

## 12 to 20 W HI-FI AUDIO POWER AMPLIFIER

The TDA1512A is a monolithic integrated hi-fi audio power amplifier designed for asymmetrical power supplies for mains-fed apparatus.

Special features are:

- Thermal protection
- Low intermodulation distortion
- Low transient intermodulation distortion
- Built-in output current limiter
- Low input offset voltage
- Output stage with low cross-over distortion
- Single in-line (SIL) power package

### QUICK REFERENCE DATA

Supply voltage range	$V_p$		15 to 35 V
Total quiescent current at $V_p = 25$ V	$I_{tot}$	typ.	65 mA
Output power at $d_{tot} = 0,7\%$			
sine-wave power			
$V_p = 25$ V; $R_L = 4 \Omega$	$P_o$	typ.	13 W
$V_p = 25$ V; $R_L = 8 \Omega$	$P_o$	typ.	7 W
music power			
$V_p = 32$ V; $R_L = 4 \Omega$	$P_o$	typ.	21 W
$V_p = 32$ V; $R_L = 8 \Omega$	$P_o$	typ.	12 W
Closed-loop voltage gain (externally determined)	$G_c$	typ.	30 dB
Input resistance (externally determined)	$R_i$	typ.	20 k $\Omega$
Signal-to-noise ratio at $P_o = 50$ mW	S/N	typ.	72 dB
Supply voltage ripple rejection at $f = 100$ Hz	RR	typ.	50 dB

### PACKAGE OUTLINES

TDA1512A: 9-lead SIL; plastic power (SOT131).

TDA1512AQ: 9-lead SIL-bent-to-DIL; plastic power (SOT157).

**PINNING**

1. Non-inverting input
2. Input ground (substrate)
3. Compensation
4. Ground potential
5. Output
6. Positive supply ( $V_p$ )
7. Externally connected to pin 6
8. Ripple rejection
9. Inverting input (feedback)

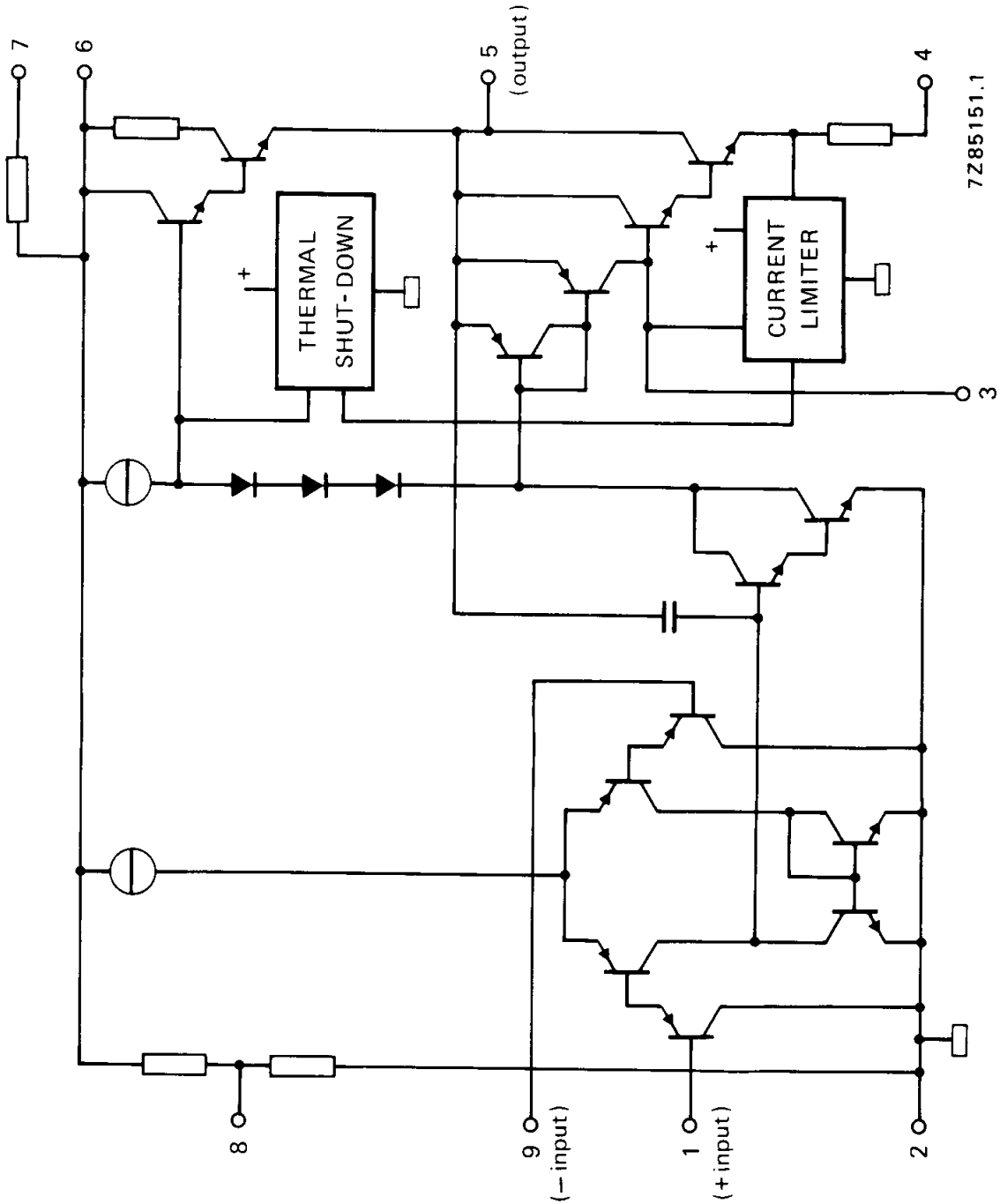


Fig. 1 Simplified internal circuit diagram.

**RATINGS**

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

Supply voltage	$V_p$	max.	35 V
Repetitive peak output current	$I_{ORM}$	max.	3,2 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	
A.C. short-circuit duration of load during full-load sine-wave drive $R_L = 0$ ; $V_p = 30$ V with $R_i = 4 \Omega$	$t_{sc}$	max.	100 hours

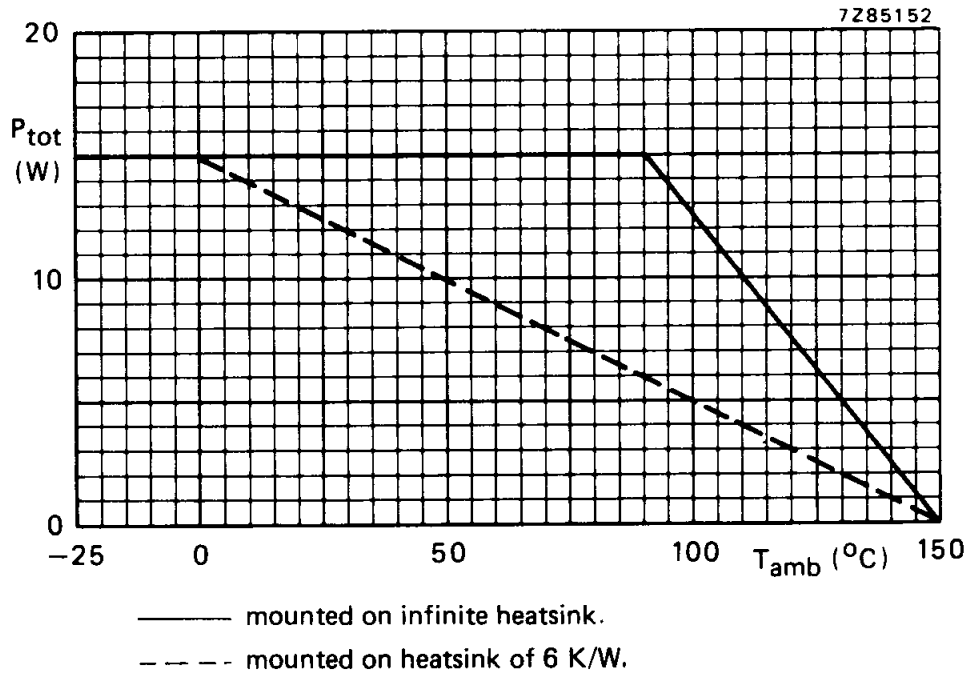


Fig. 2 Power derating curves.

**THERMAL RESISTANCE**

From junction to mounting base	$R_{th j-mb}$	typ.	3 K/W
		$\leq$	4 K/W

**D.C. CHARACTERISTICS**

Supply voltage range	$V_p$		15 to 35 V
Total quiescent current at $V_p = 25$ V	$I_{tot}$	typ.	65 mA

**A.C. CHARACTERISTICS**

$V_p = 25$  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  $d_{tot} = 0,7$  %

$R_L = 4 \Omega$

$R_L = 8 \Omega$

$P_o$	typ.	13 W
$P_o$	typ.	7 W

music power at  $V_p = 32$  V

$R_L = 4 \Omega$ ;  $d_{tot} = 0,7$  %

$R_L = 4 \Omega$ ;  $d_{tot} = 10$  %

$R_L = 8 \Omega$ ;  $d_{tot} = 0,7$  %

$R_L = 8 \Omega$ ;  $d_{tot} = 10$  %

$P_o$	typ.	21 W
$P_o$	typ.	25 W
$P_o$	typ.	12 W
$P_o$	typ.	15 W

Power bandwidth;  $-1,5$  dB;  $d_{tot} = 0,7$  %

B		40 Hz to 16 kHz
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**Voltage gain**

open-loop

closed-loop

$G_o$	typ.	74 dB
$G_c$	typ.	30 dB

Input resistance (pin 1)

$R_i$	>	100 k $\Omega$
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Input resistance of test circuit (Fig. 3)

$R_i$	typ.	20 k $\Omega$
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**Input sensitivity**

for  $P_o = 50$  mW

for  $P_o = 10$  W

$V_i$	typ.	16 mV
$V_i$	typ.	210 mV

**Signal-to-noise ratio**

at  $P_o = 50$  mW;  $R_S = 2$  k $\Omega$ ;

$f = 20$  Hz to 20 kHz; unweighted

S/N	>	68 dB
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weighted; measured according to IEC 173 (A-curve)

S/N	typ.	76 dB
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Ripple rejection at  $f = 100$  Hz

RR	typ.	50 dB
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Total harmonic distortion at  $P_o = 10$  W

$d_{tot}$	typ.	0,1 %
	<	0,3 %

Output resistance (pin 5)

$R_o$	typ.	0,1 $\Omega$
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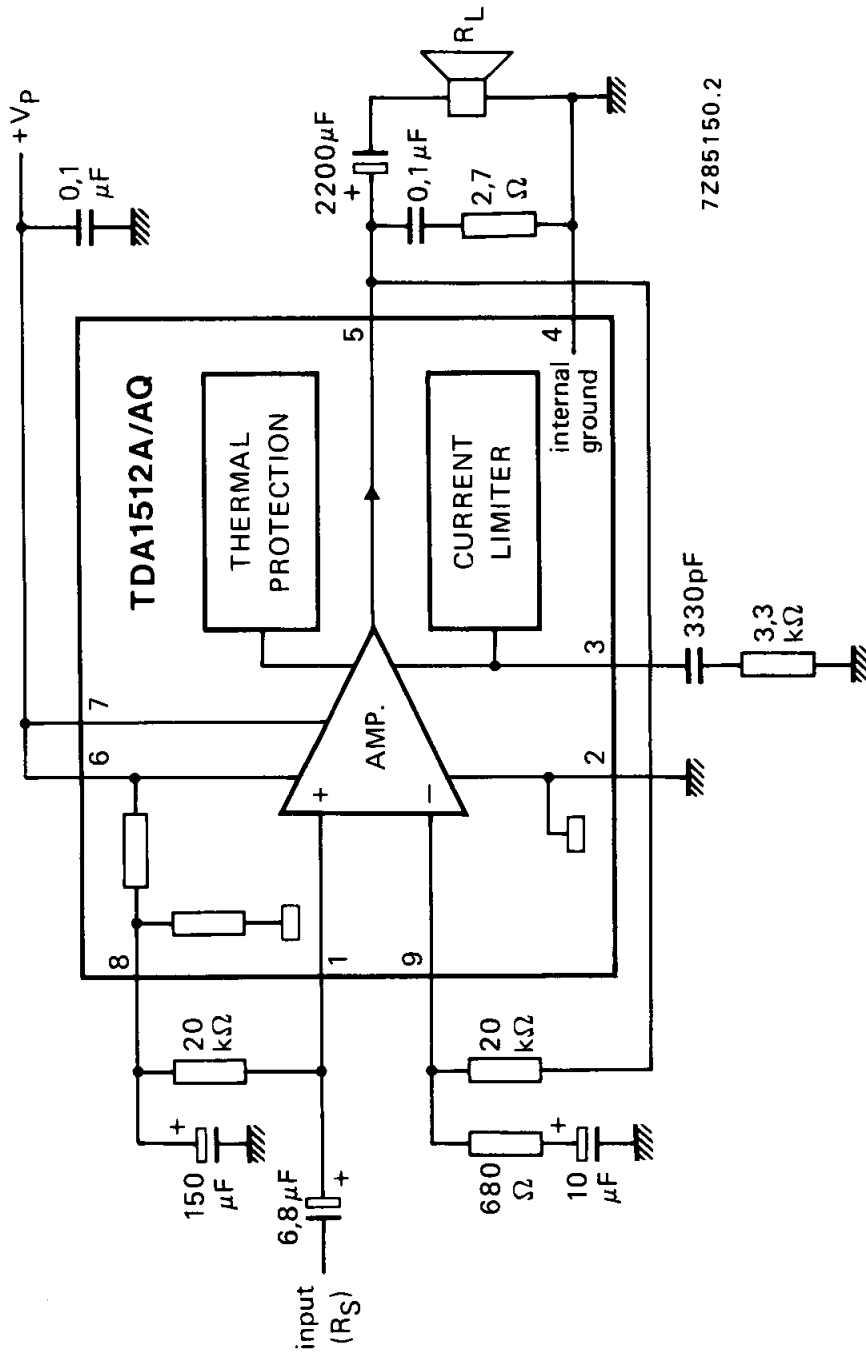


Fig. 3 Test circuit.

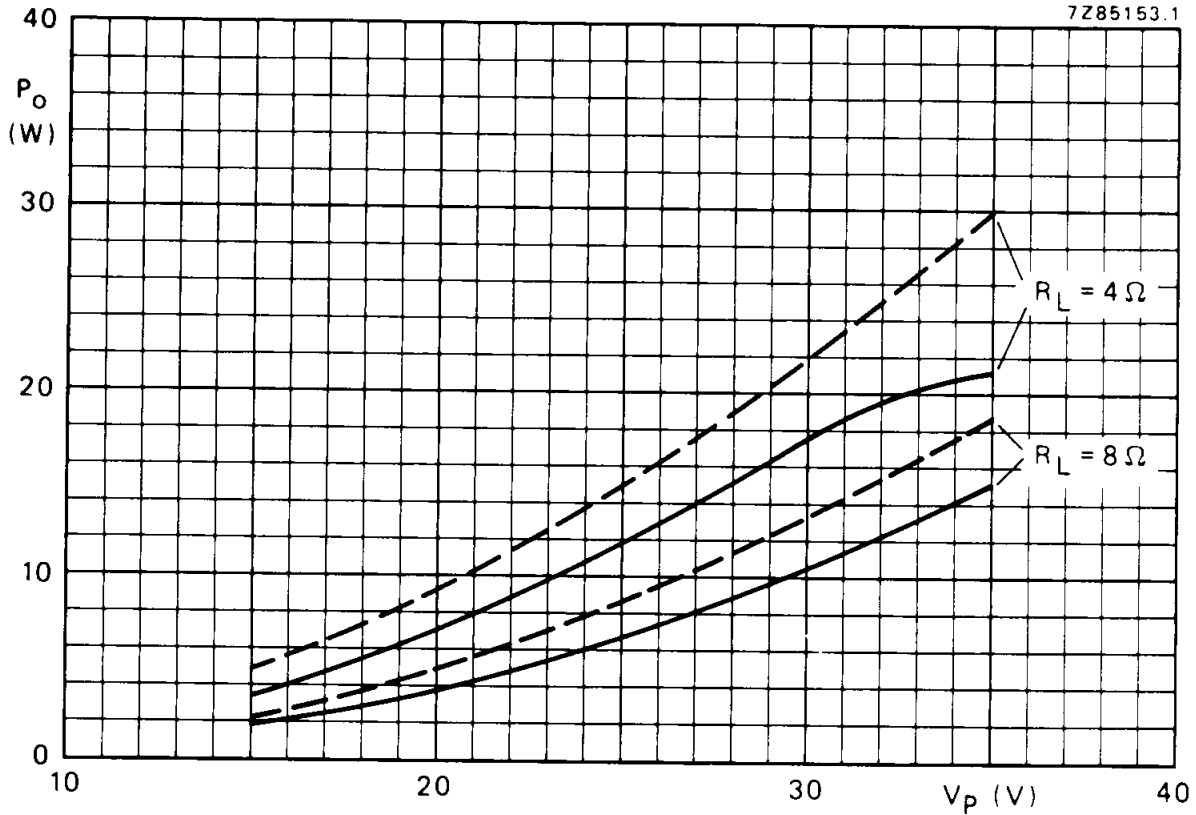


Fig. 4 Output power as a function of the supply voltage;  $f = 1 \text{ kHz}$ ;  
—  $d_{\text{tot}} = 0,7 \%$ ; - - -  $d_{\text{tot}} = 10 \%$ .

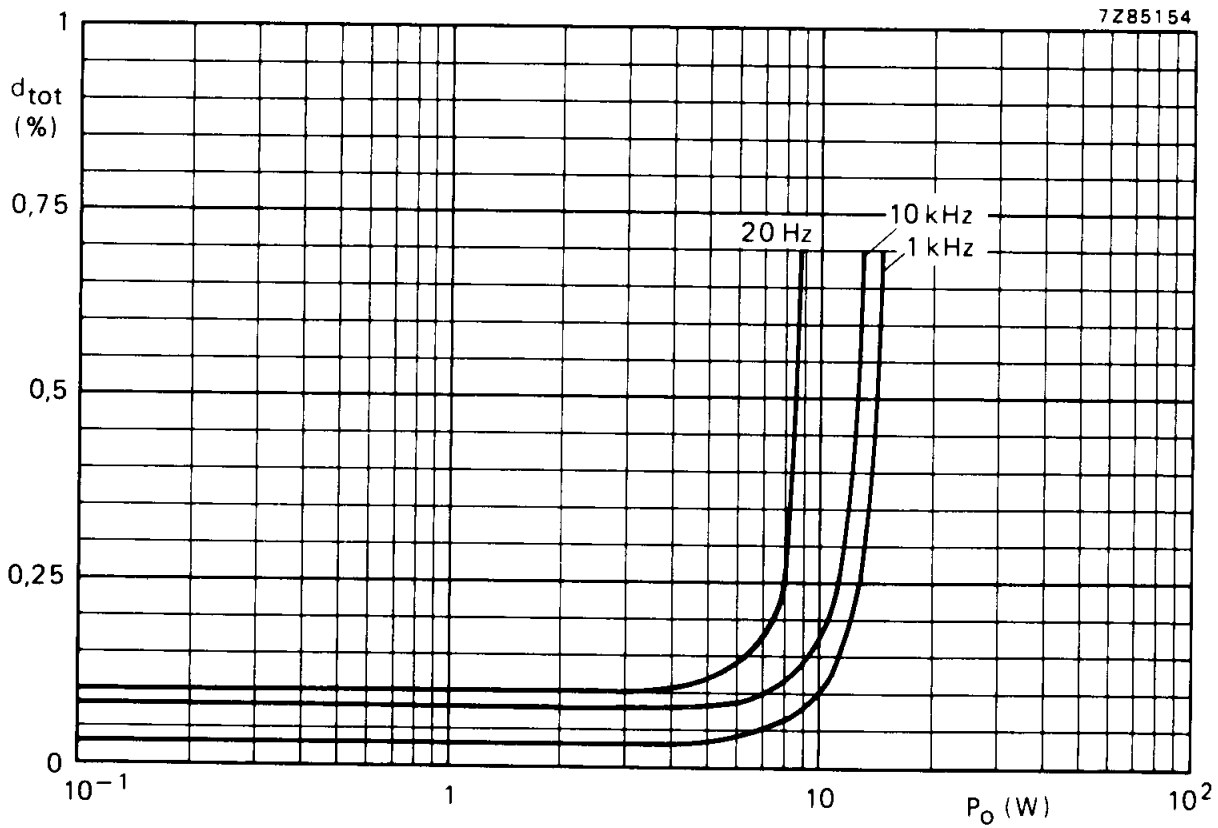


Fig. 5 Total harmonic distortion as a function of the output power.