

UTC TDA7496L LINEAR INTEGRATED CIRCUIT

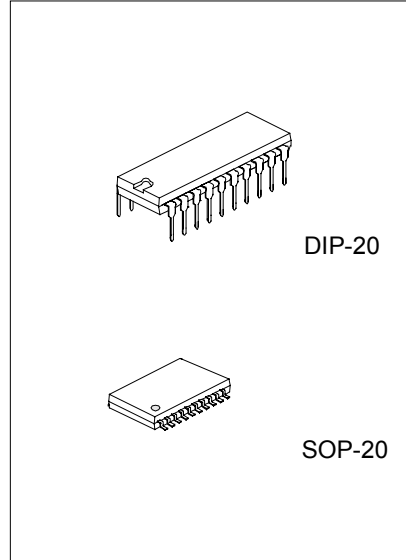
2W+2W AMPLIFIER WITH DC VOLUME CONTROL

DESCRIPTION

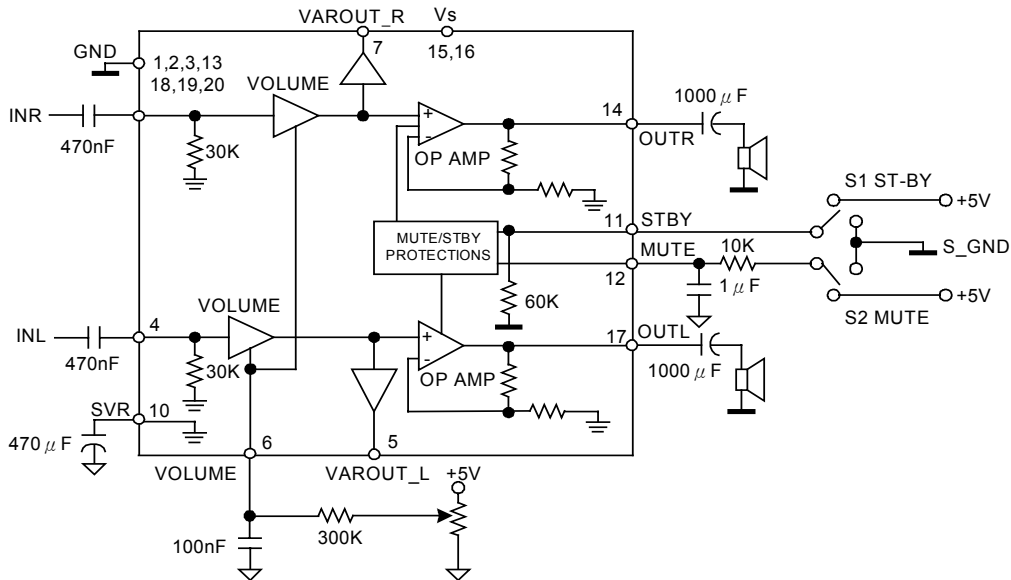
The UTC TDA7496L is a stereo 2W+2W class AB power amplifier, specially designed for high quality sound, TV and Monitor applications. Features of the UTC TDA7496L include linear volume control, Stand-by and mute functions.

FEATURES

- *2W+2W output power: $R_L=8\ \Omega$ @THD=10%, $V_{CC}=14V$
- *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 15V
- *Short circuit protection
- *Thermal overload protection
- *Internally fixed gain
- *Soft clipping
- *Variable output after volume control circuit



BLOCK DIAGRAM

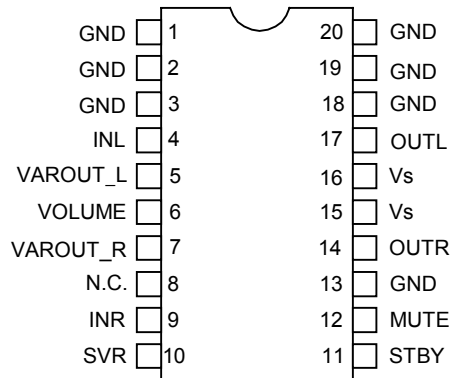


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ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	RATING	UNIT
DC Supply Voltage	Vs	26	V
Maximum Input Voltage	VIN	8	Vpp
Total Power Dissipation (Tcase =60°C)	Ptot	6	W
Ambient Operating Temperature	Ta	0 ~ 70	°C
Junction Temperature	Tj	-40 ~ 150	°C
Storage Temperature	Tstg	-40 ~ 150	°C
Volume CTRL DC voltage	V6	7	V

PIN CONNECTION



ELECTRICAL CHARACTERISTICS (Refer to the test circuit Vs = 14V, RL = 8 Ω, Rg = 50 Ω, Ta = 25°C).

PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Supply Voltage Range	Vs		10		18	V
Quiescent Current	Iq			25	50	mA
Output DC Offset Referred to SVR Potential	DCVos	No Input Signal		200		mV
Quiescent Output Voltage	Vo			7		V
Output Power	Po	THD=10%, RL=8 Ω THD=1%, RL=8 Ω	1.6	2 1.3		W
Total Harmonic Distortion	THD	Gv=30dB, Po=1W, f=1KHz			0.4	%
Output Peak Current	Ipeak	(internally limited)	0.7	0.9		A
Input Signal	Vin				2.8	Vrms
Closed Loop Gain	Gv	Vol Ctrl>4.5V	28.5	30	31.5	dB
Monitor Out Gain	Gvline	Vol Ctrl>4.5V, Zload>30k Ω	-1.5	0	1.5	dB
Attenuation at Minimum Volume	Amin Vol	Vol Ctrl<0.5V	80			dB
Bandwidth	BW			0.6		MHz

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PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Total Output Noise	eN	f=20Hz to 22KHz Play,max volume		500	800	μ V
		f=20Hz to 22KHz Play,max attenuation		100	250	μ V
		f=20Hz to 22KHz Mute		60	150	μ V
Slew Rate	SR		5	8		V/ μ s
Input Resistance	Ri		22.5	30		k Ω
Variable Output Resistance	Rvar Out			30	100	Ω
Variable Output Load	Rload var Out		2			k Ω
Supply Voltage Rejection	SVR	f=1kHz, max volume CSVR=470 μ F, VRIP=1Vrms	35	39		dB
		f=1kHz, max attenuation CSVR=470 μ F, VRIP=1Vrms	55	65		
Thermal Muting	TM			150		$^{\circ}$ C
Thermal Shut-down	Ts			160		$^{\circ}$ C
MUTE STAND-BY&INPUT SELECTION FUNCTIONS						
Stand-by ON Threshold	VST ON		3.5			V
Stand-by OFF Threshold	VST OFF				1.5	V
Mute ON Threshold	VM ON		3.5			V
Mute OFF Threshold	VM OFF				1.5	V
Quiescent Current@Stand-by	IQST-BY			0.6	1	mA
Mute Attenuation	AMUTE		50	65		dB
Stand-by bias current	IstbyBIAS	Stand by on VST-BY=5V VMUTE=5V		80		μ A
		Play or Mute	-20	-5		μ A
Mute bias current	ImuteBIAS	Mute		1	5	μ A
		Play		0.2	2	μ 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 μ 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	470nF	Ripple rejection	Better SVR	Worse SVR
C5	100nF	Volume control time Constant	Larger volume regulation time	Smaller volume regulation time
C6	1000 μ F	Output DC decoupling	Lower low frequency cutoff	Higher low frequency cutoff

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COMPONENT	SUGGESTION VALUE	PURPOSE	LARGER THAN SUGGESTION	SMALLER THAN SUGGESTION
C7	1 μ F	Mute time constant	Larger mute on/off time	Smaller mute on/off time
C8	1000 μ F	Output DC decoupling	Lower low frequency cutoff	Higher low frequency cutoff
C9	100nF	Supply voltage bypass		Danger of oscillation

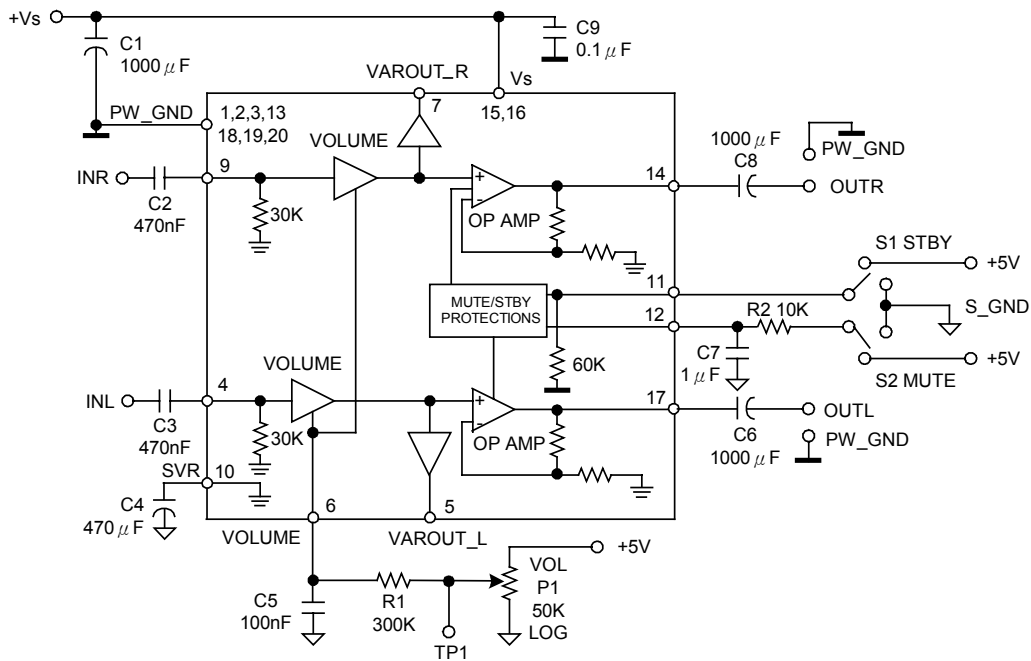


FIGURE 1. APPLICATION CIRCUIT

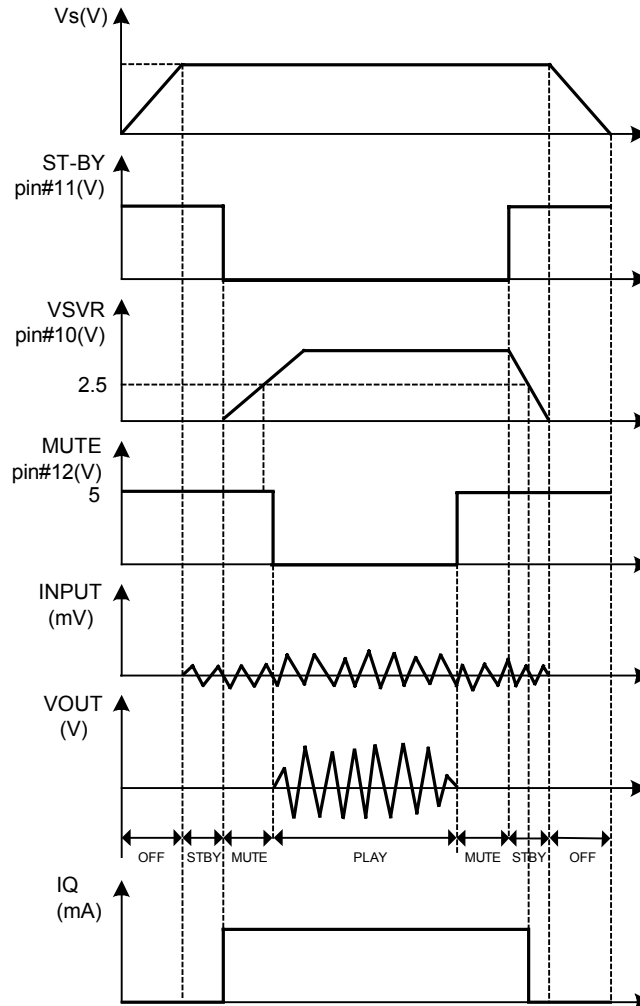
MUTE STAND-BY TRUTH TABLE

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

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TURN ON/OFF SEQUENCES (FOR OPTIMIZING THE POP PERFORMANCES)

(A) USING MUTE AND STAND-BY FUNCTIONS



(B) USING ONLY THE MUTE FUNCTION

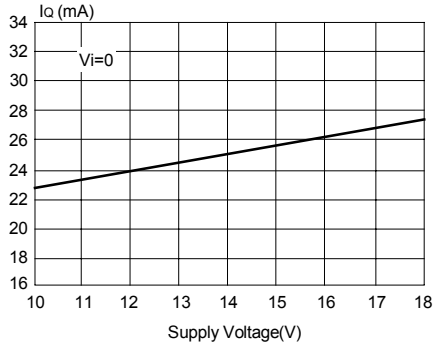
To simplify the application, the stand-by pin can be connected directly to Ground. During the ON/OFF transitions it is recommended to respect the following conditions.

At the turn-on, the transition mute - play must be made when the SVR pin is higher than 2.5V.

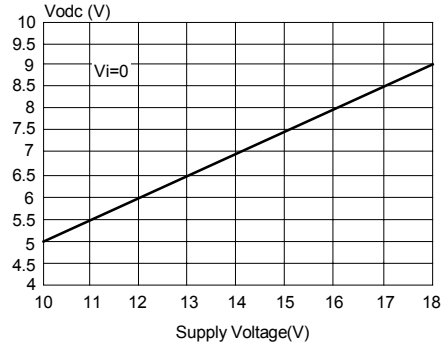
At the turn-off, the TDA7496L must be brought to mute from the play condition when the SVR pin is higher than 2.5V.

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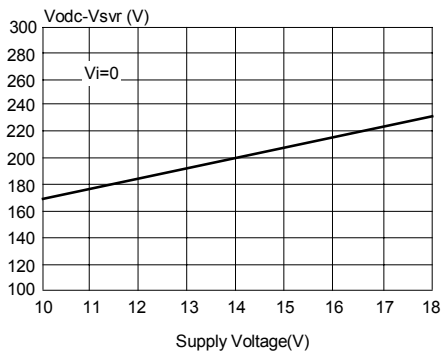
Quiescent current vs. Supply Voltage



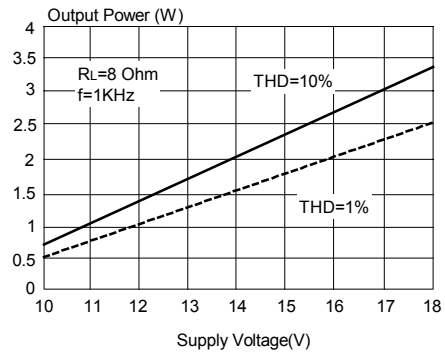
Output DC Voltage vs. Supply Voltage



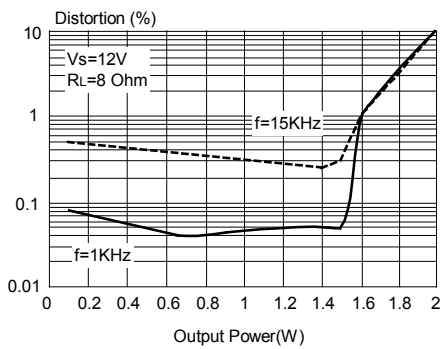
Output DC Offset vs. Supply Voltage



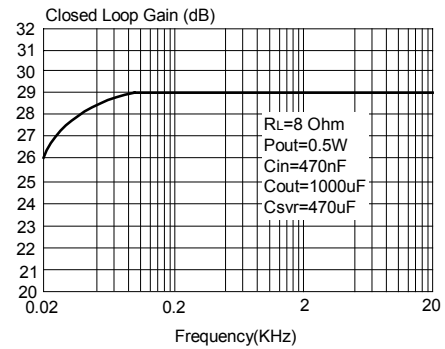
Output Power vs. Supply Voltage



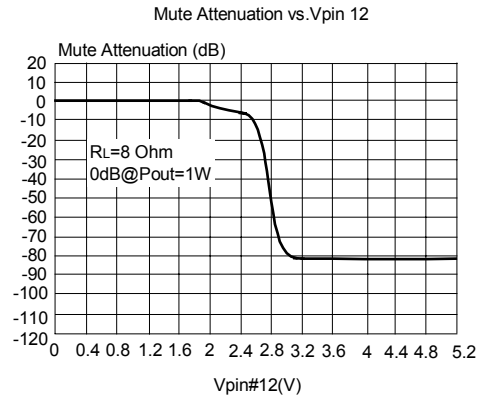
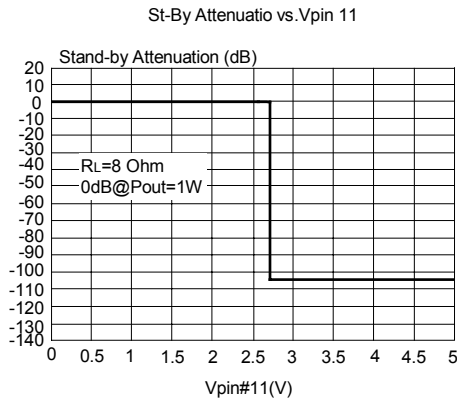
Distortion vs. Output Power



Closed Loop gain vs. Frequency

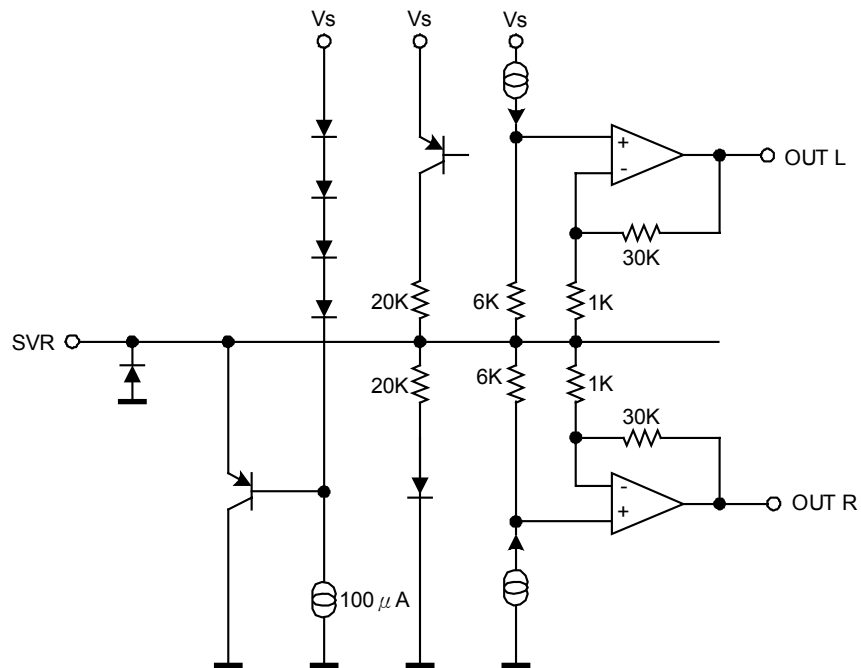


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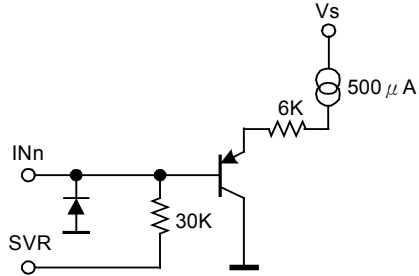
PIN DESCRIPTION

PIN: SVR

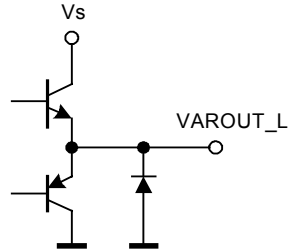


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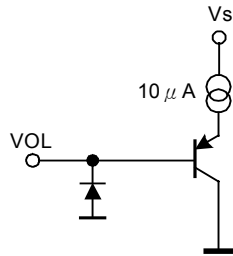
PINS: INL,INR



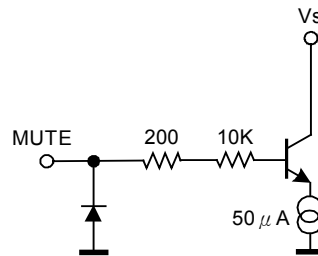
PINS: VAROUT_L,VAROUT_R



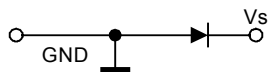
PIN: VOLUME



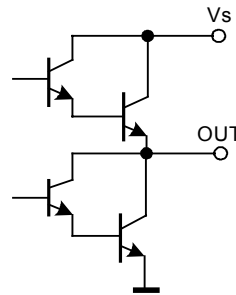
PIN: MUTE



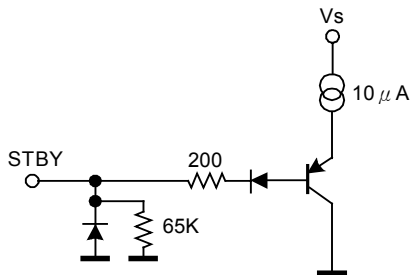
PINS: PW_GND,S_GND



PINS: VAROUT-L,VAROUT-R



PIN: STBY



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