

**Amplifier, Power, 1.3W  
17.7-19.7 GHz**

**MAAP-000072-PKG003**

Rev —  
Advance Information

## Features

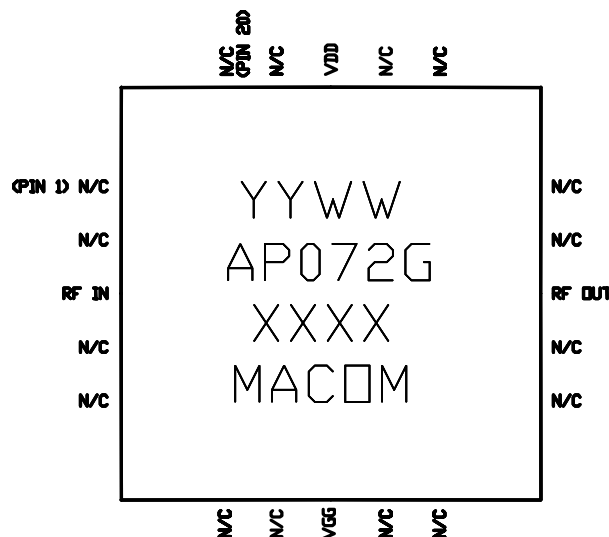
- ◆ **1.3 Watt Saturated Output Power Level**
- ◆ **Variable Drain Voltage (4-10V) Operation**
- ◆ **MSAG™ Process**

## Description

The MAAP-000072-PKG0003 is a 4-stage 1.3 W power amplifier with on-chip bias networks in a 20 lead MLP package, allowing easy assembly. This product is fully matched to 50 ohms on both the input and output. It can be used as a power amplifier stage or as a driver stage in high power applications.

Each device is 100% RF tested to ensure performance compliance. The part is fabricated using M/A-COM's GaAs Multifunction Self-Aligned Gate (MSAG) Process.

M/A-COM's MSAG™ process features robust silicon-like manufacturing processes, planar processing of ion implanted transistors and multiple implant capability enabling power, low-noise, switch and digital FETs on a single chip. The use of refractory metals and the absence of platinum in the gate metal formulation prevents hydrogen poisoning when employed in hermetic packaging.



## Primary Applications

- ◆ **Point-to-Point Radios**
- ◆ **18 GHz Band**

## Also Available in:

Description	Die	Ceramic Package	Die Sample Board	Die Mechanical Sample	Packaged Sample Board
Part Number	MAAPGM0072-DIE	MAAPGM0072	MAAP-000072-SMB004	MAAP-000071-MCH000	MAAP-000072-SMB003 (Lead Free)

**Electrical Characteristics:**  $T_B = 40^\circ\text{C}^1$ ,  $Z_0 = 50\ \Omega$ ,  $V_{DD} = 8\text{V}$ ,  $I_{DQ} = 500\text{mA}^2$ ,  $P_{in} = 12\ \text{dBm}$ ,  $R_G = 200\ \Omega$

Parameter	Symbol	Typical	Units
Bandwidth	f	17.7-19.7	GHz
Output Power	$P_{OUT}$	31	dBm
1-dB Compression Point	$P_{1dB}$	30	dBm
Small Signal Gain	G	19	dB
Input VSWR	VSWR	2.0:1	
Output VSWR	VSWR	1.6:1	
Gate Current	$I_{GG}$	10	mA
Drain Current	$I_{DD}$	750	mA

1.  $T_B$  = MMIC Base Temperature
2. Adjust  $V_{GG}$  between -2.6 and -1.2V to achieve specified  $I_{DQ}$ .

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Visit [www.macom.com](http://www.macom.com) for additional data sheets and product information.

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### Maximum Operating Conditions <sup>3</sup>

Parameter	Symbol	Absolute Maximum	Units
Input Power	$P_{IN}$	17.0	dBm
Drain Supply Voltage	$V_{DD}$	+12.0	V
Gate Supply Voltage	$V_{GG}$	-3.0	V
Quiescent Drain Current (No RF)	$I_{DQ}$	790	mA
Quiescent DC Power Dissipated (No RF)	$P_{DISS}$	7.9	W
Junction Temperature	$T_J$	170	°C
Storage Temperature	$T_{STG}$	-55 to +150	°C

3. Operation beyond these limits may result in permanent damage to the part.

### Recommended Operating Conditions <sup>4</sup>

Characteristic	Symbol	Min	Typ	Max	Unit
Drain Voltage	$V_{DD}$	4.0	8.0	10.0	V
Gate Voltage	$V_{GG}$	-2.6	-2.0	-1.2	V
Input Power	$P_{IN}$		12.0	14.0	dBm
Junction Temperature	$T_J$			150	°C
Thermal Resistance	$\Theta_{JC}$		16.4		°C/W
MMIC Base Temperature	$T_B$			Note 4	°C

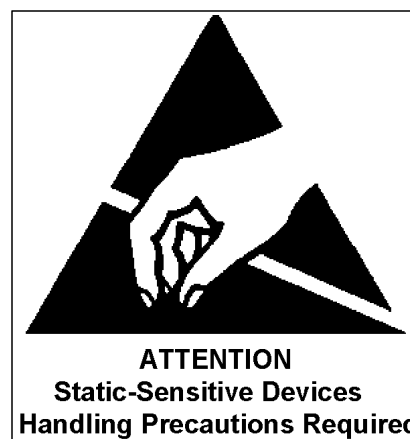
4. MMIC Base Temperature = 170°C —  $\Theta_{JC} * V_{DD} * I_{DQ}$

5. Operation outside of these ranges may reduce product reliability.

### Operating Instructions

This device is static sensitive. Please handle with care. To operate the device, follow these steps.

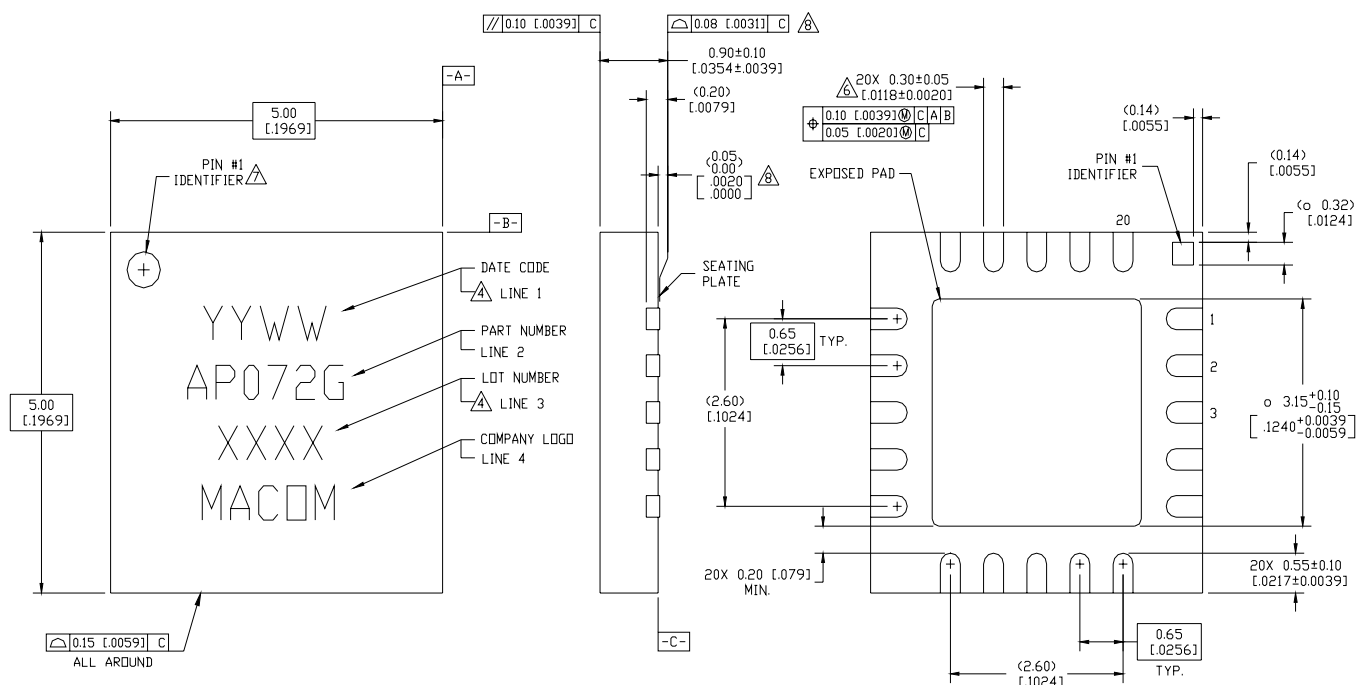
1. Apply  $V_{GG} = -2.7$  V,  $V_{DD} = 0$  V.
2. Ramp  $V_{DD}$  to desired voltage, typically 8.0 V.
3. Adjust  $V_{GG}$  to set  $I_{DQ}$ , (approximately @ -2.0 V).
4. Set RF input.
5. Power down sequence in reverse. Turn  $V_{GG}$  off last.



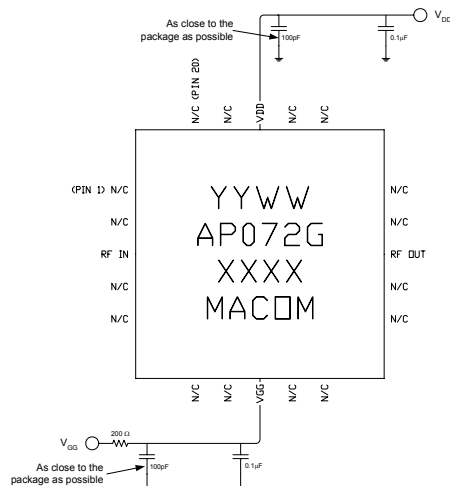
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**Figure 1. 5x5 mm 20-Lead MLP.**



**Figure 2. Recommended Bias Configuration.**

Note: The exposed pad centered on the package bottom must be connected to RF and dc ground for proper electrical and thermal operation.

Refer to M/A-COM Application Note **Surface Mounting Instructions for PQFN Packages #S2083\*** for assembly guidelines.

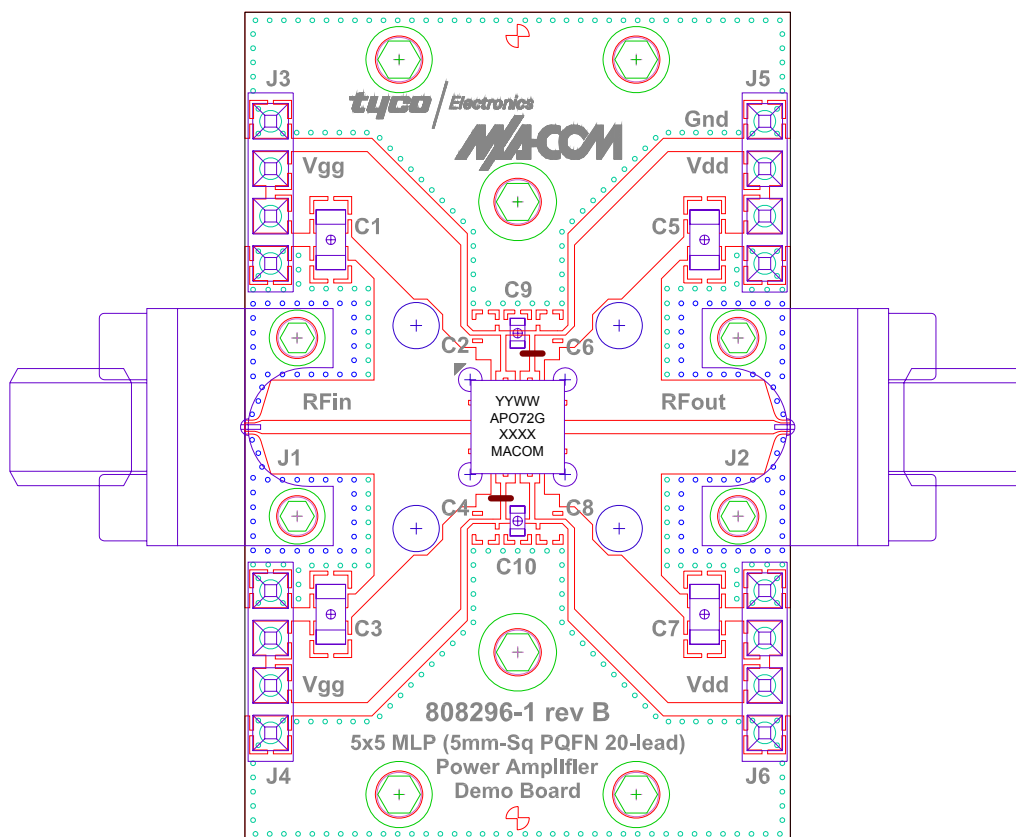
**Additional Precaution:** All parts must receive a bake-out of 125°C for 24 hours prior to any solder reflow operation.

\*Application Notes can be found by going to the Site Search Page of M/A-COM's web page (<http://www.macom.com/Application%20Notes/index.htm>) and searching for the required Application Note.

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**Figure 3. Demonstration Board PN MAAP-000072-SMB003 (available upon request).**