Features

- Operating voltage: 2.2V to 5.5V
- High signal-to-noise ratio
- Low distortion
- Large output voltage swing
- Low power consumption
- Output power 1500mW at 10% THD+N into 8Ω (V_{DD}=5V)
- Wide temperature operating range
- Low power-on and chip enable or disable POP noise
- Low standby current
- Power off control
- Can directly drive speakers
- 8-pin SOP package

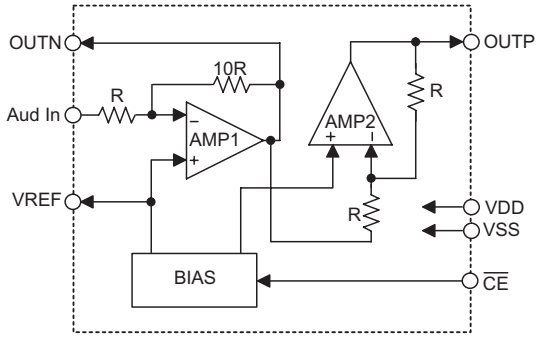
Applications

- Wide range of audio applications

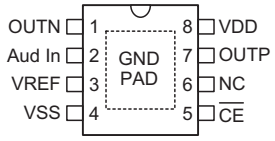
General Description

The HT82V73A is an integrated class AB mono speaker driver contained in an SOP 8-pin package. The device is capable of delivering 1500mW of output power into an 8Ω load with less than 10% (THD+N) distortion from a 5V power supply. When in the shutdown mode the very low standby current is an important feature for a wide range of battery powered audio applications.

Block Diagram



Pin Assignment



HT82V73A
8 SOP-A (EPAD)

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	$\overline{CE}$	I	Chip enable, low active
6	NC	—	Not connected
7	OUTP	O	Positive output
8	VDD	—	Positive power supply

PCB Layout Consideration

It is desirable to maximize the PCB cooper area connecting to GND/EPAD pin to achieve the best thermal performance, if the board space allowed, a ground plane is highly desirable.

Absolute Maximum Ratings

Supply Voltage ..... V_{SS}–0.3V to V_{SS}+6.0V

Storage Temperature ..... −50°C to 125°C

Input Voltage ..... V_{SS}–0.3V to V_{DD}+0.3V

Operating Temperature ..... −40°C to 85°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.

D.C. Characteristics

Ta=25°C, V_{DD}=5V, V_{SS}=0V (unless otherwise noted)

Symbol	Parameter	Test Conditions			Min.	Typ.	Max.	Unit
		V_{DD}	Conditions					
V_{DD}	Supply Voltage	—	—		2.2	5.0	5.5	V
I_{DD}	Quiescent Power Supply Current	3V	V_{IN}=0V, No load		1	3	7	mA
		5V			2	4	8	mA
I_{SD}	Shut-down Power Supply Current	5V	V_{IN}=0V, $\overline{CE}$=V_{DD}, No load		—	—	1	μA
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<1%, V_{IN}=1kHz sinewave	R_L=4Ω	—	600	—	mW
				R_L=8Ω	—	400	—	
				R_L=16Ω	—	250	—	
			(THD+N)/S<10%, V_{IN}=1kHz sinewave	R_L=4Ω	—	780	—	
				R_L=8Ω	—	550	—	
				R_L=16Ω	—	300	—	
		5V	(THD+N)/S<1%, V_{IN}=1kHz sinewave	R_L=4Ω	—	1850	—	mW
				R_L=8Ω	—	1200	—	
				R_L=16Ω	—	700	—	
			(THD+N)/S<10%, V_{IN}=1kHz sinewave	R_L=4Ω	—	2350	—	
				R_L=8Ω	—	1500	—	
				R_L=16Ω	—	850	—	

A.C. Characteristics

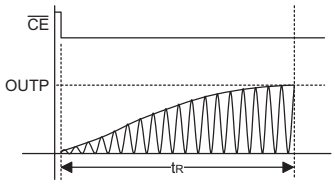
Ta=25°C, V_{DD}=5V, V_{SS}=0V (unless otherwise noted)

Symbol	Parameter	Test Conditions			Min.	Typ.	Max.	Unit
		V_{DD}	Conditions					
t_{Wake}	Wake-up Time	5V	R_L=8Ω	C_L=0.1μF	—	100	—	ms
				C_L=1μF	—	150	—	ms
				C_L=10μF	—	175	—	ms
(THD+N)/S	Total Harmonic Distortion plus. Noise-to-signal Ratio	5V	Output power = 500mW, V_{IN}=1kHz sinewave	R_L=4Ω	—	0.5	—	%
				R_L=8Ω	—	0.2	—	%
				R_L=16Ω	—	0.17	—	%
S/N	Signal to Noise Ratio	5V	V_O=1Vrms 1kHz sinewave	R_L=4Ω	—	71	—	dB
				R_L=8Ω	—	72.5	—	dB
				R_L=16Ω	—	73.5	—	dB

Functional Description

OUTP Rising Time (t_R)

When $\overline{CE}$ is active low, the device requires a certain time before it can output its full power on the OUTP pin. This time is dependent upon the value of C1. (*see the application circuits)

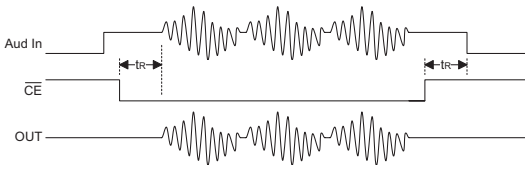


Capacitor / t_R / Voltage	0.1μF	1μF	4.7μF	10μF
2.2V	15ms	30ms	90ms	185ms
3.0V	15ms	30ms	90ms	185ms
4.0V	15ms	30ms	90ms	185ms

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 ($1/2V_{DD}$)→enable amplifier→wait t_R for amplifier ready→"Aud In" signal start

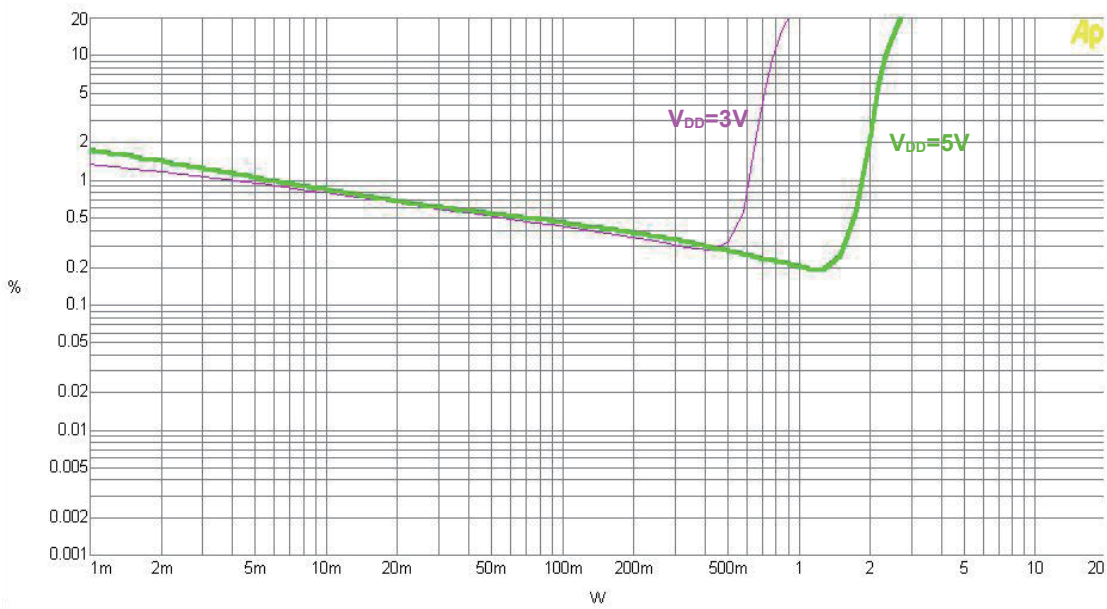
Turn Off: "Aud In" signal finish → disable amplifier → wait t_R for amplifier off → "Aud In" signal off



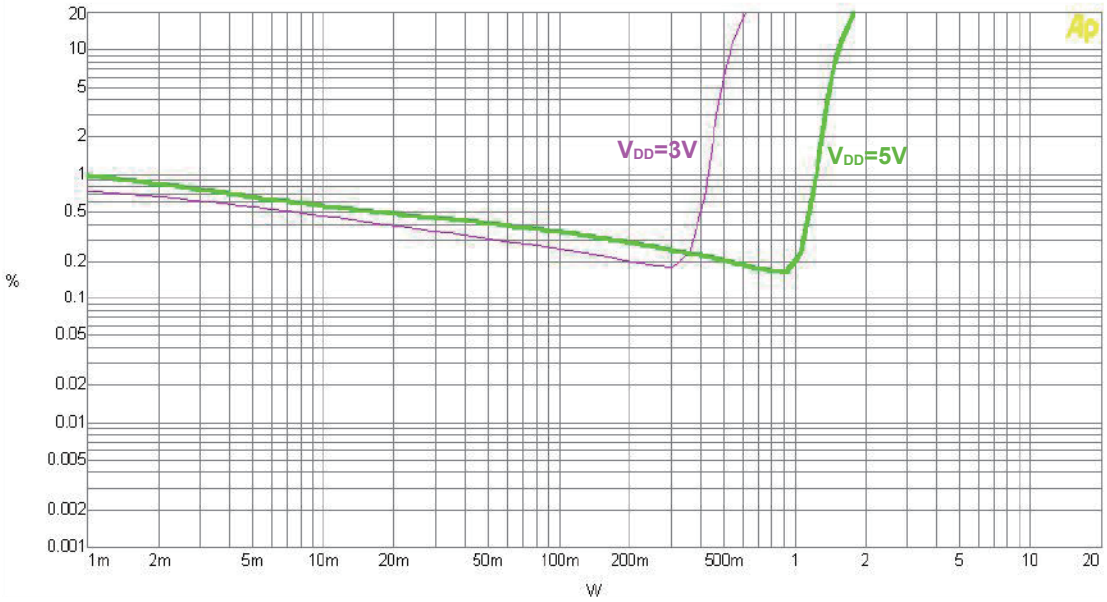
If the application is not powered by batteries and there is no problem with amplifier On/Off issue, a capacitor value of 0.1μF for C1 is recommended.

THD+N vs. Output Power @ V_{DD}=3V & 5V

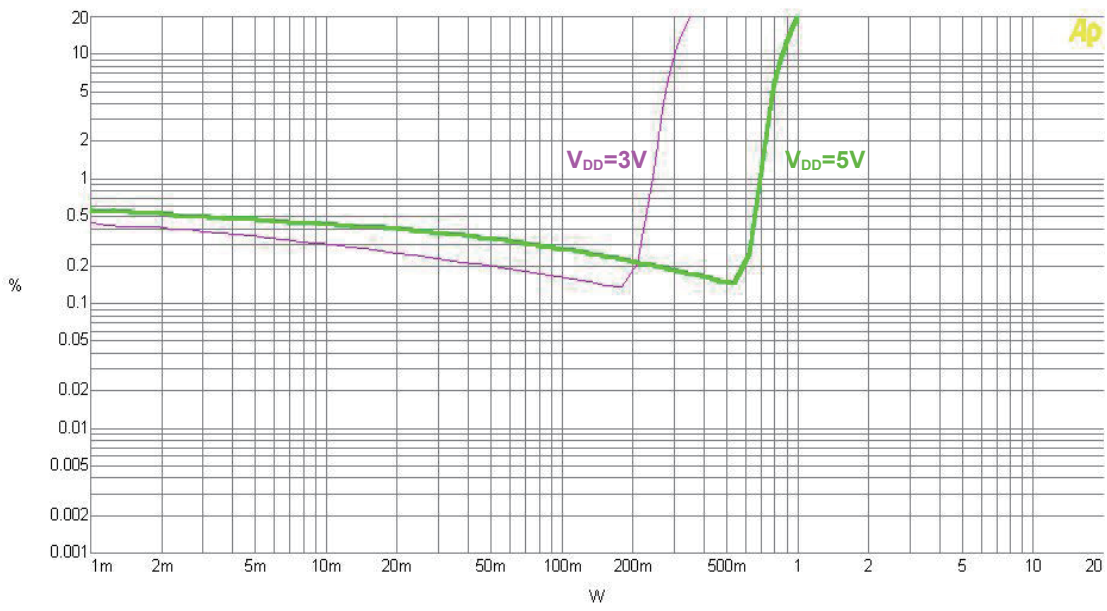
R_{LOAD}=4Ω, V_{IN}=1kHz sinewave



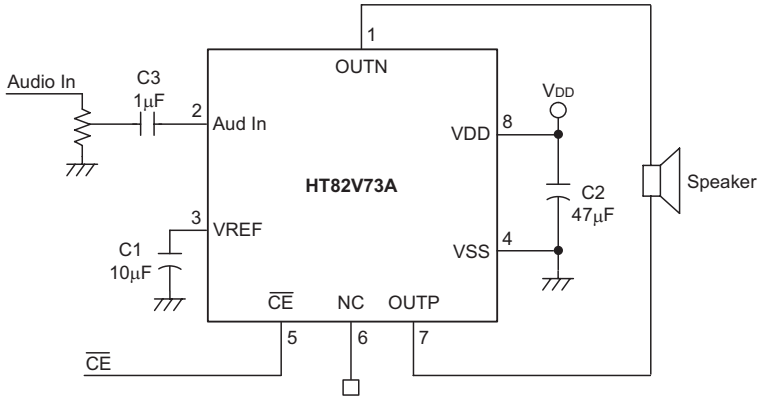
R_{LOAD}=8Ω, V_{IN}=1kHz sinewave



R_{LOAD}=16Ω, V_{IN}=1kHz sinewave



Application Circuits



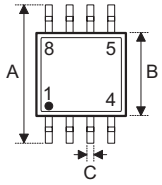
Package Information

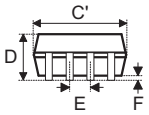
Note that the package information provided here is for consultation purposes only. As this information may be updated at regular intervals users are reminded to consult the Holtek website for the latest version of the Package/Carton Information.

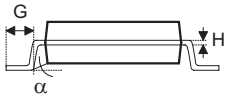
Additional supplementary information with regard to packaging is listed below. Click on the relevant section to be transferred to the relevant website page.

- Further Package Information (include Outline Dimensions, Product Tape and Reel Specifications)
- Packing Meterials 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
α	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
α	0°	—	8°