


MOTOROLA

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 Ω 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_{CC} = 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_{CC}, L = Open.

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
Maximum Output Current, Pin 4	I _O	10	mA

NOTE: ESD data available upon request.

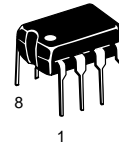
MC12080

MECL PLL COMPONENTS $\div 10/20/40/80$ PRESCALER

SEMICONDUCTOR TECHNICAL DATA

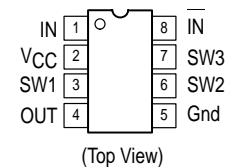


D SUFFIX
PLASTIC PACKAGE
CASE 751
(SO-8)



P SUFFIX
PLASTIC PACKAGE
CASE 626

PIN CONNECTIONS



ORDERING INFORMATION

Device	Operating Temperature Range	Package
MC12080D	T _A = -40° to +85°C	SO-8
MC12080P		Plastic

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

Parameter	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	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 ¹	V_{out}	0.8	1.2	–	Vpp

$R_L = 820 \Omega$, $I_O = 4.0$ mA for ± 10
 $R_L = 1.6$ k Ω , $I_O = 2.1$ mA for ± 20
 $R_L = 3.3$ k Ω , $I_O = 1.1$ mA for ± 40
 $R_L = 6.2$ k Ω , $I_O = 0.57$ mA for ± 80

NOTE: 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 (MC12080)

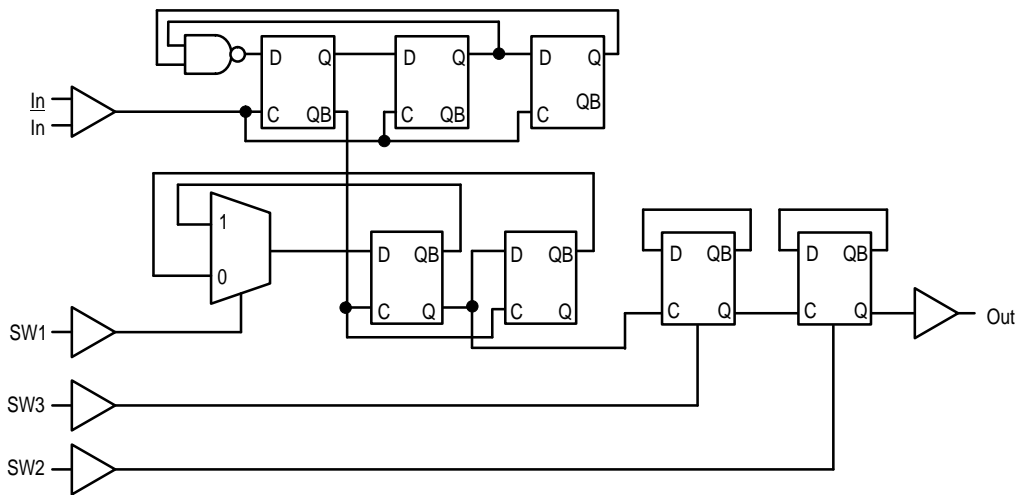
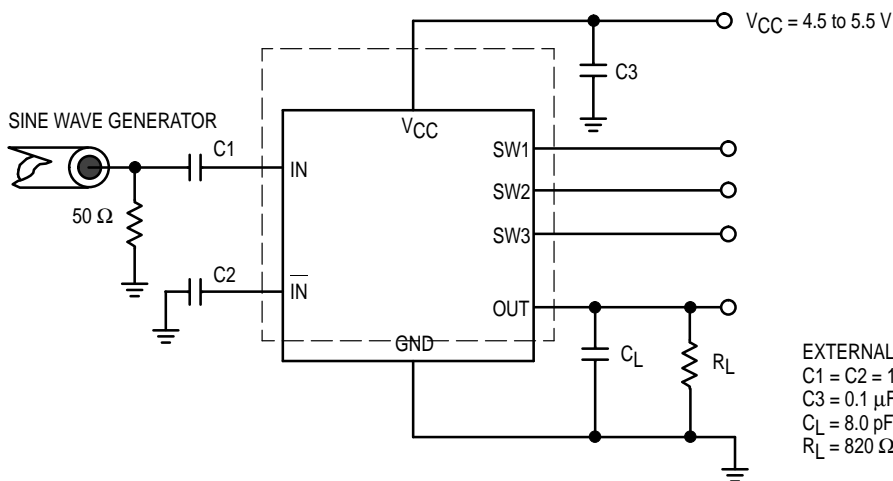


Figure 2. AC Test Circuit



EXTERNAL COMPONENTS
 $C1 = C2 = 1000$ pF
 $C3 = 0.1$ μF
 $C_L = 8.0$ pF (Including Scope and Jig Capacitance)
 $R_L = 820 \Omega$ for ± 10 at 1.1 GHz

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Figure 3. Input Signal Amplitude versus Input Frequency

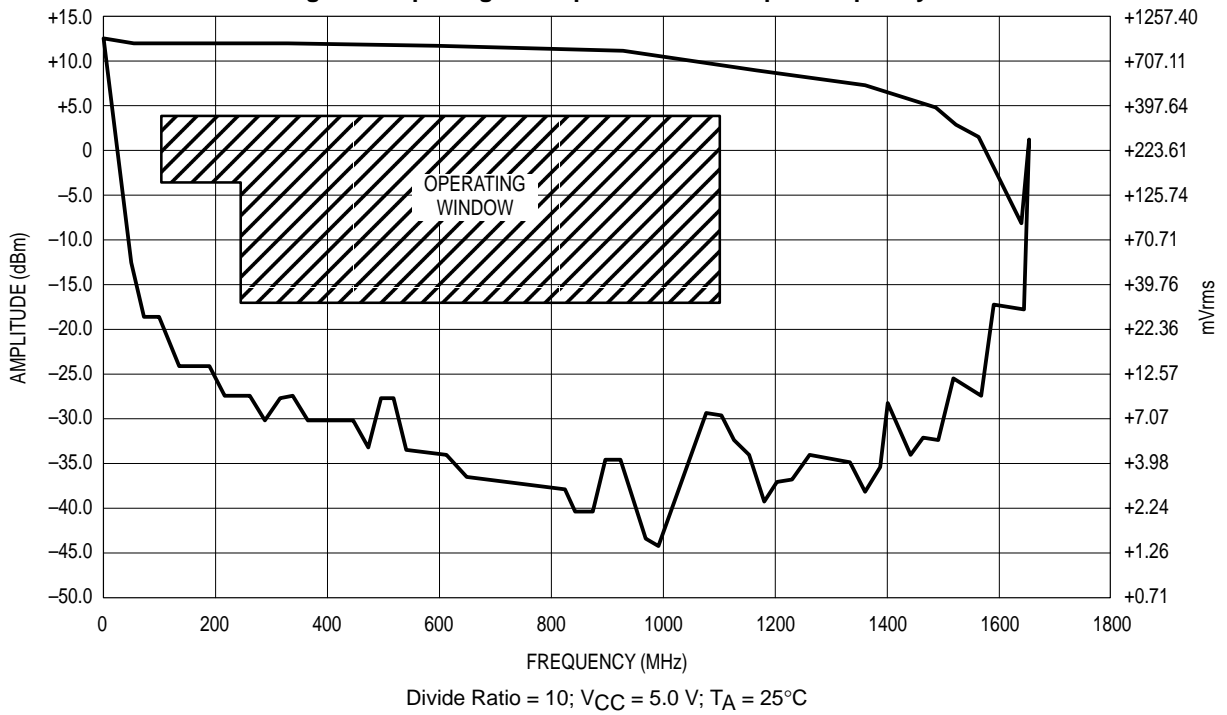
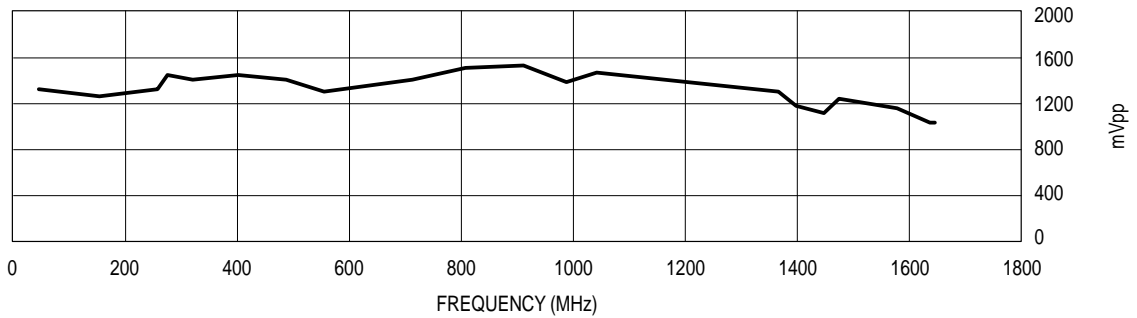
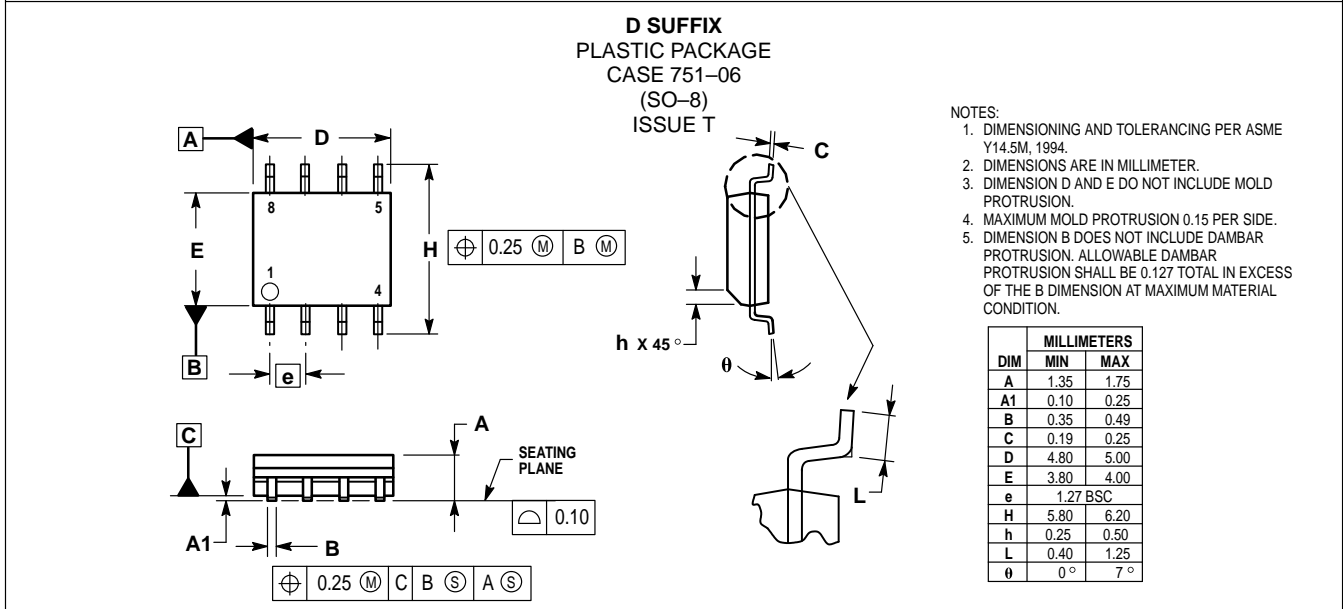
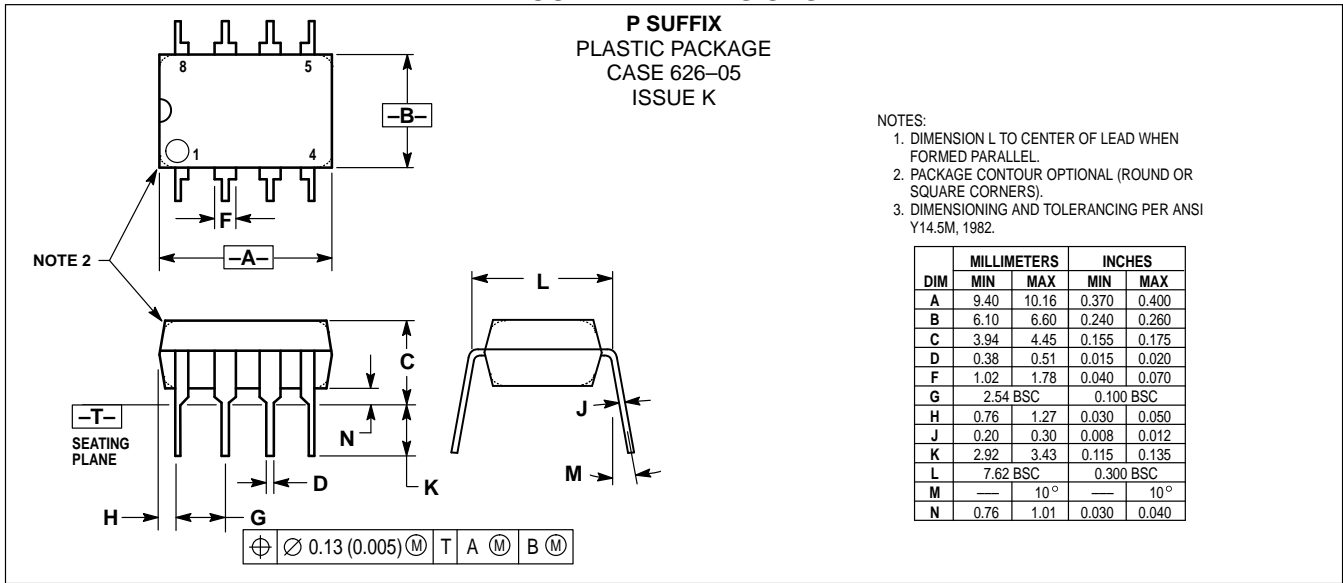


Figure 4. Output Amplitude versus Input Frequency



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OUTLINE DIMENSIONS



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