

## TDA 4930 Stereo/Bridge AF Amplifier 2 x 10 W/20 W

The TDA 4930 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.

### Features

- Universal application as stereo amplifier or mono amplifier in bridge configuration
- Wide supply voltage range
- Minimum of external components
- Outputs AC and DC short-circuit resistant

### Maximum ratings

Supply voltage	$V_S$	32	V
Output peak current	$I_1; I_{9pp}$	2.5	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)	$R_{thJC}$	6	K/W

### Operating range

Supply voltage	$V_S$	8 to 26	V
$R_L \geq 8 \Omega$	$V_S$	8 to 22	V
$R_L = 4 \Omega$	$T_C$	-20 to 85	°C
Case temperature			
$P_V = 10 W$			

### Characteristics

$V_S = 19\text{ V}$ ;  $T_A = 25\text{ }^\circ\text{C}$

		Test circuit	min	typ	max	
Quiescent current ( $V_i = 0$ )	$I_5$	1		30	60	mA
Output voltage ( $V_i = 0$ )	$V_{q9;1}$	1	9	9.5	10	V
Input resistance <sup>1)</sup>	$R_{i7;3}$	1		20		k $\Omega$
Output power ( $f = 1\text{ kHz}$ )						
– stereo operation						
THD = 1%	$P_{q9;1}$	1	7	8		W
THD = 10%	$P_{q9;1}$	1	9	10		W
– bridge operation						
THD = 1%	$P_{q9;1}$	2	14	16		W
THD = 10%	$P_{q9;1}$	2	18	20		W
Line hum suppression <sup>2)</sup>	$a_{\text{hum}}$	1	40	46		dB
$f_r = 100\text{ Hz}$ ; $V_r = 0.5\text{ V}$						
Current consumption	$I_5$	1		1.5		A
$P_9 = P_1 = 10\text{ W}$ ; $f_i = 1\text{ kHz}$						
Efficiency	$\eta$	1		70		%
$P_9 = P_1 = 10\text{ W}$ ; $f_i = 1\text{ kHz}$						
Total harmonic distortion	THD	1		0.2	0.5	%
$P_{9/1} = 0.05\text{ to }6\text{ W}$						
$f_i = 40\text{ Hz to }15\text{ kHz}$						
Cross-talk rejection	$a_{\text{cr}}$	1		50		dB
$f_i = 1\text{ kHz}$ ; $P_9$ or $P_1 = 10\text{ W}$						
Transmission range <sup>3)</sup>	$B$	1	40 Hz to 60 kHz			
Disturbance voltage ( $B = 30\text{ Hz to }20\text{ kHz}$ )	$V_d$	1		5		$\mu\text{V}$
in acc. with DIN 45405 referred to input <sup>4)</sup>						
Noise voltage (CCIR filter)	$V_n$	1		15		$\mu\text{V}_S$
in accordance with DIN 45405						
referred to the input <sup>4)</sup>						
Difference in transmission measure	$\Delta G_V$	1			1	dB
$P_9 = P_1 = 7\text{ W}$						
$f_i = 40\text{ Hz to }20\text{ kHz}$						
Voltage gain stereo	$G_V$	1		30		dB
Voltage gain bridge configuration	$G_V$	2		36		dB
DC output voltage at active DC protection	$V_{q9;1}$	2		0.15	0.30	V
if S1/9 is closed; $V_S \geq 10\text{ V}$						

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 4930 can be applied as stereo amplifier or amplifier in bridge configuration for operating voltages ranging between 8 V and 26 V, with speakerload impedance from 1 to 16  $\Omega$ .

The prestages 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).

Each power element is equipped with an independent protective circuit, rendering the outputs of the amplifiers AC and DC short-circuit resistant.

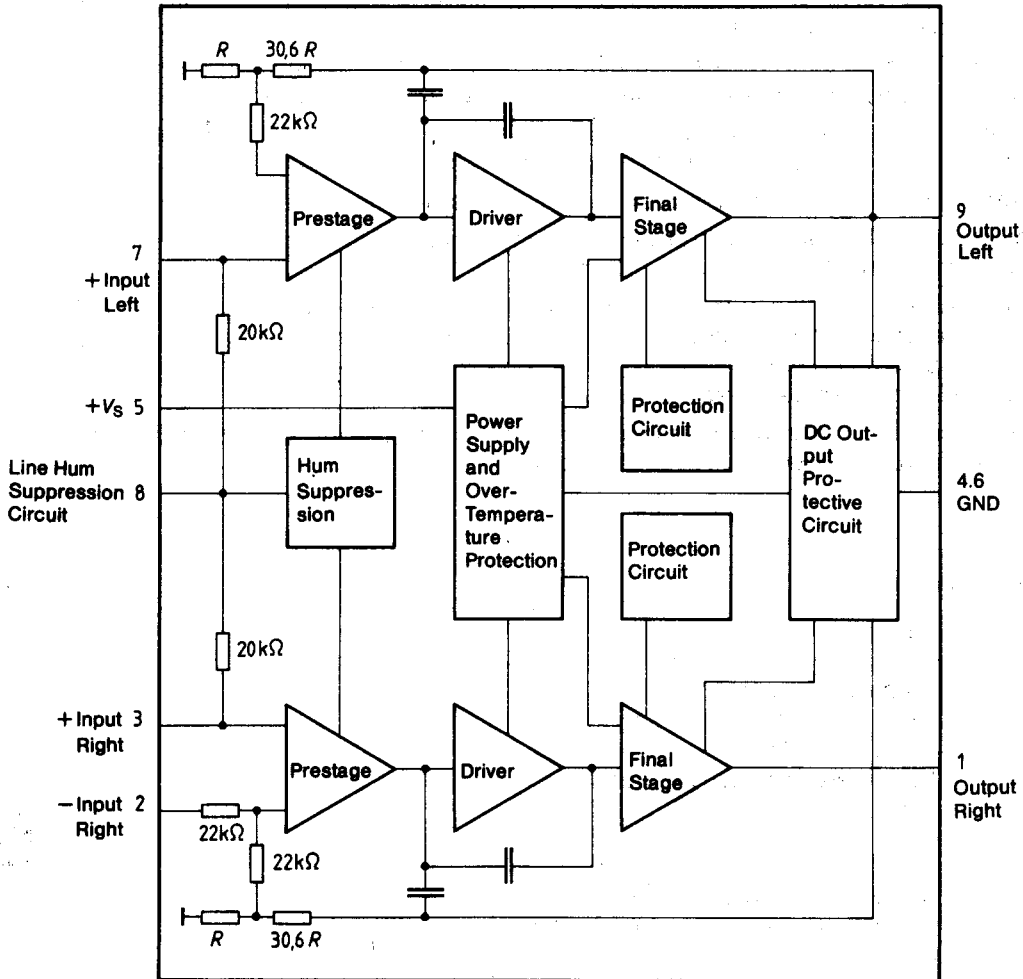
A DC protective circuit of the outputs prevents overloading of the loudspeakers, if ground connections become apparent during bridge operations. To avoid overheating, a temperature fuse affecting both amplifiers prevents current supply to the power output stages during inadmissibly high chip temperatures.

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

### Pin description

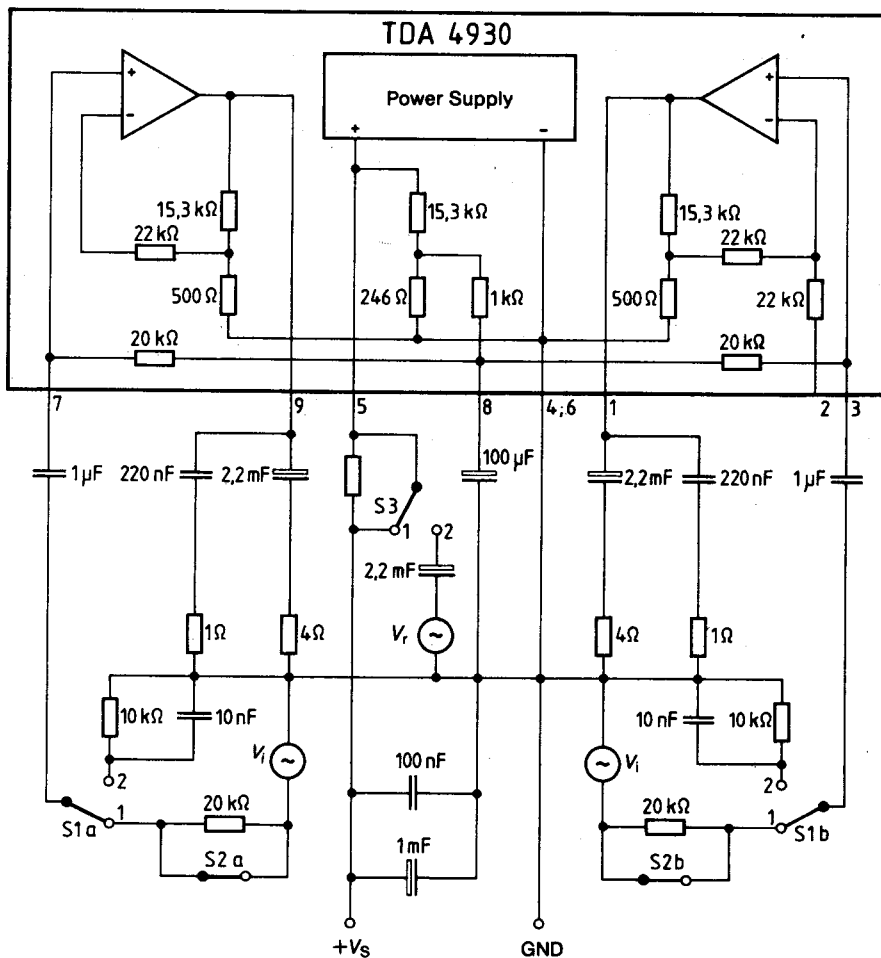
Pin	Function
1	Output right channel
2	Inverting input right channel (more than 22 k $\Omega$ )
3	Non-inverting input right channel
4	GND
5	+V <sub>s</sub>
6	GND
7	Non-inverting input left channel
8	Line hum suppression right and left channel
9	Output left channel

Block diagram



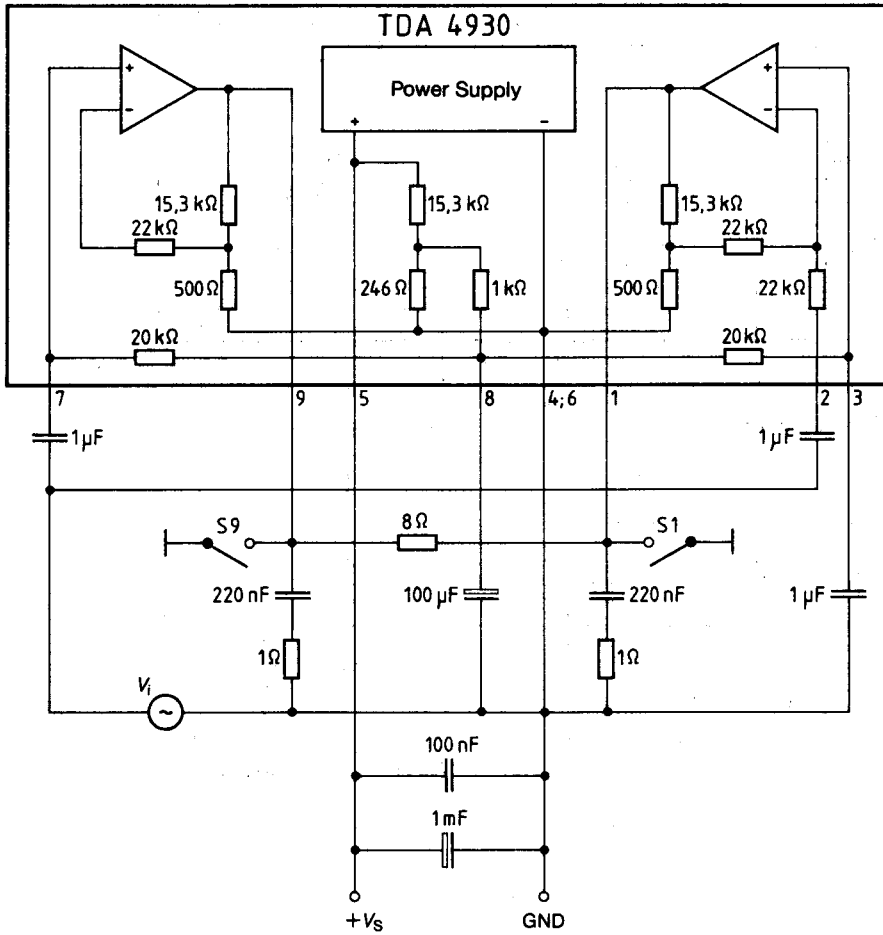
Test and measurement circuit

1. Stereo operation



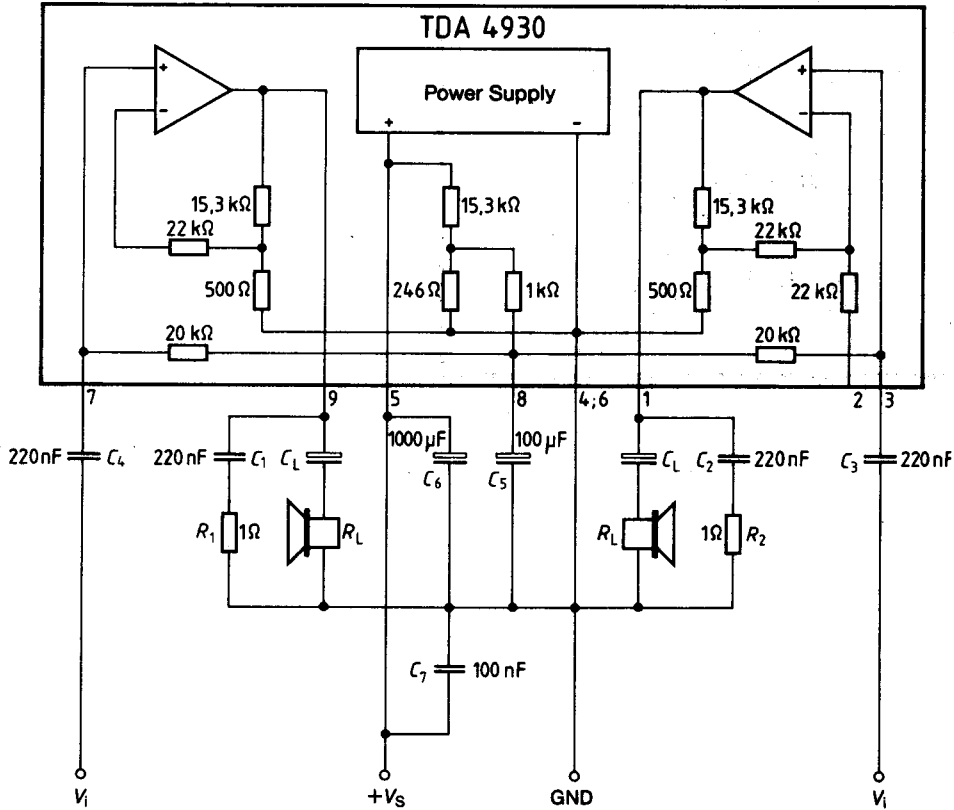
Test and measurement circuit

2. Bridge operation



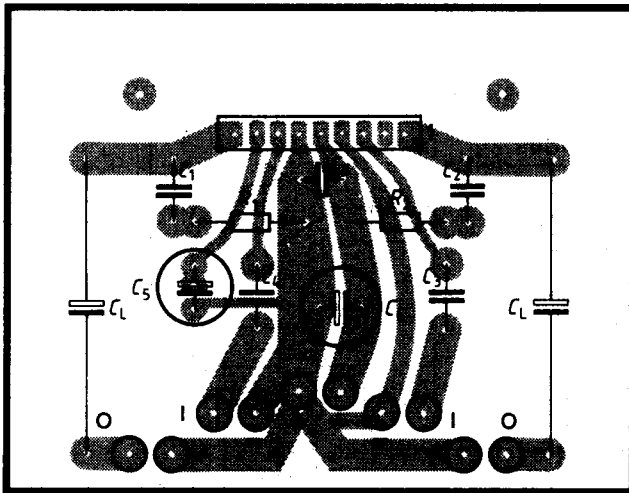
Application circuit

1. Stereo operation



$V_S$	19 V	26 V
$R_L$	4 Ω	8 Ω
$C_L$	1000 μF	470 μF

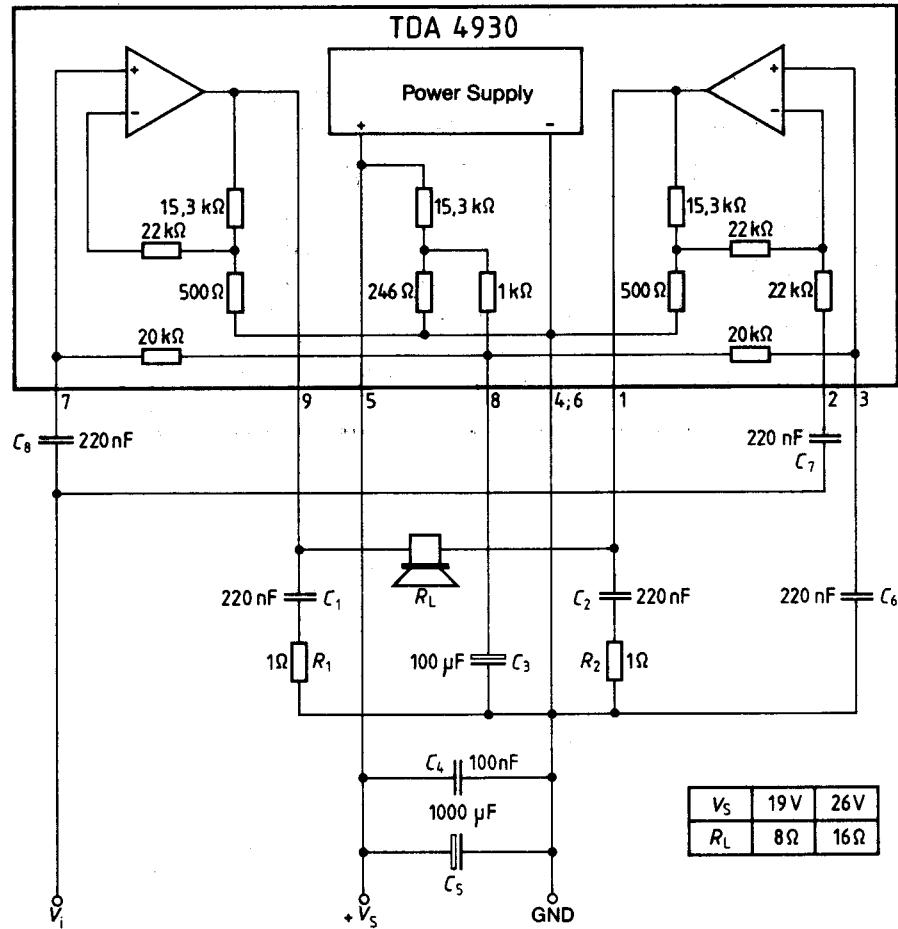
Layout/Plug-in location plan



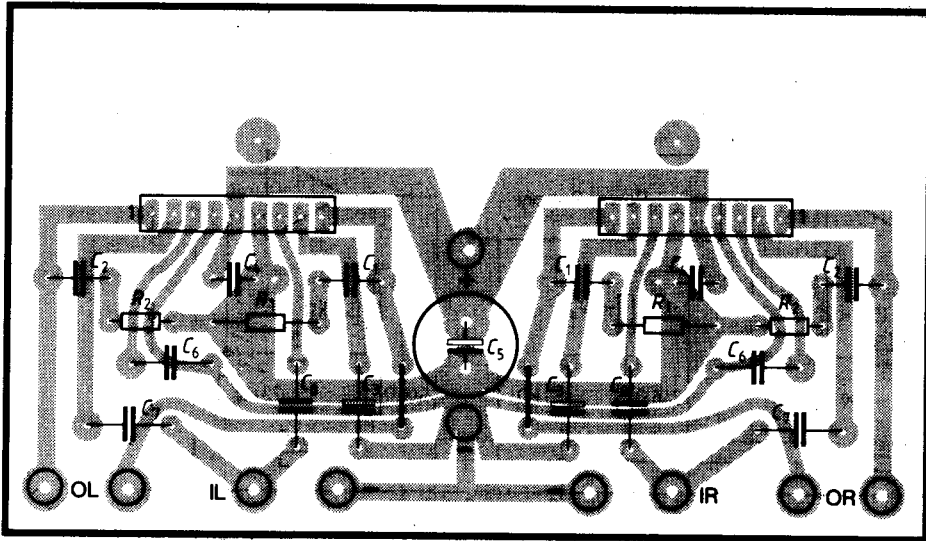


Application circuit

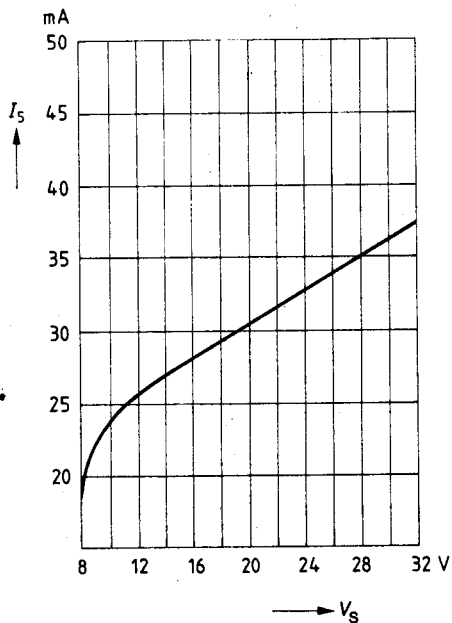
2. Bridge operation (only one channel)



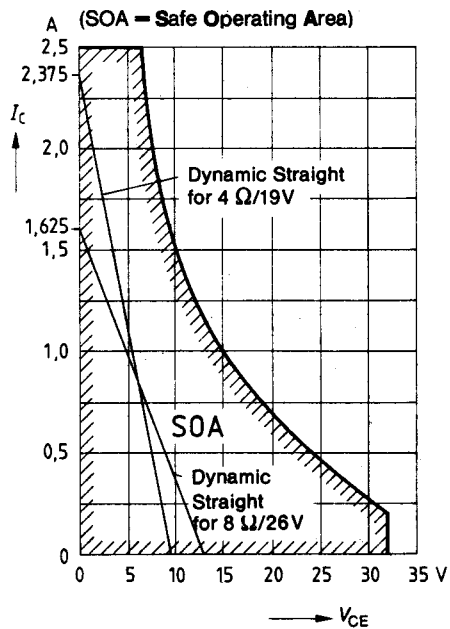
Layout/Plug-in location plan



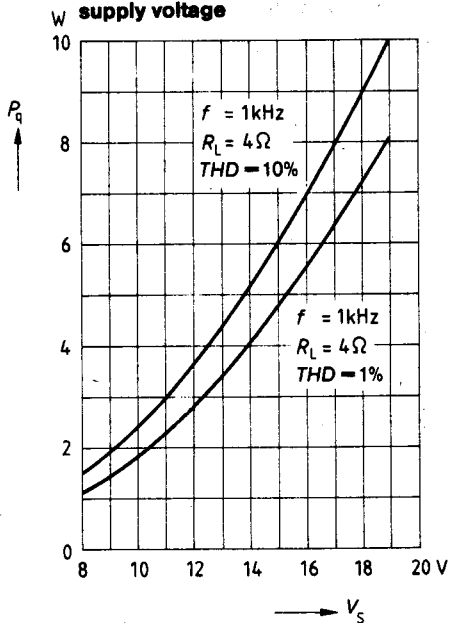
**Quiescent current versus supply voltage**



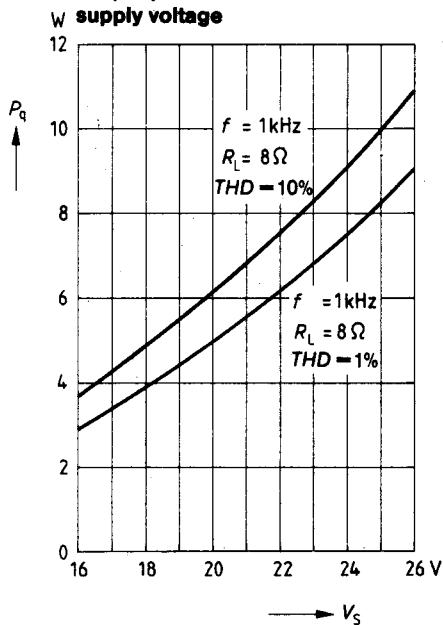
**Typical operating range of the final transistors adjusted by internal protective circuits**



**Stereo operation**  
**Output power versus supply voltage**

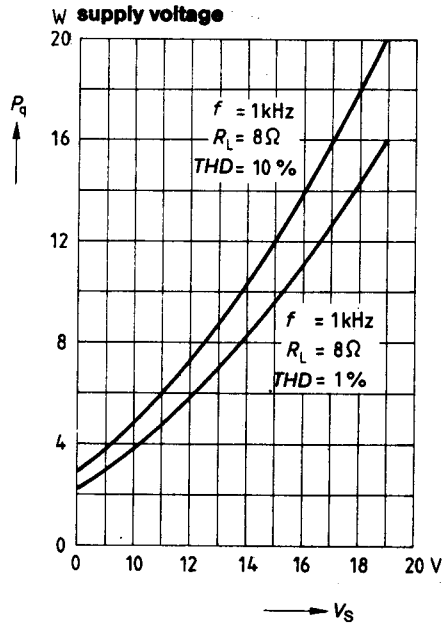


**Stereo operation**  
**Output power versus supply voltage**



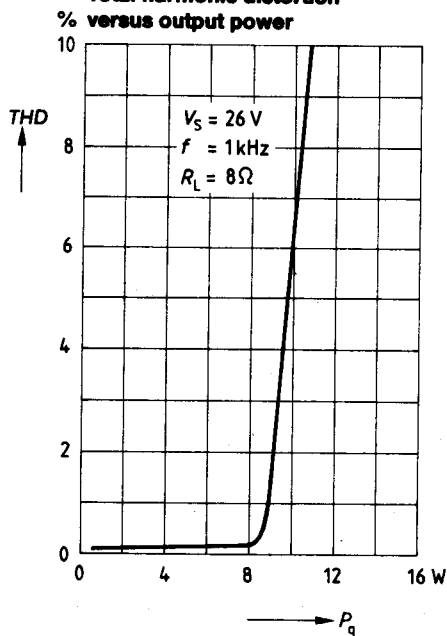
**Bridge operation**

**Output power versus supply voltage**



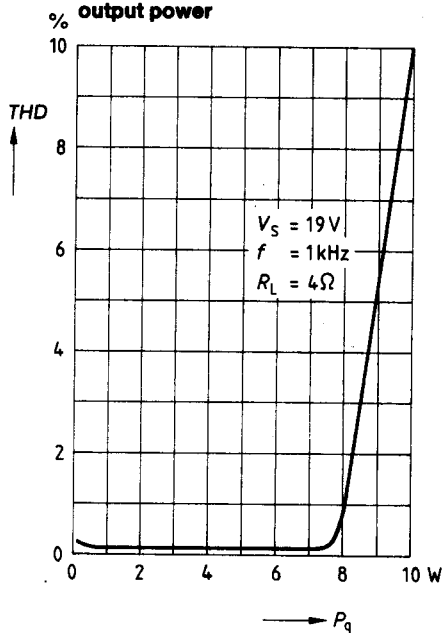
**Stereo operation**

**Total harmonic distortion versus output power**



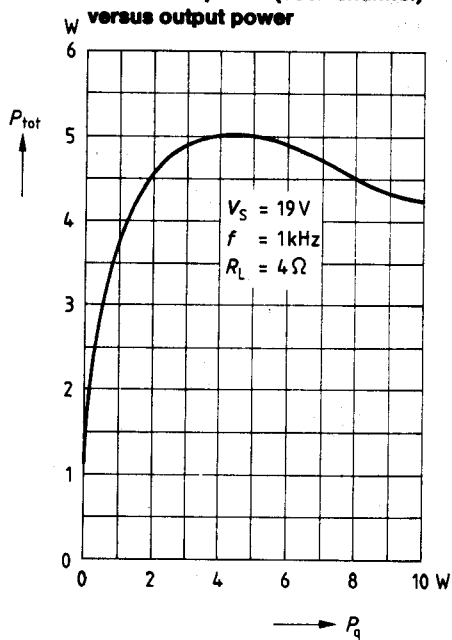
**Stereo operation**

**Total harmonic distortion versus output power**

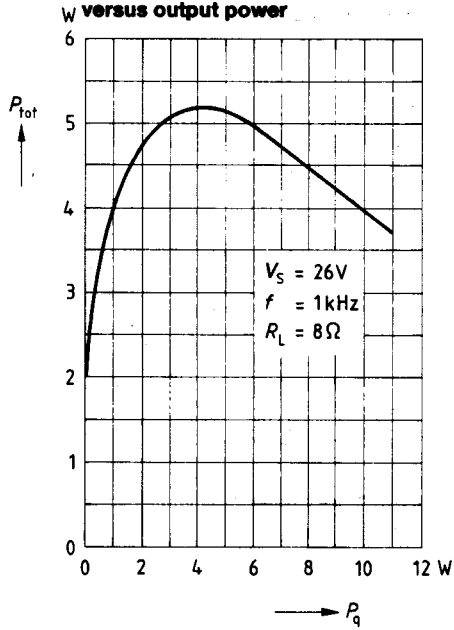


**Stereo operation**

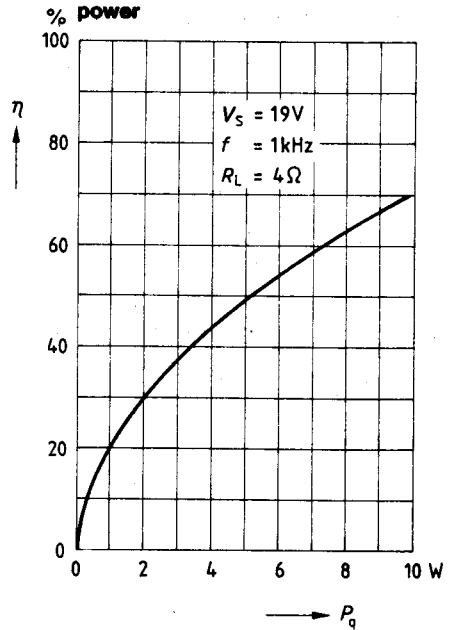
**Power dissipation (each channel) versus output power**



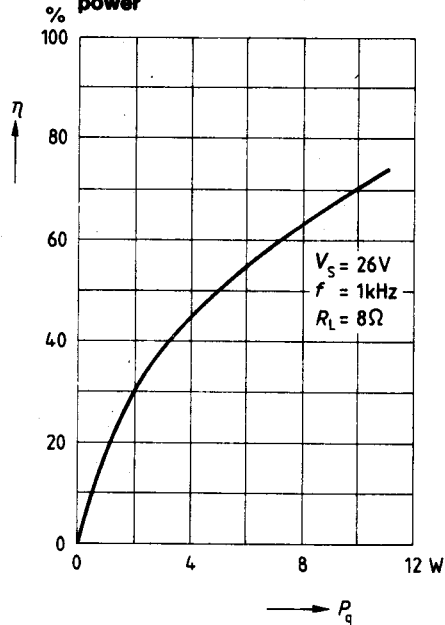
**Stereo operation**  
**Power dissipation (each channel)**  
**versus output power**



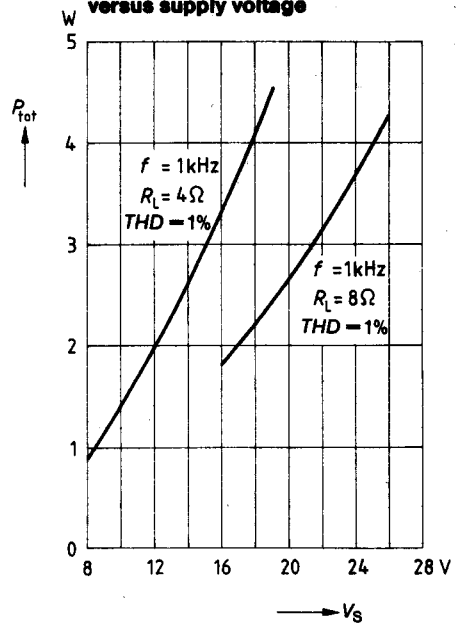
**Stereo operation**  
**Efficiency versus output power**



**Stereo operation**  
**Efficiency versus output power**

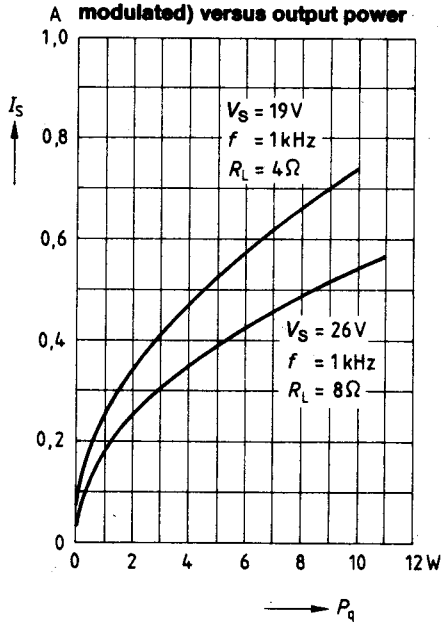


**Stereo operation**  
**Power dissipation (each channel)**  
**versus supply voltage**



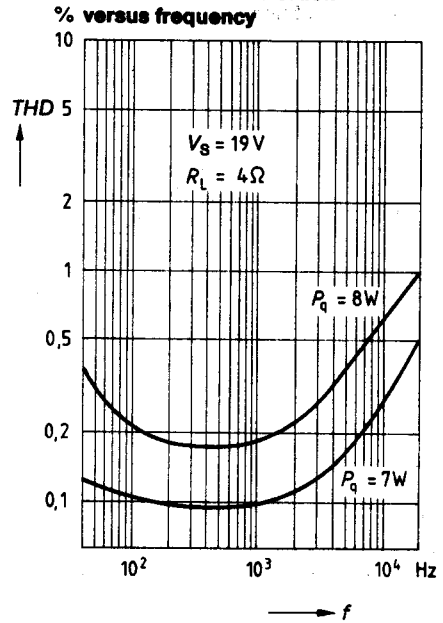
**Stereo operation**

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

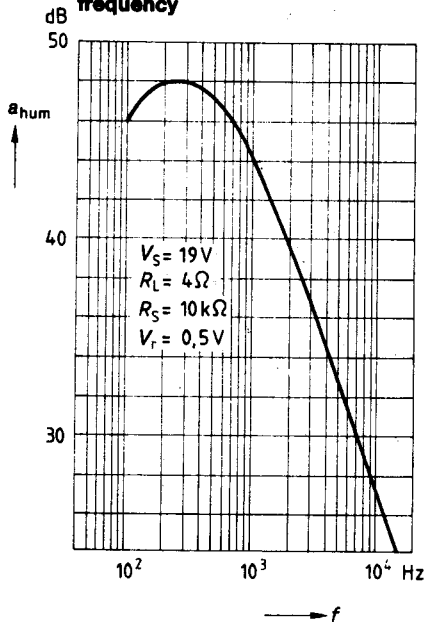


**Stereo operation**

**Total harmonic distortion % versus frequency**



**Line hum suppression versus frequency**



**Cross-talk rejection versus frequency**

