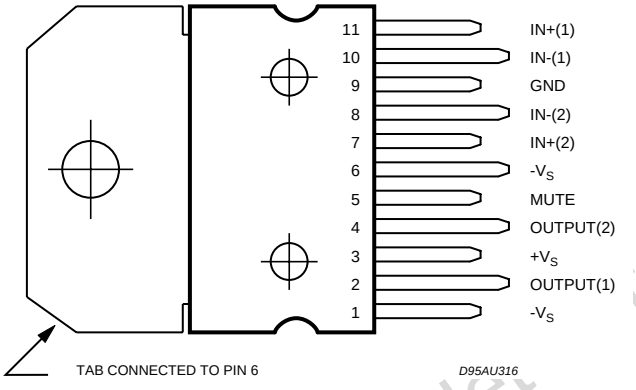
### Table 2. Absolute Maximum Ratings

| Symbol | Parameter | Value | Unit |
|---|---|---|---|
| $V_S$ | DC Supply Voltage | ±20 | V |
| $I_O$ | Output Power Current (internally limited) | 2.5 | A |
| $P_{tot}$ | Total Power Dissipation (Tamb = 70°C) | 23 | W |
| $T_{amb}$ | Ambient Operating Temperature (1) | 0 to 70 | °C |
| $T_{stg}$, $T_j$ | Storage and Junction Temperature | -40 to 150 | °C |

### Figure 3. Pin Connection (Top view)




### Table 3. Thermal Data

| Symbol | Parameter | Value | Unit |
|---|---|---|---|
| $R_{th\ j\text{-}case}$ | Thermal Resistance Junction-case | max 2.8 | °C/W |
| $R_{th\ j\text{-}amb}$ | Thermal Resistance Junction-ambient | max 35 | °C/W |

### Figure 4. Single Supply Application

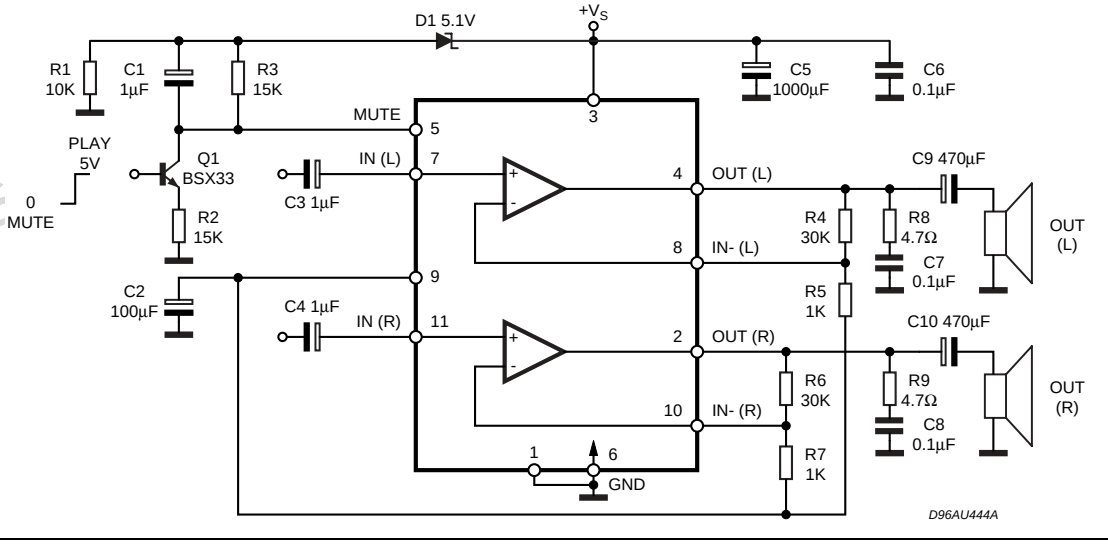


**Table 4. Electrical Characteristcs** (Refer to the test circuit VS = ±10V; Rs = 50Ω; GV = 30dB, f = 1KHz; Tamb = 25°C, unless otherwise specified)

| Symbol | Parameter | Test Condition | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| $V_S$ | Supply Voltage Range | $R_L$ = 8Ω | ±5 | | ±18 | V |
| | | $R_L$ = 4Ω; | ±5 | | ±13.5 | V |
| $I_q$ | Total Quiescent Current | | | 50 | 90 | mA |
| $V_{OS}$ | Input Offset Voltage | | -25 | | +25 | mV |
| $I_b$ | Output Bias Current | | | 500 | | nA |
| $P_O$ | Output Power | THD = 10%;<br>$R_L$ = 8Ω;<br>$V_S$ = ±8.5V; $R_L$ = 4Ω; | | <br>6<br>6 | | <br>W<br>W |
| | | THD = 1%;<br>$R_L$ = 8Ω;<br>$V_S$ = ±8.5V; $R_L$ = 4Ω; | | <br>5<br>5 | | <br>W<br>W |
| THD | Total Harmonic Distortion | $R_L$ = 8Ω; $P_O$ = 1W; f = 1KHz; | | 0.03 | | % |
| | | $R_L$ = 8Ω; $V_S$ = ±10V;<br>$P_O$ = 0.1 to 3W;<br>f = 100Hz to 15KHz; | | 0.2 | 0.5 | % |
| | | $R_L$ = 4Ω; $P_O$ = 1W; f = 1KHz; | | 0.02 | | % |
| | | $R_L$ = 4Ω; $V_S$ = ±8.5V;<br>$P_O$ = 0.1 to 2W;<br>f = 100Hz to 15KHz; | | 0.2 | 1 | % |
| $C_T$ | Cross Talk | f = 1KHz;<br>f = 10KHz; | <br>50 | 70<br>60 | | dB<br>dB |
| SR | Slew Rate | | 6.5 | 10 | | V/µs |
| $G_{OL}$ | Open Loop Voltage Gain | | | 80 | | dB |
| $e_N$ | Total Output Noise | A Curve<br>f = 20Hz to 22KHz | | 3<br>4 | <br>8 | µV<br>µV |
| $R_i$ | Input Resistance | | 15 | 20 | | KΩ |
| SVR | Supply Voltage Rejection (each channel) | f = 100Hz; $V_R$ = 0.5V | | 60 | | dB |
| $T_j$ | Thermal Shut-down Junction Temperature | | | 145 | | °C |
| **MUTE & INPUT SELECTION FUNCTIONS** | | | | | | |
| $V_{MUTE}$ | Mute /Play threshold | | -7 | -6 | -5 | V |
| $A_{MUTE}$ | Mute Attenuation | | 60 | 70 | | dB |
| **STAND-BY FUNCTIONS [ref: +$V_S$] (only for Split Supply)** | | | | | | |
| $V_{ST-BY}$ | Stand-by Mute threshold | | -3.5 | -2.5 | -0.5 | V |
| $A_{ST-BY}$ | Stand-by Attenuation | | | 110 | | dB |
| $I_{qST-BY}$ | Quiescent Current @ Stand-by | | | 3 | 6 | mA |

### Table 5. Electrical Characteristics in Single Supply

(by correlation with test conditions in split supply)

| Symbol | Parameter | Test Condition | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| $V_S$ | Supply Range | $R_L$ = 8Ω | 10 | | 36 | V |
| | | $R_L$ = 4Ω | 10 | | 27 | V |
| $I_q$ | Total Quiescent Current | | | 50 | 90 | mA |
| $I_b$ | Non Inverting Input Bias Current | | | 500 | | nA |
| $P_O$ | Output Power | THD = 10%<br>$R_L$ = 8Ω<br>$V_S$ = 22V; $R_L$ = 4Ω | 8 | 10<br>7.5 | | W<br>W |
| | | THD = 1%<br>$R_L$ = 8Ω<br>$V_S$ = 22V; $R_L$ = 4Ω | 6 | 7.5<br>6 | | W<br>W |
| THD | Total Harmonic Distortion | $R_L$ = 8Ω ; $P_O$ = 1W; f = 1KHz | | 0.03 | | % |
| | | $R_L$ = 8Ω ;<br>$P_O$ = 0.1 to 5W; $V_S$ = 26V;<br>f = 100Hz to 15KHz | | 0.2 | 0.5 | % |
| | | $R_L$ = 4Ω ; $P_O$ = 1W; f = 1KHz | | 0.02 | | % |
| | | $R_L$ = 4Ω ; $V_S$ =20V;<br>$P_O$ = 0.1 to 4W;<br>f = 100Hz to 15KHz | | 0.2 | 1 | % |
| $C_T$ | Cross Talk | f = 1KHz<br>f = 10KHz | <br>50 | 70<br>60 | | dB<br>dB |
| SR | Slew Rate | | 6.5 | 10 | | V/µs |
| $G_{OL}$ | Open Loop Voltage Gain | | | 80 | | dB |
| $e_N$ | Total Input Noise | A Curve<br>f = 20Hz to 22KHz | | 3<br>4 | <br>8 | µV<br>µV |
| $R_i$ | Input Resistance | | 15 | 20 | | KΩ |
| SVR | Supply Voltage Rejection (each channel) | fr = 100Hz; Vr = 0.5V | | 60 | | dB |
| $T_j$ | Thermal Shut-down Junction Temperature | | | 145 | | °C |
| **MUTE FUNCTION** [ref: +$V_S$] | | | | | | |
| $VT_{MUTE}$ | Mute / Play Threshold | | -7 | -6 | -5 | V |
| $A_M$ | Mute Attenuation | | 60 | 70 | | dB |

## 3 MUTE STAND-BY FUNCTION

The pin 5 (MUTE/STAND-BY) controls the amplifier status by two different thresholds, referred to $+V_S$.

- When $V_{pin5}$ higher than = $+V_S$ -2.5V the amplifier is in Stand-by mode and the final stage generators are off.
- When $V_{pin5}$ between = $+V_S$ -2.5V and $V_S$ -6V the final stage generators are switched on and the amplifier is in mute mode.
- When $V_{pin5}$ lower than = $+V_S$ -6V the amplifier is play mode.

**Figure 5.**

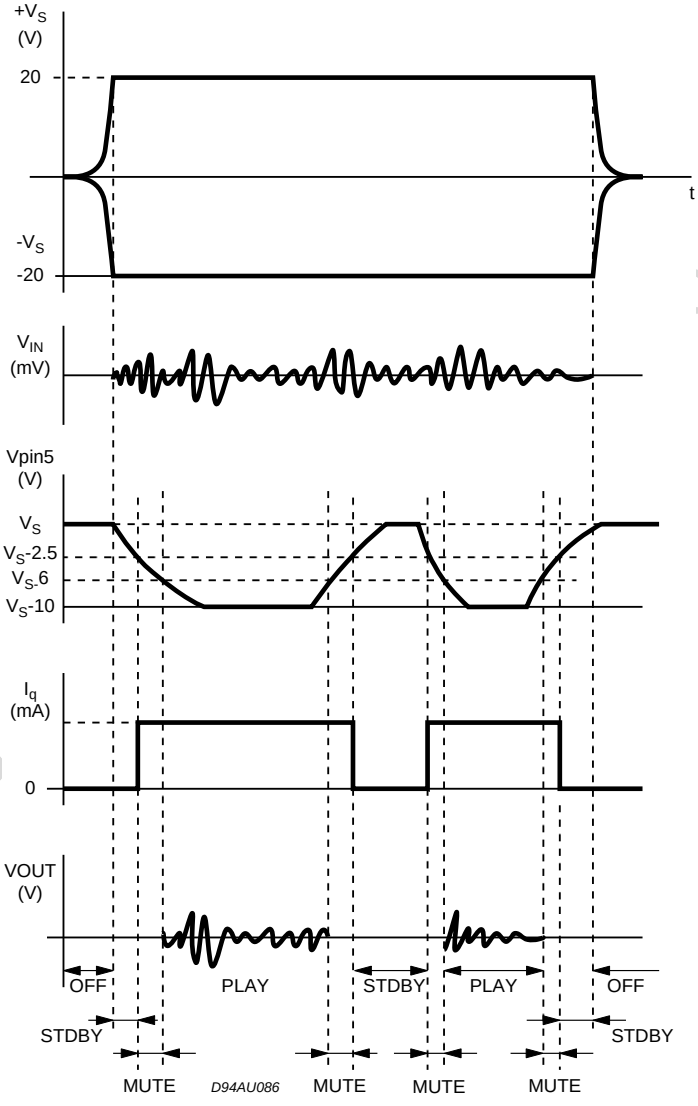
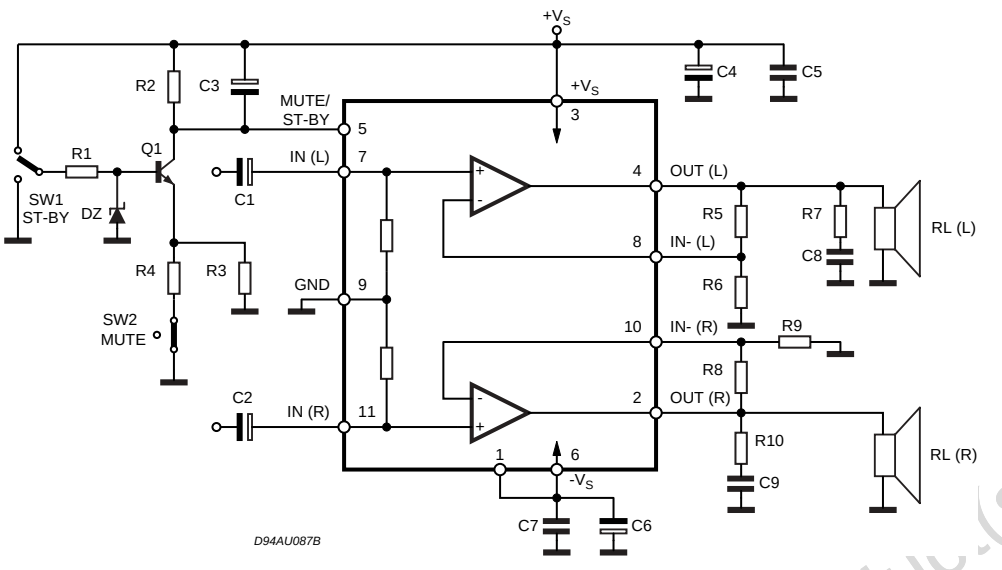


**Figure 6. Test and Application Circuit (Stereo Configuration)**




## 4 APPLICATION SUGGESTIONS

(Demo Board Schematic)

The recommended values of the external components are those shown the demoboard schematic different values can be used, the following table can help the designer.

**Table 6.**

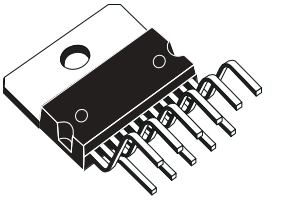
| COMPONENT | SUGGESTION VALUE | PURPOSE | LARGER THAN RECOMMENDED VALUE | SMALLER THAN RECOMMENDED VALUE |
|---|---|---|---|---|
| R1 | 10KΩ | Mute Circuit | Increase of Dz Biasing Current | |
| R2 | 15KΩ | Mute Circuit | $V_{pin}$ #5 Shifted Downward | $V_{pin}$ #5 Shifted Upward |
| R3 | 18KΩ | Mute Circuit | $V_{pin}$ #5 Shifted Upward | $V_{pin}$ #5 Shifted Downward |
| R4 | 15KΩ | Mute Circuit | $V_{pin}$ #5 Shifted Upward | $V_{pin}$ #5 Shifted Downward |
| R5, R8 | 18KΩ | Closed Loop Gain Setting (*) | Increase of Gain | |
| R6, R9 | 560KΩ | | Decrease of Gain | |
| R7, R10 | 4.7Ω | Frequency Stability | Danger of Oscillations | Danger of Oscillations |
| C1, C2 | 1µF | Input DC Decoupling | | Higher low frequency cutoff |
| C3 | 1µF | St-By/Mute Time Constant | Larger On/Off Time | Smaller On/Off Time |
| C4, C6 | 1000µF | Supply Voltage Bypass | | Danger of Oscillations |
| C5, C7 | 0.1µF | Supply Voltage Bypass | | Danger of Oscillations |
| C8, C9 | 0.1µF | Frequency Stability | | |
| Dz | 5.1V | Mute Circuit | | |

(*) Closed loop gain has to be ≥25dB

**Figure 7. Multiwatt11V Mechanical Data & Package Dimensions**

| DIM. | mm | | | inch | | |
|---|---|---|---|---|---|---|
| | MIN. | TYP. | MAX. | MIN. | TYP. | MAX. |
| A | | | 5 | | | 0.197 |
| B | | | 2.65 | | | 0.104 |
| C | | | 1.6 | | | 0.063 |
| D | | 1 | | | 0.039 | |
| E | 0.49 | | 0.55 | 0.019 | | 0.022 |
| F | 0.88 | | 0.95 | 0.035 | | 0.037 |
| G | 1.45 | 1.7 | 1.95 | 0.057 | 0.067 | 0.077 |
| G1 | 16.75 | 17 | 17.25 | 0.659 | 0.669 | 0.679 |
| H1 | 19.6 | | | 0.772 | | |
| H2 | | | 20.2 | | | 0.795 |
| L | 21.9 | 22.2 | 22.5 | 0.862 | 0.874 | 0.886 |
| L1 | 21.7 | 22.1 | 22.5 | 0.854 | 0.87 | 0.886 |
| L2 | 17.4 | | 18.1 | 0.685 | | 0.713 |
| L3 | 17.25 | 17.5 | 17.75 | 0.679 | 0.689 | 0.699 |
| L4 | 10.3 | 10.7 | 10.9 | 0.406 | 0.421 | 0.429 |
| L7 | 2.65 | | 2.9 | 0.104 | | 0.114 |
| M | 4.25 | 4.55 | 4.85 | 0.167 | 0.179 | 0.191 |
| M1 | 4.73 | 5.08 | 5.43 | 0.186 | 0.200 | 0.214 |
| S | 1.9 | | 2.6 | 0.075 | | 0.102 |
| S1 | 1.9 | | 2.6 | 0.075 | | 0.102 |
| Dia1 | 3.65 | | 3.85 | 0.144 | | 0.152 |

**OUTLINE AND MECHANICAL DATA**



**Multiwatt11 (Vertical)**

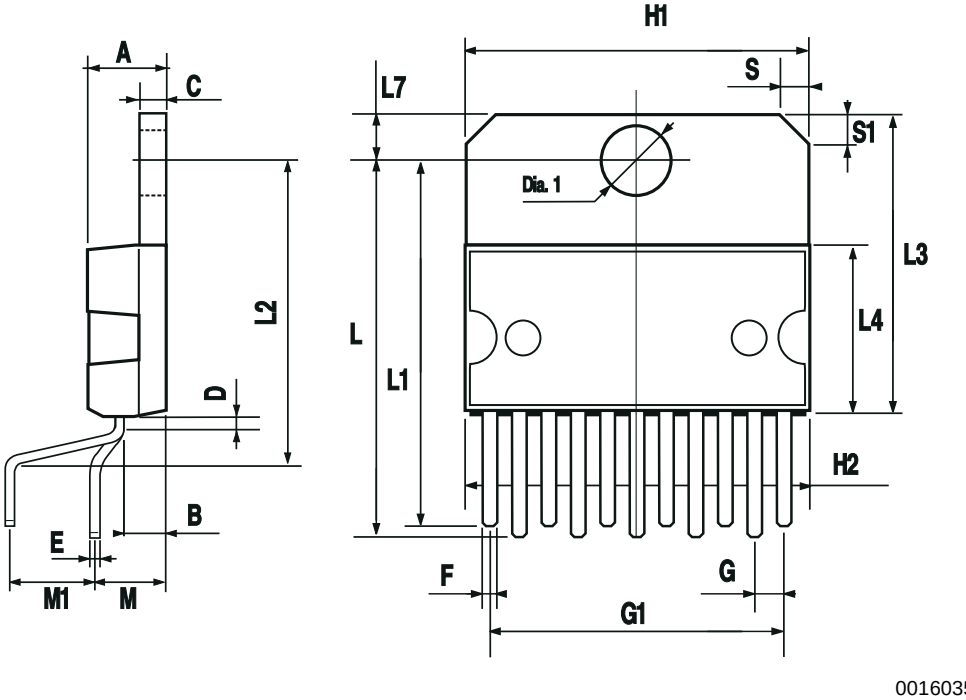


**Table 7. Revision History**

| Date | Revision | Description of Changes |
|---|---|---|
| September 2003 | 4 | First Issue in EDOCS DMS |
| August 2004 | 5 | Stylesheet update. Change fig. 4 |

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