DEC 16 1992

SIEMENS

AF-Amplifier for Television Sets

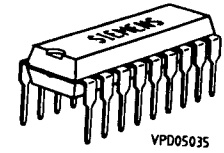
TDA 1138

Preliminary Data

Bipolar IC

Features

- Voltage range up to 30 V
- Music Power = 16 W (R_L = 4 Ω, d = 10 %)
- Output current up to 2.5 A
- Muting and standby function
- No audible switch on/off noise
- Short-circuit proof to ground and V_{CC}



P-DIP-18

Type	Ordering Code	Package
TDA1138	Q67000-A5109	P-DIP-18

Functional Description

This device is a short-circuit proof AF-amplifier with minimal external circuitry requirements. It offers a standby function that insures no audible switch on/off noise.

Circuit Description

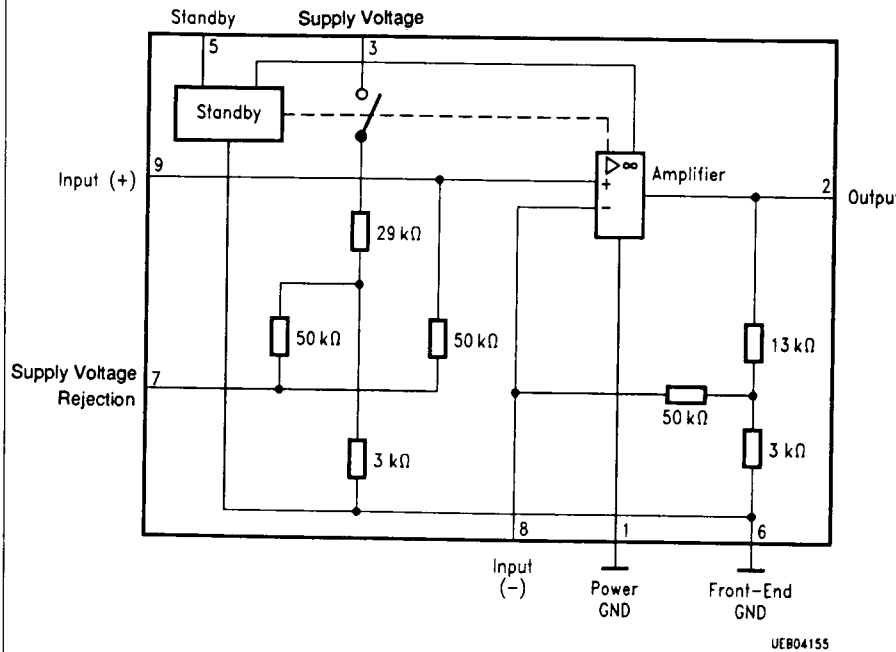
On pin 7, the supply voltage ripple rejection is achieved by adding a filter capacitor of typ. 47 µF/ 6.3 V.

The output power stages are protected against short circuits both to ground and supply voltage by limiting the current amplification of the output transistors.

Protection against chip over temperature prevents the output transistors from overheating. The stand-by pin employs a mute function, without switching off the amplifier entirely.

Pin Definitions and Functions

Pin No.	Function
1	**Power ground;** to be routed separately from the pre-amplifier ground to the base of the power-supply electrolytic capacitor. The lead is to be designed for currents up to 3 A.
2	**Output;** push-pull stage B output, produces ± 1 A and must be terminated with 2.2 Ω in series with 100 nF to ground (Boucherot network).
3	**Supply voltage;** in addition to the power-supply electrolytic capacitor, to be blocked against the power ground close up to the IC by a ceramic capacitor of 220 nF.
4	**Not connected.**
5	**Standby input;** serves simultaneously for the muting function.
6	**Pre-amplifier ground;** to be routed separately from the power ground to the base of the power-supply electrolytic capacitor.
7	**Supply voltage ripple rejection;** approx. 47 µF to blank the ripple voltage of the power supply.
8	**Inverting input;** feedback via a voltage divider from the output.
9	**Non-inverting input;** for feeding in the AF-signal.
10–18	**Ground**



Block Diagram

Absolute Maximum Ratings
T_C = – 25 to 85 °C

Parameter	Symbol	Limit Values		Unit	Remarks
		min.	max.		
Supply voltage	V_S	– 0.3	35	V	
Peak output current	I_2	– 3	3	A	t = 100 µs, single pulse
Peak output current	I_2	– 2.5	2.5	A	f > 20 Hz
Input voltage	V_9	– 0.3	6	V	
Input voltage	V_8	– 0.3	V_S	V	
Junction temperature	T_j		150	°C	
Storage temperature	T_{stg}	– 50	150	°C	

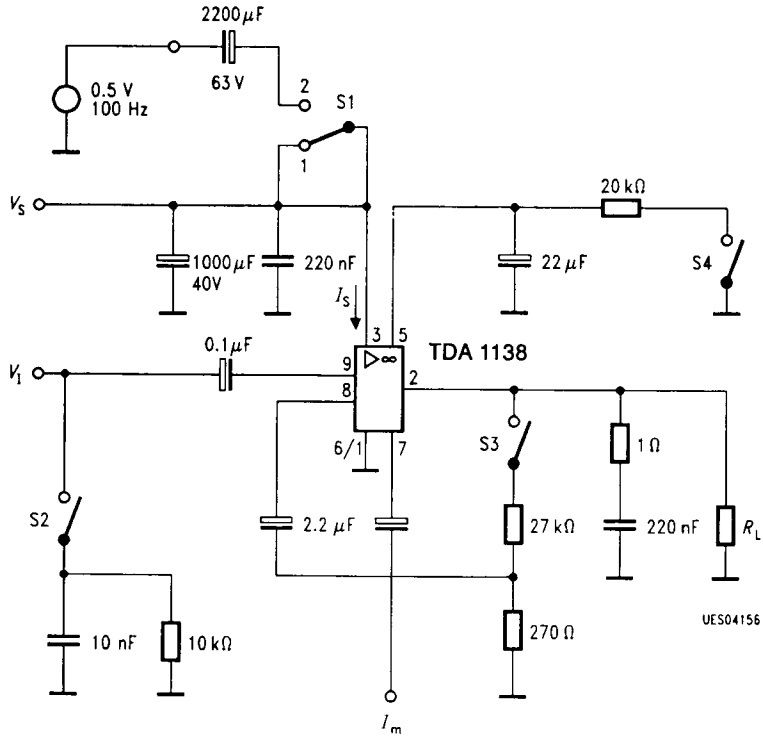
Operating Range

Supply voltage	V_S	12	30	V	
Case temperature	T_C	– 25	75	°C	
Thermal resistance					
system-air	$R_{th\,JA}$		50	K/W	
system-case	$R_{th\,JC}$		10	K/W	Pins 10–18

Characteristics

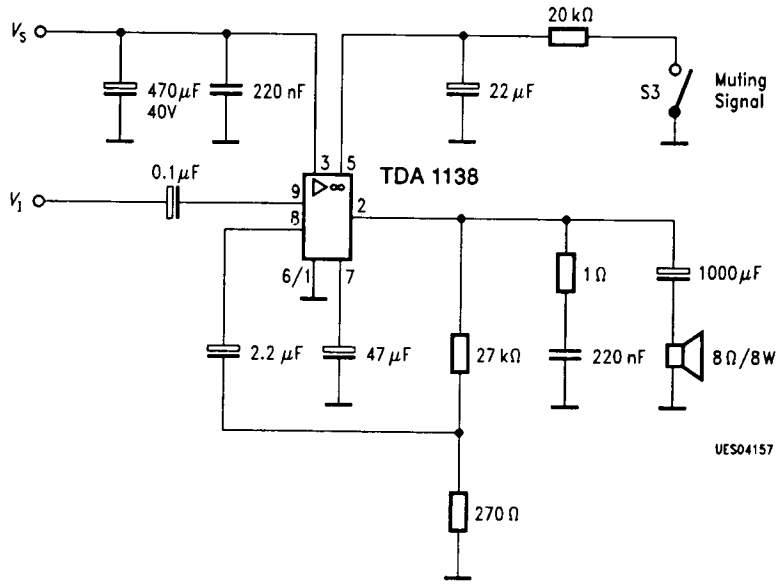
V_S = 16.5 V, R_L = 4 Ω, f = 1 kHz, T_C = 25 °C, switches as in test circuit, unless stated otherwise

Parameter	Symbol	Limit Values			Unit	Test Condition
		min.	typ.	max.		
Quiescent current	I_S		22	35	mA	V_S = 28 V
Output voltage	V_Q		11.6		V	V_S = 24 V, no input signal
Input resistance	R_I	30			kΩ	
Output power	P_Q		6		W	THD = 1 %
Output power	P_Q	6.5	7.5		W	THD = 10 %
Output power	P_Q		5		W	V_S = 20 V, R_L = 8 Ω, THD = 1 %
Output power	P_Q		6.5		W	V_S = 20 V, R_L = 8 Ω, THD = 10 %
Supply voltage rejection	a_{hum}	40	42		dB	R_L = 8 Ω, f = 100 Hz, R_S = 10 kΩ, V_V = 0.5 Vrms, S1 in setting 2
Harmonic distortion	THD		0.15 0.8	0.5	% %	P_Q = 0.05 – 3 W f = 10 kHz
Transmission range	B	0.02		40	kHz	P_Q = 1 W, – 3 dB referred to 1 kHz
Noise voltage	V_N		5		µV	DIN 45405: referred to input; S2 made
Voltage gain	G_V		75		dB	Control loop open
	G_V	39	40	41	dB	Control loop made
Output noise voltage when muted	V_{QN}			160	µV	V_I = 1 V, I_5 = 2.6 mA, S1 made



Switches as illustrated, unless stated otherwise

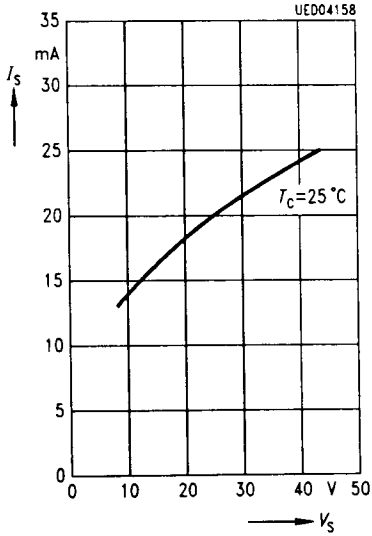
Test Circuit



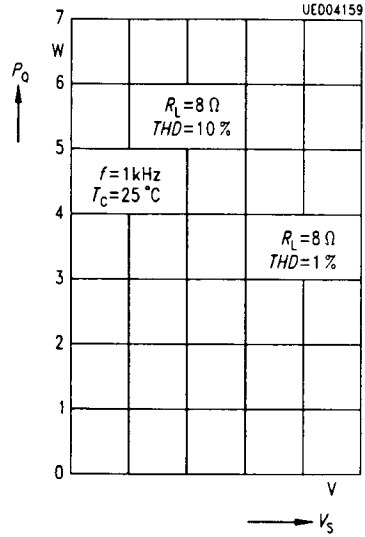
Application Circuit

Diagrams

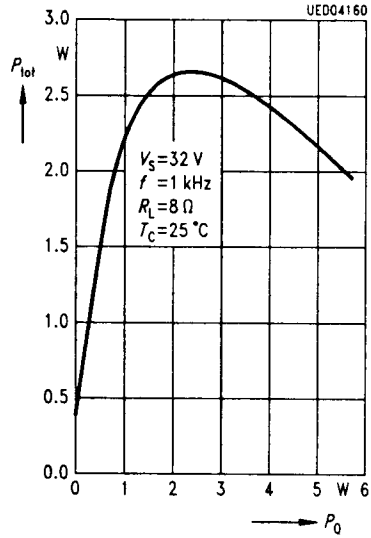
Quiescent Current versus Supply Voltage



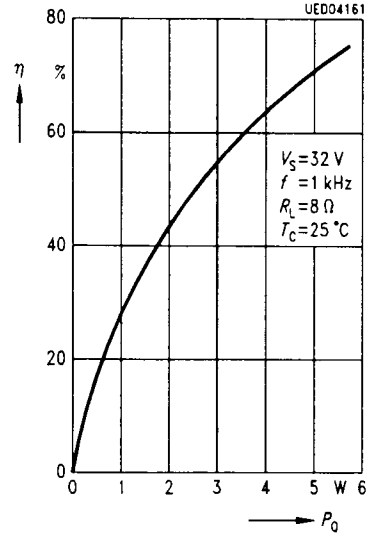
Output Power versus Supply Voltage



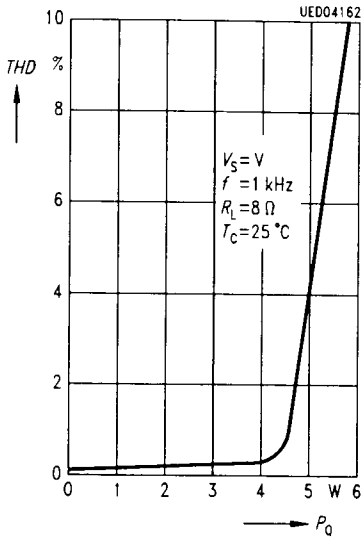
Power Dissipation versus Output Power



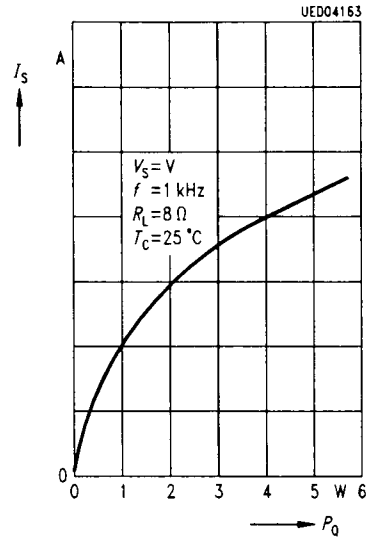
Efficiency versus Output Power



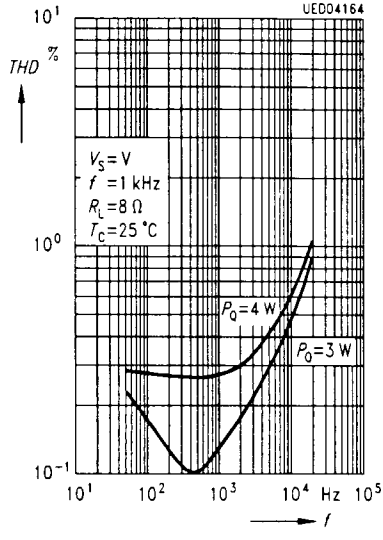
Total Harmonic Distortion versus Output Power



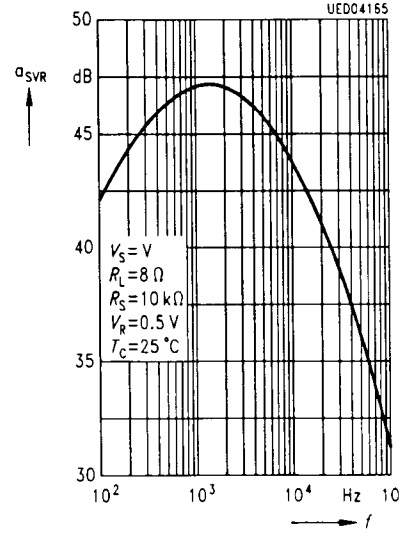
Current Drain versus Output Power



Total Harmonic Distortion versus Frequency

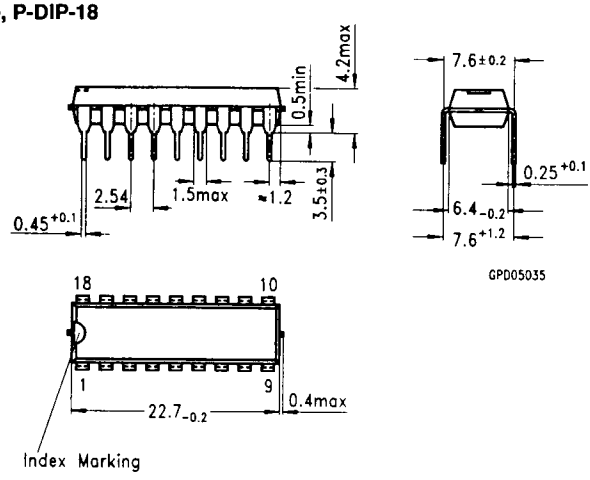


Line Hum Suppression versus Frequency



Package Outlines

Plastic Package, P-DIP-18
(Dual-in-Line)



Sorts of Packing
Package outlines for tubes, trays ect. are contained in our Data Book "Package Information"

Dimensions in mm