

1.5 Watt Ku-Band VSAT Power Amplifier

13.75 - 14.5 GHz

AM42-0042

V1.30

Features

- High Linear Gain: 32 dB Typ.
- High Saturated Output Power: +32 dBm Typ.
- High Power Added Efficiency: 25% Typ.
- 50 Ω Input/Output Broadband Matched
- Integrated Output Power Detector

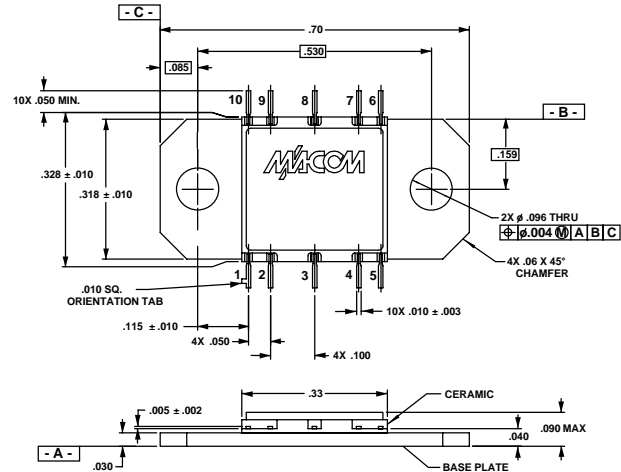
Description

M/A-COM's AM42-0042 is a four stage MMIC power amplifier in a bolt down ceramic package, allowing easy assembly. The AM42-0042 employs a fully matched chip with internally decoupled gate and drain bias networks. The AM42-0042 is designed to operate from a constant current drain supply or a constant voltage gate supply. By varying the bias conditions, the saturated output power performance of this device may be tailored for various applications.

The AM42-0042 is ideally suited for use as an output stage or a driver amplifier in VSAT systems. The AM42-0042 includes internal supply line bypassing in the package, minimizing the number of external components required.

M/A-COM's AM42-0042 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: in .xxx = $\pm .005$

.xx = $\pm .010$

Ordering Information

Part Number	Package
AM42-0042	Ceramic Bolt Down Package

Electrical Specifications: $V_{DD} = +8 \text{ V}$, V_{GG} adjusted for $I_{ds} = 750 \text{ mA}$, 13.75 - 14.5 GHz, $Z_o = 50 \Omega$, $T_A = +25 \text{ }^\circ\text{C}$.

Parameter	Test Conditions	Units	Min.	Typ.	Max.
Linear Gain	$P_{in} = -20 \text{ dBm}$, $I_{ds} = 750 \text{ mA Typ.}$	dB	29.5	32.0	36.5
Input VSWR	$P_{in} = +3 \text{ dBm}$, $I_{ds} = 750 \text{ mA Typ.}$			2.0:1	2.7:1
Output VSWR	$P_{in} = -20 \text{ dBm}$, $I_{ds} = 750 \text{ mA Typ.}$			2.0:1	
Output Power	$P_{in} = +3 \text{ dBm}$, $I_{ds} = 750 \text{ mA Typ.}$	dBm	31.0	32.0	
Output Power vs. Frequency	$P_{in} = +3 \text{ dBm}$, $I_{ds} = 750 \text{ mA Typ.}$	dB		± 0.3	± 0.7
Output Power vs. Temperature	$T_A = -40^\circ\text{C}$ to $+85^\circ\text{C}$, $P_{in} = +3 \text{ dBm}$	dB		± 0.5	
Drain Bias Current	$P_{in} = +3 \text{ dBm}$	mA	600	750	900
Gate Bias Voltage	$P_{in} = +3 \text{ dBm}$, $I_{ds} = 750 \text{ mA Typ.}$	V	-2.0	-1.0	-0.4
Gate Bias Current	$P_{in} = +3 \text{ dBm}$, $I_{ds} = 750 \text{ mA Typ.}$	mA		10	20
Thermal Resistance (θ_{JC})	25 $^\circ\text{C}$ Heat Sink	$^\circ\text{C/W}$		8.0	
Second Harmonic	$P_{in} = +3 \text{ dBm}$, $I_{ds} = 750 \text{ mA Typ.}$	dBc		-35	
Third Harmonic	$P_{in} = +3 \text{ dBm}$, $I_{ds} = 750 \text{ mA Typ.}$	dBc		-45	
Detector Voltage	$P_{in} = +3 \text{ dBm}$, $I_{ds} = 750 \text{ mA Typ.}$	V		2.4	

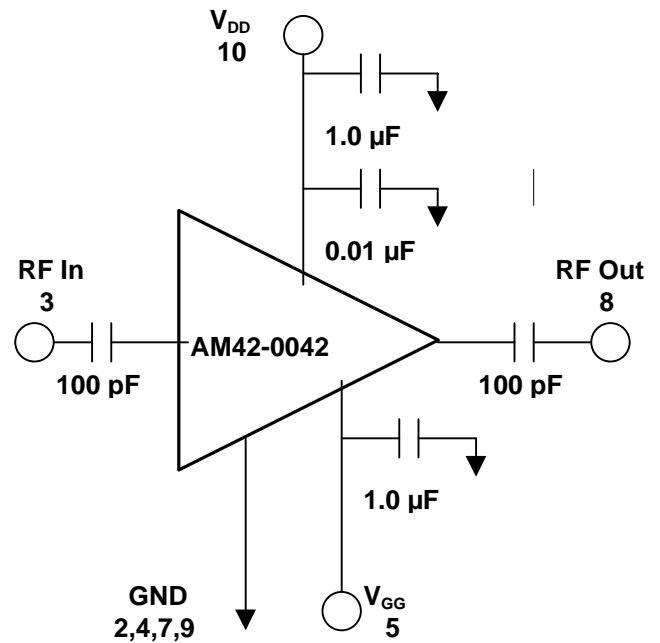
Absolute Maximum Ratings ^{1, 2}

Parameter	Absolute Maximum
Input Power	+13 dBm
V _{DD}	+10 volts
V _{GG}	-3 volts
V _{DD} - V _{GG}	12 volts
I _{ds}	1000 mA
Channel Temperature	+150 °C
Operating 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. Adequate heat sinking and grounding required on flange base.

Pin Configuration

Pin No.	Pin Name	Description
1	VDD	Drain Supply
2	GND	DC and RF Ground
3	RF In	RF Input
4	GND	DC and RF Ground
5	VGG	Gate Supply
6	DET	Output Power Detector
7	GND	DC and RF Ground
8	RF Out	RF Output
9	GND	DC and RF Ground
10	VDD	Drain Supply



3. Apply -2 volts to pin 5 (V_{GG}), prior to applying +8 volts to pins 1 or 10 (V_{DD}). Adjust V_{GG} for typical drain current.
4. External DC blocking capacitors required on the RF ports.
5. For optimum IP3 performance, V_{DD} bypass capacitors should be placed within 0.5 inches of the V_{DD} leads.

Typical Bias Configuration ^{3,4,5}