



TP5228

Class AB Stereo Headphone
Driver with Mute

DataSheet

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General Specification

The TP5228 is an integrated class AB stereo headphone driver contained in an SO-8 or a DIP-8 plastic package with Mute feature. The TP5228 operates in low power mode to reduce supply current to $600\ \mu A$ and keep no switch ON/OFF clicks. Besides the common Mute feature, the TP5228 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.

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 ($\frac{V_{DD}}{2}$) to Eliminate External Resistors

Applications

- ◆ Portable Digital Audio



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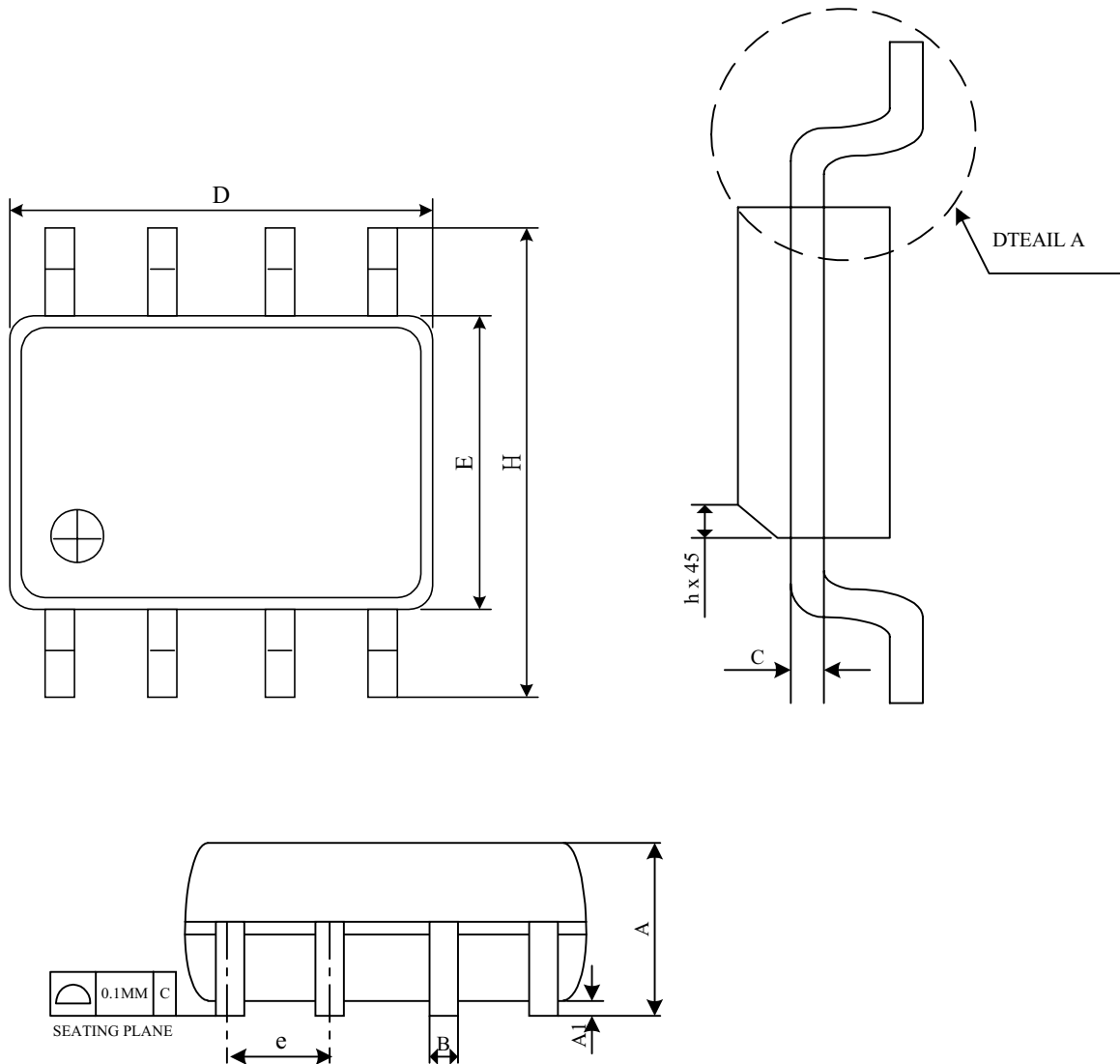
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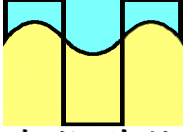
Pin Configurations and Package Type

Package Information

SOP-8



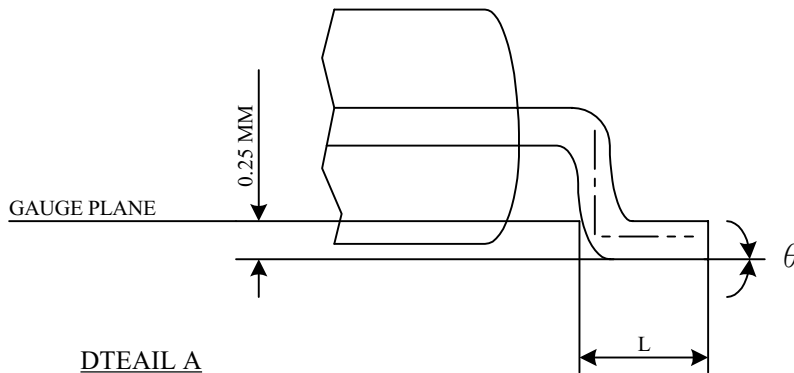
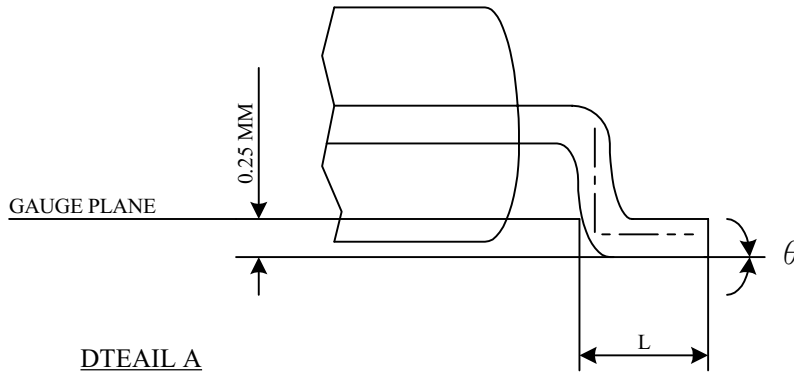
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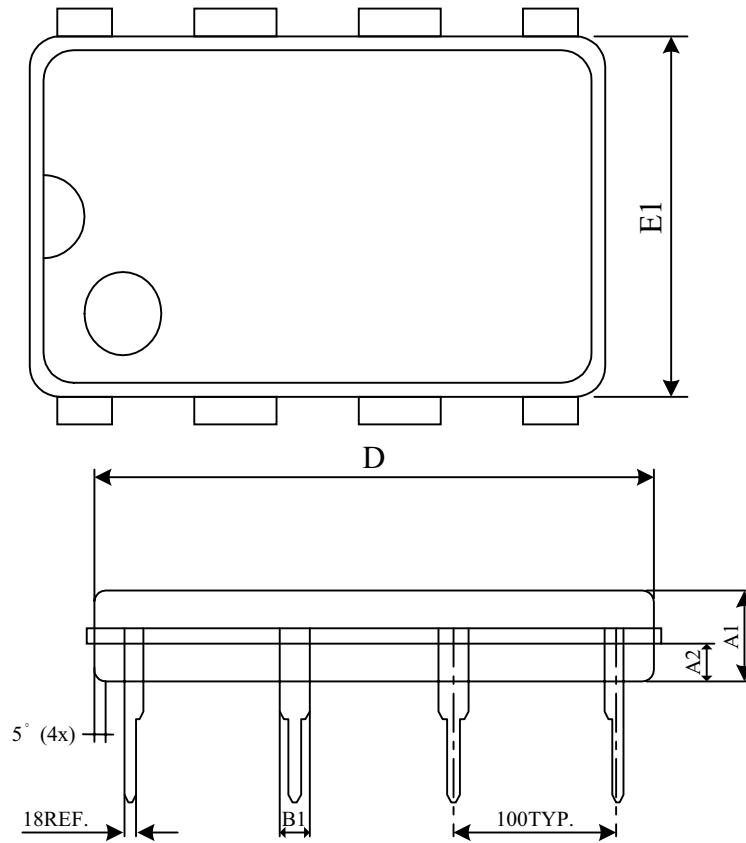


SYMBOL	DIMENSION IN MM		DIMENSION IN INCH	
	MIN	MAX	MIN	MAX
A	1.35	1.75	0.0532	0.0688
A1	0.10	0.25	0.0040	0.0098
B	0.33	0.51	0.013	0.020
C	0.19	0.25	0.0075	0.0098
e	1.27 BSC		0.050 BSC	
D	4.80	5.00	0.1890	0.1968
H	5.80	6.20	0.2284	0.2440
E	3.80	4.00	0.1497	0.1574
L	0.40	1.27	0.016	0.050
h	0.25	0.50	0.0099	0.0196
θ	0°	8°	0°	8°
JEDEC	MS-012(AA)			

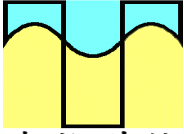
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DIP-8



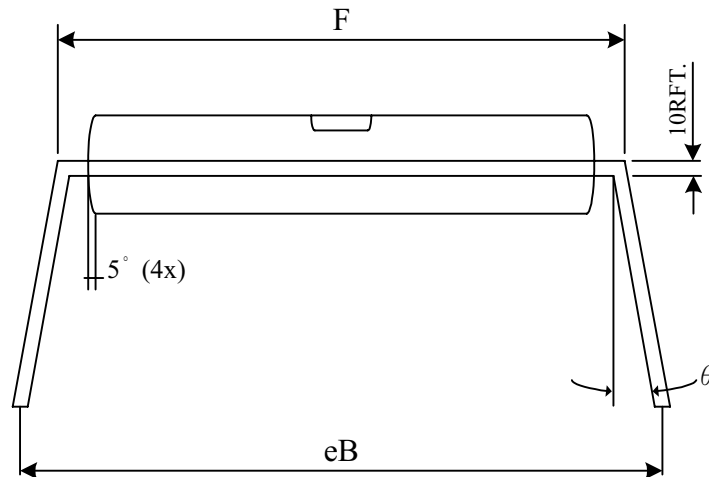
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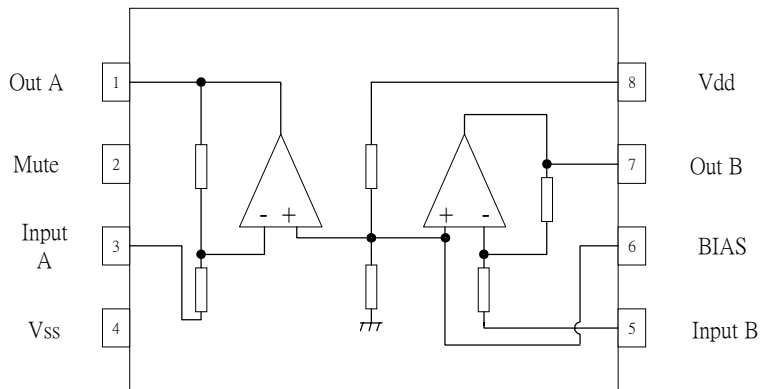
Symbol	Dimension in mils			Dimension in mm		
	Min	Non	Max	Min	Non	Max
A1	126	130	134	3.20	3.30	3.40
A2	58	60	62	1.473	1.524	1.575
B1	56	60	64	1.422	1.524	1.626
D	358	360	362	9.093	9.144	9.194
E1	258	260	262	6.553	6.604	6.655
F	295	300	305	7.493	7.620	7.747
eB	305	355	405	7.747	9.017	10.287
θ	0°	7.5°	15°	0°	7.5°	15°

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Functional Block Diagram

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Absolute Maximum Ratings

Absolute Maximum Ratings

Symbol	Parameter	Rating	Unit
V_{DD}	Supply Voltage	8	V
$t_{SC(O)}$	Output Short-circuit Duration, at $T_A = 25^\circ\text{C}$, $P_{tot} = 1W$	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	300	$^\circ\text{C}$
V_{ESD}	Electrostatic Discharge	-3000 to -3000 ⁻¹ -200 to 200 ⁻²	V

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

2. Machine model : C = 200pF, L = 0.5mH, R = 0 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 Characteristic

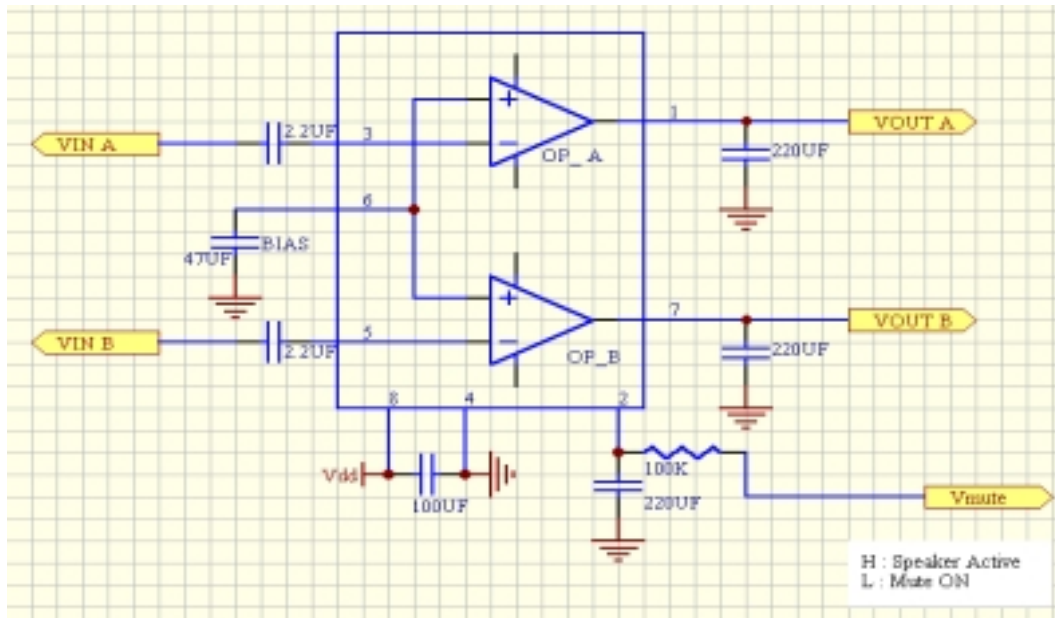
$V_{IN} = 0dBV, V_{CC} = 5V, T_A = 25^\circ C, f = 1KHz, R_L = 32\Omega$ (Unless otherwise noted)

Symbol	Parameter	Test Conditions	TP5228			Unit
			Min.	Typ.	Max.	
I_Q	Quiescent Current	$V_{IN} = 0V_{rms}$		3	4	mA
		Muteing		600	1000	μA
V_{TM}	Mute Terminal Voltage		0.3	0.7	1.6	V
G_{VCL}	Voltage Gain		-1	-0.15	1	dB
ΔG_{VC}	Differential Channel Voltage Gain		-0.5		0.5	dB
THD	Total Harmonic Channel Distortion Factor	BW = 20 ~ 30KHz		0.05	0.1	%
P_{U1}	Rated Output Power 1	$R_L = 32\Omega, THD < 0.1\%$	25	31		mW
P_{U2}	Rated Output Power 2	$R_L = 16\Omega, THD < 0.1\%$	50	62		mW
V_{NO}	Output Noise Voltage	BW = 20 ~ 20KHz, $R_G = 0\Omega$		-96	-87	dBV
CS	Channel Separation	$R_G = 0\Omega$	75	85		dB
ATT	Mute Attenuation	$R_G = 0\Omega$	80	90		dB
RR	Ripple Rejection	$F_{RR} = 100Hz, V_{RR} - 20dBV$	50	60		dB

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Application Diagrams



Application Notes

Fig 1 Measurement circuit for inverting application

