

## 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)	$R_{thJC}$	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 $V_i = 0$	$I_5$		40	80	mA	1
Output voltage $V = 0$	$V_{O1,9}$	11	12	13	V	1
Input resistance <sup>1)</sup>	$R_{13,7}$		20		k $\Omega$	1
Output power $f = 1 \text{ kHz}$						
– stereo operation						
THD = 1%	$P_{O1,9}$	10	12		W	1
THD = 10%	$P_{O1,9}$	13	15		W	1
– bridge operation						
THD = 1%	$P_{O1,9}$	20	24		W	2
THD = 10%	$P_{O1,9}$	26	30		W	2
Line hum suppression <sup>2)</sup> $f_R = 100 \text{ Hz}; V_R = 0.5 \text{ V}$	$a_{\text{hum}}$	40	46		dB	1
Current consumption $P_9 = P_1 = 15 \text{ W}; f_i = 1 \text{ kHz}$	$I_5$		1.8		A	1
Efficiency $P_9 = P_1 = 10 \text{ W}; f_i = 1 \text{ kHz}$	$\eta$		70		%	1
Total harmonic distortion $P_{9/1} = 0.05 - 10 \text{ W}$ $f_1 = 40 \text{ Hz to } 15 \text{ kHz}$	THD		0.2	0.5	%	1
Cross-talk rejection $f_1 = 1 \text{ kHz};$ $P_9 \text{ or } P_1 = 15 \text{ W}$	$a_{\text{cr}}$		50		dB	1
Transmission range <sup>3)</sup>	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 <sup>4)</sup>	$V_d$		5		$\mu\text{V}$	1
Noise voltage (CCIR filter) in acc. with DIN 45 405 referred to input <sup>4)</sup>	$V_n$		15		$\mu\text{Vs}$	1
Difference in transmission measure $P_9 = P_1 = 10 \text{ W}$ $f_i = 40 \text{ Hz to } 20 \text{ kHz}$	$\Delta G_v$			1	dB	1
Voltage gain stereo	$G_v$		30		dB	1
bridge configuration	$G_v$		36		dB	2

1) S2a (b) open/closed

2) S1a (b) and S3 in position 2

3)  $P_{9/1} = 6 \text{ W}; -3 \text{ dB}$  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).

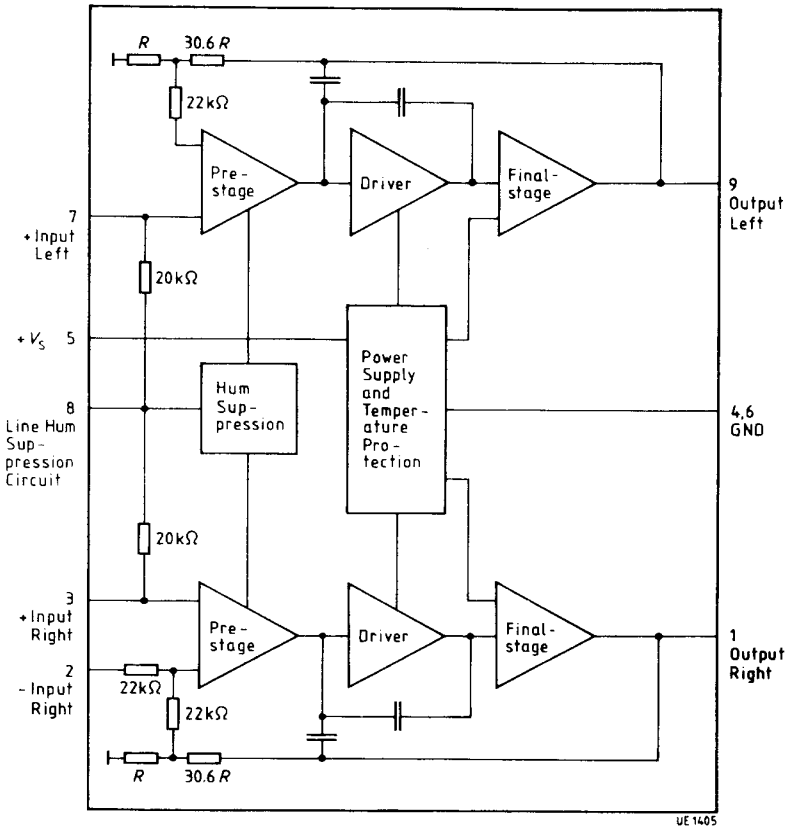
To avoid overheating, a temperature fuse affecting both amplifiers prevents current supply to the power output stages during inadmissibly high chip temperatures.

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

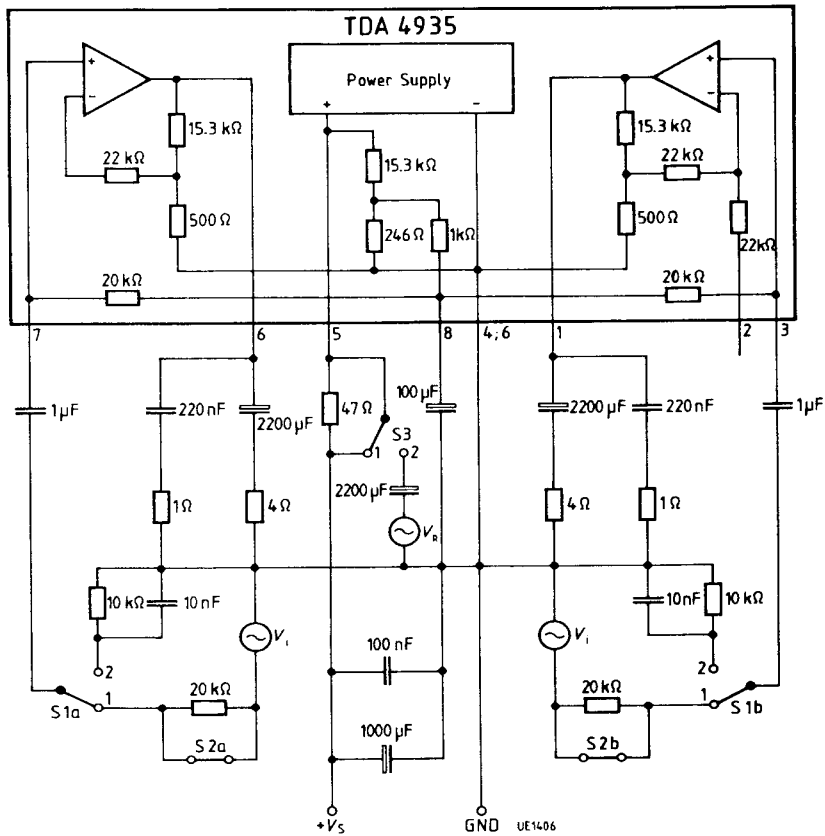
Pin No.	Function
1	Output right channel
2	Inverting input right channel (more than 22 k $\Omega$ )
3	Non-inverting input right channel
4	GND
5	+ $V_s$
6	GND
7	Non-inverting input left channel
8	Line hum suppression right and left channel
9	Output left channel

Block Diagram



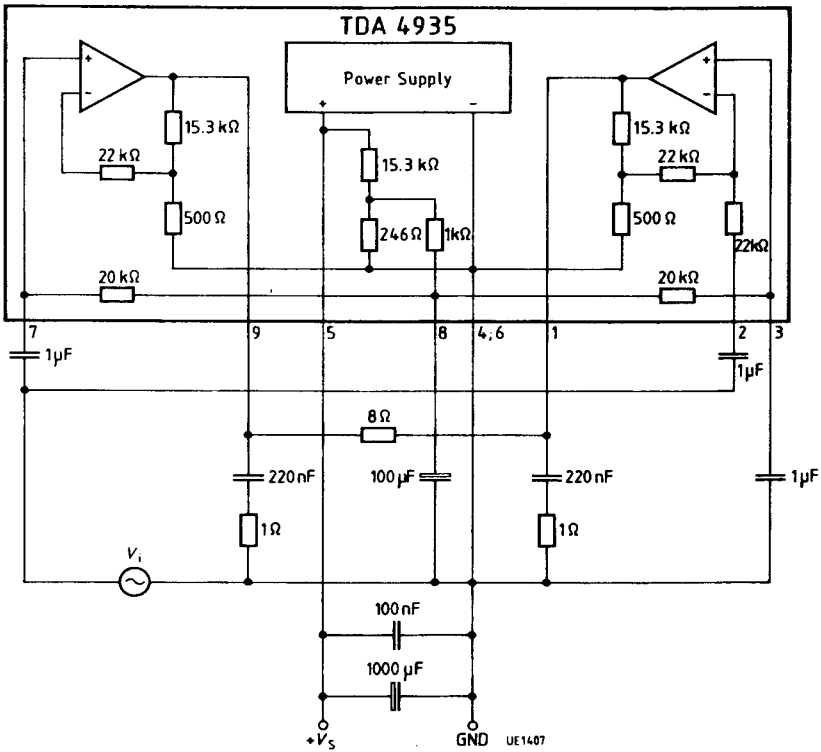
Test Circuit

1. Stereo Operation



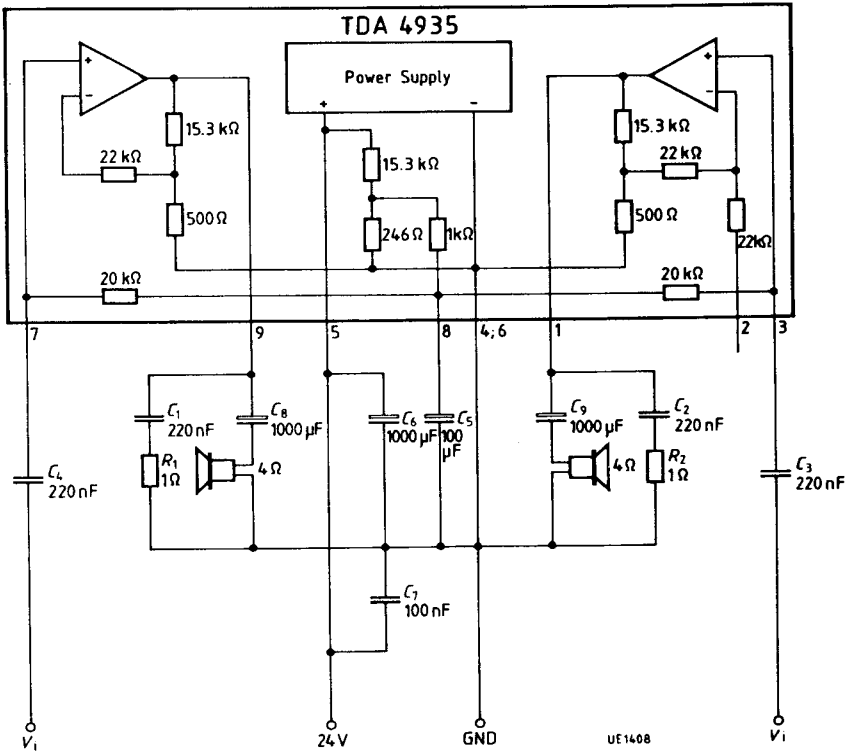
## Test Circuit

## 2. Bridge Operation



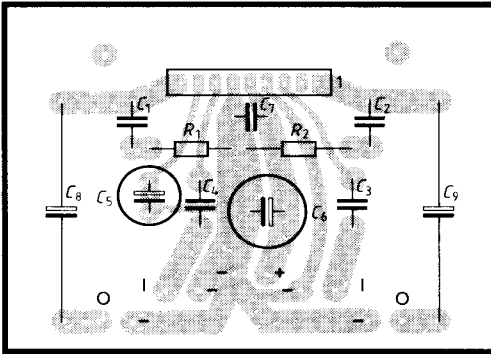
Application Circuit

1. Stereo Operation



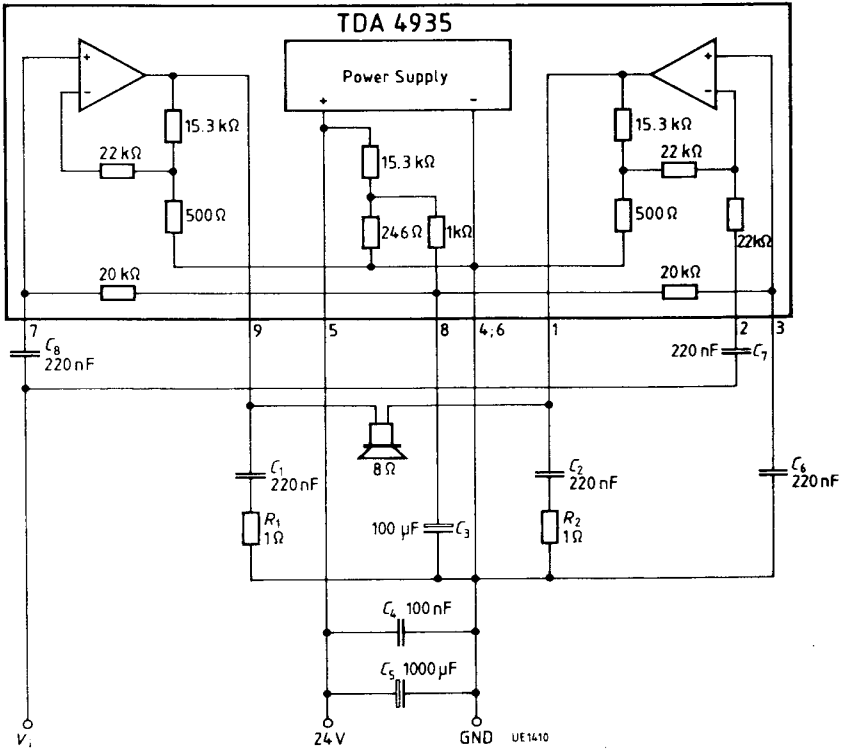


## Layout / Plug-in Location Plan

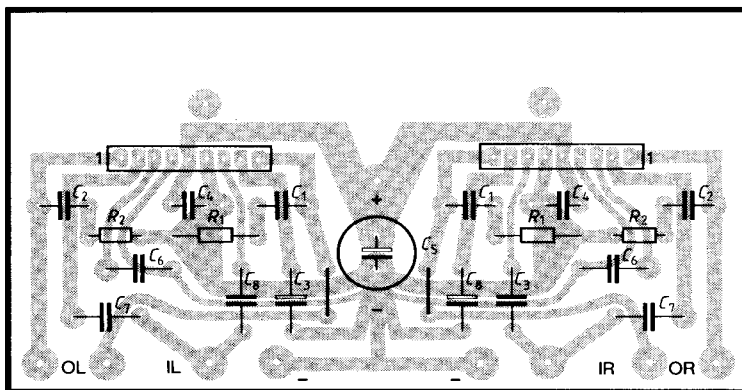


**Application Circuit**

**2. Bridge Operation (one channel only)**

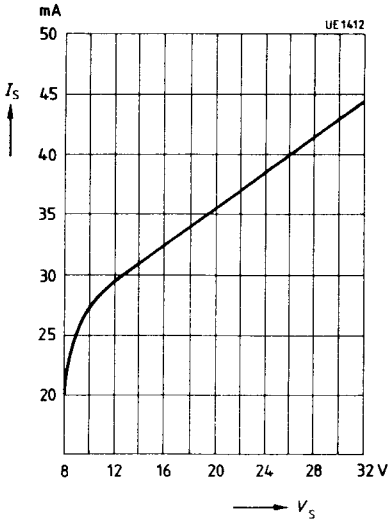


## Layout / Plug-in Location Plan

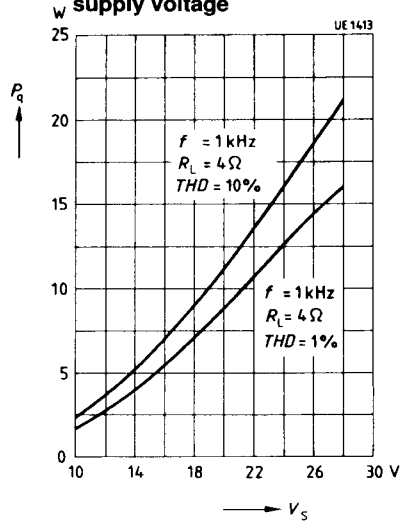


2 x 30W

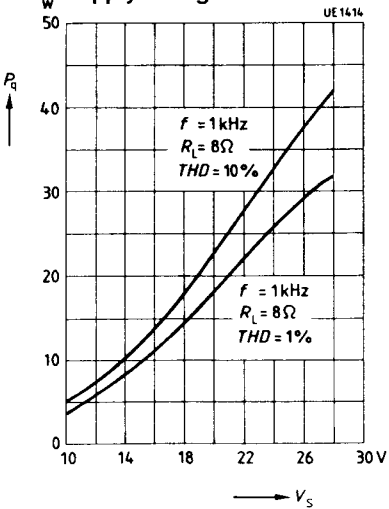
**Quiescent current versus supply voltage**



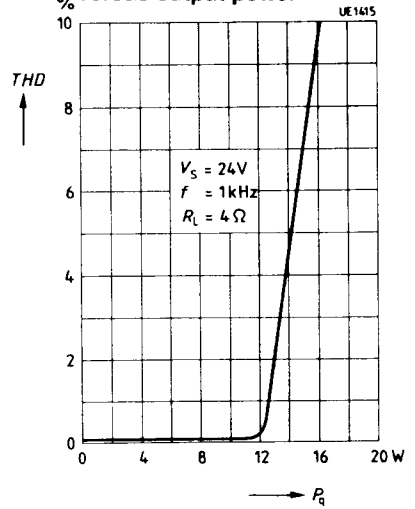
**Stereo Operation  
Output power versus supply voltage**



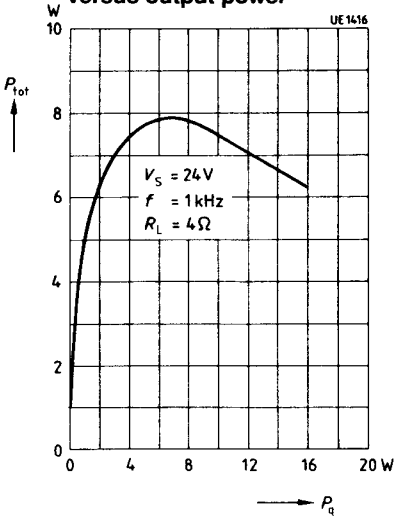
**Bridge Operation  
Output power versus supply voltage**



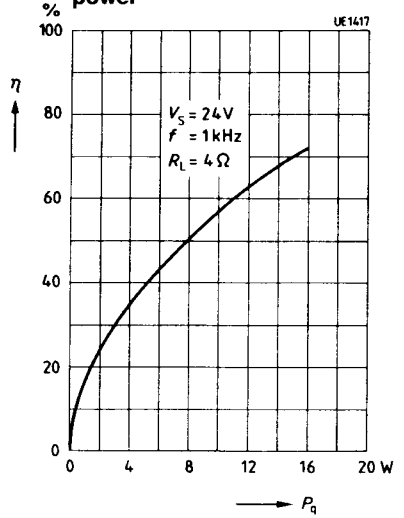
**Stereo Operation  
Total harmonic distortion versus output power**



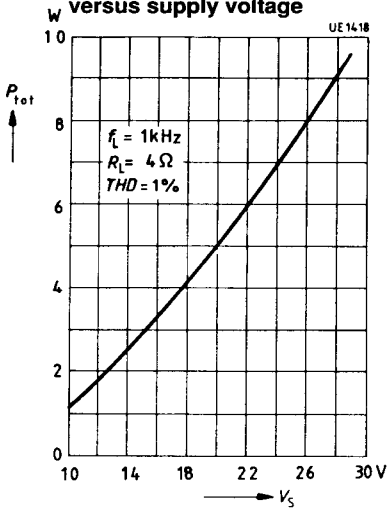
**Stereo Operation**  
**Power dissipation (each channel)**  
**versus output power**



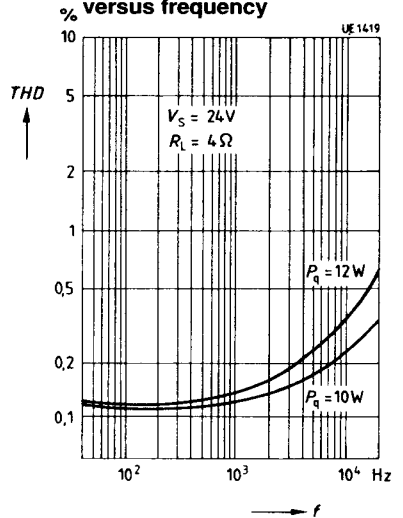
**Stereo Operation**  
**Efficiency versus output power**



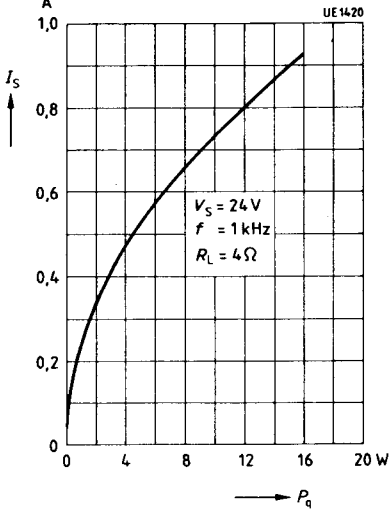
**Stereo Operation**  
**Power dissipation (each channel)**  
**versus supply voltage**



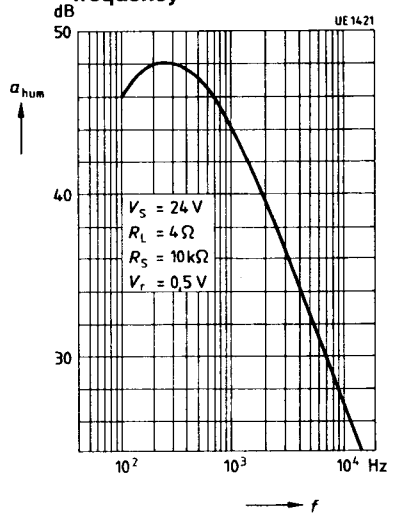
**Stereo Operation**  
**Total harmonic distortion**  
**versus frequency**



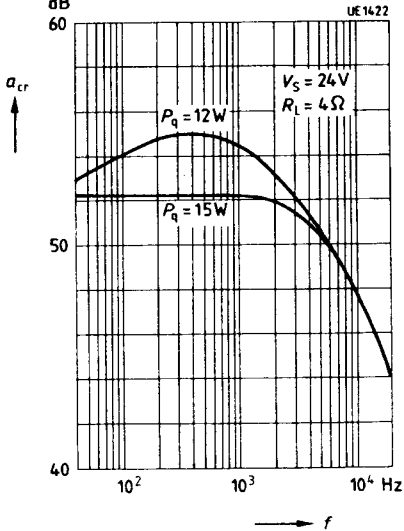
**Stereo Operation**  
**Supply current (one channel)**  
**modulated versus output power**



**Stereo Operation**  
**Line hum suppression versus**  
**frequency**



**Cross-talk rejection**  
**versus frequency**



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