



÷2, ÷4, ÷8 1.1GHz Low Power Prescaler with Stand-By Mode

The MC12093 is a single modulus prescaler for low power frequency division of a 1.1 GHz high frequency input signal. Motorola's advanced MOSAIC™ V technology is utilized to achieve low power dissipation of 6.75 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 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 inputs SW1 and SW2 select the required divide ratio of ÷2, ÷4, or ÷8.

Stand-By mode is featured to reduce current drain to 50 µA typical when the standby pin SB is switched LOW disabling the prescaler.

- 1.1 GHz Toggle Frequency
- Supply Voltage 2.7 V to 5.5 Vdc
- Low Power 3.0 mA Typical
- Operating Temperature -40 to 85°C
- Divide by 2, 4 or 8 Selected by SW1 and SW2 Pins
- On-Chip Termination

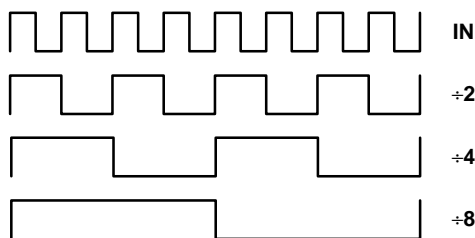
MOSAIC V is a trademark of Motorola

FUNCTIONAL TABLE

SW	SW2	Divide Ratio
L	L	8
H	L	4
L	H	4
H	H	2

NOTES: 1. SW1 & SW2: H = ($V_{CC} - 0.5$ V) to V_{CC} ; L = Open.
2. SB: H = 2.0 V to V_{CC} ; L = GND to 0.8 V.

Function Chart



MC12093

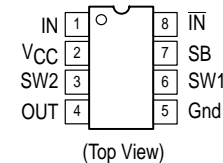
MECL PLL COMPONENTS ÷2, ÷4, ÷8 LOW POWER PRESCALER WITH STAND-BY MODE

SEMICONDUCTOR TECHNICAL DATA



D SUFFIX
PLASTIC PACKAGE
CASE 751
(SO-8)

PIN CONNECTIONS



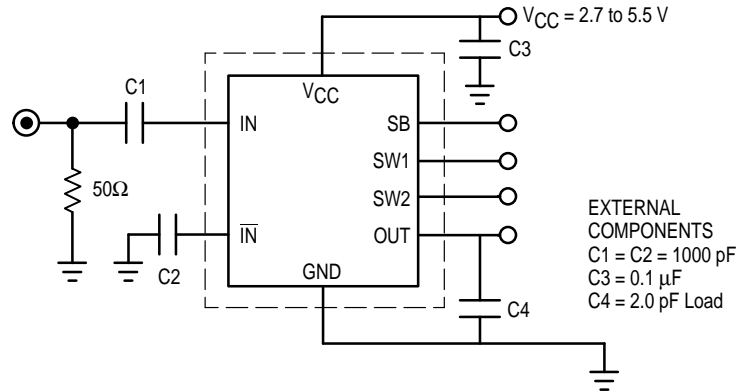
A LOW on the Stand-By Pin 7 disables the device.

ORDERING INFORMATION

Device	Operating Temp Range	Package
MC12093D	$T_A = -40$ to 85°C	SO-8

MC12093

Figure 1. AC Test Circuit



MAXIMUM RATINGS

Parameter	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	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)

Parameter	Symbol	Min	Typ	Max	Unit
Toggle Frequency (Sine Wave)	ft	0.1	1.4	1.1	GHz
Supply Current	I_{CC}	-	3.0	4.5	mA
Stand-By Current	ISB	-	120	200	μA
Stand-By Input HIGH (SB)	V_{IH1}	2.0	-	V_{CC}	V
Stand-By Input LOW (SB)	V_{IL1}	Gnd	-	0.8	V
Divide Ratio Control Input HIGH (SW1 & SW2)	V_{IH2}	$V_{CC} - 0.5$	V_{CC}	$V_{CC} + 0.5$	V
Divide Ratio Control Input LOW (SW1 & SW2)	V_{IL2}	OPEN	OPEN	OPEN	
Output Voltage Swing (2.0 pF Load)	V_{OUT}				V_{pp}
Output Frequency 12.5–350 MHz (Note 1)		0.6	0.80	-	
Output Frequency 350–400 MHz (Note 2)		0.5	0.70	-	
Output Frequency 400–450 MHz (Note 3)		0.4	0.55	-	
Output Frequency 450–550 MHz (Note 4)		0.3	0.45	-	
Input Voltage Sensitivity	V_{IN}				mVpp
250–1100 MHz		100	-	1000	
100–250 MHz		400	-	1000	

NOTES: 1. Input frequency 1.1 GHz, +8, minimum output frequency of 12.5 MHz.

2. Input frequency 700–800 MHz, +2.

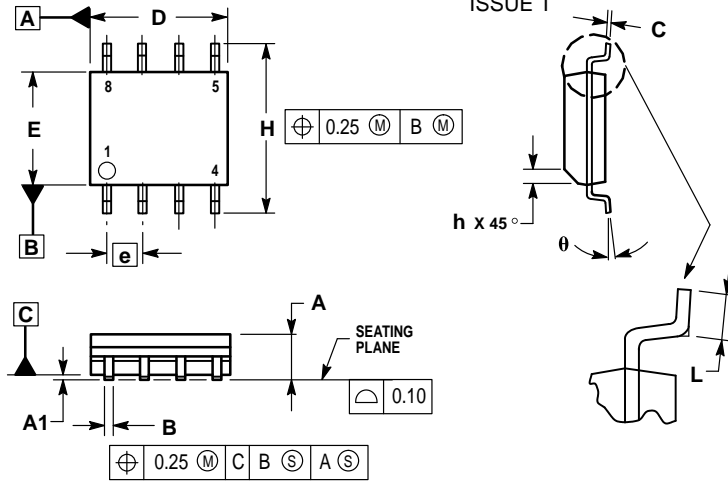
3. Input frequency 800–900 MHz, +2.

4. Input frequency 900–1100 MHz, +2.

MC12093

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.

Motorola reserves the right to make changes without further notice to any products herein. Motorola makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does Motorola assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation consequential or incidental damages. "Typical" parameters which may be provided in Motorola data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. Motorola does not convey any license under its patent rights nor the rights of others. Motorola products are not designed, intended, or authorized for use as components in systems intended for surgical implant into the body, or other applications intended to support or sustain life, or for any other application in which the failure of the Motorola product could create a situation where personal injury or death may occur. Should Buyer purchase or use Motorola products for any such unintended or unauthorized application, Buyer shall indemnify and hold Motorola and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that Motorola was negligent regarding the design or manufacture of the part. Motorola and are registered trademarks of Motorola, Inc. Motorola, Inc. is an Equal Opportunity/Affirmative Action Employer.

Mfax is a trademark of Motorola, Inc.

How to reach us:

USA/EUROPE/Locations Not Listed: Motorola Literature Distribution;
P.O. Box 5405, Denver, Colorado 80217. 1-303-675-2140 or 1-800-441-2447

JAPAN: Motorola Japan Ltd.; SPD, Strategic Planning Office, 141,
4-32-1 Nishi-Gotanda, Shinagawa-ku, Tokyo, Japan. 81-3-5487-8488

Customer Focus Center: 1-800-521-6274

Mfax™: RMFAX0@email.sps.mot.com – TOUCHTONE 1-602-244-6609
Motorola Fax Back System – US & Canada ONLY 1-800-774-1848
– http://sps.motorola.com/mfax/

ASIA/PACIFIC: Motorola Semiconductors H.K. Ltd.; 8B Tai Ping Industrial Park,
51 Ting Kok Road, Tai Po, N.T., Hong Kong. 852-26629298

HOME PAGE: <http://motorola.com/sps/>

