TEMIC

TDA 1083

Monolithic Integrated Circuit

Description

The integrated circuit TDA 1083 includes, with exception of the FM front end, a complete AM–/FM–radio–circuit with audio power amplifier. An internal Z–diode stabilizes the supply voltage at $V_S \approx 13V$, which allows with the aid of a resistor and a rectifier, the circuit to be driven by a higher external supply voltage.

Applications: AM–/FM– and Audio–Amplifier

Features

- Large supply voltage range V_S=3 ... 12V
- High AM–Sensitivity
- Limiting threshold voltage V_i=50 μV

- Audio output power $P_{0=}0.7$ W
- AFC–connection for VHF–Tuner
- AM–FM switching without high frequency voltages

1 IF-Decoupling
2 IF-Input
3 HF-Ground
4 AM-Mixer output
5 AM-Oscillator circuit
6 AM-Input
7 AM-Decoupling
8 Demodulator-Output
9 Audio-Input
10 Audio-Feedback
11 Audio-Ground
12 Audio-Output
13 + V_S
14 Demodulator circuit
15 Demodulator circuit
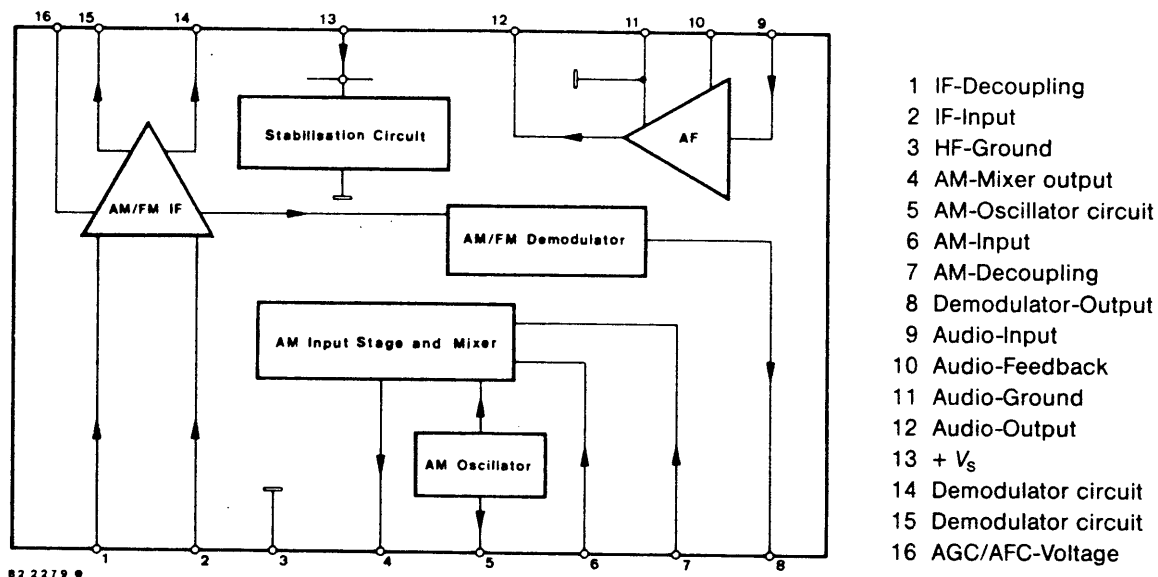16 AGC/AFC-Voltage

Figure 1 Block diagram and pin connections

Absolute Maximum Ratings

Reference points Pin 3 and 11, unless otherwise specified

Parameters	Symbol	Value	Unit
Supply voltage range Pin 13	V_s	3 ... 12	V
Supply current when using the integrated stabilisation circuit, V_S=12.5 to 14.3V Pin 13	I_S	50	mA
Power dissipation T_{amb}=65 °C	P_{tot}	600	mW
Junction temperature	T_j	125	°C
Storage temperature range	T_{stg}	−25 ... +125	°C

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Thermal Resistance

Parameters	Symbol	Maximum	Unit
Junction ambient	R_{thJA}	100	K/W

Electrical Characteristics
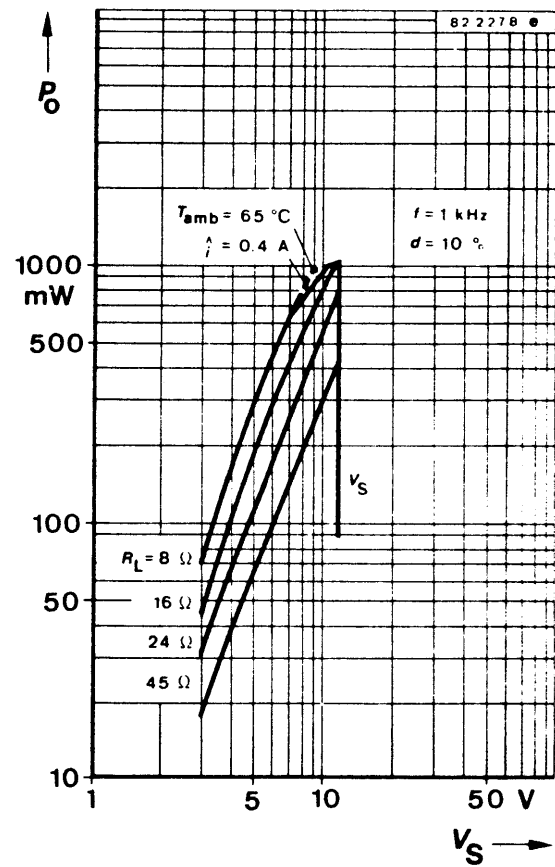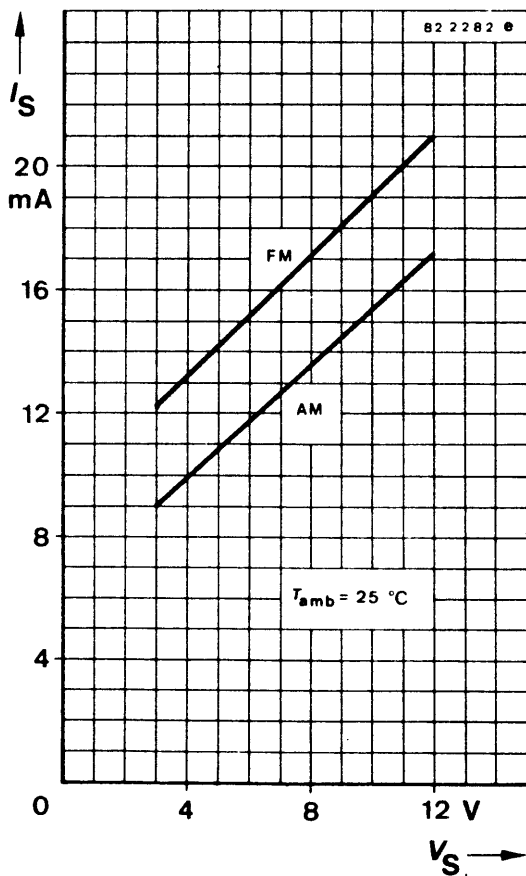
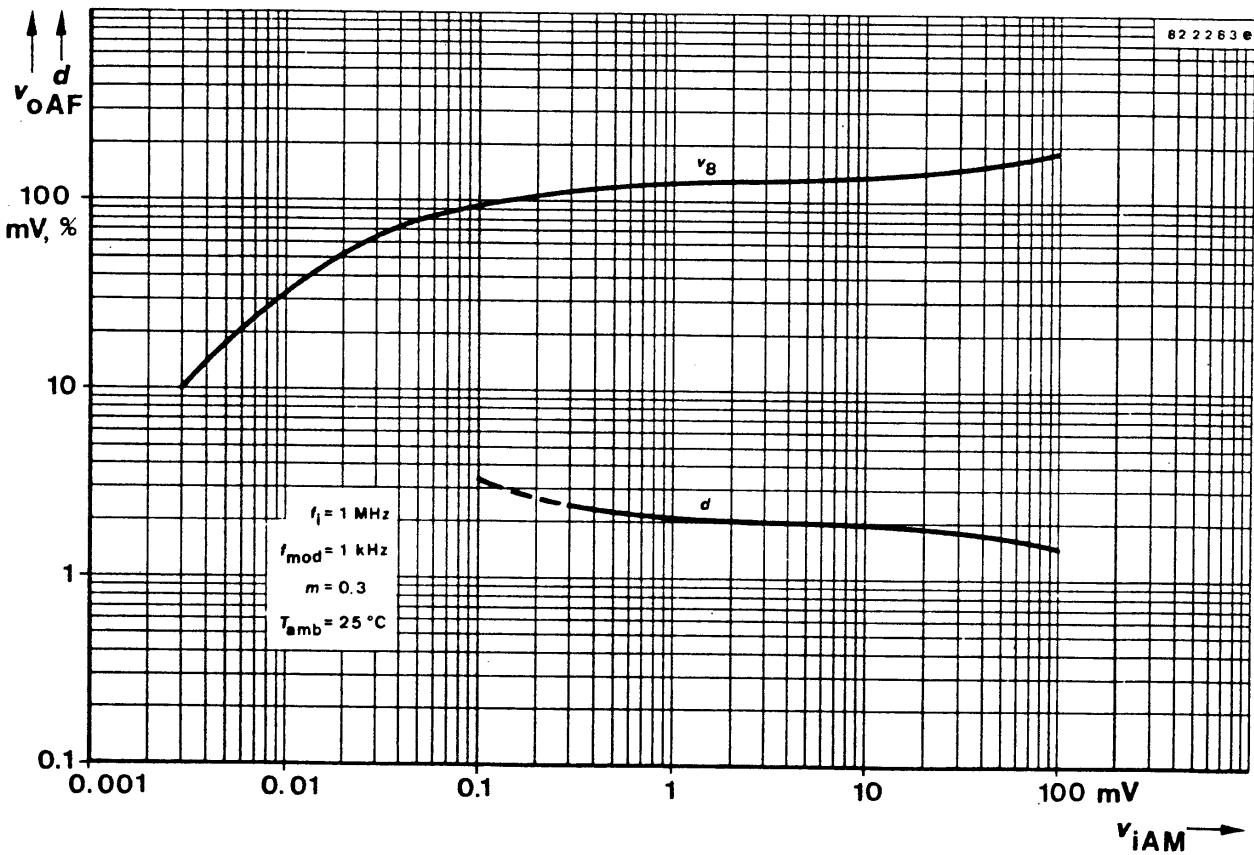V_s= 9 V, reference points Pin 3 and 11, T_{amb}= 25 °C, unless otherwise specified

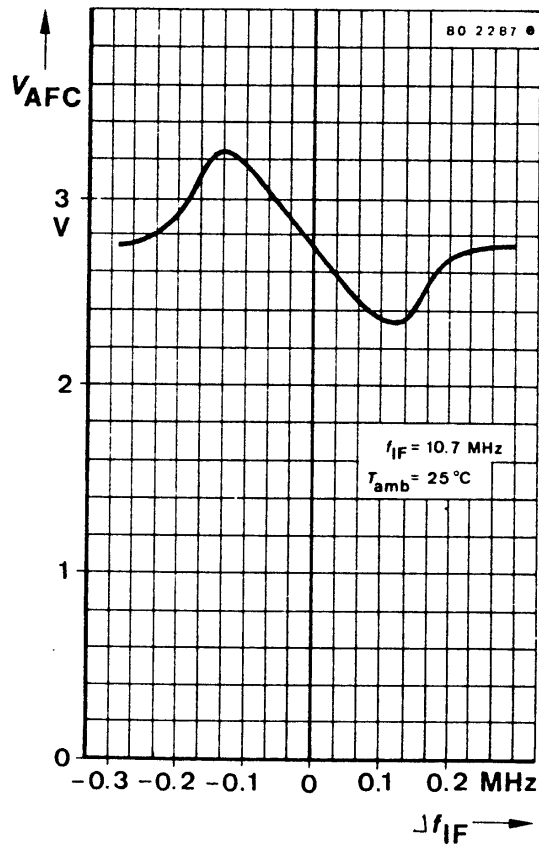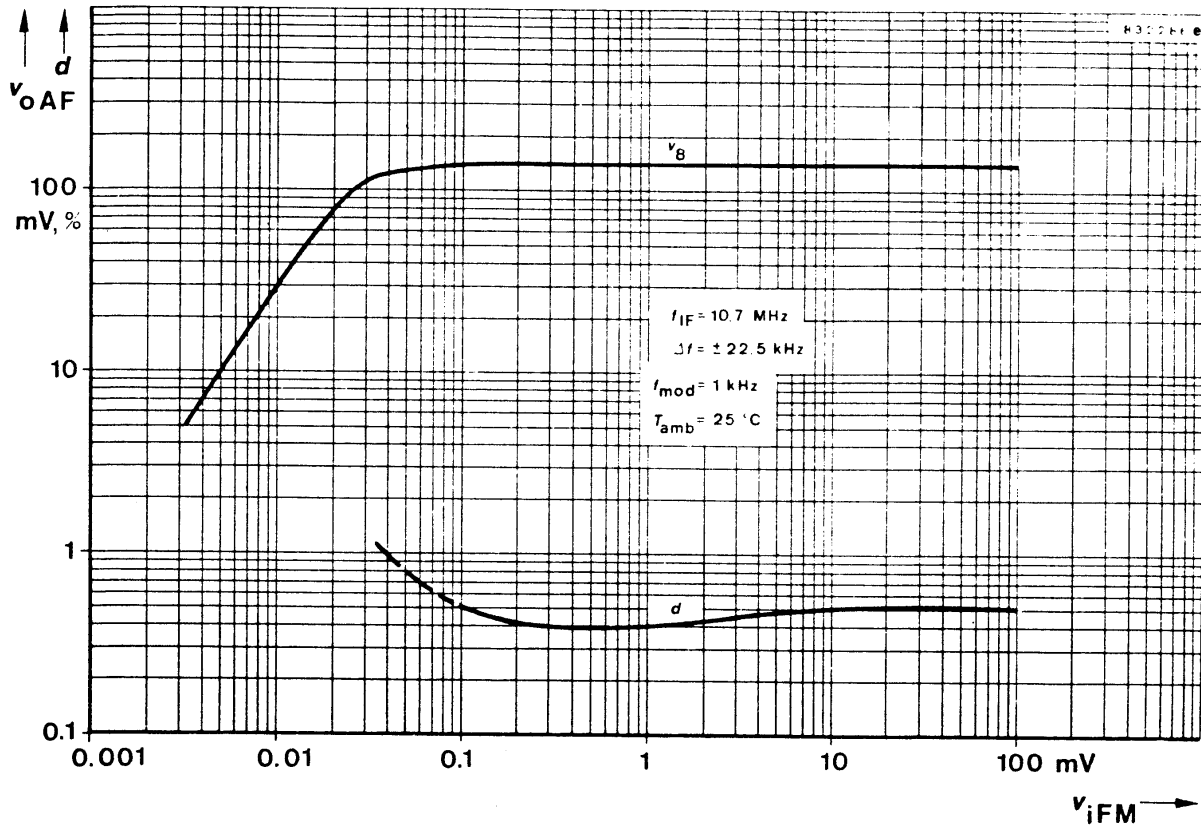| Parameters	Test Conditions / Pin	Symbol	Min	Typ	Max	Unit
AF Amplifier						
AF voltage amplification	f= 1 kHz	G_v		40		dB
Input impedance		R_i		150		kΩ
Output power	Figure 4, 5 V_S=5.5V, R_L= 8Ω,= 10%	P_o	300			mW
AM-IF Amplifier, f_i=1MHz, f_{IF}=455kHz, f_{mod}=1kHz, m=0.3						
DC voltages at AM mode without signal at: V_S=3V	Pin 10	V_{10B}		1.2		V
	Pin 12	V_{12B}	1.0		1.4	V
	Pin 13	V_{13B}	3.0	3.0	3.0	V
	Pin 16	V_{16B}	1.25		2.0	V
I_S=42 mA (V_S =12.5...14.3 V)	Pin 10	V_{10B}		1.2		V
	Pin 12	V_{12B}	5.9		7.2	V
	Pin 13	V_{13B}	12.5	13.3	14.3	V
	Pin 16	V_{16B}	1.5		2.0	V
Regulation range for: $V_{oAF}/V_{oAF} = -10dB$	Pin 6	ΔV_i		70		dB
AF voltage at demodulator output	Pin 8	V_{oAF}		100		mV
FM-IF Amplifier, f_{IF}=10.7 MHz, $\Delta f = \pm 22{,}5$ kHz, f_{mod}=1 kHz						
DC voltages at FM mode without signal at: V_S=3V	Pin 10	V_{10B}		1.2		V
	Pin 12	V_{12B}	1.0		1.4	V
	Pin 13	V_{13B}	3.0	3.0	3.0	V
	Pin 16	V_{16B}	1.8		2.8	V
I_S=42 mA (V_S =12.5...14.3 V)	Pin 10	V_{10B}		1.2		V
	Pin 12	V_{12B}	5.9		7.2	V
	Pin 13	V_{13B}	12.5	13.3	14.3	V
	Pin 16	V_{16B}	2.0		3.1	V
Limiting threshold (–3 dB)	Pin 2	V_i		50		µV
AF voltage at demodulator output	Pin 8	V_{oAF}		100		mV

Different dc voltages are developed at Pin 16 due to gain spread of AM–IF–amplifier. To determine the value of parallel resistance R_8, at the output of the demodulator Pin 8 for $V_S = 9$ V, AM mode without signal, dc voltage should be selected at Pin 16.

Available in following voltage groups:

V_{16}	1.4 ... 1.7 V	1.7 ... 1.9 V	1.9 ... 2.1 V
R_8	∞	47 kΩ	33 kΩ
Group	1	2	3

Diagram (top left): d (%) vs P_o (mW)
- $V_S = 9$ V; $R_L = 16$ Ω
- $V_S = 6.5$ V; $R_L = 8$ Ω
- $V_S = 12$ V; $R_L = 45$ Ω
- $f = 1$ kHz
- $T_{amb} = 25$ °C

Diagram (top right): v_{iAM} (mV) vs Δf (kHz)
- $v_{OAF} = 50$ mV
- $V_{AFC} = $ constant
- $f_i = 1$ MHz
- $f_{mod} = 1$ kHz
- $m = 0.3$
- $T_{amb} = 25$ °C
- 4 kHz

Diagram (bottom): v_{OAF}, d (mV, %) vs v_{iAM} (mV)
- v_8
- d
- $f_i = 1$ MHz
- $f_{mod} = 1$ kHz
- $m = 0.3$
- $T_{amb} = 25$ °C

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$f_{IF} = 10.7$ MHz
$\Delta f = \pm 22.5$ kHz
$f_{mod} = 1$ kHz
$T_{amb} = 25$ °C

$f_{IF} = 10.7$ MHz
$T_{amb} = 25$ °C

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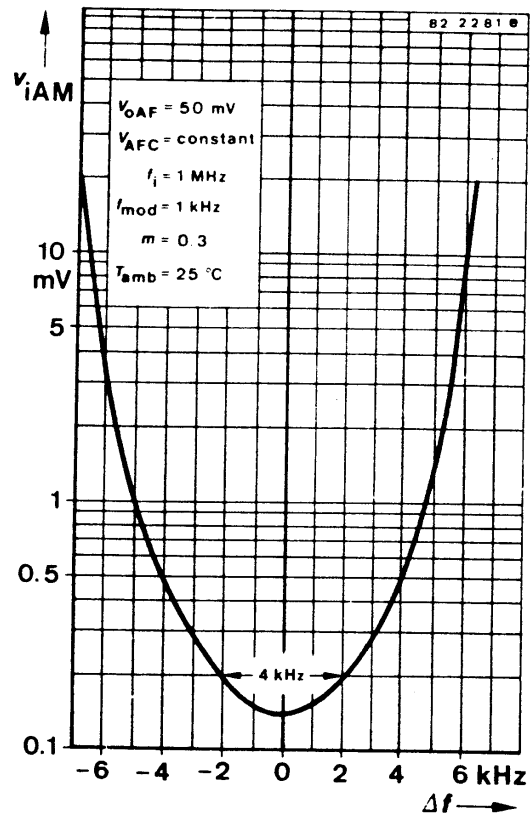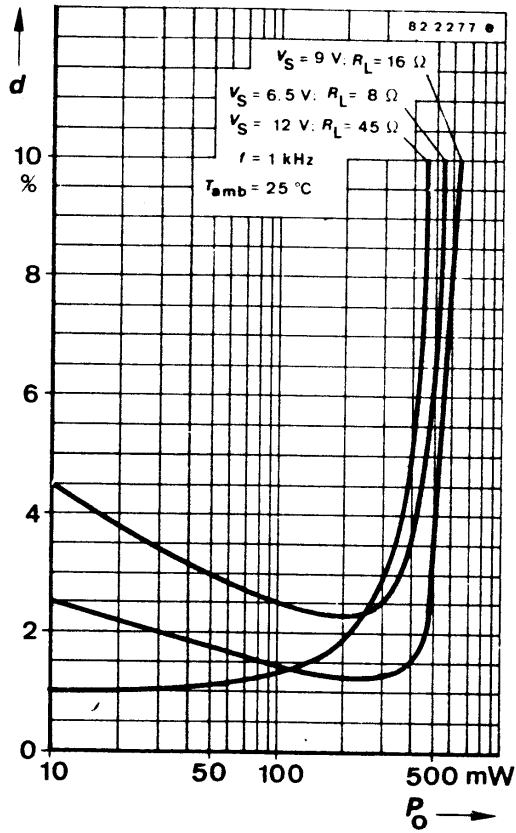
Components in Figure 9

|				
L_1	=	4		Wdg $\varnothing$ 0.45 CuL, Threaded core 7.5x3 material: Fi 01 U8 (Vogt GmbH)
L_2	=	5		Wdg $\varnothing$ 0.45 CuL
L_3	=	5		Wdg $\varnothing$ 0.45 CuL, air core $\varnothing$ 3.5 mm
L_4	=	3+3		Wdg $\varnothing$ 0.45 CuL, air core $\varnothing$ 2.7 mm
L_5	=	12		Wdg $\varnothing$ 0.25 CuL, Pin 3–1, Filter kit 154 AN(C) or 154ANS–7 A6363A0 (TOKO, Componex)
L_6	=	2		Wdg $\varnothing$ 0.25 CuL, Pin 4–6
L_7	=	7		Wdg $\varnothing$ 0.25 CuL, Pin 6–3, Filter kit 154AN(C) or 154EES–7 A6392FA (TOKO, Componex)
L_8	=	7		Wdg $\varnothing$ 0.16 CuL, Pin 1–4, Filter kit 154AN(C) or 154EES–7 A6391ABM (TOKO, Componex)
L_9	=	5		Wdg $\varnothing$ 0.16 CuL, Pin 2–6
L_{10}	=	96		Wdg $\varnothing$ 0.25 CuLs, Ferrite aerial $\varnothing$ 8x130 mm, Type 031039–2103–606, (Draloric)
L_{11}	=	6		Wdg $\varnothing$ 0.25 CuLs
L_{12}	=	78		Wdg $\varnothing$ 0.09 CuL, Pin 3–4, Filter kit RBR or RWOS–6A7609AAU (TOKO, Componex)
L_{13}	=	7		Wdg $\varnothing$ 0.09 CuL, Pin 2–1
L_{14}	=	18		Wdg $\varnothing$ 0.09 CuL, Pin 3–4, Filter kit RHN(C) or RHCS–1A7607AQH (TOKO, Componex)
L_{15}	=	46+100		Wdg $\varnothing$ 0.09 CuL, Pin 6–2–1
L_{16}	=	72+72		Wdg $\varnothing$ 0.09 Cul Pin 3–4/6–1, Filter kit RHN(C) or RHNS–1A7608AZP (TOKO, Componex)
455 kHz	=	Ceramic filter LBF 6 (Componex) or CFU 445 H (Stettner)		
10.7 MHz	=	Ceramic filter 10.7 MF–18 (Componex) or SFE 10.7 MA (Stettner)		
D_{r1}, D_{r3}	=	Ferrit bead on the transistor terminal		
D_{r2}	=	16		Wdg $\varnothing$ 0.25 CuL, $\varnothing$ 2 air core
D_{r4}	=	6		Wdg $\varnothing$ 0.15 CuL, $\varnothing$ 2.1x3 mm Ferrit bead
$C_6 = C_{14}$	=	4.5 ... 20 pF, Variable capacitor Type CY2–22124–RT02 (TOKO, Componex)		
C_{19}	=	5 ... 80 pF		
C_{21}	=	5 ... 140 pF		
R_8	=	according to gain groups ∞, 47 kΩ or 33 kΩ		

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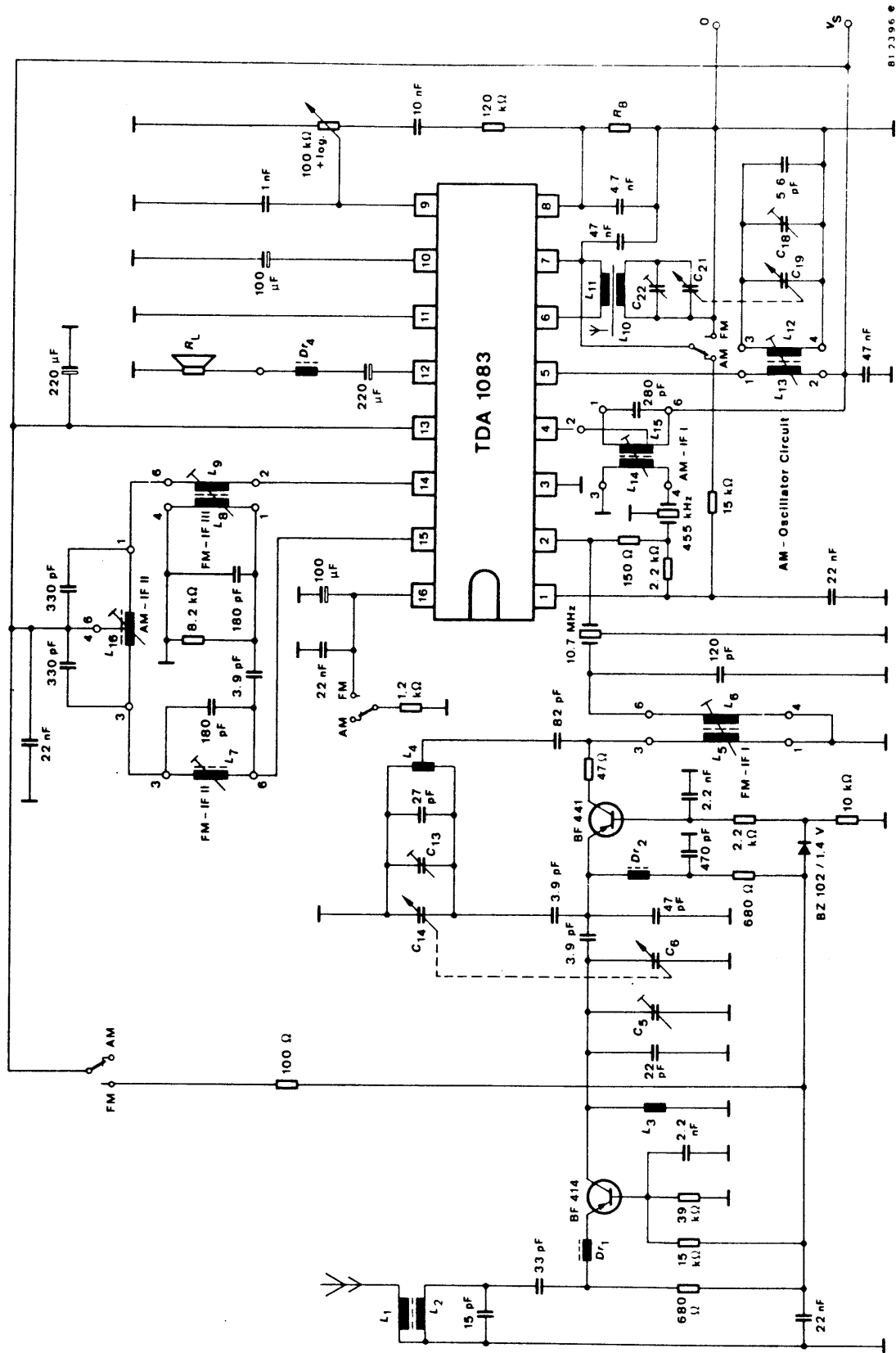
Figure 9 FM–/AM–receiver circuit
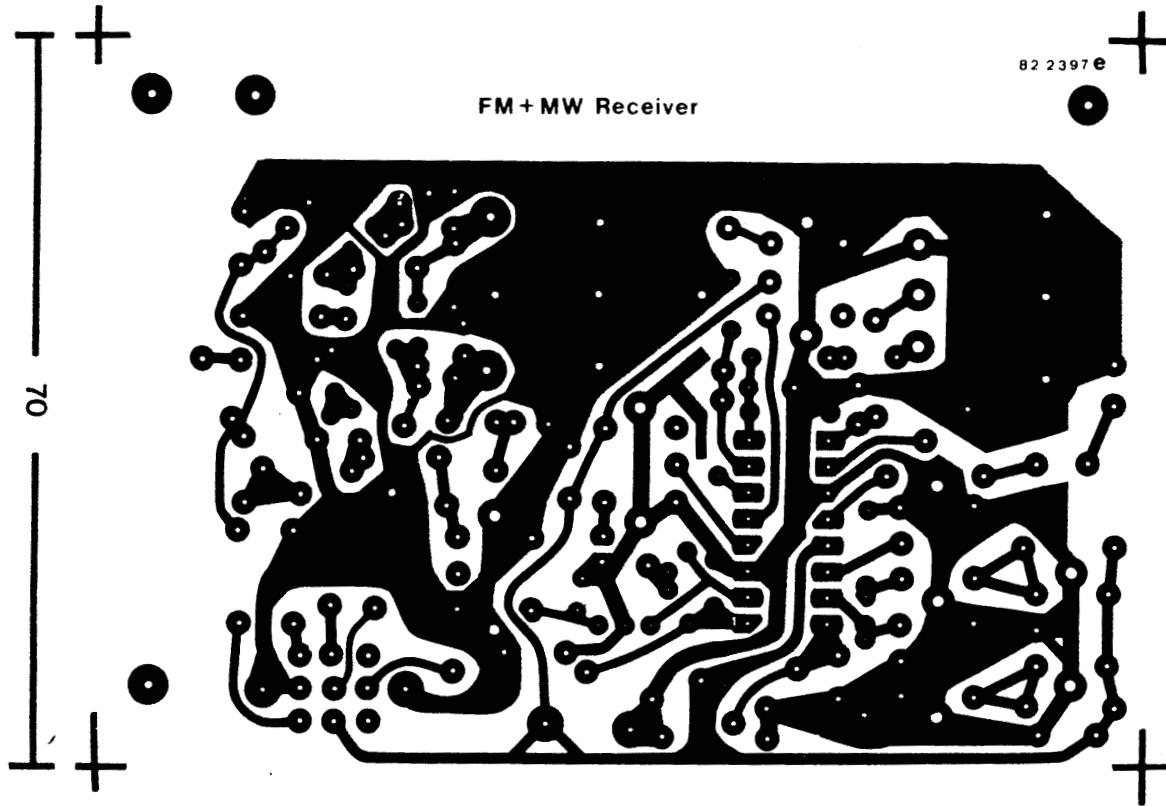
Figure 10 Layout of circuit board (soldered side) of the FM–/AM–receiver
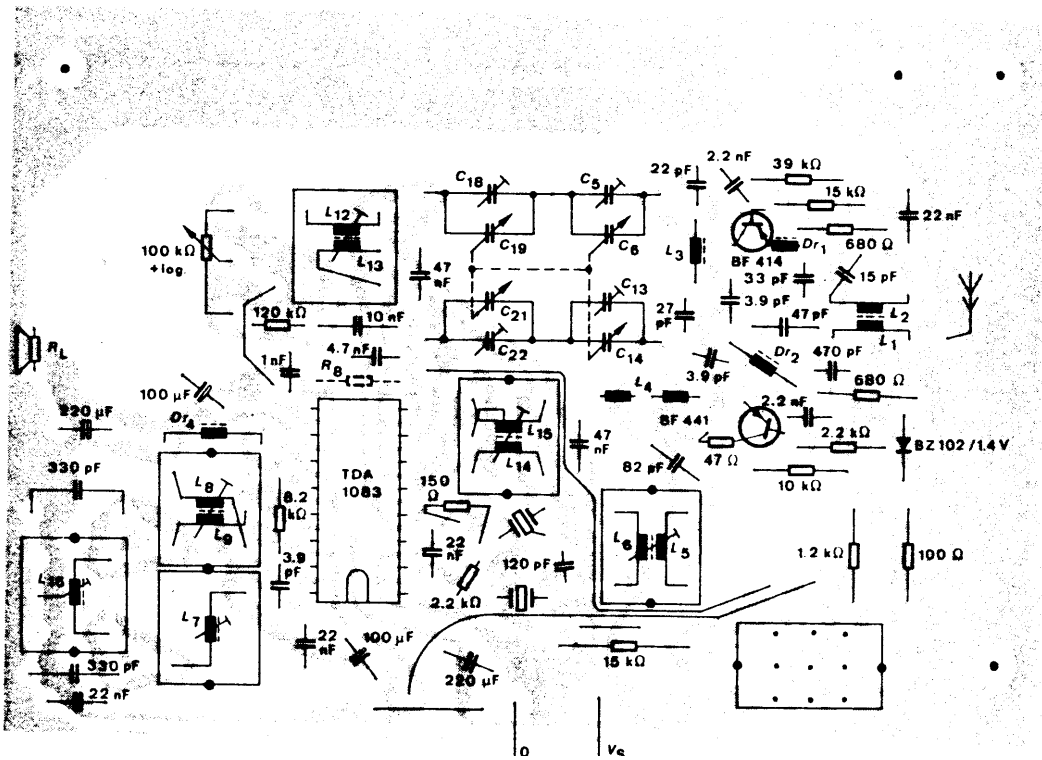
Figure 11 Printed board with components for FM–/AM–receiver

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Figure 12 27 MHz–receiver circuit
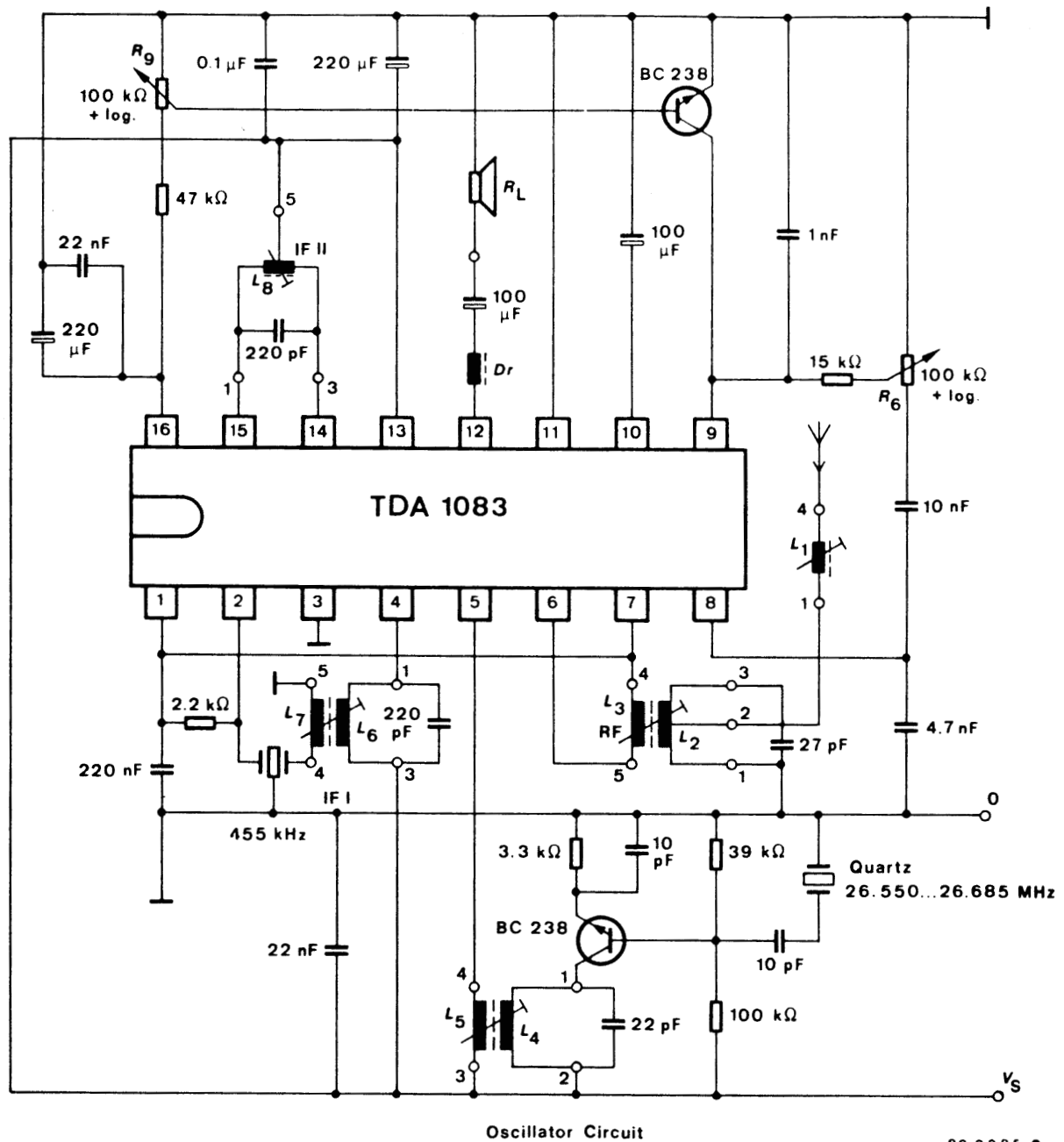
L_1	=	3	Wdg $\varnothing$ 0.25 CuL Pin 3–4 (Neosid 7F1)
L_2	=	3+4	Wdg $\varnothing$ 0.25 CuL Pin 1–2–3 (Neosid 7F1)
L_3	=	3	Wdg $\varnothing$ 0.25 CuL Pin 4–5
L_4	=	8	Wdg $\varnothing$ 0.45 CuL Pin 1–2 (Neosid 7F1)
L_5	=	1	Wdg $\varnothing$ 0.25 CuL Pin 3–4
L_6	=	154	Wdg $\varnothing$ 0.08 CuL Pin 1–3 (Neosid 7A1)

L_7	=	30	Wdg $\varnothing$ 0.08 CuL Pin 4–5
L_8	=	76+76	Wdg $\varnothing$ 0.08 CuL Pin 1–5–3 (Neosid 7A1)
D_r	=	4	Wdg $\varnothing$ 0.25 CuL Ferrit bead
455 kHz	=		Ceramic filter LFB 6 (Componex) or CFU 455 H (Stettner)
R_6	=		Volume control
R_9	=		Squelch

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Figure 13 Layout of circuit board (soldered side) for 27 MHz–receiver
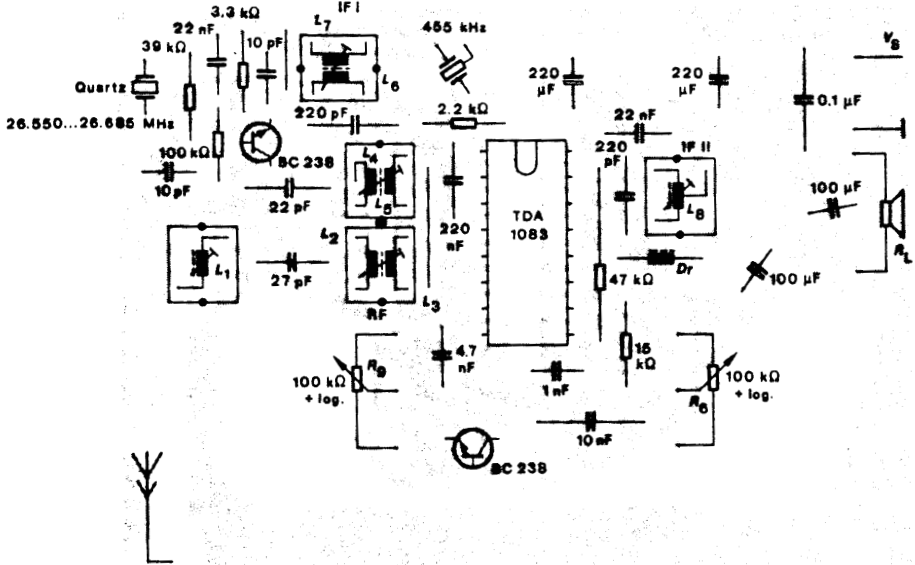
Figure 14 Printed board with components for 27 MHz–receiver

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Dimensions in mm
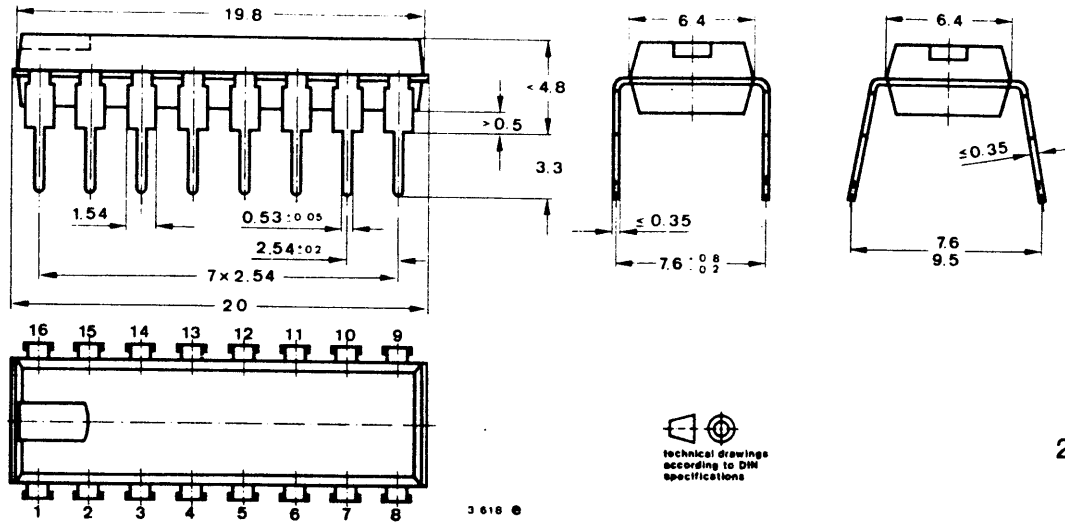
Case
20 A 16 DIN 41866
JEDEC MO 001

OZONE DEPLETING SUBSTANCES POLICY STATEMENT

It is the policy of **TEMIC TELEFUNKEN microelectronic GmbH** to

1. Meet all present and future national and international statutory requirements and

2. Regularly and continuously improve the performance of our products, processes, distribution and operating systems with respect to their impact on the health and safety of our employees and the public, as well as their impact on the environment.

Of particular concern is the control or elimination of releases into the atmosphere of those substances which are known as ozone depleting substances (ODSs).

The Montreal Protocol (1987) and its London Amendments (1990) will soon severely restrict the use of ODSs and forbid their use within the next ten years. Various national and international initiatives are pressing for an earlier ban on these substances.

TEMIC TELEFUNKEN microelectronic GmbH semiconductor division has been able to use its policy of continuous improvements to eliminate the use of any ODSs listed in the following documents.

1. Annex A, B and list of transitional substances of the Montreal Protocol and the London Amendments respectively

2. Class I and II ozone depleting substances in the Clean Air Act Amendments of 1990 by the Environmental Protection Agency (EPA) in the USA and

3. Council Decision 88/540/EEC and 91/690/EEC Annex A, B and C (transitional substances) respectively.

TEMIC can certify that our semiconductors are not manufactured with and do not contain ozone depleting substances.

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