

**GaAs MMIC VSAT Power Amplifier, 0.5W
14.0 - 14.5 GHz**

**AM42-0041
V2**

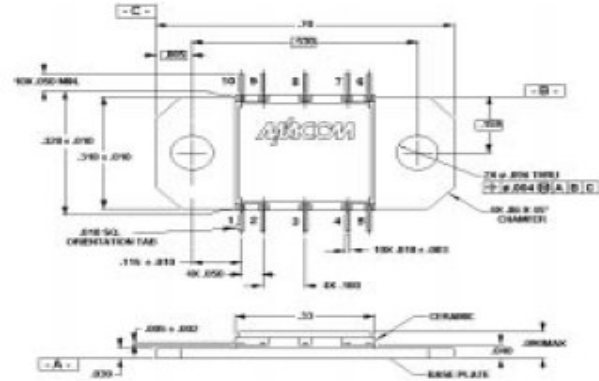
Features

- High Linear Gain: 28 dB Typ.
- High Saturated Output Power: +28 dBm Typ.
- High Power Added Efficiency: 22% Typ.
- 50W Input/Output Broadband Matched
- High Performance Ceramic Bolt Down Package

Description

M/A-COM's AM42-0041 is a four-stage MMIC linear power amplifier in a ceramic bolt down style hermetic package. The AM42-0041 employs a fully matched chip with internally decoupled Gate and Drain bias networks. The AM42-0041 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 AM42-0041 is ideally suited for use as an output stage or a driver, in applications for VSAT systems. This design is fully monolithic and requires a minimum of external components. M/A-COM's AM42-0041 is fabricated using a mature 0.5 micron MBE based GaAs MESFET process. The process features full passivation for increased performance and reliability. This product is 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
AM42-0041	Ceramic Bolt Down Package

Electrical Specifications: $T_A = +25^\circ\text{C}$, $V_{DD} = +8\text{V}$, V_{GG} adjusted for $I_{ds} = 500\text{ mA}$, $Z_0 = 50\Omega$, $F = 14.0 - 14.5\text{ GHz}$

Parameter	Abbv.	Test Conditions	Units	Min.	Typ.	Max.
Linear Gain	G_L	$P_{IN} \leq -10\text{ dBm}$	dB	27	28	—
Input VSWR	$VSWR_{IN}$	$P_{IN} \leq -10\text{ dBm}$	—	—	2.5:1	2.7:1
Output VSWR	$VSWR_{OUT}$	$P_{IN} \leq -10\text{ dBm}$	—	—	2.5:1	—
Saturated Output Power	P_{SAT}	$P_{IN} = +3\text{ dBm}$, $I_{DD} = 500\text{ mA Typ.}$	dBm	27.0	28.0	29.0
Output Power Flatness vs. Frequency	P_{SAT}	$P_{IN} = +3\text{ dBm}$, $I_{DD} = 500\text{ mA Typ.}$	dB	—	1.0	1.5
Output Power vs. Temperature (with respect to $T_A = +25^\circ\text{C}$)	P_{SAT}	$P_{IN} = +3\text{ dBm}$, $I_{DD} = 500\text{ mA Typ.}$ $T_A = -40^\circ\text{C}$ to 70°C	dB	—	±0.4	—
Noise Figure	NF	$P_{IN} \leq -10\text{ dBm}$, $I_{DD} = 500\text{ mA Typ.}$	dB	—	7	—
Drain Bias Current	I_{DD}	$P_{IN} = +3\text{ dBm}$	mA	400	500	600
Gate Bias Voltage	V_{GG}	$P_{IN} = +3\text{ dBm}$, $I_{DD} = 500\text{ mA Typ.}$	V	-2.4	-1.0	-0.4
Gate Bias Current	I_{GG}	$P_{IN} = +3\text{ dBm}$, $I_{DD} = 500\text{ mA Typ.}$	mA	—	5	15
Thermal Resistance	θ_{JC}	25°C Heat Sink	$^\circ\text{C/W}$	—	9.5	—
Power Added Efficiency	PAE	$P_{IN} = +3\text{ dBm}$, $I_{DD} = 500\text{ mA Typ.}$	%	—	22	—

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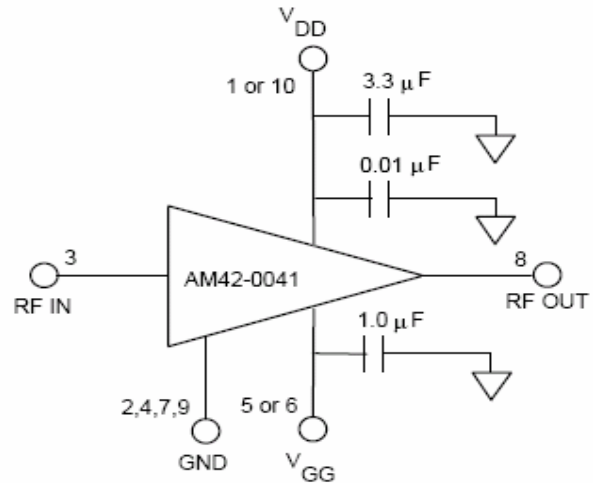
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Absolute Maximum Ratings ^{1,2,3,4}

Parameter	Absolute Maximum
Input Power	+ 23 dBm
V _{DD}	+ 12 Volts
V _{GG}	-3 Volts
V _{DD} -V _{GG}	12 Volts
I _{ds}	1000 mA
Channel Temperature	-40°C to +85°C
Storage Temperature	-65°C to +150°C

1. Operation of this device outside any of these limits may cause permanent damage.
2. Case Temperature (T_c) = +85°C.
3. Nominal bias is obtained by first connecting -2.4 volts to pin 5 or pin 6 (V_{GG}), followed by connecting +8 volts to pin 1 or pin 10 (V_{DD}). Note sequence. Adjust V_{GG} for a drain current of 500 mA typical.
4. RF ground and thermal interface is the flange (case bottom). Adequate heat sinking is required.
5. No dc bias voltage appears 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 IP₃ performance, the V_{DD} bypass capacitors should be placed within 0.5 inches of the V_{DD} leads.

Typical Bias Configuration ^{3,4,7}



Pin Configuration

Pin No.	Pin Name	Description
1	V _{DD}	Drain Supply
2	GND	RF and DC Ground
3	RF IN	RF Input
4	GND	RF and DC Ground
5	V _{GG}	Gate Supply
6	V _{GG}	Gate Supply
7	GND	RF and DC Ground
8	RF OUT	RF Output
9	GND	RF and DC Ground
10	V _{DD}	Drain Supply

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Typical Performance @ +25°C

