

# AN7174K

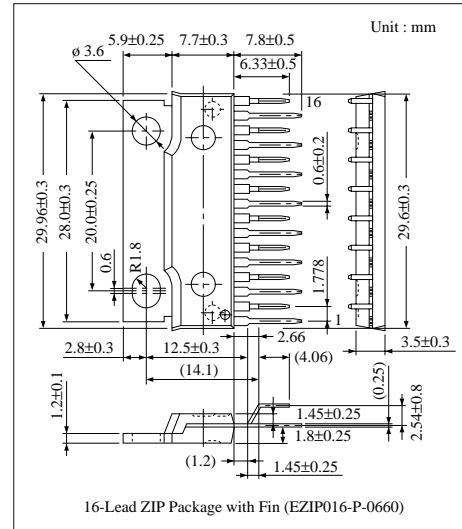
## Dual BTL 14W Audio Power Amplifier Circuit

### ■ Overview

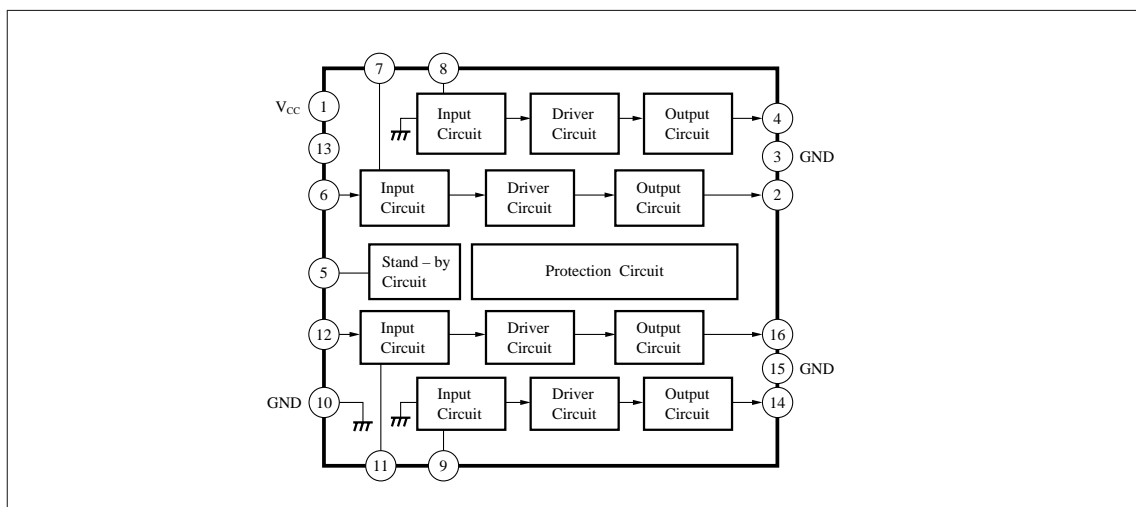
The AN7174K is an integrated circuit for 14W (13.2V, 4Ω) output power amplifier circuit. Two BTL amplifiers are built-in on a single chip and stereo operation is possible. It is highly reliable due to protection circuits built-in. The built-in stand-by circuit makes it possible to switch the circuit ON/OFF with a charge mode to power supply pin.

### ■ Features

- High output power (BTL 14W × 2)
- Stand-by circuit built-in
- Protection circuits built-in (temperature, overvoltage,  $V_{OUT}-GND$  short, Load short,  $V_{OUT}-V_{CC}$  short)
- Low shock noise from power ON/OFF operation
- Fewer external parts
- Highly stable operation



### ■ Block Diagram



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

Parameter	Symbol	Rating	Unit
Supply Voltage <small>Note 1)</small>	V <sub>CC</sub>	24	V
Peak Supply Voltage <small>Note 2)</small>	V <sub>CC(surge)</sub>	50	V
Supply Current	I <sub>CC</sub>	6	A
Power Dissipation <small>Note 3)</small>	P <sub>D</sub>	62.5	W
Operating Ambient Temperature	T <sub>opr</sub>	- 30 ~ + 75	°C
Storage Temperature	T <sub>stg</sub>	- 55 ~ + 150	°C

Note 1) No Signal

Note 2) Time= 0.2s

Note 3) R<sub>θj-c</sub> = 2°C/W

### ■ Recommended Operating Range (Ta = 25°C)

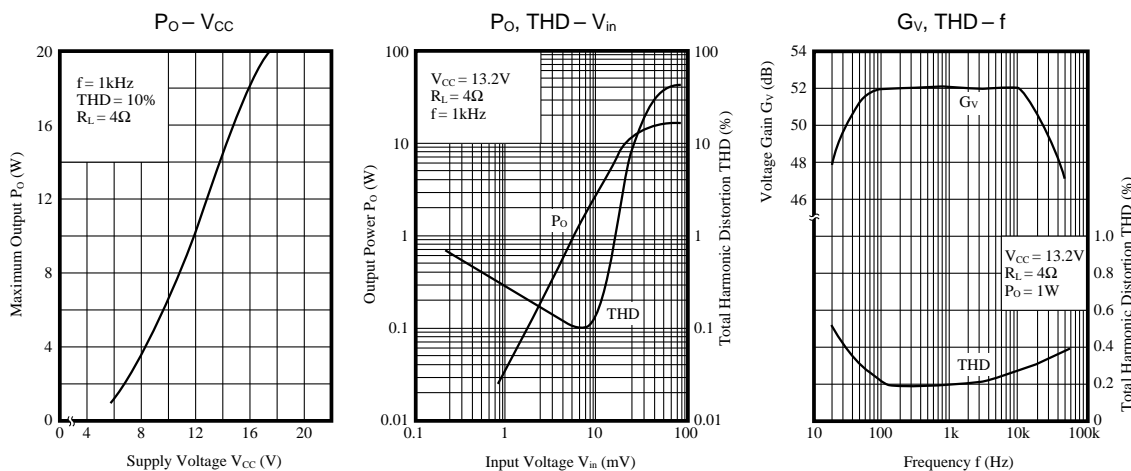
Parameter	Symbol	Range
Operating Supply Voltage Range	V <sub>CC</sub>	8V ~ 18V

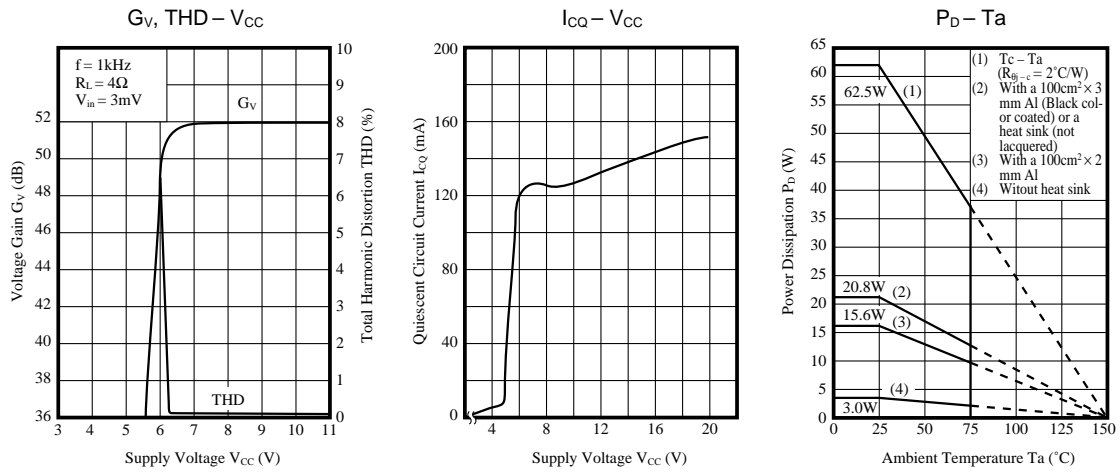
### ■ Electrical Characteristics (V<sub>CC</sub> = 13.2V, R<sub>L</sub> = 4Ω, f = 1kHz, Ta = 25°C)

Parameter	Symbol	Condition	min.	typ.	max.	Unit
Quiescent Circuit Current	I <sub>CQ</sub>	V <sub>in</sub> = 0mV	—	120	200	mA
Output Noise Voltage	V <sub>no</sub> *	V <sub>in</sub> = 0mV, R <sub>g</sub> = 10kΩ	—	0.6	1.5	mV
Voltage Gain	G <sub>V</sub>	V <sub>in</sub> = 5mV	50.5	52.5	54.5	dB
Total Harmonic Distortion	THD	V <sub>in</sub> = 5mV	—	0.2	0.75	%
Maximum Output Power (4Ω)	P <sub>O</sub>	THD = 10%	9	12.5	—	W
Ripple Rejection Ratio	RR *	R <sub>g</sub> = 0Ω, V <sub>in</sub> = 0mV, Ripple = 300mV, 120Hz	35	40	—	dB
Output Offset Voltage	V <sub>O(offset)</sub>	V <sub>in</sub> = 0mV	-300	0	300	mV
Channel Balance	CB	V <sub>in</sub> = 5mV	-1	0	1	dB
Total Harmonic Distortion	THD	V <sub>in</sub> = 5mV, 100Hz	—	0.26	—	%
Total Harmonic Distortion	THD	V <sub>in</sub> = 5mV, 10kHz	—	0.45	—	%
Frequency Characteristics	f <sub>CH</sub>	V <sub>in</sub> = 5mV, -3dB down	—	22	—	kHz
Frequency Characteristics	f <sub>CL</sub>	V <sub>in</sub> = 5mV, -3dB down	—	21	—	Hz
Quiescent Circuit Current at Stand-by Pin	I <sub>CQ(STBY-ON)</sub>	Stand-by Pin ON	—	21	—	μA
Crosstalk	CT	V <sub>in</sub> = 5mV, R <sub>g</sub> = 10kΩ	—	61	—	dB

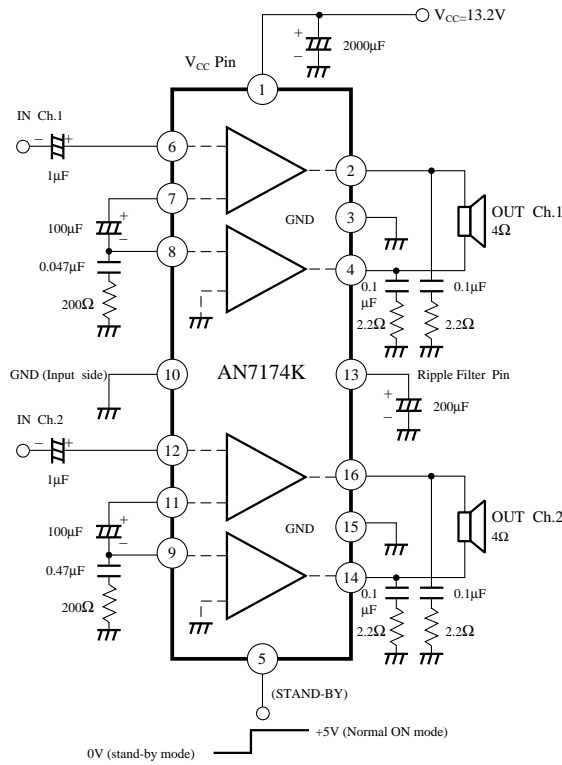
\* With 15Hz ~ 30kHz (12dB/oct) filter

### ■ Characteristics Curve





■ Application Circuit

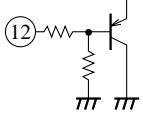
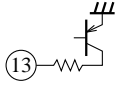
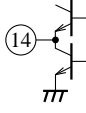
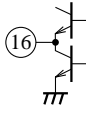


Note) 300mV, 120Hz ripple component should be applied at the measurement of ripple rejection ratio.

### ■ Pin Descriptions

Pin No.	Pin Name	Description	Equivalent Circuit
1	Supply Pin	Supply connection pin	
2	Output Ch.1	Ch.1 positive-phase output pin	
3	GND (Output Ch.1)	GND pin for Ch.1 output	
4	Output Ch.1	Ch.1 reverse-phase output pin	
5	Stand-by	Circuit mode (stand-by ↔ operation) switching pin	
6	Input Ch.1	Ch.1 input signal applied pin	
7	Negative Feedback Ch.1	Ch.1 negative feedback pin (+)	
8	Negative Feedback Ch.1	Ch.1 negative feedback pin (-)	
9	Negative Feedback Ch.2	Ch.2 negative feedback pin (-)	
10	GND (Input)	GND pin for input signal source	
11	Negative Feedback Ch.2	Ch.2 negative feedback pin (+)	

### ■ Pin Descriptions (Cont.)

Pin No.	Pin Name	Description	Equivalent Circuit
12	Input Ch.2	Ch.2 input signal applied pin	
13	Ripple Filter	Supply ripple rejection pin	
14	Output Ch.2	Ch.2 reverse-phase output pin	
15	GND (Output Ch.2)	GND pin for Ch.2 output	—
16	Output Ch.2	Ch.2 positive-phase output pin	

### ■ Precautions on use

1. Thermal breaking protection  
The protective operation starts at the chip temperature of  $150^{\circ}\text{C}\pm 5^{\circ}\text{C}$ .
2. Overvoltage protection  
The protective operation starts at  $V_{\text{CC}} - 26\text{V}$ .
3. Ground fault protection  
The protective operation starts when the contact resistance dropped below  $0.3\Omega$ .
4. Load shortcircuit protection  
The protective operation starts when the contact resistance dropped below  $0.3\Omega$ .
5. Atmospheric fault protection  
The protective operation starts only when a shortcircuit between pins occurred.
6. TAB shortcircuit  
Even TAB short-circuiting with the GND potential causes no breaking trouble.
7. The operation remains normal even when the load is  $2\Omega$ .
8. When the chip temperature abnormally rose, the temperature protection circuit gets actuated, but it is automatically reset when the chip temperature dropped below the set level.