

20W Hi-Fi Audio Amplifier**TDA1520A****GENERAL DESCRIPTION**

The TDA1520A is a monolithic integrated hi-fi audio power amplifier designed for asymmetrical or symmetrical power supplies for mains-fed apparatus.

Features

- Low input offset voltage
- Output stage with low cross-over distortion
- Single in-line (SIL) power package
- A.C. short-circuit protected
- Very low internal thermal resistance
- Thermal protection
- Very low intermodulation distortion
- Very low transient intermodulation distortion
- Complete SOAR protection

QUICK REFERENCE DATA

Supply voltage range	V_p	15 to 50 V
Total quiescent current at $V_p = 33$ V	I_{tot}	typ. 70 mA
Output power at $d_{tot} = 0.5\%$ sine-wave power		
$V_p = 33$ V; $R_L = 4 \Omega$	P_o	typ. 22 W
$V_p = 33$ V; $R_L = 4 \Omega$	P_o	> 20 W
$V_p = 42$ V; $R_L = 8 \Omega$	P_o	typ. 20 W
Closed-loop voltage gain (externally determined)	G_c	typ. 30 dB
Input resistance (externally determined by $R_{g.1}$)	R_i	typ. 20 k Ω
Signal-to-noise ratio at $P_o = 50$ mW	S/N	typ. 76 dB
Supply voltage ripple rejection at $f = 100$ Hz	RR	typ. 60 dB

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PACKAGE OUTLINE

TDA1520A : 9-lead SIL; plastic power (SOT-131A).

TDA1520AQ: 9-lead SIL-bent-to-DIL; plastic power (SOT-157A).

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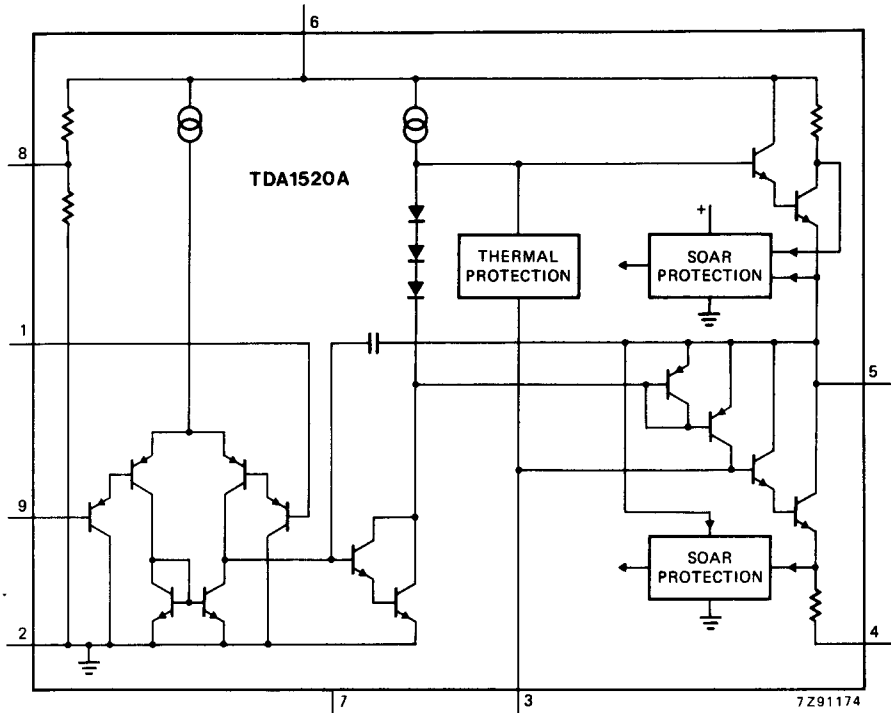


Fig. 1 Simplified internal circuit diagram.

PINNING

- 1. Non-inverting input
- 2. Input ground (substrate)
- 3. Compensation
- 4. Negative supply (ground)
- 5. Output
- 6. Positive supply (V_p)
- 7. Not connected
- 8. Ripple rejection
- 9. Inverting input (feedback)

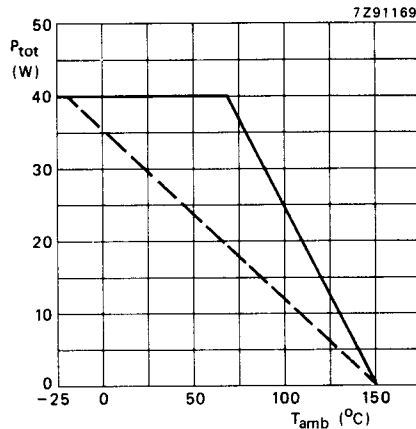
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RATINGS

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

Supply voltage	V_p	max.	50 V
Repetitive peak output current	I_{ORM}	max.	4 A
Non-repetitive peak output current	I_{OSM}	max.	5 A
Total power dissipation	see derating curve Fig. 2		
Storage temperature	T_{stg}	-55 to + 150 °C	
Operating ambient temperature	T_{amb}	-25 to + 150 °C	
Duration of a.c. short-circuit of load ($R_L = 0 \Omega$) during full-load sine-wave drive at: $V_S = \pm 20$ V (symmetrical) and $R_{supply} = 0 \Omega$; or $V_S = 35$ V (asymmetrical) and $R_{supply} \geq 4 \Omega$	t_{sc}	max.	100 hours



— mounted on infinite heatsink.
 - - - mounted on heatsink of 2.3 K/W.

Fig. 2 Power derating curves.

THERMAL RESISTANCE

From junction to mounting base

$$R_{th\ j-mb} \leq 2 \text{ K/W}$$

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D.C. CHARACTERISTICS

Supply voltage range	V_P	15 to 50 V
Total quiescent current at $V_P = 33$ V	I_{tot}	typ. 70 mA \leq 105 mA
Minimum guaranteed output current (peak value)	I_{ORM}	\geq 3.2 A

A.C. CHARACTERISTICS

$V_P = 33$ V; $R_L = 4 \Omega$; $f = 1$ kHz; $T_{amb} = 25$ °C; measured in test circuit of Fig. 3; unless otherwise specified

Output power

sine-wave power at $d_{tot} = 0.5\%$

$R_L = 4 \Omega$

$R_L = 4 \Omega$

$R_L = 8 \Omega$; $V_P = 42$ V

(Fig. 4)

P_O typ. 22 W

$P_O >$ 20 W

P_O typ. 20 W

Power bandwidth at $d_{tot} = 0.5\%$ from $P_O = 50$ mW to 10 W

B 20 Hz to 20 kHz

Voltage gain

open-loop

G_O typ. 74 dB

closed-loop

G_C typ. 30 dB

Internal resistance of pin 1 (at $R_{1-8} = \infty$)

$R_i >$ 1 M Ω

Input resistance of test circuit at pin 1 (Fig. 3)

R_i typ. 20 k Ω

Input sensitivity

for $P_O = 16$ W

V_i typ. 260 mV

Signal-to-noise ratio

at $P_O = 50$ mW; $R_{source} = 2$ k Ω

$f = 20$ Hz to 20 kHz; unweighted

S/N typ. 76 dB

weighted; measured according to

IEC 179 (A-curve)

S/N typ. 80 dB

Ripple rejection at $f = 100$ Hz; $R_S = 0 \Omega$

RR typ. 60 dB

Total harmonic distortion at $P_O = 16$ W

d_{tot} typ. 0.01 %

Output resistance (pin 5)

R_O typ. 0.01 Ω

Input offset voltage

V_{5-8} typ. 1 mV
 $<$ 100 mV

Transient intermodulation distortion

at $P_O = 10$ W

d_{TIM} typ. 0.01 %

Intermodulation distortion at $P_O = 10$ W

d_{IM} typ. 0.01 %

Slew rate

SR typ. 9 V/ μ s

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APPLICATION INFORMATION

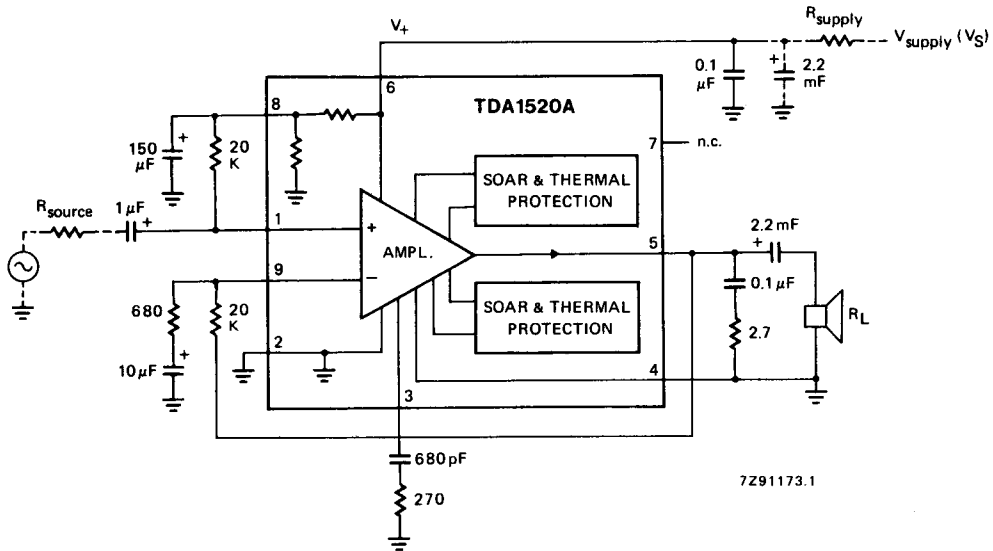


Fig. 3 Test and application circuit.

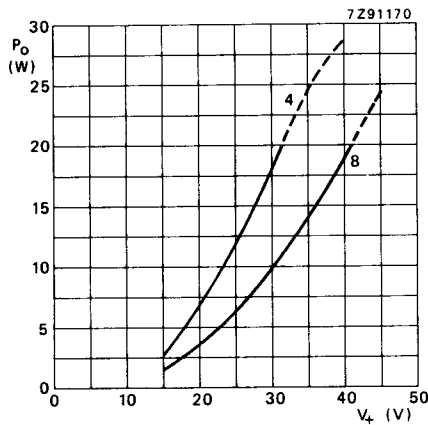


Fig. 4 Output power (P_O) versus supply voltage (V_P) at $f = 1$ kHz, $d_{tot} = 0.5\%$, $G_V = 30$ dB.



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APPLICATION INFORMATION (continued)

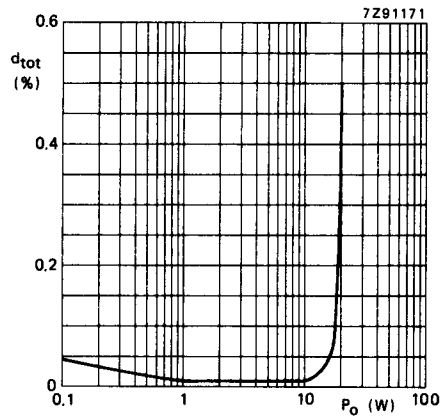


Fig. 5 Total harmonic distortion (d_{tot}) versus output power (P_o) at $V_p = 33$ V, $R_L = 4 \Omega$, $f = 1$ kHz.

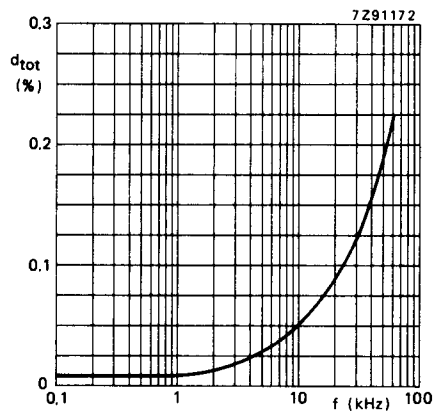


Fig. 6 Total harmonic distortion (d_{tot}) versus operating frequency (f) at $V_p = 33$ V, $R_L = 4 \Omega$, $P_o = 10$ W (constant).