

## GaAs pHEMT MMIC POWER AMPLIFIER, 0.2 - 22 GHz

### Typical Applications

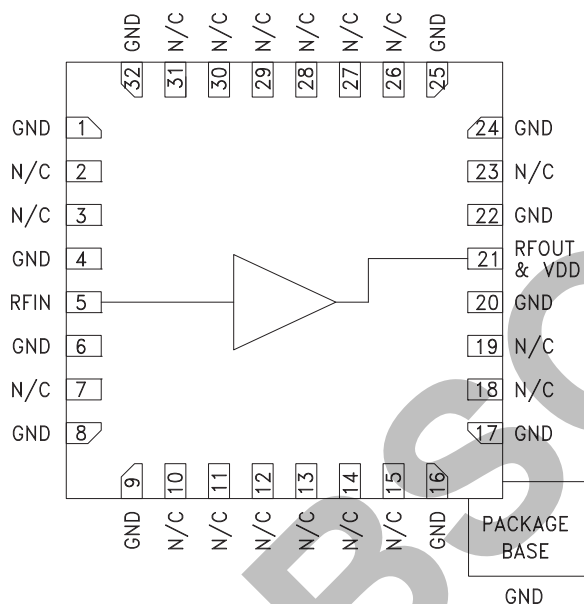
The HMC907ALP5E is ideal for:

- Test Instrumentation
- Microwave Radio & VSAT
- Military & Space
- Telecom Infrastructure
- Fiber Optics

### Features

- High P1dB Output Power: +26 dBm
- High Gain: 12 dB
- High Output IP3: +36 dBm
- Single Supply: +10 V @ 350 mA
- 50 Ohm Matched Input/Output
- 32 Lead 5x5 mm SMT Package: 25 mm<sup>2</sup>

### Functional Diagram



### General Description

The HMC907ALP5E is a GaAs MMIC pHEMT Distributed Power Amplifier which operates between 0.2 and 22 GHz. This self-biased power amplifier provides 12 dB of gain, +36 dBm output IP3 and +26 dBm of output power at 1 dB gain compression while requiring only 350 mA from a +10 V supply. Gain flatness is excellent at  $\pm 0.7$  dB from 0.2 to 22 GHz making the HMC907ALP5E ideal for EW, ECM, Radar and test equipment applications. The HMC907ALP5E amplifier I/Os are internally matched to 50 Ohms facilitating integration into Multi-Chip-Modules (MCMs) and is packaged in a leadless QFN 5x5 mm surface mount package, and requires no external matching components.

### Electrical Specifications, $T_A = +25^\circ\text{C}$ , $V_{dd} = +10\text{ V}$ , $I_{dd} = 350\text{ mA}$

| Parameter   | Min.     | Typ.      | Max. | Min.    | Typ.      | Max. | Min.    | Typ.      | Max. | Units |
|---|----------|-----------|------|---------|-----------|------|---------|-----------|------|-------|
| Frequency Range   | 0.2 - 10 |           |      | 10 - 18 |           |      | 18 - 22 |           |      | GHz   |
| Gain  | 10       | 12        |      | 10      | 11.5      |      | 10      | 11.5      |      | dB    |
| Gain Flatness   |          | $\pm 0.7$ |      |         | $\pm 0.6$ |      |         | $\pm 0.7$ |      | dB    |
| Gain Variation Over Temperature                           |          | 0.01      |      |         | 0.013     |      |         | 0.014     |      | dB/°C |
| Input Return Loss   |          | 15        |      |         | 9         |      |         | 8         |      | dB    |
| Output Return Loss  |          | 13        |      |         | 12        |      |         | 8         |      | dB    |
| Output Power for 1 dB Compression (P1dB)                  | 23       | 26        |      | 21      | 25        |      | 19.5    | 21.5      |      | dBm   |
| Saturated Output Power (P <sub>sat</sub> )                |          | 28.5      |      |         | 27        |      |         | 24.5      |      | dBm   |
| Output Third Order Intercept (IP3)                        |          | 36        |      |         | 34        |      |         | 31        |      | dBm   |
| Noise Figure  |          | 3.5       |      |         | 3.5       |      |         | 4         |      | dB    |
| Supply Current (I <sub>dd</sub> ) (V <sub>dd</sub> = 10V) |          | 350       | 400  |         | 350       | 400  |         | 350       | 400  | mA    |

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### Absolute Maximum Ratings

|  |              |
|--|--------------|
| Drain Bias Voltage (Vdd)                                     | +11 Vdc      |
| RF Input Power (RFIN)(Vdd = +11V)                            | +20 dBm      |
| Channel Temperature  | 150 °C       |
| Continuous Pdiss (T= 85 °C)<br>(derate 63 mW/°C above 85 °C) | 4.1 W        |
| Thermal Resistance<br>(channel to ground paddle)             | 15.9 °C/W    |
| Storage Temperature  | -65 to 150°C |
| Operating Temperature  | -55 to 85 °C |
| ESD Sensitivity (HBM)  | Class 1A     |

### Typical Supply Current vs. Vdd

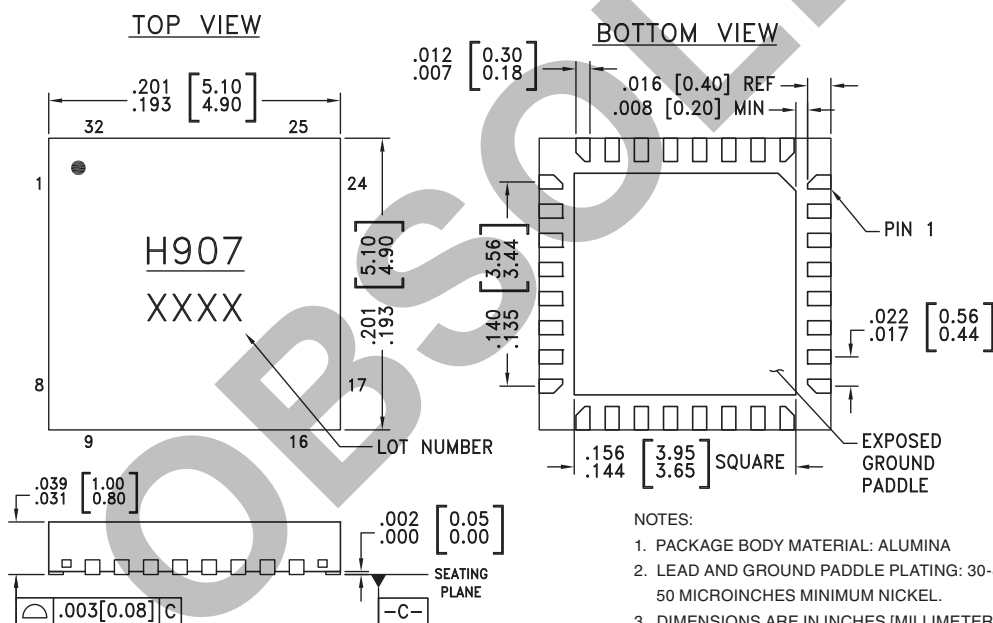
| Vdd (V) | Idd (mA) |
|---------|----------|
| +8      | 335      |
| +9      | 343      |
| +10     | 350      |
| +11     | 357      |



ELECTROSTATIC SENSITIVE DEVICE  
OBSERVE HANDLING PRECAUTIONS

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### Outline Drawing



NOTES:

1. PACKAGE BODY MATERIAL: ALUMINA
2. LEAD AND GROUND PADDLE PLATING: 30-80 MICROINCHES GOLD OVER 50 MICROINCHES MINIMUM NICKEL.
3. DIMENSIONS ARE IN INCHES [MILLIMETERS].
4. LEAD SPACING TOLERANCE IS NON-CUMULATIVE
5. PACKAGE WARP SHALL NOT EXCEED 0.05mm DATUM [-C-]
6. ALL GROUND LEADS AND GROUND PADDLE MUST BE SOLDERED TO PCB RF GROUND.
7. CLASSIFIED AS MOISTURE SENSITIVITY LEVEL (MSL) 1.