


MOTOROLA

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

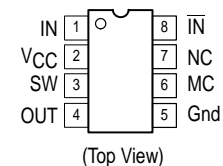
MECL PLL COMPONENTS
 $\div 126/128$, $\div 254/256$
LOW POWER
DUAL MODULUS PRESCALER

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

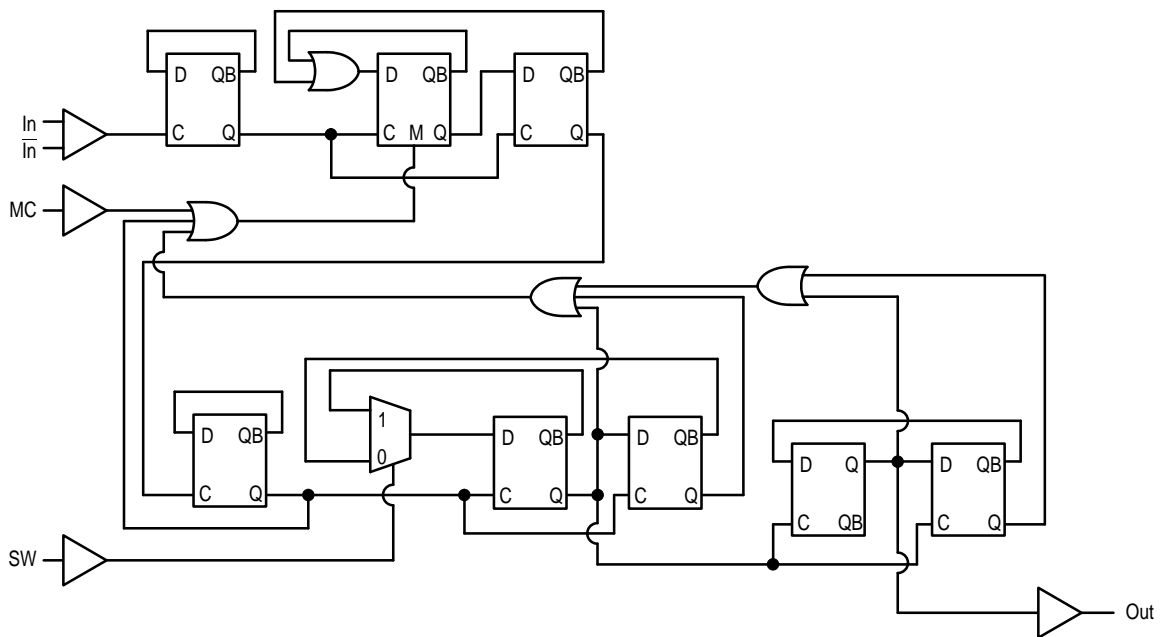
MC12058

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}	250–1100 MHz	100	–	1000	mVpp
		100–250 MHz	400	–	1000	

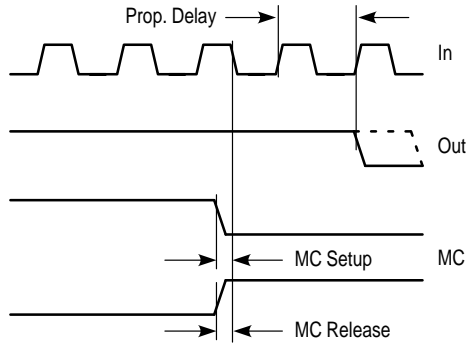
NOTE: Assumes 8.0 pF high impedance load.

Figure 1. Logic Diagram (MC12058)



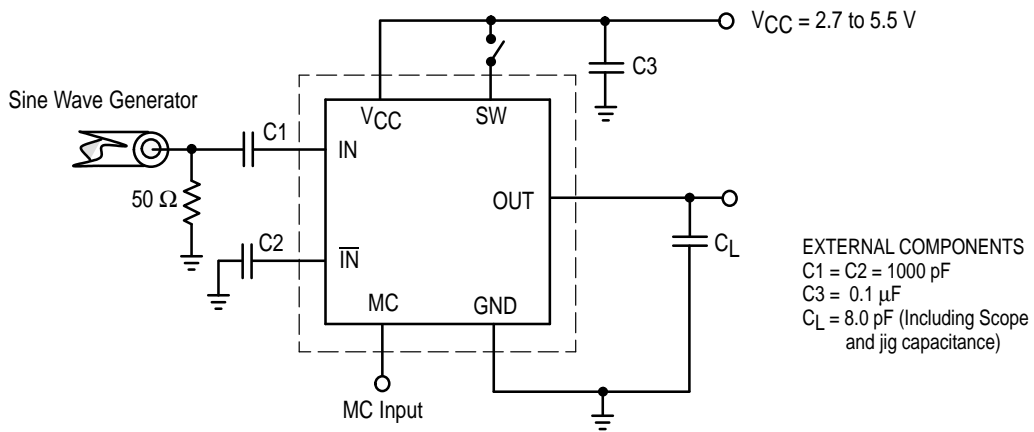
MC12058

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



MC12058

Figure 4. Input Signal Amplitude versus Input Frequency

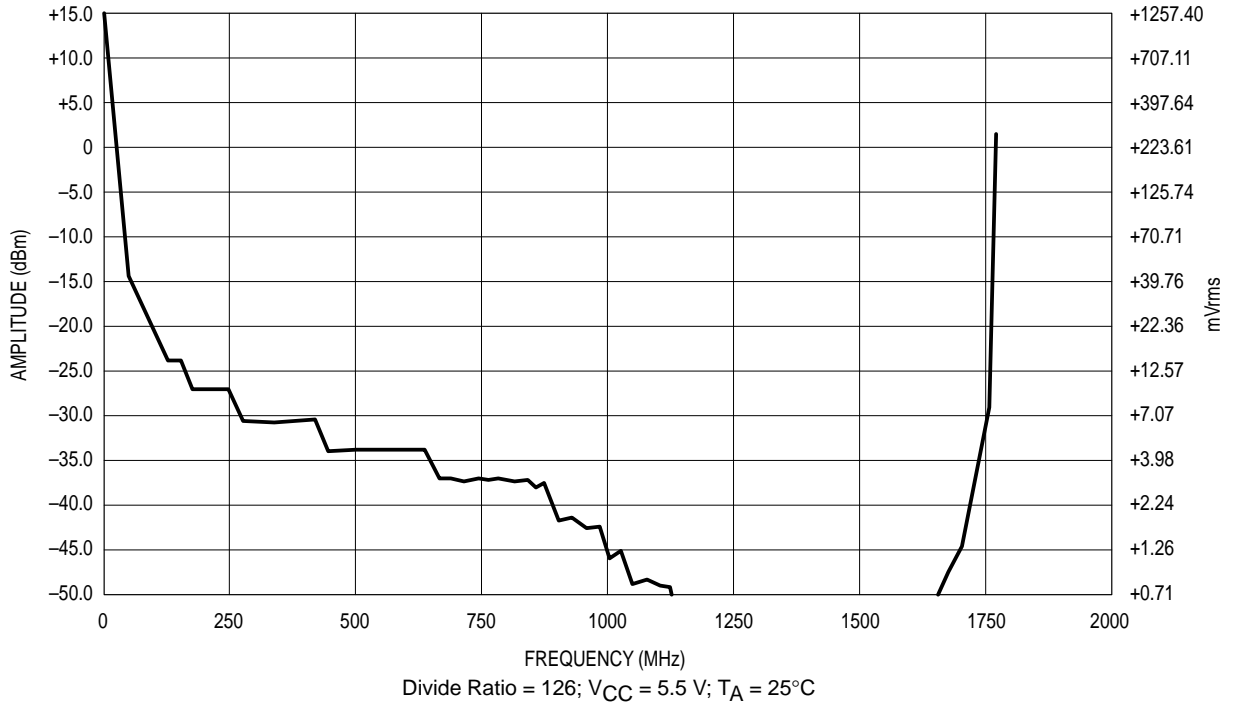
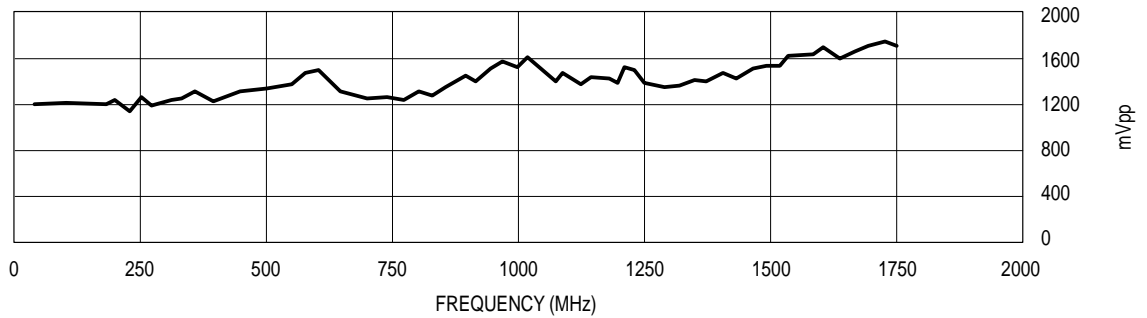
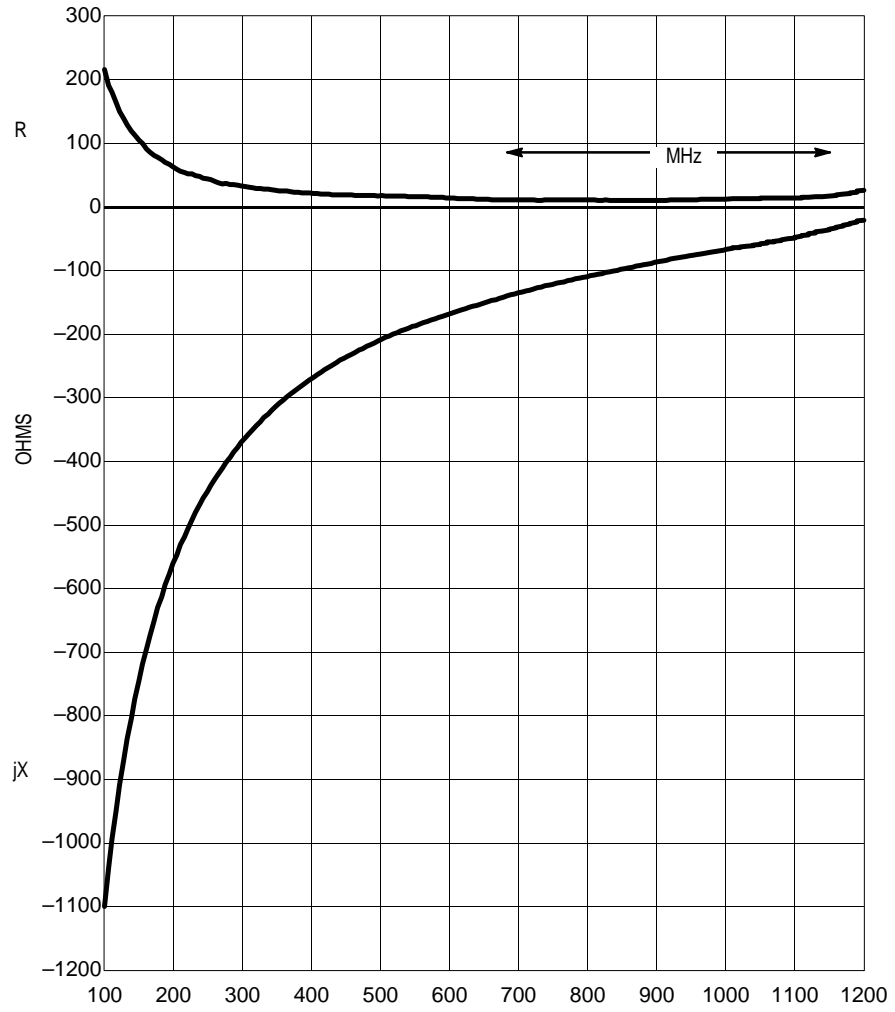


Figure 5. Output Amplitude versus Input Frequency



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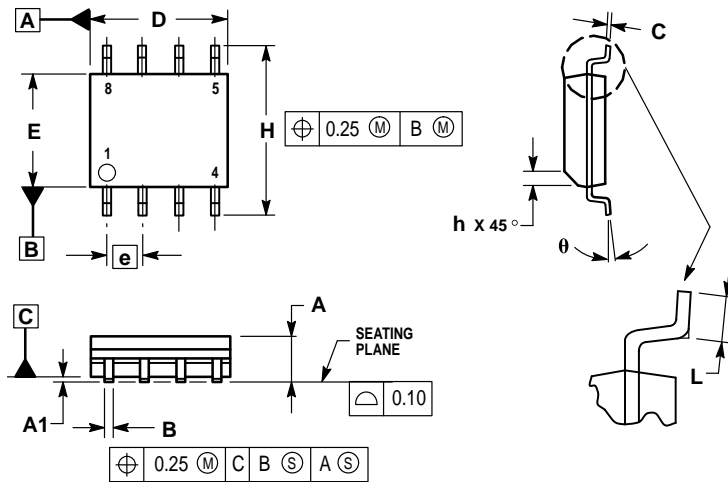
Figure 6. Typical Input Impedance versus Input Frequency



MC12058

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.

DIM	MILLIMETERS	
	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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