

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

V 1P.00

Preliminary

AM42-0055

Features

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

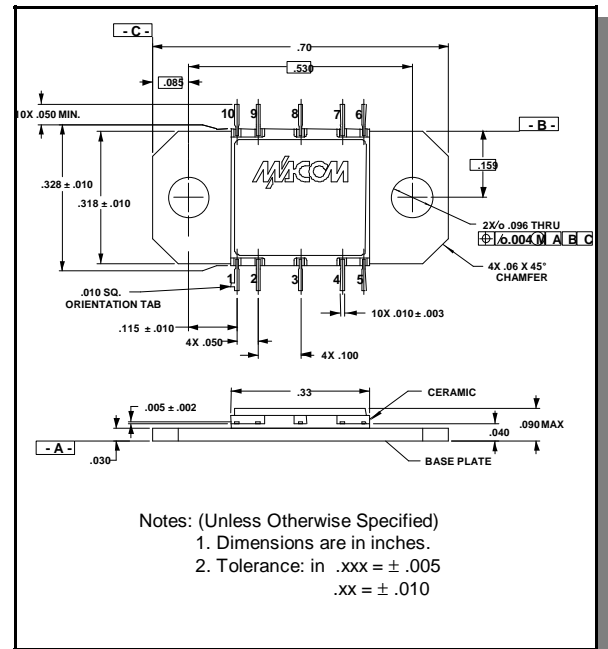
Description

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



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), $Z_o = 50 \Omega$, $T_A = 25^\circ C$.

Parameter	Test Conditions	Frequency	Units	$V_{DD} = +5 V$ (1 W operation)	$V_{DD} = +8 V$ (2 W operation)
Linear Gain	$P_{in} = -10$ dBm, $I_{ds} = 800$ mA Typ.	2.2 - 2.4 GHz	dB	25 typ.	25 typ.
Input VSWR	$P_{in} = -10$ dBm	2.2 - 2.4 GHz	Ratio	< 2.0:1	< 2.0:1
Output VSWR	$P_{in} = -10$ dBm	2.2 - 2.4 GHz	Ratio	< 2.0:1	< 2.0:1
Output Power (saturated)	$P_{in} = +10$ dBm	2.2 - 2.4 GHz	dBm	30 typ.	33 typ.
Output Power vs. Frequency	$P_{in} = +10$ dBm	2.2 - 2.4 GHz	dBm	±0.9 typ.	±0.4 typ.
Drain Bias Current	$P_{in} = +10$ dBm	2.2 - 2.4 GHz	mA	700 typ.	800 typ.
Gate Bias Voltage (V_{GG})	$P_{in} = +10$ dBm	2.2 - 2.4 GHz	V	-2.0 min; -0.4max	-2.0 min; -0.4max
Gate Bias Current (I_{GG})	$P_{in} = +10$ dBm	2.2 - 2.4 GHz	mA	25 typ.	25 typ.
Power Added Efficiency	$P_{in} = +10$ 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

- Exceeding any one or a combination of these limits may cause permanent damage.
- Adequate heat sinking and grounding required on flange base.
- Apply -3 volts to pins 5 and 6 (V_{GG}), prior to applying +8 volts to pins 1 or 10 (V_{DD}). Adjust V_{GG} for typical drain current.
- For optimum IP3 performance, V_{DD} bypass capacitors should be placed within 0.5 inches of the V_{DD} leads.
- 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	DC and RF Ground
3	RF In	RF Input
4	GND	DC and RF Ground
5	VG1	Gate Supply to First Stage
6	VG2	Gate Supply to Second Stage
7	GND	DC and RF Ground
8	RF Out	RF Output
9	GND	DC and RF Ground
10	VD2	Drain Supply to Second Stage

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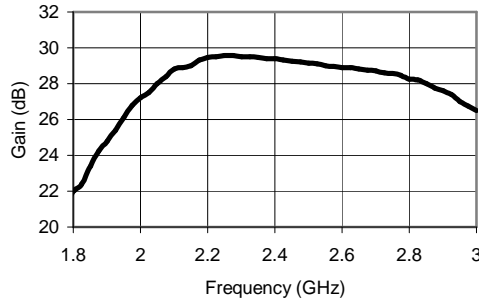
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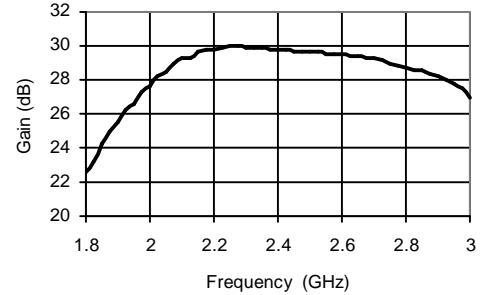
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Typical Performance Curves

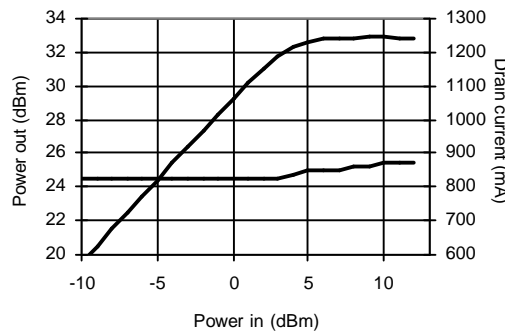
2 WATT PERFORMANCE
LINEAR GAIN VS FREQUENCY



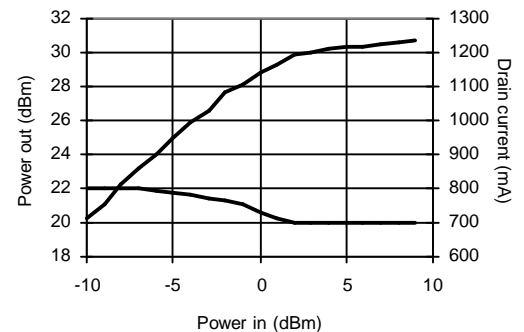
1 WATT PERFORMANCE
LINEAR GAIN VS FREQUENCY



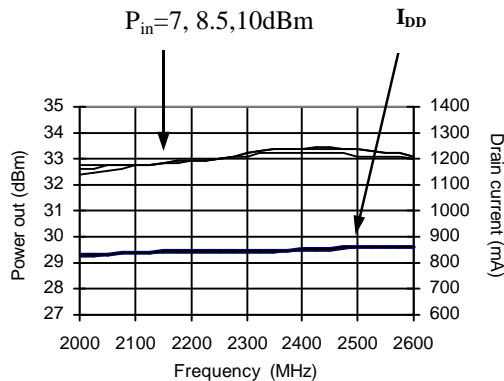
2 WATT PERFORMANCE
P_{OUT} AND CURRENT VS P_{IN}



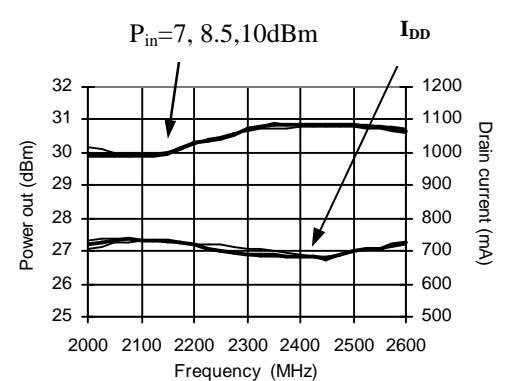
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P_{OUT} AND CURRENT VS P_{IN}



2 WATT PERFORMANCE
GAIN AND CURRENT VS FREQ.



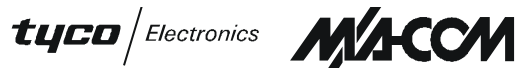
1 WATT PERFORMANCE
GAIN AND CURRENT VS FREQ.



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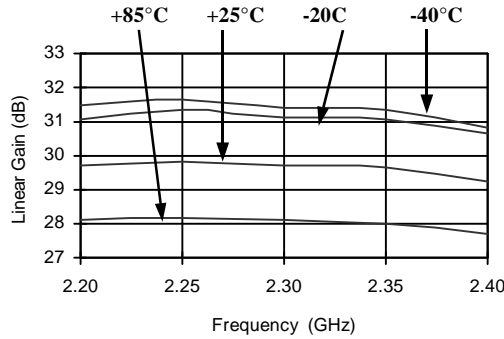
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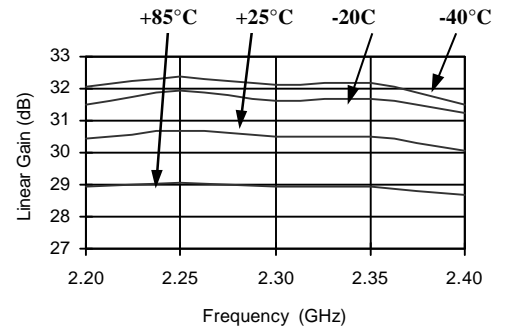


Typical Performance Curves

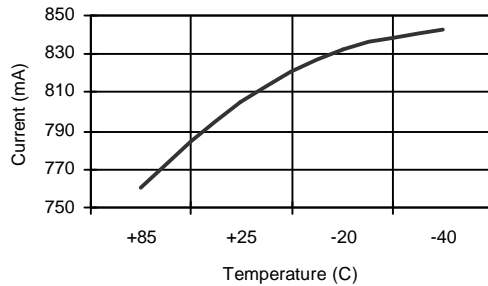
2 WATT PERFORMANCE
LINEAR GAIN VS FREQ AND TEMP



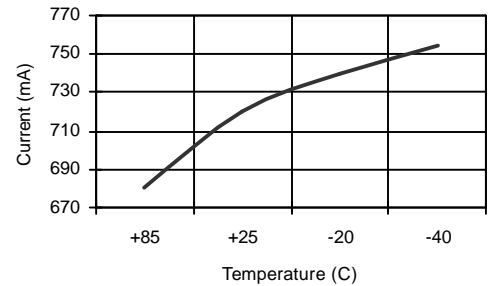
1 WATT PERFORMANCE
LINEAR GAIN VS FREQUENCY



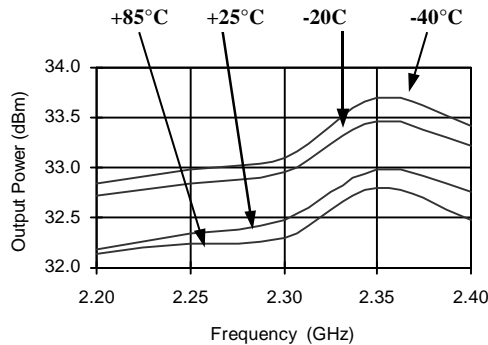
2 WATT PERFORMANCE
CURRENT VS TEMP AT 1.5 GHz



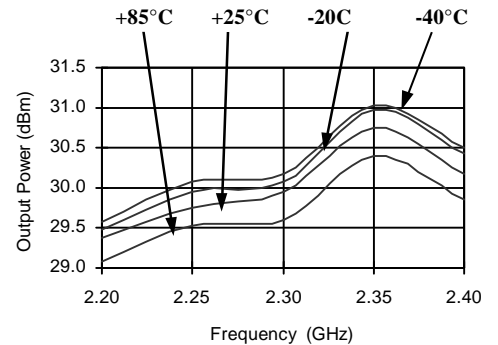
1 WATT PERFORMANCE
CURRENT VS TEMP AT 1.5 GHz



2 WATT PERFORMANCE
P_{out} VS FREQ AND TEMP



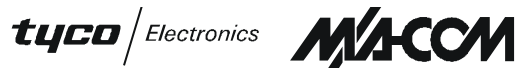
1 WATT PERFORMANCE
P_{out} VS FREQ AND TEMP



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Ordering Information ⁷

Part Number	Package
AM42-0055	CR-15 Package

7. Die available upon request.

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