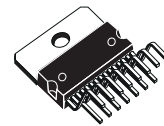




## 5W+5W AMPLIFIER WITH DC VOLUME CONTROL

- 5+5W OUTPUT POWER  
 $R_L = 8\Omega$  @THD = 10%  $V_{CC} = 22V$
- ST-BY AND MUTE FUNCTIONS
- LOW TURN-ON TURN-OFF POP NOISE
- LINEAR VOLUME CONTROL DC COUPLED WITH POWER OP. AMP.
- 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
- VARIABLE OUTPUT AFTER VOLUME CONTROL CIRCUIT
- MULTIWATT 15 PACKAGE

### MULTIPOWER BI50II TECHNOLOGY



**Multiwatt 15**  
**ORDERING NUMBER: TDA7496**

plifier assembled in the @ Multiwatt 15 package, specially designed for high quality sound, TV applications.

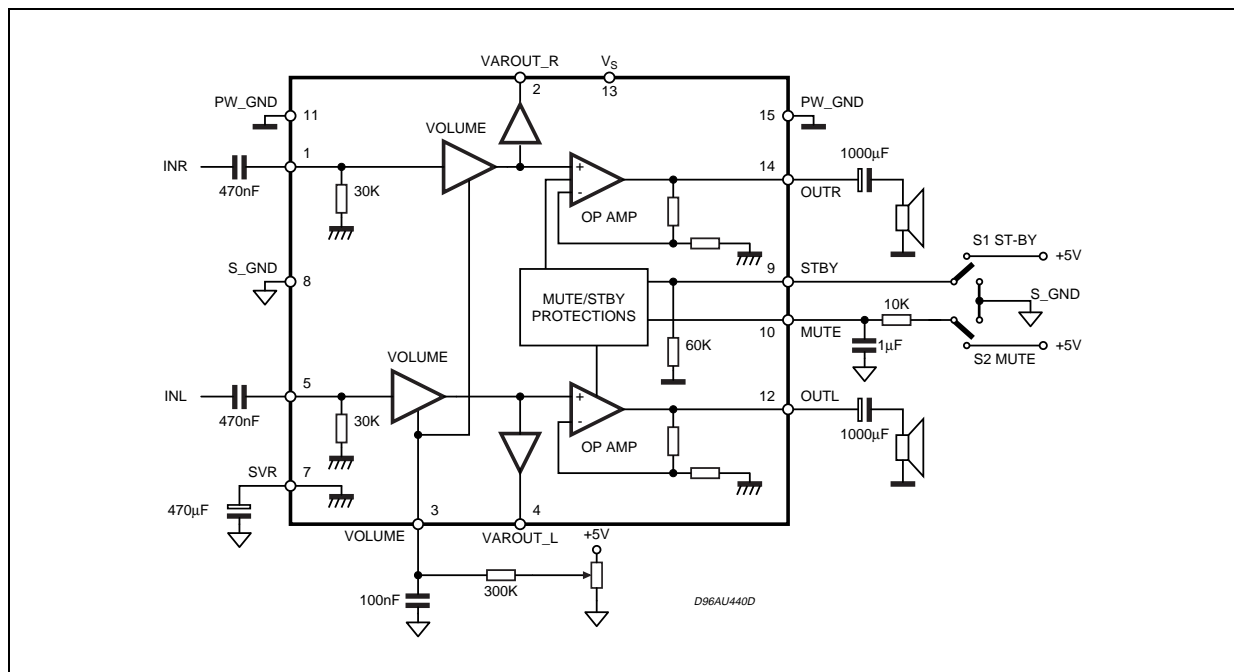
Features of the TDA7496 include linear volume control Stand-by and Mute functions.

The TDA7496 is pin to pin compatible with TDA7496S, TDA7496SA, TDA7495, TDA7495SA, TDA7494S, TDA7494SA.

### DESCRIPTION

The TDA7496 is a stereo 5+5W class AB power am-

### BLOCK DIAGRAM

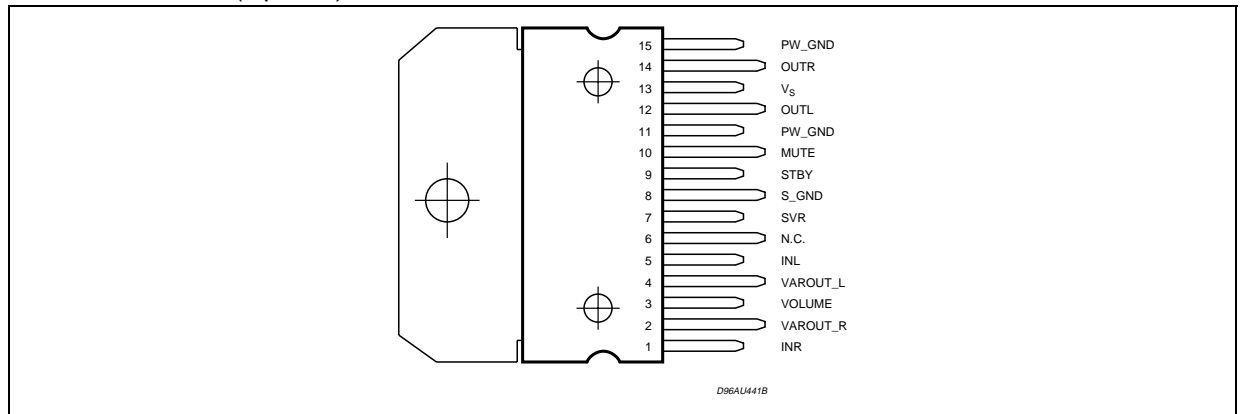


# TDA7496

## ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
$V_S$	DC Supply Voltage	35	V
$V_{IN}$	Maximum Input Voltage	8	V <sub>pp</sub>
$P_{tot}$	Total Power Dissipation ( $T_{amb} = 80^{\circ}C$ )	15	W
$T_{amb}$	Ambient Operating Temperature (1)	0 to 70	$^{\circ}C$
$T_{stg}, T_J$	Storage and Junction Temperature	-40 to 150	$^{\circ}C$
$V_3$	Volume Control DC Voltage	7	V

## PIN CONNECTION (top view)



## THERMAL DATA

Symbol	Parameter	Value	Unit
$R_{th\ j-case}$	Thermal Resistance junction-case	Typ. = 4; Max. = 4.6	$^{\circ}C/W$
$R_{th\ j-amb}$	Thermal Resistance junction-ambient Max.	35	$^{\circ}C/W$

## ELECTRICAL CHARACTERISTICS

(Refer to the test circuit  $V_S = 22V$ ;  $R_L = 8\Omega$ ,  $R_G = 50\Omega$ ,  $T_{amb} = 25^{\circ}C$ )

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
$V_S$	Supply Voltage Range		10		32	V
$I_q$	Total Quiescent Current			25	50	mA
$DCV_{os}$	Output DC Offset Referred to SVR Potential	No Input Signal		200		mV
$V_O$	Quiescent Output Voltage			11		V
$P_O$	Output Power	THD = 10%; $R_L = 8\Omega$ ; THD = 1%; $R_L = 8\Omega$ ;	5	5.5 4		W
		THD = 10%; $R_L = 4\Omega$ ; $V_S = 12V$ THD = 1%; $R_L = 4\Omega$ ; $V_S = 12V$		2.1 1.0		W
THD	Total Harmonic Distortion	$G_V = 30dB$ ; $P_O = 1W$ ; $f = 1KHz$			0.4	%

**ELECTRICAL CHARACTERISTICS** (continued)(Refer to the test circuit  $V_S = 22V$ ;  $R_L = 8\Omega$ ,  $R_G = 50\Omega$ ,  $T_{amb} = 25^\circ C$ )

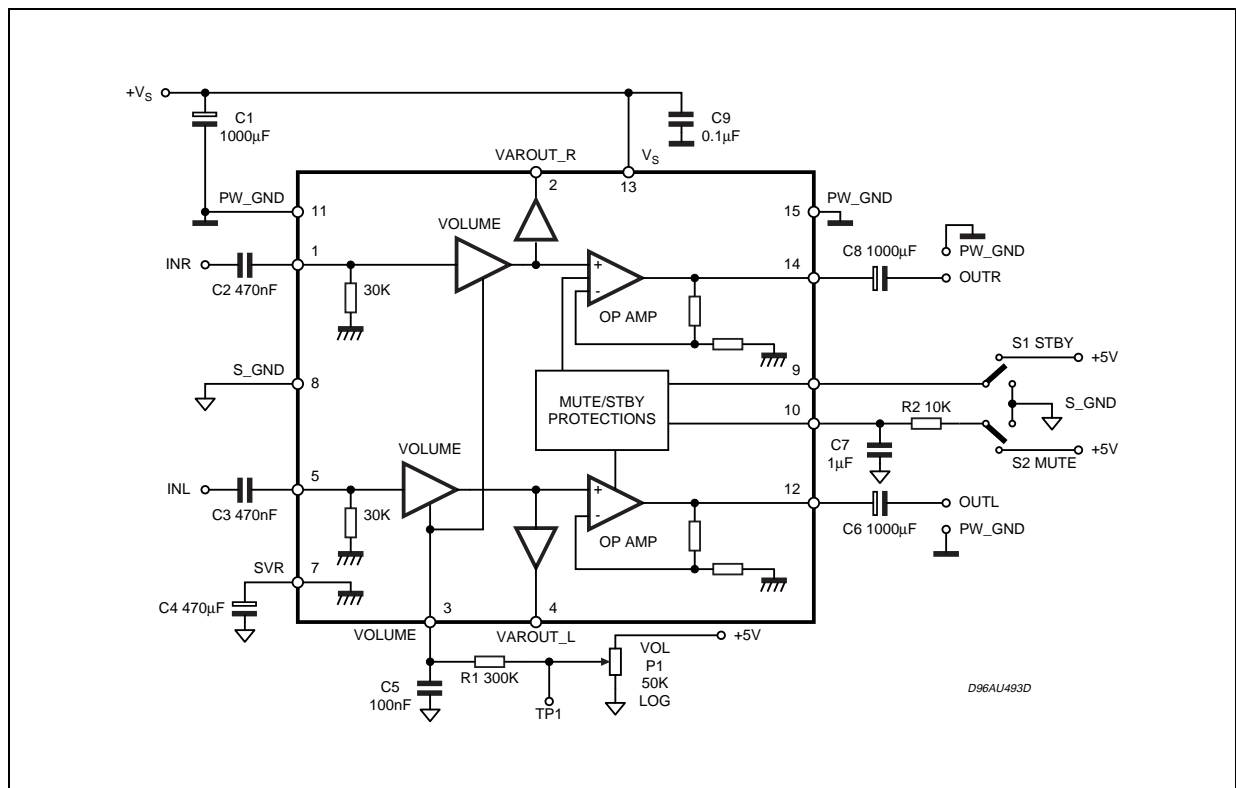
Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
$I_{peak}$	Output Peak Current	(internally limited)	1.0	1.3		A
$V_{IN}$	Input Signal				2.8	V <sub>rms</sub>
$G_V$	Closed Loop Gain	$V_{OI Ctrl} > 4.5V$	28.5	30	31.5	dB
$G_{VLine}$	Monitor Out Gain	$V_{OI Ctrl} > 4.5V$ ; $Z_{load} > 30K\Omega$	-1.5	0	1.5	dB
$A_{Min VOL}$	Attenuation at Minimum Volume	$V_{OI Ctrl} < 0.5V$	80			dB
BW				0.6		MHz
$e_N$	Total Output Noise	$f = 20Hz$ to $22KHz$ PLAY, max volume		500	800	$\mu V$
		$f = 20Hz$ to $22KHz$ PLAY, max attenuation		100	250	$\mu V$
		$f = 20Hz$ to $22KHz$ MUTE		60	150	$\mu V$
SR	Slew Rate		5	8		V/ $\mu s$
$R_i$	Input Resistance		22.5	30		K $\Omega$
$R_{Var Out}$	Variable Output Resistance			30	100	$\Omega$
$R_{L Var Out}$	Variable Output Load		2			K $\Omega$
SVR	Supply Voltage Rejection	$f = 1KHz$ ; max volume $C_{SVR} = 470\mu F$ ; $V_{RIP} = 1V_{rms}$	35	39		dB
		$f = 1KHz$ ; max attenuation $C_{SVR} = 470\mu F$ ; $V_{RIP} = 1V_{rms}$	55	65		dB
$T_M$	Thermal Muting			150		$^\circ C$
$T_S$	Thermal Shut-down			160		$^\circ C$
<b>MUTE &amp; INPUT SELECTION FUNCTIONS</b>						
$V_{ST-ON}$	Stand-by ON Threshold		3.5			V
$V_{ST-OFF}$	Stand-by OFF Threshold				1.5	V
$V_{MUTEON}$	Mute ON threshold		3.5			V
$V_{MUTEOFF}$	Mute OFF threshold				1.5	V
$A_{MUTE}$	Mute Attenuation		50	65		dB
$I_{qST-BY}$	Quiescent Current @ Stand-by			0.6	1	mA
$I_{stbyBIAS}$	Stand-by bias current	Stand by ON: $V_{ST-BY} = 5V$ ; $V_{mute} = 5V$		80		$\mu A$
		Play or Mute	-20	-5		$\mu A$
$I_{muteBIAS}$	Mute Bias Current	Mute		1	5	$\mu A$
		Play		0.2	2	$\mu A$

**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
R1	300K	Volume Control Circuit	Larger volume regulation time	Smaller volume regulation time
R2	10K	Mute time constant	Larger mute on/off time	Smaller mute on/off time
P1	50K	Volume Control Circuit		
C1	1000 $\mu$ F	Supply voltage bypass		Danger of oscillation
C2	470nF	Input DC decoupling	Lower low frequency cutoff	Higher low frequency cutoff
C3	470nF	Input DC decoupling	Lower low frequency cutoff	Higher low frequency cutoff
C4	470 $\mu$ F	Ripple rejection	Better SVR	Worse SVR
C5	100nF	Volume control time constant	Larger volume regulation time	Smaller volume regulation time
C6	1000 $\mu$ F	Output DC decoupling	Lower low frequency cutoff	Higher low frequency cutoff
C7	1 $\mu$ F	Mute time constant	Larger mute on/off time	Smaller mute on/off time
C8	1000 $\mu$ F	Output DC decoupling	Lower low frequency cutoff	Higher low frequency cutoff
C9	100nF	Supply voltage bypass		Danger of oscillation

**Figure 1. Application Circui**

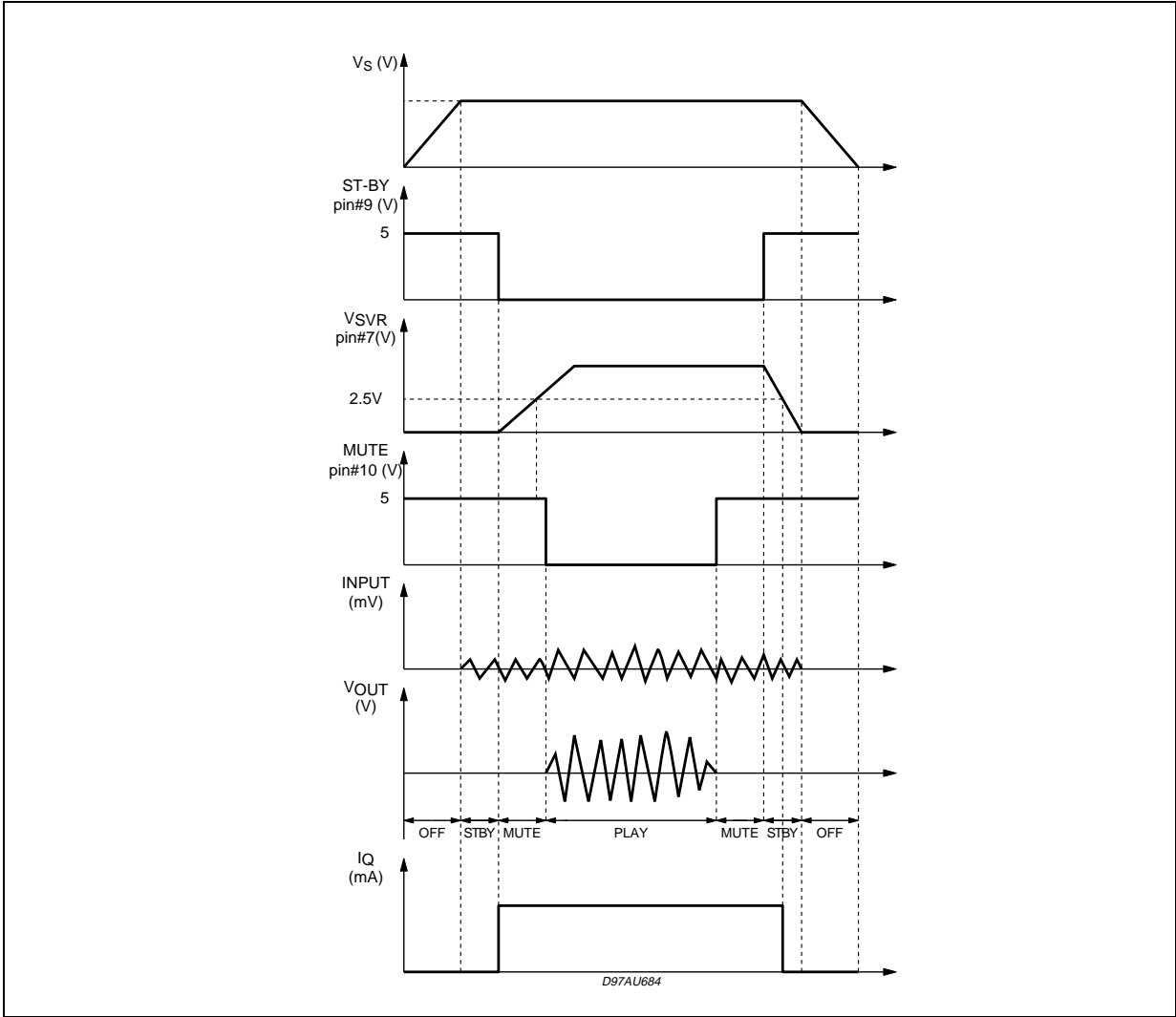


**MUTE STAND-BY TRUTH TABLE**

MUTE	St-BY	OPERATING CONDITION
H	H	STAND-BY
L	H	STAND-BY
H	L	MUTE
L	L	PLAY

Turn ON/OFF Sequences (for optimizing the POP performances)

**Figure 1. USING ONLY THE MUTE FUNCTION**



**USING ONLY THE MUTE FUNCTION**

To simplify the application, the stand-by pin can be connected directly to Ground. During the ON/OFF transitions is recommended to respect the following conditions:

- At the turn-on the transition mute to mute - play must be made when the SVR pin is higher than 2.5V
- At the turn-off the TDA7496 must be brought to mute from the play condition when the SVR pin is higher than 2.5V.

Figure 2. P.C.B. and Component layout PCB and Component Layout

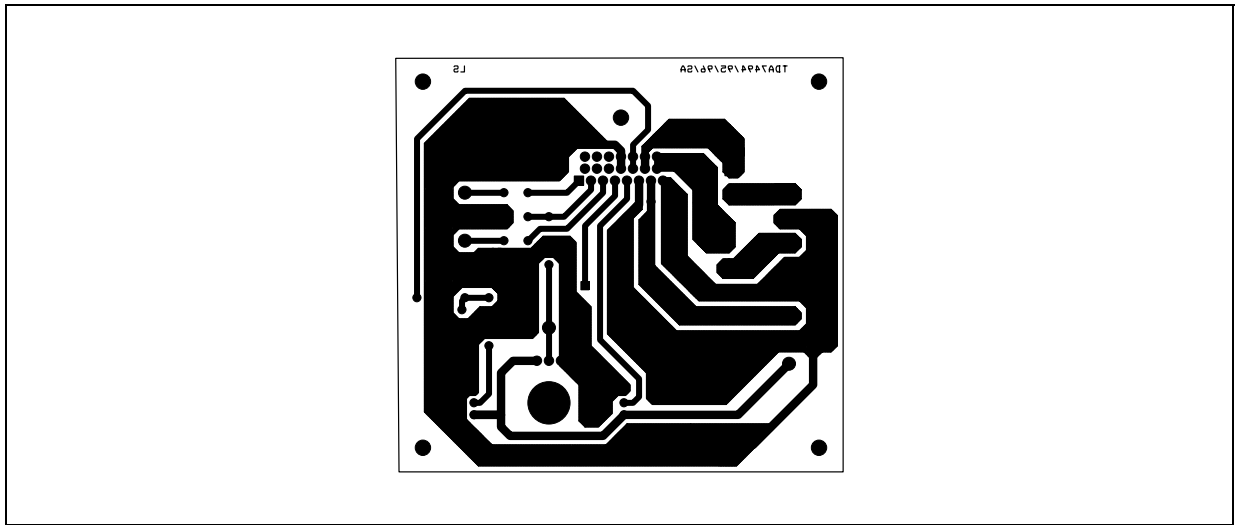


Figure 3.

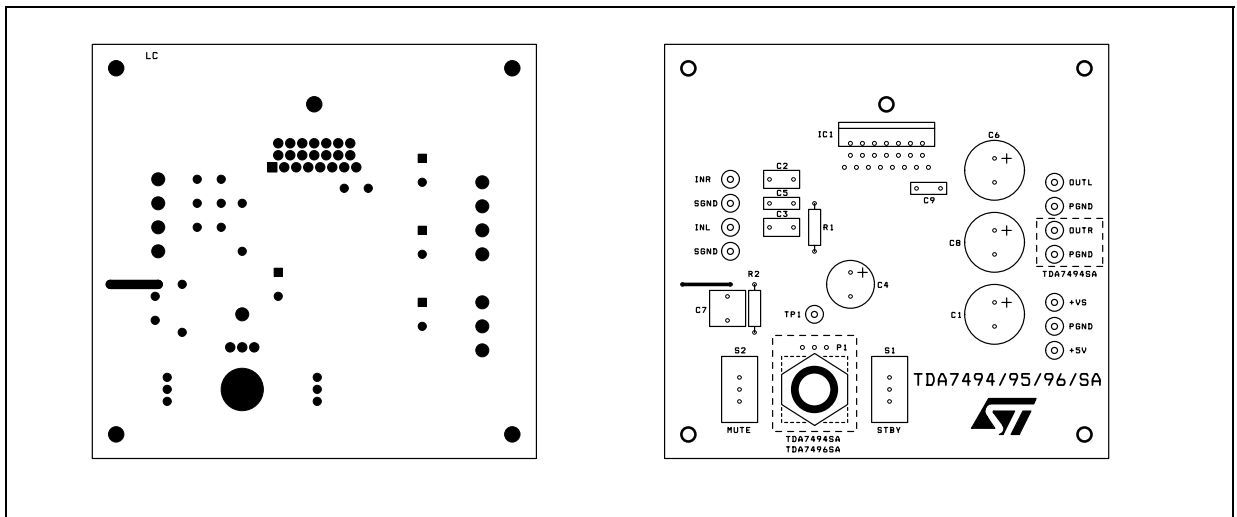


Figure 4. Quiescent Current vs. Supply Voltage

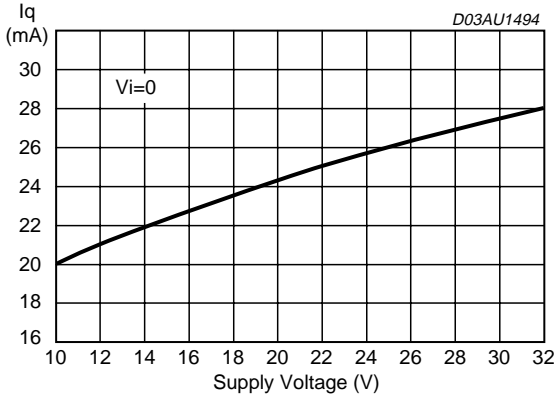


Figure 7. Output DC Offset vs. Supply Voltage

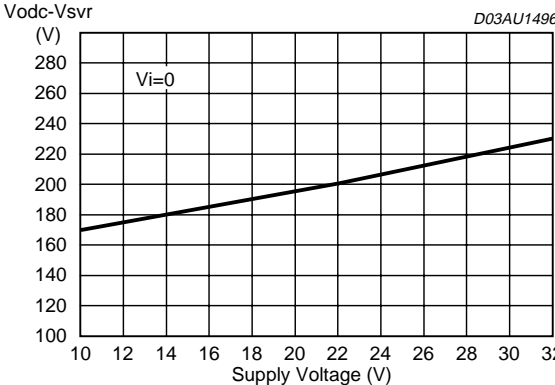


Figure 5. Output Dc Offset vs. Supply Voltage

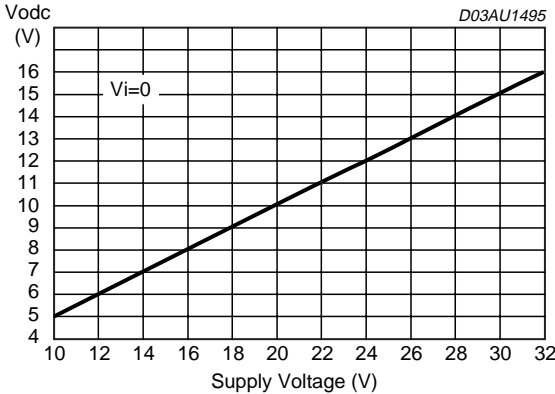


Figure 8. Output Power vs Supply Voltage

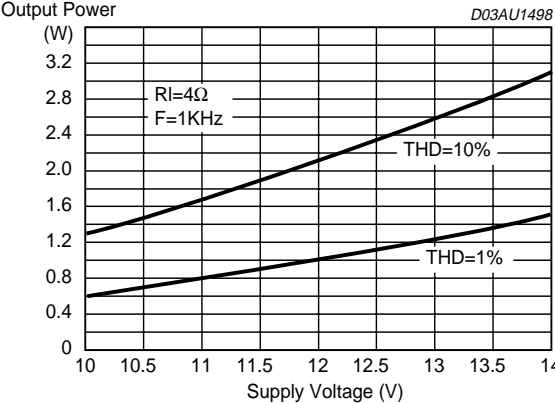


Figure 6. Output Power vs. Supply Voltage

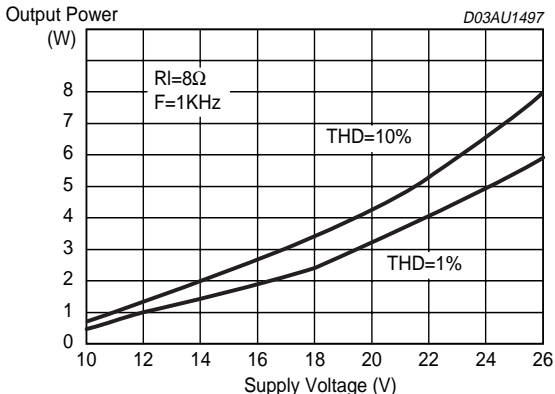


Figure 9. Distortion vs Output Power

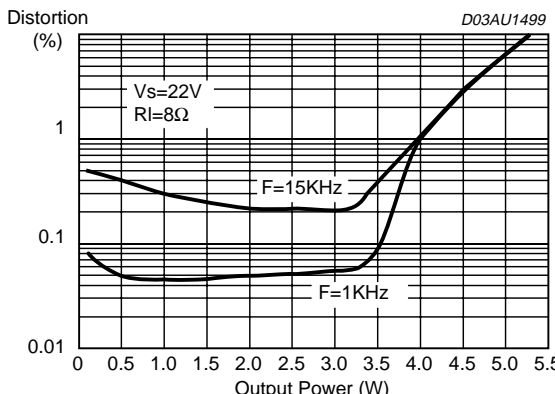


Figure 10. Distortion vs Output Power

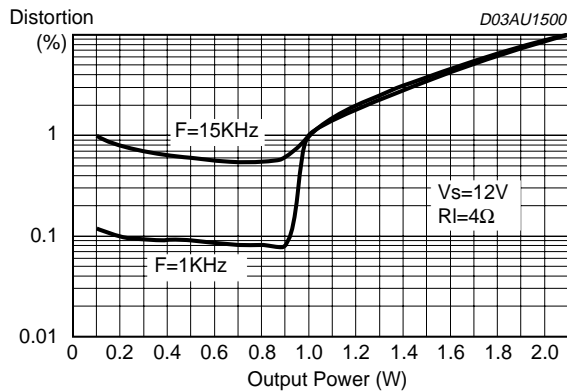


Figure 11. Closed Loop Gain vs. Frequency

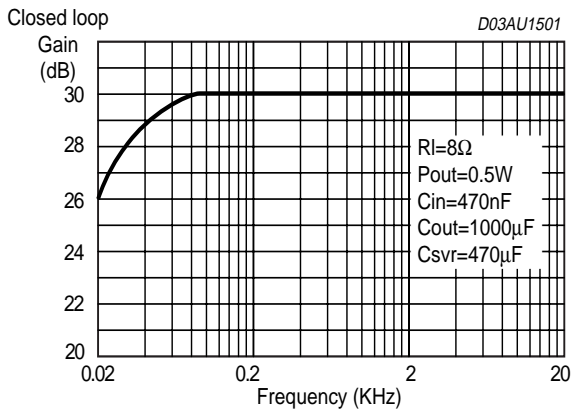


Figure 12. St-By Attenuation vs Vpin 9

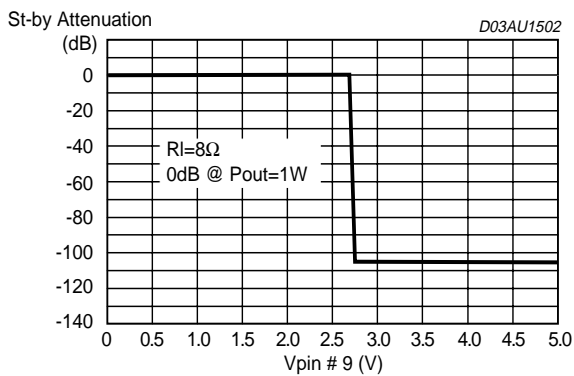
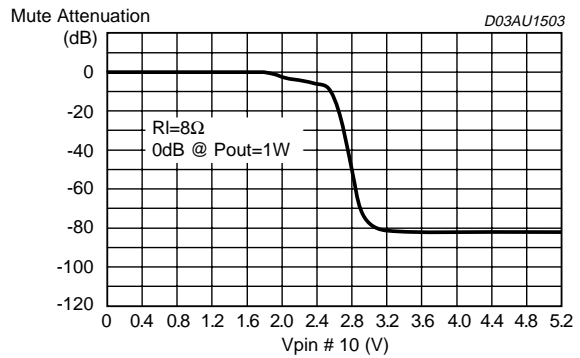


Figure 13. Mute Attenuation vs Vpin 10



PINS DESCRIPTION

Figure 14. PIN SVR

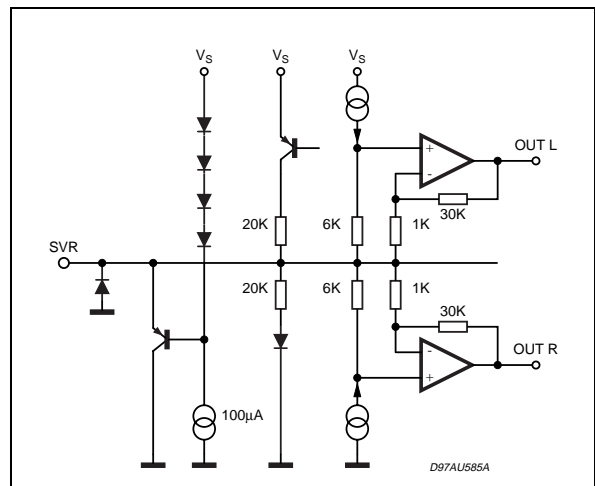


Figure 15. PINS: INL,INR

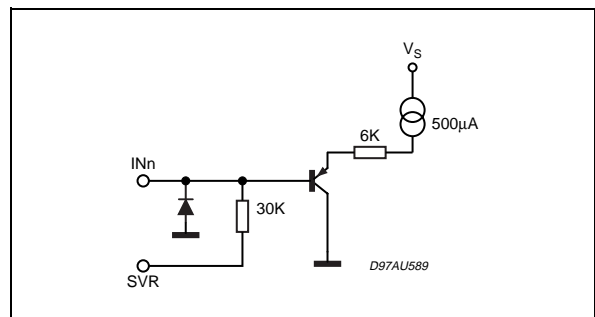




Figure 17. PIN ST-BY

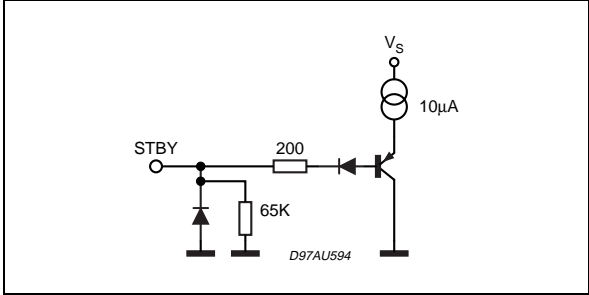


Figure 18. PIN: MUTE

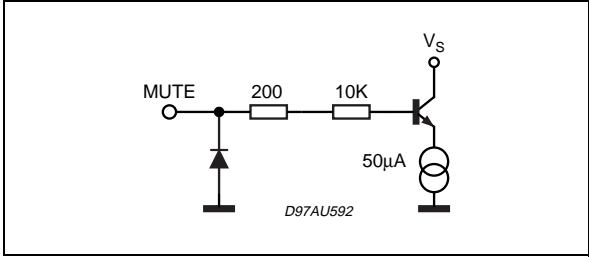


Figure 19. PINS: OUT R, OUT L

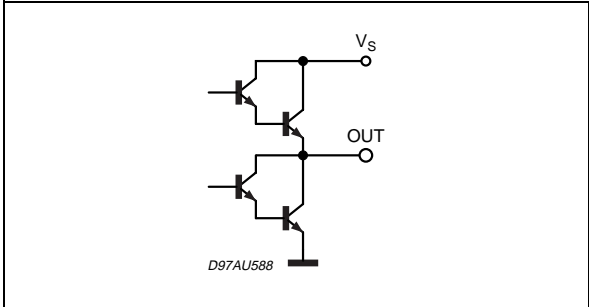


Figure 20. PINS: VAROUT-L VAROUT-R

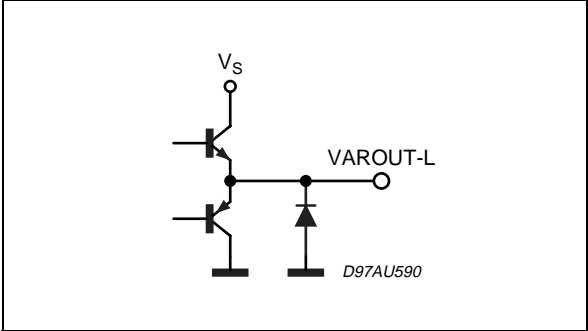


Figure 21. PIN: VOLUME

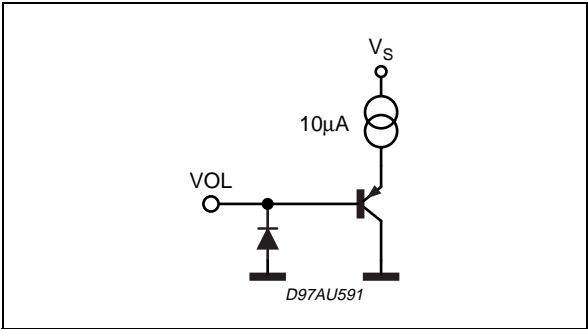
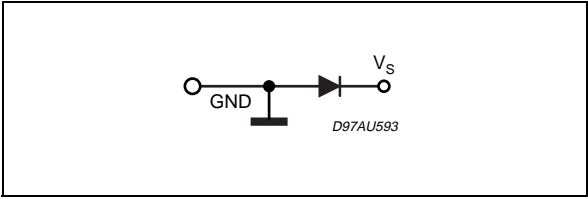
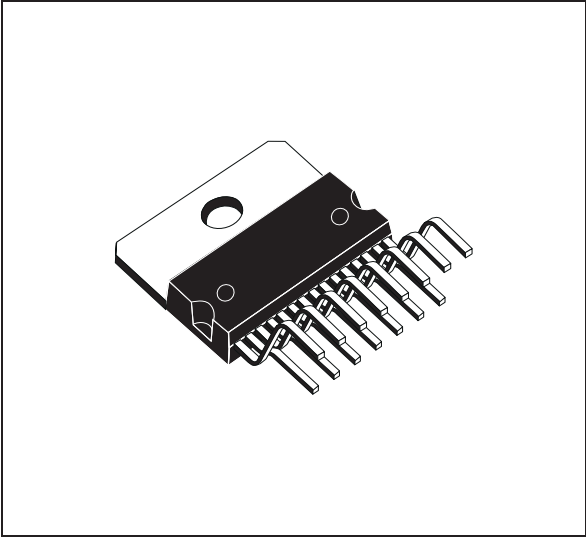


Figure 22. PINS: PW-GND, S-GND

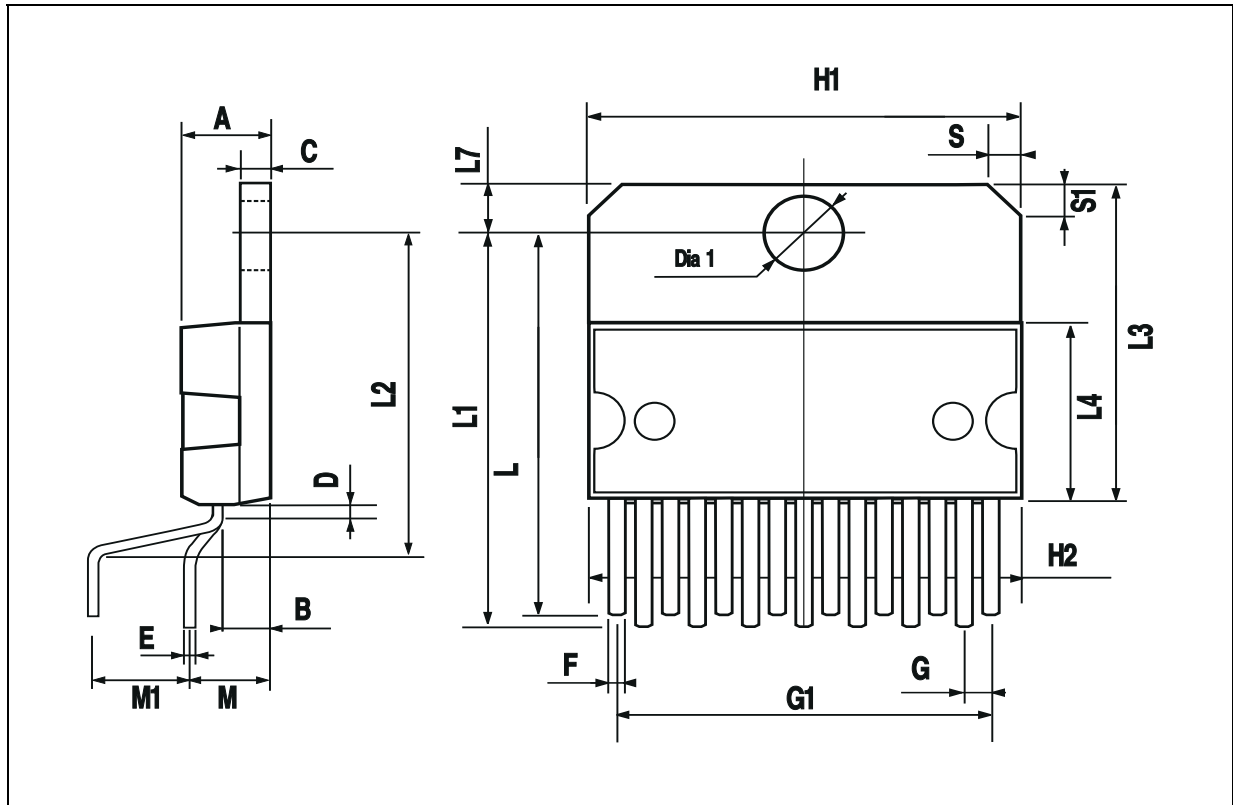


DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A			5			0.197
B			2.65			0.104
C			1.6			0.063
D		1			0.039	
E	0.49		0.55	0.019		0.022
F	0.66		0.75	0.026		0.030
G	1.02	1.27	1.52	0.040	0.050	0.060
G1	17.53	17.78	18.03	0.690	0.700	0.710
H1	19.6			0.772		
H2			20.2			0.795
L	21.9	22.2	22.5	0.862	0.874	0.886
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**



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