

M54456P

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1/64 HIGH SPEED DIVIDER WITH ECL OUTPUT**DESCRIPTION**

The M54456P is a semiconductor integrated circuit consisting of a built-in 1/64 high-speed frequency divider with an ECL circuit configuration.

FEATURES

- Ultra-high-speed operation ($f_{max} = 1.2\text{GHz}$)
- Operation at low input amplitude (300mV_{p-p} minimum input amplitude)
- ECL level output
- Two inputs (UHF and VHF)
- TTL level compatible band switching input

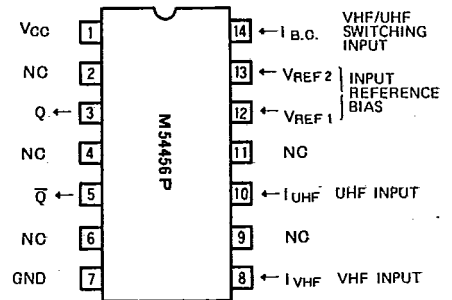
APPLICATIONS

Prescalers for PLL synthesizer TV tuners; digital equipment for consumer and industrial applications

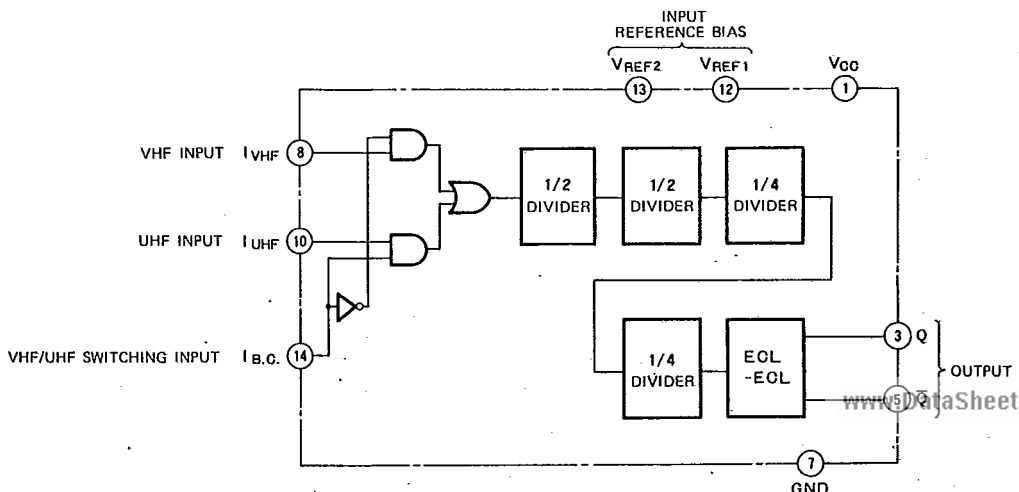
FUNCTION

This 1/64 frequency divider is based on an ECL circuit configuration. When a frequency between 450MHz and 950MHz is applied to the UHF input (I_{UHF}) pin, a 1/64-divided frequency output is obtained. The same output is obtained when a frequency between 80MHz and 350MHz is applied to the VHF input (I_{VHF}) pin. The outputs (Q , \bar{Q}) conform to ECL levels.

A wide-band operating system should be used when the UHF input pin is supplied with frequencies ranging from 80MHz to 950MHz.

PIN CONFIGURATION

When the band switching input (I_{B.C.}) pin is high or open, the UHF input (I_{UHF}) pin can be used and when it is low the VHF input (I_{VHF}) pin can be used. Do not supply signals simultaneously to the UHF input (I_{UHF}) and VHF input (I_{VHF}) pins.

BLOCK DIAGRAM

ABSOLUTE MAXIMUM RATINGS ($T_a = -10 \sim +75^\circ\text{C}$, unless otherwise noted)

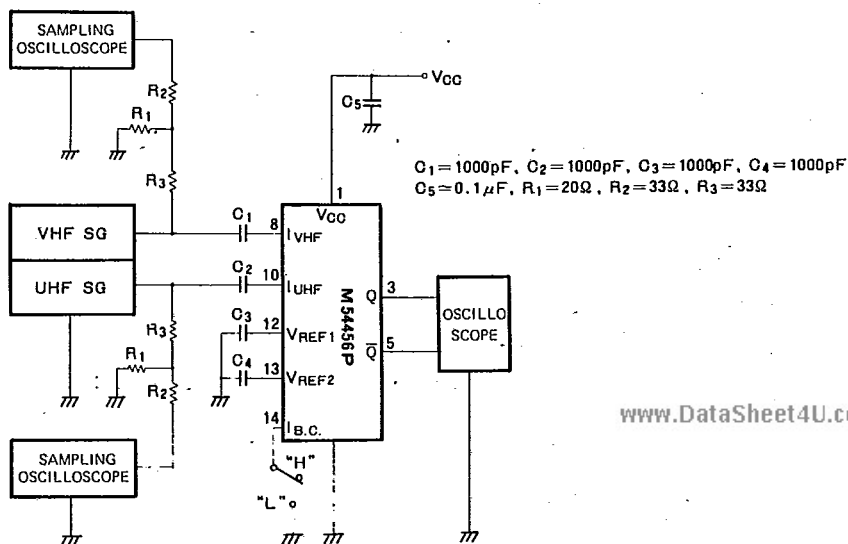
Symbol	Parameter	Condition	Limits	Unit
V_{CC}	Supply voltage		9	V
V_I	Input voltage		2.5	V _{p-p}
$V_{B,C}$	Band switching input voltage		-0.5 ~ +7.2	V
I_O	Output current		-30 ~ +30	mA
T_{opr}	Operating temperature		-10 ~ +75	°C
T_{stg}	Storage temperature		-55 ~ +125	°C

RECOMMENDED OPERATING CONDITIONS ($T_a = -10 \sim +75^\circ\text{C}$, unless otherwise noted)

Symbol	Parameter	Limits			Unit
		Min	Typ	Max	
V_{CC}	Supply voltage	6.1	6.8	7.5	V
I_{OL}	Low-level output current			5	mA

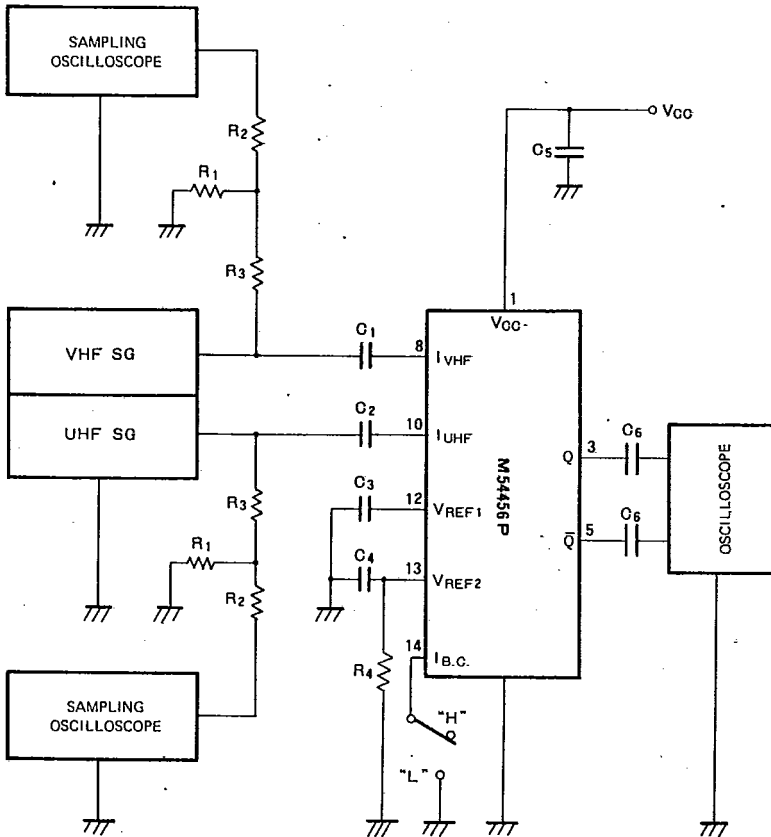
ELECTRICAL CHARACTERISTICS ($T_a = -10 \sim +75^\circ\text{C}$ unless otherwise noted)

Symbol	Parameter	Test conditions	Limits			Unit
			Min	Typ	Max	
I_{CO}	Circuit current	$V_{CC}=6.8\text{V}$		68		mA
V_O	Output voltage	$V_{CC}=6.8\text{V}$		0.8		V _{p-p}
V_{BCH}	High-level band switching 2 input voltage		2.5			V
V_{BCL}	Low-level band switching 2 input voltage				0.4	V
V_S	VHF input sensitivity	$V_{CC}=6.8\text{V}$, $T_a=25^\circ\text{C}$ $f_{IN}=80\sim 350\text{MHz}$			300	mV _{p-p}
U_{S1}	UHF input sensitivity 1	$V_{CC}=6.8\text{V}$, $T_a=25^\circ\text{C}$ $f_{IN}=450\sim 950\text{MHz}$			300	mV _{p-p}
U_{S2}	UHF input sensitivity 2	$V_{CC}=6.8\text{V}$, $T_a=25^\circ\text{C}$ $f_{IN}=80\sim 350\text{MHz}$			300	mV _{p-p}
V_{max}	VHF maximum input level	$f_{IN}=80\sim 350\text{MHz}$	1			V _{p-p}
U_{max}	UHF maximum input level	$f_{IN}=450\sim 950\text{MHz}$	1			V _{p-p}

 f_{max} TEST CIRCUIT

APPLICATION EXAMPLE

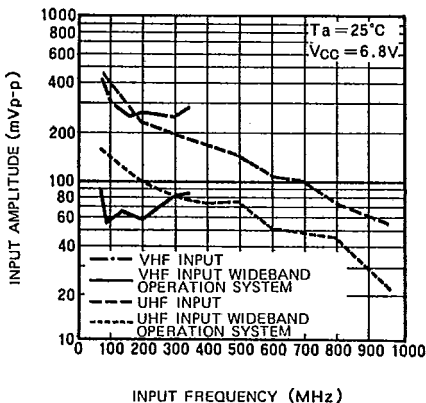
For wide-band operation



Operation across an even wider frequency range is enabled for the UHF input by setting R_4 between V_{REF2} and GND with $C_1 = 1000\text{pF}$, $C_2 = 1000\text{pF}$, $C_3 = 1000\text{pF}$, $C_4 = 1000\text{pF}$, $C_5 = 0.1\mu\text{F}$, $C_6 = 0.1\mu\text{F}$, $R_1 = 20\Omega$, $R_2 = 33\Omega$, $R_3 = 33\Omega$, $R_4 = 36\text{k}\Omega$.

TYPICAL CHARACTERISTICS

MINIMUM INPUT AMPLITUDE VS INPUT FREQUENCY



MINIMUM INPUT AMPLITUDE VS SUPPLY VOLTAGE

