

M54456P

MITSUBISHI (DGTL LOGIC) 3LE D 6249827 0014423 7 MITS

1/64 HIGH SPEED DIVIDER WITH ECL OUTPUT

T-45-19-13

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

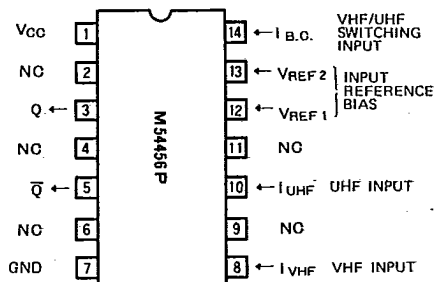
Prescalers for PLL synthesizer TV tuners; digital equipment for consumer and industrial applications

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

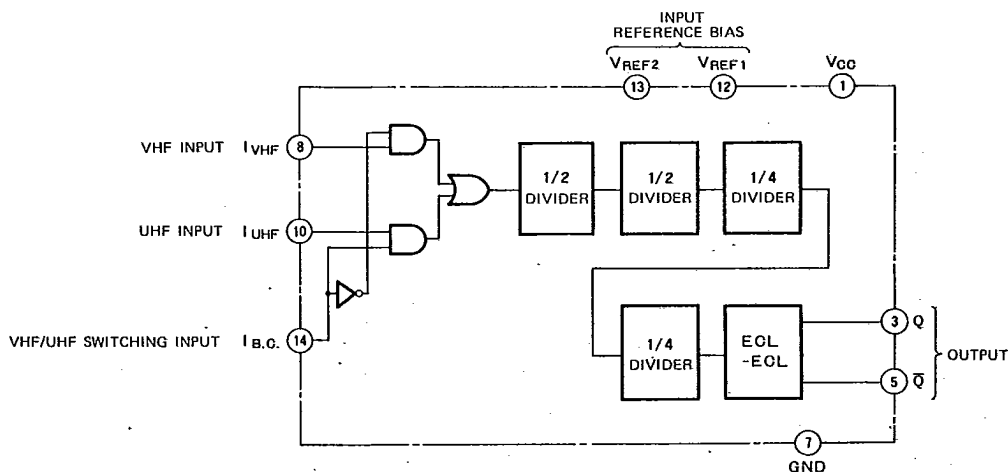


Outline 14P4

NC: NO CONNECTION

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



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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		$-0.5 \sim +7.2$	V
I_O	Output current		$-30 \sim +30$	mA
T_{opr}	Operating temperature		$-10 \sim +75$	$^\circ\text{C}$
T_{stg}	Storage temperature		$-55 \sim +125$	$^\circ\text{C}$

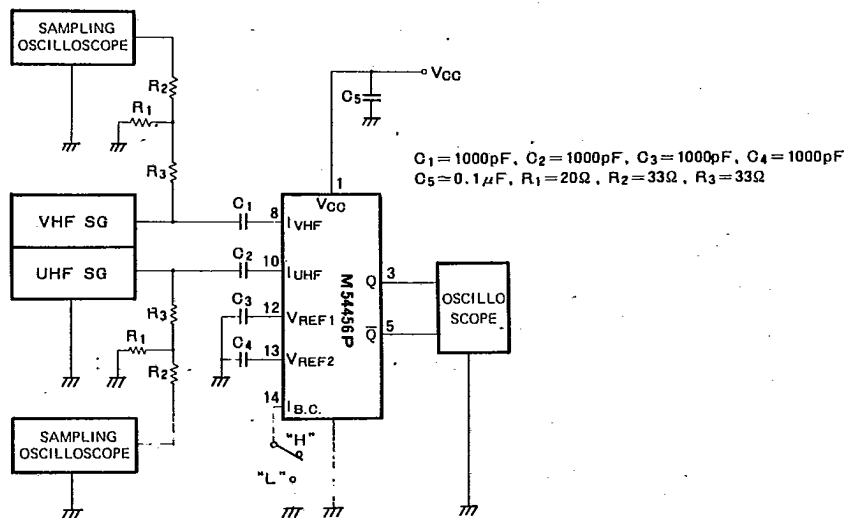
RECOMMENDED OPERATING CONDITIONS ($T_a = -10 \sim +75^\circ\text{C}$, unless otherwise noted)

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_{BOH}	High-level band switching 2 input voltage		2.5			V
V_{BOL}	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



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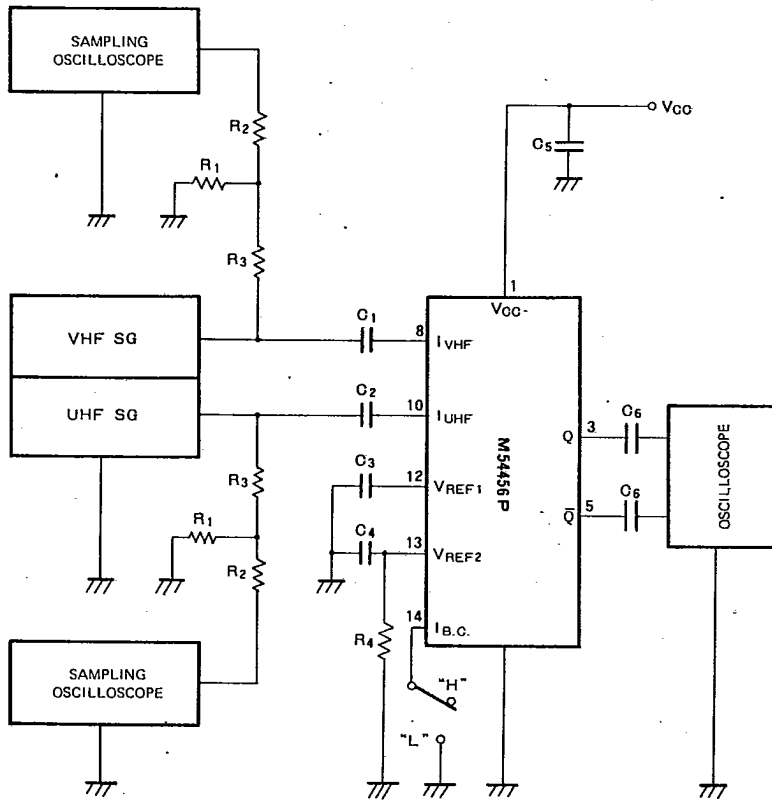
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APPLICATION EXAMPLE

For wide-band operation



Operation across an even wider frequency range is enabled for the UHF input by setting R4 between VREF2 and GND with C1 = 1000pF, C2 = 1000pF, C3 = 1000pF, C4 = 1000pF, C5 = 0.1μF, C6 = 0.1μF, R1 = 20Ω, R2 = 33Ω, R3 = 33Ω, R4 = 36kΩ

TYPICAL CHARACTERISTICS

