tyco Electronics

RoHS Compliant

MACOM

4 Watt Extended C-Band VSAT Power Amplifier 5.9 - 7.1 GHz

AM42-0046 V2

Features

- High Linear Gain: 30 dB Typical
- High Saturated Output Power: +36 dBm Typical
- High Power Added Efficiency: 25% Typical
- 50 Ω Input / Output Broadband Matched
- Integrated Output Power Detector
- Lead-Free Bolt Down Ceramic Package
- RoHS* Compliant and 260°C Reflow Compatible

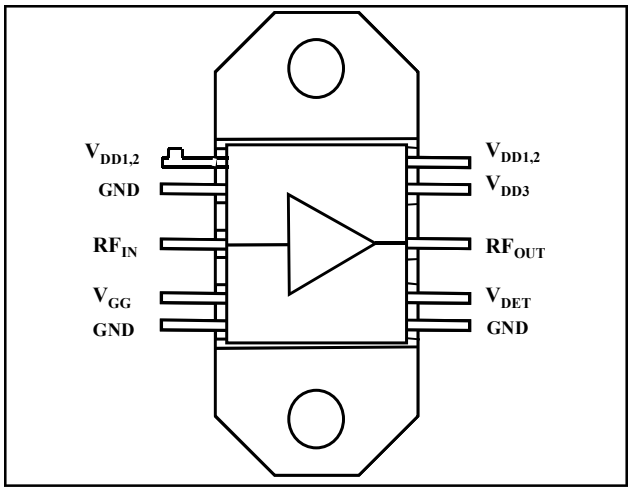
Description

M/A-COM's AM42-0046 is a three stage MMIC power amplifier in a lead-free, bolt down ceramic package, allowing easy assembly. The AM42-0046 employs a fully matched chip with internally decoupled gate and drain bias networks. The AM42-0046 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 AM42-0046 is ideally suited for use as an output stage or a driver amplifier in VSAT systems. The AM42-0046 includes internal supply line bypassing in the package, minimizing the number of external components required.

M/A-COM's AM42-0046 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.

Functional Schematic



Pin Configuration

PIN No.	PIN Name	Description
1	$V_{DD1,2}$	1st and 2nd Stage Drain Supply
2	GND	DC and RF Ground
3	RF_{IN}	RF Input
4	V_{GG}	Gate Supply
5	GND	DC and RF Ground
6	GND	DC and RF Ground
7	V_{DET}	Output Power Detector
8	RF_{OUT}	RF Output
9	V_{DD3}	3rd Stage Drain Supply
10	$V_{DD1,2}$	1st and 2nd Stage Drain Supply
Flange	GND	DC and RF Ground

Ordering Information

Part Number	Package
AM42-0046	Bulk Packaging

* Restrictions on Hazardous Substances, European Union Directive 2002/95/EC.

- **North America** Tel: 800.366.2266 / Fax: 978.366.2266
- **Europe** Tel: 44.1908.574.200 / Fax: 44.1908.574.300
- **Asia/Pacific** Tel: 81.44.844.8296 / Fax: 81.44.844.8298

Visit www.macom.com for additional data sheets and product information.

Electrical Specifications:
Frequency = 5.9 - 7.1 GHz, $V_{DD1,2,3}$ = +8 Vdc; V_{GG} = -5 Vdc; T_A = 25°C, Z_0 = 50 Ω

Parameter	Test Conditions	Units	Min.	Typ.	Max.
Linear Gain	Pin = -4 dBm	dB	27	30	—
Input VSWR	Pin = -4 dBm	Ratio	—	2.5:1	3.0:1
Output VSWR	Pin = -4 dBm	Ratio	—	2.5:1	—
Output Power	Pin = +8 dBm, Ids = 1900 mA Typ.	dBm	35	36.0	—
Output Power vs. Frequency	Pin = +8 dBm, Ids = 1900 mA Typ. (5.9 to 6.4 GHz) Pin = +8 dBm, Ids = 1900 mA Typ. (6.4 to 7.1 GHz)	dB dB	— —	±0.3 ±0.3	±1.25 ±1.25
Drain Bias Current	Pin = +8 dBm	mA	—	1900	2200
Gate Bias Current	Pin = +8 dBm, Ids = 1900 mA Typ.	mA	—	10	25
Detector Voltage	Pin = +8 dBm, Ids = 1900 mA Typ.	V	2.0	4.0	—

Absolute Maximum Ratings [1,2,3]

Parameter	Absolute Maximum
Input Power	+15 dBm
Operating Voltages	0 V ≤ V_{DD} ≤ 10 V -6 V ≤ V_{GG} ≤ -3 V
Ids	2300 mA
Channel Temperature	+150°C
Operating Temperature	-40°C to +80°C
Storage Temperature	-65°C to +150°C

1. Exceeding any one or combination of these limits may cause permanent damage to this device.
2. M/A-COM does not recommend sustained operation near these survivability limits.
3. Adequate heat sinking and grounding required on flange base.

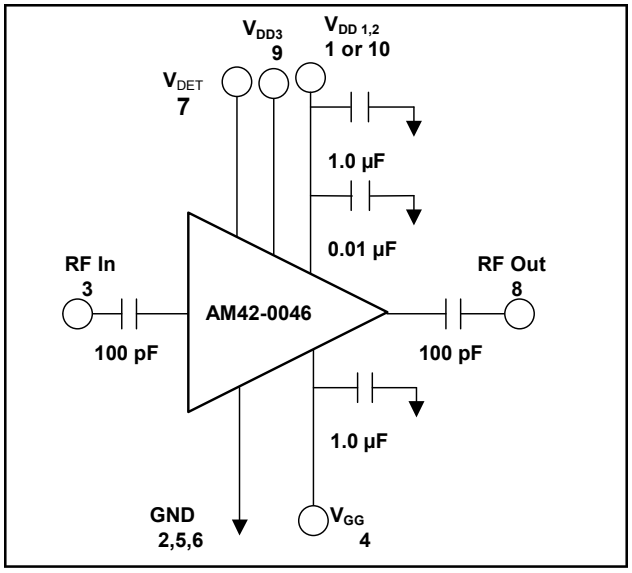
Handling Procedures

Please observe the following precautions to avoid damage:

Static Sensitivity

Gallium Arsenide Integrated Circuits are sensitive to electrostatic discharge (ESD) and can be damaged by static electricity. Proper ESD control techniques should be used when handling these devices.

Application Schematic [4]



4. External DC blocking capacitors required on the RF ports.

Operating the AM42-0046

To operate the AM42-0046, follow these steps.

1. Apply -5.0 Volts to V_{GG}.
2. Ramp V_{DD} to +8 V.
3. Apply RF.
4. Power down in reverse sequence. Turn gate voltage off last.

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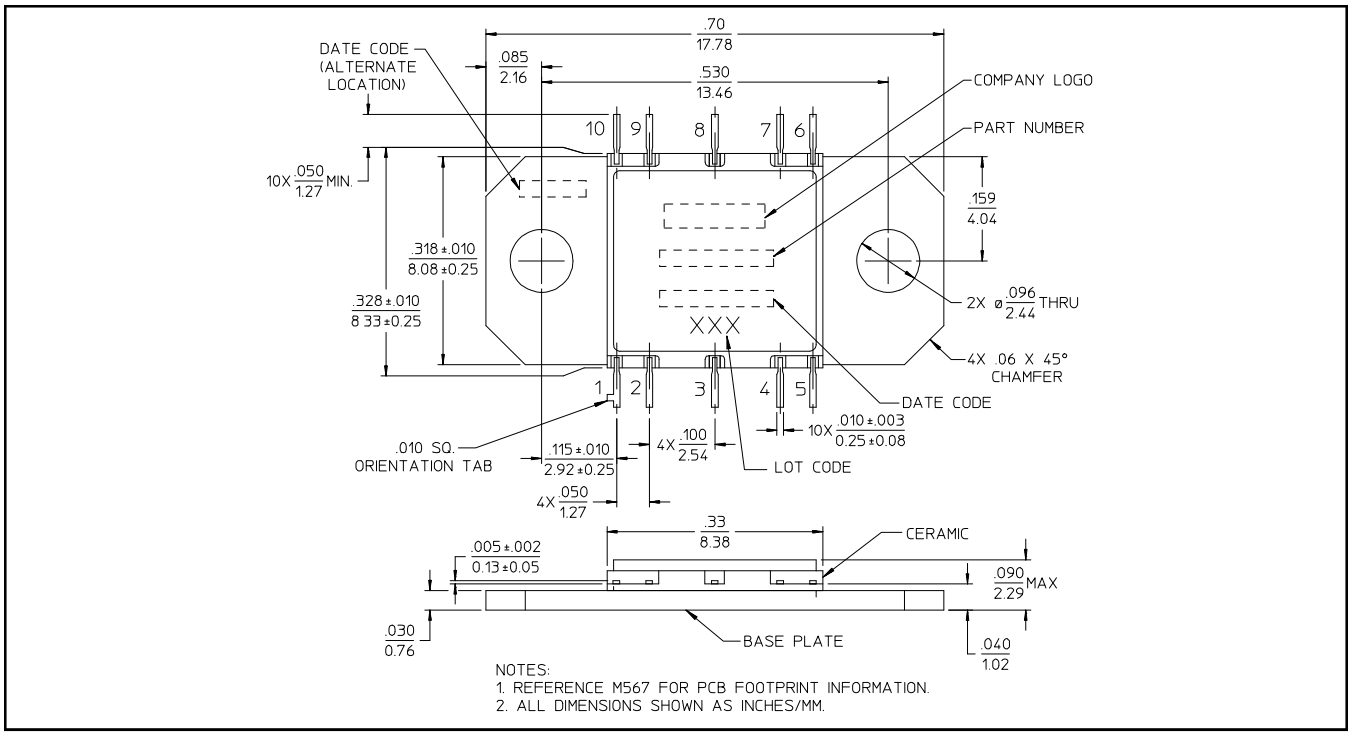
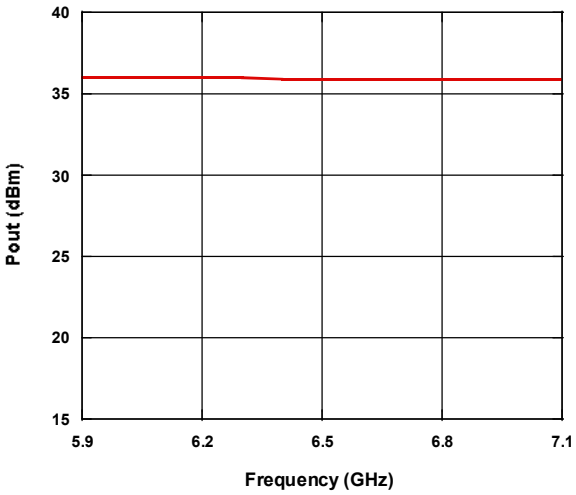
Lead-Free CR-15†



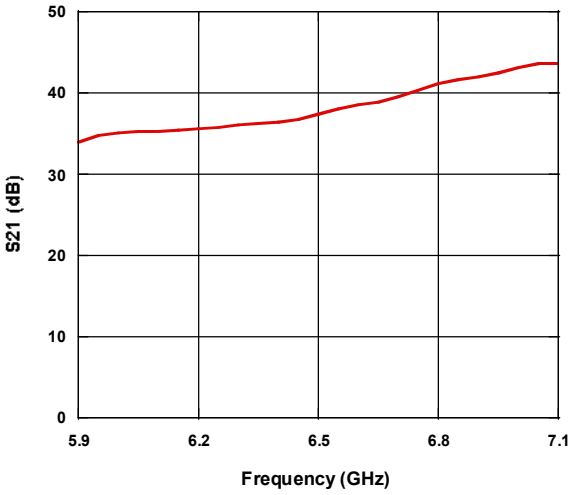
† Reference Application Note M538 for lead-free solder reflow recommendations.

Typical Performance Curves

P_{OUT} vs. Frequency



S21 vs. Frequency



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