

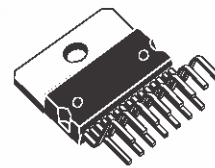


TDA7496

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



Multiwatt15

ORDERING NUMBER: TDA7496

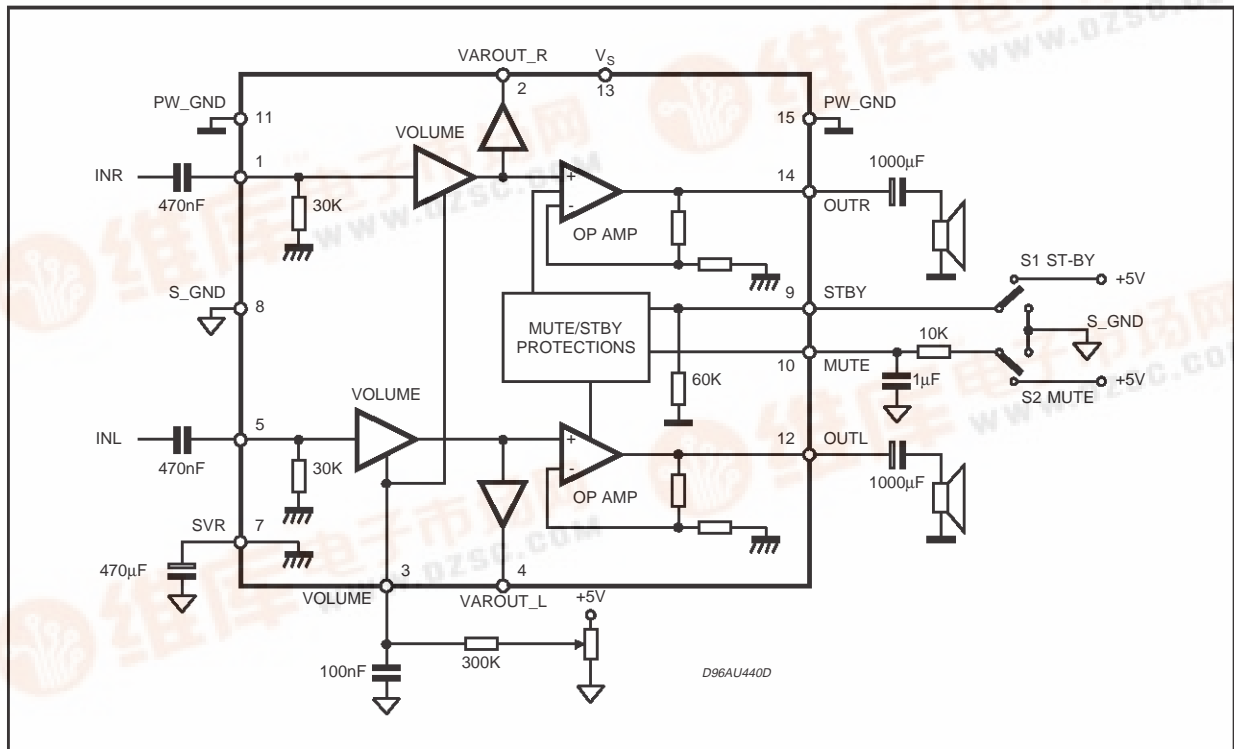
amplifier assembled in the @ Multiwatt 15 package, specially designed for high quality sound, TV applications.

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

DESCRIPTION

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

BLOCK AND APPLICATION DIAGRAM

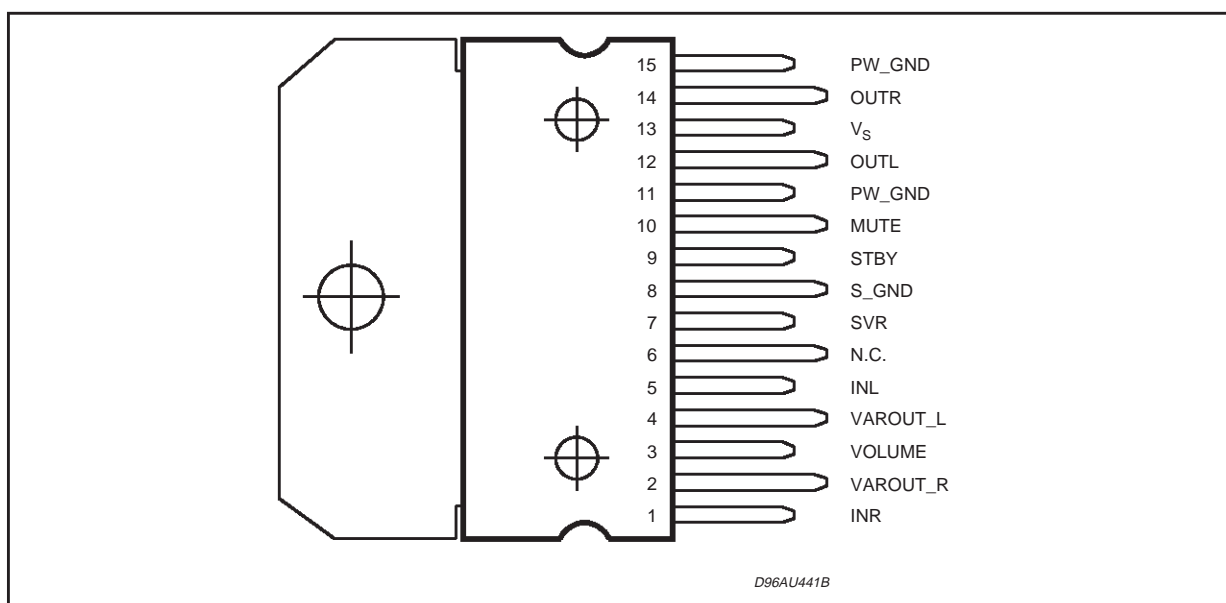


## TDA7496

### 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 ( $T_{amb} = 80^{\circ}\text{C}$ )	15	W
$T_{amb}$	Ambient Operating Temperature	0 to 70	$^{\circ}\text{C}$
$T_{stg}, T_j$	Storage and Junction Temperature	-40 to 150	$^{\circ}\text{C}$
$V_3$	Volume CTRL 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	$^{\circ}\text{C}/\text{W}$
$R_{th\ j-amb}$	Thermal Resistance Junction-ambient	max 35	$^{\circ}\text{C}/\text{W}$

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

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
$V_S$	Supply Voltage Range		10		32	V
$I_q$	Total Quiescent Current			25	50	mA
DCVos	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%; $R_L = 8\Omega$ ;	5	5.5		W
		THD = 1%; $R_L = 8\Omega$ ;		4		W
		THD = 10%; $R_L = 4\Omega$ ; $V_{CC} = 12\text{V}$		2.1		W
		THD = 1%; $R_L = 4\Omega$ ; $V_{CC} = 12\text{V}$		1.0		W
THD	Total Harmonic Distortion	$G_v = 30\text{dB}$ ; $P_O = 1\text{W}$ ; $f = 1\text{KHz}$ ;			0.4	%
$I_{peak}$	Output Peak Current	(internally limited)	1	1.3		A
$V_{in}$	Input Signal				2.8	V <sub>rms</sub>
$G_v$	Closed Loop Gain	Vol Ctrl > 4.5V	28.5	30	31.5	dB

## ELECTRICAL CHARACTERISTICS (continued)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
G <sub>VLine</sub>	Monitor Out Gain	Vol Ctrl > 4.5V; Zload > 30KΩ	-1.5	0	1.5	dB
A <sub>Min VOL</sub>	Attenuation at Minimum Volume	Vol Ctrl < 0.5V	80			dB
BW				0.6		MHz
e <sub>N</sub>	Total Output Noise	f = 20Hz to 22KHz Play, max volume		500	800	μV
		f = 20Hz to 22KHz Play, max attenuation		100	250	μV
		f = 20Hz to 22KHz Mute		60	150	μV
SR	Slew Rate		5	8		V/μs
R <sub>i</sub>	Input Resistance		22.5	30		KΩ
R <sub>Var Out</sub>	Variable Output Resistance			30	100	Ω
R <sub>load Var Out</sub>	Variable Output Load		2			KΩ
SVR	Supply Voltage Rejection	f = 1kHz; max volume C <sub>SVR</sub> = 470μF; V <sub>RIP</sub> = 1V <sub>rms</sub>	35	39		dB
		f = 1kHz; max attenuation C <sub>SVR</sub> = 470μF; V <sub>RIP</sub> = 1V <sub>rms</sub>	55	65		dB
T <sub>M</sub>	Thermal Muting			150		°C
T <sub>s</sub>	Thermal Shut-down			160		°C
<b>MUTE STAND-BY &amp; INPUT SELECTION FUNCTIONS</b>						
V <sub>ST-ON</sub>	Stand-by ON threshold		3.5			V
V <sub>ST-OFF</sub>	Stand-by OFF threshold				1.5	V
V <sub>M ON</sub>	Mute ON Threshold		3.5			V
V <sub>M OFF</sub>	Mute OFF Threshold				1.5	V
I <sub>qST-BY</sub>	Quiescent Current @ Stand-by			0.6	1	mA
A <sub>MUTE</sub>	Mute Attenuation		50	65		dB
I <sub>stbyBIAS</sub>	Stand-by bias current	Stand by on V <sub>ST-BY</sub> = 5V V <sub>MUTE</sub> = 5V		80		μA μA
		Play or Mute	-20	-5		μA
I <sub>muteBIAS</sub>	Mute bias current	Mute		1	5	μA
		Play		0.2	2	μA

## APPLICATION SUGGESTIONS

The recommended values of the external components are those shown on the application circuit of figure 1a. 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	1000μF	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	470μF	Ripple rejection	Better SVR	Worse SVR
C5	100nF	Volume control time constant	Larger volume regulation time	Smaller volume regulation time
C6	1000μF	Output DC decoupling	Lower low frequency cutoff	Higher low frequency cutoff
C7	1μF	Mute time constant	Larger mute on/off time	Smaller mute on/off time
C8	1000μF	Output DC decoupling	Lower low frequency cutoff	Higher low frequency cutoff
C9	100nF	Supply voltage bypass		Danger of oscillation

# TDA7496

Figure 1a: Application Circuit.

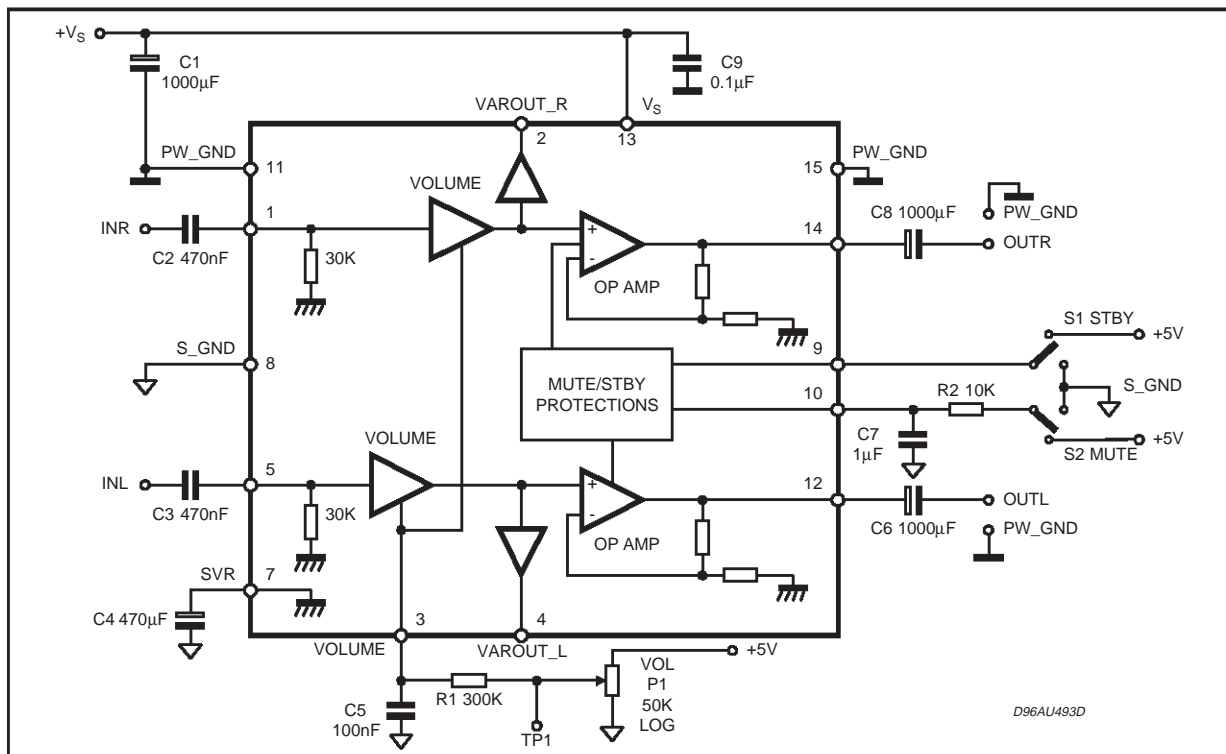
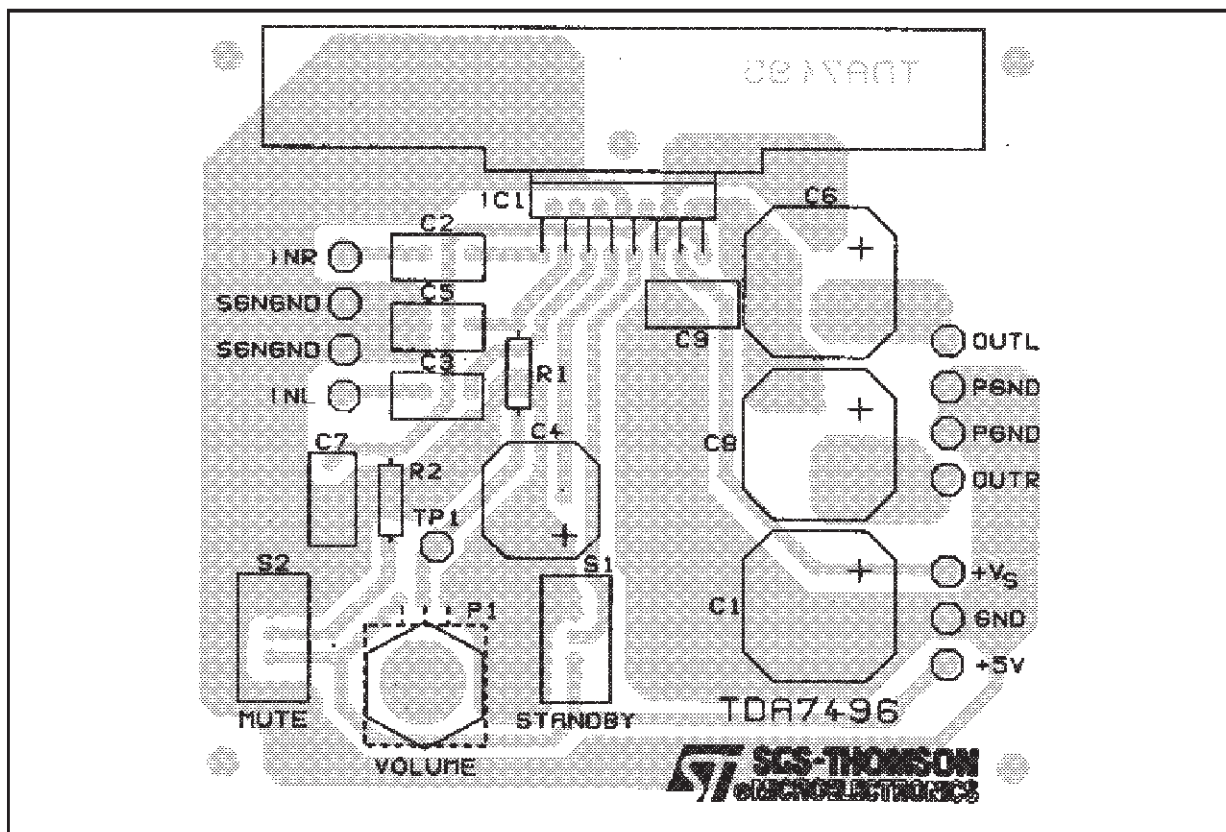


Figure 1b: P.C.B. and Component Layout.

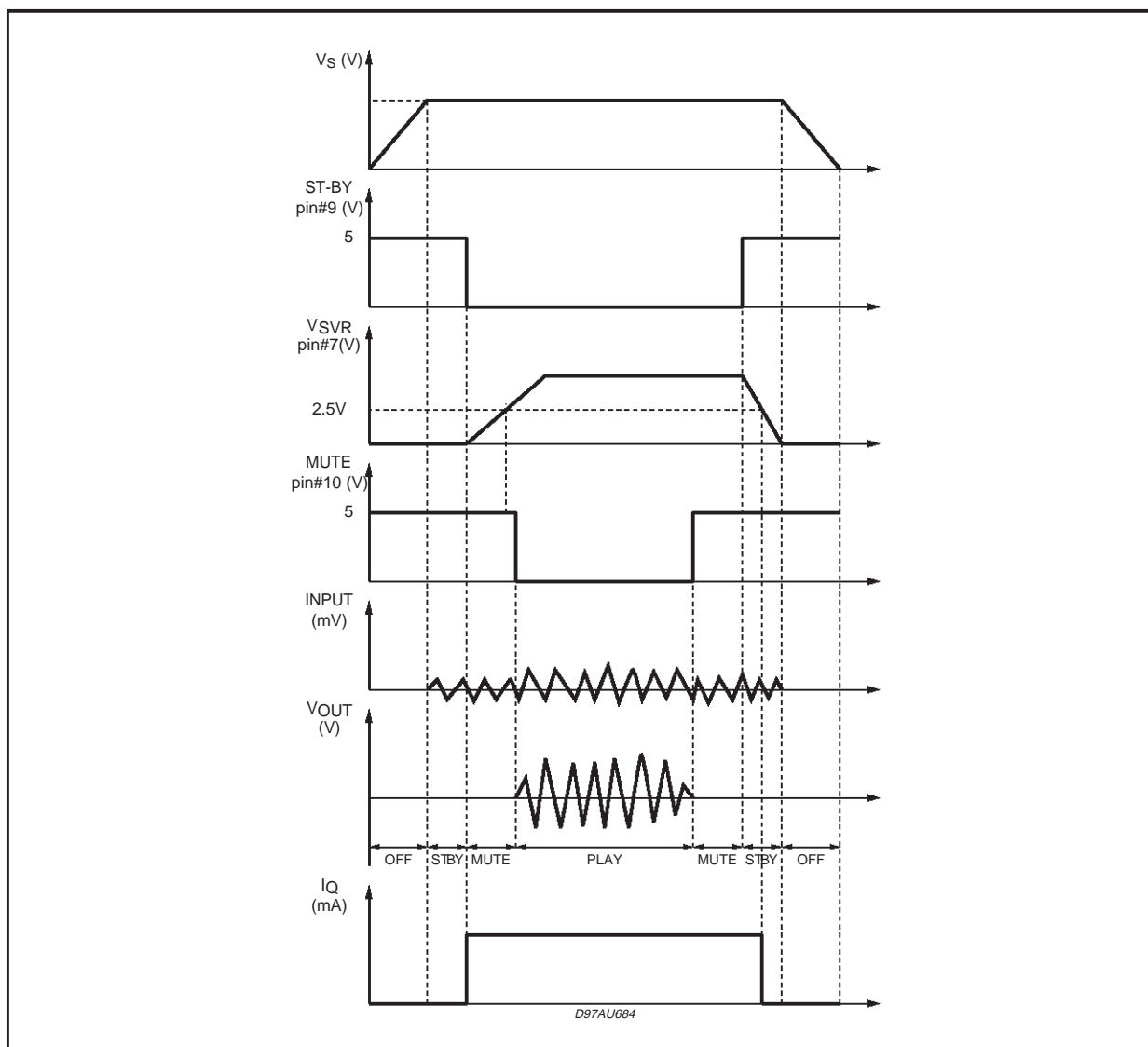


**MUTE STAND-BY TRUTH TABLE**

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

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

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



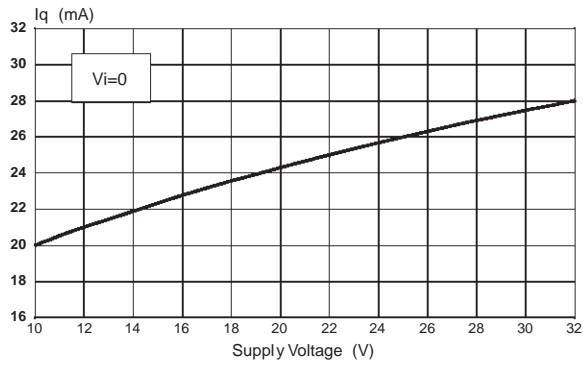
**B) USING ONLY THE MUTE FUNCTION**

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

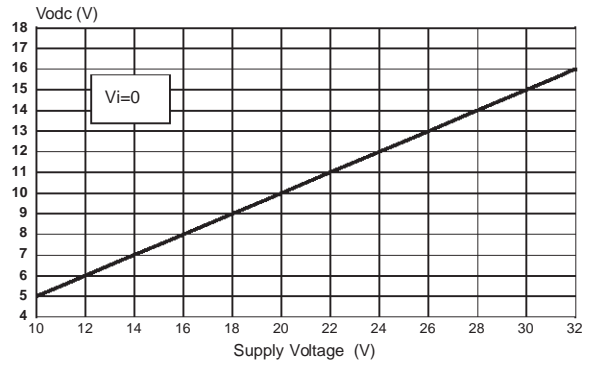
During the ON/OFF transitions it is recommended to respect the following conditions.

- At the turn-on, the transition 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.

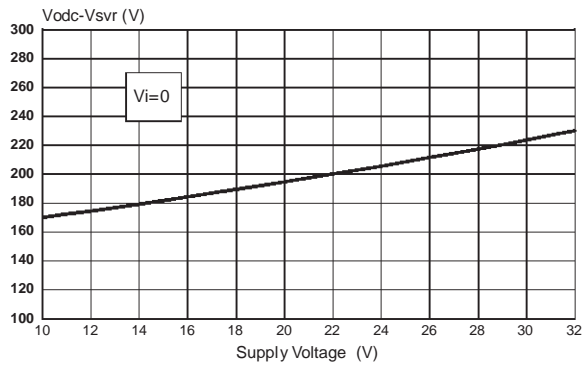
Quiescent Current vs. Supply Voltage



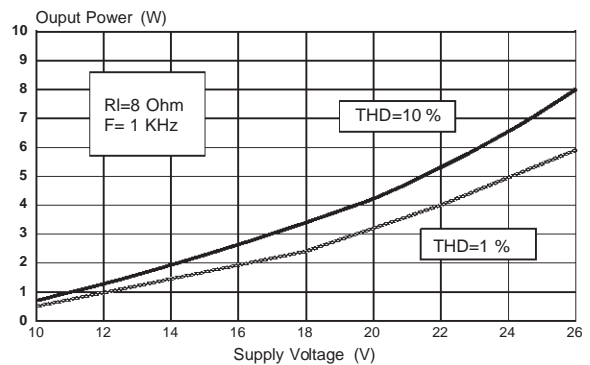
Output DC Voltage vs. Supply Voltage



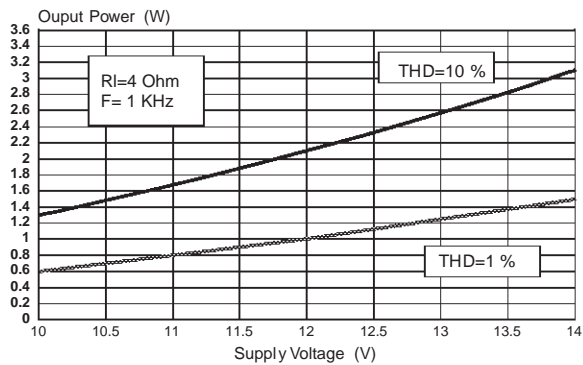
Output DC Offset vs. Supply Voltage



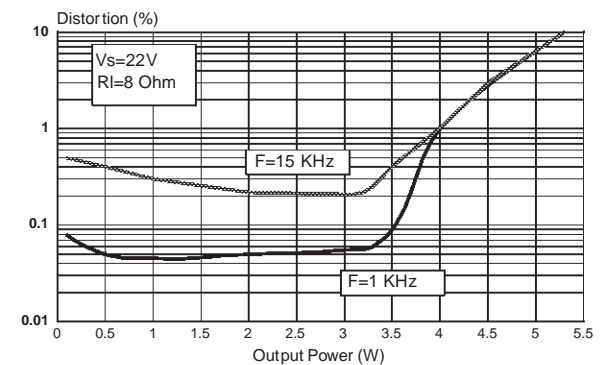
Output Power vs. Supply Voltage



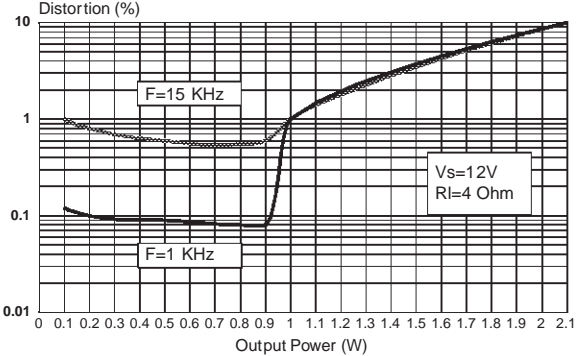
Output Power vs. Supply Voltage



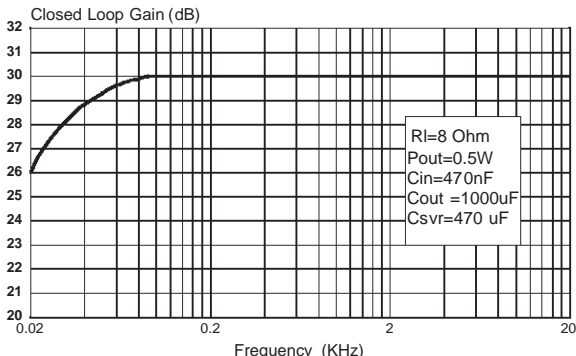
Distortion vs. Output Power



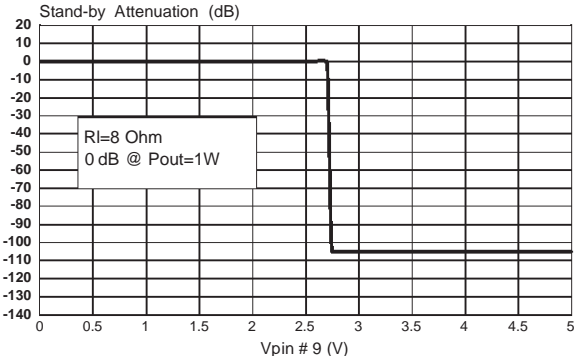
Distortion vs. Output Power



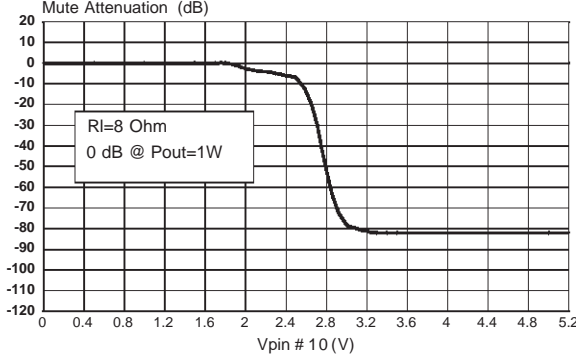
Closed Loop Gain vs. Frequency



St-By Attenuation vs. Vpin 9

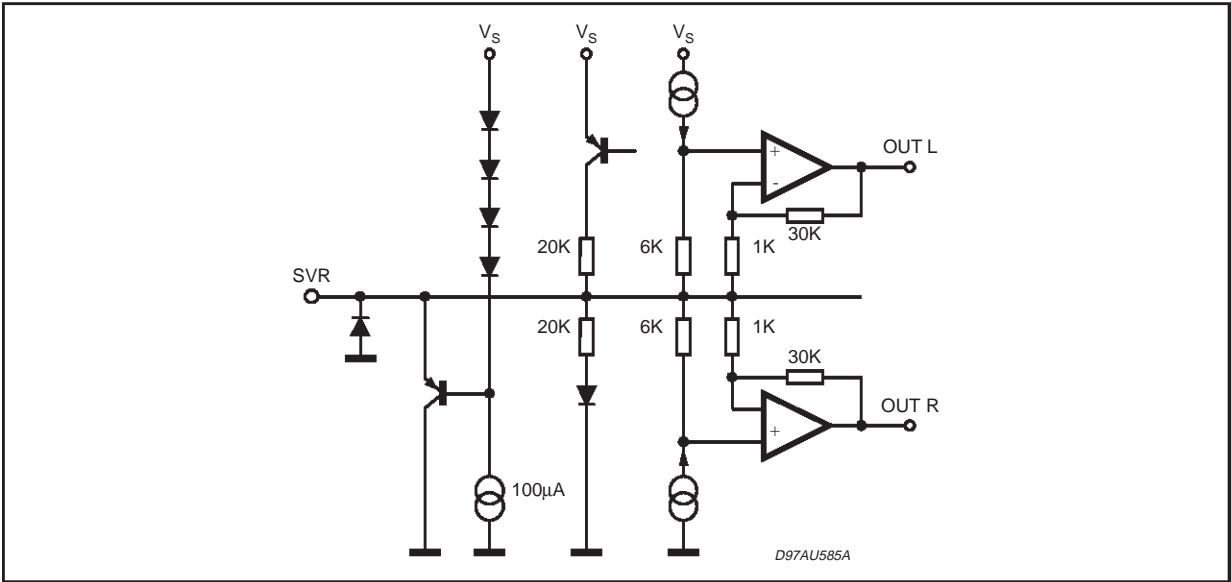


Mute Attenuation vs. Vpin 10



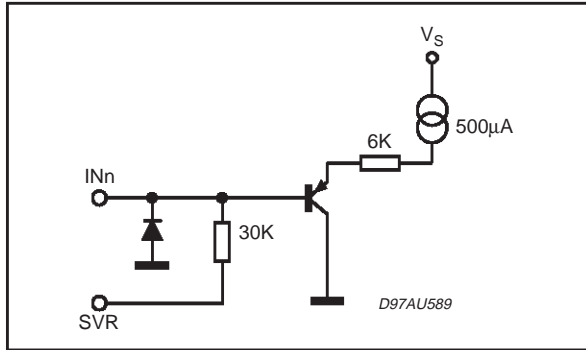
PINS DESCRIPTION

PIN: SVR

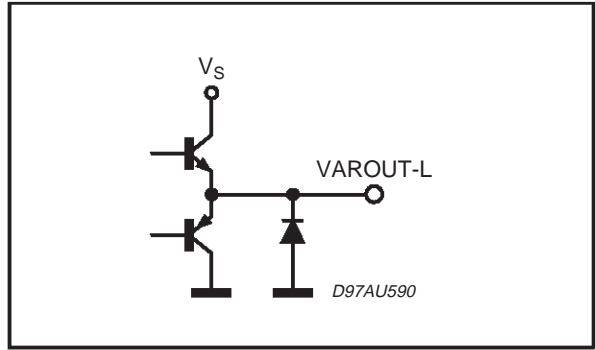


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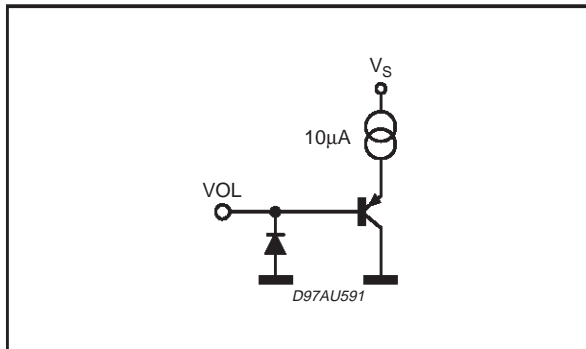
**PINS:** INL, INR



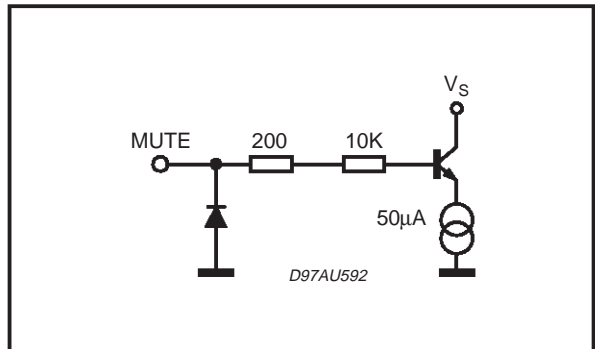
**PINS:** VAROUT-L, VAROUT-R



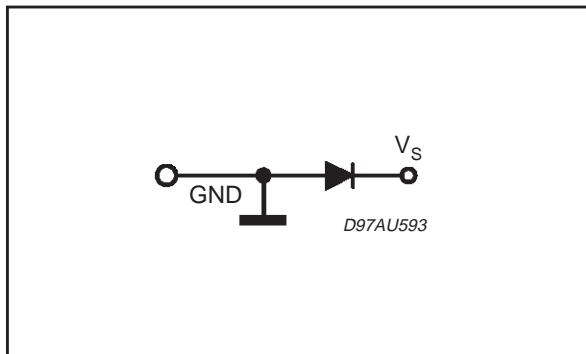
**PIN:** VOLUME



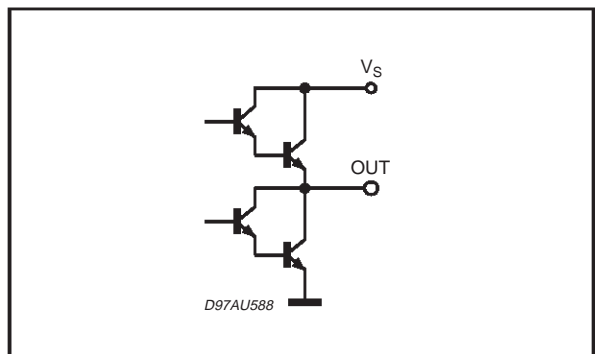
**PIN:** MUTE



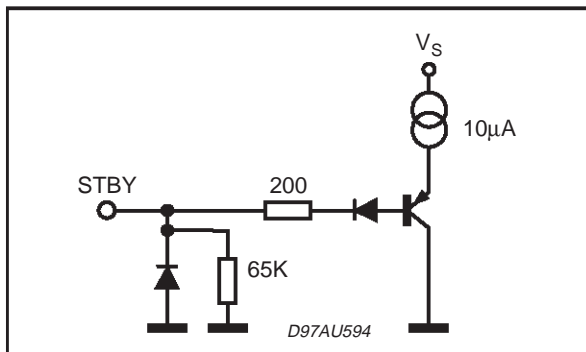
**PINS:** PW-GND, S-GND



**PINS:** OUT R, OUT L

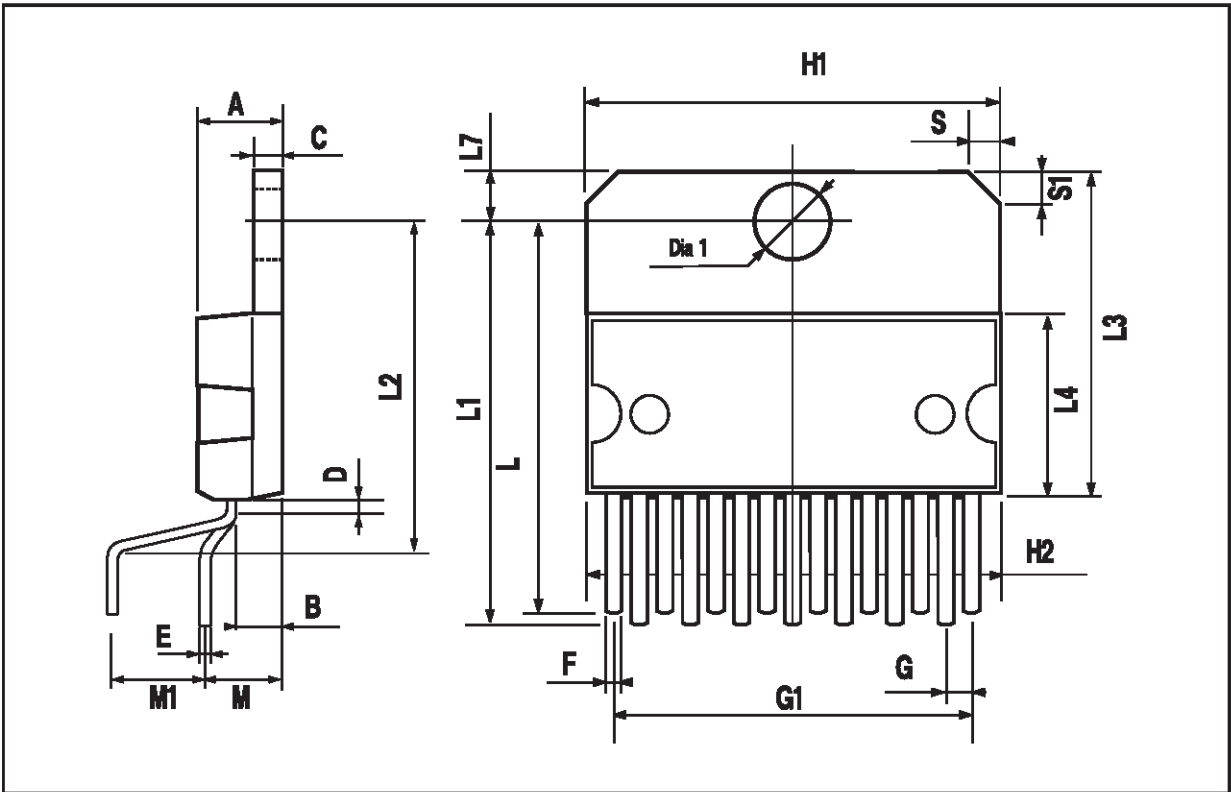


**PIN:** STBY



MULTIWATT15 PACKAGE MECHANICAL DATA

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



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