

PERSONAL AMPLIFIER AP-U70

SERVICE MANUAL

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.

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This Service Manual uses recycled paper.



■ TO SERVICE PERSONNEL

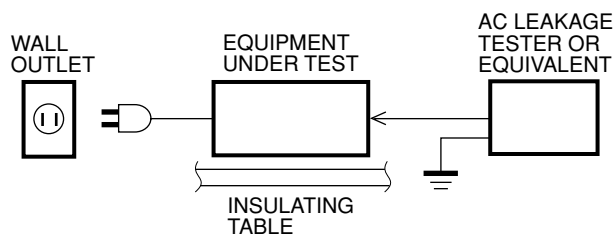
1. Critical Components Information

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 ohm shunted by 0.15 μ F.
- Leakage current must not exceed 0.5mA.



- Be sure to test for leakage with the AC plug in both polarities.



“CAUTION”

“F1 : FOR CONTINUED PROTECTION AGAINST RISK OF FIRE, REPLACE ONLY WITH SAME TYPE 2.5A, 125V FUSE.”

CAUTION

F1 : REPLACE WITH SAME TYPE 2.5A, 125V FUSE.

ATTENTION

F1 : UTILISER UN FUSIBLE DE RECHANGE DE MEME TYPE DE 2.5A, 125V.

WARNING: CHEMICAL CONTENT NOTICE!

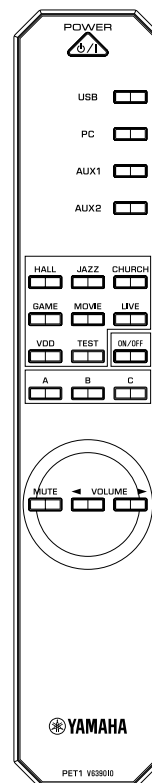
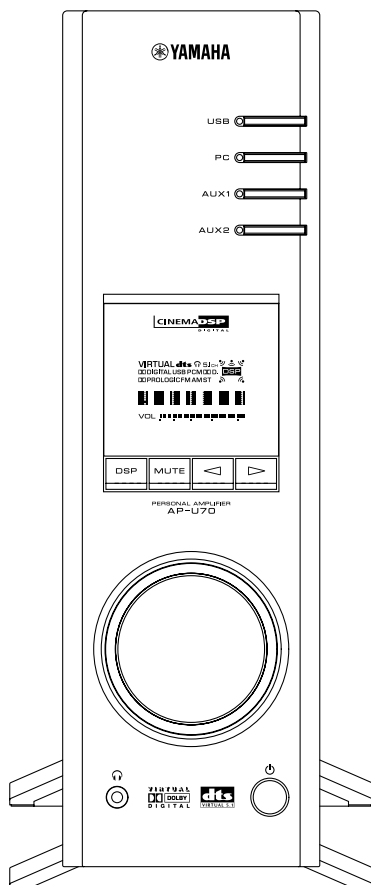
The solder used in the production of this product contains LEAD. In addition, other electrical/ electronic and/or plastic (where applicable) components may also contain traces of chemicals found by the California Health and Welfare Agency (and possibly other entities) to cause cancer and/or birth defects 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!

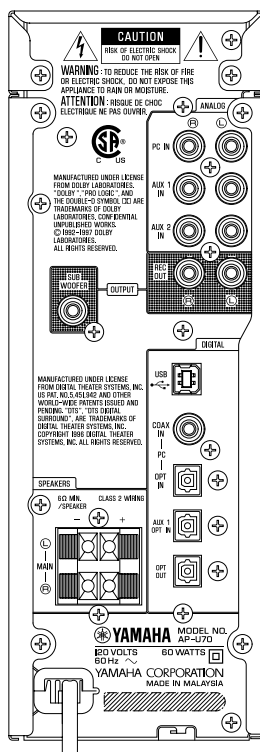
If you come in contact with solder or components located inside the enclosure of this product, wash your hands before handling food.

FRONT PANEL

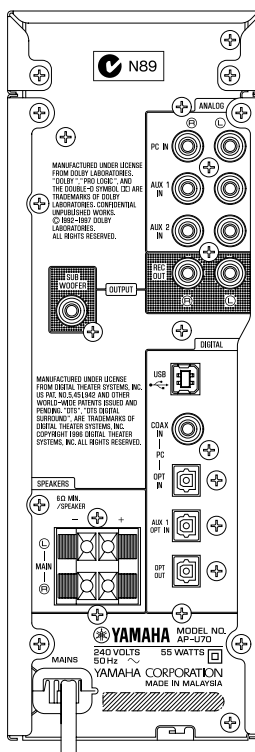


REAR PANELS

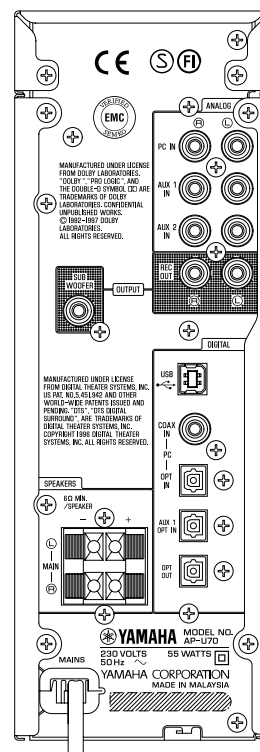
U, C models



A model



B, G models



SPECIFICATIONS

AUDIO SECTION

Minimum RMS Output Power per Channel	
Stereo, 20Hz to 20kHz, 0.8% THD, 6Ω	20W+20W
Maximum Power per Channel	
Stereo, 1kHz, EIAJ, 10% THD, 6Ω	26W+26W
Input Sensitivity/Impedance	
PC, AUX 1, AUX 2 (Analog)	150mV/35kΩ
Maximum Input Signal Level	
PC, AUX 1, AUX 2, 1kHz (DSP= THRU)	2.1V
Output Level/Impedance	
REC OUT	130mV/2.0kΩ
SUB WOOFER (50Hz)	2.0V/1.7kΩ
Headphone Jack Rated Output/Impedance	
PC Analog Input, etc (1kHz, 150mV)	320mV/61Ω
Frequency Response	
USB	
20Hz	-1.0+1.0/-1.0dB
1kHz	+0/-0dB
20kHz	-0.5+1.0/-1.0dB
PC, AUX Digital Input	
20Hz	-1.0+1.0/-1.0dB
1kHz	+0/-0dB
20kHz	-0.5+1.0/-1.0dB
Total Harmonic Distortion (1kHz, 20k LPF)	
USB to SP OUT (4V/6Ω)	0.06%
PC, AUX Digital Input to SP OUT (4V/6Ω)	0.06%
Signal-to-Noise Ratio (IHF-A-Network)	
USB to SP OUT (11V/6Ω)	85dB
PC, AUX Digital Input to SP OUT (11V/6Ω)	90dB
Residual Noise (IHF-A-Network)	
MAIN L/R SP OUT	-68dBV

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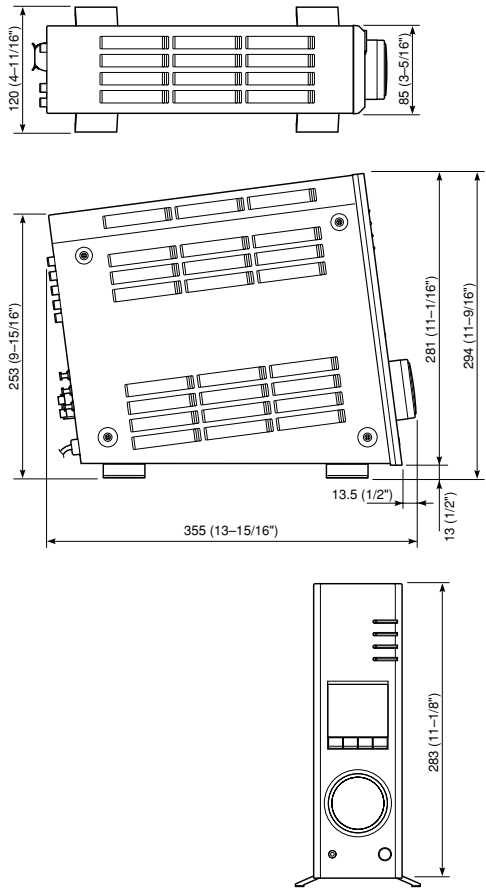
GENERAL

Power Supply	
U, C models	AC 120V, 60Hz
A model	AC 240V, 50Hz
B, G models	AC 230V, 50Hz
Power Consumption	
U, C, B, G models	60W
A model	55W
Standby Power Consumption	
5W	
Dimensions (W x H x D)	
120 x 294 x 355mm	
(4-11/16" x 11-9/16" x 13-15/16")	
Weight	
5.5 kg (12 lbs 2oz)	
Finish	
Silver color	
Accessories	
Remote Control Transmitter x 1	
Battery (size "AA", "R06") x 2	
USB Cable x 1	
CD ROM x 1	

* Specifications subject to change without notice.

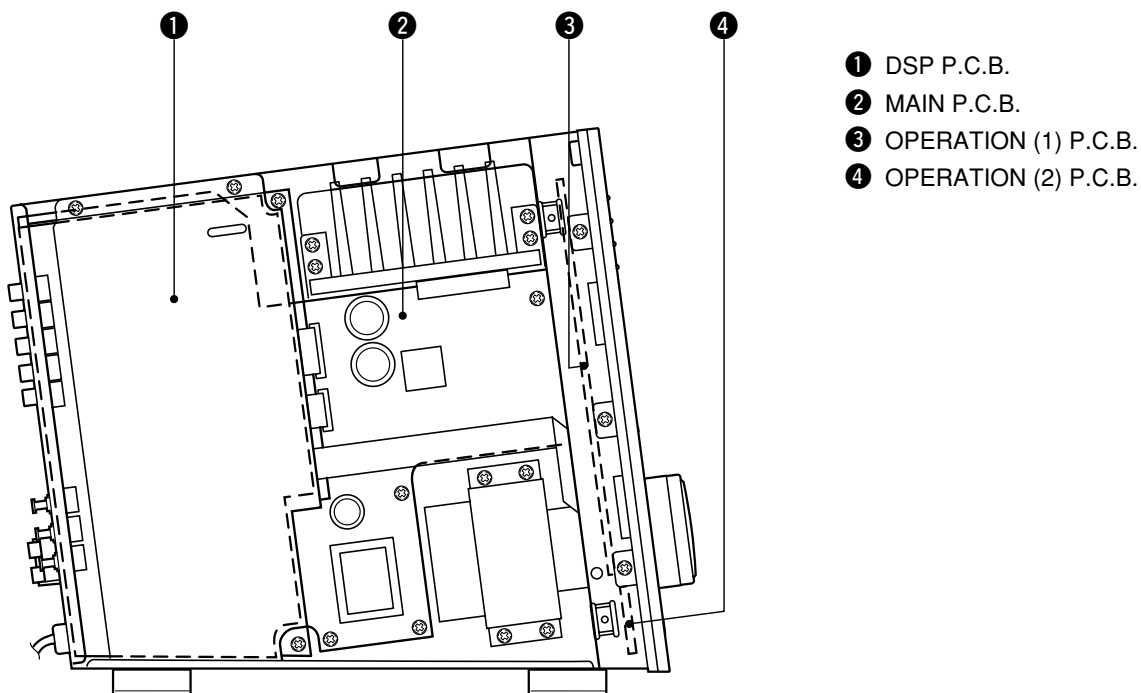
- U USA model
- C Canadian model
- A Australian model
- B British model
- G European model

DIMENSIONS



Units : mm (inch)

INTERNAL VIEW



DISASSEMBLY PROCEDURES (Remove parts in the order as numbered.)

1. Removal of Top Cover

Remove 14 screws (① and ②) and then remove the Top Covers in Fig. 1.

2. Removal of Front Panel

Remove 6 screws (③) and then remove the Front Panel in Fig. 2.

3. Checking the DSP P.C.B.

Remove 4 screws (④) and then remove the Shield Case in Fig. 2.

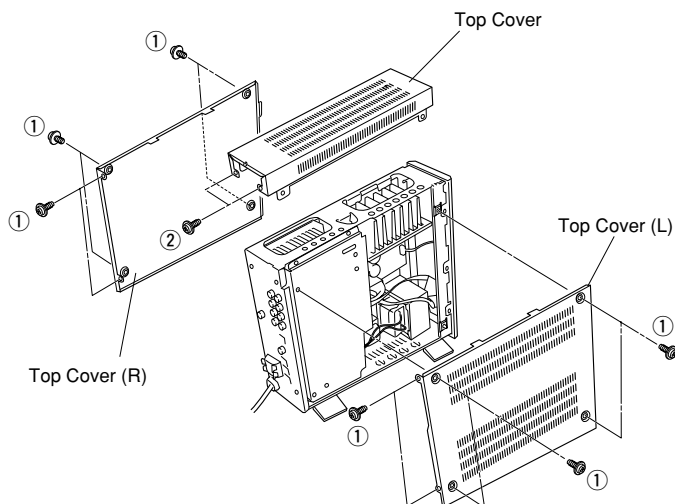


Fig. 1

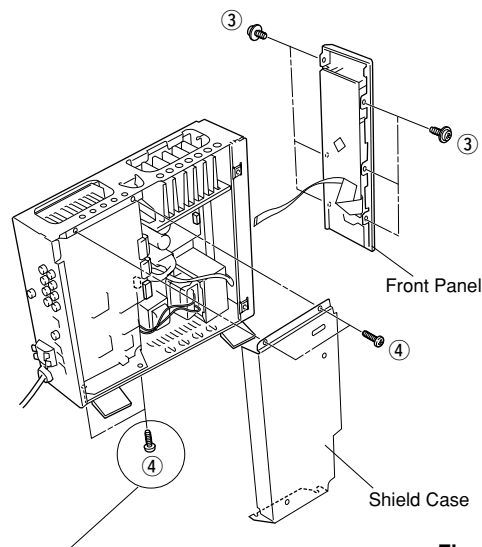


Fig. 2

The shield case can be removed only by loosening these 2 screws marked (④).

■ SELF DIAGNOSIS FUNCTION

This product has a built-in self diagnosis function (DIAG) that can be used for inspection, measurement and determination of a faulty point, if any.

There are ten menu items, each of which has a number of sub menu items.

Listed below are these menu items and sub-menu items.

No.	Main menu	Sub menu
1	ALL (Sequential test)	
2	DEV (Device test)	
3	DSP (DSP test)	1. THROUGH 2. DELAY 3. HALL 4. JAZZ 5. CHURCH 6. GAME 7. MOVIE 8. LIVE 9. PC-ANA 10. PC-Digi 11. AUX1-A 12. AUX1-D 13. AUX2-A 14. RETURN
4	FL (FL test)	1. AUTO 2. MANUAL 3. RETURN
5	AD (AD test)	1. KEY 2. LEVEL 3. JUDGE 4. V-ERR 5. V-MAX 6. V-MID60 7. V-MID55 8. V-MID52 9. V-MID49 10. V-MID29 11. V-MID1 12. V-MIN 13. RETURN
6	USB (USB loop back test)	1. START 2. STOP 3. RETURN
7	INIT (Memory initialization)	1. MEMORY 2. CANCEL 3. RETURN
8	VER (Version information)	1. SHV 2. EGAV 3. ChckSum 4. RETURN
9	ERROR (Error history)	1. E0- 2. E1- 3. E2- 4. E3- 5. E4- 6. E5 - 7. E6- 8. E7- 9. CLEAR 10. RETURN

No.	Main menu	Sub menu
10	DIT (Digital interface)	1. GENERAL 2. CD 3. PCM Enc 4. DAT 5. BS JPN 6. Synthe 7. AD 8. SD 9. BS Eur 10. MIXER 11. SFC 12. DSP 13. L Pa:Ch 14. DIR RV 15. RETURN
0	EXIT	

● Starting DIAG

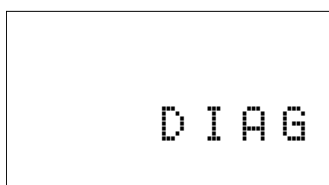
While the opening message appearing at the power ON is on display, press the “DSP” key 3 times; quickly at the first and second times and keep pressing it at the third time until the DIAG function is started.

● Display when DIAG function is started

First, “DIAG” appears on the FL display of the main unit, followed by the version of the microcomputer for 1 second (e.g., 1.000f), the checksum of the microcomputer for 2 seconds (e.g., 7720) and finally the DIAG menu (e.g., 1: ALL). Also, all the function LED segments light up.

DIAG started

When there is no protection function history (*1)

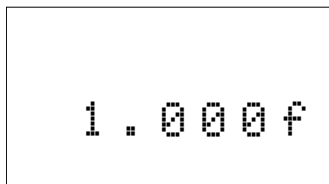


(*1) When there is a history of the protection function recorded, the type of the last protection function in the record appears.



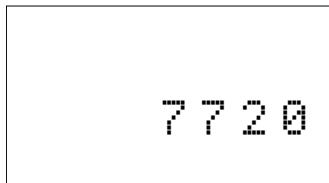
Some seconds
later

Version of the microcomputer



1 second
later

Checksum of microcomputer



2 seconds
later

DIAG menu



When the protection function works and the power is turned off after DIAG was started

When the protection function (*2) works, its history appears in the abbreviated form as described below and the power turns off. Correct the failure based on the history of the protection function.

(*2) When an excessive current or something abnormal in the power source, DC, etc. is detected, the power is forced to turn off as a protection function.

AmPpt I display

(Turning on the power without solving the problem causes the protection function to work at that moment and the power turns off immediately.)

Possible cause: An excessive electric current flow to the power amplifier
Supplementary information: The current of the power IC (IC9) is detected.

PT PS display

(Turning on the power without solving the problem causes the protection function to work at that moment and the power turns off. If the trouble is in the power supply related to the display, display may disappear.)

Possible cause: An abnormality in the power supply section (voltage)
Supplementary information: As the following power supply is detected, the faulty point can be identified.

Transformer secondary winding
 RE X 2(CB10)

Stabilizing power source
 $\pm 15A$, +9V, +5A, +5D SW, -VP

AmPptDc display

(Turning on the power without solving the problem causes the protection function to work at that moment and the power turns off.)

Possible cause: DC output of the power amplifier detected.

Besides the above possible causes, the cause may be disconnection of the connector, an error around CPU, etc.

● History of protection

When the protection function has worked, its history is stored in the backup memory. Even if no abnormality is found while servicing, the abnormality the user experienced can be identified by using the data in the backup memory.

The recorded history of the protection function is cleared when the DIAG function is cancelled by setting DIAG menu No.7 INIT to "MEMORY" (memory initialization) or when the backup memory is erased.

● Operation procedure of DIAG menu and SUB-MENU

- 1) Use the UP ▷ (forward) / DOWN ◁ (reverse) keys to select a main menu item.
- 2) In case of main menu items 1. ALL and 2. DEV neither of which has sub menu, the menu item is executed when the DSP key is pressed.
- 3) In case of main menu items which have sub menu, the sub menu appears when the DSP key is pressed.
- 4) Use the UP ▷ (forward) / DOWN ◁ (reverse) keys to select a sub-menu item.
- 5) The sub-menu item is executed when the DSP key is pressed.
- 6) To return from the sub-menu to the main menu, have "RETURN" displayed by using the UP ▷ (forward) / DOWN ◁ (reverse) keys and press the DSP key.
- 7) To return to the DIAG initial setting (1.ALL) during DIAG operation, press the MUTE key except for the special case (*3).

(*3) : It is not possible to return to 1.ALL during execution of the AD test.

When using remote controller

Main unit	Remote control key	Remote control code
UP ▷ (forward)	VOLUME UP ▷ (forward)	7B---0D
DOWN ◁ (reverse)	VOLUME DOWN ◁ (reverse)	7B---0E
DSP	ON/OFF	7B---07
MUTE	--- (operation unavailable)	---

● Functions during DIAG operation

Following functions are available even during the DIAG operation.

- Power ON/OFF
- Master volume

● Canceling DIAG

There are two methods to cancel the DIAG function.

- 1) Press the "POWER" (STANDBY) key of the main unit or the "POWER" (STANDBY) key of the remote controller to enter the stand-by state.
- 2) Selecting the DIAG menu item 0. EXIT, cancel the DIAG function. Then the self-diagnosis process ends and the normal operation is restored.

CAUTION: Prior to cancellation of the DIAG function, be sure to execute setting of DIAG menu 7. INIT (reserve / reserve cancel of memory initialization). (To keep the user memory, execute "CANCEL" (cancellation of resetting reservation) of 7. INIT setting before canceling the DIAG function.)

Details of DIAG menu

1. ALL (Sequential test)

This menu is used to execute major five items of the DIAG menu. The items are as follows.
(Set the volume level to the intermediate value before execution.)
Press the DSP key to advance one step to the next item.
To skip a step, press the MUTE key.
(To end the DIAG function during the AD test of Step 5, keep pressing the DSP key for a long period of time.)

1. Device test (DEVICE)page 9

2. DSP test (THROUGH)page 10

3. DSP test (DELAY)page 10

4. FL test (Automatic FL change)page 10

5. AD test (KEY reception test)page 11
2. DEV

3. DSP

3. DSP

4. FL

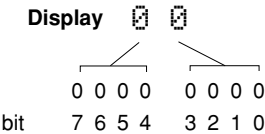
5. AD

The AD test checks if pressing of each key is received properly or not.
Press the key in the order of USB, PC, AUX1, AUX2, DSP, MUTE, DOWN (<) and UP (>).

For the details of Steps 1 through 5, refer to the item corresponding to each step described hereafter.

2. DEV (Device Test)

This menu checks each of the five devices (IC417, 430, 438, 447, 475) for an error.
“OK” appears when no error is detected.
When an error is detected, its content is displayed as “NG-XX” (XX in hexadecimal notation).



Display	bit			
	7	6	5	4
0	0	0	0	0
1	0	0	0	1

Display	bit			
	3	2	1	0
0	0	0	0	0
1	0	0	0	1
2	0	0	1	0
3	0	0	1	1
4	0	1	0	0
5	0	1	0	1
6	0	1	1	0
7	0	1	1	1
8	1	0	0	0
9	1	0	0	1
A	1	0	1	0
B	1	0	1	1
C	1	1	0	0
D	1	1	0	1
E	1	1	1	0
F	1	1	1	1

bit7	Unused (“0” usually)
bit6	Unused (“0” usually)
bit5	Unused (“0” usually)
bit4	Checks checksum of IC438 (ROM) (0: OK / 1: NG)
bit3	Checks IC447 (RAM) (0: OK / 1: NG)
bit2	Checks register Read/Write of IC430 (USS820) (0: OK / 1: NG)
bit1	Checks register Read/Write of IC417 (YSS928) (0: OK / 1: NG)
bit0	Checks register Read/Write of IC475 (LC27287B) (0: OK / 1: NG)

3. DSP (DSP Test)

Using this menu, it is possible to set the sound field effect and input signals.

There are 14 sub-menus.

1. **THROUGH** [Remote control code : 7B—16(VDD)]
Passes signals through the DSP section.

2. **DELAY** [Remote control code : 7B—1F(TEST)]
Uses the delay function in the DSP section.

3. **HALL** [Remote control code : 7B—10(HALL)]
Sets the DSP for HALL.

4. **JAZZ** [Remote control code : 7B—11(JAZZ)]
Sets the DSP for JAZZ.

5. **CHURCH** [Remote control code : 7B—12(CHURCH)]
Sets the DSP for CHURCH.

6. **GAME** [Remote control code : 7B—13(GAME)]
Sets the DSP for GAME.

7. **MOVIE** [Remote control code : 7B—14(MOVIE)]
Sets the DSP for MOVIE.

8. **LIVE** [Remote control code : 7B—15(LIVE)]
Sets the DSP for LIVE.

9. **PC-ANA** [Remote control code : 7B—02(PC)]
Sets the input for PC-ANALOG.

10. **PC-Digi**
Sets the input for PC-DIGITAL.

11. **AUX1-A** [Remote control code : 7B—03(AUX1)]
Sets the input for AUX1-ANALOG.

12. **AUX1-D**
Sets the input for AUX1-DIGITAL.

13. **AUX2-A** [Remote control code : 7B—04(AUX2)]
Sets the input for AUX2-ANALOG.

14. **RETURN**
Returns the menu to the main menu (3.DSP).

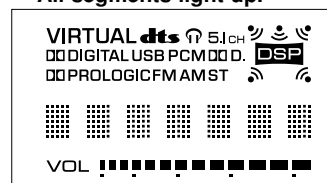
4. FL (FL Test)

This menu is a lighting program for the FL display.

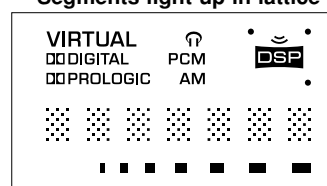
1. **AUTO** (Automatic FL change)

Changes the display automatically at 1-second intervals.

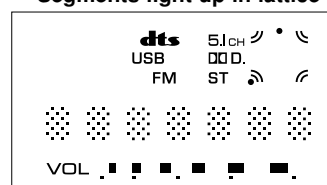
All segments light up.



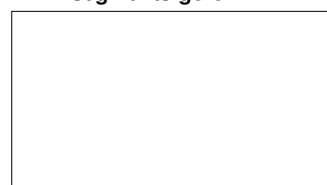
Segments light up in lattice (Pattern A).



Segments light up in lattice (Pattern B)



All segments go off.



2. **MANUAL** (Manual FL change)

Changes the display every time the DSP key is pressed.
The display contents are the same as the above.

3. **RETURN**

Returns the menu to the main menu (4. FL).

5. AD (AD Test)

There are 13 sub-menu items.

1. KEY (Key reception test)

Checks if pressing of each key is properly received, using the key reception program. Keys should be checked in the order of USB, PC, AUX1, AUX2, DSP, MUTE, DOWN (◀) and UP (▶).

When the key reception test is executed, ">USB<" appears, urging to press the USB key.

When the USB key is pressed properly, "OK" appears for a moment followed by ">PC<", urging to press the next PC key.

When all these keys are checked in this way and check results are satisfactory, this mode is over.

If an incorrect key is received, "NG" appears and testing does not proceed to the next key. To exit from this mode, keep pressing the DSP key for a long period of time.

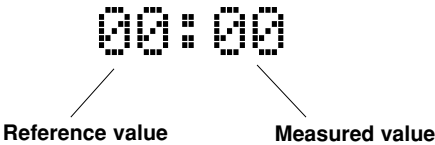
2. LEVEL (Display of key voltage level)

Displays the voltage level of the key and the reference value in parallel.

Use the same order for checking keys as the previous key reception test.

When the voltage level test is executed, ">USB<" appears, urging to press the USB key.

When the USB key is pressed, "00:00" appears for 1 second followed by ">PC<", urging to press the next PC key.



The A/D value is displayed in % (voltage value based on 5V as 100%).

When the voltage level of all the keys is checked in this way, this mode is over.

To exit from this mode before checking all the keys, keep pressing the DSP key for a long period of time.

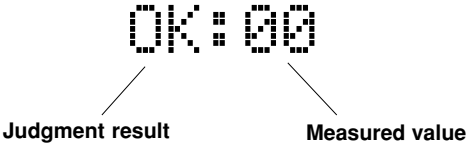
3. JUDGE (Judgment of key voltage level)

Checks if the voltage level of each key is within the normal range by comparing it with the reference value.

Use the same order for checking keys as the previous key reception test.

When the key voltage level judge test is executed, ">USB<" appears, urging to press the USB key.

When the USB key is pressed, "OK:00" appears for 1 second followed by ">PC<", urging to press the next PC key.



When the judgment result is not satisfactory, "NG" appears.

When the voltage level of all the keys is judged in this way, this mode is over.

To exit from this mode before making judgment of all the keys, keep pressing the DSP key for a long period of time.

4. V-ERR (Display of power voltage , when abnormal)

Displays for 2 seconds the voltage value when the power supply protection function has worked due to abnormal voltage. (The voltage value is meaningless unless the power supply protection function has worked.)

The voltage value said here is obtained through calculation using 5V as the reference voltage. Note that deviation of the reference voltage will result in an error of the voltage on display.

5. V-MAX

Sets the main volume to 0dB.

6. V-MID60

Set the main volume to -20dB.

7. V-MID55

Sets the main volume to -25dB.

8. V-MID52

Sets the main volume to -28dB.

9. V-MID49

Sets the main volume to -31dB.

10. V-MID29

Sets the main volume to -51dB.

11. V-MID1

Sets the main volume to -79dB.

12. V-MIN

Sets the main volume to -80dB.

13. RETURN

Returns the menu to the main menu (5. AD).

6. USB (USB loop back test)**1. START** [Remote control code : 7B—1C (A)]

Starts the loop back of USB.

2. STOP [Remote control code : 7B—1D (B)]

Stops the loop back of USB.

3. RETURN

Returns the menu to the main menu (6. USB).

* This menu is used for the factory inspection before shipping.

7. INIT (Memory initialization)**1. MEMORY** (Memory reset reservation)

Reserves the backup RAM to be reset to the factory setting before shipping.

Actual initialization is executed when the power is turned on with the DIAG function cancelled.

2. CANCEL (Cancellation of memory reset reservation)

Makes the memory reset reservation invalid. RAM initialization is not executed.

3. RETURN

Returns the menu to the main menu (7. INIT).

8. VER (Version information)**1. SHV**

Displays the version information of the microcomputer (IC436).

The final alphabet indicates the version of the boot area. If the rewrite version is different, it is not transmitted properly.

2. EGAV

Displays the version information of the gate array (IC475: LC27287B).

3. ChckSum

Displays the checksum information of the microcomputer (IC436).

4. RETURN

Returns the menu to the main menu (8.VER).

9. ERROR (Error history)

1 – 8 E0 –E7 (Error history)

The history of up to 8 errors is stored in memory. The error codes are used to display it.

Error code	Description
00	No error
11 – 14	USB internal error
21 – 2B	USB interrupt error
2C – 2E	USB communication error (*1)
2F	USB interrupt transmission error
41 – 46	USB stream error (*2)
80	Checksum error
81	RAM (IC447) Read/Write error
82	AC3D(IC417) Read/Write error
83	EGAV (IC475) Read/Write error
84	Backup RAM initialized at the power ON (*3)
85	RAM for Y-mersion coefficient initialized at the power ON
90	Detection of abnormality in power voltage
91	Detection of current of power amplifier
92	Detection of DC of power amplifier
93	Detection of abnormality in Tri-path amplifier (unused)
A0	Auto power OFF (24h)

(*1) : When the AC plug is plugged and unplugged with USB connected, this error may be recorded but it causes no problem in actual use.

(*2) : This error is not as fatal as to cause any problem in actual use.

(*3) : This code is recorded in the error history at least once because the memory is cleared at the time of shipping from the factory.

9. CLEAR (Error history clear)

Clears the entire error history in memory and overwrites with the normal value (00).

10. RETURN

Returns the menu to the main menu (9. ERROR).

10. DIT (Digital input/output control)

1. GENERAL

GENERAL category code output (0x00)

2. CD

CD category code output (0x01)

3. PCM Enc

PCM Encoder/decoder category code output (0x02)

4. DAT

DAT category code output (0x03)

5. BS JPN

BS JAPAN category code output (0x04)

6. Synthe

Synthesizer category code output (0x05)

7. AD

A/D converter category code output (0x06)

8. SD

Solid state memory category code output (0x08)

9. BS Eur

BS Euro category code output (0x0E)

10. MIXER

Digital signal mixer category code output (0x12)

11. SFC

Sampling rate converter category code output (0x1A)

12. DSP

Digital sound processor category code output (0x2A)

13. L Pa:Ch

Ch Change L bit parent ↔ child

14. DIR RV

Digital interface receive code display

15. RETURN

Returns the menu to the main menu (10. DIT).

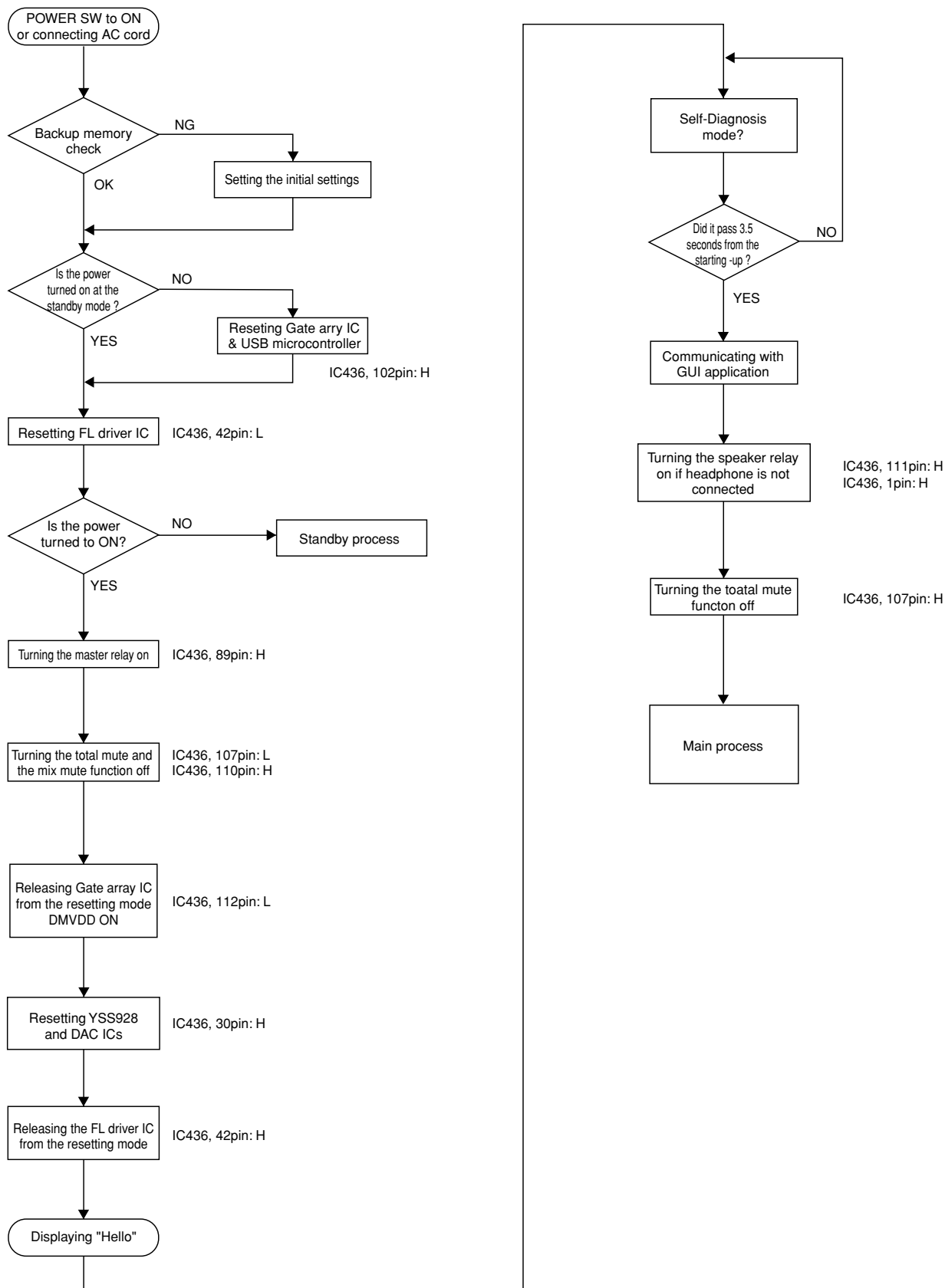
0. EXIT (DIAG end)

Terminates the DIAG function, executes CPU resetting and restart operation.

Use the input selector USB for restarting operation.

Executing the memory reset reservation setting will set to the standby mode.

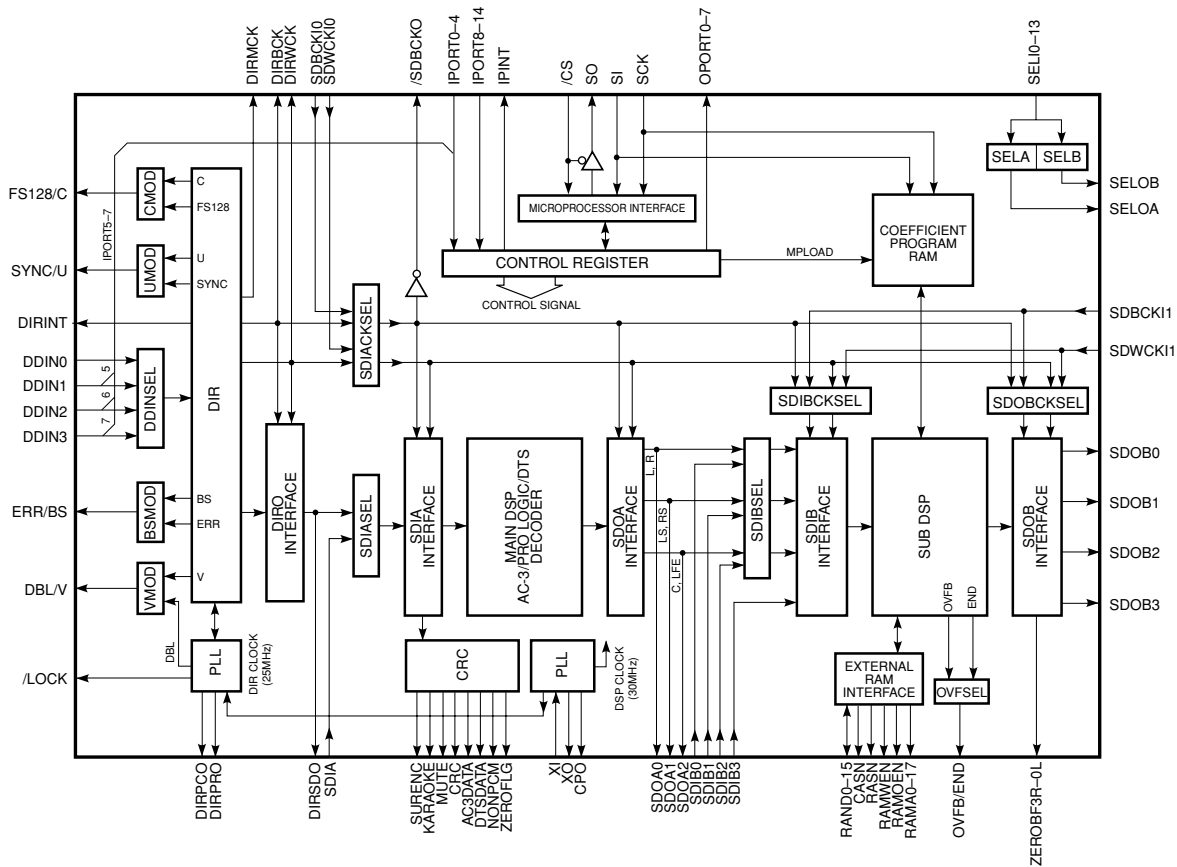
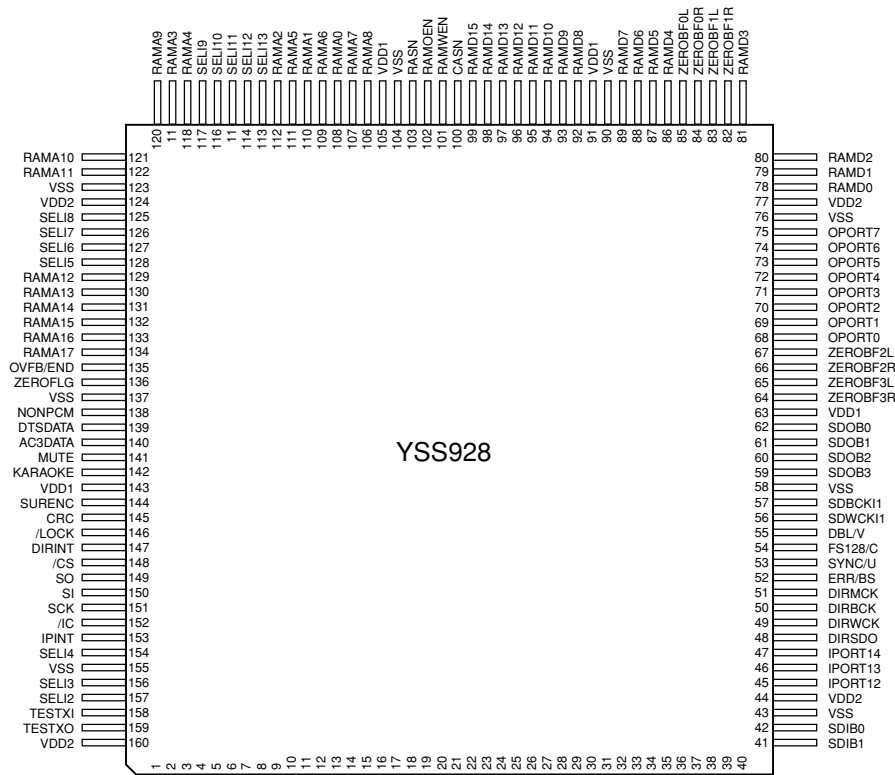
■ STANDARD OPERATION CHART



IC DATA

IC417 : YSS928
AC3D3

AP-U70



IC417 : YSS928

AC3D3

No.	Name	I/O	Function
1	XO	O	Crystal oscillator connecting terminal
2	XI	I	Crystal oscillator connecting terminal (24.576MHz)
3	SEL11	I+	Built-in selector input 1 (SDOA1)
4	SEL10	I+	Built-in selector input 0 (SDOA0)
5	SELOA	O+	Built-in selector output A (PA17)
6	SELOB	O+	Built-in selector output B (unconnected)
7	TESTMS	I+	Test terminal (unconnected)
8	TESTXEN	I+	Test terminal (unconnected)
9	IPORT0	I+	General purpose input terminal (unconnected)
10	IPORT1	I+	General purpose input terminal (unconnected)
11	IPORT2	I+	General purpose input terminal (unconnected)
12	IPORT3	I+	General purpose input terminal (unconnected)
13	IPORT4	I+	General purpose input terminal (unconnected)
14	DDIN0	Is	DIR: Digital audio interface data input terminal 0 (PA09)
15	DDIN1	Is	DIR: Digital audio interface data input terminal 1/General purpose input terminal (GND)
16	DDIN2	Is	DIR: Digital audio interface data input terminal 2/General purpose input terminal (GND)
17	DDIN3	Is	DIR: Digital audio interface data input terminal 3/General purpose input terminal (GND)
18	VSS		Ground terminal
19	CPO	A	PLL filter connecting terminal
20	AVDD		+3.3V power terminal (for DIR)
21	DIRPCO	A	DIR: PLL filter connecting terminal
22	DIRPRO	A	DIR: PLL filter connecting terminal
23	AVSS		Ground terminal (for DIR)
24	TESTBRK	I+	Test terminal (unconnected)
25	TESTR1	I+	PLL initialization signal input terminal for DSP (/D_RST)
26	TESTR2	I+	Test terminal (unconnected)
27	VDD1		+3.3V power terminal (for terminal section)
28	SDWCKI0	I+	Word clock input terminal for SDIA, SDOA, SDIB, SDOB interface (SFS)
29	SDBCKI0	I+	Bit clock input terminal for SDIA, SDOA, SDIB, SDOB interface (S64F)
30	/SDBCK0	O	DIRBCK or SDBCKI0 invert clock output terminal (unconnected)
31	IPORT8	I+	IPINT general purpose input terminal (unconnected)
32	IPORT9	I+	IPINT general purpose input terminal (unconnected)
33	IPORT10	I+	IPINT general purpose input terminal (unconnected)
34	IPORT11	I+	IPINT general purpose input terminal (unconnected)
35	SDIA	I	AC-3/DTS bit stream (or PCM) data input terminal to Main DSP (PA03)
36	SDOA2	O	PCM output terminal from Main DSP (C/LFE output) (SDOA2)
37	SDOA1	O	PCM output terminal from Main DSP (LS/RS output) (SDOA1)
38	SDOA0	O	PCM output terminal from Main DSP (L/R output) (SDOA0)
39	SDIB3	I+	PCM input terminal 3 to Sub DSP (unconnected)
40	SDIB2	I+	PCM input terminal 2 to Sub DSP (PA06)
41	SDIB1	I+	PCM input terminal 1 to Sub DSP (PA05)
42	SDIB0	I+	PCM input terminal 0 to Sub DSP (PA04)
43	VSS		Ground terminal
44	VDD2		+2.5V power terminal (for internal circuit)
45	IPORT12	I+	IPINT general purpose input terminal (unconnected)
46	IPORT13	I+	IPINT general purpose input terminal (unconnected)
47	IPORT14	I+	IPINT general purpose input terminal (unconnected)
48	DIRSDO	O	AC-3/DTS bit stream (or PCM) data output terminal from DIR (PA18)
49	DIRWCK	O	DIR: Serial data word clock (fs) output terminal (XFS)
50	DIRBCK	O	DIR: Serial data bit clock (64fs) output terminal (X64FS)
51	DIRMCK	O	DIR: Serial data master clock (256fs or 128fs) output terminal (X256FS)
52	ERR/BS	O	DIR: Data error detect output/block start output terminal (DIRERR)
53	SYNC/U	O	DIR: Serial data synchronous timing output/user data output terminal (XSYNC)
54	FS128/C	O	DIR: Serial data master clock 128fs output/channel status output terminal (X128FS)
55	DBL/V	O	DIR: Double rate clock output/validity flag output terminal (DBL/V)

IC417 : YSS928

AC3D3

No.	Name	I/O	Function
56	SDWCKI1	I+	Word clock input terminal for SDIB, SDOB interface (unconnected)
57	SDBCKI1	I+	Bit clock input terminal for SDIB, SDOB interface (unconnected)
58	VSS		Ground terminal
59	SDOB3	O	PCM output terminal from Sub DSP (SDOB3)
60	SDOB2	O	PCM output terminal from Sub DSP (PAI6)
61	SDOB1	O	PCM output terminal from Sub DSP (PAI5)
62	SDOB0	O	PCM output terminal from Sub DSP (PAI4)
63	VDD1		+3.3V power terminal (for terminal section)
64	ZEROBF3R	O+	SDOB3 Rch zero flag output terminal (unconnected)
65	ZEROBF3L	O+	SDOB3 Lch zero flag output terminal (unconnected)
66	ZEROBF2R	O+	SDOB2 Rch zero flag output terminal (unconnected)
67	ZEROBF2L	O+	SDOB2 Lch zero flag output terminal (unconnected)
68	OPORT0	O	General purpose output terminal (LED_PC)
69	OPORT1	O	General purpose output terminal (LED_A1)
70	OPORT2	O	General purpose output terminal (LED_A2)
71	OPORT3	O	General purpose output terminal (LED_TU)
72	OPORT4	O	General purpose output terminal (unconnected)
73	OPORT5	O	General purpose output terminal (unconnected)
74	OPORT6	O	General purpose output terminal (unconnected)
75	OPORT7	O	General purpose output terminal (unconnected)
76	VSS		Ground terminal
77	VDD2		+2.5V power terminal (for internal circuit)
78	RAMD0	I+/O	Sub DSP: External memory data terminal 0
79	RAMD1	I+/O	Sub DSP: External memory data terminal 1
80	RAMD2	I+/O	Sub DSP: External memory data terminal 2
81	RAMD3	I+/O	Sub DSP: External memory data terminal 3
82	ZEROBF1R	O+	SDOB1 Rch zero flag output terminal (unconnected)
83	ZEROBF1L	O+	SDOB1 Lch zero flag output terminal (unconnected)
84	ZEROBF0R	O+	SDOB0 Rch zero flag output terminal (unconnected)
85	ZEROBF0L	O+	SDOB0 Lch zero flag output terminal (unconnected)
86	RAMD4	I+/O	Sub DSP: External memory data terminal 4
87	RAMD5	I+/O	Sub DSP: External memory data terminal 5
88	RAMD6	I+/O	Sub DSP: External memory data terminal 6
89	RAMD7	I+/O	Sub DSP: External memory data terminal 7
90	VSS		Ground terminal
91	VDD1		+3.3V power terminal (for terminal section)
92	RAMD8	I+/O	Sub DSP: External memory data terminal 8
93	RAMD9	I+/O	Sub DSP: External memory data terminal 9
94	RAMD10	I+/O	Sub DSP: External memory data terminal 10
95	RAMD11	I+/O	Sub DSP: External memory data terminal 11
96	RAMD12	I+/O	Sub DSP: External memory data terminal 12
97	RAMD13	I+/O	Sub DSP: External memory data terminal 13
98	RAMD14	I+/O	Sub DSP: External memory data terminal 14
99	RAMD15	I+/O	Sub DSP: External memory data terminal 15
100	CASN	O	Sub DSP: Column address strobe output terminal for external DRAM
101	RAMWEN	O	Sub DSP: Write enable terminal for external memory
102	RAMOEN	O	Sub DSP: Output enable terminal for external memory
103	RASN	O	Sub DSP: Low address strobe output terminal for external DRAM
104	VSS		Ground terminal
105	VDD1		+3.3V power terminal (for terminal section)
106	RAMA8	O	Sub DSP: External memory address terminal 8
107	RAMA7	O	Sub DSP: External memory address terminal 7
108	RAMA0	O	Sub DSP: External memory address terminal 0
109	RAMA6	O	Sub DSP: External memory address terminal 6
110	RAMA1	O	Sub DSP: External memory address terminal 1

IC417 : YSS928

AC3D3

No.	Name	I/O	Function
111	RAMA5	O	Sub DSP: External memory address terminal 5
112	RAMA2	O	Sub DSP: External memory address terminal 2
113	SELI13	I+	Built-in selector input 13 (unconnected)
114	SELI12	I+	Built-in selector input 12 (unconnected)
115	SELI11	I+	Built-in selector input 11 (unconnected)
116	SELI10	I+	Built-in selector input 10 (unconnected)
117	SELI9	I+	Built-in selector input 9 (unconnected)
118	RAMA4	O	Sub DSP: External memory address terminal 4
119	RAMA3	O	Sub DSP: External memory address terminal 3
120	RAMA9	O	Sub DSP: External memory address terminal 9 (unconnected)
121	RAMA10	O	Sub DSP: External memory address terminal 10 (unconnected)
122	RAMA11	O	Sub DSP: External memory address terminal 11 (unconnected)
123	VSS		Ground terminal
124	VDD2		+2.5V power terminal (for internal circuit)
125	SELI8	I+	Built-in selector input 8 (unconnected)
126	SELI7	I+	Built-in selector input 7 (unconnected)
127	SELI6	I+	Built-in selector input 6 (SDOB3)
128	SELI5	I+	Built-in selector input 5 (PAI6)
129	RAMA12	O	Sub DSP: External memory address terminal 12 (unconnected)
130	RAMA13	O	Sub DSP: External memory address terminal 13 (unconnected)
131	RAMA14	O	Sub DSP: External memory address terminal 14 (unconnected)
132	RAMA15	O	Sub DSP: External memory address terminal 15 (unconnected)
133	RAMA16	O	Sub DSP: External memory address terminal 16 (unconnected)
134	RAMA17	O	Sub DSP: External memory address terminal 17 (unconnected)
135	OVFB/END	O	Sub DSP: Overflow/program end detect terminal (OVFB)
136	ZEROFLG	O	Main DSP: Zero flag output terminal (ZEROFLG)
137	VSS		Ground terminal
138	NONPCM	O	Main DSP: Non-PCM data detect terminal
139	DTSDATA	O	Main DSP: DTS data detect terminal
140	AC3DATA	O	Main DSP: AC3 data detect terminal
141	MUTE	O	Main DSP: Auto mute detect terminal
142	KARAOKE	O	Main DSP: AC3 KARAOKE data detect terminal
143	VDD1		+3.3V power terminal (for terminal section)
144	SURENC	O	Main DSP: AC-3 2/0 mode Dolby surround encode input detect terminal
145	CRC	O	Main DSP: AC3 CRC error detect terminal
146	/LOCK	O	DIR: PLL lock detect terminal (/DIRLOCK)
147	DIRINT	O	DIR: Interrupt output terminal
148	/CS	Is	Microprocessor interface chip select input terminal (AC3CS)
149	SO	Ot	Microprocessor interface data output terminal (SDI)
150	SI	Is	Microprocessor interface data input terminal (SDO)
151	SCK	Is	Microprocessor interface clock input terminal
152	/IC	Is	Initial clear input terminal (/ICD)
153	IPINT	O+	Interrupt output terminal by IPORT 8-14 (unconnected)
154	SELI4	I+	Built-in selector input 4 (PAI5)
155	VSS		Ground terminal
156	SELI3	I+	Built-in selector input 3 (PAI4)
157	SELI2	I+	Built-in selector input 2 (SDOA2)
158	TESTXI	I	Test terminal (should be always connected to VSS)
159	TESTXO	O	Test terminal (unconnected)
160	VDD2		+2.5V power terminal (for internal circuit)

Is: Schmitt trigger input terminal

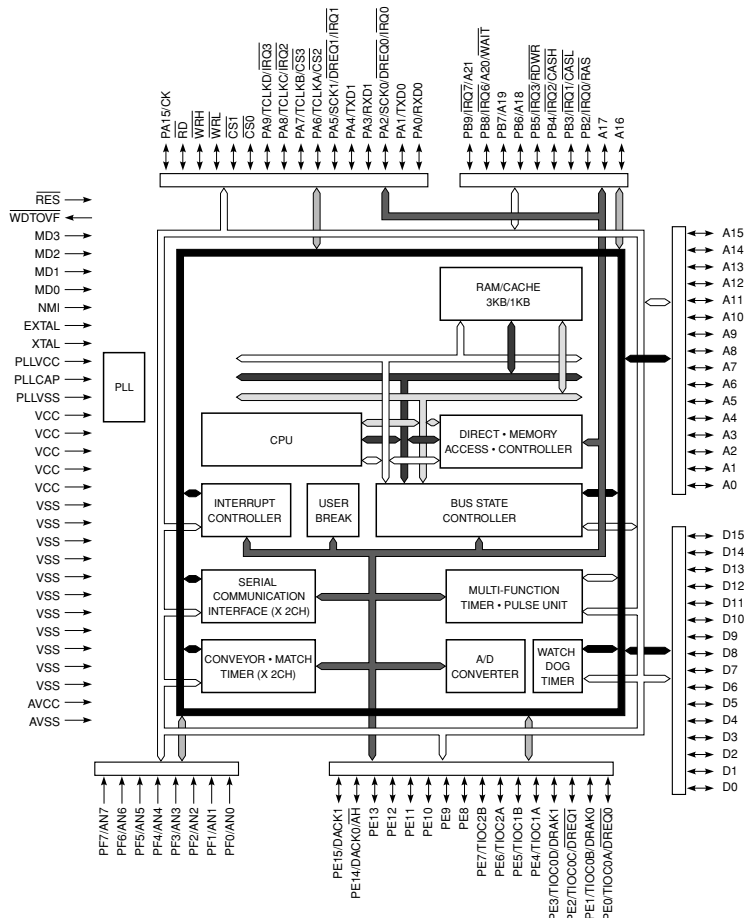
I+: Input terminal with pull-up resistor

O: digital output terminal

Ot: Tri-state digital output terminal

A: Analog terminal

16 bit μ -COM (CPU)



IC436 : HD6417014F28

16 bit μ -COM (CPU)

No.	Port	Name	I/O	Function
1	PE14/DACK0//AH	SP_ON	O	Speaker relay control (H: ON, L: OFF)
2	PE15/DACK1	T_MUTE	O	Tripath Amp Mute (Not used)
3	VSS	VSS		GND
4	A0	A0	O	Address bus
5	A1	A1	O	Address bus
6	A2	A2	O	Address bus
7	A3	A3	O	Address bus
8	A4	A4	O	Address bus
9	A5	A5	O	Address bus
10	A6	A6	O	Address bus
11	A7	A7	O	Address bus
12	A8	A8	O	Address bus
13	A9	A9	O	Address bus
14	A10	A10	O	Address bus
15	A11	A11	O	Address bus
16	A12	A12	O	Address bus
17	A13	A13	O	Address bus
18	A14	A14	O	Address bus
19	A15	A15	O	Address bus
20	A16	A16	O	Address bus
21	VCC	VCC		+5V
22	A17	A17	O	Address bus
23	VSS	VSS		GND
24	PB2//IRQ0//RAS	DC_ON	I	Power down detection (using power level detection)
25	PB3//IRQ1//CASL	USBSOF	I	Start of Frame input from USB
26	PB4//IRQ2//CASH	USBINT	I	Interruption input from USB
27	VSS	VSS		GND
28	PB5//IRQ3/RDWR	/EAINT	I	Interruption input from Gate Array
29	PB6/A18	A18	O	Address bus
30	PB7/A19	/D_RST	O	Reset signal for YSS928, CS5360(A/D), AD1854(D/A)
31	PB8//IRQ6/A20//WAIT	/DIRINT	I	Interruption input from YSS928 (DIR)
32	PB9//IRQ7/A21	/AC3MUTE	I	Interruption input from YSS928 (MUTE)
33	VSS	VSS		GND
34	/RD	RDB	O	Control signal output for reading
35	/WDTOVF	/WDTOVF		Watched timer overflow output (Not used)
36	/WRH	/WRH	O	Control signal output for upper byte writing
37	VCC	VCC		+5V
38	/WRL	WRL	O	Control signal output for lower byte writing
39	VSS	VSS		GND
40	/CS1	EACS	O	Chip select output for Gate Array
41	/CS0	FLASHCS	O	Chip select output for external ROM
42	PA9/TCLKD//IRQ3	/ICD	O	Chip select output for FL driver
43	PA8/TCLKC//IRQ2	/NONPCM	I	Interruption input from YSS928 (NONPCM)
44	PA7/TCLKB//CS3	SRAMCS	O	Chip select output for SRAM
45	PA6/TCLKA//CS2	USBCS	O	Chip select output for USB
46	PA5/SCK1//DREQ1//IRQ1	T-FAULT	I	Protection for Tripath Amp (Not used)
47	PA4/TXD1	TX	O	Serial data output for Debug Monitor (RS232C)
48	PA3/RXD1	RX	I	Serial data input for Debug Monitor (RS232C)
49	PA2/SCK0//DREQ0//IRQ0	FLCK	O	Serial clock output to FL driver
50	PA1/TXD0	FLDA	O	Serial data output to FL driver
51	PA0/RXD0	FLCS	O	Chip select output to FL driver
52	D15	D15	I/O	Data bus
53	D14	D14	I/O	Data bus
54	D13	D13	I/O	Data bus
55	VSS	VSS		GND
56	D12	D12	I/O	Data bus

IC436 : HD6417014F28

16 bit μ -COM (CPU)

No.	Port	Name	I/O	Function
57	D11	D11	I/O	Data bus
58	D10	D10	I/O	Data bus
59	D9	D9	I/O	Data bus
60	D8	D8	I/O	Data bus
61	VSS	VSS		GND
62	D7	D7	I/O	Data bus
63	D6	D6	I/O	Data bus
64	D5	D5	I/O	Data bus
65	VCC	VCC		+5V
66	D4	D4	I/O	Data bus
67	D3	D3	I/O	Data bus
68	D2	D2	I/O	Data bus
69	D1	D1	I/O	Data bus
70	D0	D0	I/O	Data bus
71	VSS	VSS		GND
72	XTAL	XTAL	I	Connect to crystal (7MHz)
73	MD3	MD3	I	Mode setup input (+5V)
74	EXTAL	EXTAL	I	Connect to crystal (7MHz)
75	MD2	MD2	I	Mode setup input (GND)
76	NMI	NMI		Not used (Pull up)
77	VCC	VCC		+5V
78	MD1	MD1	I	Mode setup input (GND)
79	MD0	MD0	I	Mode setup input (+5V)
80	PLLVC	PLLVC	I	Power input of internal PLL oscillator (+5V)
81	PLLCAP	PLLCAP	I	Capacitor terminal of internal PLL oscillator
82	PLLVSS	PLLVSS	I	GND of internal PLL oscillator (GND)
83	PA15/CK	CPUCCLK	O	CPU clock output
84	/RES	RST	I	Power on reset input
85	PE0/TIOC0A//DREQ0	REM	I	Remote control input
86	PE1/TIOC0B//DACK0	E_A	I	Encoder detection (Volume)
87	PE2/TIOC0C//DREQ1	E_B	I	Encoder detection (Volume)
88	PE3/TIOC0D//DACK1	RYDY	I	ROM Ready input
89	PE4/TIOC1A	POW	O	Power relay control
90	VSS	VSS		GND
91	PF0/AN0	KEY0	I	Key input (AD)
92	PF1/AN1	PS	I	Protection PS
93	PF2/AN2	PRT_DC	I	Amp protection (DC) (Active-L)
94	PF3/AN3	PRT_I	I	Amp protection (current) (Active-H)
95	PF4/AN4	TYPE	I	Model detection
96	PF5/AN5	DEST	I	Market detection
97	AVSS	AVSS	I	GND (analog)
98	PF6/AN6	DC_ON	I	DC level detection of power supply
99	PF7/AN7	P_SW	I	ON/OFF detection of power switch
100	AVCC	AVCC		+5V (analog)
101	VSS	VSS		GND
102	PE5/TIOC1B	USBRST	O	Reset output for USB, Gate Array
103	VCC	VCC		+5V
104	PE6/TIOC2A	SUSPN	I	Suspend input from USB
105	PE7/TIOC2B	RWUPN	O	Remote Wake-Up output to USB
106	PE8	SW-MUTE	O	Subwoofer mute (ON: L)
107	PE9	A-MUTE	O	Total mute (ON: L)
108	PE10	SFMUTE	O	DAC soft mute (ON: H)
109	VSS	VSS		GND
110	PE11	MIX_MUTE	O	DAC MIX signal path mute (ON: H)
111	PE12	HP	I	Headphone detection
112	PE13	DMVDD	O	Enable output to Gate Array (ON: H)

IC430 : USS-820DT-DB

USB Device Controller

No.	Port	Name	I/O	Function
1	NC	NC		No connect
2	VDDA	VDDA		+3.3V power supply for analog PLL
3	XTAL1	XTAL1	I	Crystal/Clock input
4	XTAL2	XTAL2	O	Crystal/Clock output
5	VDDT	VDDT		+3.3V power supply for USB transceiver
6	DMNS	DMNS	I/O	USB Differential data bus minus
7	DPLS	DPLS	I/O	USB Differential data bus plus
8	VSST	VSST		Device ground for USB transceiver
9	A0	A1	I	Address bus
10	A1	A2	I	Address bus
11	A2	A3	I	Address bus
12	A3	A4	I	Address bus
13	A4	A5	I	Address bus
14	VSSX	VSSX		Device ground
15	VSS0	VSS0		Device ground
16	NC	NC		No connect
17	NC	NC		No connect
18	VDD0	VDD0		+3.3V power supply
19	NC	NC		No connect
20	NC	NC		No connect
21	NC	NC		No connect
22	VSS1	VSS1		Device ground
23	VSSX	VSSX		Device ground
24	VSSX	VSSX		Device ground
25	VSSX	VSSX		Device ground
26	VSSX	VSSX		Device ground
27	NC	NC		No connect
28	RWUPN	RWUPN	I	Remote wake-up (active-low)
29	SUSPN	SUSPN	O	Suspend (active-low)
30	IRQN	USBINT	O	Interrupt
31	SOFN	USBSOF	O	Start of frame (active-low)
32	RESET	USBIRST	I	Reset
33	NC	NC		No connect
34	IOCSN	USBCS	I	Chip select (active-low)
35	WRN	WRL	I	Control register write (active-low)
36	RDN	RDB	I	Control register read (active-low)
37	VSSX	VSSX		Device ground
38	D7	D7	I/O	Data bus
39	D6	D6	I/O	Data bus
40	D5	D5	I/O	Data bus
41	D4	D4	I/O	Data bus
42	D3	D3	I/O	Data bus
43	VSS2	VSS2		Device ground
44	D2	D2	I/O	Data bus
45	D1	D1	I/O	Data bus
46	D0	D0	I/O	Data bus
47	VDD1	VDD1		+3.3V power supply
48	DPPU	DPPU	O	DPLS pull up

IC475 : LC27287B-TF3

Embedded Array

No.	Name	I/O	Function
1	VSS	I	GND
2	XI	I	X'tal in (GND)
3	XO	O	X'tal out (OPEN)
4	/SIOIRQ	O	Serial IRQ (OPEN)
5	/FIFOIRQ	O	FIFO IRQ (/EAINT)
6	A0	I	Address Bus
7	A1	I	Address Bus
8	A2	I	Address Bus
9	A3	I	Address Bus
10	A4	I	Address Bus
11	A5	I	Address Bus
12	TEST9	I	(OPEN)
13	TEST10	I	(OPEN)
14	D0	I/O	Data Bus
15	D1	I/O	Data Bus
16	D2	I/O	Data Bus
17	D3	I/O	Data Bus
18	D4	I/O	Data Bus
19	D5	I/O	Data Bus
20	D6	I/O	Data Bus
21	D7	I/O	Data Bus
22	VDD5	I	+5V
23	VSS	I	GND
24	D8	I/O	Data Bus
25	D9	I/O	Data Bus
26	D10	I/O	Data Bus
27	D11	I/O	Data Bus
28	D12	I/O	Data Bus
29	D13	I/O	Data Bus
30	D14	I/O	Data Bus
31	D15	I/O	Data Bus
32	RDB	I	Read Strobe input
33	WRL	I	Write Strobe Low input
34	WRH	I	Write Strobe High input
35	GACS	I	Bus Chip Select (EACS)
36	GARST	I	Global Reset input (USBRS)
37	CPUCLK	I	System clock input
38	DMVDD	I	Master Vdd active detection
39	USBDAO	O	USB audio data
40	CAPTIN	I	USB capture audio data in (PAO7)
41	TEST0	I	OPEN
42	TEST1	I	OPEN
43	TEST2	I	OPEN
44	VDD5	I	+5V
45	VSS	I	GND
46	MCLKAI	I	X'tal in (11.2896MHz)
47	MCLKAO	O	X'tal out (11.2896MHz)
48	PIO0	I/O	Extended I/O port (OPEN)
49	PIO1	I/O	Extended I/O port (OPEN)
50	PIO2	I/O	Extended I/O port (OPEN)
51	PIO3	I	YSS928 AC3DATA
52	PIO4	I	YSS928 SURENC
53	PIO5	I	YSS928 DIRERR
54	PIO6	I	YSS928 DIRLOCK
55	PIO7	I	YSS928 KARAOKE

No.	Name	I/O	Function
56	PIO8	I	YSS928 OVFB
57	PIO9	I	YSS928 DTSDATA
58	PIO10	I	YSS928 ZEROFLAG
59	PIO11	I	YSS928 CRC
60	PIO12	I/O	Extended I/O port (OPEN)
61	PIO13	I	YSS928 DBL/V
62	PIO14	I/O	Extended I/O port (OPEN)
63	PIO15	I/O	Extended I/O port (OPEN)
64	I2CCK	O	I2C serial Bus clock (OPEN)
65	I2SDA	I/O	I2C serial Bus data (OPEN)
66	VDD5	I	+5V
67	VSS	I	GND
68	MCLKBI	I	X'tal in (GND)
69	MCLKBO	O	X'tal out (OPEN)
70	TEST3	I	(OPEN)
71	TEST4	I	(OPEN)
72	TEST5	I	(OPEN)
73	TEST6	I	H: PLL TEST out, L: normal (OPEN)
74	TEST7	I	H: pllclks in, L: NC (OPEN)
75	TEST8	I	H: PLL TEST out, L: normal (OPEN)
76	PLLCKO	I	PLL clock input
77	PLLREF	O	PLL reference clock out
78	RFCLK	I	Internal PLL reference clock
79	VDD33	I	+3.3V
80	PCH	O	PLL PCH out (TEST8: H) (OPEN)
81	NCH	O	PLL NCH out (TEST8: H) (OPEN)
82	DIV2	O	Internal PLL VCO div2 (OPEN)
83	VSS	I	GND
84	PO	O	Charge pump out
85	VCNT	I	VCO control input
86	R	I	VCO Bias Resistor
87	AVSS	I	GND (for Analog)
88	AVDD	I	+3.3V (for Analog)
89	VSS	I	GND
90	VDD5	I	+5V
91	SFS	O	Other device audio clock
92	/S64FS	O	Other device audio clock
93	S128FS	O	Other device audio clock (OPEN)
94	S256FS	O	Other device audio clock
95	SSYNC	O	Other device audio clock (OPEN)
96	R64FS	O	Render device bit clock (OPEN)
97	C64FS	O	Capture device bit clock (OPEN)
98	D64FS	O	USB bit clock (OPEN)
99	S64FS	O	Other device bit clock (OPEN)
100	X64FS	O	External bit clock (DIR) (OPEN)
101	XFS	I	External audio clock (DIR)
102	/X64FS	I	External audio clock (DIR)
103	X128FS	I	External audio clock (DIR)
104	X256FS	I	External audio clock (DIR)
105	XSYNC	I	External audio clock (DIR)
106	PAI3	I	Patch input (A/D)
107	PAI4	I	Patch input (YSS928 SDOB0)
108	PAI5	I	Patch input (YSS928 SDOB1)
109	PAI6	I	Patch input (YSS928 SDOB2)
110	VDD33	I	+3.3V

IC475 : LC27287B-TF3

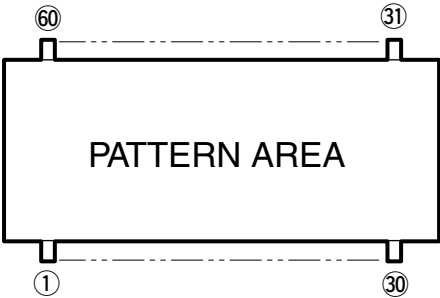
Embedded Array

No.	Name	I/O	Function
111	VSS	I	GND
112	PAI7	I	Patch input (YSS928 SELOA)
113	PAI8	I	Patch input (YSS928 DIRSDO)
114	PAI9	I	Patch input (OPEN)
115	PAI10	I	Patch input (GND)
116	PAI11	I	Patch input (OPEN)
117	PAI12	I	Patch input (OPEN)
118	PAI13	I	Patch input (PC IN)
119	PAI14	I	Patch input (AUX1 IN)
120	SXSDI	I	Extendedserial Bus data in (SDI)
121	SXSDO	O	Extendedserial Bus data out (SDO)
122	SXSCK	O	Extendedserial Bus clock (SCK)
123	SXCS0	O	Extendedserial Bus CS0 (AC3CS)
124	SXCS1	O	Extendedserial Bus CS1 (OPEN)
125	SXCS2	O	Extendedserial Bus CS2 (OPEN)
126	SXCS3	O	Extendedserial Bus CS3 (OPEN)
127	RFS	O	Render device audio clock (OPEN)
128	/R64FS	O	Render device audio clock (OPEN)
129	R128FS	O	Render device audio clock (OPEN)
130	R256FS	O	Render device audio clock (OPEN)
131	RSYNC	O	Render device audio clock (OPEN)
132	VDD5	I	+5V
133	VSS	I	GND
134	DFS	O	USB audio clock
135	/D64FS	O	USB audio clock
136	D256FS	O	USB audio clock
137	CFS	O	Capture device audio clock
138	/C64FS	O	Capture device audio clock
139	C128FS	O	Capture device audio clock (OPEN)
140	C256FS	O	Capture device audio clock
141	CSYNC	O	Capture device audio clock (OPEN)
142	SELA	I	74153 Logic function (GND)
143	SELB	I	74153 Logic function
144	CI0	I	74153 Logic function
145	CI1	I	74153 Logic function (GND)
146	CI2	I	74153 Logic function
147	CI3	I	74153 Logic function (GND)
148	YO	O	74153 Logic function (PAI13)
149	CCBDI	I	Sanyo serial Bus data in
150	CCBDO	O	Sanyo serial Bus data out
151	CCBCLK	O	Sanyo serial Bus clock
152	CCBCS0	O	Sanyo serial Bus CS0 (SYCS0)
153	CCBCS1	O	Sanyo serial Bus CS1 (SYCS1)
154	VDD5	I	+5V
155	VSS	I	GND
156	CCBCS2	O	Sanyo serial Bus CS2 (SYCS2)
157	CCBCS3	O	Sanyo serial Bus CS3 (SYCS3)
158	TEST11	I	(OPEN)
159	SZSDO	O	Extended serial Bus data out
160	SZSCK	O	Extended serial Bus clock
161	SZCS0	O	Extended serial Bus CS0
162	SZCS1	O	Extended serial Bus CS1
163	SZCS2	O	Extended serial Bus CS2
164	SZCS3	O	Extended serial Bus CS3
165	PAO0	O	Patch out (MAIN DAC)

No.	Name	I/O	Function
166	PAO1	O	Patch out (NC)
167	PAO2	O	Patch out (NC)
168	PAO3	O	Patch out (YSS928 SDIA)
169	PAO4	O	Patch out (YSS928 SDIB0)
170	PAO5	O	Patch out (YSS928 SDIB1)
171	PAO6	O	Patch out (YSS928 SDIB2)
172	PAO7	O	Patch out (CAPTIN)
173	PAO8	O	Patch out (NC)
174	PAO9	O	Patch out (YSS928 DDIN0)
175	PAO10	O	Patch out (OPT OUT)
176	VDD5	I	+5V

■ DISPLAY DATA

V301 : 8-ST-24GN (V6445100)



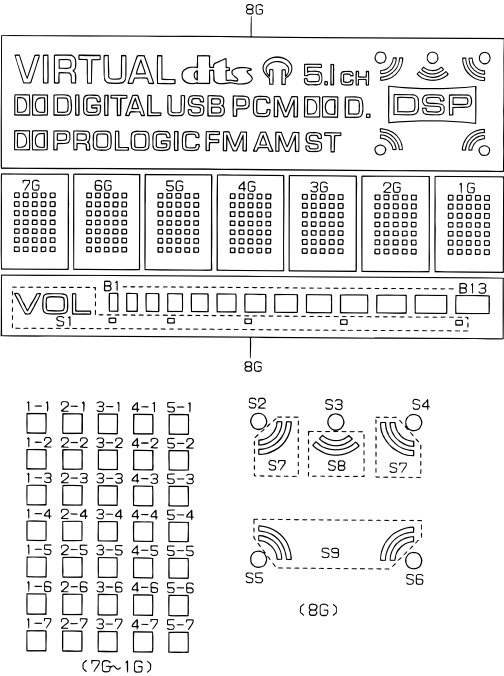
● PIN CONNECTION

Pin No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Connection	F1	NP	F1	NP	1G	2G	3G	4G	5G	6G	7G	8G	P35	P34	P33	P32	P31	P30	P29	P28	P27	P26	P25	P24	P23	P22	NP	F2	NP	F2

Pin No.	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
Connection	F2	NP	F2	NP	P21	P20	P19	P18	P17	P16	P15	P14	P13	P12	P11	P10	P9	P8	P7	P6	P5	P4	P3	P2	P1	IC	NP	F1	NP	F1

Note 1) F1, F2 Filament 3) IC Internal connection 5) 1G~8G Grid
2) NP No Pin 4) P1~P35 Datum Line

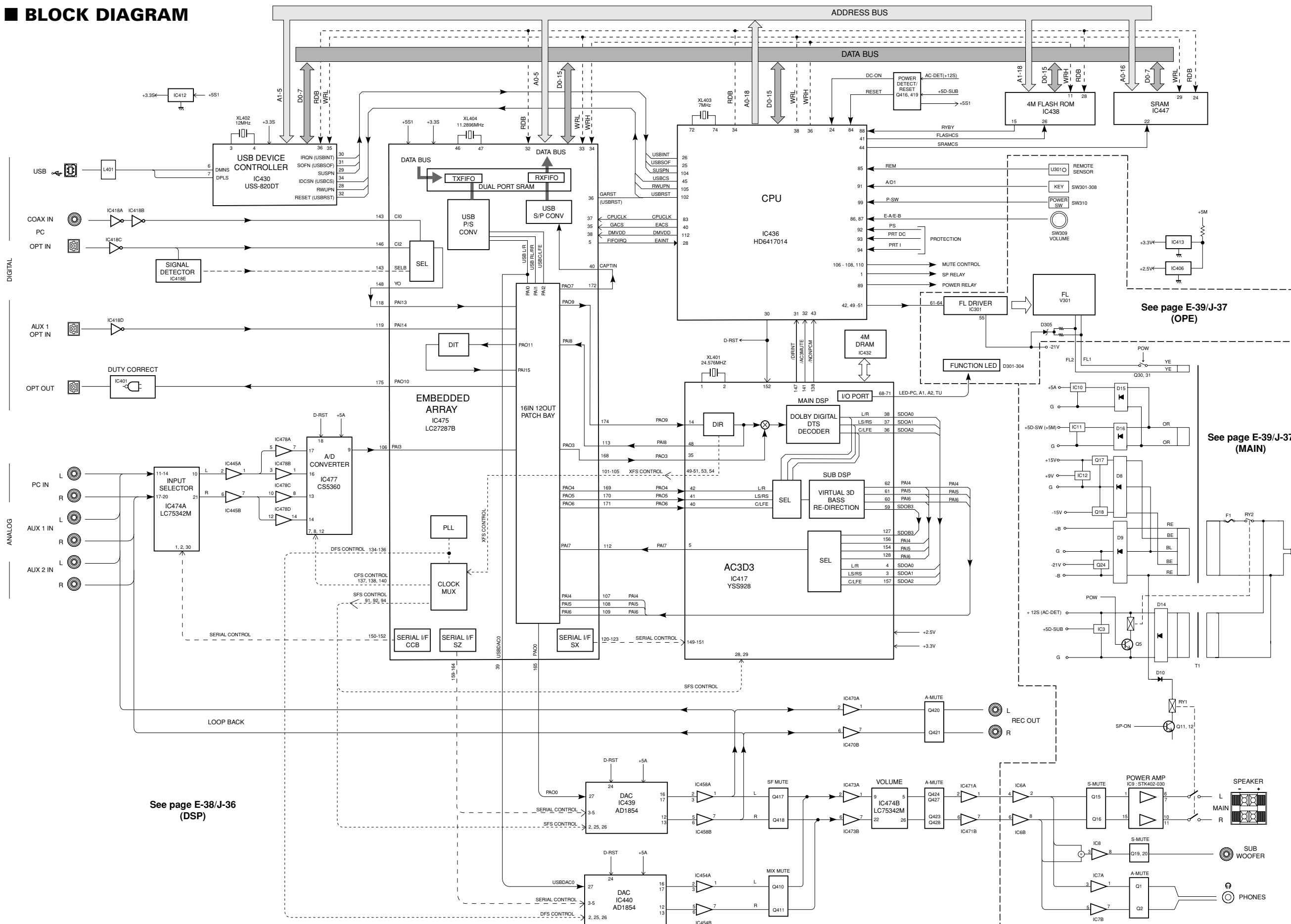
● GRID ASSIGNMENT



● ANODE CONNECTION

	8G	7G~1G
P1	B1	1-1
P2	B2	2-1
P3	B3	3-1
P4	B4	4-1
P5	B5	5-1
P6	B6	1-2
P7	B7	2-2
P8	B8	3-2
P9	B9	4-2
P10	B10	5-2
P11	B11	1-3
P12	B12	2-3
P13	B13	3-3
P14	S1	4-3
P15	VIRTUAL	5-3
P16	dts	1-4
P17	5.1ch	2-4
P18	DDD DIGITAL	3-4
P19	USB	4-4
P20	PCM	5-4
P21	DDD.	1-5
P22	PROLOGIC	2-5
P23	FM	3-5
P24	AM	4-5
P25	ST	5-5
P26	S2	1-6
P27	S3	2-6
P28	S4	3-6
P29	S5	4-6
P30	S6	5-6
P31	S7	1-7
P32	S8	2-7
P33	S9	3-7
P34	S10	4-7
P35	DSP	5-7

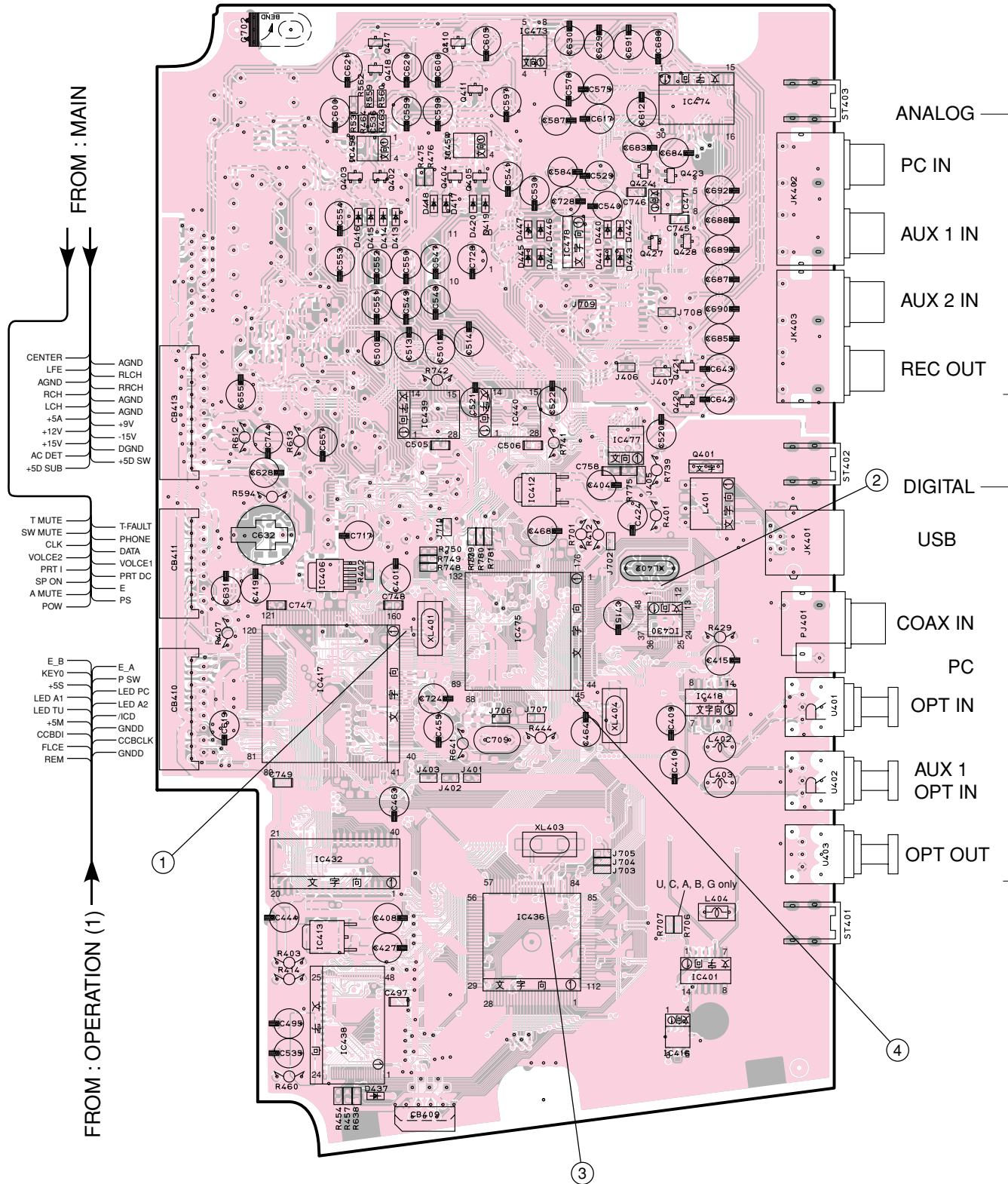
BLOCK DIAGRAM



PRINTED CIRCUIT BOARD (Foil side)

DSP P.C.B.

(Lead Type Device)



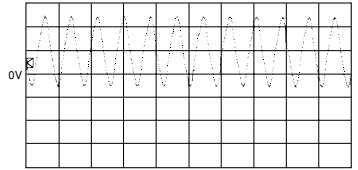
● Semiconductor Location

Ref. No.	Location
D413	C2
D414	C2
D415	C2
D416	C2
D417	C2
D418	C2
D419	C2
D420	C2
D437	C5
D440	D2
D441	D2
D442	D2
D443	D2
D444	D2
D445	D2
D446	D2
D447	D2

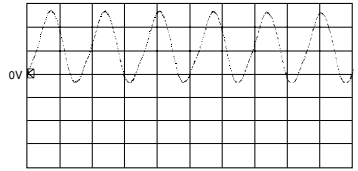
Ref. No.	Location
IC401	D5
IC406	C3
IC412	D3
IC413	C5
IC416	D5
IC417	C4
IC418	D4
IC430	D3
IC432	C4
IC436	D5
IC438	C5
IC439	C3
IC440	C3
IC454	C2
IC458	C2
IC471	D2
IC473	D1
IC474	D2
IC475	D3
IC477	C2
IC478	D2

Ref. No.	Location
Q401	D3
Q402	C2
Q403	C2
Q404	C2
Q405	C2
Q410	C1
Q411	C2
Q417	C1
Q418	C2
Q420	D3
Q421	D3
Q423	D2
Q424	D2
Q427	D2
Q428	D2

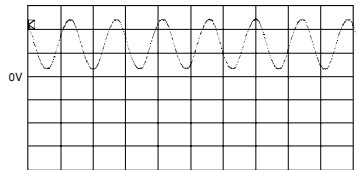
Point ① (Pin 1 of IC417)
V : 2V/div, H : 50 nsec/div
DC, 1 : 1 probe



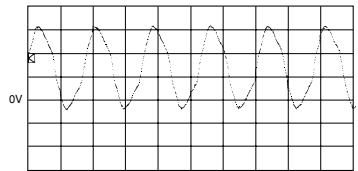
Point ② (Pin 4 of IC430)
V : 1V/div, H : 50 nsec/div
DC, 1 : 1 probe



Point ③ (Pin 74 of IC436)
V : 2V/div, H : 0.1 μsec/div
DC, 1 : 1 probe



Point ④ (Pin 47 of IC475)
V : 2V/div, H : 50 nsec/div
DC, 1 : 1 probe



NOTE)

The DSP P.C.B. actually has a four-layer pattern structure (part face pattern, internal pattern 1, internal pattern 2 and solder face pattern) but it is shown as "part face pattern + solder face pattern" in this diagram.

NOTE)

DSP P.C.B.は、4層パターン構造（部品面パターン、内層1パターン、内層2パターン、ハンダ面パターン）ですが、本図のDSP P.C.B.は、部品面パターン+ハンダ面パターンを表記しております。

PRINTED CIRCUIT BOARD (Foil side)

DSP P.C.B.

(Surface Mount Device)

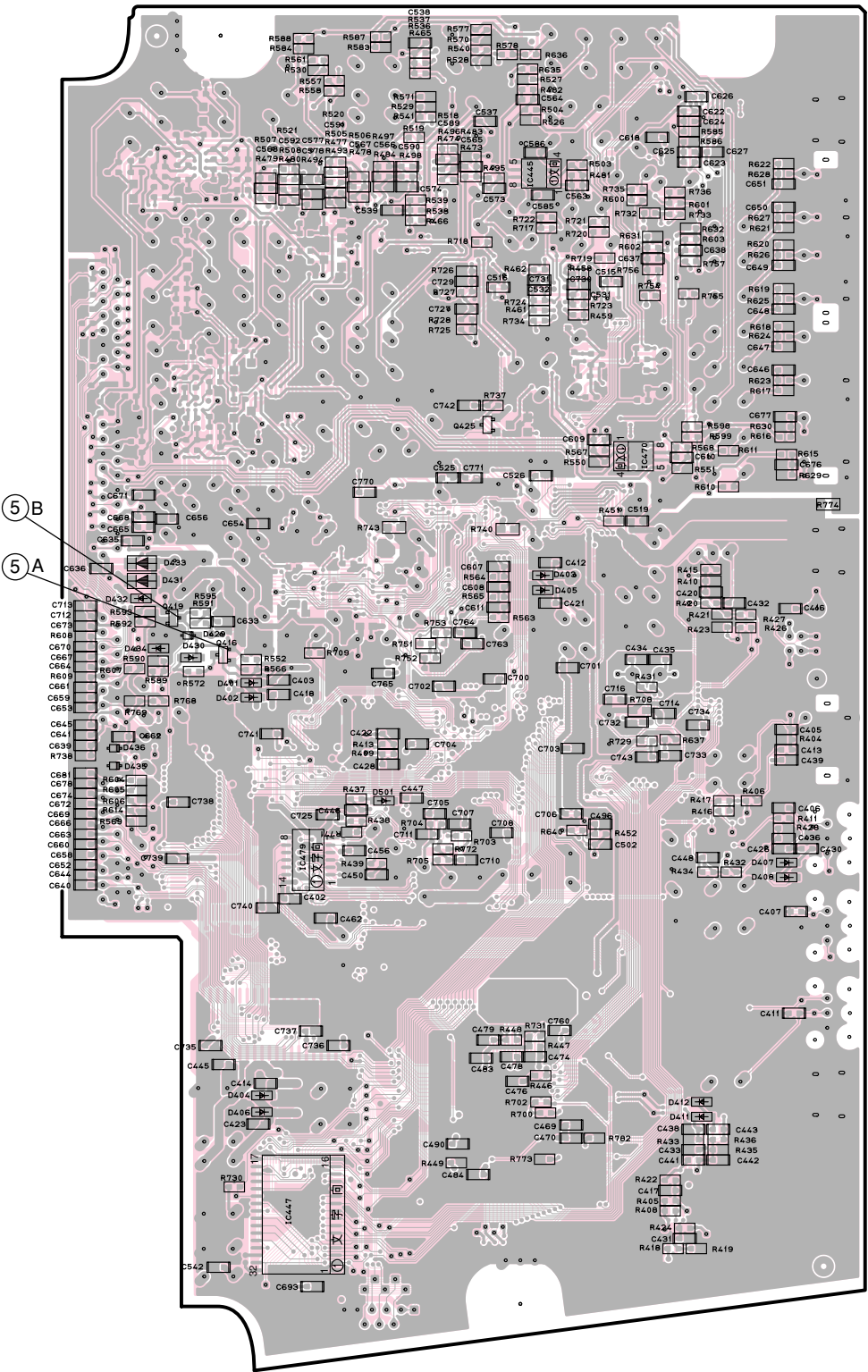
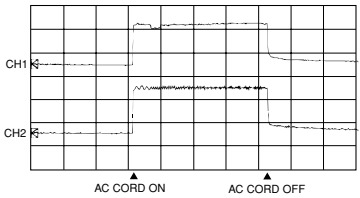
Semiconductor Location

Ref. No.	Location
D401	C3
D402	C3
D403	D3
D404	C5
D405	D3
D406	C5
D407	D4
D408	D4
D411	D5
D412	D5
D429	C3
D430	C3
D431	B3
D432	B3
D433	B3
D434	B3
D435	B4
D436	B4
D501	C4

Ref. No.	Location
IC445	D2
IC447	C5
IC470	D3
IC479	C4

Ref. No.	Location
Q416	C3
Q419	B3
Q425	C3

Point ⑤-A (CH1 : Emitter of Q416)
Point ⑤-B (CH2 : Collector of Q419)
V : 5V/div (CH1), V : 2V/div (CH2)
DC, 1 : 1 probe, H : 5 sec/div



NOTE)
The DSP P.C.B. actually has a four-layer pattern structure (part face pattern, internal pattern 1, internal pattern 2 and solder face pattern) but it is shown as "part face pattern + solder face pattern" in this diagram.

NOTE)
DSP P.C.B.は、4層パターン構造（部品面パターン、内層1パターン、内層2パターン、ハンダ面パターン）ですが、本図のDSP P.C.B.は、部品面パターン+ハンダ面パターンを表記しております。

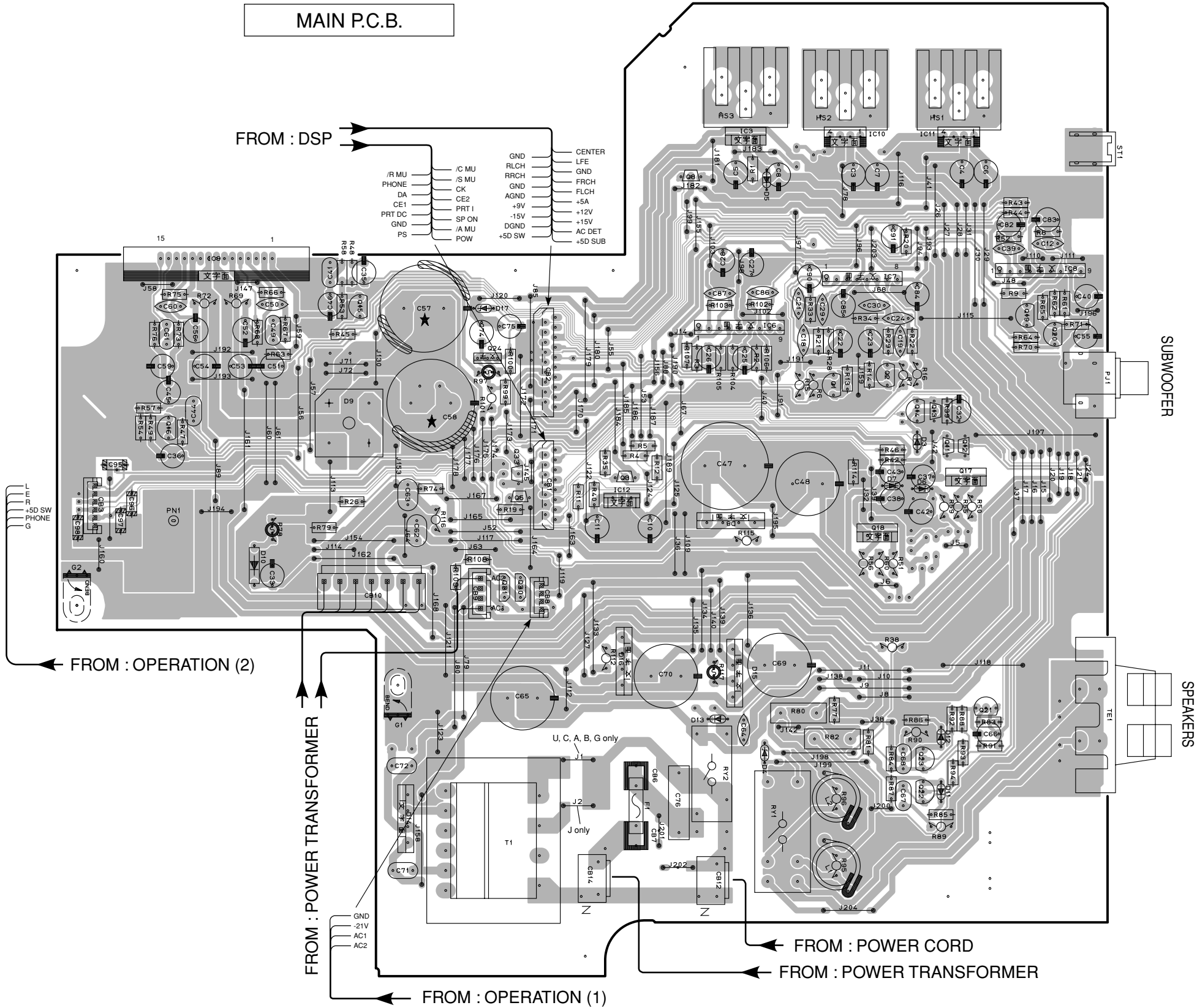
PRINTED CIRCUIT BOARD (Foil side)

Semiconductor Location

Ref. No.	Location
D3	F3
D4	E4
D5	E2
D6	F3
D7	F3
D8	E3
D9	C3
D10	C3
D11	F4
D12	F4
D13	E4
D14	D5
D15	E4
D16	E4
D17	D2

Ref. No.	Location
IC3	E2
IC6	E2
IC7	F2
IC8	F2
IC9	C2
IC10	F2
IC11	F2
IC12	E3

Ref. No.	Location
Q1	E3
Q2	F3
Q3	E3
Q5	D3
Q8	E2
Q11	F3
Q12	F3
Q13	F3
Q14	F3
Q15	C2
Q16	C3
Q17	F3
Q18	F3
Q19	F2
Q20	F2
Q21	F4
Q22	F4
Q23	F4
Q24	D3
Q30	D4
Q31	D4
Q24	D3



PRINTED CIRCUIT BOARD (Foil side)

Semiconductor Location

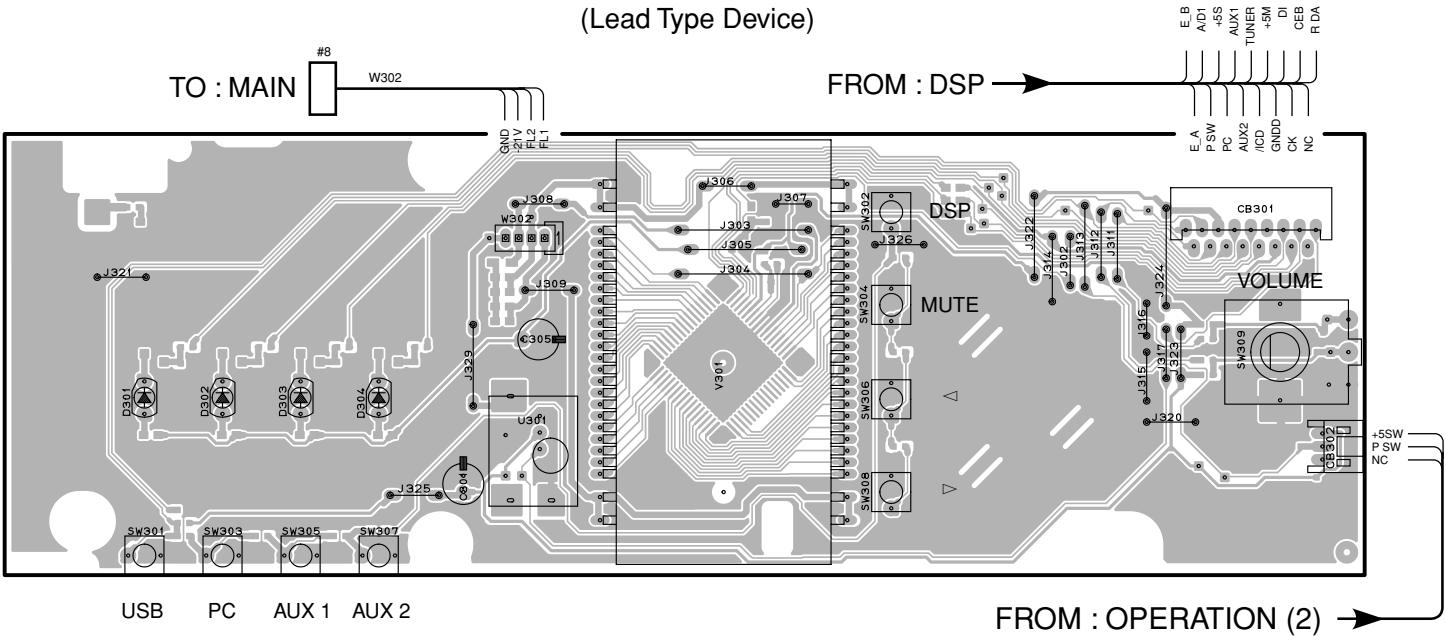
Ref. No.	Location
D301	B2
D302	C2
D303	C2
D304	C2
D305	C4

Ref. No.	Location
IC301	D4

Ref. No.	Location
Q301	B4
Q302	C4
Q303	C4
Q304	C4

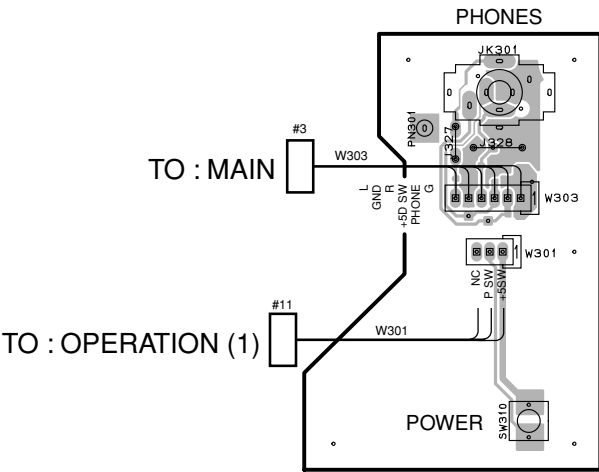
OPERATION (1) P.C.B.

(Lead Type Device)



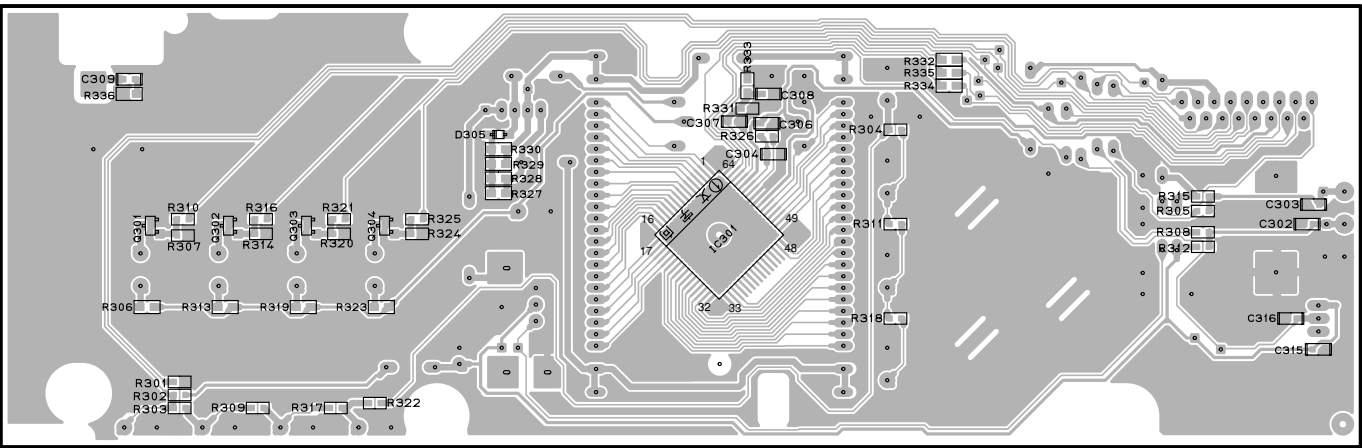
OPERATION (2) P.C.B.

(Lead Type Device)



OPERATION (1) P.C.B.

(Surface Mount Device)

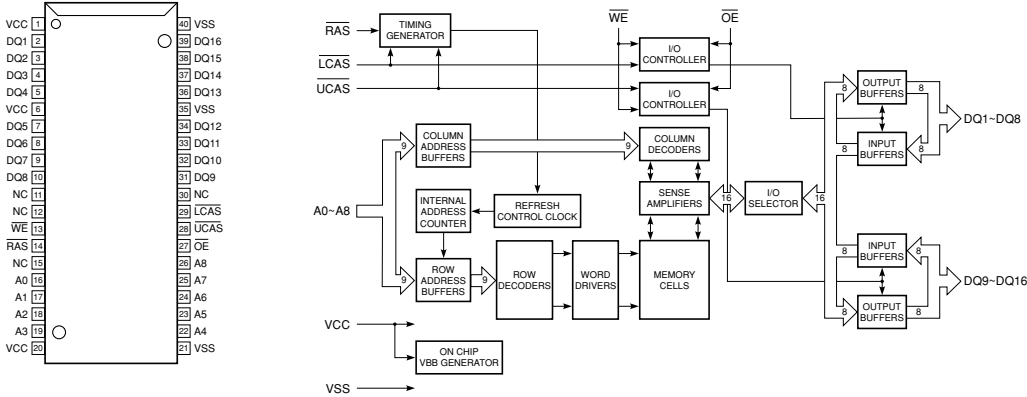


AP-U70

IC BLOCK

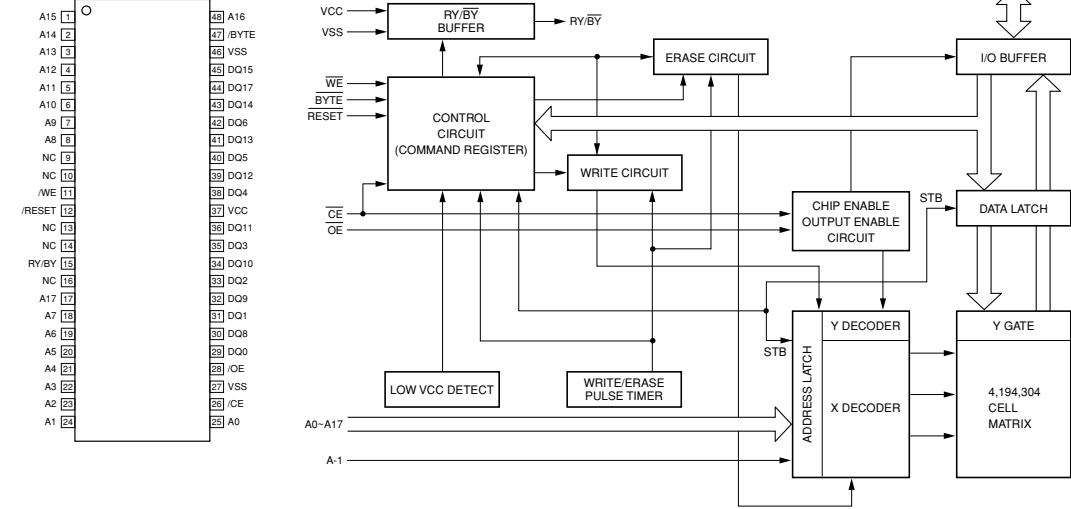
IC432 : MSM514260C-60JS

262,144-word x 16 bit Dynamic RAM



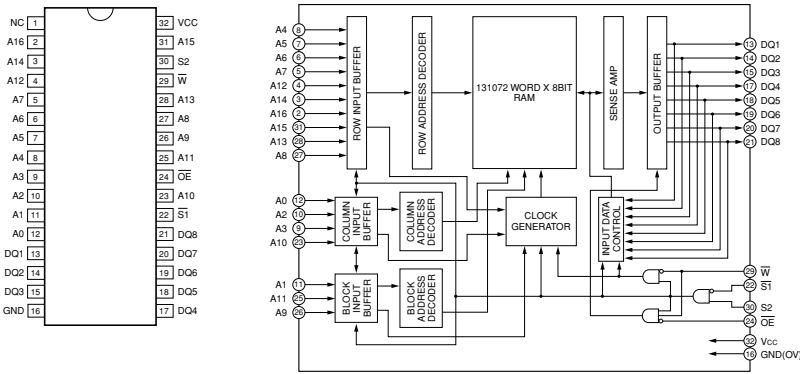
IC438 : MBM29F400BC-55

4M Bit Flash Memory



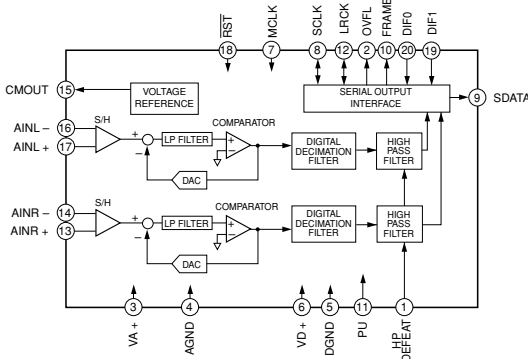
IC447 : M5M51008CFP-70H

131, 72-word X 8 bit Static RAM



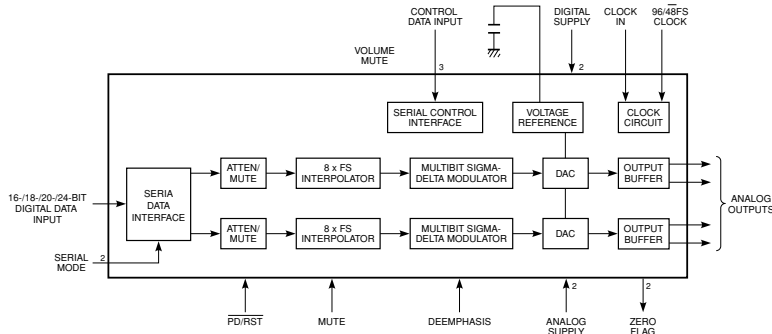
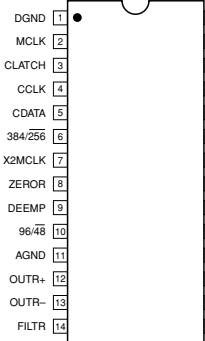
IC477 : CS5360-KSR

24-Bit A/D Converter



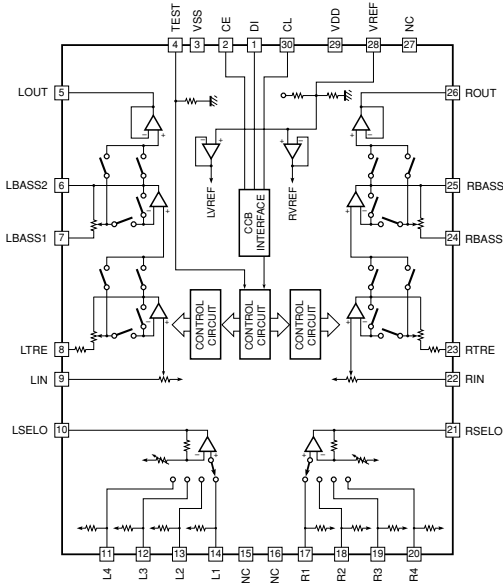
IC439, 440 : AD1854JSRSRL

24-Bit, 96kHz, Multibit Sigma-Delta D/A Converter



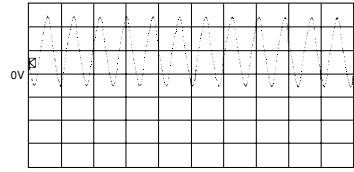
IC474 : LC75342M-TLM

Input Selector & Electric Controlled Volume

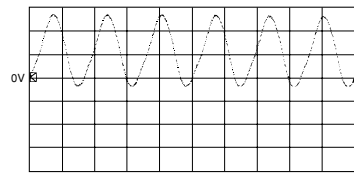


SCHEMATIC DIAGRAM (DSP)

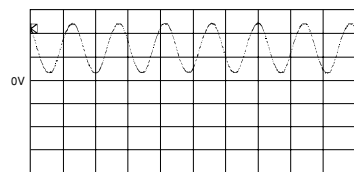
Point ① (Pin 1 of IC417)
V : 2V/div, H : 50 nsec/div
DC, 1 : 1 probe



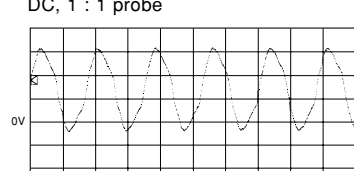
Point ② (Pin 4 of IC430)
V : 1V/div, H : 50 nsec/div
DC, 1 : 1 probe



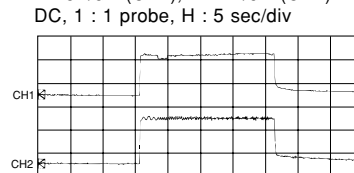
Point ③ (Pin 74 of IC436)
V : 2V/div, H : 0.1 μsec/div
DC, 1 : 1 probe



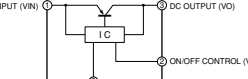
Point ④ (Pin 47 of IC475)
V : 2V/div, H : 50 nsec/div
DC, 1 : 1 probe



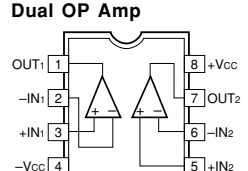
Point ⑤-A (CH1 : Emitter of Q416)
Point ⑤-B (CH2 : Collector of Q419)
V : 5V/div (CH1), V : 2V/div (CH2)
DC, 1 : 1 probe, H : 5 sec/div



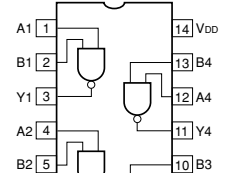
IC406 : P0025E25MZP
+2.5V Regulator



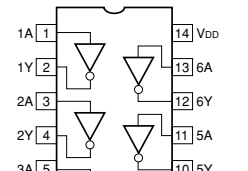
IC445, 454, 458, 470, 471,
473 : μPC4570G2
IC416 : NJM2904M-T1
Dual OP Amp



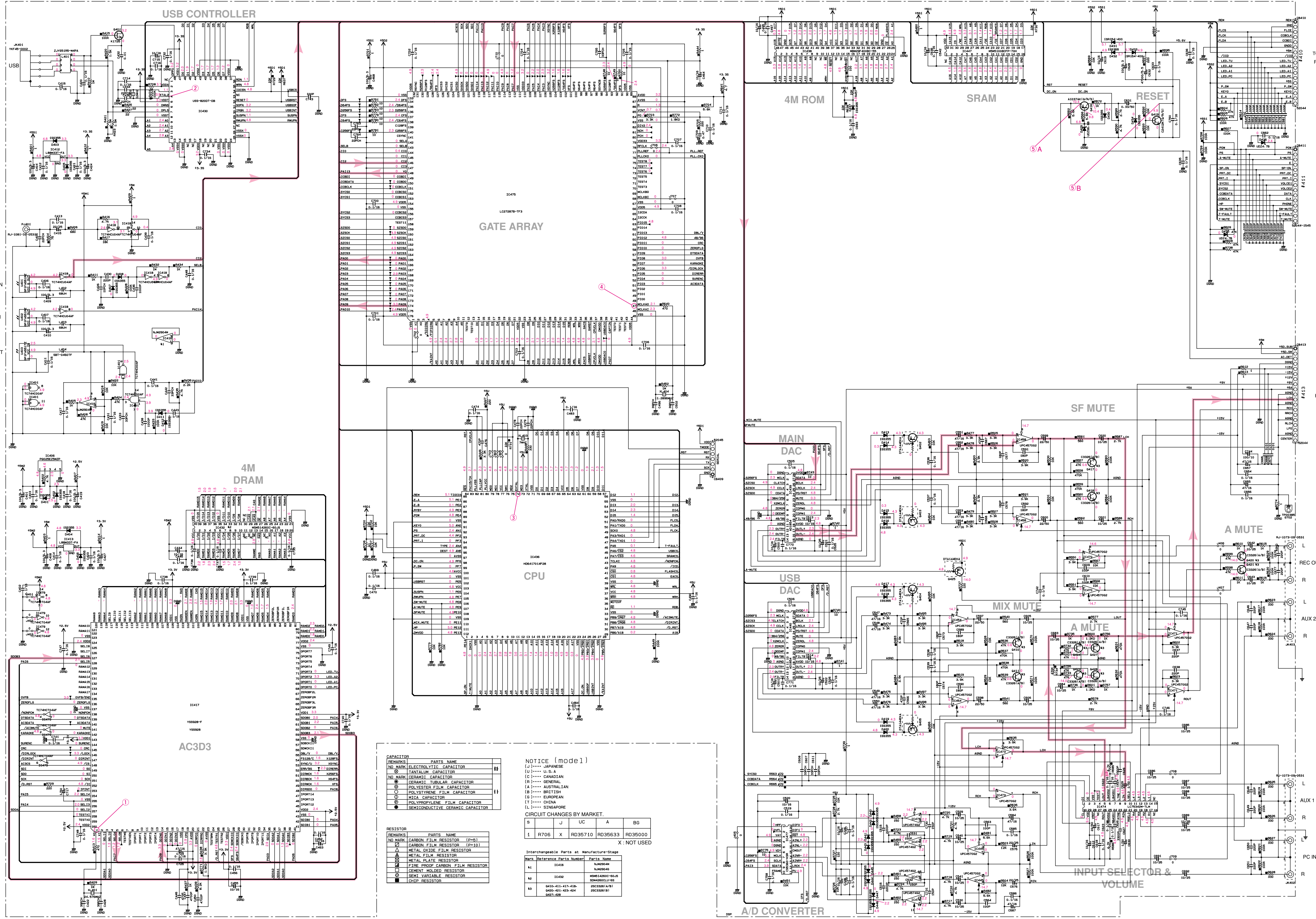
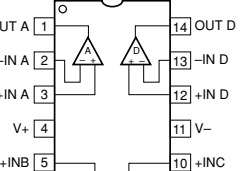
IC401 : TC74HC00AF
Quad 2 Input NAND



IC418 : TC74HC00AF-TP1
IC479 : TC74HC00AF-T1
Hex Inverters



IC478 : μPC4574G2
4channel OP-Amp



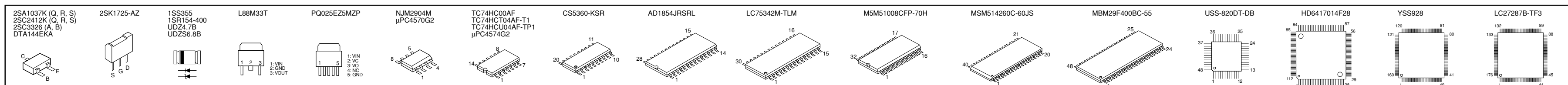
REMARKS	PARTS NAME	REMARKS
NO MARK ELECTROLYTIC CAPACITOR		
NO MARK TANTALUM CAPACITOR		
NO MARK CERAMIC CAPACITOR		
NO MARK CERAMIC TUBULAR CAPACITOR		
NO MARK POLYESTER FILM CAPACITOR		
NO MARK POLYSTYRENE FILM CAPACITOR		
NO MARK MICR CAPACITOR		
NO MARK POLYPROPYLENE FILM CAPACITOR		
NO MARK SEMICONDUCTIVE CERAMIC CAPACITOR		

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

NOTICE (model)	
(J)..... JAPANESE	
(U)..... U.S.A	
(C)..... CANADIAN	
(A)..... AUSTRALIAN	
(E)..... BRITISH	
(G)..... GERMAN	
(F)..... FRENCH	
(I)..... ITALIAN	
(S)..... SPANISH	
(K)..... KOREAN	
(P)..... PORTUGUESE	
(R)..... RUSSIAN	
(T)..... TURKISH	
(Y)..... YUGOSLAVIAN	

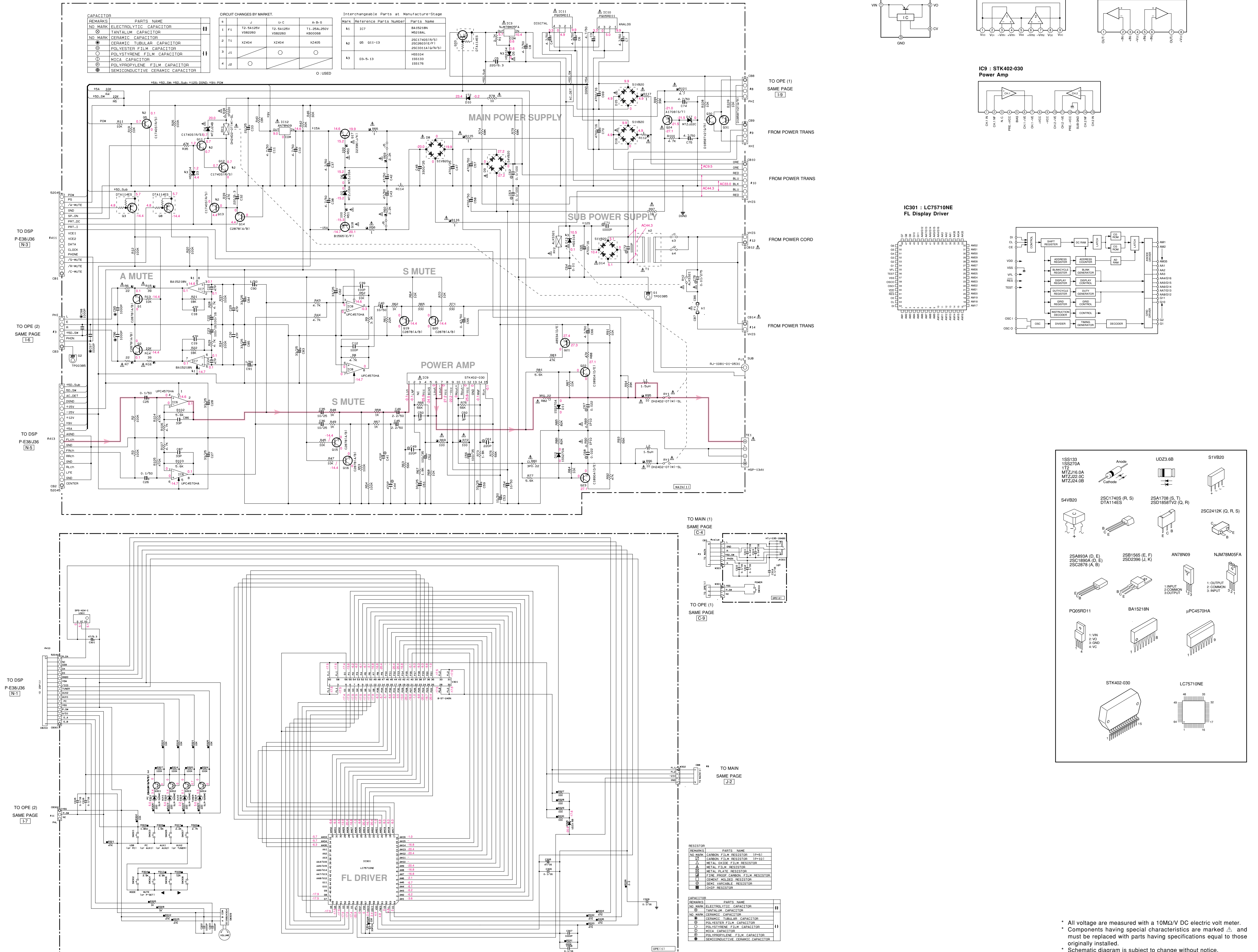
CIRCUIT CHANGES BY MARKET.	
J R706 X RD35710 RD35633 RD35000	
X : NOT USED	

Interchangeable Parts at Manufacture-Stage	
Mark Reference Parts Number Parts Name	
K1 IC406 HMM1400C-00-05 HMM1400C-00-05	
K2 IC401 HMM1400C-00-05 HMM1400C-00-05	
K3 IC402 HMM1400C-00-05 HMM1400C-00-05	



* All voltages are measured with a 10MΩ/V DC electric volt meter.
* Components having special characteristics are marked Δ. and must be replaced with parts having specifications equal to those originally installed.
* Schematic diagram is subject to change without notice.

■ SCHEMATIC DIAGRAM (MAIN & OPERATION)



PARTS LIST

■ ELECTRICAL PARTS

■ WARNING

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

- Carbon resistors (1/6W or 1/4W) are not included in the ELECTRICAL PARTS List. For the parts No. of the carbon resistors, refer to last page.
- Chip resistors are listed on page 46.

ABBREVIATIONS IN THIS LIST ARE AS FOLLOWS :

C.A.EL.CHP	: CHIP ALUMI. ELECTROLYTIC CAP	L.EMIT	: LIGHT EMITTING MODULE
C.CE	: CERAMIC CAP	LED.DSPLY	: LED DISPLAY
C.CE.ARRAY	: CERAMIC CAP ARRAY	LED.INFRD	: LED, INFRARED
C.CE.CHP	: CHIP CERAMIC CAP	MODUL.RF	: MODULATOR, RF
C.CE.ML	: MULTILAYER CERAMIC CAP	PHOT.CPL	: PHOTO COUPLER
C.CE.M.CHP	: CHIP MULTILAYER CERAMIC CAP	PHOT.INTR	: PHOTO INTERRUPTER
C.CE.SAFTY	: RECOGNIZED CERAMIC CAP	PHOT.RFLCT	: PHOTO REFLECTOR
C.CE.TUBLR	: CERAMIC TUBULAR CAP	PIN.TEST	: PIN, TEST POINT
C.CE.SMI	: SEMI CONDUCTIVE CERAMIC CAP	PLST.RIVET	: PLASTIC RIVET
C.EL	: ELECTROLYTIC CAP	R.ARRAY	: RESISTOR ARRAY
C.MICA	: MICA CAP	R.CAR	: CARBON RESISTOR
C.ML.FLM	: MULTILAYER FILM CAP	R.CAR.CHP	: CHIP RESISTOR
C.MP	: METALLIZED PAPER CAP	R.CAR.FP	: FLAME PROOF CARBON RESISTOR
C.MYLAR	: MYLAR FILM CAP	R.FUS	: FUSABLE RESISTOR
C.MYLAR.ML	: MULTILAYER MYLAR FILM CAP	R.MTL.CHP	: CHIP METAL FILM RESISTOR
C.PAPER	: PAPER CAPACITOR	R.MTL.FLM	: METAL FILM RESISTOR
C.PLS	: POLYSTYRENE FILM CAP	R.MTL.OXD	: METAL OXIDE FILM RESISTOR
C.POL	: POLYESTER FILM CAP	R.MTL.PLAT	: METAL PLATE RESISTOR
C.POLY	: POLYETHYLENE FILM CAP	RSNR.CE	: CERAMIC RESONATOR
C.PP	: POLYPROPYLENE FILM CAP	RSNR.CRYS	: CRYSTAL RESONATOR
C.TNTL	: TANTALUM CAP	R.TW.CEM	: TWIN CEMENT FIXED RESISTOR
C.TNTL.CHP	: CHIP TANTALUM CAP	R.WW	: WIRE WOUND RESISTOR
C.TRIM	: TRIMMER CAP	SCR.BND.HD	: BIND HEAD B-TITE SCREW
CN	: CONNECTOR	SCR.BW.HD	: BW HEAD TAPPING SCREW
CN.BS.PIN	: CONNECTOR, BASE PIN	SCR.CUP	: CUP TITE SCREW
CN.CANNON	: CONNECTOR, CANNON	SCR.TERM	: SCREW TERMINAL
CN.DIN	: CONNECTOR, DIN	SCR.TR	: SCREW, TRANSISTOR
CN.FLAT	: CONNECTOR, FLAT CABLE	SUPRT.PCB	: SUPPORT, P.C.B.
CN.POST	: CONNECTOR, BASE POST	SURG.PRTCT	: SURGE PROTECTOR
COIL.MX.AM	: COIL, AM MIX	SW.TACT	: TACT SWITCH
COIL.AT.FM	: COIL, FM ANTENNA	SW.LEAF	: LEAF SWITCH
COIL.DT.FM	: COIL, FM DETECT	SW.LEVER	: LEVER SWITCH
COIL.MX.FM	: COIL, FM MIX	SW.MICRO	: MICRO SWITCH
COIL.OUTPT	: OUTPUT COIL	SW.PUSH	: PUSH SWITCH
DIOD.ARRAY	: DIODE ARRAY	SW.RT.ENC	: ROTARY ENCODER
DIODE.BRG	: DIODE BRIDGE	SW.RT.MTR	: ROTARY SWITCH WITH MOTOR
DIODE.CHP	: CHIP DIODE	SW.RT	: ROTARY SWITCH
DIODE.VAR	: VARACTOR DIODE	SW.SLIDE	: SLIDE SWITCH
DIOD.Z.CHP	: CHIP ZENER DIODE	TERM.SP	: SPEAKER TERMINAL
DIODE.ZENR	: ZENER DIODE	TERM.WRAP	: WRAPPING TERMINAL
DSCR.CE	: CERAMIC DISCRIMINATOR	THRMST.CHP	: CHIP THERMISTOR
FER.BEAD	: FERRITE BEADS	TR.CHP	: CHIP TRANSISTOR
FER.CORE	: FERRITE CORE	TR.DGT	: DIGITAL TRANSISTOR
FET.CHP	: CHIP FET	TR.DGT.CHP	: CHIP DIGITAL TRANSISTOR
FL.DSPLY	: FLUORESCENT DISPLAY	TRANS	: TRANSFORMER
FLTR.CE	: CERAMIC FILTER	TRANS.PULS	: PULSE TRANSFORMER
FLTR.COMB	: COMB FILTER MODULE	TRANS.PWR	: POWER TRANSFORMER ASS'y
FLTR.LC.RF	: LC FILTER ,EMI	TUNER.AM	: TUNER PACK, AM
GND.MTL	: GROUND PLATE	TUNER.FM	: TUNER PACK, FM
GND.TERM	: GROUND TERMINAL	TUNER.PK	: FRONT-END TUNER PACK
HOLDER.FUS	: FUSE HOLDER	VR	: ROTARY POTENTIOMETER
IC.PRTCT	: IC PROTECTOR	VR.MTR	: POTENTIOMETER WITH MOTOR
JUMPER.CN	: JUMPER CONNECTOR	VR.SW	: POTENTIOMETER WITH ROTARY SW
JUMPER.TST	: JUMPER, TEST POINT	VR.SLIDE	: SLIDE POTENTIOMETER
L.DTCT	: LIGHT DETECTING MODULE	VR.TRIM	: TRIMMER POTENTIOMETER

Note) Those parts marked with “#” are not included in the P.C.B. ass'y.

P.C.B. DSP

Schm Ref.	PART NO.	Description
*	V6550100	P.C.B.
*	V6550200	P.C.B.
*	V6550300	P.C.B.
CB409	VQ047100	CN.BS.PIN 7P
CB410	VF982300	CN.BS.PIN 17P
CB411	VM929900	CN.BS.PIN 15P
CB413	VQ044900	CN.BS.PIN 19P
C401	UR818100	C.EL 100uF 6.3V
C402	US035100	C.CE.M.CHP 0.1uF 16V
C403	US035100	C.CE.M.CHP 0.1uF 16V
C404	UR818100	C.EL 100uF 6.3V
C405	US061220	C.CE.M.CHP 22pF 50V
C406	US035100	C.CE.M.CHP 0.1uF 16V
C407	US035100	C.CE.M.CHP 0.1uF 16V
C408	UR818100	C.EL 100uF 6.3V
C409	UR818100	C.EL 100uF 6.3V
C410	UR818100	C.EL 100uF 6.3V
C411	US035100	C.CE.M.CHP 0.1uF 16V
C412	US035100	C.CE.M.CHP 0.1uF 16V
C413	US035100	C.CE.M.CHP 0.1uF 16V
C414	US035100	C.CE.M.CHP 0.1uF 16V
C415	UR847220	C.EL 22uF 25V
C416	US035100	C.CE.M.CHP 0.1uF 16V
C417	US035100	C.CE.M.CHP 0.1uF 16V
C418	US035100	C.CE.M.CHP 0.1uF 16V
C419	UR818100	C.EL 100uF 6.3V
C420	US035100	C.CE.M.CHP 0.1uF 16V
C421	US035100	C.CE.M.CHP 0.1uF 16V
C422	US061390	C.CE.M.CHP 39pF 50V
C423	US035100	C.CE.M.CHP 0.1uF 16V
C424	UR818100	C.EL 100uF 6.3V
C426	US061100	C.CE.M.CHP 10pF 50V
C427	UR818100	C.EL 100uF 6.3V
C428	US061390	C.CE.M.CHP 39pF 50V
C430	US062220	C.CE.CHP 220pF 50V
C431	US035100	C.CE.M.CHP 0.1uF 16V
C432	US064100	C.CE.M.CHP 0.01uF 50V
C433	US061330	C.CE.M.CHP 33pF 50V
C434	US061220	C.CE.M.CHP 22pF 50V
C435	US061220	C.CE.M.CHP 22pF 50V
C436	US063100	C.CE.M.CHP 1000pF 50V
C438	US063100	C.CE.M.CHP 1000pF 50V
C439	US035100	C.CE.M.CHP 0.1uF 16V
C441	US035100	C.CE.M.CHP 0.1uF 16V
C442	US061330	C.CE.M.CHP 33pF 50V
C443	US035100	C.CE.M.CHP 0.1uF 16V
C444	UR837100	C.EL 10uF 16V
C445	US035100	C.CE.M.CHP 0.1uF 16V
C446	US062470	C.CE.M.CHP 470pF 50V
C447	US063470	C.CE.CHP 4700pF 50V
C448	US035100	C.CE.M.CHP 0.1uF 16V
C450	US063470	C.CE.CHP 4700pF 50V
C455	UR837100	C.EL 10uF 16V

* New Parts

Schm Ref.	PART NO.	Description
C456	US035100	C.CE.M.CHP 0.1uF 16V
C462	US035100	C.CE.M.CHP 0.1uF 16V
C463	UR837100	C.EL 10uF 16V
C464	UR837100	C.EL 10uF 16V
C468	UR818100	C.EL 100uF 6.3V
C469	US035100	C.CE.M.CHP 0.1uF 16V
C470	US035100	C.CE.M.CHP 0.1uF 16V
C474	US035100	C.CE.M.CHP 0.1uF 16V
C476	US062470	C.CE.M.CHP 470pF 50V
C478	US061220	C.CE.M.CHP 22pF 50V
C479	US061220	C.CE.M.CHP 22pF 50V
C483	US035100	C.CE.M.CHP 0.1uF 16V
C484	US035100	C.CE.M.CHP 0.1uF 16V
C490	US035100	C.CE.M.CHP 0.1uF 16V
C495	UR837100	C.EL 10uF 16V
C496	US061390	C.CE.M.CHP 39pF 50V
C497	US035100	C.CE.M.CHP 0.1uF 16V
C500	UR837100	C.EL 10uF 16V
C501	UR837100	C.EL 10uF 16V
C502	US061390	C.CE.M.CHP 39pF 50V
C505	US035100	C.CE.M.CHP 0.1uF 16V
C506	US035100	C.CE.M.CHP 0.1uF 16V
C513	UR837100	C.EL 10uF 16V
C514	UR837100	C.EL 10uF 16V
C515	US063220	C.CE.M.CHP 2200pF 50V
C516	US063220	C.CE.M.CHP 2200pF 50V
C519	US035100	C.CE.M.CHP 0.1uF 16V
C520	UR837100	C.EL 10uF 16V
C521	UU147100	C.EL 10uF 25V
C522	UU147100	C.EL 10uF 25V
C525	US035100	C.CE.M.CHP 0.1uF 16V
C526	US035100	C.CE.M.CHP 0.1uF 16V
C529	UU147100	C.EL 10uF 25V
C530	UU147100	C.EL 10uF 25V
C531	US062150	C.CE.CHP 150pF 50V
C532	US062150	C.CE.CHP 150pF 50V
C535	UR837100	C.EL 10uF 16V
C536	US035100	C.CE.M.CHP 0.1uF 16V
C537	US035100	C.CE.M.CHP 0.1uF 16V
C538	US035100	C.CE.M.CHP 0.1uF 16V
C539	US035100	C.CE.M.CHP 0.1uF 16V
C540	UU147100	C.EL 10uF 25V
C541	UU147100	C.EL 10uF 25V
C542	US035100	C.CE.M.CHP 0.1uF 16V
C547	UU137470	C.EL 47uF 16V
C548	UU137470	C.EL 47uF 16V
C549	UU137470	C.EL 47uF 16V
C550	UU137470	C.EL 47uF 16V
C551	UU137470	C.EL 47uF 16V
C552	UU137470	C.EL 47uF 16V
C553	UU137470	C.EL 47uF 16V
C554	UU137470	C.EL 47uF 16V
C563	US062100	C.CE.M.CHP 100pF 50V

* New Parts

P.C.B. DSP

Schm Ref.	PART NO.	Description		
C564	US062100	C.CE.M.CHP	100pF	50V
C565	US062470	C.CE.M.CHP	470pF	50V
C566	US062470	C.CE.M.CHP	470pF	50V
C567	US062470	C.CE.M.CHP	470pF	50V
C568	US062470	C.CE.M.CHP	470pF	50V
* C573	US062180	C.CE.CHP	180P	50V
* C574	US062180	C.CE.CHP	180P	50V
C575	UU147220	C.EL	22uF	25V
C576	UU147220	C.EL	22uF	25V
* C577	US062180	C.CE.CHP	180P	50V
* C578	US062180	C.CE.CHP	180P	50V
C584	UU137470	C.EL	47uF	16V
C585	US035100	C.CE.M.CHP	0.1uF	16V
C586	US035100	C.CE.M.CHP	0.1uF	16V
C587	UU137470	C.EL	47uF	16V
* C589	US062180	C.CE.CHP	180P	50V
* C590	US062180	C.CE.CHP	180P	50V
* C591	US062180	C.CE.CHP	180P	50V
* C592	US062180	C.CE.CHP	180P	50V
* C597	UU167220	C.EL	22uF	50V
* C598	UU167220	C.EL	22uF	50V
* C599	UU167220	C.EL	22uF	50V
* C600	UU167220	C.EL	22uF	50V
C605	UU147100	C.EL	10uF	25V
C606	UU147100	C.EL	10uF	25V
C607	US061330	C.CE.M.CHP	33pF	50V
C608	US061330	C.CE.M.CHP	33pF	50V
C609	US062100	C.CE.M.CHP	100pF	50V
C610	US062100	C.CE.M.CHP	100pF	50V
C611	US061330	C.CE.M.CHP	33pF	50V
C612	UU137100	C.EL	10uF	16V
* C617	UU167220	C.EL	22uF	50V
C618	US035100	C.CE.M.CHP	0.1uF	16V
C619	UR837100	C.EL	10uF	16V
C620	UU147100	C.EL	10uF	25V
C621	UU147100	C.EL	10uF	25V
C622	US035100	C.CE.M.CHP	0.1uF	16V
C623	US035100	C.CE.M.CHP	0.1uF	16V
C624	US035100	C.CE.M.CHP	0.1uF	16V
C625	US035100	C.CE.M.CHP	0.1uF	16V
* C626	US063330	C.CE.M.CHP	3300pF	50V
* C627	US063330	C.CE.M.CHP	3300pF	50V
C628	UR818100	C.EL	100uF	6.3V
C629	UU166100	C.EL	1uF	50V
C630	UU166100	C.EL	1uF	50V
C631	UR865330	C.EL	0.33uF	50V
C632	VU545000	C.EL	47000uF	5.5V
C633	US035100	C.CE.M.CHP	0.1uF	16V
C635	US035100	C.CE.M.CHP	0.1uF	16V
C636	US035100	C.CE.M.CHP	0.1uF	16V
C637	US062220	C.CE.CHP	220pF	50V
C638	US062220	C.CE.CHP	220pF	50V
C639	US062100	C.CE.M.CHP	100pF	50V

* New Parts

Schm Ref.	PART NO.	Description		
C640	US062100	C.CE.M.CHP	100pF	50V
C641	US062100	C.CE.M.CHP	100pF	50V
C642	UU147100	C.EL	10uF	25V
C643	UU147100	C.EL	10uF	25V
C644	US062100	C.CE.M.CHP	100pF	50V
C645	US062100	C.CE.M.CHP	100pF	50V
C646	US062220	C.CE.CHP	220pF	50V
C647	US062220	C.CE.CHP	220pF	50V
C648	US062220	C.CE.CHP	220pF	50V
C649	US062220	C.CE.CHP	220pF	50V
C650	US062220	C.CE.CHP	220pF	50V
C651	US062220	C.CE.CHP	220pF	50V
C652	US062100	C.CE.M.CHP	100pF	50V
C653	US062100	C.CE.M.CHP	100pF	50V
C654	US035100	C.CE.M.CHP	0.1uF	16V
C655	UU137470	C.EL	47uF	16V
C656	US035100	C.CE.M.CHP	0.1uF	16V
C657	UU137470	C.EL	47uF	16V
C658	US062100	C.CE.M.CHP	100pF	50V
C659	US062100	C.CE.M.CHP	100pF	50V
C660	US062100	C.CE.M.CHP	100pF	50V
C661	US062100	C.CE.M.CHP	100pF	50V
C662	US035100	C.CE.M.CHP	0.1uF	16V
C663	US062100	C.CE.M.CHP	100pF	50V
C664	US062100	C.CE.M.CHP	100pF	50V
C665	US064100	C.CE.M.CHP	0.01uF	50V
C666	US062100	C.CE.M.CHP	100pF	50V
C667	US062100	C.CE.M.CHP	100pF	50V
C668	US064100	C.CE.M.CHP	0.01uF	50V
C669	US062100	C.CE.M.CHP	100pF	50V
C670	US062100	C.CE.M.CHP	100pF	50V
C671	US064100	C.CE.M.CHP	0.01uF	50V
C672	US062100	C.CE.M.CHP	100pF	50V
C673	US062100	C.CE.M.CHP	100pF	50V
C674	US062100	C.CE.M.CHP	100pF	50V
C676	US062220	C.CE.CHP	220pF	50V
C677	US062220	C.CE.CHP	220pF	50V
C678	US062100	C.CE.M.CHP	100pF	50V
C681	US062100	C.CE.M.CHP	100pF	50V
C683	UU147100	C.EL	10uF	25V
C684	UU147100	C.EL	10uF	25V
C685	UU147100	C.EL	10uF	25V
C686	UU147100	C.EL	10uF	25V
C687	UU147100	C.EL	10uF	25V
C688	UU147100	C.EL	10uF	25V
C689	UU147100	C.EL	10uF	25V
C690	UU147100	C.EL	10uF	25V
C691	UU147100	C.EL	10uF	25V
C692	UU147100	C.EL	10uF	25V
C693	US035100	C.CE.M.CHP	0.1uF	16V
C700	US035100	C.CE.M.CHP	0.1uF	16V
C701	US035100	C.CE.M.CHP	0.1uF	16V
C702	US035100	C.CE.M.CHP	0.1uF	16V

* New Parts

P.C.B. DSP

Schm Ref.	PART NO.	Description
C703	US035100	C.CE.M.CHP 0.1uF 16V
C704	US035100	C.CE.M.CHP 0.1uF 16V
C705	US035100	C.CE.M.CHP 0.1uF 16V
C706	US035100	C.CE.M.CHP 0.1uF 16V
C707	US035100	C.CE.M.CHP 0.1uF 16V
C708	US035100	C.CE.M.CHP 0.1uF 16V
C709	VR169200	C.MYLAR.ML ECQ-V1H474JL3
C710	US035100	C.CE.M.CHP 0.1uF 16V
C711	US035100	C.CE.M.CHP 0.1uF 16V
C712	US062100	C.CE.M.CHP 100pF 50V
C713	US062100	C.CE.M.CHP 100pF 50V
C714	US035100	C.CE.M.CHP 0.1uF 16V
C715	UR837100	C.EL 10uF 16V
C716	US035100	C.CE.M.CHP 0.1uF 16V
C717	UR866100	C.EL 1uF 50V
C724	UR837470	C.EL 47uF 16V
C725	US035100	C.CE.M.CHP 0.1uF 16V
C726	UR837100	C.EL 10uF 16V
C727	US035100	C.CE.M.CHP 0.1uF 16V
C728	UR837100	C.EL 10uF 16V
C729	US035100	C.CE.M.CHP 0.1uF 16V
C730	US062150	C.CE.CHP 150pF 50V
C731	US062150	C.CE.CHP 150pF 50V
C732	US035100	C.CE.M.CHP 0.1uF 16V
C733	US035100	C.CE.M.CHP 0.1uF 16V
C734	US035100	C.CE.M.CHP 0.1uF 16V
C735	US035100	C.CE.M.CHP 0.1uF 16V
C736	US035100	C.CE.M.CHP 0.1uF 16V
C737	US035100	C.CE.M.CHP 0.1uF 16V
C738	US035100	C.CE.M.CHP 0.1uF 16V
C739	US035100	C.CE.M.CHP 0.1uF 16V
C740	US035100	C.CE.M.CHP 0.1uF 16V
C741	US035100	C.CE.M.CHP 0.1uF 16V
C742	US035100	C.CE.M.CHP 0.1uF 16V
C743	US062100	C.CE.M.CHP 100pF 50V
C744	UR828100	C.EL 100uF 10V
C745	US035100	C.CE.M.CHP 0.1uF 16V
C746	US035100	C.CE.M.CHP 0.1uF 16V
C747	US035100	C.CE.M.CHP 0.1uF 16V
C748	US035100	C.CE.M.CHP 0.1uF 16V
C749	US035100	C.CE.M.CHP 0.1uF 16V
C758	US035100	C.CE.M.CHP 0.1uF 16V
C760	US035100	C.CE.M.CHP 0.1uF 16V
C763	US061220	C.CE.M.CHP 22pF 50V
C764	US061220	C.CE.M.CHP 22pF 50V
C770	US035100	C.CE.M.CHP 0.1uF 16V
C771	US035100	C.CE.M.CHP 0.1uF 16V
D401	VT332900	DIODE 1SS355
D402	VT332900	DIODE 1SS355
D403	VT332900	DIODE 1SS355
D404	VT332900	DIODE 1SS355
D405	VT332900	DIODE 1SS355
D406	VT332900	DIODE 1SS355

* New Parts

Schm Ref.	PART NO.	Description
D407	VT332900	DIODE 1SS355
D408	VT332900	DIODE 1SS355
D411	VT332900	DIODE 1SS355
D412	VT332900	DIODE 1SS355
D413	VT332900	DIODE 1SS355
D414	VT332900	DIODE 1SS355
D415	VT332900	DIODE 1SS355
D416	VT332900	DIODE 1SS355
D417	VT332900	DIODE 1SS355
D418	VT332900	DIODE 1SS355
D419	VT332900	DIODE 1SS355
D420	VT332900	DIODE 1SS355
D429	VU172200	DIODE.ZENR UDZ6.8B 6.8V
D430	VT332900	DIODE 1SS355
* D431	VT532500	DIODE 1SR154-400
* D432	VT332900	DIODE 1SS355
* D433	VT532500	DIODE 1SR154-400
D434	VT332900	DIODE 1SS355
D435	VU171800	DIODE.ZENR UDZ4.7B 4.7V
D436	VU171800	DIODE.ZENR UDZ4.7B 4.7V
D437	VT332900	DIODE 1SS355
D440	VT332900	DIODE 1SS355
D441	VT332900	DIODE 1SS355
D442	VT332900	DIODE 1SS355
D443	VT332900	DIODE 1SS355
D444	VT332900	DIODE 1SS355
D445	VT332900	DIODE 1SS355
D446	VT332900	DIODE 1SS355
D447	VT332900	DIODE 1SS355
D501	VT332900	DIODE 1SS355
G702	VR463400	TERM.GND D3.5 TP00385
IC401	XD655A00	IC TC74HC00AF NAND
IC406	XZ003A00	IC PQ025EZ5MZP 2.5V
* IC412	XY494A00	IC L88M33T-FA 3.3V
* IC413	XY494A00	IC L88M33T-FA 3.3V
IC416	XR038A00	IC NJM2904M OP AMP
IC417	XY580A00	IC YSS928
IC418	XD660A00	IC TC74HCU04AF-TP1
* IC430	XY524B00	IC.CPU USS-820DT-DB CPU
IC432	XV077A00	IC MSM514260C-60JS
* IC436	XU147A00	IC HD6417014F28 CPU
* IC438	XZ457B00	IC MBM29F400BC-55
* IC439	XY782A00	IC AD1854JRSRL
* IC440	XY782A00	IC AD1854JRSRL
IC445	XF291A00	IC uPC4570G2
* IC447	XV976A00	IC M5M51008CFP-70H SR
IC454	XF291A00	IC uPC4570G2
IC458	XF291A00	IC uPC4570G2
IC470	XF291A00	IC uPC4570G2
IC471	XF291A00	IC uPC4570G2
IC473	XF291A00	IC uPC4570G2
* IC474	XY935A00	IC LC75342M-TLM
* IC475	XZ143A00	IC.CPU LC27287B-TF3 CPU

* New Parts

P.C.B. DSP & OPERATION

Schm Ref.	PART NO.	Description
* IC477	XY172A00	IC CS5360-KSR
IC478	XE518A00	IC uPC4574G2
IC479	Xi297A00	IC TC74HCT04AF-T1
* JK401	V3671200	JACK.USB 4P
* JK402	V6385400	JACK.PIN 4P
* JK403	V6385400	JACK.PIN 4P
* L401	V3939900	ZJYS51R5-M4PAT
L402	GE901970	COIL 68uH
L403	GE901970	COIL 68uH
L404	VD473700	COIL 60uH
* PJ401	V6385600	JACK.PIN 1P
* Q401	VU019600	FET 2SK1725
Q402	VV655300	TR.DGT DTA144EKA
Q403	VV655300	TR.DGT DTA144EKA
Q404	VV655300	TR.DGT DTA144EKA
Q405	VV655300	TR.DGT DTA144EKA
Q410	VD303700	TR 2SC3326 A,B
Q411	VD303700	TR 2SC3326 A,B
Q416	VV556500	TR 2SA1037K Q,R,S
Q417	VD303700	TR 2SC3326 A,B
Q418	VD303700	TR 2SC3326 A,B
Q419	VV556400	TR 2SC2412K Q,R,S
Q420	VD303700	TR 2SC3326 A,B
Q421	VD303700	TR 2SC3326 A,B
Q423	VD303700	TR 2SC3326 A,B
Q424	VD303700	TR 2SC3326 A,B
Q425	VV655300	TR.DGT DTA144EKA
Q427	VD303700	TR 2SC3326 A,B
Q428	VD303700	TR 2SC3326 A,B
R401	HV753100	R.CAR.FP 1Ω 1/4W
R403	HV753100	R.CAR.FP 1Ω 1/4W
R407	HV753100	R.CAR.FP 1Ω 1/4W
R412	HV753100	R.CAR.FP 1Ω 1/4W
R414	HV753100	R.CAR.FP 1Ω 1/4W
R429	HV753100	R.CAR.FP 1Ω 1/4W
R444	HV753100	R.CAR.FP 1Ω 1/4W
R460	HV753100	R.CAR.FP 1Ω 1/4W
R594	HV753100	R.CAR.FP 1Ω 1/4W
R612	HV753100	R.CAR.FP 1Ω 1/4W
R613	HV753100	R.CAR.FP 1Ω 1/4W
R641	HV753470	R.CAR.FP 4.7Ω 1/4W
R701	HV753100	R.CAR.FP 1Ω 1/4W
R706	RD357100	R.CAR.CHP 10KΩ 1/10W(UC)
R706	RD356330	R.CAR.CHP 3.3KΩ 1/10W(A)
R706	RD350000	R.CAR.CHP 0Ω 1/10W(BG)
R739	HV753100	R.CAR.FP 1Ω 1/4W
R741	HV753100	R.CAR.FP 1Ω 1/4W
R742	HV753100	R.CAR.FP 1Ω 1/4W
ST401	V4040500	SCR.TERM M3
ST402	V4040500	SCR.TERM M3
ST403	V4040500	SCR.TERM M3
U401	V5478200	CN.PHOT.SN 1P GP1FA551RZ
U402	V5478200	CN.PHOT.SN 1P GP1FA551RZ

* New Parts

Schm Ref.	PART NO.	Description	
U403	V6022800	CN.FBRLINK	1P GP1FA551TZ
XL401	V3625700	RSNR.CRYS	24.576MHz
XL402	VE463500	RSNR.CRYS	AT-49/12.0MHz
XL403	VV762900	RSNR.CRYS	7MHz SMD-49
XL404	VY712700	RSNR.CRYS	11.2896M SMD-49
	V6440800	P.C.B.	OPERATION
CB301	VF982300	CN.BS.PIN	17P
CB302	VB858200	CN.BS.PIN	3P
C301	VR804100	C.EL.AL	47uF 6.3V
C302	US063100	C.CE.M.CHP	1000pF 50V
C303	US063100	C.CE.M.CHP	1000pF 50V
C304	US061330	C.CE.M.CHP	33pF 50V
C305	UM397470	C.EL	47uF 16V
C306	US035100	C.CE.M.CHP	0.1uF 16V
C307	US063100	C.CE.M.CHP	1000pF 50V
C308	US035100	C.CE.M.CHP	0.1uF 16V
C309	US035100	C.CE.M.CHP	0.1uF 16V
C310	US035100	C.CE.M.CHP	0.1uF 16V
C311	US034470	C.CE.M.CHP	0.047uF 16V
C312	US035100	C.CE.M.CHP	0.1uF 16V
C313	US034470	C.CE.M.CHP	0.047uF 16V
C314	US035100	C.CE.M.CHP	0.1uF 16V
C315	US035100	C.CE.M.CHP	0.1uF 16V
C316	US035100	C.CE.M.CHP	0.1uF 16V
D301	VR711400	LED(gr)	SLR-325MC
D302	VR711400	LED(gr)	SLR-325MC
D303	VR711400	LED(gr)	SLR-325MC
D304	VR711400	LED(gr)	SLR-325MC
D305	VU171500	DIODE.ZENR	UDZ 3.6BTE-17 3.6V
IC301	XR188A00	IC	LC75710NE FLD
JK301	VY810500	JACK.MNI	HTJ-035-18ABG
PN301	V3750100	PIN	L=50
Q301	VV556400	TR	2SC2412K Q,R,S
Q302	VV556400	TR	2SC2412K Q,R,S
Q303	VV556400	TR	2SC2412K Q,R,S
Q304	VV556400	TR	2SC2412K Q,R,S
SW301	VG392900	SW.TACT	SKHVAA
SW302	VG392900	SW.TACT	SKHVAA
SW303	VG392900	SW.TACT	SKHVAA
SW304	VG392900	SW.TACT	SKHVAA
SW305	VG392900	SW.TACT	SKHVAA
SW306	VG392900	SW.TACT	SKHVAA
SW307	VG392900	SW.TACT	SKHVAA
SW308	VG392900	SW.TACT	SKHVAA
SW309	VT941400	SW.RT.ENC	EC16B24304
SW310	VG392900	SW.TACT	SKHVAA
U301	VR023400	L.DTCT	SPS-424-1
V301	V6445100	FL.DSPLY	8-ST-24GN
	V3534200	SPACER.FL	
	V6955200	SHEET	W=35

* New Parts

P.C.B. MAIN

Schm Ref.	PART NO.	Description
*	V6440300	P.C.B. MAIN(UC)
*	V6440400	P.C.B. MAIN(ABG)
CB1	VM859600	CN.BS.PIN 15P
CB2	VQ047400	CN.BS.PIN 19P
CB3	VB390200	CN.BS.PIN 6P
CB6	VP206500	HOLDER.FUS EYF-52BCT
CB7	VP206500	HOLDER.FUS EYF-52BCT
CB8	VB390000	CN.BS.PIN 4P
CB9	VL844800	CN.BS.PIN 4P
* CB10	LB932070	CN.BS.PIN 7P
CB12	VG879900	CN.BS.PIN 2P
CB14	VG879900	CN.BS.PIN 2P
C3	UR866470	C.EL 4.7uF 50V
C4	UR866470	C.EL 4.7uF 50V
C5	UR818220	C.EL 220uF 6.3V
C6	UR866470	C.EL 4.7uF 50V
C7	UU166470	C.EL 4.7uF 50V
C8	UU166470	C.EL 4.7uF 50V
C10	UU166470	C.EL 4.7uF 50V
C11	UU166470	C.EL 4.7uF 50V
C12	FG652100	C.CE 100pF 50V
C18	FG651470	C.CE 47pF 50V
C19	FG651470	C.CE 47pF 50V
C21	FG651470	C.CE 47pF 50V
C22	UU138100	C.EL 100uF 16V
C23	UU138100	C.EL 100uF 16V
C24	FG651470	C.CE 47pF 50V
C25	UU165100	C.EL 0.1uF 50V
C26	UU165100	C.EL 0.1uF 50V
* C27	UU147330	C.EL 33uF 25V
* C28	UU147330	C.EL 33uF 25V
C29	FG651470	C.CE 47pF 50V
C30	FG651470	C.CE 47pF 50V
C32	UU118220	C.EL 220uF 6.3V
C33	UR847220	C.EL 22uF 25V
C35	UU147100	C.EL 10uF 25V
C36	UU147100	C.EL 10uF 25V
C37	UU166470	C.EL 4.7uF 50V
C38	UU166470	C.EL 4.7uF 50V
C39	FG652100	C.CE 100pF 50V
C40	UU167100	C.EL 10uF 50V
C41	UA652470	C.MYLAR 470pF 50V
C42	UU167470	C.EL 47uF 50V
C43	UU167470	C.EL 47uF 50V
C44	UA652470	C.MYLAR 470pF 50V
C45	UU166220	C.EL 2.2uF 50V
C46	UU166220	C.EL 2.2uF 50V
* C47	V6452400	C.EL 4700uF 25V
* C48	UR749330	C.EL 3300uF 25V
C49	UA652220	C.MYLAR 220pF 50V
C50	FG650300	C.CE 3pF 50V
* C51	UU147330	C.EL 33uF 25V
* C52	UU158100	C.EL 100uF 35V
C53	UU167100	C.EL 10uF 50V
C54	UU167100	C.EL 10uF 50V
C55	UU165470	C.EL 0.47uF 50V
* C56	UU158100	C.EL 100uF 35V

* New Parts

Schm Ref.	PART NO.	Description
* C57	V6476700	C.EL 4700uF 50V
* C58	V6476700	C.EL 4700uF 50V
* C59	UU147330	C.EL 33uF 25V
C60	FG650300	C.CE 3pF 50V
C61	UA652220	C.MYLAR 220pF 50V
C62	VR324900	C.MYLAR 0.1uF 100V
C63	VR324900	C.MYLAR 0.1uF 100V
C64	FG644100	C.CE 0.01uF 50V
C65	UR739470	C.EL 4700uF 16V
C66	UU166470	C.EL 4.7uF 50V
C67	UA654220	C.MYLAR 0.022uF 50V
C68	UA654220	C.MYLAR 0.022uF 50V
C69	UR739470	C.EL 4700uF 16V
C70	UR739470	C.EL 4700uF 16V
C71	UA653100	C.MYLAR 1000pF 50V
C72	UA653100	C.MYLAR 1000pF 50V
C74	UR866470	C.EL 4.7uF 50V
C75	UR866470	C.EL 4.7uF 50V
C76	VS741700	C.CE.SAFTY 0.01uF 275V
C77	FG644100	C.CE 0.01uF 50V
* C82	UU147330	C.EL 33uF 25V
* C83	UU147330	C.EL 33uF 25V
* C84	UU147330	C.EL 33uF 25V
* C85	UU147330	C.EL 33uF 25V
C86	FG651330	C.CE 33pF 50V
C87	FG651330	C.CE 33pF 50V
C90	UU166100	C.EL 1uF 50V
C91	UU166100	C.EL 1uF 50V
C95	VF467000	C.CE.TUBLR 1000pF 50V
C96	VF467000	C.CE.TUBLR 1000pF 50V
C97	VF467000	C.CE.TUBLR 1000pF 50V
C98	VF467000	C.CE.TUBLR 1000pF 50V
D3	VD631600	DIODE 1SS133,176
△ D4	VG442500	DIODE.ZENR MTZJ24B 24V
△ D5	VD631600	DIODE 1SS133,176
D6	VG441000	DIODE.ZENR MTZJ16A 16V
D7	VG441000	DIODE.ZENR MTZJ16A 16V
△ D8	VQ379300	DIODE.BRG S1VB20 1.0A 200V
△ D9	iH001090	DIODE.BRG S4VB20 2.6A 200V
D10	VS997800	DIODE 1T2
D11	VN008700	DIODE 1SS270A
D12	VN008700	DIODE 1SS270A
△ D13	VD631600	DIODE 1SS133,176
△ D14	VQ379300	DIODE.BRG S1VB20 1.0A 200V
△ D15	VQ379300	DIODE.BRG S1VB20 1.0A 200V
△ D16	VQ379300	DIODE.BRG S1VB20 1.0A 200V
D17	VG442200	DIODE.ZENR MTZJ22C 22V
△ F1	KB000680	FUSE 1.25A 250V(ABG)
△ * F1	VS822600	FUSE T2.5A 125V(UC)
G1	VR463400	TERM.GND D3.5 TP00385
G2	VR463400	TERM.GND D3.5 TP00385
* HS1	VJ564300	RADIATOR OSH-2025-SP
* HS2	VJ564300	RADIATOR OSH-2025-SP
* HS3	VJ564300	RADIATOR OSH-2025-SP
△ * IC3	XJ604A00	IC NJM78M05FA
IC6	XB247A00	IC uPC4570HA
IC7	XG938A00	IC BA15218N

* New Parts

P.C.B. MAIN & CHIP RESISTOR

Schm Ref.	PART NO.	Description
△ *	IC8 XB247A00	IC uPC4570HA
△ *	IC9 XY256A00	IC STK402-030 20W 2CH
△	IC10 XU814A00	PQ05RD11 +5V 1.0A
△	IC11 XU814A00	PQ05RD11 +5V 1.0A
△	IC12 XQ084A00	IC AN78N09
	L1 VU038100	COIL 1.5uH
	L2 VU038100	COIL 1.5uH
*	PJ1 V6352000	JACK.PIN 1P
	PN1 V3750100	PIN L=50
	Q1 iC287820	TR 2SC2878 A,B
	Q2 iC287820	TR 2SC2878 A,B
	Q3 VD678500	TR.DGT DTA114ES
	Q5 iC174020	TR 2SC1740S R,S
	Q8 VD678500	TR.DGT DTA114ES
	Q11 iC174020	TR 2SC1740S R,S
	Q12 iC174020	TR 2SC1740S R,S
	Q13 iC174020	TR 2SC1740S R,S
	Q14 iC287820	TR 2SC2878 A,B
	Q15 iC287820	TR 2SC2878 A,B
	Q16 iC287820	TR 2SC2878 A,B
△	Q17 VR510800	TR 2SD2396 J,K
△	Q18 VS883300	TR 2SB1565 E,F
	Q19 iC287820	TR 2SC2878 A,B
	Q20 iC287820	TR 2SC2878 A,B
	Q21 VP883000	TR 2SA893A D,E
	Q22 VP883100	TR 2SC1890A D,E
	Q23 VP883100	TR 2SC1890A D,E
△	Q24 VP872600	TR 2SA1708 S,T
	Q30 VE613400	TR 2SD1858 Q,R
	Q31 VE613400	TR 2SD1858 Q,R
	Q33 VD678500	TR.DGT DTA114ES
△	R6 HV754220	R.CAR.FP 22Ω 1/4W
△	R7 HV754220	R.CAR.FP 22Ω 1/4W
△	R15 HV754390	R.CAR.FP 39Ω 1/4W
△	R16 HV754390	R.CAR.FP 39Ω 1/4W
△	R38 VP940600	R.MTL.OXD 220Ω 1W
△	R50 HV755100	R.CAR.FP 100Ω 1/4W
△	R51 HV755100	R.CAR.FP 100Ω 1/4W
△	R55 HV753100	R.CAR.FP 1Ω 1/4W
△	R56 HV753100	R.CAR.FP 1Ω 1/4W
△	R59 HV756220	R.CAR.FP 2.2KΩ 1/4W
△	R60 HV756220	R.CAR.FP 2.2KΩ 1/4W
△	R69 HV755100	R.CAR.FP 100Ω 1/4W
△	R72 HV755100	R.CAR.FP 100Ω 1/4W
△	R78 VK186600	R.FUS 10Ω 1/4W
△ *	R80 VN765600	R.WW 0.22Ω 3W
△ *	R82 VN765600	R.WW 0.22Ω 3W
△	R89 VP939800	R.MTL.OXD 10Ω 1W
△	R90 VP939800	R.MTL.OXD 10Ω 1W
△	R95 HV754100	R.CAR.FP 10Ω 1/4W
△	R96 HV754100	R.CAR.FP 10Ω 1/4W
△	R97 VK186600	R.FUS 10Ω 1/4W
△	R101 HV753470	R.CAR.FP 4.7Ω 1/4W
△	R112 HV753100	R.CAR.FP 1Ω 1/4W
△	R115 HV753100	R.CAR.FP 1Ω 1/4W
△	R116 HV753100	R.CAR.FP 1Ω 1/4W
△	R117 HV753100	R.CAR.FP 1Ω 1/4W

* New Parts

Schm Ref.	PART NO.	Description
△	RY1 V6322600	RELAY DC DH24D2-0T(M)-SL
△ *	RY2 V2850400	RELAY DC ALKS321
△ *	ST1 V4040500	SCR.TERM M3
△ *	T1 XZ404A00	TRANS (UC)
△ *	T1 XZ405A00	TRANS (ABG)
△ *	TE1 V7337100	TERM.SP 4P HSP-134V
	EP600530	SCR.BND.HD 3x8 MFZN2-BL
	RD250000	R.CAR.CHP 0Ω 1/10W
	RD253220	R.CAR.CHP 2.2Ω 1/10W
	RD254100	R.CAR.CHP 10Ω 1/10W
	RD255100	R.CAR.CHP 100Ω 1/10W
	RD255220	R.CAR.CHP 220Ω 1/10W
	RD255470	R.CAR.CHP 470Ω 1/10W
*	RD259150	R.CAR.CHP 1.5MΩ 1/10W
	RD350000	R.CAR.CHP 0Ω 1/10W
	RD354100	R.CAR.CHP 10Ω 1/10W
	RD355120	R.CAR.CHP 120Ω 1/10W
	RD355150	R.CAR.CHP 150Ω 1/10W
	RD356100	R.CAR.CHP 1KΩ 1/10W
	RD356330	R.CAR.CHP 3.3KΩ 1/10W
	RD356470	R.CAR.CHP 4.7KΩ 1/10W
	RD356560	R.CAR.CHP 5.6KΩ 1/10W
	RD357100	R.CAR.CHP 10KΩ 1/10W
	RD357470	R.CAR.CHP 47KΩ 1/10W
	RD358100	R.CAR.CHP 100KΩ 1/10W
	RD358220	R.CAR.CHP 220KΩ 1/10W
	RD358470	R.CAR.CHP 470KΩ 1/10W
	RD359100	R.CAR.CHP 1MΩ 1/10W
*	RF454220	R.CAR.CHP 22Ω 1/10W
*	RF454750	R.CAR.CHP 75Ω 1/10W
*	RF455100	R.CAR.CHP 100Ω 1/10W
*	RF455220	R.CAR.CHP 220Ω 1/10W
*	RF455330	R.CAR.CHP 330Ω 1/10W
*	RF455470	R.CAR.CHP 470Ω 1/10W
*	RF455680	R.CAR.CHP 680Ω 1/10W
*	RF456100	R.CAR.CHP 1.0KΩ 1/10W
*	RF456120	R.CAR.CHP 1.2KΩ 1/10W
*	RF456150	R.CAR.CHP 1.5KΩ 1/10W
*	RF456180	R.CAR.CHP 1.8KΩ 1/10W
*	RF456220	R.CAR.CHP 2.2KΩ 1/10W
*	RF456270	R.CAR.CHP 2.7KΩ 1/10W
*	RF456330	R.CAR.CHP 3.3KΩ 1/10W
*	RF456390	R.CAR.CHP 3.9KΩ 1/10W
*	RF456470	R.CAR.CHP 4.7KΩ 1/10W
*	RF456680	R.CAR.CHP 6.8KΩ 1/10W
*	RF456820	R.CAR.CHP 8.2KΩ 1/10W
*	RF457100	R.CAR.CHP 10KΩ 1/10W
*	RF457120	R.CAR.CHP 12KΩ 1/10W
*	RF457180	R.CAR.CHP 18KΩ 1/10W
*	RF457470	R.CAR.CHP 47KΩ 1/10W
*	RF458100	R.CAR.CHP 100KΩ 1/10W

* New Parts

A

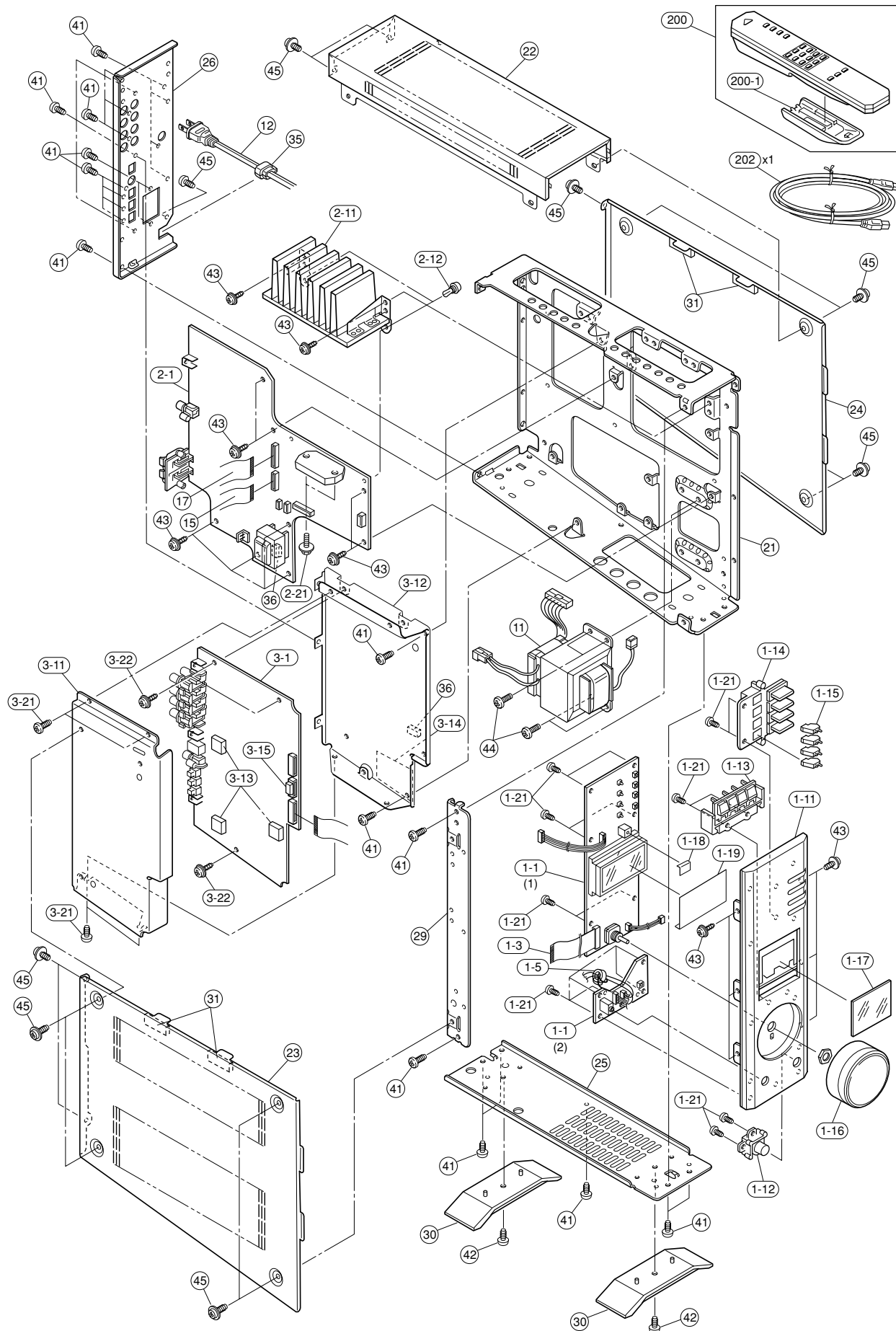
B

C

D

E

AP-U70

EXPLODED VIEW

MECHANICAL PARTS

Ref. No.	PART NO.	Description	Remarks	Markets
* 1-1	V6440800	P.C.B. ASS'Y	OPERATION	
* 1-3	V7029600	CONNECTOR, FLAT CABLE	17P 230mm P=1.25	
1-5	Vi491100	FERRITE CORE		
* 1-11	V6052600	FRONT PANEL		
* 1-12	V6052800	BUTTON		
* 1-13	V6052900	BUTTON/FUNC		
* 1-14	V6053200	BUTTON ASS'Y		
* 1-15	V6053300	LENS, LED		
* 1-16	V6231100	KNOB ASSY		
* 1-17	V6053400	WINDOW/FL		
* 1-18	V7393400	SHEET/RE		
* 1-19	V7413900	SHEET/FL		
1-21	VF617600	PAN HEAD P-TITE SCREW	2.6x8 MFC2-BL	
* 2-1	V6440300	P.C.B. ASS'Y	MAIN	(UC)
* 2-1	V6440400	P.C.B. ASS'Y	MAIN	(ABG)
* 2-11	V6054800	HEAT SINK ASS'Y		
2-12	VQ368600	PUSH RIVET	P3555-B	
2-21	VK865300	HEX. HEAD TAP. SCREW WITH WS	3x18 MFC2-BL	
* 3-1	V6550100	P.C.B. ASS'Y	DSP	(UC)
* 3-1	V6550200	P.C.B. ASS'Y	DSP	(A)
* 3-1	V6550300	P.C.B. ASS'Y	DSP	(BG)
* 3-11	V6052000	SHIELD CASE/UP		
* 3-12	V6052100	SHIELD CASE/DW		
3-13	VS758000	DAMPER, T5		
* 3-14	V6955300	SHEET/DSP		
3-15	VS936800	DAMPER	3x5x10	
3-21	EP600830	BIND HEAD B-TITE SCREW	3x8 MFC2-BL	
3-22	VH365800	PW HEAD B-TITE SCREW	3x6-8 MFC2	
△ * 11	XZ402A00	POWER TRANSFORMER		(UC)
△ * 11	XZ403A00	POWER TRANSFORMER		(BG)
△ * 11	XZ485A00	POWER TRANSFORMER		(A)
△ 12	V2296800	POWER CORD ASS'Y		(A)
△ 12	V2363800	POWER CORD ASS'Y		(UC)
△ 12	VN363700	POWER CORD ASS'Y		(G)
△ 12	VV437300	POWER CORD ASS'Y		(B)
* 15	V7355700	CONNECTOR, FLAT CABLE	15P 45mm P=1.25	
* 17	V7355800	CONNECTOR, FLAT CABLE	19p 45mm P=1.25	
* 21	V6048700	CHASSIS		
* 22	V6048800	TOP COVER		
* 23	V6049100	TOP COVER-L		
* 24	V6049400	TOP COVER-R		
* 25	V6049700	BOTTOM COVER		(ABG)
* 25	V6050000	BOTTOM COVER		(UC)
* 26	V6050900	REAR PANEL		(UC)
* 26	V6051100	REAR PANEL		(A)
* 26	V6051200	REAR PANEL		(BG)
* 29	V6052200	FRAME/FRONT		
* 30	V3989600	LEG		
* 31	V6773900	DAMPER/SIDE		
35	V2438700	CORD STOPPER	10P1	
36	VZ092400	DAMPER	6x5x10	
41	VN413300	BIND HEAD BONDING B-T. SCREW	3x8 MFZN2-BL	
42	EP600830	BIND HEAD B-TITE SCREW	3x8 MFC2-BL	

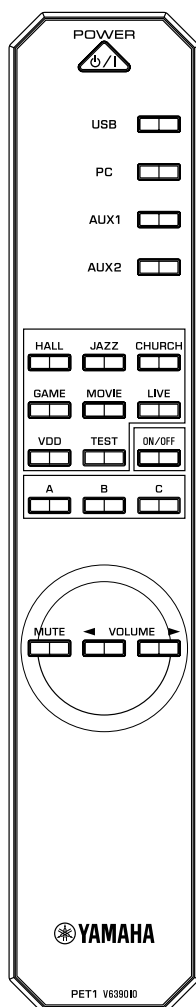
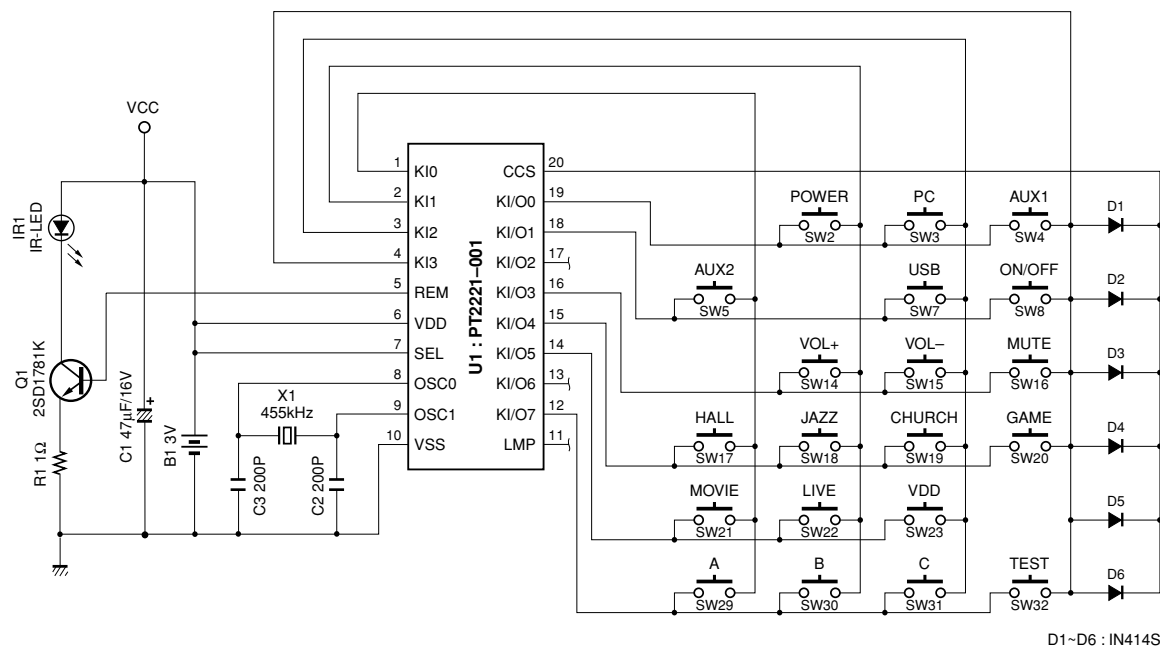
* New Parts

Ref. No.	PART NO.	Description	Remarks	Markets
43	VH365800	PW HEAD B-TITE SCREW	3x6-8 MFC2	
44	V2728500	BIND HEAD S-TITE SCREW	4x7 MFZN2-BL	
45	V5633800	TAPPING B-TITE SCREW	3x6-8 MFN133	
		ACCESSORIES		
* 200	V6390100	REMOTE CONTROL TRANSMITTER	RC-7060-01-0014	
200-1	AAX14020	LID	GRYJYE	60050007
* 202	V4382000	USB CABLE	4P 2.0m	
* *	XZ674A00	CD-ROM	V1.0	
		BATTERY, MANGANESE	SUM-3,AA,R06	

* New Parts

REMOTE CONTROL TRANSMITTER

■ SCHEMATIC DIAGRAM



CUSTOM CODE	HEX
	7B

DATA CODE	HEX
O/I	01
USB	06
PC	02
AUX-1	03
AUX-2	04
WALL	10
JAZZ	11
CHURCH	12
GAME	13
MOVIE	14
LIVE	15
VDD	16
TEST	1F
ON/OFF	07
A	1C
B	1D
C	1E
MUTE	0F
VOLUME -	0E
VOLUME+	0D

Parts List for 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	10 kΩ	HF45 7100	HF45 7100
1.8 Ω	HJ35 3180	※	11 kΩ	HF45 7110	HF45 7110
2.2 Ω	HJ35 3220	HF85 3220	12 kΩ	HJ35 7120	HF85 7120
3.3 Ω	HJ35 3330	HF85 3330	13 kΩ	HF45 7130	HF45 7130
4.7 Ω	HJ35 3470	HF85 3470	15 kΩ	HF45 7150	HF45 7150
5.6 Ω	HJ35 3560	HF85 3560	18 kΩ	HF45 7180	HF45 7180
10 Ω	HF45 4100	HF45 4100	22 kΩ	HF45 7220	HF45 7220
15 Ω	HJ35 4150	HF85 4150	24 kΩ	HF45 7240	HF45 7240
22 Ω	HF45 4220	HF45 4220	27 kΩ	HJ35 7270	HF85 7270
27 Ω	HJ35 4270	HF85 4270	30 kΩ	HF45 7300	HF45 7300
33 Ω	HF45 4330	HF45 4330	33 kΩ	HF45 7330	HF45 7330
39 Ω	HJ35 4470	HF85 4390	36 kΩ	HF45 7360	HF45 7360
47 Ω	HF45 4470	HF45 4470	39 kΩ	HF45 7390	HF45 7390
56 Ω	HF45 4560	HF45 4560	47 kΩ	HF45 7470	HF45 7470
68 Ω	HF45 4680	HF45 4680	51 kΩ	HF45 7510	HF45 7510
75 Ω	HF45 4750	HF45 4750	56 kΩ	HF45 7560	HF45 7560
82 Ω	HF45 4820	HF45 4820	62 kΩ	HF45 7620	HF45 7620
91 Ω	HF45 4910	HF45 4910	68 kΩ	HF45 7680	HF45 7680
100 Ω	HF45 5100	HF45 5100	82 kΩ	HF45 7820	HF45 7820
110 Ω	HJ35 5110	HF85 5110	91 kΩ	HF45 7910	HF45 7910
120 Ω	HF45 5120	HF45 5120	100 kΩ	HF45 8100	HF45 8100
150 Ω	HF45 5150	HF45 5150	110 kΩ	HF45 8110	HF45 8110
160 Ω	HJ35 5160	※	120 kΩ	HF45 8120	HF45 8120
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			

1/4W Type

HF45 ○○○○

1/6W Type

HF85 ○○○○

10mm

5mm