Class AB Stereo Headphone Driver with Mute

Features

- High Signal-to-Noise Ratio
- High Slew Rate
- Low Distortion
- Large Output Voltage Swing
- Flexible Mute Function
- Excellent Power Supply Ripple Rejection
- Low Power Consumption
- Short-circuit Elimination
- Wide Temperature Range
- No Switch ON/OFF Clicks
- Integrated Voltage Divider (V_{DD}/2) to Eliminate External Resistors

Applications

- Portable Digital Audio

General Description

The APA3541 is an integrated class AB stereo headphone driver contained in an SO-8 or a DIP-8 plastic package with Mute feature . Besides the common Mute feature , the APA3541 further integrates a voltage divider inside the chip . Thus , the external resistors can be eliminated . The device is fabricated in a CMOS process and has been primarily developed for portable digital audio applications .

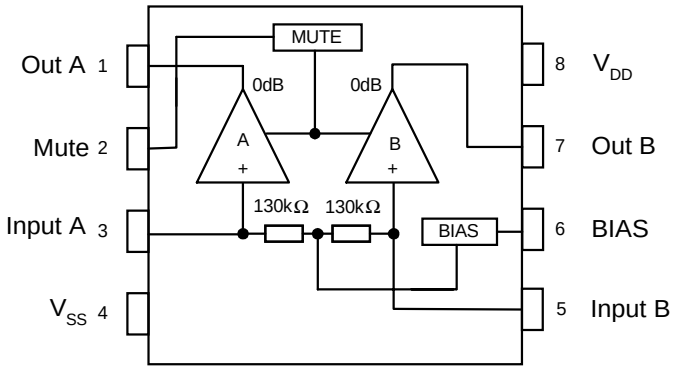
Ordering Information

APA3541 □□-□□

Handling Code
Temp. Range
Package Code

Package Code
J : PDIP-8
K : SOP-8
Y : Chip Form
Temp. Range
I : - 40 to 85 C
Handling Code
TU : Tube
TR : Tape & Reel

Block Diagram



Function Pin Description

Pin Name	I/O	Function Description
Out A	O	A channel output pin
Mute	I	Chip disable control input, low active and high for normal operating
Input A	I	A channel input terminal
V_{SS}		Power ground pin
Input B	I	B channel input terminal
BIAS	I	Right channel bias input pin
OUT B	O	B channel output pin
V_{DD}		Power input pin

Absolute Maximum Ratings

Symbol	Parameter	Rating	Unit
V_{DD}	Supply Voltage	8	V
$t_{SC(O)}$	Output Short-circuit Duration, at T_A=25°C, P_{tot}=1W	20	S
T_A	Operating Ambient Temperature range	-40 to 85	°C
T_J	Maximum Junction Temperature	150	°C
T_{STG}	Storage Temperature Range	-65 to +150	°C
T_S	Soldering Temperature,10 seconds	300	°C
V_{ESD}	Electrostatic Discharge	-3000 to 3000 *1	V

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

Thermal Characteristics

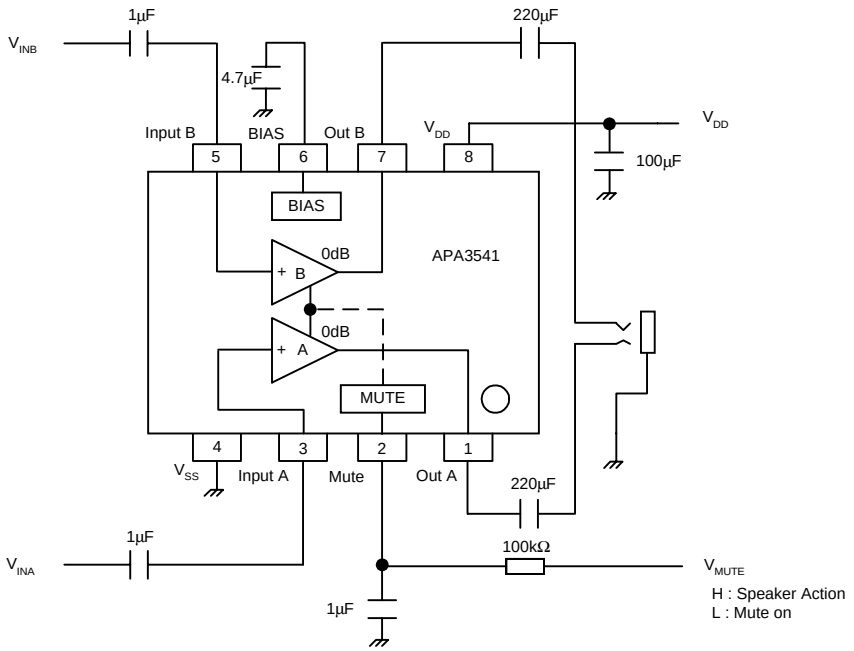
Symbol	Parameter	Value	Unit
R_{THJA}	Thermal Resistance from Junction to Ambient in Free Air		
	DIP-8	109	K/W
	SO-8	210	K/W

Electrical Characteristics

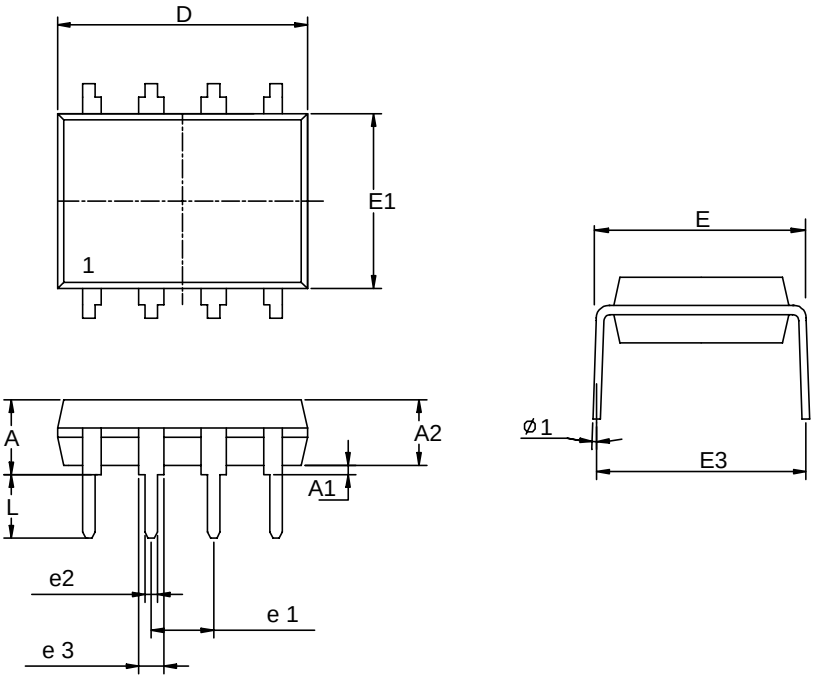
V_{IN}=0dBV, V_{CC}=5V, T_A=25°C, f=1kHz, R_L=32Ω (unless otherwise noted)

Symbol	Parameter	Test Conditions	APA3541			Unit
			Min.	Typ.	Max.	
I_Q	Quiescent Current	V_{IN} = 0 Vrms		3.5	5	mA
V_{TM}	Mute Terminal Voltage		0.3	0.7	1.6	V
G_{VCL}	Voltage Gain	V_{IN} = 1 Vrms , f =1kHz, R_L=32Ω	-2	0	2	dB
ΔG_{VC}	Differential Channel Voltage Gain		-0.5	0	0.5	dB
THD	Total Harmonic Channel Distortion Factor	BW<80 kHz		0.03	0.1	%
P_{U1}	Rated Output Power 1	R_L=32Ω , THD+N = 0.1%, BW<80 kHz		55		mW
P_{U2}	Rated Output Power 2	R_L=16Ω , THD+N = 0.1% , BW<80 kHz		100		mW
V_{NO}	Output Noise Voltage	BW= 20~ 20 kHz, V_{IN} = 0 Vrms		-93	-85	dBv
CS	Channel Separation	f =1 kHz	-80	-85		dB
ATT	Mute Attenuation	V_{IN} = 1 Vrms, f =1 kHz, Mute=L	65	70		dB
RR	Ripple Rejection	F_{RR} =100Hz, V_{RR} = -20dBv	50	60		dB

Test and Application Circuit



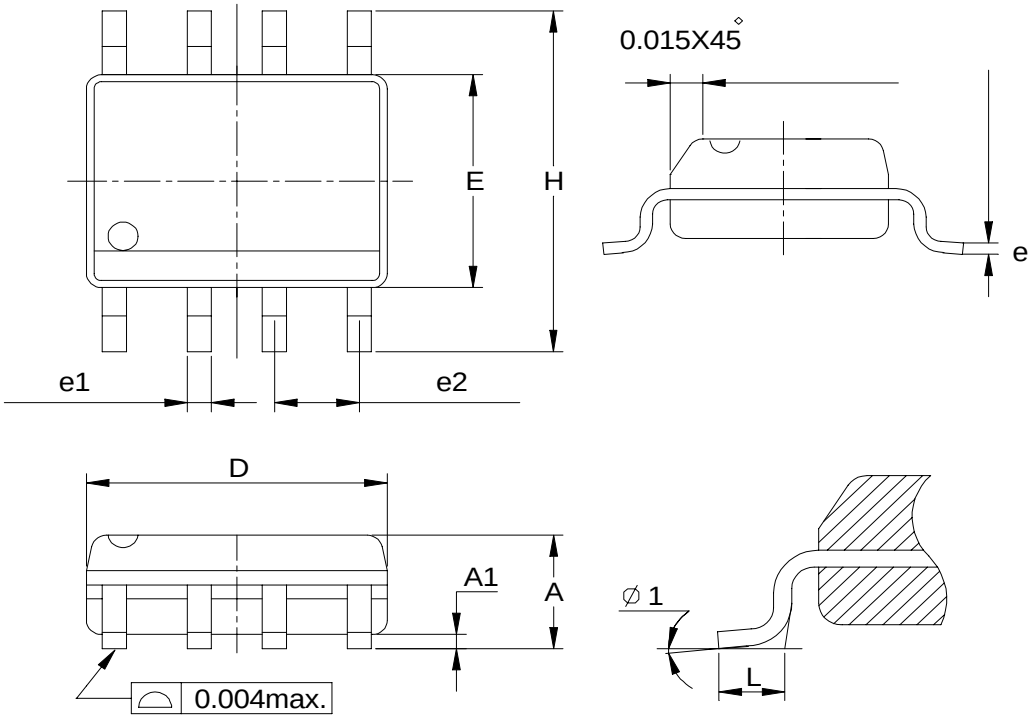
Packaging Information



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	
ϕ 1	0°	8°	0°	8°