

10W+10W STEREO AMPLIFIER WITH MUTE & ST-BY

1 FEATURES

- WIDE SUPPLY VOLTAGE RANGE UP TO +20V
- SPLIT SUPPLY
- 10+10W @THD = 10%, $R_L = 8\Omega$, $V_S = \pm 14V$
- NO POP AT TURN-ON/OFF
- MUTE (POP FREE)
- STAND-BY FEATURE (LOW I_a)
- SHORT CIRCUIT PROTECTION TO GND
- THERMAL OVERLOAD PROTECTION
- CLIPWATT 11 PACKAGE

2 DESCRIPTION

The TDA7269SA is class AB power amplifier assembled in the @ Clipwatt 11 package, specially de-

Figure 1. Package



Table 1. Order Codes

Part Number	Package	
TDA7269SA	Clipwatt11	

signed for high quality sound application as Hi-Fi music centers and stereo TV sets.

The TDA7269SA is pin to pin compatible with TDA7269, TDA7269A, TDA7269ASA, TDA7265, TDA7499, TDA7499SA.

Figure 2. Block Diagram

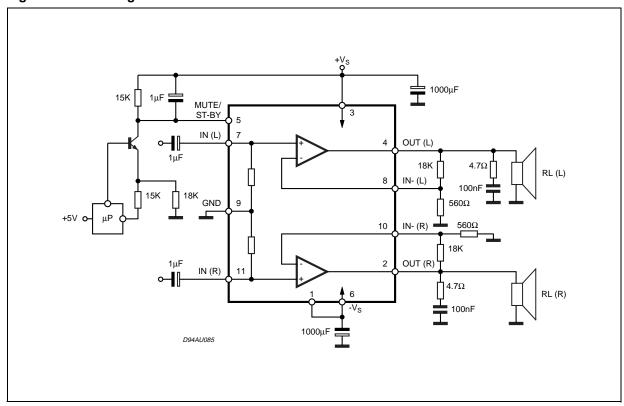


Table 2. Absolute Maximum Ratings

Symbol	Parameter	Value	Unit
Vs	DC Supply Voltage	±22	V
Io	Output Power Current (internally limited)	3	Α
P _{tot}	Total Power Dissipation (Tamb = 70°C)	20	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)

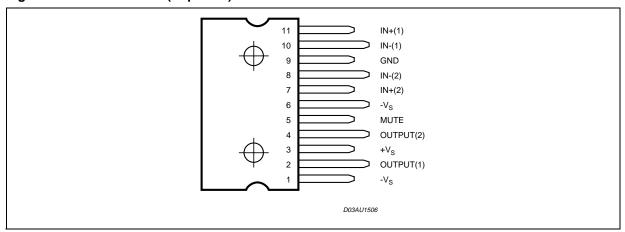
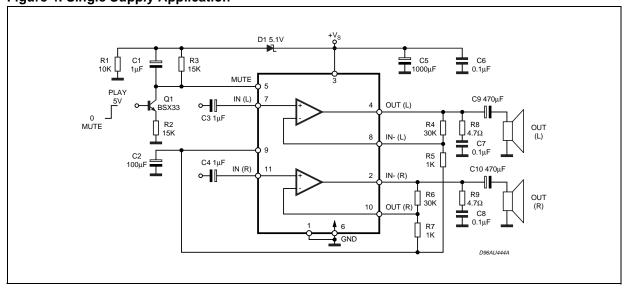


Table 3. Thermal Data

Ī	Symbol	Parameter	Value	Unit
	R _{th j-case}	Thermal Resistance Junction-case Max.	3.9	°C/W
	R _{th j-amb}	Thermal Resistance Junction-ambient	48	°C/W

Figure 4. Single Supply Application



2/11

Table 4. ELECTRICAL CHARACTERISTCS

(Refer to the test circuit $V_S = \pm 14V$; $R_L = 8\Omega$; $R_S = 50\Omega$; $G_V = 30 dB$, f = 1 KHz; $T_{amb} = 25 ^{\circ}C$, unless otherwise specified)

Symbol	Parameter	Test Condition	Min.	Тур.	Max.	Unit
V _S	Supply Voltage Range	$\begin{aligned} R_L &= 8\Omega; \\ R_L &= 4\Omega; \end{aligned}$	±5 ±5		±20 ±15	V
Iq	Total Quiescent Current			60	100	mA
Vos	Input Offset Voltage		-25		25	mV
lb	Non Inverting Input Bias Current			500		nA
Po	Output Power	THD = 10%; $R_L = 8\Omega$; $V_S = \pm 12.5V$; $R_L = 4\Omega$;	8 7.5	10 10		W W
		$\begin{aligned} &THD = 1\%;\\ &R_L = 8\Omega;\\ &V_S = \pm 12.5V; \ R_L = 4\Omega; \end{aligned}$		7.5 7.5		W W
THD	Total Harmonic Distortion	$R_L = 8\Omega; P_O = 1W; f = 1KHz;$		0.03		%
		$R_L = 8\Omega$; $P_O = 0.1$ to 5W; $f = 100$ Hz to 15KHz;			0.7	%
		$R_L = 4\Omega$; $P_O = 1W$; $f = 1KHz$;		0.02		%
		$R_L = 4\Omega; V_S = \pm 10V;$ $P_O = 0.1 \text{ to } 5W;$ f = 100Hz to 15KHz;			1	%
Ст	Cross Talk	f = 1KHz; f = 10KHz;	50	70 60		dB dB
SR	Slew Rate		6.5	10		V/μs
G _{OL}	Open Loop Voltage Gain			80		dB
e _N	Total Output Noise	A Curve f = 20Hz to 22KHz		3 4	8	μV μV
Ri	Input Resistance		15	20		ΚΩ
SVR	Supply Voltage Rejection (each channel)	f = 100Hz; V _R = 0.5V		60		dB
Tj	Thermal Shut-down Junction Temperature			145		°C
MUTE FUNCTION [ref +V _S] (*)						
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	-1.5	V
A _{ST-BY}	Stand-by Attenuation			110		dB
I _{qST-BY}	Quiescent Current @ Stand-by			3	6	mA
		i			·	

^(*) In mute condition the current drawn from Pin 5 must be ≤650µA

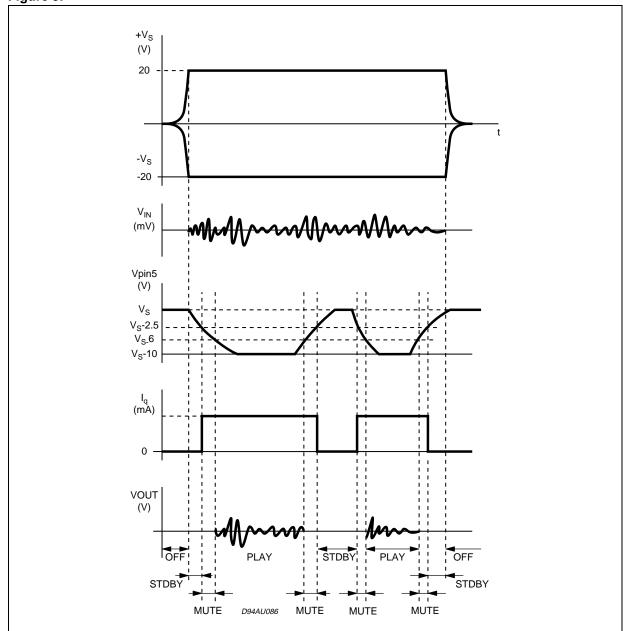


3 MUTE STAND-BY FUNCTION

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 current 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.



4/11

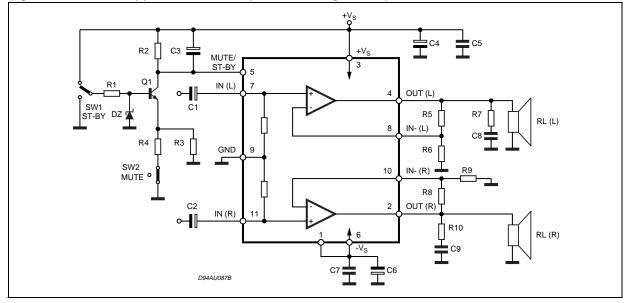


Figure 6. Test and Application Circuit (Stereo Configuration)

4 APPLICATION SUGGESTIONS

4.1 (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 5..

COMPONENT	SUGGESTION VALUE	PURPOSE	LARGER THAN RECOMMENDED VALUE	SMALLER THAN RECOMMENDED VALUE
R1	10ΚΩ	Mute Circuit	Increase of Dz Biasing Current	
R2	15ΚΩ	Mute Circuit	V _{pin} #5 Shifted Downward	V _{pin} #5 Shifted Upward
R3	18ΚΩ	Mute Circuit	V _{pin} #5 Shifted Upward	V _{pin} #5 Shifted Downward
R4	15ΚΩ	Mute Circuit	V _{pin} #5 Shifted Upward	V _{pin} #5 Shifted Downward
R5, R8	18ΚΩ	Closed Loop Gain	Increase of Gain	
R6, R9	560Ω	Setting (*)	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



4.2 PC Board

Figure 7. LC

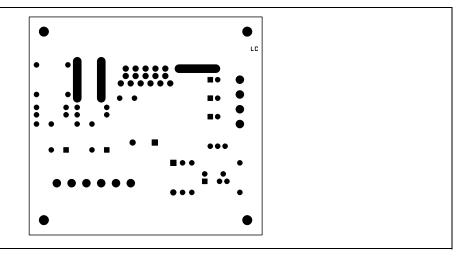


Figure 8. LS

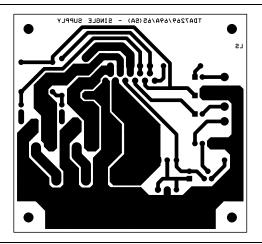
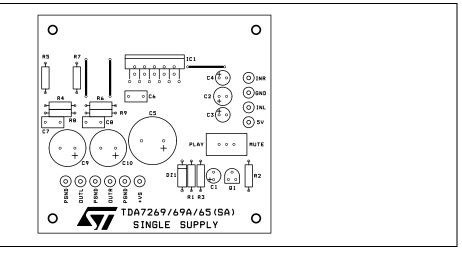


Figure 9. Component Layout



477

5 HEAT SINK DIMENSIONING:

In order to avoid the thermal protection intervention, that is placed approximatively at $T_j = 150$ °C, it is important the dimensioning of the Heat Sinker R_{Th} (°C/W).

The parameters that influence the dimensioning are:

- Maximum dissipated power for the device (P_{dmax})
- Max thermal resistance Junction to case (R_{Th i-c})
- Max. ambient temperature T_{amb max}
- Quiescent current Iq (mA)

5.1 Example:

$$V_{CC} = \pm 14V$$
, $R_{load} = 80$ hm, $R_{Th i-c} = 3.9$ °C/W, $T_{amb max} = 50$ °C

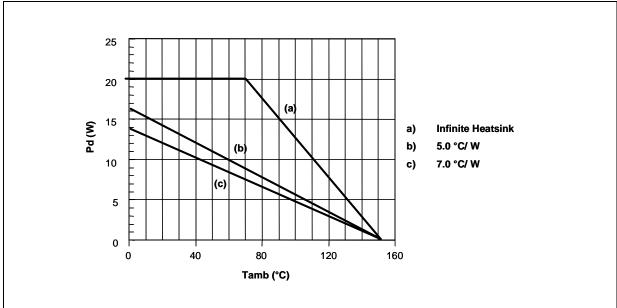
$$P_{dmax} = (N^{\circ} \text{ channels}) \cdot \frac{2V_{cc}^2}{\Pi^2 \cdot R_{load}} + I_q \cdot V_{cc}$$

$$P_{dmax} = 2 \cdot (4.96) + 0.84 = 10.7 W$$

(Heat Sinker)
$$R_{Th\ c-a} = \frac{150 - T_{amb\ max}}{P_{d\ max}} - R_{Th\ j-c} = \frac{150 - 50}{10.7} - 3.9 = 5.4^{\circ} C/W$$

In figure 7 is shown the Power derating curve for the device.

Figure 10. Power derating curve



6 CLIPWATT ASSEMBLING SUGGESTIONS

The suggested mounting method of Clipwatt on external heat sink, requires the use of a clip placed as much as possible in the plastic body center, as indicated in the example of figure 11.

A thermal grease can be used in order to reduce the additional thermal resistance of the contact between package and heatsink.

A pressing force of 7 - 10 Kg gives a good contact and the clip must be designed in order to avoid a maximum contact pressure of 15 Kg/mm2 between it and the plastic body case.

As example, if a 15Kg force is applied by the clip on the package, the clip must have a contact area of 1mm2 at least.

Figure 11. Example of right placement of the clip

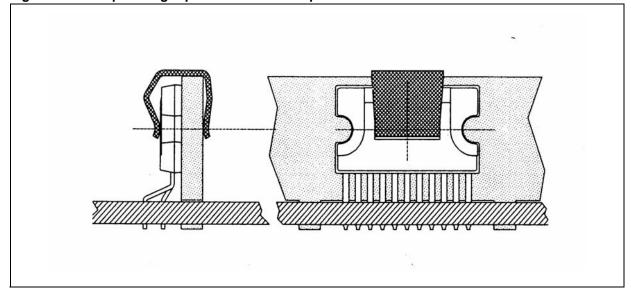
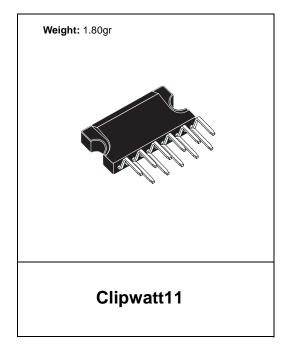
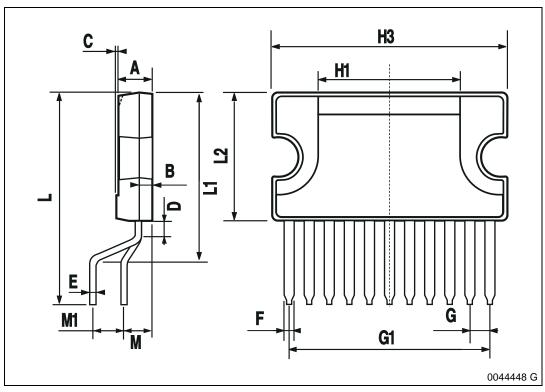


Figure 12. Clipwat11 Mechanical Data & Package Dimensions

DIM.	mm			inch		
DIW.	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
Α			3.2			0.126
В			1.05			0.041
С		0.15			0.006	
D		1.5			0.059	
Е	0.49		0.55	0.019		0.002
F	0.77	0.8	0.88	0.030	0.031	0.035
F1			0.15			0.006
G	1.57	1.7	1.83	0.062	0.067	0.072
G1	16.87	17	17.13	0.664	0.669	0.674
H1		12			0.480	
H2		18.6			0.732	
НЗ	19.85			0.781		
L		17.9			0.700	
L1		14.55			0.580	
L2	10.7	11	11.2	0.421	0.433	0.441
L3		5.5			0.217	
М		2.54			0.100	
M1		2.54			0.100	

OUTLINE AND MECHANICAL DATA





TDA7269SA

Table 6. Revision History

Date	Revision	Description of Changes
May 2003	1	First Issue
Septembe 2004	2	Changed Status and the graphic aspect in compliant to the new rules "Corporate Technical Pubblications Design Guide"

Information furnished is believed to be accurate and reliable. However, STMicroelectronics assumes no responsibility for the consequences of use of such information nor for any infringement of patents or other rights of third parties which may result from its use. No license is granted by implication or otherwise under any patent or patent rights of STMicroelectronics. Specifications mentioned in this publication are subject to change without notice. This publication supersedes and replaces all information previously supplied. STMicroelectronics products are not authorized for use as critical components in life support devices or systems without express written approval of STMicroelectronics.

The ST logo is a registered trademark of STMicroelectronics. All other names are the property of their respective owners

© 2004 STMicroelectronics - All rights reserved

STMicroelectronics group of companies

Australia - Belgium - Brazil - Canada - China - Czech Republic - Finland - France - Germany - Hong Kong - India - Israel - Italy - Japan - Malaysia - Malta - Morocco - Singapore - Spain - Sweden - Switzerland - United Kingdom - United States of America www.st.com

