

**SP-011**

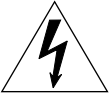
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# **Service manual**

***IBBK***

## CAUTIONS

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- 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

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### CAUTIONS

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1 sp-011 makeup

---

2 CIRCUIT CONNECTION DIAGRAM & BLOCK DIAGRAM

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3 DETAILED CIRCUIT EXPLANATIONS

---

8 the explanation for key components

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## SP-011 MAKEUP

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# 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

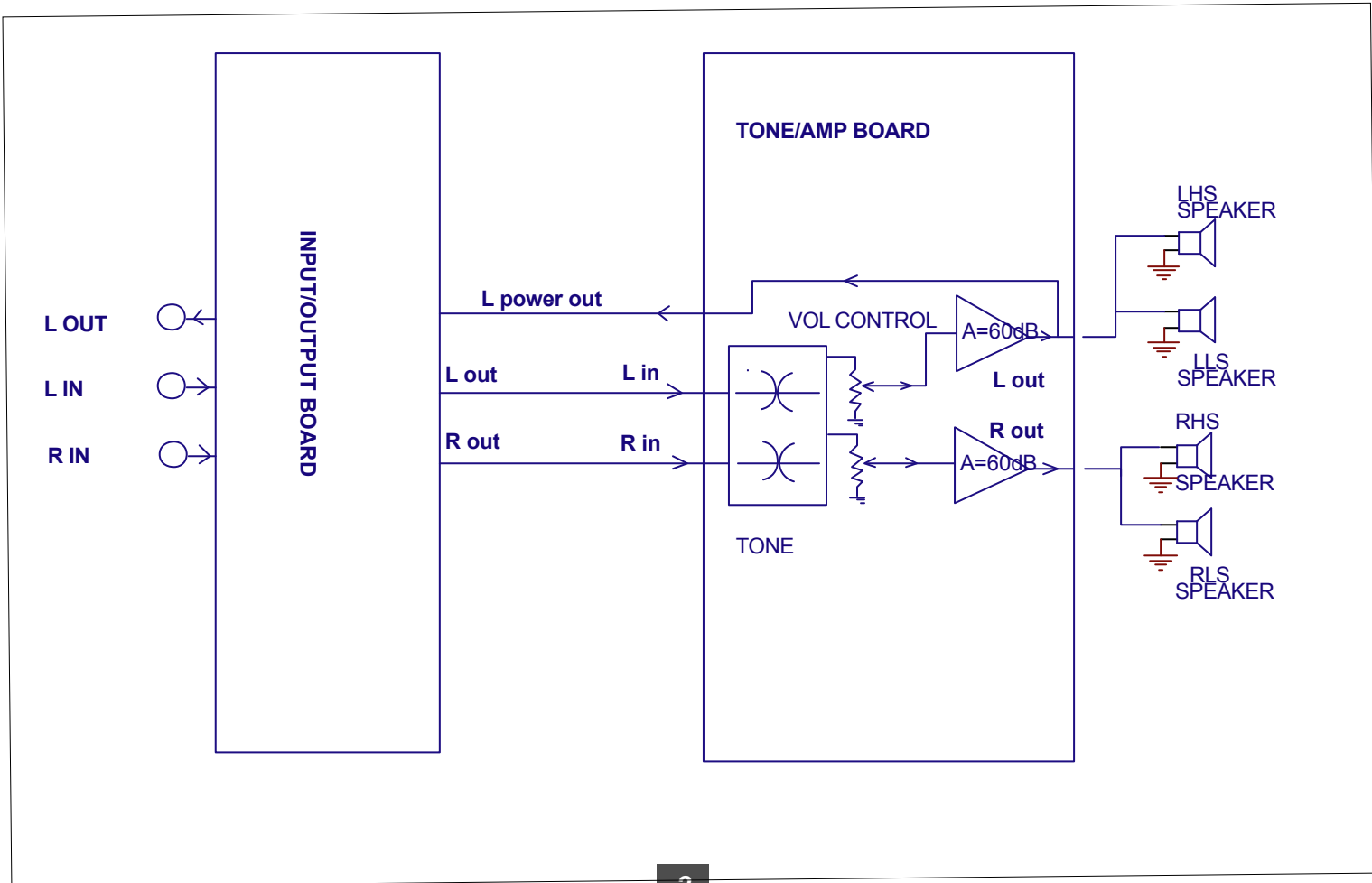
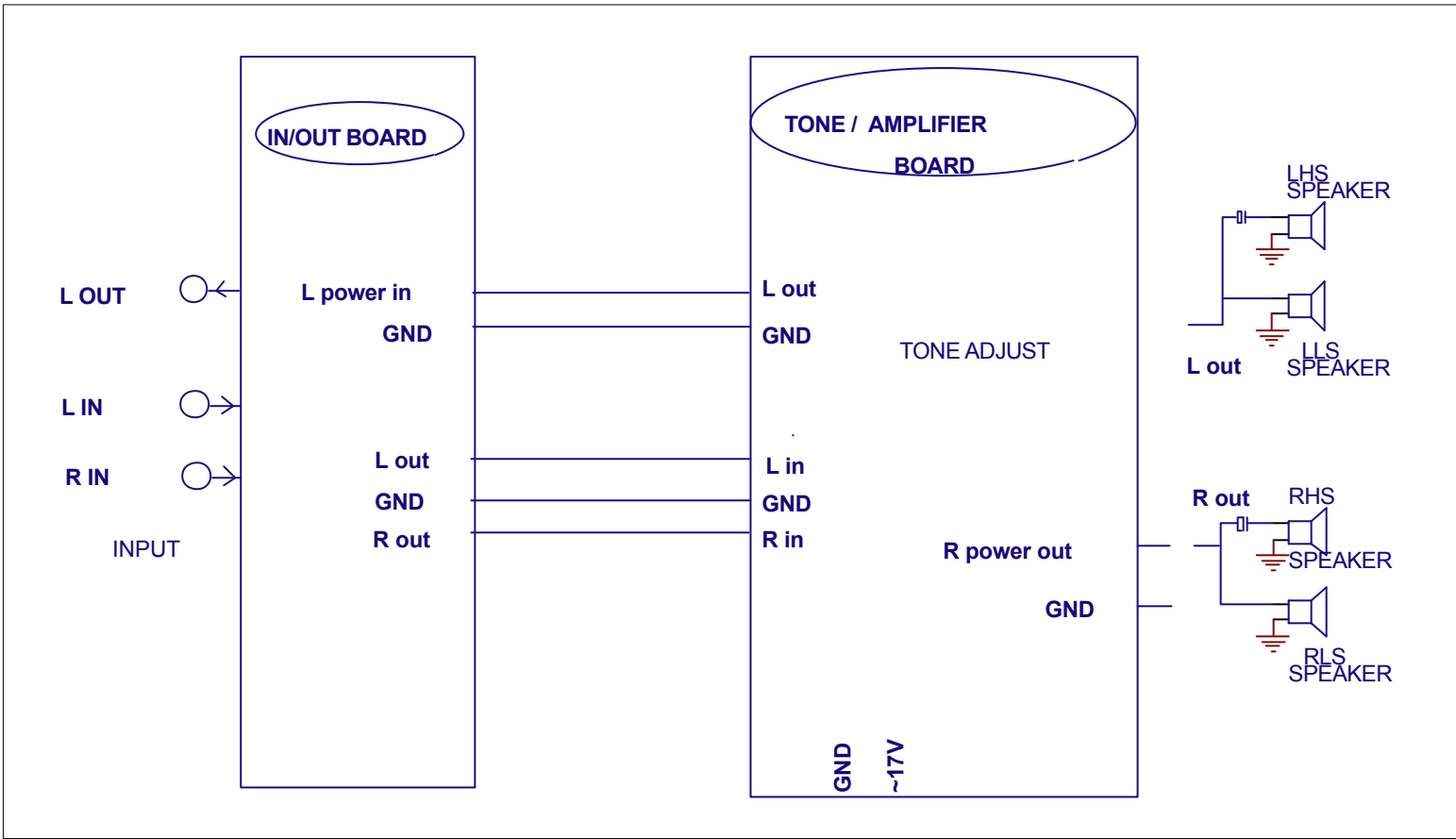
Input circuit

Volume control circuit

Tone adjust circuit

Power amplifier

**CIRCUIT CONNECTION DIAGRAM & block diagram**



## DETAILED CIRCUIT EXPLANATIONS

### 1. THE POWER AMPLIFYING BOARD

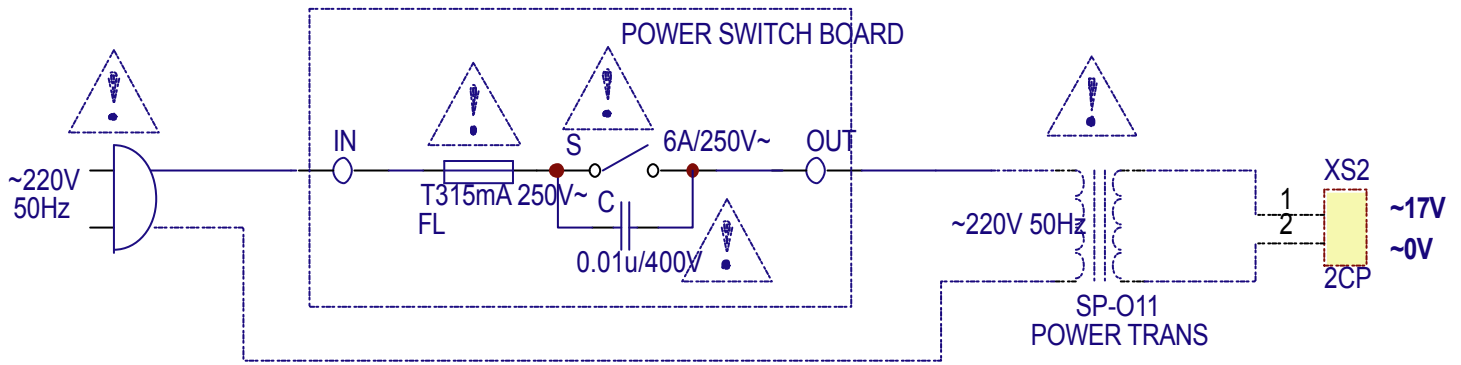
#### MAIN PARTS LIST OF THE MAIN POWER AMPLIFYING BOARD

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 ?% 5mm	C2,C4
9	Terylene Capacitor	100V 103 ?% 3.5mm	C7,C8
10	Terylene Capacitor	100V 224 ?% 8mm	C13,C15,C16
11	Terylene Capacitor	50V 563 ?% 6mm	C23,C22
12	Terylene Capacitor	100V 562 ?% 3.5mm	C18,C19,C20,C21
13	CD	CD11 16V2200u? £• 10? 5	C12,C14
14	CD	CD11 25V10U?%5?1 2	C1,C3
15	CD	CD11 25V220U?%8?2 3.5	C11
16	CD	CD110 25V 100UF ?% 6?2 2.5	C5,C6,C9,C10
17	CD	CD11 25V2200U?%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**



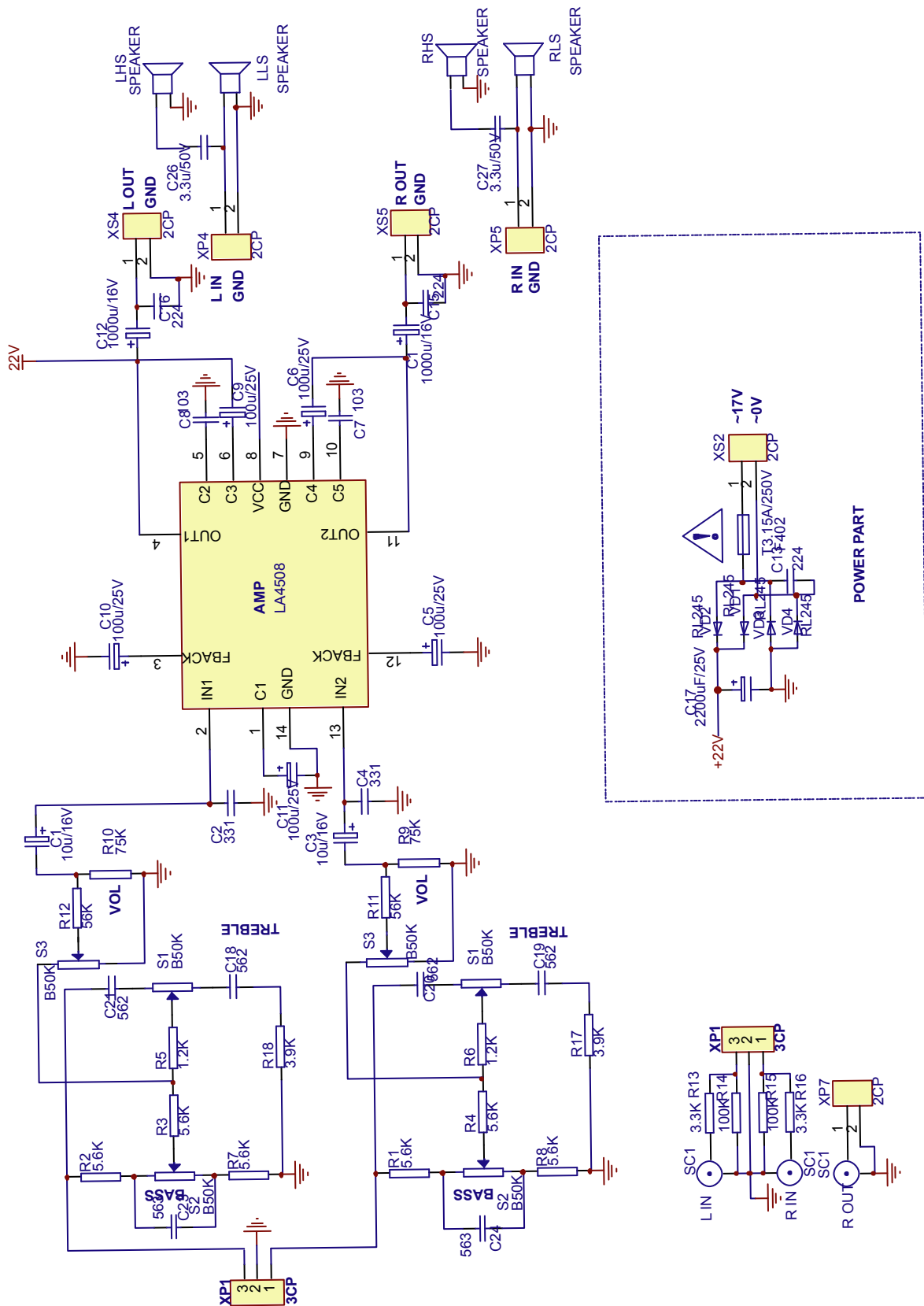
NO	DESCRIPTION	SPECIFICATION	LOCATION
1	Figuline Capacitor	CT7 400V 103 ±0% 10mm	POWER BLOCK
2	Power Transformer	SP-10	POWER BLOCK
3	Power Switch	PS8-11 2#	POWER BLOCK
4	POWER CORD	2P 1.9m 2.5A MA-800S	POWER BLOCK
5	Radiator	40±0±0.5 BSY01	For power amplifier IC
6	BACK PANEL	SP-011 2#	QR-4.4-20
7	Fuse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



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

DETAILED CIRCUIT EXPLANATIONS

- SCHEMATIC DIAGRAM OF THE MAIN POWER AMPLIFYING BOARD



## 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( $V_s=15v, R_L=3 \text{ Ohm}, THD=10\%, f=1kHz$ ):8.5w
- Full protection function

#### Caution:

This amplifier IC working with single power,  
so it's output has half power voltage



<b>SANYO</b>	No.1440E	<b>LA4508</b>
	8.5W 2-CHANNEL AF POWER AMPLIFIER	

**Features**

- Low idling current (20mA/2 channels)
- Output power 8.5W x 2 typ. ( $R_L = 3\Omega$ )
- High ripple rejection (60dB at steady state)
- Small pop noise at the time of power supply ON
- Thermal protector
- Adoption of SEP14H ( $\theta_{j-c} = 3^\circ\text{C/W}$ ) facilitates thermal design.

**Maximum Ratings/ $T_a = 25^\circ\text{C}$**

			unit
Maximum supply voltage	$V_{CC}$ max		24 V
Allowable power dissipation	$P_d$ max	With infinite heat sink	15 W
Maximum output current	$I_o$ peak	1 channel	2.5 A
Operating temperature	$T_{opr}$		-20 to +75 $^\circ\text{C}$
Storage temperature	$T_{stg}$		-40 to +150 $^\circ\text{C}$

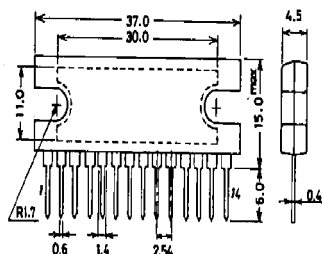
**Operating Conditions/ $T_a = 25^\circ\text{C}$**

			unit
Recommended supply voltage	$V_{CC}$		15 V
Operating voltage range	$V_{CC}^*$	$P_d$ max must not be exceeded.	9 to 23 V
Recommended load resistance	$R_L$	2 channels	3 $\Omega$

**Operating Characteristics/ $T_a = 25^\circ\text{C}$ ,  $V_{CC} = 15\text{V}$ ,  $R_L = 3\Omega$  (2 channels),  $f = 1\text{kHz}$ ,  $R_g = 600\Omega$ ,  
See specified test circuit.**

			min	typ	max	unit
Quiescent current	$I_{CCQ}$	2 channels	10	20	30	mA
Voltage gain	VG		42	44	46	dB
Voltage gain difference	$\Delta\text{VG}$	ch1, ch2			$\pm 1$	dB
Output power	$P_o$	THD = 10%	7.5	8.5		W
Total harmonic distortion	THD	$V_o = 2\text{V}$		0.15	1.0	%
Input resistance	$r_i$			30k		$\Omega$
Output noise voltage	$V_{NO1}$	$R_g = 0$ , $f = 20\text{Hz to } 20\text{kHz}$ , B.P.F.		0.2	0.5	mV
	$V_{NO2}$	$R_g = 10\text{k}\Omega$ , $f = 20\text{Hz to } 20\text{kHz}$ , B.P.F.		0.3	1.0	mV
Ripple rejection	$R_r$		45	60		dB
Channel separation	ch sep		45	55		dB

**Package Dimensions 3023A-S14HIC  
(unit: mm)**



SANYO: SEP14H

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