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SIEMENS

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

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Characteristics
V_S = 24 V; T_C = 25 °C

Parameter	Symbol	Limit Values			Unit	Test Circuit
		min.	typ.	max.		
Quiescent current V_I = 0	I_5		40	80	mA	1
Output voltage V = 0	$V_{Q\,1;9}$	11	12	13	V	1
Input resistance[1]	$R_{I\,3;7}$		20		kΩ	1
Output power f = 1 kHz – stereo operation						
THD = 1%	$P_{Q\,1;9}$	10	12		W	1
THD = 10%	$P_{Q\,1;9}$	13	15		W	1
– bridge operation						
THD = 1%	$P_{Q\,1;9}$	20	24		W	2
THD = 10%	$P_{Q\,1;9}$	26	30		W	2
Line hum suppression[2] f_R = 100 Hz; V_R = 0.5 V	a_{hum}	40	46		dB	1
Current consumption $P_9 = P_1$ = 15 W; f_I = 1 kHz	I_5		1.8		A	1
Efficiency $P_9 = P_1$ = 10 W; f_I = 1 kHz	η		70		%	1
Total harmonic distortion $P_{9/1}$ = 0.05 – 10 W f_I = 40 Hz to 15 kHz	THD		0.2	0.5	%	1
Cross-talk rejection f_I = 1 kHz; P_9 or P_1 = 15 W	a_{cr}		50		dB	1
Transmission range[3]	B	40 Hz to 60 kHz				1

Characteristics (cont'd)
V_S = 25 V; T_C = 25 °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		µVs	1
Difference in transmission measure $P_9 = P_1$ = 10 W f_1 = 40 Hz to 20 kHz	ΔG_V			1	dB	1
Voltage gain stereo bridge configuration	G_V G_V		30 36		dB dB	1 2

[1] S2a (b) open/closed
[2] S1a (b) and S3 in position 2
[3] $P_{9/1}$ = 6 W; –3 dB referred to 1 kHz
[4] 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).

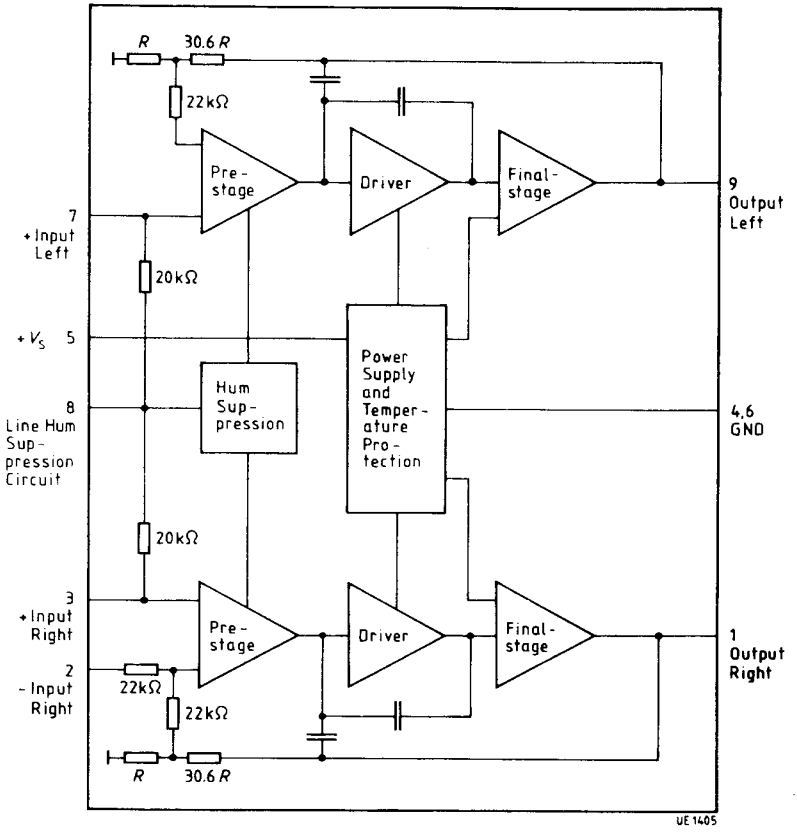
To avoid overheating, a temperature fuse affecting both amplifiers prevents current supply to the power output stages during inadmissibly high chip temperatures.

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

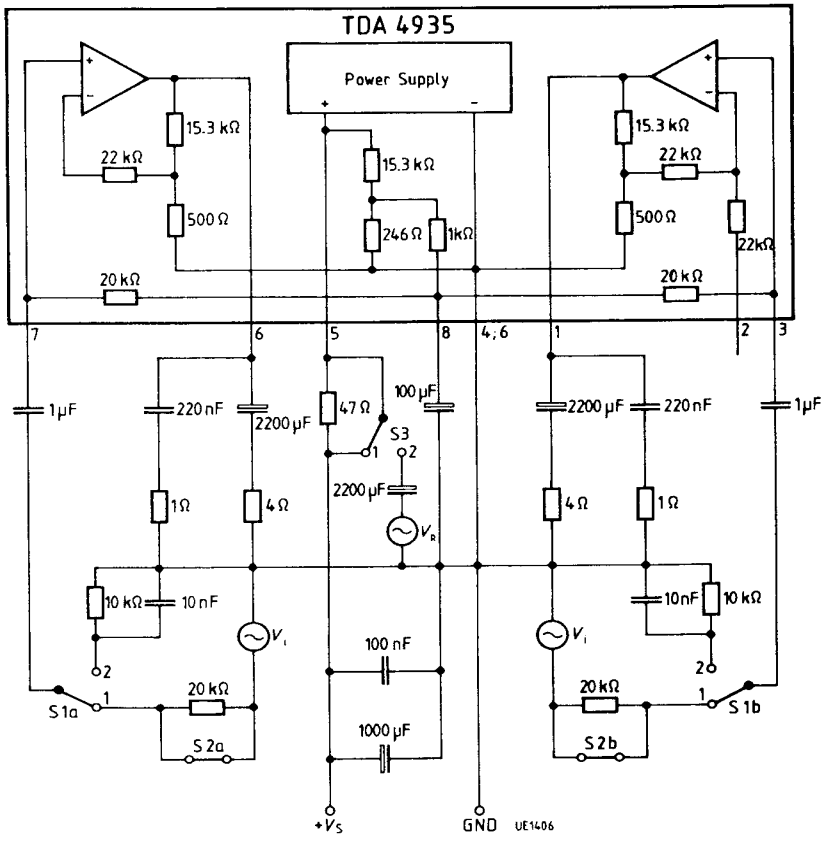
Pin No.	Function
1	Output right channel
2	Inverting input right channel (more than 22 kΩ)
3	Non-inverting input right channel
4	GND
5	$+V_S$
6	GND
7	Non-inverting input left channel
8	Line hum suppression right and left channel
9	Output left channel

Block Diagram



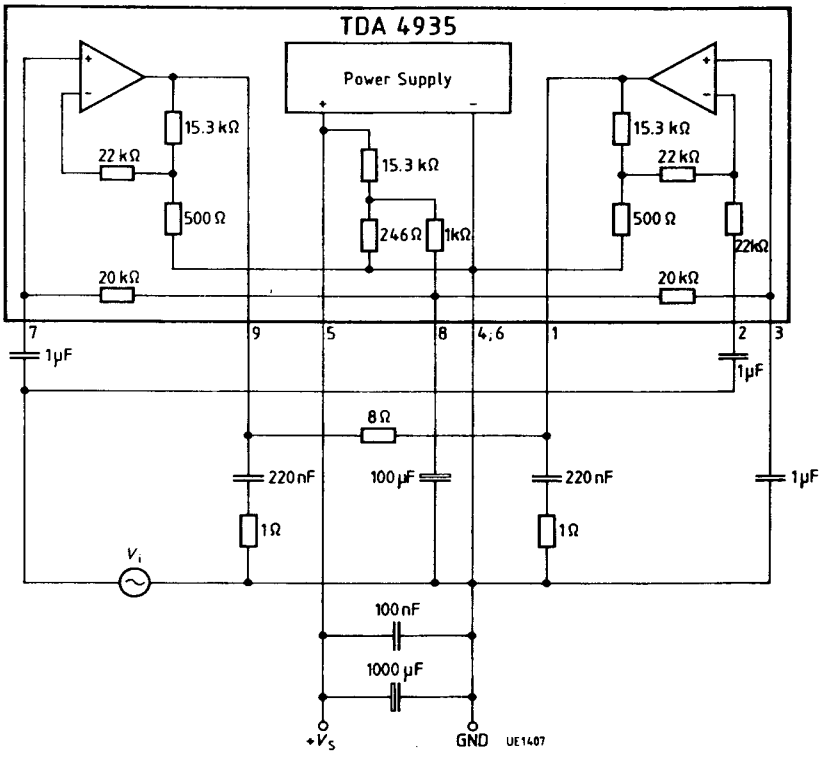
Test Circuit

1. Stereo Operation



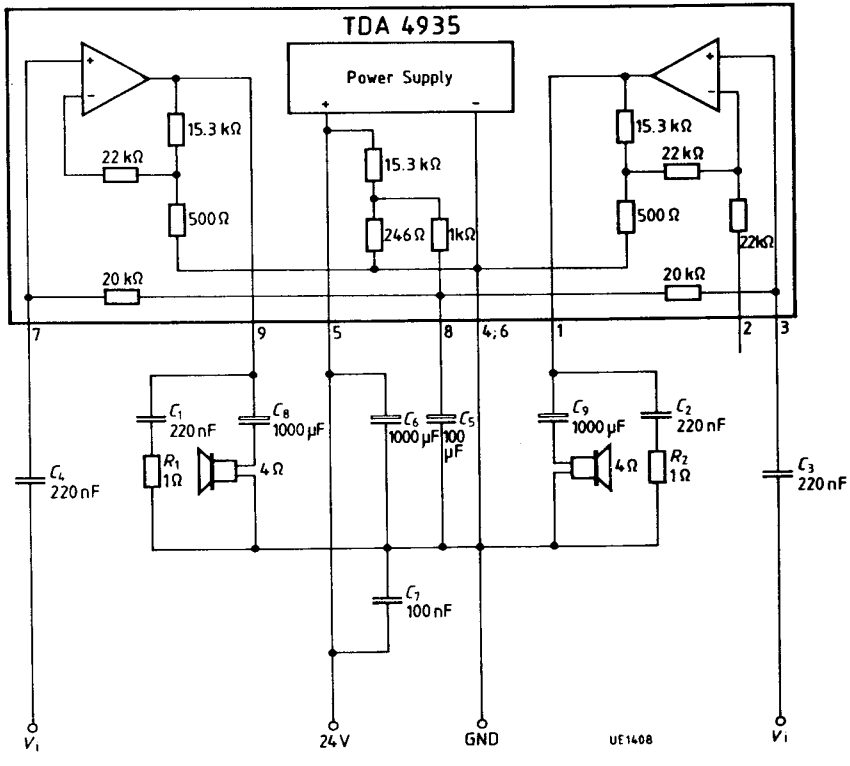
Test Circuit

2. Bridge Operation

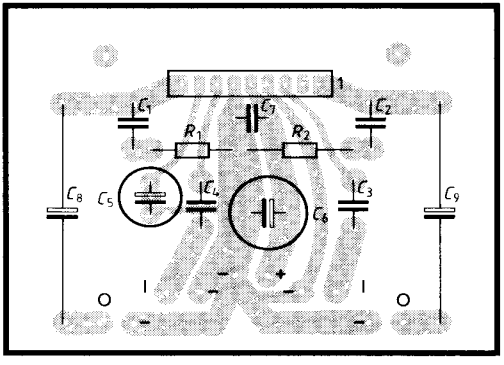


Application Circuit

1. Stereo Operation

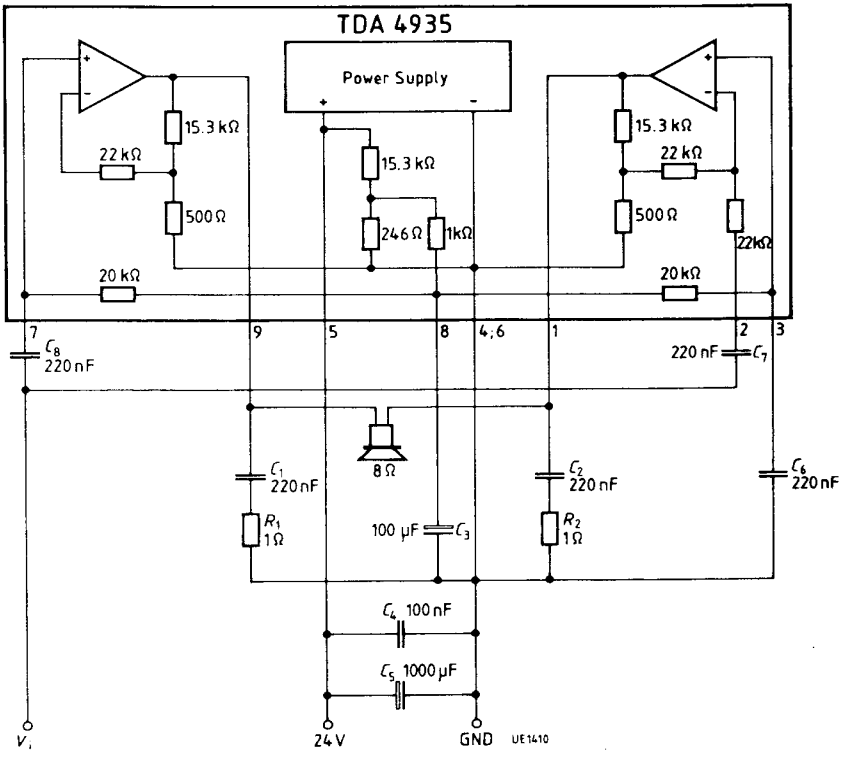


Layout / Plug-in Location Plan

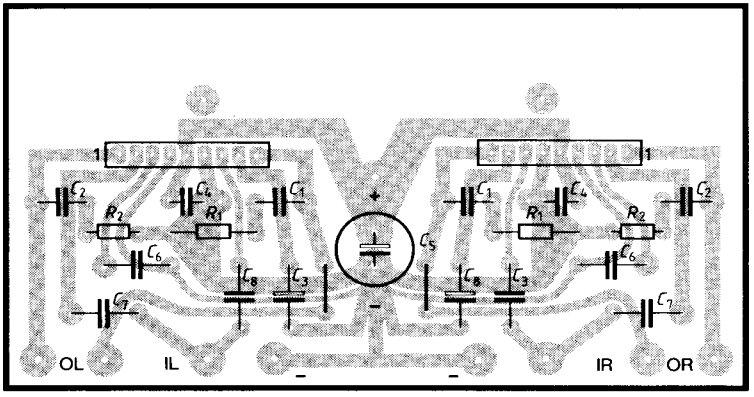


Application Circuit

2. Bridge Operation (one channel only)

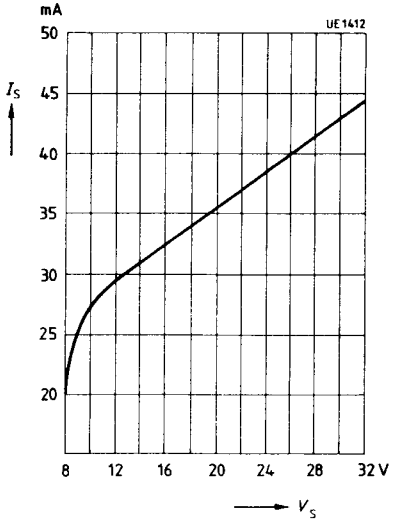


Layout / Plug-in Location Plan



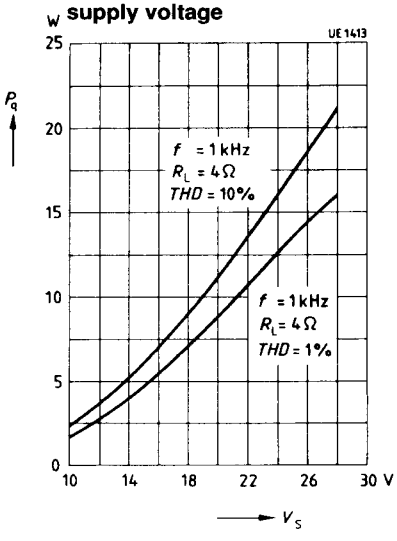
2 x 30 W

Quiescent current versus supply voltage



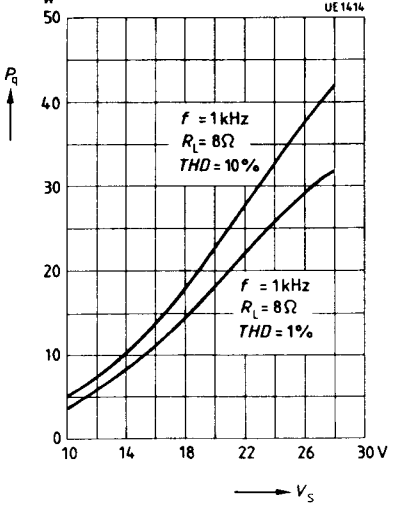
Stereo Operation

Output power versus supply voltage



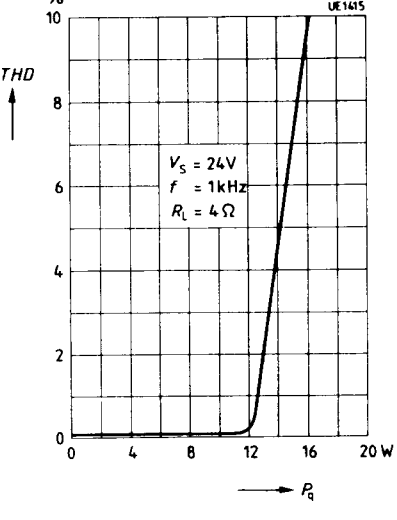
Bridge Operation

Output power versus supply voltage



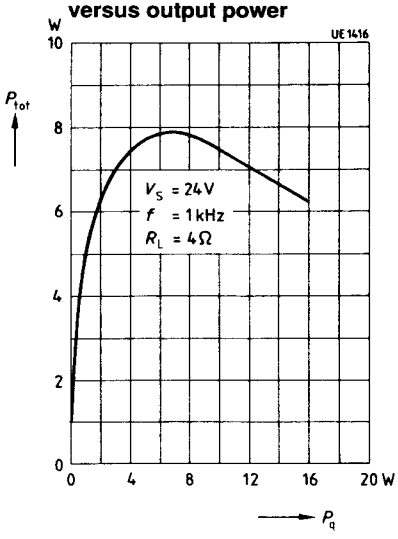
Stereo Operation

Total harmonic distortion versus output power



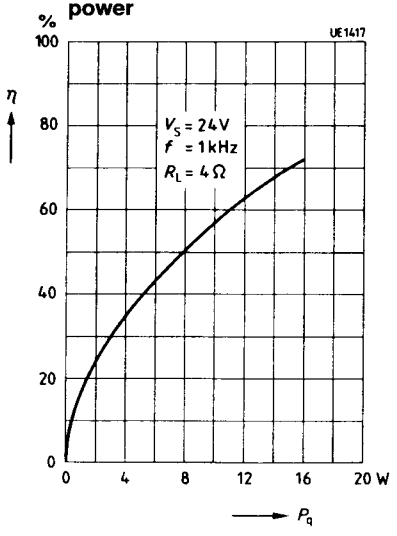
Stereo Operation

Power dissipation (each channel) versus output power



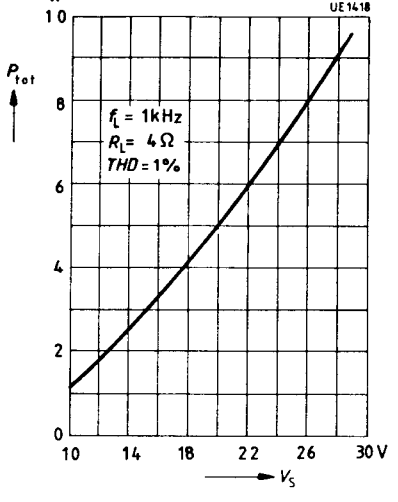
Stereo Operation

Efficiency versus output power



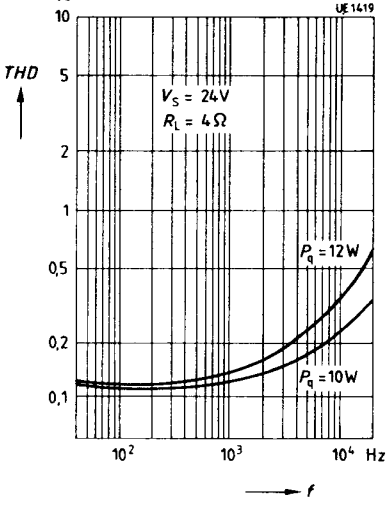
Stereo Operation

Power dissipation (each channel) versus supply voltage



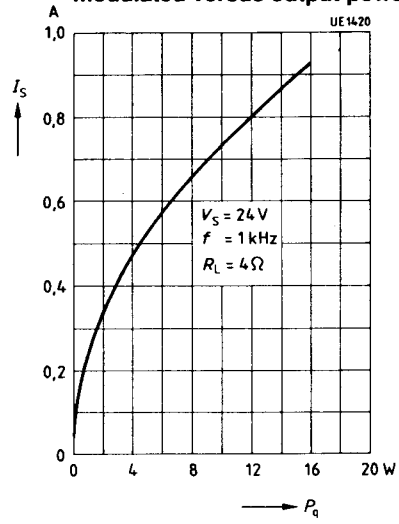
Stereo Operation

Total harmonic distortion versus frequency



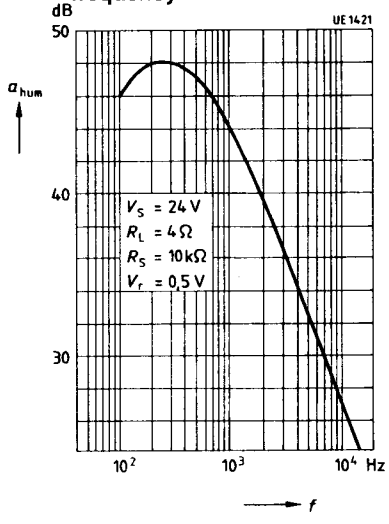
Stereo Operation

Supply current (one channel) modulated versus output power



Stereo Operation

Line hum suppression versus frequency



Cross-talk rejection versus frequency