

# MC12095

## 2.5 GHz Low Power Prescaler With Stand-By Mode

The MC12095 is a single modulus prescaler for low power frequency division of a 2.5 GHz high frequency input signal. MOSAIC V™ technology is utilized to achieve low power dissipation of 24 mW at a minimum supply voltage of 2.7 V.

On-chip output termination provides output current to drive a 2.0 pF (typical) high impedance load. 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.

Divide ratio control input (SW) selects the required divide ratio of  $\div 2$  or  $\div 4$ . Stand-By mode is available to reduce current drain to 100  $\mu$ A typical when the standby pin SB is switched LOW disabling the prescaler.

### Features

- 2.5 GHz Toggle Frequency
- Supply Voltage 2.7 V to 5.5 Vdc
- Low Power 8.7 mA Typical
- Operating Temperature  $-40$  to  $85^\circ\text{C}$
- Divide by 2 or 4 Selected by the SW Pin

### FUNCTIONAL TABLE

SW	Divide Ratio
H	2
L	4

1. SW: H = ( $V_{CC} - 0.4$  V) to  $V_{CC}$ ; L = OPEN
2. SB: H = 2.0 V to  $V_{CC}$ ; L = GND to 0.8 V

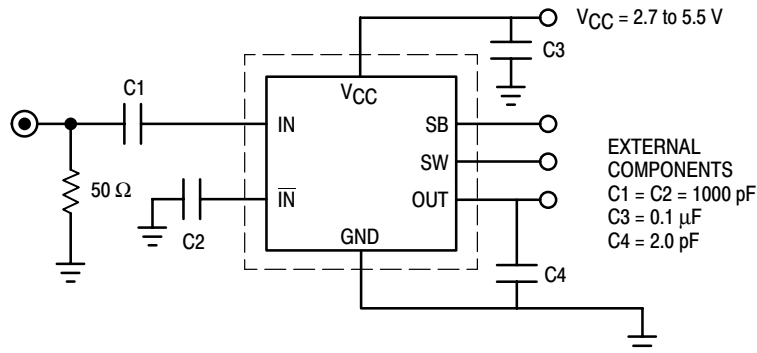


Figure 1. AC Test Circuit



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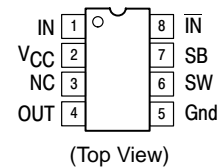
<http://onsemi.com>

### MARKING DIAGRAM



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

### PIN CONNECTIONS



### ORDERING INFORMATION

Device	Package	Shipping
MC12095D	SO-8	96 Units/Rail
MC12095DR2	SO-8	2500 Tape & Reel

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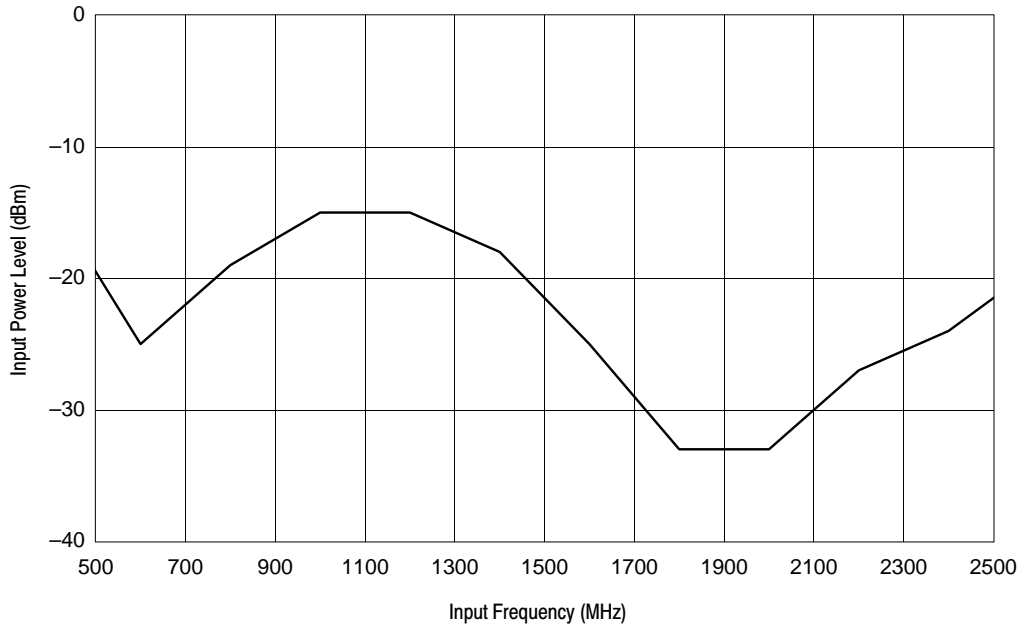
## MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Power Supply Voltage, Pin 2	$V_{CC}$	-0.5 to 6.0	Vdc
Operating Temperature Range	$T_A$	-40 to 85	°C
Storage Temperature Range	$T_{stg}$	-65 to 150	°C
Maximum Output Current, Pin 4	$I_O$	8.0	mA

NOTE: ESD data available upon request.

## ELECTRICAL CHARACTERISTICS ( $V_{CC} = 2.7$ to $5.5$ V; $T_A = -40$ to $85^\circ\text{C}$ , unless otherwise noted.)

Characteristic	Symbol	Min	Typ	Max	Unit	
Toggle Frequency (Sine Wave)	$f_t$	500	3.0	2.5	GHz	
Supply Current	$I_{CC}$	-	8.7	14	mA	
Stand-By Current	$I_{SB}$	-	100	200	$\mu\text{A}$	
Stand-By Input HIGH (SB)	$V_{IH1}$	2.0	-	$V_{CC} + 0.5$ V	V	
Stand-By Input LOW (SB)	$V_{IL1}$	GND	-	0.8	V	
Divide Ratio Control Input HIGH (SW)	$V_{IH2}$	$V_{CC} - 0.4$	$V_{CC}$	$V_{CC} + 0.5$ V	V	
Divide Ratio Control Input LOW (SW)	$V_{IL2}$	OPEN	OPEN	OPEN		
Output Voltage Swing (2pF Load)	$V_{OUT}$	500–1000 MHz Input	800	-	-	mVpp
1000–1500 MHz Input		400	450	-		
1500–2500 MHz Input		200	250	-		
Input Voltage Sensitivity	$V_{IN}$	200	-	1000	mVpp	



(Divide By 2 Mode,  $T = 25^\circ\text{C}$ ,  $V_{CC} = 2.7$  V)

**Figure 2. Typical Minimum Input Sensitivity versus Input Frequency**

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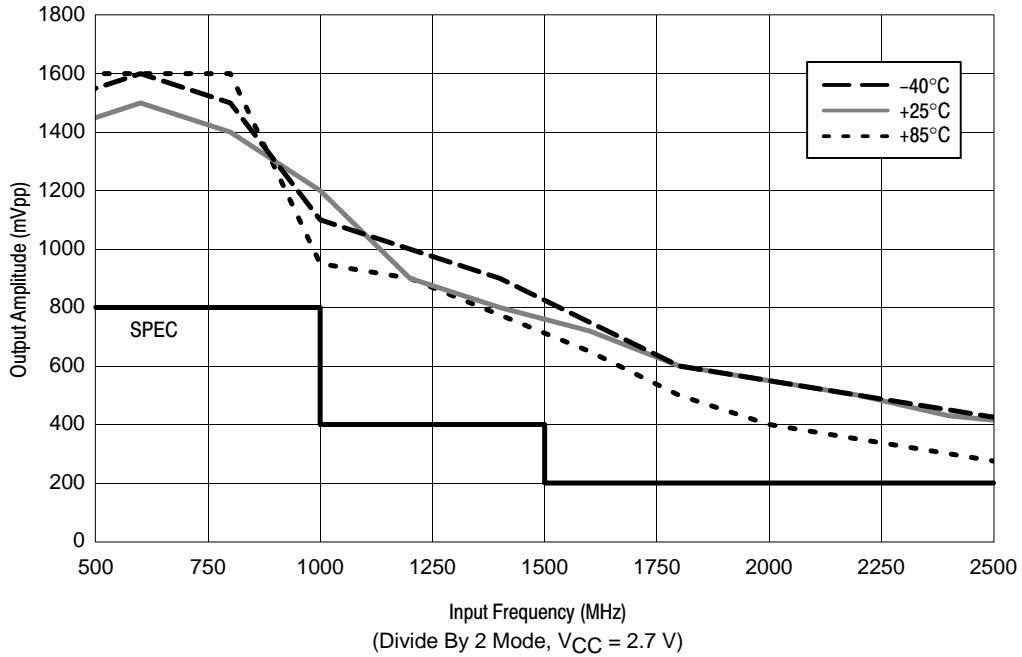


Figure 3. Typical Output Amplitude versus Frequency Over Temperature

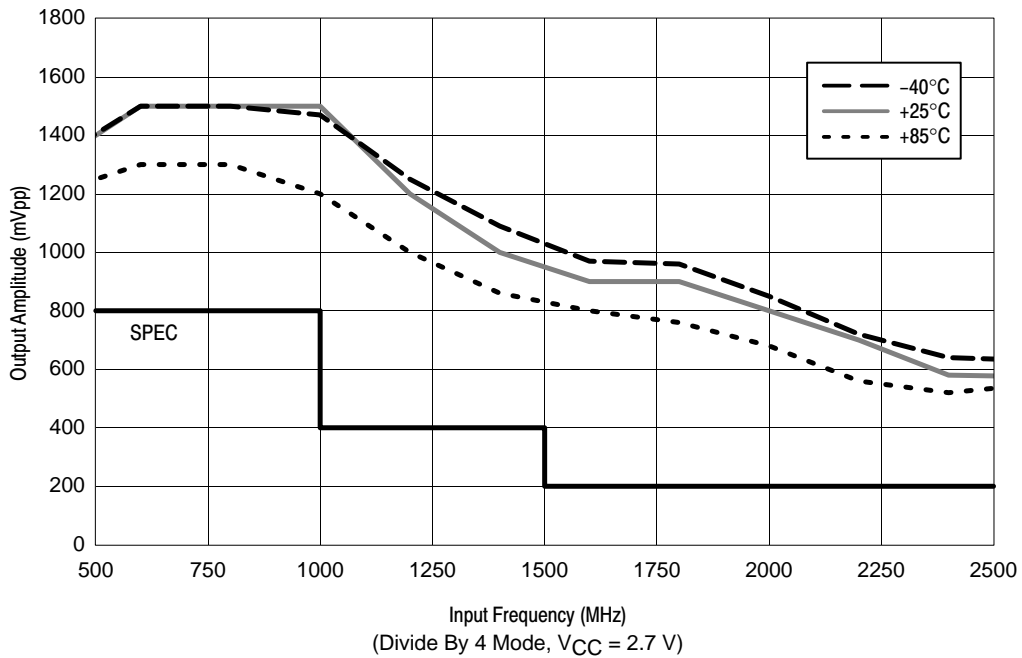
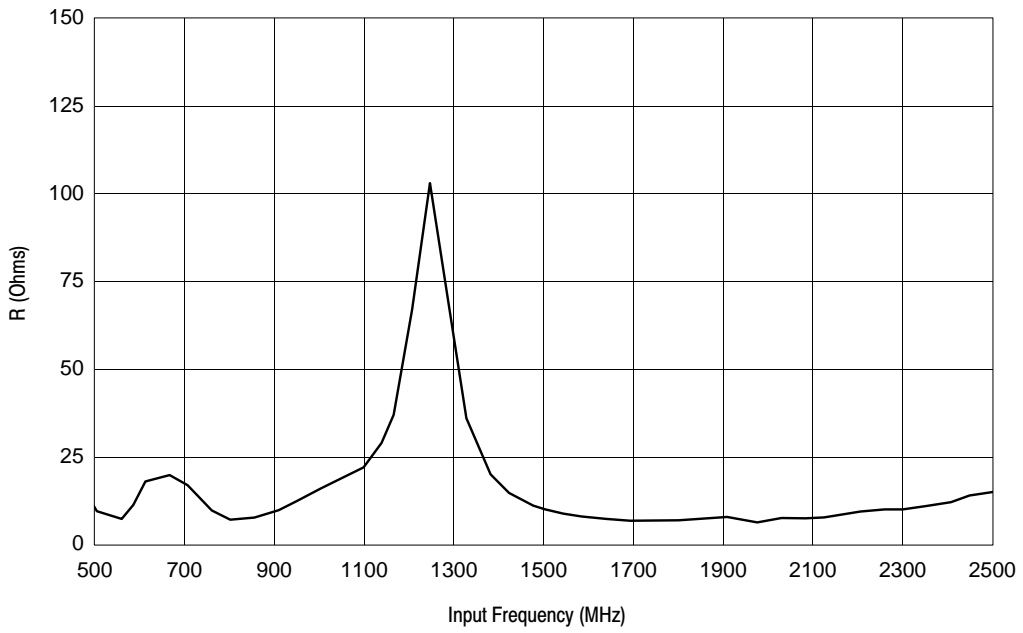
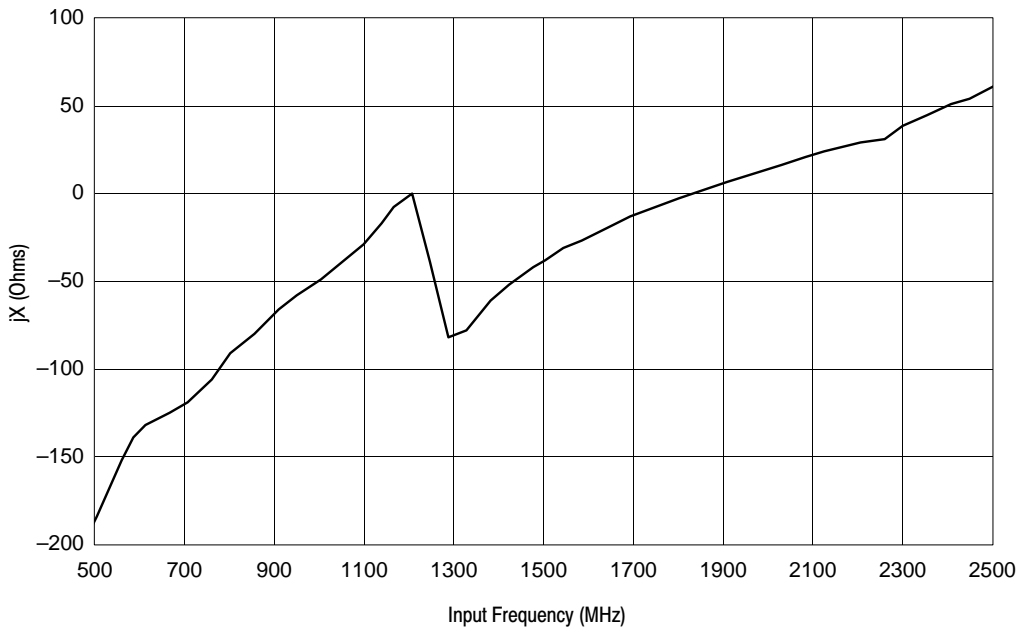


Figure 4. Typical Output Amplitude versus Frequency Over Temperature

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**Figure 5. Input Impedance versus Frequency**

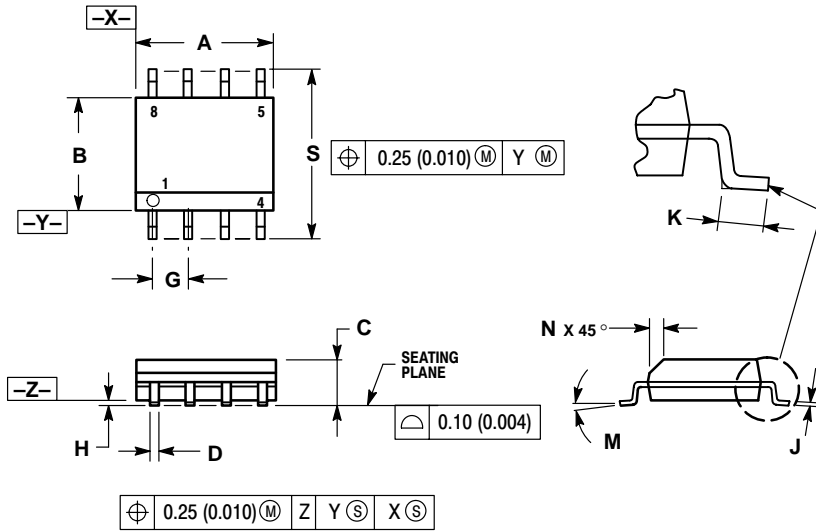


**Figure 6. Input Impedance versus Frequency**

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## 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

**Notes**

**Notes**

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