

SP-011

Service manual

***IBB*K**

CAUTIONS



- There is high voltage inside this unit. Make sure to pull out the plug of this unit before repairing!
- There are many high voltage components inside this unit. Please pay attention to all warnings and instructions marked on this unit to avoid electric shock!



- Specifications of the replaced components must be the same as that of the original components. Do not change the components' specifications to prevent risks!

Contents

Contents

CAUTIONS

1 sp-011 makeup

2 CIRCUIT CONNECTION DIAGRAM & BLOCK DIAGRAM

3 DETAILED CIRCUIT EXPLANATIONS

8 the explanation for key components

SP-011 MAKEUP

FUNCTIONS

- Two Channel audio in
- Power output
- Volume control
- Bass/Treble adjustment
- Two channel power amplifier with IC La4508
- Two band : woofer;tweeter speakers

MAIN CIRCUITS

Power circuit ~17V-----+22V

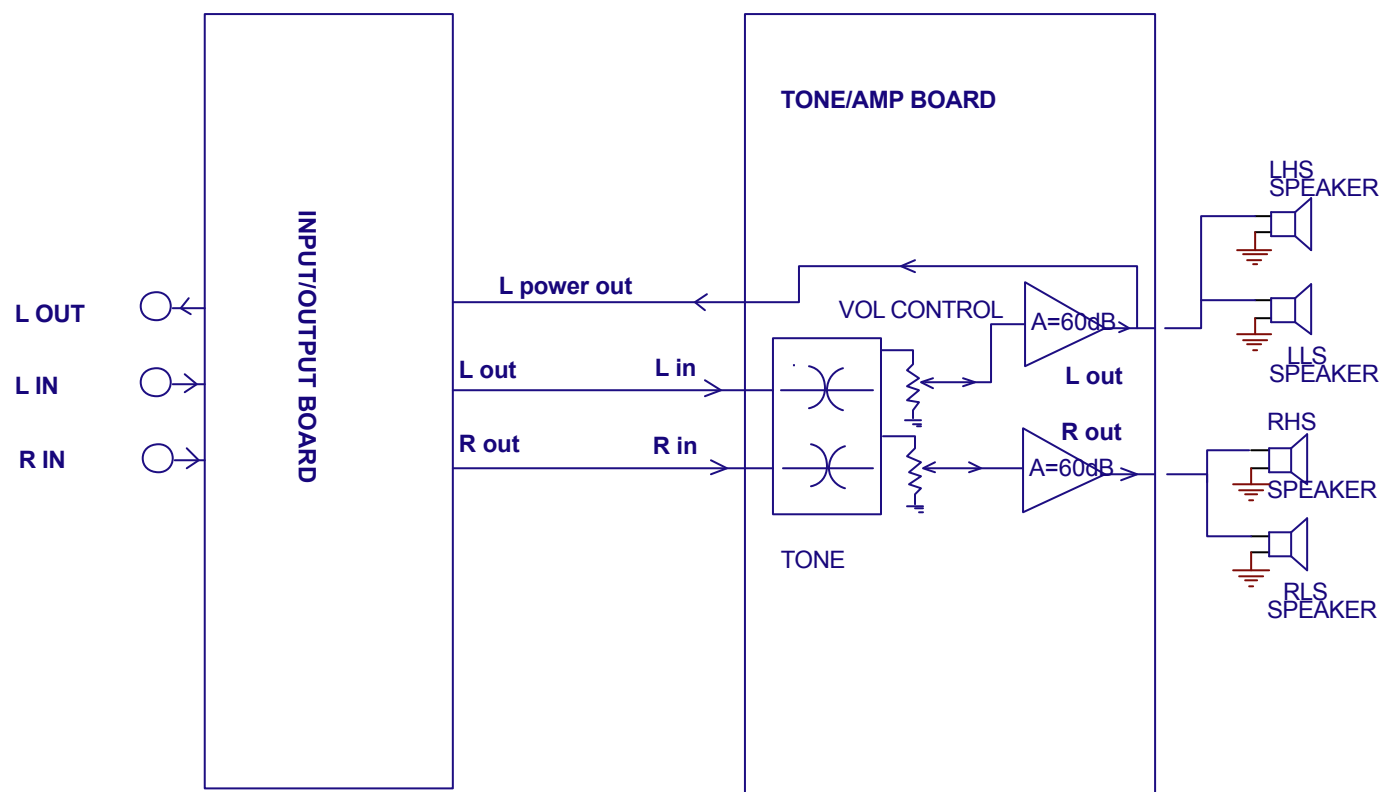
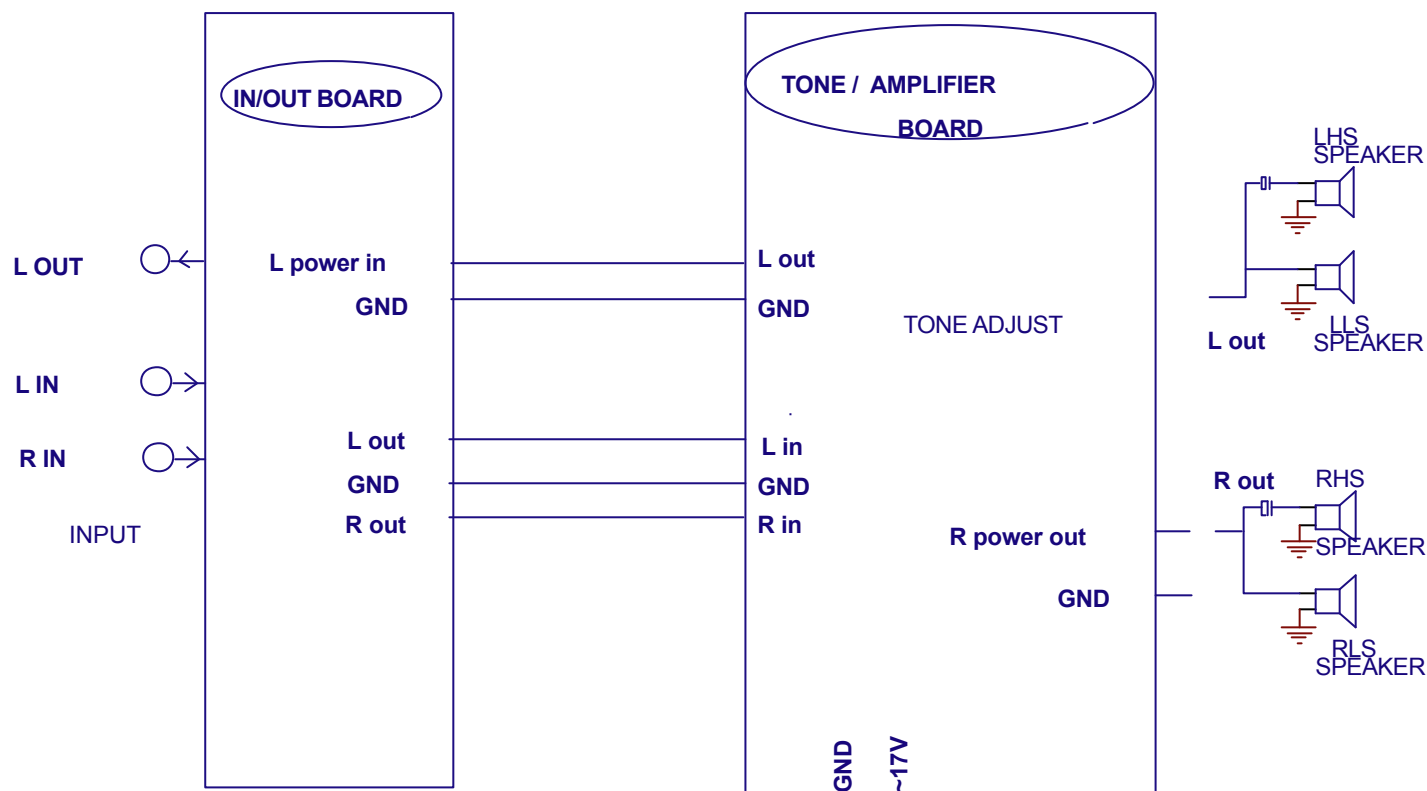
Input circuit

Volume control circuit

Tone adjust circuit

Power amplifier

CIRCUIT CONNECTION DIAGRAM & block diagram



DETAILED CIRCUIT EXPLANATIONS

1. THE POWER AMPLIFYING BOARD

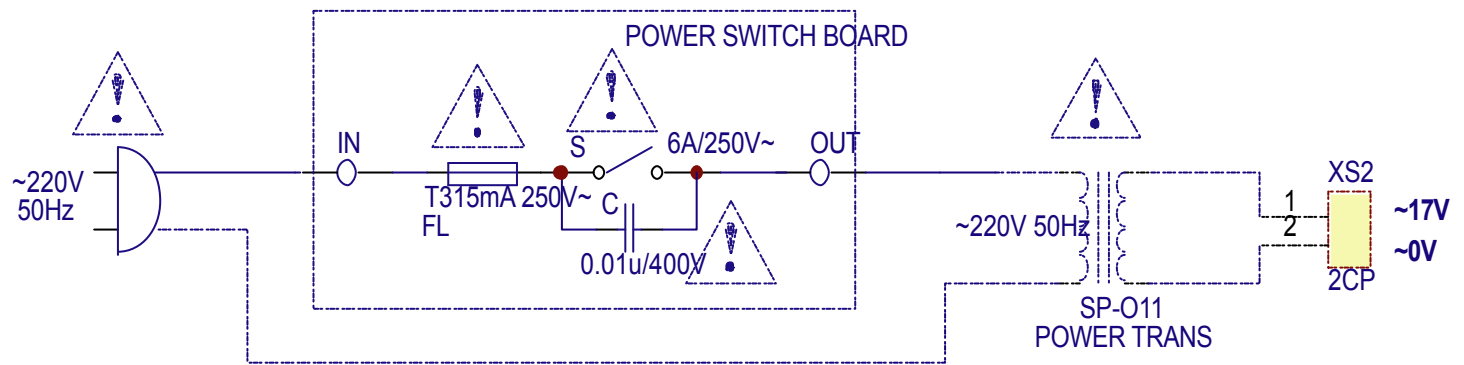
MAIN PARTS LIST OF THE MAIN POWER AMPLIFYING BOARD

NO	DESCRIPTION	SPECIFICATION	LOCATION
1	Carbon-film Resistor	1/4W3.9K?	R17,R18
2	Carbon-film Resistor	1/4W5.6K?	R1,R2,R3,R4,R7,R8
3	Carbon-film Resistor	1/4W56K?	R11,R12
4	Carbon-film Resistor	1/4W75K?	R9,R10
5	Carbon-film Resistor	1/4W1.2K?	R5,R6
6	Adjustable Resistance	D161GOAX-V1B503-016	S1,S2
7	Adjustable Resistance	D161GOAX-V1B503-017	S3
8	Porcelain Capacitor	50V 331 ?0% 5mm	C2,C4
9	Terylene Capacitor	100V 103 ?0% 3.5mm	C7,C8
10	Terylene Capacitor	100V 224 ?0% 8mm	C13,C15,C16
11	Terylene Capacitor	50V 563 ?0% 6mm	C23,C22
12	Terylene Capacitor	100V 562 ?% 3.5mm	C18,C19,C20,C21
13	CD	CD11 16V2200u?0 £• 10?0 5	C12,C14
14	CD	CD11 25V10U?0%5?1 2	C1,C3
15	CD	CD11 25V220U?0%8?2 3.5	C11
16	CD	CD110 25V 100UF ?0% 6?2 2.5	C5,C6,C9,C10
17	CD	CD11 25V2200U?0%16?8 7.5	C17
18	Diode	RL254	VD1~VD4
19	IC	LA4508 ZIP	U1
20	PCB	401-2	
21	Socket	2P 2.5mm	XS2,XS4
22	Jumper	F0.6 7.5mm	W1,W5,W6
23	Jumper	F0.6 10mm	W3
24	Jumper	F0.6 12.5mm	W7
25	Jumper	F0.6 20mm	W2
27	Raft Cords	20# 260mm red/black	XS5
28	Raft Cords	3P 90mm	XS1~XP1
29	Fuse Tube	T3.15AL 250V	F402
30	Fuse Holder		F402

2. THE Input/output board

NO	DESCRIPTION	SPECIFICATION	LOCATION
1	Carbon-film Resistor	1/4W3.3K?	R13,R16
2	Carbon-film Resistor	1/4W100K?	R14,R15
3	PCB	701-2	
4	Jack	AV3-8.4-2	XC1
5	Socket	3P 2.5mm	XS1
6	Raft Cords	2P 140mm 2.5	XS4~XP4

DETAILED CIRCUIT EXPLANATIONS



NO	DESCRIPTION	SPECIFICATION	LOCATION
1	Figuline Capacitor	CT7 400V 103 ±0% 10mm	POWER BLOCK
2	Power Transformer	SP-10	POWER BLOCK
3	Power Switch	PS8-11 2#	POWER BLOCK
4	POWER CORD	2P 1.9m 2.5A MA-800S	POWER BLOCK
5	Radiator	40±0±0.5 BSY01	For power amplifier IC
6	BACK PANEL	SP-011 2#	QR-4.4-20
7	Fuse Tube	T315mAL 250V	$\mu/1$ " $\geq \pi \leq 1$ " " $\geq$ "



Specifications of the replaced components must be the same as that of the original components. Do not change the components' specifications to prevent risks!

The explanation for Key components

POWER IC La4508

STEREO AUDIO AMPLIFIER

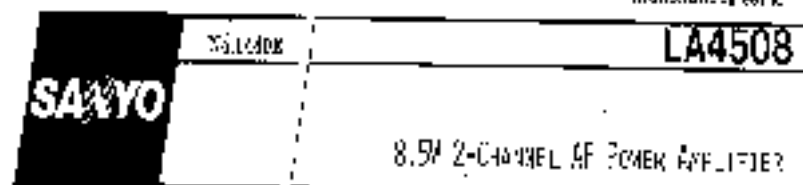
Features:

- Recommended Voltage: +16v, Max. +24v
- Max. output Peak Current: 2.5A
- Output Power ($V_s=15v, R_L=3\ \Omega, THD=10\%, f=1kHz$): 8.5w
- Full protection function

Caution:

This amplifier IC working with single power,
so its output has half power voltage

Monolithic Linear IC



Features

- Low distortion (20mA/2 channels)
- Output power 8.5W (50% $R_L = 16\Omega$)
- High noise rejection (30dB at steady state)
- Small power dissipation at the time of power supply ON
- Thermal protection
- Accurate of SETTING $R_{L2} = 17\Omega$ for thermal design

Maximum Rating ($T_A = 25^\circ\text{C}$)

			unit
Maximum supply voltage	$V_{CC(max)}$	20	V
Maximum power dissipation	$P_{T(max)}$	15	W
Maximum output current	$I_{T(max)}$	2.5	A
Operating temperature	$T_{A,op}$	-20 to $+75$	$^\circ\text{C}$
Storage temperature	T_{stg}	-40 to $+120$	$^\circ\text{C}$

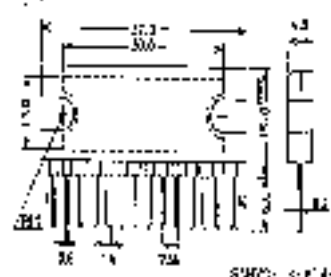
Operating Conditions ($T_A = 25^\circ\text{C}$)

			unit
Recommended supply voltage	V_{CC}	15	V
Operating voltage range	V_{CC}	9 to 18	V
Recommended load impedance	R_L	16 ohms	Ω

Operating Characteristics ($T_A = 25^\circ\text{C}$, $V_{CC} = 15\text{V}$, $R_L = 16\Omega$ 2 channels, $f = 1\text{kHz}$, $R_f = 800\Omega$)

See graph for test circuit.

			TH	TL	max	min
Quiescent current	I_{QD}	2 channels	10	22	30	mA
Voltage gain	V_G		47	44	46	dB
Voltage gain (10 to 20kHz)	V_{G1}	0.1, 0.2			41	dB
Output power	P_O	THD = 1%	7.5	5.5	6	W
Total harmonic distortion	THD	$V_O = 2V$		0.12	1.0	%
Input resistance	r_i			30k		Ω
Output noise voltage	$V_{N(1)}$	$f_c = 0.1 = 20\text{Hz}$ to 20kHz , BPF		1.2	0.5	mV
	$V_{N(2)}$	$f_c = 10\text{kHz}$ to 20kHz or 20kHz , BPF		1.3	1.0	mV
Block rejection	R_r		45	60		dB
Channel separation	ch sep		45	55		dB

Package Dimensions (S223A-S224C)
(unit: mm)

SANYO Electric Co., Ltd. Semiconductor Business Headquarters

1-3-1 Choshi, Choshi City, Chiba Prefecture, Japan

D0855JCN-0147630050830407281 No. 1440-167