

### Description

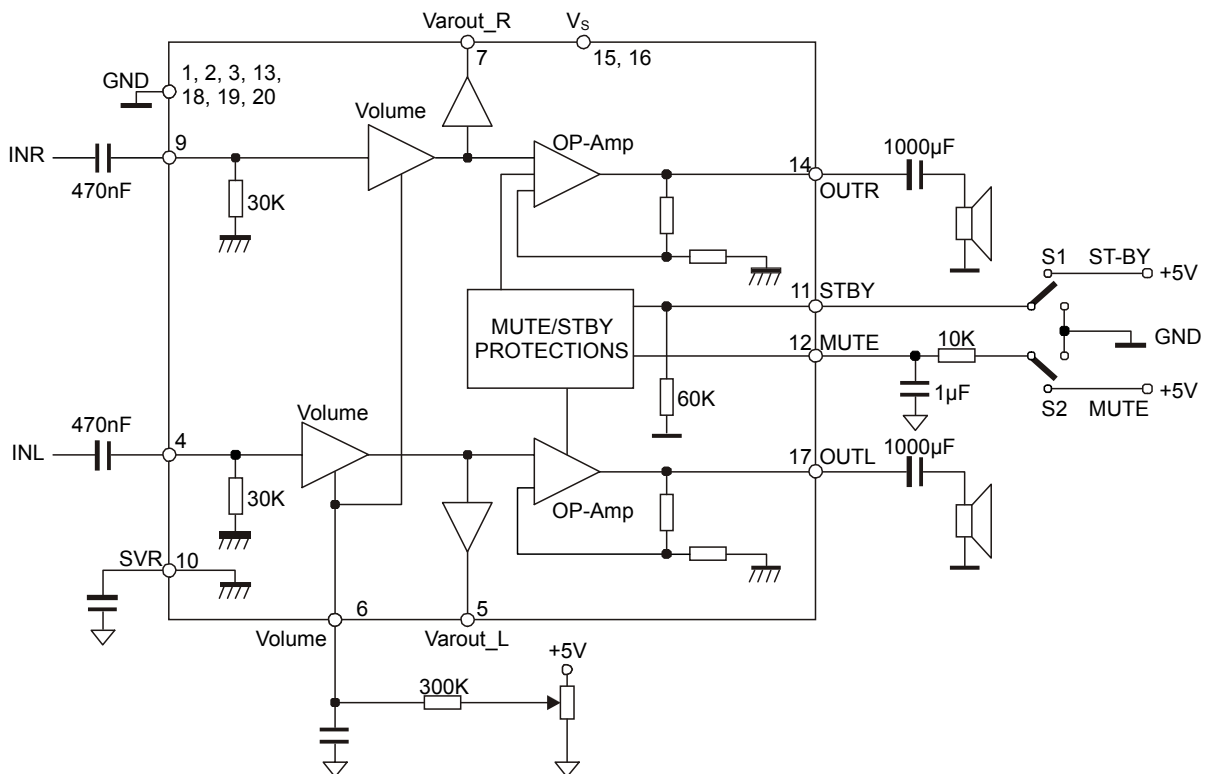
The GMA7496L is a stereo 2W+2W class AB power amplifier assembled in the Powerdip 14+3+3 package, specially designed for high quality sound, TV and monitor applications.

Features of the GMA7496L include linear volume control, stand-by and mute functions.

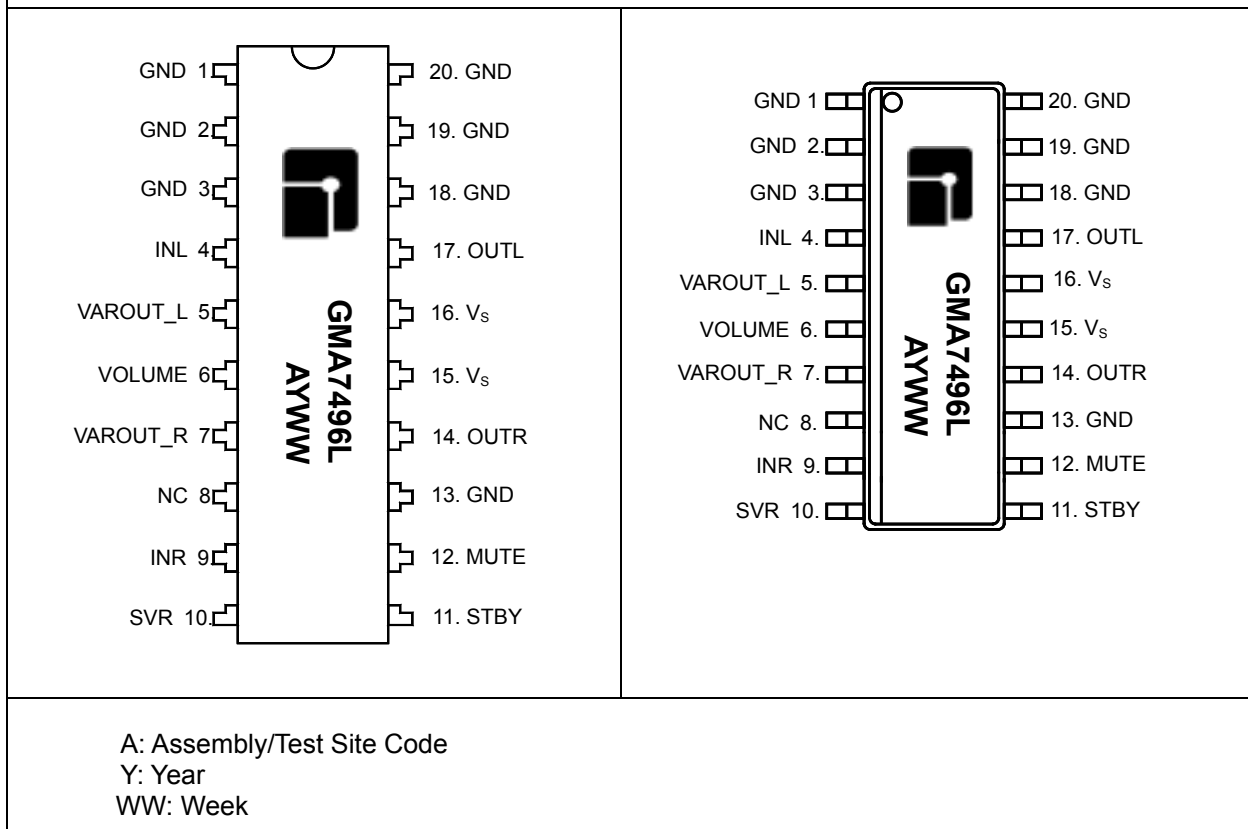
### Features

- ◆ **2W+2W Output Power  $R_L = 8\Omega$  @THD = 10%,  $V_{CC} = 14V$**
- ◆ **Standby 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**
- ◆ **DIP- 20 & SOP- 20 Package**

### Typical Application Circuit



### Marking Information and Pin Configurations (Top View)



### Ordering Information

Ordering Number	Package	Shipping
GMA7496LD20T	DIP-20	22 Units/Tube
GMA7496LS20T	SO-20	38 Units/Tube

## Absolute Maximum Ratings

PARAMETER	SYMBOL	RATINGS	UNITS
DC Supply Voltage	$V_S$	26	V
Maximum Input Voltage	$V_{IN}$	8	$V_{PP}$
Total Power Dissipation ( $T_{CASE} = 60^{\circ}C$ )	$P_{tot}$	6	W
Operating Ambient Temperature	$T_A$	0 to 70	
Storage Temperature	$T_{stg}$	- 40 to 150	
Volume CTRL DC Voltage	$V_6$	7	V
ESD Capability, Machine Mode	$V_{ESD}$	200	V

## Thermal Data

PARAMETER	SYMBOL	RATINGS	UNITS
Thermal Resistance Junction-pins (max)	$R_{th\ i-pins}$	15	$^{\circ}C/W$
Thermal Resistance Junction-Ambient (max)	$R_{th\ i-amb(*)}$	50	$^{\circ}C/W$

(\*) Mounted on PCB with no heatsink.

## Electrical Characteristics

Refer to the test circuit:  $V_S = 14V$ ,  $R_L = 8\Omega$ ,  $R_g = 50\Omega$ ,  $T_A = 25^\circ C$

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Supply Voltage	$V_S$		10		18	V
Total Quiescent Current	$I_Q$			25	50	mA
Output DC Offset Referred to SVR Potential	$DCV_{OS}$	No Input Signal		200		mV
Quiescent Output Voltage	$V_O$		6.0	6.7	8.0	V
Output Power	$P_O$	THD = 10%, $R_L = 8\Omega$	1.6	2		W
		THD = 1%, $R_L = 8\Omega$		1.3		
Total Harmonic Distortion	THD	$G_V = 30dB$ , $P_O = 1W$ , $f = 1kHz$			0.4	%
Output Peak Current	$I_{PEAK}$	(Internally Limited)	0.7	0.9		A
Input Signal	$V_{IN}$				2.8	$V_{RMS}$
Closed Loop Gain	$G_V$	Vol Ctrl > 4.5V	28.5	30	31.5	dB
Monitor Out Gain	$G_{VLine}$	Vol Ctrl > 4.5V, $Z_{load} > 30k\Omega$	-1.5	0	1.5	dB
Attenuation at Minimum Volume	$A_{MIN VOL}$	Vol Ctrl < 0.5V	80			dB
Frequency Response	BW			0.6		MHz
Total Output Noise	eN	f = 20Hz to 22KHz, Play Max Volume		500	800	$\mu V$
		f = 20Hz to 22KHz, Play Max Attenuation		100	250	
		f = 20Hz to 22KHz, Mute		60	150	
Slew Rate	SR		5	8		$V/\mu S$
Input Resistance	$R_i$		22.5	30		$k\Omega$
Variable Output Resistance	$R_{Var Out}$			30	100	$\Omega$
Variable Output Load	$R_{load Var}$		2			$k\Omega$
Supply voltage Rejection	SVR	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		
Thermal Muting	$T_M$			150		$^\circ C$
Thermal Shut-down	$T_S$			160		$^\circ C$

## Electrical Characteristics (continued)

Refer to the test circuit:  $V_S = 14V$ ,  $R_L = 80\Omega$ ,  $R_g = 50\Omega$ ,  $T_A = 25^\circ C$

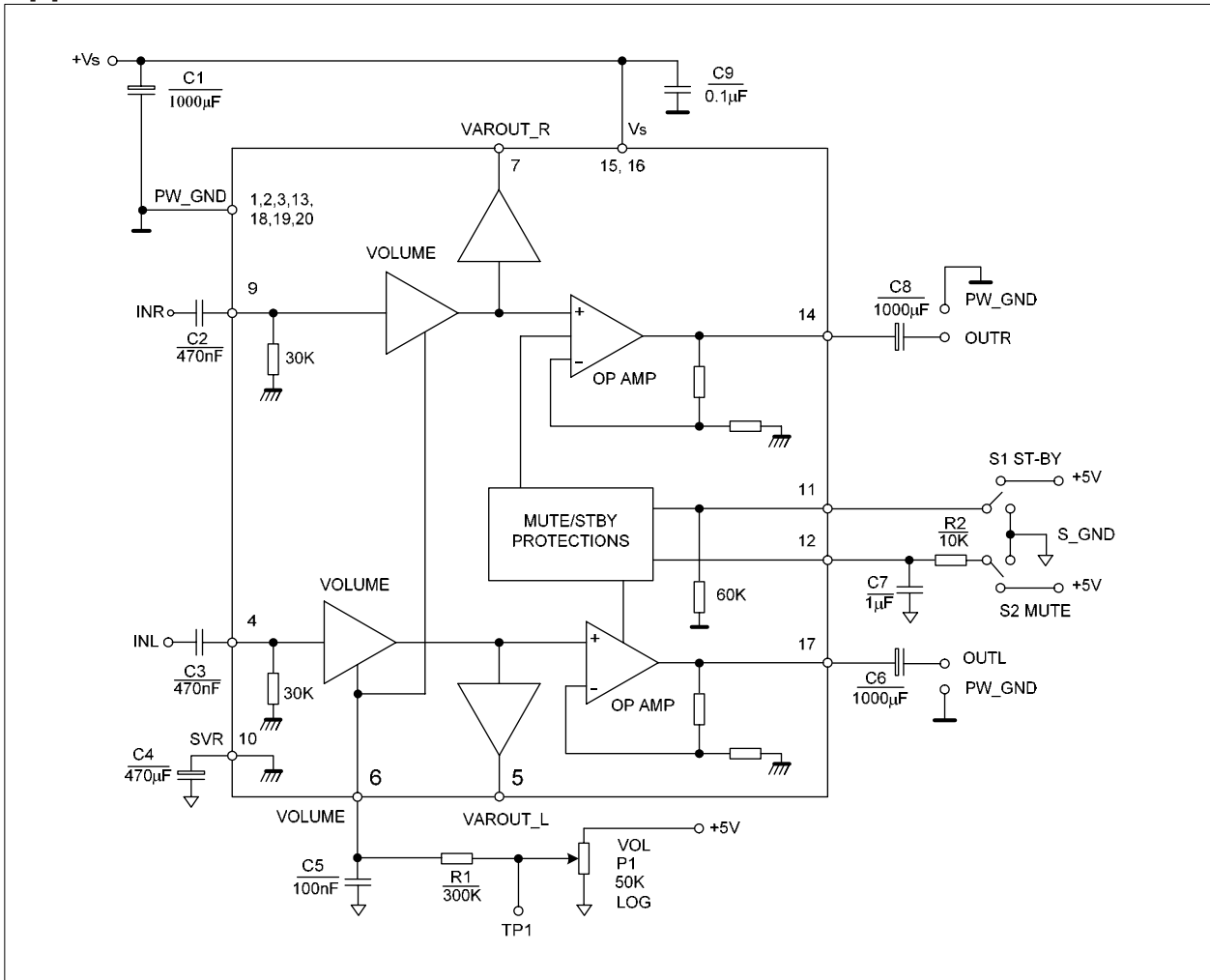
Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
<b>MUTE STAND-BY &amp; INPUT SELECTION FUNCTIONS</b>						
Stand-by ON Threshold	$V_{ST\ ON}$		3.5			V
Stand-by OFF Threshold	$V_{ST\ OFF}$				1.5	V
Mute ON Threshold	$V_{M\ ON}$		3.5			V
Mute OFF Threshold	$V_{M\ OFF}$				1.5	V
Quiescent Current @ Stand-by	$I_{q\ ST-BY}$			0.6	1	mA
Mute Attenuation	$A_{MUTE}$		50	65		dB
Stand-by Bias Current	$I_{ST-BY\ BIAS}$	Stand by on $V_{ST-BY} = 5V$		80		$\mu A$
		Play or Mute	-20	-5		
Mute Bias Current	$I_{mute\ BIAS}$	Mute		1	5	$\mu A$
		Play		0.2	2	

## Application Suggestions:

The recommended values of the external components are those shown in the application circuit of figure 1. However, different values can be used from the following table of references for further help.

Component	Suggestion Value	Purpose	Larger than Suggestion	Smaller than Suggestion
R1	300K	Volume control circuit	Longer volume regulation time	Shorter volume regulation time
R2	10K	Mute time constant	Longer mute on/off time	Shorter 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	Longer mute on/off time	Shorter 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

### Application Circuit:

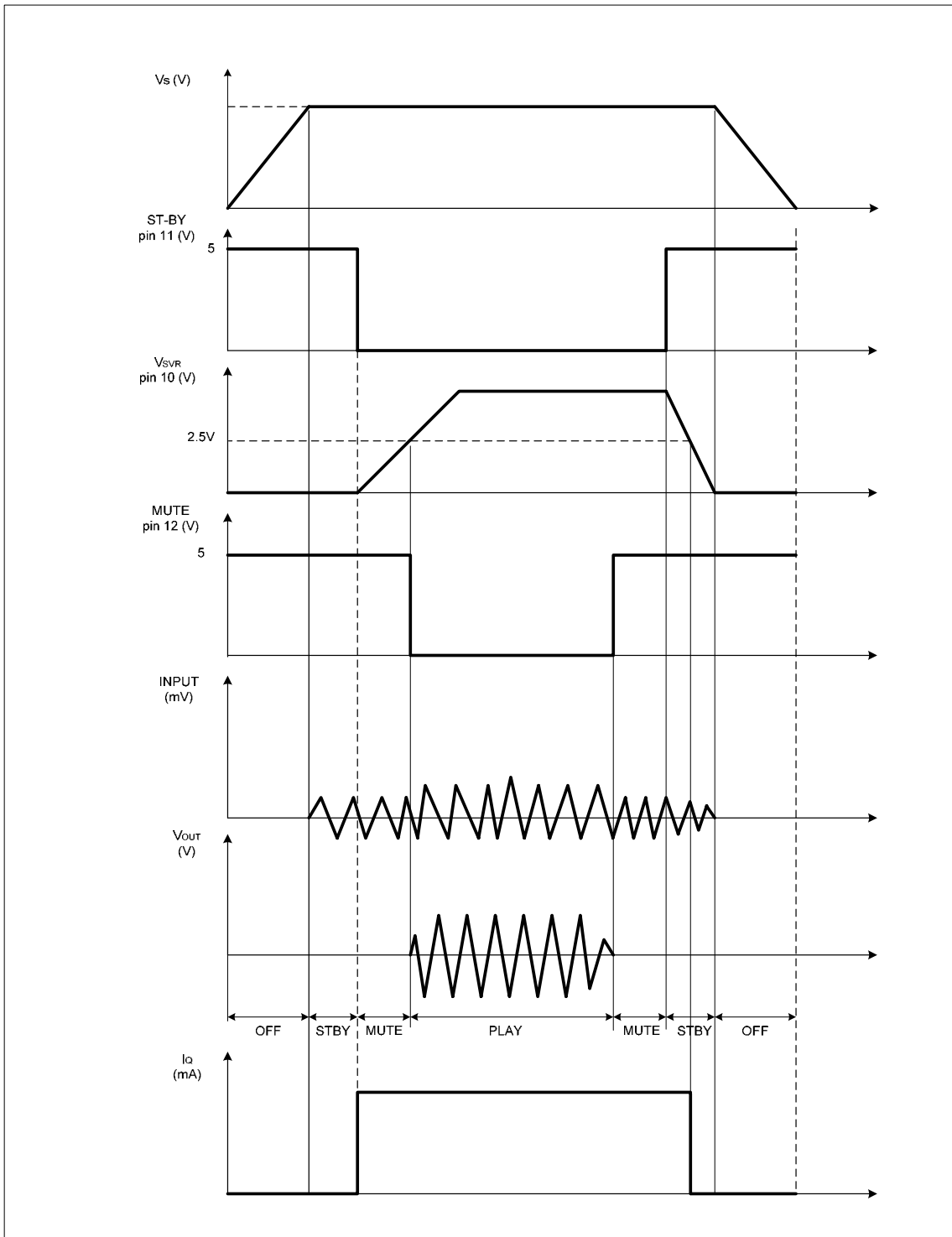


### Mute Stand-By Truth Table

MUTE	ST-BY	OPERATING CONDITIO
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



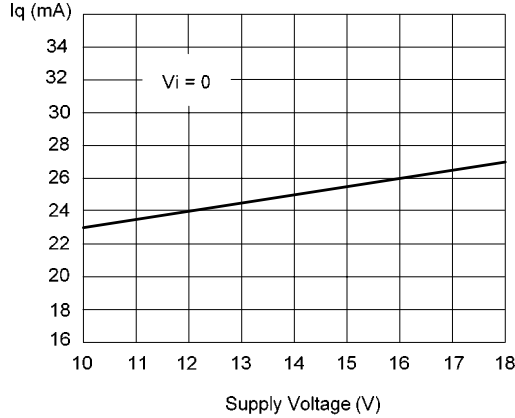
### B. USING ONLY THE MUTE FUNCTION

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.

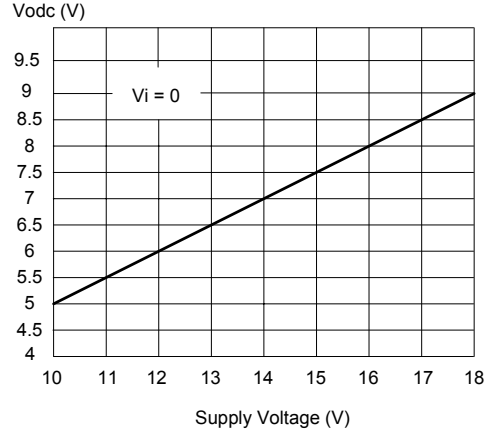
- At the turn-on, the transition mute-play must be made when the SVR pin is higher than 2.5V
- At the turn-off, the GMA7496L must be brought to mute from the play condition when the SVR pin is higher than 2.5V

### Typical Performance Characteristics:

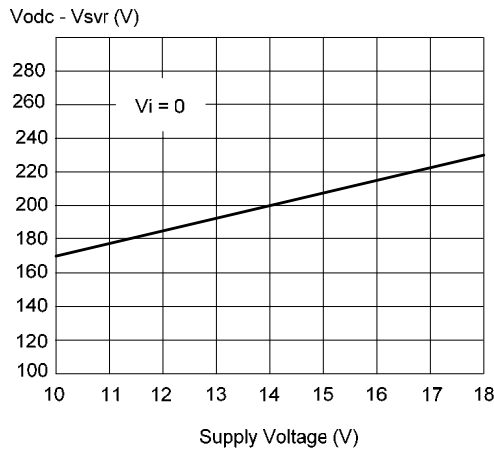
**Quiescent current vs. Supply Voltage**



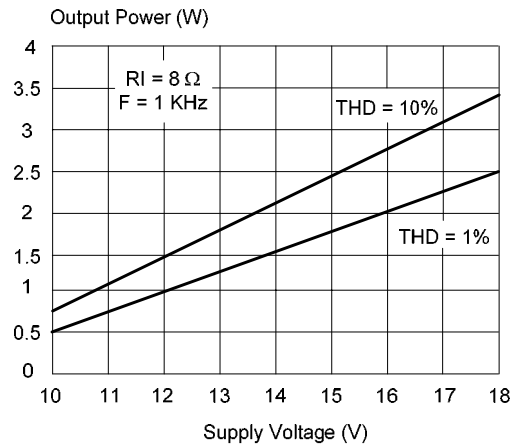
**Output DC Voltage vs. Supply Voltage**



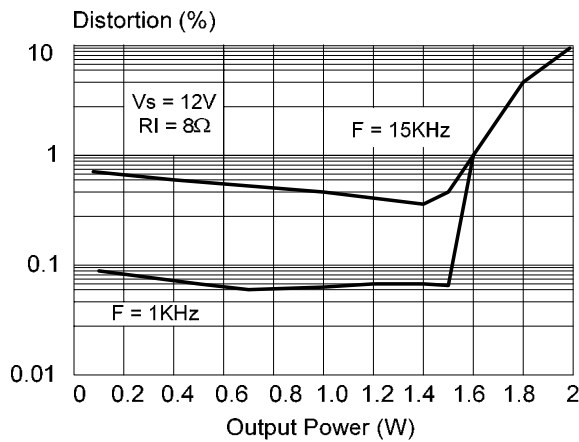
**Output DC Offset vs. Supply Voltage**



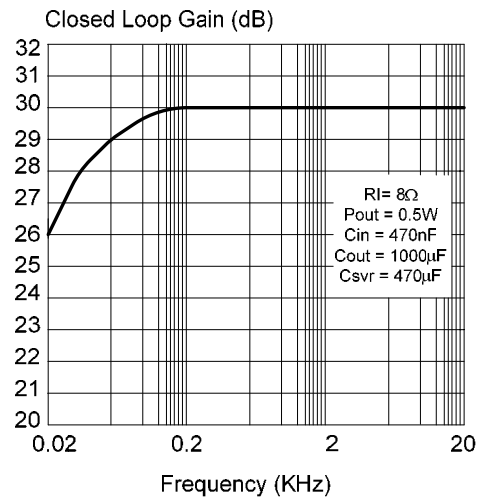
**Output Power vs. Supply Voltage**



**Distortion vs. Output Power**



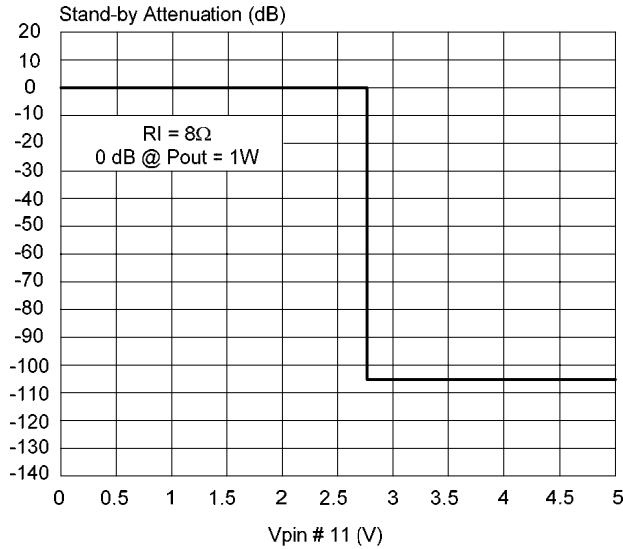
**Closed Loop gain vs. Frequency**



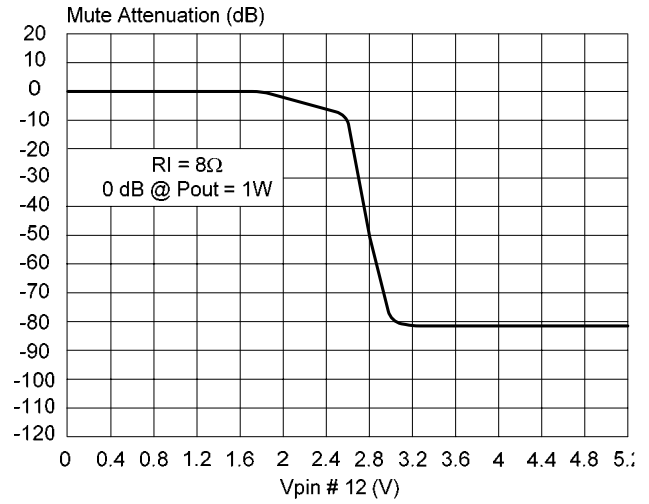


## Typical Performance Characteristics (continuous):

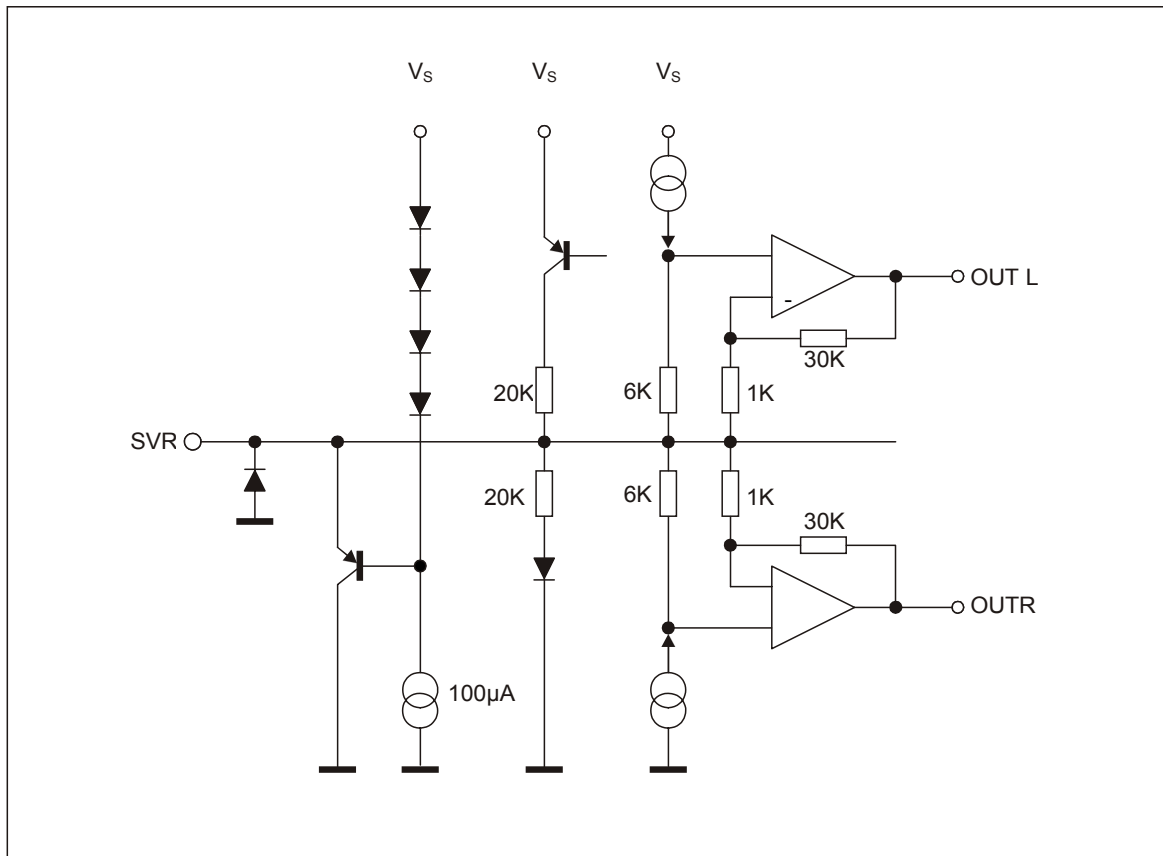
### St-By Attenuation vs. Vpin 11



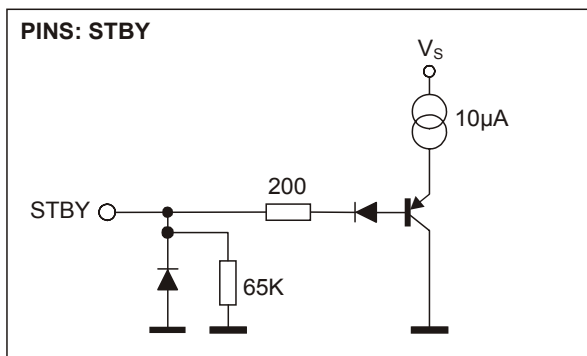
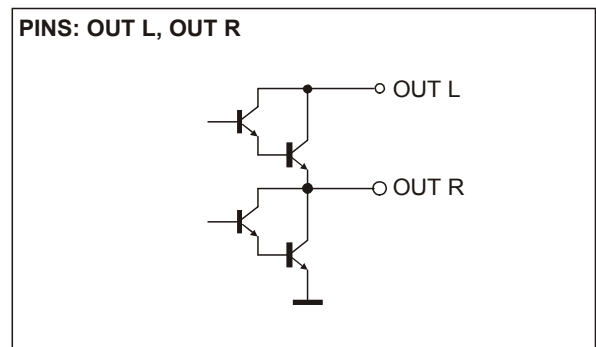
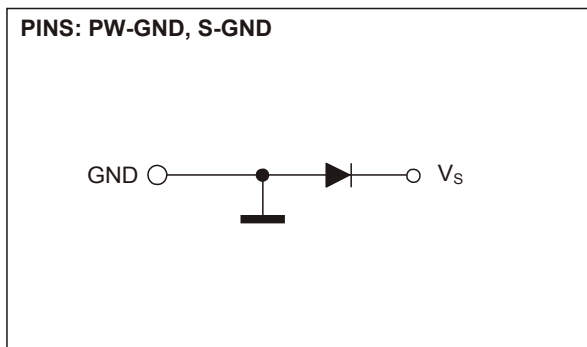
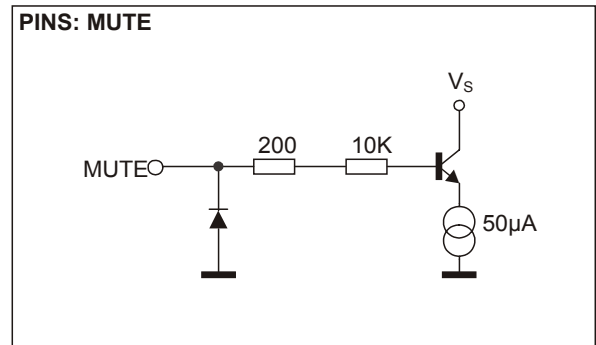
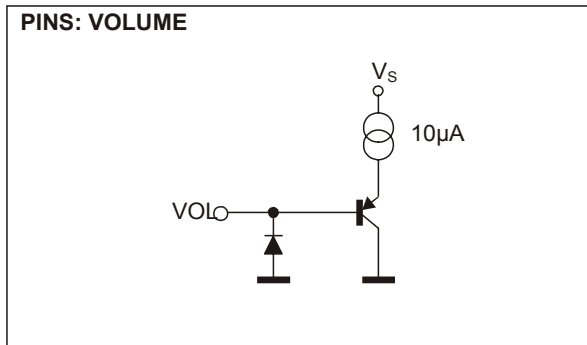
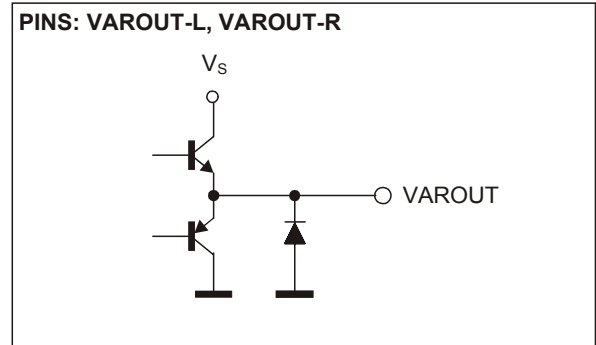
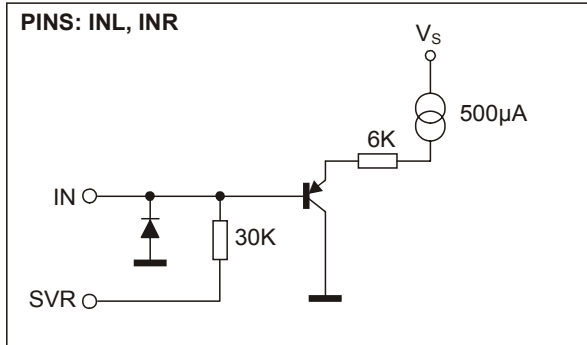
### Mute Attenuation vs. Vpin 12



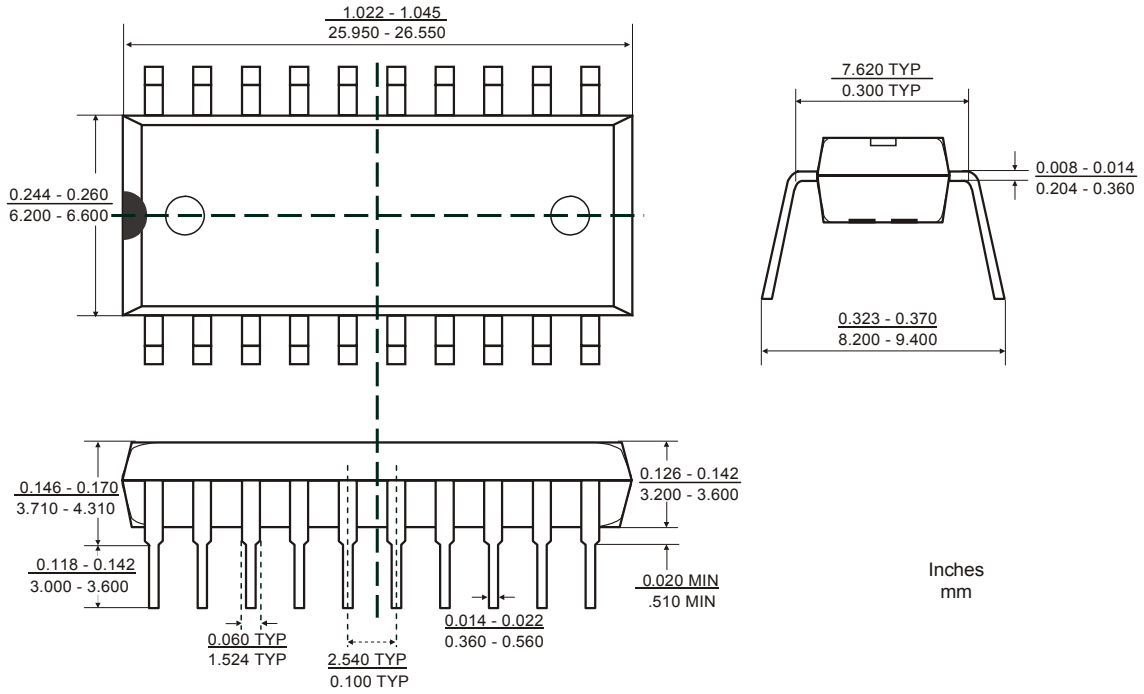
## Pin Descriptions



### Pin Descriptions (continued)



## Package Outline Dimensions – DIP 20



## Ordering Number

**GMA 7496L D20 I**

APM Gamma Micro	Circuit Type	Package Type	Shipping Type
		D20: DIP-20 S20: SOP-20	T: Tube R: Tape & Reel