1.1GHz Dual Modulus Prescaler

MC12026A
MC12026B

MECL PLL COMPONENTS

÷8/9, ÷16/17
DUAL MODULUS PRESCALER

The MC12026 is a high frequency, low voltage dual modulus prescaler used in phase–locked loop (PLL) applications.

The MC12026A 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.

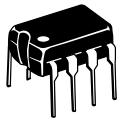
The MC12026B can be used with CMOS synthesizers requiring negative edges to trigger internal counters.

A Divide Ratio Control (SW) permits selection of an 8/9 or 16/17 divide ratio as desired.

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

NOTE: The "B" Version Is Not Recommended for New Designs

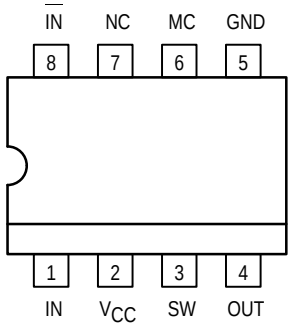
- 1.1GHz Toggle Frequency
- Supply Voltage 4.5V to 5.5V
- Low Power 4.0mA Typical
- Operating Temperature Range of –40°C to +85°C
- The MC12026 is Pin Compatible With the MC12022
- Short Setup Time (t_{set}) 6ns Typical @ 1.1GHz
- Modulus Control Input Level is Compatible With Standard CMOS and TTL



P SUFFIX
8–LEAD PLASTIC PACKAGE
CASE 626–05

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

Pinout: 8–Lead Plastic (Top View)



FUNCTION TABLE

SW	MC	Divide Ratio
H	H	8
H	L	9
L	H	16
L	L	17

Note: SW: H = V_{CC}, L = OPEN
MC: H = 2.0V to V_{CC}; L = GND to 0.8V

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
I_O	Maximum Output Current, Pin 4	10.0	mA

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

Symbol	Characteristic	Min	Typ	Max	Unit
f_t	Toggle Frequency (Sin Wave)	0.1	1.4	1.1	GHz
I_{CC}	Supply Current Output Unloaded (Pin 2)	—	4.0	5.3	mA
V_{IH1}	Modulus Control Input High (MC)	2.0	—	V_{CC}	V
V_{IL1}	Modulus Control Input Low (MC)	GND	—	0.8	V
V_{IH2}	Divide Ratio Control Input High (SW)	V_{CC} – 0.5V	V_{CC}	V_{CC} + 0.5V	V
V_{IL2}	Divide Ratio Control Input Low (SW)	OPEN	OPEN	OPEN	—
V_{out}	Output Voltage Swing (R_L = 560Ω; I_O = 5.5mA)[1] (R_L = 1.1kΩ; I_O = 2.9mA)[2]	1.0	1.6	—	V_{p-p}
t_{SET}	Modulus Setup Time MC to Out[3]	—	6	9	ns
V_{in}	Input Voltage Sensitivity 100–250MHz 250–1100MHz	 400 100	 — —	 1000 1000	mVpp

1. Divide Ratio of ÷8/9 at 1.1GHz, C_L = 8pF
2. Divide Ratio of ÷16/17 at 1.1GHz, C_L = 8pF
3. Assuming R_L = 560Ω at 1.1GHz

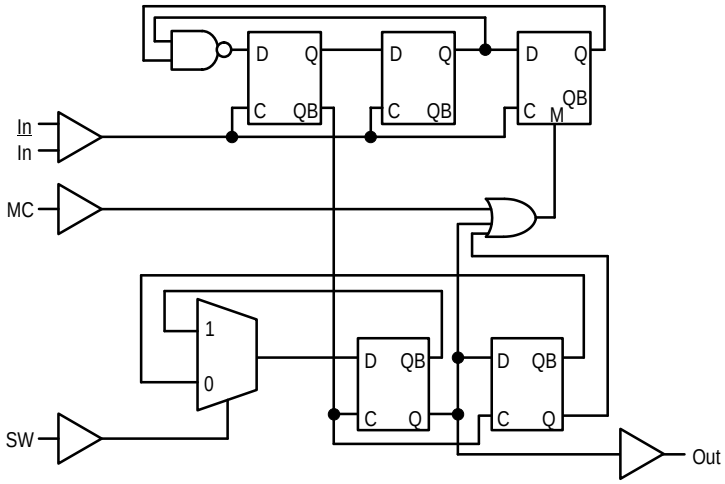
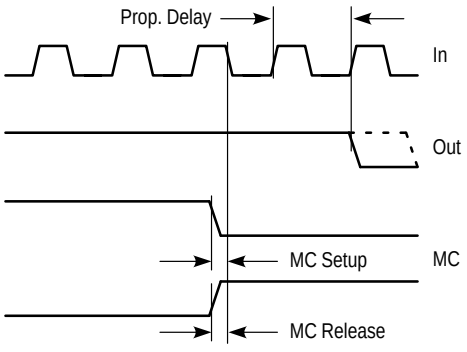


Figure 1. Logic Diagram (MC12026A)



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

Figure 2. Modulus Setup Time

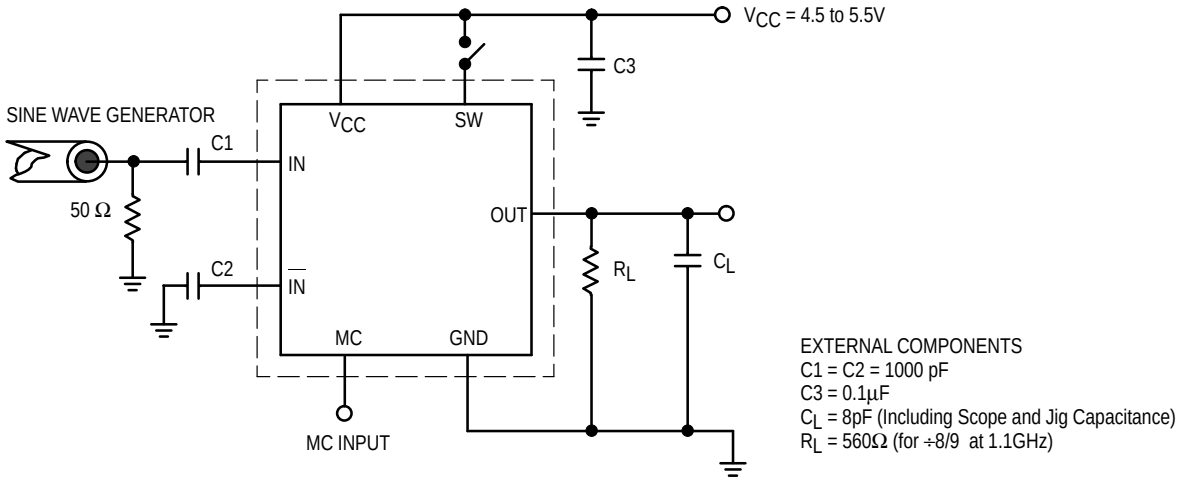


Figure 3. AC Test Circuit

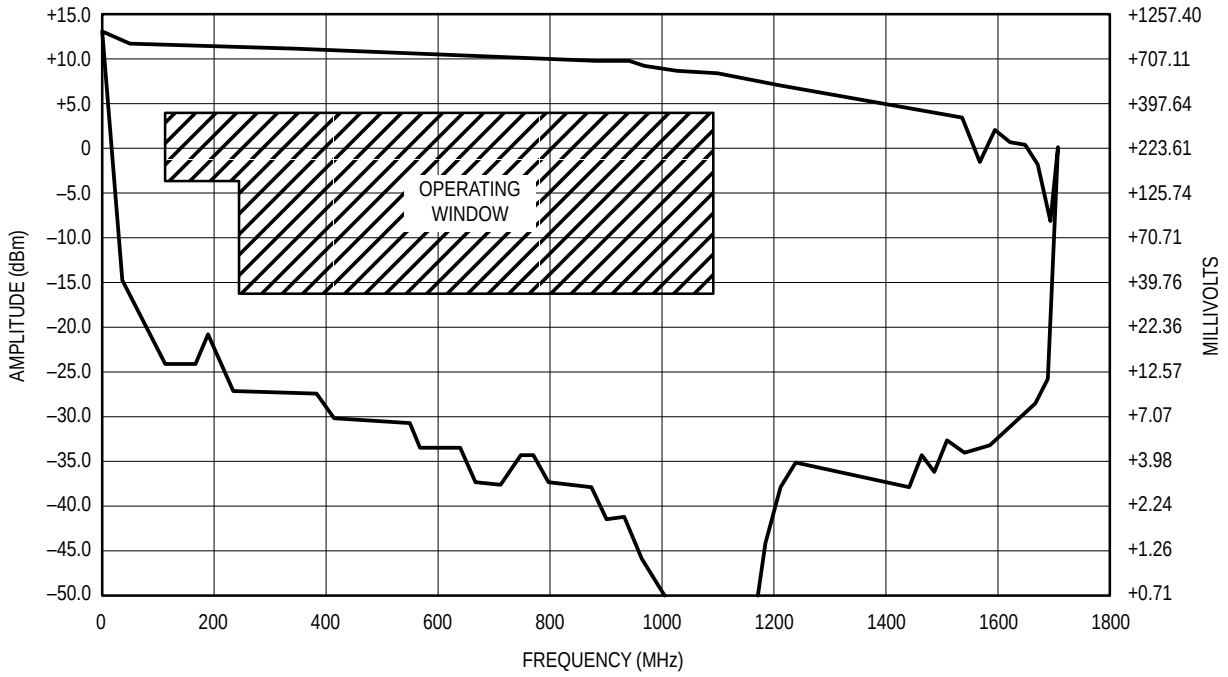


Figure 4. Input Signal Amplitude versus Input Frequency
Divide Ratio = 8; V_{CC} = 5.0V; T_A = 25°C

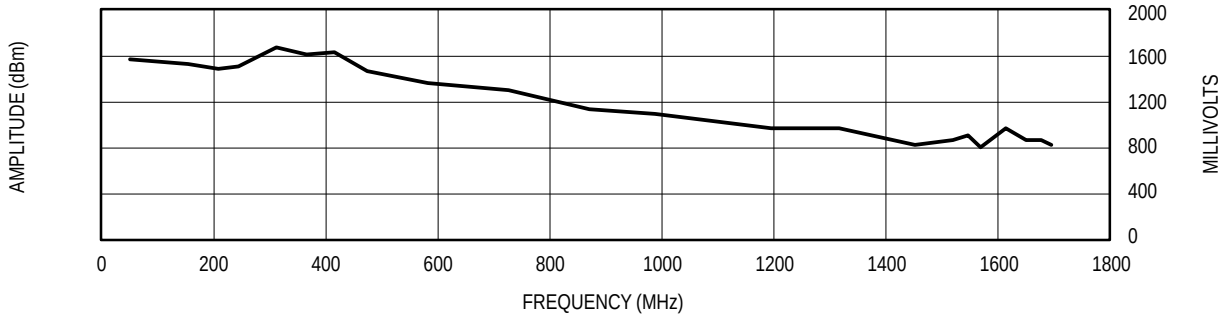


Figure 5. Output Amplitude versus Input Frequency

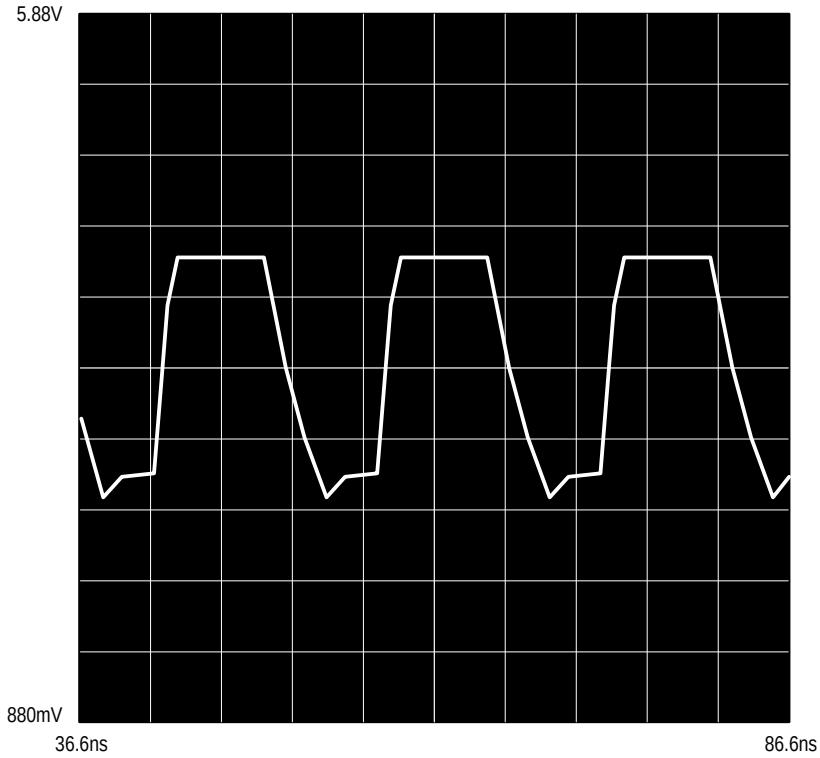


Figure 6. Typical Output Waveform
(÷8, 1.1GHz Input Frequency, V_{CC} = 5.0, T_A = 25°C, Output Loaded With 8pF)

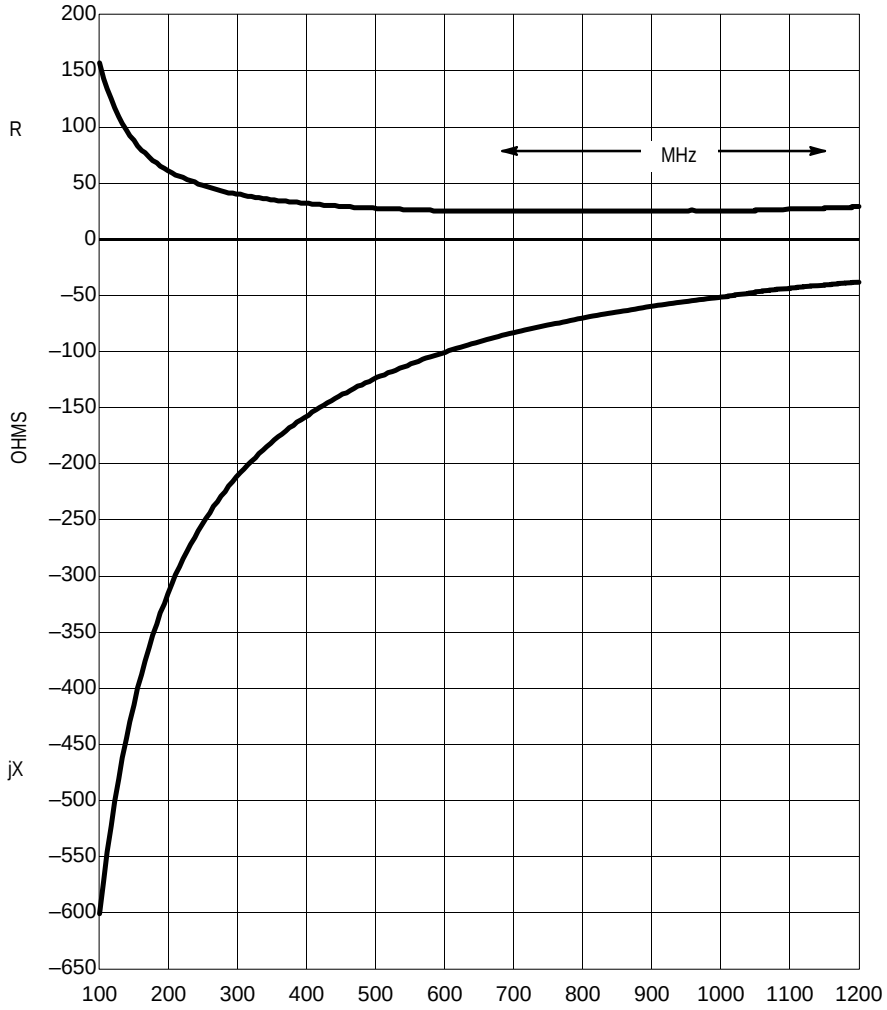
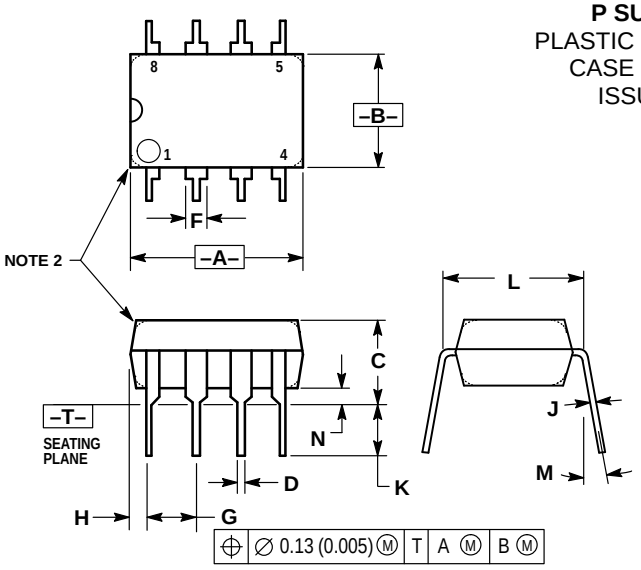


Figure 7. Typical Input Impedance versus Input Frequency

OUTLINE DIMENSIONS

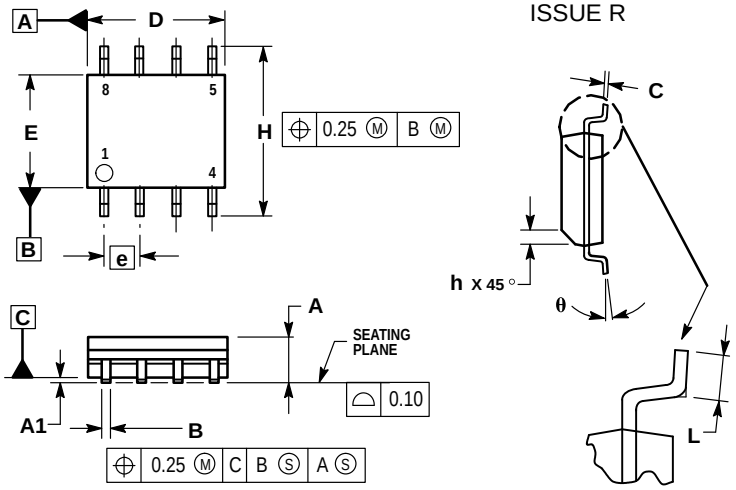
P SUFFIX
PLASTIC PACKAGE
CASE 626–05
ISSUE K



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.

	MILLIMETERS		INCHES	
DIM	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.

	MILLIMETERS	
DIM	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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