

TDA2008

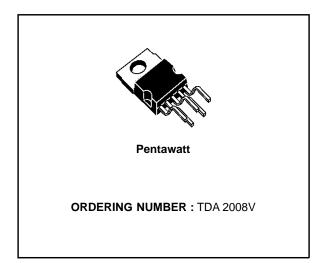
12W AUDIO AMPLIFIER ($V_S = 22V$, $R_L = 4\Omega$)

DESCRIPTION

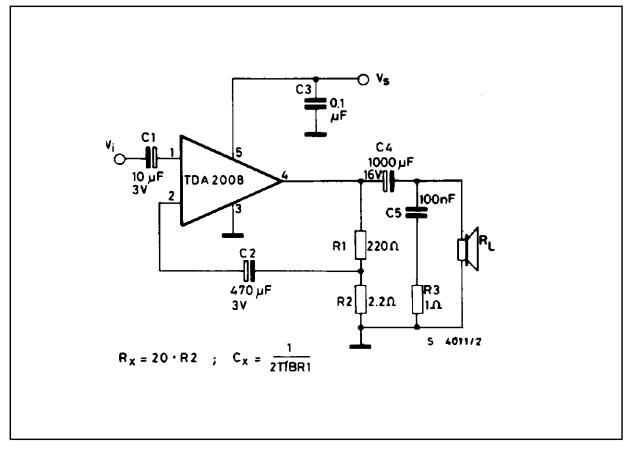
The TDA2008 is a mololithic class B audio power amplifier in Pentawatt[®] package designed for driving low impedence loads (down to 3.2Ω). The divice provides a high output current capability (up to 3A), very low harmonic and crossover distortion.

In addition, the device offers the following features:

- very low number of external components;
- assembly ease, due to Pentawatt[®] power package with no electrical insulations requirements;
- space and cost saving;
- high reliability;
- flexibility in use;
- thermal protection.

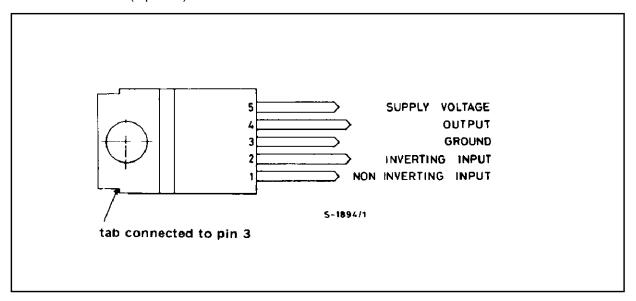


TYPICAL APPLICATION CIRCUIT



March 1993 1/9

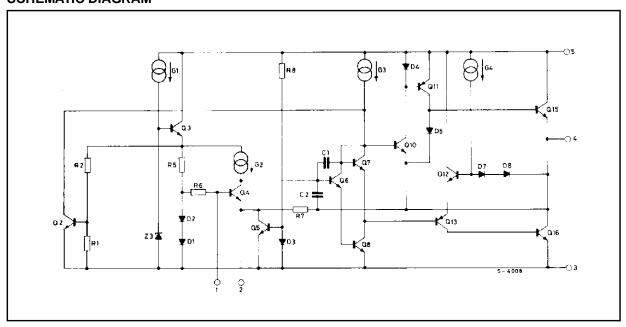
PIN CONNECTION (top view)



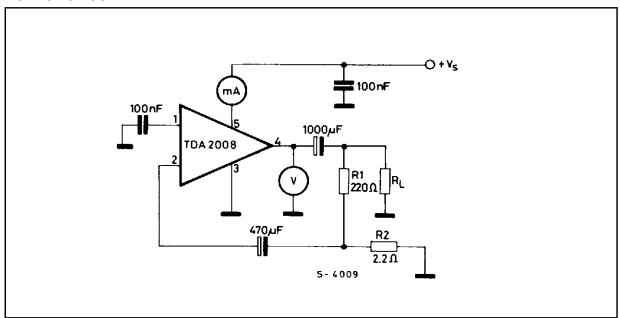
ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
Vs	DC supply voltage	28	V
Io	Output peak current (repetitive)	3	Α
Io	Output peak current (non repetitive)	4	Α
P _{tot}	Power dissipation at T _{case} = 90°C	20	W
T _{stg} , T _j	Storage and junction temperature	- 40 to 150	°C

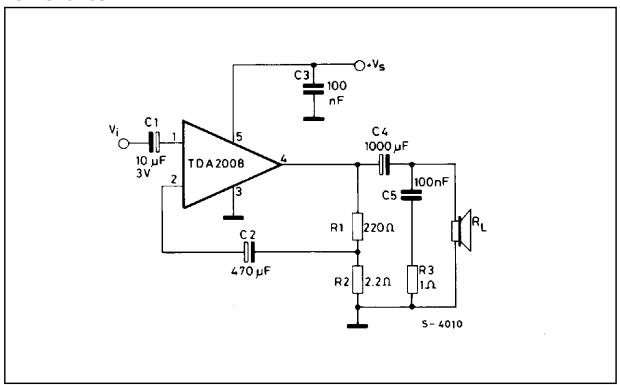
SCHEMATIC DIAGRAM



DC TEST CIRCUIT



AC TEST CIRCUIT



THERMAL DATA

Symbol	Parameter	Value	Unit
R _{th-j-case}	Thermal resistance junction-case max	3	°C/W

ELECTRICAL CHARACTERISTICS (Refer to the test circuit, V_s = 18V, T_{amb} = 25 °C unless otherwise specified)

Symbol	Parameter	Test co	nditions	Min.	Тур.	Max.	Unit
Vs	Supply voltage			10		28	V
Vo	Quiescent output voltage (pin 4)				10.5		V
l _d	Quiescent drain current (pin 5)				65	115	mA
Po	Output power	d = 10%	$R_L = 8\Omega$		8		W
		f = 1 KHz	$R_L = 4\Omega$	10	12		W
V _i (RMS)	Input saturation voltage			300			mV
Vi	Input sensitivity	$f = 1 \text{ KHz} \\ P_0 = 0.5W \\ P_0 = 8W \\ P_0 = 0.5W \\ P_0 = 12W$	$R_{L} = 8\Omega$ $R_{L} = 8\Omega$ $R_{L} = 4\Omega$ $R_{L} = 4\Omega$		20 80 14 70		mV mV mV
В	Frequency response (-3 dB)	$P_0 = 1W$ $R_L = 4\Omega$		40	0 to 15,00	0	Hz
d	Distortion	f = 1 KHz P _o = 0.05 to 4W P _o = 0.05 to 6W	$R_L = 8\Omega$ $R_L = 4\Omega$		0.12 0.12	1	% %
Ri	Input resistance (pin 1)	f = 1 KHz		70	150		ΚΩ
Gv	Voltage gain (open loop)	f = 1 KHz	$R_L = 8\Omega$		80		dB
Gv	Voltage gain (closed loop)	1 - 1 1012	IVE = 022	39.5	40	40.5	dB
e _N	Input noise voltage	BW = 22Hz to 22	DW 2011= to 20 KH=		1	5	μV
i _N	Input noise current		. IXI IZ		60	200	pА
SVR	Supply voltage rejection	$V_{ripple} = 0.5$ $R_g = 10K\Omega$ $R_L = 4\Omega$	f = 100 Hz	30	36		dB



APPLICATION INFORMATION

Figure 1. Typical application circuit

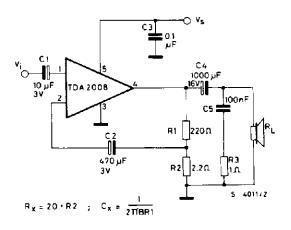
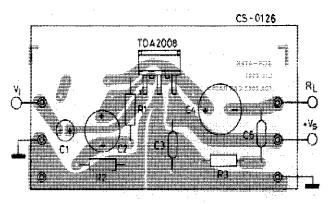


Figure 2. P.C. board and component layout for the circuit of fig. 1 (1:1 scale)



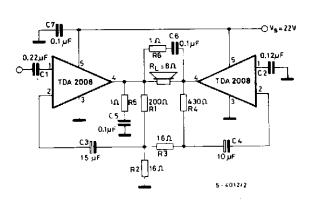
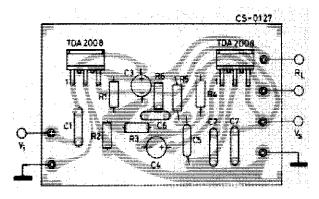


Figure 3.25W bridge configuration application Figure 4. P.C. board and component layout for the circuit (°)

Figure 4. P.C. board and component layout for the circuit of fig. 3 (1:1 scale)



(°) The value of the capacitorr C3 and C4 are different to optimize the SVR (Typ. = 40 dB)

Figure 5. Quiescent current vs. supply voltage

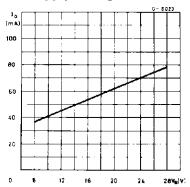


Figure 6. Output voltage vs. supply voltage

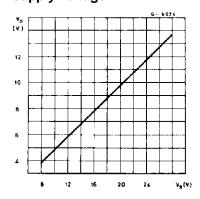


Figure 7. Output power vs. supply voltage

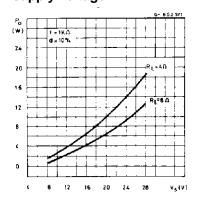


Figure 8. Distortion vs. frequency

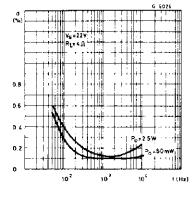


Figure 9. Supply voltage rejection vs. frequency

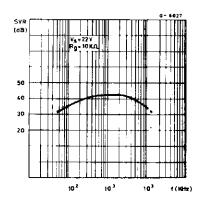
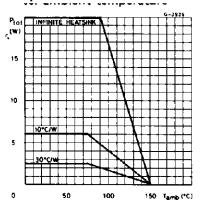


Figure 10. Maximum al-lowable power dissipation vs. ambient temperature



PRACTICAL CONSIDERATIONS

Printed circuit board

The layout shown in Fig. 2 is recommended. If different layouts are used, the ground points of input 1 and input 2 must be well decoupled from the ground of the output through which a rather high current flows.

Assembly suggestion

No electrical insulation is needed between the

package and the heat-sink. Pin length should be as short as possible. The soldering temperature must not exceed 260°C for 12 seconds.

Application suggestions

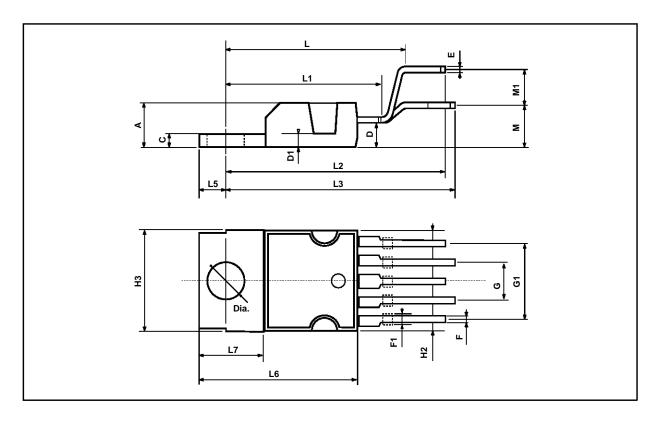
The recommended component values are those shown in the application circuits of Fig. 1. Different values can be used. The following table is intended to aid the car-radio designer.

Component	Recommended value	Purpose	Larger than recommended value	Smaller than recommended value
C1	2.2μF	Input DC decoupling		Noise at switch-on, switch-off
C2	470μF	Ripple rejection.		Degradation of SVR.
C3	0.1μF	Supply by passing.		Danger of oscillation.
C4	1000μF	Output coupling.		Higher low frequency cutoff.
C5	0.1μF	Frequency stability.		Danger of oscillation at high frequencies with inductive loads.
R1	(G _v - 1) • R2	Setting of gain. (*)		Increase of drain current.
R2	2.2Ω	Setting of gain and SVR.	Degradation of SVR.	
R3	1Ω	Frequency stability.	Danger of oscillation at high frequencies with inductive loads.	

^(*) The closed loop gain must be higher than 26dB.

PENTAWATT PACKAGE MECHANICAL DATA

DIM.	mm			inch			
DIIVI.	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	
Α			4.8			0.189	
С			1.37			0.054	
D	2.4		2.8	0.094		0.110	
D1	1.2		1.35	0.047		0.053	
Е	0.35		0.55	0.014		0.022	
F	0.8		1.05	0.031		0.041	
F1	1		1.4	0.039		0.055	
G		3.4		0.126	0.134	0.142	
G1		6.8		0.260	0.268	0.276	
H2			10.4			0.409	
H3	10.05		10.4	0.396		0.409	
L		17.85			0.703		
L1		15.75			0.620		
L2		21.4			0.843		
L3		22.5			0.886		
L5	2.6		3	0.102		0.118	
L6	15.1		15.8	0.594		0.622	
L7	6		6.6	0.236		0.260	
M		4.5			0.177		
M1		4			0.157		
Dia	3.65		3.85	0.144		0.152	



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