2.8GHz Prescaler

MC12089

MECL PLL COMPONENTS

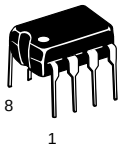
÷64/128 PRESCALER

The MC12089 is a single modulus divide by 64 and 128 prescaler for low power frequency division of a 2.8GHz high frequency input signal. The low power (10.2mA typical at 5.0V) and high operating frequency features make this prescaler ideal in satellite TV receiver applications.

Divide ratio control input SW selects the required divide ratio of ÷64 or ÷128.

On-chip output termination provides 2.5mA of output current to drive a 12pF (typical) high impedance load. The output voltage swing under typical supply voltage and temperature conditions is 1.2V. If additional drive is required for the prescaler output, an external resistor can be added in 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.

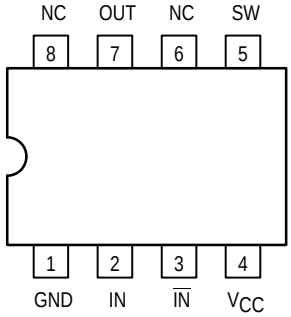
- 2.8GHz Toggle Frequency
- Supply Voltage 4.5V to 5.5V
- Low Power Dissipation 51mW Typical
- Operating Temperature Range of –40°C to +85°C



P SUFFIX
PLASTIC PACKAGE
CASE 626-05

D SUFFIX
PLASTIC SOIC PACKAGE
CASE 751-05

Pinout: 8-Lead Plastic (Top View)



MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V_{CC}	Power Supply Voltage, Pin 4	–0.5 to +7.0	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 7	4	mA

ELECTRICAL CHARACTERISTICS (V_{CC} = 4.5 to 5.5V; T_A = –40 to +85°C)

Symbol	Parameter	Min	Typ	Max	Unit
ft	Toggle Frequency (Sine Wave)	0.25	3.4	2.8	GHz
I_{CC}	Supply Current Output (Pin 2)	—	10.2	14.5	mA
V_{in}	Input Voltage Sensitivity 250–500MHz 500–2800MHz	400 100	— —	1000 1000	mV_{PP}
V_{IH}	Divide Ratio Control Input High (SW)	V_{CC} – 0.5	V_{CC}	V_{CC} + 0.5	V
V_{IL}	Divide Ratio Control Input Low (SW)	Open	Open	Open	—
V_{out}	Output Voltage Swing[1]	0.8	1.2	—	V_{PP}

1 Assumes C_L = 12pF

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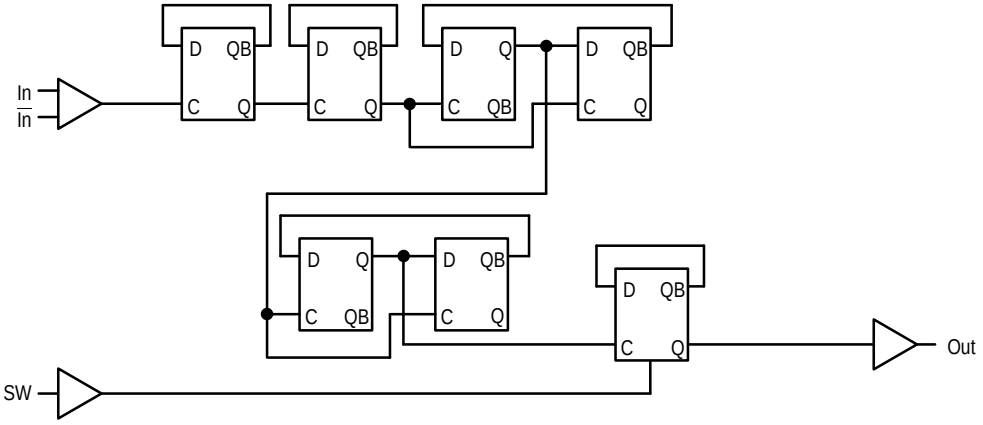


Figure 1. Logic Diagram (MC12089)

FUNCTION TABLE

SW	Divide Ratio
H	64
L	128

Note: H = V_{CC}; L = Open

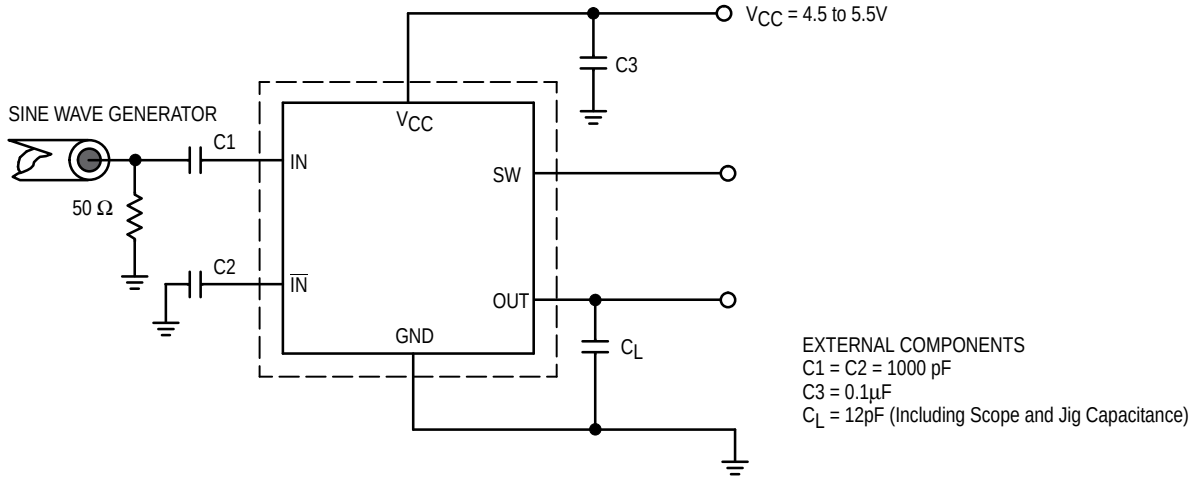


Figure 2. AC Test Circuit

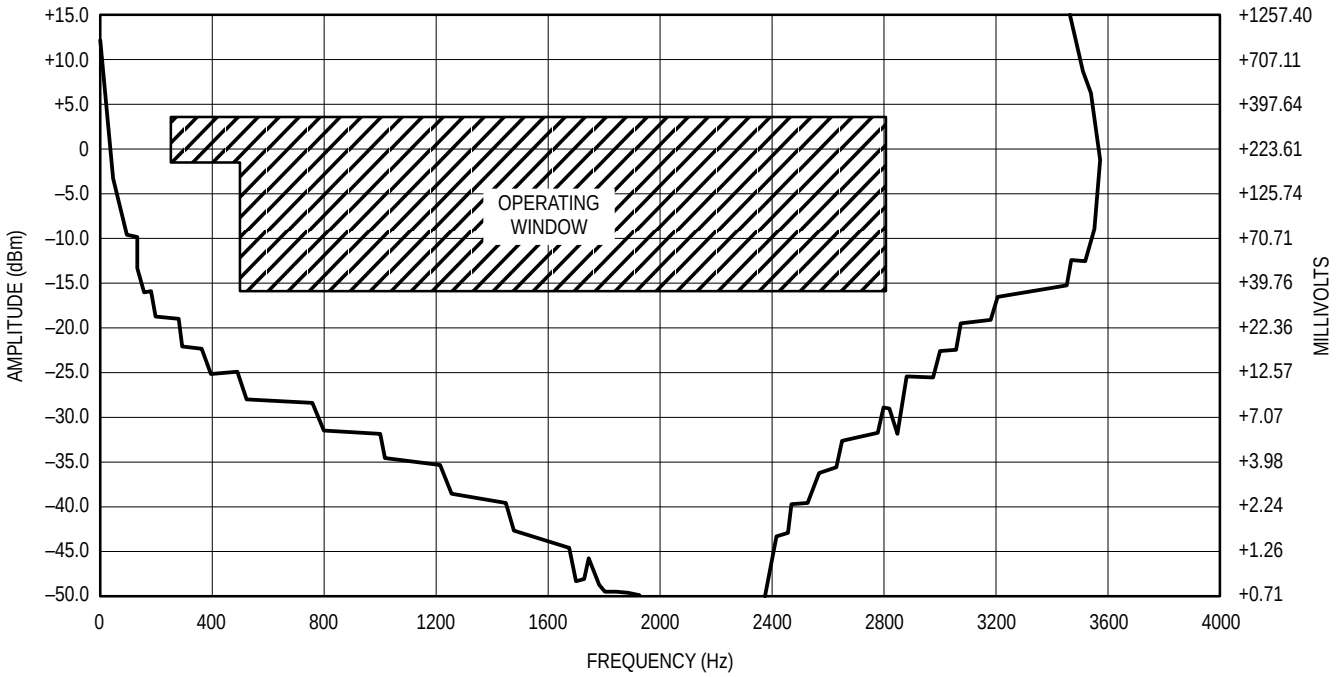
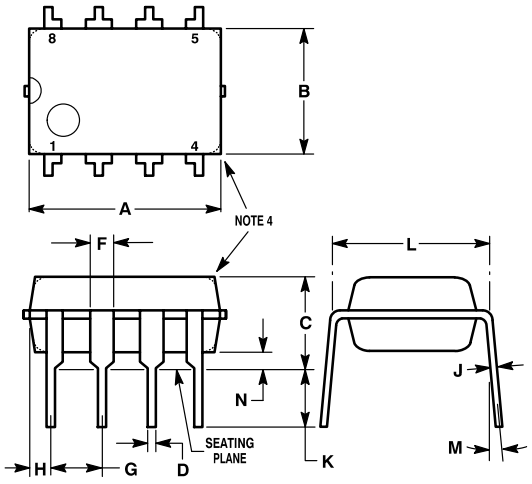


Figure 3. Input Signal Amplitude versus Input Frequency
Divide Ratio = 64; V_{CC} = 5.0V; T_A = 25°C

OUTLINE DIMENSIONS

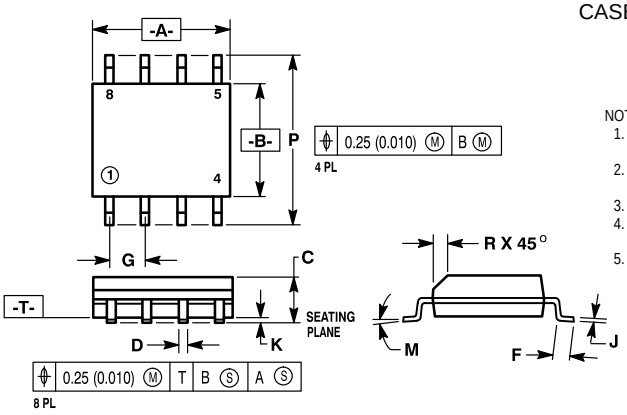
P SUFFIX
PLASTIC PACKAGE
CASE 626-04



NOTES:
1. LEAD POSITIONAL TOLERANCE:
   ⌖ | ϕ 0.13 (0.005) Ⓜ | T | A Ⓜ | B Ⓜ
2. DIMENSION L TO CENTER OF LEADS WHEN FORMED PARALLEL.
3. PACKAGE CONTOUR OPTIONAL (ROUND OR SQUARE CORNERS).
4. DIMENSIONS A AND B ARE DATUMS.
5. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.

	MILLIMETERS		INCHES	
DIM	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	1.52	0.040	0.060
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° 0.76	—	10° 0.030
N	0.51		0.020	

D SUFFIX
PLASTIC SOIC PACKAGE
CASE 751-03



NOTES:
1. DIMENSIONS "A" AND "B" ARE DATUMS AND "T" IS A DATUM SURFACE.
2. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
3. CONTROLLING DIM: MILLIMETER.
4. DIMENSION "A" AND "B" DO NOT INCLUDE MOLD PROTRUSION.
5. MAXIMUM MOLD PROTRUSION 0.15 (0.006) PER SIDE.

	MILLIMETERS		INCHES	
DIM	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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