

# **AN7171NK, AN7176K**

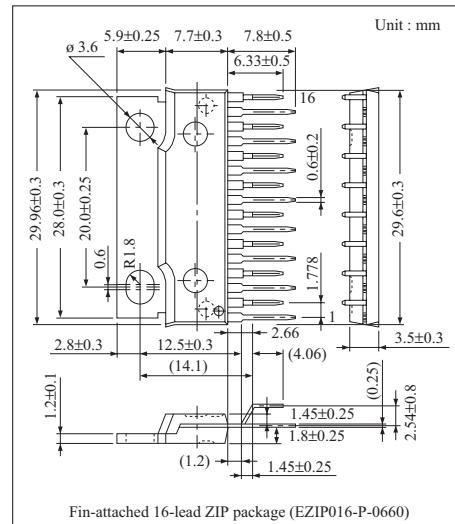
## Dual BTL 14W Audio Power Amplifier Circuits

## ■ Overview

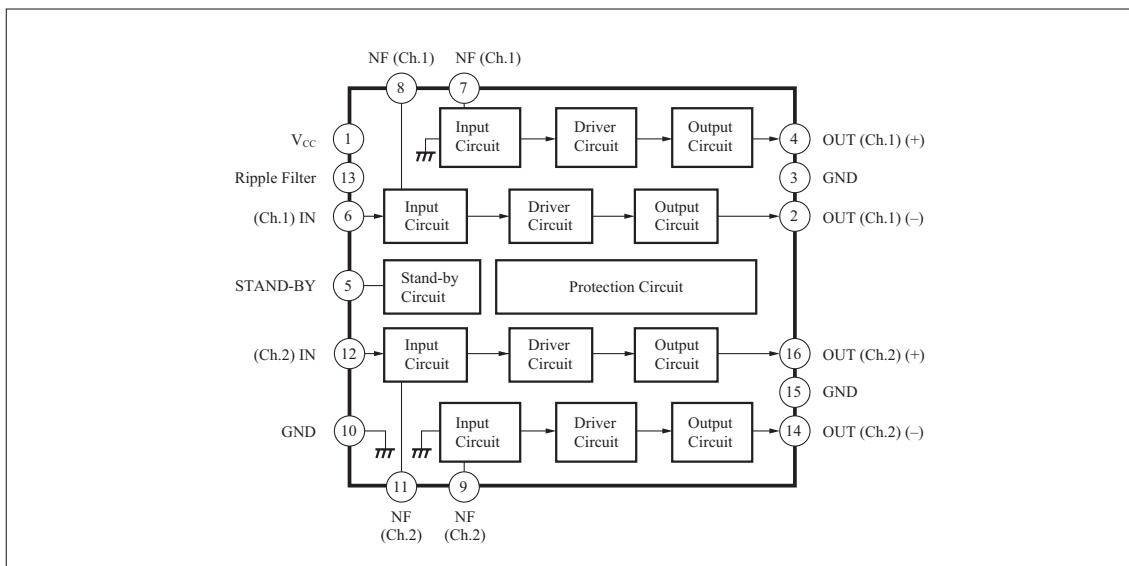
The AN7171NK and AN7176K are ICs for power amplification of 14W (13.2V, 4Ω) output. It can provide stereo operation since two BTL amplifiers are incorporated in a chip. It incorporates various protective circuits, thus providing high reliability. The circuits can be turned on or off with supply pins 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> Note 1)	24	V
Peak Supply Voltage	V <sub>CC</sub> (surge) Note 2)	50.0	V
Supply Current	I <sub>CC</sub>	6.0	A
Power Dissipation	P <sub>D</sub> Note 3)	37.5 Note 4)	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>ej - c</sub> = 2°C/W

Note 4) Ta = 75°C

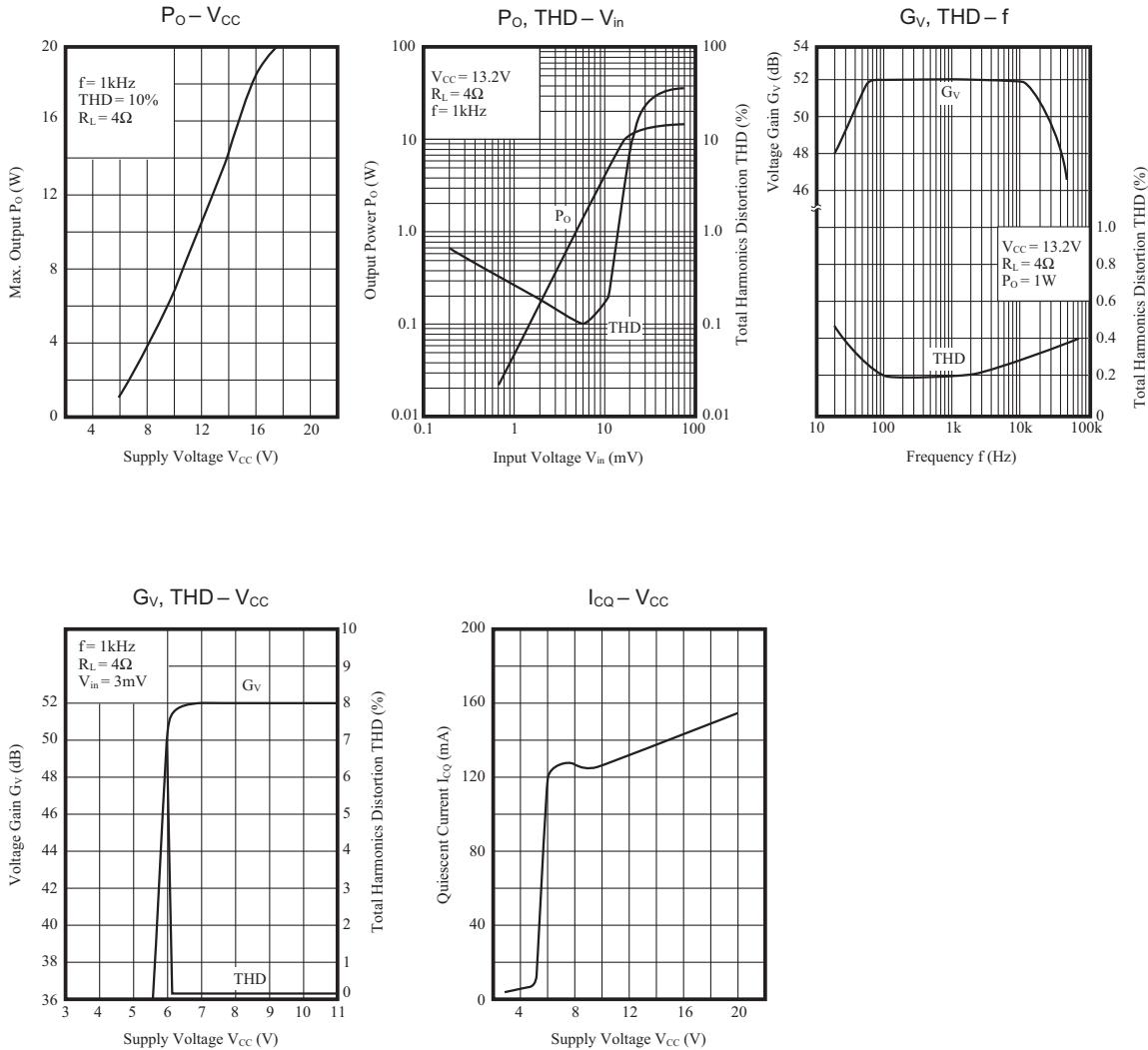
### ■ Recommended Operating Range (Ta = 25°C)

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 Note)	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 Note)	RR	R <sub>g</sub> = 0Ω, V <sub>in</sub> = 0mV, Ripple= 300mVrms, 120Hz	35	40	—	dB
Output Offset Voltage	V <sub>O</sub> (offset)	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	—
			AN7176K	400	650	1000
Crosstalk	CT	V <sub>in</sub> = 5mV, R <sub>g</sub> = 10kΩ	—	61	—	dB

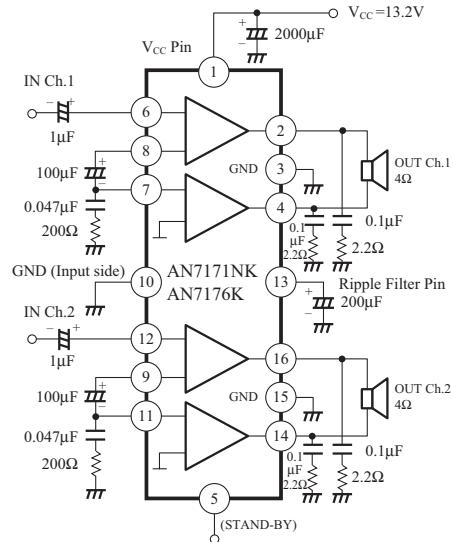
Note) With 15Hz to 30kHz (12dB/OCT) filter



### ■ 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<sub>j</sub> = approx. 150°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<sub>cc</sub> 26V.
6. The ground fault protective circuit starts the protective operation at 0.3Ω or less of contact resistance.
7. The load short-circuit protective circuit starts the protective operation at 0.3Ω 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<sub>cc</sub> is set high or when the load is 2Ω.

### ■ Application Circuit



AN7171NK : 0V → +5V (Stand-by mode)

AN7176K : +5V → 0V (Stand-by mode)

### ■ Printed Circuit Board Layout

