

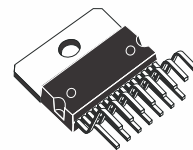


# TDA7494S

## 10W AMPLIFIER

- 10W OUTPUT POWER  $R_L = 8\Omega$ , @ THD = 10%  $V_{CC} = 28V$
- ST-BY AND MUTE FUNCTIONS
- NO BOUCHEROT CELL
- NO ST-BY RC INPUT NETWORK
- SINGLE SUPPLY RANGING UP TO 35V
- SHORT CIRCUIT PROTECTION
- THERMAL OVERLOAD PROTECTION
- INTERNALLY FIXED GAIN
- SOFT CLIPPING
- LOW TURN-ON TURN-OFF POP NOISE
- MULTIWATT 15 PACKAGE

### MULTIPOWER B150II TECHNOLOGY



Multiwatt15

ORDERING NUMBER: TDA7494S

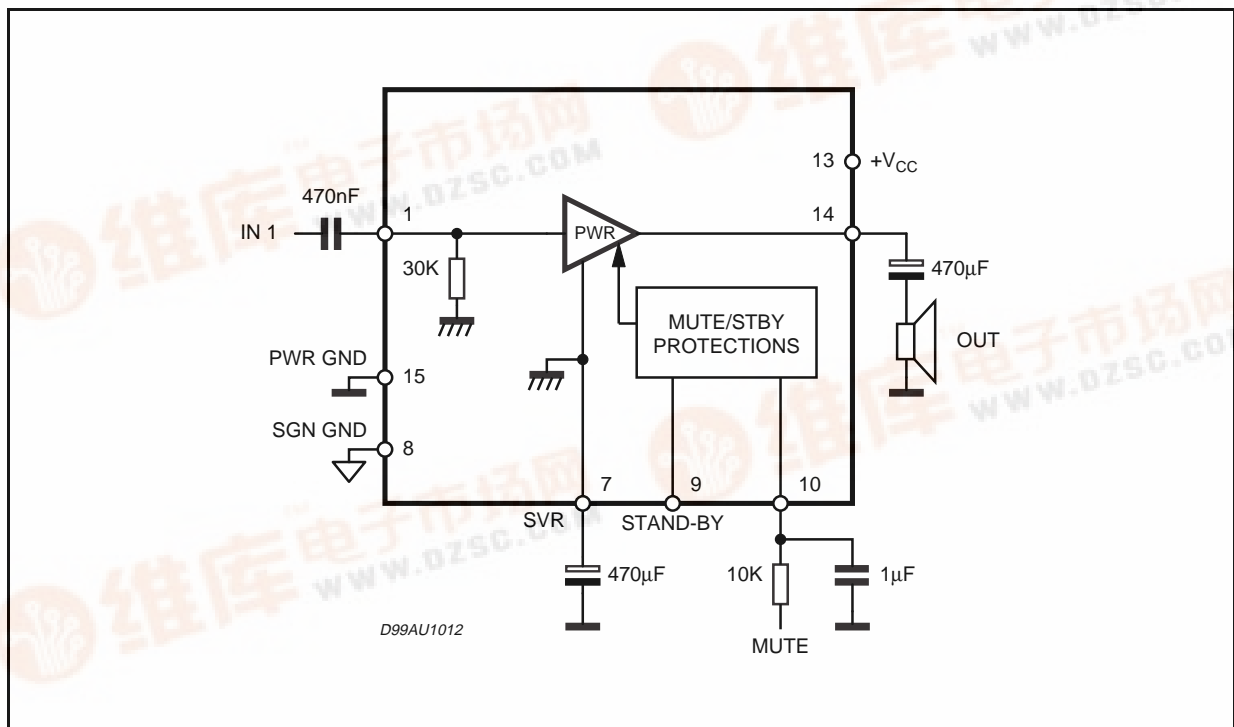
### DESCRIPTION

The TDA7494S 10W is class AB power amplifier assembled in the @Multiwatt 15 package, spe-

cially designed for high quality sound, TV applications.

Features of the TDA7494S include Stand-by and mute functions.

### BLOCK AND APPLICATION DIAGRAM



## TDA7494S

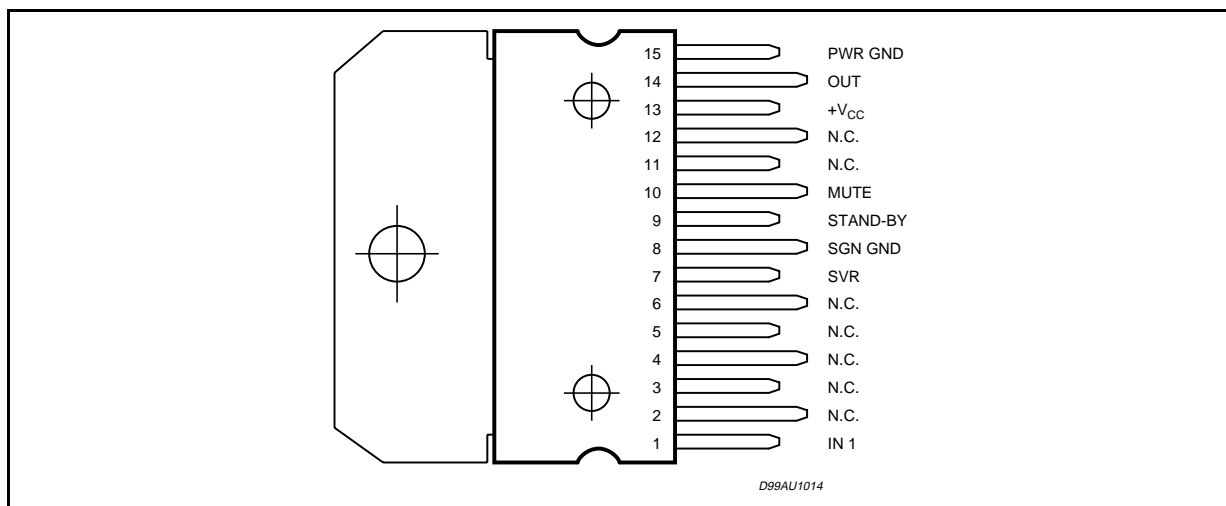
### ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
$V_S$	DC Supply Voltage	40	V
$V_{IN}$	Maximum Input Voltage	8	V <sub>pp</sub>
$P_{tot}$	Total Power Dissipation (T <sub>amb</sub> = 70°C)	16	W
T <sub>amb</sub>	Ambient Operating Temperature Range (1)	-20 to +85	°C
T <sub>stg</sub> , T <sub>j</sub>	Storage and Junction Temperature	-40 to 150	°C

(1) Operation between -20 to 85 °C guaranteed by correlation with 0 to 70°C.

(2) Pin 3 is ESD sensitive (max. voltage ±1.5KV)

### PIN CONNECTION



### THERMAL DATA

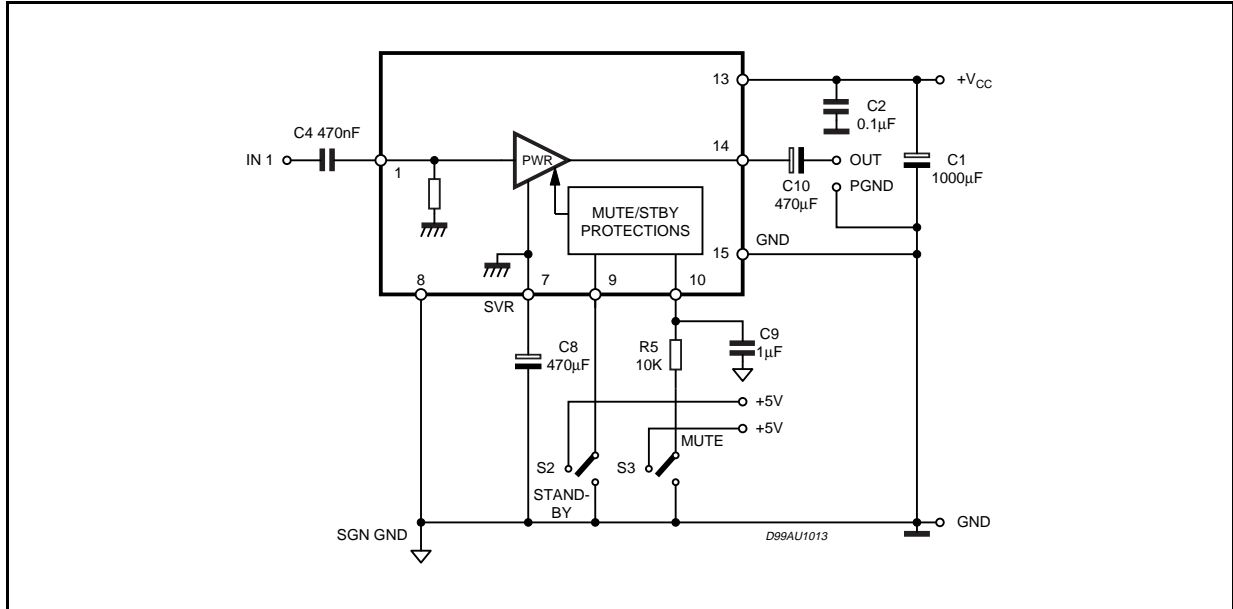
Symbol	Parameter	Value	Unit
R <sub>th j-case</sub>	Thermal Resistance Junction-case	Typ = 3.8    Max = 4.8	°C/W
R <sub>th j-amb</sub>	Thermal Resistance Junction-ambient	max 35	°C/W

**ELECTRICAL CHARACTERISTICS**(Refer to the test circuit,  $V_S = 21V$ ,  $R_L = 8\Omega$ ;  $R_g = 50\Omega$ ;  $T_{amb} = 25^\circ C$ ; unless otherwise specified.)

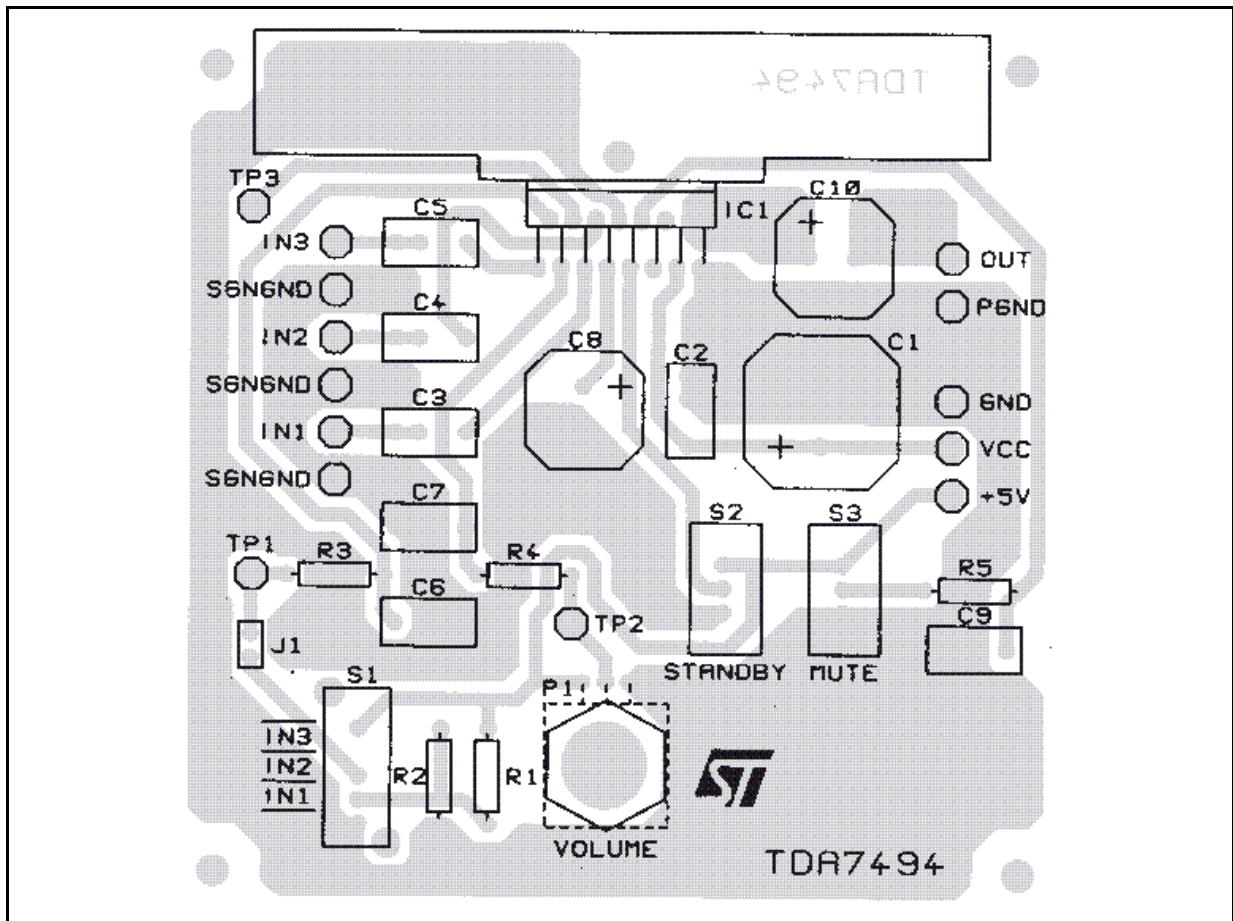
Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
$V_S$	Supply Voltage Range		11		35	V
$I_q$	Total Quiescent Current			22	50	mA
DCVos	Output DC Offset Referred to SVR Potential	No Input Signal	-550		550	mV
$V_o$	Quiescent Output Voltage	$V_S = 18V$	7.8	9	10.2	V
		$V_S = 21V$	10	10.5	11	V
$P_o$	Output Power	THD = 10%; $V_{CC} = 28V$ , $R_L = 8\Omega$ THD = 1%; $V_{CC} = 28V$	8 6	10 8		W
		THD = 10%; $V_{CC} = 21V$ , THD = 1%; $V_{CC} = 21V$ ,	5 3.5	5.5 4		W
		THD = 10%; $V_{CC} = 21V$ , $R_L = 4\Omega$ THD = 1%; $V_{CC} = 21V$ ,	5 3.9	6.6 5.5		W
		THD = 10%; $V_{CC} = 18V$ , THD = 1%; $V_{CC} = 18V$	4.5 3.5	6 4.5		W
		THD = 10%; $V_{CC} = 18V$ , $R_L = 8\Omega$ THD = 1%; $V_{CC} = 18V$	3.5 2.2	3.75 2.85		W W
THD	Total Harmonic Distortion	$P_o = 1W$ ; $f = 1KHz$ ; $G_v = 26dB$			0.4	%
$I_{peak}$	Output Peak Current	(internally limited)	1.4	1.9		A
$T_{op}$	Operating Temperature		0		70	$^\circ C$
$V_{in}$	Input Signal				2.8	$V_{rms}$
$G_v$	Closed Loop Gain		24.5	26	27.5	dB
BW				0.6		MHz
$e_n$	Total Output Noise	$f = 20Hz$ to $22KHz$ Play		30	50	$\mu V$
		$f = 20Hz$ to $22KHz$ Mute		30	50	$\mu V$
SR	Slew Rate		5	8		$V/\mu s$
$R_i$	Input Resistance		22.5	30		$K\Omega$
SVR	Supply Voltage Rejection	$f = 1kHz$ ; $C_{SVR} = 470\mu A$ ; $V_{RIP} = 1V_{RMS}$	36	43		dB
$T_M$	Thermal Muting			150		$^\circ C$
$T_s$	Thermal Shut-down			160		$^\circ C$
$V_{ST-BY}$	Stand-by threshold		2.3	2.5	2.7	V
$V_{MUTE}$	Mute Threshold		2.3	2.5	2.7	V
$I_{qST-BY}$	Quiescent Current @ Stand-by			0.6	1	mA
$A_{MUTE}$	Mute Attenuation		60	75		dB
$I_{stbyBIAS}$	Stand-by bias current	Stand by on; $V_{ST-BY} = 5V$ ; $V_{MUTE} = 5V$ ;		80	150	$\mu A$
		Play or Mute		2	20	$\mu A$
$I_{muteBIAS}$	Mute bias current	Mute		1.5	10	$\mu A$
		Play		0.5	5	$\mu A$

# TDA7494S

**Figure 1:** Test and Application Circuit.



**Figure 2:** P.C.B. and component layout (Pin IN1 of relevant device must be connected to IN3 of TDA7494 Board position).



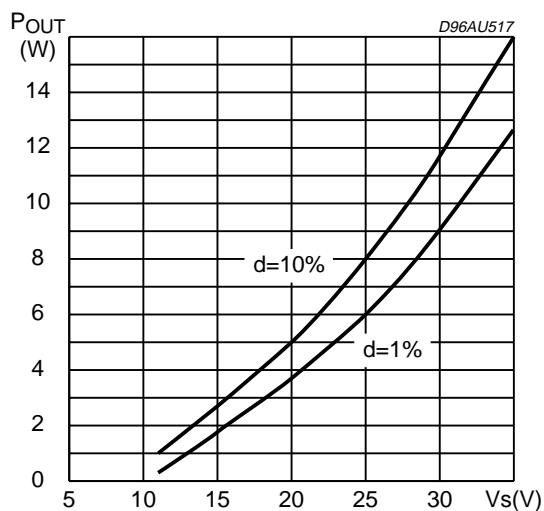
### APPLICATION SUGGESTIONS

The recommended values of the external components are those shown on the application circuit of figure 1. Different values can be used; the following table can help the designer.

COMPONENT	SUGGESTION VALUE	PURPOSE	LARGER THAN SUGGESTION	SMALLER THAN SUGGESTION
R5	10K $\Omega$	Mute time constant	Larger mute on/off time	Smaller mute on/off time
C1	1000 $\mu$ F	Supply voltage bypass		Danger of oscillation
C2	100nF	Supply voltage bypass		Danger of oscillation
C5	470nF	Input DC decoupling	Lower low frequency cutoff	Higher low frequency cutoff
C8	470 $\mu$ F	Ripple Rejection	Better SVR	Worse SVR
C9	1 $\mu$ F	Mute time constant	Larger mute on/off time	Smaller mute on/off time
C10	470 $\mu$ F	Output DC decoupling	Lower low frequency cutoff	Higher low frequency cutoff

**TYPICAL CHARACTERISTICS:** Refer to the Application Circuit of Fig.1  $V_S = 21V$ ;  $R_L = 8\Omega$ ;  $f = 1KHz$ ;  $R_s = 8\Omega$ ;  $T_{amb} = 25^\circ C$ ;  $R_s = 50\Omega$ ; unless otherwise specified

**Figure 3:** Output Power vs Supply Voltage



**Figure 4:** Distortion vs Output Power

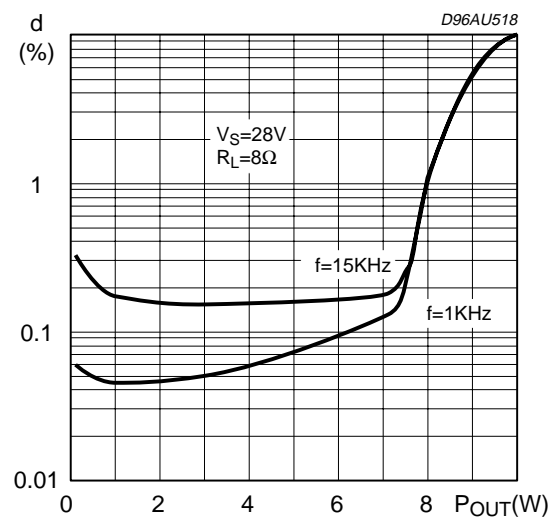


Figure 5: Output Power vs Supply Voltage

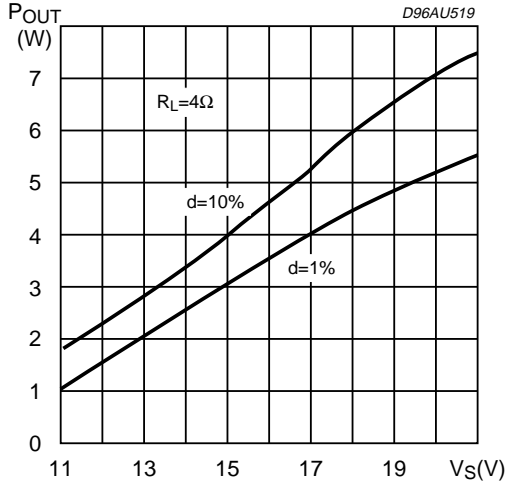


Figure 6: Distortion vs Output Power

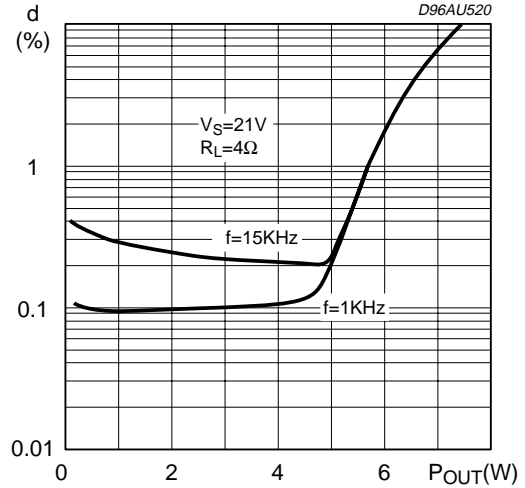


Figure 7: Distortion vs Frequency

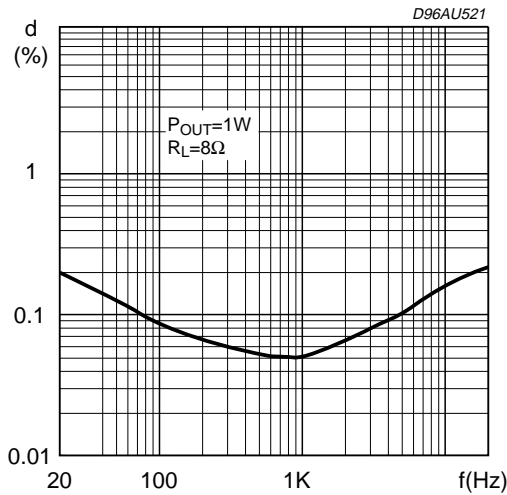


Figure 8: Distortion vs Frequency

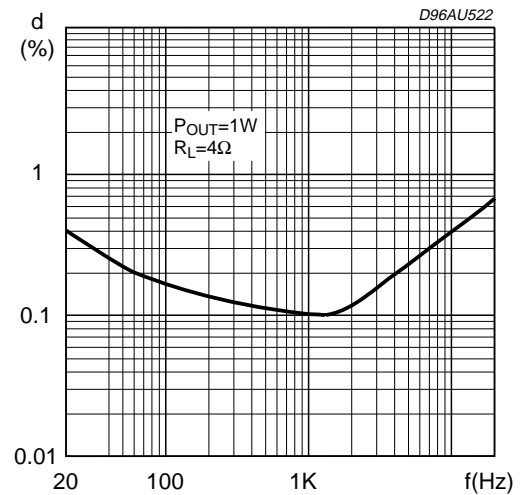


Figure 9: Quiescent Current vs Supply Voltage

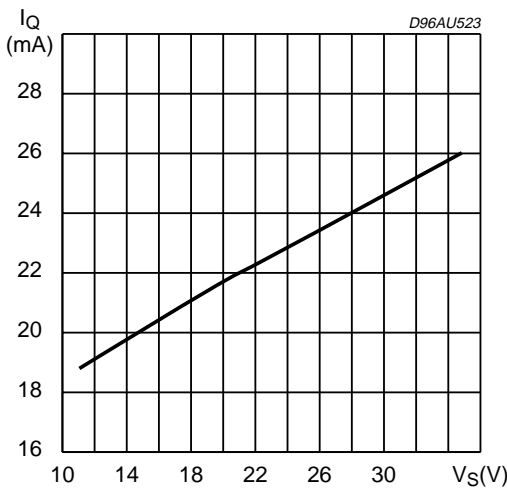
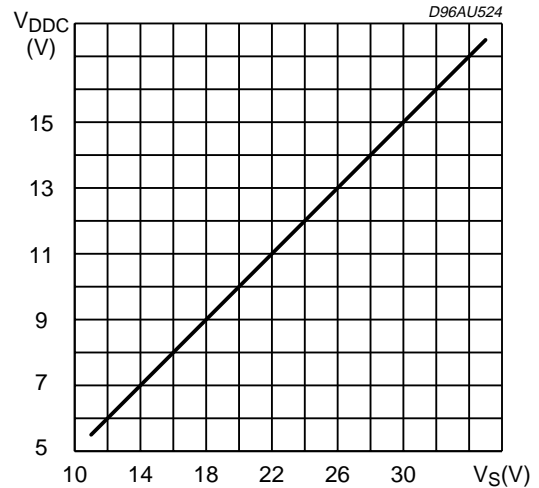
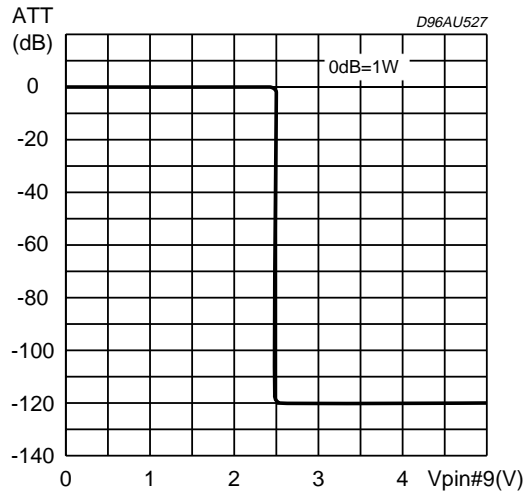


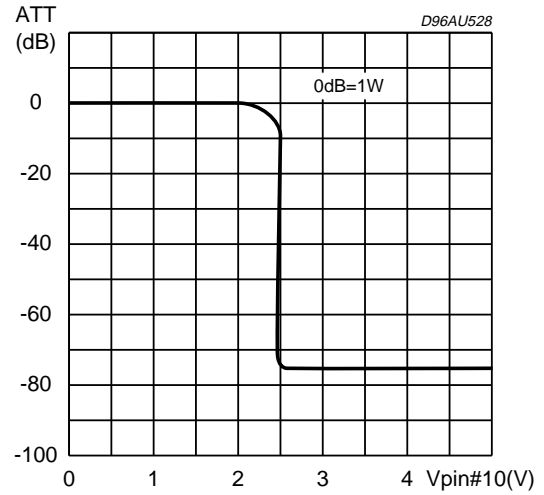
Figure 10: Quiescent Output Voltage vs Supply Voltage



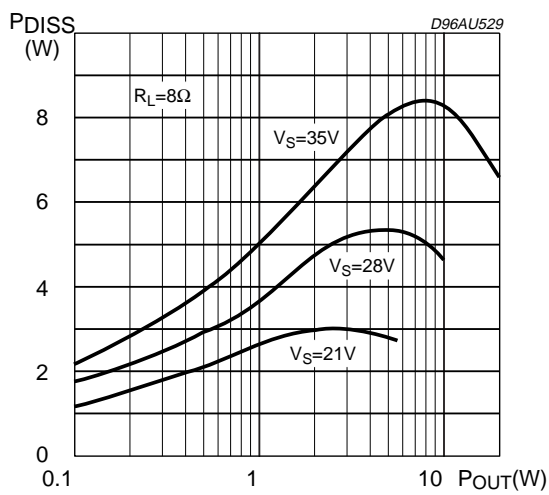
**Figure 11: Stand-by Attenuation vs Vpin # 9**



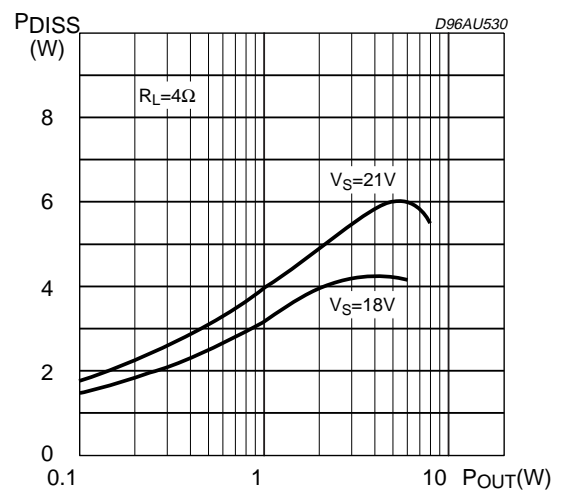
**Figure 12: Mute Attenuation vs Vpin # 10**



**Figure 13: Power Dissipation vs Output Power**



**Figure 14: Power Dissipation vs Output Power**



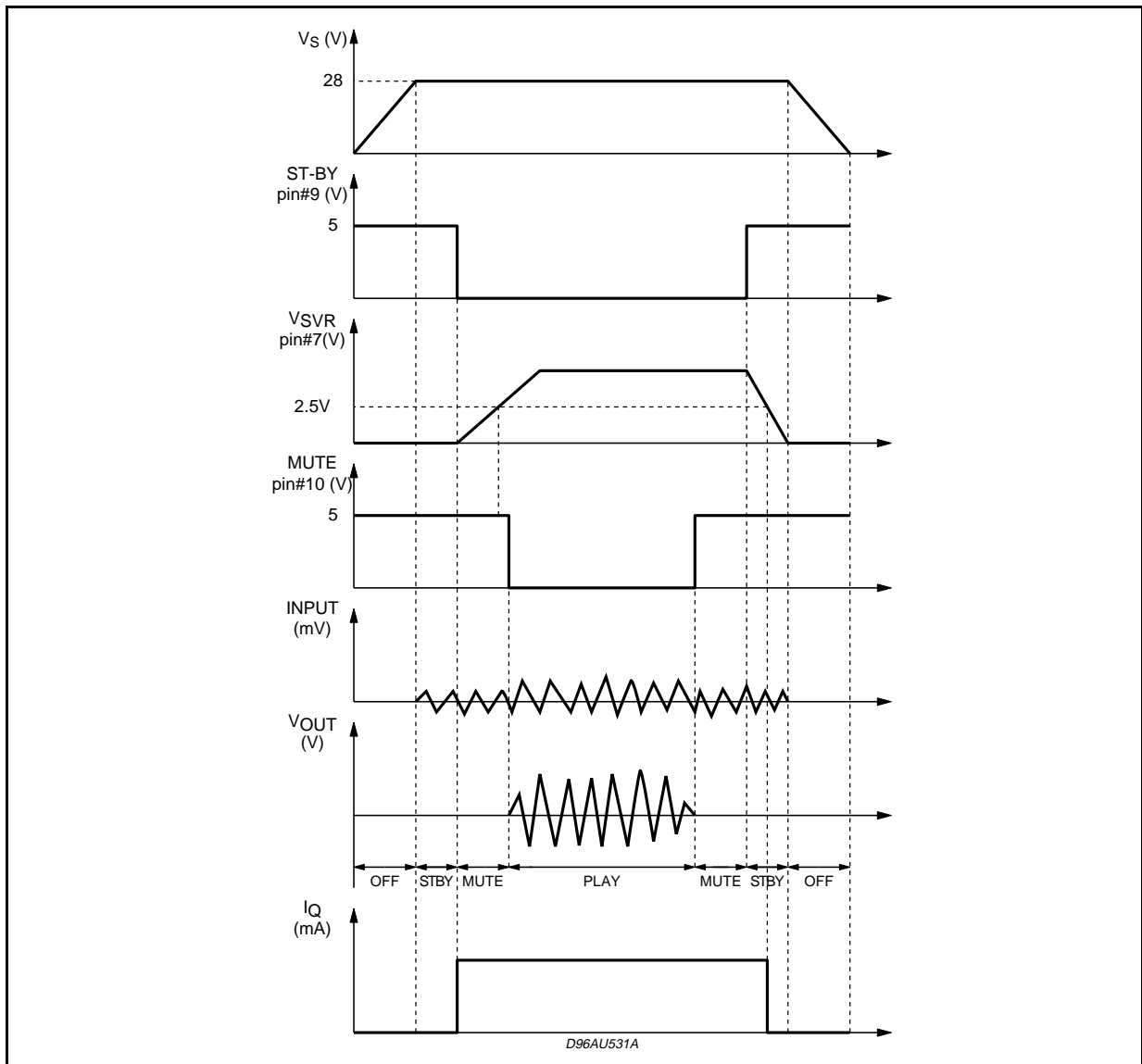
**TDA7494S**

**MUTE STAND-BY TRUTH TABLE**

MUTE	ST-BY	OPERATING CONDITION
H	H	STANDBY
L	H	STANDBY
H	L	MUTE
L	L	PLAY

**Turn ON/OFF Sequences (for optimising the POP performances)**

**A) USING MUTE AND STAND-BY FUNCTIONS**



**B) USING ONLY THE MUTE FUNCTION**

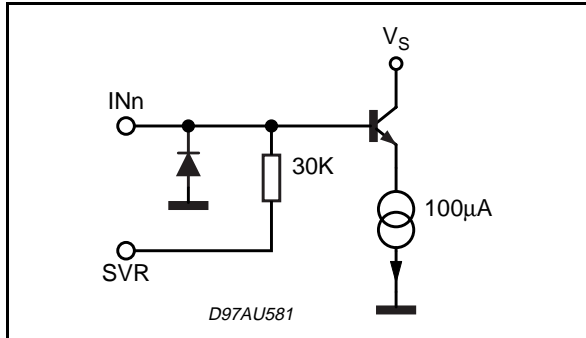
To simplify the application, the stand-by pin can be connected directly to Ground.

During the ON/OFF transitions we recommend to respect the following conditions:

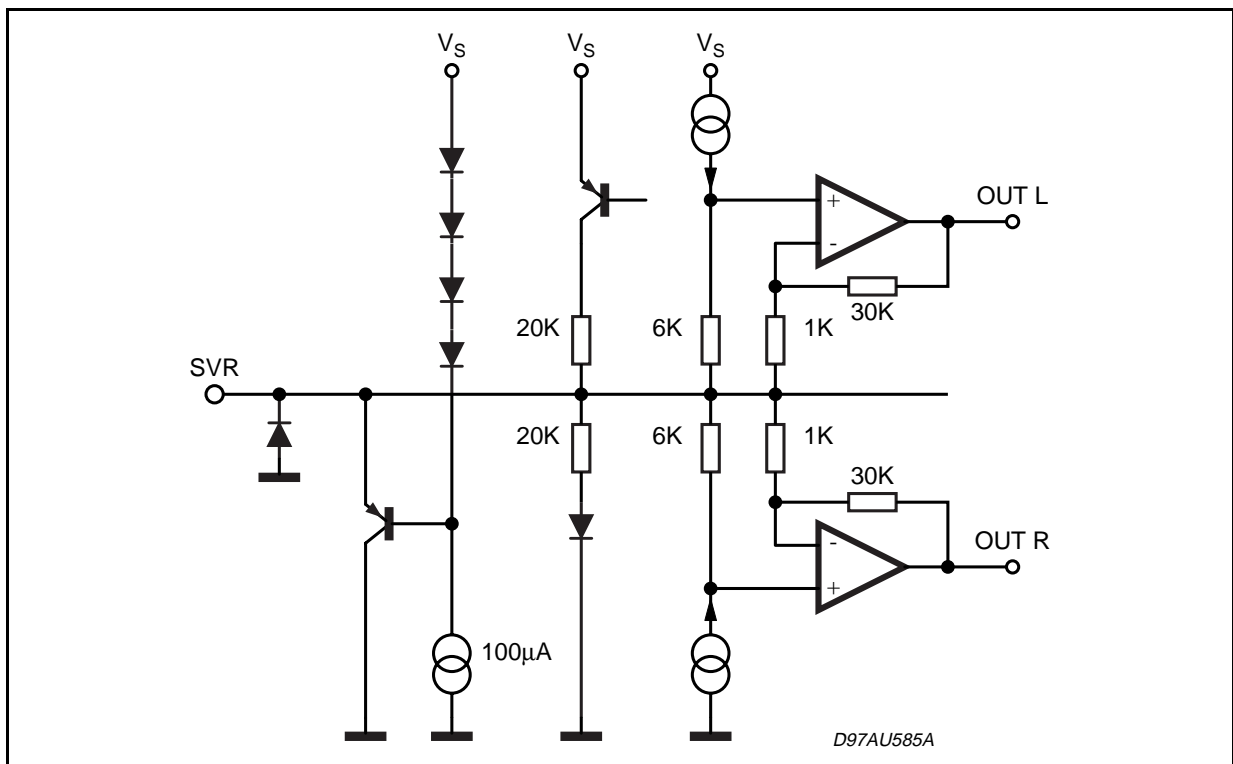
- At the turn-on the transition mute to play must be made when the SVR pin is higher than 2.5V
- At the turn-off the TDA7494S must be brought to mute from the play condition when the SVR pin is higher than 2.5V.



**PINS: IN1**

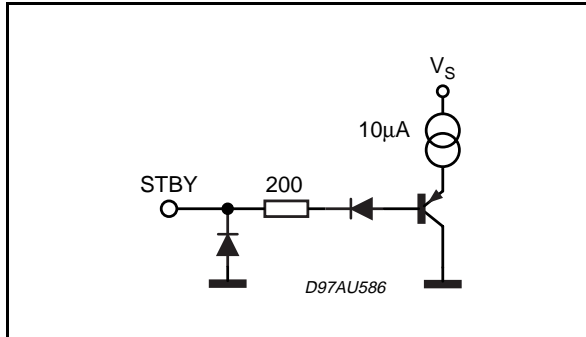


**PIN: SVR**

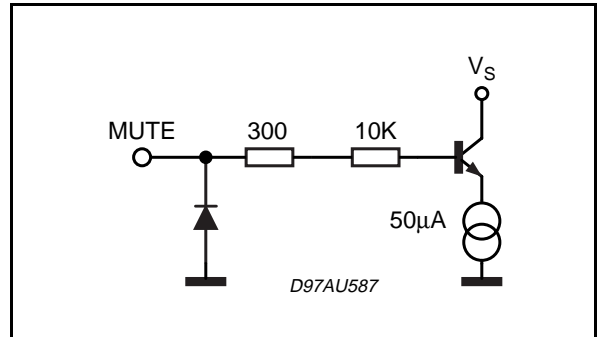


# TDA7494S

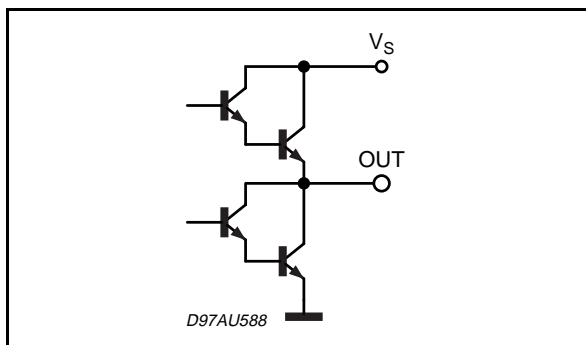
**PIN: ST-BY**



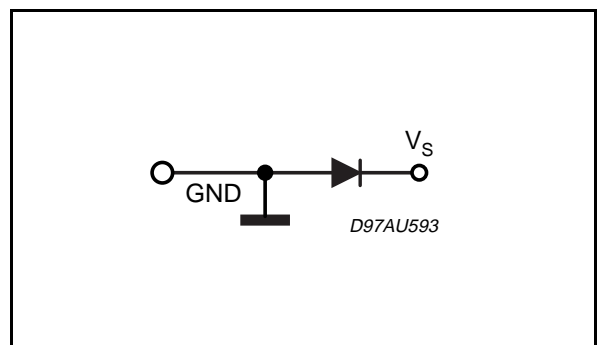
**PIN: MUTE**



**PIN: OUT**

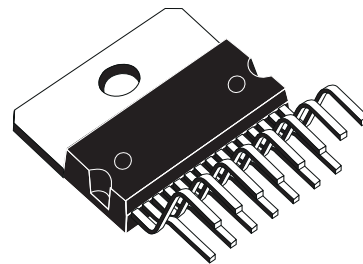


**PINS: PW-GND, S-GND**

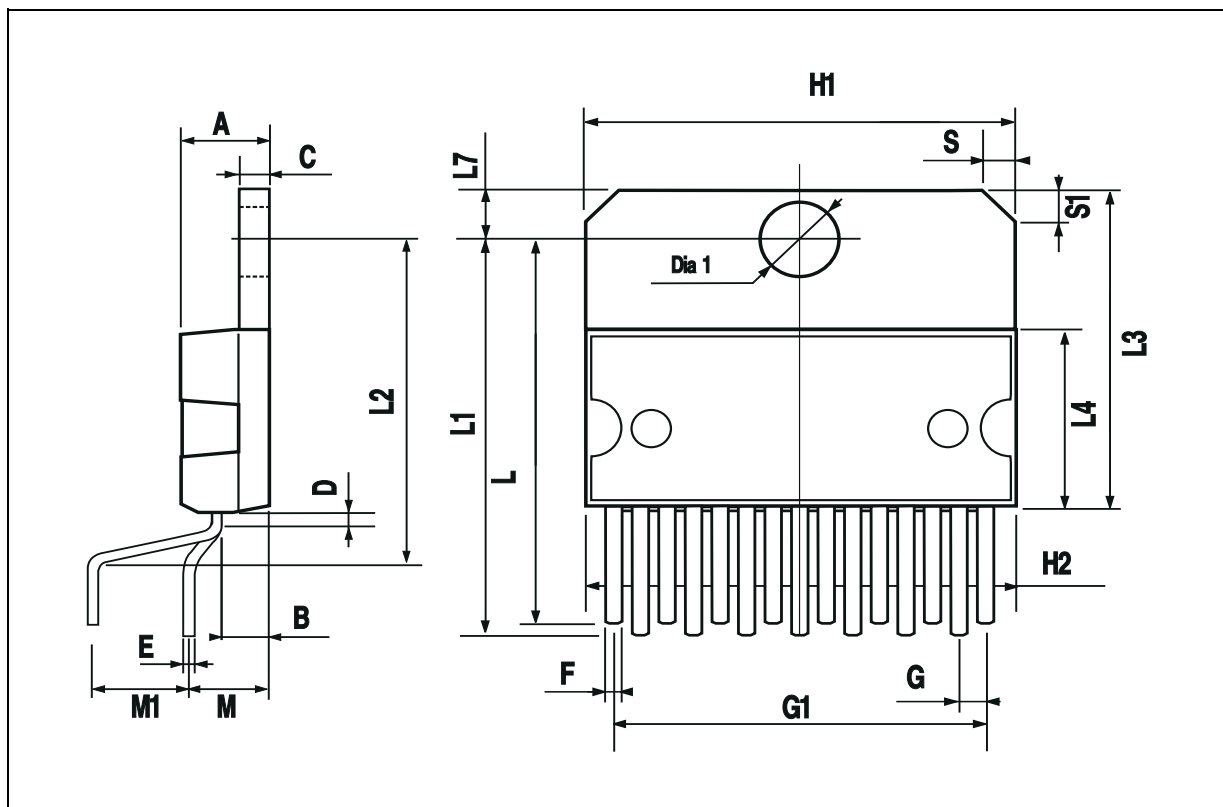


DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A			5			0.197
B			2.65			0.104
C			1.6			0.063
D		1			0.039	
E	0.49		0.55	0.019		0.022
F	0.66		0.75	0.026		0.030
G	1.02	1.27	1.52	0.040	0.050	0.060
G1	17.53	17.78	18.03	0.690	0.700	0.710
H1	19.6			0.772		
H2			20.2			0.795
L	21.9	22.2	22.5	0.862	0.874	0.886
L1	21.7	22.1	22.5	0.854	0.870	0.886
L2	17.65		18.1	0.695		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	4.63	5.08	5.53	0.182	0.200	0.218
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**



**Multiwatt15 V**



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. Specification 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

© 2000 STMicroelectronics – Printed in Italy – All Rights Reserved

STMicroelectronics GROUP OF COMPANIES

Australia - Brazil - China - Finland - France - Germany - Hong Kong - India - Italy - Japan - Malaysia - Malta - Morocco -  
Singapore - Spain - Sweden - Switzerland - United Kingdom - U.S.A.

<http://www.st.com>