



**MC12015  
MC12016  
MC12017**

**Dual Modulus Prescaler**

The MC12015, MC12016 and MC12017 are dual modulus prescalers which will drive divide by 32 and 33, 40 and 41, and 64 and 65, respectively. An internal regulator is provided to allow these devices to be used over a wide range of power-supply voltages. The devices may be operated by applying a supply voltage of 5.0 Vdc  $\pm$ 10% at Pin 7, or by applying an unregulated voltage source from 5.5Vdc to 9.5 Vdc to Pin 8.

- 225 MHz Toggle Frequency
- Low-Power 7.5 mA Maximum at 6.8 V
- Control Input and Output Are Compatible With Standard CMOS
- Connecting Pins 2 and 3 Allows Driving One TTL Load
- Supply Voltage 4.5 V to 9.5 V

**MECL PLL COMPONENTS  
DUAL MODULUS PRESCALER**

**SEMICONDUCTOR  
TECHNICAL DATA**



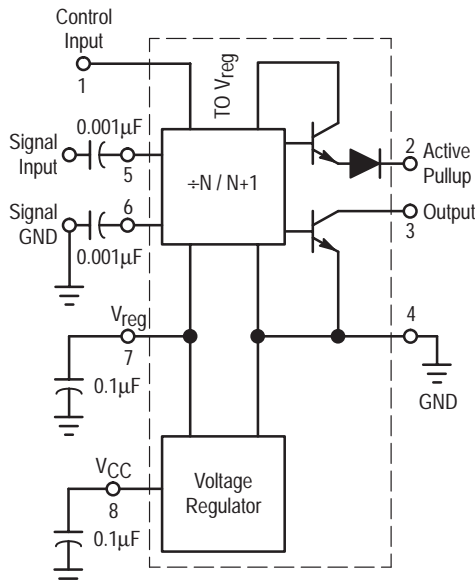
**D SUFFIX  
PLASTIC PACKAGE  
CASE 751  
(SO-8)**

**NOT RECOMMENDED FOR NEW DESIGN  
DEVICES TO BE PHASED OUT.**  
For the MC12015 and MC12016 no replacement available.  
For the MC12017 consider MC12054A for New Designs.

**ORDERING INFORMATION**

Device	Operating Temperature Range	Package
MC12015D	$T_A = -40$ to $85^\circ\text{C}$	SO-8
MC12016D		
MC12017D		

**SIMPLIFIED BLOCK DIAGRAM**



1.  $V_{reg}$  at Pin 7 is not guaranteed to be between 4.5 and 5.5V when  $V_{CC}$  is being applied to Pin 8
2. Pin 7 is not to be used as a source of regulated output voltage

# MC12015 MC12016 MC12017

## MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Regulated Voltage, Pin 7	$V_{reg}$	8.0	Vdc
Power Supply Voltage, Pin 8	$V_{CC}$	10	Vdc
Operating Temperature Range	$T_A$	-40 to +85	°C
Storage Temperature Range	$T_{stg}$	-65 to +175	°C

**NOTE:** ESD data available upon request.

## ELECTRICAL CHARACTERISTICS ( $V_{CC} = 5.5$ to $9.5$ V; $V_{reg} = 4.5$ 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 Input)	$f_{max}$	225	–	–	MHz
	$f_{min}$	–	–	35	
Supply Current	$I_{CC}$	–	6.0	7.8	mA
Control Input HIGH (+32, 40 or 64)	$V_{IH}$	2.0	–	–	V
Control Input LOW (+33, 41 or 65)	$V_{IL}$	–	–	0.8	V
Output Voltage HIGH ( $I_{source} = 50\mu\text{A}$ ) [Note 1]	$V_{OH}$	2.5	–	–	V
Output Voltage LOW ( $I_{sink} = 2\text{mA}$ ) [Note 1]	$V_{OL}$	–	–	0.5	V
Input Voltage Sensitivity	$V_{in}$				mVpp
35 MHz		400	–	800	
50 to 225 MHz		200	–	800	
PLL Response Time [Notes 2 and 3]	$t_{PLL}$	–	–	$t_{out}$ to 70	ns

**NOTES:** 1. Pin 2 connected to Pin 3.

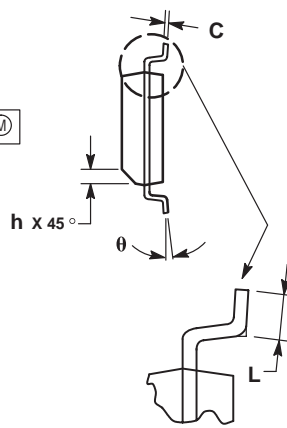
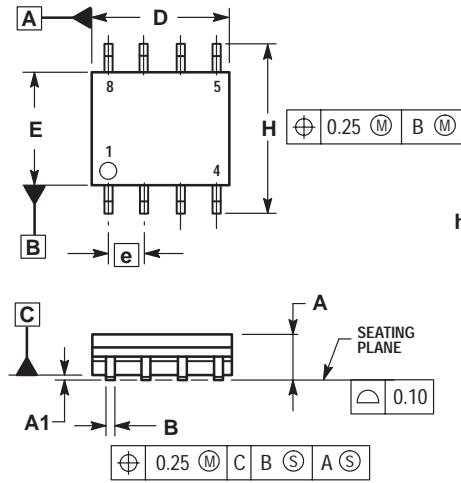
2.  $t_{PLL}$  = the period of time the PLL has from the prescaler rising output transition (50%) to the modulus control input edge transition (50%) to ensure proper modulus selection.

3.  $t_{out}$  = period of output waveform.

# MC12015 MC12016 MC12017

## 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.

DIM	MILLIMETERS	
	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°

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.; Silicon Harbour Centre,  
 2, Dai King Street, Tai Po Industrial Estate, Tai Po, N.T., Hong Kong.  
 852-26668334

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

