



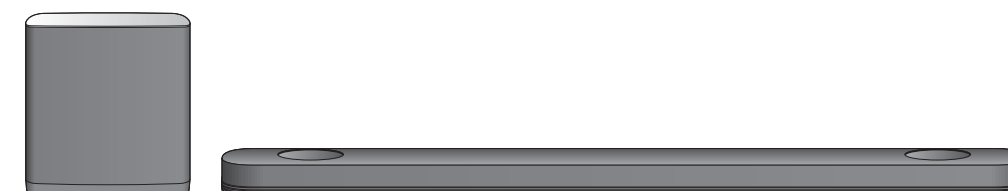
SERVICE MANUAL

MODEL: SJ9 (SJ9, SPJ9B-W)

# SMART Hi-Fi AUDIO Wireless Multi-room Sound Bar **SERVICE MANUAL**

**MODEL: SJ9**  
(SJ9, SPJ9B-W)

**CAUTION**  
BEFORE SERVICING THE UNIT, READ THE "SAFETY PRECAUTIONS"  
IN THIS MANUAL.



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JANUARY, 2015

LG

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# SECTION 1

## SUMMARY

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# PRODUCT SAFETY SERVICING GUIDELINES FOR AUDIO PRODUCTS

## IMPORTANT SAFETY NOTICE

This manual was prepared for use only by properly trained audio-video service technicians.

When servicing this product, under no circumstances should the original design be modified or altered without permission from LG Corporation. All components should be replaced only with types identical to those in the original circuit and their physical location, wiring and lead dress must conform to original layout upon completion of repairs.

Special components are also used to prevent x-radiation, shock and fire hazard. These components are indicated by the letter "x" included in their component designators and are required to maintain safe performance. No deviations are allowed without prior approval by LG Corporation.

Circuit diagrams may occasionally differ from the actual circuit used. This way, implementation of the latest safety and performance improvement changes into the set is not delayed until the new service literature is printed.

**CAUTION :** Do not attempt to modify this product in any way. Never perform customized installations without manufacturer's approval. Unauthorized modifications will not only void the warranty, but may lead to property damage or user injury.

Service work should be performed only after you are thoroughly familiar with these safety checks and servicing guidelines.

## GRAPHIC SYMBOLS



The exclamation point within an equilateral triangle is intended to alert the service personnel to important safety information in the service literature.



The lightning flash with arrowhead symbol within an equilateral triangle is intended to alert the service personnel to the presence of noninsulated "dangerous voltage" that may be of sufficient magnitude to constitute a risk of electric shock.



The pictorial representation of a fuse and its rating within an equilateral triangle is intended to convey to the service personnel the following fuse replacement caution notice:

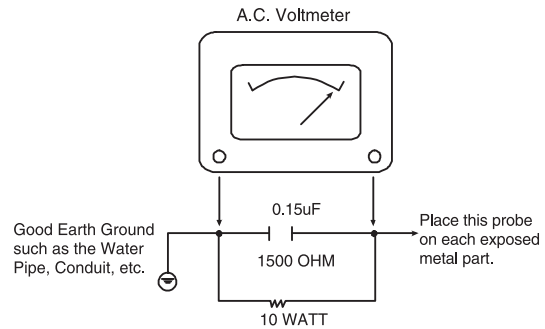
**CAUTION :** FOR CONTINUED PROTECTION AGAINST RISK OF FIRE, REPLACE ALL FUSES WITH THE SAME TYPE AND RATING AS MARKED NEAR EACH FUSE.

## SERVICE INFORMATION

While servicing, use an isolation transformer for protection from AC line shock. After the original service problem has been corrected, make a check of the following:

### FIRE AND SHOCK HAZARD

1. Be sure that all components are positioned to avoid a possibility of adjacent component shorts. This is especially important on items transported to and from the repair shop.
2. Verify that all protective devices such as insulators, barriers, covers, shields, strain reliefs, power supply cords, and other hardware have been reinstalled per the original design. Be sure that the safety purpose of the polarized line plug has not been defeated.
3. Soldering must be inspected to discover possible cold solder joints, solder splashes, or sharp solder points. Be certain to remove all loose foreign particles.
4. Check for physical evidence of damage or deterioration to parts and components, for frayed leads or damaged insulation (including the AC cord), and replace if necessary.
5. No lead or component should touch a high current device or a resistor rated at 1 watt or more. Lead tension around protruding metal surfaces must be avoided.
6. After reassembly of the set, always perform an AC leakage test on all exposed metallic parts of the cabinet (the channel selector knobs, antenna terminals, handle and screws) to be sure that set is safe to operate without danger of electrical shock. **DO NOT USE A LINE ISOLATION TRANSFORMER DURING THIS TEST.** Use an AC voltmeter having 5000 ohms per volt or more sensitivity in the following manner: Connect a 1500 ohm, 10 watt resistor, paralleled by a .15 mfd 150V AC type capacitor between a known good earth ground water pipe, conduit, etc.) and the exposed metallic parts, one at a time. Measure the AC voltage across the combination of 1500 ohm resistor and .15 mfd capacitor. Reverse the AC plug by using a non-polarized adaptor and repeat AC voltage measurements for each exposed metallic part. Voltage measured must not exceed 0.75 volts RMS. This corresponds to 0.5 milliamp AC. Any value exceeding this limit constitutes a potential shock hazard and must be corrected immediately.



## TIPS ON PROPER INSTALLATION

1. Never install any receiver in a closed-in recess, cubbyhole, or closely fitting shelf space over, or close to, a heat duct, or in the path of heated air flow.
2. Avoid conditions of high humidity such as: outdoor patio installations where dew is a factor, near steam radiators where steam leakage is a factor, etc.
3. Avoid placement where draperies may obstruct venting. The customer should also avoid the use of decorative scarves or other coverings that might obstruct ventilation.
4. Wall- and shelf-mounted installations using a commercial mounting kit must follow the factory-approved mounting instructions. A product mounted to a shelf or platform must retain its original feet (or the equivalent thickness in spacers) to provide adequate air flow across the bottom. Bolts or screws used for fasteners must not touch any parts or wiring. Perform leakage tests on customized installations.
5. Caution customers against mounting a product on a sloping shelf or in a tilted position, unless the receiver is properly secured.
6. A product on a roll-about cart should be stable in its mounting to the cart. Caution the customer on the hazards of trying to roll a cart with small casters across thresholds or deep pile carpets.
7. Caution customers against using extension cords. Explain that a forest of extensions, sprouting from a single outlet, can lead to disastrous consequences to home and family.

# SERVICING PRECAUTIONS

**CAUTION:** Before servicing the Audio products covered by this service data and its supplements and addends, read and follow the SAFETY PRECAUTIONS.

**NOTE:** if unforeseen circumstances create conflict between the following servicing precautions and any of the safety precautions in this publication, always follow the safety precautions.

Remember Safety First :

## General Servicing Precautions

1. Always unplug the Audio products AC power cord from the AC power source before:
  - (1) Removing or reinstalling any component, circuit board, module, or any other assembly.
  - (2) Disconnecting or reconnecting any internal electrical plug or other electrical connection.
  - (3) Connecting a test substitute in parallel with an electrolytic capacitor.  
**Caution:** A wrong part substitution or incorrect polarity installation of electrolytic capacitors may result in an explosion hazard.
2. Do not spray chemicals on or near this Audio products or any of its assemblies.
3. Unless specified otherwise in this service data, clean electrical contacts by applying an appropriate contact cleaning solution to the contacts with a pipe cleaner, cotton-tipped swab, or comparable soft applicator.  
Unless specified otherwise in this service data, lubrication of contacts is not required.
4. Do not defeat any plug/socket B+ voltage interlocks with which instruments covered by this service manual might be equipped.
5. Do not apply AC power to this Audio products and / or any of its electrical assemblies unless all solid state device heat sinks are correctly installed.
6. Always connect the test instrument ground lead to an appropriate ground before connecting the test instrument positive lead. Always remove the test instrument ground lead last.

## Insulation Checking Procedure

Disconnect the attachment plug from the AC outlet and turn the power on. Connect an insulation resistance meter (500V) to the blades of the attachment plug. The insulation resistance between each blade of the attachment plug and accessible conductive parts (Note 1) should be more than 1Mohm.

**Note 1:** Accessible Conductive Parts include Metal panels, Input terminals, Earphone jacks, etc.

## Electrostatically Sensitive (ES) Devices

Some semiconductor (solid state) devices can be damaged easily by static electricity. Such components commonly are called Electrostatically Sensitive (ES) Devices. Examples of typical ES devices are integrated circuits and some field effect transistors and semiconductor chip components.

The following techniques should be used to help reduce the incidence of component damage caused by static electricity.

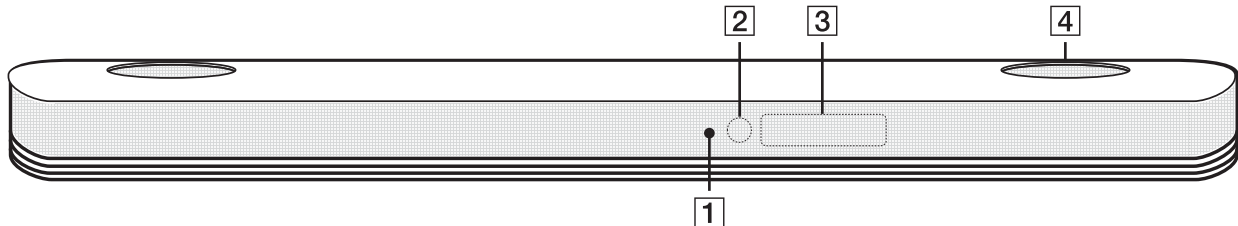
1. Immediately before handling any semiconductor component or semiconductor-equipped assembly, drain off any electrostatic charge on your body by touching a known earth ground. Alternatively, obtain and wear a commercially available discharging wrist strap device, which should be removed for potential shock reasons prior to applying power to the unit under test.
2. After removing an electrical assembly equipped with ES devices, place the assembly on a conductive surface such as aluminum foil, to prevent electrostatic charge buildup or exposure of the assembly.
3. Use only a grounded-tip soldering iron to solder or unsolder ES devices.
4. Use only an anti-static solder removal device. Some solder removal devices not classified as "anti-static" can generate electrical charges sufficient to damage ES devices.
5. Do not use freon-propelled chemicals. These can generate an electrical charge sufficient to damage ES devices.
6. Do not remove a replacement ES device from its protective package until immediately before you are ready to install it. (Most replacement ES devices are packaged with leads electrically shorted together by conductive foam, aluminum foil, or comparable conductive material).
7. Immediately before removing the protective material from the leads of a replacement ES device, touch the protective material to the chassis or circuit assembly into which the device will be installed.

**Caution:** Be sure no power is applied to the chassis or circuit, and observe all other safety precautions.

8. Minimize bodily motions when handling unpackaged replacement ES devices. (Normally harmless motion such as the brushing together of your clothes fabric or the lifting of your foot from a carpeted floor can generate static electricity sufficient to damage an ES device.)

# NAME OF EACH COMPONENT

## • Front Panel



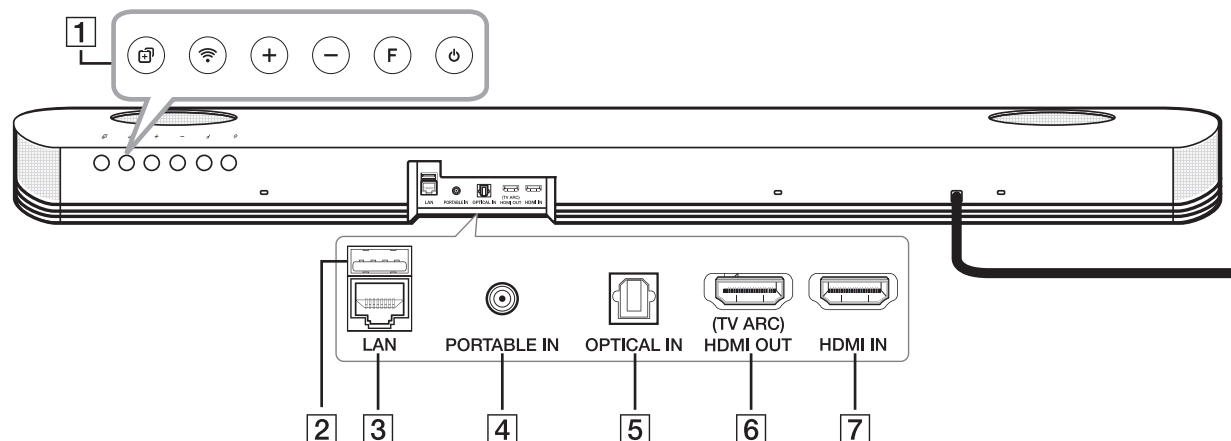
**1** LED indicator  
Shows connection status.

**2** Remote sensor

**3** Display window

**4** The buttons are located on the rear.

## • Rear Panel



**1** (Standby)

**F (Function):** Selects the function and input source. (WI-FI, OPT/HDMI ARC, BT, LG TV, HDMI IN, PORTABLE)

**- / + (Volume)**

**(Wi-Fi):** Connects initial Music Flow product to your network wirelessly.

**(Add):** Adds the additional Music Flow product to your network.  
(In case one or more Music Flow products are connected.)

**2** **USB (Service only) :** S/W download connector

**3** **LAN port**

**4** **PORTABLE IN connector**

**5** **OPTICAL IN connector**

**6** **HDMI OUT (TV ARC) :** Connect to HDMI IN (ARC) on TV.

**7** **HDMI IN**

# WIRELESS SUBWOOFER CONNECTION

## LED indicator of wireless subwoofer

LED Color	Status
Green (Blink)	The connection is trying.
Green	The connection is completed.
Red	The wireless subwoofer is in standby mode or the connection is failed.
Off (No display)	The power cord of wireless subwoofer is disconnected.

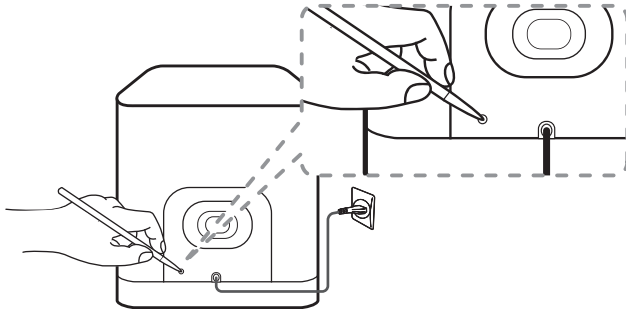
## Setting up the wireless subwoofer for the first time

1. Connect the power cord of the sound bar and the wireless subwoofer to the outlet.
2. Turn on the sound bar. The sound bar and the wireless subwoofer will be automatically connected.

## Manually pairing wireless subwoofer

When your connection is not completed, you can check red LED on the wireless subwoofer and the wireless subwoofer does not make sound. To solve the problem, follow the steps below.

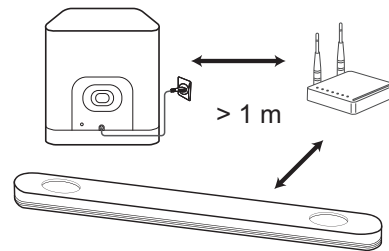
1. Press **Pairing** button on the rear of the wireless subwoofer.



- The green LED on the front of the wireless subwoofer blinks quickly.
2. Turn on the sound bar.
  3. Pairing is completed.
    - The green LED on the front of the wireless subwoofer turns on.

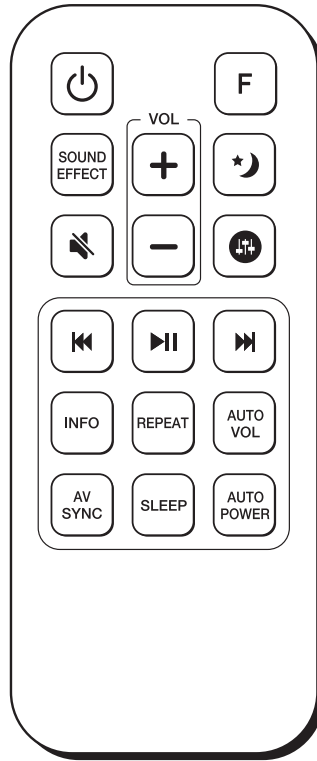
## Note:

- It takes a few seconds (and may take longer) for the main unit and the subwoofer to communicate with each other and make sounds.
- The closer the main unit and the subwoofer, the better sound quality. It is recommended to install the main unit and the subwoofer as close as possible and avoid the cases below.
  - There is an obstacle between the main unit and the subwoofer.
  - There is a device using the same frequency as this wireless connection, such as a medical device, a microwave, or a wireless LAN device.
  - Keep the sound bar and the subwoofer away from the device (ex. wireless router, microwave oven, etc.) over 1 m to prevent wireless interference.



# HIDDEN KEY MODE

HIDDEN MODE	KEYS
<b>MICOM RESET</b>	Main unit '—(Volume)' + Remote control ' <b>SOUND EFFECT</b> ' for more than 3 seconds.
<b>VERSION CHECK</b>	Main unit '—(Volume)' + Remote control '▶   (Play/Pause)' for more than 3 seconds. Next : Forward Skip / Previous : Backward Skip Exit : Power off
<b>Woofers TX Reset</b>	Main unit "MIN" (volume minimum state) + Remote control '🔇(Mute)' for about 5 seconds.
<b>Woofers RX Reset</b>	'RESET' on the woofer for 3 seconds.





# SOFTWARE UPDATE GUIDE

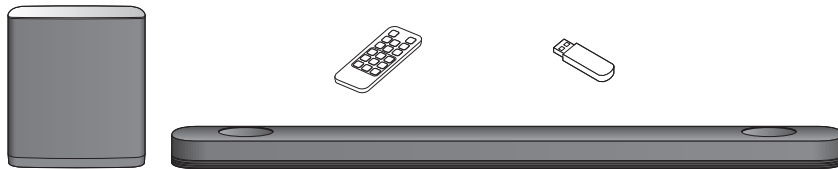
## 1. Using USB

### 1-1. Preparation

- Remote control.
- Do format USB Memory to FAT32 File system.
- USB : **Update file exist only in the USB Memory stick.**

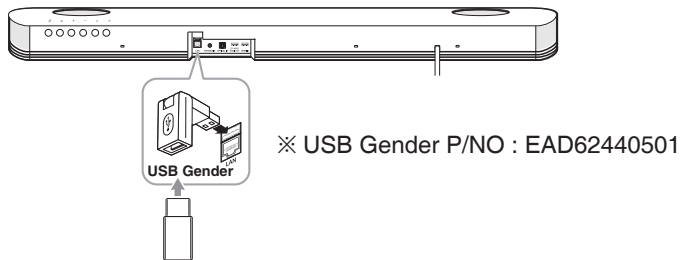
Ex ) SJ9 :

<b>MAIN</b>	⇒ E:W <b>DSP_SJ9.HEX</b> (if USB driver is E:₩)
<b>MICOM</b>	⇒ E:W <b>MICOM_SJ9.HEX</b> (if USB driver is E:₩)
<b>B/E</b>	⇒ E:W <b>LG_NB_C003M06.ROM</b> (if USB driver is E:₩)
<b>MEQ</b>	⇒ E:W <b>MEQ_SJ9.BIN</b> (if USB driver is E:₩)
<b>PEQ</b>	⇒ E:W <b>PEQ_PRG_SJ9.BIN</b> (if USB driver is E:₩)
<b>HDMI</b>	⇒ E:W <b>HDMI_SJ9.BIN</b> (if USB driver is E:₩)
<b>WIRELESS(TX)</b>	⇒ E:W <b>WIRELESS_TX.bin</b> (if USB driver is E:₩)
<b>WIRELESS(RX)</b>	⇒ E:W <b>WIRELESS_RX.bin</b> (if USB driver is E:₩)

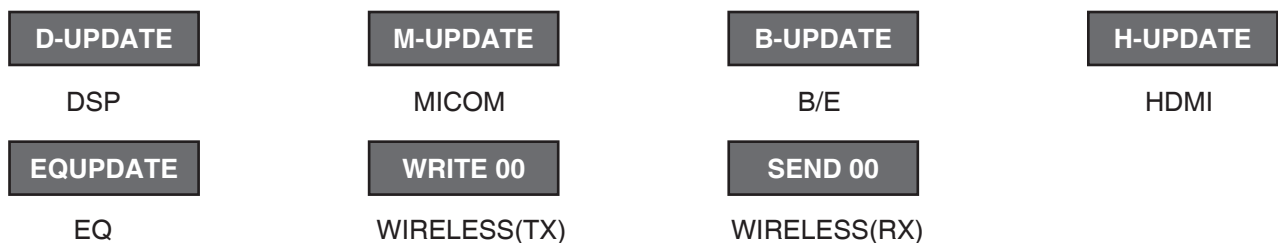


### 1-2. Update

- 1) Power on.
- 2) Insert USB.
  - When connecting USB to the main unit, you can connect easily using USB Gender.



- 3) When display "**UPDATE**" on LCD, press play/pause key on remote control and proceed update.
- 4) Never remove USB or AC cord while updating.
- 5) During the update, LCD is displayed as like below.

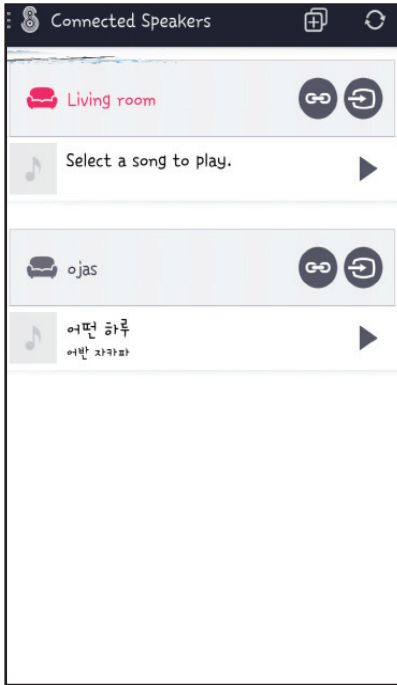


- 6) After update finish, power will be off automatically.

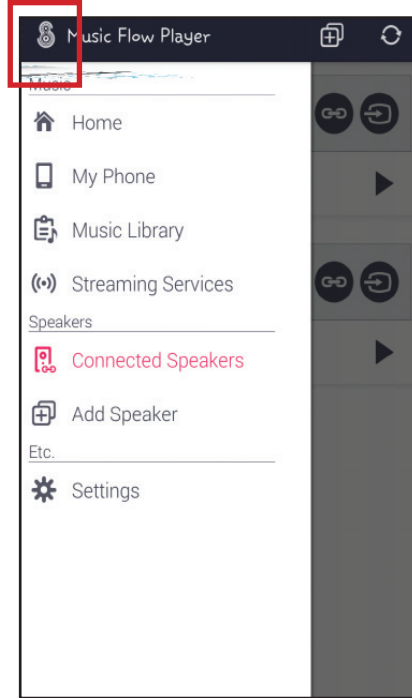
## 2. Using APP

Power on Smart Audio and implement Music Flow App in your smart phone.

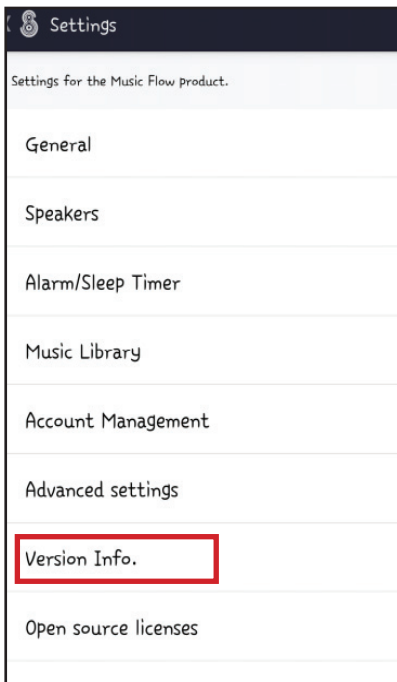
### 1) Connect Speaker.



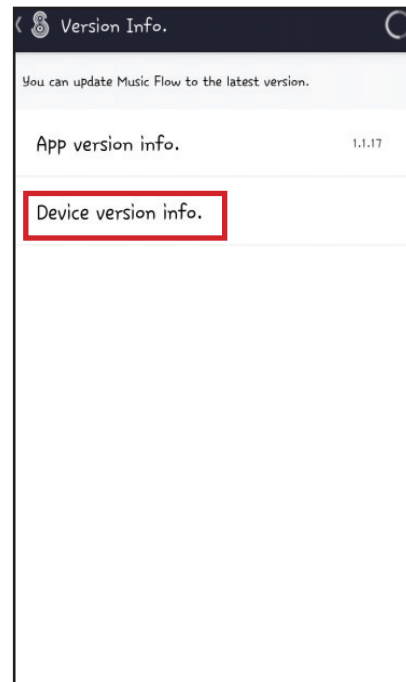
### 2) Select red box.



### 3) Settings -> Version Info.

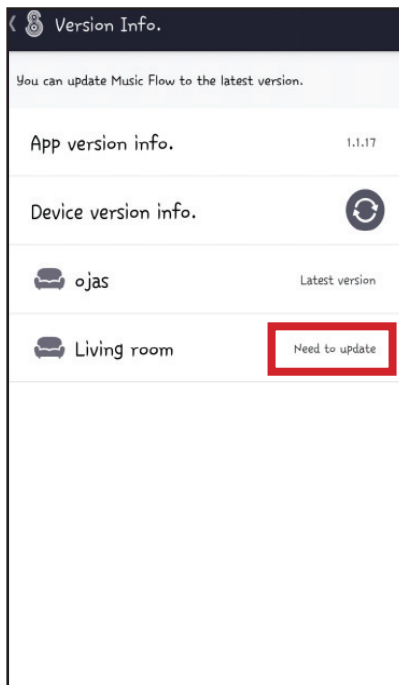


### 4) Select Device version info.

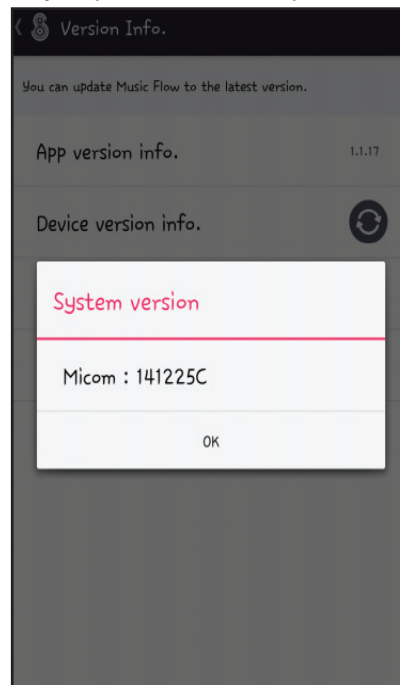


## Using APP

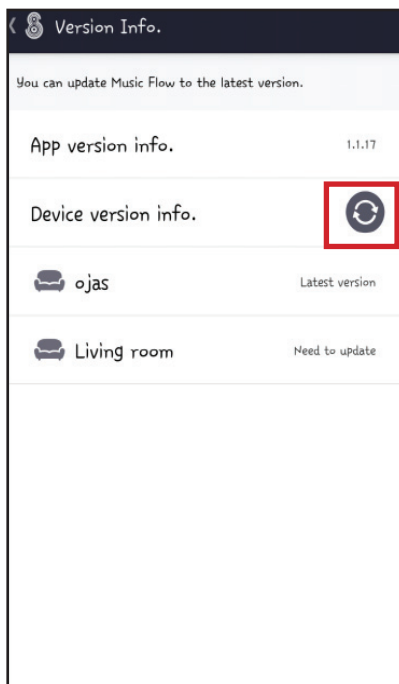
5) Display “Need to update” if there are new firmware in the server.



※ Display new version info if you press “Need to update”.

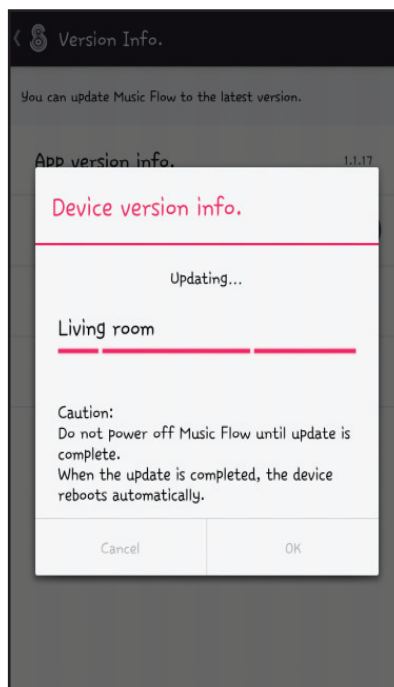
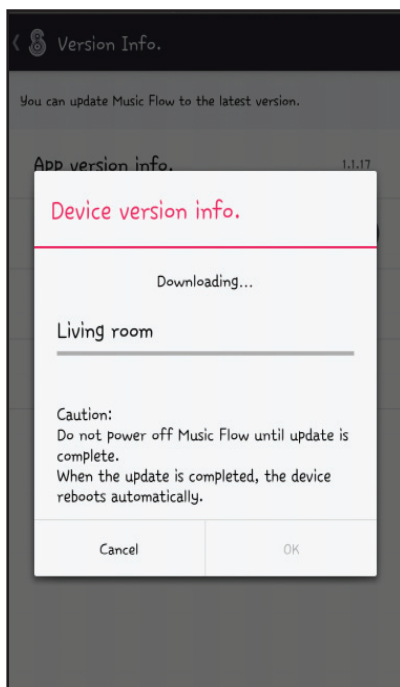


6) Start Update below icon.



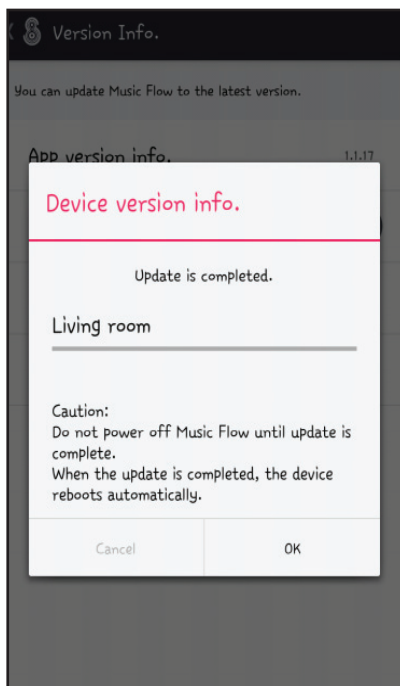
# Using APP

## 7) Display update info.



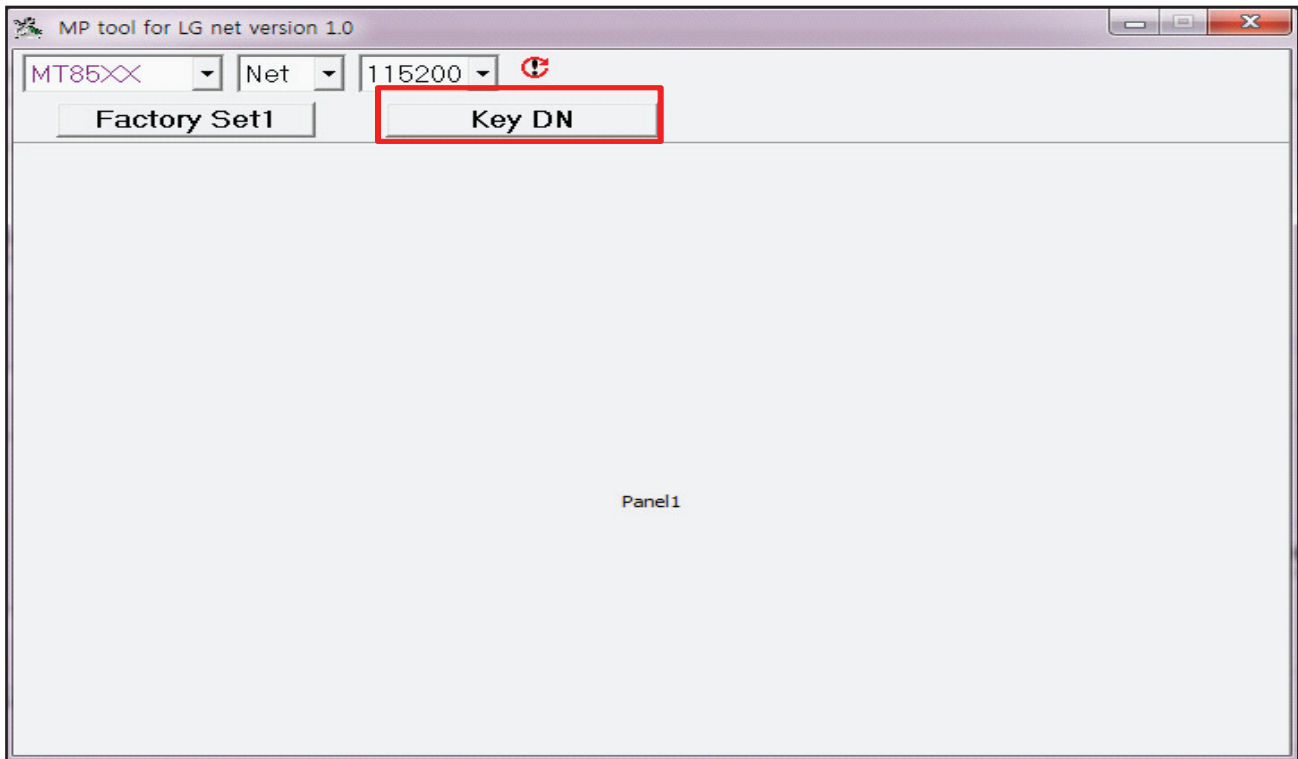
※ Do not power off during update.

## 8) Display “Update is completed” message when Complete update.

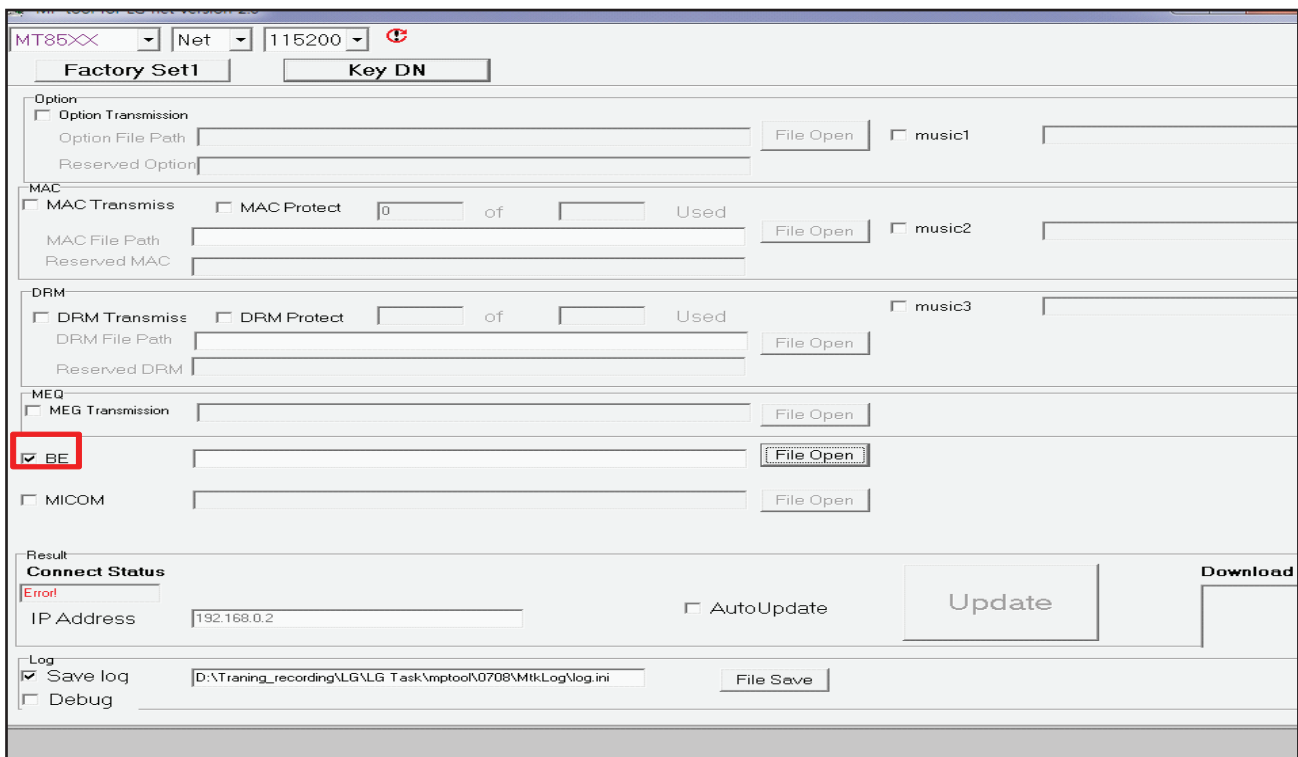


### 3. Using MP tool

- 1) Open MP tool and select "Key DN".



- 2) Check the section for download and open download file.



## Using MP tool

3) Connect PC and SET by cross LAN cable.

PC IP setting

IP: 192.168.0.1

Subnet: 255.255.254.0

Gateway: 10.168.0.1

4) Set power on.

5) Connect LAN cable to Set and then Press "ADD" key within 3 seconds after connect the LAN.  
(Please connect the LAN when blinking WiFi-LED after booting)

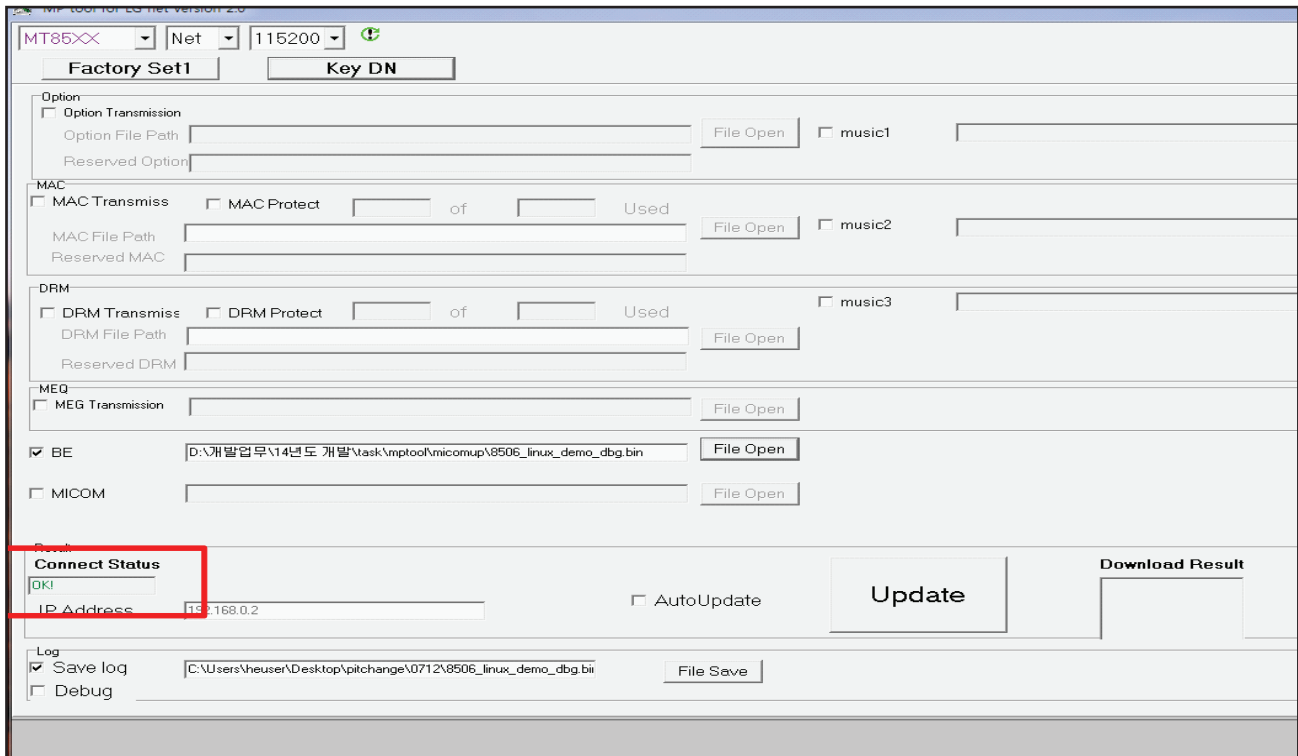
\*Download file name

B/E : **LG\_NB\_C003M06.ROM**

MICOM : **MICOM\_SJ9.HEX**

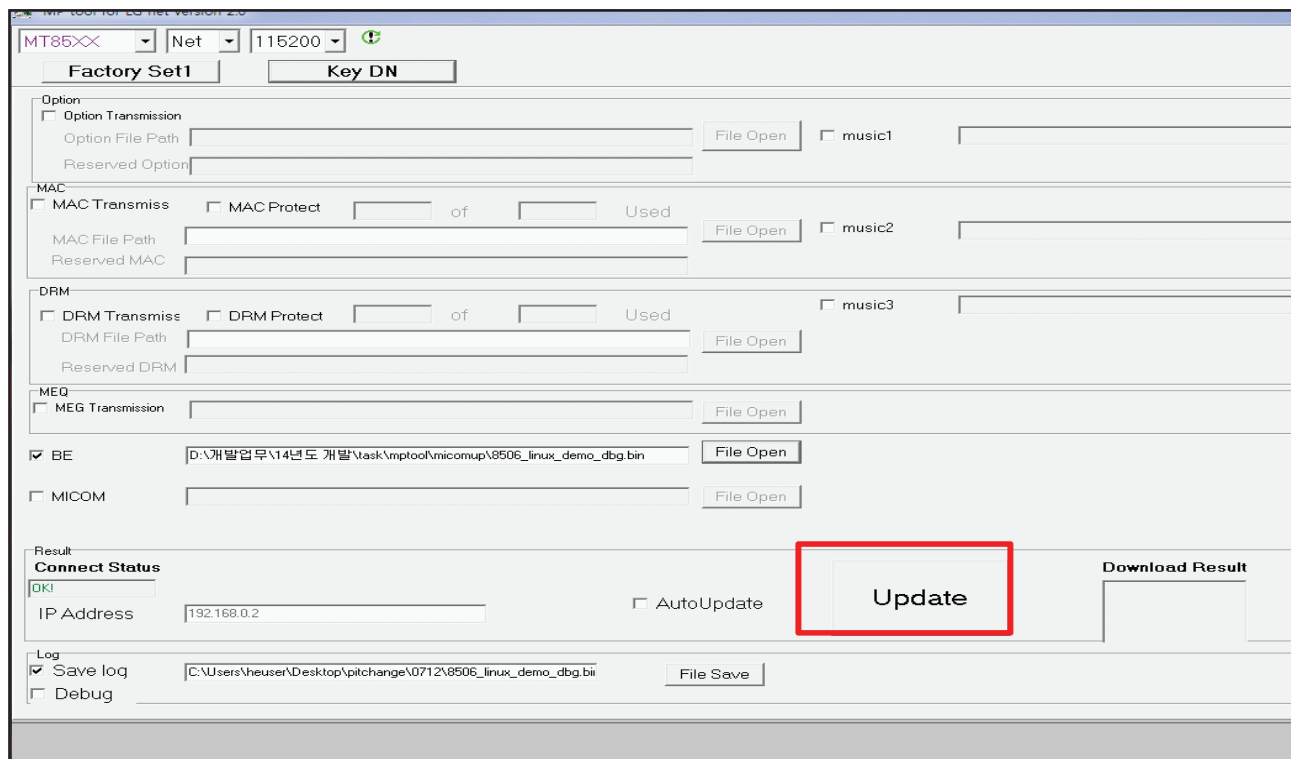
※ Caution : Do not you update the B/E program and MICOM program at the same time.

6) Connect Status change "OK!" if success connect MP tool.

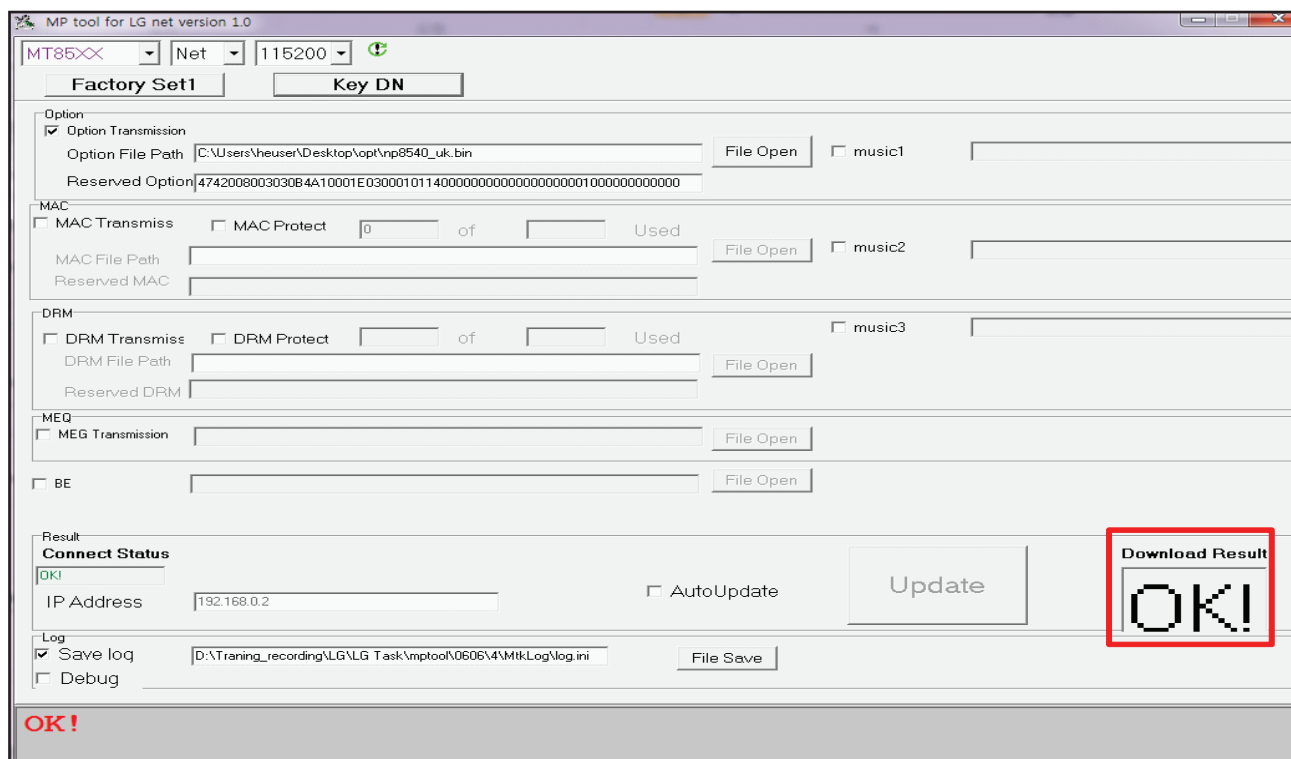


## Using MP tool

7) Press "Update" button.

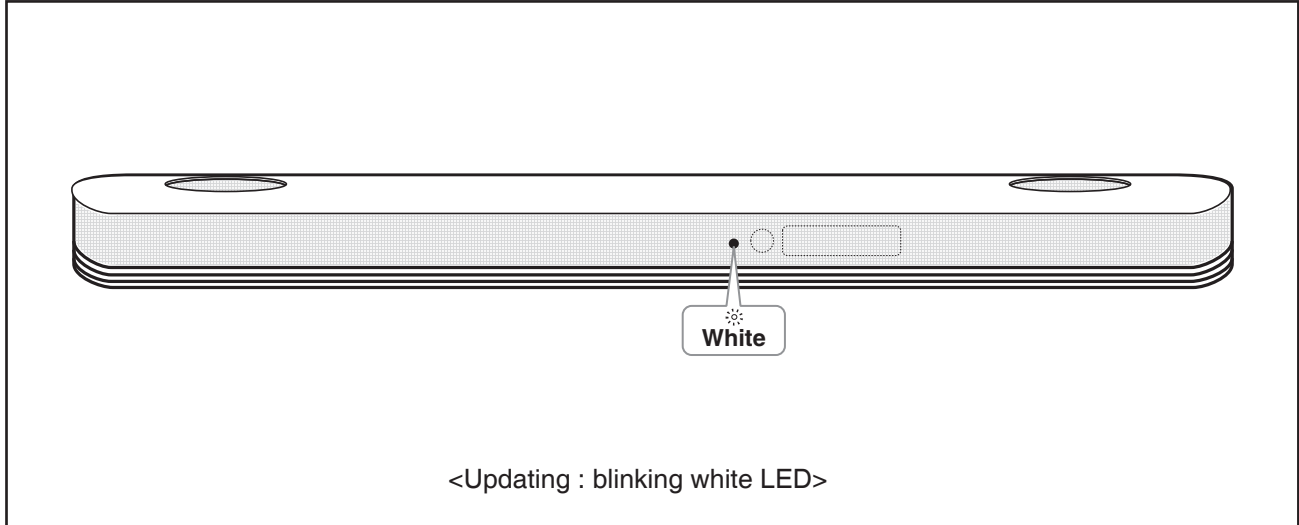


8) Download result display "OK!" if start download.



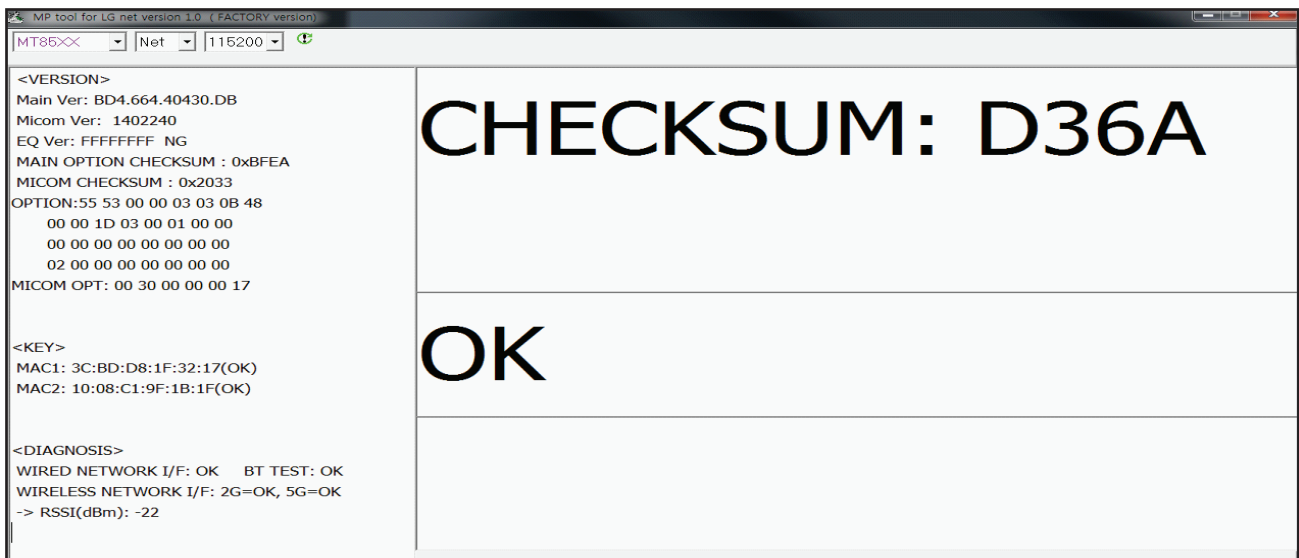
## Using MP tool

9) You can identify update status by network indicator lamp.



### 3-1. Version check

- 1) PC IP setting  
IP: 192.168.0.1  
Subnet: 255.255.254.0  
Gateway: 10.168.0.1
- 2) Open MP tool.
- 3) Set power on.
- 4) Press "ADD" button after connect LAN cable.
- 5) Display the version in the tool.





# SPECIFICATIONS

## • GENERAL

Power requirements	Refer to the main label on the unit.
Power consumption	Refer to the main label on the unit.
Dimensions (W x H x D)	Approx. 1200 mm x 58 mm x 145 mm (with foot)
Operating temperature	5 °C to 35 °C
Operating humidity	5 % to 90 %
Available Digital Input Audio	
Sampling Frequency	32 kHz, 44.1 kHz, 48 kHz, 88.2 kHz, 96 kHz
Available Digital Input Audio format	Dolby Atmos, Dolby Audio, DTS Digital Surround, PCM

## • INPUT/OUTPUT

OPTICAL IN	3 V (p-p), Optical jack x 1
PORTABLE IN	0.5 Vrms (3.5 mm stereo jack) x 1
HDMI IN	19 Pin (Type A, HDMI™ connector) x 1
HDMI OUT	19 Pin (Type A, HDMI™ connector) x 1
	4K Sources dependent on HDCP 2.2 are supported at 4K resolutions.

## • AMPLIFIER (RMS Output)

Total	500 W RMS
Front	43 W RMS x 2 (4 Ω at 1 kHz, THD 10%)
Center	43 W RMS (4 Ω at 1 kHz, THD 10%)
Surround	43 W RMS x 2 (4 Ω at 1 kHz, THD 10%)
Top	43 W RMS x 2 (4 Ω at 1 kHz, THD 10%)
Subwoofer	200 W RMS (3 Ω at 80 Hz, THD 10%)

## • WIRELESS SUBWOOFER

Power requirements	Refer to the main label on the subwoofer.
Power consumption	Refer to the main label on the subwoofer.
Type	1 Way 1 Speaker
Impedance	3 Ω
Rated Input Power	200 W RMS
Max. Input Power	400 W RMS
Dimensions (W x H x D)	Approx. 296 mm x 332 mm x 296 mm

## • SYSTEM

LAN port	Ethernet jack x 1, 10 BASE-T/100 BASE-TX
Wireless LAN (Internal antenna)	Integrated IEEE 802.11n (Draft 2.0) wireless networking access, compatible with 802.11a/b/g/n Wi-Fi networks.

- Designs and specifications are subject to change without prior notice.

# SECTION 2

## CABINET & MAIN CHASSIS

### CONTENTS

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# DISASSEMBLY INSTRUCTIONS

## 1. HOW TO DISASSEMBLE THE MAIN UNIT

※ Before begin, position the Main Unit upside down.

### 1-1. Case Bottom Assembly

- 1) Remove the 36 screws.
- 2) Remove the Case Bottom Assembly.

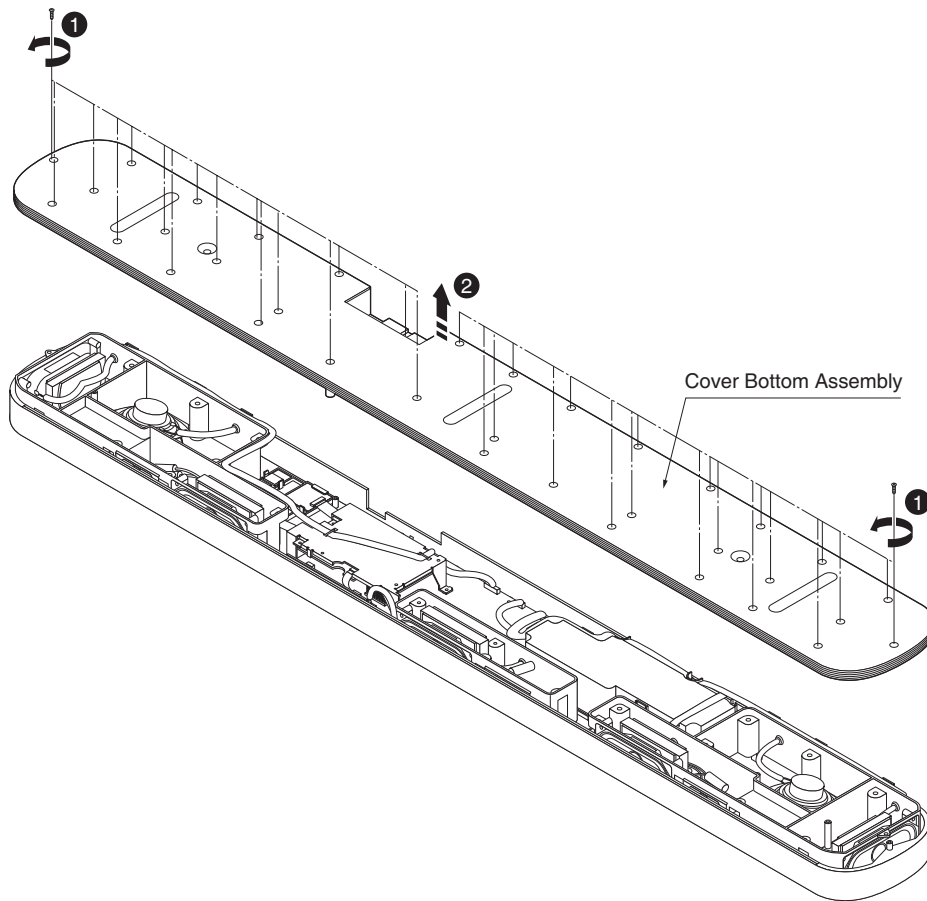


Figure 1-1

## HOW TO DISASSEMBLE THE MAIN UNIT

### 1-2. Cover SMPS

1) Disconnect the 3 SPK cables from the Main PCB.

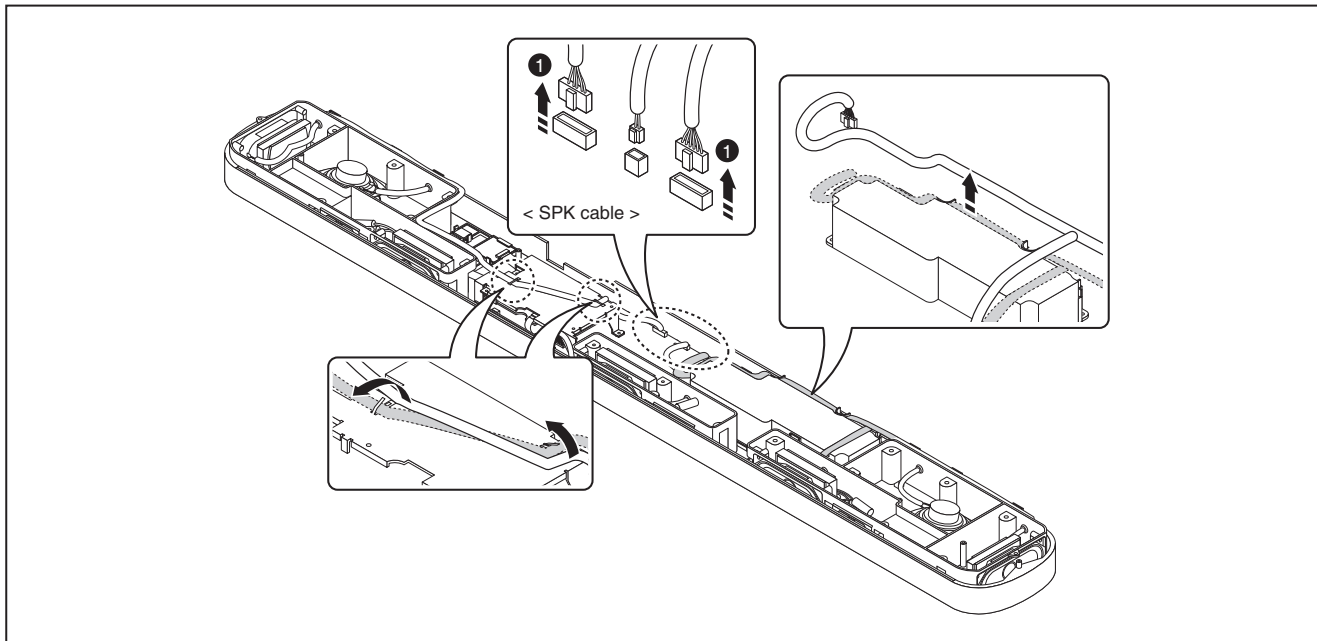


Figure 1-2 (1)

2) Remove the 4 screws.

3) Remove the Cover SMPS.

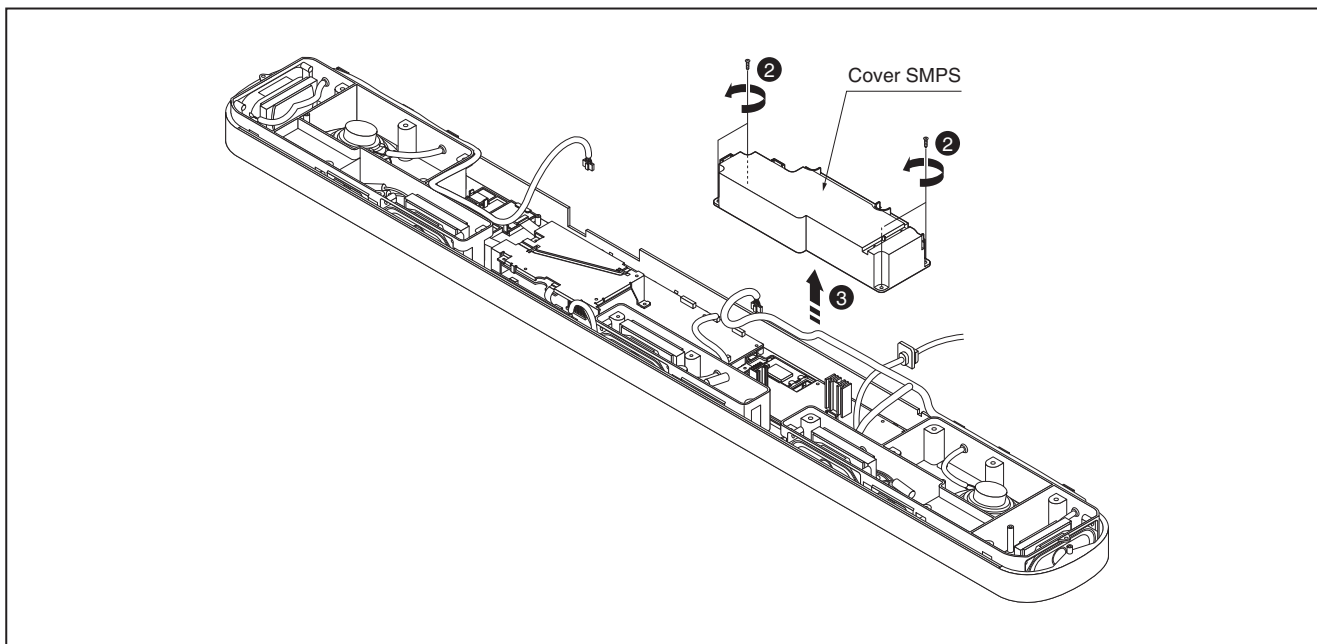


Figure 1-2 (2)

# HOW TO DISASSEMBLE THE MAIN UNIT

## 1-3. Main Chassis Assembly

1) Disconnect the 3 cables from the Main PCB. (KEY, BT and WIRELESS)

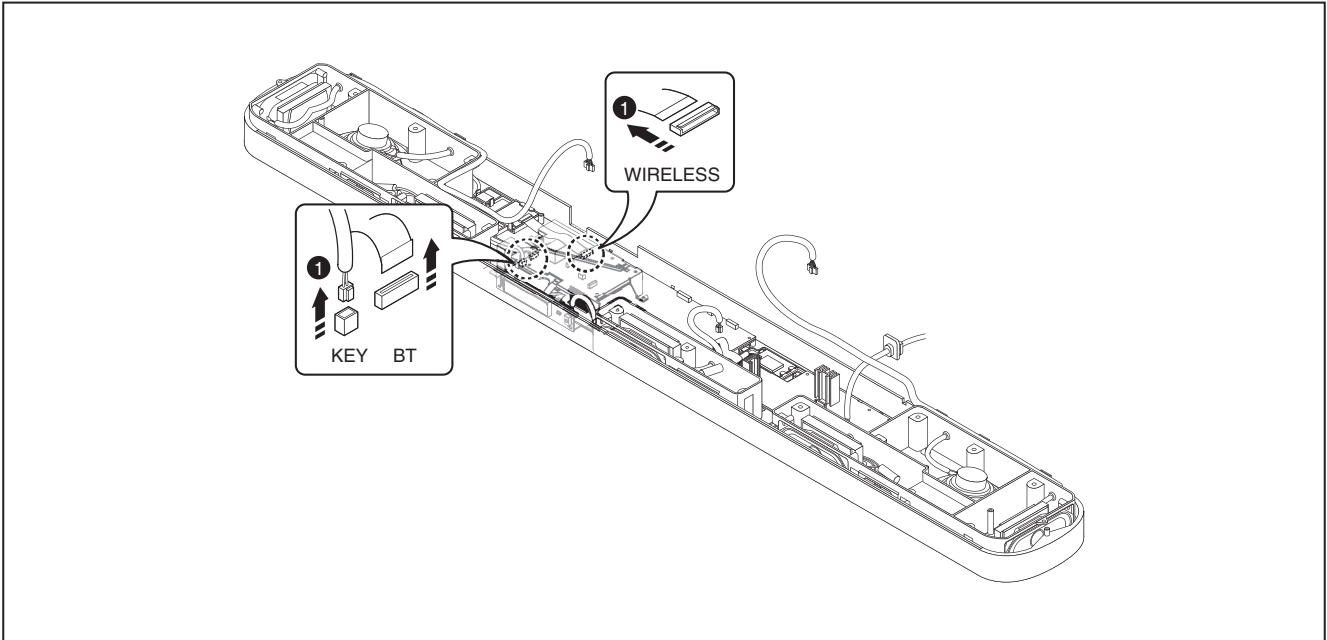


Figure 1-3 (1)

2) Remove the 3 screws.

3) Remove the Main Chassis Assembly. (Main Chassis + PCBA)

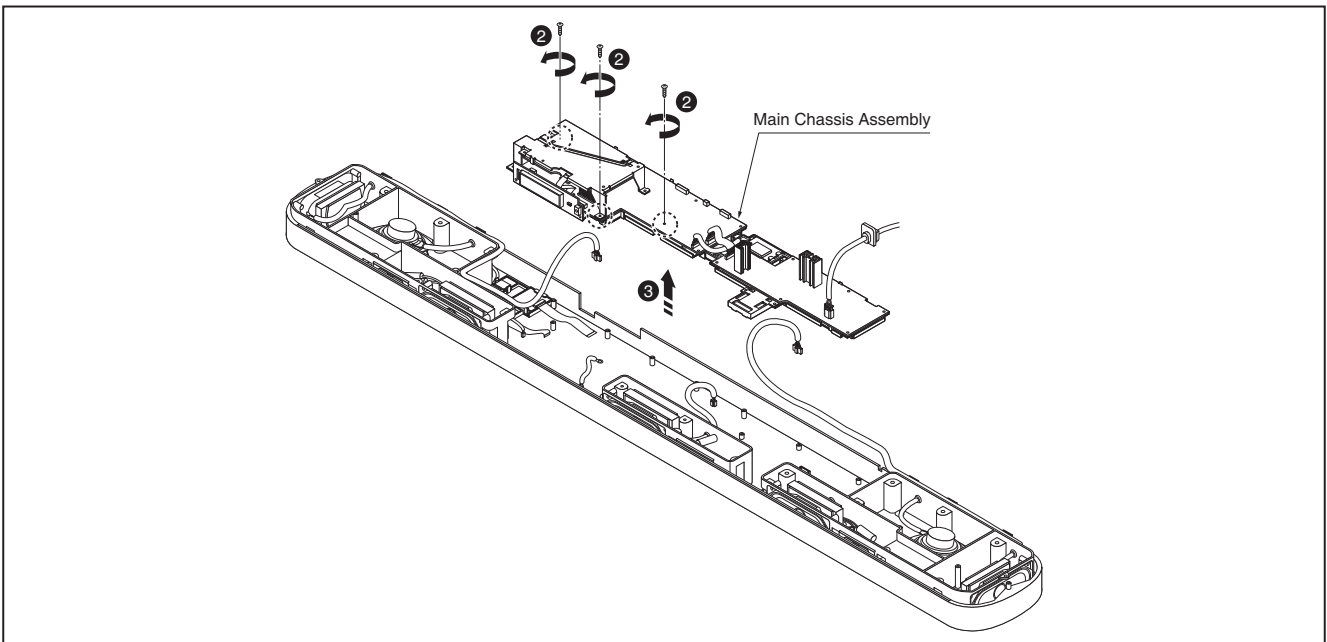


Figure 1-3 (2)

# HOW TO DISASSEMBLE THE MAIN UNIT

## 1-3-1. Front PCB Assembly

- 1) Remove the 2 screws.
- 2) Remove the Front PCB Assembly.

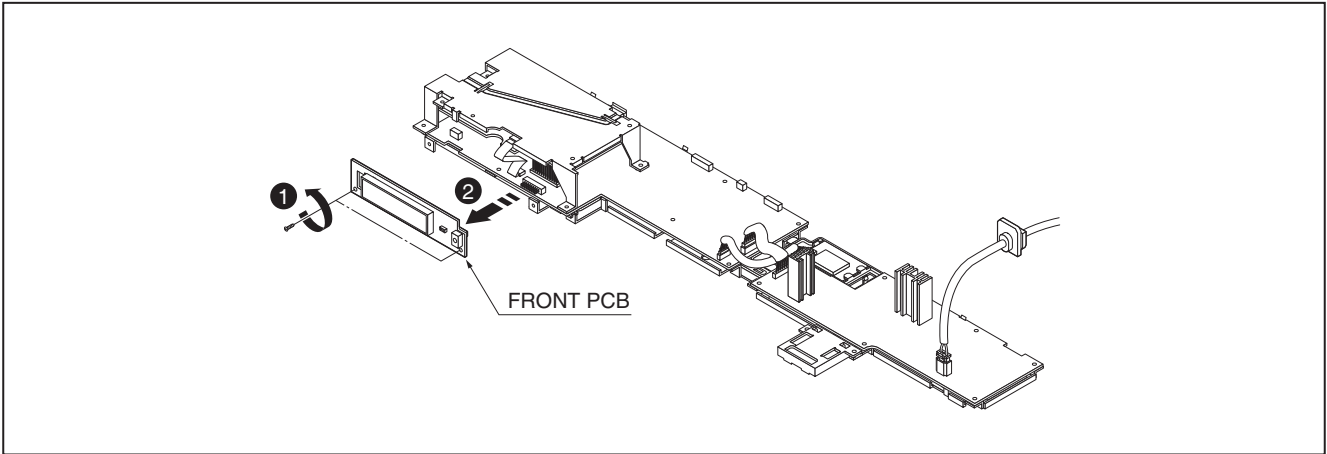


Figure 1-3-1

## 1-3-2. JACK PCB Assembly

- 1) Disconnect the cable.
- 2) Remove the 2 screws.
- 3) Remove the JACK PCB Sub Assembly.
- 4) Remove the 6 screws.
- 5) Remove the JACK PCB Assembly.

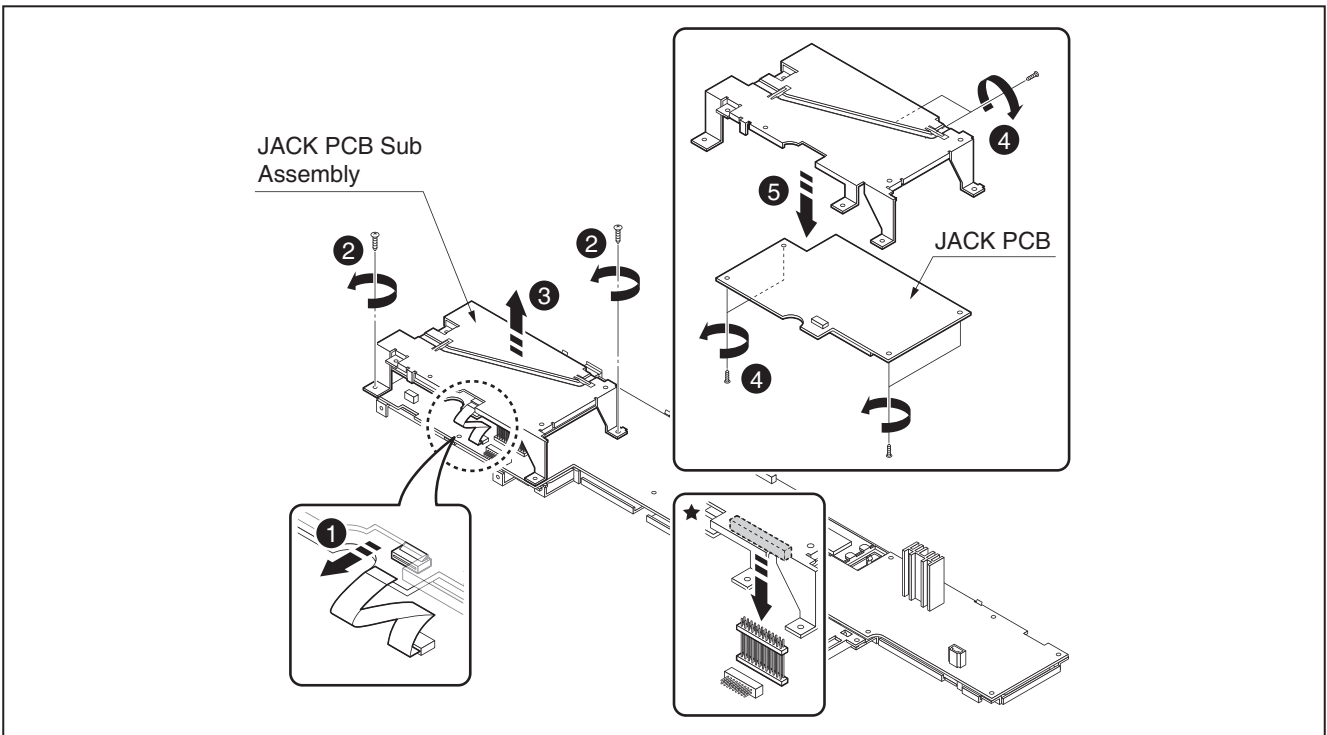


Figure 1-3-2

## HOW TO DISASSEMBLE THE MAIN UNIT

### 1-3-3. SMPS PCB Assembly

- 1) Disconnect the 2 cables.
- 2) Remove the screw.
- 3) Remove the SMPS PCB Assembly.

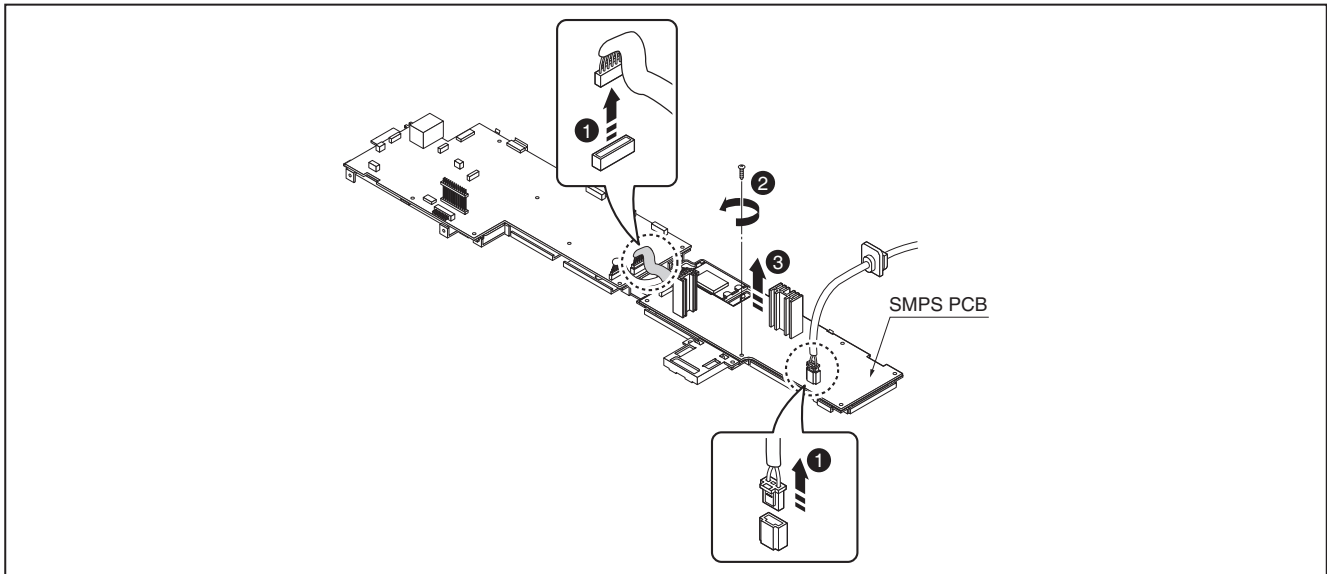


Figure 1-3-3

### 1-3-4. MAIN PCB Assembly

- 1) Disconnect the cables.
- 2) Remove the screw.
- 3) Remove the MAIN PCB Assembly.

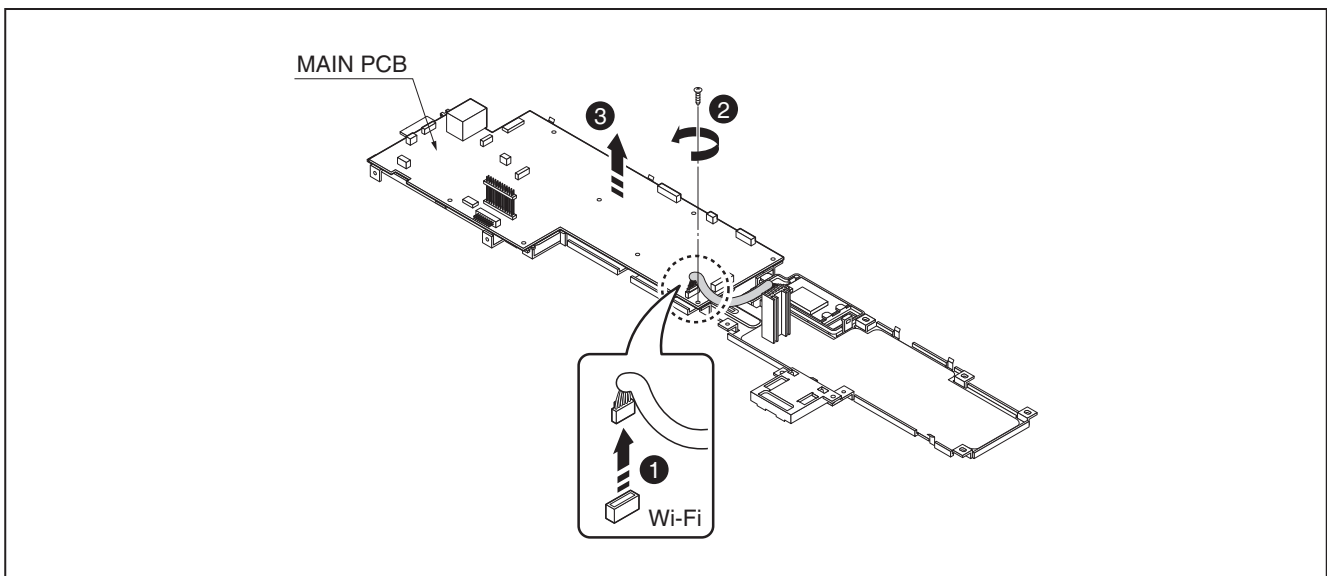


Figure 1-3-4

## HOW TO DISASSEMBLE THE MAIN UNIT

### 1-3-5. Wi-Fi Module

- 1) Remove the screw.
- 2) Remove the Wi-Fi holder.
- 3) Remove the Wi-Fi module.
- 4) Disconnect the cable.

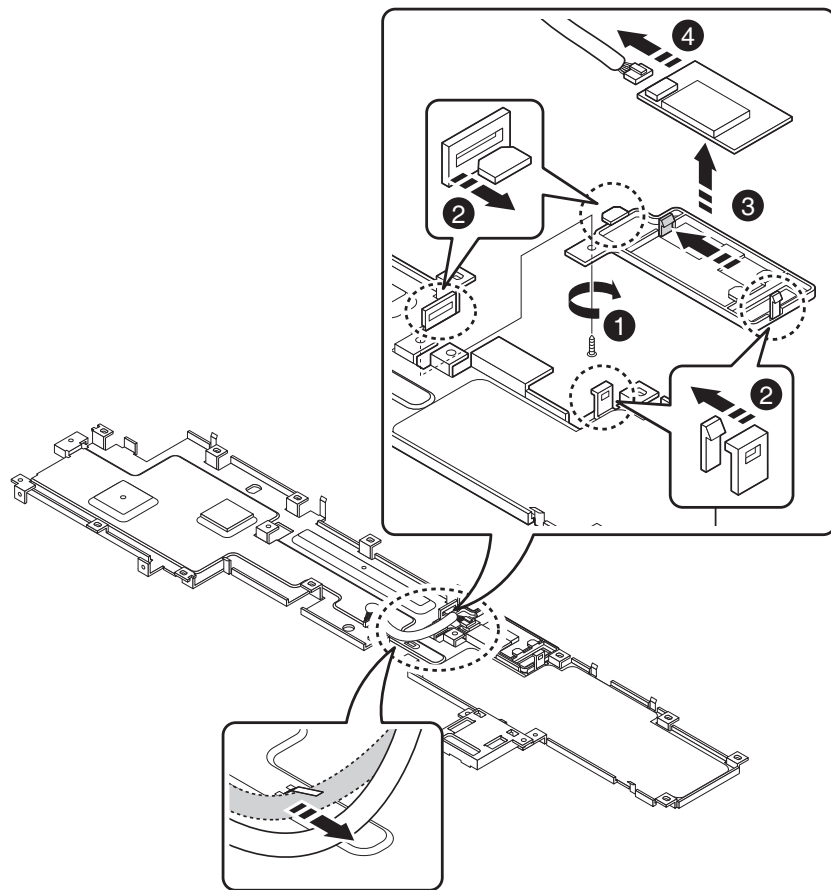


Figure 1-3-5



## HOW TO DISASSEMBLE THE MAIN UNIT

### 1-4. BT and WIRELESS Module

- 1) Disconnect the FFC cable from the BT module.
- 2) Disconnect the 2 hooks and then remove the BT module.
- 3) Disconnect the FFC cable from the WIRELESS module.
- 4) Disconnect the 2 hooks and then remove the WIRELESS module.

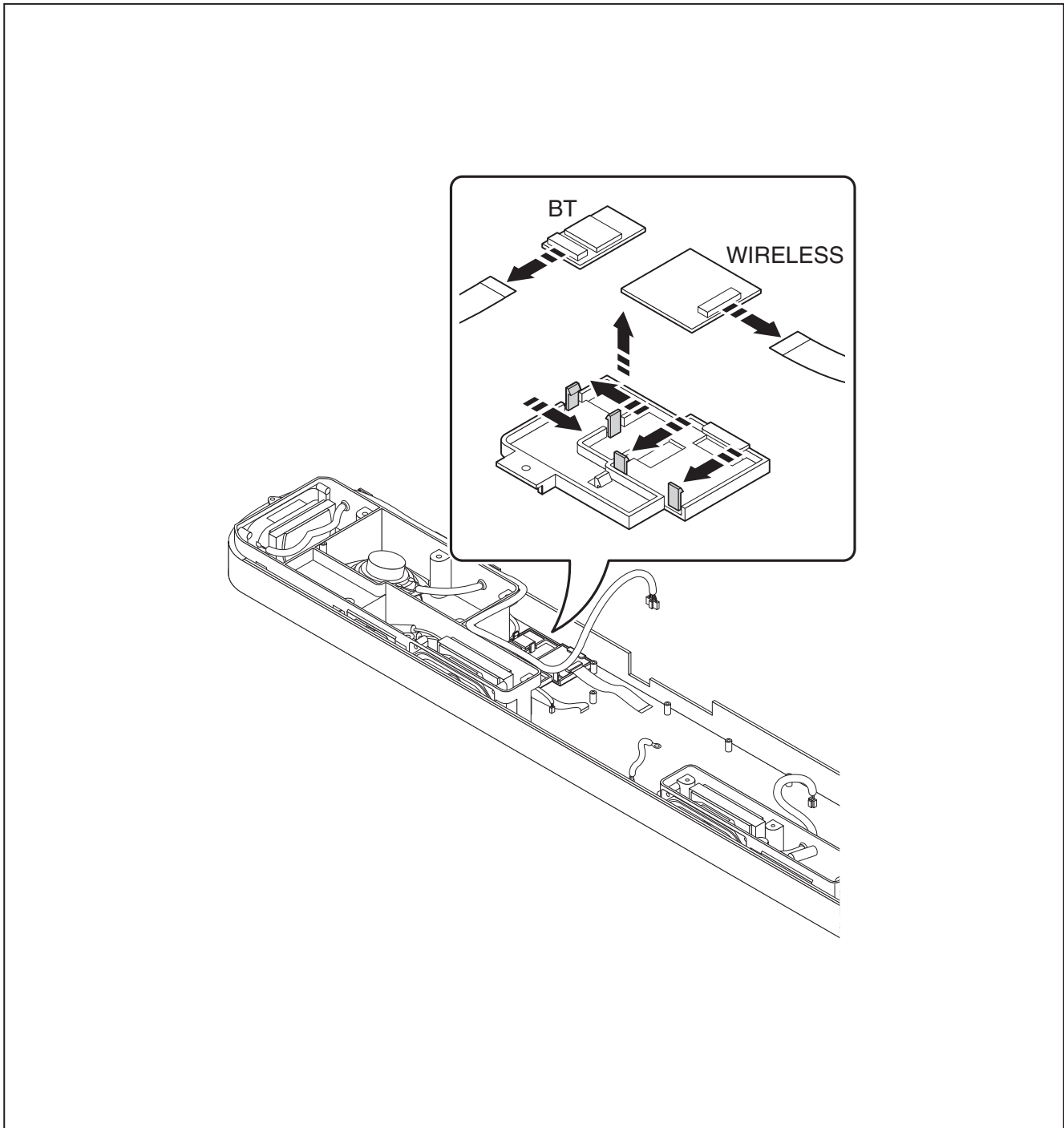


Figure 1-4

## HOW TO DISASSEMBLE THE MAIN UNIT

### 1-5. SPEAKER CHAMBER Assembly

- 1) Remove the Speaker Chamber Assembly.

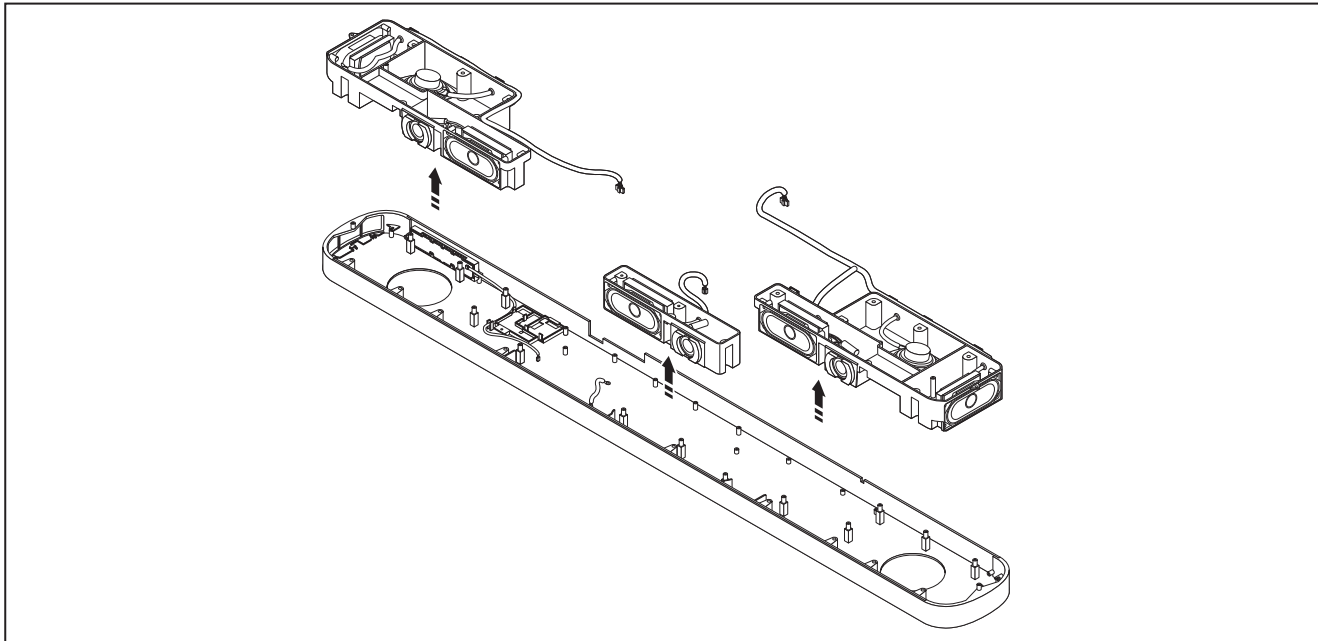


Figure 1-5

### 1-6. KEY PCB Assembly

- 1) Remove the 2 screws.
- 2) Disconnect the 5 hooks and then remove the KEY PCB Assembly.

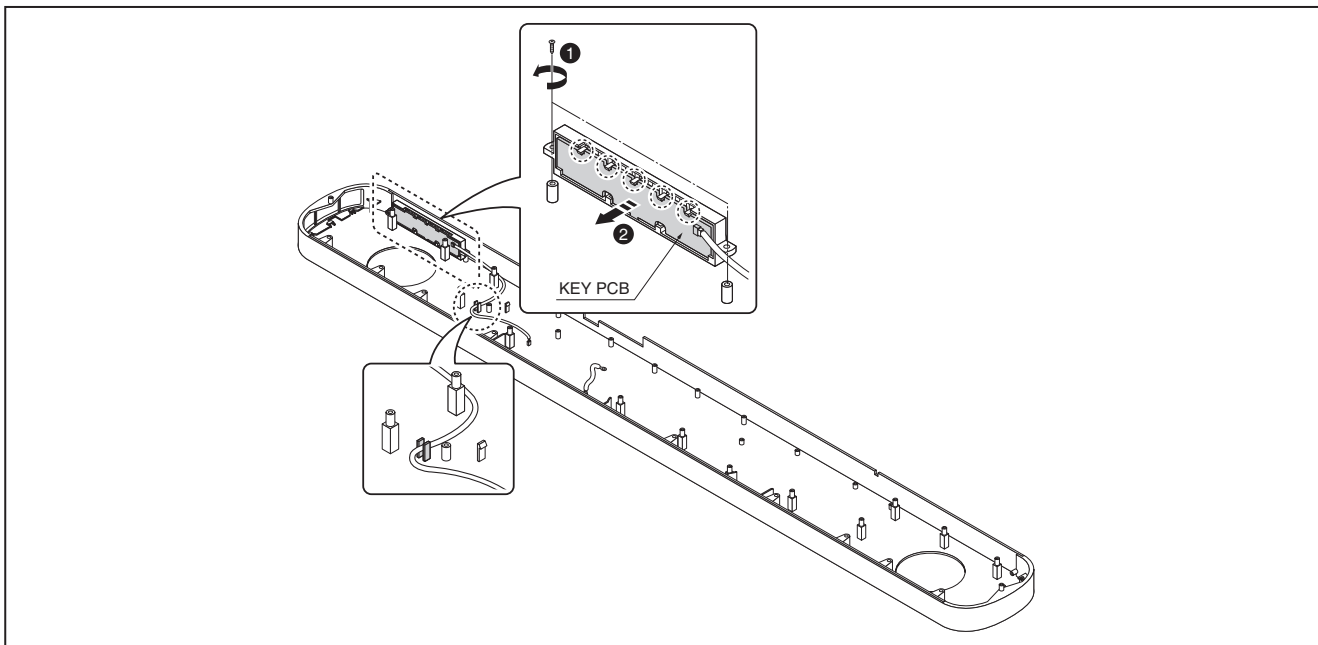


Figure 1-6

## HOW TO DISASSEMBLE THE MAIN UNIT

### 1-7. How to organize cables

When assembling, place the SPK network cables as shown in the figure below.

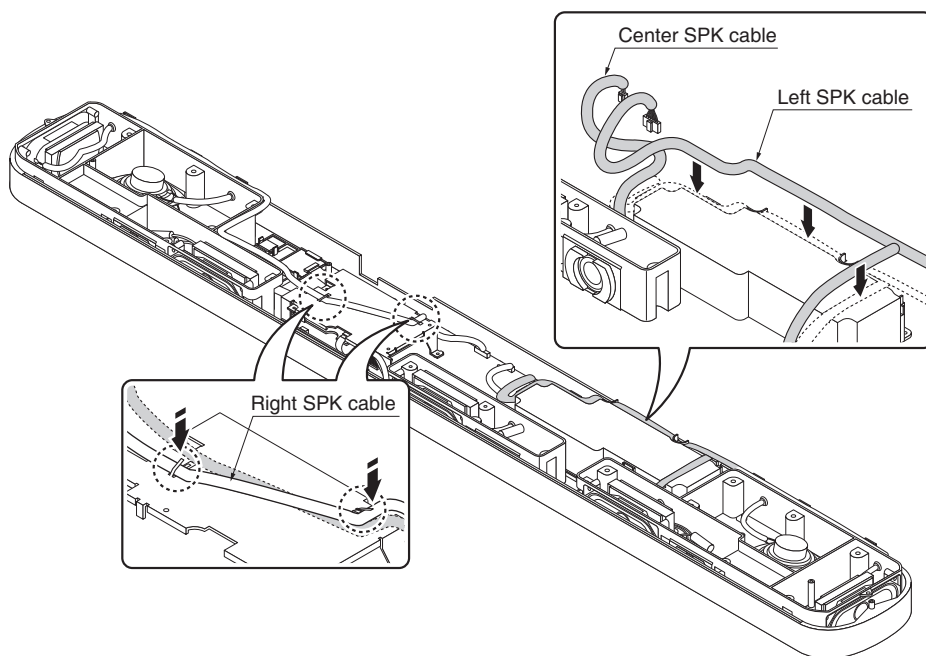


Figure 1-7

## 2. HOW TO DISASSEMBLE THE SUBWOOFER

### 2-1. Sub-Woofer Board Assembly

- 1) Remove the 4 Foot Rubbers.
- 2) Remove the 8 screws.

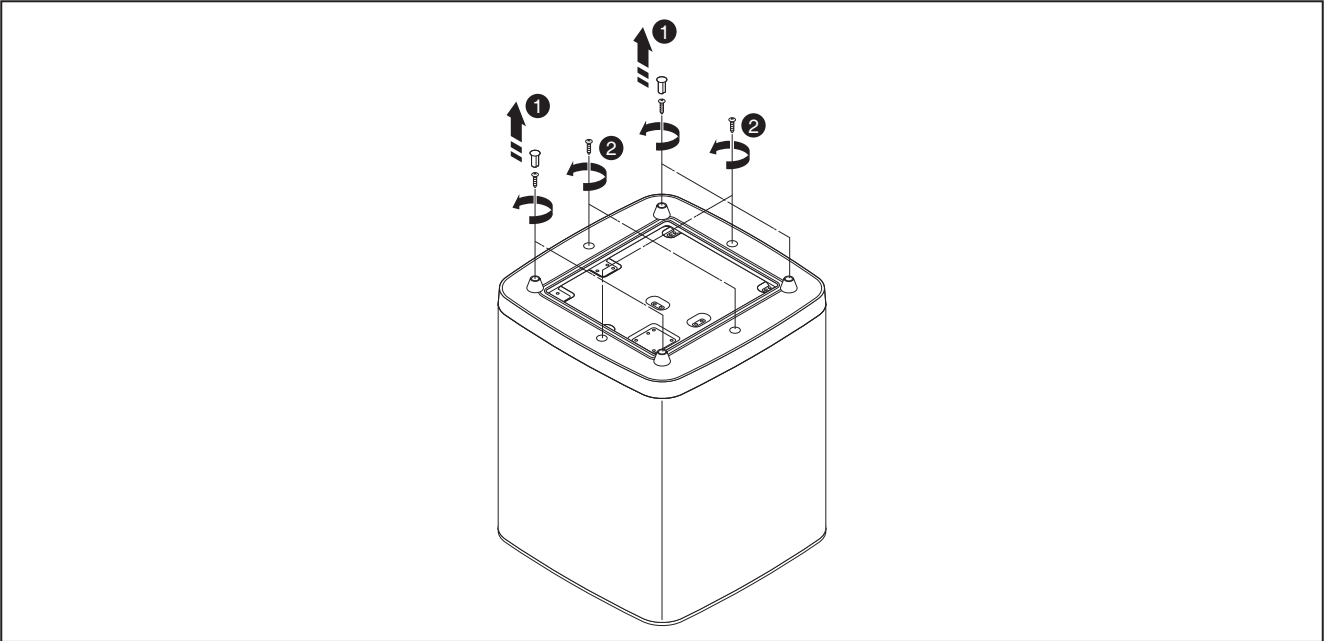


Figure 2-1 (1)

- 3) Pull out the Sub-Woofer Board Assembly and disconnect the SPK cable.

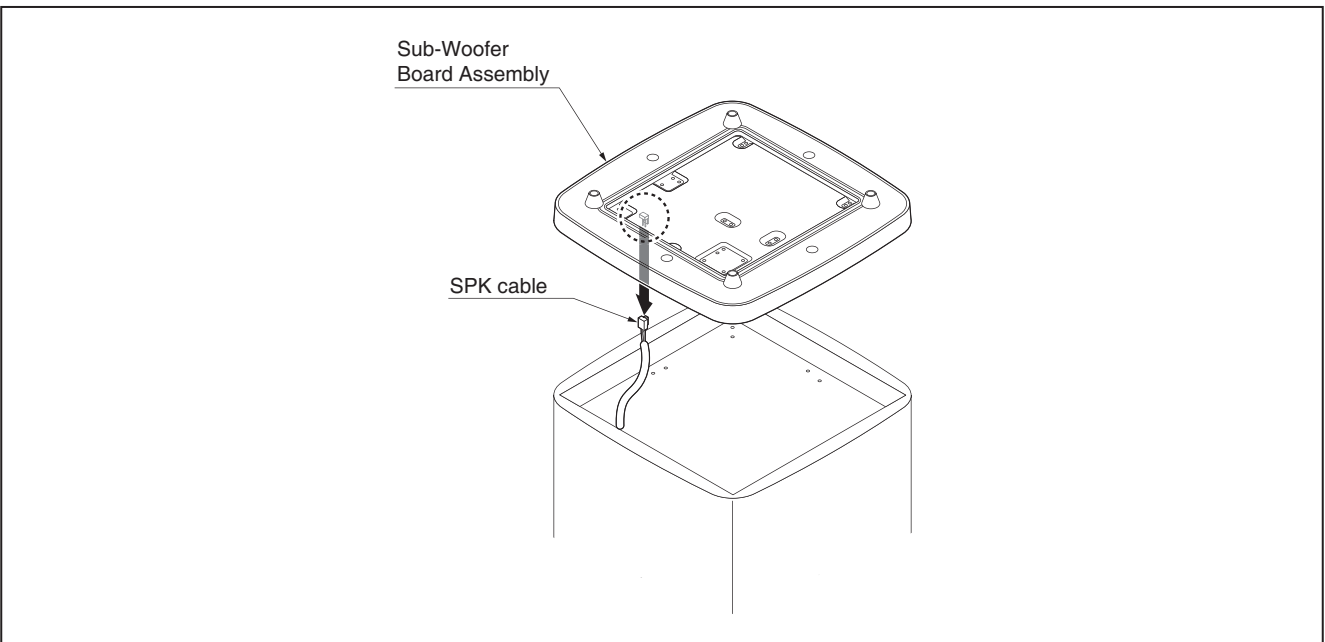


Figure 2-1 (2)

## HOW TO DISASSEMBLE THE SUBWOOFER

### 2-2. SMPS PCB Assembly

- 1) Disconnect the 2 cables. (AMP and Power cord)
- 2) Remove the 4 screws.
- 3) Remove the SMPS PCB Assembly.

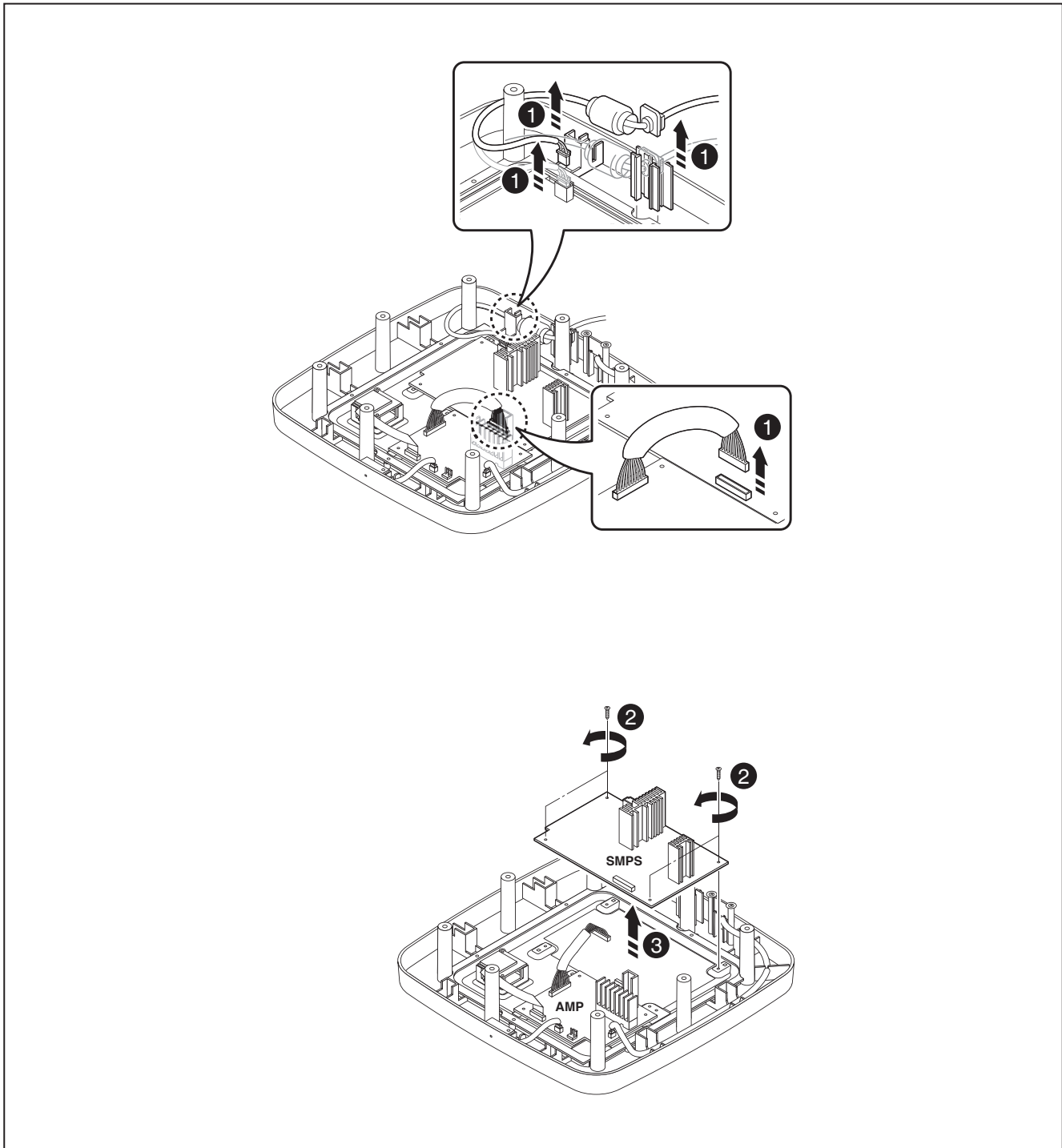


Figure 2-2

## HOW TO DISASSEMBLE THE SUBWOOFER

### 2-3. AMP PCB Assembly

1) Disconnect the 3 cables. (WIRELESS, LED and KEY)

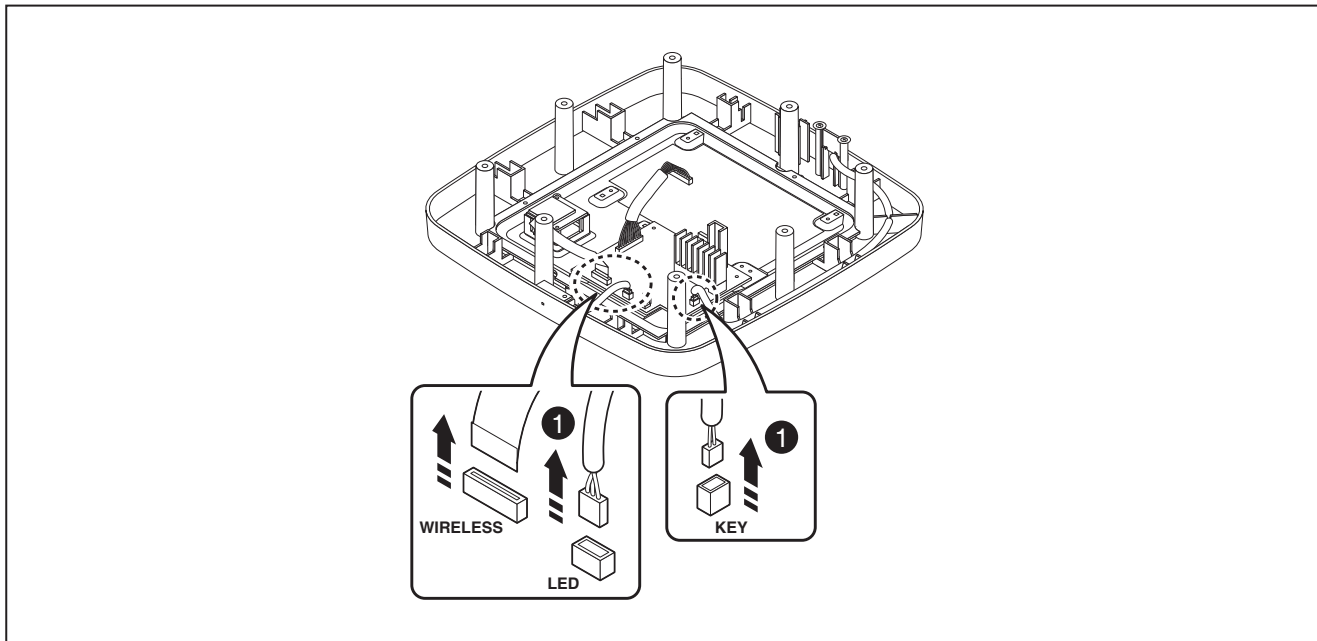


Figure 2-3 (1)

2) Remove the 4 screws.

3) Remove the AMP PCB Assembly.

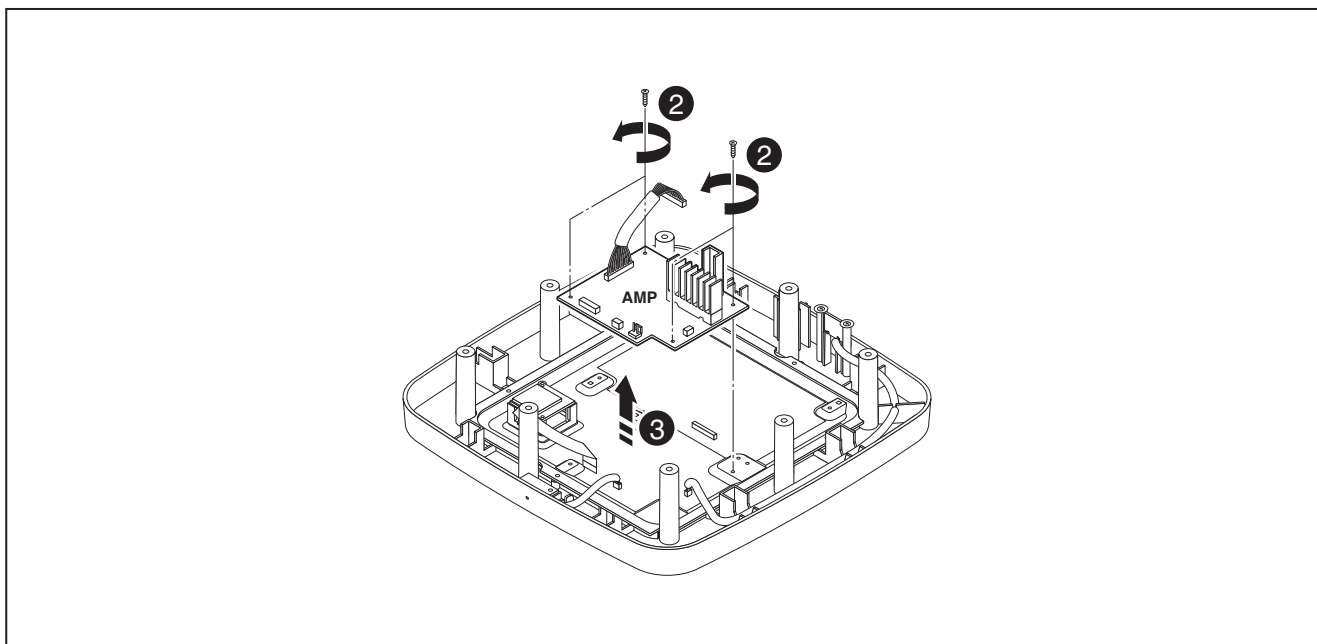


Figure 2-3 (2)

## HOW TO DISASSEMBLE THE SUBWOOFER

### 2-4. WIRELESS Module

- 1) Remove the 2 screws.
- 2) Remove WIRELESS module.
- 3) Disconnect the cable.

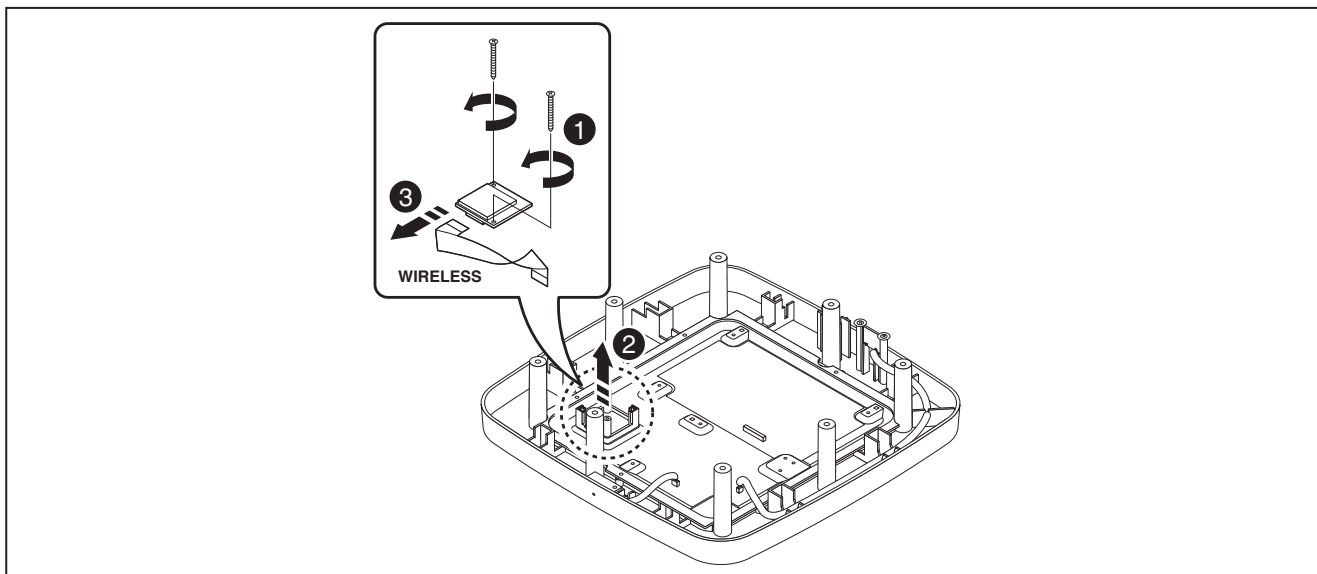


Figure 2-4

### 2-5. LED PCB Assembly

- 1) Remove the 2 screws.
- 2) Remove LED PCB Assembly.
- 3) Disconnect the cable.

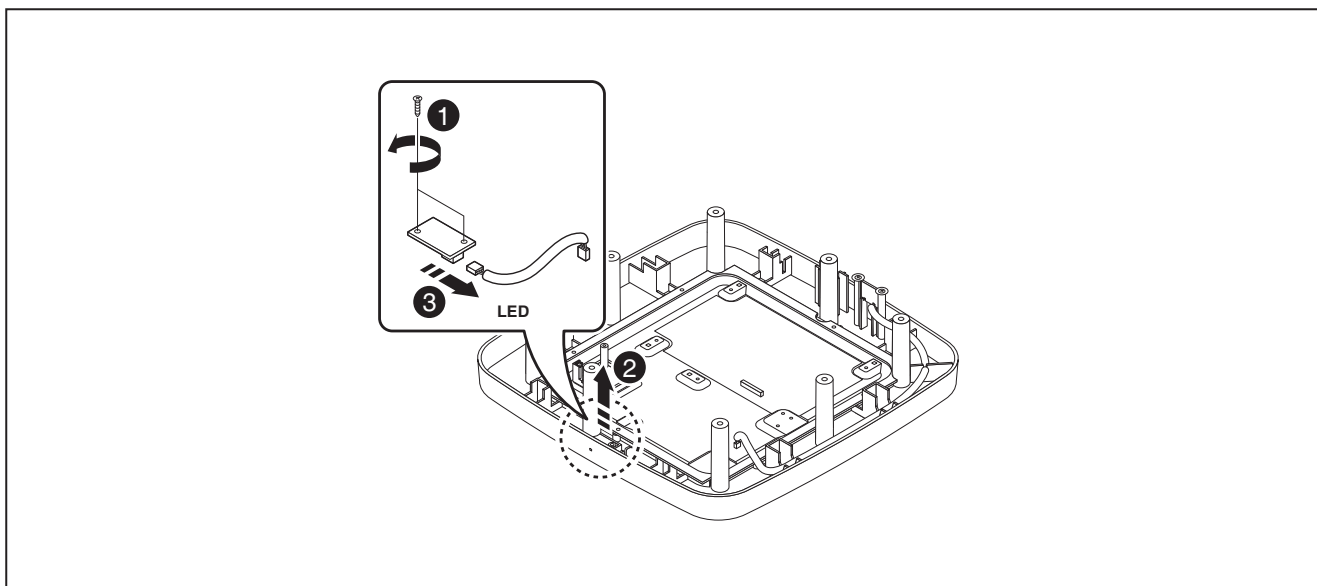


Figure 2-5

## HOW TO DISASSEMBLE THE SUBWOOFER

### 2-6. KEY PCB Assembly

- 1) Remove the 2 screws.
- 2) Remove KEY PCB Assembly.

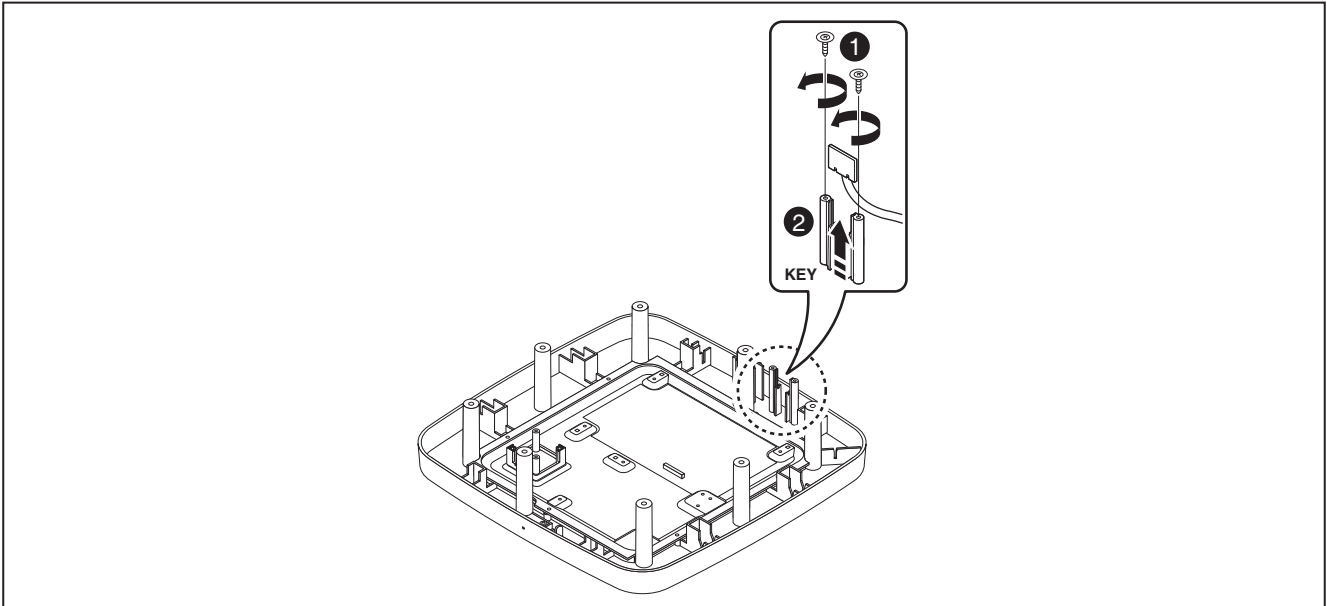


Figure 2-6

### 2-7. How to organize cables

When assembling, place the cables as shown in the figure below.

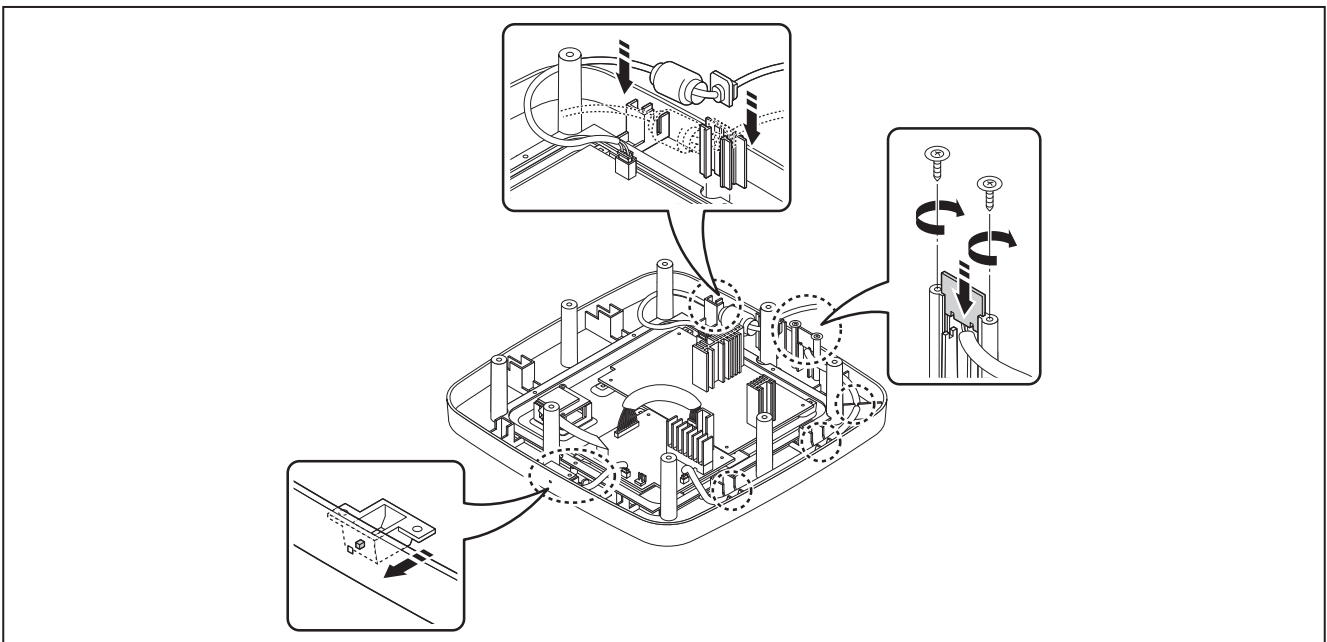


Figure 2-7

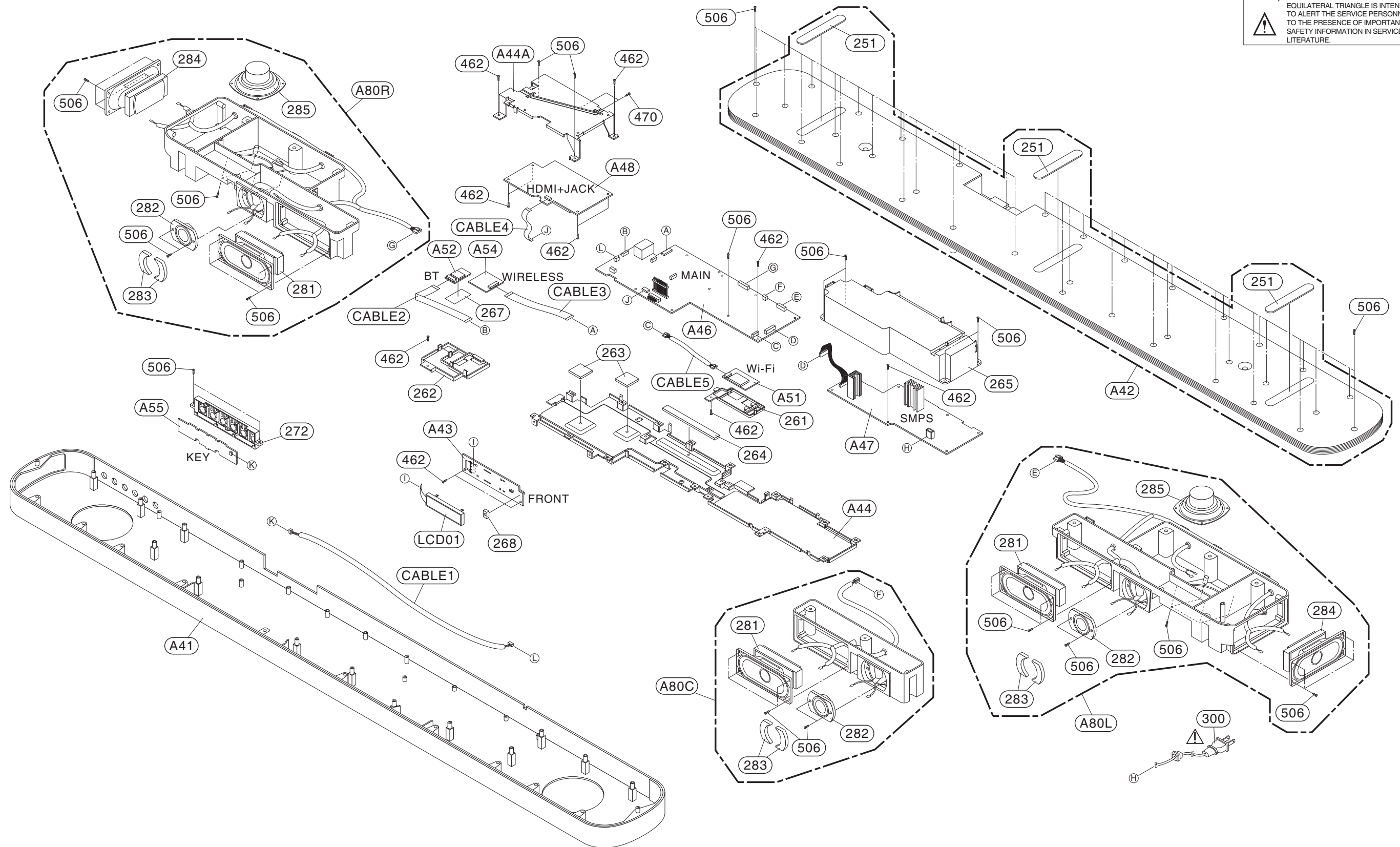




# EXPLODED VIEWS

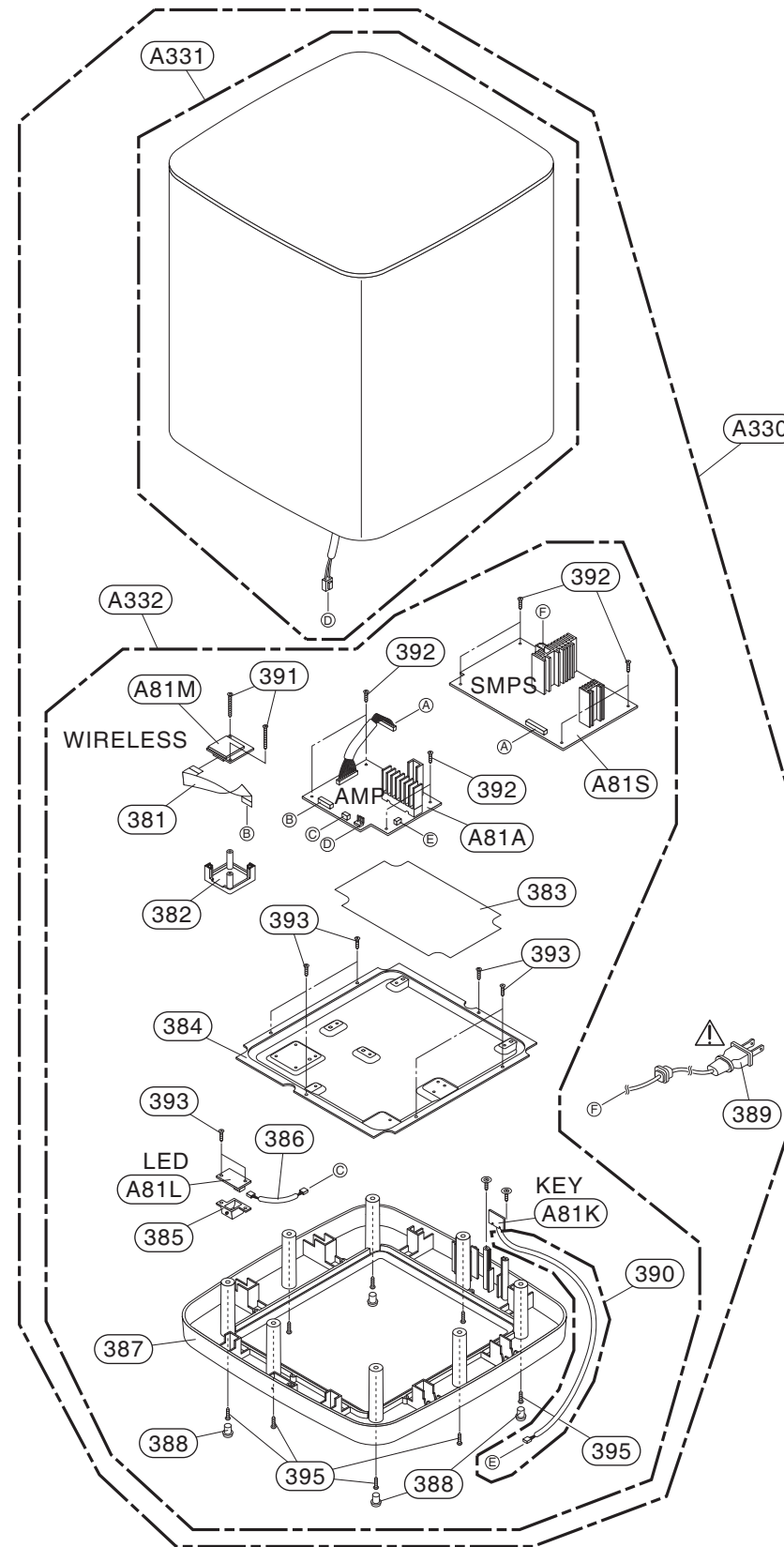
## 1. MAIN UNIT SECTION

**NOTES)** THE EXCLAMATION POINT WITHIN AN EQUILATERAL TRIANGLE IS INTENDED TO ALERT THE SERVICE PERSONNEL TO THE PRESENCE OF IMPORTANT SAFETY INFORMATION IN SERVICE LITERATURE.

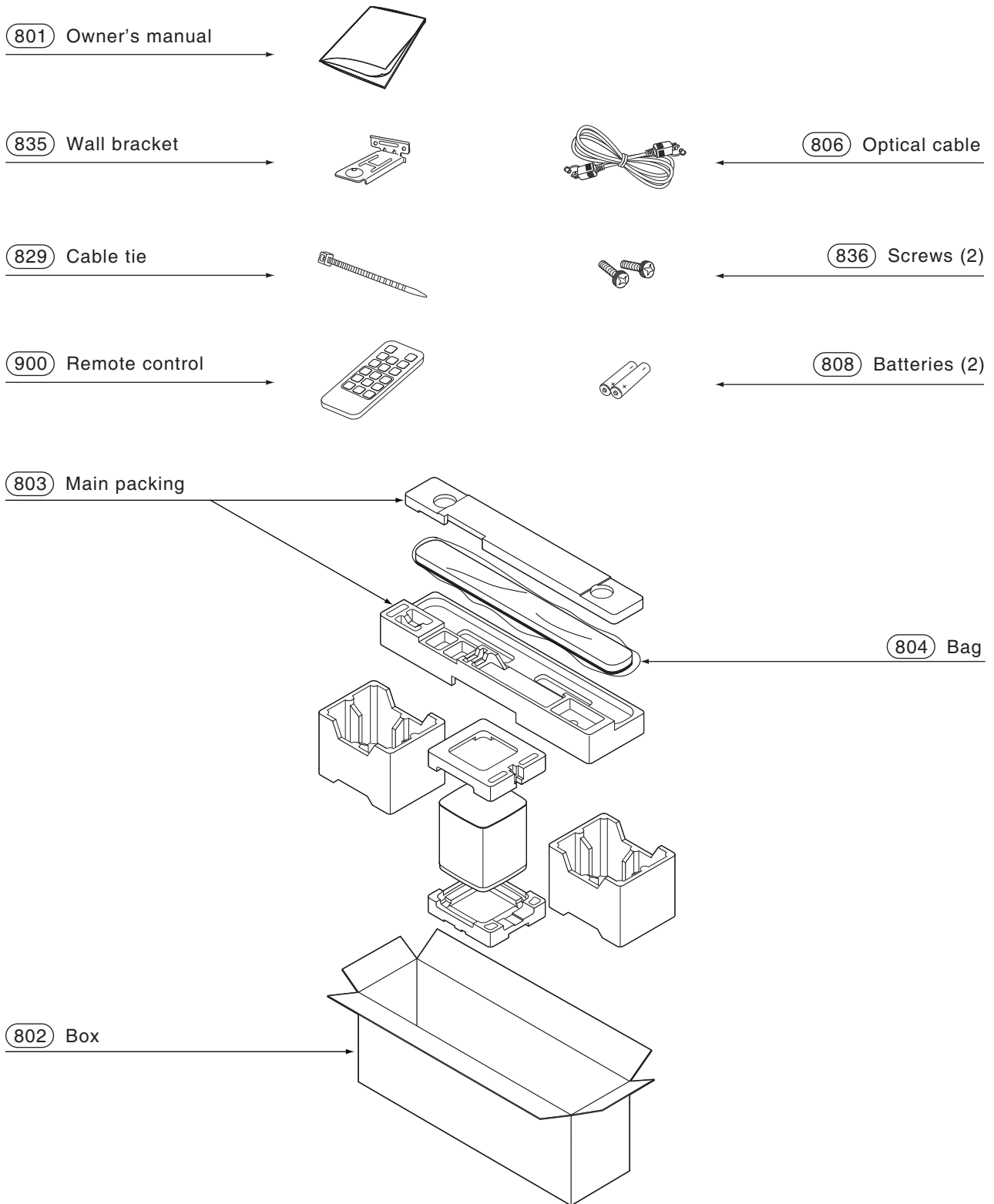


## 2. WIRELESS SUBWOOFER SECTION

**NOTES)** THE EXCLAMATION POINT WITHIN AN EQUILATERAL TRIANGLE IS INTENDED TO ALERT THE SERVICE PERSONNEL TO THE PRESENCE OF IMPORTANT SAFETY INFORMATION IN SERVICE LITERATURE.



### 3. PACKING ACCESSORY SECTION



# MEMO

A series of horizontal dotted lines for writing a memo.

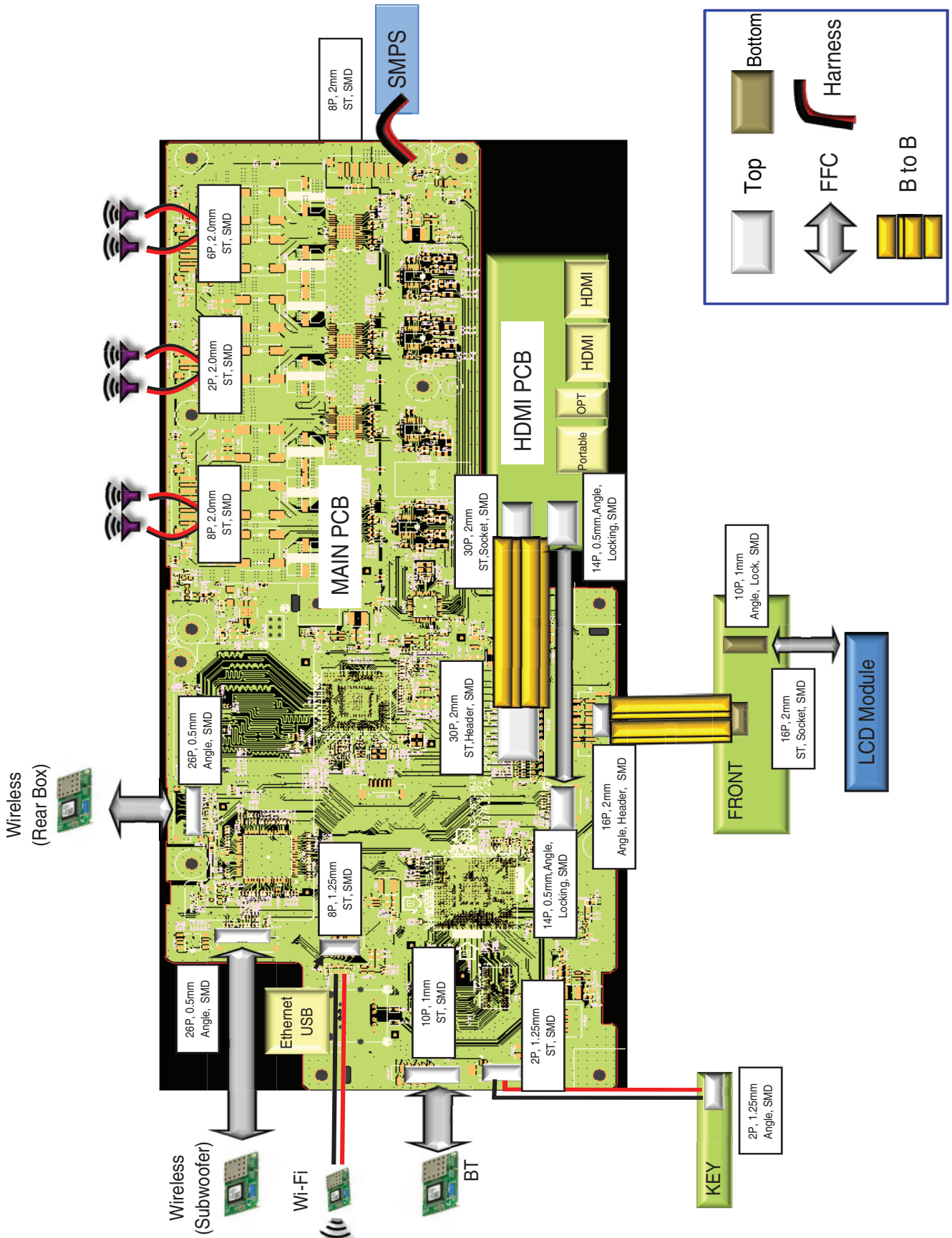
# SECTION 3

## ELECTRICAL

### CONTENTS

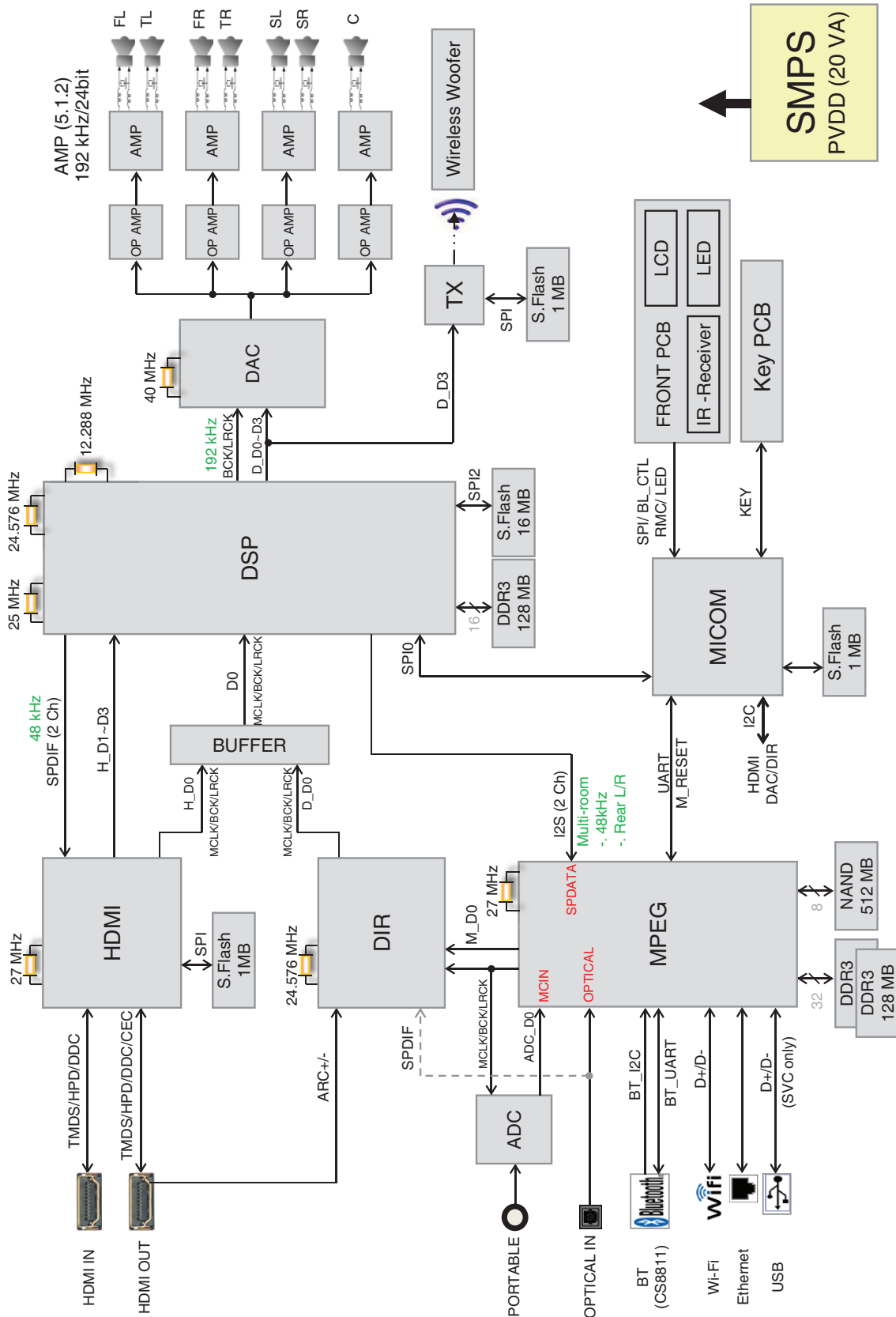
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<b>BLOCK DIAGRAMS</b> .....	<b>3-3</b>
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# WIRING DIAGRAM



# BLOCK DIAGRAMS

## 1. SYSTEM BLOCK DIAGRAM







# ONE POINT REPAIR GUIDE

## 1. NO BOOTING WHEN YOU TURN THE UNIT ON, NO MESSAGE OR “HELLO” ON FRONT PANEL

When you turn on your set, no message on the front panel, and stand-by LED doesn't work.

### 1-1. IC300 System 12 VA (No 12 VA)

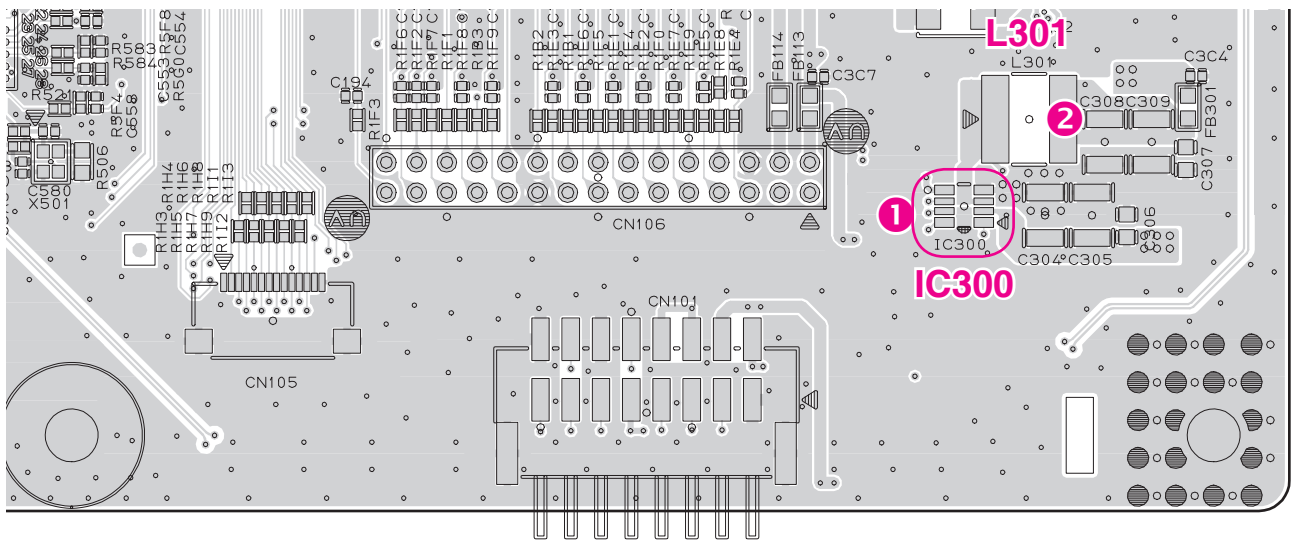
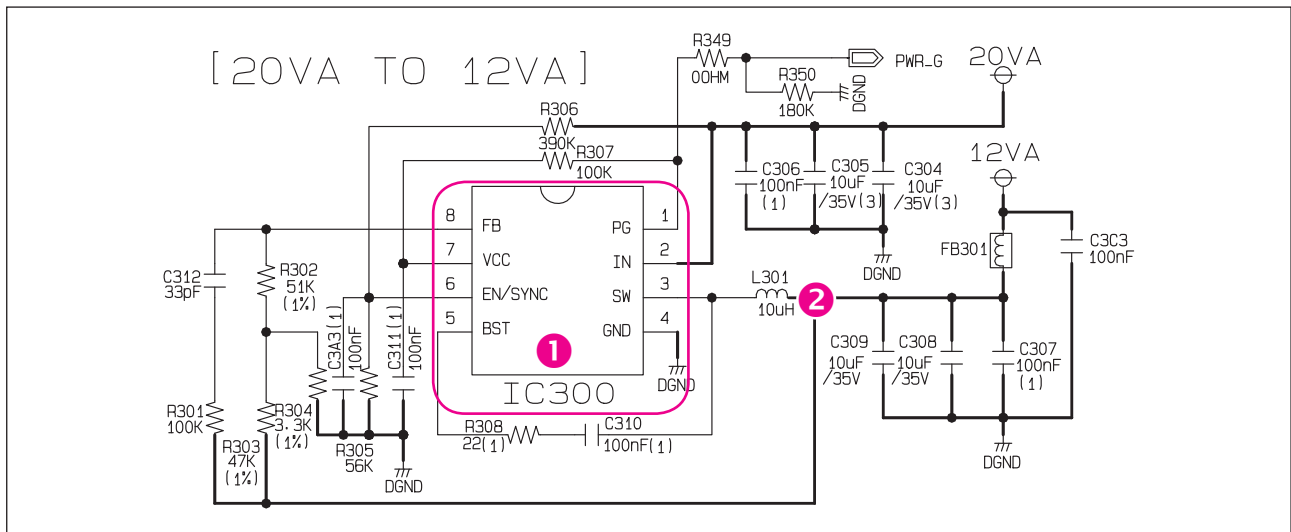
#### 1-1-1. Solution

Replace MAIN board.

#### 1-1-2. How to troubleshoot (Countermeasure)

- 1) Please check 20 VA of IC300 pin2 (VIN).
- 2) If 20 VA is abnormal, please check adapter.
- 3) If 20 VA is OK, but 12 VA is abnormal pin3 of IC300 (VOUT), replace MAIN board.

#### 1-1-3. Service hint (Any picture / Remark)



< MAIN board top view >

# ONE POINT REPAIR GUIDE

## NO BOOTING WHEN YOU TURN THE UNIT ON, NO MESSAGE OR “HELLO” ON FRONT PANEL

When you turn on your set, it will blank / no message on front panel, and stand-by LED doesn't work.

### 1-2. IC303 System 3.3 V (No 3.3 VA)

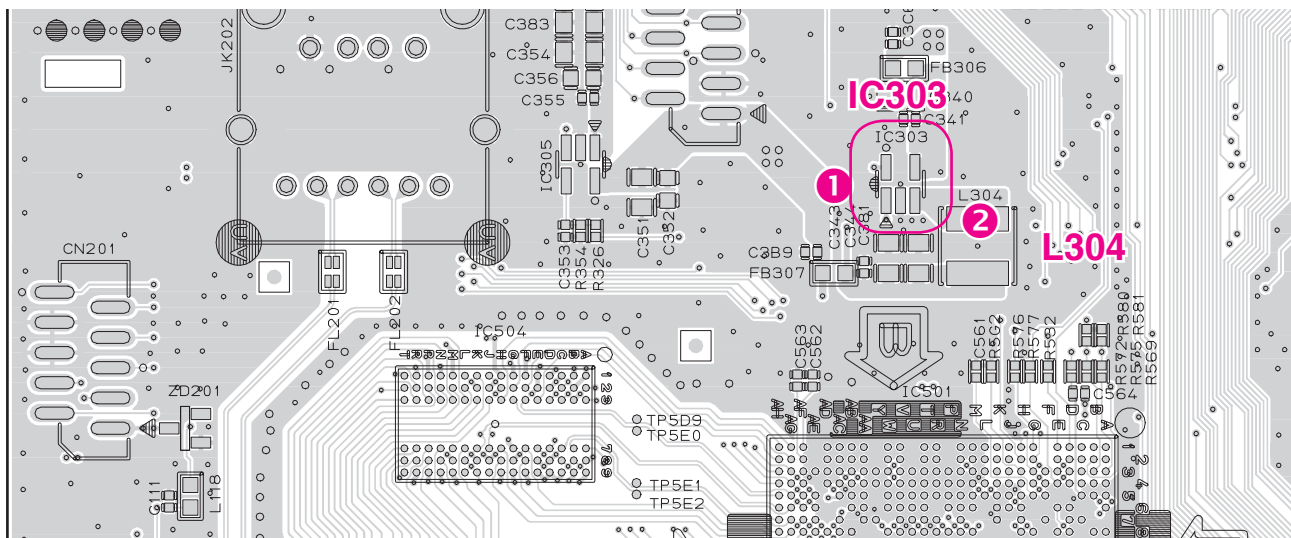
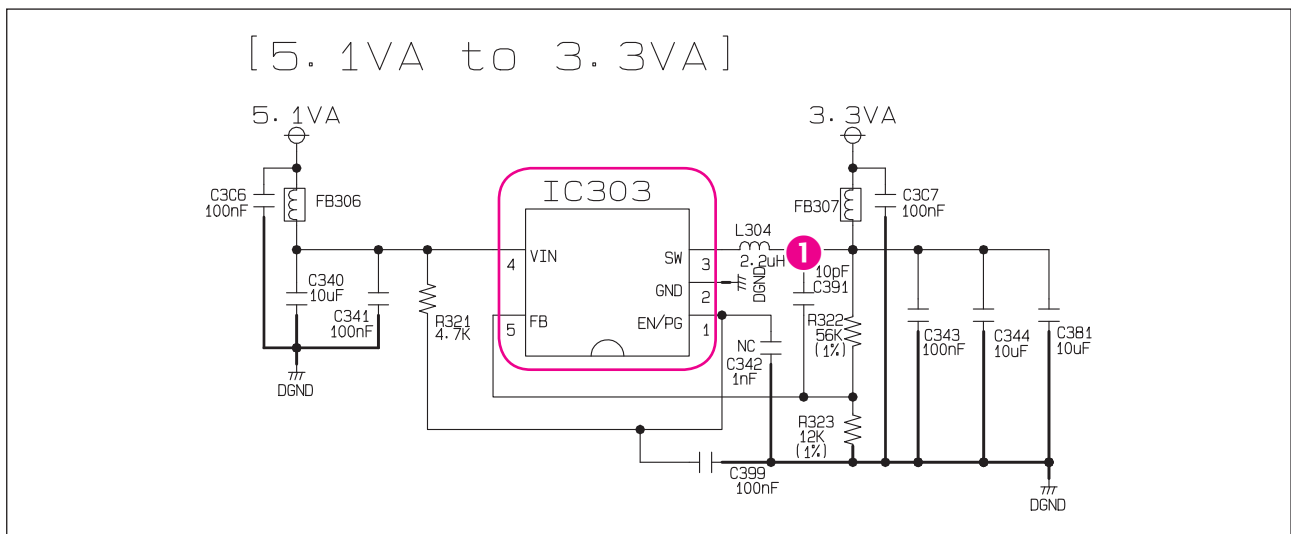
#### 1-2-1. Solution

Replace MAIN/ FRONT board.

#### 1-2-2. How to troubleshoot (Countermeasure)

- 1) Please check 3.3 VA of IC303 pin3.
- 2) If 3.3 VA is abnormal, replace MAIN board.
- 3) If 5.1 VA is OK, replace FRONT board.

#### 1-2-3. Service hint (Any picture / Remark)



< MAIN board top view >

# ONE POINT REPAIR GUIDE

## NO BOOTING WHEN YOU TURN THE UNIT ON, NO MESSAGE OR “HELLO” ON FRONT PANEL

When you turn on your set, it will blank / no message on front panel, and stand-by LED doesn't work.

### 1-3. LCD System power 12 V, VCC\_5V (No 12 V, VCC\_5V)

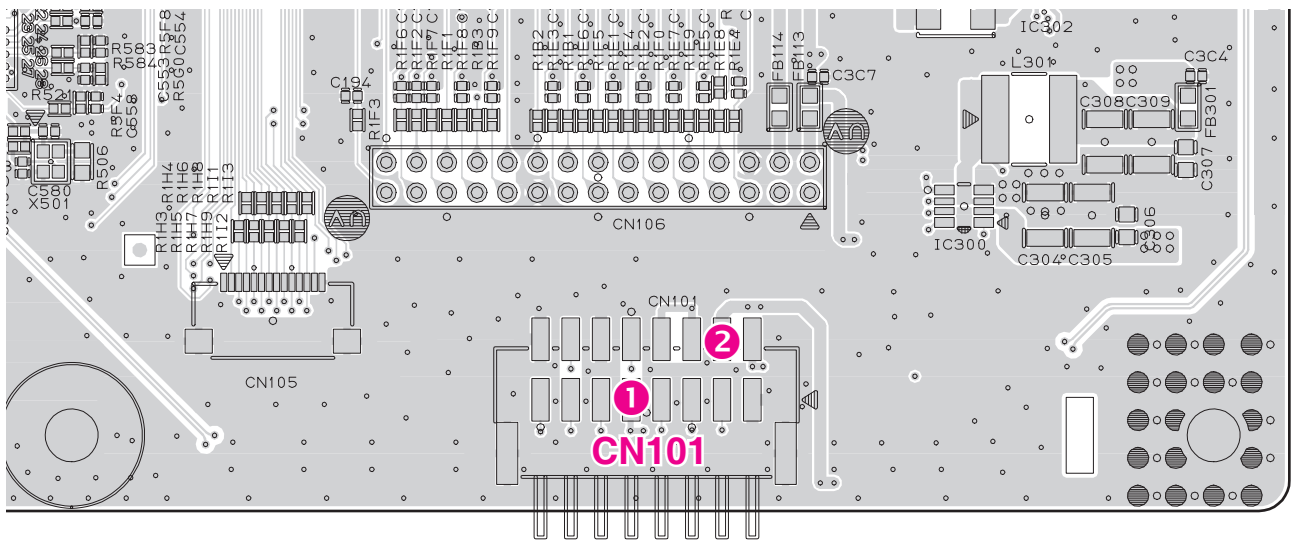
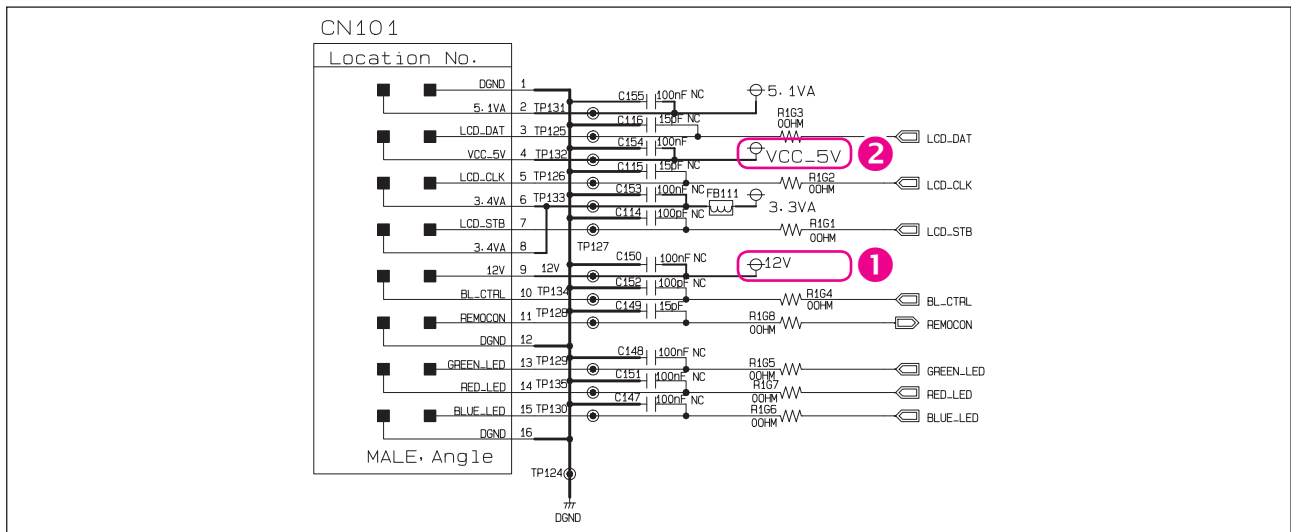
#### 1-3-1. Solution

Replace MAIN/ FRONT board.

#### 1-3-2. How to troubleshoot (Countermeasure)

- 1) Please check CN101 12 V (pin9), VCC\_5V (pin4).
- 2) If 12V, VCC\_5V is abnormal, replace MAIN board.
- 3) If 12V, VCC\_5V OK, replace FRONT board.

#### 1-3-3. Service hint (Any picture / Remark)



# ONE POINT REPAIR GUIDE

## 2. NO SOUND

### 2-1. BLUETOOTH

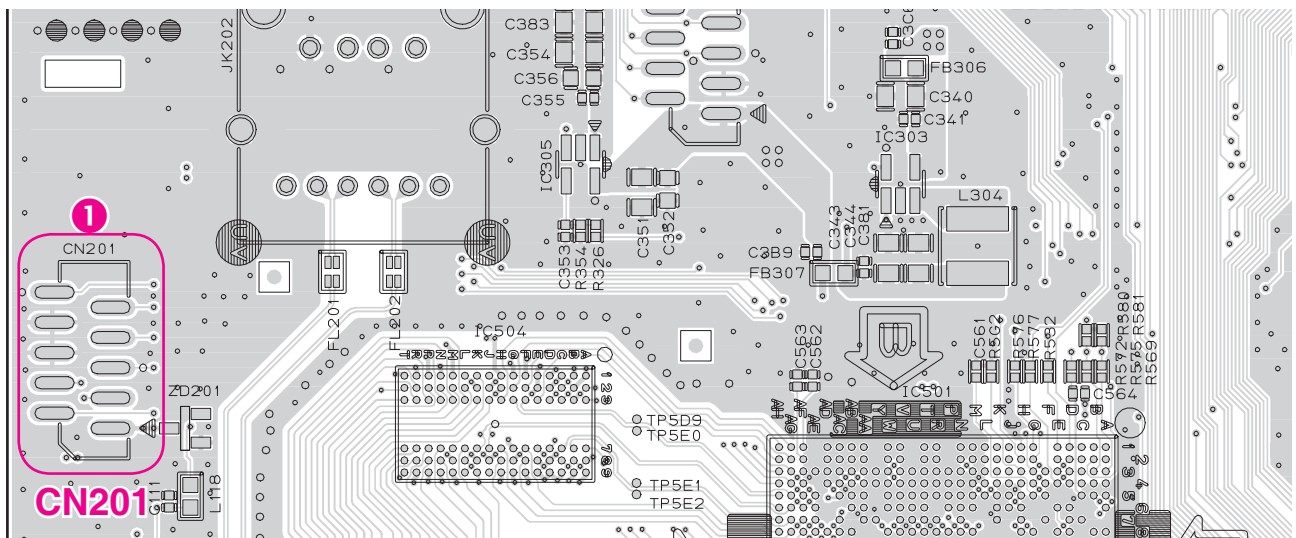
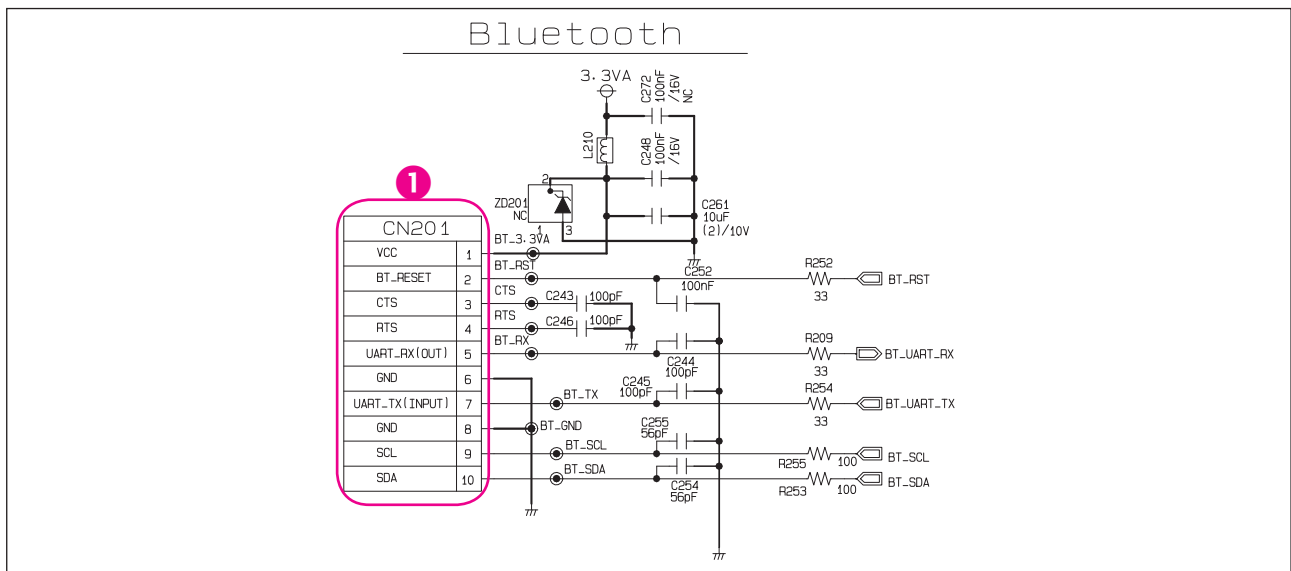
#### 2-1-1. Solution

Replace Bluetooth module/ MAIN board.

#### 2-1-2. How to troubleshoot (Countermeasure)

- 1) Please check status of Bluetooth cable connection (at CN201 and BT Module).
- 2) Please check 3.3 VA (at pin1 of CN201).  
If 3.3 V is OK, please check BT\_RST, BT\_UART\_RX, BT\_UART\_TX, BT\_SCL, BT\_SDA (pin2, 5, 7, 9, 10).  
If no signal, please replace MAIN board.

#### 2-1-3. Service hint (Any picture / Remark)



< MAIN board top view >

# ONE POINT REPAIR GUIDE

## NO SOUND

### 2-2. OPTICAL

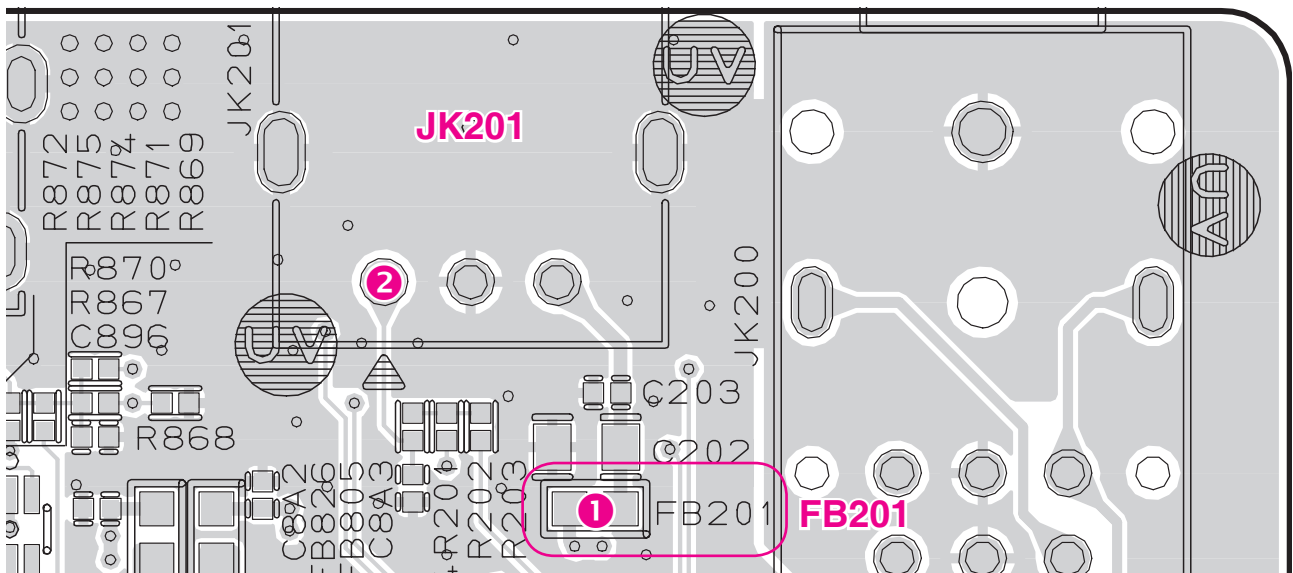
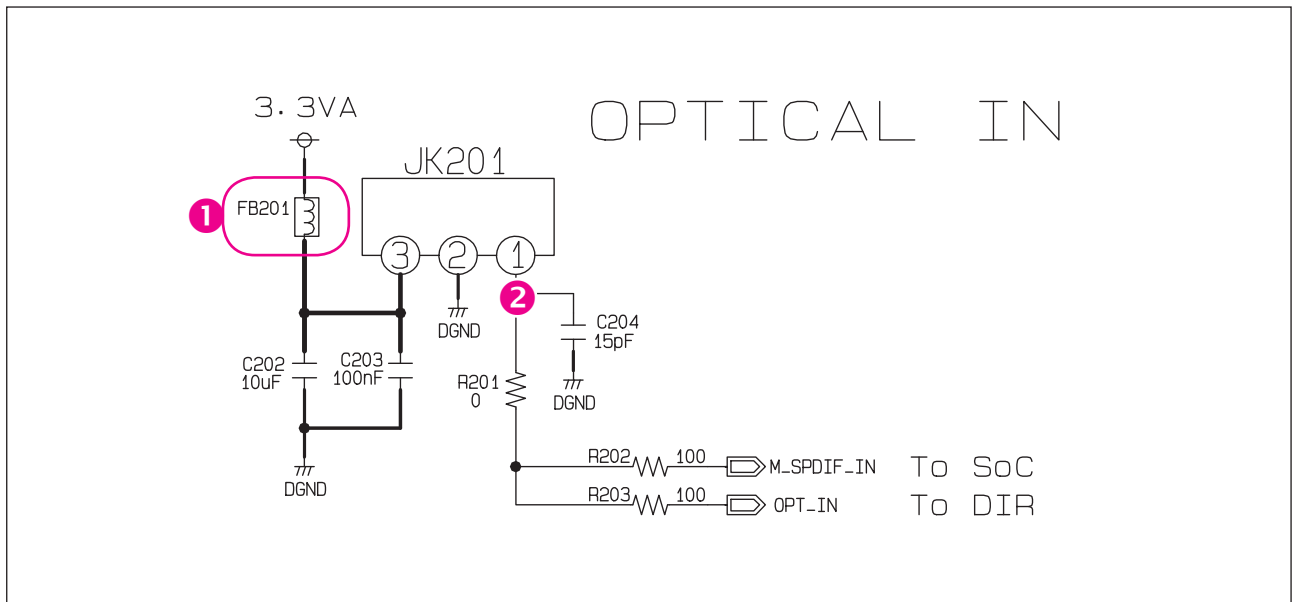
#### 2-2-1. Solution

Replace JACK board.

#### 2-2-2. How to troubleshoot (Countermeasure)

- 1) Please check 3.3 VA at FB201.
- 2) If 3.3 VA is ok, please check OPT\_IN signal (R201) when optical mode.
- 3) If signal is abnormal, replace JACK board.

#### 2-2-3. Service hint (Any picture / Remark)



< JACK board top view >

# ONE POINT REPAIR GUIDE

## NO SOUND

### 2-3. HDMI

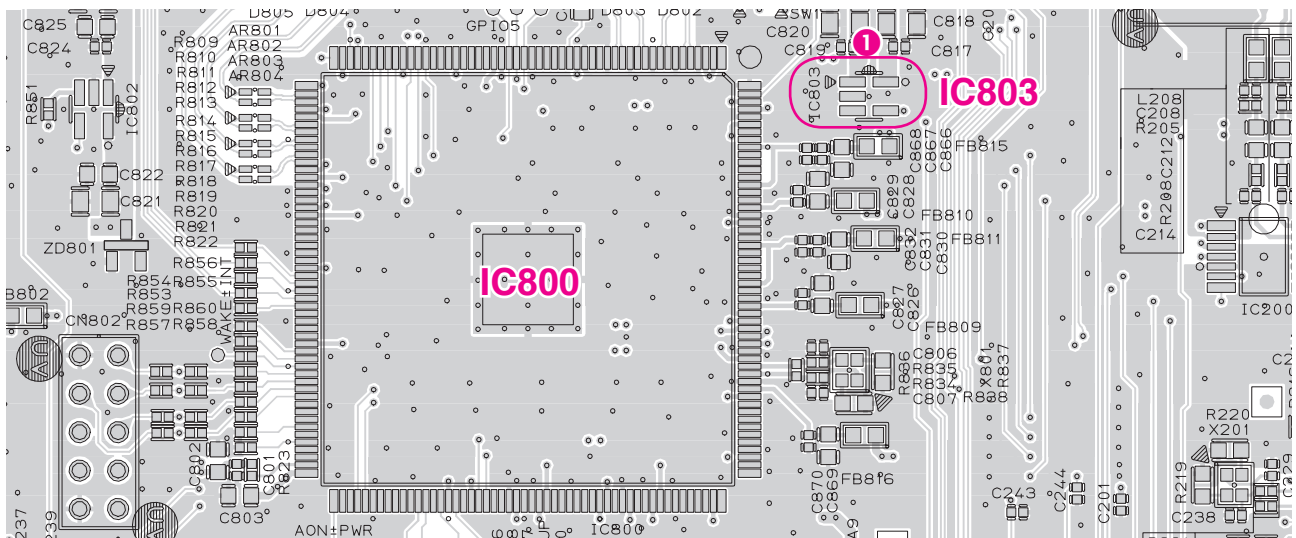
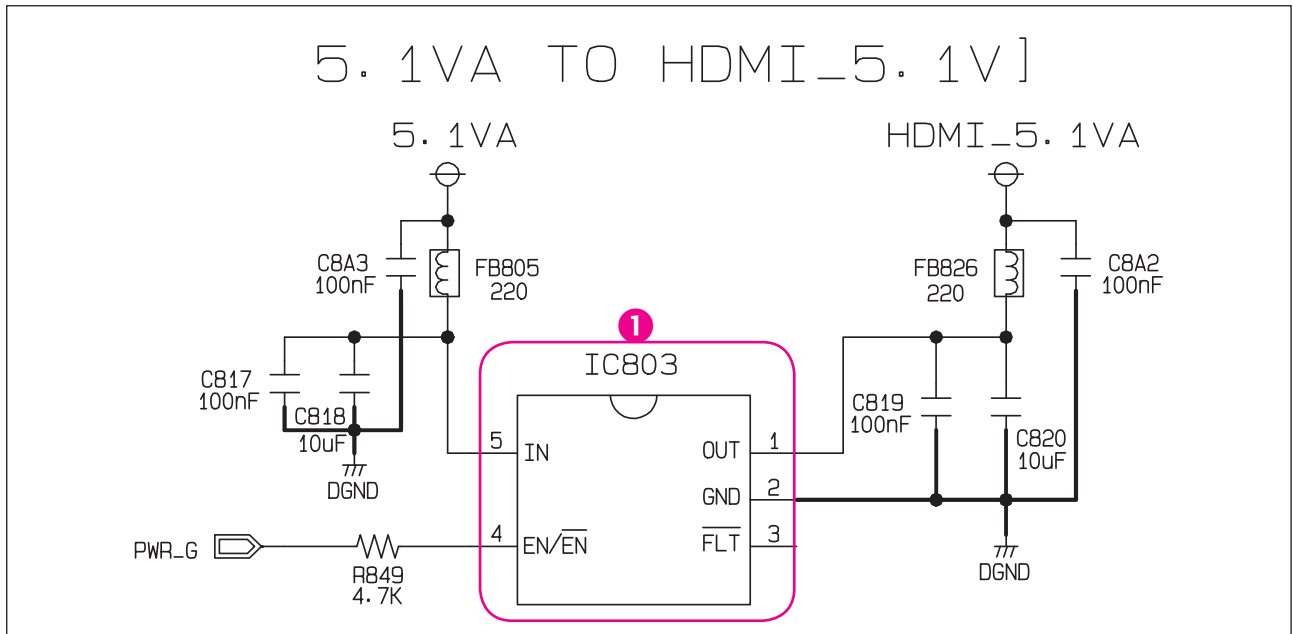
#### 2-3-1. Solution

Replace JACK board.

#### 2-3-2. How to troubleshoot (Countermeasure)

- 1) Please check soldering status of HDMI jack and check HDMI\_5.1VA at IC803 pin1.
- 2) If soldering status and 5.1 VA are abnormal, replace JACK board.

#### 2-3-3. Service hint (Any picture / Remark)



< JACK board top view >

# ONE POINT REPAIR GUIDE

## NO SOUND

### 2-4. Portable

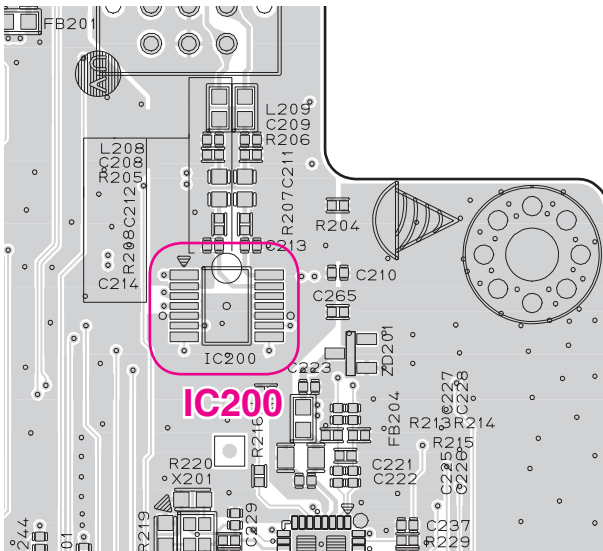
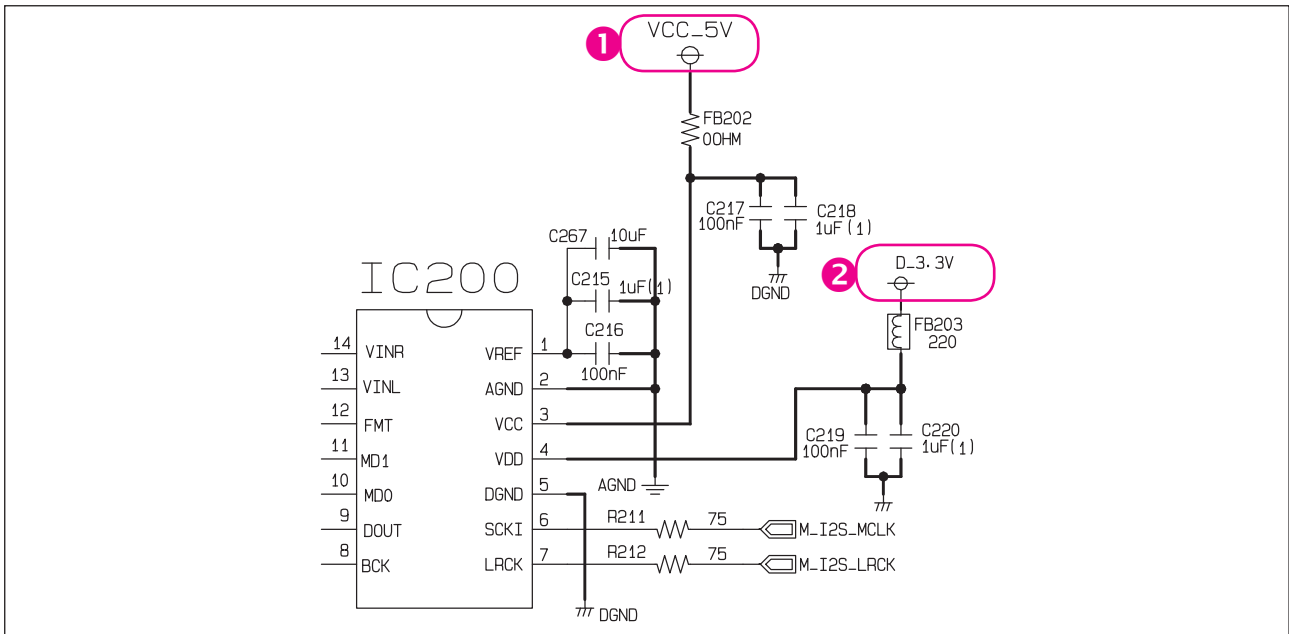
#### 2-4-1. Solution

Replace JACK board.

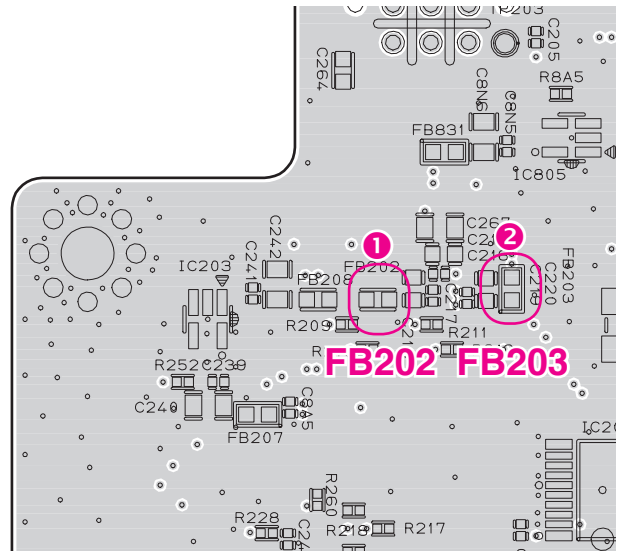
#### 2-4-2. How to troubleshoot (Countermeasure)

- 1) Please check soldering status of portable jack and check IC200 pin3 (VCC\_5V), pin4 (D\_3.3V).
- 2) If portable jack and voltage has abnormal status, replace JACK board.

#### 2-4-3. Service hint (Any picture / Remark)



< JACK board top view >



< JACK board bottom view >



# ONE POINT REPAIR GUIDE

## 3. PROTECTION ERROR

No display or No Sound.

### 3-1. D(DC) PROTECTION

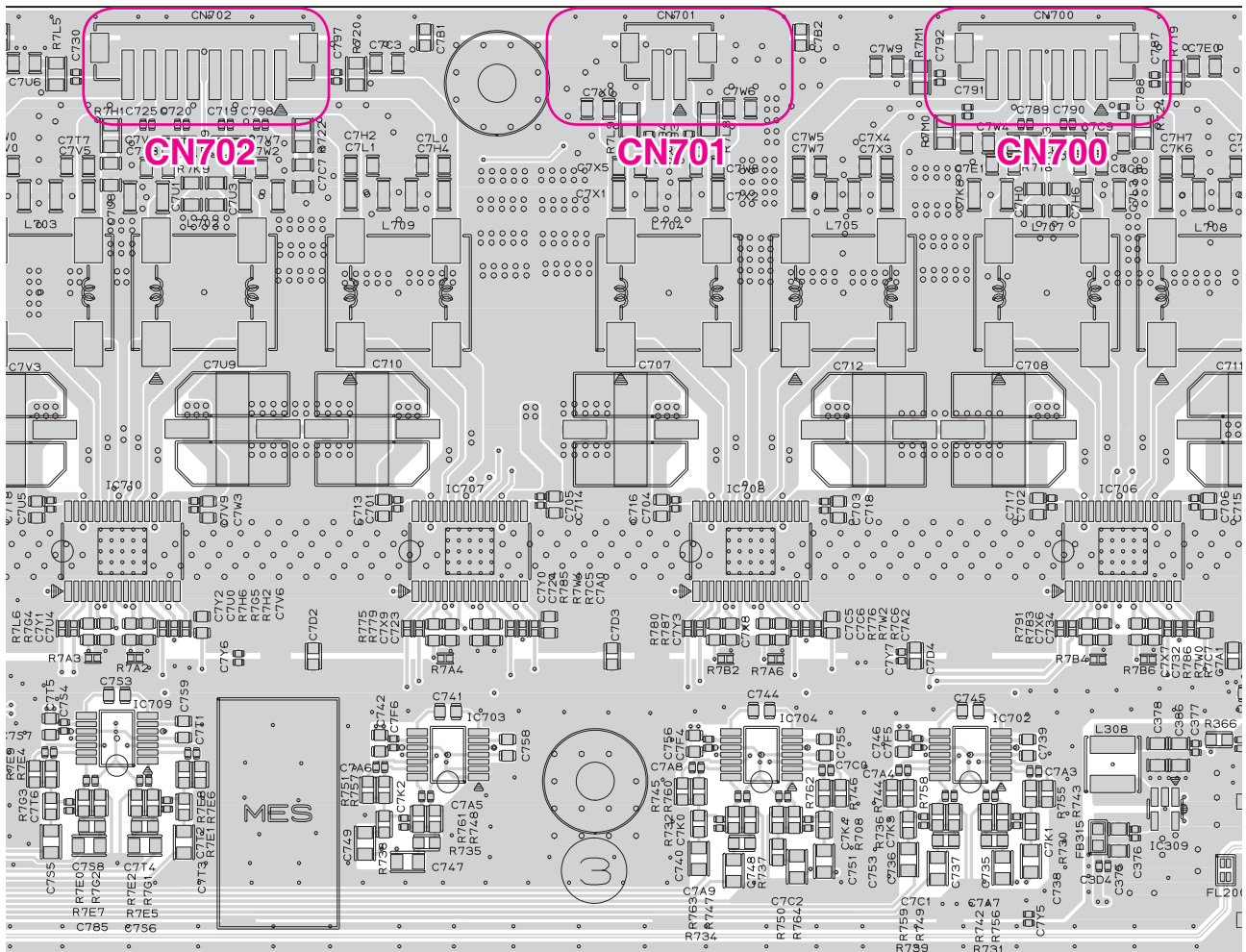
#### 3-1-1. Solution

Replace MAIN board.

#### 3-1-2. How to troubleshoot (Countermeasure)

- 1) Check DC voltage of speaker out FL+, FL-, TOP L+, TOP L-, SR L+, SR L+ (CN700 pin6, 5, 4, 3, 2, 1), Center+, Center- (CN701 pin2, 1) and SR L+, SRL-, TOP R+, TOP R-, FR R+, FR R- (CN702 pin8, 7, 5, 4, 2, 1).
- 2) Check resistor crack, cold solder of AMP IC out (R718, R723, R724, R719, R7L9, R7L8, R7M1, R7M0, R722, R720, R7L5, R7H1, R7K9, R7H9).
- 3) If AMP IC out is ok and speaker out has DC voltage, replace MAIN board.

#### 3-1-3. Service hint (Any picture / Remark)



< MAIN board top view >

# ONE POINT REPAIR GUIDE

## PROTECTION ERROR

No display or No Sound.

### 3-2. S(SHUT DOWN) PROTECTION

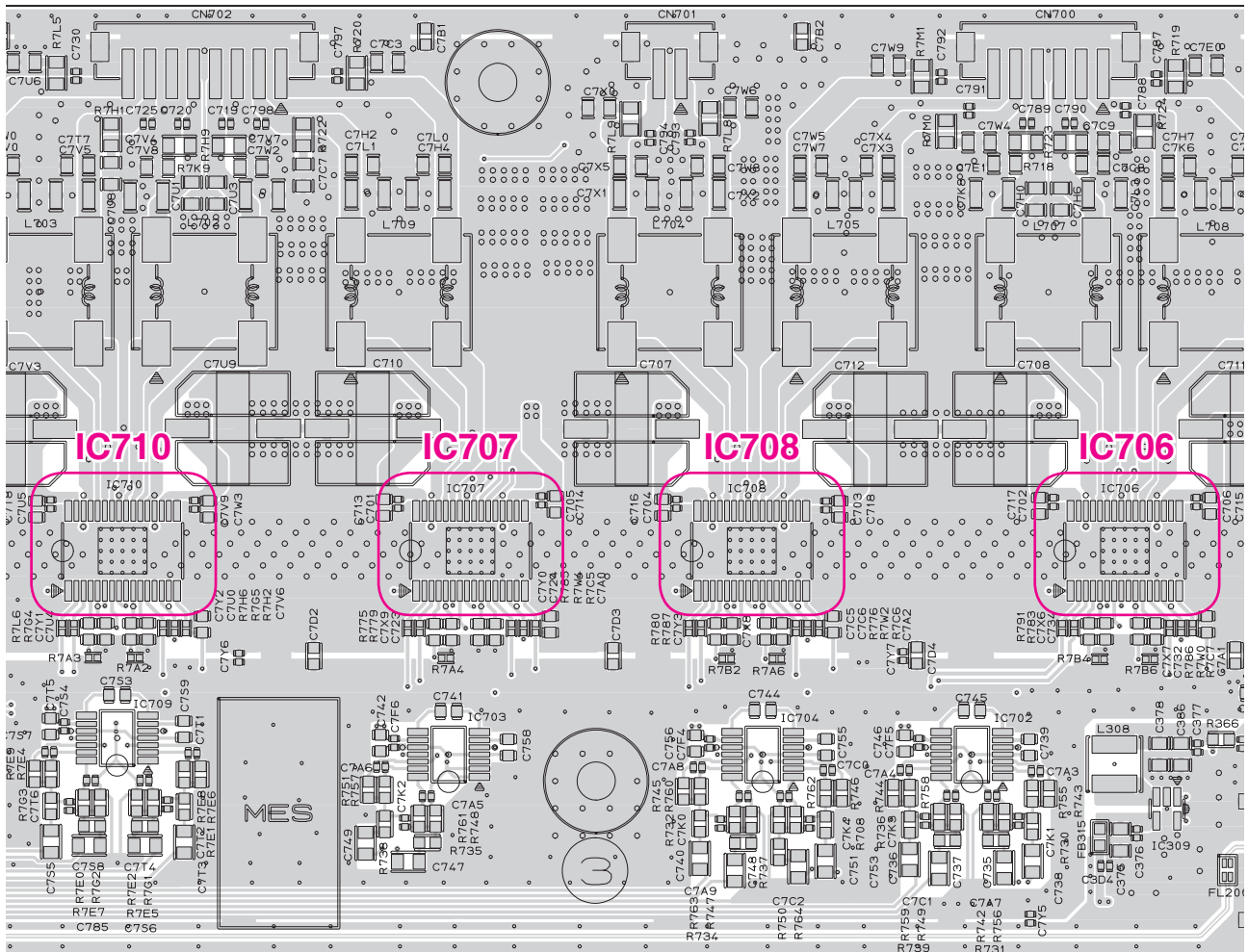
#### 3-2-1. Solution

Replace MAIN board.

#### 3-2-2. How to troubleshoot (Countermeasure)

- 1) Check PVDD voltage (20 VA) of IC706, IC708, IC707, IC710 pin17, 18, 19, 31, 32.
  - If PVDD voltage has 20 V under, refer to STEP 1-1.
- 2) Check impedance (4  $\Omega$ ) of speaker unit.
  - If impedance of speaker unit has 1  $\Omega$  under, replace speaker unit.
- 3) If check point 1), 2) is ok, replace MAIN board.

#### 3-2-3. Service hint (Any picture / Remark)



< MAIN board top view >

# ONE POINT REPAIR GUIDE

## PROTECTION ERROR

No display or No Sound.

### 3-3. B(BURNT) PROTECTION

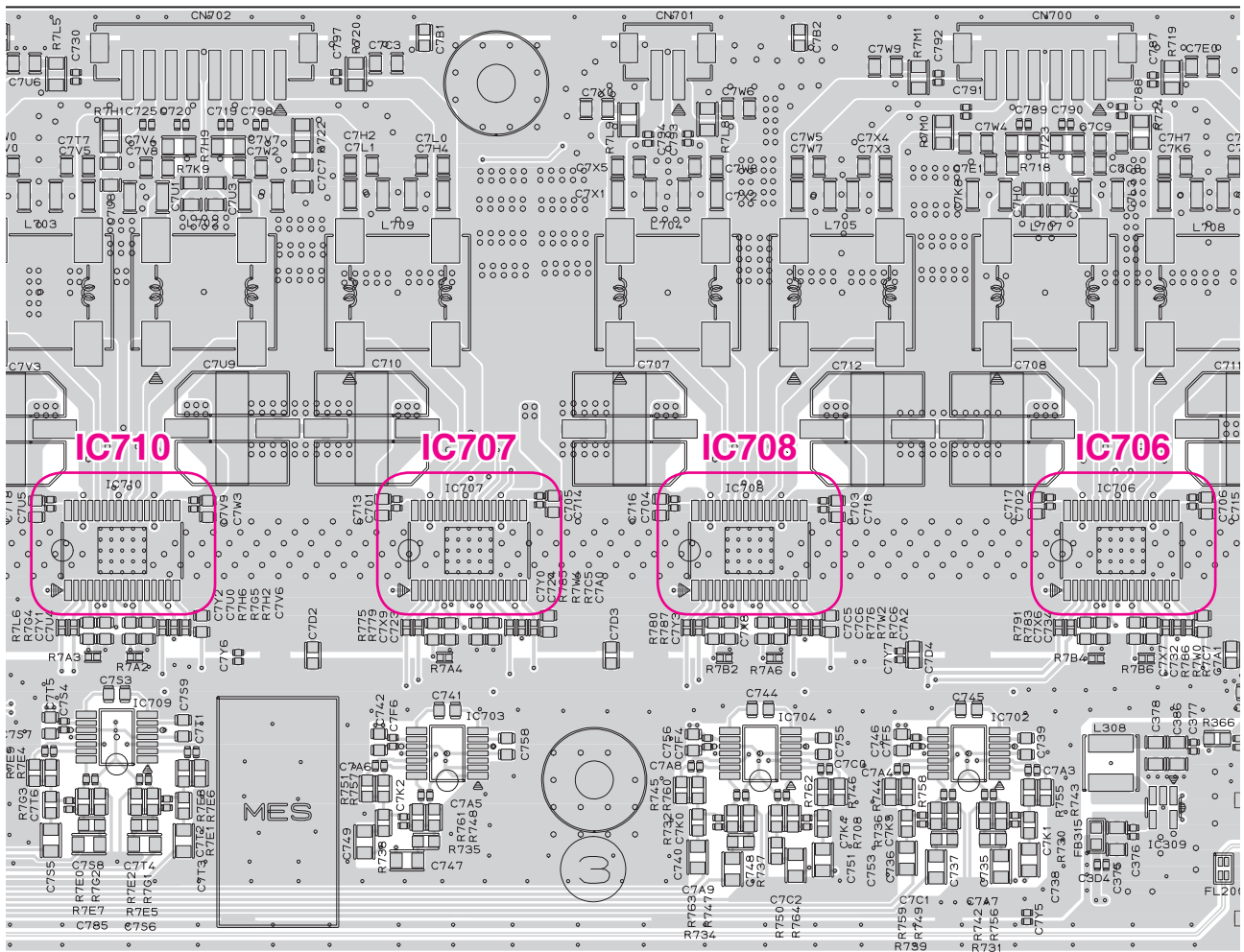
#### 3-3-1. Solution

Replace MAIN board.

#### 3-3-2. How to troubleshoot (Countermeasure)

- 1) Check voltage 20 V of IC706, IC708, IC707, IC710 at pin17, 18, 19, 31, 32, if 12 V has problem refer to STEP 1-1.
- 2) If 20 V is OK, replace MAIN board.

#### 3-3-3. Service hint (Any picture / Remark)



< MAIN board top view >

# WAVEFORMS OF MAJOR CHECK POINT

## 1. CRYSTAL

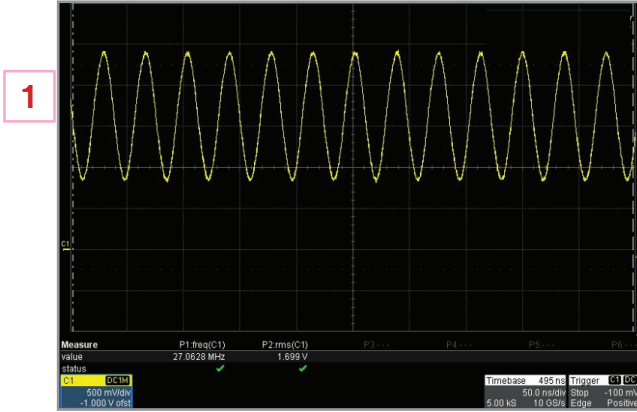


Fig 1-1. Crystal X501 (27 MHz)

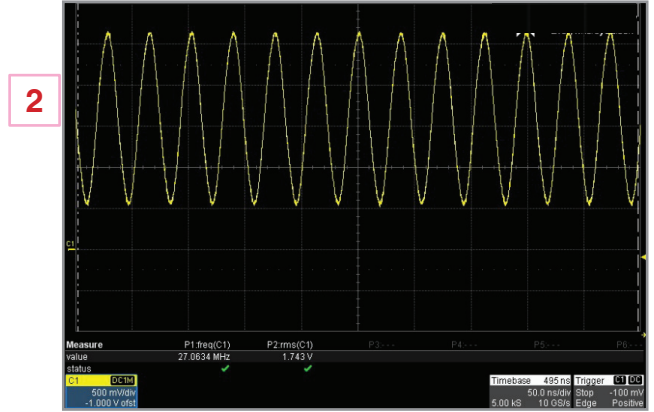
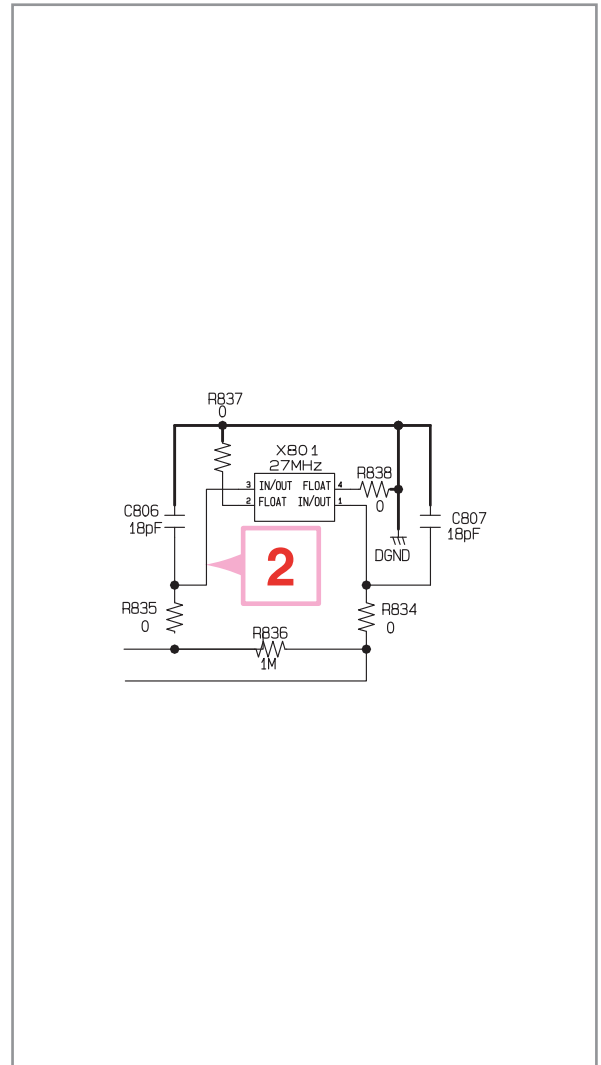
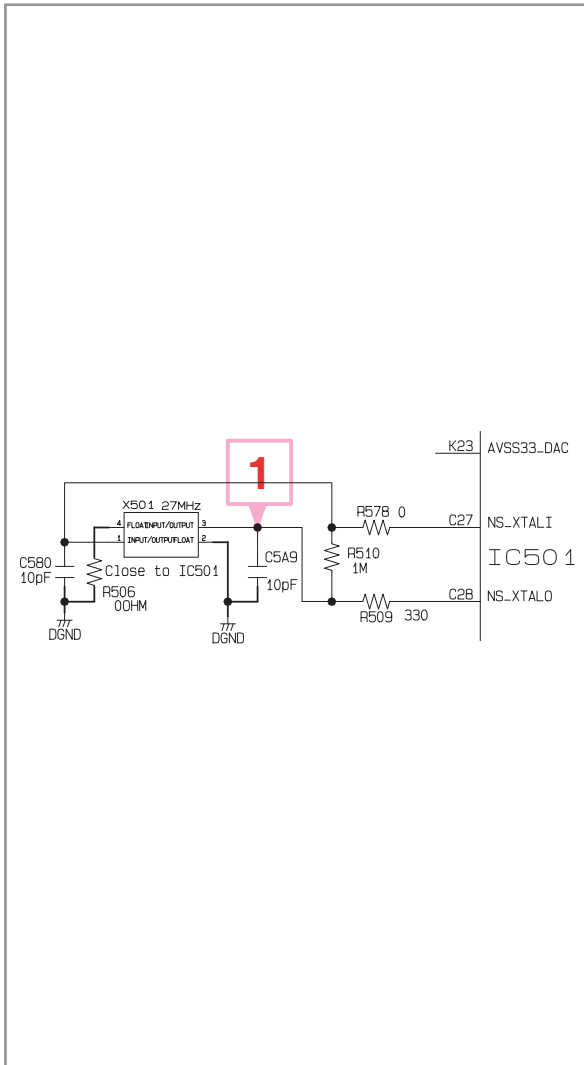
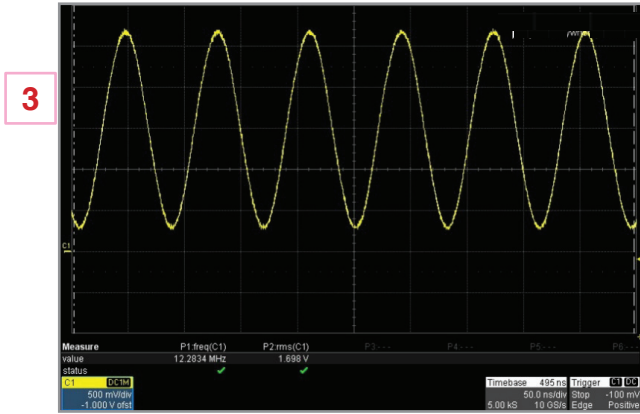


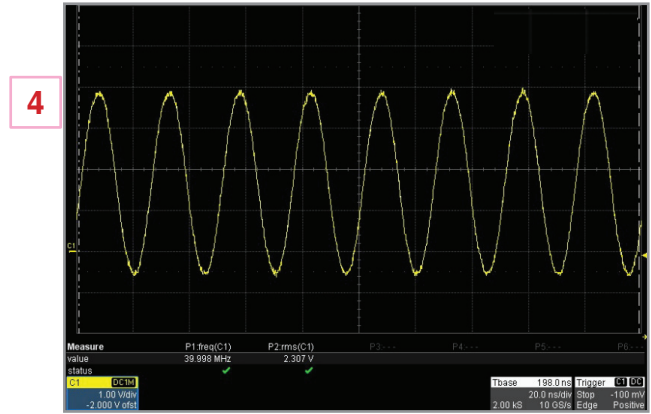
Fig 1-2. Crystal X801 (27 MHz)



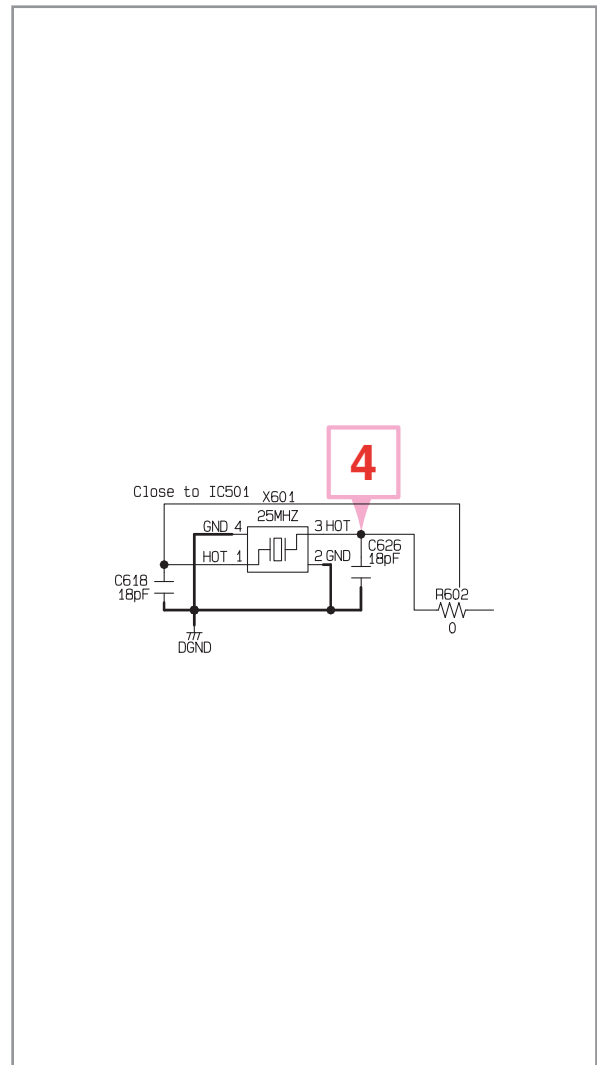
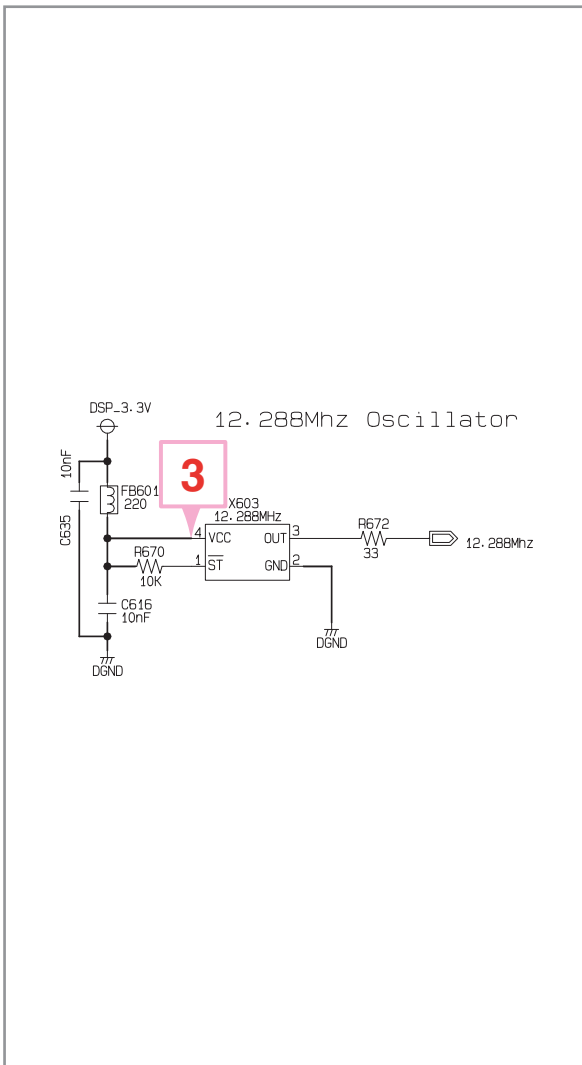
# CRYSTAL



**Fig 1-3. Crystal X603 (12.288 MHz)**



**Fig 1-4. Crystal X601 (25 MHz)**



## 2. FLASH

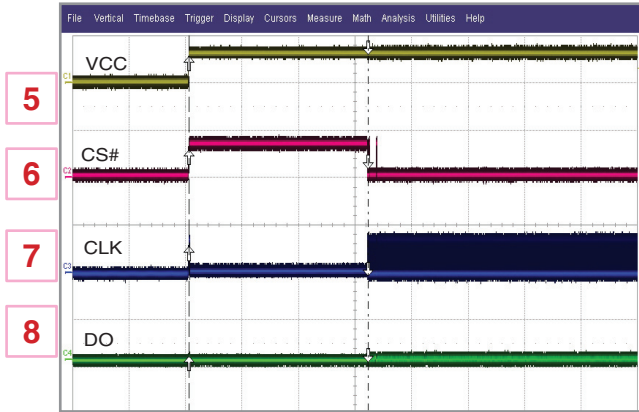


Fig 2. Flash  
VCC/ CS#/ CLK/ DO

## 3. TACT KEY

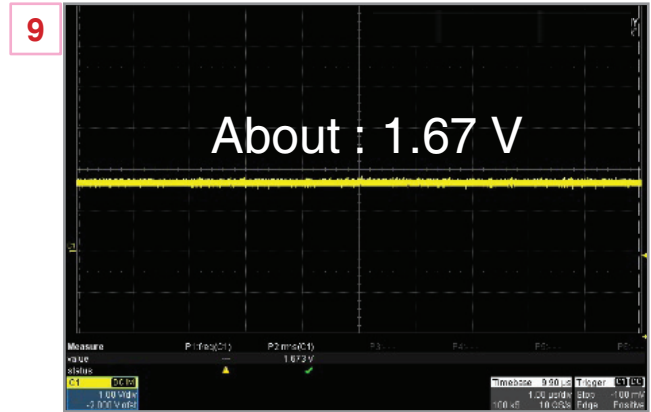


Fig 3-1. Tact Key  
Press Power Key

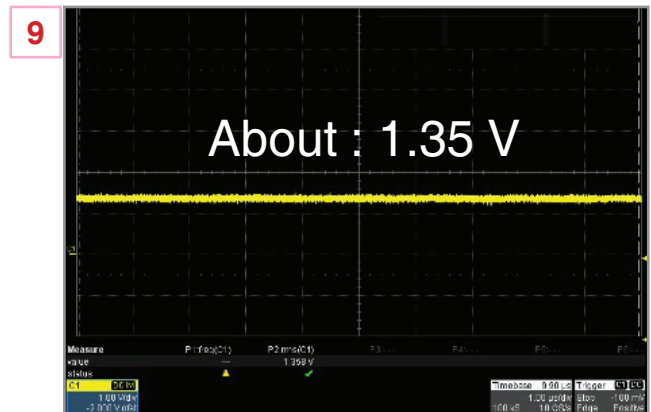
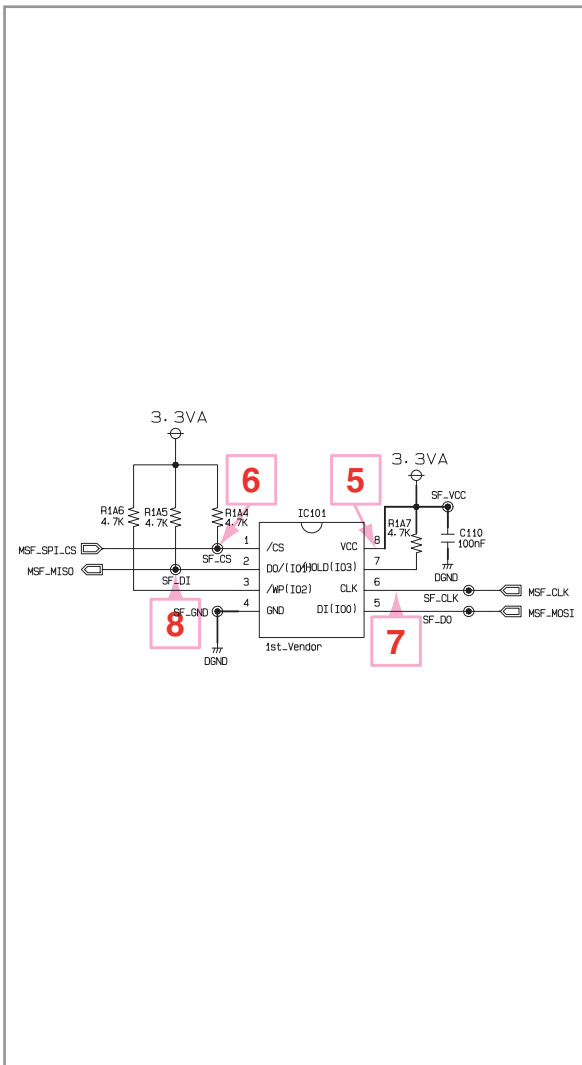


Fig 3-2. Tact Key  
Press FUNC Key

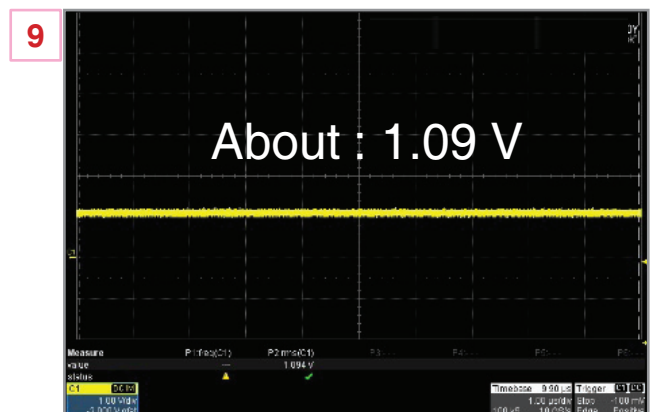


Fig 3-3. Tact Key  
Press VOL(-) Key

# TACT KEY

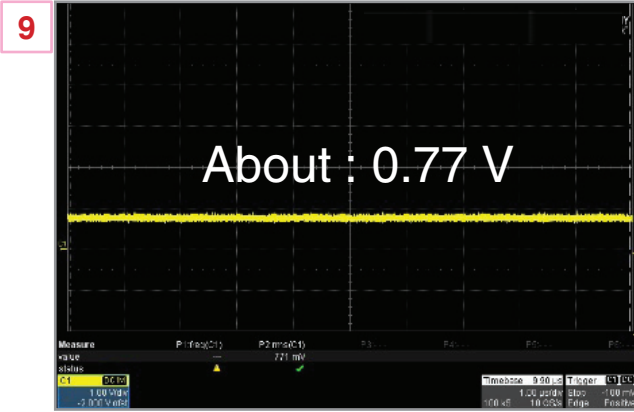


Fig 3-4. Tact Key Press VOL(+) Key

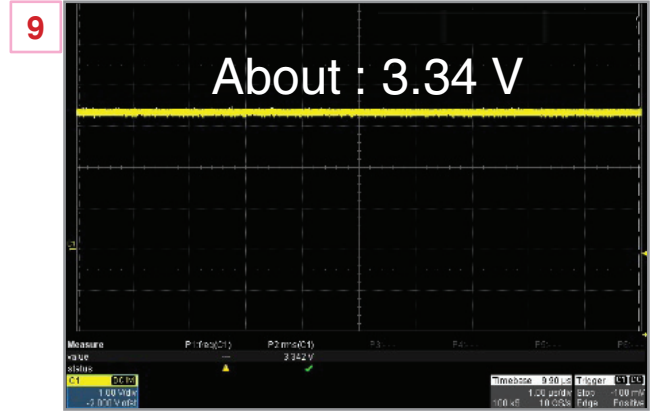


Fig 3-7. Tact Key Press No Key

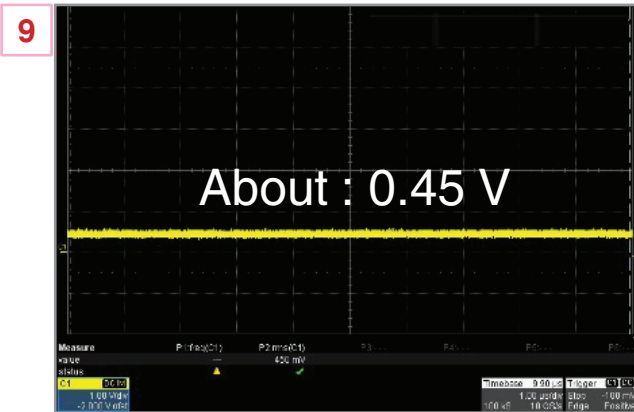


Fig 3-5. Tact Key Press Wi-Fi Key

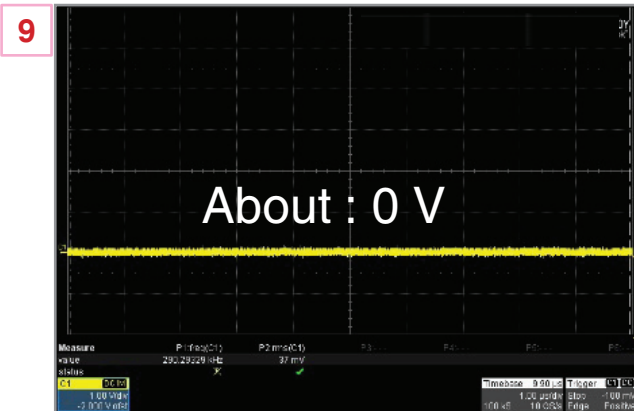
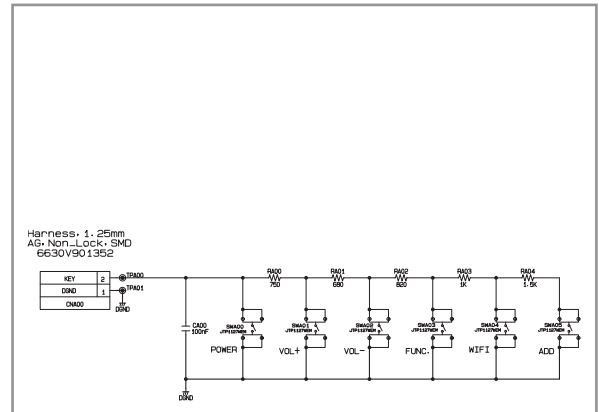
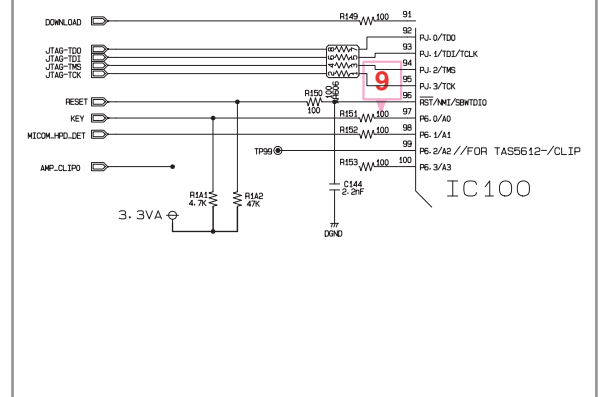


Fig 3-6. Tact Key Press ADD Key



Tact Key



# 4. REMOTE CONTROL

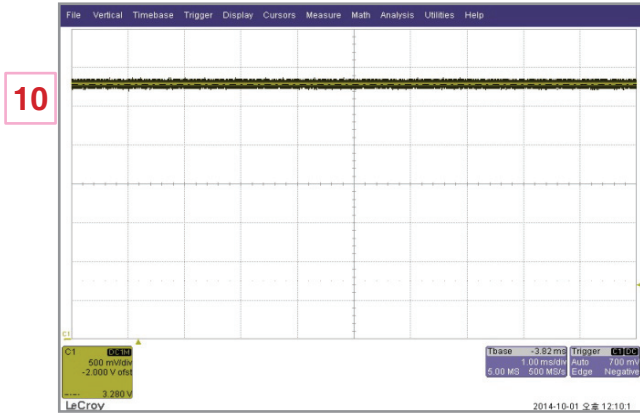


Fig 4-1. Remote Control Input Voltage

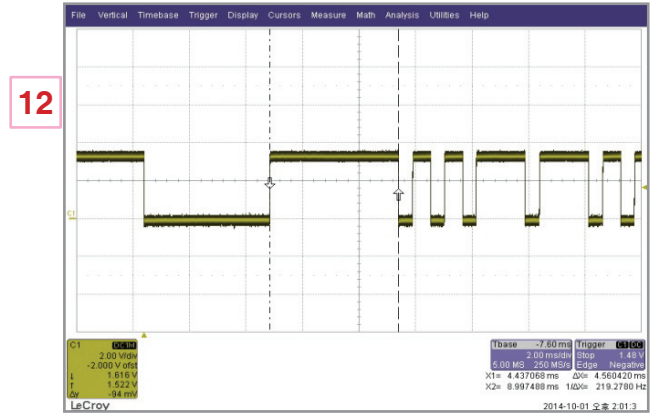


Fig 4-3. Remote Control High Timing

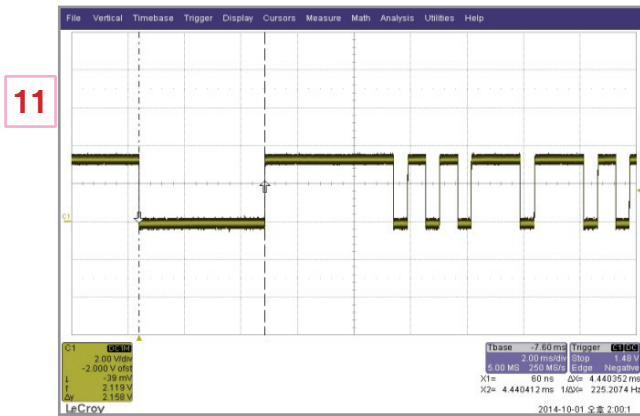
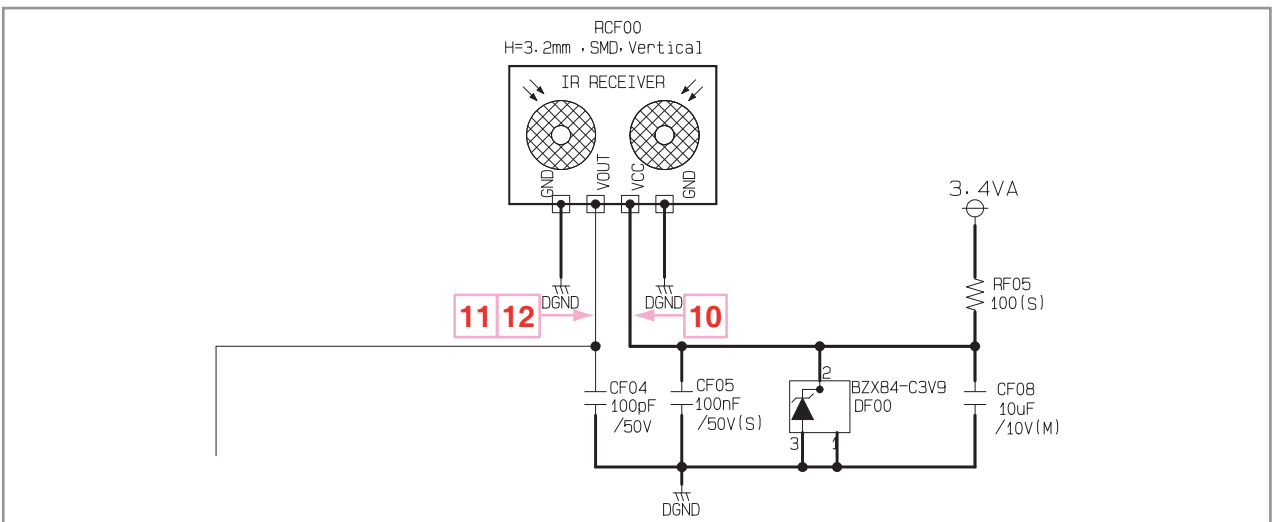


Fig 4-2. Remote Control Low Timing

Item	Measured	Spec.
Input Level	3.3 V	IR Receiver Spec: 2.7 ~ 5.5 V
" Low" Timing	4.4 ms	3.6 ms ~ 5.04 ms
" High" Timing	4.48 ms	4.08 ms ~ 5.04 ms





# 5. OPTICAL

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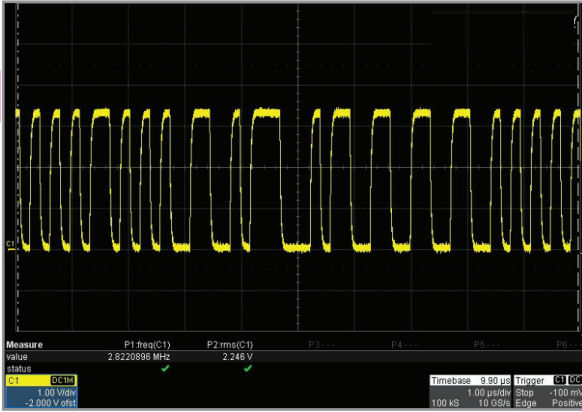


Fig 5-1. Optical Opt In

14

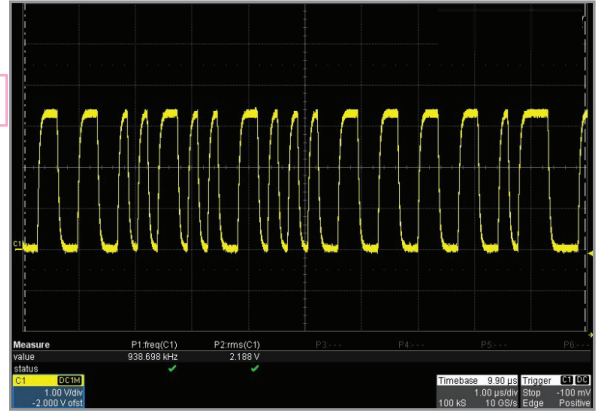
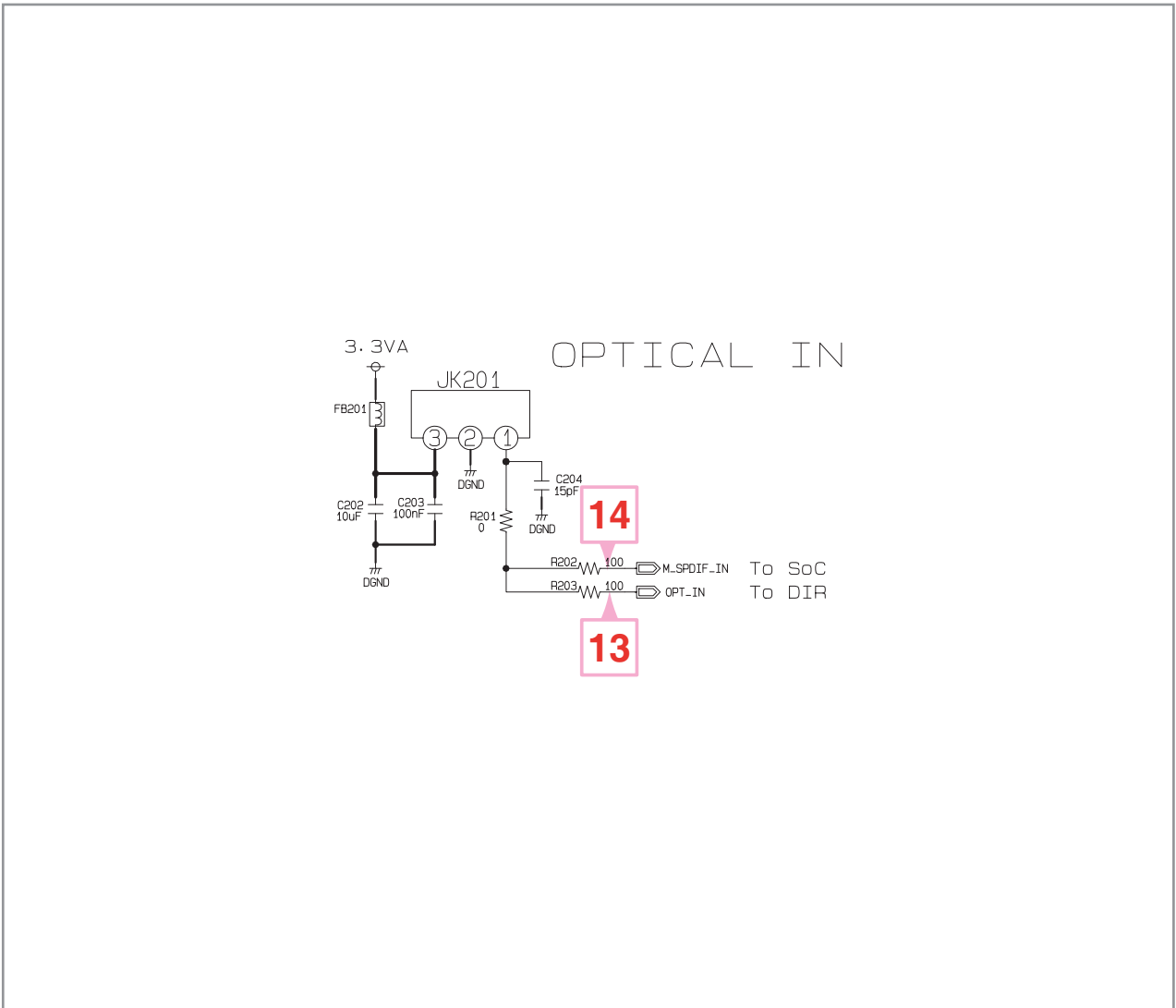


Fig 5-2. Optical Opt Det



14

13

# CIRCUIT VOLTAGE CHART

## 1. ICs

Location	Name	Pin No	Pin Name	Spec	Measured Voltage
IC100	MICOM	87, 38, 16, 64	VDD	1.8 V ~ 3.6 V	3.342 V
IC101	Serial Flash	8	VCC	2.7 V ~ 3.6 V	3.345 V
IC102	Serial Flash	8	VCC	2.7 V ~ 3.6 V	3.343 V
IC103	Serial Flash	8	VCC	2.7 V ~ 3.6 V	3.344 V
IC300	DC,DC	2	VIN	+ 4.0 V ~ + 30 V	+ 20.13 V
		3	VOUT	0.8 V ~ 27 V	12.08 V
IC301	DC,DC	1	VIN	+ 4.5 V ~ + 17 V	+ 12.07 V
		2	VOUT	0.8 V ~ 10 V	1.210 V
IC302	DC,DC	1	VIN	+ 4.5 V ~ + 17 V	+ 12.06 V
		2	VOUT	0.8 V ~ 10 V	5.13 V
IC303	DC,DC	4	VIN	+ 2.7 V ~ + 5.5 V	+ 5.09 V
		3	VOUT	0.6 V ~ 5 V	3.365 V
IC304	Switch	5	VIN	+ 2.5 V ~ + 5.5 V	+ 3.345 V
		1	VOUT		
IC305	Switch	5	VIN	+ 2.5 V ~ + 5.5 V	+ 3.346 V
		1	VOUT		
IC306	LDO	3	VIN	+ 2.5 V ~ + 5.5 V	+ 5.12 V
		6	VOUT	1.5 V ~ 5 V	3.312 V
IC307	LDO	1	VIN	+ 2.0 V ~ + 6.0 V	+ 3.319 V
		5	VOUT	0.8 V ~ 5 V	1.214 V
IC308	Switch	5	VIN	+ 2.5 V ~ + 5.5 V	+ 3.343 V
		1	VOUT		
IC310	DC,DC	4	VIN	+ 2.7 V ~ + 5.5 V	+ 5.08 V
		3	VOUT	0.6 V ~ 5 V	1.516 V
IC312	DC,DC	4	VIN	+ 2.7 V ~ + 5.5 V	+ 5.09 V
		3	VOUT	0.6 V ~ 5 V	1.11 V
IC501	MPEG	K12	DVCC12	1.14 V ~ 1.26 V	+ 1.215 V
		G14	DVCC33	3.15 V ~ 3.45 V	+ 3.341 V
		N23	AVDD12	1.14 V ~ 1.26 V	+ 1.214 V
		R26	AVDD33	3.15 V ~ 3.45 V	+ 3.342 V
		AC3	DDRVCCIO1		
N8	DDRVREF				
IC503	DDR3 SDRAM		VIN	+ 2.8 V ~ + 5.5 V	+ 3.42 V
IC504	DDR3 SDRAM		VIN	+ 2.8 V ~ + 5.5 V	+ 3.42 V
IC505	NAND		VCC	- 0.6 V ~ + 4.6 V	+ 3.345 V
IC601	DSP	01 ~ 32	VDD_INT	1.05 V ~ 1.15 V	1.14 V
		1 ~ 18	VDD_EXT	3.13 V ~ 3.47 V	3.331 V
		1 ~ 18	VDD_DMC	1.7 V ~ 1.9 V	1.8 V
IC602	Serial Flash	8	VCC	2.7 V ~ 3.6 V	3.342 V
IC705	DAC	13, 21, 25, 47	VDD	1.14 V ~ 1.26 V	+ 1.215 V
		20, 48	DVCC	3.135 V ~ 3.465 V	+ 3.32 V
		14, 24, 31	AVCC	3.135 V ~ 3.465 V	+ 3.32 V
IC706	AMP	17	AVCC	4.5 V ~ 26 V	20.12 V
		18, 19, 31, 32	PVCC	4.5 V ~ 26 V	20.13 V
IC708	AMP	17	AVCC	4.5 V ~ 26 V	20.12 V
		18, 19, 31, 32	PVCC	4.5 V ~ 26 V	20.13 V
IC707	AMP	17	AVCC	4.5 V ~ 26 V	20.12 V
		18, 19, 31, 32	PVCC	4.5 V ~ 26 V	20.13 V
IC710	AMP	17	AVCC	4.5 V ~ 26 V	20.12 V
		18, 19, 31, 32	PVCC	4.5 V ~ 26 V	20.13 V

## ICs

Location	Name	Pin No	Pin Name	Spec	Measured Voltage
IC800	HDMI		LPSBV	4.5 V ~ 5.5 V	5.05 V
			RXn1_PWR5V	4.5 V ~ 5.3 V	5.04 V
			SBVCC5	4.5 V ~ 5.5 V	5.05 V
			IO_VDD33	3.14 V ~ 3.46 V	3.321 V
			RX_AVDD33	3.14 V ~ 3.46 V	3.324 V
			TX0_AVDD33	3.14 V ~ 3.46 V	3.323 V
			RX_AVDD10	1.0 V ~ 1.1 V	1.041 V
			TXn_AVDD10	1.0 V ~ 1.1 V	1.042 V
			TXn_PVDD10	1.0 V ~ 1.1 V	1.041 V
			CVDD10	1.0 V ~ 1.1 V	1.044 V
			CGO_PVDD10	1.0 V ~ 1.1 V	1.04 V
	RX_PVDD10	1.0 V ~ 1.1 V	1.041 V		
IC802	Switch	5	VIN	+ 2.5 V ~ + 5.5 V	+ 3.341 V
		1	VOUT		
IC803	Switch	5	VIN	+ 4.5 V ~ + 5.5 V	+ 5.096 V
		1	VOUT		
IC804	DC,DC	1	VIN	+ 4.5 V ~ + 17 V	+ 5.11 V
		2	VOUT	0.8 V ~ 10 V	3.31 V
IC805	Switch	5	VIN	+ 4.5 V ~ + 5.5 V	+ 5.097 V
		1	VOUT		

## 2. CAPACITORS

Location	Spec	Measured [V]
C707	330uF/35V (105/ 2000HR)	+25.2V
C708	330uF/35V (105/ 2000HR)	+25.2V
C710	330uF/35V (105/ 2000HR)	+25.2V
C711	330uF/35V (105/ 2000HR)	+25.2V
C712	330uF/35V (105/ 2000HR)	+25.2V
C7U9	330uF/35V (105/ 2000HR)	+25.2V
C7V3	330uF/35V (105/ 2000HR)	+25.2V

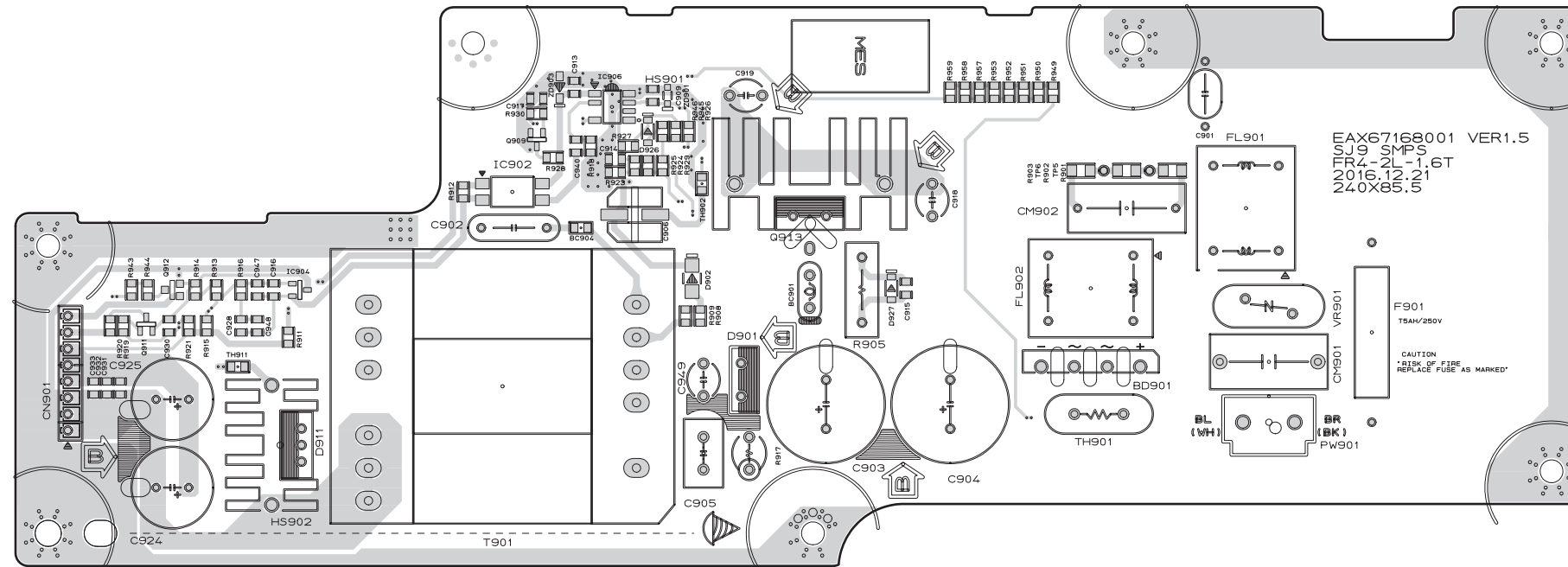
## 3. CONNECTORS

Test	Connector	Spec	Measured [V]
Bluetooth	CN201 (PIN10)	3.0 V ~ 3.6 V	3.352 V
Wi-Fi	CN200 (PIN1)	2.97 V ~ 3.63 V	3.421 V
Wireless (Subwoofer)	CN104 (PIN1)	3.0 V ~ 3.6 V	3.354 V
Wireless (Rear Box)	CN107	3.0 V ~ 3.6 V	3.352 V

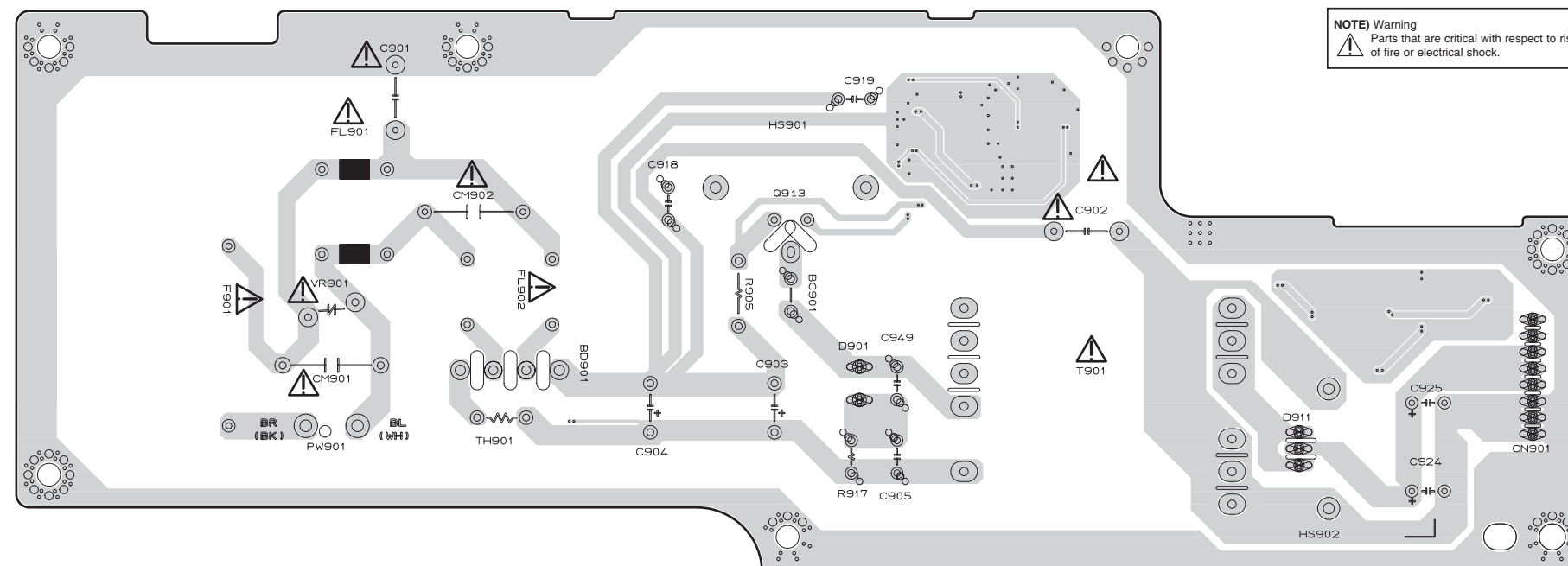
# PRINTED CIRCUIT BOARD DIAGRAMS

## 1. SMPS P. C. BOARD DIAGRAM

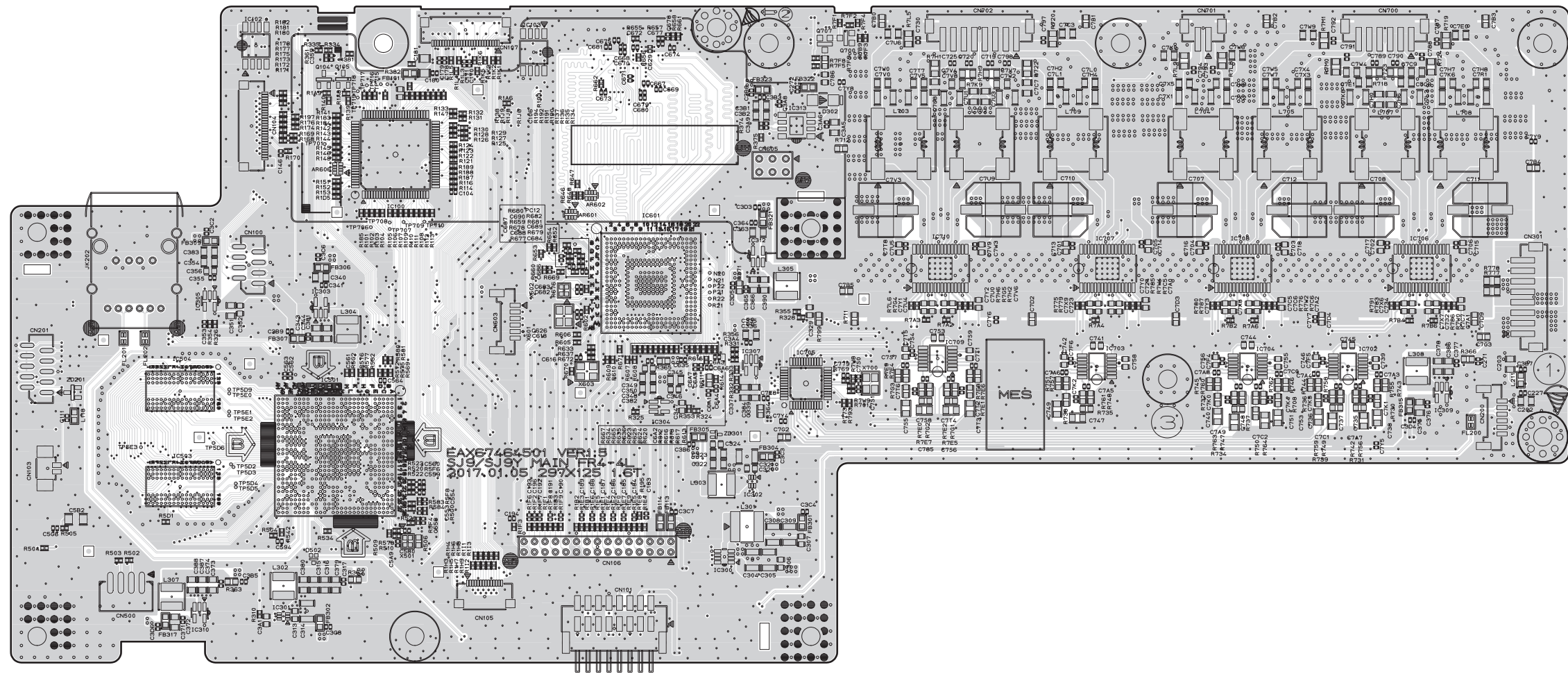
(TOP VIEW)



(BOTTOM VIEW)

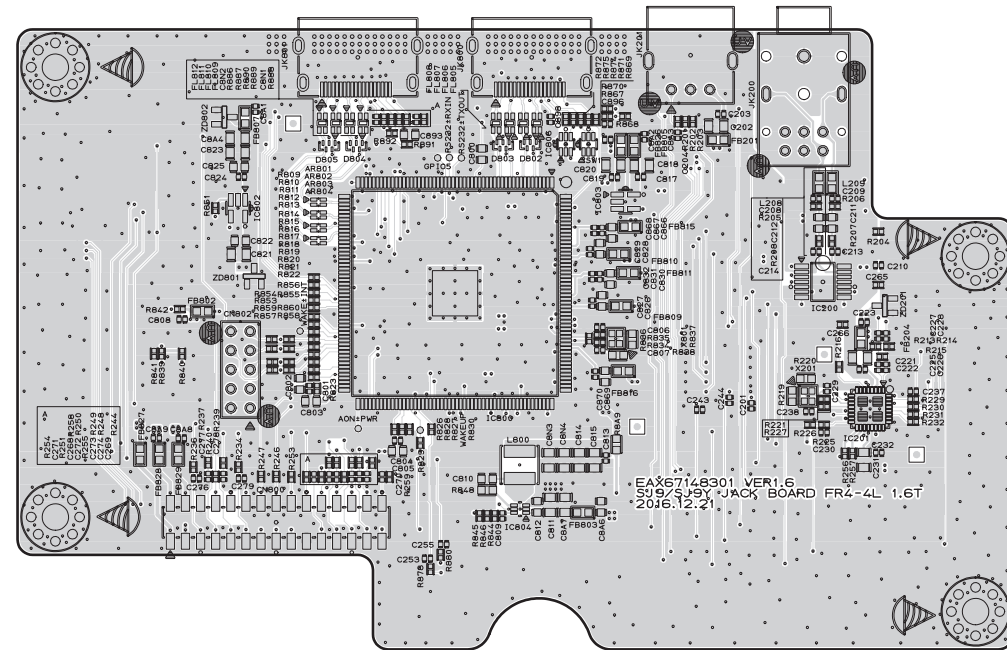


## 2. MAIN P. C. BOARD DIAGRAM (TOP VIEW)

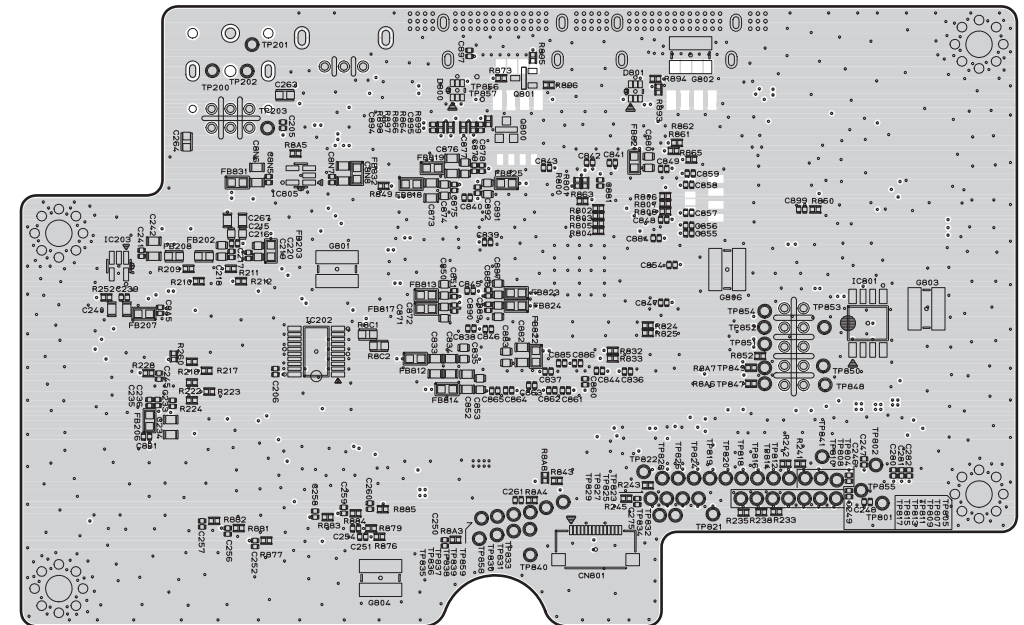




### 3. HDMI/ JACK P. C. BOARD DIAGRAM (TOP VIEW)



### (BOTTOM VIEW)





# SECTION 4

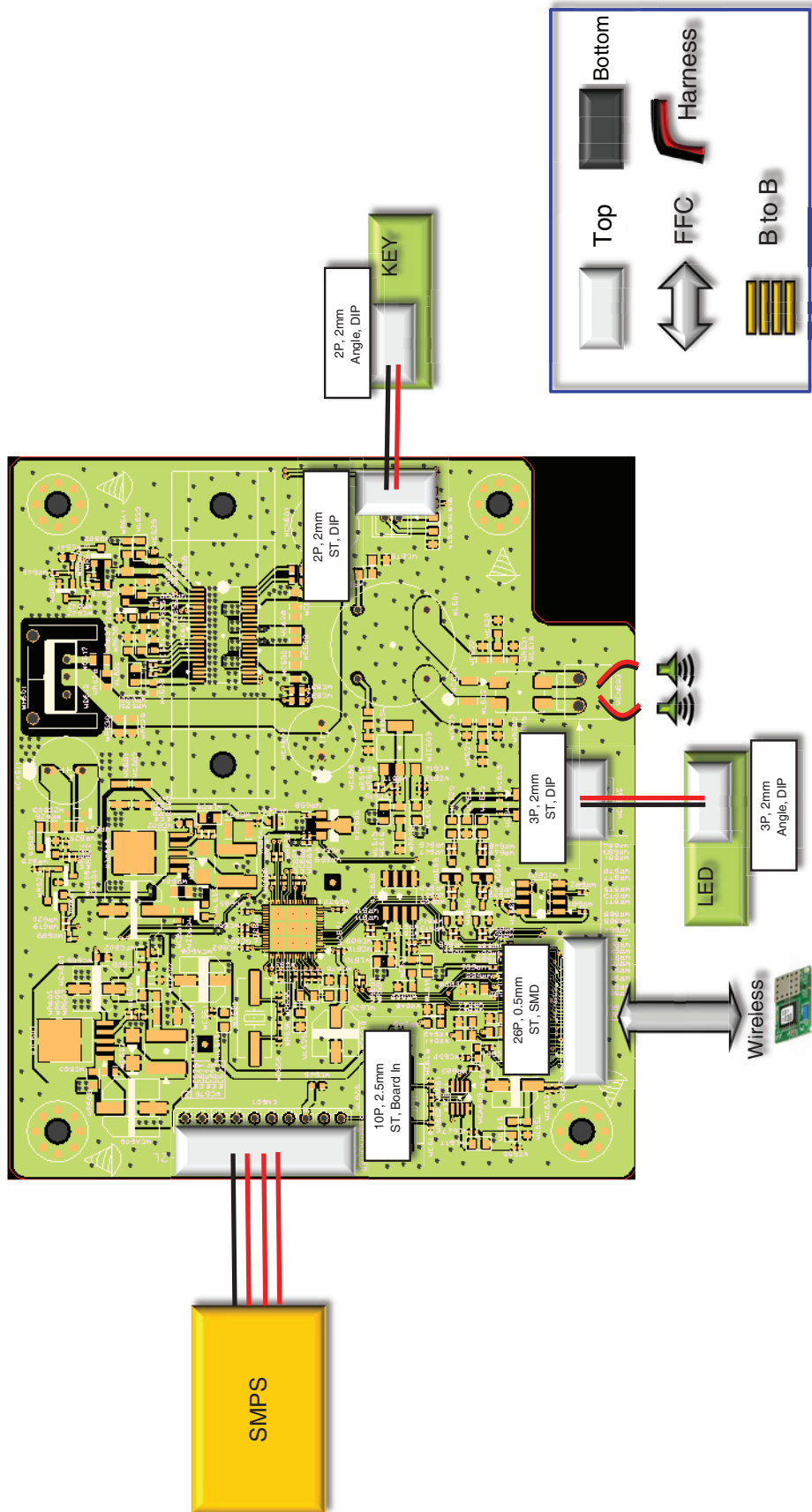
## WIRELESS SUBWOOFER PART

### CONTENTS

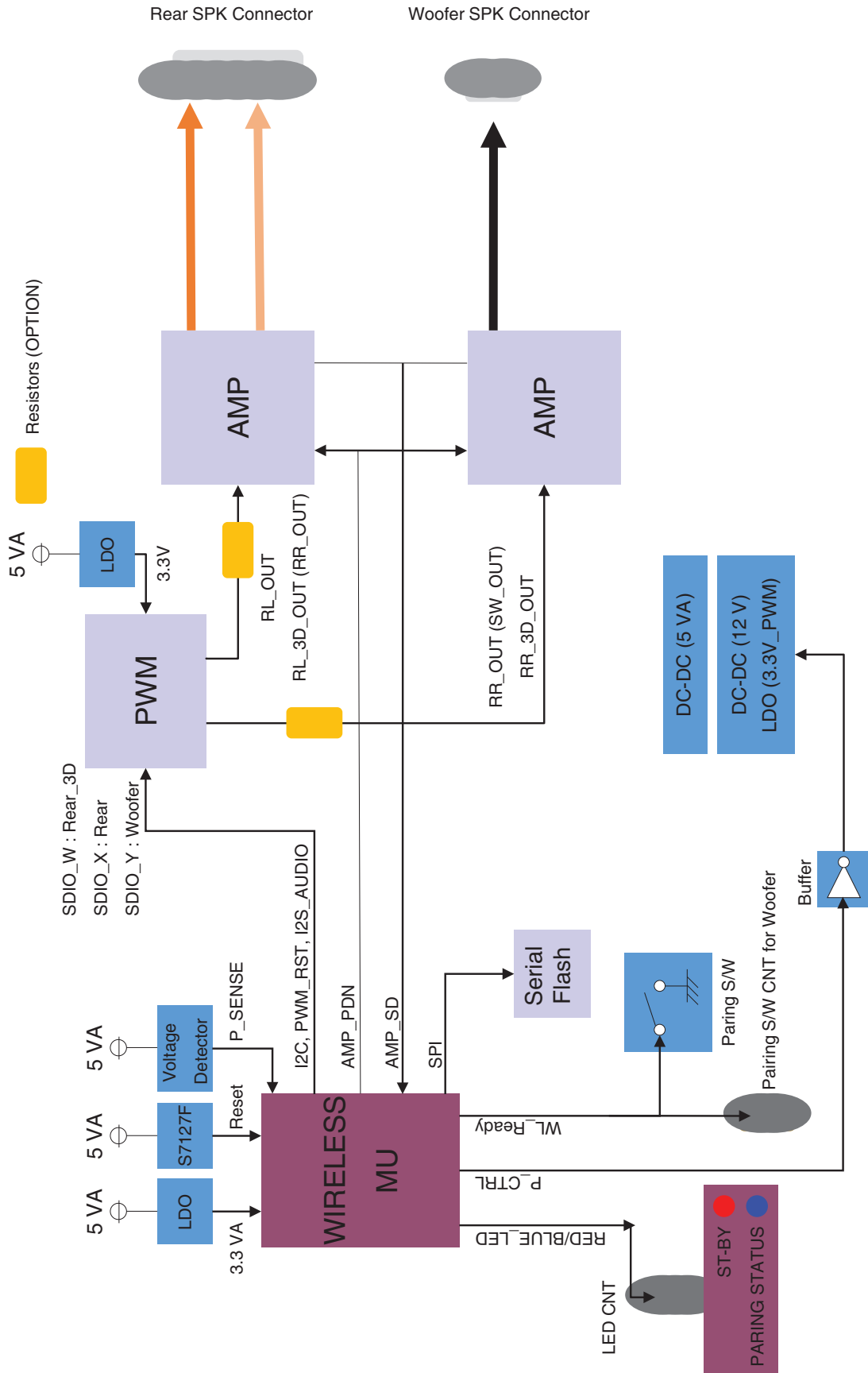
<b>WIRING DIAGRAM</b> .....	<b>4-2</b>
<b>BLOCK DIAGRAM</b> .....	<b>4-3</b>
<b>ONE POINT REPAIR GUIDE</b> .....	<b>4-4</b>
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3. POWER ON ERROR (3.3 VA, 3 V) .....	4-7
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# WIRING DIAGRAM



# BLOCK DIAGRAM



# ONE POINT REPAIR GUIDE

## 1. NO POWER PROBLEM

No power problem occurs when you power on the unit.

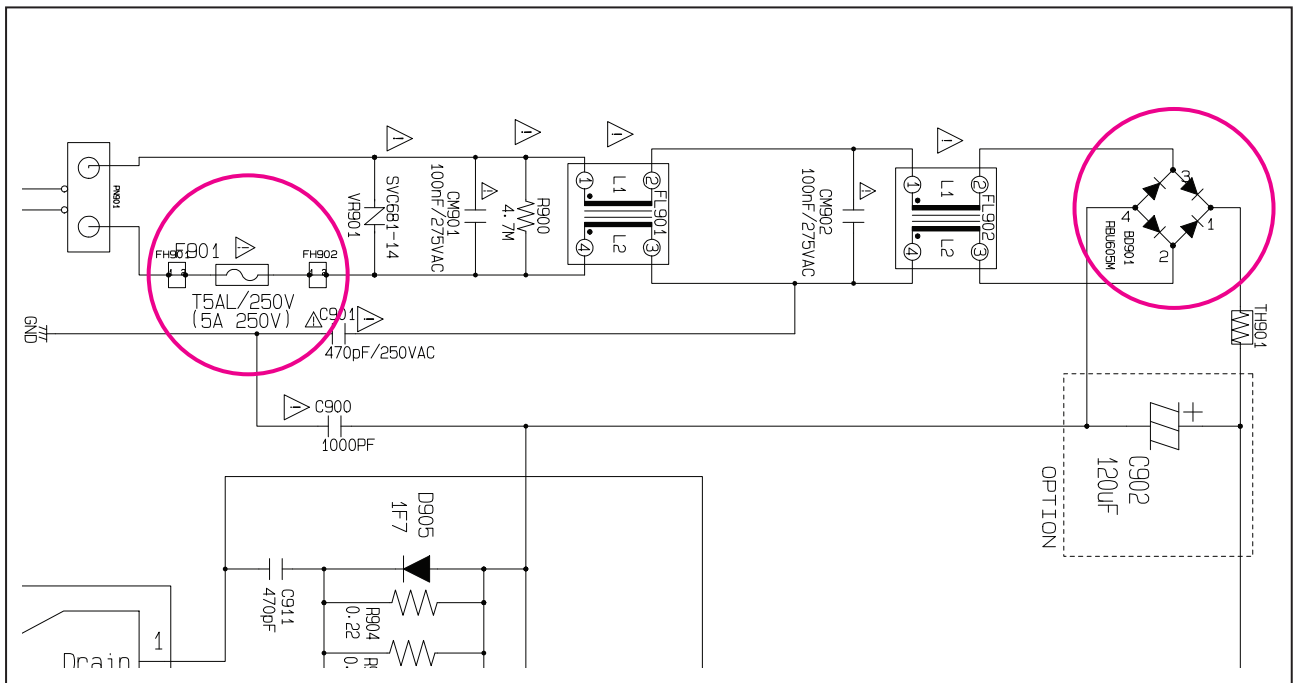
### 1-1. Fuse & Bridge diode

#### 1-1-1. Solution

Replace F901, BD901 on SMPS board.

#### 1-1-2. How to troubleshoot (Countermeasure)

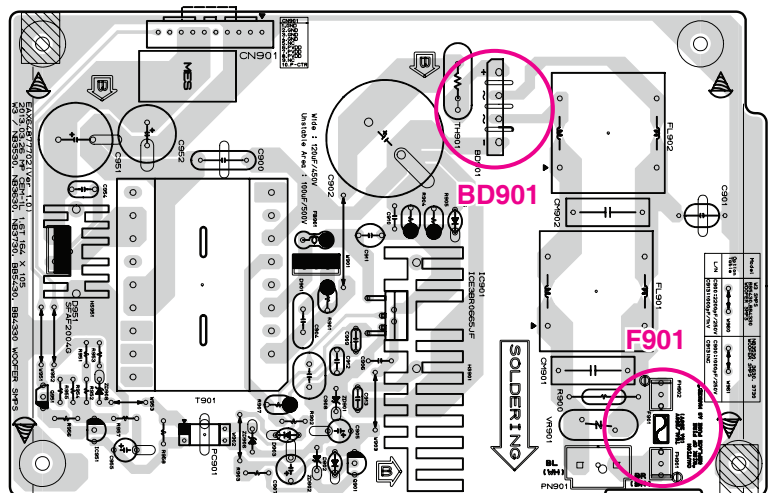
- 1) Look at the physical of fuse F901.
- 2) Check the bridge diode BD901.



#### 1-1-3. Service hint (Any picture / Remark)



< Fuse, F901 >  
Can look at physical condition.



< Woofer SMPS board top view >



# ONE POINT REPAIR GUIDE

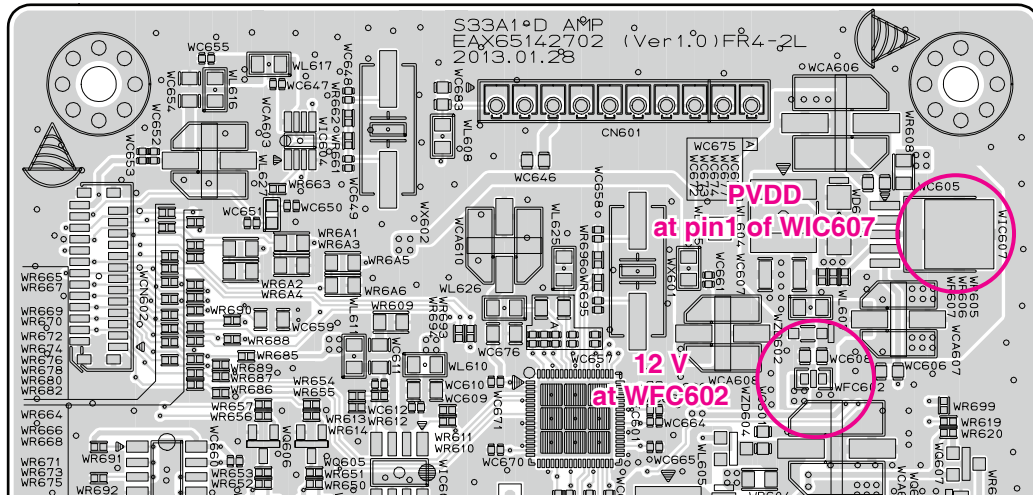
## 2. POWER ON ERROR (12 V, 5 VA)

Fundamental power check points

### 2-1. 12 V

- 1) Check 12 V at WFC602.
- 2) If 12 V is not checked at the point, then find PVDD at pin1 of WIC607.
- 3) 1), 2) is NG → Replace WIC607.

If you can't check PVDD voltage, then you replace woofer SMPS board.

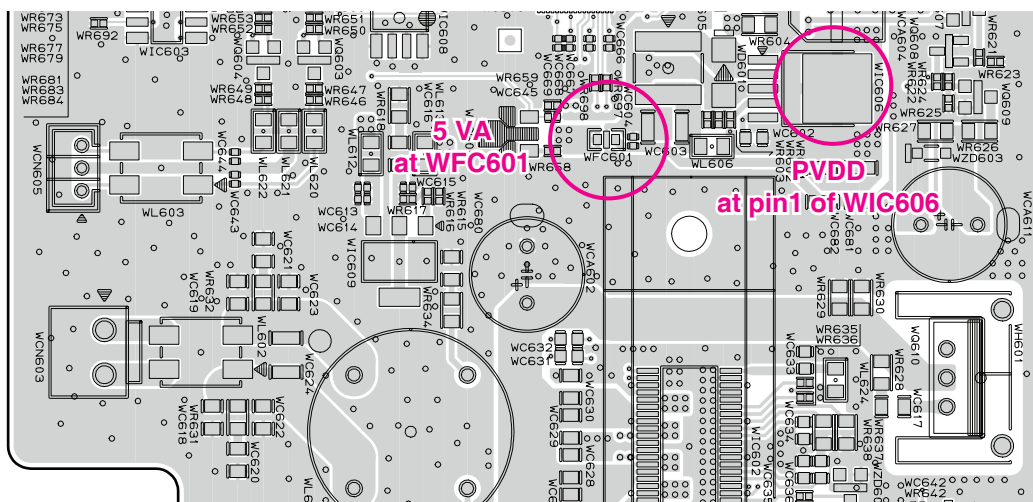


< Woofer AMP board top view >

### 2-2. 5 VA

- 1) Check 5 VA at WFC601.
- 2) If 5 VA is not checked at the point, then find PVDD at pin1 of WIC606.
- 3) 1), 2) is NG → Replace WIC606.

If you can't check PVDD voltage, then you replace woofer SMPS board.



< Woofer AMP board top view >

# ONE POINT REPAIR GUIDE

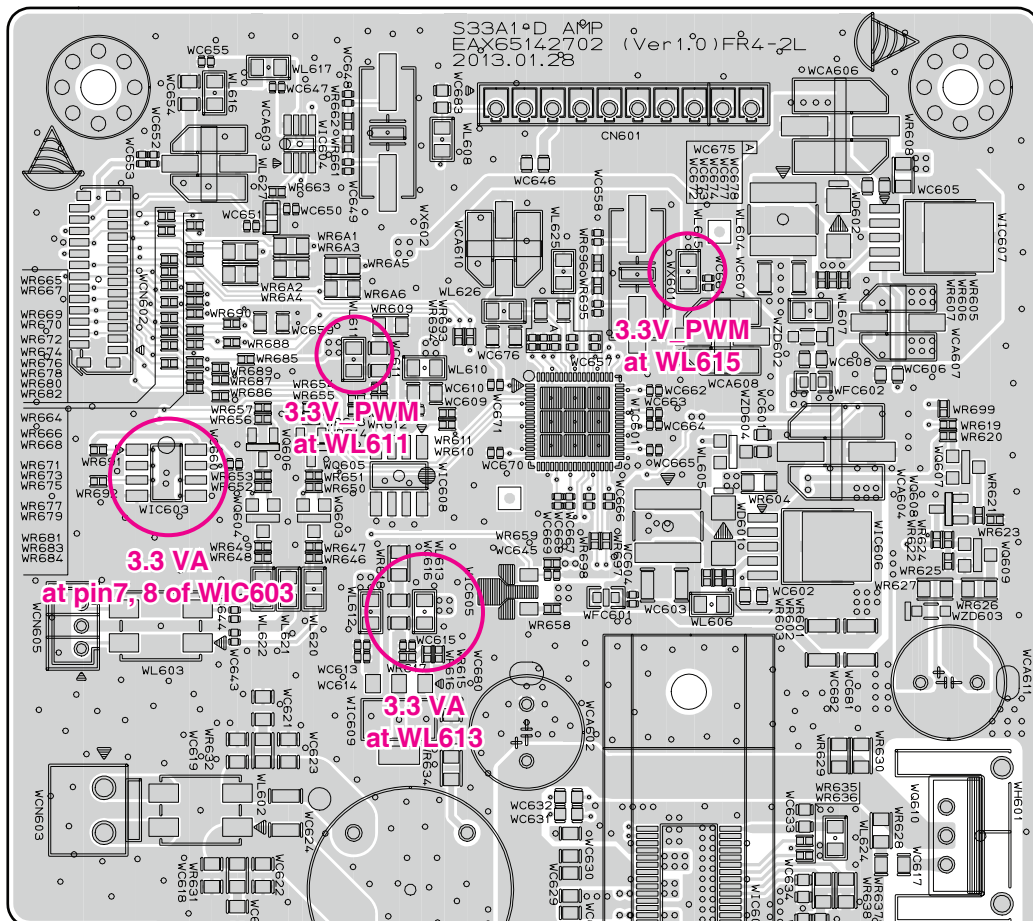
## 3. POWER ON ERROR (3.3 VA, 3 V)

MAIN SoC IC supply voltage check points

### 3-1. 3.3 VA

- 1) Check 3.3 VA at WL613 nearby WIC609.
- 2) Check 3.3 VA at pin7, 8 of WIC603.
- 3) Check 3.3V\_PWM at WL611 nearby WIC608.
- 4) Check 3.3V\_PWM at WL615 nearby WIC601.

If all voltages are OK, then check the PVDD voltage of woofer SMPS board.



< Woofer AMP board top view >

# ONE POINT REPAIR GUIDE

## 4. WIRELESS CONNECTION

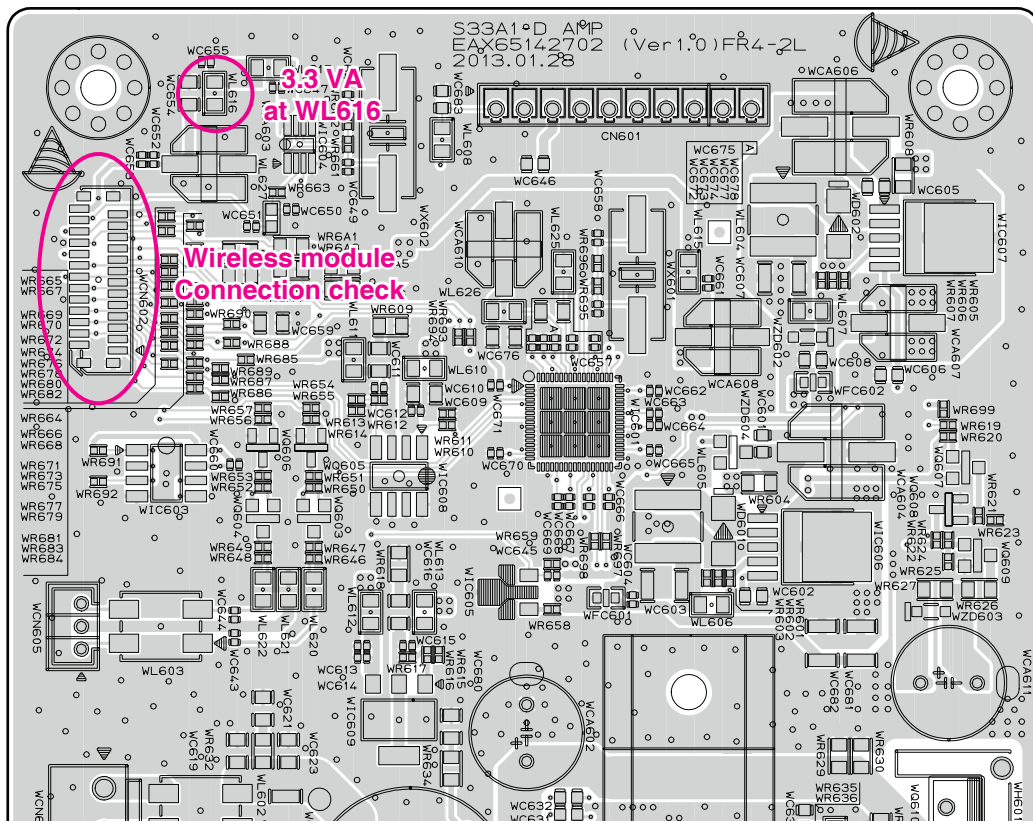
### Wireless connection malfunction

#### 4-1. 3.3 VA

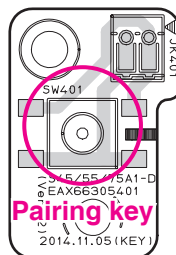
- 1) Check 3.3 VA at WL616.

#### 4-2. Connection

- 1) Wireless module connection closely.
- 2) Implement Wireless Factory Reset.
  - ➔ MAIN SET : Soundbar vol MIN and push Mute key (sustain 3 ~ 5 sec).
  - ➔ Subwofer :
    - ❶ Push Pairing key on the back case of the wireless subwoofer.
    - ❷ The LED of of the wireless subwoofer blink red and green, pull out power cord.
    - ❸ The main set and the wireless subwoofer are factory reset mode, then power on.



< Woofer AMP board top view >



< Woofer KEY board top view >

# WAVEFORMS OF MAJOR CHECK POINT

## 1. CRYSTAL

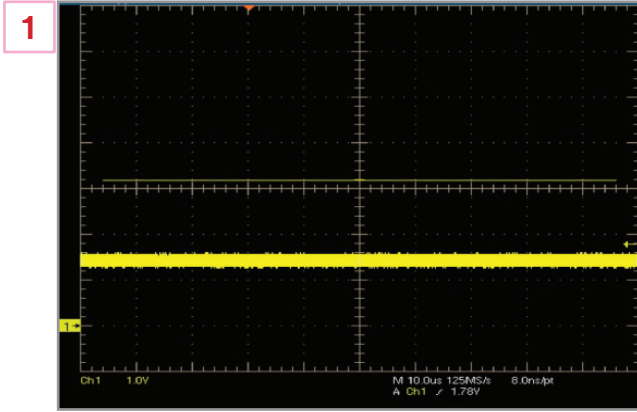


Fig 1. Crystal  
WX602 (24.576 MHz)

## 2. FLASH MEMORY

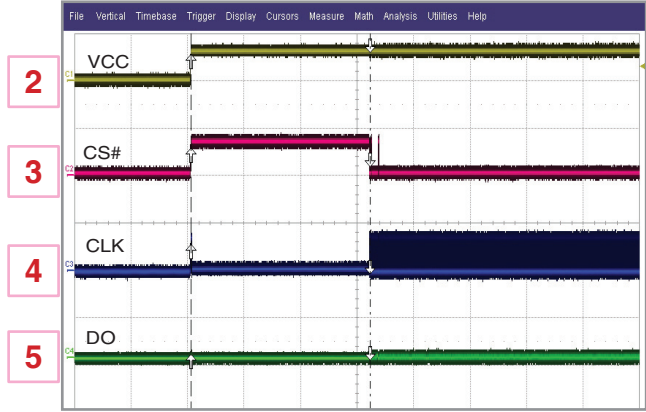
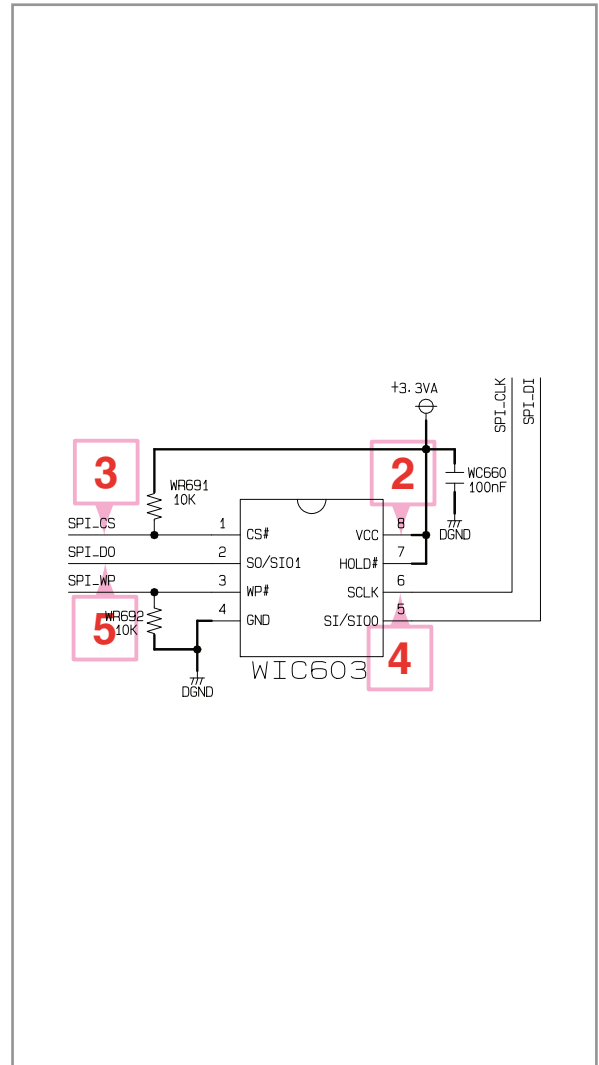
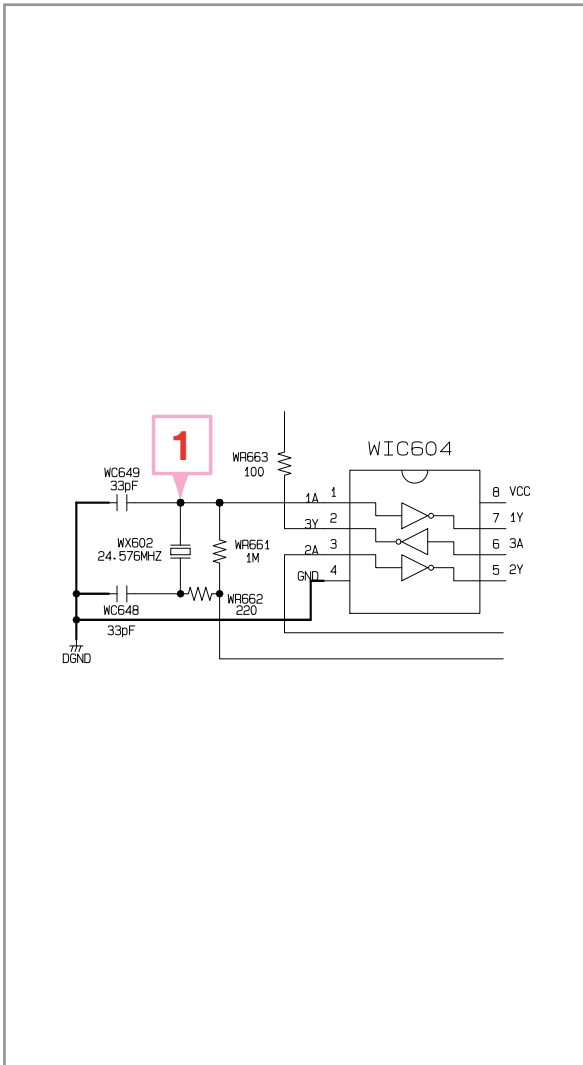


Fig 2. Flash Memory





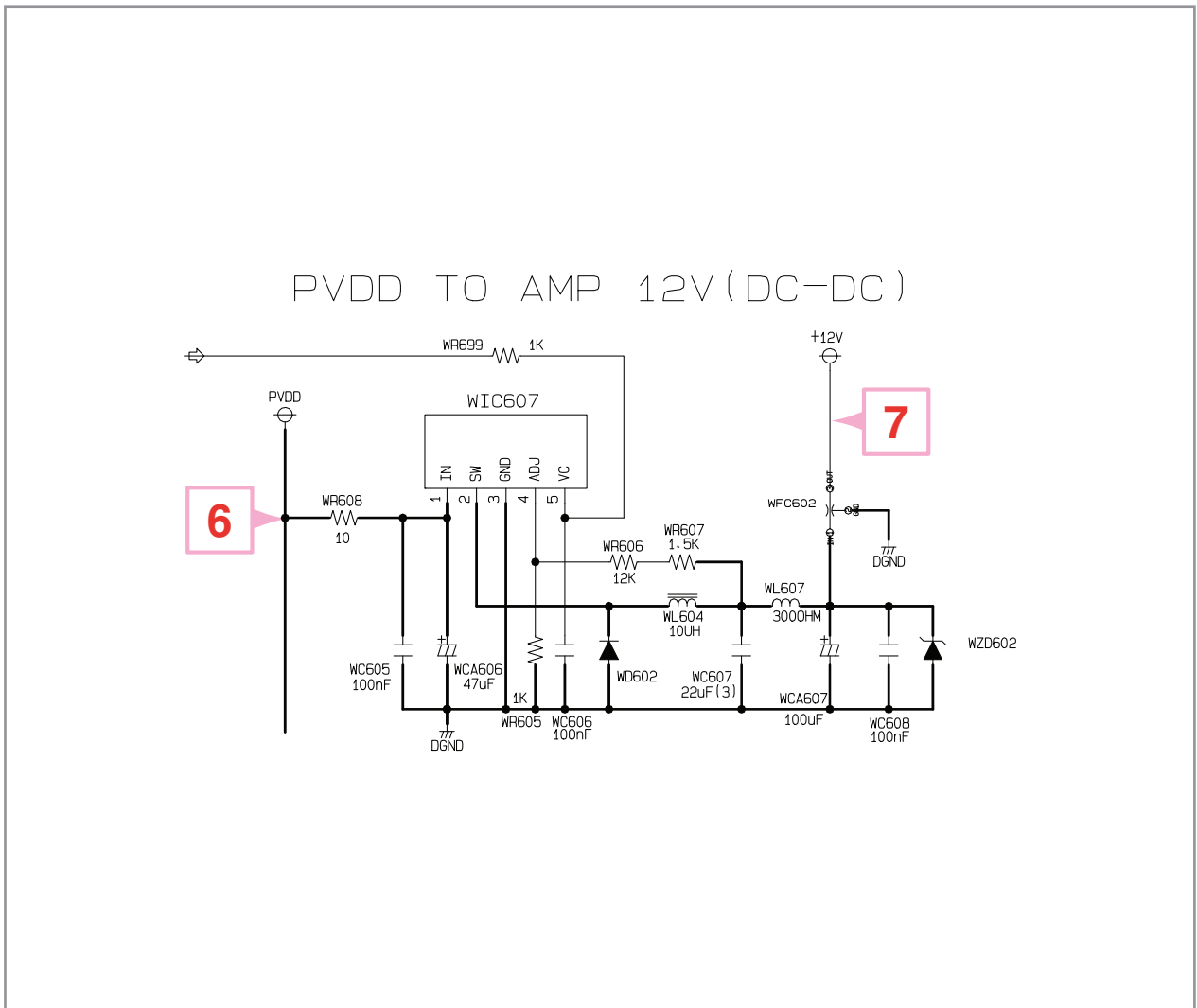
### 3. VOLTAGE



Fig 3-1. Woofer PVDD



Fig 3-2. Woofer 12 VA



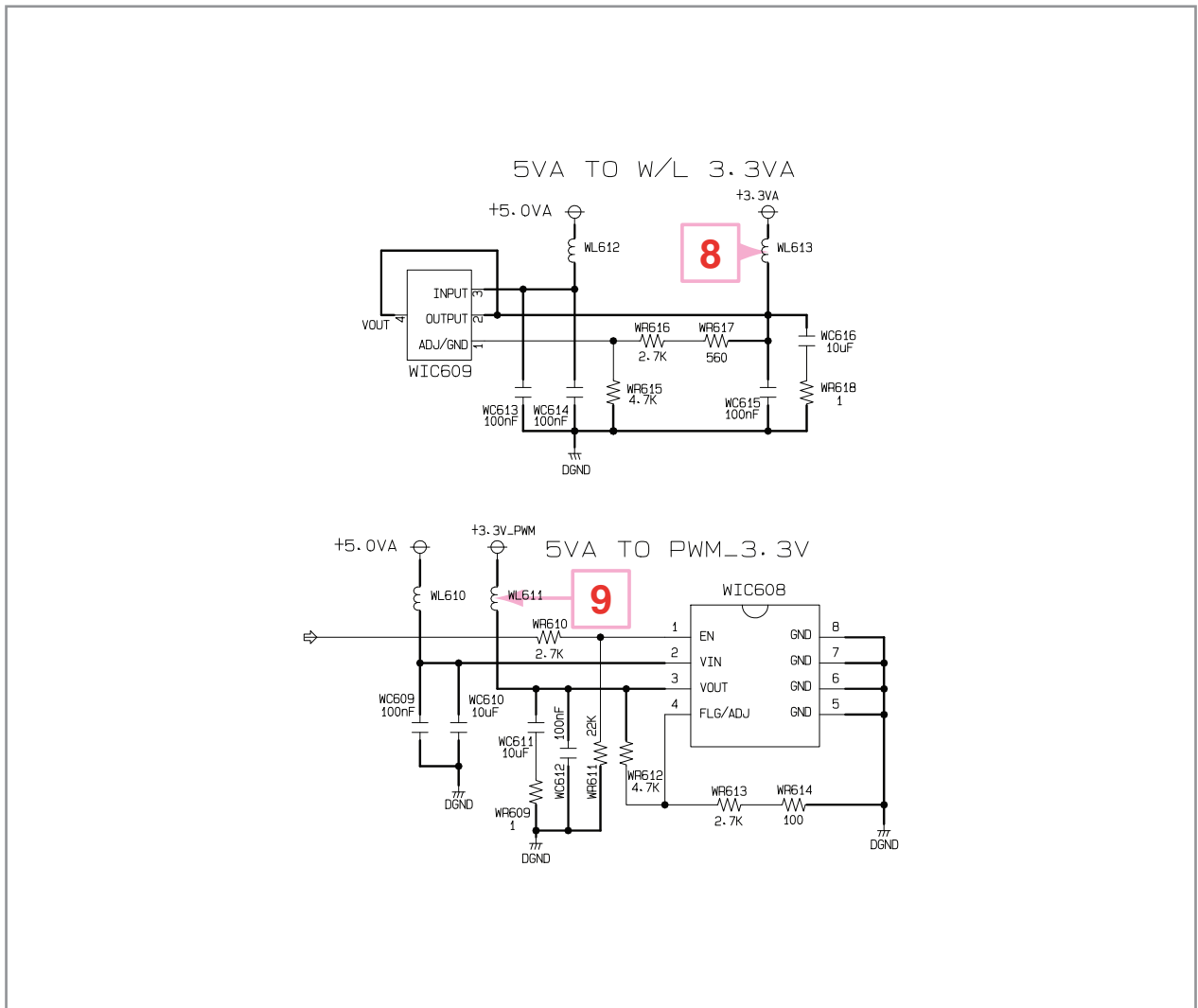
# VOLTAGE



Fig 3-3. Woofer 3.3 VA



Fig 3-4. Woofer 3.3V\_PWM



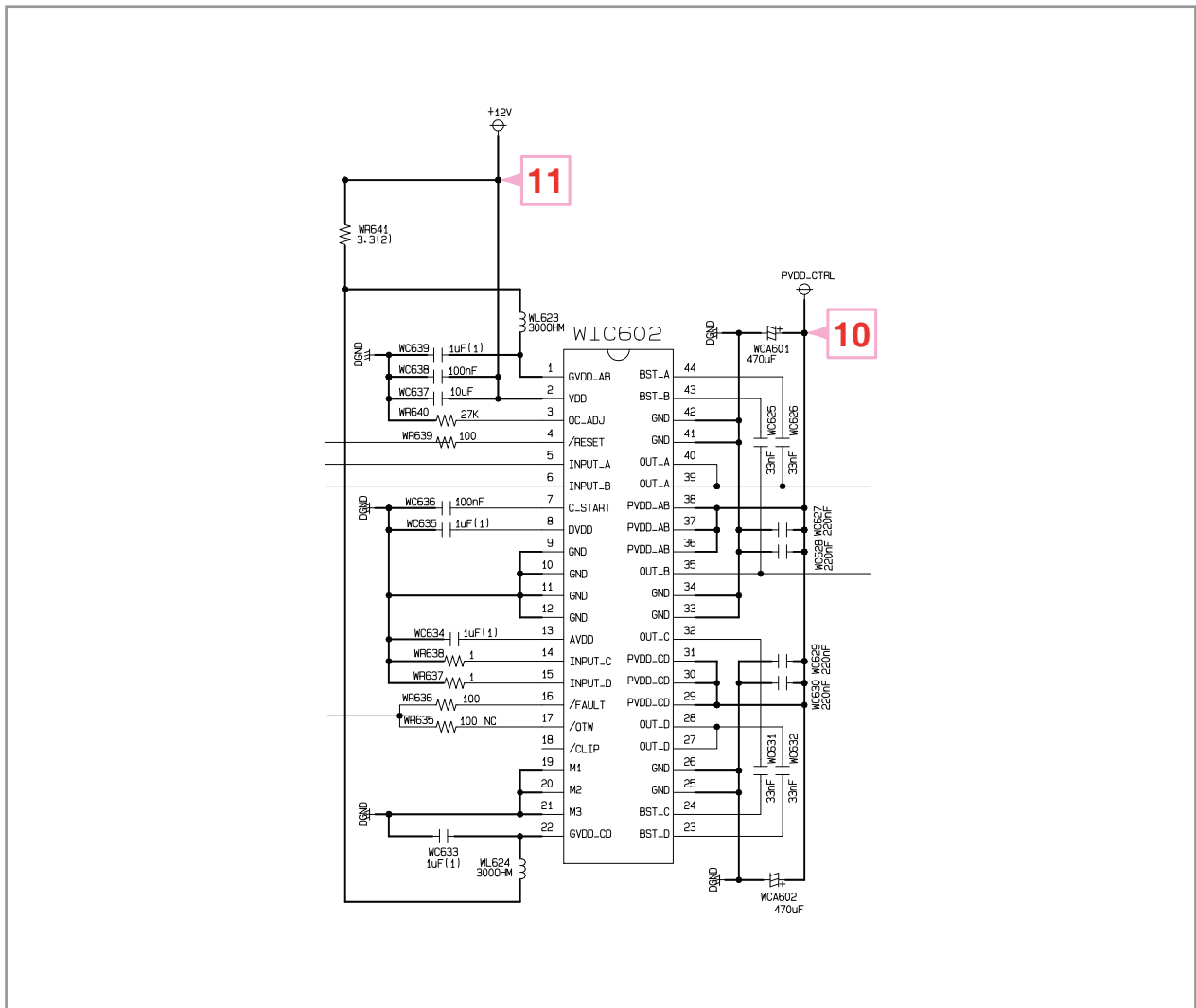
# 4. AMP VOLTAGE



Fig 4-1. AMP PVDD



Fig 4-2. AMP 12 V



## 5. PWM

12

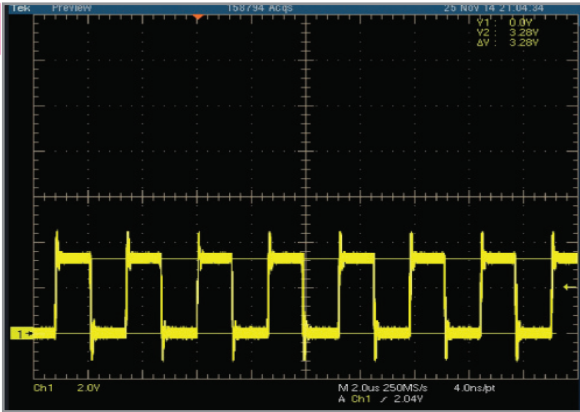


Fig 5-1. Woofer PWM SW+ Signal

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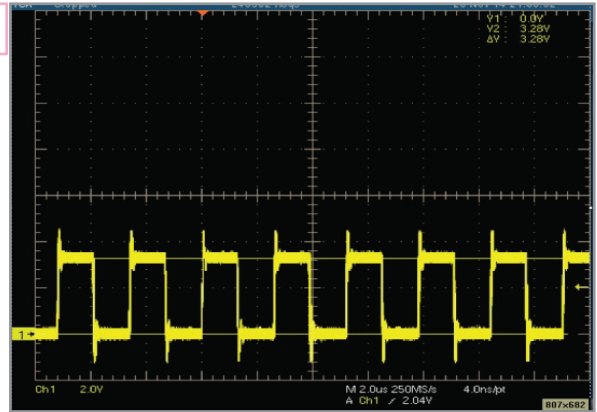
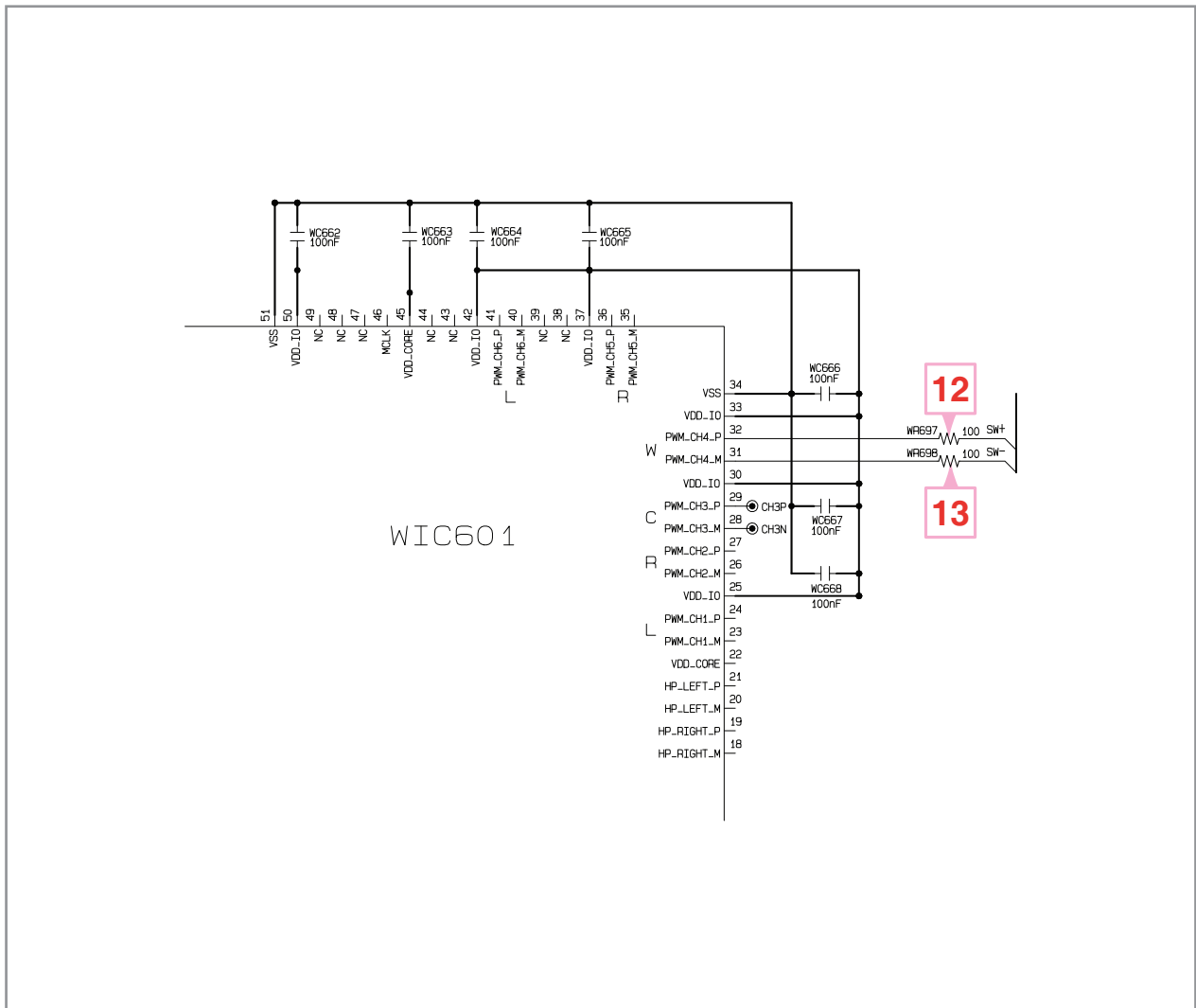


Fig 5-2. Woofer PWM SW- Signal



## 6. LED

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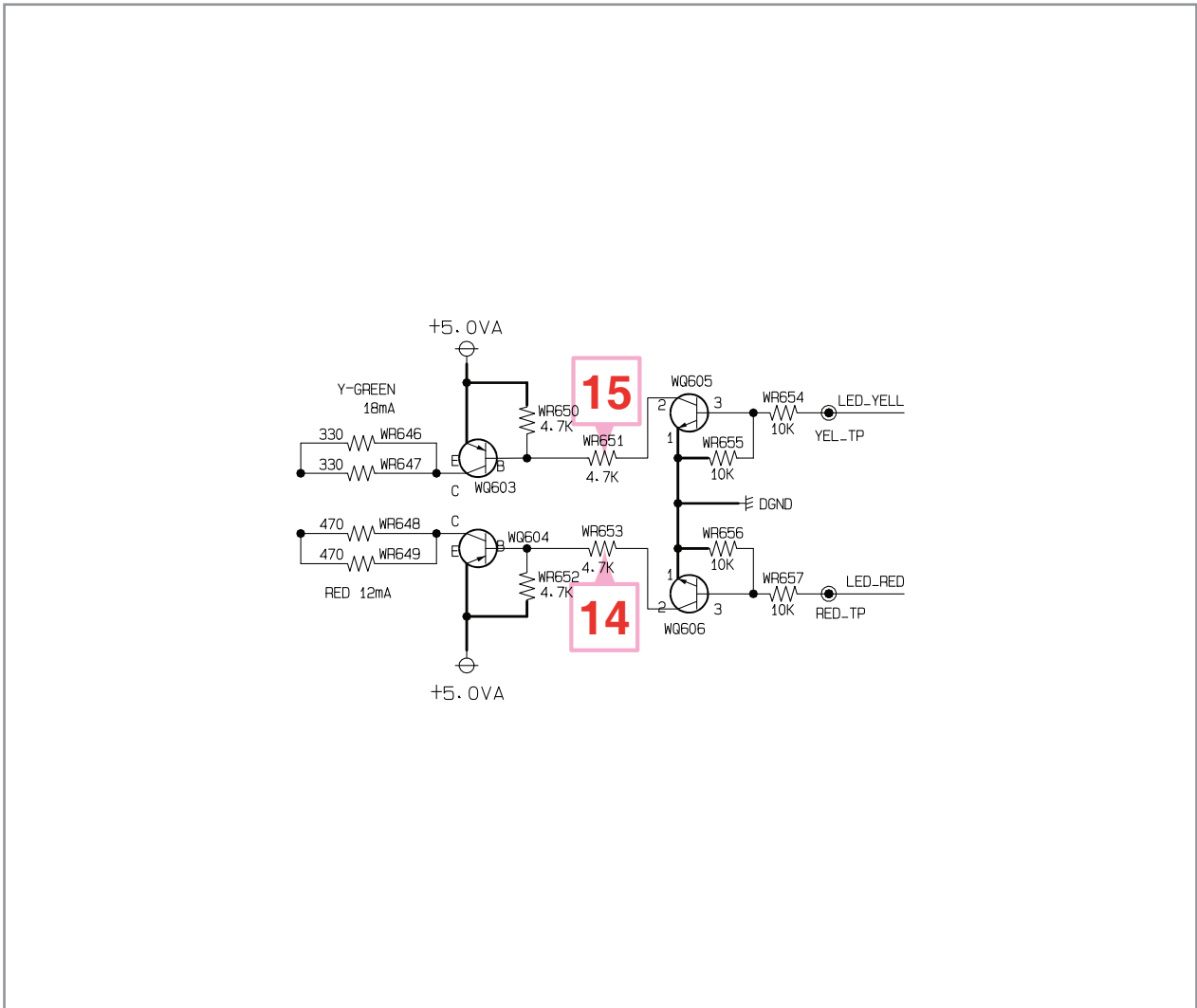


Fig 6-1. Pairing Off Status → Red LED

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Fig 6-2. Pairing On Status → Green LED

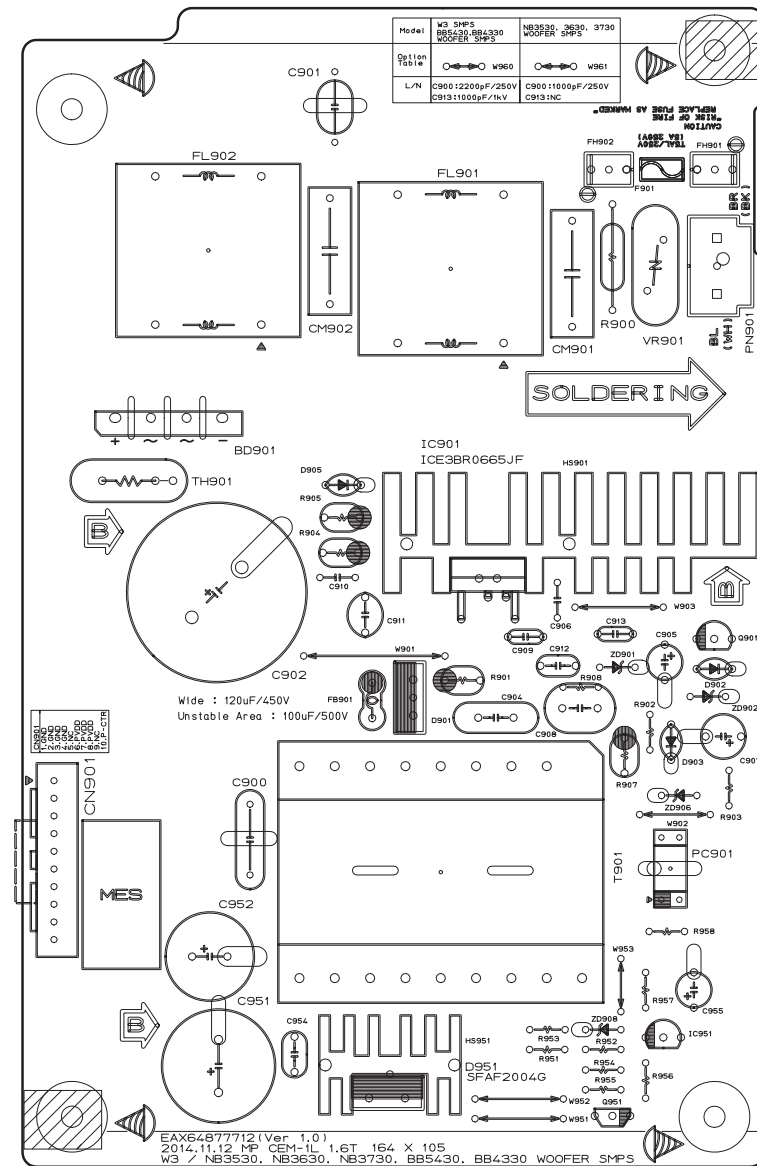




# PRINTED CIRCUIT BOARD DIAGRAMS

## 1. WOOFER SMPS P. C. BOARD

(TOP VIEW)



(BOTTOM VIEW)

