M54452P

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.

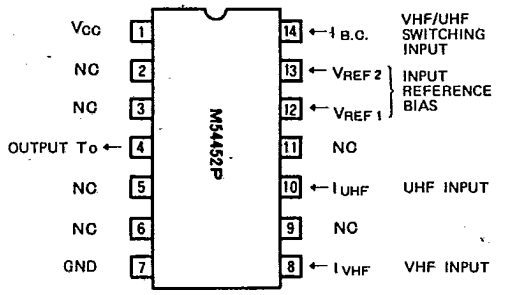
FEATURES

- 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

PIN CONFIGURATION (TOP VIEW)



NC: NO CONNECTED

Package Outline 14P4

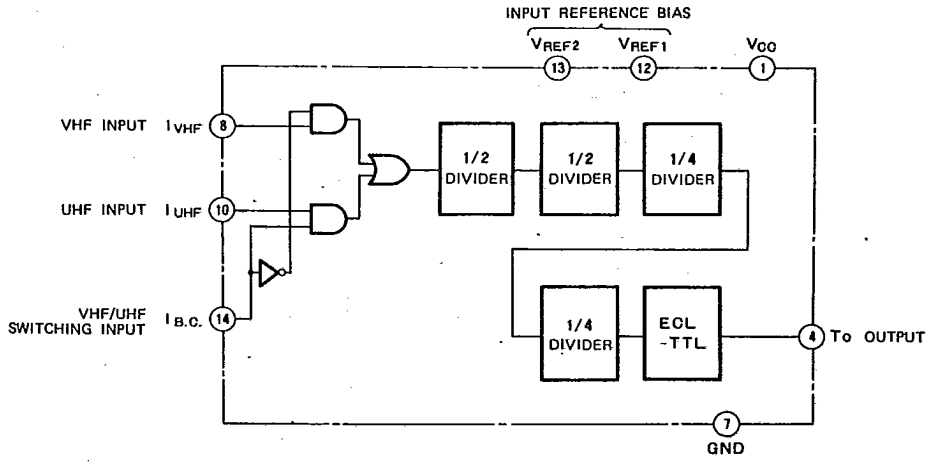
FUNCTION

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_O) conforms to the TTL level.

A wide-band operating system should be used when the 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



MITSUBISHI ELECTRIC

ABSOLUTE MAXIMUM RATINGS (Ta=−10~+75°C, unless otherwise noted)

Symbol	Parameter	Conditions	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
Topr	Operating temperature		−10~+75	°C
Tstg	Storage temperature		−55~+125	°C

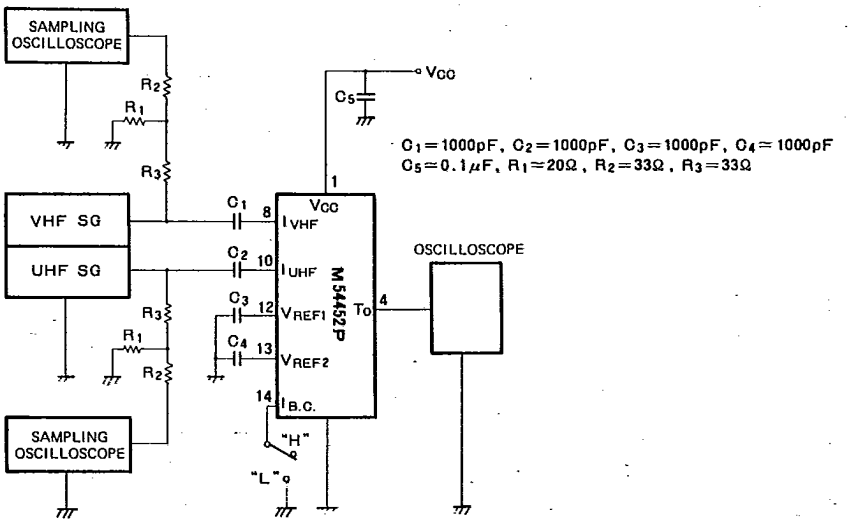
RECOMMENDED OPERATING CONDITIONS (Ta=−10~+75°C, unless otherwise noted)

Symbol	Parameter	Limits			Unit
		Min	Typ	Max	
V_{CC}	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)

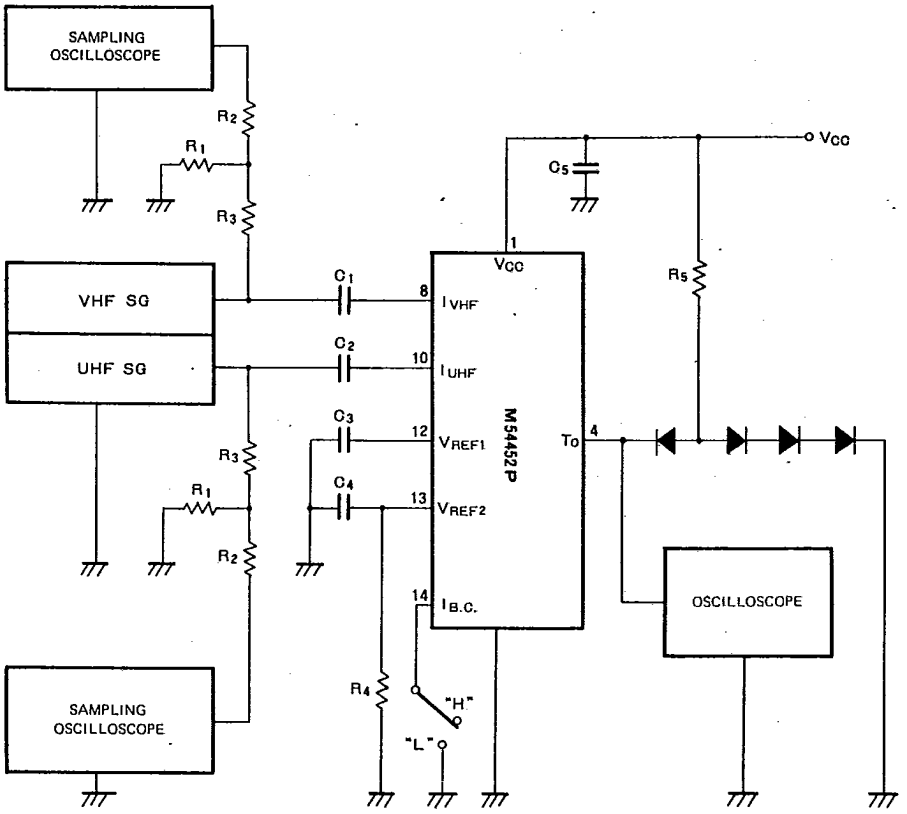
Symbol	Parameter	Test Conditions	Limits			Unit
			Min	Typ	Max	
I_{CC}	Circuit current	V_{CC}=6.8V		68		mA
V_{OH}	High-level output voltage	V_{CC}=6.8V, I_{OH}=−0.2mA	2.5	3.5		V
V_{OL}	Low-level output voltage	V_{CC}=6.8V, I_{OL}=5mA			0.4	V
V_{BCH}	High-level band switching input voltage		2.5			V
V_{BCL}	Low-level band switching input voltage				0.4	V
V_S	VHF Input sensitivity	V_{CC}=6.8V, Ta=25°C f_{IN}=80~350MHz			300	mV_{P-P}
U_{S1}	UHF Input sensitivity 1	V_{CC}=6.8V, Ta=25°C f_{IN}=450~950MHz			300	mV_{P-P}
U_{S2}	UHF Input sensitivity 2	V_{CC}=6.8V, Ta=25°C f_{IN}=80~350MHz			300	mV_{P-P}
Vmax	VHF Maximum input level	f_{IN}=80~350MHz	1			V_{P-P}
Umax	UHF Maximum input level	f_{IN}=450~950MHz	1			V_{P-P}

f_{max} TEST CIRCUIT



APPLICATION EXAMPLE

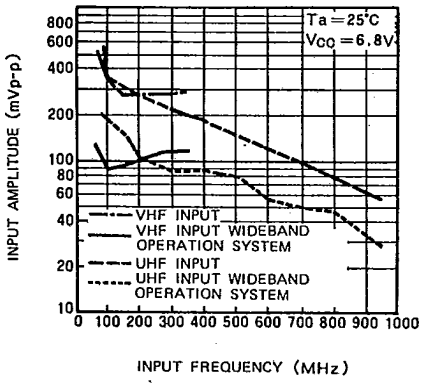
For wide-band operation



Operation across an even wider frequency range is enabled for the UHF input by setting R_4 between V_{REF2} and GND with C_1 = 1000pF, C_2 = 1000pF, C_3 = 1000pF, C_4 = 1000pF, C_5 = 0.1μF, R_1 = 20Ω, R_2 = 33Ω, R_3 = 33Ω, R_4 = 36kΩ, R_5 = 1kΩ.

TYPICAL CHARACTERISTICS

MINIMUM INPUT AMPLITUDE VS INPUT FREQUENCY



MINIMUM INPUT AMPLITUDE VS SUPPLY VOLTAGE