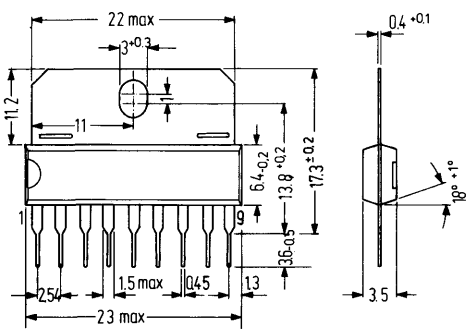
Preliminary data

AF amplifier for use in radio and TV sets. Its wide supply voltage range allows manifold use. The amplifier has class-B push-pull output and is furnished in single-in-line package. The integrated shutdown protects the IC from overheating.

- Large 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

Type	Ordering code
TDA 1037	Q67000-A1229

Package outlines



Plastic package
Single-In-Line, 9 pins
Cooling fin
Weight approx. 1.9 g
Dimensions in mm

Absolute maximum ratings

Supply voltage	V_{cc}	28	V
Output peak current (not periodical)	I_q	3.5	A
Output current (periodical)	I_q	2.5	A
Junction temperature	T_j	150	°C
Thermal resistance (system-case)	R_{thsc}	12	K/W
Storage temperature	T_s	−40 to +125	°C

Range of operation

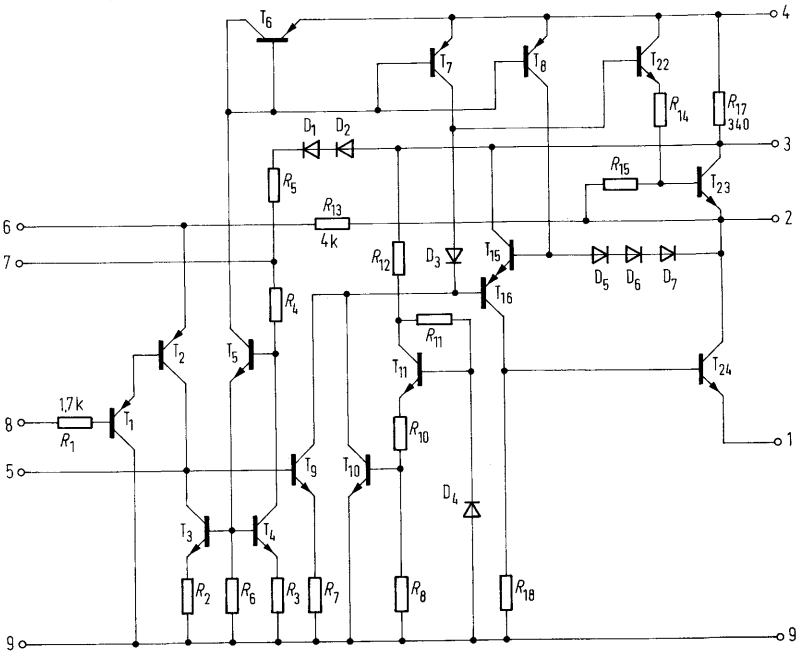
Supply voltage	V_{cc}	4 to 28	V
Ambient temperature in operation	T_{amb}	−25 to +85	°C

Preliminary data

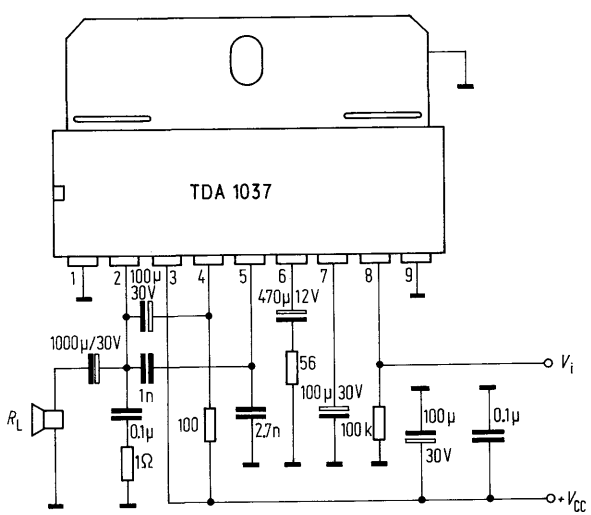
Electrical characteristics (with reference to test circuit; T_{amb} = 25°C; f_i = 1 kHz)

		min	typ	max	
Output DC voltage					
V_{cc} = 24 V	V_2	11	12	13	V
V_{cc} = 18 V	V_2	8	9	10	V
V_{cc} = 14 V	V_2	6.4	7.2	8	V
Quiescent current consumption					
V_{cc} = 24 V	I_3+I_4		15	25	mA
V_{cc} = 18 V	I_3+I_4		13	22	mA
V_{cc} = 14 V	I_3+I_4		12	20	mA
Input DC current					
V_{cc} = 24 V	I_8		1		μA
V_{cc} = 18 V	I_8		.6		μA
V_{cc} = 14 V	I_8		.4		μA
Output power (k = 10%)					
V_{cc} = 24 V, R_L = 16Ω	P_q		5.5		W
V_{cc} = 18 V, R_L = 8Ω	P_q		5.0		W
V_{cc} = 14 V, R_L = 4Ω	P_q		5.0		W
Input sensitivity (P_q = 5 W)					
V_{cc} = 24 V, R_L = 16Ω	V_i		150		mV
V_{cc} = 18 V, R_L = 8Ω	V_i		110		mV
V_{cc} = 14 V, R_L = 4Ω	V_i		80		mV
Input impedance	R_i	1	5		MΩ
Frequency range (−3 dB)	f	35		20000	Hz
Total harmonic distortion (P_q = .05...3 W; V_{cc} = 14 V; R_L = 4Ω)	THD		.3		%
Voltage gain					
with negative feedback	G_v	33	36	39	dB
without negative feedback	G_v		70		dB
Mains hum suppression (V_{cc} = 14 V; R_L = 4Ω; f_{hum} = 100 Hz)	a_{hum}		38		dB
Noise voltage acc. DIN 45405 (with reference to input; R_G = 100 kΩ)				10	μV

Circuit diagram



Test and application circuit



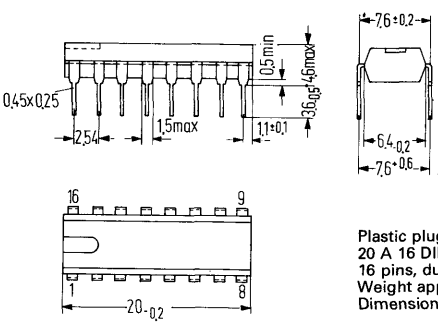
Preliminary data

TDA 1046 is a monolithic IC suitable for AM receivers up to 30 MHz in car radios as well as mains-operated radio sets. For the use in high-quality radio sets the TDA 1046 is preferred to the TCA 440. TDA 1046 contains a controlled RF pre and intermediate stage, a multiplicative push-pull mixer with separate oscillator, controlled IF amplifier, full-wave demodulator, active low pass, as well as an amplifier to directly feed a field-strength indicator instrument. By means of its amplitude-controlled oscillator, the TDA 1046 is particularly suited for applications with varicap diodes. The circuit is balanced.

- Provision of internal AGC-voltage
- High capability for large signals
- Internal demodulator
- Internal AF filtering
- Direct feed of a logarithmical field strength indicator (range 90 dB)
- High AF output voltage with low distortion factor
- Minimisation of external components
- Provisions for additional RF-circuit

Type	Ordering code
TDA 1046	Q67000-A1092

Package dimensions



Plastic plug-in package
20 A 16 DIN 41866
16 pins, dual-in-line
Weight approx. 1.2 g
Dimensions in mm

Absolute maximum ratings

Operating voltage	V_7	18	V
Thermal resistance	R_{thsa}	120	K/W
Junction temperature	T_j	150	°C
Storage temperature	T_s	−40 to +125	°C

Range of operation

Operating voltage	V_7	8 to 18	V
Oscillator frequency	f_{osc}	.5 to 31	MHz
Input frequency RF part	f_{iRF}	0 to 30	MHz
IF part	f_{iIF}	.2 to 1	MHz
Ambient temperature in operation	T_{amb}	−15 to +85	°C

Preliminary data

Electrical characteristics (V_7 = 10 V, T_{amb} = 25 °C, f_{mod} = 1 kHz, f_{iRF} = 1000 kHz) according to application circuit

Current consumption	I_{cc}	18	mA
AF output voltage and distortion factor			
m = 80%; V_{iRF} = 2.5 mV_{eff}	V_{AF}	800	mV_{eff}
	THD_{typ}	.8	%
m = 80%; V_{iRF} = 25 mV_{eff}	V_{AF}	800	mV_{eff}
	THD_{max}	1.5	%
m = 30%; V_{iRF} = 2.5 mV_{eff}	V_{AF}	280	mV_{eff}
	THD_{typ}	.6	%
m = 30%; V_{iRF} = 45 mV_{eff}	V_{AF}	300	mV_{eff}
	THD_{max}	.9	%
Total range of AGC (variation of AF voltage $\Delta V_6 < 6$ dB)	ΔG_{Vtyp}	85	dB
Input voltage for AGC triggering			
with tuned LC circuit	$V_{i\ 9-10}$	19	µV
with wide-band circuit	$V_{i\ 9-10}$	28	µV
Input sensitivity (measured at 60 Ω; m = 30%/0%)			
at signal-to-noise ratio $\frac{S+N}{N}$ = 6 dB	V_{iRF}	2.5	µV
$\frac{S+N}{N}$ = 26 dB	V_{iRF}	14	µV
$\frac{S+N}{N}$ = 53 dB	V_{iRF}	1	mV
Instrument current (V_{cc} = 15 V; at G_{min}; $V_{11} \leq V_7 - 3$ V)	I_{11}	1.5	mA
AF output impedance	R_6	3	kΩ

Preliminary data

Electrical characteristics RF stage
(V_7 = 10 V, T_{amb} = 25 °C, f_{iRF} = 1000 kHz, f_{mod} = 1 kHz, m = 95%, f_{IF} = 450 kHz)

according to test circuit 1

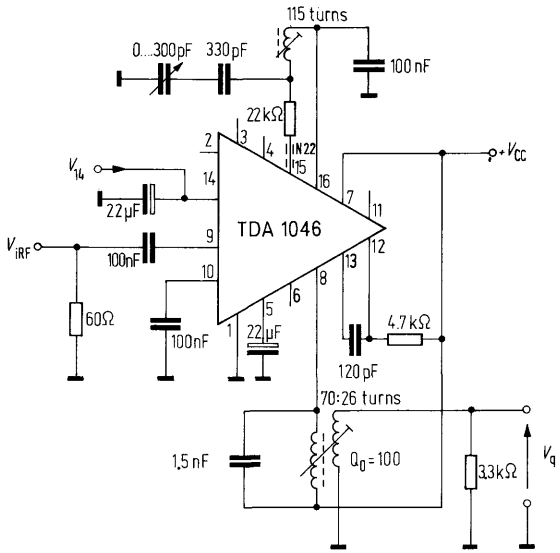
Oscillator voltage (f_{osc} = 1.45 MHz)	V_{15}	600	mV_{ss}
AGC range of RF prestage	ΔG_V	40	dB
Voltage gain	G_V	40	dB
Voltage gain of RF stage	$G_{V\ 13-9/10}$	20	dB
Input impedance	$Z_{i\ 9-1} = Z_{i\ 10-1}$	2/5	kΩ/pF
	$Z_{i\ 9-10}$	4/5	kΩ/pF
Input voltage for prestage AGC-triggering	$V_{i\ 9-10}$	1	mV_{eff}
Input voltage for overload (THD_{mod} = 10%)	$V_{i\ 9-10}$	2	V_{ss}
Reference voltage ($I_{16} \leq 1$ mA)	V_{16}	3.3	V

Electrical characteristics IF stage
(V_7 = 10 V, T_{amb} = 25 °C, f_{IF} = 450 kHz, f_{mod} = 1 kHz, m = 95%)

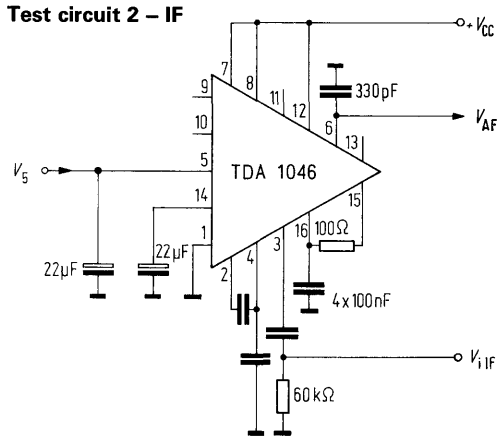
according to test circuit 2

AGC range at 450 kHz	ΔG	45	dB
Input voltage for overload (THD = 10 %)	V_3	120	mV_{eff}
AGC-triggerring-level at 450 kHz	V_3	.6	mV_{eff}
Input impedance	Z_3	3.3/3	kΩ/pF
AF output voltage (V_3 = 10 mV_{eff}, m = 50%)	V_{AF}	360	mV_{eff}

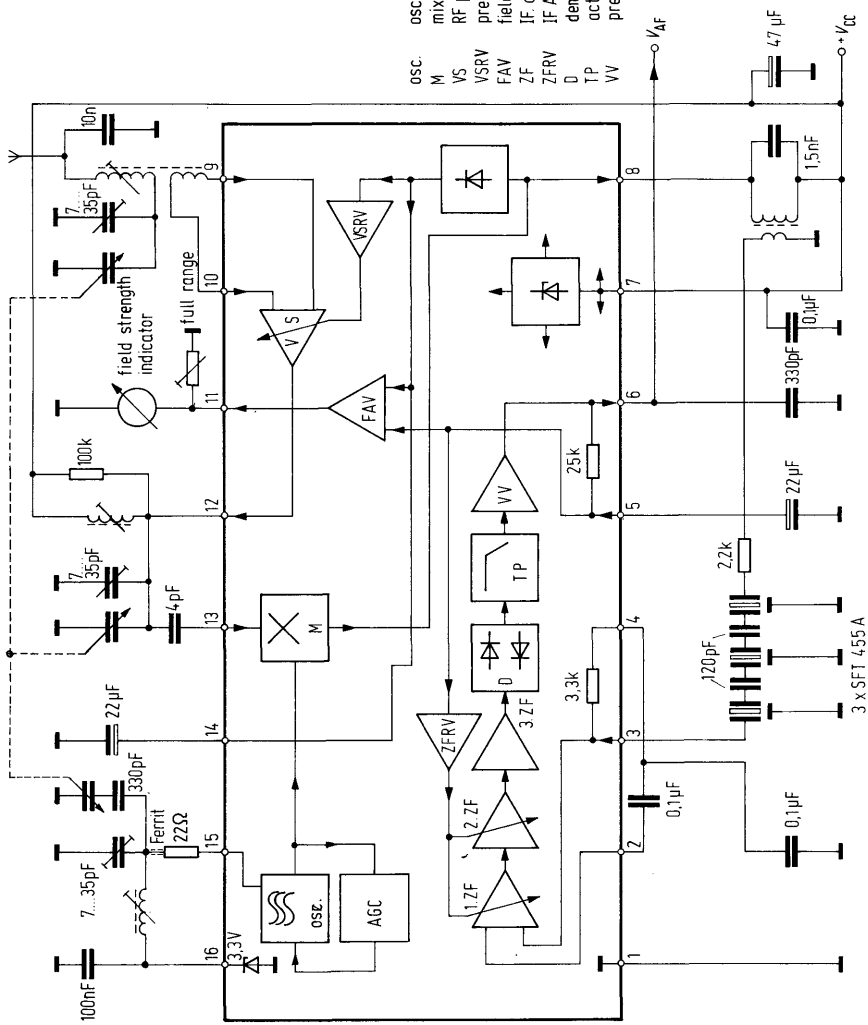
Test circuit 1 – RF

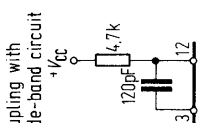


Test circuit 2 – IF



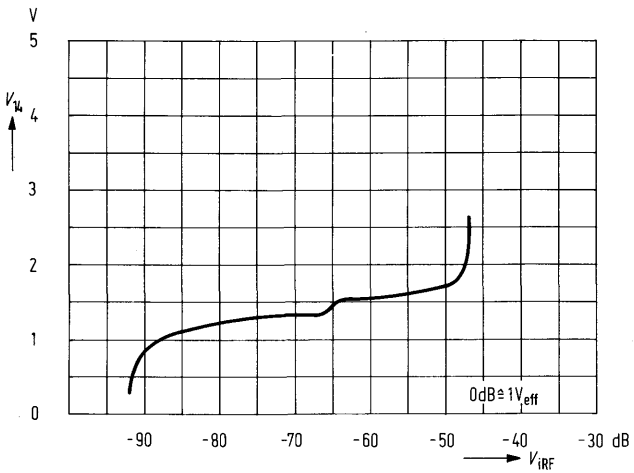
Block diagram and application circuit





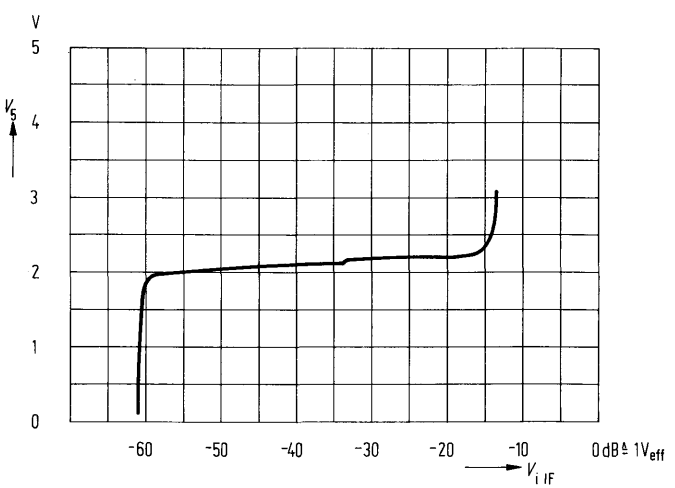
Prestage control
according to test circuit 1

V_{cc} = 10 V; T_{amb} = 25 °C; f_{iRF} = 1000 kHz; f_{mod} = 1 kHz;
m = 80%; $V_{IF} = V_q$ = const.



IF-stage control
according to test circuit 2

V_{cc} = 10 V; T_{amb} = 25 °C; f_{iIF} = 450 kHz; f_{mod} = 1 kHz;
$V_{AF} = V_6$ = const.



AF output voltage, total harmonic distortion, instrument voltage versus RF input voltage
V_{cc} = 15 V, Coupling with wide-band circuit