

# MC12019

## Dual Modulus Prescaler

The MC12019 is a divide by 20 and 21 dual modulus prescaler. It will divide by 20 when the modulus control input is HIGH and divide by 21 when the modulus control input is LOW.

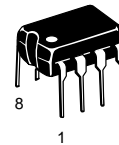
- 225 MHz Toggle Frequency
- Low-Power 7.5 mA Maximum at 5.5 V
- Control Input is Compatible with Standard Motorola CMOS Synthesizers
- Emitter Follower Output

### MECL PLL COMPONENTS ÷20/21 DUAL MODULUS PRESCALER

#### SEMICONDUCTOR TECHNICAL DATA

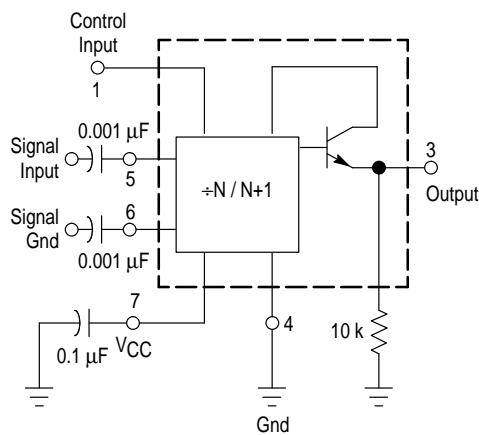


**D SUFFIX**  
PLASTIC PACKAGE  
CASE 751  
(SO-8)

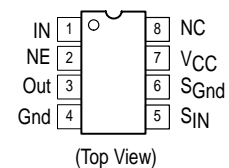


**P SUFFIX**  
PLASTIC PACKAGE  
CASE 626

#### SIMPLIFIED BLOCK DIAGRAM



#### PIN CONNECTIONS



#### ORDERING INFORMATION

| Device   | Operating Temperature Range                      | Package |
|----------|--|---------|
| MC12019D | $T_A = -40^\circ \text{ to } +85^\circ \text{C}$ | SO-8    |
| MC12019P |  | Plastic |

# MC12019

## MAXIMUM RATINGS

| Rating                      | Symbol    | Value       | Unit |
|-----------------------------|-----------|-------------|------|
| Power Supply Voltage, Pin 7 | $V_{CC}$  | 8.0         | 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.

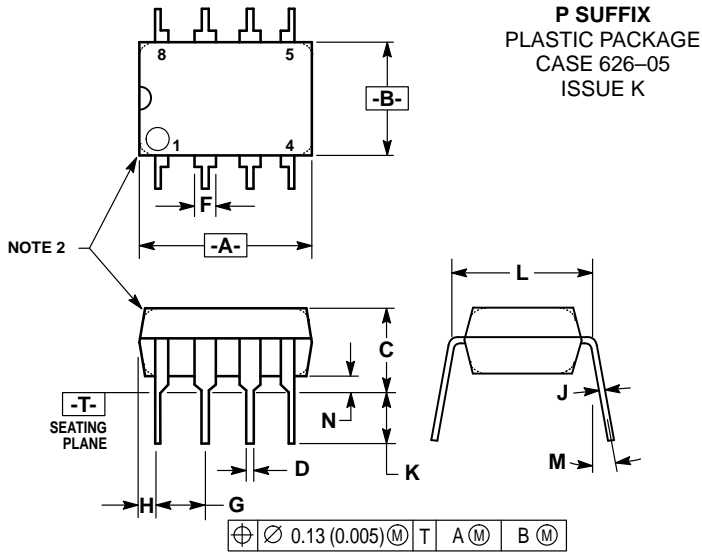
## ELECTRICAL CHARACTERISTICS ( $V_{CC} = 4.5$ to $5.5$ V; $T_A = -40$ to $85^\circ\text{C}$ ), unless otherwise noted.)

| Characteristic                                 | Symbol                 | Min      | Typ    | Max          | Unit |
|--|------------------------|----------|--------|--------------|------|
| Toggle Frequency (Sine Wave Input)             | $f_{max}$<br>$f_{min}$ | 225<br>– | –<br>– | –<br>20      | MHz  |
| Supply Current                                 | $I_{CC}$               | –        | –      | 7.5          | mA   |
| Control Input HIGH (+20)                       | $V_{IH}$               | 2.0      | –      | –            | V    |
| Control Input LOW (+21)                        | $V_{IL}$               | –        | –      | 0.8          | V    |
| Output Swing Voltage (10 k $\Omega$ to ground) | $V_{out}$              | 600      | –      | 1200         | mVpp |
| Input Voltage Sensitivity<br>20 MHz to 225 MHz | $V_{in}$               | 200      | –      | 800          | mVpp |
| PLL Response Time (Notes 1 and 2)              | $t_{PLL}$              | –        | –      | $t_{out-70}$ | ns   |

**NOTES:** 1.  $t_{PLL}$  = 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.  
2.  $t_{out}$  = period of output waveform.

# MC12019

## OUTLINE DIMENSIONS

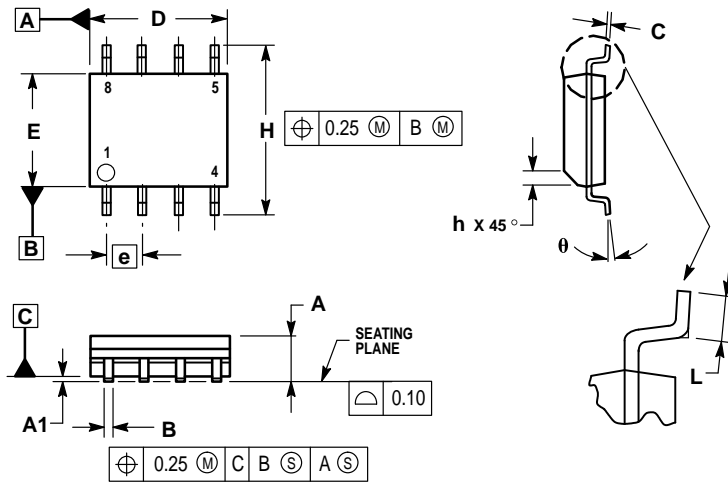


NOTES:

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°       |       |
| N   | 0.76        | 1.01  | 0.030     | 0.040 |


**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 |
| $\theta$ | 0° 7°       |      |

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