250 mW S-Band Power Amplifier, 2.2 - 2.4 GHz

V 1P.00

Preliminary

AM59-0029

Features

- High Linear Gain: 29 dB typ.
- High Saturated Output Power: +24 dBm typ.
- 50 Ohm Input/Output Matched
- InGaP HBT Process

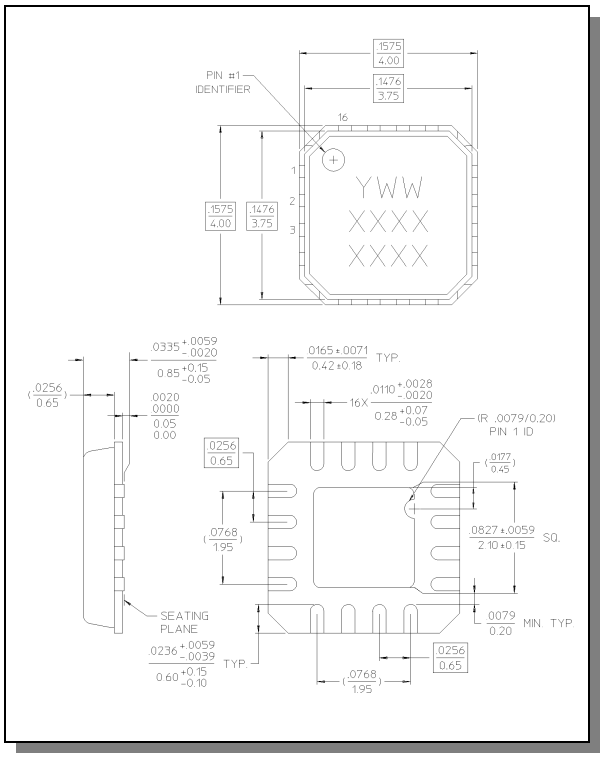
Description

M/A-COM's AM59-0029 is a two-stage MMIC power amplifier available in a 4mm FQFP-16 plastic package. The AM59-0029 has fully matched input and output networks. The AM59-0029 is designed to operate from a constant voltage collector supply. By varying the bias conditions, the saturated output power performance of this device may be tailored for various applications.

The AM59-0029 is ideally suited for use as an output stage in telemetry systems. The AM59-0029 requires only supply line bypassing, minimizing the number of external components required.

M/A-COM's AM59-0029 is fabricated using an InGaP HBT 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



Electrical Specifications: Vcc = +3V, Zo = 50 Ohms, T_A = 25°C

Parameter	Test Conditions	Frequency	Units	Min	Typ	Max
Linear Gain	Pin = -20 dBm	2.2 - 2.4 GHz	dB	—	29	—
Input VSWR	Pin = -20 dBm	2.2 - 2.4 GHz	Ratio	—	—	2.0:1
Output VSWR	Pin = -20 dBm	2.2 - 2.4 GHz	Ratio	—	—	2.0:1
Output Power (Saturated)	Pin = +10 dBm	2.2 - 2.4 GHz	dBm	—	24	—
Output Power vs. Frequency	Pin = +10 dBm	2.2 - 2.4 GHz	dB	—	—	± 0.4
Output Power vs. Temperature	T_A = -40°C to +85°C, Pin = +10 dBm	2.2 - 2.4 GHz	dB	—	—	± 0.8
Collector Bias Current	Pin = +10 dBm	2.2 - 2.4 GHz	mA	—	400	—
Base Bias Current	Pin = +10 dBm	2.2 - 2.4 GHz	mA	—	5	—
Power Added Efficiency	Pin = +10 dBm	2.2 - 2.4 GHz	%	—	22	—

Absolute Maximum Ratings [1,2]

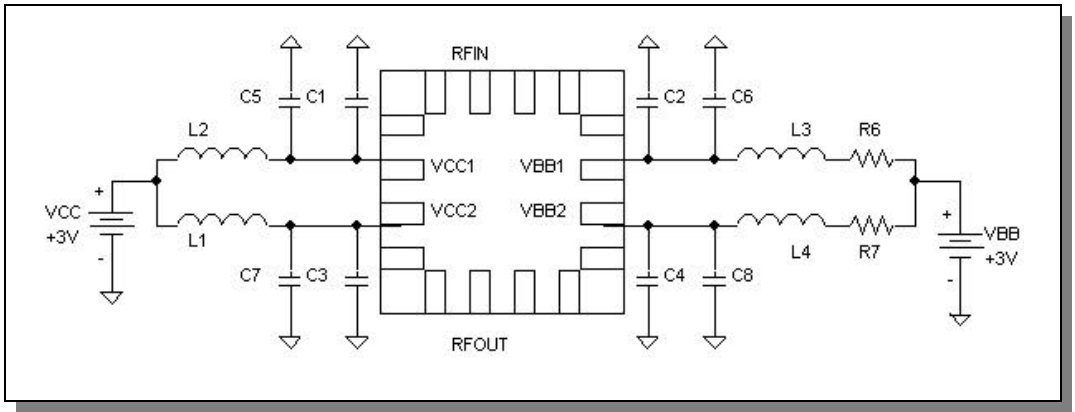
Parameter	Absolute Maximum
Input Power	+13 dBm
V_{CC}	+12 volts
V_{BB}	-8 volts to +6 volts
I_{CC}	600 mA
Max. Dissipation Power	1350 mW
Channel Temperature	+150°C
Operating Temperature	-40°C to +85°C
Storage Temperature	-65°C to +150°C

1. Operation of this device above any one of these parameters may cause permanent damage.
2. Adequate heat sinking and grounding required.

Pin Configuration

Pin No.	Pin Name	Function
1	GND	GND
2	RF In	RF Input
3	GND	GND
4	GND	GND
5	GND	GND
6	VC1	Collector Supply to Stage 1
7	VC2	Collector Supply to Stage 2
8	GND	GND
9	GND	GND
10	RF Out	RF Output
11	GND	GND
12	GND	GND
13	GND	GND
14	VB2	Base Supply to Stage 2
15	VB1	Base Supply to Stage 2
16	GND	GND

Recommended Bias Configuration [3,4]



Component	Value
R6	3.9K Ohm
R7	301 Ohm
L1, L2	68 nH
L3, L4	220 nH
C1,C2,C3,C4	100 pF
C5,C6,C7,C8	0.1 µF

3. Apply +3 volts V_{CC}. Adjust V_{BB} by changing the resistors, R6 and R7, for desired base current.
4. For optimum IP3 performance, V_{CC} bypass capacitors should be placed within 0.5 inches of the V_{CC} leads.

- **North America:** Tel. (978) 656-2693
- **Asia/Pacific:** Tel.+81-44-844-8296, Fax +81-44-844-8298
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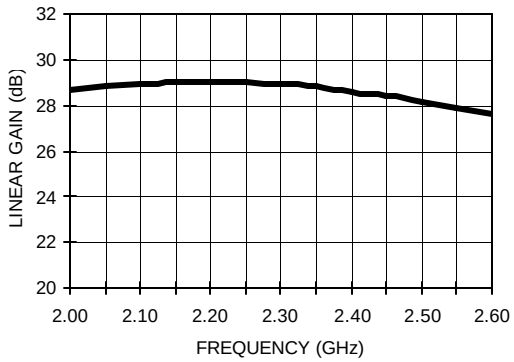
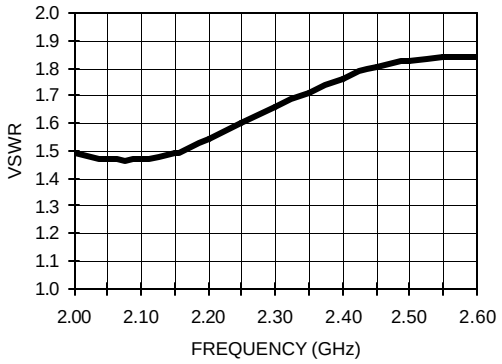
Typical Performance Curves

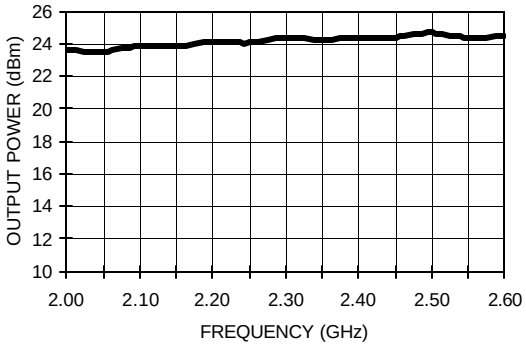
Linear Gain vs. Frequency



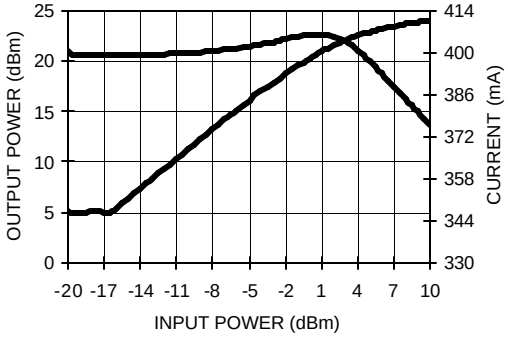
VSWR vs. Frequency



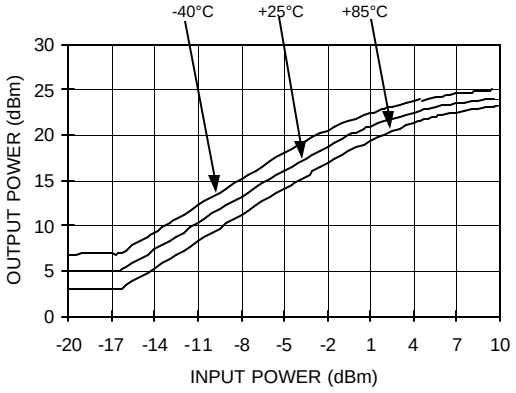
Saturated Output Power vs. Frequency (PIN = +10 dBm)



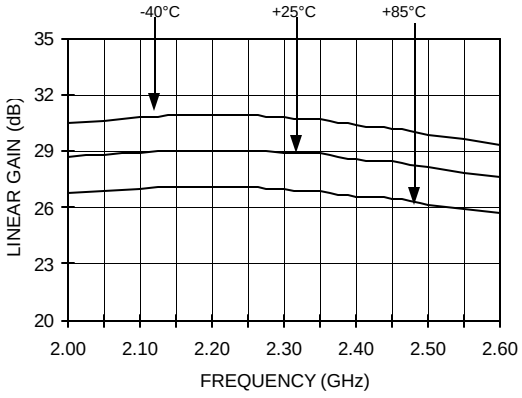
Output Power and ICC vs. Input Power



Output Power vs. Input Power and Temperature



Linear Gain vs. Frequency and Temperature



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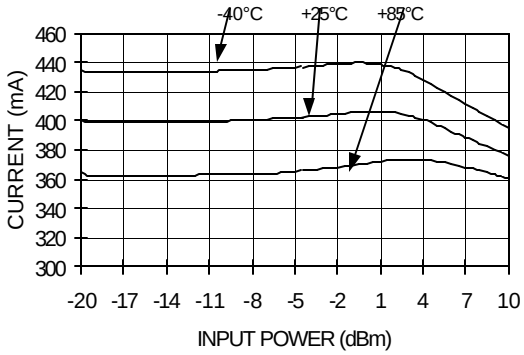
Typical Performance Curves

Collector Current vs. Input Power and Temperature



Ordering Information

Part Number	Package
AM59-0029	FQFP-16 4mm

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