

AN7171NK, AN7176K

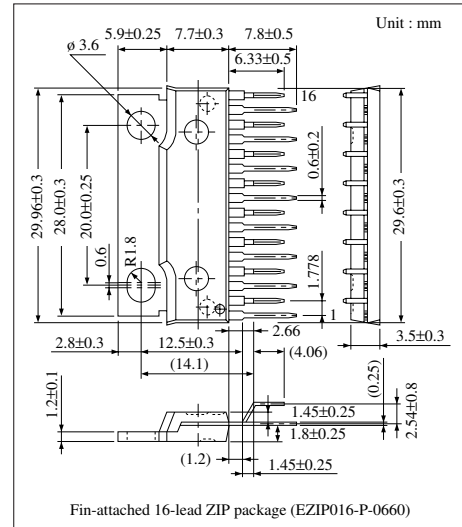
Dual BTL 14W Audio Power Amplifier Circuits

■ Overview

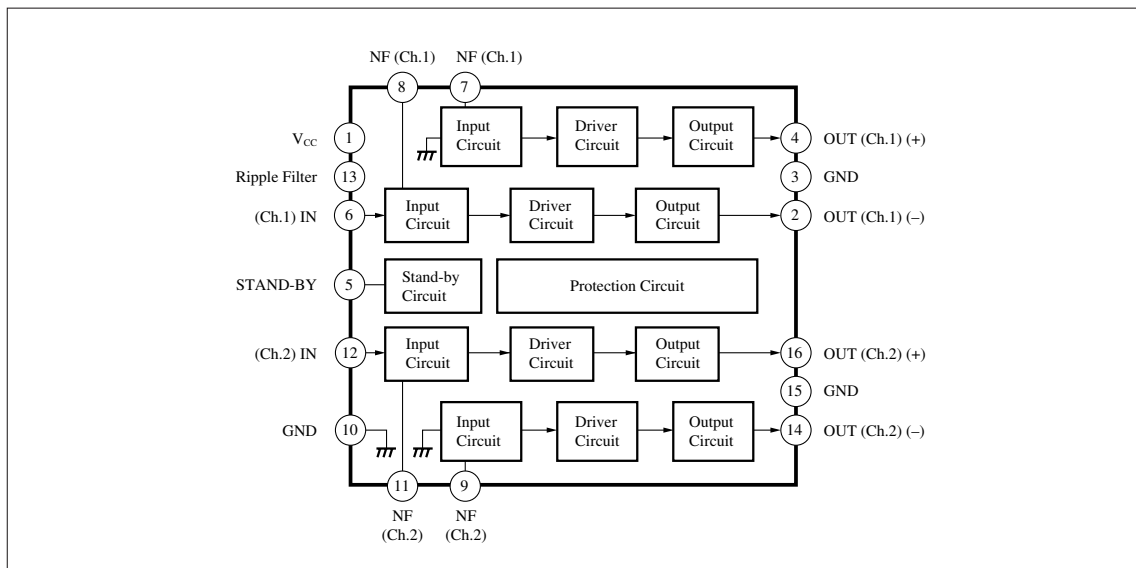
The AN7171NK and AN7176K are ICs for power amplification of 14W (13.2V, 4Ω) output. It can provide stereo operation since two BTL amplifiers are incorporated in a chip. It incorporates various protective circuits, thus providing high reliability. The circuits can be turned on or off with supply pins 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 _{CC}	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 _{CC} ^{Note 1)}	24	V
Peak Supply Voltage	V _{CC (surge)} ^{Note 2)}	50.0	V
Supply Current	I _{CC}	6.0	A
Power Dissipation	P _D ^{Note 3)}	37.5 ^{Note 4)}	W
Operating Ambient Temperature	T _{opr}	- 30 ~ + 75	°C
Storage Temperature	T _{stg}	- 55 ~ + 150	°C

Note 1) When no signals

Note 2) Time = 0.2s

Note 3) R_{θj-c} = 2°C/W

Note 4) Ta = 75°C

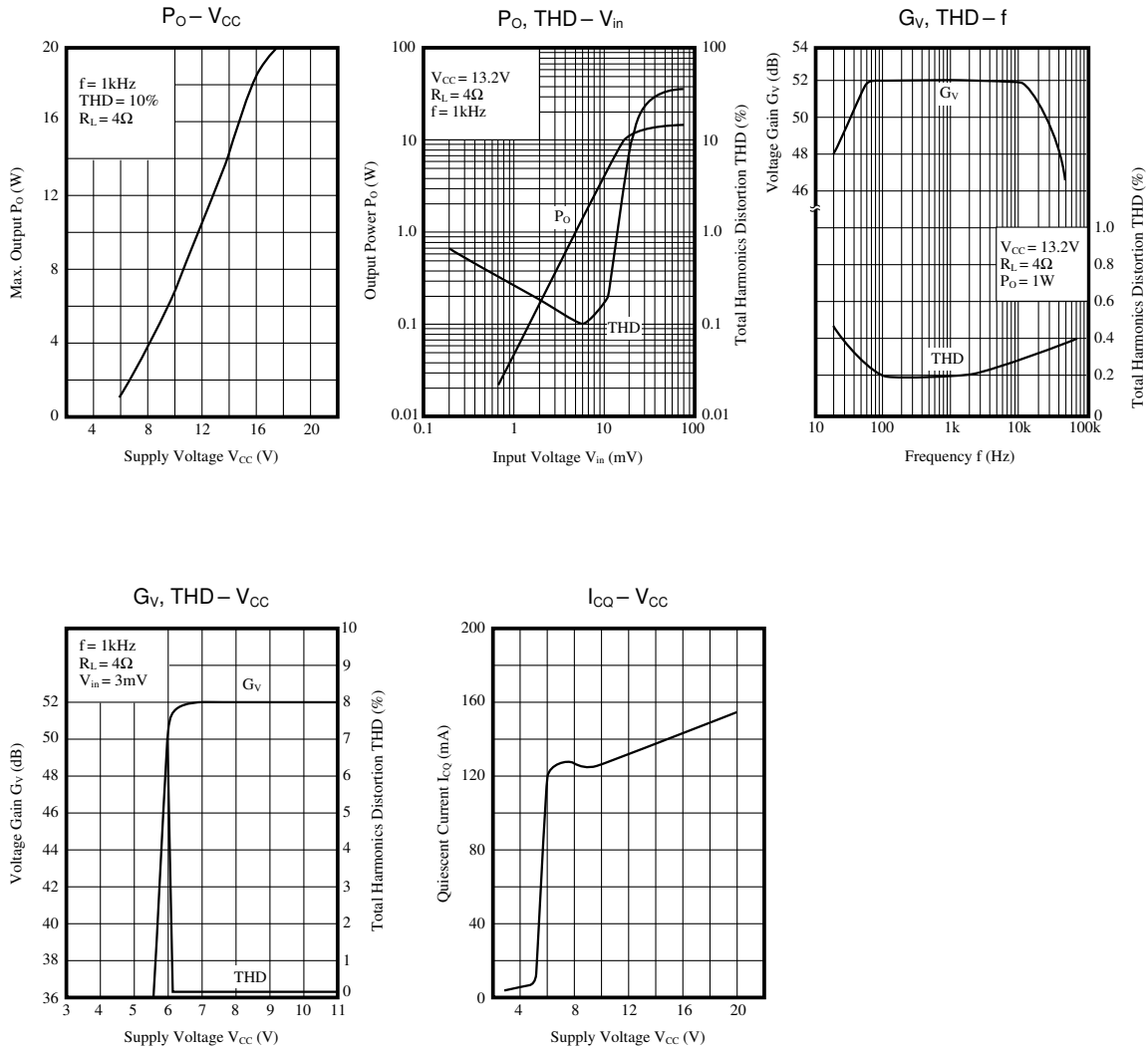
■ Recommended Operating Range (Ta = 25°C)

Parameter	Symbol	Range
Operating Supply Voltage Range	V _{CC}	8.0V ~ 18.0V

■ Electrical Characteristics (V_{CC} = 13.2V, R_L = 4Ω, f = 1kHz, Ta = 25°C)

Parameter	Symbol	Condition	min.	typ.	max.	Unit	
Quiescent Current	I _{CQ}	V _{in} = 0mV	—	120	200	mA	
Output Noise Voltage ^{Note)}	V _{no}	V _{in} = 0mV, R _g = 10kΩ	—	0.60	1.50	mVrms	
Voltage Gain	G _v	V _{in} = 5mV	50.5	52.5	54.5	dB	
Total Harmonic Distortion	THD	V _{in} = 5mV	—	0.20	0.75	%	
Max. Output Power (4Ω)	P _O	THD = 10%	9.0	12.5	—	W	
Ripple Rejection Ratio ^{Note)}	RR	R _g = 0Ω, V _{in} = 0mV, Ripple = 300mVrms, 120Hz	35	40	—	dB	
Output Offset Voltage	V _{O (offset)}	R _g = 0Ω	-200	0	+ 200	mV	
Channel Balance	CB	V _{in} = 5mV	-1	0	+ 1	dB	
Total Harmonic Distortion	THD	V _{in} = 5mV, 100Hz	—	0.26	—	%	
Total Harmonic Distortion	THD	V _{in} = 5mV, 10kHz	—	0.45	—	%	
Frequency Characteristics	f _{CH}	V _{in} = 5mV, -3dB down	—	22	—	kHz	
Frequency Characteristics	f _{CL}	V _{in} = 5mV, -3dB down	—	21	—	Hz	
Stand-by Current	I _{STB}	Stand-by Pin ON	AN7171NK	—	21	—	μA
			AN7176K	400	650	1000	μA
Crosstalk	CT	V _{in} = 5mV, R _g = 10kΩ	—	61	—	dB	

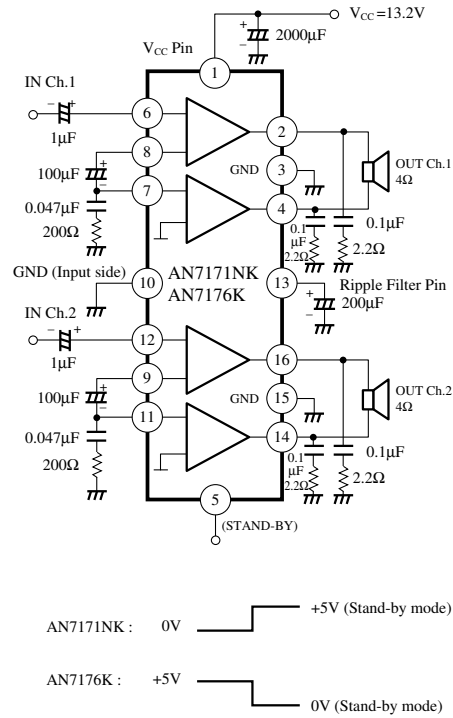
Note) With 15Hz to 30kHz (12dB/OCT) filter



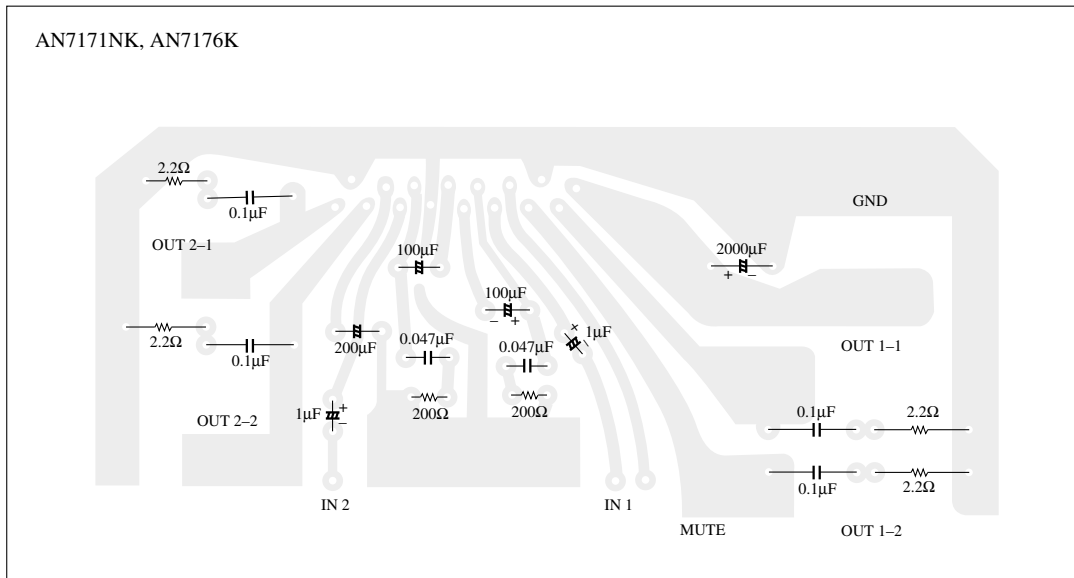
■ Precautions on use

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 $T_j = \text{approx. } 150^\circ\text{C}$, 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 0.3Ω 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_{CC} is set high or when the load is 2Ω .

■ Application Circuit



■ Printed Circuit Board Layout



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