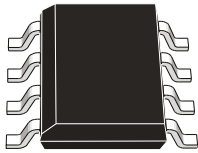

Dual low voltage power amplifier



SO8

Features

- Supply voltage down to 1.8 V
- Low crossover distortion
- Low quiescent current
- Bridge or stereo configuration

Description

The **TDA2822D** is a monolithic integrated circuit in 8 lead (SO-8) package. It is intended for use as a dual audio power amplifier in portable cassette players, radios and CD players.

| Product status link |
|--------------------------|
| TDA2822D |
| Ordering information |
| TDA2822D013TR |

1 Application circuit

Figure 1. Application circuit

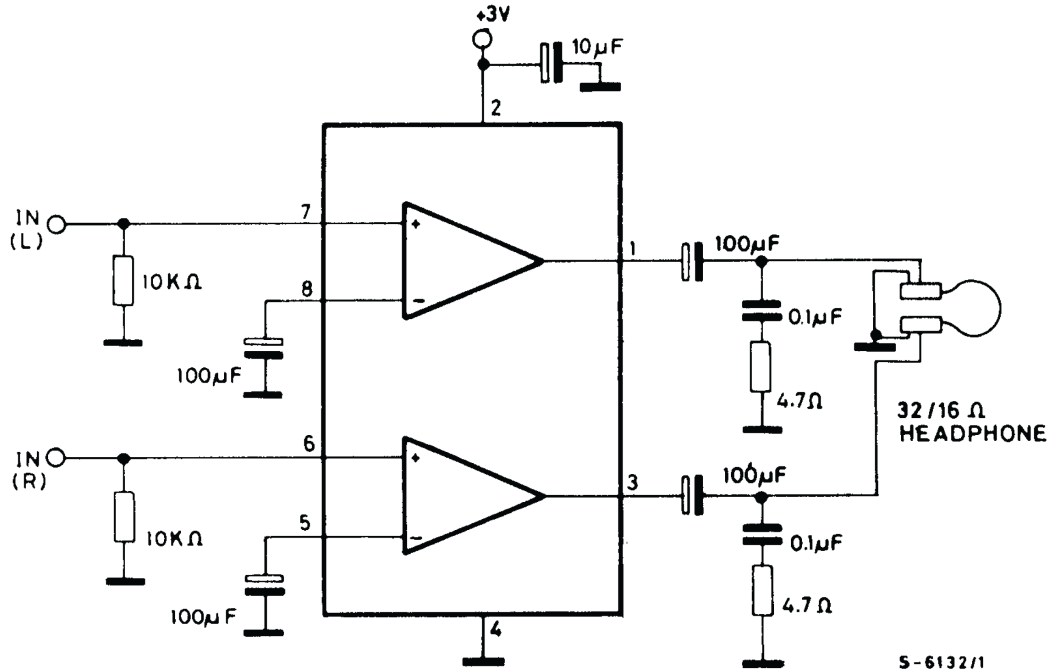


Figure 2. Stereo application and test circuit

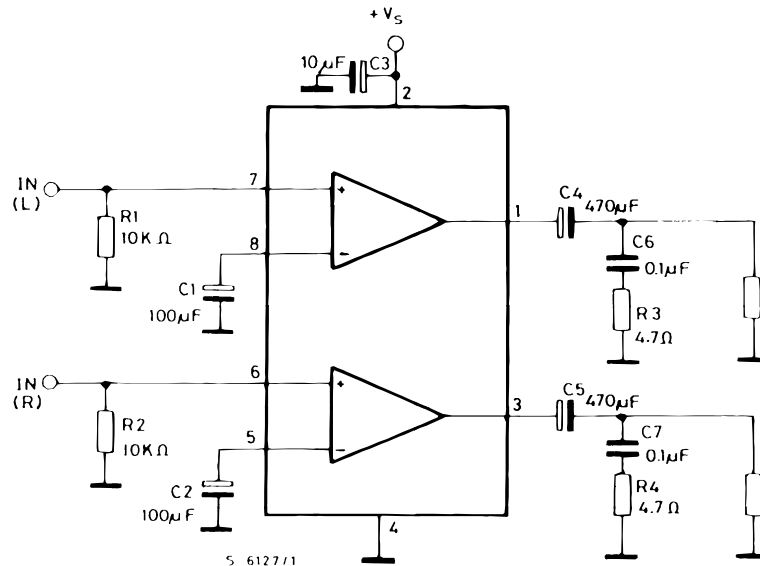
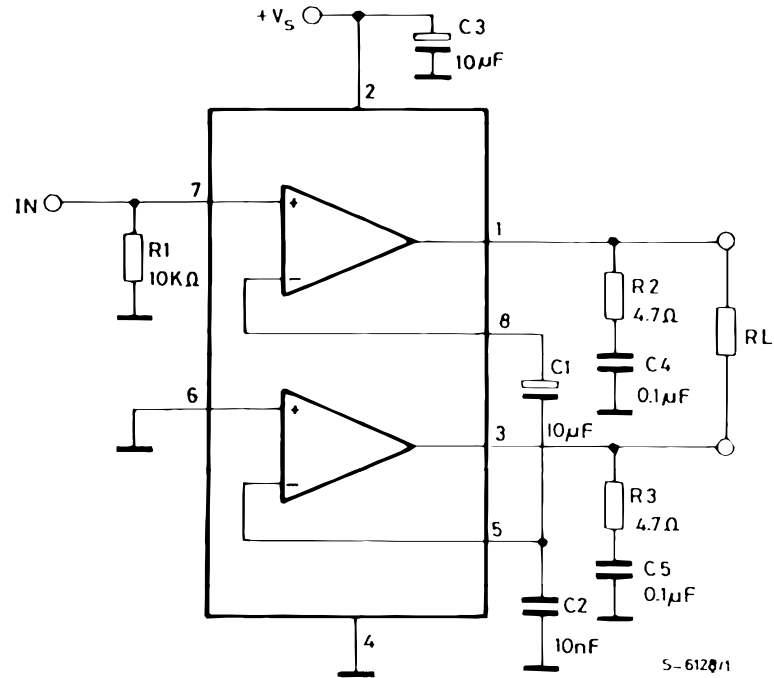
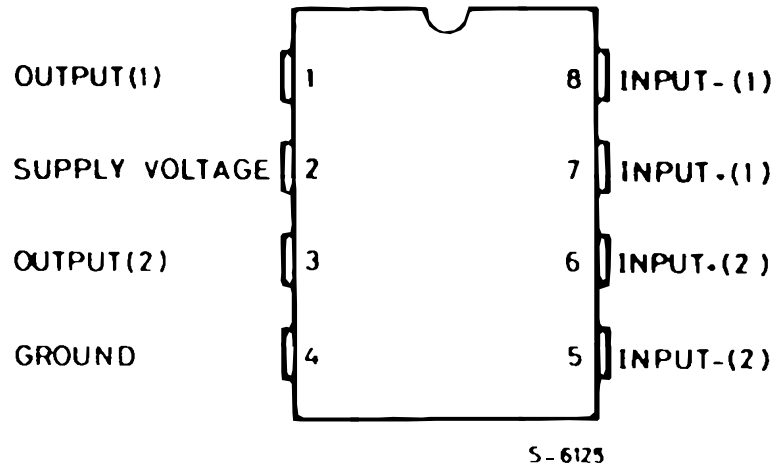


Figure 3. Bridge application and test circuit



2 Pin connection

Figure 4. Pin connection



3 Absolute maximum ratings

Table 1. Absolute maximum ratings

| Symbol | Parameter | Value | Unit |
|-----------|--|------------|------|
| V_S | Supply voltage | 15 | V |
| I_O | Peak output | 1 | A |
| P_{tot} | Total power dissipation $T_{amb} = 50\text{ °C}$ | 0.5 | W |
| T_{stg} | Storage and junction temperature | -40 to 150 | °C |
| T_j | | | |

Table 2. Thermal data

| Symbol | Description | Value | Unit |
|---------------|--|-------|------|
| $R_{thj-amb}$ | Thermal resistance junction-ambient max. | 200 | °C/W |

4 Electrical characteristics

($V_S = 6\text{ V}$; $T_{amb} = 25\text{ °C}$, unless otherwise specified.
 STEREO (see Figure 2. Stereo application and test circuit).

Table 3. Electrical characteristics (stereo)

| Symbol | Parameter | Test conditions | Min. | Typ. | Max. | Unit | |
|--------------------|---|--|-----------------------|------|------|---------------|----|
| V_S | Supply voltage | | 1.8 | | 15 | V | |
| I_d | Total quiescent drain current | | | | 15 | mA | |
| V_O | Quiescent output voltage | | | 2.7 | | V | |
| | | $V_S = 3\text{ V}$ | | 1.2 | | V | |
| I_b | Input bias current | | | 100 | | nA | |
| P_O | Output power (each channel) ($f = 1\text{ kHz}$, $d = 10\%$) | $R_L = 32\ \Omega$ | $V_S = 9\text{ V}$ | 300 | | mW | |
| | | | $V_S = 6\text{ V}$ | 120 | | | |
| | | | $V_S = 4.5\text{ V}$ | 60 | | | |
| | | | $V_S = 3\text{ V}$ | 20 | | | |
| | | | $V_S = 2\text{ V}$ | 5 | | | |
| | | $R_L = 16\ \Omega$ | $V_S = 6\text{ V}$ | 170 | 220 | | mW |
| | | $R_L = 8\ \Omega$ | $V_S = 6\text{ V}$ | 300 | 380 | | mW |
| | | $R_L = 4\ \Omega$ | $V_S = 4.5\text{ V}$ | | 320 | | mW |
| $V_S = 3\text{ V}$ | | 110 | | | | | |
| d | Distortion | $R_L = 32\ \Omega$ | $P_O = 40\text{ mW}$ | | 0.2 | % | |
| | | $R_L = 16\ \Omega$ | $P_O = 75\text{ mW}$ | | 0.2 | % | |
| | | $R_L = 8\ \Omega$ | $P_O = 150\text{ mW}$ | | 0.2 | % | |
| G_V | Closed loop voltage gain | $f = 1\text{ kHz}$ | 36 | 39 | 41 | dB | |
| ΔG_V | Channel balance | | | | 1 | dB | |
| R_i | Input resistance | $f = 1\text{ kHz}$ | 100 | | | k Ω | |
| e_N | Total input noise | $R_S = 10\text{ k}\Omega$, B = curve A | | 2 | | μV | |
| | | $R_S = 10\text{ k}\Omega$, B = 22 Hz to 22 kHz | | 2.5 | | μV | |
| SVR | Supply voltage rejection | $f = 100\text{ Hz}$, $C_1 = C_2 = 100\text{ F}$ | 24 | 30 | | dB | |
| C_s | Channel separation | $f = 1\text{ kHz}$ | | 50 | | dB | |

Bridge (see Figure 3. Bridge application and test circuit).

Table 4. Electrical characteristics (bridge)

| Symbol | Parameter | Test conditions | | Min. | Typ. | Max. | Unit |
|-------------|---|-------------------|--|------|------|----------|---------------|
| V_S | Supply voltage | | | 1.8 | | 15 | V |
| I_d | Total quiescent drain current | | $R_L = \infty$ | | | 15 | mA |
| V_{OS} | Output offset voltage between the outputs | | $R_L = 8 \Omega$ | | | ± 80 | mV |
| I_b | Input bias current | | | | 100 | | nA |
| P_O | Output power (f = 1 kHz, d = 10%) | $R_L = 32 \Omega$ | $V_S = 9 V$ | 1000 | | | mW |
| | | | $V_S = 6 V$ | 320 | 400 | | |
| | | | $V_S = 4.5 V$ | | 200 | | |
| | | | $V_S = 3 V$ | 50 | 65 | | |
| | | | $V_S = 2 V$ | | 8 | | |
| | | $R_L = 16 \Omega$ | $V_S = 6 V$ | | 800 | | mW |
| | | | $V_S = 3 V$ | | 120 | | |
| | | $R_L = 8 \Omega$ | $V_S = 4.5 V$ | | 700 | | mW |
| | | | $V_S = 3 V$ | | 220 | | |
| | | $R_L = 4 \Omega$ | $V_S = 3 V$ | | 350 | | mW |
| $V_S = 2 V$ | | | 80 | | | | |
| d | Distortion | $R_L = 8 \Omega$ | $P_O = 0.5 \text{ mW}, f = 1 \text{ kHz}$ | | 0.2 | | % |
| G_V | Closed loop voltage gain | | f = 1 kHz | | 39 | | dB |
| R_i | Input resistance | | f = 1 kHz | 100 | | | k Ω |
| e_N | Total input noise | | $R_S = 10 \text{ k}\Omega, B = \text{curve A}$ | | 2.5 | | μV |
| | | | $R_S = 10 \text{ k}\Omega, B = 22 \text{ Hz to } 22 \text{ kHz}$ | | 3 | | |
| SVR | Supply voltage rejection | | f = 100 Hz | | 40 | | dB |
| B | Power bandwidth (-3 dB) | | $R_L = 8 \text{ k}\Omega, P_O = 1 \text{ W}$ | | 120 | | kHz |

Figure 5. Supply voltage rejection vs. frequency

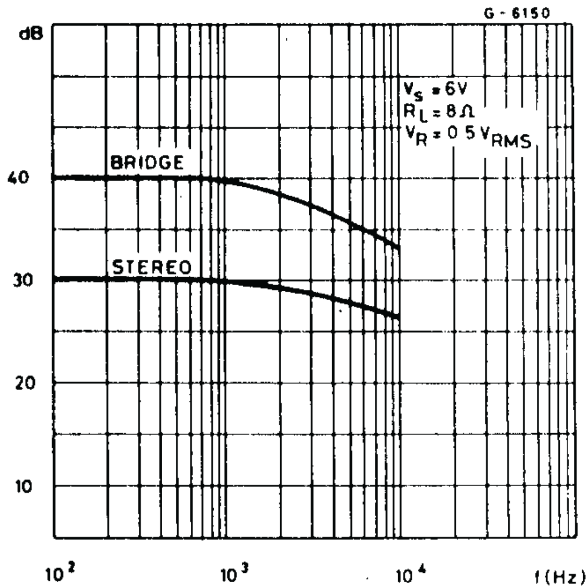


Figure 6. Output power vs. supply voltage (THD= 10%, f=1 kHz stereo)

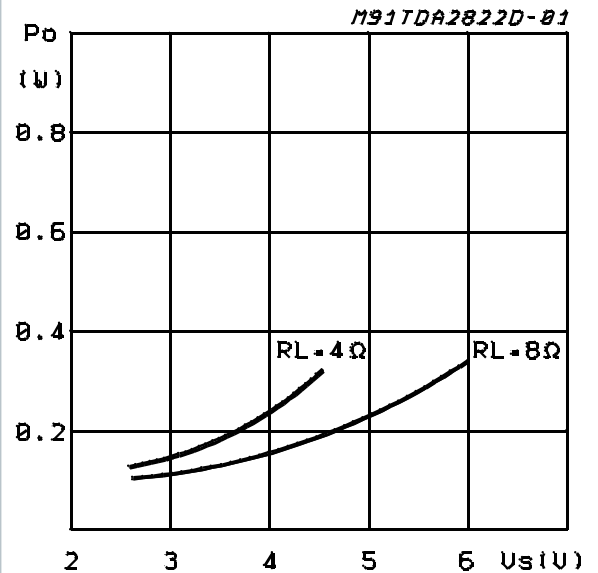


Figure 7. Total power dissipation vs. output power (bridge, RL=8 Ω)

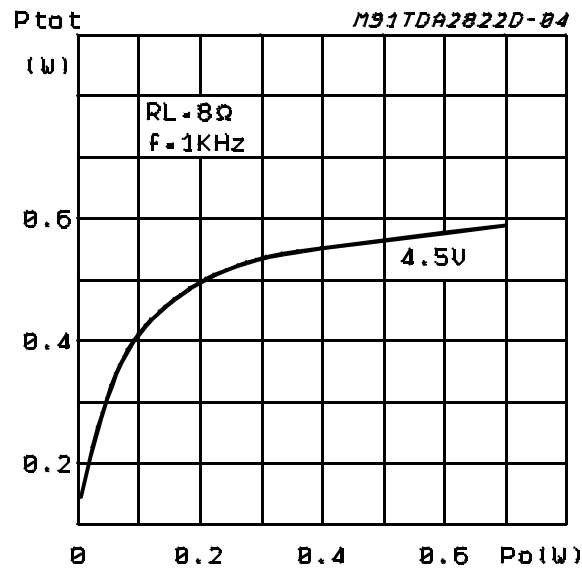
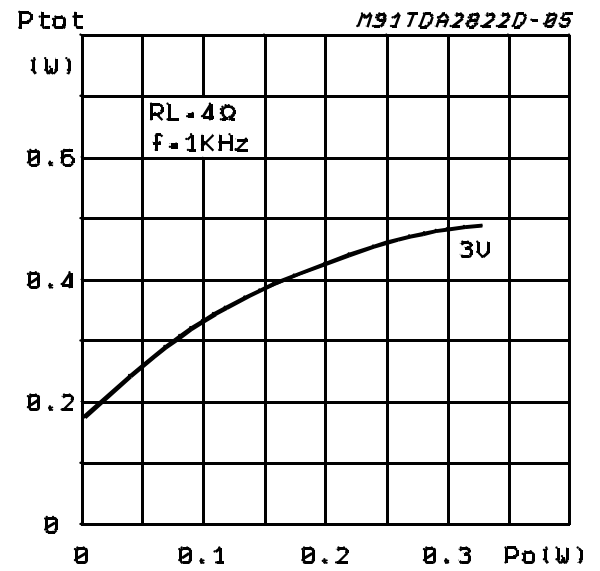


Figure 8. Total power dissipation vs. output power (bridge, RL=4 Ω)



5 Package information

In order to meet environmental requirements, ST offers these devices in different grades of **ECOPACK** packages, depending on their level of environmental compliance. ECOPACK specifications, grade definitions and product status are available at: www.st.com. ECOPACK is an ST trademark.

5.1 SO8 package information

Figure 9. SO8 package outline

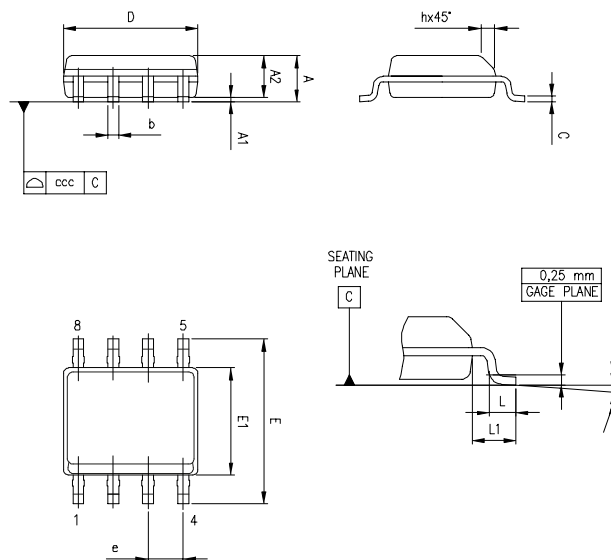


Table 5. SO-8 mechanical data

| Dim. | mm | | | Inches | | |
|------|------|------|------|--------|-------|-------|
| | Min. | Typ. | Max. | Min. | Typ. | Max. |
| A | | | 1.75 | | | 0.069 |
| A1 | 0.1 | | 0.25 | 0.004 | | 0.01 |
| A2 | 1.25 | | | 0.049 | | |
| b | 0.28 | | 0.48 | 0.011 | | 0.019 |
| c | 0.17 | | 0.23 | 0.007 | | 0.01 |
| D | 4.8 | 4.9 | 5 | 0.189 | 0.193 | 0.197 |
| E | 5.8 | 6 | 6.2 | 0.228 | 0.236 | 0.244 |
| E1 | 3.8 | 3.9 | 4 | 0.15 | 0.154 | 0.157 |
| e | | 1.27 | | | 0.05 | |
| h | 0.25 | | 0.5 | 0.01 | | 0.02 |
| L | 0.4 | | 1.27 | 0.016 | | 0.05 |
| L1 | | 1.04 | | | 0.04 | |
| k | | | 8 ° | | | 8 ° |
| ccc | | | 0.1 | | | 0.004 |

Revision history

Table 6. Document revision history

| Date | Version | Changes |
|-------------|---------|---|
| 05-Sep-2003 | 1 | No history because of migration. |
| 19-Sep-2016 | 2 | |
| 28-Aug-2020 | 3 | Updated the ordering information table in cover page. |

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