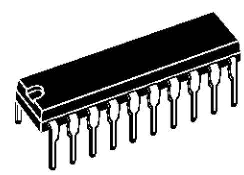
60 W HI-FI DUAL AUDIO DRIVER

- WIDE SUPPLY VOLTAGE RANGE : 20 TO 90 V (± 10 to ± 45 V)
- 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 60 W/8 Ω AND 100 W/4 Ω

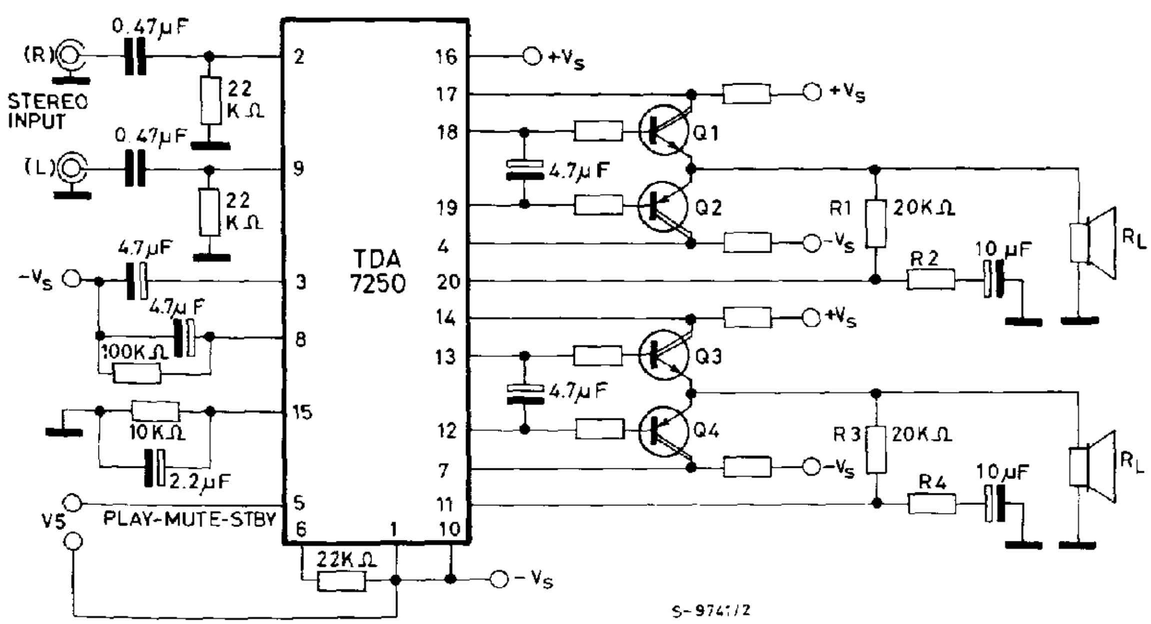


DIP20
ORDERING NUMBER : TDA7250

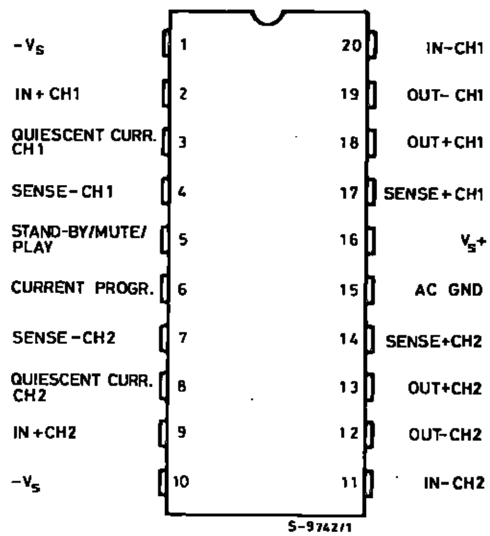
DESCRIPTION

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

APPLICATION CIRCUIT



PIN CONNECTION (top view)



ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
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

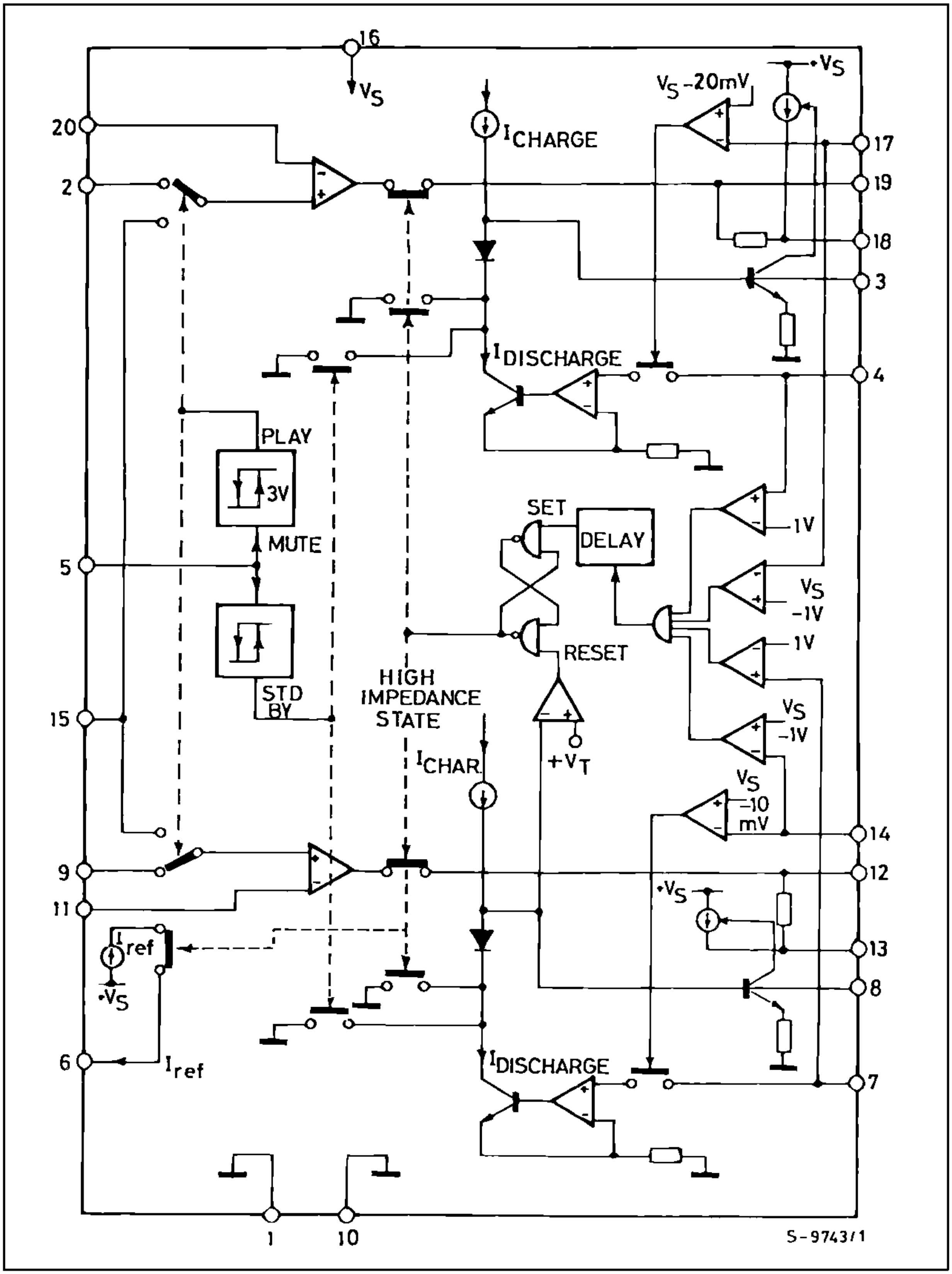
THERMAL DATA

Symbol	Parameter		Value	Unit
$R_{th\ j\text{-}amb}$	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. CH1	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 3 V, the device is in MUTE and only quiescent current flows in the power stages ; - for V_{IN} < 1 V, the device is in STAND-BY mode and no quiescent current is present in the power stages ; - for V_{IN} > 3 V, the devic
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 250 mV, 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



SGS-THOMSON MICROELECTRONICS

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

Symbol	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 = 100 Hz		90		dB
		f = 10 kHz		60		
e_N	Input Noise Voltage	R_G = 600 Ω B = 20 Hz to 20 kHz		3		µV
SR	Slew Rate			10		V/µs
d	Total Harmonic Distortion	G_v = 26 dB, P_o = 40 W f = 1 kHz f = 20 kHz		 0.004 0.03		 % %
V_{opp}	Output Voltage Swing			60		V_{pp}
P_o	Output Power (*)	V_S = ± 35 V, R_L = 8 Ω V_S = ± 30 V, R_L = 8 Ω V_S = ± 35 V, R_L = 4 Ω		60 40 100		W W W
I_o	Output Current			± 5		mA
SVR	Supply Voltage Rejection	f = 100 Hz		75		dB
C_s	Channel Separation	f = 1 kHz		75		dB

MUTE / STANDBY/ PLAY FUNCTIONS

Symbol	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 = 1 kHz		60		dB
V_i	Input Voltage Max. (pin 5)		12 (**)			V

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

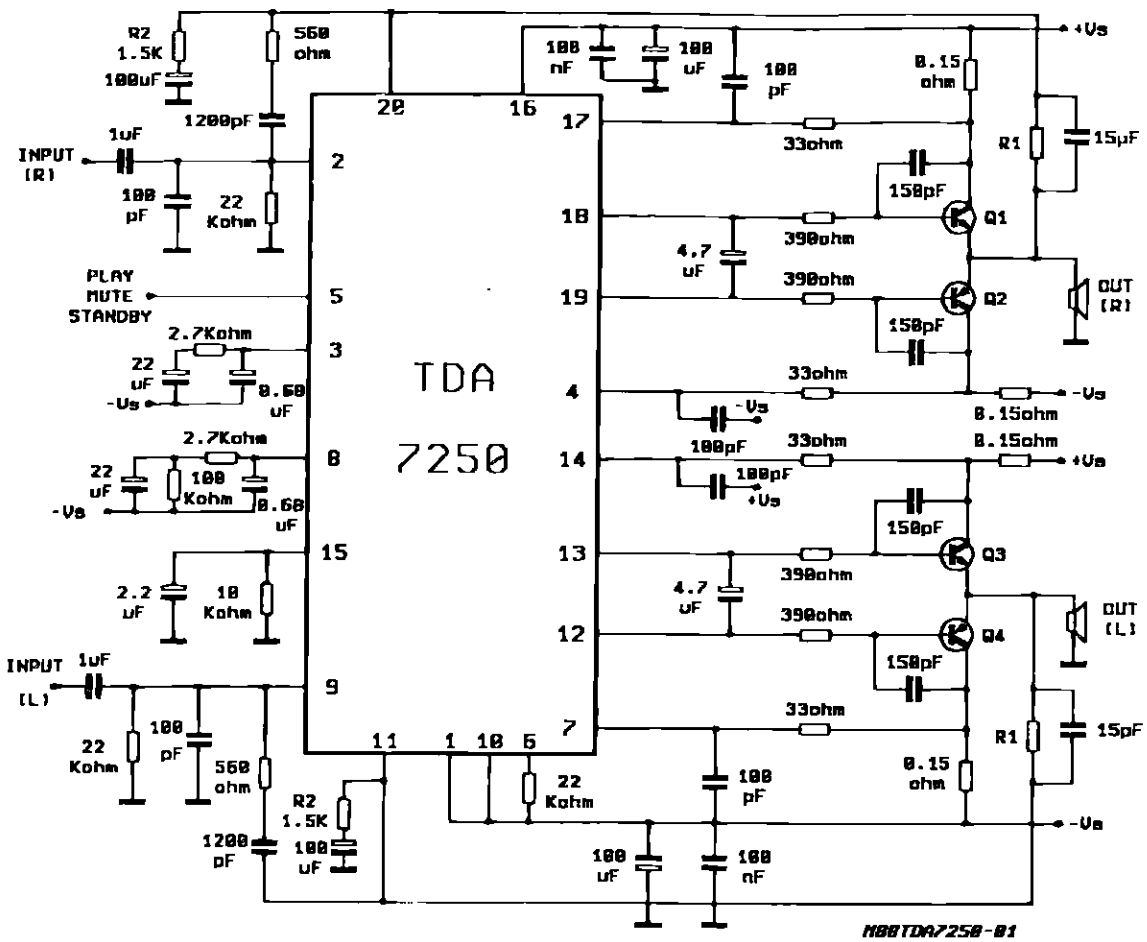
CURRENT SURVEY CIRCUITRY

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
	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

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
	Capacitor Current	Charge Discharge	30 250	60 500		µA µA
	Comparator Reference	to + V_S to – V_S	10	20 10	25	mV mV

Figure 1 : Application Circuit with Power Darlingtons.



Note : Q1/Q2 = Q3/Q4 = TIP 142/TIP147
GV = 1 + R1/R2

Figure 2 : Output Power vs. Supply Voltage.

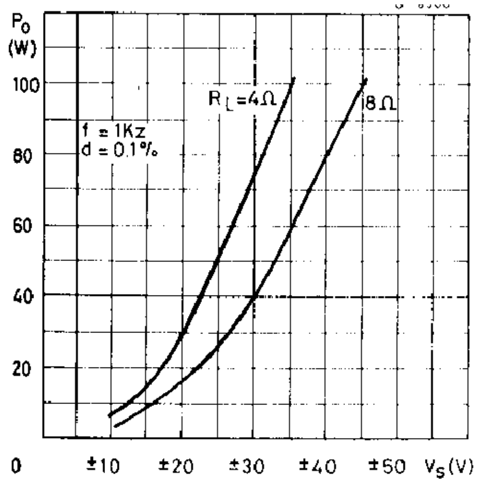


Figure 3 : Distortion vs.Output Power (*).

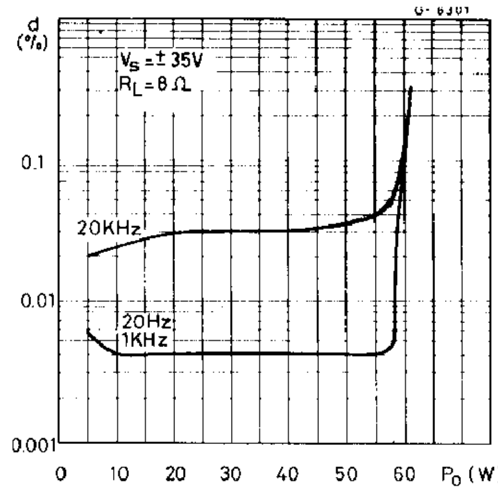


Figure 4 : Channel Separation.

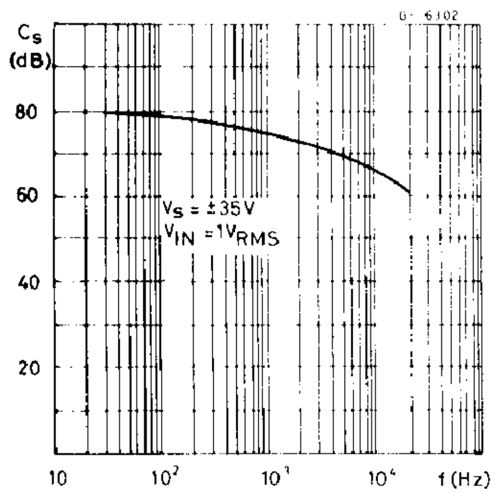


Figure 5 : Supply Voltage Rejection vs. Frequency.

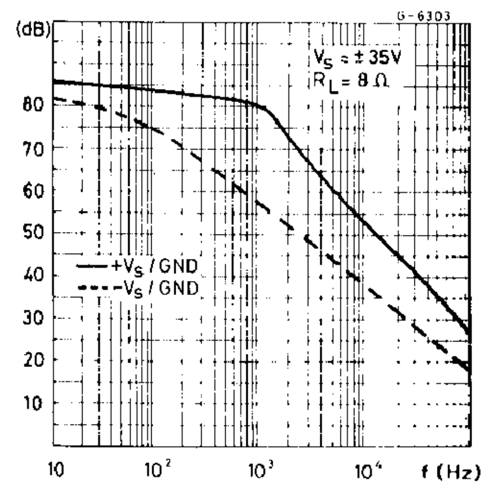


Figure 6 : Quiescent Current vs. Supply Voltage.

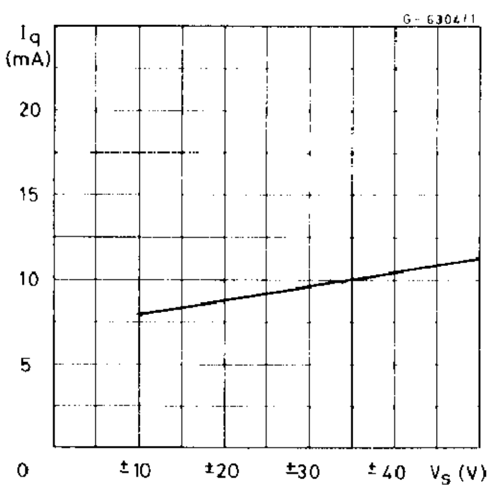


Figure 7 : Quiescent Current vs. T_{amb}.

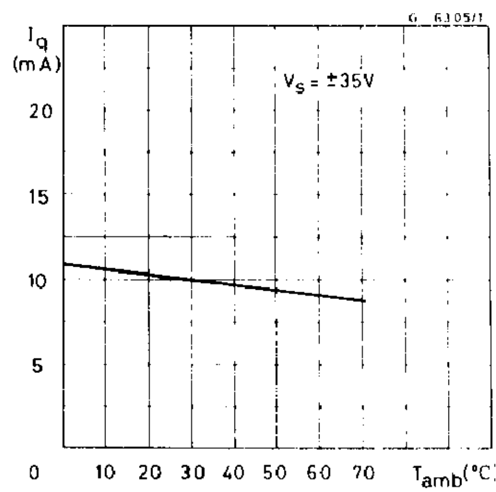


Figure 8 : Total Dissipated Power vs. Output Powe r (*).

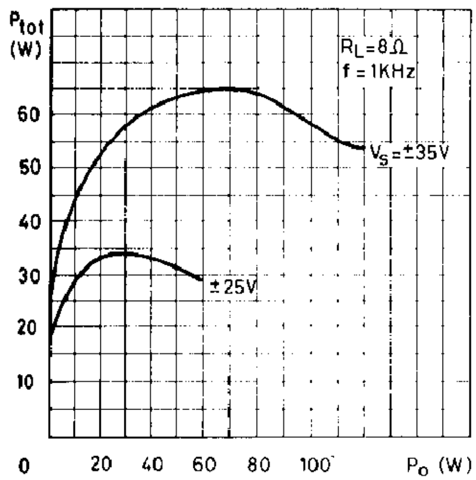


Figure 9 : Efficiency vs. Output Power (*).

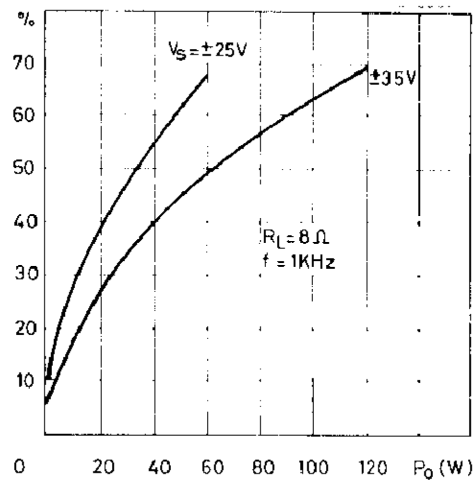
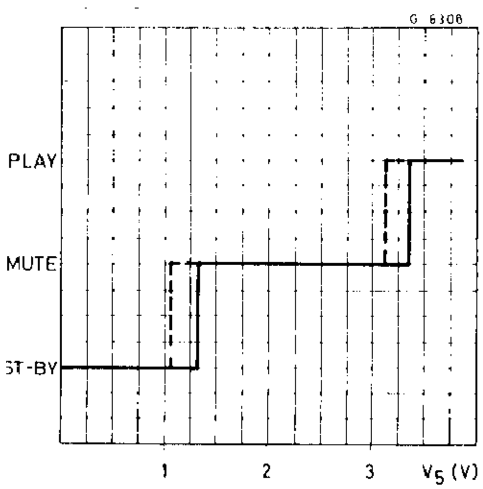


Figure 10 : Play-mute Standby Operation.



(*) Complete circuit

Figure 11 : Application Circuit Using Power Transistors.

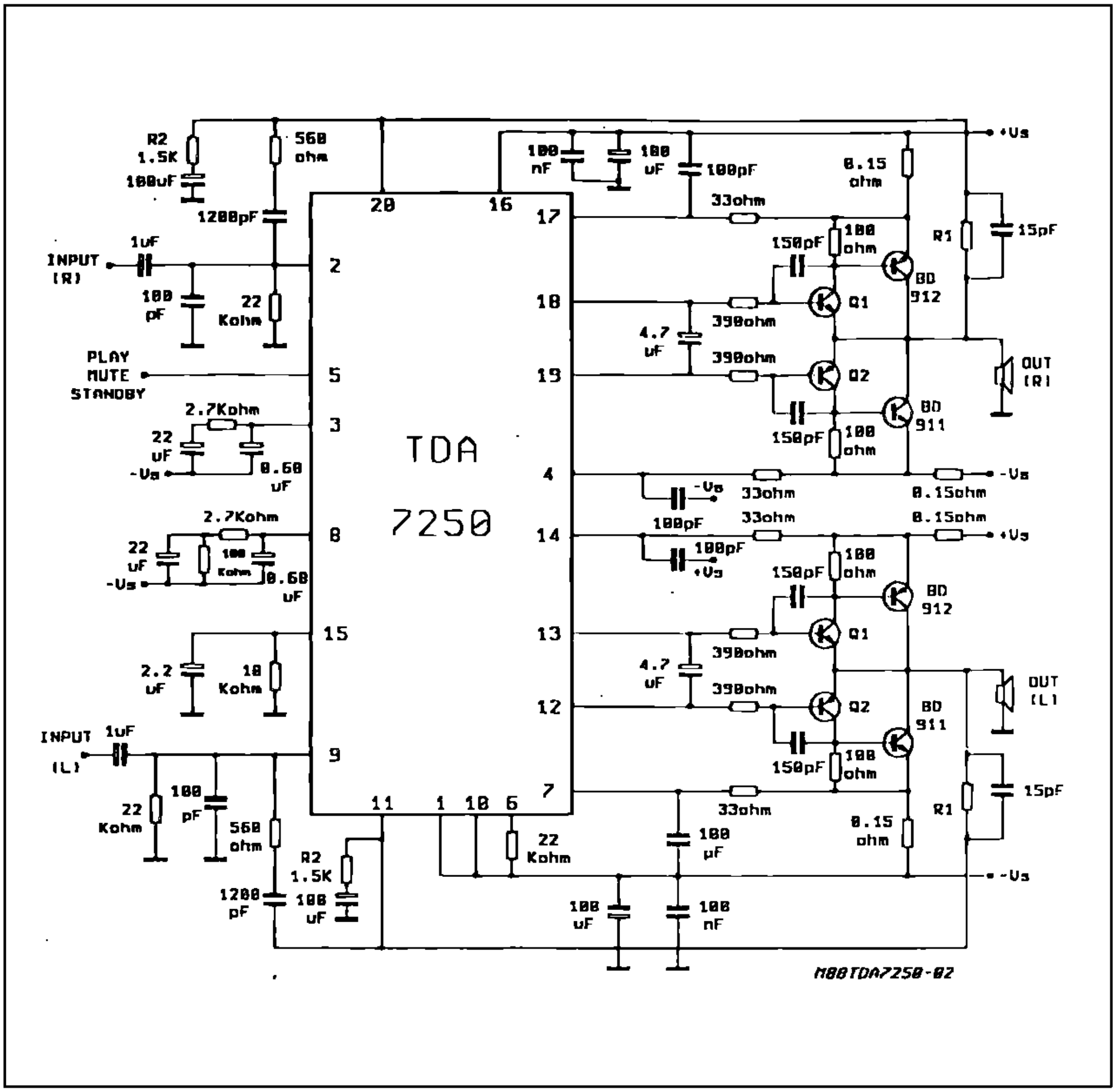


Figure 12 : Suggested Transistor Types for Various Loads and Powers.

$R_L = 8\ \Omega$

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

$T_L = 4\ \Omega$

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

DIP20 PACKAGE MECHANICAL DATA

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
a1	0.51			0.020		
B	0.85		1.40	0.033		0.055
b		0.50			0.020	
b1	0.38		0.50	0.015		0.020
D			24.80			0.976
E		8.80			0.346	
e		2.54			0.100	
e3		22.86			0.900	
F			7.10			0.280
I			5.10			0.201
L		3.30			0.130	
Z			1.27			0.050