

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

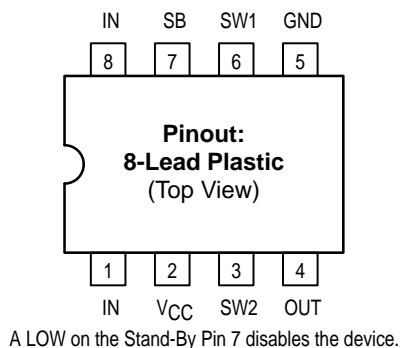
The MC12093 is a single modulus prescaler for low power frequency division of a 1.1GHz high frequency input signal. Motorola's advanced MOSAIC™ V technology is utilized to achieve low power dissipation of 6.75mW at a minimum supply voltage of 2.7V.

On-chip output termination provides output current to drive a 2pF (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.

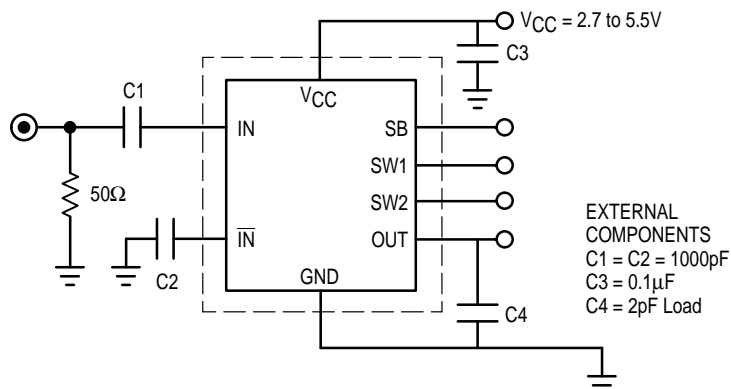
Divide ratio control inputs SW1 and SW2 select the required divide ratio of ÷2, ÷4, or ÷8.

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

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



### AC TEST CIRCUIT



## MC12093

### MECL PLL COMPONENTS

#### ÷2, ÷4, ÷8 LOW POWER PRESCALER WITH STAND-BY MODE



**D SUFFIX**  
PLASTIC SOIC PACKAGE  
CASE 751-05



**SD SUFFIX**  
PLASTIC SSOP PACKAGE  
CASE 940-02

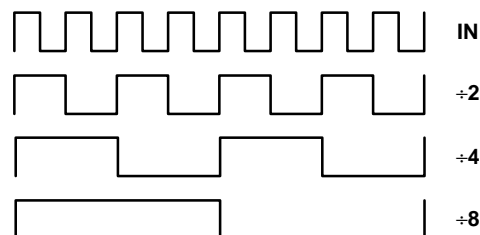
### FUNCTION TABLE

SW1	SW2	Divide Ratio
L	L	8
H	L	4
L	H	4
H	H	2

Note: SW1 & SW2: H = (VCC-0.5V) to VCC;  
L = OPEN

SB: H = 2.0V to VCC; L = GND to 0.8V

### FUNCTION CHART



**MAXIMUM RATINGS**

Symbol	Parameter	Value	Unit
$V_{CC}$	Power Supply Voltage, Pin 2	-0.5 to +6.0	VDC
$T_A$	Operating Temperature Range	-40 to +85	°C
$T_{stg}$	Storage Temperature Range	-65 to +150	°C
$I_O$	Maximum Output Current, Pin 4	4.0	mA

**ELECTRICAL CHARACTERISTICS** ( $V_{CC} = 2.7$  to  $5.5V$ ;  $T_A = -40$  to  $+85^\circ C$ )

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

<sup>1</sup> Input frequency 1.1GHz,  $\pm 8$ , minimum output frequency of 12.5MHz.

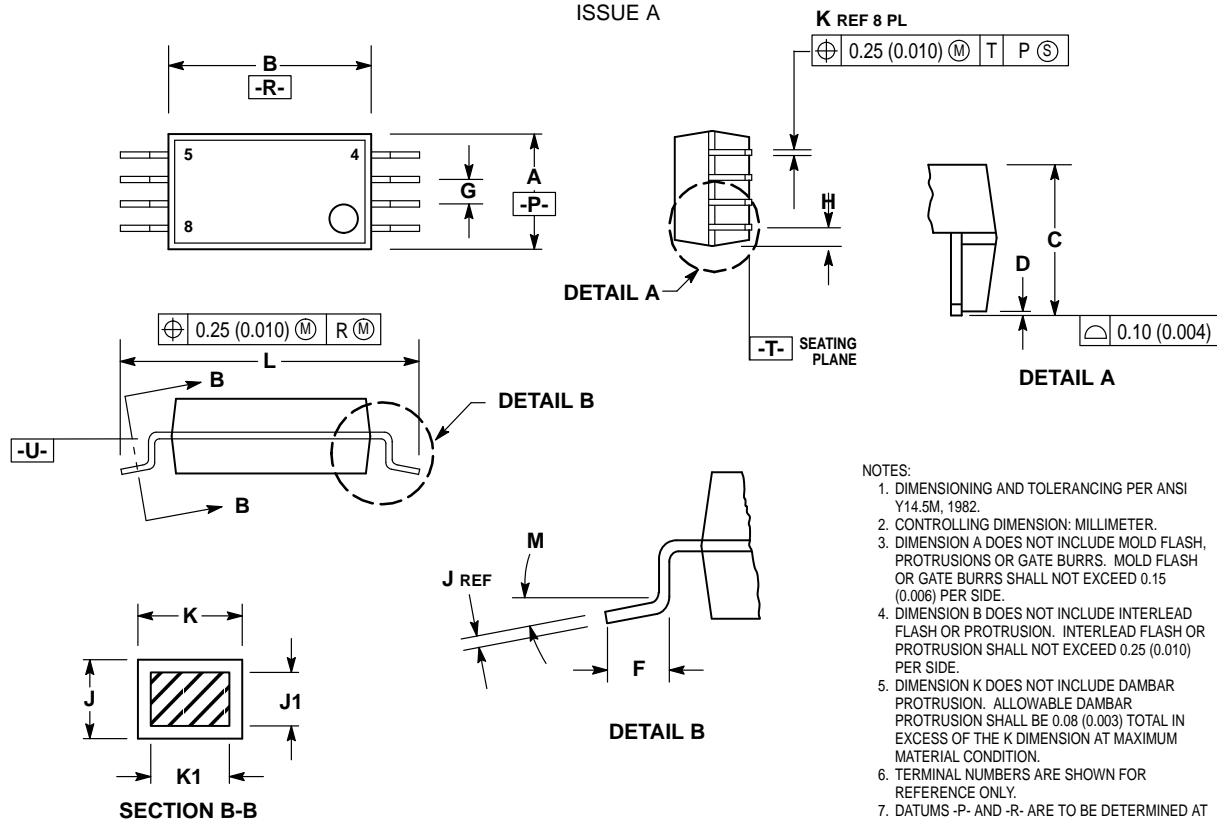
<sup>2</sup> Input frequency 700–800MHz,  $\pm 2$ .

<sup>3</sup> Input frequency 800–900MHz,  $\pm 2$ .

<sup>4</sup> Input frequency 900–1100MHz,  $\pm 2$ .

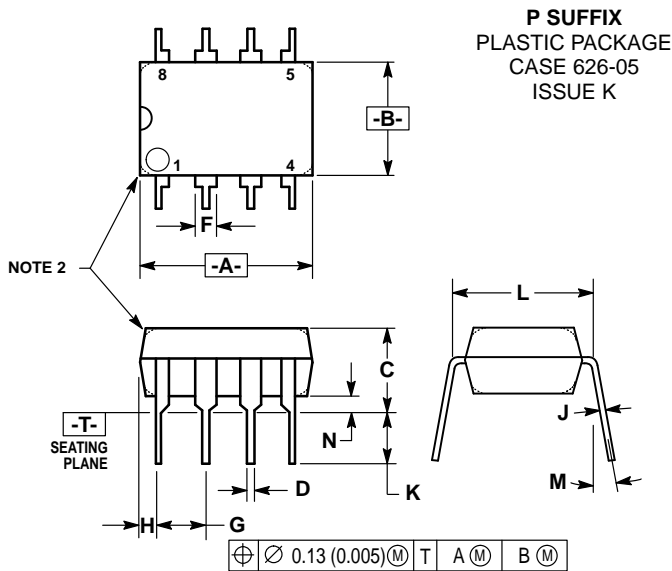
## OUTLINE DIMENSIONS

**SD SUFFIX**  
**PLASTIC SSOP PACKAGE**  
CASE 940-02  
ISSUE A



DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	2.87	3.13	0.113	0.123
B	5.20	5.38	0.205	0.212
C	1.73	1.99	0.068	0.078
D	0.05	0.21	0.002	0.008
F	0.55	0.95	0.022	0.037
G	0.65 BSC		0.026 BSC	
H	0.50	—	0.020	—
J	0.09	0.20	0.004	0.008
J1	0.09	0.16	0.004	0.006
K	0.22	0.38	0.009	0.015
K1	0.22	0.33	0.009	0.013
L	7.65	7.90	0.301	0.311
M	0°	8°	0°	8°

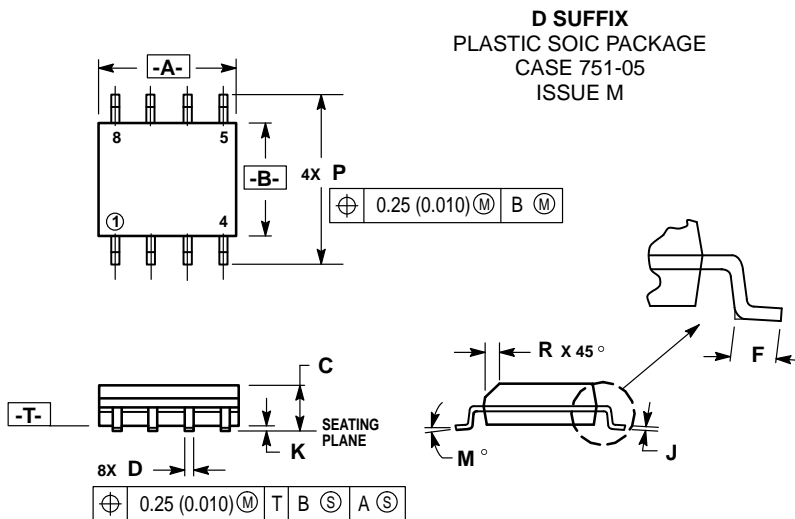
## OUTLINE DIMENSIONS



## NOTES:

1. DIMENSION L TO CENTER OF LEAD WHEN FORMED PARALLEL.
2. PACKAGE CONTOUR OPTIONAL (ROUND OR SQUARE CORNERS).
3. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.


DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	9.40	10.16	0.370	0.400
B	6.10	6.60	0.240	0.260
C	3.94	4.45	0.155	0.175
D	0.38	0.51	0.015	0.020
F	1.02	1.78	0.040	0.070
G	2.54 BSC	0.100 BSC		
H	0.76	1.27	0.030	0.050
J	0.20	0.30	0.008	0.012
K	2.92	3.43	0.115	0.135
L	7.62 BSC	0.300 BSC		
M	—	10°	—	10°
N	0.76	1.01	0.030	0.040



## NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: MILLIMETER.
3. DIMENSIONS 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	0.196
B	3.80	4.00	0.150	0.157
C	1.35	1.75	0.054	0.068
D	0.35	0.49	0.014	0.019
F	0.40	1.25	0.016	0.049
G	1.27 BSC	0.050 BSC		
J	0.18	0.25	0.007	0.009
K	0.10	0.25	0.004	0.009
M	0°	7°	0°	7°
P	5.80	6.20	0.229	0.244
R	0.25	0.50	0.010	0.019

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