



**M/A-COM**

**AM42-0039**

## GaAs MMIC VSAT Power Amplifier, 2W 6.40 - 7.025 GHz



### Features

- High Linear Gain: 30 dB Typ.
- High Saturated Output Power: +33 dBm Typ.
- High Power Added Efficiency: 22% Typ.
- 50Ω Input/Output Broadband Matched
- High Performance Ceramic Bolt Down Package

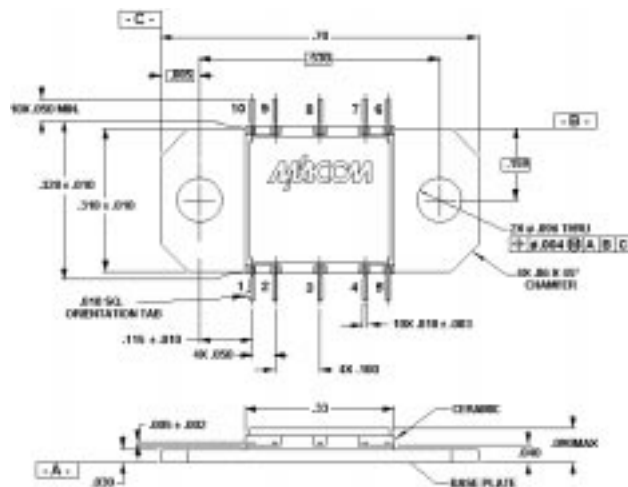
### Description

M/A-COM's AM42-0039 is a three-stage MMIC power amplifier in a ceramic bolt down style hermetic package. The AM42-0039 employs a fully matched monolithic chip with internally decoupled Gate and Drain bias networks. The AM42-0039 is designed to be operated from a constant current Drain supply. By varying the Gate bias voltage, the saturated output power performance of this device can be tailored for various applications.

The AM42-0039 is designed for use as an output stage or driver amplifier for VSAT transmitter systems. This amplifier is monolithic and requires a minimum of external components.

M/A-COM's AM42-0039 is fabricated using a mature 0.5 micron GaAs MESFET process. The chip is fully passivated for increased performance and reliability. These amplifiers are 100% RF tested to ensure compliance to performance specifications.

### CR-15



Notes: (unless otherwise specified)

1. Dimensions are in inches.
2. Tolerance: .XXX =  $\pm 0.005$   
.XX =  $\pm 0.010$

### Ordering Information

Part Number	Package
AM42-0039	Ceramic Bolt Down Package

### Electrical Specifications: $T_A = +25^\circ\text{C}$ , $V_{DD} = +9\text{V}$ , $V_{GG}$ adjusted for $I_{DD} = 1050\text{ mA}$ , Freq. = 6.40 to 7.025 GHz

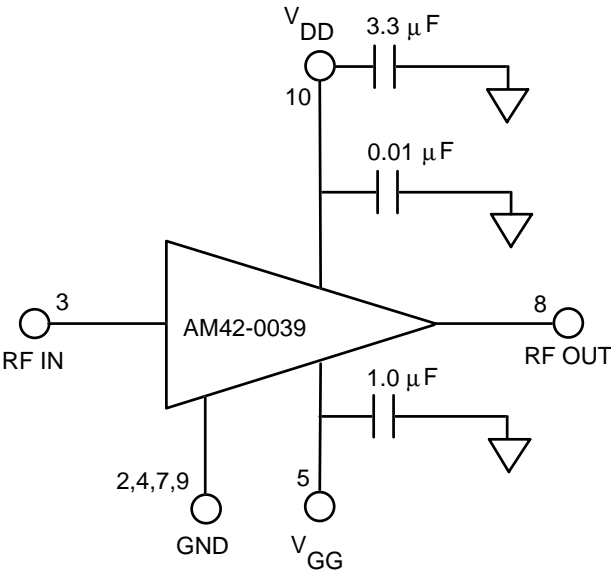
Parameter	Abbv.	Test Conditions	Units	Min.	Typ.	Max.
Linear Gain	$G_L$	$P_{IN} \leq -10\text{ dBm}$	dB	27	30	—
Input VSWR	$VSWR_{IN}$	$P_{IN} \leq -10\text{ dBm}$	—	—	2.3:1	2.7:1
Output VSWR	$VSWR_{OUT}$	$P_{IN} \leq -10\text{ dBm}$	—	—	2.3:1	—
Output Power	$P_{SAT}$	$P_{IN} = +10\text{ dBm}$ , $I_{DD} = 1050\text{ mA Typ.}$	dBm	31.5	33.0	34.0
Output Power vs. Frequency	$P_{SAT}$	$P_{IN} = +10\text{ dBm}$ , $I_{DD} = 1050\text{ mA Typ.}$	dB	—	1.0	1.5
Output Power vs. Temperature (with respect to $T_A = +25^\circ\text{C}$ )	$P_{SAT}$	$P_{IN} = +10\text{ dBm}$ , $I_{DD} = 1050\text{ mA Typ.}$ $T_A = -40^\circ\text{C to } +70^\circ\text{C}$	dB	—	$\pm 0.4$	—
Drain Bias Current	$I_{DD}$	$P_{IN} = +10\text{ dBm}$	mA	900	1050	1100
Gate Bias Voltage	$V_{GG}$	$P_{IN} = +10\text{ dBm}$ , $I_{DD} = 1050\text{ mA Typ.}$	V	-2.4	-1.2	-0.4
Gate Bias Current	$I_{GG}$	$P_{IN} = +10\text{ dBm}$ , $I_{DD} = 1050\text{ mA Typ.}$	mA	—	20	40
Thermal Resistance	$\theta_{JC}$	25°C Heat Sink	$^\circ\text{C/W}$	—	7 (Est.)	—
Second Harmonic	$f_2$	$P_{IN} = +10\text{ dBm}$ , $I_{DD} = 1050\text{ mA Typ.}$	dBc	—	-35	—
Third Harmonic	$f_3$	$P_{IN} = +10\text{ dBm}$ , $I_{DD} = 1050\text{ mA Typ.}$	dBc	—	-45	—

Absolute Maximum Ratings<sup>1,2,3,4</sup>

Parameter	Absolute Maximum
Input Power	+23 dBm
V <sub>DD</sub>	+12 Volts
V <sub>GG</sub>	-3 Volts
V <sub>DD</sub> - V <sub>GG</sub>	12 Volts
I <sub>DD</sub>	1700 mA
Channel Temperature	-40°C to +85°C
Storage Temperature	-65°C to +150°C

- 1. Exceeding any one or a combination of these limits may cause permanent damage.
- 2. Case Temperature (T<sub>C</sub>) = +25°C.
- 3. Nominal bias is obtained by first connecting -2 volts to pin 5 (V<sub>GG</sub>), followed by connecting +9 volts to pin 10 (V<sub>DD</sub>). Note sequence. Adjust V<sub>GG</sub> for a drain current of 1050 mA typical.
- 4. RF ground and thermal interface is the flange (case bottom). Adequate heat sinking is required.
- 5. No dc supply voltage will appear at the RF ports.
- 6. The dc resistance at the input and output ports is a short circuit. No voltage is allowed on these ports.
- 7. For optimum IP<sub>3</sub> performance, the V<sub>DD</sub> bypass capacitors should be placed within 0.5 inches of the V<sub>DD</sub> leads.

Typical Bias Configuration<sup>4,5,6,7</sup>



Pin Configuration

Pin No.	Pin Name	Description
1	N/C	No Connection
2	GND	DC and RF Ground
3	RF In	RF Input
4	GND	DC and RF Ground
5	V <sub>GG</sub>	Gate Supply
6	N/C	No Connection
7	GND	DC and RF Ground
8	RF Out	RF Output
9	GND	DC and RF Ground
10	V <sub>DD</sub>	Drain Supply

## Typical Performance @ +25°C

