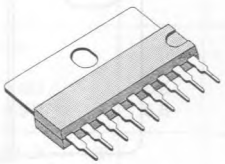
SGS-THOMSON MICROELECTRONICS

TDA2007

6+6W STEREO AMPLIFIER

The TDA 2007 is a class AB dual Audio power amplifier assembled in single in line 9 pins package, specially designed for stereo application in music centers TV receivers and portable radios. Its main features are:

- High output power
- High current capability
- Thermal overload protection
- Space and cost saving: very low number of external components and simple mounting thanks to the SIP. 9 package.



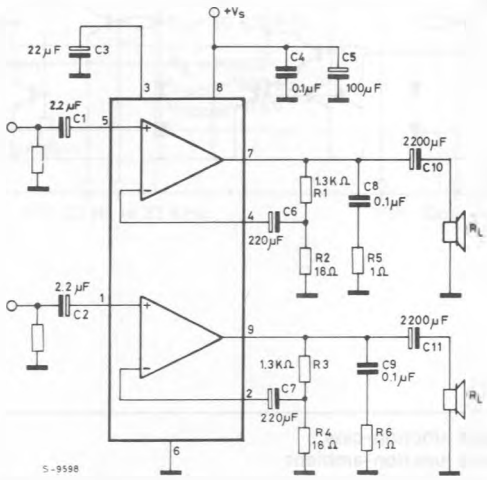
SIP. 9

ORDERING NUMBER: TDA 2007

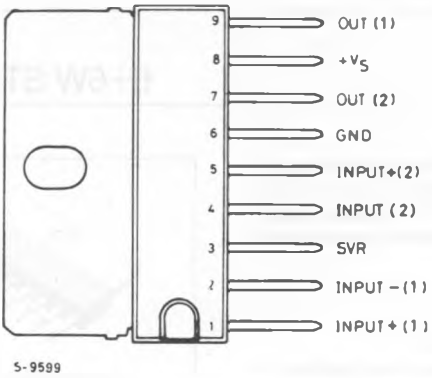
ABSOLUTE MAXIMUM RATINGS

V_s	Supply voltage	28	V
I_o	Output peak current (repetitive f ⩾ 20 Hz)	3	A
I_o	Output peak current (non repetitive, t = 100 μs)	3.5	A
P_{tot}	Power dissipation at T_{case} = 70°C	10	W
T_{stg}, T_j	Storage and junction temperature	-40 to 150	°C

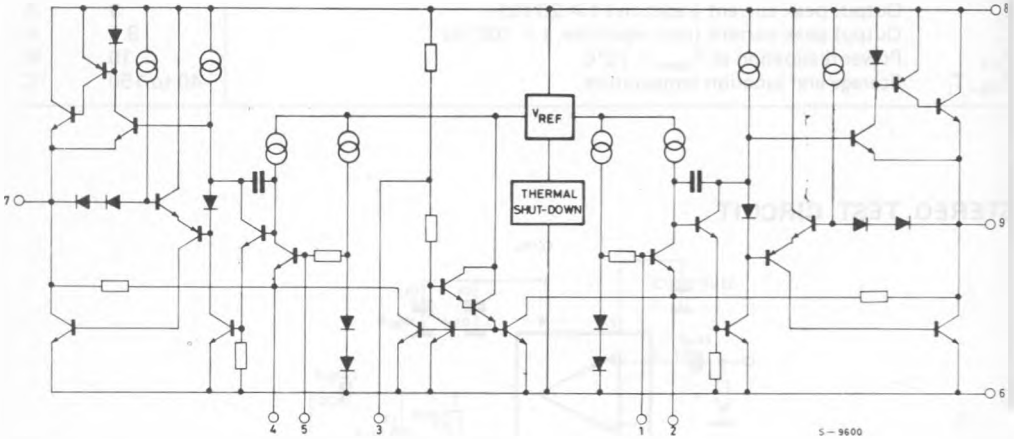
STEREO TEST CIRCUIT



CONNECTION DIAGRAM
(Top view)



SCHEMATIC DIAGRAM



THERMAL DATA

$R_{th\ j\text{-}case}$	Thermal resistance junction-case	max	8	°C/W
$R_{th\ j\text{-}amb}$	Thermal resistance junction-ambient	max	70	°C/W

ELECTRICAL CHARACTERISTICS (Refer to the **stereo** application circuit, T_{amb} = 25°C, V_s = 18V, G_v = 36 dB, unless otherwise specified)

Parameters		Test conditions		Min.	Typ.	Max.	Unit
V_s	Supply voltage			8		26	V
V_o	Quiescent output voltage				8.5		V
I_d	Total quiescent drain current				48		mA
P_o	Output power (each channel)	f = 100 Hz to 16 KHz d = 0.5% V_s = 18V R_L = 4Ω V_s = 22V R_L = 8Ω		 5.5 5.5	 6 6		 W W
d	Distortion (each channel)	f = 1 KHz, V_s = 18V, R_L = 4Ω P_o = 100 mW to 3W			0.1		%
		f = 1 KHz, V_s = 22V, R_L = 8Ω P_o = 100 mW to 3W			0.05		%
CT	Cross talk (°°°)	R_L = ∞	f = 1 KHz	50	60		dB
		R_g = 10 KΩ	f = 10 KHz	40	50		dB
V_i	Input saturation voltage (rms)			300			mV
R_i	Input resistance	f = 1 KHz		70	200		KΩ
f_L	Low frequency roll off (-3 dB)	R_L = 4Ω, C10 = C11= 2200 μF			40		Hz
f_H	High frequency roll off (-3 dB)				80		KHz
G_v	Voltage gain (closed loop)	f = 1 KHz		35.5	36	36.5	dB
ΔG_v	Closed loop gain matching				0.5		dB
e_N	Total input noise voltage	R_g = 10 KΩ (°)			1.5		μV
		R_g = 10 KΩ (°°)			2.5	8	μV
SVR	Supply voltage rejection (each channel)	R_g = 10 KΩ f_{ripple}= 100 Hz V_{ripple}= 0.5V			55		dB
T_J	Thermal shut-down junction temperature				145		°C

(°) Curve A. (°°) 22 Hz to 22 KHz. (°°°) Optimized test box.

Fig. 1 - Stereo test circuit (G_v = 36 dB)

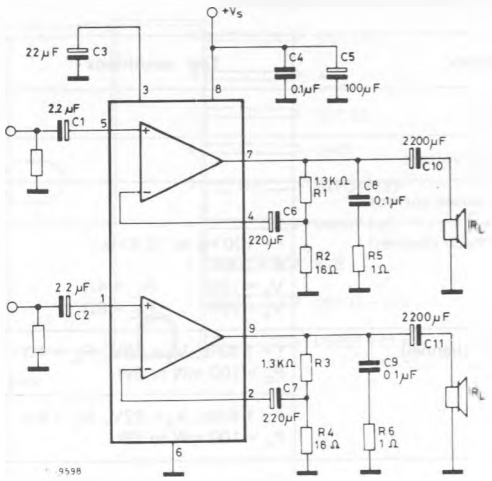


Fig. 2 - P.C. board and components layout of the circuit of fig. 1 (1 : 1 scale)

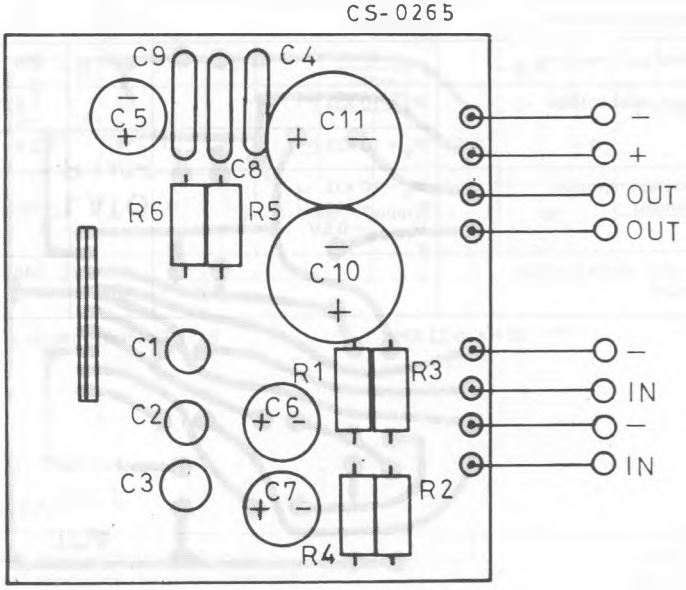


Fig. 3 - Output power vs. supply voltage (d = 0.5%)

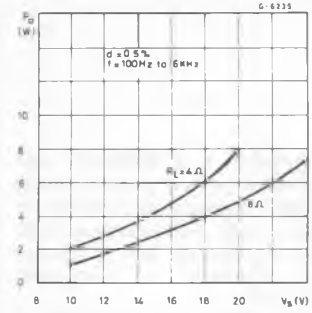


Fig. 4 - Output power vs. supply voltage (d = 10%)

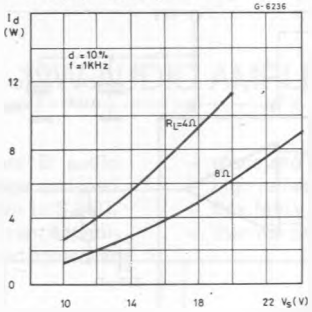


Fig. 5 - Quiescent current vs. supply voltage

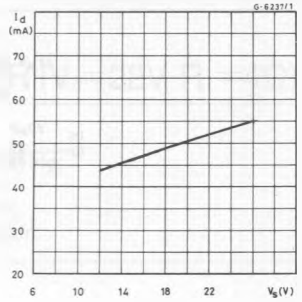


Fig. 6 - Supply voltage rejection vs. value of capacitor C3

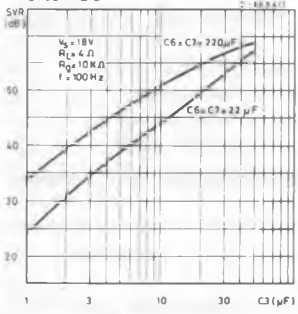


Fig. 7 - Supply voltage rejection vs. frequency

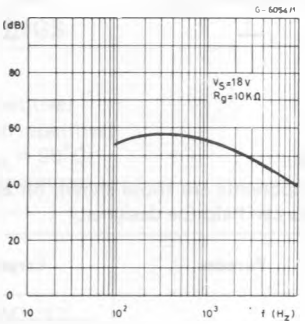


Fig. 8 - Total power dissipation vs. output power

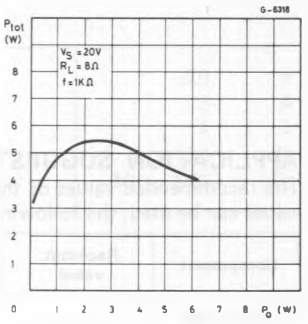


Fig. 9 - Cross-talk vs. frequency

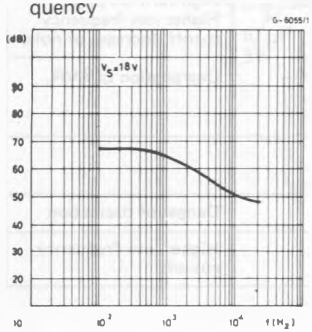


Fig. 10 - Simple short-circuit protection

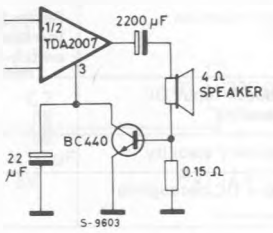
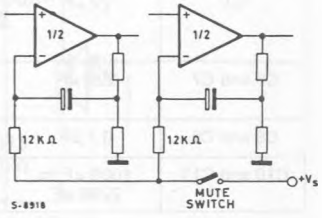
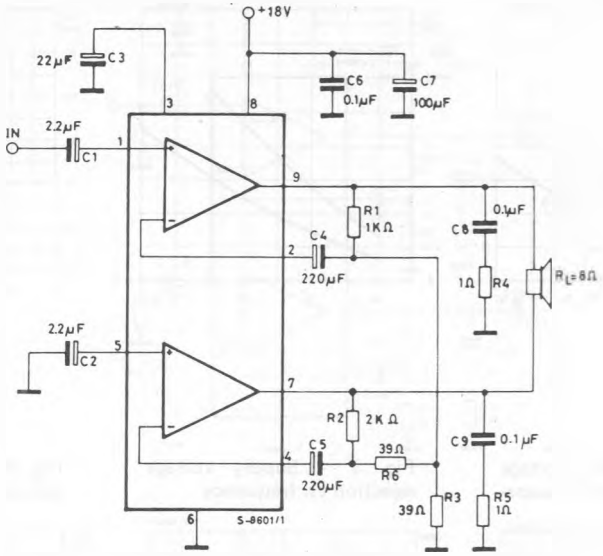


Fig. 11 - Example of muting circuit



APPLICATION INFORMATION

Fig. 12 - 12W bridge amplifier (d = 0,5%, G_v = 40dB)



APPLICATION SUGGESTION

The recommended values of the components are those shown on application circuit of fig. 1. Different values can be used; the following table can help the designer.

Component	Recomm. value	Purpose	Larger than	Smaller than
R1 and R3	1.3 KΩ	Close loop gain setting(*)	Increase of gain	Decrease of gain
R2 and R4	18 Ω		Decrease of gain	Increase of gain
R5 and R6	1 Ω	Frequency stability	Danger of oscillation at high frequency with inductive load	
C1 and C2	2.2 μF	Input DC decoupling	High turn-on delay	High turn-on pop Higher low frequency cutoff. Increase of noise
C3	22 μF	Ripple rejection	Better SVR. Increase of the switch-on time	Degradation of SVR.
C6 and C7	220 μF	Feedback Input DC decoupling		
C8 and C9	0.1 μF	Frequency stability		Danger of oscillation
C10 and C11	1000 μF to 2200 μF	Output DC decoupling		Higher low-frequency cut-off

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