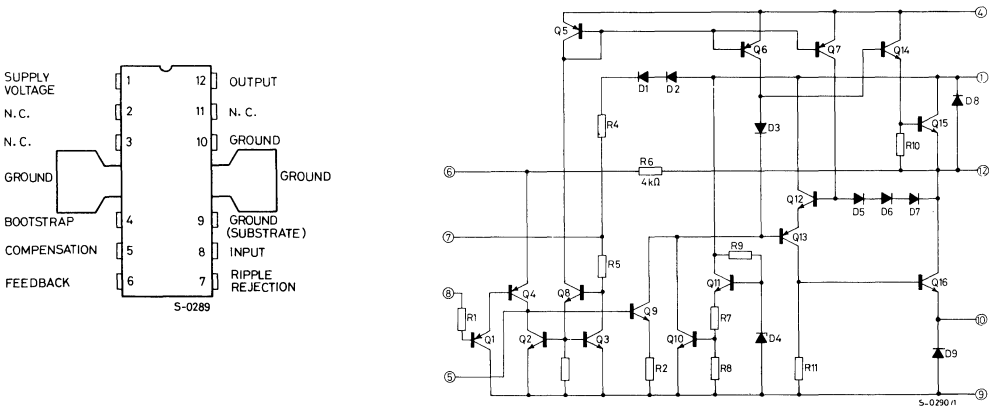
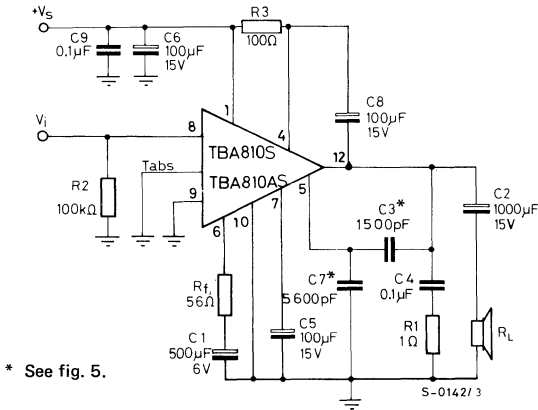


## CONNECTION AND SCHEMATIC DIAGRAM (top view)



## TEST AND APPLICATION CIRCUIT



## THERMAL DATA

|                  |                                     | TBA810S      | TBA810AS |
|------------------|-------------------------------------|--------------|----------|
| $R_{th \ j-tab}$ | Thermal resistance junction-tab     | max 12 °C/W  | 10 °C/W  |
| $R_{th \ j-amb}$ | Thermal resistance junction-ambient | max 70* °C/W | 80 °C/W  |

\* Obtained with tabs soldered to printed circuit with minimized copper area.

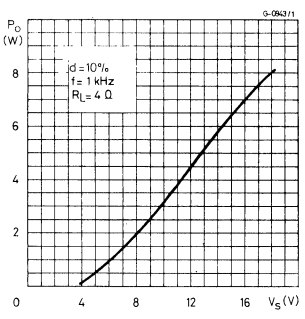


**TBA810S**

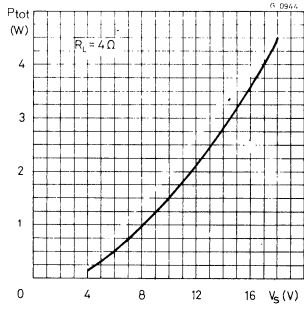
**ELECTRICAL CHARACTERISTICS** (Refer to the test circuit;  $T_{amb} = 25^{\circ}C$ )

| Parameter    |                                   | Test conditions  | Min. | Typ.     | Max.                         | Unit       |
|--------------|-----------------------------------|--|------|----------|------------------------------|------------|
| $V_s$        | Supply voltage (pin 1)            |  | 4    |          | 20                           | V          |
| $V_o$        | Quiescent output voltage (pin 12) |  | 6.4  | 7.2      | 8                            | V          |
| $I_d$        | Quiescent drain current           | $V_s = 14.4V$  |      | 12       | 20                           | mA         |
| $I_b$        | Bias current (pin 8)              |  |      | 0.4      |                              | $\mu A$    |
| $P_o$        | Power output                      | $d = 10\%$   | 5.5  | 7        |                              | W          |
|              |                                   | $R_L = 4\Omega$  |      | 6        |                              | W          |
|              |                                   | $f = 1\text{ kHz}$   |      | 2.5      |                              | W          |
|              |                                   | $V_s = 16V$  |      | 1        |                              | W          |
|              |                                   | $V_s = 14.4V$  |      |          |                              | W          |
|              |                                   | $V_s = 9V$   |      |          |                              | W          |
|              |                                   | $V_s = 6V$   |      |          |                              | W          |
| $V_{i(rms)}$ | Input voltage                     |  |      |          | 220                          | mV         |
| $V_i$        | Input sensitivity                 | $P_o = 6W$<br>$V_s = 14.4V$<br>$R_L = 4\Omega$<br>$f = 1\text{ kHz}$<br>$R_f = 56\Omega$<br>$R_f = 22\Omega$ |      | 80<br>35 |                              | mV<br>mV   |
| $R_i$        | Input resistance (pin 8)          |  |      | 5        |                              | M $\Omega$ |
| B            | Frequency response<br>(-3 dB)     | $V_s = 14.4V$<br>$R_L = 4\Omega$<br>$C3 = 820\text{ pF}$<br>$C3 = 1500\text{ pF}$                            |      |          | 40 to 20,000<br>40 to 10,000 | Hz<br>Hz   |
| d            | Distorsion                        | $P_o = 50\text{ mW to } 3W$<br>$V_s = 14.4V$<br>$R_L = 4\Omega$<br>$f = 1\text{ kHz}$                        |      | 0.3      |                              | %          |
| $G_v$        | Voltage gain<br>(open loop)       | $V_s = 14.4V$<br>$R_L = 4\Omega$<br>$f = 1\text{ kHz}$   |      | 80       |                              | dB         |
| $G_v$        | Voltage gain<br>(closed loop)     | $V_s = 14.4V$<br>$R_L = 4\Omega$<br>$f = 1\text{ kHz}$   | 34   | 37       | 40                           | dB         |
| $e_N$        | Input noise voltage               | $V_s = 14.4V$<br>$R_g = 0$<br>B (-3 dB) = 20Hz to<br>20,000 Hz   |      | 2        |                              | $\mu V$    |
| $i_N$        | Input noise current               | $V_s = 14.4V$<br>B (-3 dB) = 20 Hz to<br>20,000 Hz   |      | 0.1      |                              | nA         |
| $\eta$       | Efficiency                        | $P_o = 5W$<br>$V_s = 14.4V$<br>$R_L = 4\Omega$<br>$f = 1\text{ kHz}$   |      | 70       |                              | %          |
| SVR          | Supply voltage rejection          | $V_s = 14.4V$<br>$R_L = 4\Omega$<br>$f_{ripple} = 100\text{ Hz}$   |      | 38       |                              | dB         |

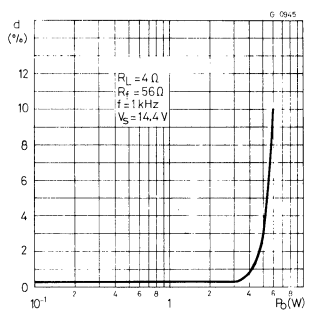
**Fig. 1 - Power output versus supply voltage**



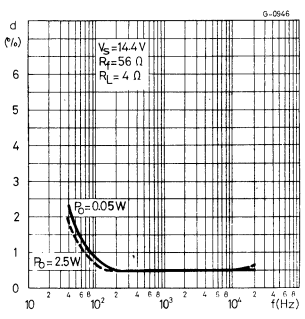
**Fig. 2 - Maximum power dissipation versus supply voltage (sine wave operation)**



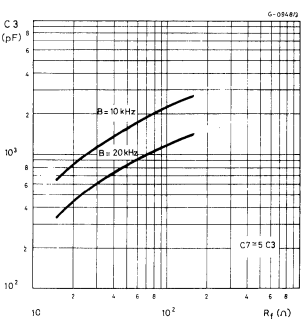
**Fig. 3 - Distorsion versus output power**



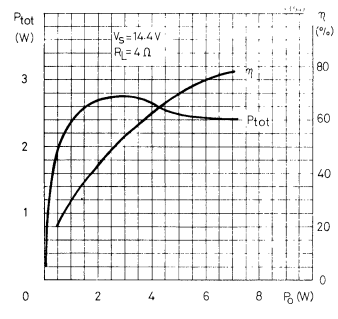
**Fig. 4 - Distorsion versus frequency**



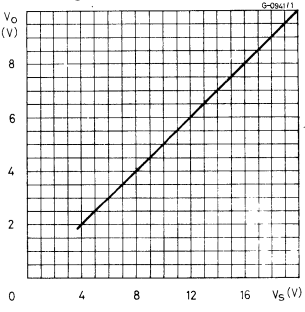
**Fig. 5 - Value of C3 versus Rf for various values of B**



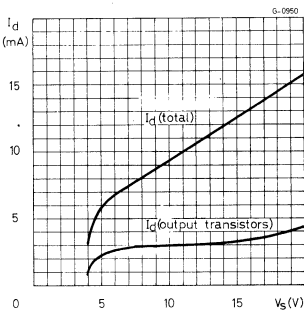
**Fig. 6 - Power dissipation and efficiency versus output power**



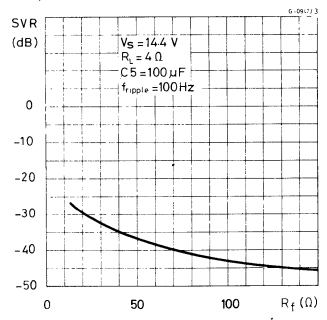
**Fig. 7 - Quiescent output voltage (pin 12) versus supply voltage**



**Fig. 8 - Quiescent current versus supply voltage**

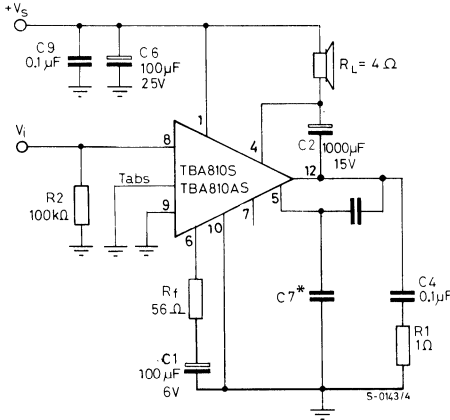


**Fig. 9 - Supply voltage rejection**



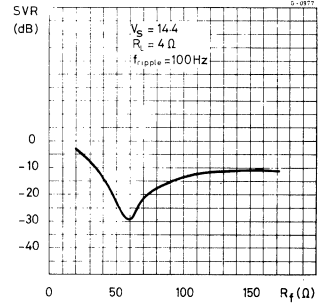
For portable equipment the circuit in Fig. 10 has the advantages of fewer external components and a better behaviour at low supply voltages (down to 4 V).

Fig. 10 - Application circuit with load connected to the supply voltage



\* C3, C7 see fig. 5

Fig. 11 - Supply voltage rejection versus  $R_f$  (circuit of fig. 10)



## MOUNTING INSTRUCTIONS

The thermal power dissipated in the circuit may be removed by connecting the tabs to an external heat sink (TBA 810 AS - fig. 12) or by soldering them to an area of copper on the printed circuit board (TBA 810 S - fig. 13).

Fig. 12 - Maximum power dissipation versus ambient temperature (for TBA 810 AS only)

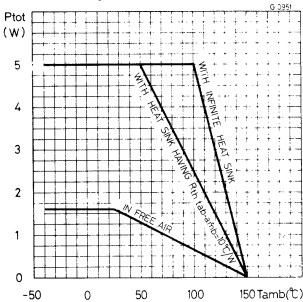
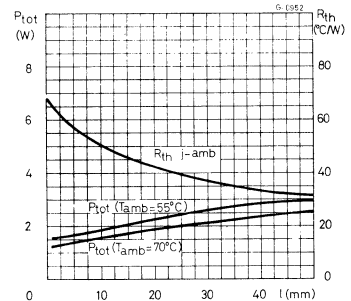
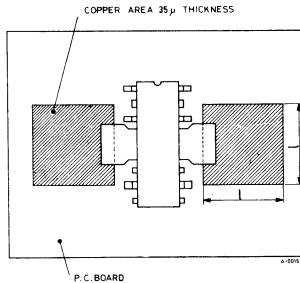


Fig. 13 - Maximum power dissipation versus copper area of the P.C. board (for TBA 810 S only)



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

Fig. 14a and 14b show two ways that can be used for mounting the device.

Fig. 14a shows a method of mounting the TBA 810 S, that is satisfactory both from the point of view of heat dissipation and from mechanical considerations. For TBA 810 AS the desired thermal resistance is obtained by fixing the elements shown in fig. 14b, to a suitably dimensioned plate. This plate can also act as a support for the whole printed circuit board; the mechanical stresses do not damage the integrated circuit. This is firmly fixed to the element, in fig. 14b.

Fig. 14a

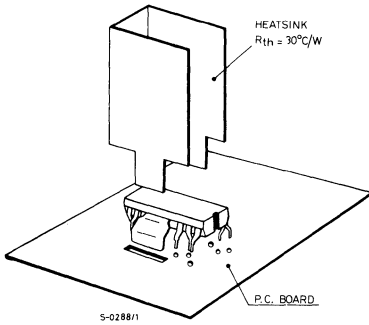
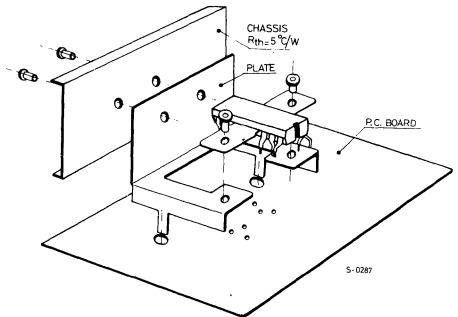


Fig. 14b



## THERMAL SHUT-DOWN

The presence of a thermal limiting circuit offers the following advantages:

- 1) An overload on the output (even if it is permanent), or an above-limit ambient temperature can be easily supported.
- 2) The heat sink can have a smaller factor of safety compared with that of a conventional circuit. There is no device damage in the case of too high a junction temperature: all that happens is that  $P_o$  (and therefore  $P_{tot}$ ) and  $I_d$  are reduced (fig. 15).

Fig. 15 - Output power and drain current versus package temperature

