

## AF-Amplifier for Television Sets

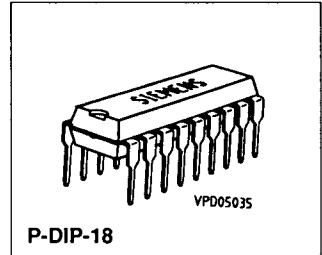
TDA 1138

## Preliminary Data

Bipolar IC

## Features

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



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

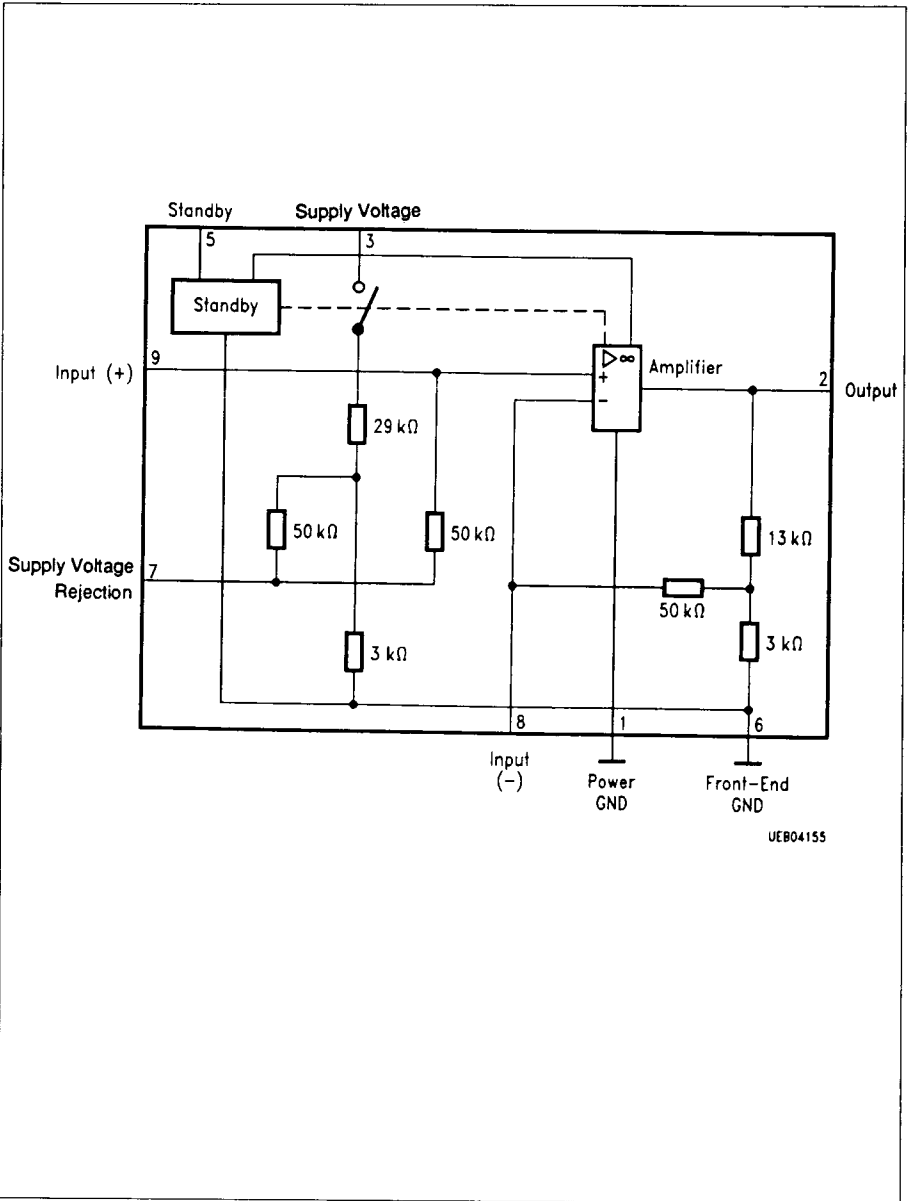
On pin 7, the supply voltage ripple rejection is achieved by adding a filter capacitor of typ. 47  $\mu\text{F}$ /6.3 V.

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	<b>Power ground;</b> 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	<b>Output;</b> push-pull stage B output, produces $\pm 1$ A and must be terminated with $2.2 \Omega$ in series with 100 nF to ground (Boucherot network).
3	<b>Supply voltage;</b> 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	<b>Not connected.</b>
5	<b>Standby input;</b> serves simultaneously for the muting function.
6	<b>Pre-amplifier ground;</b> to be routed separately from the power ground to the base of the power-supply electrolytic capacitor.
7	<b>Supply voltage ripple rejection;</b> approx. 47 $\mu$ F to blank the ripple voltage of the power supply.
8	<b>Inverting input;</b> feedback via a voltage divider from the output.
9	<b>Non-inverting input;</b> for feeding in the AF-signal.
10–18	<b>Ground</b>



UEB04155

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	$t = 100$ $\mu$ s, 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	

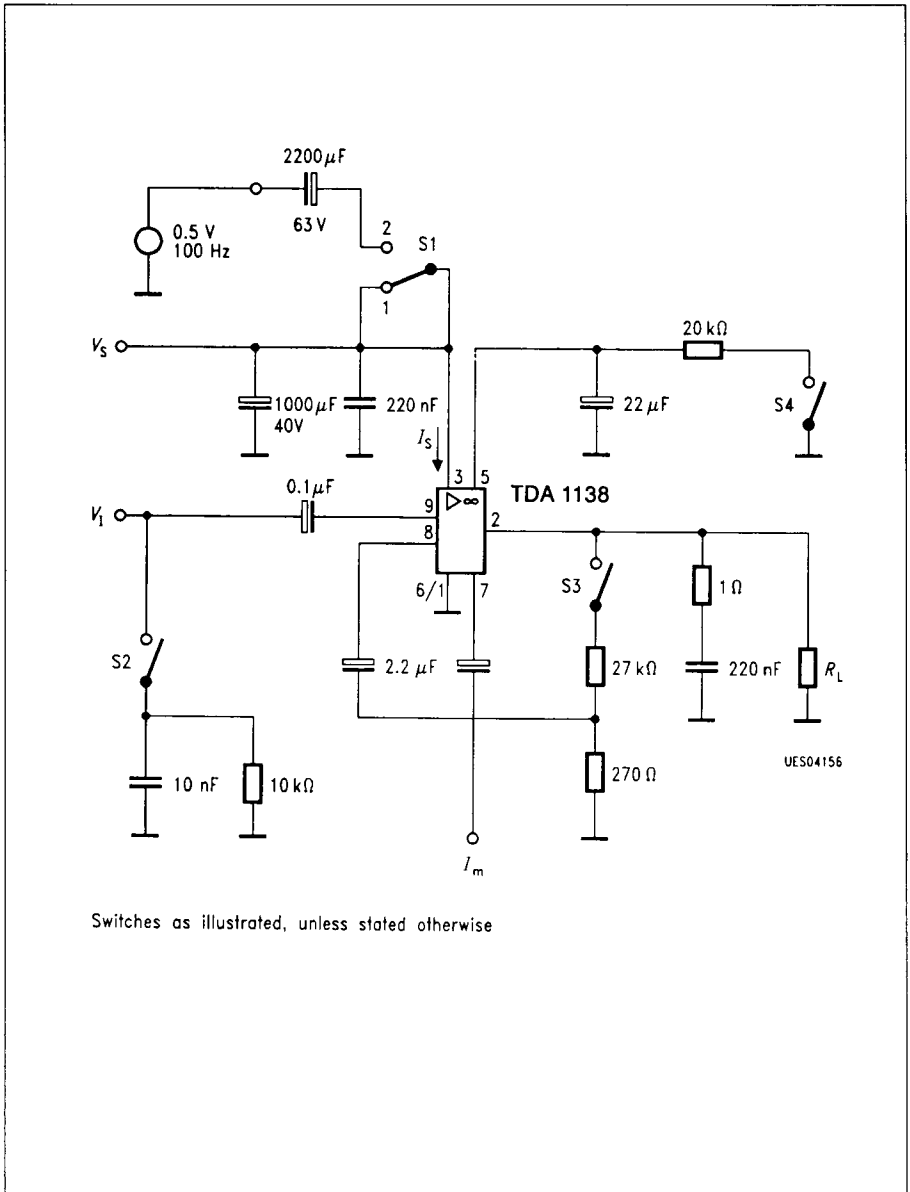
## Operating Range

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

### Characteristics

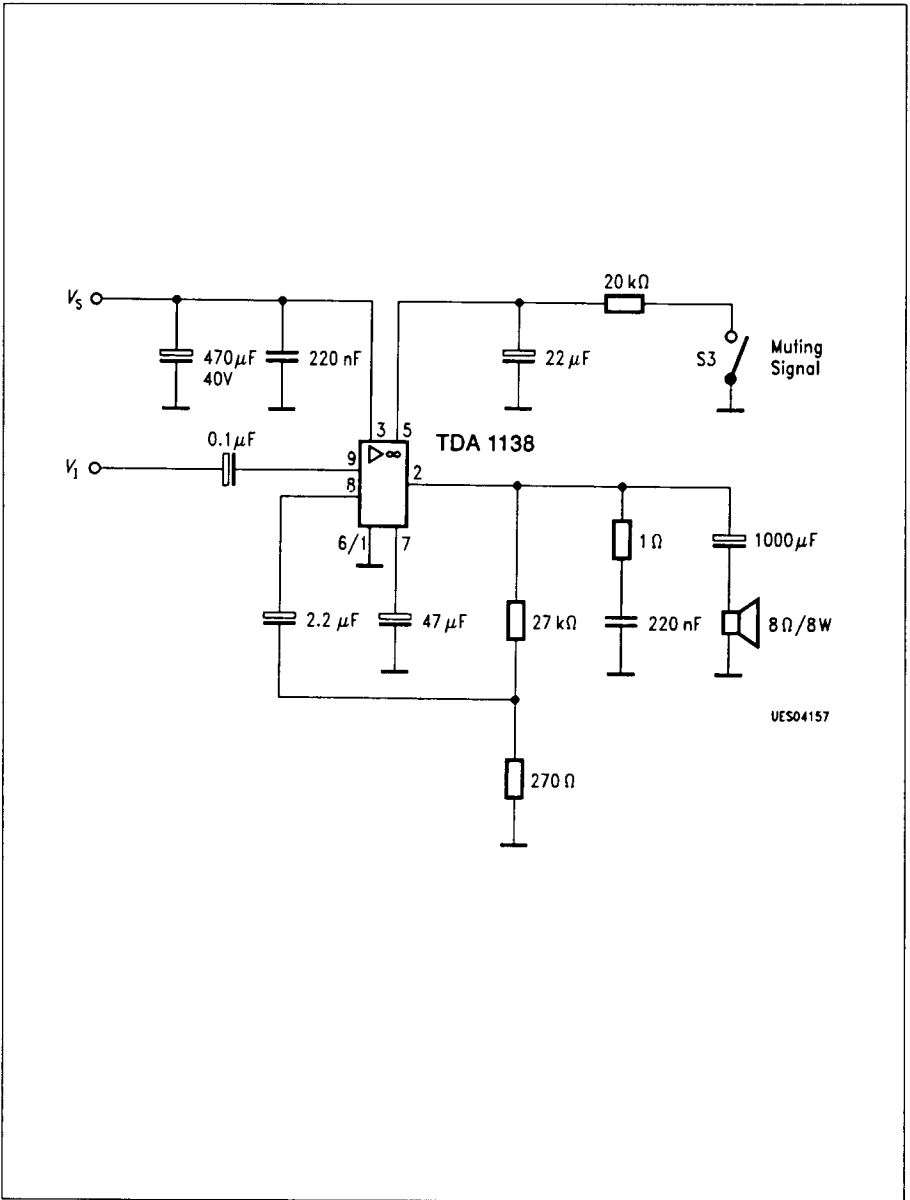
$V_S = 16.5 \text{ V}$ ,  $R_L = 4 \text{ } \Omega$ ,  $f = 1 \text{ kHz}$ ,  $T_C = 25 \text{ } ^\circ\text{C}$ , switches as in test circuit, unless stated otherwise

Parameter	Symbol	Limit Values			Unit	Test Condition
		min.	typ.	max.		
Quiescent current	$I_S$		22	35	mA	$V_S = 28 \text{ V}$
Output voltage	$V_O$		11.6		V	$V_S = 24 \text{ V}$ , no input signal
Input resistance	$R_I$	30			k $\Omega$	
Output power	$P_O$		6		W	$THD = 1 \%$
Output power	$P_O$	6.5	7.5		W	$THD = 10 \%$
Output power	$P_O$		5		W	$V_S = 20 \text{ V}$ , $R_L = 8 \text{ } \Omega$ , $THD = 1 \%$
Output power	$P_O$		6.5		W	$V_S = 20 \text{ V}$ , $R_L = 8 \text{ } \Omega$ , $THD = 10 \%$
Supply voltage rejection	$a_{hum}$	40	42		dB	$R_L = 8 \text{ } \Omega$ , $f = 100 \text{ Hz}$ , $R_S = 10 \text{ k}\Omega$ , $V_V = 0.5 \text{ Vrms}$ , S1 in setting 2
Harmonic distortion	$THD$		0.15 0.8	0.5	% %	$P_O = 0.05 - 3 \text{ W}$ $f = 10 \text{ kHz}$
Transmission range	$B$	0.02		40	kHz	$P_O = 1 \text{ W}$ , $-3 \text{ dB}$ referred to 1 kHz
Noise voltage	$V_N$		5		$\mu\text{V}$	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	$V_{ON}$			160	$\mu\text{V}$	$V_I = 1 \text{ V}$ , $I_S = 2.6 \text{ mA}$ , S1 made



Switches as illustrated, unless stated otherwise

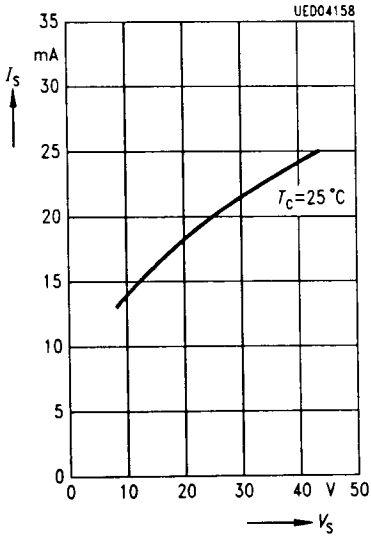
Test Circuit



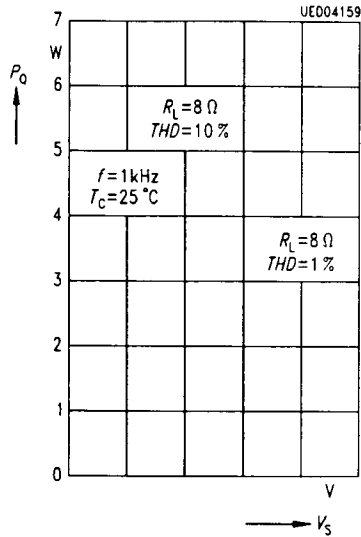
Application Circuit

Diagrams

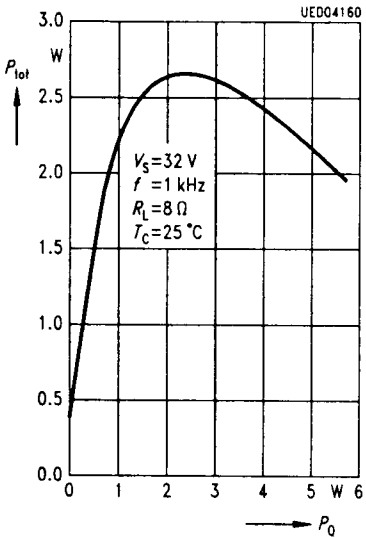
Quiescent Current versus Supply Voltage



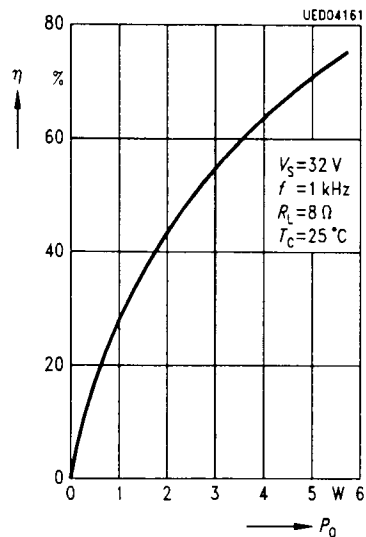
Output Power versus Supply Voltage



Power Dissipation versus Output Power

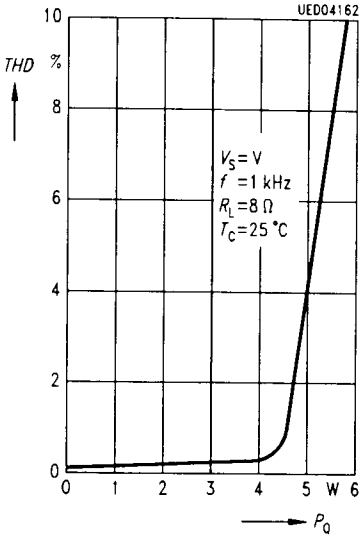


Efficiency versus Output Power

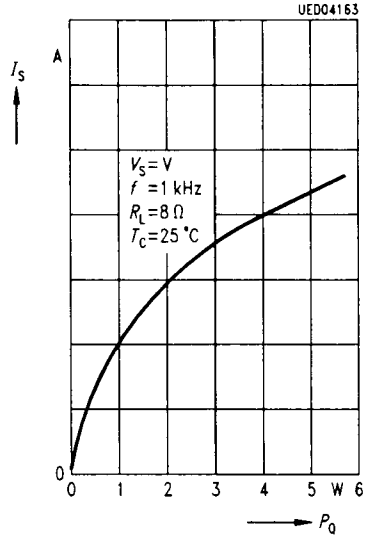




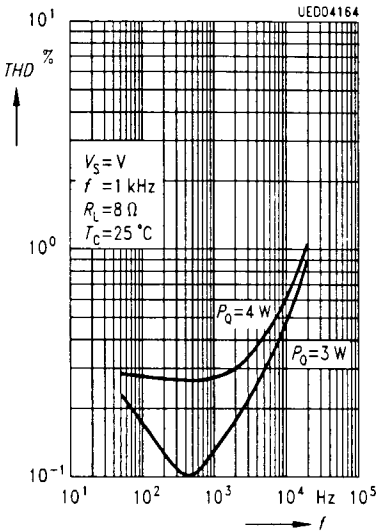
**Total Harmonic Distortion versus Output Power**



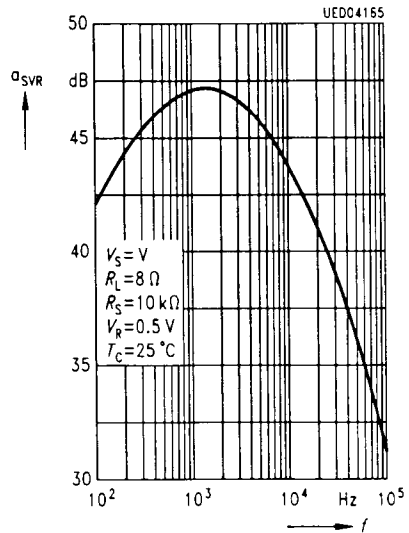
**Current Drain versus Output Power**



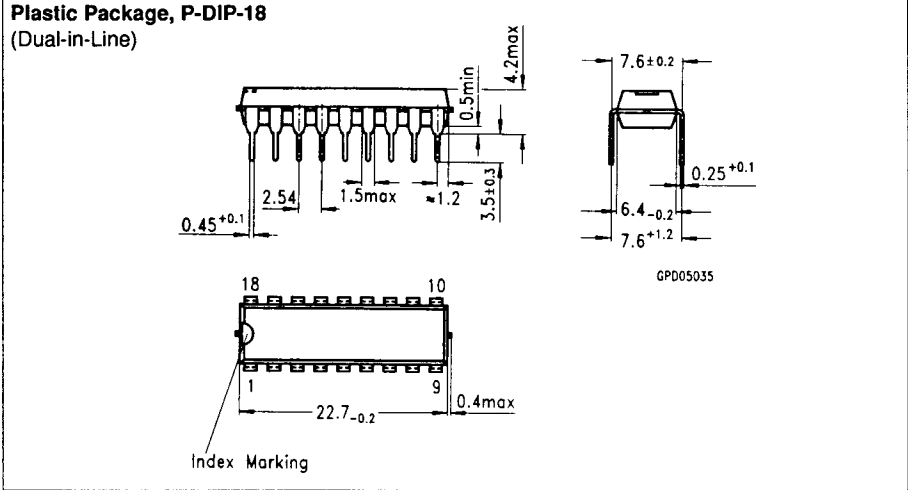
**Total Harmonic Distortion versus Frequency**



**Line Hum Suppression versus Frequency**



Package Outlines



**Sorts of Packing**

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

Dimensions in mm