

Typical Applications

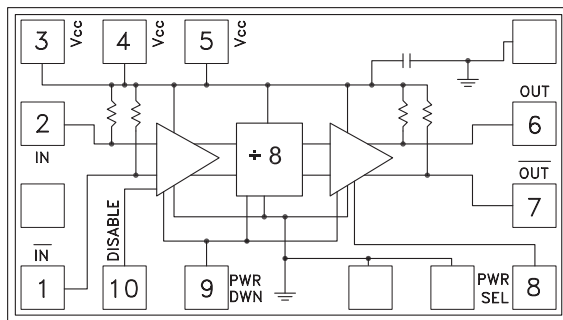
Prescaler for DC to X Band PLL Applications:

- 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
- Small Size: 1.45 x 0.69 x 0.1 mm

Functional Diagram



General Description

The HMC363 is a low noise Divide-by-8 Static Divider with InGaP GaAs HBT technology that has a small size of 1.45 x 0.69 mm. 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, $V_{CC} = 5V$

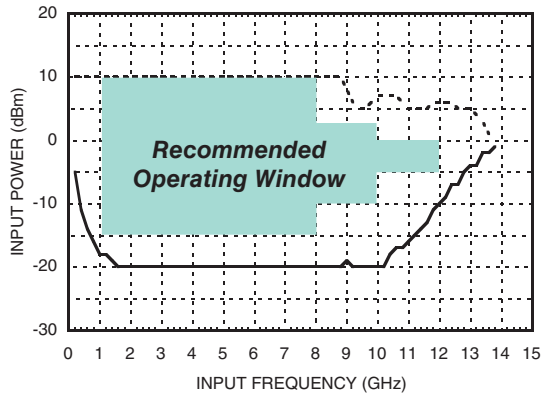
Parameter	Conditions	Min.	Typ.	Max.	Units
Maximum Input Frequency		12	13		GHz
Minimum Input Frequency	Sine Wave Input. [1]		0.2	0.5	GHz
Input Power Range	$F_{in} = 1$ to 8 GHz	-15	>-20	+10	dBm
	$F_{in} = 8$ to 10 GHz	-10	>-15	+2	dBm
	$F_{in} = 10$ to 12 GHz	-5	>-8	0	dBm
Output Power [2]	$F_{in} = 12$ GHz	-9	-6		dBm
Reverse Leakage	Both RF Outputs Terminated		60		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}) [2]			70		mA

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

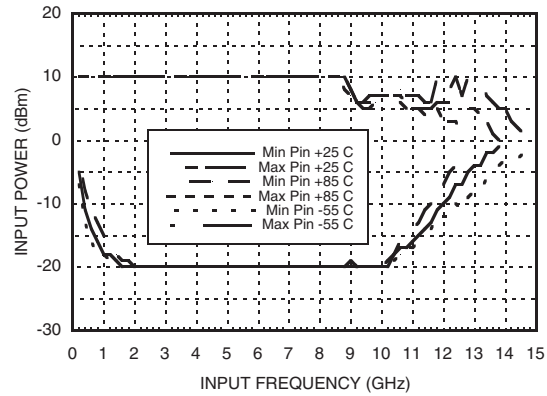
[2] When operated in low power mode (pin 8 floating).

**GaAs HBT MMIC
DIVIDE-BY-8, DC - 12 GHz**

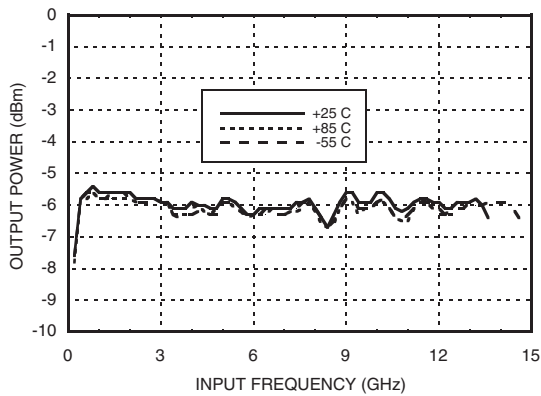
Input Sensitivity Window, $T = 25\text{ }^\circ\text{C}$



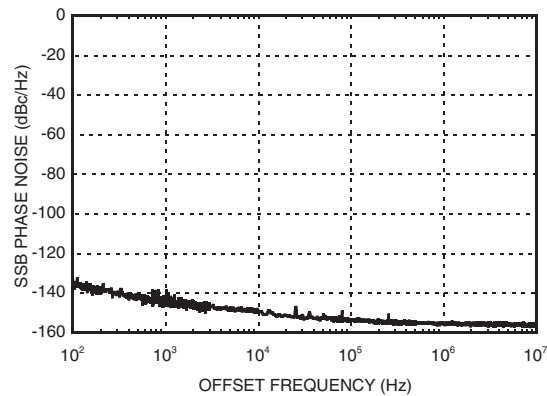
Input Sensitivity Window vs. Temperature



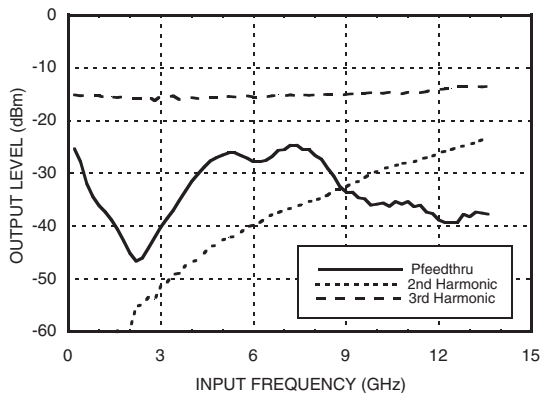
Output Power vs. Temperature



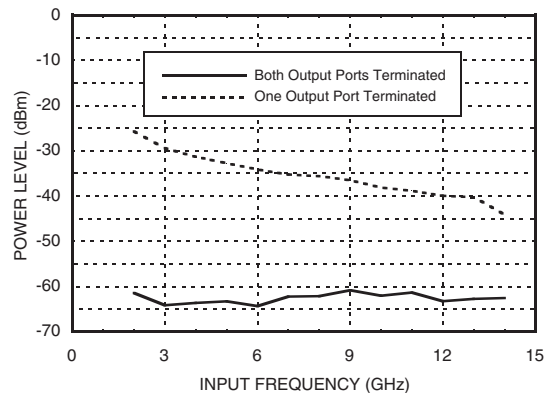
SSB Phase Noise Performance, $P_{in} = 0\text{ dBm}$, $T = 25\text{ }^\circ\text{C}$



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



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

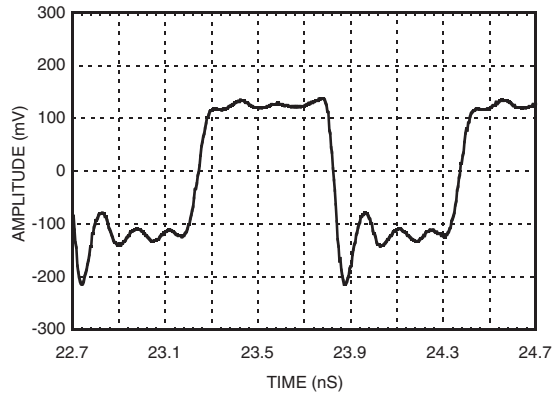


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**GaAs HBT MMIC
DIVIDE-BY-8, DC - 12 GHz**

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



Absolute Maximum Ratings

RF Input (Vcc = +5V)	+13 dBm
Vcc	+5.5V
VLogic	Vcc -1.6V to Vcc -1.2V
Storage Temperature	-65 to +150 °C
Operating Temperature	-55 to +85 °C



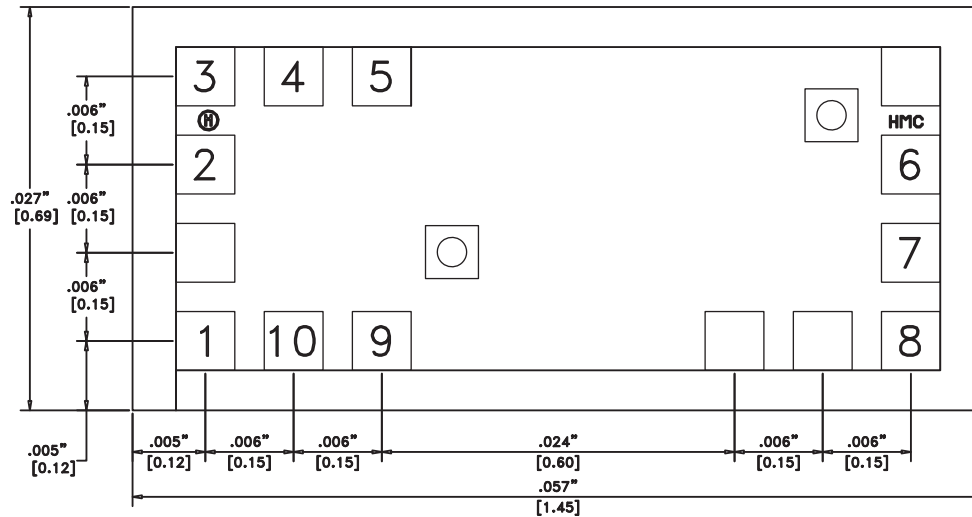
**ELECTROSTATIC SENSITIVE DEVICE
OBSERVE HANDLING PRECAUTIONS**

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

Outline Drawing



Die Packaging Information [1]

Standard	Alternate
WP-8 (Waffle Pack)	[2]

[1] Refer to the "Packaging Information" section for die packaging dimensions.

[2] For alternate packaging information contact Hittite Microwave Corporation.

NOTE:

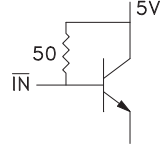
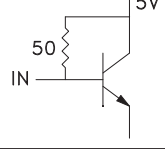
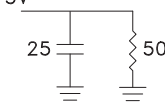
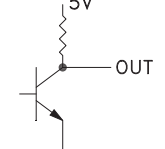
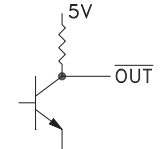
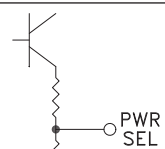
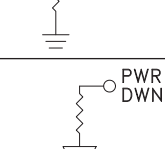
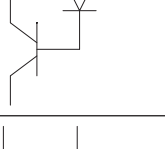
1. ALL DIMENSIONS IN INCHES (MILLIMETERS)
2. ALL TOLERANCES ARE ±0.001 (0.025)
3. DIE THICKNESS IS 0.004 (0.100) BACKSIDE IS GROUND
4. BOND PADS ARE 0.004 (0.100) SQUARE
5. BOND PAD SPACING, CTR-CTR: 0.006 (0.150)
6. BACKSIDE METALLIZATION: GOLD
7. BOND PAD METALLIZATION: GOLD

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

Pad Description

Pad Number	Function	Description	Interface Schematic
1	\overline{IN}	RF Input 180° out of phase with pad 3 for differential operation. AC ground for single ended operation.	
2	IN	RF Input must be DC blocked.	
3, 4, 5	Vcc	Supply Voltage 5V ±0.25V can be applied to pad 3, 4, or 5.	
6	OUT	Divided Output	
7	\overline{OUT}	Divided output 180° out of phase with OUT.	
8	PWR SEL	In the low power mode, the power select pin is left floating. By grounding this pin, the output power is increased by approximately 10 dB.	
9	PWR DWN	The power down pin is grounded for normal operation. Applying 5 volts to this pin will power down this device.	
10	DISABLE	The disable pin is grounded for normal operation. Applying 5 volts to this pin will disable the input buffer amplifier.	

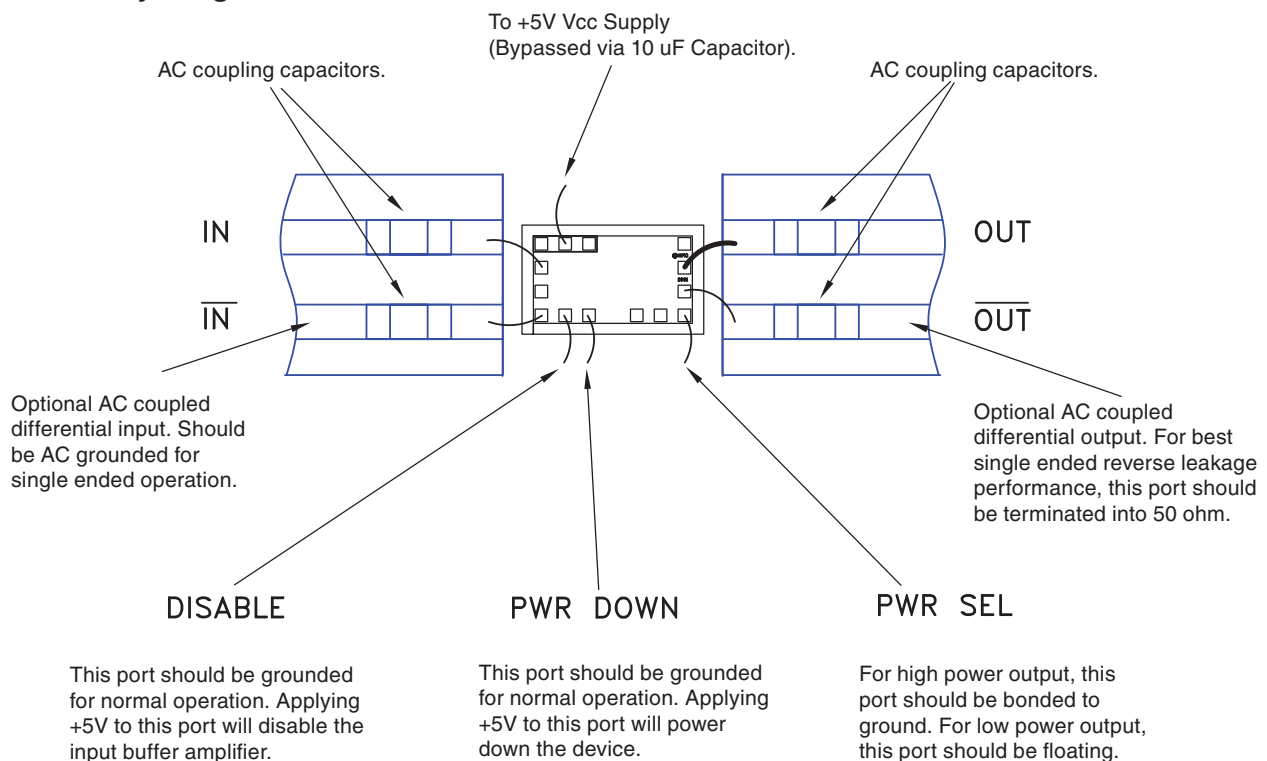
**GaAs HBT MMIC
DIVIDE-BY-8, DC - 12 GHz**

Truth Table

Function	Pin	5V	GND	Float
DISABLE	10	Output Off	Output On	X
PWR DWN	9	Power Down	Power Up	X
PWR SEL	8	X	High Power Output	Low Power Output

X = State not permitted.

Assembly Diagram



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