

## 1200mW Audio Power Amp with Shutdown

### Features

- Operating voltage: 2.2V to 5.5V
- High signal-to-noise ratio
- Low distortion
- Large output voltage swing
- Low power consumption
- Output power 1200mW at 10% THD+N into 8Ω (V<sub>DD</sub>=5V)
- Wide temperature operating range
- Low power-on and chip enable or disable POP noise.
- Low standby current
- Power off control
- Direct drive speaker
- 8-pin SOP package

### Applications

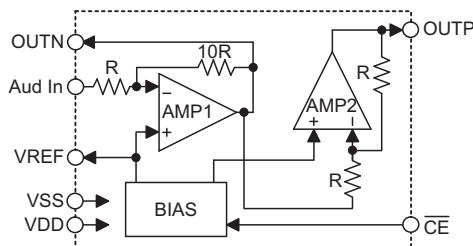
- Applied for HT36 series, HT86 series and other Holtek products

### General Description

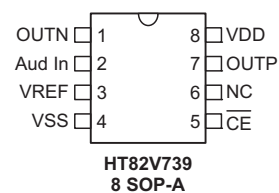
HT82V739 is an integrated class AB mono speaker driver contained in a 8-pin SOP package. The HT82V739 is capable of delivering 1200mW output power to an 8Ω load with less than 10% (THD+N) from a

5V power supply. The very low standby current in shutdown mode contributes to the reduction of power consumption of battery-powered equipments.

### Block Diagram



### Pin Assignment



### Pin Description

Pin No.	Pin Name	I/O	Description
1	OUTN	O	Negative output
2	Aud In	I	Audio input
3	VREF	O	Speaker non-inverting input voltage reference
4	VSS	—	Negative power supply, ground
5	CE	I	Chip enable, low active
6	NC	—	Not connected
7	OUTP	O	Positive output
8	VDD	—	Positive power supply

**Absolute Maximum Ratings**

Supply Voltage .....	$V_{SS}-0.3V$ to $V_{SS}+6.0V$	Storage Temperature .....	$-50^{\circ}C$ to $125^{\circ}C$
Input Voltage .....	$V_{SS}-0.3V$ to $V_{DD}+0.3V$	Operating Temperature .....	$-40^{\circ}C$ to $85^{\circ}C$

Note: These are stress ratings only. Stresses exceeding the range specified under "Absolute Maximum Ratings" may cause substantial damage to the device. Functional operation of this device at other conditions beyond those listed in the specification is not implied and prolonged exposure to extreme conditions may affect device reliability.

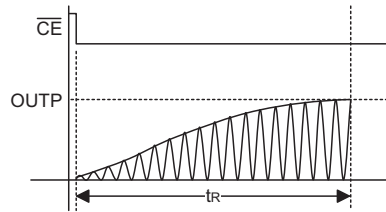
**Electrical Characteristics**
 $V_{SS}=0V, T_a=25^{\circ}C$ 

Symbol	Parameter	Test Conditions		Min.	Typ.	Max.	Unit	
		$V_{DD}$	Conditions					
<b>D.C. Characteristics</b>								
$V_{DD}$	Supply Voltage	—	—	2.2	5.0	5.5	V	
$I_{DD}$	Quiescent Power Supply Current	3V	$V_{IN}=0V_{P-P}$ , No load	—	2.2	4.0	mA	
		5V		—	3.5	6.0	mA	
$I_{SD}$	Shutdown Power Supply Current	5V	$V_{IN}=0V_{P-P}$ , $\overline{CE}=V_{DD}$ , No load	—	—	1	$\mu A$	
$V_{IH}$	Input High Voltage for $\overline{CE}$	—	—	$0.7V_{DD}$	—	$V_{DD}$	V	
$V_{IL}$	Input Low Voltage for $\overline{CE}$	—	—	0	—	$0.3V_{DD}$	V	
$P_O$	Output Power	3V	(THD+N)/S $\leq$ 1%, $V_{IN}=1kHz$ sinewave	$R_L=4\Omega$	198	330	—	mW
				$R_L=8\Omega$	180	300	—	
				$R_L=16\Omega$	144	240	—	
			(THD+N)/S $\leq$ 10%, $V_{IN}=1kHz$ sinewave	$R_L=4\Omega$	270	450	—	
				$R_L=8\Omega$	240	400	—	
				$R_L=16\Omega$	168	280	—	
		5V	(THD+N)/S $\leq$ 1%, $V_{IN}=1kHz$ sinewave	$R_L=4\Omega$	690	1150	—	mW
				$R_L=8\Omega$	570	950	—	
				$R_L=16\Omega$	390	650	—	
			(THD+N)/S $\leq$ 10%, $V_{IN}=1kHz$ sinewave	$R_L=4\Omega$	840	1400	—	
				$R_L=8\Omega$	720	1200	—	
				$R_L=16\Omega$	480	800	—	
<b>A.C. Characteristics</b>								
$t_{ON}$	Enable Time	3V	$V_{IN}=1kHz$ sinewave, No load	—	145	—	$\mu s$	
		5V		—	105	—	$\mu s$	
(THD+N)/S	Total Harmonic Distortion Plus Noise-to-signal Ratio	5V	Power output=500mW, $V_{IN}=1kHz$ sinewave	$R_L=4\Omega$	—	0.3	—	%
				$R_L=8\Omega$	—	0.18	—	%
				$R_L=16\Omega$	—	0.13	—	%
S/N	Signal to Noise Ratio	5V	$V_{IN}=1V_{rms}$ 1kHz sinewave	$R_L=4\Omega$	—	66	—	dB
				$R_L=8\Omega$	—	70	—	dB
				$R_L=16\Omega$	—	72	—	dB

**Functional Description**

**OUTP Rising Time ( $t_R$ )**

When  $\overline{CE}$  is active low, the HT82V739 needs rising time to output fully on OUTP pin. However, the rising time depends on C1. (\*see the application circuits)

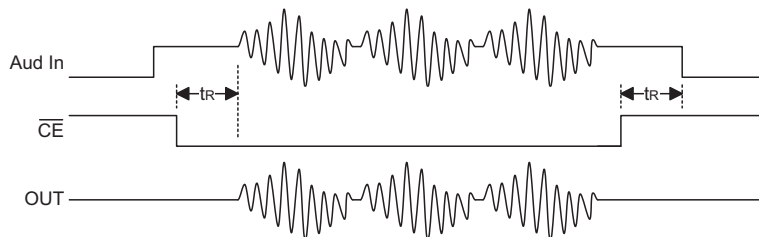


Voltage	Capacitor				
	$t_R$	0.1 $\mu$ F	1 $\mu$ F	4.7 $\mu$ F	10 $\mu$ F
2.2V		15ms	30ms	90ms	185ms
3V		15ms	30ms	90ms	185ms
4V		15ms	30ms	90ms	185ms

For battery based applications, power consumption is a key issue, therefore the amplifier should be turned off when in the standby state. In order to eliminate any speaker sound bursts while turning the amplifier on, the application circuit, which will incorporate a capacitance value of C1, should be adjusted in accordance with the speaker's audio frequency response. A greater value of C1 will improve the noise burst while turning on the amplifier. The recommended operation sequence is:

Turn On: "Aud In" signal standby (1/2 VDD) → enable amplifier → wait  $t_R$  for amplifier ready → "Aud In" signal start

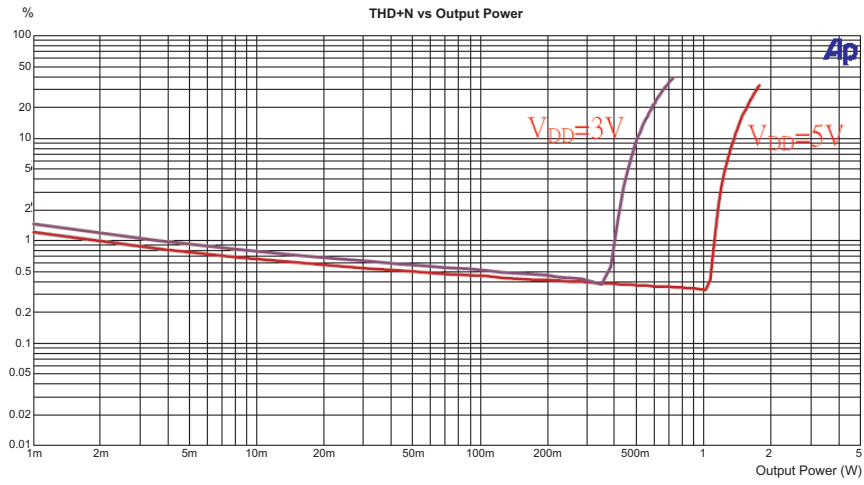
Turn Off: "Aud In" signal finish → disable amplifier → wait  $t_R$  for amplifier off → "Aud In" signal off



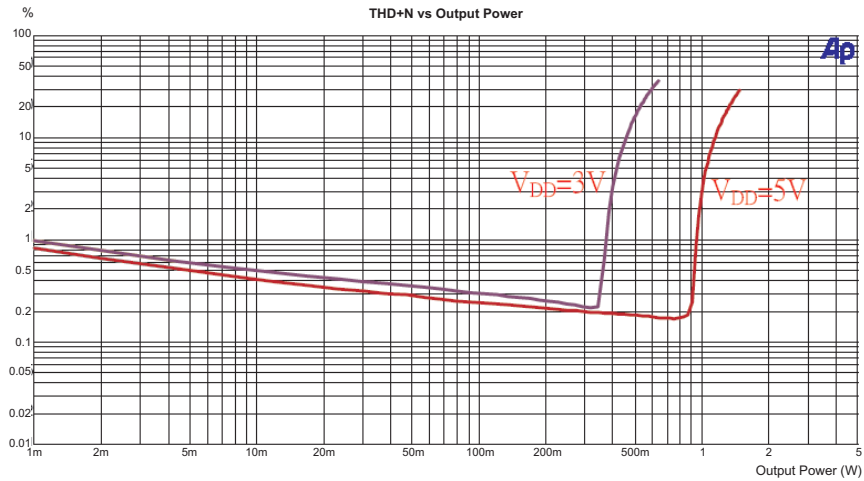
If the application is not powered by batteries and there is no problem with amplifier On/Off issue, a capacitor value of 0.1 $\mu$ F for C1 is recommended.

THD+N VS. Output Power

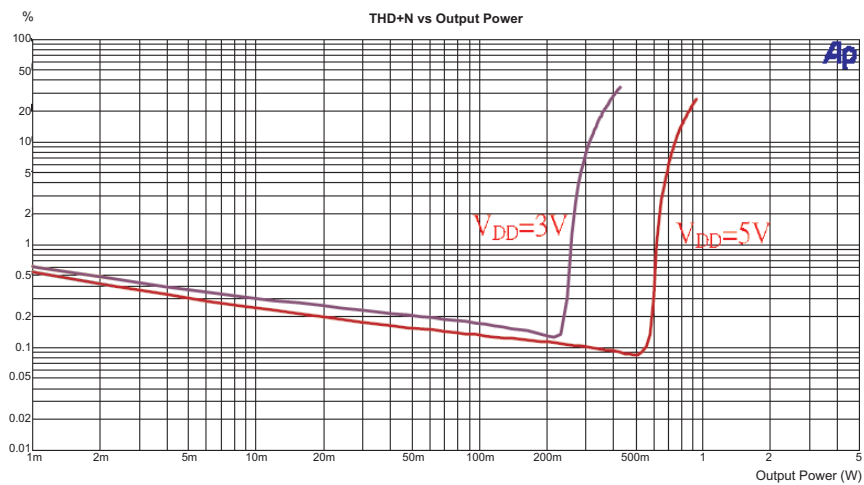
- $R_{LOAD}=4\Omega$ ,  $V_{IN}=1\text{kHz}$  sinewave



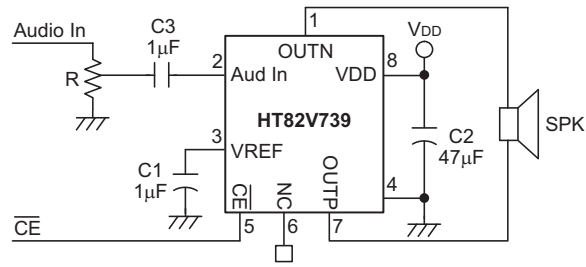
- $R_{LOAD}=8\Omega$ ,  $V_{IN}=1\text{kHz}$  sinewave



- $R_{LOAD}=16\Omega$ ,  $V_{IN}=1\text{kHz}$  sinewave



Application Circuits

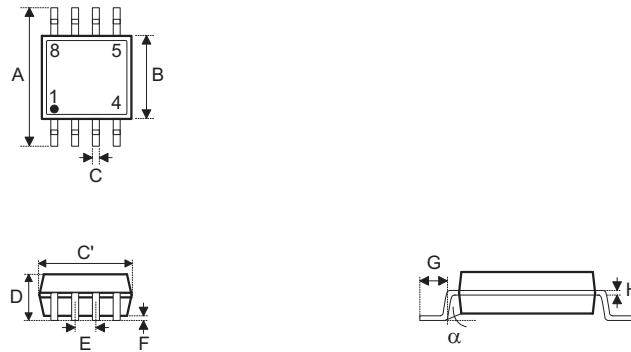


**Package Information**

Note that the package information provided here is for consultation purposes only. As this information may be updated at regular intervals users are reminded to consult the [Holtek website](#) for the latest version of the [Package/Carton Information](#).

Additional supplementary information with regard to packaging is listed below. Click on the relevant section to be transferred to the relevant website page.

- [Further Package Information \(include Outline Dimensions, Product Tape and Reel Specifications\)](#)
- [Packing Materials Information](#)
- [Carton information](#)

**8-pin SOP (150mil) Outline Dimensions**


Symbol	Dimensions in inch		
	Min.	Nom.	Max.
A	—	0.236 BSC	—
B	—	0.154 BSC	—
C	0.012	—	0.020
C'	—	0.193 BSC	—
D	—	—	0.069
E	—	0.050 BSC	—
F	0.004	—	0.010
G	0.016	—	0.050
H	0.004	—	0.010
$\alpha$	0°	—	8°

Symbol	Dimensions in mm		
	Min.	Nom.	Max.
A	—	6.00 BSC	—
B	—	3.90 BSC	—
C	0.31	—	0.51
C'	—	4.90 BSC	—
D	—	—	1.75
E	—	1.27 BSC	—
F	0.10	—	0.25
G	0.40	—	1.27
H	0.10	—	0.25
$\alpha$	0°	—	8°

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