18 W BTL Audio Power Amplifier

HITACHI

ADE-207-329 (Z)

1st Edition Dec. 2000

Description

The HA13118 is power IC designed for component car stereo amplifiers. At 13.2 V to 4 Ω load, this power IC provides an output power of 18W with 10% distortion.

It is easy to design as this IC employs internal each protection circuit and the new small package.

Features

- Small outline package, easy to mount
- Internal each protection circuits
 - Surge protection circuit
 - Thermal shut-down circuit
 - Ground fault protection circuit
 - Power supply fault protection circuit

Absolute Maximum Ratings ($Ta = 25^{\circ}C$)

| Symbol | Rating | Unit | Note |
|------------------------|---|---|--|
| V _{cc} | 18 | V | |
| V _{cc} (DC) | 26 | V | 1 |
| V _{cc} (peak) | 50 | V | 2 |
| lo (peak) | 4 | А | |
| P _T | 15 | W | |
| θj — c | 3.5 | °C/W | |
| Tj | 150 | °C | |
| Topr | -30 to +80 | °C | |
| Tstg | -55 to +125 | °C | |
| | V_{cc} $V_{cc} (DC)$ $V_{cc} (peak)$ $Io (peak)$ P_{τ} $\theta j - c$ $T j$ $Topr$ | V_{cc} 18 V_{cc} (DC) 26 V_{cc} (peak) 50 lo (peak) 4 P_{τ} 15 $\theta j - c$ 3.5 Tj 150 Topr -30 to +80 | V_{cc} 18 V V_{cc} (DC) 26 V V_{cc} (peak) 50 V lo (peak) 4 A P_{τ} 15 W $\theta j - c$ 3.5 °C/W Tj 150 °C Topr -30 to +80 °C |

Notes: 1. Value at t = 30 sec.

2. Value at width tw = 200 ms and rise time tr = 1 ms.



Electrical Characteristics (V $_{\rm CC}$ = 13.2 V, f = 1 kHz, R $_{\rm L}$ = 4 $\Omega,$ Ta = 25 °C)

| Item | Symbol | Min | Тур | Max | Unit | Test Conditions |
|--------------------------------|----------------|-----|-----|------|------|--|
| Quiescent current | ۱ _۵ | 40 | 80 | 160 | mA | Vin = 0 |
| Input bias voltage | V _B | _ | 20 | 40 | mV | Vin = 0 |
| Output offset voltage | ΔV_{Q} | _ | | +330 | mV | Vin = 0 |
| Voltage gain | G _v | 53 | 55 | 57 | dB | Vin = -55 dBm |
| Output power | Pout | 15 | 18 | _ | W | $THD = 10~\% \qquad R_{\scriptscriptstyle L} = 4~\Omega$ |
| | | _ | 11 | _ | | $R_{L} = 8 \Omega$ |
| Total harmonic distortion | THD | _ | 0.2 | 1.0 | % | Pout = 1.5 W |
| Output noise voltage | WBN | — | 1.0 | 2.0 | mV | Rg = 10 kΩ, BW = 20 Hz 20 kHz |
| Supply voltage rejection ratio | SVR | 33 | 44 | — | dB | f = 500 Hz |
| Input resistance | Rin | 20 | 30 | 40 | kΩ | |
| Rolloff frequency | f_ | _ | 20 | _ | Hz | $\Delta Gv = -3 dB$ Low |
| | f _H | 10 | 20 | 40 | kHz | from f = 1 kHz Ref. High |

Block Diagram

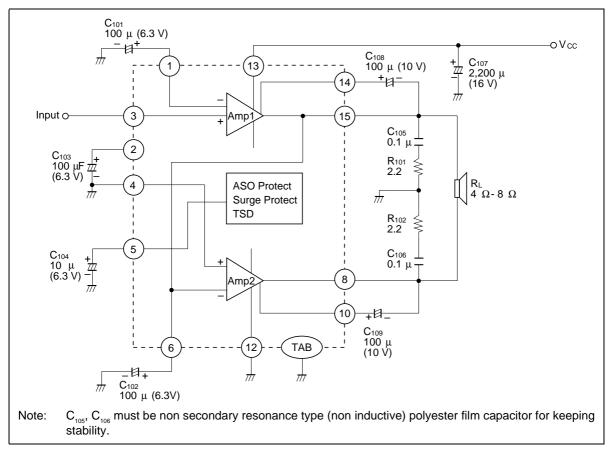


Figure 1 Typical Application Circuit

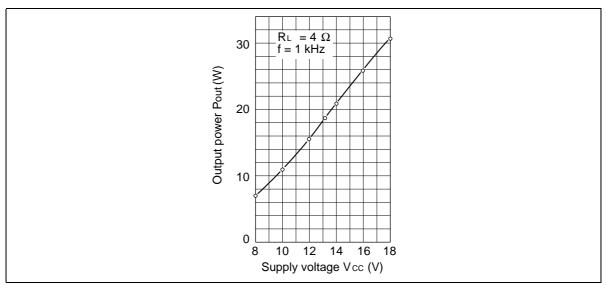


Figure 2 Output Power vs. Supply Voltage

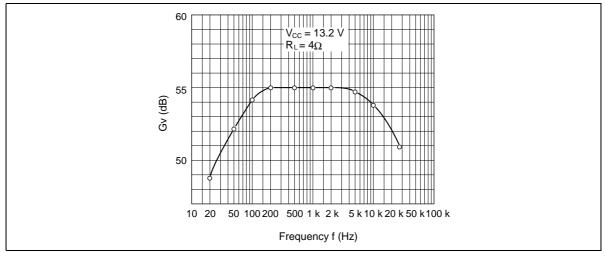


Figure 3 Voltage Gain vs. Frequency

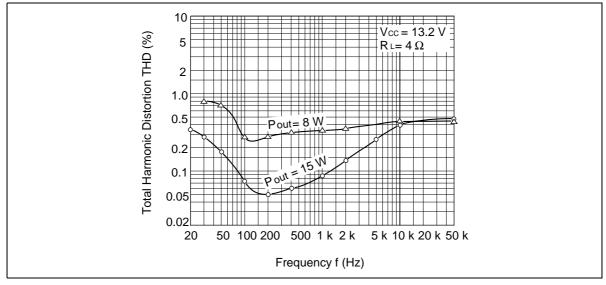


Figure 4 Total Harmonic Distortion vs. Frequency

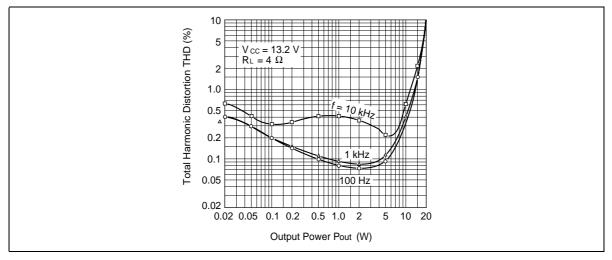


Figure 5 Total Harmonic Distortion vs. Output Power

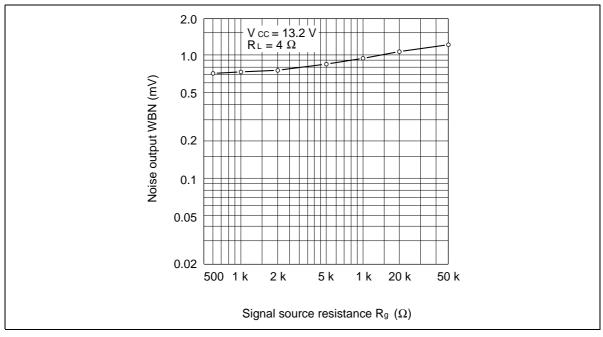


Figure 6 Noise Output vs. Signal Source Resistance

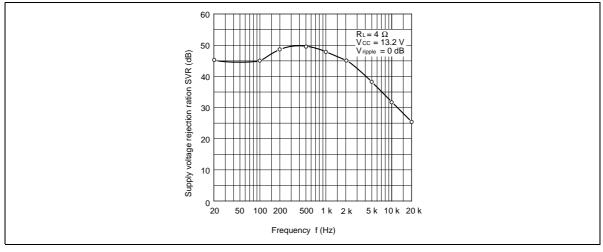
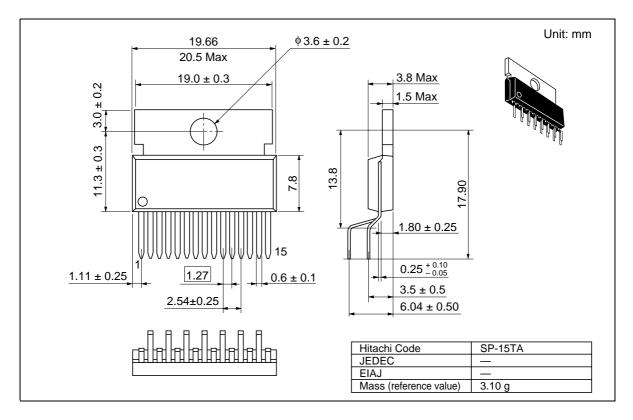


Figure 7 Supply Voltage Rejection Ratio vs. Frequency

Package Dimensions



Disclaimer

- 1. Hitachi neither warrants nor grants licenses of any rights of Hitachi's or any third party's patent, copyright, trademark, or other intellectual property rights for information contained in this document. Hitachi bears no responsibility for problems that may arise with third party's rights, including intellectual property rights, in connection with use of the information contained in this document.
- 2. Products and product specifications may be subject to change without notice. Confirm that you have received the latest product standards or specifications before final design, purchase or use.
- 3. Hitachi makes every attempt to ensure that its products are of high quality and reliability. However, contact Hitachi's sales office before using the product in an application that demands especially high quality and reliability or where its failure or malfunction may directly threaten human life or cause risk of bodily injury, such as aerospace, aeronautics, nuclear power, combustion control, transportation, traffic, safety equipment or medical equipment for life support.
- 4. Design your application so that the product is used within the ranges guaranteed by Hitachi particularly for maximum rating, operating supply voltage range, heat radiation characteristics, installation conditions and other characteristics. Hitachi bears no responsibility for failure or damage when used beyond the guaranteed ranges. Even within the guaranteed ranges, consider normally foreseeable failure rates or failure modes in semiconductor devices and employ systemic measures such as fail-safes, so that the equipment incorporating Hitachi product does not cause bodily injury, fire or other consequential damage due to operation of the Hitachi product.
- 5. This product is not designed to be radiation resistant.
- 6. No one is permitted to reproduce or duplicate, in any form, the whole or part of this document without written approval from Hitachi.
- Contact Hitachi's sales office for any questions regarding this document or Hitachi semiconductor products.

Sales Offices

HITACHI Hitachi, Ltd.

Semiconductor & Integrated Circuits. Nippon Bldg., 2-6-2, Ohte-machi, Chiyoda-ku, Tokyo 100-0004, Japan Tel: Tokyo (03) 3270-2111 Fax: (03) 3270-5109

| URL | NorthAmeric Europe Asia Japan | : http://www.hitachi-e : http://sicapac.hitach | : http://semiconductor.hitachi.com/ : http://www.hitachi-eu.com/hel/ecg : http://sicapac.hitachi-asia.com : http://www.hitachi.co.jp/Sicd/indx.htm | | | |
|-----------------------------------|--|---|---|--|--|--|
| For further information write to: | | | | | | |
| Hitachi S | Semiconductor | Hitachi Europe GmbH | Hitachi Asia Ltd. | | | |
| (America | a) Inc. | Electronic Components Group | Hitachi Tower | | | |
| 170 Eoo | Toomon Drivo | Dornacher Stroße 2 | 16 Collvor Ouov #20.00 | | | |

America) Inc. 179 East Tasman Drive, San Jose,CA 95134 Tel: <1> (408) 433-1990 Fax: <1>(408) 433-0223

Electronic Components Group Dornacher Straße 3 D-85622 Feldkirchen, Munich Germany Tel: <49> (89) 9 9180-0 Fax: <49> (89) 9 29 30 00 Hitachi Europe Ltd. Electronic Components Group. Whitebrook Park Lower Cookham Road Maidenhead Berkshire SL6 8YA, United Kingdom Tel: <44> (1628) 585000 Fax: <44> (1628) 585160 Hitachi Asia Ltd. Hitachi Tower 16 Collyer Quay #20-00, Singapore 049318 Tel : <65>-538-6533/538-8577 Fax : <65>-538-6933/538-3877 URL : http://www.hitachi.com.sg Hitachi Asia Ltd. (Taipei Branch Office) 4/F, No. 167, Tun Hwa North Road, Hung-Kuo Building, Taipei (105), Taiwan Tel : <886>-(2)-2718-3666 Fax : <886>-(2)-2718-8180 Telex : 23222 HAS-TP URL : http://www.hitachi.com.tw Hitachi Asia (Hong Kong) Ltd. Group III (Electronic Components) 7/F., Noth Tower, World Finance Centre, Harbour City, Canton Road Tsim Sha Tsui, Kowloon, Hong Kong Tel : <852>-(2)-735-9218 Fax : <852>-(2)-730-0281 URL : http://www.hitachi.com.hk

Copyright © Hitachi, Ltd., 2000. All rights reserved. Printed in Japan. Colophon 2.0