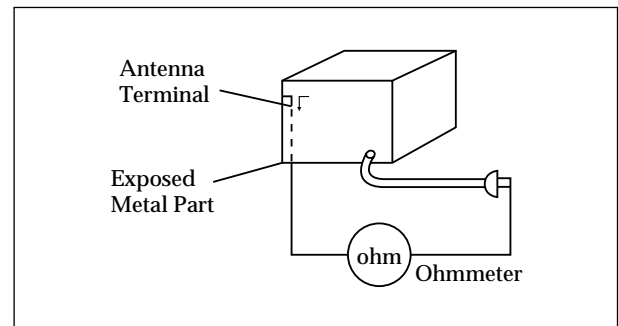


Fig. 1-2 Insulation Resistance Test

## 1-1 Safety Precautions (Continued)

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7. Components, parts and wiring that appear to have overheated or that are otherwise damaged should be replaced with parts that meet the original specifications. Always determine the cause of damage or overheating, and correct any potential hazards
8. Observe the original lead dress, especially near the following areas: Antenna wiring, sharp edges, and especially the AC and high voltage power supplies. Always inspect for pinched, out-of-place, or frayed wiring. Do not change the spacing between components and the printed circuit board. Check the AC power cord for damage. Make sure that no wires or components touch thermally hot parts.
9. **Product Safety Notice:**  
Some electrical and mechanical parts have special safety-related characteristics which might not be obvious from visual inspection. These safety features and the protection they give might be lost if the replacement component differs from the original--even if the replacement is rated for higher voltage, wattage, etc.
- 10 Components that are critical for safety are indicated in the circuit diagram by shading, ⚠ or ⚡ . Use replacement components that have the same ratings, especially for flame resistance and dielectric strength specifications. A replacement part that does not have the same safety characteristics as the original might create shock, fire or other hazards.

## 1-2 Servicing Precautions

---

**Warning1:** First read the "Safety Precautions" section of this manual. If some unforeseen circumstance creates a conflict between the servicing and safety precautions, always follow the safety precautions.

1. Servicing precautions are printed on the cabinet. Follow them.
2. Always unplug the unit's AC power cord from the AC power source before attempting to: (a) Remove or reinstall any component or assembly, (b) Disconnect an electrical plug or connector, (c) Connect a test component in parallel with an electrolytic capacitor.
3. Some components are raised above the printed circuit board for safety. An insulation tube or tape is sometimes used. The internal wiring may be clamped to prevent contact with thermally hot components. Reinstall all such elements to their original position.
4. After servicing, always check that the screws, components and wiring have been correctly reinstalled. Make sure that the portion around the serviced part has not been damaged.
5. Check the insulation between the blades of the AC plug and accessible conductive parts (examples: metal panels, input terminals and earphone jacks).
6. **Insulation Checking Procedure:** Disconnect the power cord from the AC source and turn the power switch ON. Connect an insulation resistance meter (500V) to the blades of the AC plug.  
  
The insulation resistance between each blade of the AC plug and accessible conductive parts (see above) should be greater than 1 megohm.
7. Never defeat any of the B+ voltage interlocks. Do not apply AC power to the unit (or any of its assemblies) unless all solid-state heat sinks are correctly installed.
8. Always connect a test instrument's ground lead to the instrument chassis ground *before* connecting the positive lead; always remove the instrument's ground lead last.

## 1-3 Precautions for Electrostatically Sensitive Devices (ESDs)

1. Some semiconductor ("solid state") devices are easily damaged by static electricity. Such components are called Electrostatically Sensitive Devices (ESDs). Examples include integrated circuits and some field-effect transistors. The following techniques will reduce the occurrence of component damage caused by static electricity.
2. Immediately before handling any semiconductor components or assemblies, drain the electrostatic charge from your body by touching a known earth ground. Alternatively, wear a discharging wrist-strap device. (Be sure to remove it prior to applying power--this is an electric shock precaution.)
3. After removing an ESD-equipped assembly, place it on a conductive surface such as aluminum foil to prevent accumulation of electrostatic charge.
4. Do not use freon-propelled chemicals. These can generate electrical charges that damage ESDs.
5. Use only a grounded-tip soldering iron when soldering or unsoldering ESDs.
6. Use only an anti-static solder removal device. Many solder removal devices are not rated as "anti-static" (these can accumulate sufficient electrical charge to damage ESDs).
7. Do not remove a replacement ESD from its protective package until you are ready to install it. Most replacement ESDs are packaged with leads that are electrically shorted together by conductive foam, aluminum foil or other conductive materials.
8. Immediately before removing the protective material from the leads of a replacement ESD, touch the protective material to the chassis or circuit assembly into which the device will be installed.
9. Minimize body motions when handling unpackaged replacement ESDs. Motions such as brushing clothes together, or lifting a foot from a carpeted floor can generate enough static electricity to damage an ESD.

## 1-4 Special Precautions and Warning Labels for Laser Products

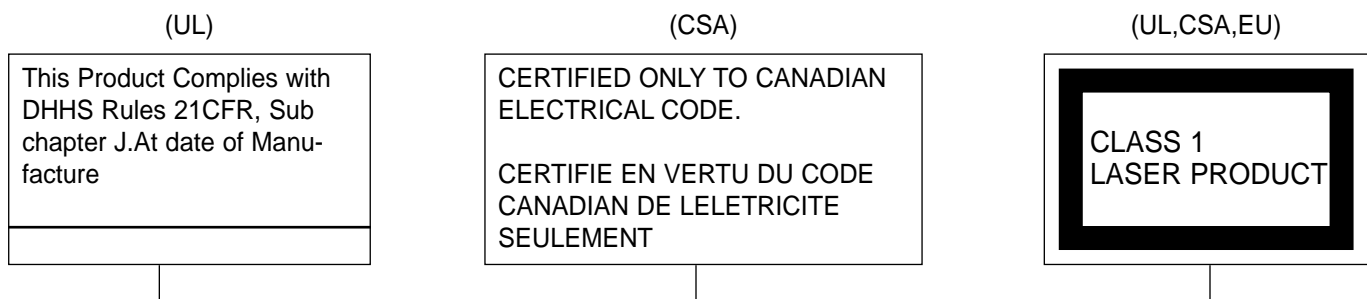


Fig. 1-3 Warning Labels (Location: Enclosure Block)

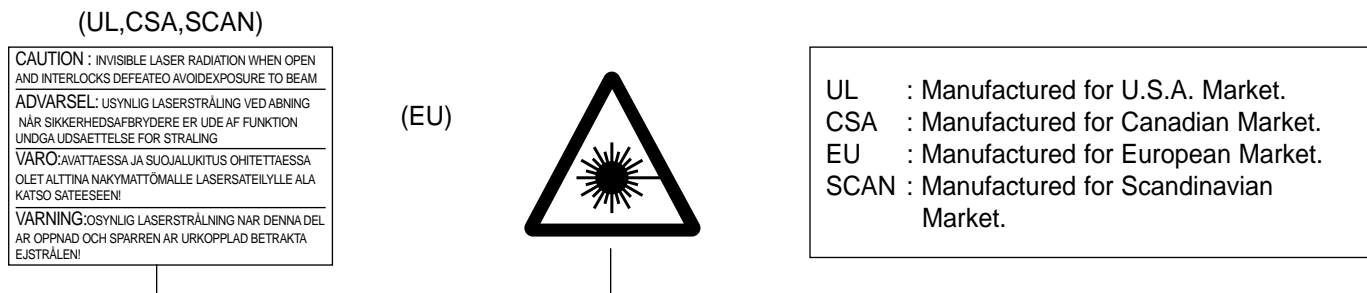


Fig. 1-4 Warning Labels (Location: Disc Clamper, Inner Side of Unit Door or Nearby Unit Chassis )

## 1-4 Special Precautions and Warning Labels for Laser Products (Continued)

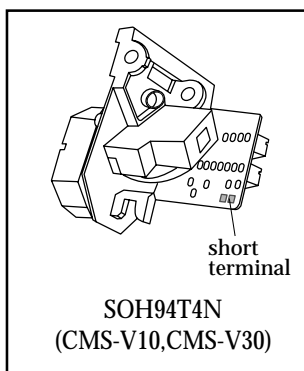
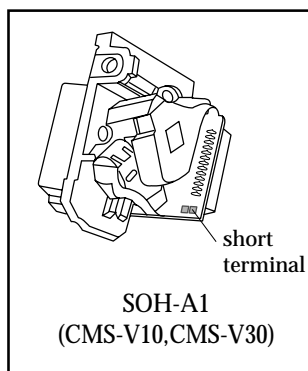
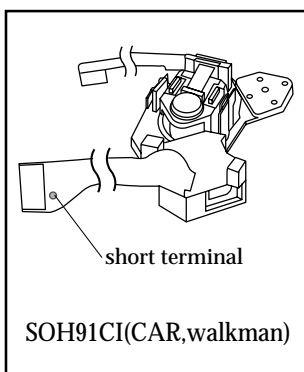
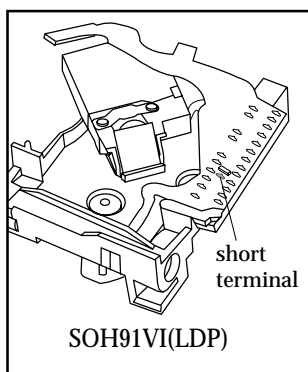
### 1-4-1 Warnings

1. When servicing, do not approach the LASER exit with the eye too closely. In case it is necessary to confirm LASER beam emission, be sure to observe from a distance of more than 30 cm from the surface of the objective lens on the optical pick-up block.
2. Do not attempt to handle the objective lens when the DISC is not on the tray.

### 1-4-2 Laser Diode Specifications

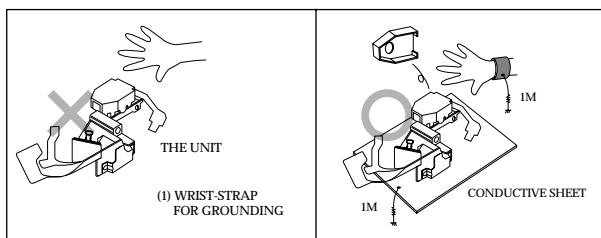
Material: GaAs+ GaAlAs  
 Wavelength: 760-800 nm  
 Emission Duration: Continuous

Laser Output: 0.2 mw (measured at a 1.6 mm distance from the objective lens surface on the optical pick-up block.)



### 1-4-3 Handling the Optical Pick-up

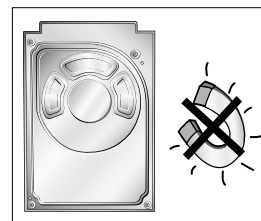
1. Static electricity from clothing or the body may cause electrostatic breakdown of the laser diode in the Optical Pickup. Follow this procedure:
  2. Place a conductive sheet on the work bench (i.e., the black sheet used for wrapping repair parts.) Note: The surface of the work bench should be covered by a copper ground plane, which is grounded.
  3. The repair technician must wear a wrist strap which is grounded to the copper sheet.
  4. To remove the Optical Pickup block: Place the set on the conductive sheet, and momentarily touch the conductive sheet with both hands. (While working, do not allow any electrostatic sources--such as clothes--to touch the unit.)
  5. Ground the "Short Terminal" (located on the PCB, inside the Pickup Assembly) before replacing the Pickup. This terminal should be shorted whenever the Pickup Assembly is lifted or moved.
  6. After replacing the Pickup, reopen the Short
- See diagrams below:



## 1-5 Special Precautions for HDD

### \* HDD Data Maintenance Step

1. Since the data on the HDD is weak to mechanical shock, place the HDD in a safe location that is free from mechanical shock once it is removed from the main unit.
2. In order to safe keep the data on the HDD, back up the data before the repair or make sure not to place the HDD near any electrical appliance that generates a strong magnetic field.



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## 2. Product Descriptions

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### 1. Product Feature

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	Product Feature
High-tech Multimedia Player!	<ul style="list-style-type: none"><li>▪ The player is a top-notch multimedia player featuring photo/text view, movie playback, FM radio, voice recording and Bluetooth.</li></ul>
Expansion & Compatibility!	<ul style="list-style-type: none"><li>▪ Supports various file formats including MP3, WMA and Ogg.</li></ul>
Easy File Browser!	<ul style="list-style-type: none"><li>▪ With user-friendly file browser, it allows you to navigate through the folders without exiting your music experience.</li></ul>
Longer Play Time and Shorter Downloading!	<ul style="list-style-type: none"><li>▪ A fully charged player can play up to 30 hours of music, or 6 hours of movie.</li><li>▪ The player supports USB 2.0 capability, much faster than USB 1.1 to enable faster communication with the PC.</li></ul>
3D Surround Sound! High-Definition Quality!	<ul style="list-style-type: none"><li>▪ The player has built-in DNSe (Digital Natural Sound engine), Samsung's unique sound technology for richer sound.</li></ul>
Ergonomic Design!	<ul style="list-style-type: none"><li>▪ Experience the good sense of grip and easy operation.</li></ul>

## 2. Specifications


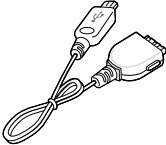
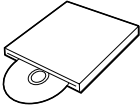
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Model Name		YP-T9
Power		3.7V (Li-Polymer Rechargeable)
Built-in Battery Power		740 mAh
File	Compatibility	AUDIO: MPEG1/2/2.5 Layer3(8kbps~320kbps, 8kHz~48kHz), WMA(5kbps~320kbps,8kHz~48kHz) Video: SVI (Video: MPEG4, Audio: MP3 (44.1kHz, 128kbps), Resolution: 208X176, Frame Rate: 15fps) Image: JPG (Progressive, Sequential Scanning, File Size: less than 3MB)
Supported Number of folders and Files		Folder: Max. 500, File: Max. 5000(Include folder)
Earphone Output		20mW (16Ω)
Output Frequency Range		20Hz~20KHz
Noise Ratio		85 dB with 20kHz LPF(based on 1KHz 0 dB)
Play Time		Maximum of 30 hours for music playback (based on: MP3 128kbps, Volume: 20, Normal Mode), Maximum of 6 hours for video playback
Temperature Range for Operation		-5~35 °C (23~95°F)
Case		Plastics
Weight		1.73 oz
Dimension (WxHxD)		1.67 X 3.27 X 0.43 inches

FM	FM Frequency	87.5~108.0MHz	FM T.H.D	1%
Radio	FM Signal to Noise Ratio	55dB	FM Useable Sensitivity	10dBμ

- The contents of this Manual are subject to change without prior notice for further improvement.

3. Accessories

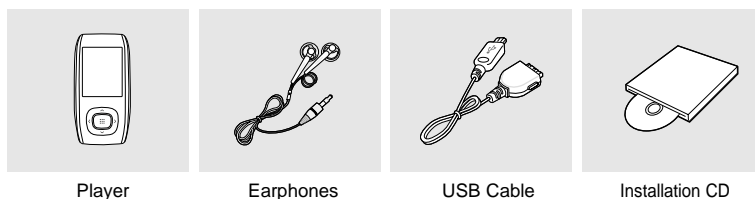
Accessories	Name	Code No.
	Earphones	AH59-01748A
	USB Cable	AH39-00899A
	Installation CD	AH80-00137A

## 3. Product Functions

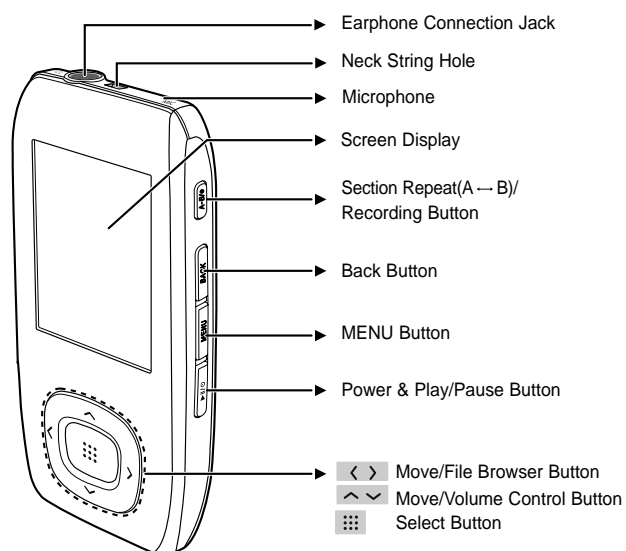
### 1. Basic Functions

## Components

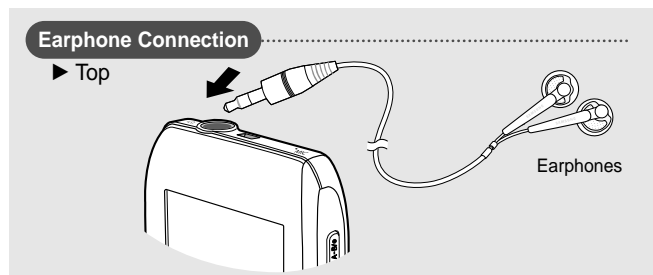
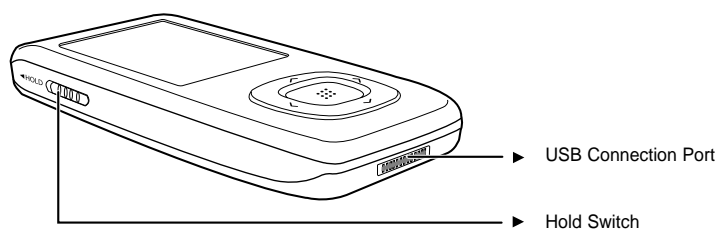
#### Checking the Accessories



#### Front, Right Side and Top

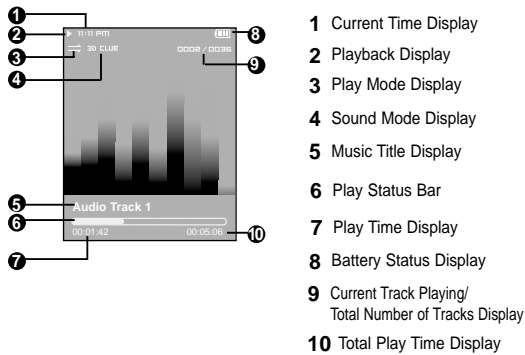


#### Bottom and Left Side

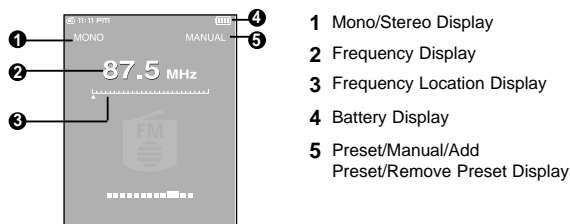


## Screen Display Information

### Music



### FM Radio



### Basic Information

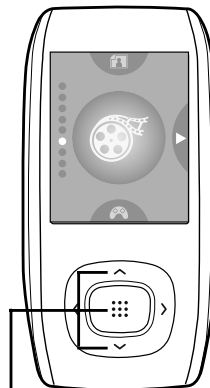
## Button Functions

Buttons	Functions and Use
	<ul style="list-style-type: none"> <li>Press and hold for power on/off.</li> <li>Press for play/pause.</li> </ul>
	<ul style="list-style-type: none"> <li>Press to display the menu screen.</li> </ul>
	<ul style="list-style-type: none"> <li>Press and hold to move to the main menu.</li> <li>Press to return to the previous stage.</li> </ul>
	<ul style="list-style-type: none"> <li>Press and hold to start recording.</li> <li>Press to set section repetition, stop recording and add to/delete from the playlist.</li> </ul>
	<ul style="list-style-type: none"> <li>Press to move to the selected menu/confirm and save your selection.</li> </ul>
	<ul style="list-style-type: none"> <li>Press and hold to quickly scan tracks.</li> <li>Press to move to the previous track or play the current track from the beginning.</li> </ul>
	<ul style="list-style-type: none"> <li>Press and hold to quickly scan tracks.</li> <li>Press to move to next track.</li> </ul>
	<ul style="list-style-type: none"> <li>Press to increase the volume or move to an upper item/menu.</li> </ul>
	<ul style="list-style-type: none"> <li>Press to reduce the volume or move to a lower item/menu.</li> </ul>
	<ul style="list-style-type: none"> <li>Push in the direction of the arrow to lock the button functions.</li> </ul>

## 2. New Functions

### Video

**Before you start!** Connect the earphones, then turn on the player, and check the battery.



**1** Press the [ ^ v ] button to select <Video> and then press the [ :::: ] button.

**2** Press the [ ^ v ] button to select the desired video clip and then press the [ :::: ] button.

- The selected video file starts to play.

**To stop playing the video file**

Press the [ ►||/◁ ] button in Video mode.

- Each time you press the [ ►||/◁ ] button, the player stops playing the video file or resumes playback.

**1,2**

**NOTE**

- When transferring a video file to the player using <Media Studio>, it is automatically converted into SVI format before transfer. The file size is automatically adjusted, too.
- Press and hold the [BACK] button to move to the main menu.

### Video Information Display

Press the [ :::: ] button in Video mode.

- Information on the current video appears. Press the [ :::: ] button again to make the information disappear.



### To move to a certain position of the current video file

- In a horizontal view, press and hold the [ < > ] button.
  - This enables you to scroll through the current video file.
- Release the button when you have moved to the desired position.
  - The video starts playing from the position.

## Video (Continued)

### To play the previous/next video file



Press the [ < ] button within 5 seconds after the current video started playing.

- This will return to the previous video.

Press the [ > ] button.

- This will move to the next video.

### To set a bookmark

Once you bookmark a specific scene that you want to see again, you can enjoy it at any time you want.



Press the [A ↔ B/●] button at the desired scene.

- A bookmark is created at the currently played/stopped point.

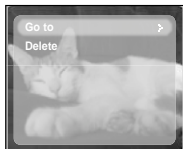


NOTE

- You can set a maximum of 20 bookmarks.

## Using Video menu

### To Move to the bookmark



1 Press the [MENU] button in Video mode.

- The Bookmark menu appears.

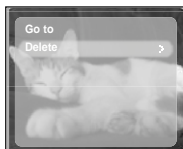
2 Press the [:::] button.

3 Press the [ ^ v ] button to select <Go to> and press the [:::] button.

4 Press [ ^ v ] to select the desired bookmark and press the [:::] button.

- Playback will start from the selected bookmark.

### To Remove to the bookmark



1 Press the [MENU] button in Video mode.

- The Bookmark menu appears.

2 Press the [:::] button.

3 Press the [ ^ v ] button to select <Delete> and press the [:::] button.

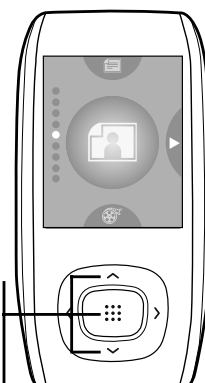
4 Press [ ^ v ] to select the removed bookmark and press the [:::] button.

- It will remove the selected bookmark.

## Photo Viewing

### Before you start!

Connect the earphones, then turn on the player, and check the battery.



1,2

1 Press the [ ^ v ] button to select <Photo> and then press the [:::] button.

- The photo preview window appears.

2 Press the [ ^ v ] button to select the desired photo and then press the [:::] button.

- The selected photo is displayed.

### To move to the previous/next photo

Press the [ < > ] button while viewing a photo or press the [ ^ v ] button in preview mode to display the previous or next photo.



Photo Viewing mode



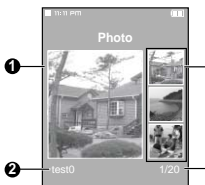
Preview mode



NOTE

- When transferring a photo file to the player using <Media Studio>, it is automatically converted into JPG format before transfer. The file size is automatically adjusted, too.
- You can also use the <File Browser> to search for a photo file. ► Page 14
- You can keep listening to music even if you select <Photo> to view a photo.
- Press and hold the [BACK] button to move to the main menu.

### Photo Display Window



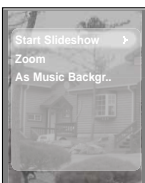
1 Preview Pane

2 File Name

3 Thumbnails

4 The current file number/total number of photos

### Slideshow Viewing



1 Press the [MENU] while viewing a photo

2 Press the [ ^ v ] button to select <Start Slideshow> and then press the [:::] button.

- The slideshow will start.

### To stop the slideshow



Press the [:::] button in Slideshow mode.

- This will stop the slideshow.

## Using Photo menu

### Photo Enlarging



- 1 Press the [MENU] while viewing a photo
- 2 Press the [ ^ v ] button to select <Zoom> and then press the [ ::: ] button.
  - The Zoom Setting menu appears.
- 3 Press the [ ^ v ] button to select the desired scale factor and then press the [ ::: ] button.
  - You can select either <100%> <200%> or <400%>.
- 4 Press the [ ^ v < > ] to move to the portion of the photo to magnify.
- 5 To cancel the magnification, select <100%> from the Zoom options and then press the [ ::: ] button.
  - This returns to the original size.



## NOTE

- Press the [ ::: ] button in the Photo Viewing mode to display the Zoom Setting menu.

### To set a photo as a music background image



- 1 Select a photo file to set as a background image.
- 2 Press the [MENU] while viewing the photo.
- 3 Press the [ ^ v ] button to select <As Music Background> and then press the [ ::: ] button.
  - The Music Background Image Setting menu appears.
- 4 Press the [ < > ] button to select <Yes> and then press the [ ::: ] button.
  - The selected photo file is set to a background image for music.



## NOTE

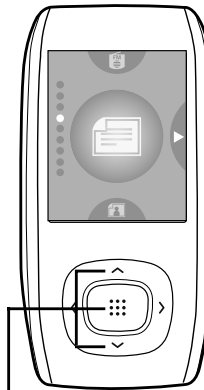
- Press the [A → B/•] button while viewing a photo to display the Music Background Setting menu.

## Text Viewing

You can read a novel or see the manuscript text of a news story or soap opera while listening to music.

### Before you start!

For instructions on transferring a text file to the player, refer to page 20-21. Turn on the player, and check the battery.



1,2

- 1 Press the [ ^ v ] button to select <Text> and then press the [ ::: ] button.
- 2 Press the [ ^ v ] button to select Text and then press the [ ::: ] button.
  - You will see the text on the screen.

### To scroll the text by the line

Press the [ < > ] button.

- Once you set <Scroll By> → <Page> in Text menu, you can move to the previous / next page of the text file. ► page 47
- Once you set <Scroll By> → <Line> in Text menu, you can move to the previous / next line of the text file. ► page 47 Press and hold the [ < > ] button to move up or down faster through the file.



## NOTE

- You can also use the <File Browser> to search for a text file. ► page 14
- This product supports the TXT file format in Text mode.
- You can keep listening to music even if you select <Text>.
- Press the [ ▶II/⏸ ] button if you want to play a music while viewing text. Press the [ ▶II/⏸ ] button again to stop playing the music.
- Press and hold the [BACK] button to move to the main menu.

## Using Text menu

### To set a bookmark

Once you bookmark a specific part of text that you want to read again, you can enjoy it at any time you want.



Press the [A → B/•] button while viewing a text.

- The current text screen is set to a bookmark with the ▼ symbol displayed on the top left corner.
- The bookmark can be deleted by pressing the [A → B/•] button in the bookmarked page.



## NOTE

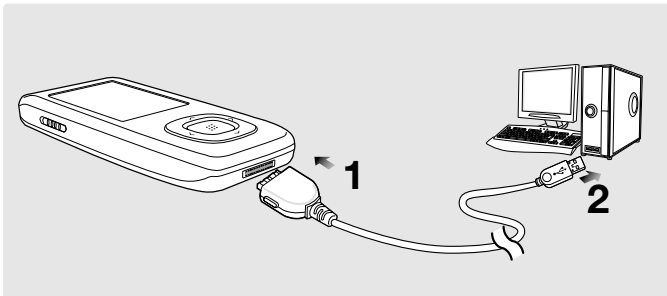
- You can set a maximum of 20 bookmarks.

### 3. PC Connection

Loading Your Desired File

#### Connecting to your PC

**Before you start!** Use the USB Cable provided when connecting the player to your PC.



**1** Connect the larger end of the USB cable to the USB Connection Port on the bottom of the player.

**2** Connect the USB cable to the USB port ( ) on your PC.

- <USB Connected> appears on the screen display of the player.



CAUTION

- If you connect the player through a USB hub, the connection may be unstable. Please connect the player to the computer directly.

#### PC Requirements

For use in conjunction with your PC, the following is required:

- Pentium 300MHz or higher
- USB Port 2.0
- Windows XP Service Pack 2 or higher
- DirectX 9.0 or higher
- 100MB of free hard disc space
- CD Rom Drive (2X or higher)
- Windows Media Player 10.0 or higher
- Resolution 1024 X 768 or higher

---

## 4. Adjustments

---

### 1. How to upgrade Firmware

---

#### Updating with the Latest Firmware when It is Assembled

1. Connect the player to your computer.



2. Copy the "SYSDATA.bin" and "MUON.rom" files into the root directory of the Removable Disk.  
[The names of the above files must be maintained for the purpose of updating.]
3. Select Safely Remove Hardware and remove the player from the USB port of the computer.
4. When you turn the player on, firmware updates are automatically performed during booting.
5. To confirm an update  
Select MENU --> SETTING --> SYSTEM INFO from the menu to view the firmware version.

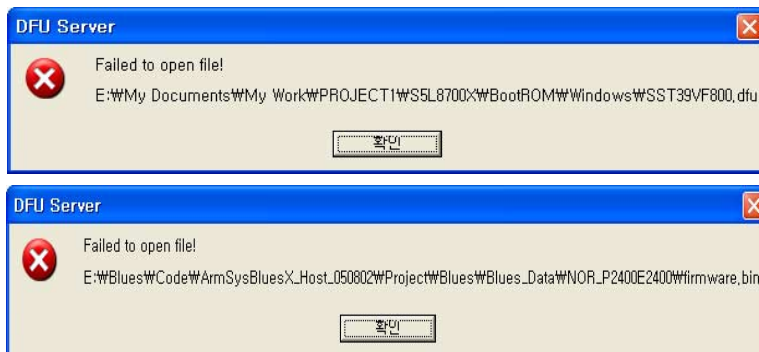
### 2. Downloading Bootloader

---

#### Downloading NOR Flash Firmware

Saving Bootloader into the SST39VF800 NOR Flash Memory within the SA58700 IC.

1. Press the PLAY button while holding the OK button down to turn the player on.  
→ Connect the player in UMS Mode using the USB interface.  
→ After that, do not press the PLAY button, but press the OK button until the Firmware update is complete.
2. Make a USB connection and you have install the device.
3. Run the Secdfu.EXE file in the DFU folder to launch the dfu program.



When you run the file, two warning messages will appear as shown above. Ignore them and press the OK button.

4. Specify a file and download it.
5. Press the Send button to download the file.

### 3. Setting MAC Address

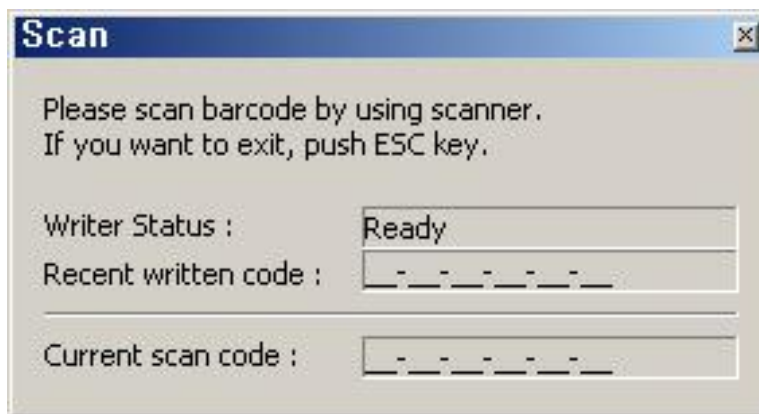
---

## Setting MAC Address

- 1. Requirements for MAC Address Setting:** Windows XP  
Serial Cable  
Serial Port [COM1]

### 2. Downloading MAC Address

- 1) Disassemble the YP-T9 case and find the MAC address sticker inside.
- 2) Connect the serial cable to the YP-T9 and connect the other end of the cable to the COM1 port of your computer.
- 3) Run BtMacAddrWriter.exe and click the "Start to scan barcode" button.  
The MAC Address Input screen appears.



- 4) Type the MAC address in the "Current scan code" field.
- 5) If an error occurs, the address of the error is saved in the ErrorMac.txt file as text.

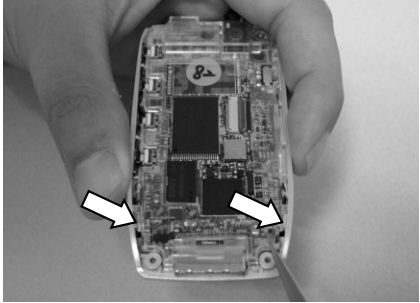
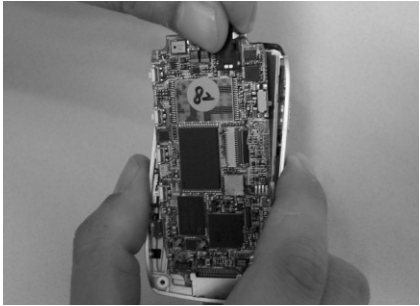
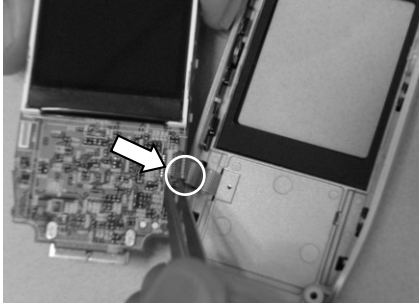

# 5. How to disassemble

\* CAUTIONS

1. To avoid damage to the product, follow the disassembly method in the Service Manual.

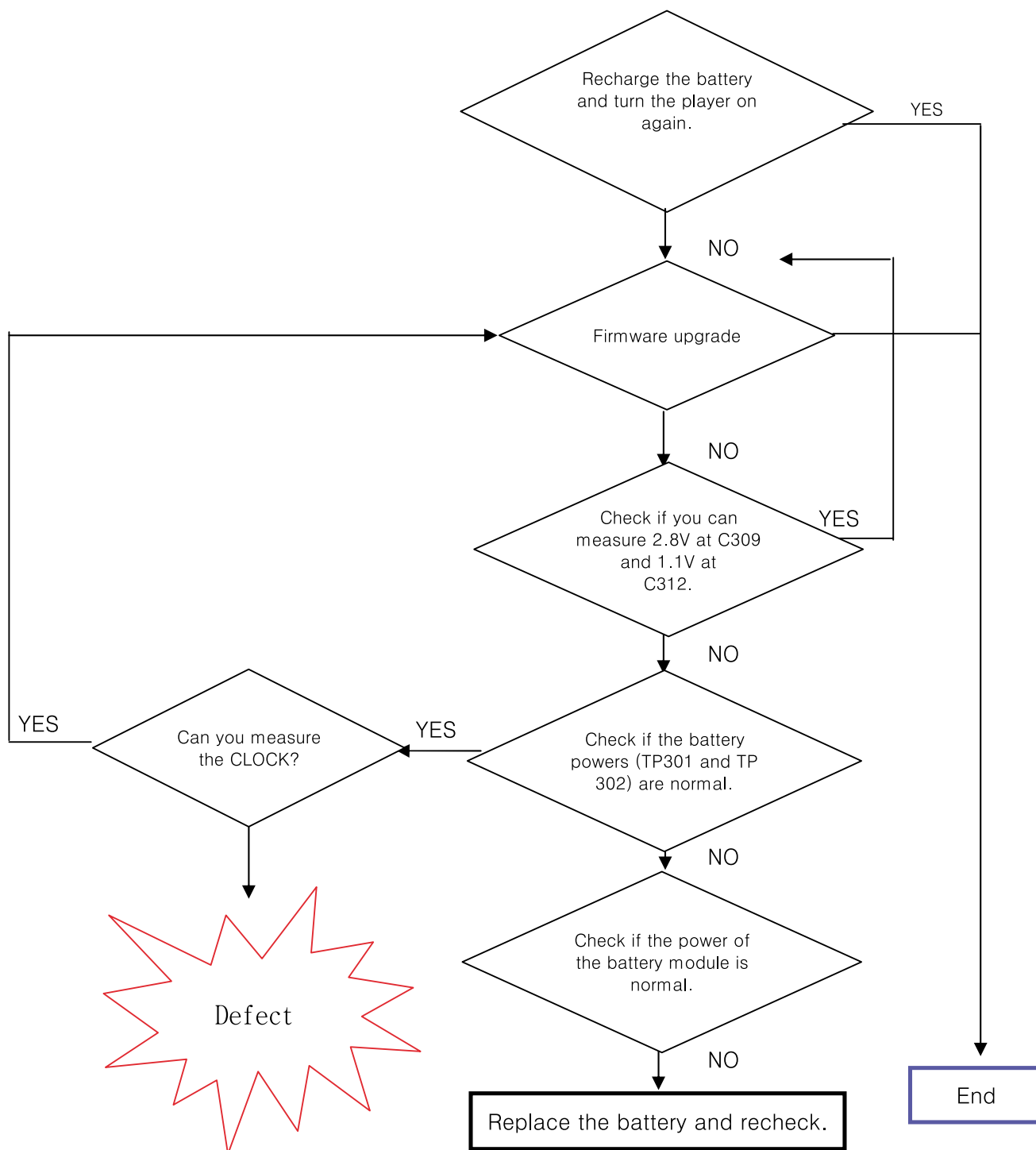
2. As some Semiconductor devices are very sensitive to static, ensure that all procedures are adhered to when handling ESD's.

Order(Description)	Picture
1. Remove the 4 Cover- Screws- B.	
2. Remove the 4 screws .	
3. Separate the Back Casing with your thumbnail as shown in the figure below.	
4. Separate the Battery Terminal with tweezers.	

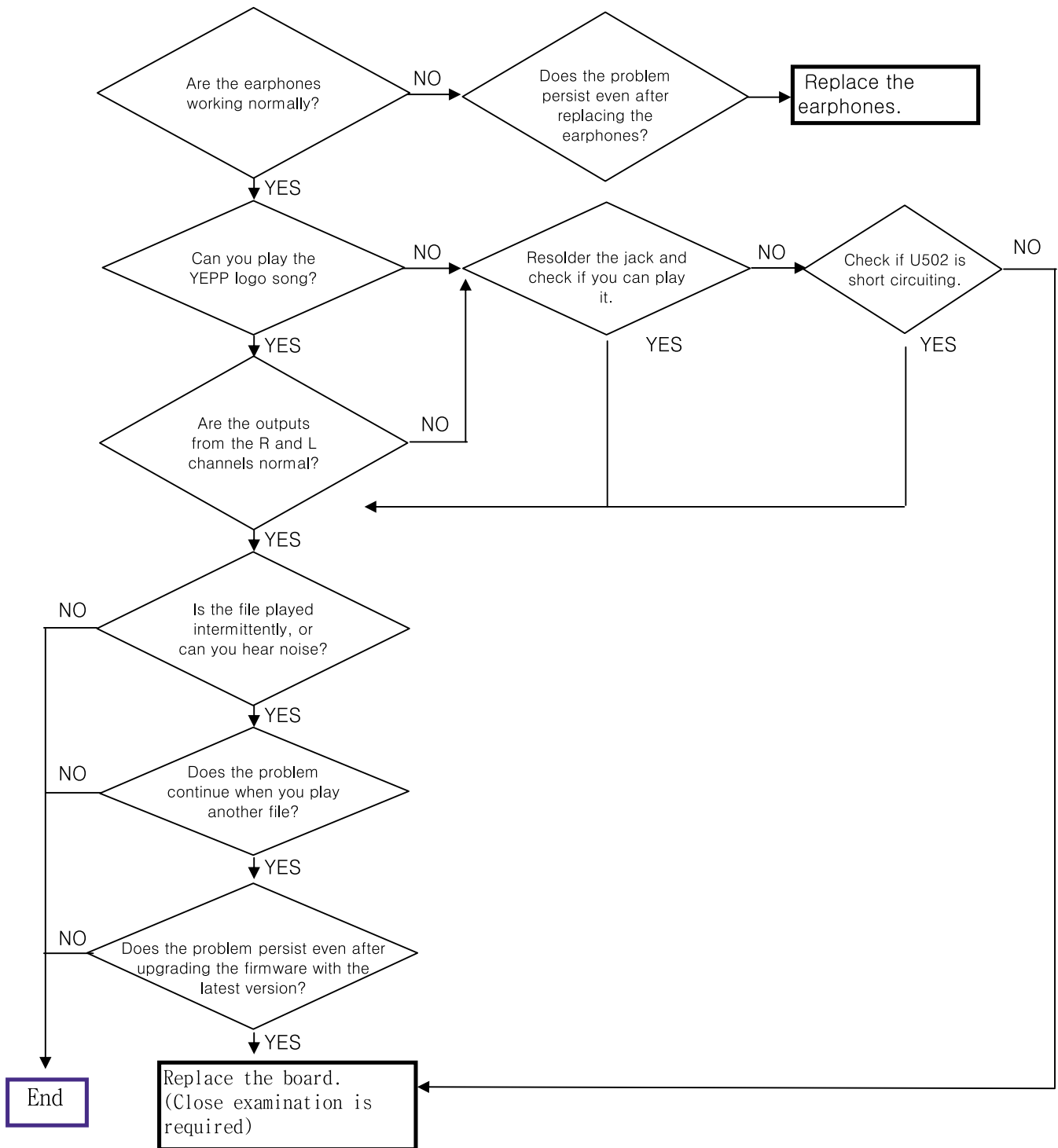
Order(Description)	Picture
<p><b>5. Separate the Battery Holder from the Central Casing by using tweezers. (Release the two catches.)</b></p>	
<p><b>6. Separate the PCB by using the projecting earphone jack.</b></p>	
<p><b>7. Separate the Front FPCB terminal by using tweezers.</b></p>	
<p><b>8. Separate the Front Casing with your thumbnail as shown in the figure below.</b></p>	

## 6. Troubleshooting

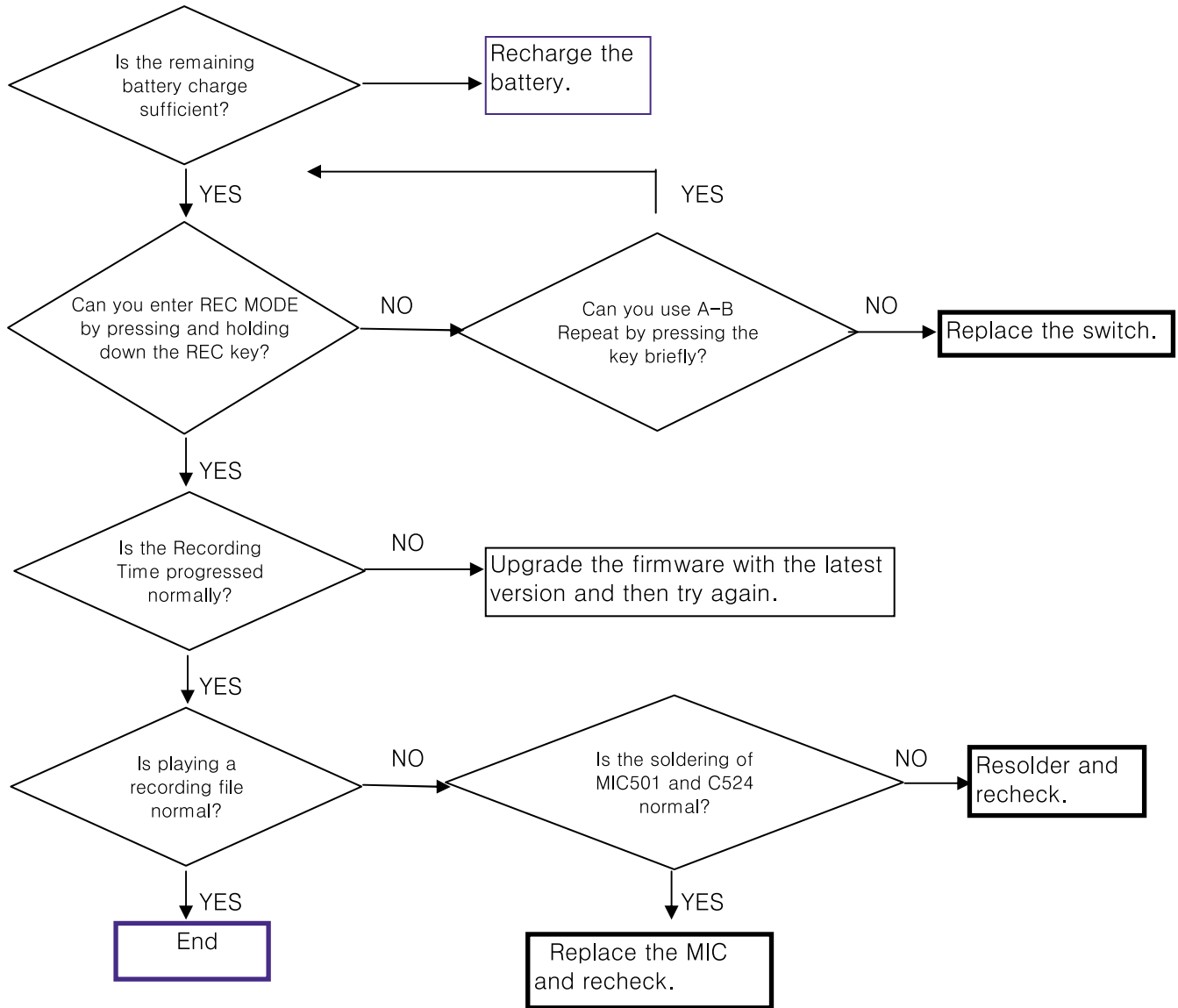
### 1. Power Failure



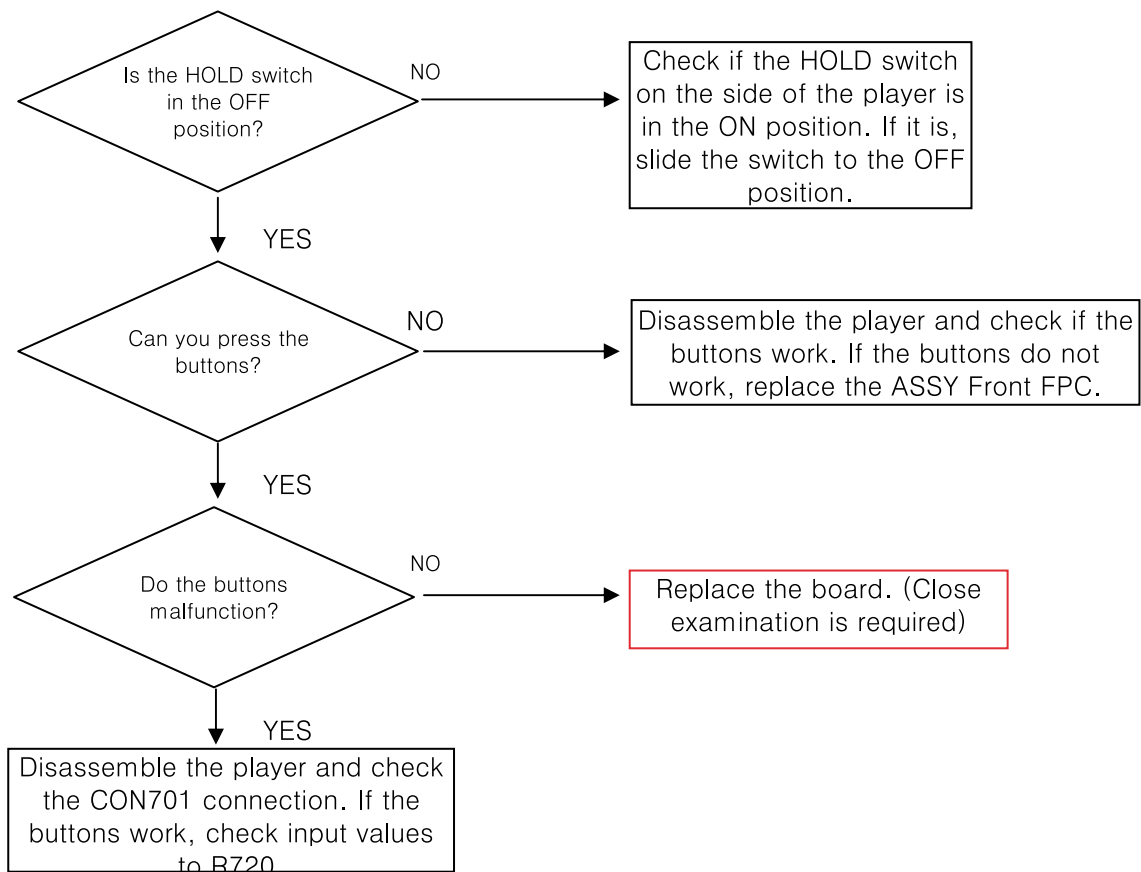
## 2. No Sound



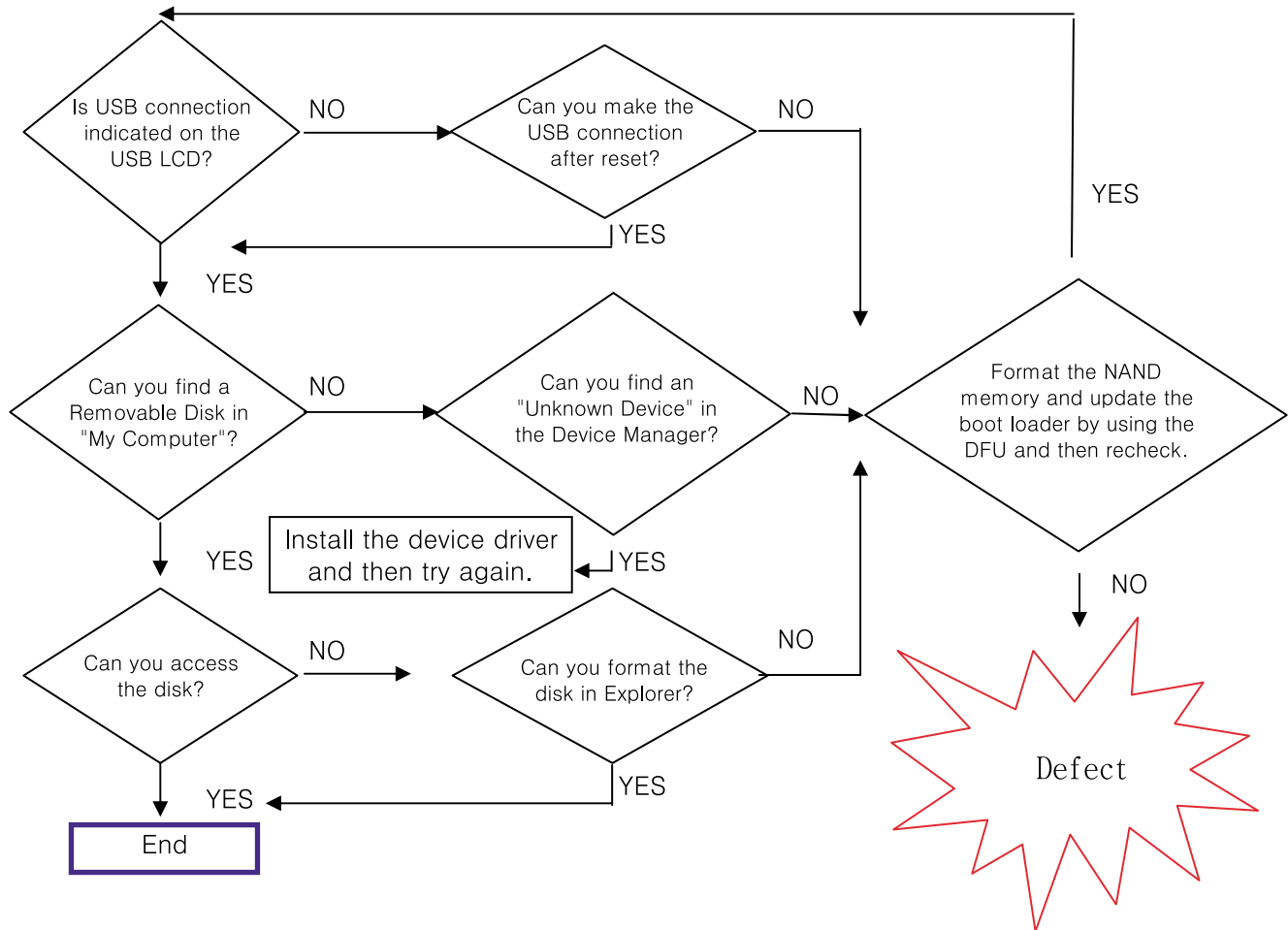
### 3. Voice Recording Failure



## 4. Button Operation Failure

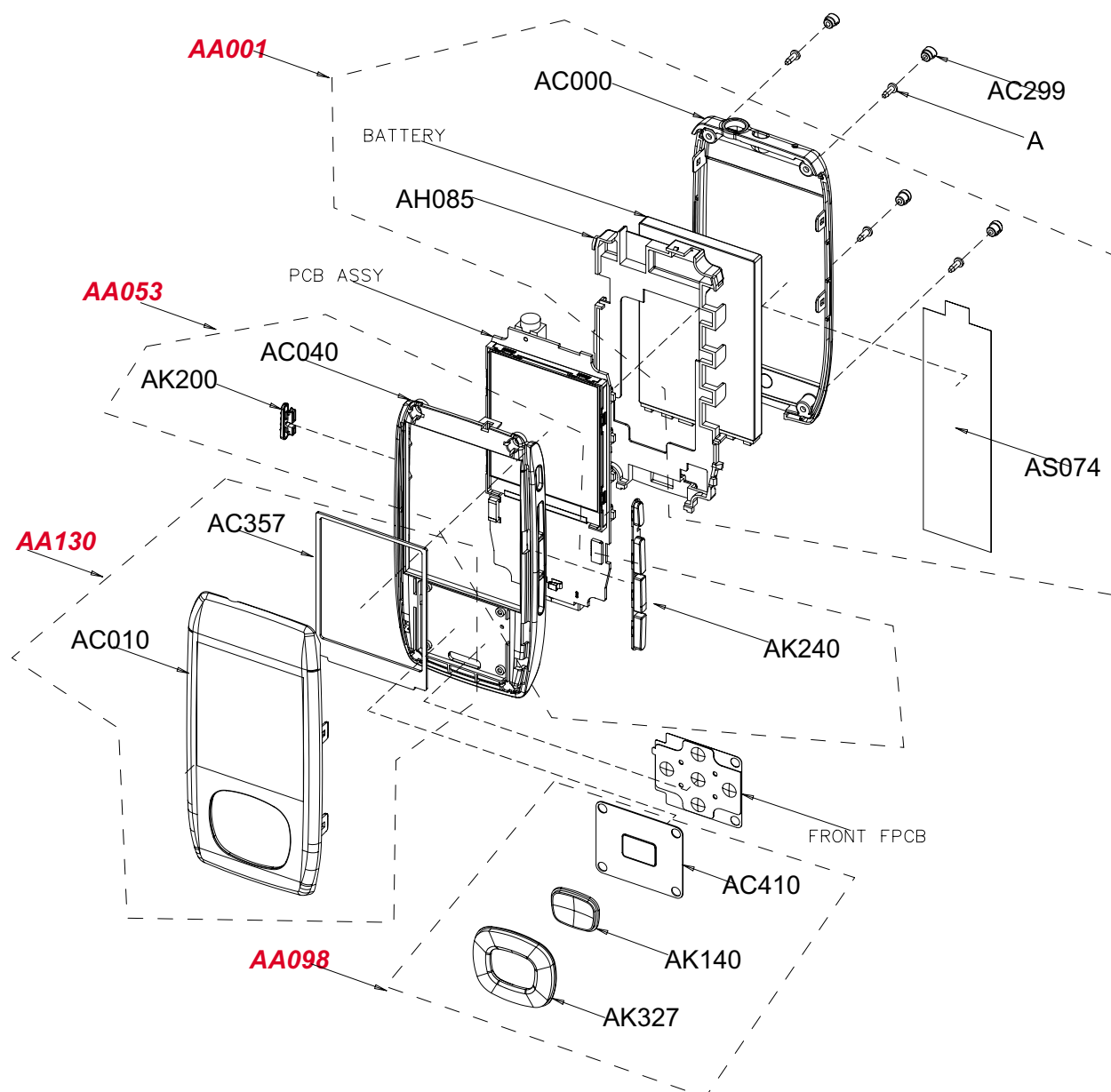


## 5. PC Connection Failure



## 7.Exploded View & Parts List

### 1. Total Exploded View



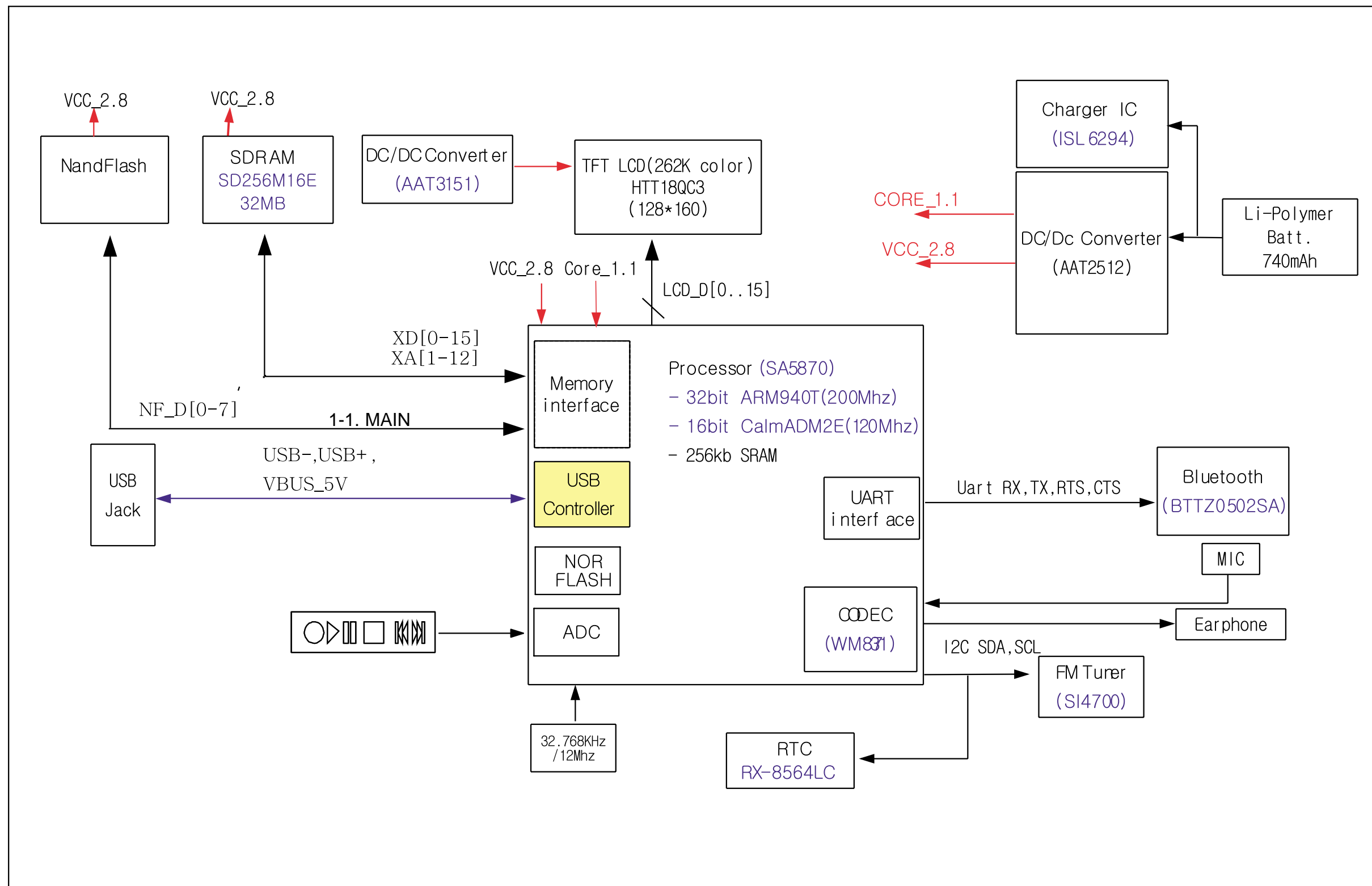
## 2. Parts List

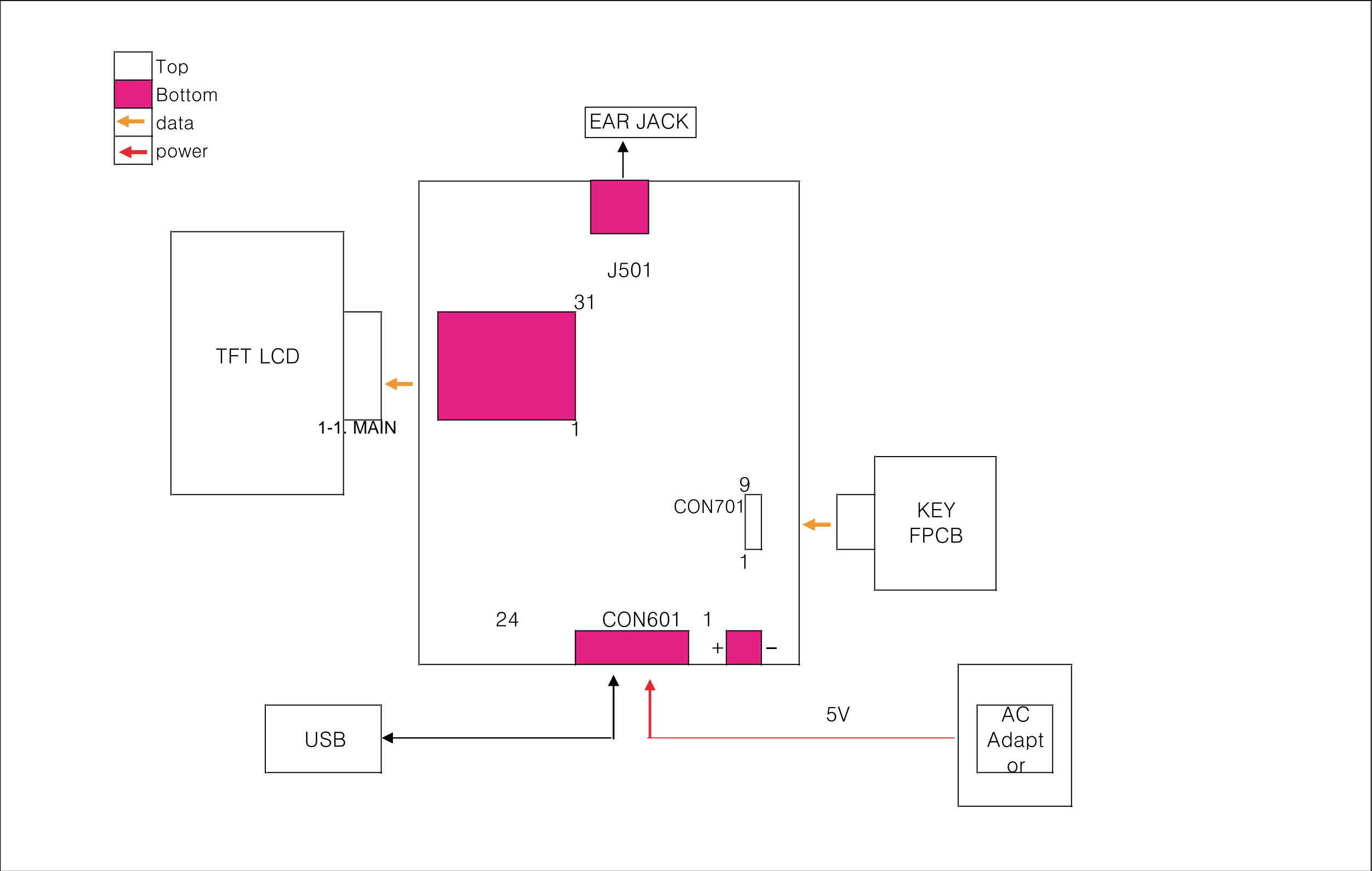
- S.N.A : Service Not Available -

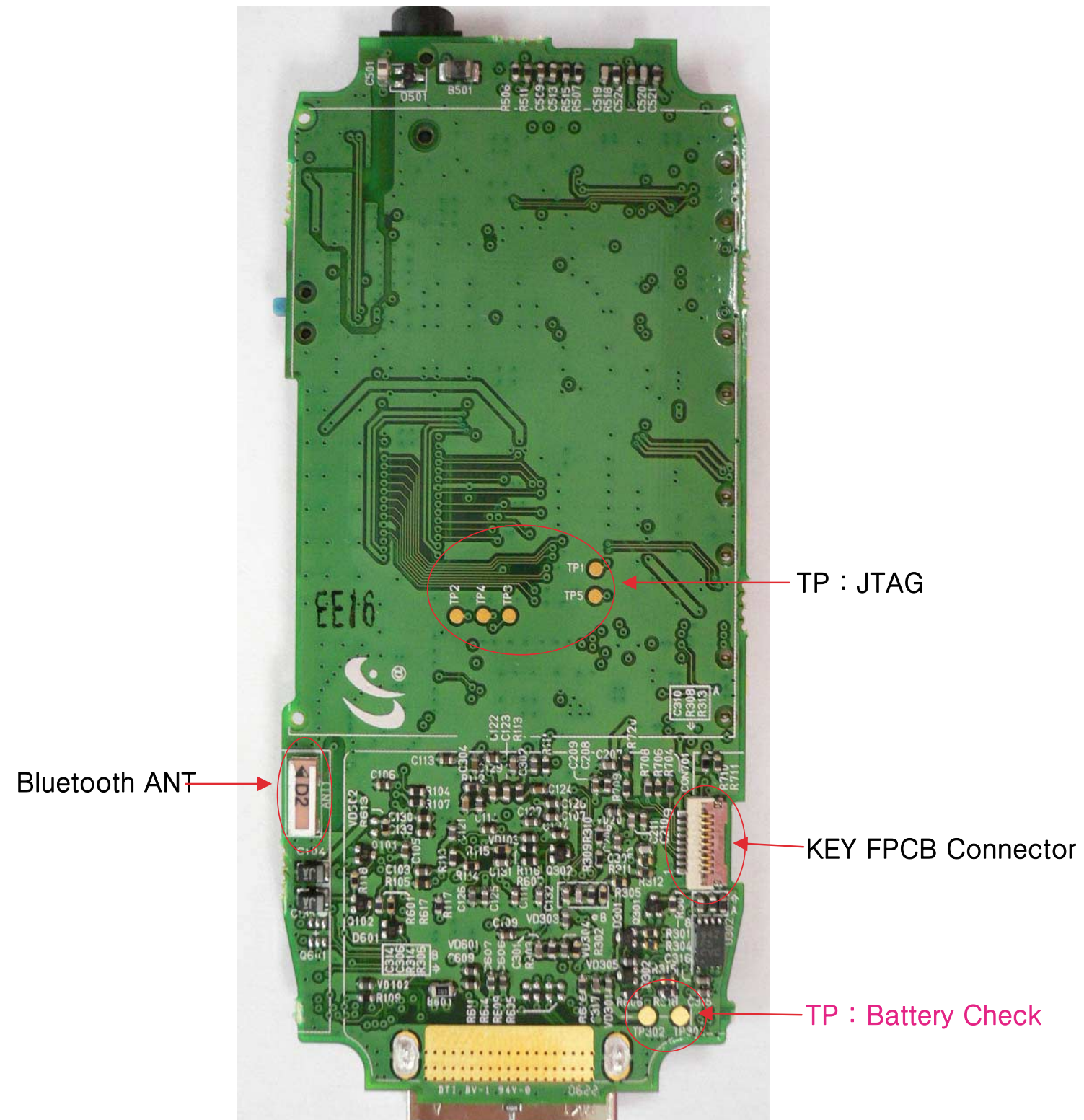
Location No	Part No.	Description	Specification	Q'TY	SNA
AA130	AH97-01676A	ASSY-CABINET-FRONT	ASSY	1	
AC010	AH64-04061A	CABINET-FRONT	PMMA	1	SNA
AC357	AH63-01207A	CUSHION-LCD	PORON	1	SNA
AA001	AH97-01775B	ASSY CABINET-BACK	ASSY	1	
AC000	AH64-04062B	CABINET-BACK	PC	1	SNA
AS074	AH63-01194D	SHEET-EMI	SHEET EMI	1	SNA
AA053	AH97-01677A	ASSY-CABINET-MIDDLE	ASSY	1	
AC040	AH64-04063A	CABINET-MIDDLE	PPA+GF50%	1	SNA
AK200	AH64-04066A	KNOB-HOLD	ABS/PC	1	
AK240	AH64-04067A	KNOB-MENU	ABS/TPU	1	
AA098	AH97-01678A	ASSY-ENTER	ASSY	1	
AK140	AH64-04064A	KNOB-ENTER	ABS	1	SNA
AK327	AH64-04065A	KNOB-SELECT	PC	1	SNA
AC410	AH63-01208A	CUSHION-SELECT	SILICON	1	SNA
AH085	AH61-02203A	HOLDER-BATTERY	PC	1	
AC299	AH63-01211A	COVER-SCREW-B	RUBBER	4	
AL004	AH68-01881A	LABEL-WINDOW	PET	1	SNA
A	6003-001166	SCREW-TAPTITE	SUS	4	

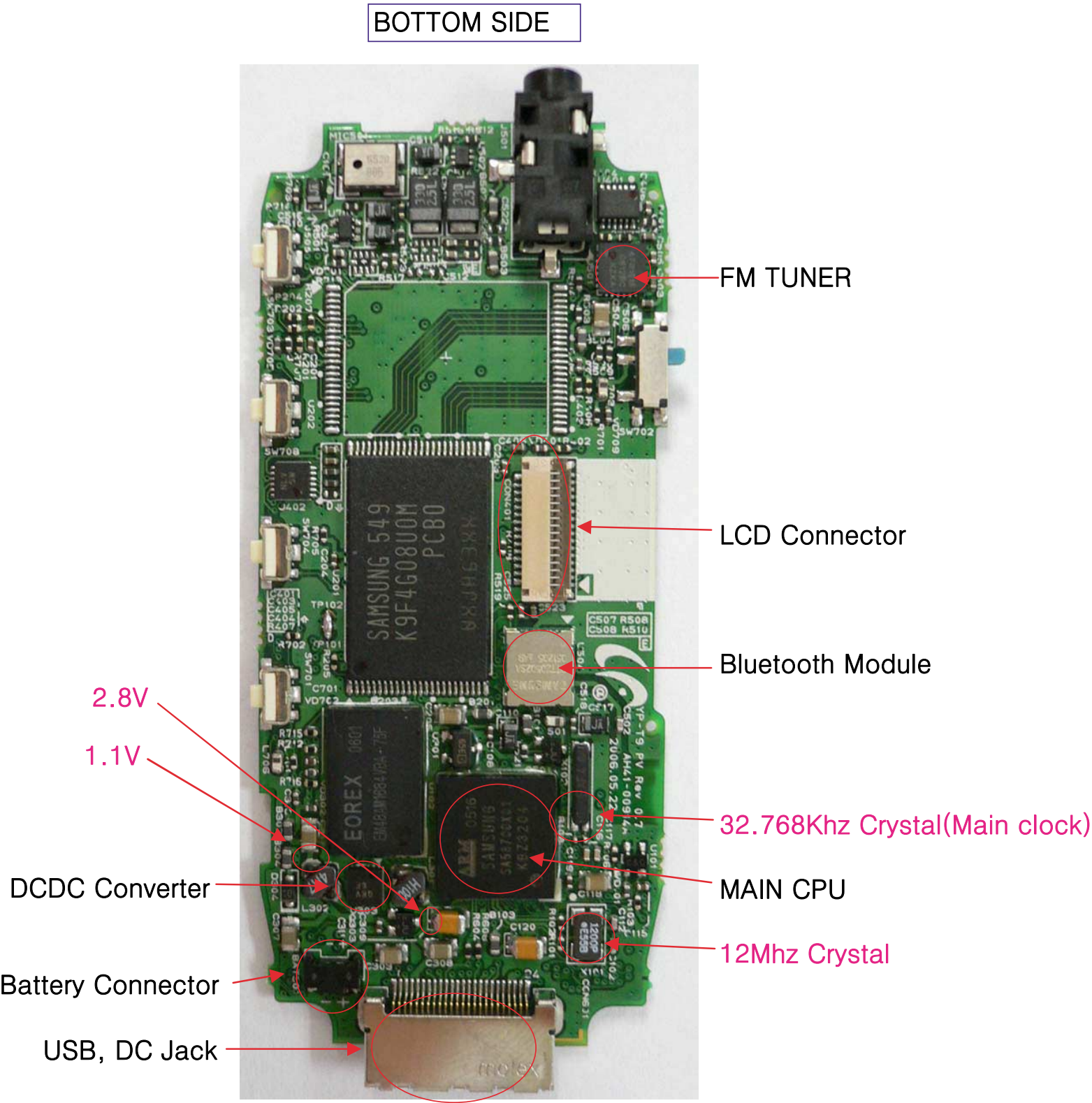
## 8. Electrical Parts List

Location no.	Code no.	Description & Specification	Remarks	Location no.	Code no.	Description & Specification	Remarks
D601	0401-000164	DIODE-SWITCHING;KDS121V,80V,100MA,VSM,TP		MIC50	3003-001108	MIC-CONDENSOR;5.5V;0.100-0.350 mA,-22 dB	
D304	0404-001089	DIODE-SCHOTTKY;RB851V-30,20V,500MA,SOD-3		B503	3301-001105	BEAD-SMD;1.6x0.8x0.8mm,-,-	
D501	0406-001239	DIODE-TVS;RClamp0502B,6V,125W,SOT-523		B302	3301-001148	BEAD-SMD;60ohm,1608,TP,-,-	
Q101	0504-001170	TR-DIGITAL;KRA304V,PNP,100MW,47K/47KOHM,		B501	3301-001345	BEAD-SMD;600ohm,2012,300mA,TP,679ohm/11	
Q302	0504-001193	TR-DIGITAL;KRC408V,NPN,100MW,22K/47KOHM,		SW704	3404-001152	SWITCH-TACT;12V DC,200mA,160gf,4.5x4.0x2.	
U502	0505-001893	FET-SILICON;Si1024X,N,20V,515mA,0.7ohm,0		SW702	3408-001038	SWITCH-SLIDE;4V,300mA,SPST,ON-ON,-	
Q501	0505-001930	FET-SILICON;MCH3319,P,-12V,-2.6A,MAX255m		CON70	3708-001912	CONNECTOR-FPC/FFC/PIC;9P;0.5mm,SMD-A,AU,	
U102	0902-001905	IC-MICROPROCESSOR;SA58700X,24MHz,32Bit,F		CON40	3708-001971	CONNECTOR-FPC/FFC/PIC;31P;0.3mm,SMD-A,AU	
U401	0909-001041	IC-REAL TIME CLOCK;RX-8564LC,VSOJ-12,12P		BAT30	3710-001436	SOCKET-BOARD TO BOARD;2P,1R,1.27mm,SMD-A	
U503	1001-001298	IC-ANALOG SWITCH,-,-,L10X,10P2,1x1.6,1,		CON60	3710-002276	CONNECTOR-INTERFACE;24P,1R,0.5mm,SMD-A,A	
U203	1105-001672	IC-DRAM;EM48AM1684,16Mx16Bit,TFBGA,54P		J501	3722-001605	JACK-PHONE;3PAG,BLK,SMD-A	
U101	1203-002213	IC-VOL DETECTOR;XC61CC2502,SSOT-24,4P,-		ANT1	4202-001164	ANTENNA-CHIP;2400-2490MHz,-,-5dB,5.1,50o	
U301	1203-003549	IC-POSIFIXED REG.;XC6206P152MR,SOT-23,3		U504	4709-001374	BLUETOOTH MODULE;BTTZ0502SA,3.6V,2400-24	
U302	1203-003663	IC-BATTERY;ISL6294IRZ-T,DFN,8P,2x3mm,PLA		P601	AH63-01273A	GASKET;YP-T9,SUS,0.5mm,1.5mm,3mm,GOLD	
U402	1203-003708	IC-DC/DC CONVERTER;AAT3151,DFN,12P,3x3mm		AB035	4302-001205	BATTERY-POLYMER;3.7V,740mAh,-,-,4.2V,360	
U303	1203-004064	IC-DC/DC CONVERTER;AAT2512,TDFN,12P,3x3mm		AH07-00191A		LCD-DISPLAY;HTT18QC3,YP-T9,-,34x47.8x0.2	
U501	1204-002581	IC-TUNER;S14701-A14-GM,QFN,24P,4x4mm,PL		AH30-00087D		PHONE-EAR;EP-370;BLACK,EP-370,16ohm,NOR	
VD102	1405-001093	VARISTOR;14V,20A,1x0.5x0.6mm,TP		AH39-00899A		CBF CABLE;USB CABLE,49338-0001,YP-T9,24,	
R710	2007-000137	R-CHIP;2KOHM,5%,1/16W,TP,1005		AH61-02031B		NECK-LACE,-,-,-,-,-,-,-,-,-,-,-,-,-,-,-,-,-,-	
R520	2007-000138	R-CHIP;100ohm,5%,1/16W,TP,1005		AH68-00908H		LABEL-SERIAL;YP-T9,ALL,art paper,-,W21,L	
R506	2007-000139	R-CHIP;220ohm,5%,1/16W,TP,1005		AH92-02637A		ASSY PCB;YP-T9BZ,MLC 1GB, Bluetooth YP-T9BZ Series	
R510	2007-000140	R-CHIP;1Kohm,5%,1/16W,TP,1005		AH92-02637B		ASSY PCB;YP-T9BQ,MLC 2GB, Bluetooth YP-T9BQ Series	
R607	2007-000143	R-CHIP;4.7Kohm,5%,1/16W,TP,1005		AH92-02637C		ASSY PCB;YP-T9BA,MLC 4GB, Bluetooth YP-T9BA Series	
R704	2007-000144	R-CHIP;5.1KOHM,5%,1/16W,TP,1005					
R716	2007-000148	R-CHIP;10Kohm,5%,1/16W,TP,1005					
R518	2007-000155	R-CHIP;27Kohm,5%,1/16W,TP,1005					
R701	2007-000157	R-CHIP;47Kohm,5%,1/16W,TP,1005					
R118	2007-000162	R-CHIP;100Kohm,5%,1/16W,TP,1005					
R512	2007-000170	R-CHIP;1Mohm,5%,1/16W,TP,1005					
R105	2007-000171	R-CHIP;0ohm,5%,1/16W,TP,1005					
R303	2007-000636	R-CHIP;270KOHM,5%,1/16W,TP,1005					
R112	2007-000982	R-CHIP;5.6Kohm,5%,1/16W,TP,1005					
R401	2007-001292	R-CHIP;33ohm,5%,1/16W,TP,1005					
R501	2007-001298	R-CHIP;51ohm,5%,1/16W,TP,1005					
R708	2007-001323	R-CHIP;3KOHM,5%,1/16W,TP,1005					
R114	2007-001325	R-CHIP;3.3Kohm,5%,1/16W,TP,1005					
R319	2007-001333	R-CHIP;18KOHM,5%,1/16W,TP,1005					
R405	2007-001335	R-CHIP;36KOHM,5%,1/16W,TP,1005					
R706	2007-007001	R-CHIP;3.9KOHM,5%,1/16W,TP,1005					
R108	2007-007100	R-CHIP;10Mohm,5%,1/16W,TP,1005					
R318	2007-007107	R-CHIP;100Kohm,1%,1/16W,TP,1005					
R712	2007-007148	R-CHIP;3.6KOHM,5%,1/16W,TP,1005					
R604	2007-007199	R-CHIP;2.7KOHM,5%,1/16W,DA,TP,1005					
R314	2007-007942	R-CHIP;1Mohm,1%,1/16W,TP,1005					
R309	2007-008517	R-CHIP;240Kohm,1%,1/16W,TP,1005					
C502	2203-000233	C-CER,CHIP;0.1nF,5%,50V,COG,1005					
C132	2203-000254	C-CER,CHIP;10nF,10%,16V,X7R,1005					
C112	2203-000330	C-CER,CHIP;0.012nF,5%,50V,COG,1005					
C116	2203-000854	C-CER,CHIP;0.039nF,5%,50V,COG,1005					
C122	2203-000885	C-CER,CHIP;4.7nF,10%,25V,X7R,1005					
C519	2203-001405	C-CER,CHIP;22nF,+80-20%,25V,Y5V,1005					
C109	2203-002709	C-CER,CHIP;100nF,+80-20%,16V,Y5V,1005					
C117	2203-005383	C-CER,CHIP;0.0070nF,0.1pF,50V,-,1005					
C302	2203-005900	C-CER,CHIP;1000nF,+80-20%,10V,Y5V,1005					
C121	2203-005993	C-CER,CHIP;68nF,10%,16V,X7R,TP,1005					
C601	2203-006093	C-CER,CHIP;1000nF,+80-20%,6.3V,Y5V,1005					
C101	2404-001064	C-TA,CHIP;10UF,20%,6.3V,WT,TP,2012					
C120	2404-001348	C-TA,CHIP;100UF,20%,6.3V,-,TP,3.2X1.6X1.					
C515	2404-001407	C-TA,CHIP;330uF,20%,2.5V,-,REEL,3528					
L501	2703-001167	INDUCTOR-SMD;8.2nH,5%,1608					
L703	2703-002203	INDUCTOR-SMD;15nH,5%,1005					
L302	2703-002653	INDUCTOR-SMD;4.7uH,20%,2828					
L301	2703-002829	INDUCTOR-SMD;10uH,20%,2828					
X102	2801-003856	CRYSTAL-SMD;0.032768MHz,20ppm,28-ACP7pF					
X101	2801-004318	CRYSTAL-SMD;12MHz,20ppm,-,12PF,80ohm,TP					

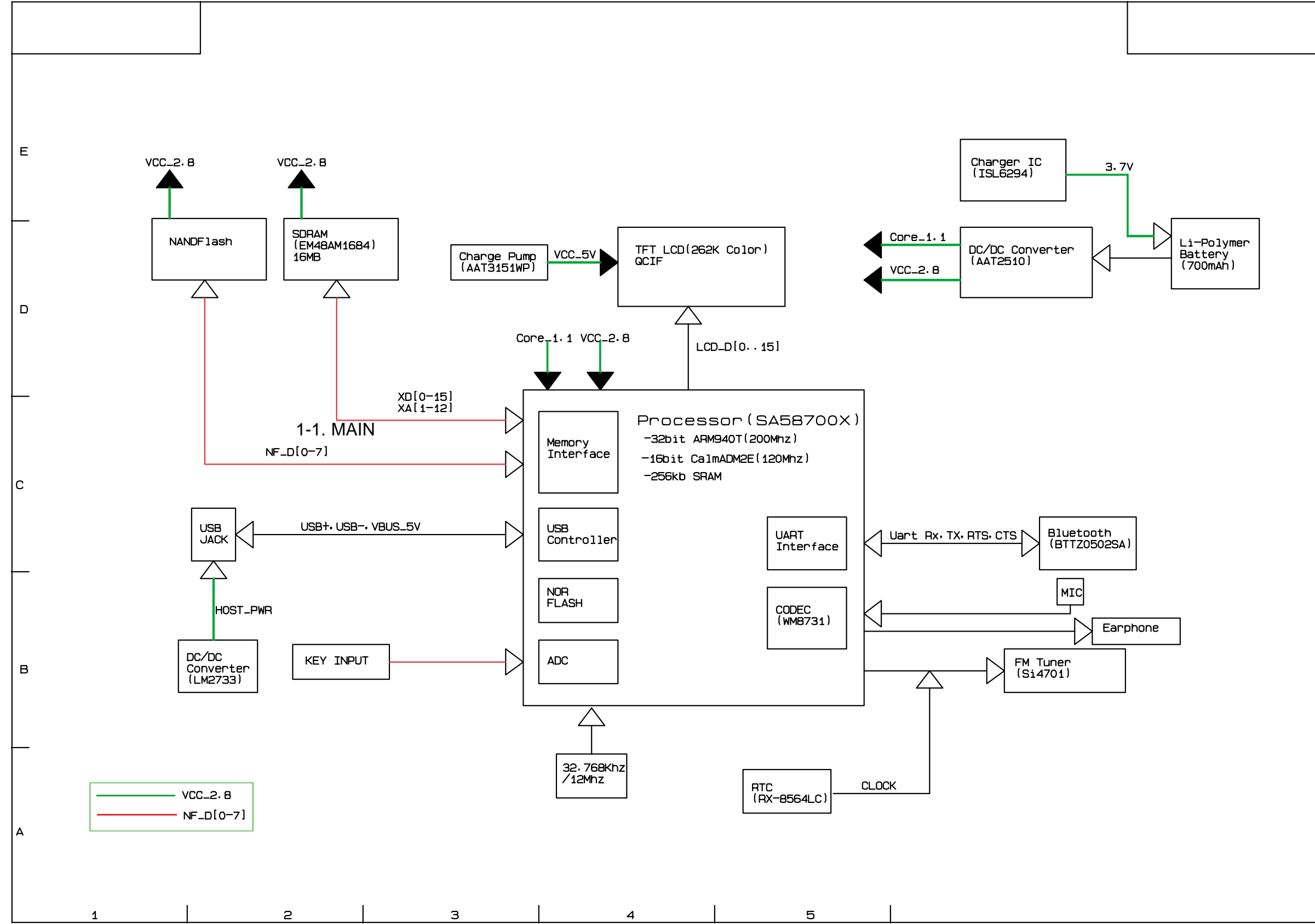


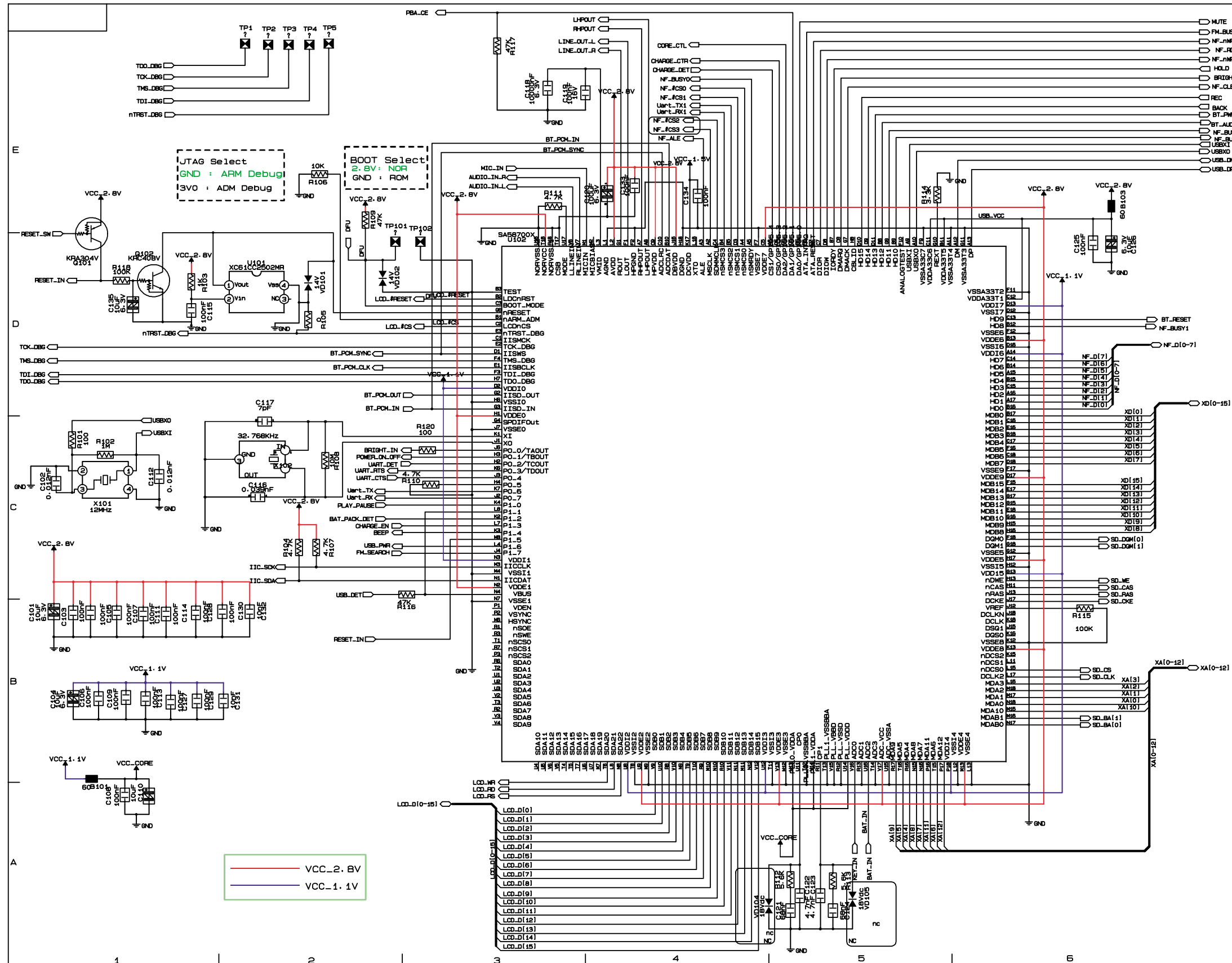




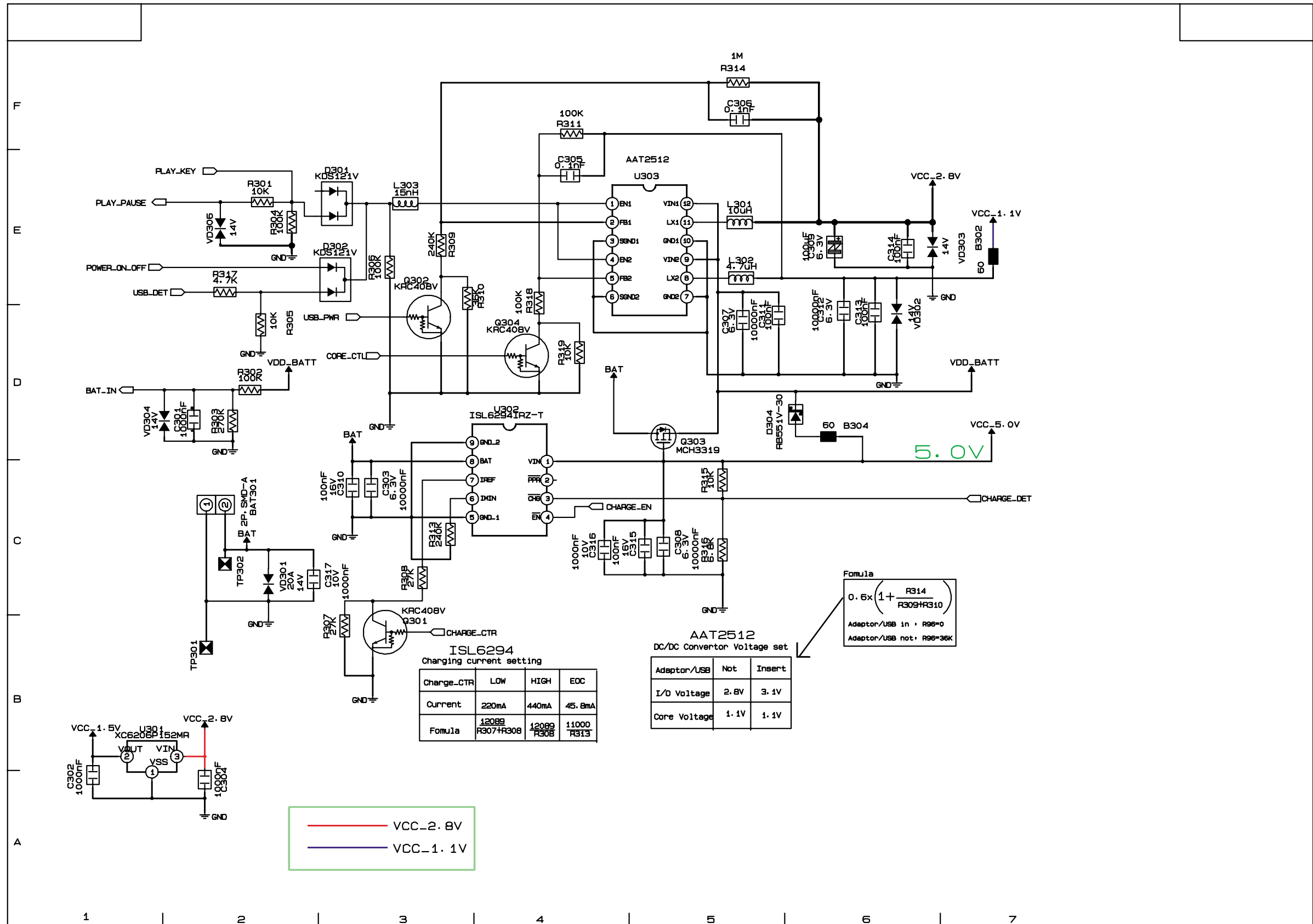


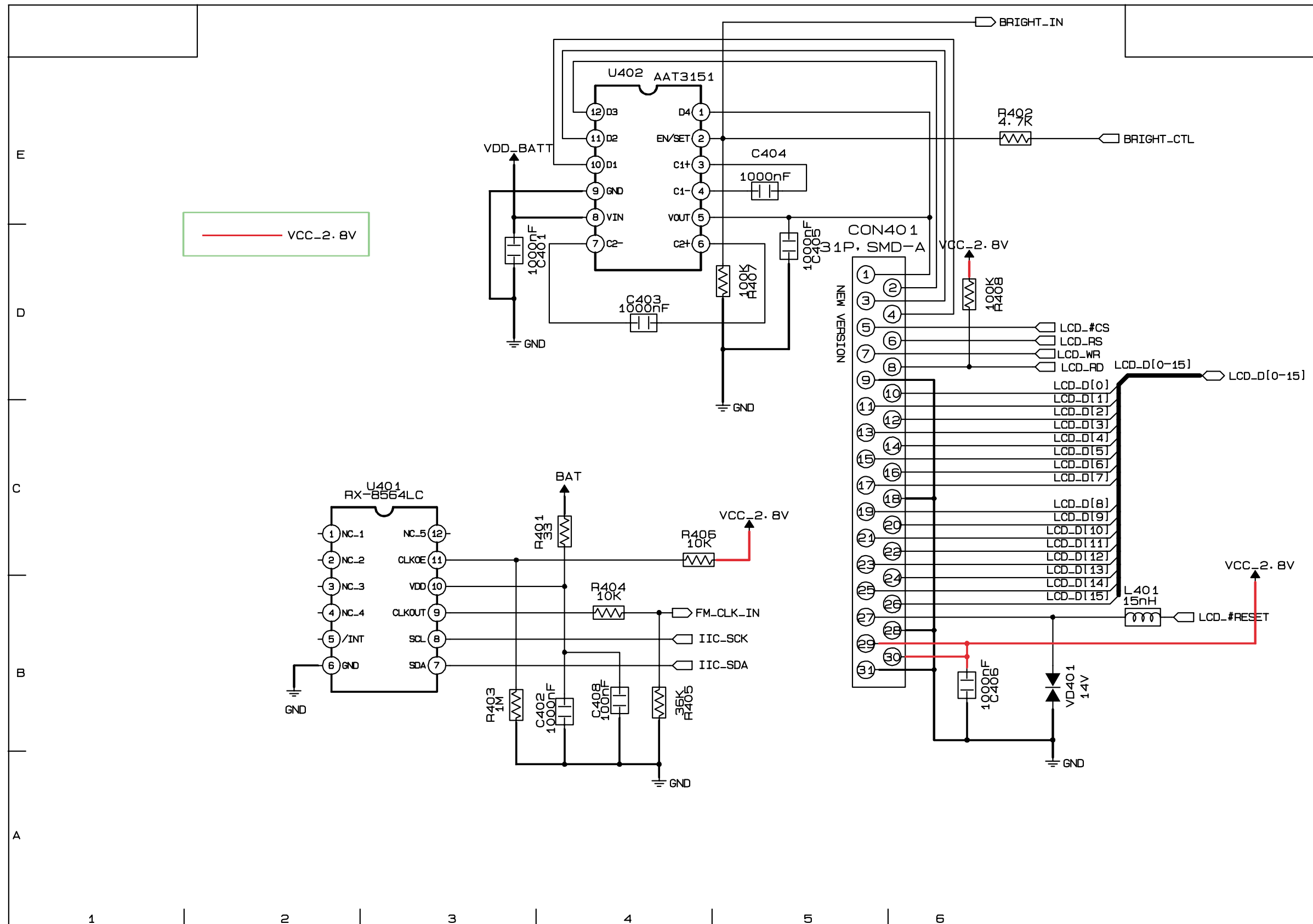
1-1. BLOCKDIAGRAM

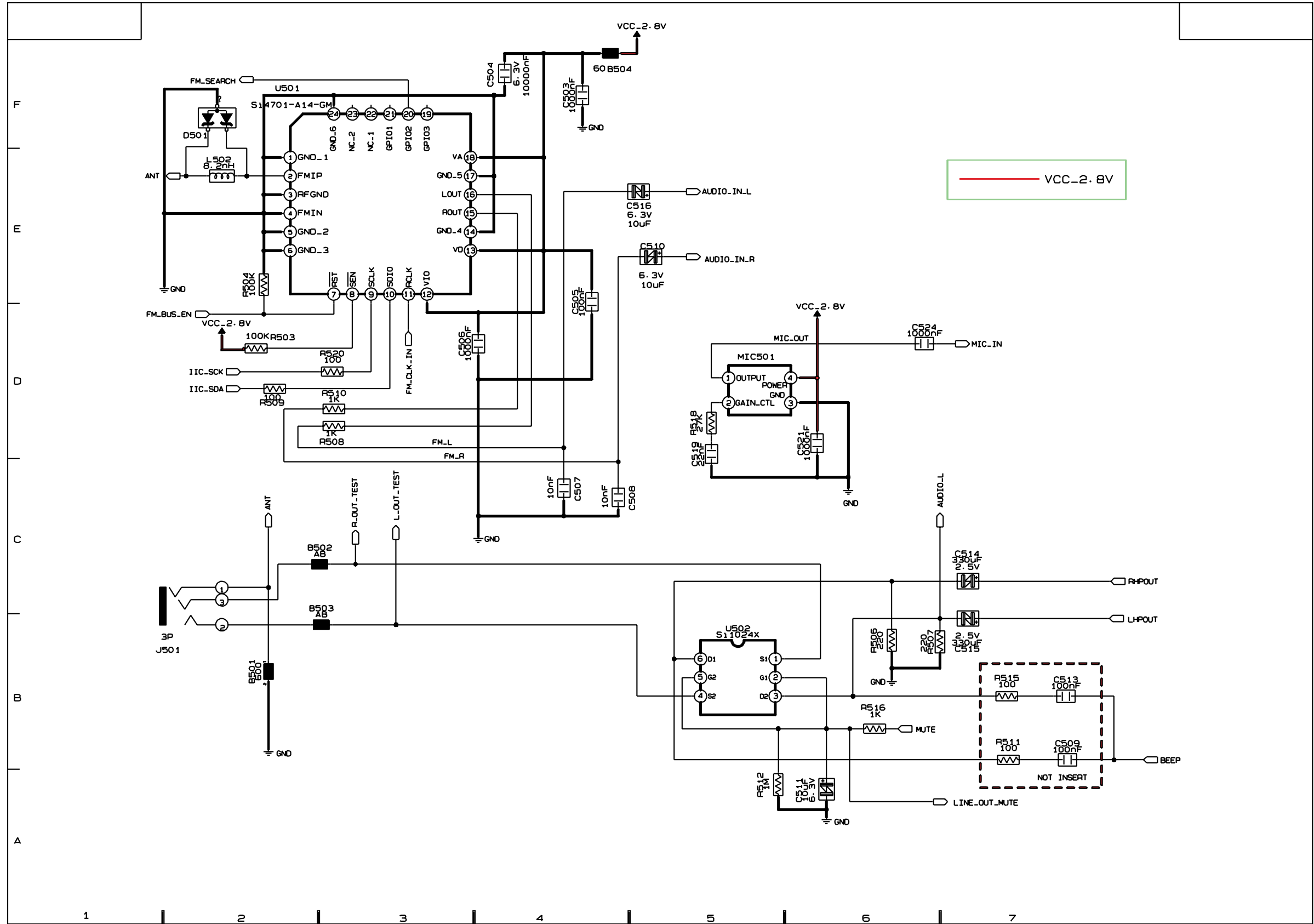




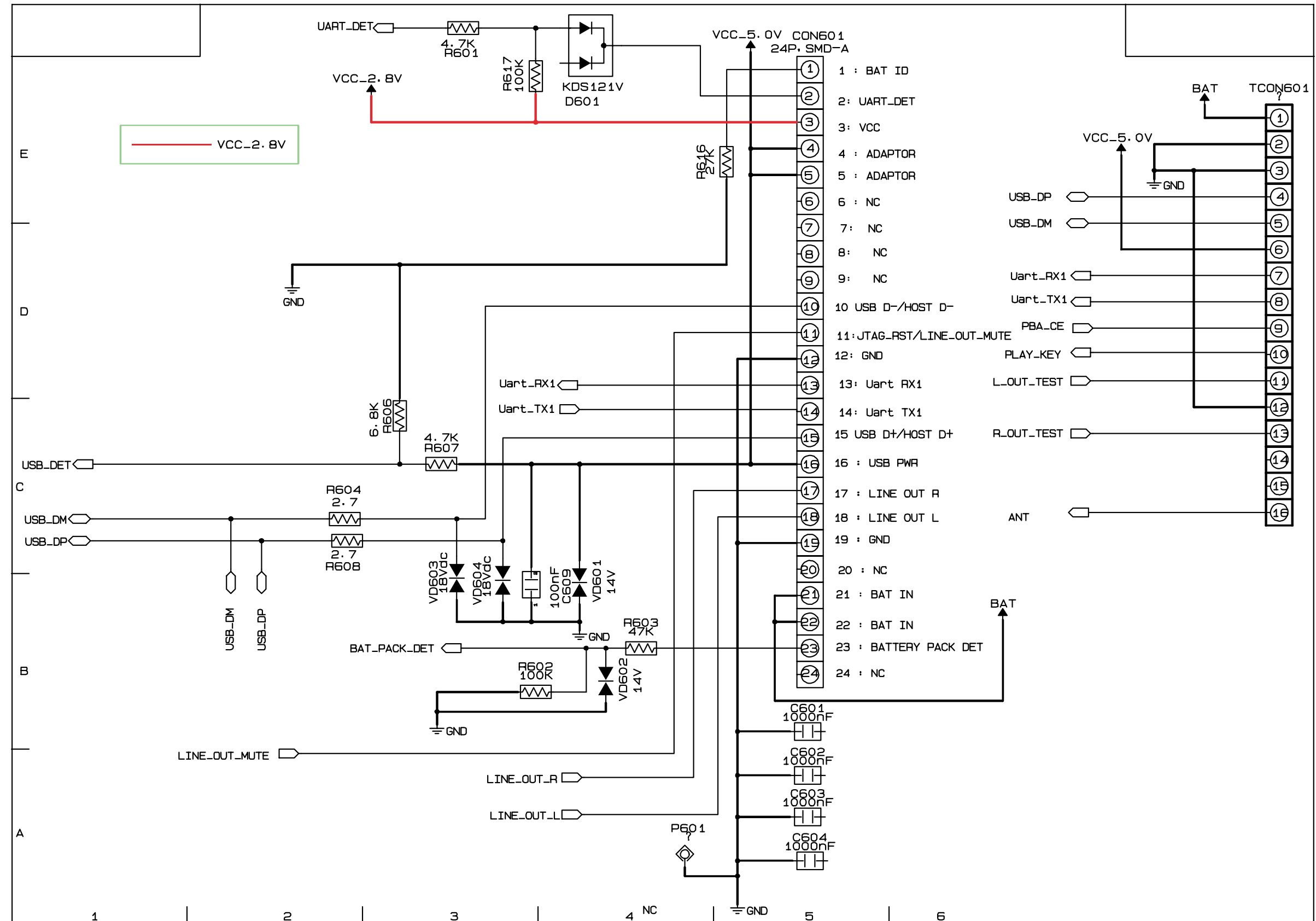


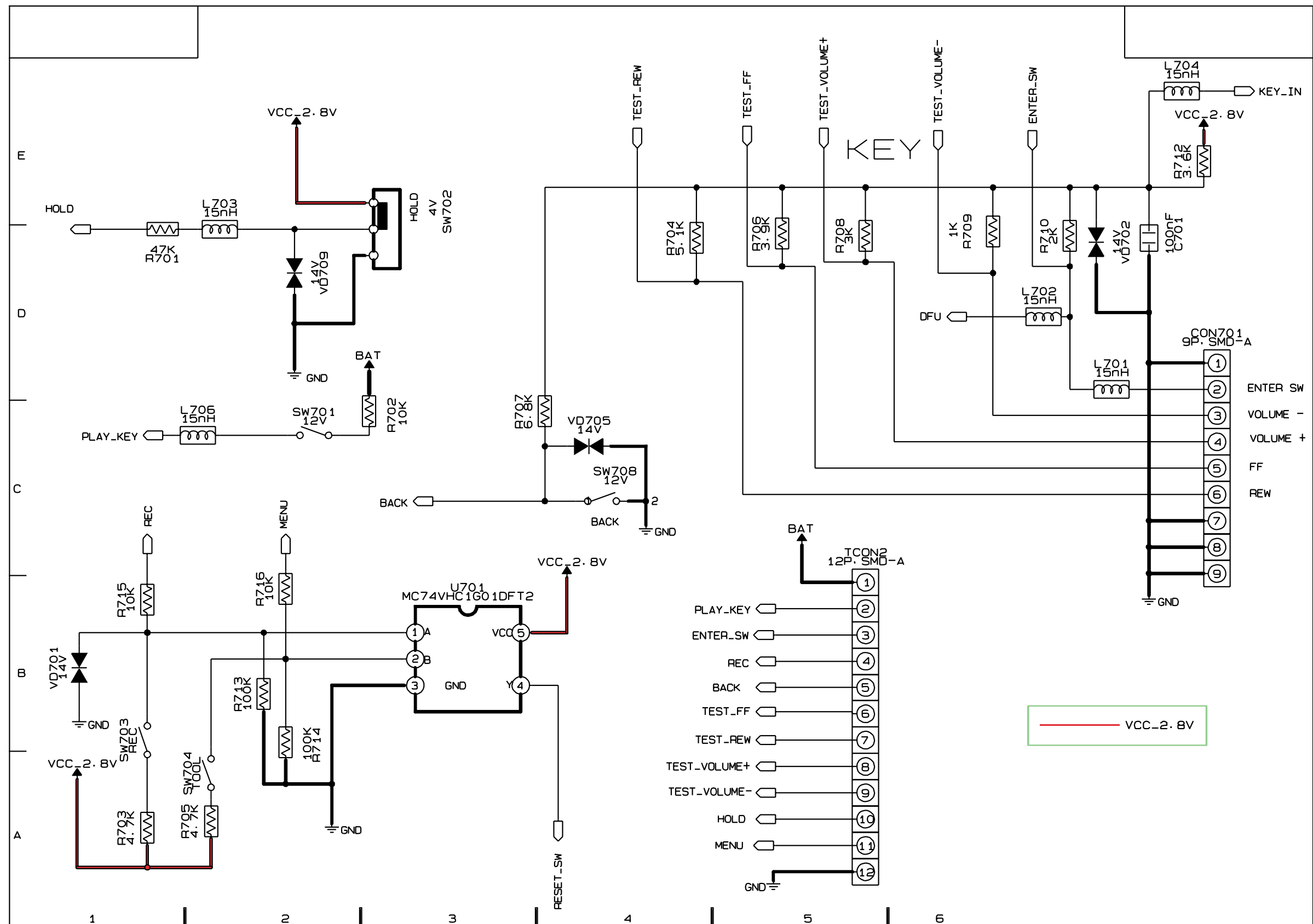


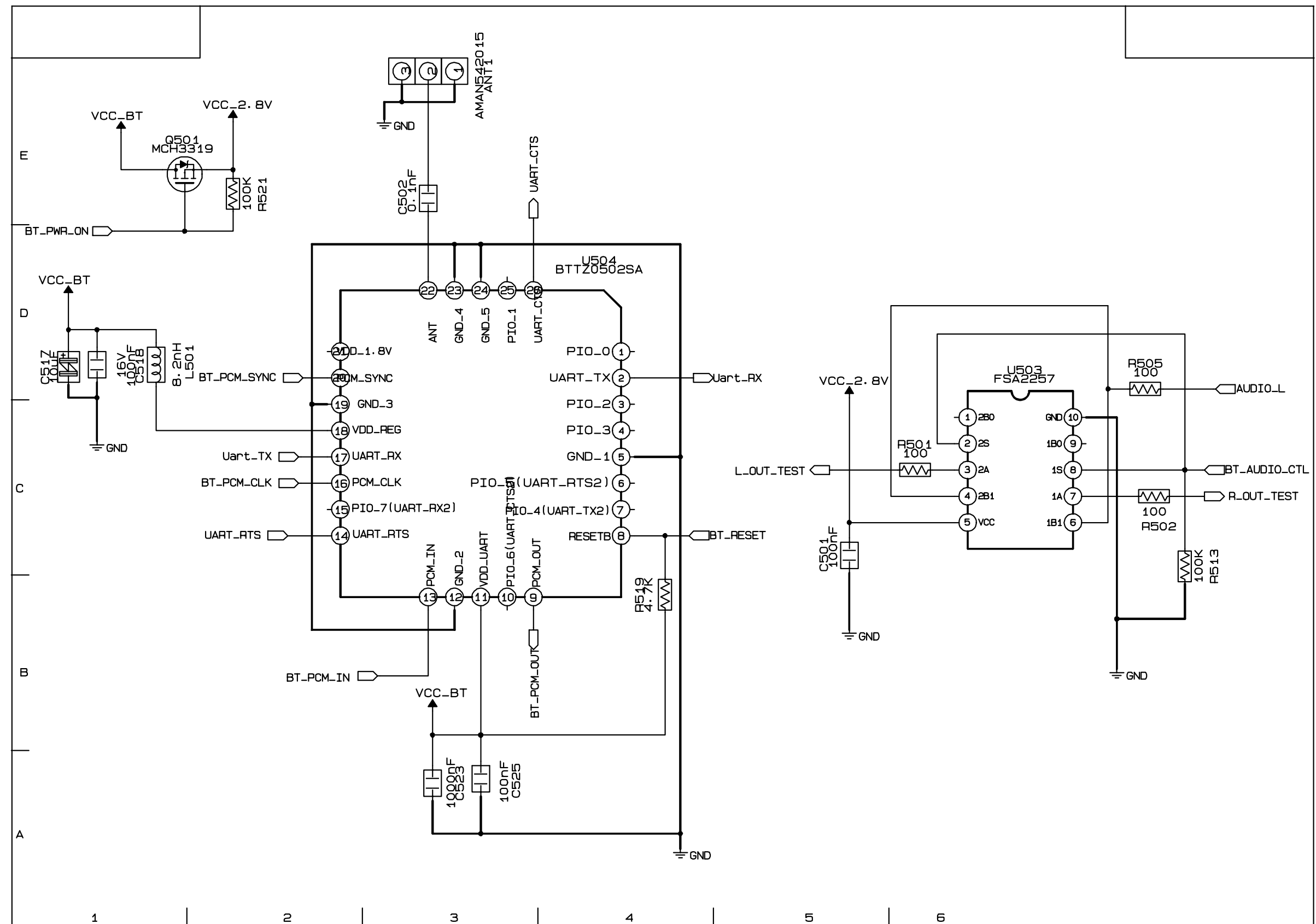




1-7. CONNECTOR







1. Major Functions by Blocks

Circuit Block	Major Functions	Remarks
MAIN	1. <u>Main CPU Block</u> * Responsible for encoding and decoding MP3 and WMA. Controls all the MP3 player operations.	Circuit Diagram 1
	2. <u>Memory Block</u> * NAND Flash : Memory used to save data. * SDRAM : High-speed memory used as a buffer.	Circuit Diagram 2
	3. <u>Power Block</u> * Converts voltage from the charged battery into voltages for IC operations (2.8V, 1.1V).	Circuit Diagram 3
	4. <u>LCD &amp; RTC Block</u> * LCD : Displays data from the Micom Block. * RTC : Provides time information for the Micom.	Circuit Diagram 4
	5. <u>Audio &amp; FM Block</u> * Outputs signals processed by the Micom IC to the earphones. * Receives FM radio signals and outputs the signals as audio signals.	Circuit Diagram 5
	6. <u>24 Pin Connector Block</u> * Connector used for the USB connection and charge operation.	Circuit Diagram 6
	7. <u>Key Block</u> * Receives key inputs and delivers the data to the Micom.	Circuit Diagram 7
	8. <u>Bluetooth Block</u> * Responsible for wireless data communication via Bluetooth conneciton.	Circuit Diagram 8

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## 14. Basic Information of MP3

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### 1-1. Operating Principle of yepp

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#### Terms and Overview

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**AV Conversion:** process of converting Analog Data to Digital Data

**SAMPLING RATE :** means precision rate of A/D conversion and is indicated in Hz, bit number and channel number(for CD: 44.1 KHz, 16bit, 2channels)

**ENCODING :** process of compressing and converting digital data obtained through A/D conversion to audio format

**Compression rate:** indicated in bps(bit per second)

(For MP3: sound quality of CD level with compression rate of 128kbps)

**ENCODING FORMAT :** MP3 : MPEG Layer3

AAC : MPEG-2 AAC

WMA : Windows Media Audio (Microsoft)

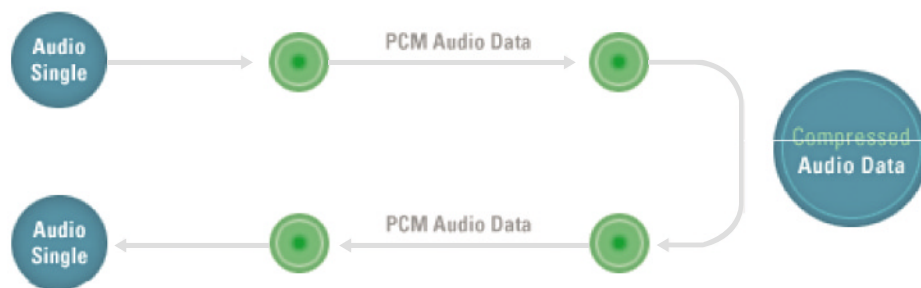
ATRAC(3) : Adaptive TRansform Acoustic Coding (SONY)

EPAC : Enhanced Perceptual Audio Coder (Luscent Technology)

OGG : Ogg Vorbis

**DECODING :** Process of recovering the digital data encoded to the data before encoding

**D/A :** Process of converting Digital Data to Analog Data

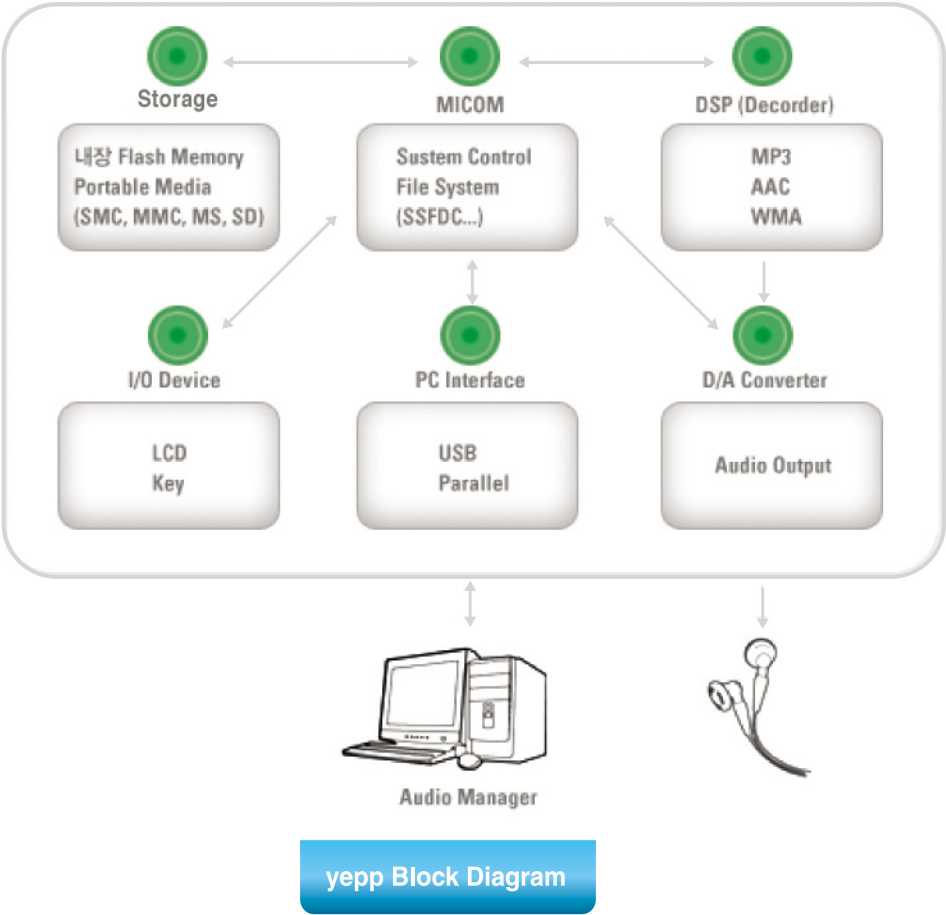


CD Data Size (44.1KHz, 16Bit, 2Channel sampling으로 1분 용량의 경우)

$44100/\text{sec} * 2\text{bytes}(16\text{bit}) * 2(\text{channel}) * 60\text{sec} = 10,584,000 \text{ bytes}$

Process of converting digital data to analog data

Yepp Block Diagram



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## **Yepp Vocabulary**

---

### **Yepp (Young Energetic Personal Passinate)**

MP3 player that enables you to enjoy audio data like music file in existing CD in high quality by compressing it to 1/12 level without loss of quality using MPEG1 Layer3(audio compression technology of animation and sound compression technique). You can also use it for learning foreign language and Internet broadcasting.

### **MPEG**

MPEG is an abbreviation of Moving Picture Expert Group and means specification defining the compression and de-compression type of animation by MPEG established in 1988.

### **MP3**

MP3 means MPEG1 Layer3 and compression rate can be up to 96:1(phone) to 12:1(CD) depending on sound quality with compression coding technique of audio of MPEG technology.

(file extension: "mp3") That is, up to 150 pieces of songs can be recorded in one copy of CD with MP3 compression.

### **FLASH Memory**

Flash memory is the memory chip where entered information will not be deleted even if the power is turned off while data is entered, and data can be freely entered or deleted.

### **Smart Media Card**

Compact and light semiconductor media card in dimension of 45.1 x 37.1 x 0.76mm and weight of 2.0g. It is used as a storage of portable device and high quality media storage device of digital camera and music MP3 player.

Flash memory is embedded to store the data even if the power is turned off and it is a super-high speed product that can record up to 250 characters per second.(mass production of 8MB, 16MB, 32MB currently at Samsung Electronics)

### **OTP (Once Time Programmable)**

OTP is one type of micro controller(MCU) and is the customer-oriented semi-conductor on which the customers can directly record the program. OTP type MCU is rapidly growing as its life cycle of set product and multi-kind/small quantity production system is introduced.

Since existing type of micro controller uses Mask ROM which cannot be played or recorded again, it requires over 5 months to develop set products, and it is not suitable for products with rapid change of product model.

### **Firmware**

It is a program that controls and manages hardware. Firmware is distinguished from hardware in that it is a program but is distinguished from general applications in that it is closely related to hardware. In general, firmware is saved in ROM.

## IP (Information Provider)

Company that provides information that users want through communication system with certain fee.

## SecuMAX

As multimedia digital contents distributions become active in networks such as Internet and PC communication, copyright issue has appeared as an important topic. It is a system that can protect the right of copyright holders and enables the user to conveniently use contents. To receive service, member registration is required at digital contents service site adopting SecuMAX.

When completing member registration, customer ID, password and resident registration number will be registered at SecuMAX server and utilized as a basic data for performing user certification role. After registration, download the dedicated player and decryption key to use service.

Music drive developed by Samsung Electronics is embedded with SecuMAX decryption module.

Decryption key will be registered during installation of music drive. Music file downloaded from digital contents music service site with SecuMAX can be played back.

## Yepp Explorer

This software controls yepp player in PC. You can move or delete music list or voice saved in yepp card or embedded memory. This software is required to use yepp.

## Music Drive

Software audio player for PC embedded with MPEG II AAC Decoder first in Korea. It supports not only playback of MPEG audio format as well as SecuMAX, encryption protection system.

## CD Ripper

MP3 compression software that converts CD music in PC to MP3 file.

## OGG (Ogg Vorbis)

OGG(Ogg Vorbis) is featured to have 'higher compression rate than MP3', 'higher quality than MP3', 'no limit in use, distribution and development due to open source type. The biggest feature of Ogg Vorbis is that it has no limit in use of format itself.

The biggest feature that distinguishes Ogg Vorbis from existing music file is that it supports VBR(Variable Bit Rate) by default.

Of course, MP3 also supports VBR format, but has effect of reducing capacity due to VBR based on existing MP3. Ogg Vorbis file supports VBR by default and helps you enjoy high quality music without loss due to big width of bit rate.

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## 1-2. MP3 Overview

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**MP3 is one of file extension like .hwp, .wav, .txt used in computer.**

**Exactly, it is the abbreviation of MPEG Audio Layer-3.**

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### Origin of MP3

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MPEG is Motion Pictures Expert Group and is a standard made by experts in this area under international standard organization like ISO(International Standard Organization) and IEC(International Electric Committee). It is technical standard of compressing and transmitting video and audio signals and recovering them again.

The first specification that MPEG made is MPEG-1 in 1988. It is the technology used to produce video CD. MP3 means the audio compression part among specification of MPEG-1(1995). MPEG-2 is used together with MPEG-1. AAC(Advanced Audio Coding or MP4) receives attention with its excellent digital audio and is derived from MPEG-2. MPEG-4(latest standard on movie compression for conference communication) is being established.

MP3 is most widely used and called "MPEG Audio Layer-3", which is version up from Layer-1 and Layer-2. In general, it is called MP3 since Layer-1 has compression rate of 1:4, Layer-2 of 1:61:8, Layer-3 of 1:101:12.

Using MP3 technology, up to 100 songs(7 hours) can be contained in one copy of empty CD of 650MB.

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### Transition of Portable Player

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Transition of Portable Player

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## 1-3. Understanding of Digital Audio Format

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### MP3

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### AAC



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### WMA (Windows Media Audio)



Multimedia compression type of Microsoft. Only music data is compressed from "WMT". Streaming and file format also support this data. In a same quality as MP3, it is about 1/2 size and contains Windows Media Rights Manager with copyright protection technology. It can be played back with [Media Player] provided in Windows98.

### ATRAC3



Sound compression type of MD and latest specification of [ATRAC (Adaptive TRansform Acoustic Coding)] developed by SONY. Has about 2 compression rate than existing ATRAC.

### Real Audio G2



Format type developed by Real Network. High quality can be obtained at low transmission speed of 16Kbps-32Kbps using [RealAUDIO G2 Music Codec] as compression type. Since streaming play in Internet radio is the main purpose, file does not contain copyright protection technology. "Real Player G2" supports MP3 playback and "Real Juke Box" supports encoding from CD to MP3.

## Tips

### How MP3 can produce same quality as CD?

Ears of human can listen to signal in the range of 20Hz~20KHz. It is called "audible frequency". To convey the audible sound in digital type CD, sampling frequency of 44.1KHz, about 2 times of audible frequency, should be used. It is the task of dividing sound signal to 44,100 pieces per second and making the signal to digital format of 0 and 1. How delicately the sample can be expressed will be determined by number of bit per sample. Audio CD is 16 bit. It means that 1 sample can be expressed in 65,536(16 square of 2) stage.

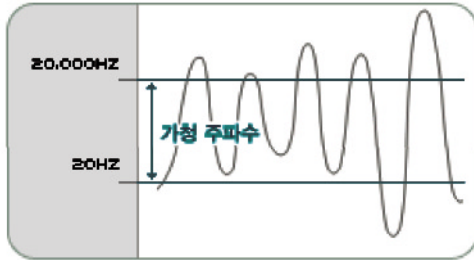


Fig. 1 Sound Wave before Loss Compression

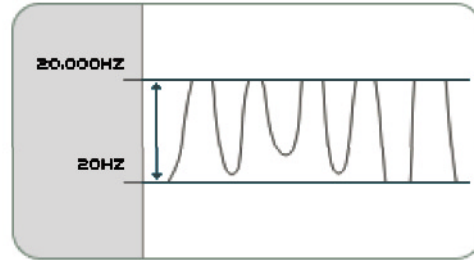
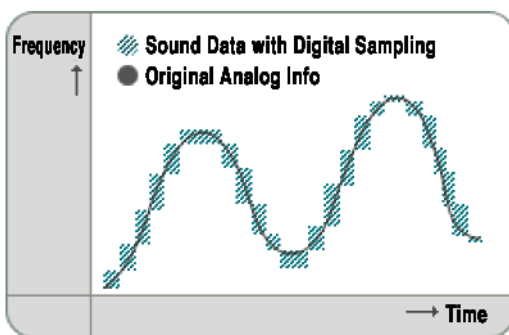


Fig. 2 Sound Wave after Loss Compression

When converting CD music to WAV file, the capacity is about 40MB(for 4 minutes). By converting it to MP3, it reduces to 4MB since "loss compression", the feature of MP3, is used. Loss compression type removes the sound beyond the range of audible frequency(20Hz~20KHz). It uses the features that small sound cannot be heard after very strong sound. <Figure 1> is the sound wave before loss compression. It can be regarded as the sound wave of music CD or cassette tape containing sound people cannot listen. When it is made into MP3, it is as shown in <Fig.2>.

### Volume Control



Capacity can be reduced much by adjusting the degree of loss. However, it causes deterioration of sound quality. Music CD contains sound made with 16 bit 44.1KHz of stereo sampling. Stereo is the type of dividing the sound into left and right. CD should change analog sound to digital.

Digital information is cut between sections and location information is saved in each section. "Sampling rate" is the standard of how many sub-section it will divide 1section. Divided frequency part is called 8 bit and 16 bit. 8 bit sampling means that frequency is divided into 2 stage, that is, sound pitch of 256 stage. 16 bit sampling divides into 65,536 sound pitch. In addition, 44.1KHz means sampling of 44,100 times per second. To reduce the amount of information made at digital, sampling bit number and frequency should be set low, but it will cause deterioration of sound quality. There is no difference in sound quality between MP3 and CD since encoding(converting CD track to MP3) is done with 44.1KHz at 16 bit. Better CD sound quality cannot be obtained by lowering the sampling rate, but the capacity can be reduced.

## OGG(Ogg Vorbis)

OGG(Ogg Vorbis) is featured to have "higher compression rate than MP3", "higher quality than MP3", "no limit in use, distribution and development due to open source type. The biggest feature of Ogg Vorbis is that it has no limit in use of format itself.

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## 1-4. Type of Storage

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MP3 is regarded as MP3.

Let's examine what are the types of storages currently used.

Optical Disc : CD, MD Player / Flash Memory : MP3 Player, Digital audio player

Type of Digital audio player storage.

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### Audio Format Table





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	 SD	 MMC	 Smart Media	 Memory Stick
Source	Matsushita, Toshiba, SanDisk	SanDisk Hitachi	Samsung Toshiba	Sony
Size(mm)	32 x 24 x 2.1	32 x 24 x 1.4	45 x 37 x 0.76	21.5 x 50 x 2.8
Weight(gram)	2.5	1.5	2	4
Pin Count	9 (7of MIMC + 2 I/O)	7	22	10
ESD (Contact/air)	±10K/±15K V	—	±4K/±8K V	—
SDMICompliance	Phase 1 & 2	Phase 1	Phase 1	Phase 1 & 2
Security	Challenge & Response	Unique ID	Unique ID	Encryption Logic
Density	'00 : 32MB, 64MB '01 : 256MB	'00 : 32MB, 64MB	'99 : 32MB, 64MB '01 : 128MB	'00 : 32MB, 64MB '01 : 128MB
Licensing	Required	Open Standard	Open Standard	Required

\* SSFDC (Solid State Floppy Disc Card) File System

\* Standard file system for support of SMC's compatibility(DOS/FAT adopted)

## Small Form - factor Cards Comparison

Item	 CD Player	 MD Player	 MP3 Player	 MP3-CDP
Audio Format	PCM	ATRAC	MP3, AAC, WMA...	MP3, WMA, Audio-CD
Audio Data compression	X	5:1	Various compression rate	Various compression rate
Storage	Optical Disc	Optical Disc	Flash Memory	Flash Memory
Basic function	Audio play	Audio play	Audio play	Audio play
Additional function	X	X	Voice recording, play phonebook FM Radio	Multi codec support Multi-functional LCD Remote controller, FM Radio
PC S/W	X	X	Audio Manager Ripper	Audio Manager Ripper

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## 1-5. Copyright

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.....  
**Various kinds of methods are combined to unify technical**

**specification to prevent digital music data from illegal reproduction.**

.....  
**Let's examine groups and vocabularies related to copyright.**

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### **SDMI (Secure Digital Music Initiative)**

Internet music record company consortium to pursue development of digital music file format.  
World-class music makers and related groups are formed to protect copyright of music and to prevent illegal reproduction.

- PD : Portable Device
- PM : Portable Media (SMC,MMC,MS,SD Card)
- UID : All PD, PM should have unique ID.
- Binding : All Digital Audio should be bounded to PD or PM.

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### **DRM (Digital Rights Management)**

Manage interests of persons related to copyright that occurs due to use of digital contents protected from illegal use of digital contents through various channels.

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### **WaterMarking**

Technology of inserting the specific data to claim copyright of multimedia contents so that eyes and ears of human cannot be distinguished.

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### **SecuMAX**

Digital Security Total Solution adopting Snake encoding algorithm.  
Version1.0 contents in service in Korea (M4you.com, etc.)  
SDMI compliant version2.0 development completed

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### **Reproduction Prevention System**

**Reopening of MP3 music service.**

Lots of dispute have occurred in network due to copyright.  
However, as online MP3 sales have resumed, the number of legal Internet sites has increased.  
However, reproduction prevention system is required for legal sales. All Internet sites serving Korean songs in MP3 are introducing reproduction prevention system.

## Meaning of SecuMAX System Application

Most legal Internet MP3 service sites adopt SecuMAX and YEPP of Samsung and several companies have hardware supporting SecuMAX among MP3 players currently distributed. Then, user needs to receive MP3 applied with SecuMAX to receive legal service. It is required to have program that can play back MP3 applied with SecuMAX technology in MP3 player. For example, since YEPP supports SecuMAX, it can play back, but it means that you cannot play back this at the players of other companies that do not support SecuMAX.

At present, organization has been formed for standardization of reproduction prevention system in foreign countries. Samsung Electronics has also participated in this standard using SecuMAX and completed development of SecuMAX 2.0 with world compatibility.

## SecuMAX

**SecuMAX is the reproduction prevention system that is made for protection of copyright in rapidly growing distribution of digital contents.**

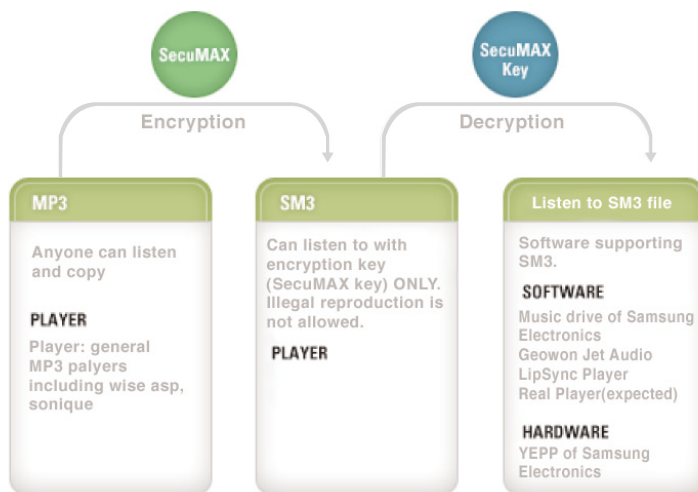
### Reopening of MP3 Music Service

- Digital contents copyright protection and management service.
- Fundamentally prevent the illegal distribution

### Only legal users can play back music

**Dedicated software required(ex.Samsung Electronics, Music Dreve)**

**Prevention of usual illegal use such as file transfer, CD-R Copy and hardware reproduction.**



- Report for copyright holder
  - Basic data for collection of copyright fee and near copyright fee
  - Track sales of all publications through Internet, PC communication or 3rd path.
  - Provide sales information per IP, song and hour real time.
- Can serve any type of files
- Can applied to Internet and PC communication equally
- Can provide copyright protection service for hardware at the same time.