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. 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

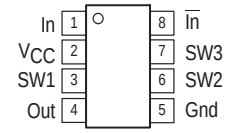
MC12080

MECL PLL COMPONENTS
÷10/20/40/80 PRESCALER

SEMICONDUCTOR
TECHNICAL DATA

D SUFFIX
PLASTIC PACKAGE
CASE 751
(SO–8, Tape and Reel Only)

PIN CONNECTIONS



(Top View)

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.

ORDERING INFORMATION

Device	Operating Temperature Range	Package
MC12080DR2	T_A = – 40 to 85°C	SO–8

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)	f_t	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] 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}

NOTE: 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

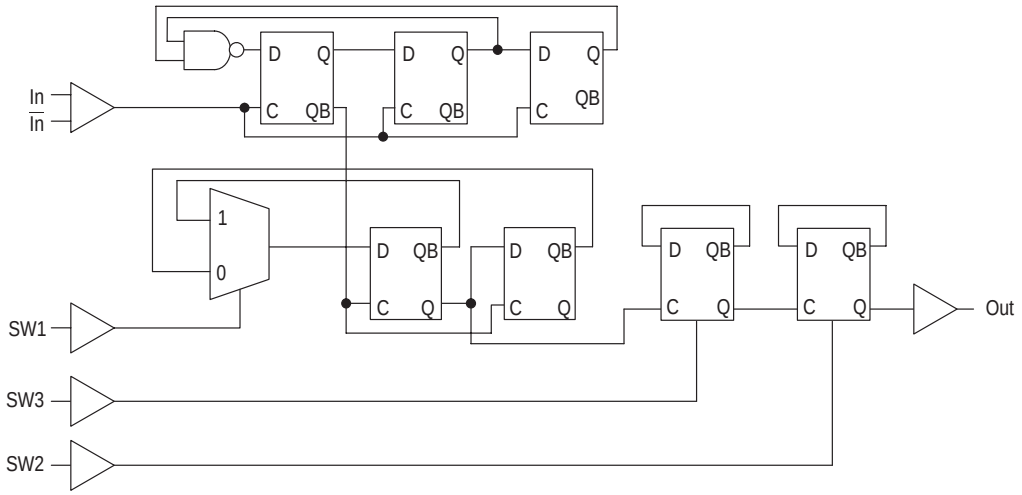
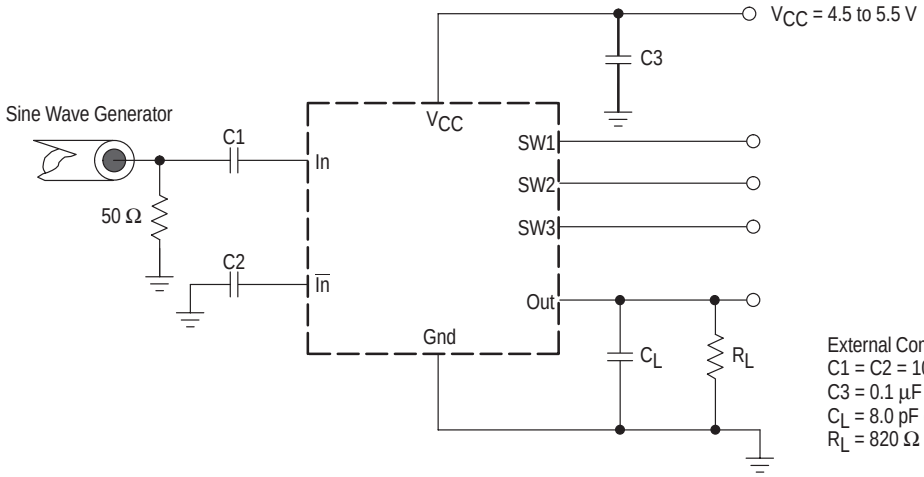
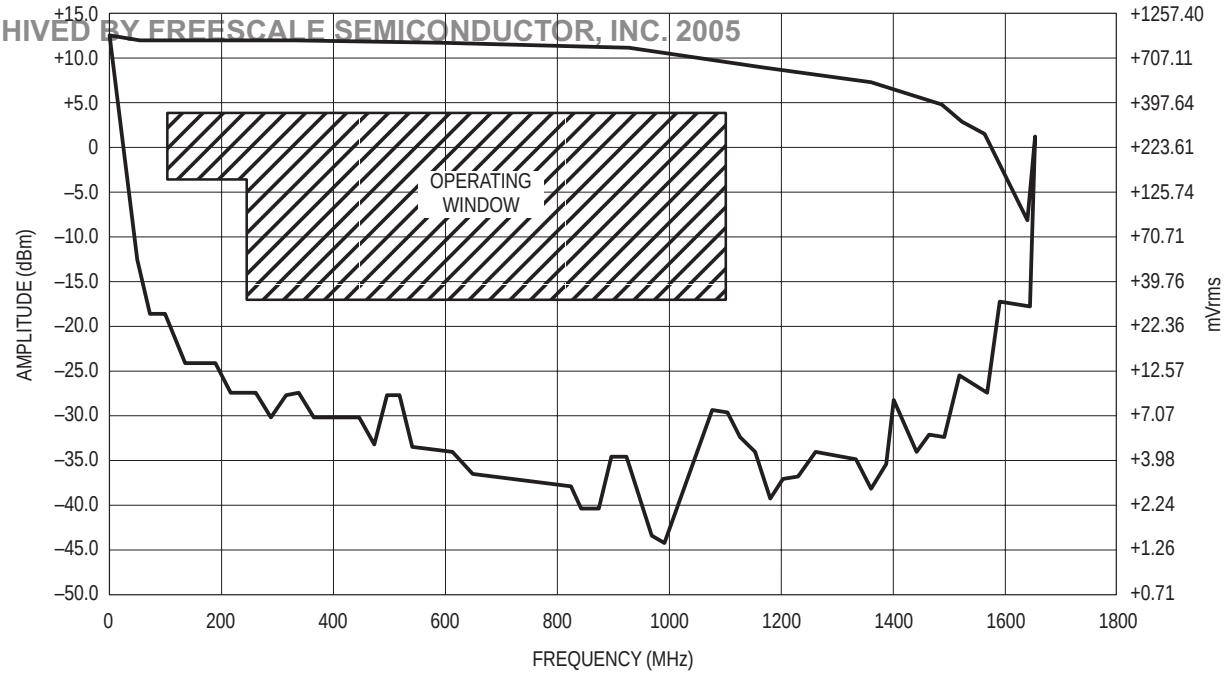


Figure 2. AC Test Circuit



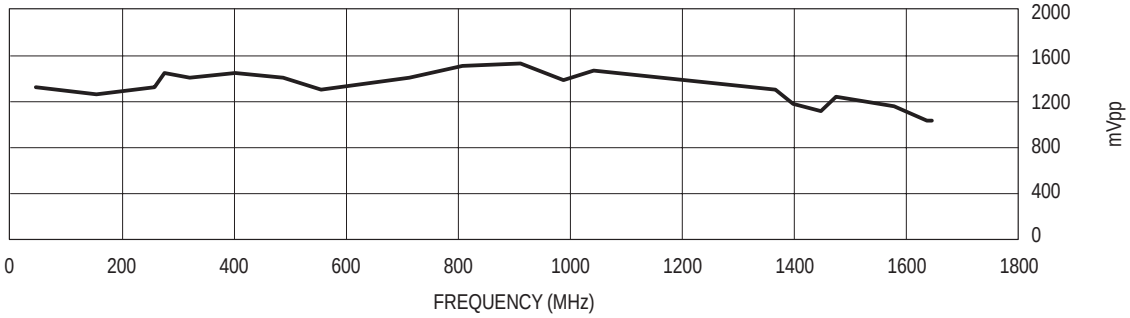
External Components
C1 = C2 = 1000 pF
C3 = 0.1 µF
C_L = 8.0 pF (Including Scope and Jig Capacitance)
R_L = 820 Ω for ÷10 at 1.1 GHz

Figure 3. Input Signal Amplitude versus Input Frequency



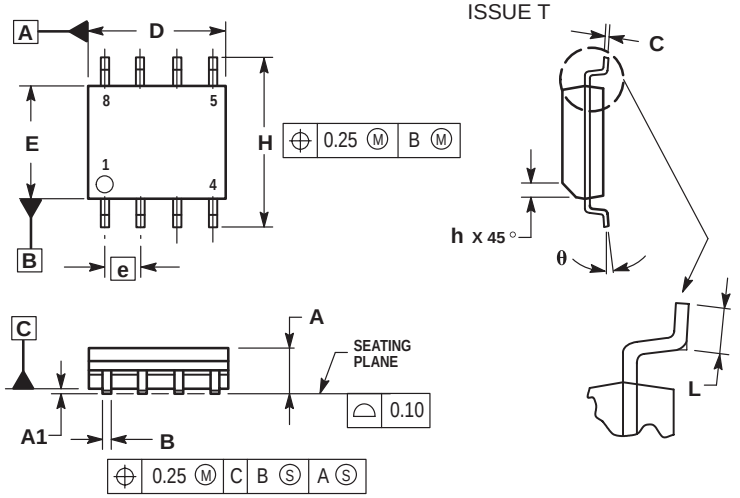
Divide Ratio = 10; V_{CC} = 5.0 V; T_A = 25°C

Figure 4. Output Amplitude versus Input Frequency



OUTLINE DIMENSIONS

D SUFFIX
PLASTIC PACKAGE
CASE 751–06
(SO–8)
ISSUE T



NOTES:
1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. DIMENSIONS ARE IN MILLIMETER.
3. DIMENSION D AND E DO NOT INCLUDE MOLD PROTRUSION.
4. MAXIMUM MOLD PROTRUSION 0.15 PER SIDE.
5. 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
A	1.35	1.75
A1	0.10	0.25
B	0.35	0.49
C	0.19	0.25
D	4.80	5.00
E	3.80	4.00
e	1.27 BSC	
H	5.80	6.20
h	0.25	0.50
L	0.40	1.25
θ	0°	7°

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