



# VHF Mixer/Oscillator Circuit

## TDA5030A

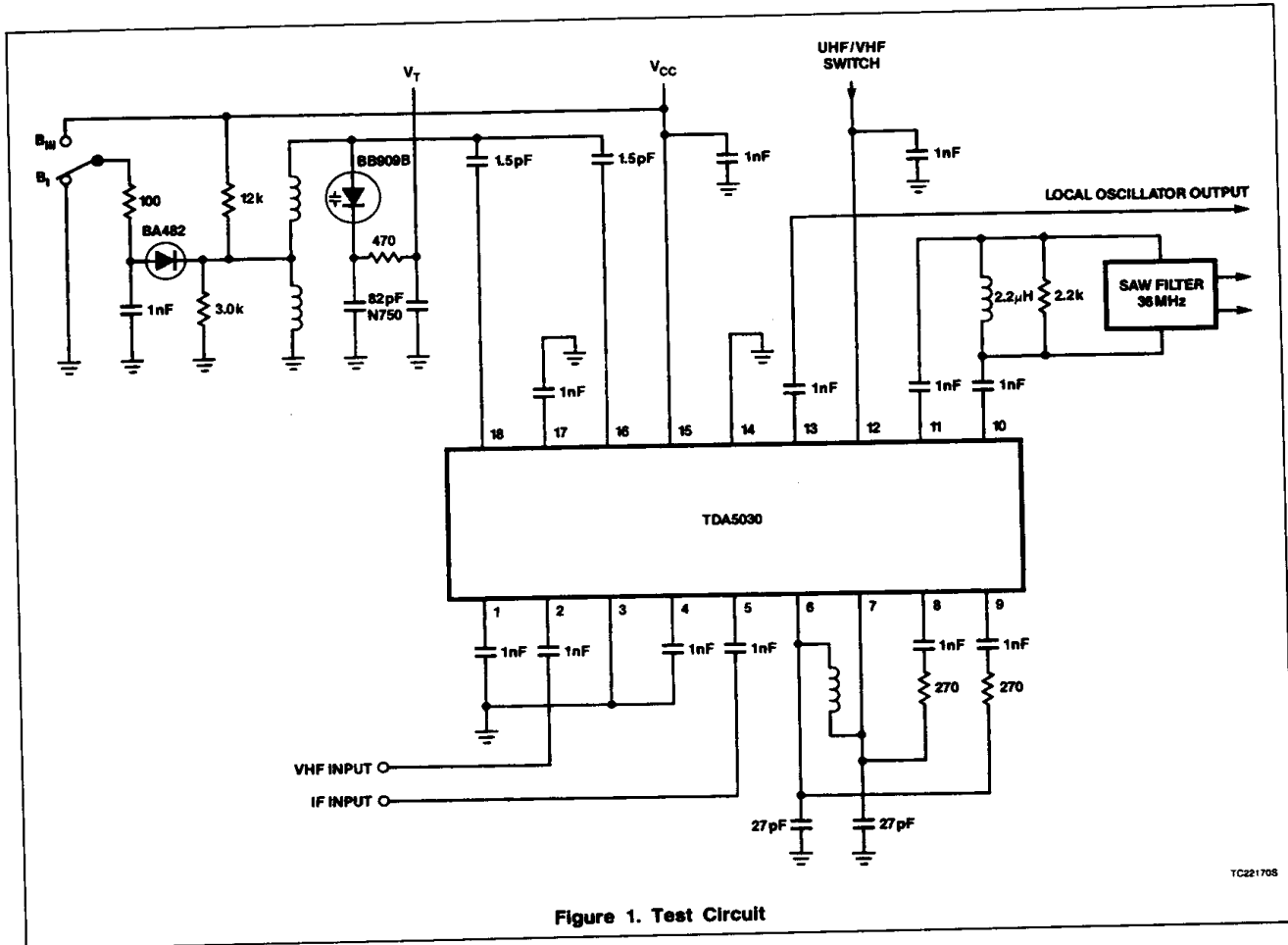


Figure 1. Test Circuit

### ABSOLUTE MAXIMUM RATINGS

SYMBOL	PARAMETER	RATING	UNIT
V <sub>CC</sub>	Supply voltage (Pin 15)	14	V
V <sub>I</sub>	Input voltage (Pin 1, 2, 4, and 5)	0 to 5	V
V <sub>I2</sub>	Switching voltage (Pin 12)	0 to V <sub>CC</sub> +0.3	V
-I <sub>10, 11, 13</sub>	Output currents	10	mA
t <sub>SS</sub>	Storage-circuit time on outputs (Pin 10 and 11)	10	s
T <sub>STG</sub>	Storage temperature range	-65 to +150	°C
T <sub>A</sub>	Operating ambient temperature range	-25 to +85	°C
T <sub>J</sub>	Junction temperature	+125	°C
θ <sub>JA</sub>	Thermal resistance from junction to ambient	+55	°C/W

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**DC AND AC ELECTRICAL CHARACTERISTICS** Measured in circuit of Figure 1;  $V_{CC} = 12V$ ;  $T_A = 25^\circ C$ , unless otherwise specified.

SYMBOL	PARAMETER	LIMITS			UNIT
		Min	Typ	Max	
<b>Supply</b>					
$V_{CC}$	Supply voltage	10		13.2	V
$I_{CC}$	Supply current		42	55	mA
$V_{12}$	Switching voltage VHF	0		2.5	V
$V_{12}$	Switching voltage UHF	9.5		$V_{CC} + 0.3$	V
$I_{12}$	Switching current UHF			0.7	mA
<b>VHF mixer (including IF amplifier)</b>					
$f_R$	Frequency range	50		470	MHz
NF	Noise figure (Pin 2) 50MHz 225MHz 300MHz		7.5	9	dB
			9	10	dB
			10	12	dB
G	Optimum source admittance (Pin 2) 50MHz 225MHz 300MHz		0.5		ms
			1.1		ms
			1.2		ms
$G_I$	Input conductance (Pin 2) 50MHz 225MHz 300MHz		0.23		ms
			0.5		ms
			0.67		ms
$C_I$	Input capacitance (Pin 2) 50MHz		2.5		pF
$V_{2-3}$	Input voltage for 1% cross-modulation (in channel); $R_P > 1k\Omega$ ; tuned circuit with $C_P = 22pF$ ; $f_{RES} = 36MHz$	97	99		dB $\mu$ V
$V_{2-14}$	Input voltage for 10kHz pulling (in channel) at $< 300MHz$	100			dB $\mu$ V
$A_V$	Voltage gain	22.5	24.5	26.5	dB
<b>UHF preamplifier (including IF amplifier)</b>					
$G_I$	Input conductance (Pin 5)		0.3		ms
$C_I$	Input capacitance (Pin 5)		3.0		pF
NF	Noise figure		5	6	dB
$V_{5-14}$	Input voltage for 1% cross-modulation (in channel)	88	90		dB $\mu$ V
$A_V$	Voltage gain	31.5	33.5	35.5	dB
$G_5$	Optimum source admittance		3.3		ms

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**DC AND AC ELECTRICAL CHARACTERISTICS (Continued)** Measured in circuit of Figure 1;  $V_{CC} = 12V$ ;  $T_A = 25^\circ C$ , unless otherwise specified.

SYMBOL	PARAMETER	LIMITS			UNIT
		Min	Typ	Max	
<b>VHF mixer</b>					
$Y_{C2-6,7}$	Conversion transadmittance		5.7		ms
$Z_O$	Output impedance		1.6		$k\Omega$
<b>VHF oscillator</b>					
$f_R$	Frequency range	70		520	MHz
$\Delta f$	Frequency shift $\Delta V_{CC} = 10\%$ ; 70 to 330MHz			200	kHz
$\Delta f$	Frequency drift $\Delta T = 15k$ ; 70 to 330MHz			250	kHz
$\Delta f$	Frequency drift from 5sec to 15min after switching on			200	kHz
<b>SAW filter IF amplifier</b>					
$Z_{8,9}$	Input impedance $Z_{10,11} = 2k\Omega$ ; $f = 36MHz$		$340 + j100$		$\Omega$
$Z_{8,9-10,11}$	Transimpedance		2.2		$k\Omega$
$Z_{10,11}$	Output impedance $Z_{8,9} = 1.6k\Omega$ ; $f = 36MHz$		$50 + j40$		$\Omega$
<b>VHF local oscillator buffer stage</b>					
$V_{13}$ $V_{13}$	Output voltage $R_L = 75\Omega$ ; $f < 100MHz$ $R_L = 75\Omega$ ; $f > 100MHz$	14 10	20 20		mV mV
$Z_{13}$	Output impedance $f = 100MHz$		90		$\Omega$
$\frac{RF}{(RF+LO)}$	RF signal on LO output; $R_L = 50\Omega$ ; $V_I = 1V$ ; $f \leq 225MHz$			10	dB