

Rev. V1

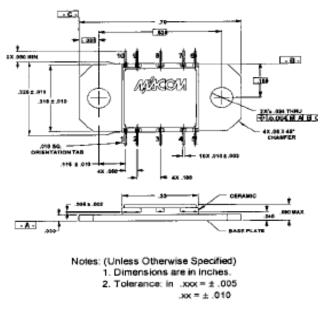
# 1 Watt/2 Watt S-Band Power Amplifier 2.2 - 2.4 GHz

#### Features

- High Linear Gain: 29 dB typ.
- High Saturated Output Power: +33 dBm typ.
- 50 Ohm Input/Output Broadband Matched

#### Description

M/A-COM's AM42-0055 is a two stage MMIC power amplifier in a bolt down ceramic package, allowing easy assembly. The AM42-0055 employs a fully matched chip with internally decoupled gate and grain bias networks. The AM42-0055 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 AM42-0055 is ideally suited for use as an output stage in telemetry systems. The AM42-0055 includes internal supply line bypassing in the package, minimizing the number of external components required. M/A-COM's AM42-0055 is fabricated using a mature 0.5micron 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.



Outline Drawing<sup>1</sup>

1. Die available upon request (die size = 2970 x 2550 μm).

## Electrical Specifications: , $V_{DD}$ = +5V/+8V, $V_{GG}$ adjusted for Ids = 800 mA (with RF), $Z_0$ = 50 $\Omega$ , $T_A$ = 25°C

Parameter	Test Conditions	Frequency	Units	V <sub>DD</sub> = +5 V (1 W operation)	V <sub>DD</sub> = +8 V (2 W operation)
Linear Gain	Pin = -10 dBm, Ids = 800 mA typ.	2.2 - 2.4 GHz	dB	25 typ.	25 typ.
Input VSWR	Pin = -10 dBm	2.2 - 2.4 GHz	Ratio	<2.0:1	<2.0:1
Output VSWR	Pin = -10 dBm	2.2 - 2.4 GHz	Ratio	<2.0:1	<2.0:1
Saturated Output Power	Pin = +10 dBm	2.2 - 2.4 GHz	dBm	30 typ.	33 typ.
Output Power vs. Frequency	Pin = +10 dBm	2.2 - 2.4 GHz	dBm	±0.9 typ.	±0.4 typ.
Drain Bias Current	Pin = +100 dBm	2.2 - 2.4 GHz	mA	700 typ.	800 typ.
Gate Bias Voltage (V <sub>GG)</sub>	Pin = +10 dBm	2.2 - 2.4 GHz	V	-2.0 min; -0.4 max	-2.0 min; -0.4 max
Gate Bias Current (I <sub>GG</sub> )	Pin = +10 dBm	2.2 - 2.4 GHz	mA	25 typ.	25 typ.
Power Added Efficiency	Pin = +100 dBm	2.2 - 2.4 GHz	%	30 typ.	29 typ.

<sup>1</sup> 

North America Tel: 800.366.2266
 Europe Tel: +353.21.244.6400
 India Tel: +91.80.4155721
 China Tel: +86.21.2407.1588

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

**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.

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### Absolute Maximum Ratings <sup>2,3,4,5,6</sup>

Parameter	Absolute Maximum	
Input Power	+ 12 dBm	
V <sub>DD</sub>	+ 10 Volts	
V <sub>GG</sub>	-5 Volts	
V <sub>DD</sub> —V <sub>GG</sub>	12 Volts	
l <sub>ds</sub>	1200 mA	
Channel Temperature	+150°C	
Operating Temperature	-40°C to +85°C	
Storage Temperature	-65°C to +150°C	

2. Operation of this device outside any of these limits may cause permanent damage.

3. Adequate heat sinking and grounding required on flange base.

4. Apply –3 volts to pins 5 and 6 (V\_{GG}), prior to applying +8 volts to pins 1 pr 10 (V\_{DD}). Adjust  $V_{GG}$  for typical drain current.

5. For optimum IP3 performance, the Vob bypass capacitors

should be placed within 0.5 inches of the  $V_{DD}$  leads.

6. DC blocks are required for RF input and output ports.

#### **Pin Configuration**

Pin No.	Pin Name	Description
1	VD1	Drain Supply to First Stage
2	GND	RF and DC Ground
3	RF IN	RF Input
4	GND	RF and DC Ground
5	VG1	Gate Supply to First Stage
6	VG2	Gate Supply to Second Stage
7	GND	RF and DC Ground
8	RF OUT	RF Output
9	GND	RF and DC Ground
10	VD2	Drain Supply to Second Stage

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## AM42-0055

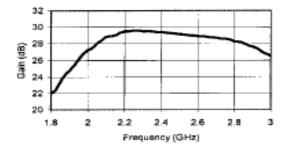


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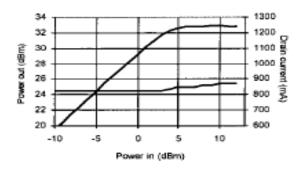
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#### **Typical Performance Curves**

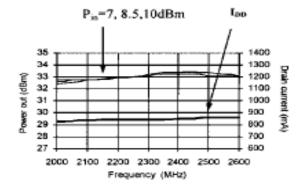
#### 2 WATT PERFORMANCE LINEAR GAIN VS FREQUENCY



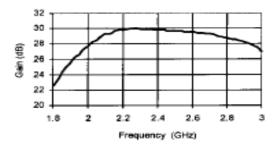
#### 2 WATT PERFORMANCE Pout AND CURRENT VS P™



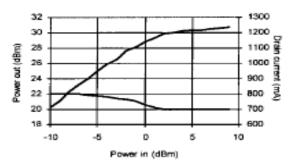
#### 2 WATT PERFORMANCE GAIN AND CURRENT VS FREQ.



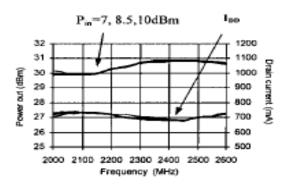
#### 1 WATT PERFORMANCE LINEAR GAIN VS FREQUENCY



#### 1 WATT PERFORMANCE Pour AND CURRENT VS PIN



#### 1 WATT PERFORMANCE GAIN AND CURRENT VS FREQ.



3

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-40°C

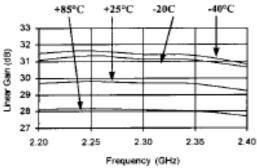
2.40

-20C

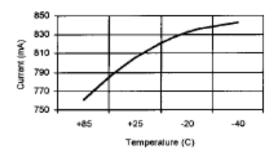
2.35

#### **Typical Performance Curves**

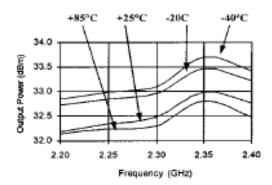
#### 2 WATT PERFORMANCE LINEAR GAIN VS FREQ AND TEMP



#### 2 WATT PERFORMANCE CURRENT VS TEMP AT 1.5 GHz



#### 2 WATT PERFORMANCE Pout VS FREQ AND TEMP



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1 WATT PERFORMANCE CURRENT VS TEMP AT 1.5 GHz

33

32 Gein (dB)

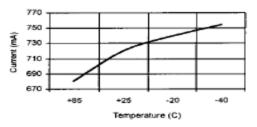
31

30 je j 29

28

27

2.20



#### **1 WATT PERFORMANCE** Pout VS FREQ AND TEMP

1 WATT PERFORMANCE

+85°C

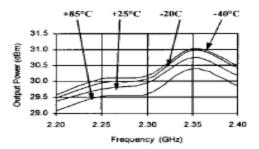
2.25

LINEAR GAIN VS FREQUENCY

+25°C

2 30

Frequency (GHz)



### Ordering Information<sup>7</sup>

Part Number	Package	
AM42-0055	CR-15 Package	

7. Die available upon request.

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