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MOTOROLA

1.1 GHz Dual Modulus Prescaler

MC12026A
MC12026B

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 1.1 GHz 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.

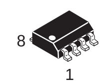
NOTE: The "B" Version Is Not Recommended for New Designs

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

MC12026A IS NOT RECOMMENDED FOR NEW DESIGN
DEVICE TO BE PHASED OUT.
No replacement available.
MC12026B is on Life Time Buy

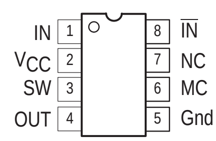
MECL PLL COMPONENTS
÷8/9, ÷16/17
DUAL MODULUS PRESCALER

SEMICONDUCTOR TECHNICAL DATA



D SUFFIX
PLASTIC PACKAGE
CASE 751
(SO–8)

PIN CONNECTIONS



(Top View)

FUNCTIONAL TABLE

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

NOTES: 1. SW: H = V_{CC}, L = Open. A logic L can also be applied by grouunding this pin, but this is not recommended due to increased power soncumption.
2. MC: H = 2.0 V to V_{CC}, L = GND to 0.8 V.

MAXIMUM RATINGS

Characteristics	Symbol	Range	Unit
Power Supply Voltage, Pin 2	V_{CC}	–0.5 to 7.0	Vdc
Operating Temperature Range	T_A	–40 to 85	°C
Storage Temperature Range	T_{stg}	–65 to 150	°C
Modulus Control Input, Pin 6	MC	–0.5 to 6.5	Vdc
Maximum Output Current, Pin 4	I_O	10.0	mA

NOTE: ESD data available upon request.

ORDERING INFORMATION

Device	Operating Temp Range	Package
MC12026AD	T_A =–40 to 85°C	SO–8
MC12026BD		

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ELECTRICAL CHARACTERISTICS (V_{CC} = 4.5 to 5.5; T_A = –40 to 85°C, unless otherwise noted.)

Characteristic	Symbol	Min	Typ	Max	Unit
Toggle Frequency (Sin Wave)	f_t	0.1	1.4	1.1	GHz
Supply Current Output Unloaded (Pin 2)	I_{CC}	–	4.0	5.3	mA
Modulus Control Input High (MC)	V_{IH1}	2.0	–	V_{CC}	V
Modulus Control Input Low (MC)	V_{IL1}	GND	–	0.8	V
Divide Ratio Control Input High (SW)	V_{IH2}	V_{CC} – 0.5 V	V_{CC}	V_{CC} + 0.5 V	V
Divide Ratio Control Input Low (SW)	V_{IL2}	OPEN	OPEN	OPEN	–
Output Voltage Swing (R_L = 560 Ω; I_O = 5.5 mA)[1] (R_L = 1.1 kΩ; I_O = 2.9 mA)[2]	V_{out}	1.0	1.6	–	V_{pp}
Modulus Setup Time MC to Out[3]	t_{SET}	–	6	9	ns
Input Voltage Sensitivity 100–25 0MHz 250–1100 MHz	V_{in}	 400 100	 – –	 1000 1000	mVpp

notes: 1. Divide Ratio of ÷8/9 at 1.1 GHz, C_L = 8.0 pF
2. Divide Ratio of ÷16/17 at 1.1 GHz, C_L = 8.0 pF
3. Assuming R_L = 560 Ω at 1.1 GHz

Figure 1. Logic Diagram (MC12026A)

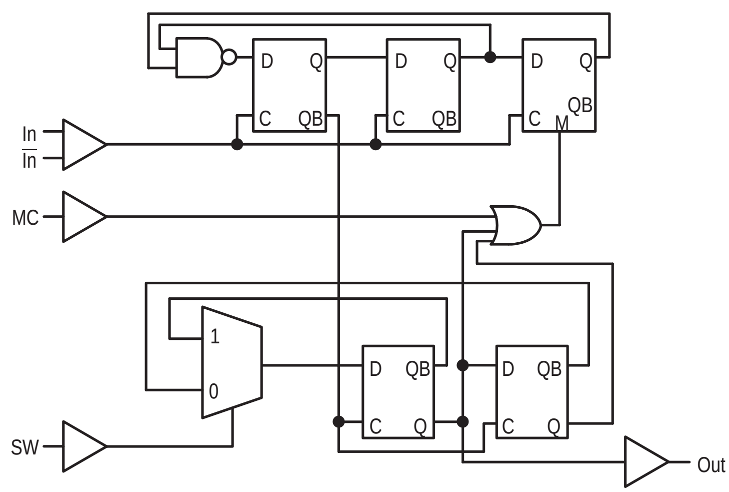
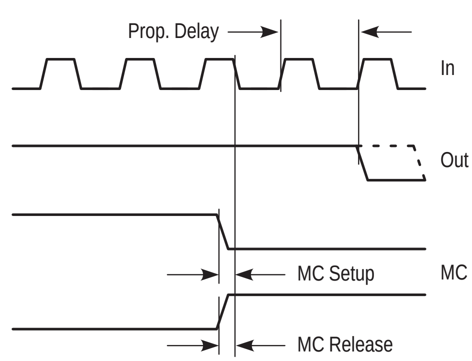


Figure 2. Modulus Setup Time



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

Figure 3. AC Test Circuit

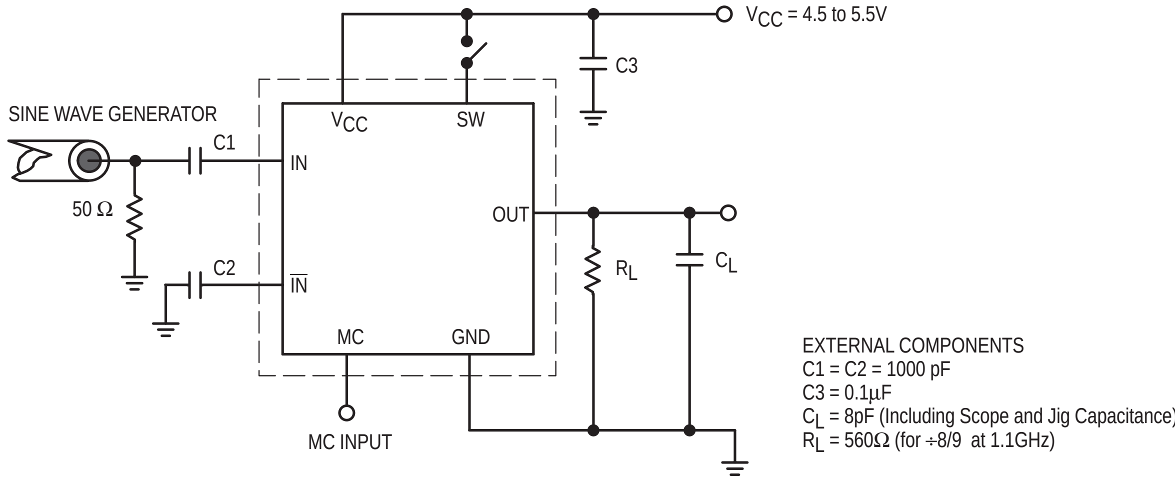
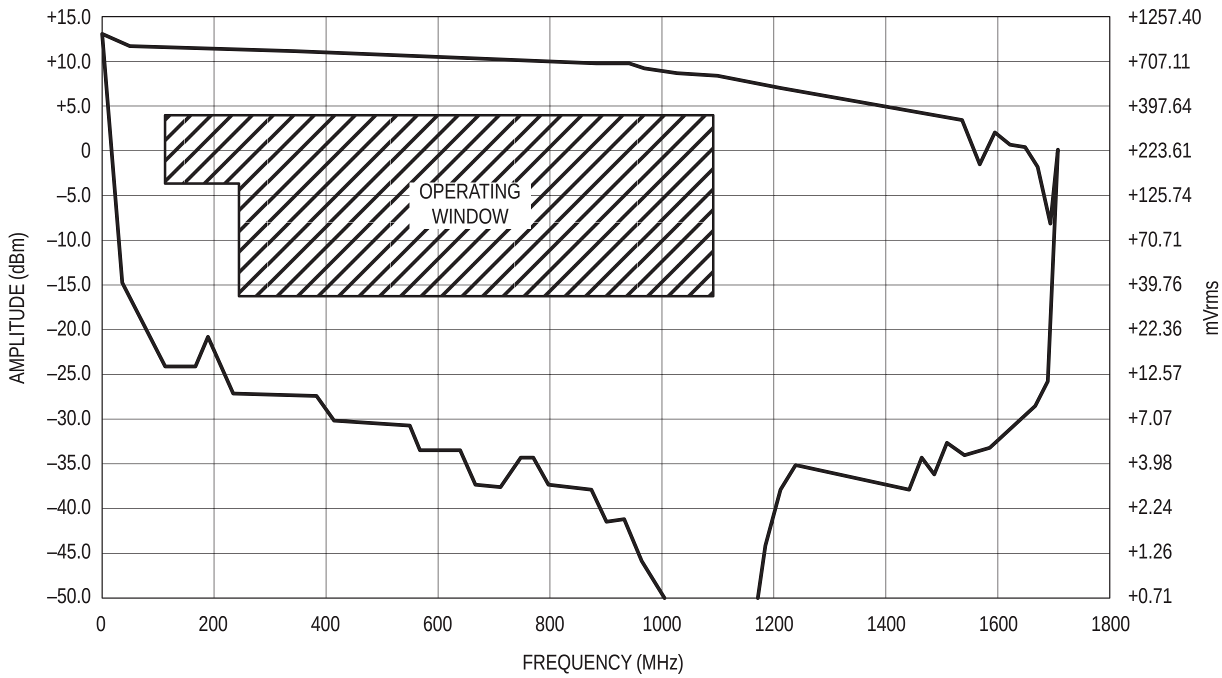


Figure 4. Input Signal Amplitude versus Input Frequency



Divide Ratio = 8; V_{CC} = 5.0 V; T_A = 25°C

Figure 5. Output Amplitude versus Input Frequency

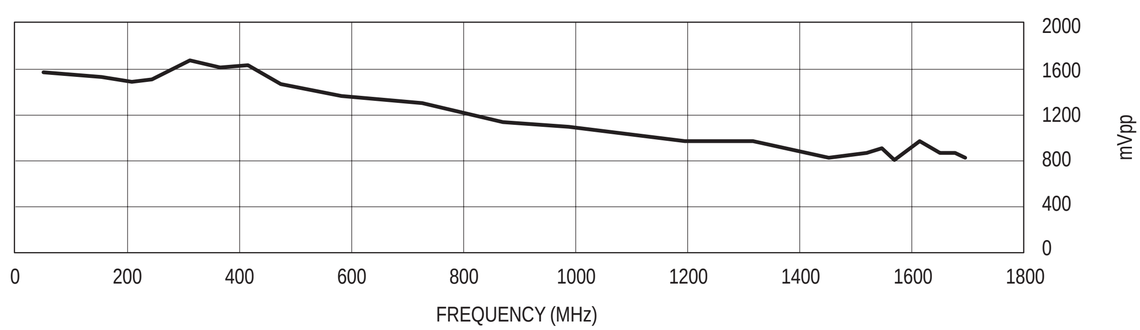
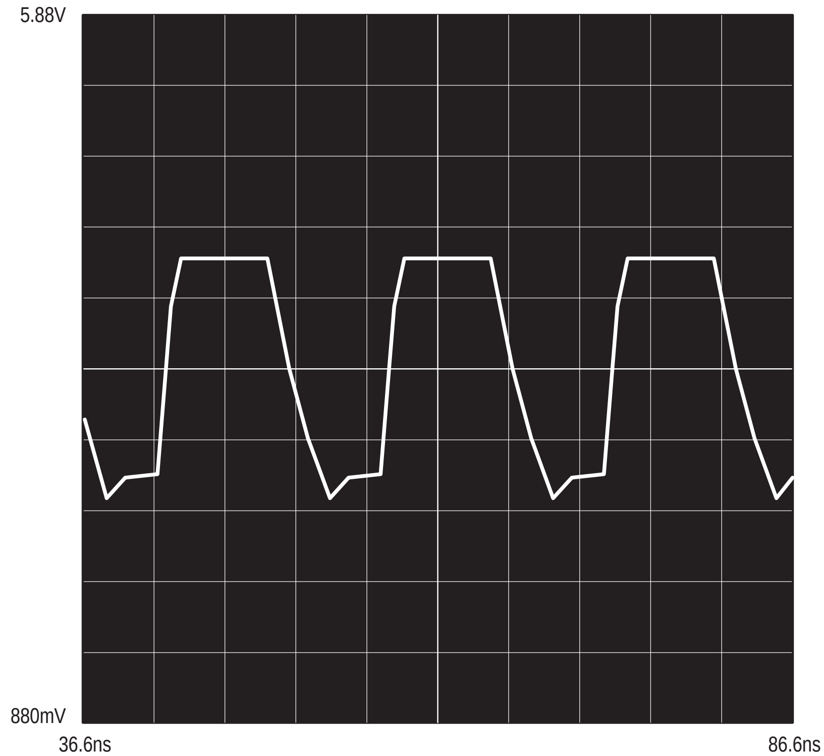
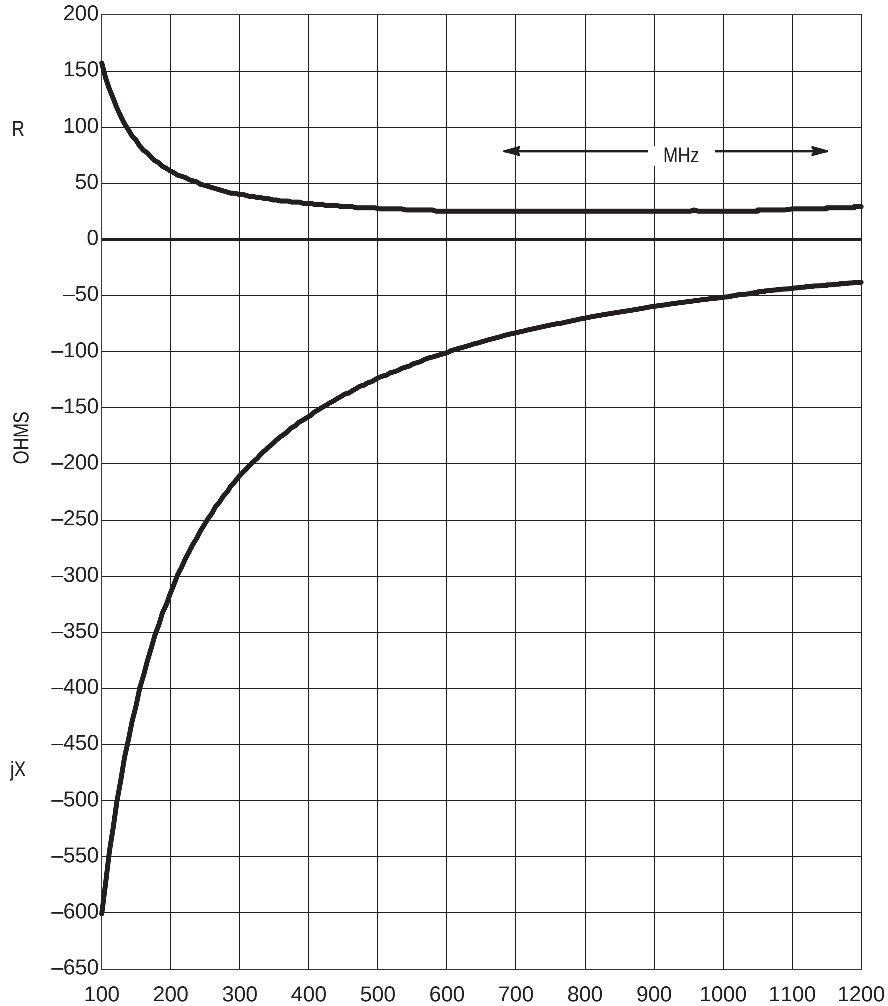


Figure 6. Typical Output Waveform



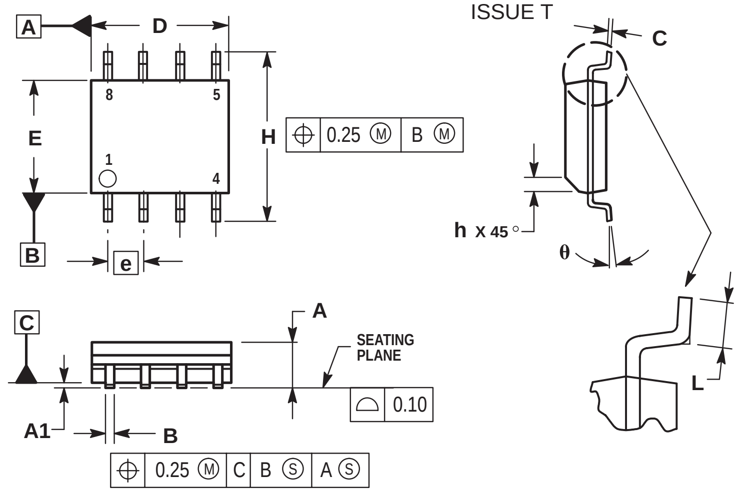
(÷8, 1.1 GHz Input Frequency, V_{CC} = 5.0, T_A = 25°C, Output Loaded With 8.0pF)

Figure 7. Typical Input Impedance versus Input Frequency



OUTLINE DIMENSIONS

D SUFFIX
PLASTIC PACKAGE
CASE 751–06
(SO–8)
ISSUE T



NOTES:
1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. DIMENSIONS ARE IN MILLIMETER.
3. DIMENSION D AND E DO NOT INCLUDE MOLD PROTRUSION.
4. MAXIMUM MOLD PROTRUSION 0.15 PER SIDE.
5. DIMENSION B DOES NOT INCLUDE DAMBAR 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	0.19	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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