HOME THEATER PACKAGE YHT-1810
AV RECEIVER / SPEAKERS
HTR-2067 / NS-B20/NS-C20/NS-SWP20

SERVICE MANUAL

The YHT-1810 consists of the HTR-2067, NS-B20, NS-C20 and NS-SWP20.

Note:

- When the DIGITAL P.C.B. or IC222 on DIGITAL P.C.B. is replaced, this unit will display "Internal Error" and will not operate properly. The model name and destination MUST be written to the backup IC (EEPROM: IC222 on DIGITAL P.C.B.) to have proper operation. (For details, refer to "S5. SOFT SWITCH" menu of the self-diagnostic function.)

  DIGITAL P.C.B.
  EEPROM: IC222 on DIGITAL P.C.B.

IMPORTANT NOTICE

This manual has been provided for the use of authorized Yamaha Retailers and their service personnel.
It has been assumed that basic service procedures inherent to the industry, and more specifically Yamaha Products, are already known and understood by the users, and have therefore not been restated.

WARNING: Failure to follow appropriate service and safety procedures when servicing this product may result in personal injury, destruction of expensive components, and failure of the product to perform as specified. For these reasons, we advise all Yamaha product owners that any service required should be performed by an authorized Yamaha Retailer or the appointed service representative.

IMPORTANT: The presentation or sale of this manual to any individual or firm does not constitute authorization, certification or recognition of any applicable technical capabilities, or establish a principle-agent relationship of any form.

The data provided is believed to be accurate and applicable to the unit(s) indicated on the cover. The research, engineering, and service departments of Yamaha are continually striving to improve Yamaha products. Modifications are, therefore, inevitable and specifications are subject to change without notice or obligation to retrofit. Should any discrepancy appear to exist, please contact the distributor's Service Division.

WARNING: Static discharges can destroy expensive components. Discharge any static electricity your body may have accumulated by grounding yourself to the ground buss in the unit (heavy gauge black wires connect to this buss).

IMPORTANT: Turn the unit OFF during disassembly and part replacement. Recheck all work before you apply power to the unit.

■ CONTENTS

101304

YAMAHA
YAMAHA CORPORATION
P.O.Box 1, Hamamatsu, Japan
IP '14.06

■ TO SERVICE PERSONNEL

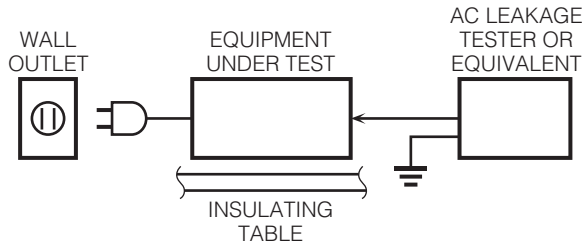
1. Critical Components Information

   Components having special characteristics are marked ⚠ and must be replaced with parts having specifications equal to those originally installed.

2. Leakage Current Measurement (For 120V Models Only)

   When service has been completed, it is imperative to verify that all exposed conductive surfaces are properly insulated from supply circuits.

- Meter impedance should be equivalent to 1500 ohms shunted by 0.15 µF.



- Leakage current must not exceed 0.5mA.
- Be sure to test for leakage with the AC plug in both polarities.

CAUTION
F1501: REPLACE WITH SAME TYPE 6.3A, 250V FUSE.
ATTENTION
F1501: UTILISER UN FUSIBLE DE RECHANGE DE MÉME TYPE DE 6.3A, 250V.

WARNING: CHEMICAL CONTENT NOTICE!

This product contains chemicals known to the State of California to cause cancer, or birth defects or other reproductive harm.

DO NOT PLACE SOLDER, ELECTRICAL/ELECTRONIC OR PLASTIC COMPONENTS IN YOUR MOUTH FOR ANY REASON WHATSOEVER!

Avoid prolonged, unprotected contact between solder and your skin! When soldering, do not inhale solder fumes or expose eyes to solder/flux vapor!

If you come in contact with solder or components located inside the enclosure of this product, wash your hands before handling food.

About lead free solder

All of the P.C.B.s installed in this unit and solder joints are soldered using the lead free solder.

Among some types of lead free solder currently available, it is recommended to use one of the following types for the repair work.

- Sn + Ag + Cu (tin + silver + copper)
- Sn + Cu (tin + copper)
- Sn + Zn + Bi (tin + zinc + bismuth)

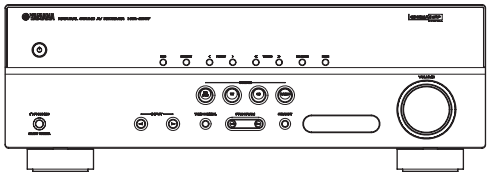
Caution:
As the melting point temperature of the lead free solder is about 30˚ C to 40˚ C (50˚ F to 70˚ F) higher than that of the lead solder, be sure to use a soldering iron suitable to each solder.

■ SYSTEM COMPOSITION

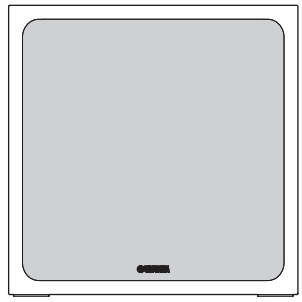
The YHT-1810 consists of the HTR-2067, NS-B20 x4, NS-C20 x1 and NS-SWP20 x1.

YHT-1810

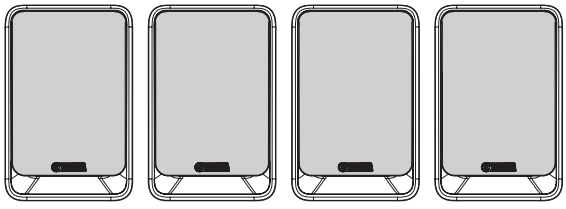
HTR-2067 x 1



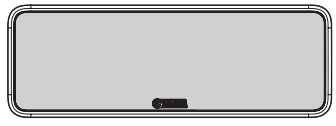
NS-SWP20 x 1



NS-B20 x 4



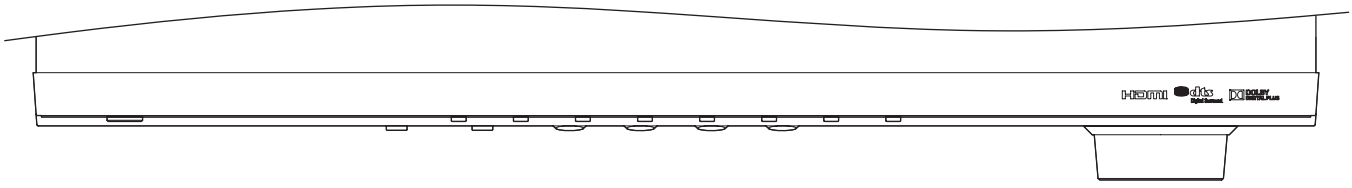
NS-C20 x 1



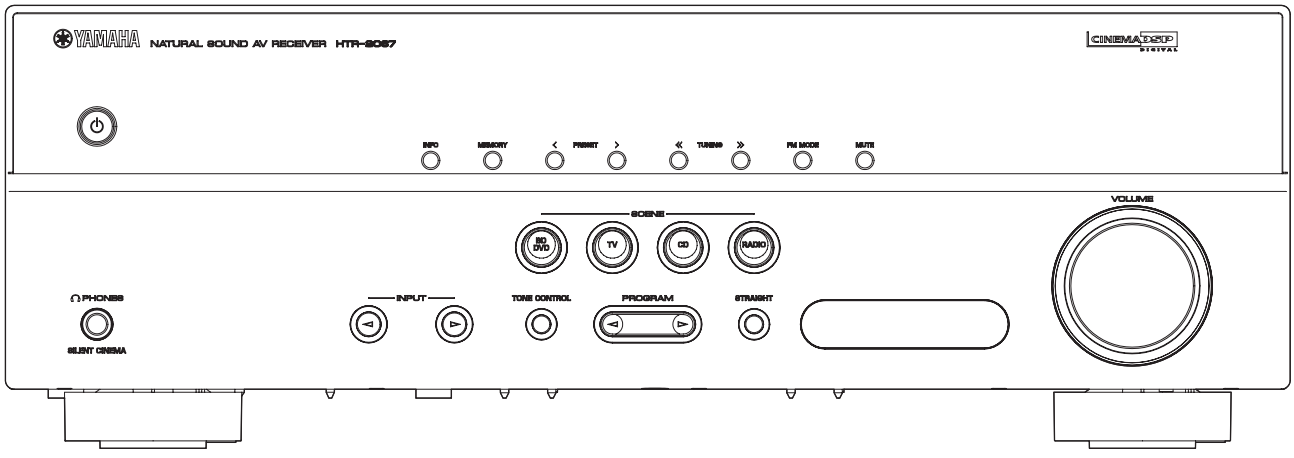
■ FRONT PANELS

HTR-2067

Top view

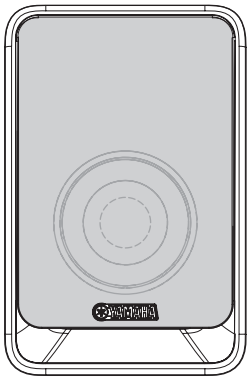


Front view

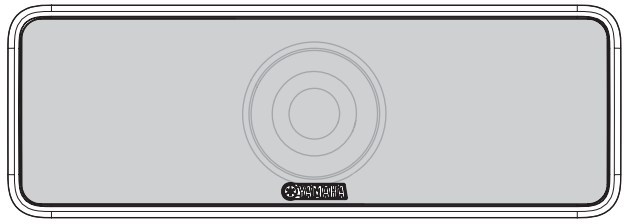


NS-B20/NS-C20/NS-SWP20

NS-B20

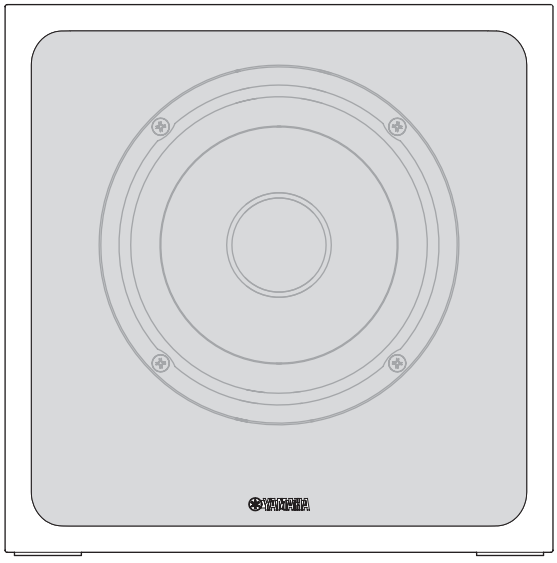


NS-C20

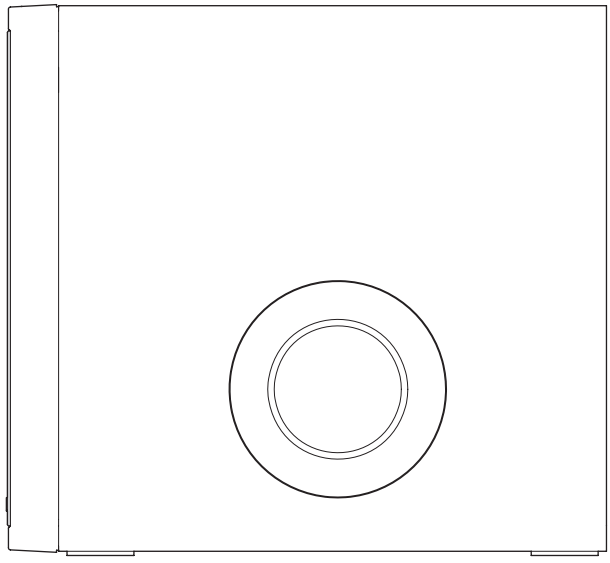


NS-SWP20

Front view



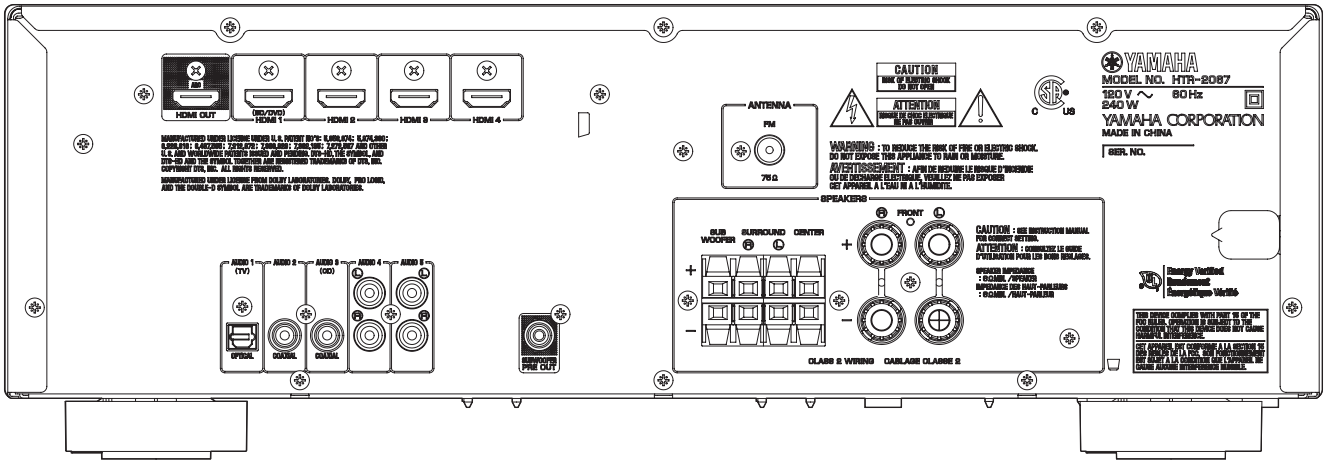
Side view



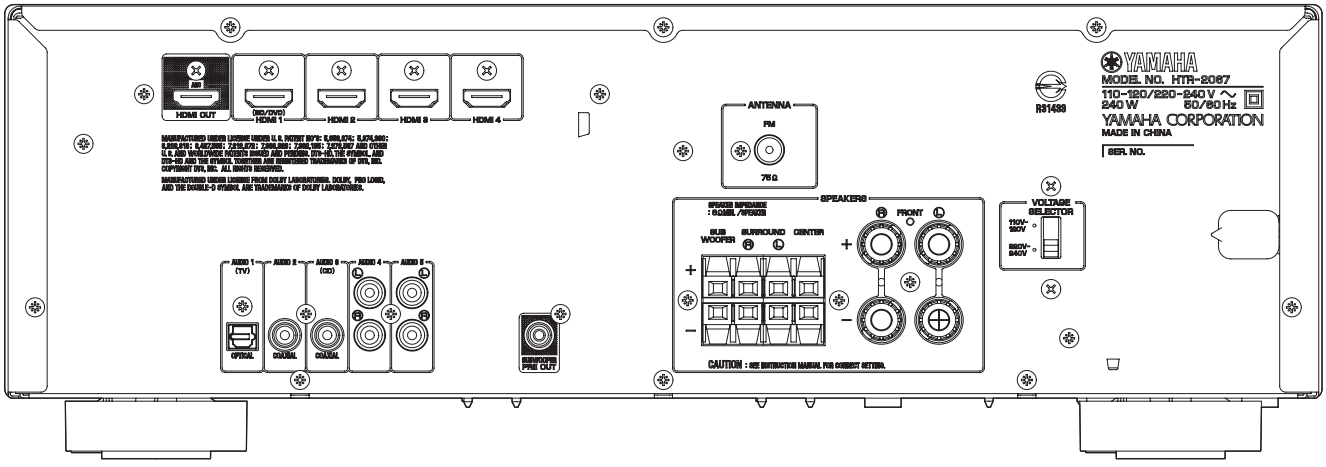
■ REAR PANELS

HTR-2067

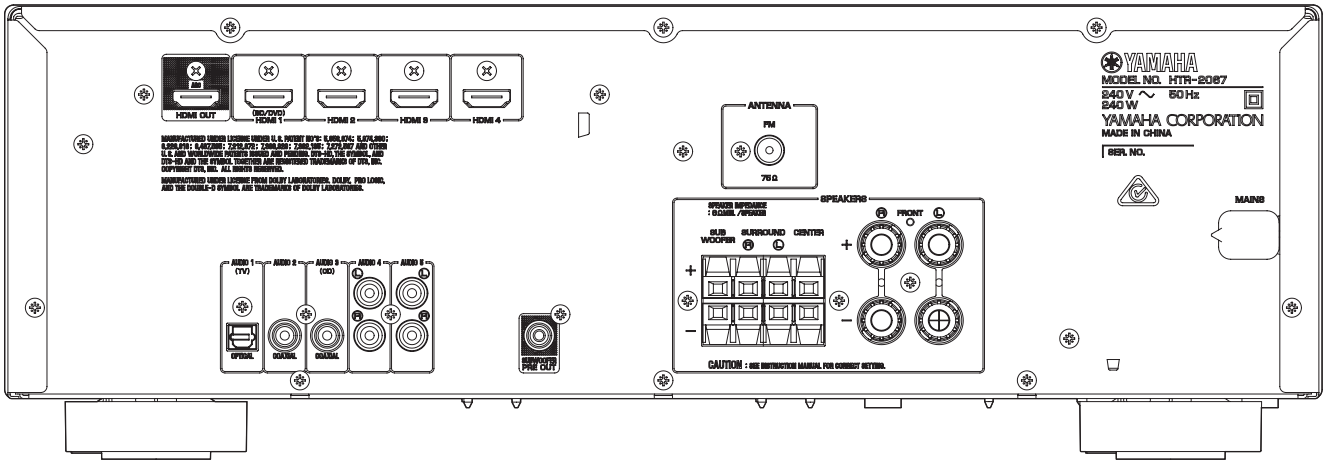
C model



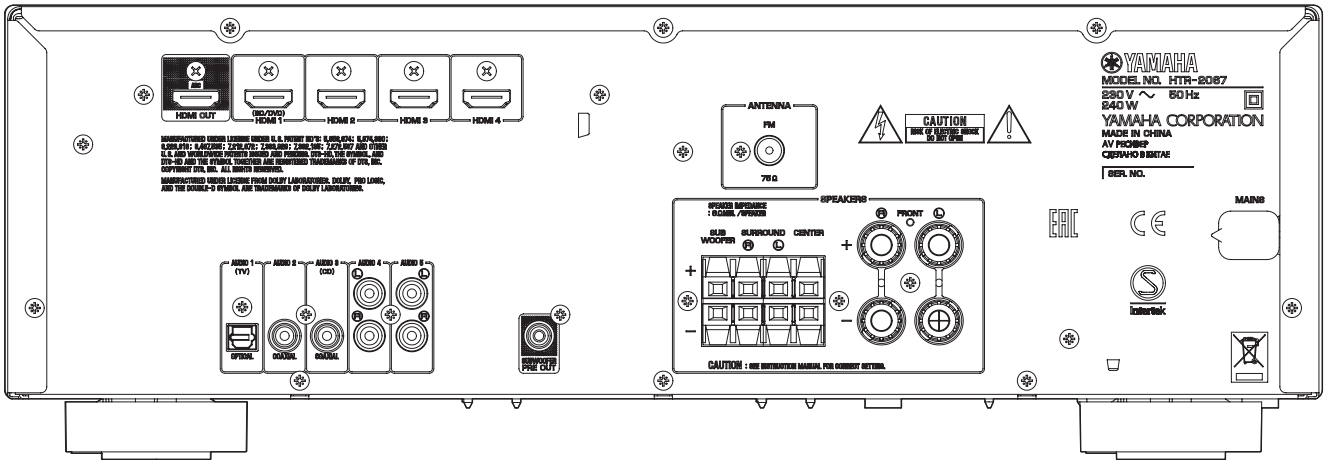
R model



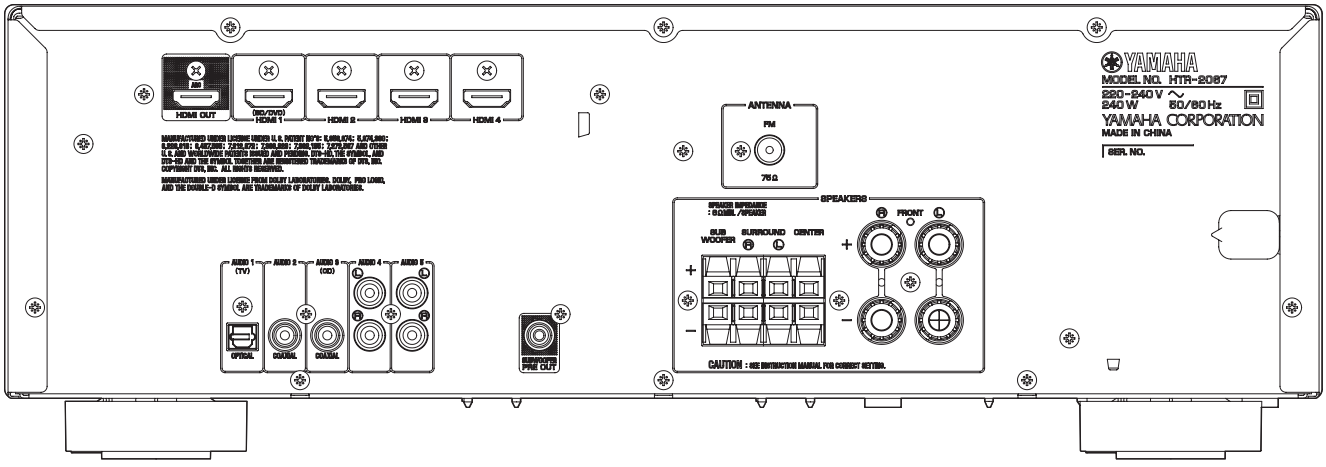
A model



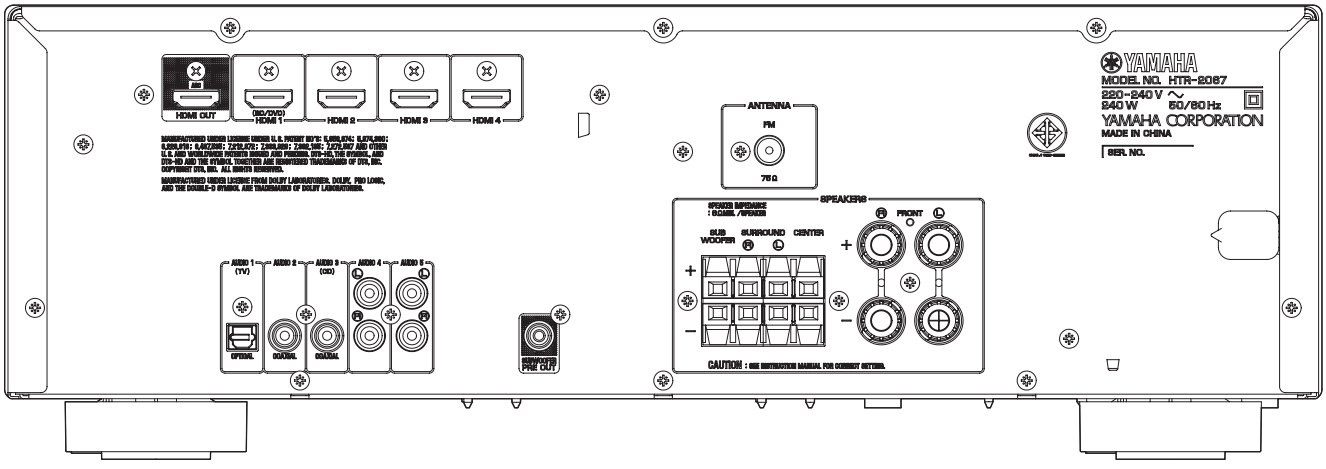
B, G, F models



L model

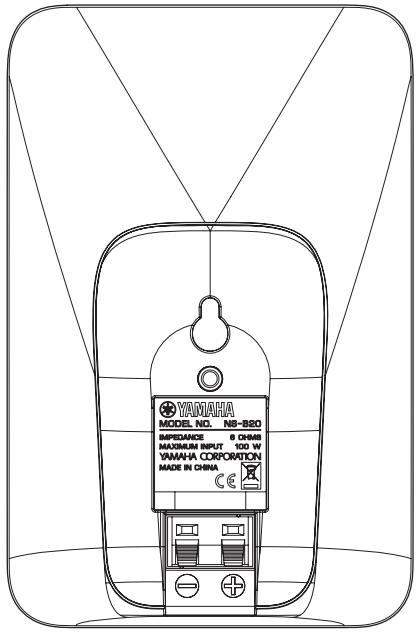


H model

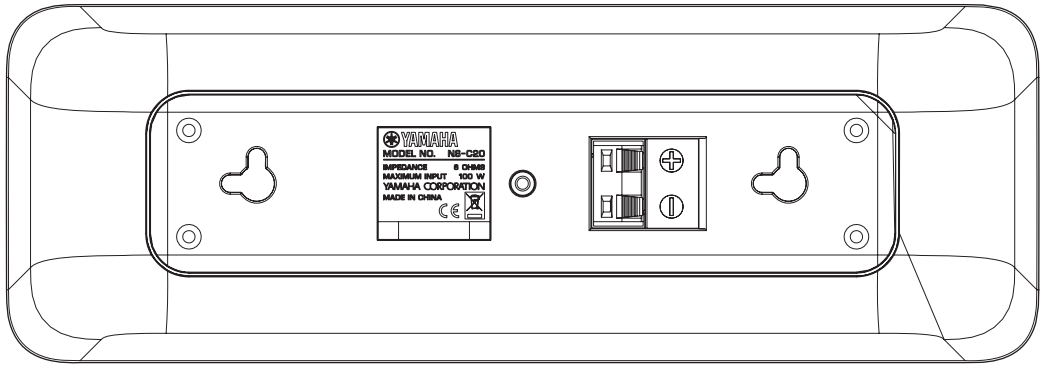


NS-B20/NS-C20/NS-SWP20

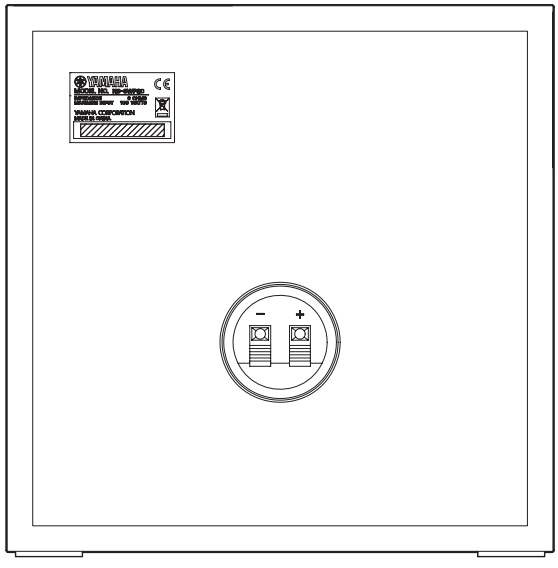
NS-B20



NS-C20

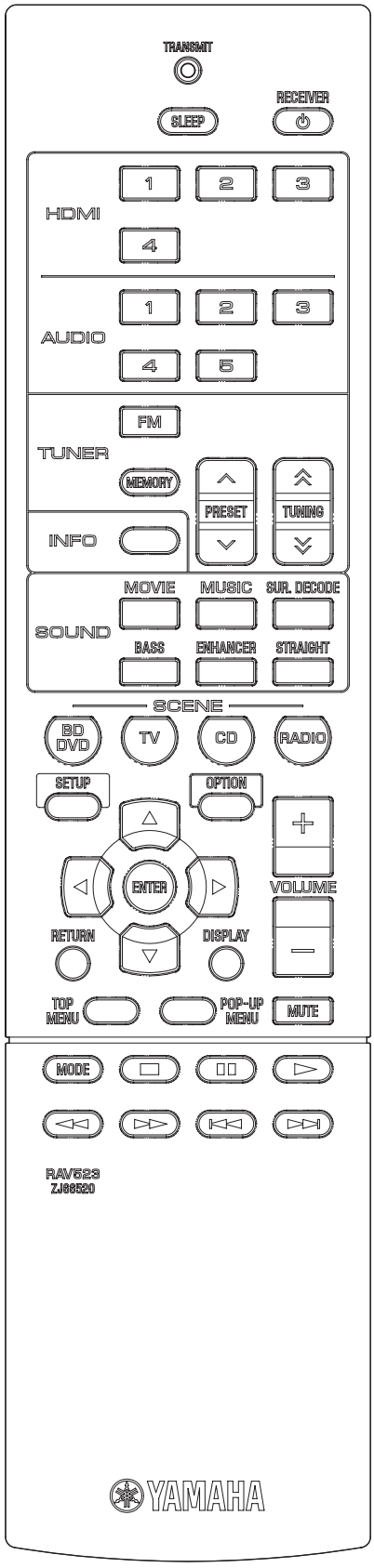


NS-SWP20



■ REMOTE CONTROL PANEL

RAV523



■ SPECIFICATIONS

HTR-2067

■ Audio Section

Rated Output Power (Power Amp. Section) (0.9 % THD, 6 ohms)

– 2 channel driven – (C model)
FRONT L/R (1 kHz)..... 85 W + 85 W
CENTER (1 kHz).....85 W
SURROUND L/R (1 kHz) ..... 85 W + 85 W
SUBWOOFER (50 Hz).....85 W

– 2 channel driven – (R, A, B, G, F, L, H models)
FRONT L/R (20–20 kHz)..... 70 W + 70 W

– 1 channel driven –
FRONT L/R (1 kHz).....100 W/ch
CENTER (1 kHz).....100 W/ch
SURROUND L/R (1 kHz) .....100 W/ch
SUBWOOFER (50 Hz).....100 W

Maximum Effective Output Power (1 channel driven, JEITA)

(10 % THD, 6 ohms) [R, L, H models]
FRONT L/R (1 kHz).....135 W/ch
CENTER (1 kHz) .....135 W/ch
SURROUND L/R (1 kHz).....135 W/ch
SUBWOOFER (50 Hz) .....135 W/ch

Dynamic Power Per Channel (1 channel driven, IHF)

FRONT L/R
C model
8/6/4/2 ohms.....110/130/160/180 W
R, A, B, G, F, L, H models
6/4/2 ohms.....110/130/150 W

Input Sensitivity/Input Impedance (1 kHz, 100 W / 6 ohms)
AUDIO4, etc. .....200 mV / 47 k-ohms

Maximum Input Signal (1 kHz, 0.5 % THD, Effect on)
AUDIO4, etc. ..... 2.3 V

Output Level/Output Impedance
SUBWOOFER (2 ch STEREO and FRONT speaker: Small)
..... 1 V / 1.2 k-ohms

Headphone Jack Rated Output/Impedance (1 kHz, 50 mV)
AUDIO4, etc. input ..... 100 mV / 470 ohms

Frequency Response (10 Hz to 100 kHz)
AUDIO4, etc. to FRONT L/R ..... 0 / -3.0 dB

Signal to Noise Ratio (IHF-A Network)
AUDIO4, etc. (STEREO)
Input shorted (250 mV) to speaker out..... 110 dB or more

Residual Noise (IHF-A Network)
FRONT L/R to speaker out..... 150 µV or less

Channel Separation
AUDIO4, etc. (Input 1 k-ohm shorted, 1 kHz / 10 kHz)
..... 70 dB or more / 50 dB or more

Volume Control
.....MUTE / -80 dB to +16.5 dB / 0.5 dB step

Tone Control Characteristics * FRONT L/R channel only

BASS
- Boost/Cut ..... ±6 dB / 0.5 dB step / 50 Hz
- Turnover frequency ..... 350 Hz

TREBLE
- Boost/Cut ..... ±6 dB / 0.5 dB step / 20 kHz
- Turnover frequency ..... 3.5 kHz

Filter Characteristics

FRONT, CENTER, SURROUND (H.P.F.)
..... fc=40/60/80/90/100/110/120/160/200 Hz, 12 dB/oct.

SUBWOOFER (L.P.F.)
..... fc=40/60/80/90/100/110/120/160/200 Hz, 24 dB/oct.

Optical Jack, Coaxial Jack (Support Frequencies)
..... 32 kHz to 96 kHz

■ FM Section

Tuning Range
- C model ..... 87.5 to 107.9 MHz
- R, L, H models ..... 87.5 to 108.0 / 87.50 to 108.00 MHz
- A, B, G, F models ..... 87.50 to 108.00 MHz

50 dB Quieting Sensitivity (IHF) (1 kHz, 100 % Mod.)
- Mono ..... 2 µV (17.3 dBf)

Signal to Noise Ratio (IHF)
- Mono / Stereo ..... 71 dB / 70 dB

Harmonic Distortion (1 kHz)
- Mono / Stereo ..... 0.5 % / 0.6 %

Antenna Input
..... 75 ohms unbalanced

■ General

Power Supply
- C model ..... AC 120 V, 60 Hz
- R model ..... AC 110–120/220–240 V, 50/60 Hz
- A model ..... AC 240 V, 50 Hz
- B, G, F models ..... AC 230 V, 50 Hz
- L, H models ..... AC 220–240 V, 50/60 Hz

Power Consumption
..... 240 W

Standby Power Consumption
- C, A, B, G, F, L, H models ..... 0.3 W or less
- R model ..... 0.5 W or less

Maximum Power Consumption
..... 470 W

Dimensions (W x H x D)
..... 435 x 151 x 315 mm (17-1/8" x 6" x 12-3/8")

Weight
..... 7.4 kg (16.3 lbs.)

Accessories
- Remote control ..... x 1
- Batteries (R03, AAA, UM-4) ..... x 2
- FM antenna (1.4 m) ..... x 1

* Specifications are subject to change without notice.

NS-B20/NS-C20/NS-SWP20

■ NS-B20/NS-C20

Type ..... Full-range acoustic suspension speaker system
Non-magnetic shielding type

Driver
Full-range.....7 cm (2-3/4") cone type x 1

Frequency Response
[NS-B20] ..... 70 Hz to 25 kHz (-10 dB)
to 45 kHz (-30 dB)
[NS-C20] ..... 65 Hz to 25 kHz (-10 dB)
to 45 kHz (-30 dB)

Impedance..... 6 ohms

Nominal Input.....30 W

Maximum Input ..... 100 W

Sensitivity
[NS-B20] ..... 83 dB/2.83 V/m
[NS-C20] ..... 84 dB/2.83 V/m

Input Terminal ..... Push type

Dimensions (W x H x D)
[NS-B20] ..... 115 mm x 176 mm x 88 mm
(4-1/2" x 6-7/8" x 3-1/2")
[NS-C20] ..... 291 mm x 101 mm x 103 mm
(11-1/2" x 4" x 4")

Weight
[NS-B20] .....0.48 kg (1.06 lbs.)
[NS-C20] .....0.68 kg (1.50 lbs.)

■ NS-SWP20

Type .....Bass reflex speaker system
Non-magnetic shielding type

Driver
Subwoofer.....16 cm (6-1/2") cone type x 1

Frequency Response..... 30 Hz to 2 kHz (-10 dB)
to 9 kHz (-30 dB)

Impedance..... 6 ohms

Nominal Input.....30 W

Maximum Input ..... 100 W

Sensitivity..... 86 dB/2.83 V/m

Input Terminal ..... Push type

Dimensions (W x H x D)
..... 262 mm x 264 mm x 287 mm
(10-3/8" x 10-3/8" x 11-1/4")

Weight.....5.2 kg (11.5 lbs.)

■ General

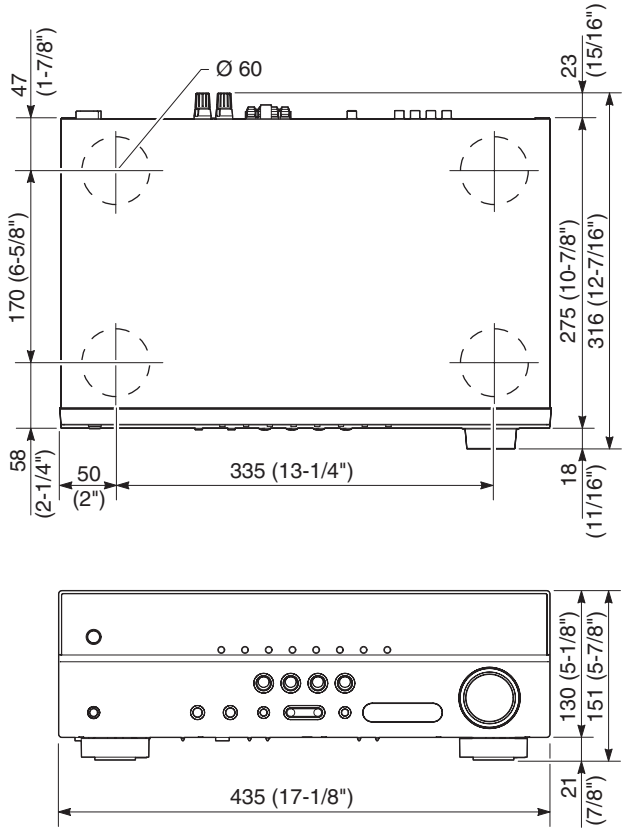
Accessories
Speaker cable (25 m) ..... x 1
Nonskid pad (NS-B20/NS-C20)..... x 24

* Specifications are subject to change without notice.

C..... ***Canadian model***
R..... ***General model***
A.....***Australian model***
B.....***British model***
G..... ***European model***
F..... ***Russian model***
L..... ***Singapore model***
H.....***Thai model***

- **DIMENSIONS**

HTR-2067

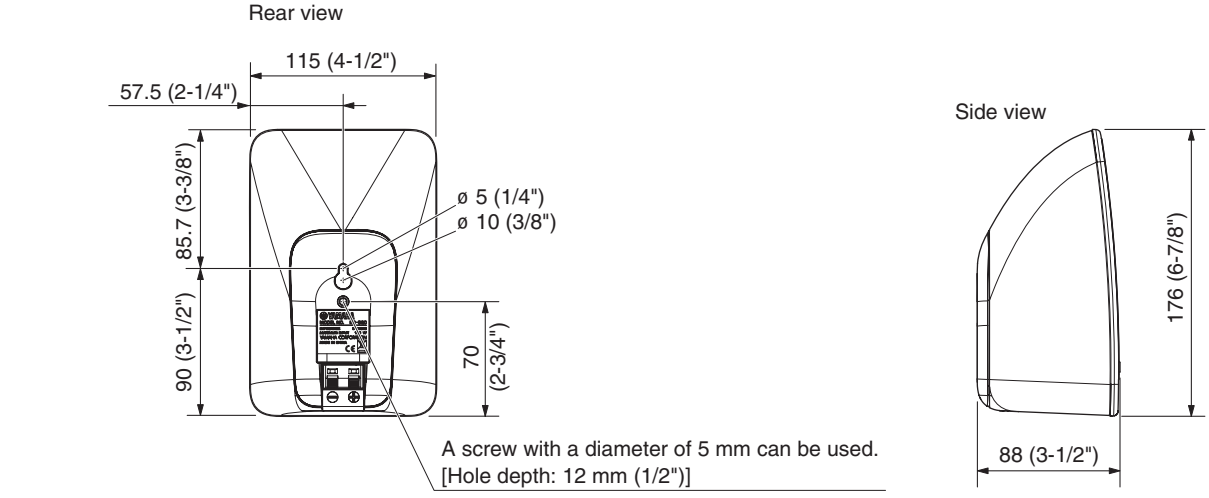


Unit: mm (inch)

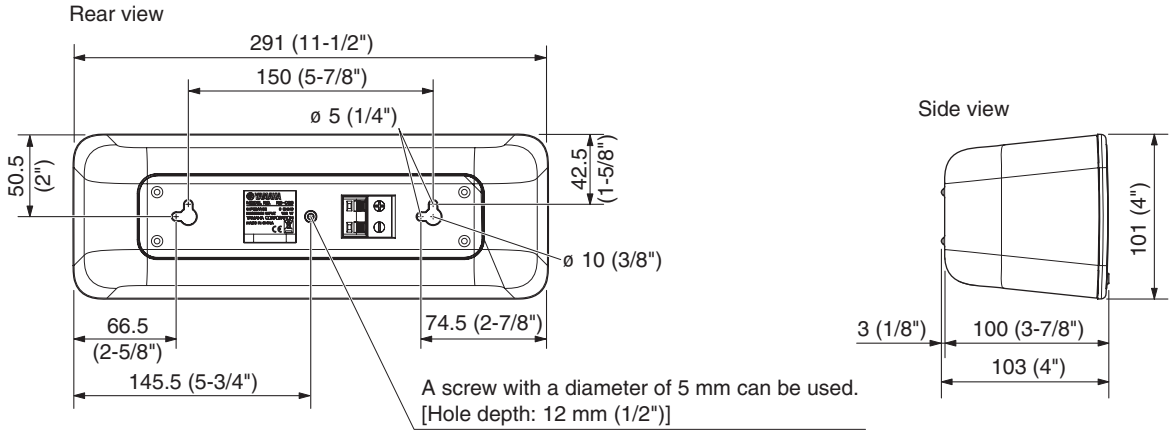
NS-B20/NS-C20/NS-SWP20

Unit: mm (inch)

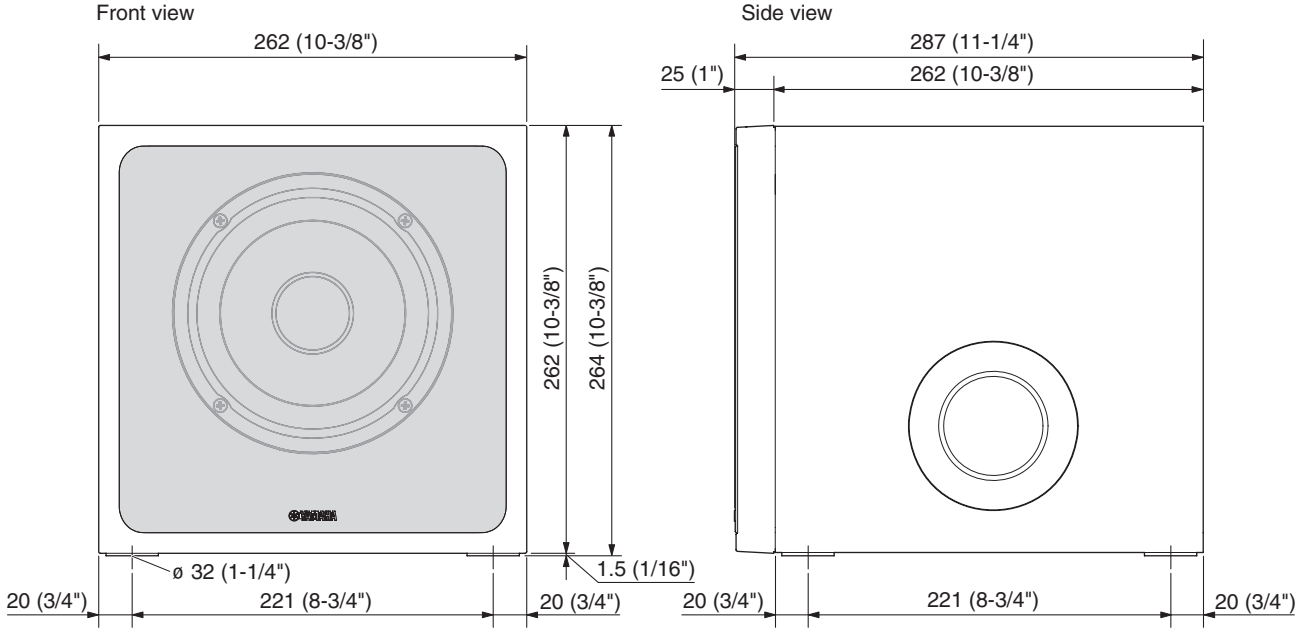
▼ NS-B20



▼ NS-C20



▼ NS-SWP20



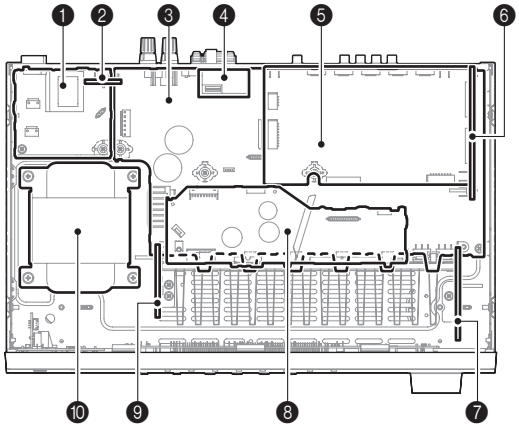
- **SET MENU TABLE**

MAIN MENU	SUB-MENU	PARAMETER			VALUE [INITIAL VALUE]
Speaker	Configuration	Subwoofer			[Use] / None
		Front			[Small] / Large
		Center			[Small] / Large / None
		Surround			[Small] / Large / None
		Crossover			40 Hz / 60 Hz / 80 Hz / 90 Hz / 100Hz / 110 Hz / 120 Hz / [160 Hz] / 200 Hz
		Subwoofer Phase			[Normal] / Reverse
		Extra Bass			[Off] / On * "Extra Bass" is not available when "Subwoofer" is set to "None".
		Virtual CINEMA FRONT			[Off] / On
	Distance	Unit			Meter / Feet
		Front L			0.30 to 24.00 m, [3.00 m], 0.05 m step 1.0 to 80.0 ft, [10.0 ft], 0.2 ft step
		Front R			
		Center			0.30 to 24.00 m, [2.60 m], 0.05 m step 1.0 to 80.0 ft, [8.6 ft], 0.2 ft step
		Surround L			0.30 to 24.00 m, [2.40 m], 0.05 m step 1.0 to 80.0 ft, [8.0 ft], 0.2 ft step
		Surround R			
		Subwoofer			0.30 to 24.00 m, [3.00 m], 0.05 m step 1.0 to 80.0 ft, [10.0 ft], 0.2 ft step
	Level	Front L			-10.0 to +10.0 dB, [0.0 dB], 0.5 dB step
		Front R			
		Center			-10.0 to +10.0 dB, [-1.0 dB], 0.5 dB step
		Surround L			
		Surround R			
		Subwoofer			-10.0 to +10.0 dB, [0.0 dB], 0.5 dB step
	Equalizer	EQ Select			[GEQ] / Off
		GEQ Edit	Front L	63 Hz ·····||·····	-6.0 to +6.0 dB, [0 dB], 0.5 dB step
			Front R	160 Hz ·····||·····	
			Center	400 Hz ·····||·····	
			Surround L	1 kHz ·····||·····	
			Surround R	2.5 kHz ·····||·····	
				6.3 kHz ·····||·····	
				16 kHz ·····||·····	
	Test Tone				[Off] / On

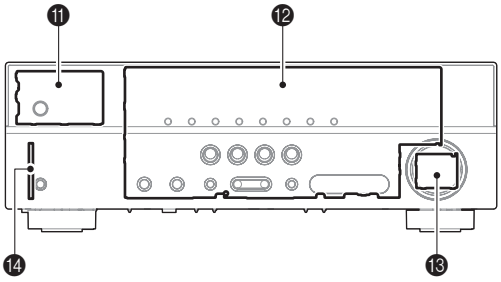
MAIN MENU	SUB-MENU	PARAMETER		VALUE [INITIAL VALUE]
HDMI	Configuration	HDMI Control		[Off] / On
		Audio Output	Amp	Off / [On]
			HDMI OUT (TV)	[Off] / On
		* This setting is available only when "HDMI Control" is set to "Off".		
		TV Audio Input		AV1 / AV2 / AV3 / [AV4] / AV5 * This setting is available only when "HDMI Control" is set to "On".
		Standby Sync		Off / On / [Auto] * This setting is available only when "HDMI Control" is set to "On".
		ARC		Off / [On] * This setting is available only when "HDMI Control" is set to "On".
		SCENE	BD / DVD	Off / [On]
			TV	
			CD	[Off] / On
			RADIO	
		* This setting is available only when "HDMI Control" is set to "On".		
Sound	DSP Parameter	Panorama		[Off] / On
		Center Width		0 to 7, [3]
		Dimension		-3 to +3, [0]
	Lipsync	Select		Manual / [Auto]
		Adjustment		0 to 500 ms, [0 ms], 1 ms step
	Volume	Scale		[dB] / 0 to 97
		Dynamic Range		[Maximum] / Standard / Min/Auto
		Max Volume		-30.0 to +15.0 dB / +16.5 dB (Maximum volume), [+16.5 dB], 5.0 dB step
		Initial Volume		[Off] / Mute / -80.0 to +16.5 dB, 0.5 dB step
ECO	Auto Power Standby			C, R, A, L, H models: [Off] / 2 hours / 4 hours / 8 hours / 12 hours / 20 minutes B, G, F models: Off / 2 hours / 4 hours / 8 hours / 12 hours / [20 minutes]
	ECO Mode			[Off] / On
Function	Input Rename			Input sources: HDMI1 / HDMI2 / HDMI3 / HDMI4 / AV1 / AV2 / AV3 / AV4 / AV5 Input is possible to 9 characters Input possible Character type Capital: A to Z Small: a to z Figure: 0 to 9 Symbols: + , - etc. Space Preset name select: Blu-ray / DVD / SetTopBox / Game / TV / DVR / CD / CD-R / Satellite / VCR / Tape / MD / PC / iPod / HD DVD
	Dimmer			-4 to 0 (higher to brighten), [0]
	Memory Guard			[Off] / On
Language				English (English) / 日本語 (Japanese) / Français (French) / Deutsch (German) / Español (Spanish) / Русский (Russian) / Italiano (Italian) / 中文 (Chinese)

■ INTERNAL VIEW

Top view



Front view



❶ OPERATION (3) P.C.B.
❷ MAIN (3) P.C.B. (R model)
❸ MAIN (1) P.C.B.
❹ FM TUNER
❺ DIGITAL P.C.B.
❻ OPERATION (4) P.C.B.
❼ MAIN (5) P.C.B.
❽ OPERATION (2) P.C.B.
❾ MAIN (4) P.C.B.
❿ POWER TRANSFORMER
⓫ OPERATION (7) P.C.B.
⓬ OPERATION (1) P.C.B.
⓭ OPERATION (6) P.C.B.
⓮ OPERATION (5) P.C.B.

■ SERVICE PRECAUTIONS

Safety measures

- Some internal parts in this product contain high voltages and are dangerous.
  Be sure to take safety measures during servicing, such as wearing insulating gloves.
- Note that the capacitors indicated below are dangerous even after the power is turned off because an electric charge remains and a high voltage continues to exist there.
  Before starting any repair work, connect a discharging resistor (5 k-ohms/10 W) to the terminals of each capacitor indicated below to discharge electricity.
  The time required for discharging is about 30 seconds per each.

  C1326–C1328 on OPERATION (2) P.C.B.
  C79, C80 on MAIN (1) P.C.B.

  For details, refer to "PRINTED CIRCUIT BOARDS".

■ DISASSEMBLY PROCEDURES

(Remove parts in the order as numbered.)

Disconnect the power cable from the AC outlet.

1. Removal of Top Cover

a. Remove 5 screws (①) and 4 screws (②). (Fig. 1)

b. Slide the top cover rearward to remove it. (Fig. 1)

2. Removal of Front Panel Unit

a. Remove 7 screws (③). (Fig. 1)

b. Remove CB166 and CB221. (Fig. 1)

c. Unlock and remove CB136. (Fig. 1)

d. Release hook and then remove the front panel unit. (Fig. 1)

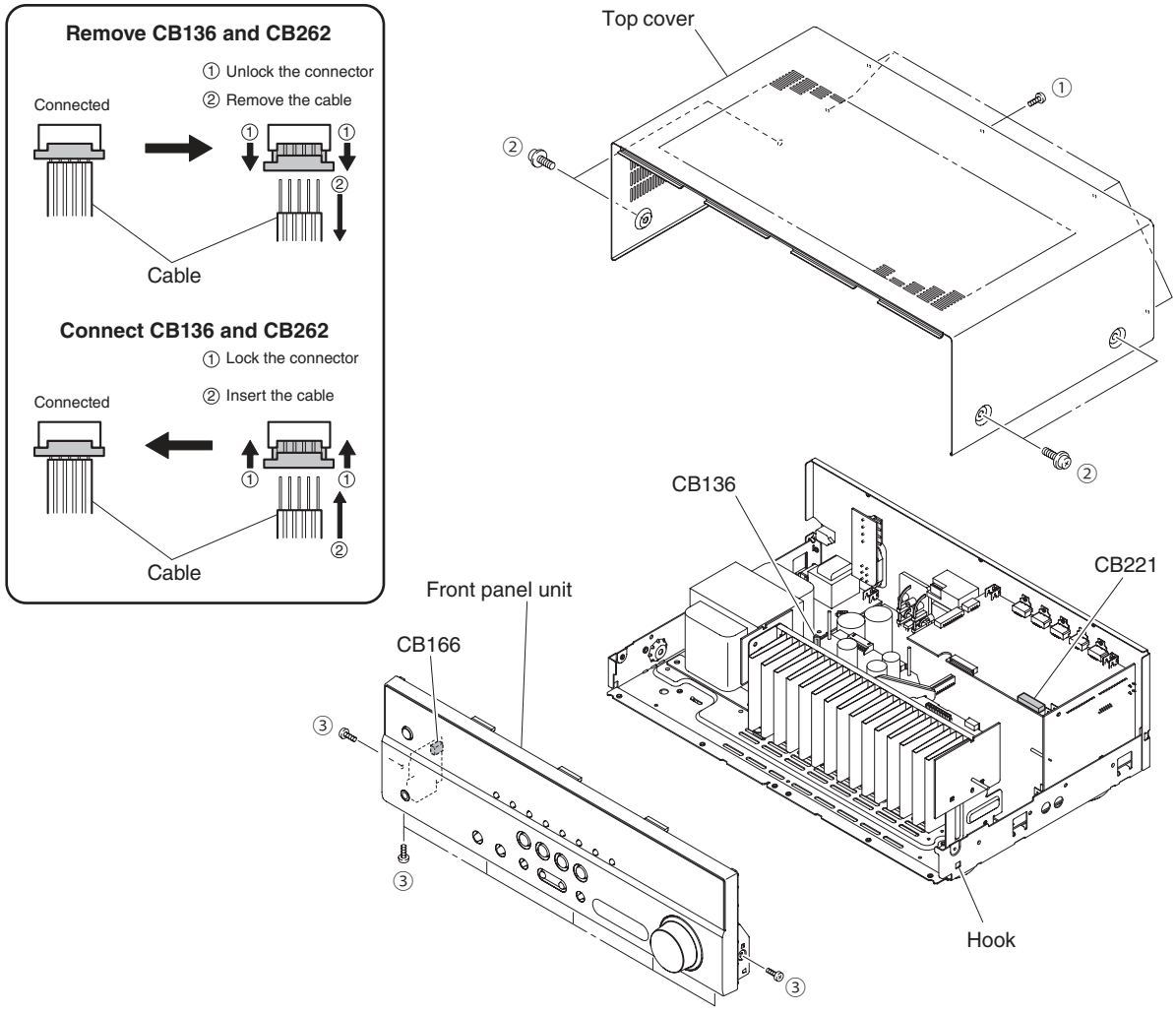


Fig. 1

3. Removal of DIGITAL P.C.B.

a. Remove CB222 and CB223. (Fig. 2)
b. Unlock and remove CB262. (Fig. 2)
c. Remove screw (④). (Fig. 2)
d. Remove 2 screws (⑤) and 5 screws (⑥). (Fig. 3)
e. Remove the DIGITAL P.C.B. which is connected directly to the OPERATION (4) P.C.B. with board-to-board connectors. (Fig. 2)

4. Removal of OPERATION (4) P.C.B.

a. Remove screw (⑦). (Fig. 2)
b. Remove screw (⑧). (Fig. 3)
c. Remove the OPERATION (4) P.C.B. which is connected directly to the MAIN (1) P.C.B. with board-to-board connectors. (Fig. 2)

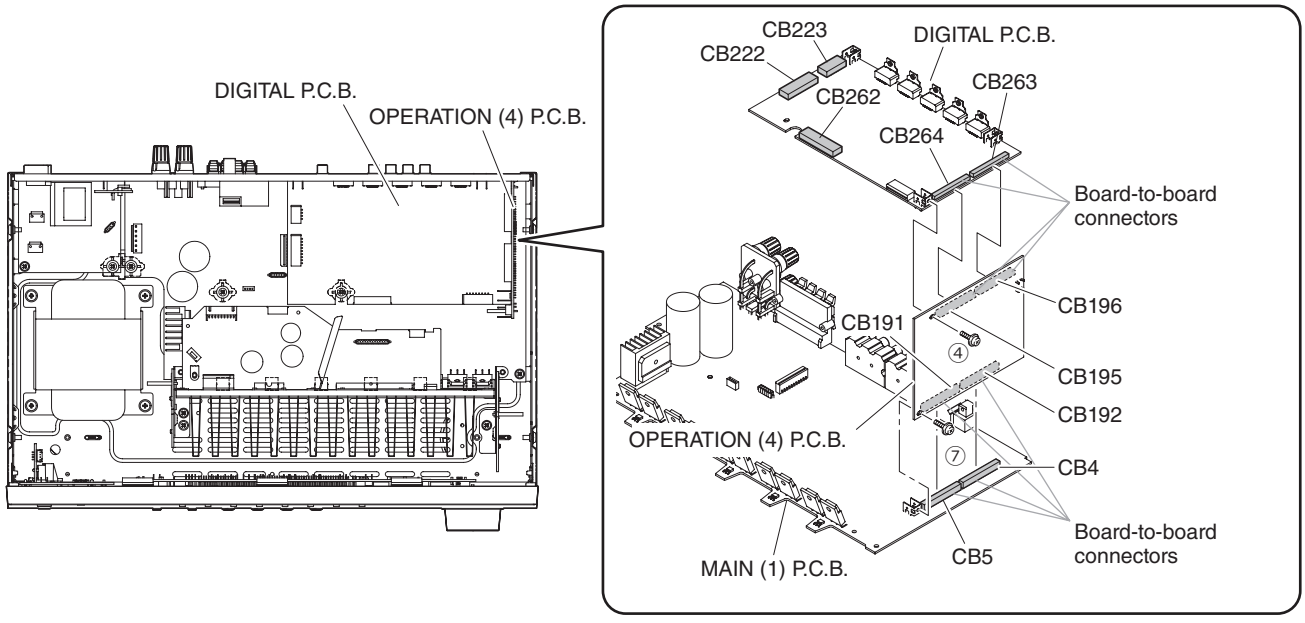


Fig. 2

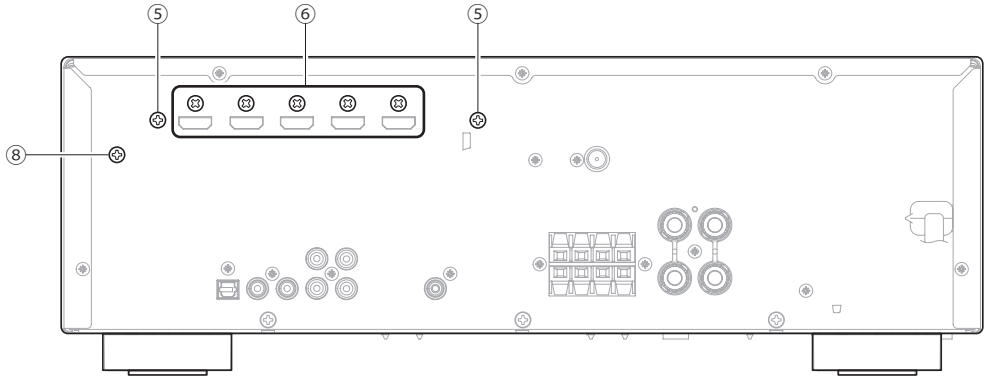


Fig. 3

When checking the DIGITAL P.C.B.

- Put the rubber sheet and cloth over this unit, and place the DIGITAL P.C.B. on them. (Fig. 4)
- Connect ST261 on DIGITAL P.C.B. to the chassis with a ground lead. (Fig. 4)
- Reconnect all cables (connectors) that have been disconnected. Be sure to use the P.C.B. CHECKING JIG (Part No. ZM169300) to connect between the following connectors.
  CB263 on DIGITAL P.C.B. – CB196 on OPERATION (4) P.C.B.
  CB264 on DIGITAL P.C.B. – CB195 on OPERATION (4) P.C.B.
- When connecting the flexible flat cable, be careful with polarity.

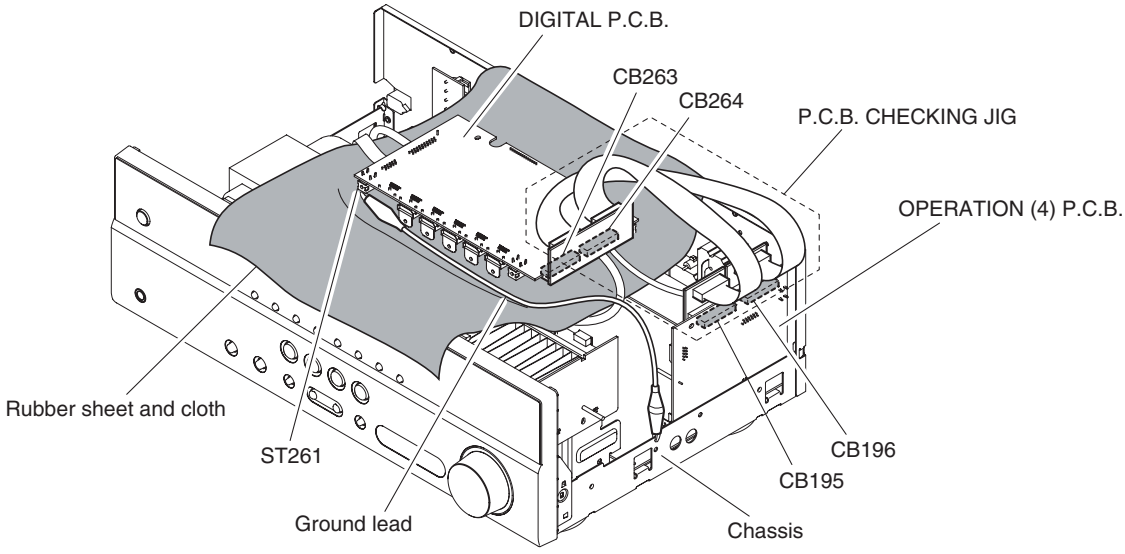


Fig. 4

When checking the MAIN (1) P.C.B.

a. Remove the top cover. (For details, refer to "1. Removal of Top Cover".)
b. Remove 3 screws (⑨). (Fig. 5)
c. Remove 5 screws (⑩) and 4 screws (⑪). (Fig. 5)
d. Place the P.C.B.s (with rear panel) upright. (Fig. 6)
e. Connect the heatsink, rear panel and MAIN (1) P.C.B. (G1) to the chassis with a ground lead. (Fig. 6)

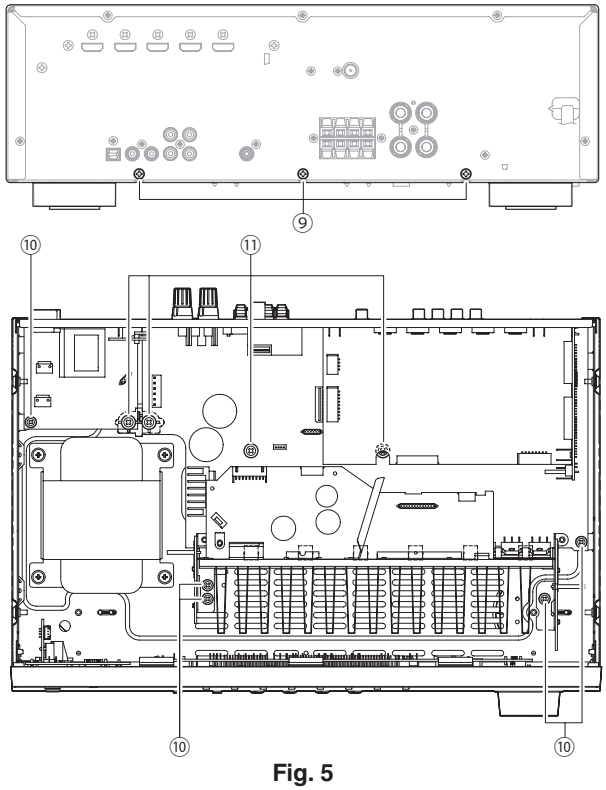


Fig. 5

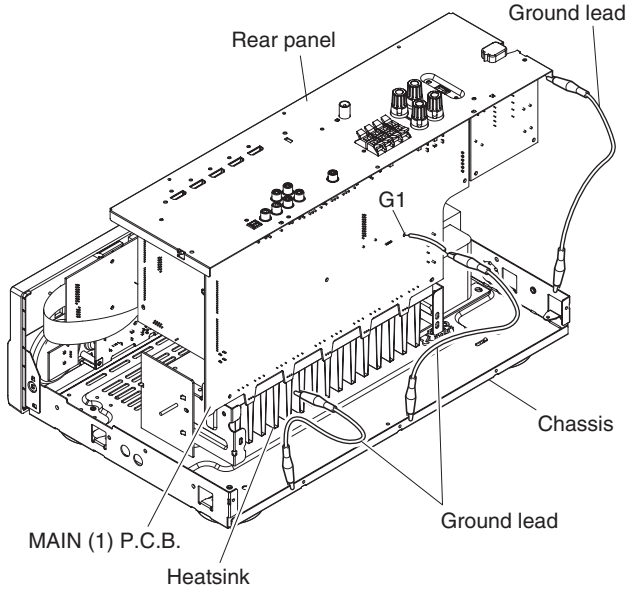


Fig. 6

■ UPDATING FIRMWARE

When the following parts are replaced, the firmware must be updated to the latest version.

DIGITAL P.C.B.

DSP FLASH ROM (IC242 on DIGITAL P.C.B.)

● Confirmation of firmware version and checksum

Before and after updating the firmware, check the firmware version and checksum by using the self-diagnostic function menu.
Start up the self-diagnostic function and select "S4. ROM VERSION/CHECKSUM" menu.
Using the sub-menu, have the firmware version and checksum displayed, and note them down.
(For details, refer to "SELF-DIAGNOSTIC FUNCTION")

* When the firmware version is different from written one after updating, perform the updating procedure from the beginning again.

● Initializing the back-up IC (EEPROM: IC222 on DIGITAL P.C.B.)

After updating the firmware, the back-up IC MUST be initialized by the following procedure to store the setting information (soundfield parameters, system memory and tuner presetting, etc.) properly.

Start up the self-diagnostic function and select "S3. FACTORY PRESET" menu.
(For details, refer to "SELF-DIAGNOSTIC FUNCTION")

Select "PRESET RSRV", press the "⏻" (Power) key to turn off the power once and turn on the power again. Then the back-up IC is initialized.

● Required Tools

- CD, DVD or BD player (with DIGITAL OUTPUT (OPTICAL or COAXIAL) jack)

* The following models can be used as a tool to update the firmware.

CD player:	CD-C600/CD-S1000/CD-S2000/CD-S300/CD-S700/CDX-496/CDX-596/CDX-890
DVD player:	DV-C6760/DVD-840/DVD-C740/DVD-C750/DVD-C940/DVD-C950/DVD-CX1/DVD-S1200/DVD-S1800/ DVD-S2300(MKII)/DVD-S2700/DVD-S30/DVD-S510/DVD-S520/DVD-S530/DVD-S540/DVD-S550/ DVD-S657/DVD-S700/DVD-S80/DVD-S840
BD player:	BD-940/BD-S1065/BD-S1900/BD-S2900/BD-S671
Others:	CDR-D651/CDR-HD1000/CDR-HD1300/CDR-HD1500/DV-SL100/CDX-E100/CRX-430/CRX-E150/ RDX-E700

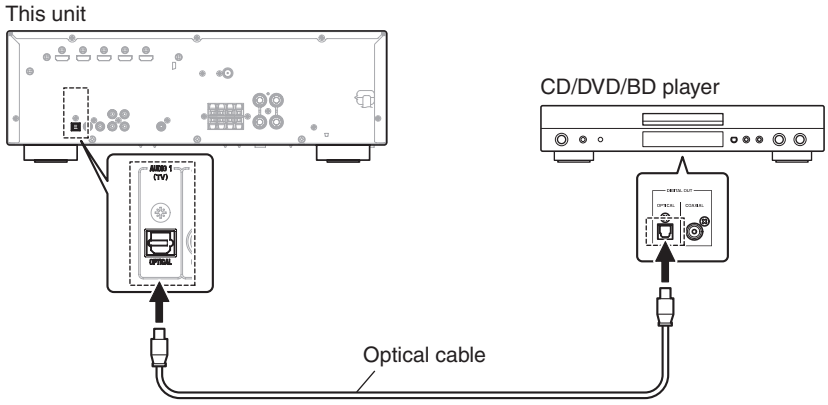
- Optical cable (when OPTICAL jack is used)
- Digital audio pin cable (when COAXIAL jack is used)
- Firmware CD

  Download the latest firmware from the specified download source and create the firmware CD.

● Connection

Connect a CD/DVD/BD player to this unit as shown below. (Fig. 1)

Example of connection between digital OPTICAL jacks



Example of connection between digital COAXIAL jacks

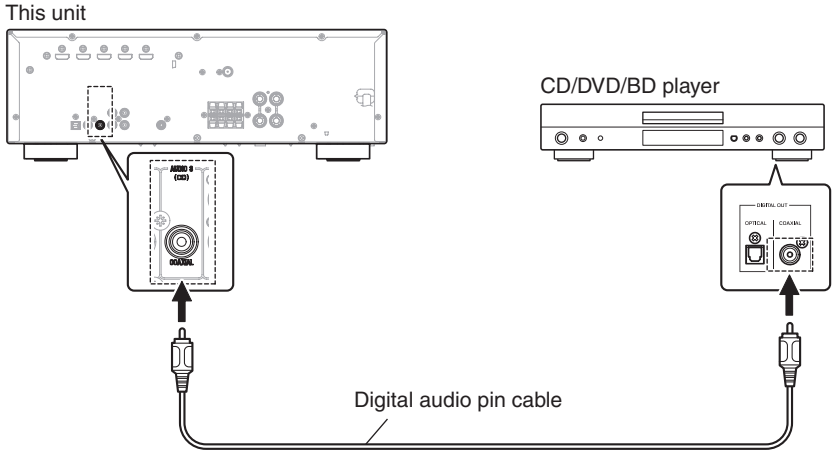
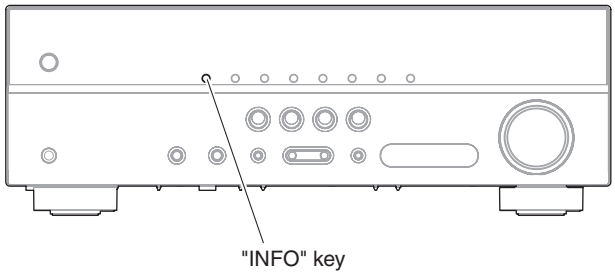


Fig. 1

● Operation Procedures

1. While pressing the "INFO" key, connect the power cable to the AC outlet. (Fig. 2)
   The FIRMWARE UPDATE mode is activated and "PLAY CDDA!" is displayed. (Fig. 2)



Display

PLAY CDDA!

Fig. 2

2. Play the firmware CD on the CD/DVD/BD player. Writing of the firmware starts automatically. (Fig. 3)
3. When writing of the firmware is completed, "Update Success", "Please..." and "Power off!!" are displayed repeatedly. (Fig. 3)

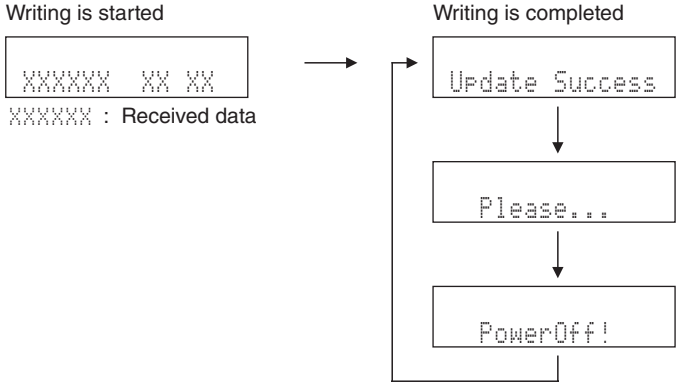


Fig. 3

* If the following error messages are displayed, perform the operation procedure again form the beginning.
- Unplayed: This message will be displayed if the receiver does not detect the spinning of the firmware CD.
- Unreceived: This message will be displayed if the data on the firmware CD is incorrect even though the receiver detects the spinning of the firmware CD.

4. Press the "⏻" (Power) key to turn off the power.
5. Eject the firmware CD from the CD/DVD/BD player.
6. Start up the self-diagnostic function and check that the firmware version and checksum are the same as written ones. (See "Confirmation of firmware version and checksum")

■ SELF-DIAGNOSTIC FUNCTION

This unit has self-diagnostic functions that are intended for inspection, measurement and location of faulty point.

There are 28 main menu items, each of which has sub-menu items.

Listed in the table below are main menu items and sub-menu items.

Note: Some of the menu items listed below may not apply to the models covered in this service manual.

No.	Main menu	No.	Sub-menu
A: Audio system			
A1	DSP AUDIO	1	DSP MARGIN
		2	DSP NON MARGIN
		3	DSP FULL CENTER
		4	DSP FULL SURROUND
		5	DSP FULL SURROUND BACK (Not for service)
		6	DSP FULL SUBWOOFER
A2	DIRECT AUDIO	1	ANALOG DIRECT
		2	NET DIRECT (Not for service)
A3	HDMI AUDIO	1	HDMI AUTO
		2	ARC
A4	SPEAKERS SET	1	FULL MUTE
		2	BI-AMP (Not for service)
		3	AC_B : HIGH (Not for service)
		4	AC_B : LOW (Not for service)
A5	MIC CHECK	1	MIC ROUTE CHECK (Not for service)
A6	INVALID ITEM (Not for service)	1	INVALID ITEM
		2	INVALID ITEM
		3	INVALID ITEM
A7	DIR PLL (Not for service)	1	DIR PLL
A8	MANUAL TEST	1	TEST ALL
H: HDMI			
H1	INVALID ITEM (Not for service)	1	INVALID ITEM
		2	INVALID ITEM
D: Display system			
D1	FL CHECK	1	FL CHECK
		2	ALL SEGMENT OFF
		3	ALL SEGMENT ON
		4	CHECK PATTERN 1
		5	CHECK PATTERN 2
U: Universal system			
U1	USB (Not for service)	1	USB FRONT 1 TRACK
		2	USB BOOT
		3	INVALID ITEM
		4	APL ID CHECK

No.	Main menu	No.	Sub-menu
N: Network system			
N1	INVALID ITEM (Not for service)	1	INVALID ITEM
		2	INVALID ITEM
		3	INVALID ITEM
		4	INVALID ITEM
		5	INVALID ITEM
		6	INVALID ITEM
		7	INVALID ITEM
		8	INVALID ITEM
		9	INVALID ITEM
		10	INVALID ITEM
N2	INVALID ITEM (Not for service)	1	INVALID ITEM
		2	INVALID ITEM
		3	INVALID ITEM
		4	INVALID ITEM
		5	INVALID ITEM
		6	INVALID ITEM
		7	INVALID ITEM
		8	INVALID ITEM
		9	INVALID ITEM
		10	INVALID ITEM
		11	INVALID ITEM
C: Communication system			
C1	DIGITAL PCB CHECK	1	ALL
		2	MCPU OSD
		3	OSD HDMI
		4	VIDEO I/F (Not for service)
		5	DIR BUS
		6	DSP BUS
		7	EEPROM
		8	TUNER
C2	HDMI INFO	1	HDMI MODEL NAME
		2	HDMI PRODUCT ID (Not for service)
C3	INVALID ITEM (Not for service)	1	INVALID ITEM
		2	INVALID ITEM
		3	INVALID ITEM
		4	INVALID ITEM
V: Video system			
V1	ANALOG VIDEO CHECK (Not for service)	1	ANALOG BYPASS
		2	MUTE CHECK
V2	DIGITAL VIDEO CHECK	1	HDMI REPEAT
		2	OSD-VIDEO OUT
R: Radio system			
R1	INVALID ITEM (Not for service)	1	INVALID ITEM
		2	INVALID ITEM

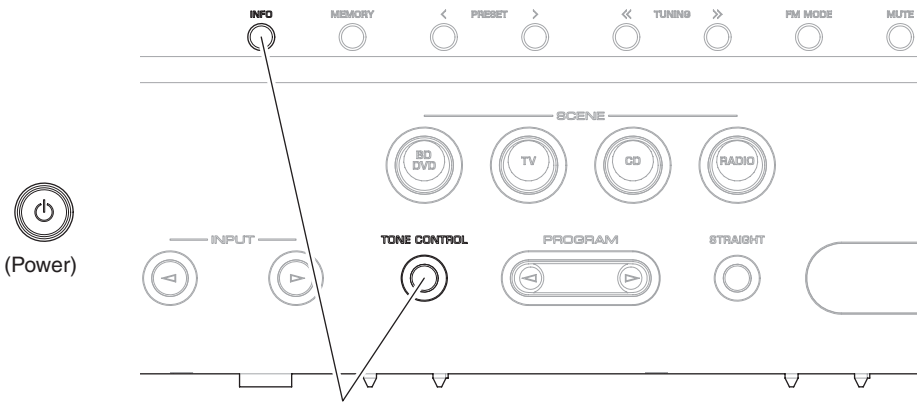
No.	Main menu	No.	Sub-menu
P: Power supply and protection system			
P1	SYSTEM MONITOR	1	DC
		2	PS
		3	TMP
		4	OUTPUT LEVEL
		5	LIMITER CONTROL
		6	USB / DC (Not for service)
		7	KEY
P2	PROTECTION HISTORY	1	HISTORY 1
		2	POWER PORT 1
		3	LAST INPUT 1
		4	LAST VOLUME 1
		5	HISTORY 2
		6	POWER PORT 2
		7	LAST INPUT 2
		8	LAST VOLUME 2
		9	HISTORY 3
		10	POWER PORT 3
		11	LAST INPUT 3
		12	LAST VOLUME 3
		13	HISTORY 4
		14	POWER PORT 4
		15	LAST INPUT 4
		16	LAST VOLUME 4
T: Troubleshooting Information			
T1	TROUBLE SHOOTING INFORMATION	1	OPERATING TIME
		2	POWER-RELAY ON
		3	POWER AMP B
		4	OUTPUT LEVEL
		5	NRC (Net Restart Counter) (Not for service)
S: System and version system			
S1	FIRMWARE UPDATE	1	DSP FIRMWARE UPDATE (Not for service)
S2	SET INFORMATION	1	INITIAL DISPLAY
		2	MODEL/DESTINATION
S3	FACTORY PRESET	1	PRESET INHIBIT
		2	PRESET RESERVED
S4	ROM VERSION/CHECKSUM	1	SYSTEM VERSION
		2	MICROPROCESSOR VERSION
		3	MICROPROCESSOR CHECKSUM
		4	DSP VERSION
		5	DSP CHECKSUM
		6	OSD VERISON
		7	OSD CHECKSUM
		8	NETWORK VERSION (Not for service)
		9	NETWORK CHECKSUM (Not for service)
		10	USB CONTROLLER VERSION (Not for service)
		11	USB CONTROLLER CHECKSUM (Not for service)
S5	SOFT SWITCH	1	SWITCH MODE
		2	MODEL NAME
		3	DESTINATION
S6	SYSTEM INFORMATION	1	MODEL/DESTINATION
		2	VERIFY (Not for service)

● Starting Self-Diagnostic Function

While pressing the "TONE CONTROL" and "INFO" keys, press the "⏻" (Power) key to turn on the power, and release those 2 keys.

The self-diagnostic function mode is activated.

Keys of this unit



While pressing these keys, turn on the power.

● Starting Self-Diagnostic Function in the protection cancel mode

If the protection function works and causes hindrance to troubleshooting, cancel the protection function by the procedure below, and it will be possible to enter the selfdiagnostic function mode. (The protection functions other than the excess current detect function will be disabled.)

While pressing the "TONE CONTROL" and "INFO" keys, press the "⏻" (Power) key to turn on the power and keep pressing those 2 keys and "⏻" (Power) key for 3 seconds or longer.

The self-diagnostic function mode is activated with the protection functions disabled.

In this mode, the "SLEEP" segment of the FL display flashes to indicate that the mode is self-diagnostic function mode with the protection functions disabled.

CAUTION!
Using this unit with the protection function disabled may cause further damage to this unit. Use special care for this point when using this mode.

● Canceling Self-Diagnostic Function

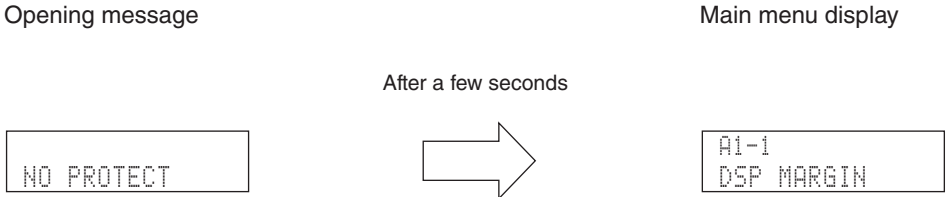
1. Before canceling self-diagnostic function, execute setting for "S3. FACTORY PRESET" menu. (Memory initialization inhibited or Memory initialized).
   * In order to keep the user memory preserved, be sure to select PRESET INHIBIT (Memory initialization inhibited).
2. Press the "⏻" (Power) key to turn off the power.

● Display provided when Self-Diagnostic Function started

The display is as described below depending on the situation when the power to this unit is turned off.

1. When the power is turned off by usual operation:

"NO PROTECT" is displayed. Then "A1-1. DSP MARGIN" is displayed in a few seconds.



2. When the protection function worked to turn off the power:

The information of protection function which worked at that time is displayed. Then "A1-1. DSP MARGIN" is displayed in a few seconds.

Note: At that time if you restart the self-diagnostic function after turning off the power once, "NO PROTECT" will be displayed. That is because that situation is equal to "1. When the power is turned off by usual operation:".

However history of the protection function is stored in memory as backup data. For details, refer to "P2. PROTECTION HISTORY" menu.

2-1. When there is a history of protection function due to excess current.

Cause: An excessive current flowed through the power amplifier.

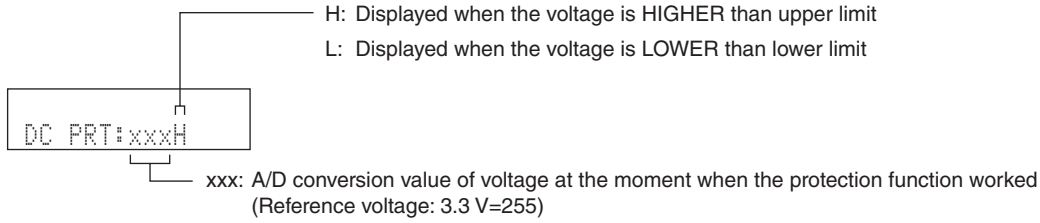
Supplementary information: As current of the power amplifier is detected, the abnormal channel can be identified by checking the current detect transistor.

Turning on the power without correcting the abnormality will cause the protection function to work immediately and the power supply will instantly be shut off.

Notes:

- **Applying the power to this unit without correcting the abnormality can be dangerous and cause additional circuit damage. To avoid this, if "I PROTECT" protection function works 1 time, the power will not turn on even when the "⏻" (Power) key is pressed. In order to turn on the power again, start up the self-diagnostic function.**
- **The output transistors in each amplifier channel should be checked for damage before applying power to this unit.**
- **Amplifier current should be monitored by measuring DC voltage across the emitter resistors for each channel.**

2-2. When the protection function worked due to abnormal DC output.

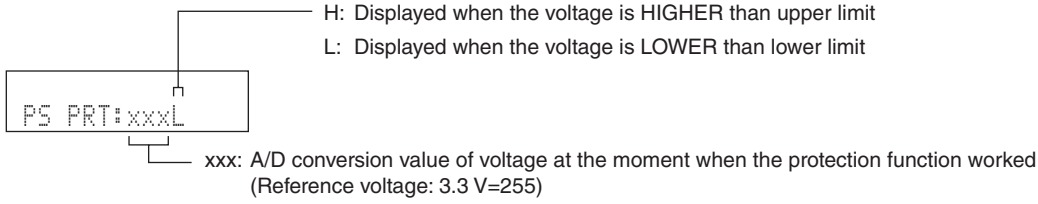


Cause: DC output of the power amplifier is abnormal.

Supplementary information: The protection function worked due to a DC voltage appearing at the speaker terminal. A cause could be a defect in the amplifier.

Turning on the power without correcting the abnormality will cause the protection function to work in 5 seconds and the power supply will be shut off.

2-3. When the protection function worked due to abnormal voltage in the power supply section.



Cause: The voltage in the power supply section is abnormal.

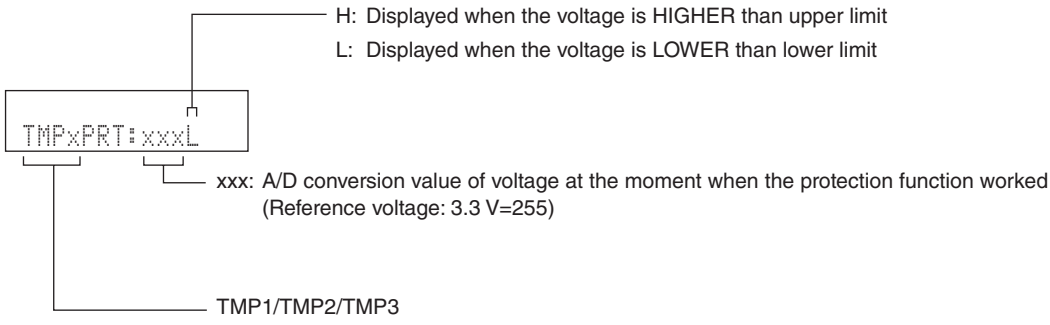
Supplementary information: The protection function worked due to a defect or overload in the power supply.

Turning on the power without correcting the abnormality will cause the protection function to work in 1 seconds and the power supply will be shut off.

Notes:

- **Applying the power to this unit without correcting the abnormality can be dangerous and cause additional circuit damage. To avoid this, if "PS" and "DC" protection function works 3 times consecutively, the power will not turn on even when the "⏻" (Power) key is pressed. In order to turn on the power again, start up the self-diagnostic function.**
- **The output transistors in each amplifier channel should be checked for damage before applying power to this unit.**
- **Amplifier current should be monitored by measuring DC voltage across the emitter resistors for each channel.**

2-4. When the protection function worked due to excessive heatsink temperature.



Cause: The temperature of the heatsink is excessive.

Supplementary information: The protection function worked due to the temperature limit being exceeded. Causes could be poor ventilation or a defect related to the thermal sensor.

Turning on the power without correcting the abnormality will cause the protection function to work in 1 seconds and the power supply will be shut off.

● **History of protection function**

When the protection function has worked, its history is stored in memory as backup data.

Even if no abnormality is noted while servicing the unit, an abnormality which has occurred previously can be defined as long as the backup data has been stored.

For details, refer to “P2. PROTECTION HISTORY” menu.

● Operation procedure of Main menu and Sub-menu

There are 28 main menu items, each of which has sub-menu items.

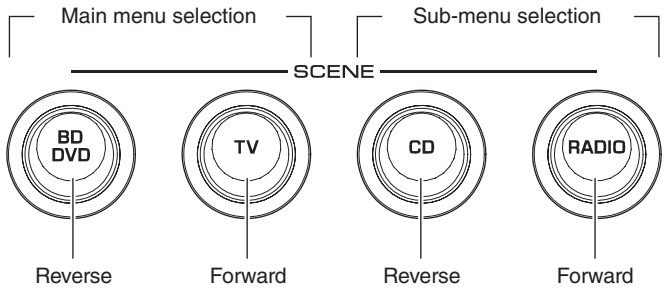
Main menu selection

Select the main menu using “SCENE TV” (forward) and “SCENE BD/DVD” (reverse) keys.

Sub-menu selection

Select the sub-menu using “SCENE RADIO” (forward) and “SCENE CD” (reverse) keys.

Keys of this unit



● Functions in Self-Diagnostic Function mode

In addition to the self-diagnostic function menu items, functions listed below are available.

- Power ON/OFF
- Master volume
- Muting
- Input selection

* Functions related to the tuner and the set menu are not available.

● Initial settings when Self-Diagnostic Function started

The following initial settings are used when self-diagnostic function is started.

When self-diagnostic function is canceled, these settings are restored to those before starting self-diagnostic function.

- Master volume: -20 dB
- Input: AV5
- Speaker setting: LARGE
- HDMI Control: Off

● Details of Self-Diagnostic Function menu

A1. DSP AUDIO

This menu is used to check audio signal route via DSP.

A1-1. DSP MARGIN

The audio signal is output including the head margin via DSP.

* When input source is stereo, signal is assigned as below.

Front L:	Front L, Center, Surround L
Front R:	Front R, Surround R
Front L +10 dB:	Subwoofer

A1-2. DSP NON MARGIN

The SUBWOOFER signal is output including the head margin via DSP.
The audio signal other than SUBWOOFER is output without including the head margin via DSP.

A1-3. DSP FULL CENTER

The audio signal is output to only CENTER channel in digital full bit without including the head margin.

A1-4. DSP FULL SURROUND

The audio signal is output to only SURROUND L/R channels in digital full bit without including the head margin.

A1-5. DSP FULL SURROUND BACK

Not for service.

```
A1-5
DSP FULL SB
```

A1-6. DSP FULL SUBWOOFER

The audio signal is output to only SUBWOOFER channel in digital full bit without including the head margin.

```
A1-6
DSP FULL SW
```

A2. DIRECT AUDIO

This menu is used to check audio signal route of DIRECT mode.

A2-1. ANALOG DIRECT

The analog input audio signal is output to FRONT L/R in DIRECT mode.

```
A2-1
ANALOG DIRECT
```

A2-2. NET DIRECT

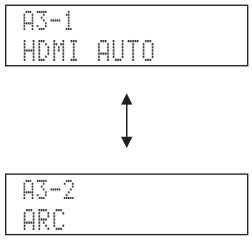
Not for service.

```
A2-2
NET DIRECT
```

A3. HDMI AUDIO

This menu is used to check the route of audio signal input to HDMI IN/OUT jack.

* Before check using "A3-2. ARC" menu, be sure to connect a TV monitor equipped with Audio Return Channel function to this unit in advance.



A3-1. HDMI AUTO

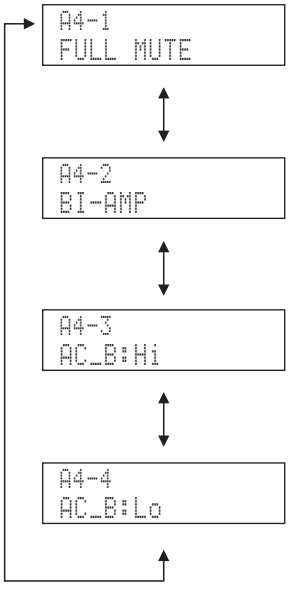
The audio signal input to selected HDMI IN jack is output.

A3-2. ARC (Audio Return Channel function)

The audio signal input to HDMI OUT jack is output.

A4. SPEAKERS SET

This menu is used to check the speaker output.



A4-1. FULL MUTE

The audio signals are muted at all channels.

A4-2. BI-AMP

Not for service.

A4-3. AC B HIGH

Not for service.

A4-4. AC B LOW

Not for service.

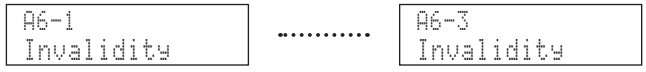
A5. MIC CHECK

A5-1. MIC ROUTE CHECK

Not for service.

A6. INVALID ITEM

Not for service.



A7. DIR PLL (Phase Lock Loop)

Not for service.

A8. MANUAL TEST

The test noise generated by built-in noise generator in DSP is output to the channels specified by the sub-menu.

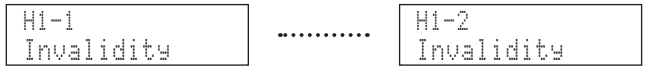
	Test noise
for SUBWOOFER	30 Hz to 80 Hz pink noise
for other than SUBWOOFER	500 Hz to 2 kHz pink noise

A8-1. TEST ALL

The test noise is output to all channels.

H1. INVALID ITEM

Not for service.



D1. FL CHECK

This menu is used to check operation of the FL display.

FL display

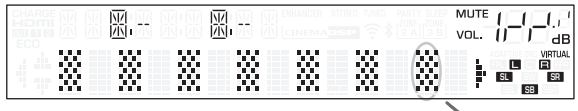
D1-1. INITIAL DISPLAY

D1-2. ALL SEGMENT OFF

D1-3. ALL SEGMENT ON

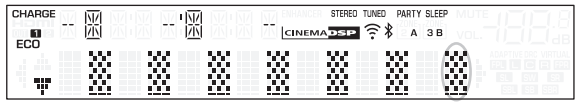
* After check, change to next menu at once.

D1-4. CHECK PATTERN 1



Example
Lighting on segments in lattice.

D1-5. CHECK PATTERN 2



Segment conditions of the FL tube is checked by turning ON and OFF all segments.

Next, a short between segments next to each other is checked by turning ON and OFF all segments alternately (in lattice).

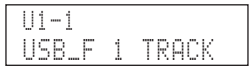
(In the above example, the segments in the second row from the top are shorted.)

U1. USB

Not for service.

U1-1. USB FRONT 1 TRACK

Not for service.



U1-2. USB BOOT

Not for service.

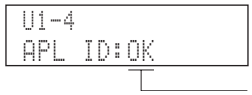
OK: No error detected
NG: An error is detected
--: Checking

U1-3. INVALID ITEM

Not for service.

U1-4. APL (Apple) ID CHECK

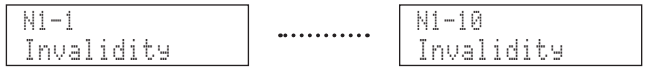
Not for service.



OK: No error detected
NG: An error is detected
--: Checking

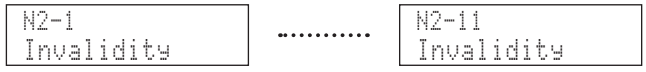
N1. INVALID ITEM

Not for service.



N2. INVALID ITEM

Not for service.

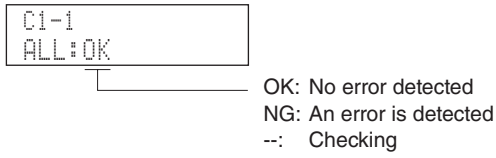


C1. DIGITAL P.C.B. CHECK

This menu is used to check the communication and bus line connection between devices on DIGITAL P.C.B.

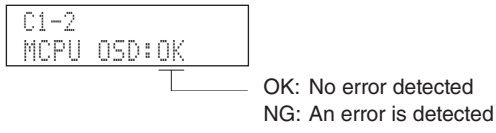
C1-1. ALL

The total detection result of sub-menus from C1-2 to C1-8 is displayed.



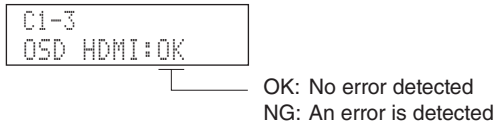
C1-2. MCPU OSD

Microprocessor (IC221) and OSD FLASH ROM(IC201)'s reading/writing are checked.



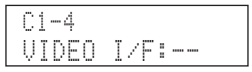
C1-3. OSD HDMI

OSD FLASH ROM (IC201) and HDMI IC (IC202)'s reading/writing are checked.



C1-4. VIDEO I/F

Not for service.



C1-5. BUS DIR

Communication and bus line connection between microprocessor (IC221) and DIR (IC265) are checked.

OK: No error detected
NG: An error is detected
--: Checking

C1-6. BUS DSP

Communication and bus line connection between microprocessor (IC221) and DSP (IC241) are checked.

OK: No error detected
NG: An error is detected
--: Checking

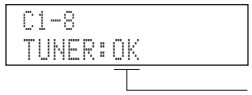
C1-7. EEPROM

EEPROM (IC222)'s reading is checked.

OK: No error detected
NG: An error is detected
--: Checking

C1-8. TUNER

The AM/FM TUNER I2C (Inter integrated circuit) bus line connection is checked.



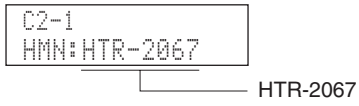
OK: No error detected
NG: An error is detected
--: Checking

C2. HDMI INFORMATION

This menu is used to display information about HDMI.

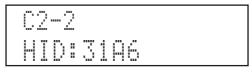
C2-1. HDMI MODEL NAME

The model name written to this unit is displayed.



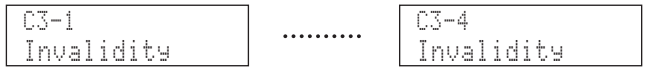
C2-2. HDMI PRODUCT ID

Not for service.



C3. INVALID ITEM

Not for service.



V1. ANALOG VIDEO CHECK

Not for service.

V1-1. ANALOG BYPASS

Not for service.

V1-2. MUTE CHECK

Not for service.

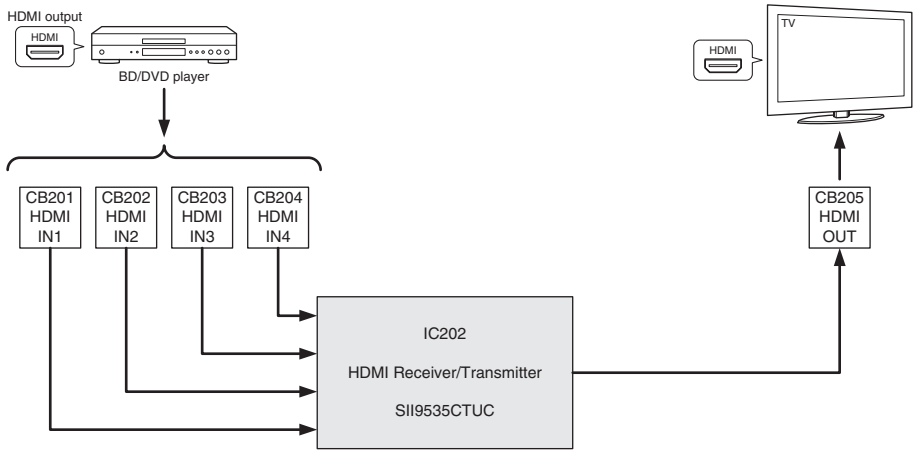
V2. DIGITAL VIDEO CHECK

This menu is used to check the digital video signal route.

V2-1. HDMI REPEAT

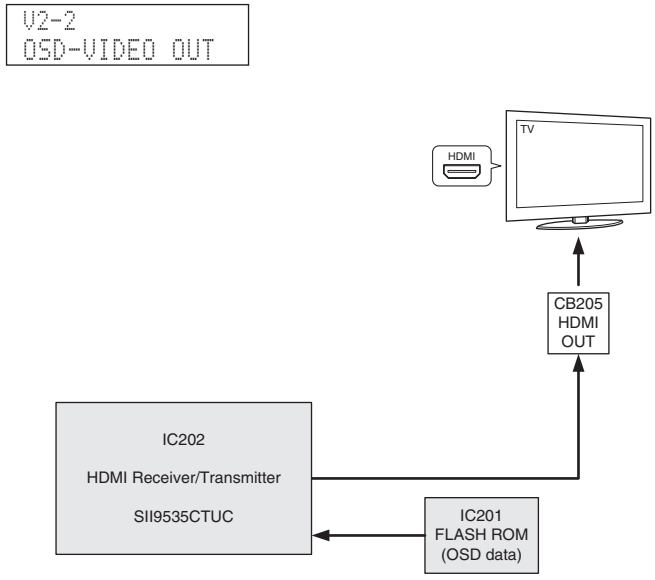
The video/audio signals input to HDMI IN jack are output to HDMI OUT jack.

The Deep Color video signals is input, “30” bit or “36” bit is displayed.

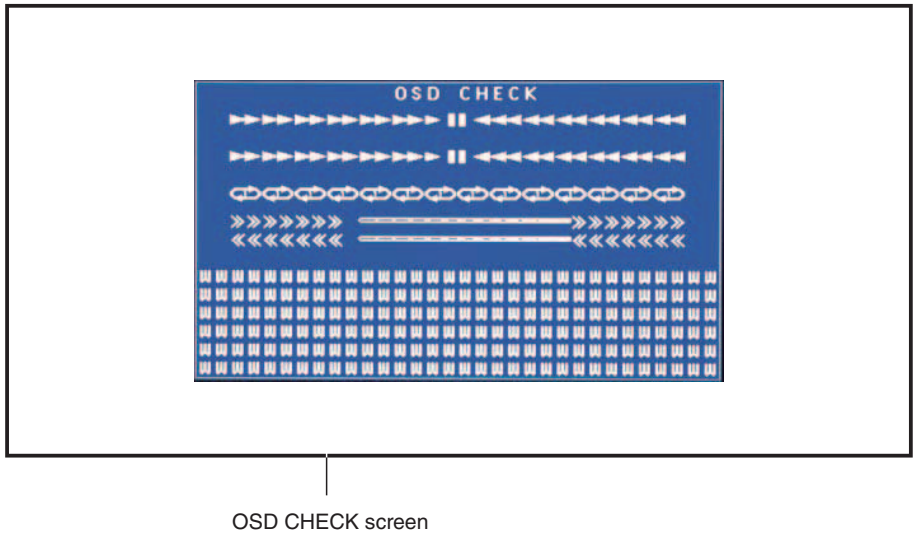


V2-2. OSD (On-Screen Display) VIDEO OUT

The "OSD CHECK" screen is output to HDMI OUT jack.



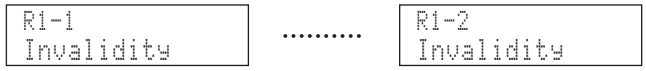
TV screen display



OSD CHECK screen

R1. INVALID ITEM

Not for service.



P1. SYSTEM MONITOR

This menu is used to display the A/D conversion value of the microprocessor which detects panel keys and protection functions by using the sub-menu.

When "P1-7. KEY1/KEY2" sub-menu is selected, keys become inoperable due to detection of the values of all keys. However, it is possible to advance to the next menu by turning the VOLUME knob.

* Numeric values in the figure are given as reference only.

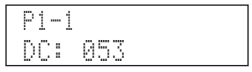
P1-1. DC

Power amplifier DC (DC voltage) output is detected.

The voltage at 141 pin (DC_PRT) of IC221 is displayed.

Normal value: 27 to 88
(Reference voltage: 3.3 V=255)

* If DC becomes out of the normal value range, the protection function works to turn off the power.



P1-2. PS

Power supply voltage (PS) protection detection.

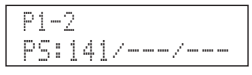
The voltage at 138 pin (PS_PRT) of IC221 are displayed.

Voltage detects: ACL, AC2, AC3, AC4

Normal value: 101 to 155
(Reference voltage:

3.3 V=255)

* If PS becomes out of the normal value range, the protection function works to turn off the power.



P1-3. TMP

Temperature of the heatsink is detected.

The voltage at 136 pin (THM1)/137 pin (THM2) of IC221 is displayed.

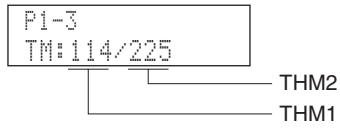
Normal value

THM1: 42 to 255

THM2: 42 to 255

(Reference voltage: 3.3 V=255)

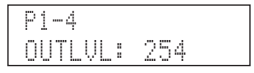
* If THM1 or THM2 becomes out of the normal value range, the protection function works to turn off the power.



P1-4. OUTPUT LEVEL

Output level of speaker output is detected.

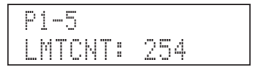
The voltage at 142 pin (AMP_OLV) of IC221 is displayed.
(Reference voltage: 3.3 V=255)



P1-5. LIMITER CONTROL

Power limitter control is detected.

The voltage at 39 pin (AMP_LMT) of IC221 is displayed.
(Reference voltage: 3.3 V=255)



P1-6. USB DC

Not for service.

P1-7. KEY

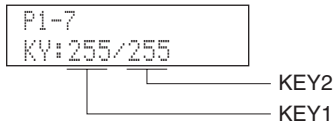
Panel key is detected.

When the A/D conversion value of the panel key becomes out of the specified range, normal operation will not be available.

In that case, check the constant of voltage dividing resistor, solder condition, etc. Refer to table.

* When "P1-7. KEY1/KEY2" menu is selected, keys become inoperable due to detection of the values of all keys. However, it is possible to advance to the next menu by turning the VOLUME knob.

(Reference voltage: 3.3 V=255)



Display	KEY1
0 – 11	STRAIGHT
12 – 37	MUTE
38 – 64	FM MODE
65 – 88	TUNING >>
89 – 113	TUNING <<
114 – 139	PRESET >
140 – 164	PRESET <
165 – 186	MEMORY
187 – 226	INFO
255	Key off

Display	KEY2
0 – 11	RADIO (SCENE4)
12 – 32	CD (SCENE3)
33 – 54	TV (SCENE2)
55 – 75	BD/DVD (SCENE1)
76 – 96	PROGRAM >
97 – 119	PROGRAM <
120 – 142	INPUT >
143 – 163	IINPUT <
164 – 181	–
182 – 197	⏻ (Power)
198 – 229	TONE CONTROL
255	Key off

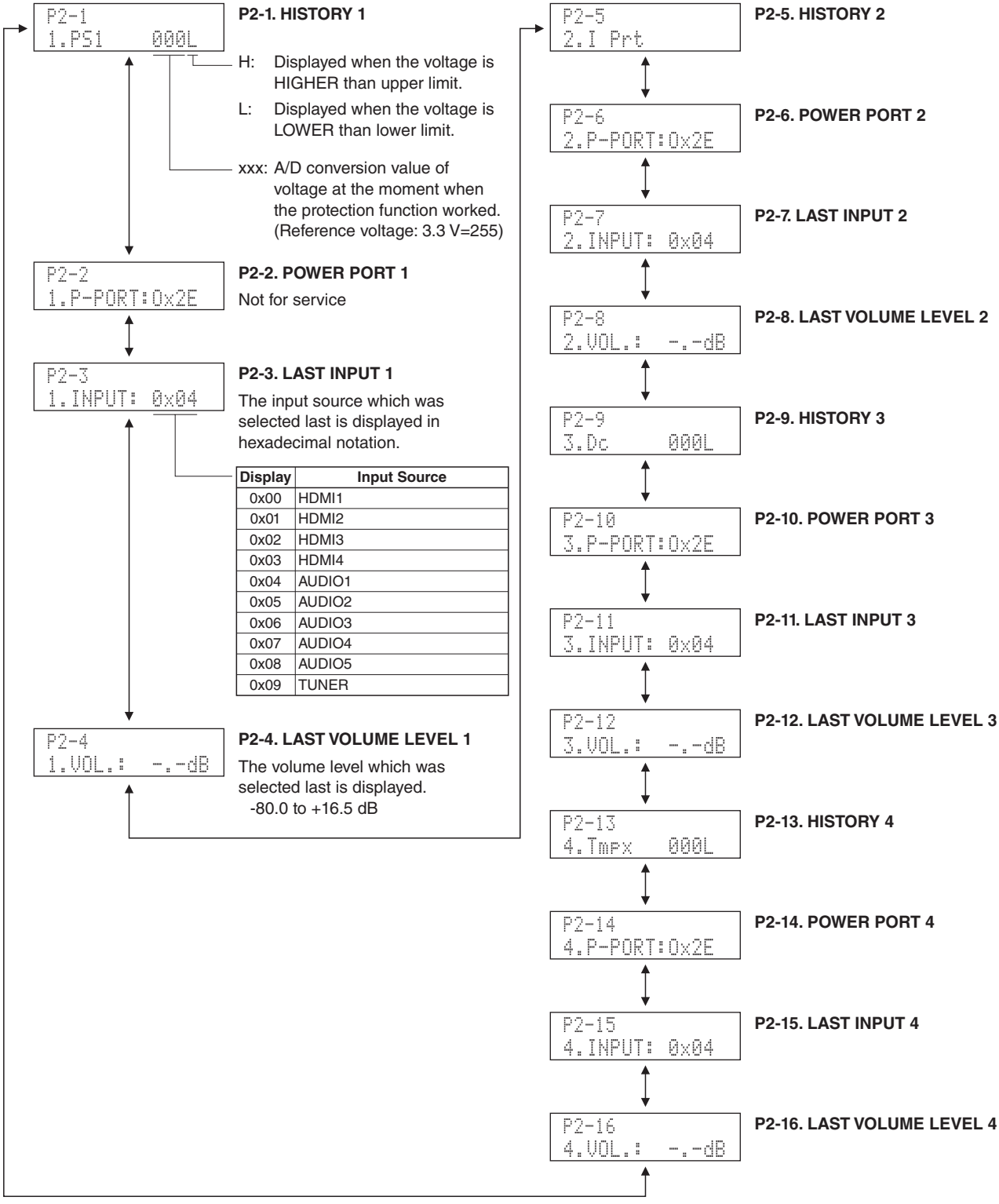
P2. PROTECTION HISTORY

This menu is used to display the history of protection function.

In the history 1 to 4, the setting information for operation of each protection function will be stored.

All history of protection function and setting information will be erased by pressing the "STRAIGHT" key.

* Numeric values in the figure are given as reference only.



Display	Input Source
0x00	HDMI1
0x01	HDMI2
0x02	HDMI3
0x03	HDMI4
0x04	AUDIO1
0x05	AUDIO2
0x06	AUDIO3
0x07	AUDIO4
0x08	AUDIO5
0x09	TUNER

T1. TROUBLE SHOOTING INFORMATION

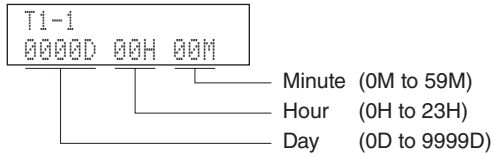
This menu is used to display the operating time and operation frequency of this unit.

* The operating time and operation frequency during the self-diagnostic function mode will not be stored.

T1-1. OPERATING TIME

The operating time of this unit is displayed.

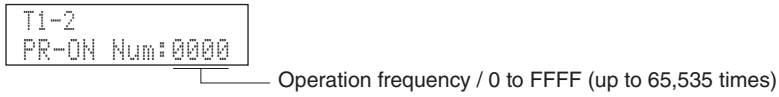
The operating time will be erased by pressing the "STRAIGHT" key.



T1-2. POWER-RELAY ON

The operation frequency of the power relay (RY151) is displayed in hexadecimal notation.

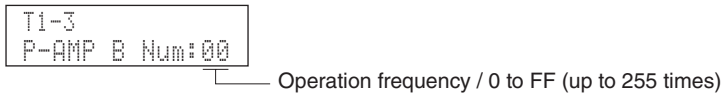
The operation frequency will be erased by pressing the "STRAIGHT" key.



T1-3. POWER AMP B

The operation frequency of the POWER AMP B relay (RY5) is displayed in hexadecimal notation.

The operation frequency will be erased by pressing the "STRAIGHT" key.



T1-4. OUTPUT LEVEL

The maximum value of the speaker output level is displayed in hexadecimal notation.

The maximum value will be erased by pressing the "STRAIGHT" key.

T1-5. NRC (Net Restart Counter)

Not for service.

S1. FIRMWARE UPDATE

Not for service.

```
S1-1
UPDATE T1
```

S2. SET INFORMATION

This menu is used to display the model name and destination.

S2-1. INITIAL DISPLAY

```
S2-1
MODEL/DEST
```

S2-2. MODEL/DESTINATION

The model name and destination are displayed.

```
S2-2
M/D:H2067 L  0
```

- Not for service
- Destination
  U / C / R (R, S) / A / G (B, G, F) / L (L, H)
- Model name
  H2067 : HTR-2067

S3. FACTORY PRESET

This menu is used to reserve/inhibit initialization of the back-up IC (EEPROM: IC222 on DIGITAL P.C.B.).

```
S3-1
PRESET INHI
```

↕

```
S3-2
PRESET RSRV
```

S3-1. PRESET INHIBIT (Initialization inhibited)

Initialization of the back-up IC is not executed. Select this sub-menu to protect the values set by the user.

S3-2. PRESET RESERVED (Initialization reserved)

Initialization of the back-up IC is reserved. (Actual initialization is executed when the power is turned on next.) To reset to the original factory settings or to reset the backup IC, select this sub-menu and press the "⏻" (Power) key to turn off the power.

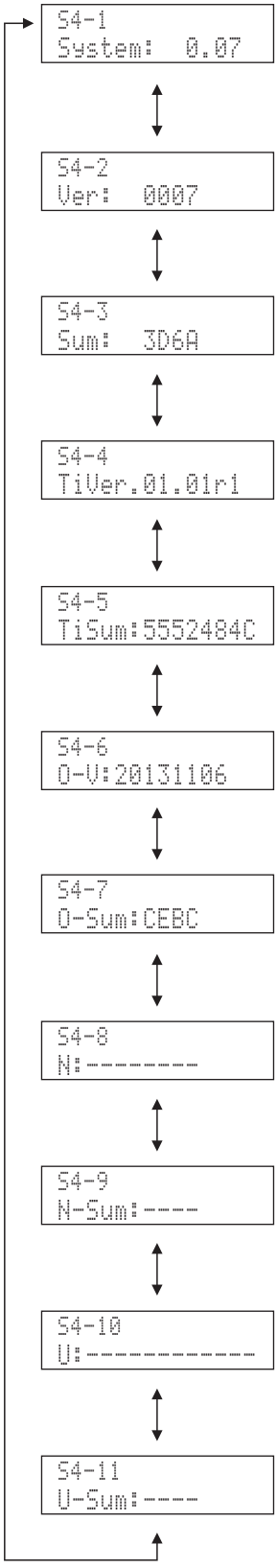
CAUTION: Before setting to the PRESET RESERVED, write down the existing preset memory content of the tuner. (This is because setting to the PRESET RESERVED will cause the user memory content to be erased.)

S4. ROM VERSION/CHECKSUM

The firmware version and checksum values are displayed.

The checksum is obtained by adding the data at every 8-bit and expressing the result as a hexadecimal notation.

* Numeric values in the figure are given as reference only.



S4-1. SYSTEM VERSION

The firmware version is displayed.

S4-2. MICROPROCESSOR VERSION

The firmware version of MICROPROCESSOR (IC221 on DIGITAL P.C.B.) is displayed.

S4-3. MICROPROCESSOR CHECKSUM

The checksum value of MICROPROCESSOR (IC221 on DIGITAL P.C.B.) is displayed.

S4-4. DSP VERSION

The firmware version of DSP (IC241 on DIGITAL P.C.B.) is displayed.

S4-5. DSP CHECKSUM

The checksum value of DSP (IC241 on DIGITAL P.C.B.) is displayed.

S4-6. OSD (On-Screen Display) VERSION

The firmware version of OSD data (IC201 on DIGITAL P.C.B.) is displayed.

S4-7. OSD (On-Screen Display) CHECKSUM

The checksum value of OSD data (IC201 on DIGITAL P.C.B.) is displayed.

S4-8. NETWORK VERSION

Not for service.

S4-9. NETWORK CHECKSUM

Not for service.

S4-10. USB CONTROLLER VERSION

Not for service.

S4-11. USB CONTROLLER CHECKSUM

Not for service.

S5. SOFT SWITCH

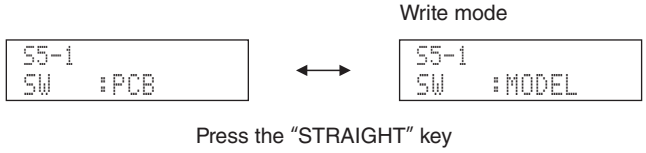
This menu is used to write the model name and destination to the back-up IC (EEPROM: IC222 on DIGITAL P.C.B.).

When the following parts are replaced, the model name and destination MUST be written by using this menu to have proper operation.

DIGITAL P.C.B.

EEPROM: IC222 on DIGITAL P.C.B.

To write the model name and destination, first switch to the write mode by using the "S5-1. SWITCH MODE" menu and then select the desired destination by using the "S5-3. DESTINATION" menu and the desired model name by using "S5-2. MODEL NAME" menu.



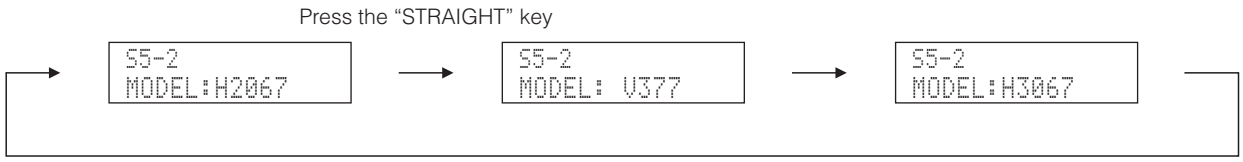
S5-1. SWITCH MODE

Pressing the "STRAIGHT" key will change the display alternately as shown above. When "S5-1. SW: MODEL" is displayed, this unit is in the write mode.

Note: After writing of the model name and destination are completed, be sure to change to "S5-1. SW: PCB".

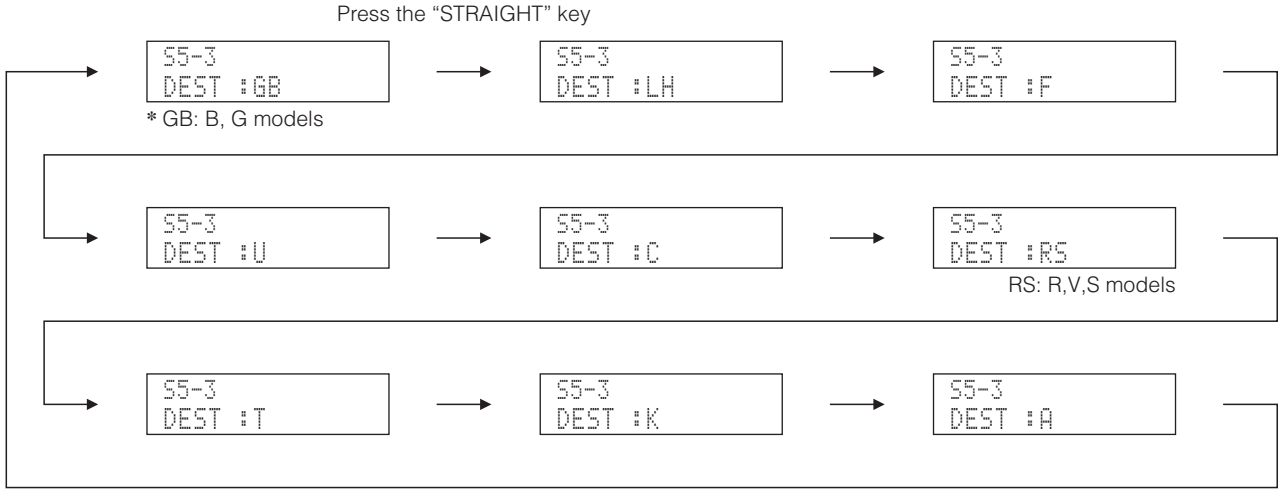
S5-2. MODEL NAME

Select the desired model name by pressing the "STRAIGHT" key. Then the selected model name is written automatically.



S5-3. DESTINATION

Select the desired destination by pressing the "STRAIGHT" key. Then the selected destination is written automatically.

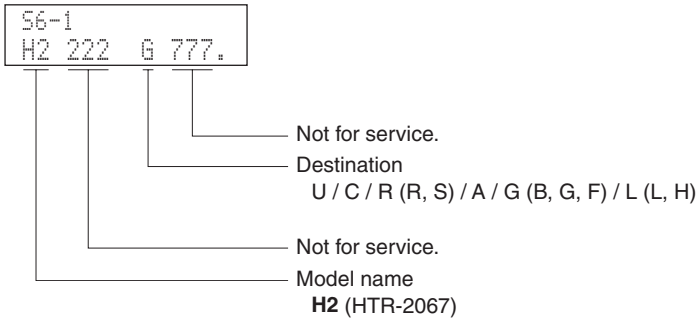


S6. SYSTEM INFORMATION

This menu is used to display the model name and destination.

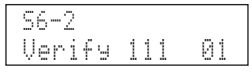
S6-1. MODEL

The model name and destination are displayed.



S6-2. VERIFY

Not for service.

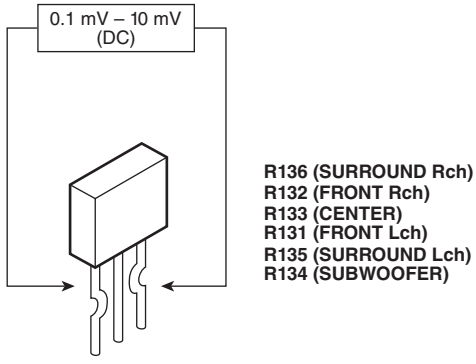


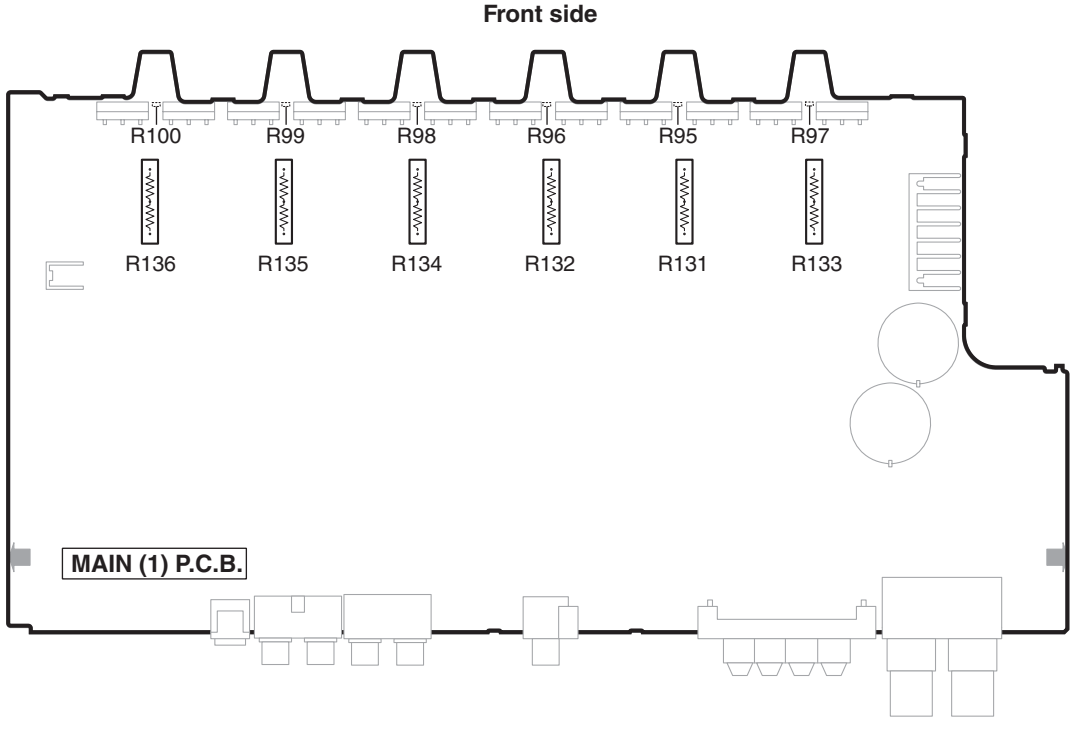
■ POWER AMPLIFIER ADJUSTMENT

1. Right after power is turned on, confirm that the voltage across the terminals of R136 (SURROUND Rch), R132 (FRONT Rch), R133 (CENTER), R131 (FRONT Lch), R135 (SURROUND Lch) and R134 (SUBWOOFER) are within the confines of 0.1 mV to 10 mV.
2. If measured voltage exceeds 10 mV, remove R100 (SURROUND Rch), R96 (FRONT Rch), R97 (CENTER), R95 (FRONT Lch), R99 (SURROUND Lch) and R98 (SUBWOOFER), and then reconfirm the voltage.

   Attention

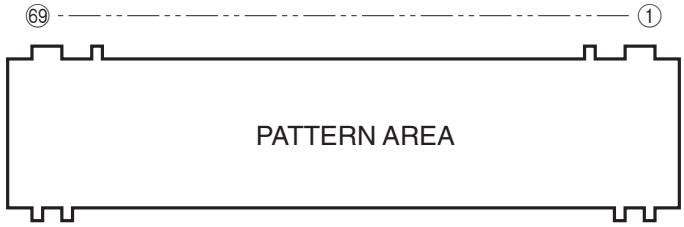
   If the measured voltage exceeds 10 mV after repairing the power amplifier, check other parts again for any possible defect before removing the resistor.
3. Confirm that the voltage is within the confines of 0.2 mV to 15 mV after 60 minutes.





■ DISPLAY DATA

● V1001 : 020MT008GNK (OPERATION P.C.B.)



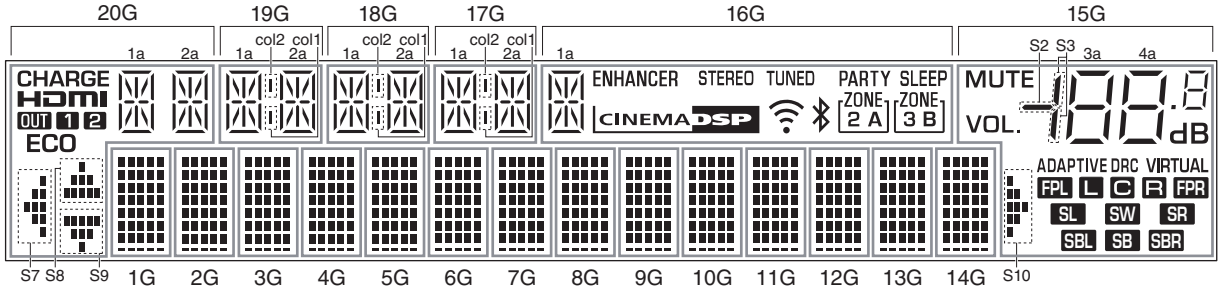
● PIN CONNECTION

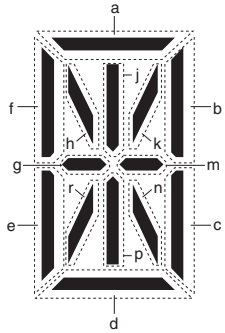
Pin No.	69	68	67	66	65	67	65	62	61	60	59	58	57	56	55	54	53	52	51	50	49	48	47	46	45	44	43	42	41	40	39	38	37	36	35
Connection	F2	NX	NP	NP	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P12	P13	P14	P15	P16	P17	P18	P19	P20	P21	P22	P23	P24	P25	P26	P27	P28	P29	P30	P31

Pin No.	34	33	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
Connection	P32	P33	P34	P35	P36	P37	NX	NX	NX	NX	20G	19G	18G	17G	16G	15G	14G	13G	12G	11G	10G	9G	8G	7G	6G	5G	4G	3G	2G	1G	NP	NP	NX	F1

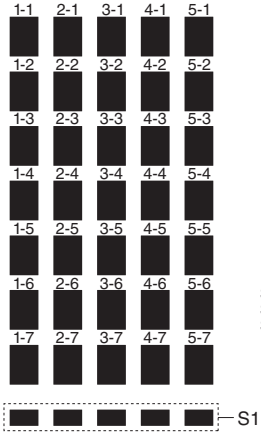
Note : 1) F1, F2 ..... Filament pin 2) NP ..... No pin 3) NX ..... No extend pin 4) 1G-18G ..... Grid pin

● GRID ASSIGNMENT

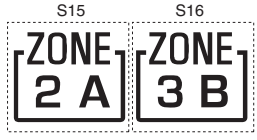




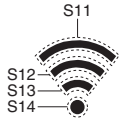
(20G–16G)



(1G–14G)

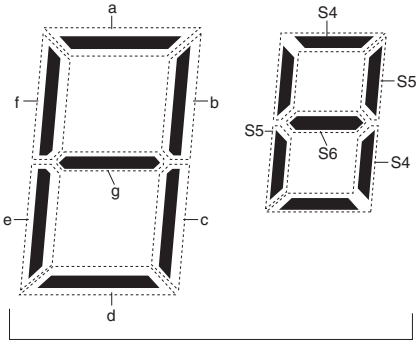


(16G)



(16G)

(15G)



(15G)

● ANODE CONNECTION

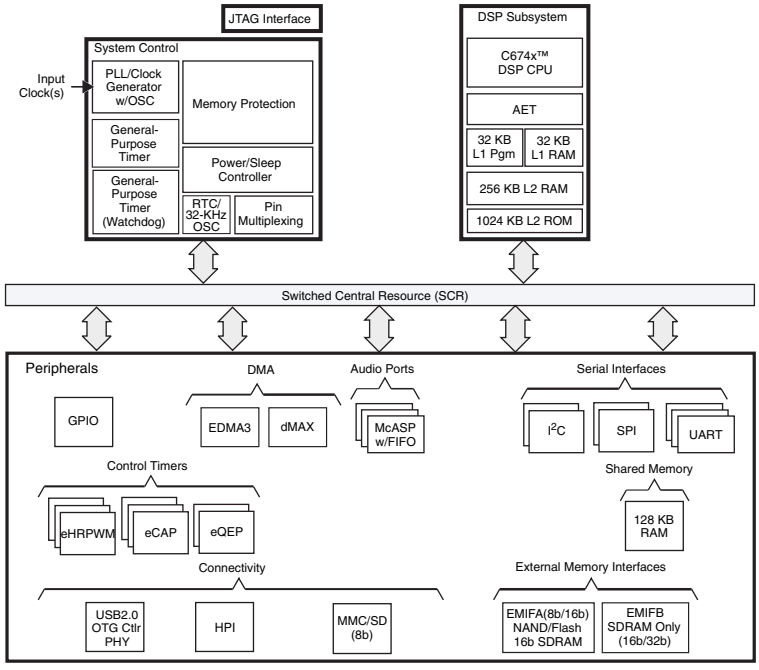
	20G	19G	18G	17G	16G	15G	1G-14G
P1	1d	1d	1d	1d	1d	VOL.	1-1
P2	2d	2d	2d	2d	CINEMA DSP	S2	2-1
P3	1e	1e	1e	1e	1e	S3	3-1
P4	2e	2e	2e	2e	S14	3d	4-1
P5	1r	1r	1r	1r	1r	3e	5-1
P6	2r	2r	2r	2r	S13	3c	1-2
P7	1p	1p	1p	1p	1p	3g	2-2
P8	2p	2p	2p	2p	S12	3f	3-2
P9	1n	1n	1n	1n	1n	3b	4-2
P10	2n	2n	2n	2n	S11	3a	5-2
P11	1c	1c	1c	1c	1c	MUTE	1-3
P12	2c	2c	2c	2c	ᛒ	4d	2-3
P13	HDMI	col1	col1	col1	S15	4e	3-3
P14	1g	1g	1g	1g	1g	4c	4-3
P15	2g	2g	2g	2g	S16	4g	5-3
P16	1m	1m	1m	1m	1m	4f	1-4
P17	2m	2m	2m	2m	2	4b	2-4
P18	CHARGE	col2	col2	col2	3	4a	3-4
P19	1f	1f	1f	1f	1f	S17	4-4
P20	2f	2f	2f	2f	A	S4	5-4
P21	1h	1h	1h	1h	1h	S5	1-5
P22	2h	2h	2h	2h	B	S6	2-5
P23	1j	1j	1j	1j	1j	S10	3-5
P24	2j	2j	2j	2j	SLEEP	ADAPTIVE DRC	4-5
P25	1k	1k	1k	1k	1k	VIRTUAL	5-5
P26	2k	2k	2k	2k	PARTY	FPL	1-6
P27	1b	1b	1b	1b	1b	L	2-6
P28	2b	2b	2b	2b	TUNED	C	3-6
P29	1a	1a	1a	1a	1a	R	4-6
P30	2a	2a	2a	2a	STEREO	FPR	5-6
P31	2	–	–	–	ENHANCER	SL	1-7
P32	1	–	–	–	–	SW	2-7
P33	OUT	–	–	–	–	SR	3-7
P34	ECO	–	–	–	–	SBL	4-7
P35	S8	–	–	–	–	SB	5-7
P36	S9	–	–	–	–	SBR	S1
P37	S7	–	–	–	–	–	–

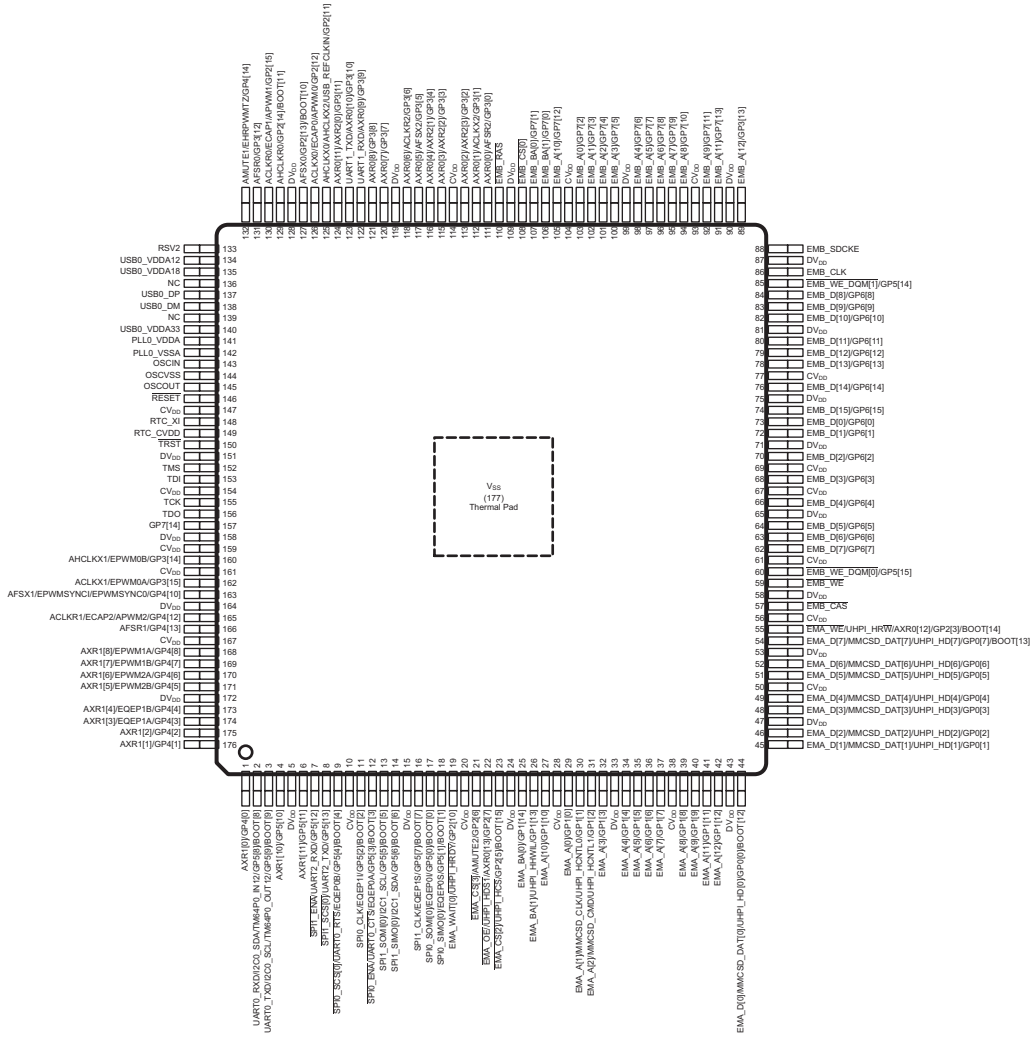
■ IC DATA

IC241: D80YK113DPTP400 (DIGITAL P.C.B.)

Decoder/Post processor

*** No replacement part available.**





No.	Function Name (P.C.B.)	I/O	Detail of Function
1	AXR1[0]/GP4[0]	I/O	McASP1serial data
2	UART0_RXD/I2C0_SDA/TM64P0_IN12/GP5[8]/BOOT[8]	I	UART0 receive data
		I/O	I2C0 serial data
		I	Timer0 lower input
		I	BOOT[8]
3	UART0_TXD/I2C0_SCL/TM64P0_OUT12/GP5[9]/BOOT[9]	O	UART0 transmit data
		I/O	I2C0 serial clock
		I	Timer0 lower output
		I	BOOT[9]
4	AXR1[10]/GP5[10]	I/O	McASP1serial data
5	DVDD		
6	AXR1[11]/GP5[11]	I/O	McASP1serial data
7	SPI1_ENA/UART2_RXD/GP5[12]	I/O	SPI1enable
		I	UART2 receive data
8	SPI1_SCS[0]/UART2_TXD/GP5[13]	I/O	SPI1 chip select
		O	UART2 transmit data
9	SPI0_SCS[0]/ UART0_RTS /EQEP0B/GP5[4]/BOOT[4]	I/O	SPI0 chip select
		O	UART0 ready-to-send output
		I	eQEP0B quadrature input
		I	BOOT[4]
10	CVDD		
11	SPI0_CLK/EQEP1I/GP5[2]/BOOT[2]	I/O	SPI0 clock
		I	eQEP1 index
		I	BOOT[2]
12	SPI0_ENA/ UART0_CTS /EQEP0A/GP5[3]/BOOT[3]	I/O	SPI0 enable
		I	UART0 clear-to-send input
		I	eQEP0A quadrature input
		I	BOOT[3]
13	SPI1_SOMI[0]/I2C1_SCL/GP5[5]/BOOT[5]	I/O	SPI1 data slave-out-master-in
		I/O	I2C1 serial clock
		I	BOOT[5]
14	SPI1_SIMO[0]/I2C1_SDA/GP5[6]/BOOT[6]	I/O	SPI1 data slave-in-master-out
		I/O	I2C1 serial data
		I	BOOT[6]
15	DVDD		
16	SPI1_CLK/EQEP1S/GP5[7]/BOOT[7]	I/O	SPI1 clock
		I	eQEP1 strobe
		I	BOOT[7]
17	SPI0_SOMI[0]/EQEP0I/GP5[0]/BOOT[0]	I/O	SPI0 data slave-out-master-in
		I	eQEP0 index
		I	BOOT[0]
18	SPI0_SIMO[0]/EQEP0S/GP5[1]/BOOT[1]	I/O	SPI0 data slave-in-master-out
		I	eQEP0 strobe
		I	BOOT[1]
19	EMA_WAIT[0]/ UHPI_HRDY /GP2[10]	I	EMIFA wait input/interrupt
		I/O	UHPI ready
20	CVDD		
21	EMA_CS[3]/AMUTE2/GP2[6]	O	EMIFA Async chip select
		I/O	McASP2 mute output
22	EMA_OE/UHPI_HDS1/AXR0[13]/GP2[7]	O	EMIFA output enable
		I/O	UHPI data strobe
		I/O	McASP0 serial data
23	EMA_CS[2]/ UHPI_HCS /GP2[5]/BOOT[15]	O	EMIFA Async chip select
		I/O	UHPI chip select
		I	BOOT[15]
24	DVDD		
25	EMA_BA[0] / GP1[14]	O	EMIFA bank address
26	EMA_BA[1] / UHPI_HHWIL / GP1[13]	O	EMIFA bank address
		I/O	UHPI half-word identification control
27	EMA_A[10] / GP1[10]	O	EMIFA address bus
28	CVDD		
29	EMA_A[0] / GP1[0]	O	EMIFA address bus
30	EMA_A[1] / MMCSD_CLK / UHPI_HCNTL0 / GP1[1]	O	EMIFA address bus
		O	MMCSD_CLK
		I/O	UHPI access control

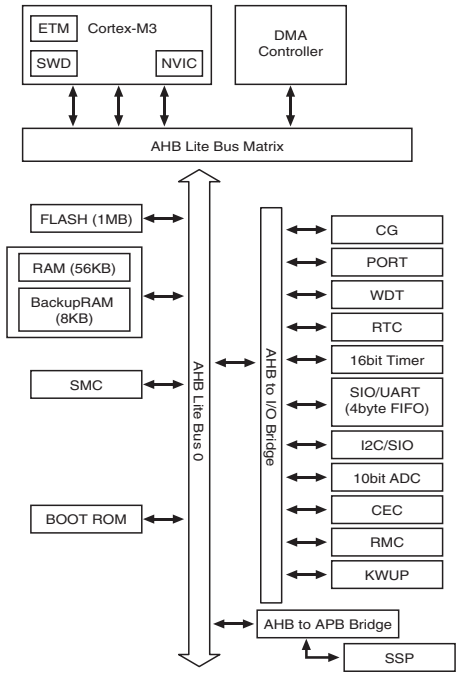
No.	Function Name (P.C.B.)	I/O	Detail of Function
31	EMA_A[2] / MMCSD_CMD / UHPI_HCNTL1 / GP1[2]	O	EMIFA address bus
		I/O	MMCSD_CMD
		I/O	UHPI access control
32	EMA_A[3] / GP1[3]	O	EMIFA address bus
33	DVDD		
34	EMA_A[4] / GP1[4]	O	EMIFA address bus
35	EMA_A[5] / GP1[5]	O	EMIFA address bus
36	EMA_A[6] / GP1[6]	O	EMIFA address bus
37	EMA_A[7] / GP1[7]	O	EMIFA address bus
38	CVDD		
39	EMA_A[8] / GP1[8]	O	EMIFA address bus
40	EMA_A[9] / GP1[9]	O	EMIFA address bus
41	EMA_A[11] / GP1[11]	O	EMIFA address bus
42	EMA_A[12] / GP1[12]	O	EMIFA address bus
43	DVDD		
44	EMA_D[0] / MMCSD_DAT[0] / UHPI_HD[0] / GP0[0] / BOOT[12]	I/O	EMIFA data bus
		I/O	MMC/SD data
		I/O	UHPI data bus
45	EMA_D[1] / MMCSD_DAT[1] / UHPI_HD[1] / GP0[1]	I/O	EMIFA data bus
		I/O	MMC/SD data
		I/O	UHPI data bus
46	EMA_D[2] / MMCSD_DAT[2] / UHPI_HD[2] / GP0[2]	I/O	EMIFA data bus
		I/O	MMC/SD data
		I/O	UHPI data bus
47	DVDD		
48	EMA_D[3] / MMCSD_DAT[3] / UHPI_HD[3] / GP0[3]	I/O	EMIFA data bus
		I/O	MMC/SD data
		I/O	UHPI data bus
49	EMA_D[4] / MMCSD_DAT[4] / UHPI_HD[4] / GP0[4]	I/O	EMIFA data bus
		I/O	MMC/SD data
		I/O	UHPI data bus
50	CVDD		
51	EMA_D[5] / MMCSD_DAT[5] / UHPI_HD[5] / GP0[5]	I/O	EMIFA data bus
		I/O	MMC/SD data
		I/O	UHPI data bus
52	EMA_D[6] / MMCSD_DAT[6] / UHPI_HD[6] / GP0[6]	I/O	EMIFA data bus
		I/O	MMC/SD data
		I/O	UHPI data bus
53	DVDD		
54	EMA_D[7] / MMCSD_DAT[7] / UHPI_HD[7] / GP0[7] / BOOT[13]	I/O	EMIFA data bus
		I/O	MMC/SD data
		I/O	UHPI data bus
55	EMA_WE / UHPI_HRW / AXR0[12] / GP2[3] / BOOT[14]	O	EMIFA SDRAM write enable
		I/O	UHPI read/write
		I/O	McASP0 serial data
56	CVDD		
57	EMB_CAS	O	EMIFB column address strobe
58	DVDD		
59	EMB_WE	O	EMIFB write enable
60	EMB_WE_DQM[0] / GP5[15]	O	EMIFB write enable/data mask for EMB_D
61	CVDD		
62	EMB_D[7] / GP6[7]	I/O	EMIFB SDRAM data bus
63	EMB_D[6] / GP6[6]	I/O	EMIFB SDRAM data bus
64	EMB_D[5] / GP6[5]	I/O	EMIFB SDRAM data bus
65	DVDD		
66	EMB_D[4] / GP6[4]	I/O	EMIFB SDRAM data bus
67	CVDD		
68	EMB_D[3] / GP6[3]	I/O	EMIFB SDRAM data bus
69	CVDD		
70	EMB_D[2] / GP6[2]	I/O	EMIFB SDRAM data bus
71	DVDD		
72	EMB_D[1] / GP6[1]	I/O	EMIFB SDRAM data bus
73	EMB_D[0] / GP6[0]	I/O	EMIFB SDRAM data bus
74	EMB_D[15] / GP6[15]	I/O	EMIFB SDRAM data bus
75	DVDD		

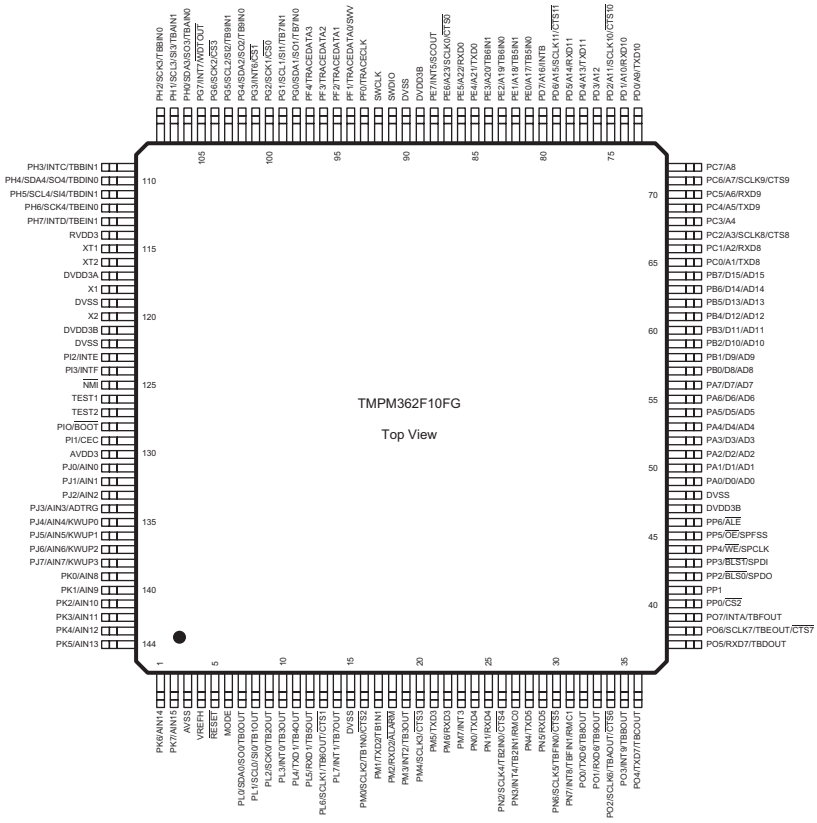
No.	Function Name (P.C.B.)	I/O	Detail of Function
76	EMB_D[14] / GP6[14]	I/O	EMIFB SDRAM data bus
77	CVDD		
78	EMB_D[13] / GP6[13]	I/O	EMIFB SDRAM data bus
79	EMB_D[12] / GP6[12]	I/O	EMIFB SDRAM data bus
80	EMB_D[11] / GP6[11]	I/O	EMIFB SDRAM data bus
81	DVDD		
82	EMB_D[10] / GP6[10]	I/O	EMIFB SDRAM data bus
83	EMB_D[9] / GP6[9]	I/O	EMIFB SDRAM data bus
84	EMB_D[8] / GP6[8]	I/O	EMIFB SDRAM data bus
85	EMB_WE_DQM[1] / GP5[14]	O	EMIFB write enable/data mask for EMB_D
86	EMB_CLK	O	EMIF SDRAM clock
87	DVDD		
88	EMB_SDCKE	O	EMIFB SDRAM clock enable
89	EMB_A[12] / GP3[13]	O	EMIFB SDRAM row/column address bus
89	EMB_A[12] / GP3[13]	O	EMIFB SDRAM row/column address bus
90	DVDD		
91	EMB_A[11] / GP7[13]	O	EMIFB SDRAM row/column address bus
92	EMB_A[9] / GP7[11]	O	EMIFB SDRAM row/column address bus
93	CVDD		
94	EMB_A[8] / GP7[10]	O	EMIFB SDRAM row/column address bus
95	EMB_A[7] / GP7[9]	O	EMIFB SDRAM row/column address bus
96	EMB_A[6] / GP7[8]	O	EMIFB SDRAM row/column address bus
97	EMB_A[5] / GP7[7]	O	EMIFB SDRAM row/column address bus
98	EMB_A[4] / GP7[6]	O	EMIFB SDRAM row/column address
99	DVDD		
100	EMB_A[3] / GP7[5]	O	EMIFB SDRAM row/column address
101	EMB_A[2] / GP7[4]	O	EMIFB SDRAM row/column address
102	EMB_A[1] / GP7[3]	O	EMIFB SDRAM row/column address
103	EMB_A[0] / GP7[2]	O	EMIFB SDRAM row/column address
104	CVDD		
105	EMB_A[10] / GP7[12]	O	EMIFB SDRAM row/column address bus
106	EMB_BA[1] / GP7[0]	O	EMIFB SDRAM bank address
107	EMB_BA[0] / GP7[1]	O	EMIFB SDRAM bank address
108	EMB_CS[0]	O	EMIFB SDRAM chip select 0
109	DVDD		
110	EMB_RAS	O	EMIFB SDRAM row address strobe
111	AXR0[0]/AFSR2/GP3[0]	I/O	McASP0 serial data
		I/O	McASP2 serial data
112	AXR0[1]/ ACLKX2/GP3[1]	I/O	McASP0 serial data
		I/O	McASP2 transmit bit clock
113	AXR0[2]/ AXR2[3]/GP3[2]	I/O	McASP0 serial data
		I/O	McASP2 serial data
114	CVDD		
115	AXR0[3]/ AXR2[2]/GP3[3]	I/O	McASP0 serial data
		I/O	McASP2 serial data
116	AXR0[4]/ AXR2[1]/GP3[4]	I/O	McASP0 serial data
		I/O	McASP2 serial data
117	AXR0[5]/ AFSX2/GP3[5]	I/O	McASP0 serial data
		I/O	McASP2 transmit frame sync
118	AXR0[6]/ ACLKR2/GP3[6]		McASP0 serial data
119	DVDD		
120	AXR0[7]/GP3[7]	I/O	McASP0 serial data
121	AXR0[8]/GP3[8]	I/O	McASP0 serial data
122	UART1_RXD/AXR0[9]/GP3[9]	I	UART1 receive data
		I/O	McASP0 serial data
123	UART1_TXD/AXR0[10]/GP3[10]	O	UART1 transmit data
		I/O	McASP0 serial data
124	AXR0[11]/ AXR2[0]/GP3[11]	I/O	McASP0 serial data
		I/O	McASP2 serial data
125	AHCLKX0/AHCLKX2/USB_REFCLKIN/GP2[11]	I/O	McASP0 transmit master clock
		I/O	McASP2 transmit master clock
		I	USB_REFCLKIN. Optional 48 MHz clock input
126	ACLKX0/ECAP0/APWM0/GP2[12]	I/O	McASP0 transmit bit clock
		I/O	Enhanced capture 0 input or auxiliary PWM 0 output
127	AFSX0/GP2[13]/BOOT[10]	I/O	McASP0 transmit frame sync
		I	BOOT[10]

No.	Function Name (P.C.B.)	I/O	Detail of Function
128	DVDD		
129	AHCLKR0/GP2[14]/BOOT[11]	I/O	McASP0 receive master clock
		I	BOOT[11]
130	ACLKR0/ECAP1/APWM1/GP2[15]	I/O	McASP0 receive bit clock
		I/O	Enhanced capture 1 input or auxiliary PWM 1 output
131	AFSR0/GP3[12]	I/O	McASP0 receive frame sync
132	AMUTE1/EPWMTZ/GP4[14]	I/O	McASP1 mute output
		I/O	eHRPWM0 trip zone input
		I/O	eHRPWM1 trip zone input
		I/O	eHRPWM2 trip zone input
133	RSV2	PWR	Reserved. For proper device operation, this pin must be tied directly to CVDD or left unconnected [do not connect to ground (VSS)].
134	USB0_VDDA12	PWR	USB0 PHY 1.2-V LDO output for bypass cap
135	USB0_VDDA18	PWR	USB0 PHY 1.8-V supply input
136	NC	-	-
137	USB0_DP	A	USB0 PHY data plus
138	USB0_DM	A	USB0 PHY data minus
139	NC	-	-
140	USB0_VDDA33	PWR	USB0 PHY 3.3-V supply
141	PLL0_VDDA	PWR	PLL analog VDD (1.2-V filtered supply)
142	PLL0_VSSA	GND	PLL analog VSS (for filter)
143	OSCIN	I	Oscillator input
144	OSCVSS	GND	Oscillator ground (for filter only)
145	OSCOUT	O	Oscillator output
146	RESET	I	Device reset input
147	CVDD		
148	RTC_XI	I	Low-frequency (32-kHz) oscillator receiver for real-time clock
149	RTC_CVDD	PWR	RTC module core power (isolated from rest of chip CVDD)
150	TRST	I	JTAG test reset
151	DVDD		
152	TMS	I	JTAG test mode select
153	TDI	I	JTAG test data input
154	CVDD		
155	TCK	I	JTAG test clock
156	TDO	O	JTAG test data output
157	GP7[14]	I/O	General-Purpose IO signal
158	DVDD		
159	CVDD		
160	AHCLKX1/EPWM0B/GP3[14]	I/O	McASP1transmit master clock
		I/O	eHRPWM0 B output
161	CVDD		
162	ACLKX1/EPWM0A/GP3[15]	I/O	McASP1transmit bit clock
		I/O	eHRPWM0 A output
163	AFSX1/EPWMSYNCI/EPWMSYNCO/GP4[10]	I/O	McASP1transmit frame sync
		I/O	Sync input to eHRPWM0 module or sync output to external PWM
164	DVDD		
165	ACLKR1/ECAP2/APWM2/GP4[12]	I/O	McASP1receive bit clock
		I/O	Enhanced capture 2 input or auxiliary PWM 2 output
166	AFSR1/GP4[13]	I/O	McASP1receive frame sync
167	CVDD		
168	AXR1[8]/EPWM1A/GP4[8]	I/O	McASP1 serial data
		I/O	eHRPWM1 A output (with high-resolution)
169	AXR1[7]/EPWM1B/GP4[7]	I/O	McASP1 serial data
		I/O	eHRPWM1 B output
170	AXR1[6]/EPWM2A/GP4[6]	I/O	McASP1 serial data
		I/O	eHRPWM2 A output (with high-resolution)
171	AXR1[5]/EPWM2B/GP4[5]	I/O	McASP1 serial data
		I/O	eHRPWM2 B output
172	DVDD		
173	AXR1[4]/EQEP1B/GP4[4]	I/O	McASP1 serial data
		I	eQEP1B quadrature input
174	AXR1[3]/EQEP1A/GP4[3]	I/O	McASP1 serial data
		I	eQEP1A quadrature input
175	AXR1[2]/GP4[2]	I/O	McASP1 serial data
176	AXR1[1]/GP4[1]	I/O	McASP1 serial data

IC221: TMPM362F10FG (DIGITAL P.C.B.)
Microprocessor

*** No replacement part available.**





Pin No.	Port Name	Function Name (P.C.B.)	I/O				Detail of Function
			Power off	MCU sleep	MCU Reset Cancellation	AC off	
1	PK6/AIN14	N_FCT	I+	I+	I+	I	FCT detection
2	PK7/AIN15	(no_use)					
3	AVSS	AVSS	MCU	MCU	MCU	MCU	Microprocessor ground
4	VREFH	VREFH	MCU	MCU	MCU	MCU	Microprocessor power supply
5	/RESET	CPU_N_RST	MCU	MCU	MCU	MCU	Reset input
6	MODE	MODE	MCU	MCU	MCU	MCU	Mode terminal (GND)
7	PL0/SDA0/SO0/TB0OUT	HDMI_SDA	HiZ	HiZ	HiZ	HiZ	HDMI Rx/Tx 12C SDA input and output
8	PL1/SCL0/SI0/TB1OUT	HDMI_SCL	HiZ	HiZ	HiZ	HiZ	HDMI Rx/Tx 12C SCL output
9	PL2/SCK0/TB2OUT	HDMI_N_RST	O	HiZ	O	O	HDMI RxTx reset
10	PL3/INT0/TB3OUT	HDMI_N_INT	I	I	I	I	Interrupt input from HDMI RxTx
11	PL4/TXD1/TB4OUT	DSP_MOSI	O	O	O	O	DSP, DIR, DAC synchronization data output
12	PL5/RXD1/TB5OUT	DSP_MISO	I	I	I	I	DSP, DIR synchronization data input
13	PL6/SCLK1/TB6OUT//CTS1	DSP_SCK	HiZ	HiZ	HiZ	HiZ	DSP, DIR, DAC synchronization clock output
14	PL7/INT1/TB7OUT	DSP_N_INT	I	I	I	I	Interrupt input from DSP
15	DVSS	DVSS	MCU	MCU	MCU	MCU	Microprocessor ground
16	PM0/SCLK2/TB1N0//CTS2	DIR_N_CS	O	O	O	O	DIR chip select
17	PM1/TXD2/TB1N1	DIR_N_RST	O	HiZ	HiZ	HiZ	DIR reset
18	PM2/RXD2//ALARM	DSP_N_CS	O	O	O	O	DSP chip select
19	PM3/INT2/TB3OUT	DIR_N_INT	I	I	I	I	DIR interrupt input
20	PM4/SCLK3//CTS3	DSP_N_RST	O	HiZ	O	O	DSP reset
21	PM5/TXD3	DSP_N_RDY	I	I	I	I	DSP Ready input
22	PM6/RXD3	DSP_FMT	HiZ	HiZ	HiZ	HiZ	DSP Full Mute output
23	PM7/INT3	DAC_N_CS	O	O	O	O	DAC chip select
24	PN0/TXD4	FLASH_TXD	HiZ	HiZ	HiZ	HiZ	Serial port for F/W writing
25	PN1/RXD4	FLASH_RXD	I+	I+	I+	I	Serial port for F/W writing
26	PN2/SCLK4/TB2IN0//CTS4	232C_N_CTS	I+	I+	I+	I	Serial port for F/W writing
27	PN3/INT4/TB2IN1/RMC0	232C_INT	O	O	O	O	Serial port for F/W writing interrupt
28	PN4/TXD5	232C_RTS	O	O	O	O	Serial port for F/W writing
29	PN5/RXD5	USB_SEARCH	I–	I–	I–	I–	Search flag input from USB device
30	PN6/SCLK5/TBFIN0//CTS5	USB_BUSY	I	I	I	I	Command parsing input from USB device
31	PN7/INT8/TBFIN1/RMC1	USB_MCHNG	I	I	I	I	File playback end flag input from USB device
32	PO0/TXD6/TB8OUT	USB_SPI_MOSI	O	HiZ	O	O	USB device SPI data output
33	PO1/RXD6/TB9OUT	USB_SPI_MISO	I	I	I	I	USB device SPI data input
34	PO2/SCLK6/TBAOUT//CTS6	USB_SPI_SCK	O	O	O	O	USB device SPI clock output
35	PO3/INT9/TBBOUT	USB_SPI_N_CS	O	O	O	O	USB device SPI chip select output
36	PO4/TXD7/TBCOUT	USB_N_RST	O	HiZ	O	O	USB device reset output
37	PO5/RXD7/TBDOUT	USB_IRPTO	I–	I–	I–	I–	Host interrupt input from USB device
38	PO6/SCLK7/TBEOUT//CTS7	no_use	O	O	O	O	Mute control
39	PO7/INTA/TBFOUT	AMP_LMT	O	O	O	O	Limiter control output
40	PP0//CS2	DIR_SDO	O	O	O	O	DIR, SDO input for CDDA writing
41	PP1	DIR_WCK	I	I	I	I	DIR, WCK input for CDDA writing
42	PP2//BLS0/SPDO	OSDFS_MOSI	O	HiZ	O	O	OSD Flash synchronization data output
43	PP3//BLS1/SPDI	OSDFS_MISO	I–	I–	I–	I–	OSD Flash synchronization data input
44	PP4//WE/SPCLK	OSDFS_SCK	O	O	O	O	OSD Flash synchronization clock output
45	PP5//OE/SPFSS	OSDFS_N_CS	HiZ	HiZ	HiZ	HiZ	OSD Flash chip select control from Microprocessor
46	PP6//ALE	OSDFS_BUS_SEL	O	HiZ	O	O	Connection switching of Microprocessor SPI and HDMI OSD SPI to OSD Flash SPI
47	DVDD3B	DVDD3B	MCU	MCU	MCU	MCU	Microprocessor power supply
48	DVSS	DVSS	MCU	MCU	MCU	MCU	Microprocessor ground

Pin No.	Port Name	Function Name (P.C.B.)	I/O				Detail of Function
			Power off	MCU sleep	MCU Reset Cancellation	AC off	
49	PA0/D0/AD0	PRY	O	O	O	O	Power relay control
50	PA1/D1/AD1	TRANS_RY	O	HiZ	O	O	Switching transformer winding
51	PA2/D2/AD2	HPRY	O	HiZ	O	O	Headphone relay control
52	PA3/D3/AD3	SPRY_5CH	O	HiZ	O	O	Speaker relay control (Front/Center/Surround)
53	PA4/D4/AD4	no_use	O	O	O	O	
54	PA5/D5/AD5	DIAG_FCT	O	O	O	O	Diag OK: output High
55	PA6/D6/AD6	MT_N_5CH	O	HiZ	O	O	Mute control (Front/Center/Surround)
56	PA7/D7/AD7	no_use	O	O	O	O	
57	PB0/D8/AD8	MT_N_SW	O	HiZ	O	O	Mute control (Subwoofer)
58	PB1/D9/AD9	no_use	O	O	O	O	
59	PB2/D10/AD10	no_use	O	O	O	O	
60	PB3/D11/AD11	5D_PON	O	HiZ	O	O	
61	PB4/D12/AD12	3D_PON	O	HiZ	O	O	
62	PB5/D13/AD13	APL_PON	O	HiZ	O	O	
63	PB6/D14/AD14	DAC_PON	O	HiZ	O	O	
64	PB7/D15/AD15	no_use	O	O	O	O	
65	PC0/A1/TXD8	no_use	O	O	O	O	
66	PC1/A2/RXD8	no_use	O	O	O	O	
67	PC2/A3/SCLK8//CTS8	no_use	O	O	O	O	
68	PC3/A4	no_use	O	O	O	O	
69	PC4/A5/TXD9	no_use	O	O	O	O	
70	PC5/A6/RXD9	VOL_SCK	O	O	O	O	Electronic volume flip-flop synchronization clock output
71	PC6/A7/SCLK9//CTS9	VOL_MOSI	O	O	O	O	Electronic volume flip-flop synchronization data output
72	PC7/A8	EEP_SPI_N_CS	O	HiZ	O	O	EEPROM chip select
73	PD0/A9/TXD10	EEP_SPI_MOSI	SO	O	SO	SO	EEPROM synchronization data output
74	PD1/A10/RXD10	EEP_SPI_MISO	SI	I	SI	SI	EEPROM synchronization data input
75	PD2/A11/SCLK10//CTS10	EEP_SPI_SCK	O	O	O	O	EEPROM synchronization clock output
76	PD3/A12	CVBS_ON	O	HiZ	O	O	Video SW
77	PD4/A13/TXD11	CPNT_ON	O	HiZ	O	O	Video SW
78	PD5/A14/RXD11	no_use	O	O	O	O	
79	PD6/A15/SCLK11//CTS11	no_use	O	O	O	O	
80	PD7/A16/INTB	REM_IN	IRQ	IRQ	IRQ	IRQ	Remote control pulse input
81	PE0/A17/TB5IN0	J_N_DEST	I+	I+	I+	I	J destination detection L: J destination / H: Other than J destination
82	PE1/A18/TB5IN1	HDA_N_DET	O	O	O	O	HD Audio decode decision detection L: Validity / H: Invalidity
83	PE2/A19/TB6IN0	FLD_N_RST	O	O	O	O	FL driver reset
84	PE3/A20/TB6IN1	FLD_N_CS	O	O	O	O	FL driver chip select
85	PE4/A21/TXD0	FLD_MOSI	O	O	O	O	FL driver synchronization data output
86	PE5/A22/RXD0	FL_PON	O	HiZ	O	O	FL driver +VP control output
87	PE6/A23/SCLK0//CTS0	FLD_SCK	O	O	O	O	FL driver synchronization clock output
88	PE7/INT5/SCOUT	PSW_N_DET	IRQ	IRQ	IRQ	IRQ	Power system switch (Power, Scene) detection
89	DVDD3B	DVDD3B	MCU	MCU	MCU	MCU	Microprocessor power supply
90	DVSS	DVSS	MCU	MCU	MCU	MCU	Microprocessor ground
91	SWDIO	SWD_IO	MCU	MCU	MCU	MCU	Terminal for debugging
92	SWCLK	SWD_SCK	MCU	MCU	MCU	MCU	Terminal for debugging
93	PF0/TRACECLK	(reserved)					
94	PF1/TRACEDATA0/SWV	SWD_SWV	MCU	MCU	MCU	MCU	Terminal for debugging
95	PF2/TRACEDATA1	VSEL1	O	O	O	O	Video selector control signal level convert
96	PF3/TRACEDATA2	VSEL2	O	O	O	O	Video selector control signal level convert

Pin No.	Port Name	Function Name (P.C.B.)	I/O				Detail of Function
			Power off	MCU sleep	MCU Reset Cancellation	AC off	
97	PF4/TRACEDATA3	VSEL3	O	O	O	O	Video selector control signal level convert
98	PG0/SDA1/SO1/TB7IN0	TUN_SDA	HiZ	HiZ	HiZ	HiZ	Tuner I2C synchronization data input and output
99	PG1/SCL1/SI1/TB7IN1	TUN_SCL	HiZ	HiZ	HiZ	HiZ	Tuner I2C synchronization clock output
100	PG2/SCK1//CS0	TUN_N_RST	O	O	O	O	Tuner reset
101	PG3/INT6//CS1	TUN_N_INT	I	I	I	I	Tuner GPIO2 input
102	PG4/SDA2/SO2/TB9IN0	USB_SDA	HiZ	HiZ	HiZ	HiZ	USB I2C synchronization data input and output
103	PG5/SCL2/SI2/TB9IN1	USB_SCL	HiZ	HiZ	HiZ	HiZ	USB I2C synchronization clock output
104	PG6/SCK2//CS3	VOL_RA	I+	I+	I+	I	Volume rotary encoder A
105	PG7/INT7//WDTOUT	VOL_RB	I+	I+	I+	I	Volume rotary encoder B
106	PH0/SDA3/SO3/TBAIN0	(no_use)					
107	PH1/SCL3/SI3/TBAIN1	(no_use)					
108	PH2/SCK3/TBBIN0	HP_N_DET	I	I	I	I	Headphone detection
109	PH3/INTC/TBBIN1	MIC_N_DET	I	I	I	I	MIC detection
110	PH4/SDA4/SO4/TBDIN0	APL_SDA	HiZ	HiZ	HiZ	HiZ	Apple coprocessor I2C synchronization data input and output
111	PH5/SCL4/SI4/TBDIN1	APL_SCL	HiZ	HiZ	HiZ	HiZ	Apple coprocessor I2C synchronization clock output
112	PH6/SCK4/TBEIN0	APL_N_RST	O	HiZ	O	O	Apple coprocessor reset output
113	PH7/INTD/TBEIN1	HDMI_MUTE	I–	I–	I–	I–	HDMI MUTE input
114	RVDD3	RVDD3	MCU	MCU	MCU	MCU	Microprocessor power supply
115	XT1	XT1	MCU	MCU	MCU	MCU	Low frequency oscillation circuit input
116	XT2	XT2	MCU	MCU	MCU	MCU	Low frequency oscillation circuit output
117	DVDD3A	DVDD3A	MCU	MCU	MCU	MCU	Microprocessor power supply
118	X1	X1	MCU	MCU	MCU	MCU	High frequency oscillation circuit input
119	DVSS	DVSS	MCU	MCU	MCU	MCU	Microprocessor ground
120	X2	X2	MCU	MCU	MCU	MCU	High frequency oscillation circuit output
121	DVDD3B	DVDD3B	MCU	MCU	MCU	MCU	Microprocessor power supply
122	DVSS	DVSS	MCU	MCU	MCU	MCU	Microprocessor ground
123	PI2/INTE	ACPWR_DET	IRQ	IRQ	IRQ	IRQ	AC power detection
124	PI3/INTF	MHL_WAKE					Reserved
125	/NMI	NMI_N_INT	IRQ	IRQ	IRQ	IRQ	Non-maskable interrupt
126	TEST1	TEST1					Do not connect.
127	TEST2	TEST2					Do not connect.
128	PI0//BOOT	FLASH_N_BOOT	I+	I+	I+	I	L: Single boot mode (boot from built-in MaskROM)
129	PI1/CEC	HDMI_CEC	IO+	IO+	IO+	HiZ	Microprocessor CEC control
130	AVDD3	AVDD3	MCU	MCU	MCU	MCU	Microprocessor power supply
131	PJ0/AIN0	I_PRT	I–	I–	I–	I–	Overcurrent protection detection
132	PJ1/AIN1	DEST					Destination detection
133	PJ2/AIN2	KEY1	I+	I+	I+		KEY AD value uptake 1
134	PJ3/AIN3//ADTRG	KEY2	I+	I+	I+		KEY AD value uptake 2
135	PJ4/AIN4/KWUP0	KEY3					KEY AD value uptake 3 (spare)
136	PJ5/AIN5/KWUP1	THM1_PRT	I	I	I	I	Temperature detection 1
137	PJ6/AIN6/KWUP2	THM2_PRT	I	I	I	I	Temperature detection 2
138	PJ7/AIN7/KWUP3	PS_PRT	I	I	I	I	PS protection detection 1
139	PK0/AIN8	(no_use)					
140	PK1/AIN9	(no_use)					
141	PK2/AIN10	DC_PRT	I	I	I	I	Power amp DC detection
142	PK3/AIN11	AMP_OLV	I	I	I	I	Power amp output level detection
143	PK4/AIN12	USB_VBUS_PRT					USB power supply voltage detection
144	PK5/AIN13	+5EX_PRT					DC_OUT power supply voltage detection

Key detection for A/D port

Key input (A/D) pull-up resistance: 10 k-ohms

	0 Ω	+ 1.0 k Ω	+ 1.5 k Ω	+ 1.8 k Ω	+ 2.2 k Ω	+ 3.3 k Ω
Detected voltage value at 133 pin	0 – 0.15 V	0.15 – 0.48 V	0.49 – 0.82 V	0.83 – 1.14 V	1.15 – 1.46 V	1.47 – 1.79 V
A/D value (3.3 V=255)	0 – 11	12 – 37	38 – 64	65 – 88	89 – 113	114 – 139
KEY1	STRAIGHT	MUTE	FM MODE	TUNING >>	TUNING <<	PRESET >

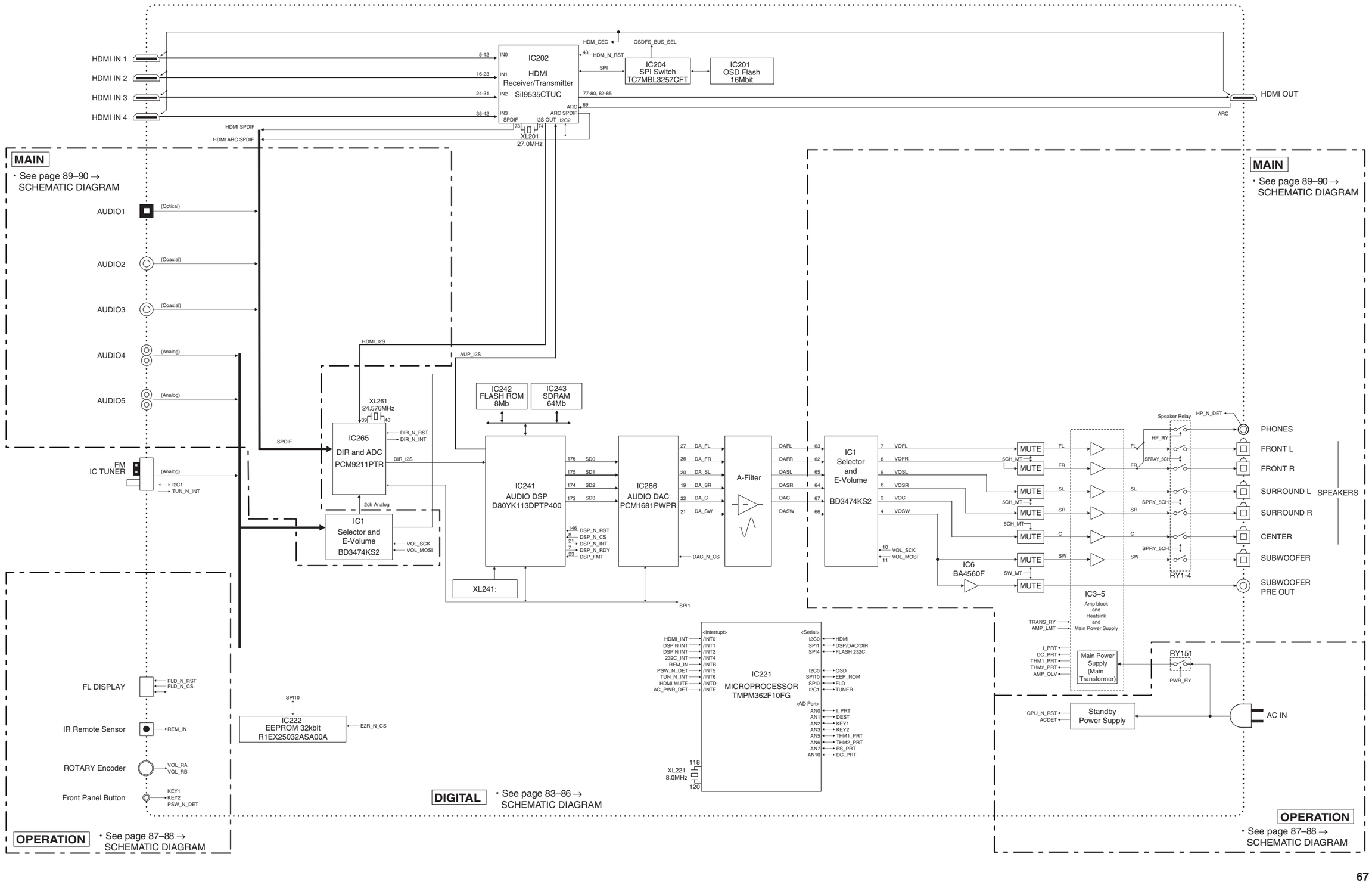
	+ 4.7 k Ω	+ 8.2 k Ω	+ 10 k Ω
Detected voltage value at 133 pin	1.80 – 2.12 V	2.13 – 2.40 V	2.41 – 2.91 V
A/D value (3.3 V=255)	140 – 164	165 – 186	187 – 226
KEY1	PRESET <	MEMORY	INFO

	0 Ω	+ 1.0 k Ω	+ 1.0 k Ω	+ 1.5 k Ω	+ 1.5 k Ω	+ 2.2 k Ω
Detected voltage value at 134 pin	0 – 0.15 V	0.15 – 0.42 V	0.43 – 0.70 V	0.71 – 0.97 V	0.98 – 1.24 V	1.25 – 1.53 V
A/D value (3.3 V=255)	0 – 11	12 – 32	33 – 54	55 – 75	76 – 96	97 – 119
KEY2	RADIO (SCENE4)	CD (SCENE3)	TV (SCENE2)	BD/DVD (SCENE1)	PROGRAM >	PROGRAM <

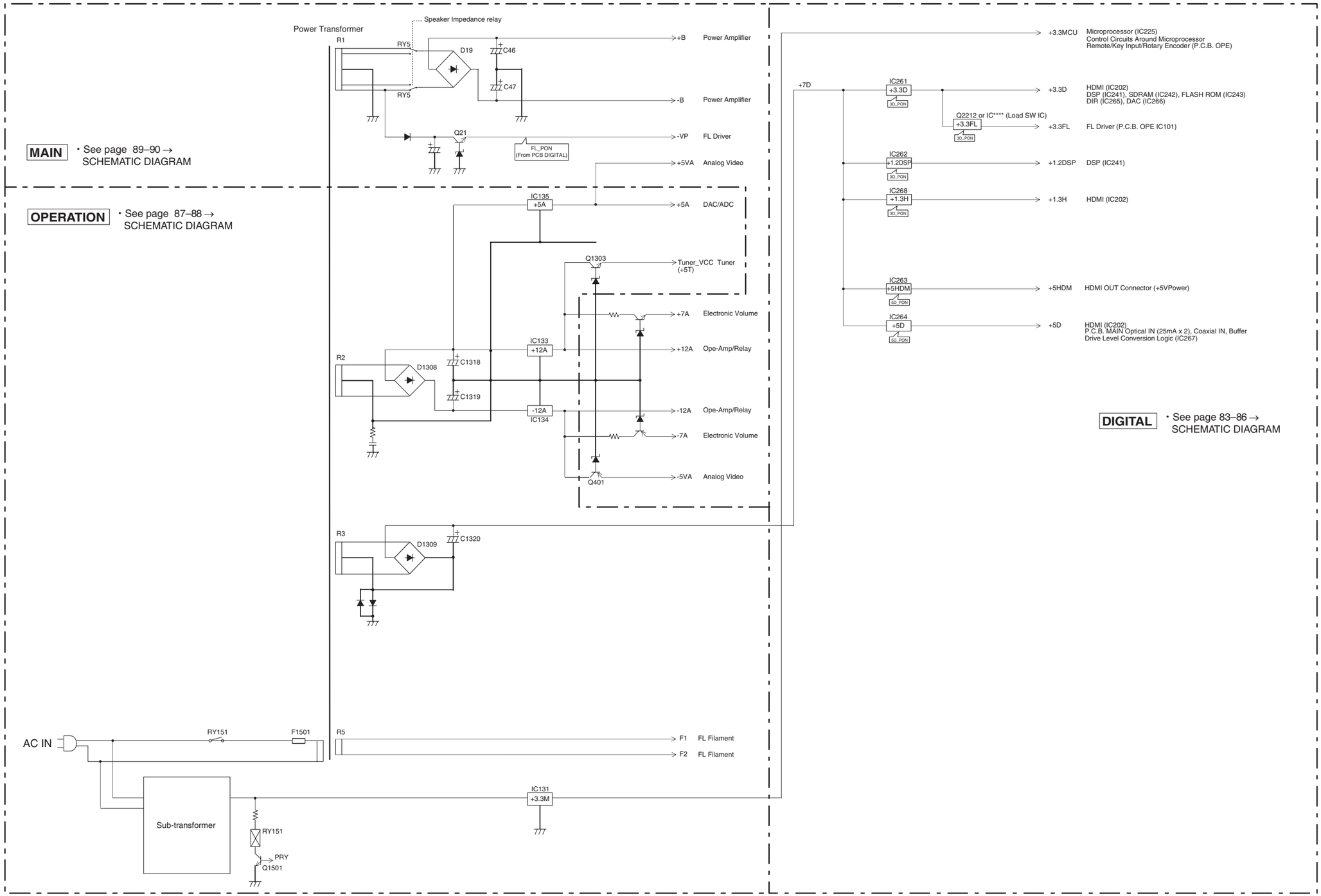
	+ 3.3 k Ω	+ 4.7 k Ω	(22 k Ω + 33 k Ω)	+ 22 k Ω	+ 33 k Ω
Detected voltage value at 134 pin	1.54 – 1.84 V	1.84 – 2.10 V	2.11 – 2.33 V	2.34 – 2.54 V	2.55 – 2.97 V
A/D value (3.3 V=255)	120 – 142	143 – 163	164 – 181	182 – 197	198 – 229
KEY2	INPUT >	INPUT <	—	⏻ (power)	TONE CONTROL

MEMO

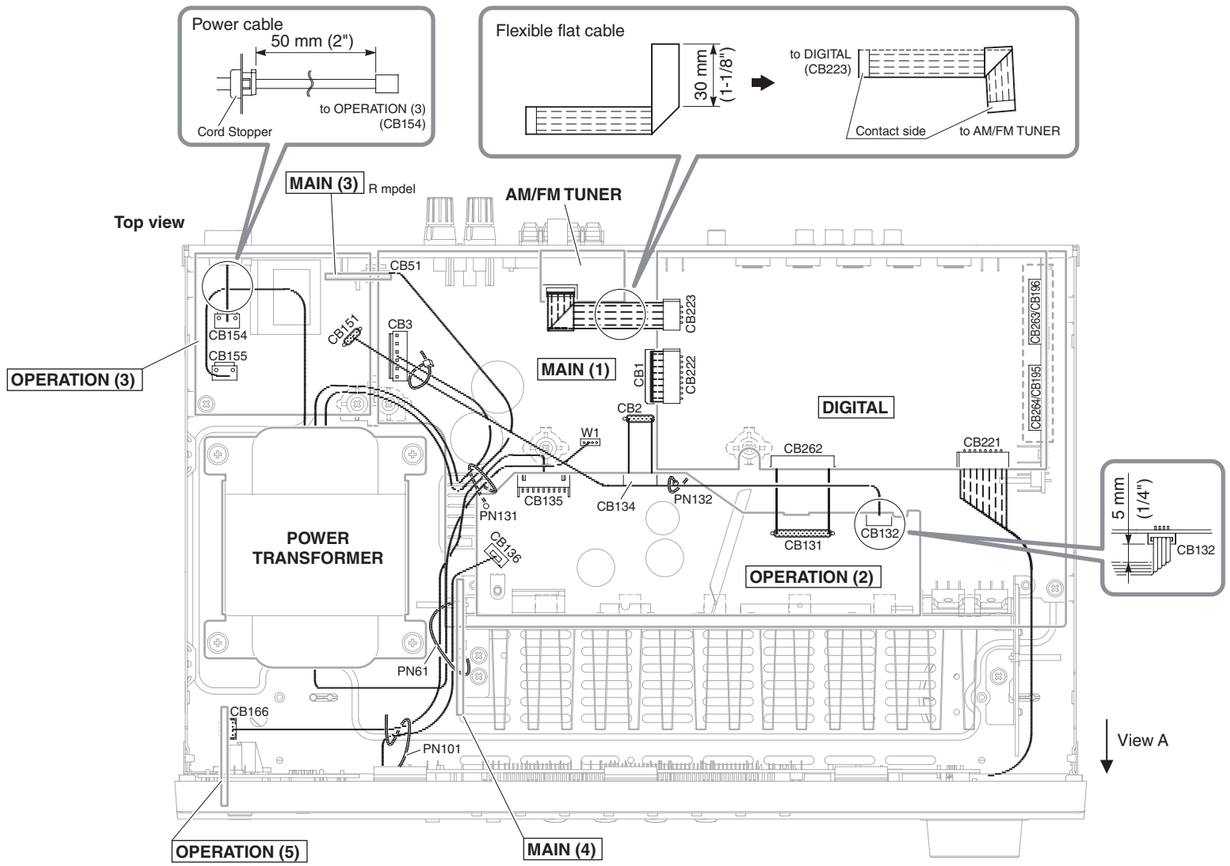
■ BLOCK DIAGRAMS

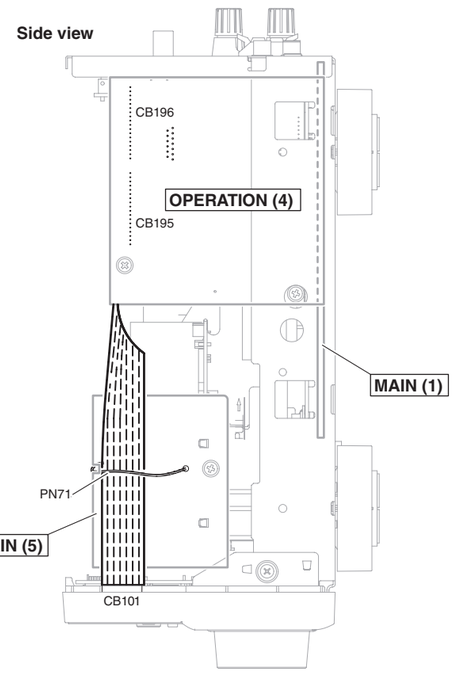


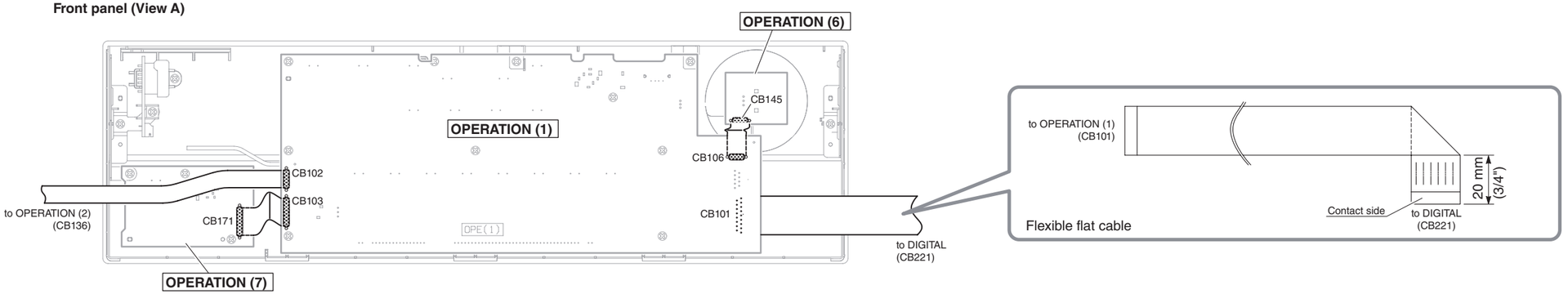
Power Supply Section Block Diagram



■ WIRING DIAGRAM

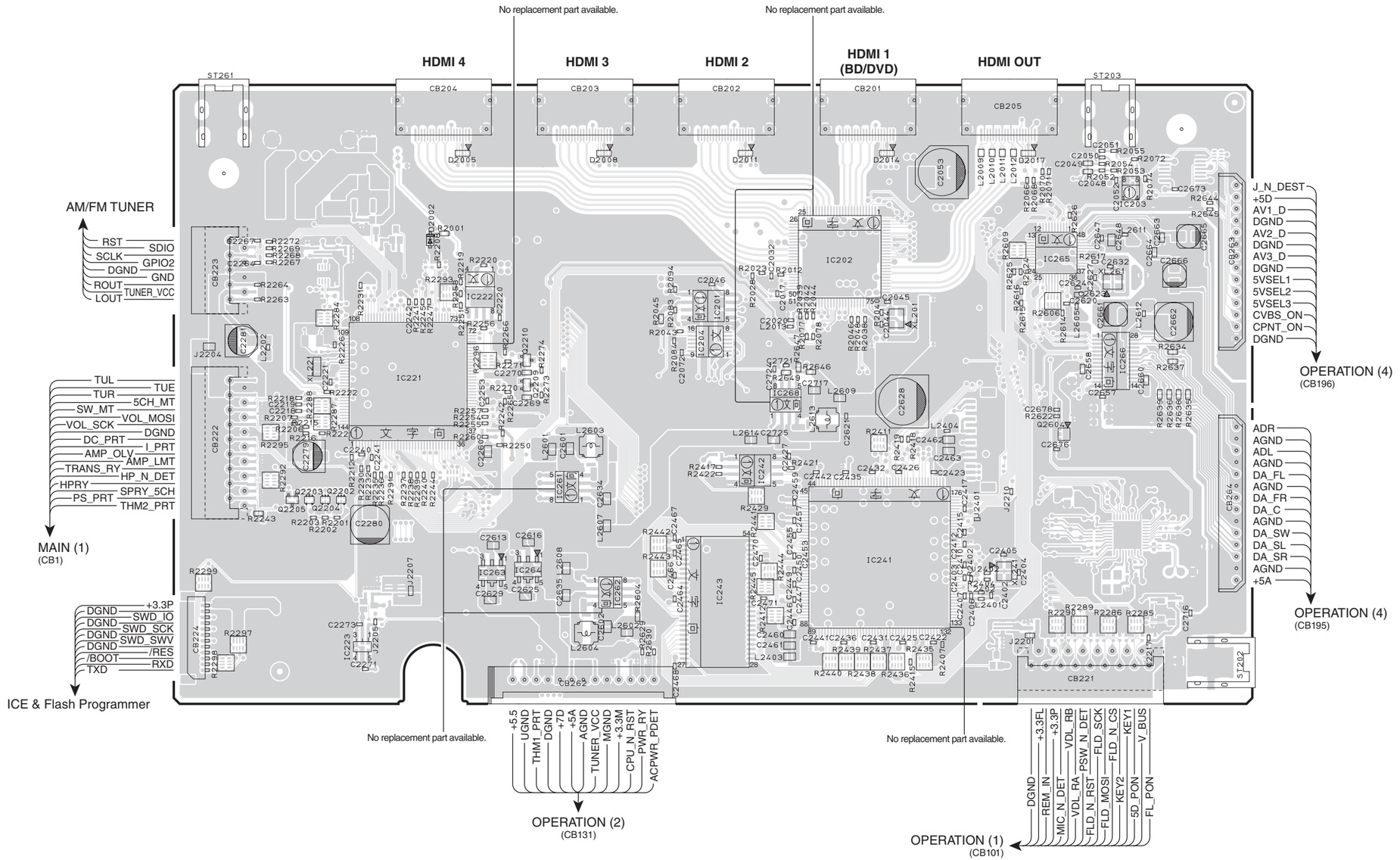






■ PRINTED CIRCUIT BOARDS

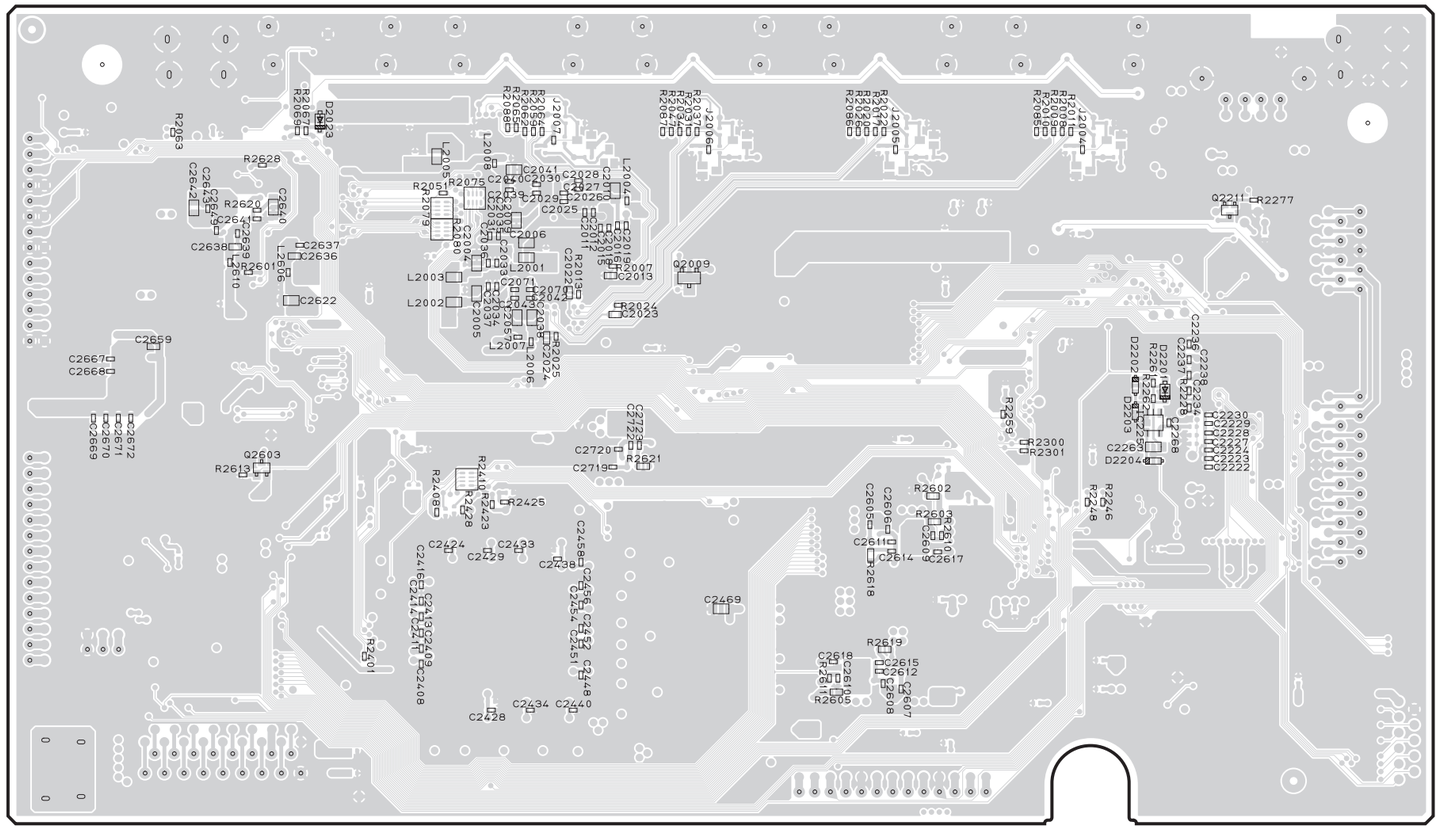
DIGITAL (Side A)



• Semiconductor Location

Ref no.	Location
D2011	F3
D2002	D3
D2005	D3
D2008	E3
D2014	G3
D2017	G3
IC201	F4
IC202	F3
IC203	H3
IC204	F4
IC221	D4
IC222	D3
IC223	D5
IC241	F5
IC242	F4
IC243	F5
IC261	E5
IC262	E5
IC263	D5
IC264	E5
IC265	H3
IC266	H4
IC268	F4
Q2202	D5
Q2203	C5
Q2204	D5
Q2205	C5
Q2209	E4
Q2210	E4
Q2604	H4

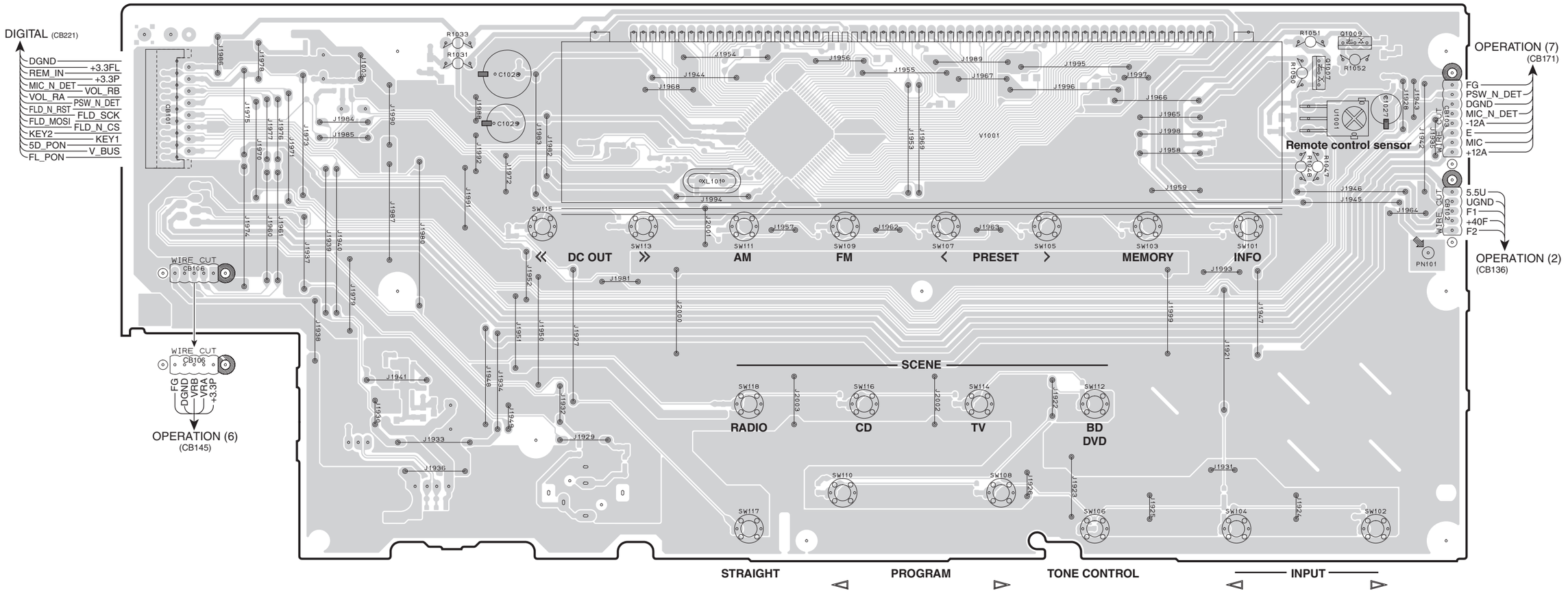
DIGITAL (Side B)



• Semiconductor Location

Ref no.	Location
D2023	D3
D2201	H4
D2202	G4
D2203	G4
D2204	G4
IC225	G4
Q2009	E3
Q2603	D4

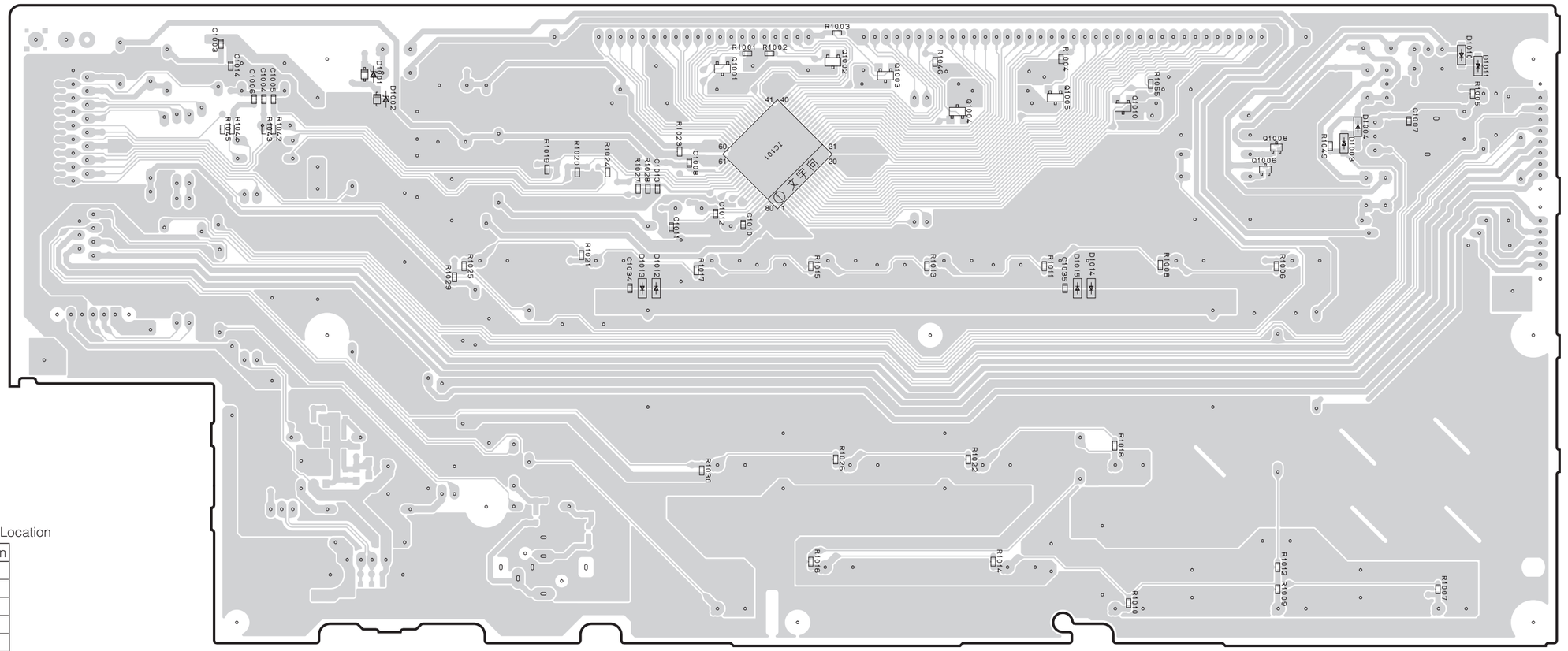
OPERATION (1) (Side A)



• Semiconductor Location

Ref no.	Location
Q1007	I3
Q1009	I3

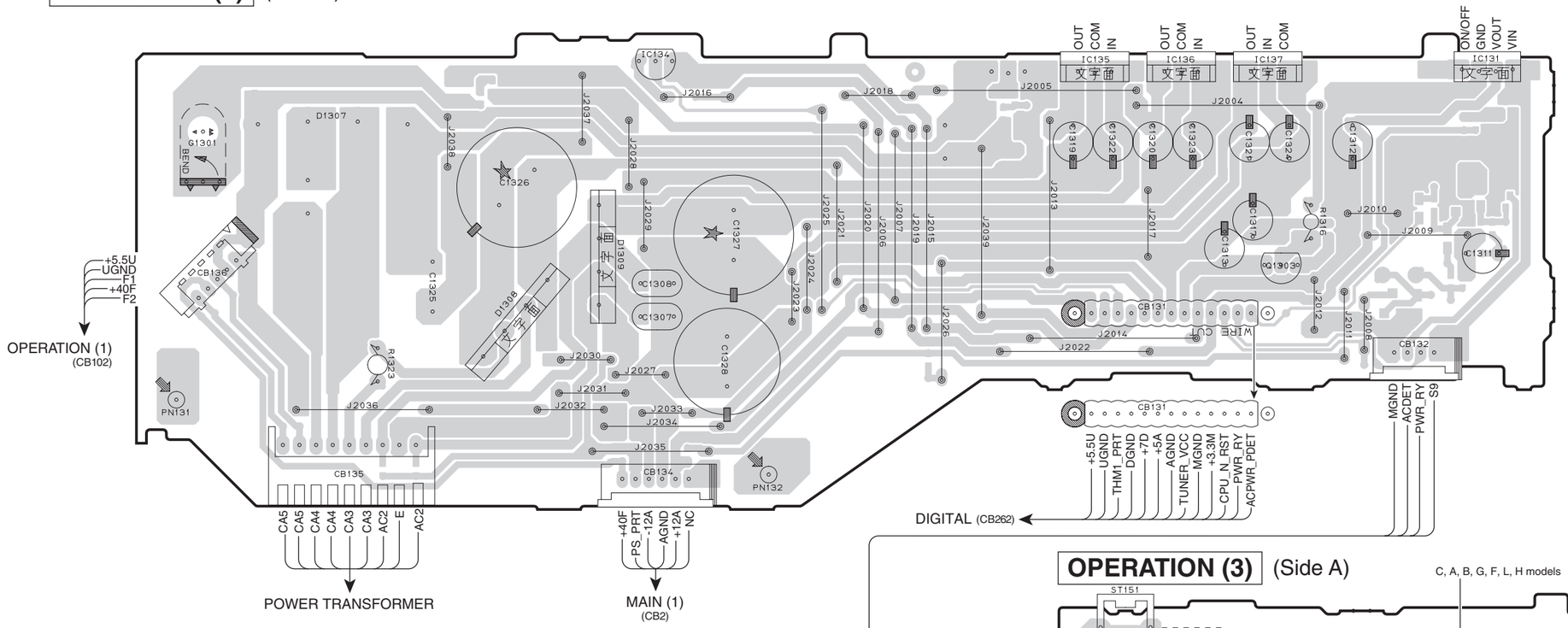
OPERATION (1) (Side B)



• Semiconductor Location

Ref no.	Location
D1001	D3
D1002	D3
D1003	I3
D1004	I3
D1010	I3
D1011	I3
D1012	E4
D1013	E4
D1014	G4
D1015	G4
IC101	F3
Q1001	E3
Q1002	F3
Q1003	F3
Q1004	G3
Q1005	G3
Q1006	H3
Q1008	H3
Q1010	H3

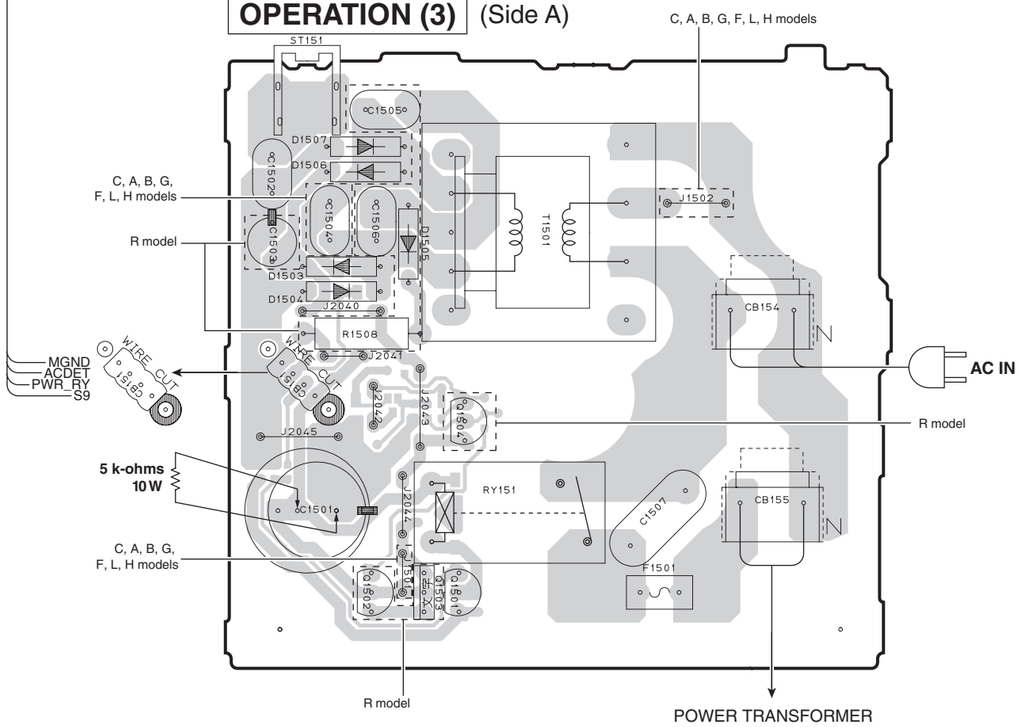
OPERATION (2) (Side A)



• Semiconductor Location

Ref no.	Location
D1308	D3
D1309	D3
D1503	G5
D1504	G5
D1505	G5
D1506	G5
D1507	G5
IC131	H2
IC134	D2
IC135	F2
IC136	G2
IC137	G2
Q1303	G3
Q1501	G6
Q1502	G6
Q1503	G6
Q1504	G6

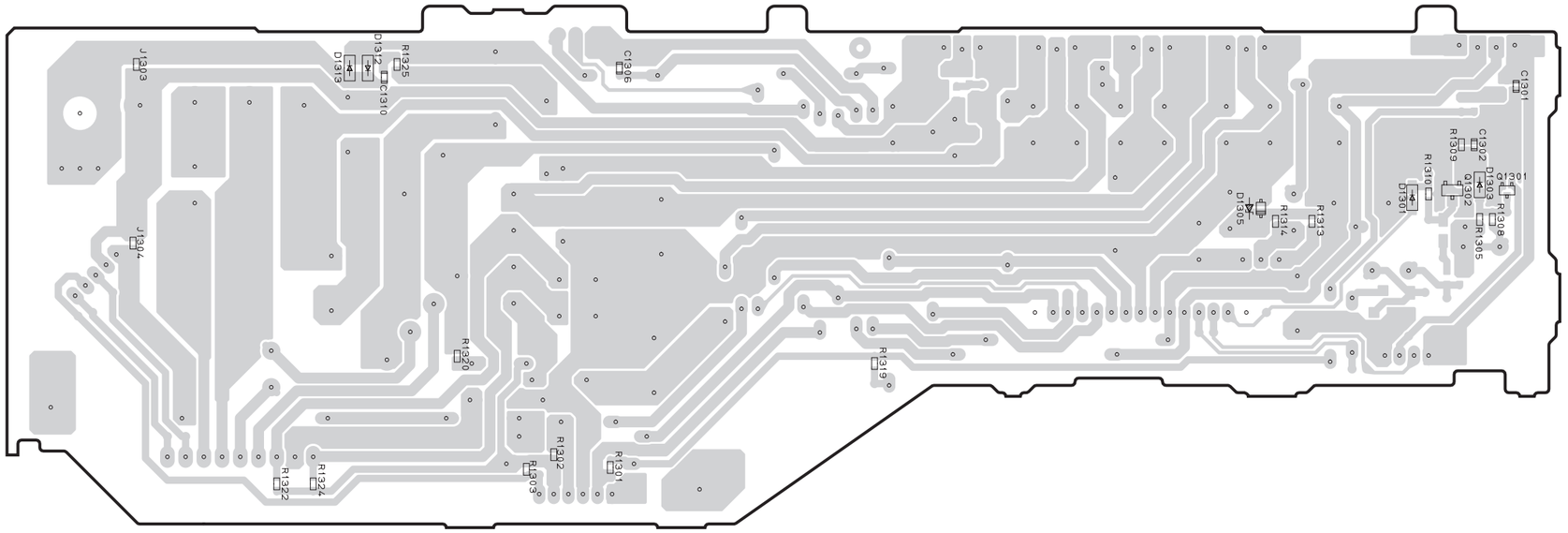
OPERATION (3) (Side A)



Safety measures

- Some internal parts in this product contain high voltages and are dangerous. Be sure to take safety measures during servicing, such as wearing insulating gloves.
- Note that the capacitors indicated below are dangerous even after the power is turned off because an electric charge remains and a high voltage continues to exist there. Before starting any repair work, connect a discharging resistor (5 k-ohms/10 W) to the terminals of each capacitor indicated below to discharge electricity. The time required for discharging is about 30 seconds per each.
  C1501 on OPERATION (3) P.C.B.

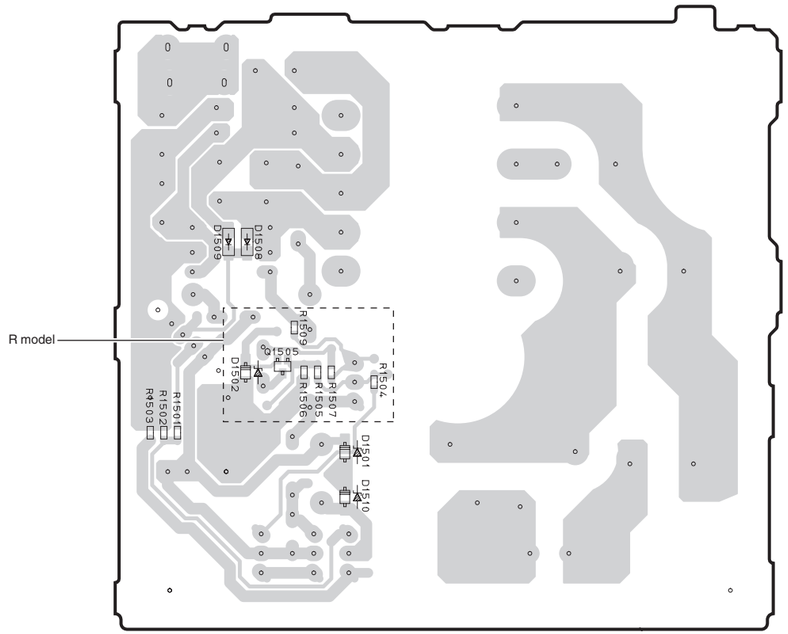
OPERATION (2) (Side B)



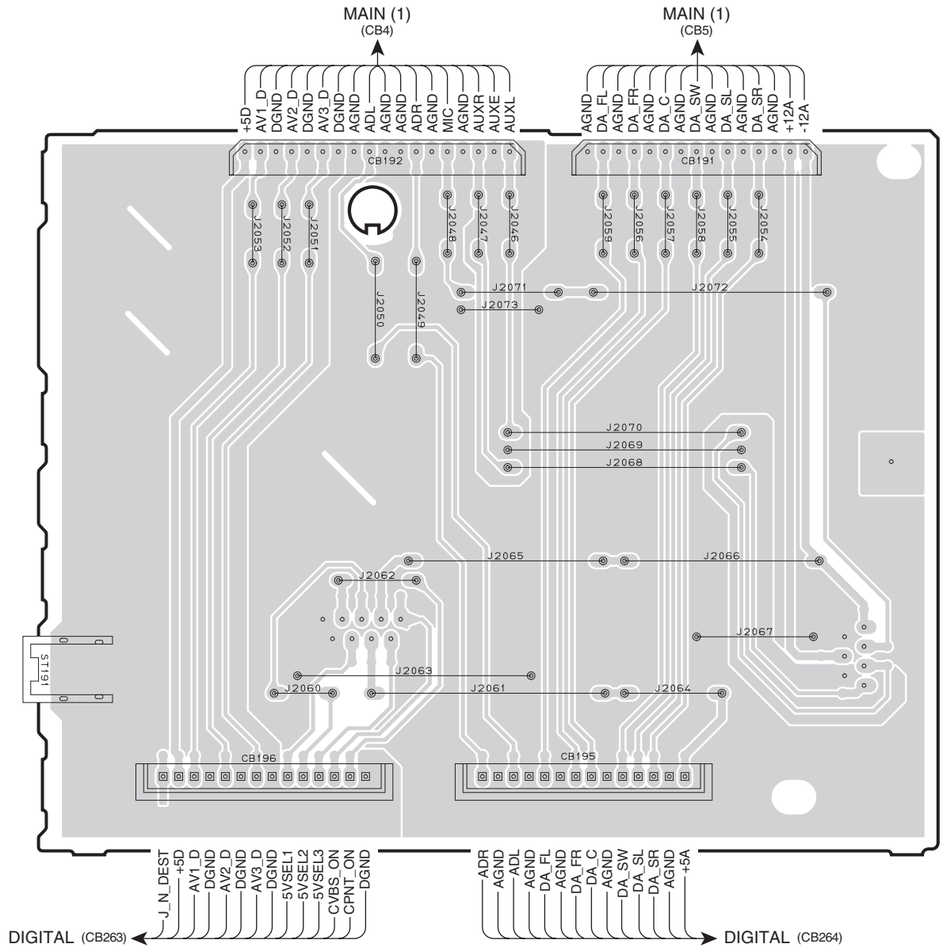
• Semiconductor Location

Ref no.	Location
D1301	H2
D1303	H2
D1305	G2
D1312	D2
D1313	C2
D1501	G6
D1502	G6
D1508	G5
D1509	G5
D1510	G6
Q1301	I2
Q1302	H2
Q1505	G6

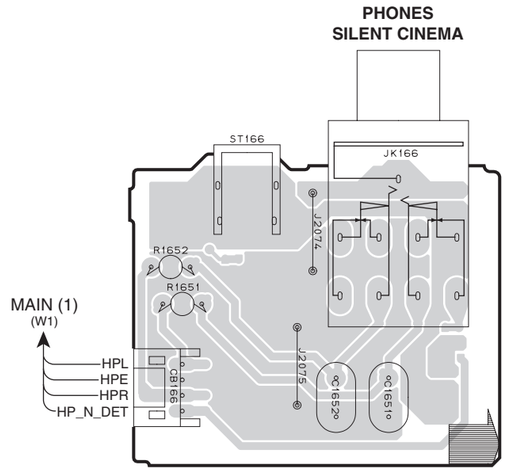
OPERATION (3) (Side B)



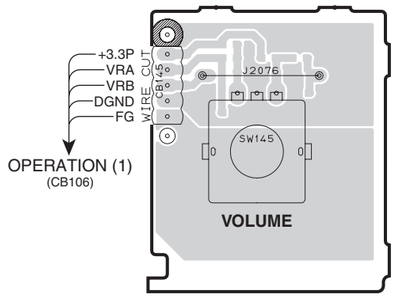
OPERATION (4) (Side A)



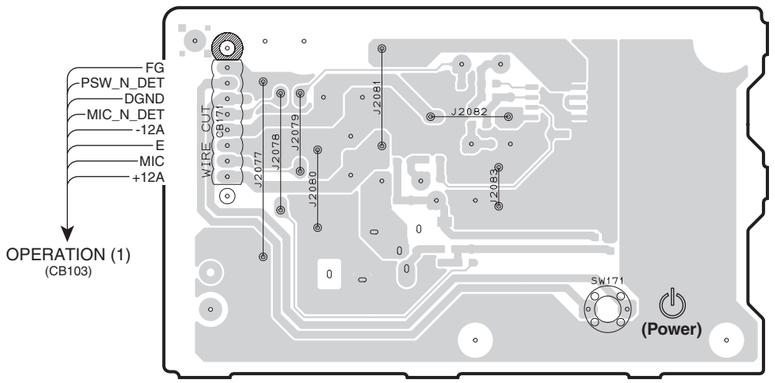
OPERATION (5) (Side A)



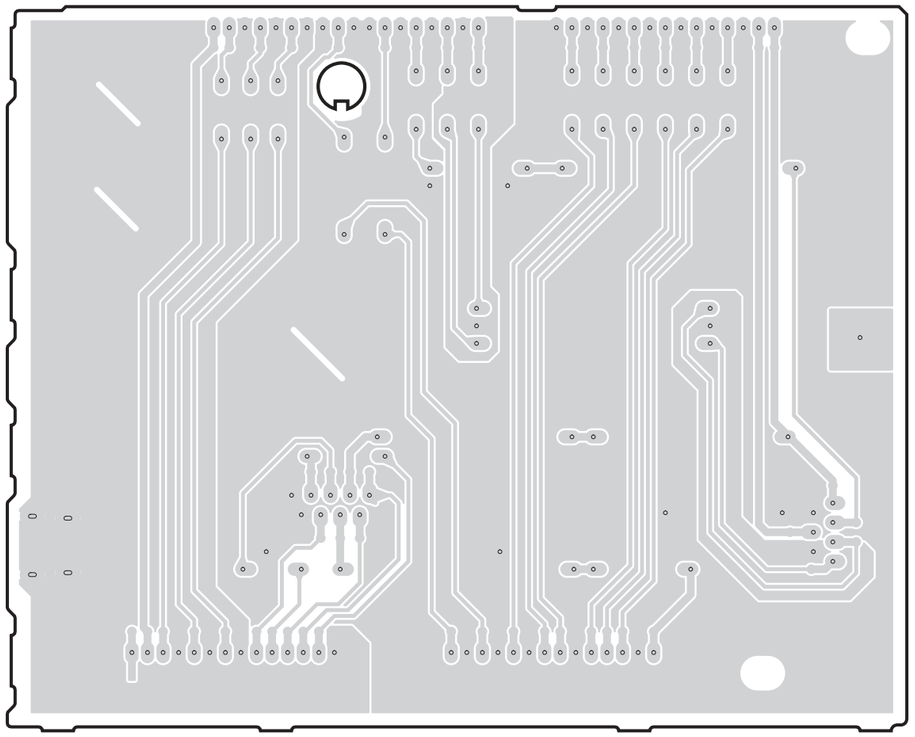
OPERATION (6) (Side A)



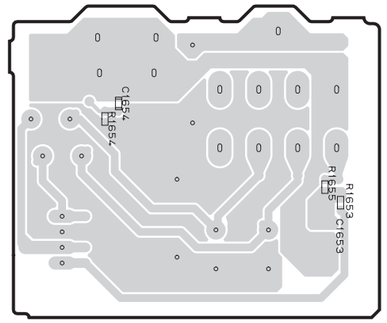
OPERATION (7) (Side A)



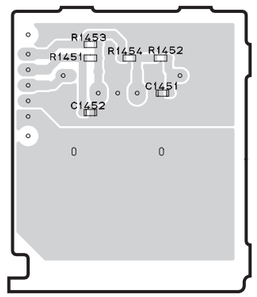
OPERATION (4) (Side B)



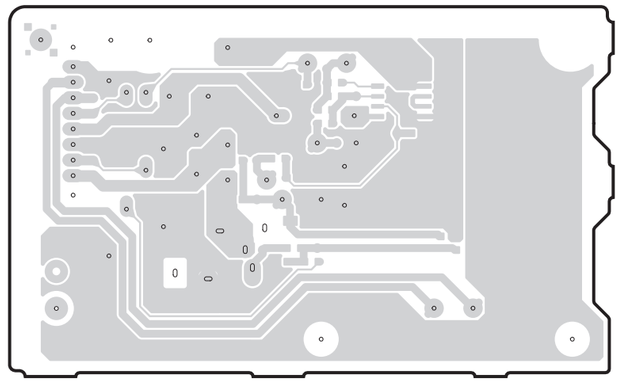
OPERATION (5) (Side B)



OPERATION (6) (Side B)



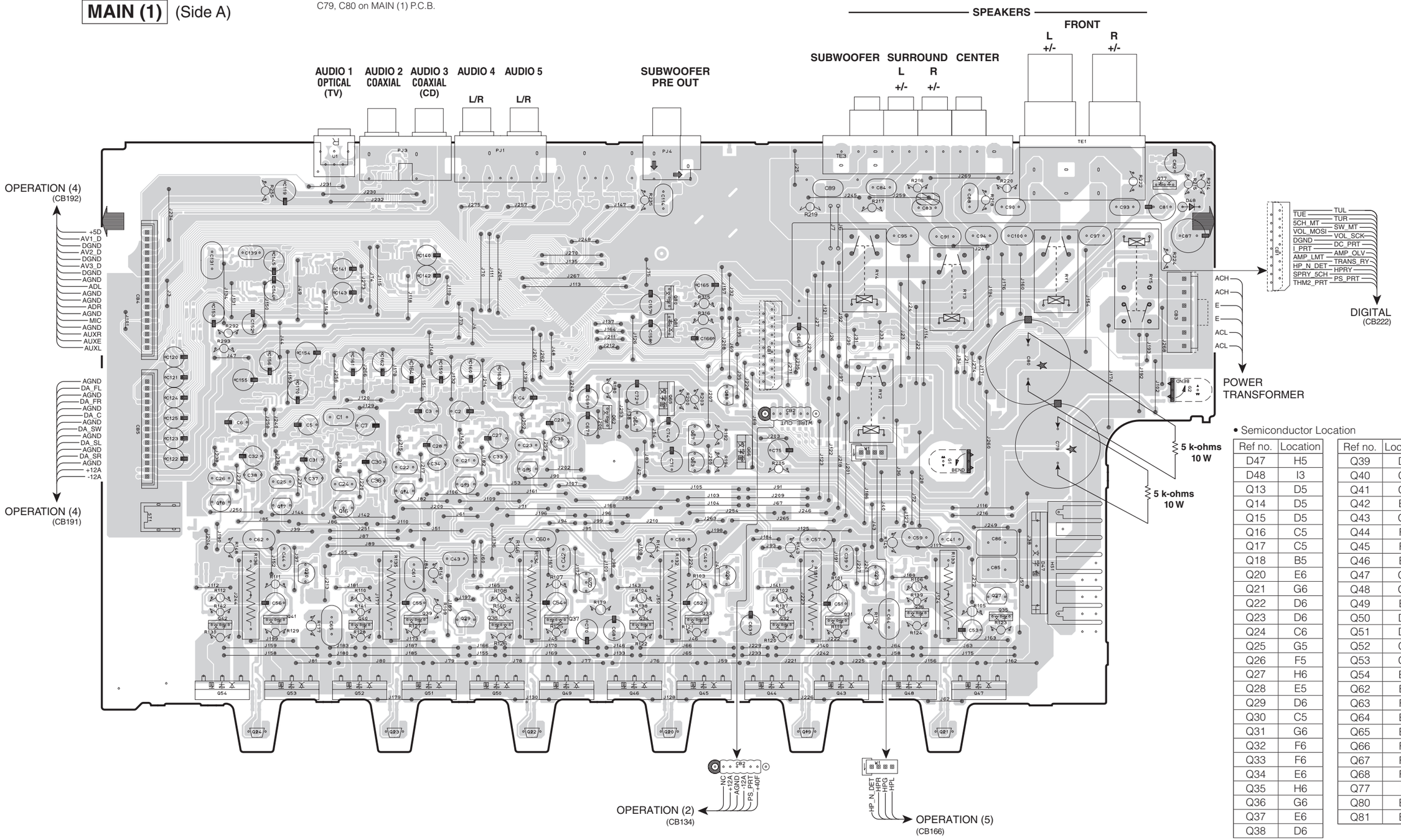
OPERATION (7) (Side B)



Safety measures

- Some internal parts in this product contain high voltages and are dangerous. Be sure to take safety measures during servicing, such as wearing insulating gloves.
- Note that the capacitors indicated below are dangerous even after the power is turned off because an electric charge remains and a high voltage continues to exist there. Before starting any repair work, connect a discharging resistor (5 k-ohms/10 W) to the terminals of each capacitor indicated below to discharge electricity. The time required for discharging is about 30 seconds per each.
  C79, C80 on MAIN (1) P.C.B.

MAIN (1) (Side A)



• Semiconductor Location

Ref no.	Location
D47	H5
D48	I3
Q13	D5
Q14	D5
Q15	D5
Q16	C5
Q17	C5
Q18	B5
Q20	E6
Q21	G6
Q22	D6
Q23	D6
Q24	C6
Q25	G5
Q26	F5
Q27	H6
Q28	E5
Q29	D6
Q30	C5
Q31	G6
Q32	F6
Q33	F6
Q34	E6
Q35	H6
Q36	G6
Q37	E6
Q38	D6

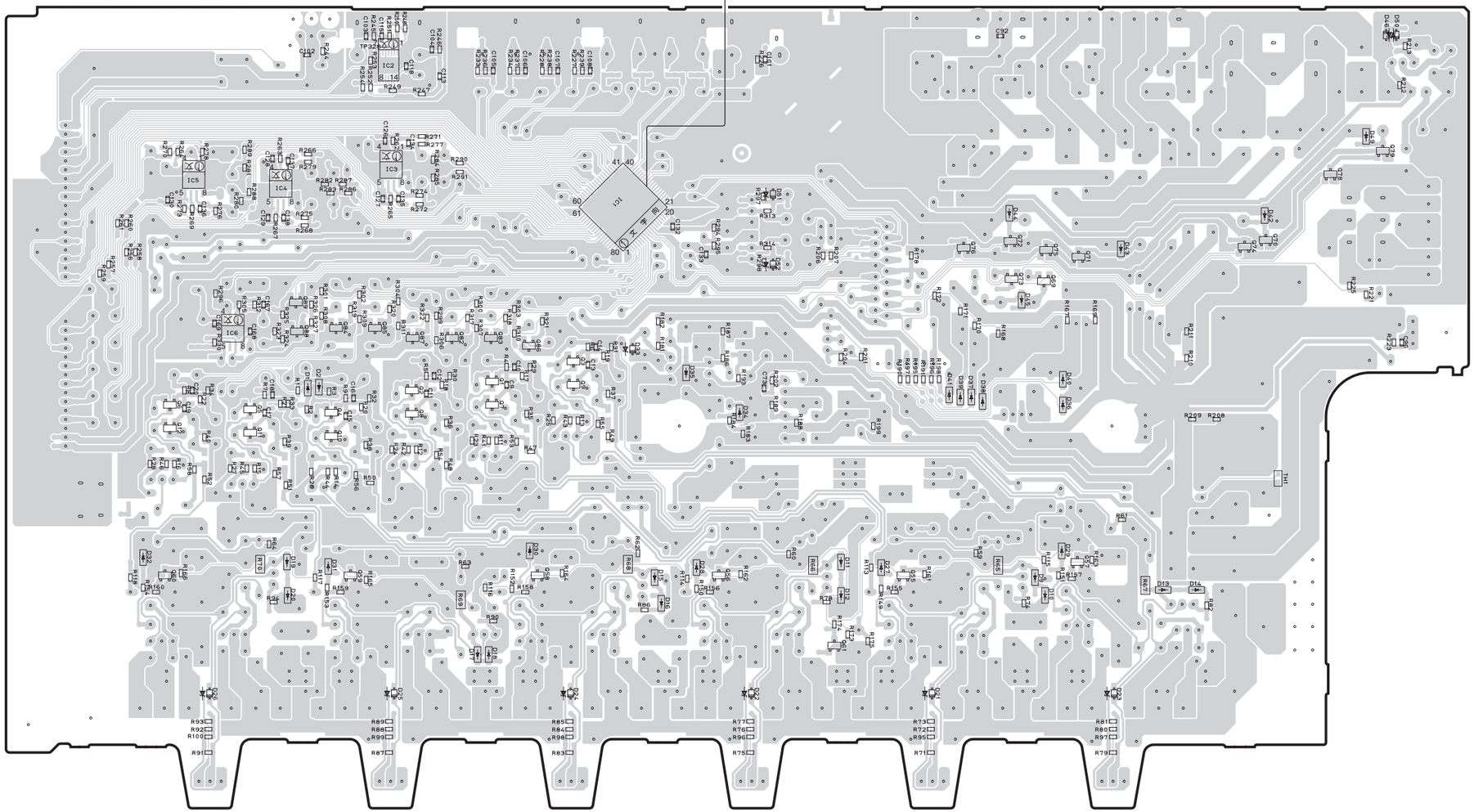
Ref no.	Location
Q39	D6
Q40	C6
Q41	C6
Q42	B6
Q43	G6
Q44	F6
Q45	F6
Q46	B6
Q47	G6
Q48	G6
Q49	E6
Q50	D6
Q51	D6
Q52	C6
Q53	C6
Q54	B6
Q62	E4
Q63	F5
Q64	E4
Q65	E4
Q66	F5
Q67	F5
Q68	F4
Q77	I3
Q80	E4
Q81	E4

MAIN (1) (Side B)

• Semiconductor Location

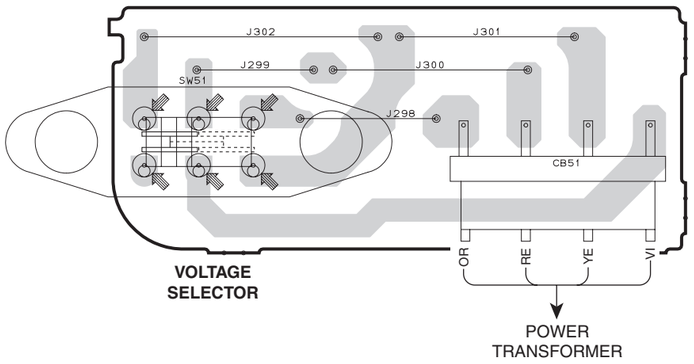
Ref no.	Location	Ref no.	Location	Ref no.	Location	Ref no.	Location	Ref no.	Location	Ref no.	Location	Ref no.	Location	Ref no.	Location	Ref no.	Location
D1	C4	D16	E5	D25	D6	D34	E5	D43	G4	IC2	D3	Q5	C5	Q56	E5	Q72	G4	Q84	C4
D2	C4	D17	D6	D26	C6	D35	E4	D44	G4	IC3	D3	Q6	B5	Q57	G5	Q73	G4	Q85	D4
D9	G5	D18	D6	D27	F5	D36	G5	D45	G4	IC4	C3	Q7	D5	Q58	D5	Q74	H4	Q86	D4
D10	G6	D19	C5	D28	E5	D37	G4	D46	I3	IC5	C3	Q8	D5	Q59	C5	Q75	G4	Q87	D4
D11	F5	D20	C6	D29	G5	D38	G5	D49	I3	IC6	C4	Q9	E4	Q60	B5	Q76	G4	Q88	C4
D12	F6	D21	F6	D30	D5	D39	F5	D50	I3	Q1	D4	Q10	C5	Q61	F6	Q78	H3	Q89	C4
D13	H6	D22	E6	D31	C5	D40	G4	D51	F3	Q2	D5	Q11	C5	Q69	G4	Q79	I3		
D14	H6	D23	G6	D32	B5	D41	F5	D52	F4	Q3	E4	Q12	B5	Q70	H4	Q82	D4		
D15	E5	D24	E6	D33	E4	D42	H4	IC1	E3	Q4	C5	Q55	F5	Q71	G4	Q83	D4		

No replacement part available.

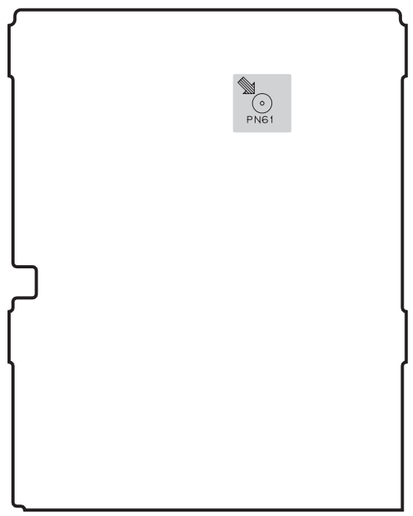


MAIN (3) (Side A)

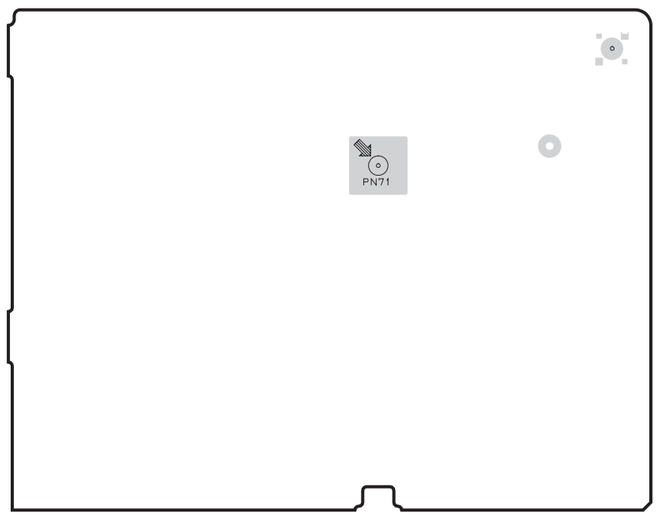
R model



MAIN (4) (Side A)

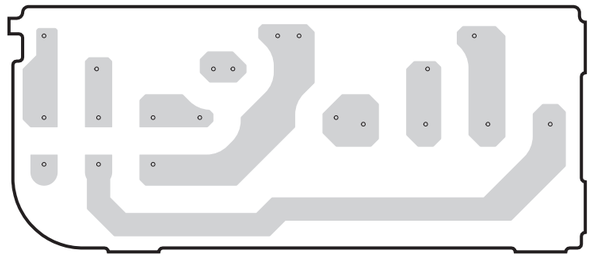


MAIN (5) (Side A)

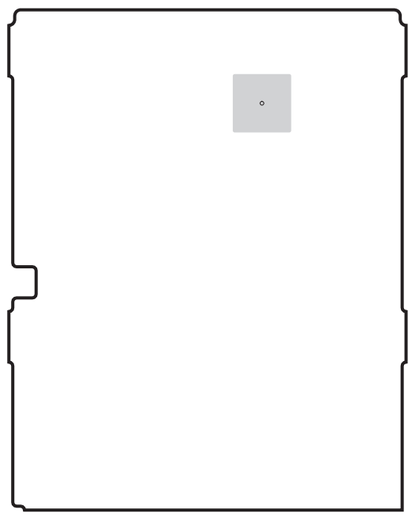


MAIN (3) (Side B)

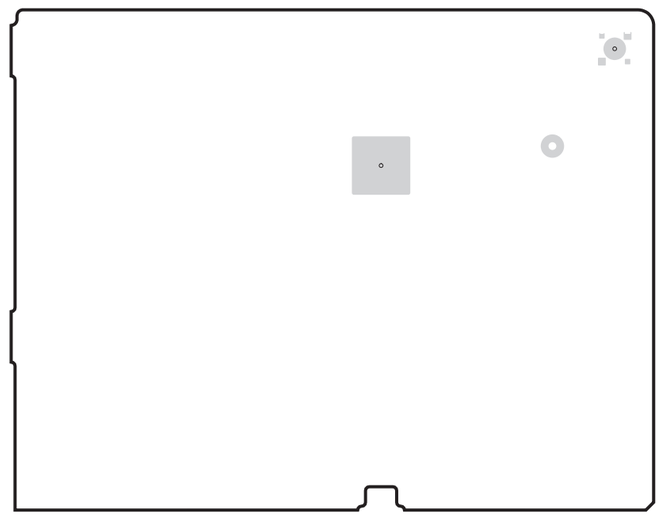
R model



MAIN (4) (Side B)



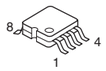
MAIN (5) (Side B)



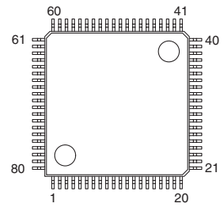
■ PIN CONNECTION DIAGRAMS

• ICs

BA4560F



BD3474KS2



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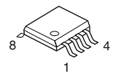
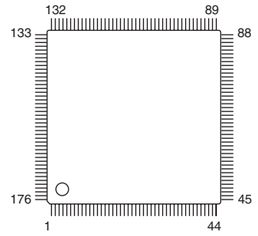
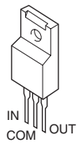


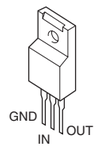
D80YK113DPTP400



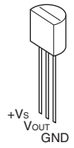
KIA7805API
KIA7812API



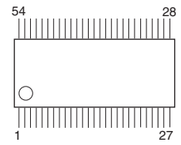
KIA7912PI



LM19CIZ/LF



M12L64164A-5TG



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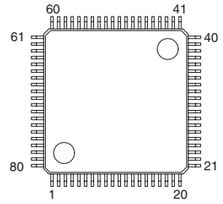

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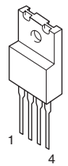
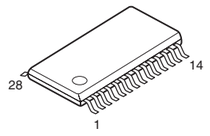
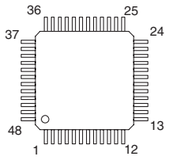


1. VIN
2. VOUT
3. GND
4. ON/OFF CONTROL

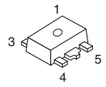
PCM1681PWPR



PCM9211PTR



R1191H050B-T1-FE
R1191H050D-T1-FE



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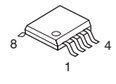
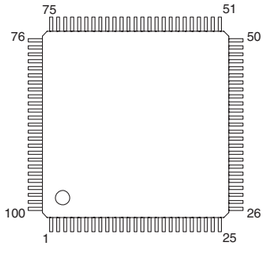


R3116N271A-TR-FE

SII9535CTUC



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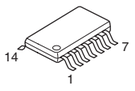
TC74VHCU04FT



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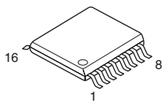
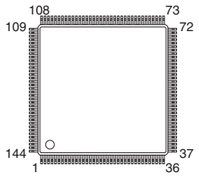


TMPM362F10FG(C,AS)



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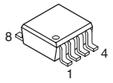

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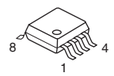
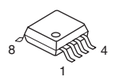
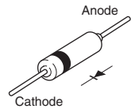


W25Q80BVSSIG

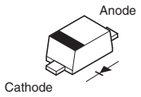


• Diodes

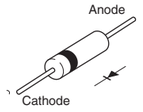
1N4003S



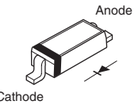
1SS355
1SS400TE61



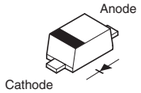
1T2



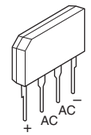
KDS160-RTK



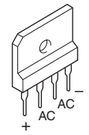
RB500V-40
RB501V-40
RB521SM



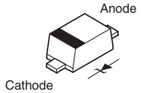
RS203M



TS6P03G

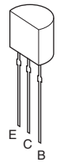


UDZV13B
UDZV4.7B
UDZV5.1B
UDZV5.6B
UDZV20B
UDZV7.5B

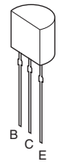


• Transistors

2N5401C-AT/P

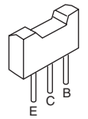


2N5551C-AT/P

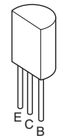


2SA1576UBTLR

2SA1708
2SC4488

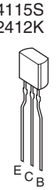


2SA1145
2SC2229



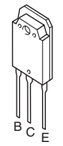
2SC2713-GR
INA6002AC1
INC6002AC1

2SC4115S
2SC2412K



2SD2704 K

2STA1695
2STC4468



DTA044EUBTL
DTC014EUBTL
DTC044EUBTL

1: IN
2: GND
3: OUT

HN4B01JE

1. BASE 1 (B1)
2. EMITTER (E)
3. BASE 2 (B2)
4. COLLECTOR 2 (C2)
5. COLLECTOR 1 (G2)

KRA104S-RTK
KRC102S-RTK

KTA1266 Y AT

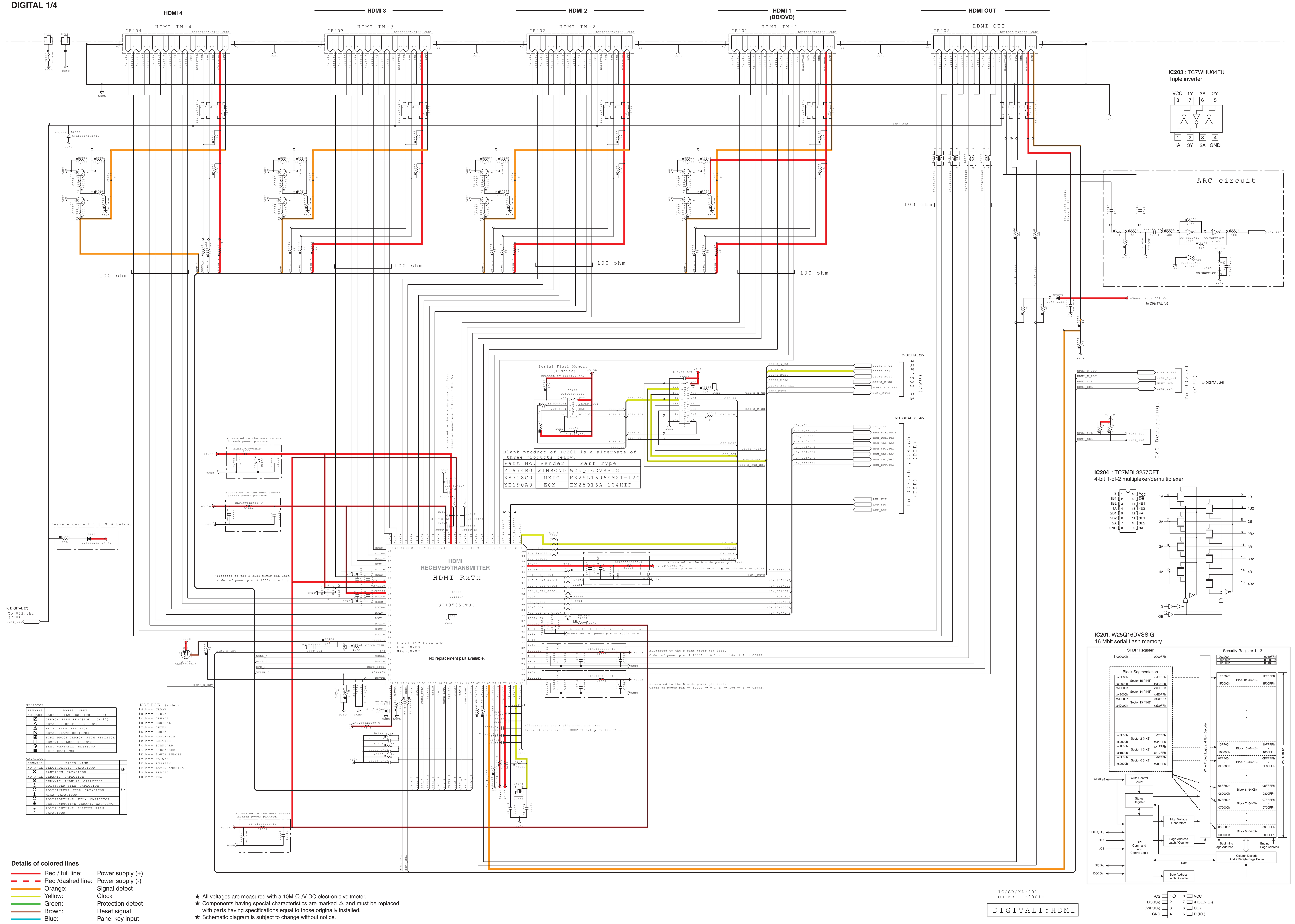
KTA1659A-Y-U/PF

KTC3198 Y AT

KTC3875S

■ SCHEMATIC DIAGRAMS

DIGITAL 1/4



Details of colored lines

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Red /dashed line:	Power supply (-)
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Yellow:	Clock
Green:	Protection detect
Brown:	Reset signal
Blue:	Panel key input

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DIGITAL 2/4

Page 87 B8
to OPERATION (1)_CB101
to OPE(1)
CB221

Page 89 I1
to MAIN (1)_CB1
to MAIN
CB222

to AM/FM TUNER
to TUNER PACK

MICROPROCESSOR

IC221

YF912AS

TMPM362F10FG(C,AS)

No replacement part available.

No replacement part available.

Force RESET

EEPROM

EEPROM
(32kbits)

IC222
R1EX25032ASA00A

IC222 alternate three products below.

Part No.	Vender	Part Type
YC408A0	RENESAS	R1EX25032ASA00A
YD833A0	ROHM	BR25S320FJ-WE2
YD902B0	ST-MICRO	M95320-RMN6TP

to 001.sht (HDMI)
to 001.sht (HDMI)
to DIGITAL 1/5
to 003.sht (DSP)
to DIGITAL 3/5
to 003.sht to 004.sht (DSP&DAC)
to DIGITAL 3/5, 4/5
to 004.sht (DIR&PS)
to DIGITAL 4/5

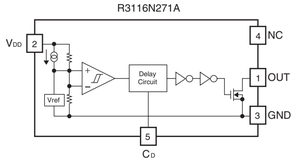
IC/CB/XL:221-
OHTER :2201-

DIGITAL2:CPU

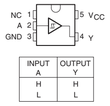
Test point.
Placed side by side to the B side connector.

IC223: R3116N271A-TR-F
Voltage detector

R3116N271A

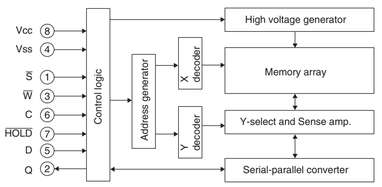


IC225: SN74LVC1G17DCKR
Single schmitt-trigger buffer



INPUT A	OUTPUT Y
H	H
L	L

IC222: R1EX25032ASA00A
4096 x 8-bit SPI serial interface EEPROM



RESISTOR

REMARKS	PARTS NAME
NO MARK	CARBON FILM RESISTOR (F=5%)
	CARBON FILM RESISTOR (F=10%)
	METAL OXIDE FILM RESISTOR
	METAL FILM RESISTOR
	METAL PLATE RESISTOR
	FIRE PROOF CARBON FILM RESISTOR
	CEMENT MOLDED RESISTOR
	SEMI VARIABLE RESISTOR
	CHIP RESISTOR

CAPACITOR

REMARKS	PARTS NAME
NO MARK	ELECTROLYTIC CAPACITOR
	TANTALUM CAPACITOR
NO MARK	CERAMIC CAPACITOR
	CERAMIC TUBULAR CAPACITOR
	POLYESTER FILM CAPACITOR
	POLYESTERENE FILM CAPACITOR
	MICA CAPACITOR
	POLYPROPILENE FILM CAPACITOR
	SEMICONDUCTIVE CERAMIC CAPACITOR
	POLYPHENYLENE SULFIDE FILM CAPACITOR

NOTICE (model)
{J} ..... JAPAN
{U} ..... U.S.A
{C} ..... CANADA
{G} ..... GENERAL
{T} ..... CHINA
{K} ..... KOREA
{A} ..... AUSTRALIA
{B} ..... BRITISH
{G} ..... STANDARD
{L} ..... SINGAPORE
{E} ..... SOUTH EUROPE
{V} ..... TAIWAN
{P} ..... RUSSIAN
{P} ..... LATIN AMERICA
{P} ..... BRAZIL
{H} ..... THAI

Details of colored lines

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Red /dashed line:	Power supply (-)
Orange:	Signal detect
Yellow:	Clock
Green:	Protection detect
Brown:	Reset signal
Blue:	Panel key input

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DIGITAL 3/4

to DIGITAL 2/5

to DIGITAL 1/5

to DIGITAL 4/5

A/D IN

C/SW FL/FR SL/SR

to DIGITAL 4/5

AUDIO DSP

IC241
D80YK113DPTP400
YD998D0

No replacement part available.

SDRAM 64 Mbit

SDRAM 64Mbit

IC243 alternate three products below.

Part No.	Vender	Part Type
X9625C0	ESMT	M12L64164A-5TG2Y
X2414F0	WINBOND	W9864G6JH-6
YD487C0	ZENTEL	A3V64S40GTP-60

Serial Flash Memory
(8Mbits)
Blank product of IC242 is a alternate of two products below.

Part No.	Vender	Part Type
YD762A0	WINBOND	W25Q80BVSSIG
YE005A0	EON	EN25Q80A-100HIP

Written by YES:YG375A0

IC/CB/XL:241-
OHTER :2401-

DIGITAL3:DSP

IC242: W25Q80BVSSIG
8 Mbit serial flash memory

IC243: M12L64164A-5TG
1M x 16-bit x 4 banks synchronous DRAM

Details of colored lines

Red / full line:	Power supply (+)
Red /dashed line:	Power supply (-)
Orange:	Signal detect
Yellow:	Clock
Green:	Protection detect
Brown:	Reset signal
Blue:	Panel key input

RESISTOR

REMARKS	PARTS NAME
NO MARK	CARBON FILM RESISTOR (F=5)
	CARBON FILM RESISTOR (F=10)
	METAL OXIDE FILM RESISTOR
	METAL FILM RESISTOR
	METAL PLATE RESISTOR
	FIRE PROOF CARBON FILM RESISTOR
	CEMENT MOLDED RESISTOR
	SEMI VARIABLE RESISTOR
	CHIP RESISTOR

CAPACITOR

REMARKS	PARTS NAME
NO MARK	ELECTROLYTIC CAPACITOR
	TANTALUM CAPACITOR
NO MARK	CERAMIC CAPACITOR
	CERAMIC TUBULAR CAPACITOR
	POLYESTER FILM CAPACITOR
	POLYSTYRENE FILM CAPACITOR
	MICA CAPACITOR
	POLYPROPYLENE FILM CAPACITOR
	SEMICONDUCTIVE CERAMIC CAPACITOR
	POLYPHENYLENE SULFIDE FILM CAPACITOR

NOTICE (model)
(C)..... JAPAN
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(G)..... STANDARD
(L)..... SINGAPORE
(E)..... SOUTH EUROPE
(T)..... TAIWAN
(P)..... RUSSIAN
(P)..... LATIN AMERICA
(B)..... BRAZIL
(H)..... THAI

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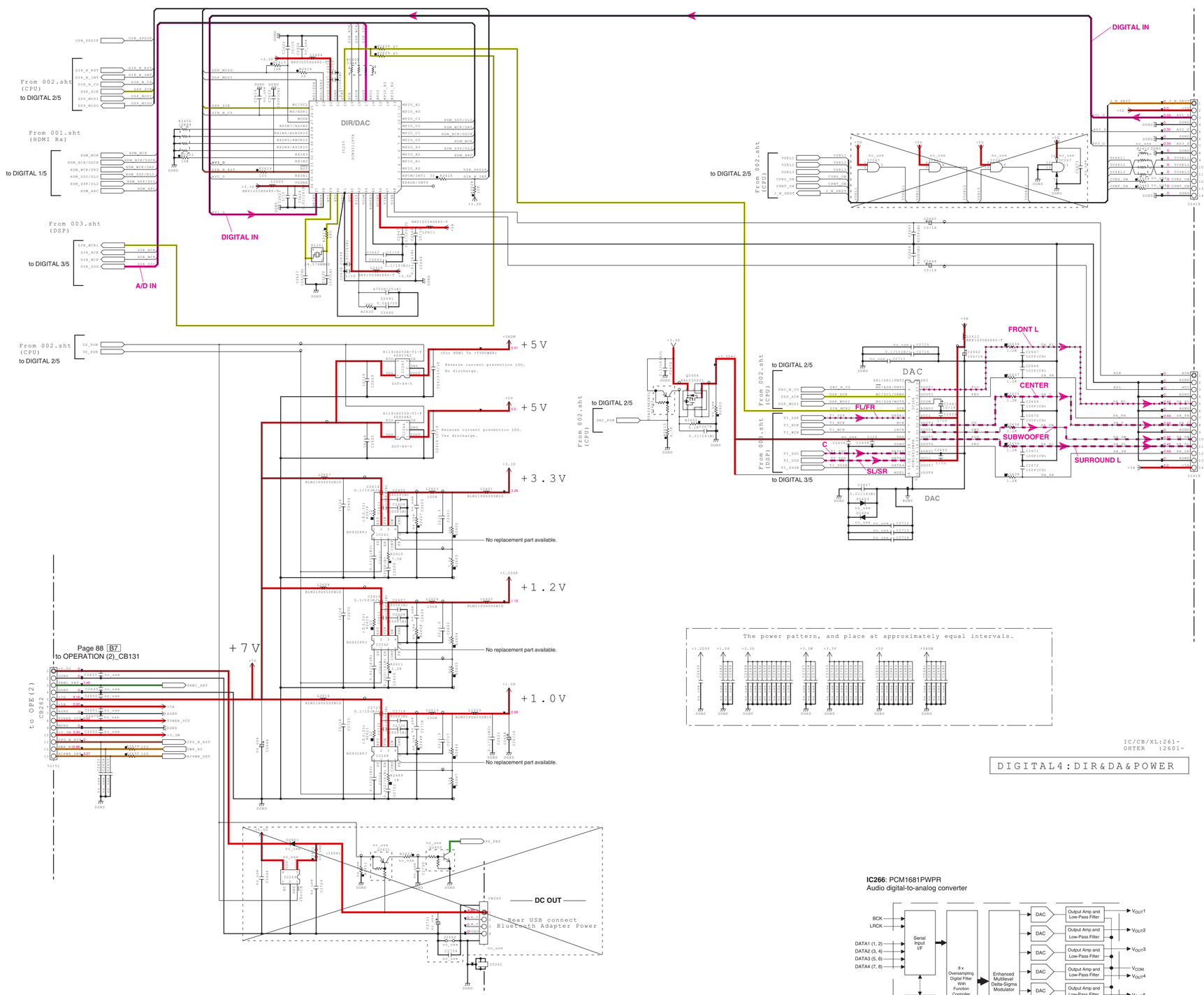
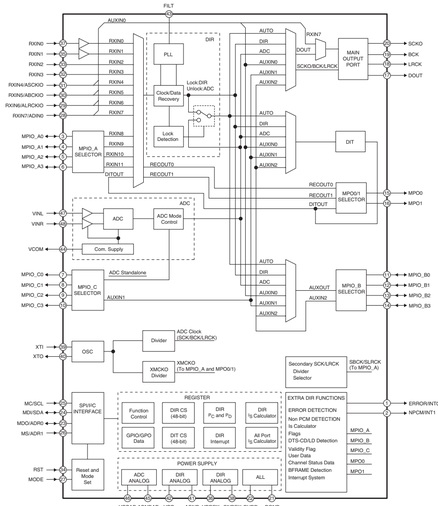
DIGITAL 4/4



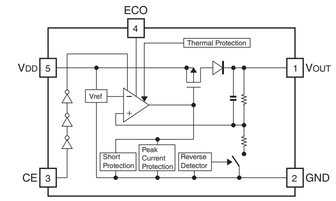
IC/CB/XL:261-
OHTER :2601-

DIGITAL4:DIR&DA&POWER

IC265: PCM9211PTR
216-kHz digital audio interface transceiver (DIX) with stereo ADC and routing

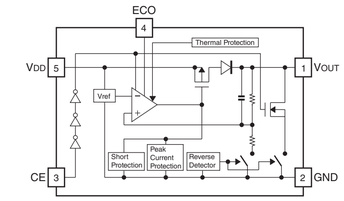


IC263: R1191H050B-T1-FE
Voltage regulator



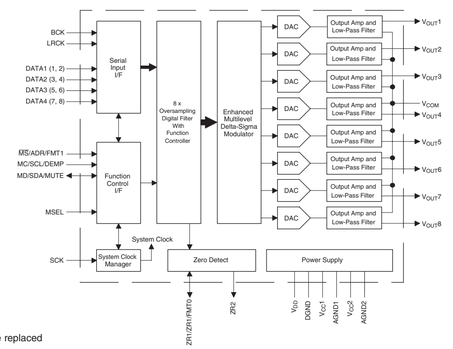
Pin No.	Symbol	Description
1	VOUT	Output Pin
2	GND	Ground Pin
3	CE	Chip Enable Pin ("H" Active)
4	ECO	Low Power / Fast Mode Changer Pin
5	VDD	Input Pin

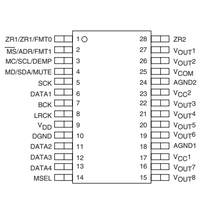
IC264: R1191H050D-T1-FE
Voltage regulator



Pin No.	Symbol	Description
1	VOUT	Output Pin
2	GND	Ground Pin
3	CE	Chip Enable Pin ("H" Active)
4	ECO	Low Power / Fast Mode Changer Pin
5	VDD	Input Pin

IC266: PCM1681PWPR
Audio digital-to-analog converter





Details of colored lines

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Orange:	Signal detect
Yellow:	Clock
Green:	Protection detect
Brown:	Reset signal
Blue:	Panel key input

RESISTOR

REMARKS	PARTS NAME
NO MARK	CARBON FILM RESISTOR (1/4)
	CARBON FILM RESISTOR (1/10)
	METAL OXIDE FILM RESISTOR
	METAL FILM RESISTOR
	METAL PLATE RESISTOR
	FIRE PROOF CARBON FILM RESISTOR
	CEMENT MOLDED RESISTOR
	SEMI-VARIABLE RESISTOR
	CHIP RESISTOR

CAPACITOR

REMARKS	PARTS NAME
NO MARK	ELECTROLYTIC CAPACITOR
	TANTALUM CAPACITOR
NO MARK	CERAMIC CAPACITOR
	CERAMIC TUBULAR CAPACITOR
	POLYESTER FILM CAPACITOR
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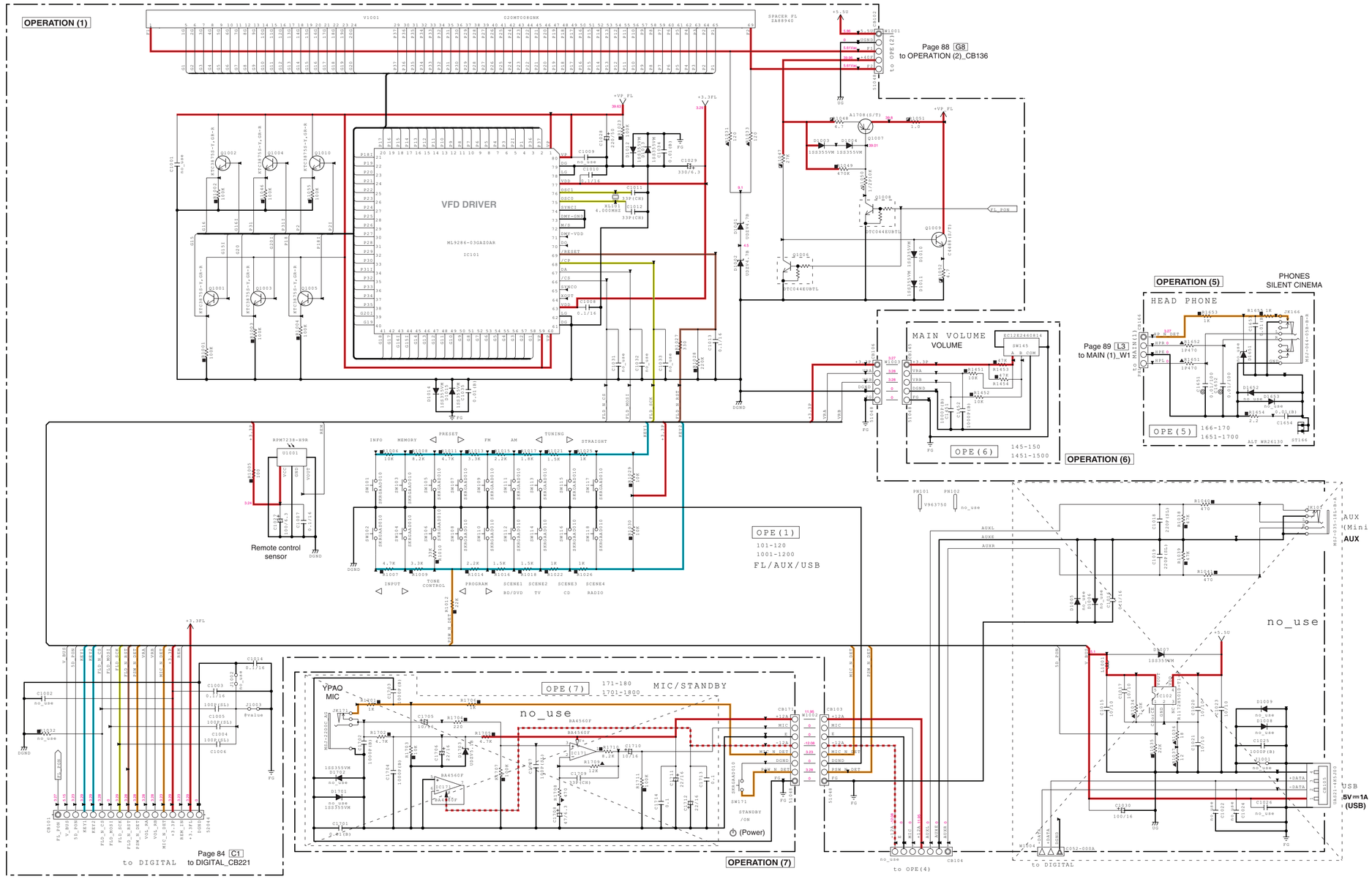
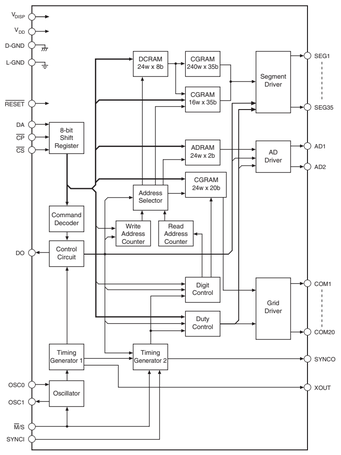
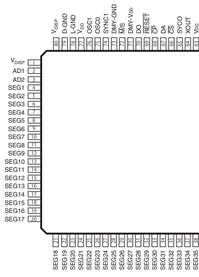
OPERATION 1/2



IC101: ML9286-03GAZ0ARL
VFD controller/driver





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Yellow:	Clock
Green:	Protection detect
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Blue:	Panel key input

RESISTOR

REMARKS	PARTS NAME
NO MARK	CARBON FILM RESISTOR (F=5%)
☑	CARBON FILM RESISTOR (F=1%)
△	METAL OXIDE FILM RESISTOR
△	METAL FILM RESISTOR
⊗	METAL PLATE RESISTOR
▨	FIRE PROOF CARBON FILM RESISTOR
□	CEMENT MOLDED RESISTOR
⊗	SEMI VARIABLE RESISTOR
■	CHIP RESISTOR

CAPACITOR

REMARKS	PARTS NAME
NO MARK	ELECTROLYTIC CAPACITOR
⊗	TANTALUM CAPACITOR
NO MARK	CERAMIC CAPACITOR
◉	CERAMIC TUBULAR CAPACITOR
◉	POLYESTER FILM CAPACITOR
◇	POLYSTYRENE FILM CAPACITOR
◐	MICA CAPACITOR
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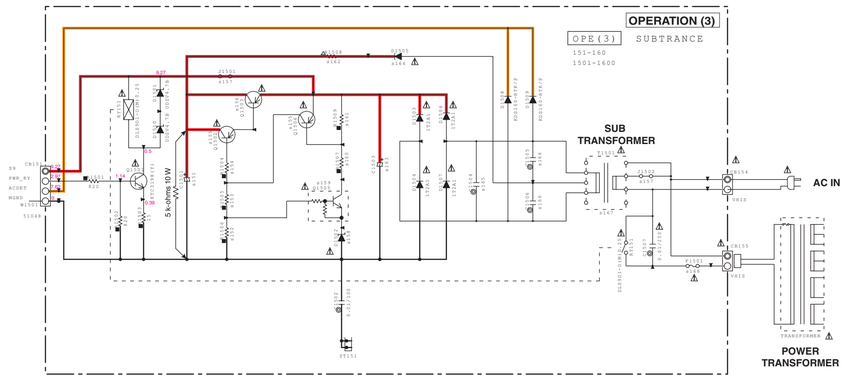
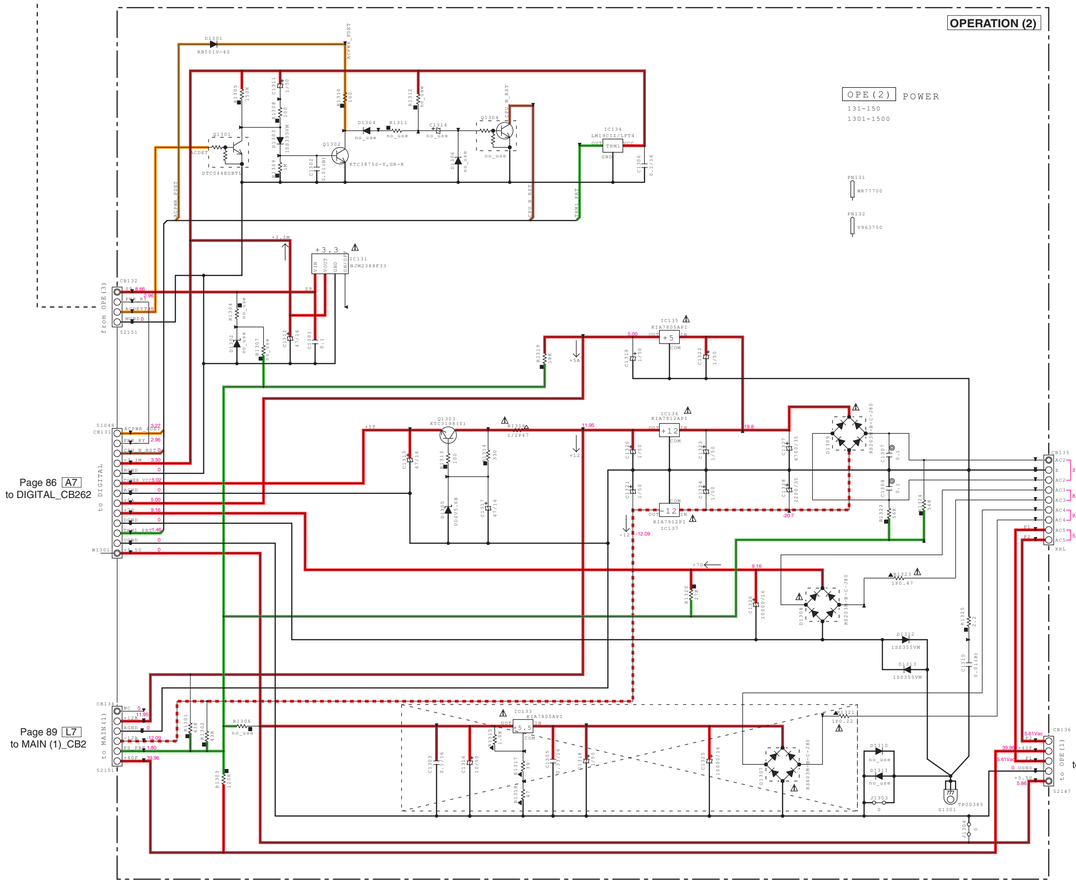
Key detection for A/D port
Key input (A/D) pull-up resistance: 10 k-ohms

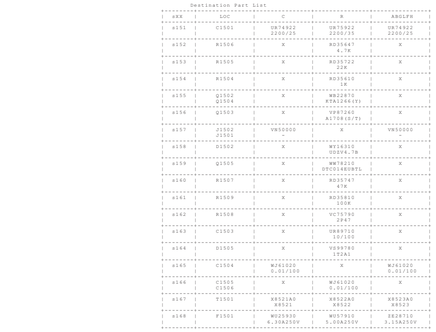
	0 Ω	+ 1.0 kΩ	+ 1.5 kΩ	+ 1.8 kΩ	+ 2.2 kΩ	+ 3.3 kΩ	+ 4.7 kΩ	+ 8.2 kΩ	+ 10 kΩ
Detected voltage value at 133 pin	0 – 0.15 V	0.15 – 0.48 V	0.49 – 0.82 V	0.83 – 1.14 V	1.15 – 1.46 V	1.47 – 1.79 V	1.80 – 2.12 V	2.13 – 2.40 V	2.41 – 2.91 V
A/D value (3.3 V=255)	0 – 11	12 – 37	38 – 64	65 – 88	89 – 113	114 – 139	140 – 164	165 – 186	187 – 226
KEY1	STRAIGHT	MUTE	FM MODE	TUNING >>	TUNING <<	PRESET >	PRESET <	MEMORY	INFO

	0 Ω	+ 1.0 kΩ	+ 1.0 kΩ	+ 1.5 kΩ	+ 1.5 kΩ	+ 2.2 kΩ	+ 3.3 kΩ	+ 4.7 kΩ	(22 kΩ + 33 kΩ)	+ 22 kΩ	+ 33 kΩ
Detected voltage value at 134 pin	0 – 0.15 V	0.15 – 0.42 V	0.43 – 0.70 V	0.71 – 0.97 V	0.98 – 1.24 V	1.25 – 1.53 V	1.54 – 1.84 V	1.84 – 2.10 V	2.11 – 2.33 V	2.34 – 2.54 V	2.55 – 2.97 V
A/D value (3.3 V=255)	0 – 11	12 – 32	33 – 54	55 – 75	76 – 96	97 – 119	120 – 142	143 – 163	164 – 181	182 – 197	198 – 229
KEY2	RADIO (SCENE4)	CD (SCENE3)	TV (SCENE2)	BD/DVD (SCENE1)	PROGRAM >	PROGRAM <	INPUT >	INPUT <	__	⏻ (power)	TONE CONTROL

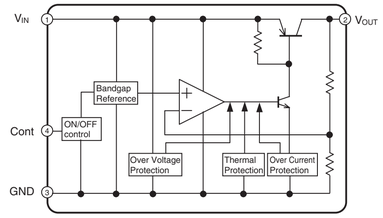
OPERATION 2/2



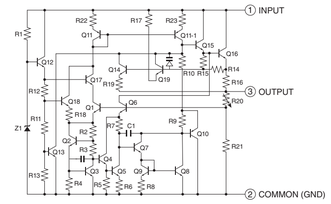




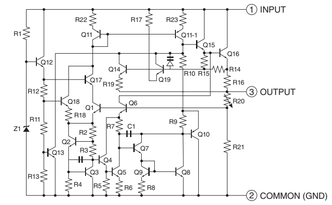
IC131: NJM2388F33
Low dropout voltage regulator with ON/OFF control



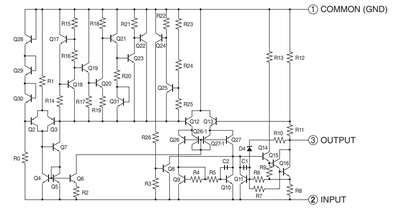
IC133, 135: KIA7805API
Voltage regulator



IC136: KIA7812API
Voltage regulator



IC137: KIA7912PI
Voltage regulator



Details of colored lines

Red / full line:	Power supply (+)
Red /dashed line:	Power supply (-)
Orange:	Signal detect
Yellow:	Clock
Green:	Protection detect
Brown:	Reset signal
Blue:	Panel key input

RESISTOR

REMARKS	PARTS NAME
NO MARK	CARBON FILM RESISTOR (P=5)
	CARBON FILM RESISTOR (P=10)
	METAL OXIDE FILM RESISTOR
	METAL FILM RESISTOR
	METAL PLATE RESISTOR
	FIRE PROOF CARBON FILM RESISTOR
	CEMENT MOLDED RESISTOR
	SEMI VARIABLE RESISTOR
	CHIP RESISTOR

CAPACITOR

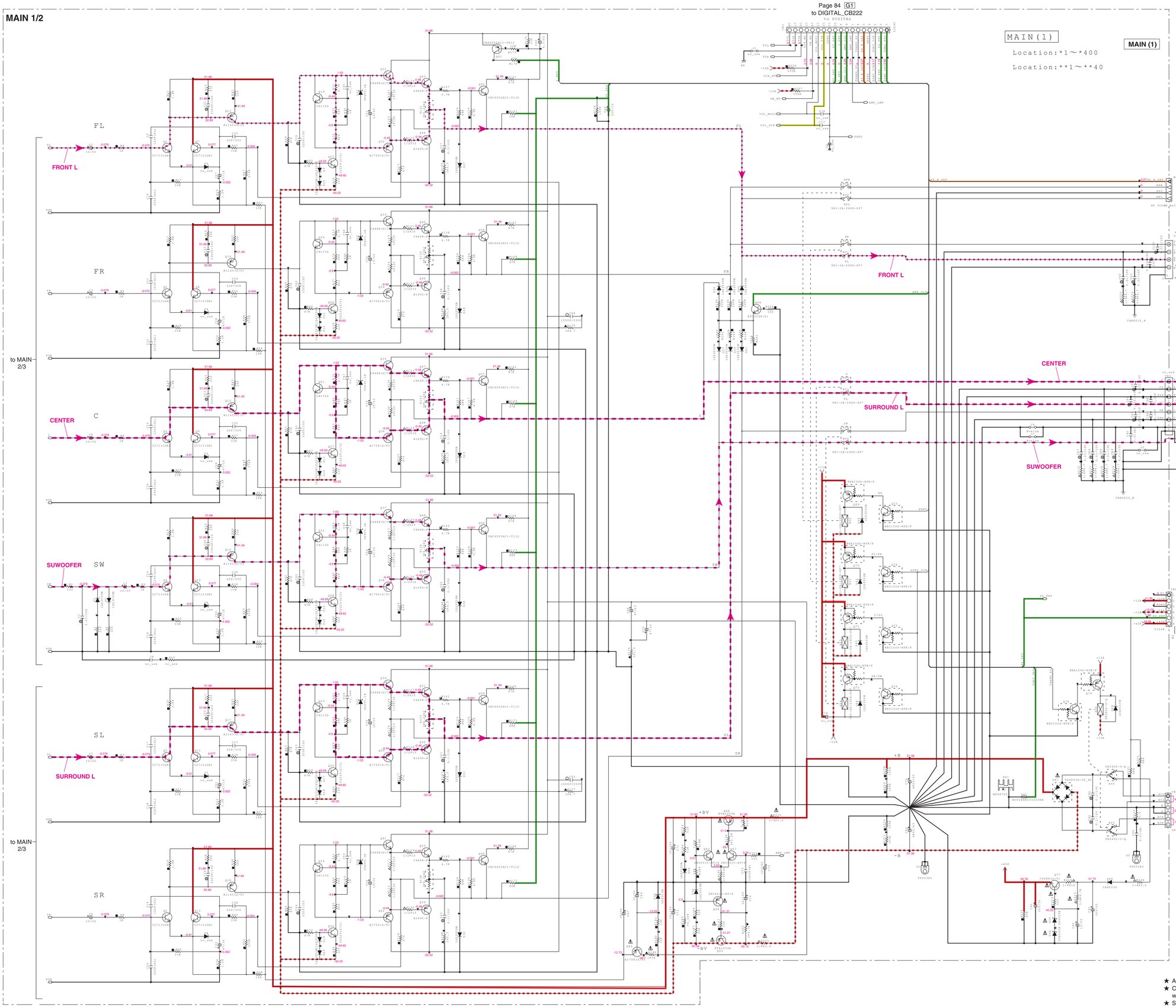
REMARKS	PARTS NAME
NO MARK	ELECTROLYTIC CAPACITOR
	TANTALUM CAPACITOR
NO MARK	CERAMIC CAPACITOR
	CERAMIC TUBULAR CAPACITOR
	POLYESTER FILM CAPACITOR
	POLYSTYRENE FILM CAPACITOR
	MICA CAPACITOR
	POLYPROPYLENE FILM CAPACITOR
	SEMICONDUCTIVE CERAMIC CAPACITOR
	POLYPHENYLENE SULFIDE FILM CAPACITOR

NOTICE (mode1)
(J) ..... JAPAN
(U) ..... U.S.A
(C) ..... CANADA
(B) ..... GENERAL
(K) ..... CHINA
(W) ..... KOREA
(A) ..... AUSTRALIA
(B) ..... BRITISH
(G) ..... STANDARD
(L) ..... SINGAPORE
(E) ..... SOUTH EUROPE
(D) ..... TAIWAN
(P) ..... RUSSIAN
(P) ..... LATIN AMERICA
(S) ..... BRAZIL
(H) ..... THAI

Safety measures
- Some internal parts in this product contain high voltages and are dangerous. Be sure to take safety measures during servicing, such as wearing insulating gloves.
- Note that the capacitors indicated below are dangerous even after the power is turned off because an electric charge remains and a high voltage continues to exist there. Before starting any repair work, connect a discharging resistor (5 k-ohms/10 W) to the terminals of each capacitor indicated below to discharge electricity. The time required for discharging is about 30 seconds per each.
C1501 on OPERATION (3) P.C.B.

★ All voltages are measured with a 10M Ω /V DC electronic voltmeter.
★ Components having special characteristics are marked ⚠ and must be replaced with parts having specifications equal to those originally installed.
★ Schematic diagram is subject to change without notice.

MAIN 1/2



RESISTOR	
REMARKS	PARTS NAME
NO MARK	CARBON FILM RESISTOR (F-5%)
	CARBON FILM RESISTOR (F-1%)
	METAL OXIDE FILM RESISTOR
	METAL FILM RESISTOR
	METAL PLATE RESISTOR
	FINE PROOF CARBON FILM RESISTOR
	CEMENT MOLDED RESISTOR
	SEMI VARIABLE RESISTOR
	CHIP RESISTOR

CAPACITOR	
REMARKS	PARTS NAME
NO MARK	ELECTROLYTIC CAPACITOR
	TANTALUM CAPACITOR
NO MARK	CERAMIC CAPACITOR
	CERAMIC TUBULAR CAPACITOR
	POLYESTER FILM CAPACITOR
	POLYSTYRENE FILM CAPACITOR
	MICA CAPACITOR
	POLYPROPYLENE FILM CAPACITOR
	SEMICONDUCTIVE CERAMIC CAPACITOR
	POLYPHENYLENE SULFIDE FILM CAPACITOR

NOTICE (model)
- (J)..... JAPAN
- (U)..... U.S.A
- (C)..... CANADA
- (G)..... GENERAL
- (T)..... CHINA
- (K)..... KOREA
- (A)..... AUSTRALIA
- (B)..... BRITISH
- (S)..... STANDARD
- (E)..... SINGAPORE
- (M)..... SOUTH EUROPE
- (O)..... TAIWAN
- (P)..... RUSSIAN
- (D)..... LATIN AMERICA
- (H)..... BRAZIL
- (N)..... THAI

Details of colored lines

Red / full line:	Power supply (+)
Red /dashed line:	Power supply (-)
Orange:	Signal detect
Yellow:	Clock
Green:	Protection detect
Brown:	Reset signal
Blue:	Panel key input

Safety measures

- Some internal parts in this product contain high voltages and are dangerous. Be sure to take safety measures during servicing, such as wearing insulating gloves.
- Note that the capacitors indicated below are dangerous even after the power is turned off because an electric charge remains and a high voltage continues to exist there.
  Before starting any repair work, connect a discharging resistor (5 k-ohms/10 W) to the terminals of each capacitor indicated below to discharge electricity.
  The time required for discharging is about 30 seconds per each.
  C79, C80 on MAIN (1) P.C.B.

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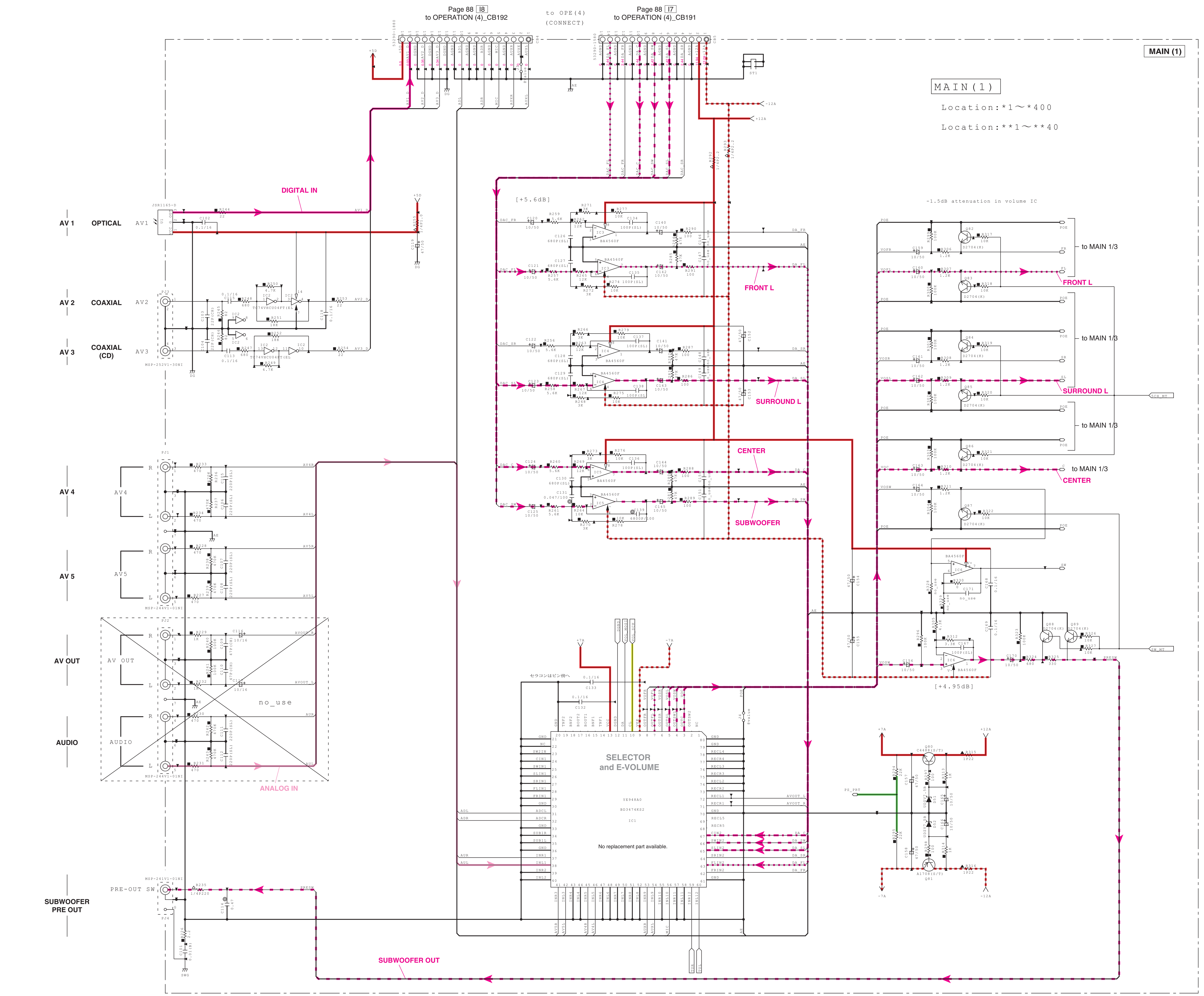
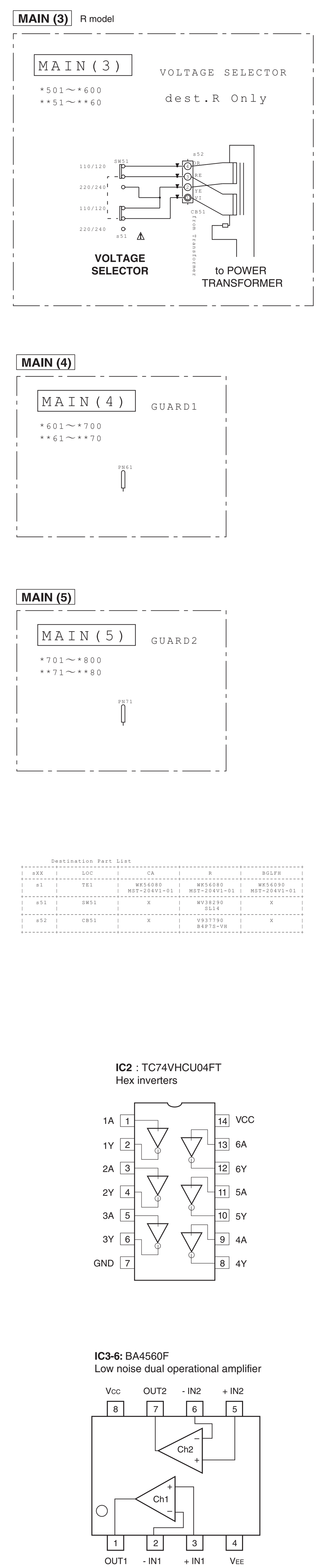
★ Schematic diagram is subject to change without notice.

MAIN 2/2





RESISTOR

REMARKS	PARTS NAME
NO MARK	CARBON FILM RESISTOR (P=5)
⍁	CARBON FILM RESISTOR (P=10)
△	METAL OXIDE FILM RESISTOR
▲	METAL FILM RESISTOR
⊠	METAL PLATE RESISTOR
◪	FIRE PROOF CARBON FILM RESISTOR
□	CEMENT MOLDED RESISTOR
⊘	SEMI VARIABLE RESISTOR
■	CHIP RESISTOR

CAPACITOR

REMARKS	PARTS NAME	
NO MARK	ELECTROLYTIC CAPACITOR	
⊗	TANTALUM CAPACITOR	
NO MARK	CERAMIC CAPACITOR	
◉	CERAMIC TUBULAR CAPACITOR	
◎	POLYESTER FILM CAPACITOR	
○	POLYSTYRENE FILM CAPACITOR	
⦶	MICA CAPACITOR	
Ⓟ	POLYPROPYLENE FILM CAPACITOR	
⊕	SEMICONDUCTIVE CERAMIC CAPACITOR	
Ⓢ	POLYPHENYLENE SULFIDE FILM CAPACITOR	

NOTICE (model)

(J)…… JAPAN
(U)…… U.S.A
(C)…… CANADA
(R)…… GENERAL
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(A)…… AUSTRALIA
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(F)…… RUSSIAN
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Blue:	Panel key input

★ All voltages are measured with a 10M Ω /V DC electronic voltmeter.
★ Components having special characteristics are marked ⚠ and must be replaced with parts having specifications equal to those originally installed.
★ Schematic diagram is subject to change without notice.

■ REPLACEMENT PARTS LIST

• ELECTRICAL COMPONENT PARTS

WARNING

● Components having special characteristics are marked ⚠ and must be replaced with parts having specifications equal to those originally installed.

ABBREVIATIONS IN THIS LIST ARE AS FOLLOWS:

C.A.EL.CHP : CHIP ALUMI.ELECTROLYTIC CAP
C.CE : CERAMIC CAP
C.CE.ARRAY : CERAMIC CAP ARRAY
C.CE.CHP : CHIP CERAMIC CAP
C.CE.M.CHP : CHIP MULTILAYER CERAMIC CAP
C.CE.SAFTY : RECOGNIZED CERAMIC CAP
C.CE.TUBLR : CERAMIC TUBULAR CAP
C.CE.SMI : SEMI CONDUCTIVE CERAMIC CAP
C.EL : ELECTROLYTIC CAP
C.EL.BP : BIPOLAR ELECTROLYTIC CAP
C.EL.CHP : CHIP ELECTROLYTIC CAP
C.MICA : MICA CAP
C.ML.FLM : MULTILAYER FILM CAP
C.MP : METALLIZED POLYESTER FILM CAP
C.MYLAR : MYLAR FILM CAP
C.MYLAR.ML : MULTILAYER MYLAR FILM CAP
C.NIOB.OXD : NIOBIUM OXIDE CAP
C.PAPER : PAPER CAPACITOR
C.PLS : POLYSTYRENE FILM CAP
C.POL : POLYESTER FILM CAP
C.PP : POLYPROPYLENE FILM CAP
C.PP.CHP : CHIP POLYPROPYLENE FILM CAP
C.TNTL : TANTALIUM CAP
C.TNTL.CHP : CHIP TANTALIUM CAP
C.TRIM : TRIMMER CAP
CN : CONNECTOR
CN.BS.PIN : CONNECTOR,BASE PIN
CN.CANNON : CONNECTOR,CANNON
CN.DIN : CONNECTOR,DIN
CN.FLAT : CONNECTOR,FLAT CABLE
CN.FFC : CONNECTOR,FLEXIBLE FLAT CABLE
CN.HDMI : HDMI CONNECTOR
CN.PHOTO.R : PHOTO FIBER SENSOR,RECEIVED
CN.PHOTO.T : PHOTO FIBER SENSOR,TRANSMITTED
D.SCHOTTKY : SCHOTTKY BARRIER DIODE
DIODE.ARRAY : DIODE ARRAY
DIODE.BRG : DIODE BRIDGE
DIODE.CHP : CHIP DIODE
DIODE.VAR : VARACTOR DIODE
DIODE.ZENR : ZENER DIODE
DIODE.Z.CHP : CHIP ZENER DIODE
DIODE.PHOT : PHOTO DIODE
FER.BEAD : FERRITE BEADS
FER.CORE : FERRITE CORE
FET.CHP : CHIP FET
FL.DSPLY : FLUORESCENT DISPLAY
FLTR.CE : CERAMIC FILTER
FLTR.COMB : COMB FILTER MODULE
FLTR.LC.RF : LC FILTER,EMI
FUSE.CHP : CHIP FUSE
GND.MTL : GROUND PLATE
GND.TERM : GROUND TERMINAL
JUMPER.CN : JUMPER CONNECTOR
JUMPER.TST : JUMPER,TEST POINT
L.DTCT : LIGHT DETECTING MODULE
LED.CHP : CHIP LED
LED.DSPLY : LED DISPLAY
LED.INFRD : LED,INFRARED
PHOT.CPL : PHOTO COUPLER
PHOT.INTR : PHOTO INTERRUPTER
PHOT.RFLCT : PHOTO REFLECTOR
PHOT.TR : PHOTO TRANSISTOR
PIN.TEST : PIN,TEST POINT
PTC.THERM : POSITIVE TEMPERATURE COEFFICIENT THERMISTOR
R.ANTI.SURGE : FIXED ANTI SURGE RESISTOR
R.ARRAY : RESISTOR ARRAY
R.CAR. : CARBON RESISTOR
R.CAR.CHP : CHIP RESISTOR
R.CAR.FP : FLAME PROOF CARBON RESISTOR
R.CEMENT : CEMENT RESISTOR
R.CHP : CHIP RESISTOR
R.FUS : FUSIBLE RESISTOR
R.MTL.CHP : CHIP METAL FILM RESISTOR
R.MTL.FLM : METAL FILM RESISTOR
R.MTL.OXD : METAL OXIDE FILM RESISTOR
R.MTL.PLAT : METAL PLATE RESISTOR
RSNR.CE : CERAMIC RESONATOR
RSNR.CRYS : CRYSTAL RESONATOR
SCR.BND.HD : BIND HEAD B-TIGHT SCREW
SCR.TERM : SCREW TERMINAL
SCR.TR : SCREW,TRANSISTOR
SURG.PRTCT : SURGE PROTECTOR
SUPRT.PCB : P.C.B. SUPPORT
SW.LEVER : LEVER SWITCH
SW.MICRO : MICRO SWITCH
SW.LEAF : LEAF SWITCH
SW.PUSH : PUSH SWITCH
SW.RT : ROTARY SWITCH
SW.RT.ENC : ROTARY ENCODER
SW.RT.MTR : ROTARY SWITCH WITH MOTOR
SW.SLIDE : SLIDE SWITCH
SW.TACT : TACT SWITCH
TERM.SP : SPEAKER TERMINAL
TERM.WRAP : WRAPPING TERMINAL
THRMST.CHP : CHIP THERMISTOR
TR : TRANSISTOR
TR.CHP : CHIP TRANSISTOR
TR.DGT : DIGITAL TRANSISTOR
TR.DGT.CHP : CHIP DIGITAL TRANSISTOR
TR.PAIR : PAIR TRANSISTOR
TRANS : TRANSFORMER
TRANS.PULS : PULSE TRANSFORMER
TRANS.PWR : POWER TRANSFORMER
VARISTOR.C : CHIP VARISTOR
VOLT.SELCT : VOLTAGE SELECTOR
VR : ROTARY POTENTIOMETER
VR.MTR : POTENTIOMETER WITH MOTOR
VR.SLIDE : SLIDE POTENTIOMETER
VR.SW : POTENTIOMETER WITH SWITCH
VR.TRIM : TRIMMER POTENTIOMETER

DIGITAL

	Ref No.	Part No.	Description			Markets
*		ZJ995800	P. C. B.	DIGITAL		
	CB201-205	ZD534300	CN. HDMI	19P SE		
	CB221	VF982300	CN. BS. PIN	17P		
	CB222	VQ044800	CN. BS. PIN	18P		
	CB223	VQ044400	CN. BS. PIN	9P		
	CB224	WC196200	CN. BS. PIN	12P TE	FMN	
	CB262	VK027200	CN	13P		
	CB263-264	VQ961700	CN. BS. PIN	14P		
	C2004-2006	WD758300	C. CE. CHP	10uF	10V	
	C2009-2010	WD758300	C. CE. CHP	10uF	10V	
	C2011	US625100	C. CE. CHP	0. 1uF	10V	
	C2012	US663100	C. CE. CHP	1000pF	50V	
	C2013	WE773800	C. CE. M. CHP	1uF	10V B	
	C2015-2017	US625100	C. CE. CHP	0. 1uF	10V	
	C2018-2019	US663100	C. CE. CHP	1000pF	50V	
	C2020	US625100	C. CE. CHP	0. 1uF	10V	
	C2022-2024	WE773800	C. CE. M. CHP	1uF	10V B	
	C2025	US625100	C. CE. CHP	0. 1uF	10V	
	C2026	US663100	C. CE. CHP	1000pF	50V	
	C2027	US625100	C. CE. CHP	0. 1uF	10V	
	C2028	US663100	C. CE. CHP	1000pF	50V	
	C2029	US625100	C. CE. CHP	0. 1uF	10V	
	C2030-2031	US663100	C. CE. CHP	1000pF	50V	
	C2032	US662100	C. CE. CHP	100pF	50V	
	C2033-2034	US663100	C. CE. CHP	1000pF	50V	
	C2035-2037	US625100	C. CE. CHP	0. 1uF	10V	
	C2038	WD758300	C. CE. CHP	10uF	10V	
	C2039	US663100	C. CE. CHP	1000pF	50V	
	C2040	US625100	C. CE. CHP	0. 1uF	10V	
	C2041	WD758300	C. CE. CHP	10uF	10V	
	C2042-2043	US625100	C. CE. CHP	0. 1uF	10V	
	C2044-2045	US660900	C. CE. CHP	9pF	50V	
	C2046	US625100	C. CE. CHP	0. 1uF	10V	
	C2048-2049	US046100	C. CE. CHP	1uF	25V	
	C2050	US661220	C. CE. CHP	22pF	50V	
	C2051-2052	US625100	C. CE. CHP	0. 1uF	10V	
	C2053	UF138220	C. EL. CHP	220uF	16V	
	C2057	WD758300	C. CE. CHP	10uF	10V	
	C2070-2071	US663100	C. CE. CHP	1000pF	50V	
	C2072	US625100	C. CE. CHP	0. 1uF	10V	
	C2218-2220	US625100	C. CE. CHP	0. 1uF	10V	
	C2221-2224	US634100	C. CE. CHP	0. 01uF	16V	
	C2227-2230	US634100	C. CE. CHP	0. 01uF	16V	
	C2234	US625100	C. CE. CHP	0. 1uF	10V	
	C2236-2238	US625100	C. CE. CHP	0. 1uF	10V	
	C2240	US625100	C. CE. CHP	0. 1uF	10V	
	C2241	US662100	C. CE. CHP	100pF	50V	
	C2242	US625100	C. CE. CHP	0. 1uF	10V	
	C2253	US625100	C. CE. CHP	0. 1uF	10V	
	C2260	WD758300	C. CE. CHP	10uF	10V	
	C2263	WD758300	C. CE. CHP	10uF	10V	
	C2264	US662100	C. CE. CHP	100pF	50V	
	C2267	US662100	C. CE. CHP	100pF	50V	
	C2268	US625100	C. CE. CHP	0. 1uF	10V	
	C2269-2270	US046100	C. CE. CHP	1uF	25V	
	C2271	US634150	C. CE. CHP	0. 015uF	16V	
	C2273	US625100	C. CE. CHP	0. 1uF	10V	
	C2279	UF027330	C. EL. CHP	33uF	10V	
	C2280	UF018100	C. EL. CHP	100uF	6. 3V	
	C2281	UF027330	C. EL. CHP	33uF	10V	
	C2402	US663100	C. CE. CHP	1000pF	50V	
	C2403	US662470	C. CE. CHP	470pF	50V	
	C2404-2405	US661180	C. CE. CHP	18pF	50V	
	C2406	US625100	C. CE. CHP	0. 1uF	10V	

* New Parts

Ref No.	Part No.	Description			Markets
C2407	US634100	C. CE. CHP	0. 01uF	16V	
C2408-2417	US625100	C. CE. CHP	0. 1uF	10V	
C2422-2429	US625100	C. CE. CHP	0. 1uF	10V	
C2431-2436	US625100	C. CE. CHP	0. 1uF	10V	
C2438	US625100	C. CE. CHP	0. 1uF	10V	
C2440-2442	US625100	C. CE. CHP	0. 1uF	10V	
C2446-2459	US625100	C. CE. CHP	0. 1uF	10V	
C2460-2463	WD758300	C. CE. CHP	10uF	10V	
C2464-2468	US625100	C. CE. CHP	0. 1uF	10V	
C2469	WD758300	C. CE. CHP	10uF	10V	
C2470-2471	US625100	C. CE. CHP	0. 1uF	10V	
C2601-2602	WJ344400	C. CE. CHP	22uF	6. 3V	
C2605	US663390	C. CE. CHP	3900pF	50V	
C2606	US663100	C. CE. CHP	1000pF	50V	
C2607	US663390	C. CE. CHP	3900pF	50V	
C2608	US663100	C. CE. CHP	1000pF	50V	
C2609	US663330	C. CE. CHP	3300pF	50V	
C2610	US634220	C. CE. CHP	0. 022uF	16V	
C2611-2612	US663100	C. CE. CHP	1000pF	50V	
C2613	WD758300	C. CE. CHP	10uF	10V	
C2614-2615	US625100	C. CE. CHP	0. 1uF	10V	
C2616	WD758300	C. CE. CHP	10uF	10V	
C2617	US625100	C. CE. CHP	0. 1uF	10V	
C2618	US634100	C. CE. CHP	0. 01uF	16V	
C2620	US662100	C. CE. CHP	100pF	50V	
C2621	US625100	C. CE. CHP	0. 1uF	10V	
C2622	WD758300	C. CE. CHP	10uF	10V	
C2623	US126100	C. CE. CHP	1uF	10V	
C2624	US634100	C. CE. CHP	0. 01uF	16V	
C2625	WK004400	C. CE. M. CHP	10uF	16V	
C2627	US661120	C. CE. CHP	12pF	50V	
C2628	UF138220	C. EL. CHP	220uF	16V	
C2629	WK004400	C. CE. M. CHP	10uF	16V	
C2632	US661150	C. CE. CHP	15pF	50V	
C2634-2635	WK004400	C. CE. M. CHP	10uF	16V	
C2636	US126100	C. CE. CHP	1uF	10V	
C2637	US634100	C. CE. CHP	0. 01uF	16V	
C2638	US126100	C. CE. CHP	1uF	10V	
C2639	US634100	C. CE. CHP	0. 01uF	16V	
C2640	UB214680	C. CE. CHP	0. 068uF	25V	
C2641	US643470	C. CE. CHP	4700pF	25V	
C2642	WD758300	C. CE. CHP	10uF	10V	
C2643	US625100	C. CE. CHP	0. 1uF	10V	
C2647	US625100	C. CE. CHP	0. 1uF	10V	
C2648	WD758300	C. CE. CHP	10uF	10V	
C2649	US634100	C. CE. CHP	0. 01uF	16V	
C2657	US634100	C. CE. CHP	0. 01uF	16V	
C2658-2660	US126100	C. CE. CHP	1uF	10V	
C2661	UF037100	C. EL. CHP	10uF	16V	
C2662	UF438100	C. EL. CHP	100uF	16V	
C2663-2664	US062820	C. CE. CHP	820pF	50V B	
C2665-2666	UF037100	C. EL. CHP	10uF	16V	
C2667-2672	US662100	C. CE. CHP	100pF	50V	
C2676	US625100	C. CE. CHP	0. 1uF	10V	
C2678	US634100	C. CE. CHP	0. 01uF	16V	
C2716	US625100	C. CE. CHP	0. 1uF	10V	
C2717	WJ344400	C. CE. CHP	22uF	6. 3V	
C2719	US663390	C. CE. CHP	3900pF	50V	
C2720	US663100	C. CE. CHP	1000pF	50V	
C2721	US634220	C. CE. CHP	0. 022uF	16V	
C2722	US663100	C. CE. CHP	1000pF	50V	
C2723-2724	US625100	C. CE. CHP	0. 1uF	10V	
C2725	WK004400	C. CE. M. CHP	10uF	16V	
D2002	V2376600	D. SCHOTTKY	RB500V-40		

* New Parts

DIGITAL and OPERATION

	Ref No.	Part No.	Description		Markets
	D2005	ZF358000	PROTECTOR	ESD7004MUTAG	
	D2008	ZF358000	PROTECTOR	ESD7004MUTAG	
	D2011	ZF358000	PROTECTOR	ESD7004MUTAG	
	D2014	ZF358000	PROTECTOR	ESD7004MUTAG	
	D2017	ZF358000	PROTECTOR	ESD7004MUTAG	
	D2023	VV220700	D. SCHOTTKY	RB501V-40	
	D2201	WW783900	DIODE	1SS355VM	
	D2202-2203	WJ785100	DIODE	1SS400TE61 TE-	
	D2204	ZJ683500	D. SCHOTTKY	RB521SM-30T2R TP	
*	IC201	YG374A00	IC. MEMORY	W25Q16DVSSIG	(written)
	IC203	X4063A00	IC	TC7WHU04FU	
	IC204	YD236A00	IC	TC7MBL3257CFT	
	IC222	YC408A00	IC. MEMORY	R1EX25032ASA00A	
	IC223	YC109A00	IC	R3116N271A-TR-F	
	IC225	X4453A00	IC	SN74LVC1G17DCKR	
*	IC242	YG375A00	IC. MEMORY	W25Q80BVSSIG	(written)
	IC243	X9625C00	IC. MEMORY	M12L64164A-5TG2Y	
	IC263	YD957A00	IC	R1191H050B-T1-FE	
	IC264	YD956A00	IC	R1191H050D-T1-FE	
	IC265	YD216A00	IC	PCM9211PTR	
	IC266	X9870A00	IC	PCM1681PWPR	
	Q2009	WH445000	FET	3LN01C-TB-E	
	Q2202-2204	WY001400	TR. ARRAY	HN4B01JE	
	Q2205	WZ461700	TR. CHP	2SA1576UBTLR	
	Q2209-2210	WZ461700	TR. CHP	2SA1576UBTLR	
	Q2603	WW782000	TR. DGT	DTA044EUBTL	
	Q2604	WZ703400	FET	RAL035P01	
	XL201	ZA692800	RSNR. CRYS	27MHz DSX321G	
	XL221	WA782500	RSNR. CE	8MHz	
	XL241	WN318100	RSNR. CRYS	20MHz DSX321G	
	XL261	ZF825600	RSNR. CRYS	24.576MHz SK-1038	
*		ZJ995300	P. C. B.	OPERATION	C
*		ZJ995400	P. C. B.	OPERATION	R
*		ZJ995600	P. C. B.	OPERATION	ABGFLH
	CB101	VF982300	CN. BS. PIN	17P	
	CB132	VK026300	CN. BS. PIN	4P	
	CB134	VK026500	CN. BS. PIN	6P	
	CB135	LB919090	CN. BS. PIN	9P	
	CB136	VK024900	CN. BS. PIN	52147 5P TE	
⚠	CB154-155	VG879900	CN. BS. PIN	2P	
	CB166	VB858300	CN. BS. PIN	4P	
	CB191	VQ961800	CN. BS. PIN	15P	
	CB192	VQ962100	CN. BS. PIN	18P	
	CB195-196	VQ963500	CN. BS. PIN	14P	
	C1003	US035100	C. CE. CHP	0. 1uF 16V B	
	C1004-1006	US062100	C. CE. CHP	100pF 50V B	
	C1007-1008	US035100	C. CE. CHP	0. 1uF 16V B	
	C1010	US035100	C. CE. CHP	0. 1uF 16V B	
	C1011-1012	US061330	C. CE. CHP	33pF 50V B	
	C1013-1014	US035100	C. CE. CHP	0. 1uF 16V B	
	C1027	UM388100	C. EL	100uF 6. 3V	
	C1028	UR868220	C. EL	220uF 50V	
	C1029	UM388330	C. EL	330uF 6. 3V	
	C1034-1035	US064100	C. CE. CHP	0. 01uF 50V B	
	C1301	WU447000	C. CE. CHP	0. 1uF 50V K	
	C1302	US064100	C. CE. CHP	0. 01uF 50V B	
	C1306	US035100	C. CE. CHP	0. 1uF 16V B	
	C1307-1308	VR168300	C. MYLAR	0. 1uF 50V	
	C1310	US064100	C. CE. CHP	0. 01uF 50V B	
	C1311	UR866100	C. EL	1uF 50V	
	C1312-1313	UR837470	C. EL	47uF 16V	

* New Parts

	Ref No.	Part No.	Description		Markets
	C1317	UR837470	C. EL	47uF 16V	
	C1319-1324	UR866100	C. EL	1uF 50V	
	C1326	UR73A100	C. EL	10000uF 16V	
	C1327	UR759470	C. EL	4700uF 35V	
	C1328	UR759220	C. EL	2200uF 35V	
	C1451-1452	US063100	C. CE. CHP	1000pF 50V B	
	C1501	UR749220	C. EL	2200uF 25V	CABGFLH
	C1501	UR759220	C. EL	2200uF 35V	R
	C1502	WJ610200	C. MYLAR	0. 01uF 100V	
	C1503	UR897100	C. EL	10uF 100V	R
	C1504	WJ610200	C. MYLAR	0. 01uF 100V	CABGFLH
	C1505-1506	WJ610200	C. MYLAR	0. 01uF 100V	R
⚠	C1507	WQ939400	C. CE. SAFTY	0. 01uF 250V	
	C1651-1652	WJ610200	C. MYLAR	0. 01uF 100V	
	C1653-1654	US064100	C. CE. CHP	0. 01uF 50V B	
	D1001-1002	WY163100	DIODE. ZENR	UDZV4. 7B	
	D1003-1004	WW783900	DIODE	1SS355VM	
	D1010-1015	WW783900	DIODE	1SS355VM	
	D1301	VV220700	D. SCHOTTKY	RB501V-40	
	D1303	WW783900	DIODE	1SS355VM	
	D1305	WY163300	DIODE. ZENR	UDZV5. 6B	
⚠	D1308-1309	WH487300	DIODE. BRG	RS203M 2. 0A 200V	
	D1312-1313	WW783900	DIODE	1SS355VM	
	D1501	WY163100	DIODE. ZENR	UDZV4. 7B	
⚠	D1502	WY163100	DIODE. ZENR	UDZV4. 7B	R
⚠	D1503-1504	VS997800	DIODE	1T2	
⚠	D1505	VS997800	DIODE	1T2	R
⚠	D1506-1507	VS997800	DIODE	1T2	
	D1508-1509	WC398800	DIODE	KDS160-RTK	
	D1510	WY163100	DIODE. ZENR	UDZV4. 7B	
⚠ *	F1501	WU259300	FUSE	6. 3A 250V	C
⚠ *	F1501	WU579100	FUSE	5A 250V	R
⚠	F1501	ZE287100	FUSE	3. 15A 250V	ABGFLH
	IC101	YF855A00	IC	ML9286-03GAZOARL	
⚠	IC131	X6248A00	IC	NJM2388F33	
	IC134	YA381A00	IC	LM19CIZ/LF THERMAL	
⚠	IC135	X4928A00	IC	KIA7805API 5V	
⚠	IC136	X4153A00	IC	KIA7812API	
⚠	IC137	X4154A00	IC	KIA7912PI	
	JK166	WZ975700	JACK. PHONE	MSJ-064-05B-B-RF	
	Q1001-1005	WC529400	TR	KTC3875S Y GR RTK	
	Q1006	WW782300	TR. DGT	DTC044EUBTL	
	Q1007	VP872600	TR	2SA1708 S, T	
	Q1008	WW782300	TR. DGT	DTC044EUBTL	
	Q1009	VP872700	TR	2SC4488 S, T	
	Q1010	WC529400	TR	KTC3875S Y GR RTK	
	Q1301	WW782300	TR. DGT	DTC044EUBTL	
	Q1302	WC529400	TR	KTC3875S Y GR RTK	
	Q1303	WB228800	TR	KTC3198 Y AT	
⚠	Q1501	WB228800	TR	KTC3198 Y AT	
⚠	Q1502	WB228700	TR	KTA1266 Y AT	R
⚠	Q1503	VP872600	TR	2SA1708 S, T	R
⚠	Q1504	WB228700	TR	KTA1266 Y AT	R
⚠	Q1505	WW782100	TR. DGT	DTC014EUBTL	R
	R1031	WW969500	R. MTL. OXD	120Ω 1/4W	
	R1033	WW969500	R. MTL. OXD	120Ω 1/4W	
	R1047	WW866700	R. CAR. FP	27KΩ 1/4W	
	R1048	WW861700	R. CAR. FP	4. 7Ω 1/4W	
	R1050	HL007100	R. MTL. OXD	10KΩ 1/2W	
	R1051	WW861100	R. CAR. FP	1Ω 1/4W	
	R1052	WW861700	R. CAR. FP	4. 7Ω 1/4W	
⚠	R1316	HL004470	R. MTL. OXD	47Ω 1/2W	
⚠	R1323	WJ682000	R. MTL. FLM	0. 47Ω 1W J	
	R1508	VC757900	R. MTL. OXD	47Ω 2W	R

* New Parts

OPERATION and MAIN

	Ref No.	Part No.	Description		Markets
	R1651-1652	WJ685600	R. MTL. FLM	470Ω 1W J	
⚠	RY151	V9366900	RELAY	DLS9D1-0(M)0.25W	
	SW101-118	WD483100	SW. TACT	SKRGAAD010	
	SW145	V9597100	SW. RT. ENC	EC12E2460802	
	SW171	WD483100	SW. TACT	SKRGAAD010	
⚠	T1501	X8521A00	TRANS. PWR		C
⚠	T1501	X8522A00	TRANS. PWR		R
⚠	T1501	X8523A00	TRANS. PWR		ABGFLH
	U1001	WR153900	L. DTCT	RPM7238-H9R	
	V1001	ZJ801000	FL. DSPLY	020MT008GNK	
	XL101	ZJ062700	RSNR. CRYS	HC-49US	
		ZA889500	FL. SPACER	8x30x4.3	
*		ZJ994900	P. C. B.	MAIN	CA
*		ZJ995000	P. C. B.	MAIN	R
*		ZJ995100	P. C. B.	MAIN	BGFLH
	CB1	VP573800	CN. BS. PIN	18P	
	CB3	LB932060	CN. BS. PIN	6P	
	CB4	VQ963900	CN. BS. PIN	18P	
	CB5	VQ963600	CN. BS. PIN	15P	
	CB51	V9377900	CN. BS. PIN	4P	R
	C1	WJ610200	C. MYLAR	0.01uF 100V	
	C2-7	WY270200	C. EL	10uF 50V	
	C9	US062120	C. CE. CHP	120pF 50V B	
	C10	US062220	C. CE. CHP	220pF 50V B	
	C11	US062120	C. CE. CHP	120pF 50V B	
	C12	US062220	C. CE. CHP	220pF 50V B	
	C13	US062120	C. CE. CHP	120pF 50V B	
	C14	US062220	C. CE. CHP	220pF 50V B	
	C15	US062120	C. CE. CHP	120pF 50V B	
	C16	US062220	C. CE. CHP	220pF 50V B	
	C17	US062120	C. CE. CHP	120pF 50V B	
	C18	US062220	C. CE. CHP	220pF 50V B	
	C19	US062120	C. CE. CHP	120pF 50V B	
	C20	US062220	C. CE. CHP	220pF 50V B	
	C21-26	WJ609500	C. MYLAR	3300pF 100V	
	C27-32	UR837470	C. EL	47uF 16V	
	C33-38	WQ627600	C. CE	22pF 500V	
	C39-44	WJ608400	C. MYLAR	330pF 100V	
	C51-56	UR867100	C. EL	10uF 50V	
	C57-62	ZH996900	C. MYLAR	0.1uF 100V	
	C63	UR866470	C. EL	4.7uF 50V	
	C64-65	WN156000	C. PP	1000pF 250V	
	C66	UR828220	C. EL	220uF 10V	
	C67	UR867100	C. EL	10uF 50V	
	C68	UR877470	C. EL	47uF 63V	
	C69	UR867330	C. EL	33uF 50V	
	C70	UR877470	C. EL	47uF 63V	
	C71-72	UR897100	C. EL	10uF 100V	
	C73	US063100	C. CE. CHP	1000pF 50V B	
	C74-75	UR897100	C. EL	10uF 100V	
	C79-80	ZJ902900	C. EL	6800uF 63V	
	C81	UR868100	C. EL	100uF 50V	
	C82	UR867100	C. EL	10uF 50V	
	C83-84	WJ610200	C. MYLAR	0.01uF 100V	
	C85-86	WJ611400	C. MYLAR	0.1uF 100V J	
	C87	UR878100	C. EL	100uF 63V	
	C88-90	WJ610200	C. MYLAR	0.01uF 100V	
	C91	WJ610600	C. MYLAR	0.022uF 100V	
	C92	US064100	C. CE. CHP	0.01uF 50V B	
	C93	WJ610200	C. MYLAR	0.01uF 100V	
	C94-95	WJ610600	C. MYLAR	0.022uF 100V	

* New Parts

	Ref No.	Part No.	Description		Markets
	C96	US064100	C. CE. CHP	0.01uF 50V B	
	C97	WJ610600	C. MYLAR	0.022uF 100V	
	C100	WJ610600	C. MYLAR	0.022uF 100V	
	C101	US064100	C. CE. CHP	0.01uF 50V B	
	C102	US135100	C. CE. CHP	0.1uF 16V	
	C103-104	US061220	C. CE. CHP	22pF 50V B	
	C105-108	US062220	C. CE. CHP	220pF 50V B	
	C113	US135100	C. CE. CHP	0.1uF 16V	
	C114	VR169200	C. MYLAR	0.47uF 50V	
	C115	US135100	C. CE. CHP	0.1uF 16V	
	C118	US135100	C. CE. CHP	0.1uF 16V	
	C119	UR867470	C. EL	47uF 50V	
	C120-125	WY270200	C. EL	10uF 50V	
	C126-130	US062680	C. CE. CHP	680pF 50V B	
	C131	WJ611000	C. MYLAR	0.047uF 100V	
	C132-133	US135100	C. CE. CHP	0.1uF 16V	
	C134-138	US062100	C. CE. CHP	100pF 50V B	
	C139	WJ609900	C. MYLAR	6800pF 100V	
	C140-145	WY270200	C. EL	10uF 50V	
	C152-155	UR867470	C. EL	47uF 50V	
	C156	WY270200	C. EL	10uF 50V	
	C157-158	UR867470	C. EL	47uF 50V	
	C159-164	WY270200	C. EL	10uF 50V	
	C165-166	UR867100	C. EL	10uF 50V	
	C167	US062100	C. CE. CHP	100pF 50V B	
	C168-169	US135100	C. CE. CHP	0.1uF 16V	
	C170	WY270200	C. EL	10uF 50V	
	D1-2	WW783900	DIODE	1SS355VM	
	D9-20	WW783900	DIODE	1SS355VM	
	D21-26	WY163200	DIODE. ZENR	UDZV5.1B	
	D27-32	WW783900	DIODE	1SS355VM	
	D33	WY164200	DIODE. ZENR	UDZV13B	
	D34-45	WW783900	DIODE	1SS355VM	
⚠	D46	WY164600	DIODE. ZENR	UDZV20B	
⚠	D47	WA653200	DIODE. BRG	TS6P03G 6A 200V	
	D48	WU201600	DIODE	1N4003S TP	
	D49	WW783900	DIODE	1SS355VM	
⚠	D50	WY164600	DIODE. ZENR	UDZV20B	
	D51-52	WY163600	DIODE. ZENR	UDZV7.5B	
	IC2	XZ509A00	IC	TC74VHCU04FT INVER	
	IC3-6	YD779A00	IC	BA4560F OP AMP	
	PJ1	V7046700	JACK. PIN	4P MSP-244V1-01NI	
	PJ3	V9420700	JACK. PIN	2P MSP-252V1-30NI	
	PJ4	V7189700	JACK. PIN	1P	
	Q1-12	WK452300	TR	2SC2713 GR	
	Q13-18	ZH762900	TR	2SA1145 O,Y	
	Q19-24	ZD495300	TR	2SC4115S S	
	Q25-30	ZH763000	TR	2SC2229 O,Y	
	Q31	VP872700	TR	2SC4488 S,T	
	Q32	VP872600	TR	2SA1708 S,T	
	Q33	VP872700	TR	2SC4488 S,T	
	Q34	VP872600	TR	2SA1708 S,T	
	Q35	VP872700	TR	2SC4488 S,T	
	Q36	VP872600	TR	2SA1708 S,T	
	Q37	VP872700	TR	2SC4488 S,T	
	Q38	VP872600	TR	2SA1708 S,T	
	Q39	VP872700	TR	2SC4488 S,T	
	Q40	VP872600	TR	2SA1708 S,T	
	Q41	VP872700	TR	2SC4488 S,T	
	Q42	VP872600	TR	2SA1708 S,T	
	Q43	ZF358200	TR. POWER	2STC4468	
	Q44	ZF358100	TR. POWER	2STA1695	
	Q45	ZF358200	TR. POWER	2STC4468	
	Q46	ZF358100	TR. POWER	2STA1695	

* New Parts

MAIN

	Ref No.	Part No.		Description	Markets
	Q47	ZF358200	TR. POWER	2STC4468	
	Q48	ZF358100	TR. POWER	2STA1695	
	Q49	ZF358200	TR. POWER	2STC4468	
	Q50	ZF358100	TR. POWER	2STA1695	
	Q51	ZF358200	TR. POWER	2STC4468	
	Q52	ZF358100	TR. POWER	2STA1695	
	Q53	ZF358200	TR. POWER	2STC4468	
	Q54	ZF358100	TR. POWER	2STA1695	
	Q55-60	ZF457100	TR	INC6002AC1-T112-1W	
	Q61	ZF457000	TR	INA6002AC1-TH12-1W	
⚠	Q62	VP872600	TR	2SA1708 S,T	
⚠	Q63	WC398400	TR	2N5551C-AT	
⚠	Q64	WC397700	TR	2N5401C-AT	
⚠	Q65-66	WW510000	TR	KTA1659A-Y-U/PF	
⚠	Q67	WC398400	TR	2N5551C-AT	
	Q68	WB228800	TR	KTC3198 Y AT	
	Q69-72	WC434900	TR. DGT	KRA104S-RTK	
	Q73-76	WC435000	TR. DGT	KRC102S-RTK	
⚠	Q77	VP872700	TR	2SC4488 S,T	
	Q78	WC435000	TR. DGT	KRC102S-RTK	
	Q79	WC434900	TR. DGT	KRA104S-RTK	
	Q80	VP872700	TR	2SC4488 S,T	
	Q81	VP872600	TR	2SA1708 S,T	
	Q82-89	WC883400	TR	2SD2704 K	
	R101-106	WJ684900	R. MTL. FLM	120Ω 1W	
	R107-112	WU950700	R. MTL. OXD	120Ω 1/2W	
	R119-130	WU949400	R. MTL. OXD	10Ω 1/2W	
	R131-136	WP839400	R. CEMENT	0.22+0.22 3W	
	R137-142	WW865600	R. CAR. FP	4.7KΩ 1/4W	
*	R143-148	WJ683000	R. MTL. FLM	3.3Ω 1W	
	R176-177	WJ683200	R. MTL. FLM	4.7Ω 1W	
	R179	WJ682400	R. MTL. FLM	1Ω 1W J	
⚠	R180	WJ686000	R. MTL. FLM	1KΩ 1W	
	R192	WZ679800	R. MTL. OXD	560Ω 1/4W	
	R194	WJ686900	R. MTL. FLM	5.6KΩ 1W	
	R200	WJ686800	R. MTL. FLM	4.7KΩ 1W	
⚠	R203	WZ676500	R. MTL. OXD	1Ω 1/4W	
⚠	R205	WZ676500	R. MTL. OXD	1Ω 1/4W	
⚠	R214	WZ677700	R. MTL. OXD	10Ω 1/4W	
⚠	R215	WZ680900	R. MTL. OXD	4.7KΩ 1/4W	
	R216-220	WZ677300	R. MTL. OXD	4.7Ω 1/4W	
	R222	WZ677300	R. MTL. OXD	4.7Ω 1/4W	
⚠	R224	WZ676900	R. MTL. OXD	2.2Ω 1/4W	
	R235	WZ679300	R. MTL. OXD	220Ω 1/4W	
	R255	WZ676500	R. MTL. OXD	1Ω 1/4W	
	R292-293	WZ676900	R. MTL. OXD	2.2Ω 1/4W	
	R315-316	WJ684000	R. MTL. FLM	22Ω 1W	
	RY1-4	WJ122400	RELAY	981-2A-24DS-SP7	
	RY5	WE648700	RELAY	DC DH24D2-O-Q	
	SW51	WV382900	SW. SLIDE	SL14	R
	TE1	WK560800	TERM. SP	4P MST-204V1-01 NC	CAR
	TE1	WK560900	TERM. SP	4P MST-204V1-01 WC	BGFLH
*	TE3	ZJ079600	TERM. SP	8P MPT-118V2-05-76	
	TH1	V9760200	THRMST. CHP	NCP18XH103J03RB	
	U1	WU204200	CN. PHOTO. R	1P JSR1165-D	
		WE774200	SCR. BND. HD	3x10 MFZN2W3	

* New Parts

Carbon Resistors

Value	**1/4W** Type Part No.	**1/6W** Type Part No.	Value	**1/4W** Type Part No.	**1/6W** Type Part No.
1.0 Ω	HJ35 3100	HF85 3100	11 kΩ	HF45 7110	HF45 7110
1.8 Ω	HJ35 3180	❊	12 kΩ	HJ35 7120	HF85 7120
2.2 Ω	HJ35 3220	HF85 3220	13 kΩ	HF45 7130	HF45 7130
3.3 Ω	HJ35 3330	HF85 3330	15 kΩ	HF45 7150	HF45 7150
4.7 Ω	HJ35 3470	HF85 3470	18 kΩ	HF45 7180	HF45 7180
5.6 Ω	HJ35 3560	HF85 3560	22 kΩ	HF45 7220	HF45 7220
10 Ω	HF45 4100	HF45 4100	24 kΩ	HF45 7240	HF45 7240
15 Ω	HJ35 4150	HF85 4150	27 kΩ	HJ35 7270	HF85 7270
22 Ω	HF45 4220	HF45 4220	30 kΩ	HF45 7300	HF45 7300
27 Ω	HJ35 4270	HF85 4270	33 kΩ	HF45 7330	HF45 7330
33 Ω	HF45 4330	HF45 4330	36 kΩ	HF45 7360	HF45 7360
39 Ω	HJ35 4470	HF85 4390	39 kΩ	HF45 7390	HF45 7390
47 Ω	HF45 4470	HF45 4470	47 kΩ	HF45 7470	HF45 7470
56 Ω	HF45 4560	HF45 4560	51 kΩ	HF45 7510	HF45 7510
68 Ω	HF45 4680	HF45 4680	56 kΩ	HF45 7560	HF45 7560
75 Ω	HF45 4750	HF45 4750	62 kΩ	HF45 7620	HF45 7620
82 Ω	HF45 4820	HF45 4820	68 kΩ	HF45 7680	HF45 7680
91 Ω	HF45 4910	HF45 4910	82 kΩ	HF45 7820	HF45 7820
100 Ω	HF45 5100	HF45 5100	91 kΩ	HF45 7910	HF45 7910
110 Ω	HJ35 5110	HF85 5110	100 kΩ	HF45 8100	HF45 8100
120 Ω	HF45 5120	HF45 5120	110 kΩ	HF45 8110	HF45 8110
150 Ω	HF45 5150	HF45 5150	120 kΩ	HF45 8120	HF45 8120
160 Ω	HJ35 5160	❊	130 kΩ	HF45 8130	❊
180 Ω	HF45 5180	HF45 5180	150 kΩ	HF45 8150	HF45 8150
200 Ω	HF45 5200	HF45 5200	180 kΩ	HF45 8180	HF45 8180
220 Ω	HF45 5220	HF45 5220	220 kΩ	HJ35 8220	HF85 8220
270 Ω	HF45 5270	HF45 5270	270 kΩ	HF45 8270	HF45 8270
330 Ω	HF45 5330	HF45 5330	300 kΩ	HF45 8300	HF45 8300
390 Ω	HF45 5390	HF45 5390	330 kΩ	HF45 8330	HF45 8330
430 Ω	HF45 5430	HF45 5430	390 kΩ	HJ35 8390	HF85 8390
470 Ω	HF45 5470	HF45 5470	470 kΩ	HF45 8470	HF45 8470
510 Ω	HF45 5510	HF45 5510	560 kΩ	HJ35 8560	HF85 8560
560 Ω	HF45 5560	HF45 5560	680 kΩ	HJ35 8680	HF85 8680
680 Ω	HF45 5680	HF45 5680	820 kΩ	HJ35 8820	HF85 8820
820 Ω	HF45 5820	HF45 5820	1.0 MΩ	HF45 9100	HF45 9100
910 Ω	HF45 5910	HF45 5910	1.2 MΩ	HJ35 9120	❊
1.0 kΩ	HF45 6100	HF45 6100	1.5 MΩ	HJ35 9150	HF85 9150
1.2 kΩ	HF45 6120	HF45 6120	1.8 MΩ	HJ35 9180	HF85 9180
1.5 kΩ	HF45 6150	HF45 6150	2.2 MΩ	HJ35 9220	HF85 9220
1.8 kΩ	HF45 6180	HF45 6180	3.3 MΩ	HJ35 9330	HF85 9330
2.0 kΩ	HJ35 6200	HF85 6200	3.9 MΩ	HJ35 9390	❊
2.2 kΩ	HF45 6220	HF45 6220	4.7 MΩ	HJ35 9470	HF85 9470
2.4 kΩ	HJ35 6240	HF85 6240			
2.7 kΩ	HF45 6270	HF45 6270			
3.0 kΩ	HF45 6300	HF45 6300			
3.3 kΩ	HF45 6330	HF45 6330			
3.6 kΩ	HJ35 6360	HF85 6360			
3.9 kΩ	HF45 6390	HF45 6390			
4.7 kΩ	HF45 6470	HF45 6470			
5.1 kΩ	HF45 6510	HF45 6510			
5.6 kΩ	HF45 6560	HF45 6560			
6.8 kΩ	HF45 6680	HF45 6680			
8.2 kΩ	HF45 6820	HF45 6820			
9.1 kΩ	HF45 6910	HF45 6910			
10 kΩ	HF45 7100	HF45 7100			

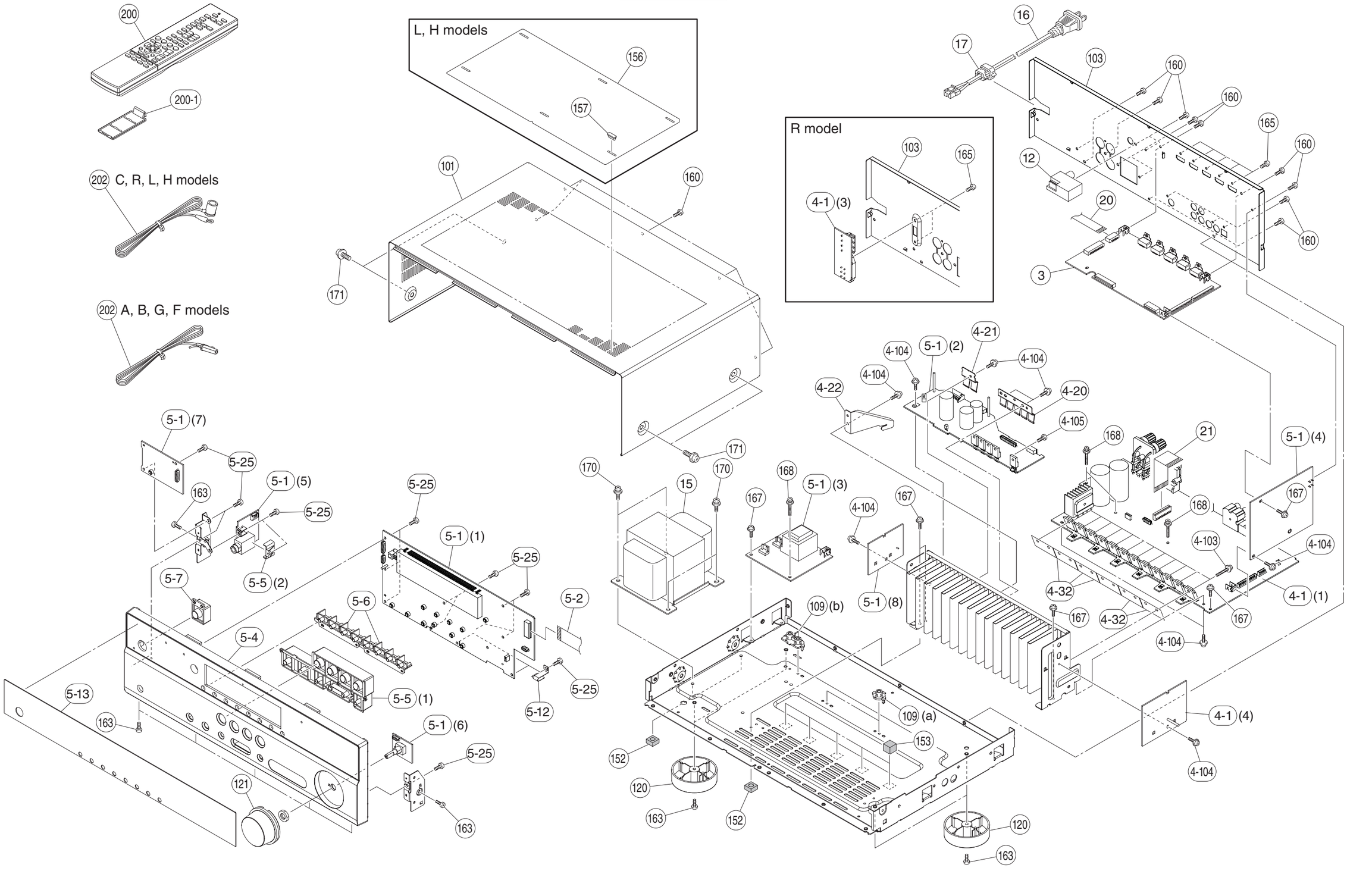
1/4W Type
HJ35○○○○
10mm

1/4W Type
HF45○○○○
1/6W Type
HF85○○○○
5mm

❊: Not available

• OVERALL ASSEMBLY

HTR-2067



	Ref No.	Part No.	Description		Remarks	Markets
*	3	ZJ995800	P.C.B. ASSEMBLY	DIGITAL		
*	4-1	ZJ994900	P.C.B. ASSEMBLY	MAIN		CA
*	4-1	ZJ995000	P.C.B. ASSEMBLY	MAIN		R
*	4-1	ZJ995100	P.C.B. ASSEMBLY	MAIN		BGFLH
	4-20	ZJ691300	SUPPORT	TR 5P		
	4-21	ZF382900	SUPPORT	TR 2P		
	4-22	ZF383000	PCB SUPPORT			
	4-32	WQ753200	RADIATION SHEET	40x23x0.06 MICA		
	4-103	WM220800	HEXAGONAL HEAD B-TIGHT SCREW	3x15 SP MFZN2W3		
	4-104	WF002600	PW HEAD B-TIGHT SCREW	3x8 MFZN2W3		
	4-105	WE774300	BIND HEAD B-TIGHT SCREW	3x8 MFZN2W3		
*	5-1	ZJ995300	P.C.B. ASSEMBLY	OPERATION		C
*	5-1	ZJ995400	P.C.B. ASSEMBLY	OPERATION		R
*	5-1	ZJ995600	P.C.B. ASSEMBLY	OPERATION		ABGFLH
*	5-2	WV537800	FLEXIBLE FLAT CABLE	17P 180mm P=1.25		
*	5-4	ZJ408800	FRONT PANEL	Black		
	5-5	WT829100	BUTTON	CASE		
	5-6	WZ199100	BUTTON TUNER	TUNER		
	5-7	WT829600	BUTTON	POWER		
	5-12	WU200600	EARTH PLATE			
*	5-13	ZJ538100	WINDOW SHEET	HTR-2067		
	5-25	WE774800	BIND HEAD P-TIGHT SCREW	3x8 MFZN2W3		
	12	WY781200	FM TUNER	KST-MWO04FS1-S86S		CRLH
	12	WY782900	FM TUNER	KST-MWO04FS1-S86		ABGF
⚠	15	YG016A00	POWER TRANSFORMER			C
⚠	15	YG017A00	POWER TRANSFORMER			R
⚠	15	YG019A00	POWER TRANSFORMER			ALH
⚠	15	YG020A00	POWER TRANSFORMER			BGF
⚠	16	WY040900	POWER CABLE	1.8m		C
⚠	16	WY042500	POWER CABLE	1.8m		R
⚠	16	WY042100	POWER CABLE	1.8m		A
⚠	16	WY041100	POWER CABLE	1.8m		B
⚠	16	WY041700	POWER CABLE	1.8m		GFL
⚠	16	WY094600	POWER CABLE	1.8m		H
	17	V2438700	CORD STOPPER	10P1		
*	20	WV528500	FLEXIBLE FLAT CABLE	9P 90mm P=1.25		
*	21	WV538500	FLEXIBLE FLAT CABLE	18P 100mm P=1.25		
	101	WT824900	TOP COVER	Black		
*	103	ZJ432900	REAR PANEL			C
*	103	ZJ640900	REAR PANEL			R
*	103	ZJ641000	REAR PANEL			A
*	103	ZJ641100	REAR PANEL			BGF
*	103	ZJ641200	REAR PANEL			LH
	109	WA796100	P.C.B. SUPPORT			
	120	ZJ5127i0	LEG	D60 H21 Black		
	121	WZ872200	KNOB	D52 VOLUME		
	152	WP126800	DAMPER	SCREW MASK		
	153	ZE988400	DAMPER	10x10x10		
	156	ZH109200	SHEET	TOP COVER		LH
	157	ZJ5363i0	RIVET	TOP COVER		LH
	160	WE774100	BIND HEAD BONDING B-T. SCREW	3x8 MFZN2B3		
	163	WE774300	BIND HEAD B-TIGHT SCREW	3x8 MFZN2W3		
	165	WE877900	BIND HEAD S-TIGHT SCREW	3x6 MFZN2W3		
	167	WF002600	PW HEAD B-TIGHT SCREW	3x8 MFZN2W3		

* New Parts

Finish..... GD: Gold color, BL: Black color, TI: Titanium color

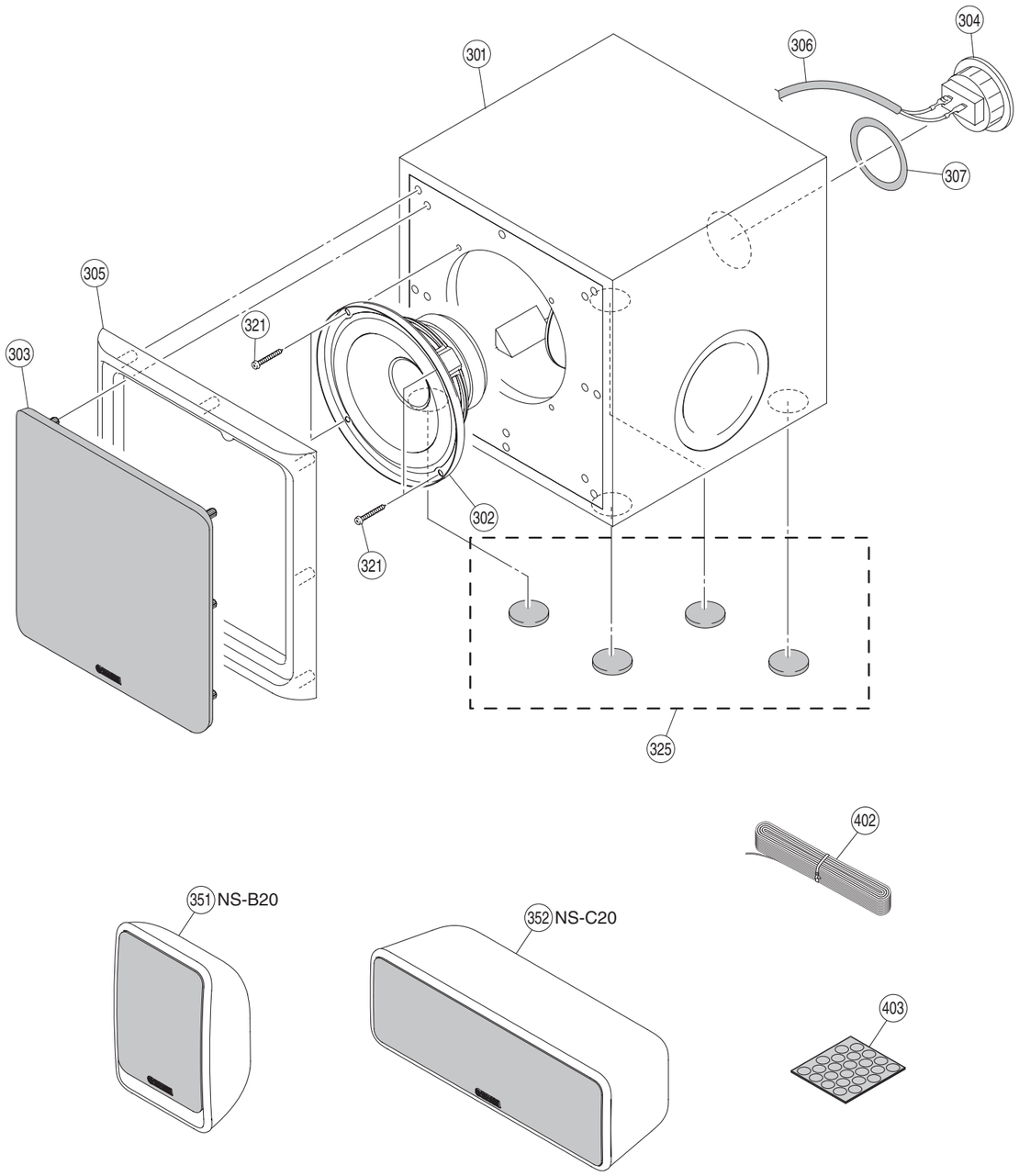
	Ref No.	Part No.	Description		Remarks	Markets
	168	WE774600	HEXAGONAL HEAD B-TIGHT SCREW	3x18 MFZN2W3		
	170	WU048900	BIND HEAD S-TIGHT SCREW	4x10 MFZN2W3		
	171	VH313200	PW HEAD S-TIGHT SCREW	4x8-10 MFNI3BL		
			ACCESSORIES			
*	200	ZJ665200	REMOTE CONTROL	RAV523	000-231120010	
	200-1	AAX82380	BATTERY COVER	Black	CG-2209	
	202	WB212500	FM ANTENNA	1.4m 1pc		CRLH
	202	WB212400	FM ANTENNA	1.4m 1pc		ABGF
			BATTERY	R03,AAA,UM-4 2pcs		
			SERVICE TOOL			
		ZM169300	PCB CHECKING JIG	with FFC	DIGITAL to OPER	

* New Parts

Finish..... GD: Gold color, BL: Black color, TI: Titanium color

• OVERALL ASSEMBLY

NS-B20/NS-C20/NS-SWP20



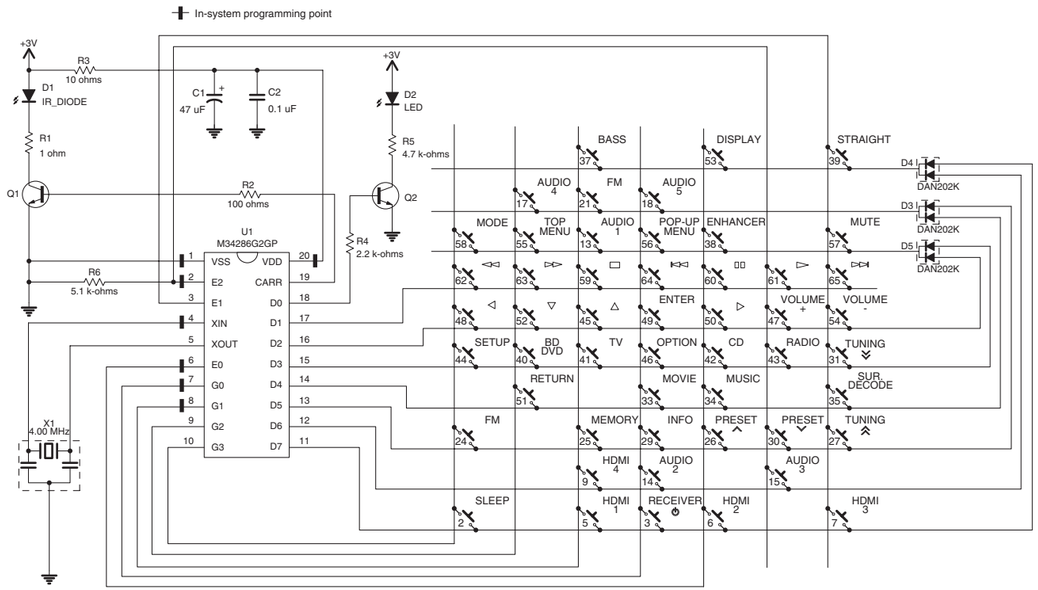
	Ref No.	Part No.	Description		Remarks	Markets
*	301	WZ118300	CABINET ASSEMBLY			
	302	YA897A00	DRIVER WOOFER	16cm 6Ω		
	303	WY603300	FRONT GRILLE ASSEMBLY			
*	304	WY587000	TERMINAL ASSEMBLY	2P, PUSH TYPE		
	305	WY263600	FRONT PANEL			
	306	WW479900	PACKING	15x175		
	307	WU037000	PACKING	3x550		
	321	WE955200	BIND HEAD TAPPING SCREW	4x20 MFZN2B3		
	325	WC731500	NONSKID PAD	D32 t2 4pcs/set		
	351	WY614200	SPEAKER FINAL ASSEMBLY	NS-B20		
	352	WY614300	SPEAKER FINAL ASSEMBLY	NS-C20		
			ACCESSORIES			
	402	WR994200	SPEAKER CABLE	25m 1pc		
	403	WY826100	NONSKID PAD	D8 t1 24pcs/set	NS-B20, NS-C20	

* New Parts

■ REMOTE CONTROL

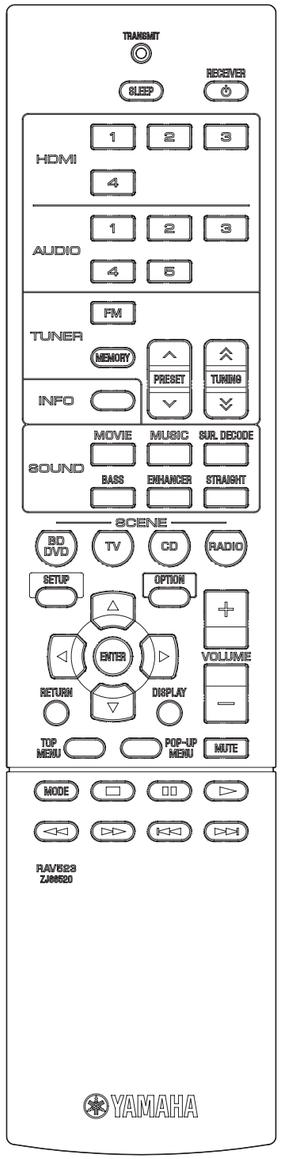
SCHEMATIC DIAGRAM

RAV523



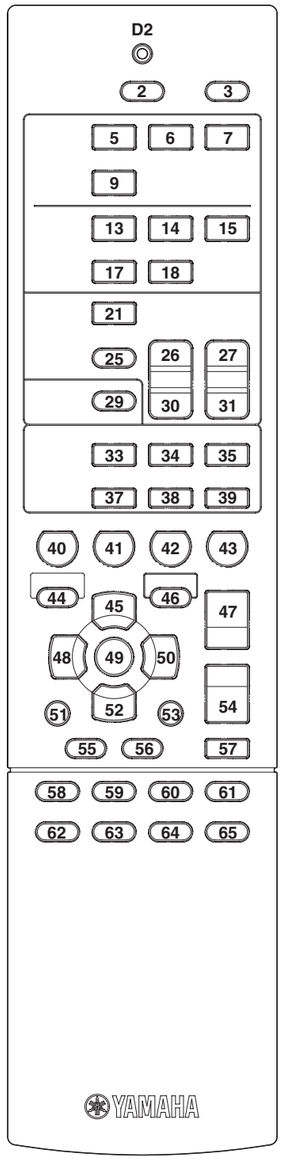
PANEL

RAV523



KEY NO. LAYOUT

RAV523



KEY CODE

RAV523

Key No.		Key Name	ID-1		ID-2	
			MAIN	ZONE2	MAIN	ZONE2
LED1		TRANSMIT	–	–	–	–
"RECEIVER" (mode fixed)	K2	SLEEP	7A-30	7A-31	7A-30CE	7A-31CF
	K3	RECEIVER ⏻	7E-2A	7A-453A	7E-2AD4	7A-453B
	K5	HDMI 1	7A-4738	7A-4837	7A-4739	7A-4836
	K6	HDMI 2	7A-4A35	7A-4B34	7A-4A34	7A-4B35
	K7	HDMI 3	7A-4D32	7A-4E31	7A-4D33	7A-4E30
	K9	HDMI 4	7A-502F	7A-512E	7A-502E	7A-512F
	K13	AUDIO 1	7A-651A	7A-6619	7A-651B	7A-6618
	K14	AUDIO 2	7A-6817	7A-6916	7A-6816	7A-6917
	K15	AUDIO 3	7A-7C03	7A-7D02	7A-7C02	7A-7D03
	K17	AUDIO 4	7A-7F00	7A-80FF	7A-7F01	7A-80FE
	K18	AUDIO 5	7A-ACD3	7A-ADD2	7A-ACD2	7A-ADD3
	K21	FM (TUNER)	7F01-5827	7F01-5926	7F01-5826	7F01-5927
	K25	MEMORY (TUNER)	7F01-6718	7F01-6817	7F01-6719	7F01-6816
	K26	PRESET ∧ (TUNER)	7F01-5B24	7F01-5C23	7F01-5B25	7F01-5C22
	K27	TUNING ⋀ (TUNER)	7F01-611E	7F01-621D	7F01-611F	7F01-621C
	K29	INFO	7A-2758	7A-2857	7A-2759	7A-2856
	K30	PRESET ∨ (TUNER)	7F01-5E21	7F01-5F20	7F01-5E20	7F01-5F21
	K31	TUNING ⋁ (TUNER)	7F01-641B	7F01-651A	7F01-641A	7F01-651B
	K33	MOVIE (SOUND)	7A-88	–	7A-8876	–
	K34	MUSIC (SOUND)	7A-89	–	7A-8977	–
	K35	SUR. DECODE (SOUND)	7A-8D	–	7A-8D73	–
	K37	BASS (SOUND)	7A-BDC2	–	7A-BDC3	–
	K38	ENHANCER (SOUND)	7A-94	–	7A-946A	–
	K39	STRAIGHT (SOUND)	7A-56	–	7A-56A8	–
	K40	SCENE BD/DVD	7A-007F	7A-017E	7A-007E	7A-017F
	K41	SCENE TV	7A-037C	7A-047B	7A-037D	7A-047A
	K42	SCENE CD	7A-0679	7A-0778	7A-0678	7A-0779
	K43	SCENE RADIO	7A-0976	7A-0A75	7A-0977	7A-0A74
	K44	SETUP	7A-84	–	7A-847A	–
	K45	△	7A-9D	7A-2B54	7A-9D63	7A-2B55
	K46	OPTION	7A-6B14	–	7A-6B15	–
	K47	VOLUME +	7A-1A	7A-DA	7A-1AE4	7A-DA24
	K48	◁	7A-9F	7A-2D52	7A-9F61	7A-2D53
	K49	ENTER	7A-DE	7A-2F50	7A-DE20	7A-2F51
	K50	▷	7A-9E	7A-2E51	7A-9E60	7A-2E50
	K51	RETURN	7A-AA	7A-3C43	7A-AA54	7A-3C42
	K52	▽	7A-9C	7A-2C53	7A-9C62	7A-2C52
	K53	DISPLAY	7F01-60	7F01-80	7F01-609E	7F01-807E

Key No.		Key Name	ID-1		ID-2	
			MAIN	ZONE2	MAIN	ZONE2
LED1		TRANSMIT	–	–	–	–
"RECEIVER" (mode fixed)	K54	VOLUME -	7A-1B	7A-DB	7A-1BE5	7A-DB25
	K55	TOP MENU	7A-A0DF	7A-A1DE	7A-A0DE	7A-A1DF
	K56	POP-UP MENU	7A-A4DB	7A-A5DA	7A-A4DA	7A-A5DB
	K57	MUTE	7A-1C	7A-DC	7A-1CE2	7A-DC22
	K58	MODE	7F01-66	7F01-86	7F01-6698	7F01-8678
	K59	▭	7F01-69	7F01-89	7F01-6997	7F01-8977
	K60	▭▭	7F01-67	7F01-87	7F01-6799	7F01-8779
	K61	▷	7F01-68	7F01-88	7F01-6896	7F01-8876
	K62	◁◁	7F01-6A	7F01-8A	7F01-6A94	7F01-8A74
	K63	▷▷	7F01-6B	7F01-8B	7F01-6B95	7F01-8B75
	K64	⏮	7F01-6C	7F01-8C	7F01-6C92	7F01-8C72
	K65	▷▷|	7F01-6D	7F01-8D	7F01-6D93	7F01-8D73

NOTE:

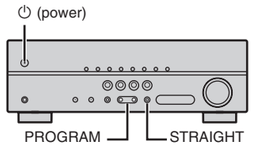
ID setting	K48 [◁] + K40 [SCENE BD/DVD]	ID-1
	K48 [◁] + K41 [SCENE TV]	ID-2
	DEFAULT	ID-1
ZONE setting	K50 [▷] + K40 [SCENE BD/DVD] / K50 [▷] + K41 [SCENE TV]	MAIN / ZONE2
	K50 [▷] + K40 [SCENE BD/DVD] / K50 [▷] + K41 [SCENE TV]	MAIN / ZONE2
	DEFAULT	MAIN
30-SEC TIMER on/off	K51 [RETURN] + K7 [HDMI 3] → K5 [HDMI 1]	30-SEC TIMER on
	K46 [OPTION] + K7 [HDMI 3] → K5 [HDMI 1]	30-SEC TIMER off
	DEFAULT	30-SEC TIMER on

■ ADVANCED SETUP

Configure the system settings of the unit while viewing the front display.

1 Set the unit to standby mode.

2 While holding down STRAIGHT on the front panel, press ⏻ (power).



3 Press PROGRAM to select an item.

4 Press STRAIGHT to select a setting.

5 Press ⏻ (power) to set the unit to standby mode and turn it on again.

The new settings take effect.

ADVANCED SETUP menu items

• Default settings are underlined.

Item	Function
REMOTE ID	Selects the unit's remote control ID.
TU	(Asia and General models only) Changes the FM tuning frequency setting.
TV FORMAT	Switches the video signal type of HDMI output.
INIT	Restores the default settings.
VERSION	Checks the version of firmware currently installed on the unit.

Selecting the remote control ID (REMOTE ID)

Change the unit's remote control ID so that it matches the remote control's ID (default: ID1). When using multiple Yamaha AV receivers, you can set each remote control with a unique remote control ID for its corresponding receiver.

Settings

ID1, ID2

■ Changing the remote control ID of the remote control

1 To select ID1, hold down the cursor key (◁) and SCENE (BD/DVD) together for 3 seconds.
To select ID2, hold down the cursor key (◁) and SCENE (TV) together for 3 seconds.

Changing the FM tuning frequency setting (TU)

(Asia and General models only)

Change the FM tuning frequency setting of the unit depending on your listening environment.

Settings

FM100	Select this when you want to adjust the FM frequency by 100-kHz steps.
FM50	Select this when you want to adjust the FM frequency by 50-kHz steps.

Switching the video signal type (TV FORMAT)

Switch the video signal type of HDMI output so that it matches to the format of your TV.

Since the unit automatically selects the video signal type so that it matches to the TV, it is unnecessary to change the setting normally. Change the setting only when images on the TV screen do not appear correctly.

Settings

NTSC, PAL

Default

Canada and General models: NTSC
Other models: PAL

Restoring the default settings (INIT)

Restores the default settings for the unit.

Choices

ALL	Restores the default settings for the unit.
CANCEL	Does not perform an initialization.

Checking the firmware version (VERSION)

Check the version of firmware currently installed on the unit.

HTR-2067 /
NS-B20/NS-C20/NS-SWP20

YAMAHA