

# HMC406\* PRODUCT PAGE QUICK LINKS

Last Content Update: 10/05/2017

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## COMPARABLE PARTS

View a parametric search of comparable parts.

## EVALUATION KITS

- HMC406MS8G Evaluation Board

## DOCUMENTATION

### Application Notes

- AN-1363: Meeting Biasing Requirements of Externally Biased RF/Microwave Amplifiers with Active Bias Controllers

### Data Sheet

- HMC406 Data Sheet

## TOOLS AND SIMULATIONS

- HMC406 S-Parameter

## REFERENCE MATERIALS

### Quality Documentation

- HMC Legacy PCN: MS##, MS##E and MS##G,MS##GE packages - Relocation of pre-existing production equipment to new building
- Package/Assembly Qualification Test Report: MS8G (QTR: 2014-00393)
- PCN: MS, QS, SOT, SOIC Packages - Sn/Pb Plating Vendor Change
- Semiconductor Qualification Test Report: GaAs HBT-B (QTR: 2013-00229)

## DESIGN RESOURCES

- HMC406 Material Declaration
- PCN-PDN Information
- Quality And Reliability
- Symbols and Footprints

## DISCUSSIONS

View all HMC406 EngineerZone Discussions.

## SAMPLE AND BUY

Visit the product page to see pricing options.

## TECHNICAL SUPPORT

Submit a technical question or find your regional support number.

## DOCUMENT FEEDBACK

Submit feedback for this data sheet.

# HMC406\* PRODUCT PAGE QUICK LINKS

Last Content Update: 02/23/2017

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- HMC406MS8G Evaluation Board

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## SAMPLE AND BUY

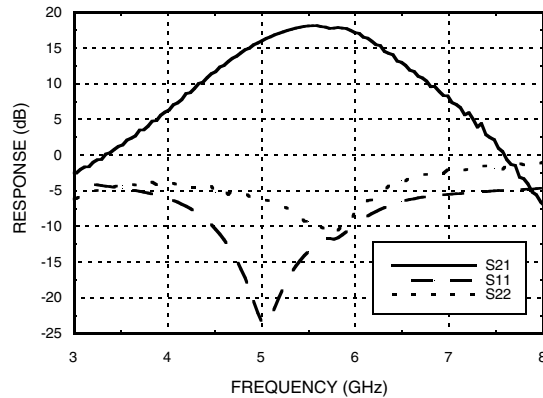
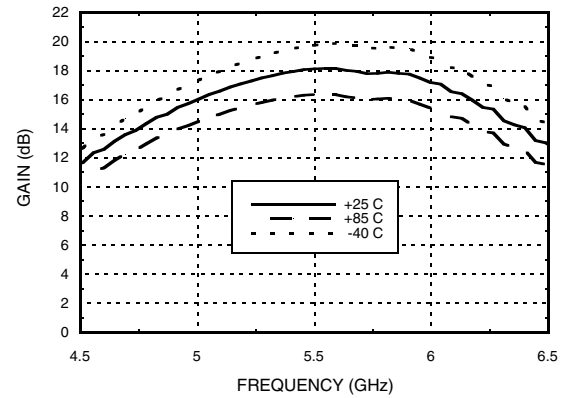
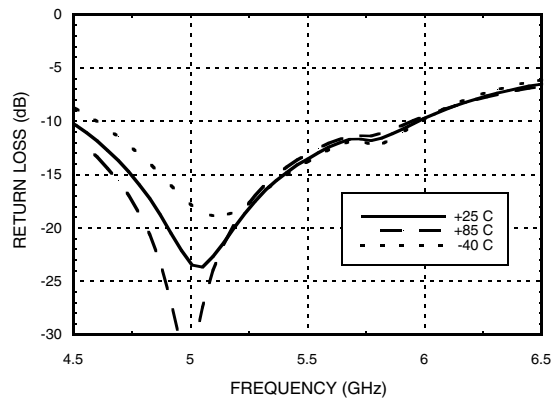
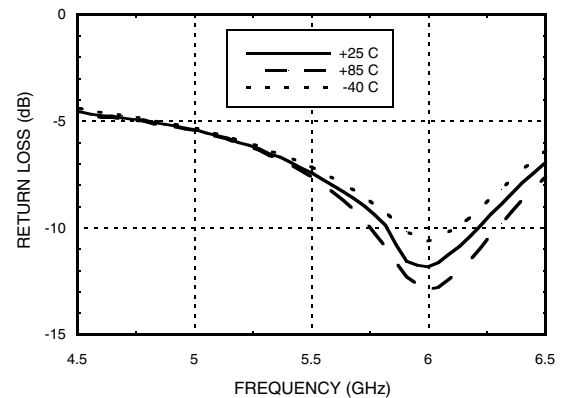
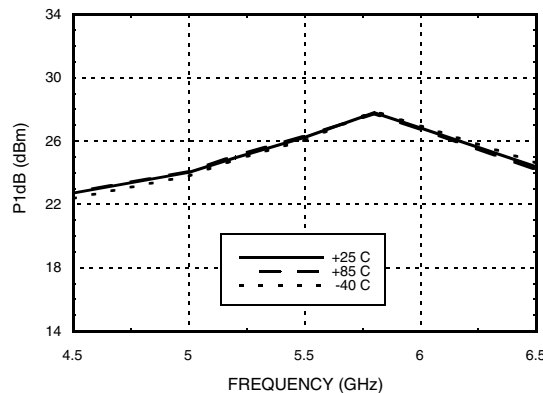
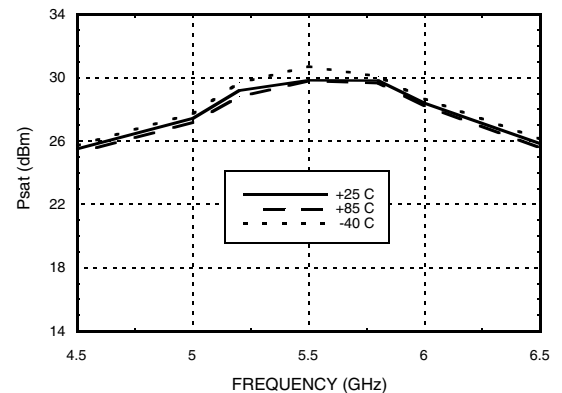
Visit the product page to see pricing options.

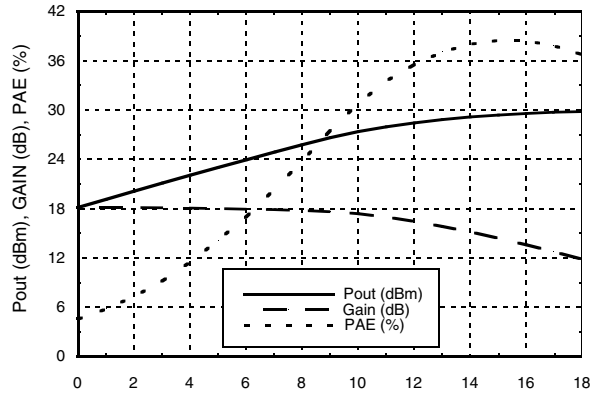
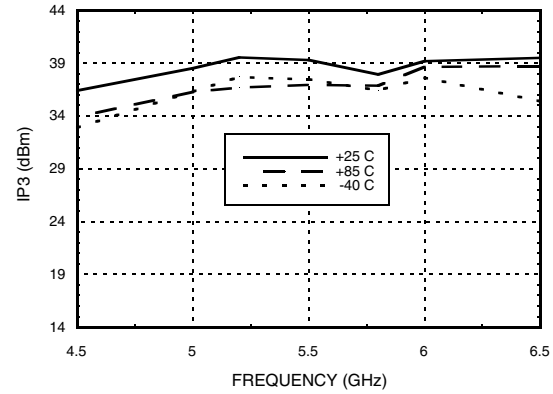
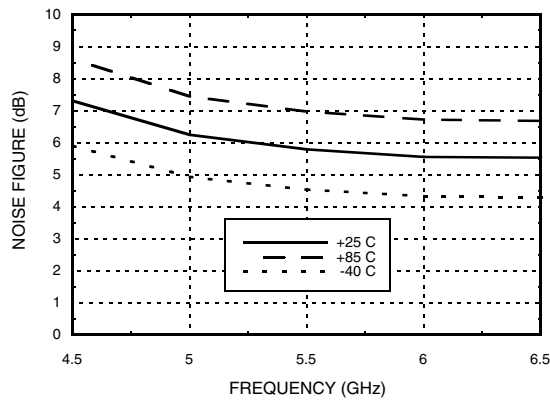
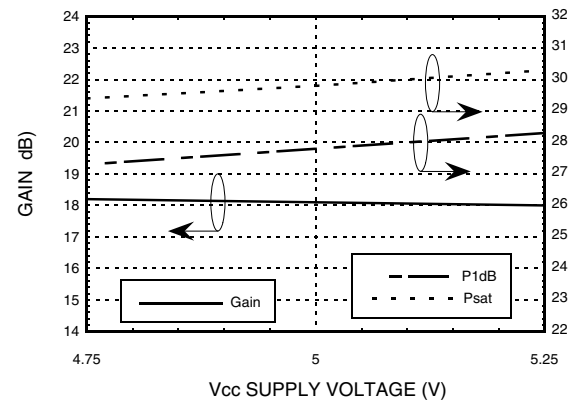
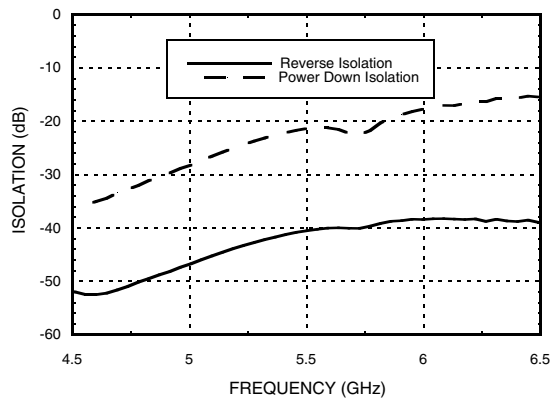
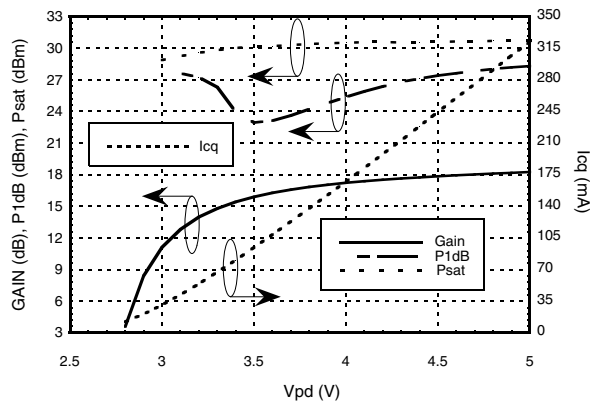
## TECHNICAL SUPPORT

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## DOCUMENT FEEDBACK

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**Broadband Gain & Return Loss**

**Gain vs. Temperature**

**Input Return Loss vs. Temperature**

**Output Return Loss vs. Temperature**

**P1dB vs. Temperature**

**Psat vs. Temperature**


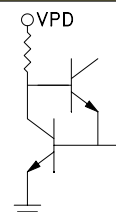
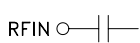
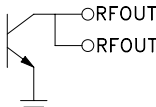
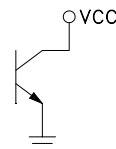
**Power Compression @ 5.8 GHz**

**Output IP3 vs. Temperature**

**Noise Figure vs. Temperature**

**Gain & Power vs. Supply Voltage**

**Reverse Isolation vs. Temperature**

**Gain, Power & Quiescent  
Supply Current vs. Vpd @ 5.8 GHz**






## GaAs InGaP HBT MMIC POWER AMPLIFIER, 5 - 6 GHz

### Pin Descriptions

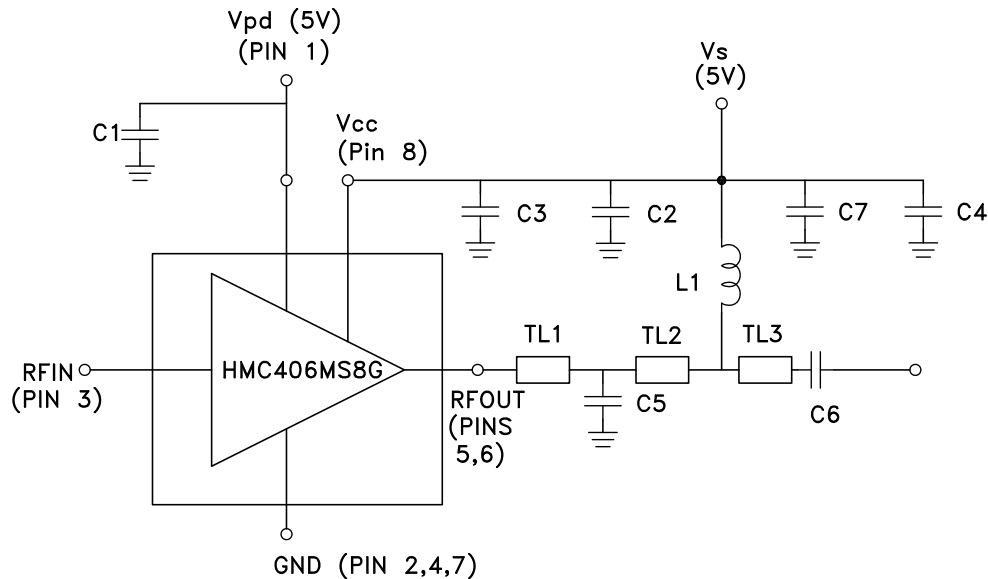
| Pin Number | Function | Description                                                                                                                                                                  | Interface Schematic                                                                  |
|------------|----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| 1          | Vpd      | Power Control Pin. For maximum power, this pin should be connected to 5V. A higher voltage is not recommended. For lower idle current, this voltage can be reduced.          |   |
| 2, 4, 7    | GND      | Ground: Backside of package has exposed metal ground slug that must be connected to ground thru a short path. Vias under the device are required.                            |   |
| 3          | RFIN     | This pin is AC coupled and matched to 50 Ohms.                                                                                                                               |   |
| 5, 6       | RFOUT    | RF output and bias for the output stage. The power supply for the output device needs to be supplied to these pins.                                                          |   |
| 8          | Vcc      | Power supply voltage for the first amplifier stage. An external bypass capacitor of 330 pF is required. This capacitor should be placed as close to the devices as possible. |  |



# HMC406MS8G / 406MS8GE

**GaAs InGaP HBT MMIC  
POWER AMPLIFIER, 5 - 6 GHz**

## Application Circuit

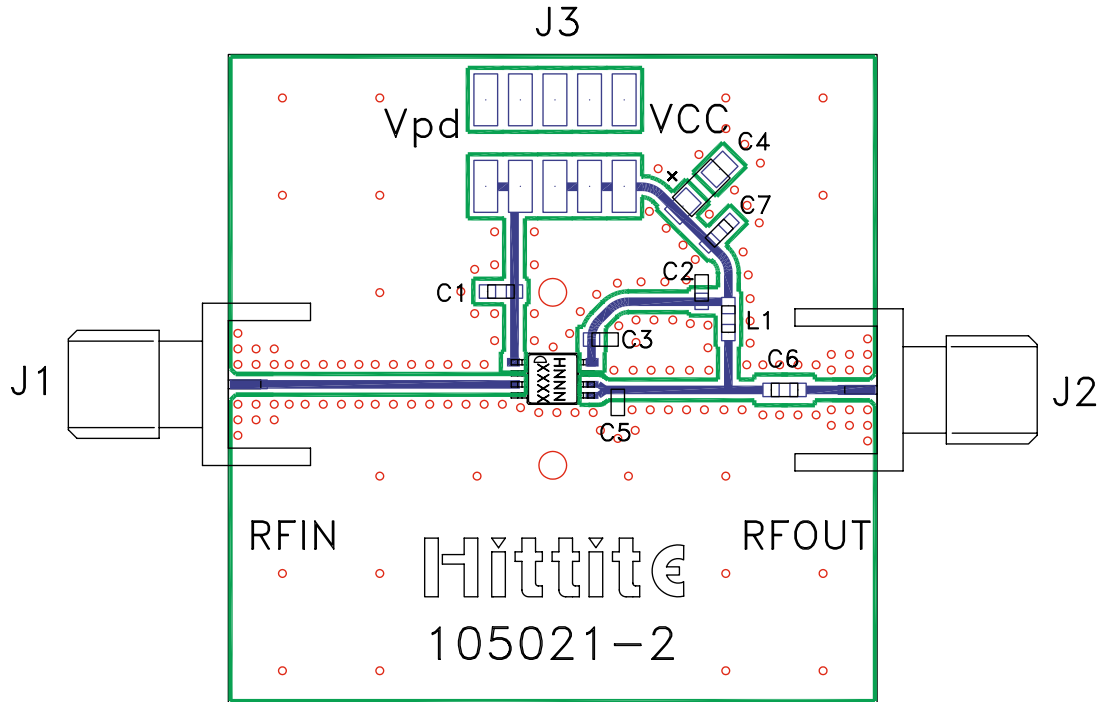


Note 1: C3 should be located < 0.020" from Pin 8 (Vcc)

Note 2: C2 should be located < 0.020" from L1.

|                             | TL1                                            | TL2                                            | TL3                                          |
|-----------------------------|------------------------------------------------|------------------------------------------------|----------------------------------------------|
| Impedance                   | 50 ohm                                         | 50 ohm                                         | 50 ohm                                       |
| Physical Length             | 0.0443"                                        | 0.2556"                                        | 0.1000"                                      |
| Electrical Length @ 5.5 GHz | 11.3°                                          | 65.2°                                          | 25.5°                                        |
| Measurement                 | Edge of package pin to center of capacitor C5. | Center of capacitor C5 to center of bias line. | Center of bias line to edge of capacitor C6. |

PCB Material: 10 mil Rogers 4350 or Arlon 25FR

**Evaluation PCB**

**List of Materials for Evaluation PCB 104989 <sup>[1]</sup>**

| Item               | Description                     |
|--------------------|---------------------------------|
| J1 - J2            | PCB Mount SMA RF Connector      |
| J3                 | 2mm DC Header                   |
| C1 - C3            | 330 pF Capacitor, 0603 Pkg.     |
| C4                 | 2.2 $\mu$ F Capacitor, Tantalum |
| C5                 | 0.6 pF Capacitor, 0603 Pkg.     |
| C6                 | 1.6 pF Capacitor, 0603 Pkg.     |
| C7                 | 100 pF Capacitor, 0603 Pkg.     |
| L1                 | 3.9 nH Inductor, 0603 Pkg.      |
| U1                 | HMC406MS8G(E) Amplifier         |
| PCB <sup>[2]</sup> | 105021 Eval Board               |

[1] Reference this number when ordering complete evaluation PCB

[2] Circuit Board Material: Roger 4350 or Arlon 25FR

The circuit board used in the application should use RF circuit design techniques. Signal lines should have 50 Ohm impedance while the package ground leads and exposed paddle should be connected directly to the ground plane similar to that shown. A sufficient number of via holes should be used to connect the top and bottom ground planes. The evaluation board should be mounted to an appropriate heat sink. The evaluation circuit board shown is available from Hittite upon request.





## Notes:

# HMC406MS8G / 406MS8GE

v06.0611

**GaAs InGaP HBT MMIC  
POWER AMPLIFIER, 5 - 6 GHz**