

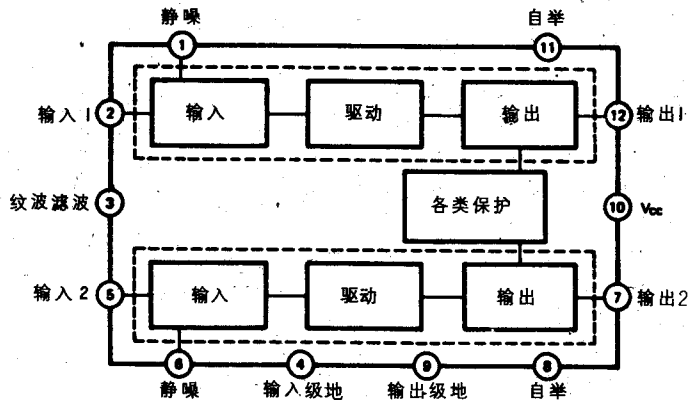
# AN7168, AN7169 5.7W 双低频功率放大器 12脚单列直插式塑封

松下

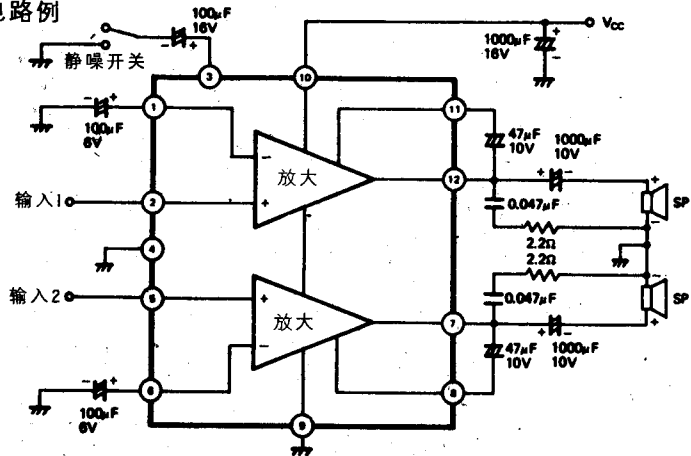
是电源电压13.2V、负载4Ω的低频功率放大器；

- 内含过热、过电压、过电流保护电路；
- 电源接通时电冲击声小。

方框图



应用电路例



## 极限参数 (T<sub>a</sub>=25°C)

V <sub>CC</sub>	24V
V <sub>CC(surge)</sub>	50V (t=0.2sec)
I <sub>CC</sub>	4A (每通道)
P <sub>T</sub>	41.7W
R <sub>th</sub>	3°C/W (PN结与管壳间)
T <sub>stg</sub>	-30~+75°C
T <sub>stg</sub>	-55~+150°C

## 电特性参数 (V<sub>CC</sub>=13.2V, R<sub>L</sub>=4Ω, f=1kHz, T<sub>a</sub>=25°C)

符号	测定条件	参数值			单位	
		最小	典型	最大		
I <sub>CC(zs)</sub>	V <sub>i</sub> =0	30	55	100	mA	
G <sub>v</sub>	P <sub>o</sub> =0.5W	AN7168	52	54	56	dB
		AN7169	45	47	49	
P <sub>om</sub>	KF=10%		5	5.7	W	
	KF=10%, R <sub>L</sub> =2Ω		8.9			
	KF=10%, R <sub>L</sub> =8Ω		3.1			
KF	P <sub>o</sub> =1W	AN7168	0.1	0.5	%	
		AN7169	0.06			
	P <sub>o</sub> =1W, f=100Hz	AN7168	0.1			
		AN7169	0.07			
	P <sub>o</sub> =1W, f=10kHz	AN7168	0.2			
		AN7169	0.15			
N <sub>o</sub>	R <sub>s</sub> =10kΩ, 1000pF BW=15Hz~30kHz 12dB/oct	AN7168	0.8	1.5	mV	
		AN7169	0.5			
	R <sub>s</sub> =10kΩ, 无滤波	AN7168	1.1			
		AN7169	0.65			
CH <sub>n</sub>	V <sub>i</sub> =3mV			1	dB	

# AN7169

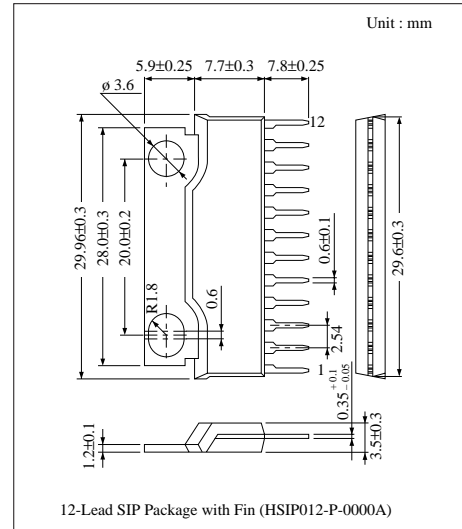
## Dual 5.8W Audio Power Amplifier Circuit

### ■ Overview

The AN7169 is an integrated circuit designed for low distortion, low noise and low power dissipation audio set of 5.8W (13.2V, 4Ω) output. Stereo operation is enabled due to incorporating two amplifiers on one chip. 12-pin SIL package enabled compact and high integrated set. Thermal protection, short protection and excessive voltage protection circuits are built in.

### ■ Features

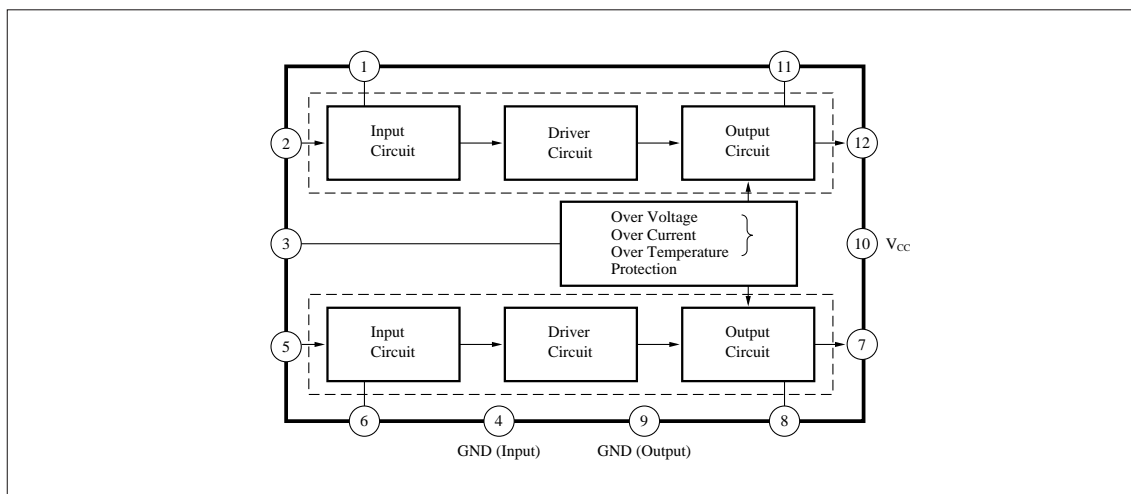
- Highly stable operation
- Low distortion
- Low quiescent current
- Low noise
- Low shock noise from power ON/OFF operation
- Built-in muting circuit
- Fewer external components
- Incorporating protection circuits



### ■ Pin Descriptions

Pin No.	Pin Name	Pin No.	Pin Name
1	NFB Ch.1	7	Output Ch.2
2	Input Ch.1	8	Bootstrap Ch.2
3	Ripple Filter	9	GND (Output)
4	GND (Input)	10	V <sub>CC</sub>
5	Input Ch.2	11	Bootstrap Ch.1
6	NFB Ch.2	12	Output Ch.1

### ■ Block Diagram



### ■ Absolute Maximum Ratings (Ta= 25°C)

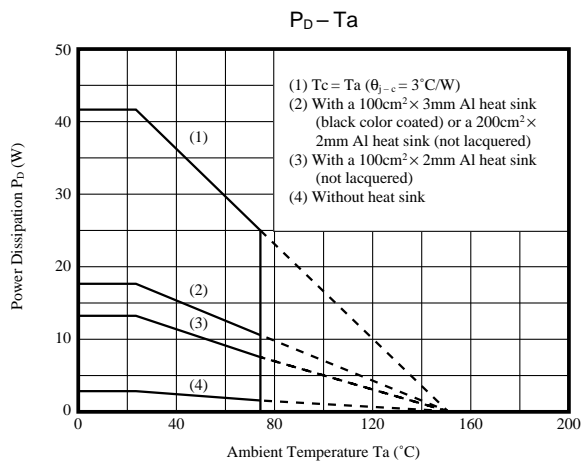
Parameter	Symbol	Rating	Unit
Supply Voltage	V <sub>CC</sub>	24	V
Supply Current	I <sub>CC</sub>	4.0	A
Power Dissipation	P <sub>D</sub>	41.7 <small>Note 1)</small>	W
Peak Supply Voltage	V <sub>CC(surge)</sub>	50 <small>Note 2)</small>	V
Operating Ambient Temperature	T <sub>opr</sub>	- 30 ~ + 75	°C
Storage Temperature	T <sub>stg</sub>	- 55 ~ + 150	°C

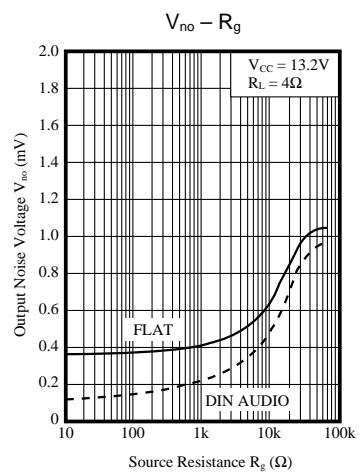
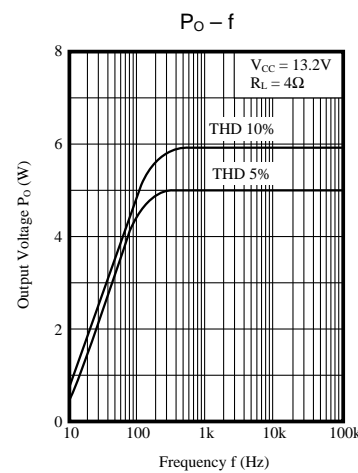
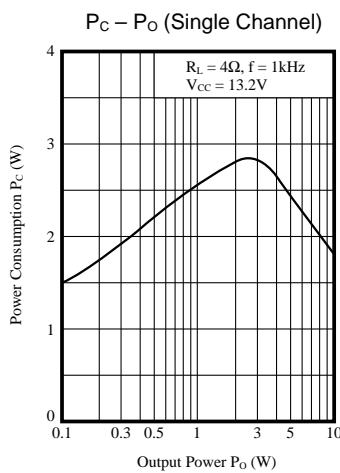
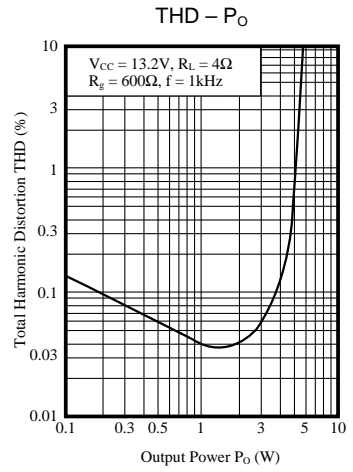
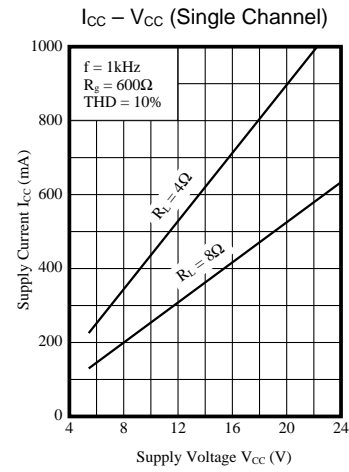
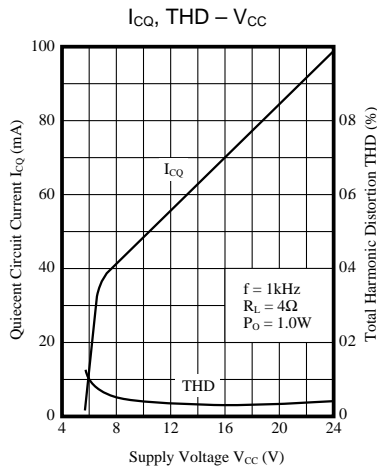
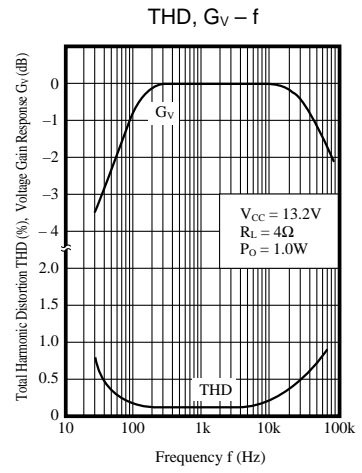
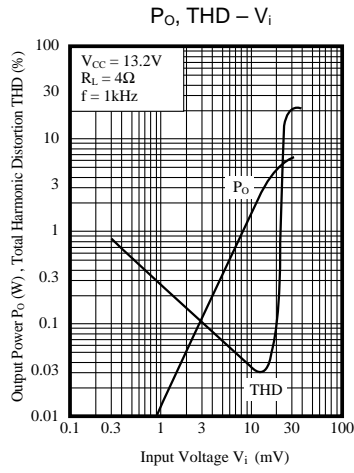
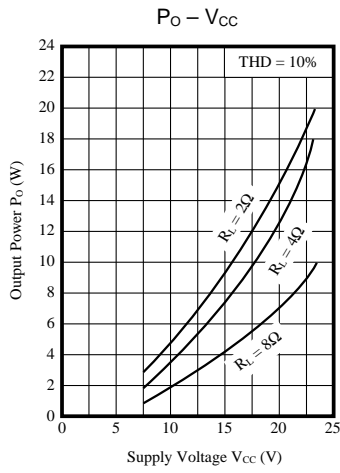
Note 1)  $R_{\theta j-c} = 3^{\circ}\text{C/W}$

Note 2) Voltage applied time = 0.2s

### ■ Electrical Characteristics (V<sub>CC</sub> = 13.2V, f = 1kHz, R<sub>L</sub> = 4Ω, Ta = 25°C)

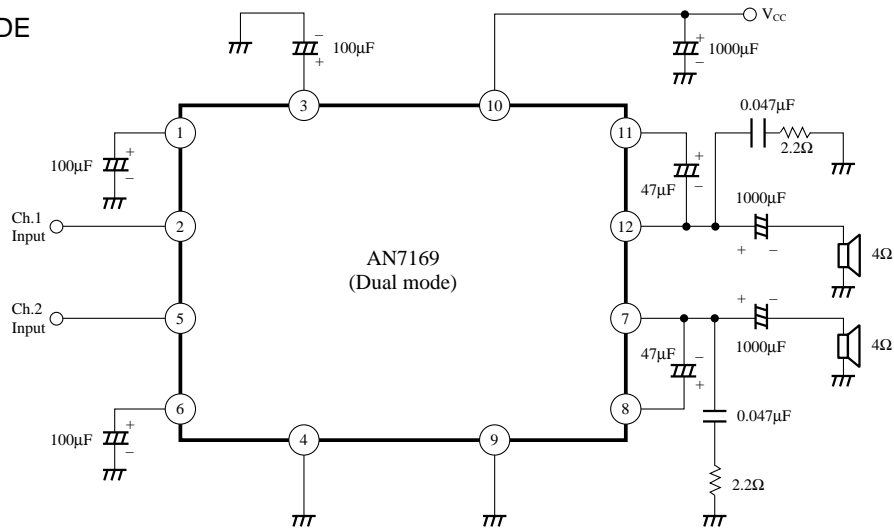
Parameter	Symbol	Condition	min.	typ.	max.	Unit
Quiescent Circuit Current	I <sub>CQ</sub>	V <sub>i</sub> = 0mV	30	55	100	mA
Voltage Gain	G <sub>V</sub>	P <sub>O</sub> = 0.5W	45	47	49	dB
Total Harmonic Distortion	THD	P <sub>O</sub> = 0.5W, f = 1kHz	—	0.06	0.5	%
		P <sub>O</sub> = 0.5W, f = 100Hz	—	0.07	—	
		P <sub>O</sub> = 0.5W, f = 10kHz	—	0.15	—	
Maximum Output	P <sub>O</sub>	THD = 10%	5.0	5.7	—	W
		THD = 10%, R <sub>L</sub> = 2Ω	—	8.9	—	
		THD = 10%, R <sub>L</sub> = 8Ω	—	3.1	—	
Output Noise Voltage	V <sub>no</sub>	R <sub>g</sub> = 10kΩ, 1000pF, f = 15Hz ~ 30kHz, 12dB/OCT	—	0.5	1.5	mV
		R <sub>g</sub> = 10kΩ, 1000pF, Without Filter	—	0.65	—	
Channel Balance	CB	P <sub>O</sub> = 0.5W	—	0	1.0	dB
Channel Separation	CS	P <sub>O</sub> = 0.5W	40	50	—	dB
Ripple Rejection Ratio	RR	P <sub>O</sub> = 0.5W, V <sub>ripple</sub> = 280mV <sub>rms</sub> , f <sub>ripple</sub> = 120Hz Sine wave	35	45	—	dB
Offset Voltage	V <sub>O(offset)</sub>	V <sub>i</sub> = 0mV	—	0	200	mV



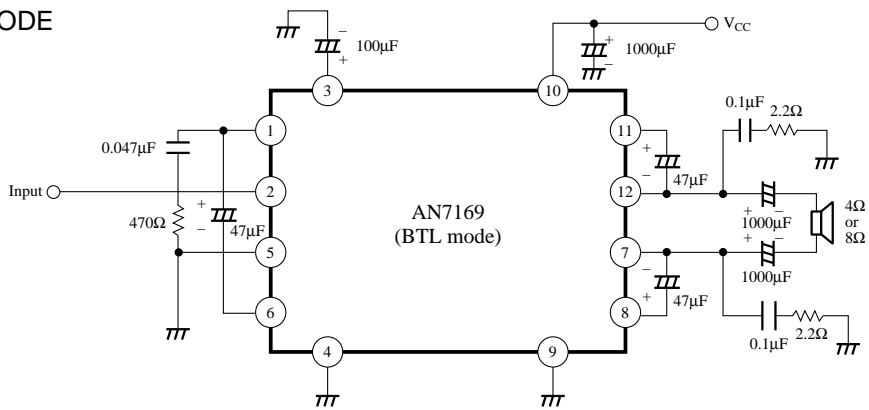


■ Application Circuits

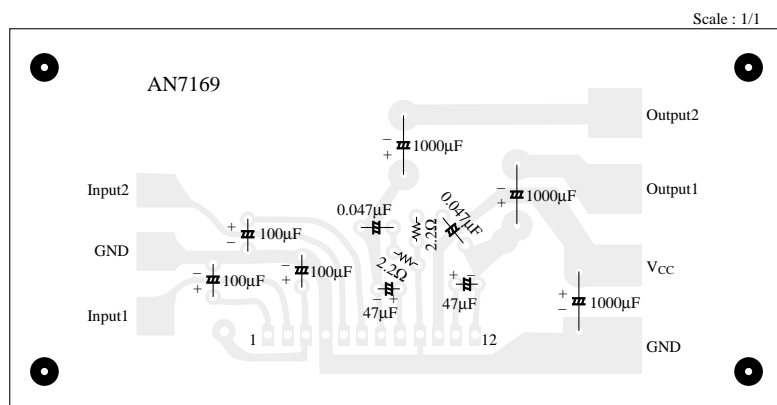
• DUAL MODE



• BTL MODE



■ Printed Circuit Board Layout



# AN7169

## Dual 5.8W Audio Power Amplifier

### ■ Description

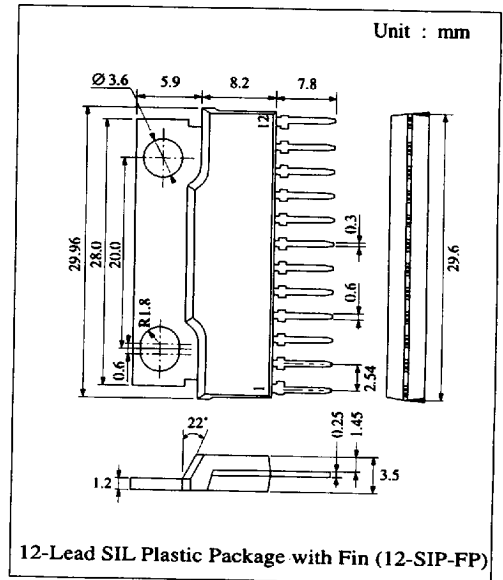
The AN7169 is a monolithic integrated circuit designed for dual 5.8W audio power amplifier. Stereo operation is possible due to the 2 built-in amplifiers and together with the muting circuit and excess current/voltage/temperature protection circuits, high reliability and compactness can be realized.

### ■ Features

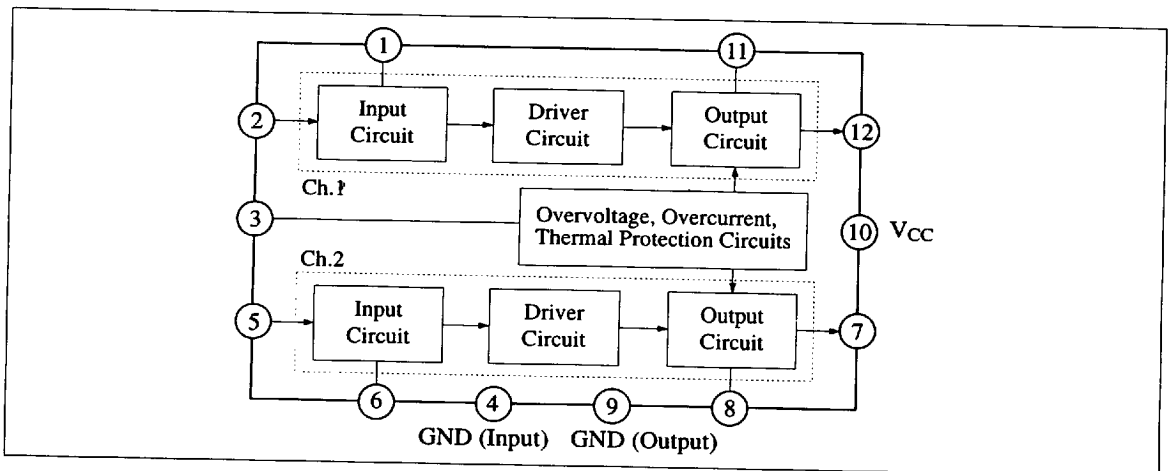
- Highly stable operation
- Low distortion
- Low quiescent current
- Low noise
- Low shock noise from power ON/OFF operation
- Built-in muting circuit
- Few external components
- Incorporating protection circuits

### ■ Pin

Pin No	Pin Name	Pin No	Pin Name
1	N.F.B. Ch.1	7	Output Ch.2
2	Input Ch.1	8	Bootstrap Ch.2
3	Ripple Filter	9	GND (Output)
4	GND (Input)	10	V <sub>CC</sub>
5	Input Ch.2	11	Bootstrap Ch.1
6	N.F.B. Ch.2	12	Output Ch.1



### ■ Block Diagram



## ■ Absolute Maximum Ratings (Ta=25°C)

Item	Symbol	Rating	Unit
Supply Voltage	V <sub>CC</sub>	24	V
Supply Current	I <sub>CC</sub>	4	A
Power Dissipation *1	P <sub>D</sub>	41.7	W
Surge Supply Voltage *2	V <sub>CC(surge)</sub>	50	V
Operating Ambient Temperature	T <sub>opr</sub>	-30 ~ +75	°C
Storage Temperature	T <sub>stg</sub>	-55 ~ +150	°C

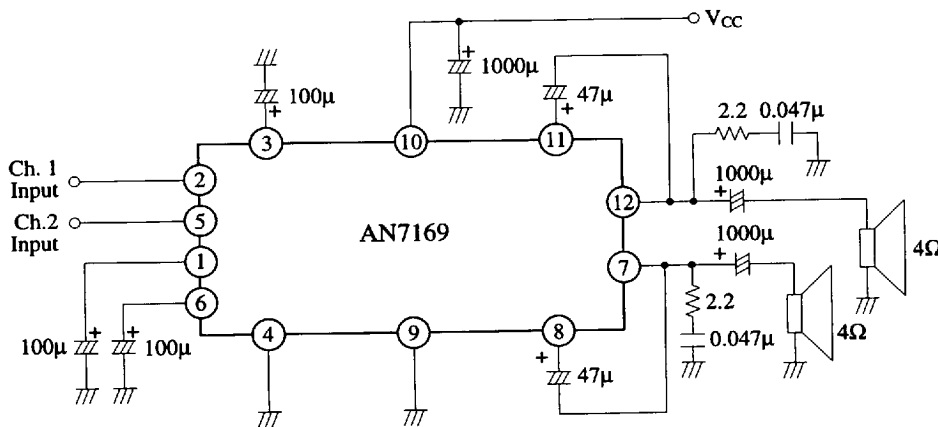
Operating Voltage Range: V<sub>CC</sub> = 7.0V ~ 20.0V

\*1 R<sub>θj-c</sub> = 3°C/W \*2 Voltage applied time = 0.2s

## ■ Electrical Characteristics (V<sub>CC</sub>=13.2V, R<sub>L</sub>=4Ω, f=1kHz, Ta=25°C)

Item	Symbol	Condition	min.	typ.	max.	Unit
Quiescent Current	I <sub>CQ</sub>	V <sub>in</sub> = 0mV	30	55	100	mA
Total Harmonic Distortion	THD	P <sub>O</sub> = 0.5W, f = 1kHz		0.06	0.5	%
		P <sub>O</sub> = 0.5W, f = 100Hz		0.07		
		P <sub>O</sub> = 0.5W, f = 10kHz		0.15		
Maximum Output Power	P <sub>O</sub>	THD = 10%	5.0	5.7	W	
		THD = 10%, R <sub>L</sub> = 2Ω		8.9		
		THD = 10%, R <sub>L</sub> = 8Ω		3.1		
Voltage Gain	G <sub>v</sub>	P <sub>O</sub> = 0.5W	45	47	49	dB
Output Noise Voltage	V <sub>no</sub>	R <sub>g</sub> = 10kΩ, 1000pF, f = 15Hz~30kHz, 12dB/OCT		0.5	1.5	mV
		R <sub>g</sub> = 10kΩ, 1000pF, Without filter		0.65		
Channel Balance	CB	P <sub>O</sub> = 0.5W		0	1	dB
Channel Separation	CS	P <sub>O</sub> = 0.5W	40	50		dB
Ripple Rejection	RR	R <sub>g</sub> = 10kΩ, V <sub>r</sub> = 280mV, f <sub>r</sub> = 120Hz	35	45		dB
Offset Voltage	V <sub>O(offset)</sub>	V <sub>in</sub> = 0mV		0	200	mV

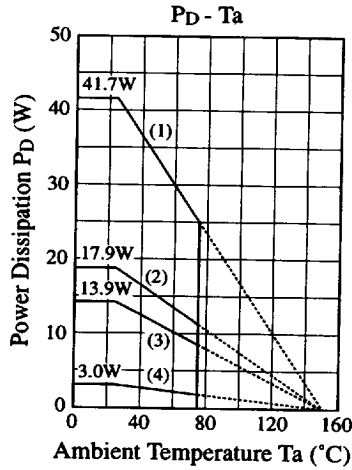
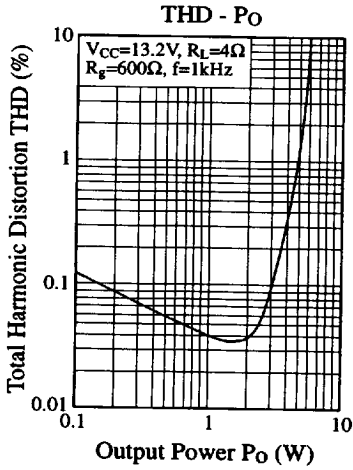
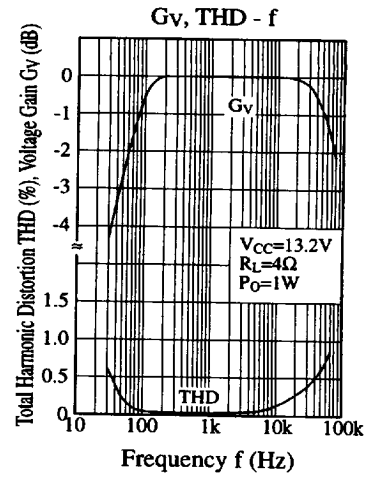
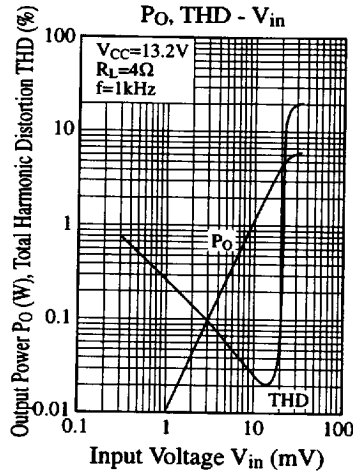
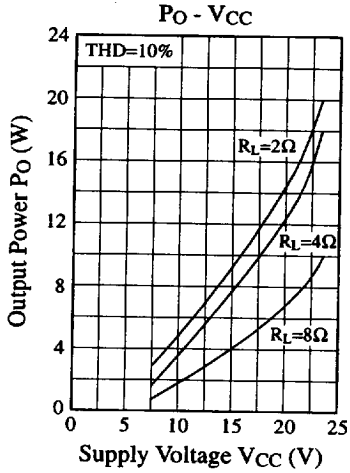
## ■ Application Circuit



■ 6932852 0013826 06T ■  
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Panasonic

■ Characteristics Curve



- (1)  $T_c=T_a$  ( $\theta_{j-c}=3^\circ C/W$ )
- (2) With a  $100cm^2 \times 3mm$  Al heat sink (black colour coated) or a  $200cm^2 \times 2mm$  Al heat sink (not lacquered)
- (3) With a  $100cm^2 \times 2mm$  Al heat sink (not lacquered)
- (4) Without heat sink

■ Printed Circuit Board Layout (Scale: 1:1)

