

1.1GHz Dual Modulus Prescaler

The MC12022A can be used with CMOS synthesizers requiring positive edges to trigger internal counters such as Motorola's MC145XXX series in a PLL to provide tuning signals up to 1.1GHz in programmable frequency steps.

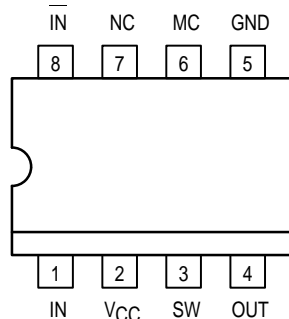
The MC12022B can be used with CMOS synthesizers requiring negative edges to trigger internal counters.

A Divide Ratio Control (SW) permits selection of a 64/65 or 128/129 divide ratio as desired.

The Modulus Control (MC) selects the proper divide number after SW has been biased to select the desired divide ratio.

- 1.1 GHz Toggle Frequency
- Supply Voltage of 4.5 to 5.5V
- Low-Power 7.5mA Typical
- Operating Temperature Range of -40 to +85°C
- Short Setup Time (t_{set}) 16ns Maximum @ 1.1GHz
- Modulus Control Input Level Is Compatible With Standard CMOS and TTL. Maximum Input Voltage Should Be Limited to 6.5Vdc

Pinout: 8-Lead Plastic (Top View)



FUNCTIONAL TABLE

SW	MC	Divide Ratio
H	H	64
H	L	65
L	H	128
L	L	129

Note: SW: H = V_{CC} , L = Open

MC: H = 2.0 V to V_{CC} , L = GND to 0.8 V

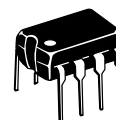
MAXIMUM RATINGS

Symbol	Characteristic	Range	Unit
V_{CC}	Power Supply Voltage, Pin 2	-0.5 to + 7.0	Vdc
T_A	Operating Temperature Range	-40 to + 85	°C
T_{stg}	Storage Temperature Range	-65 to + 150	°C
MC	Modulus Control Input, Pin 6	-0.5 to + 6.5	Vdc

MC12022A
MC12022B

MECL PLL COMPONENTS

÷64/65, ÷128/129
DUAL MODULUS
PRESCALER



P SUFFIX
8-LEAD PLASTIC PACKAGE
CASE 626-05



D SUFFIX
8-LEAD PLASTIC SOIC PACKAGE
CASE 751-05



ELECTRICAL CHARACTERISTICS (V_{CC} = 4.5 to 5.5V; T_A = -40°C to +85°C)

Symbol	Characteristic	Min	Typ	Max	Unit
f _t	Toggle Frequency (Sine Wave Input)	0.1	1.6	1.1	GHz
I _{CC}	Supply Current Output Unloaded (Pin 2)		7.5	10	mA
V _{IH1}	Modulus Control Input High (MC)	2.0		V _{CC}	V
V _{IL1}	Modulus Control Input Low (MC)			0.8	V
V _{IH2}	Divide Ratio Control Input High (SW)	V _{CC}	V _{CC}	V _{CC}	V _d c
V _{IL2}	Divide Ratio Control Input Low (SW)	Open	Open	Open	—
V _{out}	Output Voltage Swing (C _L = 12pF; R _L = 2.2kΩ)	1.0	1.6		V _{p-p}
t _{set}	Modulus Setup Time MC to Out		11	16	ns
V _{in}	Input Voltage Sensitivity 250–1100 MHz 100–250 MHz	100 400		1500 1500	mV _{pp}
I _O	Output Current (C _L = 12pF; R _L = 2.2kΩ)		1.5	4.0	mA

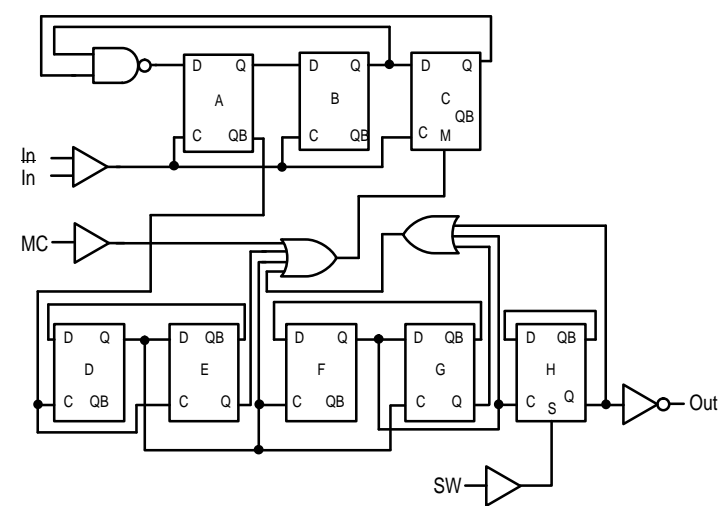
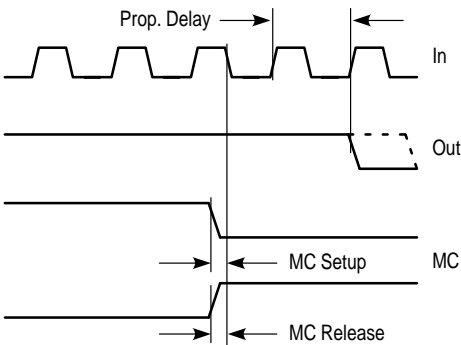
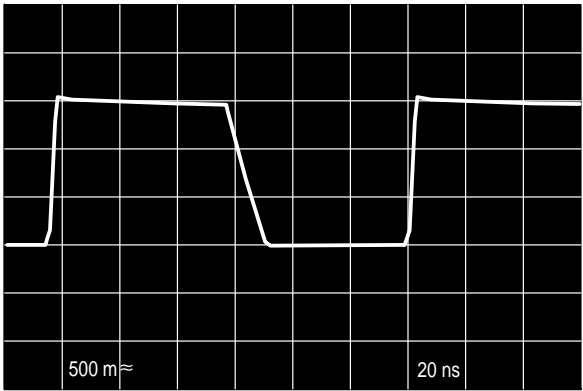


Figure 1. Logic Diagram (MC12022A)

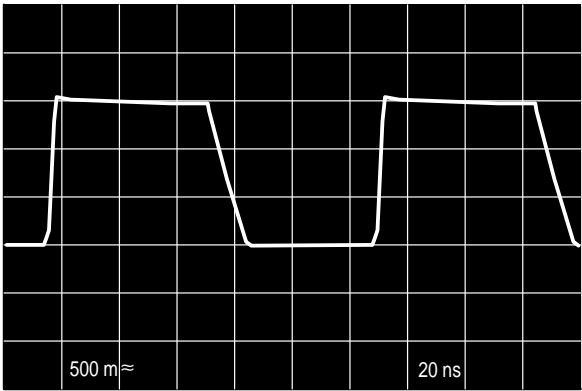


Modulus setup time MC to out is the MC setup or MC release plus the prop delay.

Figure 2. Modulus Setup Time



(+64, 500MHz Input Frequency, V_{CC} = 5.0V, T_A = 25°C, Output Loaded)



(+128, 1.1GHz Input Frequency, V_{CC} = 5.0V, T_A = 25°C, Output Loaded)

Figure 3. Typical Output Waveforms

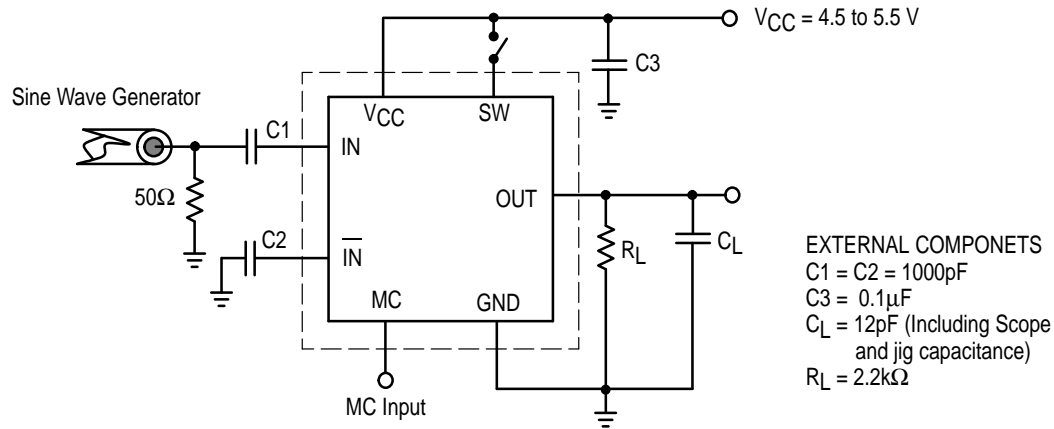


Figure 4. AC Test Circuit

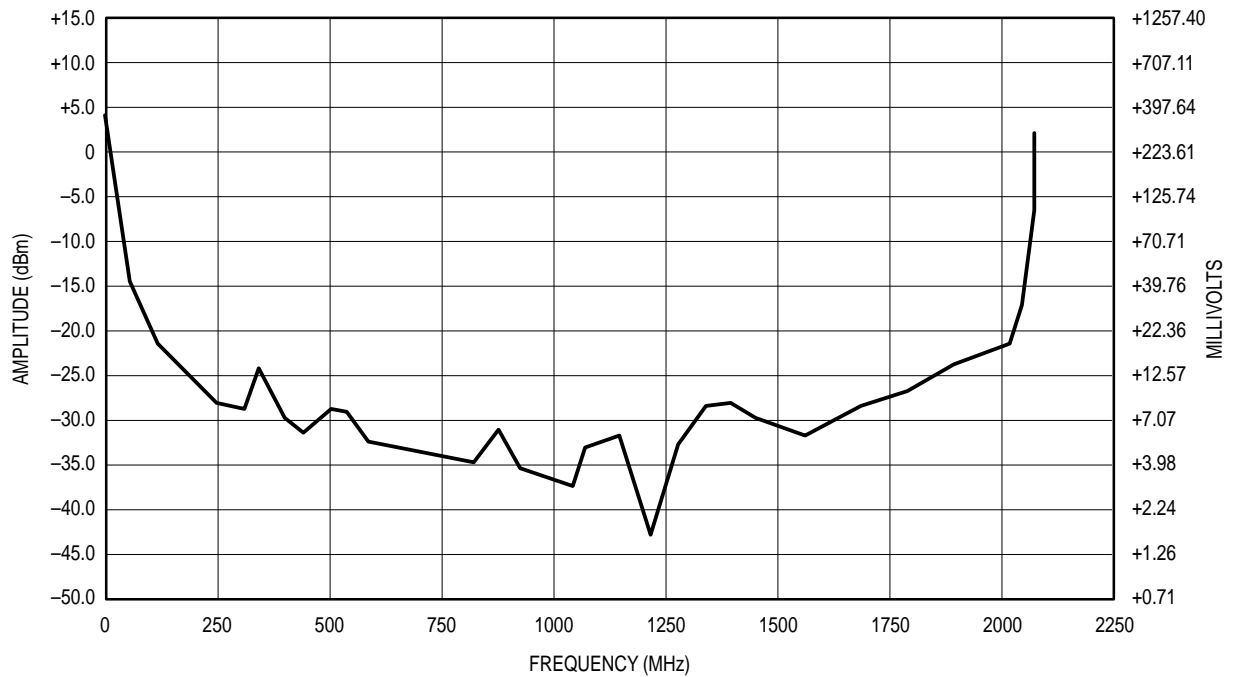


Figure 5. Input Signal Amplitude versus Input Frequency

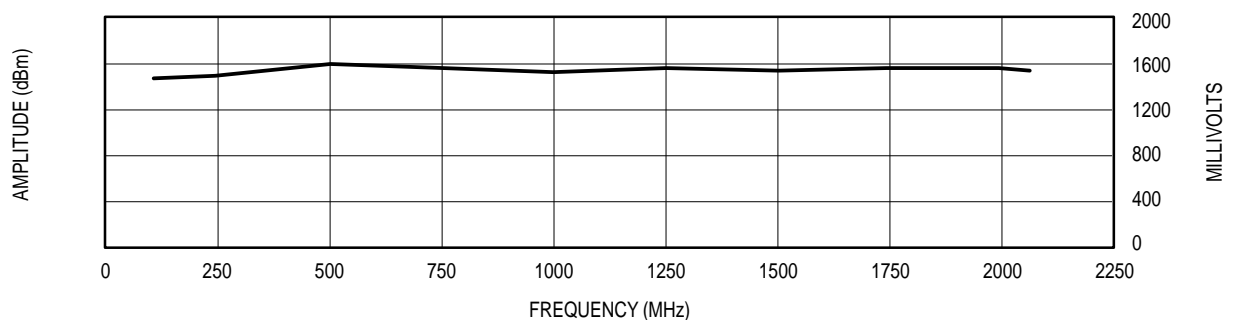
Divide Ratio = 8; $V_{CC} = 5.0\text{V}$; $T_A = 25^\circ\text{C}$ 

Figure 6. Output Amplitude versus Input Frequency

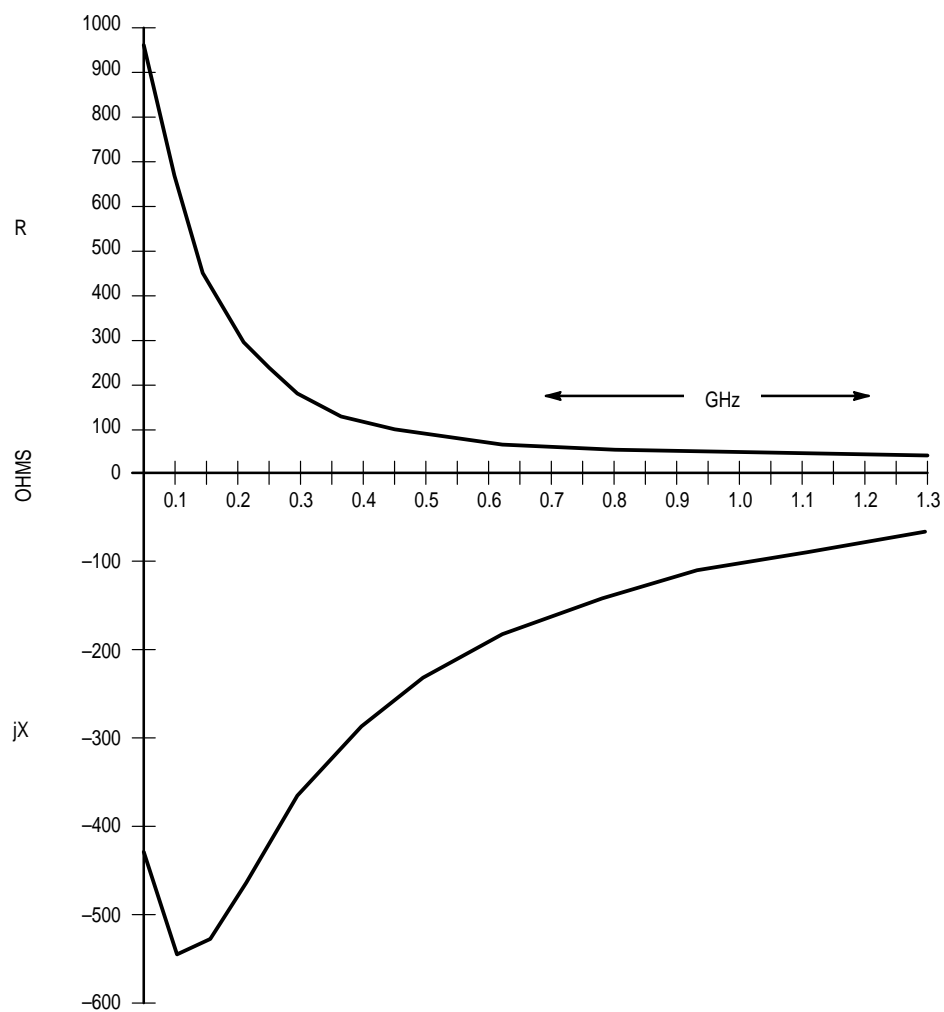
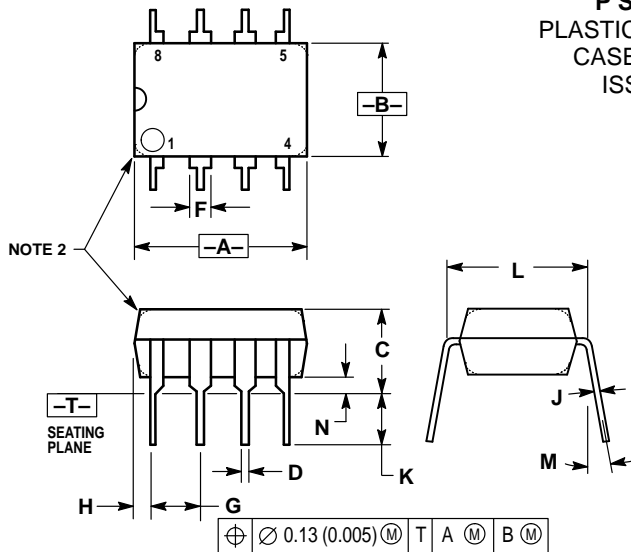


Figure 7. Typical Input Impedance versus Input Frequency

OUTLINE DIMENSIONS

P SUFFIX
PLASTIC PACKAGE
CASE 626-05
ISSUE K

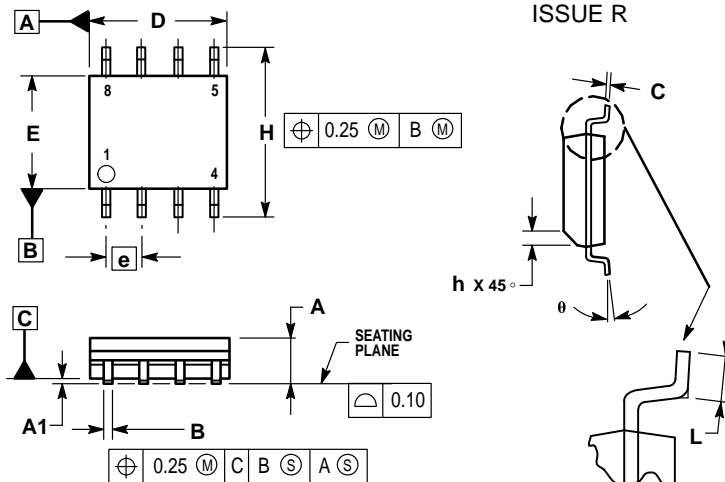


NOTES:

1. DIMENSION L TO CENTER OF LEAD WHEN FORMED PARALLEL.
2. PACKAGE CONTOUR OPTIONAL (ROUND OR SQUARE CORNERS).
3. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.

DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	9.40	10.16	0.370	0.400
B	6.10	6.60	0.240	0.260
C	3.94	4.45	0.155	0.175
D	0.38	0.51	0.015	0.020
F	1.02	1.78	0.040	0.070
G	2.54 BSC		0.100 BSC	
H	0.76	1.27	0.030	0.050
J	0.20	0.30	0.008	0.012
K	2.92	3.43	0.115	0.135
L	7.62 BSC		0.300 BSC	
M	— 10°		— 10°	
N	0.76	1.01	0.030	0.040


D SUFFIX
PLASTIC SOIC PACKAGE
CASE 751-05
ISSUE R



NOTES:

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. DIMENSIONS ARE IN MILLIMETERS.
3. DIMENSION D AND E DO NOT INCLUDE MOLD PROTRUSION.
4. MAXIMUM MOLD PROTRUSION 0.15 PER SIDE.
5. DIMENSION B DOES NOT INCLUDE MOLD PROTRUSION. ALLOWABLE DAMBAR PROTRUSION SHALL BE 0.127 TOTAL IN EXCESS OF THE B DIMENSION AT MAXIMUM MATERIAL CONDITION.

DIM	MILLIMETERS	
	MIN	MAX
A	1.35	1.75
A1	0.10	0.25
B	0.35	0.49
C	0.18	0.25
D	4.80	5.00
E	3.80	4.00
e	1.27 BSC	
H	5.80	6.20
h	0.25	0.50
L	0.40	1.25
θ	0°	7°

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