

MITSUBISHI (DGTL LOGIC)

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1/64 HIGH-SPEED DIVIDER WITH TTL OUTPUT

T-45-19-13

DESCRIPTION

The M54452P is a semiconductor integrated circuit consisting of a 1/64 high-speed frequency divider with an ECL circuit configuration.

FEATURES

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

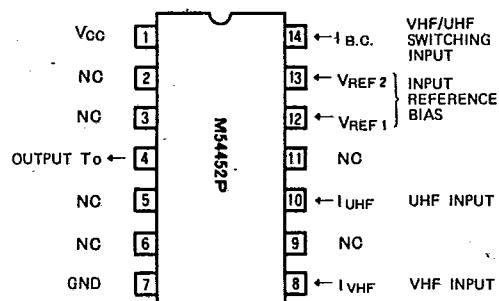
APPLICATIONS

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 output (T_0) conforms to the TTL level.

A wide-band operating system should be used when the

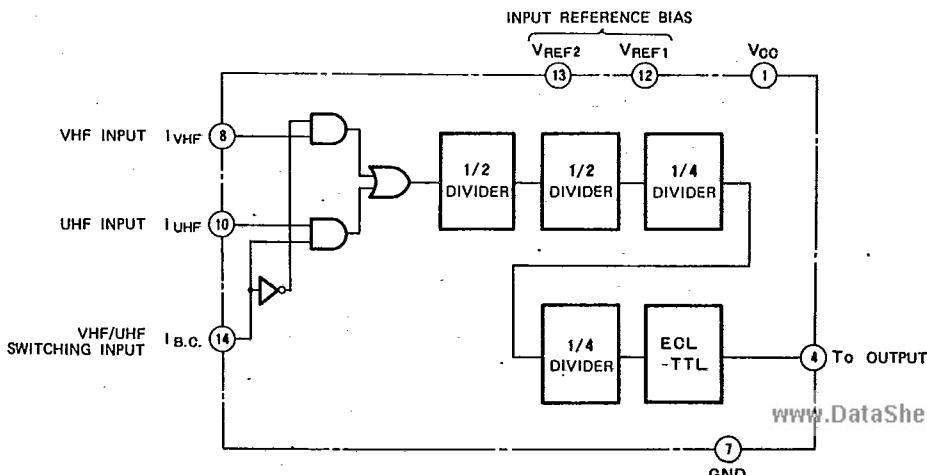
PIN CONFIGURATION (TOP VIEW)

NC: NO CONNECTED

Package Outline 14P4

UHF input pin is supplied with frequencies ranging from 80MHz to 950MHz.

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 (Ta = -10 ~ +75°C, unless otherwise noted)

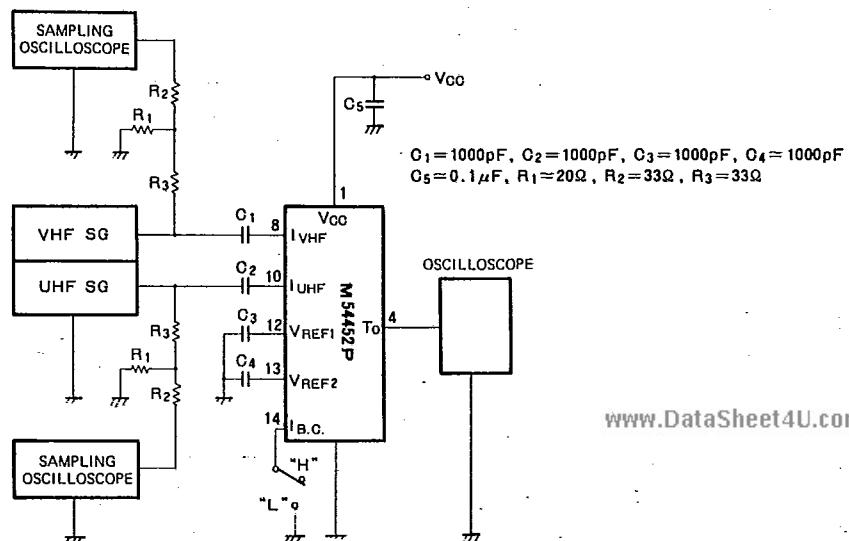
Symbol	Parameter	Conditions	Limits	Unit
V _{CO}	Supply voltage		9	V
V _I	Input voltage		2.5	V _{P-P}
V _{B,C}	Band switching input voltage		-0.5 ~ +7.2	V
I _O	Output current		-30 ~ +30	mA
T _{OPR}	Operating temperature		-10 ~ +75	°C
T _{STG}	Storage temperature		-55 ~ +125	°C

RECOMMENDED OPERATING CONDITIONS (Ta = -10 ~ +75°C, unless otherwise noted)

Symbol	Parameter	Limits			Unit
		Min	Typ	Max	
V _{CO}	Supply voltage	6.1	6.8	7.5	V
I _{OL}	"L" Output current			5	mA

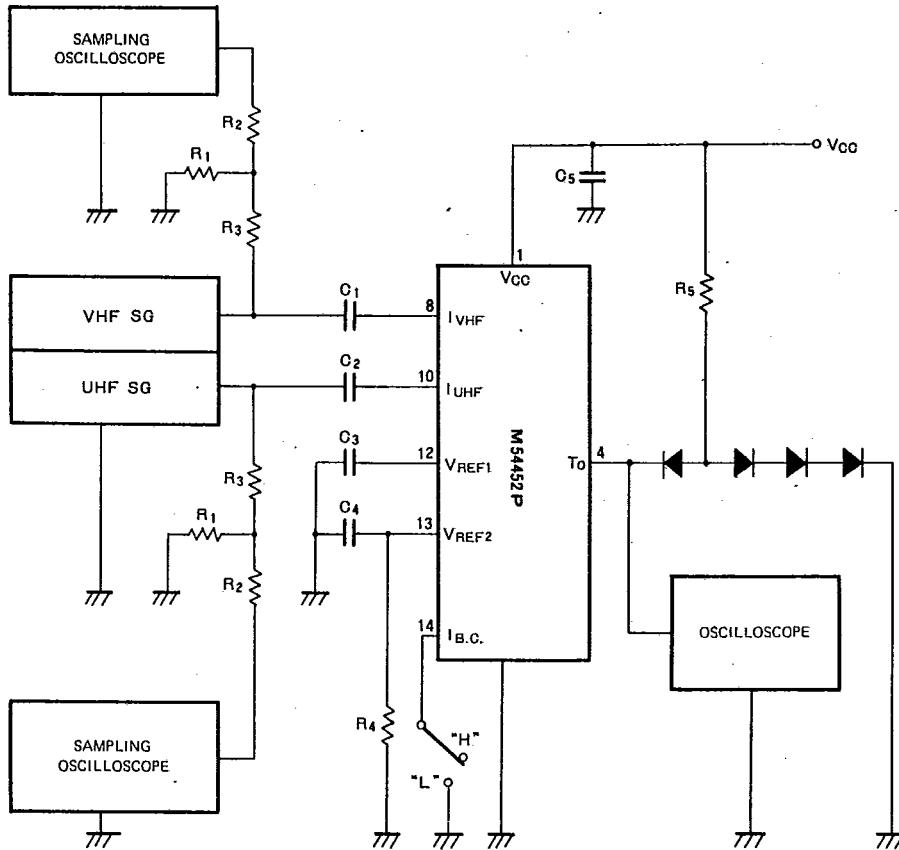
ELECTRICAL CHARACTERISTICS (Ta = -10 ~ +75°C unless otherwise noted)

Symbol	Parameter	Test Conditions	Limits			Unit
			Min	Typ	Max	
I _{OC}	Circuit current	V _{CO} =6.8V		68		mA
V _{OH}	High-level output voltage	V _{CO} =6.8V, I _{OL} =-0.2mA	2.5	3.5		V
V _{OL}	Low-level output voltage	V _{CO} =6.8V, I _{OL} =5mA			0.4	V
V _{BCH}	High-level band switching input voltage			2.5		V
V _{BCL}	Low-level band switching input voltage				0.4	V
V _S	VHF Input sensitivity	V _{CO} =6.8V, Ta=25°C f _{IN} =80~350MHz			300	mV _{P-P}
U _{S1}	UHF Input sensitivity 1	V _{CO} =6.8V, Ta=25°C f _{IN} =450~950MHz			300	mV _{P-P}
U _{S2}	UHF Input sensitivity 2	V _{CO} =6.8V, Ta=25°C f _{IN} =80~350MHz			300	mV _{P-P}
V _{MAX}	VHF Maximum input level	f _{IN} =80~350MHz		1		V _{P-P}
U _{MAX}	UHF Maximum input level	f _{IN} =450~950MHz		1		V _{P-P}

f_{MAX} TEST CIRCUIT

APPLICATION EXAMPLE

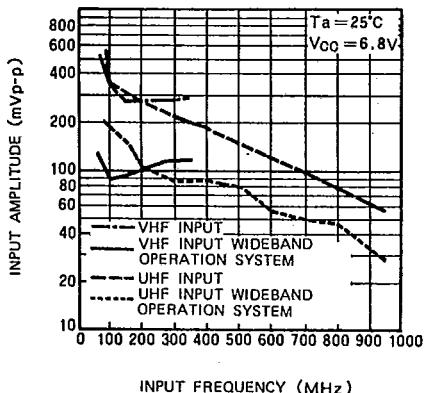
For wide-band operation



Operation across an even wider frequency range is enabled for the UHF input by setting R₄ between V_{REF2} and GND with C₁ = 1000pF, C₂ = 1000pF, C₃ = 1000pF, C₄ = 1000pF, C₅ = 0.1μF, R₁ = 20Ω, R₂ = 33Ω, R₃ = 33Ω, R₄ = 36kΩ, R₅ = 1kΩ.

TYPICAL CHARACTERISTICS

MINIMUM INPUT AMPLITUDE VS INPUT FREQUENCY



MINIMUM INPUT AMPLITUDE VS SUPPLY VOLTAGE

