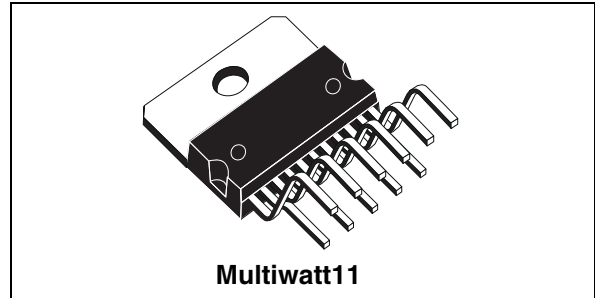


40 W + 40 W stereo amplifier with mute and standby

Features

- Wide supply voltage range (up to ± 33 V)
- Split supply
- High output power
- 40 W + 40 W into 8Ω 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

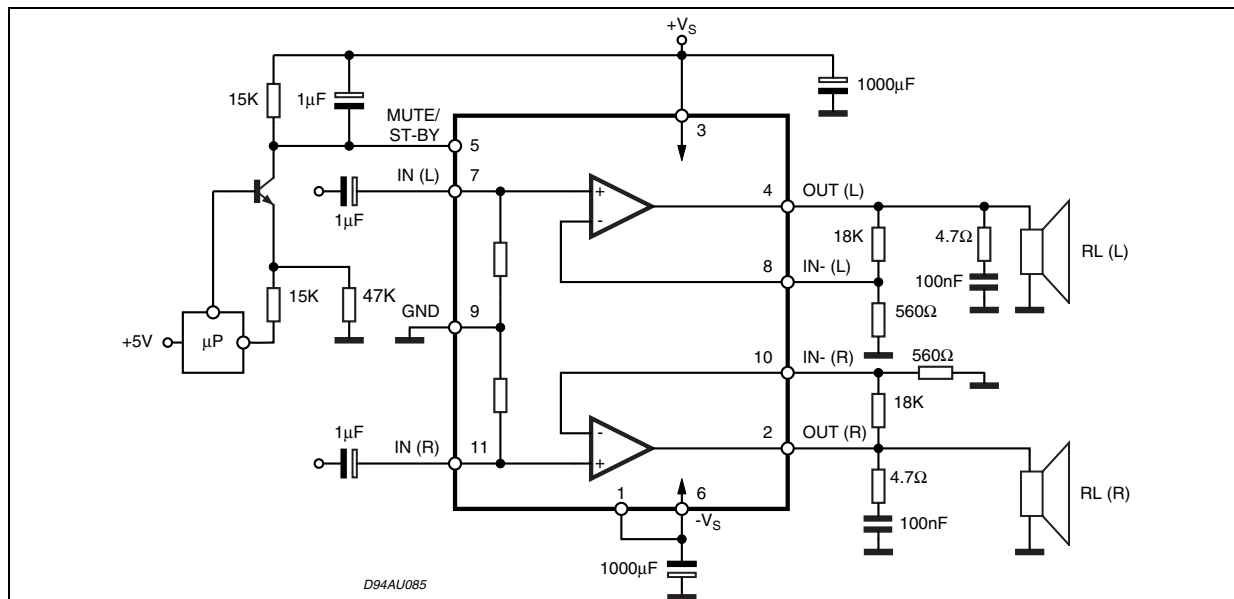
The TDA7292 is class-AB dual audio power amplifier assembled in a Multiwatt package.

It is specially 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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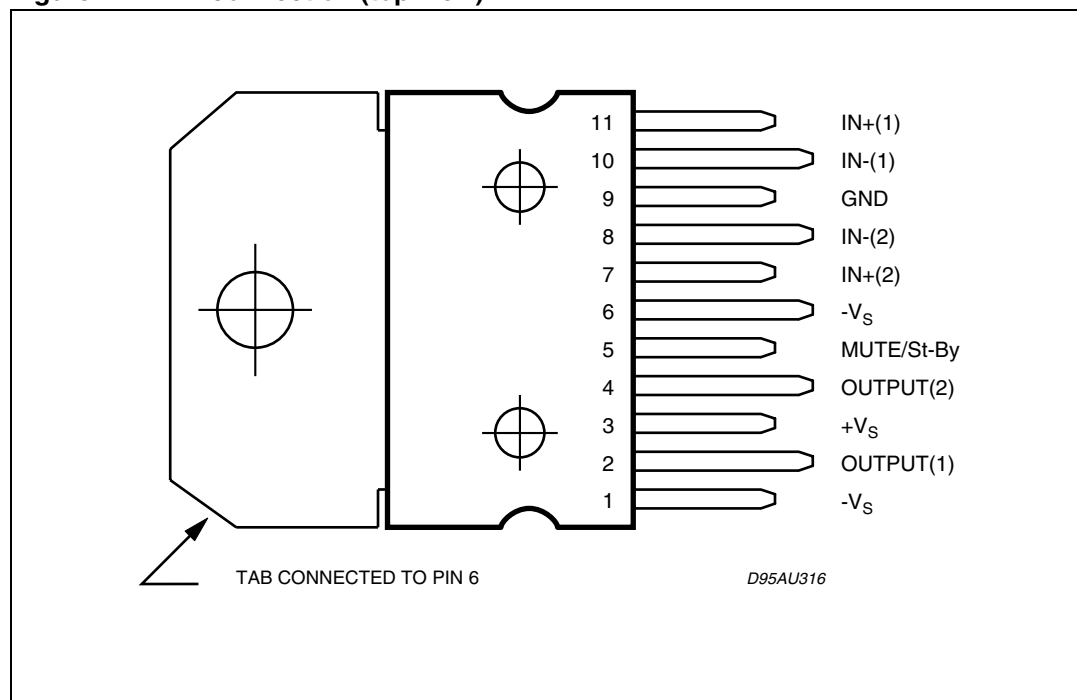
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1 Pin description

Figure 2. Pin connection (top view)



2 Electrical specifications

2.1 Absolute maximum ratings

Table 2. Absolute maximum ratings

Symbol	Parameter	Value	Unit
V_S	DC supply voltage	± 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 Ω , R_S (source) = 50 Ω , $f = 1\text{ kHz}$, $G_V = 30\text{ dB}$, 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	-	± 8	-	± 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	-	μV
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 Table 5 on page 13)						
V_{T_MUTE}	Mute/play threshold	-	-7	-6	-5	V
A_{MUTE}	Mute attenuation	-	-	75	-	dB
Standby mode (see also Table 5 on page 13)						
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

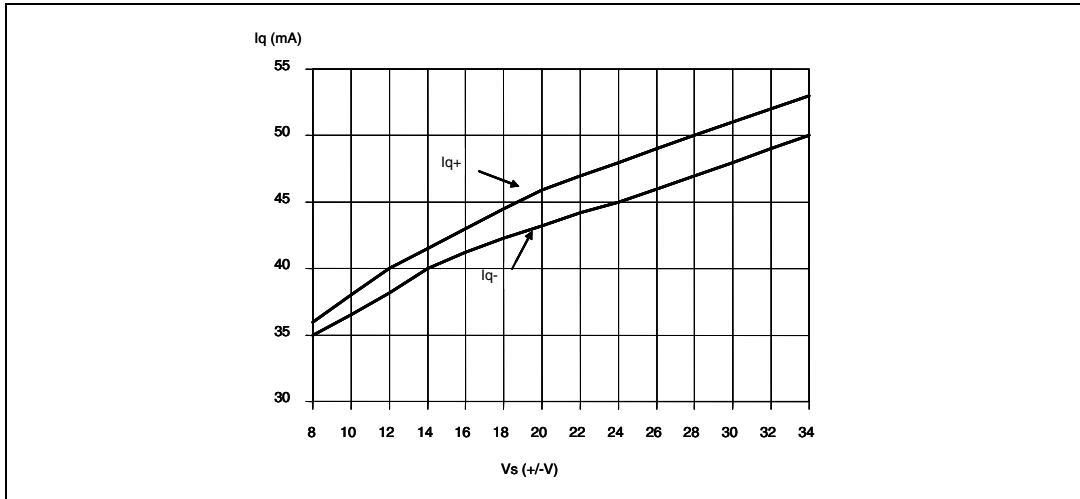


Figure 4. Frequency response

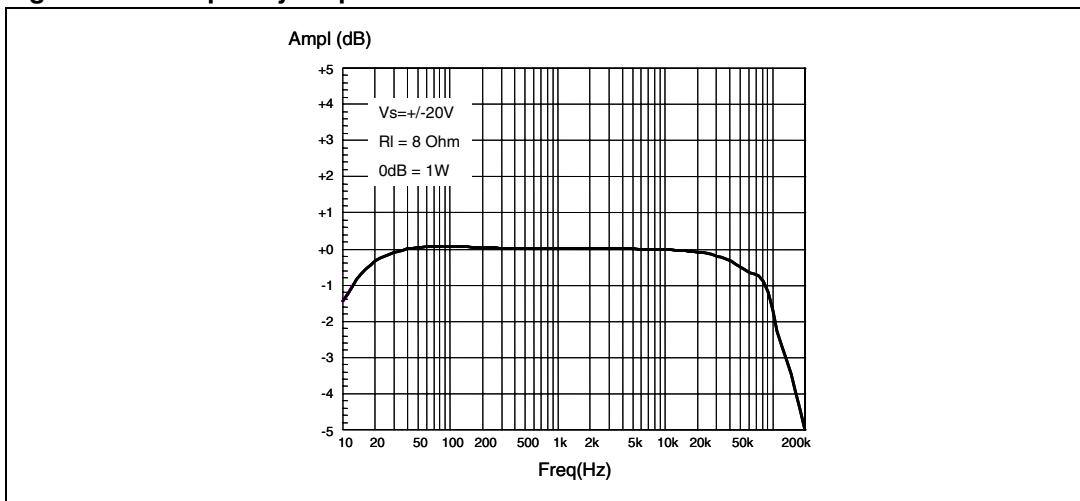


Figure 5. Output power vs supply voltage

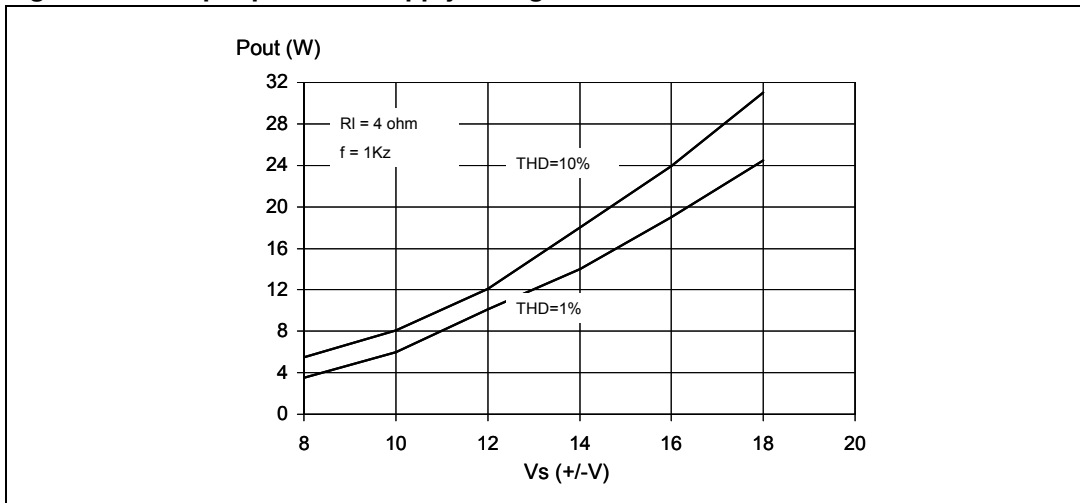


Figure 6. Output power vs supply voltage

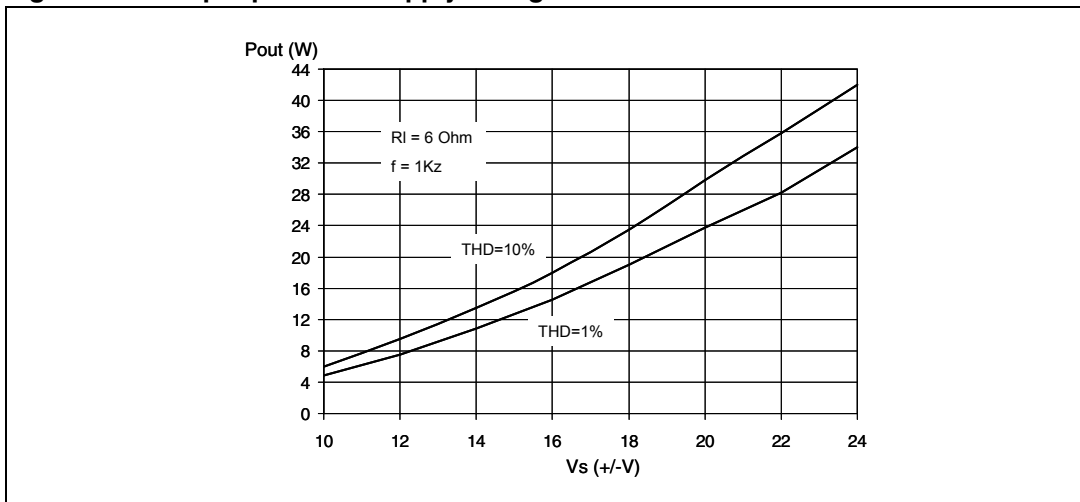


Figure 7. Output power vs supply voltage

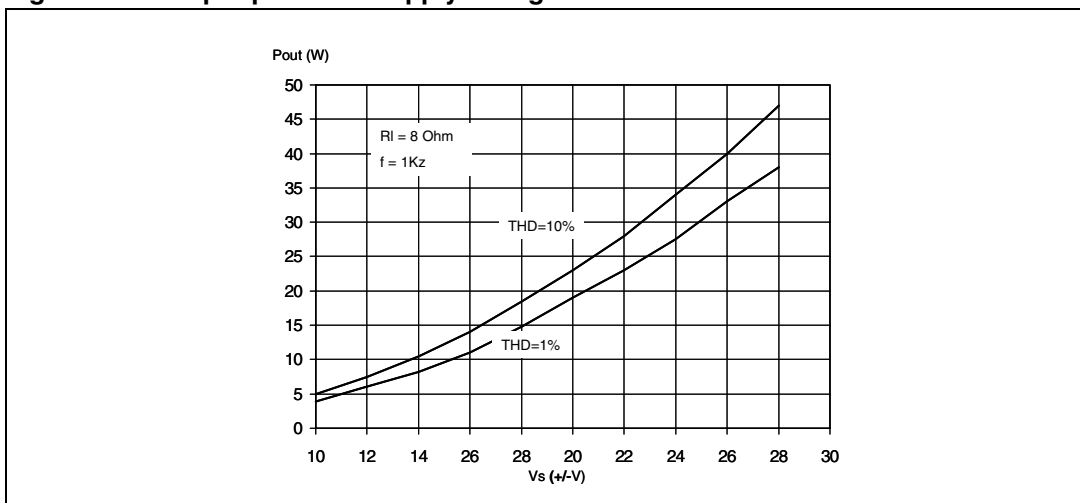


Figure 8. THD vs output power

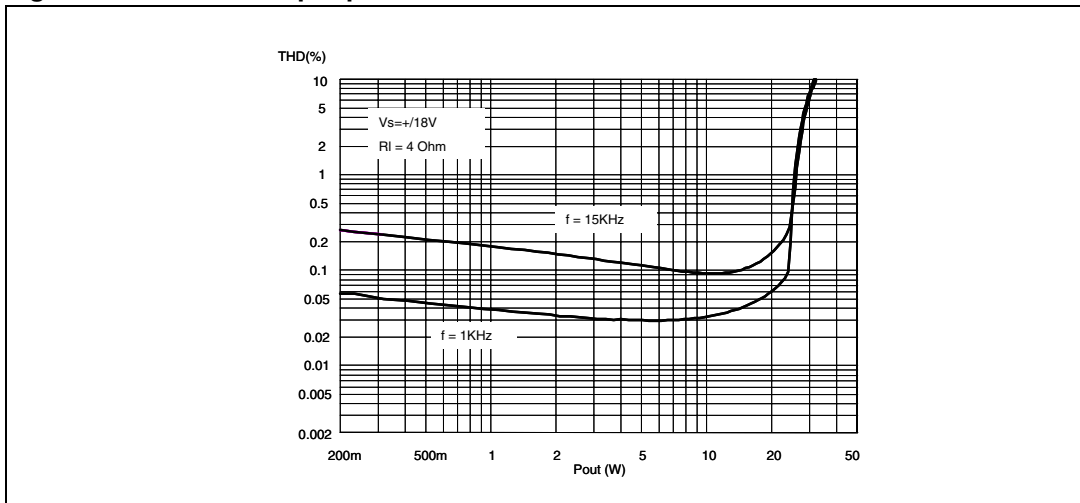


Figure 9. THD vs output power

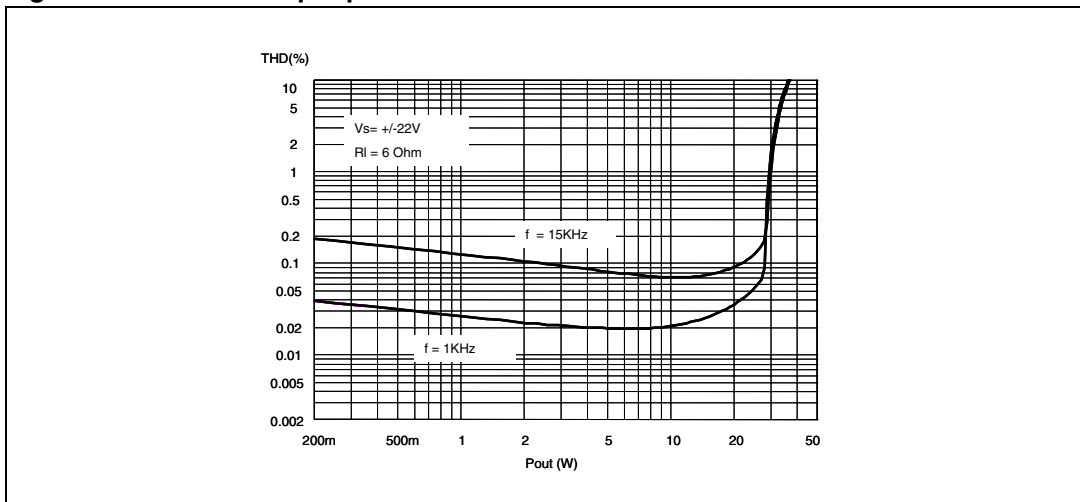


Figure 10. THD vs output power

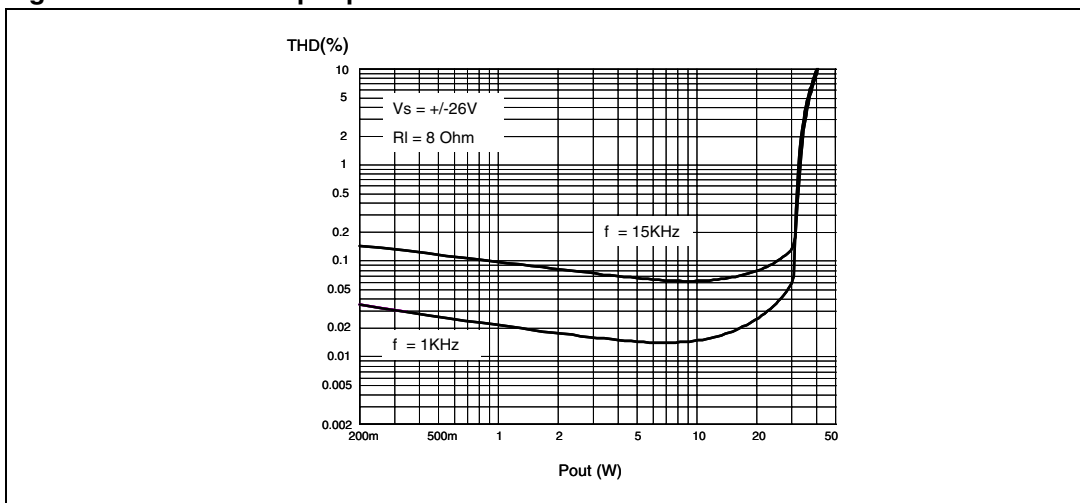


Figure 11. Quiescent current vs voltage on pin 5

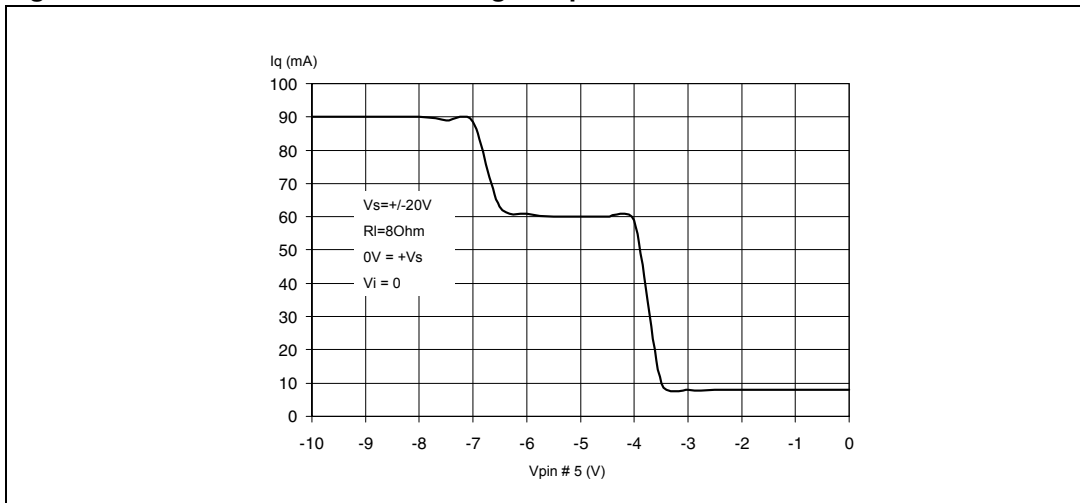


Figure 12. Attenuation vs voltage on pin 5

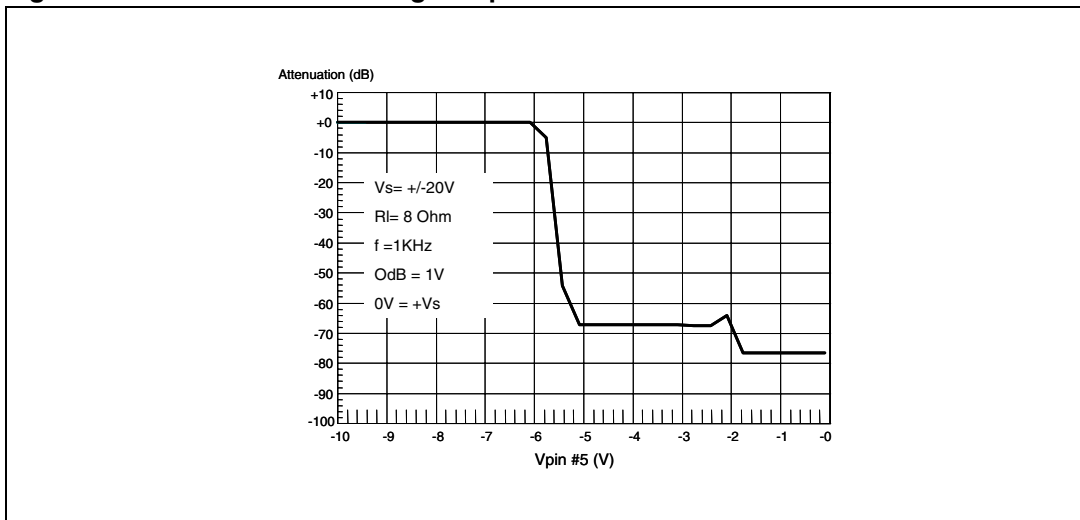


Figure 13. Crosstalk vs frequency

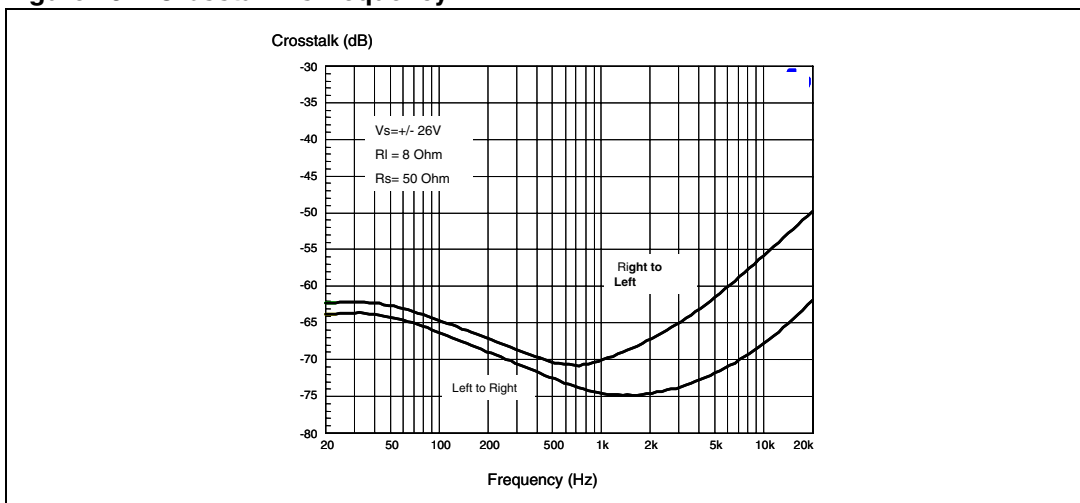


Figure 14. Power dissipation vs output power

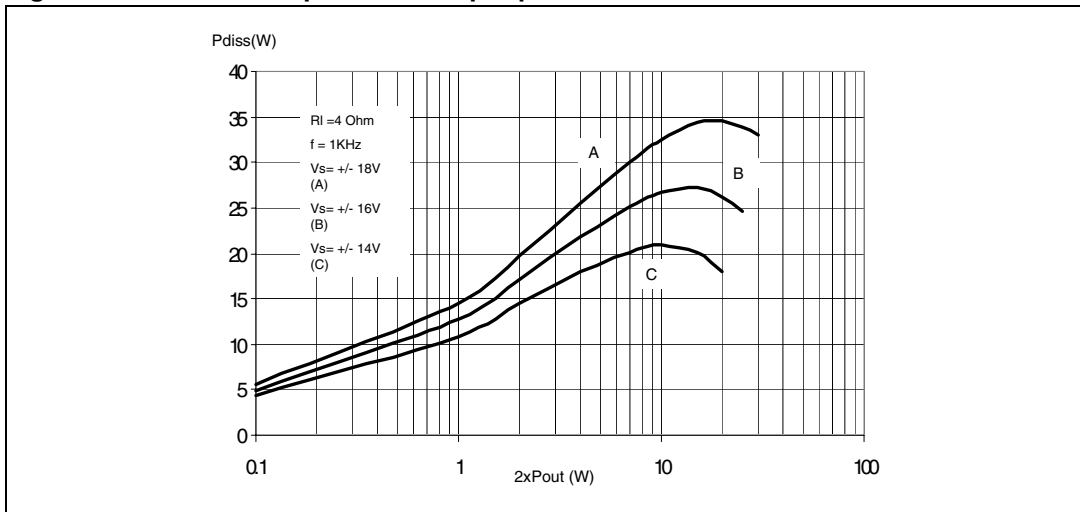


Figure 15. Power dissipation vs output power

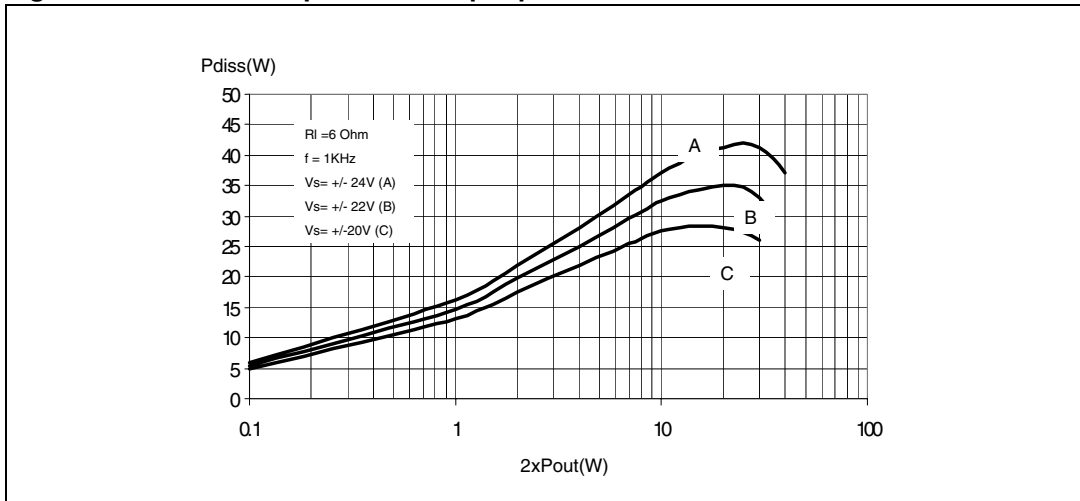
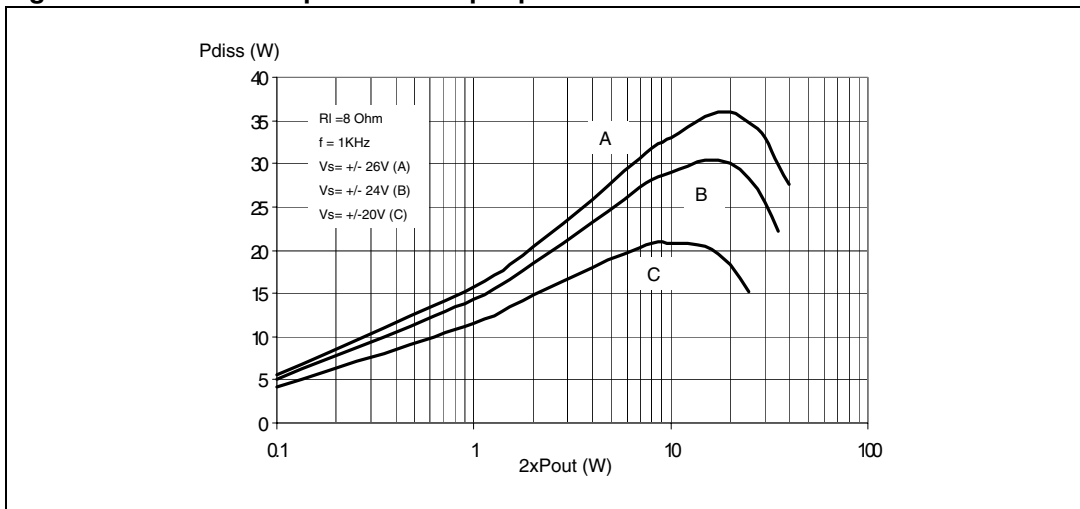


Figure 16. Power dissipation vs output power



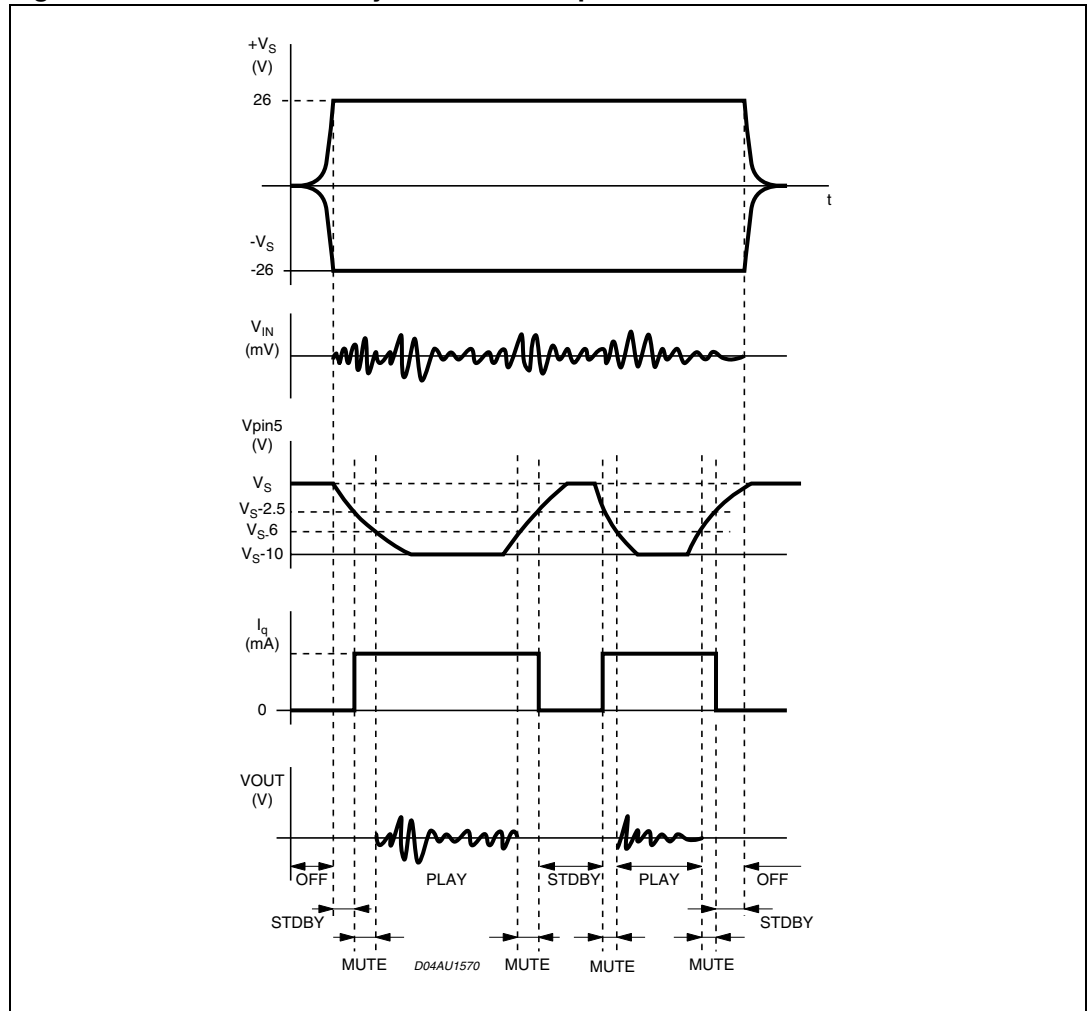
4 Mute and standby modes

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-kΩ / 1-W resistor can be used at Vcc = ±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)

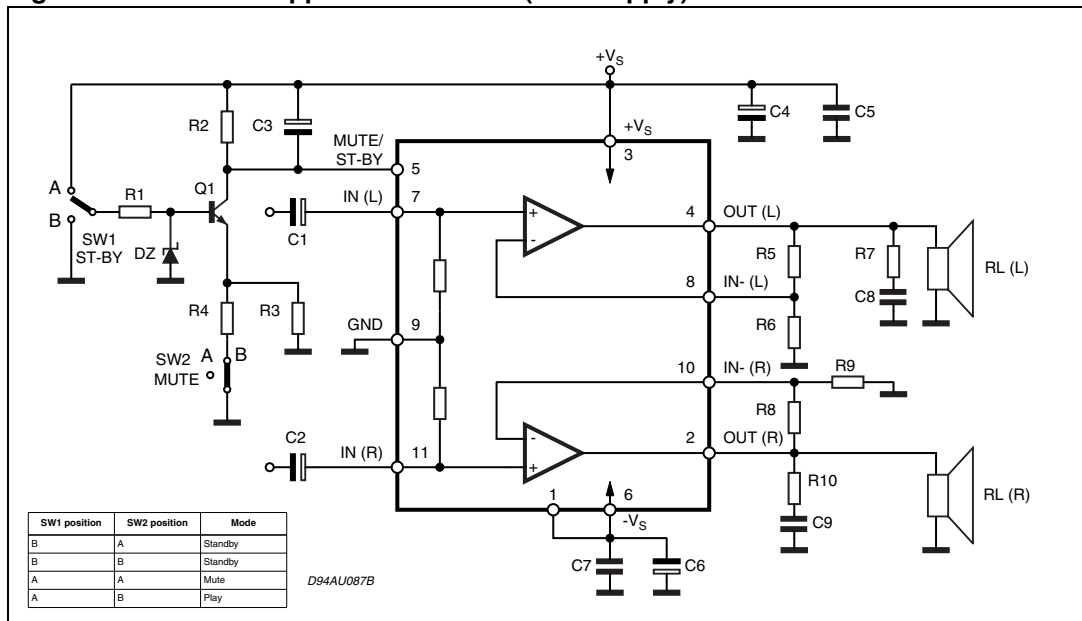


Table 6. Recommended values

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

1. Closed-loop gain must be >29 dB

Figure 19. PCB layout, solder side

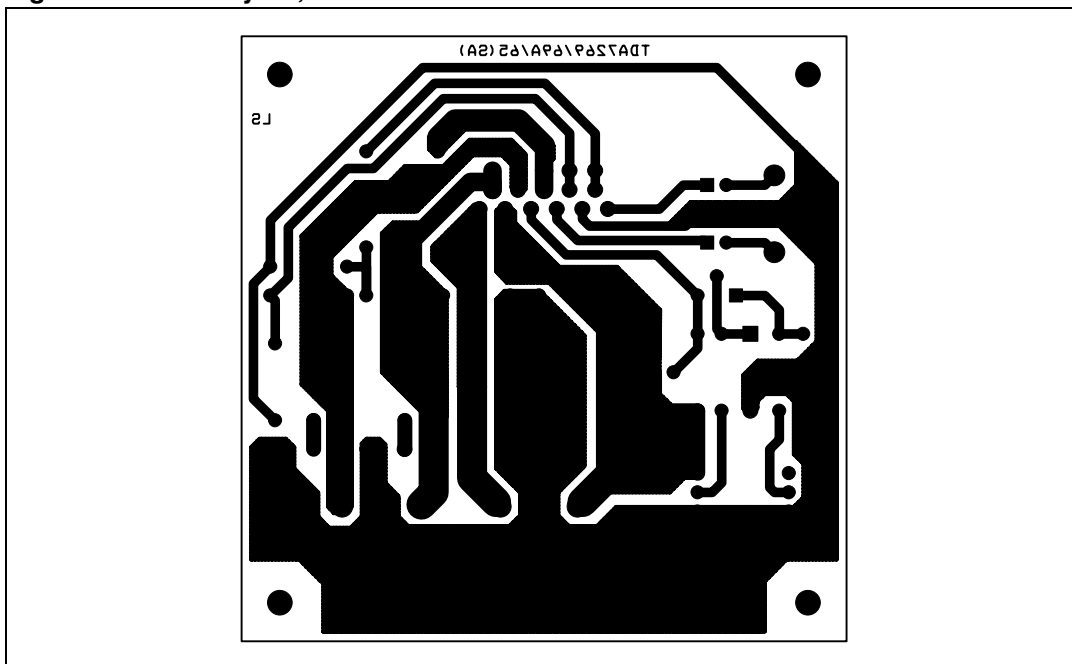


Figure 20. PCB layout, component side

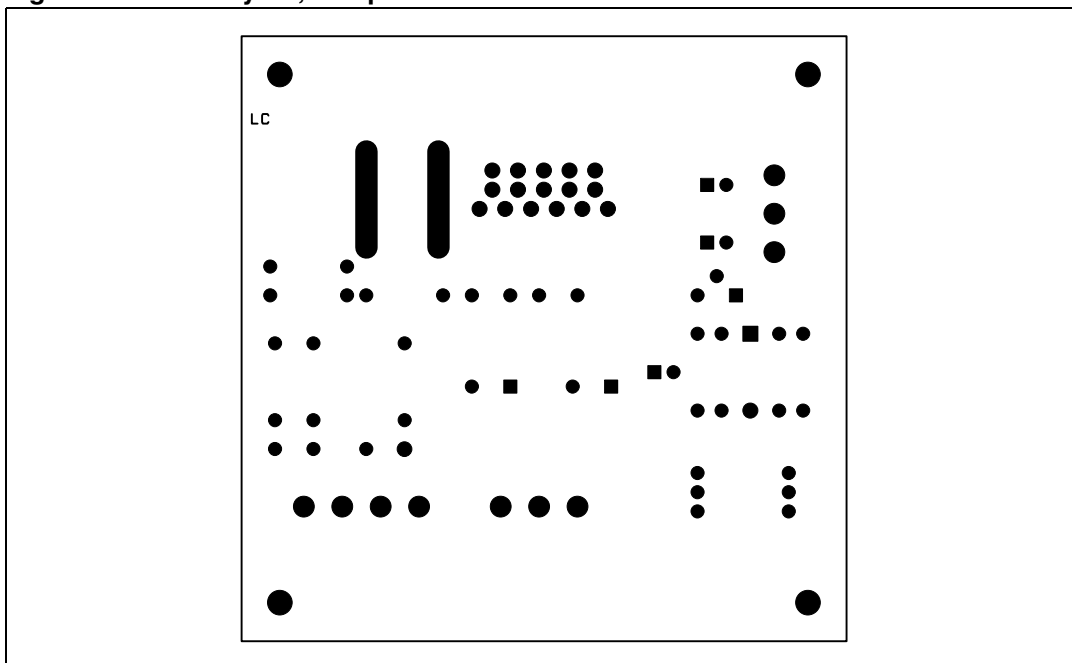
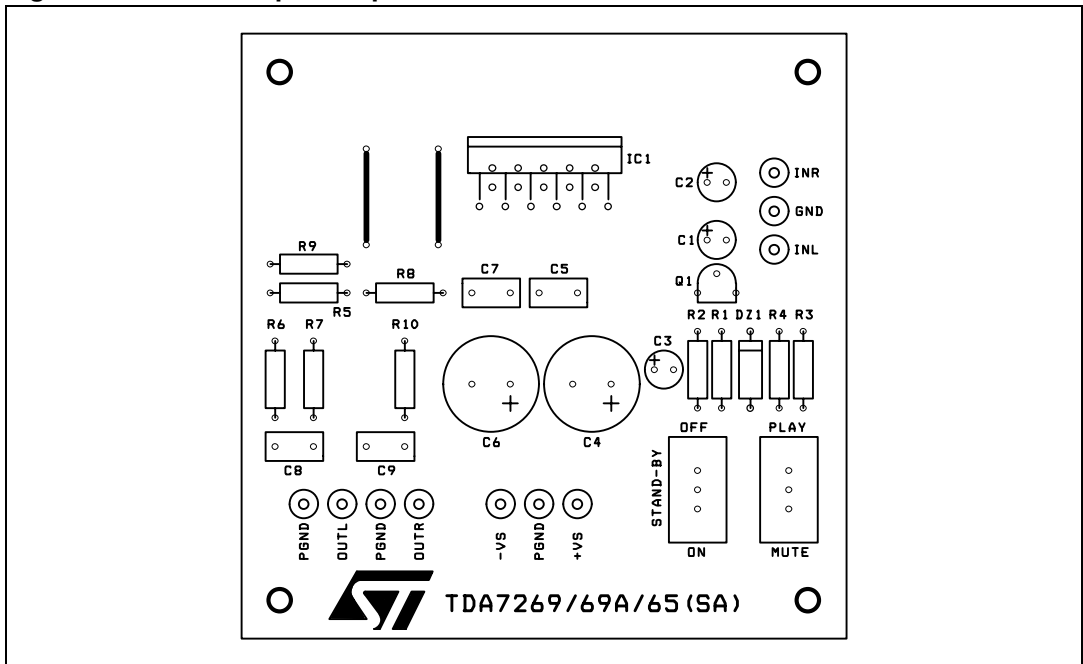


Figure 21. PCB component placement



5.2 Applications with single supply

Figure 22. Typical applications circuit (single supply)

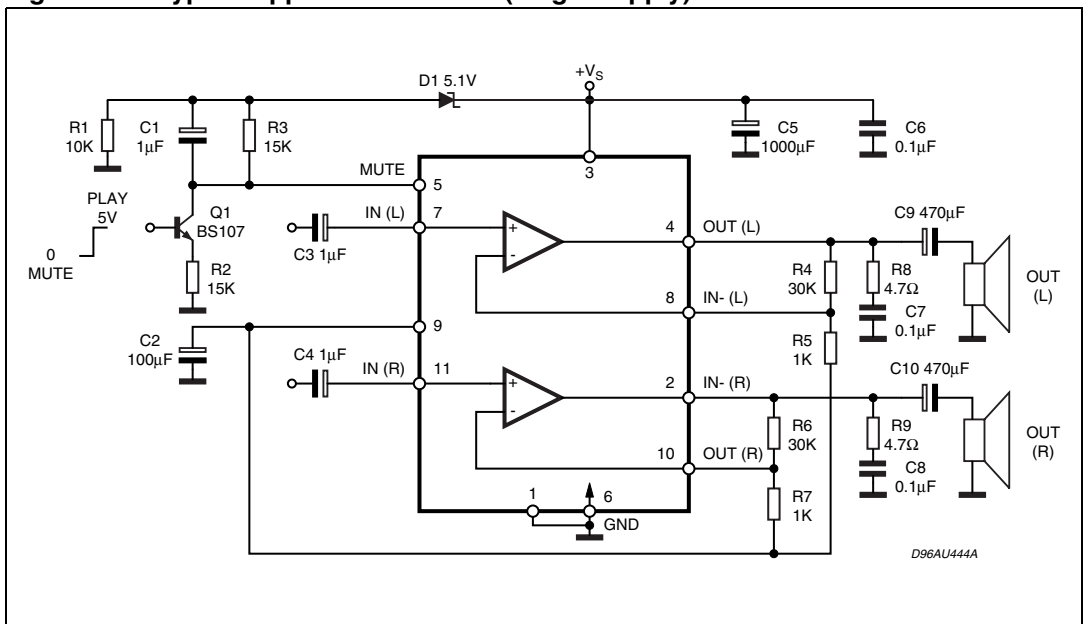


Figure 23. PCB layout, solder side

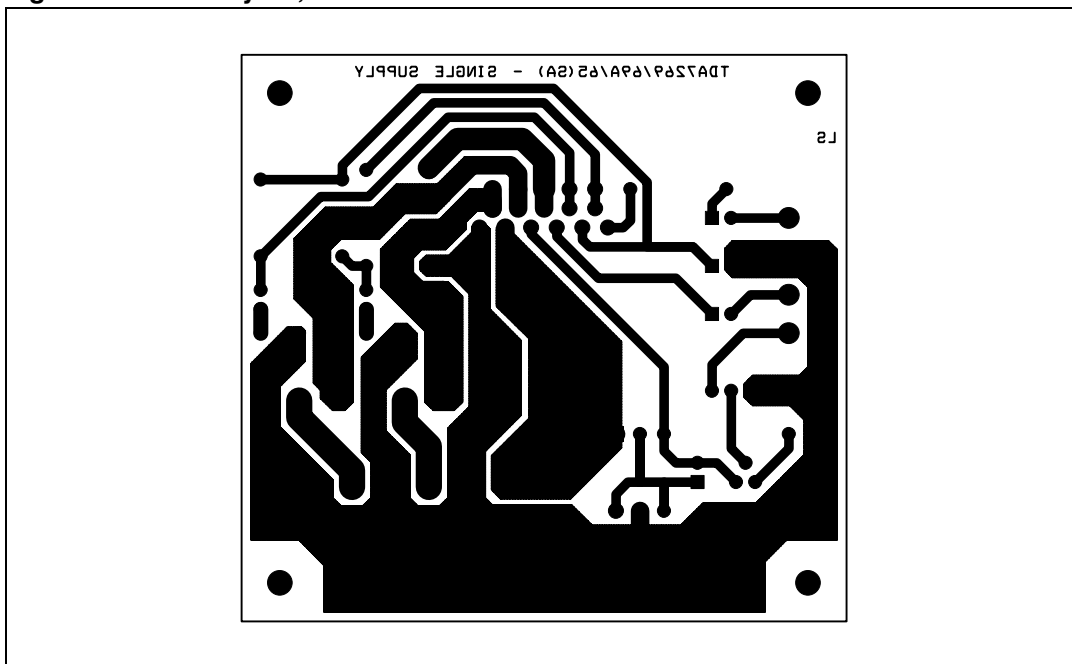


Figure 24. PCB layout, component side

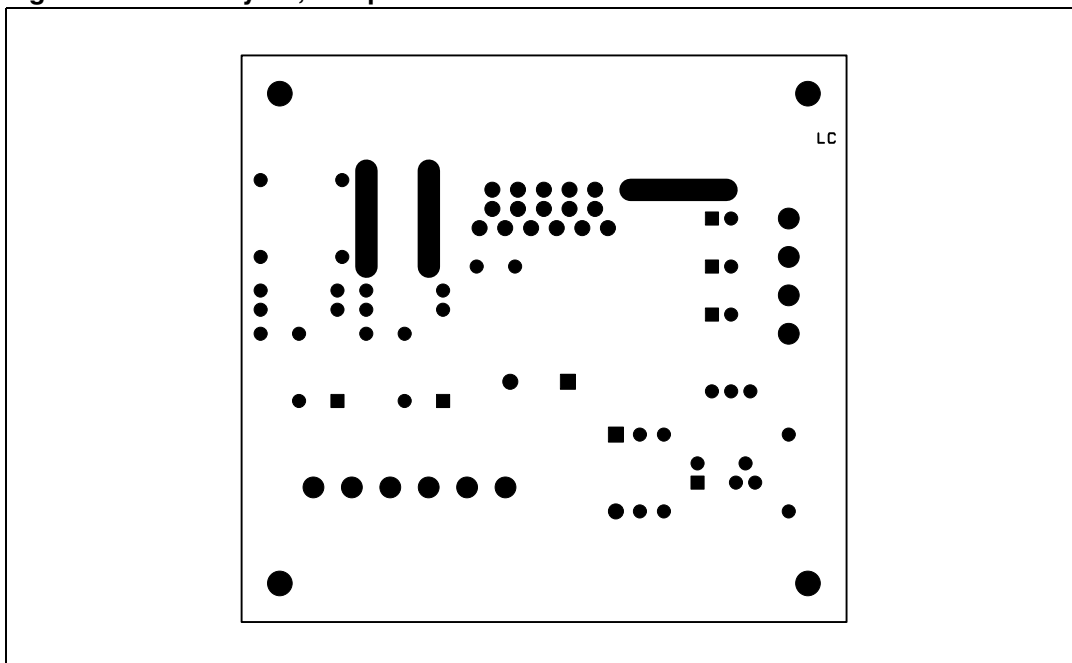
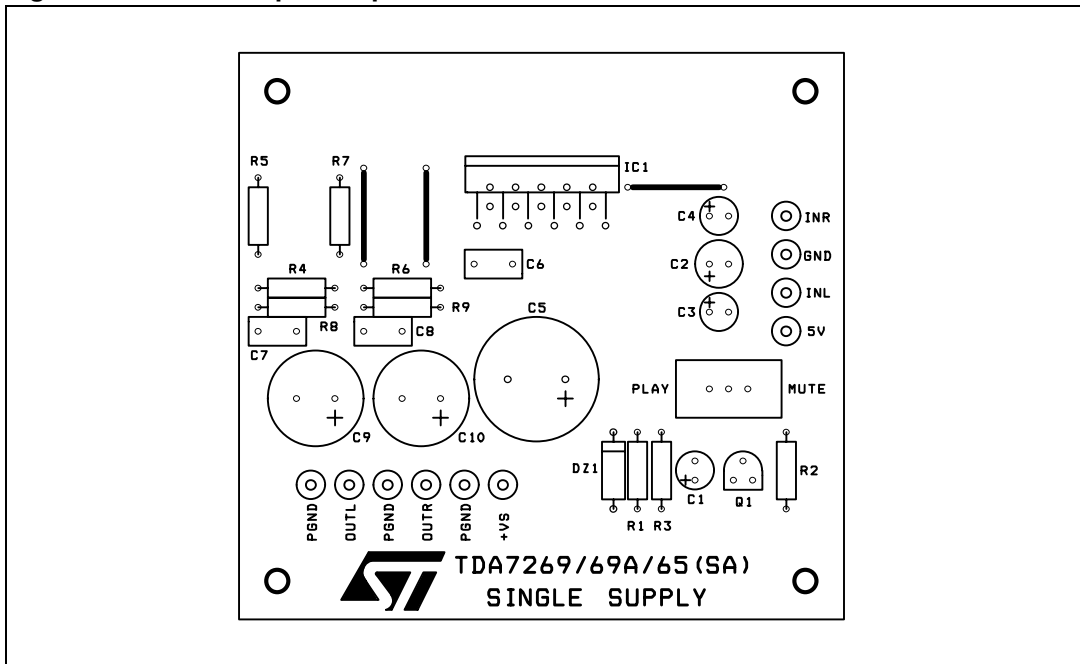


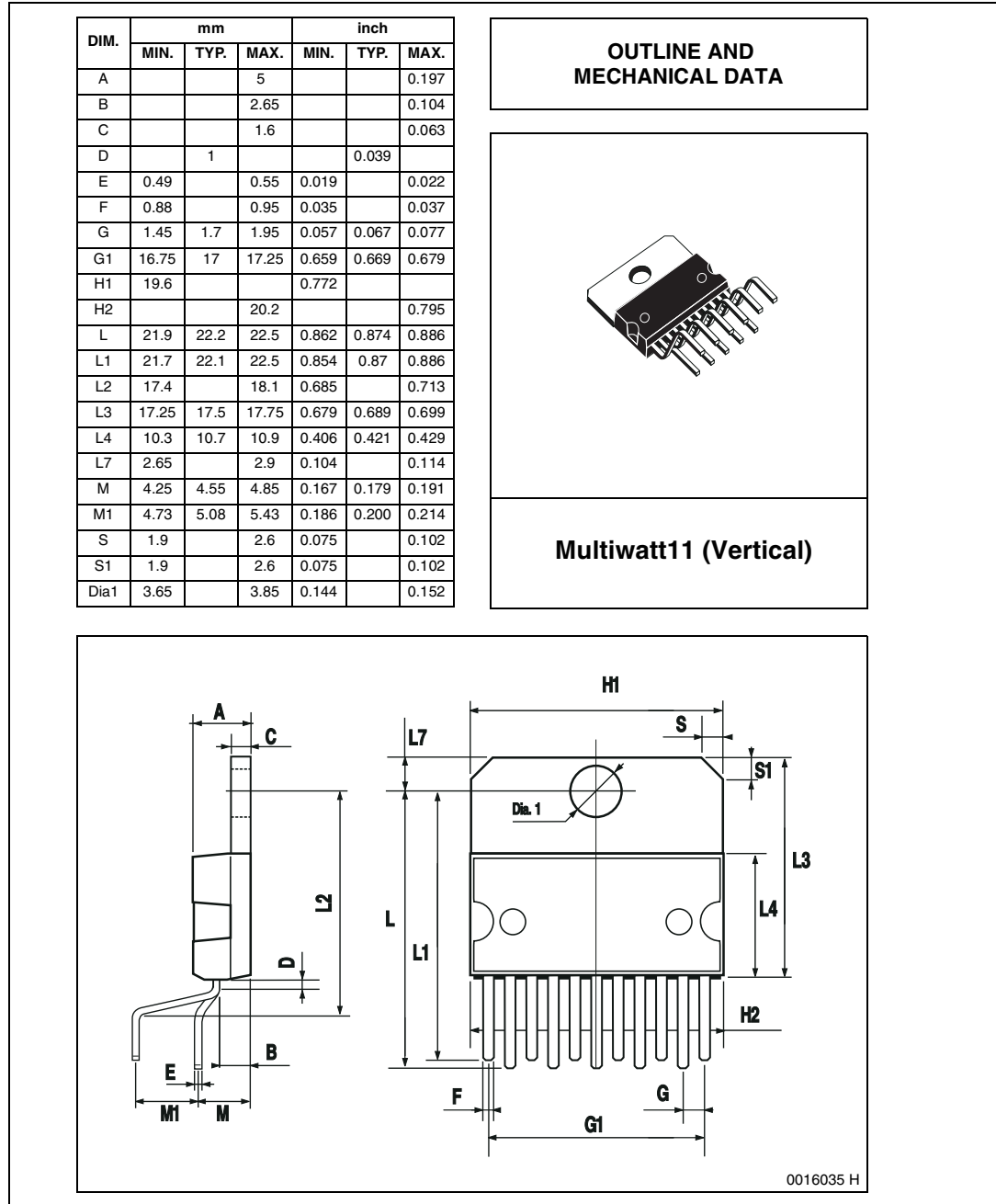
Figure 25. PCB component placement



6 Package mechanical data

The TDA7292 comes in an 11-pin Multiwatt package.

Figure 26. Multiwatt11 outline drawing and dimensions



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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 Figure 1 on page 1 and Table 5 on page 13 .

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