# 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.

- 1.3GHz Toggle Frequency
- Operating Supply Voltage of 4.5 to 5.5V
- Low-Power 36mA Typical at V<sub>CC</sub> = 5.0V
- Operating Temperature Range of 0°C to +85°C
- High Input Sensitivity
- 800mV 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	рЈ

<sup>\*</sup> Equivalent to a two-input NAND gate

#### **MAXIMUM RATINGS**

Symbol	Characteristic	Range	Unit
VCC	Power Supply Voltage	7.0	Vdc
TA	Operating Temperature Range	0 to +85	°C
T <sub>stg</sub>	Storage Temperature Range	-65 to +175	°C

### **ELECTRICAL CHARACTERISTICS** (V<sub>CC</sub> = 4.5 to 5.5V; T<sub>A</sub> = 0 to +85°C)

Symbol	Characteristic	Min	Тур*	Max	Unit
f <sub>max</sub> 1 f <sub>min</sub>	Toggle Frequency (Sine Wave Input)	1.3	1.6	70	GHz MHz
ICC	Supply Current at 5.5V		36	50	mA
V <sub>out</sub>	Output Voltage (Load =10pF)	0.8	1.2		VPP
Vin min	Input Voltage 70MHz Sensitivity 150–1100MHz 1.2GHz 1.3GHz		10 1.0 1.5 3.0	20 4.0 15 20	mV <sub>rms</sub>
V <sub>in max</sub>	Input 70–1300MHz Overload	400			mV <sub>rms</sub>

<sup>\*</sup> Typical measured at +25°C, 5.0V

# MC12075

## **MECL PLL COMPONENTS**

÷64 PRESCALER

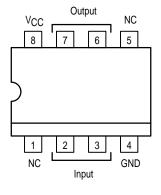


P SUFFIX 8-LEAD PLASTIC PACKAGE CASE 626-05



**D SUFFIX** 8-LEAD PLASTIC SOIC PACKAGE CASE 751-05

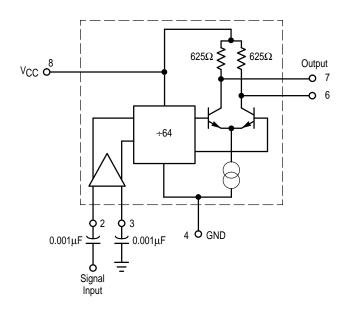
## Pinout: 8-Lead Plastic (Top View)





<sup>1.</sup> See Figure 1

# PRESCALER BLOCK DIAGRAM



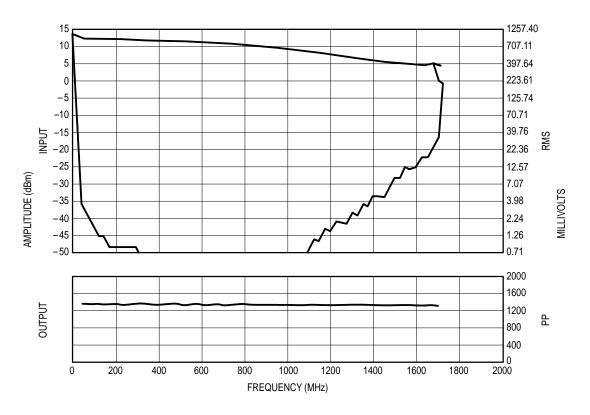
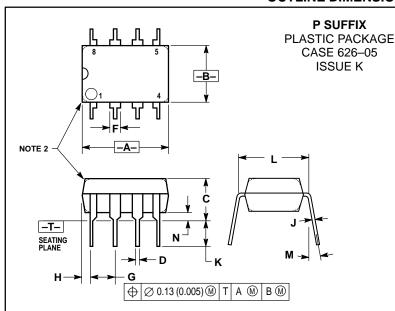


Figure 1. Typical MC12075 Input Signal Amplitude versus Input Frequency

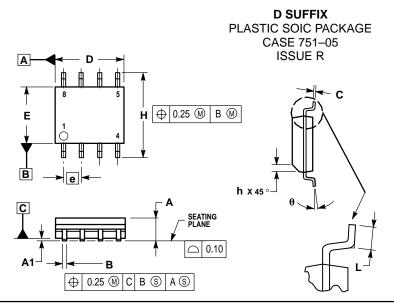
#### **OUTLINE DIMENSIONS**



#### NOTES:

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

	MILLIMETERS		INCHES	
DIM	MIN	MAX	MIN	MAX
Α	9.40	10.16	0.370	0.400
В	6.10	6.60	0.240	0.260
С	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	
Н	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:

- DIMENSIONING AND TOLERANCING PER ASME Y14.5M. 1994.
- 2. DIMENSIONS ARE IN MILLIMETERS.
- 3. DIMENSION D AND E DO NOT INCLUDE MOLD
- PROTRUSION.
  4. MAXIMUM MOLD PROTRUSION 0.15 PER SIDE.
- 5. DIMENSION B DOES NOT INCLUDE MOLD PROTRUSION. ALLOWABLE DAMBAR PROTRUSION SHALL BE 0.127 TOTAL IN EXCESS OF THE B DIMENSION AT MAXIMUM MATERIAL CONDITION.

	MILLIMETERS		
DIM	MIN	MAX	
Α	1.35	1.75	
A1	0.10	0.25	
В	0.35	0.49	
С	0.18	0.25	
D	4.80	5.00	
E	3.80	4.00	
е	1.27 BSC		
Н	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 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.

#### 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™: RMFAX0@email.sps.mot.com – TOUCHTONE 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



MC12075/D