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1.1 GHz Low Power Dual Modulus Prescaler

The MC12058 is a low power $\div 126/128$, $\div 254/256$ dual modulus prescaler. Motorola's advanced Bipolar MOSAIC™ V technology is utilized to achieve low power dissipation of 3.0 mW at a minimum supply voltage of 2.7 V. The MC12058 can be operated down to a minimum supply voltage of 2.7 V required for battery operated portable systems.

On-chip output termination provides 250 μ A (typical) output current to drive a 8.0 pF (typical) high impedance load. The Divide Ratio Control input, SW, permits selection of divide ratio as desired. A HIGH on SW selects $\div 126/128$; an OPEN on SW selects $\div 254/256$. The Modulus Control input, MC, selects the proper divide number after SW has been biased to select the desired divide ratio.

- 1.1 GHz Toggle Frequency
- Supply Voltage 2.7 to 5.5 V
- Low Power 1.1 mA Typical at $V_{CC} = 3.0$ V
- Operating Temperature Range of -40 to 85°C
- On-Chip Output Termination

MOSAIC V is a trademark of Motorola

FUNCTIONAL TABLE

SW	MC	Divide Ratio
H	H	126
H	L	128
L	H	254
L	L	256

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	$^{\circ}\text{C}$
Storage Temperature Range	T_{stg}	-65 to 150	$^{\circ}\text{C}$
Modulus Control Input, Pin 6	MC	-0.5 to V_{CC}	Vdc
Maximum Output Current, Pin 4	I_O	4.0	mA

NOTE: ESD data available upon request.

MC12058

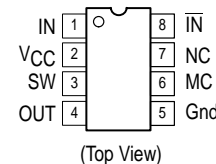
MECL PLL COMPONENTS
 $\div 126/128$, $\div 254/256$
LOW POWER
DUAL MODULUS PRESCALER

SEMICONDUCTOR
TECHNICAL DATA



D SUFFIX
 PLASTIC PACKAGE
 CASE 751
 (SO-8)

PIN CONNECTIONS



ORDERING INFORMATION

Device	Operating Temp Range	Package
MC12058D	$T_A = -40$ to 85°C	SO-8

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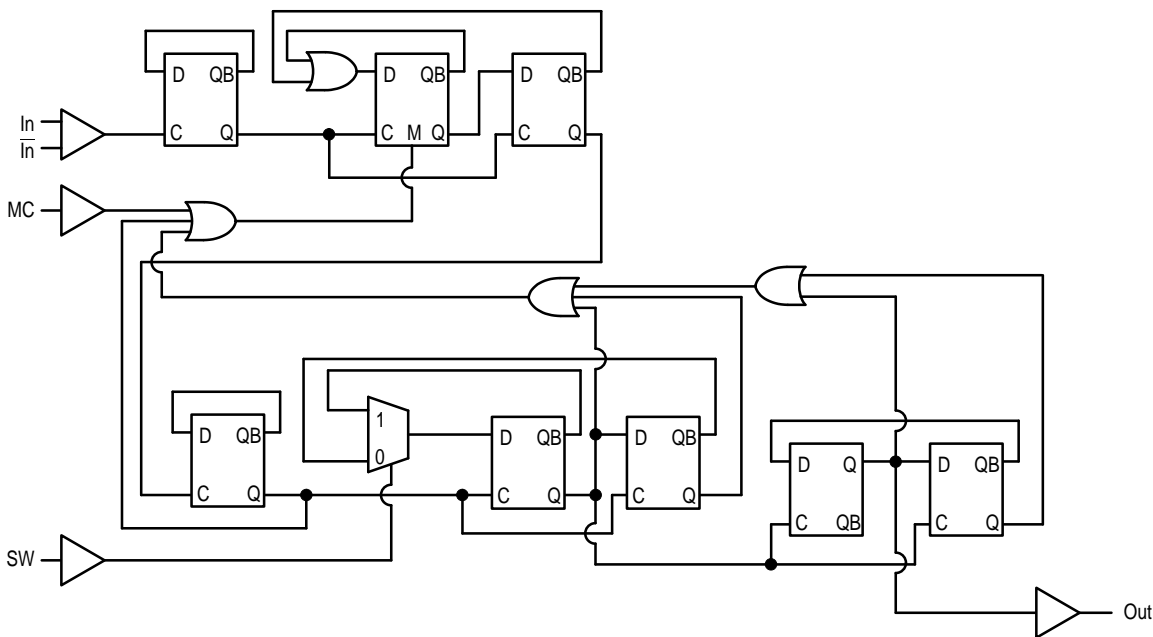
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ELECTRICAL CHARACTERISTICS ($V_{CC} = 2.7$ to 5.5 V; $T_A = -40$ to 85°C , unless otherwise noted.)

Characteristic	Symbol	Min	Typ	Max	Unit
Toggle Frequency (Sine Wave Input)	f_t	0.1	1.4	1.1	GHz
Supply Current Output (Pin 2)	I_{CC}	–	1.1	2.0	mA
Modulus Control Input HIGH (MC)	V_{IH1}	2.0	–	$V_{CC} + 0.5$	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_{CC}	$V_{CC} + 0.5$	V
Divide Ratio Control Input LOW (SW)	V_{IH2}	Open	Open	Open	–
Output Voltage Swing (Note 1)	V_{out}	0.8	1.1	–	V_{pp}
Modulus Setup Time MC to OUT at 1100 MHz	t_{set}	–	11	16	ns
Input Voltage Sensitivity	V_{in}	100	–	1000	mVpp
		250–1100 MHz	–	1000	
		100–250 MHz	400	–	

NOTE: Assumes 8.0 pF high impedance load.

Figure 1. Logic Diagram (MC12058)

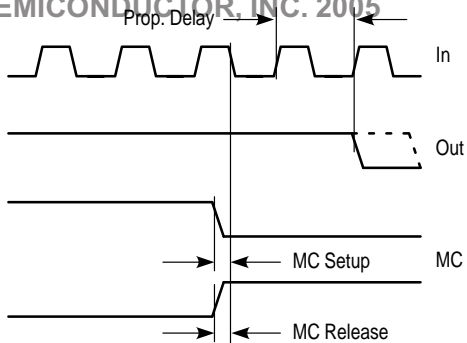


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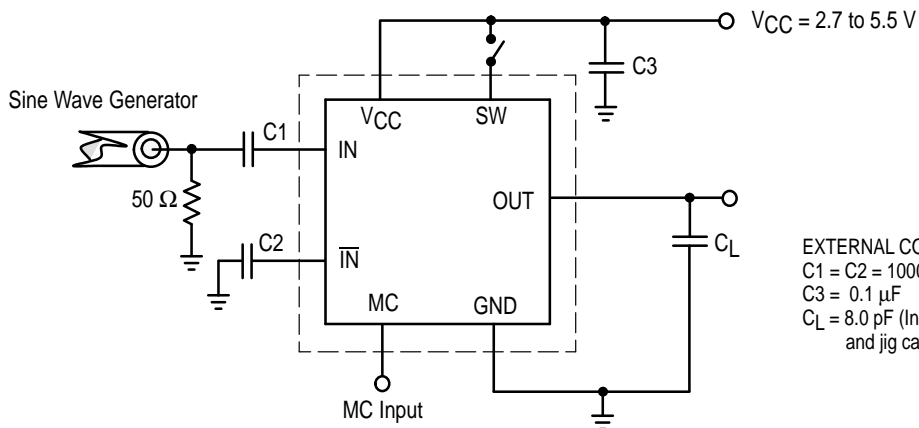
Figure 2. Modulus Setup Time

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

Figure 3. AC Test Circuit



EXTERNAL COMPONENTS
 C1 = C2 = 1000 pF
 C3 = 0.1 μ F
 CL = 8.0 pF (Including Scope and jig capacitance)



Figure 4. Input Signal Amplitude versus Input Frequency

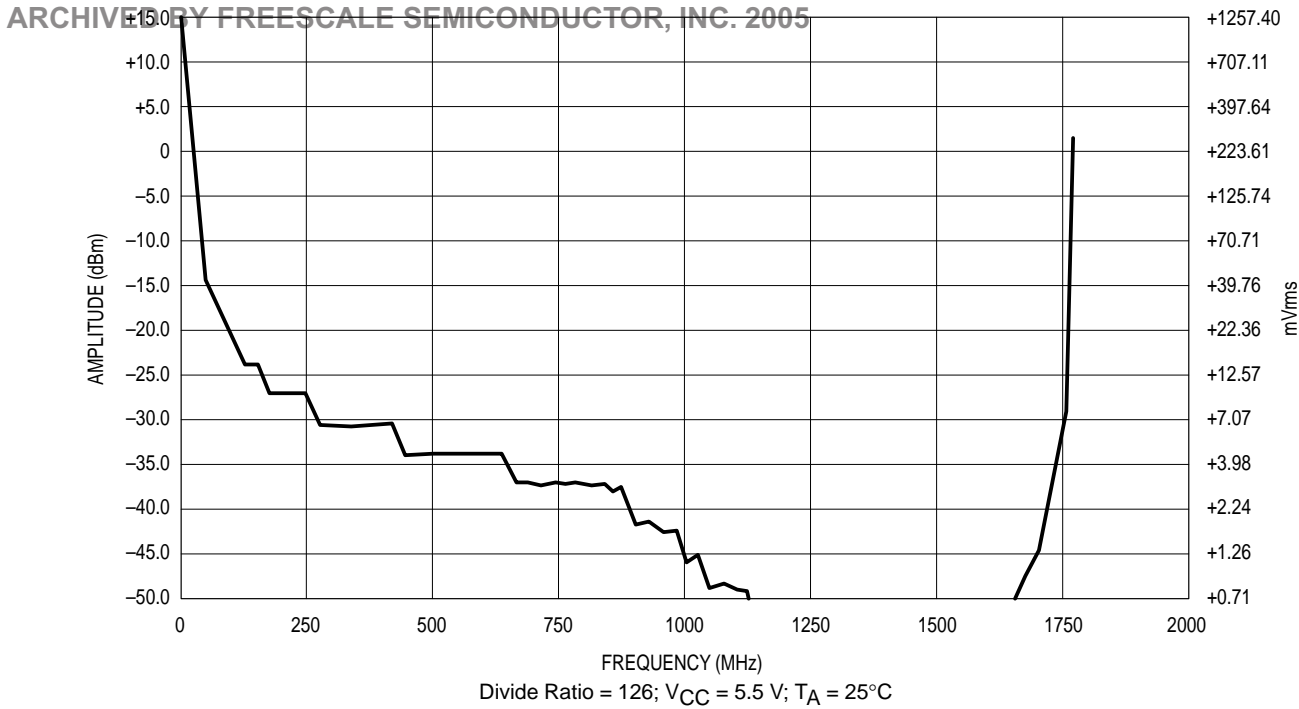
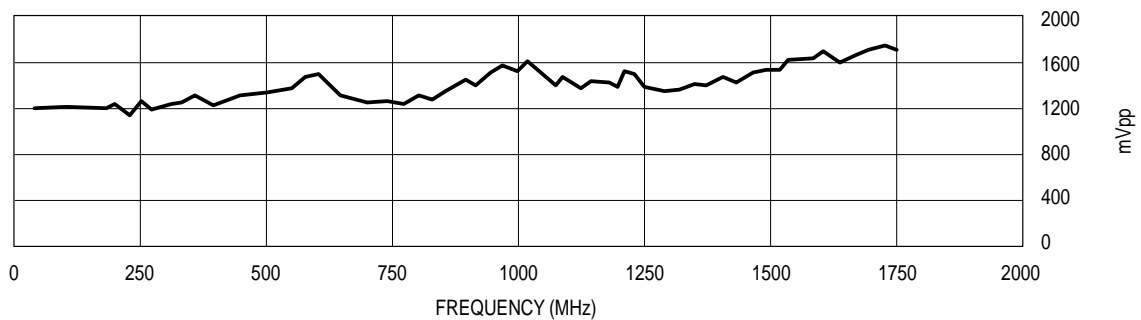


Figure 5. Output Amplitude versus Input Frequency



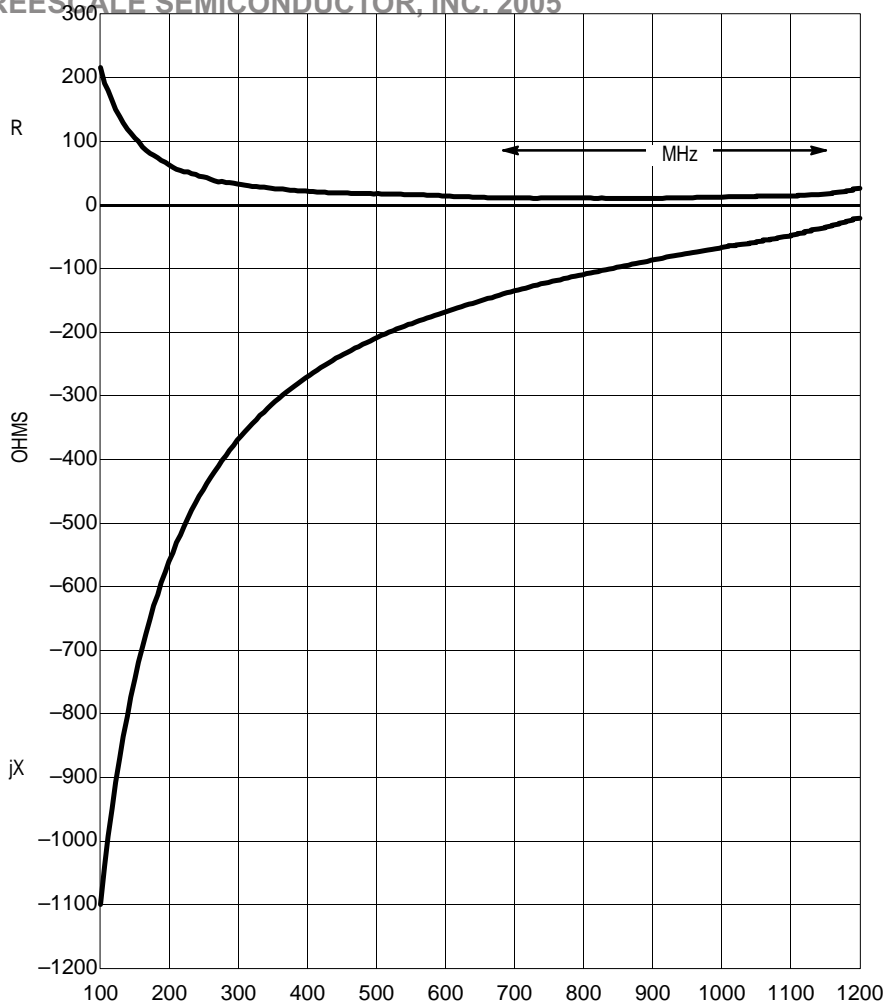
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Figure 6. Typical Input Impedance versus Input Frequency

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OUTLINE DIMENSIONS

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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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