

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

An external load resistor is required to terminate the output. An 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.

Features

- 1.1 GHz Toggle Frequency
- Supply Voltage 4.5 to 5.5 V
- Low Power 3.7 mA 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

Rating	Symbol	Value	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.



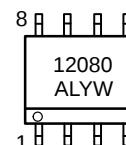
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MARKING DIAGRAM

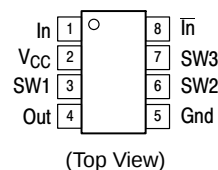


SO-8
D SUFFIX
CASE 751



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°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 Ω, I _O = 4.0 mA for +10 R _L = 1.6 kΩ, I _O = 2.1 mA for +20 R _L = 3.3 kΩ, I _O = 1.1 mA for +40 R _L = 6.2 kΩ, I _O = 0.57 mA for +80	V _{out}	0.8	1.2	–	V _{pp}

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

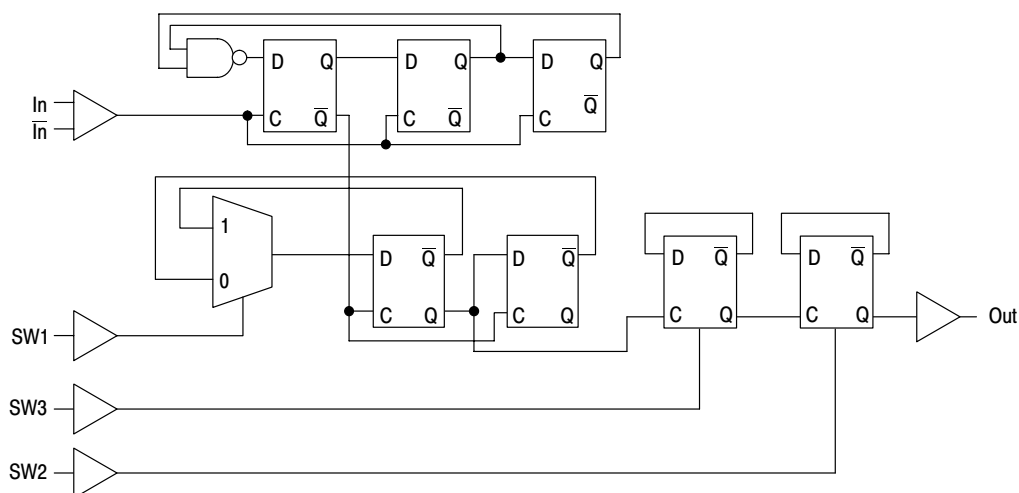


Figure 1. Logic Diagram

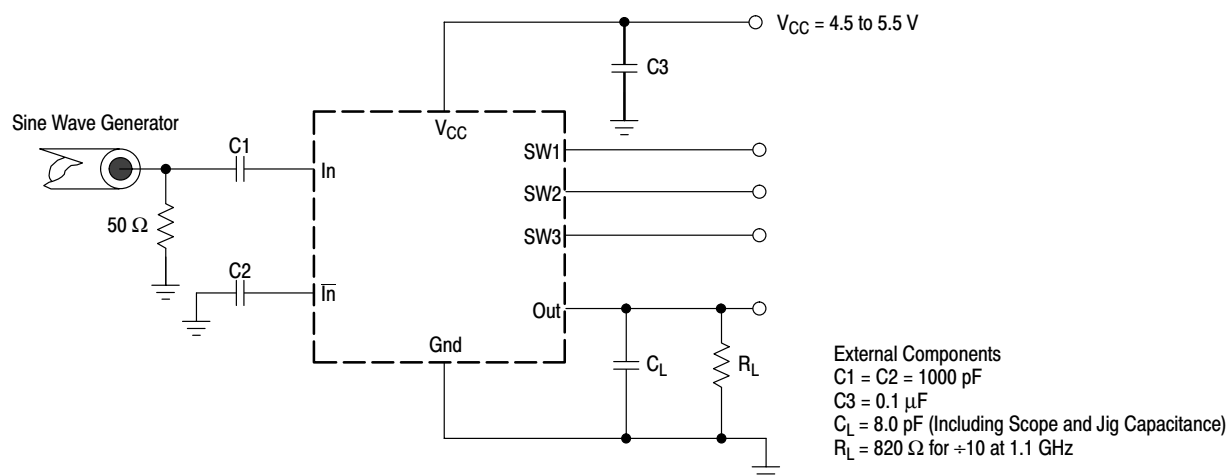


Figure 2. AC Test Circuit

MC12080

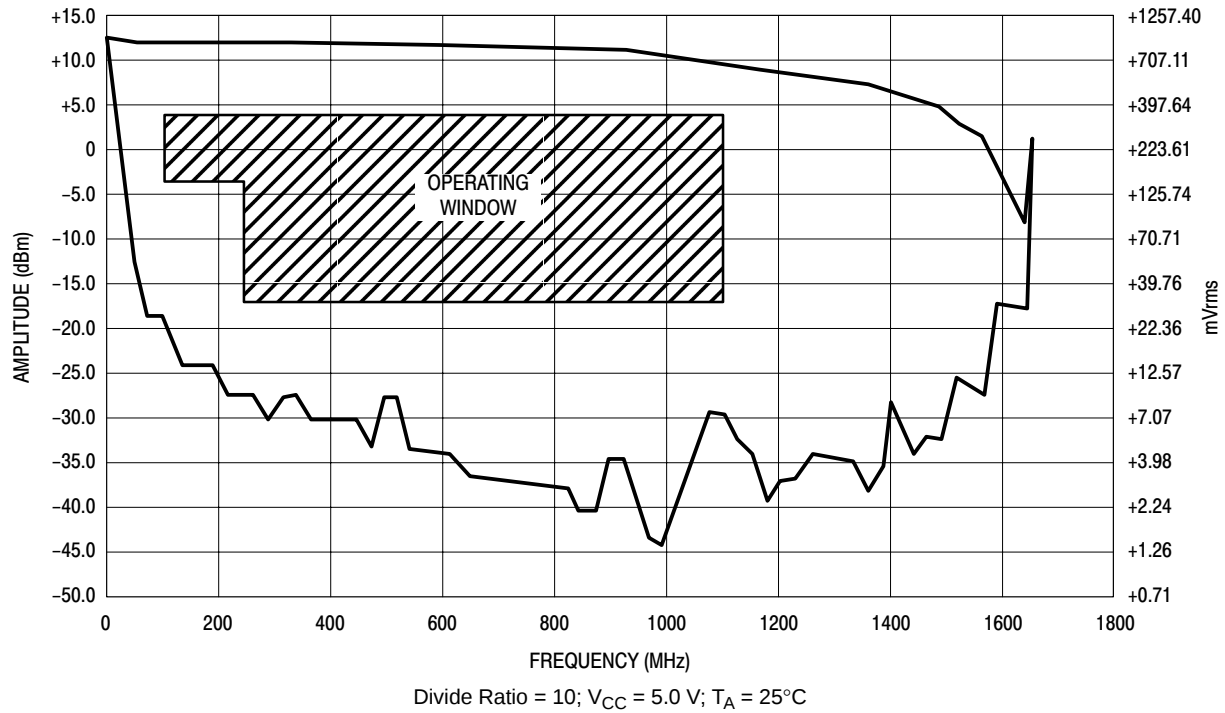


Figure 3. Input Signal Amplitude versus Input Frequency

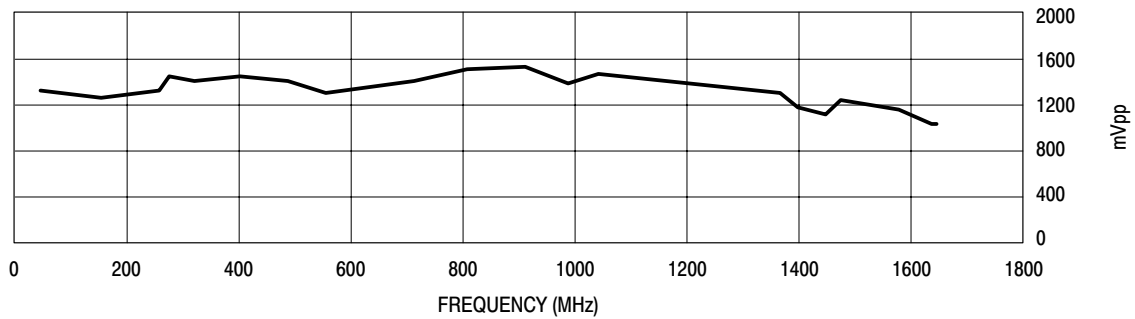
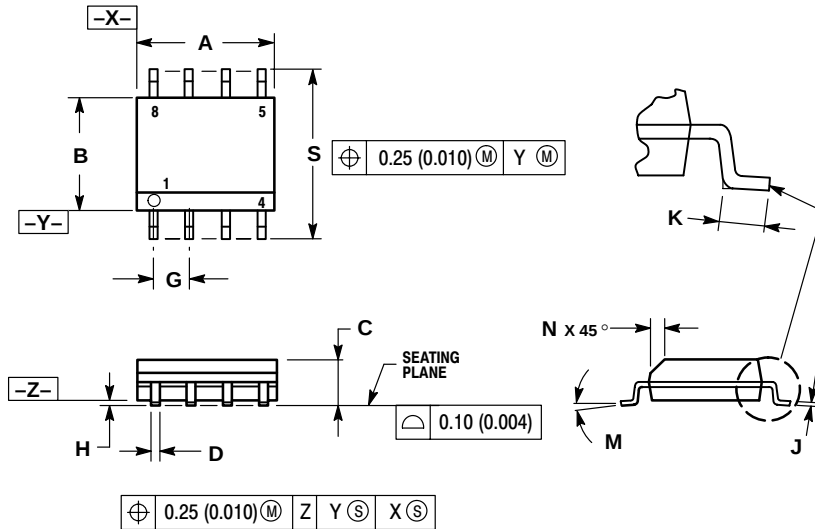


Figure 4. Output Amplitude versus Input Frequency

MC12080

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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