

AM Short-Wave Tuner IC for Superheterodyne Receivers

S 054 T

Bipolar circuit

The S 054 T is an AM short-wave tuner IC comprising an adjustable prestage at 45 dB gain and internal control voltage generation. Moreover, the S 054 T includes a mixer with a separate, amplitude-controlled oscillator. The oscillator drive signal to the counter is available subsequently to an emitter-follower. The input is resistant to large signals and cross modulation. The oscillator is generally designed for varicap tuning and can additionally be used with a crystal. The IC is mainly suitable for use in double and multiple superhet receivers.

- Resistance to large signals and cross modulation
- Linear mixer
- Wide control range
- Designed for varicap tuning

Type	Ordering code	Package outline
S 054 T	Q 67000-A 1472	DIP 14

Maximum ratings

Supply voltage	V_S	18	V
Junction temperature	T_j	150	°C
Thermal resistance (system-air)	$R_{th SA}$	90	K/W
Storage temperature range	T_{stg}	-40 to 125	°C

Range of operation

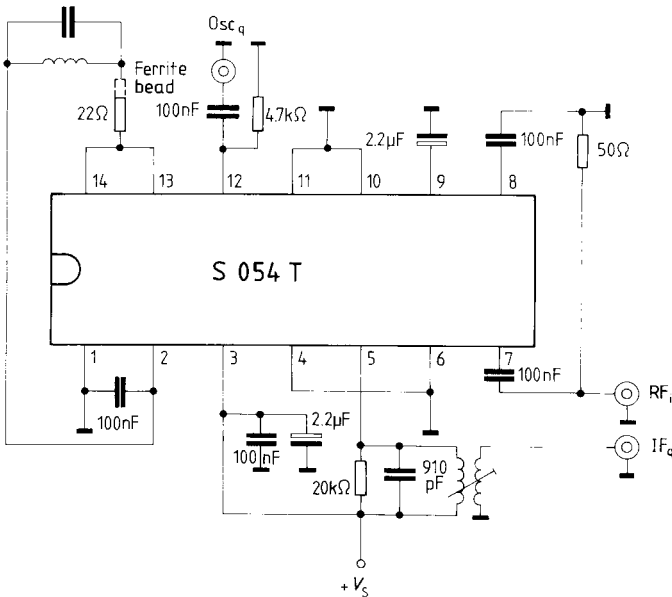
Supply voltage range	V_S	4 to 18	V
Oscillator frequency range	f_{osc}	0.1 to 32	MHz
Input frequency range	f_i	0 to 30	MHz
Output frequency range	f_q	0 to 30	MHz
Ambient temperature range	T_{amb}	-20 to 85	°C

Characteristics (see test circuit) ($V_S = 10\text{ V}$; $f_i = 1\text{ MHz}$; $T_{\text{amb}} = 25\text{ }^\circ\text{C}$)

	min	typ	max	
Current consumption		13	15	mA
Output voltage (Q_B approx. 20)		500		mV _{rms}
Range of AGC	40	45		dB
Input voltage causing overdrive		1.8		V _{pp}
Oscillator voltage	150		350	mV _{rms}
Reference voltage		3.6		V
Counter dc voltage output at $R_{12-1} = 4.7\text{ k}\Omega$		1.4		V
Short circuit output current ($R_{12-1} = 0$; $t = 10\text{ s}$)			20	mA

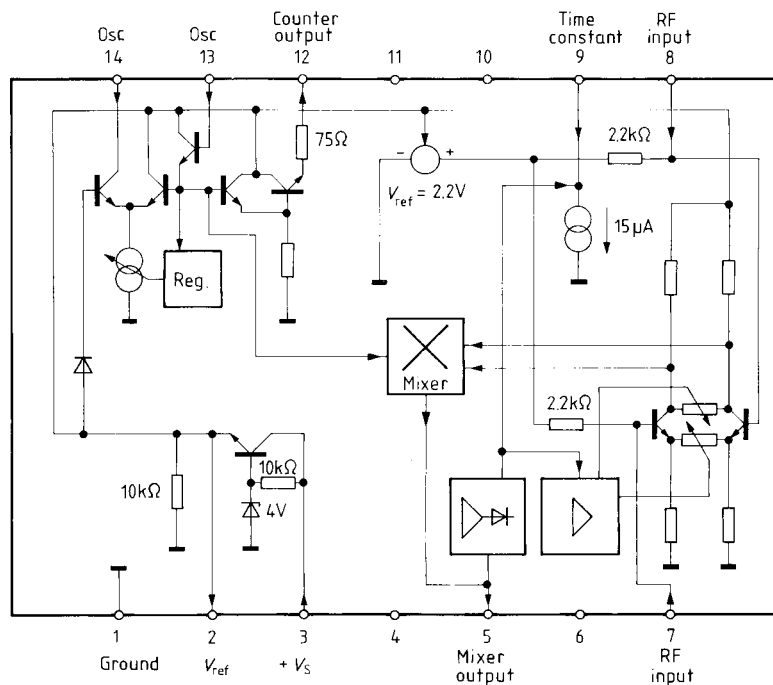
Test circuit

$V_S = 10\text{ V}$, $f = 1\text{ MHz}$
 $f_{\text{osc}} = 1.2\text{ MHz}$, $f_{\text{IF}} = 200\text{ kHz}$
 $T_{\text{amb}} = 25\text{ }^\circ\text{C}$



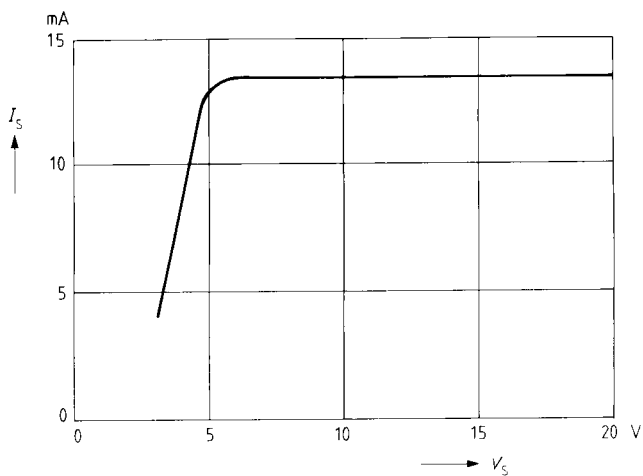
- 1) Pot core N28 A_L 250
 $n_1 : n_2 = 50 : 5$ turns $12 \times 0.04\text{ CuLS}$
 Q_O approx. 250, Q_B approx. 20

Block diagram

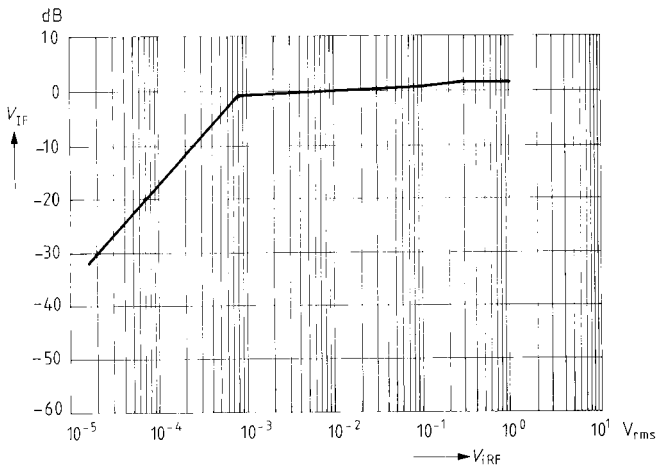


Current consumption on battery voltage

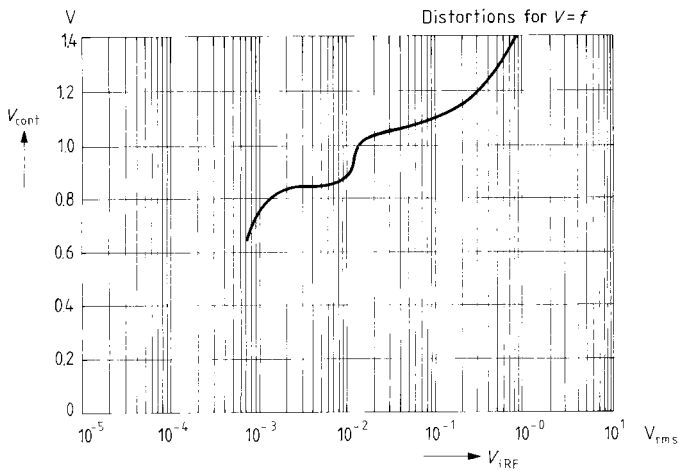
$V_{ref} (10\text{ V} = V_S) = 3.7\text{ V}$



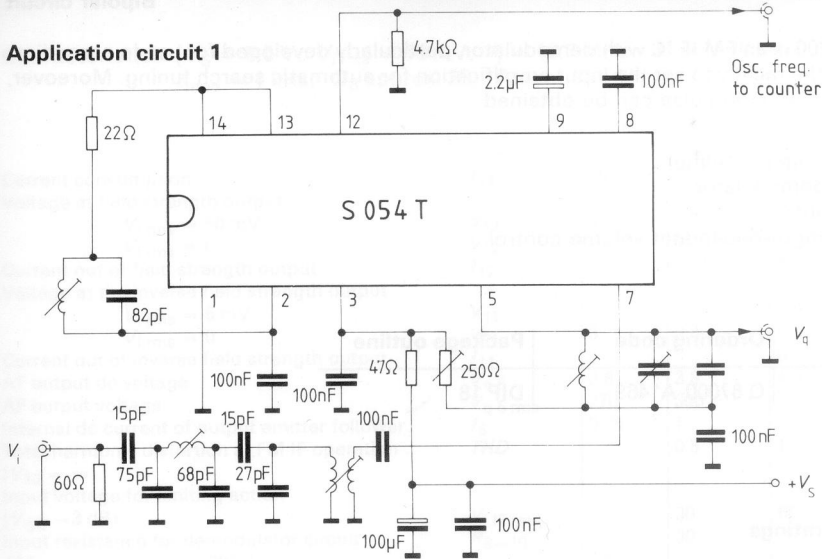
IF output on RF input signal $V_S = 10 \text{ V}$; $0 \text{ dB} \cong 225 \text{ mV}_{\text{rms}}$



Control characteristic curve $V_S = 10 \text{ V}$; $V_{\text{IF}} = 225 \text{ mV}_{\text{rms}}$



Application circuit 1



Application circuit 2

Crystal-controlled oscillator (series resonance)

