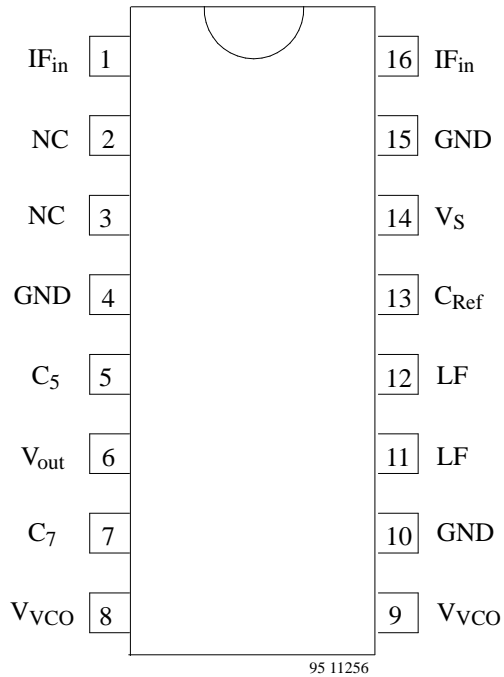




## Pin Description



Pin	Symbol	Function
1	IF <sub>in</sub>	IF input
2	NC	Not connected
3	NC	Not connected
4	GND	Ground
5	C <sub>5</sub>	IF-AGC time constant
6	V <sub>out</sub>	Output for AM (audio frequency) or FM (intercarrier frequency)
7	C <sub>7</sub>	Averaging value (IF-AGC function)
8	V <sub>VCO</sub>	VCO circuit
9	V <sub>VCO</sub>	VCO circuit
10	GND	Ground
11	LF	PLL loop filter
12	LD	PLL time constant switch
13	C <sub>Ref</sub>	Reference voltage (internal use only)
14	V <sub>S</sub>	Supply voltage
15	GND	Ground
16	IF <sub>in</sub>	IF input

## Absolute Maximum Ratings

Reference point Pin 4, unless otherwise specified

Parameters	Symbol	Value	Unit
Supply voltage	Pin 14 V <sub>S</sub>	6.8 to 13.0	V
Supply current	Pin 14 I <sub>S</sub>	55	mA
Output current	Pin 6 I <sub>out</sub>	5.0	mA
Maximum power dissipation	P	720	mW
Junction temperature	T <sub>j</sub>	+125	°C

## Thermal Resistance

Parameters	Symbol	Value	Unit
Junction ambient	note 1 R <sub>thJA</sub>	60	K/W
Ambient temperature	T <sub>amb</sub>	-25 to +85	°C
Storage temperature	T <sub>stg</sub>	-25 to +125	°C

## Electrical Characteristics

$V_s = 8\text{ V}$ ,  $T_{\text{amb}} = 25^\circ\text{C}$ , reference point Pin 4, unless otherwise stated

Parameters	Test Conditions / Pins	Symbol	Min.	Typ.	Max.	Unit
<b>DC-supply</b> <span style="float: right;"><b>Pin 14</b></span>						
Supply voltage		$V_s$	6.8	8.0	13.0	V
Supply current		$I_s$		45	55	mA
<b>IF-amplifier</b> <span style="float: right;"><b>Pins 1–16</b></span>						
Input sensitivity RMS value	change of output signal at Pin 6: -3 dB	$V_{\text{in}}$		80	120	$\mu\text{V}_{\text{RMS}}$
Input impedance		$R_{\text{in}}$		1.2		$\text{k}\Omega$
Input capacitance		$C_{\text{in}}$		2		pF
<b>IF-AGC</b> <span style="float: right;"><b>Pins 5 and 7</b></span>						
IF gain control range		$G_v$	60	66		dB
AGC capacitor		$C_5$		4.7		$\mu\text{F}$
Average capacitor		$C_7$		0.33	1.0	$\mu\text{F}$
<b>PLL</b> <span style="float: right;"><b>Pins 8–9, 11 and 12</b> <b>see note 2</b></span>						
PLL capture range		$\Delta f_{\text{cap}}$		$\pm 1.5$		MHz
VCO-tuning range		$\Delta f_{\text{VCO}}$		3.0		MHz
VCO-tuning sensitivity		$\Delta f / \Delta u$	3.0	4.5		kHz/mV
<b>FM-mode: Inter-carrier mixer operation</b> <span style="float: right;"><b>Pin 6</b> <b>see note 3</b></span>						
DC output voltage	$V_5 = 4.5\text{ V}$ , $v_{\text{in}} = 0$	$V_{\text{DC}}$		4.2		V
Output resistance		$R_{\text{out}}$		100		$\Omega$
Sound IF output voltage 5.50 MHz output voltage 5.74 MHz output voltage	$v_{\text{in}} = 10\text{ mV}$	$V_{\text{out}}$ $V_{\text{out}}$	80 35	120 55	180 80	$\text{mV}_{\text{RMS}}$ $\text{mV}_{\text{RMS}}$
Weighted signal to noise ratio: (CCIR 468)	ref. signal: $v_{\text{in}} = 10\text{ mV}$ , $f_{\text{dev}} = \pm 30\text{ kHz}$ , $f_{\text{mod}} = 1\text{ kHz}$ , measured with FM demodulator U2831B, standard B/G modulated IF signal (residual carrier 10%);					
Black screen: 1. Channel 2. Channel		S/N S/N		62 60		dB dB
Grid pattern: 1. Channel 2. Channel		S/N S/N		52 50		dB dB
Grey screen 50%: 1. Channel 2. Channel		S/N S/N		59 58		dB dB

Parameters	Test Conditions / Pins	Symbol	Min.	Typ.	Max.	Unit
<b>AM mode:</b>		<b>Pin 6</b>		<b>see note 4</b>		
DC output voltage	$V_5 = 4.5 \text{ V}$ , $v_{in} = 0$	$V_{DC}$		4.2		V
Output resistance		$R_{out}$			100	$\Omega$
AF output voltage		$V_{o,AF}$	420	560	750	mV <sub>RMS</sub>
Total harmonic distortion	$m = 80\%$ $f_{mod} = 40 \text{ Hz}$ $f_{mod} = 1 \text{ kHz}$ $f_{mod} = 12.5 \text{ kHz}$	THD			3	%
Signal to noise ratio	Reference: $m = 54\%$ $f_{mod} = 1 \text{ kHz}$ 22 kHz low pass	S/N		65		dB
Ripple rejection	Pin 15/Pin 7			28		dB

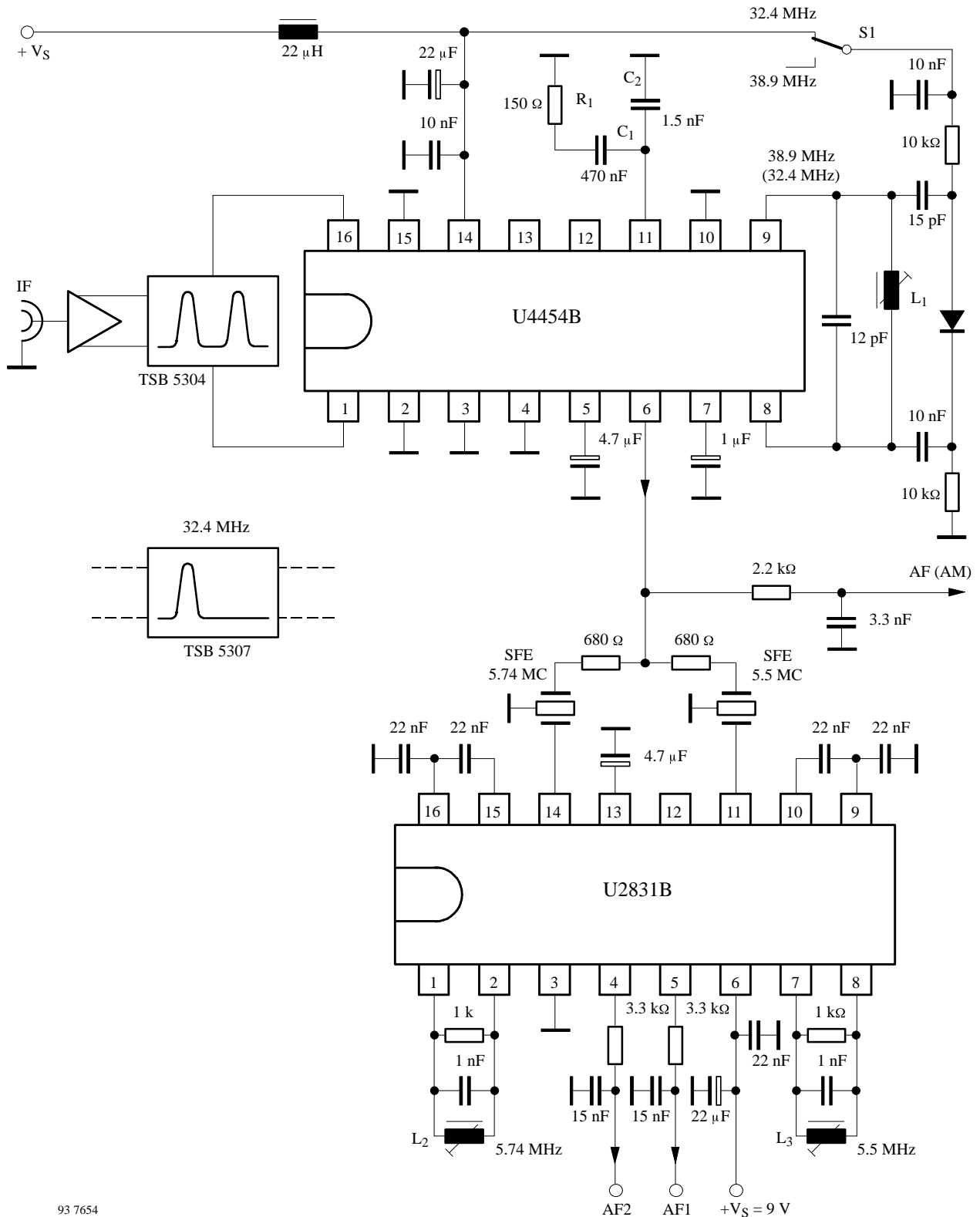
### Notes

- When soldered to PCB
- With: VCO-capacitor:  $C_{VCO} = 22 \text{ pF}$ ;  
Loop filter:  $R_1 = 150 \Omega$ ,  $C_1 = 470 \text{ nF}$ ,  $C_2 = 1.5 \text{ nF}$
- Picture carrier  $PC = 38.9 \text{ MHz}$ ; sound carrier  
 $SC_1 = 33.4 \text{ MHz}$ ,  $SC_2 = 33.16 \text{ MHz}$ ;  $PC/SC_1 = 13 \text{ dB}$ ;  
 $PC/SC_2 = 20 \text{ dB}$ ; PC unmodulated (equivalent to  
sync peak level
- Sound carrier  $SC = 32.4 \text{ MHz}$ , modulated with  
 $f_{mod} = 1 \text{ kHz}$ ,  $m = 54\%$ ,  $V_{in} = 10 \text{ mV}$

### Alignment of the VCO

- Apply 4.5 V to Pin 5, to disable the broadband amplifier.
- Measure the dc-voltage at Pin 11 (phase detector).
- Apply a 38.9 MHz unmodulated carrier signal to the IF input (Pins 1–16); adjust the input level so that the AGC voltage at Pin 5 is between 2.5 V and 3.3 V.
- Adjust the VCO circuit until Pin 11 has the same dc-voltage as measured in step 2.
- Step 1–4 is a coarse alignment but sufficient for AM-mode. For sound optimum in FM-mode adjust for the minimum buzz at critical test pattern (grid pattern) in the second sound channel.

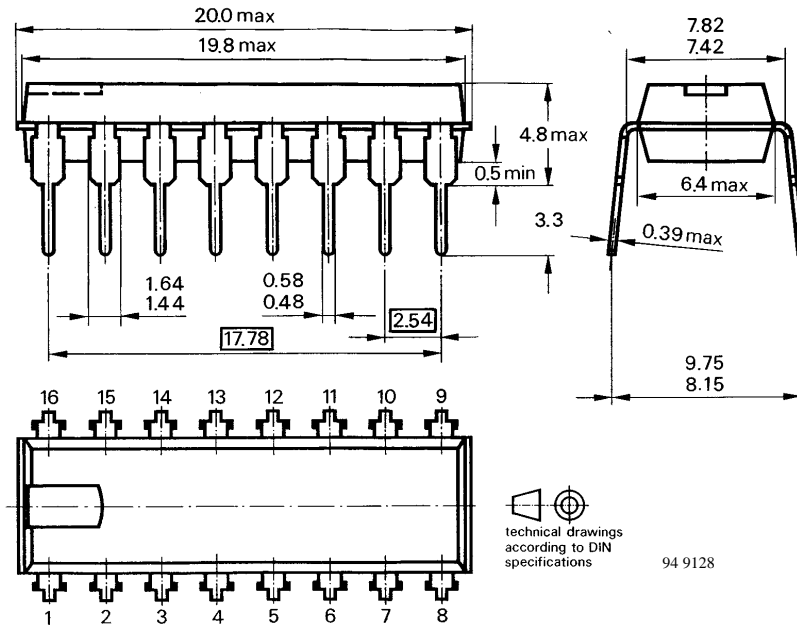
## Typical Application Circuit



93 7654

## Dimensions in mm

Package: DIP16



## 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.
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.

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

The Montreal Protocol (1987) and its London Amendments (1990) intend to 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 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
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 ozone depleting substances and do not contain such substances.

**We reserve the right to make changes to improve technical design and may do so without further notice.**

Parameters can vary in different applications. All operating parameters must be validated for each customer application by the customer. Should the buyer use TEMIC products for any unintended or unauthorized application, the buyer shall indemnify TEMIC against all claims, costs, damages, and expenses, arising out of, directly or indirectly, any claim of personal damage, injury or death associated with such unintended or unauthorized use.

TEMIC TELEFUNKEN microelectronic GmbH, P.O.B. 3535, D-74025 Heilbronn, Germany  
Telephone: 49 (0)7131 67 2831, Fax number: 49 (0)7131 67 2423