

# 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  $\div$ 10,  $\div$ 20,  $\div$ 40, or  $\div$ 80.

An external load resistor is required to terminate the output. A 820  $\Omega$  resistor is recommended to achieve a 1.2  $V_{pp}$  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  $V_{Out}$  specification for various divide ratios at 1.1 GHz input frequency.

- 1.1 GHz Toggle Frequency
- Supply Voltage 4.5 to 5.5 V
- Low Power 3.7mA 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	Н	40
L	Н	L	40
L	Н	Н	20
Н	L	L	40
Н	L	Н	20
Н	Н	L	20
Н	Н	Н	10

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

### **MAXIMUM RATINGS**

Characteristic	Symbol	Range	Unit
Power Supply Voltage, Pin 2	VCC	-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	Io	10	mA

NOTE: ESD data available upon request.

# MC12080

# MECL PLL COMPONENTS +10/20/40/80 PRESCALER

SEMICONDUCTOR TECHNICAL DATA

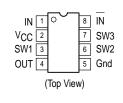


**D SUFFIX**PLASTIC PACKAGE
CASE 751
(SO-8)



P SUFFIX PLASTIC PACKAGE CASE 626

#### **PIN CONNECTIONS**



## ORDERING INFORMATION

Device	Operating Temperature Range	Package
MC12080D	T <sub>A</sub> = - 40° to +85°C	SO-8
MC12080P	1A = 40 10 465 C	Plastic

# MC12080

**ELECTRICAL CHARACTERISTICS** ( $V_{CC}$  = 4.5 to 5.5 V;  $T_A$  = -40 to 85°C, unless otherwise noted.)

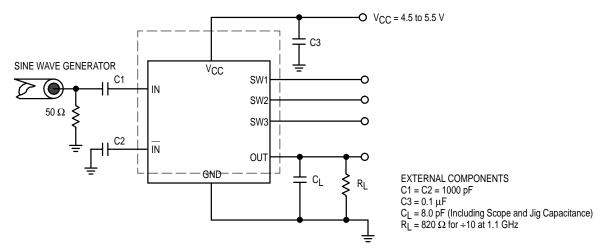
Parameter		Symbol	Min	Тур	Max	Unit
Toggle Frequency (Sine Wave)		ft	0.1	1.4	1.1	GHz
Supply Current Output (Pin 2)		ICC	_	3.7	5.0	mA
Input Voltage Sensitivity	100–250 MHz 250–1100 MHz	V <sub>in</sub>	400 100	-	1000 1000	mVpp
Divide Ratio Control Input High (SW1, SW2, SW3)		VIH	V <sub>CC</sub> – 0.5 V	VCC	V <sub>CC</sub> + 0.5 V	V
Divide Ratio Control Input Low (SW1, SW2, SW3)		VIL	Open	Open	Open	-
Output Voltage Swing <sup>1</sup>	$\begin{aligned} R_L &= 820 \ \Omega, \ I_O = 4.0 \ \text{mA for } \div 10 \\ R_L &= 1.6 \ \text{k}\Omega, \ I_O = 2.1 \ \text{mA for } \div 20 \\ R_L &= 3.3 \ \text{k}\Omega, \ I_O = 1.1 \ \text{mA for } \div 40 \\ R_L &= 6.2 \ \text{k}\Omega, \ I_O = 0.57 \ \text{mA for } \div 80 \end{aligned}$	V <sub>out</sub>	0.8	1.2	_	V <sub>pp</sub>

NOTE: 1. Assumes 8.0 pF load and 1.1 GHz input frequency (typical), I<sub>O</sub> at V<sub>CC</sub> = 5.0 V and T<sub>A</sub> = 25°C

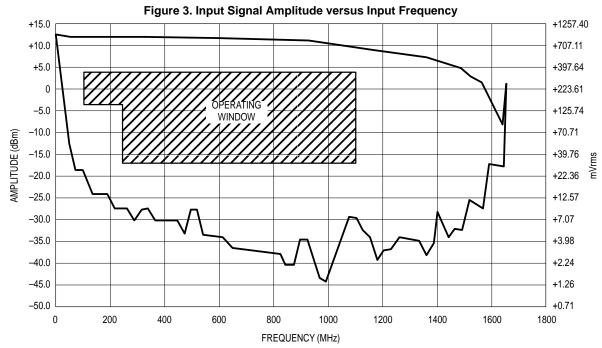
SW1 D QB D QB D QB D QB OUT

Figure 1. Logic Diagram (MC12080)

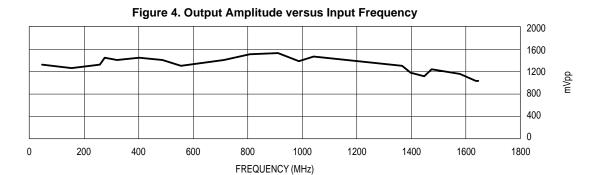
Figure 2. AC Test Circuit



# MC12080

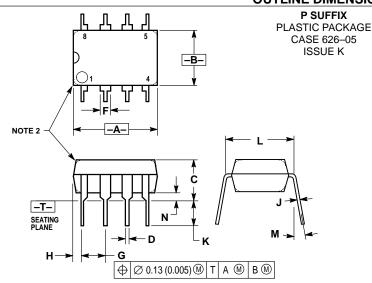


Divide Ratio = 10;  $V_{CC}$  = 5.0 V;  $T_A$  = 25°C



#### MC12080

#### **OUTLINE DIMENSIONS**

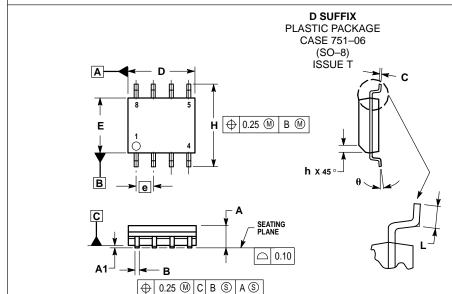


#### NOTES:

- 1. DIMENSION L TO CENTER OF LEAD WHEN FORMED PARALLEL. 2. PACKAGE CONTOUR OPTIONAL (ROUND OR
- SQUARE CORNERS).

  3. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982

1 110111, 1002.				
	MILLIMETERS		INCHES	
DIM	MIN	MAX	MIN	MAX
Α	9.40	10.16	0.370	0.400
В	6.10	6.60	0.240	0.260
O	3.94	4.45	0.155	0.175
D	0.38	0.51	0.015	0.020
F	1.02	1.78	0.040	0.070
O	2.54 BSC		0.100 BSC	
Н	0.76	1.27	0.030	0.050
۲	0.20	0.30	0.008	0.012
Κ	2.92	3.43	0.115	0.135
L	7.62 BSC		0.300	BSC
М	_	10°		10°
Z	0.76	1.01	0.030	0.040



- AUTES:
  1 DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
  2 DIMENSIONS ARE IN MILLIMETER.
  3 DIMENSION D AND E DO NOT INCLUDE MOLD PROTRICION IN AND E DO NOT INCLUDE MOLD

- PROTRUSION.

  MAXIMUM MOLD PROTRUSION 0.15 PER SIDE.

  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	
Α	1.35	1.75	
A1	0.10	0.25	
В	0.35	0.49	
С	0.19	0.25	
D	4.80	5.00	
Е	3.80	4.00	
е	1.27 BSC		
Н	5.80	6.20	
h	0.25	0.50	
L	0.40	1.25	
θ	0°	7 °	

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