



Typical Applications

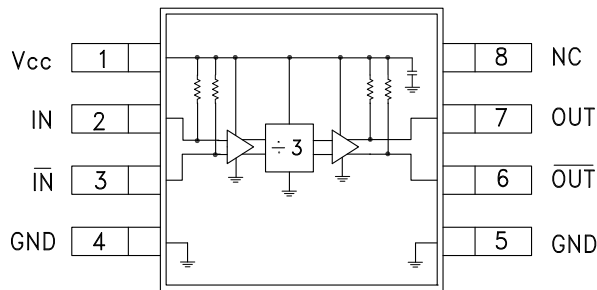
Prescaler for DC to C Band PLL Applications:

- 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, $V_{CC} = 5V$

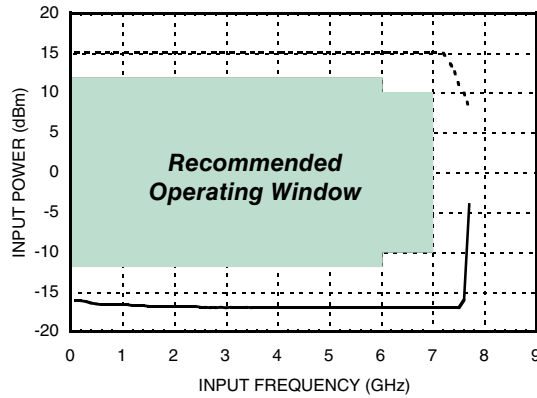
Parameter	Conditions	Min.	Typ.	Max.	Units
Maximum Input Frequency		7.0	7.5		GHz
Minimum Input Frequency	Sine Wave Input [1]		0.1		GHz
Input Power Range	$F_{in} = 1$ to 6 GHz	-12		+12	dBm
	$F_{in} = 6$ to 7 GHz	-10		+10	dBm
Output Power		-4	-1		dBm
Reverse Leakage	Both RF Outputs Terminated		-50		dBm
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.

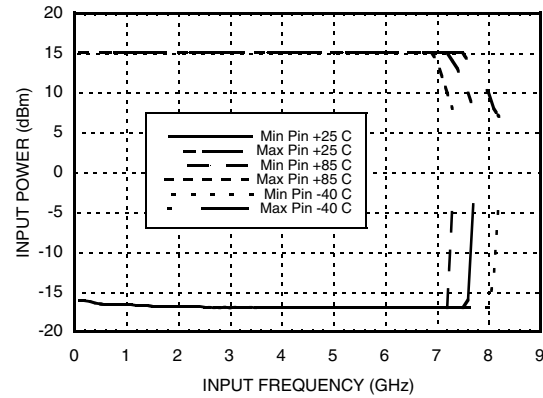


**SMT GaAs HBT MMIC
DIVIDE-BY-3, DC - 7 GHz**

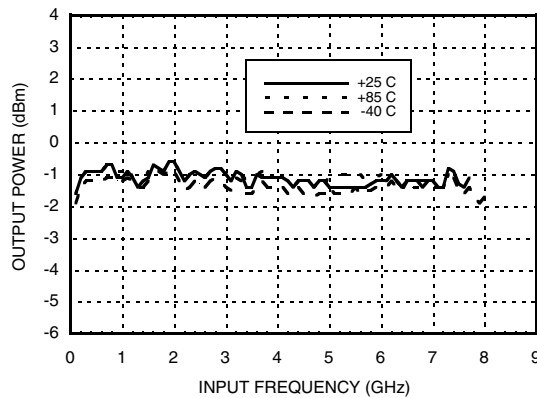
Input Sensitivity Window, $T = 25\text{ }^{\circ}\text{C}$



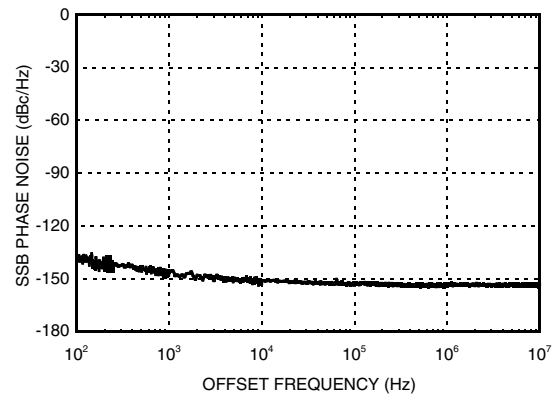
Input Sensitivity Window vs. Temperature



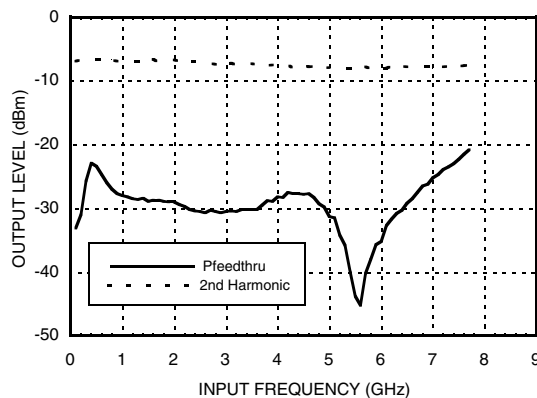
Output Power vs. Temperature



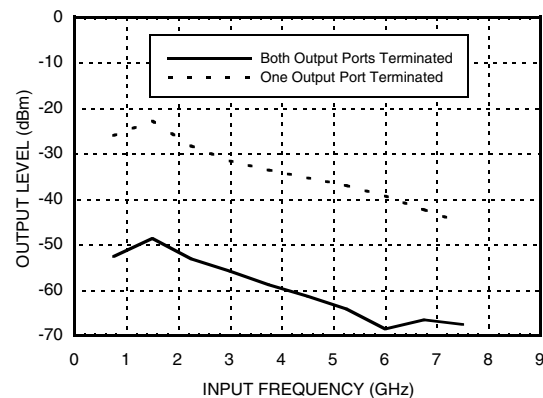
**SSB Phase Noise Performance,
 $P_{in} = 0\text{ dBm}$, $F_{in} = 6\text{ GHz}$, $T = 25\text{ }^{\circ}\text{C}$**



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



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

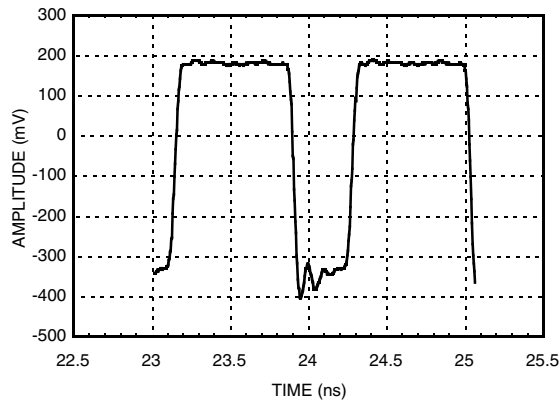


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**Output Voltage Waveform,
Pin= 0 dBm, Fout= 882 MHz, T= 25 °C**



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

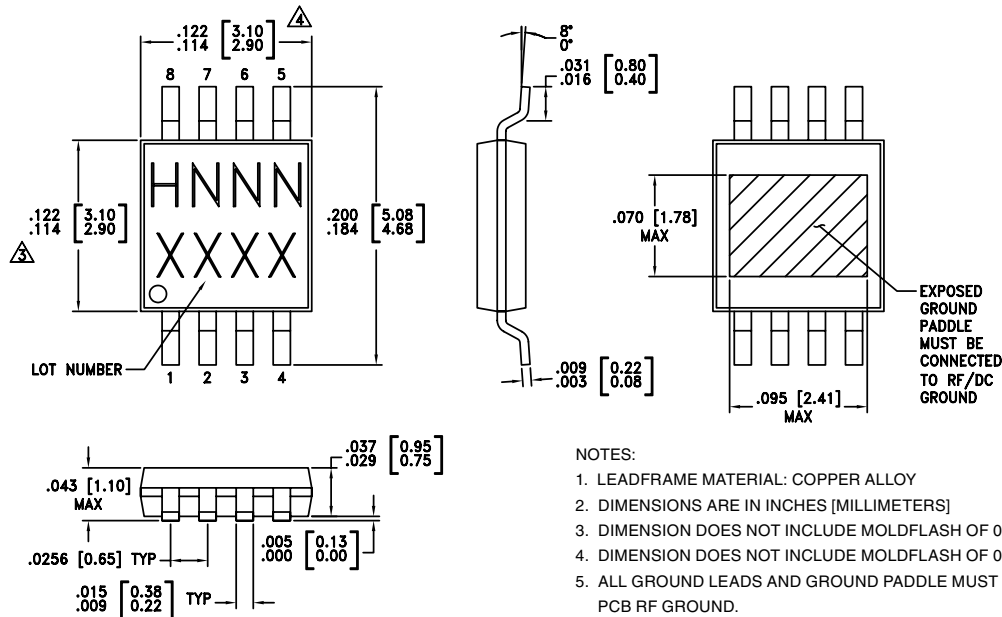
Vcc (V)	Icc (mA)
4.75	64
5.0	69
5.25	75

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 ^[3]
HMC437MS8G	Low Stress Injection Molded Plastic	Sn/Pb Solder	MSL1 ^[1]	H437 XXXX
HMC437MS8GE	RoHS-compliant Low Stress Injection Molded Plastic	100% matte Sn	MSL1 ^[2]	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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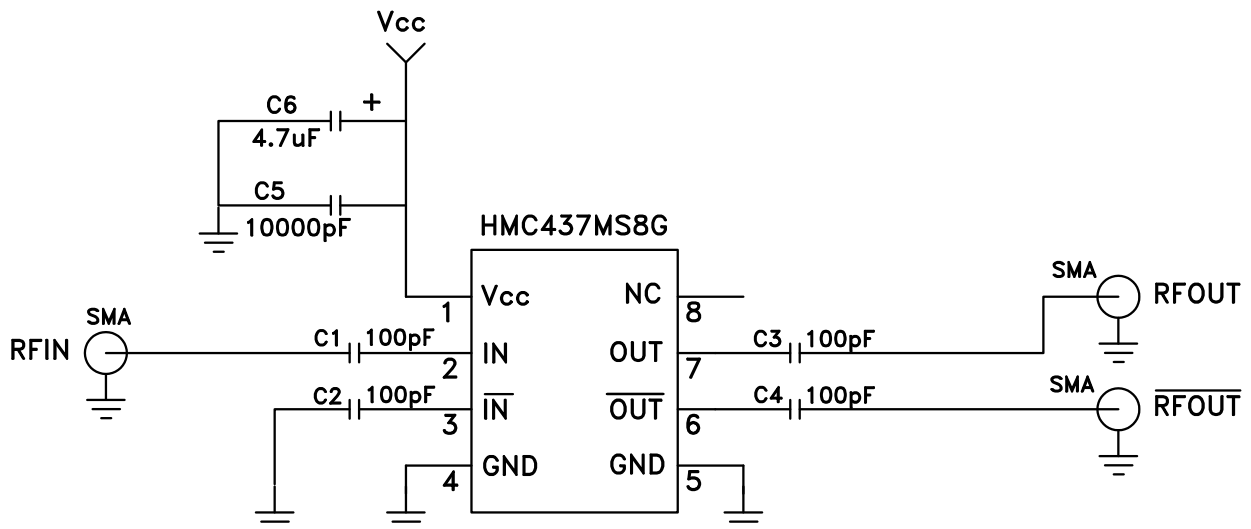


**SMT GaAs HBT MMIC
DIVIDE-BY-3, DC - 7 GHz**

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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