

# AN7171NK, AN7176K

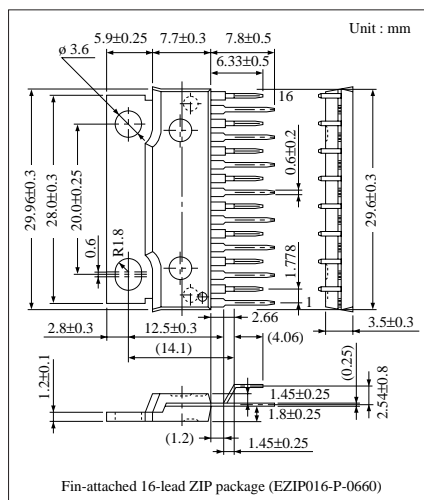
## Dual BTL 14W Audio Power Amplifier Circuits

### ■ Overview

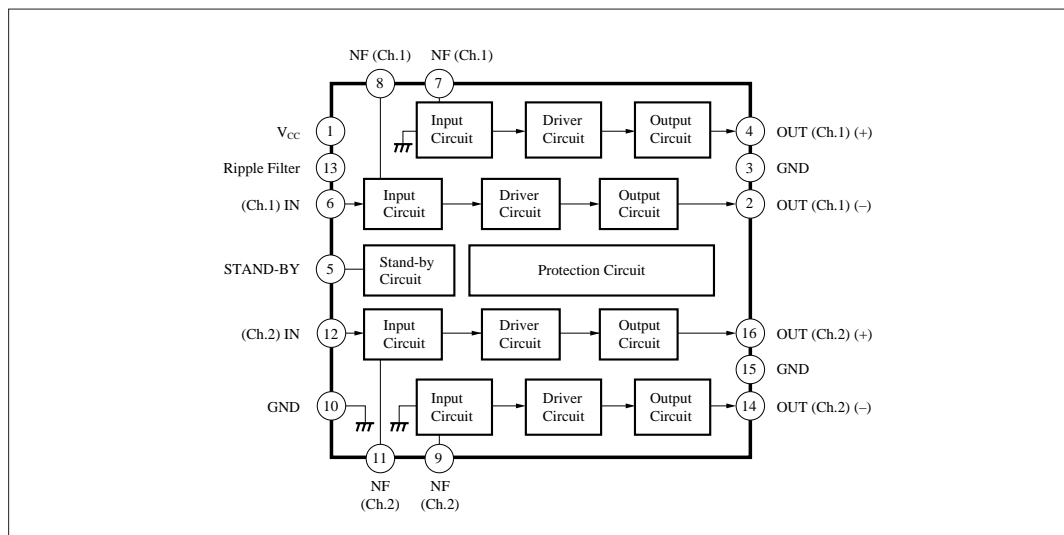
The AN7171NK and AN7176K are ICs for power amplification of 14W (13.2V, 4Ω) output. It can provide stereo operation since two BTL amplifiers are incorporated in a chip. It incorporates various protective circuits, thus providing high reliability. The circuits can be turned on or off with supply pins energized, because the stand-by circuit is built-in.

### ■ Features

- Two BTL 14W outputs built-in
- Stand-by circuit built-in
- Various protective circuits (for temperature, or against over-voltage, short-circuit between output and earth and between output and  $V_{CC}$ , load short-circuit)
- Small shock noise at power ON/OFF
- Fewer external components required
- Good oscillation stability



### ■ Block Diagram



### Pin Descriptions

Pin No.	Pin Name	Pin No.	Pin Name
1	V <sub>CC</sub>	9	Negative Feedback Ch.2
2	Output Ch.1 (+)	10	GND (Input)
3	GND (Output Ch.1)	11	Negative Feedback Ch.2
4	Output Ch.1 (–)	12	Input Ch.2
5	Stand-by	13	Ripple Filter
6	Input Ch.1	14	Output Ch.2 (–)
7	Negative Feedback Ch.1	15	GND (Output Ch.2)
8	Negative Feedback Ch.1	16	Output Ch.2 (+)

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

Parameter	Symbol	Rating	Unit
Supply Voltage	V <sub>CC</sub> <sup>Note 1)</sup>	24	V
Peak Supply Voltage	V <sub>CC (surge)</sub> <sup>Note 2)</sup>	50.0	V
Supply Current	I <sub>CC</sub>	6.0	A
Power Dissipation	P <sub>D</sub> <sup>Note 3)</sup>	37.5 <sup>Note 4)</sup>	W
Operating Ambient Temperature	T <sub>opr</sub>	– 30 ~ + 75	°C
Storage Temperature	T <sub>stg</sub>	– 55 ~ + 150	°C

Note 1) When no signals

Note 2) Time = 0.2s

Note 3) R<sub>θj-c</sub> = 2°C/W

Note 4) Ta = 75°C

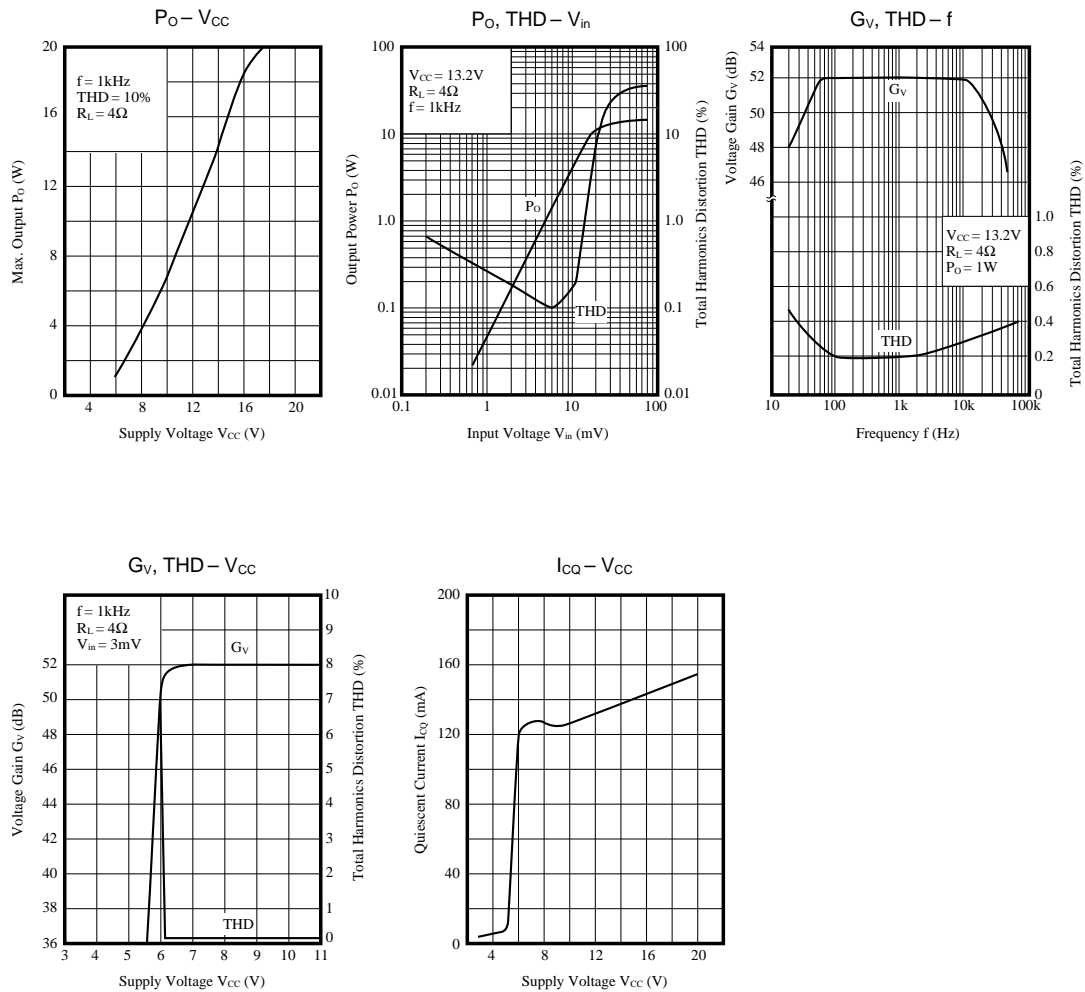
### Recommended Operating Range (Ta = 25°C)

Parameter	Symbol	Range
Operating Supply Voltage Range	V <sub>CC</sub>	8.0V ~ 18.0V

### 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 Current	I <sub>CQ</sub>	V <sub>in</sub> = 0mV	—	120	200	mA	
Output Noise Voltage <sup>Note)</sup>	V <sub>no</sub>	V <sub>in</sub> = 0mV, R <sub>g</sub> = 10kΩ	—	0.60	1.50	mVrms	
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	—	0.20	0.75	%	
Max. Output Power (4Ω)	P <sub>O</sub>	THD= 10%	9.0	12.5	—	W	
Ripple Rejection Ratio <sup>Note)</sup>	RR	R <sub>g</sub> = 0Ω, V <sub>in</sub> = 0mV, Ripple= 300mVrms, 120Hz	35	40	—	dB	
Output Offset Voltage	V <sub>O (offset)</sub>	R <sub>g</sub> = 0Ω	−200	0	+ 200	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	
Stand-by Current	I <sub>STB</sub>	Stand-by Pin ON	AN7171NK	—	21	—	μA
			AN7176K	400	650	1000	μA
Crosstalk	CT	V <sub>in</sub> = 5mV, R <sub>g</sub> = 10kΩ	—	61	—	dB	

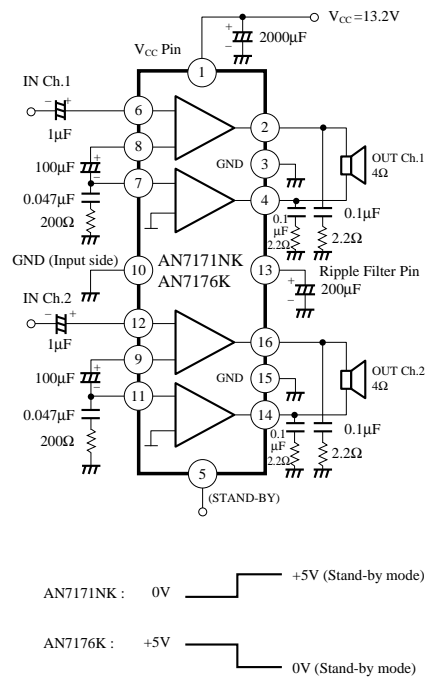
Note) With 15Hz to 30kHz (12dB/OCT) filter



### ■ Precautions on use

1. Always attach an outside heat sink to use the chip. In addition, the outside heat sink must be fastened onto a chassis for use.
2. Connect the radiation fin to the GND potential.
3. Prevent atmospheric and ground faults, and load short-circuit.
4. The temperature protective circuit gets actuated when  $T_j$  = approx.  $150^\circ\text{C}$ , but it is automatically reset when the chip temperature drops below the above set level.
5. The overvoltage protective circuit starts the protective operation at  $V_{CC}26\text{V}$ .
6. The ground fault protective circuit starts the protective operation at  $0.3\Omega$  or less of contact resistance.
7. The load short-circuit protective circuit starts the protective operation at  $0.3\Omega$  or less of contact resistance.
8. The atmospheric fault protective circuit protects the chip only from short-circuit between pins.
9. Take into consideration the heat radiation design particularly when  $V_{CC}$  is set high or when the load is  $2\Omega$ .

### ■ Application Circuit



### ■ Printed Circuit Board Layout

