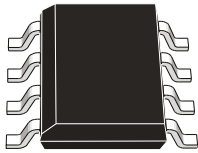


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## Dual low voltage power amplifier



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      |
|--------------------------|
| <a href="#">TDA2822D</a> |
| Ordering information     |
| TDA2822D013TR            |

# 1 Application circuit

Figure 1. Application circuit

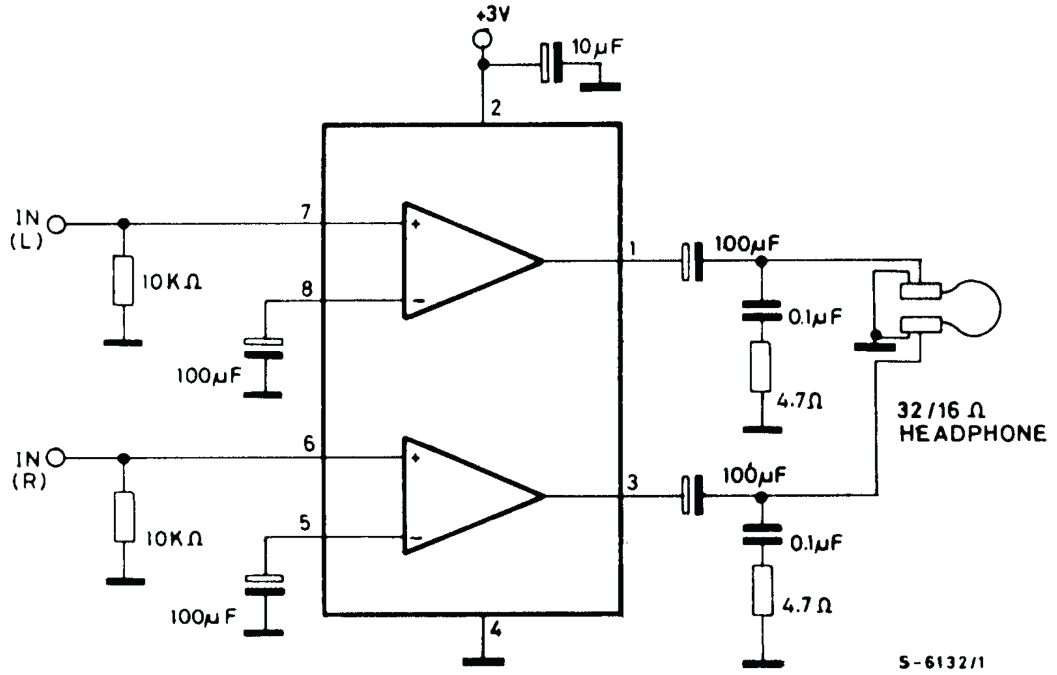


Figure 2. Stereo application and test circuit

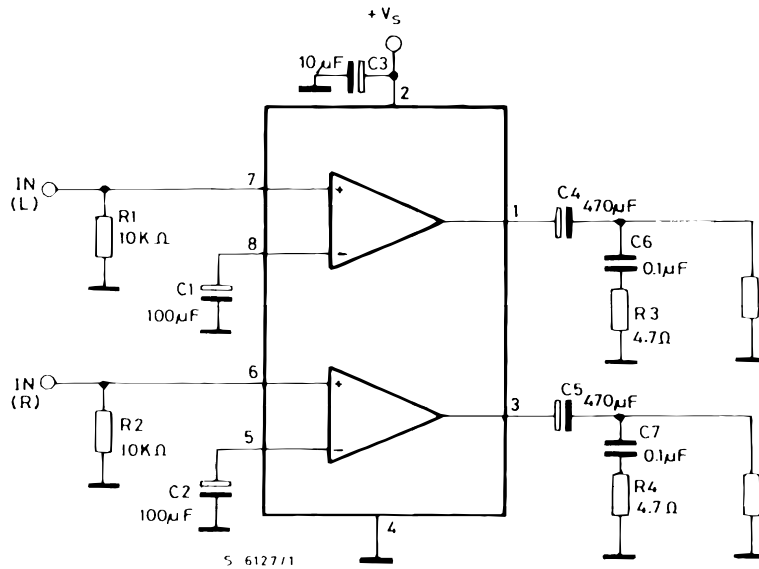
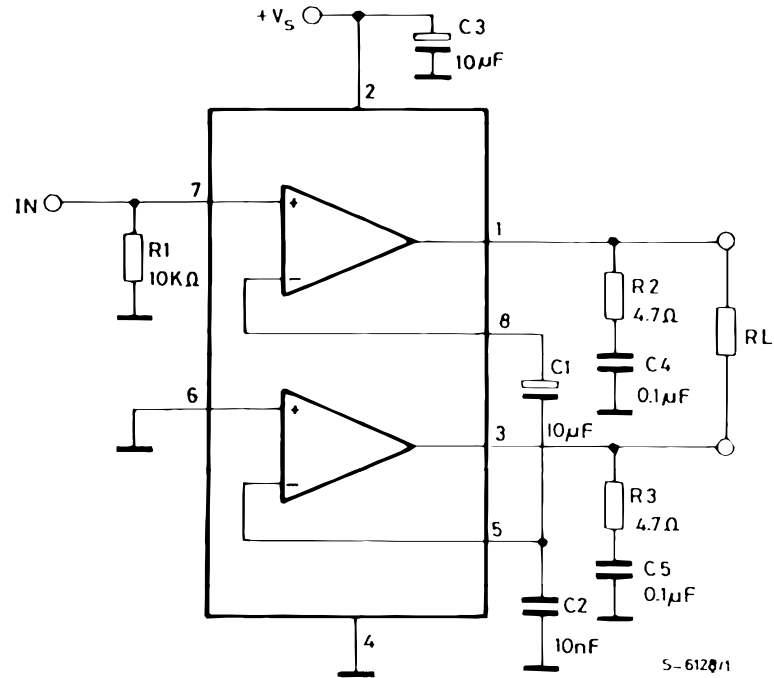
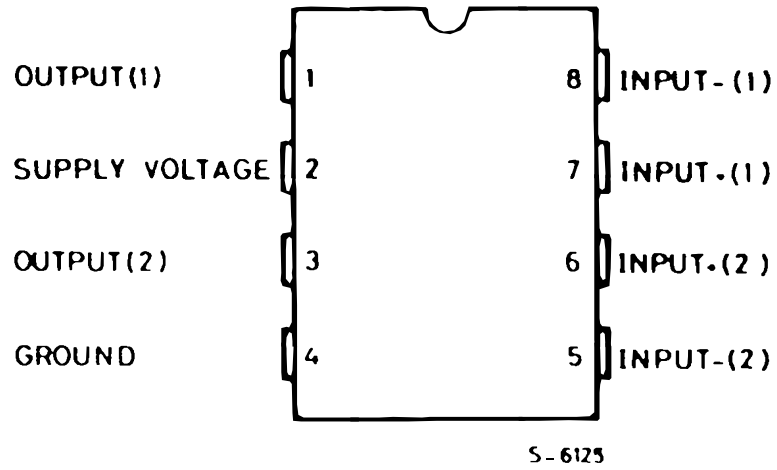


Figure 3. Bridge application and test circuit



## 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

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

**Table 3. Electrical characteristics (stereo)**

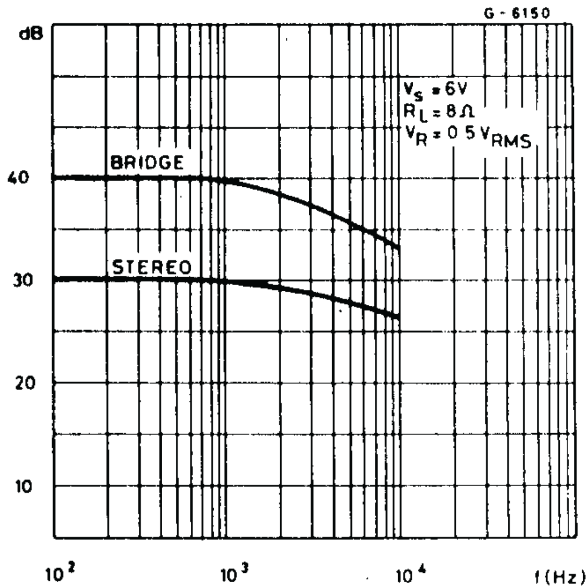
| Symbol             | Parameter   | Test conditions                                  | Min.                  | Typ. | Max. | Unit          |    |
|--------------------|---|--|-----------------------|------|------|---------------|----|
| $V_S$              | Supply voltage  |  | 1.8                   |      | 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            |    |
| $\Delta G_V$       | Channel balance   |  |                       |      | 1    | dB            |    |
| $R_i$              | Input resistance  | $f = 1\text{ kHz}$                               | 100                   |      |      | k $\Omega$    |    |
| $e_N$              | Total input noise   | $R_S = 10\text{ k}\Omega$ , B = curve A          |                       | 2    |      | $\mu\text{V}$ |    |
|                    |   | $R_S = 10\text{ k}\Omega$ , B = 22 Hz to 22 kHz  |                       | 2.5  |      | $\mu\text{V}$ |    |
| 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).

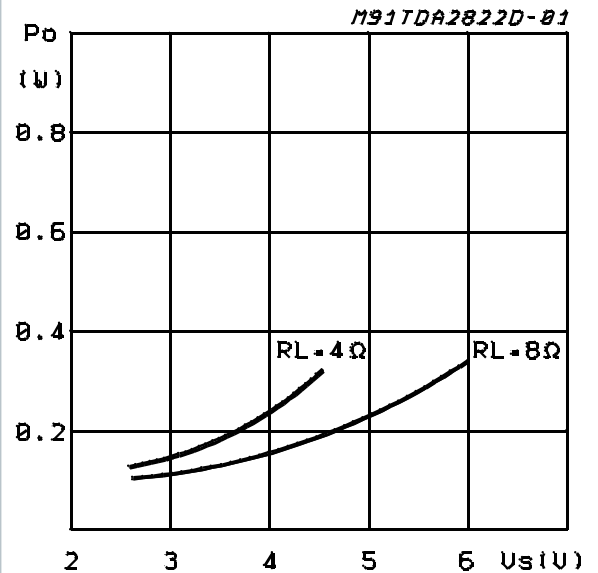
**Table 4. Electrical characteristics (bridge)**

| 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 |  | $R_L = 8 \Omega$             |      |      | $\pm 80$ | 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                                | $R_L = 8 \Omega$   | $P_O = 0.5 mW, f = 1 kHz$    |      | 0.2  |          | %          |
| $G_V$       | Closed loop voltage gain                  |  | f = 1 kHz                    |      | 39   |          | dB         |
| $R_i$       | Input resistance                          |  | f = 1 kHz                    | 100  |      |          | k $\Omega$ |
| $e_N$       | Total input noise                         | $R_S = 10 k\Omega, B = \text{curve A}$                   |                              |      | 2.5  |          | $\mu V$    |
|             |   | $R_S = 10 k\Omega, B = 22 \text{ Hz to } 22 \text{ kHz}$ |                              |      | 3    |          |            |
| SVR         | Supply voltage rejection                  |  | f = 100 Hz                   |      | 40   |          | dB         |
| B           | Power bandwidth (-3 dB)                   |  | $R_L = 8 k\Omega, P_O = 1 W$ |      | 120  |          | kHz        |

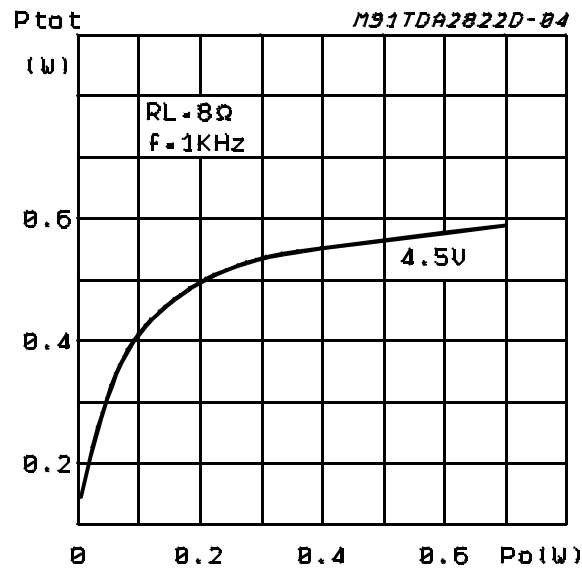
**Figure 5. Supply voltage rejection vs. frequency**



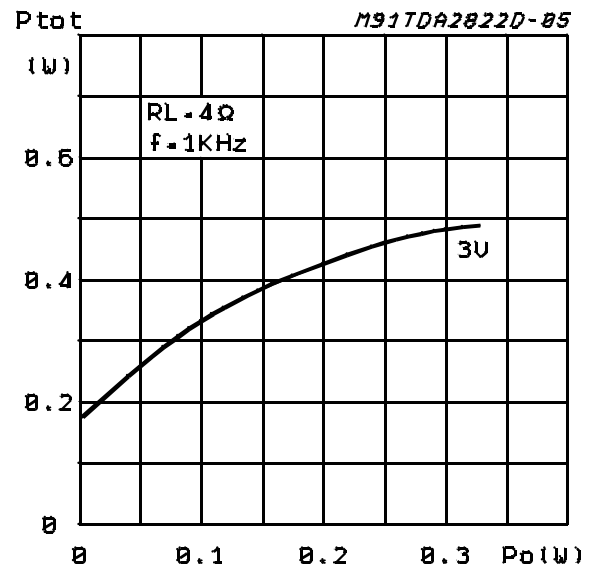
**Figure 6. Output power vs. supply voltage (THD= 10%, f=1 kHz stereo)**



**Figure 7. Total power dissipation vs. output power (bridge, RL=8  $\Omega$ )**



**Figure 8. Total power dissipation vs. output power (bridge, RL=4  $\Omega$ )**



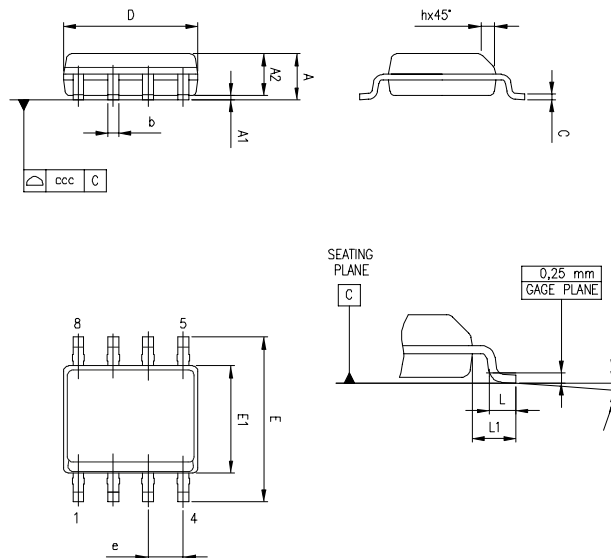


## 5 Package information

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](http://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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