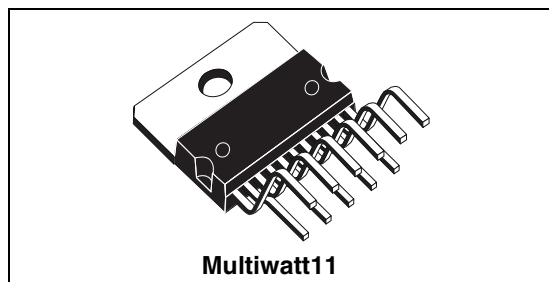


## 40 W + 40 W stereo amplifier with mute and standby

Datasheet — production data

### Features

- Wide supply voltage range (up to  $\pm 33$  V)
- Split supply
- High output power
- 40 W + 40 W into 8  $\Omega$   
with  $V_S = \pm 26$  V and THD = 10%
- No “pop” at turn on/off
- Mute (“pop”-free)
- Standby feature (low  $I_Q$ )
- Short-circuit protection
- Thermal overload protection



### Description

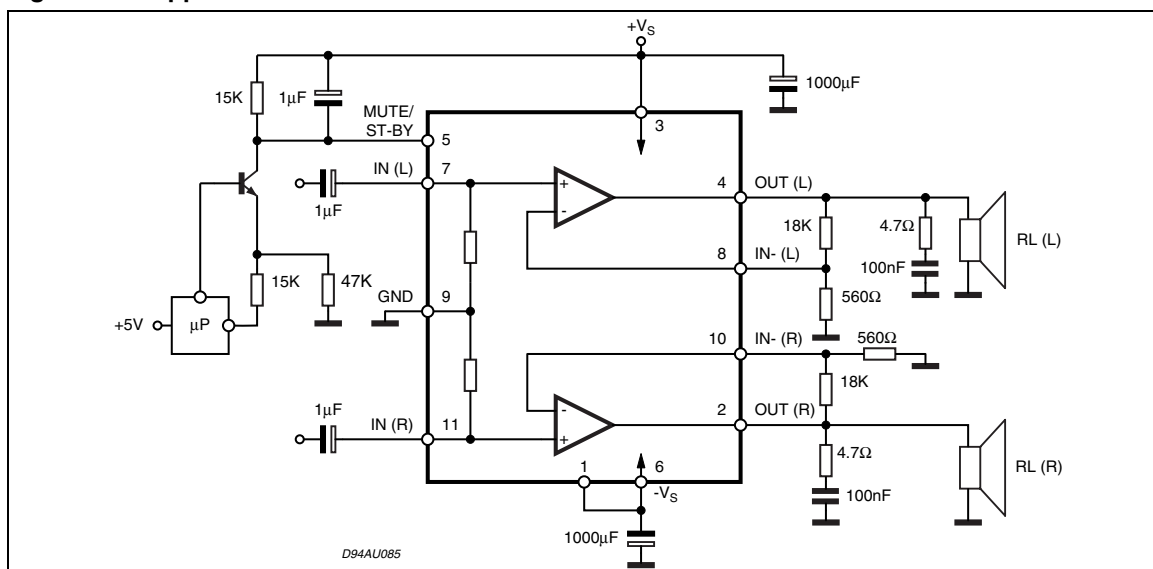
The TDA7292 is a class-AB dual audio power amplifier assembled in a Multiwatt package.

It has been specifically designed for high-quality sound applications such as hi-fi music centers and stereo TV sets.

**Table 1. Device summary**

Order code	Operating temp. range	Package	Packaging
TDA7292	0° to 70° C	Multiwatt11	Tube

**Figure 1. Applications circuit**



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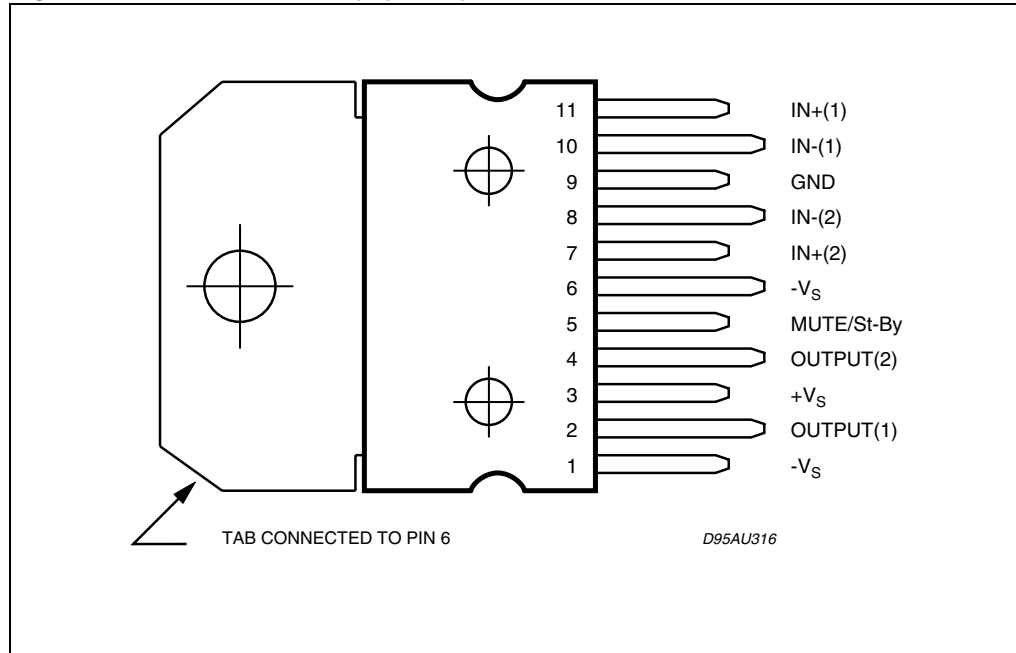
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# 1 Pin description

Figure 2. Pin connections (top view)



## 2 Electrical specifications

### 2.1 Absolute maximum ratings

**Table 2. Absolute maximum ratings**

Symbol	Parameter	Value	Unit
$V_S$	DC supply voltage	$\pm 35$	V
$I_O$	Output peak current (internally limited)	5	A
$P_{tot}$	Power dissipation $T_{case} = 70^\circ\text{C}$	40	W
$T_{op}$	Operating temperature	-20 to 85	$^\circ\text{C}$
$T_j$	Junction temperature	-40 to 150	$^\circ\text{C}$
$T_{stg}$	Storage temperature	-40 to 150	$^\circ\text{C}$

### 2.2 Thermal data

**Table 3. Thermal data**

Symbol	Parameter	Min	Typ	Max	Unit
$R_{th\ j-case}$	Thermal resistance, junction to case	-	1.5	-	$^\circ\text{C/W}$

### 2.3 Electrical specifications

Unless otherwise stated, the results in [Table 4](#) below are given for the conditions:  
 $V_S = \pm 26\text{ V}$ ,  $R_L$  (load) = 8  $\Omega$ ,  $R_S$  (source) = 50  $\Omega$ ,  $f = 1\text{ kHz}$ ,  $G_V = 30\text{ dB}$ , and  $T_{amb} = 25^\circ\text{C}$ .  
 See also the test circuit in [Figure 18 on page 14](#).

**Table 4. Electrical specifications**

Symbol	Parameter	Condition	Min	Typ	Max	Unit
$V_S$	Supply voltage range	-	$\pm 8$	-	$\pm 33$	V
$I_q$	Total quiescent current	-	-	50	130	mA
$V_{OS}$	Output offset voltage	-	-20	-	20	mV
$I_b$	Non-inverting input bias current	-	-	500	-	nA
$P_o$	Output power	THD = 10%: $R_L = 8\ \Omega$ , $V_S = \pm 26\text{ V}$ $R_L = 4\ \Omega$ , $V_S = \pm 18\text{ V}$	-	40 31	-	W
		THD = 1%: $R_L = 8\ \Omega$ , $V_S = \pm 26\text{ V}$ $R_L = 4\ \Omega$ , $V_S = \pm 18\text{ V}$	-	30 24	-	
$I_{Peak}$	Peak output current	Internally limited	-	5	-	A
THD	Total harmonic distortion	$P_o = 1\text{ W}$	-	0.02	-	%

**Table 4. Electrical specifications (continued)**

Symbol	Parameter	Condition	Min	Typ	Max	Unit
$C_T$	Crosstalk	$f = 1 \text{ kHz}$	-	70	-	dB
SR	Slew rate	-	-	11	-	V/ms
$G_{OL}$	Open-loop gain	-	-	80	-	dB
eN	Total input noise	$f = 20 \text{ Hz to } 22 \text{ kHz}$	-	4	-	$\mu\text{V}$
$R_i$	Input resistance	-	-	20	-	$\text{k}\Omega$
SVRR	Supply voltage rejection ratio	-	-	75	-	dB
$T_j$	Junction temperature at thermal shut-down	-	-	145	-	$^{\circ}\text{C}$
Mute mode (see also <a href="#">Table 5 on page 13</a> )						
$V_{T\_MUTE}$	Mute/play threshold	-	-7	-6	-5	V
$A_{MUTE}$	Mute attenuation	-	-	75	-	dB
Standby mode (see also <a href="#">Table 5 on page 13</a> )						
$V_{T\_STBY}$	Standby/mute threshold	-	-3.5	-2.5	-1.5	V
$A_{STBY}$	Standby attenuation	-	-	110	-	dB
$I_{Q\_STBY}$	Quiescent current in standby	-	-	8	-	mA

### 3 Characterization curves

Figure 3. Quiescent current vs. supply voltage

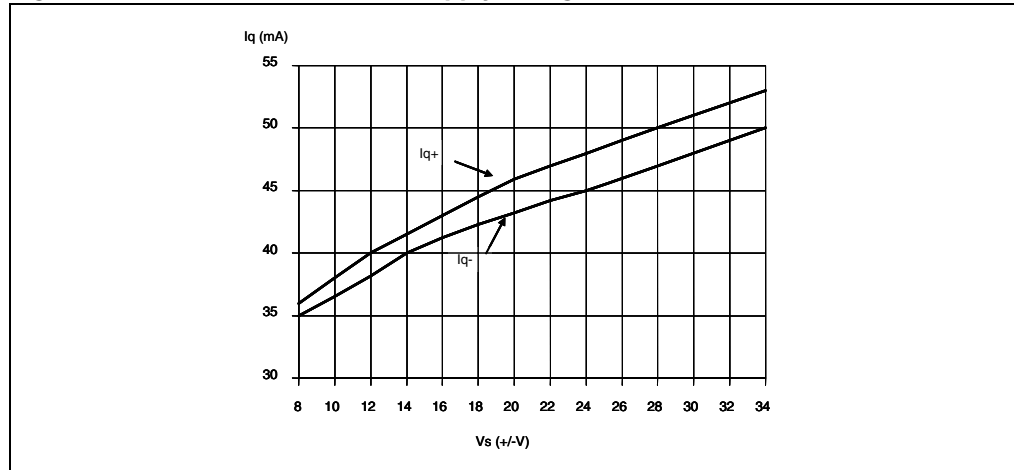
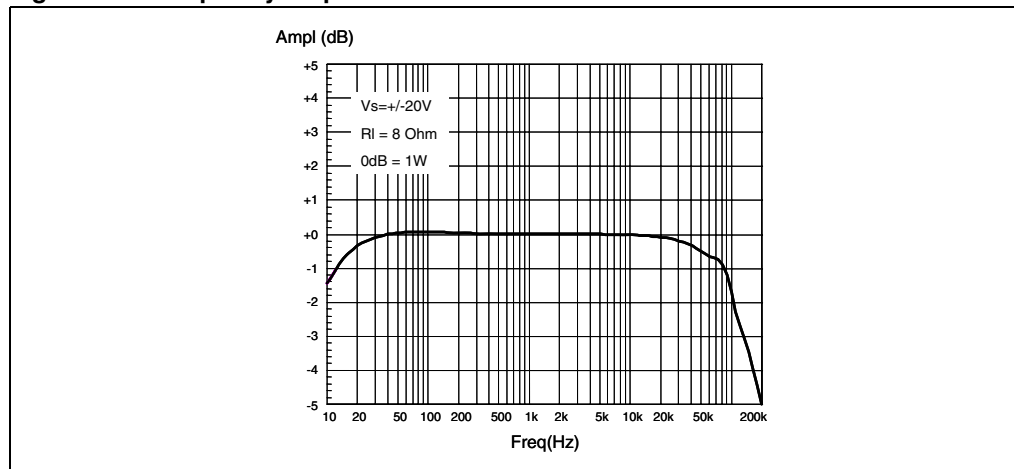


Figure 4. Frequency response





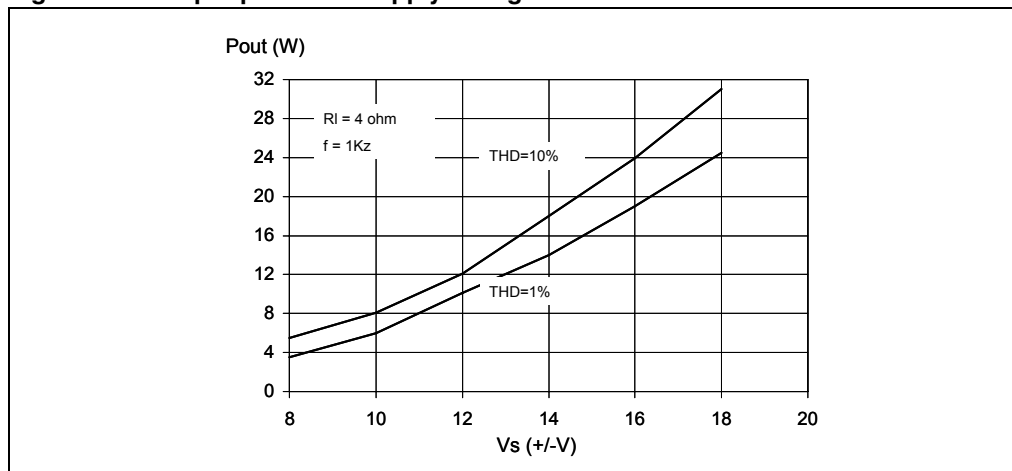
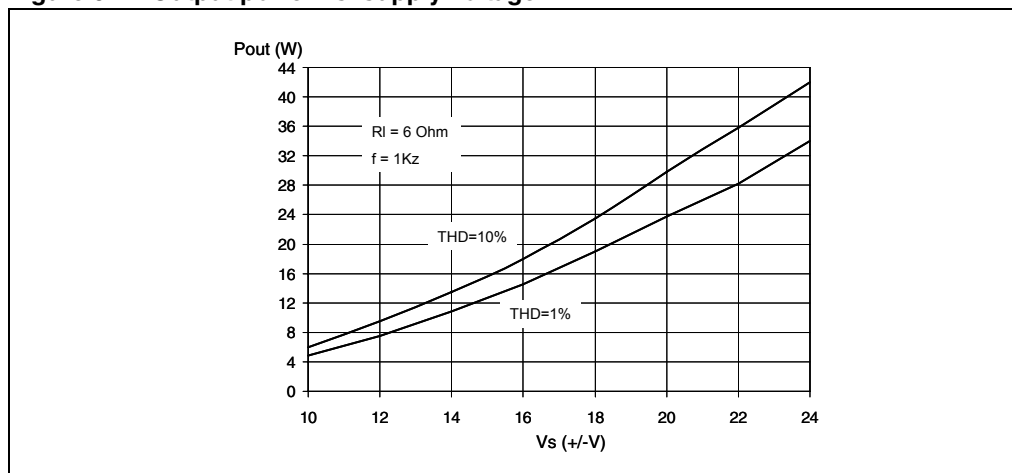
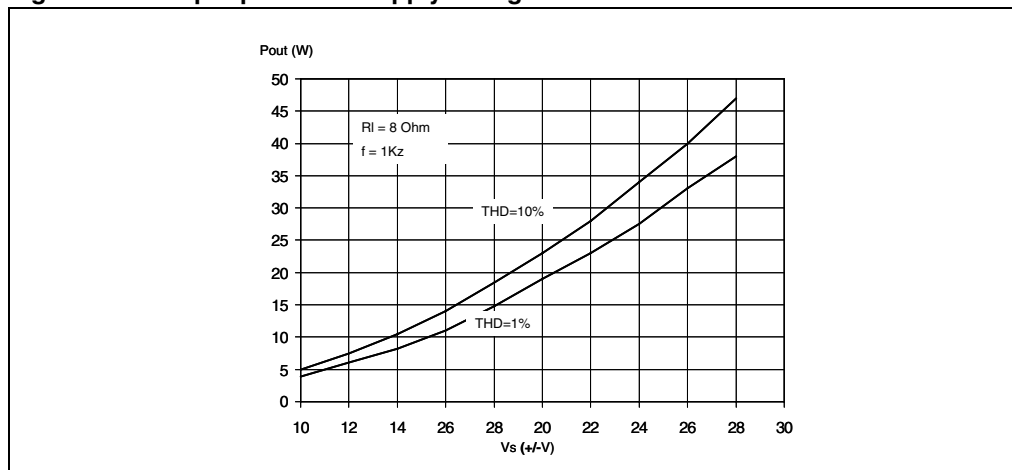
**Figure 5. Output power vs. supply voltage****Figure 6. Output power vs. supply voltage****Figure 7. Output power vs. supply voltage**

Figure 8. THD vs. output power

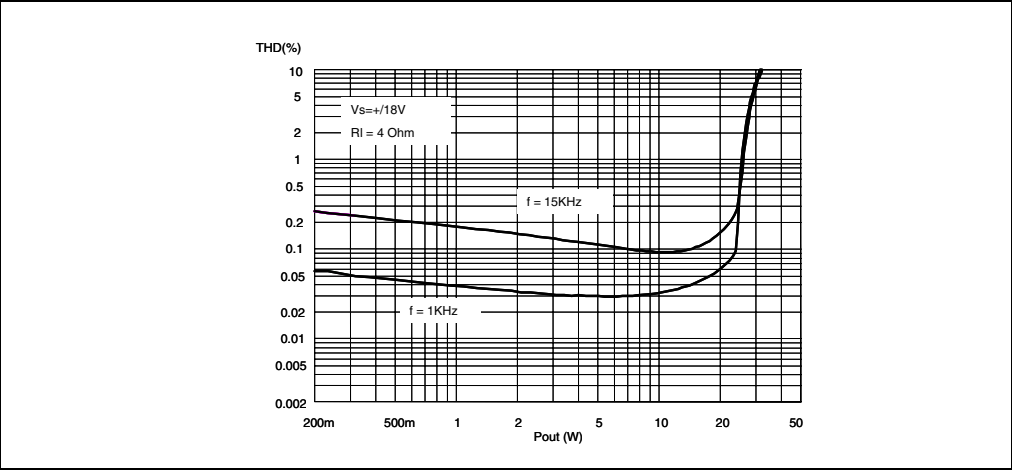


Figure 9. THD vs. output power

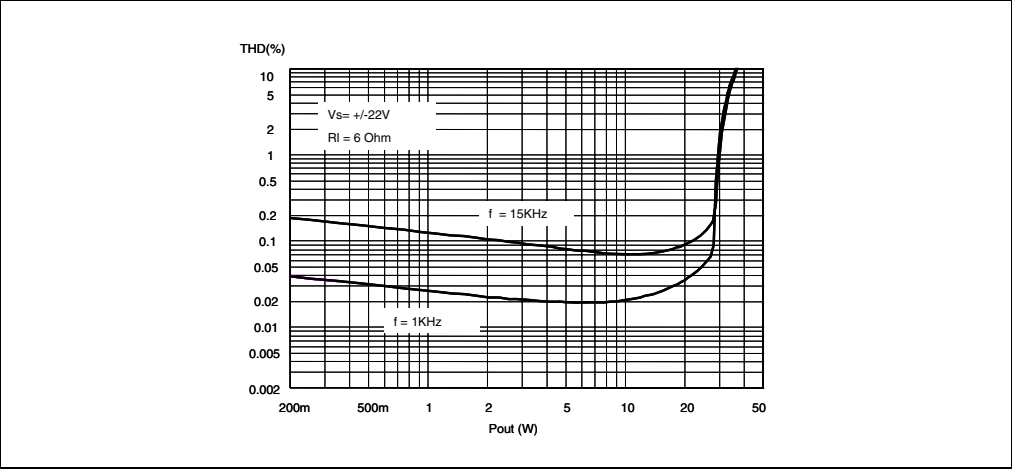


Figure 10. THD vs. output power

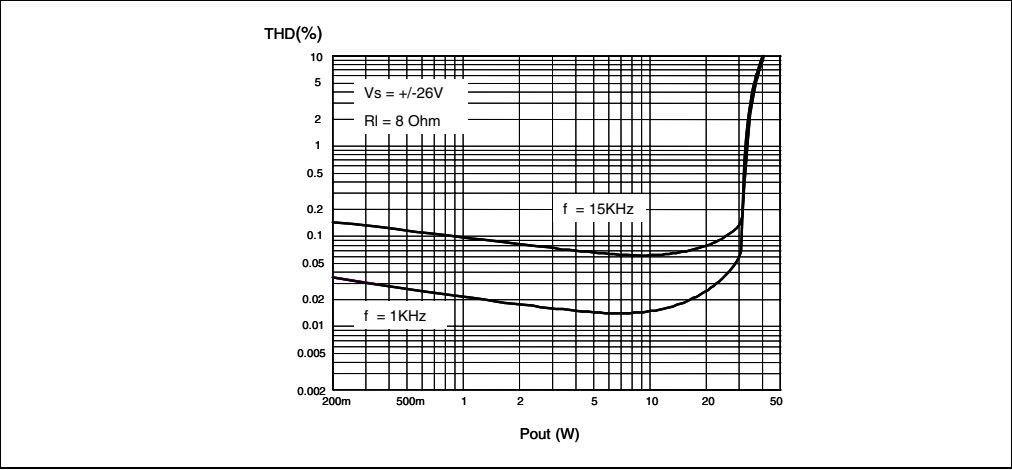


Figure 11. Quiescent current vs. voltage on pin 5

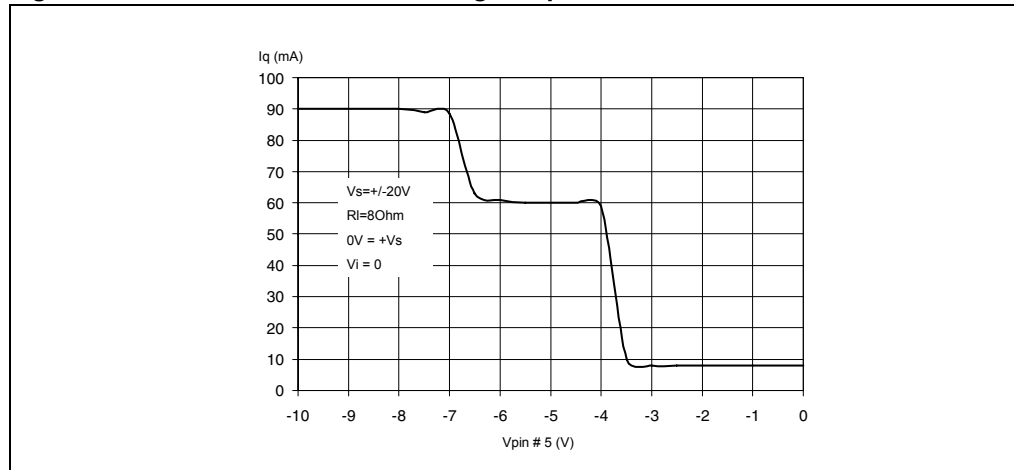


Figure 12. Attenuation vs. voltage on pin 5

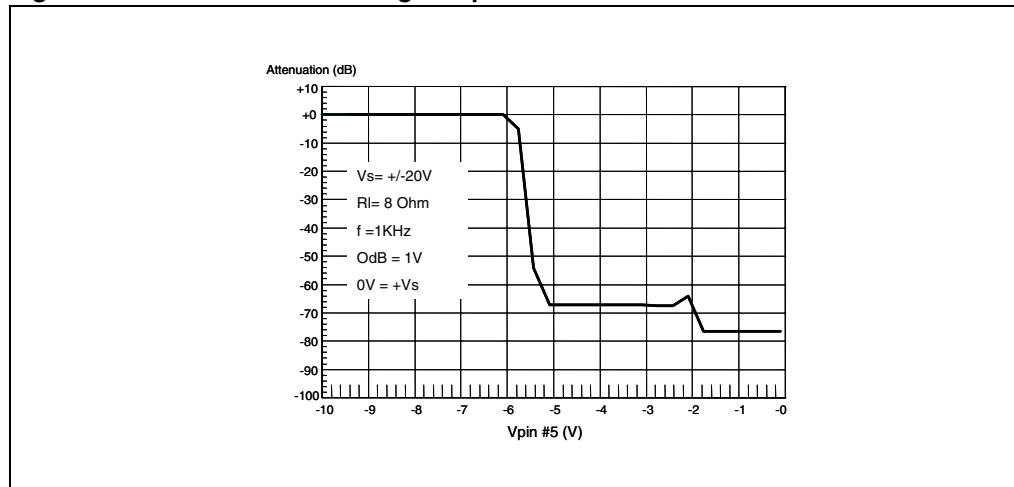


Figure 13. Crosstalk vs. frequency

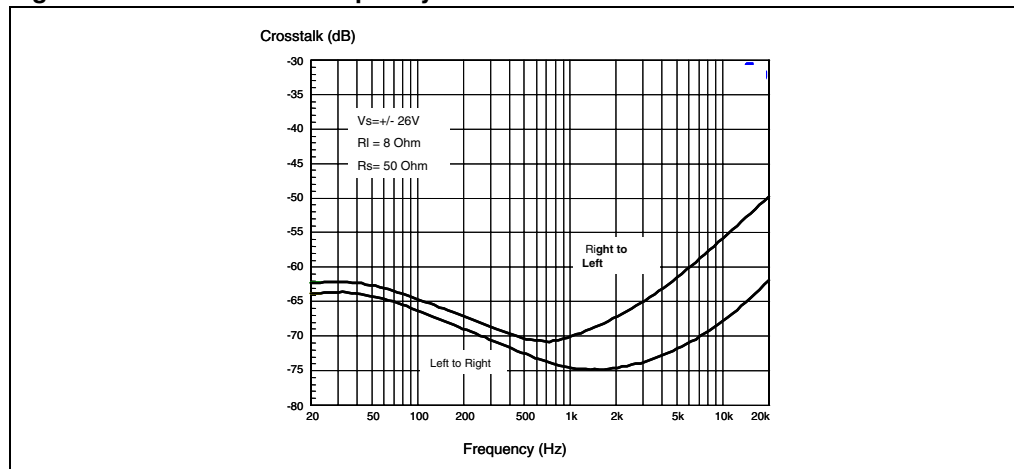


Figure 14. Power dissipation vs. output power

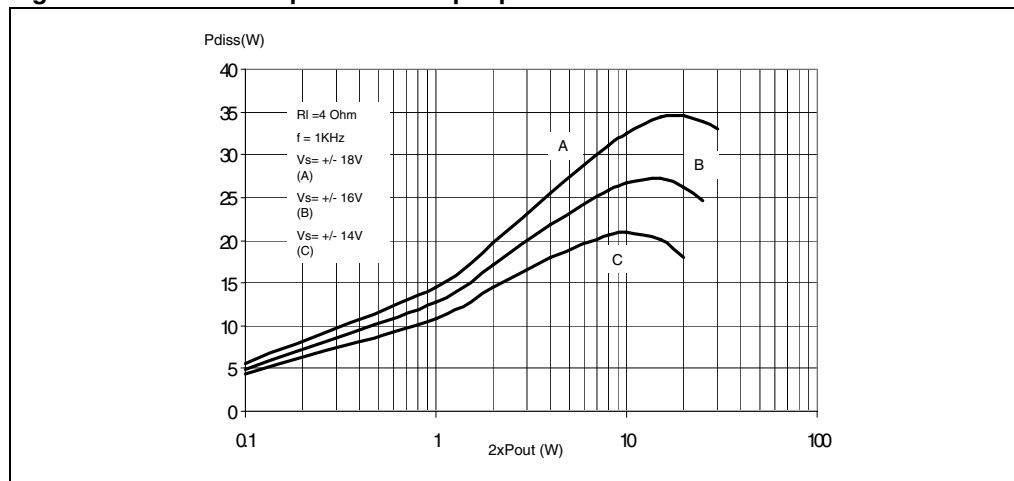


Figure 15. Power dissipation vs. output power

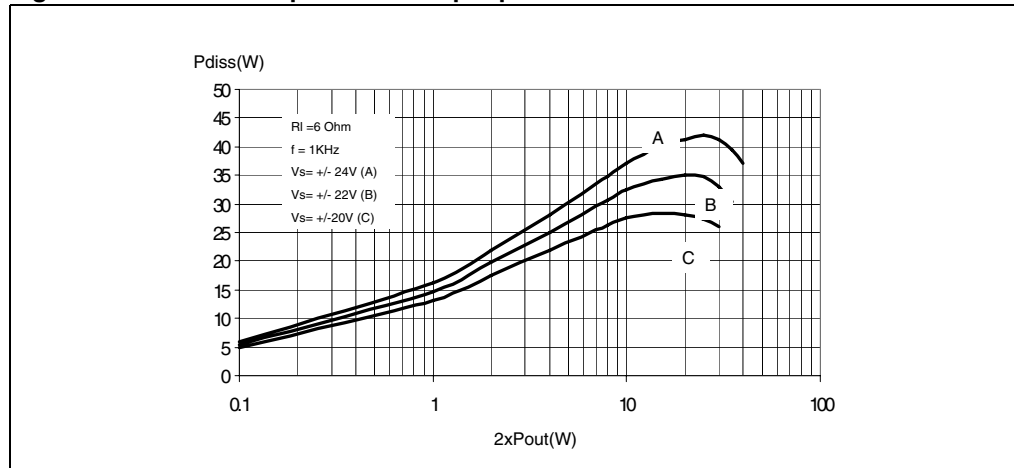
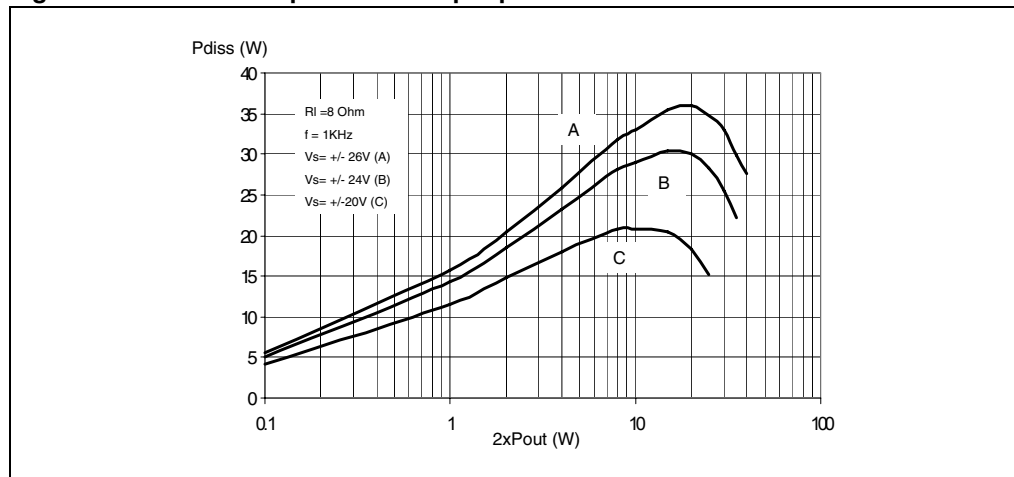


Figure 16. Power dissipation vs. output power



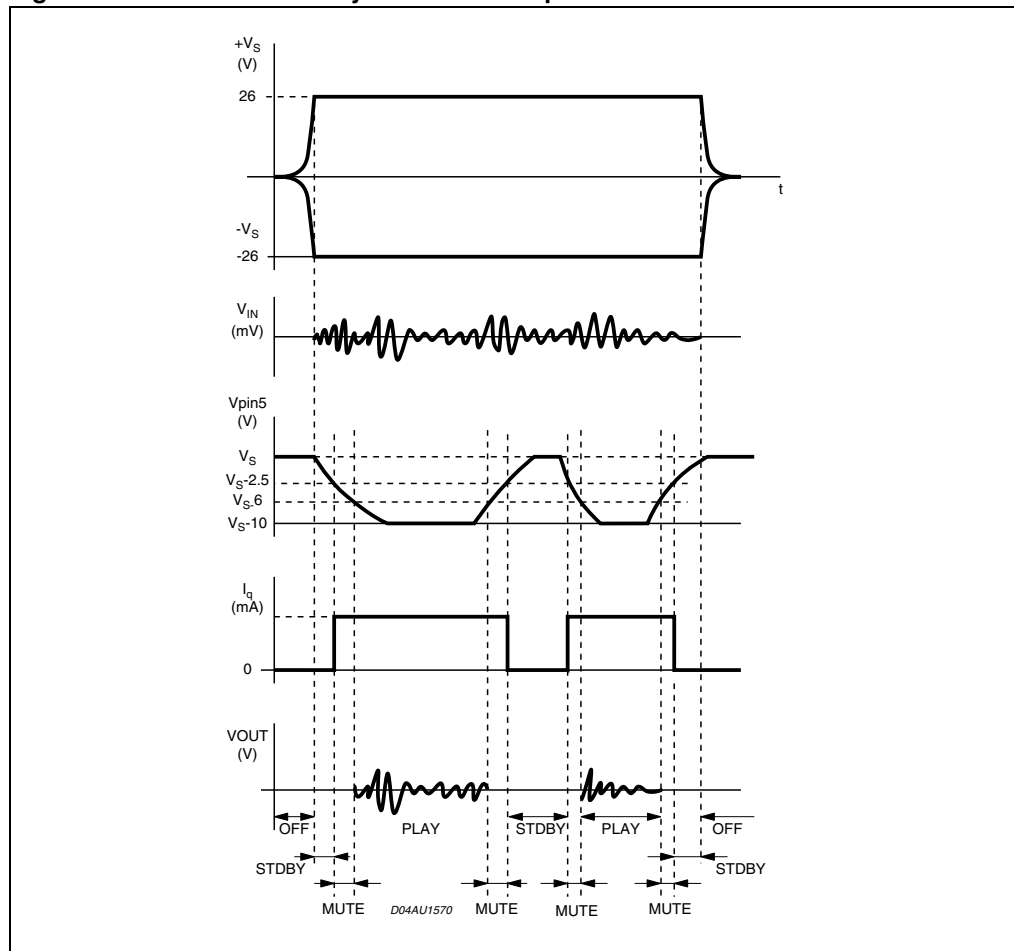
## 4 Mute and standby modes

Pin 5 (MUTE/STANDBY) controls the amplifier status by two different thresholds referenced to  $+V_S$  as given in [Table 5](#) below. See also [Table 4: Electrical specifications on page 6](#).

**Table 5. Mute and standby thresholds on pin 5**

Nominal voltage on pin 5, $V_{PIN5}$	Mode	Remarks
$> +V_S - 2.5\text{ V}$	Standby	Output stages turned off
$> +V_S - 6.0\text{ V}, < +V_S - 2.5\text{ V}$	Mute	Output stages turned on, amplifiers muted
$< +V_S - 6.0\text{ V}$	Play	Amplifiers active

**Figure 17. Mute and standby thresholds on pin 5**



## 5 Applications information

### Warning: SOA protection:

If the TDA7292 is operated without a load connected to the output terminals, the SOA protection circuit could be activated when a high amplitude and high frequency signal is applied to the input.

The frequency and amplitude of the signal able to trigger the protection is a function also of the supply voltage level used. If the above mentioned condition is possible when the speakers are not connected, it is recommended to connect the input to ground or add a dummy resistive load. For example, a 1-k $\Omega$  / 1-W resistor can be used at  $V_{CC} = \pm 26$  V. If a lower supply voltage is used, the resistor value must be decreased accordingly.

### 5.1 Applications with dual supply

Figure 18. Test and applications circuit (dual supply)

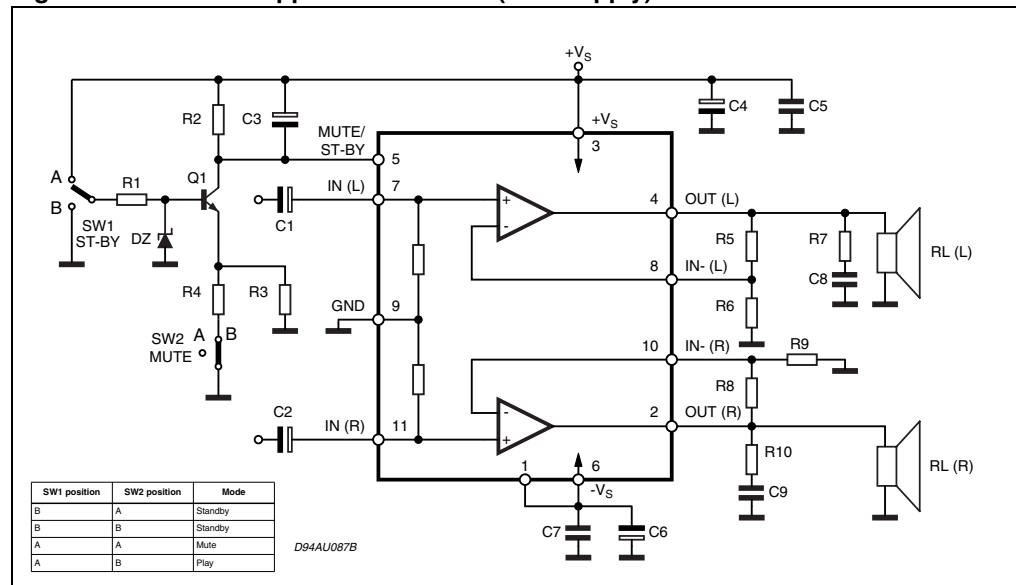


Table 6. Recommended values

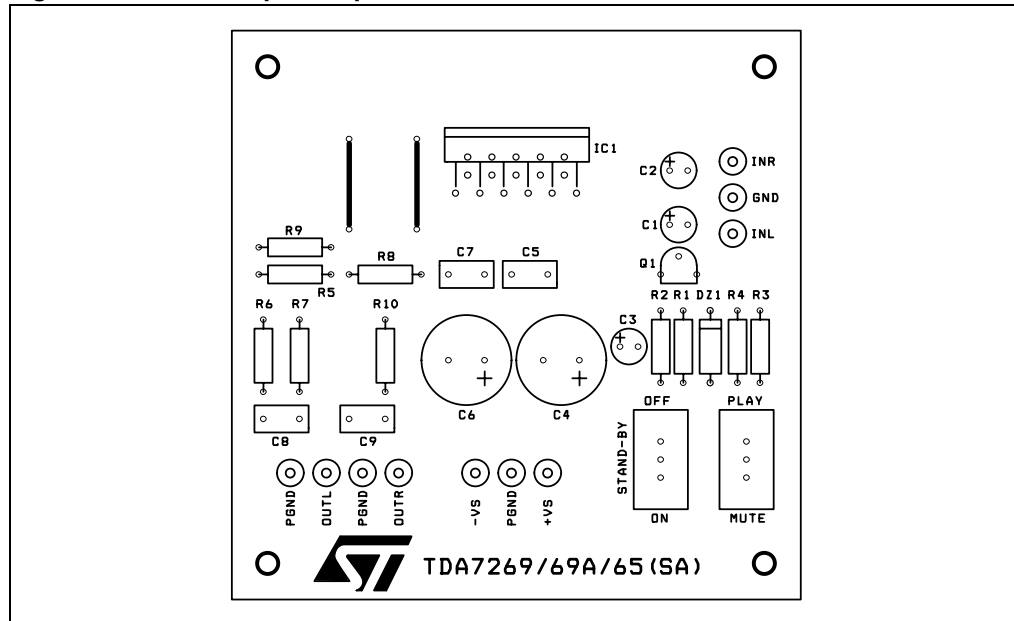
Component	Recommended value	Purpose	Larger than recommended value	Smaller than recommended value
R1	10 k $\Omega$	Mute circuit	Decrease in DZ biasing current	-
R2	15 k $\Omega$	Mute circuit	V <sub>PIN5</sub> shifted downwards	V <sub>PIN5</sub> shifted upwards
R3	47 k $\Omega$	Mute circuit	V <sub>PIN5</sub> shifted upwards	V <sub>PIN5</sub> shifted downwards
R4	15 k $\Omega$	Mute circuit	V <sub>PIN5</sub> shifted upwards	V <sub>PIN5</sub> shifted downwards
R5, R8	18 k $\Omega$	Closed-loop gain setting <sup>(1)</sup>	Increase in gain	-
R6, R9	560 $\Omega$		Decrease in gain	-
R7, R10	4.7 $\Omega$	Frequency stability	Danger of oscillation	Danger of oscillation
C1, C2	1 $\mu$ F	Input AC coupling	-	Higher low-frequency cutoff
C3	1 $\mu$ F	Standby/mute time constant	Larger on/off time	Smaller on/off time
C4, C6	1000 $\mu$ F	Supply voltage decoupling	-	Danger of oscillation
C5, C7	0.1 $\mu$ F	Supply voltage decoupling	-	Danger of oscillation
C8, C9	0.1 $\mu$ F	Frequency stability	-	-
Dz	5.1 V	Mute circuit	-	-
Q1	BC107	Mute circuit	-	-

1. Closed-loop gain must be >29 dB



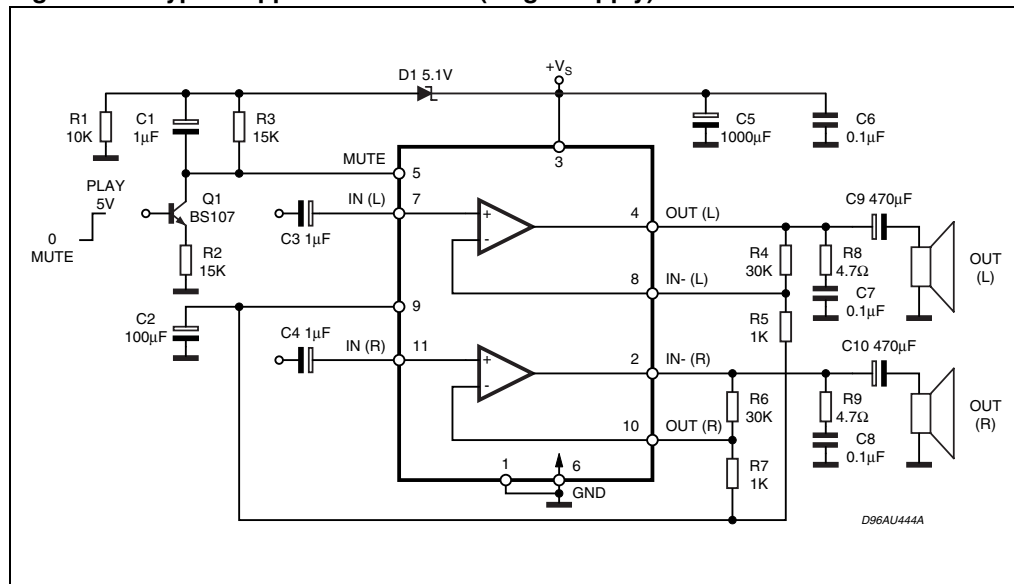


Figure 21. PCB component placement



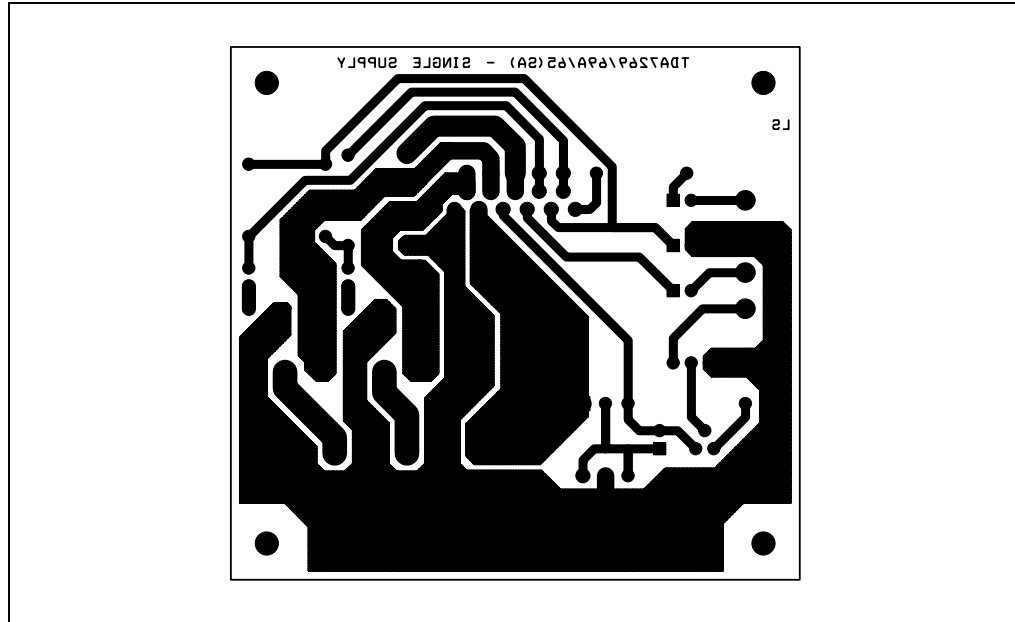
## 5.2 Applications with single supply

Figure 22. Typical applications circuit (single supply)



*Note:* The PCB layout shown in [Figure 23](#), [Figure 24](#), and [Figure 25](#) is common to the pin-to-pin compatible devices TDA7269A, TDA7265, and TDA7265B.

**Figure 23. PCB layout, solder side**



**Figure 24. PCB layout, component side**

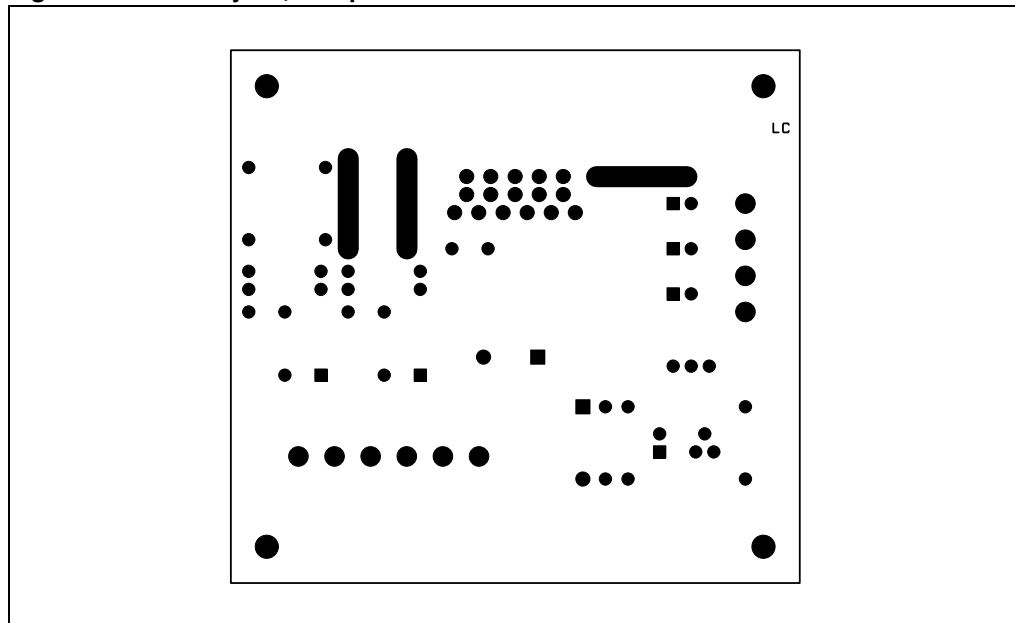
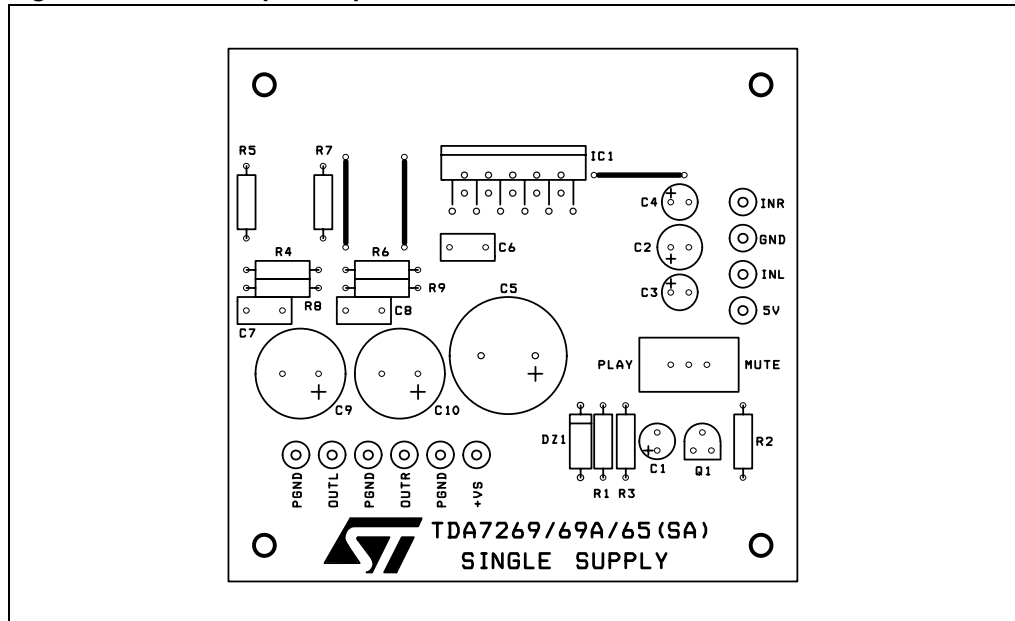


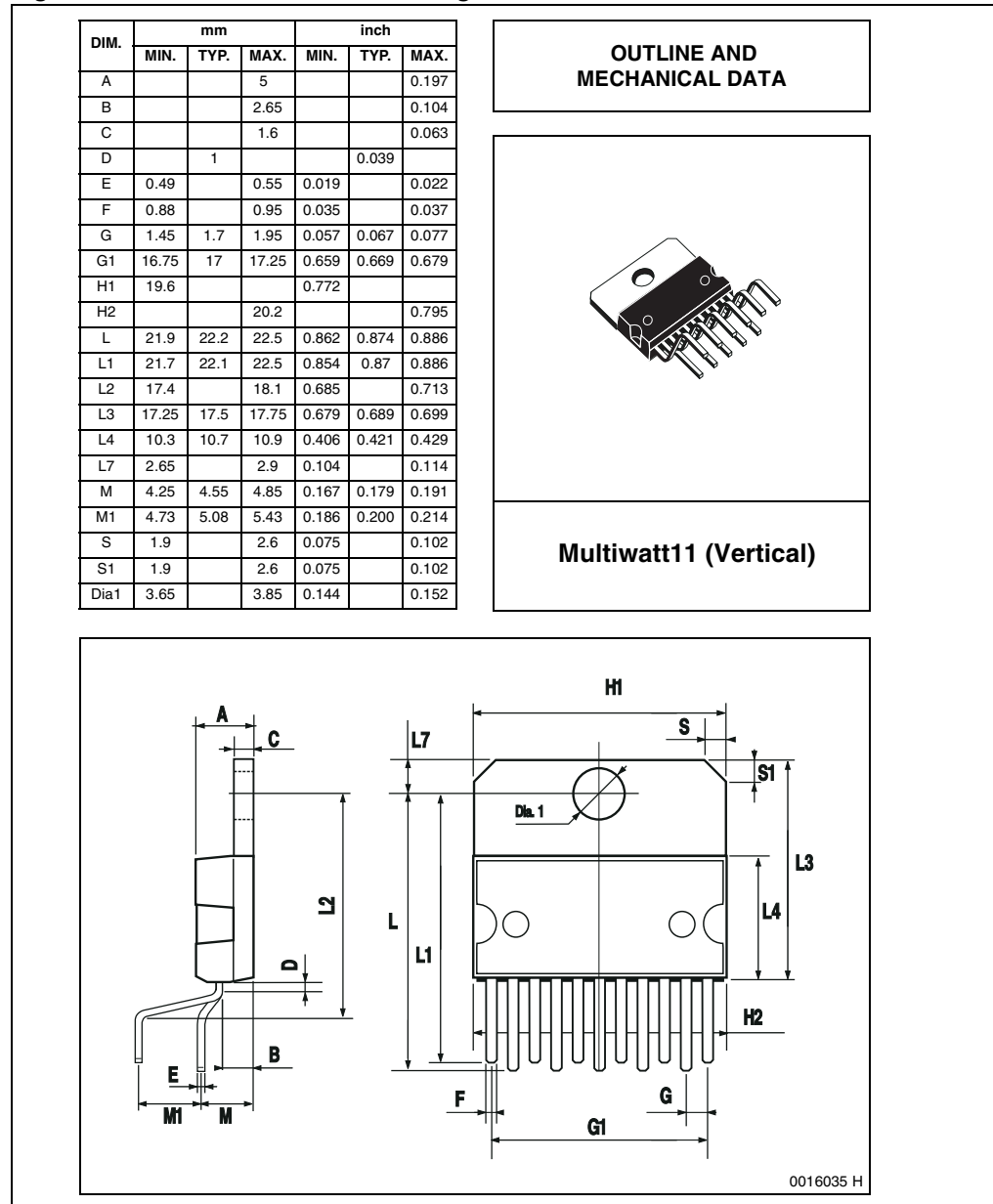
Figure 25. PCB component placement



## 6 Package mechanical data

The TDA7292 comes in an 11-pin Multiwatt package.

**Figure 26. Multiwatt11 outline drawing and dimensions**



In order to meet environmental requirements, ST offers these devices in different grades of ECOPACK<sup>®</sup> packages, depending on their level of environmental compliance. ECOPACK<sup>®</sup> specifications, grade definitions and product status are available at: [www.st.com](http://www.st.com). ECOPACK<sup>®</sup> is an ST trademark.

## 7 Revision history

Table 7. Document revision history

Date	Revision	Changes
Nov-2004	1	Initial release.
Oct-2005	2	Inserted PC board and graphics.
Mar-2006	3	Ouput peak current changed.
29-May-2009	4	Updated resistor value setting mute voltage in <a href="#">Figure 1 on page 1</a> and <a href="#">Table 5 on page 13</a> .
29-Feb-2012	5	Added <a href="#">Note: on page 16</a> and <a href="#">Note: on page 18</a> concerning PCB layout for pin-to-pin compatible devices.

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