

Consider MC12054A for New Design

2.0GHz Dual Modulus Prescaler

The MC12032A 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 2.0 GHz in programmable frequency steps.

The MC12032B 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.

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

- 2.0 GHz Toggle Frequency
- Supply Voltage 4.5 to 5.5 V
- MC12032A for Positive Edge Triggered Synthesizers
- 12 mA Maximum, -40 to 85° C, $V_{CC} = 5.5$ Vdc
- Modulus Control Input Level Is Compatible With Standard CMOS and TTL
- Low–Power 8.5 mA Typical

FUNCTIONAL TABLE

sw	МС	Divide Ratio
Н	Н	64
Н	L	65
L	Н	128
L	L	129

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.

DESIGN GUIDE

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	рЈ

NOTE: * Equivalent to a two-input NAND gate

MAXIMUM RATINGS

Characteristic	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

NOTE: ESD data available upon request.

MC12032A MC12032B

MECL PLL COMPONENTS ÷64/65, ÷128/129 DUAL MODULUS PRESCALER

SEMICONDUCTOR TECHNICAL DATA

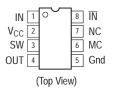


D SUFFIX
PLASTIC PACKAGE
CASE 751
(SO-8)



P SUFFIX PLASTIC PACKAGE CASE 626

PIN CONNECTIONS



ORDERING INFORMATION

Device	Operating Temp Range	Package		
MC12032AD		SO-8		
MC12032AP	T 400 to 10500	Plastic		
MC12032BD	$T_A = -40^{\circ} \text{ to } +85^{\circ}\text{C}$	SO-8		
MC120328BP		Plastic		

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

Characteristic	Symbol	Min	Тур	Max	Unit
Toggle Frequency (Sine Wave Input)	f _t	0.5	2.4	2.0	GHz
Supply Current Output Unloaded (Pin 2)	Icc	_	8.5	12	mA
Modulus Control Input High (MC)	V _{IH1}	2.0	-	V _{CC}	V
Modulus Control Input Low (MC)	V _{IL1}	_	-	0.8	V
Divide Ratio Control Input High (SW)	V _{IH2}	V _{CC}	V _{CC}	V _{CC}	Vdc
Divide Ratio Control Input Low (SW)	V _{IL2}	Open	Open	Open	_
Output Voltage Swing (C _L = 12 pF; R _L = 2.2 k Ω)	V _{out}	1.0	1.6	-	V _{pp}
Modulus Setup Time MC to Out	t _{set}	_	8.0	10	ns
Input Voltage Sensitivity 500–2000 MHz	V _{in(min)}	100	-	1500	mVpp
Output Current ($C_L = 12 \text{ pF}$; $R_L = 2.2 \text{ k}\Omega$)	I _O	_	1.5	4.0	mA

Figure 1. Logic Diagram (MC12032A)

Figure 2. Modulus Setup Time

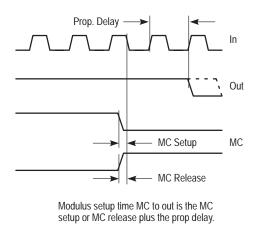
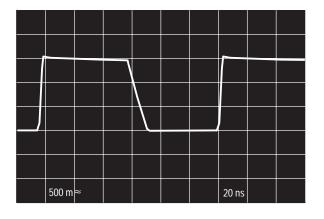
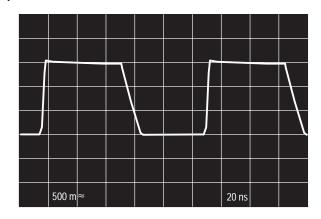


Figure 3. Typical Output Waveforms



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



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

Figure 4. AC Test Circuit

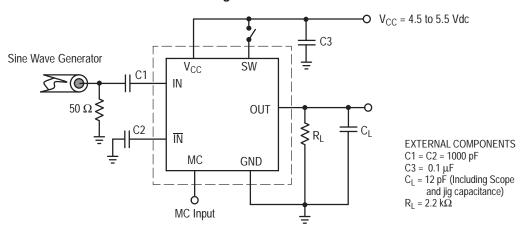
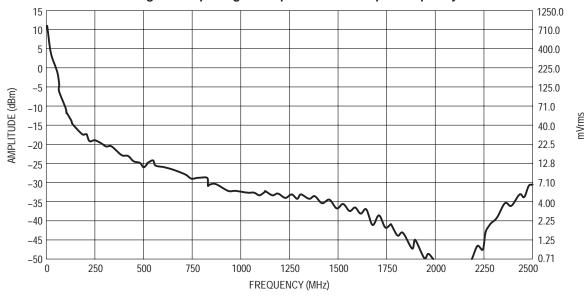


Figure 5. Input Signal Amplitude versus Input Frequency



Divide Ratio = 128

Figure 6. Output Amplitude versus Input Frequency

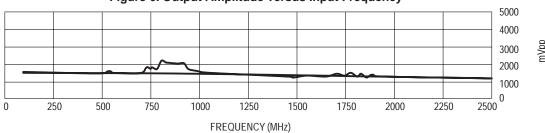
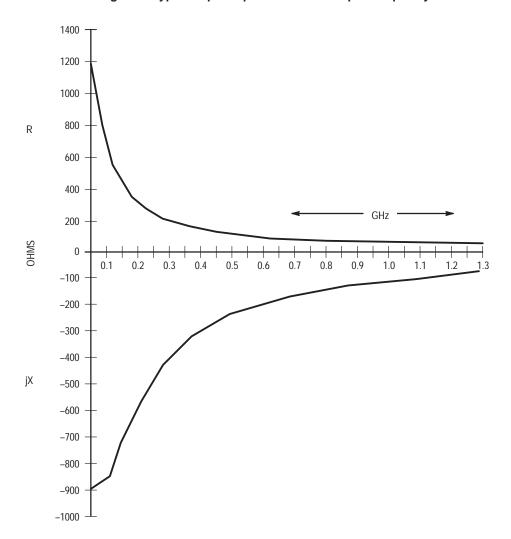


Figure 7. Typical Input Impedance versus Input Frequency



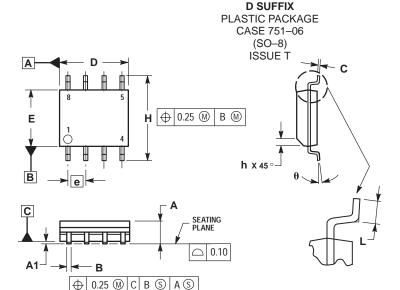
OUTLINE DIMENSIONS

P SUFFIX Д PLASTIC PACKAGE CASE 626-05 ISSUE K -B-NOTE 2 _T_ SEATING PLANE \oplus Ø 0.13 (0.005) M T A M B M

NOTES:

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

	MILLIMETERS		INCHES	
DIM	MIN	MAX	MIN	MAX
Α	9.40	10.16	0.370	0.400
В	6.10	6.60	0.240	0.260
С	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
Н	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



NOTES

- DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
 DIMENSIONS ARE IN MILLIMETER.
- DIMENSION D AND E DO NOT INCLUDE MOLD PROTRUSION.
- MAXIMUM MOLD PROTRUSION 0.15 PER SIDE.
 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		
Α	1.35	1.75		
A1	0.10	0.25		
В	0.35	0.49		
С	0.19	0.25		
D	4.80	5.00		
Ε	3.80	4.00		
е	1.27	1.27 BSC		
Н	5.80	6.20		
h	0.25	0.50		
L	0.40	1.25		
θ	0 °	7 °		
_				

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MC12032A/D