### 1.3GHz Prescaler

The MC12075 is a divide by 64 prescaler. Typical frequency synthesis applications include elctronically tuned TV/CATV and communication systems as well as instrumentation.

An internal preamplifier is included which isolates the differential inputs and provides gain for the input signal. Differential PECL outputs are provided.

The MC12075 is pin and functionally compatible with the Plessey SP4633.

- 1.3 GHz Toggle Frequency
- Operating Supply Voltage of 4.5 to 5.5 V
- Low-Power 36 mA Typical at $\mathrm{V}_{\mathrm{CC}}=5.0 \mathrm{~V}$
- Operating Temperature Range of $0^{\circ} \mathrm{C}$ to $+85^{\circ} \mathrm{C}$
- High Input Sensitivity
- 800 mV Minimum Peak-to-Peak Output Swing
- Differential PECL Outputs


## DESIGN GUIDE

| Criteria | Value | Unit |
| :--- | :---: | :---: |
| Internal Gate Count $^{*}$ | 62 | ea |
| Internal Gate Propagation Delay | 250 | ps |
| Internal Gate Power Dissipation | 10 | mW |
| Speed Power Product | 2.5 | pJ |

* Equivalent to a two-input NAND gate

MAXIMUM RATINGS

| Symbol | Characteristic | Range | Unit |
| :--- | :--- | :---: | :---: |
| $\mathrm{V}_{\mathrm{CC}}$ | Power Supply Voltage | 7.0 | Vdc |
| $\mathrm{T}_{\mathrm{A}}$ | Operating Temperature Range | 0 to +85 | ${ }^{\circ} \mathrm{C}$ |
| $\mathrm{T}_{\text {stg }}$ | Storage Temperature Range | -65 to +175 | ${ }^{\circ} \mathrm{C}$ |

ELECTRICAL CHARACTERISTICS ( $\mathrm{V}_{\mathrm{CC}}=4.5$ to $5.5 \mathrm{~V} ; \mathrm{T}_{\mathrm{A}}=0$ to $+85^{\circ} \mathrm{C}$ )

| Symbol | Characteristic | Min | Typ* | Max | Unit |
| :---: | :---: | :---: | :---: | :---: | :---: |
| $\begin{aligned} & f_{\max }^{1} \\ & f_{\min } \end{aligned}$ | Toggle Frequency (Sine Wave Input) | 1.3 | 1.6 | 70 | $\begin{aligned} & \mathrm{GHz} \\ & \mathrm{MHz} \end{aligned}$ |
| ICC | Supply Current at 5.5 V |  | 36 | 50 | mA |
| $\mathrm{V}_{\text {out }}$ | Output Voltage (Load =10pF) | 0.8 | 1.2 |  | VPP |
| $V_{\text {in min }}$ | Input Voltage 70 MHz <br> Sensitivity $150-1100 \mathrm{MHz}$ <br>  1.2 GHz <br>  1.3 GHz |  | $\begin{aligned} & 10 \\ & 1.0 \\ & 1.5 \\ & 3.0 \end{aligned}$ | $\begin{aligned} & 20 \\ & 4.0 \\ & 15 \\ & 20 \end{aligned}$ | mV rms |
| $V_{\text {in max }}$ | Input <br> Overload$\quad 70-1300 \mathrm{MHz}$ | 400 |  |  | mV rms |

* Typical measured at $+25^{\circ} \mathrm{C}, 5.0 \mathrm{~V}$

1. See Figure 1

MC12075

## MECL PLL COMPONENTS

## $\div 64$ <br> PRESCALER



Pinout: 8-Lead Plastic (Top View)


## PRESCALER BLOCK DIAGRAM



MILLIVOLTS

Figure 1. Typical MC12075 Input Signal Amplitude versus Input Frequency

## OUTLINE DIMENSIONS



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 $\mathbb{M})$ are registered trademarks of Motorola, Inc. Motorola, Inc. is an Equal Opportunity/Affirmative Action Employer.

## How to reach us:

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

Mfax ${ }^{\text {TM }: ~ R M F A X 0 @ e m a i l . s p s . m o t . c o m ~-~ T O U C H T O N E ~ 602-244-6609 ~}$ INTERNET: http://Design-NET.com

JAPAN: Nippon Motorola Ltd.; Tatsumi-SPD-JLDC, 6F Seibu-Butsuryu-Center, 3-14-2 Tatsumi Koto-Ku, Tokyo 135, Japan. 81-3-3521-8315

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

