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

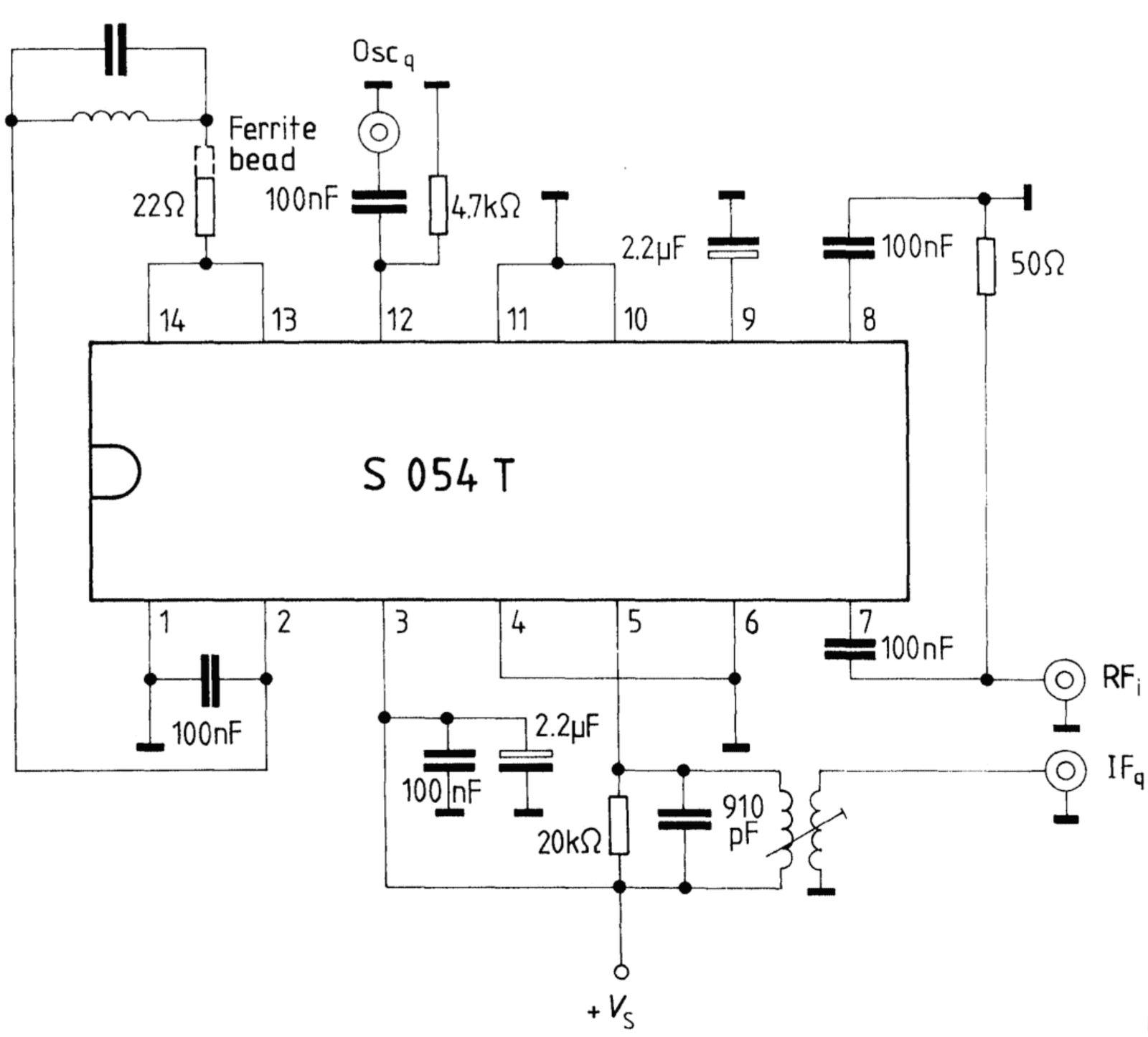
Supply voltage range	V_S	4 to 18	V
Oscillator frequency range	f_{osc}	0.1 to 32	MHz
Input frequency range	f_i	0 to 30	MHz
Output frequency range	f_q	0 to 30	MHz
Ambient temperature range	T_{amb}	−20 to 85	°C

Characteristics (see test circuit) (V_S = 10 V; f_i = 1 MHz; T_{amb} = 25 °C)

		min	typ	max	
Current consumption	I_3		13	15	mA
Output voltage (Q_B approx. 20)	V_5		500		mV_{rms}
Range of AGC	ΔG_v	40	45		dB
Input voltage causing overdrive	V_7		1.8		V_{pp}
Oscillator voltage	V_{12}	150		350	mV_{rms}
Reference voltage	V_2		3.6		V
Counter dc voltage output at $R_{12\text{-}1}$ = 4.7 kΩ	V_{12}		1.4		V
Short circuit output current ($R_{12\text{-}1}$ = 0; t = 10 s)	I_{q12}			20	mA

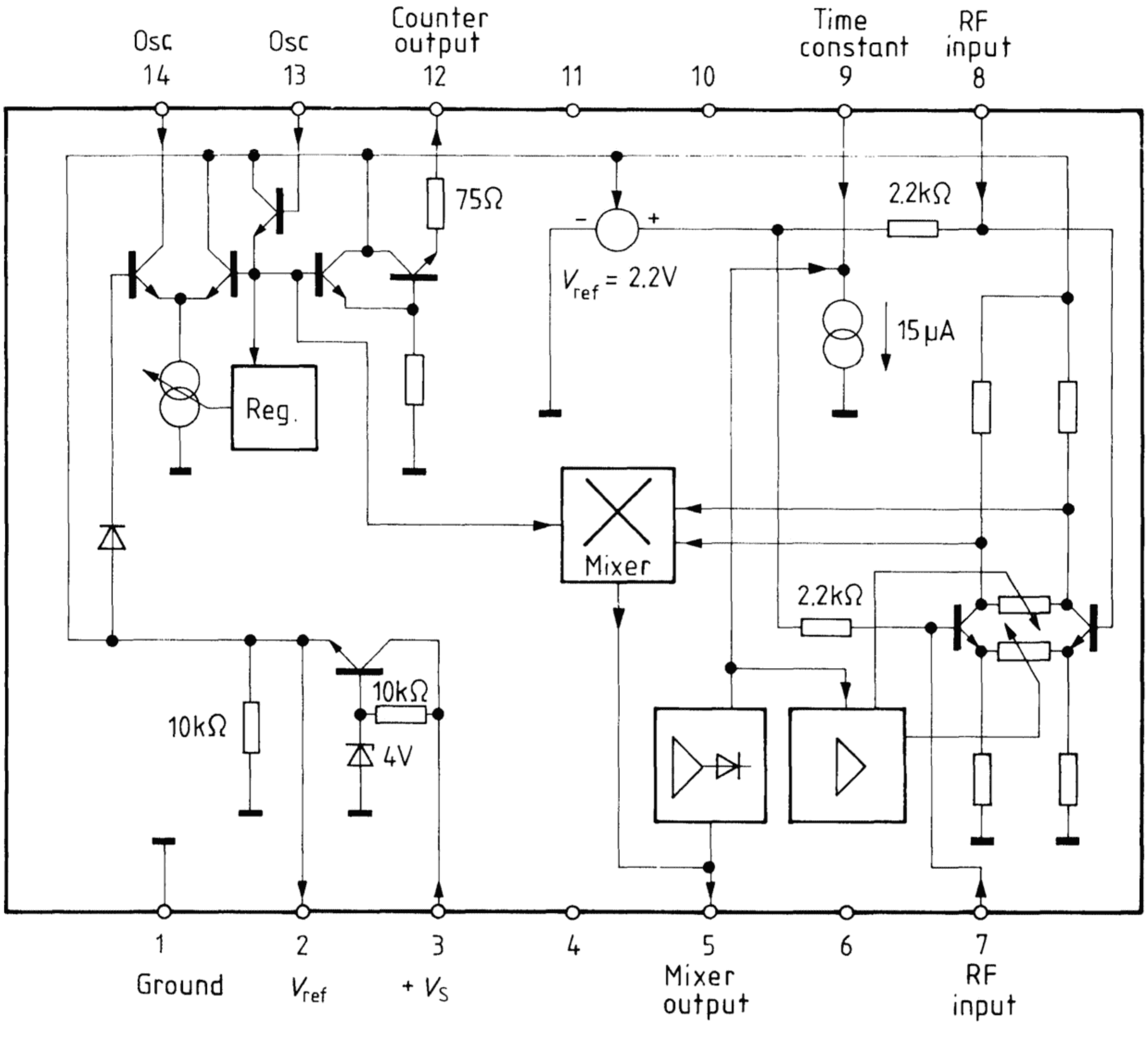
Test circuit

V_S = 10 V, f = 1 MHz
f_{osc} = 1.2 MHz, f_{IF} = 200 kHz
T_{amb} = 25 °C



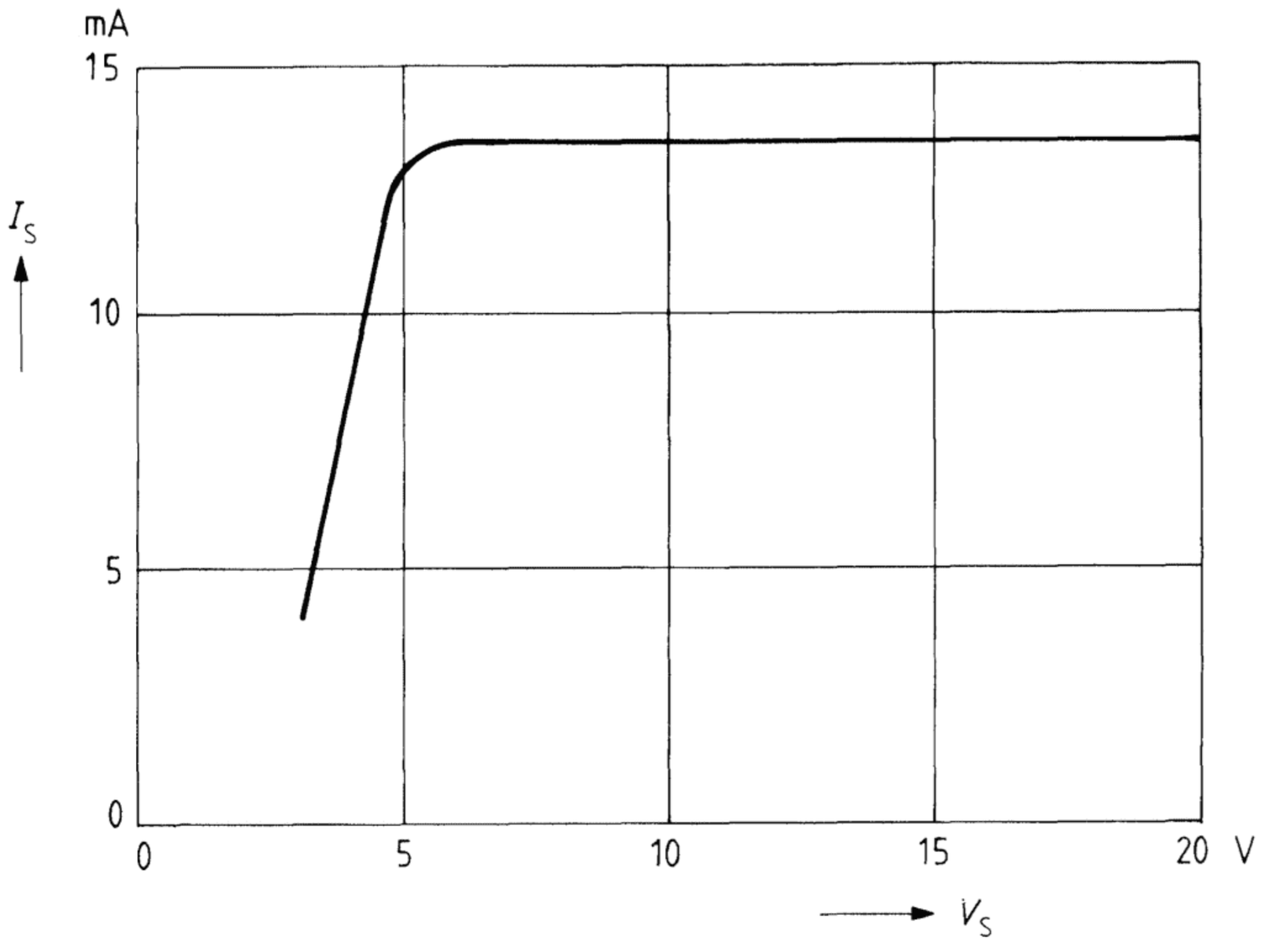
1) Pot core N28 A_L 250
$n_1 : n_2$ = 50 : 5 turns 12 × 0.04 CuLS
Q_O approx. 250, Q_B approx. 20

Block diagram

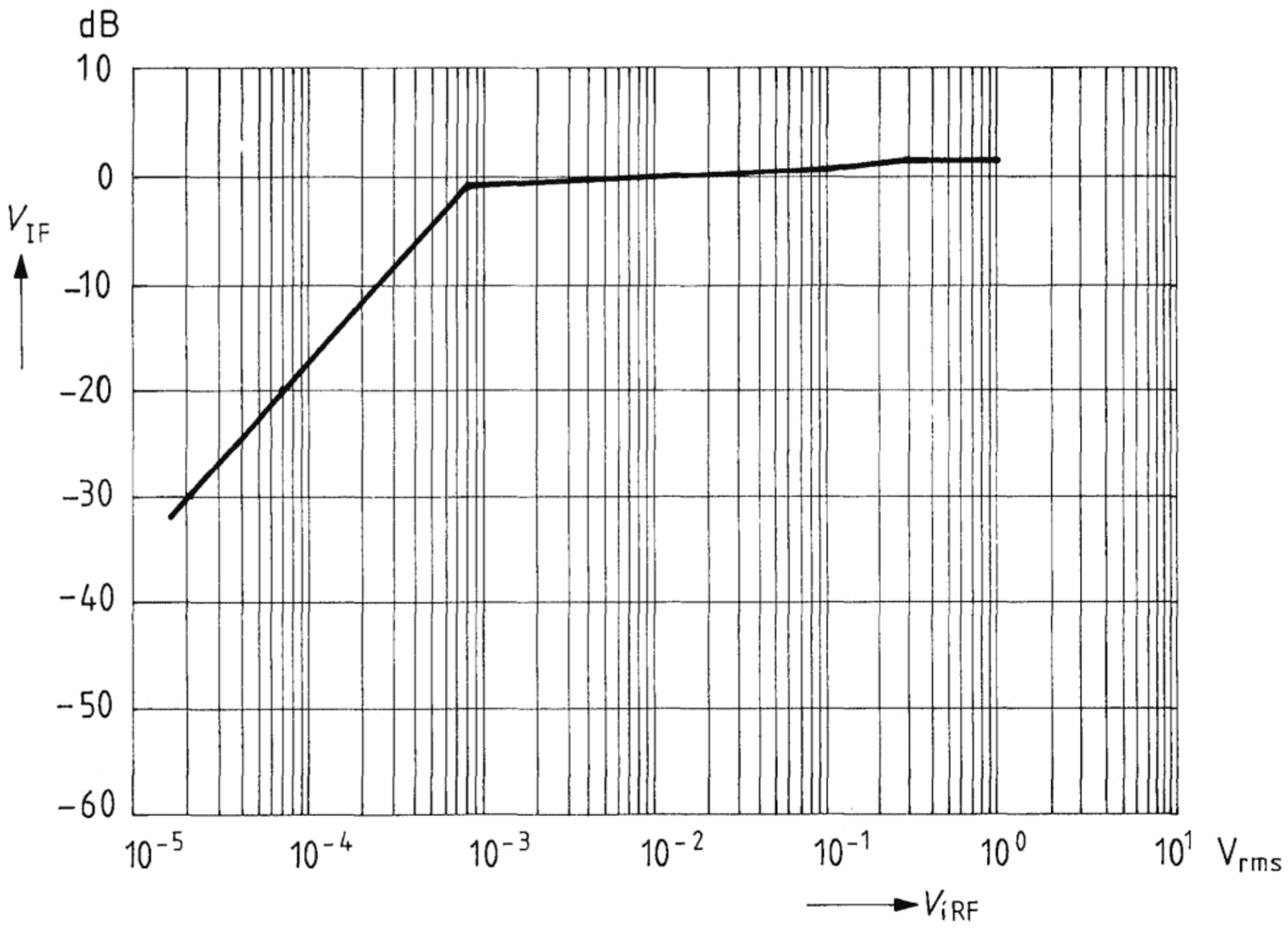


Current consumption on battery voltage

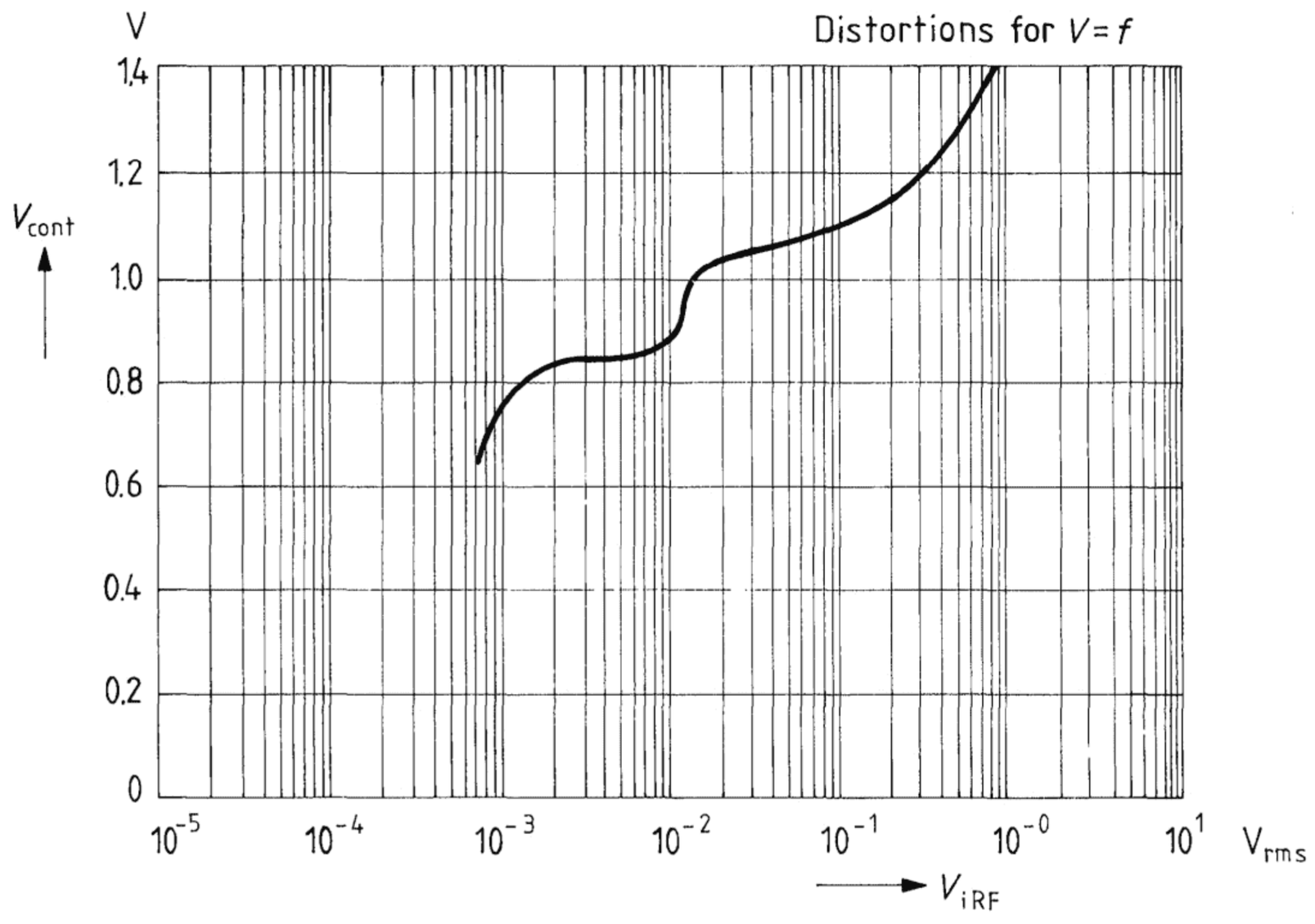
V_{ref} (10 V = V_S) = 3.7 V



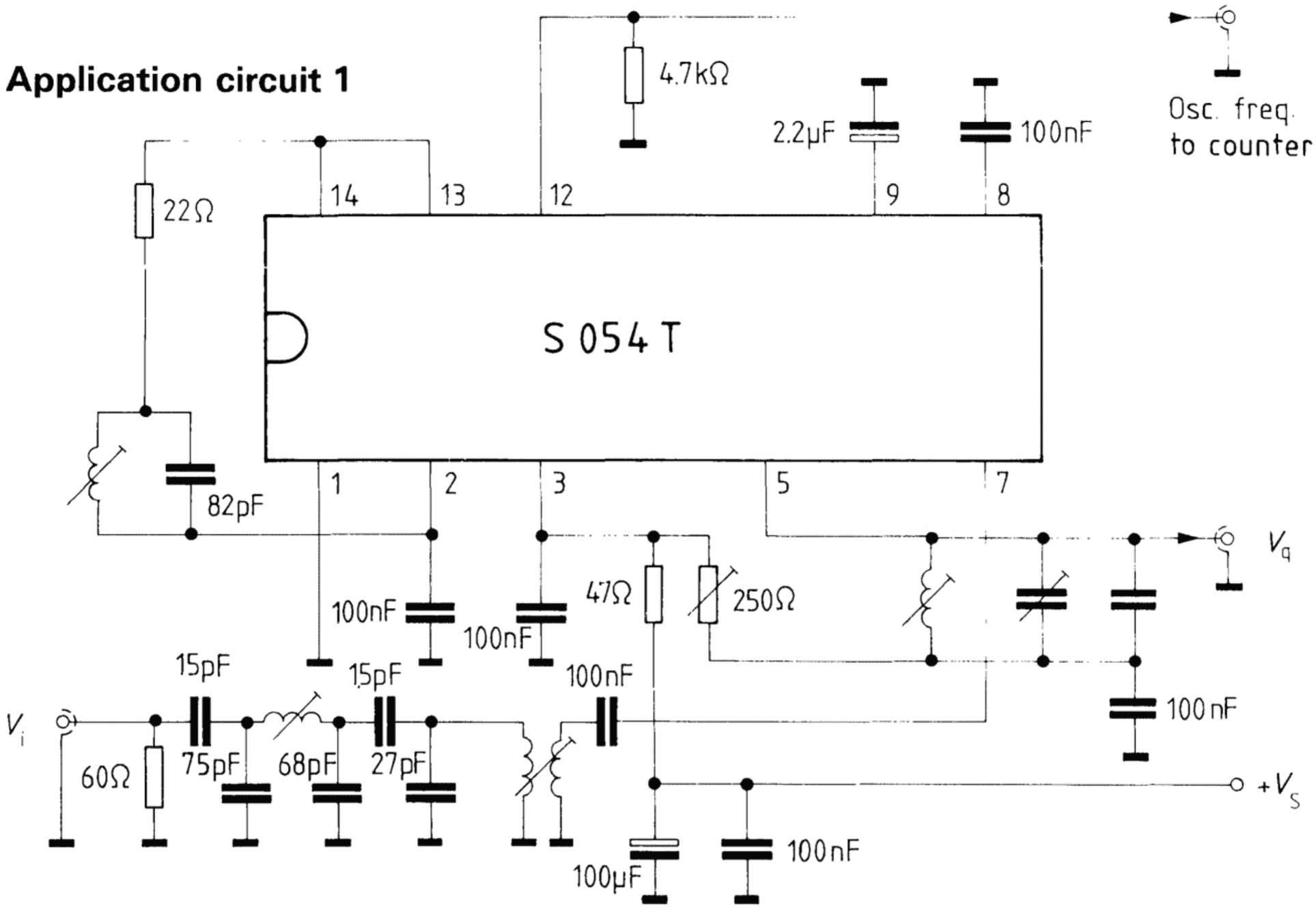
IF output on RF input signal V_S = 10 V; 0 dB ≙ 225 mV_{rms}



Control characteristic curve V_S = 10 V; V_{IF} = 225 mV_{rms}



Application circuit 1



Application circuit 2

Crystal-controlled oscillator (series resonance)