



# GaAs MMIC VSAT Power Amplifier, 2W 5.9 - 6.4 GHz



## Features

- High Linear Gain: 30 dB Typ.
- High Saturated Output Power: +33 dBm Typ.
- High Power Added Efficiency: 26% Typ.
- 50Ω Input/Output Broadband Matched
- High Performance Ceramic Bolt Down Package

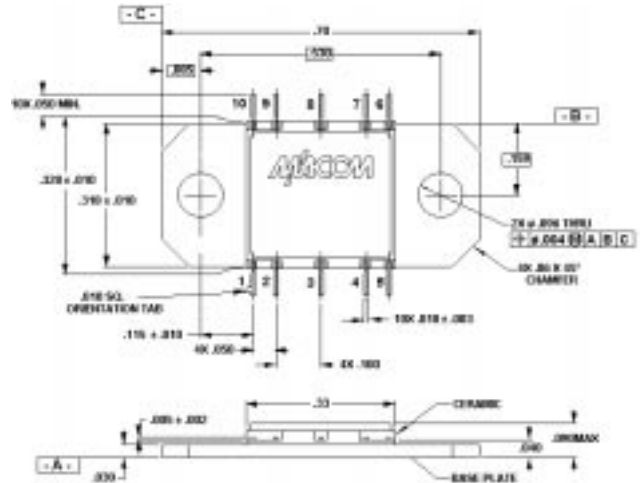
## Description

M/A-COM's AM42-0040 is a three-stage MMIC power amplifier in a ceramic bolt down style hermetic package. The AM42-0040 employs an internally matched monolithic chip with internally decoupled Gate and Drain bias networks. The AM42-0040 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 AM42-0040 is designed for use as an output stage or driver amplifier for C-band VSAT transmitter systems. This amplifier employs a fully monolithic chip and requires a minimum of external components.

M/A-COM's AM42-0040 is fabricated using a mature 0.5 micron GaAs MESFET process. The process features full chip passivation 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 = ± 0.005  
 .XX = ± 0.010

## Ordering Information

Part Number	Package
AM42-0040	Ceramic Bolt Down Package

## Electrical Specifications: T<sub>A</sub> = +25°C, V<sub>DD</sub> = +9V, V<sub>GG</sub> adjusted for I<sub>DD</sub> = 1050 mA, Frequency = 5.9 to 6.4 GHz

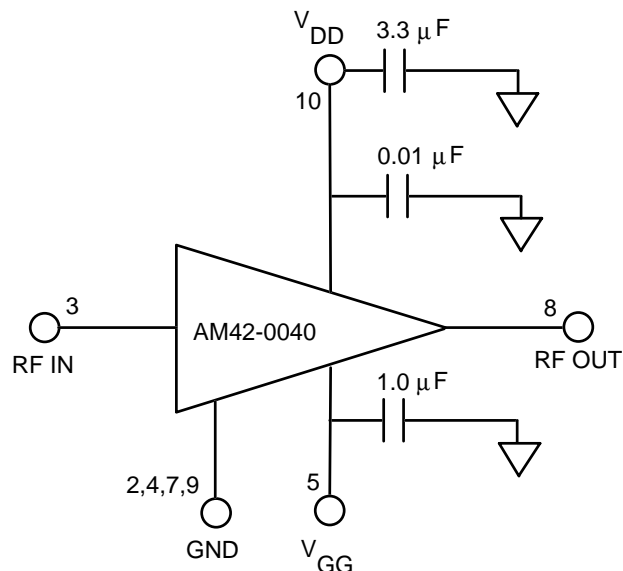
Parameter	Abbv.	Test Conditions	Units	Min.	Typ.	Max.
Linear Gain	G <sub>L</sub>	P <sub>IN</sub> ≤ -10 dBm	dB	27	30	—
Input VSWR	VSWR <sub>IN</sub>	P <sub>IN</sub> ≤ -10 dBm	—	—	2.3:1	2.7:1
Output VSWR	VSWR <sub>OUT</sub>	P <sub>IN</sub> ≤ -10 dBm	—	—	3.0:1	—
Output Power	P <sub>SAT</sub>	P <sub>IN</sub> = +10 dBm, I <sub>DD</sub> = 1050 mA Typ.	dBm	31.7	33.0	34.3
Output Power vs. Frequency	P <sub>SAT</sub>	P <sub>IN</sub> = +10 dBm, I <sub>DD</sub> = 1050 mA Typ.	dB	—	1.0	1.5
Output Power vs. Temperature (with respect to T <sub>A</sub> = +25°C)	P <sub>SAT</sub>	P <sub>IN</sub> = +10 dBm, I <sub>DD</sub> = 1050 mA Typ. T <sub>A</sub> = -40°C to +70°C	dB	—	±0.4	—
Drain Bias Current	I <sub>DD</sub>	P <sub>IN</sub> = +10 dBm	mA	900	1050	1100
Gate Bias Voltage	V <sub>GG</sub>	P <sub>IN</sub> = +10 dBm, I <sub>DD</sub> = 1050 mA Typ.	V	-2.4	-1.2	-0.4
Gate Bias Current	I <sub>GG</sub>	P <sub>IN</sub> = +10 dBm, I <sub>DD</sub> = 1050 mA Typ.	mA	—	5	20
Thermal Resistance	θ <sub>JC</sub>	25°C Heat Sink	°C/W	—	5.6	—
Second Harmonic	f <sub>2</sub>	P <sub>IN</sub> = +10 dBm, I <sub>DD</sub> = 1050 mA Typ.	dBc	—	-35	—
Third Harmonic	f <sub>3</sub>	P <sub>IN</sub> = +10 dBm, I <sub>DD</sub> = 1050 mA Typ.	dBc	—	-45	—

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

Parameter	Absolute Maximum
Input Power	+23 dBm
$V_{DD}$	+12 Volts
$V_{GG}$	-3 Volts
$V_{DD} - V_{GG}$	12 Volts
$I_{DD}$	1700 mA
Channel Temperature	-40°C to +85°C
Storage Temperature	-65°C to +150°C

- Exceeding any one or a combination of these limits may cause permanent damage.
- Case Temperature ( $T_C$ ) = +25°C.
- Nominal bias is obtained by first connecting -2.4 volts to pin 5 ( $V_{GG}$ ), followed by connecting +9 volts to pin 10 ( $V_{DD}$ ). Note sequence. Adjust  $V_{GG}$  for a drain current of 1050 mA typical.
- RF ground and thermal interface is the flange (case bottom). Adequate heat sinking is required.
- No dc supply voltage will appear at the RF ports.
- The dc resistance at the input and output ports is a short circuit. No voltage is allowed on these ports.
- For optimum  $IP_3$  performance, the  $V_{DD}$  bypass capacitors should be placed within 0.5 inches of the  $V_{DD}$  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	$V_{GG}$	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	$V_{DD}$	Drain Supply

Typical Performance @ +25°C

