MOTOROLA

MC12058

1.1 GHz Low Power Dual Modulus Prescaler

The MC12058 is a low power ÷126/128, ÷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 µA (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 ÷126/128; an OPEN on SW selects ÷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

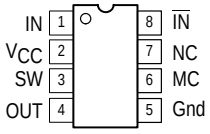
MOSAIC V is a trademark of Motorola

MECL PLL COMPONENTS
÷126/128, ÷254/256
LOW POWER
DUAL MODULUS PRESCALER

SEMICONDUCTOR
TECHNICAL DATA

D SUFFIX
PLASTIC PACKAGE
CASE 751
(SO–8)

PIN CONNECTIONS



(Top View)

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	°C
Storage Temperature Range	T_{stg}	–65 to 150	°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.

ORDERING INFORMATION

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

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 250–1100 MHz 100–250 MHz	V_{in}	100 400	– –	1000 1000	mVpp

NOTE: Assumes 8.0 pF high impedance load.

Figure 1. Logic Diagram (MC12058)

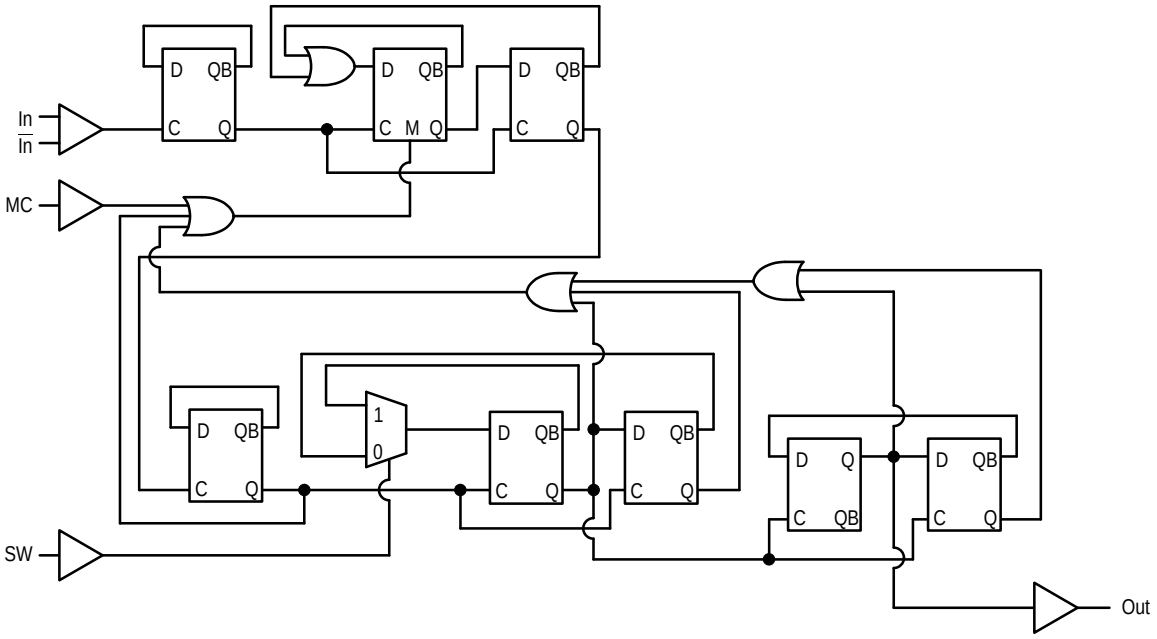
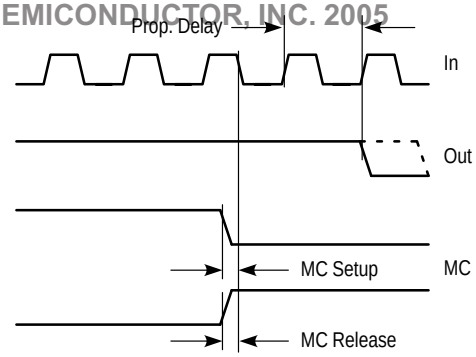
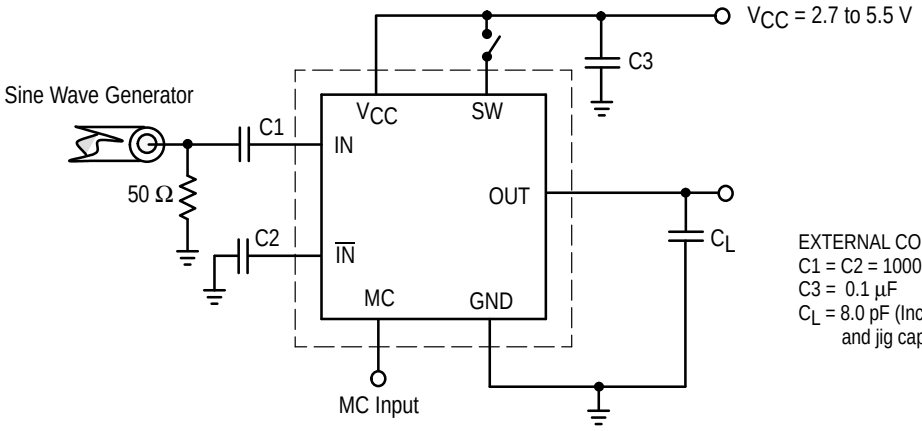


Figure 2. Modulus Setup Time



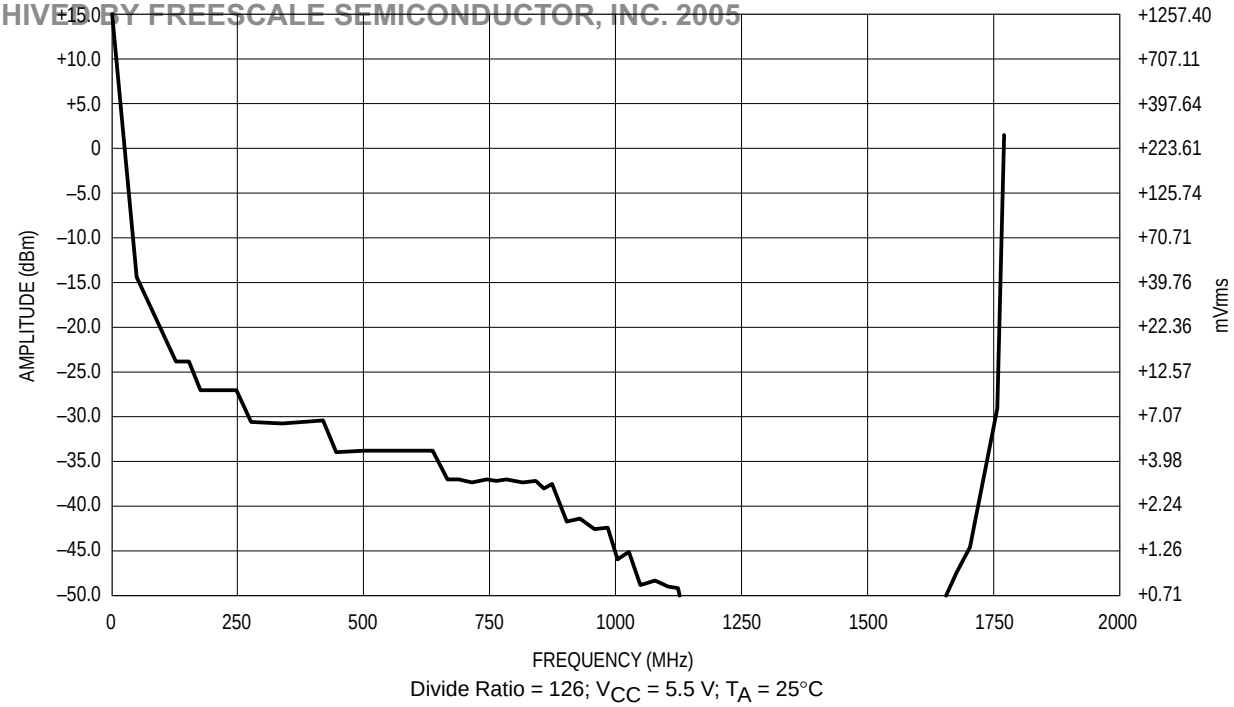
Modulus setup time MC to out is the MC setup or MC release plus the prop delay.

Figure 3. AC Test Circuit



EXTERNAL COMPONENTS
C1 = C2 = 1000 pF
C3 = 0.1 µF
C_L = 8.0 pF (Including Scope and jig capacitance)

Figure 4. Input Signal Amplitude versus Input Frequency



Divide Ratio = 126; V_{CC} = 5.5 V; T_A = 25°C

Figure 5. Output Amplitude versus Input Frequency

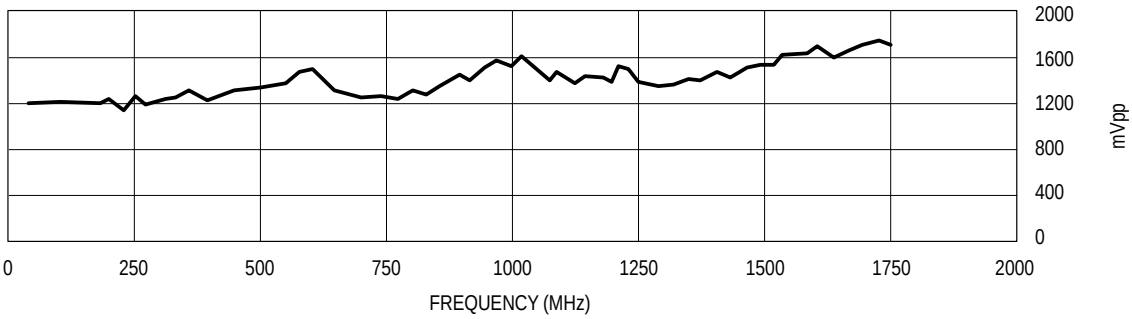
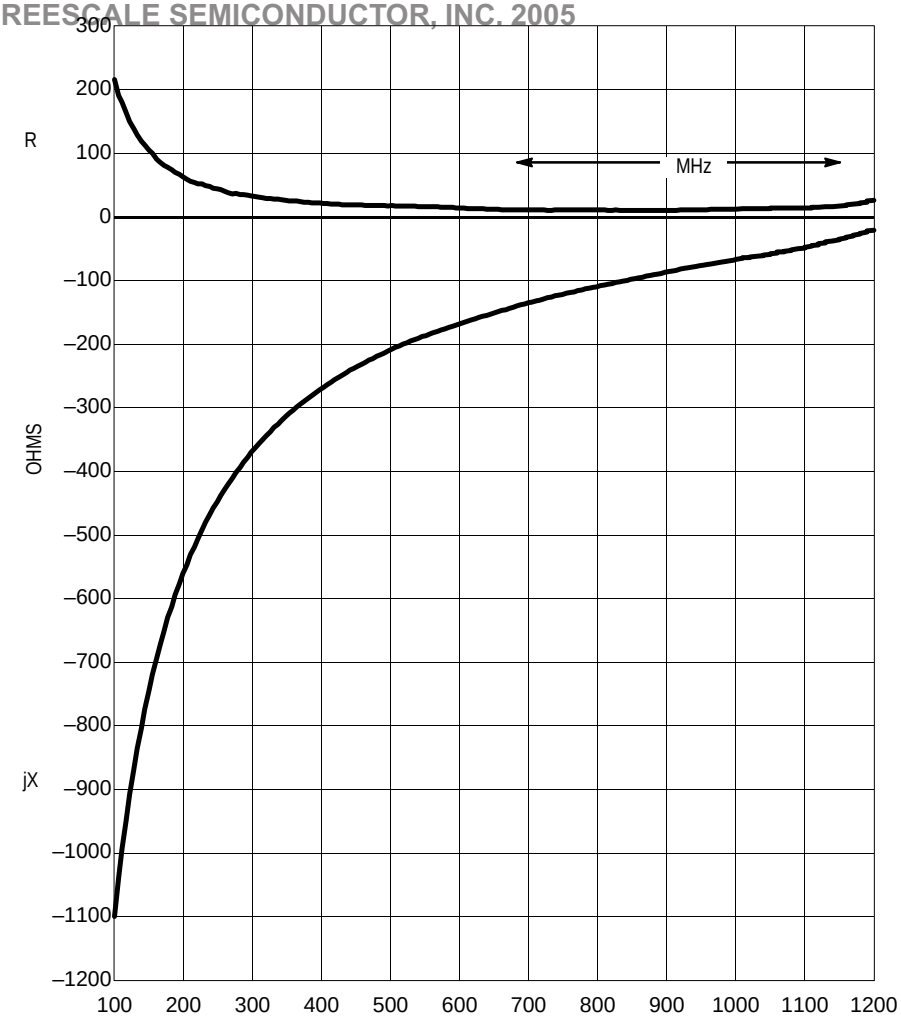
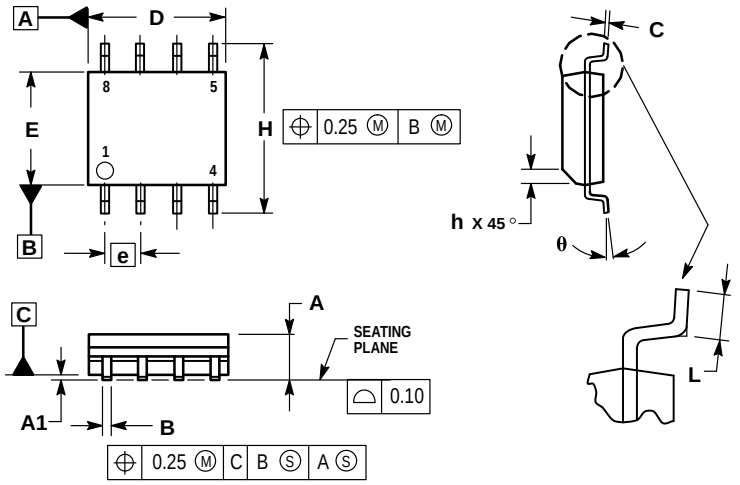


Figure 6. Typical Input Impedance versus Input Frequency



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.

	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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