

AN7174K-LC

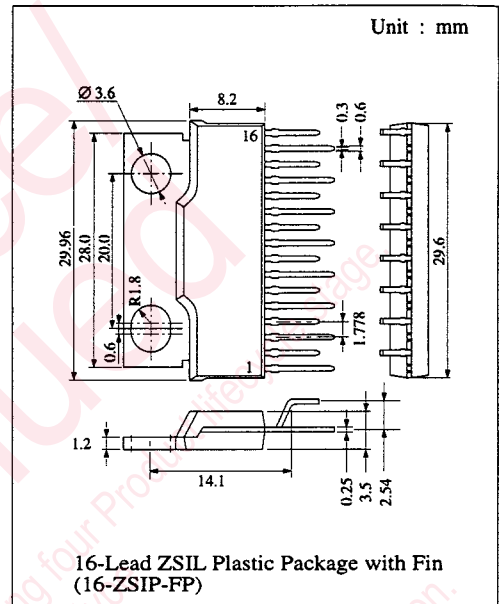
Dual BTL 14W Audio Power Amplifier

■ Description

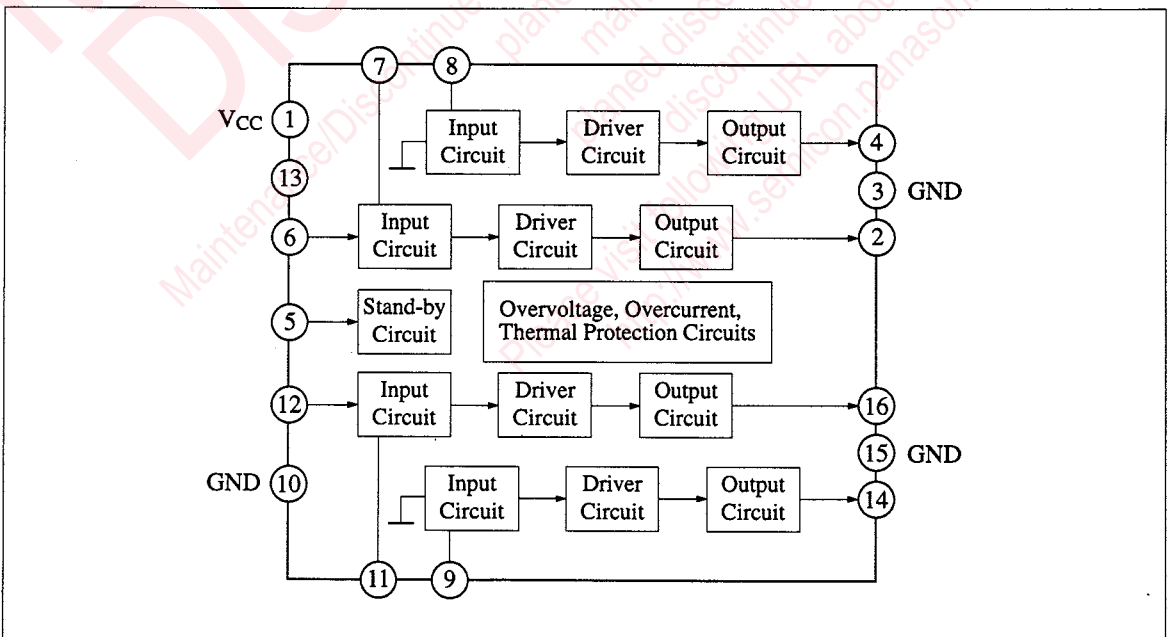
The AN7174K-LC is a monolithic integrated circuits designed for 14W (13.2V, 4Ω) output power amplifier. Stereo operation is enabled due to incorporating two BTL amplifiers in one chip. High reliability is obtained due to incorporating various protectors. ON/OFF is enabled even if power is supplied to power supply pin by incorporating stand-by circuit.

■ Features

- High output power (BTL 14W x 2)
- Incorporating stand-by circuits
- Incorporating protection circuits. (Temperature, overvoltage, V_{OUT} -GND short, Load short, V_{OUT} -VCC short)
- Low shock noise from power ON/OFF operation
- Fewer external components
- Highly stable operation



■ Block Diagram



■ Absolute Maximum Ratings (Ta=25°C)

| Item | Symbol | Rating | Unit |
|-------------------------------|---------------------------|------------|------|
| Supply Voltage | V _{CC} *1 | 24 | V |
| Supply Current | I _{CC} | 6 | A |
| Supply Voltage Surge | V _{CC(surge)} *2 | 50 | V |
| Power Dissipation | P _D *3 | 62.5 | W |
| Operating Ambient Temperature | Topr | -30 ~ +75 | °C |
| Storage Temperature | Tstg | -55 ~ +150 | °C |

Operating Supply Voltage Range: V_{CC} = 8.0V ~ 18.0V

*1 No-signal *2 Time = 0.2s *3 R_{θj-c} = 2°C/W

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

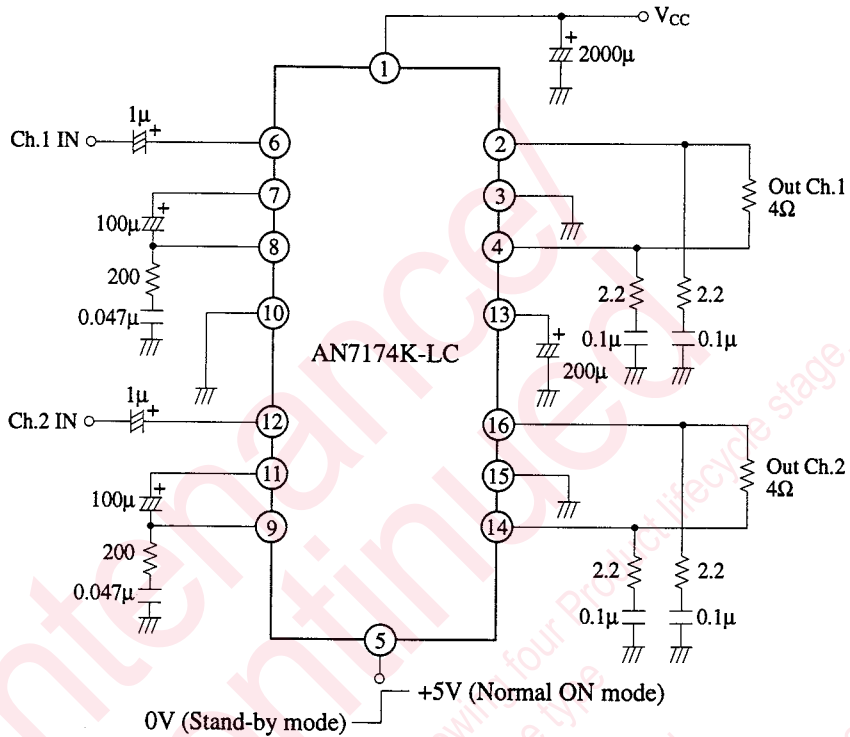
| Item | Symbol | Condition | min. | typ. | max. | Unit |
|--|--------------------------|--|------|------|------|------|
| Quiescent Current | I _{CQ} | V _{in} = 0mV | | 120 | 200 | mA |
| Output Noise Voltage | V _{no} * | V _{in} = 0mV, R _g = 10kΩ | | 0.6 | 1.5 | mV |
| Voltage Gain | G _V | V _{in} = 5mV | 50.5 | 52.5 | 54.5 | dB |
| Total Harmonic Distortion | THD | V _{in} = 5mV | | 0.2 | 0.75 | % |
| Maximum Output Power | P _O | THD = 10% | 9.0 | 12.5 | | W |
| Ripple Rejection | RR* | R _g = 0Ω, V _{in} = 0mV, V _r = 300mV, f _r = 120Hz | 35 | 40 | | dB |
| Output Offset Voltage | V _{O(offset)} | V _{in} = 0mV | -200 | 0 | +200 | mV |
| Channel Balance | CB | V _{in} = 5mV | -1 | 0 | +1 | dB |
| Total Harmonic Distortion | THD | V _{in} = 5mV, f = 100Hz | | 0.26 | | % |
| Total Harmonic Distortion | THD | V _{in} = 5mV, f = 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 |
| Quiescent Circuit Current at Stand-by Pin ON | I _{CQ(STBY-ON)} | Stand-by Pin ON | | 21 | | μA |
| Crosstalk | CT | V _{in} = 5mV, R _g = 10kΩ | | 61 | | dB |

* With 15Hz ~ 30kHz (12dB/OCT) filter

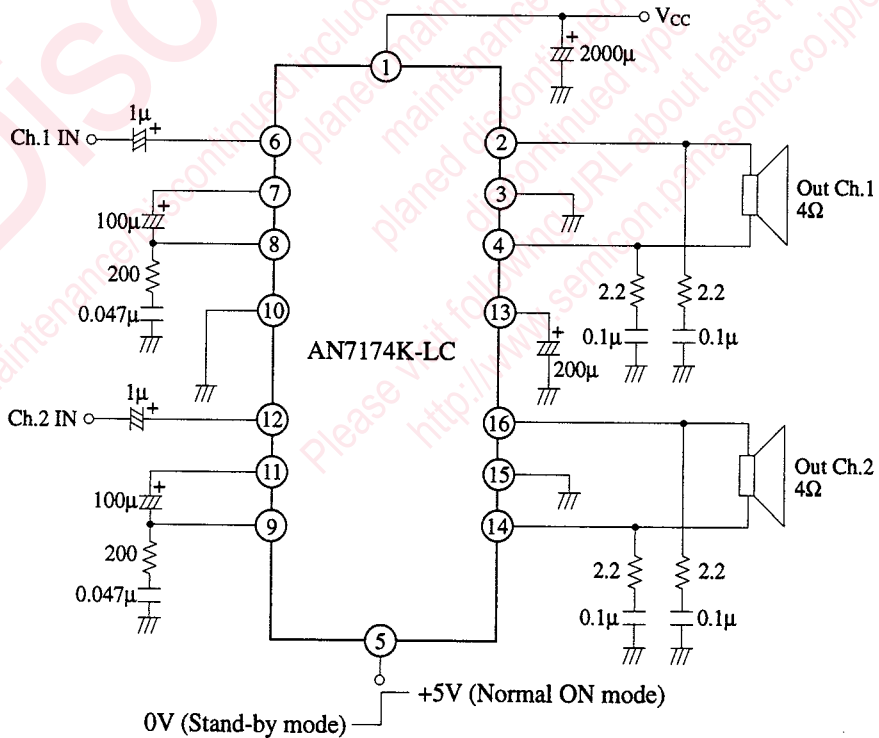
■ Pin

| Pin No | Pin Name | Pin No | Pin Name |
|--------|-------------------|--------|-------------------|
| 1 | V _{CC} | 9 | N.F.B. Ch.2 |
| 2 | Output Ch.1 | 10 | GND (Input) |
| 3 | GND (Output Ch.1) | 11 | N.F.B. 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 | N.F.B. Ch.1 | 15 | GND (Output Ch.2) |
| 8 | N.F.B. Ch.1 | 16 | Output Ch.2 |

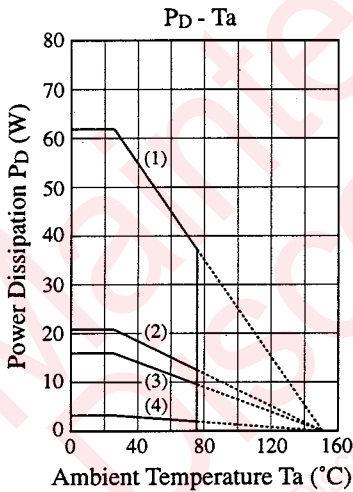
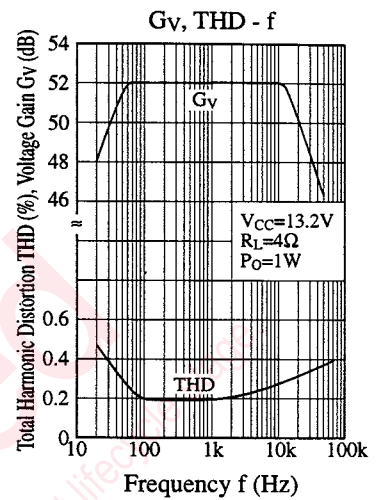
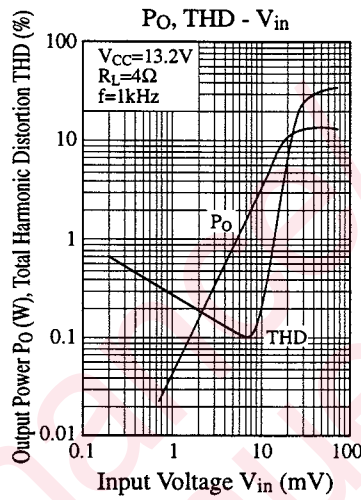
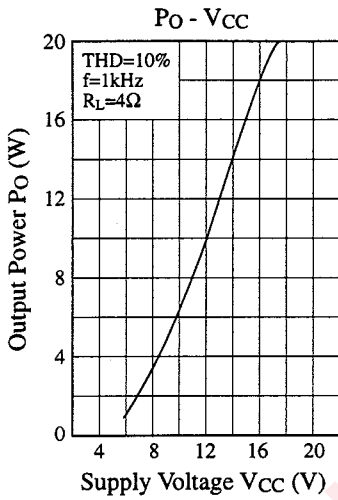
Test Circuit



■ Application Circuit



■ Characteristics Curve



- (1) T_c=T_a, 62.5W (θ_{j-c}=2°C/W)
- (2) 20.8W (θ_r=4°C/W) With a 100cm² x 3mm Al heat sink (black colour coated) or a 200cm² x 2mm Al heat sink (not lacquered)
- (3) 15.6W (θ_r=6°C/W) With a 100cm² x 2mm Al heat sink (not lacquered)
- (4) 3.0W at T_a=30°C Without heat sink

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

- (1) If any of the products or technical information described in this book is to be exported or provided to non-residents, the laws and regulations of the exporting country, especially, those with regard to security export control, must be observed.
- (2) The technical information described in this book is intended only to show the main characteristics and application circuit examples of the products. No license is granted in and to any intellectual property right or other right owned by Panasonic Corporation or any other company. Therefore, no responsibility is assumed by our company as to the infringement upon any such right owned by any other company which may arise as a result of the use of technical information described in this book.
- (3) The products described in this book 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 book are subject to change without notice for 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 range of absolute maximum rating and the guaranteed operating conditions (operating power supply voltage and operating environment etc.). Especially, please be careful not to exceed the range of absolute maximum rating on the transient state, such as power-on, power-off and mode-switching. 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, take into the consideration of incidence of break down and failure mode, possible to occur to semiconductor products. Measures on the systems such as redundant design, arresting the spread of fire or preventing glitch are recommended in order to prevent physical injury, fire, social damages, for example, by using the products.
- (6) Comply with the instructions for use in order to prevent breakdown and characteristics change due to external factors (ESD, EOS, thermal stress and mechanical stress) at the time of handling, mounting or at customer's process. When using products for which damp-proof packing is required, satisfy the conditions, such as shelf life and the elapsed time since first opening the packages.
- (7) This book may be not reprinted or reproduced whether wholly or partially, without the prior written permission of our company.