1 Watt/2 Watt L-Band Power Amplifier
1.435 - 1.525 GHz

V 1P.00

Preliminary

AM42-0054

Features

- High Linear Gain: 26 dB typ.
- High Saturated Output Power: +33 dBm typ.
- 50 Ohm Input/Output Broadband Matched

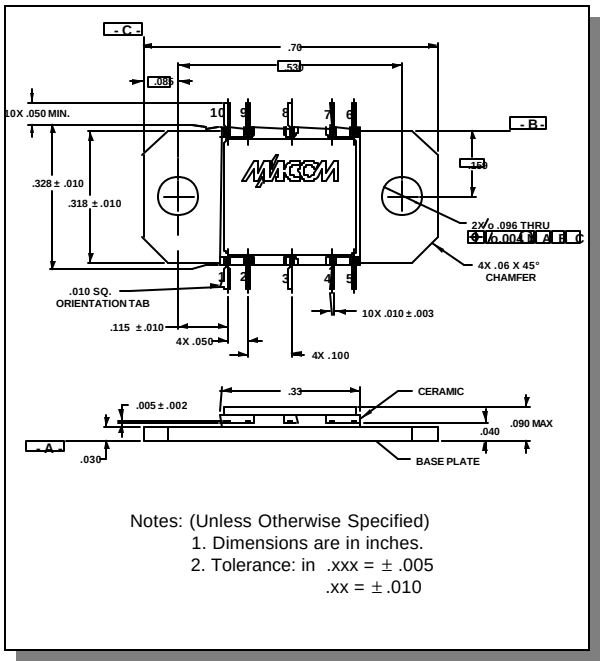
Description

M/A-COM's AM42-0054 is a two stage MMIC power amplifier in a bolt down ceramic package, allowing easy assembly. The AM42-0054 employs a fully matched chip with internally decoupled gate and drain bias networks. The AM42-0054 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 AM42-0054 is ideally suited for use as an output stage in telemetry systems. The AM42-0054 includes internal supply line bypassing in the package, minimizing the number of external components required.

M/A-COM's AM42-0054 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 Ids = 800 mA (with RF), Zo = 50 Ω, T_A = 25 °C.

Parameter	Test Conditions	Frequency	Units	V_{DD} = +5 V (1 W operation)	V_{DD} = +8 V (2 W operation)
Linear Gain	Pin = -20 dBm, Ids = 800 mA typ.	1.4 - 1.55 GHz	dB	25 typ.	25 typ.
Input VSWR	Pin = -20 dBm	1.4 - 1.55 GHz	Ratio	< 2.0:1	< 2.0:1
Output VSWR	Pin = -20 dBm	1.4 - 1.55 GHz	Ratio	< 2.0:1	< 2.0:1
Output Power (saturated)	Pin = +10 dBm	1.4 - 1.55 GHz	dBm	30 typ.	33 typ.
Output Power vs. Frequency	Pin = +10 dBm	1.4 - 1.55 GHz	dBm	±0.9 typ.	±0.4 typ.
Drain Bias Current	Pin = +10 dBm	1.4 - 1.55 GHz	mA	700 typ.	800 typ.
Gate Bias Voltage (V_{GG})	Pin = +10 dBm	1.4 - 1.55 GHz	V	-2.0 min; -0.4max	-2.0 min; -0.4max
Gate Bias Current (I_{GG})	Pin = +10 dBm	1.4 - 1.55 GHz	mA	25 typ.	25 typ.
Power Added Effiency	Pin = +10 dBm	1.4 - 1.55 GHz	%	37 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
Ids	1200 mA
Channel Temperature	+150 °C
Operating Temperature	-40 °C to +85 °C
Storage Temperature	-65 °C to +150 °C

2. Exceeding any one or a combination 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 or 10 (V_{DD}). Adjust V_{GG} for typical drain current.
5. For optimum IP3 performance, 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	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

■ **North America:** Tel. (978) 656-2693
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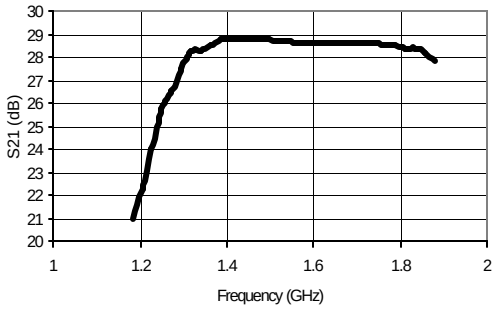
Typical Performance Curves

2 WATT PERFORMANCE LINEAR GAIN VS FREQUENCY



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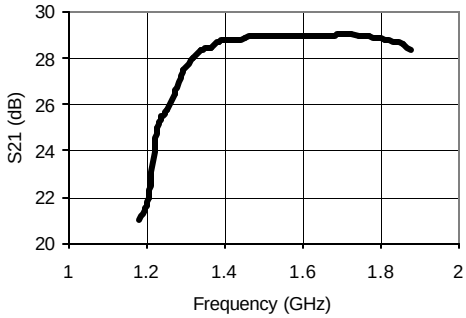
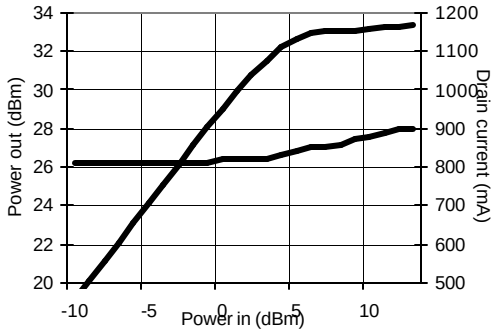


2 WATT PERFORMANCE P_{OUT} AND CURRENT VS P_{IN}



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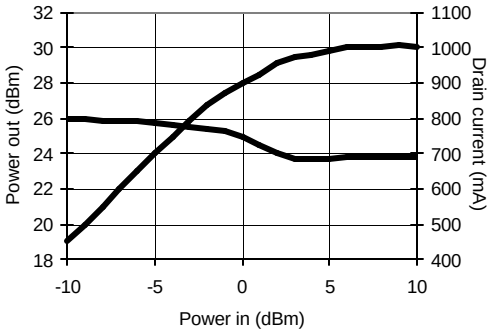

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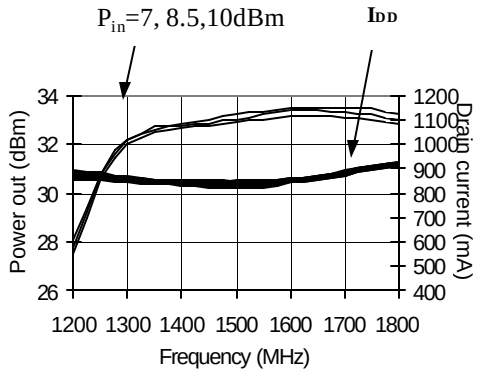

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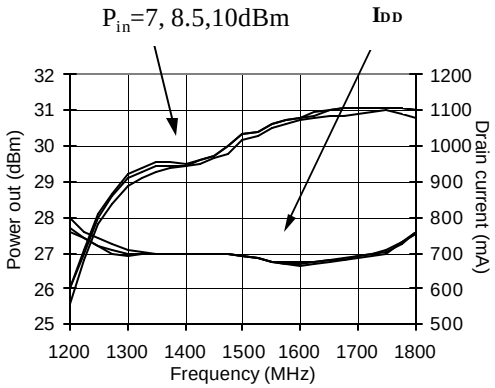

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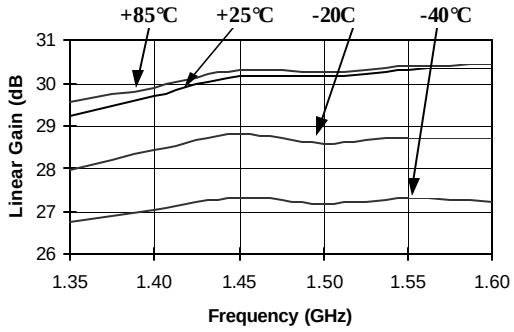
Typical Performance Curves

2 WATT PERFORMANCE LINEAR GAIN VS FREQ AND TEMP



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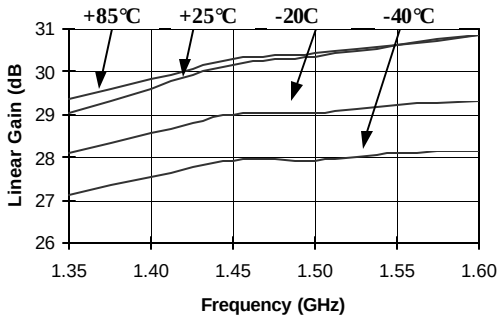
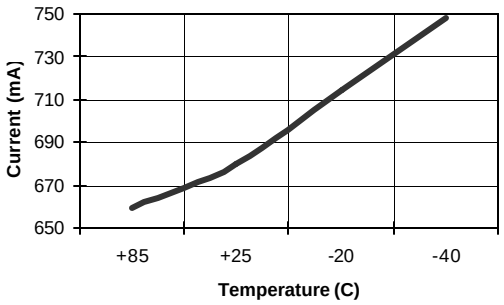


2 WATT PERFORMANCE CURRENT VS TEMP AT 1.5 GHz



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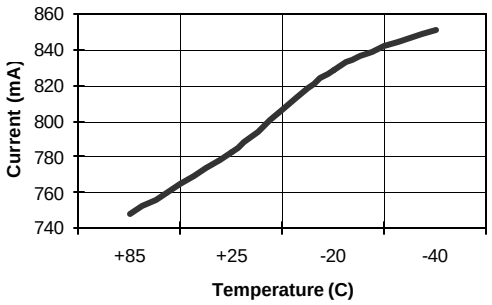
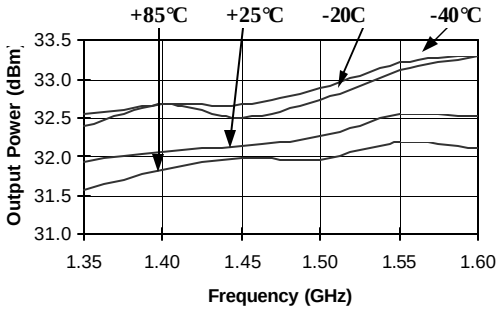


2 WATT PERFORMANCE P_{out} VS FREQ AND TEMP



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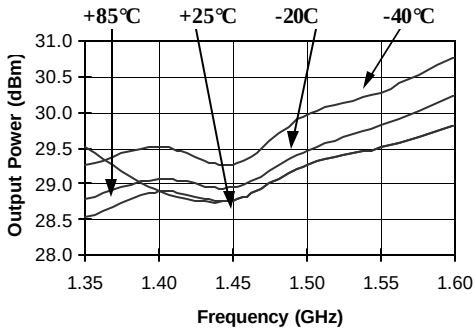

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Ordering Information [7]

Part Number	Package
AM42-0054	CR-15 package

7. Die available upon request.

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