AN7125

Dual Channel BTL Power Amplifier

■ Overview

AN7125 is a monolithic integrated circuit designed for 13.5 W (12 V,4 Ω) output audio power amplifier.It is a dual channel BTL IC suitable for stereo operation in radio cassette and TV application.

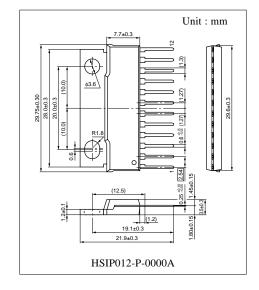
■ Features

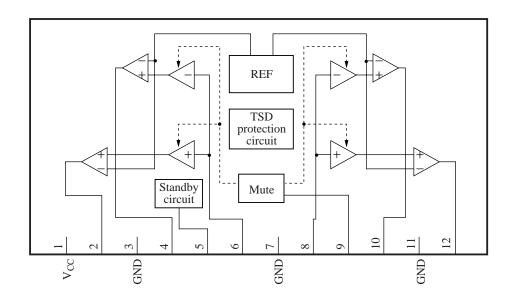
- Built-in muting pin
- Built-in stand by pin
- Built-in thermal shutdown protection circuit
- Built-in current limiting circuit
- High power : $(13.5 \text{ W}/12 \text{ V}/4 \Omega)$ $(13.0 \text{ W}/15 \text{ V}/8 \Omega)$
- Few external components
- Operating voltage range 6 V ~ 18 V (12 V typ.)

Applications

• Radio-cassette

■ Block Diagram





■ Pin Descriptions

Pin No.	Description	Pin No.	Description
1	V _{CC}	7	Pre GND
2	ch.1 + ve Phase Output	8	ch.2 Input
3	ch.1 Output GND	9	Mute
4	ch.1-ve Phase Output	10	ch.2 –ve Phase Output
5	Standby	11	ch.2 Output GND
6	ch.1 Input	12	ch.2 +ve Phase Output

■ Absolute Maximum Ratings

Parameter	Symbol	Ratings	Unit
Supply voltage *1	V _{CC}	24	V
Supply current	I_{CC}	6.0	A
Power dissipation *2	P_{D}	38.5	W
Operating ambient temperature	T_{opr}	-25 to +75	°C
Storage temperature	T _{stg}	-55 to +150	°C

Note) *1: Without input signal, V_{CC} is up to 24 V

■ Recommended Operating Range

Parameter	Symbol	Range	Unit
Supply voltage	V _{CC}	6.0 to 18.0	V

\blacksquare Electrical Caracteristics at V_{CC} = 12 V, R_L = 4 Ω , freq. = 1 kHz, 2 channel outputs, T_a = 25 °C

Parameter	Symbol	Conditions	Min	Тур	Max	Unit
Quiescent circuit current	I_{CQ}	$V_{IN} = 0 \text{ mV}$	_	100	210	mA
Output noise voltage *1	V _{NO}	$V_{IN} = 0 \text{ mV}, R_G = 6.2 \text{ k}\Omega$	_	0.27	0.5	mVrms
Voltage gain	G_{VC}	$V_{IN} = 20 \text{ mV}$	38	40	42	dB
Total harmonic distortion *2	THD	$V_{IN} = 20 \text{ mV}$	_	0.07	0.4	%
Maximum output power	Po	THD = 10 %	10	12	_	W
Channel balance	СВ	$V_{IN} = 20 \text{ mV}$	-1	0	1	dB
Channel crosstalk *2	CT	$V_{IN} = 20 \text{ mV}, R_G = 6.2 \text{ k}\Omega$	55	70	_	dB
Output offset voltage	V _{OFF}	$R_G = 6.2 \text{ k}\Omega$	-350	0	350	mV
Ripple rejection *1	RR	$V_R = 1 \ V_{rms}, f_R = 120 \ Hz, R_G = 6.2 \ k\Omega$	50	60	_	dB
Standby current	I_{STB}	$V_{IN} = 0 \text{ mV}$		1	10	μА
Muting effects *2	MT	$V_{IN} = 20 \text{ mV}$	70	80		dB

Note) *1: With a filter band 20 Hz to 20 kHz(12 dB/OCT)used.

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^{*2:} $T_a = 75$ °C.

^{*2}: With a filter band 400 Hz to 30 kHz used.

■ Terminal Equivalent Circuit

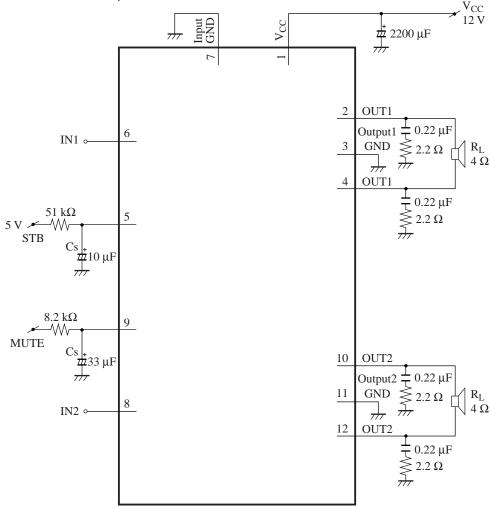
Pin No.	Equivalent Circuit	Function	Status
1	_	V _{CC} : V _{CC} input	typ.: 12 V
2	プリアンプ ドライバ回路 Pin?	ch.1 O/P: ch.1 positive phase output pin.	V _{CC} /2
3	ドライバ回路	ch.1 Power GND : ch.1 output power ground pin.	0 V
4	600 Ω 30 kΩ 30 V _{CC} /2	ch.1 O/P : ch.1 inverse phase output pin.	V _{CC} /2
5	$\begin{array}{c c} 1 \\ \hline \\ 5 \\ \hline \\ 5 \\ \hline \\ 6 \\ \hline \\ 8 \\ \hline \end{array}$	Standby: This is the standby control pin. STB off > 3.5 V STB on = 0 V/GND	V _{TH} = 2.8 V
6	200 Ω Pin6,8 30 kΩ	ch.1 Input: This is the amplifier input pin.	0 V
7	_	Pre GND : Input ground pin.	0 V

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■ Terminal Equivalent Circuit(continued)

Pin No.	Equivalent Circuit	Function	Status
8	200 Ω Pin6,8 30 kΩ	ch.2 Input: This is the amplifier input pin.	0 V
9	9 3.2 kΩ 3.6 kΩ 20 kΩ	Mute : Mute input pin. Mute on > 2.5 V Mute off = 0 V	V _{TH} = 1.5 V
10	プリアンプ「ドライバ回路」	ch.2 Output : ch.2 inverse phase output pin	V _{CC} /2
11	Pin10 12	ch.2 Power GND : ch.2 output power ground	0 V
12	600 Ω 30 kΩ (11) V _{CC} /2	ch.2 Output : ch.2 positive phase output pin	V _{CC} /2

■ Application Circuit Example



STB 'Off'	5 V
STB 'On'	0 V
Mute 'Off'	0 V
Mute 'On'	5 V

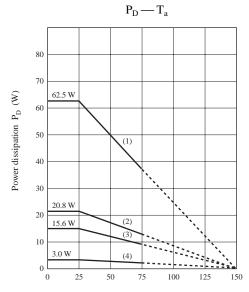
■ Application 's Precautions

- 1. External heatsink is needed when used. External heatsink should be fixed to the chassis.
- 2. Fin of the IC can be connected to GND.
- 3. Please prevent output to V_{CC} short and output to GND short.
- 4. The temperature protection circuit will operate at Tj around 150 °C. However, if temperature decrease, the protection circuit will automatically be decreased and resume normal operation.

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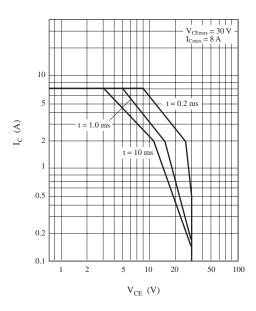
■ Technical Information

• HSIP012-P-0000A



- Ambient temperature T_a (°C)
- 1. $T_C = T_a$,62.5 W ($\theta_{j\text{-}c} = 2$ °C/W) 2. 20.83 W ($\theta f = 4.0$ °C/W) With a 100 cm² X 3 mm Al heat sink (black colour coated) or a 200 cm2 X 2 mm Al heat sink (not lacquered)
- 3. 15.63 W ($\theta_f = 6.0 \, ^{\circ}\text{C/W}$) With a 100 cm² X 2 mm Al heat sink (not lacquered)
- 4. 3.0 W at $T_a = 25$ °C($\theta_{j-a} = 42$ °C/W) Without heat sink

• Area of safe operation



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