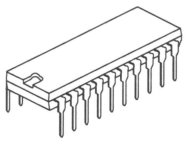
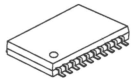
TDA7496L

LINEAR INTEGRATED CIRCUIT

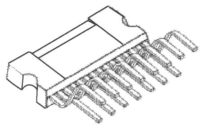
2W+2W AMPLIFIER WITH DC VOLUME CONTROL



DIP-20



SOP-20



HZIP-15D

Lead-free: TDA7496LK
Halogen-free: TDA7496LG

■ 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=8Ω@THD=10%,Vcc=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



■ ORDERING INFORMATION

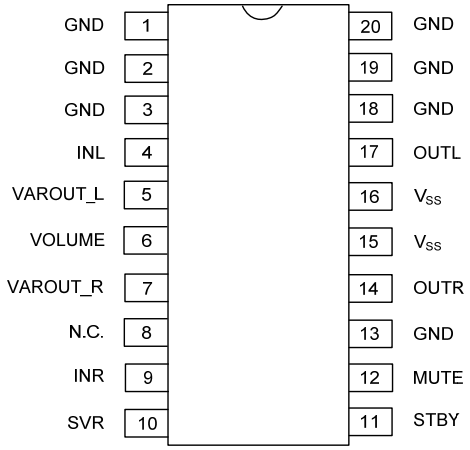
Ordering Number			Package	Packing
Normal	Lead Free Plating	Halogen Free		
TDA7496L-D20-T	TDA7496LK-D20-T	TDA7496LG-D20-T	DIP-20	Tube
TDA7496L-S20-R	TDA7496LK-S20-R	TDA7496LG-S20-R	SOP-20	Tape Reel
TDA7496L-S20-T	TDA7496LK-S20-T	TDA7496LG-S20-T	SOP-20	Tube
TDA7496L-J15-D-T	TDA7496LK-J15-D-T	TDA7496LG-J15-D-T	HZIP-15D	Tube

TDA7496LK-D20-T
(1)Packing Type
(2)Package Type
(3)Lead Plating

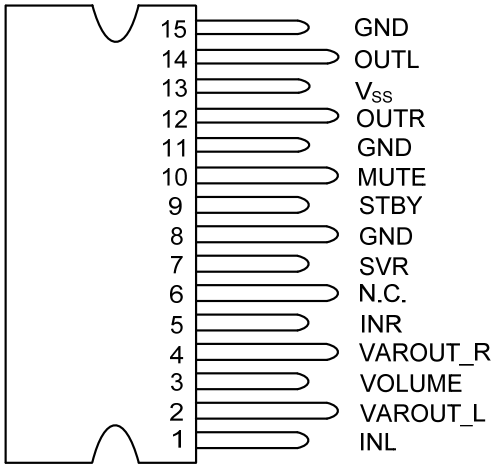
(1) T: Tube, R: Tape Reel
(2) D20: DIP-20, S20: SOP-20, J15-D:HZIP-15D
(3) G: Halogen Free, K: Lead Free, Blank: Pb/Sn

Copyright © 2008 Unisonic Technologies Co., Ltd

■ PIN CONFIGURATION

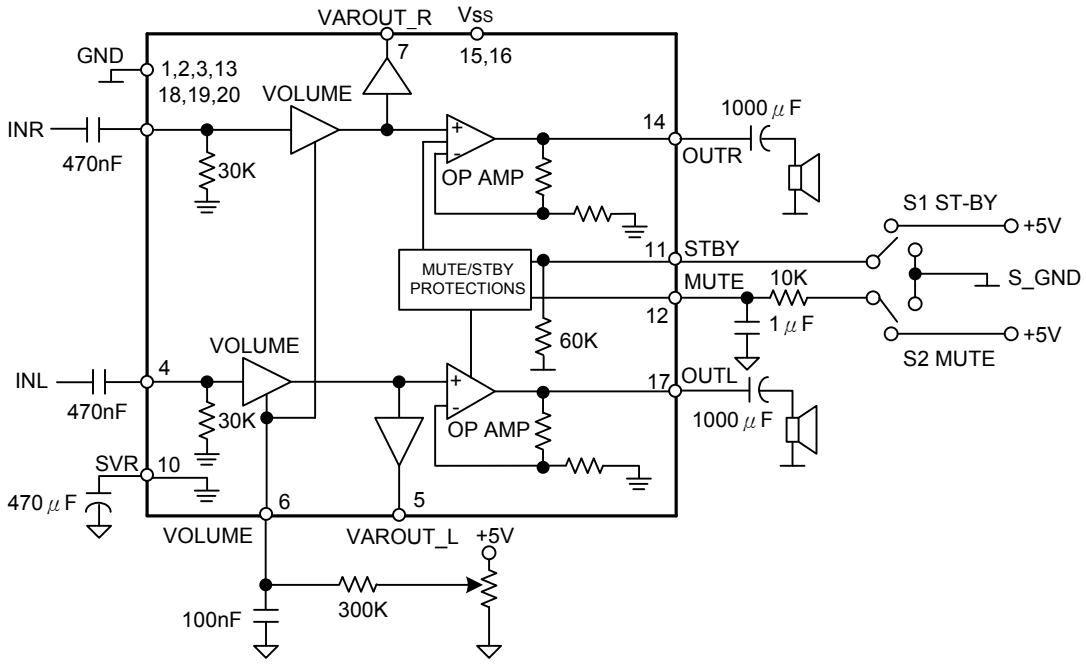


DIO-20/SOP-20



HZIP-15D

■ BLOCK DIAGRAM



■ ABSOLUTE MAXIMUM RATINGS (Ta=25℃, unless otherwise specified.)

PARAMETER		SYMBOL	RATINGS	UNIT
DC Supply Voltage		V_{SS}	26	V
Maximum Input Voltage		V_{IN}	8	V
Volume CTRL DC Voltage		V_6	6	V
Power Dissipation	DIP-20(T_C=60℃)	P_D	6	W
	HZIP-15D		7	
Junction Temperature		T_J	+150	°C
Ambient Operating Temperature		T_{OPR}	0 ~ +70	°C
Storage Temperature		T_{STG}	-40 ~ +150	°C

Note: Absolute maximum ratings are those values beyond which the device could be permanently damaged. Absolute maximum ratings are stress ratings only and functional device operation is not implied.

■ THERMAL DATA

PARAMETER		SYMBOL	MIN	TYP	MAX	UNIT
Junction-to-Ambient	DIP-20	θ_{JA}			50	℃/W
	HZIP-15D				60	

■ ELECTRICAL CHARACTERISTICS (Ta=25℃, V_{SS}=14V, unless otherwise specified.)

PARAMETER		SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT
Supply Voltage Range		V_{SS}		10		18	V
Quiescent Current		I_Q			25	50	mA
Output DC Offset Referred to SVR Potenial		DCVos	No Input Signal		200		mV
Quiescent Output Voltage		V_{OUT}			7		V
Output Power	THD=10%	P_{OUT}	R_L=8Ω	1.6	2		W
	THD=1%				1.3		
Total Harmonic Distortion		THD	G_V=30dB, P_{OUT}=1W, f=1KHz			0.4	%
Output Peak Current		$I_{OUT(PEAK)}$	(internally limited)	0.7	0.9		A
Input Signal		V_{IN}				2.8	V
Closed Loop Gain		G_V	V_{OL} Ctrl>4.5V	28.5	30	31.5	dB
Monitor Out Gain		$G_{V(line)}$	V_{OL} Ctrl>4.5V, Z_{LOAD}>30kΩ	-1.5	0	1.5	dB
Attenuation at Minimum Volume		Amin VoL	V_{OL} Ctrl<0.5V	80			dB
Bandwidth		BW			0.6		MHz
Total Output Noise	Volume	eN	f=20Hz to 22KHz		500	800	μV
	Attenuation		f=20Hz to 22KHz		100	250	
	Mute		f=20Hz to 22KHz		60	150	
Slew Rate		SR		5	8		V/μs
Input Resistance		R_{IN}		22.5	30		kΩ
Variable Output Resistance		$R_{VAR(OUT)}$			30	100	Ω
Variable Output Load		$R_{LOAD(OUT)}$		2			kΩ
Supply Voltage Rejection f=1kHz	Volume	SVR	CSVR=470μF, VRIP=1V	35	39		dB
	Attenuation			55	65		
Thermal Muting		TM			150		°C
Thermal Shut-down		T_S			160		°C
MUTE STAND-BY&INPUT SELECTION FUNCTIONS							
Stand-by ON Threshold		$V_{ST(ON)}$		3.5			V
Stand-by OFF Threshold		$V_{ST(OFF)}$				1.5	V
Mute ON Threshold		$V_{M(ON)}$		3.5			V
Mute OFF Threshold		$V_{M(OFF)}$				1.5	V
Quiescent Current@ Stand-by		I_{QST-BY}			0.6	1	mA
Mute Attenuation		AMUTE		50	65		dB
Stand-by bias current		$I_{BIAS(ST-BY)}$	Stand by on V_{ST-BY}=5V, V_{MUTE}=5V		80		μA
			Play or Mute	-20	-5		μA
Mute bias current		$I_{BIAS(MUTE)}$	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 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	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 costant	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

■ TYPICAL APPLICATION CIRCUIT

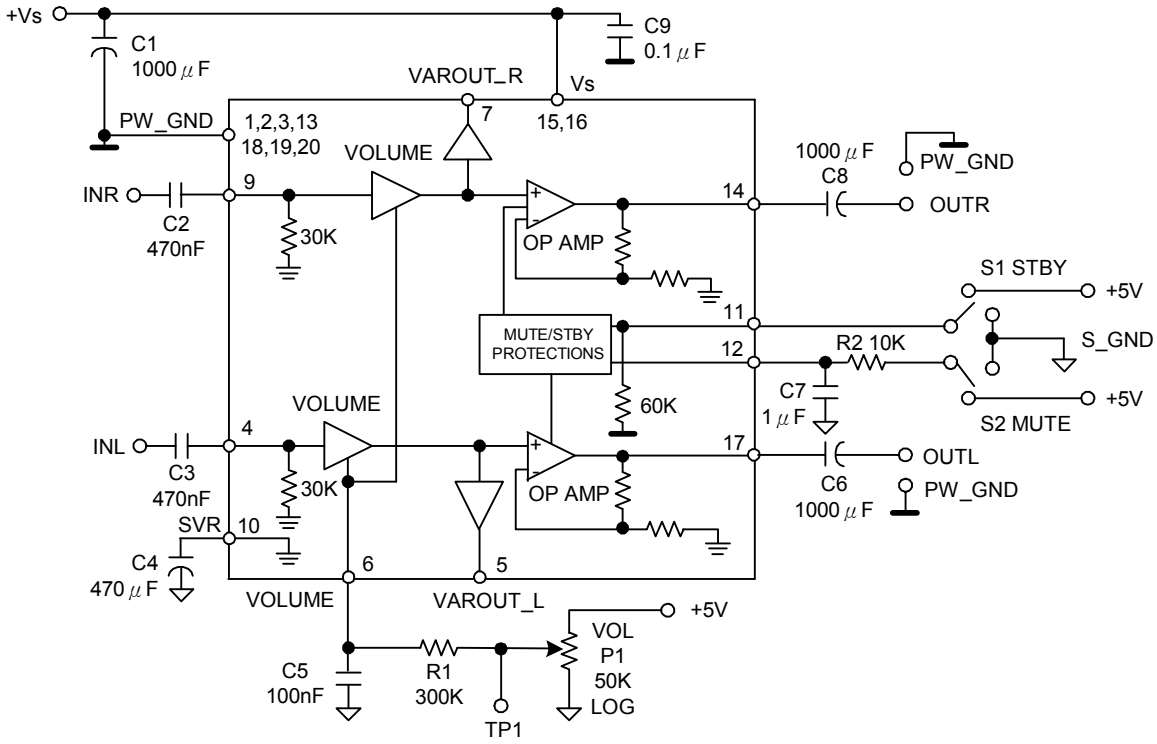


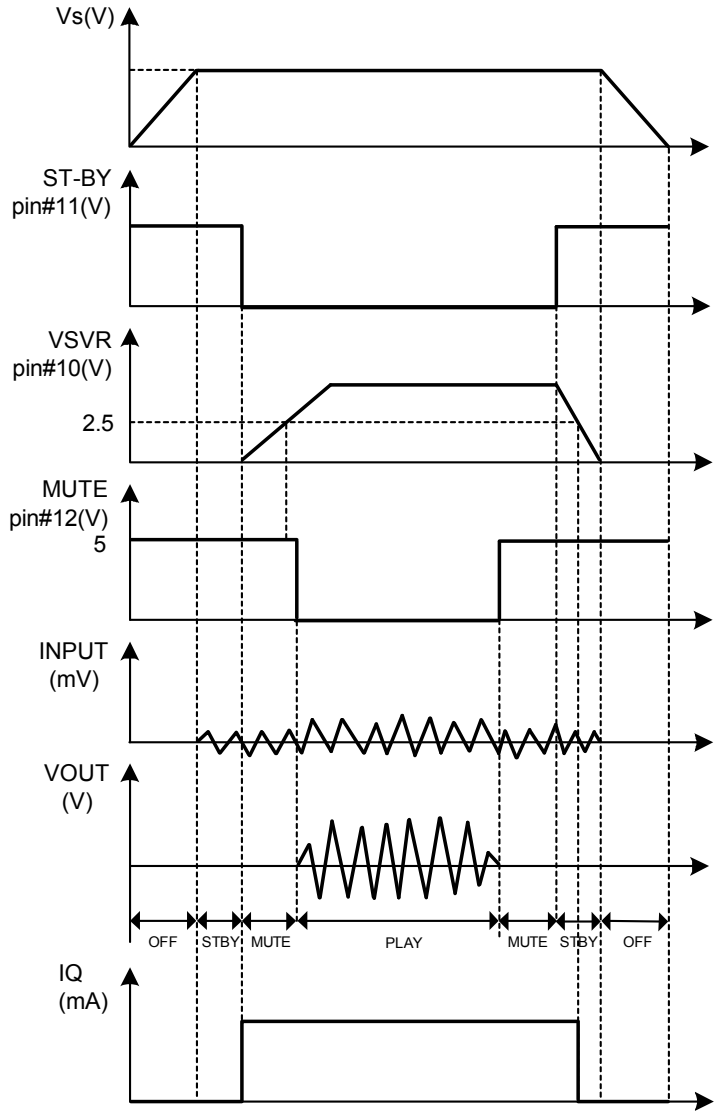
FIGURE 1. APPLICATION CIRCUIT

■ MUTE STAND-BY TRUTH TABLE

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

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

(A) USING MUTE AND STAND-BY FUNCTIONS



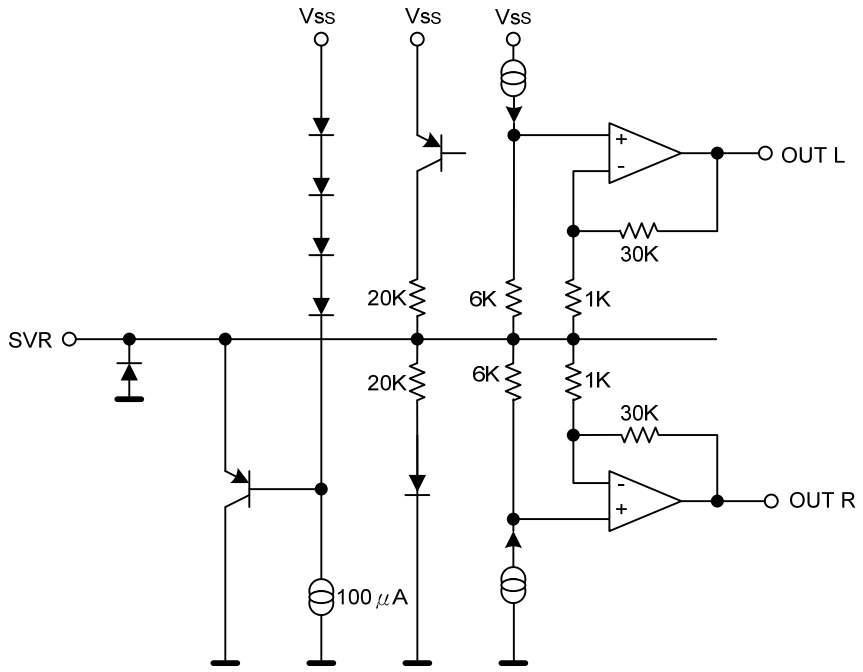
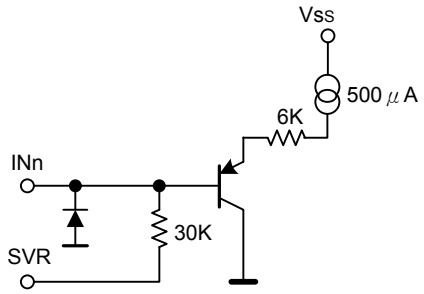
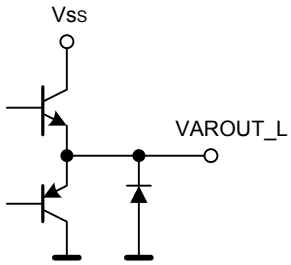
(B) USING ONLY THE MUTE FUNCTION

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

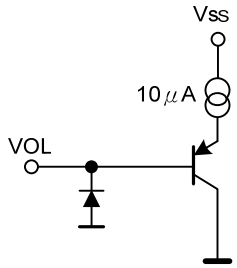
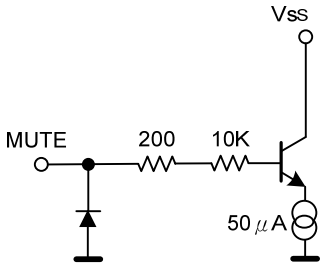
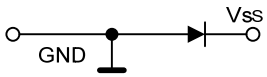
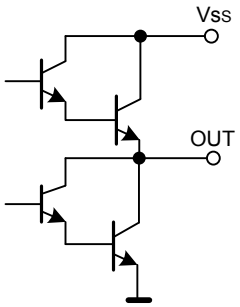
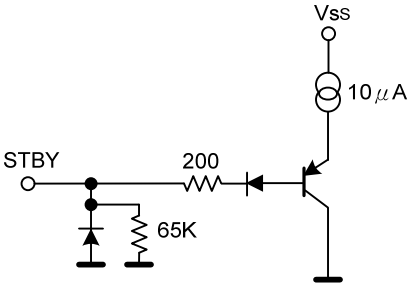
At the turn-on, the transition mute - play must be made when the SVR pin is higher than 2.5V.

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

■ FUNCTIONAL DESCRIPTION

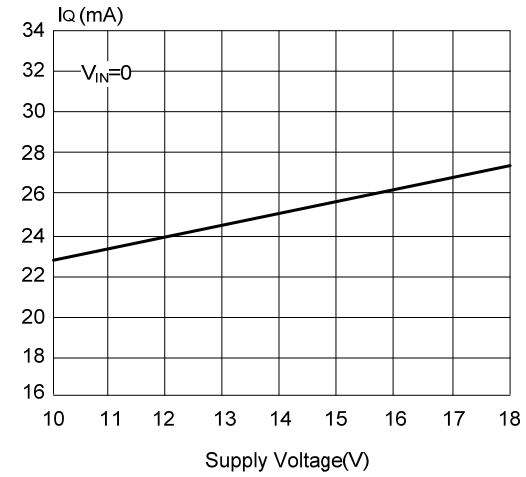
PIN	FIGURE
SVR	
INL,INR	
VAROUT_L, VAROUT_R	

■ FUNCTIONAL DESCRIPTION(Cont.)

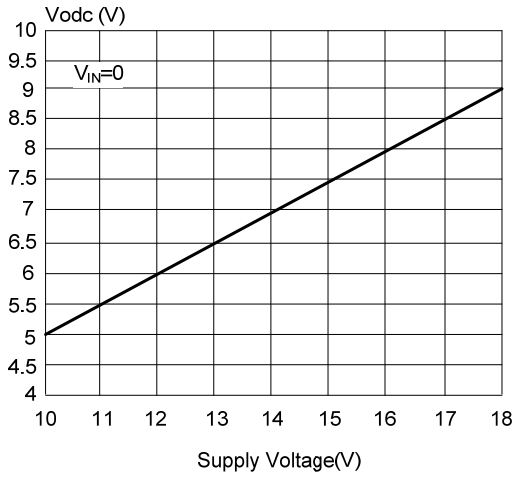
PIN	FIGURE
VOLUME	
MUTE	
PW_GND, S_GND	
VAROUT-L, VAROUT-R	
STBY	

■ TYPICAL CHARACTERISTICS

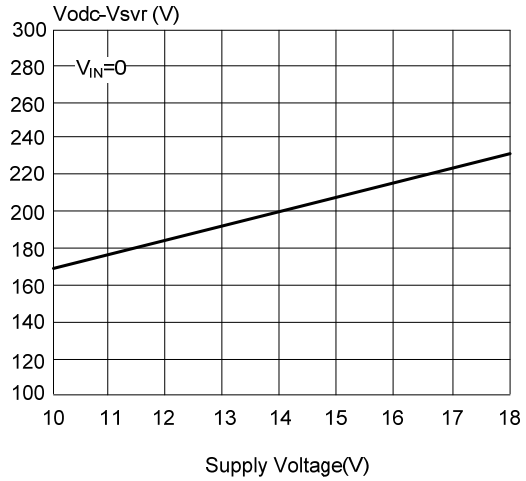
Quiescent current vs.Supply Voltage



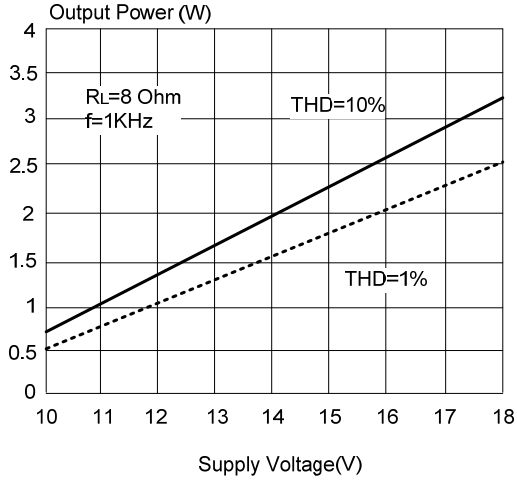
Output DC Voltage vs.Supply Voltage



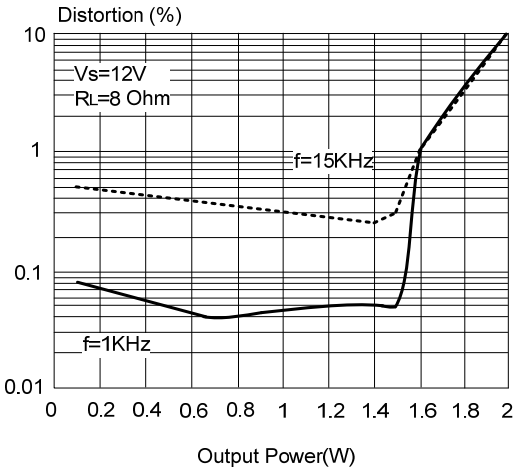
Output DC Offset vs.Supply Voltage



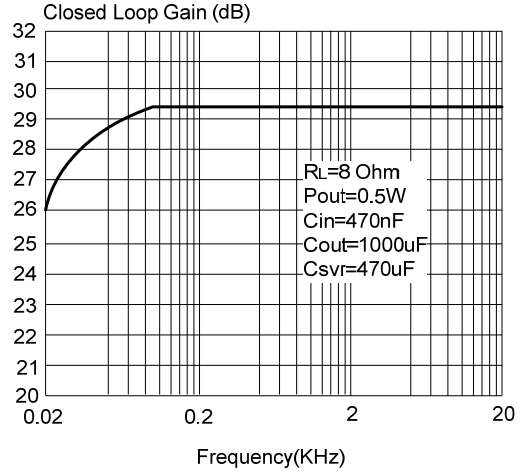
Output Power vs.Supply Voltage



Distortion vs.Output Power

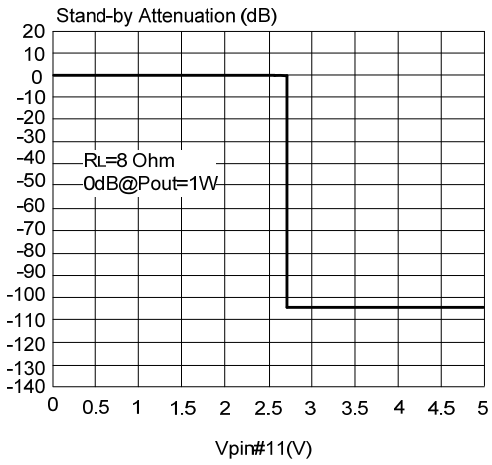


Closed Loop gain vs.Frequency

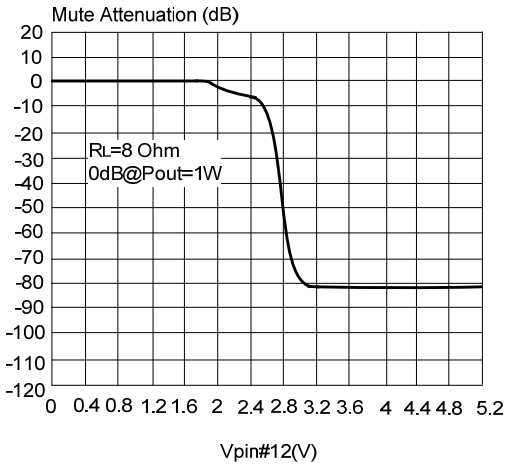


■ TYPICAL CHARACTERISTICS (Cont.)

St-By Attenuatio vs.Vpin



Mute Attenuation vs.Vpin 12



UTC assumes no responsibility for equipment failures that result from using products at values that exceed, even momentarily, rated values (such as maximum ratings, operating condition ranges, or other parameters) listed in products specifications of any and all UTC products described or contained herein. UTC products are not designed for use in life support appliances, devices or systems where malfunction of these products can be reasonably expected to result in personal injury. Reproduction in whole or in part is prohibited without the prior written consent of the copyright owner. The information presented in this document does not form part of any quotation or contract, is believed to be accurate and reliable and may be changed without notice.