2.0GHz Dual Modulus Prescaler

MC12034A
MC12034B

MECL PLL COMPONENTS

÷32/33, ÷64/65
DUAL MODULUS PRESCALER

The MC12034A 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 2.0GHz in programmable frequency steps.

The MC12034B can be used with CMOS synthesizers requiring negative edges to trigger internal counters such as Fujitsu's MB87001.

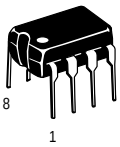
A Divide Ratio Control (SW) permits selection of a 32/33 or 64/65 divide ratio as desired.

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

- 2.0GHz Toggle Frequency
- Supply Voltage 4.5 to 5.5V
- MC12034A for Positive Edge Triggered Synthesizers
- MC12034B for Negative Edge Triggered Synthesizers
- 12mA Maximum, –40°C to +85°C, V_{CC} = 5.5Vdc
- Modulus Control Input is Compatible with Standard CMOS and TTL
- Low-Power 8.5mA Typical

Design Criteria	Value	Unit
Internal Gate Count *	67	ea
Internal Gate Propagation Delay	200	ps
Internal Gate Power Dissipation	0.75	mW
Speed Power Product	0.15	pJ

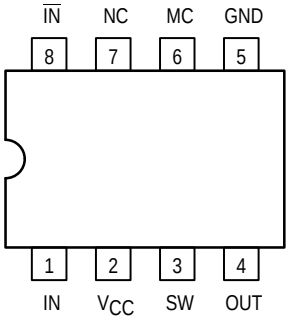
*Equivalent to a two-input NAND gate.



P SUFFIX
PLASTIC PACKAGE
CASE 626-05

D SUFFIX
PLASTIC SOIC PACKAGE
CASE 751-05

Pinout: 8-Lead Plastic (Top View)



FUNCTION TABLE

SW	MC	Divide Ratio
H	H	32
H	L	33
L	H	64
L	L	65

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

MAXIMUM RATINGS

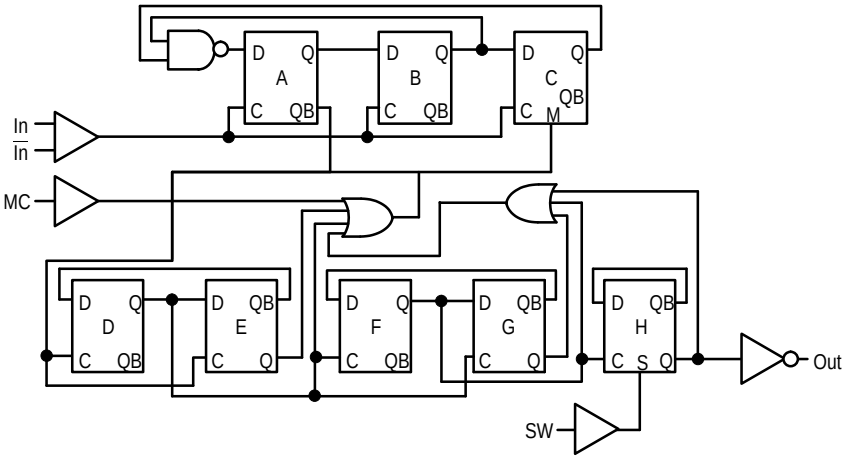
Symbol	Characteristic	Range	Unit
V_{CC}	Power Supply Voltage, Pin 2	–0.5 to +7.0	Vdc
T_A	Operating Temperature Range	–40 to +85	°C
T_{stg}	Storage Temperature Range	–65 to +150	°C
MC	Modulus Control Input, Pin 6	–0.5 to +6.5	Vdc

This device contains protection circuitry to guard against damage due to high static voltages or electric fields. However, precautions must be taken to avoid applications of any voltage higher than maximum rated voltages to this high impedance circuit. For proper operation, V_{in} and V_{out} should be constrained to the range GND ≤ (V_{in} or V_{out}) ≤ V_{CC}.

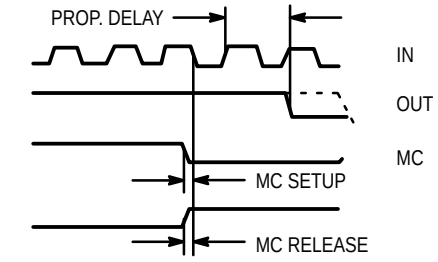
MOTOROLA

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

Symbol	Characteristic	Min	Typ	Max	Unit
f_t	Toggle Frequency (Sine Wave)	0.5	2.4	2.0	GHz
I_{CC}	Supply Current Output Unloaded (Pin 2)	—	8.5	12	mA
V_{IH1}	Modulus Control Input High (MC)	2.0	—	—	V
V_{IL1}	Modulus Control Input Low (MC)	—	—	0.8	V
V_{IH2}	Divide Ratio Control Input High (SW)	V_{CC} – 0.5V	V_{CC}	V_{CC} + 0.5V	Vdc
V_{IL2}	Divide Ratio Control Input Low (SW)	OPEN	OPEN	OPEN	—
V_{out}	Output Voltage Swing (C_L = 12 pF, R_L = 1.1 kΩ)	1.0	1.6	—	V_{p-p}
t_{SET}	Modulus Setup Time MC to Out	—	8.0	10.0	ns
V_{in}	Input Voltage Sensitivity 500–2000 MHz	100	—	1500	mVpp
I_O	Output Current (C_L = 12 pF, R_L = 1.1 kΩ)	—	—	3.5	mA



LOGIC DIAGRAM (MC12034A)



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

Figure 1. Modulus Setup Time

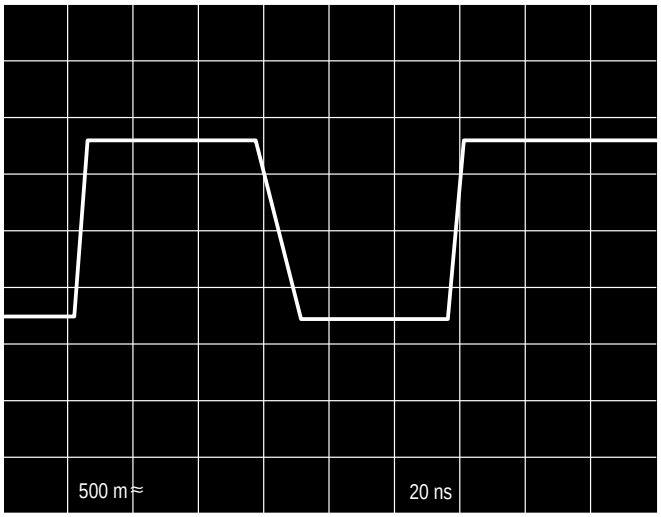


Figure 2. Typical Output Waveform

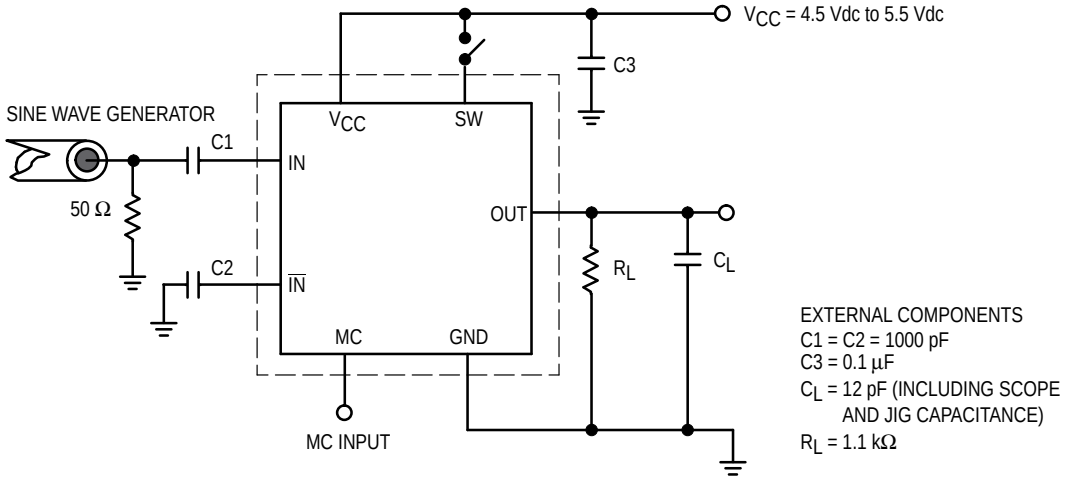


Figure 3. AC Test Circuit

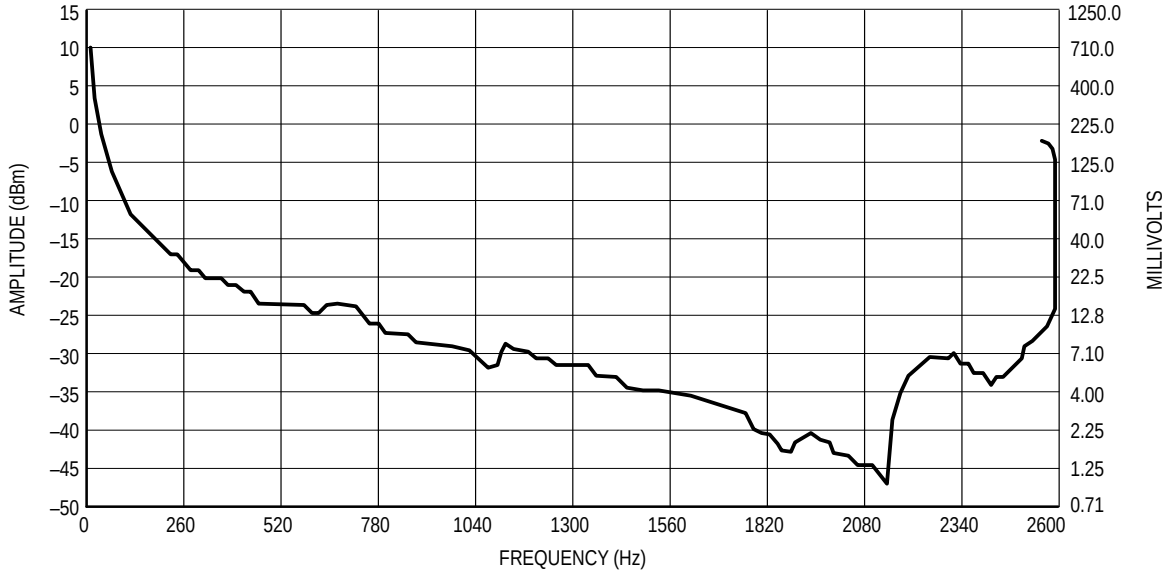


Figure 4. Input Signal Amplitude versus Input Frequency
Divide Ratio = 65

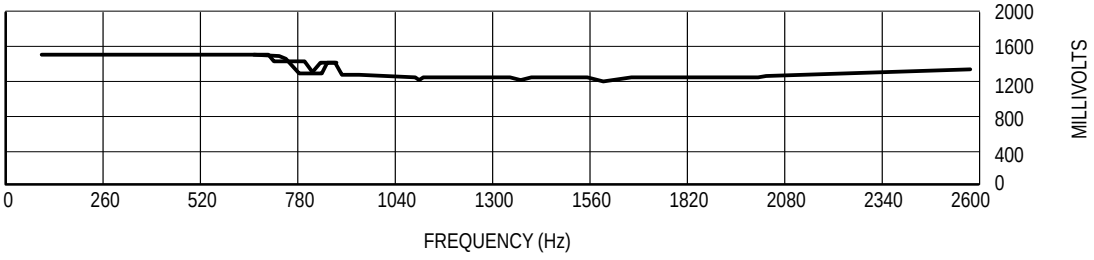


Figure 5. Output Amplitude versus Input Frequency

OUTLINE DIMENSIONS

P SUFFIX
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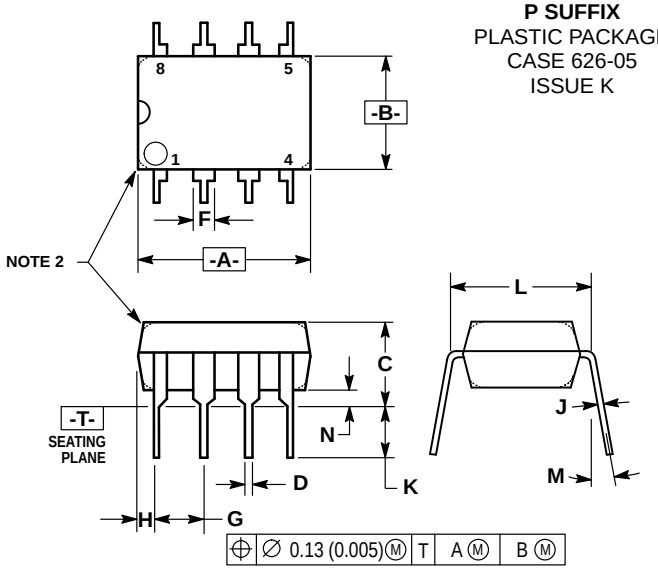
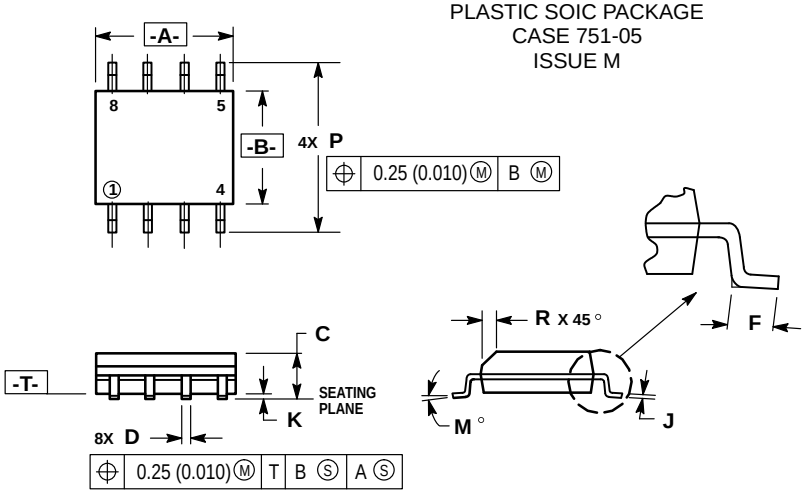
CASE 626-05
ISSUE K



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 M



NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: MILLIMETER.
3. DIMENSIONS A AND B DO NOT INCLUDE MOLD PROTRUSION.
4. MAXIMUM MOLD PROTRUSION 0.15 (0.006) PER SIDE.
5. DIMENSION D DOES NOT INCLUDE DAMBAR PROTRUSION. ALLOWABLE DAMBAR PROTRUSION SHALL BE 0.127 (0.005) TOTAL IN EXCESS OF THE D DIMENSION AT MAXIMUM MATERIAL CONDITION.

	MILLIMETERS		INCHES	
DIM	MIN	MAX	MIN	MAX
A	4.80	5.00	0.189	0.196
B	3.80	4.00	0.150	0.157
C	1.35	1.75	0.054	0.068
D	0.35	0.49	0.014	0.019
F	0.40	1.25	0.016	0.049
G	1.27 BSC		0.050 BSC	
J	0.18	0.25	0.007	0.009
K	0.10	0.25	0.004	0.009
M	0°	7°	0°	7°
P	5.80	6.20	0.229	0.244
R	0.25	0.50	0.010	0.019

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