

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.

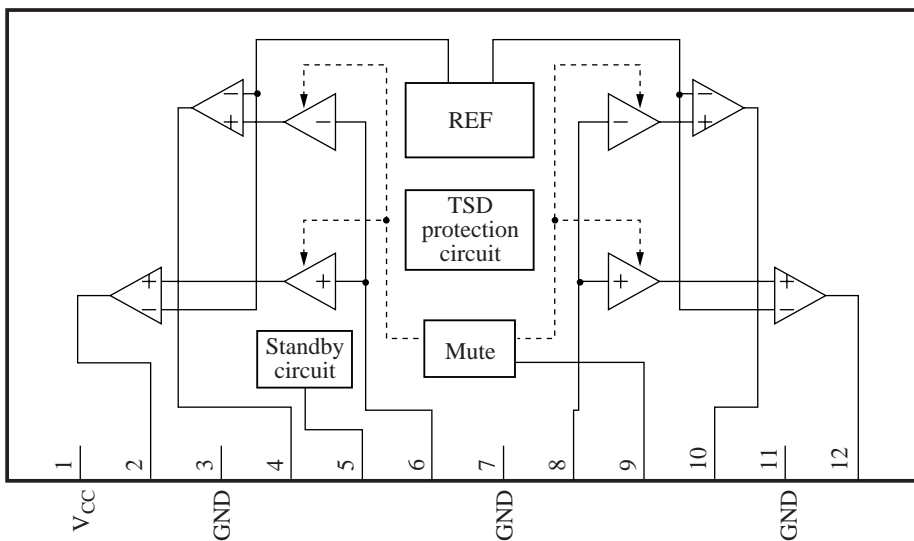
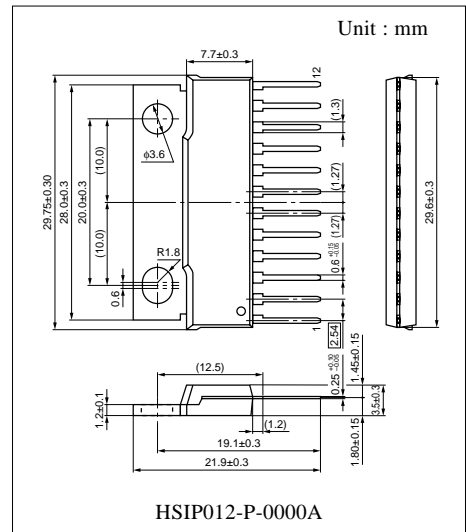
■ Features

- Built-in muting pin
- Built-in stand by pin
- Built-in thermal shutdown protection circuit
- Built-in current limiting circuit
- High power : (13.5 W/12 V/4 Ω)
(13.0 W/15 V/8 Ω)
- 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

*2 : T_a = 75 °C.

■ Recommended Operating Range

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

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

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Quiescent circuit current	I _{CQ}	V _{IN} = 0 mV	—	100	210	mA
Output noise voltage *1	V _{NO}	V _{IN} = 0 mV, R _G = 6.2 kΩ	—	0.27	0.5	mVrms
Voltage gain	G _{VC}	V _{IN} = 20 mV	38	40	42	dB
Total harmonic distortion *2	THD	V _{IN} = 20 mV	—	0.07	0.4	%
Maximum output power	P _O	THD = 10 %	10	12	—	W
Channel balance	CB	V _{IN} = 20 mV	-1	0	1	dB
Channel crosstalk *2	CT	V _{IN} = 20 mV, R _G = 6.2 kΩ	55	70	—	dB
Output offset voltage	V _{OFF}	R _G = 6.2 kΩ	-350	0	350	mV
Ripple rejection *1	RR	V _R = 1 V _{rms} , f _R = 120 Hz, R _G = 6.2 kΩ	50	60	—	dB
Standby current	I _{STB}	V _{IN} = 0 mV	—	1	10	μA
Muting effects *2	MT	V _{IN} = 20 mV	70	80	—	dB

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

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

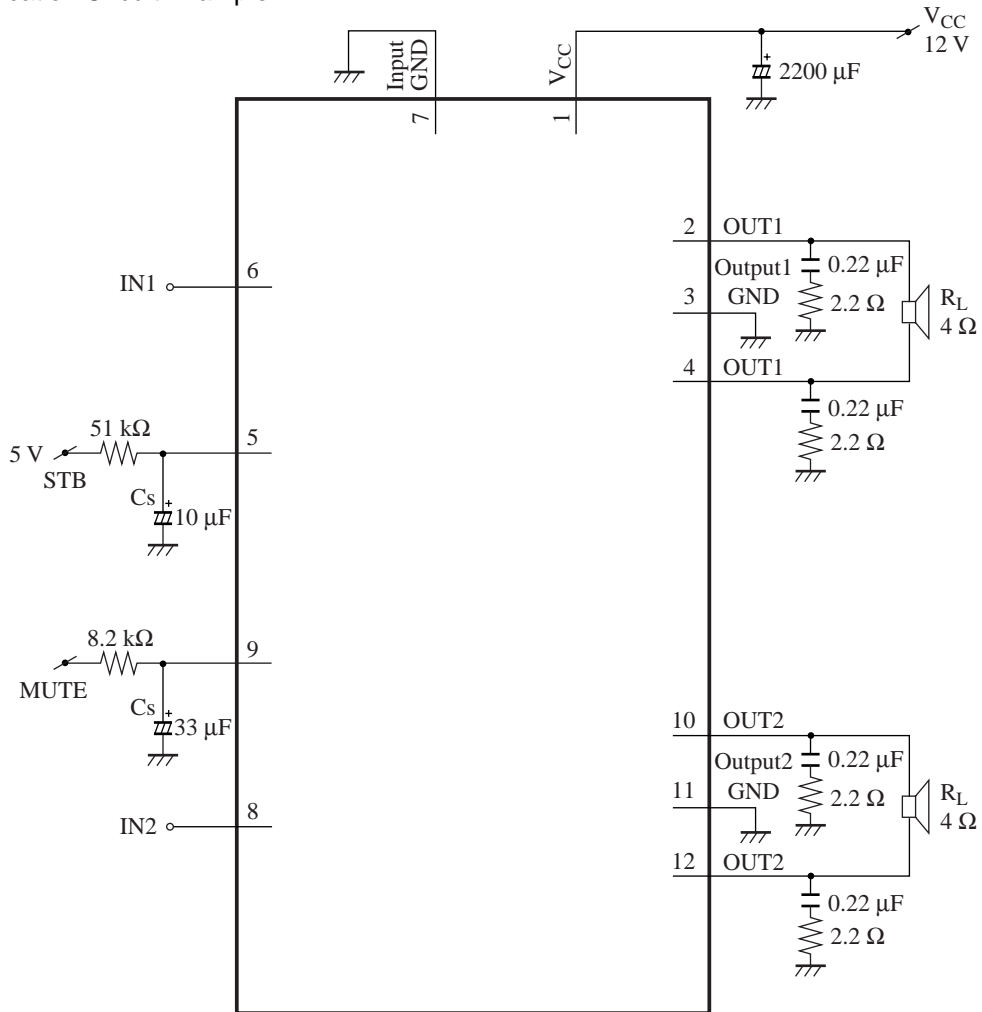
■ Terminal Equivalent Circuit

Pin No.	Equivalent Circuit	Function	Status
1	—	V _{CC} : V _{CC} input	typ. : 12 V
2		ch.1 O/P : ch.1 positive phase output pin.	V _{CC} /2
3		ch.1 Power GND : ch.1 output power ground pin.	0 V
4		ch.1 O/P : ch.1 inverse phase output pin.	V _{CC} /2
5		Standby : This is the standby control pin. STB off > 3.5 V STB on = 0 V/GND	V _{TH} = 2.8 V
6		ch.1 Input : This is the amplifier input pin.	0 V
7	—	Pre GND : Input ground pin.	0 V

■ Terminal Equivalent Circuit(continued)

Pin No.	Equivalent Circuit	Function	Status
8		ch.2 Input : This is the amplifier input pin.	0 V
9		Mute : Mute input pin. Mute on > 2.5 V Mute off = 0 V	$V_{TH} = 1.5 V$
10		ch.2 Output : ch.2 inverse phase output pin	$V_{CC}/2$
11		ch.2 Power GND : ch.2 output power ground	0 V
12		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

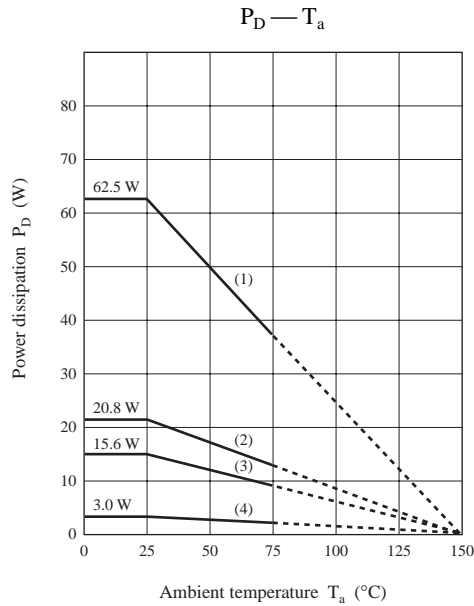
■ Application 's Precautions

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 T_j around 150 °C.

However, if temperature decrease, the protection circuit will automatically be decreased and resume normal operation.

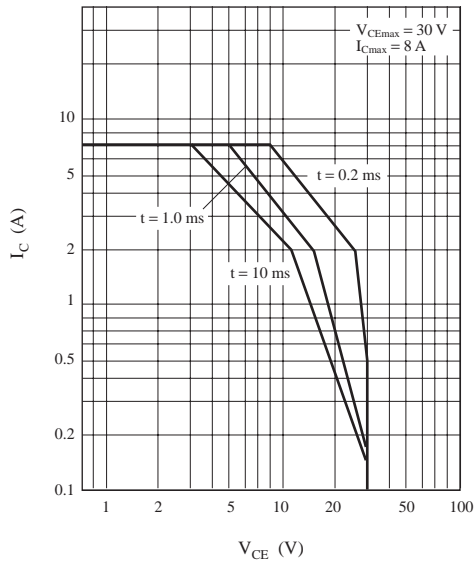
■ Technical Information

- HSIP012-P-0000A



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

• Area of safe operation



Request for your special attention and precautions in using the technical information and semiconductors described in this material

- (1) An export permit needs to be obtained from the competent authorities of the Japanese Government if any of the products or technologies described in this material and controlled under the "Foreign Exchange and Foreign Trade Law" is to be exported or taken out of Japan.
- (2) The technical information described in this material is limited to showing representative characteristics and applied circuit examples of the products. It does not constitute the warranting of industrial property, the granting of relative rights, or the granting of any license.
- (3) The products described in this material are intended to be used for standard applications or general electronic equipment (such as office equipment, communications equipment, measuring instruments and household appliances).
Consult our sales staff in advance for information on the following applications:
 - Special applications (such as for airplanes, aerospace, automobiles, traffic control equipment, combustion equipment, life support systems and safety devices) in which exceptional quality and reliability are required, or if the failure or malfunction of the products may directly jeopardize life or harm the human body.
 - Any applications other than the standard applications intended.
- (4) The products and product specifications described in this material are subject to change without notice for reasons of modification and/or improvement. At the final stage of your design, purchasing, or use of the products, therefore, ask for the most up-to-date Product Standards in advance to make sure that the latest specifications satisfy your requirements.
- (5) When designing your equipment, comply with the guaranteed values, in particular those of maximum rating, the range of operating power supply voltage and heat radiation characteristics. Otherwise, we will not be liable for any defect which may arise later in your equipment.
Even when the products are used within the guaranteed values, redundant design is recommended, so that such equipment may not violate relevant laws or regulations because of the function of our products.
- (6) When using products for which dry packing is required, observe the conditions (including shelf life and after-unpacking standby time) agreed upon when specification sheets are individually exchanged.
- (7) No part of this material may be reprinted or reproduced by any means without written permission from our company.

Please read the following notes before using the datasheets

- A. These materials are intended as a reference to assist customers with the selection of Panasonic semiconductor products best suited to their applications.
Due to modification or other reasons, any information contained in this material, such as available product types, technical data, and so on, is subject to change without notice.
Customers are advised to contact our semiconductor sales office and obtain the latest information before starting precise technical research and/or purchasing activities.
- B. Panasonic is endeavoring to continually improve the quality and reliability of these materials but there is always the possibility that further rectifications will be required in the future. Therefore, Panasonic will not assume any liability for any damages arising from any errors etc. that may appear in this material.
- C. These materials are solely intended for a customer's individual use.
Therefore, without the prior written approval of Panasonic, any other use such as reproducing, selling, or distributing this material to a third party, via the Internet or in any other way, is prohibited.

This datasheet has been download from:

www.datasheetcatalog.com

Datasheets for electronics components.