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MOTOROLA

MC12098

2.5 GHz Prescaler

The MC12098 is a single modulus divide by 8192 prescaler for low power frequency division of a 2.5 GHz high frequency input signal. The low power (3.6 mA typical at 5.0 V) and high operating frequency features make this prescaler ideal in satellite TV receiver applications.

The MC12098 is pin and functionally compatible to the Plessey SP4982, but with significantly lower power consumption.

On-chip output termination provides 2.0 mA of output current to drive a 12 pF (typical) high impedance load. The output voltage swing under typical supply voltage and temperature conditions is 1.1 V. If additional drive is required for the prescaler output, an external resistor can be added in parallel from the OUT pin to GND to increase the output power. Care must be taken not to exceed the maximum allowable current through the output.

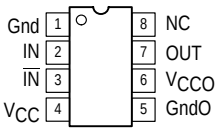
- 2.5 GHz Toggle Frequency
- Supply Voltage 2.7 to 5.5 V
- Low Power Dissipation 18 mW Typical
- Operating Temperature Range of –40 to 85°C

MECL PLL COMPONENTS
÷8192 PRESCALER

SEMICONDUCTOR
TECHNICAL DATA

D SUFFIX
PLASTIC PACKAGE
CASE 751
(SO–8)

PIN CONNECTIONS



(Top View)

MAXIMUM RATINGS

Parameter	Symbol	Value	Unit
Power Supply Voltage, Pin 4	V_{CC}	–0.5 to 6.0	VDC
Operating Temperature Range	T_A	–40 to 85	°C
Storage Temperature Range	Tstg	–65 to 150	°C
Maximum Output Current, Pin 7	I_O	4.0	mA

NOTE: ESD data available upon request.

ELECTRICAL CHARACTERISTICS (V_{CC} = 2.7 to 5.5 V; T_A = –40 to 85°C, unless otherwise noted.)

Parameter	Symbol	Min	Typ	Max	Unit
Toggle Frequency (Sine Wave)	ft	0.5	3.0	2.5	GHz
Supply Current Output (Pin 4)	I_{CC}	-	3.6	6.5	mA
Input Voltage Sensitivity 500–2500 MHz	V_{in}	140	-	1000	mVpp
Output Voltage Swing (Note 1)	V_{out}	0.8	1.1	-	V_{pp}

NOTE: 1. Assumes C_L = 12 pF

ORDERING INFORMATION

Device	Operating Temperature Range	Package
MC12098D	T_A = –40° to +85°C	SO–8

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Figure 1. MC12098 Block Diagram

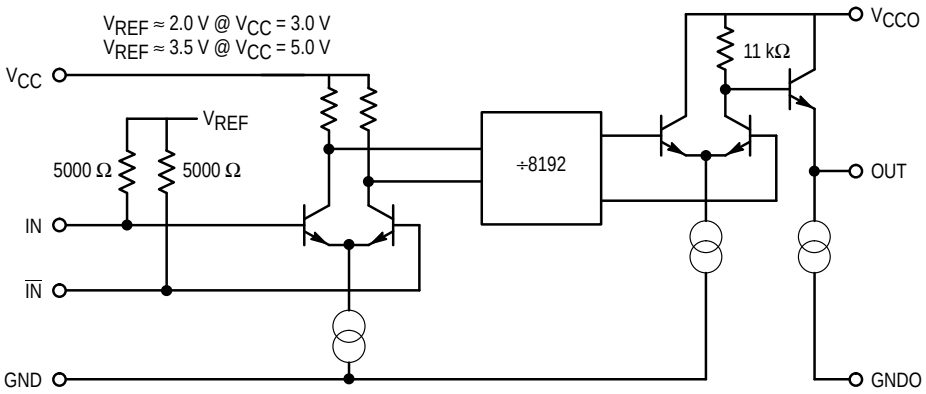
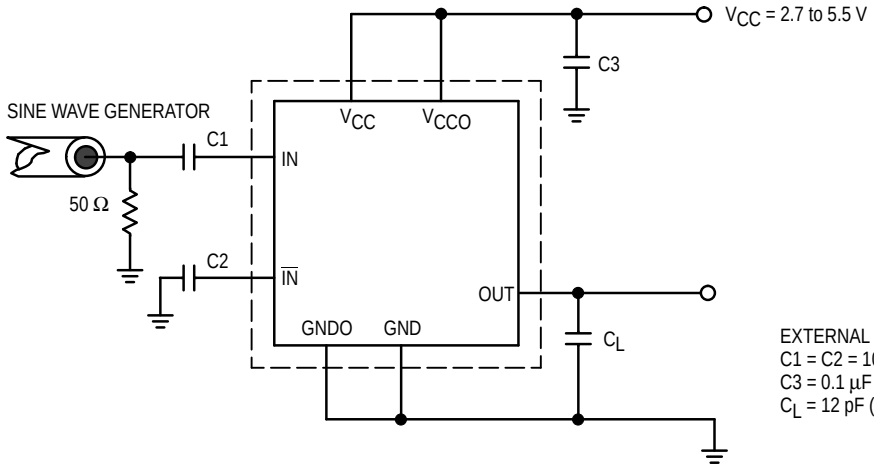
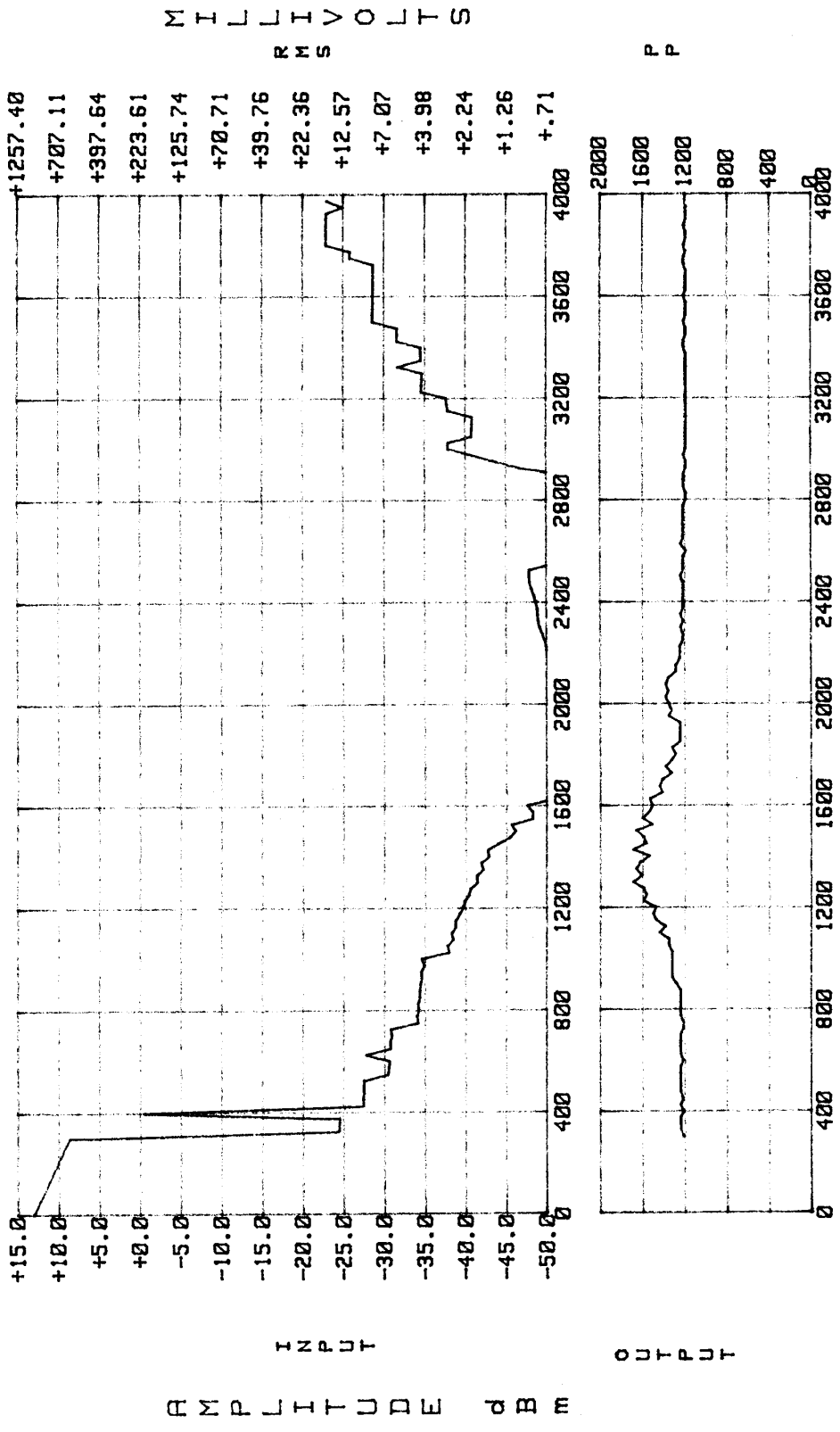


Figure 2. AC Test Circuit



EXTERNAL COMPONENTS
C1 = C2 = 1000 pF
C3 = 0.1 µF
C_L = 12 pF (Including Scope and Jig Capacitance)

Figure 3. MC12098 Input Signal Amplitude versus Input Frequency



(V_{CC} = 5.5 V, T_A = 25°C)

Figure 4. Input Impedance versus Frequency

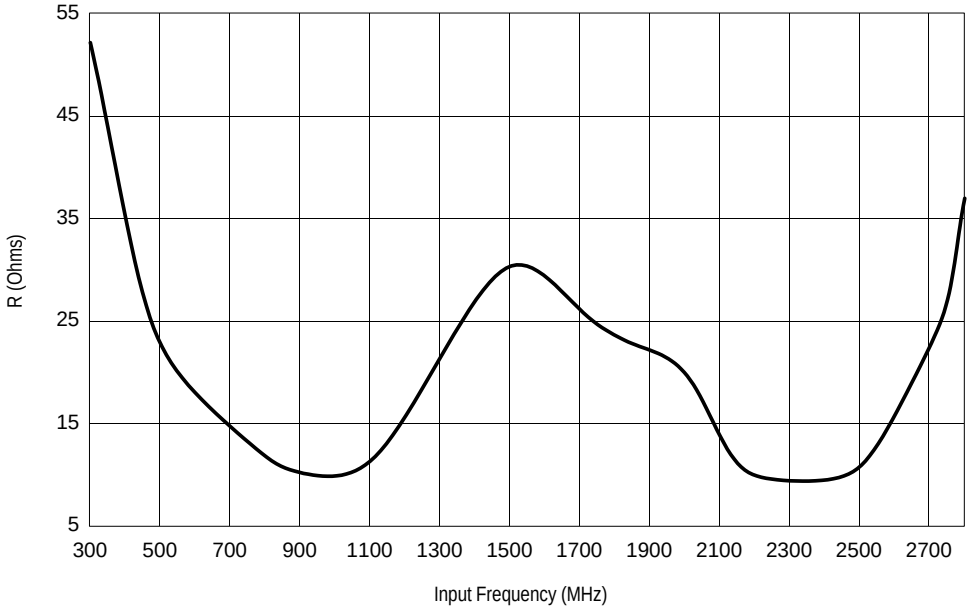
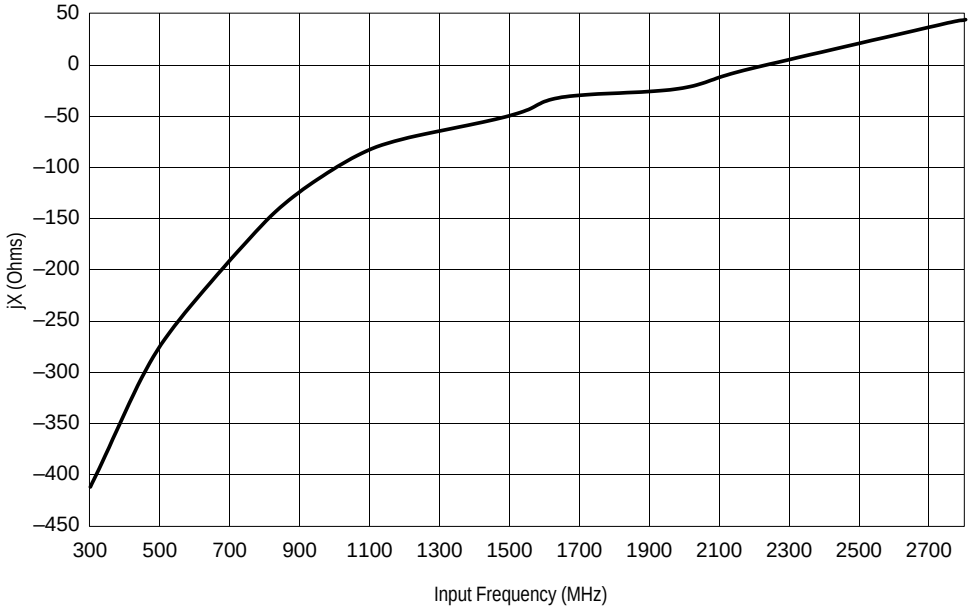
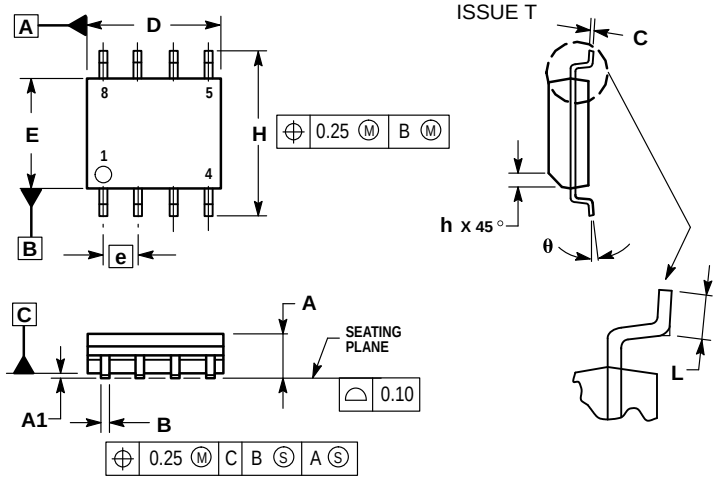


Figure 5. Input Impedance versus Frequency



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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