



## Typical Applications

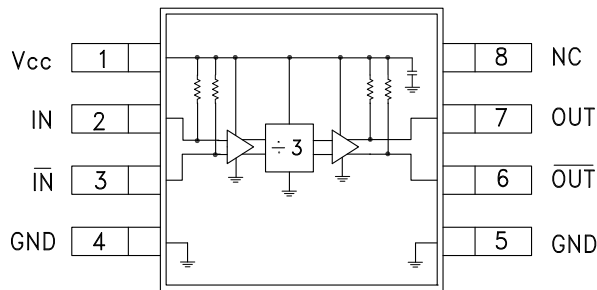
Prescaler for DC to C Band PLL Applications:

- UNII, Point-to-Point & VSAT Radios
- 802.11a & HiperLAN WLAN
- Fiber Optic
- Cellular / 3G Infrastructure

## Features

- SSB Phase Noise: -153 dBc/Hz @100KHz
- Wide Bandwidth
- Output Power: -1 dBm
- Single DC Supply: +5V @ 69 mA
- MS8G SMT Package

## Functional Diagram



## General Description

The HMC437MS8G & HMC437MS8GE are low noise Divide-by-3 Static Dividers utilizing InGaP GaAs HBT technology in low cost 8 lead surface mount plastic packages. This device operates from DC (with a square wave input) to 7 GHz input frequency from a single +5V DC supply. The low additive SSB phase noise of -153 dBc/Hz at 100 kHz offset helps the user maintain good system noise performance.

## Electrical Specifications, $T_A = +25^\circ\text{C}$ , 50 Ohm System, $V_{CC} = 5V$

Parameter	Conditions	Min.	Typ.	Max.	Units
Maximum Input Frequency		7.0	7.5		GHz
Minimum Input Frequency	Sine Wave Input [1]		0.1		GHz
Input Power Range	$F_{in} = 1$ to 6 GHz	-12		+12	dBm
	$F_{in} = 6$ to 7 GHz	-10		+10	dBm
Output Power		-4	-1		dBm
Reverse Leakage	Both RF Outputs Terminated		-50		dBm
SSB Phase Noise (100 kHz offset)	$P_{in} = 0$ dBm, $F_{in} = 6$ GHz		-153		dBc/Hz
Output Transition Time	$P_{in} = 0$ dBm, $F_{out} = 882$ MHz		100		ps
Supply Current ( $I_{CC}$ )			69		mA

1. Divider will operate down to DC for square-wave input signal.

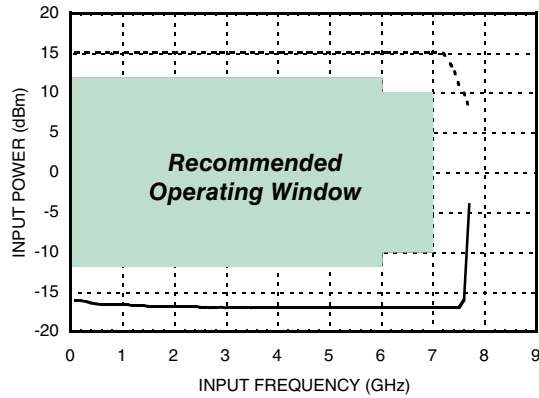
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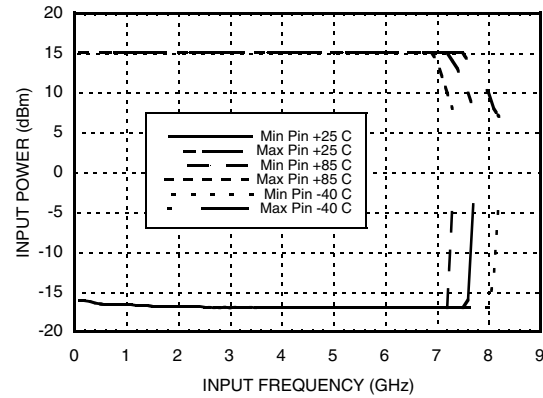


**SMT GaAs HBT MMIC  
DIVIDE-BY-3, DC - 7 GHz**

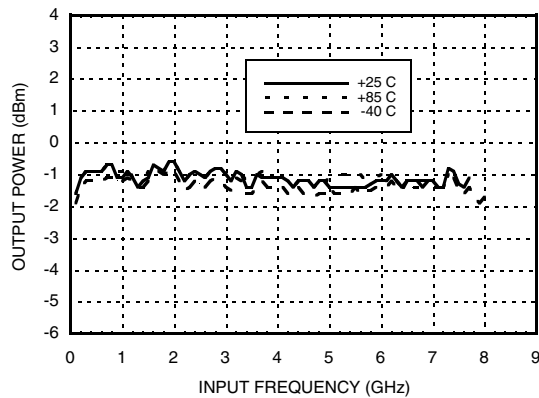
**Input Sensitivity Window,  $T = 25\text{ }^{\circ}\text{C}$**



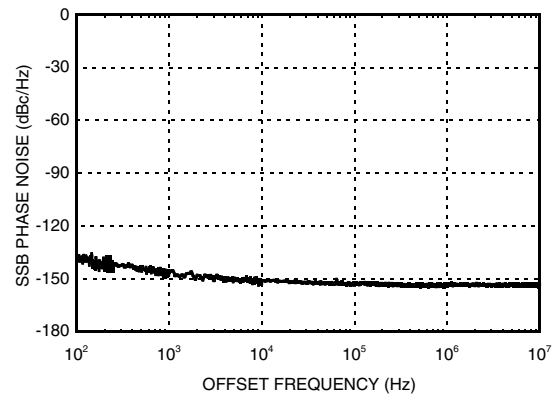
**Input Sensitivity Window vs. Temperature**



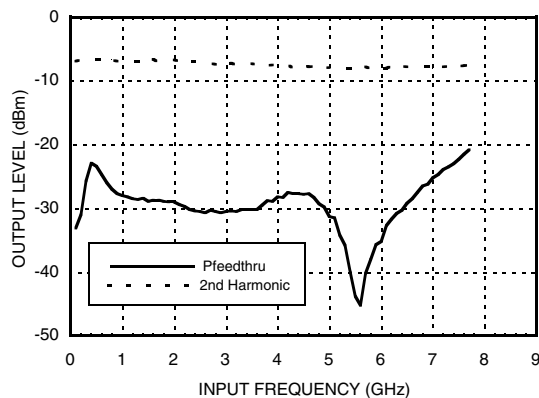
**Output Power vs. Temperature**



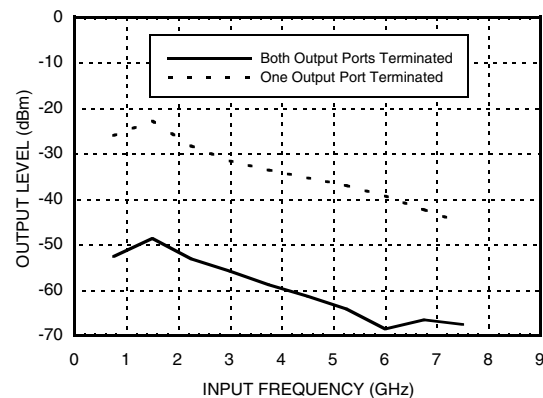
**SSB Phase Noise Performance,  
 $P_{in} = 0\text{ dBm}$ ,  $F_{in} = 6\text{ GHz}$ ,  $T = 25\text{ }^{\circ}\text{C}$**



**Output Harmonic Content,  $P_{in} = 0\text{ dBm}$ ,  $T = 25\text{ }^{\circ}\text{C}$**



**Reverse Leakage,  $P_{in} = 0\text{ dBm}$ ,  $T = 25\text{ }^{\circ}\text{C}$**

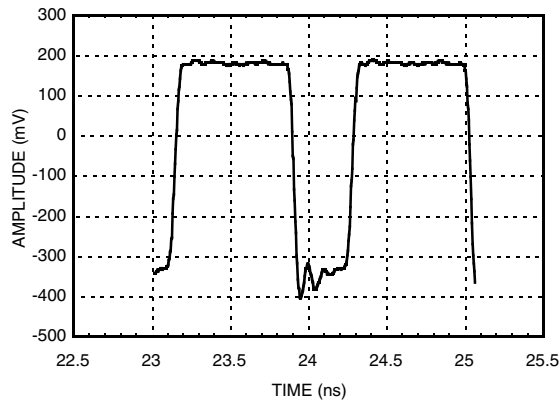


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**Output Voltage Waveform,  
Pin= 0 dBm, Fout= 882 MHz, T= 25 °C**



### Absolute Maximum Ratings

RF Input Power (Vcc = +5V)	13 dBm
Nominal +5V Supply to GND	-0.3V to +5.5V
Max Peak Flow Temperature	260 °C
Storage Temperature	-65 to +150 °C
ESD Sensitivity (HBM)	Class 1A

### Reliability Information

Junction Temperature to Maintain 1 Million Hour MTTF	135 °C
Nominal Junction Temperature (T = 85 °C)	122 °C
Thermal Resistance (Junction to GND Paddle, 5V Supply)	101.5 °C/W
Operating Temperature	-40 to +85 °C

DC blocking capacitors are required at RF input and RF output ports. Choose value for lowest frequency of operation.



**ELECTROSTATIC SENSITIVE DEVICE  
OBSERVE HANDLING PRECAUTIONS**

### Typical Supply Current vs. Vcc

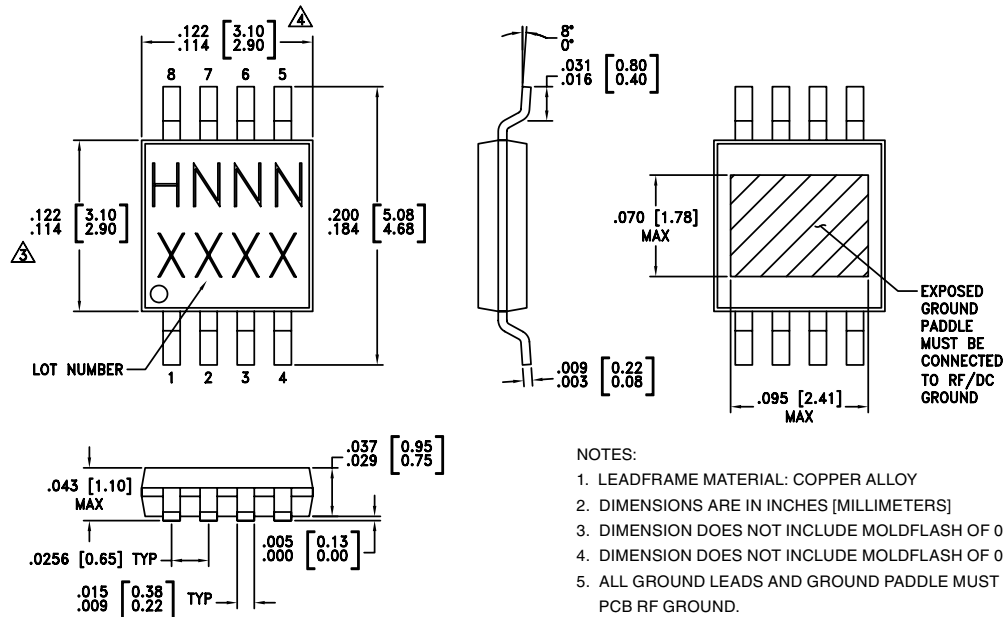
Vcc (V)	Icc (mA)
4.75	64
5.0	69
5.25	75

Note: Divider will operate over full voltage range shown above



**SMT GaAs HBT MMIC  
DIVIDE-BY-3, DC - 7 GHz**

**Outline Drawing**



**Package Information**

Part Number	Package Body Material	Lead Finish	MSL Rating	Package Marking <sup>[3]</sup>
HMC437MS8G	Low Stress Injection Molded Plastic	Sn/Pb Solder	MSL1 <sup>[1]</sup>	H437 XXXX
HMC437MS8GE	RoHS-compliant Low Stress Injection Molded Plastic	100% matte Sn	MSL1 <sup>[2]</sup>	H437 XXXX

[1] Max peak reflow temperature of 235 °C  
 [2] Max peak reflow temperature of 260 °C  
 [3] 4-Digit lot number XXXX

**Pin Description**

Pin Number	Function	Description	Interface Schematic
1	Vcc	Supply voltage 5V ± 0.25V.	
2	IN	RF input must be DC blocked.	
3	IN	RF input 180° out of phase with pin 2 for differential operation. AC ground for single ended operation.	

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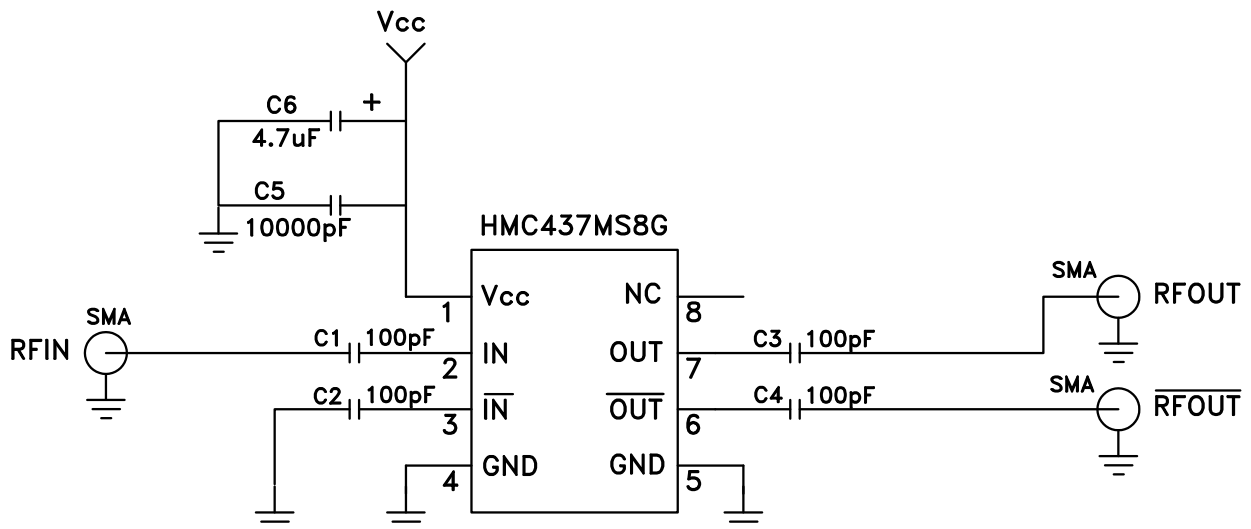
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**Pin Description (Continued)**

Pin Number	Function	Description	Interface Schematic
4, 5	GND	All ground leads and ground paddle must be soldered to PCB RF/DC ground.	
6	$\overline{\text{OUT}}$	Divided output 180° out of phase with pin 7.	
7	OUT	Divided Output.	
8	N/C	The pins are not connected internally; however, all data shown herein was measured with these pins connected to RF/DC ground externally.	

**Application Circuit**



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