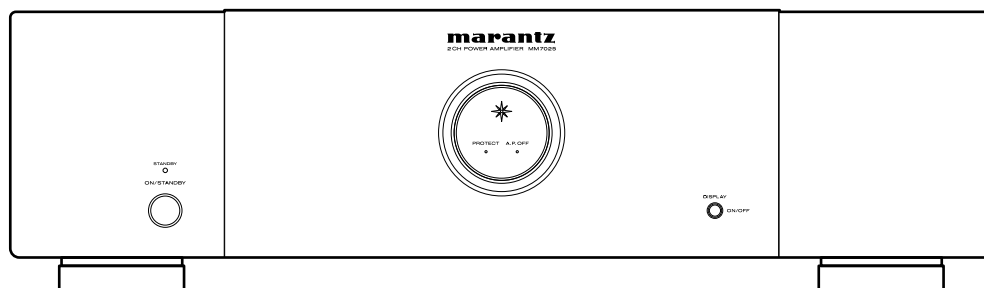


Service Manual

MM7025 /N1B/U1B

2 Channel Power Amplifier



MM7025

- For purposes of improvement, specifications and design are subject to change without notice.

- Please use this service manual with referring to the operating instructions without fail.

- Some illustrations using in this service manual are slightly different from the actual set.

marantz®

MM7025

Ver. 2

Please refer to the
MODIFICATION NOTICE.

MARANTZ DESIGN AND SERVICE

Using superior design and selected high grade components, **MARANTZ** company has created the ultimate in stereo sound. Only original **MARANTZ** parts can insure that your **MARANTZ** product will continue to perform to the specifications for which it is famous.

Parts for your **MARANTZ** equipment are generally available to our National Marantz Subsidiary or Agent.

ORDERING PARTS :

Parts can be ordered either by mail or by Fax.. In both cases, the correct part number has to be specified.

The following information must be supplied to eliminate delays in processing your order :

1. Complete address
2. Complete part numbers and quantities required
3. Description of parts
4. Model number for which part is required
5. Way of shipment
6. Signature : any order form or Fax. must be signed, otherwise such part order will be considered as null and void.

USA

MARANTZ AMERICA, INC
100 CORPORATE DRIVE
MAHWAH, NEW JERSEY 07430
USA

EUROPE / TRADING

D&M EUROPE B. V.
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BEEMDSTRAAT 11, 5653 MA EINDHOVEN
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FAX : +31 - 40 - 2507860

CANADA

D&M Canada Inc.
5-505 APPLE CREEK BLVD.
MARKHAM, ONTARIO L3R 5B1
CANADA
PHONE : 905 - 415 - 9292
FAX : 905 - 475 - 4159

JAPAN

D&M Holdings Inc.
D&M BUILDING, 2-1 NISSHIN-CHO,
KAWASAKI-KU, KAWASAKI-SHI,
KANAGAWA, 210-8569 JAPAN

株式会社 ディーアンドエムホールディングス
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神奈川県川崎市川崎区日進町2-1 D&Mビル

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D&M SALES AND MARKETING KOREA LTD.
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88-5, BANPO-DONG, SEOCHO-GU,
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ROOM.808 SHANGHAI AIRPORT CITY TERMINAL
NO.1600 NANJING (WEST) ROAD, SHANGHAI,
CHINA. 200040
TEL : 021 - 6248 - 5151
FAX : 021 - 6248 - 4434

NOTE ON SAFETY :

Symbol ⚠ Fire or electrical shock hazard. Only original parts should be used to replaced any part marked with symbol ⚠.

Any other component substitution (other than original type), may increase risk of fire or electrical shock hazard.

安全上の注意 :

⚠がついている部品は、安全上重要な部品です。必ず指定されている部品番号の部品を使用して下さい。

SHOCK, FIRE HAZARD SERVICE TEST :

CAUTION : After servicing this appliance and prior to returning to customer, measure the resistance between either primary AC cord connector pins (with unit NOT connected to AC mains and its Power switch ON), and the face or Front Panel of product and controls and chassis bottom.

Any resistance measurement less than 1 Megohms should cause unit to be repaired or corrected before AC power is applied, and verified before it is return to the user/customer.

Ref. UL Standard No. 60065.

In case of difficulties, do not hesitate to contact the Technical
Department at above mentioned address.

091105DM/DG

SAFETY PRECAUTIONS

The following check should be performed for the continued protection of the customer and service technician.

LEAKAGE CURRENT CHECK

Before returning the unit to the customer, make sure you make either (1) a leakage current check or (2) a line to chassis resistance check. If the leakage current exceeds 0.5 milliamps, or if the resistance from chassis to either side of the power cord is less than 460 kohms, the unit is defective.

Be sure to test for leakage current with the AC plug in both polarities, in addition, in each power ON, OFF and STANDBY mode, if applicable.

CAUTION Please heed the points listed below during servicing and inspection.

⦿ Heed the cautions!

Spots requiring particular attention when servicing, such as the cabinet, parts, chassis, etc., have cautions indicated on labels. Be sure to heed these cautions and the cautions indicated in the handling instructions.

⦿ Caution concerning electric shock!

- (1) An AC voltage is impressed on this set, so touching internal metal parts when the set is energized could cause electric shock. Take care to avoid electric shock, by for example using an isolating transformer and gloves when servicing while the set is energized, unplugging the power cord when replacing parts, etc.
- (2) There are high voltage parts inside. Handle with extra care when the set is energized.

⦿ Caution concerning disassembly and assembly!

Through great care is taken when manufacturing parts from sheet metal, there may in some rare cases be burrs on the edges of parts which could cause injury if fingers are moved across them. Use gloves to protect your hands.

⦿ Only use designated parts!

The set's parts have specific safety properties (fire resistance, voltage resistance, etc.). For replacement parts, be sure to use parts which have the same properties. In particular, for the important safety parts that are marked $\triangle$ on wiring diagrams and parts lists, be sure to use the designated parts.

⦿ Be sure to mount parts and arrange the wires as they were originally!

For safety reasons, some parts use tape, tubes or other insulating materials, and some parts are mounted away from the surface of printed circuit boards. Care is also taken with the positions of the wires and clamps are used to keep wires away from heating and high voltage parts, so be sure to set everything back as it was originally.

⦿ Inspect for safety after servicing!

Check that all screws, parts and wires removed or disconnected for servicing have been put back in their original positions, inspect that no parts around the area that has been serviced have been negatively affected, conduct an insulation check on the external metal connectors and between the blades of the power plug, and otherwise check that safety is ensured.

(Insulation check procedure)

Unplug the power cord from the power outlet, disconnect the antenna, plugs, etc., and turn the power switch on. Using a 500V insulation resistance tester, check that the inplug and the externally exposed metal parts (antenna terminal, headphones terminal, input terminal, etc.) is 1M Ω or greater. If it is less, the set must be inspected and repaired.

CAUTION Concerning important safety parts

Many of the electric and structural parts used in the set have special safety properties. In most cases these properties are difficult to distinguish by sight, and using replacement parts with higher ratings (rated power and withstand voltage) does not necessarily guarantee that safety performance will be preserved. Parts with safety properties are indicated as shown below on the wiring diagrams and parts lists in this service manual. Be sure to replace them with parts with the designated part number.

- (1) Schematic diagrams Indicated by the $\triangle$ mark.
- (2) Parts lists Indicated by the $\triangle$ mark.

Using parts other than the designated parts could result in electric shock, fires or other dangerous situations.

NOTE FOR SCHEMATIC DIAGRAM

WARNING:

Parts marked with this symbol $\triangle$ have critical characteristics. Use ONLY replacement parts recommended by the manufacturer.

CAUTION:

Before returning the unit to the customer, make sure you make either (1) a leakage current check or (2) a line to chassis resistance check. If the leakage current exceeds 0.5 milliamps, or if the resistance from chassis to either side of the power cord is less than 460 kohms, the unit is defective.

WARNING:

DO NOT return the unit to the customer until the problem is located and corrected.

NOTICE:

ALL RESISTANCE VALUES IN OHM. k=1,000 OHM / M=1,000,000 OHM

ALL CAPACITANCE VALUES IN MICRO FARAD. P=MICRO-MICRO FARAD EACH VOLTAGE AND CURRENT ARE MEASURED AT NO SIGNAL INPUT CONDITION. CIRCUIT AND PARTS ARE SUBJECT TO CHANGE WITHOUT PRIOR NOTICE.

NOTE FOR PARTS LIST

PARTS INFORMATION

RESISTORS

1) 00MGD05 $\times \times \times$ 140, Carbon film fixed resistor, $\pm 5\%$ 1/4W

2) 00MGD05 $\times \times \times$ 160, Carbon film fixed resistor, $\pm 5\%$ 1/6W

① — Resistance value

Examples ;

① Resistance value

0.1 Ω001	10 Ω100	1k Ω102	100k Ω104
0.5 Ω005	18 Ω180	2.7k Ω272	680k Ω684
1 Ω010	100 Ω101	10k Ω103	1M Ω105
6.8 Ω068	390 Ω391	22k Ω223	4.7M Ω475

Note : Please distinguish 1/4W from 1/6W by the shape of parts used actually.

CAPACITORS

CERAMIC CAP.

3) 00MDD1 $\times \times \times$ 370, Ceramic capacitor
Disc type
Temp.coeff.P350 ~ N1000, 50V

② — Capacity value
Tolerance

Examples ;

② Tolerance (Capacity deviation)

$\pm 0.25\text{pF}$0
$\pm 0.5\text{pF}$1
$\pm 5\%$5

* Tolerance of COMMON PARTS handled here are as follows :

0.5pF ~	5pF..... $\pm 0.25\text{pF}$
6pF ~	10pF..... $\pm 0.5\text{pF}$
12pF ~	560pF..... $\pm 5\%$

③ Capacity value

0.5pF.....005	3pF.....030	100pF.....101
1pF.....010	10pF.....100	220pF.....221
1.5pF.....015	47pF.....470	560pF.....561

CERAMIC CAP.

4) 00MDK16 $\times \times \times$ 300, High dielectric constant ceramic capacitor
Disc type
Temp.chara. 2B4, 50V

④ — Capacity value

Examples ;

④ Capacity value

100pF.....101	1000pF.....102	10000pF.....103
470pF.....471	2200pF.....222	

ELECTROLY CAP. ($\frac{\square}{\square}$)

5) 00MEA $\times \times \times \times \times \times$ 10, Electrolytic capacitor
One-way lead type, Tolerance $\pm 20\%$

⑤ — Working voltage
⑥ — Capacity value

Examples ;

⑤ Capacity value

0.1 μF104	4.7 μF475	100 μF ...107
0.33 μF334	10 μF106	330 μF ...337
1 μF105	22 μF226	1100 μF ...118
		2200 μF ...228

⑥ Working voltage

6.3V.....006	25V.....025
10V.....010	35V.....035
16V.....016	50V.....050

FILM CAP. ($\frac{\square}{\square}$)

6) 00MDF15 $\times \times \times$ 350, Plastic film capacitor
One-way type, Mylar $\pm 5\%$ 50V
00MDF15 $\times \times \times$ 310, Plastic film capacitor
One-way type, Mylar $\pm 10\%$ 50V

⑦ — Capacity value

Examples ;

⑦ Capacity value

0.001 μF (1000pF).....102	0.1 μF104
0.0018 μF182	0.56 μF564
0.01 μF103	1 μF105
0.015 μF153	

NOTE ON SAFETY FOR FUSIBLE RESISTOR :

The suppliers and their type numbers of fusible resistors are as follows;

1. KOA Corporation

Part No. (MJI)	Type No. (KOA)	Description
00MNH05 $\times \times \times$ 140	RF25S $\times \times \times \times \Omega$ J	($\pm 5\%$ 1/4W)
00MNH05 $\times \times \times$ 120	RF50S $\times \times \times \times \Omega$ J	($\pm 5\%$ 1/2W)
00MNH85 $\times \times \times$ 110	RF73B2A $\times \times \times \times \Omega$ J	($\pm 5\%$ 1/10W)
00MNH95 $\times \times \times$ 140	RF73B2E $\times \times \times \times \Omega$ J	($\pm 5\%$ 1/4W)

* Resistance value Resistance value (0.1 – 10k Ω)

2. Matsushita Electronic Components Co., Ltd

Part No. (MJI)	Type No. (MEC)	Description
00MNF05 $\times \times \times$ 140	ERD-2FCJ $\times \times \times$	($\pm 5\%$ 1/4W)
00MRF05 $\times \times \times$ 140		
00MNF02 $\times \times \times$ 140	ERD-2FCG $\times \times \times$	($\pm 2\%$ 1/4W)
00MRF02 $\times \times \times$ 140		

* Resistance value * Resistance value

Examples ;

* Resistance value

0.1 Ω001	10 Ω100	1k Ω102	100k Ω104
0.5 Ω005	18 Ω180	2.7k Ω272	680k Ω684
1 Ω010	100 Ω101	10k Ω103	1M Ω105
6.8 Ω068	390 Ω391	22k Ω223	4.7M Ω475

ABBREVIATION AND MARKS

ANT. : ANTENNA	BATT. : BATTERY
CAP. : CAPACITOR	CER. : CERAMIC
CONN. : CONNECTING	DIG. : DIGITAL
HP : HEADPHONE	MIC. : MICROPHONE
μ -PRO : MICROPROCESSOR	REC. : RECORDING
RES. : RESISTOR	SPK : SPEAKER
SW : SWITCH	TRANSF. : TRANSFORMER
TRIM. : TRIMMING	TRS. : TRANSISTOR
VAR. : VARIABLE	X'TAL : CRYSTAL

NOTE ON FUSE :

Regarding to all parts of parts code **00MFS20xxx2xx**, replace only with Wickmann-Werke GmbH, Type 372 non glass type fuse.

NOTE ON SAFETY :

Symbol $\triangle$ Fire or electrical shock hazard. Only original parts should be used to replaced any part marked with symbol $\triangle$. Any other component substitution (other than original type), may increase risk of fire or electrical shock hazard.

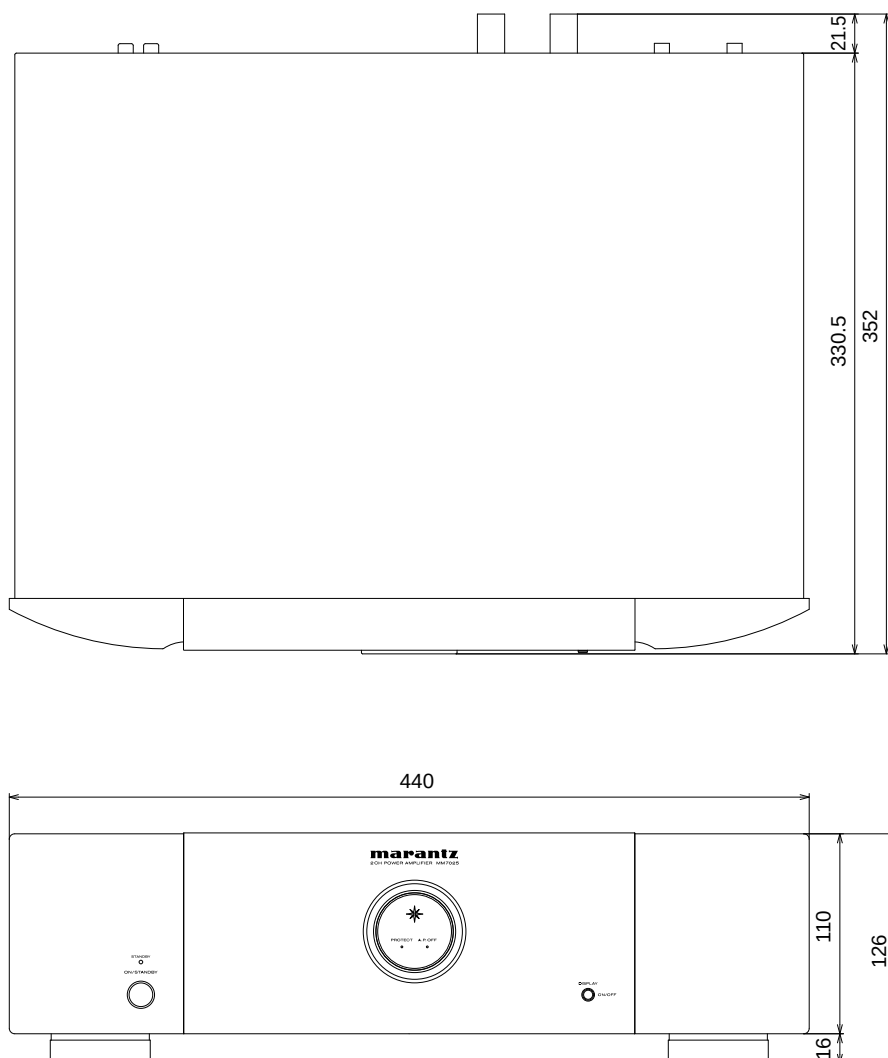
安全上の注意 :

$\triangle$ がついている部品は、安全上重要な部品です。必ず指定されている部品番号の部品を使用して下さい。

TECHNICAL SPECIFICATIONS

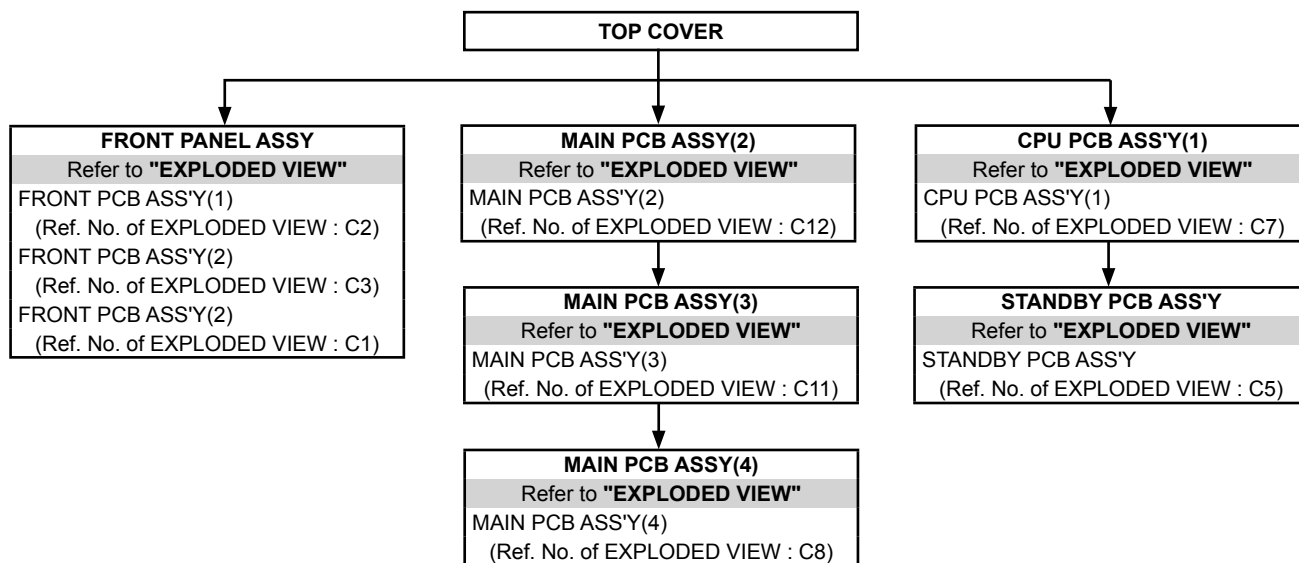
Rated power output (from 20 Hz to 20 kHz, two channels driven):	140 W/ch, 8 Ω 170 W/ch, 6 Ω
Maximum effective output power (from 1 kHz, two channels driven):	210 W/ch, 6 Ω
Output bandwidth (8 Ω load, 0.09 %):	5 Hz – 40 kHz
Frequency response (1 W, 8 Ω):	8 Hz – 100 kHz (± 3 dB)
Damping factor:	100
Input sensitivity/impedance:	1.2 V / 22 k Ω (UNBALANCED) 2.4 V / 30 k Ω (BALANCED)
Signal-to-noise ratio (IHF-A):	105 dB
Voltage amplification level:	29 dB
Supply voltage (for U1B):	AC 120 V, 60 Hz
Supply voltage (for N1B):	AC 230 V, 50 Hz
Power consumption:	330 W
Standby power:	0.2 W
Maximum external dimensions:	440 (W) x 126 (H) x 352 (D) mm
Weight:	10.8 kg

DIMENSION



DISASSEMBLY

- Disassemble in order of the arrow of the figure of following flow.
- In the case of the re-assembling, assemble it in order of the reverse of the following flow.
- In the case of the re-assembling, observe "attention of assembling" it.



Wire Arrangement

- If wire bundles are untied or moved to perform adjustment or parts replacement etc., be sure to rearrange them neatly as they were originally bundled or placed afterward.
Otherwise, incorrect arrangement can be a cause of noise generation.

[View from above]



Front side

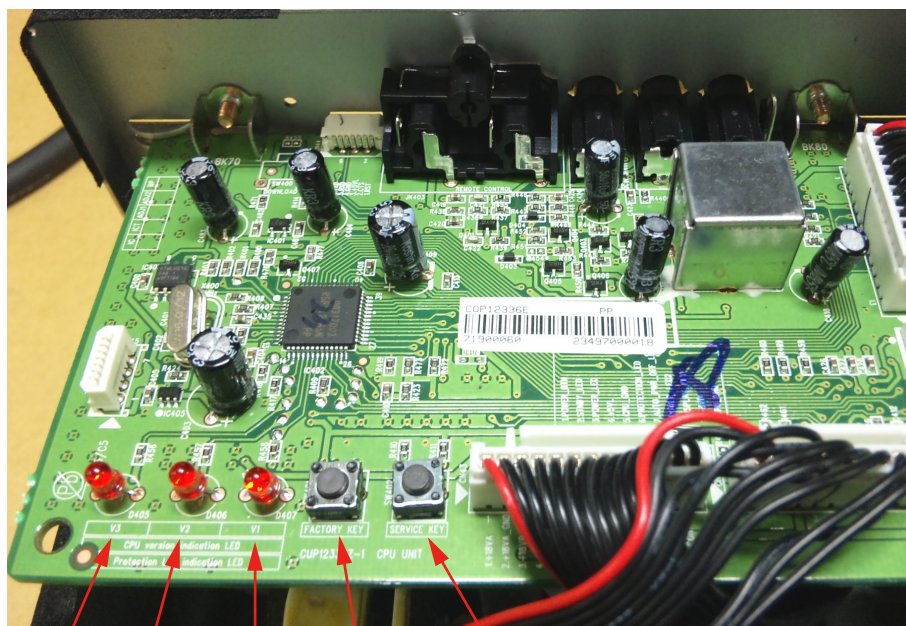


SPECIAL MODE

Special mode setting button

※ Enters the special mode when A button is pressed in normal power state.

No.	Mode	Button A	Contents
1	Service mode	Service	CPU version displayed. and Furthermore, this unit in a condition of the following by pushing the Button A.
1-1	Protection Log display	Service	Displayed protection history.
1-2	Exit from protection state	Service (Hold button more than 5 seconds.)	Displayed protection history and move to normal mode.
2	Factory mode	Factory	Cooling FAN activated . and Furthermore, this unit in a condition of the following by pushing the Button A.
2-1	AVSS output checking mode	Factory	AVSS, H/L check mode
2-2	Destination Switching checking mode	Display	Display and changing destination.
2-3	Auto standby confirm mode.	Display + ON/STANDBY	Go to standby mode condition with after 15 seconds. • no signal • no operation • no command (RC)
2-4	Initialize mode	ON/STANDBY	Initialize



V3 (D405) V2 (D406) V1 (D407) FACTORY button (SW401) SERVICE button (SW402)

CPU Version / Protection Log
Indication LED

1. CPU Version check

The firmware version is displayed on LEDs as follows.

V1(D407)	V2(D406)	V3(D405)	Version
ON	OFF	OFF	Ver1
OFF	ON	OFF	Ver2
ON	ON	OFF	Ver3
OFF	OFF	ON	Ver4
ON	OFF	ON	Ver5
OFF	ON	ON	Ver6
ON	ON	ON	Ver7

1.1. Protection Log display

The last time protection log is displayed on LEDs as follows if the Service button is pushed(>5sec) in the Service mode. For detail and coping process, please refer to “**SYSTEM ERROR**”.

V1(D407)	V2(D406)	V3(D405)	Cause of protect
OFF	OFF	OFF	No protection log
OFF	OFF	ON	Detection of over current over 200msec on Power AMP
OFF	ON	OFF	Detection of DC on Power Amp output
OFF	ON	ON	-
ON	OFF	OFF	Detection of over current below 200msec on Power Amp
ON	OFF	ON	Detection of abnormality on +/-38V, +/-15V supply or power amp supply
ON	ON	OFF	Detection of abnormal heat of Power Amp
ON	ON	ON	-

2. Cooling FAN active

The fan rotates according to the condition of the temperature sensor(IC409) as follows.

T :IC409 temperature	Fan rotate
$T < 0^{\circ}\text{C}$	STOP
$0^{\circ}\text{C} \leq T < 10^{\circ}\text{C}$	Rotate Low speed
$10^{\circ}\text{C} \leq T$	Rotate High speed

2.1. AVSS H/L Switching

The AVSS relay High/Low switching cyclic if the Factory button is pushed in the factory mode.

If not changing, there is an error in the AVSS relay circuit (RY14 on Main pcb).

This is effective only in factory mode.

2.2. Destination Switching

The destination changes cyclic if the DISPLAY button is pushed for five seconds in the factory mode.

For confirmation, The Auto Standby LED lights as follows.

The difference by destination is only a Auto Standby function.

Destination	Auto standby function	Auto standby LED (factory mode only)
N (Europe)	Enable	Lights
Others (NA/Japan)	Disable	Blinking 500msec interval

2.3. Auto Standby Function confirm mode

When press DISPLAY button(first) + ON/STANDBY button(second) together, enters Auto Standby Function confirm mode.

From this state, if there is no audio input/operation/command for 15 seconds, changes in the state of the standby.

If not changing, there is an error in the auto standby detect circuit (IC15, 16 on Main pcb).

2.4. Initialize

Initializes following setting if the ON/STANDBY button is pushed in the factory mode.

Contents	After initialized
Auto Standby Mode	Not change
Illumination LED On/Off	On
Protection log	No protection log

3. SYSTEM ERROR

The reason for the error can be presumed from Standby LED display when the error occurs and protection log display.
Refer to [1-1.] for the method of confirming protection log.
If the AC power supply is turned off, the state of all protection can be released.

Error Detection	Protection log display			Reason	Check Point	
	V1 D407	V2 D406	V3 D405			
Standby LED Blinking 125msec interval (Fast Blinking)	ON	OFF	ON	Detection of abnormality on +/-38V, +/-15V supply or power amp supply (_P LINE FAIL)	Connection	MAIN PWB : BN12- 4pin CPU PWB : CN41 - 4pin
				CPU (IC402) 45pin _P LINE FAIL : 0V : Fail 5V : Normality There is a possibility that ± 38 V supply or P-AMP power supply is broken.	Power Amp Supply Power	MAIN PWB : IC19,IC20,D133-136,R14, F102,103,F104,F105,D132, D137-140
	OFF	OFF	ON	Detection of over current over 200msec on Power AMP (_P CUR FAIL)	Connection	MAIN PWB : BN12 - 4pin, CN12-8pin CPU PWB :BN41 - 8pin.
				CPU (IC402) 38pin _P CUR FAIL : 0V : Fail 5V : Normality There is a possibility that Power AMP is broken.	Power Amp	Check Power AMP circuit (MAIN PWB)
Standby LED Blinking 500msec interval (Slow Blinking)	ON	OFF	OFF	Detection of over current below 200msec on Power Amp (_P CUR FAIL)	Connection	MAIN PWB : BN12 - 4pin, CN12-8pin CPU PWB :BN41 - 8pin.
				CPU (IC402) 38pin _P CUR FAIL : 0V : Fail 5V : Normality	Power Amp	Check Power AMP circuit (MAIN PWB)
	OFF	ON	OFF	Detection of DC on Power Amp output (_P AMP FAIL)	Connection	MAIN PWB :CN12-9pin CPU PWB : BN41 - 9pin
				Main-CPU (IC402) 41pin _P AMP FAIL : 0V : Fail 5V : Normality	Power Amp	Check Power AMP circuit (MAIN PWB)
	ON	ON	OFF	Detection of abnormal heat of Power Amp (_HEAT DET P)	Connection	MAIN PWB : CN12-10pin CPU PWB : BN41 - 10pin
				Main-CPU (IC402) 24pin 0V : Fail 5V : Normality	Posistor	TH11
	OFF	OFF	OFF	No protection log		

VERSION UPGRADE PROCEDURE OF FIRMWARE

ABOUT REPLACE THE MICROPROCESSOR WITH A NEW ONE

When replaced of the U-PRO (Microprocessor), confirm contents of the following.

PWB Name	Ref. No.	Description	After replaced	Remark
12336Z-A	IC402	R5F21246SNFP	C	

After replaced

A : Mask ROM (With software). No need write-in of software to the microprocessor.

B : Flash ROM (With software). Usually, no need write-in of software. But, when the software was updated, you should be write-in of the new software to the microprocessor or flash ROM. Please check the software version.

C : Empty Flash ROM (Without software). You should be write-in of the software to the microprocessor. Refer to "Update procedure" or "writing procedure", when you should be write-in the software.

[A]Update CPU's software to internal Flash-ROM.

- This mode is to update the software for microprocessor.
- The target devise is internal flash ROM of microprocessor (IC402) on CPU PWB (12336Z-A).
- The updating of software takes about 20 seconds.
- The software is common by MM7055 and MM7025.

Necessary Equipment

The following items are required for updating.

- Windows PC (OS: Windows2000 or WindowsXP) with Serial port.
- RS-232C Dsub-9 pin cable (female to female/straight type)
- Update software to CPU. (FlashSta.exe, MM7055_7025_yymmddvv.mot and MM7055_7025_yymmddvv.id in CPU (MM7055_7025) folder)
- DATA UPDATE KIT (part no. 90M-SR4500JIG)
Use DATA UPDATE KIT to connect PC and CN44 (FFC connector) in rear panel of the unit, when updating CPU

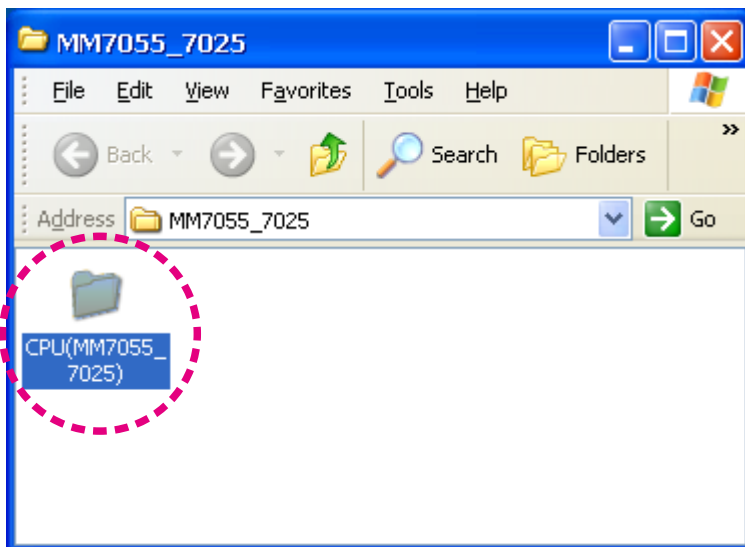
Update CPU's software to internal Flash-ROM

- (1) Disconnect the mains cord from the unit
- (2) Connect PC and the DATA UPDATE KIT with the RS-232C cable. And connect FFC (upside contact) to the connector (CN44) into the rear panel of the unit from the DATA UPDATE KIT.

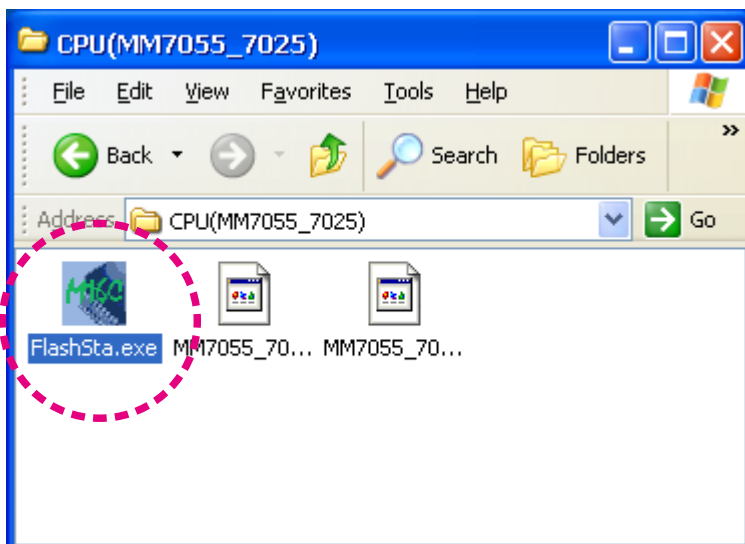


- (3) Connect the mains cord into the unit.
- (4) Press the POWER ON/OFF button for turn on the unit. Then the STANDBY LED do not turn on a light.
- (5) Put the CPU (MM7055_7025) folder into anywhere on your PC's hard disc.

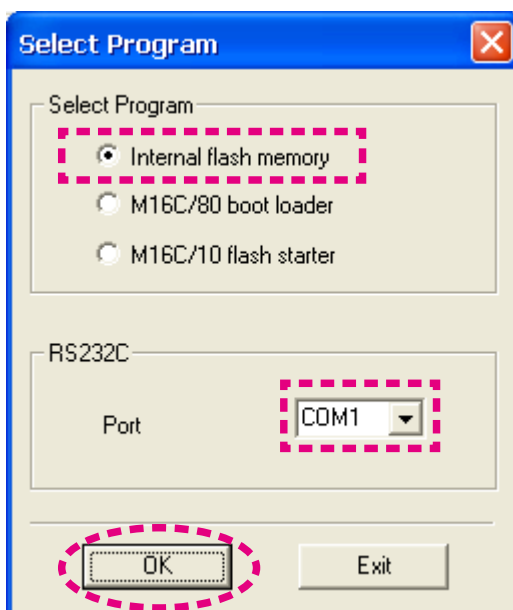
(6) Double click the CPU (MM7055_7025) folder.



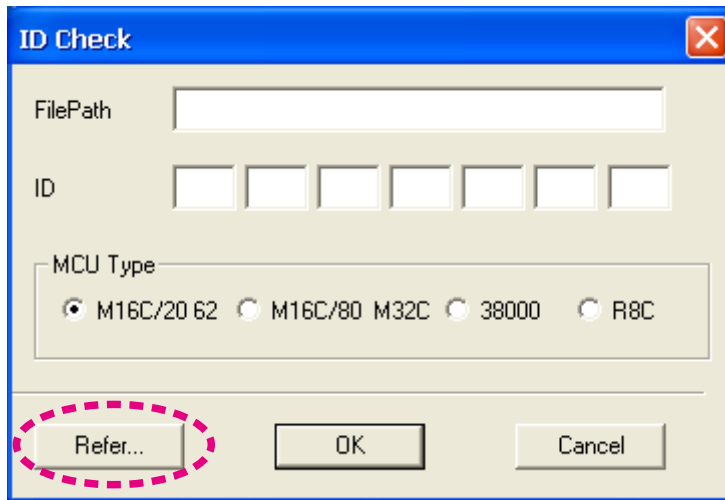
(7) Double click the FlashSta.exe. And launch the M16C Flash Start.



(8) Check the internal flash memory in the Select Program. Choose the COM Port number. And the click OK.

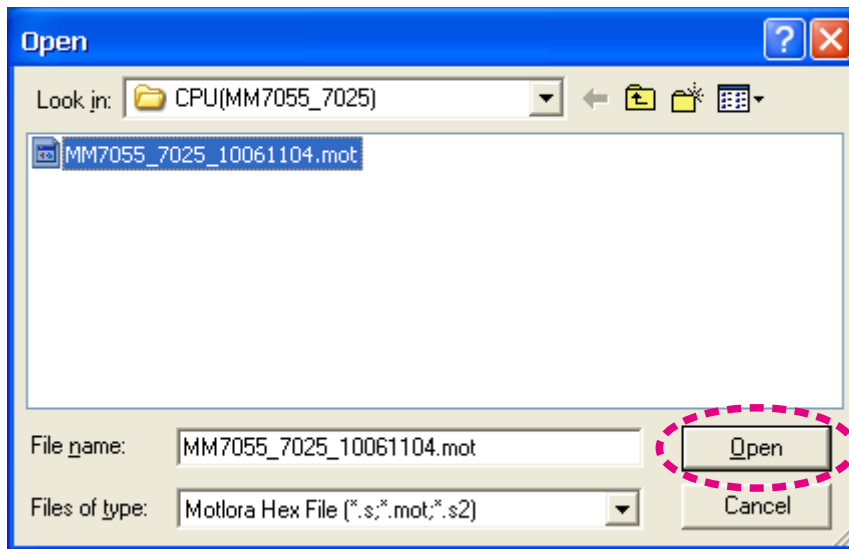


- (9) Click the Refer....



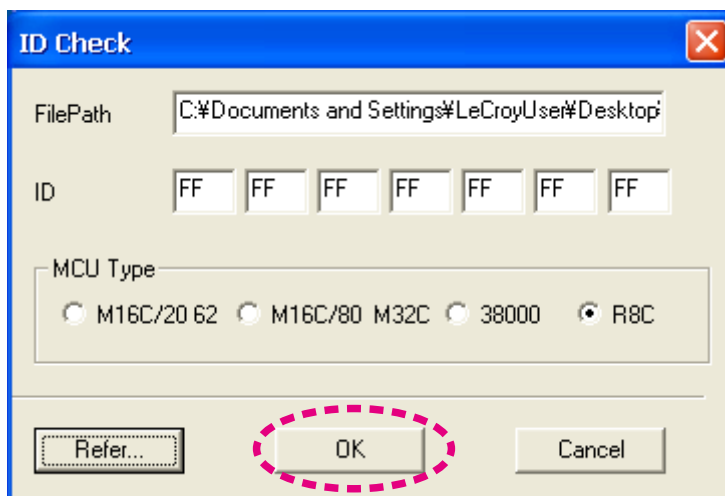
The ID Check dialog box has a blue title bar with a close button. It contains a FilePath text box, an ID field with seven empty boxes, and an MCU Type section with four radio buttons: M16C/20 62 (selected), M16C/80 M32C, 38000, and R8C. At the bottom, there are three buttons: Refer... (circled in red), OK, and Cancel.

- (10) Choose the MM7055_7025_yymmddvv.mot. And click Open.
NOTE : The yy is two digit of year. The mm is month. The dd is date. The vv is version.



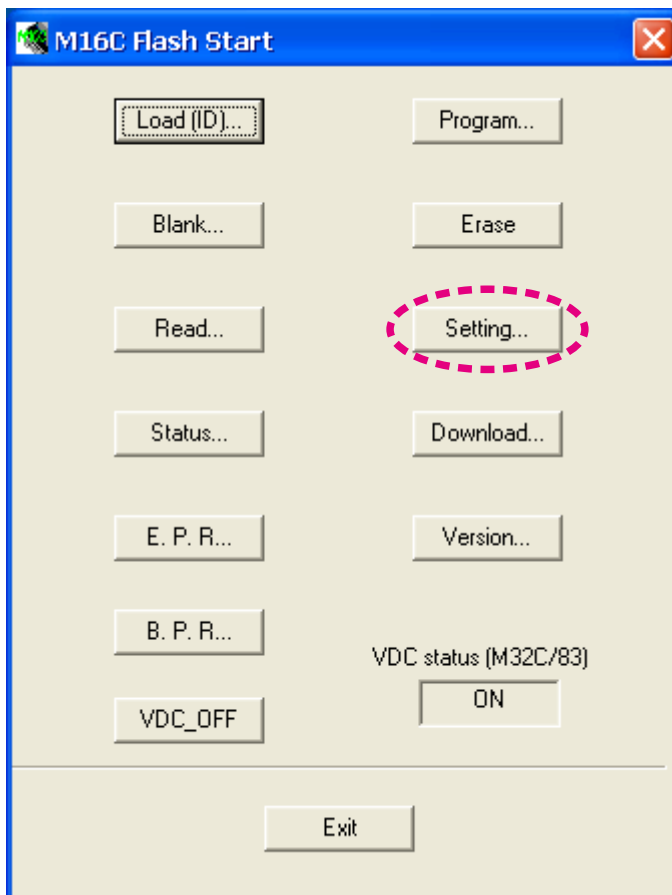
The Open file dialog box shows the 'Look in' dropdown set to 'CPU(MM7055_7025)'. The file list contains 'MM7055_7025_10061104.mot'. The 'File name' field is filled with 'MM7055_7025_10061104.mot' and the 'Files of type' dropdown is set to 'Motrola Hex File (*.s;*.mot;*.s2)'. The Open button is circled in red.

- (11) The FilePath and ID are inputted automatically, and the MCU Type is selected to R8C automatically. Click the OK.



The ID Check dialog box now has the FilePath text box filled with 'C:\Documents and Settings\LeCroyUser\Desktop'. The ID field is filled with seven 'FF' characters. The MCU Type section has the R8C radio button selected. The OK button is circled in red.

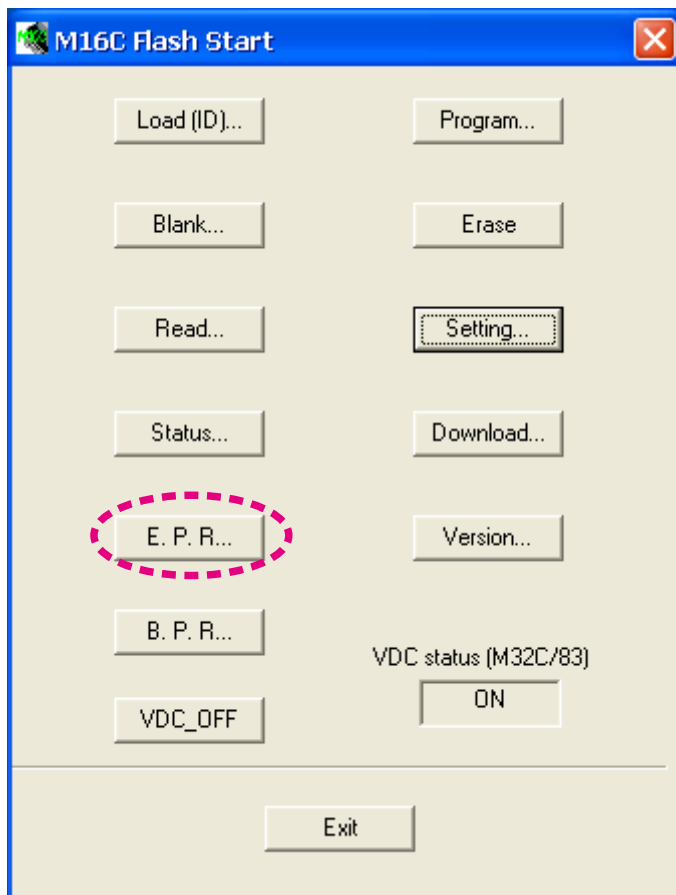
(12) Click the Setting....



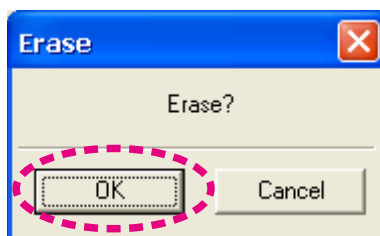
(13) Choose the 57600 in the Baud rate. (DO NOT choose the other one.)
Choose the 40 in Program_intervals(ms). Click the OK.



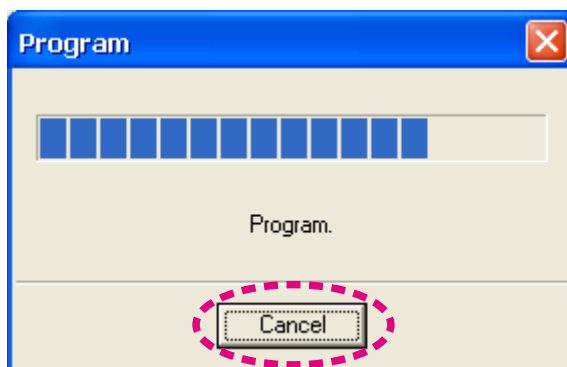
(14) Click the E.P.R....



(15) Click the OK.



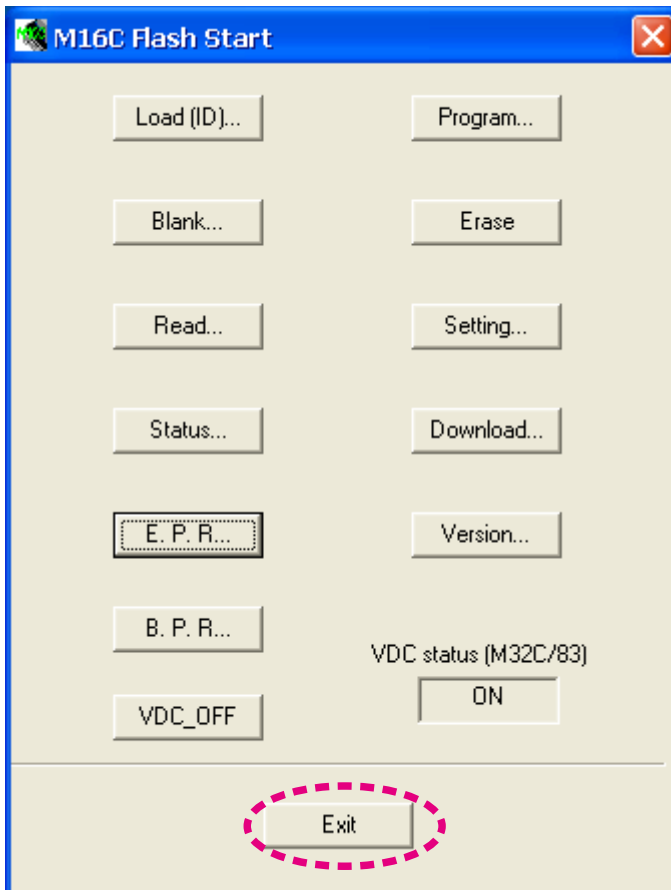
(16) Software is written into the internal Flash-ROM of CPU.
The updating of software takes about 20 seconds.



(17) Click the OK.



(18) Click the Exit.



(19) Disconnect the mains cord from the unit.

(20) Disconnect the RS-232C cable from the unit.

ADJUSTMENT

Idling Current Alignment

- (1) Each of the measurement points are provided with the two test points. Set a digital Voltage meter to DC voltage input, connect the meter to the test points at both contact points.
- (2) After the setup above, turn on the main switch.
- (3) Adjust variable resistors (VR11,VR12) according to the digital voltmeter readings. The target setting value is the following table for each channel.

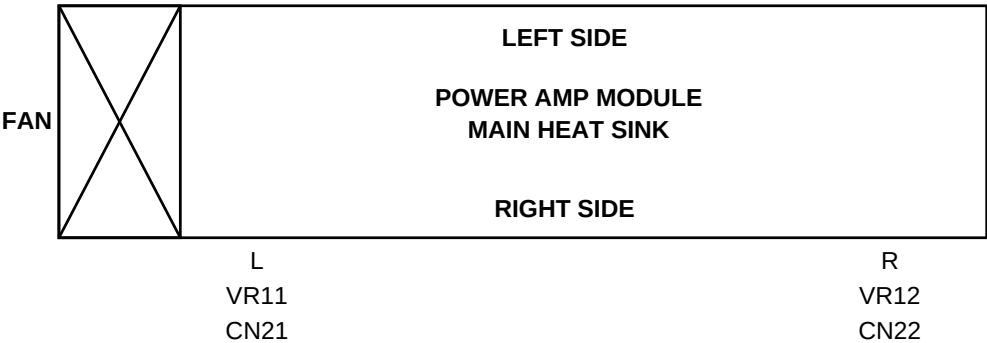
Settings : No-signal of input
Speaker out — No Load
Top lid — OPEN

Measurement Point

	Channel	Adjustment VR	Measurement Point
MAIN PWB	L	VR11	CN21
	R	VR12	CN22

Time Table of Idling Current Rise

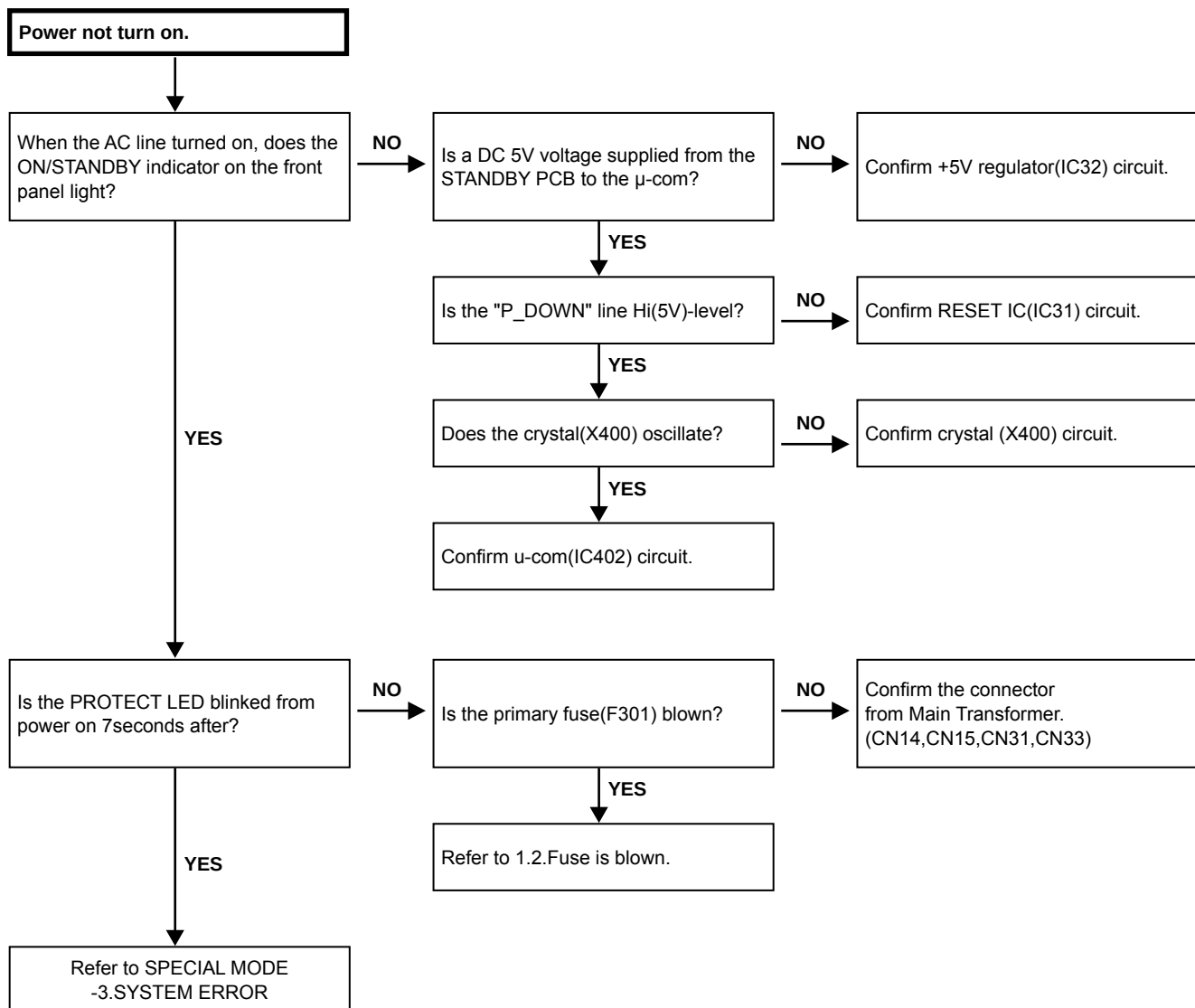
After Turning ON	Ambient temperature 20 to 30 degrees centigrade
	Measurement Voltage
10 min.	1.5 mV ± 0.2 mV
20 min.	1.5 mV ± 0.2 mV
30 min.	1.5 mV ± 0.2 mV



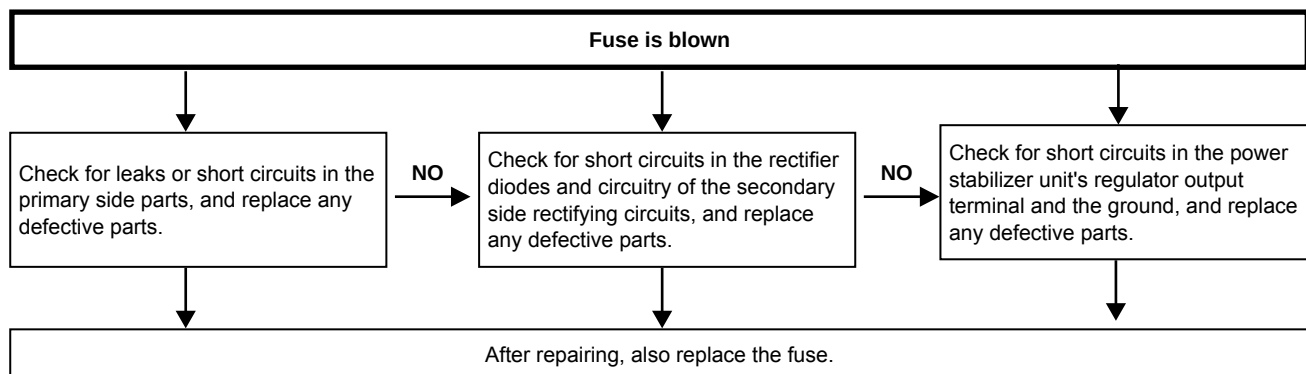
TROUBLE SHOOTING

1. POWER

1.1. Power not turn on

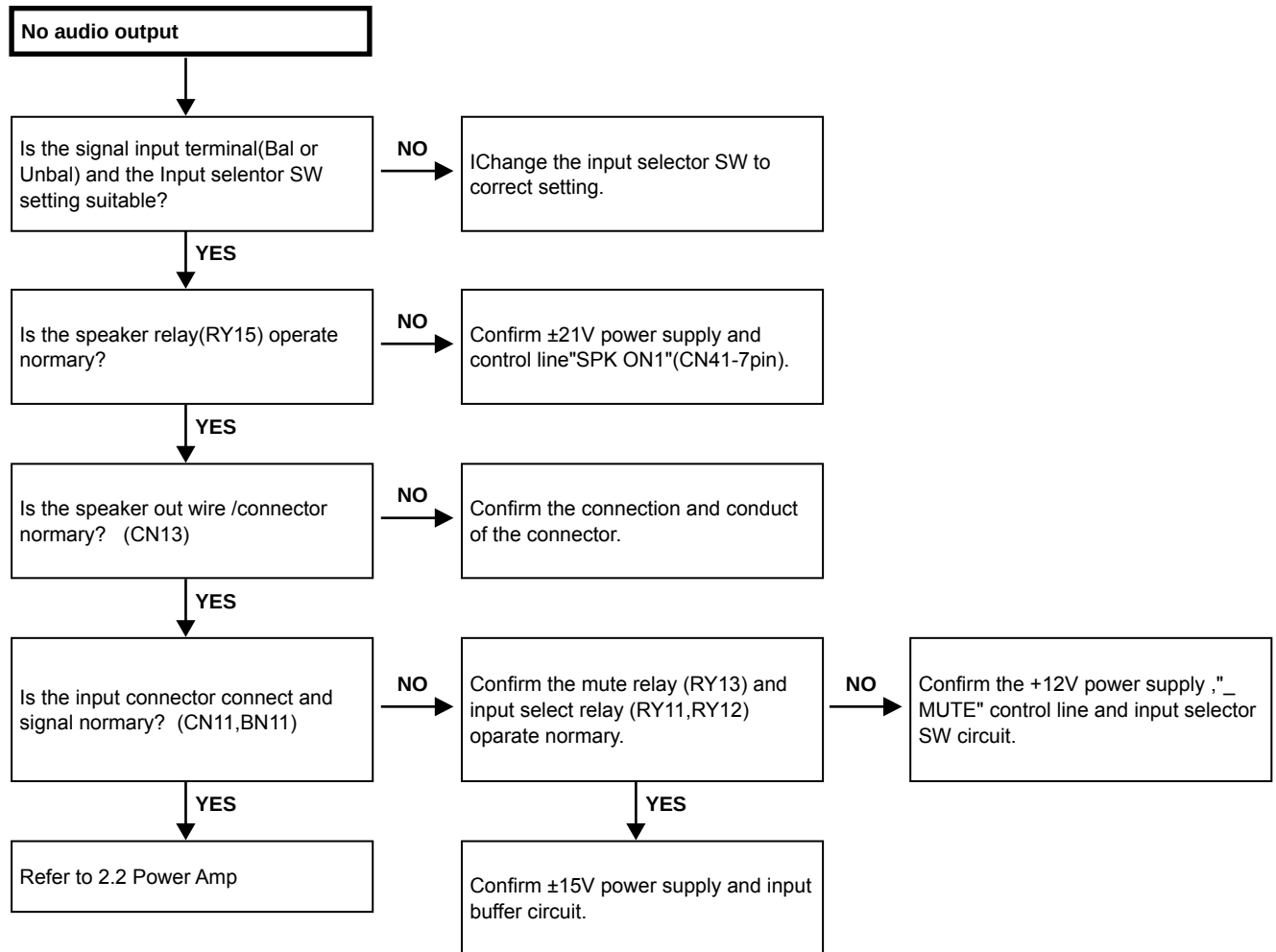


1.2. Fuse is blown

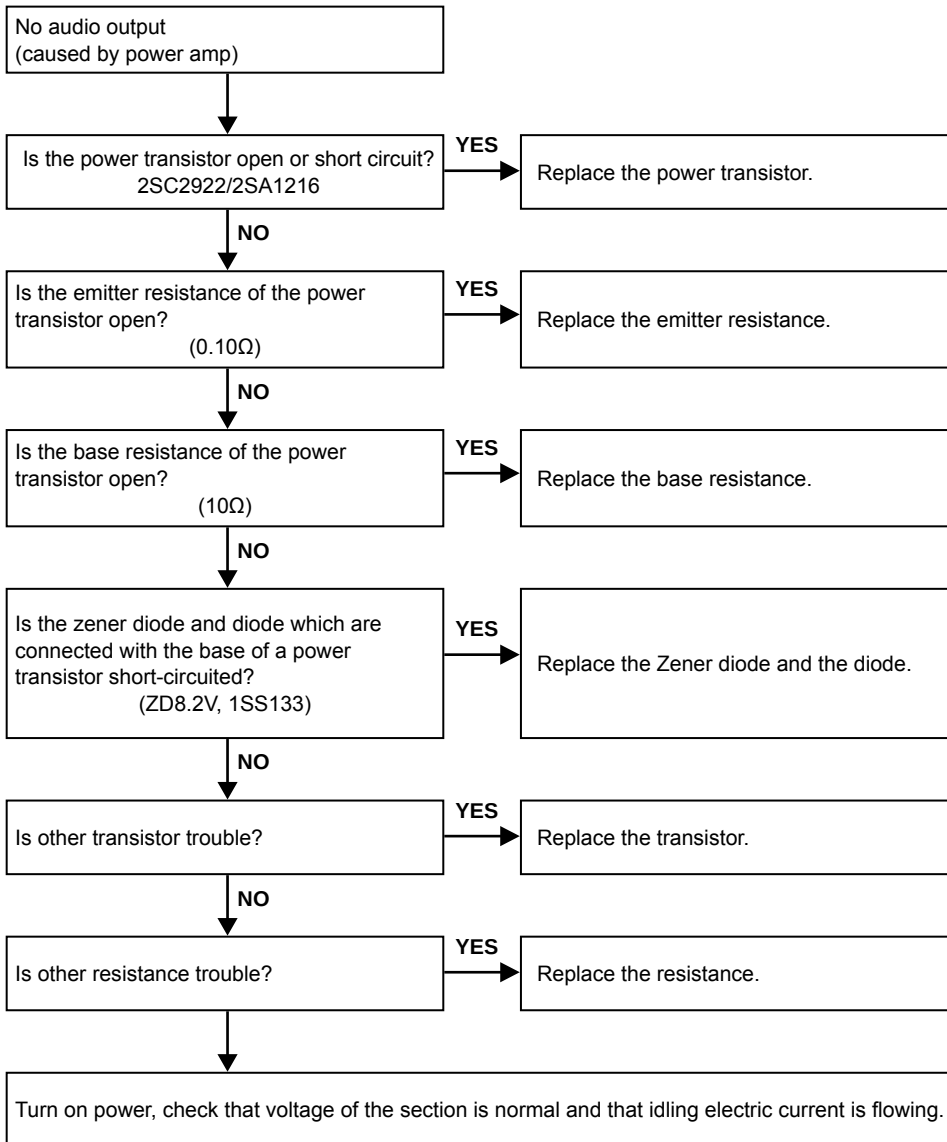


2. AUDIO

2.1. No audio output

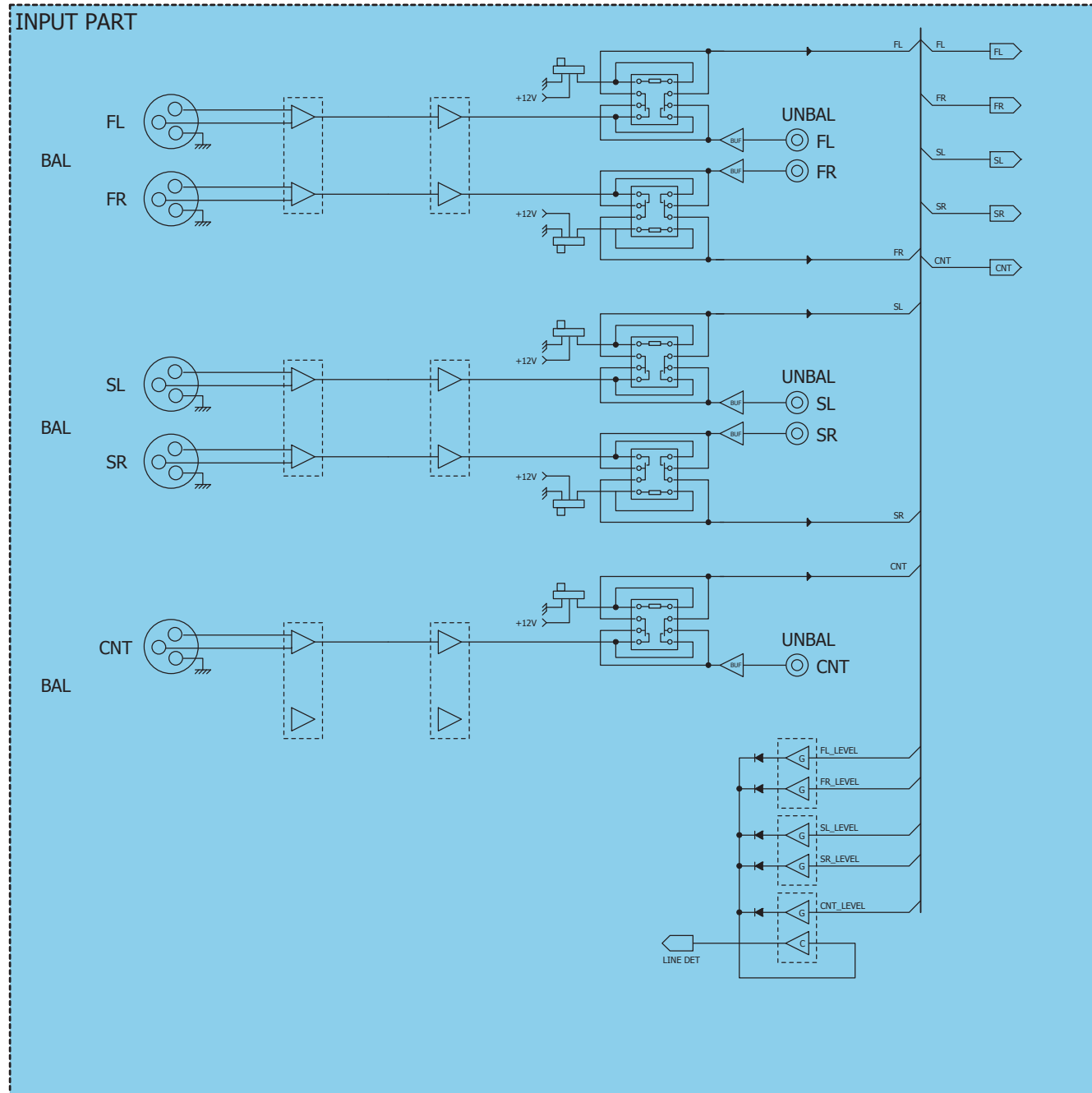


2.2. Power Amp (MAIN PWB)

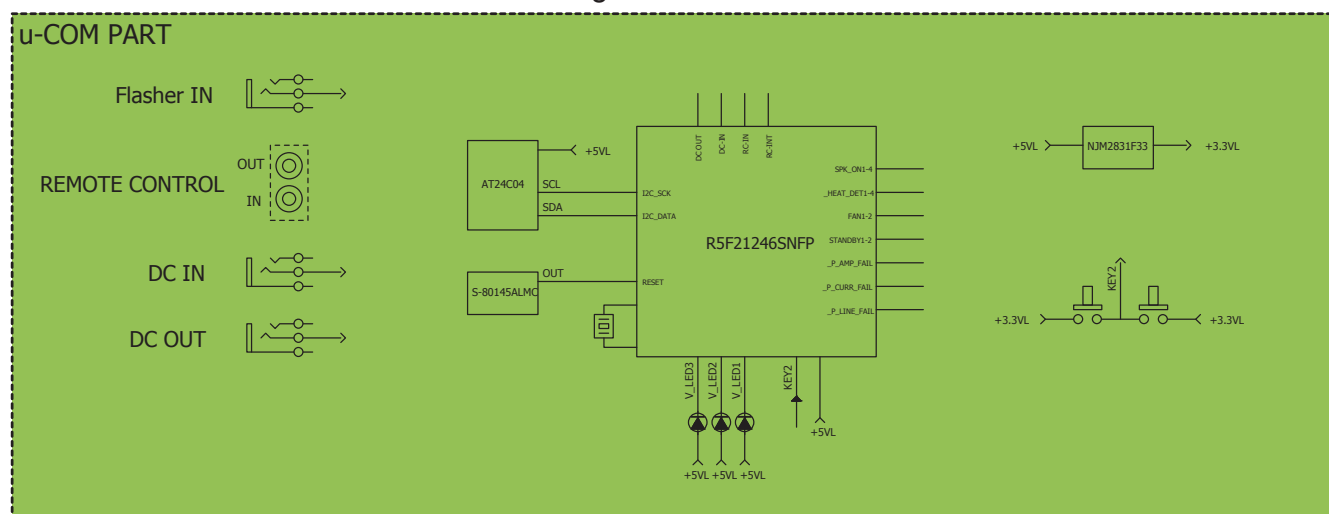


BLOCK DIAGRAM

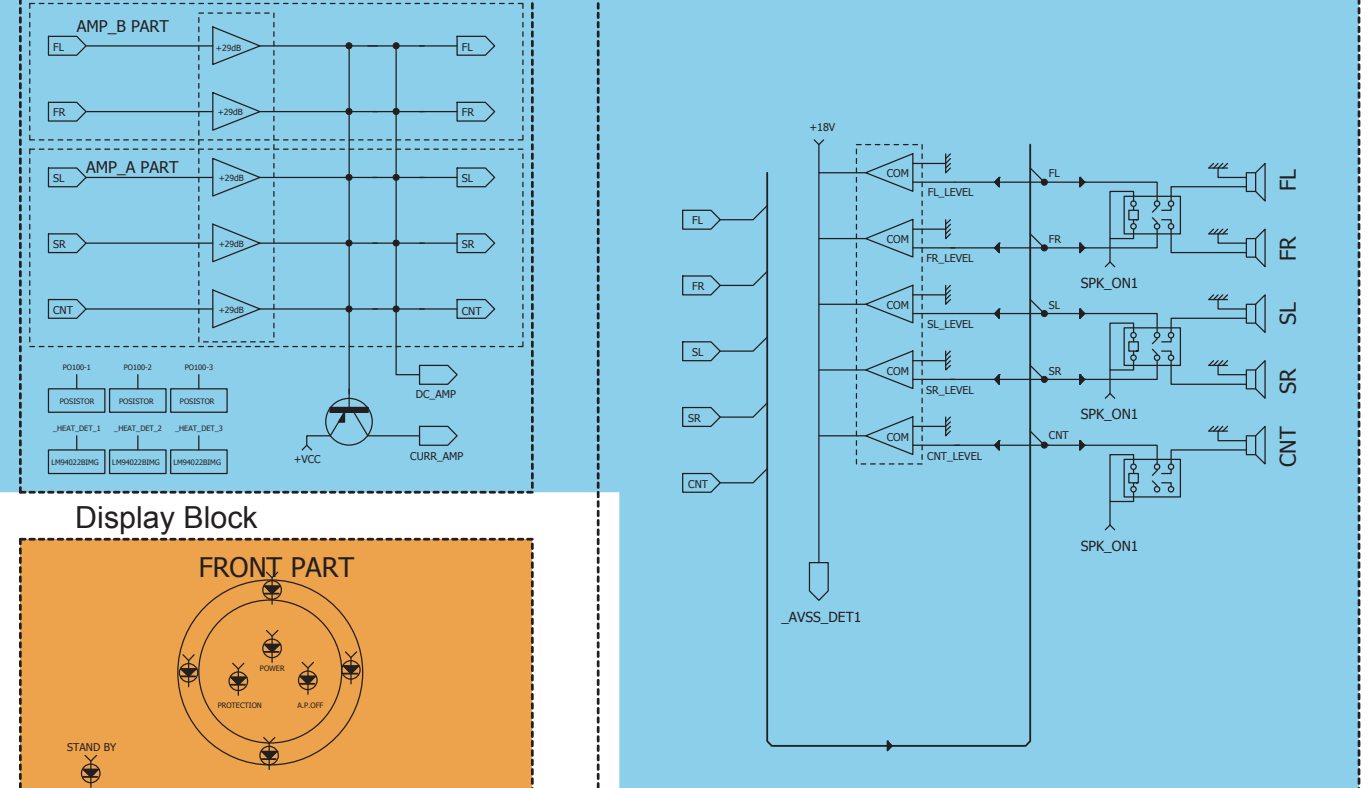
Audio Block



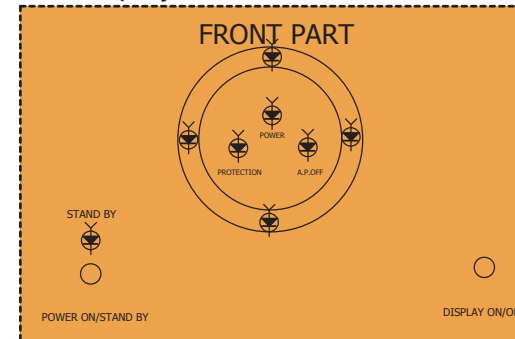
Digital Block



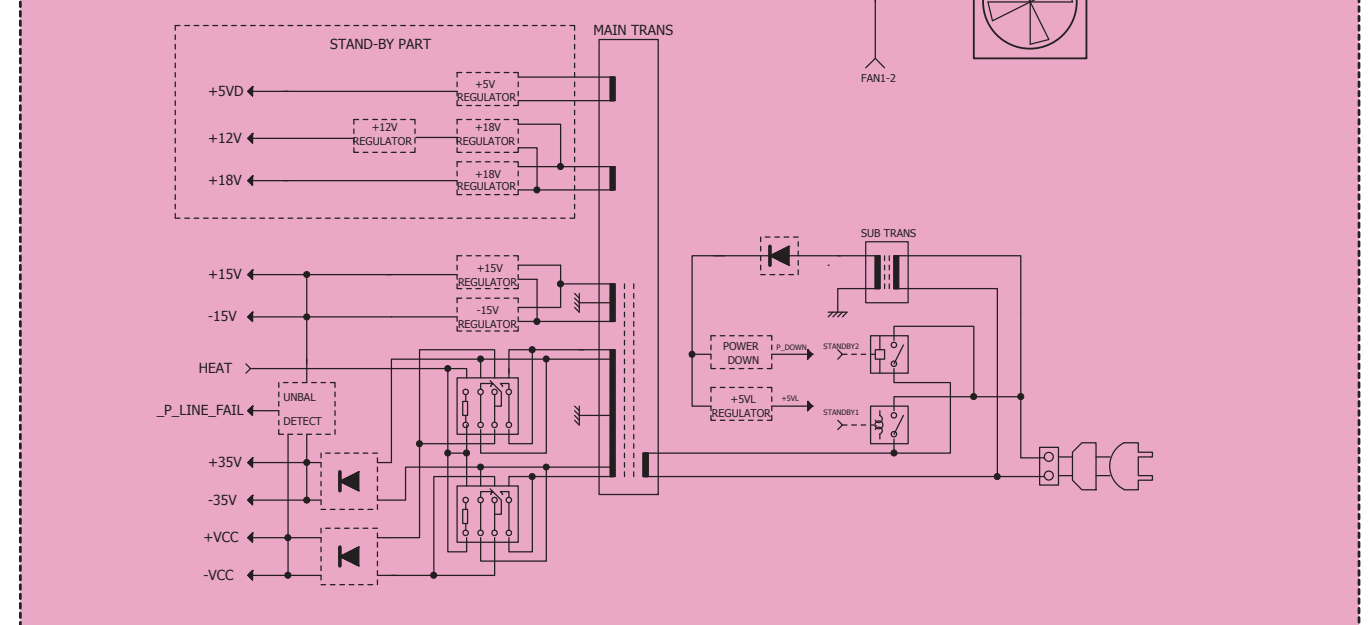
AMP PART



Display Block

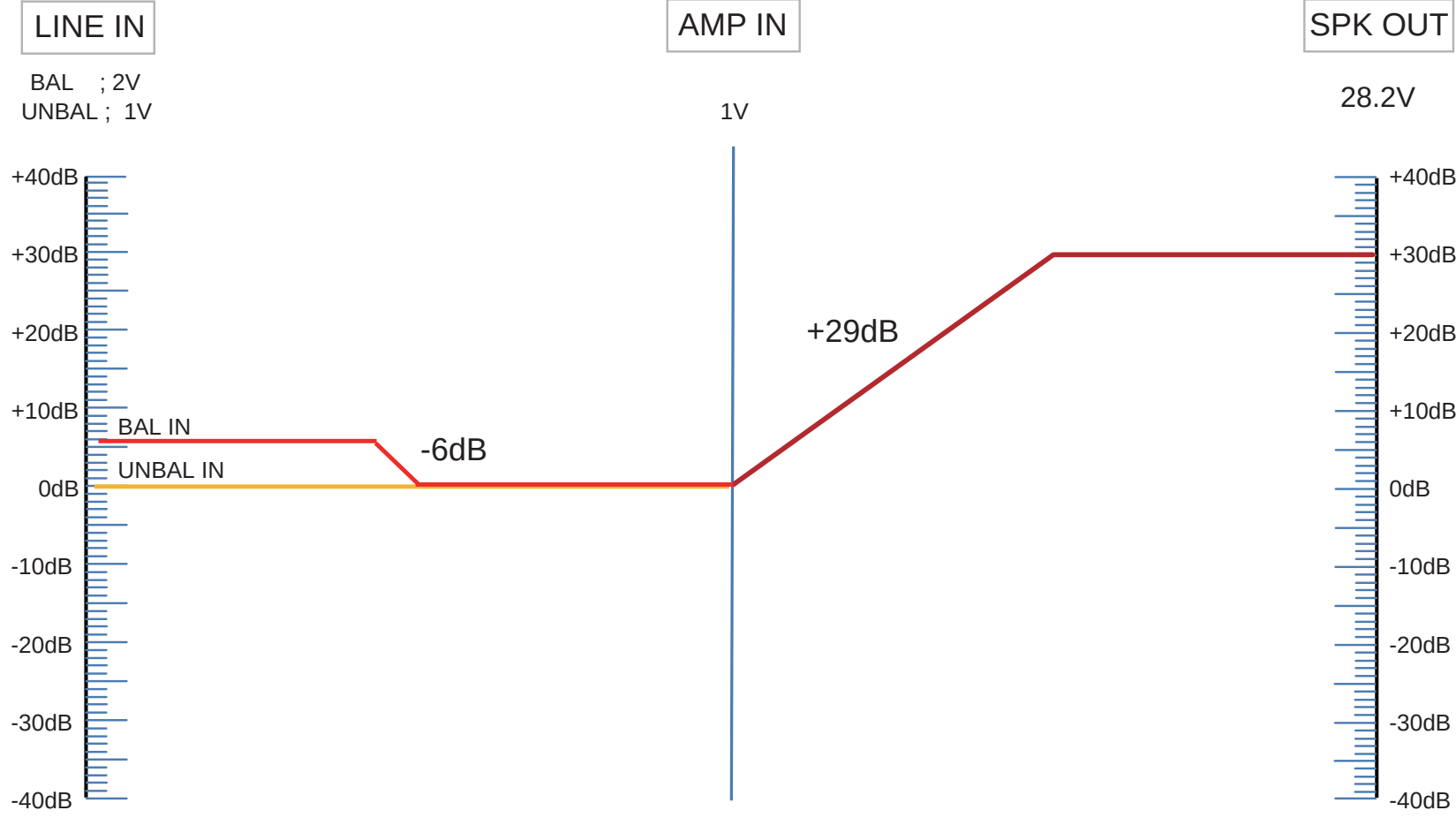
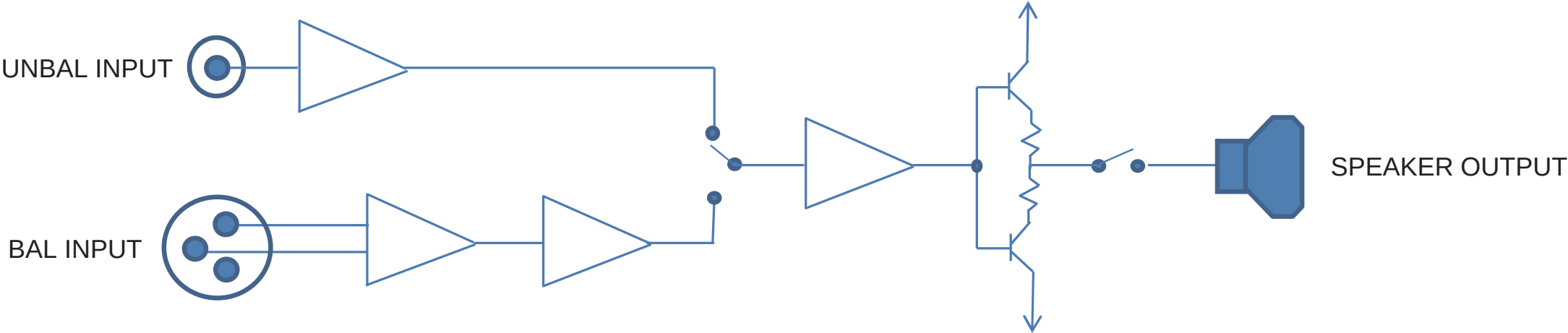


POWER & STAND-BY PART



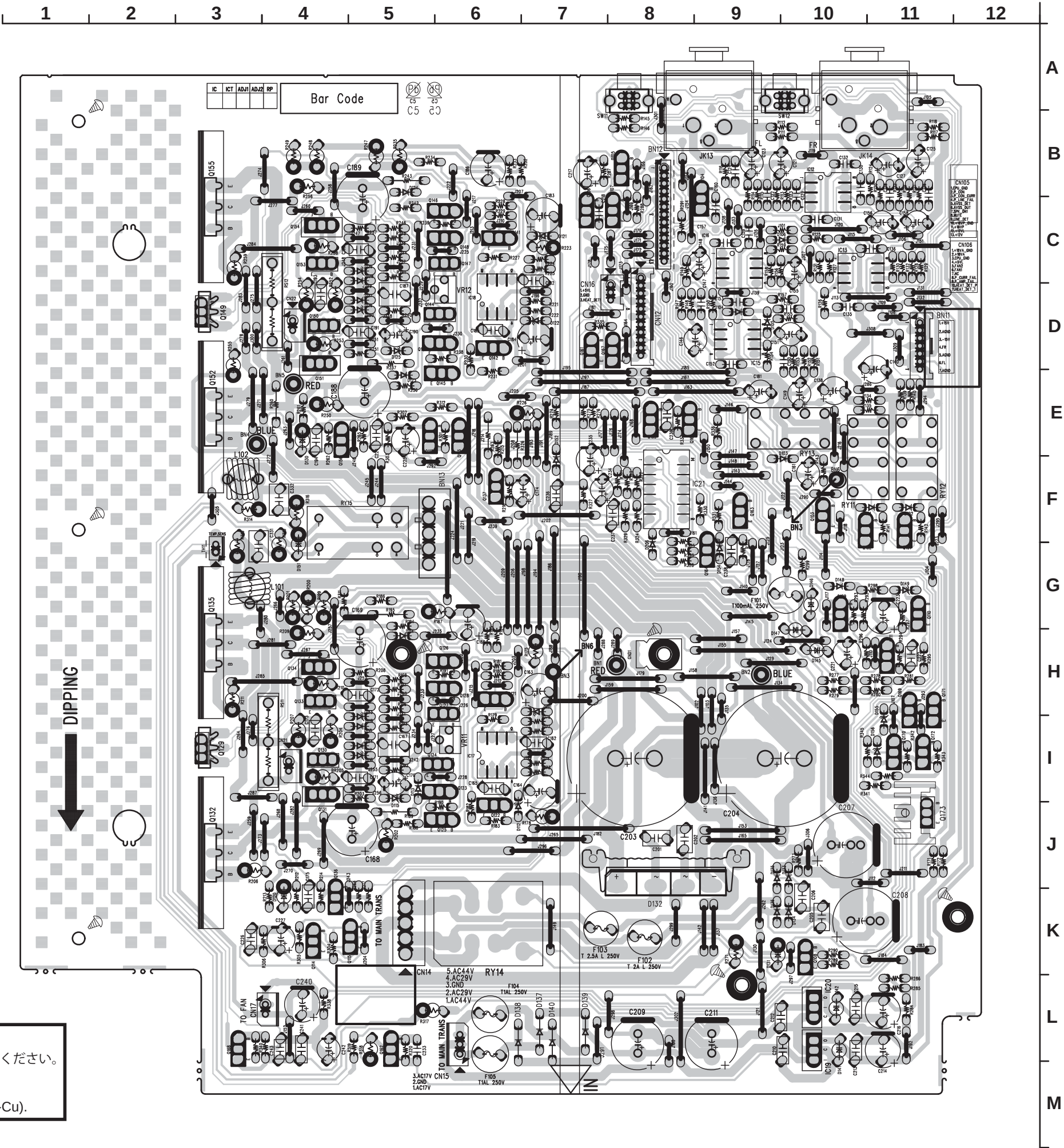
POWER Block

LEVEL DIAGRAM



PRINTED WIRING BOARDS

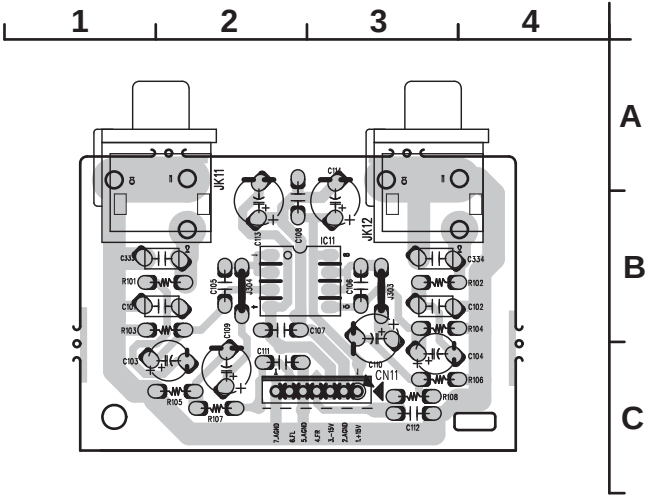
MAIN (1) (COMPONENT SIDE)



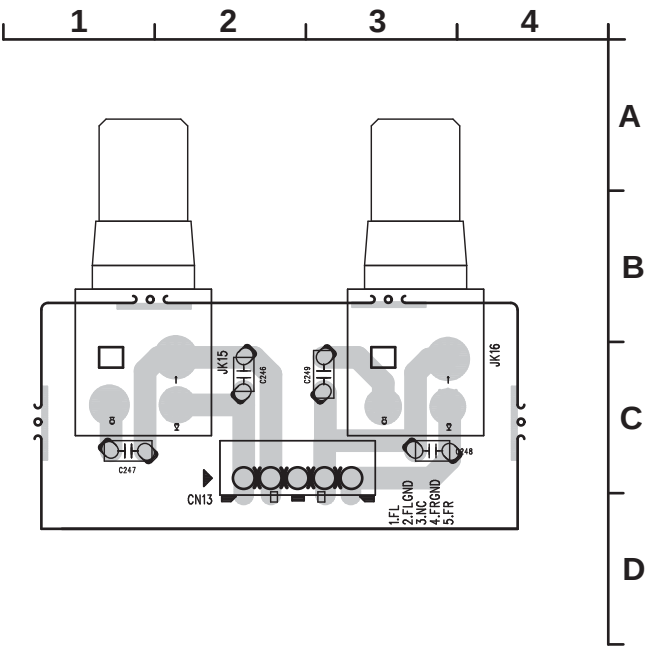
鉛フリー半田
半田付けには、鉛フリー半田 (Sn-Ag-Cu) を使用してください。

Lead-free Solder
When soldering, use the Lead-free Solder (Sn-Ag-Cu).

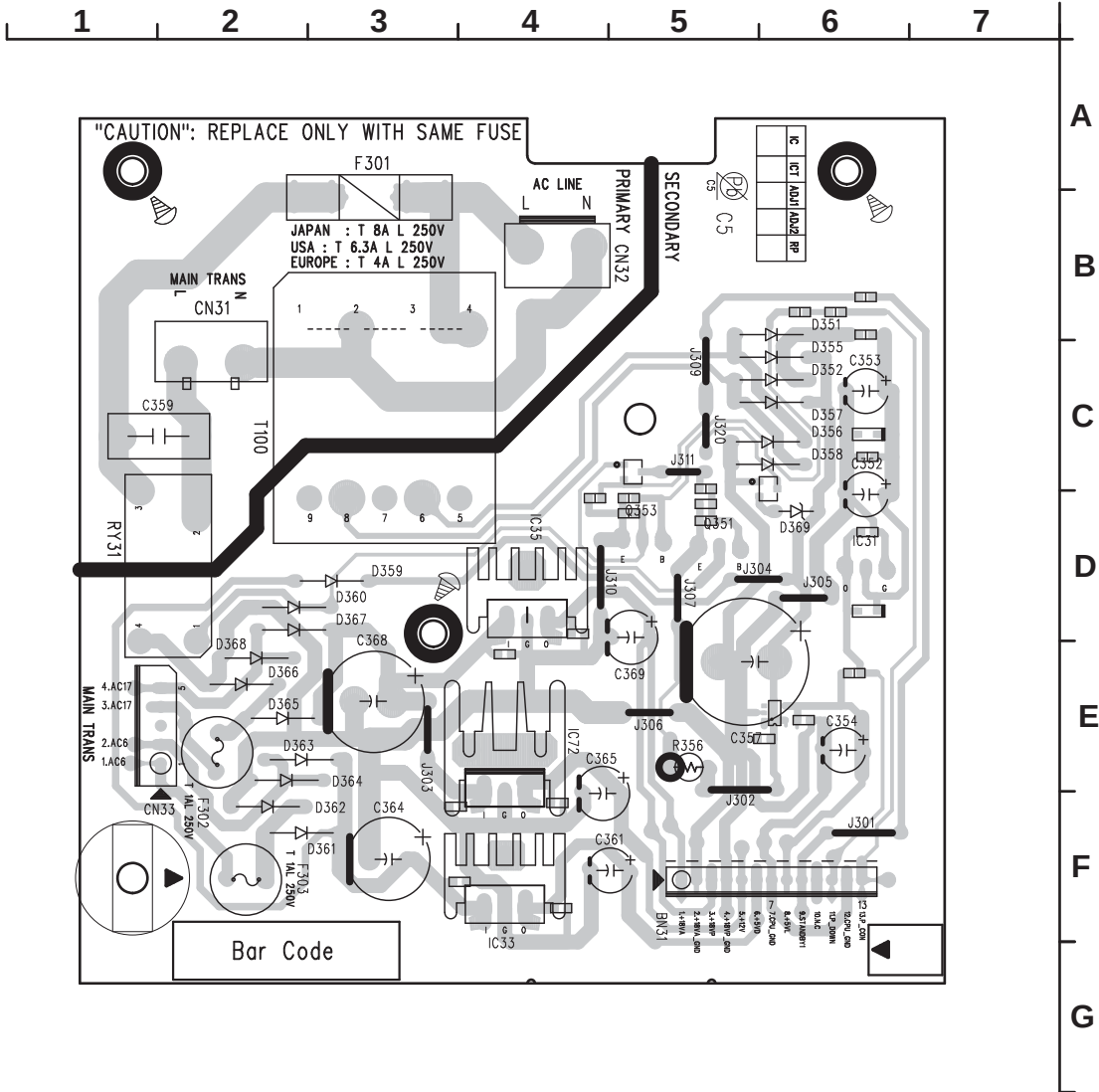
MAIN (2) (COMPONENT SIDE)



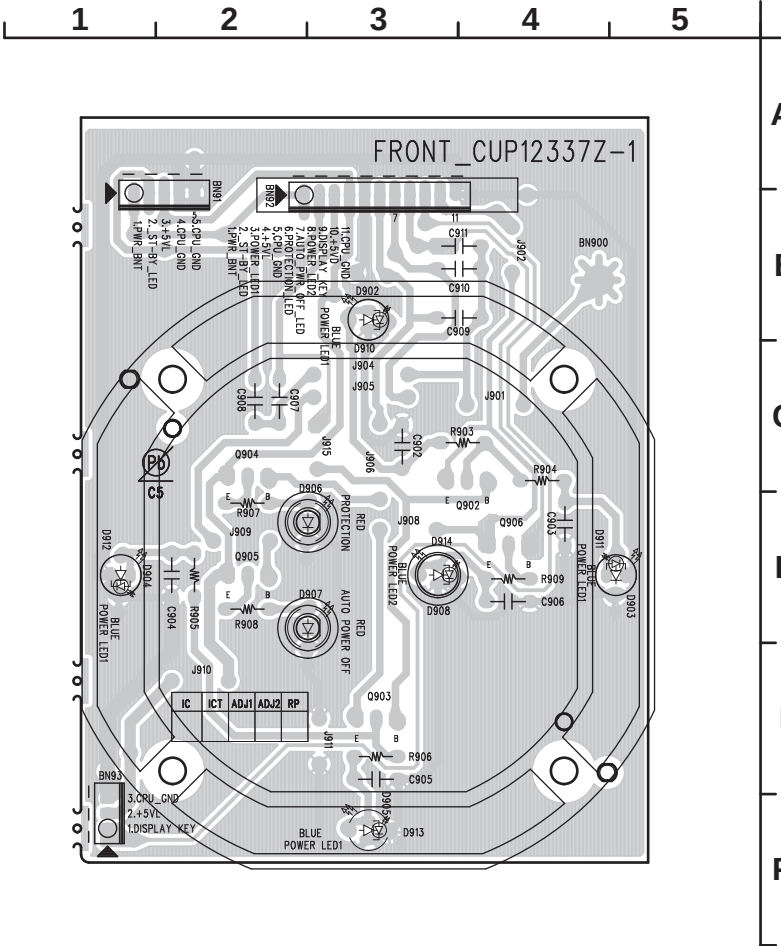
MAIN (3) (COMPONENT SIDE)



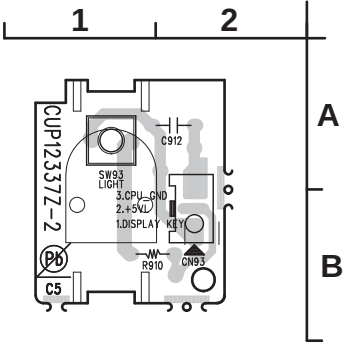
STANDBY (COMPONENT SIDE)



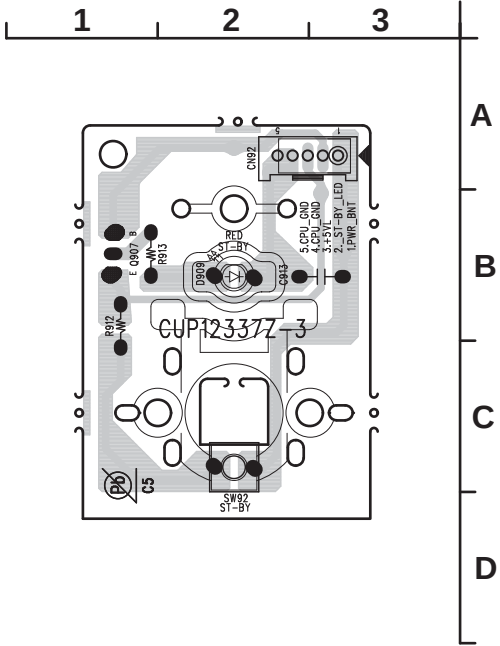
FRONT (1) (COMPONENT SIDE)



FRONT (2) (COMPONENT SIDE)

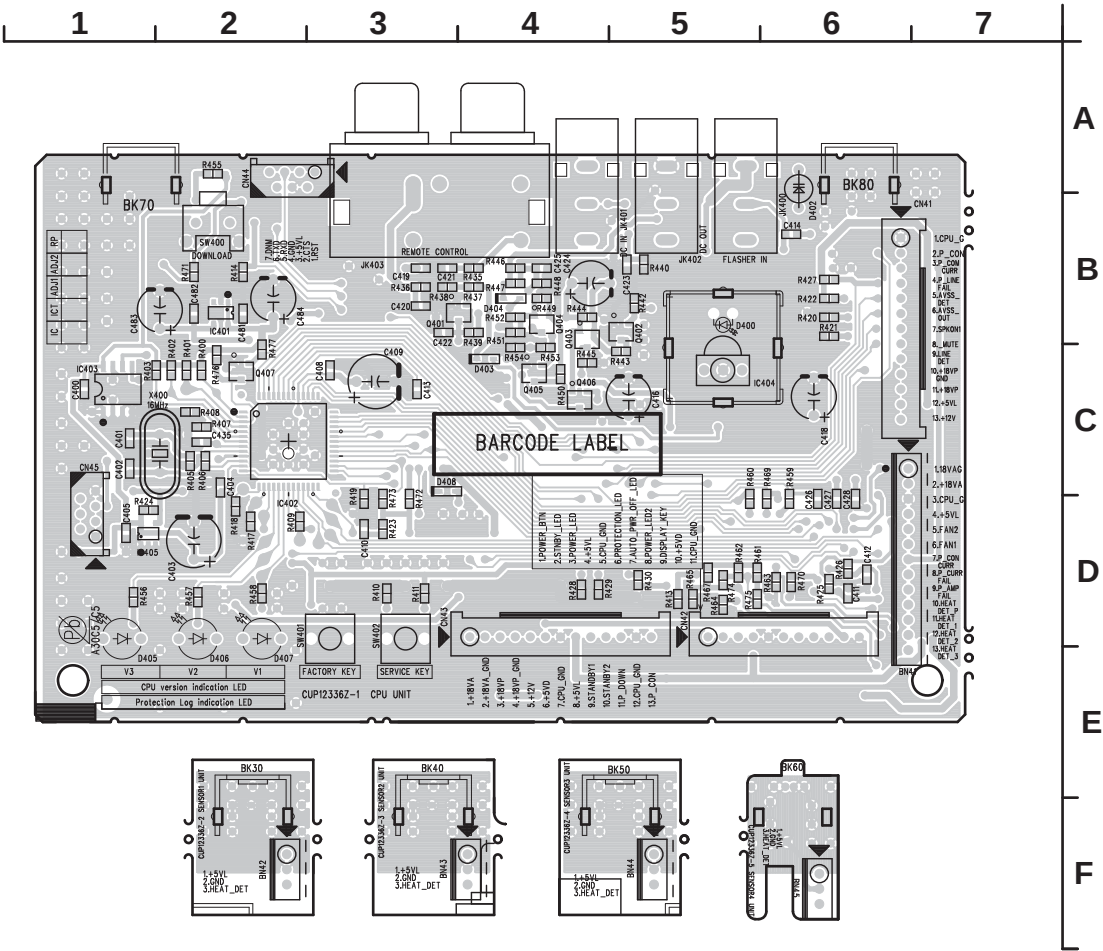


FRONT (3) (COMPONENT SIDE)

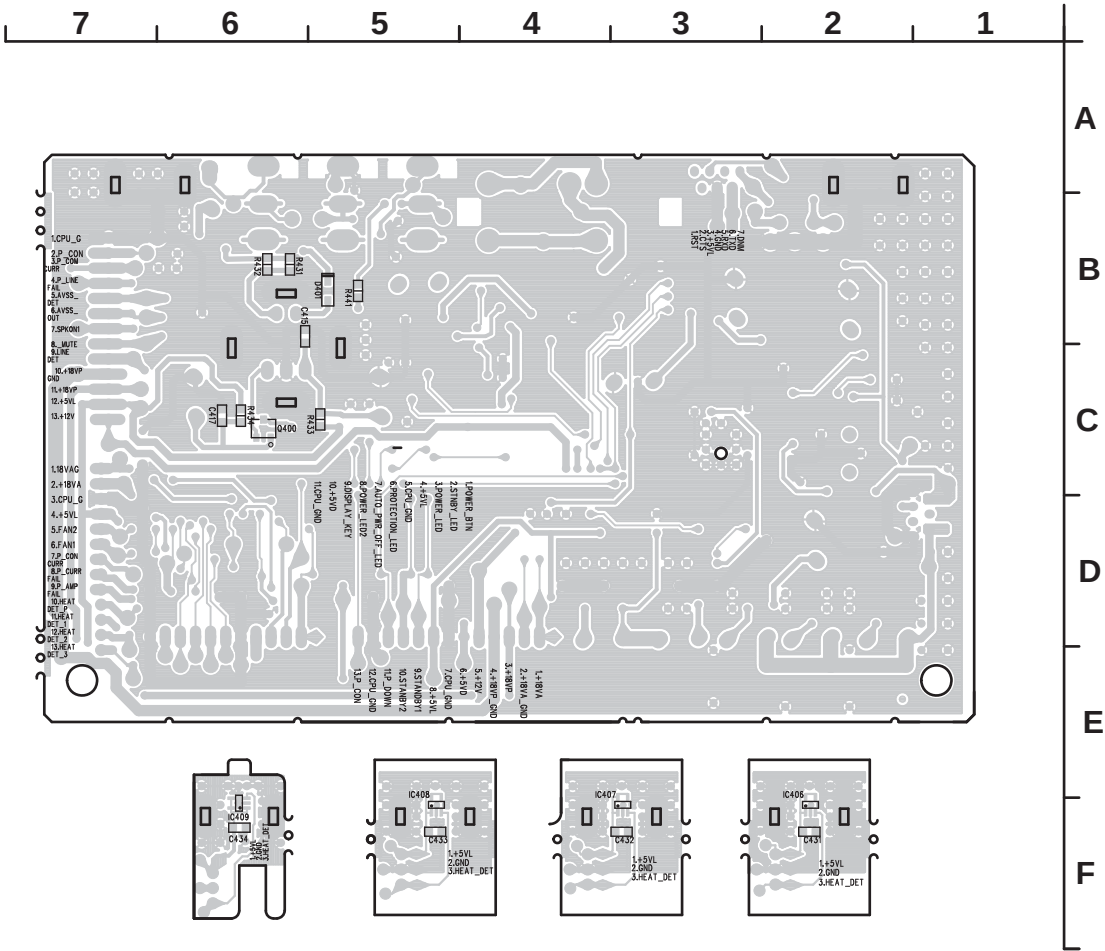


鉛フリー半田
半田付けには、鉛フリー半田 (Sn-Ag-Cu) を使用してください。
Lead-free Solder
When soldering, use the Lead-free Solder (Sn-Ag-Cu).

CPU (COMPONENT SIDE)



CPU (FOIL SIDE)



鉛フリー半田
半田付けには、鉛フリー半田 (Sn-Ag-Cu) を使用してください。

Lead-free Solder
When soldering, use the Lead-free Solder (Sn-Ag-Cu).

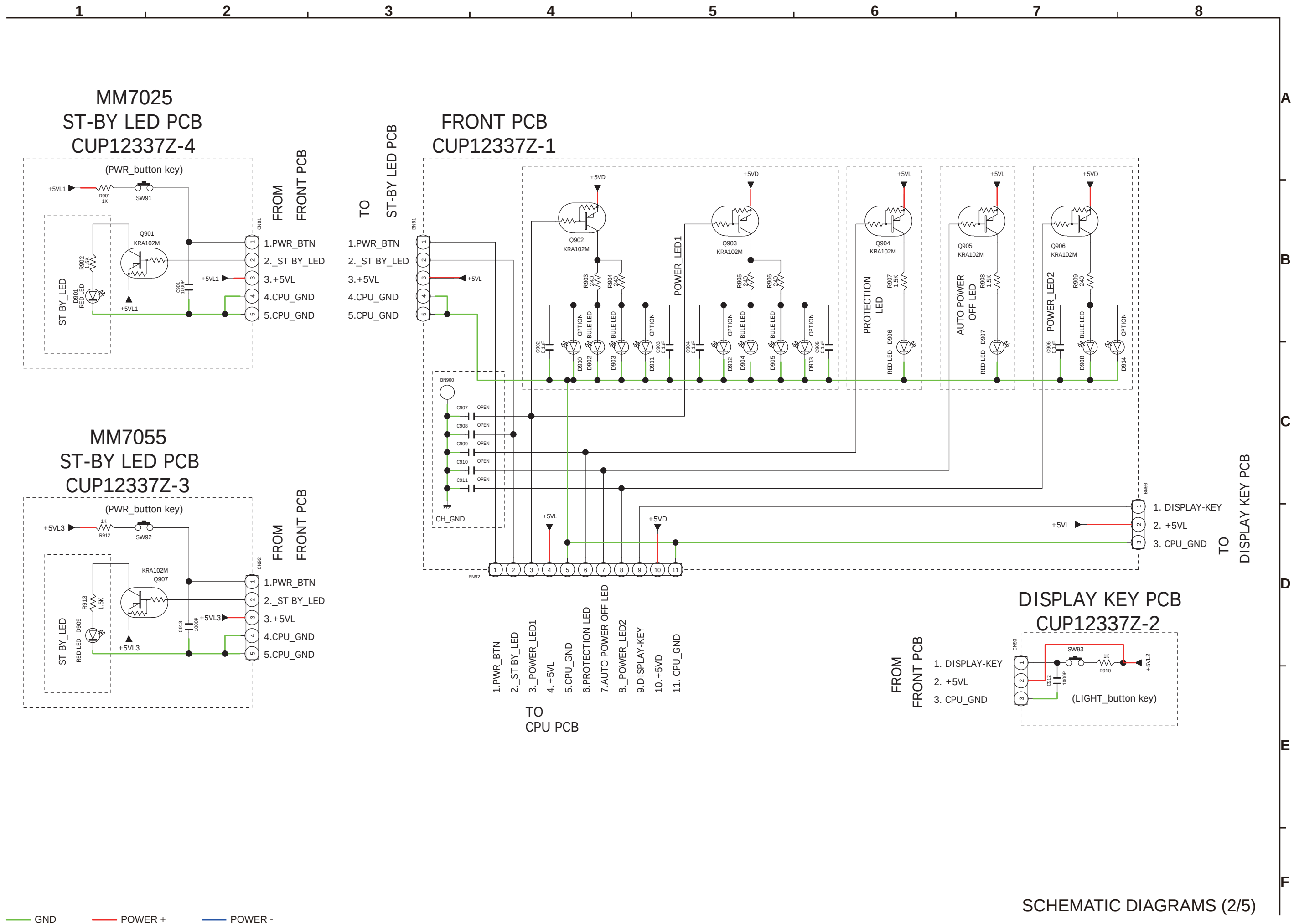
	BN41
MM7025	11P
MM7055	13P

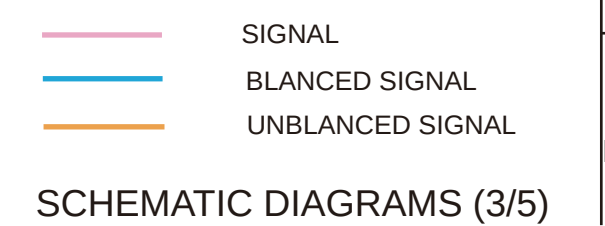
MM7025
FROM
MAIN PCB

MM7025
FROM
MAIN PCB

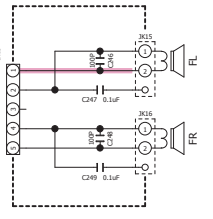
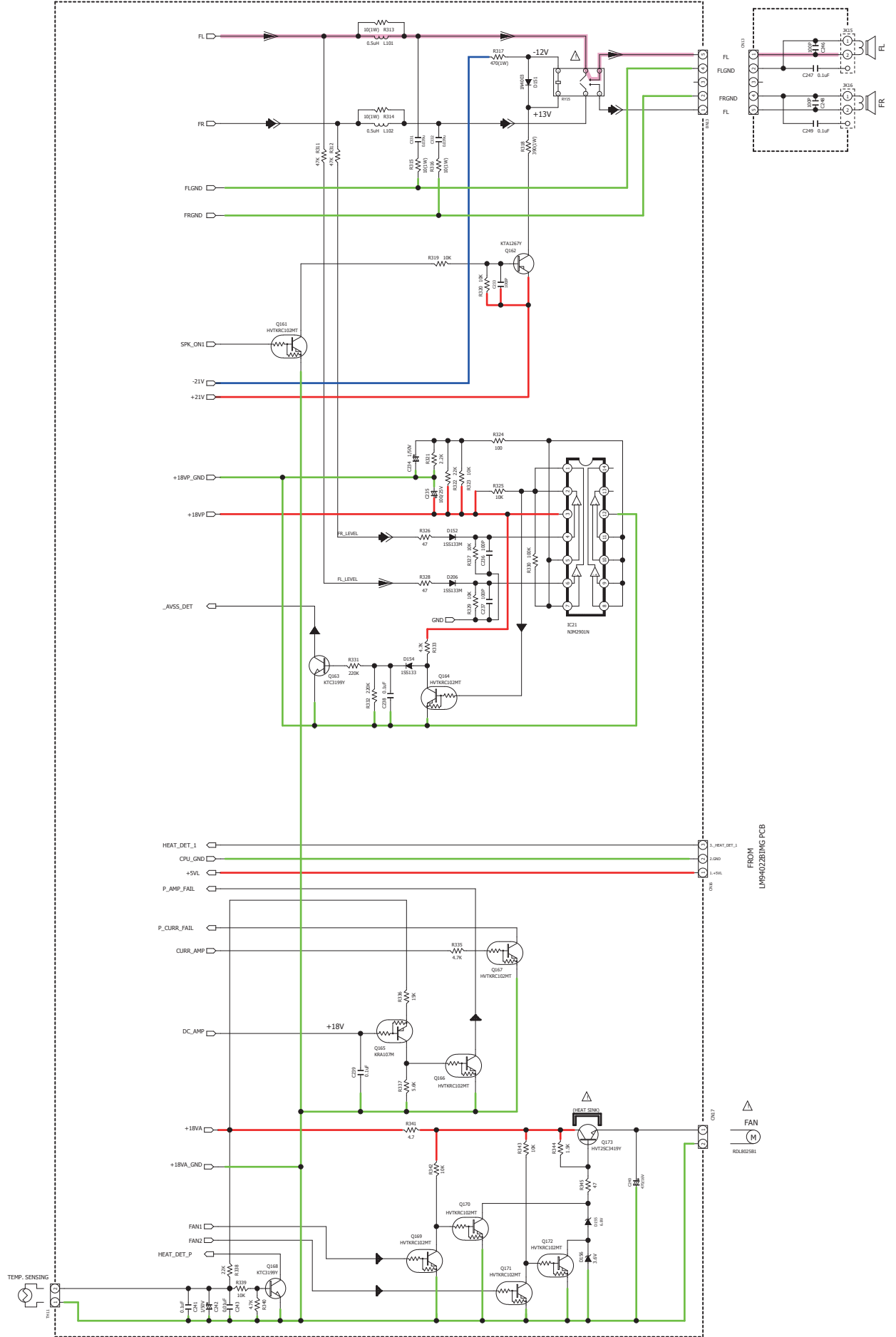
FROM FRONT PCB







SPEAKER OUT PART

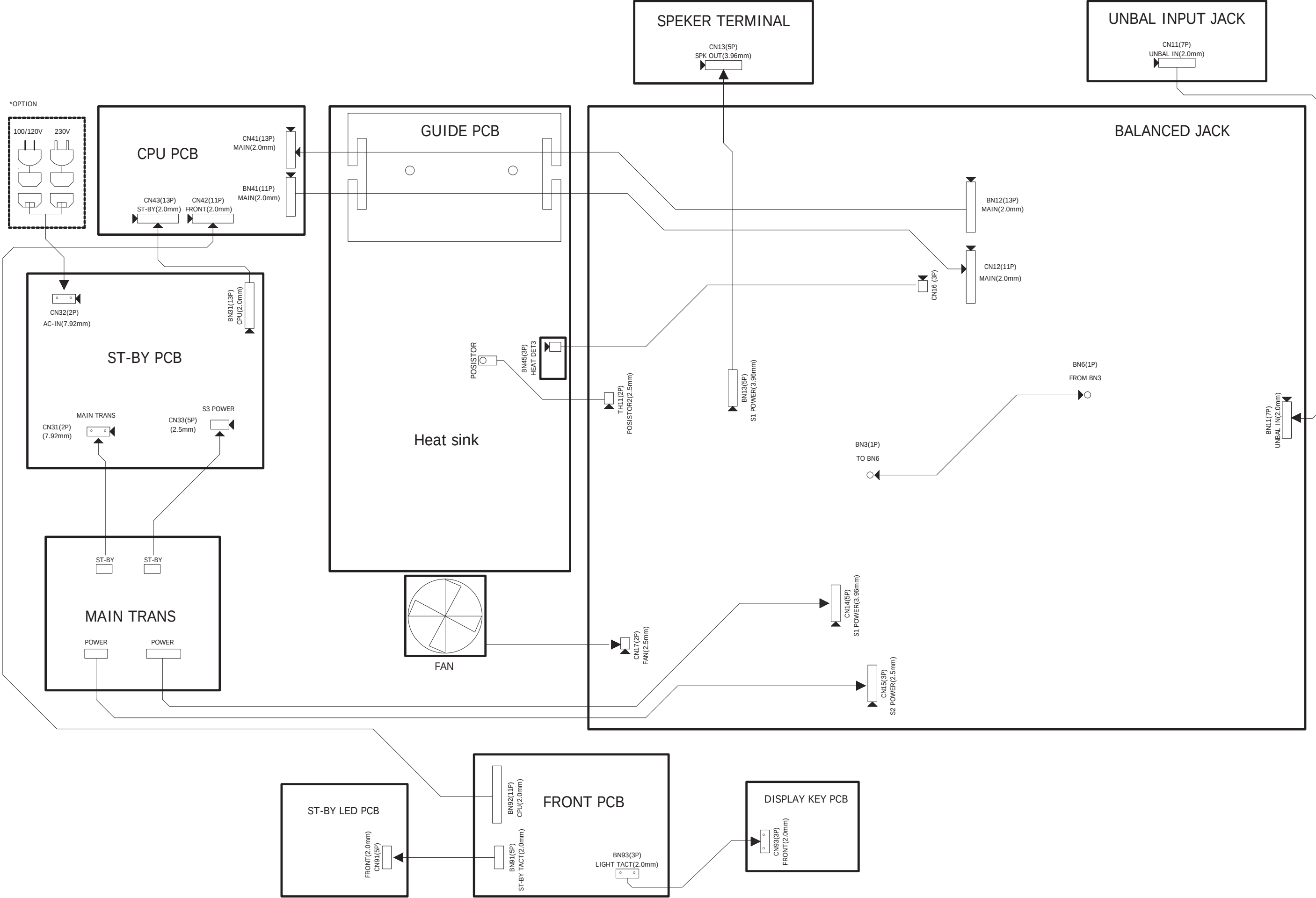


GND POWER + POWER -

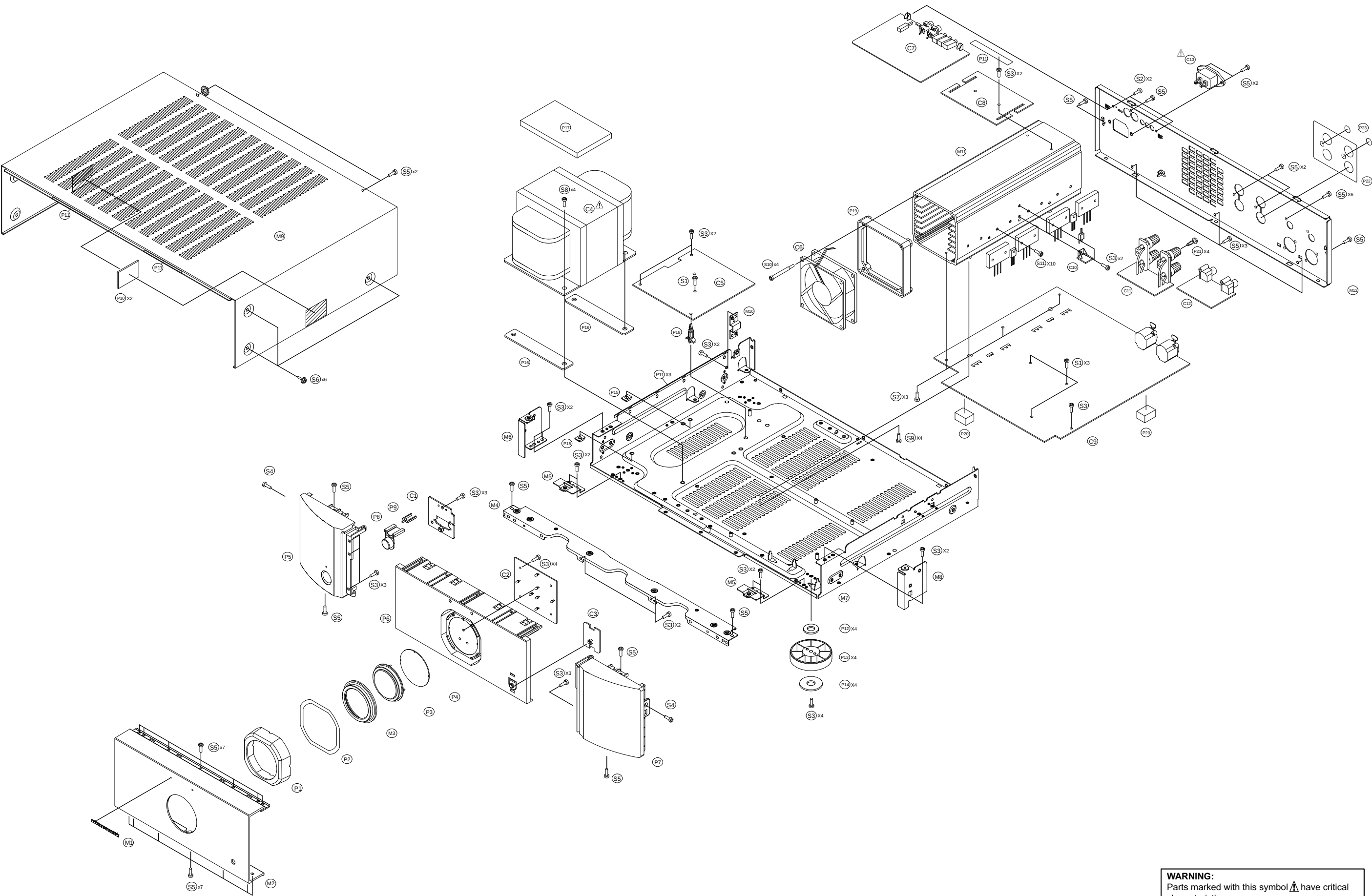
SIGNAL
SCHEMATIC DIAGRAMS (4/5)



WIRING DIAGRAM



EXPLODED VIEW



WARNING:
Parts marked with this symbol ⚠ have critical characteristics.
Use ONLY replacement parts recommended by the manufacturer.

PARTS LIST OF EXPLODED VIEW

* Parts for which "nsp" is indicated on this table cannot be supplied.

* P.W.B. ASS'Y for which "nsp" is indicated on this table cannot be supplied. When repairing the P.W.B. ASS'Y, check the board parts table and order replacement parts.

* Part indicated with the mark "★" is not illustrated in the exploded view.

* The parts listed below are for maintenance only, might differ from the parts used in the unit in appearances or dimensions.

Note: The symbols in the column "Remarks" indicate the following destinations.

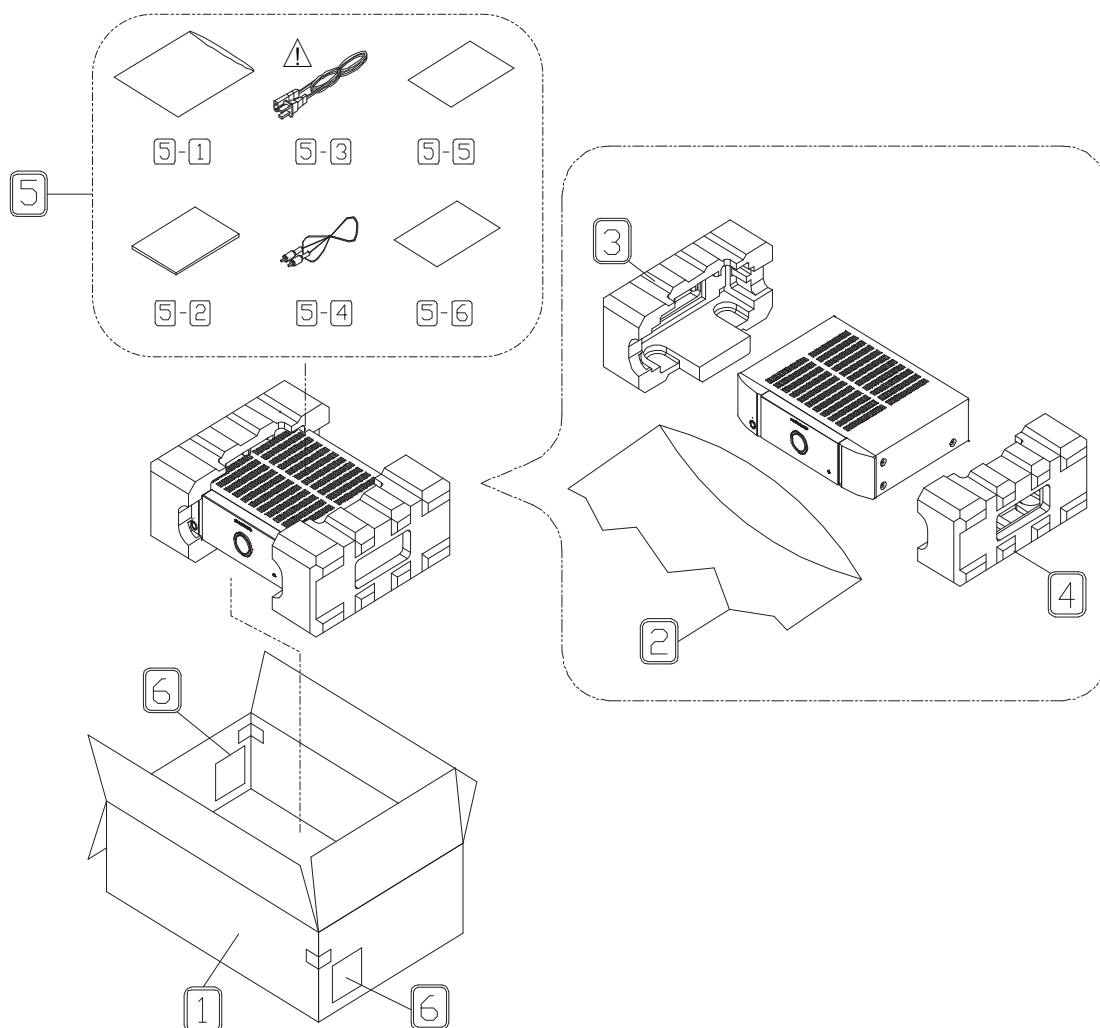
U1B : North America model

N1B : Europe model

	Ref. No.	Part No.	Part Name	Remarks		Q'ty	New
	C1A	nsp	FRONT PCB ASS'Y		COP12337C	1	
	C1	-	FRONT PCB ASS'Y(3)		-		
	C2	-	FRONT PCB ASS'Y(1)		-		
	C3	-	FRONT PCB ASS'Y(2)		-		
	C5	nsp	STANDBY PCB ASS'Y		COP12335	1	
	C7A	nsp	CPU PCB ASS'Y		COP12336E	1	
	C7	-	CPU PCB ASS'Y(1)		-		
	C10	-	CPU PCB ASS'Y(3)		-		
	C9A	nsp	MAIN PCB ASS'Y		COP12334B	1	
	C8	-	MAIN PCB ASS'Y(4)		-		
	C9	-	MAIN PCB ASS'Y(1)		-		
	C11	-	MAIN PCB ASS'Y(3)		-		
	C12	-	MAIN PCB ASS'Y(2)		-		
△	C4	943101010790M	MAIN TRANS	U1B	CLT5W043ZU	1	*
△	C4	943101010780M	MAIN TRANS	N1B	CLT5W043ZE	1	*
	C6	943685011430S	FAN		CFNRDL8025B1	1	*
△	C13	00MYJ04002640	RECEPTACLE, AC		CJJ8A006ZW	1	
	M1	421410006004M	BADGE		CGB1A206	1	
	M2	943402010740M	PANEL, FRONT AL		CKM1A236ZC23	1	*
	M3	424410019009M	RING		CGK1A163C23	1	
	M4	nsp	STAY		CUF1A012	1	
	M5	nsp	BRACKET, BOTTOM		CMD1A759	2	
	M6	nsp	RETAINER L		CMD1A750	1	
	M7	nsp	CHASSIS MAIN SECC		CUA1A306	1	
	M8	nsp	RETAINER R		CMD1A751	1	
	M9	00M14AJ257320	TOP COVER BL		CKC1A201K117	1	
	M10	nsp	SCREW STOPPER		CMD1A746	1	
	M11	nsp	HEATSINK		CMY1A365	1	*
	M12	nsp	PANEL, REAR	U1B	CKF1A439Y	1	*
	M12	nsp	PANEL, REAR	N1B	CKF1A439Z	1	*
	P1	nsp	LENS		CGL1A290	1	
	P2	nsp	SHEET, DIFFUSION		CGX1A455Z	1	*
	P3	416510046009M	WINDOW		CGU1A455	1	
	P4	943423011610S	FILTER		CGX1A449Z	1	*
	P5	943404011500S	PANEL, SIDE L		CGW1A506RNB37	1	*
	P6	943443011520S	PANEL, SUB		CGW1A505	1	*
	P7	943404011510S	PANEL, SIDE R		CGW1A507RNB37	1	*
	P8	00M24AW270050	KNOB, TACT POWER		CBT1A879	1	
	P9	481510003006M	INDICATOR, POWER		CGL1A274	1	
	P10	nsp	BUFFER TOP COVER		CHG1A454	2	
	P11	nsp	TAPE, HIMELON		CHS1A032	5	
	P12	nsp	BUFFER		CHG1A452	4	

	Ref. No.	Part No.	Part Name	Remarks		Q'ty	New
	P13	00M14AJ057210	LEGS SL		CKL1A199H46	4	
	P14	00M14AJ056110	LEGS CUSHION		CHG1A451	4	
	P15	nsp	RUBBER		CHG1A113	2	
	P16	nsp	CUSHION, MAIN TRANS		CHG1A487	2	*
	P17	nsp	CUSHION		CHG1A488	1	
	P18	nsp	PCB SUPPORT		CRE1A087	1	
	P19	nsp	SUPPORT, FAN		CMH1A312	1	*
	P20	nsp	CUSHION		CHG3A104	2	
	P21	nsp	LOCKER		CRE1A037	4	
	P22	nsp	SHEET, PROTECTOR		CMC1A409Z	1	
	P23	nsp	SHEET, COVER		CHS1A154	2	
	★ 1	90M-HT800120R	TRS. KTC3114A	Q129	HVTKTC3114A	1	
	★ 2	00MHT329222B0	TRS. 2SC2922YP	Q132	CVT2SC2922YP	1	
	★ 3	00MHT112162B0	TRS. 2SA1216YP	Q135	CVT2SA1216YP	1	
	★ 4	90M-HT800120R	TRS. KTC3114A	Q149	HVTKTC3114A	1	
	★ 5	00MHT329222B0	TRS. 2SC2922YP	Q152	CVT2SC2922YP	1	
	★ 6	00MHT112162B0	TRS.2SA1216YP	Q155	CVT2SA1216YP	1	
	★ 7	nsp	2P WIRE ASS'Y(100MM)		CWZPM5003TW91	1	
	★ 8	nsp	CLAMPER , WIRE		CHE36-3	1	
	★ 9	nsp	CLAMPER		CHR301	10	
	★ 10	nsp	WASHER		CNW1A051	4	
	★ 11	nsp	TAPE , HEMELON		CHS1A032	3	
	★ 12	nsp	LABEL , HOT		CQB1A906Z	1	
SCREWS							
	S1	nsp	SCREW		CSB3+6	4	
	S2	nsp	SCREW		CTB3+6FFB	2	
	S3	nsp	SCREW,SPECIAL		CTB3+8JR	36	
	S4	nsp	SCREW		CTS3+8JR	2	
	S5	nsp	SCREW		CTB3+8JFB	38	
	S6	nsp	SCREW		CTW3+8JFZR	6	
	S7	nsp	SCREW		CTW3+8JR	3	
	S8	nsp	SCREW ,TR		CHD1A023R	4	
	S9	nsp	SCREW		CHD1A060R	4	
	S10	nsp	SCREW ,TRANS		CHD1A090	4	
	S11	nsp	SCREW ,SPECIAL		CHD1A012ZR	10	

PACKING VIEW



PARTS LIST OF PACKING & ACCESSORIES

* Parts for which "nsp" is indicated on this table cannot be supplied.

* Part indicated with the mark "★" is not illustrated in the exploded view.

* The parts listed below are for maintenance only, might differ from the parts used in the unit in appearances or dimensions.

Note: The symbols in the column "Remarks" indicate the following destinations.

U1B : North America model

N1B : Europe model

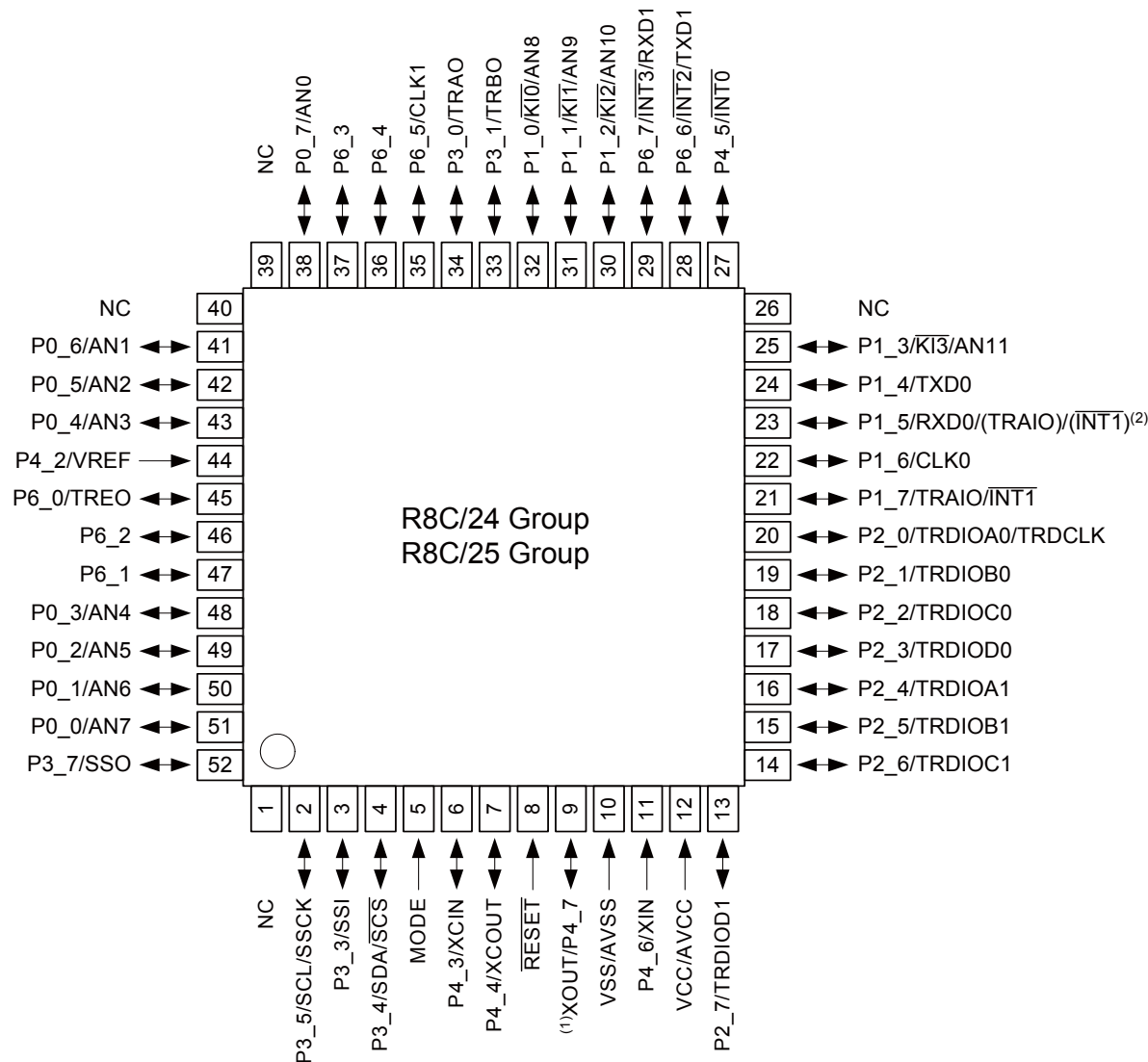
	Ref. No.	Part No.	Part Name	Remarks		Q'ty	New
	1	943531011550S	BOX , OUT CARTON		CPG1A907X	1	*
	2	nsp	BAG,POLY SET		CPP1A081Z	1	
	3	943533011530S	PAD , SNOW L		CPS1A895	1	*
	4	943533011540S	PAD , SNOW R		CPS1A896	1	
	5	-	INSTRUCTION MANUAL ASS'Y		-		
	5-1	nsp	BAG , POLY(MANUAL)		CPB1A197Z	1	
	5-2	541110586001M	MANUAL , INSTRUCTION	U1B	CQX1A1567Z	1	
	5-2	541110585008M	MANUAL , INSTRUCTION	N1B	CQX1A1566Z	1	
⚠	5-3	90M-ZC000310R	CORD , POWER(PLUG+SOCKET)UL	U1B	CJA2A070Z	1	
⚠	5-3	90M-ZC000320R	CORD , POWER(DETACHABLE/EUR)	N1B	CJA2B054Z	1	
	5-4	943613000560S	CORD , ORANGE PIN(1.2MM)		CJS4M034Z	1	
	5-5	nsp	CARD , WARRANTY	U1B	CQE1A131W	1	
	5-6	nsp	WARRANTY CANADA	U1B	CQE1A132V	1	
	6	nsp	CONTROL, LABEL		CQB1A993Z	1	

SEMICONDUCTORS

Only major semiconductors are shown, general semiconductors etc. are omitted to list.
The semiconductor which described a detailed drawing in a schematic diagram are omitted to list.

1. IC's

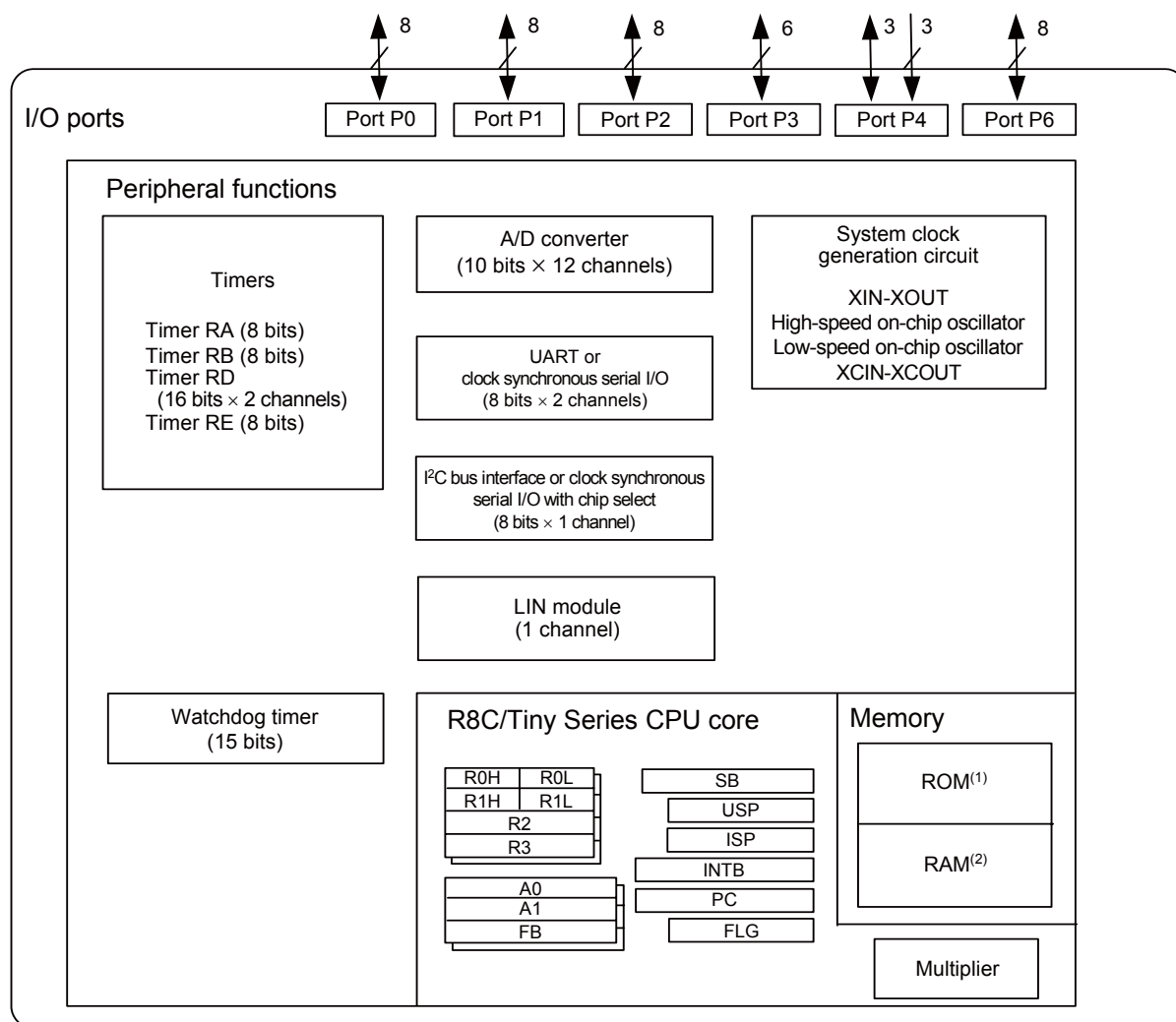
R5F21246SNFP (IC402)



Package: PLQP0052JA-A(52P6A-A)
0.65 mm pin pitch, 10 mm square body

- NOTES:
- 1. P4_7 is an input-only port.
 - 2. Can be assigned to the pin in parentheses by a program.
- NC: Non-Connection

R5F21246SNFP Block Diagram



NOTES:

1. ROM size varies with MCU type.
2. RAM size varies with MCU type.

R5F21246SNFP Terminal Function

Pin No.	Port Spec	Port Setting	I/O setting	STBY MODE	Act.	Init	Port Name	Ext. R	Description
1	NC	NC	-	X	X	X	X	OPEN	NC
2	P35/SCL/SSCK	SSCK	S_OUT	H	-	H	I2C CLK	10kPU	I2C CLK for Serial EEPROM
3	P33/SSI	P33	IN	H	H	L	LINE DET	10kPU	Audio Signal Detection for Auto Standby Function (No Signal=L/signal detect=H)
4	P34/SDA/SCS	SCS	I/O	H	-	H	I2C DATA	10kPU	I2C DATA for Serial EEPROM
5	MODE	MODE	IN	H	L	H	MODE	10kPU	For CPU writing
6	P43/XCIN	P43	-	-	-	L	-	10kPD	NO USE
7	P44/XCOUT	P44	-	-	-	L	-	10kPD	NO USE
8	RESET	RESET	IN	H	L	H	_RESET	10kPU	RESET PORT(Low Active)
9	XOUT/P47	XOUT	X_OUT	X	X	X	XOUT	1MΩ	16MHz X'tal
10	VSS/AVSS	VSS/AVSS	-	L	L	L	GND	-	GND
11	P46/XIN	XIN	X_IN	X	X	X	XIN	1MΩ	16MHz X'tal
12	VCC/AVCC	VCC/AVCC	-	H	H	H	VCC	-	+5V
13	P27/YRDIOD1	P27	OUT	L	H	L	SPK_ON1	47kPD	SPK1 OUT ON/OFF Control

Pin No.	Port Spec	Port Setting	I/O setting	STBY MODE	Act.	Init	Port Name	Ext. R	Description
14	P26/TRDIOC1	P26	OUT	L	H	L	SPK_ON2	47kPD	NO USE
15	P25/TRDIOB1	P25	OUT	L	H	L	SPK_ON3	47kPD	NO USE
16	P24/TRDIOA1	P24	OUT	H	L	H	Protection LED	DTrPU	Protection LED ON/OFF LED ON:L/ OFF:H
17	P23/TRDIOD0	P23	OUT	H	L	H	V_LED3	-	Version display LED bit3(MSB) LED ON:L/ OFF:H
18	P22/TRDIOC0	P22	OUT	H	L	H	V_LED2	-	Version display LED bit2 LED ON:L/ OFF:H
19	P21/TRDIOB0	P21	OUT	H	L	H	V_LED1	-	Version display LED bit1(LSB) LED ON:L/ OFF:H
20	P20/TRDIOA0	P20	IN	H	-	H	RC_IN	47kPU	RC5 INPUT
21	P17/TRAIO/ INT1	INT1	T_IN	H	L	H	RC_INT	47kPU	RC5 INPUT
22	P16/CLK0	P16	OUT	L	H	L	FAN_1	DTr PD	FAN Control 1 H:ON / L:OFF
23	P15/RXD0	P15	OUT	L	H	L	FAN_2	DTr PD	FAN Control 2 H:fast / L:slow
24	P14/TXD0	P14	IN	H	L	H	_HEAT_DET_P	10kPU	Power AMP Heat detection for posistor
25	P13/KI3/AN11	AN11	AD	L	H	L	KEY2	4.7kPD	Factory_Key / Service Key
26	NC	NC						OPEN	NC
27	P45/INT0	INT0	INT	H	L	H	_P_DOWN	47kPU	Power Down Detection
28	P66/INT2/ TXD1	TXD1	SO	H	-	H	TXD	10kPU	UART for RS232C
29	P67/INT3/ RXD1	RXD1	SI	H	-	H	RXD	10kPU	UART for RS232C
30	P12/KI2/AN10	P12	IN	L	H	L	DISPLAY KEY	100kPD	Display Key input
31	P11/KI1/AN9	KI1	KEY INT/AD	L	H	L	PWR_BTN	100kPD	On/Standby key input
32	P10/KI0/AN8	KI0	INT	L	H	L	DC_IN	47kPD	DC Trigger Detect H→L:Stand-by L→H:Power On
33	P31/TRBO	P31	OUT	H	L	H	_DC_OUT	DTrPU	DC Trigger OUT Set Stand-by→H Set Power ON→L
34	P30/TRA0	P30	IN	L	-	L	-	10kPD	NO USE
35	P65/CLK1	P65	OUT	H	L	H	_Auto Power OFF LED	DTrPU	Auto Power OFF LED Control LED ON:L/ OFF:H
36	P64	P64	OUT	H	L	H	_POWER_LED2	DTrPU	Power LED2(Star mark LED) LED ON:L/ OFF:H
37	P63	P63	OUT	H	L	H	_POWER_LED1	DTrPU	Power LED1(Ring illumination LED) LED ON:L/ OFF:H
38	P07/AN0	P07	IN	H	L	H	_P_CUR_FAIL	10kUP	Power Amp Current Fail Detect L:fail detect
39	NC	NC	-	X	X	X	X	OPEN	NC
40	NC	NC	-	X	X	X	X	OPEN	NC
41	P06/AN1	P06	IN	H	L	H	_P_AMP_FAIL	10kUP	Power Amp DC Fail Detect L:fail detect
42	P05/AN2	AN2	AD	Sensor Voltage	L	H	_HEAT_DET_2	100kPD	Power AMP Heat detection 2 (NS LM94022)
43	P04/AN3	AN3	AD	Sensor Voltage	L	H	_HEAT_DET_3	100kPD	Power AMP Heat detection 3 (NS LM94022)
44	P42/VREF	VREF	IN	H	-	H	VREF	-	+3.3V
45	P60/TRE0	P60	IN	H	L	H	_P_LINE_FAIL	10kPU	Emergency Protection(Power Voltage Ditection) L:fail detect

Pin No.	Port Spec	Port Setting	I/O setting	STBY MODE	Act.	Init	Port Name	Ext. R	Description
46	P62	P62	OUT	L	H	L	_STANDBY1	10kPD	Standby Control 1
47	P61	P61	OUT	L	H	L	_STANDBY2	10kPD	Standby Control 2
48	P03/AN4	AN4	AD	Sensor Voltage	L	H	_HEAT_DET_1	100kPD	"Power AMP Heat detection 1 (NS LM94022)"
49	P02/AN5	P02	IN	H	L	H	_AVSS_DET	10kPU	Power AMP AVSS Level detection
50	P01/AN6	P01	OUT	L	H	L	AVSS_OUT	10kPD	"Power Supply H/L switch H:High voltage/L:low voltage"
51	P00/AN7	P00	OUT	L	L	L	_MUTE	10kPD	ALL Channel Signal MUTE
52	P37/SSO	P37	OUT	L	L	H	_STBY_LED	DTrPU	"Standby LED On LED ON:L/ OFF:H"

Features

- Low-voltage and Standard-voltage Operation
 - 1.8 ($V_{CC} = 1.8V$ to 5.5V)
- Internally Organized 512 x 8 (4K), or 1024 x 8 (8K)
- Two-wire Serial Interface
- Schmitt Trigger, Filtered Inputs for Noise Suppression
- Bidirectional Data Transfer Protocol
- 1 MHz (5V), 400 kHz (1.8V, 2.5V, 2.7V) Compatibility
- Write Protect Pin for Hardware Data Protection
- 16-byte Page (4K, 8K) Write Modes
- Partial Page Writes Allowed
- Self-timed Write Cycle (5 ms max)
- High-reliability
 - Endurance: 1 Million Write Cycles
 - Data Retention: 100 Years
- 8-lead PDIP, 8-lead JEDEC SOIC, 8-lead Ultra-Thin Mini-MAP (MLP 2x3), 5-lead SOT23, 8-lead TSSOP and 8-ball dBG2 Packages
- Lead-free/Halogen-free
- Die Sales: Wafer Form, Tape and Reel and Bumped Wafers

Description

The AT24C04B/08B provides 4096/8192 bits of serial electrically erasable and programmable read-only memory (EEPROM) organized as 512/1024 words of 8 bits each. The device is optimized for use in many industrial and commercial applications where low-power and low-voltage operation are essential. The AT24C04B/08B is available in space-saving 8-lead PDIP, 8-lead JEDEC SOIC, 8-lead Ultra-Thin Mini-MAP (MLP 2x3), 5-lead SOT23, 8-lead TSSOP, and 8-ball dBG2 packages and is accessed via a Two-wire serial interface. In addition, the AT24C04B/08B is available in 1.8V (1.8V to 5.5V) version.

Table 0-1. Pin Configuration

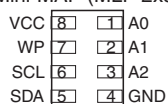
Pin Name	Function
A0 - A2	Address Inputs
SDA	Serial Data
SCL	Serial Clock Input
WP	Write Protect
NC	No Connect
GND	Ground
VCC	Power Supply

Note: For use of 5-lead SOT23

4K: The software A2 and A1 bits in the device address word must be set to zero to properly communicate.

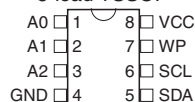
8K: The software A2 bit in the device address word must be set to zero to properly communicate.

8-lead Ultra-Thin Mini-MAP (MLP 2x3)

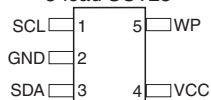


Bottom View

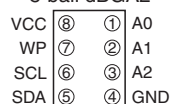
8-lead TSSOP



5-lead SOT23

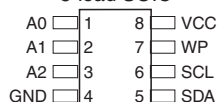


8-ball dBG2

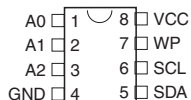


Bottom View

8-lead SOIC



8-lead PDIP



Two-wire Serial EEPROM

4K (512 x 8)

8K (1024 x 8)

AT24C04B AT24C08B

Preliminary





December 6, 2007

LM94022/LM94022Q

1.5V, SC70, Multi-Gain Analog Temperature Sensor with Class-AB Output

General Description

The LM94022 is a precision analog output CMOS integrated-circuit temperature sensor that operates at a supply voltage as low as 1.5 Volts. A class-AB output structure gives the LM94022 strong output source and sink current capability for driving heavy loads. For example, it is well suited to source the input of a sample-and-hold analog-to-digital converter with its transient load requirements. While operating over the wide temperature range of -50°C to $+150^{\circ}\text{C}$, the LM94022 delivers an output voltage that is inversely proportional to measured temperature. The LM94022's low supply current makes it ideal for battery-powered systems as well as general temperature sensing applications.

Two logic inputs, Gain Select 1 (GS1) and Gain Select 0 (GS0), select the gain of the temperature-to-voltage output transfer function. Four slopes are selectable: $-5.5\text{ mV}/^{\circ}\text{C}$, $-8.2\text{ mV}/^{\circ}\text{C}$, $-10.9\text{ mV}/^{\circ}\text{C}$, and $-13.6\text{ mV}/^{\circ}\text{C}$. In the lowest gain configuration (GS1 and GS0 both tied low), the LM94022 can operate with a 1.5V supply while measuring temperature over the full -50°C to $+150^{\circ}\text{C}$ operating range. Tying both inputs high causes the transfer function to have the largest gain of $-13.6\text{ mV}/^{\circ}\text{C}$ for maximum temperature sensitivity. The gain-select inputs can be tied directly to V_{DD} or Ground without any pull-up or pull-down resistors, reducing component count and board area. These inputs can also be driven by logic signals allowing the system to optimize the gain during operation or system diagnostics.

Applications

- Cell phones
- Wireless Transceivers
- Battery Management
- Automotive

- Disk Drives
- Games
- Appliances

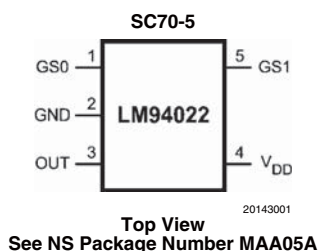
Features

- LM94022Q is AEC-Q100 Grade 0 qualified and is manufactured on an Automotive Grade Flow.
- Low 1.5V operation
- Push-pull output with $50\mu\text{A}$ source current capability
- Four selectable gains
- Very accurate over wide temperature range of -50°C to $+150^{\circ}\text{C}$
- Low quiescent current
- Output is short-circuit protected
- Extremely small SC70 package
- Footprint compatible with the industry-standard LM20 temperature sensor

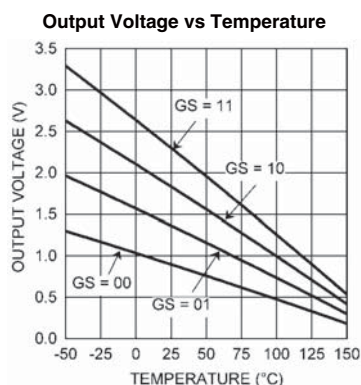
Key Specifications

■ Supply Voltage	1.5V to 5.5V
■ Supply Current	5.4 μA (typ)
■ Output Drive	$\pm 50\mu\text{A}$
■ Temperature Accuracy	20°C to 40°C $\pm 1.5^{\circ}\text{C}$ -50°C to 70°C $\pm 1.8^{\circ}\text{C}$ -50°C to 90°C $\pm 2.1^{\circ}\text{C}$ -50°C to 150°C $\pm 2.7^{\circ}\text{C}$
■ Operating Temperature	-50°C to 150°C

Connection Diagram



Typical Transfer Characteristic



LAPT 2SC2922

Silicon NPN Epitaxial Planar Transistor (Complement to type 2SA1216)

Application : Audio and General Purpose

■ Absolute maximum ratings (Ta=25°C)

Symbol	2SC2922	Unit
V _{CB0}	180	V
V _{CEO}	180	V
V _{EB0}	5	V
I _C	17	A
I _B	5	A
P _C	200(Tc=25°C)	W
T _J	150	°C
Tstg	-55 to +150	°C

■ Electrical Characteristics (Ta=25°C)

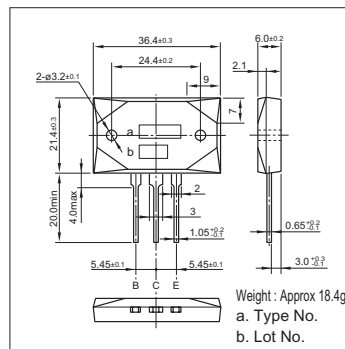
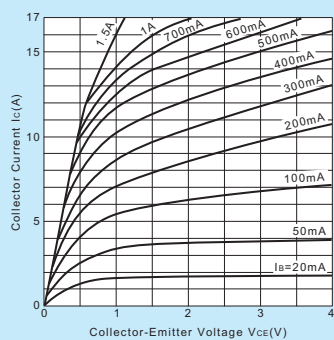
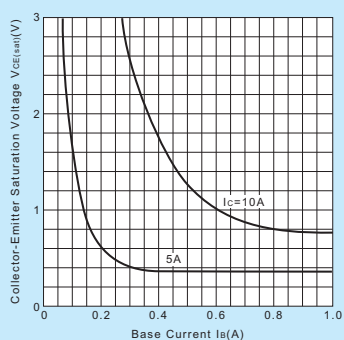
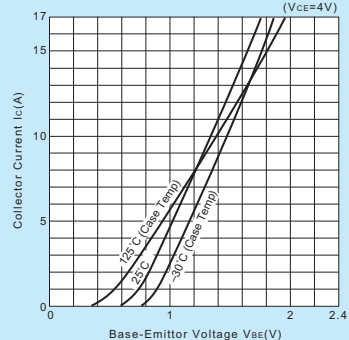
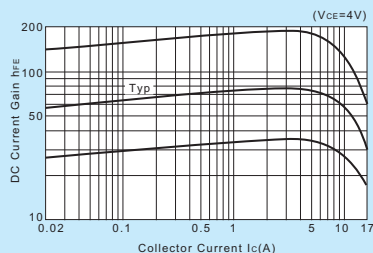
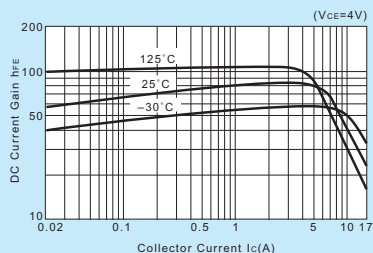
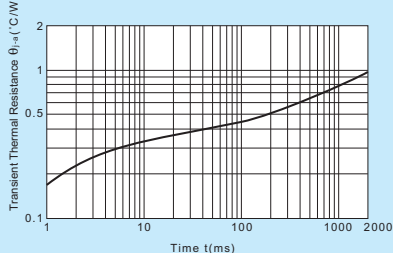
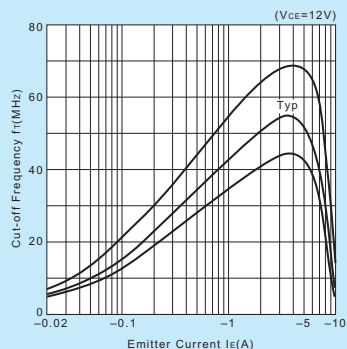
Symbol	Conditions	2SC2922	Unit
I _{CB0}	V _{CB} =180V	100max	μA
I _{EB0}	V _{EB} =5V	100max	μA
V _{(BR)CEO}	I _C =25mA	180min	V
h _{FE}	V _{CE} =4V, I _C =8V	30min*	
V _{CE(sat)}	I _C =8A, I _B =0.8A	2.0max	V
f _T	V _{CE} =12V, I _E =-2A	50typ	MHz
C _{OB}	V _{CB} =10V, f=1MHz	250typ	pF

*h_{FE} Rank: O(30 to 60), Y(50 to 100), P(70 to 140), G(90 to 180)

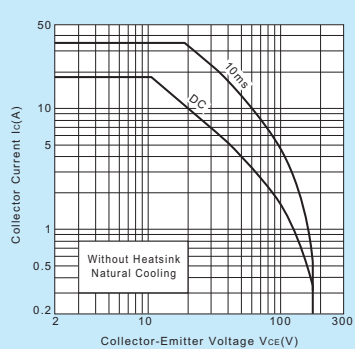
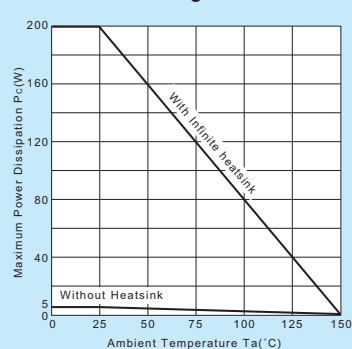
■ Typical Switching Characteristics (Common Emitter)

V _{CC} (V)	R _L (Ω)	I _C (A)	V _{BE} (V)	I _{B1} (A)	I _{B2} (A)	t _{on} (μs)	t _{stg} (μs)	t _f (μs)
40	4	10	-5	1	-1	0.2typ	1.3typ	0.45typ

External Dimensions MT-200

I_C-V_{CE} Characteristics (Typical)V_{CE(sat)}-I_B Characteristics (Typical)I_C-V_{BE} Temperature Characteristics (Typical)h_{FE}-I_C Characteristics (Typical)h_{FE}-I_C Temperature Characteristics (Typical)θ_{JA}-t Characteristicsf_T-I_E Characteristics (Typical)

Safe Operating Area (Single Pulse)

P_C-T_a Derating

LAPT 2SA1216

Silicon PNP Epitaxial Planar Transistor (Complement to type 2SC2922)

Application : Audio and General Purpose

Absolute maximum ratings (Ta=25°C)

Symbol	2SA1216	Unit
V _{CB0}	-180	V
V _{CE0}	-180	V
V _{EB0}	-5	V
I _C	-17	A
I _B	-5	A
P _C	200(T _C =25°C)	W
T _J	150	°C
T _{stg}	-55 to +150	°C

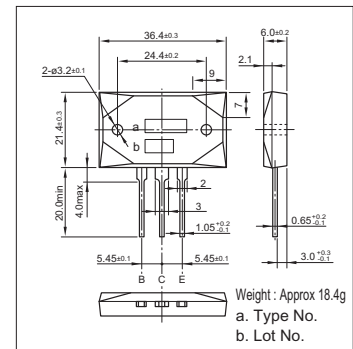
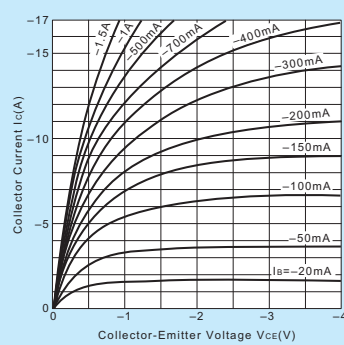
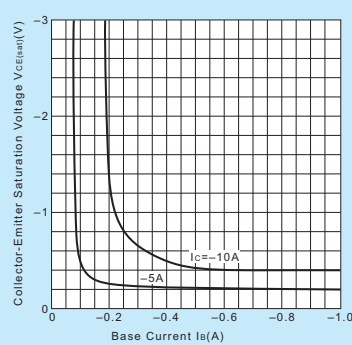
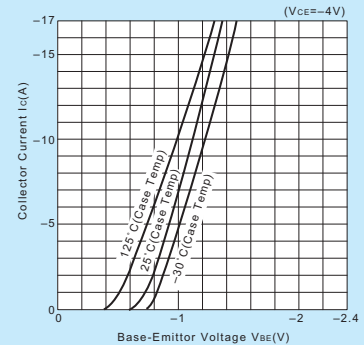
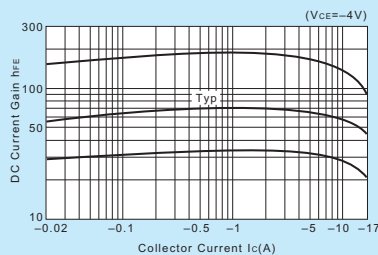
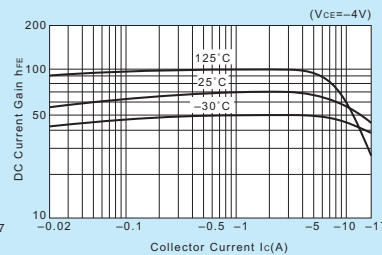
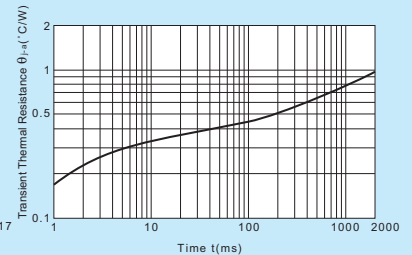
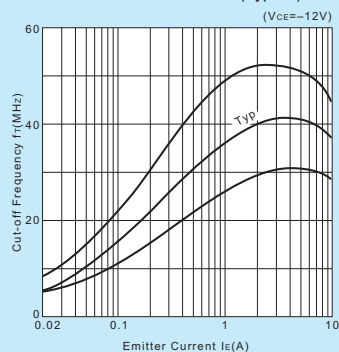
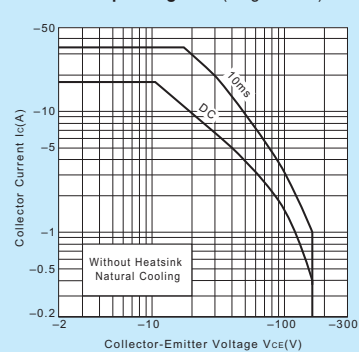
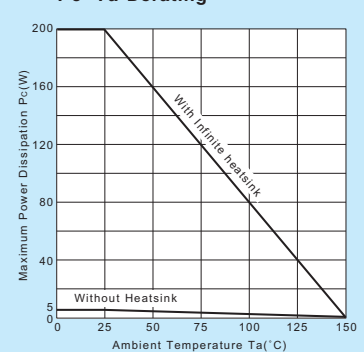
Electrical Characteristics

(Ta=25°C)

Symbol	Conditions	2SA1216	Unit
V _{CB0}	V _{CB} =-180V	-100max	μA
I _{EB0}	V _{EB} =-5V	-100max	μA
V _{(BR)CEO}	I _C =-25mA	-180min	V
h _{FE}	V _{CE} =-4V, I _C =-8A	30min*	
V _{CE(sat)}	I _C =-8A, I _B =-0.8A	-2.0max	V
f _T	V _{CE} =-12V, I _E =2A	40typ	MHz
C _{OB}	V _{CB} =-10V, f=1MHz	500typ	pF

*h_{FE} Rank O(30 to 60), Y(50 to 100), P(70 to 140), G(90 to 180)**Typical Switching Characteristics (Common Emitter)**

V _{CC} (V)	R _L (Ω)	I _C (A)	V _{BE} (V)	I _{B1} (A)	I _{B2} (A)	t _{on} (μs)	t _{stg} (μs)	t _f (μs)
-40	4	-10	5	-1	1	0.3typ	0.7typ	0.2typ

External Dimensions MT-200**I_C-V_{CE} Characteristics (Typical)****V_{CE(sat)}-I_B Characteristics (Typical)****I_C-V_{BE} Temperature Characteristics (Typical)****h_{FE}-I_C Characteristics (Typical)****h_{FE}-I_C Temperature Characteristics (Typical)****θ_{JA}-t Characteristics****f_T-I_E Characteristics (Typical)****Safe Operating Area (Single Pulse)****P_C-T_a Derating**

PARTS LIST OF P.C.B. UNIT

* Parts for which "nsp" is indicated on this table cannot be supplied.

* The parts listed below are for maintenance only, might differ from the parts used in the unit in appearances or dimensions.

Note: The symbols in the column "Remarks" indicate the following destinations.

U1B : North America model

N1B : Europe model

MAIN PCB ASS'Y

	Ref. No.	Part No.	Part Name	Remarks		Q'ty	New
SEMICONDUCTORS GROUP							
	IC11-13	00MHC10053090	IC NJM2068DD		HVINJM2068DD		
	IC15-18	00MHC10053090	IC NJM2068DD		HVINJM2068DD		
	IC19	00MHC3891509F	IC NJM7815FA		HVINJM7815FA		
	IC20	00MHC3991509F	IC NJM7915FA		HVINJM7915FA		
	IC21	943232000660S	IC NJM2901N		CVINJM2901N		
	Q101-104	00MBA20001000	TRS. KRC102M		HVTKRC102MT		
	Q105,106	00MHT30001000	TRS. KTC3199Y		HVTKTC3199YT		
	Q107	00MHT600111B0	TRS. KTA1267Y		HVTKTA1267YT		
	Q108	00MHT30001000	TRS. KTC3199Y		HVTKTC3199YT		
	Q112-115	90M-HT800050R	TRS. KTC3198Y		HVTKTC3198YT		
	Q121	00MHT600121A0	TRS. KTA1268GR		HVTKTA1268GRT		
	Q122	00MHT800931A0	TRS. KTC3200GR-AT/P		HVTKTC3200GRT		
	Q123	00MHT600121A0	TRS. KTA1268GR		HVTKTA1268GRT		
	Q124	90M-HT100540R	TRS. KTA1360Y		HVTKTA1360Y		
	Q125	00MHT800931A0	TRS. KTC3200GR-AT/P		HVTKTC3200GRT		
	Q126	00MHT600121A0	TRS. KTA1268GR		HVTKTA1268GRT		
	Q127	90M-HT300820R	TRS. KTC3423Y		HVTKTC3423Y		
	Q128	00MHT800931A0	TRS. KTC3200GR-AT/P		HVTKTC3200GRT		
	Q129	90M-HT800120R	TRS. KTC3114A		HVTKTC3114A		
	Q130	90M-HT300820R	TRS. KTC3423Y		HVTKTC3423Y		
	Q131	90M-HT300940R	TRS. 2SC4883A		HVT2SC4883A		
	Q132	00MHT329222B0	TRS. 2SC2922YP		CVT2SC2922YP		
	Q133	90M-HT100540R	TRS. KTA1360Y		HVTKTA1360Y		
	Q134	90M-HT100690R	TRS. 2SA1859A		HVT2SA1859A		
	Q135	00MHT112162B0	TRS. 2SA1216YP		CVT2SA1216YP		
	Q136	00MHT800931A0	TRS. KTC3200GR-AT/P		HVTKTC3200GRT		
	Q137	00MHT600121A0	TRS. KTA1268GR		HVTKTA1268GRT		
	Q141	00MHT600121A0	TRS. KTA1268GR		HVTKTA1268GRT		
	Q142	00MHT800931A0	TRS. KTC3200GR-AT/P		HVTKTC3200GRT		
	Q143	00MHT600121A0	TRS. KTA1268GR		HVTKTA1268GRT		
	Q144	90M-HT100540R	TRS. KTA1360Y		HVTKTA1360Y		
	Q145	00MHT800931A0	TRS. KTC3200GR-AT/P		HVTKTC3200GRT		
	Q146	00MHT600121A0	TRS. KTA1268GR		HVTKTA1268GRT		
	Q147	90M-HT300820R	TRS. KTC3423Y		HVTKTC3423Y		
	Q148	00MHT800931A0	TRS. KTC3200GR-AT/P		HVTKTC3200GRT		
	Q149	90M-HT800120R	TRS. KTC3114A		HVTKTC3114A		
	Q150	90M-HT300820R	TRS. KTC3423Y		HVTKTC3423Y		
	Q151	90M-HT300940R	TRS. 2SC4883A		HVT2SC4883A		
	Q152	00MHT329222B0	TRS. 2SC2922YP		CVT2SC2922YP		
	Q153	90M-HT100540R	TRS. KTA1360Y		HVTKTA1360Y		
	Q154	90M-HT100690R	TRS. 2SA1859A		HVT2SA1859A		
	Q155	00MHT112162B0	TRS. 2SA1216YP		CVT2SA1216YP		
	Q156	00MHT800931A0	TRS. KTC3200GR-AT/P		HVTKTC3200GRT		
	Q161	00MBA20001000	TRS. KRC102M		HVTKRC102MT		

	Ref. No.	Part No.	Part Name	Remarks		Q'ty	New
	Q162	00MHT600111B0	TRS. KTA1267Y		HVTKTA1267YT		
	Q163	00MHT30001000	TRS. KTC3199Y		HVTKTC3199YT		
	Q164	00MBA20001000	TRS. KRC102M		HVTKRC102MT		
	Q165	90M-BA001450R	TRS. KRA107M		HVTKRA107MT		
	Q166,167	00MBA20001000	TRS. KRC102M		HVTKRC102MT		
	Q168	00MHT30001000	TRS. KTC3199Y		HVTKTC3199YT		
	Q169-172	00MBA20001000	TRS. KRC102M		HVTKRC102MT		
	Q173	00MHT334191Y0	TRS. 2SC3419Y		HVT2SC3419Y		
	D101-106	00MHD20015210	DIODE 1SS133T-77		CVD1SS133MT		
	D111,112	943202000940S	ZENER DIODE ZJ16B 1/2W		CVDZJ16BT		
	D113,114	00MHD20015210	DIODE 1SS133T-77		CVD1SS133MT		
	D115	943202000950S	ZENER DIODE ZJ4.3B 1/2W		CVDZJ4.3BT		
	D116	90M-HD302410R	ZENER DIODE ZJ8.2B 1/2W		CVDZJ8.2BT		
	D117,118	00MHD20015210	DIODE 1SS133T-77		CVD1SS133MT		
	D119	90M-HD302410R	ZENER DIODE ZJ8.2B 1/2W		CVDZJ8.2BT		
	D120	90M-HD201750R	DIODE 1N4003		CVD1N4003SRT		
	D121,122	943202000940S	ZENER DIODE ZJ16B 1/2W		CVDZJ16BT		
	D123,124	00MHD20015210	DIODE 1SS133T-77		CVD1SS133MT		
	D125	943202000950S	ZENER DIODE ZJ4.3B 1/2W		CVDZJ4.3BT		
	D126	90M-HD302410R	ZENER DIODE ZJ8.2B 1/2W		CVDZJ8.2BT		
	D127,128	00MHD20015210	DIODE 1SS133T-77		CVD1SS133MT		
	D129	90M-HD302410R	ZENER DIODE ZJ8.2B 1/2W		CVDZJ8.2BT		
	D130,131	90M-HD201750R	DIODE 1N4003		CVD1N4003SRT		
	D132	00MHE20030290	DIODE ! D30XBN20 SBD BRIDGE		CVDD30XBN20		
	D133-136	00MHD20055100	DIODE ! SHOTTKY 11EQS10 1A 100V		CVD11EQS10GT		
	D137-140	90M-HD201730R	DIODE 1N4003		CVD1N4003ST		
	D141,142	90M-HD201750R	DIODE 1N4003		CVD1N4003SRT		
	D151	90M-HD201750R	DIODE 1N4003		CVD1N4003SRT		
	D152	00MHD20015210	DIODE 1SS133T-77		CVD1SS133MT		
	D154	00MHD20015210	DIODE 1SS133T-77		CVD1SS133MT		
	D155	90M-HD302360R	ZENER DIODE ZJ6.8B 1/2W		CVDZJ6.8BT		
	D156	00D2760643938	ZENER DIODE 3.0V		CVDZJ3.0BT		
	D206	00MHD20015210	DIODE 1SS133MT		CVD1SS133MT		
RESISTORS GROUP							
	R175	nsp	RES. 1.5K OHM 2W METAL OXIDE FILM		CRG2SANJ152RT		
	R178	nsp	RES. 1.5K OHM 2W METAL OXIDE FILM		CRG2SANJ152RT		
	R187	nsp	RES. 120 OHM 2W METAL OXIDE FILM		CRG2SANJ121RT		
	R188	943124011650S	RES. 470 OHM 1/4W FLAME RETARDANT		CRG14SANCJ471T		*
	R194	943124011650S	RES. 470 OHM 1/4W FLAME RETARDANT		CRG14SANCJ471T		*
	R203	943124011640S	RES. 100 OHM 1/4W FLAME RETARDANT		CRG14SANCJ101T		*
	R204	943124011670S	RES. METAL OXIDE FILM(1W 1K OHM)		CRG1SANJ102RT		*
	R205	00D943012990S	RES. 47 OHM 1W J METAL OXIDE FILM		KRG1SANJ470RT		
	R206	943124011660S	RES. METAL OXIDE FILM(1W, 10)		CRG1SANJ100RT		*
	R207	943124011680S	RES. 220 OHM 1W J METAL OXIDE FILM		CRG1SANJ221RT		*
	R208	943124011640S	RES. 100 OHM 1/4W FLAME RETARDANT		CRG14SANCJ101T		*
	R209	nsp	RES. 10 OHM 2W METAL OXIDE FILM		CRG2SANJ100RT		
	R210	00D943012990S	RES. 47 OHM 1W J METAL OXIDE FILM		KRG1SANJ470RT		
	R211	943124011660S	RES. METAL OXIDE FILM(1W, 10)		CRG1SANJ100RT		*
	R223	nsp	RES. 1.5K OHM 2W METAL OXIDE FILM		CRG2SANJ152RT		
	R226	nsp	RES. 1.5K OHM 2W METAL OXIDE FILM		CRG2SANJ152RT		

	Ref. No.	Part No.	Part Name	Remarks		Q'ty	New
	R235	nsp	RES. 120 OHM 2W METAL OXIDE FILM		CRG2SANJ121RT		
	R236	943124011650S	RES. 470 OHM 1/4W FLAME RETARDANT		CRG14SANCJ471T		*
	R242	943124011650S	RES. 470 OHM 1/4W FLAME RETARDANT		CRG14SANCJ471T		*
	R245	nsp	RES. 1K 1/4W 5% FLAME RETARDANT		CRG14SANCJ102T		
	R247,248	nsp	RES. 120 OHM 2W METAL OXIDE FILM		CRG2SANJ121RT		
	R249	nsp	RES. 150 OHM 2W METAL OXIDE FILM		CRG2SANJ151RT		
	R250	nsp	RES. 10 OHM 2W METAL OXIDE FILM		CRG2SANJ100RT		
	R251	943124011640S	RES. 100 OHM 1/4W FLAME RETARDANT		CRG14SANCJ101T		*
	R252	943124011670S	RES. METAL OXIDE FILM(1W 1K OHM)		CRG1SANJ102RT		*
	R253	00D9430129905	RES. 47 OHM 1W J METAL OXIDE FILM		KRG1SANJ470RT		
	R254	943124011680S	RES. 220 OHM 1W J METAL OXIDE FILM		CRG1SANJ221RT		*
	R255	943124011660S	RES. METAL OXIDE FILM(1W, 10)		CRG1SANJ100RT		*
	R256	nsp	RES. 10 OHM 2W METAL OXIDE FILM		CRG2SANJ100RT		
	R257	943124011640S	RES. 100 OHM 1/4W FLAME RETARDANT		CRG14SANCJ101T		*
	R258	00D9430129905	RES. 47 OHM 1W J METAL OXIDE FILM		KRG1SANJ470RT		
	R259	943124011660S	RES. METAL OXIDE FILM(1W, 10)		CRG1SANJ100RT		*
	R271	nsp	RES. 1 OHM 1W J METAL OXIDE FILM		CRG1SANJ1R0RT		
	R313-316	nsp	RES. METAL OXIDE FILM(1W, 10)		CRG1SANJ100RT		
	R317	nsp	RES. 470 OHM 1W J METAL OXIDE FILM		KRG1SANJ471RT		
	R318	nsp	RES. 390 OHM 1W J METAL OXIDE FILM		KRG1SANJ391RT		
	VR11,12	943161011690S	RES. SEMI FIXED (1K , B CURVE)		CVN12A102B03T		*
CAPACITORS GROUP							
	C101,102	nsp	CER. CAP. 270P 50V		CCBS1H271KBT		
	C103,104	00MOA22605020	ELECT CAP. 22UF 50V		CCEA1HH220T		
	C107,108	nsp	CER. CAP. 0.1UF 50V Z CERAMIC		CCBS1H104ZFT		
	C109	00MOA22605020	ELECT CAP. 22UF 50V		CCEA1HH220T		
	C109	90M-OA000230R	ELECT CAP. 22UF 25V ROA-25V220MF3#-		HCEA1EROA220T		
	C110	00MOA22605020	ELECT CAP. 22UF 50V		CCEA1HH220T		
	C110	90M-OA000230R	ELECT CAP. 22UF 25V ROA-25V220MF3#-		HCEA1EROA220T		
	C111,112	nsp	CER. CAP. 220PF 50V		CCBS1H221KBT		
	C113,114	00MOA10702520	ELECT CAP. 100UF 25V		CCEA1EH101T		
	C121	00MOA22605020	ELECT CAP. 22UF 50V		CCEA1HH220T		
	C122	nsp	CER. CAP. 47PF 50V		CCBS1H470JT		
	C123	00MOA22605020	ELECT CAP. 22UF 50V		CCEA1HH220T		
	C125	00MOA22605020	ELECT CAP. 22UF 50V		CCEA1HH220T		
	C126	nsp	CER. CAP. 47PF 50V		CCBS1H470JT		
	C127	00MOA22605020	ELECT CAP. 22UF 50V		CCEA1HH220T		
	C129,130	nsp	CER. CAP. 47PF 50V		CCBS1H470JT		
	C131,132	nsp	CER. CAP. 0.1UF 50V Z CERAMIC		CCBS1H104ZFT		
	C135,136	nsp	CER. CAP. 0.1UF 50V Z CERAMIC		CCBS1H104ZFT		
	C138	00MOA22605020	ELECT CAP. 22UF 50V		CCEA1HH220T		
	C138	90M-OA000230R	ELECT CAP. 22UF 25V ROA-25V220MF3#-		HCEA1EROA220T		
	C140	00MOA22605020	ELECT CAP. 22UF 50V		CCEA1HH220T		
	C140	90M-OA000230R	ELECT CAP. 22UF 25V ROA-25V220MF3#-		HCEA1EROA220T		
	C146	00MOA10605020	ELECT CAP. 10UF 50V		CCEA1HH100T		
	C147	nsp	CER. CAP. 100PF 50V K		CCBS1H101KBT		
	C148,149	00MOA10605020	ELECT CAP. 10UF 50V		CCEA1HH100T		
	C150	nsp	CER. CAP. 100PF 50V K		CCBS1H101KBT		
	C151	00MOA10605020	ELECT CAP. 10UF 50V		CCEA1HH100T		
	C152-154	nsp	CER. CAP. 0.1UF 50V Z CERAMIC		CCBS1H104ZFT		
	C155,156	00MOA10605020	ELECT CAP. 10UF 50V		CCEA1HH100T		

	Ref. No.	Part No.	Part Name	Remarks		Q'ty	New
	C157	nsp	CER. CAP. 0.1UF 50V Z CERAMIC		CCBS1H104ZFT		
	C158	00MOA10605020	ELECT CAP. 10UF 50V		CCEA1HH100T		
	C159	nsp	CER. CAP. 0.1UF 50V Z CERAMIC		CCBS1H104ZFT		
	C160	nsp	CER. CAP. 1000PF 50V B CERAMIC		CCBS1H102KBT		
	C161	00MOA22605020	ELECT CAP. 22UF 50V		CCEA1HH220T		
	C162	nsp	CER. CAP. 330PF 50V KB		CCKT1H331KB		
	C163,164	00MOA10705020	ELECT CAP. 100UF 50V		CCEA1HH101T		
	C165	nsp	CER. CAP. 10PF 50V DC		CCCT1H100DC		
	C166	00MOA10705020	ELECT CAP. 100UF 50V		CCEA1HH101T		
	C167	nsp	FILM CAP. 3300PF 100V J MYLAR		HCQ1H332JZT		
	C168,169	00MOA10710020	ELECT CAP. 100UF 100V		CCEA2AH101E		
	C170	00MOA22605020	ELECT CAP. 22UF 50V		CCEA1HH220T		
	C171,172	nsp	CER. CAP. 47PF/500VDC		CCCT2H470JT		
	C173	nsp	FILM CAP. 0.01UF 100V J MYLAR		HCQ1H103JZT		
	C174	00MOA47505020	ELECT CAP. 4.7UF 50V		CCEA1HH4R7T		
	C175	nsp	CER. CAP. 2200PF 50V KB		CCKT1H222KB		
	C181	00MOA22605020	ELECT CAP. 22UF 50V		CCEA1HH220T		
	C182	nsp	CER. CAP. 330PF 50V KB		CCKT1H331KB		
	C183,184	00MOA10705020	ELECT CAP. 100UF 50V		CCEA1HH101T		
	C185	nsp	CER. CAP. 10PF 50V DC		CCCT1H100DC		
	C186	00MOA10705020	ELECT CAP. 100UF 50V		CCEA1HH101T		
	C187	nsp	FILM CAP. 3300PF 100V J MYLAR		HCQ1H332JZT		
	C188,189	00MOA10710020	ELECT CAP. 100UF 100V		CCEA2AH101E		
	C190	00MOA22605020	ELECT CAP. 22UF 50V		CCEA1HH220T		
	C191,192	nsp	CER. CAP. 47PF/500VDC		CCCT2H470JT		
	C193	nsp	FILM CAP. 0.01UF 100V J MYLAR		HCQ1H103JZT		
	C194	nsp	CER. CAP. 2200PF 50V KB		CCKT1H222KB		
	C201,202	90M-OF100490R	FILM CAP. 0.1UF 250V METALLIZED		KCME2E104JP04T		
	C203,204	943134011700S	ELECT CAP. 15000UF 80V		CCET80VKL5153NK		
	C205,206	90M-OF100490R	FILM CAP. 0.1UF 250V METALLIZED		KCME2E104JP04T		
	C207,208	943134011710S	ELECT CAP. 1000UF 63V		CCEA1JKR3102E		
	C209	00MOA10803520	ELECT CAP. 1000UF 35V		CCEA1VH102E		
	C210	nsp	CER. CAP. 0.1UF 50V ZF		CCFT1H104ZF		
	C211	00MOA10803520	ELECT CAP. 1000UF 35V		CCEA1VH102E		
	C212	nsp	CER. CAP. 0.1UF 50V ZF		CCFT1H104ZF		
	C213	nsp	CER. CAP. 0.01UF 50V Z		CCFT1H103ZF		
	C214	00MOA10705020	ELECT CAP. 100UF 50V		CCEA1HH101T		
	C215	nsp	CER. CAP. 0.01UF 50V Z		CCFT1H103ZF		
	C216	00MOA10705020	ELECT CAP. 100UF 50V		CCEA1HH101T		
	C217	00MOA10702520	ELECT CAP. 100UF 25V		CCEA1EH101T		
	C218	nsp	CER. CAP. 1000PF 50V B CERAMIC		CCBS1H102KBT		
	C224	nsp	CER. CAP. 0.01UF 50V Z		CCFT1H103ZF		
	C225	00MOA47605020	ELECT CAP. 47UF 50V		CCEA1HH470T		
	C226	nsp	CER. CAP. 0.01UF 50V Z		CCFT1H103ZF		
	C227	00MOA47605020	ELECT CAP. 47UF 50V		CCEA1HH470T		
	C233	nsp	CER. CAP. 1000PF 50V B CERAMIC		CCBS1H102KBT		
	C234	00MOA10505020	ELECT CAP. 1UF 50V		CCEA1HH1R0T		
	C235	00MOA10702520	ELECT CAP. 100UF 25V		CCEA1EH101T		
	C236,237	nsp	CER. CAP. 100PF 50V KB		CCKT1H101KB		
	C238,239	nsp	CER. CAP. 0.1UF 50V ZF		CCFT1H104ZF		
	C240	00MOA47701620	ELECT CAP. 470UF 16V ZF		CCEA1CH471T		
	C241	nsp	CER. CAP. 0.1UF 50V ZF		CCFT1H104ZF		
	C242	00MOA10505020	ELECT CAP. 1UF 50V		CCEA1HH1R0T		
	C243	nsp	CER. CAP. 0.01UF 50V Z		CCFT1H103ZF		

	Ref. No.	Part No.	Part Name	Remarks		Q'ty	New
	C246	nsp	CER. CAP. 100PF 50V KB		CCKT1H101KB		
	C247	nsp	CER. CAP. 0.1UF 50V ZF		CCFT1H104ZF		
	C248	nsp	CER. CAP. 100PF 50V KB		CCKT1H101KB		
	C249	nsp	CER. CAP. 0.1UF 50V ZF		CCFT1H104ZF		
	C331,332	nsp	FILM CAP. 0.039UF 100V J MYLAR		HCQI1H393JZT		
	C333,334	nsp	CER. CAP. 270PF 50V KB		CCKT1H271KB		
OTHERS PARTS GROUP							
	BN11	nsp	WIRE ASSY(7P, 100MM, 2.0MM)		CWB1B00710047		
	BN12	nsp	WIRE ASSY(13P, 300MM, 2.0MM)		CWB1B01330047		
	BN13	nsp	WIRE ASSY(5P, 150MM, 3.96MM)		CWB3F005150UZ		
	BN3	nsp	WIRE ASS'Y (1PIN,BLACK, 120mm)		CWE81002120VV		
	CN11	nsp	CONN. STRAIGHT WAFER , 2MM		CJP07GI236ZW		
	CN12	nsp	CONN. STRAIGHT WAFER (2mm)		CJP11GI236ZW		
	CN13	nsp	CONN. WAFER , 5P(DIP, 3.96PITCH)		CJP05GA90ZY		
	CN14	nsp	CONN. 5P A3963WV2-5P (3.96MM)		CJP05GA148ZW		
	CN15	nsp	CONN. 3P STRAIGHT YMW025-03R		CJP03GA01ZY		
	CN16	nsp	CONN. STRAIGHT WAFER , 2MM		CJP03GI236ZW		
	CN17	nsp	CONN. 2P STRAIGHT YMW025-02R		CJP02GA01ZY		
	CN21,22	nsp	CONN. 2P STRAIGHT YMW025-02R		CJP02GA01ZY		
	⚠ F102,103	90M-FS001070R	FUSE ! AC250V T2.5AL		KBA2D2500TLET		
	⚠ F104,105	90M-FS001520R	FUSE ! FUSE 1A 372 SERIES/TR5		KBA2D1000A3EYT		
	JK11,12	943643002710S	TERMINAL CINCH 1P RCA-107B-04		CJJ4M046Z		
	JK13,14	00D2051254007	TERMINAL XLR IN JK-5033U*030		CJS6S005Z		
	JK15,16	943646000860S	TERMINAL 2P SPEAKER(RED/BLACK)		CJJ5N013Z		
	L101,102	nsp	COIL 0.5UH K		CLEY0R5KAK		
	RS11,12	943129000820S	RES. 0.1 OHM 5W CEMENT		CRF5EKR10X2		
	RY11-13	943682000810S	RELAY BC3-12H 12V 2C2P		CSL4A016ZU		
	⚠ RY14	90M-LY000440R	RELAY ! GB-2C-D24P		CSL4B019ZU		
	RY15	943682000800S	RELAY G5PA-28-MC DC24V		CSL3B014ZE		
	SW11,12	90M-SS000710R	SW SLIDE SWITCH		KSS2B016Z		
	TH11	943252011420S	POSISTOR ASS'Y (SENSING 100, 50mm)		CRTDHTS100050W		*
		nsp	HEAT SINK TR		CMY1A311		
		nsp	HEAT SINK		CMY2A138		
		nsp	HEAT SINK		CMY2A223		
		nsp	SCREW		CTB3+8JR		
		nsp	SCREW		CTW3+8JR		

STANDBY PCB ASS'Y

	Ref. No.	Part No.	Part Name	Remarks		Q'ty	New
SEMICONDUCTORS GROUP							
	IC31	90M-HC108410R	IC S-80842CNY-X		HVIS-80842CNY-X		
	IC32	90M-HC900200R	IC NJM2831F05		CVINJM2831F05		
	IC33	00MHC3890509F	IC NJM7805FA		HVINJM7805FA		
	IC35	00MHC3891809F	IC NJM7818FA		CVINJM7818FA		
	IC72	00MHC3891209F	IC NJM7812FA		HVINJM7812FA		
	Q351	00MHT600111B0	CHIP TRS. TKTA1267YT		HVTKTA1267YT		
	Q352	90M-HX800010R	CHIP TRS. TKRC102S		HVTKRC102S		
	Q354	90M-HX800010R	CHIP TRS. TKRC102S	U1B	HVTKRC102S		
	D351,352	90M-HD201730R	DIODE 1N4003		CVD1N4003ST		
	D353	90M-HD302290R	ZENER DIODE 7.5V		HVDUDZS7.5BSR		
	D354	00MHZ21303210	DIODE 1SS355		CVD1SS355T		
	D355-368	90M-HD201730R	DIODE 1N4003		CVD1N4003ST		
	D369	00M-HD301730R	ZENER DIODE MTZJ12B 1/2W	U1B	HVDMTZJ12BT		
RESISTORS GROUP							
	R356	nsp	RES. 1 OHM 1W J METAL OXIDE FILM		CRG1SANJ1R0RT		
CAPACITORS GROUP							
	C351	nsp	CER. CAP. 0.1UF 50V K		CCUS1H104KC		
	C352	00MOA10605020	ELECT CAP. 10UF 50V		CCEA1HH100T		
	C354	00MOA10701620	ELECT CAP. 100UF 16V		CCEA1CH101T		
	C355,356	nsp	CER. CAP. 0.1UF 50V K		CCUS1H104KC		
	C357	00MOA33802520	ELECT CAP. 3300UF 25V		CCEA1EH332E		
	C358	nsp	CER. CAP. 1000PF 50V KC		CCUS1H102KC		
	C359	nsp	CER. CAP. ! DE1610-610F103M JP (KH TYPE)		HCKWKH103MF		
	C361	00MOA10701620	ELECT CAP. 100UF 16V		CCEA1CH101T		
	C362,363	nsp	CER. CAP. 0.1UF 50V K		CCUS1H104KC		
	C364	00MOA47702520	ELECT CAP. 470UF 25V		CCEA1EH471E		
	C365	00MOA10703520	ELECT CAP. 100UF 35V		CCEA1VH101T		
	C366,367	nsp	CER. CAP. 0.1UF 50V K		CCUS1H104KC		
	C368	00MOA10803520	ELECT CAP. 1000UF 35V		CCEA1VH102E		
	C369	00MOA10703520	ELECT CAP. 100UF 35V		CCEA1VH101T		
	C370,371	nsp	CER. CAP. 0.1UF 50V K		CCUS1H104KC		
OTHERS PARTS GROUP							
	BN31	nsp	WIRE ASSY(13P, 150MM, 2.0MM)		CWB1B01315047		
	CN31	nsp	CONN. 2P WAFER		CJP02GA89ZY		
	CN32	nsp	CONN. 2P 7.92MM(YUNHO)		CJP02KA060ZY		
	CN33	nsp	CONN. 5P WAFER YMW025-05R 00906-0014		CJP05GA01ZY		
	F301	nsp	CONN. HOLDER FUSE		KJCF5S		
△	F301	90M-FS001480R	FUSE 250V 6.3A	U1B	KBA2C6300TLEY		
△	F301	943652011410S	FUSE 250V 4A	N1B	KBA2C4000TLEY		*
△	F302,303	90M-FS001520R	FUSE ! FUSE 1A 372 SERIES/TR5		KBA2D1000A3EYT		

	Ref. No.	Part No.	Part Name	Remarks		Q'ty	New
⚠	RY31	943682004660S	RELAY ! RELAY G5PA-1 DC6V		CSL1E002ZE		
⚠	T100	943101011370S	TRANSFORMER SUB EI 28*16	U1B	CLT5I008ZU		*
⚠	T100	00D9430193203	TRANSFORMER SUB EI 28*16	N1B	CLT5I008ZE		
		nsp	HEAT SINK		CMY1A223		
		nsp	HEAT SINK		CMY3A025		
		nsp	SCREW		CTB3+8JR		

CPU PCB ASS'Y

	Ref. No.	Part No.	Part Name	Remarks		Q'ty	New
SEMICONDUCTORS GROUP							
	IC401	00D2631242905	IC NJM2831F33		CVINJM2831F33		
	IC402	943243001000M	IC U-COM R5F21246SNFP		CVIR5F21246SNFP		
	IC403	943236000650S	IC AT24C04BN-SH-B		CVIAT24C04BNSHB		
	IC404	90M-HW100690R	PHOTO UNIT RPM674CBR-S	NOTE : When update Firmware, please confirm a last version in SDI. Use the service board after updating it.	CRVRPM6936		
	IC405	00MHC10099540	IC S-80145ALMC		HVIS-80145ALMC		
	IC409	943235000640S	IC LM94022BIMG		CRTLM94022BIMG		
	Q400	90M-HX600010R	CHIP TRS. KRA102S		HVTKRA102S		
	Q401,402	90M-HX800100R	CHIP TRS. KTC3875S Y RTK		HVTKTC3875SYRTK		
	Q403,404	90M-HX600020R	CHIP TRS. KTA1504S Y RTK		HVTKTA1504SYRTK		
	Q405	90M-HX800010R	CHIP TRS. KRC102S		HVTKRC102S		
	Q406	90M-HX600010R	CHIP TRS. KRA102S		HVTKRA102S		
	Q407	90M-HX800010R	CHIP TRS. KRC102S		HVTKRC102S		
CAPACITORS GROUP							
	C400	nsp	CER. CAP. 0.1UF 50V K		CCUS1H104KC		
	C401,402	nsp	CER. CAP. 15PF 50V JA		CCUS1H150JA		
	C403	00MOA10702520	ELECT CAP. 100UF 25V		CCEA1EH101T		
	C404,405	nsp	CER. CAP. 0.1UF 50V K		CCUS1H104KC		
	C408	nsp	CER. CAP. 0.1UF 50V K		CCUS1H104KC		
	C409	00MOA10702520	ELECT CAP. 100UF 25V		CCEA1EH101T		
	C410-413	nsp	CER. CAP. 0.1UF 50V K		CCUS1H104KC		
	C414	nsp	CER. CAP. 27PF 50V JA		CCUS1H270JA		
	C415	nsp	CER. CAP. 0.1UF 50V K		CCUS1H104KC		
	C416	00MOA47601640	ELECT CAP. 47UF 16V		CCEA1CH470T		
	C417	nsp	CER. CAP. 0.1UF 50V K		CCUS1H104KC		
	C418	00MOA47601640	ELECT CAP. 47UF 16V		CCEA1CH470T		
	C419,420	nsp	CER. CAP. 0.01UF 50V KC		CCUS1H103KC		
	C421,422	nsp	CER. CAP. 33PF 50V JA		CCUS1H330JA		
	C423	nsp	CER. CAP. 0.1UF 50V K		CCUS1H104KC		
	C424	00MOA10605020	ELECT CAP. 10UF 50V		CCEA1HH100T		
	C425-428	nsp	CER. CAP. 0.1UF 50V K		CCUS1H104KC		
	C434	nsp	CER. CAP. 0.1UF 50V K		CCUS1H104KC		
	C435	nsp	CER. CAP. 0.01UF 50V KC		CCUS1H103KC		
	C481,482	nsp	CER. CAP. 0.1UF 50V K		CCUS1H104KC		
	C483,484	00MOA10605020	ELECT CAP. 10UF 50V		CCEA1HH100T		
OTHERS PARTS GROUP							
	BK60	nsp	BRACKET BRACKET PWB		CMD1A629		
	BK70	nsp	BRACKET BRACKET FOR PWB		CMD1A569		
	BK80	nsp	BRACKET BRACKET FOR PWB		CMD1A569		
	BK90	nsp	BRACKET SHIELD		CMD1A775		
	BN41	nsp	WIRE ASSY(11P, 300MM, 2.0MM)		CWB1B01130047		
	BN60	nsp	WIRE ASSY(3P, 150MM, 2.0MM)		CWB1B00315047		
	CN41	nsp	CONN. 7STRAIGHT WAFER , 2MM		CJP13GI236ZW		
	CN42	nsp	CONN. 7STRAIGHT WAFER (2mm)		CJP11GI236ZW		

	Ref. No.	Part No.	Part Name	Remarks		Q'ty	New
	CN43	nsp	CONN. 7STRAIGHT WAFER , 2MM		CJP13GI236ZW		
	CN44	nsp	CONN. 7P WAFER CARD CABLE		CJP07GB113ZY		
	CN45	nsp	CONN. 7P WAFER		CJP07GA117ZY		
	D400	90M-HI200020R	L.E.D. SIR-34ST3F		BVDSIR34ST3F		
	D401	00MHZ21303210	DIODE 1SS355		CVD1SS355T		
	D402	90M-HD201750R	DIODE 1N4003		CVD1N4003SRT		
	D403,404	00MHZ21303210	DIODE 1SS355		CVD1SS355T		
	D405-407	90M-HI101040R	L.E.D. SLR342VCTB7T089		HVD342VCTB7T089		
	JK400-402	90M-YT004860R	TERMINAL 3.5MM JACK STEREO PJ-308-02		CJJ2D008Z		
	JK403	943646000850S	TERMINAL CINCH 2P JACK (OR/OR)		CJJ4N076Y		
	SW401,402	90M-SP001210R	SW TACT10910G		CST1A012ZT		
	X400	90M-JX001370R	CRYSTAL 16.000MHZ		COX16000E120TF		

FRONT PCB ASS'Y

	Ref. No.	Part No.	Part Name	Remarks		Q'ty	New
SEMICONDUCTORS GROUP							
	Q901-906	00MBA10001000	TRS KRA102M		HVTKRA102MT		
	D901	263710016400S	LED SLI-325URT31W TP		CVDSL1325URT31WT055		
	D902-905	90M-HI101190R	LED BLUE LED TOL-52CSBBCEAB2		CVD52CSBBCEAB2		
	D906,907	263710016400S	LED SLI-325URT31W TP		CVDSL1325URT31WT055		
	D908	90M-HI101190R	LED BLUE LED TOL-52CSBBCEAB2		CVD52CSBBCEAB2		
CAPACITORS GROUP							
	C901	nsp	CER. CAP. 1000PF 50V B CERAMIC		CCBS1H102KBT		
	C902-906	nsp	CER. CAP. 0.1UF 50V Z CERAMIC		CCBS1H104ZFT		
	C912	nsp	CER. CAP. 1000PF 50V B CERAMIC		CCBS1H102KBT		
OTHERS PARTS GROUP							
	BN91	nsp	WIRE ASSY(5P, 150MM, 2.0MM)		CWB1B00515047		
	BN92	nsp	WIRE ASSY(11P, 450MM, 2.0MM)		CWB1B01145047		
	BN93	nsp	WIRE ASS'Y (3PIN, 2mm, 100mm, TWIST)		CWB1B00310047		
	CN91	nsp	CONN. STRAIGHT WAFER , 2mm		CJP05GI236ZW		
	CN93	nsp	CONN. STRAIGHT WAFER , 2MM		CJP03GI236ZW		
	SW91	90M-SP001210R	SW SKHV10910G TACT		CST1A012ZT		
	SW93	90M-SP001210R	SW SKHV10910G TACT		CST1A012ZT		