

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

Rev. V1

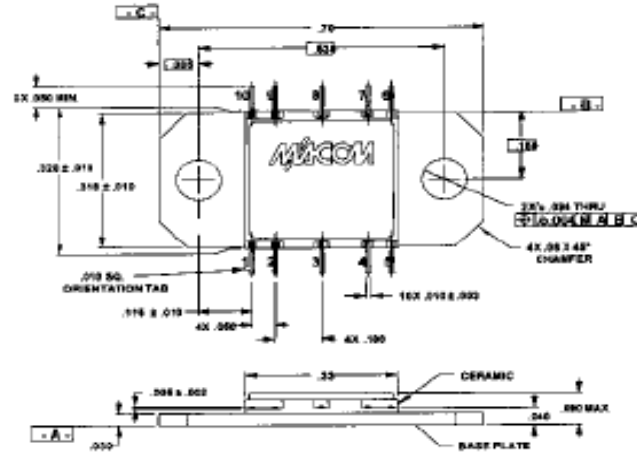
Features

- 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 drain 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 0.5-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.

Outline Drawing ¹



Notes: (Unless Otherwise Specified)
 1. Dimensions are in inches.
 2. Tolerance: in .xxx = ± .005
 .xx = ± .010

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

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

Parameter	Test Conditions	Frequency	Units	$V_{DD} = +5$ V (1 W operation)	$V_{DD} = +8$ V (2 W operation)
Linear Gain	Pin = -10 dBm, I _{ds} = 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_{GG})	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_{GG})	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.

Absolute Maximum Ratings ^{2,3,4,5,6}

Parameter	Absolute Maximum
Input Power	+ 12 dBm
V_{DD}	+ 10 Volts
V_{GG}	-5 Volts
$V_{DD}-V_{GG}$	12 Volts
I_{ds}	1200 mA
Channel Temperature	+150°C
Operating Temperature	-40°C to +85°C
Storage Temperature	-65°C to +150°C

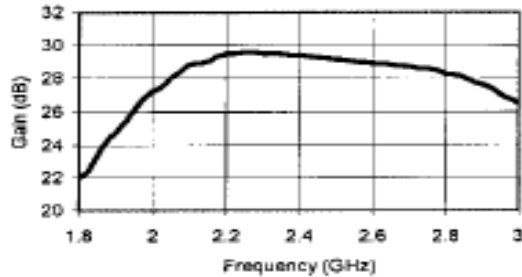
2. Operation of this device outside any of these limits may cause permanent damage.
3. Adequate heat sinking and grounding required on flange base.
4. Apply -3 volts to pins 5 and 6 (V_{GG}), prior to applying +8 volts to pins 1 pr 10 (V_{DD}). Adjust V_{GG} for typical drain current.
5. For optimum IP_3 performance, the V_{DD} 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

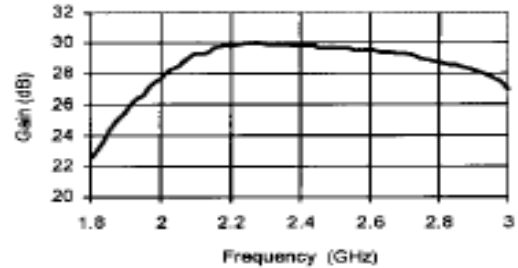
Pin No.	Pin Name	Description
1	VD1	Drain Supply to First Stage
2	GND	RF and DC Ground
3	RF IN	RF Input
4	GND	RF and DC Ground
5	VG1	Gate Supply to First Stage
6	VG2	Gate Supply to Second Stage
7	GND	RF and DC Ground
8	RF OUT	RF Output
9	GND	RF and DC Ground
10	VD2	Drain Supply to Second Stage

Typical Performance Curves

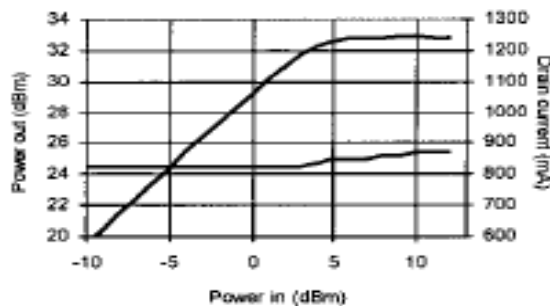
**2 WATT PERFORMANCE
LINEAR GAIN VS FREQUENCY**



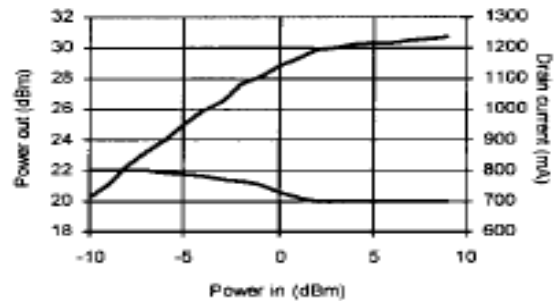
**1 WATT PERFORMANCE
LINEAR GAIN VS FREQUENCY**



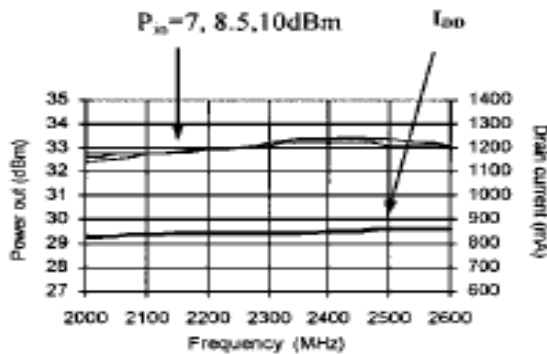
**2 WATT PERFORMANCE
 P_{OUT} AND CURRENT VS P_{IN}**



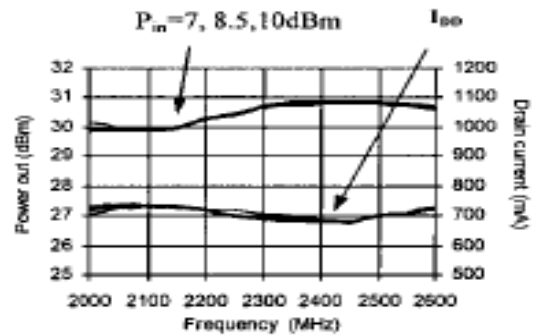
**1 WATT PERFORMANCE
 P_{OUT} AND CURRENT VS P_{IN}**



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

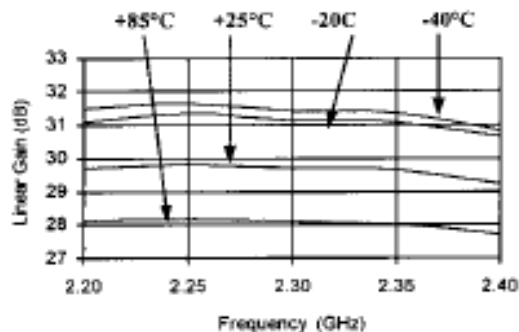


**1 WATT PERFORMANCE
GAIN AND CURRENT VS FREQ.**

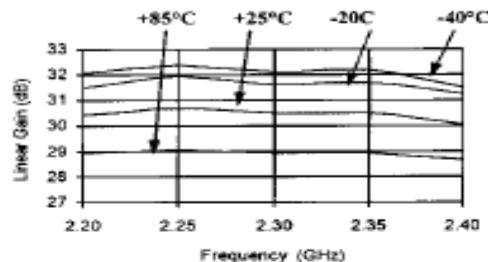


Typical Performance Curves

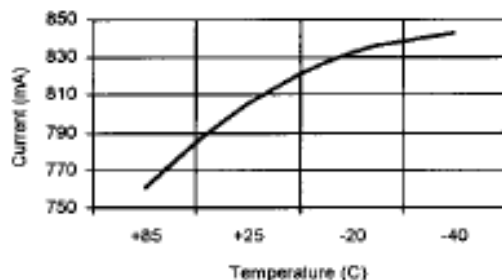
**2 WATT PERFORMANCE
LINEAR GAIN VS FREQ AND TEMP**



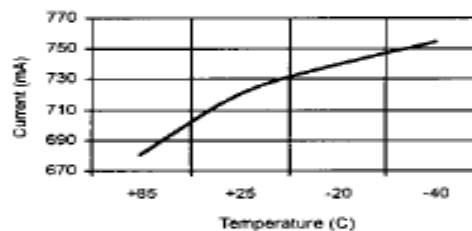
**1 WATT PERFORMANCE
LINEAR GAIN VS FREQUENCY**



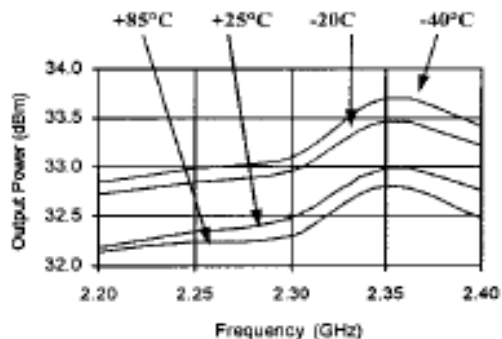
**2 WATT PERFORMANCE
CURRENT VS TEMP AT 1.5 GHz**



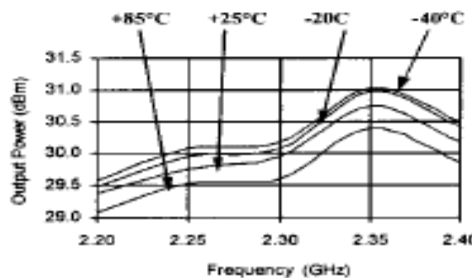
**1 WATT PERFORMANCE
CURRENT VS TEMP AT 1.5 GHz**



**2 WATT PERFORMANCE
P_{out} VS FREQ AND TEMP**



**1 WATT PERFORMANCE
P_{out} VS FREQ AND TEMP**



Ordering Information ⁷

Part Number	Package
AM42-0055	CR-15 Package

7. Die available upon request.