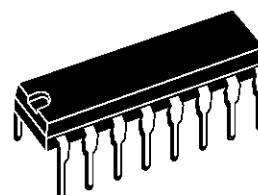


**DUAL POWER AMPLIFIER**

- SUPPLY VOLTAGE DOWN TO 3 V
- LOW CROSSOVER DISTORSION
- LOW QUIESCENT CURRENT
- BRIDGE OR STEREO CONFIGURATION



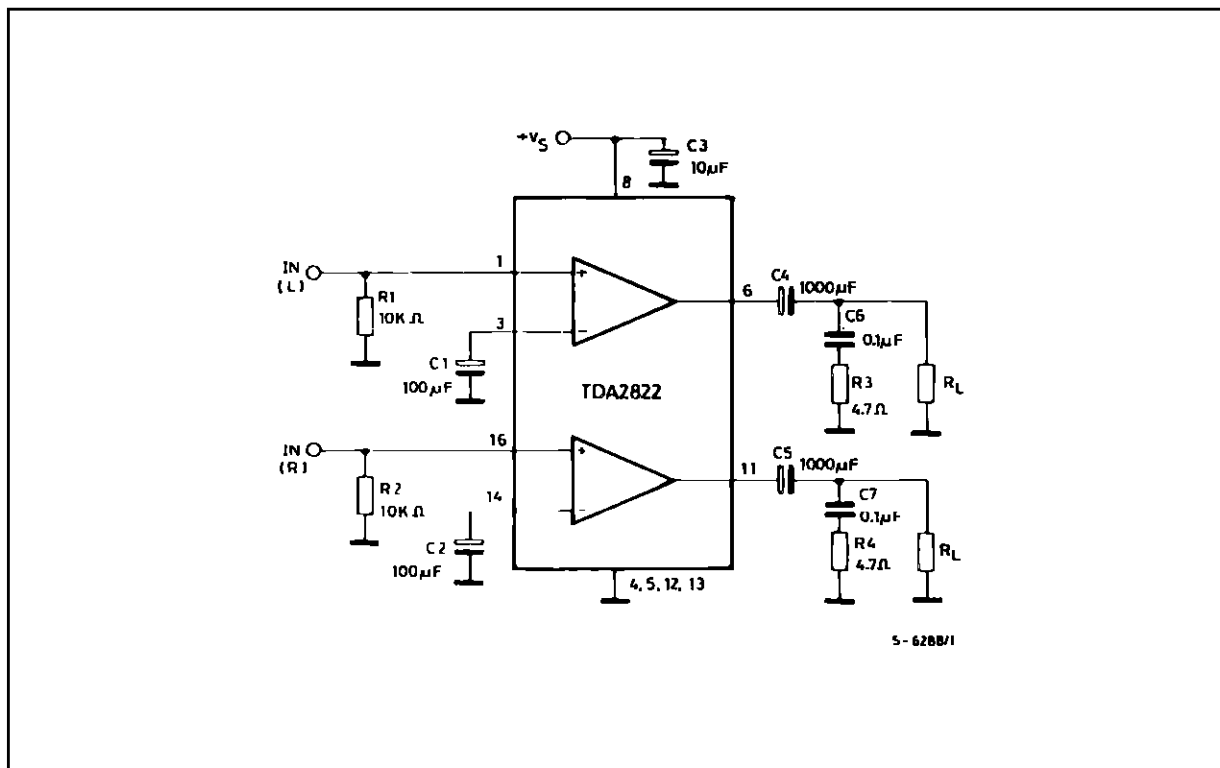
**POWERDIP**  
(Plastic 12+2+2)

**ORDERING NUMBER : TDA2822**

**DESCRIPTION**

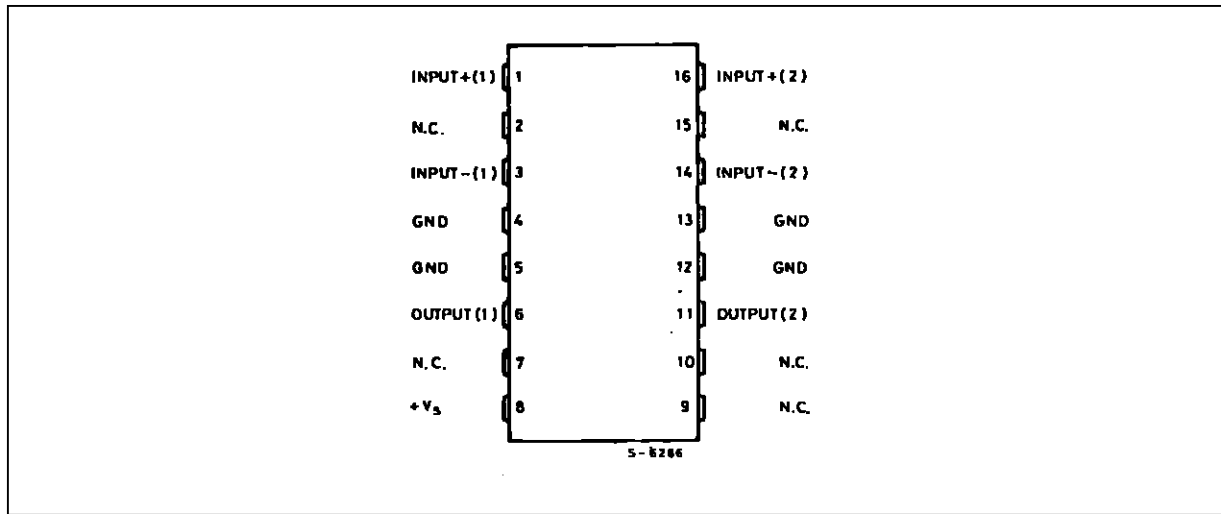
The TDA2822 is a monolithic integrated circuit in 12+2+2 powerdip, intended for use as dual audio power amplifier in portable radios and TS sets.

**TYPICAL APPLICATION CIRCUIT (STEREO)**

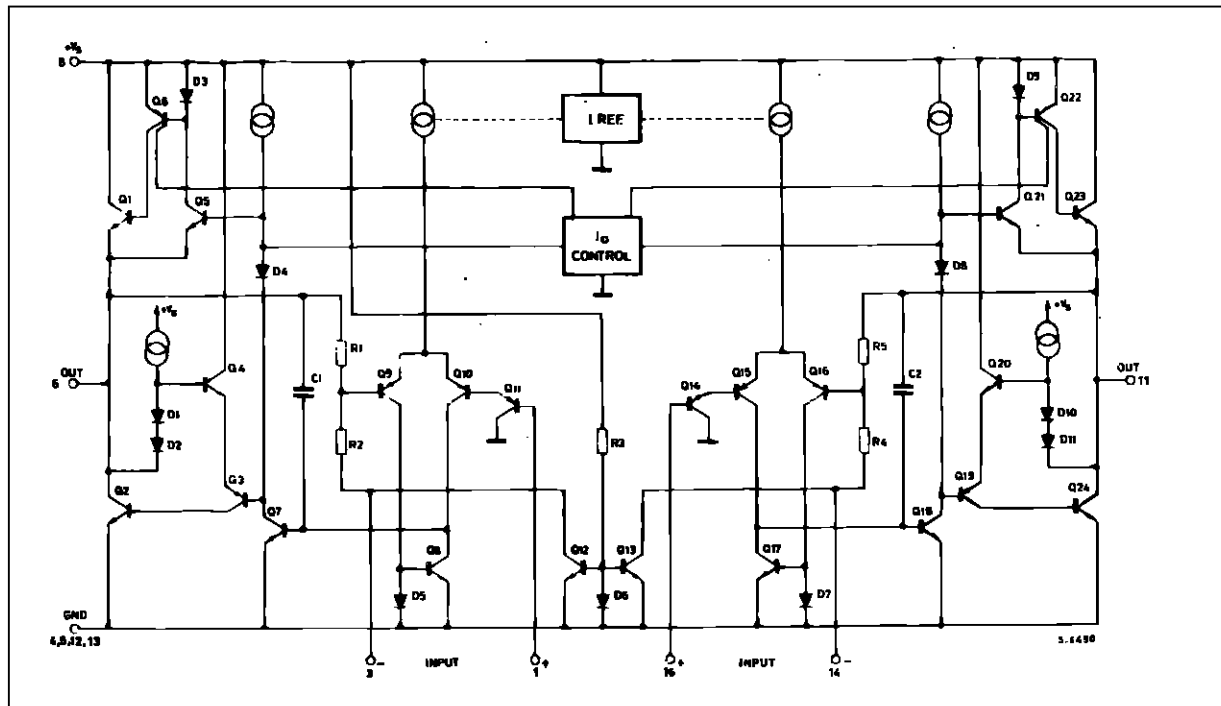


# TDA2822

## PIN CONNECTION (top view)



## SCHEMATIC DIAGRAM



## ABSOLUTE MAXIMUM RATINGS

| Symbol         | Parameter   | Value       | Unit             |
|----------------|---|-------------|------------------|
| $V_s$          | Supply Voltage  | 15          | V                |
| $I_o$          | Output Peak Current   | 1.5         | A                |
| $P_{tot}$      | Total Power Dissipation at $T_{amb} = 50\text{ }^\circ\text{C}$<br>at $T_{case} = 70\text{ }^\circ\text{C}$ | 1.25<br>4   | W<br>W           |
| $T_{stg}, T_j$ | Storage and Junction Temperature  | - 40 to 150 | $^\circ\text{C}$ |

## THERMAL DATA

| Symbol           | Parameter                           | Value  | Unit          |
|------------------|-------------------------------------|--------|---------------|
| $R_{th\ j-amb}$  | Thermal Resistance Junction-ambient | Max 80 | $^{\circ}C/W$ |
| $R_{th\ j-case}$ | Thermal Resistance Junction-pins    | Max 20 | $^{\circ}C/W$ |

**ELECTRICAL CHARACTERISTICS** ( $V_s = 6\text{ V}$ ,  $T_{amb} = 25\text{ }^{\circ}C$ , unless otherwise specified)  
STEREO (test circuit of fig. 1)

| Symbol | Parameter                      | Test Condition  | Min.        | Typ.                | Max. | Unit                           |
|--------|--------------------------------|---|-------------|---------------------|------|--------------------------------|
| $V_s$  | Supply Voltage                 |   | 3           |                     | 15   | V                              |
| $V_c$  | Quiescent Output Voltage       | $V_s = 9\text{ V}$<br>$V_s = 6\text{ V}$  |             | 4<br>2.7            |      | V<br>V                         |
| $I_d$  | Quiescent Drain Current        |   |             | 6                   | 12   | mA                             |
| $I_b$  | Input Bias Current             |   |             | 100                 |      | nA                             |
| $P_o$  | Output Power<br>(each channel) | $d = 10\%$ $f = 1\text{ kHz}$<br>$V_s = 9\text{ V}$ $R_L = 4\ \Omega$<br>$V_s = 6\text{ V}$ $R_L = 4\ \Omega$<br>$V_s = 4.5\text{ V}$ $R_L = 4\ \Omega$ | 1.3<br>0.45 | 1.7<br>0.65<br>0.32 |      | W<br>W<br>W                    |
| $G_v$  | Closed Loop Voltage Gain       | $f = 1\text{ kHz}$  | 36          | 39                  | 41   | dB                             |
| $R_i$  | Input Resistance               | $f = 1\text{ kHz}$  | 100         |                     |      | k $\Omega$                     |
| $e_N$  | Total Input Noise              | $R_s = 10\text{ k}\Omega$<br>$B = 22\text{ Hz to }22\text{ kHz}$<br>Curve A   |             | 2.5<br>2            |      | $\mu\text{V}$<br>$\mu\text{V}$ |
| SVR    | Supply Voltage Rejection       | $f = 100\text{ Hz}$   | 24          | 30                  |      | dB                             |
| CS     | Channel Separation             | $R_g = 10\text{ k}\Omega$ $f = 1\text{ kHz}$  |             | 50                  |      | dB                             |

BRIDGE (test circuit of fig. 2)

|          |                                   |   |            |                  |    |                                |
|----------|-----------------------------------|---|------------|------------------|----|--------------------------------|
| $V_s$    | Supply Voltage                    |   | 3          |                  | 15 | V                              |
| $I_d$    | Quiescent Drain Current           | $R_L = \infty$  |            | 6                | 12 | mA                             |
| $V_{os}$ | Output Offset Voltage             | $R_L = 8\ \Omega$   |            | 10               | 60 | mV                             |
| $I_b$    | Input Bias Current                |   |            | 100              |    | nA                             |
| $P_o$    | Output Power                      | $d = 10\%$ $f = 1\text{ kHz}$<br>$V_s = 9\text{ V}$ $R_L = 8\ \Omega$<br>$V_s = 6\text{ V}$ $R_L = 8\ \Omega$<br>$V_s = 4.5\text{ V}$ $R_L = 4\ \Omega$ | 2.7<br>0.9 | 3.2<br>1.35<br>1 |    | W<br>W<br>W                    |
| $d$      | Distortion ( $f = 1\text{ kHz}$ ) | $R_L = 8\ \Omega$ $P_o = 0.5\text{ W}$  |            | 0.2              |    | %                              |
| $G_v$    | Closed Loop Voltage Gain          | $f = 1\text{ kHz}$  |            | 39               |    | dB                             |
| $R_i$    | Input Resistance                  | $f = 1\text{ kHz}$  | 100        |                  |    | k $\Omega$                     |
| $e_N$    | Total Input Noise                 | $R_s = 10\text{ k}\Omega$<br>$B = 22\text{ Hz to }22\text{ kHz}$<br>Curve A   |            | 3<br>2.5         |    | $\mu\text{V}$<br>$\mu\text{V}$ |
| SVR      | Supply Voltage Rejection          | $f = 100\text{ Hz}$   |            | 40               |    | dB                             |

# TDA2822

Figure 1 : Test Circuit (stereo).

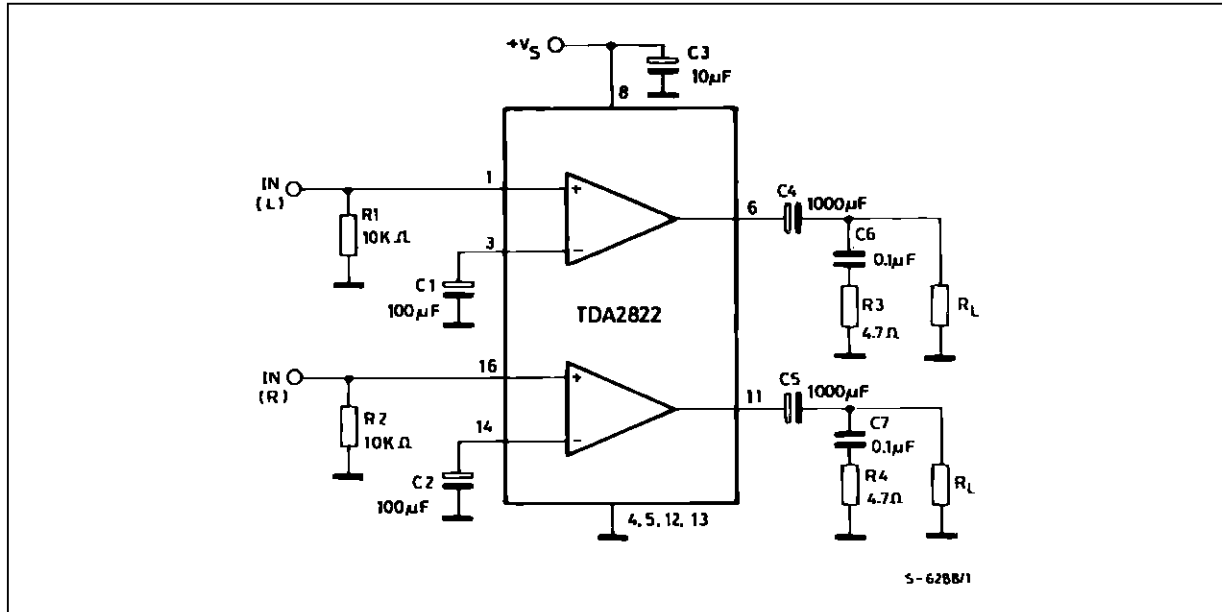


Figure 2 : P.C. Board and Components Layout of the Circuit of Figure 1 (1:1 scale).

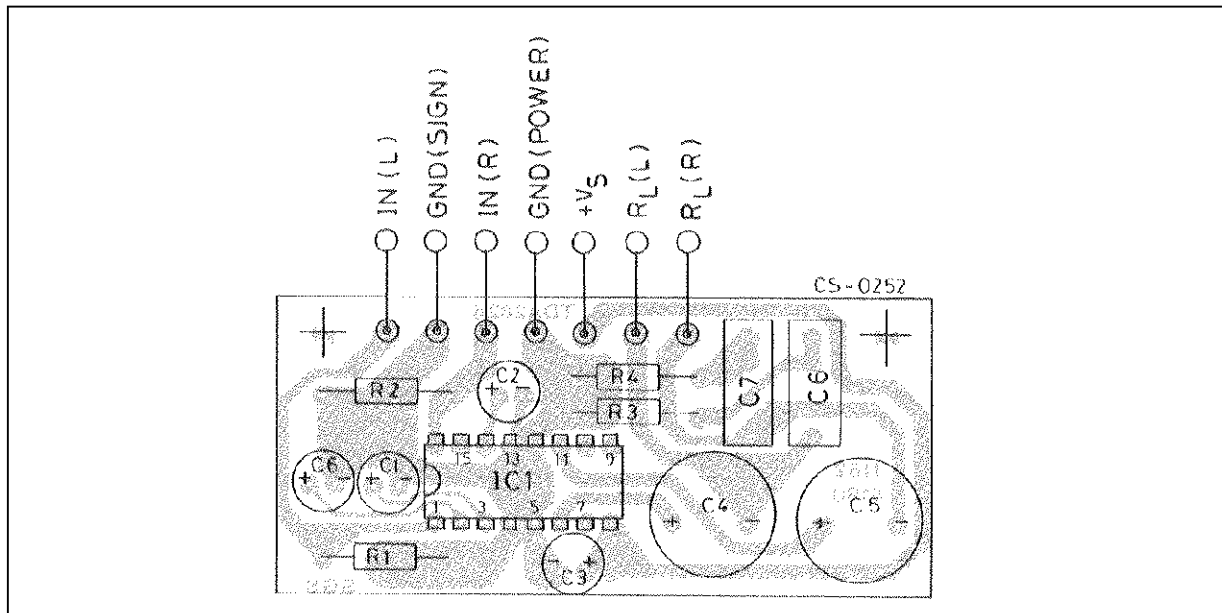


Figure 3 : Test Circuit (bridge).

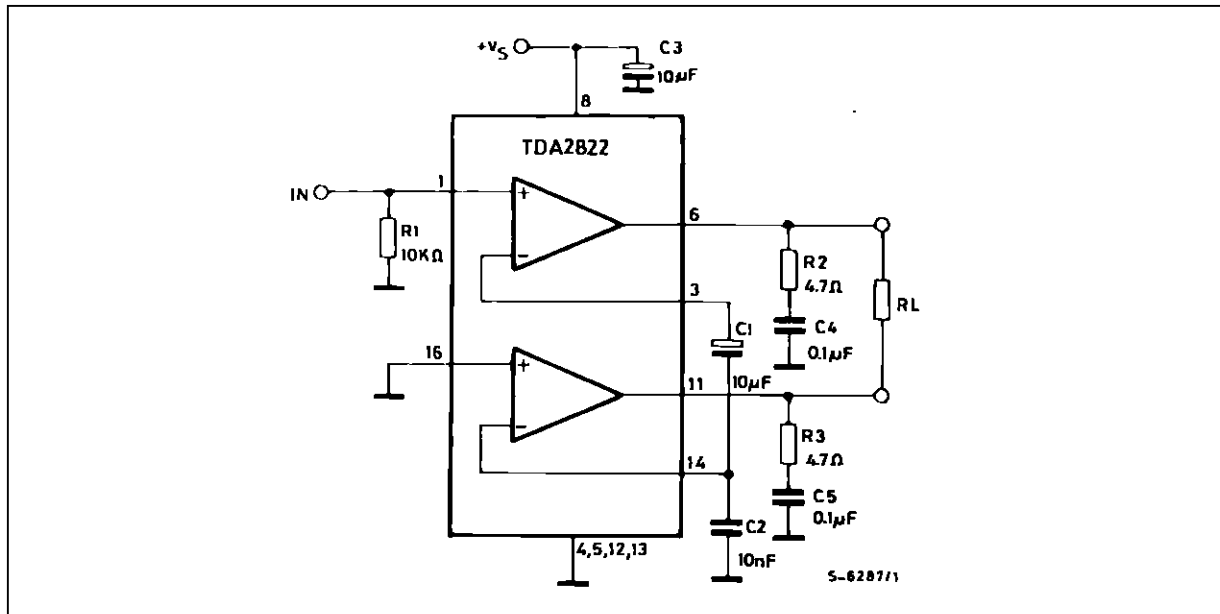


Figure 4 : P.C. Board and Components Layout of the Circuit of Figure 3 (1:1 scale).

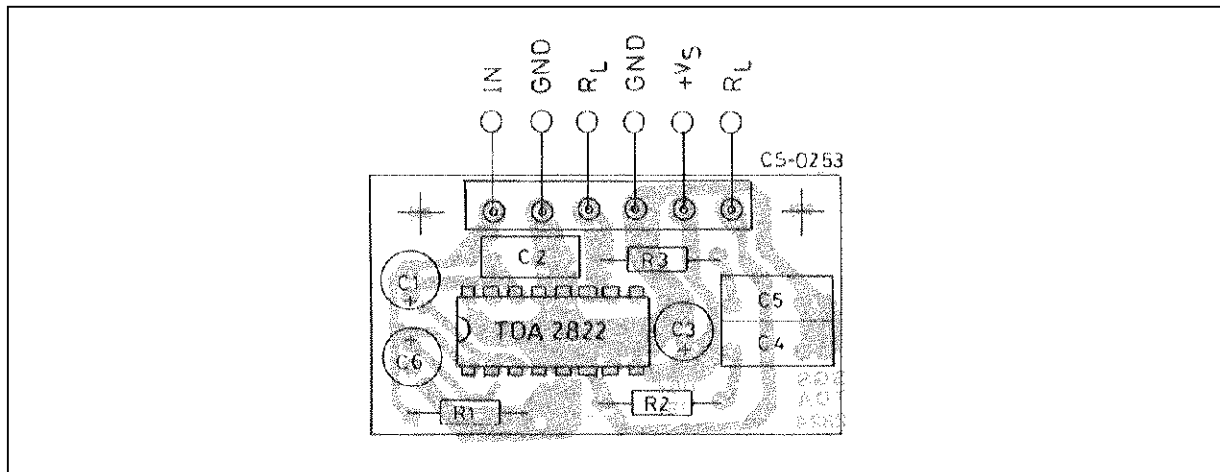


Figure 5 : Output Power vs. Supply Voltage (Stereo).

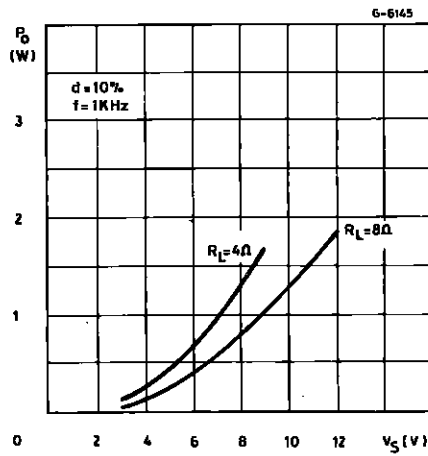


Figure 6 : Output Power vs. Supply Voltage (Bridge).

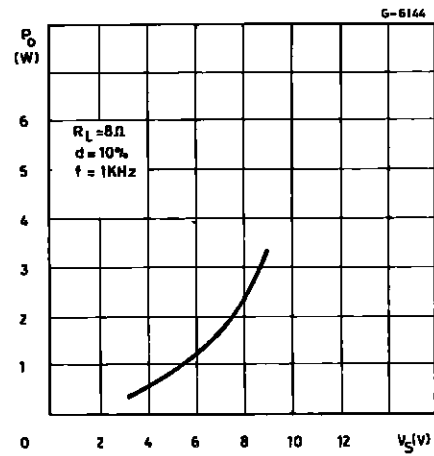


Figure 7 : Distorsion vs. Output Power (Bridge).

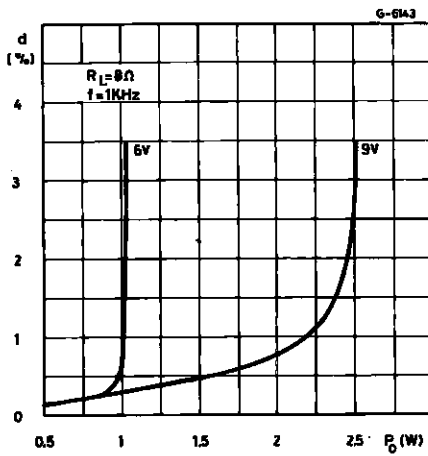


Figure 8 : Distorsion vs. Output Power (Bridge).

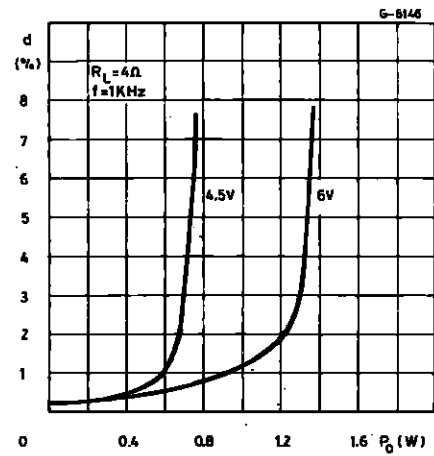


Figure 9 : Supply Voltage Rejection vs. Frequency.

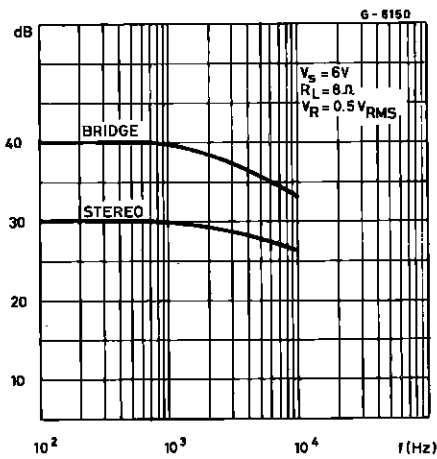


Figure 10 : Quiescent Current vs. Supply Voltage.

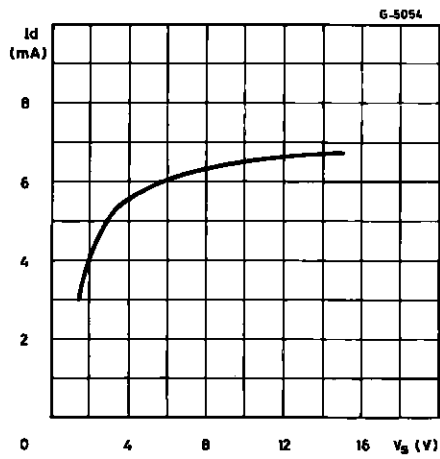


Figure 11 : Total Power Dissipation vs. Output Power (Stereo).

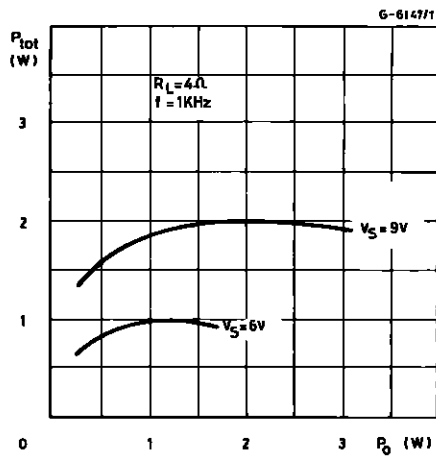


Figure 12 : Total Power Dissipation vs. Output Power (Bridge).

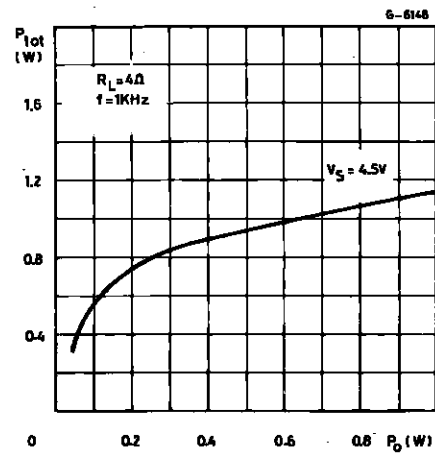
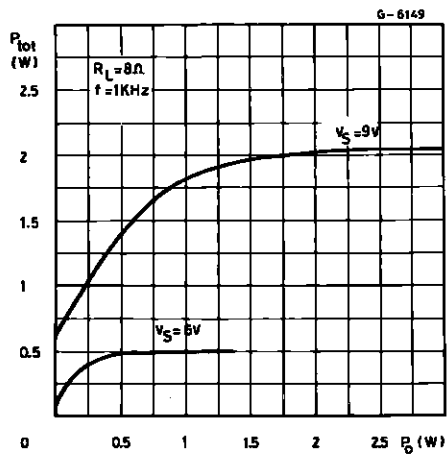
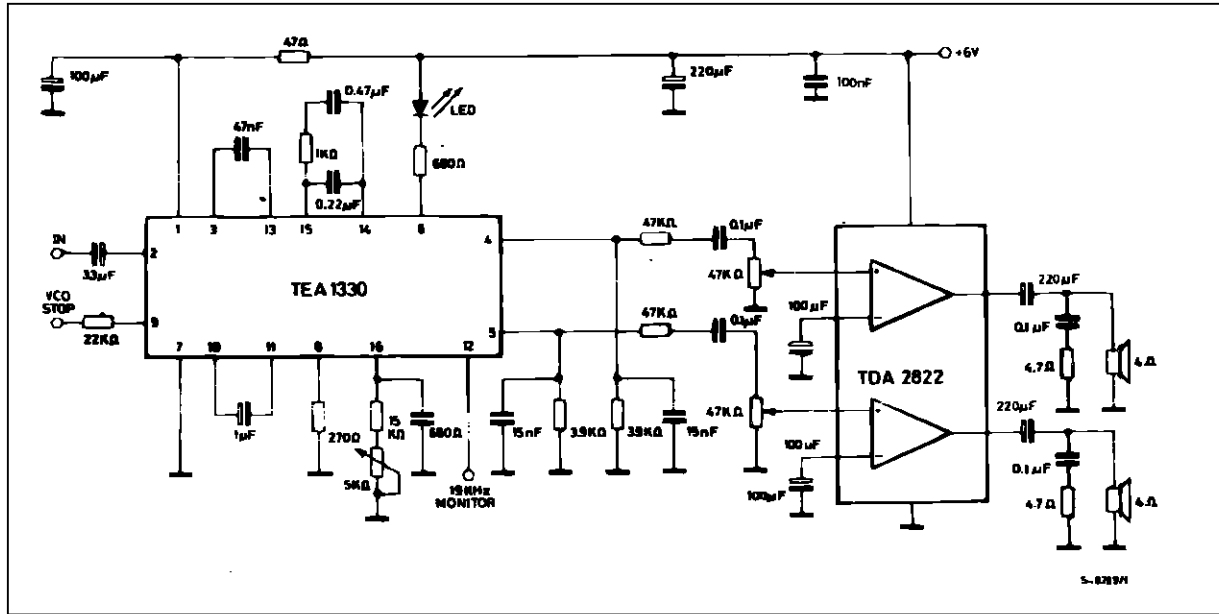


Figure 13 : Total Power Dissipation vs. Output Power (Bridge).



# TDA2822

Figure 14 : Application Circuit for Portable Radios.

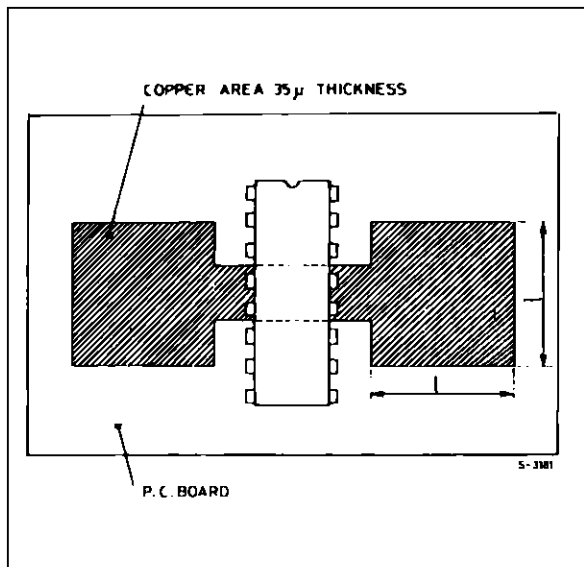


## MOUNTING INSTRUCTION

The  $R_{th j-amb}$  of the TDA2822 can be reduced by soldering the GND pins to a suitable copper area of the printed circuit board (Figure 15) or to an external heatsink (Figure 16).

The diagram of Figure 17 shows the maximum dissipable power  $P_{tot}$  and the  $R_{th j-amb}$  as a function of the side "d" of two equal square copper areas having a thickness of  $35 \mu$  (1.4 mils).

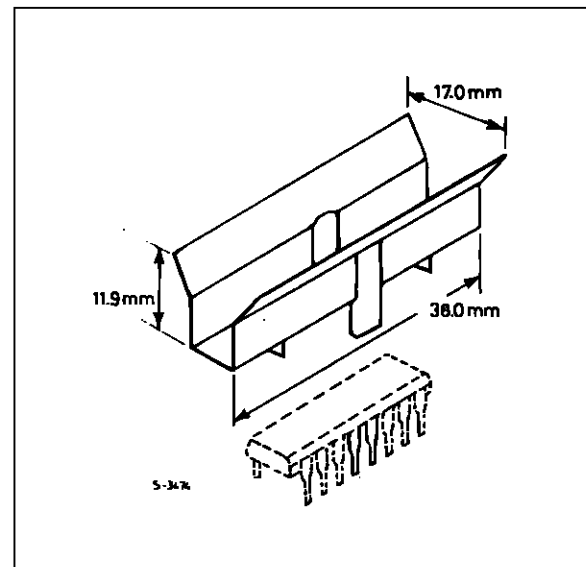
Figure 15 : Example of P.C. Board Copper Area which is used as Heatsink.



During soldering the pins temperature must not exceed  $260 \text{ }^\circ\text{C}$  and the soldering time must not be longer than 12 seconds.

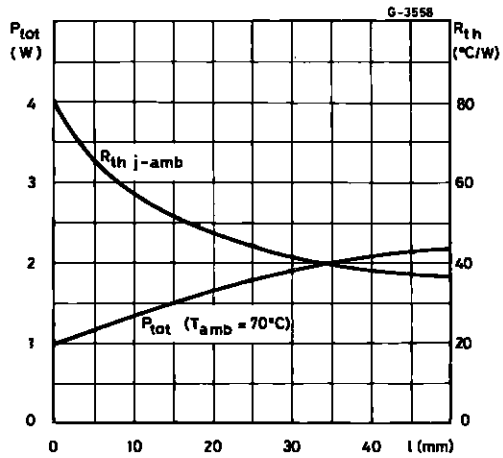
The external heatsink or printed circuit copper area must be connected to electrical ground.

Figure 16 : External Heatsink Mounting Example.

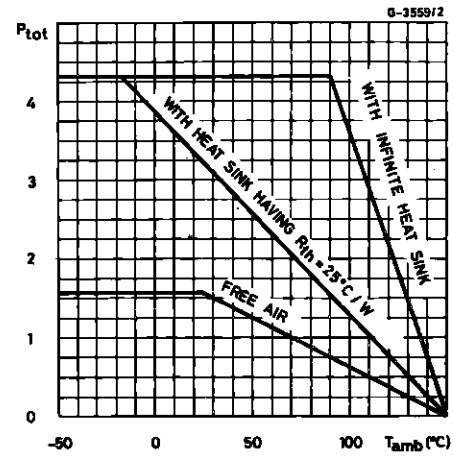




**Figure 6 :** Maximum Dissipable Power and Junction to Ambient Thermal Resistance vs. Side "d".



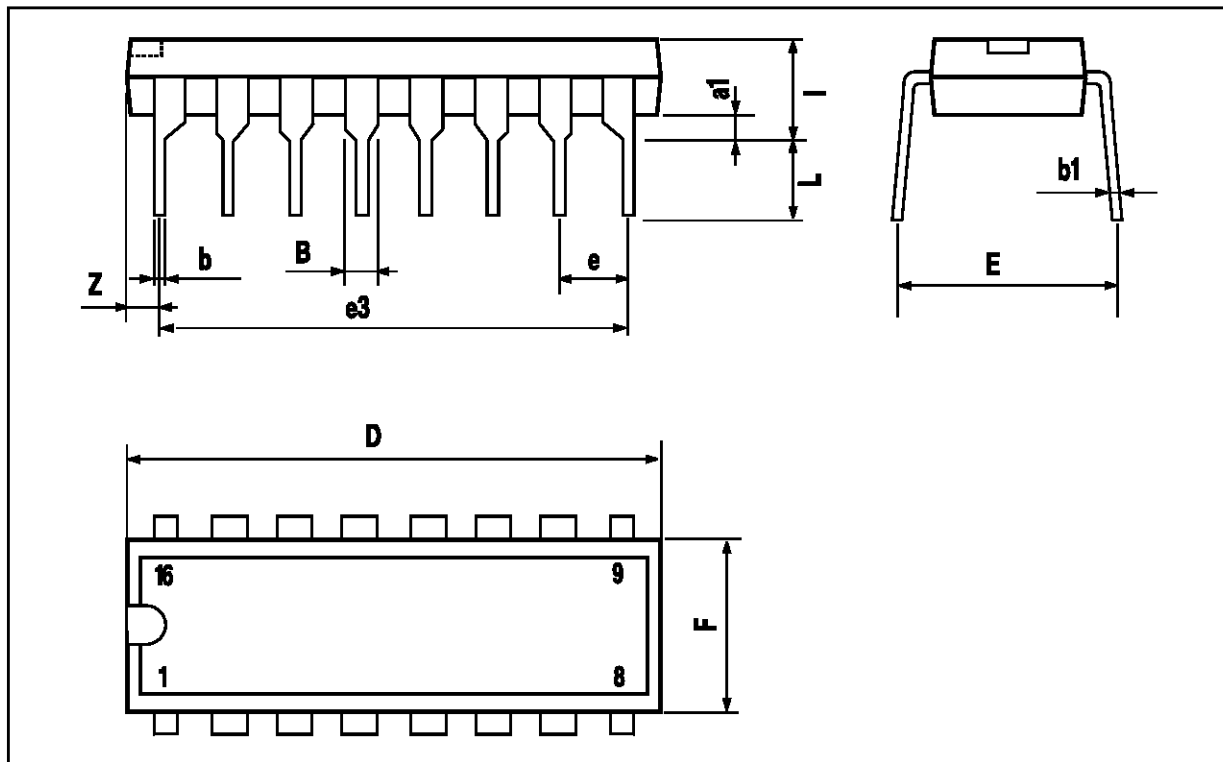
**Figure 7 :** Maximum Allowable Power Dissipation vs. Ambient Temperature.



# TDA2822

## POWERDIP 16 PACKAGE MECHANICAL DATA

| DIM. | mm   |       |      | inch  |       |       |
|------|------|-------|------|-------|-------|-------|
|      | MIN. | TYP.  | MAX. | MIN.  | TYP.  | MAX.  |
| a1   | 0.51 |       |      | 0.020 |       |       |
| B    | 0.85 |       | 1.40 | 0.033 |       | 0.055 |
| b    |      | 0.50  |      |       | 0.020 |       |
| b1   | 0.38 |       | 0.50 | 0.015 |       | 0.020 |
| D    |      |       | 20.0 |       |       | 0.787 |
| E    |      | 8.80  |      |       | 0.346 |       |
| e    |      | 2.54  |      |       | 0.100 |       |
| e3   |      | 17.78 |      |       | 0.700 |       |
| F    |      |       | 7.10 |       |       | 0.280 |
| I    |      |       | 5.10 |       |       | 0.201 |
| L    |      | 3.30  |      |       | 0.130 |       |
| Z    |      |       | 1.27 |       |       | 0.050 |



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