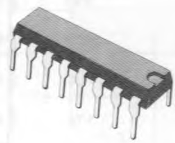
# TDA2822

## DUAL POWER AMPLIFIER

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

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



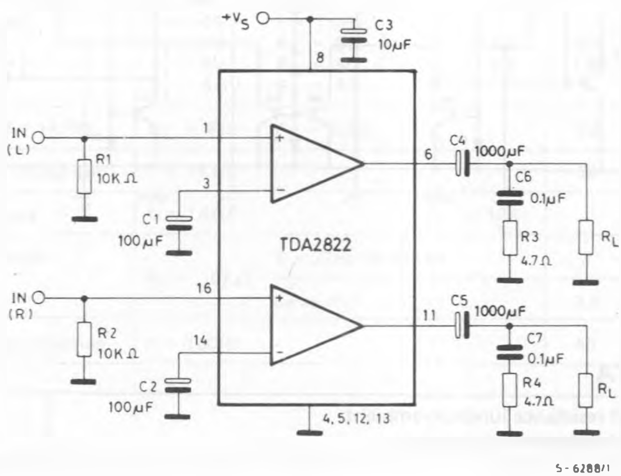
Powerdip Plastic (12+2+2)

**ORDERING NUMBER:** TDA2822

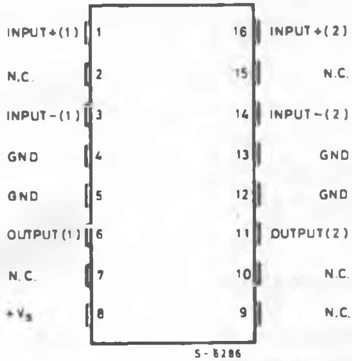
## ABSOLUTE MAXIMUM RATINGS

| | | | |
|---|---|---|---|
| $V_s$ | Supply voltage | 15 | V |
| $I_o$ | Output peak current | 1.5 | A |
| $P_{tot}$ | Total power dissipation at $T_{amb} = 50°C$ | 1.25 | W |
| | at $T_{case} = 70°C$ | 4 | W |
| $T_{stg}$, $T_j$ | Storage and junction temperature | -40 to 150 | °C |

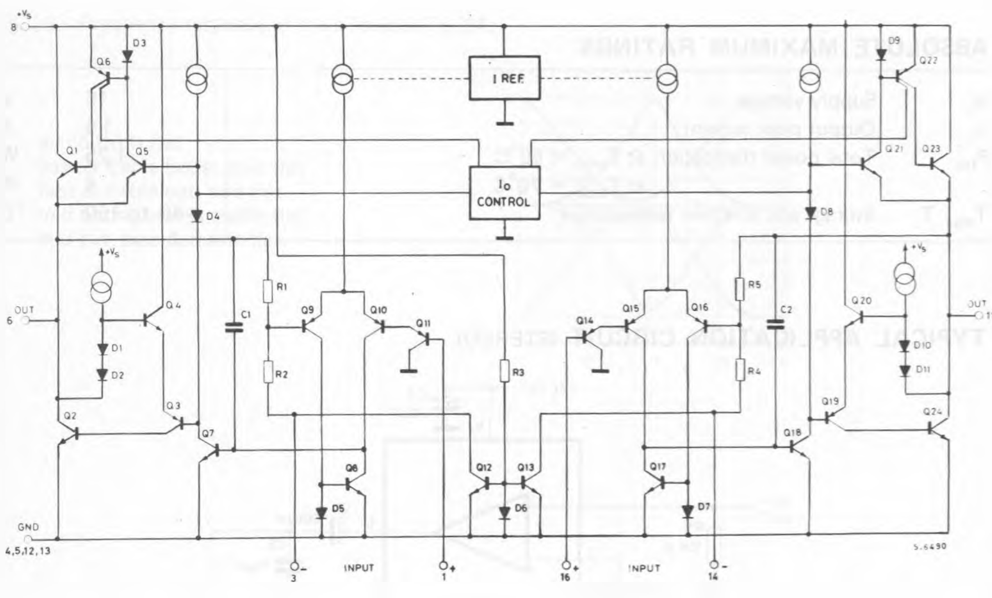
## TYPICAL APPLICATION CIRCUIT (STEREO)



## CONNECTION DIAGRAM
(top view)




## SCHEMATIC DIAGRAM




## THERMAL DATA

| | | | |
|---|---|---|---|
| $R_{th\ j\text{-}amb}$ | Thermal resistance junction-ambient | max 80 | °C/W |
| $R_{th\ j\text{-}case}$ | Thermal resistance junction-pins | max 20 | °C/W |

## ELECTRICAL CHARACTERISTICS ($V_s$ = 6V, $T_{amb}$ = 25°C, unless otherwise specified)

| Symbol | Parameter | Test Conditions | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| **STEREO** (Test circuit of Fig. 1) | | | | | | |
| $V_s$ | Supply voltage | | 3 | | 15 | V |
| $V_c$ | Quiescent output voltage | $V_s$ = 9V<br>$V_s$ = 6V | | 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 (each channel) | d = 10% f = 1KHz<br>$V_s$ = 9V $R_L$ = 4Ω<br>$V_s$ = 6V $R_L$ = 4Ω<br>$V_s$ = 4.5V $R_L$ = 4Ω | <br>1.3<br>0.45<br> | <br>1.7<br>0.65<br>0.32 | | <br>W<br>W<br>W |
| $G_v$ | Closed loop voltage gain | f = 1KHz | 36 | 39 | 41 | dB |
| $R_i$ | Input resistance | f = 1KHz | 100 | | | KΩ |
| $e_N$ | Total input noise | $R_s$ = 10KΩ, B = 22Hz to 22KHz | | 2.5 | | μV |
| | | $R_s$ = 10KΩ, Curve A | | 2 | | μV |
| SVR | Supply voltage rejection | f = 100Hz | 24 | 30 | | dB |
| CS | Channel separation | $R_g$ = 10KΩ f = 1KHz | | 50 | | dB |
| **BRIDGE** (Test circuit of Fig. 2) | | | | | | |
| $V_s$ | Supply voltage | | 3 | | 15 | V |
| $I_d$ | Quiescent drain current | $R_L$ = ∞ | | 6 | 12 | mA |
| $V_{os}$ | Output offset voltage | $R_L$ = 8Ω | | 10 | 60 | mV |
| $I_b$ | Input bias current | | | 100 | | nA |
| $P_o$ | Output power | d = 10% f = 1KHz<br>$V_s$ = 9V $R_L$ = 8Ω<br>$V_s$ = 6V $R_L$ = 8Ω<br>$V_s$ = 4.5V $R_L$ = 4Ω | <br>2.7<br>0.9<br> | <br>3.2<br>1.35<br>1 | | <br>W<br>W<br>W |
| d | Distortion (f = 1KHz) | $R_L$ = 8Ω $P_o$ = 0.5W | | 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 = 22Hz to 22KHz | | 3 | | μV |
| | | $R_s$ = 10KΩ, curve A | | 2.5 | | μV |
| SVR | Supply voltage rejection | f = 100Hz | | 40 | | dB |

Fig. 1 - Test circuit (STEREO)

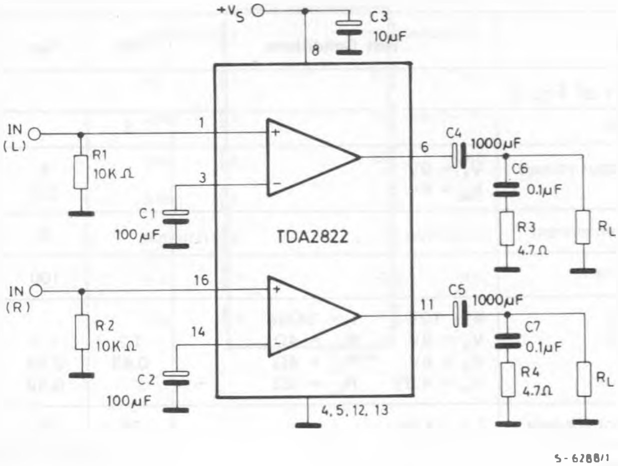



Fig. 2 - P.C. board and components layout of the circuit of Fig. 1 (1 : 1 scale)

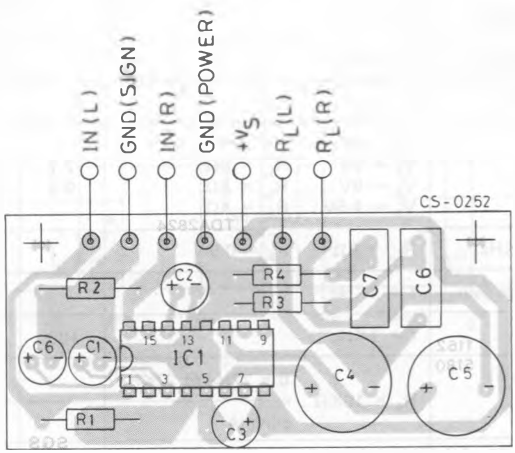


Fig. 3 - Test circuit (BRIDGE)

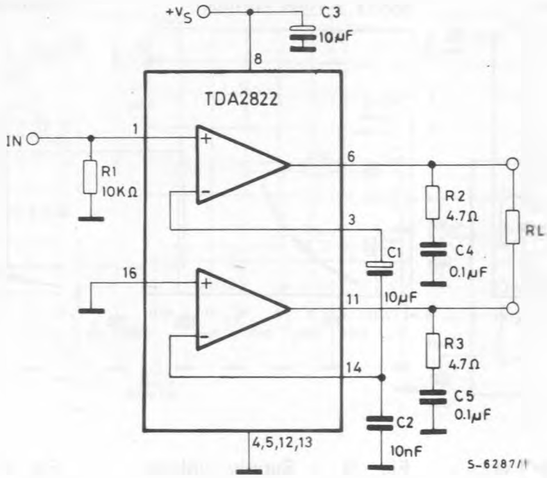



Fig. 4 - P.C. board and components layout of the circuit of Fig. 3 (1 : 1 scale)

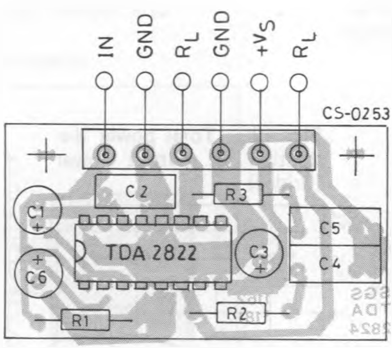


Fig. 5 - Output power vs. supply voltage (Stereo)

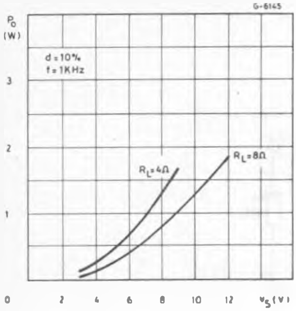



Fig. 6 - Output power vs. supply voltage (Bridge)

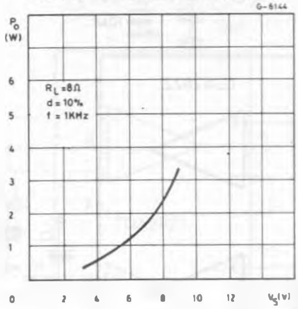



Fig. 7 - Distortion vs. output power (Bridge)

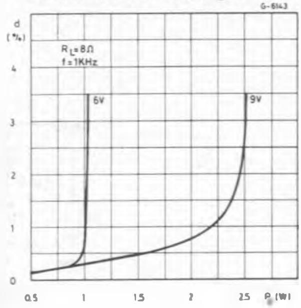



Fig. 8 - Distortion vs. output power (Bridge)

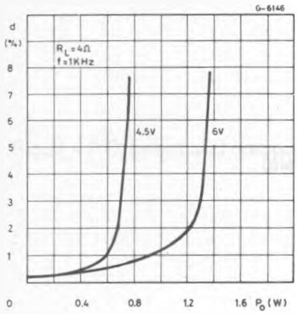



Fig. 9 - Supply voltage rejection vs. frequency

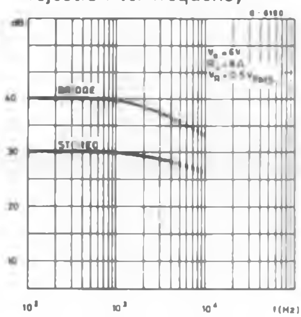



Fig. 10 - Quiescent current vs. supply voltage

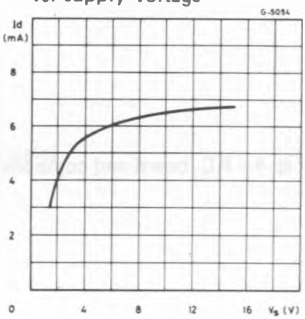



Fig. 11 - Total power dissipation vs. output power (Stereo)

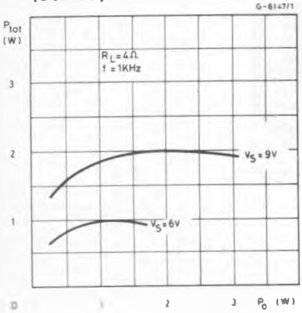



Fig. 12 - Total power dissipation vs. output power (Bridge)

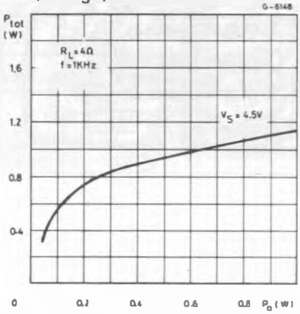



Fig. 13 - Total power dissipation vs. output power (Bridge)

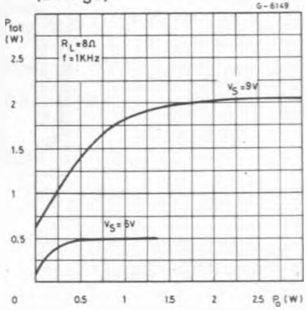
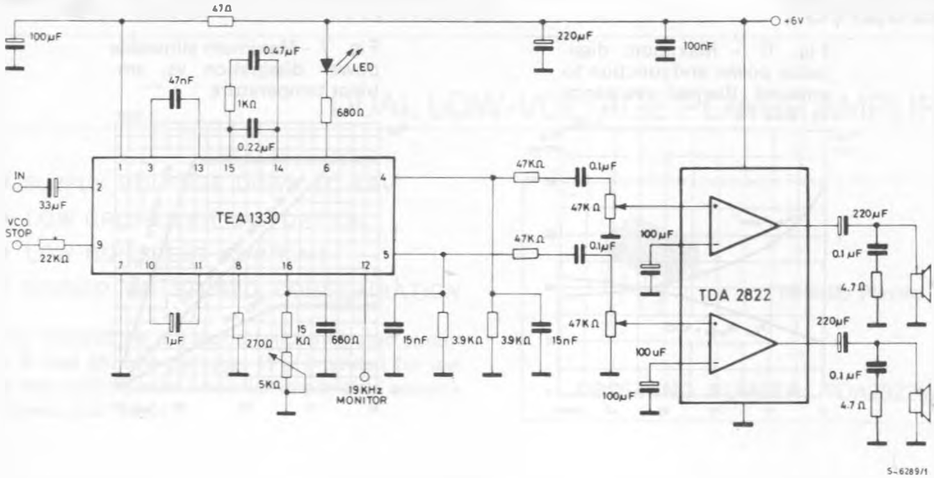


Fig. 14 - Application circuit for portable radios




## MOUNTING INSTRUCTION

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

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

During soldering the pins temperature must not exceed 260°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.

Fig. 15 - Example of P.C. board copper area which is used as heatsink.

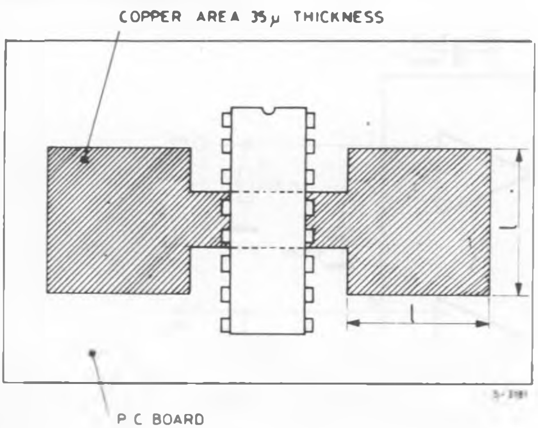
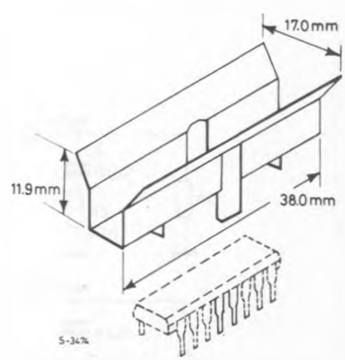



Fig. 16 - External heatsink mounting example



## MOUNTING INSTRUCTION (continued)

Fig. 6 - Maximum dissipable power and junction to ambient thermal resistance vs. side "ℓ"

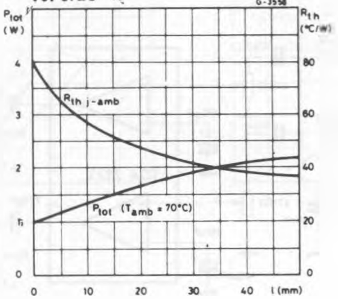



Fig. 7 - Maximum allowable power dissipation vs. ambient temperature