

# AN5277

## Dual Channel SEPP Power Amplifier

### ■ Overview

The AN5277 is a monolithic integrated circuit designed for 10.0 W (26 V, 8 Ω) output audio power amplifier. It is a dual channel SEPP IC suitable for stereo operation in TV application.

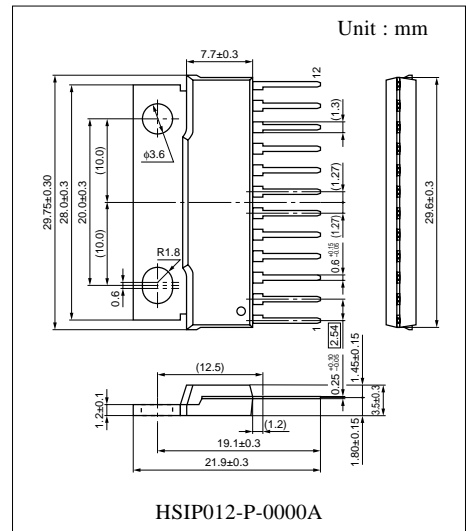
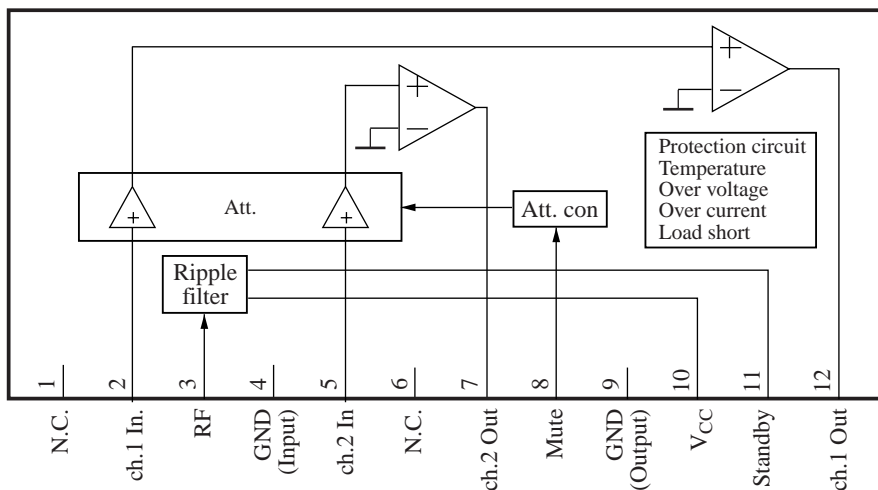
### ■ Features

- Few external components :
  - No Boucherot cells(output C, R)
  - No Bootstrap Capacitors
  - No Negative Feedback Capacitors
- Built-in muting circuit
- Built-in standby circuit
- Built-in various protection circuits (Load-short, thermal, over-voltage and current)
- High ripple rejection(55 dB)
- Compatible with AN5275, AN5276
- Operating voltage range 10 ~ 32 V(26 V typ.)

### ■ Applications

- TV

### ■ Block Diagram



### ■ Pin Descriptions

| Pin No. | Description   | Pin No. | Description     |
|---------|---------------|---------|-----------------|
| 1       | N.C.          | 7       | ch.2 Output     |
| 2       | ch.1 Input    | 8       | Mute            |
| 3       | Ripple Filter | 9       | Output GND      |
| 4       | Input GND     | 10      | V <sub>CC</sub> |
| 5       | ch.2 Input    | 11      | Standby         |
| 6       | N.C.          | 12      | ch.1 Output     |

### ■ Absolute Maximum Ratings

| Parameter                        | Symbol           | Ratings     | Unit |
|----------------------------------|------------------|-------------|------|
| Supply voltage                   | V <sub>CC</sub>  | 35.0        | V    |
| Supply current                   | I <sub>CC</sub>  | 4.0         | A    |
| Power dissipation *2             | P <sub>D</sub>   | 37.5        | W    |
| Operating ambient temperature *1 | T <sub>opr</sub> | -25 to +75  | °C   |
| Storage temperature *1           | T <sub>stg</sub> | -55 to +150 | °C   |

Note) \*1 : T<sub>a</sub> = 25 °C except operating ambient temperature and storage temperature.

\*2 : At T<sub>a</sub> = 70 °C.

### ■ Recommended Operating Range

| Parameter      | Symbol          | Range        | Unit |
|----------------|-----------------|--------------|------|
| Supply voltage | V <sub>CC</sub> | 10.0 to 32.0 | V    |

### ■ Electrical Characteristics at V<sub>CC</sub> = 26 V, R<sub>L</sub> = 8 Ω, f = 1 kHz, T<sub>a</sub> = 25 °C

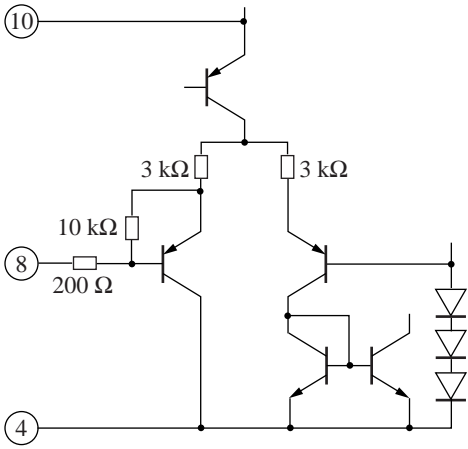
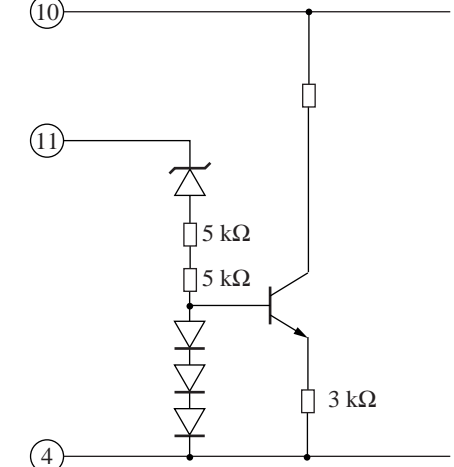
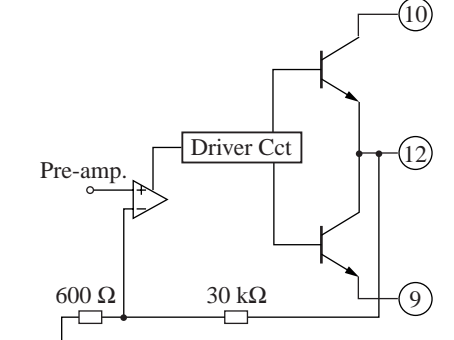
| Parameter                     | Symbol              | Conditions   | Min  | Typ  | Max | Unit |
|-------------------------------|---------------------|--|------|------|-----|------|
| Quiescent current             | I <sub>CQ</sub>     | V <sub>IN</sub> = 0 mV   | —    | 40   | 80  | mA   |
| Output end noise voltage *1   | V <sub>NO</sub>     | No input, R <sub>G</sub> = 10 k  | —    | 0.22 | 0.4 | mV   |
| Voltage gain                  | G <sub>V</sub>      | V <sub>IN</sub> = 57 mV  | 32   | 34   | 36  | dB   |
| Total harmonic distortion *1  | THD                 | V <sub>IN</sub> = 57 mV  | —    | 0.2  | 0.4 | %    |
| Maximum output power          | P <sub>O</sub>      | V <sub>CC</sub> = 26 V, THD = 10 %   | 8.0  | 10.0 | —   | W    |
| Ripple rejection ratio *1     | RR                  | V <sub>R</sub> = 1 V <sub>rms</sub> , f <sub>R</sub> = 120 Hz, R <sub>G</sub> = 10 kΩ, | 45   | 55   | —   | dB   |
| Channel balance               | CB                  | V <sub>IN</sub> = 57 mV  | -1.0 | 0    | 1.0 | dB   |
| Muting ratio                  | MR                  | V <sub>IN</sub> = 57 mV  | 70   | 80   | —   | dB   |
| Muting control voltage        | V <sub>MUTE</sub>   | V <sub>IN</sub> = 57 mV, MR ≥ 70 dB  | 3.0  | —    | —   | V    |
| Standby control voltage 'on'  | V <sub>STDON</sub>  | No input, I <sub>CC</sub> ≤ 0.1 mA   | —    | —    | 5.0 | V    |
| Standby control voltage 'off' | V <sub>STDOFF</sub> | No input, I <sub>CC</sub> ≥ 20 mA  | 8.5  | —    | —   | V    |
| Channel crosstalk             | CT                  | V <sub>IN</sub> = 57 mV, R <sub>G</sub> = 10 kΩ  | 50   | 60   | —   | dB   |

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

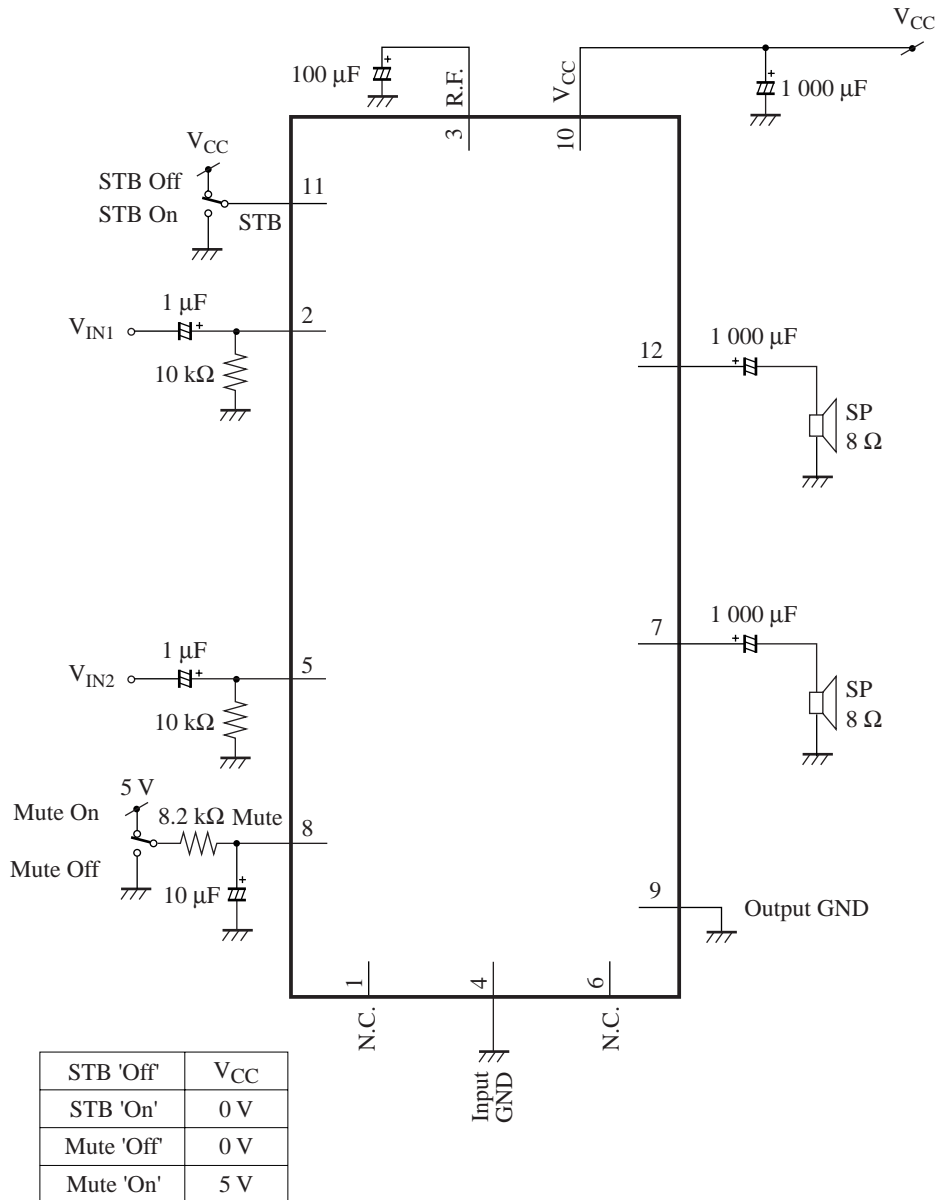
■ Terminal Equivalent Circuit

| Pin No. | Equivalent Circuit | Description   | DC Voltage            |
|---------|--------------------|---|-----------------------|
| 1       | —                  | Not connected   | —                     |
| 2       |                    | ch.1 Input :<br>This is the amplifier input pins.   | 0 V                   |
| 3       |                    | Ripple Filter :<br>This is the pin to connect the positive terminal of a ripple filter capacitor. | $V_{CC} - 1.5 V_{BE}$ |
| 4       | —                  | Input GND :<br>Input ground pin.  | 0 V                   |
| 5       | Refer to Pin2      | ch.2 Input :<br>This is the amplifier input pins.   | —                     |
| 6       | —                  | Not connected   | —                     |
| 7       |                    | ch.2 Output :<br>ch.2 output pin  | $V_{CC}/2$            |

■ Pin Equivalent Circuit (continued)

| Pin No. | Equivalent Circuit  | Description   | DC Voltage         |
|---------|---|---|--------------------|
| 8       |    | <p>Mute :</p> <p>Mute input pin.</p> <p>Mute 'On' = 5 V</p> <p>Mute 'Off' = 0 V</p> | —                  |
| 9       | —   | Output GND :<br>ch.1 & ch.2 output ground.  | 0 V                |
| 10      | —   | V <sub>CC</sub> :<br>This is the power supply pin.                                  | typ. : 26 V        |
| 11      |   | Standby :<br>This is the standby control pin.                                       | —                  |
| 12      |  | ch.1 Output :<br>ch.1 output pin  | V <sub>CC</sub> /2 |

■ Application Circuit Example



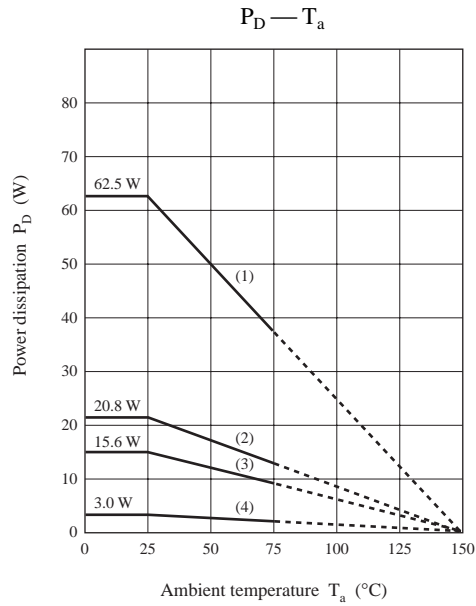
■ Usage Notes

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<sub>CC</sub> short and output to GND short.
4. Load short protection will only prevent the IC from damaging if operating V<sub>CC</sub> < 30 V
5. The temperature protection circuit will operate at T<sub>j</sub> around 150 °C.

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

## ■ Technical Information

- $P_D - T_a$  Curves of HSIP012-P-0000A



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

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