

# MC12080

## 1.1 GHz Prescaler

The MC12080 is a single modulus divide by 10, 20, 40, 80 prescaler for low power frequency division of a 1.1 GHz high frequency input signal. Divide ratio control inputs SW1, SW2 and SW3 select the required divide ratio of ÷10, ÷20, ÷40, or ÷80.

An external load resistor is required to terminate the output. An 820 Ω resistor is recommended to achieve a 1.2 V<sub>pp</sub> output swing, when dividing a 1.1 GHz input signal by the minimum divide by ratio of 10, assuming a 8.0 pF load. Output current can be minimized dependent on conditions such as output frequency, capacitive load being driven, and output voltage swing required. Typical values for load resistors are included in the V<sub>out</sub> specification for various divide ratios at 1.1 GHz input frequency.

### Features

- 1.1 GHz Toggle Frequency
- Supply Voltage 4.5 to 5.5 V
- Low Power 3.7 mA Typical at V<sub>CC</sub> = 5.0 V
- Operating Temperature Range of -40 to 85°C

### FUNCTIONAL TABLE

SW1	SW2	SW3	Divide Ratio
L	L	L	80
L	L	H	40
L	H	L	40
L	H	H	20
H	L	L	40
H	L	H	20
H	H	L	20
H	H	H	10

NOTE: SW1, SW2 and SW3: H = V<sub>CC</sub>, L = Open.

### MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Power Supply Voltage, Pin 2	V <sub>CC</sub>	-0.5 to 7.0	Vdc
Operating Temperature Range	T <sub>A</sub>	-40 to 85	°C
Storage Temperature Range	T <sub>stg</sub>	-65 to 150	°C
Maximum Output Current, Pin 4	I <sub>O</sub>	10	mA

NOTE: ESD data available upon request.



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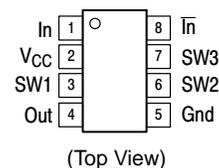
<http://onsemi.com>

### MARKING DIAGRAM



A = Assembly Location  
L = Wafer Lot  
Y = Year  
W = Work Week

### PIN CONNECTIONS



### ORDERING INFORMATION

Device	Package	Shipping
MC12080D	SO-8	98 Units/Rail
MC12080DR2	SO-8	2500 Tape & Reel

# MC12080

## ELECTRICAL CHARACTERISTICS ( $V_{CC} = 4.5$ to $5.5$ V; $T_A = -40$ to $85^\circ\text{C}$ , unless otherwise noted.)

Characteristic	Symbol	Min	Typ	Max	Unit
Toggle Frequency (Sine Wave)	ft	0.1	1.4	1.1	GHz
Supply Current Output (Pin 2)	$I_{CC}$	–	3.7	5.0	mA
Input Voltage Sensitivity 100 to 250 MHz 250 to 1100 MHz	$V_{in}$	400 100	– –	1000 1000	mVpp
Divide Ratio Control Input High (SW1, SW2, SW3)	$V_{IH}$	$V_{CC} - 0.5$ V	$V_{CC}$	$V_{CC} + 0.5$ V	V
Divide Ratio Control Input Low (SW1, SW2, SW3)	$V_{IL}$	Open	Open	Open	–
Output Voltage Swing (Note 1) $R_L = 820 \Omega$ , $I_O = 4.0$ mA for $\pm 10$ $R_L = 1.6$ k $\Omega$ , $I_O = 2.1$ mA for $\pm 20$ $R_L = 3.3$ k $\Omega$ , $I_O = 1.1$ mA for $\pm 40$ $R_L = 6.2$ k $\Omega$ , $I_O = 0.57$ mA for $\pm 80$	$V_{out}$	0.8	1.2	–	Vpp

1. Assumes 8.0 pF load and 1.1 GHz input frequency (typical),  $I_O$  at  $V_{CC} = 5.0$  V and  $T_A = 25^\circ\text{C}$ .

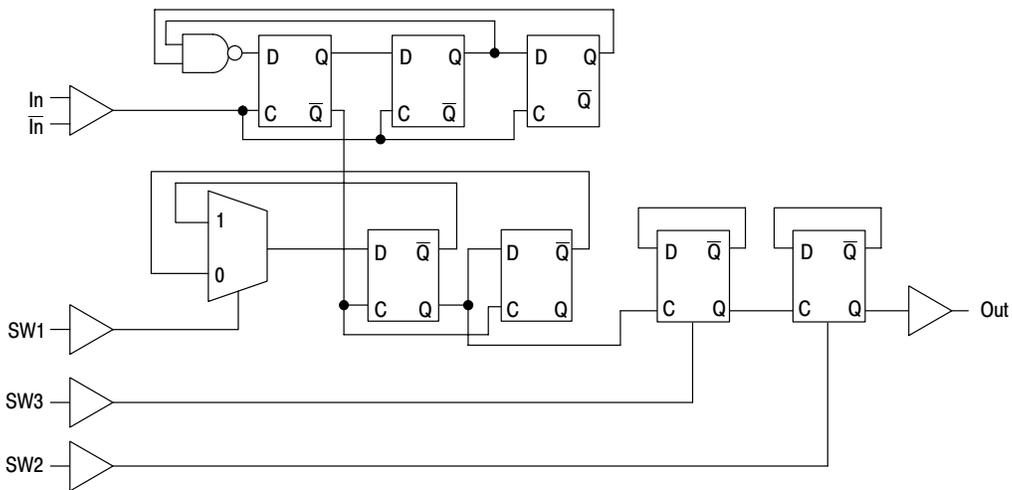


Figure 1. Logic Diagram

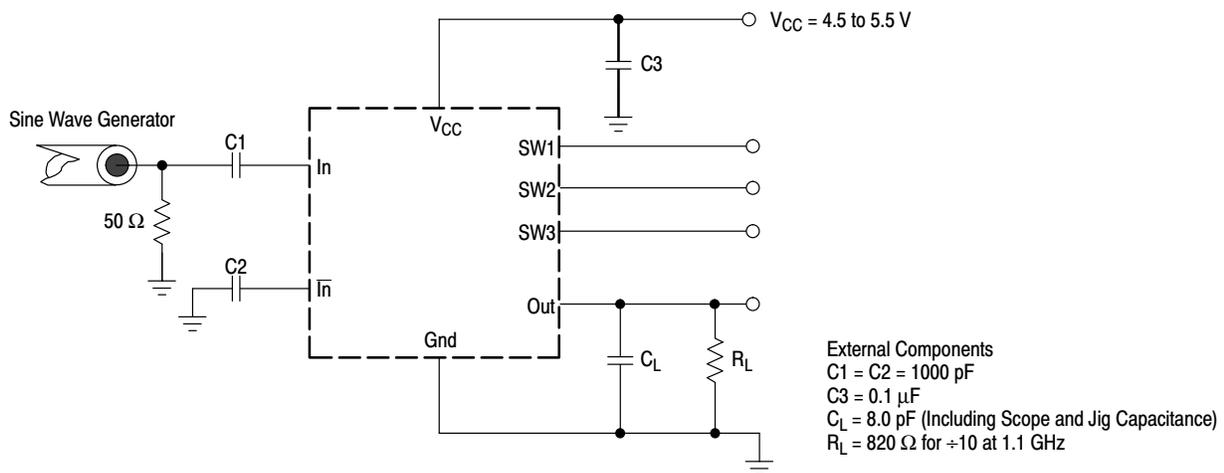


Figure 2. AC Test Circuit

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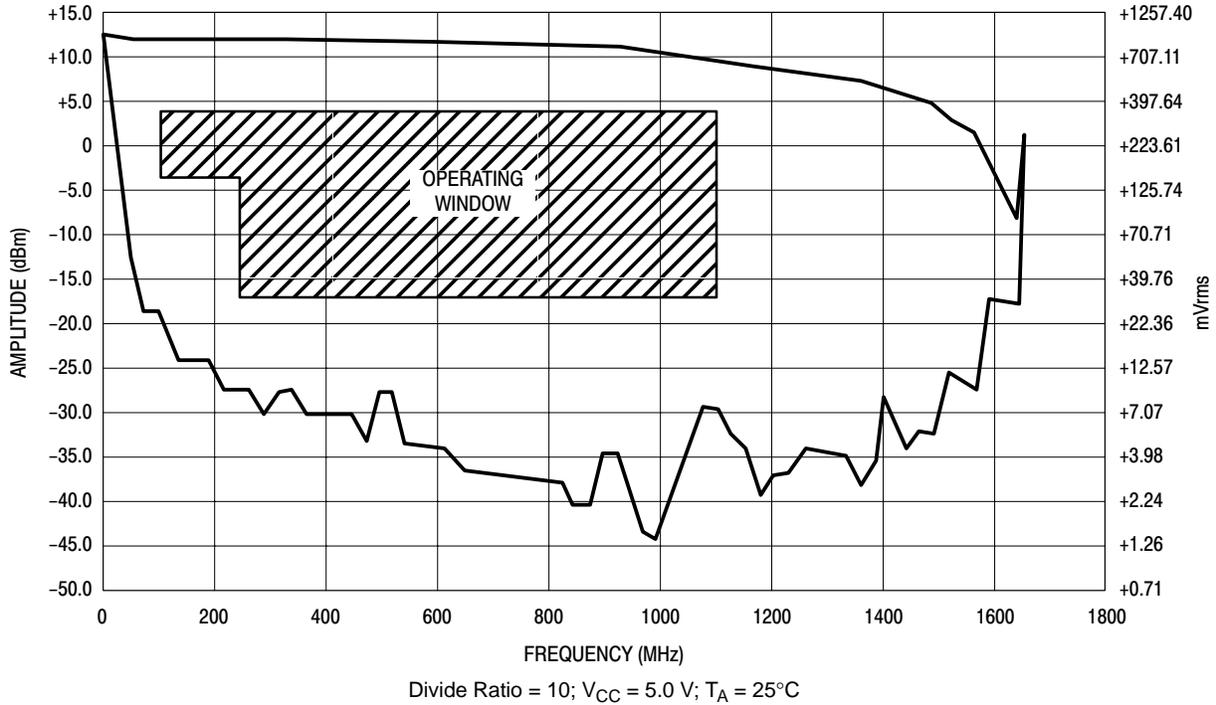


Figure 3. Input Signal Amplitude versus Input Frequency

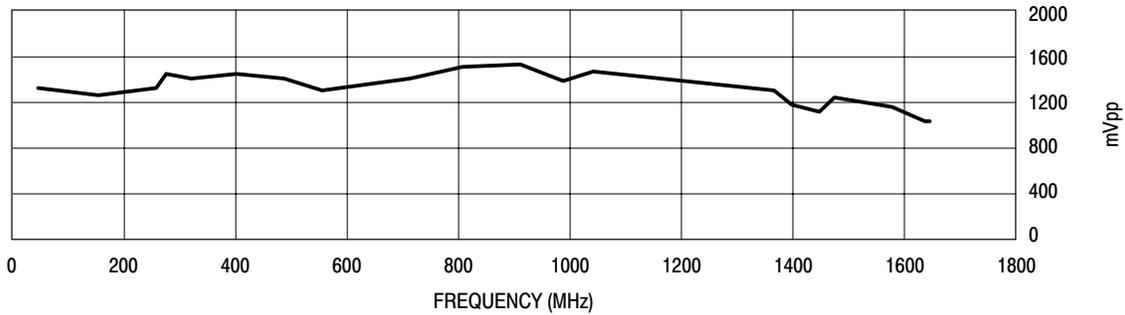
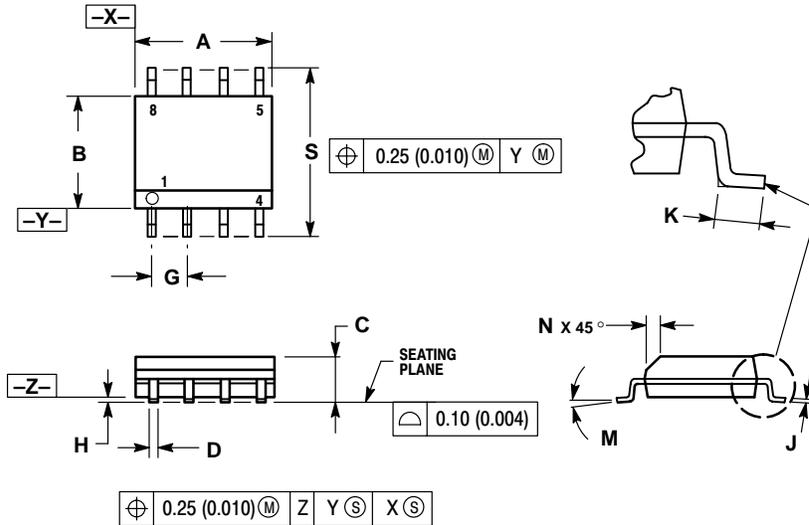


Figure 4. Output Amplitude versus Input Frequency

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## PACKAGE DIMENSIONS

SO-8  
D SUFFIX  
CASE 751-07  
ISSUE W



### NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: MILLIMETER.
3. DIMENSION A AND B DO NOT INCLUDE MOLD PROTRUSION.
4. MAXIMUM MOLD PROTRUSION 0.15 (0.006) PER SIDE.
5. DIMENSION D DOES NOT INCLUDE DAMBAR PROTRUSION. ALLOWABLE DAMBAR PROTRUSION SHALL BE 0.127 (0.005) TOTAL IN EXCESS OF THE D DIMENSION AT MAXIMUM MATERIAL CONDITION.

DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	4.80	5.00	0.189	0.197
B	3.80	4.00	0.150	0.157
C	1.35	1.75	0.053	0.069
D	0.33	0.51	0.013	0.020
G	1.27 BSC		0.050 BSC	
H	0.10	0.25	0.004	0.010
J	0.19	0.25	0.007	0.010
K	0.40	1.27	0.016	0.050
M	0°	8°	0°	8°
N	0.25	0.50	0.010	0.020
S	5.80	6.20	0.228	0.244

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