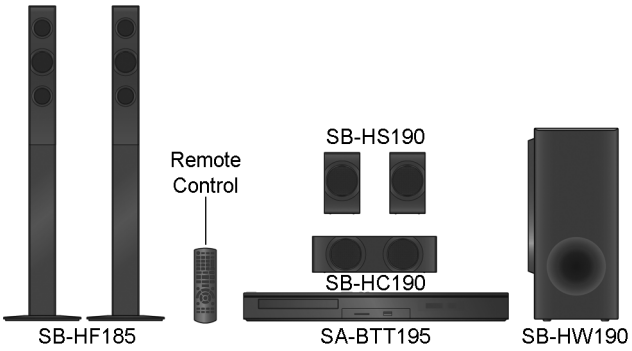
PSG1202015CE
A6

Service Manual

Blu-ray Disc™ Home Theater Sound System

The illustration shows the image of the unit SC-BTT195.



Model No. SA-BTT190P
SA-BTT190PC
SA-BTT195P
SA-BTT195PC
SA-BTT196P

Vol.1

Product Color: (K)...Black Type

Notes: Please refer to the original service manual for:
- **BD Mechanism Unit (BRS14P), Order No. PSG1201008CE**
- **Speaker system SB-BTT190P-K/PCK (For SA-BTT190P-K/PCK), Order No: PSG1202027CE**
- **Speaker system SB-BTT195P-K/PCK (For SA-BTT195P-K/PCK, SA-BTT196P-K), Order No: PSG1202028CE**

⚠ WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public.
It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product.
Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

IMPORTANT SAFETY NOTICE

There are special components used in this equipment which are important for safety. These parts are marked by ⚠ in the Schematic Diagrams, Circuit Board Diagrams, Exploded Views and Replacement Parts List. It is essential that these critical parts should be replaced with manufacturer's specified parts to prevent shock, fire or other hazards. Do not modify the original design without permission of manufacturer.

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Panasonic

1 Safety Precautions

1.1. General Guidelines

1. When servicing, observe the original lead dress. If a short circuit is found, replace all parts which have been overheated or damaged by the short circuit.
2. After servicing, see to it that all the protective devices such as insulation barriers, insulation papers shields are properly installed.
3. After servicing, carry out the following leakage current checks to prevent the customer from being exposed to shock hazards.

1.1.1. Leakage Current Cold Check

1. Unplug the AC cord and connect a jumper between the two prongs on the plug.
2. Measure the resistance value, with an ohmmeter, between the jumpered AC plug and each exposed metallic cabinet part on the equipment such as screwheads, connectors, control shafts, etc. When the exposed metallic part has a return path to the chassis, the reading should be between 1MΩ and 5.2MΩ.
   When the exposed metal does not have a return path to the chassis, the reading must be ∞

(This “Safety Precaution” is applied only in U.S.A.)

1. Before servicing, unplug the power cord to prevent an electric shock.
2. When replacing parts, use only manufacturer’s recommended components for safety.
3. Check the condition of the power cord. Replace if wear or damage is evident.
4. After servicing, be sure to restore the lead dress, insulation barriers, insulation papers, shields, etc.
5. Before returning the serviced equipment to the customer, be sure to make the following insulation resistance test to prevent the customer from being exposed to a shock hazard.

1.1.2. Leakage Current Hot Check

1. Plug the AC cord directly into the AC outlet. Do not use an isolation transformer for this check.
2. Connect a 1.5kΩ, 10 watts resistor, in parallel with a 0.15μF capacitors, between each exposed metallic part on the set and a good earth ground such as a water pipe, as shown in Figure 1.
3. Use an AC voltmeter, with 1000 ohms/volt or more sensitivity, to measure the potential across the resistor.
4. Check each exposed metallic part, and measure the voltage at each point.
5. Reverse the AC plug in the AC outlet and repeat each of the above measurements.
6. The potential at any point should not exceed 0.75 volts RMS. A leakage current tester (Simpson Model 229 or equivalent) may be used to make the hot checks, leakage current must not exceed 1/2 milliamp. In case a measurement is outside of the limits specified, there is a possibility of a shock hazard, and the equipment should be repaired and rechecked before it is returned to the customer.

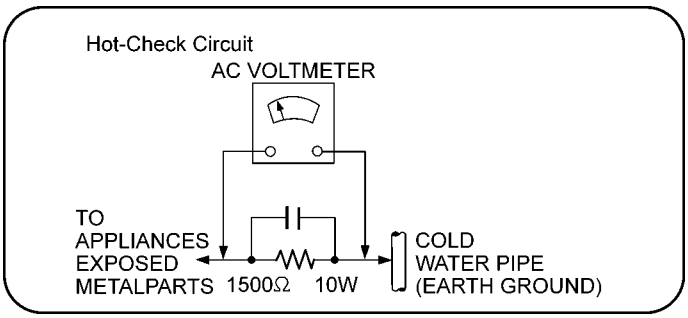


Figure 1

1.2. Before Repair and Adjustment

Disconnect AC power to discharge unit AC Capacitors as such (C5700, C5702, C5703, C5704, C5705, C5706, C5709) through a 10 Ω, 10 W resistor to ground.

Caution:

DO NOT SHORT-CIRCUIT DIRECTLY (with a screwdriver blade, for instance), as this may destroy solid state devices.

After repairs are completed, restore power gradually using a variac, to avoid overcurrent.

Current consumption at AC 120 V, 60 Hz in NO SIGNAL mode at volume minimum should be ~ 600 mA.

1.3. Protection Circuitry

The protection circuitry may have operated if either of the following conditions are noticed:

- No sound is heard when the power is turned on.
- Sound stops during a performance.

The function of this circuitry is to prevent circuitry damage if, for example, the positive and negative speaker connection wires are “shorted”, or if speaker systems with an impedance less than the indicated rated impedance of the amplifier are used.

If this occurs, follow the procedure outlines below:

1. Turn off the power.
2. Determine the cause of the problem and correct it.
3. Turn on the power once again after one minute.

Note:

When the protection circuitry functions, the unit will not operate unless the power is first turned off and then on again.

1.4. Caution For Fuse Replacement

CAUTION:

Replace with the same type fuse:
(Manufacturer: LITTELFUSE, INC, Type: 233, F1, 6A, 125V)

(For Canadian French)
ATTENTION:

Utiliser un fusible de rechange de mme type:
(Manufacturer: LITTELFUSE, INC, Type: 233, F1, 6A, 125V)

1.5. Safety Part Information

Safety Parts List:

There are special components used in this equipment which are important for safety.

These parts are marked by (⚠) in the Schematic Diagrams & Replacement Parts List. It is essential that these critical parts should be replaced with manufacturer's specified parts to prevent shock, fire or other hazards. Do not modify the original design without permission of manufacturer.

Safety	Ref No.	Part No.	Part Name & Description	Remarks
⚠	6	REXX1186-J	1P RED WIRE (AC INLET-SMPS)	
⚠	7	REXX1187-J	1P BLACK WIRE (AC INLET-SMPS)	
⚠	10	RGR0428D-A1	REAR PANEL	BTT190P
⚠	10	RGR0428D-B1	REAR PANEL	BTT190PC
⚠	10	RGR0428D-C1	REAR PANEL	BTT195P
⚠	10	RGR0428D-D1	REAR PANEL	BTT195PC
⚠	10	RGR0428D-K	REAR PANEL	BTT196P
⚠	17	RKM0668-K1	TOP CABINET	
⚠	A2	K2CB2CB00021	AC CORD	
⚠	A3	VQT3X51	O/I BOOK (En)	BTT190P/PC, BTT195P/PC
⚠	A3	VQT3X51-1	O/I BOOK (En)	BTT196P
⚠	A3	VQT3X52	O/I BOOK (Cf)	BTT190PC, BTT195PC
⚠	PCB6	REP4740A	SMPS P.C.B.	(RTL)
⚠	PCB7	REP4740A	AC INLET P.C.B.	(RTL)
⚠	DZ5701	ERZV10V511CS	ZNR	
⚠	L5701	ELF19H520E	LINE FILTER	
⚠	L5702	ELF19H520E	LINE FILTER	
⚠	T5701	ETS40BD15GAD	MAIN TRANSFORMER	
⚠	T5751	ETS19AB2E6AG	SUB TRANSFORMER	
⚠	T6100	G4D1A0000142	SWITCHING TRANSFORMER	
⚠	PC5702	B3PBA0000503	PHOTO COUPLER	
⚠	PC5720	B3PBA0000503	PHOTO COUPLER	
⚠	PC5799	B3PBA0000503	PHOTO COUPLER	
⚠	PC5901	B3PBA0000503	PHOTO COUPLER	
⚠	F1	K5D602APA008	FUSE	
⚠	TH5702	D4CAA2R20001	THERMISTOR	
⚠	P5701	K2AB2B000007	AC INLET	
⚠	R5700	ERJ8GEYJ155V	1.5M 1/4W	
⚠	R5701	ERJ8GEYJ155V	1.5M 1/4W	
⚠	C5700	F1BAF1020020	1000pF	
⚠	C5702	F0CAF104A105	0.1uF	
⚠	C5703	F0CAF104A105	0.1uF	
⚠	C5704	F1BAF1020020	1000pF	
⚠	C5705	F1BAF1020020	1000pF	
⚠	C5706	F1BAF471A013	470pF	
⚠	C5709	F0CAF104A105	0.1uF	

2 Warning

2.1. Prevention of Electrostatic Discharge (ESD) to Electrostatic 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 electrostatic discharge (ESD).

1. Immediately before handling any semiconductor component or semiconductor-equipped assembly, drain off any ESD on your body by touching a known earth ground. Alternatively, obtain and wear a commercially available discharging ESD wrist strap, 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 (ESD protected)” can generate electrical charge sufficient to damage ES devices.
5. Do not use freon-propelled chemicals. These can generate electrical charges 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. (Otherwise 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 (ESD) sufficient to damage an ES device).

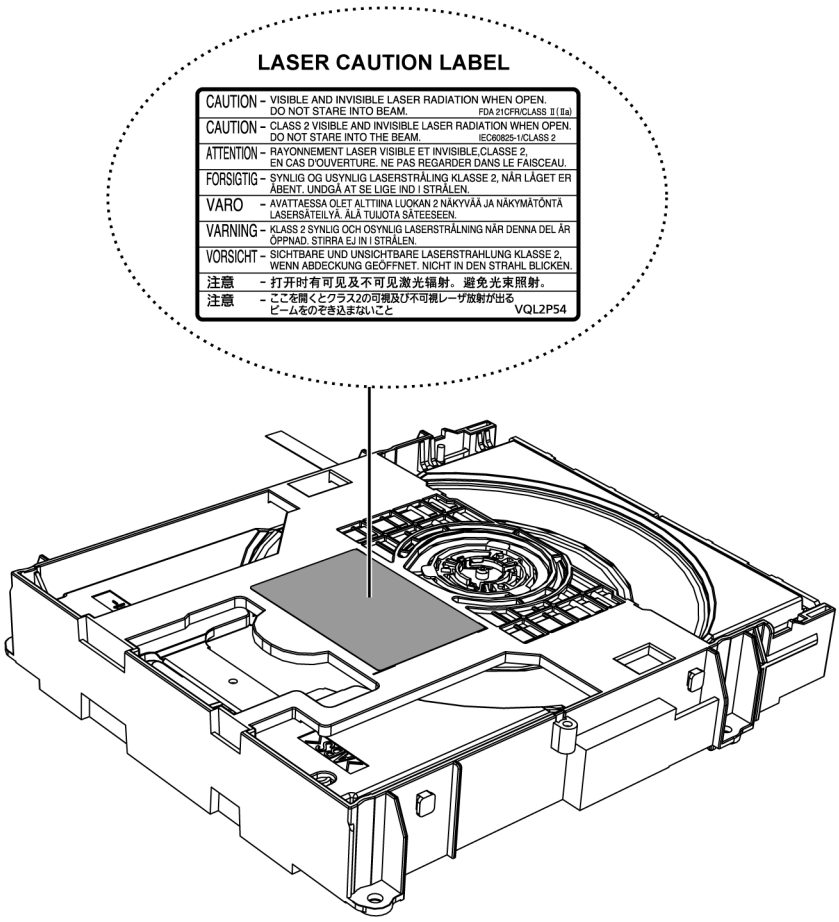
2.2. Precaution of Laser Diode

CAUTION:
THIS PRODUCT UTILIZES A LASER.
USE OF CONTROLS OR ADJUSTMENTS OR PERFORMANCE OF PROCEDURES OTHER THAN THOSE SPECIFIED HEREIN MAY RESULT IN HAZARDOUS RADIATION EXPOSURE.

Caution:

This product utilizes a laser diode with the unit turned “on”, invisible laser radiation is emitted from the pickup lens.
Wavelength: 790 nm (CDs)/660 nm (DVDs)/405 nm (BDs)
Maximum output radiation power from pickup: 100 μW/VDE
Laser radiation from the pickup unit is safety level, but be sure the followings:

1. Do not disassemble the pickup unit, since radiation from exposed laser diode is dangerous.
2. Do not adjust the variable resistor on the pickup unit. It was already adjusted.
3. Do not look at the focus lens using optical instruments.
4. Recommend not to look at pickup lens for a long time.



(Inside product on Mechanism Unit (BRS14P)).

2.3. Service caution based on Legal restrictions

The lead free solder has been used in the mounting process of all electrical components on the printed circuit boards used for this equipment in considering the globally environmental conservation.

The normal solder is the alloy of tin (Sn) and lead (Pb). On the other hand, the lead free solder is the alloy mainly consists of tin (Sn), silver (Ag) and Copper (Cu), and the melting point of the lead free solder is higher approx.30 degrees C (86°F) more than that of the normal solder.

Definition of PCB Lead Free Solder being used

The letter of “PbF” is printed either foil side or components side on the PCB using the lead free solder. (See right figure)	PbF

Service caution for repair work using Lead Free Solder (PbF)

- The lead free solder has to be used when repairing the equipment for which the lead free solder is used.
  (Definition: The letter of “PbF” is printed on the PCB using the lead free solder.)
- To put lead free solder, it should be well molten and mixed with the original lead free solder.
- Remove the remaining lead free solder on the PCB cleanly for soldering of the new IC.
- Since the melting point of the lead free solder is higher than that of the normal lead solder, it takes the longer time to melt the lead free solder.
- Use the soldering iron (more than 70W) equipped with the temperature control after setting the temperature at 350±30 degrees C (662±86°F).

Recommended Lead Free Solder (Service Parts Route.)

- The following 3 types of lead free solder are available through the service parts route.
  RFKZ03D01K----------(0.3mm 100g Reel)
  RFKZ06D01K----------(0.6mm 100g Reel)
  RFKZ10D01K----------(1.0mm 100g Reel)

Note

* Ingredient: tin (Sn), 96.5%, silver (Ag) 3.0%, Copper (Cu) 0.5%, Cobalt (Co) / Germanium (Ge) 0.1 to 0.3%

2.4. Grounding for electrostatic breakdown prevention

As for parts that use optical pick-up (laser diode), the optical pick-up is destroyed by the static electricity of the working environment.

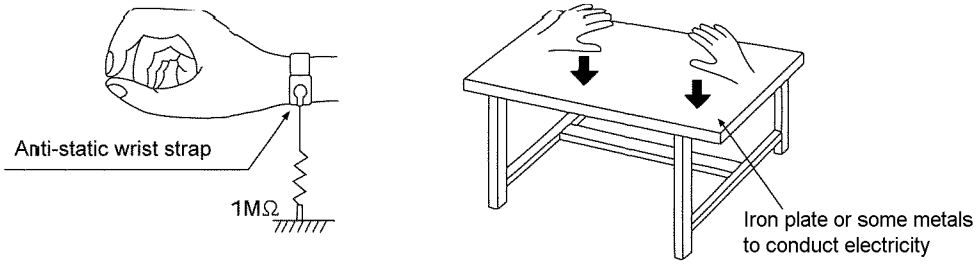
Repair in the working environment that is grounded.

2.4.1. Worktable grounding

• Put a conductive material (sheet) or iron sheet on the area where the optical pickup is placed, and ground the sheet.

2.4.2. Human body grounding

• Use the anti-static wrist strap to discharge the static electricity form your body.



3 Service Navigation

3.1. Service Information

This service manual contains technical information which will allow service personnel's to understand and service this model. Please place orders using the parts list and not the drawing reference numbers.

If the circuit is changed or modified, this information will be followed by supplement service manual to be filed with the original service manual.

• **Digital Circuitries:**

1) This service manual does not contain the following information, due to the impossibility of servicing at component level.

- Schematic Diagram, Block Diagram of Digital Circuitries on Digital P.C.B..
- Replacement Parts List for individual parts of Digital Circuitries on Digital P.C.B..
- Exploded View and Replacement Parts of individual parts of BD Mechanism Unit.

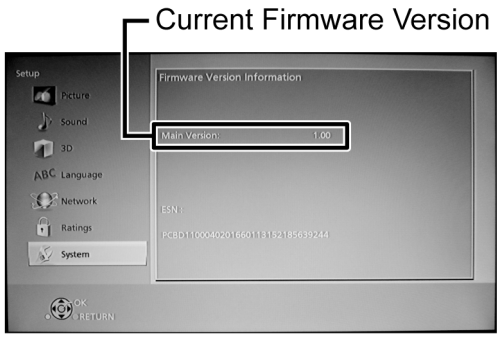
3.2. How to update the Firmware

The firmware of the unit may be renewed to improve the quality including operational performance and playability. Make sure to refer the following procedure when performing version-up.

3.2.1. Confirmation of the Firmware Version

Perform following steps to checking the firmware version currently installed in the unit.

1. Turn the unit on and wait the Home screen is displayed.
2. Select [Others] → [Setup] → [System] → [System Information] → [Firmware Version Information].
3. Firmware Version Information screen is displayed.



Firmware Version Information Screen

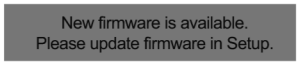
3.2.2. Updating Firmware

This unit has 2 updating method, one way to update via the internet, the other way to update using CD-R or USB device which is stored pre-downloaded firmware update file.

3.2.2.1. Updating firmware via the internet

Occasionally, Panasonic may release updated firmware for this unit that may add or improve the way a feature operates. These updates are available free of charge.

This unit is capable of checking the firmware automatically when connected to the Internet via a broadband connection.
When a new firmware version is available, the following message is displayed.



To update the firmware

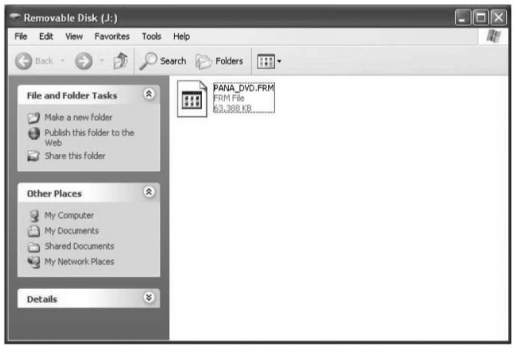
Press [HOME] ⇨ press [SETTINGS] ⇨ select "System" ⇨ [OK] ⇨ select "Firmware Update" ⇨ [OK] ⇨ select "Update Now" ⇨ [OK]

DO NOT DISCONNECT the unit from the AC power or perform any operation while the update takes place.
After the firmware is installed, "FIn" will be displayed on the unit's display. Unit will restart and the following screen will be displayed.

3.2.2.2. Updating firmware using the USB device

When updating firmware using USB device, perform following procedures.
(When using CD-R instead of USB device, perform same procedures)

1. Download the latest firmware file of the unit.
   The latest firmware required for version-up can be downloaded from “Support Information from NWBG/VDBG-PAVC” web-site in “TSN system”.
   Click file name to download.
   After download, click file to decompress. (Total: 1 file).
2. Decompress the downloaded file.
   The decompressed file will be named as follows.
   File Name: PANA_DVD.FRM
   Copy the file to root folder of the USB device.
   (If using CD-R instead of USB device, burn the file to a blank CD-R by writing software.)



3. Update the unit.

1. Turn the unit power on.
2. After the home screen is displayed and - - - - - is displayed at LED display of front panel, insert the USB device stored downloaded latest firmware file to front USB port of the unit. (or set the CD-R into the unit and playback it.)
3. UPdAt is displayed and update process starts automatically.
   (If noUPd is displayed, the unit has already been update the latest version of firmware.)
4. During the update, UPSYS , UPboo and UPdrU are displayed.
5. When F In is displayed, update process is finished.
   Remove the USB device (or the CD-R) and press the POWER button to turn the unit off.
6. Turn the unit on and home screen displayed, the firmware update is completed.

① 0:00:00

② UPdAt

③ UPSYS

④ UPboo

⑤ UPdrU

⑥ F:In:00

4 Specifications

Main unit

●GENERAL

Power consumption: 83 W

Power Consumption in standby mode:
Approx. 0.05 W

Power supply: AC 120 V, 60 Hz

Dimensions (W×H×D): 430 mm × 47 mm × 263 mm
($16^{15}/_{16}$"×$1^{55}/_{64}$"×$10^{23}/_{64}$")

Mass (Weight): Approx. 2.4 kg (5.3 lbs)

Operating temperature range: 0 °C to 40 °C (32 °F to 104 °F)

Operating humidity range:
35 % to 80 % RH (no condensation)

●AMPLIFIER SECTION

RMS Total Power Output: 1000 W

1 kHz, 10% total harmonic distortion

FRONT: 160 W per channel (3 Ω)

CENTER: 160 W per channel (3 Ω)

SURROUND: 160 W per channel (3 Ω)

100 Hz, 10% total harmonic distortion

SUBWOOFER: 200 W per channel (3 Ω)

FTC Total Power Output: 430 W

120 Hz to 20 kHz, 1.0% total harmonic distortion

FRONT: 60 W per channel (3 Ω)

CENTER: 90 W per channel (3 Ω)

SURROUND: 60 W per channel (3 Ω)

45 Hz to 120 Hz, 1.0% total harmonic distortion

SUBWOOFER: 100 W (3 Ω)

Audio Input AUX × 1

Digital Audio Input Optical × 1

Sampling frequency: 32 kHz, 44.1 kHz, 48 kHz

Audio Format: PCM, Dolby Digital, DTS

●FM TUNER SECTION

Frequency range:
87.9 MHz to 107.9 MHz (200 kHz step),
87.5 MHz to 108.0 MHz (100 kHz step)

Antenna terminals: 75 Ω (unbalanced)

●TERMINAL SECTION

USB Slot: USB2.0: 2 system

SD card slot: Connector: 1 system

Ethernet:
10BASE-T/100BASE-TX 1 system

●VIDEO SECTION

Signal system: NTSC

HDMI AV Output*

Output connector: Type A (19 pin)

LASER Specification

Class 1 LASER Product

Wave length:
790 nm (CDs) / 660 nm (DVDs) / 405 nm (BDs)

Laser power:
No hazardous radiation is emitted with the safety protection

* This unit supports “HDAVI Control 5” function.

Note:

Specifications are subject to change without notice.

Solder:

This model uses lead free solder (PbF).

System	SC-BTT190P-K	SC-BTT190PCK
Main unit	SA-BTT190P-K	SA-BTT190PCK
Speakers system	SB-BTT190P-K*1	SB-BTT190PCK*1

System	SC-BTT195P-K	SC-BTT195PCK
Main unit	SA-BTT195P-K	SA-BTT195PCK
Speakers system	SB-BTT195P-K*1	SB-BTT195PCK*1

System	SC-BTT196P-K
Main unit	SA-BTT196P-K
Speakers system	SB-BTT195P-K*1

Refer to their respective original service manuals for *1.

4.1. Others (Licences)

THE FOLLOWING APPLIES ONLY IN THE U.S.A.

FCC Note:

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

FCC Caution:To assure continued compliance, follow the attached installation instructions and use only shielded interface cables when connecting to peripheral devices. Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

This device complies with Part 15 of the FCC Rules.
Operation is subject to the following two conditions:
(1) This device may not cause harmful interference, and
(2) this device must accept any interference received, including interference that may cause undesired operation.

Declaration of Conformity
Trade Name: Panasonic
Model No.: SC-BTT195
SC-BTT190

Responsible Party:
Panasonic Corporation of North America
One Panasonic Way, Secaucus, NJ 07094

Support Contact:
Panasonic Consumer Marketing Company of North America
Telephone No.: 1-800-211-PANA (7262)

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This Class B digital apparatus complies with Canadian ICES-003.

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(4) Vorbis
The software license is displayed when "License" in the Setup menu is selected.

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http://panasonic.net/avc/oss/bdplayer/AWBPP12.html

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Contact Information
cdrequest.bdplayer@gg.jp.panasonic.com

Source code is also freely available to you and any other member of the public via our website below.
http://panasonic.net/avc/oss/bdplayer/AWBPP12.html

For the software categorized as (5) includes as follows.
1. This product includes software developed by the OpenSSL Project for use in the OpenSSL Toolkit. (http://www.openssl.org/)
2. This product includes software developed by the University of California, Berkeley and its contributors.
3. FreeType code.
4. The Independent JPEG Group's JPEG software.

5 General/Introduction

5.1. VIERA Link™ “HDAVI Control™”

What is VIERA Link “HDAVI Control”?

VIERA Link™ is a new name for EZ Sync™. VIERA Link “HDAVI Control” is a convenient function which will link the operations of this unit and a Panasonic TV (VIERA) under “HDAVI Control”.
You can use this function by connecting the equipment with an HDMI cable. See the operating instructions for connected equipment for operational details.

Preparation

① Set “VIERA Link” to “On”.
(The default setting is “On”.)
② Set the “HDAVI Control” operations on the connected equipment (e.g., TV).
③ Turn on all “HDAVI Control” compatible equipment and select this unit’s input channel on the connected TV so that the “HDAVI Control” function works properly.
Also when the connection or settings are changed, repeat this procedure.

Automatic input switching Power on link

When the following operations are performed, the input channel of the television will be automatically switched and the screen of this unit will be displayed.
When the television is off, the television will automatically turn on.
– When play starts on the unit
– When an action that uses the display screen is performed
(e.g., Home menu)
- This function does not work when the iPod/ iPhone selector is chosen.

Power Off link

All connected equipment compatible with “HDAVI Control”, including this unit, automatically turns off when you switch the television off.

Playing music continuously even after turning off power to the television
When the unit is connected to a Panasonic TV (VIERA) that supports HDAVI Control 2 or later.
Select “Video” in “Power Off link”

Easy control only with VIERA remote control

Only when TV supports “HDAVI Control 2” or later
By using the TV remote control, you can perform various playback operations and settings.
See the operating instructions of the TV for more details.

- The buttons that you can use for this unit vary depending on the TV. For details, refer to the operating instructions for the TV.
- The operation of this unit may be interrupted when you press certain buttons on the TV remote control.
- This unit supports “HDAVI Control 5” function. “HDAVI Control 5” is the newest standard (current as of November, 2011) for Panasonic’s HDAVI Control compatible equipment. This standard is compatible with Panasonic’s conventional HDAVI equipment.
- VIERA Link “HDAVI Control”, based on the control functions provided by HDMI which is an industry standard known as HDMI CEC (Consumer Electronics Control), is a unique function that we have developed and added. As such, its operation with other manufacturers’ equipment that supports HDMI CEC cannot be guaranteed.
- Please refer to individual manuals for other manufacturers’ equipment supporting VIERA Link function.

5.2. Enjoying BD-LIVE

With “BD-Live” discs, you can enjoy bonus contents that use Internet access.
For this BD-Live function, insertion of an SD card is necessary along with Internet connection.

1 **Perform network connection and settings.**

2 **Insert an SD card with 1 GB or more free space.**

- The SD card is used as the local storage.

3 **Insert the disc.**

■ Deleting data/Formatting SD cards

Select “SD Card Management” in the Home menu, then select “BD-Video Data Erase” or “Format SD Card” and press [OK].

- The usable functions and the operating method may vary with each disc, please refer to the instructions on the disc and/or visit their website.
- “BD-Live Internet Access” may need to be changed for certain discs.

5.3. Enjoying 3D Video and Photos

Enjoying 3D video and photos

Preparation
Connect 3D compatible TV to an HDMI AV OUT terminal of this unit using a High Speed HDMI Cable.

- Perform the necessary preparations for the TV.
- Play back following the instructions displayed on the screen.
- 3D Settings

- Please refrain from viewing 3D images if you do not feel well or are experiencing visual fatigue.
  In the event that you experience dizziness, nausea, or other discomfort while viewing 3D images, discontinue use and rest your eyes.
- 3D images may not output as settings of “HDMI Resolution” and “24p Output”.
- When playing back 3D photos from “Photos” screen, select from the “3D” list. (Still pictures in “2D” are played back in 2D.) If “2D” and “3D” indications are not displayed, press [R] to switch the view of playback contents.

3D Settings

■ Signal Format

Original	Keep original picture format.
Side by side	3D picture format comprising of left and right screens.
2D to 3D	Converts 2D pictures to 3D effect.

■ 3D Picture Mode

Normal	Play back pictures with normal 3D effects.
Soft	You can enjoy 3D pictures with a feeling of broadness, holding back the depth perception.
Manual	Play back 3D pictures with settings of “Manual Settings”.

■ Manual Settings

Distance	Set the amount of depth perception.
Screen Type	Selects how the screen appears during 3D playback (flat or round).
Frame Width	Set the amount of feathering at the edge of screen.
Frame Color	Set the color of feathering at the edge of screen.

■ Pop-Out Level

(Only when “Full HD” is selected in “3D Type”.)
3D position for the Option menu or message screen etc. can be adjusted during 3D playback.

5.4. Playable Media

Type	Logo examples	Type detail	Playable contents
BD		**BD-Video**	Video
		BD-RE	Video, JPEG, MPO
		BD-R	Video, MKV
DVD		**DVD-Video**	Video
		**DVD-R**	Video, AVCHD, MKV, JPEG, MPO, FLAC, MP3, WAV
		**DVD-R DL**	
		**DVD-RW**	Video, AVCHD
	—	**+R/+RW/+R DL**	
CD		**Music CD**	Music [CD-DA]
	—	**CD-R** **CD-RW**	MKV, JPEG, MPO, FLAC, MP3, Music [CD-DA], WAV
SD		**SD Memory Card (from 8 MB to 2 GB)** **SDHC Memory Card (from 4 GB to 32 GB)** **SDXC Memory Card (48 GB, 64 GB)** **(Compatible with both mini and micro types)**	AVCHD, AVCHD 3D, MP4, MPEG2, JPEG, MPO
USB	—	**USB devices (up to 2 TB)**	MP4, MPEG, MKV, JPEG, MPO, FLAC, MP3, WAV

■ Discs that cannot be played in this unit

Any other disc that is not specifically supported or previously described.

- DVD-RAM
- Super Audio CD
- Photo CD
- DVD-Audio
- Video CD and Super Video CD
- WMA discs
- All types of DivX discs
- PAL discs
- HD DVD
- BD-Video discs recorded at a rate of 50 fields/sec

■ Region management information

BD-Video

This unit can play BD-Video discs supporting the region code **"A"**.

Example:

DVD-Video

This unit can play DVD-Video discs supporting the region number **"1"** or **"ALL"**.

Example:

■ Finalize

DVD-R/RW/R DL, +R/+RW/+R DL and CD-R/RW recorded by a recorder, etc. needs to be finalized by the recorder to play on this unit. Please refer to the recorder's instructions.

■ BD-Video

- This unit supports high bit rate audio (Dolby Digital Plus, Dolby TrueHD, DTS-HD High Resolution Audio and DTS-HD Master Audio) adopted in BD-Video.
- If "Dolby D/Dolby D +/Dolby TrueHD" is set to "PCM", the maximum possible number of Dolby sound is 5.1ch PCM.

■ 3D

- 3D videos and 3D still pictures can be played back when this unit is connected to a 3D compatible TV using a High Speed HDMI Cable.
- 2D video can be enjoyed as 3D virtually.

■ Music CD

- Operation and sound quality of CDs that do not conform to CD-DA specifications (copy control CDs, etc.) cannot be guaranteed.
- The digital audio content side of a DualDisc does not meet the technical specifications of the Compact Disc Digital Audio (CD-DA) format so playback may not be possible.

■ SD card

- miniSD Cards, microSD Cards, microSDHC Cards and microSDXC Cards can be used, but must be used with an adaptor card. These are usually supplied with such cards, or otherwise customer provided.
- To protect the card's contents, move the record prevention tab (on the SD card) to "LOCK".
- This unit is compatible with SD Memory Cards that meet SD Card Specifications FAT12 and FAT16 formats, as well as SDHC Memory Cards in FAT32 format (Does not support long file names.) and SDXC Memory Cards in exFAT.
- If the SD card is used with incompatible computers or devices, recorded contents may be erased due to the card being formatted etc.
- Useable memory may be slightly less than the card capacity.

■ USB device

- This unit does not guarantee connection with all USB devices.
- This unit does not support USB device charging.
- FAT12, FAT16, FAT32 and NTFS file systems are supported.
- This unit supports USB2.0 High Speed.
- This unit supports an HDD formatted in FAT32 and NTFS. If the HDD is not recognized the power to the HDD may not be supplied. Supply power from an external source.

- It may not be possible to play the above media in some cases due to the type of media, the condition of the recording, the recording method and how the files were created.
- The producers of the disc can control how discs are played, so you may not always be able to control play as described in this Owner's Manual. Read the disc's instructions carefully.

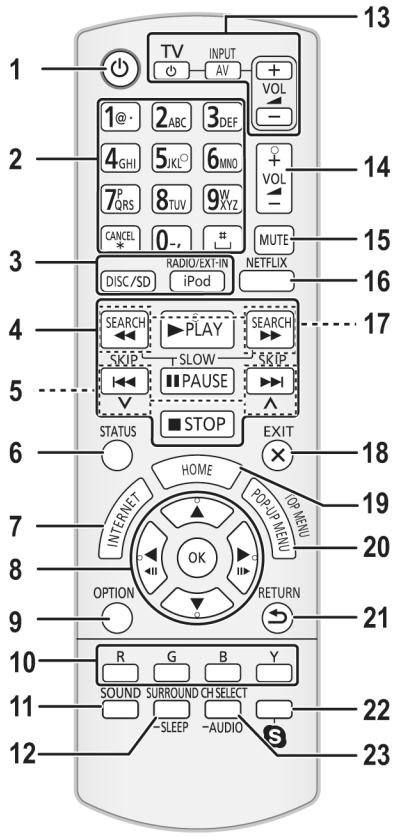
5.5. File Extension Type Support (MP3/JPEG/MKV/FLAC/WAV/MPO)

File format	Extension	Reference
MP3	".MP3", ".mp3"	This unit supports ID3 tags, but only titles, artist names and album names can be displayed.
JPEG	".JPG", ".jpg"	• MOTION JPEG and Progressive JPEG is not supported • You may not be able to play back the file if you have edited the folder structure or the file name on a PC or other device.
MKV	".MKV", ".mkv"	• The video file and subtitles text file are inside the same folder, and the file names are the same except for the file extensions. • Some MKV files may not play back, depending on the video resolution and frame rate condition.
	Subtitles text file ".SRT", ".srt", ".SSA", ".ssa", ".ASS", ".ass"	
FLAC	".flac"	Maximum sampling rate: 192 kHz/24 bit
WAV	".wav"	Maximum sampling rate: 48 kHz/16 bit
MPO	".mpo"	3D still picture

- With certain recording states and folder structures, the play order may differ or playback may not be possible.

6 Location of Controls and Components

6.1. Remote Control Key Button Operations



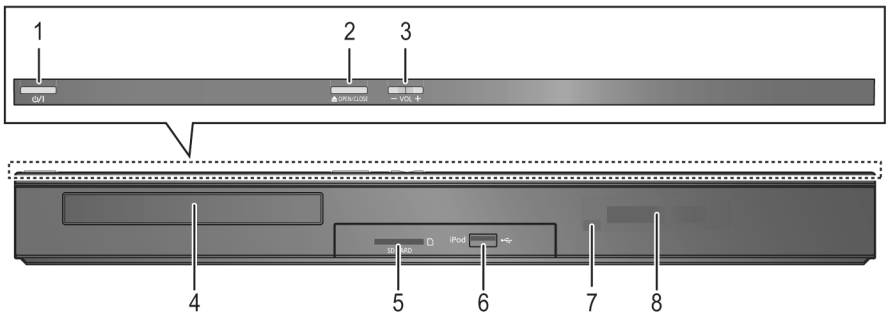
1 Turn the unit on and off
2 Select title numbers, etc./Enter numbers or characters
[CANCEL]: Cancel
3 Select the source
4 Basic playback control buttons
5 Select preset radio stations
6 Show status messages
7 Show the Home screen of the VIERA Connect
8 [▲, ▼, ◄, ►]: Move the highlight for selection
[OK]: Confirm the selection
(◄❚❚)(❚❚►): Frame-by-frame
9 Show OPTION menu
10 Colored buttons
Used for various purposes depending on the display
11 Set the sound mode
12 Select surround sound effects/Set the sleep timer
①Press and hold [–SLEEP].
②While “SLEEP ✳✳” is displayed, press [–SLEEP] several times to select the time (in minutes).
- Timer selection is up to 120 minutes.
- Select “OFF” when canceling the setting.
- To confirm the remaining time
Press and hold the button again.

13 **TV operation buttons**
[⏻ TV]: Turn the television on and off
[AV, INPUT]: Switch the input select
[+ − VOL]: Adjust the volume
14 Adjust the volume of the main unit
15 Mute the sound
- “MUTE” flashes on the unit’s display, while the function is on.
- To cancel, press the button again or adjust the volume.
- Muting is canceled if the unit is turned off.

16 Show NETFLIX screen
17 Select radio stations manually
18 Exit the menu screen
19 Show HOME menu
20 Show Pop-up Menu/Top Menu
21 Return to previous screen
22 Start up a video communication
23 Select speaker channel/Select audio

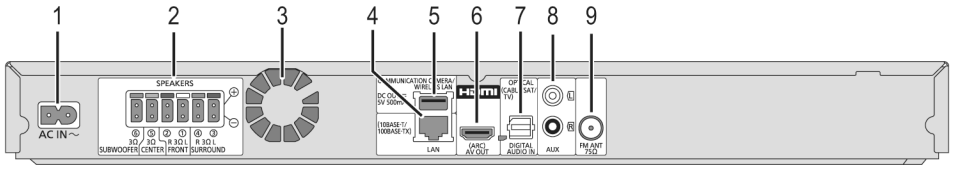
6.2. Main Unit Key Button Operations

Main unit (Front)



1 **Standby/on switch** [⏻/I]
Press to switch the unit from on to standby mode or vice versa. In standby mode, the unit is still consuming a small amount of power.
2 Open or close the disc tray
3 Adjust the volume of the main unit
4 Disc tray
5 SD card slot
6 USB port
7 Remote control signal sensor
Distance: Within approx. 7 m (23 ft.)
Angle: Approx. 20° up and down, 30° left and right
8 Display

Main unit (Rear)



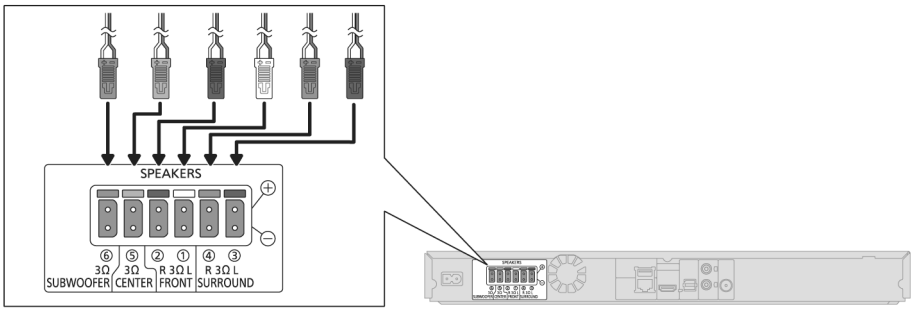
1 AC IN terminal
2 Speaker terminals
3 Cooling fan
4 LAN port
5 USB port
6 HDMI AV OUT (ARC) terminal
7 DIGITAL AUDIO IN terminal
8 AUX terminal
9 FM radio antenna terminal

7 Installation Instructions

Turn off all equipment before connection and read the appropriate operating instructions.
Do not connect the AC power supply cord until all other connections are completed.

7.1. Speaker Connection

Connect the speaker cables to the terminals of the same color.



7.2. Connection to a TV

■ **HDMI**

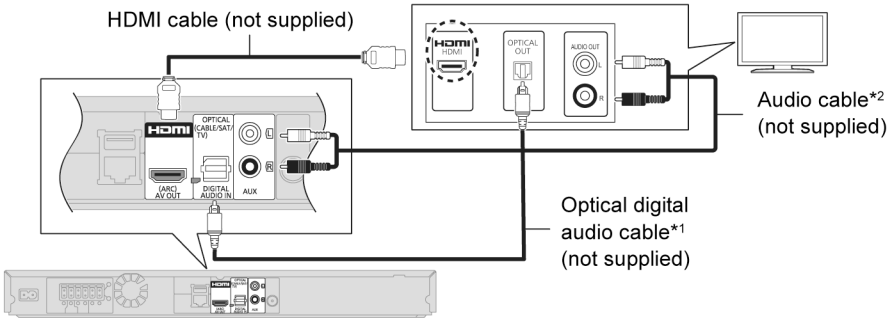
- Use the High Speed HDMI cables. Non-HDMI-compliant cables cannot be utilized.
  It is recommended that you use Panasonic's HDMI cable. When outputting 1080p signal, please use HDMI cables 5.0 meters (16.4 ft.) or less.
  Recommended part number (High Speed HDMI Cable):
  RP-CDHS15 (1.5 m/4.9 ft.), RP-CDHS30 (3.0 m/9.8 ft.), RP-CDHS50 (5.0 m/16.4 ft.), etc.
- Audio will be output through the system's speakers when "Off" is selected in "HDMI Audio Output".

■ **TV Audio**

- To output TV audio from this unit's speakers, you need to switch the selector.

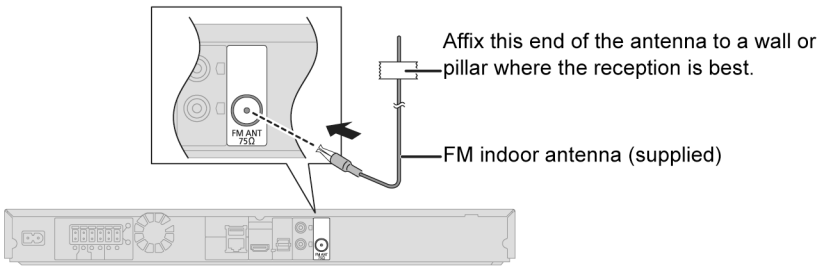
■ **OPTICAL IN**

- After making the digital audio connection, make settings to suit the type of audio from your digital equipment.



*1 If the HDMI terminal on the TV is labeled "HDMI (ARC)", the connection of the optical digital audio cable is not required.
*2 It is also possible to use an audio cable instead of the optical digital audio cable. In this case, connect the AUX terminal on the main unit with the audio output terminal on the TV.

7.3. FM Antenna Connection



- Use an FM outdoor antenna if radio reception is poor.

7.4. Connection to the Network

The following services can be used when this unit is connected to broadband.

- Firmware can be updated
- You can enjoy BD-Live
- You can enjoy VIERA Connect
- You can access other devices (Home Network)

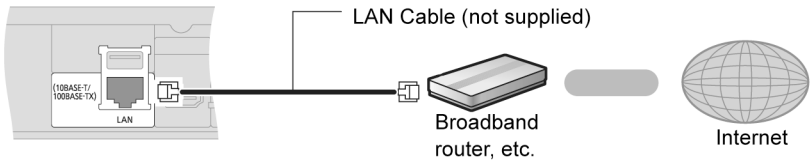
For details about connection method, refer to the instructions supplied with the connected equipment.

Wireless LAN connection

- Connect the Wireless LAN Adaptor DY-WL5 (optional). Only DY-WL5 can be used.
  Read the operating instructions for DY-WL5 thoroughly when using it.

- For up-to-date compatibility information on your wireless router refer to
  http://panasonic.jp/support/global/cs/
  (This site is in English only.)
  For additional information about this unit refer to
  http://www.panasonic.com/consumer/support (For U.S.A.)
- The unit is not compatible with public wireless LAN services provided in airports, stations, cafes etc.

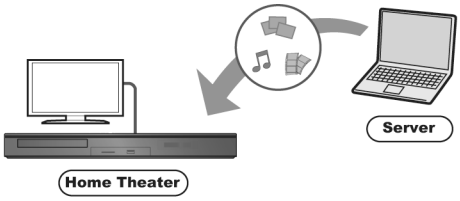
LAN cable connection



- Use category 5 or above straight LAN cables (STP) when connecting to peripheral devices.
- Inserting any cable other than a LAN cable in the LAN terminal can damage the unit.

7.5. Playing Back Contents on the DLNA Server (DLNA)

You can share photos, videos and music stored in the DLNA Certified media server (PC with Windows 7 installed, smartphone, etc.) connected to your home network, and enjoy the contents with this home theater.



Preparation

① Perform network connection and network settings of this unit.
② Perform Home Network settings of the connected equipment.
③ Add the contents and folder to the libraries of the Windows Media® Player or the smartphone, etc.
- Playlist of Windows Media® Player can play back only the contents that are stored in the libraries.

1 Press [HOME].

2 Select “Network”.

3 Select “Home Network”.

4 Select “DLNA Client”.
- The list can be updated by pressing [R] on the remote control.

5 Select the equipment and press [OK].

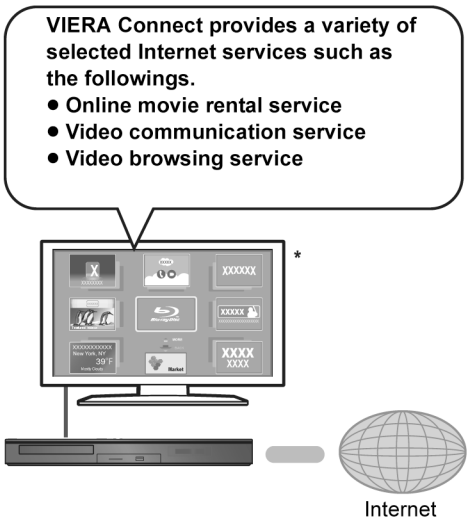
6 Select the item to play and press [OK].
- You may be able to use convenient functions depending on the content by pressing [OPTION].
- Control Panel is displayed once the playback starts. Press [OK] if the Control Panel is not displayed, and press [RETURN] to hide the Control Panel.

To exit from Home Network

Press [EXIT], [HOME] or [POP-UP MENU/TOP MENU].

7.6. Enjoying Network Service (NETFLIX, etc.)

You can access information services from the VIERA Connect Home screen via the Internet.



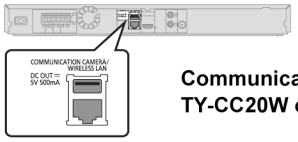
* Images are for illustration purposes, contents may change without notice.

Preparation

- Network connection
- Network setting

To enjoy video communication (ex. Skype™) :

- Connect this unit with optional Communication Camera (TY-CC20W or TY-CC10W). Depending on your location, this optional camera may not be available. Please consult your local Panasonic dealer for advice.



Communication Camera TY-CC20W or TY-CC10W

- When this unit is connected by wireless LAN connection, connect the Communication Camera via the USB port on the front of this unit.
- For operating method refer to the following website.
  http://panasonic.jp/support/global/cs/
  (This site is in English only.)

1 Press [INTERNET].

- The video communication service can be accessed directly by pressing [S] button, and NETFLIX can be accessed directly by pressing [NETFLIX] button.

2 Select the item and press [OK].

To exit from VIERA Connect

Press [EXIT], [HOME] or [POP-UP MENU/TOP MENU].

- When playing content in the media, VIERA Connect cannot be accessed by pressing [INTERNET].
- In the following cases, settings are possible using the Setup menu items.
  – When restricting the use of VIERA Connect (“Network Service Lock”)
  – When the audio is distorted (“Audio Auto Gain Control”)
  – When wrong time is displayed (“Time Zone”, “DST”)
- If using slow Internet connection, the video may not be displayed correctly. A high-speed Internet service with a speed of at least 6 Mbps is recommended.
- Be sure to update the firmware when a firmware update notice is displayed on the screen. If the firmware is not updated, you will not be able to use the VIERA Connect function.
- VIERA Connect Home screen is subject to change without notice.
- The services through VIERA Connect are operated by their respective service providers, and service may be discontinued either temporarily or permanently without notice. Therefore, Panasonic will make no warranty for the content or the continuity of the services.
- All features of websites or content of the service may not be available.
- Some content may be inappropriate for some viewers.
- Some content may only be available for specific countries and may be presented in specific languages.

8 Operating Instructions

8.1. Taking out the Disc from Drive Unit when the Disc cannot be ejected by OPEN/CLOSE button

8.1.1. Forcible Disc Eject

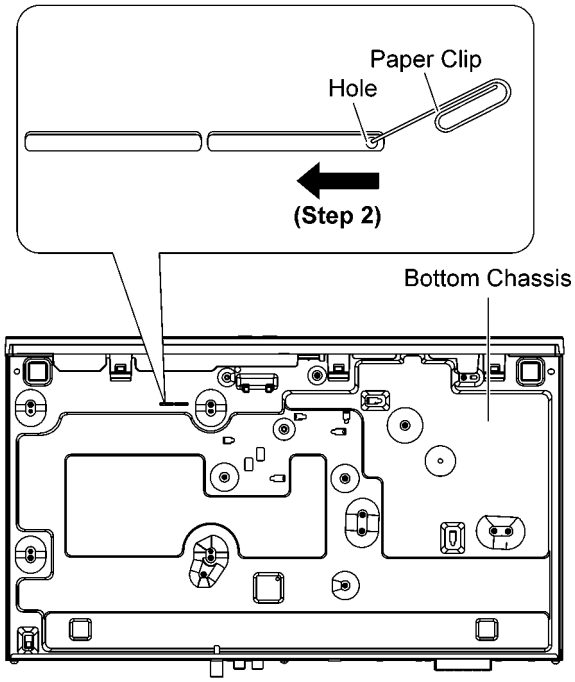
① While the unit is on, press and hold [OK], [Yellow] and [Blue] buttons on the remote control simultaneously for 5 seconds.
- " 00rEt (00RET)" is displayed on the unit's LED display.

② Repeatedly press the right cursor button on the remote Control or Power button on the unit until " 06FtO (06 FTO)" is displayed on the unit's LED display.

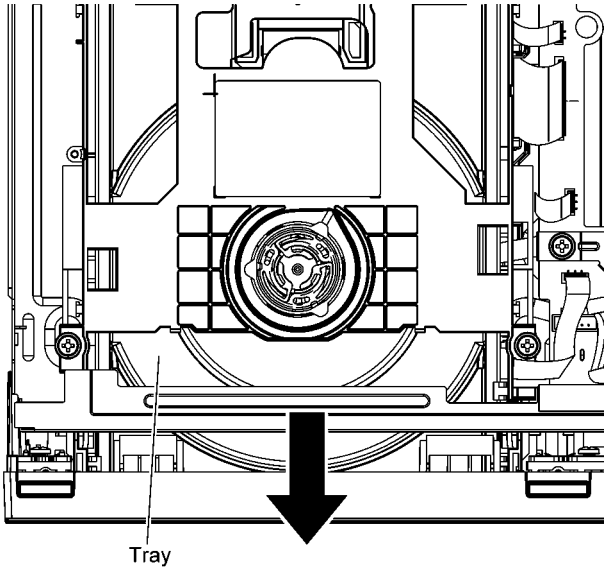
③ Press [OK] button on the remote control or [OPEN/CLOSE] button on the unit.

8.1.2. When the Disc Eject can not be done

1. Turn off the power and pull out AC cord.
2. Put the unit so that bottom can be seen.
3. Insert paper clips, etc. into the hole on the bottom of Drive and slide the paper clips, etc. in the direction of the arrow to eject tray slightly.



4. Gently pull out the tray.
5. Remove disc.



8.2. Using the iPod/iPhone

Compatible iPod/iPhone

- Update your iPod/iPhone with the latest software before using this unit.
- Compatibility depends on the software version of your iPod/iPhone.
- iPod/iPhone compatibility assures music playback and battery charge functions of this unit as a home theater system.
- For Compatibility of iPod/iPhone, please refer to Operating Instructions.

- In some locations, reception status of an iPhone may be poor when it is loaded on this unit.
- When the iPhone receives a call while connected to this unit, playback, etc. of the iPhone may stop.
  To prioritize the operation with the iPhone connected to this unit, make the setting so that the iPhone does not receive calls.
- Avoid using Wi-Fi mode on your iPhone while the network functions on this unit are in use wirelessly.

About recharging the battery

- iPod/iPhone will not be recharged after the battery charge completion.
- iPod/iPhone will start recharging when this unit is on.

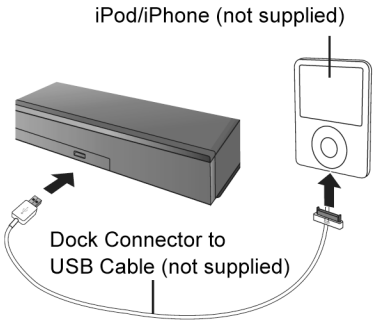
8.2.1. iPod /iPhone Connection

Preparation

- Turn the main unit off or reduce the volume of the main unit to its minimum.

1 **Connect the iPod/iPhone.**

To purchase a Dock Connector to USB Cable, consult your iPod/iPhone dealer.



8.2.2. iPod /iPhone Playback

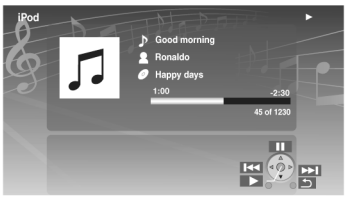
1 **Press [HOME].**

2 **Select “iPod” and press [OK].**

3 **Select the item to play.**

- Repeat this procedure if necessary.

Album artwork



- If album artwork is not contained in the data, “♫” will appear on TV.
- Depending on the software version of your iPod/iPhone, the album artwork may not appear properly.
- Some operations may not work while reading the album artwork.

- The setting of the playback mode will be kept until changes are made on the same iPod/iPhone.
- Surround sound effect and sound mode are available.

8.3. Easy Network Setting

Easy Setting

After connecting your new home theater for the first time and pressing [⏻], a screen for the basic settings will appear.

Preparation
Turn on the television and select the appropriate video input on the television.

1 **Press [⏻].**
Setup screen appears.

2 **Follow the on-screen instructions and apply the settings.**

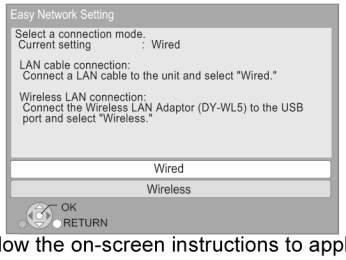
- You can perform this setup anytime by selecting “Easy Setting” in the Setup menu.
- If this unit is connected to a Panasonic TV (VIERA) supporting HDAVI Control 2 or later via an HDMI cable, then setting information on the TV such as “On-screen Language” is acquired by this unit.

Easy Network Setting

After completing “Easy Setting”, you can perform “Easy Network Setting”.

Wired connection

Select “Wired” and press [OK].



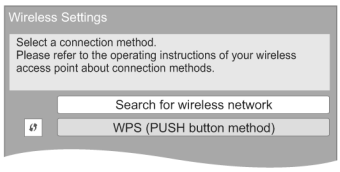
Follow the on-screen instructions to apply your connection settings.

Wireless connection

Preparation
- **Obtain your network name (SSID).**
- **If your wireless connection is encrypted, please be sure that you know your encryption key (password).**
- If “Wireless LAN Adaptor is not connected.” is displayed, check that the Wireless LAN Adaptor is fully inserted. Alternatively, disconnect and reconnect it. If there is still no change in the display, consult your dealer for advice.

1 **Select “Wireless” and press [OK].**

2 **Select “Search for wireless network” or “WPS (PUSH button method)” and press [OK], then follow the on-screen instructions and apply the settings.**



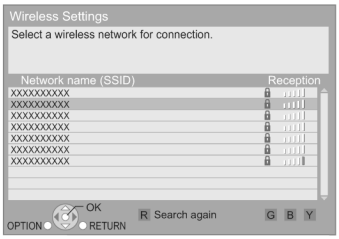
■ “WPS (PUSH button method)”

If you are using a wireless router that supports WPS (Wi-Fi Protected Setup™), you can easily perform the settings.

■ “Search for wireless network”

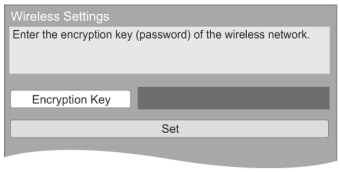
The available wireless networks will be displayed.

① Select your network name and press [OK].
- If your network name is not displayed, search again by pressing the [R] button on the remote control. Stealth SSID will not be displayed, in this case enter manually.

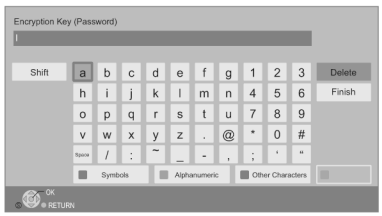


When your wireless network is encrypted

② Press [OK] to select “Encryption Key”.



③ Enter your encryption key (password).

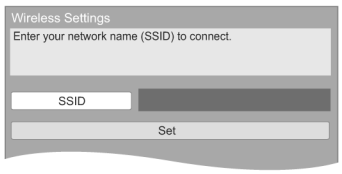


To enter your network name (SSID) manually

If your network name (SSID) is not displayed in step ①, follow these steps.

1 To display the network name (SSID) input screen:
Press [HOME] ⇨ select “Others” ⇨ [OK] ⇨ select “Setup” ⇨ [OK] ⇨ select “Network” ⇨ [OK] ⇨ select “Network Settings” ⇨ [OK] ⇨ select “Wireless Settings” ⇨ [OK] ⇨ select “Connection Setting” ⇨ [OK] ⇨ select “Manual setting” ⇨ [OK]

2 Press [OK] to select “SSID” and enter your SSID.



- If your wireless network is encrypted, go to step ②.

- Refer to the operating instructions of the hub or router.
- WPS (Wi-Fi Protected Setup) is a standard that facilitates settings relating to the connection and security of wireless LAN devices. To see whether your wireless router supports WPS, check the wireless router operating instructions.
- You can perform this setup anytime by selecting “Easy Network Setting” in the Setup menu.
- You can redo these settings individually using “Network Settings”.
- Do not use this unit to connect to any wireless network for which you do not have usage rights.
  During automatic searches in a wireless network environment, wireless networks (SSID*) for which you do not have usage rights may be displayed; however, using these networks may be regarded as illegal access.
- After performing network settings on this unit, the settings (encryption level, etc.) of the wireless router might change. When you have trouble getting online on your PC, perform the network settings on your PC in accordance with the settings of the wireless router.
- Please be aware that connecting to a network without encryption may result in the content of the communication being illegitimately viewed by a third party, or the leaking of data such as personal or secret information.

* SSID:
An SSID (Service Set IDentification) is a name used by wireless LAN to identify a particular network. Transmission is possible if the SSID matches for both devices.

9 Service Mode

9.1. Special Mode Setting

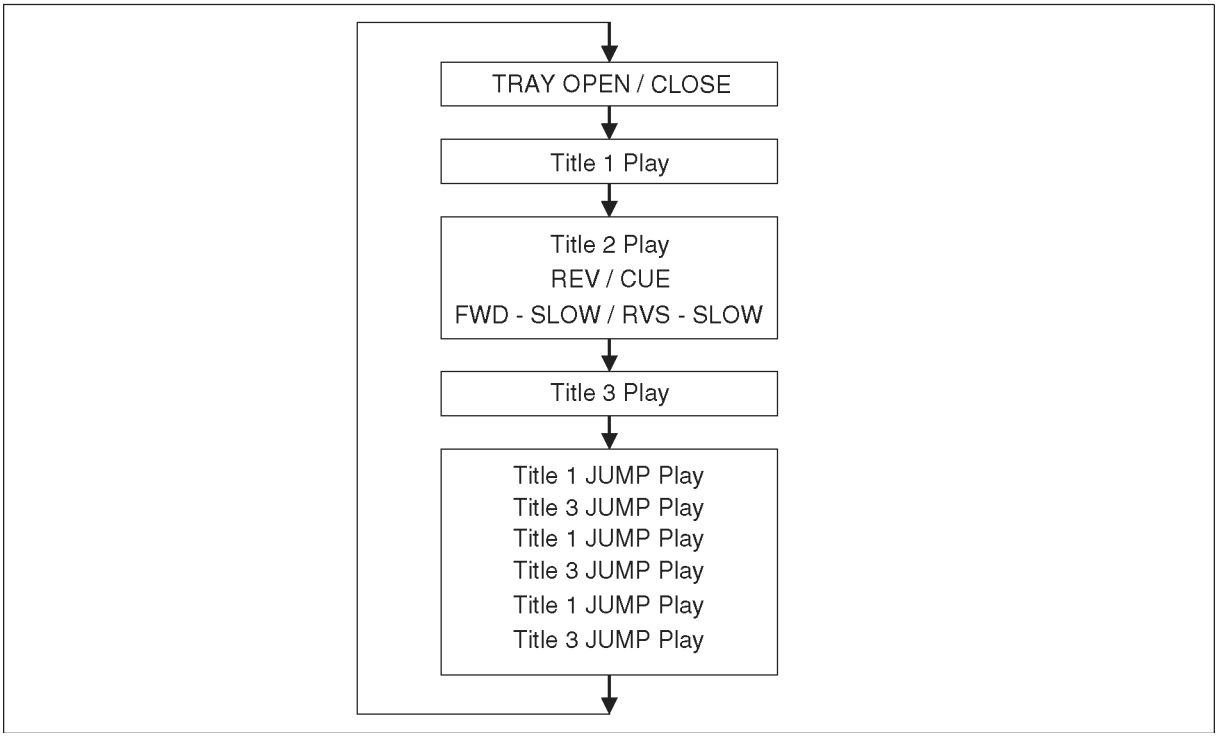
9.1.1. Special Mode Table 1

Item		FL display	Key operation
Mode name	Description		
Rating password	The audiovisual level setting password is initialized to Level 8.	① 00 RET ② 03 VL ③ INIT	① While the unit is on, press and hold [OK], [B] and [Y] on the remote control at the same time for more than 5 seconds. - "00 RET" is displayed on the unit's display. ② Repeatedly press [▶] on the remote control or [POWER] on the unit until "03 VL" is displayed on the unit's display. ③ Press [OK] on the remote control or [OPEN/CLOSE] on the unit.
Service Mode	Setting every kind of modes for servicing. *Details are described in 9.3 Service Mode	② 70 RET ③ 80 SRV ④ SERV	① Turn the power off. ② Press the [5] [9] and [R] button simultaneously for five seconds, then [70 RET] is displayed on FL. ③ Press the [◀] or [▶] button to select until [80 SRV] is displayed on FL. ④ Press the [OK] button. *The command is transmitted by attached remote control.
BD-ROM history cleaning	<Persistent Storage> of BD-ROM standard is cleaned. Screen display: [The history has been cleared] is displayed for five seconds.	****** Same display as before execution.	When the power is on, disc is not in tray, press [STOP] and [POWER] (Remote Controller) keys simultaneously for 5 seconds.
Forced disc eject	Removing a disc that cannot be ejected. The tray will open and unit will shift to P-off mode. While Demonstration Lock is being set, this Forced disc eject function is not accepted.	① 00 RET ② 06 FTO	① While the unit is off, press and hold [OK], [B] and [Y] on the remote control at the same time for more than 5 seconds. - "00 RET" is displayed on the unit's display. ② Repeatedly press [▶] on the remote control or [POWER] on the unit until "06 FTO" is displayed on the unit's display. ③ Press [OK] on the remote control or [OPEN/CLOSE] on the unit.
Forced power-off	When the power button is not effective while power is ON, turn off the power forcibly.	Display in P-off mode.	Press [POWER] over than 10 seconds.

9.1.2. Special Mode Table 2

Item		FL display	Key operation
Mode name	Description		Front Key
Aging	Perform sequence of modes as * Aging Description shown below continually.	Display following the mode.	① Turn the power on. ② Press the [5] [9] and [R] button with disc in simultaneously for five seconds, then [70 RET] is displayed on FL. ③ Press the [◀] or [▶] button to select until [81 AIG] is displayed on FL. ④ Press the [OK] button. *The command is transmitted by attached remote control. NOTE 1: If the unit has hung-up because of pressing keys for over 10 seconds, once turn off the power, and re-execute this command. *When releasing Aging mode, press [POWER] key over 4 seconds. NOTE 2: This mode will be invalid if there is no disc in the tray.

Aging Contents (Example):



9.1.3. Special Mode Table 3

Item		FL display	Key operation
Mode name	Description		Front Key
Default setting	The date of Menu, Mode and EEPROM setting, etc. is set to the default condition in factory.	① 00 RET ② 08 FIN ③ HELLO "HELLO" is displayed 10 seconds.	① While the unit is off, press and hold [OK], [B] and [Y] on the remote control at the same time for more than 5 seconds. - "00 RET" is displayed on the unit's display. ② Repeatedly press [▶] on the remote control or [POWER] on the unit until "08 FIN" is displayed on the unit's display. ③ Press and hold [OK] on the remote control or [OPEN/ CLOSE] on the unit for at least 3 seconds.
Progressive initialization	The progressive setting is initialized to Interlace.	① 00 RET ② 04 PRG	① When the power is on, press and hold [OK], [B] and [Y] on the remote control at the same time for more than 5 seconds. - "00 RET" is displayed on the unit's display. ② Repeatedly press [R] on the remote control or [POWER] on the unit until "04 PRG" is displayed on the unit's display. ③ Press and hold [G] on the remote control or [OPEN/CLOSE] on the unit.
Micro-P version check	To check for main & sub firmware version no., model no. & date of production.	FL Display (1) T: 017 -> Timer version (2) ROM 06 -> ROM (3) MV 1120 -> Main Firmware (4) P 1120 -> Sub Firmware (5) D 0104 -> Drive Version (6) R1:41:00 -> For Debug Purpose Only (7) POW ON -> For Debug Purpose Only (8) LADR:14:05 -> For Debug Purpose Only (9) PADR:30:00 -> For Debug Purpose Only	When the power is on, press & hold [SKIP REV] on remote control follow by [POWER] on main unit.

9.1.4. Special Mode Table 4

Item		FL display	Key operation
Mode name	Description		Front Key
		(10) DEST: P (For PC -> DEST: PC) -> Destination Code (11) ERR: NONE -> Error (12) P0:FF:90 -> For Debug Purpose Only (13) P1:2F:CC -> For Debug Purpose Only (14) P2:FF:20 -> For Debug Purpose Only (15) P3:ED:06 -> For Debug Purpose Only (16) P4:BE:53 -> For Debug Purpose Only (17) P5:F6:OD -> For Debug Purpose Only (18) P6:AF:10 -> For Debug Purpose Only (19) P7:CF:30 -> For Debug Purpose Only (20) P8:03:EE -> For Debug Purpose Only (21) P9:EB:2D -> For Debug Purpose Only (22) P10:CE:20 -> For Debug Purpose Only	

9.2. Error Codes

Self-Diagnostic Function provides information for error to service personnel by Self-Diagnosis Display when any error has occurred.

U, H** and F** are stored in my memory and held.**

- You can check latest error code by transmitting [0] [1] of Remote Control in Service Mode.
  Automatic Display on FL will be cancelled when the power is turned off or AC input is turned off during self-diagnosis display is ON.

9.2.1. Error Code Table 1 (For BD)

Error Code	Diagnosis contents	Description	Monitor Display	Automatic FL display
U30	Remote control code error	Display appears when main unit and remote controller codes are not matched.	No display	SET * * is remote controller code of the main unit. Display for 5 seconds.
U59	Abnormal inner temperature detected	Display appears when the drive temperature exceeds 70°C. The power is turned off forcibly. For 30 minutes after this, all key entries are disabled. (Fan motor operates at the highest speed for the first 5 minutes. For the remaining 25 minutes, fan motor is also stopped.) The event is saved in memory as well.	No display	U59 "U59" is displayed for 30 minutes.
U71	HDMI incompatible error (HDMI incompatible)	Display this error when the equipment (compatible with DVI such as TV, amplifier etc.) connected to the unit by HDMI is incompatible with HDCP (High-bandwidth Digital Content Protection).	No display	U71
U72	HDMI connection error (communication error)	Display this error when there are any communication problems with the unit and the equipments (TV, amplifier, ect.) connected to the unit by HDMI (or when there is a problem with the HDMI cable). The display disappears only when the connection is released. Neither the button operation nor the passage of the fixed time disappear the display.	No display	U72 "U72" display disappears when error has been solved by Power OFF/ON of connecting equipment or by inserting/removing of HDMI cable.
U73	HDMI connection error (authentication error)	When authentication error occurs while the equipments (TV, amplifier, etc.) are connected by HDMI (or when there is a problem with the HDMI cable). The display disappears only when the connection is released. Neither the button operation nor the passage of the fixed time disappear the display.	No display	U73 "U73" display disappears when error has been solved by Power OFF/ON of connecting equipment or by inserting/removing of HDMI cable.
U76	Connection error	This error is displayed when equipment such as TVs or amplifiers connected to the unit with the HDMI cable do not correspond to the copyright protection. (The BD/DVD video where the copyright is protected cannot be played.)	No display	U76
U77	Illegal disc error	This error is displayed when it becomes impossible to reproduce because of copyright illegal information.	No display	U77
U88	Restoration is operation. (When the disc is in the disc tray)	This error is displayed when there is a disc in the disc tray or abnormality is confirmed during playback. It is shown that the restoration to return the main unit operation normally is operating. It becomes possible to use as soon as not the breakdown but the U88 display disappears.	No display	U88 Display for 30 seconds.
H19	No working Fan Motor	Preserves the Error record in case the Fan Motor doesn't work at the time of Power-On.	No display	No display

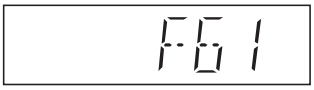
9.2.2. Error Code Table 2 (For BD)

Error Code	Diagnosis contents	Description	Monitor Display	Automatic FL display
F00	No error information	Initial setting for error code in memory (Error code Initialization is possible with error code initialization and main unit initialization).	No display	No display
F34	Initialization error	When initialization error is detected after starting up main microprocessor, the power is turned off automatically. The event is saved in memory.		No display
F58	Drive hardware error	When drive unit error is detected, the event is saved in memory.	No display	No display
F74	HDMI Device Key Communication error	This error is displayed when the information error is occurred at HDMI device key loading.	No display	F74
F75	HDMI Device Key Loading error	This error is displayed when the key of loaded is illegal at HDMI device key loading.	No display	F75
F99	Hang-up	Displayed when communication error has occurred between Main microprocessor and Timer microprocessor.	No display	F99 "F99" is displayed utill the [POWER] key is pressed.
UNSUP-PORT	Unsupported disc error	*An unsupported format disc was played, although the drive starts normally. *The data format is not supported, although the media type is supported. *Exceptionally in case of the disc is dirty.	**"This disc is incompatible."**	UNSUPPORT It is displayed for 5 seconds. The character indication flows sideways.
NO READ	Disc read error	*A disc is flawed or dirty. *A poor quality failed to start. *The track information could not be read.	**"Cannot read. Please check the disc."**	No READ
HARD ERR	Drive error	The drive detected a hard error.	**"BD drive error."**	HARD ERR It is displayed for 5 seconds. The character indication flows sideways.

9.2.3. Error Code Table 3 (For BD)

Error Code	Diagnosis contents	Description	Monitor Display	Automatic FL display
SELF CHECK	Restoration operation	Since the power cord fell out during a powerfailure or operation, it is under restoration operation. *It will OK, if a display disappears automatically. If a display does not disappear, there isthe possibility that defective Digital P.C.B. /BD drive.	No display	SELF CHECK
PLEASE WAIT	Unit is in termination process	Unit is in termination process now. BYE is displayed and power will be turned off.	No display	PLEASE WAIT The character indication flows sideways.
UNFOR-MAT	Unformatted disc error	The error is displayed when the unformatted DVD-RAM/DVD-RW or the DVD-RW recorded by another make of recorder is inserted. You have inserted an unformatted DVD-RAM or DVD-RW that is unformatted or recordedon other equipment.	No display	UNFORMAT This disc is not formatted properly. Format the disc in DISC Management
No PLAY	When there is a viewing restriction on a BD-Video or DVD-Video.	Rating password is set.	No display	No PLAY

9.2.4. Error Code Table 4 (Power Supply & Digital Amplifier)

Error Code	Diagnosis Contents	Description of error	Automatic FL Display	Remarks
F61	The abnormalities in an output or power supply circuit of POWER AMP Fan unit & its circuitries	In normal operation, when DCDET2 goes to "L" (Low) (Not during POWER OFF condition), F61 appears on FLDisplay for 1 second and PCONT goes to "L" (Low).This is due to speaker output has DC voltage or fan is not working.		Press [■STOP] on main unit for next error.
F76	Abnormality in the output voltage of stabilized power supply	In normal operation when DCDET1 is detected "L" (Low) for two consecutive times, F76 is displayed on FL for 1 second and after that PCONT will be turned to "L" (Low). This is due to any of the DC voltages (+9V, +7V, -7V, +5V, +5.3V etc.) not available.		Press [■STOP] on main unit for next error.

9.3. To enter into Service Mode

The following are the procedures to enter into service mode:

1. Turn the power off.
2. Press the [5] [9] and [R] button simultaneously for five seconds, then [70 RET] is displayed on FL.
3. Press the [▶] or [◀] button to select until [80 SRV] is displayed on FL.
4. Press the [OK] button.
5. It is displayed on FL as [SERV].: it is shown to have entered the service mode.
6. The command is transmitted by attached remote control

Method of making clear service mode: Press the power button (power off).

The display of information to each command is as follows.

NOTE:

Do not use it excluding the designated command.

9.3.1. Service Mode Table 1

Item		FL display	Key operation
Mode name	Description		(Remote controller key)
Release Items	Item of Service Mode executing is cancelled.	SERV	Press [0] [0] or [Return] in service mode.
Error Code Display	Last Error Code of U/H/F held by Timer is displayed on FL. *Details are described in **9.2. Error Code.**	♣□□ *♣ shows U/H/F. □□ shows number. If any error history dose not exist, [F00] is displayed.	Press [0] [1] in service mode
ROM Version Display	The display contents are switched over every 5 seconds. 1. Region code 2. Main firm version 3. Timer firm version 4. Drive firm version 5. ROM correction version 6. BOOT2 version 7. BOOT3 version	1. NO_$% $: Region of DVD (Example: 1,2.....) %: Region of BD (Example: A,B.....) 2. **** 3. ##0*** ##: Timer firm version O: OEM ***: Product number of microcomputer 4. **** + **** : Drive version + : Drive adjust status F : Adjusted at the factory C : Adjusted in CS - : Unadjusted 5. *** 6. *** 7. ***	Press [0] [2] in service mode
Drive Application Check	Checking whether the drive is applicable drive or not	When the drive is applicable drive. DRV OK When the drive is not applicable drive. DRV NG	Press [0][3] in service mode.

9.3.2. Service Mode Table 2

Item		FL display	Key operation
Mode name	Description		(Remote controller key)
Drive check	Simple quality of BD Mechanism.	When BD Mechanism is OK DRV OK When BD Mechanism is NG DRV NG *If the date of the present or the trouble occurred time is incorrect, it may be not able to judge correctly.	Press [3] [8] in service mode.
Laser Used Time Indication	Check laser used time (hours) of BD Mechanism.	****** (******) is the used time display in hour. Laser used time of BD/DVD/CD in Playback/Recording mode is Counted. 1. Blu-ray Playback: BP **** 2. Blu-ray Recordiing: BR **** 3. DVD Playback: DP **** 4. DVD Recording: DR **** 5. CD: CD ****	Press [4] [1] in service mode.

9.3.3. Service Mode Table 3

Item		FL display	Key operation
Mode name	Description		(Remote controller key)
BD Mechanism last error	BD Mechanism error code display.	1. Error Number is displayed for 5 seconds. NO **** 2. Time when the error has occurred is display for 5 seconds. YYMMDD DD : Day hh : Hour mm : Minute 3. Last drive error (1/2) is displayed for 5 seconds. ****** 00 : Bad disc 03 : Bad disc 04 : Bad disc or drive malfunction 4. Last drive error (2/2) is displayed for five seconds. ****** 5. Error occurring disc type is displayed for 5 seconds. DVD ROM DVD CD CD DVD-RAM (2.6GB) RAM26 DVD-RAM (4.7GB) RAM47 DVD-R DVDR DVD-RW DVDRW	Press [4] [2] in service mode.

9.3.4. Service Mode Table 4

Item		FL display	Key operation
Mode name	Description		(Remote controller key)
		CD-R CDR CD-RW CDRW DVD+R DVDPR DVD+RW DVDPRW BD-ROM BDROM BD-RE BDRE BD-R BDR BD-ROM (Multiple layer) BD X ROM BD-RE (Multiple layer) BD X RE BD-R (Multiple layer) BD X R Others MEDIA* * is displayed the respoced value from RTSC. 6. Disc maker ID is displayed for 5 seconds. ******	In case that the maker cannot be identified, display is blackout.

9.3.5. Service Mode Table 5

<table>
<tr><th colspan="2">Item</th><th rowspan="2">FL display</th><th rowspan="2">Key operation
(Remote controller key)</th></tr>
<tr><th>Mode name</th><th>Description</th></tr>
<tr><td></td><td></td><td>7. Factor of drive error (hexadecimal) occurring is left displayed.
＊＊＋＋＆＆
＊＊: Error occurring operation code (This is not used)
＋＋: Error occurring disc type
00 DVD-ROM
01 CD
02 2.6GB DVD-RAM
03 4.7GB DVD-RAM
04 DVD-R
After 05 Others
＆＆: Error occurring disc situation
Display | Detail: Disc distinction | With or without Cartridge | Disc cartridge state | Size
00 OK With Not opened 12cm
10 OK With Not opened 8cm
20 OK With Opened 12cm
30 OK With Opened 8cm
40 OK Without Not opened 12cm
50 OK Without Not opened 8cm
60 OK Without Opened 12cm
70 OK Without Opened 8cm
80 NG With Not opened 12cm
90 NG With Not opened 8cm
A0 NG With Opened 12cm
B0 NG With Opened 8cm
C0 NG Without Not opened 12cm
D0 NG Without Not opened 8cm
E0 NG Without Opened 12cm
F0 NG Without Opened 8cm
8. When the last error doesn't exist
NO DATA</td><td></td></tr>
<tr><td>CEC (H) output</td><td>Check of the CEC terminal high output of HDMI.</td><td>When the check is OK
CECHOK
When the check is NG
CECHNG</td><td>Press [5] [5] in service mode.</td></tr>
<tr><td>CEC (L) output</td><td>Check of the CEC terminal low output of HDMI.</td><td>When the check is OK
CECLOK
When the check is NG
CECLNG</td><td>Press [5] [6] in service mode.</td></tr>
<tr><td>Manufacturing Date</td><td>Read out the manufacturing date of the unit.</td><td>YYMMDD
YY: Year
MM: Month
DD: Date</td><td>Press [6] [1] in service mode.</td></tr>
</table>

9.3.6. Service Mode Table 6

Item		FL display	Key operation
Mode name	Description		(Remote controller key)
Drive adjustment value initialization	Initialize the drive going to factory production adjustment values.	DP DP* * * * **** : password digits ((4) (5) (3) (6)) Initializing: DINI Successful adjustment value initialization and automatic adjustment time : DINIOK Failed at initialization and automatic adjustment adjustment : DINING When you enter the wrong password service mode initially (SERV __ __) to return.	Press[7][1]in service mode. Write remote control number key perform the initialization.
Tray OPEN/CLOSE Test	The tray is opened and closed repeatedly.	****** *is number of open/close cycle times.	Press [9] [1] in service mode *When releasing this mode, press the [POWER] button of Remote Controller.
Delete the Laser Used Time	Laser used time stored in the memory of the unit is deleted.	CLR	Press [9] [5] in service mode.
Delete the Last Drive Error	Delete the Last Drive Error information stored on the BD Mechanism.	CLR	Press [9] [6] in service mode.
Delete the Error History	Delete Error History information stored on the unit. Release Service Mode and turns the Power off	CLR	Press [9] [7] in service mode.
Initialization of Error code	Initialization of the last error code held by timer (Write in F00) last error code information stored by timer is deleted (write in F00)	CLR	Press [9] [8] in service mode.
Initialization of Service mode	Last Drive Error, Error history and Error Codes stored on the unit are initialized to factory setting.	CLR	Press [9] [9] in service mode.
Release Service mode		Display in STOP. ******	Press power button on the front panel or Remote controller in service mode.

9.3.7. Service Mode Table 7

Item		FL display	Key operation
Mode name	Description		Front Key
Sales Demonstration lock/unlock	Ejection of the disc is prohibited. The lock setting is effective until unlocking the tray and not released by Main unit initialization of service mode.	*When lock the tray. ① 00 RET ② 04 PRG ③ 10 OCL ④ LOCK “LOCK” is displayed for 3 seconds.	① When the power is on, disc is in tray, press and hold [OK], [B] and [Y] on the remote control at the same time for more than 5 seconds. - "00 RET" is displayed on the unit's display. ② Repeatedly press [R] on the remote control or [POWER] on the unit until "04 PRG" is displayed on the unit's display. ③ Press and hold [B] on the remote control until "10 OCL" is displayed on the unit's display. ④ Press [G] on the remote control or [OPEN/CLOSE] on the unit.
		*When unlock the tray. ① 00 RET ② 04 PRG ③ 10 OCL ④ UNLOCK “UNLOCK” is displayed for 3 seconds.	① When the power is on, disc is in tray, press and hold [OK], [B] and [Y] on the remote control at the same time for more than 5 seconds. - "00 RET" is displayed on the unit's display. ② Repeatedly press [R] on the remote control or [POWER] on the unit until "04 PRG" is displayed on the unit's display. ③ Press and hold [B] on the remote control until "10 OCL" is displayed on the unit's display. ④ Press [G] on the remote control or [OPEN/CLOSE] on the unit.
		*When press [OPEN/CLOSE] key while the tray being locked. LOCK Display ”LOCK” for 3 seconds.	Press [OPEN/CLOSE] key while the tray is being locked.

10 Troubleshooting Guide

10.1. Troubleshooting Guide for F61 and/or F76

Symptom(s)		Checking items		Possible Fault(s)	Remarks
Set cannot Power ON: Condition 1: With Standby LED on	1	Photocoupler PC5702, PC5799	1	PC5702/PC5799 solder crack, dry joint , short circuit, open circuit, etc	1) Refer to Fig. 1. SMPS P.C.B. 2) Refer to Schematic Diagram of SMPS Circuit (Item 18.7)
	2	Switching IC IC5701	2	Faulty IC5701, pin 1 and 2 shorted, VCC short to GND, etc	
	3	Switching IC IC5799	3	Faulty IC5799, pin 5 and 7 shorted, VCC short to GND, etc	
Condition 2: With Standby LED Off or flickering	1	AC cord	1	Faulty AC cord, loose connection	
	2	AC Inlet P5701	2	P5701 solder crack, dry joint etc	
	3	Fuse F1	3	F1 Fuse open	
Set can Power ON then F61	1	Transformer T5701	1a	Pin 11/12 shorted to pin 9	Refer to Schematic Diagram of SMPS Circuit (Item 18.7) for terminal pin count on primary and secondary terminals
			1b	Pin 15 shorted to pin 14	
	2	Photocoupler PC5720	2	Solder crack, dry joint, short circuit, open circuit, etc	Refer to Fig. 1. SMPS P.C.B.
Set can Power ON then F76	1	DC-DC circuit	1a	L2902 Open (no input to IC2901)	1) Refer to Fig. 2. Digital P.C.B. 2) Refer to Schematic diagram of Digital (Micon/Power) Circuit (Item 18.2)
			1b	Faulty IC2901 (no output voltage at pin 10 and 11)	
			1c	Faulty Q2902 and Q2903 (regulator)	
			1d	L2908 open (No DC +5V)	
	2	SMPS FFC loose	2	Check FFC connection/ alignment from SMPS (JW2) to Digital (CN2309)	Refer to Fig. 1. SMPS P.C.B.
	3	Regulator Circuit	3a	No +3.3V output at LB2300 & LB2302 (open circuit)	1) Refer to Fig. 2. Digital P.C.B. 2) Refer to Schematic diagram of Digital (Micon/Power) Circuit (Item 18.2)
			3b	No +5V at LB2303, LB2304, LB2306 (open circuit)	
			3c	No -7V output (D2306, Q2303 faulty)	
			3d	No +3.3V output at LB2301 (open) & IC2302 faulty	
	4	FL Panel (No Display)	4a	No +12V input to T6100 (Pin 1)	
			4b	Faulty T6100, no output at Pin 8 & 9 (F+, F-)	
			4c	No -9V output due to open circuit at L6100	
Set can Power ON working normally for sometime then F61	1	Thermal Diode D5802	1a	Improper contact between D5802 to heatsink	Refer to Fig. 1. SMPS P.C.B.
			1b	OTP (thermal) protection trigger prematurely	

10.1.1. SMPS P.C.B.

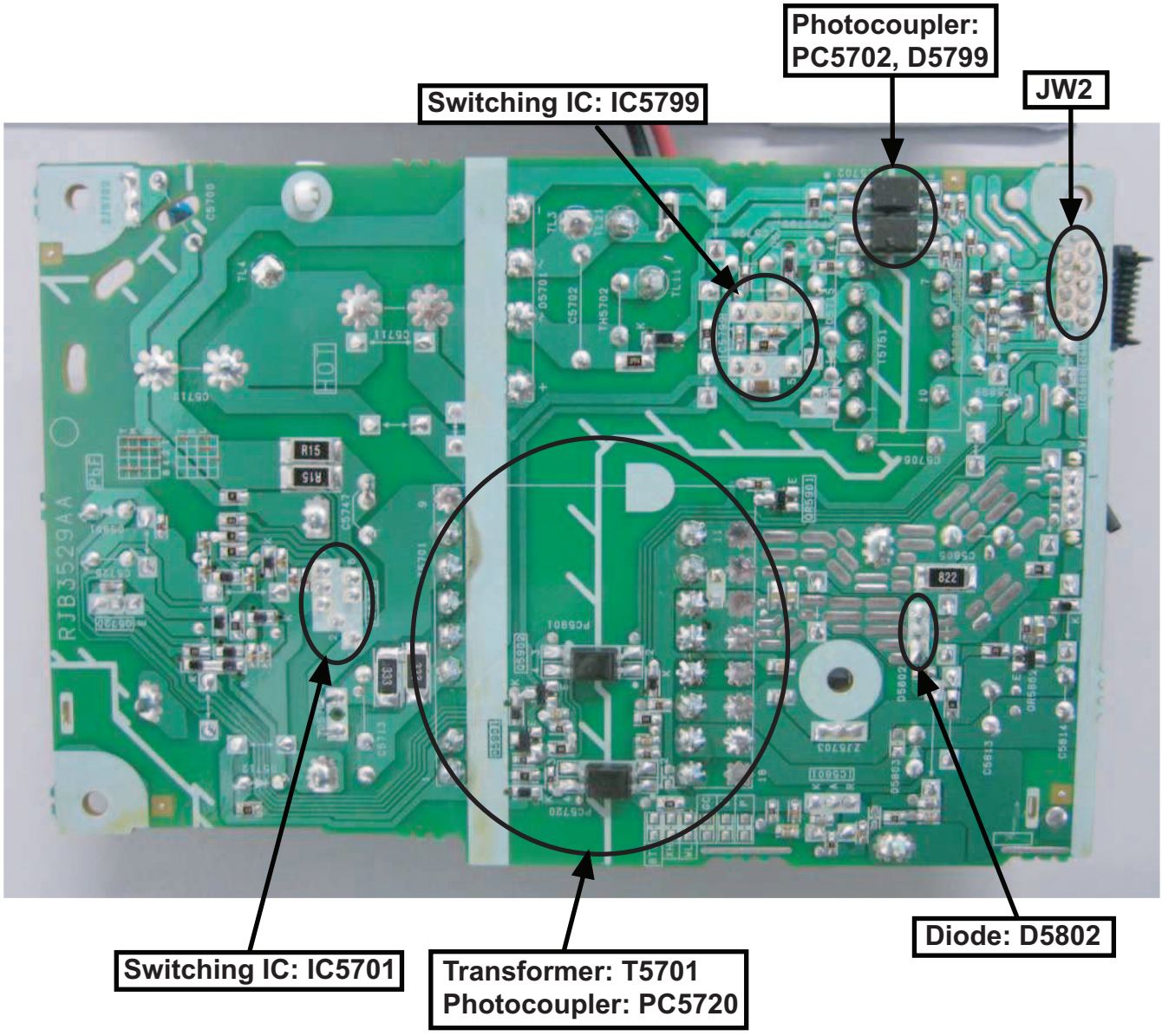
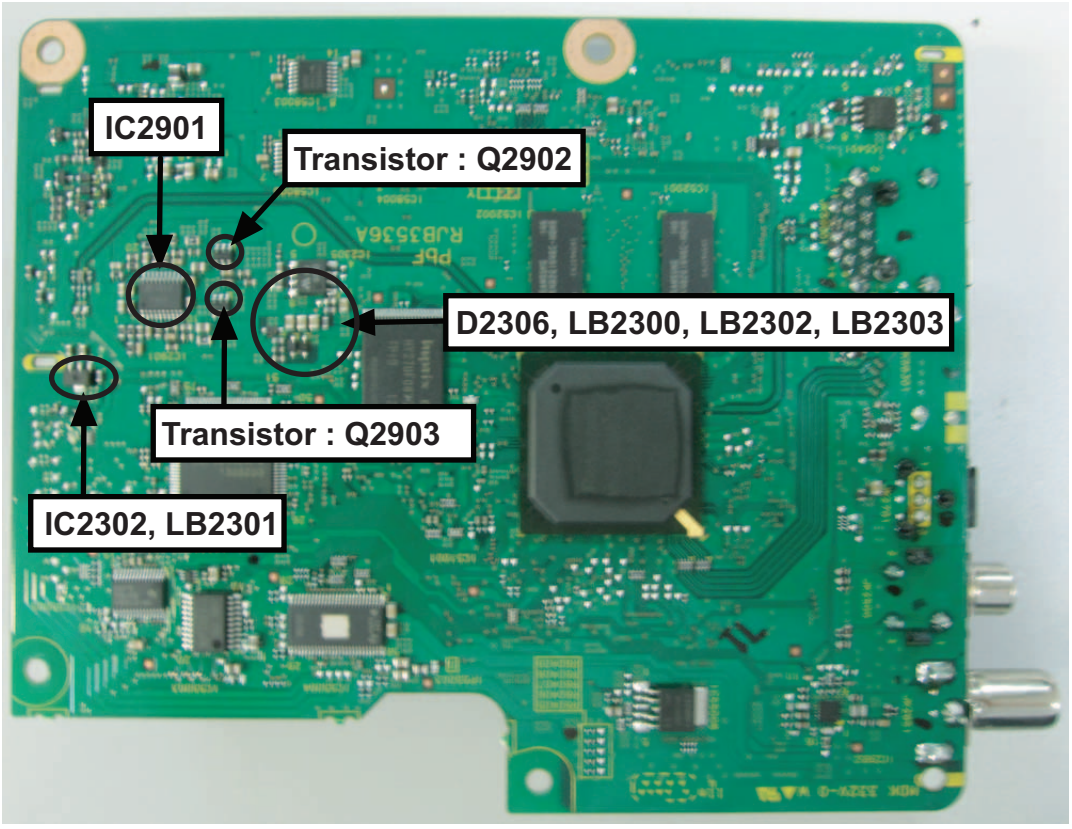


Fig 1. SMPS P.C.B.

10.1.2. Digital P.C.B.

(Side A of Digital P.C.B.)



(Side B of Digital P.C.B.)

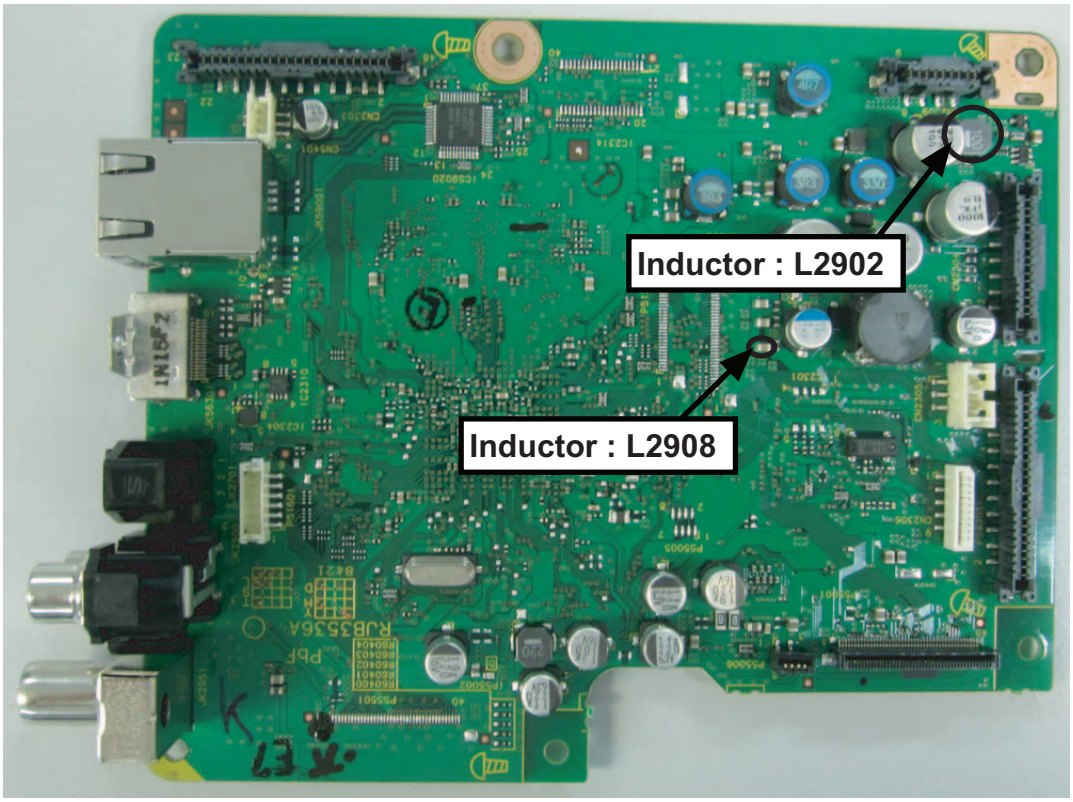


Fig 2. Digital P.C.B.

11 Service Fixture & Tools

Prepare service tools before process service position.

Ref. No	Service Tools		Remarks
SFT1	Digital P.C.B. (P59301) - Panel P.C.B. (P6801), Digital P.C.B. (CN2303) - D-Amp P.C.B. (CN5402)	RFKZ0216 (23P)	[SPG]
SFT2	Digital P.C.B. (CN2309) - SMPS P.C.B. (JW2)	RFKZ0323 (9P)	[SPG]
SFT3	Digital P.C.B. (CN2304) - Panel P.C.B. (P6001)	RFKZ0327 (15P)	[SPG]

12 Disassembly and Assembly Instructions

Caution Note:

- **This section describes the disassembly and/or assembly procedures for all major printed circuit boards & main components for the unit. (You may refer to the section of "Main components and P.C.B Locations" as described in the service manual)**
- **Before carrying out the disassembly process, please ensure all the safety precautions & procedures are followed.**
- **During the disassembly and/or assembly process, please handle with care as there may be chassis components with sharp edges.**
- **Avoid touching heatsinks due to its high temperature after prolong use. (See caution as described below)**

CAUTION: HOT!!
PLEASE DO NOT
TOUCH THE HEAT SINK

- **During disassembly and assembly, please ensure proper service tools, equipment or jigs is being used.**
- **During replacement of component parts, please refer to the section of "Replacement Parts List" as described in the service manual.**
- **Select items from the following indexes when disassembly or replacement are required.**
- Disassembly of Top Cabinet
- Replacement of Tray Ornament
- Disassembly of Front Panel Block Assembly
- Disassembly of Operation Button P.C.B.
- Disassembly of Power Button P.C.B.
- Disassembly of Panel P.C.B.
- Disassembly of Rear Panel
- Disassembly of Fan Unit
- Disassembly of Digital P.C.B.
- Disassembly of D-Amp P.C.B.
- Replacement of Digital Amplifier IC (IC5100/IC5200/IC5300)
- Disassembly of AC Inlet P.C.B.
- Disassembly of SMPS P.C.B.
- Replacement of Switching Regulator IC (IC5701)
- Replacement of Diode (D5702)
- Replacement of Diode (D5802)
- Replacement of Diode (D5803)
- Disassembly of BD Mechanism Unit (BRS14P)

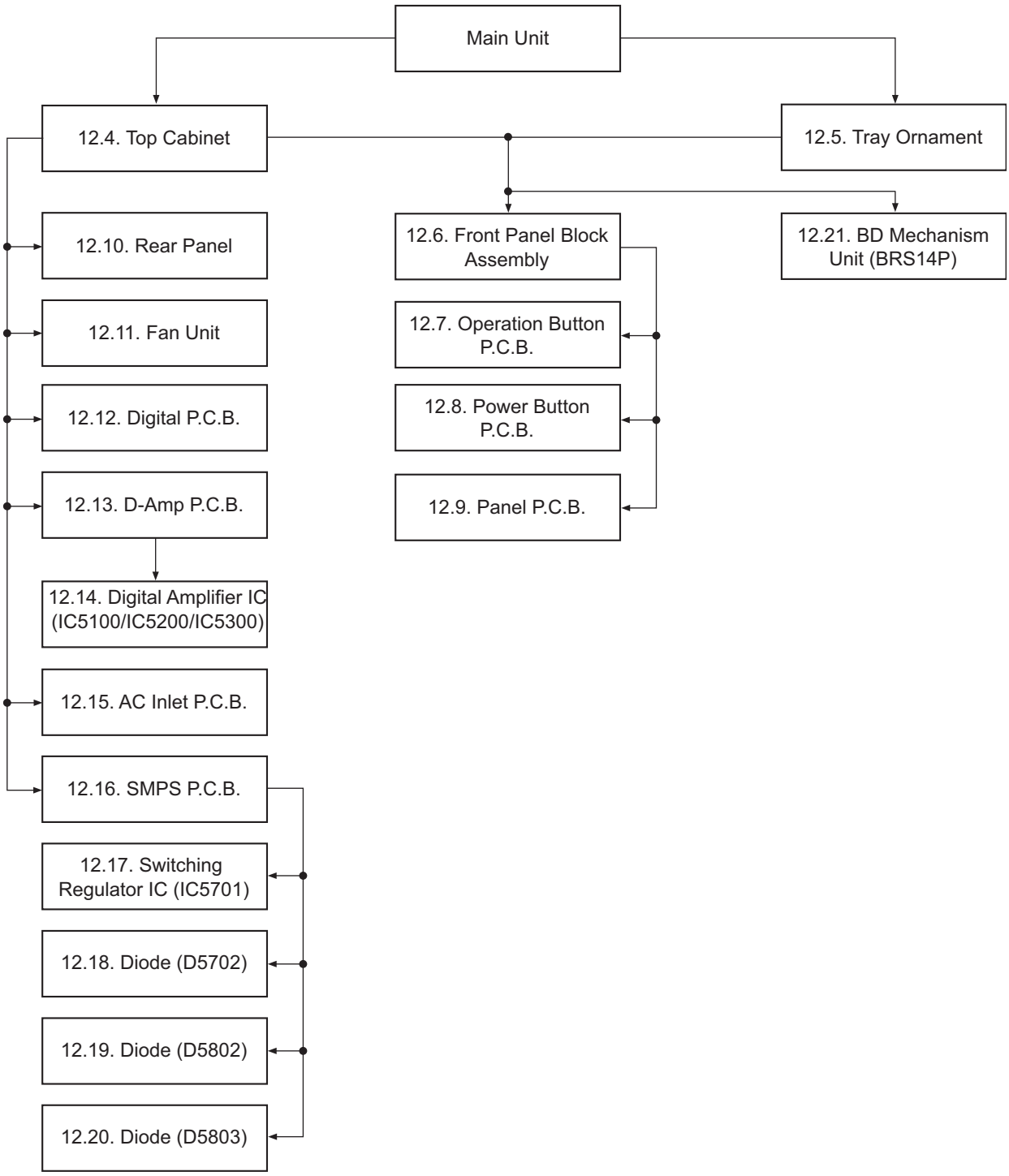
12.1. Screw Type

CAUTION NOTE:
Please use original screw and at correct locations.

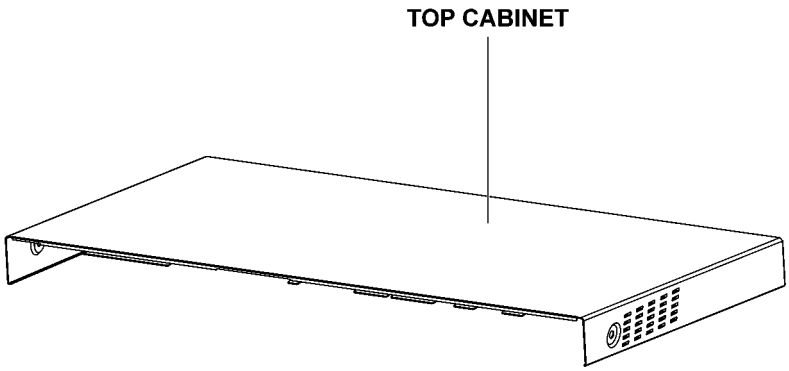
Below shown is part no. of different screw types used:

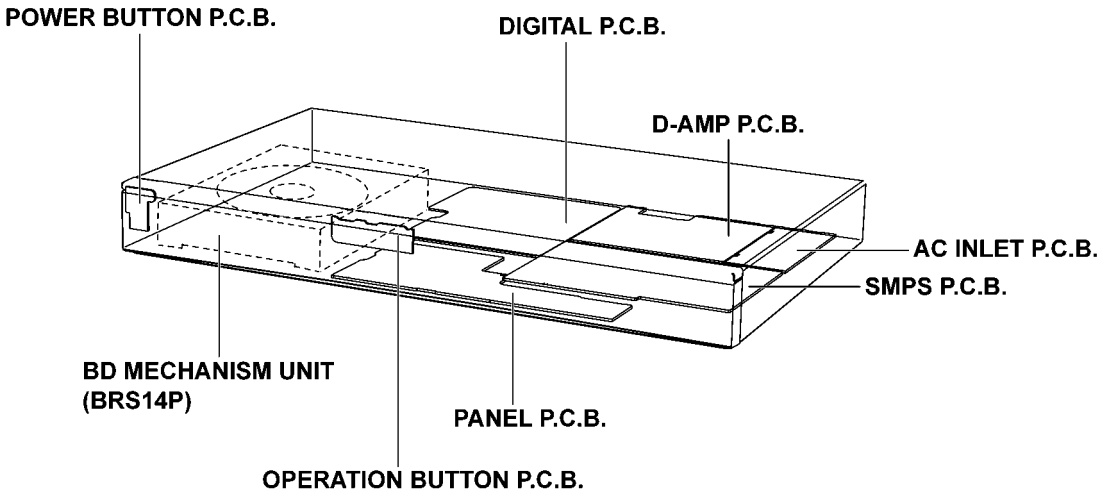
- a :RHD30007-K2J
- b :RHD30119-S
- c :RHD26046
- d :RHD30172
- e :RHDX261002

12.2. Disassembly Flow Chart



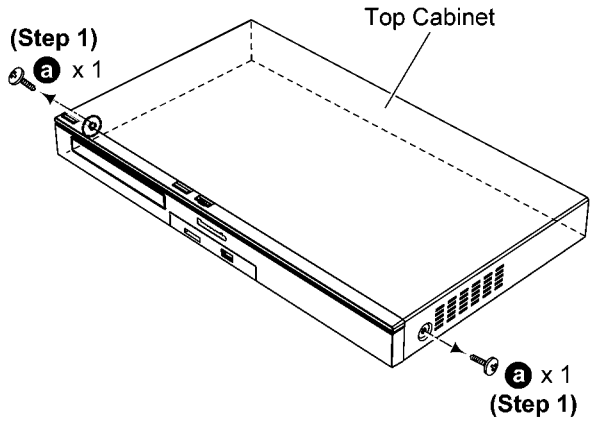
12.3. Main Components and P.C.B. Locations



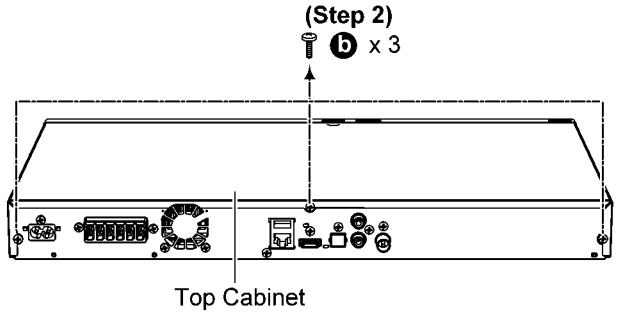


12.4. Disassembly of Top Cabinet

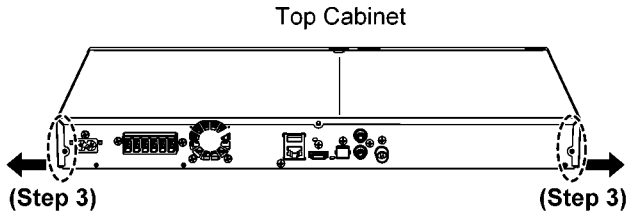
Step 1 Remove 2 screws.



Step 2 Remove 3 screws.

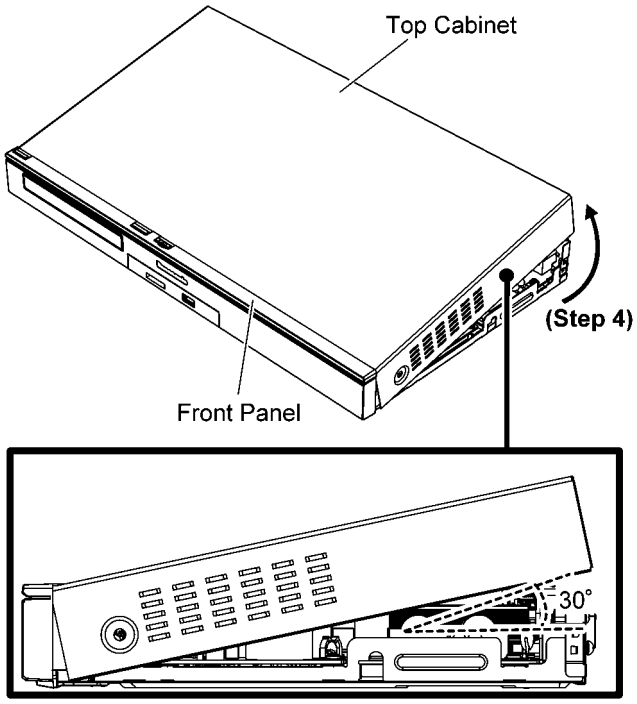


Step 3 Slightly pull both sides of the Top Cabinet as diagram shown.



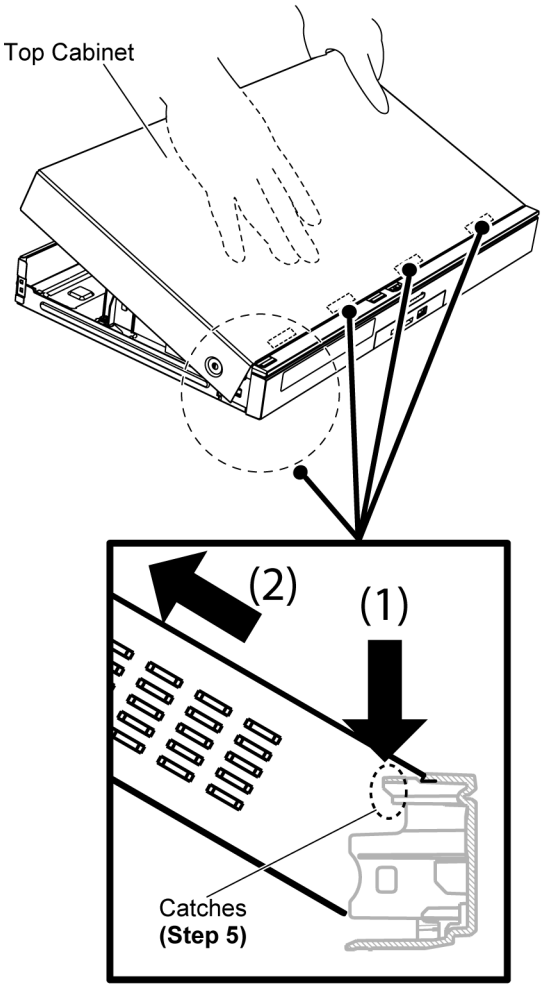
Step 4 Slightly lift both sides of the Top Cabinet in an outward direction about 30°.

Caution: Ensure that the angle from the Top Cabinet to bottom chassis is not greater than 30°.

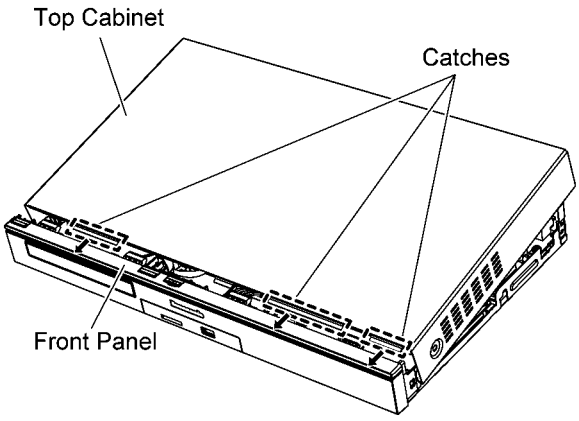


Step 5 Press the catches and remove the Top Cabinet as arrow shown in sequence.

Caution: Avoid touching electrical components when the hand is inserted under the Top Cabinet.



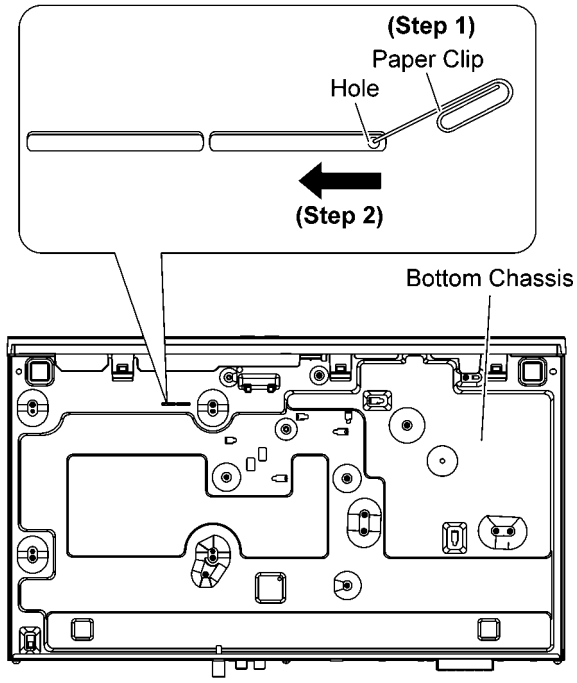
Caution: During assembling, ensure that the Top Cabinet's catches is fully inserted into the Front Panel.



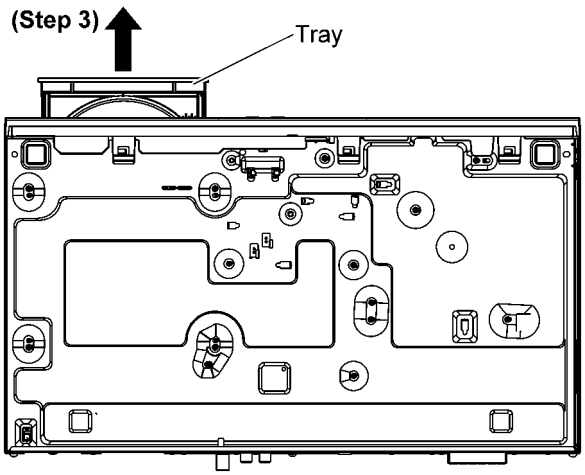
12.5. Replacement of Tray Ornament

Step 1 Use a Paper Clip and insert into the hole on the bottom of the unit.

Step 2 Push the Paper Clip sideway in the direction of the arrow to eject Tray.

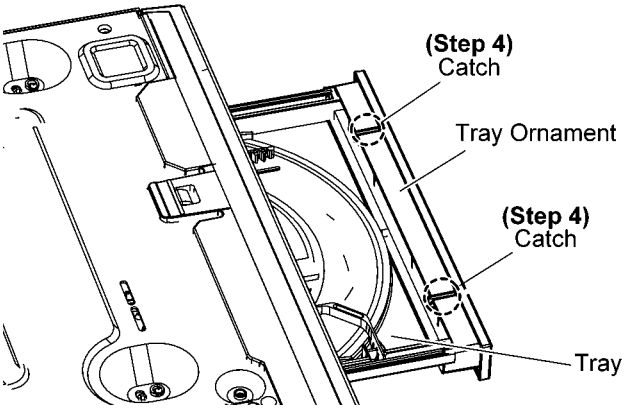


Step 3 Slide the Tray out as direction of arrow.

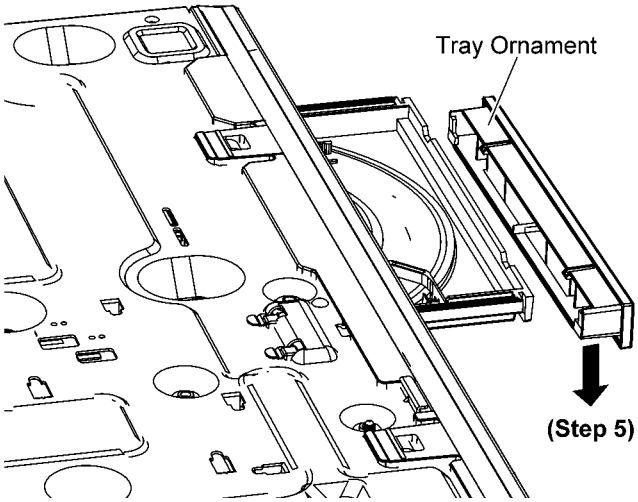


Step 4 Release 2 catches.

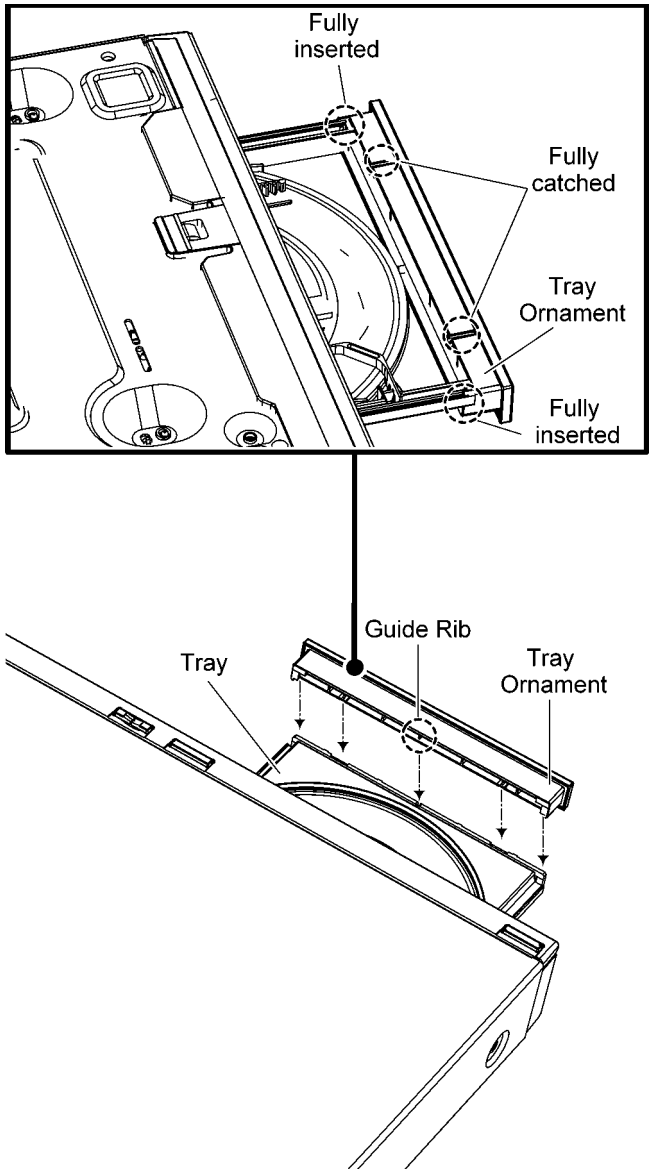
Caution: During assembling, ensure that Tray Ornament is inserted & fully catched onto the Tray.



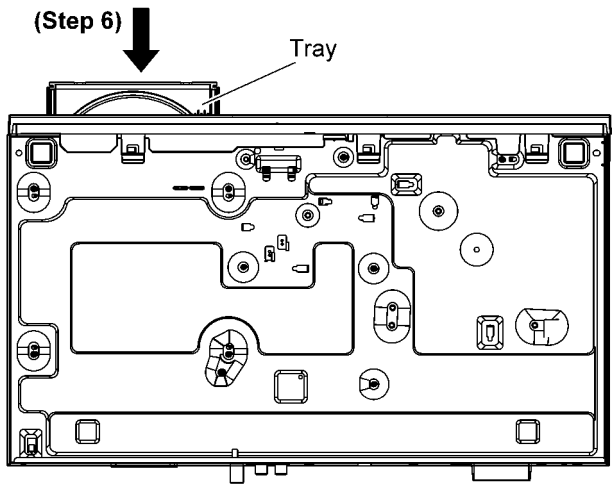
Step 5 Remove the Tray Ornament in the direction of arrow.



Caution: During assembling, ensure that the Tray Ornament's guide rib is fully catched onto the Tray.



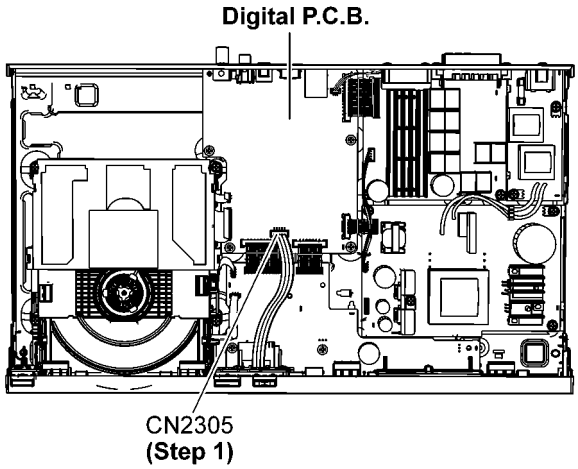
Step 6 Slide the Tray in fully.



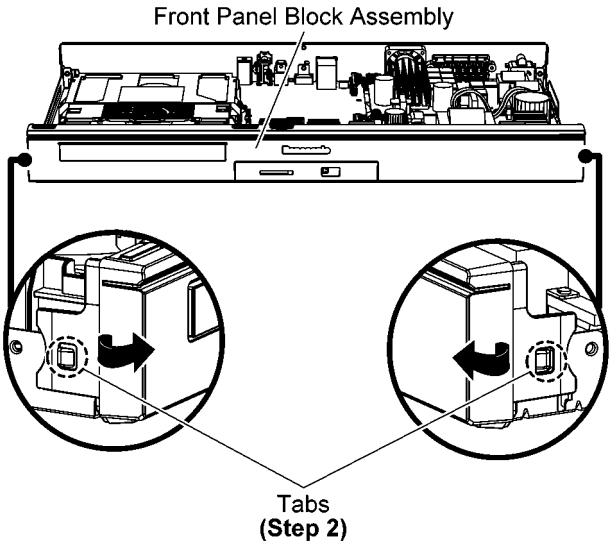
12.6. Disassembly of Front Panel Block Assembly

- **Refer to “Disassembly of Top Cabinet”.**
- **Refer to "Replacement of Tray Ornament".**

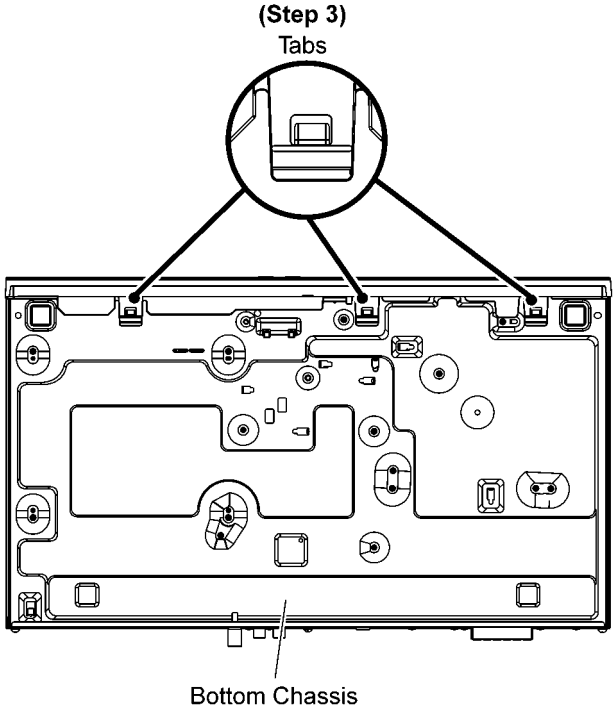
Step 1 Detach 3P Cable at the connector (CN2305) on Digital P.C.B..



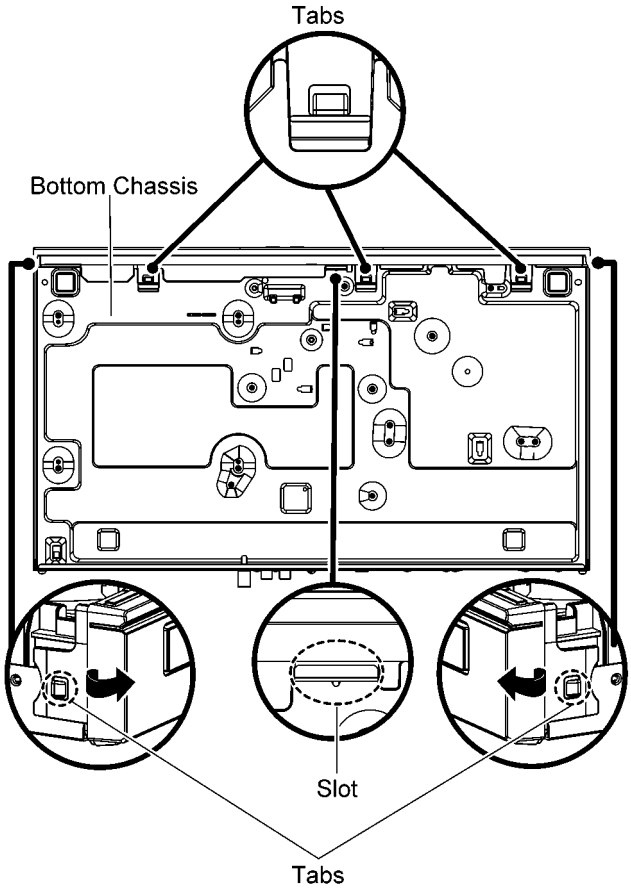
Step 2 Release the 2 tabs at each side of the Front Panel Block Assembly in the direction of arrow.



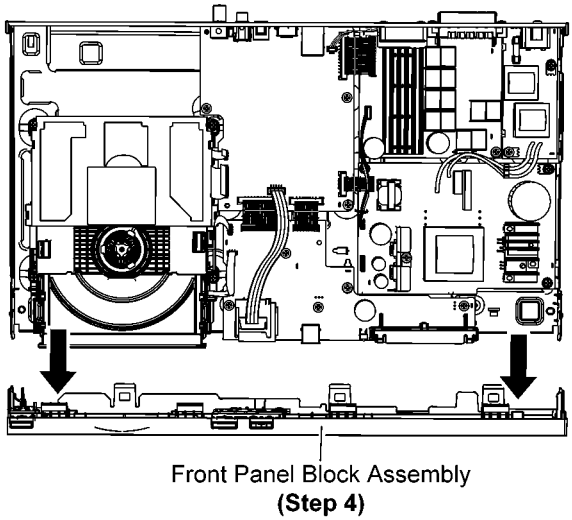
Step 3 Release the 3 tabs at the Bottom Chassis.
Caution: Do not exert strong force when releasing the tabs.



Caution: During assembling, ensure that the Front Panel Block Assembly is properly inserted and fully catched onto Bottom Chassis



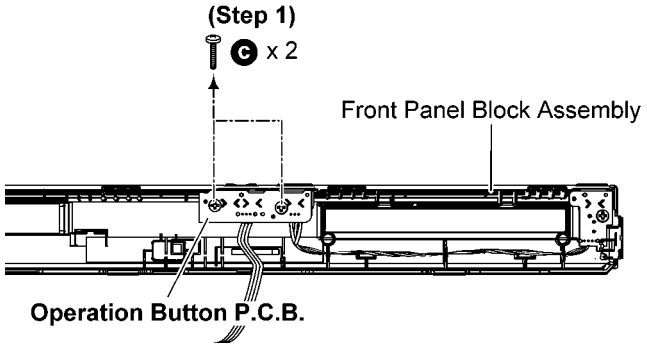
Step 4 Remove the Front Panel Block Assembly.



12.7. Disassembly of Operation Button P.C.B.

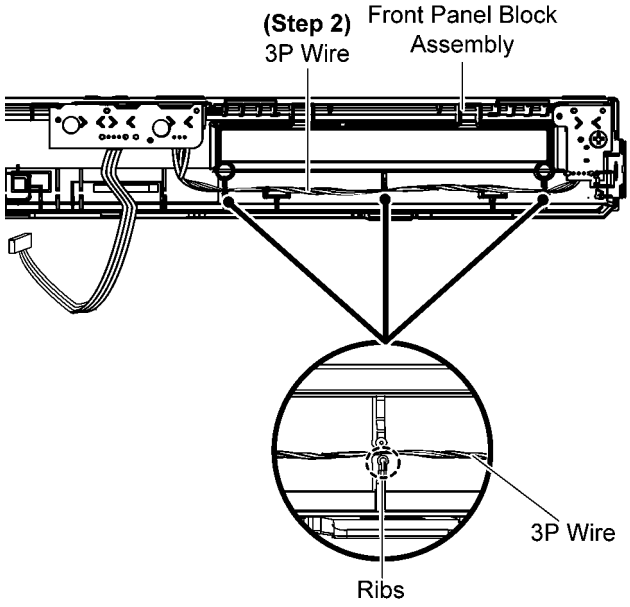
- **Refer to “Disassembly of Top Cabinet”.**
- **Refer to "Replacement of Tray Ornament".**
- **Refer to "Disassembly of Front Panel Block Assembly".**

Step 1 Remove 2 screws.



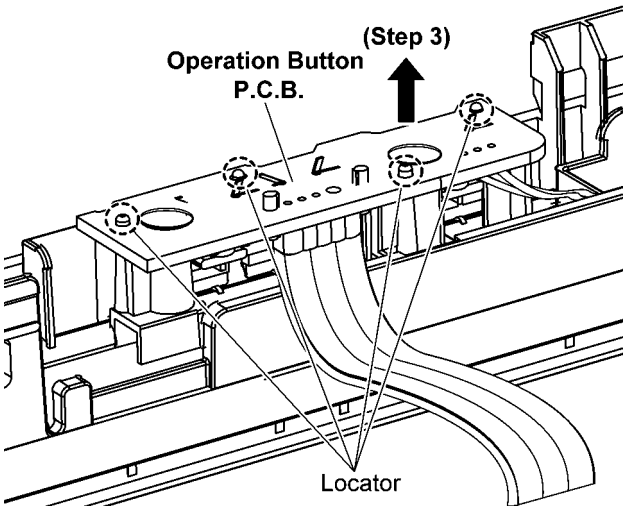
Step 2 Release 3P Wire from the ribs of the Front Panel Block Assembly.

Caution: During assembling, dressed the 3P Wire into the ribs of Front Panel Block Assembly.



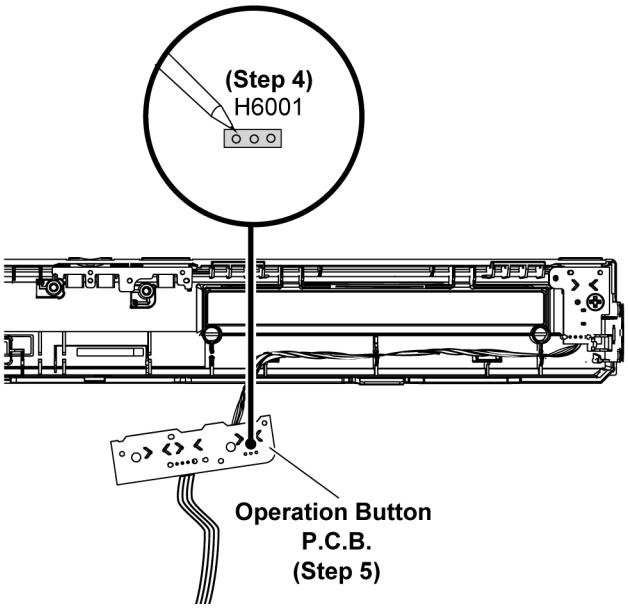
Step 3 Lift up the Operation Button P.C.B..

Caution: During assembling, ensure that the Operation Button P.C.B. is properly located and fully seated onto Front Panel Block Assembly.



Step 4 Desolder 3P Wire at the cable holder (H6001) on Operation Button P.C.B..

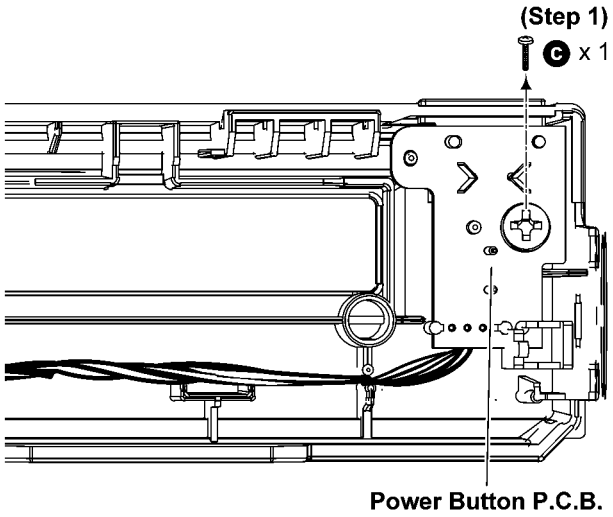
Step 5 Remove Operation Button P.C.B..



12.8. Disassembly of Power Button P.C.B.

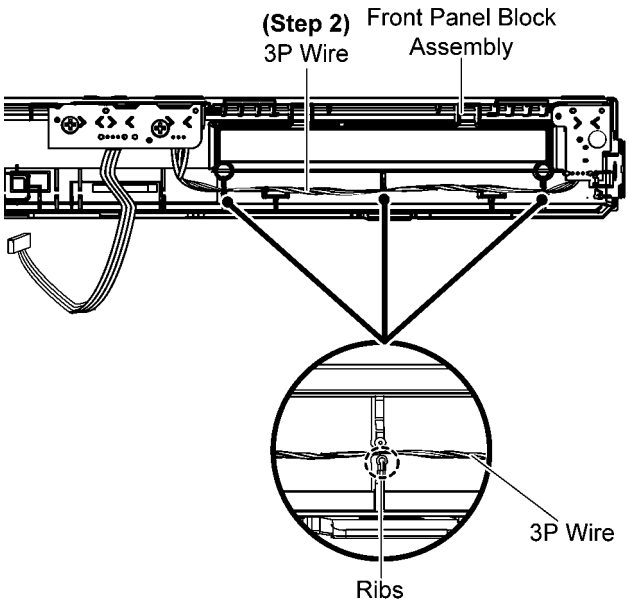
- **Refer to "Disassembly of Top Cabinet".**
- **Refer to "Replacement of Tray Ornament".**
- **Refer to "Disassembly of Front Panel Block Assembly".**

Step 1 Remove 1 screw.

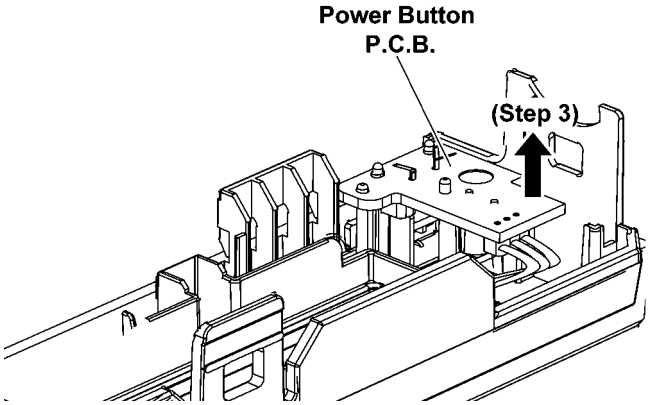


Step 2 Release 3P Wire from the ribs of the Front Panel Block Assembly.

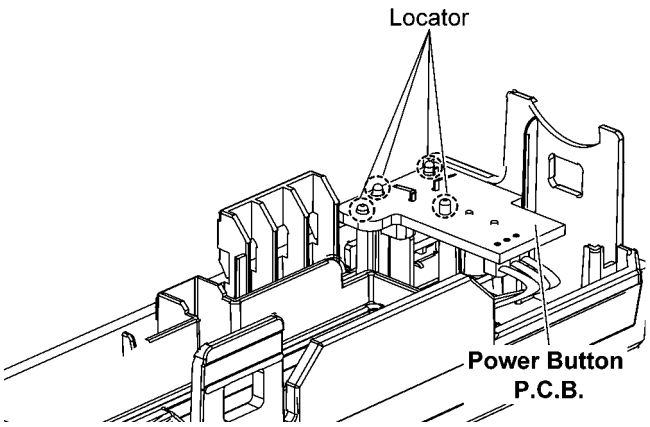
Caution: During assembling, dressed the 3P Wire into the ribs of Front Panel Block Assembly.



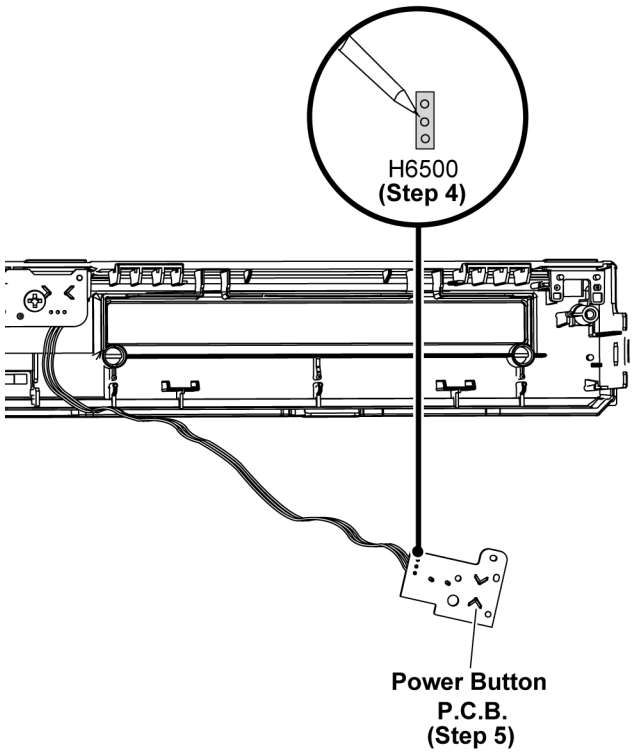
Step 3 Lift up the Power Button P.C.B..



Caution: During assembling, ensure that Power Button P.C.B. is properly located and fully seated onto Front Panel Block Assembly.



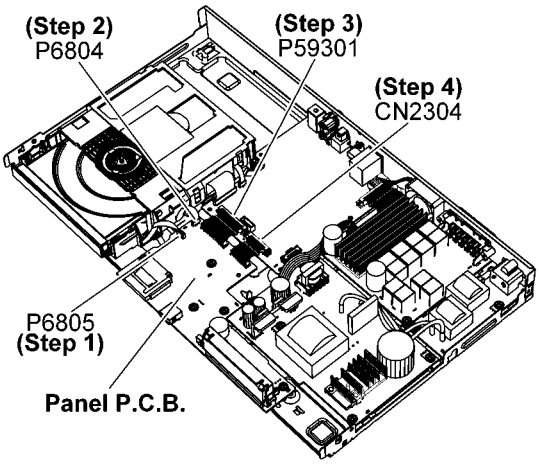
Step 4 Desolder 3P Wire at the cable holder (H6500) on Power Button P.C.B..
Step 5 Remove the Power Button P.C.B..



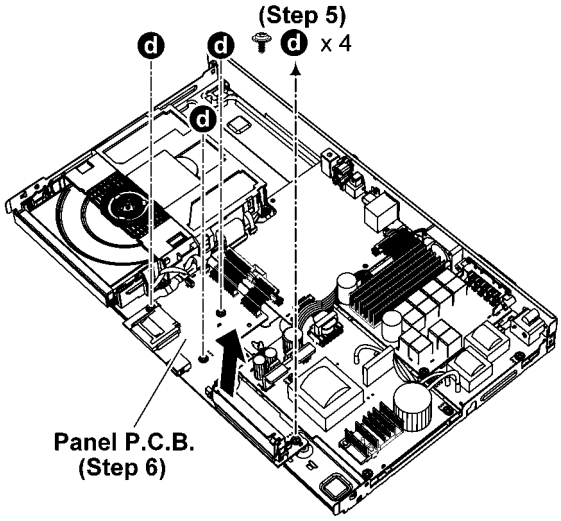
12.9. Disassembly of Panel P.C.B.

- **Refer to “Disassembly of Top Cabinet”.**
- **Refer to "Replacement of Tray Ornament".**
- **Refer to “Disassembly of Front Panel Block Assembly”.**

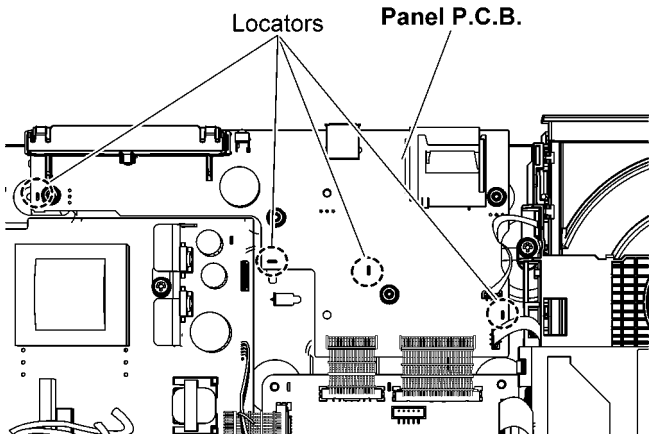
Step 1 Detach 5P FFC at the connector (P6805) on Panel P.C.B..
Step 2 Detach 5P FFC at the connector (P6804) on Panel P.C.B..
Step 3 Detach 23P Bridge Connector at the connector (P59301) on Digital P.C.B..
Step 4 Detach 15P Bridge Connector at the connector (CN2304) on Digital P.C.B..



Step 5 Remove 4 screws.
Step 6 Remove the Panel P.C.B..



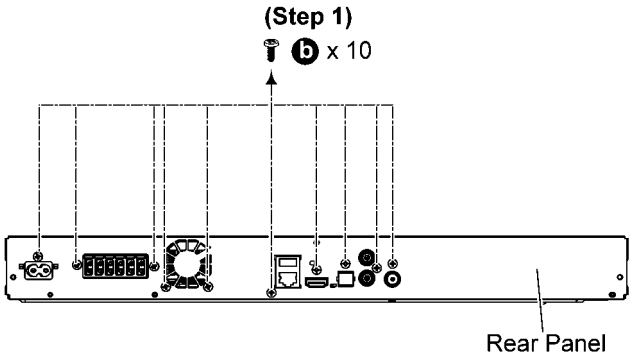
Caution: During assembling, ensure that the Panel P.C.B. is properly located & fully seated onto the Bottom Chassis.



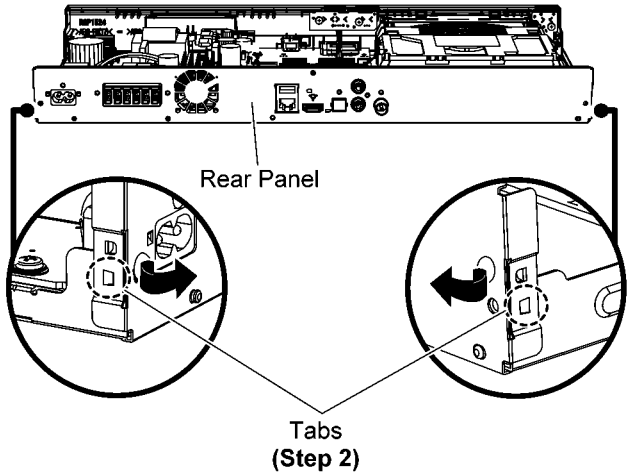
12.10. Disassembly of Rear Panel

- **Refer to “Disassembly of Top Cabinet”**

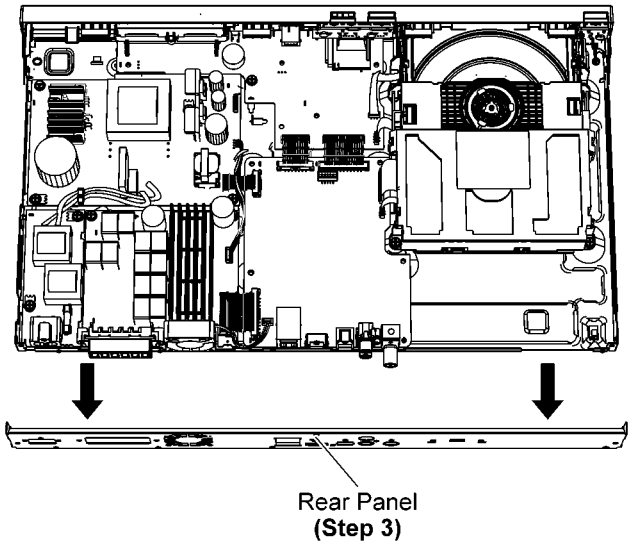
Step 1 Remove 10 screws.



Step 2 Release 2 tabs at each side of the Rear Panel in the direction of arrow.



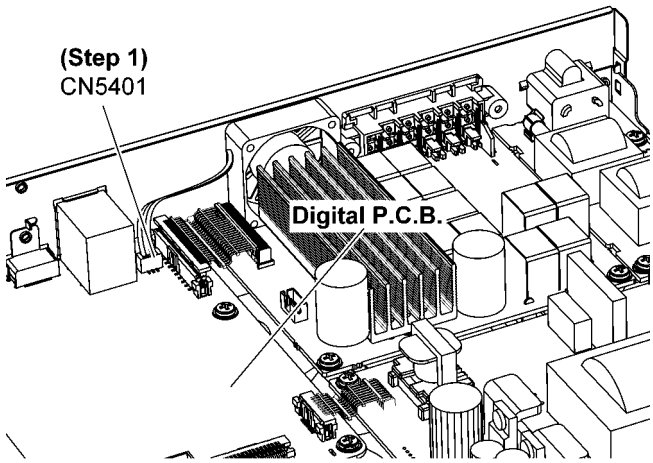
Step 3 Remove the Rear Panel.



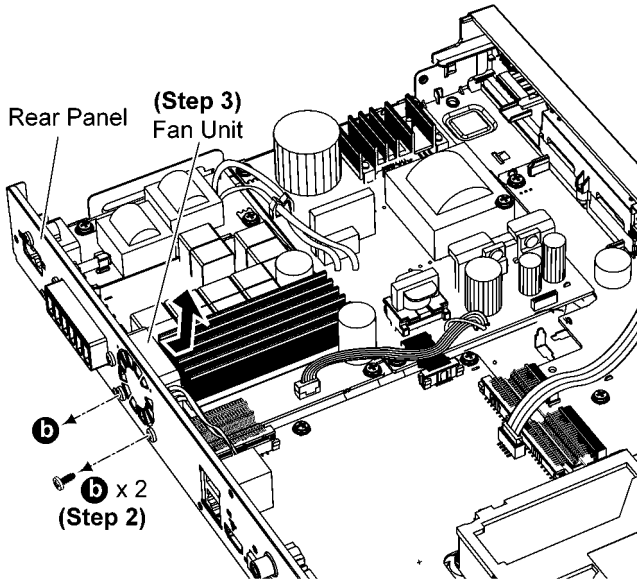
12.11. Disassembly of Fan Unit

- **Refer to "Disassembly of Top Cabinet"**

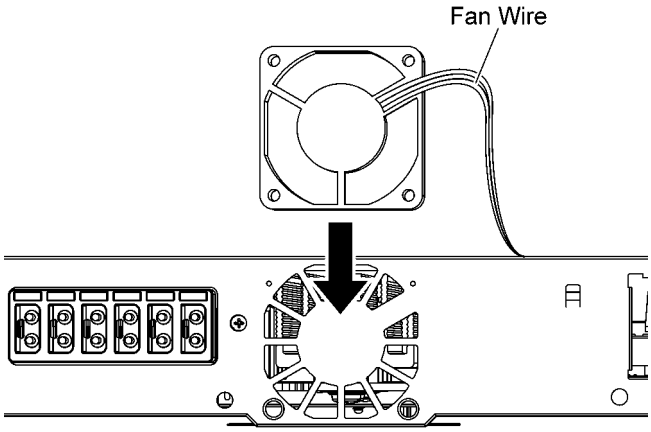
Step 1 Detach the 3P Fan Wire at connector (CN5401) on Digital P.C.B..



Step 2 Remove 2 screws.
Step 3 Lift up to remove the Fan Unit.



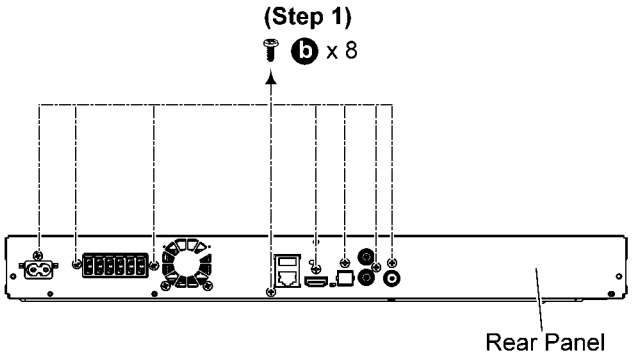
Caution: During assembling, ensure the Fan Unit is placed correctly as shown below.



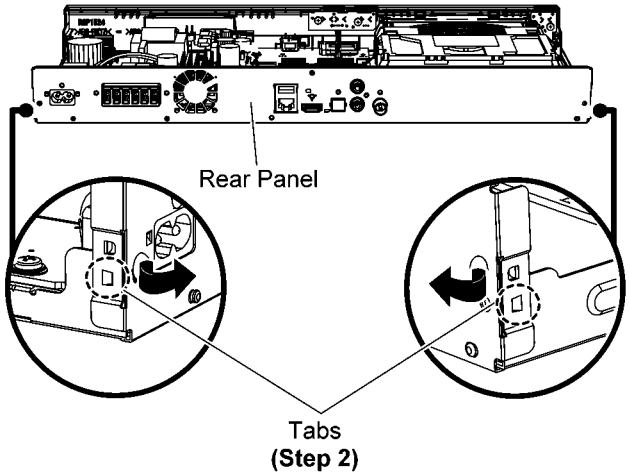
12.12. Disassembly of Digital P.C.B.

- **Refer to “Disassembly of Top Cabinet”.**

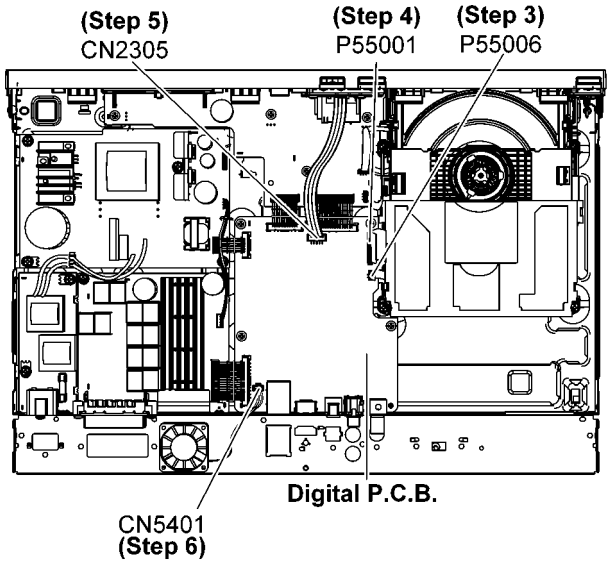
Caution: If the Digital P.C.B. and/or Mechanism Unit is exchanged, the drive adjustment is required because of the adjustment data is stored in the Digital P.C.B.. Perform the drive adjustment accordance with Section 14 "When Replacing the Mechanism Unit and/or Digital P.C.B.".
Step 1 Remove 8 screws.



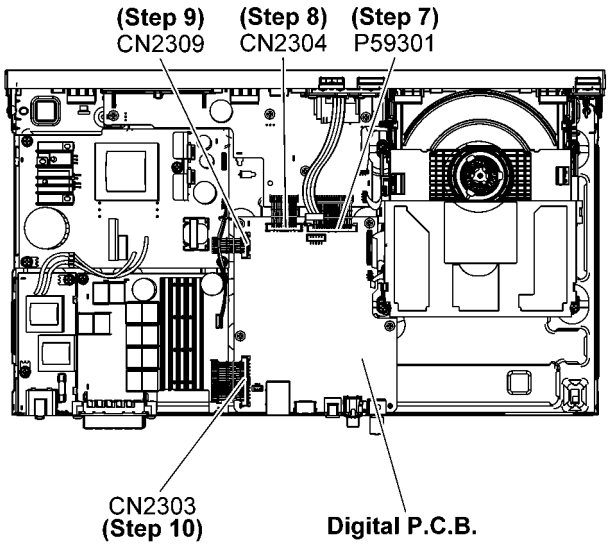
Step 2 Release 2 tabs at each side of the Rear Panel in the direction of arrow.



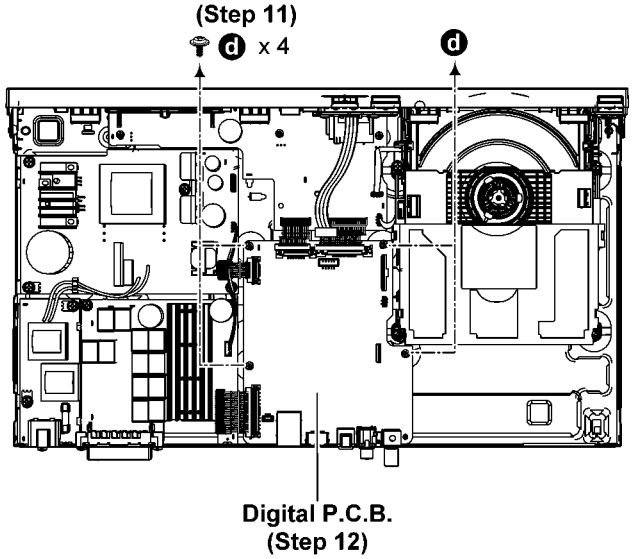
Step 3 Detach 4P FFC at the connector (P55006) on Digital P.C.B..
Step 4 Detach 45P FFC at the connector (P55001) on Digital P.C.B..
Step 5 Detach 3P Cable at the connector (CN2305) on Digital P.C.B..
Step 6 Detach 3P Fan Wire at the connector (CN5401) on Digital P.C.B..



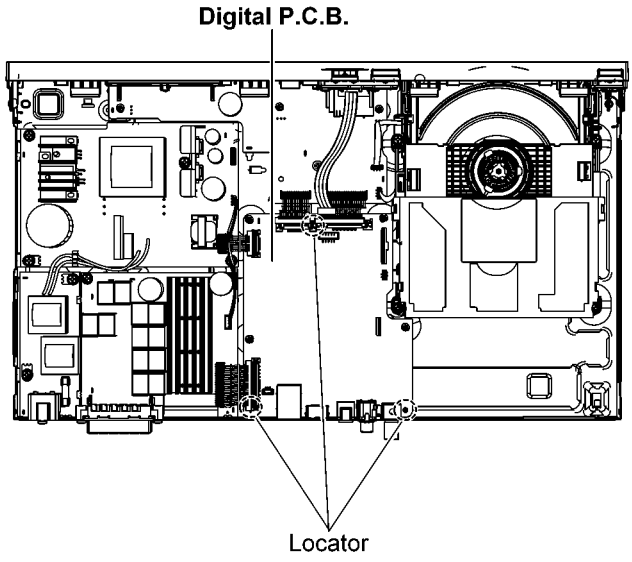
Step 7 Detach 23P Bridge Connector at the connector (P59301) on Digital P.C.B..
Step 8 Detach 15P Bridge Connector at the connector (CN2304) on Digital P.C.B..
Step 9 Detach 9P Bridge Connector at the connector (CN2309) on Digital P.C.B..
Step 10 Detach 23P Bridge Connector at the connector (CN2303) on Digital P.C.B..



Step 11 Remove 4 screws.
Step 12 Remove the Digital P.C.B..



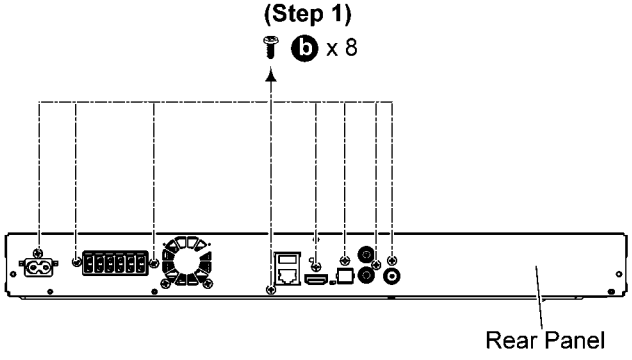
Caution: During assembling, ensure that the Digital P.C.B. is properly located & fully seated onto the Bottom Chassis.



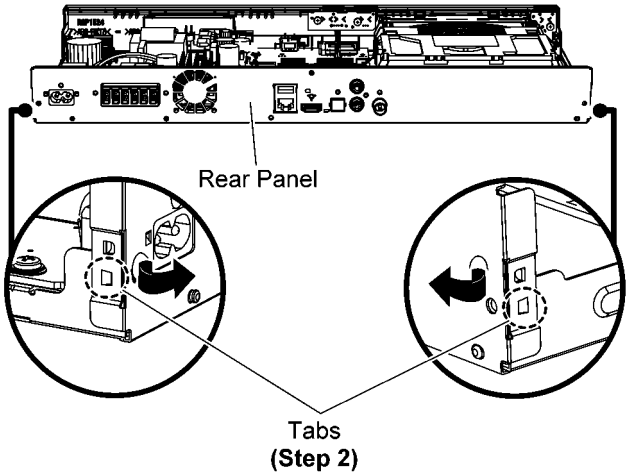
12.13. Disassembly of D-Amp P.C.B.

- **Refer to "Disassembly of Top Cabinet".**

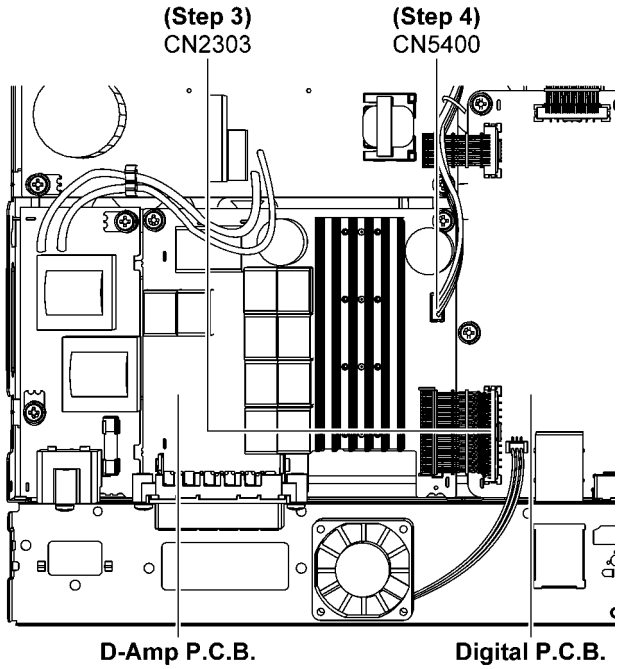
Step 1 Remove 8 screws.



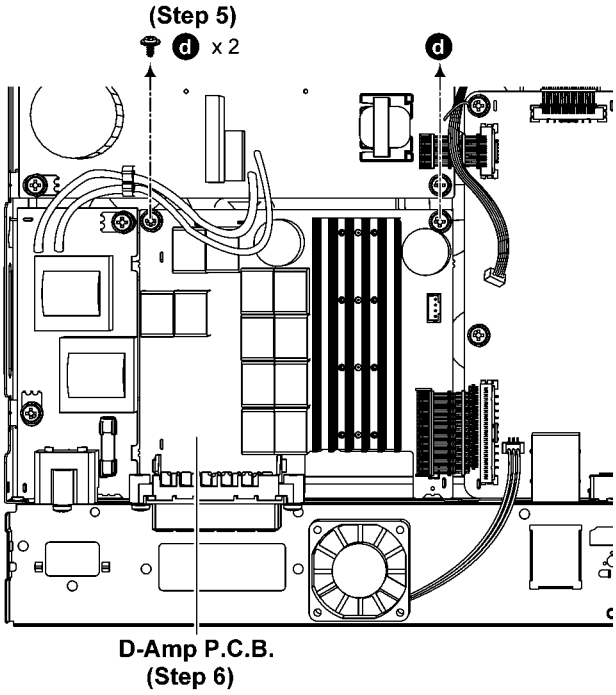
Step 2 Release 2 tabs at each side of the Rear Panel in the direction of arrow.



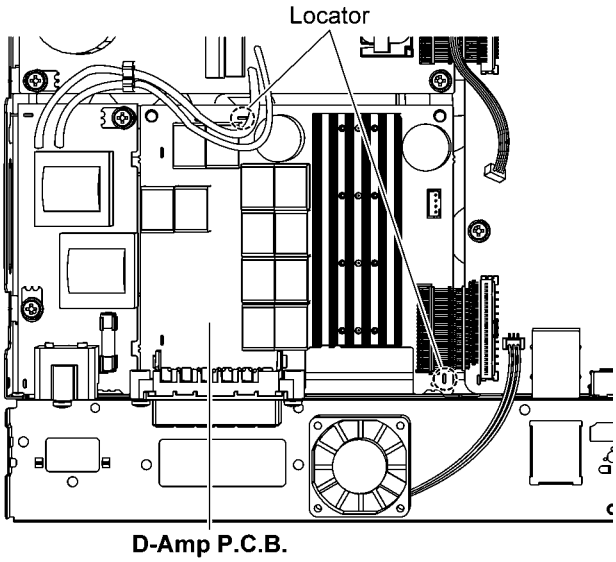
Step 3 Detach 23P Bridge connector at the connector (CN2303) on Digital P.C.B..
Step 4 Detach 4P Cable at the connector (CN5400) on D-Amp P.C.B..



Step 5 Remove 2 screws.
Step 6 Remove the D-Amp P.C.B..



Caution: During assembling, ensure that the D-Amp P.C.B. is properly located and fully seated onto the Bottom Chassis.

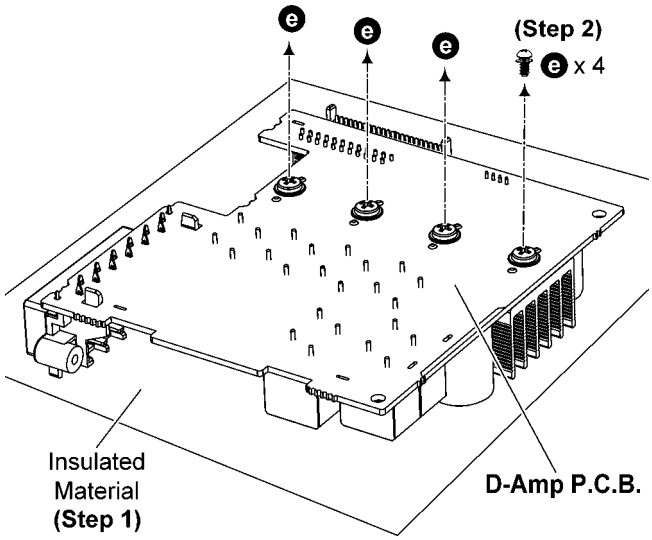


12.14. Replacement of Digital Amplifier IC (IC5100/IC5200/IC5300)

- **Refer to "Disassembly of Top Cabinet".**
- **Refer to "Disassembly of D-Amp P.C.B.".**

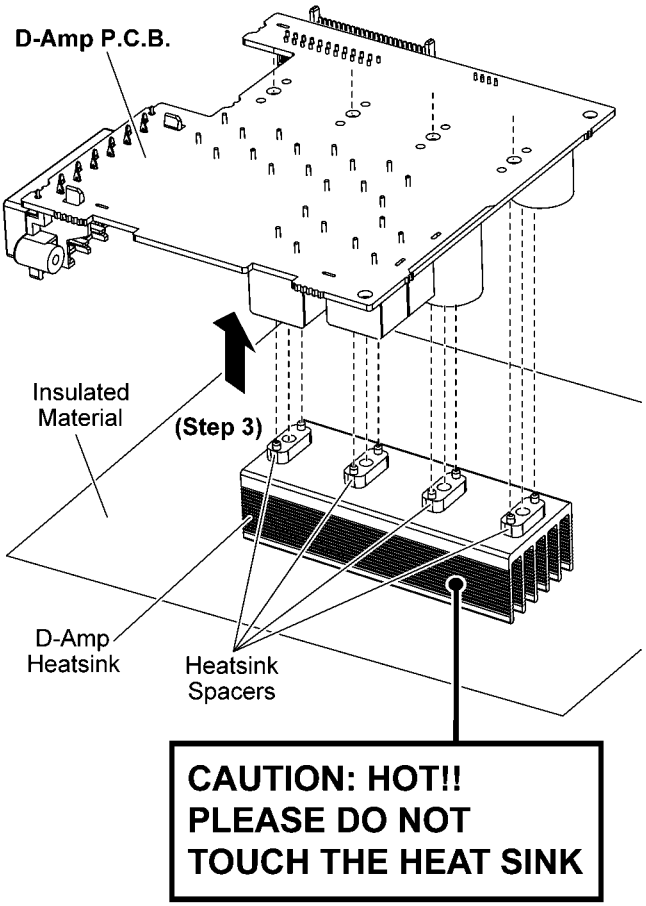
12.14.1. Disassembly of Digital Amplifier IC (IC5100/IC5200/IC5300)

Caution: Handle the D-Amp P.C.B. with caution due to it's high temperature after prolonged use. Touching it may lead to injuries.
Step 1 Place D-Amp P.C.B. on an insulated material.
Step 2 Remove 4 screws.



Step 3 Lift up D-Amp P.C.B. as arrow shown.

Caution: Keep the Heatsink Spacers in safe place. Avoid denting it, place it back during assembling.

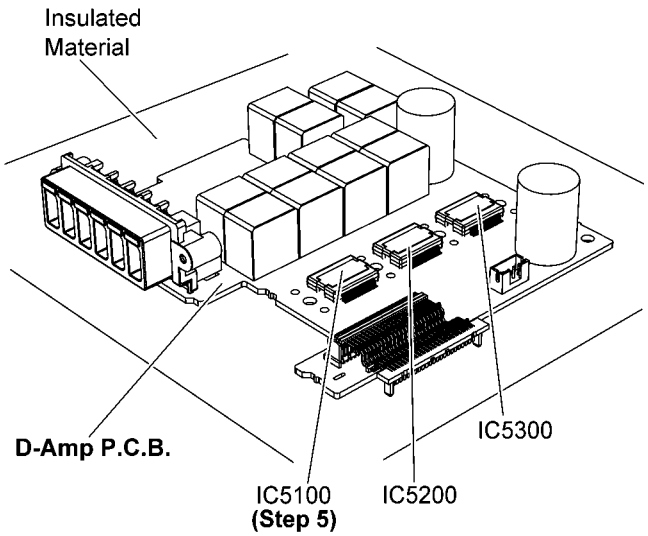


Step 4 Desolder the pins of Digital Amplifier IC (IC5100).

Step 5 Remove Digital Amplifier IC (IC5100).

Note 1: For disassembling of Digital Amplifier IC (IC5200) and (IC5300), repeat (Step 1) to (Step 5) of 12.14.1.

Note 2: Refer to diagram of D-Amp P.C.B. (item 19.3) for location of part.

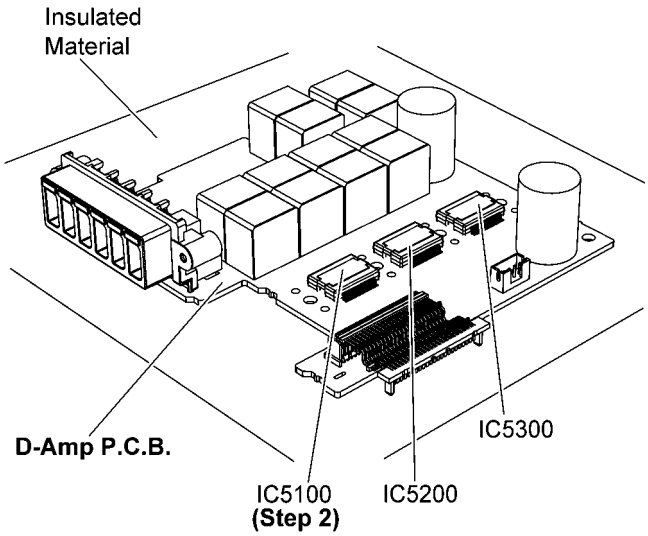


12.14.2. Assembly of Digital Amplifier IC (IC5100/IC5200/IC5300)

Step 1 Fix the Digital Amplifier IC (IC5100) onto the D-Amp P.C.B..

Step 2 Solder the pins of Digital Amplifier IC (IC5100).

Caution: Ensure that the pins of Digital Amplifier IC (IC5100) is positioned correctly on D-Amp P.C.B. before soldering.

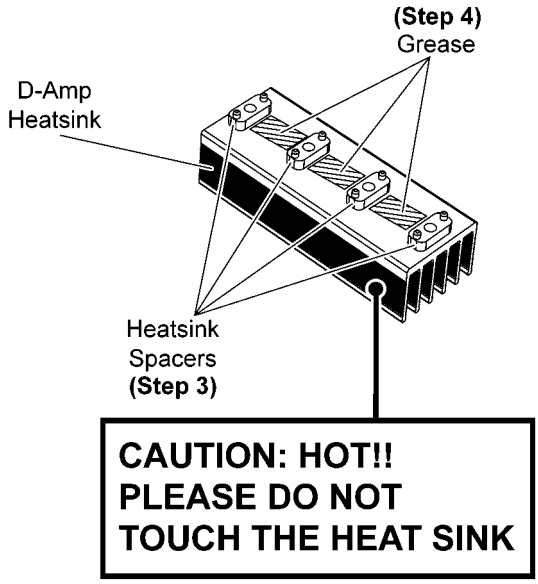


Step 3 Fix Heatsink spacers onto D-Amp Heatsink.

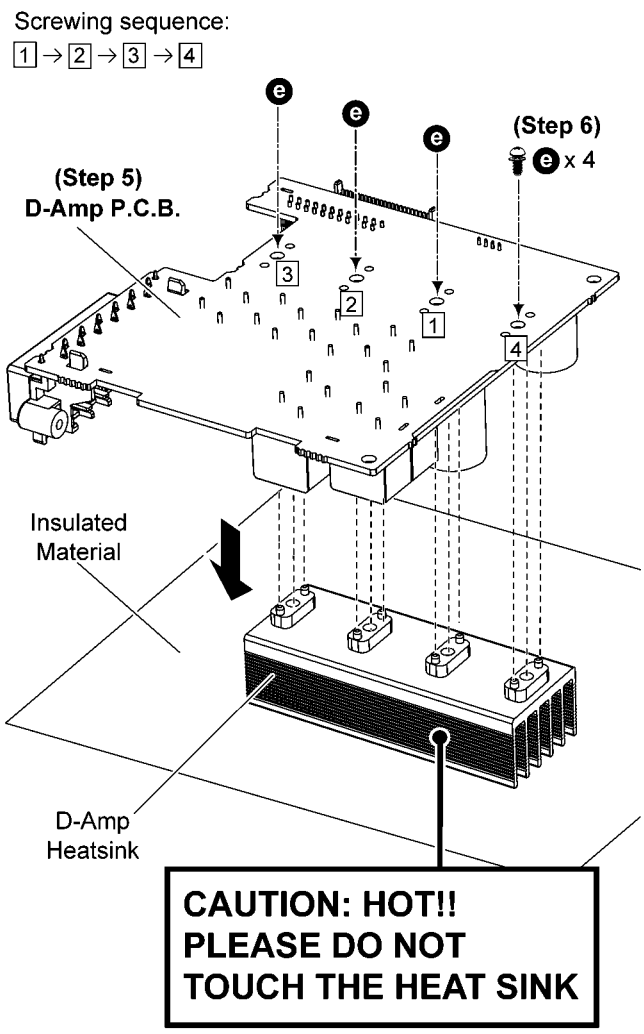
Caution: Ensure that Heatsink Spacers are properly located and seated flatly onto D-Amp Heatsink.

Step 4 Apply grease to the D-Amp Heatsink as indicate in the diagram.

Caution: Ensure Grease thickness is 0.2mm.



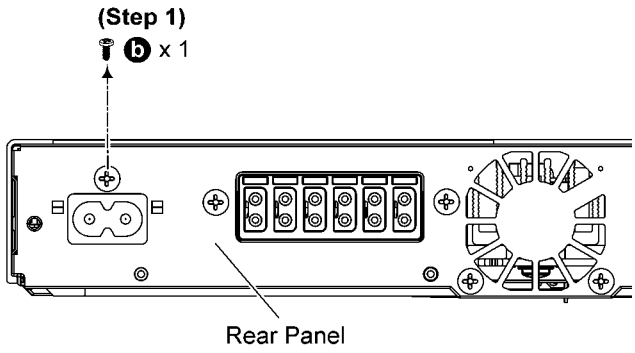
Step 5 Upset the D-Amp P.C.B..
Step 6 Fix 4 screws.
Note: For assembling of Digital Amplifier IC (IC5200) and (IC5300), repeat the (Step 1) to (Step 6) of 12.14.2.



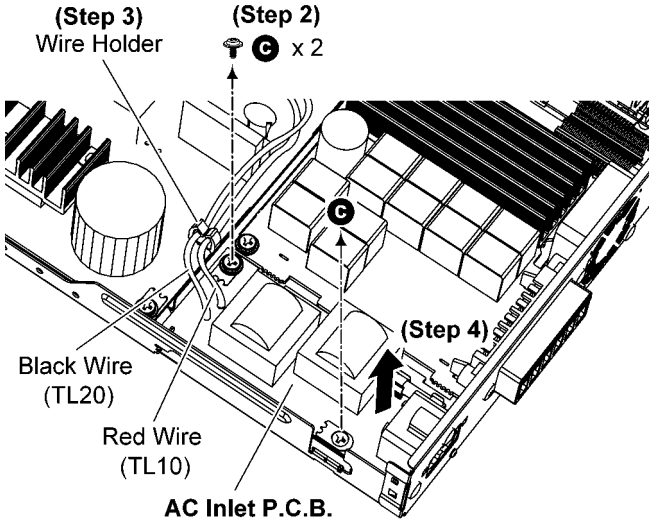
12.15. Disassembly of AC Inlet P.C.B.

- **Refer to "Disassembly of Top Cabinet"**

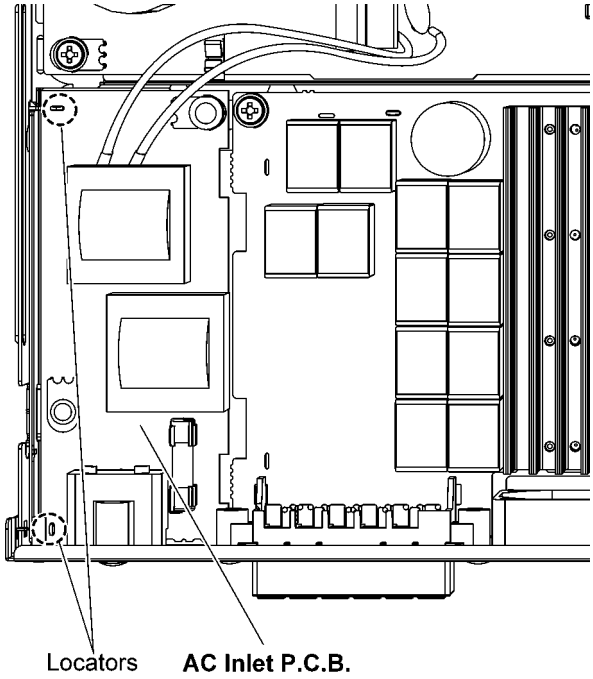
Step 1 Remove 1 screw.



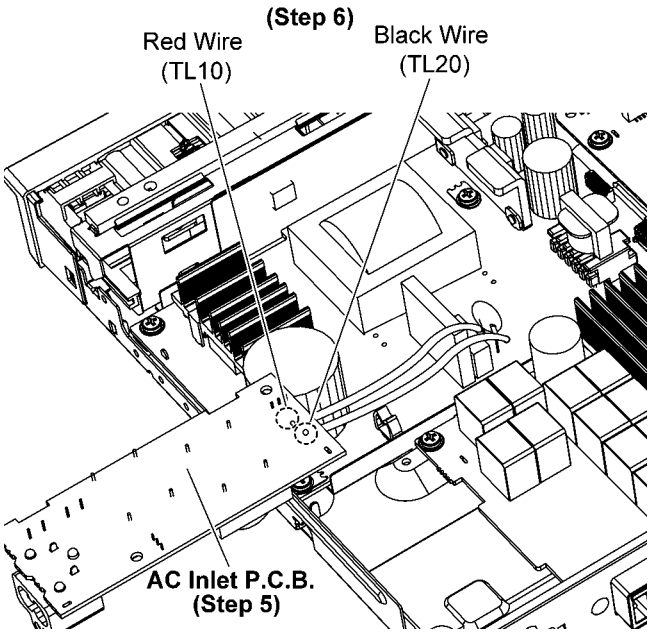
Step 2 Remove 2 screws.
Step 3 Release the Red Wire (TL10) and Black Wire (TL20) from Wire Holder.
Caution: During assembling, ensure that Red Wire (TL10) and Black Wire (TL20) are dressed into Wire Holder properly.
Step 4 Lift up the AC Inlet P.C.B..



Caution: During assembling, ensure that the AC Inlet P.C.B. is properly located and fully seated onto the Bottom Chassis.



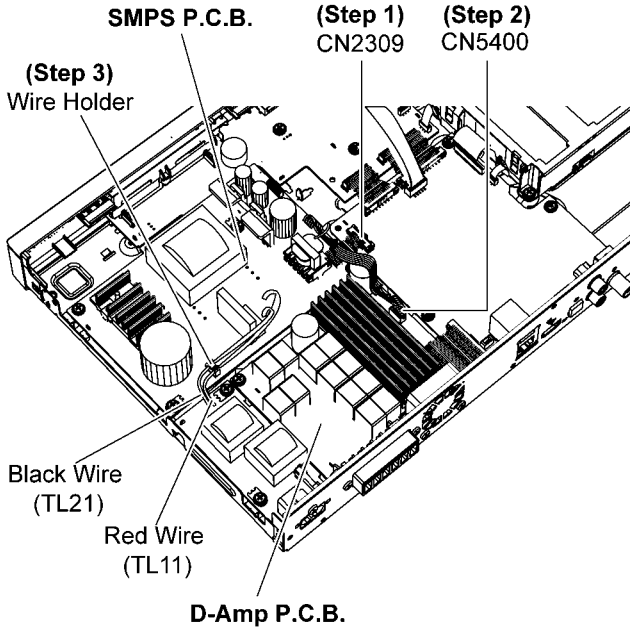
Step 5 Upset the AC Inlet P.C.B..
Step 6 Desolder Red Wire (TL10) and Black Wire (TL20) on AC Inlet P.C.B..
Step 7 Remove the AC Inlet P.C.B..



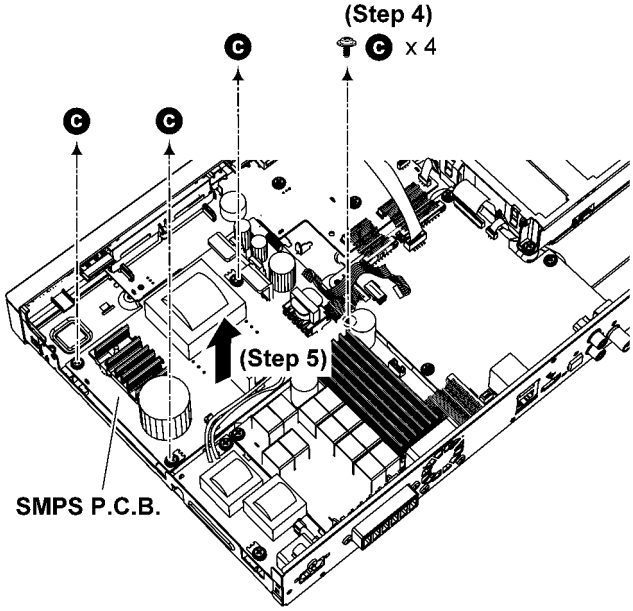
12.16. Disassembly of SMPS P.C.B.

- **Refer to "Disassembly of Top Cabinet".**

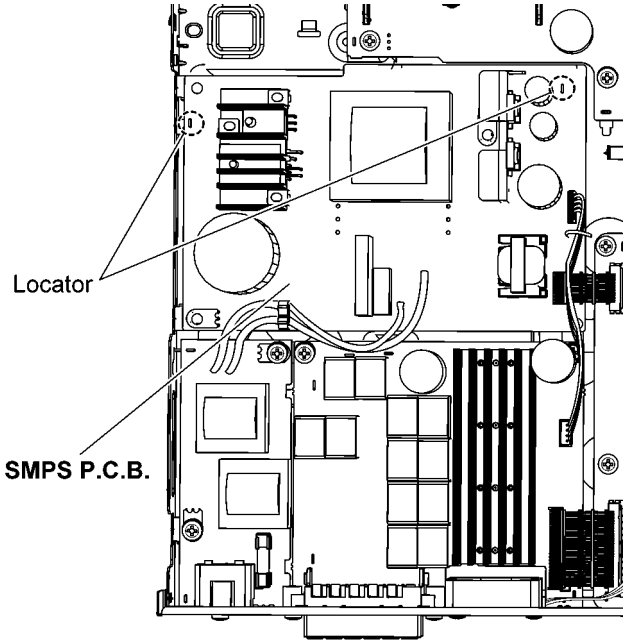
Step 1 Detach 9P Bridge connector at the connector (CN2309) on Digital P.C.B..
Step 2 Detach 4P Cable at the connector (CN5400) on D-Amp P.C.B..
Step 3 Release the Red Wire (TL11) and Black Wire (TL21) from Wire Holder.
Caution: During assembling, ensure that Red Wire (TL11) and Black Wire (TL21) are dressed into Wire Holder properly.



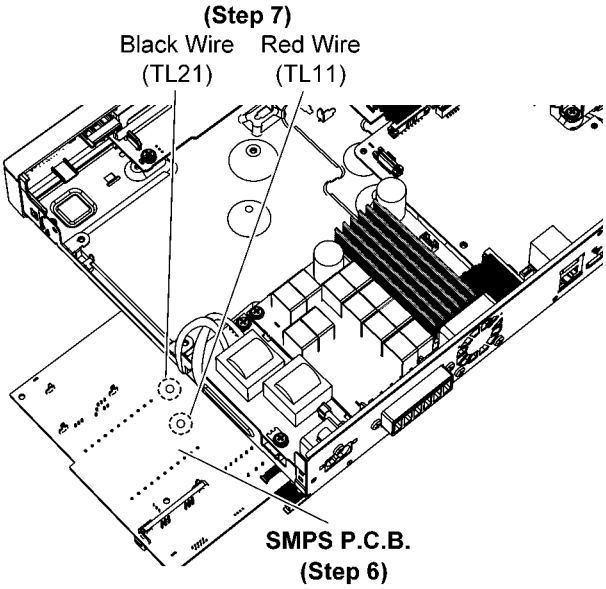
Step 4 Remove 4 screws.
Step 5 Lift up the SMPS P.C.B..



Caution: During assembling, ensure that SMPS P.C.B. is properly located and fully seated onto the Bottom Chassis.



Step 6 Upset the SMPS P.C.B..
Step 7 Desolder Red Wire (TL11) and Black Wire (TL21) on SMPS P.C.B..
Step 8 Remove the SMPS P.C.B..

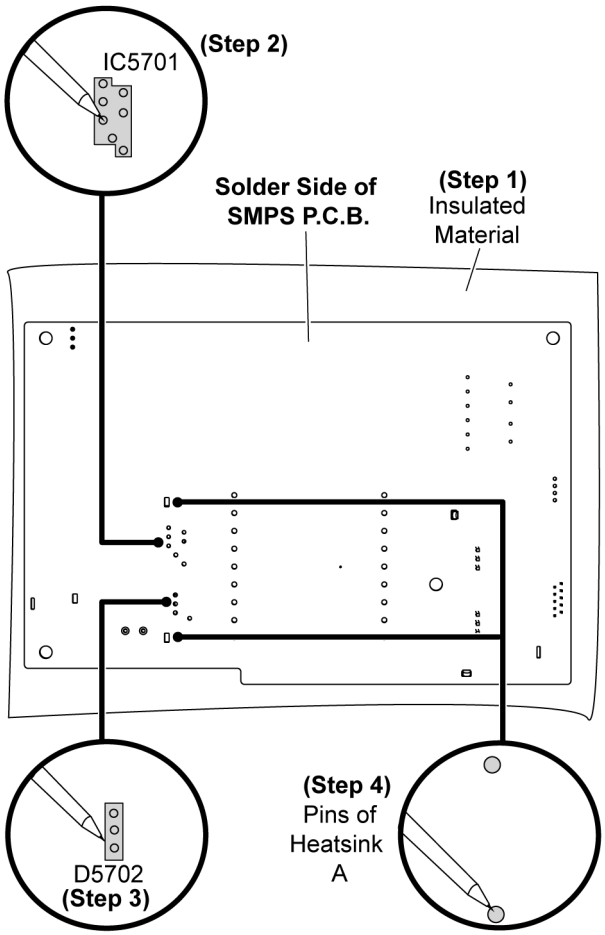


12.17. Replacement of Switching Regulator IC (IC5701)

- **Refer to "Disassembly of Top Cabinet".**
- **Refer to "Disassembly of SMPS P.C.B.".**

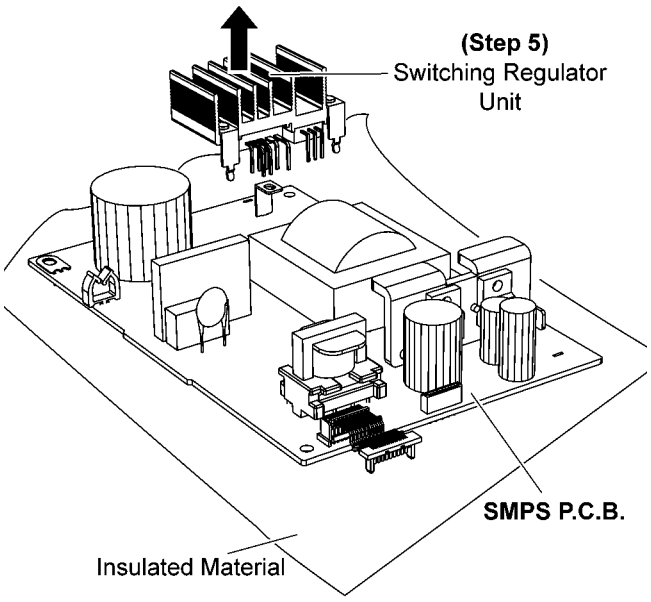
12.17.1. Disassembly of Switching Regulator IC (IC5701)

Step 1 Place SMPS P.C.B. on an insulated material.
Step 2 Desolder pins of the Switching Regulator IC (IC5701) on the solder side of SMPS P.C.B..
Step 3 Desolder pins of the Diode (D5702) on the solder side of SMPS P.C.B..
Step 4 Desolder pins of the Heatsink A.



Step 5 Remove the Switching Regulator Unit in the direction of arrow.

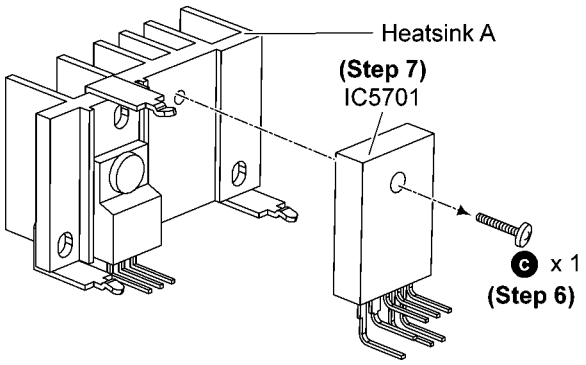
Caution: Avoid touching the Switching Regulator Unit due to its high temperature after prolonged use. Touching it may lead to injuries.



Step 6 Remove 1 screw from the Switching Regulator IC (IC5701).

Step 7 Remove the Switching Regulator IC (IC5701) from the Heatsink A.

Note: Refer to the diagrams of SMPS P.C.B. (Item 19.4) for location of the part.

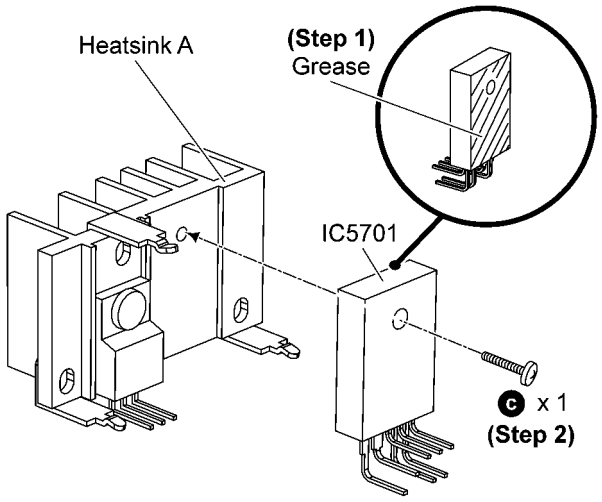


12.17.2. Assembly of Switching Regulator IC (IC5701)

Step 1 Apply Grease to the back of Switching Regulator IC (IC5701).

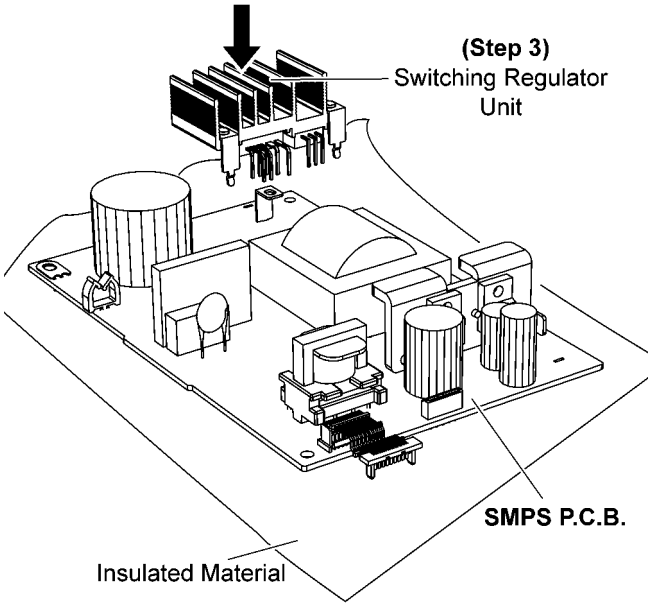
Step 2 Fix and screw the Switching Regulator IC (IC5701) to the Heatsink A.

Caution: Ensure that the Switching Regulator IC (IC5701) is properly fixed and fully screwed onto Heatsink A.

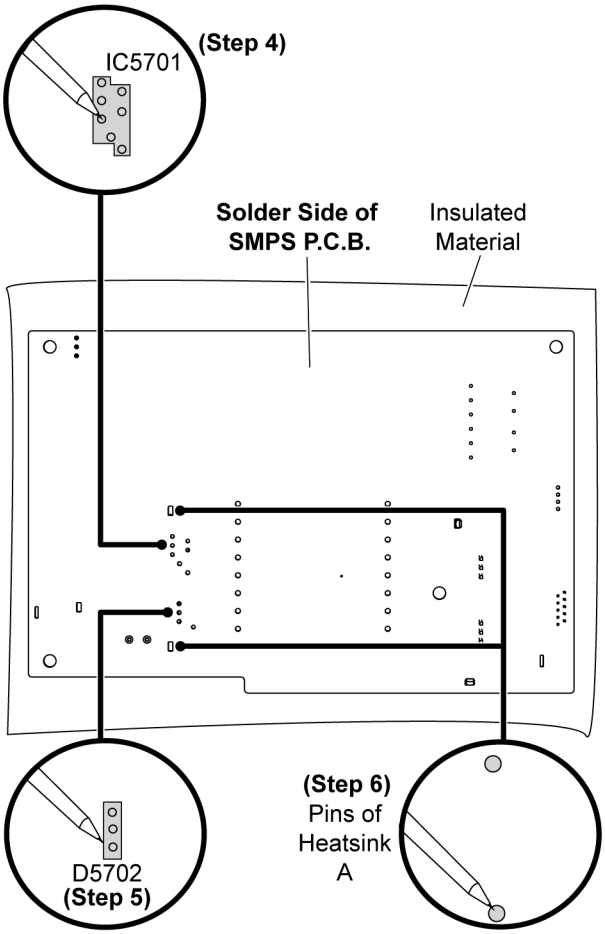


Step 3 Fix the Switching Regulator Unit onto SMPS P.C.B..

Caution: Ensure that Switching Regulator Unit is properly seated on SMPS P.C.B..



Step 4 Solder pins of the Switching Regulator IC (IC5701) on the solder side of SMPS P.C.B..
Step 5 Solder pins of the Diode (D5702) on the solder side of SMPS P.C.B..
Step 6 Solder pins of the Heatsink A.

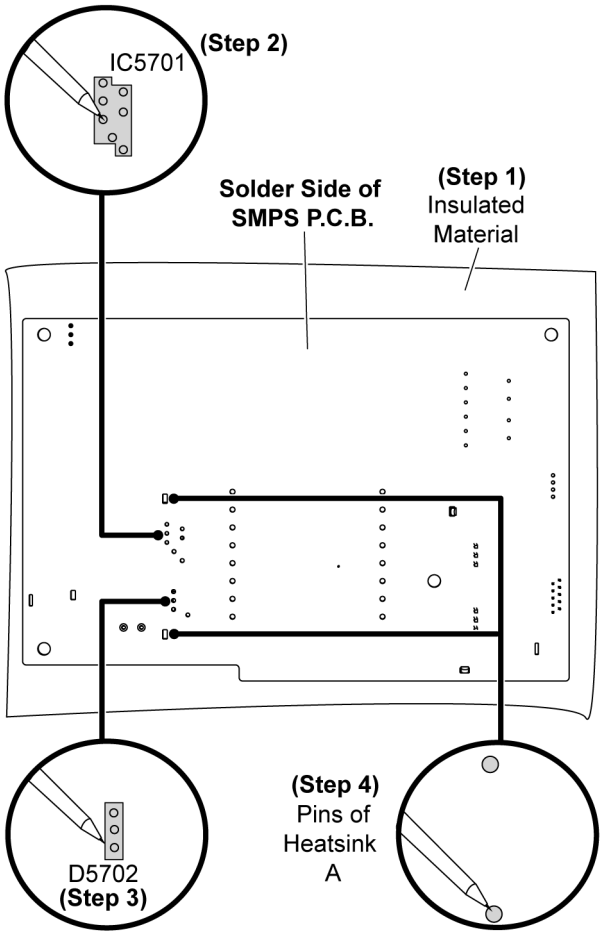


12.18. Replacement of Diode (D5702)

- **Refer to “Disassembly of Top Cabinet”.**
- **Refer to “Disassembly of SMPS P.C.B.”.**

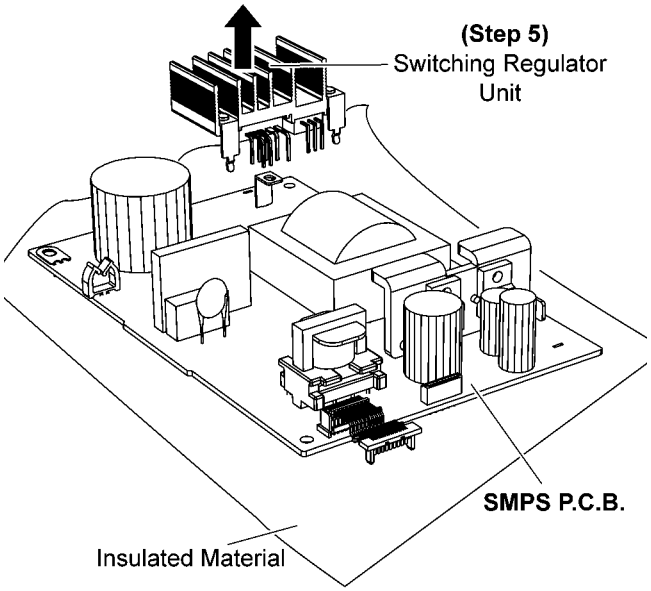
12.18.1. Disassembly of Diode (D5702)

Step 1 Place SMPS P.C.B. on an insulated material.
Step 2 Desolder pins of the Switching Regulator IC (IC5701) on the solder side of SMPS P.C.B..
Step 3 Desolder pins of the Diode (D5702) on the solder side of SMPS P.C.B..
Step 4 Desolder pins of the Heatsink A.



Step 5 Remove the Switching Regulator Unit in the direction of arrow.

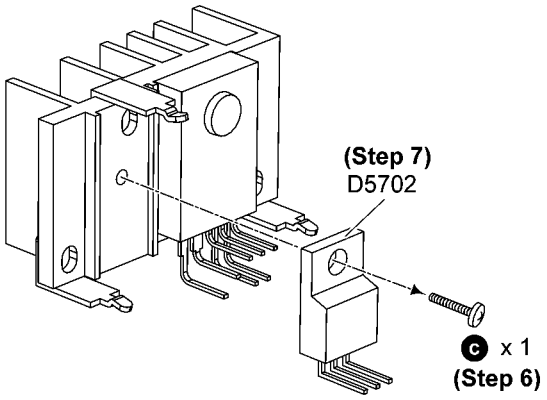
Caution: Avoid touching the Switching Regulator Unit due to its high temperature after prolonged use. Touching it may lead to injuries.



Step 6 Remove 1 screw from the Diode (D5702).

Step 7 Remove Diode (D5702) from the Heatsink A.

Note: Refer to the diagrams of SMPS P.C.B. (Item 19.4) for location of the part.

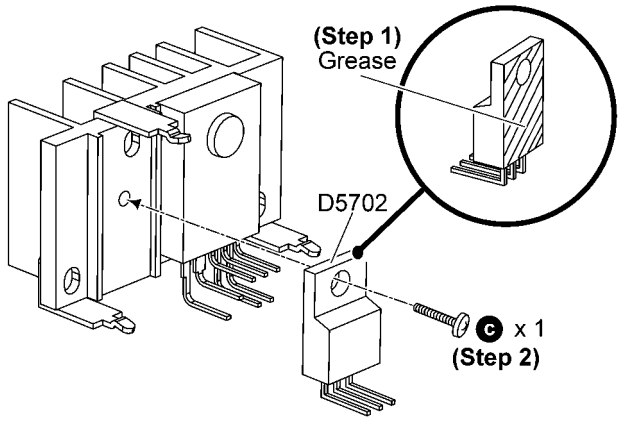


12.18.2. Assembly of Diode (D5702)

Step 1 Apply Grease to the back of Diode (D5702).

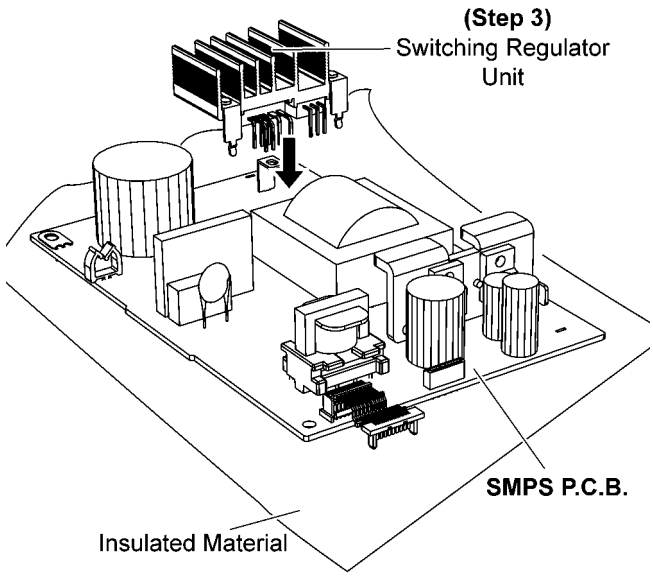
Step 2 Fix and screw the Diode (D5702) to the Heatsink A.

Caution: Ensure that Diode (D5702) is properly fixed and screwed onto Switching Regulator Unit.

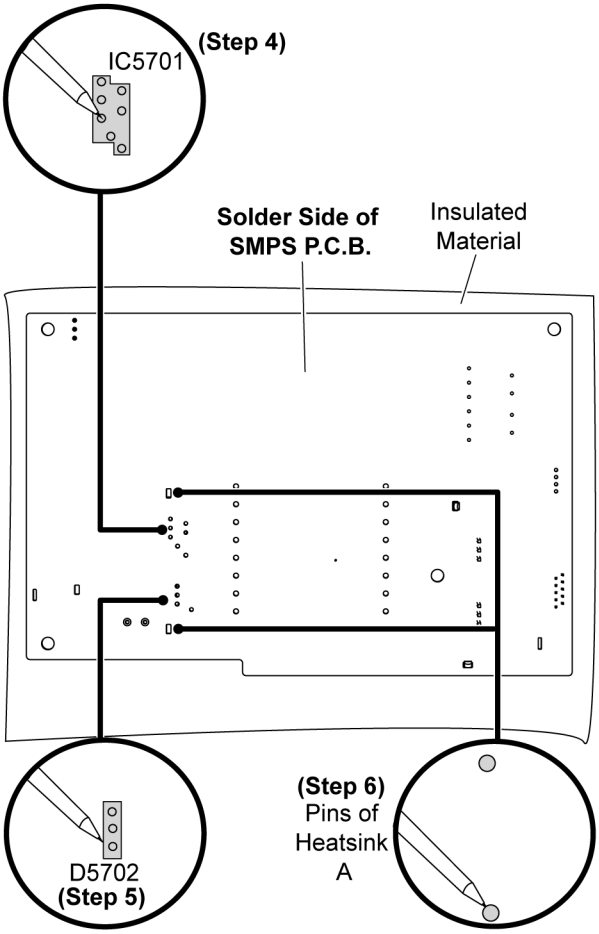


Step 3 Fix the Switching Regulator Unit onto SMPS P.C.B..

Caution: Ensure that Switching Regulator Unit is properly seated on SMPS P.C.B..



Step 4 Solder pins of the Switching Regulator IC (IC5701) on the solder side of SMPS P.C.B..
Step 5 Solder pins of the Diode (D5702) on the solder side of SMPS P.C.B..
Step 6 Solder pins of the Heatsink A.

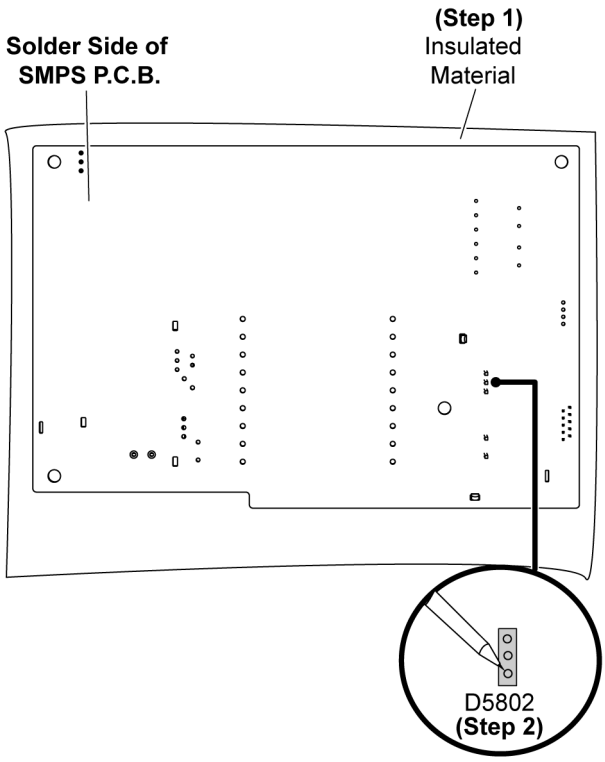


12.19. Replacement of Diode (D5802)

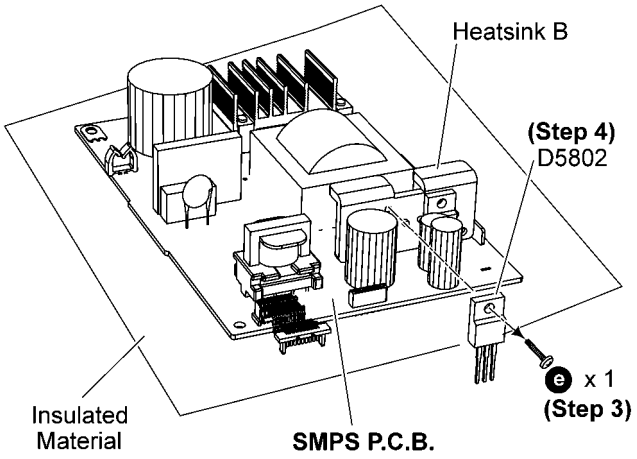
- **Refer to "Disassembly of Top Cabinet.".**
- **Refer to "Disassembly of SMPS P.C.B.".**

12.19.1. Replacement of Diode (D5802)

Step 1 Place SMPS P.C.B. on an insulated material.
Step 2 Desolder pins of the Diode (D5802) on the solder side of SMPS P.C.B..



Step 3 Remove 1 screw from the Diode (D5802).
Step 4 Remove the Diode (D5802) from SMPS P.C.B..
Caution: Avoid touching the Heatsink B due to its high temperature after prolonged use. Touching it may lead to injuries.
Note: Refer to the diagrams of SMPS P.C.B. (Item 19.4) for location of the part.

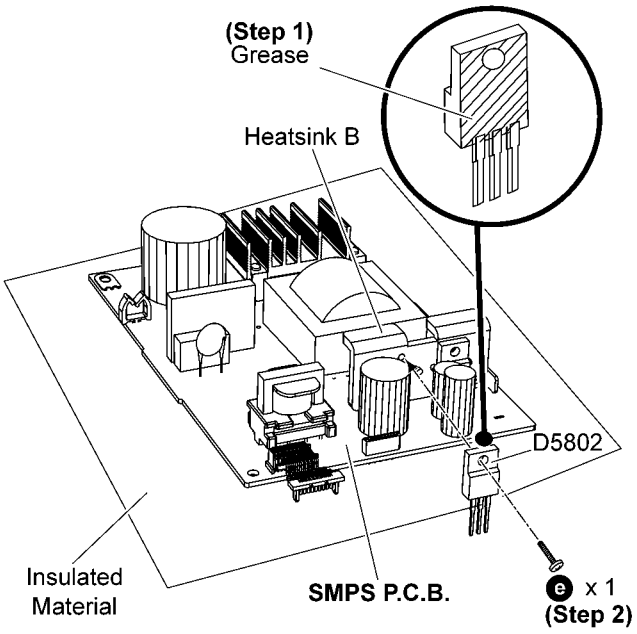


12.19.2. Assembly of Diode (D5802)

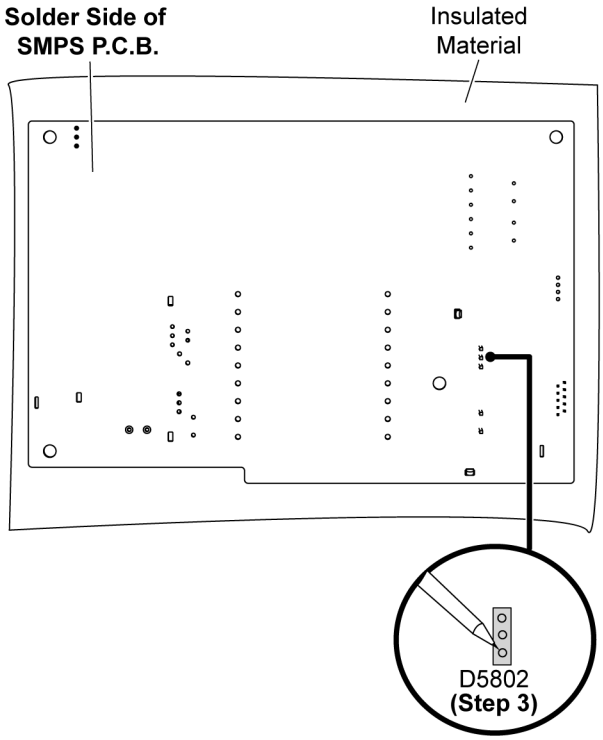
Step 1 Apply Grease to the back of Diode (D5802).

Step 2 Fix and screw the Diode (D5802) to the Heatsink B.

Caution: Ensure that Diode (D5802) is properly fixed and fully screwed to the Heatsink B.



Step 3 Solder pins of the Diode (D5802) on the solder side of SMPS P.C.B..



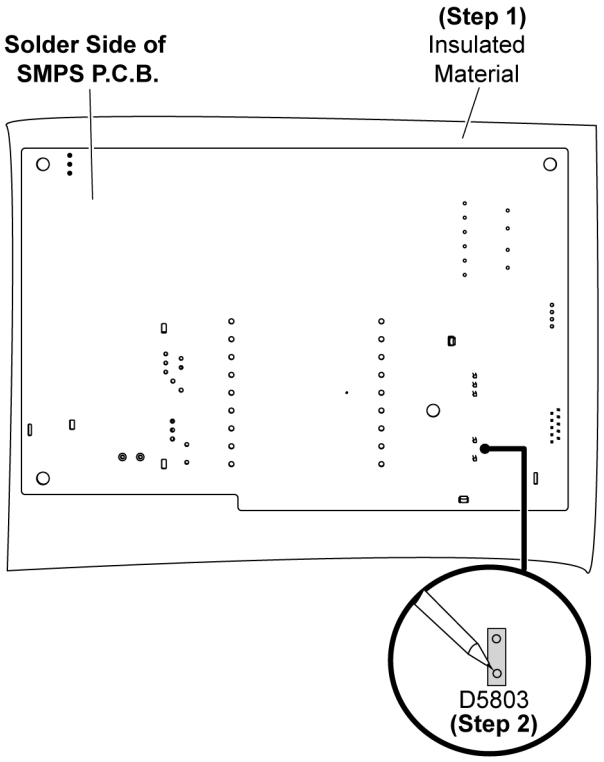
12.20. Replacement of Diode (D5803)

- **Refer to "Disassembly of Top Cabinet.".**
- **Refer to "Disassembly of SMPS P.C.B."**

12.20.1. Disassembly of Diode (D5803)

Step 1 Place an insulated material under SMPS P.C.B..

Step 2 Desolder pins of the Diode (D5803) on the solder side of SMPS P.C.B..

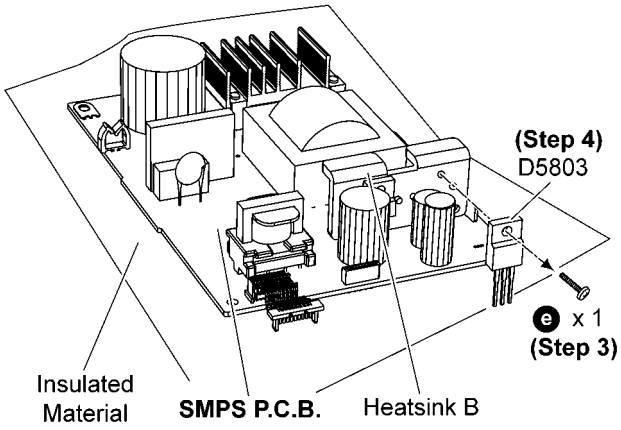


Step 3 Remove 1 screw from the Diode (D5803).

Step 4 Remove the Diode (D5803) from SMPS P.C.B..

Caution: Avoid touching the Heatsink B due to its high temperature after prolonged use. Touching it may lead to injuries.

Note: Refer to the diagrams of SMPS P.C.B. (Item 19.4) for location of the part.

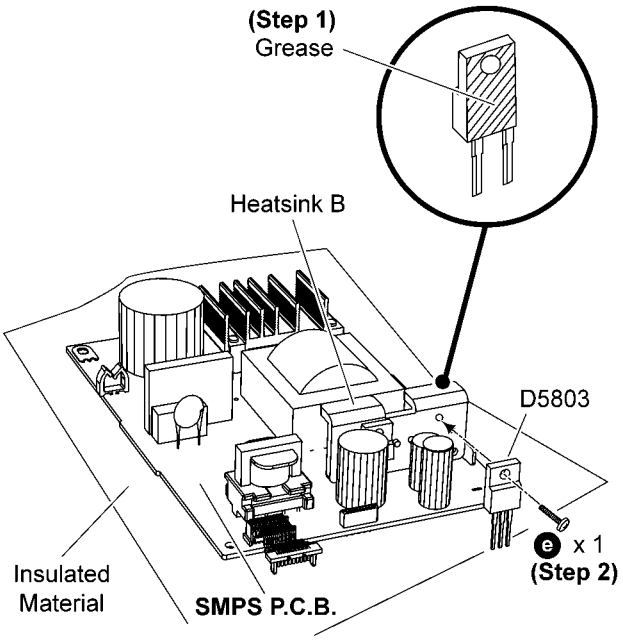


12.20.2. Assembly of Diode (D5803)

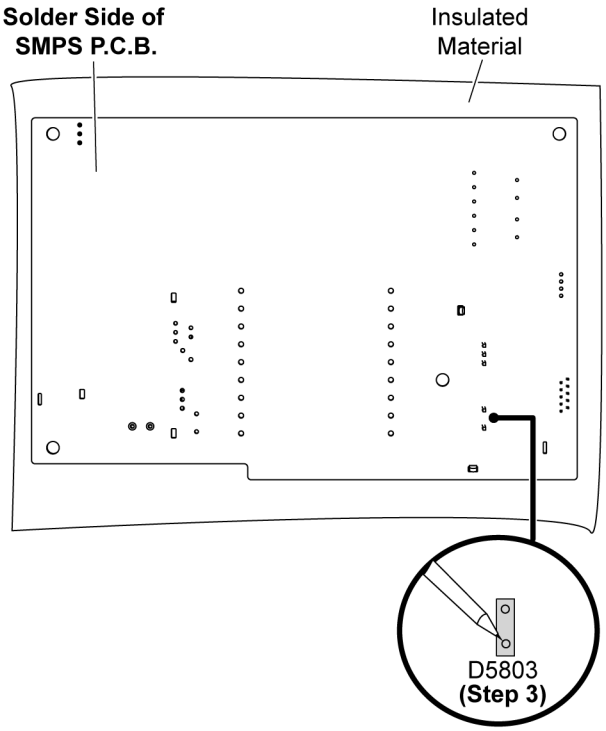
Step 1 Apply Grease to the back of Diode (D5803).

Step 2 Fix and screw the Diode (D5803) to the Heatsink B.

Caution: Ensure that Diode (D5803) is properly fixed and fully screwed to the Heatsink B.



Step 3 Solder pins of the Diode (D5803) on the solder side of SMPS P.C.B..



12.21. Disassembly of BD Mechanism Unit (BRS14P)

- **Refer to "Disassembly of Top Cabinet".**
- **Refer to "Replacement of Tray Ornament".**

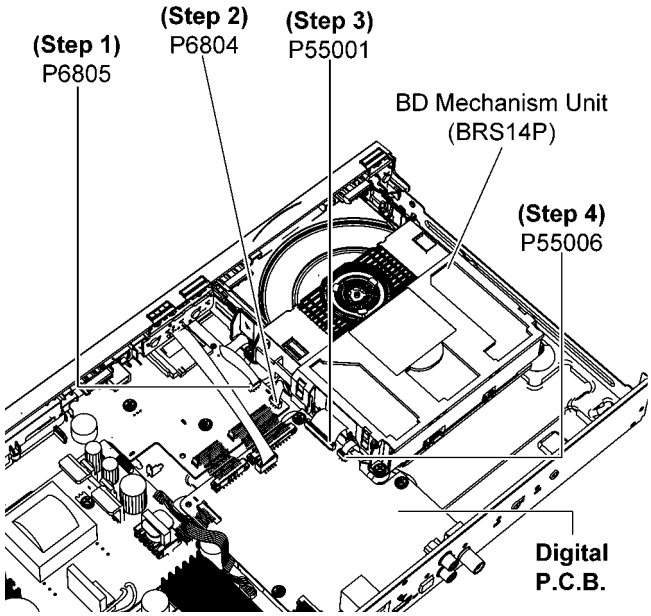
Caution: If the Digital P.C.B. and/or Mechanism Unit is exchanged, the drive adjustment is required because of the adjustment data is stored in the Digital P.C.B.. Perform the drive adjustment accordance with Section 14 "When Replacing the Mechanism Unit and/or Digital P.C.B.".

Step 1 Detach 5P FFC at the connector (P6805) on Panel P.C.B..

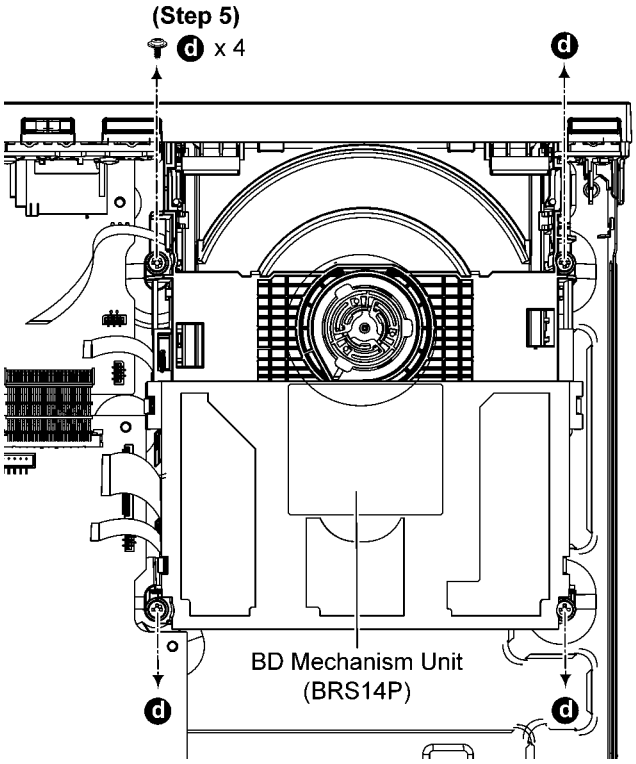
Step 2 Detach 5P FFC at the connector (P6804) on Panel P.C.B..

Step 3 Detach 45P FFC at the connector (P55001) on Digital P.C.B..

Step 4 Detach 4P FFC at the connector (P55006) on Digital P.C.B..

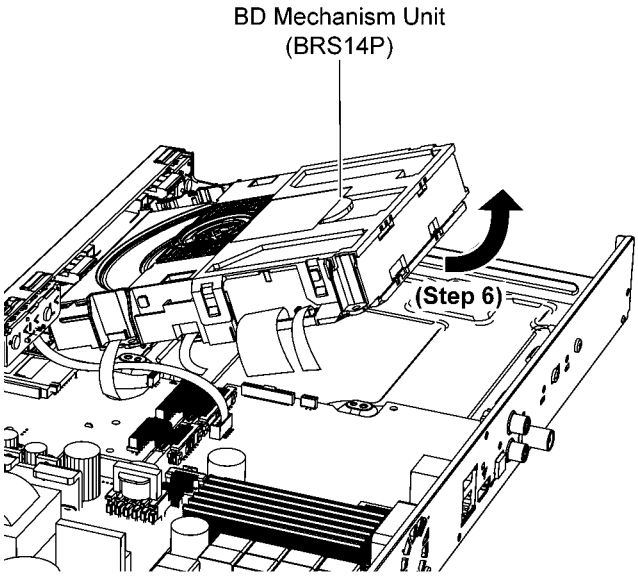


Step 5 Remove 4 screws.

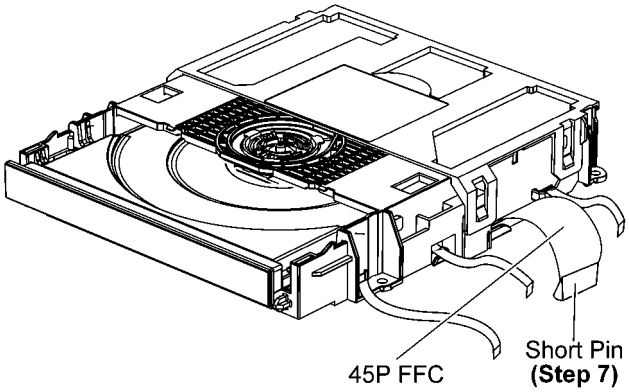


Step 6 Slightly lift up and remove the BD Mechanism Unit (BRS14P) in the direction of arrow.

Caution: During assembling, ensure that BD Mechanism Unit (BRS14P) is properly located and fully inserted on Bottom Chassis before screwing.



Step 7 Attach a short pin to the 45P FFC of the BD Mechanism Unit (BRS14P).

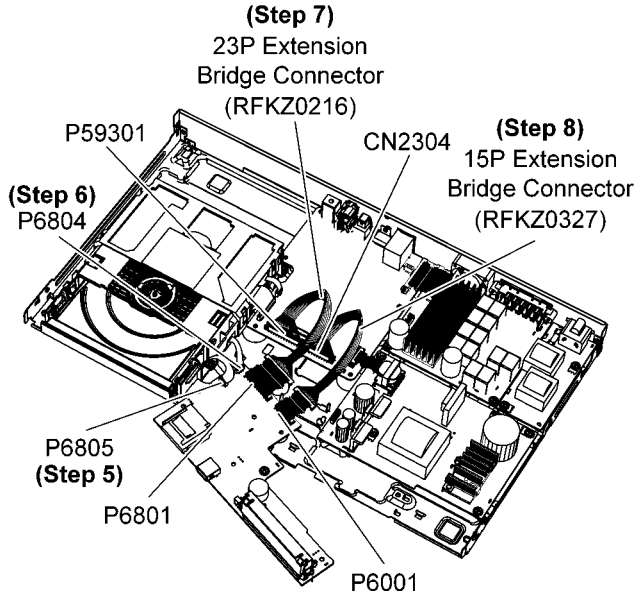


13 Service Position

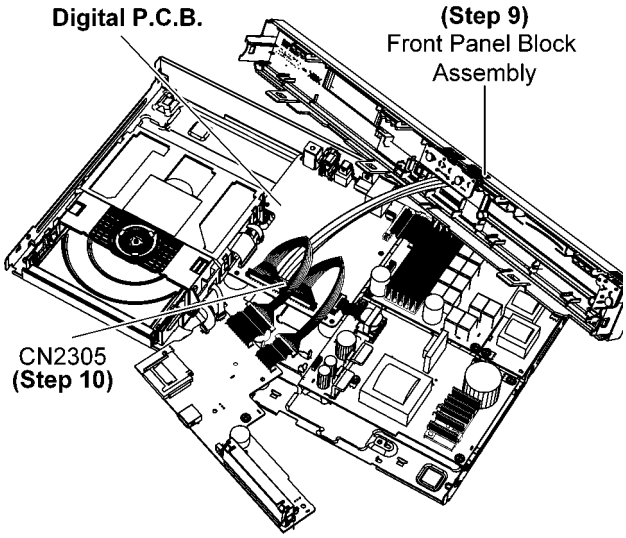
Note: For description of the disassembly procedures, see the Section 12.

13.1. Checking and Repairing Panel P.C.B.

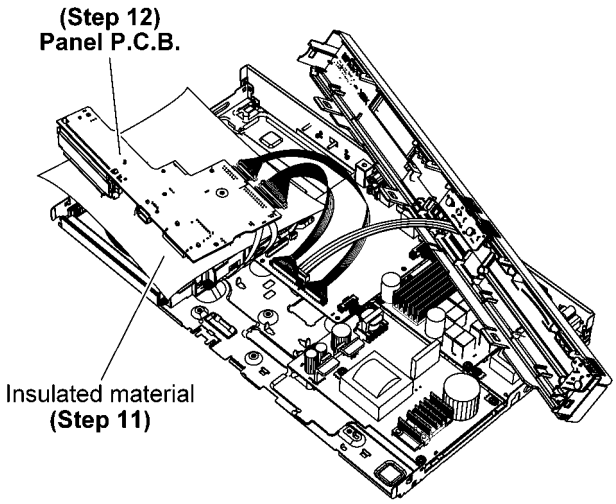
Step 1 Remove Top Cabinet.
Step 2 Remove Tray Ornament.
Step 3 Remove Front Panel Block Assembly.
Step 4 Remove the Panel P.C.B..
Step 5 Connect 5P FFC at the connector (P6805) on Panel P.C.B..
Step 6 Connect 5P FFC at the connector (P6804) on Panel P.C.B..
Step 7 Connect 23P Extension Bridge Connector (RFKZ0216) from P59301 to P6801.
Step 8 Connect 15P Extension Bridge Connector (RFKZ0327) from CN2304 to P6001.



Step 9 Position the Front Panel Block assembly as diagram shown.
Step 10 Connect 3P Cable at the connector (CN2305) on Digital P.C.B.



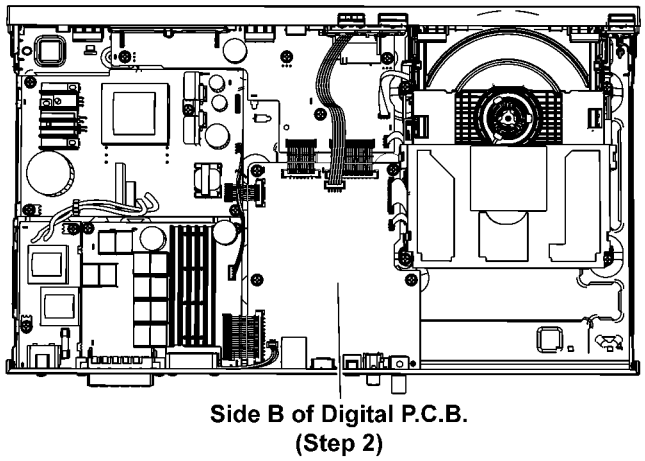
Step 11 Upset the Panel P.C.B. and position it onto the insulated material.
Step 12 Proceed to check and repair Panel P.C.B..



13.2. Checking & Repairing Digital P.C.B.

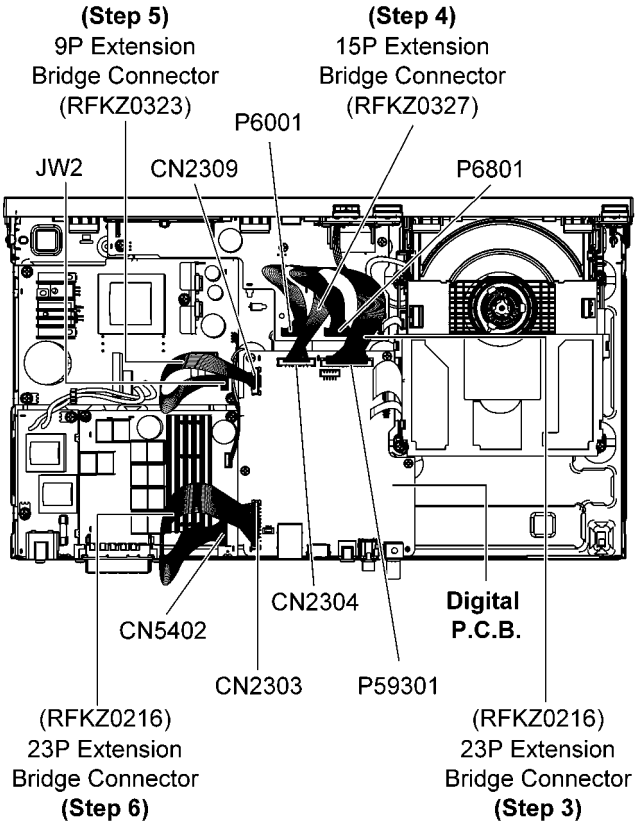
13.2.1. Checking and Repairing Digital P.C.B. (Side B)

Step 1 Remove Top Cabinet.
Step 2 Side B of Digital P.C.B. can be checked and repaired at its original position.

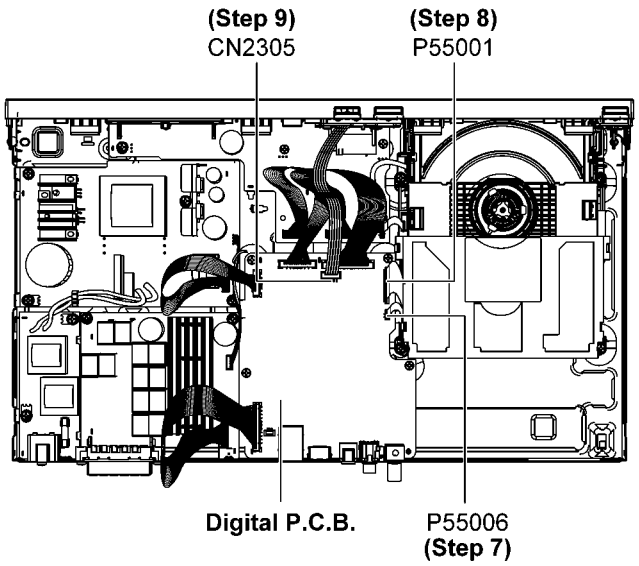


13.2.2. Checking and Repairing Digital P.C.B. (Side A)

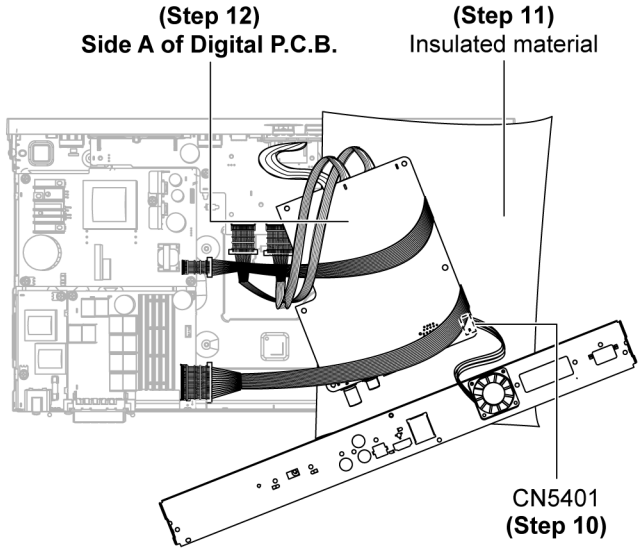
Step 1 Remove Top Cabinet.
Step 2 Remove Digital P.C.B..
Step 3 Connect 23P Extension Bridge Connector (RFKZ0216) from P6801 to P59301.
Step 4 Connect 15P Extension Bridge Connector (RFKZ0327) from P6001 to CN2304.
Step 5 Connect 9P Extension Bridge Connector (RFKZ0323) from JW2 to CN2309.
Step 6 Connect 23P Extension Bridge Connector (RFKZ0216) from CN5402 to CN2303.



Step 7 Connect 4P FFC at the connector (P55006) on Digital P.C.B..
Step 8 Connect 45P FFC at the connector (P55001) on Digital P.C.B..
Step 9 Connect 3P Cable at the connector (CN2305) on Digital P.C.B..



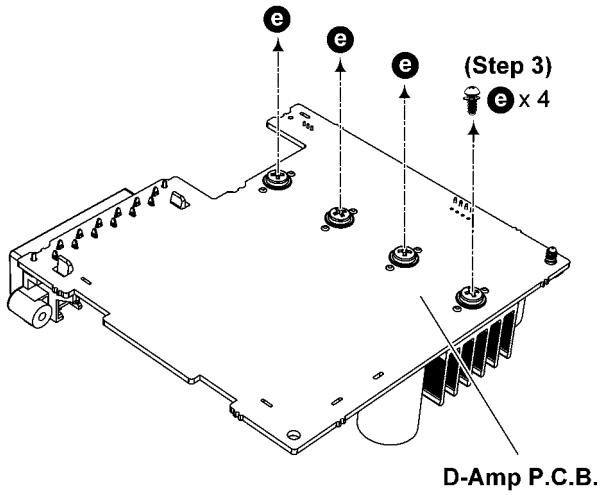
Step 10 Connect 3P Fan Wire at the connector (CN5401) on Digital P.C.B..
Step 11 Upset the Digital P.C.B. and position it onto the insulated material.
Step 12 Proceed to check and repair Side A of Digital P.C.B..



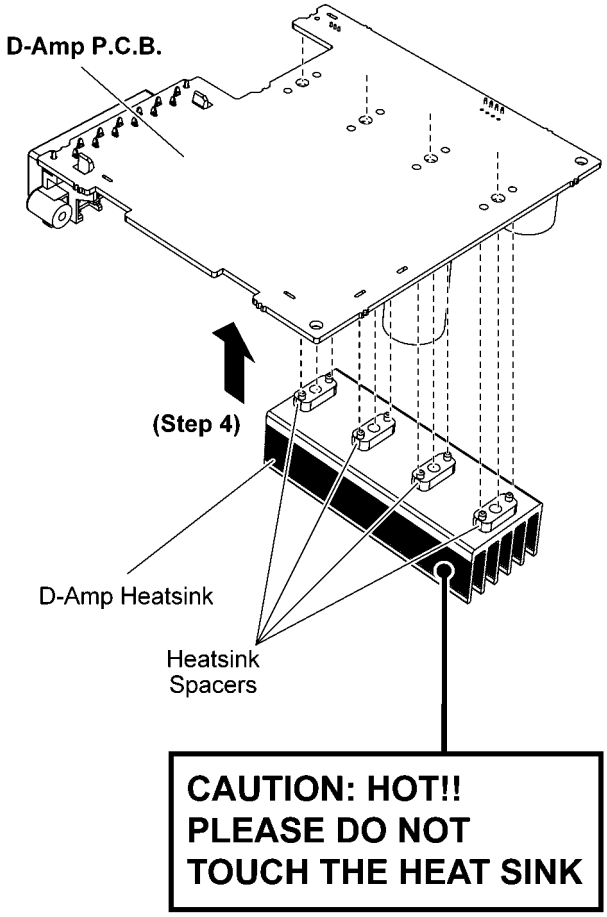
13.3. Checking and Repairing D-Amp P.C.B.

13.3.1. Checking and Repairing D-Amp P.C.B. (Side B)

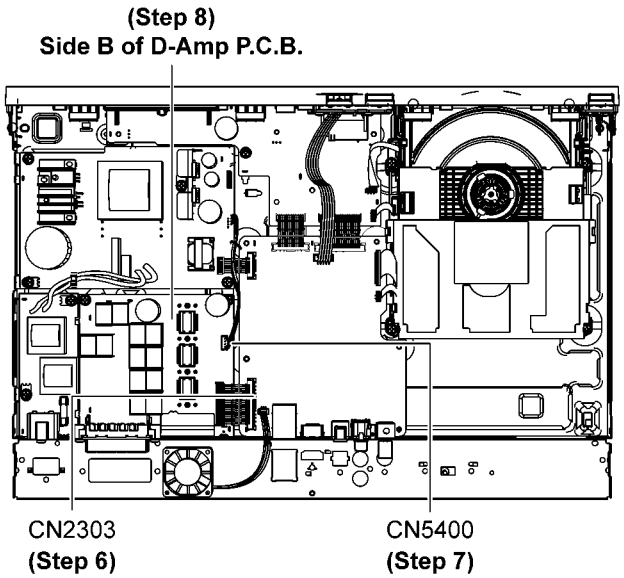
Step 1 Remove Top Cabinet.
Step 2 Remove D-Amp P.C.B..
Step 3 Remove 4 screws.



Step 4 Lift up the D-Amp P.C.B. as arrow shown.

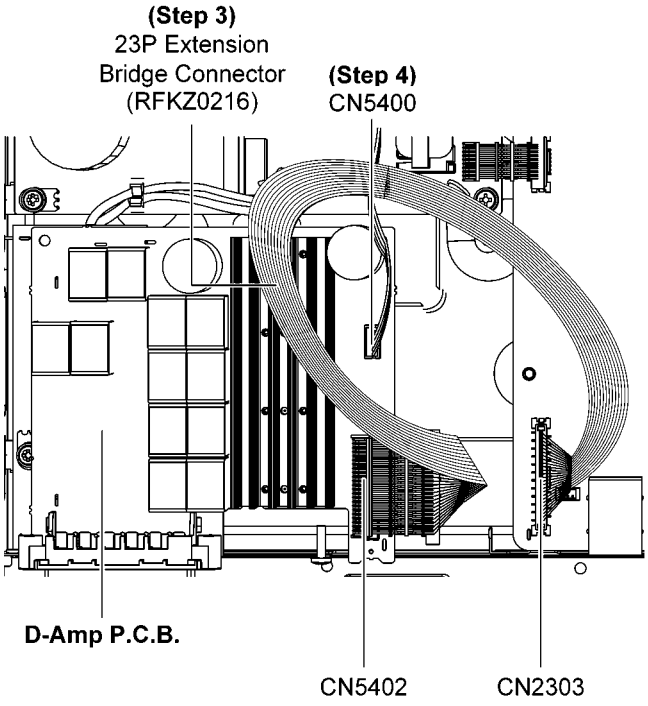


Step 5 Place the D-Amp P.C.B. back to original position.
Step 6 Connect 23P Bridge Connector at the connector (CN2303) on Digital P.C.B..
Step 7 Connect 4P Cable at the connector (CN5400) on D-Amp P.C.B..
Step 8 Proceed to check and repair Side B of D-Amp P.C.B..

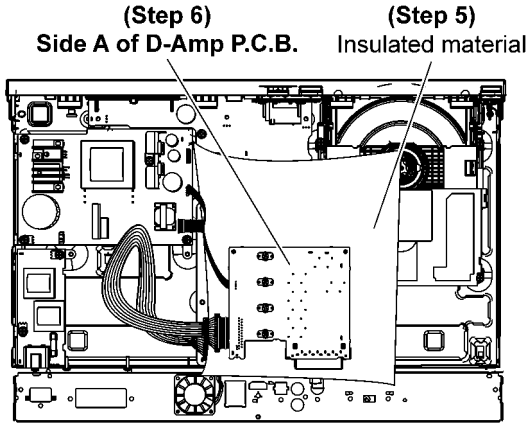


13.3.2. Checking and Repairing D-Amp P.C.B. (Side A)

Step 1 Remove Top Cabinet.
Step 2 Remove D-Amp P.C.B..
Step 3 Connect 23P Extension Bridge Connector (RFKZ0216) from CN5402 to CN2303.
Step 4 Connect 4P Cable at the connector (CN5400) on D-Amp P.C.B..

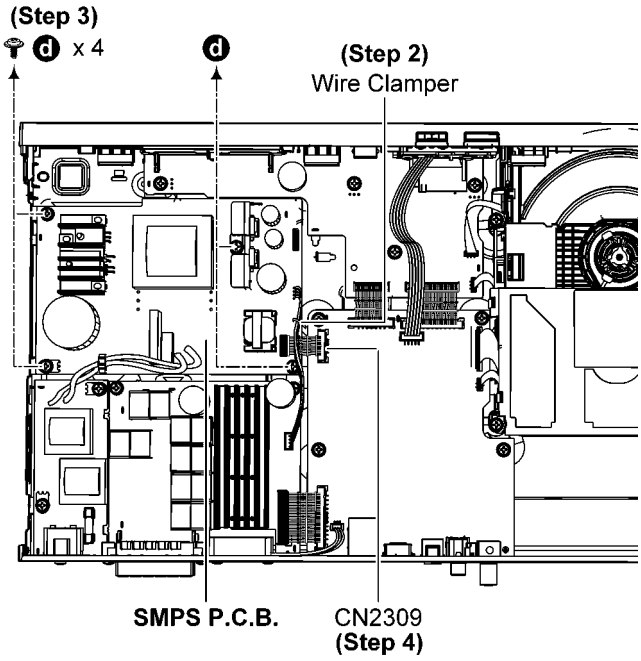


Step 5 Upset the D-Amp P.C.B. and position it onto the insulated material.
Step 6 Proceed to check and repair Side A of D-Amp P.C.B..

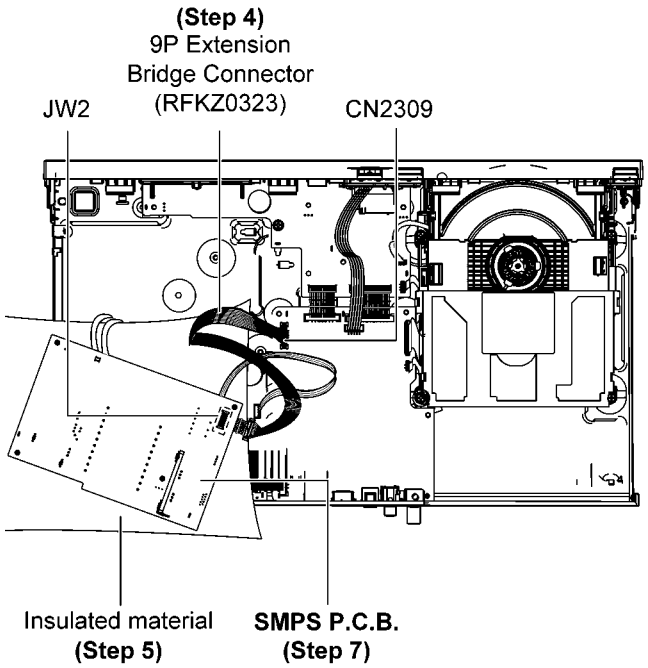


13.4. Checking & Repairing of SMPS P.C.B.

Step 1 Remove Top Cabinet.
Step 2 Lift up the Wire Clamper.
Step 3 Remove 4 screws.



Step 4 Connect 9P Extension Bridge Connector (RFKZ0323) from CN2309 to JW2.
Step 5 Upset the SMPS P.C.B. and position it onto the insulated material.
Step 6 Proceed to check and repair SMPS P.C.B..



14 Measurements and Adjustments

14.1. Standard Inspection Specifications after Making Repairs

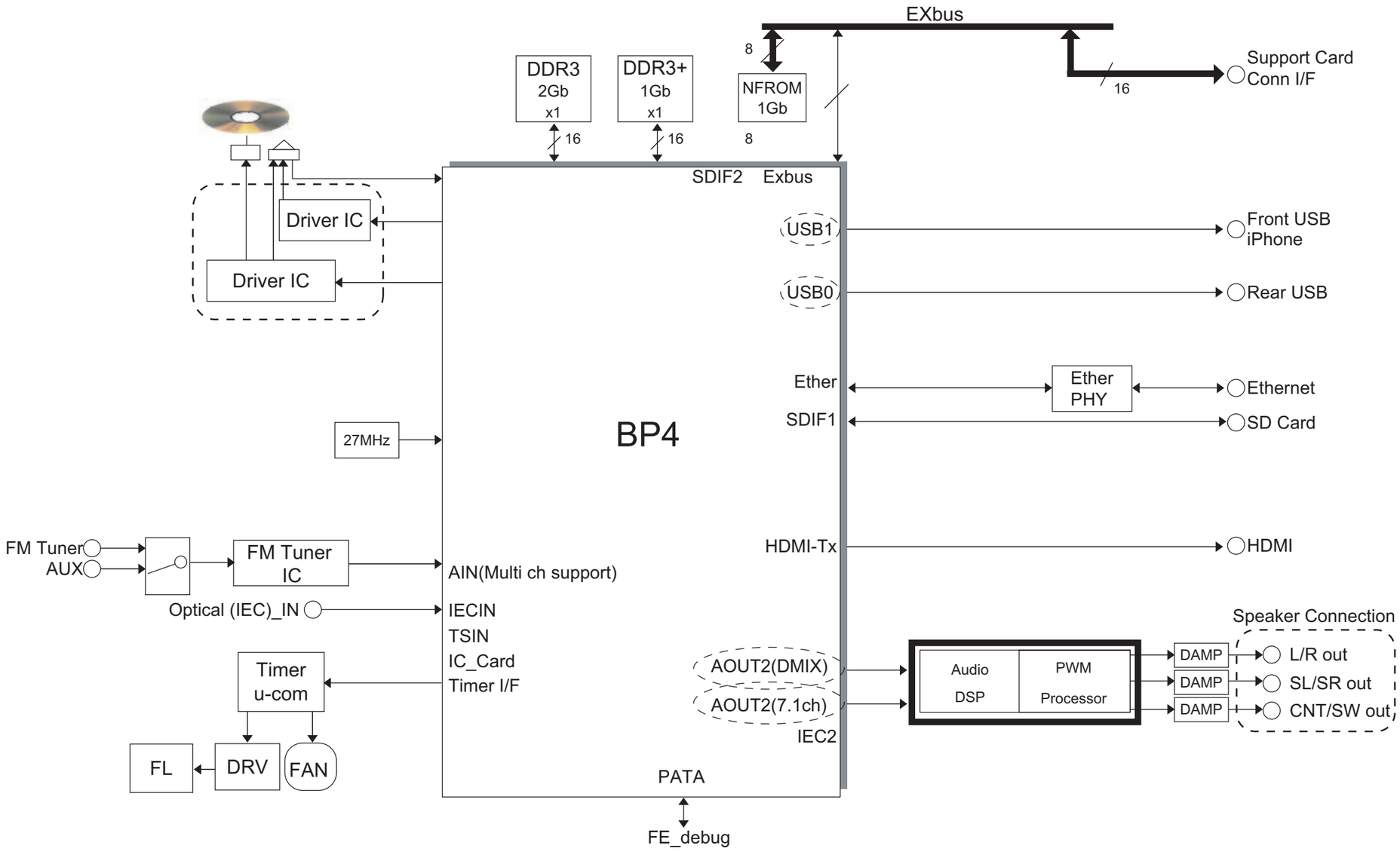
After repairing Digital P.C.B. and BD Traverse Unit, it is recommended to perform the following inspection to ensure normal operation of main unit.

No.	Procedure	Item to Check
1	Turn on the power, and confirm items pointed out.	Items pointed out should reappear.
2	Insert RAM disc.	The Panasonic RAM disc should be recognized.
4	Perform playback for one minute using the RAM disc.	No abnormality should be seen in the picture, sound or operation. *Panasonic DVD-RAM disc should be used when recording and playback.
5	Perform playback for one minute using the BD-Video disc.	No abnormality should be seen in the picture, sound or operation.
6	If a problem is caused by a BD-Video disc, VCD, DVD-R, DVD-Video, Audio-CD, or MP3, playback the test disc.	No abnormality should be seen in the picture, sound or operation.
7	After checking and making repairs, upgrade the firmware to the latest version (refer to 9.5).	Make sure that [UPD OK] appears in the FL displays. *[UNSUPPORT] display means the unit is already updated to newest same version. Then version up is not necessary.
8	Transfer [9][9] in the service mode setting, and initialize the service settings (return various settings and error information to their default values. The laser time is not included in this initialization).	Make sure that [CLR] appears in the FL display. After checking it, turn the power off.

Use the following checklist to establish the judgment criteria for the picture and sound.

Item	Contents	Check	Item	Contents	Check
Picture	Block noise		Sound	Distorted sound	
	Crosscut noise			Noise (static, background noise, etc.)	
	Dot noise			The sound level is too low.	
	Picture disruption			The sound level is too high.	
	Not bright enough			The sound level changes.	
	Too bright				
	Flickering color				
	Color fading				

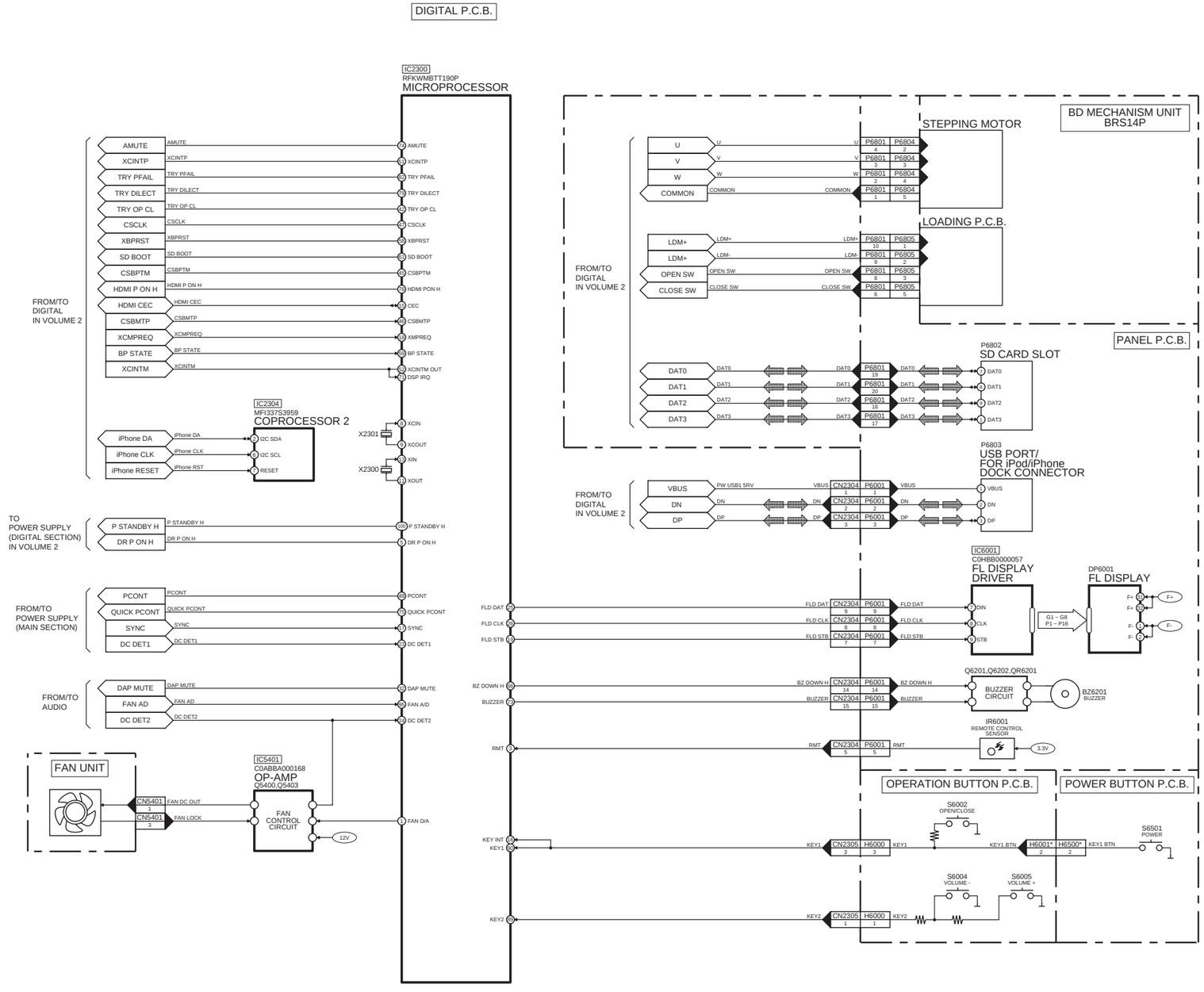
15 Overall Simplified Block Diagram



16 Block Diagram

16.1. System Control

: USB/SD/iPod/iPhone SIGNAL LINE

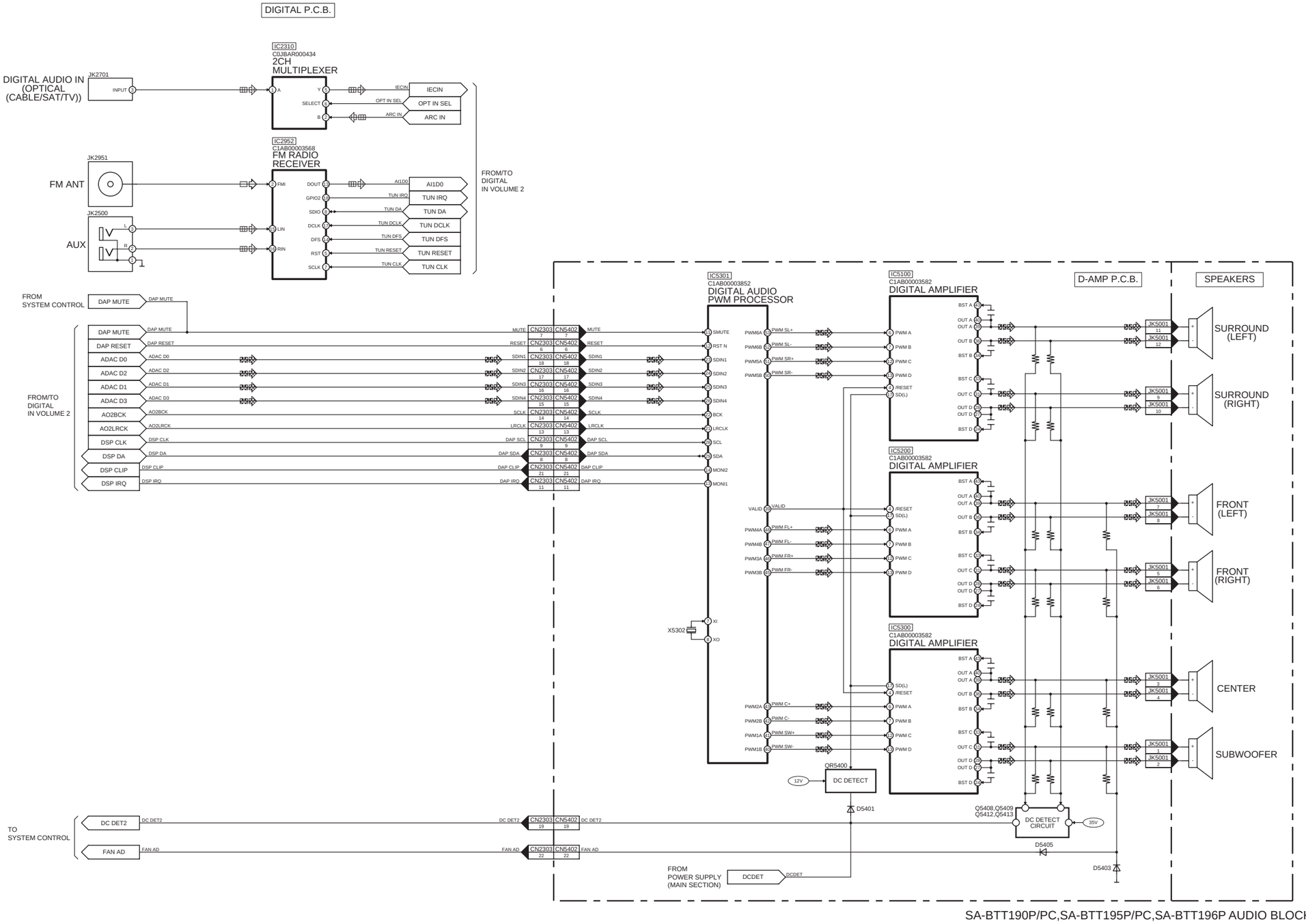


NOTE: “ * ” REF IS FOR INDICATION ONLY

SA-BTT190P/PC,SA-BTT195P/PC,SA-BTT196P SYSTEM CONTROL BLOCK DIAGRAM

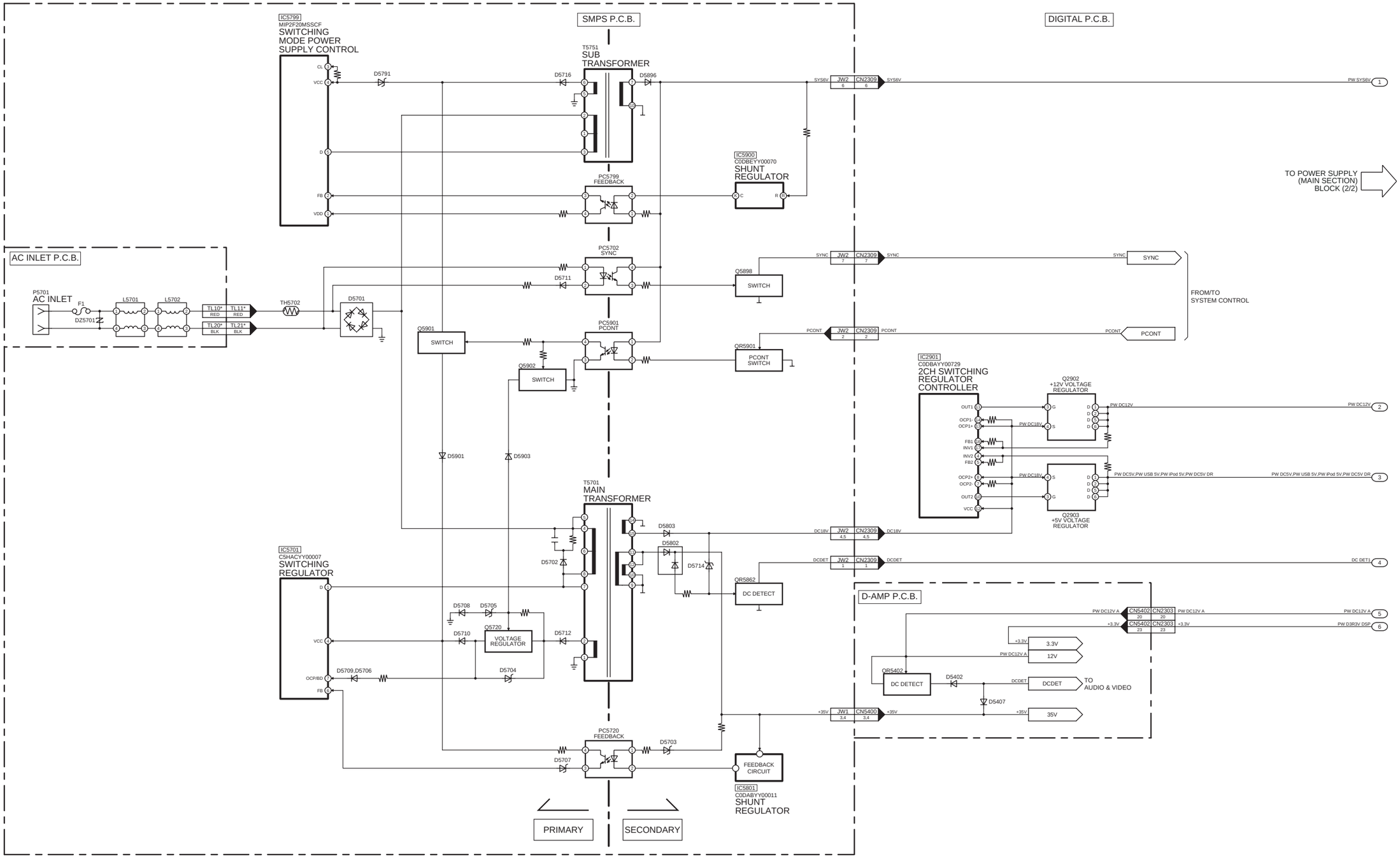
16.2. Audio

: HDMI/OPTICAL/AUX/TUNER AUDIO INPUT SIGNAL LINE : AUDIO OUTPUT SIGNAL LINE : FM SIGNAL LINE



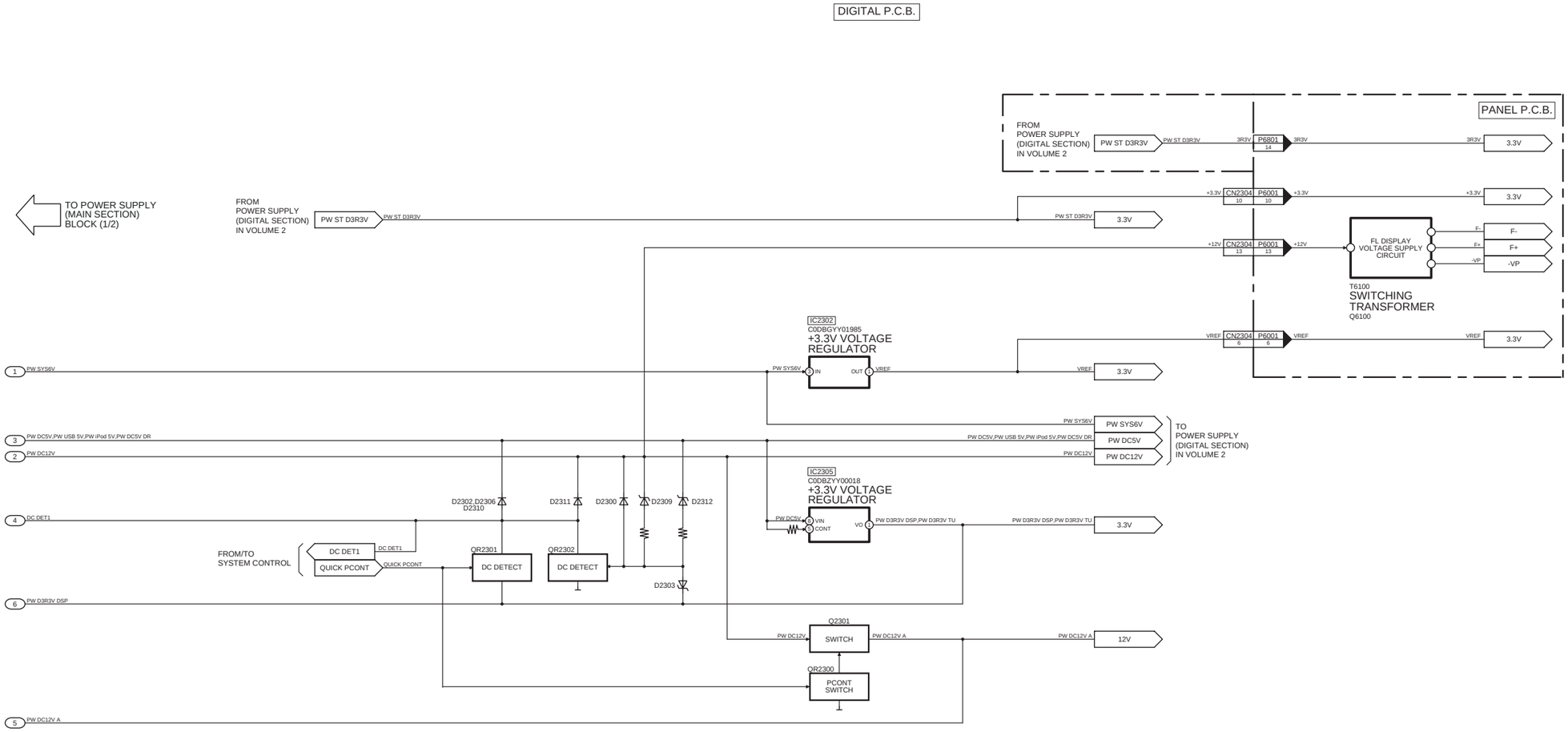
SA-BTT190P/PC,SA-BTT195P/PC,SA-BTT196P AUDIO BLOCK DIAGRAM

16.3. Power Supply(Main Section)



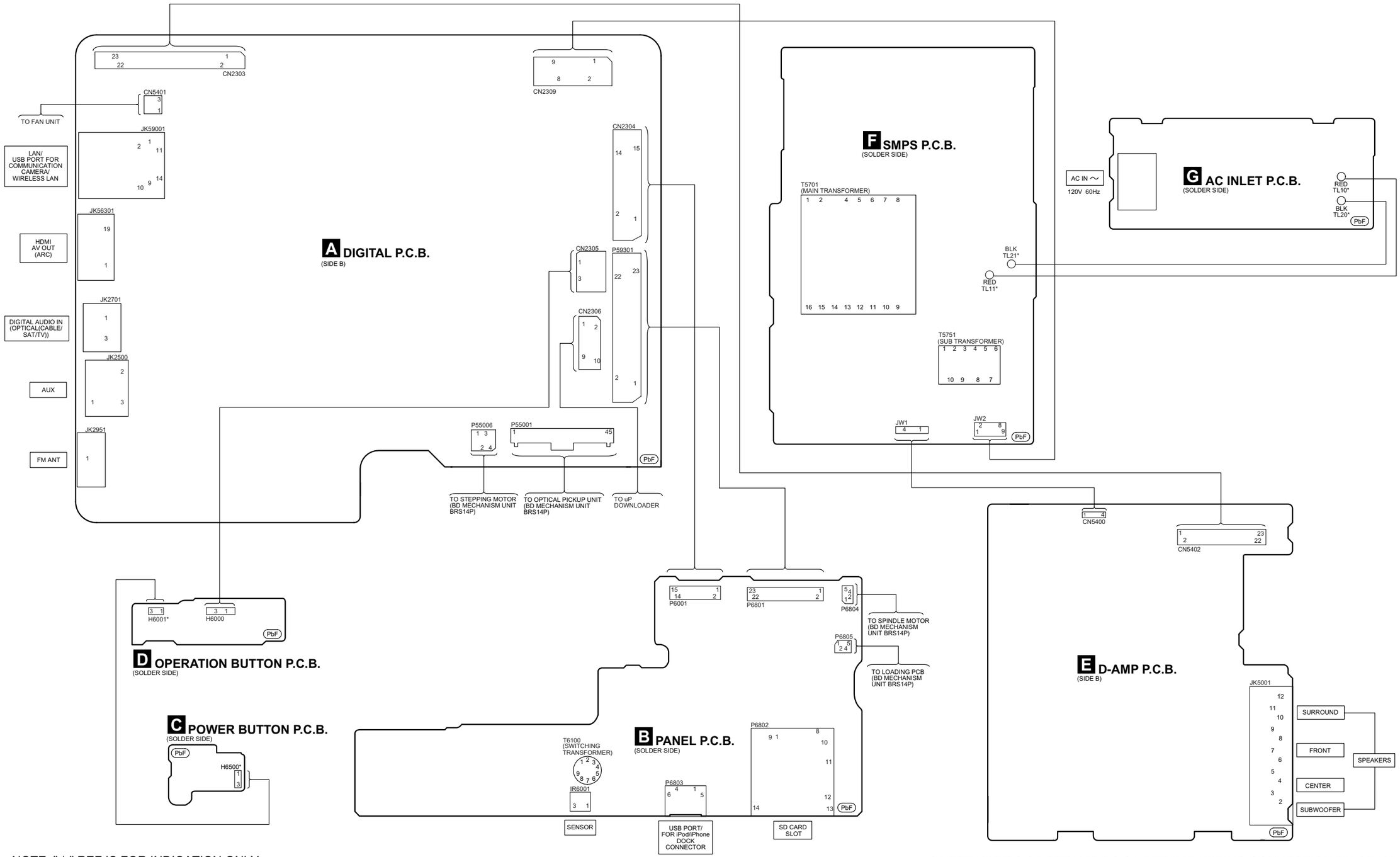
NOTE: " * " REF IS FOR INDICATION ONLY

SA-BTT190P/PC,SA-BTT195P/PC,SA-BTT196P POWER SUPPLY(MAIN SECTION) (1/2) BLOCK DIAGRAM



SA-BTT190P/PC,SA-BTT195P/PC,SA-BTT196P POWER SUPPLY(MAIN SECTION) (2/2) BLOCK DIAGRAM

17 Wiring Connection Diagram



NOTE: " * " REF IS FOR INDICATION ONLY.

SA-BTT190P/PC,SA-BTT195P/PC,SA-BTT196P WIRING CONNECTION DIAGRAM

18 Schematic Diagram

18.1. Schematic Diagram Notes

- **This schematic diagram may be modified at any time with the development of new technology.**

Notes:

S6002:	Open/Close switch (⏏).
S6004:	Vol Down (-).
S6005:	Vol Up (+).
S6501:	Power switch (⏻/I).

- Important safety notice:
  Components identified by ⚠ mark have special characteristics important for safety.
  Furthermore, special parts which have purposes of fire-retardant (resistors), high quality sound (capacitors), low-noise (resistors), etc are used.
  When replacing any of components, be sure to use only manufacturer's specified parts shown in the parts list.

- In case of AC rated voltage Capacitors, the part no. and values will be indicated in the Schematic Diagram.
  AC rated voltage capacitors:
  C5700, C5702, C5703, C5704, C5705, C5706, C5709

- **Resistor**
  Unit of resistance is OHM [Ω] (K=1,000, M=1,000,000).

- **Capacitor**
  Unit of capacitance is μF, unless otherwise noted. F=Farads, pF=pico-Farad.

- **Coil**
  Unit of inductance is H, unless otherwise noted.

- *****
  REF is for indication only.

- Voltage and signal line

: +B signal line

: -B signal line

: Tuner/AUX/HDMI/Optical Audio input signal line

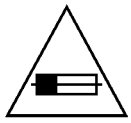
: iPod/iPhone Video input signal line

: Audio output signal line

: USB/SD/iPod/iPhone signal Line

: FM signal line

CAUTION: FOR CONTINUED PROTECTION AGAINST FIRE HAZARD, REPLACE ONLY WITH SAME TYPE F1 6A 125V FUSE

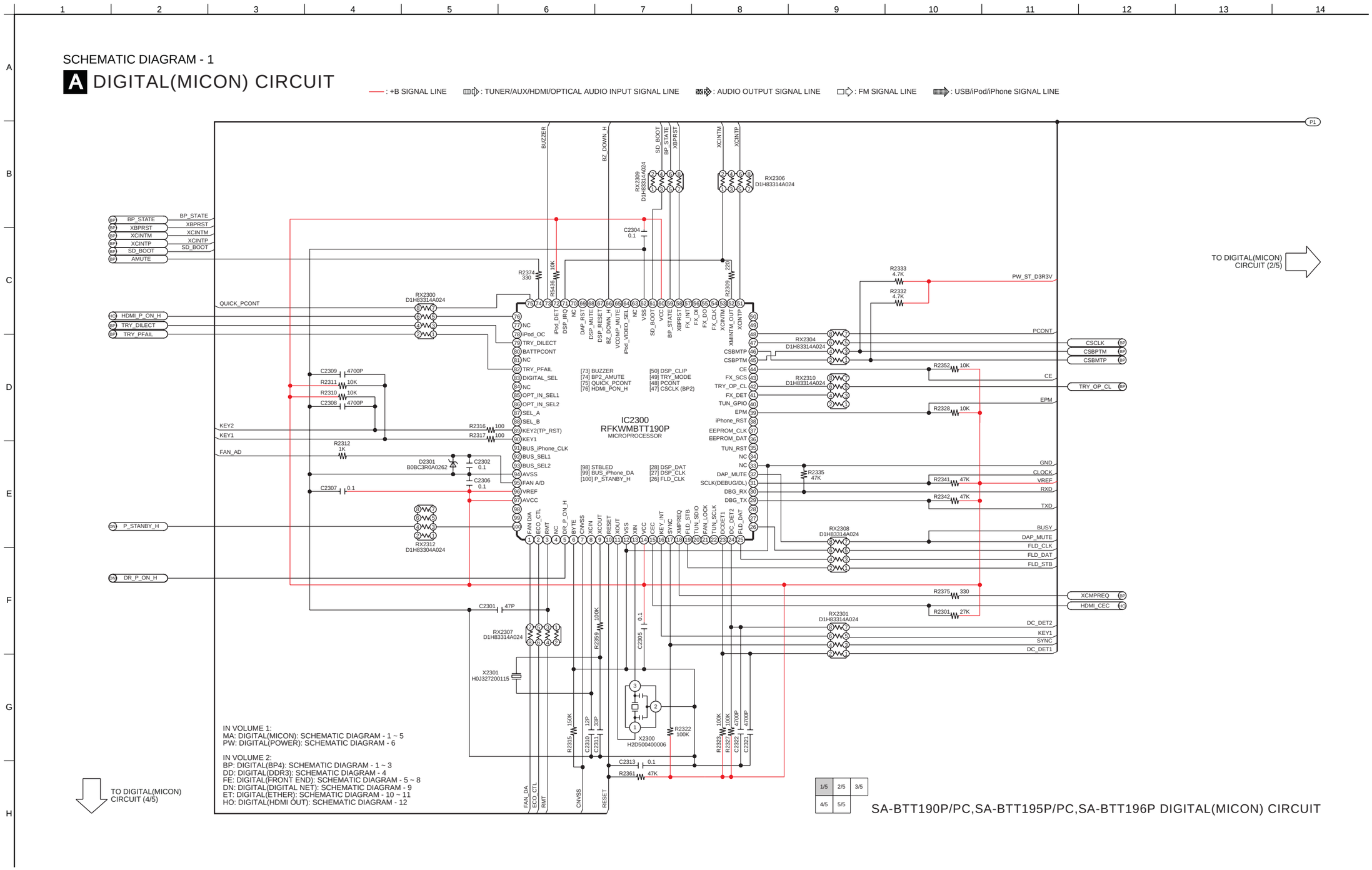


RISK OF FIRE-REPLACE FUSE AS MARKED.

FUSE CAUTION

These symbols located near the fuse indicates that the fuse used is a fast operating type. For continued protection againts fire harzard, replace with the same type fuse. fro rating, refer to the marking adjacent to the symbol.

18.2. Digital(Micon/Power) Circuit

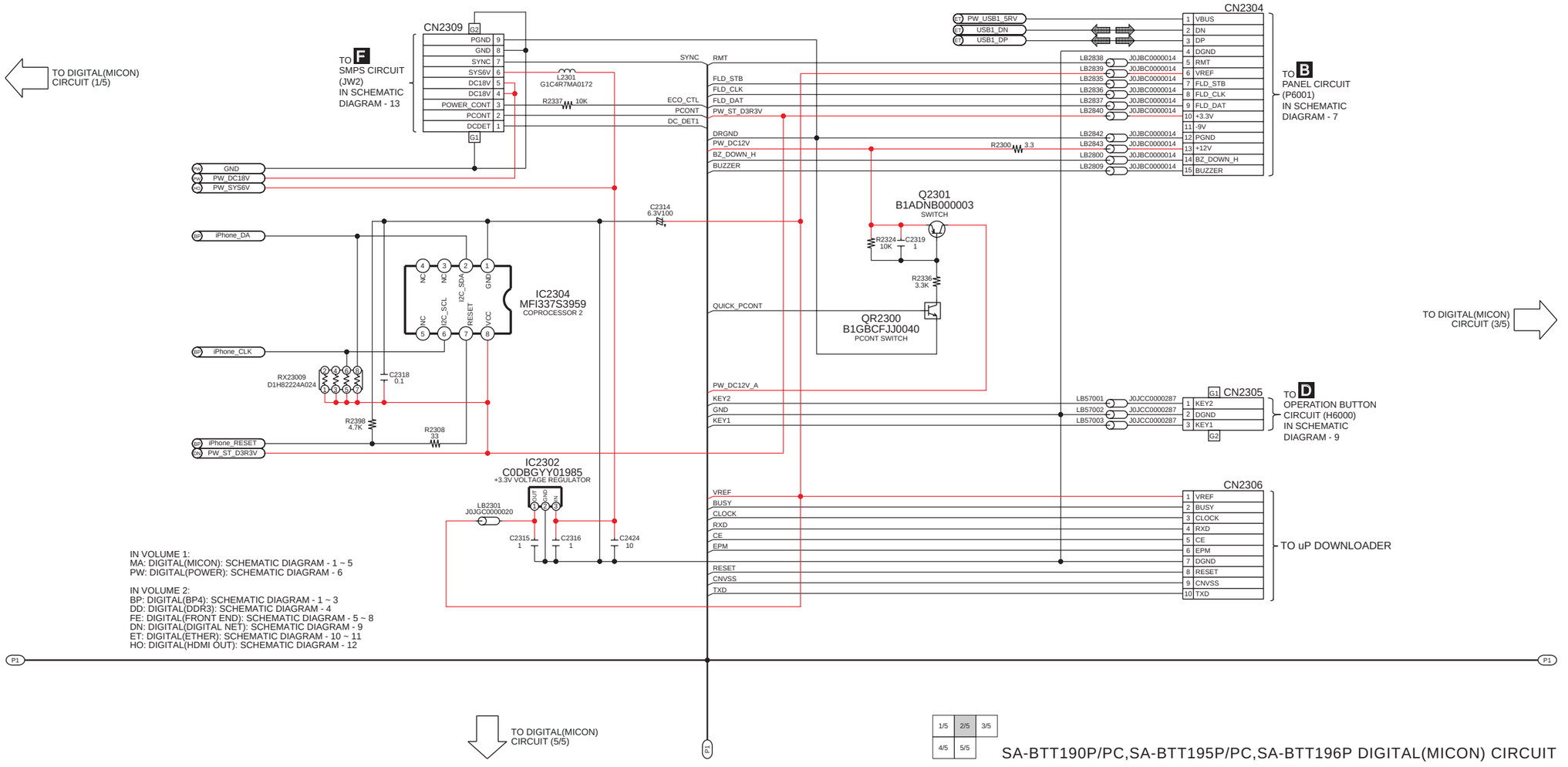


SA-BTT190P/PC,SA-BTT195P/PC,SA-BTT196P DIGITAL(MICON) CIRCUIT

SCHEMATIC DIAGRAM - 2

A DIGITAL(MICON) CIRCUIT

—— : +B SIGNAL LINE : TUNER/AUX/HDMI/OPTICAL AUDIO INPUT SIGNAL LINE : AUDIO OUTPUT SIGNAL LINE : FM SIGNAL LINE : USB/iPod/iPhone SIGNAL LINE



IN VOLUME 1:
MA: DIGITAL(MICON): SCHEMATIC DIAGRAM - 1 ~ 5
PW: DIGITAL(POWER): SCHEMATIC DIAGRAM - 6

IN VOLUME 2:
BP: DIGITAL(BP4): SCHEMATIC DIAGRAM - 1 ~ 3
DD: DIGITAL(DDR3): SCHEMATIC DIAGRAM - 4
FE: DIGITAL(FRONT END): SCHEMATIC DIAGRAM - 5 ~ 8
DN: DIGITAL(DIGITAL NET): SCHEMATIC DIAGRAM - 9
ET: DIGITAL(ETHER): SCHEMATIC DIAGRAM - 10 ~ 11
HO: DIGITAL(HDMI OUT): SCHEMATIC DIAGRAM - 12

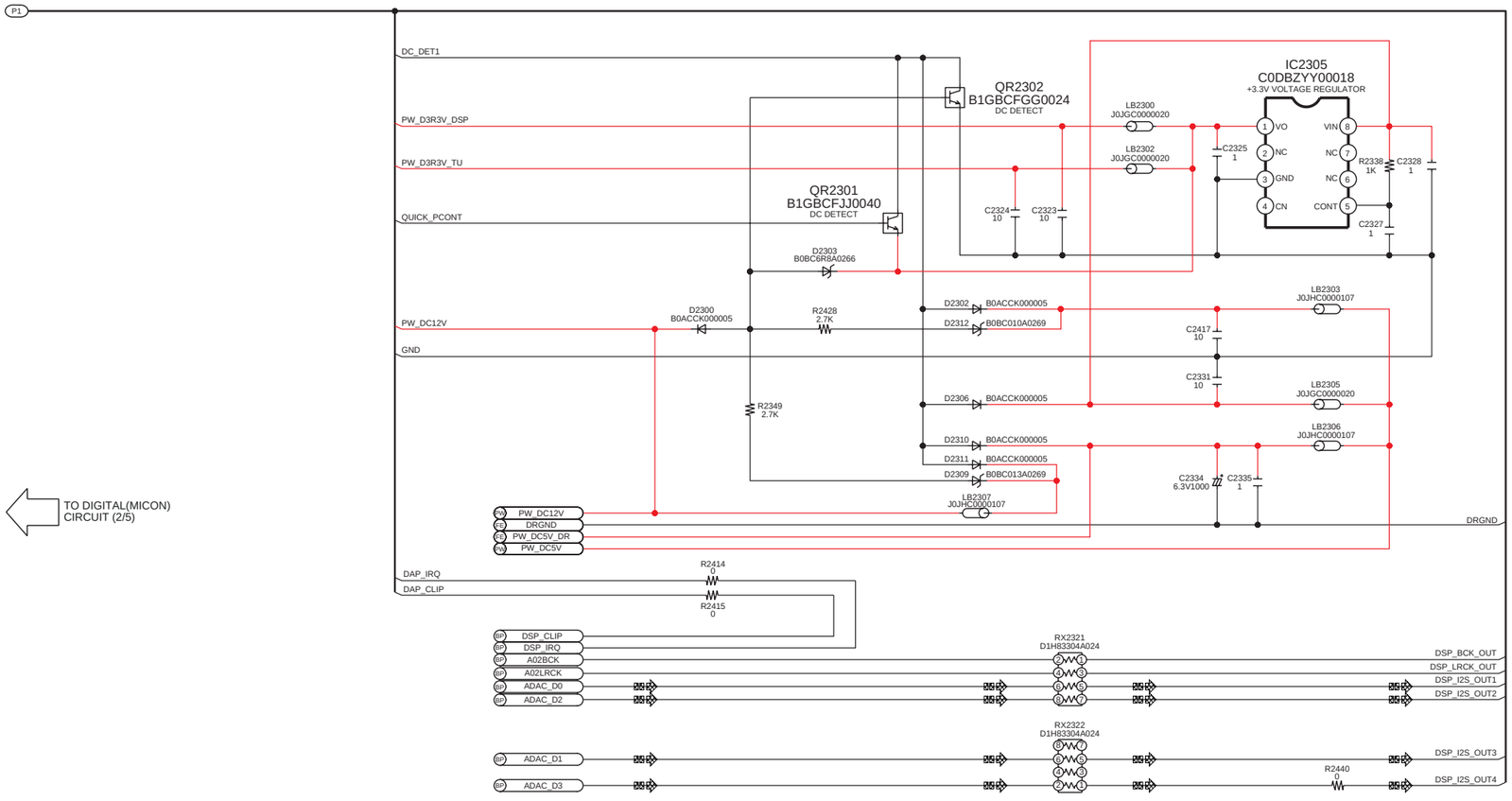
1/5 | 2/5 | 3/5 | 4/5 | 5/5

SA-BTT190P/PC,SA-BTT195P/PC,SA-BTT196P DIGITAL(MICON) CIRCUIT

SCHEMATIC DIAGRAM - 3

A DIGITAL(MICON) CIRCUIT

—— : +B SIGNAL LINE : TUNER/AUX/HDMI/OPTICAL AUDIO INPUT SIGNAL LINE : AUDIO OUTPUT SIGNAL LINE : FM SIGNAL LINE : USB/iPod/iPhone SIGNAL LINE



TO DIGITAL(MICON) CIRCUIT (2/5)

IN VOLUME 1:
MA: DIGITAL(MICON): SCHEMATIC DIAGRAM - 1 ~ 5
PW: DIGITAL(POWER): SCHEMATIC DIAGRAM - 6

IN VOLUME 2:
BP: DIGITAL(BP4): SCHEMATIC DIAGRAM - 1 ~ 3
DD: DIGITAL(DDR3): SCHEMATIC DIAGRAM - 4
FE: DIGITAL(FRONT END): SCHEMATIC DIAGRAM - 5 ~ 8
DN: DIGITAL(DIGITAL NET): SCHEMATIC DIAGRAM - 9
ET: DIGITAL(ETHER): SCHEMATIC DIAGRAM - 10 ~ 11
HO: DIGITAL(HDMI OUT): SCHEMATIC DIAGRAM - 12

1/5	2/5	3/5
4/5	5/5	

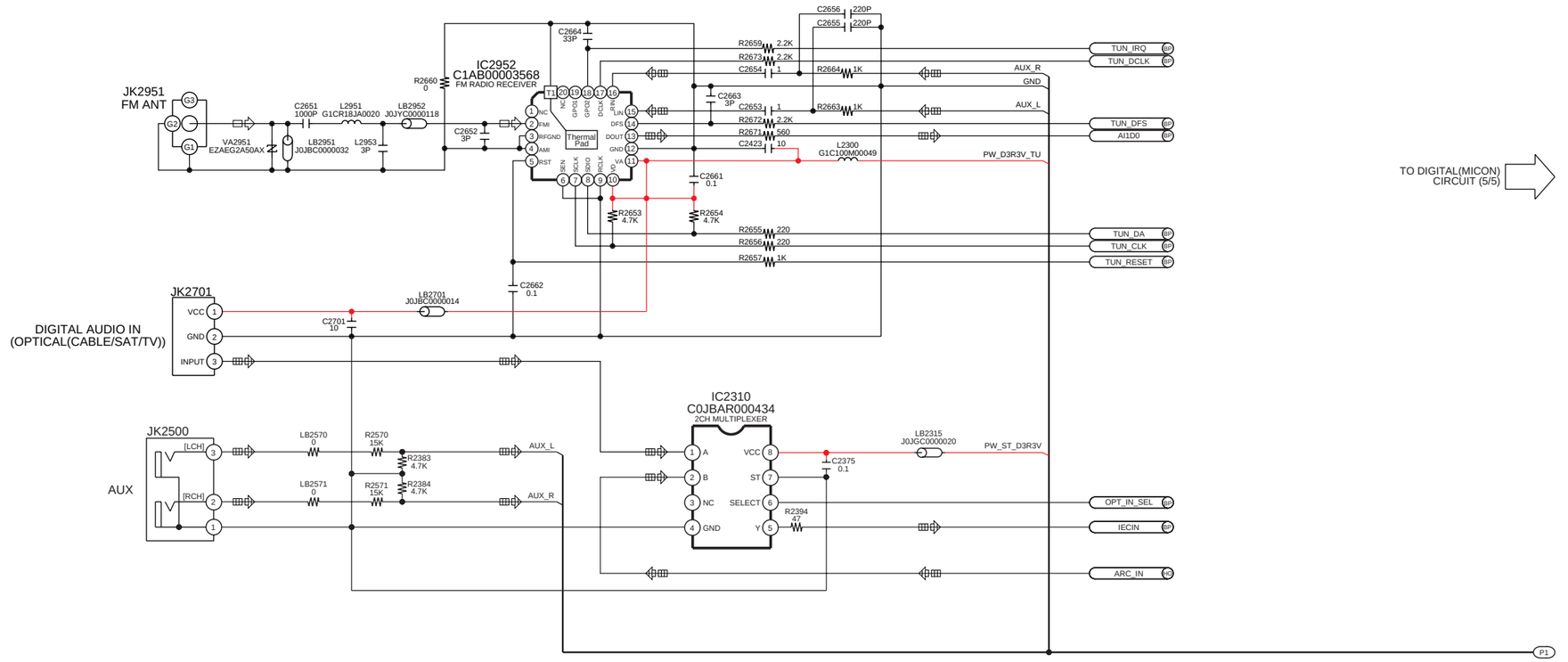
SA-BTT190P/PC,SA-BTT195P/PC,SA-BTT196P DIGITAL(MICON) CIRCUIT

SCHEMATIC DIAGRAM - 4

A DIGITAL(MICON) CIRCUIT

—— : +B SIGNAL LINE : TUNER/AUX/HDMI/OPTICAL AUDIO INPUT SIGNAL LINE : AUDIO OUTPUT SIGNAL LINE : FM SIGNAL LINE : USB/iPod/iPhone SIGNAL LINE

TO DIGITAL(MICON) CIRCUIT (1/5)



TO DIGITAL(MICON) CIRCUIT (5/5)

IN VOLUME 1:
MA: DIGITAL(MICON): SCHEMATIC DIAGRAM - 1 ~ 5
PW: DIGITAL(POWER): SCHEMATIC DIAGRAM - 6

IN VOLUME 2:
BP: DIGITAL(BP4): SCHEMATIC DIAGRAM - 1 ~ 3
DD: DIGITAL(DDR3): SCHEMATIC DIAGRAM - 4
FE: DIGITAL(FRONT END): SCHEMATIC DIAGRAM - 5 ~ 8
DN: DIGITAL(DIGITAL NET): SCHEMATIC DIAGRAM - 9
ET: DIGITAL(ETHER): SCHEMATIC DIAGRAM - 10 ~ 11
HO: DIGITAL(HDMI OUT): SCHEMATIC DIAGRAM - 12

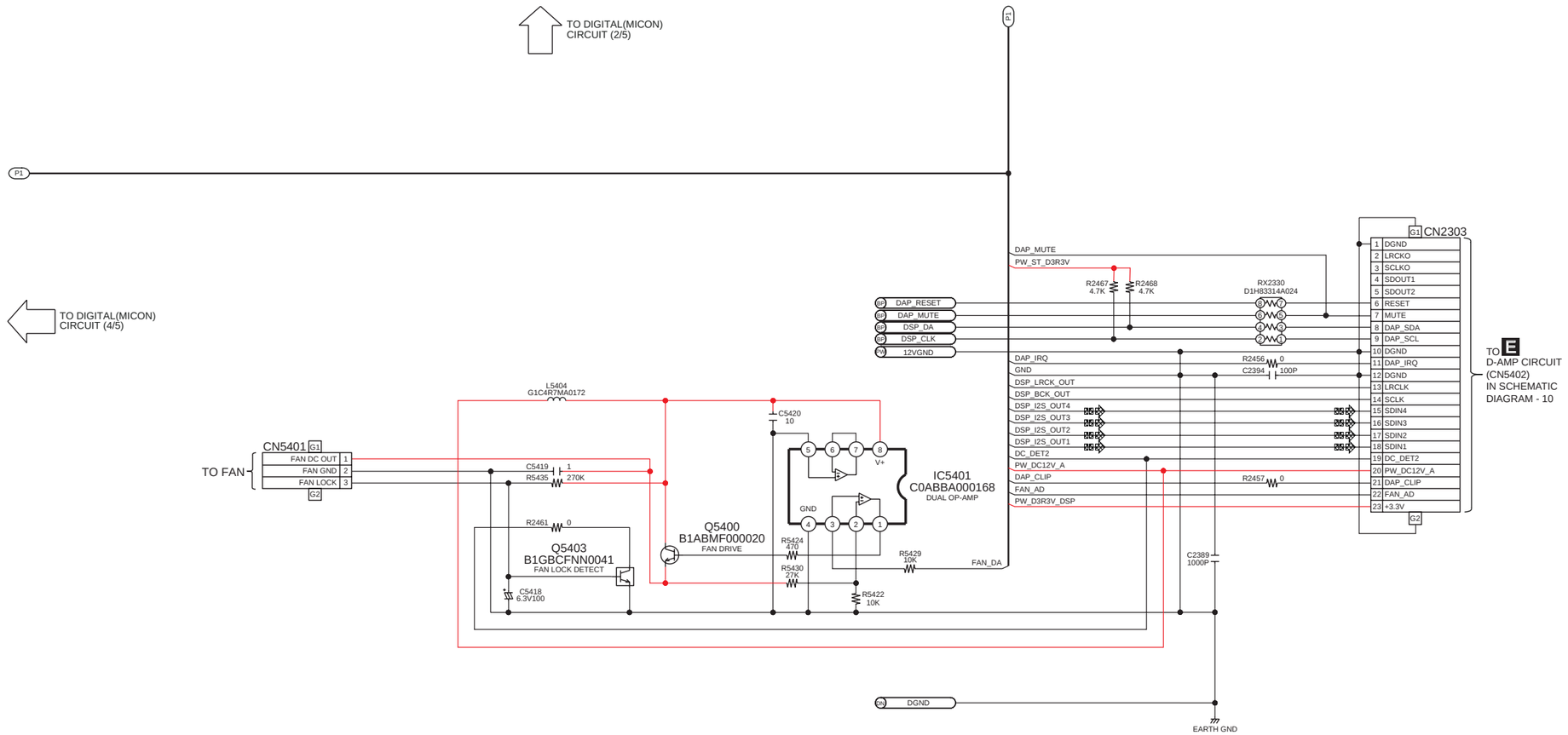
1/5	2/5	3/5
4/5	5/5	

SA-BTT190P/PC,SA-BTT195P/PC,SA-BTT196P DIGITAL(MICON) CIRCUIT

SCHEMATIC DIAGRAM - 5

A DIGITAL(MICON) CIRCUIT

: +B SIGNAL LINE : TUNER/AUX/HDMI/OPTICAL AUDIO INPUT SIGNAL LINE : AUDIO OUTPUT SIGNAL LINE : FM SIGNAL LINE : USB/iPod/iPhone SIGNAL LINE



IN VOLUME 1:
MA: DIGITAL(MICON): SCHEMATIC DIAGRAM - 1 ~ 5
PW: DIGITAL(POWER): SCHEMATIC DIAGRAM - 6

IN VOLUME 2:
BP: DIGITAL(BP4): SCHEMATIC DIAGRAM - 1 ~ 3
DD: DIGITAL(DDR3): SCHEMATIC DIAGRAM - 4
FE: DIGITAL(FRONT END): SCHEMATIC DIAGRAM - 5 ~ 8
DN: DIGITAL(DIGITAL NET): SCHEMATIC DIAGRAM - 9
ET: DIGITAL(ETHER): SCHEMATIC DIAGRAM - 10 ~ 11
HO: DIGITAL(HDMI OUT): SCHEMATIC DIAGRAM - 12

1/5	2/5	3/5
4/5	5/5	

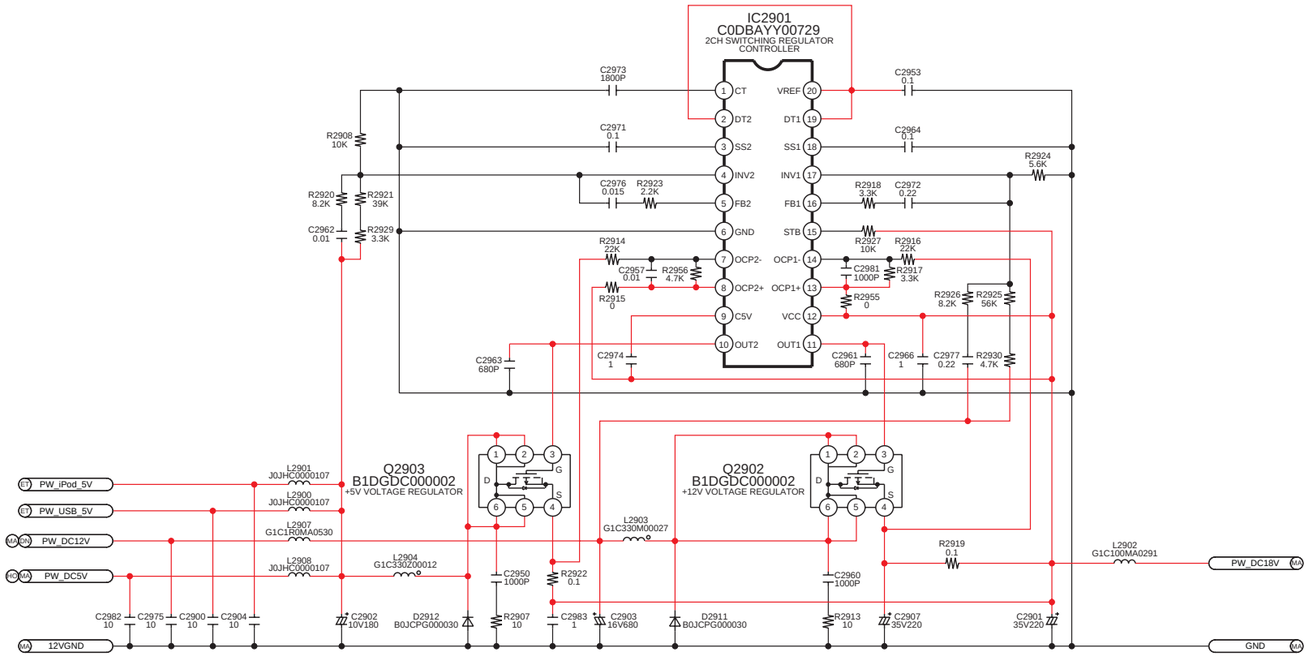
SA-BTT190P/PC,SA-BTT195P/PC,SA-BTT196P DIGITAL(MICON) CIRCUIT

15 16 17 18 19 20 21 22 23 24 25 26 27 28

SCHEMATIC DIAGRAM - 6

A DIGITAL(POWER) CIRCUIT

—— : +B SIGNAL LINE



IN VOLUME 1:
MA: DIGITAL(MICON): SCHEMATIC DIAGRAM - 1 ~ 5
PW: DIGITAL(POWER): SCHEMATIC DIAGRAM - 6

IN VOLUME 2:
BP: DIGITAL(BP4): SCHEMATIC DIAGRAM - 1 ~ 3
DD: DIGITAL(DDR3): SCHEMATIC DIAGRAM - 4
FE: DIGITAL(FRONT END): SCHEMATIC DIAGRAM - 5 ~ 8
DN: DIGITAL(DIGITAL NET): SCHEMATIC DIAGRAM - 9
ET: DIGITAL(ETHER): SCHEMATIC DIAGRAM - 10 ~ 11
HO: DIGITAL(HDMI OUT): SCHEMATIC DIAGRAM - 12

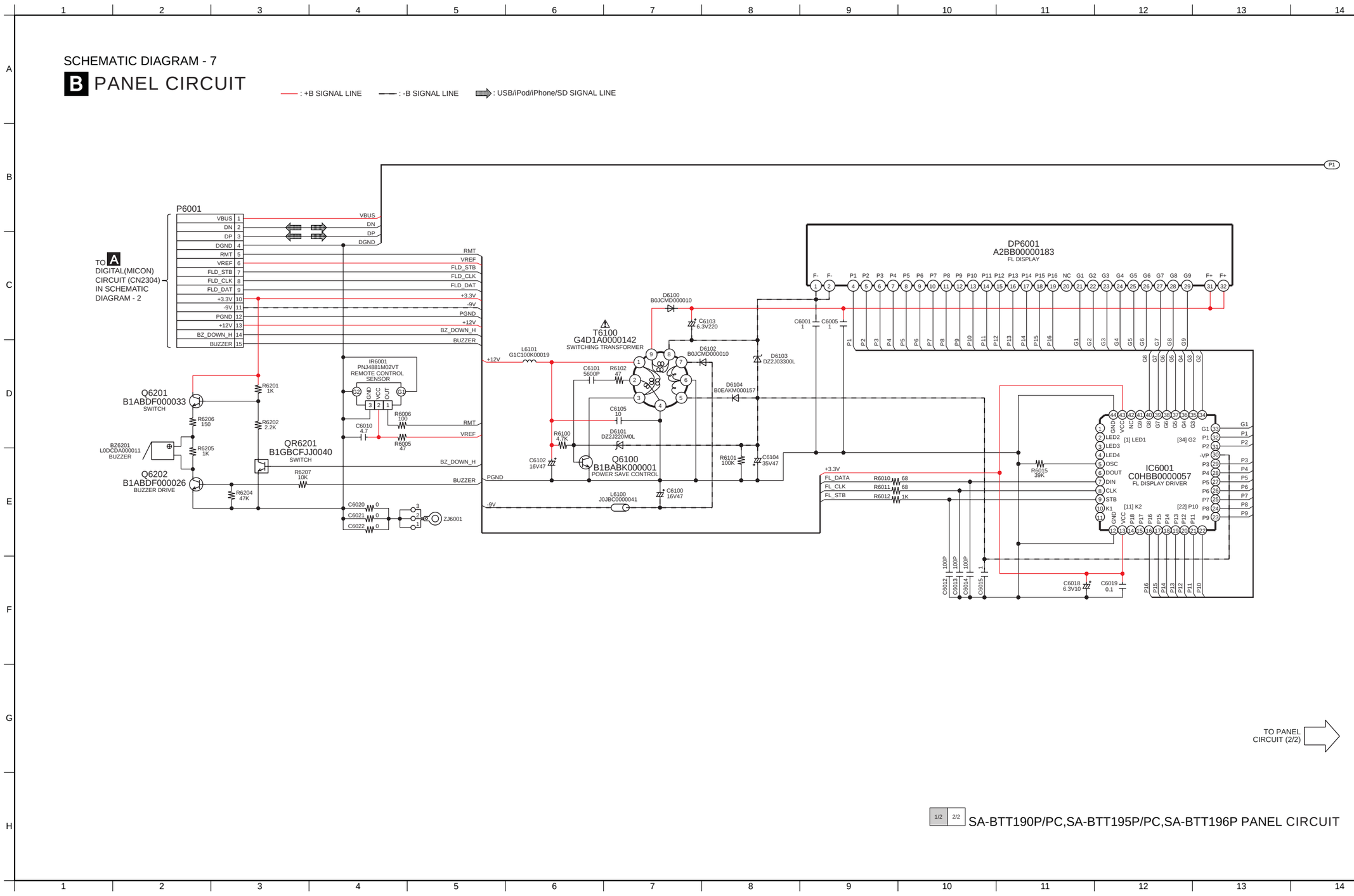
SA-BTT190P/PC,SA-BTT195P/PC,SA-BTT196P DIGITAL(POWER) CIRCUIT

18.3. Panel Circuit

SCHEMATIC DIAGRAM - 7

B PANEL CIRCUIT

—— : +B SIGNAL LINE —•— : -B SIGNAL LINE ⇨ : USB/iPod/iPhone/SD SIGNAL LINE

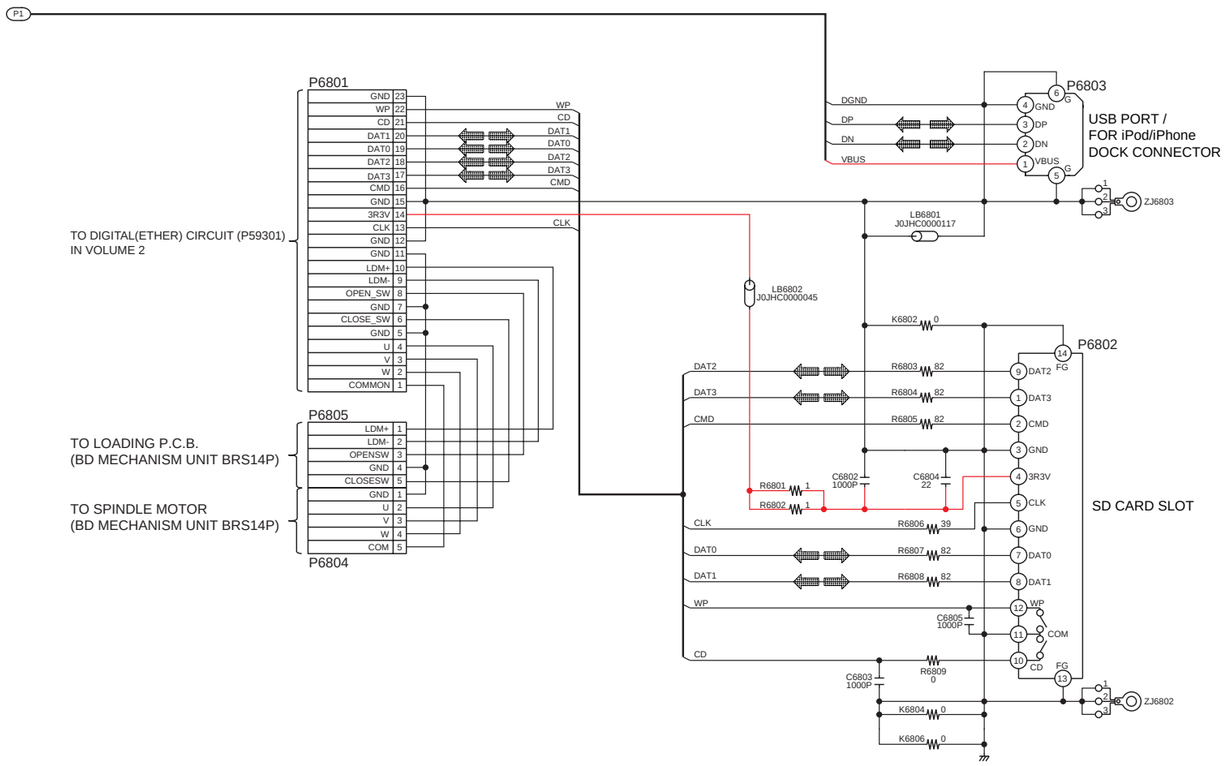


1/2 2/2 SA-BTT190P/PC,SA-BTT195P/PC,SA-BTT196P PANEL CIRCUIT

SCHEMATIC DIAGRAM - 8

B PANEL CIRCUIT

: +B SIGNAL LINE : -B SIGNAL LINE : USB/iPod/iPhone/SD SIGNAL LINE

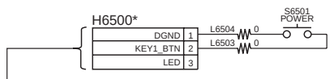


1/2 2/2 SA-BTT190P/PC,SA-BTT195P/PC,SA-BTT196P PANEL CIRCUIT

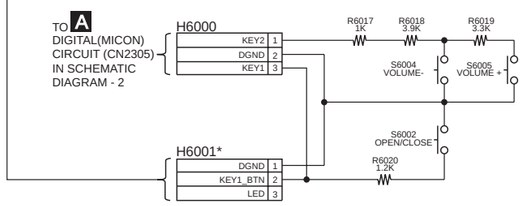
18.4. Power Button, Operation Button and AC Inlet Circuit

SCHEMATIC DIAGRAM - 9

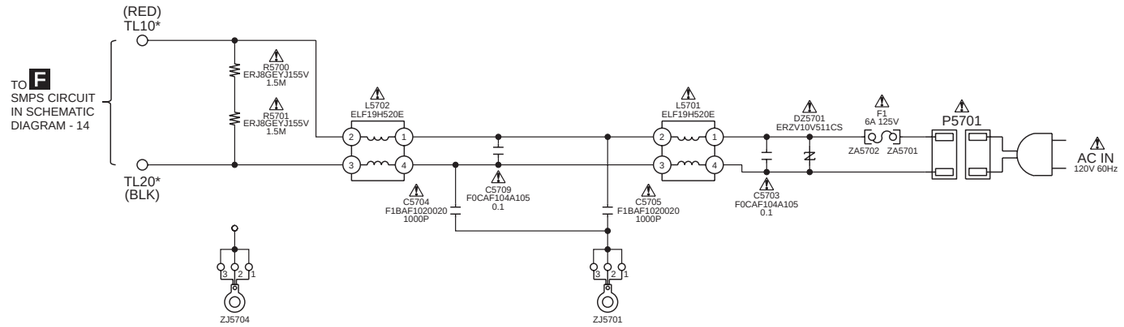
C POWER BUTTON CIRCUIT



D OPERATION BUTTON CIRCUIT



G AC INLET CIRCUIT



NOTE: " * " REF IS FOR INDICATION ONLY

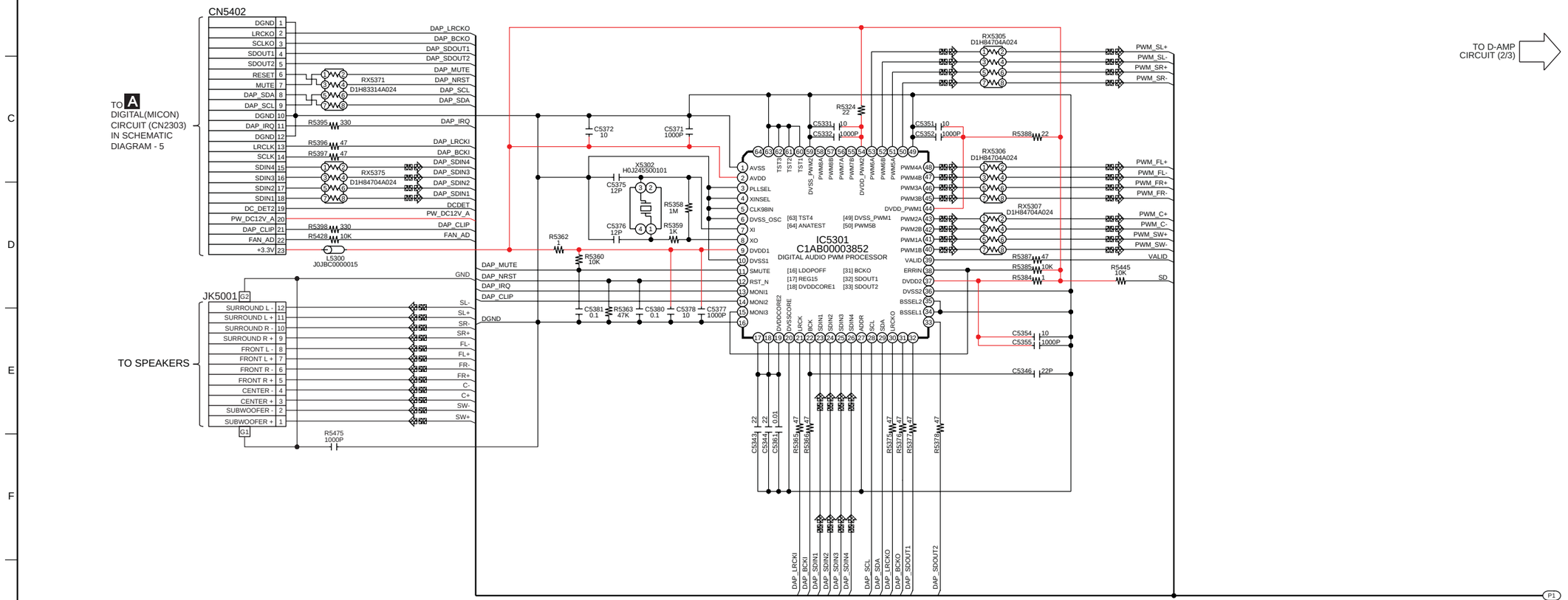
SA-BTT190P/PC,SA-BTT195P/PC,SA-BTT196P POWER BUTTON / OPERATION BUTTON / AC INLET CIRCUIT

18.5. D-Amp Circuit

SCHEMATIC DIAGRAM - 10

E D-AMP CIRCUIT

—— : +B SIGNAL LINE : AUDIO OUTPUT SIGNAL LINE



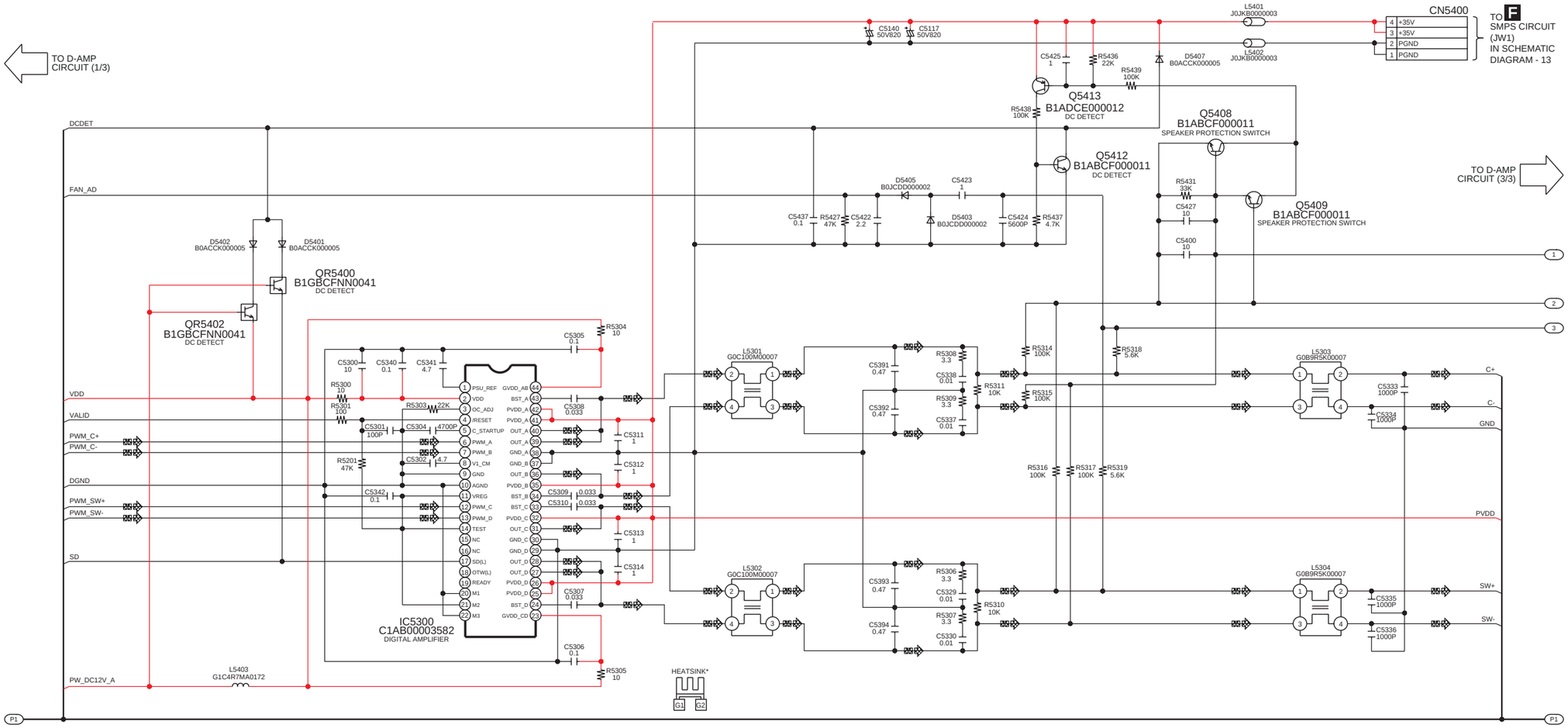
1/3 | 2/3 | 3/3

SA-BTT190P/PC,SA-BTT195P/PC,SA-BTT196P D-AMP CIRCUIT

SCHEMATIC DIAGRAM - 11

E D-AMP CIRCUIT

—— : +B SIGNAL LINE : AUDIO OUTPUT SIGNAL LINE



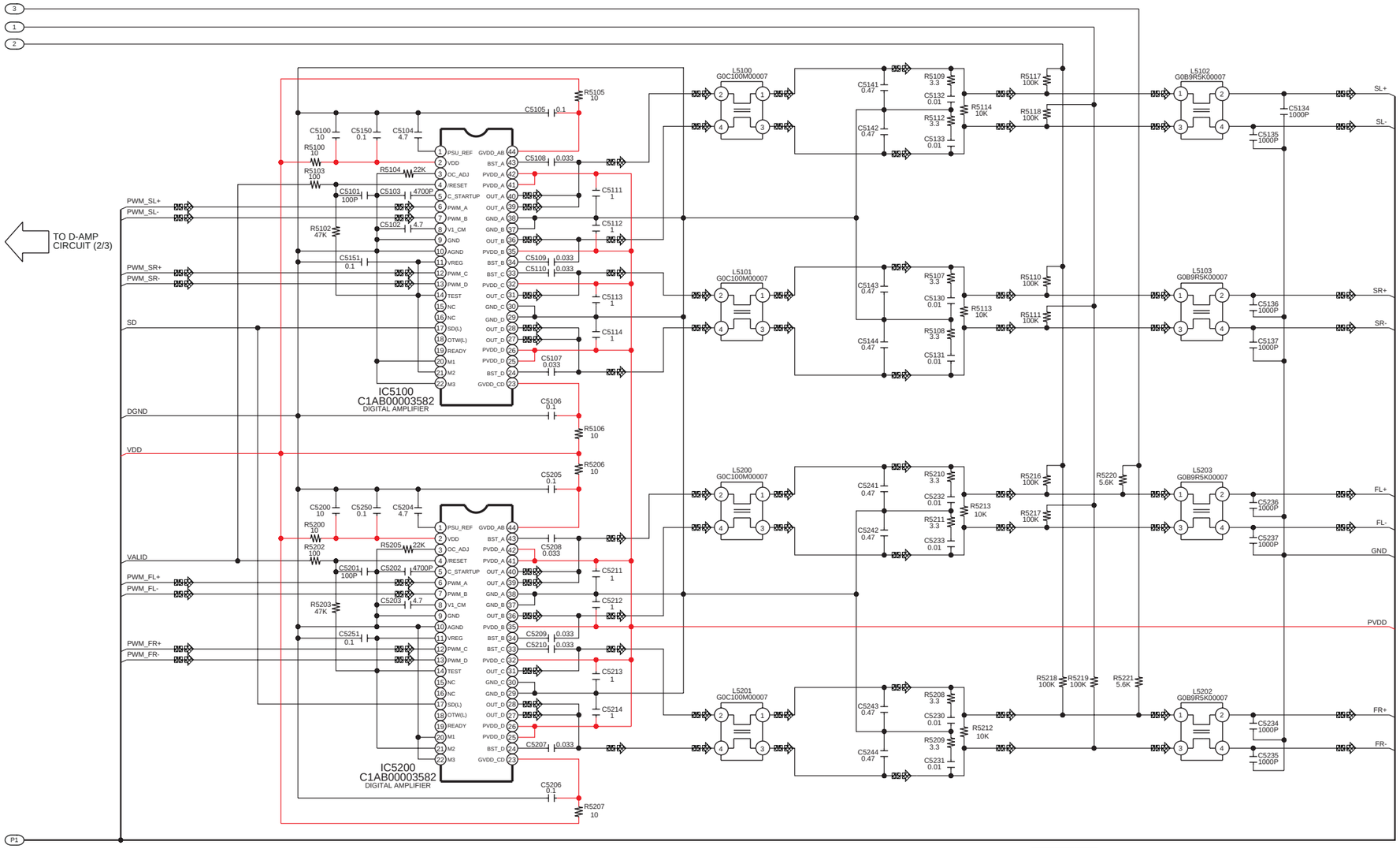
NOTE: “ * ” REF IS FOR INDICATION ONLY

1/3 2/3 3/3 SA-BTT190P/PC,SA-BTT195P/PC,SA-BTT196P D-AMP CIRCUIT

SCHEMATIC DIAGRAM - 12

E D-AMP CIRCUIT

—— : +B SIGNAL LINE ▭▭ : AUDIO OUTPUT SIGNAL LINE



1/3 | 2/3 | 3/3

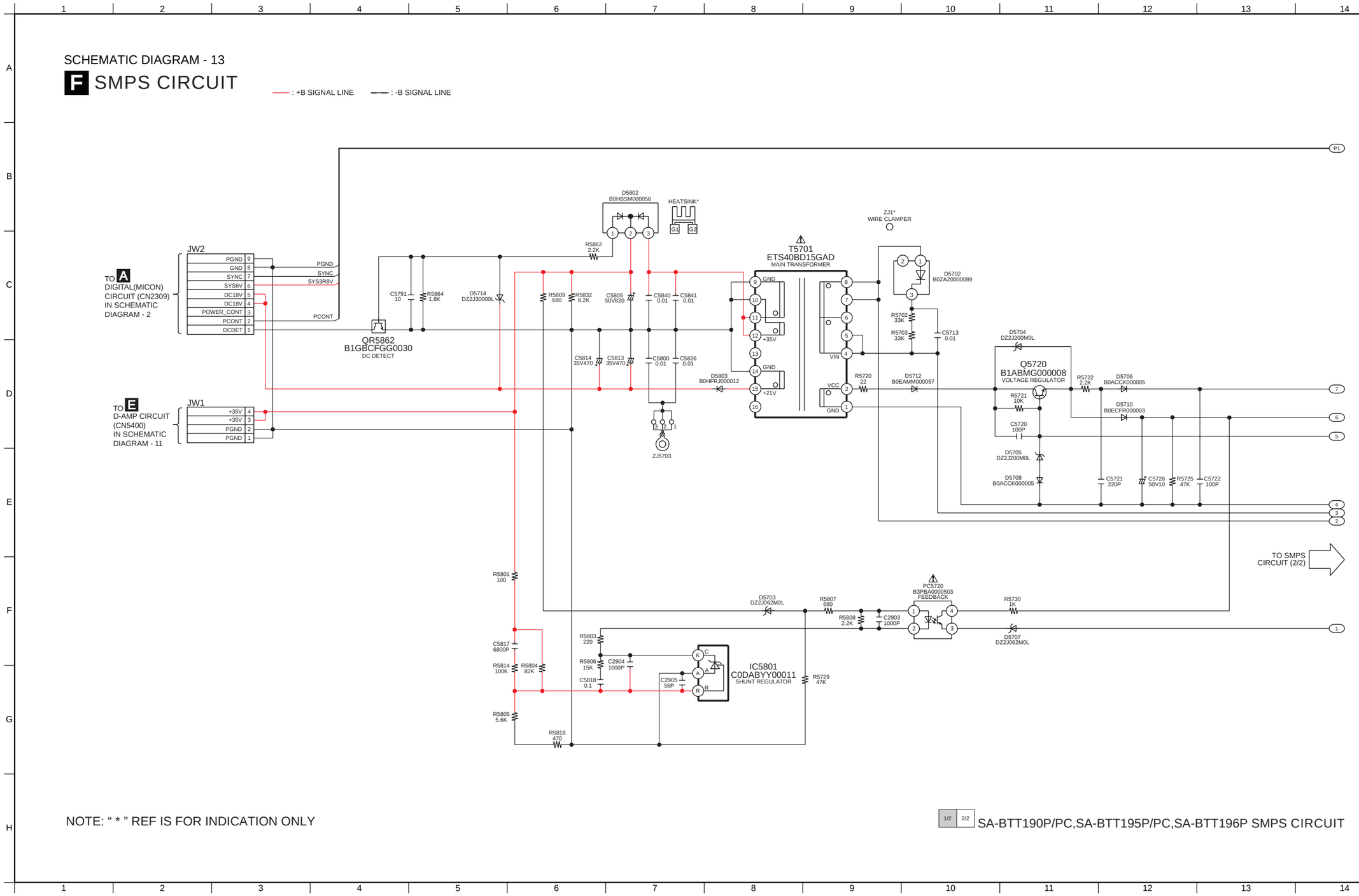
SA-BTT190P/PC,SA-BTT195P/PC,SA-BTT196P D-AMP CIRCUIT

18.6. SMPS Circuit

SCHEMATIC DIAGRAM - 13

F SMPS CIRCUIT

—— : +B SIGNAL LINE —•— : -B SIGNAL LINE



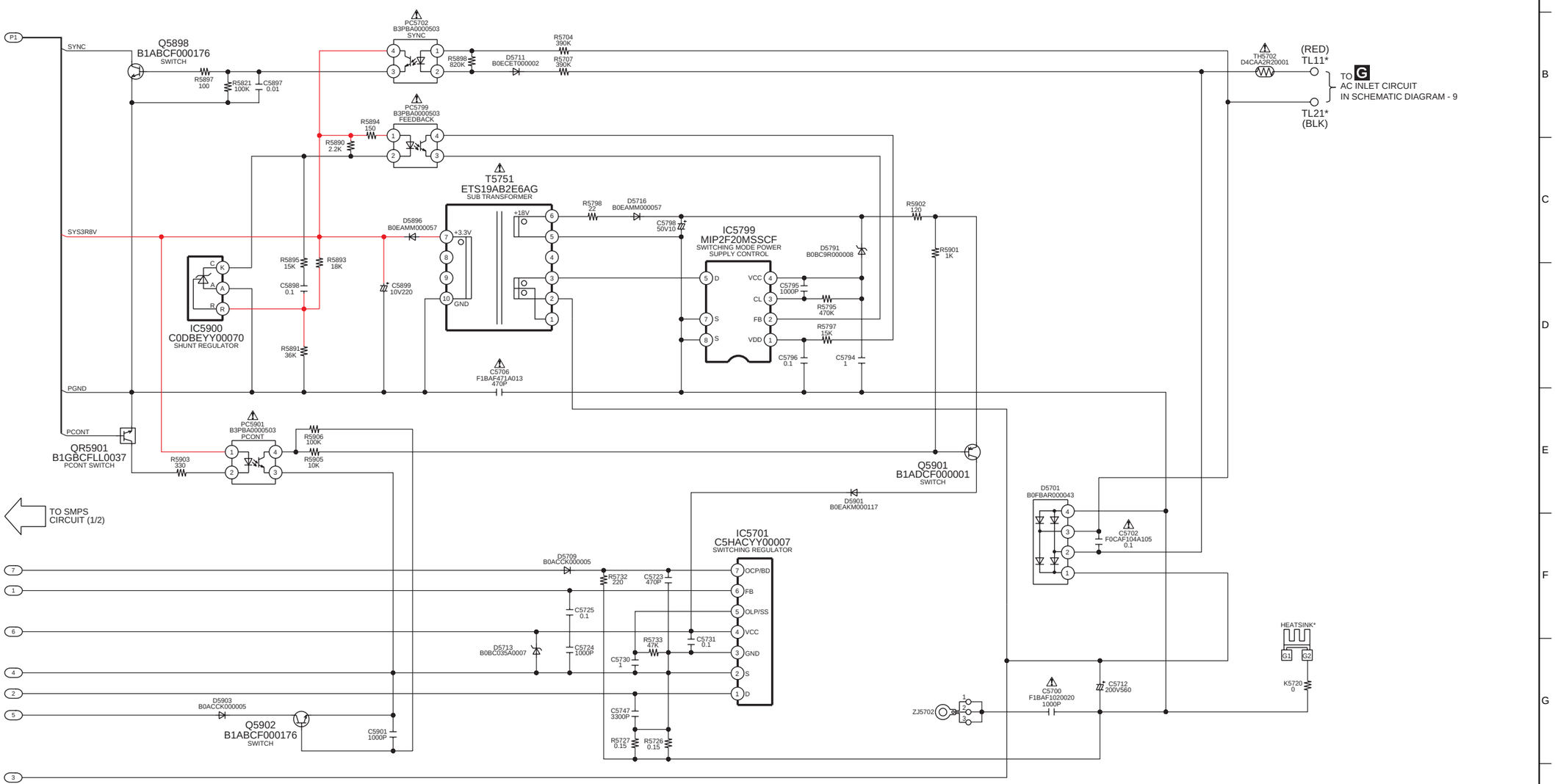
NOTE: “ * ” REF IS FOR INDICATION ONLY

1/2 2/2 SA-BTT190P/PC,SA-BTT195P/PC,SA-BTT196P SMPS CIRCUIT

SCHEMATIC DIAGRAM - 14

F SMPS CIRCUIT

: +B SIGNAL LINE : -B SIGNAL LINE



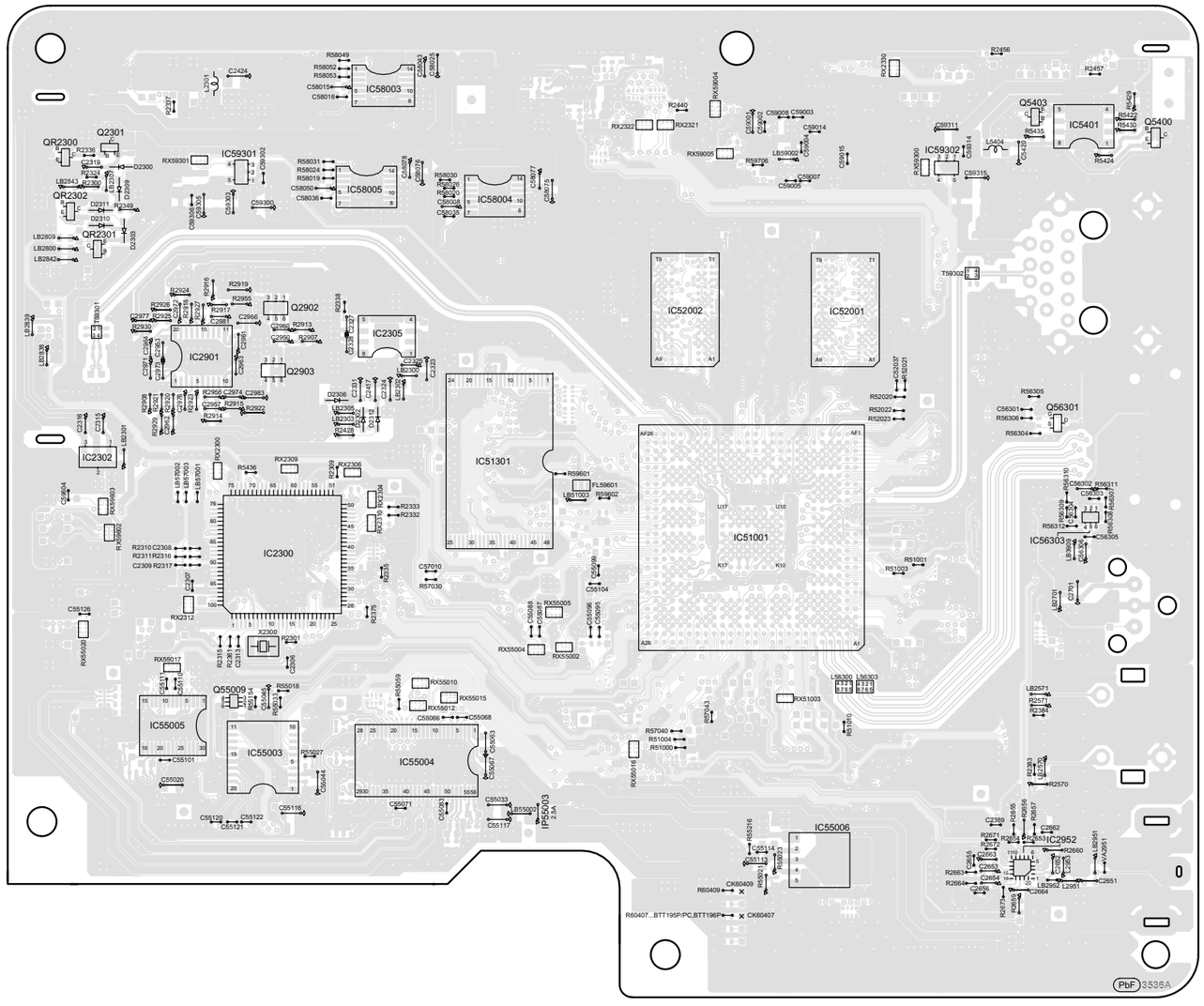
NOTE: “ * ” REF IS FOR INDICATION ONLY

1/2 2/2 SA-BTT190P/PC,SA-BTT195P/PC,SA-BTT196P SMPS CIRCUIT

19 Printed Circuit Board

19.1. Digital P.C.B.

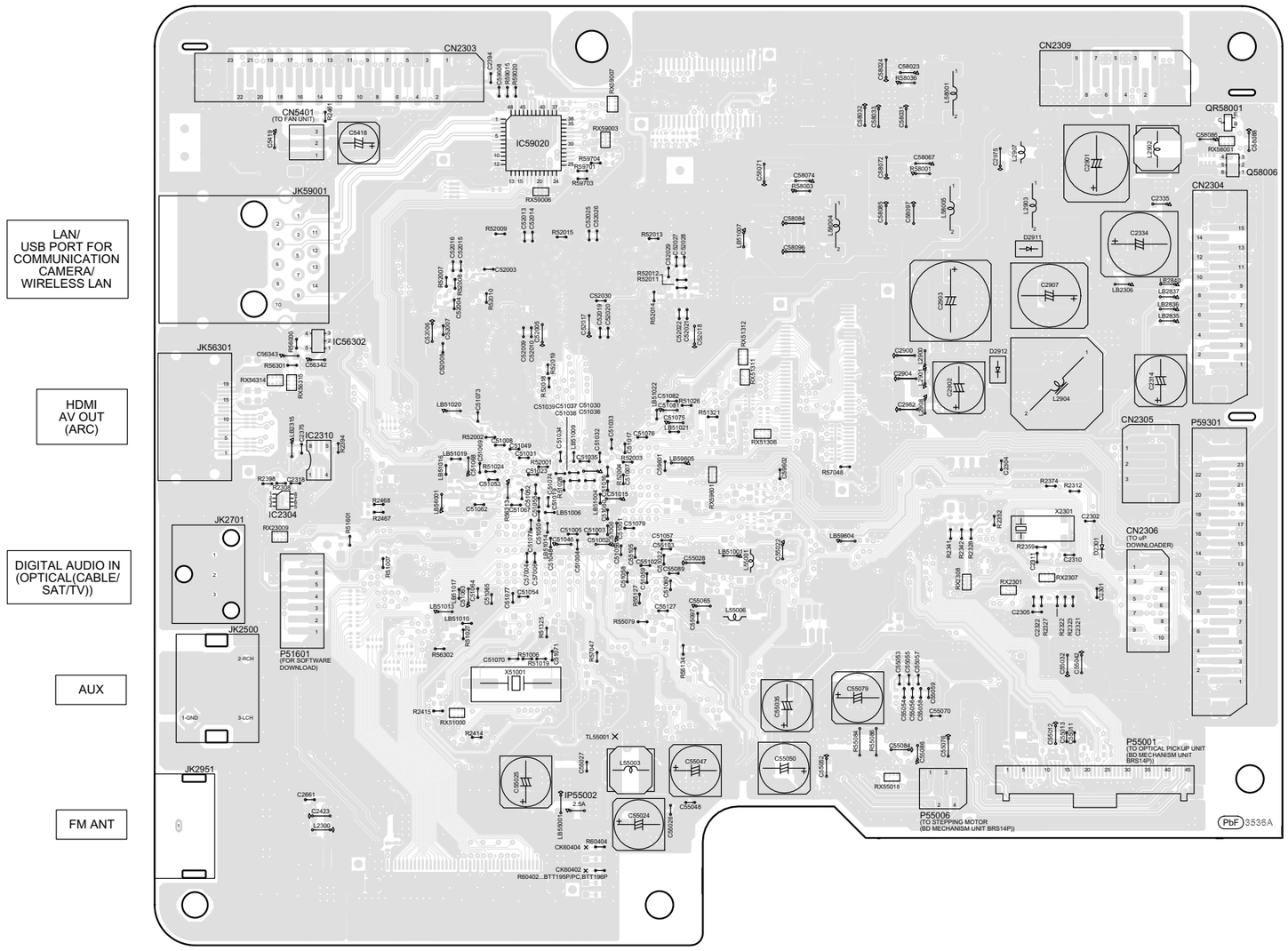
A DIGITAL P.C.B. (RFKB4753A...BTT190P/PC)
(RFKB4753E...BTT195P/PC,BTT196P)



(SIDE A)

SA-BTT190P/PC,SA-BTT195P/PC,SA-BTT196P
DIGITAL P.C.B.

A DIGITAL P.C.B. (RFKB4753A...BTT190P/PC)
(RFKB4753E...BTT195P/PC,BTT196P)

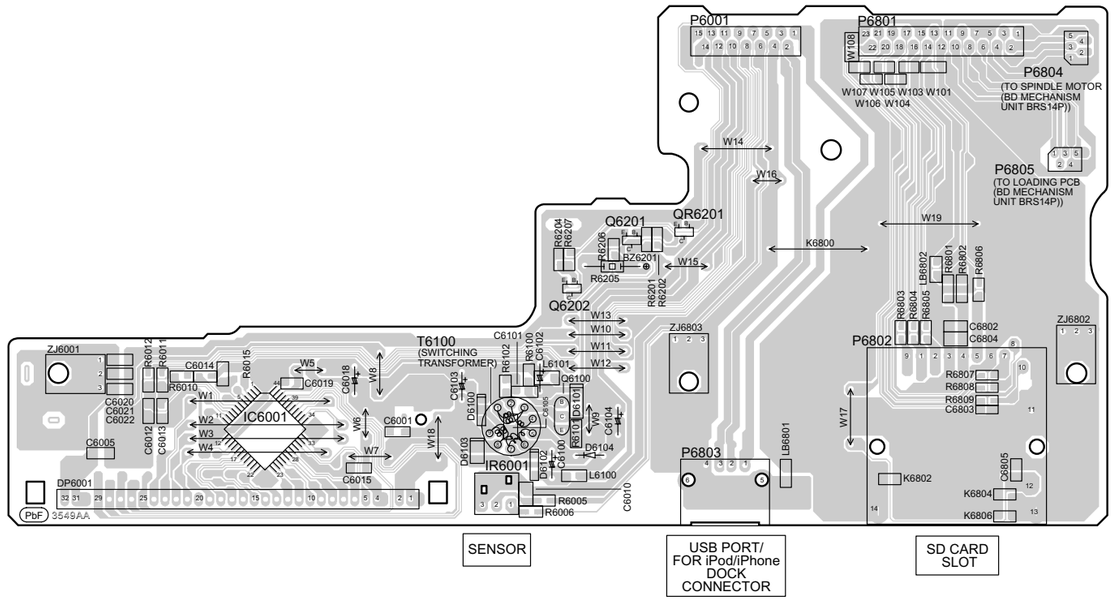


(SIDE B)

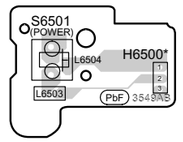
SA-BTT190P/PC,SA-BTT195P/PC,SA-BTT196P
DIGITAL P.C.B.

19.2. Panel, Power Button and Operation Button P.C.B.

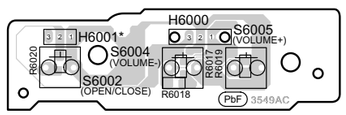
B PANEL P.C.B. (REP4754AA)



C POWER BUTTON P.C.B. (REP4754AB)



D OPERATION BUTTON P.C.B. (REP4754AB)

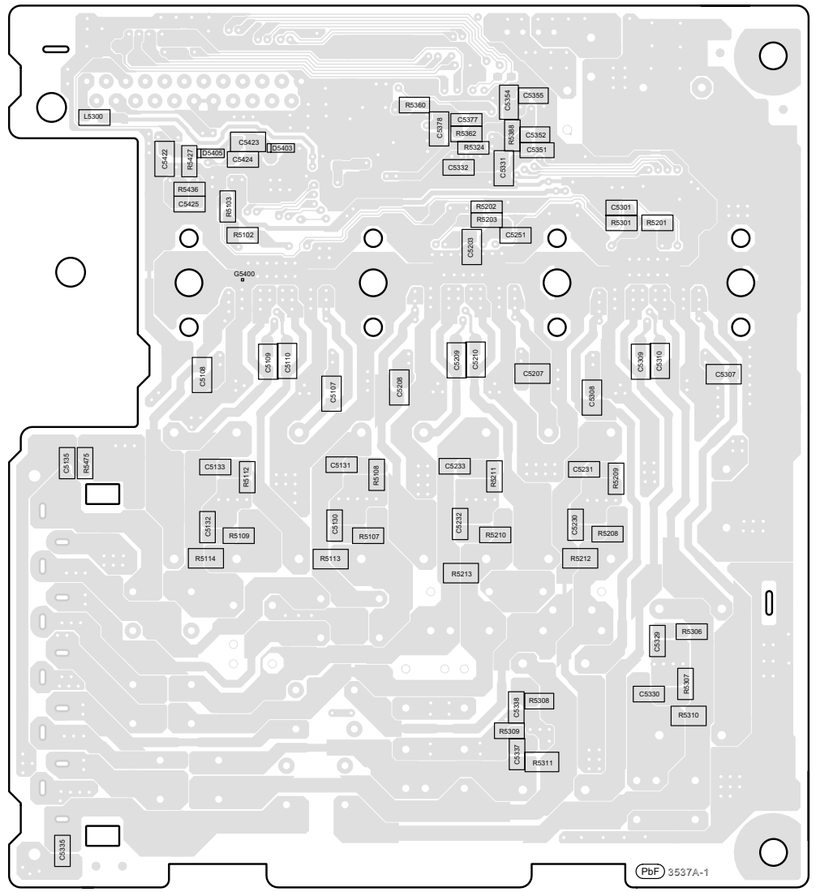


NOTE: " * " REF IS FOR INDICATION ONLY.

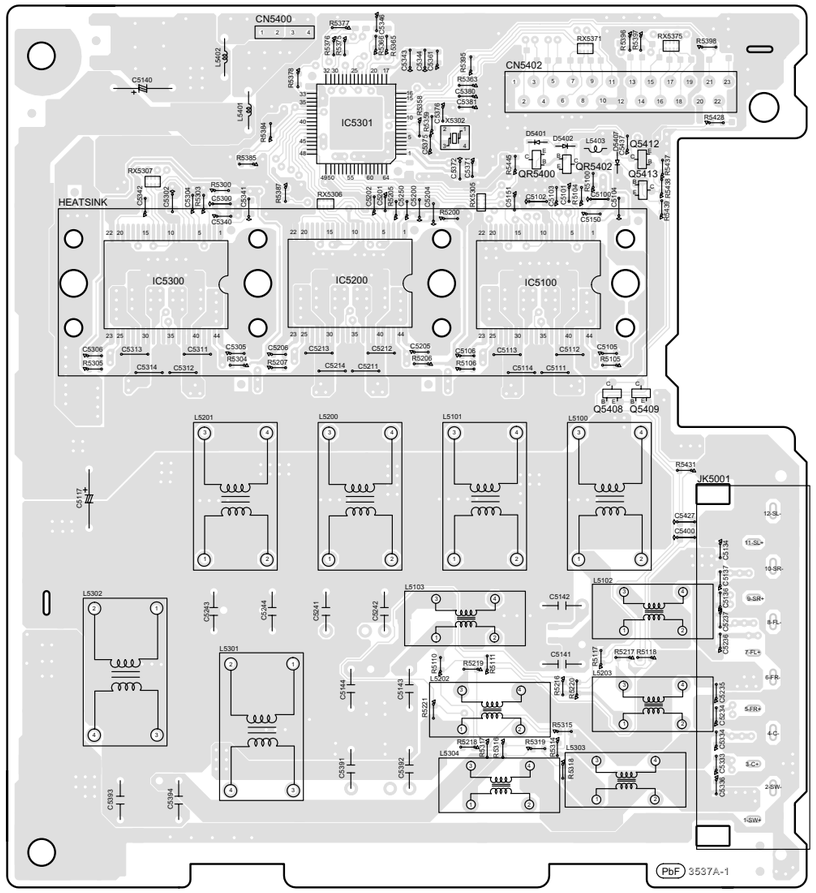
SA-BTT190P/PC,SA-BTT195P/PC,SA-BTT196P
PANEL / POWER BUTTON / OPERATION BUTTON P.C.B.

19.3. D-Amp P.C.B.

E D-AMP P.C.B. (REP4750A)



(SIDE A)

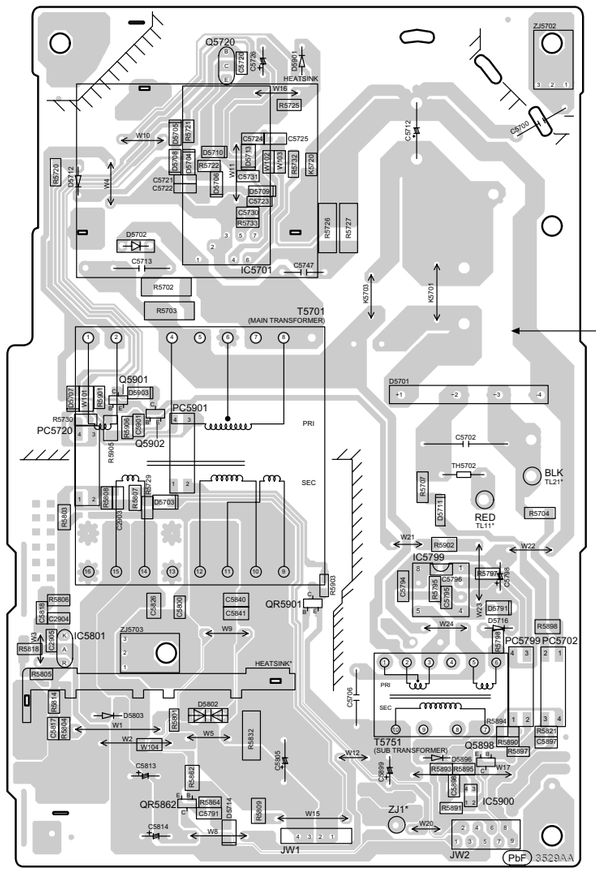


(SIDE B)

SA-BTT190P/PC,SA-BTT195P/PC,SA-BTT196P
D-AMP P.C.B.

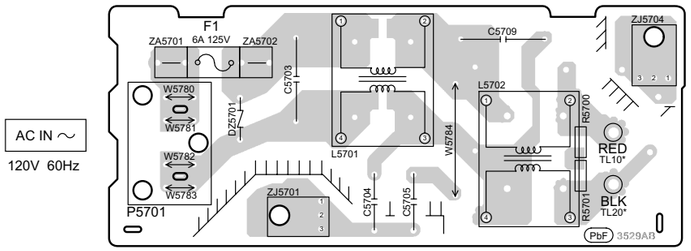
19.4. SMPS and AC Inlet P.C.B.

F SMPS P.C.B. (REP4740A)



CAUTION
RISK OF ELECTRIC SHOCK
AC VOLTAGE LINE.
PLEASE DO NOT TOUCH THIS P.C.B

G AC INLET P.C.B. (REP4740A)



NOTE: " * " REF IS FOR INDICATION ONLY.

SA-BTT190P/PC,SA-BTT195P/PC,SA-BTT196P
SMPS / AC INLET P.C.B.

20 Appendix Information of Schematic Diagram

20.1. Voltage & Waveform Chart

Note:

- Indication Voltage Values are in standard values for the unit measured by the DC electronic circuit tester (high-impedance) with the chassis taken as standard.
  Therefore, there may exist some errors in voltage values, depending on the internal impedance of the DC circuit tester.
- Circuit voltage and waveform described herein shall be regarded as reference information when probing defect point because it may differ from actual measuring value due to difference of Measuring instrument and its measuring condition and product itself.

20.1.1. Digital P.C.B. (1/2)

REF NO.	IC2300																			
MODE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
POWER ON	1.4	3.3	3.3	0	3.3	0	0	0.8	1.2	3.3	1.7	0	1.4	3.3	3.3	3.3	2.1	3.3	3.3	0
STANDBY	1.4	3.3	3.3	0	3.3	0	0	0.8	1.2	3.3	1.7	0	1.4	3.3	3.3	3.3	2.1	3.3	3.3	0

REF NO.	IC2300																			
MODE	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
POWER ON	2.9	0	3.3	3.3	0	0	0	0	3.3	0	0	0	0	0	0	0	0	0	0	0
STANDBY	2.9	0	3.3	3.3	0	0	0	0	3.3	0	0	0	0	0	0	0	0	0	0	0

REF NO.	IC2300																			
MODE	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
POWER ON	3.3	3.3	0	3.3	3.3	3.3	3.3	3.3	0	0	3.3	3.3	0	0	0	1.2	0	3.3	3.3	3.3
STANDBY	3.3	3.3	0	3.3	3.3	3.3	3.3	3.3	0	0	3.3	3.3	0	0	0	1.2	0	3.3	3.3	3.3

REF NO.	IC2300																			
MODE	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
POWER ON	0	0	0	0	3.3	0	0	0	0	0	3.3	3.3	0	0	3.3	3.3	0	0	3.3	0
STANDBY	0	0	0	0	3.3	0	0	0	0	0	3.3	3.3	0	0	3.3	3.3	0	0	3.3	0

REF NO.	IC2300																			
MODE	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
POWER ON	0	3.3	0	0	0	0	0	0	3.3	3.3	0	0	0	0	3.0	3.3	3.3	0	0	3.3
STANDBY	0	3.3	0	0	0	0	0	0	3.3	3.3	0	0	0	0	3.0	3.3	3.3	0	0	3.3

REF NO.	IC2302																			
MODE	1	2	3																	
POWER ON	6.0	0	3.3																	
STANDBY	6.0	0	3.3																	

REF NO.	IC2304																			
MODE	1	2	3	4	5	6	7	8												
CD PLAY	0	0	0	0	0	3.3	0	3.3												
STANDBY	0	3.3	0	0	0	3.3	0	3.3												

REF NO.	IC2305																			
MODE	1	2	3	4	5	6	7	8												
POWER ON	3.3	0	0	1.9	5.2	0	0	5.2												
STANDBY	3.3	0	0	1.9	5.2	0	0	5.2												

REF NO.	IC2310																			
MODE	1	2	3	4	5	6	7	8												
CD PLAY	3.1	3	0	0	3.3	0	0	3.3												
STANDBY	3	0	0	0	3.3	0	0	3.3												

REF NO.	IC2901																			
MODE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
CD PLAY	1.6	2.6	2.1	1	1.5	0	20.1	20.1	5.0	5.0	18.1	18.0	20.1	20.1	18.3	1.7	1.1	2.1	2.6	2.6
STANDBY	1.6	2.6	2.1	1	1.5	0	20.1	20.1	5.0	5.0	18.1	18.0	20.1	20.1	18.3	1.7	1.1	2.1	2.6	2.6

SA-BTT190P/PC,SA-BTT195P/PC,SA-BTT196P DIGITAL P.C.B.

20.1.2. Digital P.C.B. (2/2)

REF NO.	IC2952																			
MODE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
TUNER	0	2.8	0	0	0	0	3.3	2.8	0	3.3	3.3	0	2.8	2.8	2.8	2.8	2.8	0	0	0

REF NO.	IC5401																			
MODE	1	2	3	4	5	6	7	8												
POWER ON	5.8	1.4	1.4	0	0	0	0	11.7												
STANDBY	5.8	1.4	1.4	0	0	0	0	11.7												

REF NO.	Q2301				Q2902							Q2903								
MODE	E	C	B		1	2	3	4	5	6		1	2	3	4	5	6			
POWER ON	11.8	11.8	11.1		12.0	12.0	18.0	18.0	12.0	12.0		5.0	5.0	5.0	5.0	5.0	5.0			
STANDBY	11.8	11.8	11.1		12.0	12.0	18.0	18.0	12.0	12.0		5.0	5.0	5.0	5.0	5.0	5.0			

REF NO.	Q5400				Q5403				QR2300				QR2301				QR2302			
MODE	E	C	B		E	C	B		E	C	B		E	C	B		E	C	B	
POWER ON	5.1	11.7	5.7		0	3.3	0		0	0	3.2		3.3	3.3	0		0	3.2	0	
STANDBY	5.1	11.7	5.7		0	3.3	0		0	0	3.2		3.3	3.3	0		0	3.2	0	

SA-BTT190P/PC,SA-BTT195P/PC,SA-BTT196P DIGITAL P.C.B.

20.1.3. Panel P.C.B.

REF NO.	IC6001																			
MODE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
POWER ON	0	0	0	0	1.9	0	3.3	3.3	3.3	0	0	0	3.3	0	0	-17.3	-17.3	-11.6	-.9.7	-.9.7
STANDBY	0	0	0	0	1.9	0	3.3	3.3	3.3	0	0	0	3.3	0	0	-17.3	-17.3	-11.6	-.9.7	-.9.7

REF NO.	IC6001																			
MODE	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
POWER ON	-19.1	-19.1	-19.1	-15.3	-15.3	-19.1	-19.1	-11.2	-15.4	-19.1	-.9.8	-19.1	17.1	17.4	17.1	17.1	17.1	17.4	17.1	17.4
STANDBY	-19.1	-19.1	-19.1	-15.3	-15.3	-19.1	-19.1	-11.2	-11.2	-19.1	-.9.8	-19.1	17.1	17.4	17.1	17.1	17.1	17.1	17.1	17.1

REF NO.	IC6001																			
MODE	41	42	43	44																
POWER ON	0	0	3.3	0																
STANDBY	0	0	3.3	0																

REF NO.	Q6100				Q6201				Q6202				QR6201							
MODE	E	C	B		E	C	B		E	C	B		E	C	B					
POWER ON	0	8.6	1.9		3.1	3.3	1.6		0	4.0	4.6		0	1.0	0					
STANDBY	0	8.6	1.9		3.3	3.3	1.6		0	4.0	4.6		0	1.0	0					

SA-BTT190P/PC,SA-BTT195P/PC,SA-BTT196P PANEL P.C.B.

20.1.4. D-Amp P.C.B. (1/2)

REF NO.	IC5100																			
MODE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
CD PLAY	1.5	11.2	1.2	3.1	3.3	0	0	1.4	0	0	3.0	0	0	3.3	0	0	3.9	0	0	0
STANDBY	1.5	11.3	1.2	0	0	0	0	1.4	0	0	3.0	0	0	3.3	0	0	3.9	0	0	0

REF NO.	IC5100																			
MODE	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
CD PLAY	0	0	11.2	24.0	27.6	27.6	0	0	0	0	0	27.6	24.1	24.1	27.6	0	0	0	0	0
STANDBY	0	0	11.4	10.7	27.6	27.6	0	0	0	0	0	27.6	10.7	10.7	27.6	0	0	0	0.3	0.3

REF NO.	IC5100																			
MODE	41	42	43	44																
CD PLAY	27.6	27.6	24.1	11.4																
STANDBY	27.6	27.6	10.7	11.4																

REF NO.	IC5200																			
MODE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
CD PLAY	1.5	11.2	1.2	3.1	3.3	0	0	1.4	0	0	3.0	0	0	3.3	0	0	3.9	0	0	0
STANDBY	1.5	11.3	1.2	0	0	0	0	1.4	0	0	3.0	0	0	3.3	0	0	3.9	0	0	0

REF NO.	IC5200																			
MODE	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
CD PLAY	0	0	11.2	24.0	27.6	27.6	0	0	0	0	0	27.6	24.1	24.1	27.6	0	0	0	0	0
STANDBY	0	0	11.4	10.7	27.6	27.6	0	0	0	0	0	27.6	10.7	10.7	27.6	0	0	0	0.3	0.3

REF NO.	IC5200																			
MODE	41	42	43	44																
CD PLAY	27.6	27.6	24.1	11.4																
STANDBY	27.6	27.6	10.7	11.4																

REF NO.	IC5300																			
MODE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
CD PLAY	1.5	11.2	1.2	3.1	3.3	0	0	1.4	0	0	3.0	0	0	3.3	0	0	3.9	0	0	0
STANDBY	1.5	11.3	1.2	0	0	0	0	1.4	0	0	3.0	0	0	3.3	0	0	3.9	0	0	0

REF NO.	IC5300																			
MODE	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
CD PLAY	0	0	11.2	24.0	27.6	27.6	0	0	0	0	0	27.6	24.1	24.1	27.6	0	0	0	0	0
STANDBY	0	0	11.4	10.7	27.6	27.6	0	0	0	0	0	27.6	10.7	10.7	27.6	0	0	0	0.3	0.3

REF NO.	IC5300																			
MODE	41	42	43	44																
CD PLAY	27.6	27.6	24.1	11.4																
STANDBY	27.6	27.6	10.7	11.4																

REF NO.	IC5301																			
MODE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
CD PLAY	0	3.3	0	0	0	0	1.4	1.4	3.2	0	3.3	3.3	0	0	3.1	0	1.5	1.5	1.5	0
STANDBY	0	3.3	0	0	0	0	1.4	1.4	3.2	0	3.3	3.3	0	0	3.1	0	1.5	1.5	1.5	0

SA-BTT190P/PC,SA-BTT195P/PC,SA-BTT196P D-AMP P.C.B.

20.1.5. D-Amp P.C.B. (1/2)

REF NO.	IC5301																			
MODE	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
CD PLAY	1.7	1.6	1.2	1.2	1.2	0	0	3.3	3.3	1.6	1.6	0	1.7	0	0	0	3.2	3.2	3.2	1.6
STANDBY	1.7	1.6	1.2	1.2	1.2	0	0	3.3	3.3	1.6	1.6	0	1.7	0	0	0	3.2	3.2	3.2	1.6

REF NO.	IC5301																			
MODE	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
CD PLAY	1.6	1.6	1.6	3.2	1.6	1.6	1.6	1.6	0	1.6	1.6	1.6	1.6	3.2	0	0	0	0	0	0
STANDBY	1.6	1.6	1.6	3.2	1.6	1.6	1.6	1.6	0	1.6	1.6	1.6	1.6	3.2	0	0	0	0	0	0

REF NO.	IC5301																			
MODE	61	62	63	64																
CD PLAY	0	0	0	0																
STANDBY	0	0	0	0																

REF NO.	Q5408				Q5409				Q5412				Q5413				QR5400			
MODE	E	C	B		E	C	B		E	C	B		E	C	B		E	C	B	
CD PLAY	0	0	0		0	0	0		0	3.2	0		35.0	0	27.5		3.4	3.4	11.5	
STANDBY	0	0	0		0	0	0		0	0	0		35.0	0	27.5		0	0	0	

REF NO.	QR5402																			
MODE	E	C	B																	
CD PLAY	11.4	11.0	11.5																	
STANDBY	0	0	0																	

SA-BTT190P/PC,SA-BTT195P/PC,SA-BTT196P D-AMP P.C.B.

20.1.6. SMPS P.C.B.

REF NO.	IC5701																			
MODE	1	2	3	4	5	6	7													
POWER ON	164.8	0	0	19.1	0	1.4	0													
STANDBY	164.8	0	0	19.1	0	1.4	0													

REF NO.	IC5799																			
MODE	1	2	3	4	5	6	7	8												
POWER ON	5.9	1.0	2.3	11.0	160.2	0	0	0												
STANDBY	5.9	1.0	2.3	11.0	160.2	0	0	0												

REF NO.	IC5801																			
MODE	K	A	R																	
POWER ON	3.3	0	3.0																	
STANDBY	3.3	0	3.0																	

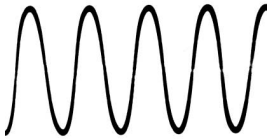
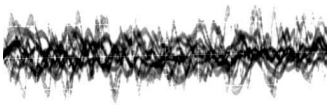
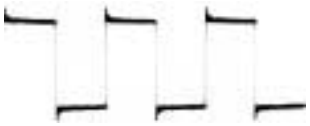
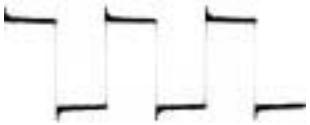
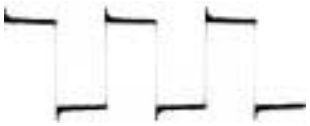
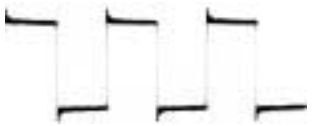
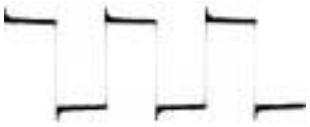
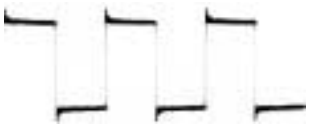
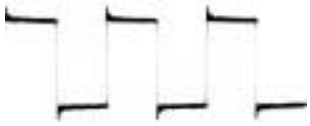
REF NO.	IC5900																			
MODE	K	A	R																	
POWER ON	3.8	2.8	2.3																	
STANDBY	3.8	2.8	2.3																	

REF NO.	Q5720				Q5898				Q5901				Q5902				QR5862			
MODE	E	C	B		E	C	B		E	C	B		E	C	B		E	C	B	
POWER ON	7.3	8.5	7.6		0	2.0	2.8		18.0	19.1	4.5		0	3.8	0		0	4.8	0	
STANDBY	7.4	8.6	7.7		0	2.0	2.8		18.0	19.1	4.5		0	3.9	0		0	4.8	0	

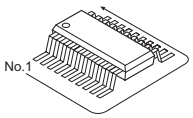
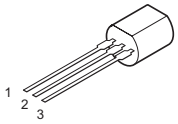
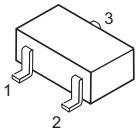
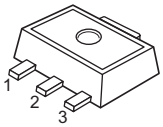
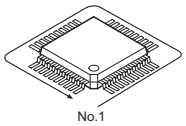
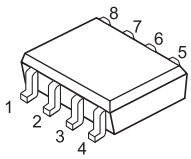
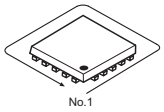
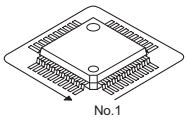
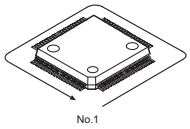
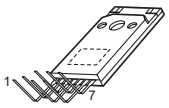
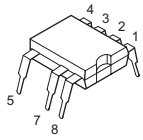
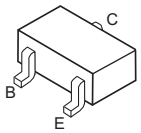
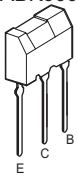
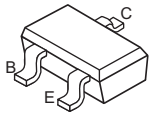
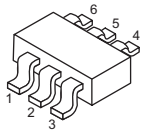
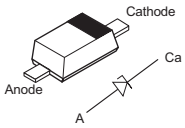
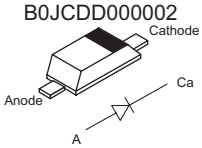
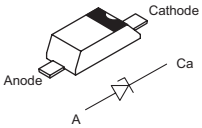
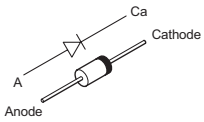
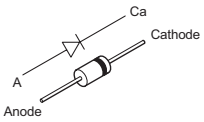
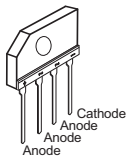
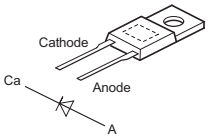
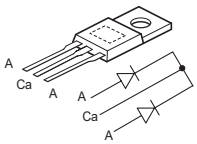
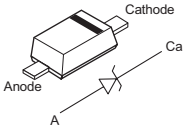
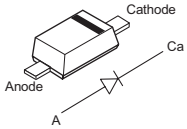
REF NO.	QR5901																			
MODE	E	C	B																	
POWER ON	0	3.0	2.0																	
STANDBY	0	3.0	2.0																	

SA-BTT190P/PC,SA-BTT195P/PC,SA-BTT196P SMPS P.C.B.

20.1.7. Waveform Table

WF No. IC2300-8 (PLAY)  1.25Vp-p(10usec/div)	WF No. IC2300-9 (PLAY)  2.5Vp-p(10usec/div)	WF No. IC2300-11 (PLAY)  4Vp-p(100nsec/div)	WF No. IC2300-13 (PLAY)  2.5Vp-p(50nsec/div)
WF No. IC2952-2,13 (PLAY)  0.4Vp-p(200usec/div)	WF No. IC5100-6,7,12,13 (PLAY)  4.8Vp-p(1usec/div)	WF No. IC5100-27,31,36, 39 (PLAY)  68Vp-p(1usec/div)	WF No. IC5200-6,7,12,13 (PLAY)  4.8Vp-p(1usec/div)
WF No. IC5200-27,31,36, 39 (PLAY)  68Vp-p(1usec/div)	WF No. IC5300-6,7,12,13 (PLAY)  4.8Vp-p(1usec/div)	WF No. IC5300-27,31,36, 39 (PLAY)  76Vp-p(1usec/div)	WF No. IC5301-7 (PLAY)  2Vp-p(20nsec/div)
WF No. IC5301-8 (PLAY)  1Vp-p(20nsec/div)	WF No. IC5301-23,24,25,26 (PLAY)  3.2Vp-p(5usec/div)	WF No. IC5301-40,41,42,43,45, 46,47,48,50,51, 52,53 (PLAY)  6Vp-p(1usec/div)	

20.2. Illustration of ICs, Transistor and Diode

C0ABBA000168 (8p) 	C0DBAYY00729 (20p) C0DBZYY00018 (8p) C1AB00003582 (44p)	C0DABYY00011 	C0DBEYY00070 	C0DBGYY01985 	C0HBB0000057 (44p) 
C0JBAR000434 	C1AB00003568 (20P) MFI337S3959 (8P) 	C1AB00003852 (64P) 	RFKWMBTT190P (100p) 	C5HACYY00007 	MIP2F20MSSCF 
B1ABCF000011 	B1ABDF000026 B1ABDF000033 B1ADCF000001 B1GBCFGG0024 B1GBCFJJ0040 B1GBCFNN0041	B1ABMG000008 B1BABK000001 	B1ABCF000176 	B1ABMF000020 B1ADCE000012 B1ADNB000003 B1GBCFGG0030 B1GBCFLL0037	B1DGDC000002 
B0BC010A0269 	B0BC013A0269 B0BC3R0A0262 B0BC6R8A0266 B0JCMD000010	B0ACCK000005 B0ECET000002 B0ECFR000003 B0JCDD000002 	B0BC035A0007 B0BC9R000008 	B0EAKM000157 B0EAMM000057 	B0EAKM000117 
B0FBAR000043 	B0HFRJ000012 B0ZAZ0000089 	B0HBSM000056 	B0JCPG000030 	DZ2J03300L 	DZ2J062M0L DZ2J200M0L DZ2J220M0L DZ2J30000L

20.3. Terminal Function of ICs

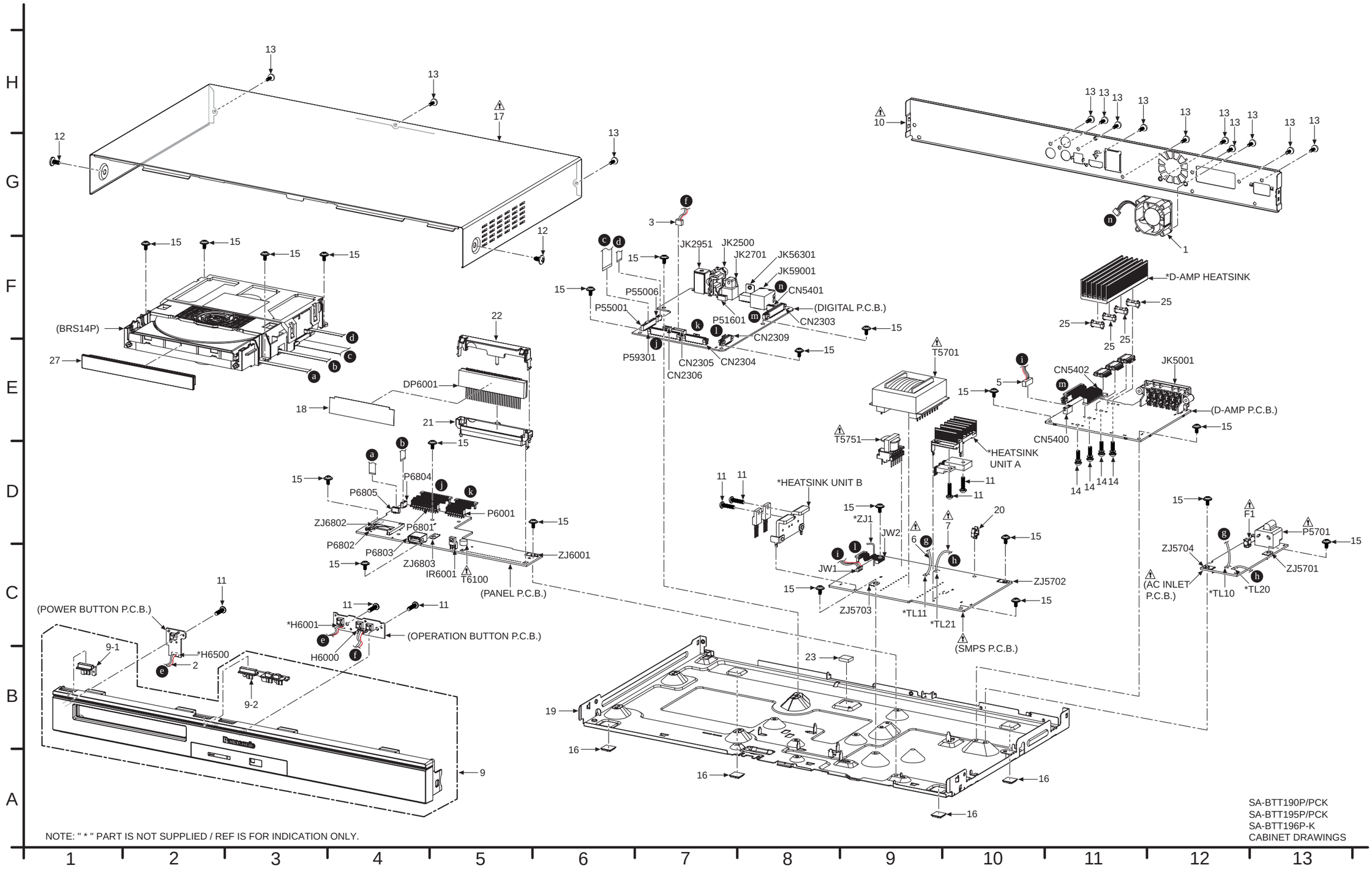
20.3.1. IC6001(C0HBB0000057): IC FL Driver

Pin No.	Terminal Name	I/O	Function
1	LED1	-	No Connection
2	LED2	-	No Connection
3	LED3	-	No Connection
4	LED4	-	No Connection
5	OSC	I	Oscillator Input
6	DOUT	-	No Connection
7	DIN	I	Data Input
8	CLK	I	Clock Input
9	STB	I	Serial Interface Strobe
10	K1	-	No Connection
11	K2	-	No Connection
12	GND	-	GND
13	VCC	-	Power Supply (+5V)
14	P18	-	No Connection
15	P17	-	No Connection
16	P16	O	Segment Output 16
17	P15	O	Segment Output 15
18	P14	O	Segment Output 14
19	P13	O	Segment Output 13
20	P12	O	Segment Output 12
21	P11	O	Segment Output 11
22	P10	O	Segment Output 10
23	P9	O	Segment Output 9
24	P8	O	Segment Output 8
25	P7	O	Segment Output 7
26	P6	O	Segment Output 6
27	P5	O	Segment Output 5
28	P4	O	Segment Output 4
29	P3	O	Segment Output 3
30	-VP	-	Voltage Supply
31	P2	O	Segment Output 2
32	P1	O	Segment Output 1
33	G1	O	Grid Segment Output 1
34	G2	O	Grid Segment Output 2
35	G3	O	Grid Segment Output 3
36	G4	O	Grid Segment Output 4
37	G5	O	Grid Segment Output5
38	G6	O	Grid Segment Output 6
39	G7	O	Grid Segment Output7
40	G8	O	Grid Segment Output 8
41	G9	O	Grid Segment Output 9
42	NC	-	No Connection
43	VCC	-	Voltage Supply (+5V)
44	GND	-	GND

21 Exploded View and Replacement Parts List

21.1. Exploded View and Mechanical Replacement Parts List

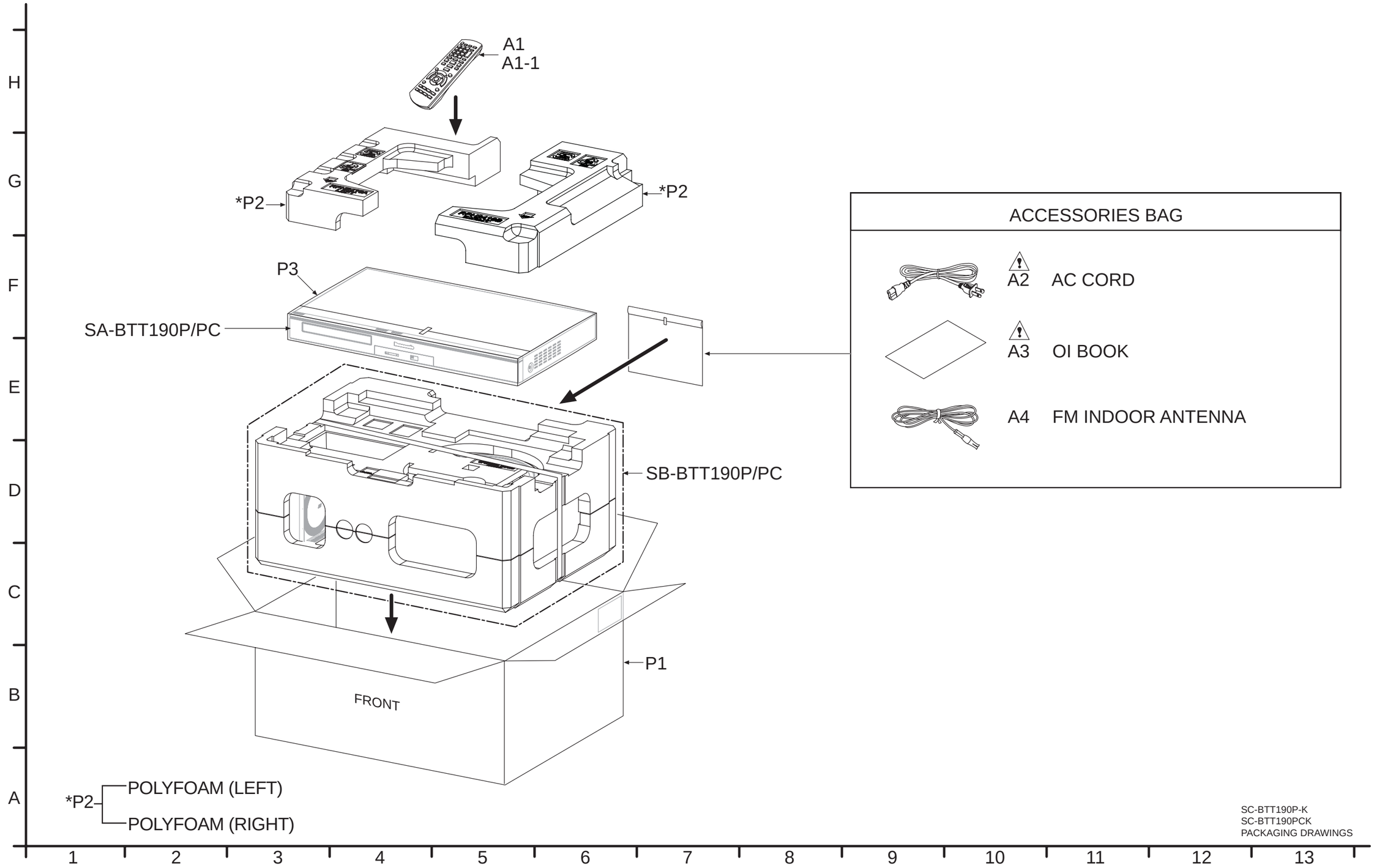
21.1.1. Cabinet Parts Location

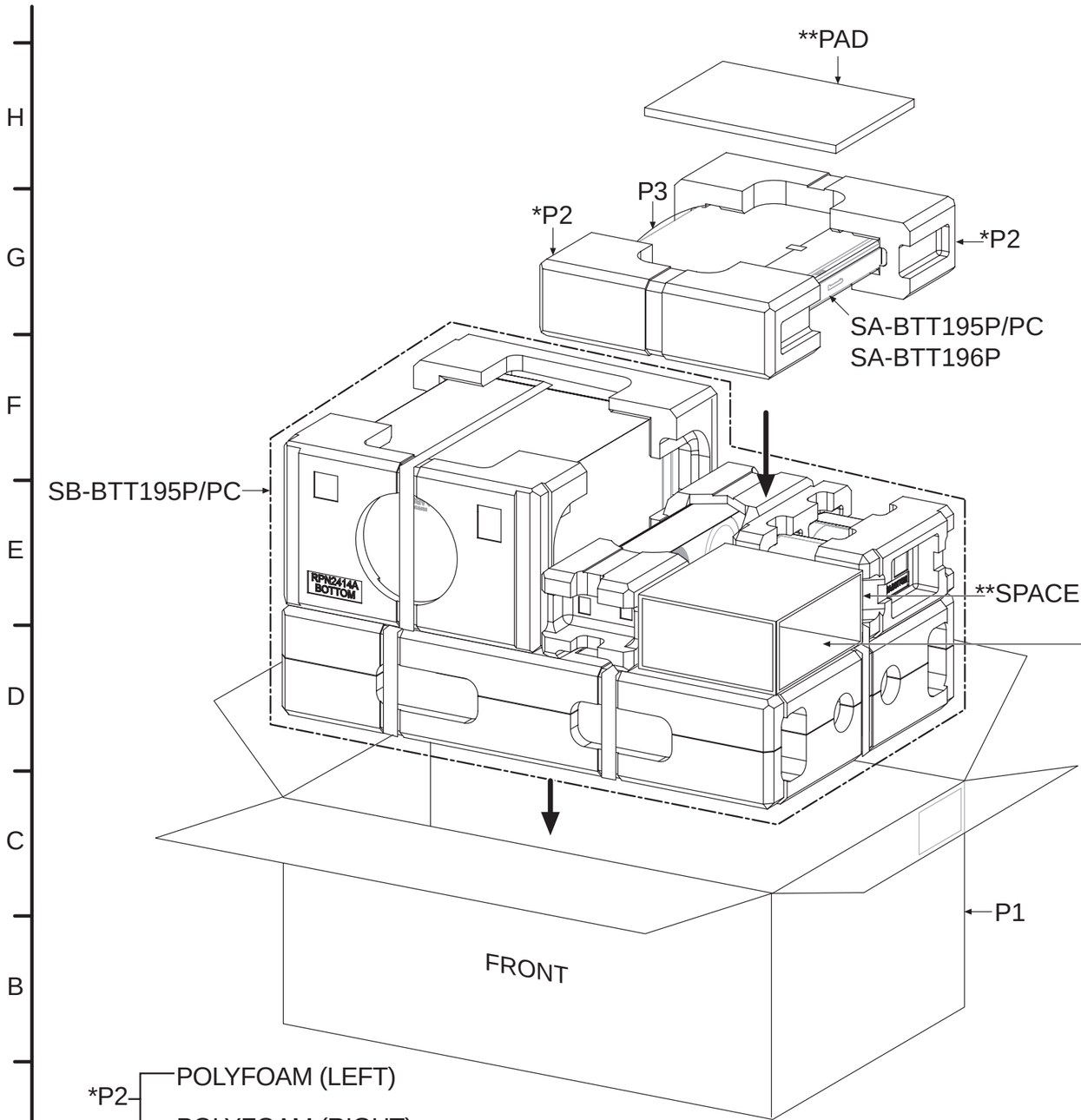


NOTE: " * " PART IS NOT SUPPLIED / REF IS FOR INDICATION ONLY.

SA-BTT190P/PCK
SA-BTT195P/PCK
SA-BTT196P-K
CABINET DRAWINGS

21.1.2. Packaging





ACCESSORIES BAG	
	A1 REMOTE CONTROL A1-1 R/C BATTERY COVER
⚠	A2 AC CORD
⚠	A3 OI BOOK
	A4 FM INDOOR ANTENNA

*P2 — POLYFOAM (LEFT)
*P2 — POLYFOAM (RIGHT)

NOTE: "**" PARTS ARE NOT SUPPLIED.

SC-BTT195P-K
SC-BTT195PCK
SC-BTT196P-K
PACKAGING DRAWINGS

21.1.3. Mechanical Replacement Part List

Important Safety Notice

Components identified by ⚠ mark have special characteristics important for safety.
When replacing any of these components, use only manufacturer's specified parts.

RTL (Retention Time Limited)

Note: The marking (RTL) indicates that the Retention Time is Limited for this item. After the discontinuation of this assembly in production, the item will continue to be available for a specific period of time. The retention period of availability is dependant on the type of assembly, and in accordance with the laws governing part and product retention. After the end of this period, the assembly will no longer be available.

Note:

- When replacing any of these components, be sure to use only manufacturer's specified parts shown in the replacement part list.
- The parenthesized indications on the Remarks column specify the destination & product color (Refer to the cover page for the information).
- Parts without these indications shall be used for all areas.
- This product uses a laser diode. Refer to "Precaution of Laser Diode".
- All parts mentioned are supplied by PAVCSG unless indicated likewise.
- Parts mentioned [SPG] in the Remarks column are supplied by PAVC-CSG.
- Reference for O/I book languages are as follows:

E.S.D. standards for Electrostatically Sensitive Devices, refer to "PREVENTION OF ELECTROSTATIC DISCHARGE (ESD) TO ELECTROSTATIC SENSITIVE (ES) DEVICES" section.

Ar:	Arabic	Du:	Dutch	It:	Italian	Sp:	Spanish
Cf:	Canadian French	En:	English	Ko:	Korean	S:	Swedish
Cz:	Czech	Fr:	French	Po:	Polish	Co:	Traditional Chinese
Da:	Danish	Ge:	German	Ru:	Russian	Cn:	Simplified Chinese
Pe:	Persian	Ur:	Ukraine	Pr:	Portuguese		

Safety	Ref. No.	Part No.	Part Name & Description	Qty	Remarks
			CABINET AND CHASSIS		
	1	L6FAYYYG0005	FAN UNIT	1	
	2	REX1426	3P WIRE (OPERATION BTN-POWER BTN)	1	
	3	REX1513	3P CABLE WIRE (DIGITAL-PANEL)	1	
	5	REXX1202	4P CABLE WIRE (D-AMP-SMPS)	1	
⚠	6	REXX1186-J	1P RED WIRE (AC INLET-SMPS)	1	
⚠	7	REXX1187-J	1P BLACK WIRE (AC INLET-SMPS)	1	
	9	RYP1759A-K	FRONT PANEL UNIT	1	BTT195P /PC
	9	RYP1759-K	FRONT PANEL UNIT	1	BTT190P /PC
	9	RYP1759G-K	FRONT PANEL UNIT	1	BTT196P
	9-1	RGUX1033-K1	POWER BUTTON	1	
	9-2	RGUX1034-K1	OPEN/CLOSE BUTTON	1	
⚠	10	RGR0428D-A1	REAR PANEL	1	BTT190P
⚠	10	RGR0428D-B1	REAR PANEL	1	BTT190P C
⚠	10	RGR0428D-C1	REAR PANEL	1	BTT195P
⚠	10	RGR0428D-D1	REAR PANEL	1	BTT195P C
⚠	10	RGR0428D-K	REAR PANEL	1	BTT196P
	11	RHD26046	SCREW	7	
	12	RHD30007-K2J	SCREW	2	

Safety	Ref. No.	Part No.	Part Name & Description	Qty	Remarks
	13	RHD30119-S	SCREW	13	
	14	RHDX261002	SCREW	4	
	15	RHD30172	SCREW	20	
	16	RKA0253-H	LEG CUSHION	4	
⚠	17	RKM0668-K1	TOP CABINET	1	
	18	RKWX1003-R	FL FILTER	1	
	19	RMK0810	BOTTOM CHASSIS	1	
	20	RMN0971	WIRE CLAMPER	1	
	21	RMN1015	FL HOLDER BOTTOM	1	
	22	RMN1020	FL HOLDER TOP	1	
	23	RSC0905	RADIATOR SHEET	1	
	25	RMZX1021	HEATSINK SPACER	4	
	27	RGK2322-K	TRAY ORANMENT	1	
			PACKING MATERIALS		
	P1	RPG9883-1	PACKING CASE	1	BTT190P
	P1	RPG9884-1	PACKING CASE	1	BTT190P C
	P1	RPG9885-1	PACKING CASE	1	BTT195P
	P1	RPG9886	PACKING CASE	1	BTT195P C
	P1	RPG0A90-1	PACKING CASE	1	BTT196P
	P2	RPN2415	POLYFOAM	1	BTT195P /PC, BTT196P
	P2	RPN2416	POLYFOAM	1	BTT190P /PC
	P3	RPFX1012-1	MIRAMAT	1	
			ACCESSORIES		

Safety	Ref. No.	Part No.	Part Name & Description	Qty	Remarks
	A1	N2QAYB000727	REMOTE CONTROL	1	
	A1-1	RKK-BTT270PK	R/C BATTERY COVER	1	
⚠	A2	K2CB2CB00021	AC CORD	1	
⚠	A3	VQT3X51	O/I BOOK (En)	1	BTT190P /PC, BTT195P /PC
⚠	A3	VQT3X51-1	O/I BOOK (En)	1	BTT196P
⚠	A3	VQT3X52	O/I BOOK (Cf)	1	BTT190P C, BTT195P C
	A4	RSAX0002	FM INDOOR ANTENNA	1	

21.2. Electrical Replacement Part List

Important Safety Notice

Components identified by ⚠ mark have special characteristics important for safety.
When replacing any of these components, use only manufacturer's specified parts.

RTL (Retention Time Limited)

Note: The marking (RTL) indicates that the Retention Time is Limited for this item. After the discontinuation of this assembly in production, the item will continue to be available for a specific period of time. The retention period of availability is dependant on the type of assembly, and in accordance with the laws governing part and product retention. After the end of this period, the assembly will no longer be available.

Note:

- When replacing any of these components, be sure to use only manufacturer's specified parts shown in the replacement part list.
- The parenthesized indications on the Remarks column specify the destination & product color (Refer to the cover page for the information).
- Parts without these indications shall be used for all areas.
- This product uses a laser diode. Refer to "Precaution of Laser Diode".
- Capacitor value are in microfarads (uF) unless specified otherwise, P=Pico-farads (pF), F=Farads.
- Resistance values are in ohms, unless specified otherwise, 1K=1000 (OHM).
- All parts mentioned are supplied by PAVCSG unless indicated likewise.
- Parts mentioned [SPG] in the Remarks column are supplied by PAVC-CSG.

E.S.D. standards for Electrostatically Sensitive Devices, refer to "PREVENTION OF ELECTROSTATIC DISCHARGE (ESD) TO ELECTROSTATIC SENSITIVE (ES) DEVICES" section.

Safety	Ref. No.	Part No.	Part Name & Description	Qty	Remarks
			PRINTED CIR-CUITS BOARDS		
	PCB1	RFKB4753E	DIGITAL P.C.B	1	E.S.D. (JIG & ADJ), BTT195P /PC, BTT196P
	PCB1	RFKB4753A	DIGITAL P.C.B	1	E.S.D. (JIG & ADJ), BTT190P /PC
	PCB2	REP4754AA	PANEL PCB	1	(RTL)
	PCB3	REP4754AB	POWER BUTTON P.C.B.	1	(RTL)
	PCB4	REP4754AB	OPERATION BUT-TON P.C.B.	1	(RTL)
	PCB5	REP4750A	D-AMP P.C.B.	1	(RTL)
⚠	PCB6	REP4740A	SMPS P.C.B.	1	(RTL)
⚠	PCB7	REP4740A	AC INLET P.C.B.	1	(RTL)
			INTERGRATED CIR-CUITS		
	IC2300	RFKWMBTT190P	IC	1	
	IC2302	C0DBGYY01985	IC	1	
	IC2304	MFI337S3959	IC	1	
	IC2305	C0DBZYY00018	IC	1	
	IC2310	C0JBAR000434	IC	1	
	IC2901	C0DBAYY00729	IC	1	
	IC2952	C1AB00003568	IC	1	
	IC5100	C1AB00003582	IC	1	
	IC5200	C1AB00003582	IC	1	
	IC5300	C1AB00003582	IC	1	

Safety	Ref. No.	Part No.	Part Name & Description	Qty	Remarks
	IC5301	C1AB00003852	IC	1	
	IC5401	C0ABBA000168	IC	1	
	IC5701	C5HACYY00007	IC	1	
	IC5799	MIP2F20MSSCF	IC	1	
	IC5801	C0DABYY00011	IC	1	
	IC5900	C0DBEYY00070	IC	1	
	IC6001	C0HBB0000057	IC	1	
			TRANSISTORS		
	Q2301	B1ADNB000003	TRANSISTOR	1	
	Q2902	B1DGDC000002	TRANSISTOR	1	
	Q2903	B1DGDC000002	TRANSISTOR	1	
	Q5400	B1ABMF000020	TRANSISTOR	1	
	Q5403	B1GBCFNN0041	TRANSISTOR	1	
	Q5408	B1ABCF000011	TRANSISTOR	1	
	Q5409	B1ABCF000011	TRANSISTOR	1	
	Q5412	B1ABCF000011	TRANSISTOR	1	
	Q5413	B1ADCE000012	TRANSISTOR	1	
	Q5720	B1ABMG000008	TRANSISTOR	1	
	Q5898	B1ABCF000176	TRANSISTOR	1	
	Q5901	B1ADCF000001	TRANSISTOR	1	
	Q5902	B1ABCF000176	TRANSISTOR	1	
	Q6100	B1BABK000001	TRANSISTOR	1	
	Q6201	B1ABDF000033	TRANSISTOR	1	
	Q6202	B1ABDF000026	TRANSISTOR	1	
	QR2300	B1GBCFJJ0040	TRANSISTOR	1	
	QR2301	B1GBCFJJ0040	TRANSISTOR	1	
	QR2302	B1GBCFGG0024	TRANSISTOR	1	
	QR5400	B1GBCFNN0041	TRANSISTOR	1	
	QR5402	B1GBCFNN0041	TRANSISTOR	1	
	QR5862	B1GBCFGG0030	TRANSISTOR	1	
	QR5901	B1GBCFLL0037	TRANSISTOR	1	
	QR6201	B1GBCFJJ0040	TRANSISTOR	1	

Safety	Ref. No.	Part No.	Part Name & Description	Qty	Remarks
			DIODES		
	D2300	B0ACCK000005	DIODE	1	
	D2301	B0BC3R0A0262	DIODE	1	
	D2302	B0ACCK000005	DIODE	1	
	D2303	B0BC6R8A0266	DIODE	1	
	D2306	B0ACCK000005	DIODE	1	
	D2309	B0BC013A0269	DIODE	1	
	D2310	B0ACCK000005	DIODE	1	
	D2311	B0ACCK000005	DIODE	1	
	D2312	B0BC010A0269	DIODE	1	
	D2911	B0JCPG000030	DIODE	1	
	D2912	B0JCPG000030	DIODE	1	
	D5401	B0ACCK000005	DIODE	1	
	D5402	B0ACCK000005	DIODE	1	
	D5403	B0JCDD000002	DIODE	1	
	D5405	B0JCDD000002	DIODE	1	
	D5407	B0ACCK000005	DIODE	1	
	D5701	B0FBAR000043	DIODE	1	
	D5702	B0ZAZ0000089	DIODE	1	
	D5703	DZ2J062M0L	DIODE	1	
	D5704	DZ2J200M0L	DIODE	1	
	D5705	DZ2J200M0L	DIODE	1	
	D5706	B0ACCK000005	DIODE	1	
	D5707	DZ2J062M0L	DIODE	1	
	D5708	B0ACCK000005	DIODE	1	
	D5709	B0ACCK000005	DIODE	1	
	D5710	B0ECFR000003	DIODE	1	
	D5711	B0ECET000002	DIODE	1	
	D5712	B0EAMM000057	DIODE	1	
	D5713	B0BC035A0007	DIODE	1	
	D5714	DZ2J30000L	DIODE	1	
	D5716	B0EAMM000057	DIODE	1	
	D5791	B0BC9R000008	DIODE	1	
	D5802	B0HBSM000056	DIODE	1	
	D5803	B0HFRJ000012	DIODE	1	
	D5896	B0EAMM000057	DIODE	1	
	D5901	B0EAKM000117	DIODE	1	
	D5903	B0ACCK000005	DIODE	1	
	D6100	B0JCMD000010	DIODE	1	
	D6101	DZ2J220M0L	DIODE	1	
	D6102	B0JCMD000010	DIODE	1	
	D6103	DZ2J03300L	DIODE	1	
	D6104	B0EAKM000157	DIODE	1	
⚠	DZ5701	ERZV10V511CS	ZNR	1	
			VARISTOR		
	VA2951	EZAEG2A50AX	VARISTOR	1	
			SWITCHES		
	S6002	EVQ21405R	SW OPEN/CLOSE	1	
	S6004	EVQ21405R	SW VOL -	1	
	S6005	EVQ21405R	SW VOL +	1	
	S6501	EVQ21405R	SW POWER	1	
			CONNECTORS		
	CN2303	K1KY23AA0607	23P CONNECTOR	1	
	CN2304	K1KY15AA0607	15P CONNECTOR	1	
	CN2305	K1KA03AA0150	3P CONNECTOR	1	
	CN2306	K1MN10AA0046	10P CONNECTOR	1	
	CN2309	K1KY09AA0607	9P CONNECTOR	1	
	CN5400	K1KA04AA0193	4P CONNECTOR	1	
	CN5401	K1KA03AA0083	3P CONNECTOR	1	
	CN5402	K1KY23AA0606	23P CONNECTOR	1	
	P6001	K1KY15AA0606	15P CONNECTOR	1	
	P6801	K1KY23AA0606	23P CONNECTOR	1	
	P6802	K1NA12B00005	SD CARD SLOT	1	
	P6803	K1FY104B0076	USB PORT	1	
	P6804	K1MN05A00003	5P CONNECTOR	1	
	P6805	K1MN05A00003	5P CONNECTOR	1	

Safety	Ref. No.	Part No.	Part Name & Description	Qty	Remarks
	JW2	K1KY09AA0606	9P CONNECTOR	1	
			COILS AND INDUCTORS		
	L2300	G1C100M00049	INDUCTOR	1	
	L2301	G1C4R7MA0172	INDUCTOR	1	
	L2900	J0JHC0000107	INDUCTOR	1	
	L2901	J0JHC0000107	INDUCTOR	1	
	L2902	G1C100MA0291	INDUCTOR	1	
	L2903	G1C330M00027	INDUCTOR	1	
	L2904	G1C330Z00012	INDUCTOR	1	
	L2907	G1C1R0MA0530	INDUCTOR	1	
	L2908	J0JHC0000107	INDUCTOR	1	
	L2951	G1CR18JA0020	INDUCTOR	1	
	L5100	G0C100M00007	INDUCTOR	1	
	L5101	G0C100M00007	INDUCTOR	1	
	L5102	G0B9R5K00007	LINE FILTER	1	
	L5103	G0B9R5K00007	LINE FILTER	1	
	L5200	G0C100M00007	INDUCTOR	1	
	L5201	G0C100M00007	INDUCTOR	1	
	L5202	G0B9R5K00007	LINE FILTER	1	
	L5203	G0B9R5K00007	LINE FILTER	1	
	L5300	J0JBC0000015	INDUCTOR	1	
	L5301	G0C100M00007	INDUCTOR	1	
	L5302	G0C100M00007	INDUCTOR	1	
	L5303	G0B9R5K00007	LINE FILTER	1	
	L5304	G0B9R5K00007	LINE FILTER	1	
	L5401	J0JKB0000003	INDUCTOR	1	
	L5402	J0JKB0000003	INDUCTOR	1	
	L5403	G1C4R7MA0172	INDUCTOR	1	
	L5404	G1C4R7MA0172	INDUCTOR	1	
⚠	L5701	ELF19H520E	LINE FILTER	1	
⚠	L5702	ELF19H520E	LINE FILTER	1	
	L6100	J0JBC0000041	INDUCTOR	1	
	L6101	G1C100K00019	INDUCTOR	1	
	LB2300	J0JGC0000020	INDUCTOR	1	
	LB2301	J0JGC0000020	INDUCTOR	1	
	LB2302	J0JGC0000020	INDUCTOR	1	
	LB2303	J0JHC0000107	INDUCTOR	1	
	LB2305	J0JGC0000020	INDUCTOR	1	
	LB2306	J0JHC0000107	INDUCTOR	1	
	LB2307	J0JHC0000107	INDUCTOR	1	
	LB2315	J0JGC0000020	INDUCTOR	1	
	LB2701	J0JBC0000014	INDUCTOR	1	
	LB2800	J0JBC0000014	INDUCTOR	1	
	LB2809	J0JBC0000014	INDUCTOR	1	
	LB2835	J0JBC0000014	INDUCTOR	1	
	LB2836	J0JBC0000014	INDUCTOR	1	
	LB2837	J0JBC0000014	INDUCTOR	1	
	LB2838	J0JBC0000014	INDUCTOR	1	
	LB2839	J0JBC0000014	INDUCTOR	1	
	LB2840	J0JBC0000014	INDUCTOR	1	
	LB2842	J0JBC0000014	INDUCTOR	1	
	LB2843	J0JBC0000014	INDUCTOR	1	
	LB2951	J0JBC0000032	INDUCTOR	1	
	LB2952	J0JYC0000118	INDUCTOR	1	
	LB6801	J0JHC0000117	INDUCTOR	1	
	LB6802	J0JHC0000045	INDUCTOR	1	
			CABLE HOLDERS		
	H6000	K1YZ03000010	3P CABLE HOLDER	1	
	JW1	K1YZ04000002	4P CABLE HOLDER	1	
			TRANSFORMERS		
⚠	T5701	ETS40BD15GAD	MAIN TRANSFORMER	1	
⚠	T5751	ETS19AB2E6AG	SUB TRANSFORMER	1	
⚠	T6100	G4D1A0000142	SWITCHING TRANSFORMER	1	
			PHOTO COUPLERS		

Safety	Ref. No.	Part No.	Part Name & Description	Qty	Remarks
⚠	PC5702	B3PBA0000503	PHOTO COUPLER	1	
⚠	PC5720	B3PBA0000503	PHOTO COUPLER	1	
⚠	PC5799	B3PBA0000503	PHOTO COUPLER	1	
⚠	PC5901	B3PBA0000503	PHOTO COUPLER	1	
			TERMINALS		
	ZJ5701	K4CZ01000027	TERMINAL	1	
	ZJ5702	K4CZ01000027	TERMINAL	1	
	ZJ5703	K4CZ01000027	TERMINAL	1	
	ZJ5704	K4CZ01000027	TERMINAL	1	
	ZJ6001	K4CZ01000027	TERMINAL	1	
	ZJ6802	K4CZ01000027	TERMINAL	1	
	ZJ6803	K4CZ01000027	TERMINAL	1	
			OSCILLATORS		
	X2300	H2D500400006	CRYSTAL OSCILLATOR	1	
	X2301	H0J327200115	CRYSTAL OSCILLATOR	1	
	X5302	H0J245500101	CRYSTAL OSCILLATOR	1	
			LCD DISPLAY		
	DP6001	A2BB00000183	LCD DISPLAY	1	
			FUSE		
⚠	F1	K5D602APA008	FUSE	1	
			FUSE HOLDERS		
	ZA5701	K3GE1ZZ00001	FUSE HOLDER	1	
	ZA5702	K3GE1ZZ00001	FUSE HOLDER	1	
			REMOTE SENSOR		
	IR6001	PNJ4881M02VT	REMOTE SENSOR	1	
			BUZZER		
	BZ6201	L0DCDA000011	BUZZER	1	
			THERMISTOR		
⚠	TH5702	D4CAA2R20001	THERMISTOR	1	
			JACKS		
	JK2500	K2HA2YYA0005	JK AUX	1	
	JK2701	B3RAB0000056	JK DIGITAL AUDIO	1	
	JK2951	K4ZZ01000276	JK FM ANTENNA	1	
	JK5001	K4AL06B00006	JK SPEAKERS	1	
⚠	P5701	K2AB2B000007	AC INLET	1	
			CHIP JUMPERS		
	K5720	D0GDR00JA017	0 1/8W	1	
	K6802	D0GBR00JA008	0 1/10W	1	
	K6804	D0GBR00JA008	0 1/10W	1	
	K6806	D0GBR00JA008	0 1/10W	1	
	L6503	D0GBR00JA008	0 1/10W	1	
	L6504	D0GBR00JA008	0 1/10W	1	
	LB2570	D0GBR00JA008	0 1/10W	1	
	LB2571	D0GBR00JA008	0 1/10W	1	
	W101	D0GBR00JA008	0 1/10W	1	
	W101	D0GDR00JA017	0 1/8W	1	
	W102	D0GDR00JA017	0 1/8W	1	
	W103	D0GBR00JA008	0 1/10W	1	
	W103	D0GDR00JA017	0 1/8W	1	

Safety	Ref. No.	Part No.	Part Name & Description	Qty	Remarks
	W104	D0GBR00JA008	0 1/10W	1	
	W104	D0GDR00JA017	0 1/8W	1	
	W105	D0GBR00JA008	0 1/10W	1	
	W106	D0GBR00JA008	0 1/10W	1	
	W107	D0GBR00JA008	0 1/10W	1	
	W108	D0GDR00JA017	0 1/8W	1	
			RESISTORS		
	R2300	ERJ3GEYJ3R3V	3.3 1/10W	1	
	R2301	D0GA273JA023	27K 1/16W	1	
	R2308	D0GA330JA023	33 1/16W	1	
	R2309	D0GA221JA023	220 1/16W	1	
	R2310	D0GA103JA023	10K 1/16W	1	
	R2311	D0GA103JA023	10K 1/16W	1	
	R2312	D0GA102JA023	1K 1/16W	1	
	R2315	ERJ2GEJ154X	150K 1/16W	1	
	R2316	D0GA101JA023	100 1/16W	1	
	R2317	D0GA101JA023	100 1/16W	1	
	R2322	D0GA104JA023	100K 1/16W	1	
	R2323	D0GA104JA023	100K 1/16W	1	
	R2324	D0GA103JA023	10K 1/16W	1	
	R2327	D0GA104JA023	100K 1/16W	1	
	R2328	D0GA103JA023	10K 1/16W	1	
	R2332	D0GA472JA023	4.7K 1/16W	1	
	R2333	D0GA472JA023	4.7K 1/16W	1	
	R2335	D0GA473JA023	47K 1/16W	1	
	R2336	D0GA332JA023	3.3K 1/16W	1	
	R2337	D0GA103JA023	10K 1/16W	1	
	R2338	D0GA102JA023	1K 1/16W	1	
	R2341	D0GA473JA023	47K 1/16W	1	
	R2342	D0GA473JA023	47K 1/16W	1	
	R2349	D0GB272JA008	2.7K 1/10W	1	
	R2352	D0GA103JA023	10K 1/16W	1	
	R2359	D0GA104JA023	100K 1/16W	1	
	R2361	D0GA473JA023	47K 1/16W	1	
	R2374	D0GA331JA023	330 1/16W	1	
	R2375	D0GA331JA023	330 1/16W	1	
	R2383	D0GA472JA023	4.7K 1/16W	1	
	R2384	D0GA472JA023	4.7K 1/16W	1	
	R2394	D0GA470JA023	47 1/16W	1	
	R2398	D0GA472JA023	4.7K 1/16W	1	
	R2414	ERJ2GE0R00X	0 1/16W	1	
	R2415	ERJ2GE0R00X	0 1/16W	1	
	R2428	D0GB272JA008	2.7K 1/10W	1	
	R2440	ERJ2GE0R00X	0 1/16W	1	
	R2456	ERJ2GE0R00X	0 1/16W	1	
	R2457	ERJ2GE0R00X	0 1/16W	1	
	R2461	ERJ2GE0R00X	0 1/16W	1	
	R2467	D0GA472JA023	4.7K 1/16W	1	
	R2468	D0GA472JA023	4.7K 1/16W	1	
	R2570	D0GB153JA008	15K 1/10W	1	
	R2571	D0GB153JA008	15K 1/10W	1	
	R2653	D0GA472JA023	4.7K 1/16W	1	
	R2654	D0GA472JA023	4.7K 1/16W	1	
	R2655	D0GA221JA023	220 1/16W	1	
	R2656	D0GB221JA007	220 1/10W	1	
	R2657	D0GA102JA023	1K 1/16W	1	
	R2659	D0GB222JA008	2.2K 1/10W	1	
	R2660	D0GBR00JA008	0 1/10W	1	
	R2663	D0GA102JA023	1K 1/16W	1	
	R2664	D0GA102JA023	1K 1/16W	1	
	R2671	ERJ2GEJ561X	560 1/16W	1	
	R2672	D0GA222JA023	2.2K 1/16W	1	
	R2673	D0GA222JA023	2.2K 1/16W	1	
	R2907	D0GB100JA008	10 1/10W	1	
	R2908	ERJ3RBD1002V	10K 1/16W	1	
	R2913	D0GB100JA008	10 1/10W	1	
	R2914	D0GB223JA008	22K 1/10W	1	
	R2915	D0GBR00JA008	0 1/10W	1	
	R2916	D0GB223JA008	22K 1/10W	1	
	R2917	D0GB332JA008	3.3K 1/10W	1	
	R2918	D0GB332JA008	3.3K 1/10W	1	

Safety	Ref. No.	Part No.	Part Name & Description	Qty	Remarks
	R2919	ERJ6RSJR10V	0.1 1/10W	1	
	R2920	D0GB822JA008	8.2K 1/10W	1	
	R2921	ERJ3RBD3902V	39K 1/16W	1	
	R2922	ERJ6RSJR10V	0.1 1/10W	1	
	R2923	D0GB222JA008	2.2K 1/10W	1	
	R2924	ERJ3RBD5601V	5.6K 1/16W	1	
	R2925	ERJ3RBD5602V	56K 1/16W	1	
	R2926	D0GB822JA008	8.2K 1/10W	1	
	R2927	D0GB103JA008	10K 1/10W	1	
	R2929	ERJ3RBD3301V	3.3K 1/16W	1	
	R2930	ERJ3RBD4701V	4.7K 1/16W	1	
	R2955	D0GBR00JA008	0 1/10W	1	
	R2956	D0GB472JA008	4.7K 1/10W	1	
	R5100	D0GB100JA008	10 1/10W	1	
	R5102	D0GB473JA008	47K 1/10W	1	
	R5103	D0GB101JA008	100 1/10W	1	
	R5104	D0GB223JA008	22K 1/10W	1	
	R5105	D0GB100JA008	10 1/10W	1	
	R5106	D0GB100JA008	10 1/10W	1	
	R5107	ERJ3GEYJ3R3V	3.3 1/10W	1	
	R5108	ERJ3GEYJ3R3V	3.3 1/10W	1	
	R5109	ERJ3GEYJ3R3V	3.3 1/10W	1	
	R5110	D0GB104JA008	100K 1/10W	1	
	R5111	D0GB104JA008	100K 1/10W	1	
	R5112	ERJ3GEYJ3R3V	3.3 1/10W	1	
	R5113	D0GD103JA017	10K 1/8W	1	
	R5114	D0GD103JA017	10K 1/8W	1	
	R5117	D0GB104JA008	100K 1/10W	1	
	R5118	D0GB104JA008	100K 1/10W	1	
	R5200	D0GB100JA008	10 1/10W	1	
	R5201	D0GB473JA008	47K 1/10W	1	
	R5202	D0GB101JA008	100 1/10W	1	
	R5203	D0GB473JA008	47K 1/10W	1	
	R5205	D0GB223JA008	22K 1/10W	1	
	R5206	D0GB100JA008	10 1/10W	1	
	R5207	D0GB100JA008	10 1/10W	1	
	R5208	ERJ3GEYJ3R3V	3.3 1/10W	1	
	R5209	ERJ3GEYJ3R3V	3.3 1/10W	1	
	R5210	ERJ3GEYJ3R3V	3.3 1/10W	1	
	R5211	ERJ3GEYJ3R3V	3.3 1/10W	1	
	R5212	D0GD103JA017	10K 1/8W	1	
	R5213	D0GD103JA017	10K 1/8W	1	
	R5216	D0GB104JA008	100K 1/10W	1	
	R5217	D0GB104JA008	100K 1/10W	1	
	R5218	D0GB104JA008	100K 1/10W	1	
	R5219	D0GB104JA008	100K 1/10W	1	
	R5220	D0GB562JA008	5.6K 1/10W	1	
	R5221	D0GB562JA008	5.6K 1/10W	1	
	R5300	D0GB100JA008	10 1/10W	1	
	R5301	D0GB101JA008	100 1/10W	1	
	R5303	D0GB223JA008	22K 1/10W	1	
	R5304	D0GB100JA008	10 1/10W	1	
	R5305	D0GB100JA008	10 1/10W	1	
	R5306	ERJ3GEYJ3R3V	3.3 1/10W	1	
	R5307	ERJ3GEYJ3R3V	3.3 1/10W	1	
	R5308	ERJ3GEYJ3R3V	3.3 1/10W	1	
	R5309	ERJ3GEYJ3R3V	3.3 1/10W	1	
	R5310	D0GD103JA017	10K 1/8W	1	
	R5311	D0GD103JA017	10K 1/8W	1	
	R5314	D0GB104JA008	100K 1/10W	1	
	R5315	D0GB104JA008	100K 1/10W	1	
	R5316	D0GB104JA008	100K 1/10W	1	
	R5317	D0GB104JA008	100K 1/10W	1	
	R5318	D0GB562JA008	5.6K 1/10W	1	
	R5319	D0GB562JA008	5.6K 1/10W	1	
	R5324	D0GB220JA008	22 1/10W	1	
	R5358	D0GB105JA008	1M 1/10W	1	
	R5359	D0GB102JA008	1K 1/10W	1	
	R5360	D0GB103JA008	10K 1/10W	1	
	R5362	D0GB1R0JA008	1 1/10W	1	
	R5363	D0GB473JA008	47K 1/10W	1	
	R5365	D0GB470JA008	47 1/10W	1	
	R5366	D0GB470JA008	47 1/10W	1	

Safety	Ref. No.	Part No.	Part Name & Description	Qty	Remarks
	R5375	D0GB470JA008	47 1/10W	1	
	R5376	D0GB470JA008	47 1/10W	1	
	R5377	D0GB470JA008	47 1/10W	1	
	R5378	D0GB470JA008	47 1/10W	1	
	R5384	D0GB1R0JA008	1 1/10W	1	
	R5385	D0GB103JA008	10K 1/10W	1	
	R5387	D0GB470JA008	47 1/10W	1	
	R5388	D0GB220JA008	22 1/10W	1	
	R5395	D0GB331JA008	330 1/10W	1	
	R5396	D0GB470JA008	47 1/10W	1	
	R5397	D0GB470JA008	47 1/10W	1	
	R5398	D0GB331JA008	330 1/10W	1	
	R5422	D0GB103JA008	10K 1/10W	1	
	R5424	D0GB471JA008	470 1/10W	1	
	R5427	D0GB473JA008	47K 1/10W	1	
	R5428	D0GB103JA008	10K 1/10W	1	
	R5429	D0GB103JA008	10K 1/10W	1	
	R5430	D0GB273JA008	27K 1/10W	1	
	R5431	D0GB333JA008	33K 1/10W	1	
	R5435	D0GB274JA007	270K 1/10W	1	
	R5436	D0GA103JA023	10K 1/16W	1	
	R5436	D0GB223JA008	22K 1/10W	1	
	R5437	D0GB472JA008	4.7K 1/10W	1	
	R5438	D0GB104JA008	100K 1/10W	1	
	R5439	D0GB104JA008	100K 1/10W	1	
	R5445	D0GB103JA008	10K 1/10W	1	
	R5475	F1H1H102A219	1000pF 50V	1	
⚠	R5700	ERJ8GEYJ155V	1.5M 1/4W	1	
⚠	R5701	ERJ8GEYJ155V	1.5M 1/4W	1	
	R5702	ERJ1TYJ333U	33K 1W	1	
	R5703	ERJ1TYJ333U	33K 1W	1	
	R5704	D0GF394JA017	390K 1/4W	1	
	R5707	D0GF394JA017	390K 1/4W	1	
	R5720	D0GD220JA017	22 1/8W	1	
	R5721	D0GD103JA017	10K 1/8W	1	
	R5722	D0GD222JA017	2.2K 1/8W	1	
	R5725	D0GB473JA008	47K 1/10W	1	
	R5726	ERJ1TRSJR15U	0.15 1W	1	
	R5727	ERJ1TRSJR15U	0.15 1W	1	
	R5729	D0GB473JA008	47K 1/10W	1	
	R5730	D0GB102JA008	1K 1/10W	1	
	R5732	ERJ6GEYJ221V	220 1/8W	1	
	R5733	D0GB473JA008	47K 1/10W	1	
	R5795	D0GD474JA017	470K 1/8W	1	
	R5797	D0GB153JA008	15K 1/10W	1	
	R5798	D0GB220JA008	22 1/10W	1	
	R5801	D0GB101JA008	100 1/10W	1	
	R5803	ERJ6GEYJ221V	220 1/8W	1	
	R5804	ERJ3RBD823V	82K 1/16W	1	
	R5805	ERJ3RBD562V	5.6K 1/16W	1	
	R5806	D0GB153JA008	15K 1/10W	1	
	R5807	D0GD681JA017	680 1/8W	1	
	R5808	D0GB222JA008	2.2K 1/10W	1	
	R5809	D0GD681JA017	680 1/8W	1	
	R5814	D0GB104JA008	100K 1/10W	1	
	R5818	D0GB471JA008	470 1/10W	1	
	R5821	D0GB104JA008	100K 1/10W	1	
	R5832	ERJ1TYJ822U	8.2K 1W	1	
	R5862	D0GD222JA017	2.2K 1/8W	1	
	R5864	D0GB182JA008	1.8K 1/10W	1	
	R5890	D0GB222JA008	2.2K 1/10W	1	
	R5891	ERJ3RBD363V	36K 1/16W	1	
	R5893	D0HB183ZA002	18K 1/16W	1	
	R5894	D0GB151JA008	150 1/10W	1	
	R5895	D0GB153JA008	15K 1/10W	1	
	R5897	D0GB101JA008	100 1/10W	1	
	R5898	D0GD824JA017	820K 1/8W	1	
	R5901	D0GB102JA008	1K 1/10W	1	
	R5902	D0GD121JA017	120 1/8W	1	
	R5903	D0GB331JA008	330 1/10W	1	
	R5905	D0GD103JA017	10K 1/8W	1	
	R5906	D0GB104JA008	100K 1/10W	1	
	R6005	D0GB470JA008	47 1/10W	1	

Safety	Ref. No.	Part No.	Part Name & Description	Qty	Remarks
	R6006	D0GB101JA008	100 1/10W	1	
	R6010	D0GB680JA008	68 1/10W	1	
	R6011	D0GB680JA008	68 1/10W	1	
	R6012	D0GB102JA008	1K 1/10W	1	
	R6015	D0GB393JA008	39K 1/10W	1	
	R6017	D0GB102JA008	1K 1/10W	1	
	R6018	D0GB392JA008	3.9K 1/10W	1	
	R6019	D0GB332JA008	3.3K 1/10W	1	
	R6020	D0GB122JA008	1.2K 1/10W	1	
	R6100	D0GB472JA008	4.7K 1/10W	1	
	R6101	D0GB104JA008	100K 1/10W	1	
	R6102	D0GB470JA008	47 1/10W	1	
	R6201	D0GB102JA008	1K 1/10W	1	
	R6202	D0GB222JA008	2.2K 1/10W	1	
	R6204	D0GB473JA008	47K 1/10W	1	
	R6205	D0GB102JA008	1K 1/10W	1	
	R6206	D0GB151JA008	150 1/10W	1	
	R6207	D0GB103JA008	10K 1/10W	1	
	R6801	D0GF1R0JA049	1 1/4W	1	
	R6802	D0GF1R0JA049	1 1/4W	1	
	R6803	D0GB820JA008	82 1/10W	1	
	R6804	D0GB820JA008	82 1/10W	1	
	R6805	D0GB820JA008	82 1/10W	1	
	R6806	D0GB390JA008	39 1/10W	1	
	R6807	D0GB820JA008	82 1/10W	1	
	R6808	D0GB820JA008	82 1/10W	1	
	R6809	D0GBR00JA008	0 1/10W	1	
			RESISTOR NETWORKS		
	RX2300	D1H83314A024	RESISTOR NETWORK	1	
	RX2301	D1H83314A024	RESISTOR NETWORK	1	
	RX2304	D1H83314A024	RESISTOR NETWORK	1	
	RX2306	D1H83314A024	RESISTOR NETWORK	1	
	RX2307	D1H83314A024	RESISTOR NETWORK	1	
	RX2308	D1H83314A024	RESISTOR NETWORK	1	
	RX2309	D1H83314A024	RESISTOR NETWORK	1	
	RX2310	D1H83314A024	RESISTOR NETWORK	1	
	RX2312	D1H83304A024	RESISTOR NETWORK	1	
	RX2321	D1H83304A024	RESISTOR NETWORK	1	
	RX2322	D1H83304A024	RESISTOR NETWORK	1	
	RX2330	D1H83314A024	RESISTOR NETWORK	1	
	RX5305	D1H84704A024	RESISTOR NETWORK	1	
	RX5306	D1H84704A024	RESISTOR NETWORK	1	
	RX5307	D1H84704A024	RESISTOR NETWORK	1	
	RX5371	D1H83314A024	RESISTOR NETWORK	1	
	RX5375	D1H84704A024	RESISTOR NETWORK	1	
	RX23009	D1H82224A024	RESISTOR NETWORK	1	
			CAPACITORS		
	L2953	F1H1H3R0A016	3pF 50V	1	
	C2301	F1G1H470A444	47pF 50V	1	
	C2302	F1G1A1040006	0.1uF 10V	1	
	C2304	F1G1A1040006	0.1uF 10V	1	
	C2305	F1G1A1040006	0.1uF 10V	1	
	C2306	F1G1A1040006	0.1uF 10V	1	
	C2307	F1G1A1040006	0.1uF 10V	1	
	C2308	F1G1E4720002	4700pF 25V	1	
	C2309	F1G1E4720002	4700pF 25V	1	
	C2310	F1G1H120A444	12pF 50V	1	
	C2311	F1G1H330A444	33pF 50V	1	
	C2313	F1G1A1040006	0.1uF 10V	1	
	C2314	F2G0J101A083	100uF 6.3V	1	
	C2315	F1H1A105A025	1uF 10V	1	
	C2316	F1H1A105A025	1uF 10V	1	
	C2318	F1G1A1040006	0.1uF 10V	1	
	C2319	F1H1E1050001	1uF 25V	1	
	C2321	F1G1E4720002	4700pF 25V	1	
	C2322	F1G1E4720002	4700pF 25V	1	
	C2323	F1J1A106A043	10uF 10V	1	
	C2324	F1J1A106A043	10uF 10V	1	

Safety	Ref. No.	Part No.	Part Name & Description	Qty	Remarks
	C2325	F1H1E1050001	1uF 25V	1	
	C2327	F1H1E1050001	1uF 25V	1	
	C2328	F1H1E1050001	1uF 25V	1	
	C2331	F1J1A106A043	10uF 10V	1	
	C2334	EEEFK0J102P	1000uF 6.3V	1	
	C2335	F1H1E1050001	1uF 25V	1	
	C2375	F1G1A1040006	0.1uF 10V	1	
	C2389	F1G1E1020001	1000pF 25V	1	
	C2394	F1G1H1010001	100pF 50V	1	
	C2417	F1J1A106A043	10uF 10V	1	
	C2423	F1J1A106A043	10uF 10V	1	
	C2424	F1J1A106A043	10uF 10V	1	
	C2651	F1H1H102A219	1000pF 50V	1	
	C2652	F1H1H3R0A016	3pF 50V	1	
	C2653	F1H1A105A025	1uF 10V	1	
	C2654	F1H1A105A025	1uF 10V	1	
	C2655	F1G1H221A541	220pF 50V	1	
	C2656	F1G1H221A541	220pF 50V	1	
	C2661	F1G1C104A077	0.1uF 16V	1	
	C2662	F1G1C104A077	0.1uF 16V	1	
	C2663	F1H1H3R0A017	3pF 50V	1	
	C2664	F1H1H330A002	33pF 50V	1	
	C2701	F1J1A106A043	10uF 10V	1	
	C2900	F1J1A1060011	10uF 10V	1	
	C2901	EEEFK1V221P	220uF 35V	1	
	C2902	F2H1A1810001	180uF 10V	1	
	C2903	EEEFK1C681P	680uF 16V	1	
	C2903	F1H1H102A219	1000pF 50V	1	
	C2904	F1H1H102A219	1000pF 50V	1	
	C2904	F1J1A1060011	10uF 10V	1	
	C2905	F1H1H560A230	56pF 50V	1	
	C2907	EEEFK1V221P	220uF 35V	1	
	C2950	F1H1H102A219	1000pF 50V	1	
	C2953	F1H1H104A013	0.1uF 50V	1	
	C2957	F1H1H103A219	0.01uF 50V	1	
	C2960	F1H1H102A219	1000pF 50V	1	
	C2961	F1H1H681A013	680pF 50V	1	
	C2962	F1H1H103A219	0.01uF 50V	1	
	C2963	F1H1H681A013	680pF 50V	1	
	C2964	F1H1H104A013	0.1uF 50V	1	
	C2966	F1J1V1050001	1uF 35V	1	
	C2971	F1H1H104A013	0.1uF 50V	1	
	C2972	F1H1C224A068	0.22uF 16V	1	
	C2973	F1H1H182A219	1800pF 50V	1	
	C2974	F1H1A105A025	1uF 10V	1	
	C2975	F1J1C1060001	10uF 16V	1	
	C2976	F1H1H153A219	0.015uF 50V	1	
	C2977	F1H1C224A068	0.22uF 16V	1	
	C2981	F1H1H102A219	1000pF 50V	1	
	C2982	F1J1A1060011	10uF 10V	1	
	C2983	F1J1V1050001	1uF 35V	1	
	C5100	F1J1C106A059	10uF 16V	1	
	C5101	F1H1H1010005	100pF 50V	1	
	C5102	F1J1C475A059	4.7uF 16V	1	
	C5103	F1H1H472A013	4700pF 50V	1	
	C5104	F1J1C475A059	4.7uF 16V	1	
	C5105	F1H1H104A013	0.1uF 50V	1	
	C5106	F1H1H104A013	0.1uF 50V	1	
	C5107	F1J1H3330006	0.033uF 50V	1	
	C5108	F1J1H3330006	0.033uF 50V	1	
	C5109	F1J1H3330006	0.033uF 50V	1	
	C5110	F1J1H3330006	0.033uF 50V	1	
	C5111	F1K1H105A240	1uF 50V	1	
	C5112	F1K1H105A240	1uF 50V	1	
	C5113	F1K1H105A240	1uF 50V	1	
	C5114	F1K1H105A240	1uF 50V	1	
	C5117	F2A1H8210026	820uF 50V	1	
	C5130	F1H1H103A219	0.01uF 50V	1	
	C5131	F1H1H103A219	0.01uF 50V	1	
	C5132	F1H1H103A219	0.01uF 50V	1	
	C5133	F1H1H103A219	0.01uF 50V	1	
	C5134	F1H2A102A009	1000pF 100V	1	
	C5135	F1H2A102A009	1000pF 100V	1	

Safety	Ref. No.	Part No.	Part Name & Description		Qty	Remarks
	C5136	F1H2A102A009	1000pF	100V	1	
	C5137	F1H2A102A009	1000pF	100V	1	
	C5140	F2A1H8210026	820uF	50V	1	
	C5141	ECQV1H474JL3	0.47uF	50V	1	
	C5142	ECQV1H474JL3	0.47uF	50V	1	
	C5143	ECQV1H474JL3	0.47uF	50V	1	
	C5144	ECQV1H474JL3	0.47uF	50V	1	
	C5150	F1H1H104A013	0.1uF	50V	1	
	C5151	F1H1H104A013	0.1uF	50V	1	
	C5200	F1J1C106A059	10uF	16V	1	
	C5201	F1H1H1010005	100pF	50V	1	
	C5202	F1H1H472A013	4700pF	50V	1	
	C5203	F1J1C475A059	4.7uF	16V	1	
	C5204	F1J1C475A059	4.7uF	16V	1	
	C5205	F1H1H104A013	0.1uF	50V	1	
	C5206	F1H1H104A013	0.1uF	50V	1	
	C5207	F1J1H3330006	0.033uF	50V	1	
	C5208	F1J1H3330006	0.033uF	50V	1	
	C5209	F1J1H3330006	0.033uF	50V	1	
	C5210	F1J1H3330006	0.033uF	50V	1	
	C5211	F1K1H105A240	1uF	50V	1	
	C5212	F1K1H105A240	1uF	50V	1	
	C5213	F1K1H105A240	1uF	50V	1	
	C5214	F1K1H105A240	1uF	50V	1	
	C5230	F1H1H103A219	0.01uF	50V	1	
	C5231	F1H1H103A219	0.01uF	50V	1	
	C5232	F1H1H103A219	0.01uF	50V	1	
	C5233	F1H1H103A219	0.01uF	50V	1	
	C5234	F1H2A102A009	1000pF	100V	1	
	C5235	F1H2A102A009	1000pF	100V	1	
	C5236	F1H2A102A009	1000pF	100V	1	
	C5237	F1H2A102A009	1000pF	100V	1	
	C5241	ECQV1H474JL3	0.47uF	50V	1	
	C5242	ECQV1H474JL3	0.47uF	50V	1	
	C5243	ECQV1H474JL3	0.47uF	50V	1	
	C5244	ECQV1H474JL3	0.47uF	50V	1	
	C5250	F1H1H104A013	0.1uF	50V	1	
	C5251	F1H1H104A013	0.1uF	50V	1	
	C5300	F1J1C106A059	10uF	16V	1	
	C5301	F1H1H1010005	100pF	50V	1	
	C5302	F1J1C475A059	4.7uF	16V	1	
	C5304	F1H1H472A013	4700pF	50V	1	
	C5305	F1H1H104A013	0.1uF	50V	1	
	C5306	F1H1H104A013	0.1uF	50V	1	
	C5307	F1J1H3330006	0.033uF	50V	1	
	C5308	F1J1H3330006	0.033uF	50V	1	
	C5309	F1J1H3330006	0.033uF	50V	1	
	C5310	F1J1H3330006	0.033uF	50V	1	
	C5311	F1K1H105A240	1uF	50V	1	
	C5312	F1K1H105A240	1uF	50V	1	
	C5313	F1K1H105A240	1uF	50V	1	
	C5314	F1K1H105A240	1uF	50V	1	
	C5329	F1H1H103A219	0.01uF	50V	1	
	C5330	F1H1H103A219	0.01uF	50V	1	
	C5331	F1J1A106A043	10uF	10V	1	
	C5332	F1H1H102A219	1000pF	50V	1	
	C5333	F1H2A102A009	1000pF	100V	1	
	C5334	F1H2A102A009	1000pF	100V	1	
	C5335	F1H2A102A009	1000pF	100V	1	
	C5336	F1H2A102A009	1000pF	100V	1	
	C5337	F1H1H103A219	0.01uF	50V	1	
	C5338	F1H1H103A219	0.01uF	50V	1	
	C5340	F1H1H104A013	0.1uF	50V	1	
	C5341	F1J1C475A059	4.7uF	16V	1	
	C5342	F1H1H104A013	0.1uF	50V	1	
	C5343	F1J0J226A014	22uF	6.3V	1	
	C5344	F1J0J226A014	22uF	6.3V	1	
	C5346	F1H1H220A230	22pF	50V	1	
	C5351	F1J1A106A043	10uF	10V	1	
	C5352	F1H1H102A219	1000pF	50V	1	
	C5354	F1J1A106A043	10uF	10V	1	
	C5355	F1H1H102A219	1000pF	50V	1	
	C5361	F1H1H103A219	0.01uF	50V	1	

Safety	Ref. No.	Part No.	Part Name & Description		Qty	Remarks
	C5371	F1H1H102A219	1000pF	50V	1	
	C5372	F1J1A106A043	10uF	10V	1	
	C5375	F1H1H1200004	12pF	50V	1	
	C5376	F1H1H1200004	12pF	50V	1	
	C5377	F1H1H102A219	1000pF	50V	1	
	C5378	F1J1A106A043	10uF	10V	1	
	C5380	F1H1H104A013	0.1uF	50V	1	
	C5381	F1H1H104A013	0.1uF	50V	1	
	C5391	ECQV1H474JL3	0.47uF	50V	1	
	C5392	ECQV1H474JL3	0.47uF	50V	1	
	C5393	ECQV1H474JL3	0.47uF	50V	1	
	C5394	ECQV1H474JL3	0.47uF	50V	1	
	C5400	F1J1A106A043	10uF	10V	1	
	C5418	EEE0JA101WR	100uF	6.3V	1	
	C5419	F1H1E105A116	1uF	25V	1	
	C5420	F1J1C106A059	10uF	16V	1	
	C5422	F1J1C2250012	2.2uF	16V	1	
	C5423	F1J1V1050001	1uF	35V	1	
	C5424	F1H1H562A219	5600pF	50V	1	
	C5425	F1H1E105A116	1uF	25V	1	
	C5427	F1J1A106A043	10uF	10V	1	
	C5437	F1H1H104A013	0.1uF	50V	1	
⚠	C5700	F1BAF1020020	1000pF		1	
⚠	C5702	F0CAF104A105	0.1uF		1	
⚠	C5703	F0CAF104A105	0.1uF		1	
⚠	C5704	F1BAF1020020	1000pF		1	
⚠	C5705	F1BAF1020020	1000pF		1	
⚠	C5706	F1BAF471A013	470pF		1	
⚠	C5709	F0CAF104A105	0.1uF		1	
	C5712	F2B2D5610025	560uF	200V	1	
	C5713	F0C2J1030007	0.01uF	630V	1	
	C5720	F1H1H101A230	100pF	50V	1	
	C5721	F1H1H2210001	220pF	50V	1	
	C5722	F1H1H101A230	100pF	50V	1	
	C5723	F1H1H471A219	470pF	50V	1	
	C5724	F1H1H102A219	1000pF	50V	1	
	C5725	F1H1H104A013	0.1uF	50V	1	
	C5726	F2A1H100A454	10uF	50V	1	
	C5730	F1H1E105A116	1uF	25V	1	
	C5731	F1H1H104A013	0.1uF	50V	1	
	C5747	F1B3A332A008	3300pF	1000V	1	
	C5791	F1J0J106A020	10uF	6.3V	1	
	C5794	F1K1H105A149	1uF	50V	1	
	C5795	F1H1H102A219	1000pF	50V	1	
	C5796	F1H1H104A013	0.1uF	50V	1	
	C5798	F2A1H100A454	10uF	50V	1	
	C5800	F1J2E1030004	0.01uF	250V	1	
	C5805	F2A1H8210023	820uF	50V	1	
	C5813	F2A1V4710074	470uF	35V	1	
	C5814	F2A1V4710074	470uF	35V	1	
	C5817	F1H1H682A219	6800pF	50V	1	
	C5818	F1H1H104A013	0.1uF	50V	1	
	C5826	F1J2E1030004	0.01uF	250V	1	
	C5840	F1J2E1030004	0.01uF	250V	1	
	C5841	F1J2E1030004	0.01uF	250V	1	
	C5897	F1H1H103A219	0.01uF	50V	1	
	C5898	F1H1H104A013	0.1uF	50V	1	
	C5899	F2A1A2210063	220uF	10V	1	
	C5901	F1H1H102A219	1000pF	50V	1	
	C6001	F1J1V1050001	1uF	35V	1	
	C6005	F1J1V1050001	1uF	35V	1	
	C6010	F1J1A4750002	4.7uF	10V	1	
	C6012	F1H1H1010005	100pF	50V	1	
	C6013	F1H1H1010005	100pF	50V	1	
	C6014	F1H1H1010005	100pF	50V	1	
	C6015	F1J1V1050001	1uF	35V	1	
	C6018	F2A0J1000008	10uF	6.3V	1	
	C6019	F1H1H104A783	0.1uF	50V	1	
	C6020	D0GBR00JA008	0	1/10W	1	
	C6021	D0GBR00JA008	0	1/10W	1	
	C6022	D0GBR00JA008	0	1/10W	1	
	C6100	F2A1C470A913	47uF	16V	1	

Safety	Ref. No.	Part No.	Part Name & Description	Qty	Remarks
	C6101	F1H1H562A219	5600pF 50V	1	
	C6102	F2A1C470A913	47uF 16V	1	
	C6103	F2A0J221A024	220uF 6.3V	1	
	C6104	F2A1V470A939	47uF 35V	1	
	C6105	F1J1C106A059	10uF 16V	1	
	C6802	F1H1H102A013	1000pF 50V	1	
	C6803	F1H1H102A013	1000pF 50V	1	
	C6804	F1J0J226A014	22uF 6.3V	1	
	C6805	F1H1H102A013	1000pF 50V	1	
			SERVICE FIXTURE & TOOLS		
	SFT1	RFKZ0216	23P B-B EXTENSION CABLE (DIGITAL - D-AMP & PANEL)	2	[SPG]
	SFT2	RFKZ0323	9P B-B EXTENSION CABLE (DIGITAL - SMPS)	1	[SPG]
	SFT3	RFKZ0327	15P B-B EXTENSION CABLE (DIGITAL - PANEL)	1	[SPG]

MMH1202