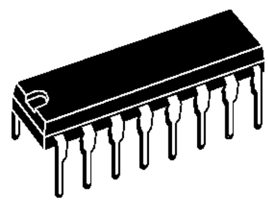
# TDA2822

## DUAL POWER AMPLIFIER

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



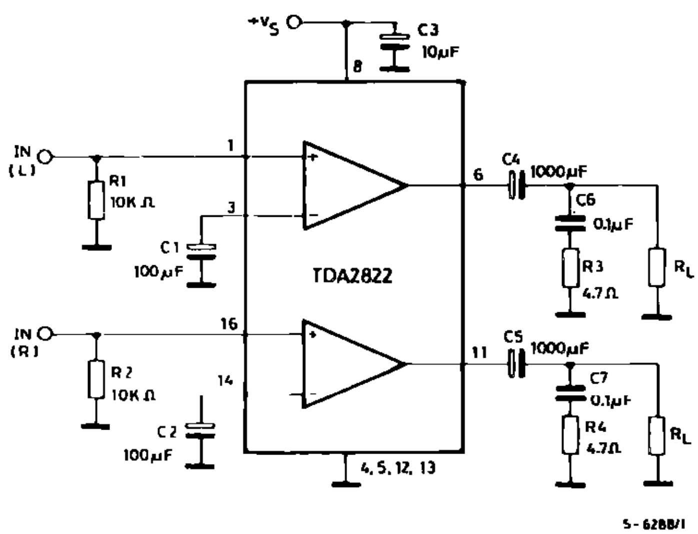
**POWERDIP**
(Plastic 12+2+2)

**ORDERING NUMBER :** TDA2822

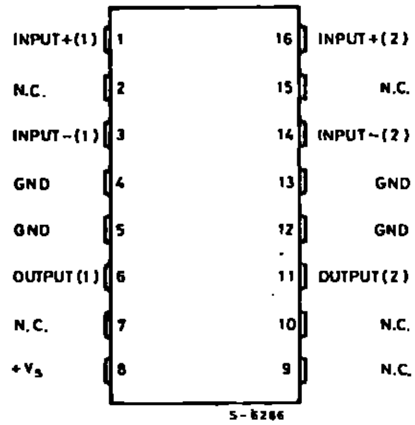
### DESCRIPTION

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.

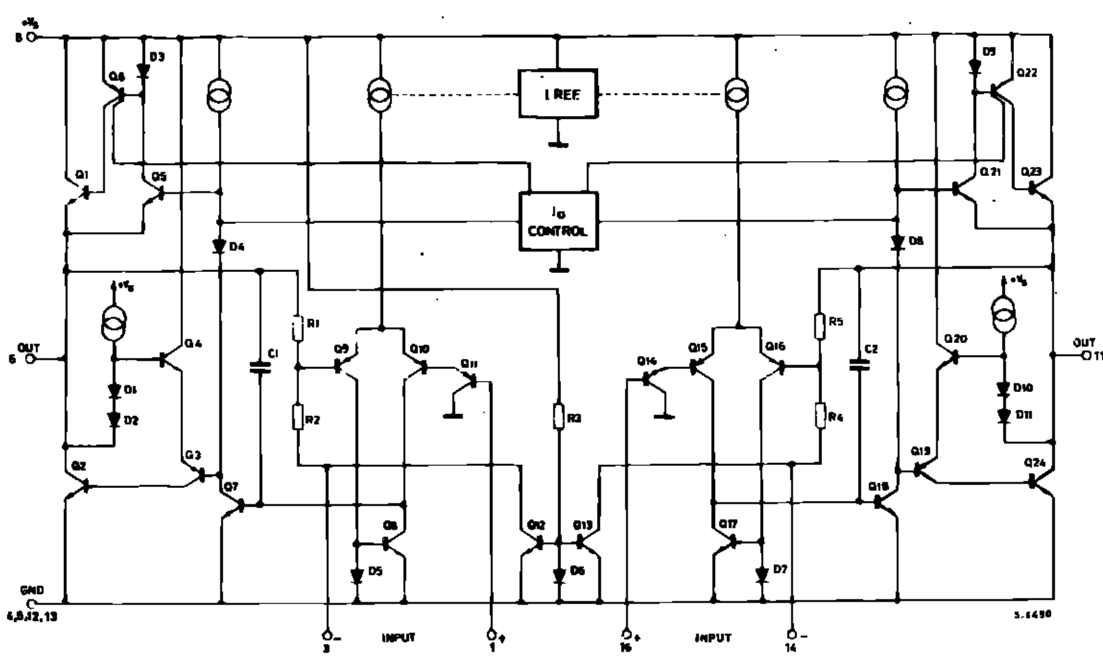
### TYPICAL APPLICATION CIRCUIT (STEREO)



## 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 °C<br>at $T_{case}$ = 70 °C | 1.25<br>4 | W<br>W |
| $T_{stg}$, $T_j$ | Storage and Junction Temperature | – 40 to 150 | °C |

## THERMAL DATA

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

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

| Symbol | Parameter | Test Condition | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| $V_s$ | Supply Voltage | | 3 | | 15 | V |
| $V_c$ | Quiescent Output Voltage | $V_s$ = 9 V<br>$V_s$ = 6 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 kHz<br>$V_s$ = 9 V $R_L$ = 4 Ω<br>$V_s$ = 6 V $R_L$ = 4 Ω<br>$V_s$ = 4.5 V $R_L$ = 4 Ω | <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 = 1 kHz | 36 | 39 | 41 | dB |
| $R_i$ | Input Resistance | f = 1 kHz | 100 | | | kΩ |
| $e_N$ | Total Input Noise | $R_s$ = 10 kΩ<br>B = 22 Hz to 22 kHz<br>Curve A | | <br>2.5<br>2 | | <br>µV<br>µV |
| SVR | Supply Voltage Rejection | f = 100 Hz | 24 | 30 | | dB |
| CS | Channel Separation | $R_g$ = 10 kΩ f = 1 kHz | | 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 | $R_L$ = 8 Ω | | 10 | 60 | mV |
| $I_b$ | Input Bias Current | | | 100 | | nA |
| $P_o$ | Output Power | d = 10 % f = 1 kHz<br>$V_s$ = 9 V $R_L$ = 8 Ω<br>$V_s$ = 6 V $R_L$ = 8 Ω<br>$V_s$ = 4.5 V $R_L$ = 4 Ω | <br>2.7<br>0.9<br> | <br>3.2<br>1.35<br>1 | | <br>W<br>W<br>W |
| d | Distortion (f = 1 kHz) | $R_L$ = 8 Ω $P_o$ = 0.5 W | | 0.2 | | % |
| $G_v$ | Closed Loop Voltage Gain | f = 1 kHz | | 39 | | dB |
| $R_i$ | Input Resistance | f = 1 kHz | 100 | | | kΩ |
| $e_N$ | Total Input Noise | $R_s$ = 10 kΩ<br>B = 22 Hz to 22 kHz<br>Curve A | | <br>3<br>2.5 | | <br>µV<br>µV |
| SVR | Supply Voltage Rejection | f = 100 Hz | | 40 | | dB |

**Figure 1 :** Test Circuit (stereo).

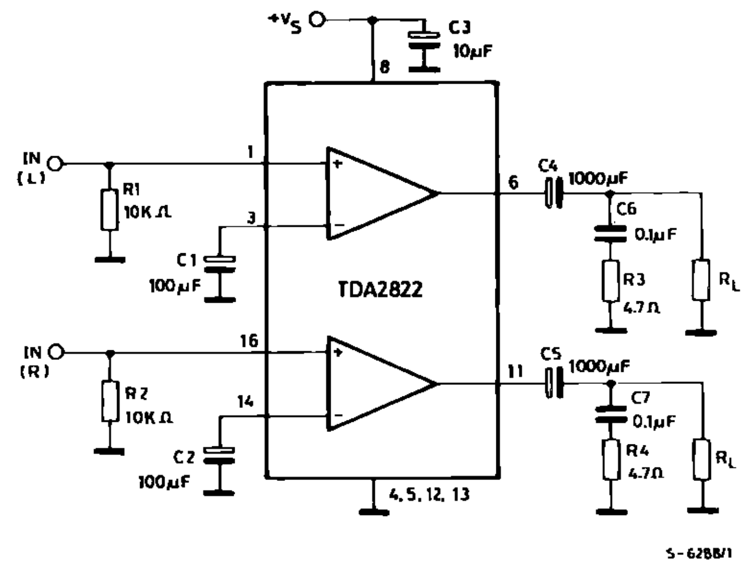



**Figure 2 :** P.C. Board and Components Layout of the Circuit of Figure 1 (1:1 scale).

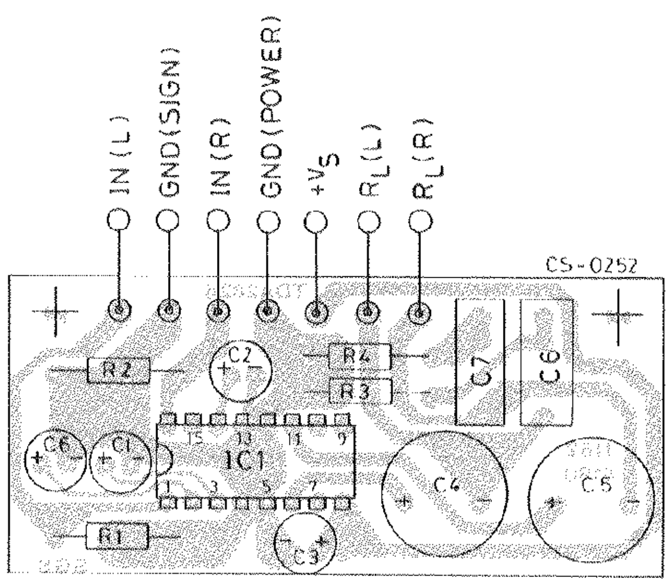


**Figure 3 :** Test Circuit (bridge).

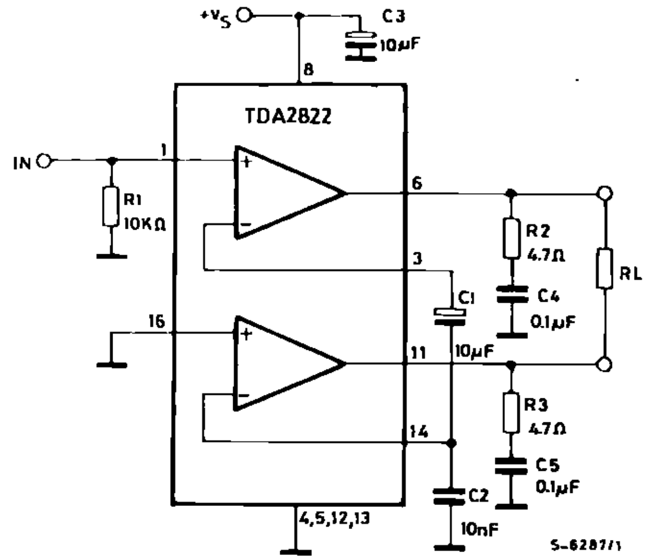



**Figure 4 :** P.C. Board and Components Layout of the Circuit of Figure 3 (1:1 scale).

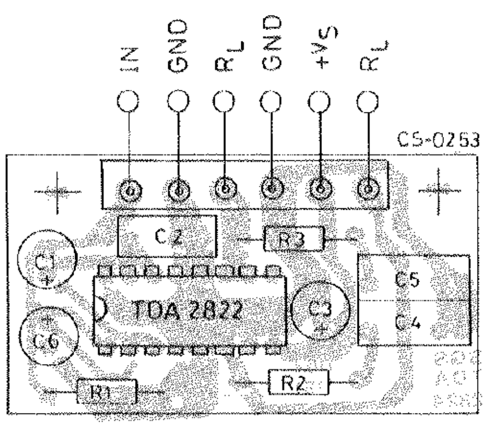


**Figure 5 :** Output Power vs. Supply Voltage (Stereo).

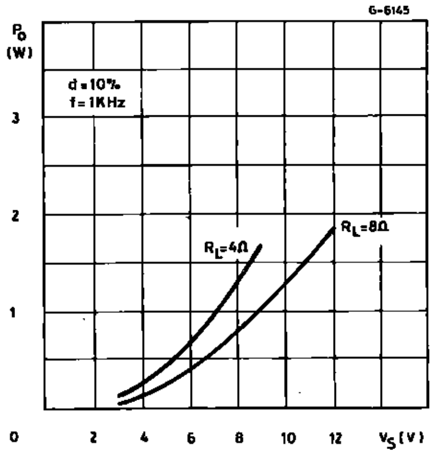



**Figure 6 :** Output Power vs. Supply Voltage (Bridge).

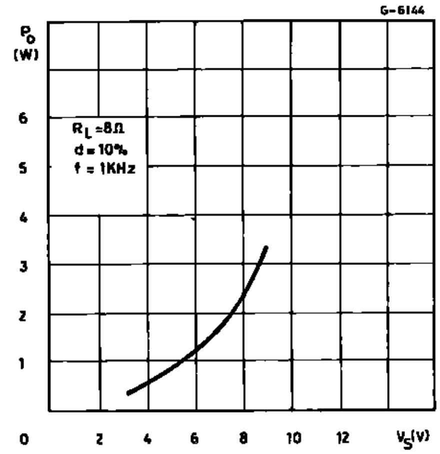



**Figure 7 :** Distorsion vs. Output Power (Bridge).

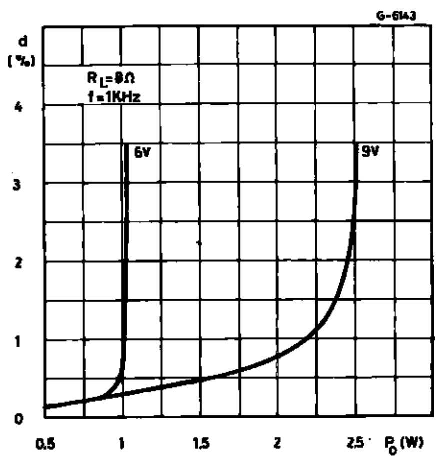



**Figure 8 :** Distorsion vs. Output Power (Bridge).

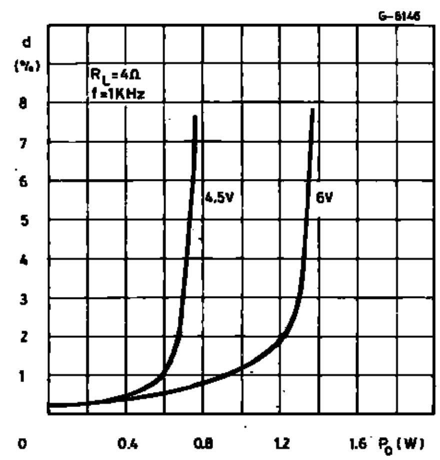



**Figure 9 :** Supply Voltage Rejection vs. Frequency.

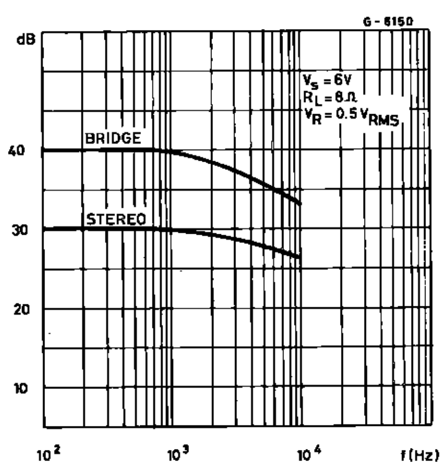



**Figure 10 :** Quiescent Current vs. Supply Voltage.

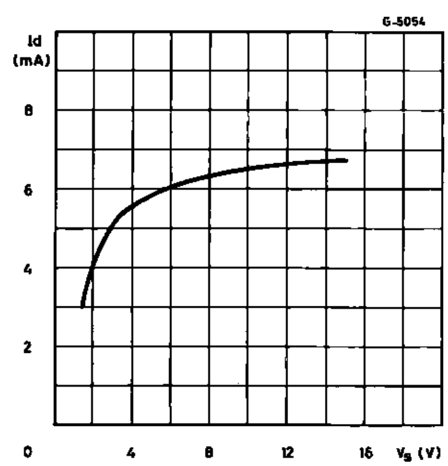





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**Figure 11 :** Total Power Dissipation vs. Output Power (Stereo).

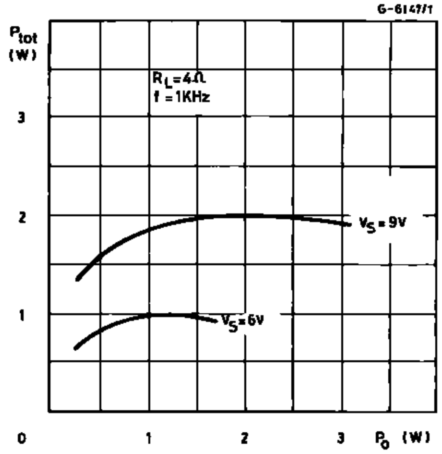



**Figure 12 :** Total Power Dissipation vs. Output Power (Bridge).

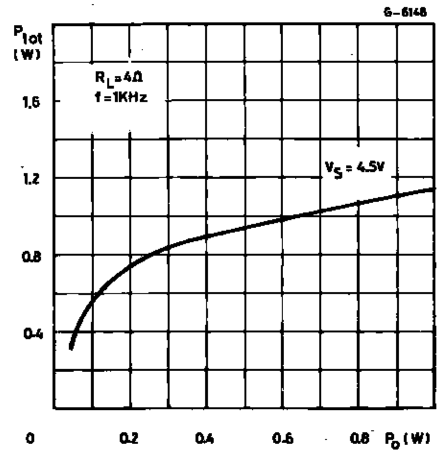



**Figure 13 :** Total Power Dissipation vs. Output Power (Bridge).

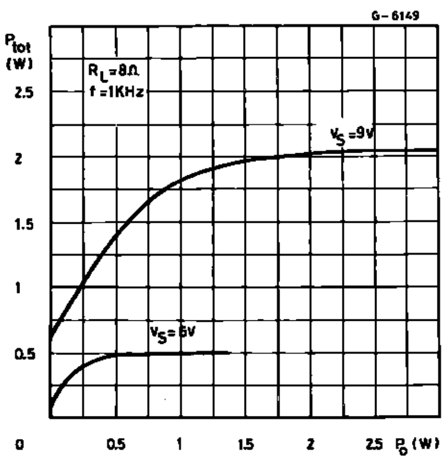
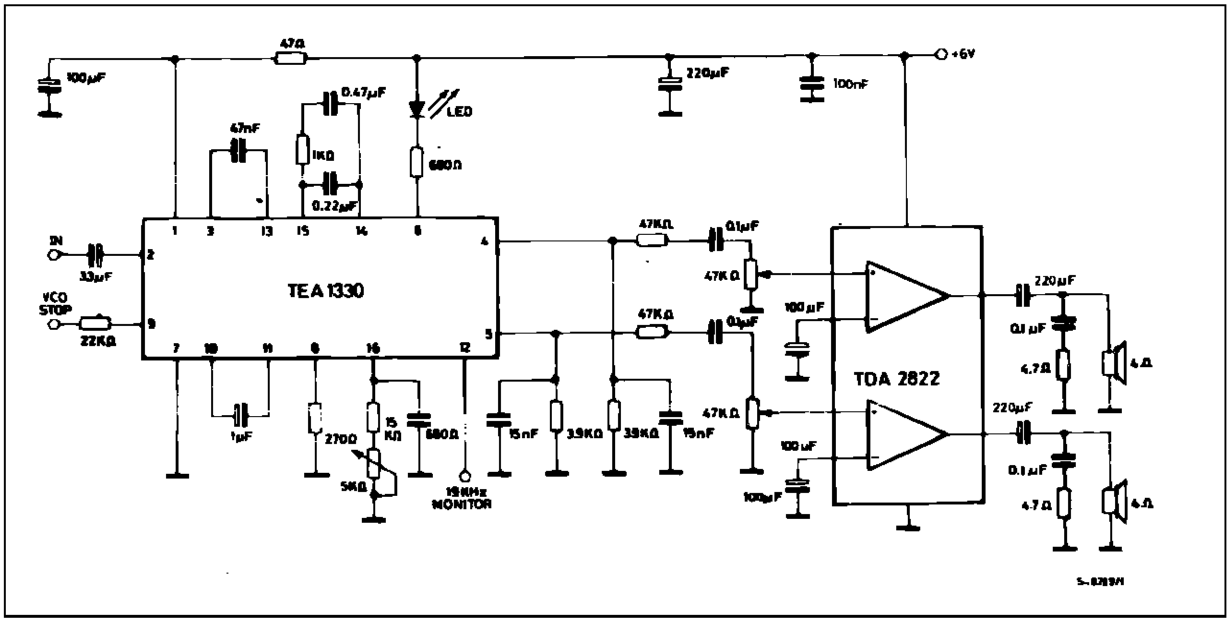


**Figure 14 :** Application Circuit for Portable Radios.




## 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 (Figure 15) or to an external heatsink (Figure 16).

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

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.

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

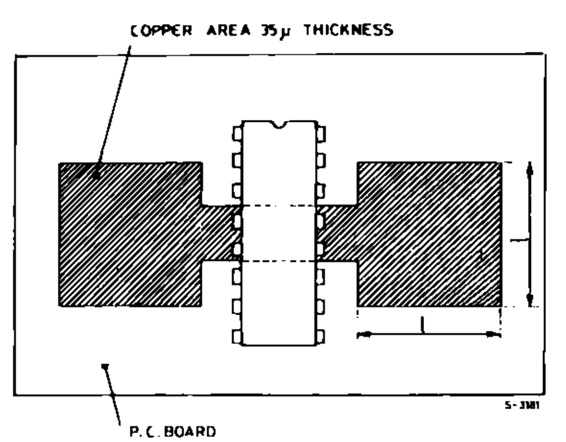



**Figure 16 :** External Heatsink Mounting Example.

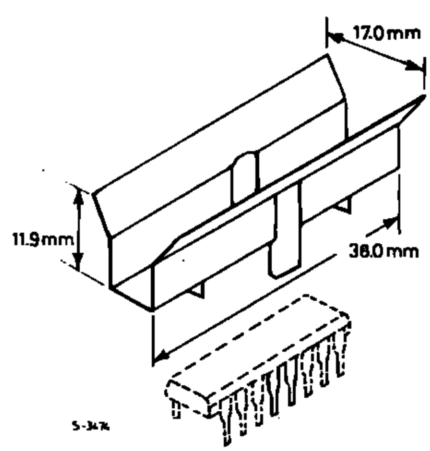




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**Figure 6 :** Maximum Dissipable Power and Junction to Ambient Thermal Resistance vs. Side "∂".

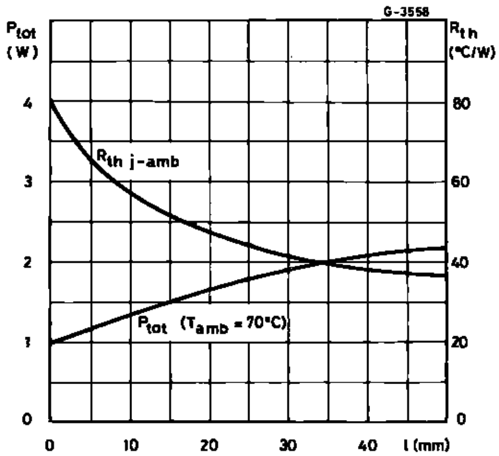
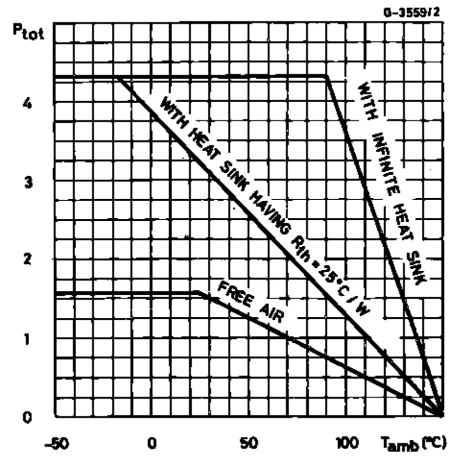



**Figure 7 :** Maximum Allowable Power Dissipation vs. Ambient Temperature.



## 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 |