SGS-THOMSON
MICROELECTRONICS

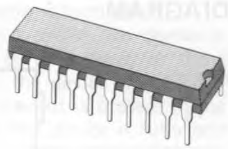
TDA7250

60W HI-FI DUAL AUDIO DRIVER

ADVANCE DATA

- WIDE SUPPLY VOLTAGE RANGE: 20 TO 90V (± 10 TO ± 45V)
- VERY LOW DISTORTION
- AUTOMATIC QUIESCENT CURRENT CONTROL FOR THE POWER TRANSISTORS WITHOUT TEMPERATURE SENSE ELEMENTS
- OVERLOAD CURRENT PROTECTION FOR THE POWER TRANSISTORS
- MUTE/STAND-BY FUNCTIONS
- LOW POWER CONSUMPTION
- OUTPUT POWER 60W/8Ω AND 100W/4Ω

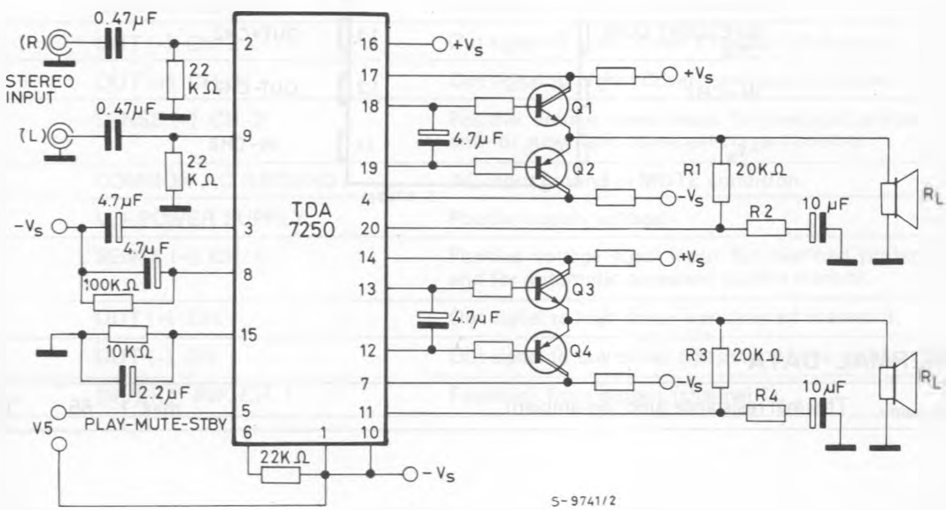
The TDA7250 stereo audio driver is designed to drive two pair of complementary output transistor in the Hi-Fi power amplifiers.



DIP-20 Plastic (0.4)

ORDERING NUMBER: TDA7250

APPLICATION CIRCUIT

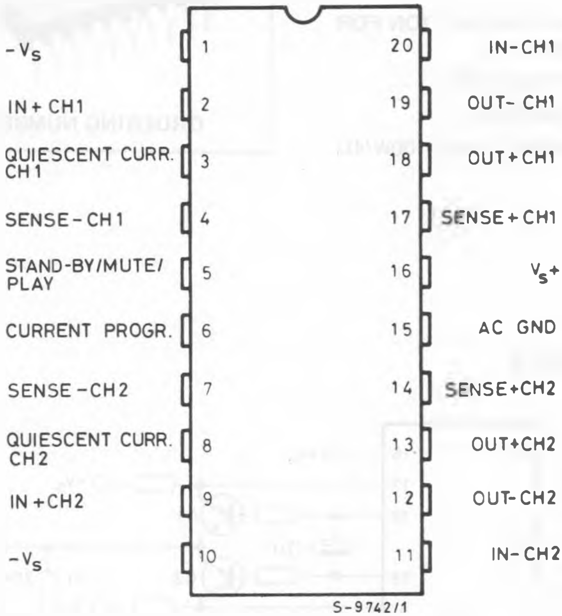


ABSOLUTE MAXIMUM RATINGS

V_s	Supply voltage	100	V
P_{tot}	Power dissipation at $T_{amb} = 60°C$	1.4	W
T_j, T_{stg}	Storage and junction temperature	-40 to +150	°C

CONNECTION DIAGRAM

(Top view)



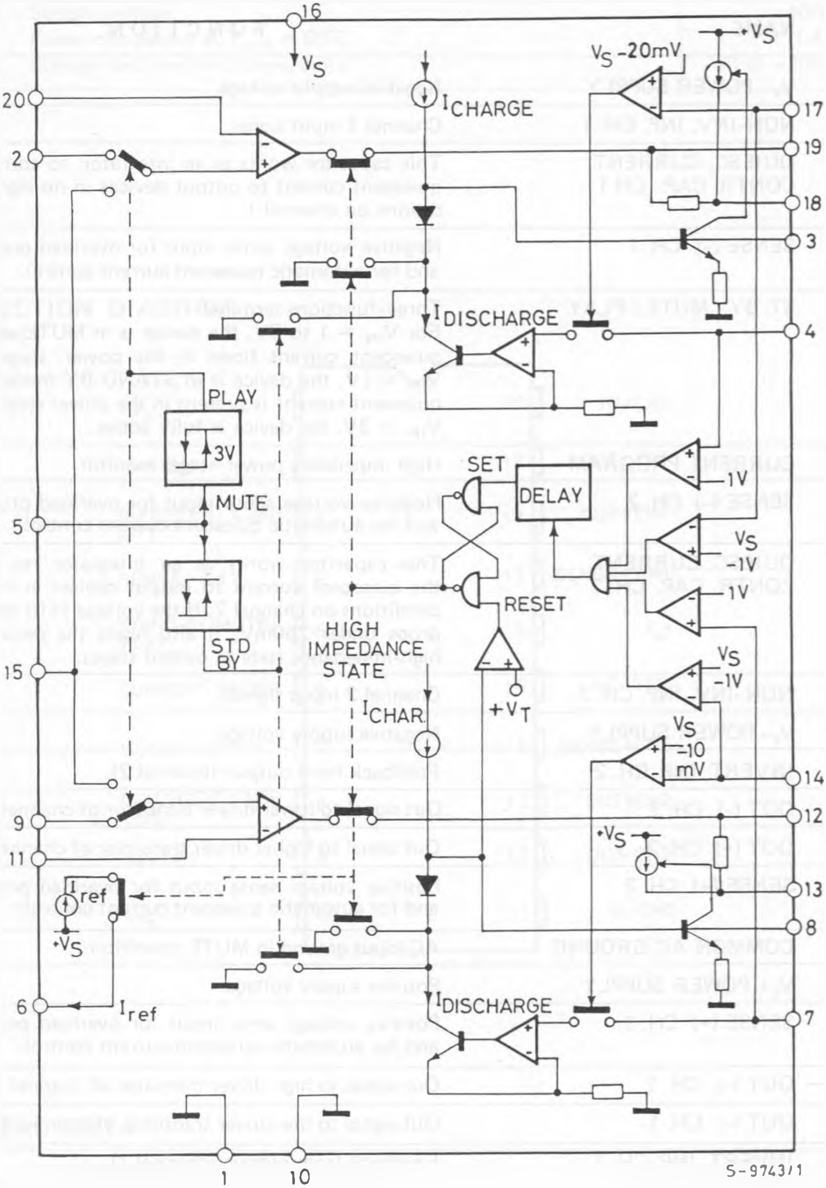
THERMAL DATA

$R_{th\ j\text{-}amb}$	Thermal resistance junction-ambient	max	65	°C/W

PIN FUNCTIONS

N°	NAME	FUNCTION
1	V_s- POWER SUPPLY	Negative supply voltage.
2	NON-INV. INP. CH. 1	Channel 1 input signal.
3	QUIESC. CURRENT CONTR. CAP. CH 1	This capacitor works as an integrator, to control the quiescent current to output devices in no-signal conditions on channel 1.
4	SENSE (-) CH. 1	Negative voltage sense input for overload protection and for automatic quiescent current control.
5	ST. BY / MUTE / PLAY	Three-functions terminal. For V_{IN} = 1 to 3V, the device is in MUTE and only quiescent current flows in the power stages;- for V_{IN} < 1V, the device is in STAND-BY mode and no quiescent current is present in the power stages; - for V_{IN} > 3V, the device is fully active.
6	CURRENT PROGRAM	High impedance power-stages monitor.
7	SENSE (-) CH. 2	Negative voltage sense input for overload protection and for automatic quiescent current control.
8	QUIESC. CURRENT CONTR. CAP. CH. 2	This capacitor works as an integrator, to control the quiescent current to output devices in no-signal conditions on channel 2. If the voltage at its terminals drops under 250mV, it also resets the device from high-impedance state of output stages.
9	NON-INV. INP. CH. 2	Channel 2 input signals.
10	V_s- POWER SUPPLY	Negative supply voltage.
11	INVERT. INP. CH. 2	Feedback from output (channel 2).
12	OUT (-) CH. 2	Out signal to lower driver transistor of channel 2.
13	OUT (+) CH. 2	Out signal to higher driver transistor of channel 2.
14	SENSE (+) CH. 2	Positive voltage sense input for overload protection and for automatic quiescent current control.
15	COMMON AC GROUND	AC input ground in MUTE condition.
16	V_s+ POWER SUPPLY	Positive supply voltage.
17	SENSE (+) CH. 1	Positive voltage sense input for overload protection and for automatic quiescent current control.
18	OUT (+) CH. 1	Out signal to high driver transistor of channel 1.
19	OUT (-) CH. 1	Out signal to low driver transistor of channel 1.
20	INVERT. INP. CH. 1	Feedback from output (channel 1).

BLOCK DIAGRAM



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ELECTRICAL CHARACTERISTICS (T_{amb} = 25°C, V_s = ± 35V, play mode, unless otherwise specified)

	Parameter	Test Conditions		Min.	Typ.	Max.	Unit
V_s	Supply voltage			± 10		± 45	V
I_d	Quiescent drain current	Stand-by mode			8		mA
		Play mode			10	14	
I_b	Input bias current				0.2	1	μA
V_{os}	Input offset voltage				1	± 10	mV
I_{os}	Input offset current				100	200	nA
G_v	Open loop voltage gain	f = 100Hz			90		dB
		f = 10KHz			60		
e_N	Input noise voltage	R_G = 600Ω B = 20Hz to 20KHz			3		μV
SR	Slew rate				10		V/μs
d	Total harmonic distortion	G_v = 26dB	f = 1KHz		0.004		%
		P_o = 40W	f = 20KHz		0.03		
V_{opp}	Output voltage swing				60		V_{pp}
P_o	Output power (*)	V_s = ± 35V V_s = ± 30V V_s = ± 35V	R_L = 8Ω R_L = 8Ω R_L = 4Ω		60 40 100		W
I_o	Output current				± 5		mA
SVR	Supply voltage rejection	f = 100Hz			75		dB
C_s	Channel separation	f = 1KHz			75		dB

MUTE / STANDBY / PLAY FUNCTIONS

	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_i	Input current (pin 5)			0.1		μA
V_{th}	Comparator standby/mute threshold (**)		1.0	1.25	1.5	V
H	Hysteresis standby/mute			200		mV
V_{th}	Comparator mute/play threshold (**)		2.4	3.0	3.6	V
H	Hysteresis mute/play			300		mV
	Mute attenuation	f = 1KHz		60		dB
V_i	Input voltage max. (Pin 5)		12 (**)			V

(*) Application circuit of fig. 1 f = 1KHz; d = 0.1%; G_v = 26dB
(**) Referred to $-V_S$

ELECTRICAL CHARACTERISTICS (continued)

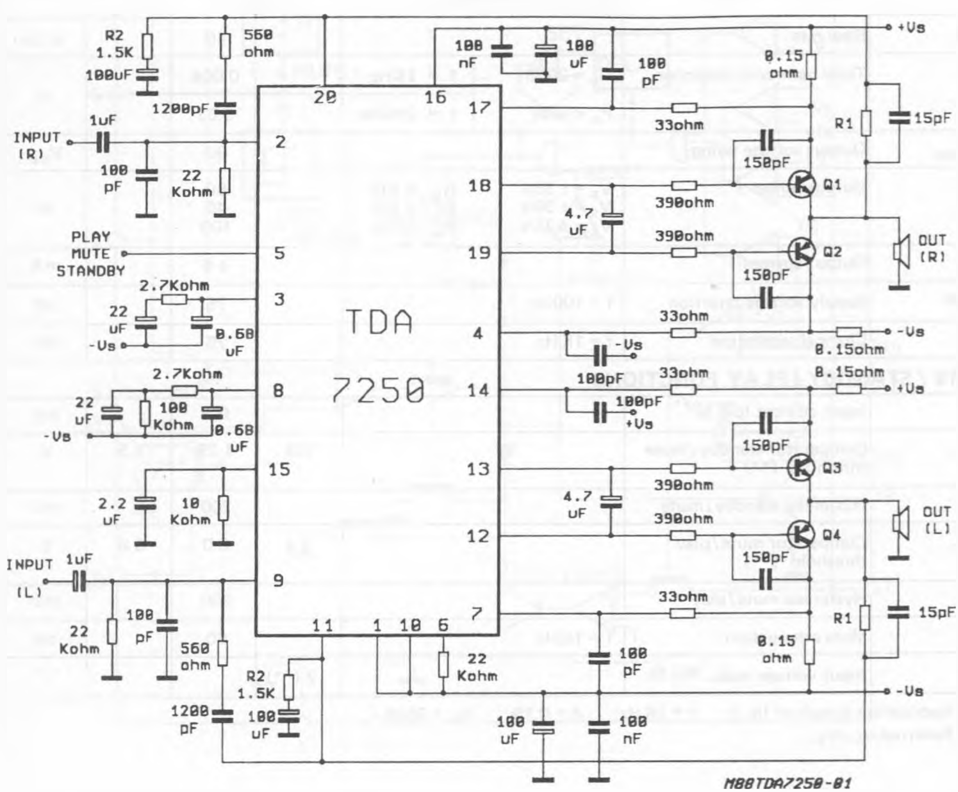
CURRENT SURVEY CIRCUITRY

	Comparator reference	to $+V_S$ to $-V_S$	0.8 0.8	1 1	1.4 1.4	V V
t_d	Delay time		10			µs

QUIESCENT CURRENT CONTROL

	Capacitor current	Charge Discharge	30 250	60 500		µA µA
	Comparator reference	to $+V_S$ to $-V_S$	10	20 10	25	mV mV

Fig. 1 – Application circuit with Power Darlingtons



NOTE: Q1/Q2 = Q3/Q4 = TIP 142/TIP 147
GV = 1+R1/R2

Fig. 2 - Output power vs. supply voltage

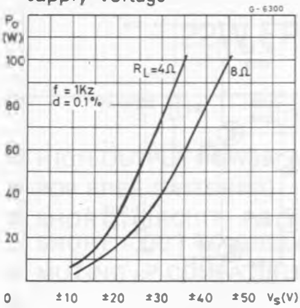


Fig. 3 - Distortion vs. output power (*)

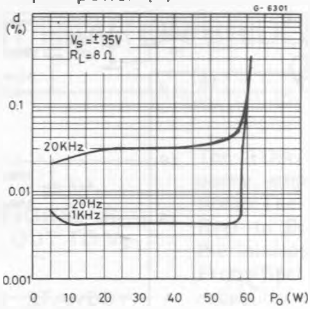


Fig. 4 - Channel separation

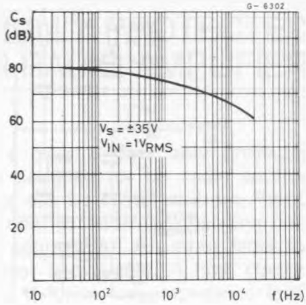


Fig. 5 - Supply voltage rejection vs. frequency

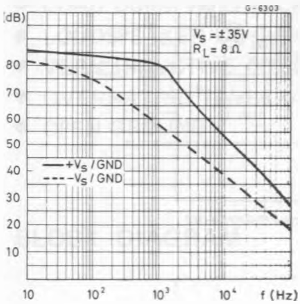


Fig. 6 - Quiescent current vs. supply voltage

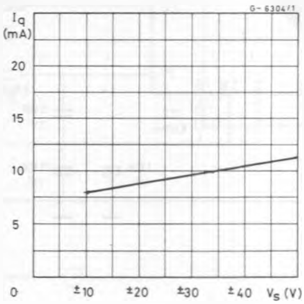


Fig. 7 - Quiescent current vs. T_{amb}

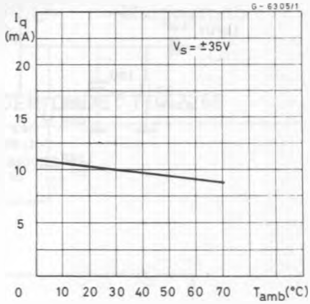


Fig. 8 - Total dissipated power vs. output power (*)

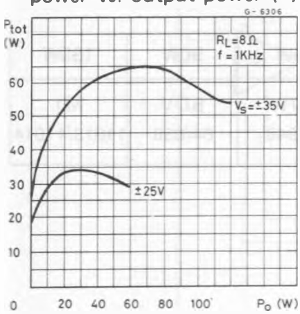


Fig. 9 - Efficiency vs. output power (*)

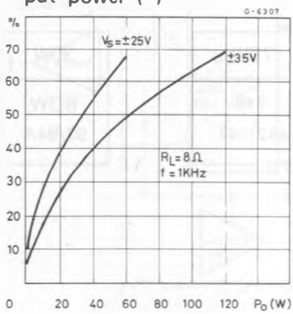
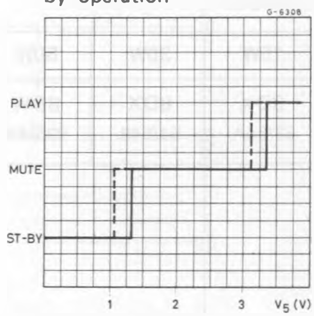


Fig. 10 - Play-mute stand-by operation



(*) Complete circuit

Fig. 11 - Application circuit using power transistors

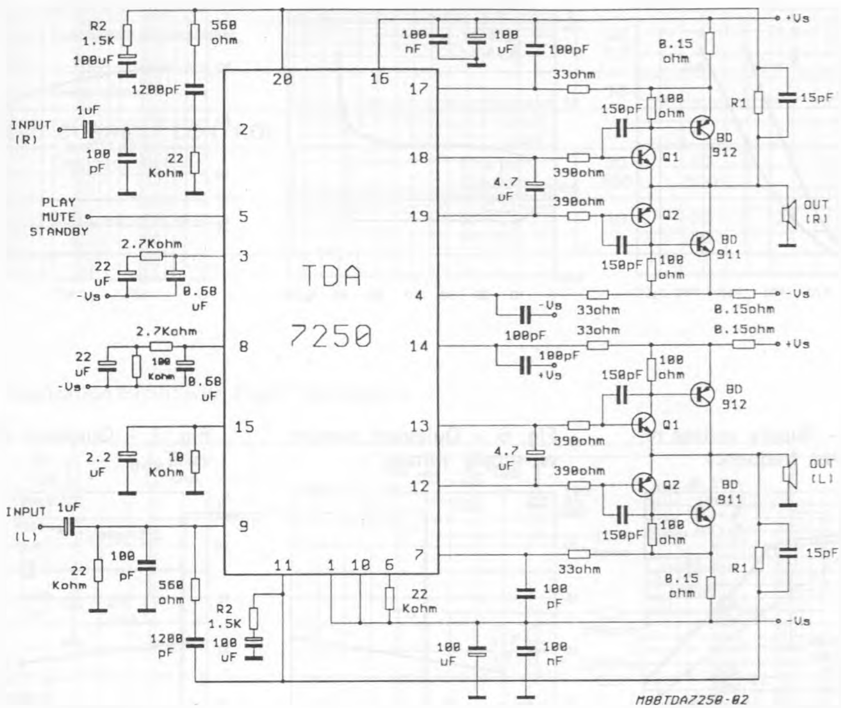


Fig. 12 - Suggested transistor types for various loads and powers.

$R_L = 8\,\Omega$

15W	30W	50W	70W
BDX 53/54A	BDX 53/54B	BDW 93/94B	TIP 142/147

$R_L = 4\,\Omega$

30W	50W	90W	130W
BDW 93/94A	BDW 93/94B	BDV 64/65B	MJ 11013/11014