SIEMENS

TDA 1037
AF Power Amplifier IC with Thermal Shutdown

AF power amplifier designed for a wide range of supply voltages to enable versatile application in entertainment electronics. The amplifier operates in the push-pull B mode and is available in the SIP 9 package. The integrated shutdown protects the IC from overheating.

Features

- Wide supply voltage range: 4 V to 28 V
- High output power up to 8 W
- Large output current up to 2.5 A
- Simple mounting

Maximum ratings

Supply voltage $R_L \geq 16\ \Omega$	V_S	30	V
$R_L \geq 8\ \Omega$	V_S	24	V
$R_L \geq 4\ \Omega$	V_S	20	V
Output peak current (not repetitive)	I_q	3.5	A
Output current (repetitive)	I_q	2.5	A
Junction temperature[1]	T_j	150	°C
Storage temperature range	T_{stg}	–40 to 125	°C

Thermal resistance			
junction-case	$R_{th\,JC}$	12	K/W
system-air	$R_{th\,SA}$	70	K/W

Operating range

Supply voltage	V_S	4 to 28	V
Ambient temperature	T_A	–25 to 85	°C

[1]) May not be exceeded even as instantaneous value.

Characteristics

with reference to test circuit

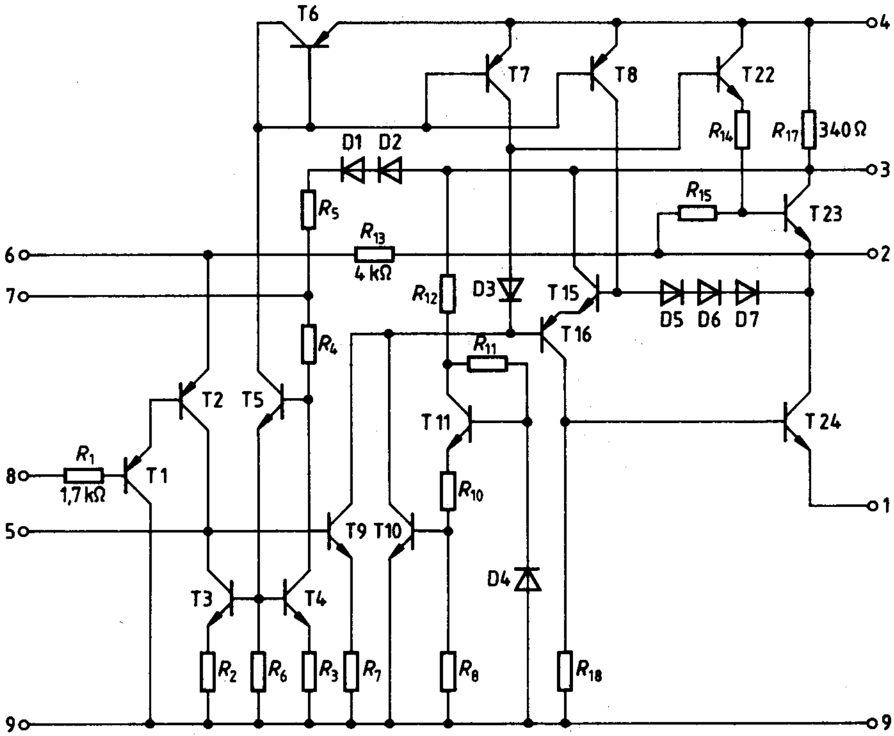
1. $V_S = 12$ V; $R_L = 4\ \Omega$; $C_1 = 1000\ \mu F$; $f_i = 1$ kHz; $T_A = 25\ °C$

		min	typ	max	
Quiescent output voltage	V_{q2}	5.4	6.0	6.6	V
Quiescent drain current	I_3+I_4		12	20	mA
Input DC current	I_{i8}		0.4	4	µA
Output power $THD = 1\%$	P_q	2.5	3.5		W
$THD = 10\%$	P_q	3.5	4.5		W
Voltage gain (closed loop)	G_V	37	40	43	dB
Voltage gain (open loop)	G_{V0}		80		dB
Total harmonic distortion ($P_q = 0.05$ to 2.5 W)	THD		0.2		%
Noise voltage referred to input ($f_i = 3$ Hz to 20 kHz)	V_n		3.8	10	μV_S
Disturbance voltage in acc. with DIN 45405 referred to input	V_d		2.5		µV
Hum suppression ($f_{hum} = 100$ Hz)	a_{hum}		48		dB
Frequency range (–3 dB)					
$C_4 = 560$ pF	f	40		20,000	Hz
$C_4 = 1000$ pF	f	40		10,000	Hz
Input resistance	R_{i8}	1	5		MΩ

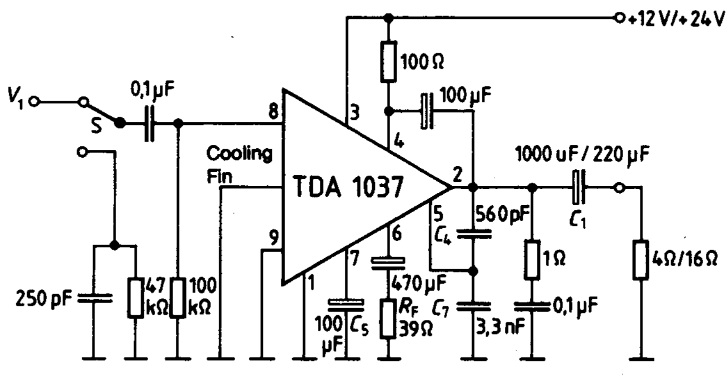
2. $V_S = 24$ V; $R_L = 16\ \Omega$; $C_1 = 220\ \mu F$; $f_i = 1$ kHz; $T_A = 25\ °C$

		min	typ	max	
Quiescent output voltage	V_{q2}	11	12	13	V
Quiescent drain current	I_3+I_4		18	30	mA
Input DC current	I_{i8}		0.8	8	µA
Output power $THD = 1\%$	P_q		3.5		W
$THD = 10\%$	P_q	4.5	5.0		W
Voltage gain (closed loop)	G_V	37	40	43	dB
Voltage gain (open loop)	G_{V0}		80		dB
Total harmonic distortion ($P_q = 0.05$ to 3 W)	THD		0.2	0.5	%
Noise voltage with reference to input $f_i = 3$ Hz to 20 kHz	V_n		5	15	μV_S
Disturbance voltage in acc. with DIN 45405 referred to input	V_d		3.8		µV
Hum suppression ($f_{hum} = 100$ Hz)	a_{hum}		40		dB
Frequency range (–3 dB)					
$C_4 = 560$ pF	f	40		20,000	Hz
$C_4 = 1000$ pF	f	40		10,000	Hz
Input resistance	R_{i8}	1	5		MΩ

Circuit diagram

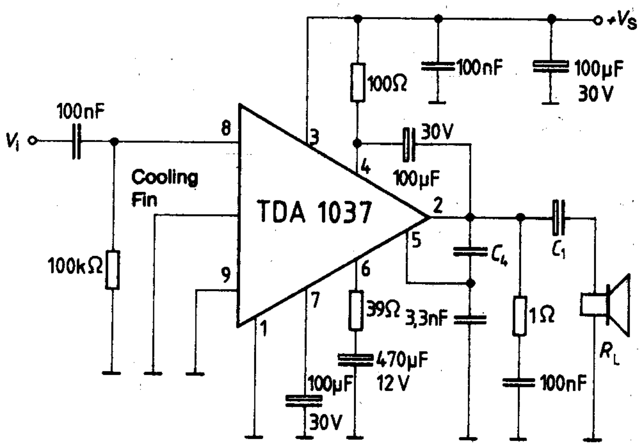


Measurement circuit



S Closed for Noise Measurement

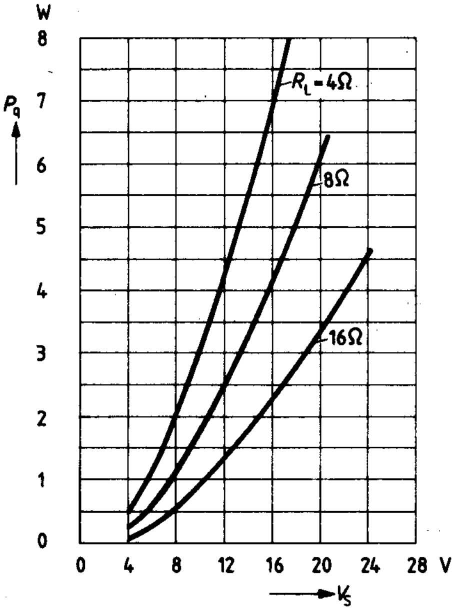
Application circuit



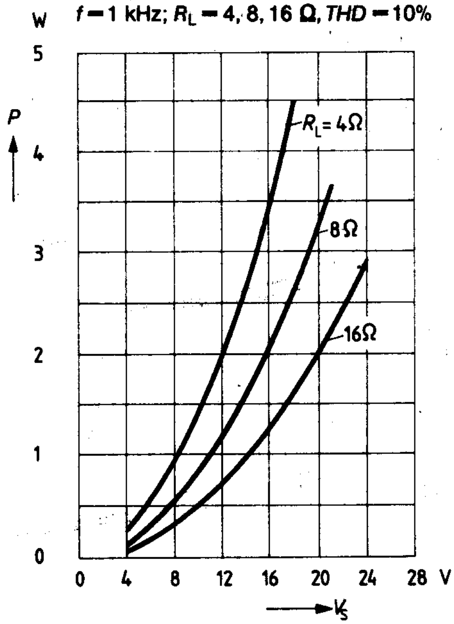
V_S	12 V	18 V	24 V
R_L	4 Ω	8 Ω	16 Ω
C_1	1000 µF	470 µF	220 µF

f_{max}	10 kHz	20 kHz
C_4	1000 pF	560 pF

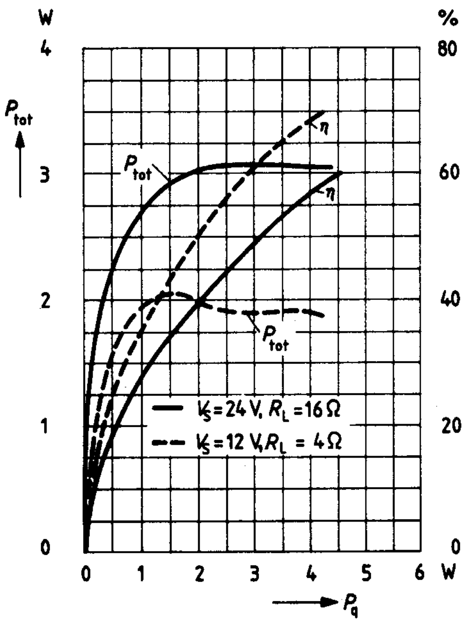
Output power versus supply voltage
$THD = 10\%$; $R_L = 4, 8, 16\ \Omega$; $f = 1$ kHz



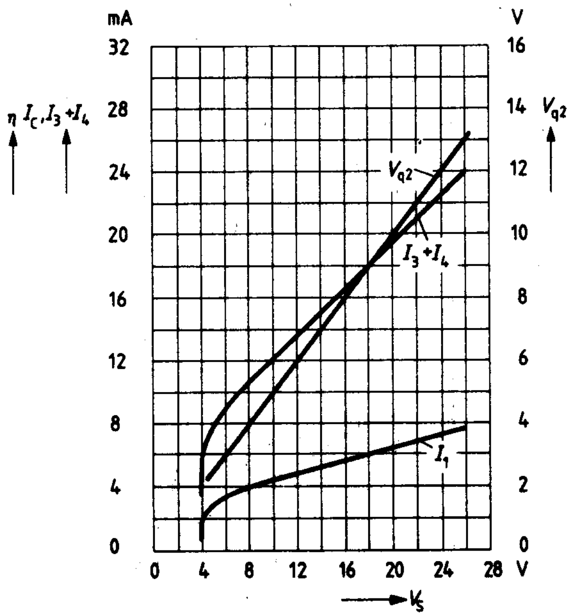
Max. power dissipation versus supply voltage at sine-shaped driving
$f = 1$ kHz; $R_L = 4, 8, 16\ \Omega$, $THD = 10\%$



Total power dissipation and efficiency versus output power
$THD = 10\%$; $f = 1$ kHz



Quiescent drain current, quiescent current of output transistors, quiescent output voltage versus supply voltage



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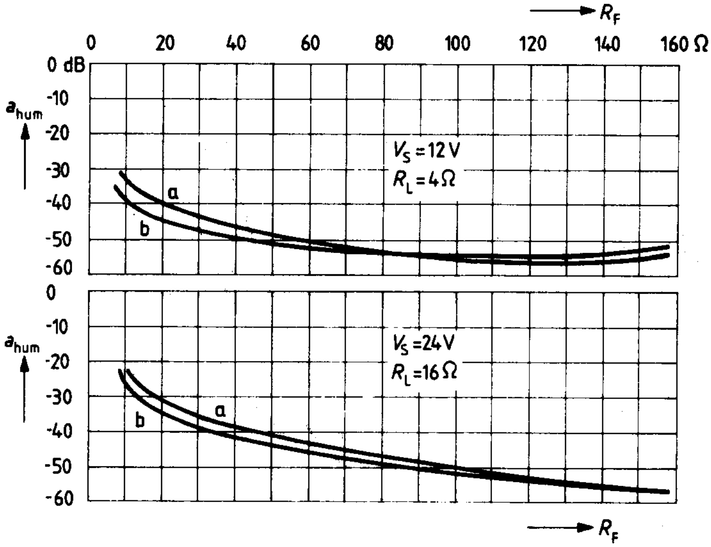
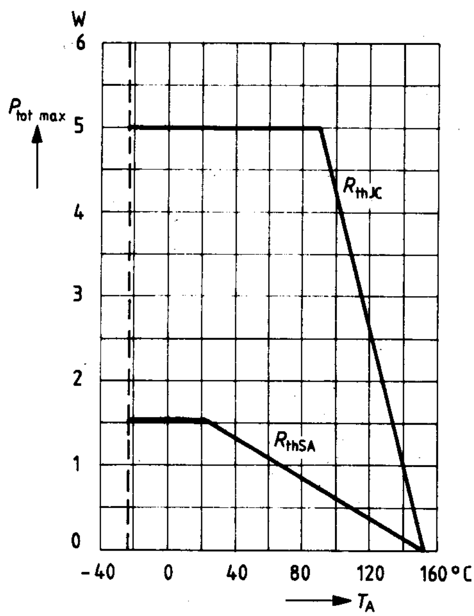
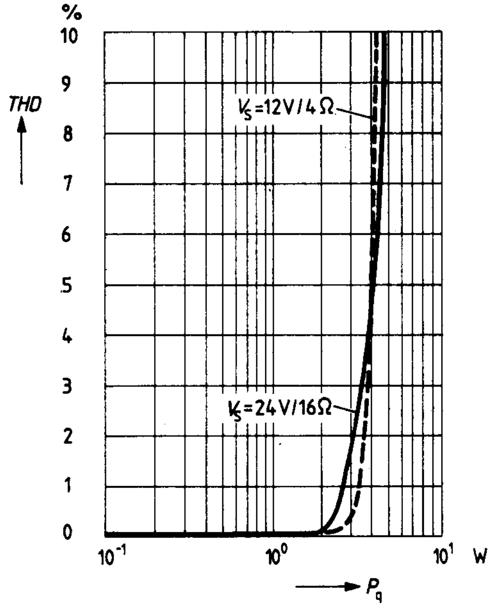
Hum suppression versus feedback resistance
$f_{hum} = 100$ Hz; $C_5 = 100$ μF
a: input short-circuited
b: input open



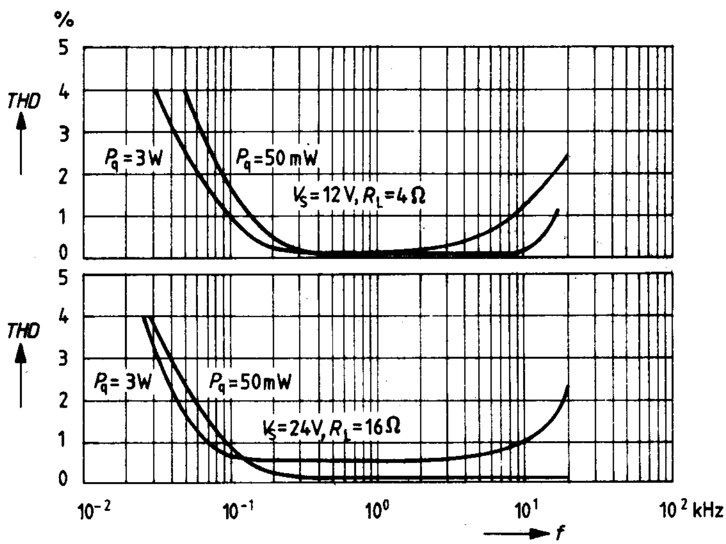
Max. total power dissipation versus ambient temperature



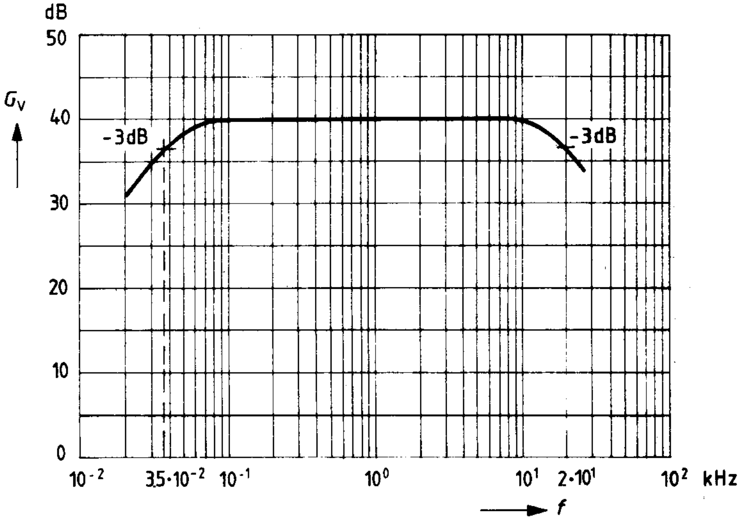
Total harmonic distortion versus output power
$f = 1$ kHz



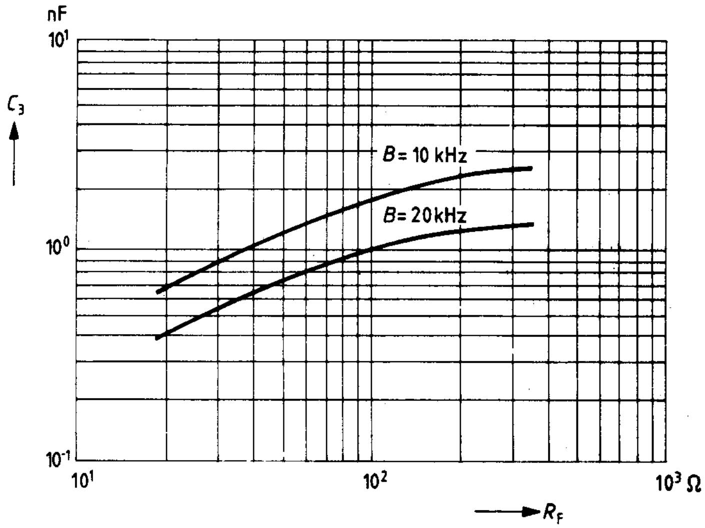
Total harmonic distortion versus frequency



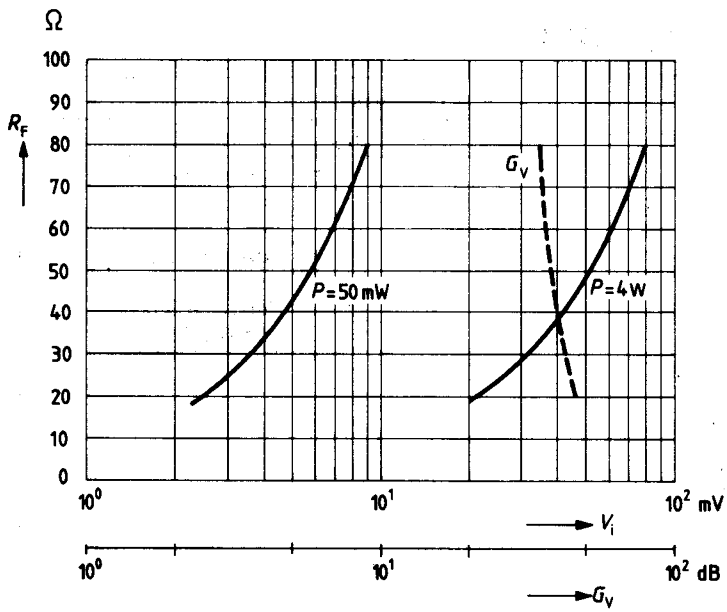
Voltage gain versus frequency
$V_S = 12$ V; $R_L = 4\ \Omega$



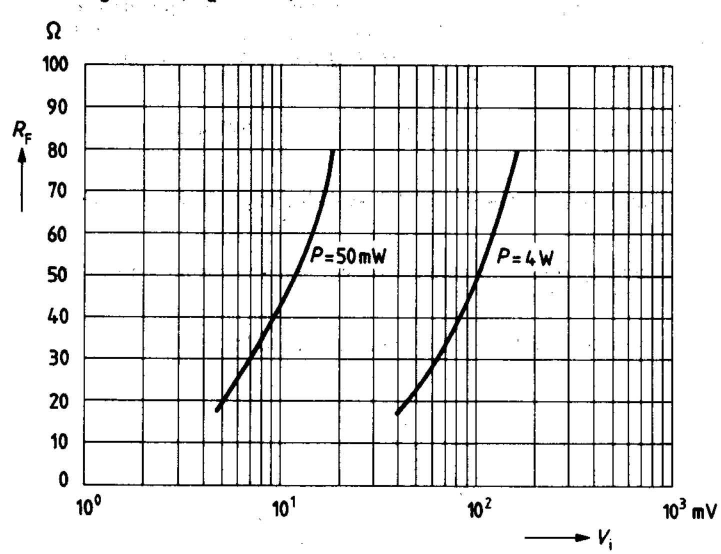
Bandwidth C_3 versus feedback resistance
$V_S = 12$ V; $R_L = 4\ \Omega, G_V = 40$ dB
$C_1 = 5 \cdot C_4$



Output power and voltage gain versus feedback resistance and input voltage
$V_S = 12$ V; $R_L = 4\ \Omega$; $f = 1$ kHz



Output power versus feedback resistance and input voltage
$V_S = 24$ V; $R_L = 16\ \Omega$; $f = 1$ kHz



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