AM42-0007-DIE



GaAs MMIC Power Amplifier, 2 W 14.0 - 14.5 GHz

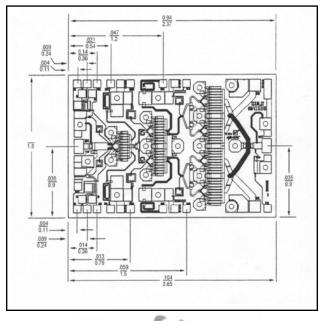
Features

- High Linear Gain: 22 dB Typical.
- High Saturated Output Power: +33 dBm Typical
- High Power Added Efficiency: 22% Typical
- High P1dB: +32 dBm Typical
- 50 Ω Input / Output Broadband Matched
- Integrated Output Power Detector
- High Performance Ceramic Bolt Down Package

Description

M/A-COM's AM42-0007-DIE is a three stage MMIC linear power amplifier fabricated on a mature 0.5 micron MBE based GaAs process. The AM42-0007-DIE employs a fully matched chip with integral bias networks and output power detector. This GaAs MMIC power amplifier is ideally suited for used as an output stage or driver in applications for VSAT applications.

Functional Schematic



Ordering Information

Ordening information		1
Part Number	Package	-+11P
AM42-0007-DIE	DIE	
Absolute Maximum	Ratings ^{1,2}	rorror
Parameter	Absolute Maximum	1 2008
V _{DD}	+12 Volts	JACIAND
V _{GG}	-10 Volts	new designs
Power Dissipation	17.9 W	new aesign
RF Input Power	+23 dBm	110.
ChannelTemperature	+150 °C	
Storage Temperature	-65 °C to +150 °C	
1. Exceeding any one or combin	nation of these limits may cause	

permanent damage to this device.

2. Back of die temperature $(T_B) = +25^{\circ}C$.

1

ADVANCED: Data Sheets contain information regarding a product M/A-COM Technology Solutions is considering for development. Performance is based on target specifications, simulated results, and/or prototype measurements. Commitment to develop is not guaranteed. **PRELIMINARY:** Data Sheets contain information regarding a product M/A-COM Technology Solutions has under development. Performance is based on engineering tests. Specifications are typical. Mechanical outline has been fixed. Engineering samples and/or test data may be available. Commitment to produce in volume is not guaranteed.

- 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.macomtech.com for additional data sheets and product information.

M/A-COM Technology Solutions Inc. and its affiliates reserve the right to make changes to the product(s) or information contained herein without notice.

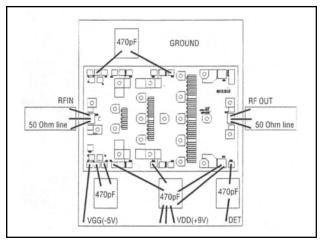
Rev. V5

AM42-0007-DIE

Technology Solutions

GaAs MMIC Power Amplifier, 2 W 14.0 - 14.5 GHz

Typical Bias Configuration ^{3,4}



3. Nominal bias is obtained by first connecting –5 volts to pin V_{GG} (resistor network used) followed by connecting +9 volts to pin V_{DD} . Note sequence.

Electrical Specifications ⁵: $T_B = +25$ °C , $V_{DD} = +9$ V, $V_{GG} = -1.2$ V, $Z_0 = 50 \Omega$

Lieutical opecifications : $T_B = 723$ G , $v_{DD} = 73$ V, $v_{GG} = 71.2$ V, $Z_0 = 30.32$							
Parameter	Test Conditions	Units	Min.	Тур.	Max.		
Linear Gain	P _{IN} < 0 dBm	dB	_	22	—		
Input VSWR		Ratio		2.5:1	—		
Output VSWR		Ratio	+	2.7:1	_		
Saturated Output Power	P _{IN} < +14 dBm	dBm 💋	\$ 7()	+33	_		
Output Power @ 1 dB Compression	- (- 10 P1)	dBm	- 31	+32	—		
Output IP ₃	++nr-nvr	dBm	\sim	41	_		
Power Added Efficiency (PAE)	P _{IN} < +14 dBm	%		22	—		
Bias Current	I _{DSQ} (No RF) I _{GG} (No RF)	mA mA	_	850 0.1	—		
Thermal Resistance	θ CB2 ⁶	°C/W	—	7	—		
Detector Output Voltage (V _{DET})	Pin = +3 dBm, lds = 750 mA Typ.	V		+3.5	—		

5. 100% on wafer tested (50 µs pulse width, 20% duty factor) without resistor network on gates.

6. Channel to die backside.

ADVANCED: Data Sheets contain information regarding a product M/A-COM Technology Solutions is considering for development. Performance is based on target specifications, simulated results, and/or prototype measurements. Commitment to develop is not guaranteed. **PRELIMINARY:** Data Sheets contain information regarding a product M/A-COM Technology Solutions has under development. Performance is based on engineering tests. Specifications are typical. Mechanical outline has been fixed. Engineering samples and/or test data may be available. Commitment to produce in volume is not guaranteed.

- 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.macomtech.com for additional data sheets and product information.

M/A-COM Technology Solutions Inc. and its affiliates reserve the right to make changes to the product(s) or information contained herein without notice.



It is recommended that the die be mounted with Au/Sn eutectic performs for good RF ground and thermal interface.

[•] North America Tel: 800.366.2266 / Fax: 978.366.2266

AM42-0007-DIE

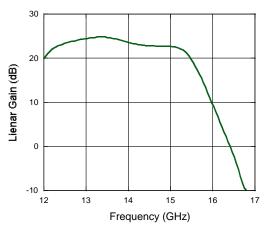


Rev. V5

GaAs MMIC Power Amplifier, 2 W 14.0 - 14.5 GHz

Typical Performance @ 25°C

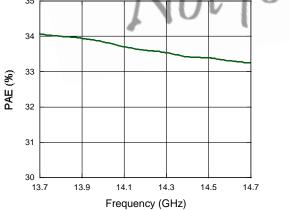
Linear Gain vs. Frequency



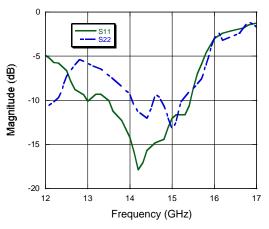
Output Power vs. Input Power @ 14 GHz

35 33 $P_{o \cup T}$ (dBm) 31 29 27 25 6 8 10 12 4 14 Input Power (dBm)

Output Power vs. Frequency @ P_{IN} = +14 dBm 35

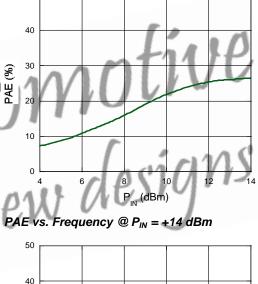


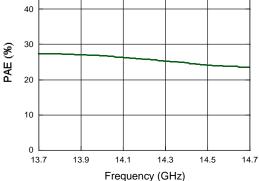
Input & Output Return Loss vs. Frequency



Power Added Efficiency vs. Input Power @ 14 GHz

50





ADVANCED: Data Sheets contain information regarding a product M/A-COM Technology Solutions is considering for development. Performance is based on target specifications, simulated results, ٠

and/or prototype measurements. Commitment to develop is not guaranteed. **PRELIMINARY:** Data Sheets contain information regarding a product M/A-COM Technology Solutions has under development. Performance is based on engineering tests. Specifications are typical. Mechanical outline has been fixed. Engineering samples and/or test data may be available. Commitment to produce in volume is not guaranteed. • 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.macomtech.com for additional data sheets and product information.

M/A-COM Technology Solutions Inc. and its affiliates reserve the right to make changes to the product(s) or information contained herein without notice.

³