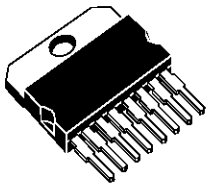
SGS-THOMSON MICROELECTRONICS

# TDA7264

## 25 + 25W STEREO AMPLIFIER WITH MUTE/ST-BY

- WIDE SUPPLY VOLTAGE RANGE (UP TO 50V ABS MAX.)
- SPLIT SUPPLY
- HIGH OUTPUT POWER: 25 + 25W @ THD =10%, $R_L$ = 8Ω, $V_S$ = ±20V
- NO POP AT TURN-ON/OFF
- MUTE (POP FREE)
- STAND-BY FEATURE (LOW $I_Q$)
- FEW EXTERNAL COMPONENTS
- SHORT CIRCUIT PROTECTION
- THERMAL OVERLOAD PROTECTION

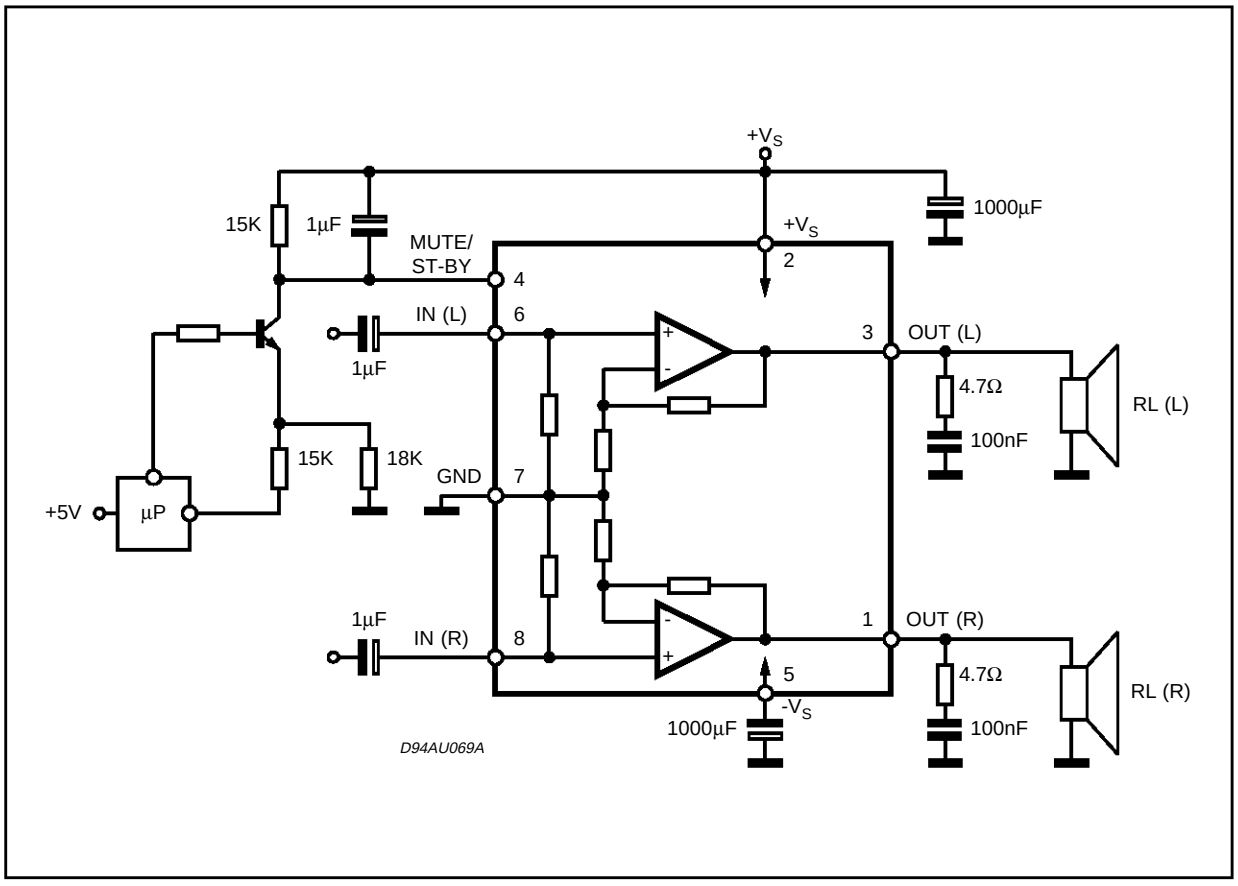


**Multiwatt 8**
**ORDERING NUMBER:** TDA7264

### DESCRIPTION

The TDA7264 is class AB dual Audio power amplifier assembled in the Multiwatt package, specially designed for high quality sound application as Hi-Fi music centers and stereo TV sets.

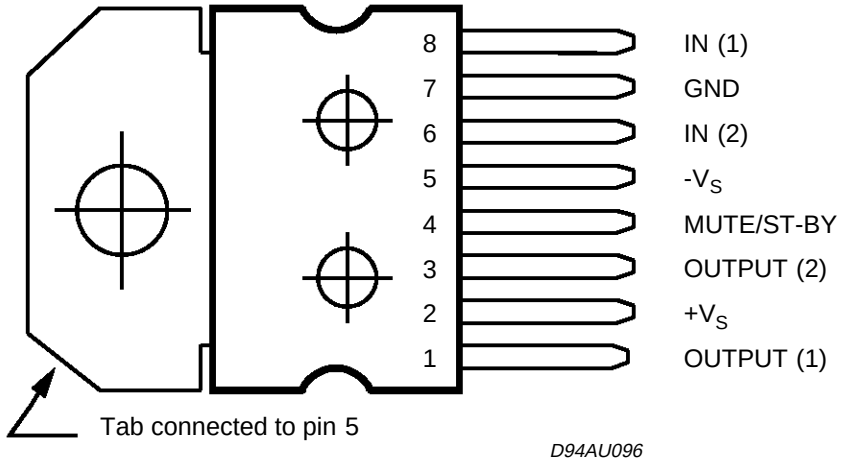
**Figure 1:** Typical Application Circuit



## ABSOLUTE MAXIMUM RATINGS

| Symbol | Parameter | Value | Unit |
|---|---|---|---|
| $V_S$ | DC Supply Voltage | 50 | V |
| $I_O$ | Output Peak Current (internally limited) | 4.5 | A |
| $P_{tot}$ | Power Dissipation $T_{case}$ = 70°C | 30 | W |
| $T_{stg}$, $T_j$ | Storage and Junction Temperature | -40 to +150 | °C |

## PIN CONNECTION (Top view)




## THERMAL DATA

| Symbol | Description | | Value | Unit |
|---|---|---|---|---|
| $R_{th\ j\text{-}case}$ | Thermal Resistance Junction-case | Max | 2 | °C/W |

**ELECTRICAL CHARACTERISTICS** (Refer to the test circuit, $V_S \pm 20V$; $R_L = 8\Omega$; $R_S = 50\Omega$; $f = 1KHz$; $T_{amb} = 25°C$, unless otherwise specified.)

| Symbol | Parameter | Test Condition | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| $V_S$ | Supply Range | | $\pm 5$ | | $\pm 22.5$ | V |
| $I_q$ | Total Quiescent Current | | | 80 | 130 | mA |
| $P_O$ | Music Output Power (*) | THD = 10%; $R_L = 8\Omega$ ; $V_S \pm 22.5V$ | | 32 | | W |
| $P_O$ | Output Power | THD = 10%<br>$R_L = 8\Omega$ ;<br>$V_S \pm 16V$; $R_L = 4\Omega$ | 20 | 25<br>25 | | W<br>W |
| | | THD = 1%<br>$R_L = 8\Omega$ ;<br>$V_S \pm 16V$; $R_L = 4\Omega$ | | 20<br>20 | | W<br>W |
| THD | Total Harmonic Distortion | $R_L = 8\Omega$ ; $P_O = 1W$; $f = 1KHz$ | | 0.02 | | % |
| | | $R_L = 8\Omega$ ;<br>$P_O = 0.1$ to $15W$;<br>$f = 100Hz$ to $15KHz$ | | | 0.5 | % |
| | | $R_L = 4\Omega$ ; $P_O = 1W$; $f = 1KHz$ | | 0.03 | | % |
| | | $R_L = 4\Omega$ ; $V_S \pm 16V$;<br>$P_O = 0.1$ to $12W$;<br>$f = 100Hz$ to $15KHz$ | | | 1 | % |
| $C_T$ | Cross Talk | $f = 1KHz$<br>$f = 10KHz$ | | 70<br>60 | | dB<br>dB |
| SR | Slew Rate | | | 10 | | V/µs |
| $G_V$ | Closed Loop Voltage Gain | | 29 | 30 | 31 | dB |
| $\Delta G_V$ | Voltage Gain Matching | | | 0.2 | | dB |
| $e_N$ | Total Input Noise | A Curve<br>$f = 20Hz$ to $22KHz$ | | 2.5<br>3.5 | 8 | µV<br>µV |
| $R_i$ | Input Resistance | | 15 | 20 | | KΩ |
| SVR | Supply Voltage Rejection (each channel) | fr = 100Hz; Vripple = $0.5V_{RMS}$ | | 60 | | dB |
| $T_j$ | Thermal Shut-down Junction Temperature | | | 145 | | °C |
| **MUTE FUNCTION [ref: +Vs]** | | | | | | |
| $VT_{MUTE}$ | Mute / Play Threshold | | -7 | -6 | -5 | V |
| $A_M$ | Mute Attenuation | | 60 | 90 | | dB |
| **STAND-BY FUNCTION [ref: +Vs]** | | | | | | |
| $VT_{ST-BY}$ | Stand-by / Mute Threshold | | -3.5 | -2.5 | -1.5 | V |
| $A_{ST-BY}$ | Stand-by Attenuation | | | 110 | | dB |
| $I_{q\ ST-BY}$ | Quiescent Current @ Stand-by | | | 3 | | mA |

**Note :**
**(*) FULL POWER up to**. $V_S = \pm 22.5V$ with $R_L = 8\Omega$ and $V_S = \pm 16V$ with $R_L = 4\Omega$
**MUSIC POWER** is the maximal power which the amplifier is capable of producing across the rated load resistance (regardless of non linearity) 1 sec after the application of a sinusoidal input signal of frequency 1KHz.

## APPLICATIONS SUGGESTION

(Demo Board Schematic)

The recommended values of the external components are those shown on the demo board schematic. Different values can be used: the following table can help the designer.

| COMPONENTS | RECOMMENDED VALUE | PURPOSE | LARGER THAN RECOMMENDED VALUE | SMALLER THAN RECOMMENDED VALUE |
|---|---|---|---|---|
| R1 | 10KΩ | Mute Circuit | Increase of Dz Biasing Current | |
| R2 | 15KΩ | Mute Circuit | $V_{pin}$ # 4 Shifted Downward | $V_{pin}$ # 4 Shifted Upward |
| R3 | 18KΩ | Mute Circuit | $V_{pin}$ # 4 Shifted Upward | $V_{pin}$ # 4 Shifted Downward |
| R4 | 15KΩ | Mute Circuit | $V_{pin}$ # 4 Shifted Upward | $V_{pin}$ # 4 Shifted Downward |
| R5, R6 | 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 | | |

**Figure 2:** Demo Board Schematic

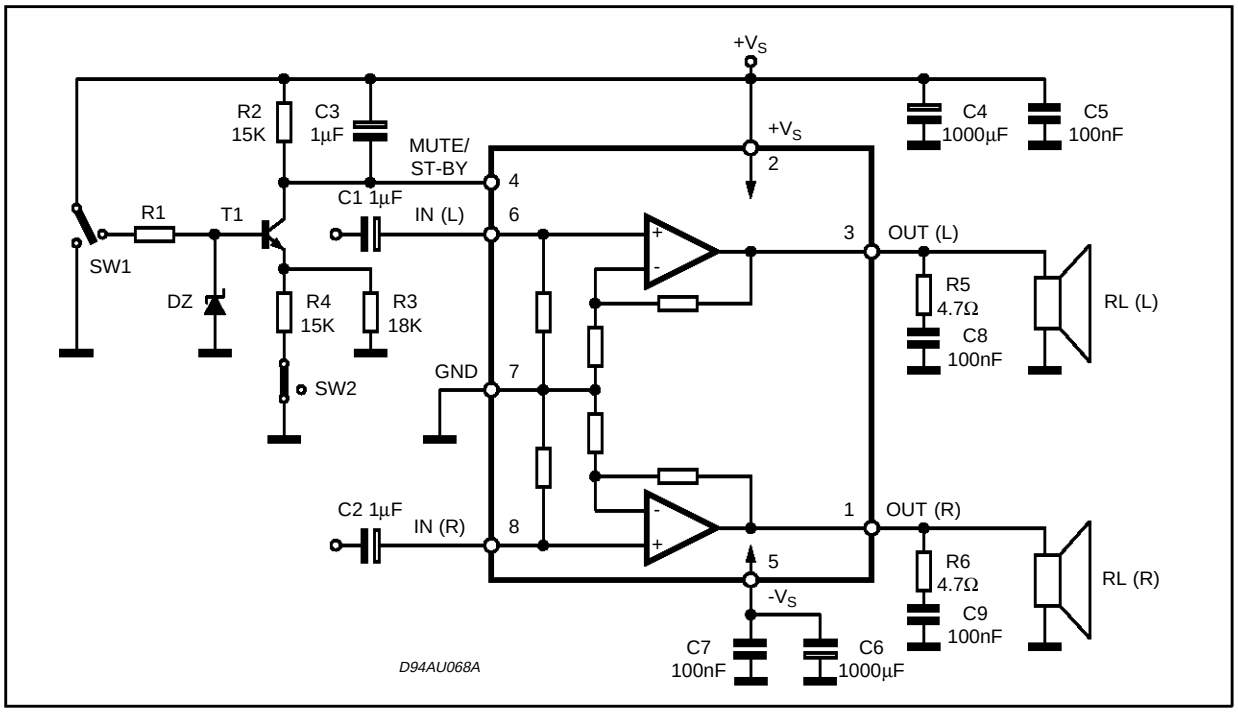



**Figure 3:** P.C. Board And Component Layout of the Demo Board Schematic (1:1 Scale)

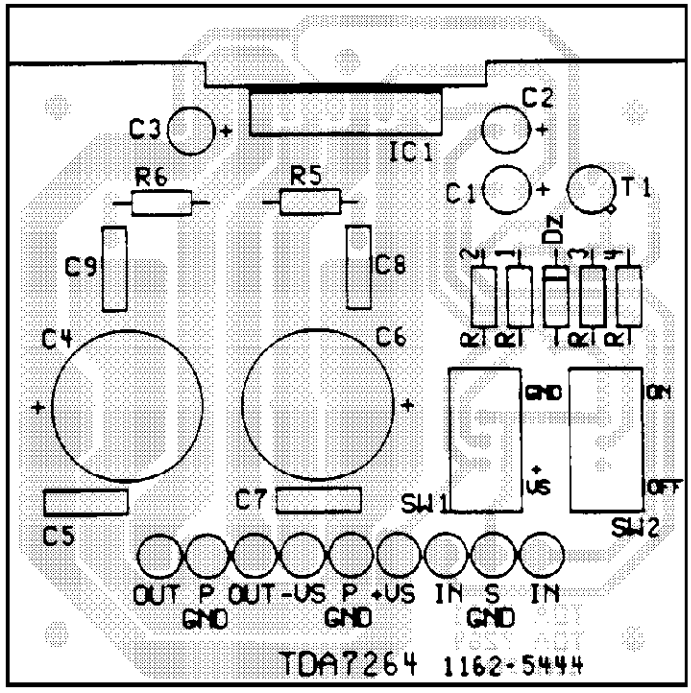


**Figure 4:** Quiescent Current vs. Supply Voltage

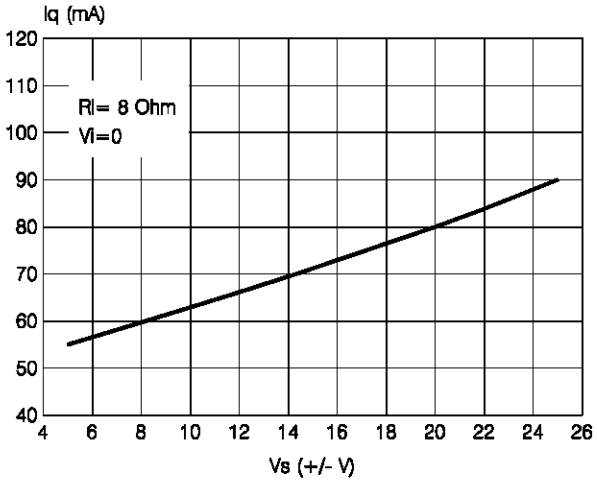



**Figure 5:** Frequency Response

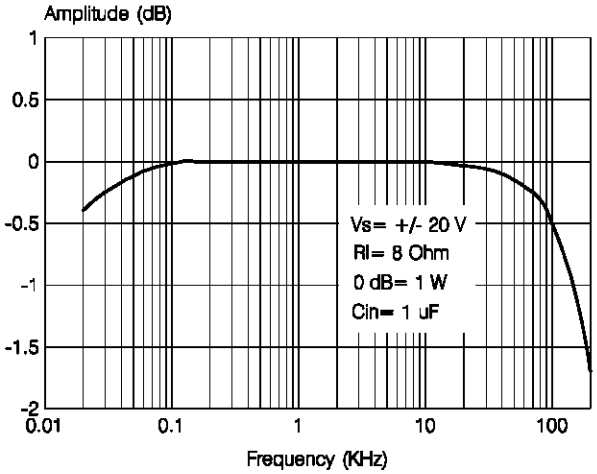



**Figure 6:** Output Power vs Supply Voltage

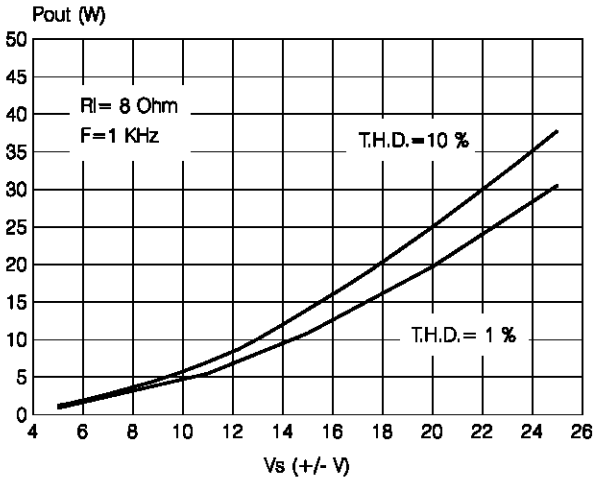



**Figure 7:** Distortion vs. Output Power

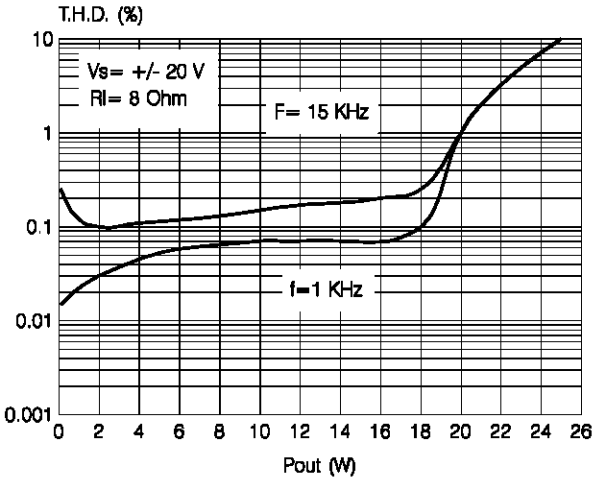



**Figure 8:** Crosstalk vs. Frequency

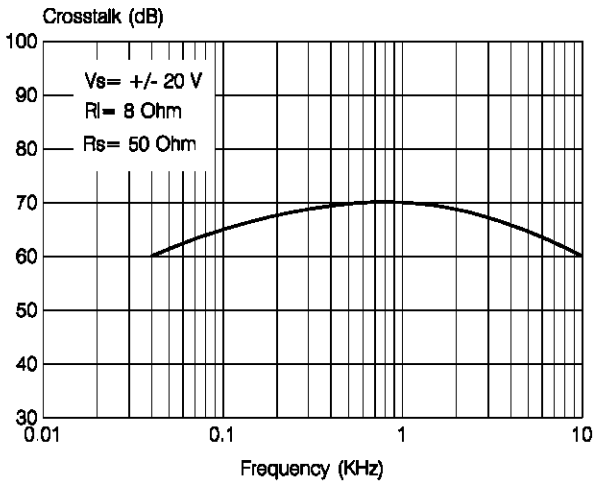



**Figure 9:** Supply Voltage Rejection vs. Fequency

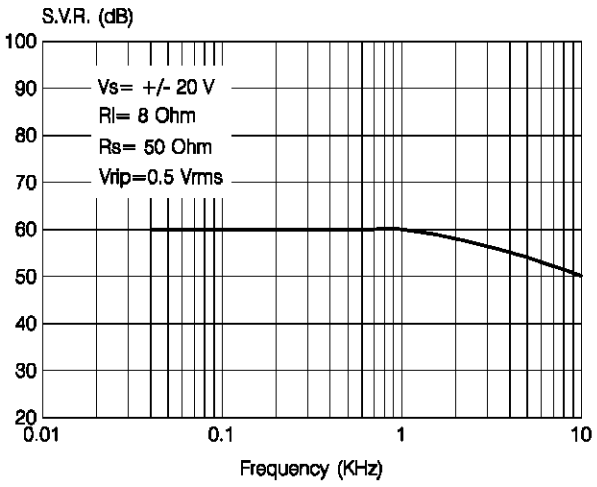


**Figure 10:** Attenuation & Total Quiescent Current vs. $V_{pin4}$ Voltage

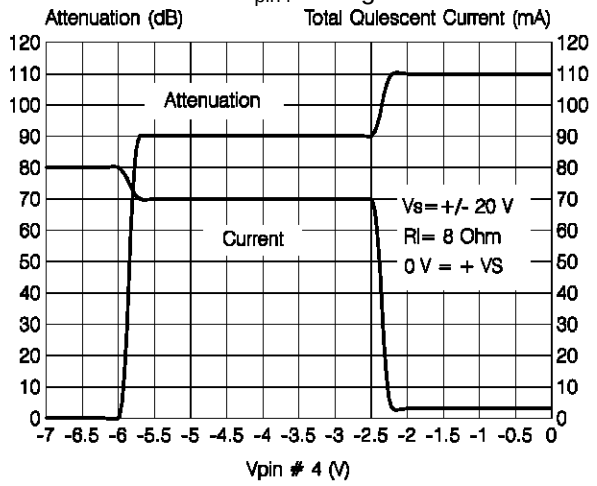
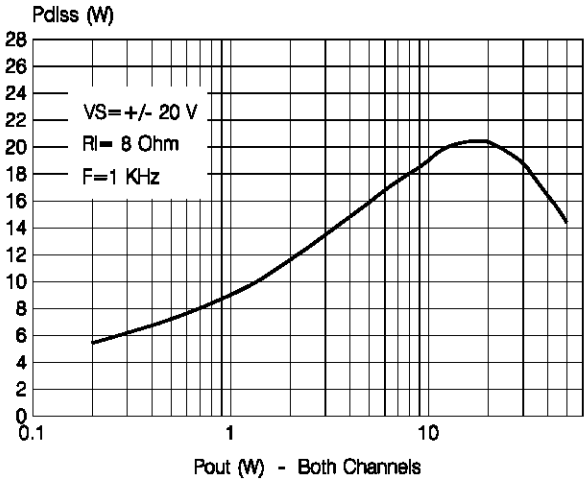



**Figure 11:** Power Dissipation vs. Output Power

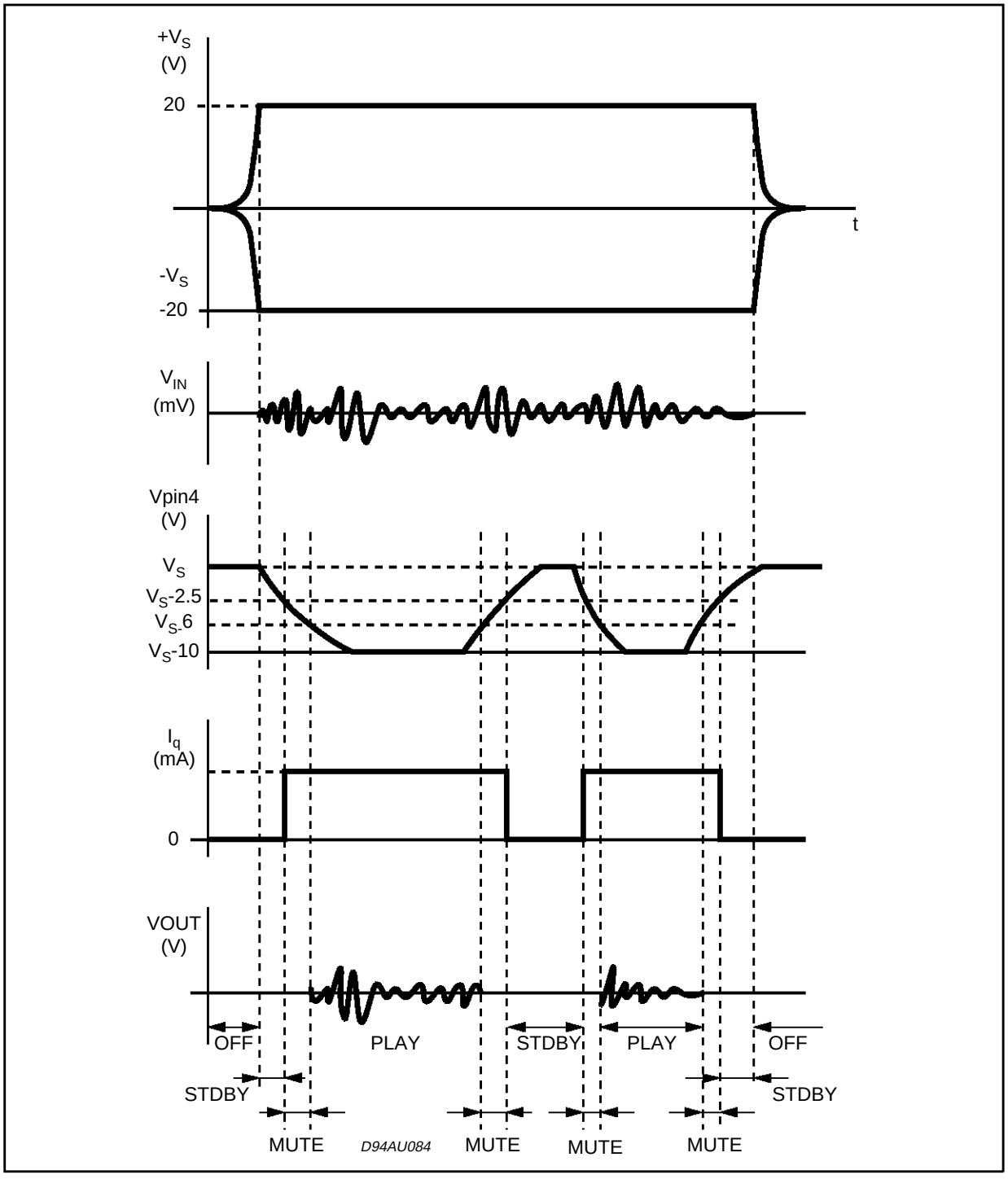


**MUTE STAND-BY FUNCTION**

The pin 4 (MUTE/STAND-BY) controls the amplifier status by two different thresholds, referred to $+V_S$.

- When $V_{pin4}$ higher than = $+V_S$ - 2.5V the amplifier is in Stand-by mode and the final stage generators are off
- when $V_{pin4}$ is between $+V_S$ - 2.5V and $+V_S$ - 6V the final stage current generators are switched on and the amplifier is in mute mode
- when $V_{pin4}$ is lower than $+V_S$ - 6V the amplifier is play mode.

**Figure 12**



## MULTIWATT8 PACKAGE MECHANICAL DATA

| DIM. | mm | | | inch | | |
|---|---|---|---|---|---|---|
| | MIN. | TYP. | MAX. | MIN. | TYP. | MAX. |
| A | | | 5 | | | 0.197 |
| B | | | 2.65 | | | 0.104 |
| C | | | 1.6 | | | 0.063 |
| E | 0.49 | | 0.55 | 0.019 | | 0.022 |
| F | 0.78 | | 0.85 | 0.030 | | 0.033 |
| F1 | 0.68 | | 0.75 | 0.027 | | 0.029 |
| G | 2.40 | 2.54 | 2.68 | 0.094 | 0.10 | 0.105 |
| G1 | 17.64 | 17.78 | 17.92 | 0.69 | 0.70 | 0.71 |
| H1 | 19.6 | | | 0.772 | | |
| H2 | | | 20.2 | | | 0.795 |
| L | 20.35 | | 20.65 | 0.80 | | 0.81 |
| L1 | | 15.7 | | | 0.62 | |
| L2 | 17.05 | 17.20 | 17.35 | 0.67 | 0.68 | 0.68 |
| 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 |
| L5 | 15.45 | | 15.75 | 0.61 | | 0.62 |
| L7 | 2.65 | | 2.9 | 0.104 | | 0.114 |
| S | 1.9 | | 2.6 | 0.075 | | 0.102 |
| S1 | 1.9 | | 2.6 | 0.075 | | 0.102 |
| U | 0.40 | | 0.55 | 0.015 | | 0.022 |
| Z | 0.70 | | 0.85 | 0.028 | | 0.034 |
| Dia1 | 3.65 | | 3.85 | 0.144 | | 0.152 |