

# Service Manual

Blu-ray Disc Player



Model No. **DMP-BD45GA**  
**DMP-BD45GC**  
**DMP-BD45GN**  
**DMP-BD45GW**  
**DMP-BD45GT**  
**DMP-BD45PU**  
**DMP-BD65GN**  
**DMP-BD65PU**  
**DMP-BD65PX**

**Notes:** These model's BDP/Digital P.C.B.

- Module are - **RFKNBD45GAT**  
- **RFKNBD45GCT**  
- **RFKNBD45GNT**  
- **RFKNBD45GWT**  
- **RFKNBD45GTT**  
- **RFKNBD45PUT**  
- **RFKNBD65GNT**  
- **RFKNBD65PUT**  
- **RFKNBD65PXT**

**Caution:**

Pairing of BD Drive and Digital P.C.B. as "BDP/  
Digital P.C.B. Module" have to be replaced together.  
If the either BD drive or Digital P.C.B. is changed,  
BD Drive unit has to be re-aligned. Because the  
alignment data for BD Drive Unit is stored in Digital P.C.B..

Vol. 1

Colour

(K).....Black Type

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For BD45PU/65PU

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## 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.

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# 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, make 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  $1M\Omega$  and  $5.2M\Omega$ .  
When the exposed metal does not have a return path to the chassis, the reading must be  $\infty$ .

### 1.1.2. Leakage current hot check (See Figure 1.)

1. Plug the AC cord directly into the AC outlet. Do not use an isolation transformer for this check.
2. Connect a  $1.5k\Omega$ , 10 watts resistor, in parallel with a  $0.15\mu F$  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

## 1.2. Caution for fuse replacement

(For English)

### CAUTION:

Replace with the same type fuse:  
(Manufacturer: Hollyland, Type: SCT, T2A, 250V )

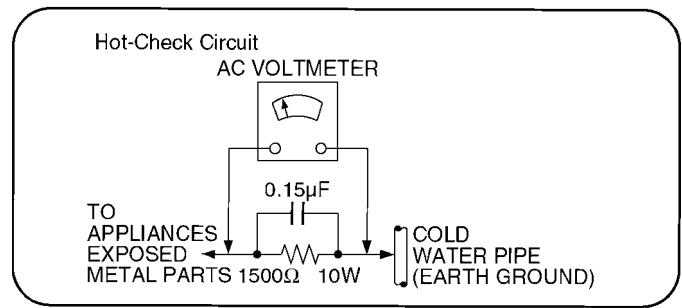
(For Canadian French)

### ATTENTION:

Utiliser un fusible de rechange de même type:  
(Fabricant: Hollyland, Type: SCT, T2A, 250V )

voltage at each point.

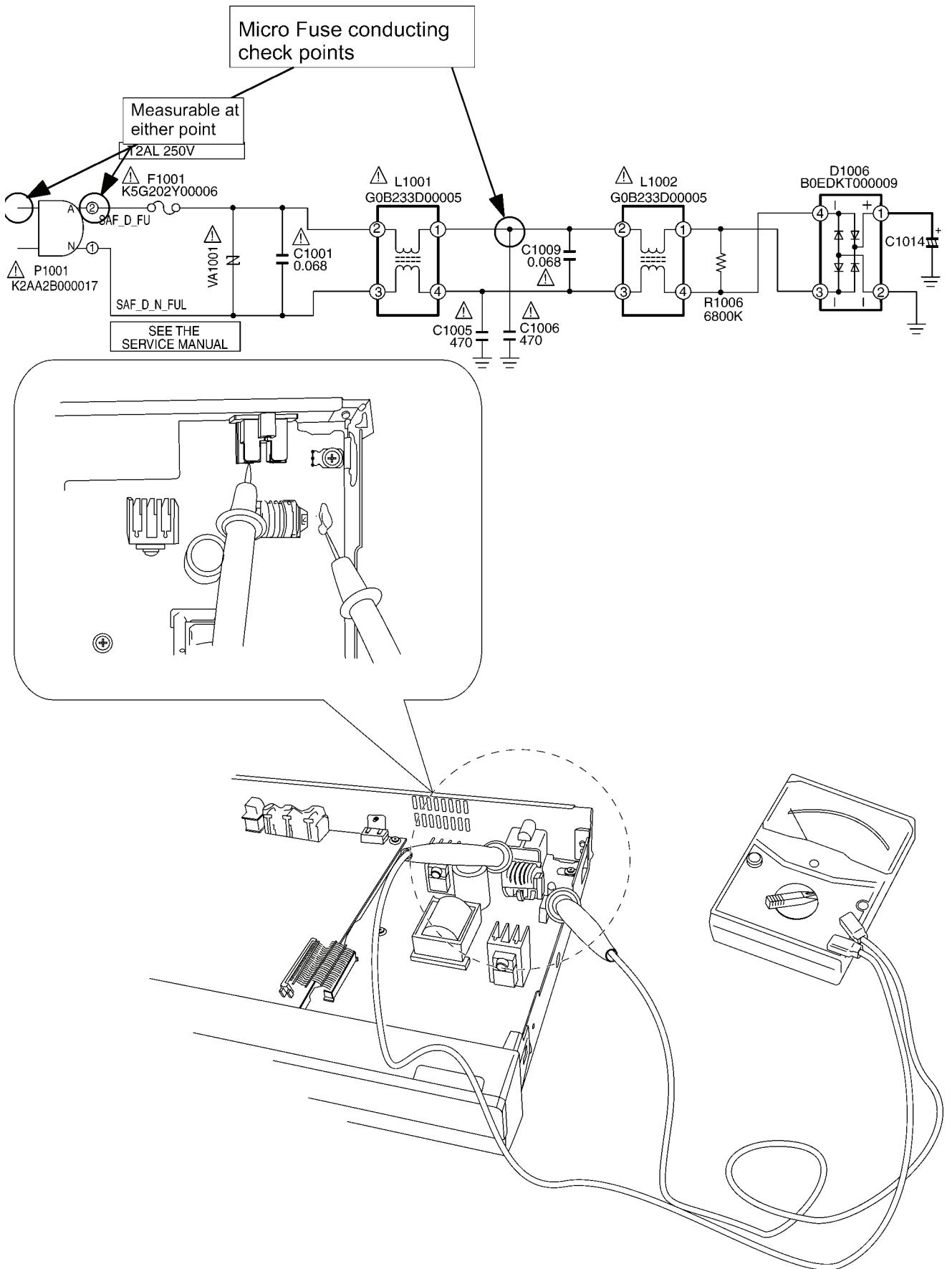
5. Reverse the AC plug in the AC outlet and repeat each of the above measurements.
6. The potential at any point should not exceed 0.75 volts RMS. A leakage current tester (Simpson Model 229 or equivalent) may be used to make the hot checks, leakage current must not exceed 1/2 milliampere. In case a 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.



### 1.2.1. Micro Fuse conducting check



This unit uses the Micro Fuse.

Check the Micro Fuse conducting using the Tester at the check points below.



### 1.3. Caution for AC cord(only for BD45GC)

#### Caution for AC Mains Lead

For your safety, please read the following text carefully.  
This appliance is supplied with a moulded three pin mains plug for your safety and convenience.  
A 5-ampere fuse is fitted in this plug.  
Should the fuse need to be replaced please ensure that the replacement fuse has a rating of 5-ampere and that it is approved by ASTA or BSI to BS1362.  
Check for the ASTA mark  or the BSI mark  on the body of the fuse.

If the plug contains a removable fuse cover you must ensure that it is refitted when the fuse is replaced.  
If you lose the fuse cover the plug must not be used until a replacement cover is obtained.  
A replacement fuse cover can be purchased from your local dealer.


#### CAUTION!

IF THE FITTED MOULDED PLUG IS UNSUITABLE FOR THE SOCKET OUTLET IN YOUR HOME THEN THE FUSE SHOULD BE REMOVED AND THE PLUG CUT OFF AND DISPOSED OF SAFELY.  
THERE IS A DANGER OF SEVERE ELECTRICAL SHOCK IF THE CUT OFF PLUG IS INSERTED INTO ANY 13-AMPERE SOCKET.

If a new plug is to be fitted please observe the wiring code as stated below.  
If in any doubt please consult a qualified electrician.

#### IMPORTANT

The wires in this mains lead are coloured in accordance with the following code:  
Blue: Neutral, Brown: Live.  
As these colours may not correspond with the coloured markings identifying the terminals in your plug, proceed as follows:  
The wire which is coloured Blue must be connected to the terminal which is marked with the letter N or coloured Black or Blue.  
The wire which is coloured Brown must be connected to the terminal which is marked with the letter L or coloured Brown or Red.

**WARNING: DO NOT CONNECT EITHER WIRE TO THE EARTH TERMINAL WHICH IS MARKED WITH THE LETTER E, BY THE EARTH SYMBOL  OR COLOURED GREEN OR GREEN/YELLOW.**

**THIS PLUG IS NOT WATERPROOF—KEEP DRY.**

#### Before use

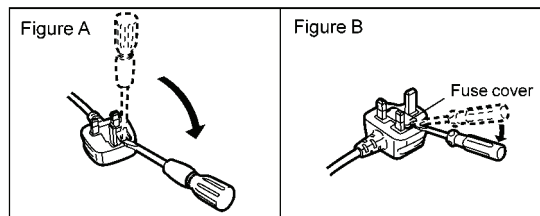
Remove the connector cover.

#### How to replace the fuse

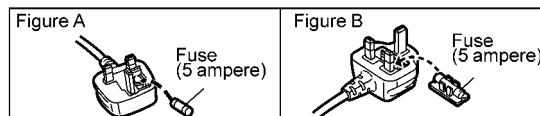
The location of the fuse differ according to the type of AC mains plug (figures A and B). Confirm the AC mains plug fitted and follow the instructions below.

Illustrations may differ from actual AC mains plug.

1. Open the fuse cover with a screwdriver.



2. Replace the fuse and close or attach the fuse cover.



## 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 Electrostatic 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 sufficient to damage an ES device).

#### 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, 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.

## 2.2. Precaution of Laser Diode

### CAUTION:

This product utilizes a laser diode with the unit turned "on", invisible laser radiation is emitted from the pickup lens.

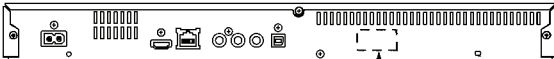
Wave length: 790 nm (CDs)/ 655 nm (DVDs)/ 405 nm (BDs)

Maximum output radiation power from pickup: 100  $\mu$  W/VDE

Laser radiation from the pickup lens is safety level, but be sure the followings:

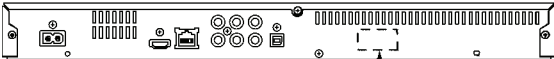
1. Do not disassemble the optical pickup unit, since radiation from exposed laser diode is dangerous.
2. Do not adjust the variable resistor on the pickup unit. It was already adjusted.
3. Do not look at the focus lens using optical instruments.
4. Recommend not to look at pickup lens for a long time.

DMR-BD45GA/GC/GN/GW/GT/PU



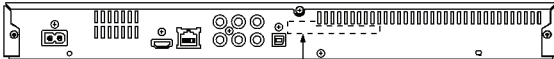
**CLASS 1  
LASER PRODUCT**

DMR-BD65GN/PU



**CLASS 1  
LASER PRODUCT**

DMR-BD65PX



Product complies  
with DHHS Rules 21 CFR Subchapter J in effect at date of manufacture.  
Panasonic Corporation Kadoma, Osaka, Japan

### ACHTUNG:

Dieses Produkt enthält eine Laserdiode.

Im eingeschalteten Zustand wird unsichtbare Laserstrahlung von der Lasereinheit abgestrahlt.

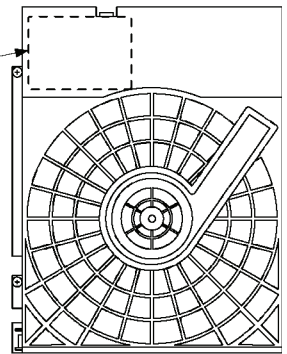
Wellenlänge: 790 nm (CDs)/ 655 nm (DVDs)/ 405 nm (BDs)

Maximale Strahlungsleistung der Lasereinheit: 100  $\mu$  W/VDE

Die Strahlung der Lasereinheit ist ungefährlich, wenn folgende Punkte beachtet werden:

1. Die Lasereinheit nicht zerlegen, da die Strahlung an der freigelegten Laserdiode gefährlich ist.
2. Den werkseitig justierten Einstellregler der Lasereinheit nicht verstellen.
3. Nicht mit optischen Instrumenten in die Fokussierlinse blicken.
4. Nicht über längere Zeit in die Fokussierlinse blicken.

<b>CAUTION</b>	VISIBLE AND INVISIBLE LASER RADIATION WHEN OPEN. DO NOT STARE INTO BEAM. FDA 21 CFR/Class II (IIa)
<b>CAUTION</b>	CLASS I VISIBLE AND INVISIBLE LASER RADIATION WHEN OPEN. DO NOT VIEW DIRECTLY WITH OPTICAL INSTRUMENTS. IEC60825-1 J2/CLASS 1M
<b>ATTENTION</b>	RAYONNEMENT LASER VISIBLE ET INVISIBLE, CLASSE 1M. NE PAS REGARDER DIRECTEMENT A L'AIDE D'INSTRUMENTS D'OPTIQUE.
<b>FORSIGTIG</b>	SYNLIG OG USYNLIG LASERSTRÅLING KLASSE 1M. NÅR LÅGET ER ÅBENT, UNDSØG AT SE LØSE PÅ MED OPTISKE INSTRUMENTER.
<b>VARO</b>	AVATTAESSA OLET ALTIINA LUOKAN 1M NÄKYVÄÄ JA NÄKYMÄTÖNTÄ LASERSTRÄLYÄ. ÄLÄ KATSO OPTISELLA LAITTEELLA SUORAAN SÄTEESSEEN.
<b>VARNING</b>	KLASS 1M SYNLIG OCH OSYNLIG LASERSTRÅLNING NÅR DENNA DEL ÄR ÖPPNAD. BETRÄKTA EJ STRÅLEN DIREKT GENOM OPTISKT INSTRUMENT.
<b>VORSICHT</b>	SICHTBARE UND UNSICHTBARE LASERSTRAHLUNG KLASSE 1M. WENN ABDECKUNG GEÖFFNET, NICHT DIREKT MIT OPTISCHEN INSTRUMENTEN BETRACHTEN.
<b>注意</b>	→ 打开时可见及不可见激光辐射。避免光辐射。
<b>注意</b>	→ ビームを覗いたり、覗かれたりしないでください。VOL11770



### 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.



## 2.3. Service caution based on legal restrictions

### 2.3.1. General description about Lead Free Solder (PbF)

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.  
RFKZ03D01KS----- (0.3mm 100g Reel)  
RFKZ06D01KS----- (0.6mm 100g Reel)  
RFKZ10D01KS----- (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%

## 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 original service manual.

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

- \* Schematic Diagram, Block Diagram and P.C.B. layout of BDP/Digital P.C.B. Module.

- \* Parts List for individual parts of BDP/Digital P.C.B. Module.

- \* Exploded View and Parts List for individual parts of BDP/Digital P.C.B. Module.

2) The following category are recycle module part. Please send them to Central Repair Center.

- \* BDP/Digital P.C.B. Module (BD45GA: RFKNBD45GAT)  
(BD45GC: RFKNBD45GCT)  
(BD45GN: RFKNBD45GNT)  
(BD45GW: RFKNBD45GWT)  
(BD45GT: RFKNBD45GTT)  
(BD45PU: RFKNBD45PUT)  
(BD65GN: RFKNBD65GNT)  
(BD65PU: RFKNBD65PUT)  
(BD65PX: RFKNBD65PXT)

3) The module and digital P.C.B for BDP model is offered respectively for the market maintenaince.




For the information about pairing adjustment of the module and digital P.C.B., please refer to "How to adjust the BDP/Digital P.C.B. Module" in Vol.2 (CHM1003008CE.).

### 3.2. Combination of Multiple Pressing on the Remote Control

Press multi-buttons (in combination) on the remote control simultaneously for operations, such as initialization or service mode, etc. There are no multiple pressing functions on the previous remote controls, thus, please be sure to use the supplied remote control.

### 3.3. Entering Special Modes with Combination of Multiple Pressing on the Remote Control

Enter the following special modes by multiple pressing functions on the supplied remote control. After entering each mode, switch to the desired menus for operation.

Disclosure mode	Nondisclosure mode 1	Nondisclosure mode 2
[OK] [Blue] [Yellow]	[6] [7] [Yellow]	[5] [9] [Red]
		

- ◆ **Menu switch:** ↓ mark.  
Right cursor (remote control),  
or  
[Power] (main unit)
- ◆ **Operating menu:**  
[OK] (remote control)  
or  
[O/C] (main unit)
- ✳ Release from special modes automatically after the operation.
- ◆ **Release from special modes:**
  - Press other buttons in no connection with the above operations.
  - No operation for over 2 min.
  - Press and hold [Power] on main unit (forced to turn off).

#### 3.3.1. Disclosure mode (Combination of multiple pressing: [OK] [Blue] [Yellow])

Press and hold [OK] [Blue] [Yellow] on the remote control simultaneously for 5 sec., then "00 RET" is displayed on FL display window.

Power	Disc	FL display	Key operation	Function	Remarks
OFF	Yes/No	00 RET	No	No	
		06 FT0	OK	Force tray open	When O/C button is invalid, the tray of BD driver is forced to open. If the tray still cannot be opened in this mode, please refer to "6.1.2 When Cannot Be Forced to Open" in Vol.1.
		08 FIN	OK	Reset to factory default setting	Reset all to factory default settings, including Quick Start and Network related settings.
ON	Yes/No	00 RET	No	No	
	No	03 VL	OK	Release from BD/DVD video play restriction	Release from the aging restriction on BD video and DVD video play.
	Yes/No	04 PRG	OK (Press and hold)	Progressive initialization	Initialize the progressive settings, and switch to the interlaced display. Press and hold [Stop] (not [OK])(on the remote control or main unit) to switch to 10 OCL (setting shop lock mode)
	Yes/No	07 DC	OK (Press and hold)	Deep Color initialization	Initialize Deep Color.
	Yes	10 OCL	OK	Shop lock mode setting/release ([O/C] is invalid/valid, while setting/release this mode.)	When 04 PRG is displayed, press and hold [Stop] (on the remote control or main unit) to switch to other displays. Press [OK] to only lock the tray switch. * When there is no disc in the driver, "NoDISC" appears and locking is invalid. * Even turn ON/OFF the power, it is still in locking.

### 3.3.2. Nondisclosure mode 1 (Combination of multiple pressing: [6] [7] [Yellow])

Press and hold [6] [7] [Yellow] on the remote control simultaneously for 5 sec., then [50 RET] is displayed on FL display window.

Power	Disc	FL display	Key operation	Function	Remarks
ON	Yes/No	50 RET	No	No	
		↓			
		51 NOP	OK	No	When "51 NOP" is displayed, press and hold [Stop] (on the remote control or main unit) to switch to "52 BRE" (delete BD-ROM history settings)
		↓			
		52 BRE	OK	BD-ROM history delete	When "51 NOP" is displayed, press and hold [Stop] (on the remote control or main unit) to switch to other displays. Press [OK] to delete BD video history.

### 3.3.3. Nondisclosure mode 2 (Combination of multiple pressing: [5] [9] [Red])

Press and hold [5] [9] [Red] on the remote control simultaneously for about 5 sec., then "70 RET" is displayed on FL display window.

Power	Disc	FL display	Key operation	Function	Remarks
OFF	Yes/No	70 RET	No	No	
		↓			
		80 SRV	OK	Switch to service mode	Press [OK], then "HELLO" is displayed, and wait about 30 sec. until "SERV" is displayed.
		↓			
		83 SDI	OK	CD/SD Diag	Do not apply in normal service.
		↓			
		91 SPD	OK	Special display	Do not apply in normal service.
		↓			
		92 F99	OK	F99 Validate/Invalidate switch	Do not apply in normal service.
ON	Yes/No	70 RET	No	No	
		↓			
		81 AIG	OK	Switch to aging mode	
		↓			
		83 SDI	OK	CD/SD Diag	Do not apply in normal service.
		↓			
		91 SPD	OK	Special display	Do not apply in normal service.
		↓			
		92 F99	OK	F99 Validate/Invalidate switch	Do not apply in normal service.

# 4 Specifications

<b>Power supply:</b>	AC110V, 60Hz(BD45GT) AC110-240V, 50/60Hz(BD45PU/ BD65PU/PX) AC220-240V, 50Hz(BD45GN/ 65GN) AC220-240, 50/60Hz(BD45GA/ GC/GW)	(SL:Single Layer/DL: Dual Layer) BD-RE(SL/DL): BD-MV (SL:Single Layer/DL: Dual Layer) BD-R(SL/DL): BD-MV (SL:Single Layer/DL: Dual Layer) DVD-ROM(SL/DL): DVD-Video (SL:Single Layer/DL: Dual Layer) DVD-RAM: DVD-VR DVD-R: DVD-Video DVD-VR
<b>Power consumption:</b>	Approx. 15W(BD45GA/GC/GW/ GT/GN) Approx. 19W(BD45PU) Approx. 20W(BD65GN) Approx. 21W(BD65PU/PX)	DVD-R(DL): DVD-Video DVD-VR DVD-RW: DVD-Video DVD-VR
in standby mode:	Approx. 0.1W(BD45GT) Approx. 0.2W(BD45GA/GC/GN/ GW/PU, BD65GN/PU/PX)	+R: Video +R (DL): Video +RW: Video CD: CD-DA, CD-R/RW
in quick start standby mode:	Approx. 7W	<b>Optical pick-up:</b> System with 2 lenses Wave length: 790nm (CDs)/655nm (DVDs)/ 405nm(BDS)
<b>Operating temperature range:</b>	+5C to +35×C(+41 to +95×F)	<b>LASER Specification:</b> Class I LASER Product Wave Length: 790nm (CDs)/655nm (DVDs)/ 405nm(BDs)
<b>Operating humidity range:</b>	10% - 80%RH (no condensation)	Laser Power: No hazardous radiation is emitted with the safety protection
<b>Signal system:</b>	NTSC(BD45PU, BD65PU/PX) PAL/NTSC(BD45GA/GC/GN/GW/ GT, BD65GN)	<b>Regional Code:</b> DVD: #1(BD65PX) DVD: #2(BD45GC) DVD: #3(BD45GA/GT) DVD: #4(BD45GN/PU, BD65GN/ PU) DVD: #5(BD45GW) BD: Region A(BD45GA/GT/PU, BD65PU/PX) BD: Region B(BD45GC/GN, BD65GN) BD: Region C(BD45GW)
<b>Video output:</b>		<b>Media:</b>
output level:	1.0Vp-p (75Ω)	<b>Playable discs:</b>
output connector:	Pin jack (1 System)	BD-Video: BD-ROM Version2 BD-RE: Version3 (SL:Single Layer/ DL: Dual Layer), JPEG
<b>Component video output:</b> <b>(1080i/720p/480p/480i:60Hz)</b> <b>(1080i/720p/576p/</b> <b>576i:50Hz)(BD65GN/PU/PX)</b>		BD-R: Version2 (SL:Single Layer/ DL: Dual Layer), Divx(*4, *5)(BD65PU)
Y output level:	1.0Vp-p (75Ω)	DVD-RAM: DVD Video Recording format, AVCHD format, JPEG
P <sub>B</sub> output level:	0.7Vp-p (75Ω)	DVD-R: DVD-Video format (*1), DVD Video Recording format(*1), AVCHD format(*1), JPEG(*2), MP3(*2), Divx(*2, *3, *5)(BD65PU)
P <sub>R</sub> output level:	0.7Vp-p (75Ω)	DVD-R DL: DVD-Video format (*1), DVD Video Recording format(*1), AVCHD format(*1), JPEG(*2), MP3(*2), Divx(*2, *3, *5)(BD65PU)
output connector:	Pin jack (Y:green, P <sub>B</sub> :blue, P <sub>R</sub> :red)(1 System)	DVD-RW: DVD-Video format (*1), DVD Video Recording format(*1), AVCHD format(*1)
<b>Video performance:</b>		+R: Video(*1), AVCHD format(*1) +R DL: Video(*1), AVCHD format(*1) +RW: Video(*1), AVCHD format(*1) DVD-Video CD-Audio CD-DA CD-R/CD-RW
Horizontal resolution:	More than 500 lines	*1: Finalizing is necessary.
Video S/N ratio:	More than 65dB	
<b>Audio output:</b>		
output level:	2 Vrms (1kHz, 0dB)	
output connector:	Pin jack	
number of connectors:	2 channel, 1 system	
<b>Audio performance:</b>		
Frequency response:		
DVD(linear audio):	4Hz-22kHz (48kHz sampling) 4Hz-44kHz (96kHz sampling)	
CD-Audio:	4Hz-20kHz	
S/N ratio:	100dB	
Dynamic range:	100dB	
Total harmonic distortion:	0.003%	
<b>Digital audio output:</b>		
Optical digital output:	optical terminal	
<b>HDMI AV output:</b>		
Output format:	1080p/1080i/720p/480p(BD45GT/ PU/BD65PU/PX) 1080p/1080i/720p/576P/ 480p(BD45GA/GC/GN/GW, BD65GN)	
Output connector:	TypeA (19pin)	
<b>SD card slot:</b>		
Connector:	1 system	
<b>USB slot (BD45PU, BD65GN/ PU/PX):</b>		
USB 2.0:	1 system	
<b>Ethernet (BD65GN/PU/PX):</b>		
10BASE-T/100BASE-TX:	1 system	
<b>Playable disc:</b>		
BD-ROM(SL/DL):	compliant Ver.1.3	

\*2: ISO9660 level1 or 2(except for extended formats), Joliet.

This unit is compatible with multi-session.

This unit is not compatible with packet writing

\*3: UDF1.02 without ISO9660, UDF1.5 with ISO9660.

\*4: UDF2.5.

\*5: DivX Certified to play Divx video up to HD 1080p, including premium content.

GMC(Global Motion Compensation) is not supported.

Maximum number of folders recognizable:300 folders.  
(including the root folder)

Maximum number of files recognizable:200 files.

**SD card:** SD Memory Card(\*6) formatted  
FAT12, FAT16, FAT32(\*7),  
exFAT(\*8), JPEG, AVCHD format,  
MPEG-2

\*6: includes SDHC, SDXC(BD45GA/GC/GN/GW/GT/PU, BD65GN/  
PX),SDXH(BD65PU) card.

includes miniSD™ Cards(need a miniSD™ Adaptor.)

includes microSD™/microSDHC/microSDXC Cards  
(need a microSD™ Adaptor.)

\*7: Not support long file name.

\*8: SDXC only.

**USB device(BD45PU,  
BD65GN/PU/PX):**

USB Standard: USB2.0 High Speed

Format: FAT12, FAT16, FAT32, MP3,  
JPEG, DivX(BD65PU)

**Contents:**

**JPEG:**

SD card, CD-R/RW, DVD-RAM, BD-RE, DVD-R,

USB device(BD45PU/BD65GN/PU/PX):

Pixels: 34x34~8192x8192

Sub Sampling: 4:2:2, 4:2:0

Motion JPEG not supported

SD card: JPEG conforming DCF(Design  
rule for Camera File system)

Thawing Time: approx.2sec (7M pixels.)

Maximum numbers of folders and files:

	CD	SD card	DVD-RAM	BD-RE	DVD-R	USB device (BD45PU/65GN /PU/PX)
Maximum folder	99	300	300	300	300	300
Maximum files	999	3000	3000	9999	3000	3000

**MP3:**

CD-R, CD-RW, DVD-R, USB device(BD45PU, BD65GN/PU/PX):

Compression rate: 32kbps~320kbps

Sampling rate: 44.1kHz, 48kHz

**AVCHD (H.264):**

SD card, DVD: AVCHD format V1.0

**HDMI:** 480p(525p)/576p(625p)/  
1080i(1125i)/720p(750p)/  
1080p(1125p)  
HDMI (Deep color, x.v.Color™,  
High Bit rate Audio)  
(This unit supports "HDAVI  
Control 5" function.)

**Dimensions:**

430mm(W) [Approx. 16 15/16"(W)]

49mm(H) [Approx. 1 15/16"(H)]

199mm(D) [Approx. 7 27/32"(D)](excluding the projecting parts)

207mm(D) [Approx. 8 5/32"(D)](including the projecting parts)

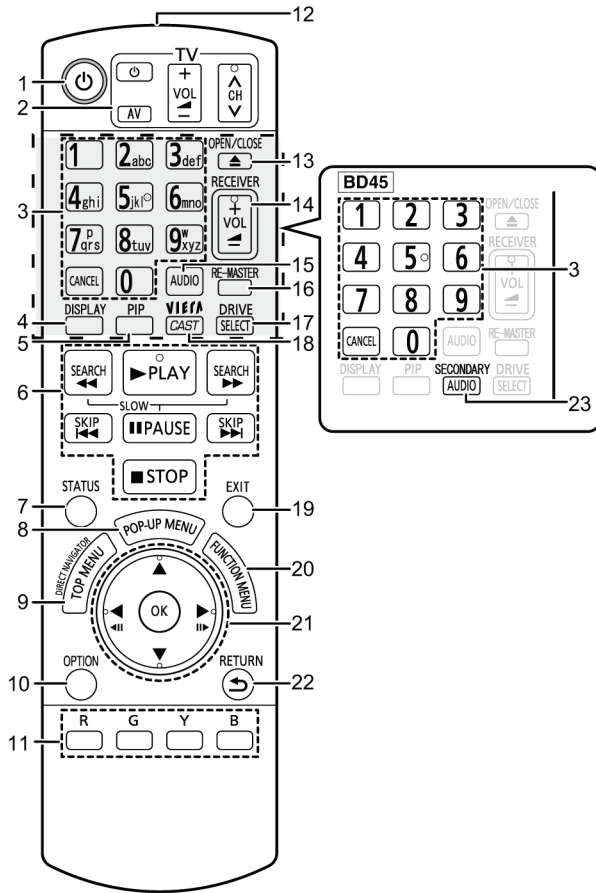
**Mass:** Approx. 1.9 kg(4.2lbs)

**Solder:** This model uses lead free  
solder(PbF).

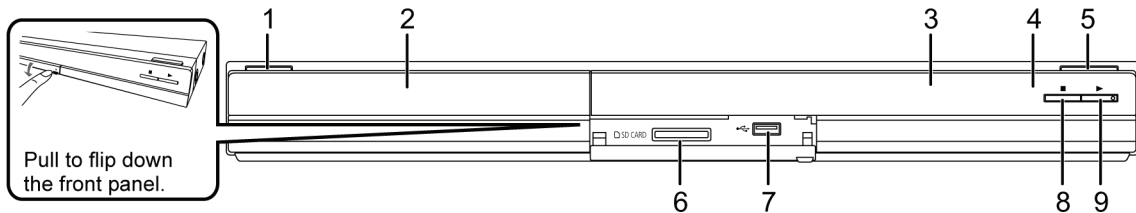
**Note:** Specifications are subject to  
change without notice.

# 5 Location of Controls and Components

For BD45GA/GC/GN/GW, BD65GN



- 1 Turn the unit on and off
- 2 **TV operation buttons**  
You can operate the TV through the unit's remote control.  
[TV] : Turn the television on and off  
[AV] : Switch the input select  
[+ - VOL] : Adjust the volume  
[^ v CH] : Channel select
- 3 Select title numbers, etc./Enter numbers or characters  
[CANCEL] : Cancel
- 4 Show playback menu
- 5 Switch on/off Secondary Video (Picture-in-picture)
- 6 Basic playback control buttons
- 7 Show status messages
- 8 Show Pop-up menu
- 9 Show Top menu/DIRECT NAVIGATOR
- 10 Show OPTION menu
- 11 Coloured buttons (red, green, yellow, blue)  
These buttons are used when;
  - Operating a BD-Video disc that includes Java™ applications (BD-J).
  - Displaying "Title View" and "Album View" screens.
  - Operating contents of VIERA CAST. **[BD65]**
- 12 Transmit the remote control signal
- 13 Open or close the disc tray
- CAUTION**  
Do not place objects in front of the unit. The disc tray may collide with objects when it is opened, and this may cause injury.
- 14 Adjust the volume of an amplifier/receiver.
- 15 Select audio
- 16 Reproduce more natural audio
- 17 Select drive (BD/DVD/CD, SD card or USB device **[BD65]**)
- 18 **[BD65]** Displays the Home screen of the VIERA CAST
- 19 Exit the menu screen
- 20 Show FUNCTION menu
- 21 Selection/OK, Frame-by-frame
- 22 Return to previous screen
- 23 **[BD45]** Switch on/off Secondary Audio



- 1 **Standby/on switch (⏻/⏻)**  
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 Disc tray
- 3 Display

	<b>SD</b>	<b>[BD65]</b> <b>USB</b>
Disc indicator	SD card indicator	USB device indicator

The indicator blinks when reading data from a disc, a card or a USB device, or writing data to a card.

- 4 Remote control signal sensor  
Distance: Within approx. 7 m  
Angle: Approx. 20° up and down, 30° left and right
- 5 Open or close the disc tray
- 6 SD card slot
- 7 **[BD65]** USB port
- 8 Stop
- 9 Start play

Rear panel terminals

## 6 Operating Instructions

### 6.1. Taking out the Disc from BD-Drive Unit when the Disc cannot be ejected by OPEN/CLOSE button

#### 6.1.1. Forcible Disc Eject

##### 6.1.1.1. When the power can be turned off.

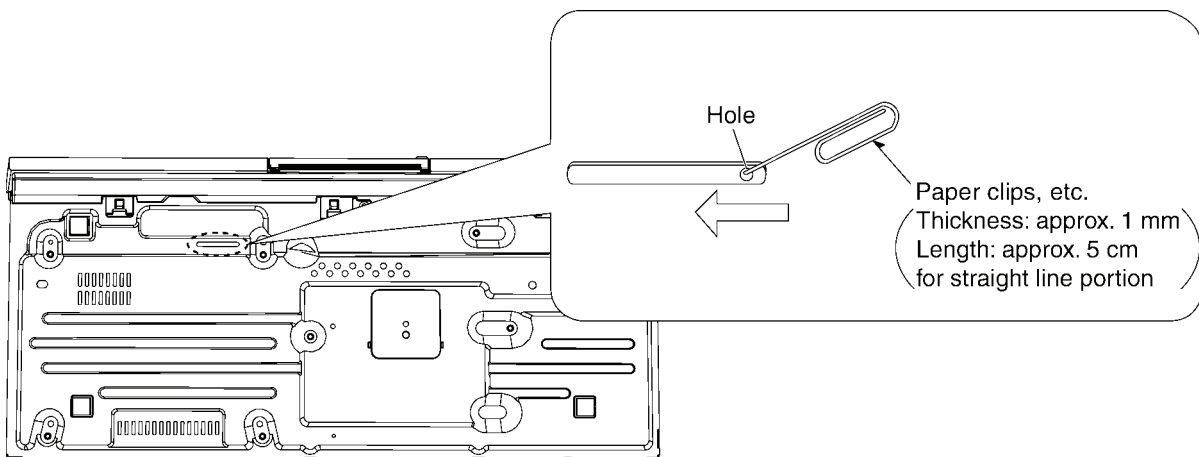
1. Turn off the power, press and hold [OK], [B] and [Y] on the remote control at the same time for more than 5 seconds. -"00 RET" is displayed on the unit's display.
2. Repeatedly press [▶] on the remote control or [POWER] on the unit until "06 FTO" is displayed on the unit's display.
3. Press [OK] on the remote control or [OPEN/CLOSE] on the unit.

##### 6.1.1.2. When the power can not be turned off.

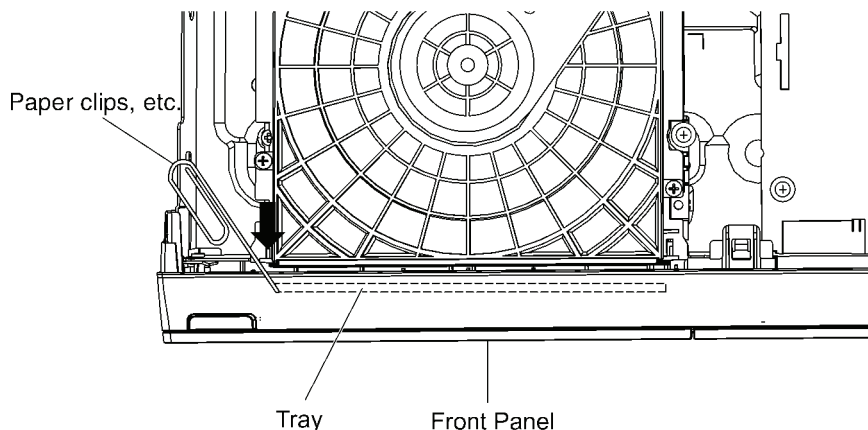
1. Press [POWER] key on the front panel for over 4 seconds to turn off the power forcibly, press and hold [OK], [B] and [Y] on the remote control at the same time for more than 5 seconds. -"00 RET" is displayed on the unit's display.
2. Repeatedly press [▶] on the remote control or [POWER] on the unit until "06 FTO" is displayed on the unit's display.
3. Press [OK] on the remote control or [OPEN/CLOSE] on the unit.

##### 6.1.2. When the Forcible Disc Eject can not be done.

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



5. Pull deck upward, and push out Tray by the Paper clips, etc. or minus screw driver (small).





# 7 Service Mode

## 7.1. Self-Diagnosis and Special Mode Setting

### 7.1.1. Self-Diagnosis Functions

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

**U\*\* and F\*\* are stored in memory and held.**

You can check latest error code by transmitting [0] [1] of Remote Controller 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.

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	<div style="border: 1px solid black; padding: 5px; text-align: center;">SET *</div> <p>* is remote controller code of the main unit. Display for 5 seconds.</p>
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. The event is saved in memory as well.	No display	<div style="border: 1px solid black; padding: 5px; text-align: center;">U59</div> <p>U59 is displayed for 30 minutes.</p>
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	<div style="border: 1px solid black; padding: 5px; text-align: center;">U71</div>
U72	HDMI connection error (communication error)	This error is displayed when there are any communication problems with the unit and the equipments (TV, amplifier etc.) 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	<div style="border: 1px solid black; padding: 5px; text-align: center;">U72</div> <p>U72 display disappears when error has been solved by Power OFF/ON of connecting equipment or by inserting/removing of HDMI cable.</p>
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	<div style="border: 1px solid black; padding: 5px; text-align: center;">U73</div> <p>U73 display disappears when error has been solved by Power OFF/ON of connecting equipment or by inserting/removing of HDMI cable.</p>
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	<div style="border: 1px solid black; padding: 5px; text-align: center;">U76</div>
U77	Illegal disc error	This error is displayed when it becomes impossible to reproduce because of copyright illegal information.	No display	<div style="border: 1px solid black; padding: 5px; text-align: center;">U77</div>
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	<div style="border: 1px solid black; padding: 5px; text-align: center;">U88</div> <p>Display for 30 seconds.</p>
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

Error Code	Diagnosis contents	Description	Monitor Display	Automatic FL 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	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	F 74
F75	HDMI Device Key Loading error	This error is displayed when the key of loaded is illegal at HDMI device key loading.	No display	F 75
F99	Hang-up	Displayed when communication error has occurred between Main microprocessor and Timer microprocessor.	No display	F99 Displayed is left until the [POWER] key is pressed.
UNSUPPORT	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.	<b>"This disc is incompatible."</b>	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.	<b>"Cannot read. Please check the disc."</b>	No READ
HARD ERR	Drive error	The drive detected a hard error.	<b>"DVD drive error."</b>	HARD ERR It is display for 5 seconds. The character indication flows sideways.
SELF CHECK	Restoration operation	Since the power cord fell out during a power failure or operation, it is under restoration operation. *It will OK, if a display disappears automatically. If a display does not disappear, there is the possibility that defective Digital P.C.B. / BDP drive.	No display	SELF CHECK The character indication flows sideways.
UNFORMAT	Unformatted disc error	This error is displayed when the unformatted DVD-RAM/DVD-RW or the DVD-RW recorded by another make of recorder is inserted.	No display	UNFORMAT This disc is not formatted properly. Format the disc in DISC MANAGEMENT?
PLEASE WAIT	Unit is in termination process	Unit is in termination process now. "BYE" is displayed and power will be turned off.	No display	PLEASEWAIT The character indication flows sideways.
No PLAY	When there is a viewing restriction on a BD-Video or DVD-Video.	Rating password is set.	No display	No PLAY

## 7.1.2. Special Modes Setting

Item		FL display	Key operation
Mode name	Description		Front Key
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 7.1.3. <b>(BD) Service Mode at a glance.</b>	② 70 RET ③ 80 SRV ④ HELLO -- 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] key over than 10 seconds.
Aging	Perform sequence of modes as * Aging Description shown below continually.	Display following the then mode.	① Turn the power on. 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 [81 AIG] is displayed on FL. ④ Press the [OK] button . *The command is transmitted by attached remote control. <b>NOTE1:</b> 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.

Item		FL display	Key operation
Mode name	Description		Front Key
<b>Aging Contents (Example):</b> <div style="border: 1px solid black; padding: 10px; margin: 10px auto; width: fit-content;"> <pre> graph TD     A[TRAY OPEN / CLOSE] --&gt; B[Title 1 Play]     B --&gt; C["Title 2 Play REV / CUE FWD - SLOW / RVS - SLOW"]     C --&gt; D[Title 3 Play]     D --&gt; E["Title 1 JUMP Play Title 3 JUMP Play Title 1 JUMP Play Title 3 JUMP Play Title 1 JUMP Play Title 3 JUMP Play"]           </pre> </div>			
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. <div style="border: 1px solid black; padding: 5px; text-align: center; width: 100px; margin: 5px auto;">LOCK</div> "LOCK" is displayed for 3 seconds.	When the power is on (SS mode), press [PLAY] and [OPEN/CLOSE] keys simultaneously for 5 seconds. <b>Note:</b> When a disc is not in tray, this setting is not effective.
		*When unlock the tray. <div style="border: 1px solid black; padding: 5px; text-align: center; width: 100px; margin: 5px auto;">UNLOCK</div> UNLOCK is displayed for 3 seconds.	When the power is on (SS mode), press [PLAY] and [OPEN/CLOSE] keys simultaneously for 5 seconds.
		*When press [OPEN/CLOSE] key while the tray being locked. <div style="border: 1px solid black; padding: 5px; text-align: center; width: 100px; margin: 5px auto;">LOCK</div> Display LOCK for 3 seconds.	Press [OPEN/CLOSE] key while the tray is being locked.
Progressive initialization	The progressive setting is initialized to Interlace.	The display before execution leaves. <div style="border: 1px solid black; padding: 5px; text-align: center; width: 100px; margin: 5px auto;">*****</div>	When the power is on (SS mode), press [STOP] and [PLAY] simultaneously for 5 seconds.
Default setting	The date of Menu, Mode and EEPROM setting, etc. is set to the default condition in factory.	① <div style="border: 1px solid black; padding: 5px; text-align: center; width: 100px; margin: 5px auto;">00 RET</div> ② <div style="border: 1px solid black; padding: 5px; text-align: center; width: 100px; margin: 5px auto;">08 FIN</div> ③ <div style="border: 1px solid black; padding: 5px; text-align: center; width: 100px; margin: 5px auto;">HELLO</div> "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.

### 7.1.3. Service Modes at a glance

Information necessary for service can be displayed.

Service mode setting:




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 [HELLO-->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.

Item		FL display	Key operation
Mode name	Description		(Remote controller key)
Release Items	Item of Service Mode executing is cancelled.	<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 0 auto;">SERV_</div>	Press [0] [0] or [Return] in service mode.
Error Code Display	Last Error Code of U/F held by Timer is displayed on FL. *Details are described in <b>7.1.1. Self-Diagnosis Functions.</b>	<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 0 auto;">  </div> <p>* shows U/F.   shows number.                      If any error history dose not exist, [F00] is displayed.</p>	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. BOO2 version 7. BOO3 version	1. <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 0 auto;">NO_ \$%</div> \$: Region of DVD (Example: 1,2.....) %: Region of BD (Example: A,B.....) 2. <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 0 auto;">****</div> 3. <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 0 auto;"># # 0****</div> # #: Timer firm version O: OEM ****: Product number of microcomputer 4. <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 0 auto;">****</div> 5. <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 0 auto;">***</div> 6. <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 0 auto;">***</div> 7. <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 0 auto;">***</div>	Press [0] [2] in service mode

Item		FL display	Key operation (Remote controller key)
Mode name	Description		
Drive application check	Checking whether the drive is applicable drive or not.	<p>When the drive is applicable drive.</p> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 0 auto;">DRV OK</div> <p>When the drive is not applicable drive.</p> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 0 auto;">DRV NG</div>	Press [0] [3] in service mode.
Drive Check	Simple quality of BD drive	<p>When BD drive is OK and a drive error is not stored in EEPROM.</p> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 0 auto;">DRV OK</div> <p>When BD drive is NG or drive errors are stored in EEPROM.</p> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 0 auto;">DRV NG</div> <p>*If the date of the present or the trouble occurred time is incorrect, it may be not able to judge correctly.</p>	Press [3][8] in service mode.
Laser Used Time Indication	Check laser used time (hours) of drive.	<p>Laser used time: BD Playback</p> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 0 auto;">BP * * * *</div> <p>Laser used time: BD Recording</p> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 0 auto;">BR * * * *</div> <p>Laser used time: DVD Playback</p> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 0 auto;">DP * * * *</div> <p>Laser used time: DVD Recording</p> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 0 auto;">DR * * * *</div> <p>Laser used time: CD Playing</p> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 0 auto;">CD * * * *</div> <p>● (****) is the used time display in hour. ● Laser used time of BD/ DVD/ CD in Playback/Recording mode is counted.</p>	Press [4] [1] in service mode.

Item		FL display	Key operation
Mode name	Description		(Remote controller key)
BD drive last error	BD drive error code display.	<p>1. Error Number is displayed for 5 seconds.</p> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 5px auto;">NO **</div> <p>2. Time when the error has occurred is display for 5 seconds.</p> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 5px auto;">YYMMDD</div> <p>YY: Year MM: Month DD: Date</p> <p>3. Last drive error (1/2) is displayed for 5 seconds.</p> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 5px auto;">*****</div> <p>00 : Bad disc 03 : Bad disc 04 : Bad disc or drive malfunction</p> <p>4. Last drive error (2/2) is displayed for five seconds.</p> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 5px auto;">*****</div> <p>5. Error occurring disc type is displayed for 5 seconds.</p> <p>DVD ROM</p> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 5px auto;">DVD</div> <p>CD</p> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 5px auto;">CD</div> <p>DVD-RAM (2.6GB)</p> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 5px auto;">RAM26</div> <p>DVD-RAM (4.7GB)</p> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 5px auto;">RAM47</div> <p>DVD-R</p> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 5px auto;">DVDR</div> <p>DVD-RW</p> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 5px auto;">DVDRW</div> <p>CD-R</p> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 5px auto;">CDR</div>	Press [4] [2] in service mode.

Item		FL display	Key operation (Remote controller key)												
Mode name	Description														
		CD-RW <div style="border: 1px solid black; padding: 5px; text-align: center;">CDRW</div>													
		DVD+R <div style="border: 1px solid black; padding: 5px; text-align: center;">DVDPR</div>													
		DVD+RW <div style="border: 1px solid black; padding: 5px; text-align: center;">DVDPRW</div>													
		BD-ROM <div style="border: 1px solid black; padding: 5px; text-align: center;">BDROM</div>													
		BD-RE <div style="border: 1px solid black; padding: 5px; text-align: center;">BDRE</div>													
		BD-R <div style="border: 1px solid black; padding: 5px; text-align: center;">BDR</div>													
		Others <div style="border: 1px solid black; padding: 5px; text-align: center;">MEDIA*</div> <p>* is displayed the respeced value from RTSC.</p>													
		6. Disc maker ID is displayed for 5 seconds. <div style="border: 1px solid black; padding: 5px; text-align: center;">*****</div>	In case that the maker cannot be identified, display is blackout.												
		7. Factor of drive error (hexadecimal) occurring is left displayed. <div style="border: 1px solid black; padding: 5px; text-align: center;">* * + + &amp; &amp;</div> <p>* * : Error occurring operation code (This is not used)</p> <p>+ + : Error occurring disc type</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td>00</td><td>DVD-ROM</td></tr> <tr><td>01</td><td>CD</td></tr> <tr><td>02</td><td>2.6GB DVD-RAM</td></tr> <tr><td>03</td><td>4.7GB DVD-RAM</td></tr> <tr><td>04</td><td>DVD-R</td></tr> <tr><td>After 05</td><td>Others</td></tr> </table>		00	DVD-ROM	01	CD	02	2.6GB DVD-RAM	03	4.7GB DVD-RAM	04	DVD-R	After 05	Others
00	DVD-ROM														
01	CD														
02	2.6GB DVD-RAM														
03	4.7GB DVD-RAM														
04	DVD-R														
After 05	Others														



Item		FL display	Key operation (Remote controller key)																																																																																								
Mode name	Description																																																																																										
		& & : Error occurring disc situation <table border="1"> <thead> <tr> <th rowspan="2">Display</th> <th colspan="3">Detail</th> </tr> <tr> <th>Disc distinction</th> <th>With or without Cartridge</th> <th>Disc cartridge slate</th> <th>Size</th> </tr> </thead> <tbody> <tr><td>00</td><td>OK</td><td>With</td><td>Not opened</td><td>12cm</td></tr> <tr><td>10</td><td>OK</td><td>With</td><td>Not opened</td><td>8cm</td></tr> <tr><td>20</td><td>OK</td><td>With</td><td>Opened</td><td>12cm</td></tr> <tr><td>30</td><td>OK</td><td>With</td><td>Opened</td><td>8cm</td></tr> <tr><td>40</td><td>OK</td><td>Without</td><td>Not opened</td><td>12cm</td></tr> <tr><td>50</td><td>OK</td><td>Without</td><td>Not opened</td><td>8cm</td></tr> <tr><td>60</td><td>OK</td><td>Without</td><td>Opened</td><td>12cm</td></tr> <tr><td>70</td><td>OK</td><td>Without</td><td>Opened</td><td>8cm</td></tr> <tr><td>80</td><td>NG</td><td>With</td><td>Not opened</td><td>12cm</td></tr> <tr><td>90</td><td>NG</td><td>With</td><td>Not opened</td><td>8cm</td></tr> <tr><td>A0</td><td>NG</td><td>With</td><td>Opened</td><td>12cm</td></tr> <tr><td>B0</td><td>NG</td><td>With</td><td>Opened</td><td>8cm</td></tr> <tr><td>C0</td><td>NG</td><td>Without</td><td>Not opened</td><td>12cm</td></tr> <tr><td>D0</td><td>NG</td><td>Without</td><td>Not opened</td><td>8cm</td></tr> <tr><td>E0</td><td>NG</td><td>Without</td><td>Opened</td><td>12cm</td></tr> <tr><td>F0</td><td>NG</td><td>Without</td><td>Opened</td><td>8cm</td></tr> </tbody> </table> 8. When the last error doesn't exist . <div style="border: 1px solid black; padding: 5px; text-align: center; width: fit-content; margin: 0 auto;">NO DATA</div>	Display	Detail			Disc distinction	With or without Cartridge	Disc cartridge slate	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	
Display	Detail																																																																																										
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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																																																																																							
CEC (H) output check	Check of the CEC terminal high output of HDMI.	When the check is OK <div style="border: 1px solid black; padding: 5px; text-align: center; width: fit-content; margin: 0 auto;">CECHOK</div> When the check is NG <div style="border: 1px solid black; padding: 5px; text-align: center; width: fit-content; margin: 0 auto;">CECHNG</div>	Press [5] [5] in service mode.																																																																																								
CEC (L) output check	Check of the CEC terminal low output of HDMI.	When the check is OK <div style="border: 1px solid black; padding: 5px; text-align: center; width: fit-content; margin: 0 auto;">CECLOK</div> When the check is NG <div style="border: 1px solid black; padding: 5px; text-align: center; width: fit-content; margin: 0 auto;">CECLNG</div>	Press [5] [6] in service mode.																																																																																								
Manufacturing Date	Read out the manufacturing date of the unit.	<div style="border: 1px solid black; padding: 5px; text-align: center; width: fit-content; margin: 0 auto;">YYMMDD</div> YY: Year MM: Month DD: Date	Press[6][1]in service mode.																																																																																								
Tray OPEN/CLOSE Test	The BD drive tray is opened and closed repeatedly.	<div style="border: 1px solid black; padding: 5px; text-align: center; width: fit-content; margin: 0 auto;">*****</div> * is number of open/close cycle times.	Press [9] [1] in service mode *When releasing this mode, press the [POWER] button of Remote Controller more than 10 seconds.																																																																																								
Delete the Laser Used Time	Laser used time information stored in the memory of the unit is deleted.	<div style="border: 1px solid black; padding: 5px; text-align: center; width: fit-content; margin: 0 auto;">CLR</div>	Press [9] [5] in service mode.																																																																																								
Delete the Last Drive Error	Laser Drive Error information stored on the BD Drive is deleted.	<div style="border: 1px solid black; padding: 5px; text-align: center; width: fit-content; margin: 0 auto;">CLR</div>	Press [9] [6] in service mode.																																																																																								
Delete the Error History	Error History information stored on the unit is deleted.	<div style="border: 1px solid black; padding: 5px; text-align: center; width: fit-content; margin: 0 auto;">CLR</div>	Press [9] [7] in service mode.																																																																																								

Item		FL display	Key operation (Remote controller key)
Mode name	Description		
Initialization of the Error code	Last Error Code information stored by timer is deleted. (Write in F00)	CLR	Press [9] [8] in service mode.
Initialization of the Service Mode	Last Drive Error, Error History and Error code information stored on the unit are initialized to factory setting.	CLR	Press [9] [9] in service mode.
Release Service Mode	Release Service Mode and turns the Power Off.	Displayed in STOP (SS) mode. *****	Press [POWER] button on the front panel or Remote controller in service mode.

## 8 Service Fixture & Tools

<b>Part Number</b>	<b>Description</b>	<b>Compatibility</b>
RFKZ0215	Extension Cable (Power P.C.B. - FL P.C.B. / 12 Pin)	Same as BR570 Series
RFKZ0216	Extension Cable (Power P.C.B. - Digital P.C.B. / 23 Pin)	Same as BR570 Series
RFKZ03D01KS	Lead Free Solder (0.3mm/100g Reel)	Same as BD60 Series
RFKZ06D01KS	Lead Free Solder (0.6mm/100g Reel)	Same as BD60 Series
RFKZ10D01KS	Lead Free Solder (1.0mm/100g Reel))	Same as BD60 Series
RFKZ0316	Solder Remover (Lead free low temperature Solder/50g)	Same as BD60 Series
RFKZ0328	Flux	Same as BD60 Series

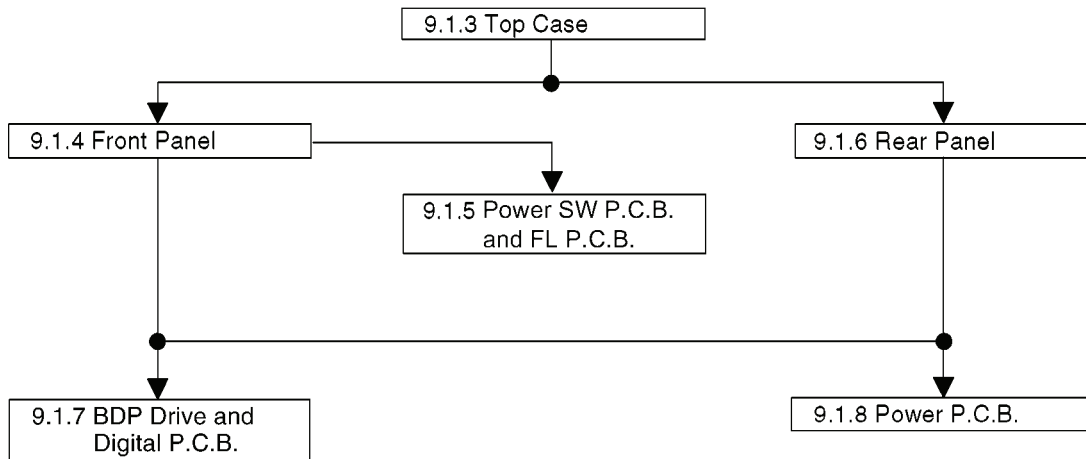
# 9 Disassembly and Assembly Instructions

## 9.1. Unit

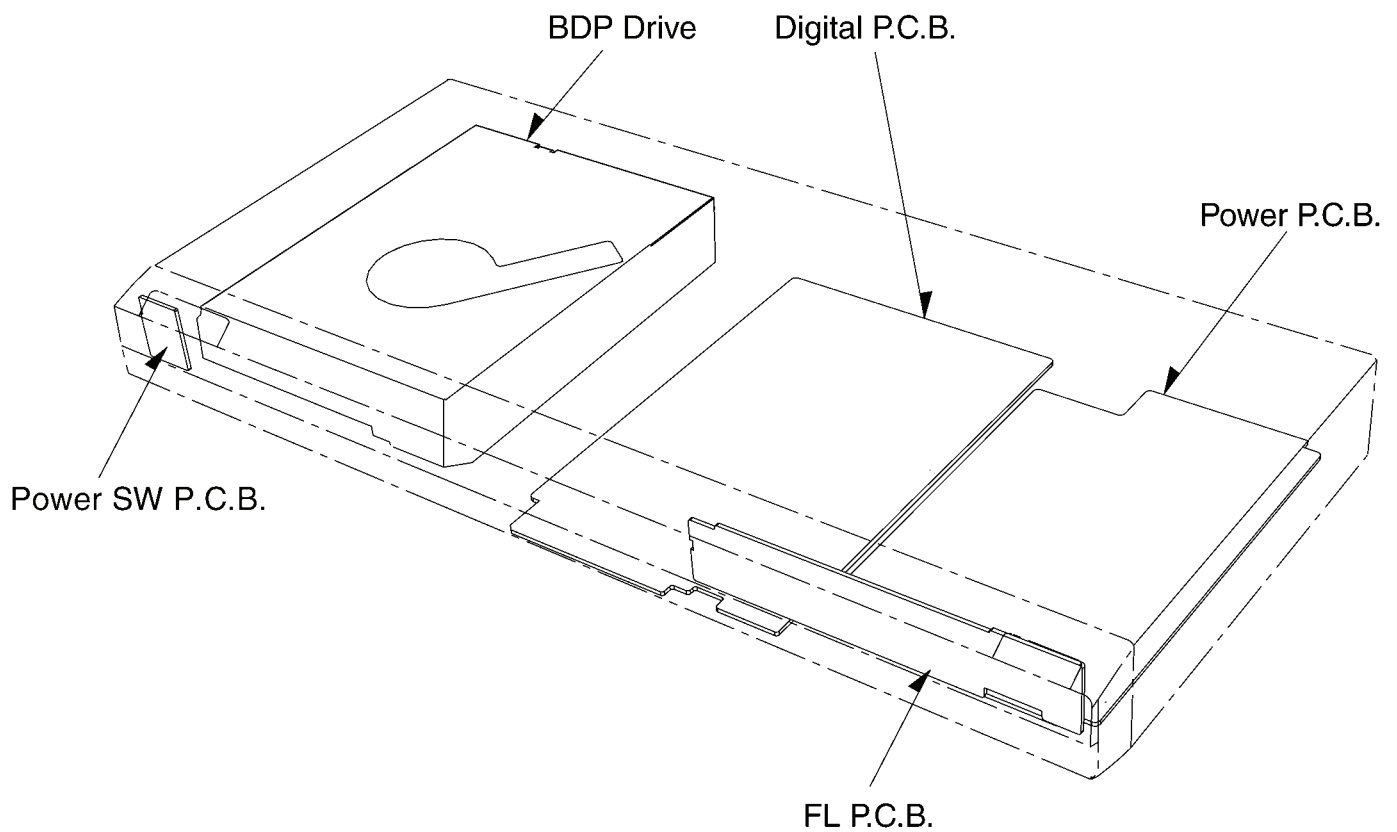
### 9.1.1. Disassembly Flow Chart

The following chart is the procedure for disassembling the casing and inside parts for internal inspection when carrying out the servicing.

To assemble the unit, reverse the steps shown in the chart below.

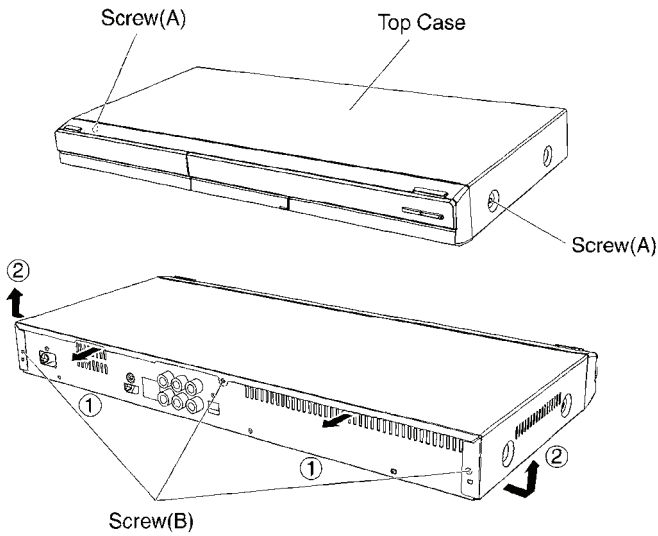


### 9.1.2. P.C.B. Positions



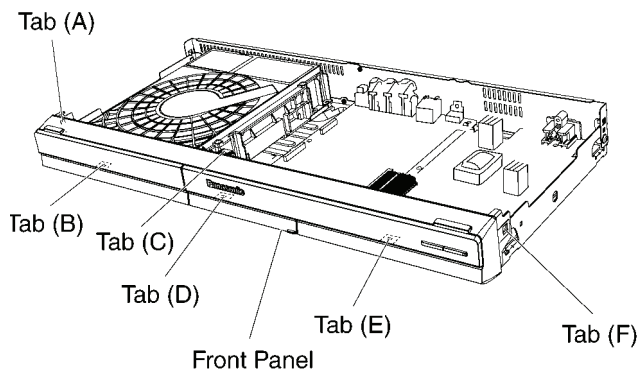
### 9.1.3. Top Case

1. Remove the 2 Screws (A) and 3 Screws (B).
2. Slide Top Case rearward and open the both ends at rear side of the Top Case a little and lift the Top Case in the direction of the arrows.



### 9.1.4. Front Panel

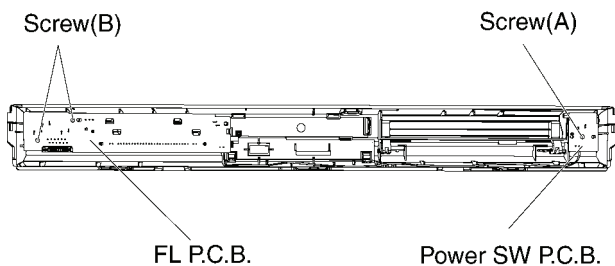
1. Unlock 6 tabs (A)-(F) turn. Pull with the Front Panel in the direction of your side.



### 9.1.5. Power SW P.C.B. and FL P.C.B.

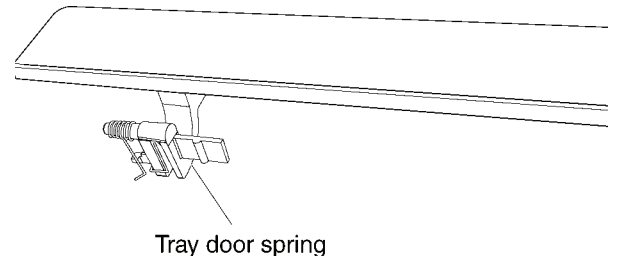
#### 9.1.5.1. Power SW P.C.B. and FL P.C.B.

1. Remove the screw (A).
2. Remove the Power SW P.C.B..
3. Remove the 2 Screws (B).
4. Remove the FL P.C.B..



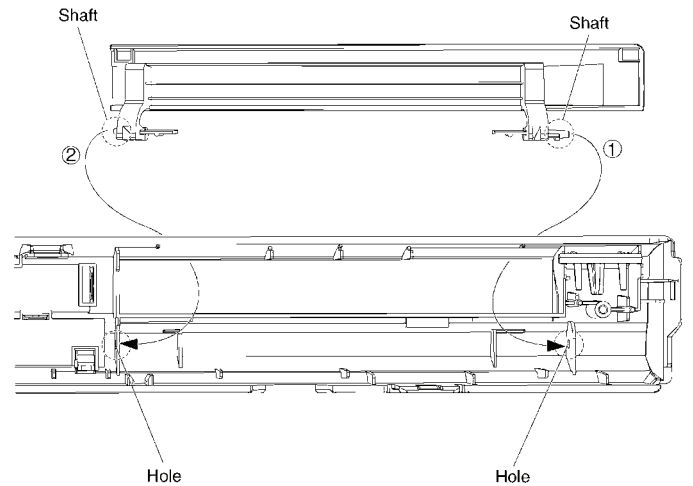
### 9.1.5.2. How to assemble Tray door ass'y.

1. Attach the Tray door spring to Tray door ass'y.

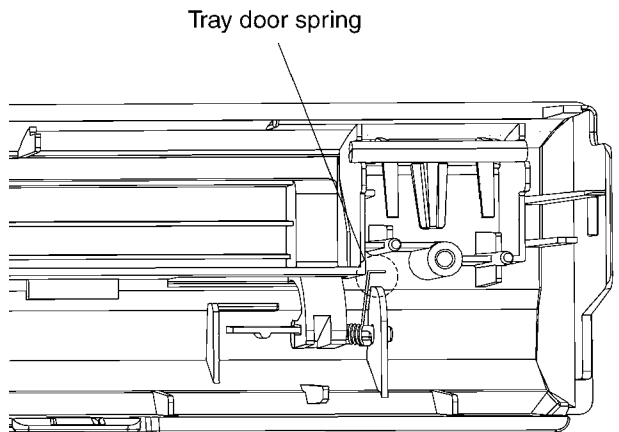


2. Attach Tray door ass'y in order from ① to ②.

- ①: Insert the shaft in the hole.
- ②: Insert the shaft in the hole.

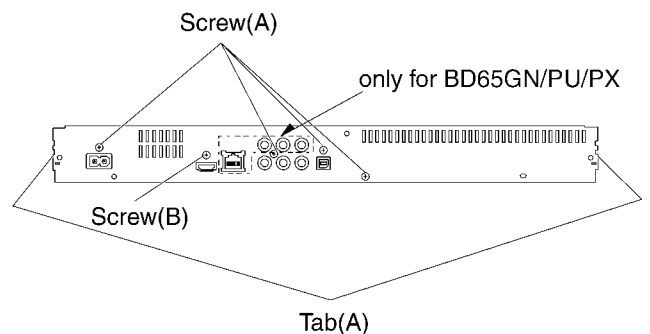


3. Confirm the Tray door spring is attached as following.



### 9.1.6. Rear Panel

1. Remove the 4 Screws (A) and Screw (B).
2. Unlock 2 locking Tabs (A) to remove the Rear Panel.



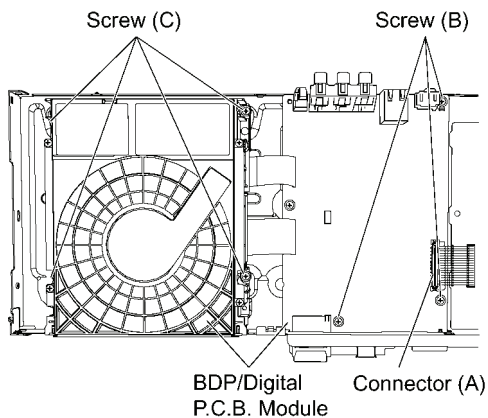
### 9.1.7. BDP Drive and Digital P.C.B.

For assembly service, please refer to step 1 to 4.  
For single part service, please refer to step 5 to 8.

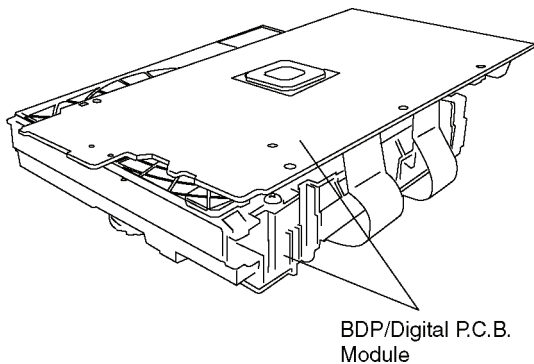
**Caution:**

Pairing of BD Drive and Digital P.C.B. as "BDP/Digital P.C.B. Module" have to be replaced together. If the either BD drive or Digital P.C.B. is changed, BD Drive unit has to be re-adjusted. Because the adjustment data for BD Drive Unit is stored in Digital P.C.B..

1. Remove the Connector (A).
2. Remove the 3 Screws (B).
3. Remove the 4 Screws (C).



4. Put Digital P.C.B. on BD Drive and remove BDP/Digital P.C.B. Module.

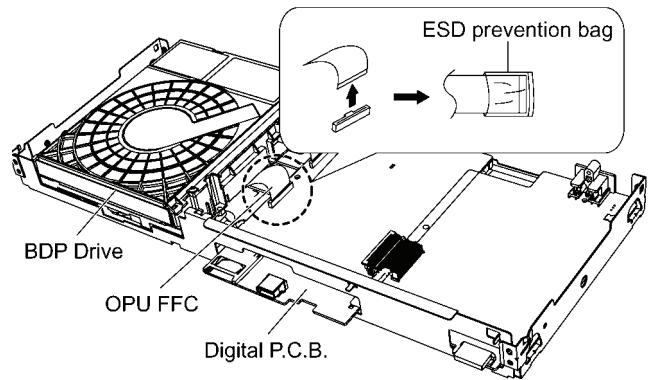


**Caution:**

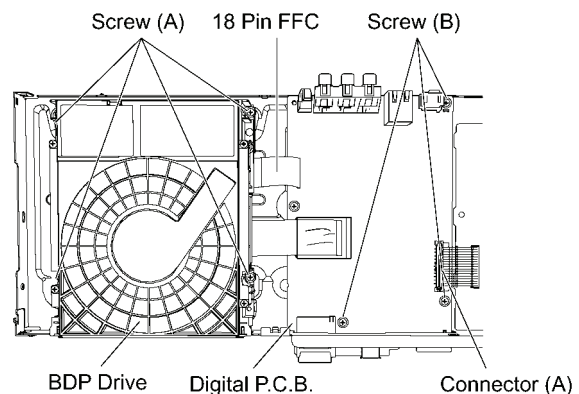
To prevent the laser diode from the ESD damage, the OPU FFC removed from the P.C.B. should be isolated with an ESD prevention bag.

5. Remove the OPU FFC, and isolate it with an ESD

prevention bag (RPF0114).



6. Remove the 18 Pin FFC.
7. Remove the 4 Screws (A) to remove the BD Drive.
8. Remove the Connector (A) and 3 Screws (B) to remove the Digital P.C.B..

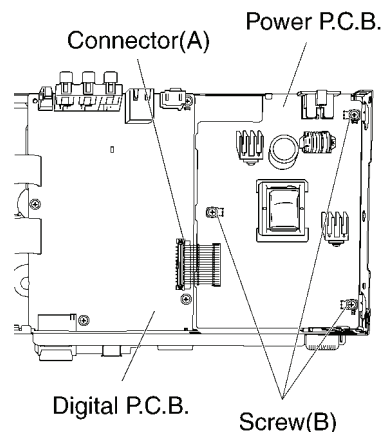


**Caution on assembly:**

When remove the ESD prevention bag, do not touch the OPU FFC conductive surface, to avoid ESD damage.

### 9.1.8. Power P.C.B.

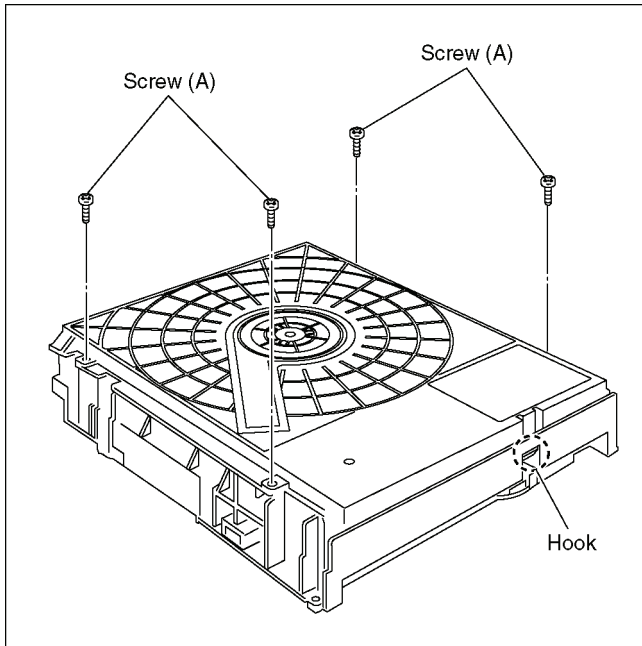
1. Remove the connector (A).
2. Remove the 3 Screws (B) to remove Power P.C.B..



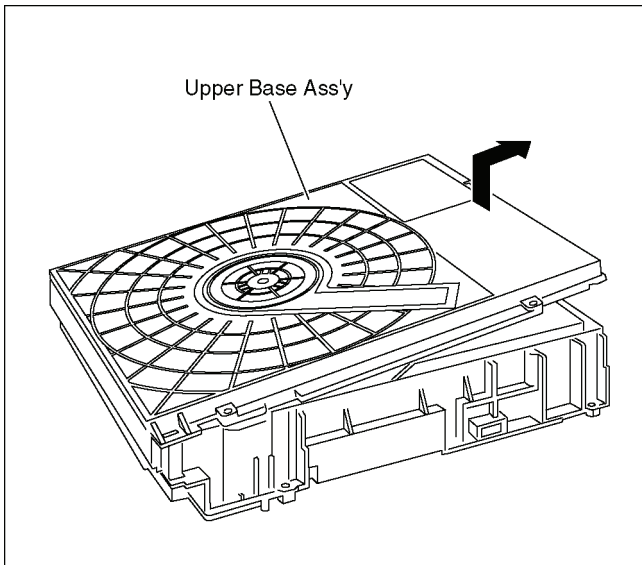
## 9.2. BD Drive

### 9.2.1. Upper Base Ass'y

1. Remove the 4 Screws (A), and push the Hook in.

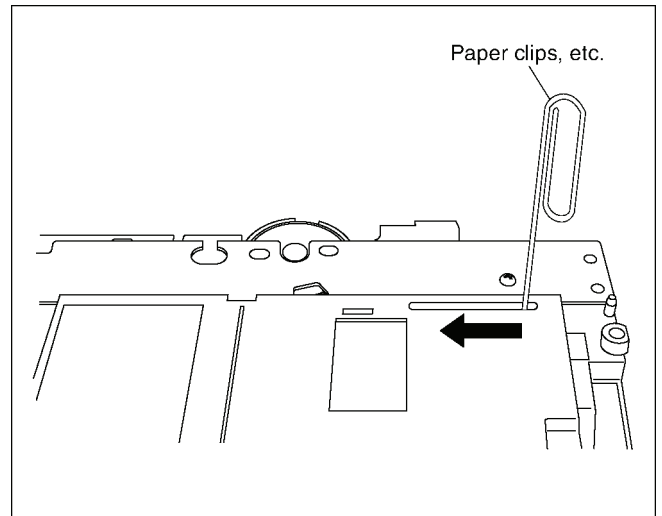


2. Lift up the Upper Base Ass'y, and pull it out to the direction of arrow.

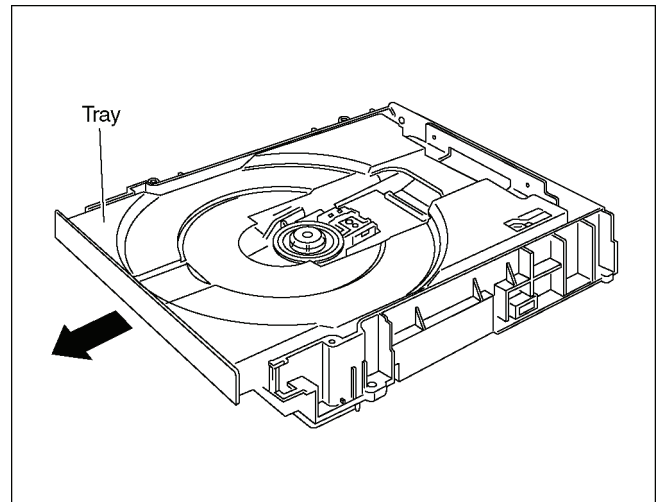


### 9.2.2. Tray

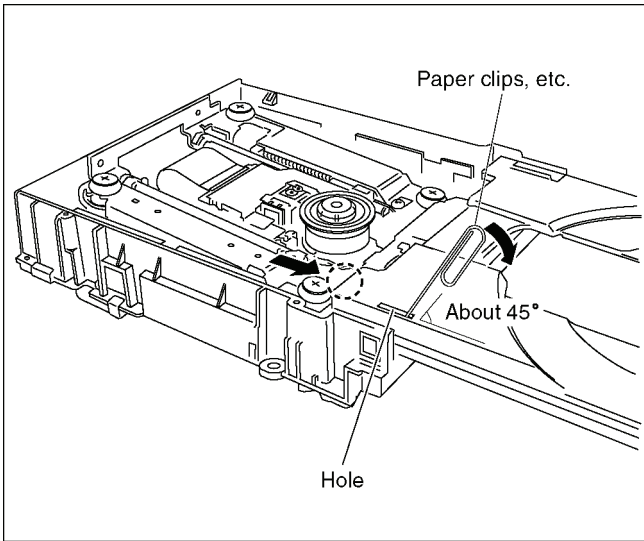
1. Perform the step "9.2.1. Upper Base Ass'y".
2. Insert the Paper clips, etc. into the hole of the bottom side, and slide it to the direction of arrow until it can be.



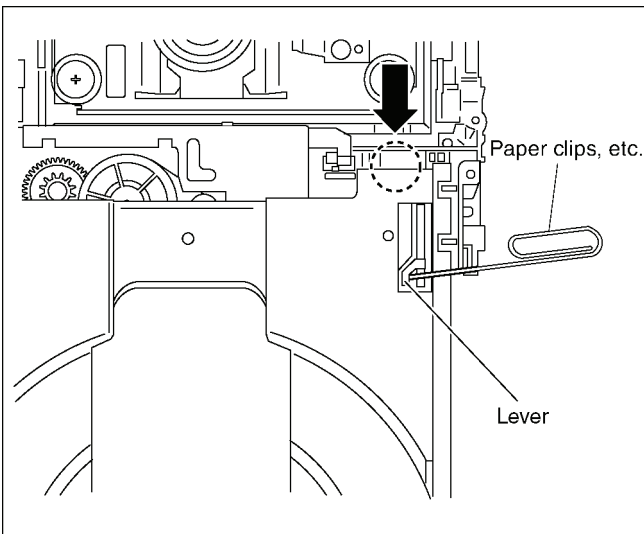
3. Pull the Tray to the direction of arrow until it can be.



4. Insert the Paper clips, etc. into the hole of the Tray at 45 degrees, and lean it to the direction of arrow with pushing the dotted point of the tray forward. Then the one side of the tray is come off from the Drive.

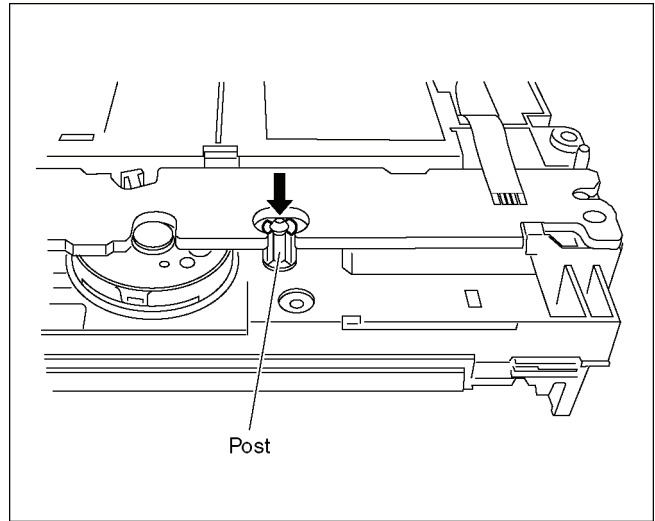


5. Insert the Paper clips, etc. into the Tray as below figure, lift up the lever using the Paper clips, etc. while pushing the dotted point of the Tray. And remove the Tray.

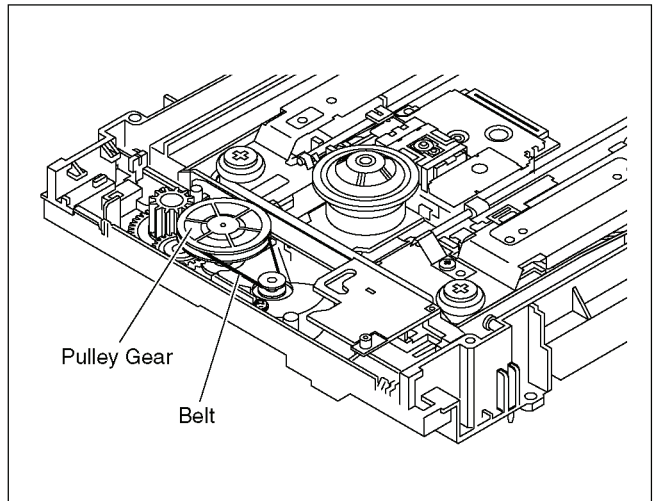


### 9.2.3. Pulley Gear, Belt

1. Perform the step "9.2.2. Tray".
2. Push the Post to the direction of arrow by using the slotted screwdriver.



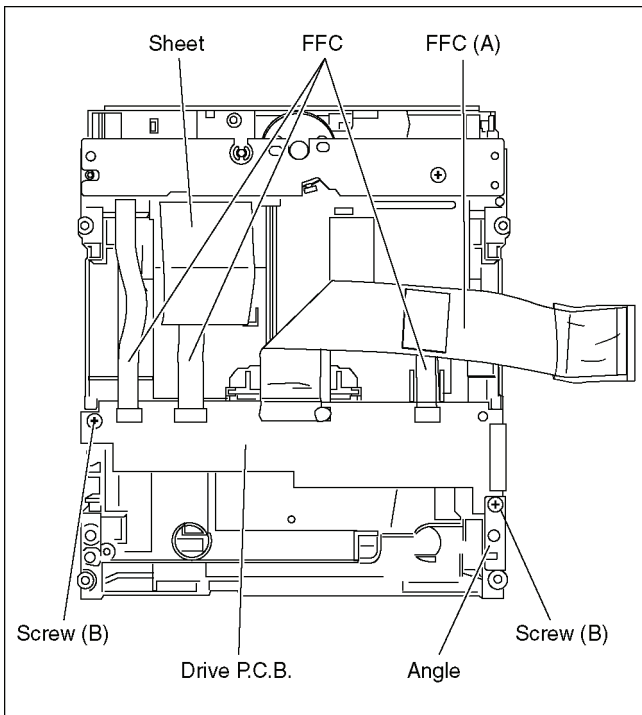
3. Remove the Pulley Gear and Belt.



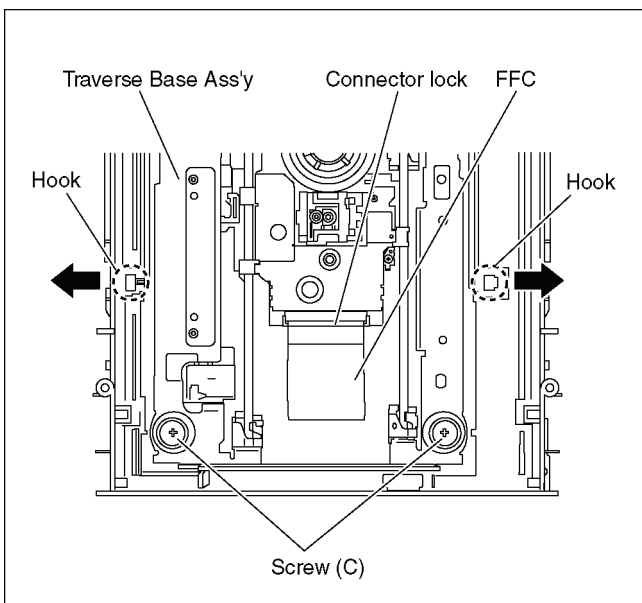


### 9.2.4. Slide Cam

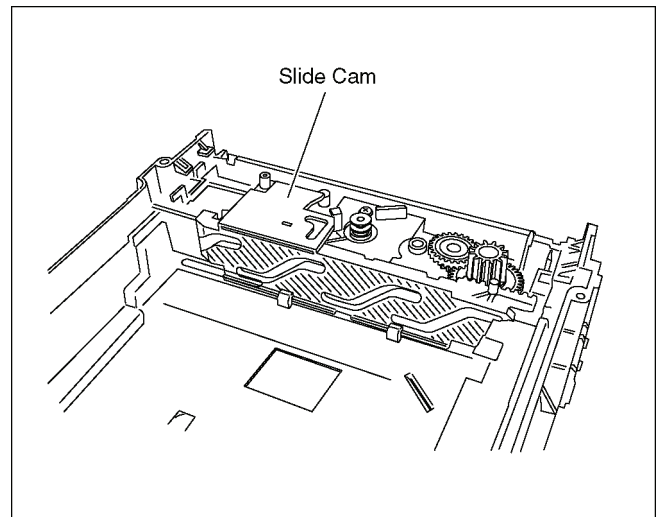
1. Perform the step "9.2.3. Pulley Gear, Belt".
2. Disconnect the 3 FFCs.
3. Remove the 2 Screws (B) and the Angle.
4. Peel off Coppery Sheet from FFC (A) and remove the Drive P.C.B.



5. Before open the connector lock, make sure to weld the short circuit solder of the OPU, and then disconnect the OPU FFC.
6. Remove the 2 Screws (C), and remove the Traverse Base Ass'y with spreading the 2 hooks to the direction of arrows.

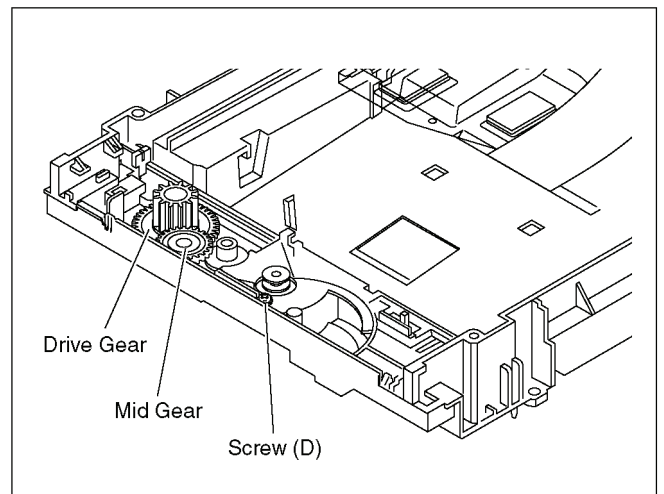


7. Remove the Slide Cam.

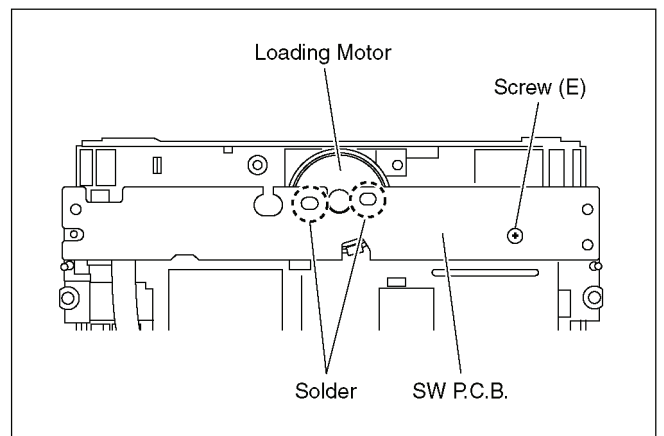


### 9.2.5. Mid Gear, Drive Gear and Loading Motor

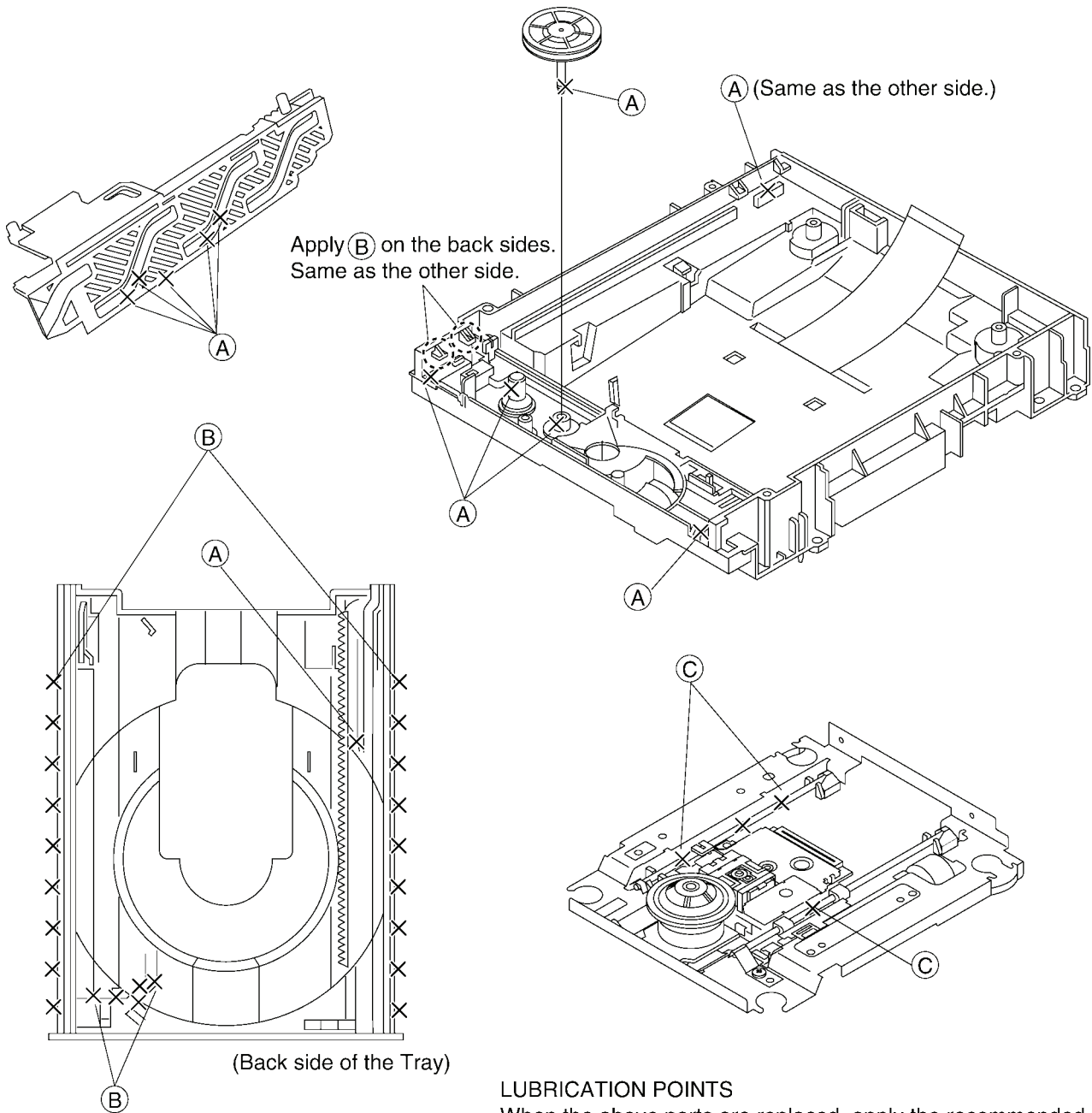
1. Perform the step "9.2.4. Slide Cam".
2. Remove the Mid Gear and Drive Gear.
3. Remove the Screw (D) to remove the Loading Motor.



4. Remove the Screw (E).  
Remove the 2 soldering points, and remove the Loading Motor and the SW P.C.B..



## 9.2.6. Grease



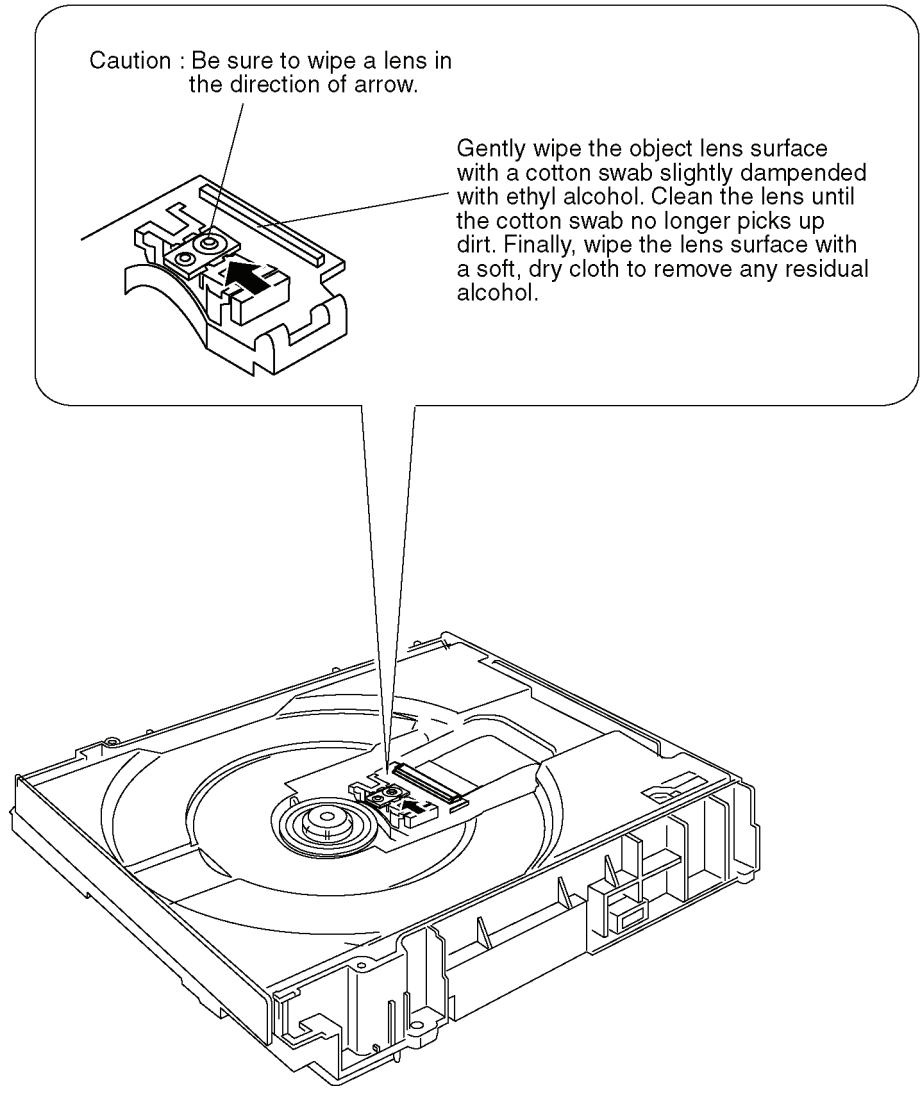
### LUBRICATION POINTS

When the above parts are replaced, apply the recommended lubricants or adhesive for better maintenance of the unit.

Mark	Kind of lubricant	Part No.
(A)	Grease	RFKZ0484
(B)	Hanarl	RFKZ0441
(C)	Grease	RFKXPG641

### 9.2.7. How to Clean the Lens of Optical Pick-UP

Follow the "9.2.1. Upper Base Ass'y".



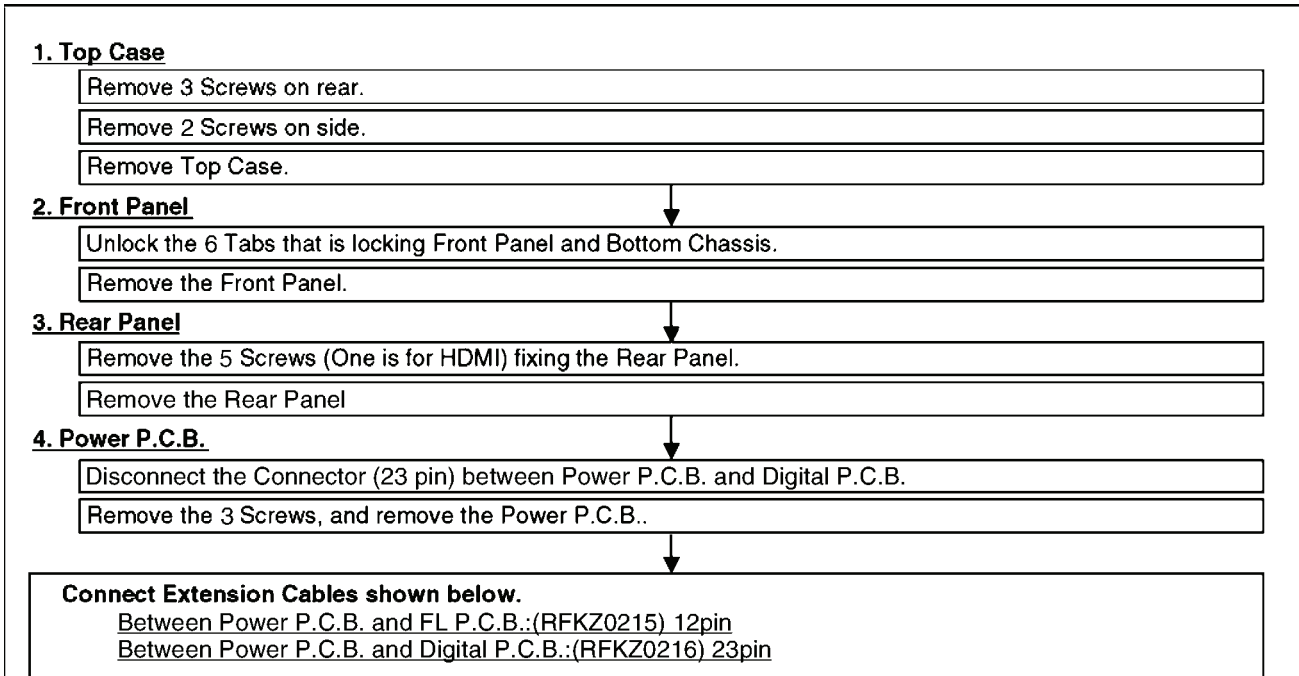
# 10 Measurements and Adjustments

## 10.1. Service Positions

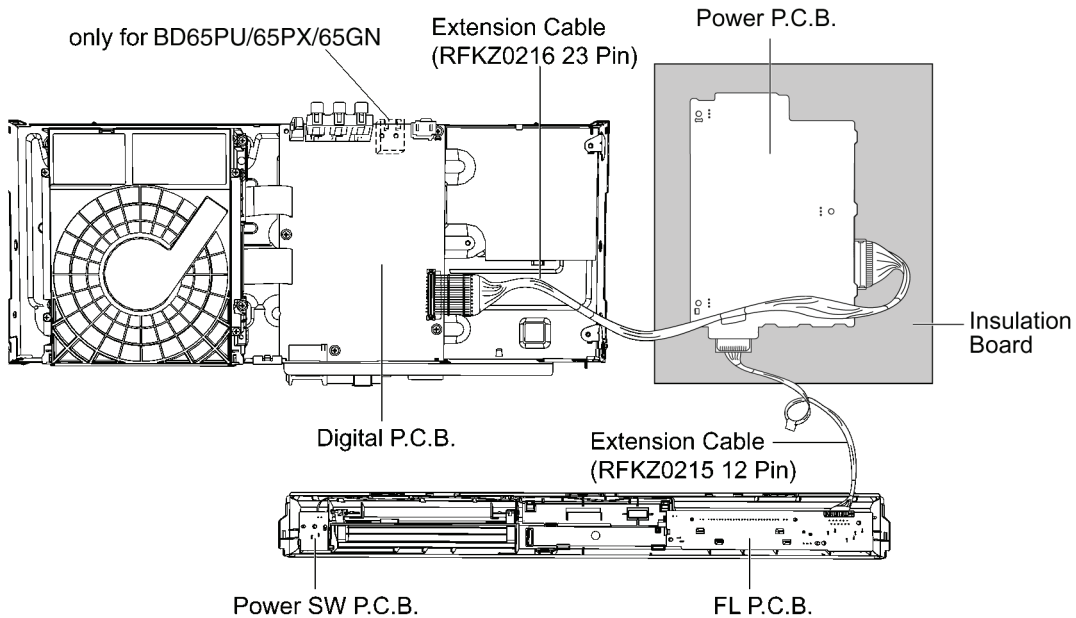
**Note:**

For description of the disassembling procedure, see the section 9.

### 10.1.1. Checking and Repairing of Power P.C.B.



**Caution:**  
Red wire should be connected to pin 1.



## 10.1.2. Checking and Repairing of BD/Digital P.C.B. Module

**1. Top Case**

Remove 3 Screws on rear.

Remove 2 Screws on side.

Remove Top Case.

**2. Rear Panel**

Remove the 5 Screws (One is for HDMI) fixing the Rear Panel.

Remove the Rear Panel.

**3. BDP/Digital P.C.B. Module**

Disconnect the Connector (23 pin) between Digital P.C.B. and Power P.C.B.

Remove the 3 Screws fixing the Digital P.C.B.

Remove the 4 Screws fixing the BD Drive.

Connecting the Digital P.C.B. to Power P.C.B. with Extension Cable (23pin).

Put Insulation Board on BD Drive, and put the Digital P.C.B. on Insulation Board.

**Connect Extension Cables shown below.**  
Between Digital P.C.B. and Power P.C.B.: (RFKZ0216)23pin

**Caution:**  
Red wire should be connected to pin 1.

The diagram illustrates the internal components of the device. On the left is the Power P.C.B. On the right, the Digital P.C.B. is mounted on a grey Insulation Board. A 23-pin extension cable, labeled 'Extension Cable (RFKZ0216 23 Pin)', connects the two boards. The Digital P.C.B. is shown with a dashed outline indicating its placement on the insulation board.

## 10.2. Caution for Replacing Parts

### 10.2.1. Items that should be done after replacing parts

√: Necessary      —: Unnecessary

Items that Should be done	Updating Firmware (Note 1)
Replacing Parts	
BDP/Digital P.C.B.	√

**Note 1:**

Download latest Firmware and burn it on CD-R or CD-RW, and update Firmware.

### 10.2.2. Standard Inspection Specifications after Making Repairs

After making repairs, we recommend performing the following inspection, to check normal operation.

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.	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 judgement criteria for the picture and sound.

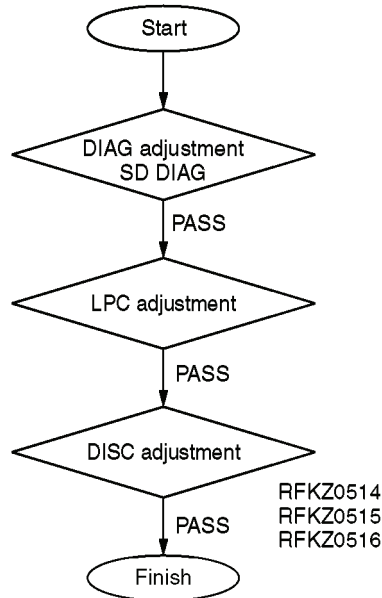
Item	Contents	Check	Item	Contents	Check
Picture	Block noise		Sound	Distorted sound	
	Crosscut noise			Noise (static, background noise, etc.)	
	Dot noise			The sound level is too low.	
	Picture disruption			The sound level is too high.	
	Not bright enough			The sound level changes.	
	Too bright				
	Flickering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

### 10.3. How to adjust the BDP/Digital P.C.B. Module

**Notes:**

This adjustment software can be downloaded from "Support Information from NWBG/VDBG-PAVC" web-site in "TSN system", together with instructions of "BD Drive Adjustment" including preparations and connections etc.

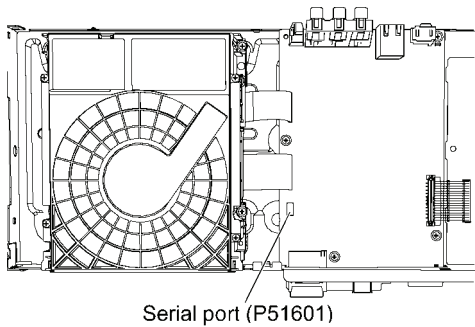
< Adjustment Flowchart >



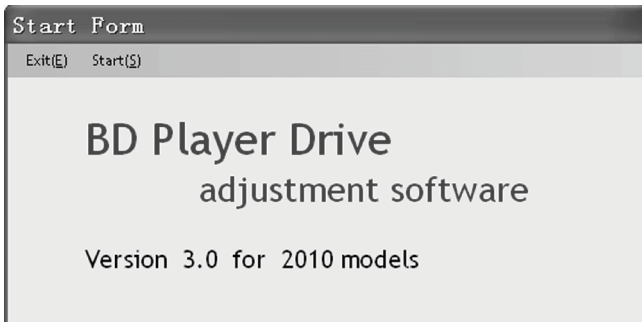
**Preparation:**

It is necessary to install the adjustment software to PC and copy DIAG software to SD card.

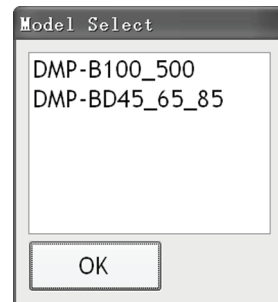
1. Connect the Serial port between P51601 on Digital P.C.B. and serial port of PC.



2. Start the adjustment software.



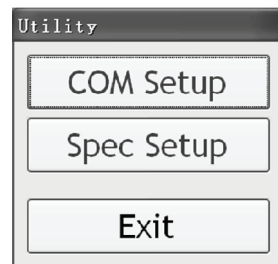
3. Select the model and click "OK".



4. Click "Utility".



5. Click "COM Setup".

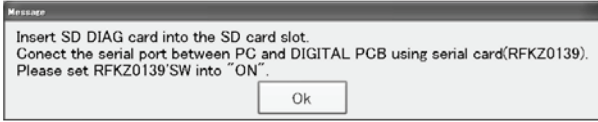


6. Select COM No., and click "OK". (COM No. is written on PC.)

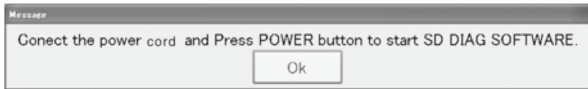


7. As returning to step 4, click "Adjustment".

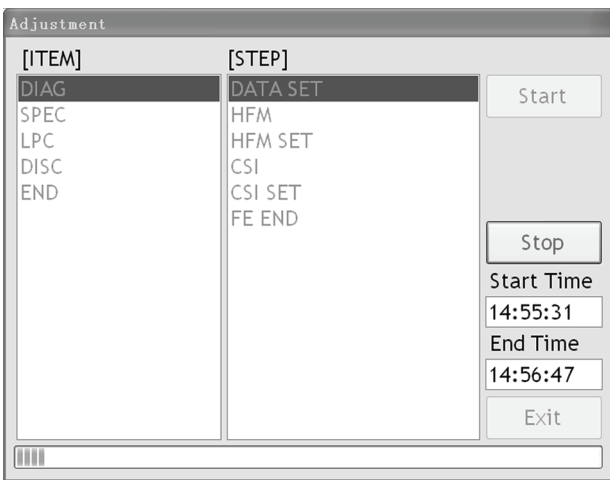
8. Perform the command of message window, click "OK".



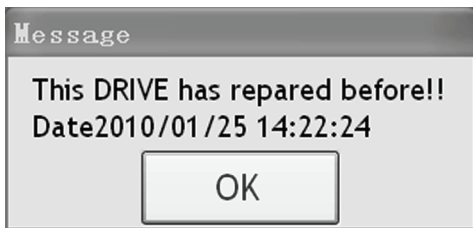
9. Perform the command of message window, click "OK".



10. Click "Start", adjustment starts automatically.

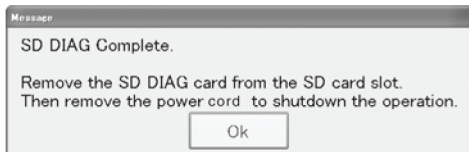


11. If BD Drive has replaced before, message window is displayed. Click "OK".

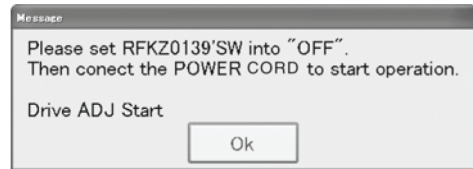


12. Adjustment starts automatically.

13. Perform the command of message window, click "OK".



14. Perform the command of message window, click "OK".

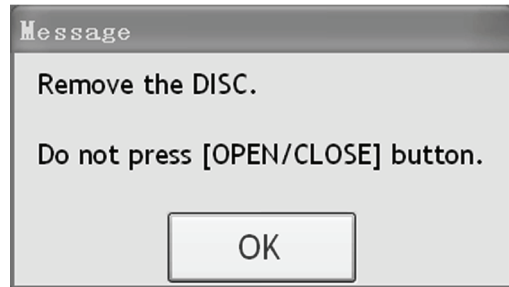


15. Insert DVD-RAM disc (X5RAM-BPS), and click "OK".

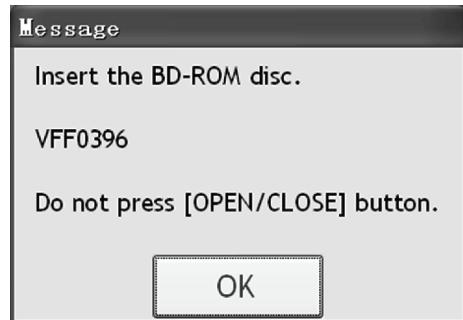


Adjustment starts automatically.

Tray is opened automatically when adjustment is finished, take out the disc and click "OK".

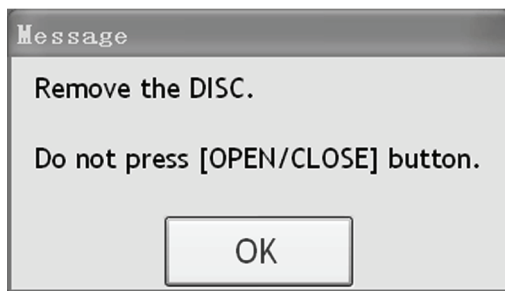


16. Insert BD-ROM disc (VFF0396), and click "OK".

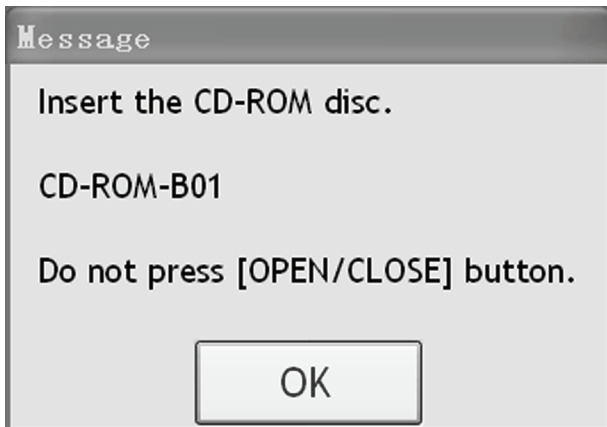




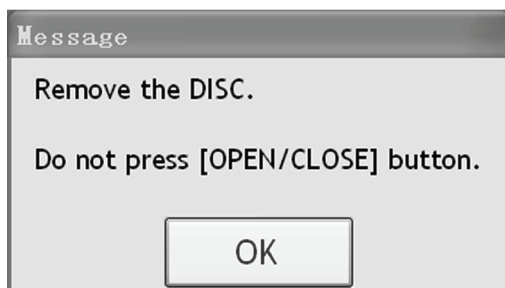
Adjustment starts automatically.  
 Tray is opened automatically when adjustment is finished,  
 take out the disc and click "OK".



17. Insert CD-ROM disc (CD-ROM-B01), and click "OK".



Adjustment starts automatically.  
 Tray is opened automatically when adjustment is finished,  
 take out the disc and click "OK".

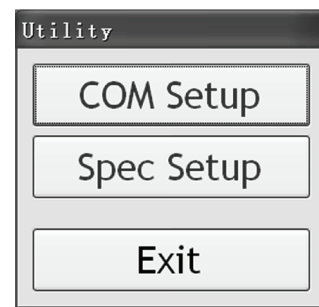


18. Disconnect the power cord and click "OK", finish the adjustment.

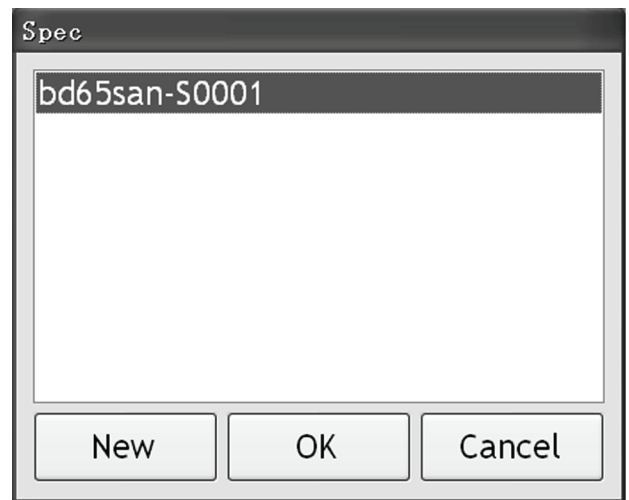


<When the latest data is updated to TSN>

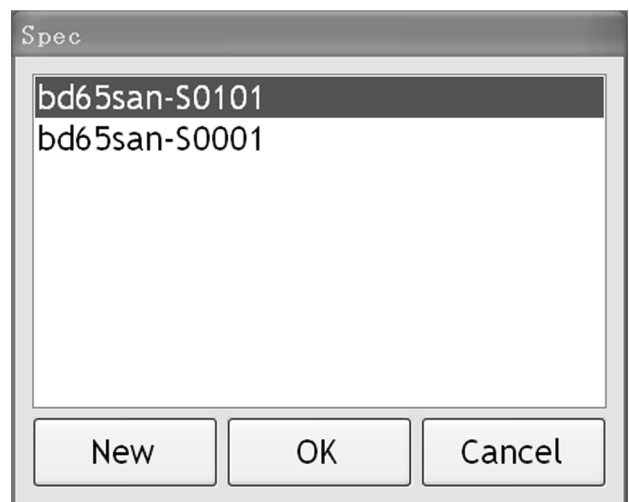
1. Download the latest data to PC.
2. Click "Spec Setup".



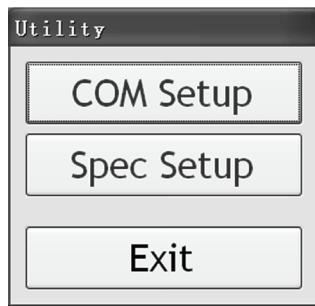
3. Open the downloaded data and click "New". Then retrieve the data.



4. Select the latest data and click "OK".



5. Go back to step 4 and click "Exit".

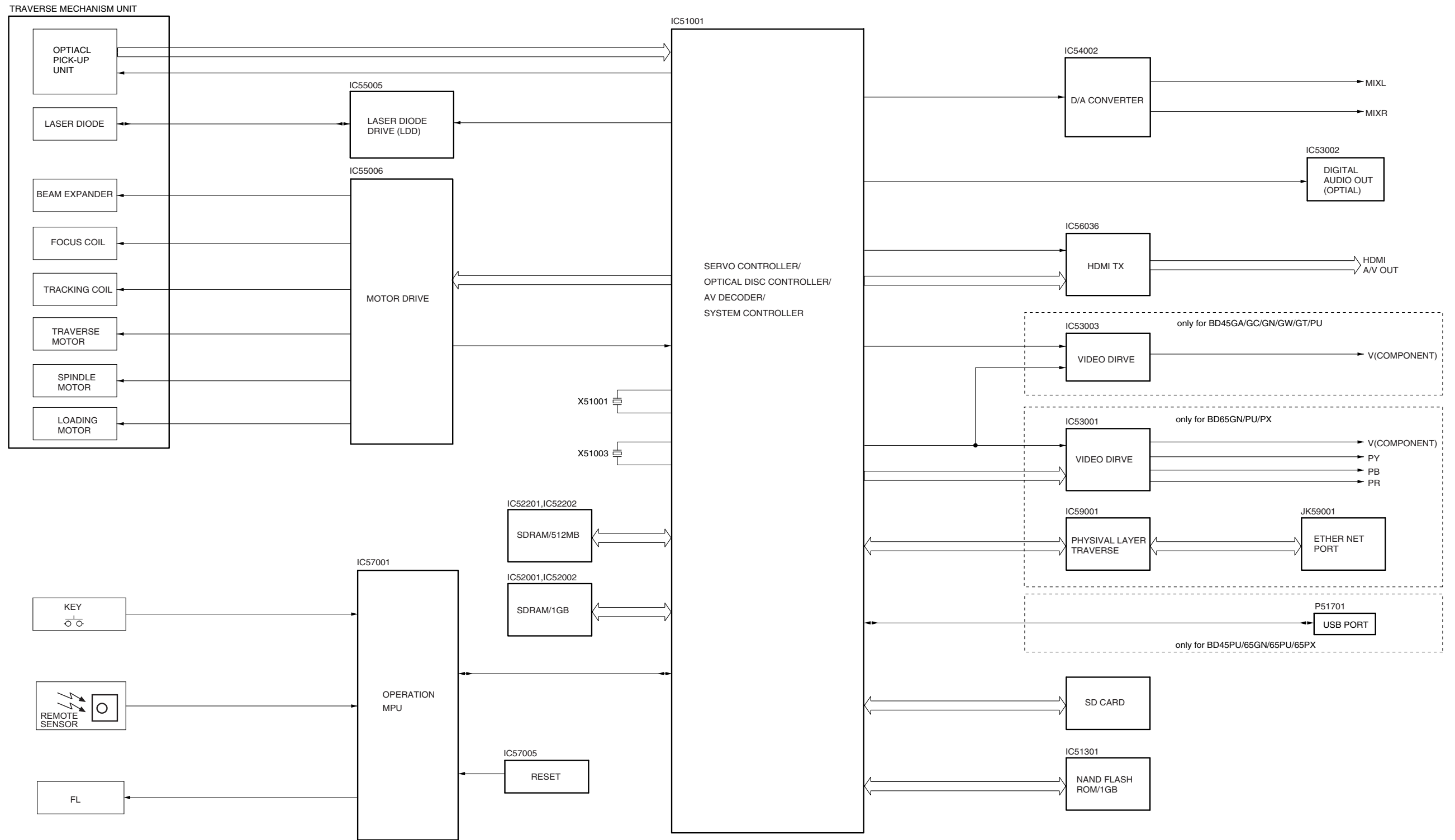


**Caution:**

If the adjustment does not work well, the unit's data might have been updated. In this case, download the latest software from TNS Web-site to update, and then adjust again.

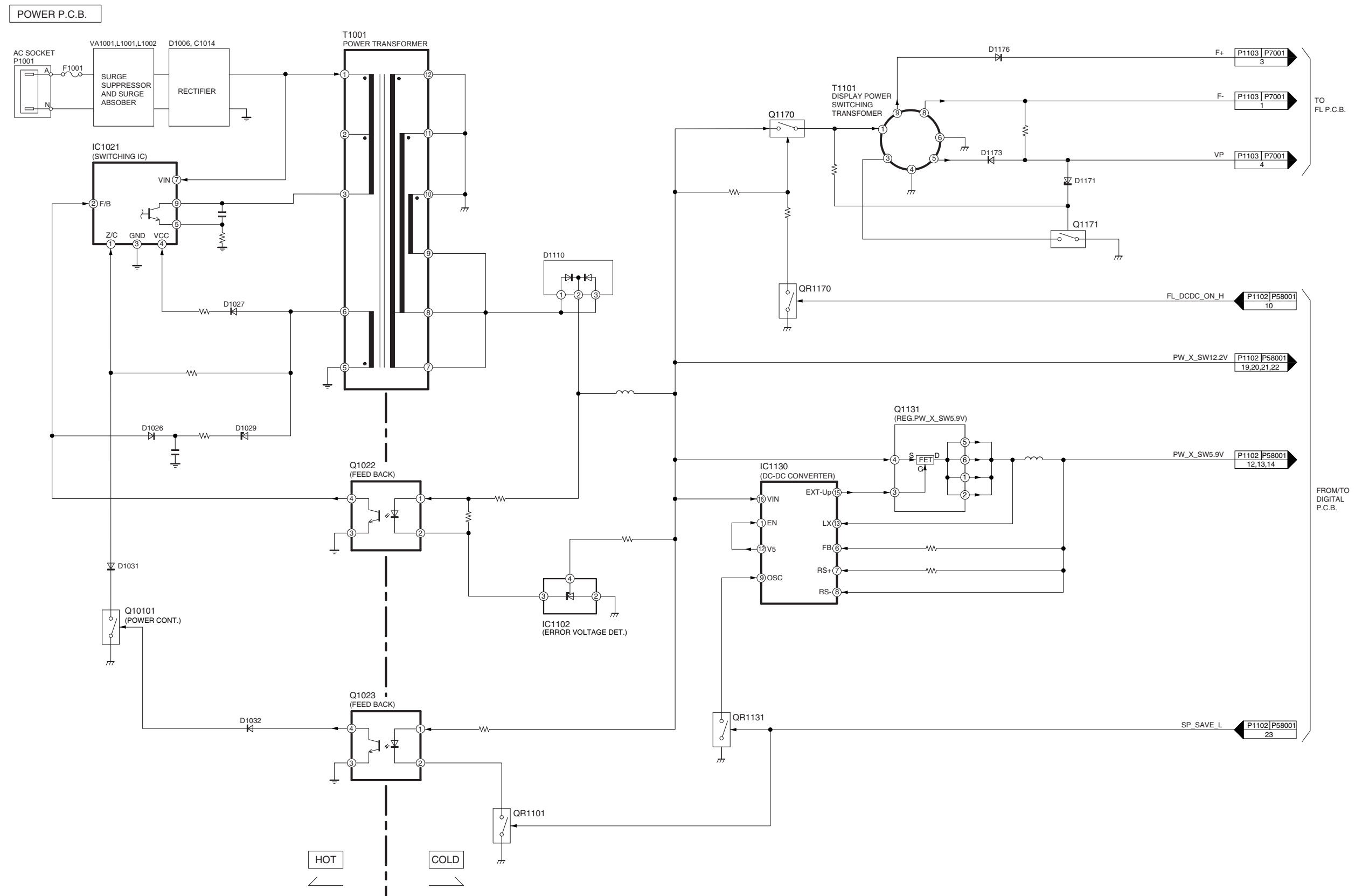
# 11 Block Diagram

## 11.1. Overall Block Diagram



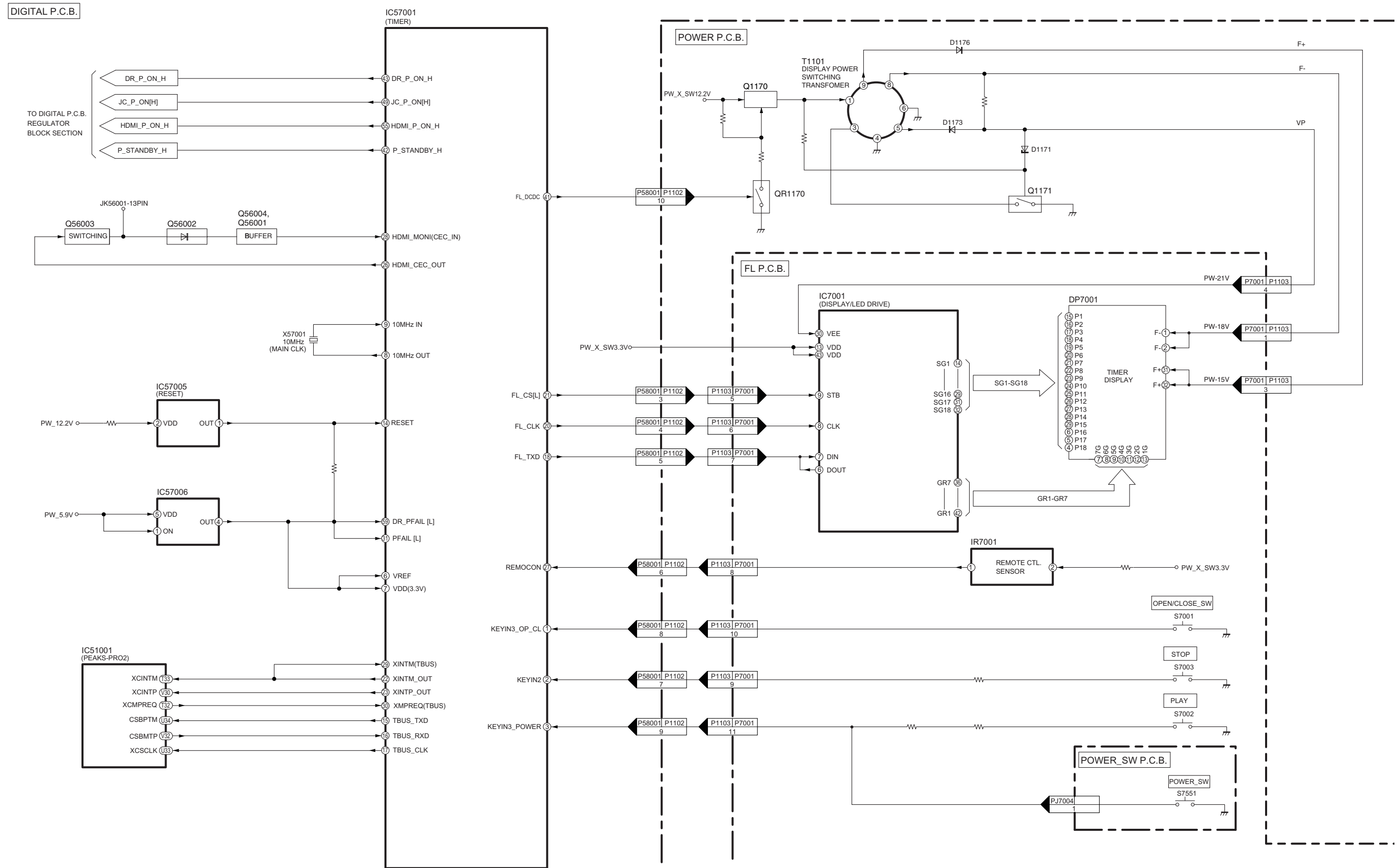
DMP-BD45GA/GC/GN/GT/GW/PU  
DMP-BD65GN/PU/PX  
OVERALL BLOCK DIAGRAM

## 11.2. Power Supply Block Diagram



DMP-BD45GA/GC/GN/GT/GW/PU  
DMP-BD65GN/PU/PX  
POWER BLOCK DIAGRAM

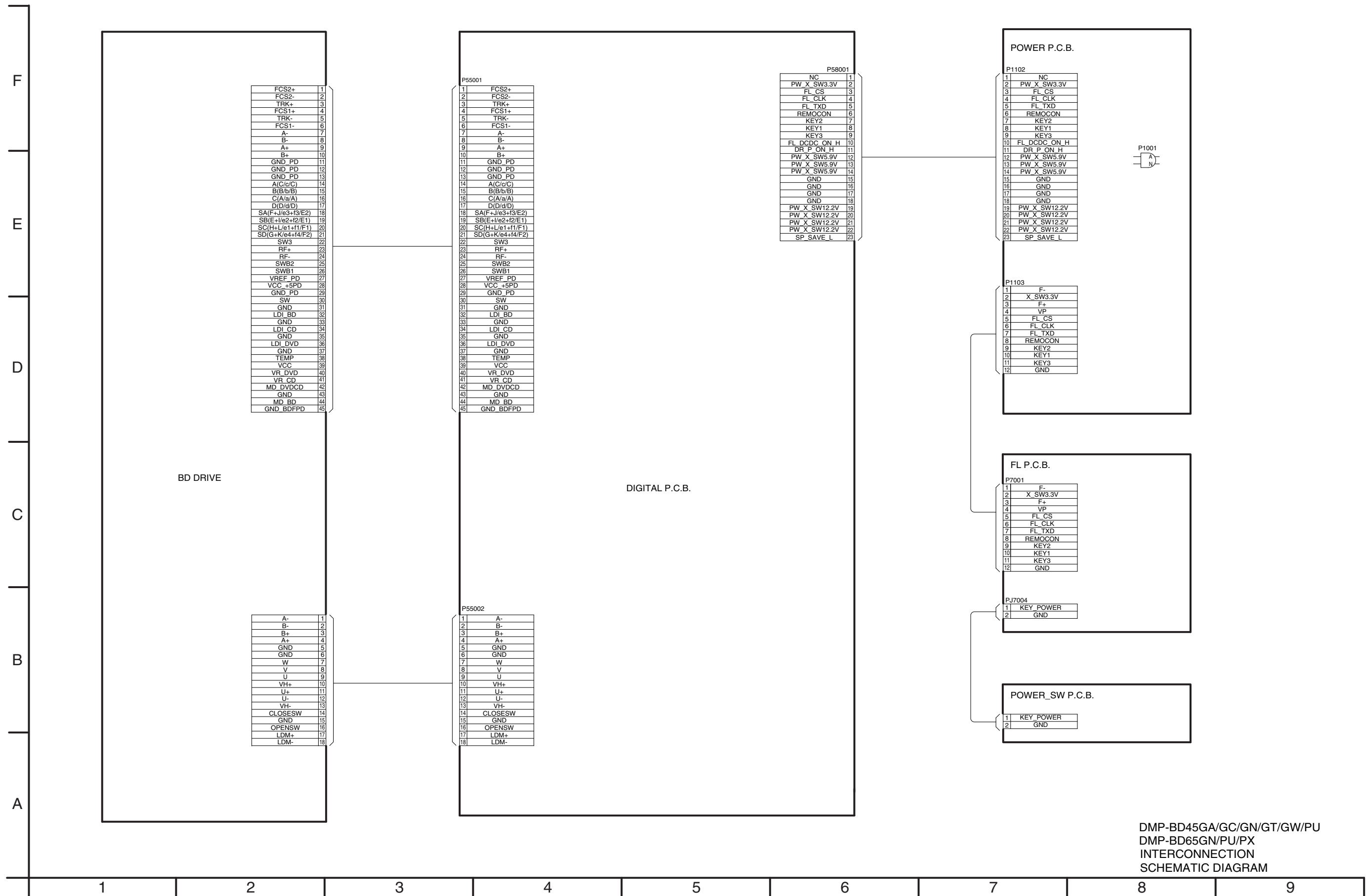
# 11.3. Timer Block Diagram



DMP-BD45GA/GC/GN/GT/GW/PU  
 DMP-BD65GN/PU/PX  
 TIMER BLOCK DIAGRAM

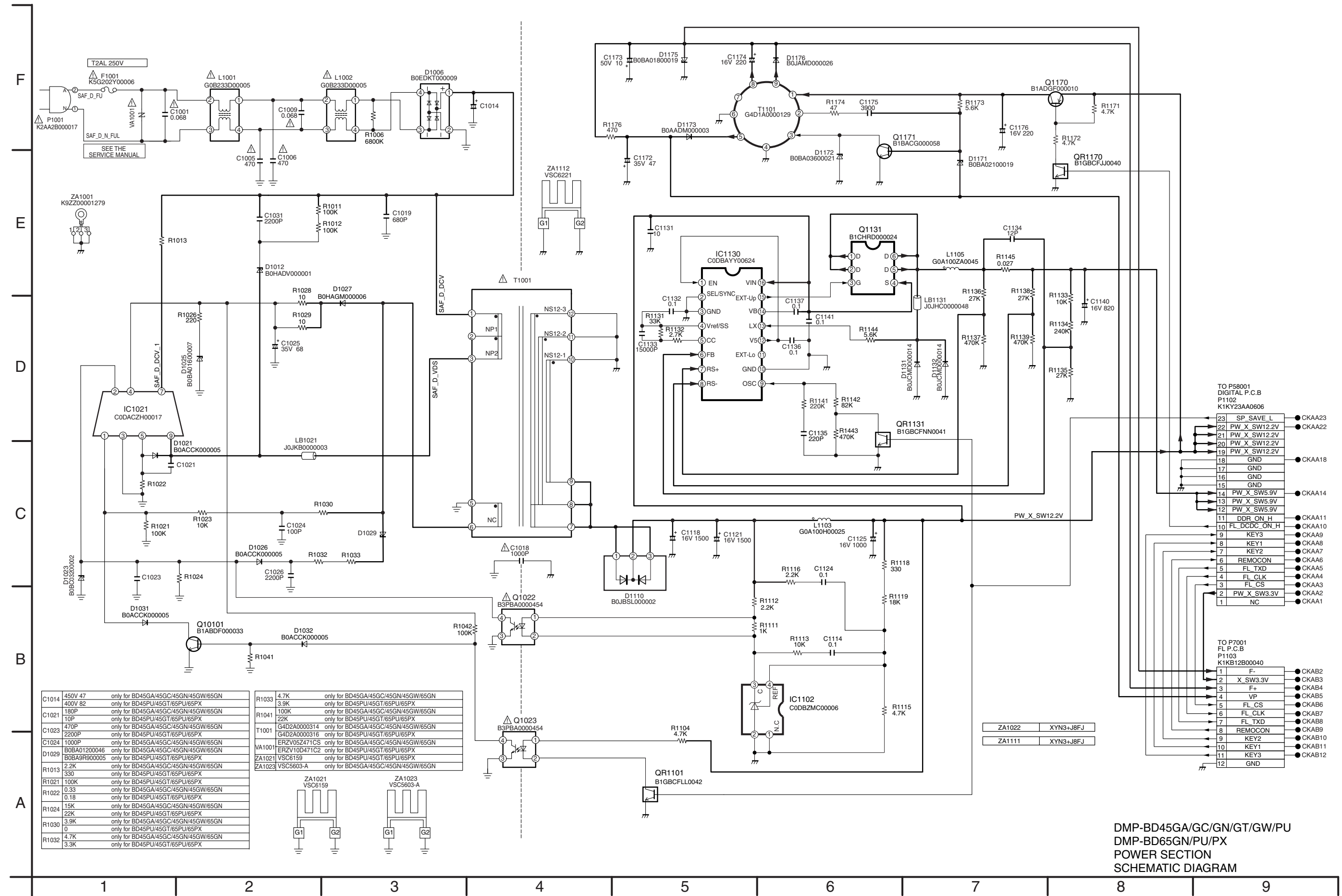
# 12 Schematic Diagram

## 12.1. Interconnection Schematic Diagram



DMP-BD45GA/GC/GN/GT/GW/PU  
DMP-BD65GN/PU/PX  
INTERCONNECTION  
SCHEMATIC DIAGRAM

# 12.2. Power Supply Schematic Diagram

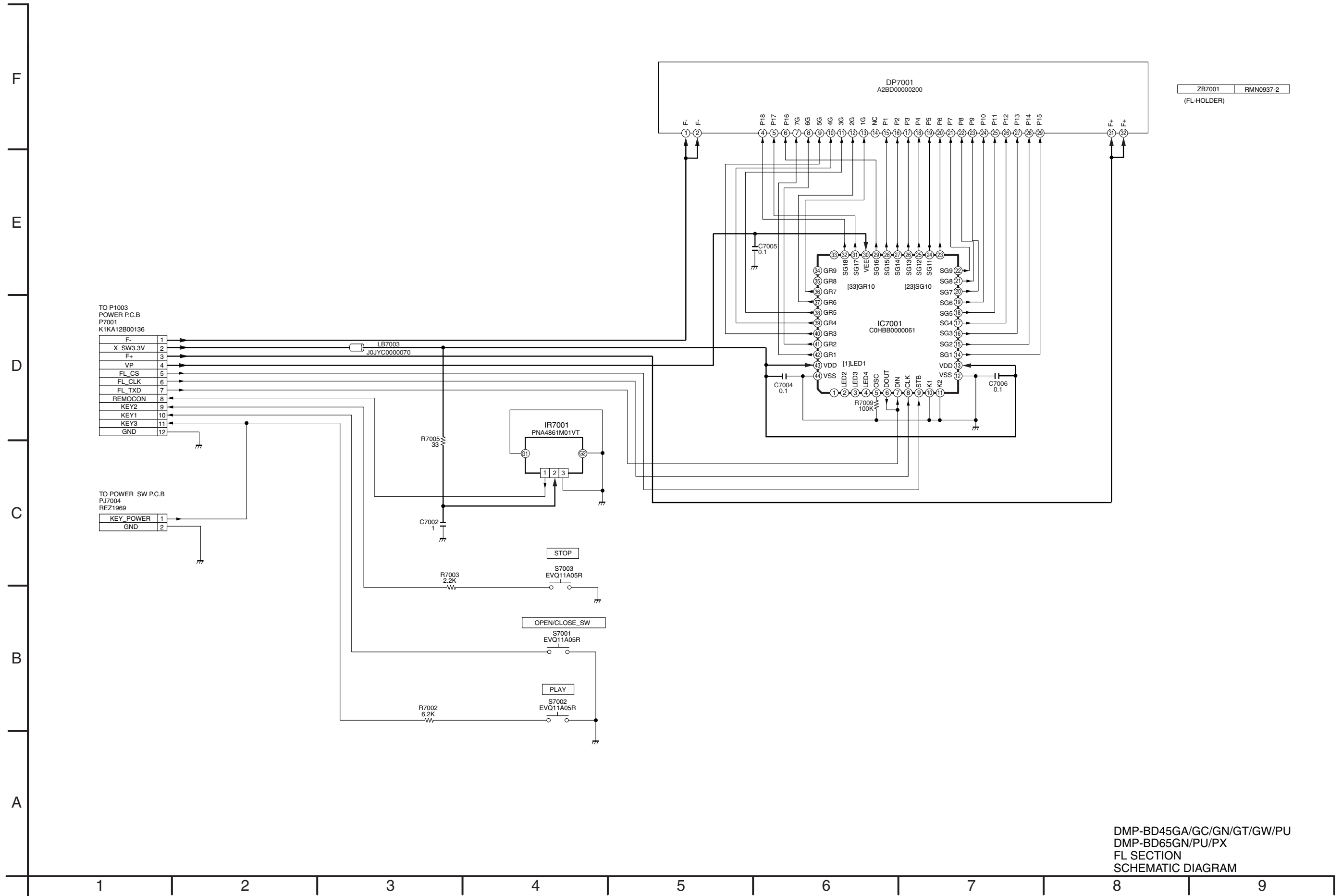


C1014	450V 47	only for BD45GA/45GC/45GN/45GW/65GN
	400V 82	only for BD45PU/45GT/65PU/65PX
C1021	180P	only for BD45GA/45GC/45GN/45GW/65GN
	10P	only for BD45PU/45GT/65PU/65PX
C1023	470P	only for BD45GA/45GC/45GN/45GW/65GN
	2200P	only for BD45PU/45GT/65PU/65PX
C1024	1000P	only for BD45GA/45GC/45GN/45GW/65GN
D1029	B0BA01200046	only for BD45GA/45GC/45GN/45GW/65GN
	B0BA9R900005	only for BD45PU/45GT/65PU/65PX
R1013	2.2K	only for BD45GA/45GC/45GN/45GW/65GN
	330	only for BD45PU/45GT/65PU/65PX
R1021	100K	only for BD45PU/45GT/65PU/65PX
R1022	0.33	only for BD45GA/45GC/45GN/45GW/65GN
	0.18	only for BD45PU/45GT/65PU/65PX
R1024	15K	only for BD45GA/45GC/45GN/45GW/65GN
	22K	only for BD45PU/45GT/65PU/65PX
R1030	3.9K	only for BD45GA/45GC/45GN/45GW/65GN
	0	only for BD45PU/45GT/65PU/65PX
R1032	4.7K	only for BD45GA/45GC/45GN/45GW/65GN
	3.3K	only for BD45PU/45GT/65PU/65PX
R1033	4.7K	only for BD45GA/45GC/45GN/45GW/65GN
	3.9K	only for BD45PU/45GT/65PU/65PX
R1041	100K	only for BD45GA/45GC/45GN/45GW/65GN
T1001	G4D2A0000314	only for BD45GA/45GC/45GN/45GW/65GN
	G4D2A0000316	only for BD45PU/45GT/65PU/65PX
VA1001	ERZV10D471C2	only for BD45PU/45GT/65PU/65PX
ZA1021	VSC6159	only for BD45PU/45GT/65PU/65PX
ZA1023	VSC5603-A	only for BD45GA/45GC/45GN/45GW/65GN

ZA1022	XYN3+J8FJ
ZA1111	XYN3+J8FJ

DMP-BD45GA/GC/GN/GT/GW/PU  
DMP-BD65GN/PU/PX  
POWER SECTION  
SCHEMATIC DIAGRAM

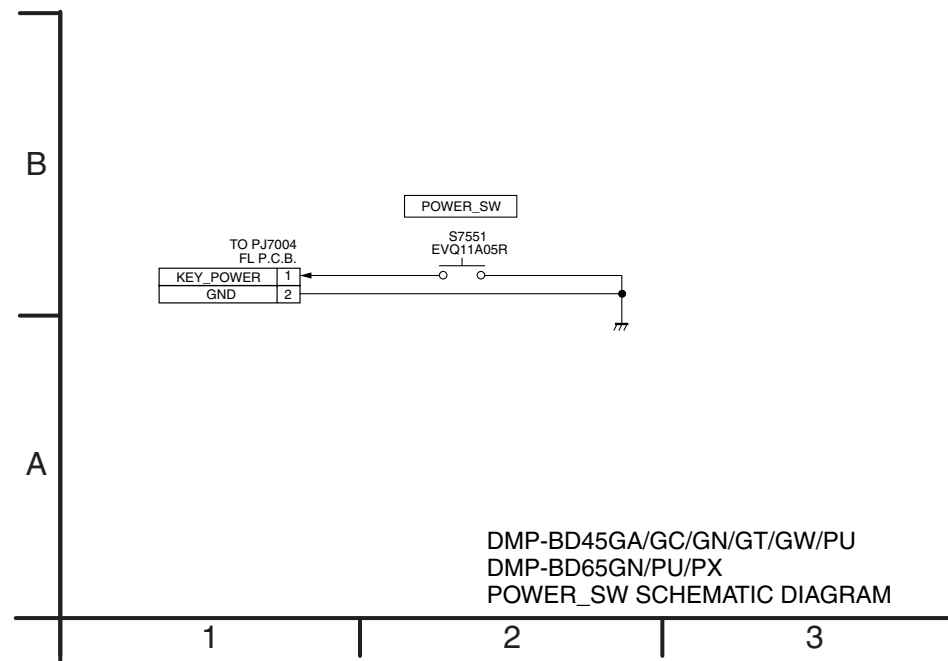
### 12.3. FL Schematic Diagram



DMP-BD45GA/GC/GN/GT/GW/PU  
DMP-BD65GN/PU/PX  
FL SECTION  
SCHEMATIC DIAGRAM

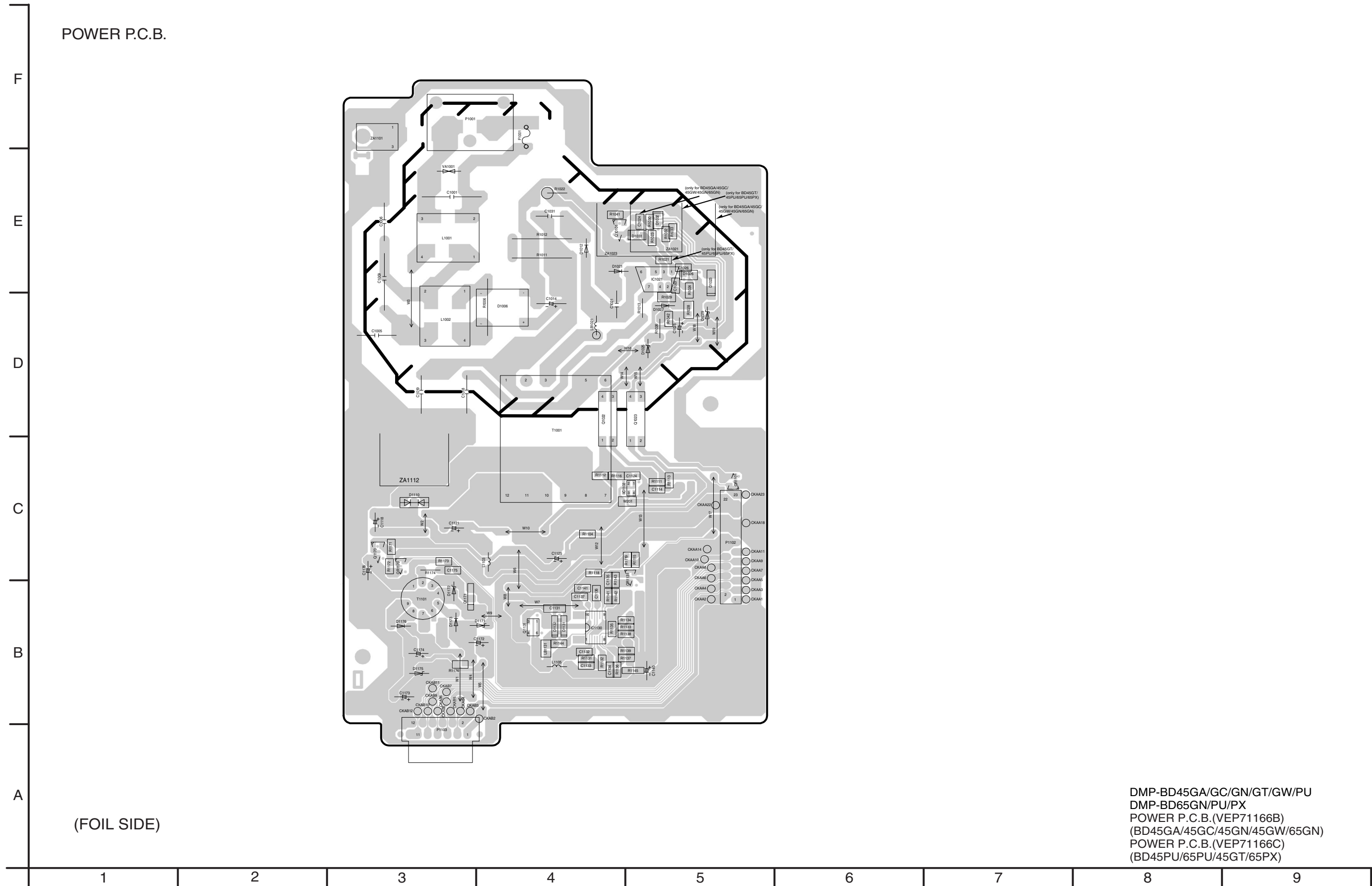


## 12.4. Power SW Schematic Diagram

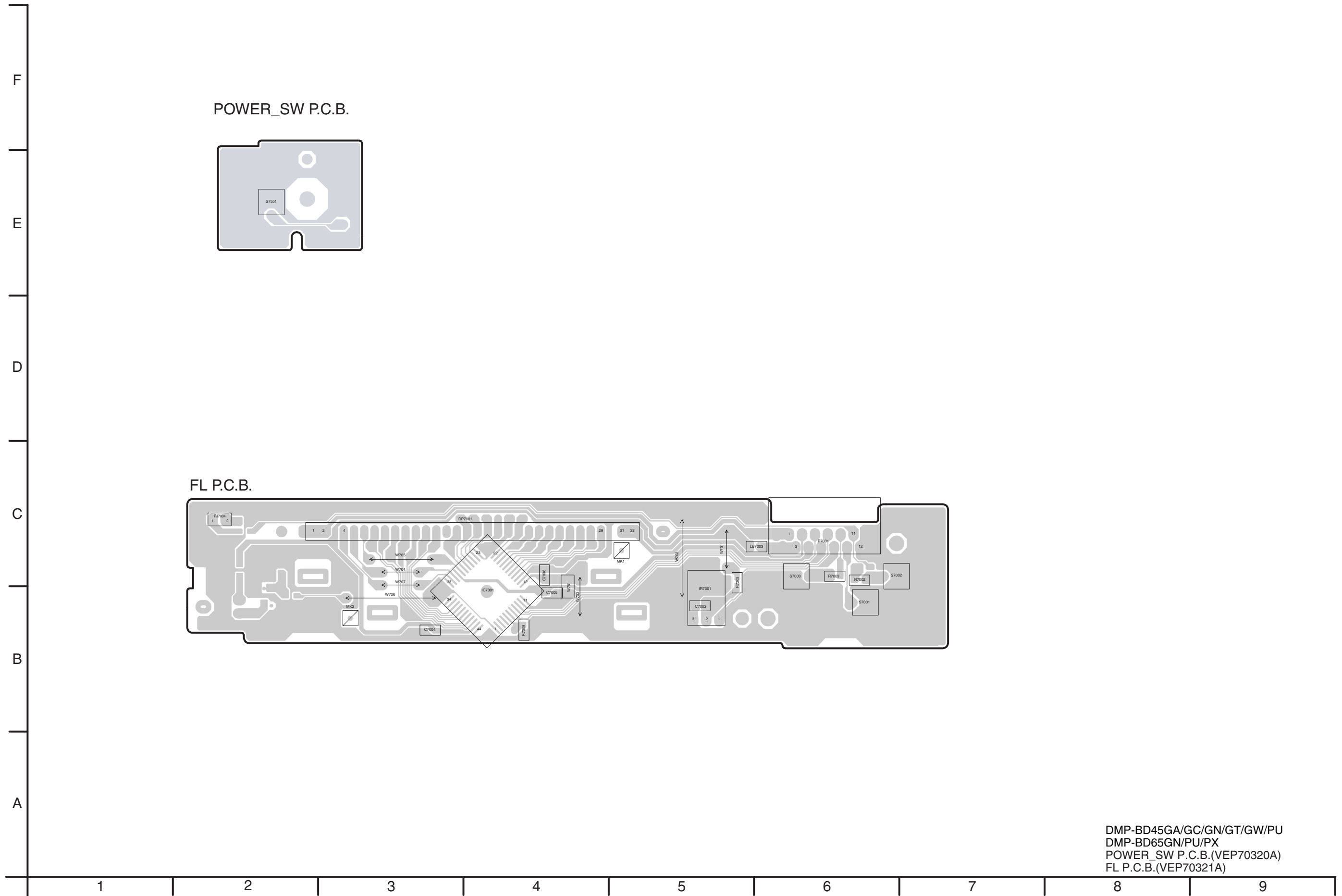


# 13 Printed Circuit Board

## 13.1. Power P.C.B.



### 13.2. Power SW P.C.B. and FL P.C.B.



DMP-BD45GA/GC/GN/GT/GW/PU  
 DMP-BD65GN/PU/PX  
 POWER\_SW P.C.B.(VEP70320A)  
 FL P.C.B.(VEP70321A)

# 14 Appendix for Schematic Diagram

## 14.1. Voltage and Waveform Chart

**NOTE:**

Circuit voltage and waveform described herein shall be regarded as reference information when probing defect point, because it may differ from an actual measuring value due to difference of Measuring instrument and its measuring condition and product itself.

### 14.1.1. Power P.C.B.

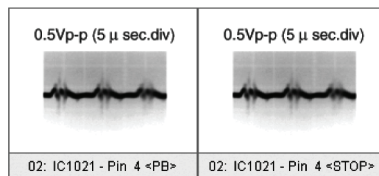
Ref No.	IC1102																		
MODE	1	2	3	4															
PLAY	0	0	8.4	2.5															
STOP	0	0	8.4	2.5															
Ref No.	IC1130																		
MODE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16			
PLAY	4.5	0	0	1.2	1.2	0.6	5.5	5.4	1.2	0	0	4.5	5.9	7.3	11.2	12.2			
STOP	4.5	0	0	1.2	1.2	0.6	5.5	5.4	1.2	0	0	4.5	5.9	7.3	11.2	12.2			
Ref No.	IC1201																		
MODE	1	2	3	4	5	6	7												
PLAY	0	0	0	0	0	-4.2	0												
STOP	0	0	0	0	0	-4.2	0												
Ref No.	Q10101			Q1022				Q1023				Q1131							
MODE	1	2	3	1	2	3	4	1	2	3	4	1	2	3	4	5	6		
PLAY	0	0	0	9.4	8.4	0	0	1.1	0	0	0	5.9	5.9	11.2	12.2	5.9	5.9		
STOP	0	0	0	9.4	8.4	0	0	1.1	0	0	0	5.9	5.9	11.2	12.2	5.9	5.9		
Ref No.	Q1170			Q1171			QR1101			QR1131			QR1170						
MODE	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3				
PLAY	12.1	12.2	11.4	0	12.1	-0.6	0	0	3.3	0	0	3.3	0	0	3.3				
STOP	12.1	12.2	11.4	0	12.1	-0.6	0	0	3.3	0	0	3.3	0	0	3.3				

### 14.1.2. P1102

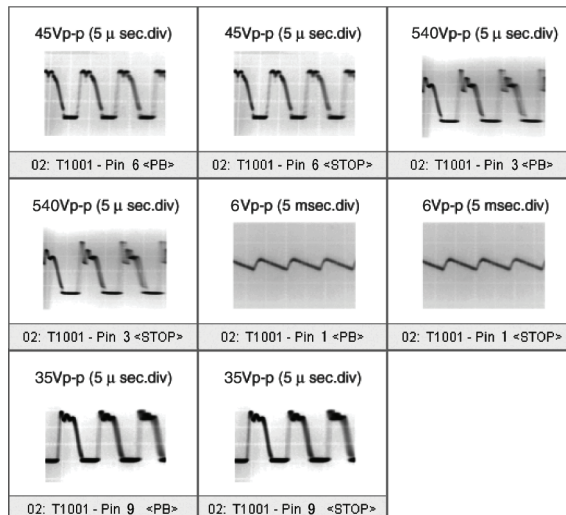
Ref No.	P1102																			
MODE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
PLAY	0	3.3	3.2	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	5.8	5.8	5.8	0	0	0	0	12.2	12.2
STOP	0	3.3	3.2	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	5.8	5.8	5.8	0	0	0	0	12.2	12.2
Ref No.	21	22	23																	
MODE	21	22	23																	
PLAY	12.2	12.2	3.3																	
STOP	12.2	12.2	3.3																	

### 14.1.3. Waveform Chart

#### <IC1021>



#### <T1001>



## 14.1.4. Abbreviations

INITIAL/LOGO		ABBREVIATIONS	
A	A0-UP	ADDRESS	
	ACLK	AUDIO CLOCK	
	AD0-UP	ADDRESS BUS	
	ADATA	AUDIO PES PACKET DATA	
	ALE	ADDRESS LATCH ENABLE	
	AMUTE	AUDIO MUTE	
	AREQ	AUDIO PES PACKET REQUEST	
	ARF	AUDIO RF	
	ASI	SERVO AMP INVERTED INPUT	
	ASO	SERVO AMP OUTPUT	
ASYN	AUDIO WORD DISTINCTION SYNC		
B	BCK	BIT CLOCK (PCM)	
	BCKIN	BIT CLOCK INPUT	
	BDO	BLACK DROP OUT	
	BLKCK	SUB CODE BLOCK CLOCK	
	BOTTOM	CAP. FOR BOTTOM HOLD	
	BYP	BYPATH	
	BYTCK	BYTE CLOCK	
C	CAV	CONSTANT ANGULAR VELOCITY	
	CBDO	CAP. BLACK DROP OUT	
	CD	COMPACT DISC	
	CDSCK	CD SERIAL DATA CLOCK	
	CDSRDATA	CD SERIAL DATA	
	CDRF	CD RF (EFM) SIGNAL	
	CDV	COMPACT DISC-VIDEO	
	CHNDATA	CHANNEL DATA	
	CKSL	SYSTEM CLOCK SELECT	
	CLV	CONSTANT LINEAR VELOCITY	
	COFTR	CAP. OFF TRACK	
	CPA	CPU ADDRESS	
	CPCS	CPU CHIP SELECT	
	CPDT	CPU DATA	
	CPUADR	CPU ADDRESS LATCH	
	CPUADT	CPU ADDRESS DATA BUS	
	CPUIRQ	CPU INTERRUPT REQUEST	
	CPRD	CPU READ ENABLE	
	CPWR	CPU WRITE ENABLE	
	CS	CHIP SELECT	
	CSYNIN	COMPOSITE SYNC IN	
CSYNOUT	COMPOSITE SYNC OUT		
D	DACCK	D/A CONVERTER CLOCK	
	DEEMP	DEEMPHASIS BIT ON/OFF	
	DEMPH	DEEMPHASIS SWITCHING	
	DIG0-UP	FL DIGIT OUTPUT	
	DIN	DATA INPUT	
	DMSRCK	DM SERIAL DATA READ CLOCK	
	DMUTE	DIGITAL MUTE CONTROL	
	DO	DROP OUT	
	DOUT0-UP	DATA OUTPUT	
	DRF	DATA SLICE RF (BIAS)	
	DRPOUT	DROP OUT SIGNAL	
	DREQ	DATA REQUEST	
	DRESP	DATA RESPONSE	
	DSC	DIGITAL SERVO CONTROLLER	
	DSLIF	DATA SLICE LOOP FILTER	
	DVD	DIGITAL VIDEO DISC	
	E	EC	ERROR TORQUE CONTROL
		ECR	ERROR TORQUE CONTROL REFERENCE
		ENCSEL	ENCODER SELECT
ETMCLK		EXTERNAL M CLOCK (81MHz/40.5MHz)	
ETSCLK		EXTERNAL S CLOCK (54MHz)	
F		FBAL	FOCUS BALANCE
		FCLK	FRAME CLOCK
	FE	FOCUS ERROR	
	FFI	FOCUS ERROR AMP INVERTED INPUT	
	FEO	FOCUS ERROR AMP OUTPUT	
	FG	FREQUENCY GENERATOR	
	FSC	FREQUENCY SUB CARRIER	
	FSCK	FS (384 OVER SAMPLING) CLOCK	
G	GND	COMMON GROUNDING (EARTH)	
H	HA0-UP	HOST ADDRESS	
	HD0-UP	HOST DATA	
	HINT	HOST INTERRUPT	
	HRXW	HOST READ/WRITE	

INITIAL/LOGO		ABBREVIATIONS
I	IECOUT	IEC958FORMATDATAOUTPUT
	IPFRAG	INTERPOLATIONFLAG
	IREF	I(CURRENT)REFERENCE
	ISEL	INTERFACEMODESELECT
L	LDON	LASERDIODECONTROL
	LPC	LASERPOWERCONTROL
	LRCK	LCH/RCHDISTINCTIONCLOCK
M	MA0-UP	MEMORYADDRESS
	MCK	MEMORYCLOCK
	MCKI	MEMORYCLOCKINPUT
	MCLK	MEMORYSERIALCOMMANDCLOCK
	MDATA	MEMORYSERIALCOMMANDDATA
	MDQ0-UP	MEMORYDATAINPUT/OUTPUT
	MDQM	MEMORYDATA/OMASK
	MLD	MEMORYSERIALCOMMANDLOAD
MPEG	MOVINGPICTUREEXPERTSGROUP	
O	ODC	OPTICALDISCONTROLLER
	OFTR	OFFTRACKING
	OSCI	OSCILLATORINPUT
	OSCO	OSCILLATOROUTPUT
	OSD	ONSCREENDISPLAY
P	P1-UP	PORT
	PCD	CDTRACKINGPHASEDIFFERENCE
	PCK	PLLLOCK
	PDVD	DVDTRACKINGPHASEDIFFERENCE
	PEAK	CAP.FORPEAKHOLD
	PLLCLK	CHANNELPLLLOCK
	PLLOK	PLLLOCK
	PWMCTL	PWMOUTPUTCONTROL
	PWMDA	PULSEWAVEMOTORDRIVEA
	PWMOA,B	PULSEWAVEMOTOROUTA,B

INITIAL/LOGO		ABBREVIATIONS	
R	RE	READENABLE	
	RFENV	RFENVELOPE	
	RFO	RFPHASEDIFFERENCEOUTPUT	
	RS	(CD-ROM)REGISTERSELECT	
	RSEL	RFPOLARITYSELECT	
	RST	RESET	
	RSV	RESERVE	
	S	SBI0,1	SERIALDATAINPUT
		SBO0	SERIALDATAOUTPUT
		SBT0,1	SERIALCLOCK
SCK		SERIALDATALOCK	
SCKR		AUDIOSERIALCLOCKRECEIVER	
SCL		SERIALCLOCK	
SCLK		SERIALCLOCK	
SDA		SERIALDATA	
SEG0-UP		FLSEGMENTOUTPUT	
SELCLK		SELECTCLOCK	
SEN		SERIALPORTENABLE	
SIN1,2		SERIALDATAIN	
SOUT1,2		SERIALDATAOUT	
SPDI		SERIALPORTDATAINPUT	
SPDO		SERIALPORTDATAOUTPUT	
SPEN		SERIALPORTR/WENABLE	
SPRCLK		SERIALPORTREADCLOCK	
SPWCLK		SERIALPORTWRITECLOCK	
SQCK		SUBCODEQCLOCK	
SQCX		SUBCODEQDATAREADCLOCK	
SRDATA		SERIALDATA	
SRMADR		SRAMADDRESSBUS	
SRMDT0-7		SRAMDATABUS0-7	
SS		START/STOP	
STAT		STATUS	
STCLK		STREAMDATACLOCK	
STD0-UP		STREAMDATA	
STENABLE	STREAMDATAINPUTENABLE		
STSEL	STREAMDATAPOLARITYSELECT		
STVALID	STREAMDATAVALIDITY		
SUBC	SUBCODESERIAL		
SBCK	SUBCODECLOCK		
SUBQ	SUBCODEQDATA		
SYSCLK	SYSTEMCLOCK		

INITIAL/LOGO		ABBREVIATIONS
T	TE	TRACKING ERROR
	TIBAL	BALANCE CONTROL
	TID	BALANCE OUTPUT 1
	TIN	BALANCE INPUT
	TIP	BALANCE INPUT
	TIS	BALANCE OUTPUT 2
	TPSN	OP AMP INPUT
	TPSO	OP AMP OUTPUT
	TPSP	OP AMP INVERTED INPUT
	TRCRS	TRACK CROSS SIGNAL
	TRON	TRACKING ON
	TRSON	TRAVERSE SERVO ON

INITIAL/LOGO		ABBREVIATIONS
V	VBLANK	V BLANKING
	VCC	COLLECTOR POWER SUPPLY VOLTAGE
	VDCONT	VIDEO CD CONTROL (TRACKING BALANCE)
	VDD	DRAIN POWER SUPPLY VOLTAGE
	VFB	VIDEO FEED BACK
	VREF	VOLTAGE REFERENCE
	VSS	SOURCE POWER SUPPLY VOLTAGE

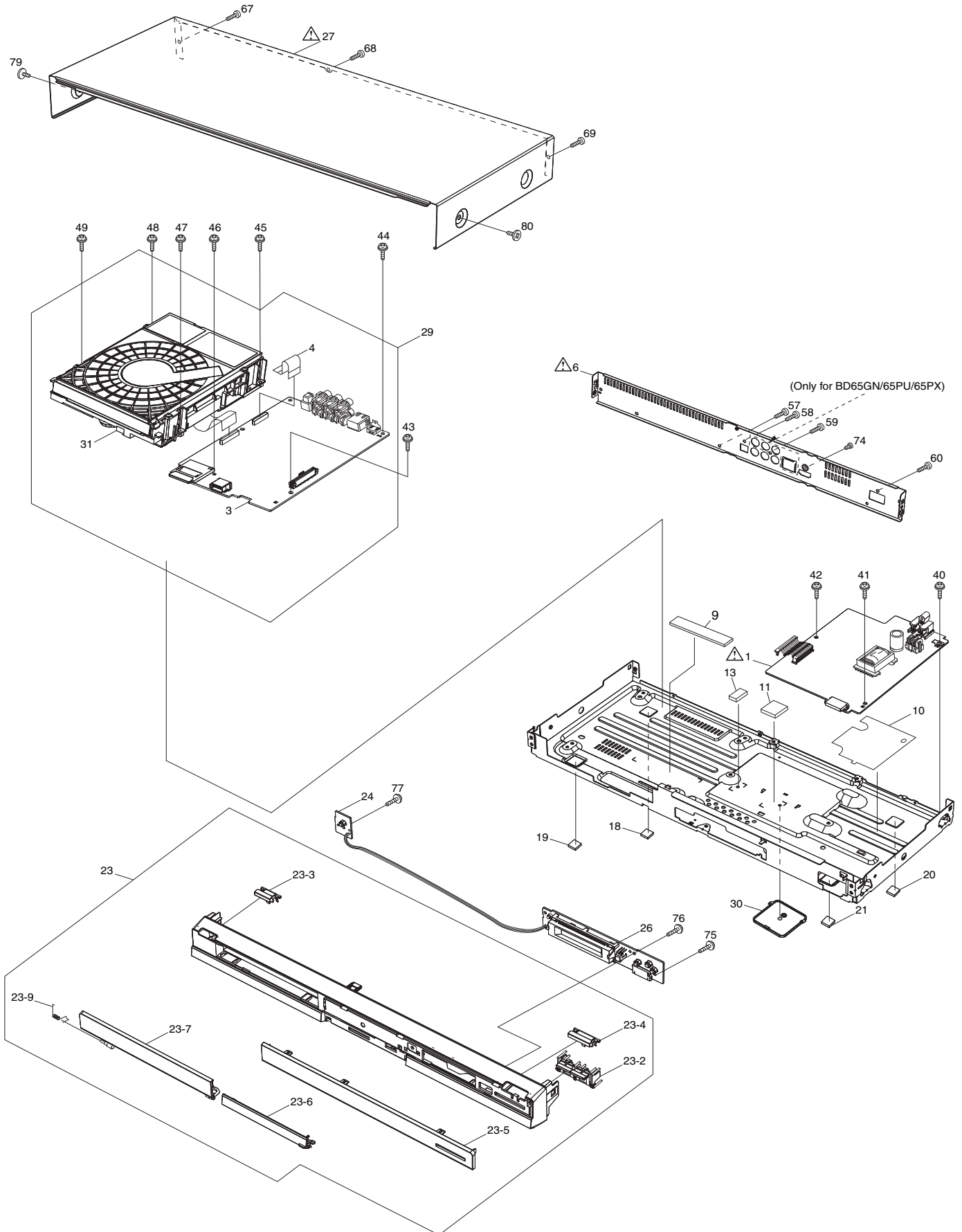
W	WAIT	BUS CYCLE WAIT
	WDCK	WORD CLOCK
	WEH	WRITE ENABLE HIGH
	WSR	WORD SELECT RECEIVER

X	X	X' TAL
	XALE	X ADDRESS LATCH ENABLE
	XAREQ	X AUDIO DATA REQUEST
	XCDROM	X CD ROM CHIP SELECT
	XCS	X CHIP SELECT
	XCSYNC	X COMPOSITE SYNC
	XDS	X DATA STROBE
	XHSYNCO	X HORIZONTAL SYNC OUTPUT
	XHINT	XH INTERRUPT REQUEST
	XI	X' TAL OSCILLATOR INPUT
	XINT	X INTERRUPT
	XMW	X MEMORY WRITE ENABLE
	XO	X' TAL OSCILLATOR OUTPUT
	XRE	X READ ENABLE
	XSRMCE	X SRAM CHIP ENABLE
	XSRMOE	X SRAM OUTPUT ENABLE
	XSRMWE	X SRAM WRITE ENABLE
	XVCS	X V-DEC CHIP SELECT
	XVDS	X V-DEC CONTROL BUS STROBE
	XVSYNCO	X VERTICAL SYNC OUTPUT

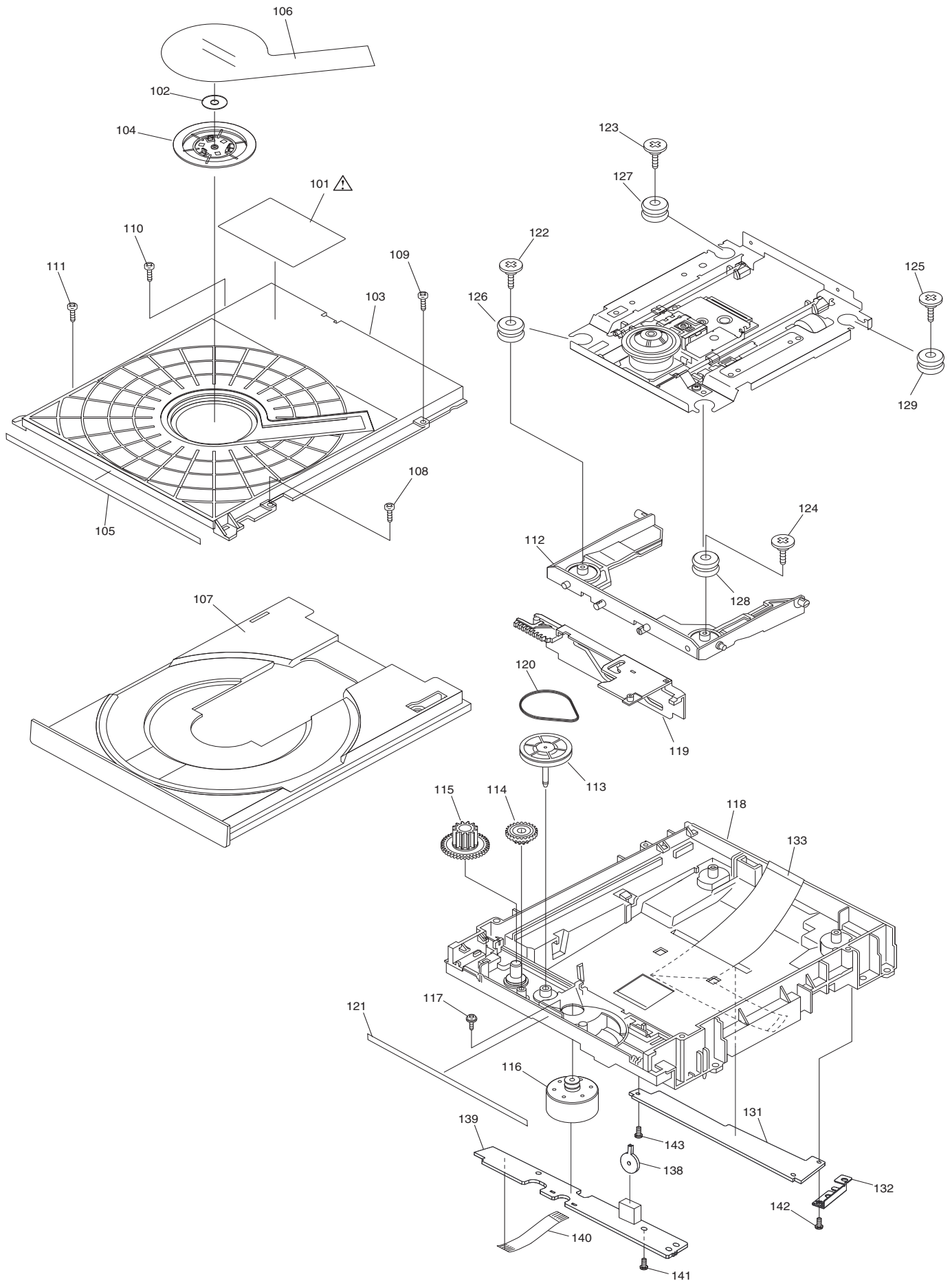
# 15 Exploded View and Replacement Parts List

## 15.1. Exploded Views

### 15.1.1. Casing Parts & Mechanism Section

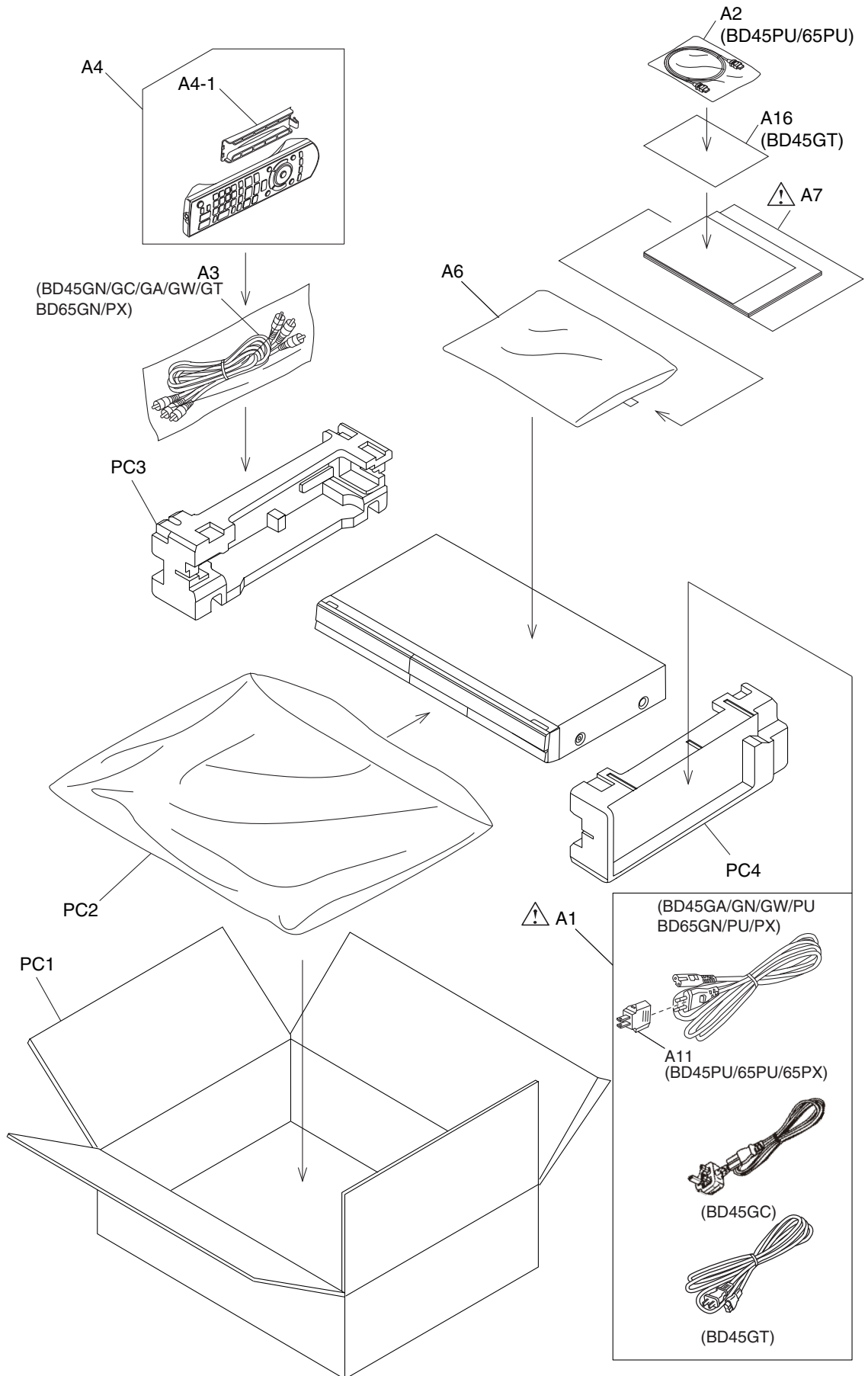


## 15.1.2. Mechanism Section





### 15.1.3. Packing & Accessories Section



## 15.1.4. Mechanical Replacement Parts List

### Notes:

\*Important safety notice:

Components identified by  $\triangle$  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.

\*Warning: This product uses a laser diode. Refer to caution statements.

\*Capacity values are in microfarads ( $\mu$ F) unless specified otherwise, P=Pico-farads (pF), F=Farads (F).

\*Resistance values are in ohms, unless specified otherwise, 1K=1,000 (OHM), 1M=1,000k (OHM).

\*The marking (RTL) indicates the retention time is limited for this item. After the discontinuation of this assembly in production, it will no longer be available.

\*(IA) - (IF) marks in Remarks indicate languages of instruction manuals. [ (IA): English; (IB): Arabic; (IC, IE): Traditional Chinese; (ID): Spanish; (IF): English, Spanish]

\*All parts are supplied by CHPAVC.

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

### Notes:

\*Parts indicated with "JIG & ADJ." in the Remarks column are necessary to adjust the BDP/Digital P.C.B..

This adjustment software can be downloaded from "Support Information from NWBG/VDBG-PAVC" web-site in "TSN system", together with instructions of "BD Drive Adjustment" including preparations and connections etc.

Safety	Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
			CASING		
$\triangle$	1	VEP71166B	POWER P.C.B.	1	BD45GA/ 45GC/ 45GN/ 45GW/ 65GN (RTL) E.S.D.
$\triangle$	1	VEP71166C	POWER P.C.B.	1	BD45PU/ 65PU/ 45GT/ 65PX (RTL) E.S.D.
	3	RFKB76200N	DIGITAL P.C.B.	1	BD65GN (RTL) E.S.D. JIG & ADJ

Safety	Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
	3	RFKB76200A	DIGITAL P.C.B.	1	BD45GC/ 45GN/ 45GW (RTL) E.S.D. JIG & ADJ
	3	RFKB76200B	DIGITAL P.C.B.	1	BD45GA/ 45GT (RTL) E.S.D. JIG & ADJ
	3	RFKB76200MT	DIGITAL P.C.B.	1	BD65PU (RTL) E.S.D. JIG & ADJ
	3	RFKB76200D	DIGITAL P.C.B.	1	BD45PU (RTL) E.S.D. JIG & ADJ
	3	RFKB76200E	DIGITAL P.C.B.	1	BD65PX (RTL) E.S.D. JIG & ADJ
	4	VWJ2125	FFC (18P)	1	
$\triangle$	6	RGR0397A-D	REAR PANEL	1	BD65GN
$\triangle$	6	RGR0397B-B	REAR PANEL	1	BD45GN
$\triangle$	6	RGR0397B-D	REAR PANEL	1	BD45GC
$\triangle$	6	RGR0397B-C1	REAR PANEL	1	BD45GA
$\triangle$	6	RGR0397A-G	REAR PANEL	1	BD65PU
$\triangle$	6	RGR0397B-F	REAR PANEL	1	BD45PU
$\triangle$	6	RGR0397B-H	REAR PANEL	1	BD45GW
$\triangle$	6	RGR0397B-G1	REAR PANEL	1	BD45GT
$\triangle$	6	RGR0397A-C	REAR PANEL	1	BD65PX
	9	RMX0437	INSULATION SHEET	1	
	10	RMZ1082	INSULATION SHEET	1	
	11	RSC0851	HEAT TRANSFER SHEET	1	
	13	RSC0854	HEAT TRANSFER SHEET2	1	
	18	RKA0206A-K	FOOT RUBBER	1	
	19	RKA0206A-K	FOOT RUBBER	1	
	20	RKA0206A-K	FOOT RUBBER	1	
	21	RKA0206A-K	FOOT RUBBER	1	
	23	RYP1547-K	FRONT PANEL ASS'Y1	1	BD65GN
	23	RYP1533-K	FRONT PANEL ASS'Y1	1	BD45GN/ 45GA/ 45GC/ 45GW/ 45GT
	23	RYP1568-K	FRONT PANEL ASS'Y1	1	BD65PU
	23	RYP1539-K	FRONT PANEL ASS'Y1	1	BD45PU
	23	RYP1543-K	FRONT PANEL ASS'Y1	1	BD65PX
	23-2	RGU2671-K	OPERATION BUTTON	1	
	23-3	RGU2672A-K	POWER BUTTON	1	BD45GA/ 45GC/ 45GW/ 45GT/ 45GN/ 65GN
	23-3	RGU2672-K	POWER BUTTON	1	BD45PU/ 65PU/ 65PX
	23-4	RGU2670-K	OPEN/CLOSE BUTTON	1	
	23-5	RYQ0746-Q	FRONT WINDOW ASS'Y	1	BD65GN/ PU/PX
	23-5	RYQ0745-Q	FRONT WINDOW ASS'Y	1	BD45PU/ 45GA/ 45GC/ 45GW/ 45GT/ 45GN
	23-6	RKF0872-K	DOOR ASS'Y	1	
	23-7	RFKGRYF0883K	TRAY DOOR ASS'Y	1	BD45GN/ 45PU/ 45GA/ 45GC/ 45GW/ 45GT

Safety	Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
	23-7	RFKGRYF0884K	TRAY DOOR ASS'Y	1	BD65GN/ 65PU/ 65PX
	23-9	RMB0877	TRAY DOOR SPRING	1	
	24	VEP70320A	POWER SW P.C.B.	1	(RTL) E.S.D.
	26	VEP70321A	FL P.C.B.	1	(RTL) E.S.D.
△	27	RKM0623-K	TOP CASE	1	
	29	RFKNBD45GNT	BDP/DIGITAL P.C.B. MODULE	1	BD45GN E.S.D.
	29	RFKNBD45GCT	BDP/DIGITAL P.C.B. MODULE	1	BD45GC E.S.D.
	29	RFKNBD45GWT	BDP/DIGITAL P.C.B. MODULE	1	BD45GW E.S.D.
	29	RFKNBD45PUT	BDP/DIGITAL P.C.B. MODULE	1	BD45PU E.S.D.
	29	RFKNBD45GAT	BDP/DIGITAL P.C.B. MODULE	1	BD45GA E.S.D.
	29	RFKNBD45GTT	BDP/DIGITAL P.C.B. MODULE	1	BD45GT E.S.D.
	29	RFKNBD65PXT	BDP/DIGITAL P.C.B. MODULE	1	BD65PX E.S.D.
	29	RFKNBD65GNT	BDP/DIGITAL P.C.B. MODULE	1	BD65GN E.S.D.
	29	RFKNBD65PUT	BDP/DIGITAL P.C.B. MODULE	1	BD65PU E.S.D.
	30	RGQ0564-K	LSI COVER	1	
	31	VXY2079T	DRIVE UNIT	1	JIG & ADJ
	40	RHD30101-1	SCREW	1	
	41	RHD30101-1	SCREW	1	
	42	RHD30101-1	SCREW	1	
	43	RHD30101-1	SCREW	1	
	44	RHD30101-1	SCREW	1	
	45	RHD30101-1	SCREW	1	
	46	RHD30101-1	SCREW	1	
	47	RHD30101-1	SCREW	1	
	48	RHD30101-1	SCREW	1	
	49	RHD30101-1	SCREW	1	
	57	RHD30119-L	SCREW	1	
	58	RHD30119-L	SCREW	1	
	59	RHD30119-L	SCREW	1	
	60	RHD30119-L	SCREW	1	
	67	RHD30119-L	SCREW	1	
	68	RHD30119-L	SCREW	1	
	69	RHD30119-L	SCREW	1	
	74	XSN3+4FJ	SCREW	1	
	75	RHD26045-J	SCREW	1	
	76	RHD26045-J	SCREW	1	
	77	RHD26045-J	SCREW	1	
	79	RHD30113-1K	SCREW	1	
	80	RHD30113-1K	SCREW	1	
△	101	VQL1V70-J	LASER CAUTION LABEL	1	
	102	VMA0V86	YOKE	1	
	103	VMD5751	UPPER BASE	1	
	104	VMD5752-1J	CLAMPER	1	
	105	VMT1981	DUST COVER A	1	
	106	VMZ3737-J	CLAMP COVER	1	
	107	VXA8619	TRAY ASS'Y	1	
	108	XTV26+10GFJ	SCREW	1	
	109	XTV26+10GFJ	SCREW	1	
	110	XTV26+10GFJ	SCREW	1	
	111	XTV26+10GFJ	SCREW	1	
	112	VMD5753-1	MID BASE	1	
	113	VDG1713-J	PULLEY GEAR	1	
	114	VDG1714	MID GEAR	1	
	115	VDG1715-J	DRIVE GEAR	1	
	116	VEM0881	LOADING MOTOR U	1	
	117	VHD1653-1	SCREW	1	
	118	VMD5748-1	MECHA CHASSIS	1	
	119	VMD5749	SLIDE CAM	1	
	120	VMG1809	BELT	1	
	121	VMT1982	DUST COVER B	1	
	122	VHD1518-1	SCREW	1	

Safety	Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
	123	VHD1518-1	SCREW	1	
	124	VHD1518-1	SCREW	1	
	125	VHD1518-1	SCREW	1	
	126	VMG1883	DAMPER	1	
	127	VMG1883	DAMPER	1	
	128	VMG1883	DAMPER	1	
	129	VMG1883	DAMPER	1	
	131	VEP70251A	JUMPER P.C.B.	1	(RTL) E.S.D.
	132	VMA0W01	EARTH PLATE	1	
	133	VWJ2126	OPU FFC	1	
	138	K0L2LB000002	LEVER SWITCH	1	
	139	VJB70218-J	SW P.C.B.	1	E.S.D.
	140	VWJ1998-1	SW FFC	1	
	141	XTV26+10GFJ	SCREW	1	
	142	XTV26+10GFJ	SCREW	1	
	143	XTV26+10GFJ	SCREW	1	
			ACCESSORY		
△	A1	K2CJ2DA00014	AC CORD	1	BD45/ 65GN
△	A1	K2CQ2CA00007	AC CORD	1	BD45GA/ 45GC/ 45GW/ 45PU/ 65PU/ 65PX
△	A1	K2CZ3YY00005	AC CORD	1	BD45GC
△	A1	K2CP2CA00001	AC CORD	1	BD45GA
△	A1	K2CA2CA00027	AC CORD	1	BD45GT
	A2	K1HA19DA0007	HDMI CABLE	1	BD45PU/ 65PU
	A3	K2KA6BA00004	AV CORD	1	BD45GA/ 45GC/ 45GN/ 45GW/ 45GT/ 65GN/ 65PX
	A4	N2QAKB000082	REMOTE CONTROL UNIT	1	BD65GN
	A4	N2QAKB000083	REMOTE CONTROL UNIT	1	BD45GA/ 45GC/ 45GN/ 45GW/ 45GT
	A4	N2QAKB000076	REMOTE CONTROL UNIT	1	BD65PU/ 65PX
	A4	N2QAKB000078	REMOTE CONTROL UNIT	1	BD45PU
	A4-1	100300055200	BATTERY COVER	1	BD45PU/ 65PU/ 65PX
	A4-1	100300048100	BATTERY COVER	1	BD45GA/ 45GC/ 45GN/ 45GW/ 45GT/ 65GN
	A6	RPFC0119	POLYETHYLENE BAG	1	
△	A7	VQT2H98	OPERATING INSTRUCTIONS	1	(IA) BD45GA/ 45GC/ 45GN/ 45GW/ 65GN
△	A7	VQT2J00	OPERATING INSTRUCTIONS	1	(IB) BD45GC
△	A7	VQT2H99	OPERATING INSTRUCTIONS	1	(IC) BD45GA
△	A7	VQT2H93	OPERATING INSTRUCTIONS	1	(ID) BD45PU/ 65PU
△	A7	VQT2J01	OPERATING INSTRUCTIONS	1	(IE) BD45GT
△	A7	VQT2H86-2	OPERATING INSTRUCTIONS	1	(IF) BD65PX
	A11	K2DAYYY00002	POWER PLUG ADAPTOR	1	BD45PU/ 65PU/ 65PX
	A16	RQLS0405	CHINESE LABEL SHEET	1	BD45GT

Safety	Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
	■		PACKING		
	PC1	RPG9079	PACKING CASE	1	BD65GN
	PC1	RPG9083	PACKING CASE	1	BD45GN
	PC1	RPG9086	PACKING CASE	1	BD45GC
	PC1	RPG9085	PACKING CASE	1	BD45GA
	PC1	RPG9080	PACKING CASE	1	BD65PU
	PC1	RPG9084	PACKING CASE	1	BD45PU
	PC1	RPG9089	PACKING CASE	1	BD45GW
	PC1	RPG9088	PACKING CASE	1	BD45GT
	PC1	RPG9081	PACKING CASE	1	BD65PX
	PC2	RPF0458	POLYETHYLENE BAG	1	
	PC3	RPN2148A-1	CUSHION (A)	1	
	PC4	RPN2148B-1	CUSHION (B)	1	

## 15.2. Electrical Replacement Parts List

### Notes:

\*Important safety notice:

Components identified by  $\triangle$  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 manufacture's specified parts shown in the parts list.

\*Warning: This product uses a laser diode. Refer to caution statements.

\*Capacity values are in microfarads ( $\mu$ F) unless specified otherwise, P=Pico-farads (pF), F=Farads (F).

\*Resistance values are in ohms, unless specified otherwise, 1K=1,000 (OHM), 1M=1,000k (OHM).

\*The marking (RTL) indicates the retention time is limited for this item. After the discontinuation of this assembly in production, it will no longer be available.

\*All parts are supplied by CHPAVC.

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

Safety	Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
$\triangle$		VEP71166B	POWER P.C.B.		BD45GA/ 45GC/ 45GN/ 45GW/ 65GN (RTL) E.S.D.
$\triangle$		VEP71166C	POWER P.C.B.		BD45PU/ 65PU/ 45GT/ 65PX (RTL) E.S.D.
$\triangle$	C1001	F0CAF683A021	250V 0.068U	1	
$\triangle$	C1005	F1B2G4710001	100V 470U	1	
$\triangle$	C1006	F1B2G4710001	100V 470U	1	
$\triangle$	C1009	F0CAF683A021	250V 0.068U	1	
	C1014	F2B2W4700003	450V 47U	1	BD45GA/ 45GC/ 45GW/ 45GN/ 65GN
	C1014	F2B2G8200010	400V 82U	1	BD45PU/ 45GT/ 65PU/ 65PX
$\triangle$	C1018	F1BAF1020020	1000P	1	
$\triangle$	C1019	F1B2G6810001	400V 680P	1	
	C1021	F1B3D181A011	2000V 180P	1	BD45GA/ 45GC/ 45GW/ 45GN/ 65GN
	C1021	F1A3D100A009	2000V 10P	1	BD45PU/ 45GT/ 65PU/ 65PX
	C1023	F1H1H222A013	50V 2200P	1	BD45PU/ 45GT/ 65PU/ 65PX

Safety	Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
	C1023	F1H1H471A792	50V 470P	1	BD45GA/ 45GC/ 45GW/ 45GN/ 65GN
	C1024	F1H1H101A004	50V 100P	1	BD45GA/ 45GC/ 45GW/ 45GN/ 65GN
	C1025	F2A1V6800002	35V 68U	1	
	C1026	F1H1H222A013	50V 2200P	1	
	C1031	F1B3D222A011	2000V 2200P	1	
	C1114	F1H1C104A071	16V 0.1U	1	
	C1118	F2A1C1520021	16V 1500U	1	
	C1121	F2A1C1520021	16V 1500U	1	
	C1124	F1H1C104A071	16V 0.1U	1	
	C1125	F2A1C102A236	16V 1000U	1	
	C1131	F1K1C106A062	16V 10U	1	
	C1132	F1H1C104A071	16V 0.1U	1	
	C1133	F1H1H153A013	50V 15000P	1	
	C1134	F1H1H120A004	50V 12P	1	
	C1135	F1H1H221A004	50V 220P	1	
	C1136	F1H1C104A071	16V 0.1U	1	
	C1137	F1H1C104A071	16V 0.1U	1	
	C1140	F2A1C8210008	16V 820U	1	
	C1141	F1H1C104A071	16V 0.1U	1	
	C1172	F2A1V470A831	35V 47U	1	
	C1173	F2A1H100B040	50V 10U	1	
	C1174	F2A1C221B111	16V 220U	1	
	C1175	F1H1H392A013	50V 3900	1	
	C1176	F2A1C221B111	16V 220U	1	
	D1006	B0EDKT000009	DIODE	1	E.S.D.
	D1012	B0HADV000001	DIODE	1	E.S.D.
	D1021	B0HADV000001	DIODE	1	E.S.D.
	D1023	B0BC03200002	DIODE	1	E.S.D.
	D1025	B0BA01600007	DIODE	1	E.S.D.
	D1026	B0ACCK000005	DIODE	1	E.S.D.
	D1027	B0HAGM000006	DIODE	1	E.S.D.
	D1029	B0BA01200046	DIODE	1	BD45GA/ 45GC/ 45GW/ 45GN/ 65GN E.S.D.
	D1029	B0BA9R900005	DIODE	1	BD45GT/ 45PU/ 65PU/ 65PX E.S.D.
	D1031	B0ACCK000005	DIODE	1	E.S.D.
	D1032	B0ACCK000005	DIODE	1	E.S.D.
	D1110	B0JBSL000002	DIODE	1	E.S.D.
	D1131	B0JCMD000014	DIODE	1	E.S.D.
	D1132	B0JCMD000014	DIODE	1	E.S.D.
	D1171	B0BA02100019	DIODE	1	E.S.D.
	D1172	B0BA03600021	DIODE	1	E.S.D.
	D1173	B0AADM000003	DIODE	1	E.S.D.
	D1175	B0BA01800019	DIODE	1	E.S.D.
	D1176	B0JAMD000026	DIODE	1	E.S.D.
$\triangle$	F1001	K5G202Y00006	FUSE	1	
	IC1021	C0DACZH00017	IC	1	E.S.D.
	IC1102	C0DBZMC00006	IC	1	E.S.D.
	IC1130	C0DBAYY00624	IC	1	E.S.D.
$\triangle$	L1001	G0B233D00005	COIL 23000UH	1	
$\triangle$	L1002	G0B233D00005	COIL 23000UH	1	
	L1103	G0A100H00025	COIL 10UH	1	
	L1105	G0A100ZA0045	COIL 10UH	1	
	LB1021	J0JKB0000003	COIL	1	
	LB1131	J0JHC0000048	FILTER	1	

Safety	Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
△	P1001	K2AA2B000017	AC INLET	1	
	P1102	K1KY23AA0606	CONNECTOR (23P)	1	
	P1103	K1KB12B00040	CONNECTOR (FEMALE) 12P	1	
	Q10101	B1ABDF000033	TRANSISTOR	1	E.S.D.
△	Q1022	B3PBA0000454	TRANSISTOR	1	E.S.D.
△	Q1023	B3PBA0000454	TRANSISTOR	1	E.S.D.
	Q1131	B1CHRD000024	TRANSISTOR	1	E.S.D.
	Q1170	B1ADGF000010	TRANSISTOR	1	E.S.D.
	Q1171	B1BACG000058	TRANSISTOR	1	E.S.D.
	QR1101	B1GBCFL0042	TRANSISTOR	1	E.S.D.
	QR1131	B1GBCFNN0041	TRANSISTOR	1	E.S.D.
	QR1170	B1GBCFJJ0040	TRANSISTOR	1	E.S.D.
	R1006	DOB685JA030	1/2W 6800K	1	
	R1011	ERG2SJ104P	2W 100K	1	
	R1012	ERG2SJ104P	2W 100K	1	
	R1013	ERG1SJ331E	1W 330	1	BD45GT/ 45PU/ 65PU/ 65PX
	R1013	ERG1SJ222E	1W 2.2K	1	BD45GA/ 45GC/ 45GW/ 45GN/ 65GN
	R1021	ERJ3GEYJ104V	1/10W 100K	1	BD45GT/ 45PU/ 65PU/ 65PX
	R1022	ERX2SJR33E	2W 0.33	1	BD45GA/ 45GC/ 45GW/ 45GN/ 65GN
	R1022	ERX2SZJR18E	2W 018	1	BD45GT/ 45PU/ 65PU/ 65PX
	R1023	ERJ3GEYJ103V	1/10W 10K	1	
	R1024	ERJ3GEYG153V	1/10W 15K	1	BD45GA/ 45GC/ 45GW/ 45GN/ 65GN
	R1024	ERJ3GEYG223V	1/10W 22K	1	BD45GT/ 45PU/ 65PU/ 65PX
	R1026	ERDS2TJ221T	1/4W 220	1	
	R1028	ERJ6GEYJ100V	1/10W 10	1	
	R1029	ERJ6GEYJ100V	1/10W 10	1	
	R1030	ERJ3GEYJ392V	1/10W 3.9K	1	BD45GA/ 45GC/ 45GW/ 45GN/ 65GN
	R1030	ERJ3GEY0R00V	1/10W 0	1	BD45GT/ 45PU/ 65PU/ 65PX
	R1032	ERJ3GEYG472V	1/10W 4.7K	1	BD45GA/ 45GC/ 45GW/ 45GN/ 65GN
	R1032	ERJ3GEYG332V	1/10W 3.3K	1	BD45GT/ 45PU/ 65PU/ 65PX
	R1033	ERJ3GEYG472V	1/10W 4.7K	1	BD45GA/ 45GC/ 45GW/ 45GN/ 65GN
	R1033	ERJ3GEYG392V	1/10W 3.9K	1	BD45GT/ 45PU/ 65PU/ 65PX

Safety	Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
	R1041	ERJ3GEYJ104V	1/10W 100K	1	BD45GA/ 45GC/ 45GW/ 45GN/ 65GN
	R1041	ERJ3GEYJ223V	1/10W 22K	1	BD45GT/ 45PU/ 65PU/ 65PX
	R1042	ERJ3GEYJ104V	1/10W 100K	1	
	R1104	ERJ3GEYJ472V	1/10W 4.7K	1	
	R1111	ERJ3GEYJ102V	1/10W 1K	1	
	R1112	ERJ3GEYJ222V	1/10W 2.2K	1	
	R1113	ERJ3GEYJ103V	1/10W 10K	1	
	R1115	ERJ3RBD472V	1/16W 4.7K	1	
	R1116	ERJ3GEYJ222V	1/10W 2.2K	1	
	R1118	ERJ3RBD331V	1/16W 330	1	
	R1119	ERJ3RBD183V	1/16W 18K	1	
	R1131	ERJ3GEYG333V	1/10W 33K	1	
	R1132	ERJ3GEYG272V	1/10W 2.7K	1	
	R1133	ERJ3GEYG103V	1/10W 10K	1	
	R1134	ERJ3GEYG224V	1/10W 240K	1	
	R1135	ERJ3GEYG273V	1/10W 27K	1	
	R1136	ERJ3RBD273V	1/16W 27K	1	
	R1137	ERJ3RED474V	1/20W 470K	1	
	R1138	ERJ3RBD273V	1/16W 27K	1	
	R1139	ERJ3RED474V	1/20W 470K	1	
	R1141	ERJ3GEYJ224V	1/10W 220K	1	
	R1142	ERJ3GEYG823V	1/10W 82K	1	
	R1143	ERJ3RED474V	1/20W 470K	1	
	R1144	ERJ3GEYG562V	1/10W 5.6K	1	
	R1145	D1BFR0270001	1/2W 0.027	1	
	R1171	ERJ3GEYJ472V	1/10W 4.7K	1	
	R1172	ERJ3GEYJ472V	1/10W 4.7K	1	
	R1173	ERJ3GEYJ562V	1/10W 5.6K	1	
	R1174	ERDS2TJ470T	1/4W 47	1	
	R1176	ERJ3GEYJ471V	1/10W 470	1	
△	T1001	G4D2A0000314	TRANSFORMER	1	BD45GA/ 45GC/ 45GW/ 45GN/ 65GN
△	T1001	G4D2A0000316	TRANSFORMER	1	BD45GT/ 45PU/ 65PU/ 65PX
	T1101	G4D1A0000129	TRANSFORMER	1	
△	VA1001	ERZV05Z471CS	VARIATOR	1	BD45GA/ 45GC/ 45GW/ 45GN/ 65GN
△	VA1001	ERZV10D471C2	VARIATOR	1	BD45GT/ 45PU/ 65PU/ 65PX
	W201	ERJ6GEY0R00V	1/10W 0	1	
	ZA1001	K9ZZ00001279	EARTH PLATE	1	
	ZA1021	VSC6159	HEAT SINK	1	BD45GT/ 45PU/ 65PU/ 65PX
	ZA1022	XYN3+J8FJ	SCREW	1	
	ZA1023	VSC5603-A	HEAT SINK	1	BD45GA/ 45GC/ 45GW/ 45GN/ 65GN
	ZA1111	XYN3+J8FJ	SCREW	1	
	ZA1112	VSC6221	HEAT SINK	1	
	■	VEP70321A	FL P.C.B.		(RTL) E.S.D.
	C7002	F1H1A105A028	10V 1U	1	

Safety	Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
	C7004	F1H1C104A071	16V 0.1U	1	
	C7005	F1H1H104A783	50V 0.1U	1	
	C7006	F1H1C104A071	16V 0.1U	1	
	DP7001	A2BD00000200	DISPLAY TUBE	1	
	IC7001	C0HBB0000061	IC	1	E.S.D.
	IR7001	PNA4861M01VT	REMOTE SENSOR	1	
	LB7003	J0JYC0000070	COIL	1	
	P7001	K1KA12B00136	CONNECTOR (12P)	1	
	PJ7004	REZ1969	WIRE	1	
	R7002	ERJ3GEYJ622V	1/10W 6.2K	1	
	R7003	ERJ3GEYJ222V	1/10W 2.2K	1	
	R7005	ERJ3GEYJ330V	1/10W 33	1	
	R7009	ERJ3GEYJ104V	1/10W 100K	1	
	S7001	EVQ11A05R	SWITCH (OPEN/CLOSE)	1	
	S7002	EVQ11A05R	SWITCH (PLAY)	1	
	S7003	EVQ11A05R	SWITCH (STOP)	1	
	W751	ERJ6GEY0R00V	1/10W 0	1	
	ZB7001	RMN0937-2	FL HOLDER	1	
	■	VEP70320A	POWER SW P.C.B.		(RTL) E.S.D.
	S7551	EVQ11A05R	SWITCH (POWER)	1	

## 16 Schematic Diagram for printing with A4 size