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AN5276

5 W × 2-ch (19V, 8 Ω) power amplifier with variable audio output and volume control

Overview

The AN5276 is a monolithic integrated circuit designed for 5.0 W (19 V, 8 Ω) output audio power amplifier. It is a dual channel SEPP IC suitable for stereo operation in TV application.

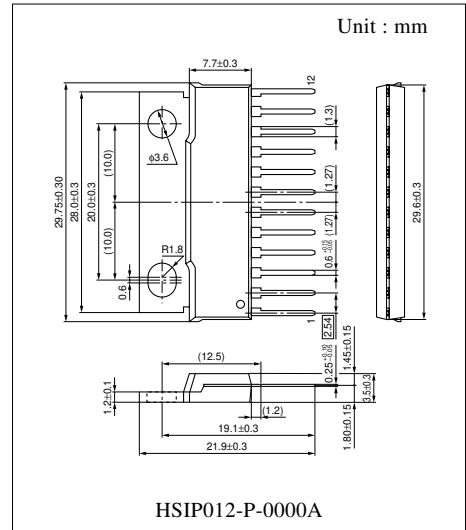
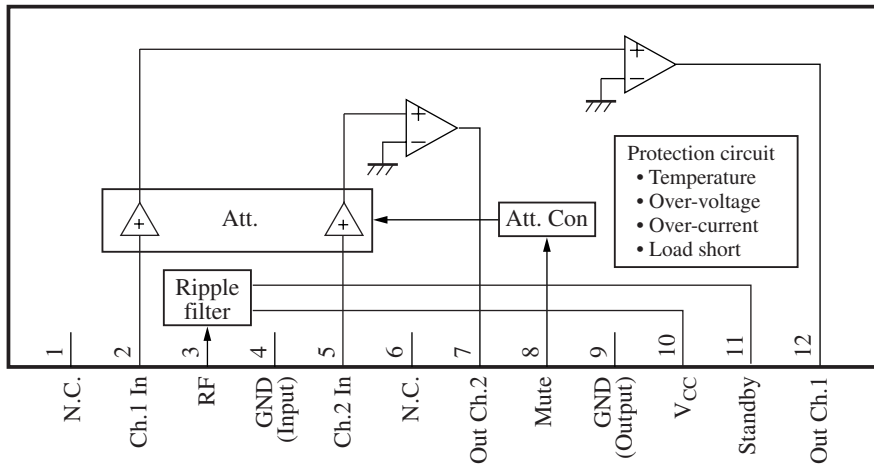
Features

- Few external components :
 - No Boucherot cells(output C, R)
 - No Bootstrap Capacitors
 - No Negative Feedback Capacitors
- Built-in muting circuit
- Built-in stand-by circuit
- Built-in various protection circuits (Load-short, thermal, over-voltage and current)
- High ripple rejection(55 dB)
- Compatible with AN5275, AN5277
- Operating voltage range 10 V to 24 V(19 V typ.)

Applications

- TV

Block Diagram



■ Pin Descriptions

| Pin No. | Descriptions | Pin No. | Descriptions |
|---------|---------------|---------|-----------------|
| 1 | N.C. | 7 | Ch.2 output |
| 2 | Ch.1 input | 8 | Mute |
| 3 | Ripple filter | 9 | Output GND |
| 4 | Input GND | 10 | V _{CC} |
| 5 | Ch.2 input | 11 | Standby |
| 6 | N.C. | 12 | Ch.1 output |

■ Absolute Maximum Ratings

| Parameter | Symbol | Rating | Unit |
|----------------------------------|------------------|-------------|------|
| Supply voltage | V _{CC} | 26.0 | V |
| Supply current | I _{CC} | 4.0 | A |
| Power dissipation *2 | P _D | 37.5 | W |
| Operating ambient temperature *1 | T _{opr} | -25 to +75 | °C |
| Storage temperature *1 | T _{stg} | -55 to +150 | °C |

Note) *1 : Except these items, all other measurements are taken at T_a = 25 °C.

*2 : T_a = 75 °C.

■ Recommended Operating Range

| Parameter | Symbol | Range | Unit |
|----------------|-----------------|--------------|------|
| Supply voltage | V _{CC} | 10.0 to 24.0 | V |

■ Electrical Characteristics at $V_{CC} = 19\text{ V}$, $f = 1\text{ kHz}$, $R_L = 8\ \Omega$, $T_a = 25\text{ }^\circ\text{C}$

| Parameter | Symbol | Conditions | Min | Typ | Max | Unit |
|-------------------------------|---------------|---|------|------|-----|------|
| Quiescent current | I_{CQ} | $V_{IN} = 0\text{ mV}$ | — | 35 | 70 | mA |
| Output end noise voltage *1 | V_{NO} | No input, $R_g = 10\text{ k}\Omega$ | — | 0.22 | 0.4 | mV |
| Voltage gain | G_V | $V_{IN} = 57\text{ mV}$ | 32 | 34 | 36 | dB |
| Total harmonic distortion | THD | $V_{IN} = 57\text{ mV}$ | — | 0.2 | 0.4 | % |
| Maximum Output Power | P_O | $V_{CC} = 22\text{ V}$, THD = 10 % | 5.6 | 7.0 | — | W |
| Maximum Output power | P_O | $V_{CC} = 19\text{ V}$, THD = 10 % | 4.0 | 5.0 | — | W |
| Ripple rejection ratio *1 | RR | $V_r = 1\text{ V}_{rms}$ $f_r = 120\text{ Hz}$, $R_g = 10\text{ k}\Omega$ | 45 | 55 | — | dB |
| Channel balance | CB | $V_{IN} = 57\text{ mV}$ | -1.0 | 0 | 1.0 | dB |
| Muting Ratio | MR | $V_{IN} = 57\text{ mV}$ | 70 | 80 | — | dB |
| Muting control voltage | V_{MUTE} | $V_{IN} = 57\text{ mV}$, MR $\geq 70\text{ dB}$ | 3.0 | — | — | V |
| Standby control voltage 'on' | V_{STD-ON} | No input, $I_{CC} \leq 0.1\text{ mA}$ | — | — | 5.0 | V |
| Standby control voltage 'off' | $V_{STD-OFF}$ | No input, $I_{CC} \geq 17\text{ mA}$ | 8.5 | — | — | V |
| Channel crosstalk | CT | $V_{IN} = 57\text{ mV}$, $R_g = 10\text{ k}\Omega$ | 50 | 60 | — | dB |

Note) *1 : For this measurement, use the 20 Hz to 20 kHz (12 dB/OCT) filter.

■ Terminal Equivalent Circuits

| Pin No. | Equivalent circuit | Description | DC voltage (V) |
|---------|--------------------|---|----------------------|
| 1 | — | Not connected | — |
| 2 | | Ch.1 input This is the amplifier input pin. | 0 |
| 3 | | Ripple filter This is the pin to connect the positive terminal of a ripple filter capacitor. | $V_{CC} - 1.5V_{BE}$ |
| 4 | — | Input GND Input ground pin | 0 |
| 5 | | Ch.2 input This is the amplifier input pin. | — |
| 6 | — | Not connected | — |

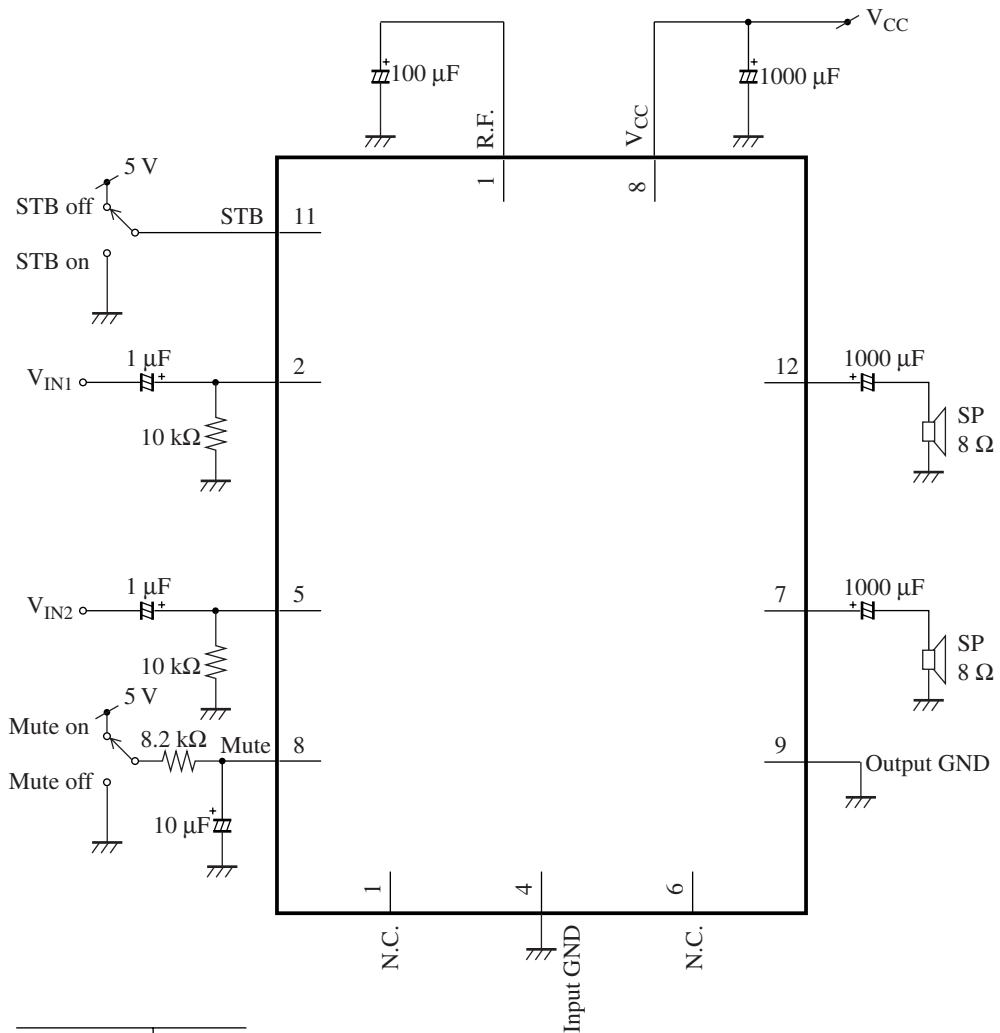
■ Terminal Equivalent Circuits (continued)

| Pin No. | Equivalent circuit | Description | DC voltage (V) |
|---------|--------------------|--|----------------|
| 7 | | Ch.2 output Ch.2 output pin | $V_{CC}/2$ |
| 8 | | Mute Mute input pin. Mute 'on' = 5 V Mute 'off' = 0 V | — |
| 9 | — | Output GND Ch.1 & Ch.2 output ground. | 0 |
| 10 | — | V_{CC} This is the power supply pin. | 19 V(typ.) |

■ Terminal Equivalent Circuits (continued)

| Pin No. | Equivalent circuit | Description | DC voltage (V) |
|---------|--------------------|---|------------------------------|
| 11 | | <p>Standby This is the standby control pin.</p> | <p>—</p> |
| 12 | | <p>Ch.1 output Ch.1 output pin</p> | <p>$V_{CC}/2$</p> |

■ Application Circuit Example



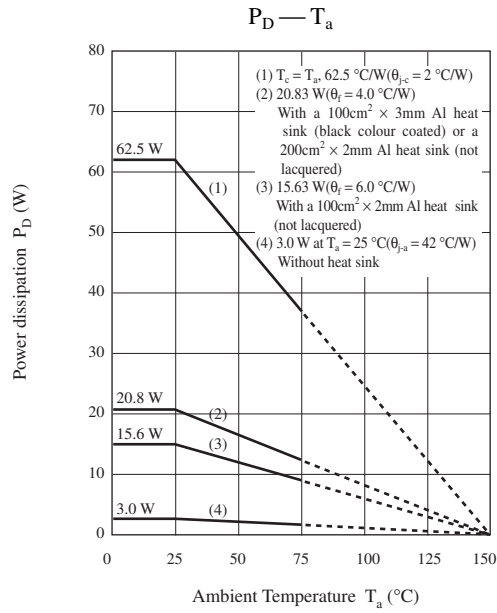
| | |
|----------|-----------------|
| STB off | V _{CC} |
| STB on | 0 V |
| Mute off | 0 V |
| Mute on | 5 V |

■ Usage Notes

- 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 decreases, the protection circuit would automatically be deactivated and resume normal operation.

■ Technical Information

- $P_D - T_a$ curves of HSI P012-P-0000A



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