

1 W BTL mono audio amplifier**TDA7052****GENERAL DESCRIPTION**

The TDA7052 is a mono output amplifier in a 8-lead dual-in-line (DIL) plastic package. The device is designed for battery-fed portable audio applications.

Features:

- No external components
- No switch-on or switch-off clicks
- Good overall stability
- Low power consumption
- No external heatsink required
- Short-circuit proof

QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
V_P	Supply voltage range		3	6	18	V
I_{tot}	Total quiescent current	$R_L = \infty$	–	4	8	mA
G_V	Voltage gain		38	39	40	dB
P_o	Output power	THD = 10%; 8 Ω	–	1,2	–	W
THD	Total harmonic distortion	$P_o = 0,1$ W	–	0,2	1,0	%

PACKAGE OUTLINE

8-lead DIL; plastic (SOT97); SOT97-1; 1996 August 21.

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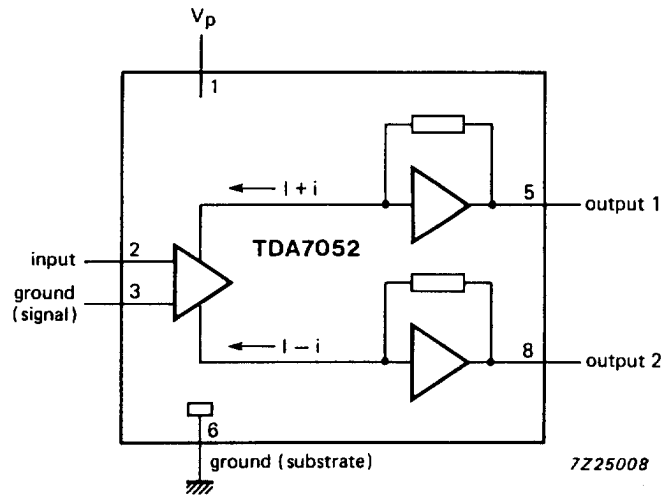


Fig.1 Block diagram.

PINNING

1	V _P	supply voltage	5	OUT1	output1
2	IN	input	6	GND2	ground (substrate)
3	GND1	ground (signal)	7	n.c.	not connected
4	n.c.	not connected	8	OUT2	output2

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FUNCTIONAL DESCRIPTION

The TDA7052 is a mono output amplifier designed for battery-fed portable audio applications, such as tape recorders and radios.

The gain is fixed internally at 40 dB. A large number of tape recorders and radios are still designed for mono sound, plus a space-saving trend by reduction of the number of battery cells. This means a decrease in supply voltage which results in an reduction of output power. To compensate for this reduction, the TDA7052 uses the Bridge-Tied-Load principle (BTL) which can deliver an output power of 1,2 W (THD = 10%) into an 8 Ω load with a power supply of 6 V. The load can be short-circuited at each signal excursion.

RATINGS

Limiting values in accordance with the Absolute Maximum System (IEC 134)

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V _P	Supply voltage	–	18	V
I _{OSM}	Non-repetitive peak output current	–	1,5	A
P _{tot}	Total power dissipation	see Fig. 2		
T _c	Crystal temperature	–	150	°C
T _{stg}	Storage temperature range	–55	+150	°C

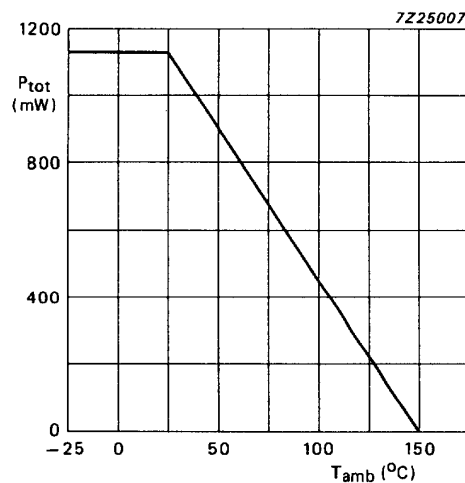


Fig.2 Power derating curve.

POWER DISSIPATION

Assume V_P = 6 V; R_L = 8 Ω; T_{amb} = 50 °C maximum.

The maximum sinewave dissipation is 0,9 W.

$$R_{th\ j-a} = \frac{150 - 50}{0,9} \approx 110\text{ K/W.}$$

Where R_{th j-a} of the package is 110 K/W, so no external heatsink is required.

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CHARACTERISTICS

$V_P = 6\text{ V}$; $R_L = 8\ \Omega$; $f = 1\text{ kHz}$; $T_{\text{amb}} = 25\text{ }^\circ\text{C}$; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
Supply						
V_P	Supply voltage range		3	6	18	V
I_{tot}	Total quiescent current	$R_L = \infty$	–	4	8	mA
G_V	Voltage gain		38	39	40	dB
P_O	Output power	THD = 10%	–	1,2	–	W
	Noise output voltage (RMS value)					
$V_{\text{no(rms)}}$		note 1	–	150	300	μV
$V_{\text{no(rms)}}$		note 2	–	60	–	μV
f_r	Frequency response		–	20 Hz to 20 kHz	–	Hz
SVRR	Supply voltage ripple rejection	note 3	40	50	–	dB
	DC output offset voltage					
ΔV_{5-8}	pin 5 to 8	$R_S = 5\text{ k}\Omega$	–	–	100	mV
THD	Total harmonic distortion	$P_O = 0,1\text{ W}$	–	0,2	1,0	%
$ Z_i $	Input impedance		–	100	–	$\text{k}\Omega$
I_{bias}	Input bias current		–	100	300	nA

Notes to the characteristics

1. The unweighted RMS noise output voltage is measured at a bandwidth of 60 Hz to 15 kHz with a source impedance (R_S) of 5 k Ω .
2. The RMS noise output voltage is measured at a bandwidth of 5 kHz with a source impedance of 0 Ω and a frequency of 500 kHz. With a practical load ($R = 8\ \Omega$; $L = 200\ \mu\text{H}$) the noise output current is only 100 nA.
3. Ripple rejection is measured at the output with a source impedance of 0 Ω and a frequency between 100 Hz and 10 kHz. The ripple voltage = 200 mV (RMS value) is applied to the positive supply rail.

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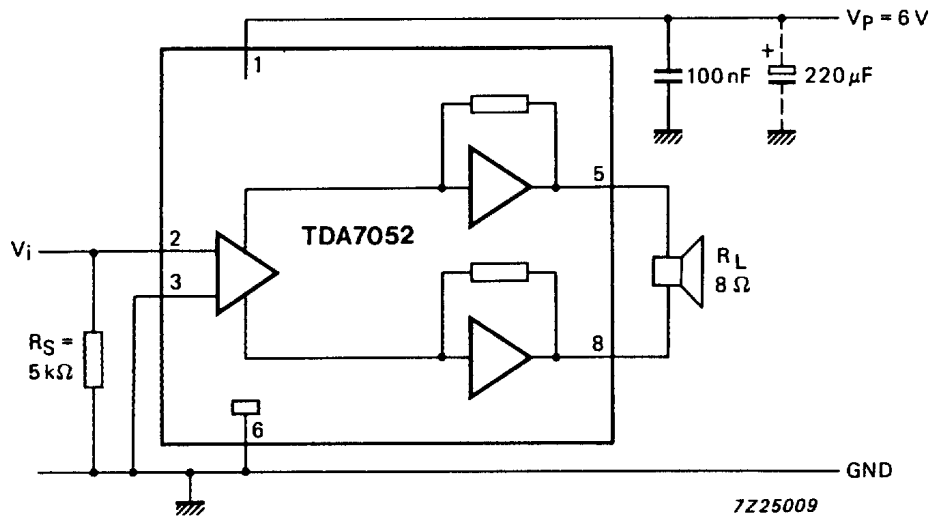


Fig.3 Application diagram.

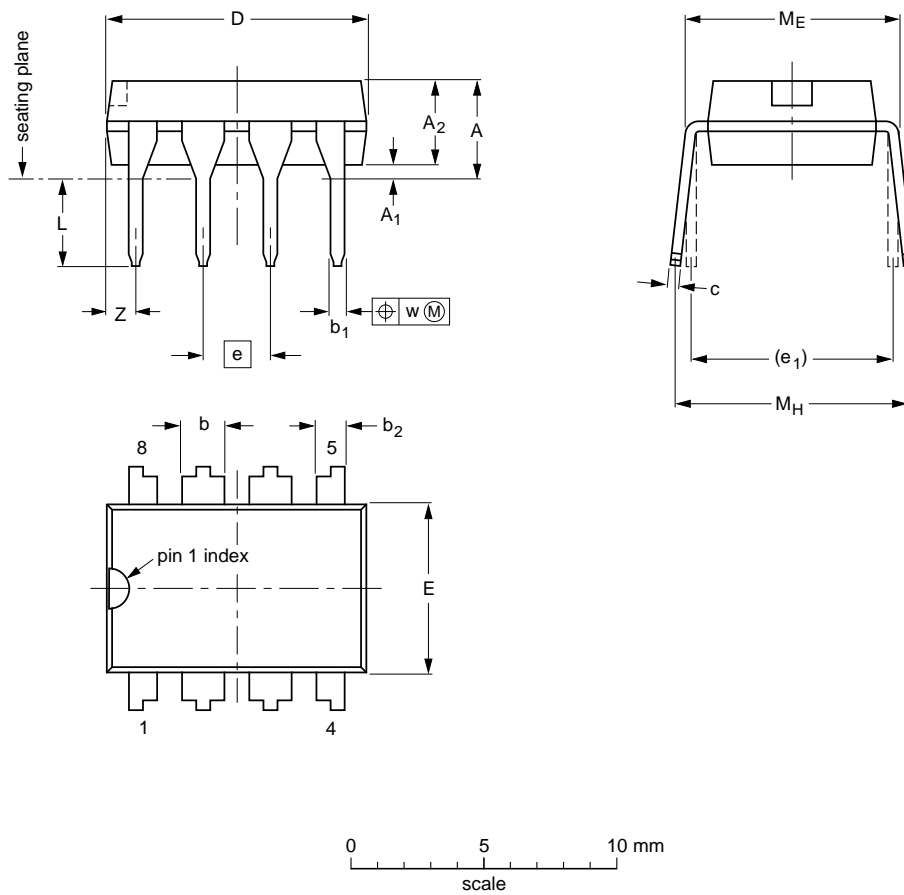
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PACKAGE OUTLINE

DIP8: plastic dual in-line package; 8 leads (300 mil)

SOT97-1



DIMENSIONS (inch dimensions are derived from the original mm dimensions)

UNIT	A max.	A ₁ min.	A ₂ max.	b	b ₁	b ₂	c	D ⁽¹⁾	E ⁽¹⁾	e	e ₁	L	M _E	M _H	w	Z ⁽¹⁾ max.
mm	4.2	0.51	3.2	1.73 1.14	0.53 0.38	1.07 0.89	0.36 0.23	9.8 9.2	6.48 6.20	2.54	7.62	3.60 3.05	8.25 7.80	10.0 8.3	0.254	1.15
inches	0.17	0.020	0.13	0.068 0.045	0.021 0.015	0.042 0.035	0.014 0.009	0.39 0.36	0.26 0.24	0.10	0.30	0.14 0.12	0.32 0.31	0.39 0.33	0.01	0.045

Note

1. Plastic or metal protrusions of 0.25 mm maximum per side are not included.

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	EIAJ			
SOT97-1	050G01	MO-001AN				92-11-17 95-02-04