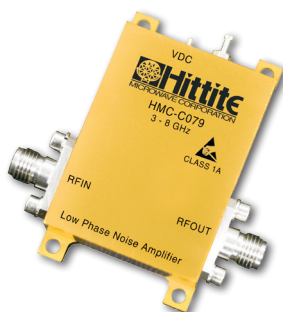


## ULTRA LOW PHASE NOISE AMPLIFIER MODULE, 3 - 8 GHz

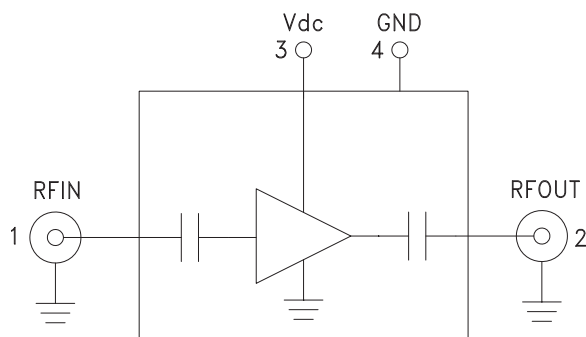


### Typical Applications

The HMC-C079 is ideal for:

- Microwave Radio
- Military & Space
- Test Instrumentation
- VSAT

### Functional Diagram



### Features

- Ultra Low Phase Noise: -162 dBc/Hz @ 1 kHz
- Noise Figure: 6 dB
- Gain: 11 dB
- Psat: +21 dBm
- 50 Ohm Matched Input/Output
- Single Supply Voltage: +7V @ 110mA
- Hermetically Sealed Module
- Field Replaceable SMA Connectors
- 55 °C to +85 °C Operating Temperature

### General Description

The HMC-C079 is a GaAs HBT Ultra Low Noise Amplifier in a miniature, hermetic module designed to operate between 3 and 8 GHz. This high dynamic range amplifier module provides 11 dB of gain, 6 dB noise figure and up to +21 dBm of output power with a single supply of +7V. The ultra low phase noise contribution of -162 dBc/Hz at 1 kHz offset, enables superior modulation accuracy within transceiver architectures. The wideband distributed amplifier I/O's are internally matched to 50 Ohms and DC blocked for robust performance. The module features removable SMA connectors which can be detached to allow direct connection of the I/O pins to a microstrip or coplanar circuit.

### Electrical Specifications, $T_A = +25^\circ\text{C}$ , $V_{dc} = +7V$

| Parameter                                | Min.  | Typ. | Max. | Units  |
|------------------------------------------|-------|------|------|--------|
| Frequency Range                          | 3 - 8 |      |      | GHz    |
| Vdc Range                                | 6.5   | 7    | 8    | V      |
| Gain                                     | 9     | 11   |      | dB     |
| Gain Variation Over Temperature          |       | 0.01 |      | dB/ °C |
| Noise Figure                             |       | 6    |      | dB     |
| Input Return Loss                        |       | 18   |      | dB     |
| Output Return Loss                       |       | 20   |      | dB     |
| Output Power for 1 dB Compression (P1dB) | 11    | 14   |      | dBm    |
| Saturated Output Power (Psat)            |       | 21   |      | dBm    |
| Output Third Order Intercept (IP3)       |       | 25   |      | dBm    |
| Phase Noise @ 100 Hz, Psat, 6 GHz        |       | -148 |      | dBc/Hz |
| Phase Noise @ 1 kHz, Psat, 6 GHz         |       | -162 |      | dBc/Hz |
| Phase Noise @ 10 kHz, Psat, 6 GHz        |       | -168 |      | dBc/Hz |
| Supply Current (Quiescent)               |       | 110  | 150  | mA     |
| Supply Current (Under RF Drive)          |       |      | 250  | mA     |



MICROWAVE CORPORATION

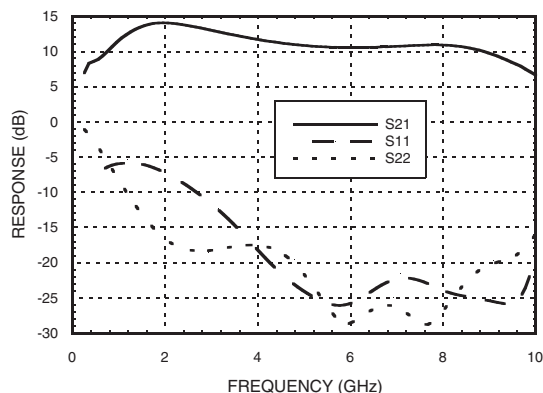
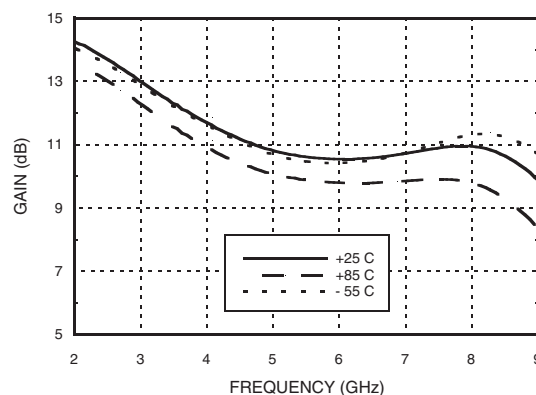
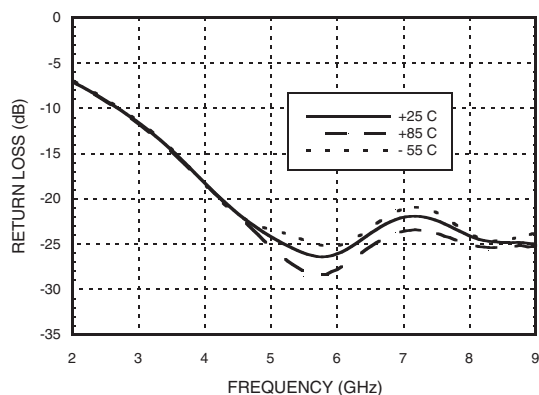
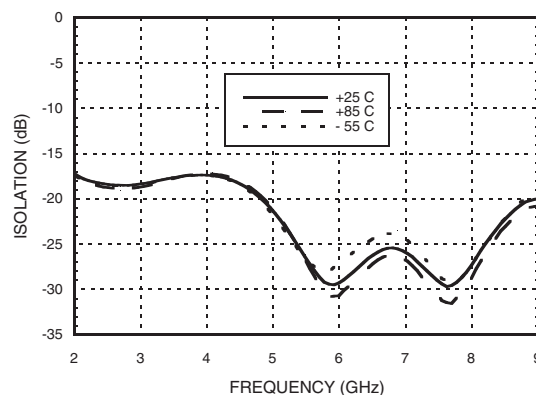
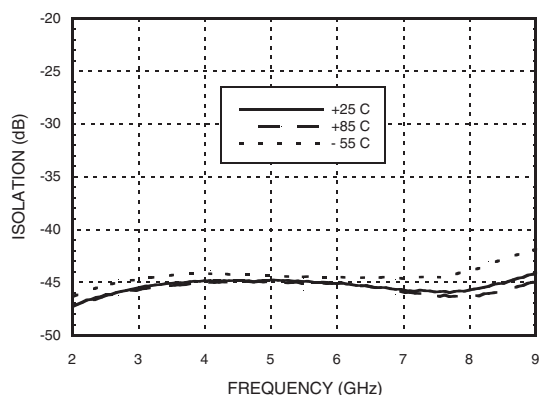
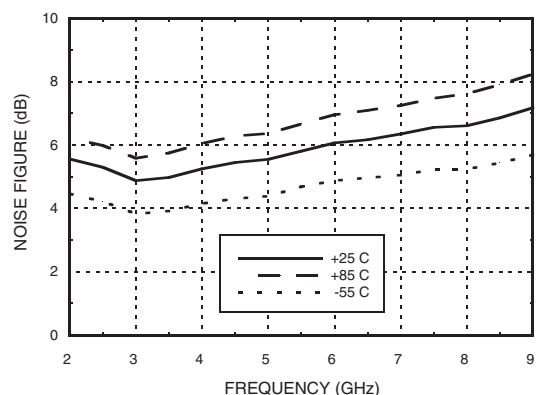
v00.0110

**HMC-C079**

## ULTRA LOW PHASE NOISE AMPLIFIER MODULE, 3 - 8 GHz

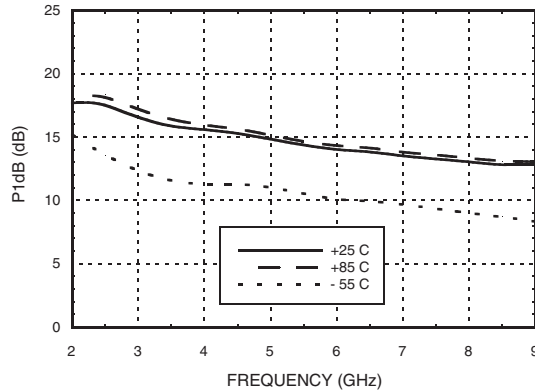
1

AMPLIFIERS

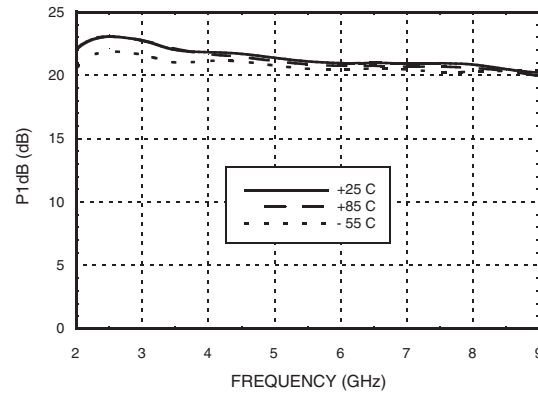
**Broadband, Gain & Return Loss****Gain vs. Temperature****Input Return Loss vs. Temperature****Output Return Loss vs. Temperature****Reverse Isolation vs. Temperature****Noise Figure vs. Temperature**

**ULTRA LOW PHASE NOISE  
AMPLIFIER MODULE, 3 - 8 GHz**

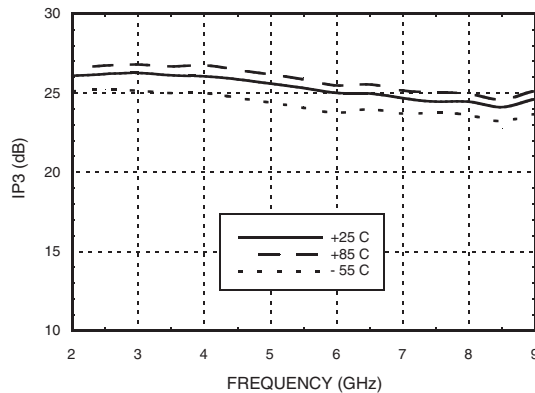
**Output P1dB vs. Temperature**



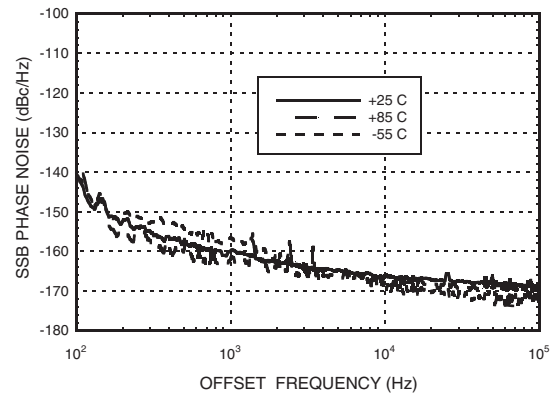
**Output Psat vs. Temperature**



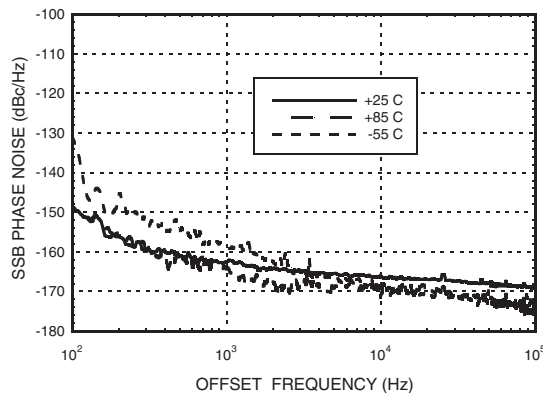
**Output IP3 vs. Temperature**



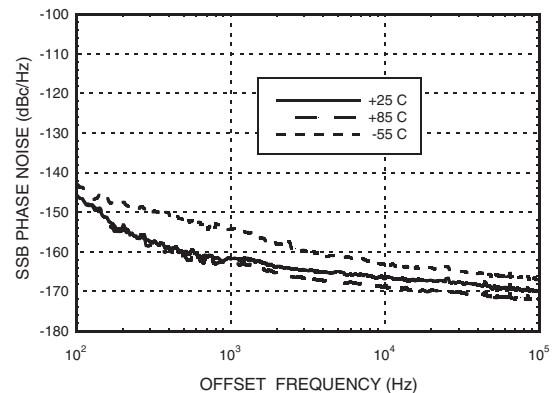
**Phase Noise at Pout = 10 dBm @ 3.5 GHz**



**Phase Noise at Pout = P1dB @ 3.5 GHz**



**Phase Noise at Pout = Psat @ 3.5 GHz**





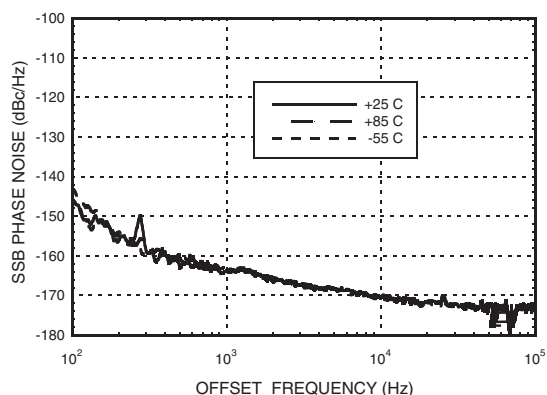
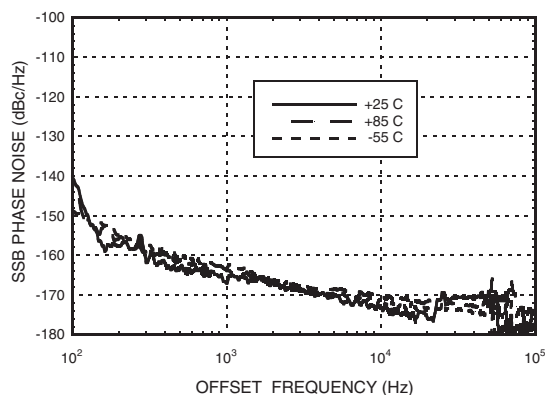
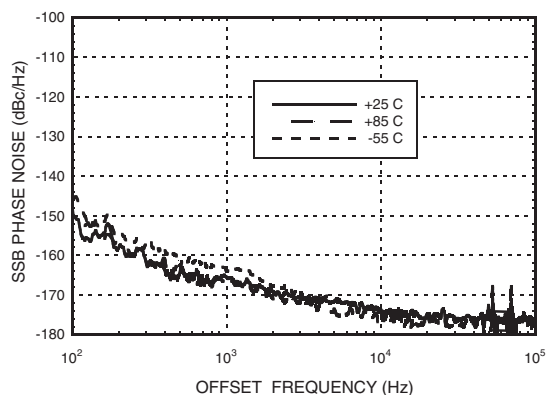
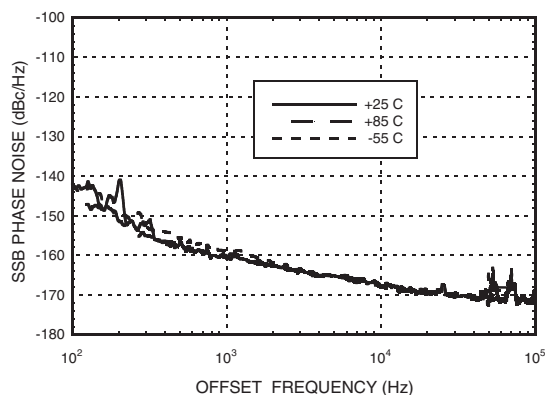
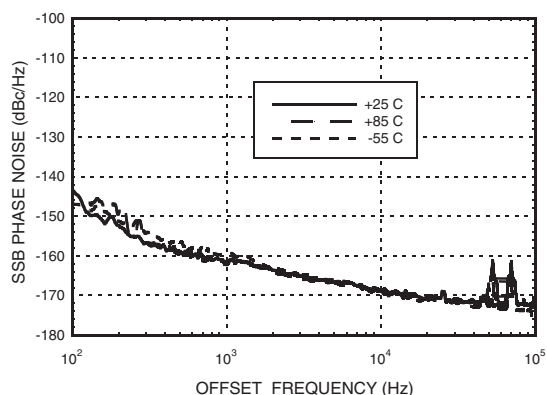
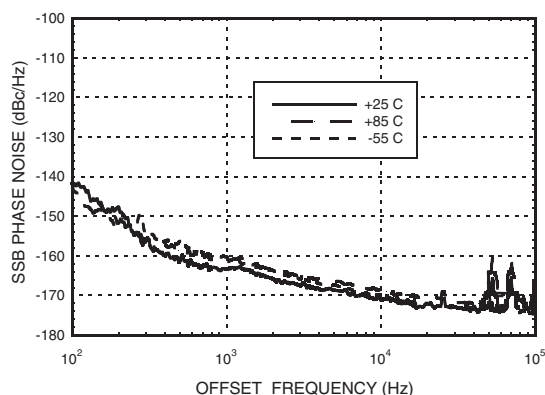
MICROWAVE CORPORATION v00.0110

**HMC-C079**

# ULTRA LOW PHASE NOISE AMPLIFIER MODULE, 3 - 8 GHz

1

AMPLIFIERS

**Phase Noise at  $P_{out} = 10 \text{ dBm}$  @ 5.12 GHz**

**Phase Noise at  $P_{out} = P_{1dB}$  @ 5.12 GHz**

**Phase Noise at  $P_{out} = P_{sat}$  @ 5.12 GHz**

**Phase Noise at  $P_{out} = 10 \text{ dBm}$  @ 7 GHz**

**Phase Noise at  $P_{out} = P_{1dB}$  @ 7 GHz**

**Phase Noise at  $P_{out} = P_{sat}$  @ 7 GHz**


## ULTRA LOW PHASE NOISE AMPLIFIER MODULE, 3 - 8 GHz

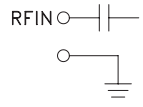
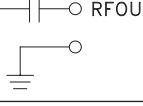
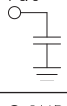
### Absolute Maximum Ratings

|                                          |                |
|------------------------------------------|----------------|
| Bias Supply Voltage (V)                  | +8V            |
| RF Input Power (RFIN)                    | +15 dBm        |
| Continuous P <sub>diss</sub> (T = 85 °C) | 1.2W           |
| Storage Temperature                      | -65 to +150 °C |
| Operating Temperature                    | -55 to +85 °C  |
| ESD Sensitivity (HBM)                    | Class 1A       |



ELECTROSTATIC SENSITIVE DEVICE  
OBSERVE HANDLING PRECAUTIONS

### Pin Descriptions

| Pin Number | Function             | Description                                                                                               | Interface Schematic                                                                   |
|------------|----------------------|-----------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| 1          | RFIN &<br>RF Ground  | RF input connector, coaxial female, field replaceable.<br>This pin is AC coupled and matched to 50 Ohms.  |   |
| 2          | RFOUT &<br>RF Ground | RF output connector, coaxial female, field replaceable.<br>This pin is AC coupled and matched to 50 Ohms. |  |
| 3          | Vdc                  | Power supply voltage for the amplifier.                                                                   |  |
| 4          | GND                  | Power supply ground.                                                                                      |  |

