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_{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.

ON Semiconductor™

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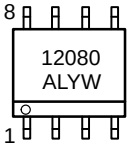
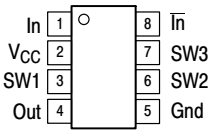
MARKING DIAGRAM

SO–8
D SUFFIX
CASE 751



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

PIN CONNECTIONS



(Top View)

ORDERING INFORMATION

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

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_O at V_{CC} = 5.0 V and T_A = 25°C.

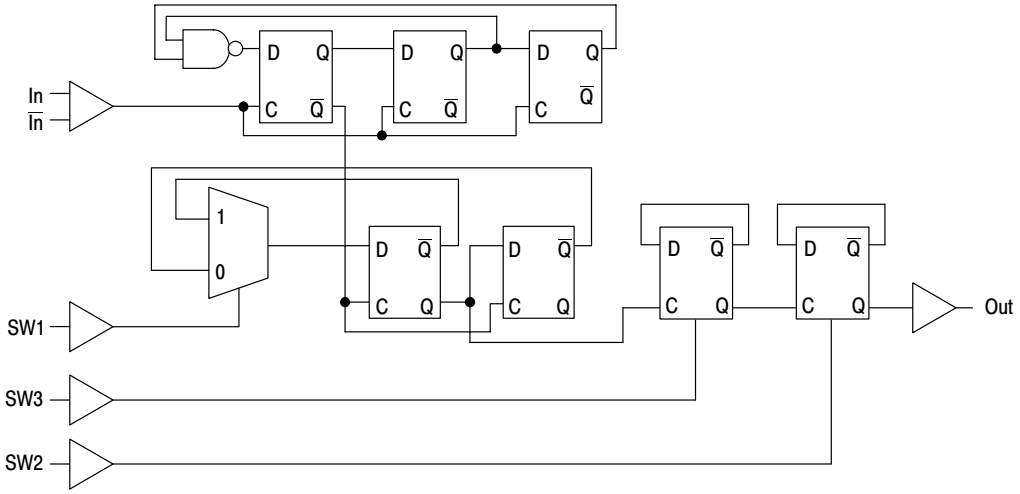


Figure 1. Logic Diagram

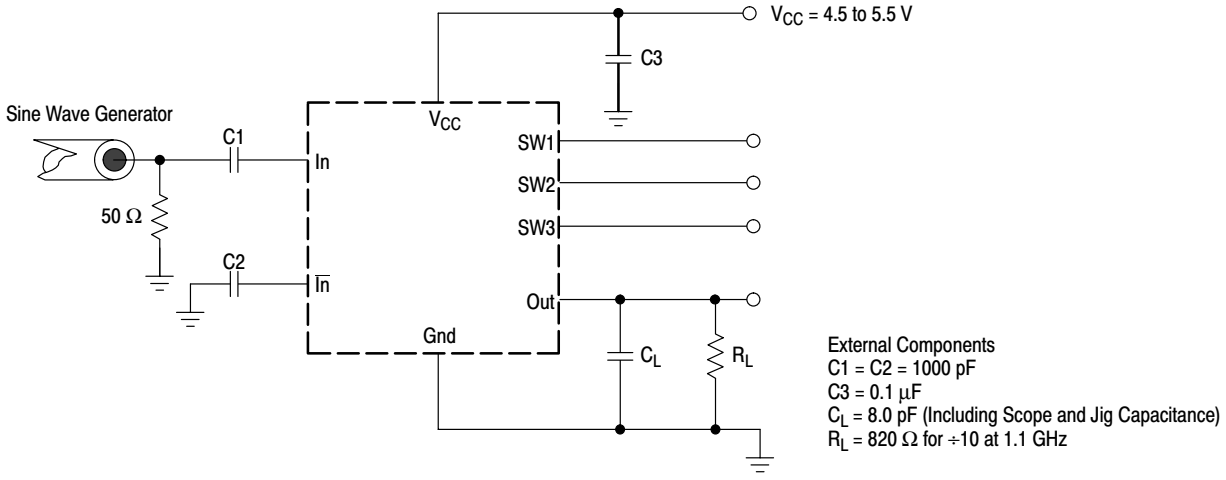
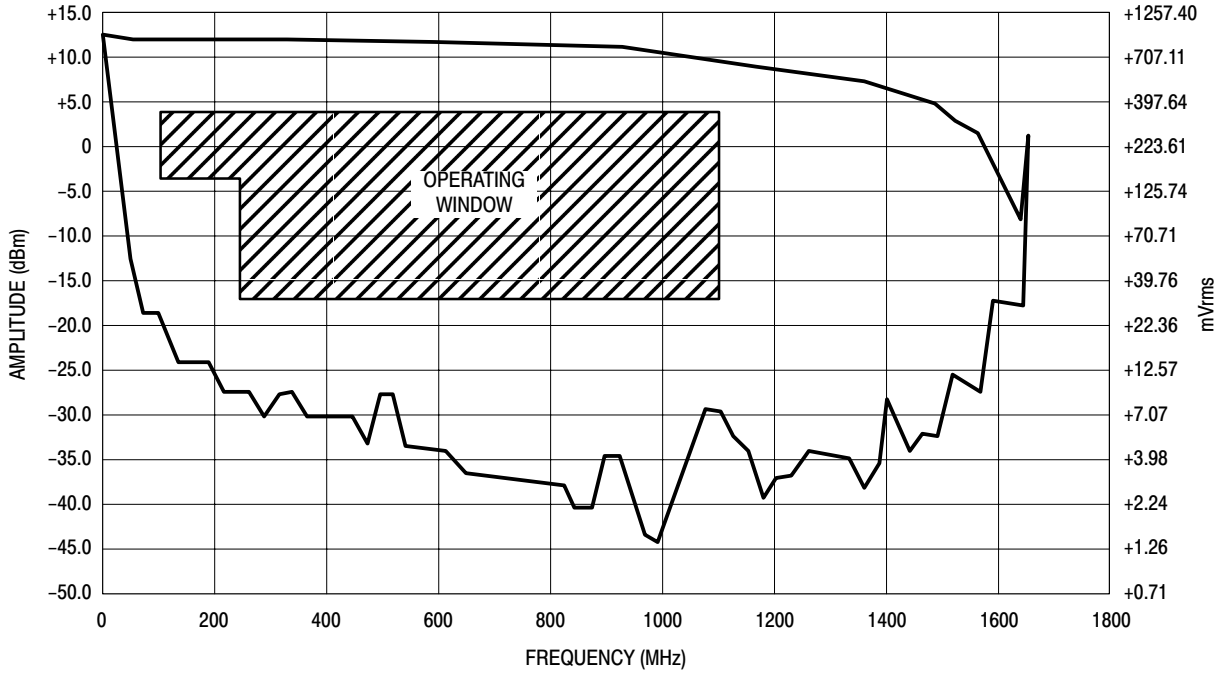


Figure 2. AC Test Circuit



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

Figure 3. Input Signal Amplitude versus Input Frequency

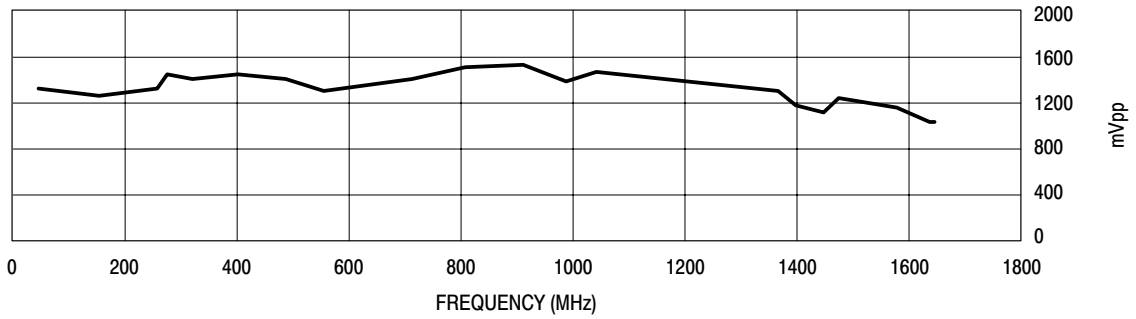
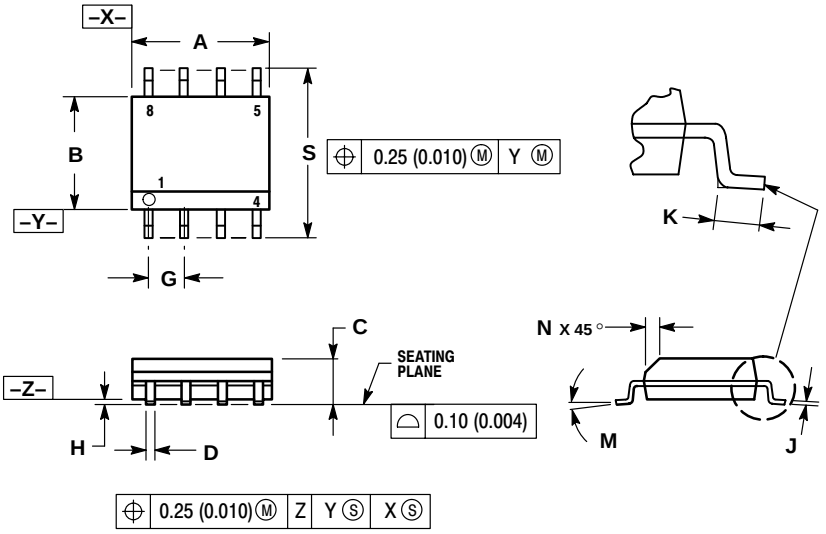


Figure 4. Output Amplitude versus Input Frequency

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.

	MILLIMETERS		INCHES	
DIM	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

PUBLICATION ORDERING INFORMATION

Literature Fulfillment:
Literature Distribution Center for ON Semiconductor
P.O. Box 5163, Denver, Colorado 80217 USA
Phone: 303–675–2175 or 800–344–3860 Toll Free USA/Canada
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Phone: 81–3–5740–2700
Email: r14525@onsemi.com

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