

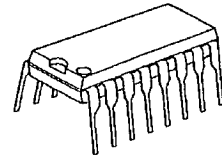
DUAL AUDIO POWER AMPLIFIER

■ GENERAL DESCRIPTION

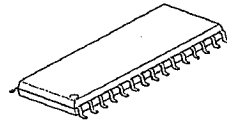
The NJW1105 is a dual audio amplifier which supplies 2.4W (1.2W/channel) to 8Ω loads at 5V. Its features are wide operating voltage range from 4V to 12V and low consumption output by Bi-MOS technology.

The NJW1105 is suitable for speaker amplifier required high output power, such as personal computers, camcorders, and others. It includes thermally protected and mute on/off circuit.

■ PACKAGE OUTLINE



NJW1105D

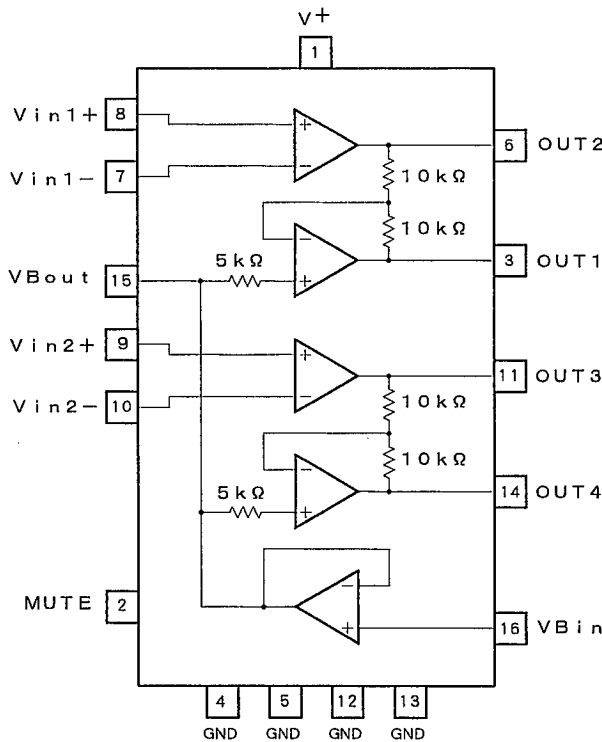


NJW1105M

■ FEATURES

- Operating Voltage (V<sup>+</sup>=4V~12V)
- Output Power (1.2W/ch at V<sup>+</sup>=5V, R<sub>L</sub>=8Ω)
- Supply Current (35mA MAX.)
- Supply Current on Mute (3.5mA MAX.)
- Bi-MOS Technology
- Package Outline DIP16, SDMP30

■ BLOCK DIAGRAM



(Package DIP-16)

5

■ ABSOLUTE MAXIMUM RATINGS (T<sub>a</sub> = 25°C)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V <sup>+</sup>	15	V
Operating Current	I <sub>o</sub>	1	A
Mute Terminal Current	I <sub>M</sub>	1.0	mA
Power Dissipation	P <sub>o</sub>	(DIP16) 1.9 (SDMP30) 1.8 (note 1)	W
Operating Temperature Range	T <sub>OPR</sub>	-40~+85	°C
Storage Temperature Range	T <sub>STG</sub>	-40~+150	°C

(note 1) At on PC board.

■ ELECTRICAL CHARACTERISTICS (V<sup>+</sup> = 5 V, T<sub>a</sub> = 25°C)

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
-----------	--------	----------------	------	------	------	------

[ALL]

Operating Supply Voltage Range	V <sup>+</sup>		4	5	12	V
Mute OFF Current Dissipation	I <sub>CC1</sub>	V <sub>M</sub> =4.2V, V <sub>IN</sub> =2.5V	-	20	35	mA
Mute ON Current Dissipation	I <sub>CC2</sub>	V <sub>M</sub> =0V, V <sub>IN</sub> =2.5V	-	2	3.5	mA

[POWER AMPLIFIER]

Output Offset Voltage	ΔV <sub>o</sub>	R <sub>L</sub> =8Ω	-50	-	50	mV
Input Bias Current	I <sub>B</sub>		-	-	300	nA
Output Power	P <sub>o1</sub>	THD=10%, f=1kHz, R <sub>L</sub> =8Ω	-	1.2	-	W
	P <sub>o2</sub>	THD=10%, f=1kHz, R <sub>L</sub> =8Ω V <sup>+</sup> =7V	-	2.5	-	W
Total Harmonic Distortion	THD	R <sub>L</sub> =8Ω, P <sub>o</sub> =800mW, f=1kHz	-	0.35	-	%
Power Supply Rejection Ratio	PSRR	f=1kHz	-	45	-	dB
Voltage Gain	A <sub>v</sub>	AMP2, AMP3, R <sub>L</sub> =2kΩ, V <sub>IN</sub> =2.5V	35	50	-	dB

[BUFFER AMPLIFIER]

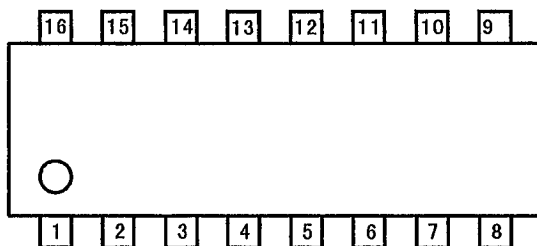
Input Output Potential Difference	V <sub>BO</sub>		-30	0	30	mV
Input Voltage Range	V <sub>BI</sub>		1.5	2.5	3.5	V
Output Voltage Range	ΔV <sub>BO</sub>	I <sub>L</sub> =-5mA I <sub>L</sub> =+5mA	-	-	-50	mV

[MUTING]

Mute OFF Voltage	V <sub>MH</sub>		3.5	4.2	-	V
Mute ON Voltage	V <sub>ML</sub>		-	0.8	1.0	V
Mute Sink Current	I <sub>M</sub>	V <sub>M</sub> =5V	70	100	130	μA

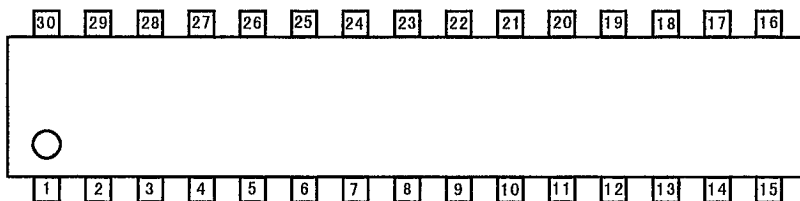
5

## ■ PIN CONFIGURATION



DIP-16

1 : V <sup>+</sup>	9 : V <sub>in</sub> 2 (+)
2 : MUTE	10 : V <sub>in</sub> 2 (-)
3 : OUT1	11 : OUT3
4 : GND	12 : GND
5 : GND	13 : GND
6 : OUT2	14 : OUT4
7 : V <sub>in</sub> 1 (-)	15 : V <sub>B</sub> out
8 : V <sub>in</sub> 1 (+)	16 : V <sub>B</sub> in



SDMP-30

1 : GND	16 : GND
2 : GND	17 : GND
3 : OUT4	18 : OUT2
4 : NC	19 : NC
5 : NC	20 : NC
6 : V <sub>B</sub> out	21 : V <sub>in</sub> 1 (-)
7 : V <sub>B</sub> in	22 : V <sub>in</sub> 1 (+)
8 : NC	23 : NC
9 : V <sup>+</sup>	24 : V <sub>in</sub> 2 (+)
10 : MUTE	25 : V <sub>in</sub> 2 (-)
11 : NC	26 : NC
12 : NC	27 : NC
13 : OUT1	28 : OUT3
14 : GND	29 : GND
15 : GND	30 : GND

■ TERMINAL EXPLANATION

PIN NO.		PIN NAME	FUNCTION	INSIDE EQUIVALENT CIRCUIT
DIP - 1 6	SDMP - 3 0			
4 5 12 13	1 2 14 15 16 17 29 30	GND	Recommend expanding the island in order to heat radiation properties.	
14	3	OUT4	Output terminal of AMP. 4. OUT4 signal is opposite phase against OUT3.	<p>The diagram shows an operational amplifier (AMP) circuit. The non-inverting input (+) is connected to a 5kΩ resistor leading to a terminal labeled VBout. The inverting input (-) is connected to a 10kΩ resistor leading to a terminal labeled V+. A feedback network consisting of a 10kΩ resistor and a transistor is connected between the output and the inverting input. The output of the amplifier is connected to a terminal labeled OUT4. The other end of the output transistor is connected to GND.</p>
-	4 5 8 11 12 19 20 23 26 27	NC	Non-connection terminal. Recommend connecting to GND.	

5

## ■ TERMINAL EXPLANATION

PIN NO.		PIN NAME	FUNCTION	INSIDE EQUIVALENT CIRCUIT
DIP - 1 6	SDMP - 3 0			
1 5	6	V B o u t	An buffer ampli- fier output.	
1 6	7	V B i n	An buffer ampli- fier input.	
1	9	V c c	Supply Voltage.	
2	1 0	M U T E	An mute input. Pulldown by 50kΩ (TYP) resistor.	

■ TERMINAL EXPLANATION

PIN NO.		PIN NAME	FUNCTION	INSIDE EQUIVALENT CIRCUIT
DIP - 1 6	SDMP - 3 0			
3	1 3	OUT 1	Output terminal of AMP. 1. OUT1 signal is opposite phase against OUT2.	
6	1 8	OUT 2	Output terminal of AMP. 2.	
7	2 1	V in1(-)	Inverting input terminal of AMP. 2.	
8	2 2	V in1(+)	Non-inverting input terminal of AMP. 2.	

5

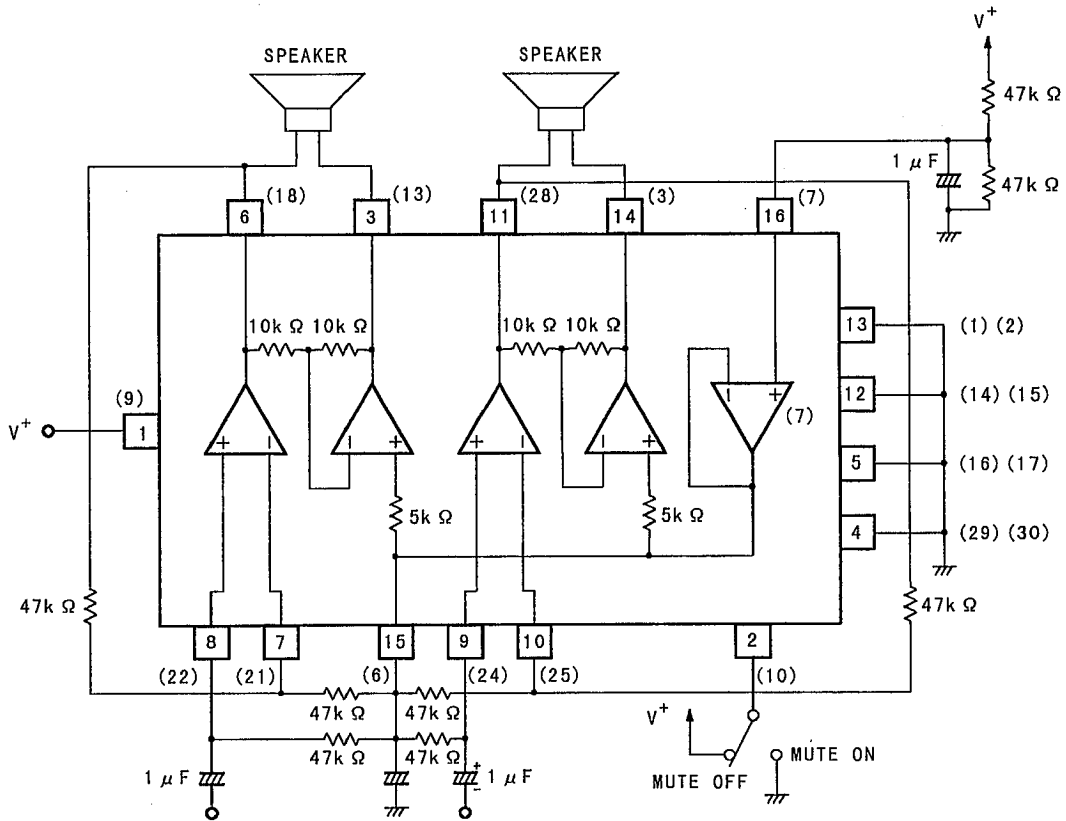
## ■ TERMINAL EXPLANATION

PIN NO.		PIN NAME	FUNCTION	INSIDE EQUIVALENT CIRCUIT
DIP — 1 6	SDMP — 3 0			
9	2 4	V i n 2(+)	Inverting input terminal of AMP. 3.	
1 0	2 5	V i n 2(-)	Non-inverting input terminal of AMP. 3.	
1 1	2 8	O U T 3	Output terminal of AMP. 3.	

5

APPLICATION CIRCUIT

(1) BTL



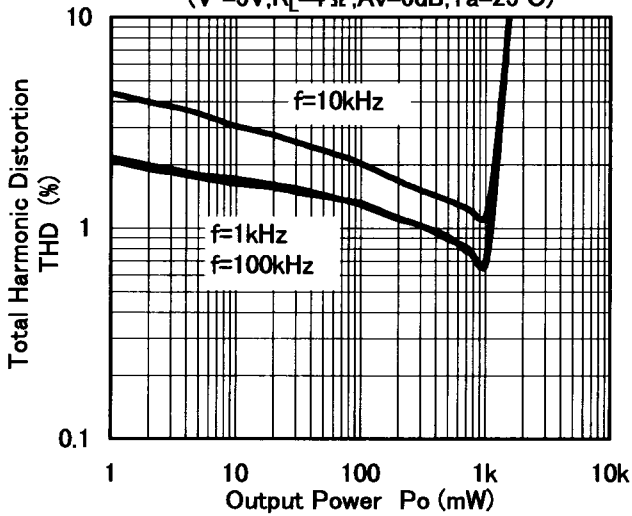
(The number in '( )' indicates a pin number of SDMP.)

5

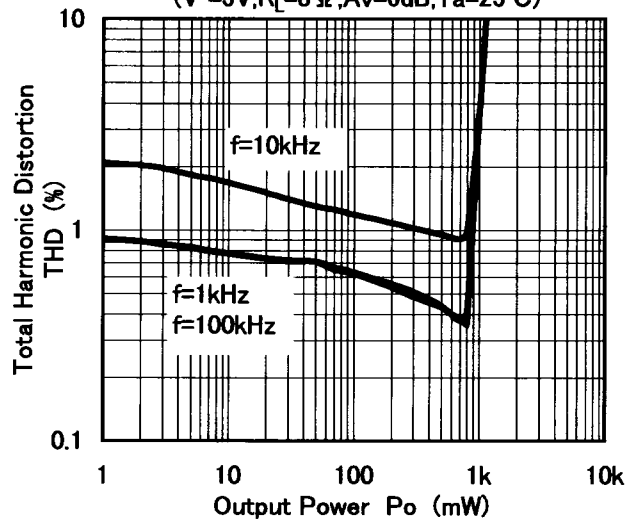


## TYPICAL CHARACTERISTICS

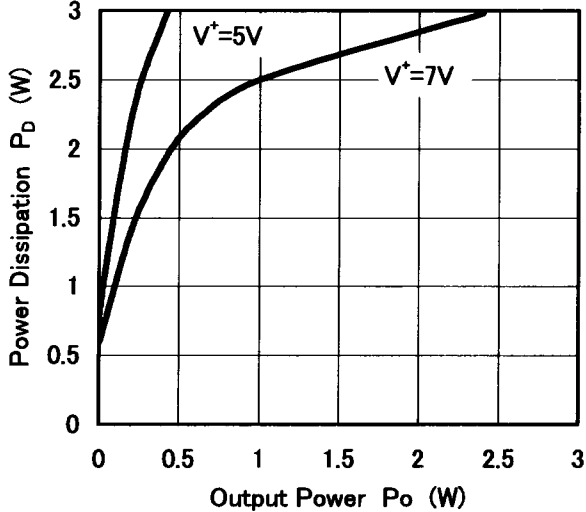
Total Harmonic Distortion VS. Output Power  
( $V^*=5V, R_L=4\Omega, A_v=6dB, T_a=25^\circ C$ )



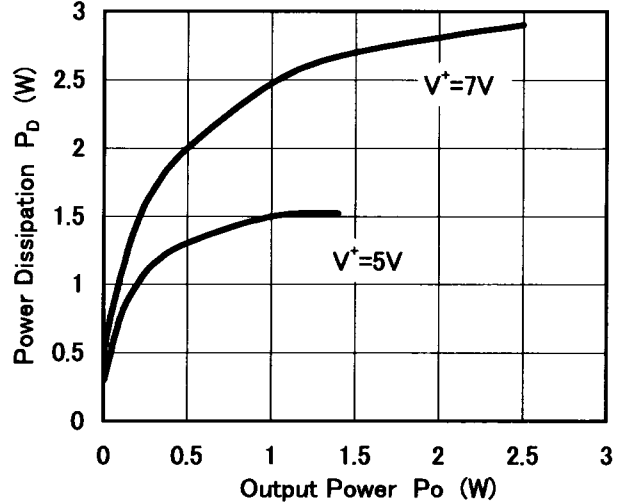
Total Harmonic Distortion VS. Output Power  
( $V^*=5V, R_L=8\Omega, A_v=6dB, T_a=25^\circ C$ )



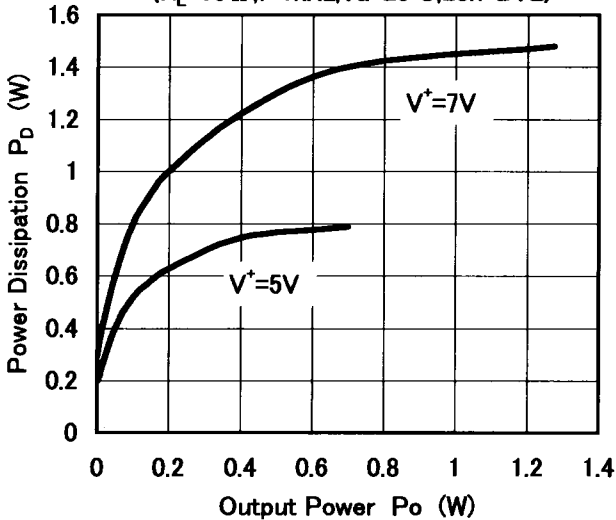
Power Dissipation VS. Output Power  
( $R_L=4\Omega, f=1kHz, T_a=25^\circ C, 2ch-BTL$ )



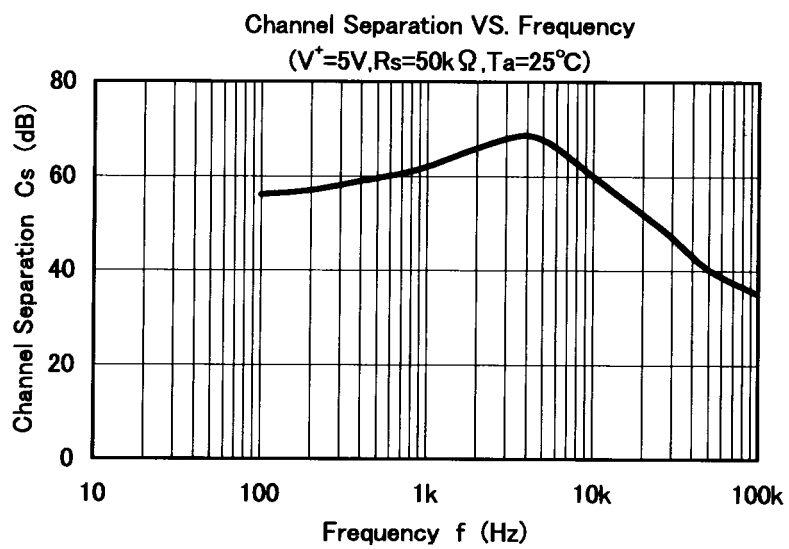
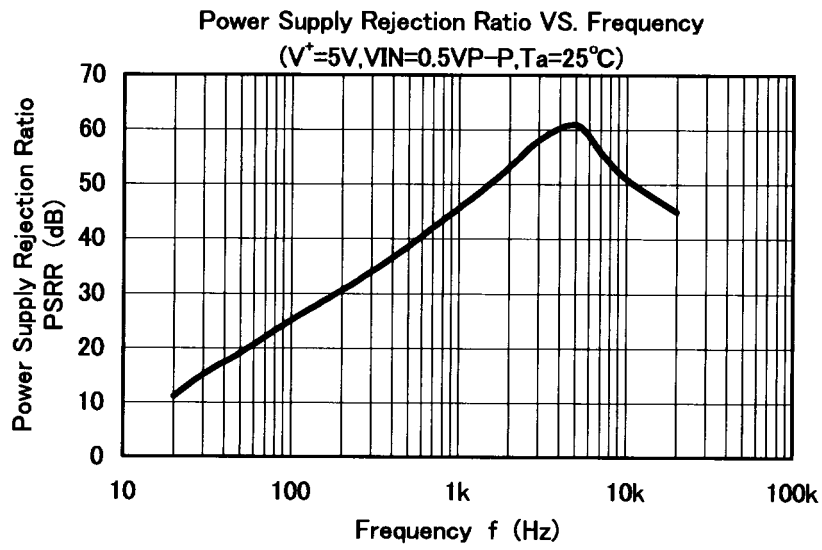
Power Dissipation VS. Output Power  
( $R_L=8\Omega, f=1kHz, T_a=25^\circ C, 2ch-BTL$ )



Power Dissipation VS. Output Power  
( $R_L=16\Omega, f=1kHz, T_a=25^\circ C, 2ch-BTL$ )



## TYPICAL CHARACTERISTICS



## MEMO

[CAUTION]

The specifications on this databook are only given for information, without any guarantee as regards either mistakes or omissions. The application circuits in this databook are described only to show representative usages of the product and not intended for the guarantee or permission of any right including the industrial rights.