SGS-THOMSON MICROELECTRONICS

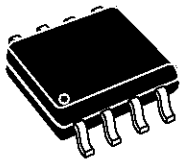
# TDA2822D

## DUAL LOW-VOLTAGE POWER AMPLIFIER

- SUPPLY VOLTAGE DOWN TO 1.8V
- LOWCROSSOVER 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 dual audio power amplifier in portable cassette players, radios and CD players



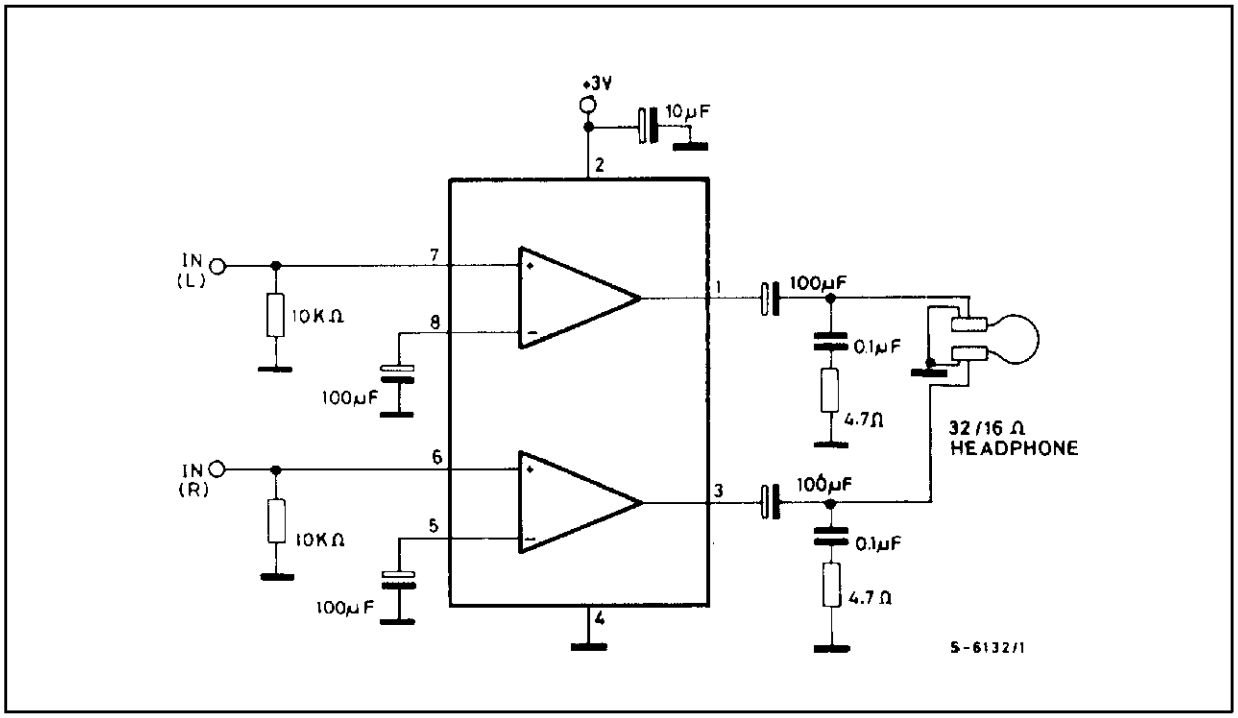
**SO8**

**ORDERING NUMBER:** TDA2822D

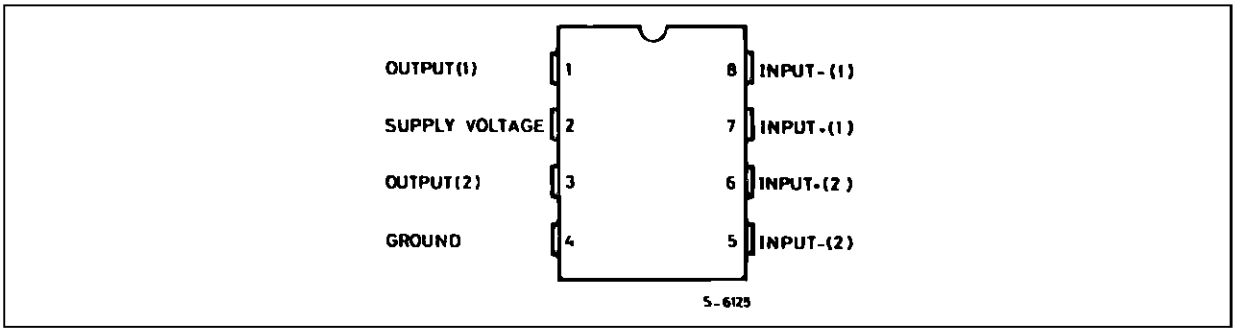
### ABSOLUTE MAXIMUM RATINGS

| Symbol | Parameter | Value | Unit |
|---|---|---|---|
| $V_S$ | Supply Voltage | 15 | V |
| $I_O$ | Peak Output | 1 | A |
| $P_{tot}$ | Total Power Dissipation $T_{amb}$ = 50°C | 0.5 | W |
| $T_{stg}$, $T_j$ | Storage and Junction Temperature | -40 to 150 | °C |

### APPLICATION CIRCUIT



**PIN CONNECTION** (Top view)




**THERMAL DATA**

| Symbol | Description | | Value | Unit |
|---|---|---|---|---|
| $R_{th\ j\text{-}amb}$ | Thermal Resistance Junction-ambient | Max | 200 | °C/W |

**Figure 1:** Stereo Application and Test Circuit

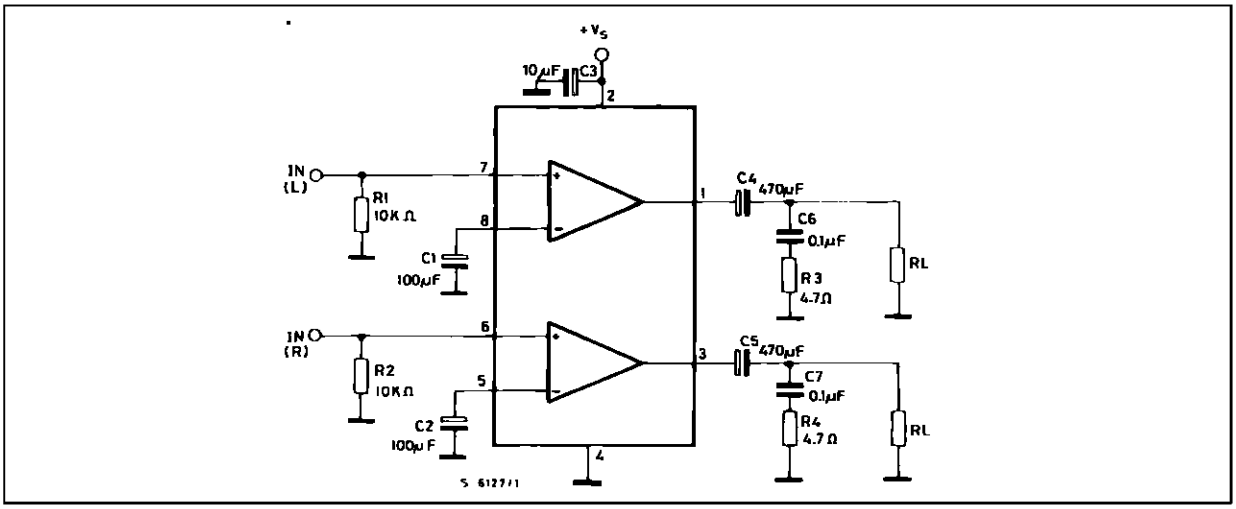
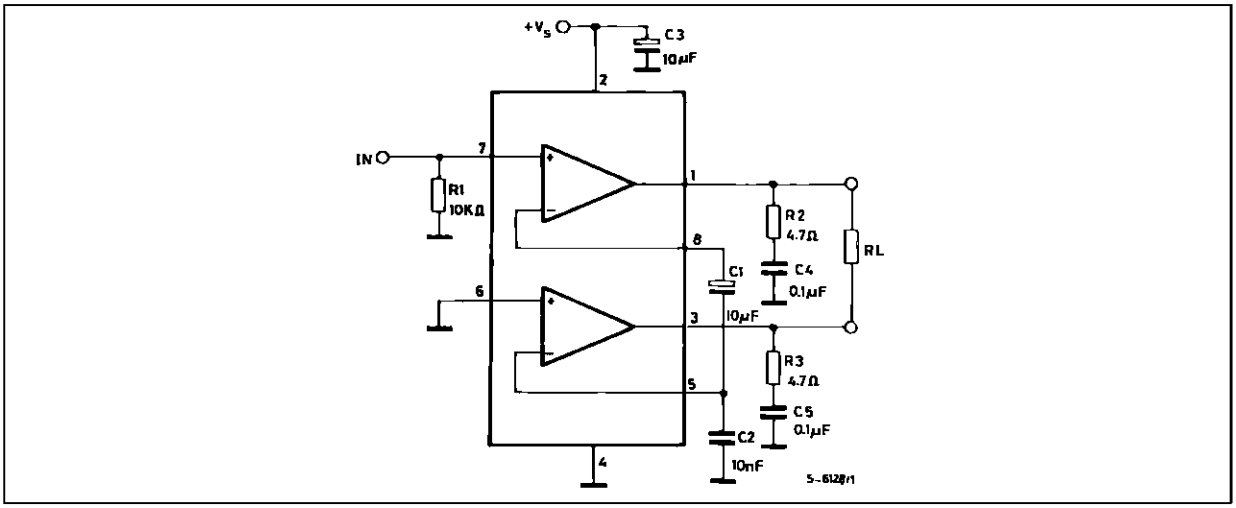



**Figure 2:** Bridge Application and Test Circuit



**ELECTRICAL CHARACTERISTICS** ($V_S$ = 6V; $T_{amb}$ = 25°C, unless otherwise specified.
STEREO (Test circuit of fig. 1).

| Symbol | Parameter | Test Condition | | 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 |
| | | $V_S$ = 3V | | | 1.2 | | V |
| $I_b$ | Input Bias Current | | | | 100 | | nA |
| $P_O$ | Output Power (each channel) (f = 1KHz, d = 10%) | $R_L$ = 32Ω | $V_S$ = 9V<br>$V_S$ = 6V<br>$V_S$ = 4.5V<br>$V_S$ = 3V<br>$V_S$ = 2V | | 300<br>120<br>60<br>20<br>5 | | mW |
| | | $R_L$ = 16Ω | $V_S$ = 6V | 170 | 220 | | mW |
| | | $R_L$ = 8Ω | $V_S$ = 6V | 300 | 380 | | mW |
| | | $R_L$ = 4Ω | $V_S$ = 4.5V<br>$V_S$ = 3V | | 320<br>110 | | mW<br>mW |
| d | Distortion | $R_L$ = 32Ω | $P_O$ = 40mW | | 0.2 | | % |
| | | $R_L$ = 16Ω | $P_O$ = 75mW | | 0.2 | | % |
| | | $R_L$ = 8Ω | $P_O$ = 150mW | | 0.2 | | % |
| $G_V$ | Closed Loop Voltage Gain | f = 1KHz | | 36 | 39 | 41 | dB |
| $\Delta G_V$ | Channel Balance | | | | | ±1 | dB |
| $R_i$ | Input Resistance | f = 1KHz | | 100 | | | KΩ |
| $e_N$ | Total Input Noise | $R_s$ = 10kΩ | B = Curve A | | 2 | | μV |
| | | $R_s$ = 10kΩ | B = 22Hz to 22KHz | | 2.5 | | μV |
| SVR | Supply Voltage Rejection | f = 100Hz | C1 = C2 = 100μF | 24 | 30 | | dB |
| $C_s$ | Channel Separation | f = 1KHz | | | 50 | | dB |

BRIDGE (Test circuit of fig.2)

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| $V_S$ | Supply Voltage | | | 1.8 | | 15 | V |
| $I_d$ | Total Quiescent Drain Current | $R_L$ = ∞ | | | | 15 | mA |
| $V_{os}$ | Output Offset Voltage (between the outputs) | $R_L$ = 8Ω | | | | ±80 | mV |
| $I_b$ | Input Bias Current | | | | 100 | | nA |
| $P_O$ | Output Power (f = 1KHz, d = 10%) | $R_L$ = 32Ω | $V_S$ = 9V<br>$V_S$ = 6V<br>$V_S$ = 4.5V<br>$V_S$ = 3V<br>$V_S$ = 2V | 320<br><br>50 | 1000<br>400<br>200<br>65<br>8 | | mW |
| | | $R_L$ = 16Ω | $V_S$ = 6V<br>$V_S$ = 3V | | 800<br>120 | | mW<br>mW |
| | | $R_L$ = 8Ω | $V_S$ = 4.5V<br>$V_S$ = 3V | | 700<br>220 | | mW<br>mW |
| | | $R_L$ = 4Ω | $V_S$ = 3V<br>$V_S$ = 2V | | 350<br>80 | | mW<br>mW |
| d | Distortion | $R_L$ = 8Ω $P_O$ = 0.5W f = 1KHz | | | 0.2 | | % |
| $G_V$ | Closed Loop Voltage Gain | f = 1KHz | | | 39 | | dB |
| $R_i$ | Input Resistance | f = 1KHz | | 100 | | | KΩ |
| $e_N$ | Total Input Noise | $R_s$ = 10kΩ | B = Curve A | | 2.5 | | μV |
| | | $R_s$ = 10kΩ | B = 22Hz to 22KHz | | 3 | | μV |
| SVR | Supply Voltage Rejection | f = 100Hz | | | 40 | | dB |
| B | Power Bandwidth (-3dB) | $R_L$ = 8Ω $P_O$ = 1W | | | 120 | | KHz |

**Figure 3:** Supply Voltage Rejection vs. Frequency

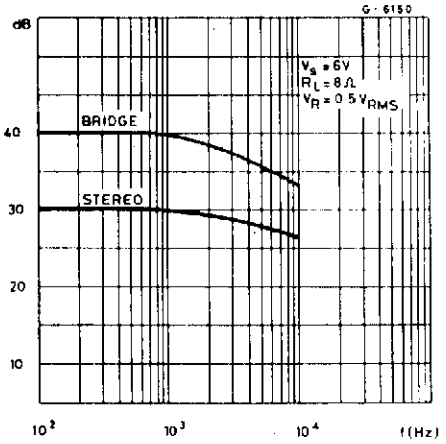



**Figure 4:** Output Power vs. Supply Voltage (THD = 10%, f = 1KHz Stereo)

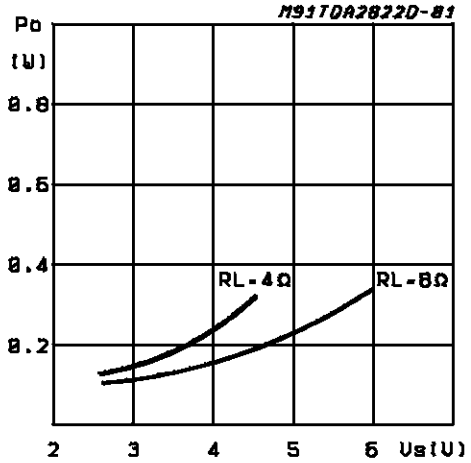



**Figure 5:** Total Power Dissipation vs. Output Power (Bridge)

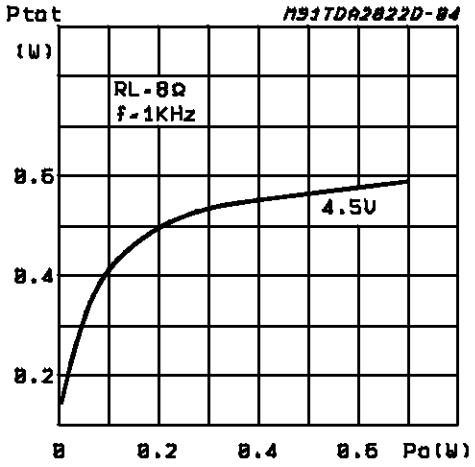
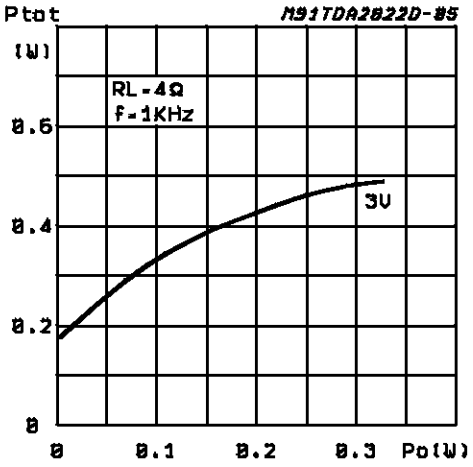



**Figure 6:** Total Power Dissipation vs. Output Power (Bridge)



## SO8 PACKAGE MECHANICAL DATA

| DIM. | mm | | | inch | | |
|---|---|---|---|---|---|---|
| | MIN. | TYP. | MAX. | MIN. | TYP. | MAX. |
| A | | | 1.75 | | | 0.069 |
| a1 | 0.1 | | 0.25 | 0.004 | | 0.010 |
| a2 | | | 1.65 | | | 0.065 |
| a3 | 0.65 | | 0.85 | 0.026 | | 0.033 |
| b | 0.35 | | 0.48 | 0.014 | | 0.019 |
| b1 | 0.19 | | 0.25 | 0.007 | | 0.010 |
| C | 0.25 | | 0.5 | 0.010 | | 0.020 |
| c1 | 45° (typ.) | | | | | |
| D | 4.8 | | 5.0 | 0.189 | | 0.197 |
| E | 5.8 | | 6.2 | 0.228 | | 0.244 |
| e | | 1.27 | | | 0.050 | |
| e3 | | 3.81 | | | 0.150 | |
| F | 3.8 | | 4.0 | 0.15 | | 0.157 |
| L | 0.4 | | 1.27 | 0.016 | | 0.050 |
| M | | | 0.6 | | | 0.024 |
| S | 8° (max.) | | | | | |