

1.5 Watt K-Band VSAT Power Amplifier

13.75 - 14.5 GHz

V1A.0

MAAPSS0058

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Features

- High Linear Gain: 33.5 dB Typ.
- High Saturated Output Power: +32 dBm Typ.
- High Power Added Efficiency: 25% Typ.
- 50 Ω Input / Output Broadband Matched
- Integrated Output Power Detector

Description

M/A-COM's MAAPSS0058 is a four stage MMIC power amplifier in a bolt down ceramic package, allowing easy assembly. The MAAPSS0058 employs a fully matched chip with internally decoupled gate and drain bias networks. The MAAPSS0058 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 MAAPSS0058 is ideally suited for use as an output stage or a driver amplifier in VSAT systems. The MAAPSS0058 includes internal supply line bypassing in the package, minimizing the number of external components required. M/A-COM's MAAPSS0065 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.

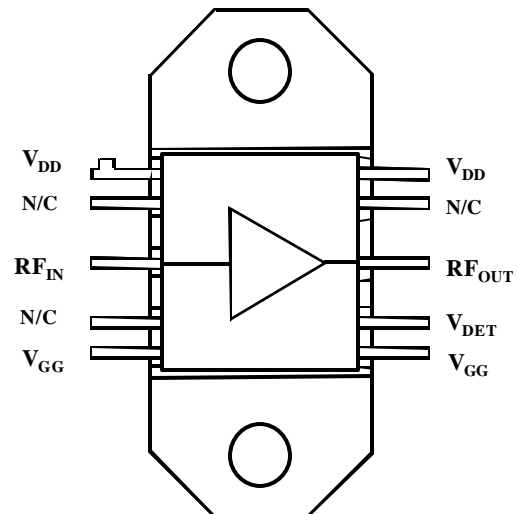
Absolute Maximum Ratings^{1,2}

Parameter	Absolute Maximum
Input Power	+13 dBm
Operating Voltages	$V_{DD} = +10$ volts; $V_{GG} = -3$ volts; $V_{DD} - V_{GG} = 12$ volts
I_{ds}	1000 mA
Channel Temperature	+150 °C
Operating Temperature	-40 °C to +80 °C
Storage Temperature	-65 °C to +150 °C

1. Exceeding any one or a combination of these limits may cause permanent damage.

2. Adequate heat sinking and grounding required on flange base.

Functional Schematic



Pin Configuration

PIN No.	PIN Name	Description
1	V_{DD}	Drain Supply
2	N/C	No Connect
3	RF_{IN}	RF Input
4	N/C	No Connect
5	V_{GG}	Gate Supply
6	V_{GG}	Gate Supply
7	V_{DET}	Output Power Detector
8	RF_{OUT}	RF Output
9	N/C	No Connect
10	V_{DD}	Drain Supply
Flange	GND	DC & RF Ground

Ordering Information

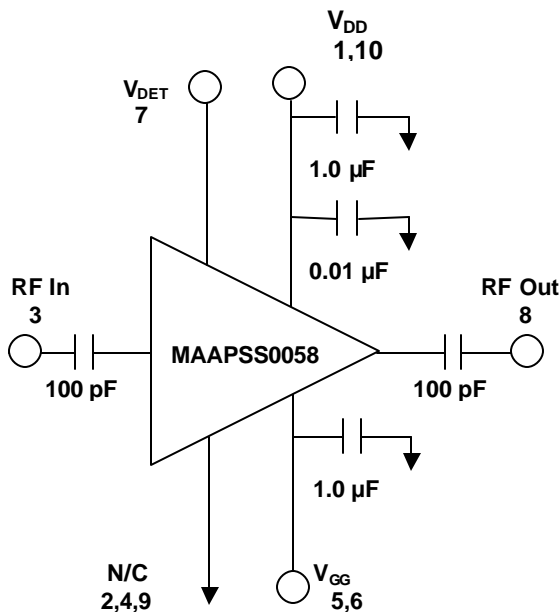
Part Number	Package
MAAPSS0058	CR-15 Ceramic Bolt Down Package

- **North America:** Tel. (800) 366-2266
- **Asia/Pacific:** Tel.+81-44-844-8296, Fax +81-44-844-8298
- **Europe:** Tel. +44 (1344) 869 595, Fax+44 (1344) 300 020

Electrical Specifications: $V_{DD} = 8.0\text{ V}$, $I_{DS} = 750\text{ mA}$, $T_A = 25^\circ\text{C}$

Parameter	Test Conditions	Units	Min.	Typ.	Max.
Linear Gain	Pin = -20 dBm, $I_{DS} = 750\text{ mA Typ.}$	dB		33.5	
Input VSWR	Pin = +3 dBm, $I_{DS} = 750\text{ mA Typ.}$			2.5:1	
Output VSWR	Pin = -20 dBm, $I_{DS} = 750\text{ mA Typ.}$			2.5:1	
Output Power	Pin = +3 dBm, $I_{DS} = 750\text{ mA Typ.}$	dBm		32.0	
Output Power vs. Frequency	Pin = +3 dBm, $I_{DS} = 750\text{ mA Typ.}$	dB		± 0.3	
Output Power vs. Temperature	$T_A = -40^\circ\text{C to } +85^\circ\text{C}$, Pin = +3 dBm	dB		± 0.5	
Drain Bias Current	Pin = +3 dBm	mA		750	
Gate Bias Voltage	Pin = +3 dBm, $I_{DS} = 750\text{ mA Typ.}$	V		-1.0	
Gate Bias Current	Pin = +3 dBm, $I_{DS} = 750\text{ mA Typ.}$	mA		10	
Thermal Resistance (θ_{JC})	25°C Heat Sink	$^\circ\text{C/W}$		8.0	
Second Harmonic	Pin = +3 dBm, $I_{DS} = 750\text{ mA Typ.}$	dBc		-35	
Third Harmonic	Pin = +3 dBm, $I_{DS} = 750\text{ mA Typ.}$	dBc		-45	
Detector Voltage	Pin = +3 dBm, $I_{DS} = 750\text{ mA Typ.}$	V		2.4	

Application Schematic ^{3,4}



- 3. External DC blocking capacitors required on the RF ports.
- 4. For optimum IP3 performance, V_{DD} bypass capacitors should be placed within 0.5 inches of the V_{DD} leads.

Handling Procedures

Please observe the following precautions to avoid damage to the MAAPSS0058:

Static Sensitivity

Gallium arsenide integrated circuits are ESD sensitive and can be damaged by static electricity. Use proper ESD precautions when handling these devices.

Operating the MAAPSS0058

The MAAPSS0065 is static sensitive. Please handle with care. To operate the device, follow these steps.

1. Apply -2.0 Volts to V_{GG} .
2. Ramp V_{DD} to +8V.
3. Adjust V_{GG} to set typical drain current .
4. Apply RF.
5. Power down sequence in reverse. Turn gate voltage off last.

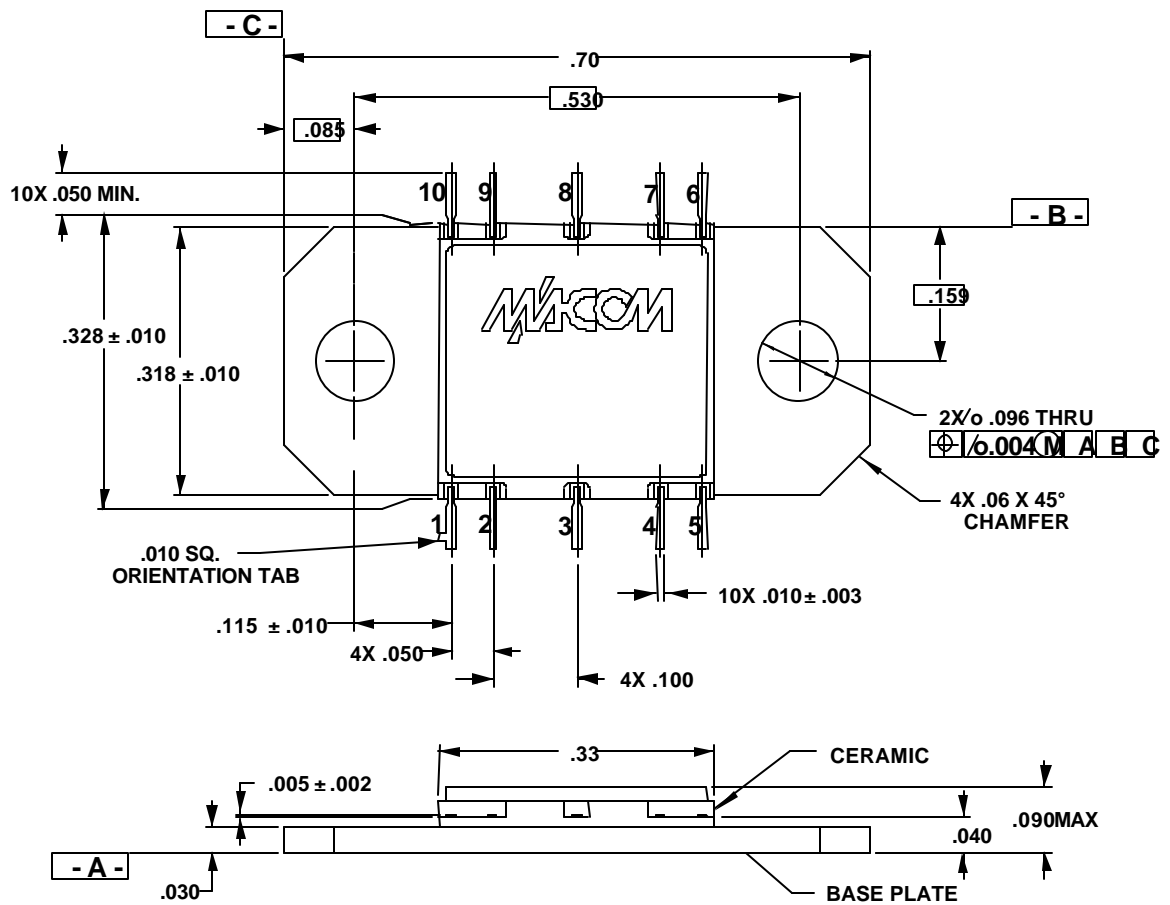
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Visit www.macom.com for additional data sheets and product information.

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