



## SMT GaAs HBT MMIC DIVIDE-BY-8, DC - 12 GHz

### Typical Applications

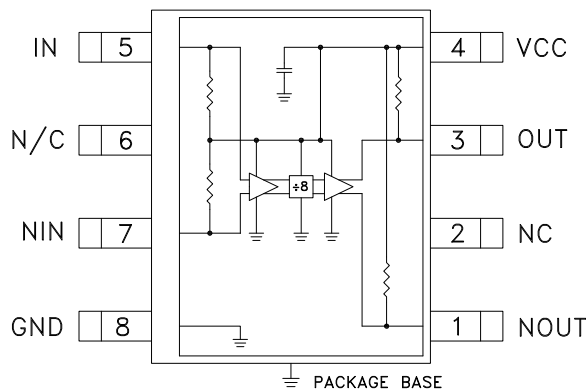
Prescaler for DC to X Band PLL Applications:

- Satellite Communication Systems
- Fiber Optic
- Point-to-Point and Point-to-Multi-Point Radios
- VSAT

### Features

- Ultra Low SSB Phase Noise: -153 dBc/Hz
- Wide Bandwidth
- Output Power: -6 dBm
- Single DC Supply: +5V
- S8G SMT Package

### Functional Diagram



### General Description

The HMC363S8G & HMC363S8GE are low noise Divide-by-8 Static Dividers with InGaP GaAs HBT technology in 8 lead surface mount plastic packages. This device operates from DC (with a square wave input) to 12 GHz input frequency with 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, $V_{CC} = 5V$

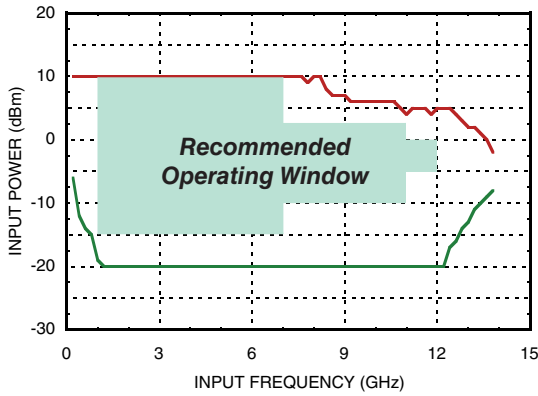
Parameter	Conditions	Min.	Typ.	Max.	Units
Maximum Input Frequency		12	13		GHz
Minimum Input Frequency	Sine Wave Input. [1]		0.2	0.5	GHz
Input Power Range	$F_{in} = 1$ to 7 GHz	-15	>-20	+10	dBm
	$F_{in} = 7$ to 11 GHz	-10	>-15	+2	dBm
	$F_{in} = 11$ to 12 GHz	-5	>-8	0	dBm
Output Power	$F_{in} = 12$ GHz	-9	-6		dBm
Reverse Leakage	Both RF Outputs Terminated		65		dB
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 ( $I_{CC}$ )			70		mA

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

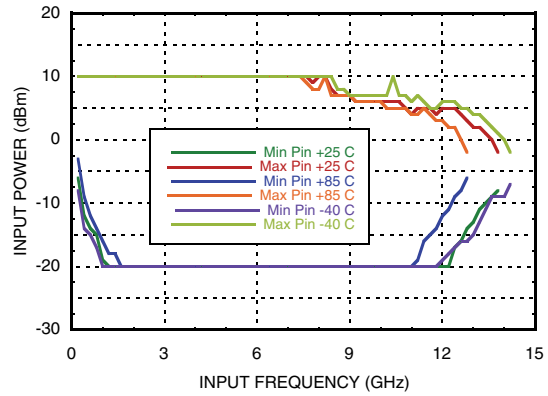


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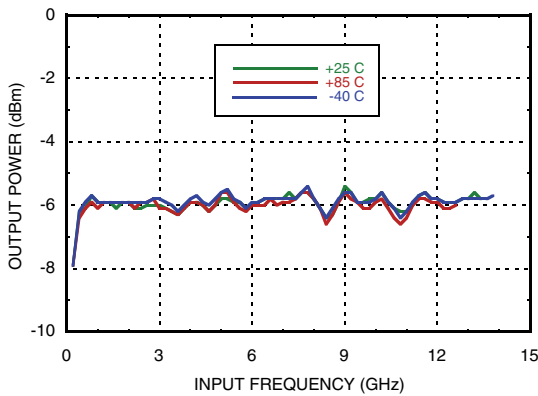
**Input Sensitivity Window, T= 25 °C**



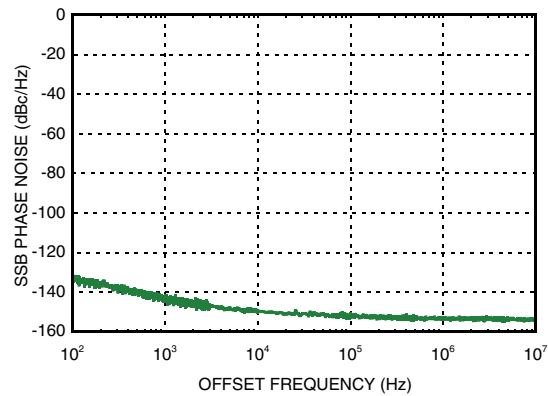
**Input Sensitivity Window vs. Temperature**



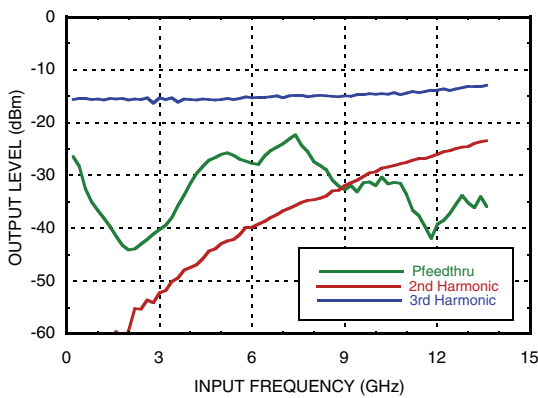
**Output Power vs. Temperature**



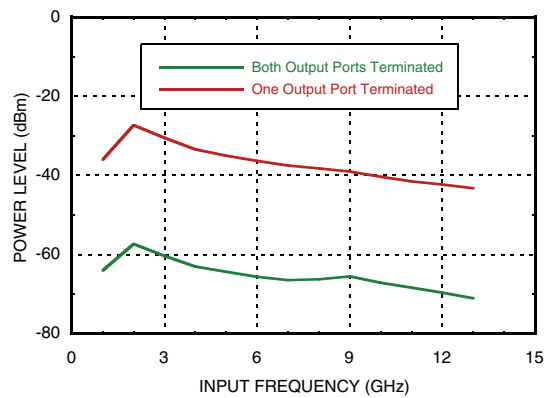
**SSB Phase Noise Performance, Pin= 0 dBm, T= 25 °C**



**Output Harmonic Content, Pin= 0 dBm, T= 25 °C**



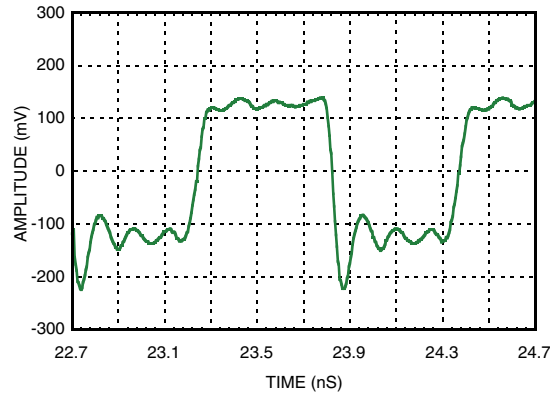
**Reverse Leakage, Pin= 0 dBm, T= 25 °C**





## SMT GaAs HBT MMIC DIVIDE-BY-8, DC - 12 GHz

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



### Absolute Maximum Ratings

RF Input (Vcc = +5V)	+13 dBm
Vcc	+5.5V
Channel Temperature	135 °C
Continuous Pdiss (T=85°C) (derate 13.7 mW/°C above 85°C)	680 mW
Thermal Resistance (channel to ground paddle)	73.2 C/W
Storage Temperature	-65 to +150 °C
Operating Temperature	-40 to +85 °C

### Typical Supply Current vs. Vcc

Vcc (V)	Icc (mA)
4.75	64
5.0	70
5.25	75

Note: Divider will operate over full voltage range shown above

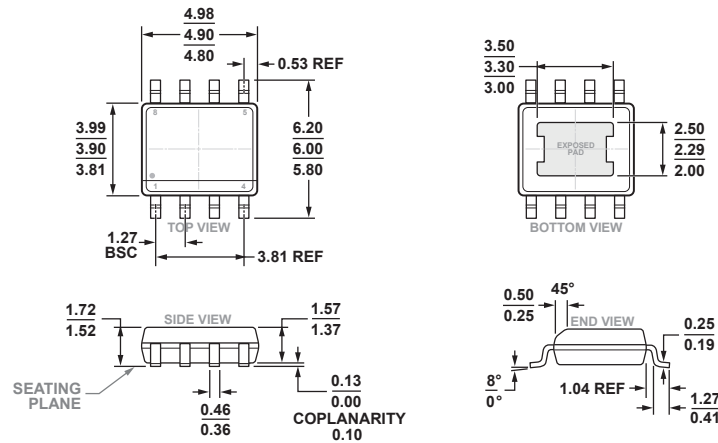


**ELECTROSTATIC SENSITIVE DEVICE  
OBSERVE HANDLING PRECAUTIONS**



## SMT GaAs HBT MMIC DIVIDE-BY-8, DC - 12 GHz

### Outline Drawing



COMPLIANT TO JEDEC STANDARDS MS-012-BA

8-Lead Standard Small Outline Package, with Exposed Pad [SOIC\_N\_EP]  
 Narrow Body, Low Stand-off  
 (RD-8-3)  
 Dimensions shown in millimeters.

### Package Information

Part Number	Package Body Material	Lead Finish	MSL Rating	Package Marking <sup>[3]</sup>
HMC363S8G	Low Stress Injection Molded Plastic	Sn/Pb Solder	MSL1 <sup>[1]</sup>	HMC363 XXXX
HMC363S8GTR	Low Stress Injection Molded Plastic	Sn/Pb Solder	MSL1 <sup>[1]</sup>	HMC363 XXXX
HMC363S8GE	RoHS-compliant Low Stress Injection Molded Plastic	100% matte Sn	MSL1 <sup>[2]</sup>	HMC363 XXXX
HMC363S8GETR	RoHS-compliant Low Stress Injection Molded Plastic	100% matte Sn	MSL1 <sup>[2]</sup>	HMC363 XXXX
104631- HMC363S8G	Eval Board			

[1] Max peak reflow temperature of 235 °C

[2] Max peak reflow temperature of 260 °C

[3] 4-Digit lot number XXXX



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**Pin Description**

Pin Number	Function	Description	Interface Schematic
1	NOUT	Divided output 180° out of phase with pin 3.	
2, 6	N/C	No connection. These pins must not be grounded.	
3	OUT	Divided Output.	
4	VCC	Supply voltage 5V ± 0.25V.	
5	IN	RF Input must be DC blocked.	
7	NIN	RF Input 180° out of phase with pin 5 for differential operation. A/C ground for single ended operation	
8, paddle	GND	Backside of package has exposed metal ground slug which must be connected to ground.	

**Application Circuit**

