

Class AB Stereo Headphone Driver

Features

- Operating Voltage
 - Single Supply 3V to 7V
 - Dual Supply $\pm 1.5V$ to $\pm 3.5V$
- High Signal-to-Noise Ratio 100dB
- High Slew Rate 5V/ μs
- Low Distortion -65dB
- Large Output Voltage Swing
- Excellent Power Supply Ripple Rejection
- Low Power Consumption
- Short-circuit Elimination
- Wide Temperature Range
- No Switch ON/OFF Clicks
- Available in 8 pin SOP or DIP Package

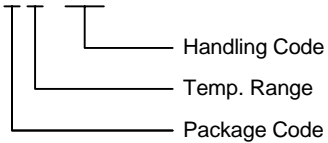
Applications

- Portable Digital Audio

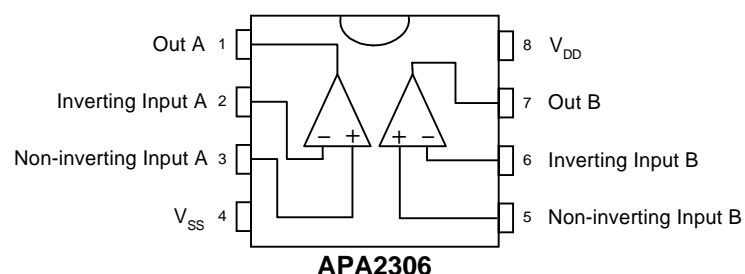
General Description

The APA2306 is an integrated class AB stereo headphone driver contained in an SO-8 or a DIP-8 plastic package. The APA2306 is capable of delivering 280mW of max. output power to an 8 Ω load or 110mW to a 32 Ω load with less than 10% (THD+N) from a 5V power supply. The device is fabricated in a CMOS process and has been primarily developed for portable digital audio applications.

Ordering Information

<p>APA2306 □□-□□</p>  <p>Handling Code</p> <p>Temp. Range</p> <p>Package Code</p>	<p>Package Code</p> <p>J : PDIP - 8</p> <p>K : SOP - 8</p> <p>Temp. Range</p> <p>I : 40 to 85 °C</p> <p>Handling Code</p> <p>TU : Tube TR : Tape & Reel</p>
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Block Diagram



ANPEC reserves the right to make changes to improve reliability or manufacturability without notice, and advise customers to obtain the latest version of relevant information to verify before placing orders.

Absolute Maximum Ratings

Symbol	Parameter	Rating	Unit
V_{DD}	Supply Voltage	8	V
$T_{SC(O)}$	Output Short-circuit Duration, at $T_A=25^{\circ}\text{C}$, $P_{TOT}=1\text{W}$	20	S
T_A	Operating Ambient Temperature range	-40 to 85	$^{\circ}\text{C}$
T_J	Maximum Junction Temperature	150	$^{\circ}\text{C}$
T_{STG}	Storage Temperature Range	-65 to +150	$^{\circ}\text{C}$
T_S	Soldering Temperature, 10 seconds	260	$^{\circ}\text{C}$
V_{ESD}	Electrostatic Discharge	-3000 to 3000 *1	V

Note: *1. Human body model : C=100pF, R=1500 Ω , 3 positive pulses plus 3 negative pulses

Thermal Characteristics

Symbol	Parameter	Value	Unit
R_{THJA}	Thermal Resistance from Junction to Ambient in Free Air		
	DIP-8	109	K/W
	SO-8	210	K/W

Electrical Characteristics

$V_{DD}=5\text{V}$, $V_{SS}=0\text{V}$, $T_A=25^{\circ}\text{C}$, $f_i=1\text{kHz}$, $R_L=32\Omega$ (unless otherwise noted)

Symbol	Parameter	Test Conditions	APA2306			Unit
			Min.	Typ.	Max.	
Supply						
V _{DD}	Supply Voltage					V
	Single		3.0	5.0	7.0	
	Dual		1.5	2.5	3.5	
V _{SS}	Negative Supply Voltage		-1.5	-2.5	-3.5	V
I _{DD}	Supply Current	No Load		2.5	5	mA
P _{TOT}	Total Power Dissipation	No Load		12.5	25	mW
DC Characteristics						
V _{I(OS)}	Input Offset Voltage			5		mV
I _{BIAS}	Input Bias Current			10		pA
V _{CM}	Common Mode Voltage		0		3.5	V
G _V	Open-loop Voltage Gain	R _L =5kΩ		75		dB
I _O	Max. Output Current	(THD+N)/S<0.1%		100		mA
R _O	Output Resistance			0.25		Ω
V _O	Output Voltage Swing	R _L =32Ω ^{*1}	0.25		4.75	V
		R _L =16Ω ^{*1}	0.5		4.5	
PSRR	Power Supply Rejection Ratio	f _i =100Hz V _{RI} PPLE(P-P)=100mV		65		dB
α _{CS}	Channel Separation	R _L =32Ω		95		dB
C _I	Load Capacitance				200	pF

Electrical Characteristics Cont.

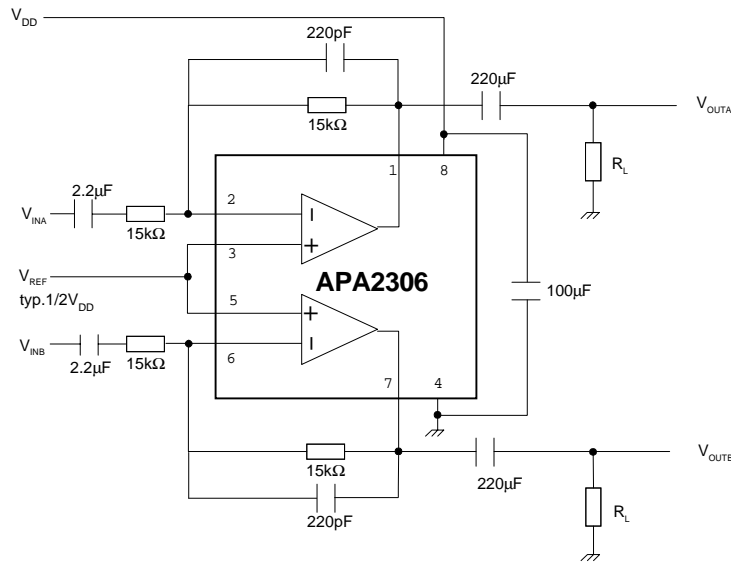
$V_{DD}=5V$, $V_{SS}=0V$, $T_A=25^{\circ}C$, $f_i=1kHz$, $R_L=32\Omega$ (unless otherwise noted)

Symbol	Parameter	Test Conditions	APA2306			Unit
			Min.	Typ.	Max.	
AC Characteristics						
(THD+N)/S	Total Harmonic Distortion plus Noise to Signal Ratio	$R_L=32\Omega^{*2}$		-65	-60	dB
				0.05	0.1	%
S/N	Signal to Noise Ratio		90	100		dB
f_G	Unity Gain Frequency	Open-loop, $R_L=5k\Omega$		5		MHz
P_O	Max. Output Power	(THD+N)/S < 0.1%		60		mW
C_i	Input Capacitance			3		pF
SR	Slew Rate	Unity Gain Inverting		5		V/ μs
B	Power Bandwidth	Unity Gain Inverting		20		kHz

Notes : * 1 : Values are proportional to V_{DD} ; (THD+N)/S < 0.1%

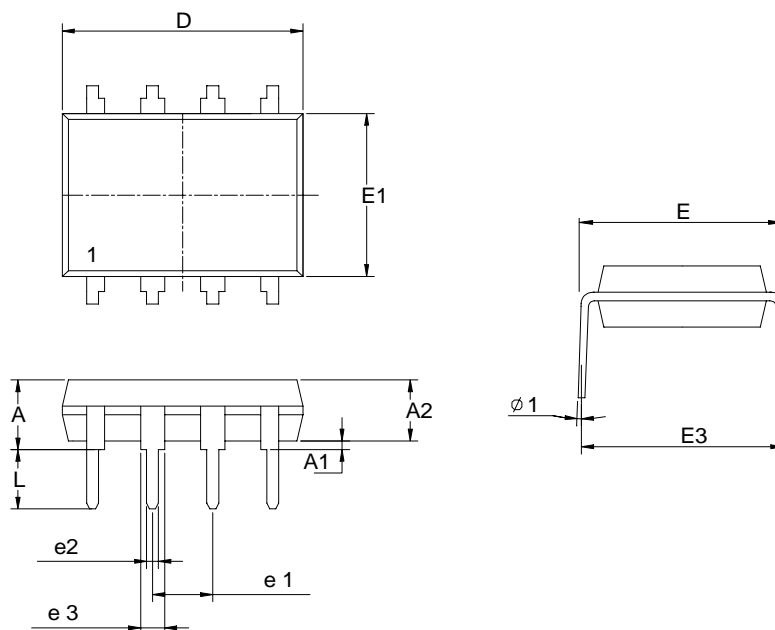
*2 : $V_{DD}=5.0V$; $V_{O(p-p)}=3.5V$ (at 0 dB)

Test And Application Circuits



Packaging Information

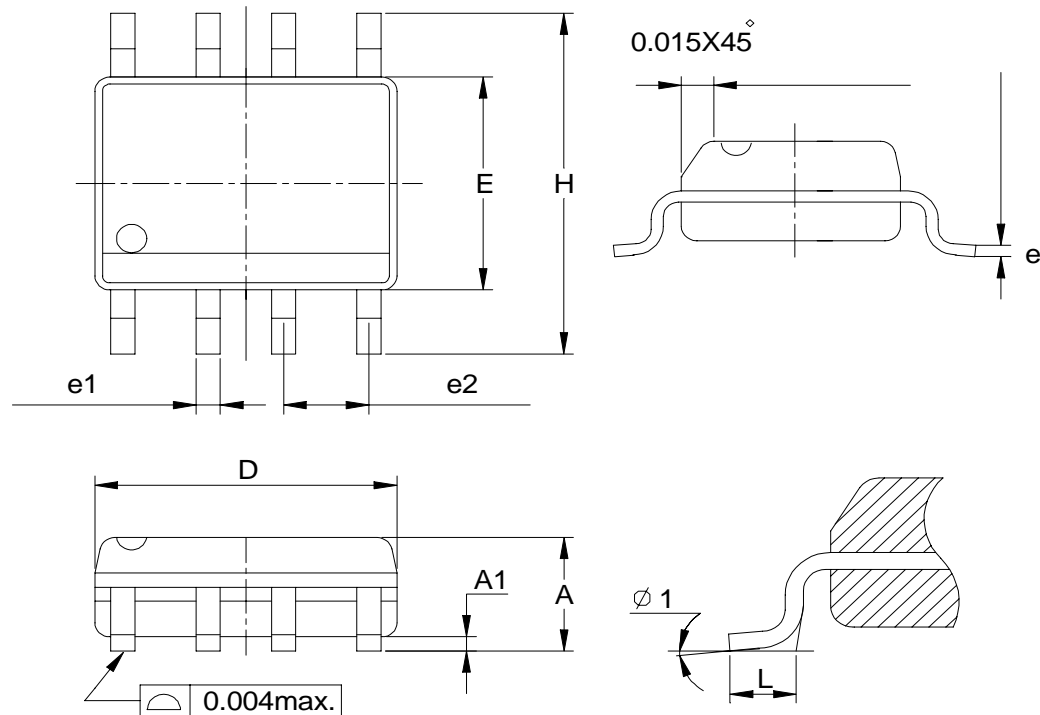
PDIP-8 pin (Reference JEDEC Registration MS-001)



Dim	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A		5.33		0.210
A1	0.38		0.015	
A2	2.92	3.68	0.115	0.145
D	9.02	10.16	0.355	0.400
e1	2.54BSC		0.100BSC	
e2	0.36	0.56	0.014	0.022
e3	1.14	1.78	0.045	0.070
E	7.62 BSC		0.300 BSC	
E1	6.10	7.11	0.240	0.280
E3		10.92		0.430
L	2.92	3.81	0.115	0.150
φ 1	15°		15°	

Packaging Information

SOP-8 pin (Reference JEDEC Registration MS-012)



Dim	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	1.35	1.75	0.053	0.069
A1	0.10	0.25	0.004	0.010
D	4.80	5.00	0.189	0.197
E	3.80	4.00	0.150	0.157
H	5.80	6.20	0.228	0.244
L	0.40	1.27	0.016	0.050
e1	0.33	0.51	0.013	0.020
e2	1.27BSC		0.50BSC	
Ø 1	0°	8°	0°	8°