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1.1 GHz Super Low Power Dual Modulus Prescaler

The MC12052A is a super low power dual modulus prescaler used in phase-locked loop applications. Motorola's advanced Bipolar MOSAIC™ V technology is utilized to achieve low power dissipation of 2.7 mW at a minimum supply voltage of 2.7 V.

The MC12052A 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.

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
- The MC12052 is Pin and Functionally Compatible with the MC12022
- Low Power 1.0 mA Typical
- 2.0 mA Maximum, -40 to 85°C, V_{CC} = 2.7 to 5.5 Vdc
- Short Setup Time (t_{set}) 16 ns Maximum @ 1.1 GHz
- Modulus Control Input Level is Compatible with Standard CMOS and TTL
- Maximum Input Voltage Should Be Limited to 6.5 Vdc

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FUNCTIONAL TABLE

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

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

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

MC12052A

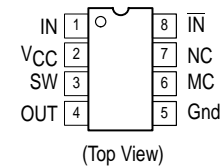
MECL PLL COMPONENTS ÷64/65, ÷128/129 LOW POWER DUAL MODULUS PRESCALER

SEMICONDUCTOR TECHNICAL DATA



D SUFFIX
PLASTIC PACKAGE
CASE 751
(SO-8)

PIN CONNECTIONS



ORDERING INFORMATION

Device	Operating Temp Range	Package
MC12052AD	T _A = -40 to 85°C	SO-8

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ELECTRICAL CHARACTERISTICS (V_{CC} = 2.7 to 5.5 VDC, T_A = -40 to 85°C, unless otherwise noted.)

Characteristic	Symbol	Min	Typ	Max	Unit
Toggle Frequency (Sine Wave Input)	f _t	0.1	1.4	1.1	GHz
Supply Current (Pin 2)	I _{CC}	–	1.0	2.0	mA
Modulus Control Input High (MC)	V _{IH1}	2.0	–	V _{CC} + 0.5 V	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	VDC
Divide Ratio Control Input Low (SW)	V _{IL2}	Open	Open	Open	–
Output Voltage Swing (Note 2) (C _L = 8.0 pF, R _L = 3.3 kΩ)	V _{out}	0.8	1.1	–	V _{PP}
Modulus Setup Time MC to Out @ 1100 MHz	t _{set}	–	11	16	ns
Input Voltage Sensitivity 250–1100 MHz 100–250 MHz	V _{in}	100 400	– –	1000 1000	mV _{PP}
Output Current (Note 1) V _{CC} = 2.7 V, C _L = 8.0 pF, R _L = 3.3 kΩ V _{CC} = 5.0 V, C _L = 8.0 pF, R _L = 7.2 kΩ	I _O	– –	0.5 0.5	3.0 3.0	mA

NOTES: 1. Divide ratio of +64/65 @ 1.1 GHz
 2. Valid over voltage range 2.7 to 5.5 V; R_L = 3.3 kΩ @ V_{CC} = 2.7 V; R_L = 7.2 kΩ @ V_{CC} = 5.0 V

Figure 1. Logic Diagram (MC12052A)

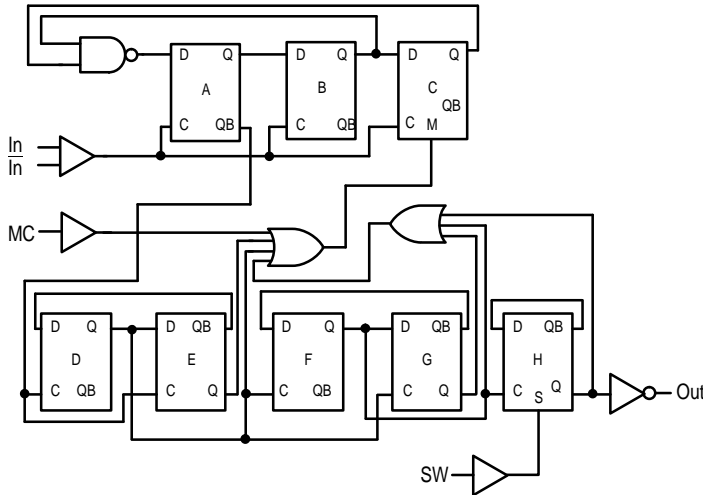


Figure 2. Modulus Setup Time

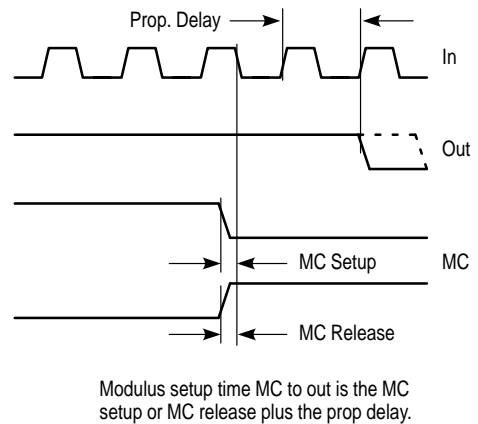
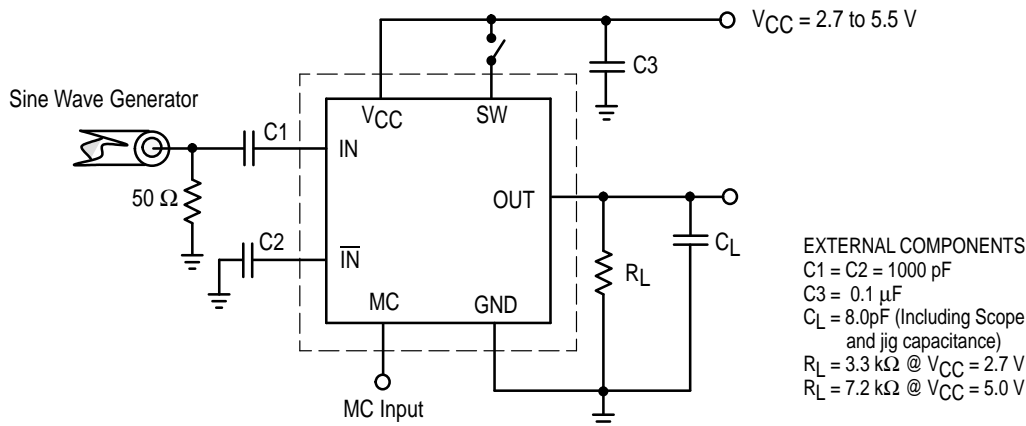


Figure 3. AC Test Circuit

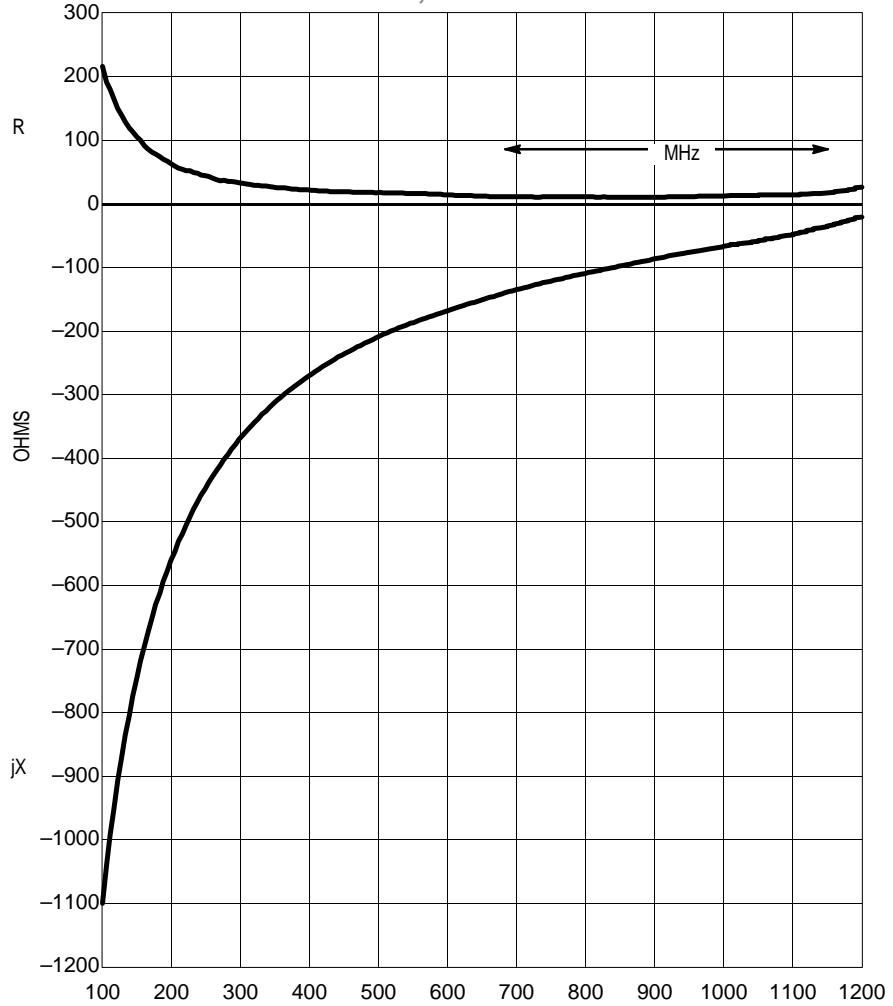


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Figure 4. Typical Input Impedance versus Input Frequency

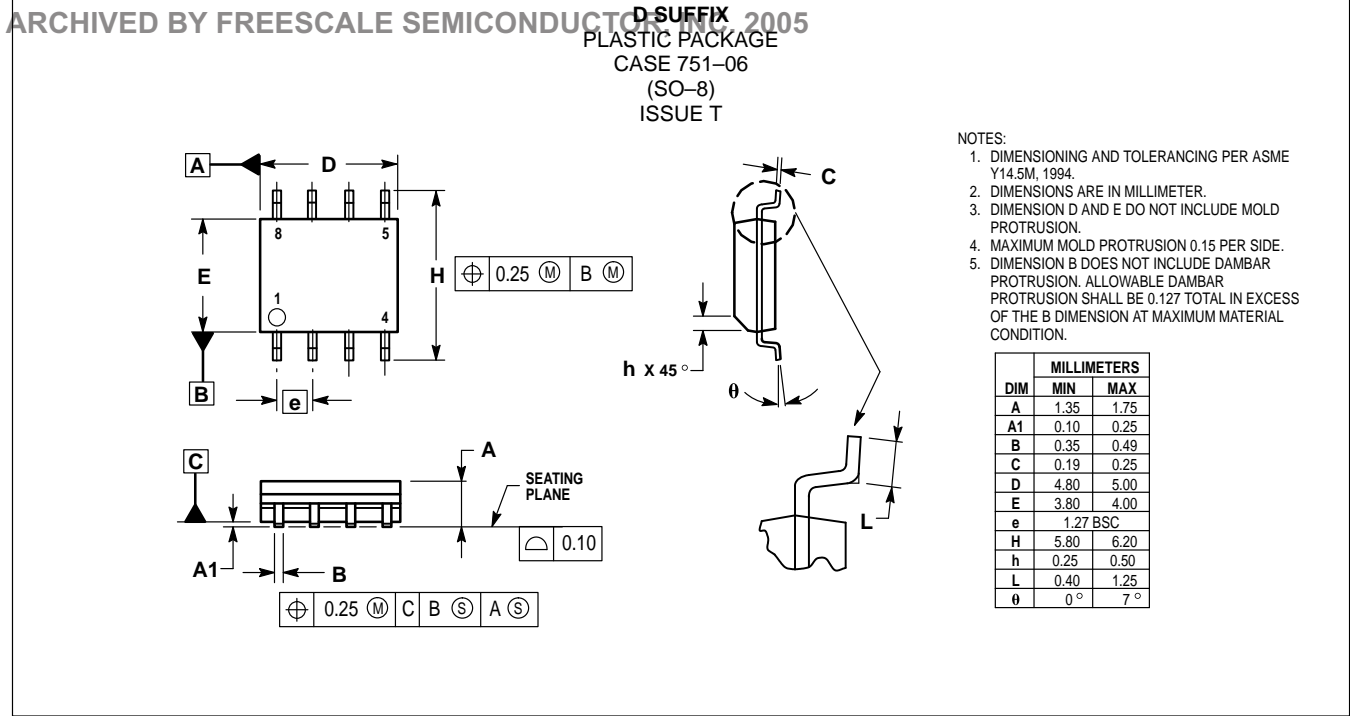
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