

Stereo/Bridge AF Amplifier 2 x 15 W/30 W

TDA 4935

Bipolar IC

Features

- Universal application as stereo amplifier or mono amplifier in bridge configuration
- Wide supply voltage range
- Minimum of external components

Type	Ordering Code	Package
TDA 4935	Q67000-A2538	P-SIP-9

The TDA 4935 can be applied as a class B stereo amplifier or mono amplifier in bridge configuration for AF signals. In addition, the component is provided with a protective circuitry against overtemperature and overload.

Absolute Maximum Ratings

Parameter	Symbol	Limit Values	Unit
Supply voltage	V_S	32	V
Output peak current	$I_1; I_9$	2.8	A
Input voltage range	$V_2; V_3; V_7$	– 0.3 to V_S	V
Junction temperature	T_j	150	°C
Storage temperature range	T_{stg}	– 40 to 125	°C
Thermal resistance (system-case)	$R_{th JC}$	4	K/W

Operating Range

Supply voltage $R_L \geq 8 \Omega$ $R_L = 4 \Omega$	V_S	8 to 30	V
	V_S	8 to 24	V
Case temperature ($P_V=15W$)	T_C	– 20 to 85	°C

Characteristics $V_S = 24\text{ V}$; $T_C = 25\text{ }^\circ\text{C}$

Parameter	Symbol	Limit Values			Unit	Test Circuit
		min.	typ.	max.		
Quiescent current $V_I = 0$	I_S		40	80	mA	1
Output voltage $V = 0$	$V_{O\ 1;9}$	11	12	13	V	1
Input resistance ¹⁾	$R_{I\ 3;7}$		20		k Ω	1
Output power $f = 1\text{ kHz}$ – stereo operation $THD = 1\%$ $THD = 10\%$ – bridge operation $THD = 1\%$ $THD = 10\%$	$P_{O\ 1;9}$ $P_{O\ 1;9}$ $P_{O\ 1;9}$ $P_{O\ 1;9}$	10 13	12 15		W W W W	1 1 2 2
Line hum suppression ²⁾ $f_R = 100\text{ Hz}$; $V_R = 0.5\text{ V}$	a_{hum}	40	46		dB	1
Current consumption $P_9 = P_1 = 15\text{ W}$; $f_i = 1\text{ kHz}$	I_S		1.8		A	1
Efficiency $P_9 = P_1 = 10\text{ W}$; $f_i = 1\text{ kHz}$	η		70		%	1
Total harmonic distortion $P_{9/1} = 0.05 - 10\text{ W}$ $f_i = 40\text{ Hz to }15\text{ kHz}$	THD		0.2	0.5	%	1
Cross-talk rejection $f_i = 1\text{ kHz}$; P_9 or $P_1 = 15\text{ W}$	a_{cr}		50		dB	1
Transmission range ³⁾	B	40 Hz to 60 kHz				1

Characteristics (cont'd) $V_S = 25\text{ V}$; $T_C = 25\text{ }^\circ\text{C}$

Parameter	Symbol	Limit Values			Unit	Test Circuit
		min.	typ.	max.		
Disturbance voltage (B = 30 Hz to 20 kHz) in acc. with DIN 45 405 referred to input ⁴⁾	V_d		5		μV	1
Noise voltage (CCIR filter) in acc. with DIN 45 405 referred to input ⁴⁾	V_n		15		μV_S	1
Difference in transmission measure $P_9 = P_1 = 10\text{ W}$ $f_1 = 40\text{ Hz to } 20\text{ kHz}$	ΔG_v			1	dB	1
Voltage gain stereo bridge configuration	G_v		30		dB	1
	G_v		36		dB	2

¹⁾ S2a (b) open/closed²⁾ S1a (b) and S3 in position 2³⁾ $P_{9/1} = 6\text{ W}$; -3 dB referred to 1 kHz⁴⁾ S1a (b) in position 2

Circuit Description

The IC contains 2 complete amplifiers and can be used for a wide variety of applications with a minimum of external circuitry.

The TDA 4935 can be applied as stereo amplifier or amplifier in bridge configuration for operating voltages ranging between 8 V and 26 V.

The pre-stages are differential amplifiers with strong negative feedback. Internal frequency compensation in the driver amplifier limits the gain-bandwidth product to 4.5 MHz.

The power output stages are comprised of quasi PNP transistors (small saturation voltage).

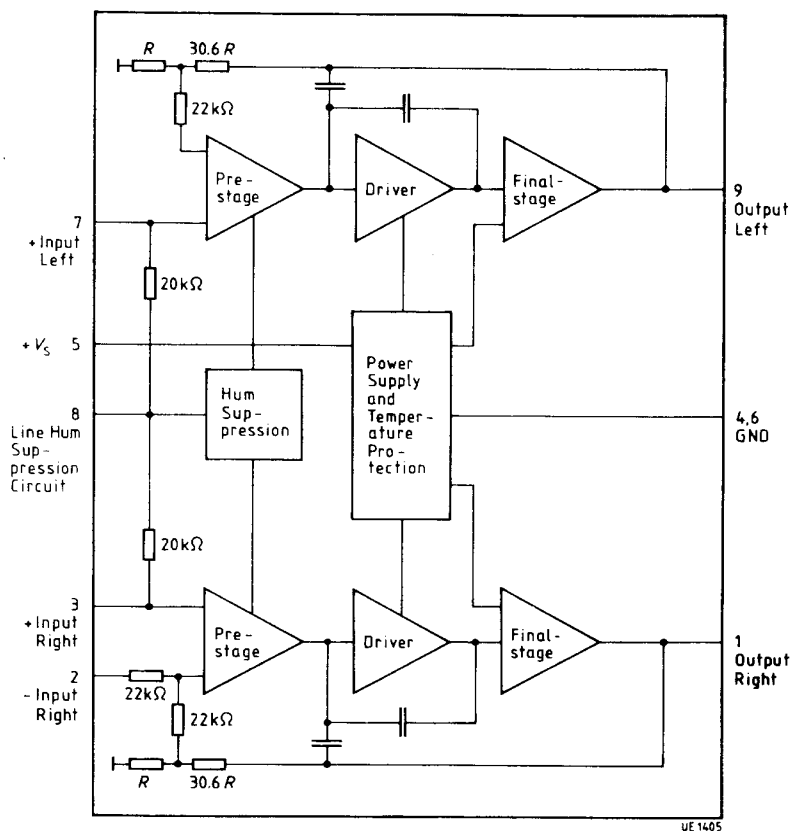
To avoid overheating, a temperature fuse affecting both amplifiers prevents current supply to the power output stages during inadmissibly high chip temperatures.

As a special economic feature, the negative feedback resistances for $G_V = 30$ dB and the input voltage reference divider have been integrated.

Pin Functions

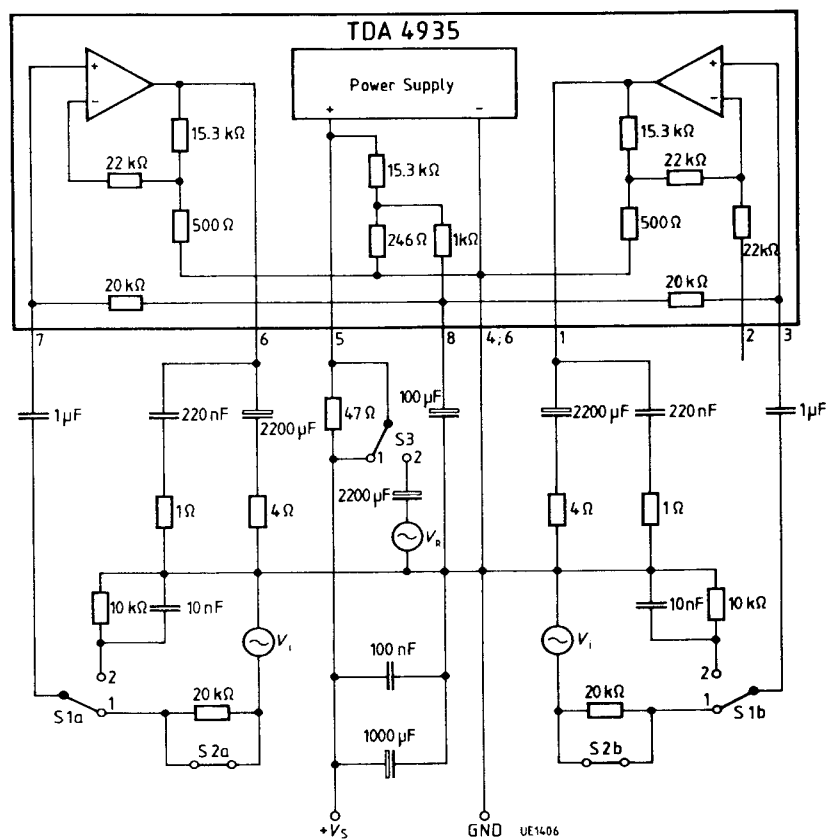
Pin No.	Function
1	Output right channel
2	Inverting input right channel (more than 22 k Ω)
3	Non-inverting input right channel
4	GND
5	+ V _s
6	GND
7	Non-inverting input left channel
8	Line hum suppression right and left channel
9	Output left channel

Block Diagram



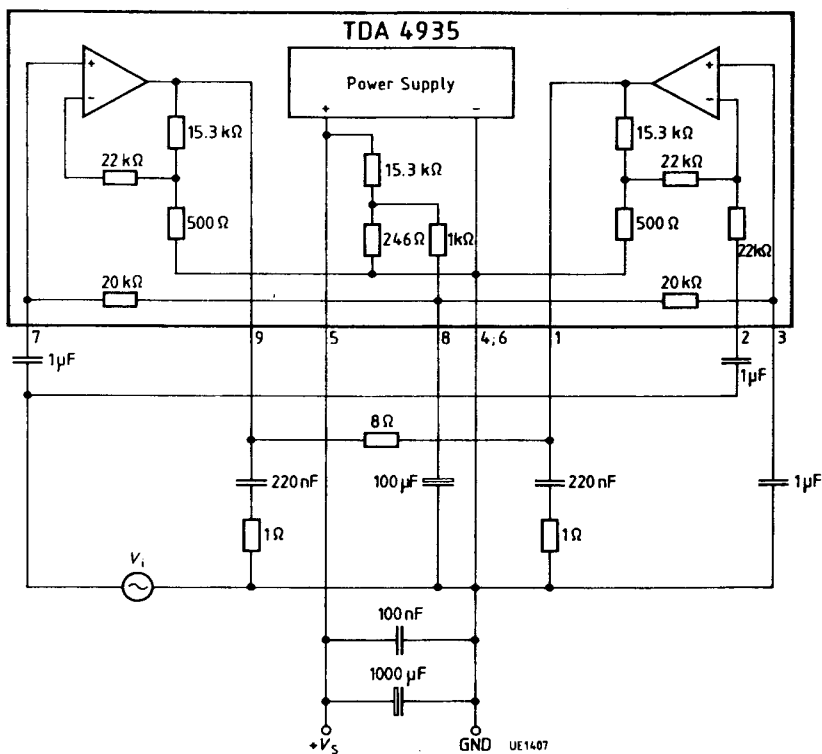
Test Circuit

1. Stereo Operation



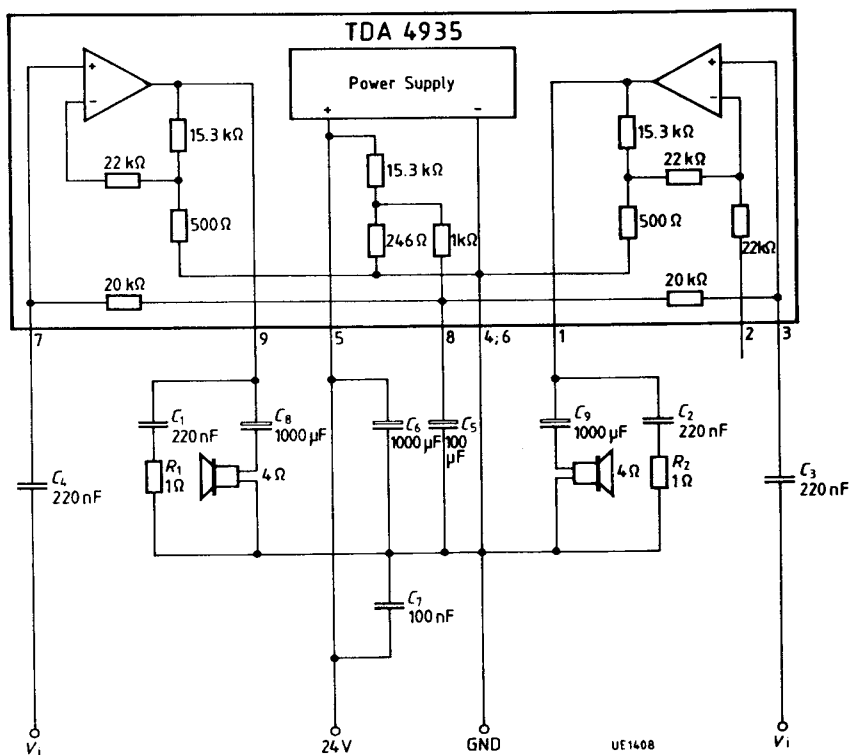
Test Circuit

2. Bridge Operation

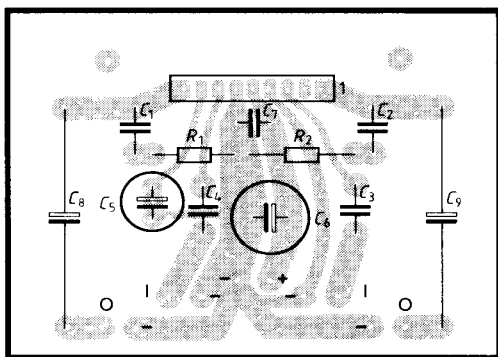


Application Circuit

1. Stereo Operation

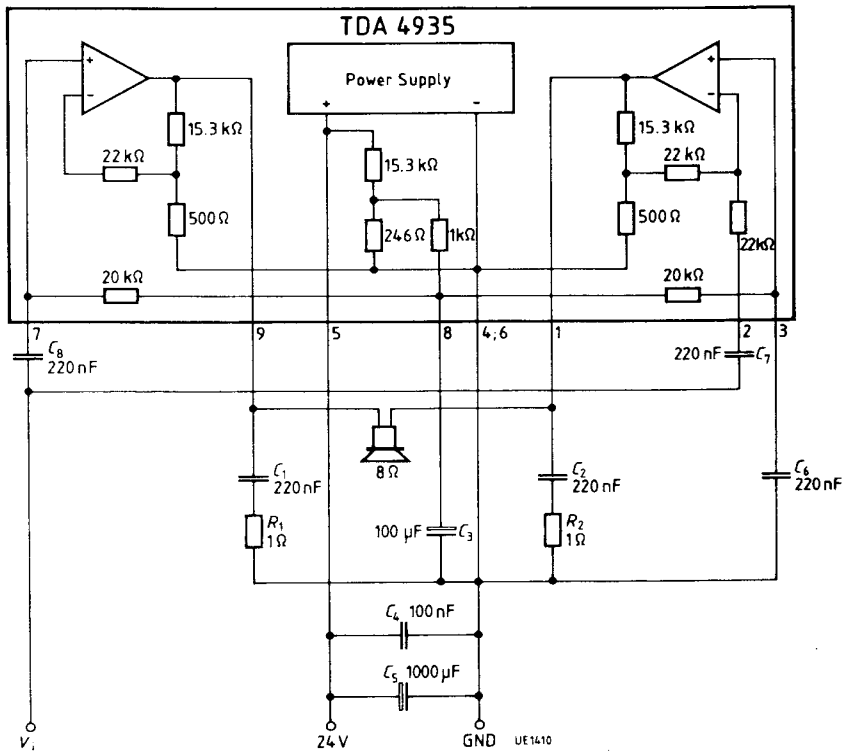


Layout / Plug-in Location Plan

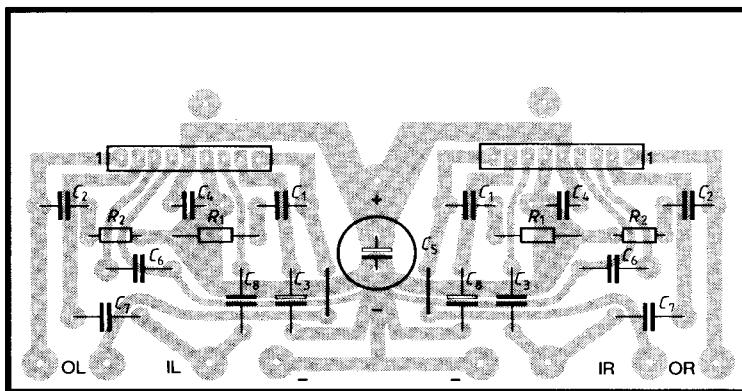


Application Circuit

2. Bridge Operation (one channel only)

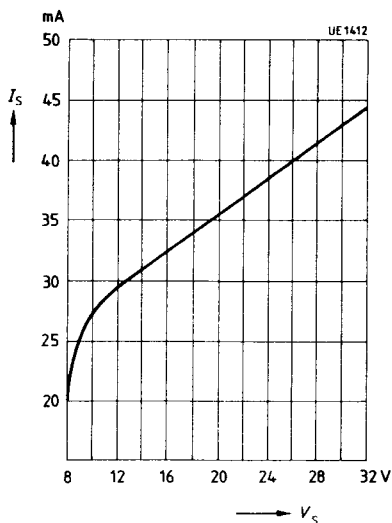


Layout / Plug-in Location Plan

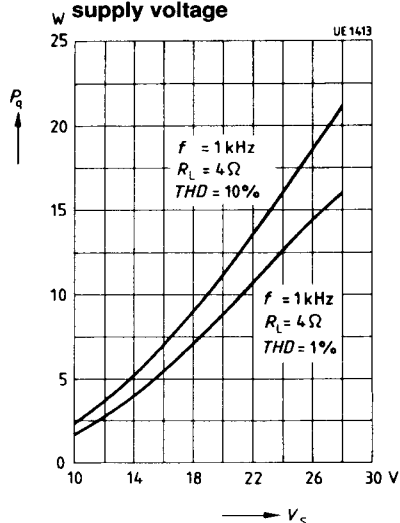


2 x 30W

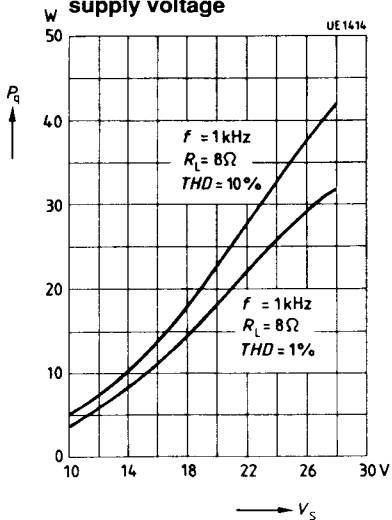
Quiescent current versus supply voltage



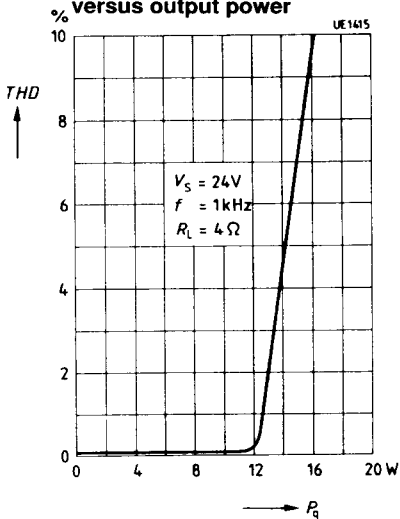
Stereo Operation
Output power versus supply voltage

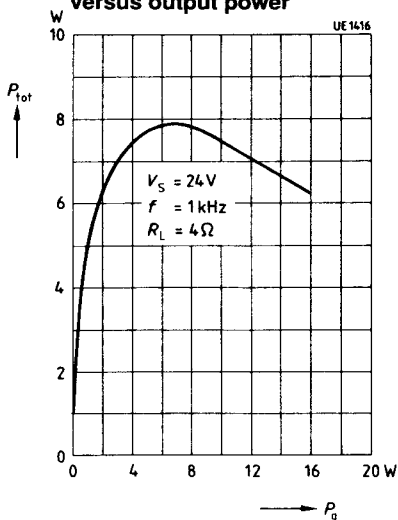
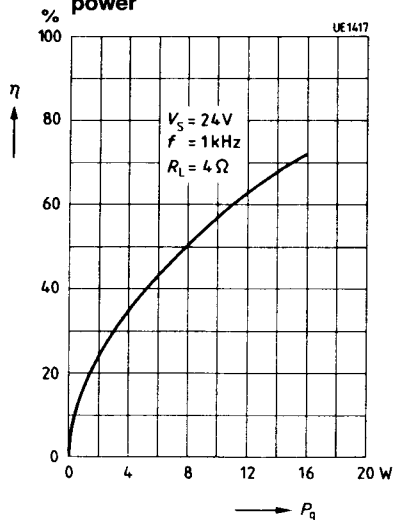
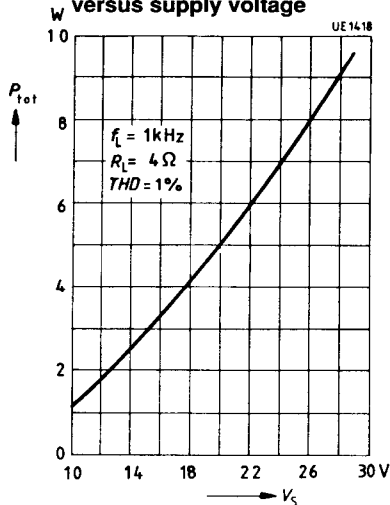
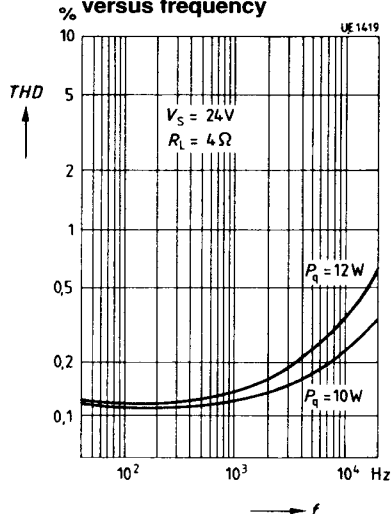


Bridge Operation
Output power versus supply voltage



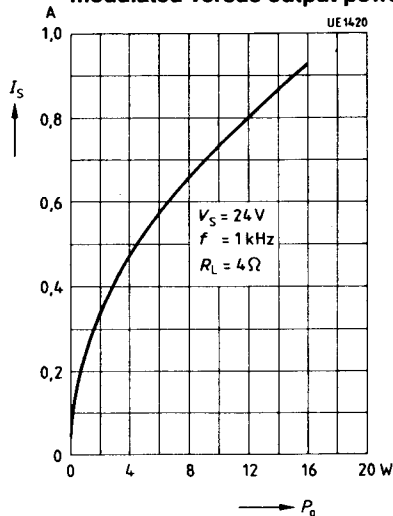
Stereo Operation
Total harmonic distortion versus output power



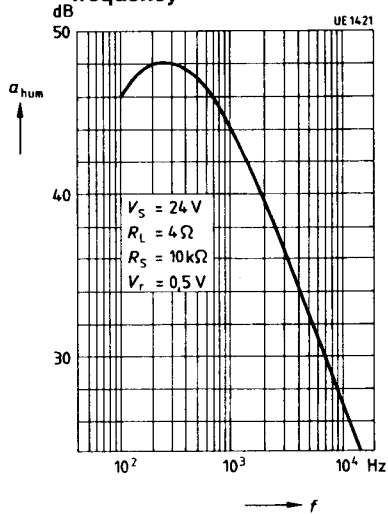
Stereo Operation**Power dissipation (each channel)
versus output power****Stereo Operation****Efficiency versus output
power****Stereo Operation****Power dissipation (each channel)
versus supply voltage****Stereo Operation****Total harmonic distortion
versus frequency**

Stereo Operation

**Supply current (one channel)
modulated versus output power**

**Stereo Operation**

**Line hum suppression versus
frequency**

**Cross-talk rejection
versus frequency**