High Power Linear Amplifier
5.7 - 5.9 GHz

MAAP-007899
V3P

Features

- Ideal for 802.11a MESH and Access Point, 5.8 GHz WiMax, and other Linear Applications
- Linear Pout: 20 dBm (802.11a Signal, 3% EVM)
- IP1dB: +28 dBm Typical
- Small Signal Gain: 23 dB Typical
- EVM: 3% at 20 dBm Linear (OFDM) P_{OUT}
- Lead-Free 4 mm 16 lead PQFN Package
- 100% Matte Tin Plating over Copper
- Halogen-Free "Green" Mold Compound
- RoHS* Compliant and 260°C Reflow Compatible

Description

M/A-COM's MAAP-007899 RF power amplifier is a three stage GaAs MMIC designed specifically for 5.7-5.9 GHz WiMax 802.16 and 802.11a applications.

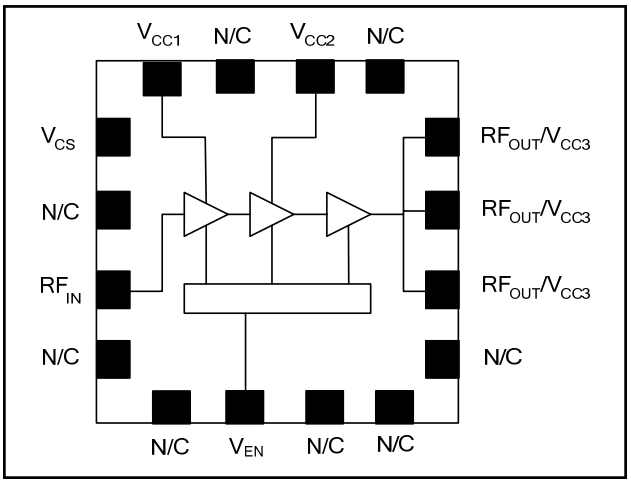
The power amplifier maintains high linearity under OFDM modulation. The MAAP-007899 is fabricated using a high reliability GaAs HBT process to realize low current and high power functionality. The process features full passivation for increased performance and reliability.

Ordering Information [1]

Part Number	Package
MAAP-007899-TR1000	1000 piece reel
MAAP-007899-TR3000	3000 piece reel
MAAP-007899-001SMB	Sample Test Board 5.7 - 5.9 GHz

1. Reference Application Note M513 for reel size information.

Block Diagram



Pin Configuration

Pin	Pin Name	Description
1	V_{CS}	Bias Supply Voltage
2	N/C	No Connection
3	RF_{IN}	RF Input
4	N/C	No Connect
5	N/C	No Connect
6	V_{EN}	Power Enable
7	N/C	No Connection
8	N/C	No Connection
9	N/C	No Connection
10	RF_{OUT}/V_{CC3}	RF Output, 3rd Stage Supply
11	RF_{OUT}/V_{CC3}	RF Output, 3rd Stage Supply
12	RF_{OUT}/V_{CC3}	RF Output, 3rd Stage Supply
13	N/C	No Connection
14	V_{CC2}	2nd Stage Supply
15	N/C	No Connection
16	V_{CC1}	1st Stage Supply
17	Paddle [2]	RF & DC Ground

2. The exposed pad centered on the package bottom must be connected to RF and DC ground.

This PRELIMINARY Data Sheet contains information regarding a product M/A-COM is considering for development. Performance is based on simulated results or target specifications. Commitment to produce in volume is not guaranteed.

* Restrictions on Hazardous Substances, European Union Directive 2002/95/EC.

- **North America** Tel: 800.366.2266 / Fax: 978.366.2266
- **Europe** Tel: 44.1908.574.200 / Fax: 44.1908.574.300
- **Asia/Pacific** Tel: 81.44.844.8296 / Fax: 81.44.844.8298

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

Electrical Specifications: T_A = +25 °C, V_{CC} = 5.0 V, Z_0 = 50 Ω

Parameter	Test Conditions	Units	Min.	Typ.	Max.
Frequency		GHz	5.7	—	5.9
Gain	5.8 GHz	dB	—	23	—
Gain Flatness	5.7 to 5.9 GHz	dB	—	±0.25	—
Input Return Loss	5.8 GHz	dB	—	13	—
Output Return Loss	5.8 GHz	dB	—	9	—
Output P1dB	5.8 GHz	dBm	—	28	—
EVM [3]	P_{OUT} = 20 dBm, 5.8 GHz OFDM, QAM-64, 54 Mbps	%	—	3	—
Device / Supply Voltage		V	—	5	—
Enable Voltage	V_{EN} I_{EN} (for I_{CQ} = 350 mA)	V mA	— —	5 9	— —
Active Supply Current	P_{OUT} = 20 dBm	mA	—	475	—

3. Includes system EVM of 0.8%.

Absolute Maximum Ratings [4,5]

Parameter	Absolute Maximum
Input Power	+ 5 dBm
Operating Supply Voltage	+6.0 Volts
Operating Control Voltage	+5.5 Volts
Operating Temperature	-40 °C to +85 °C
Channel Temperature	+150 °C
Storage Temperature	-40 °C to +150 °C

4. Exceeding any one or combination of these limits may cause permanent damage to this device.
5. M/A-COM does not recommend sustained operation near these survivability limits.

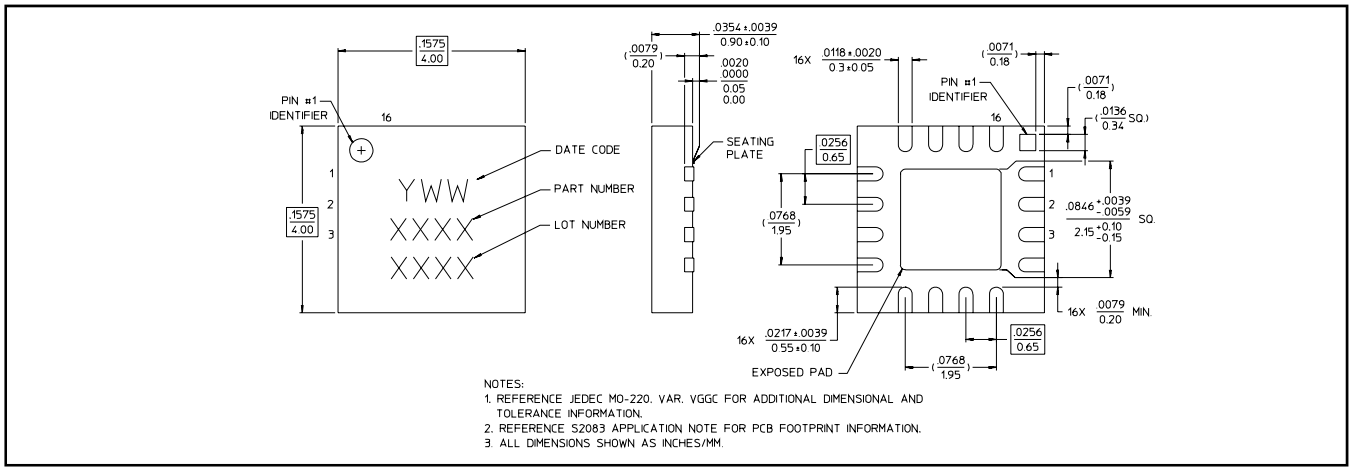
Handling Procedures

Please observe the following precautions to avoid damage:

Static Sensitivity

Gallium Arsenide Integrated Circuits are sensitive to electrostatic discharge (ESD) and can be damaged by static electricity. Proper ESD control techniques should be used when handling these devices.

Lead-Free 4 mm 16-Lead PQFN†



† Reference Application Note M538 for lead-free solder reflow recommendations.
Meets JEDEC moisture sensitivity level 1 requirements.

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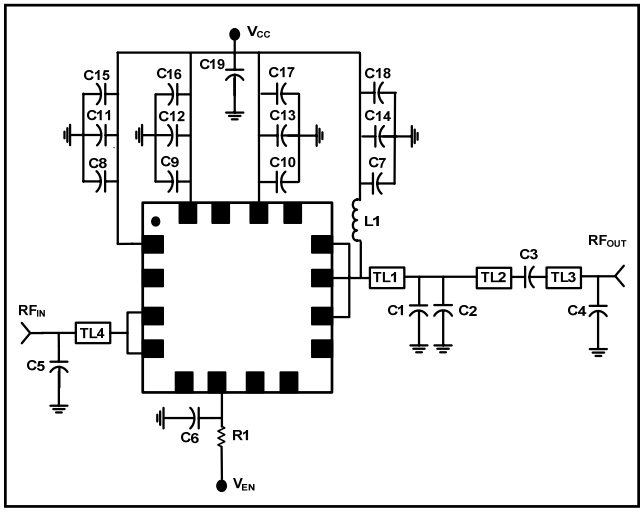
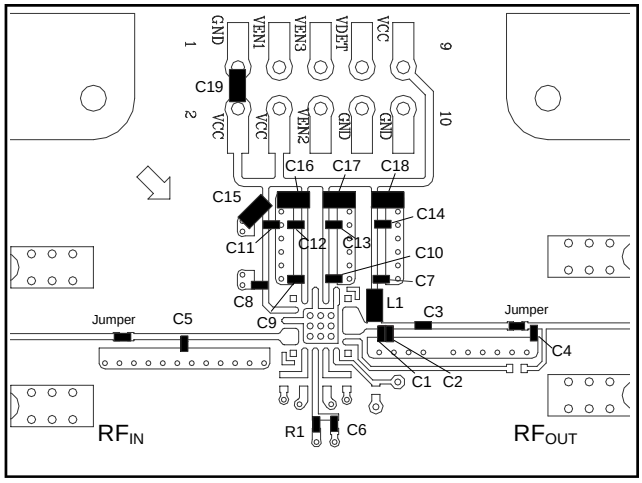
Application Schematic



Sample Board [6,7,8]



6. PCB Material FR406 - 50 Ohm Line = 0.37 mm (W)
7. Ven voltage supplied through DC Connector silkscreen VEN2.
8. Turn on sequence:
   Supply 5 V to VCC
   Supply 5 V to VEN2

External Parts List [9]

Component	Value	Case Size	Manufacturer
C1	0.5 pF	0402	Murata
C2	0.1 pF	0402	Murata
C3	3.0 pF	0402	Murata
C4, C5	0.2 pF	0402	Murata
C6	100 pF	0402	Murata
C7	10 pF	0402	Murata
C8, C9, C10	5 pF	0402	Murata
C11, C12, C13, C14	0.1 µF [10]	0402	Murata
C15, C16, C17, C18	3.3 µF	0805	AVX
C19	10 µF	1206	AVX
L1	2.55 nH	0906 3L	Coilcraft
R1	220 Ohm [10]	0402	KOA
TL1	1.43 mm (L) 0.38 mm (W)	-	-
TL2	1.31 mm (L) 0.38 mm (W)	-	-
TL3	6.1 mm (L) 0.38 mm (W)	-	-
TL4	5.9 mm (L) 0.38 mm (W)	-	-

9. TL1, TL4 (L) defined from package edge to component edge
   TL2, TL3 (L) defined from component edge to component edge.
10. For Ven = 5V

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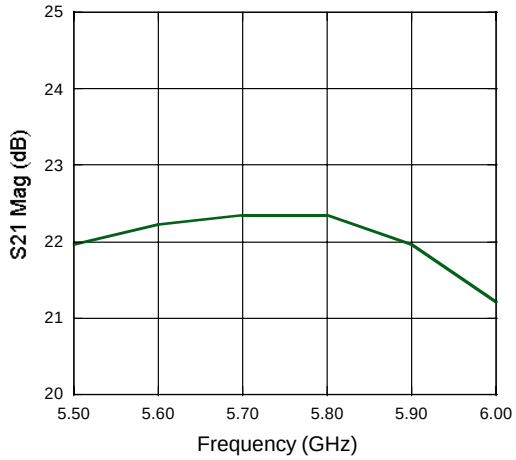
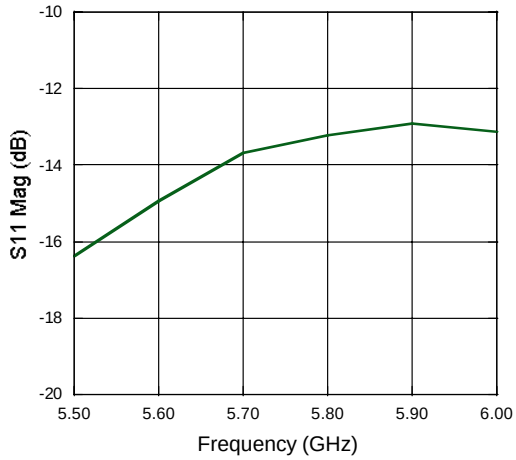
Typical Performance Curves: V_{CC} = 5 V, V_{EN} = 5 V, +25°C

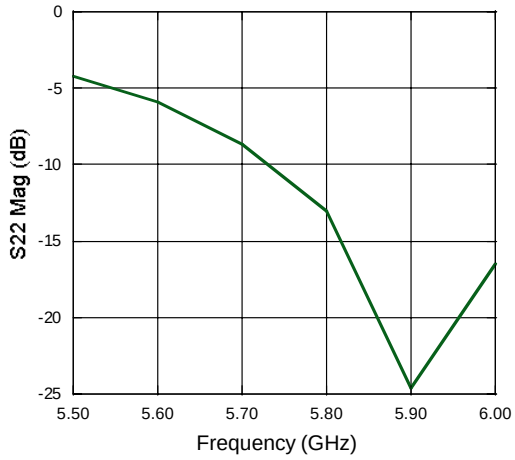
Gain



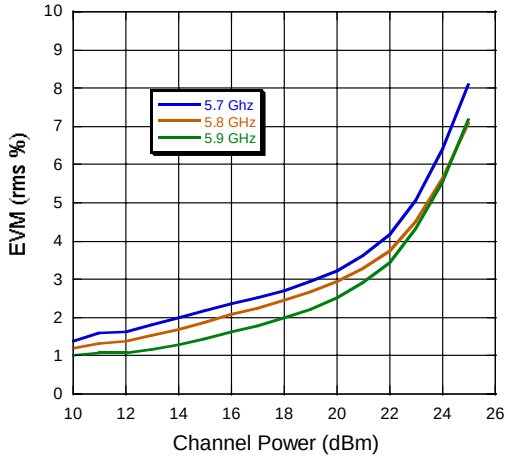
S11



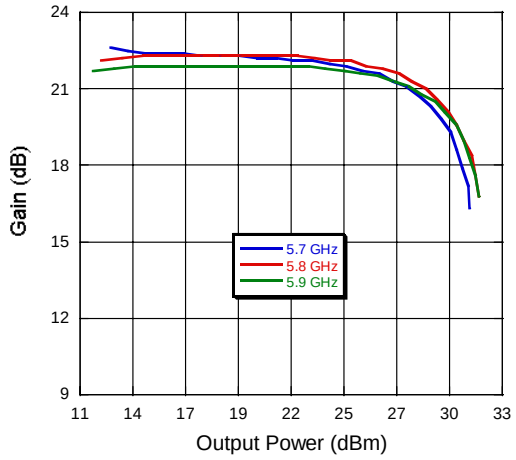
S22



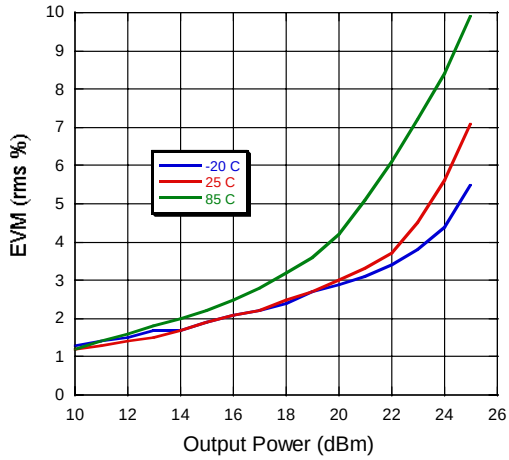
EVM



P1dB



EVM vs. Temperature @ 5.8 GHz



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