

Features

- Low Distortion
- Low Noise Figure
- Push Pull Design
- Single Positive Supply
- 4 mm FQFP-N 20 Lead Package

Description

M/A-COM's MAAMSS0003 is a GaAs pHEMT MMIC amplifier in a 4 mm FQFP-N 20 lead package. The MMIC design is configured as a pair of cascode PHEMT amplifiers for broadband performance. It is designed for integration in a 75-ohm push-pull low distortion amplifier circuit. The device is ideally suited for use in CATV applications where low noise figure, low distortion and high linearity are required.

Ordering Information ¹

Part Number	Package
MAAMSS0003	FQFP-N 20 Lead Plastic Package
MAAMSS0003TR	7 inch, 1000 Piece Reel
MAAMSS0003SMB	Sample Test Board (Includes 5 Samples)

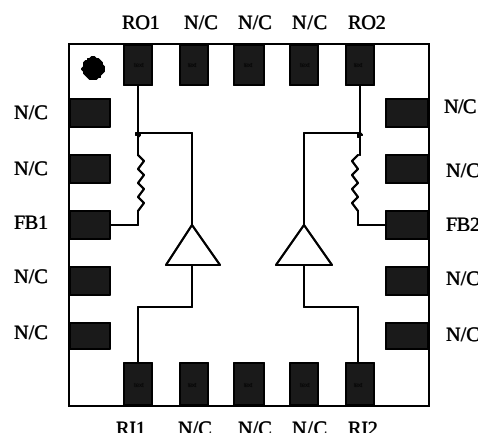
1. Reference Application Note M513 for reel size information.

Absolute Maximum Ratings ²

Parameter	Absolute Maximum
Input Power	+20 dBm
Operating Voltage	+10 volts
Operating Temperature	-40 °C to +85 °C
Storage Temperature	-65 °C to +150 °C

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

Functional Schematic



Pin Configuration

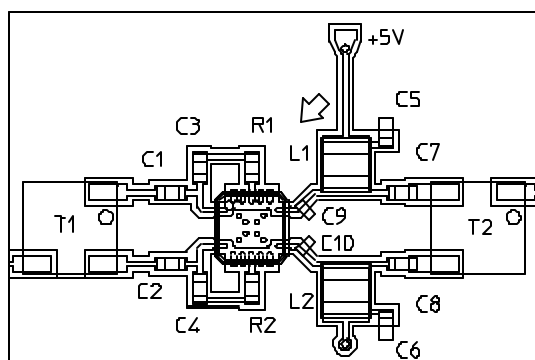
PIN No.	PIN Name	Description
1	N/C	No Connect
2	N/C	No Connect
3	FB1	Feedback 1
4	N/C	No Connect
5	N/C	No Connect
6	RI1	RF Input 1
7	N/C	No Connect
8	N/C	No Connect
9	N/C	No Connect
10	RI2	RF Input 2
11	N/C	No Connect
12	N/C	No Connect
13	FB2	Feedback 2
14	N/C	No Connect
15	N/C	No Connect
16	RO2	RF Output 2
17	N/C	No Connect
18	N/C	No Connect
19	N/C	No Connect
20	RO1	RF Output 1

Electrical Specifications: $T_A = 25^\circ\text{C}$, Freq: 50 - 870 MHz, $V_{DD} = +5$ Volts,

$Z_0 = 75$ ohms, Test Circuit with M/A-COM Balun ETN1-1-13TR

Parameter	Test Conditions	Units	Min.	Typ.	Max.
Gain		dB		12.5	
Gain Flatness		dB		0.6	
Noise Figure		dB		3.3	
Input VSWR		ratio		1.3:1	
Output VSWR		ratio		1.5:1	
Output IP3	Two tones at 397 & 403 MHz, +4 dBm output per tone	dBm		32	
Composite Triple Beat, CTB	135 Channels, +25 dBmV/Channel at the output.	dBc		-70	
Composite Second Order, CSO	135 Channels, +25 dBmV/Channel at the output.	dBc		-70	
Cross modulation	135 Channels, +25 dBmV/Channel at the output	dBc		-66	
P1dB	400 MHz	dBm		24	
I_{DD}	+ 5 Volts	mA		190	

Test Circuit Wiring Board



Reference M/A-COM Application Note S2083 for recommended PCB configuration. R1 and R2 are 0 Ohms.

Qty	Description
8	Capacitor, 0.01 uF, 0603, SMT, 10% (C1-C8)
2	Capacitor, 2 pF, 0402, SMT, ± 0.25 pF (C9-C10)
2	Inductor, 390 nH, 1008, SMT, 10% (L1, L2)
2	Balun, 1:1, M/A-COM, ETN1-1-13, SMT (T1,T2)
2	Resistor, 0 ohms, 0603, SMT (R1, R2)

Handling Procedures

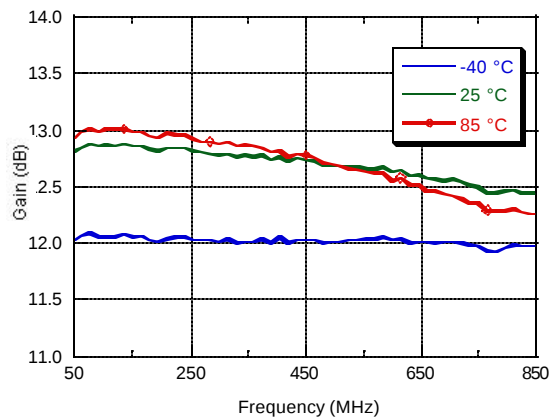
Please observe the following precautions to avoid damage:

Static Sensitivity

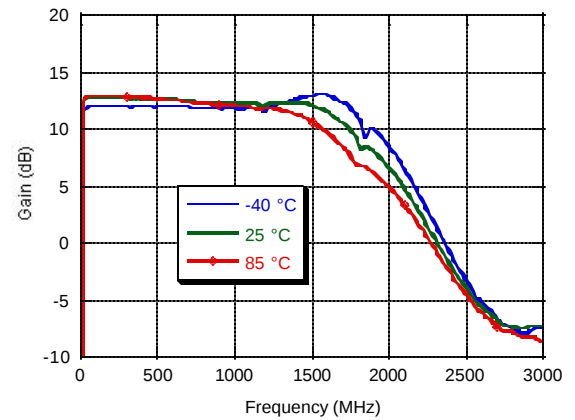
Gallium arsenide integrated circuits are sensitive to electrostatic discharge (ESD) and can be damaged by static electricity. Use proper ESD control precautions when handling these devices.

Typical Performance Curves

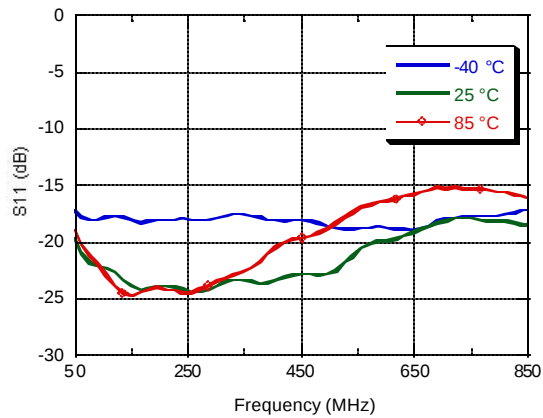
Gain vs. Frequency over Temperature



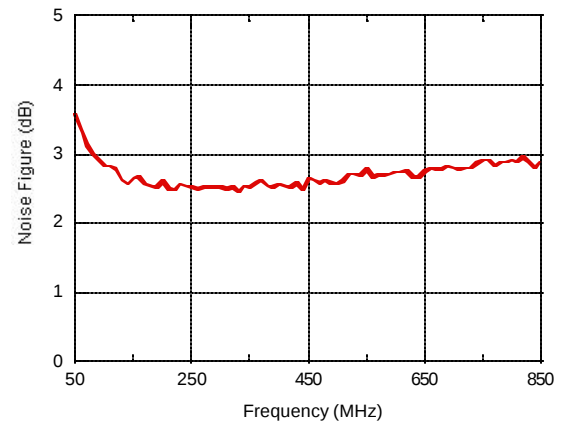
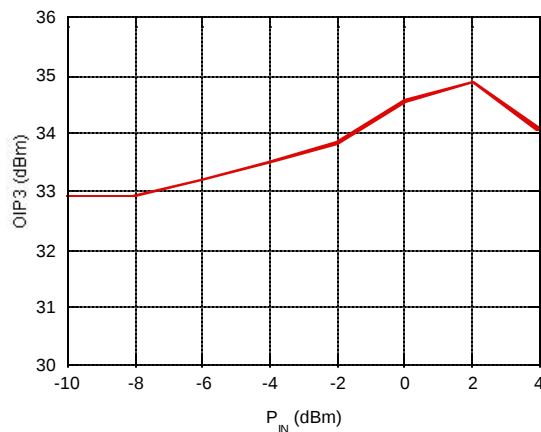
Gain vs. Frequency to 3 GHz over Temperature



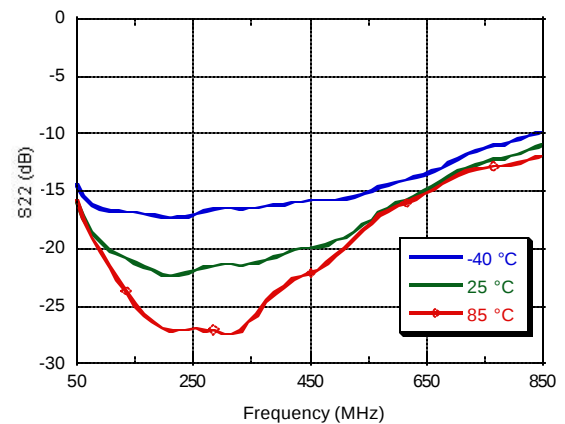
Input Return Loss vs. Frequency over Temperature



Noise Figure vs. Frequency, 25 °C

OIP3 vs. P_{IN} at 400 MHz, 25 °C

Output Return Loss vs. Frequency over Temperature



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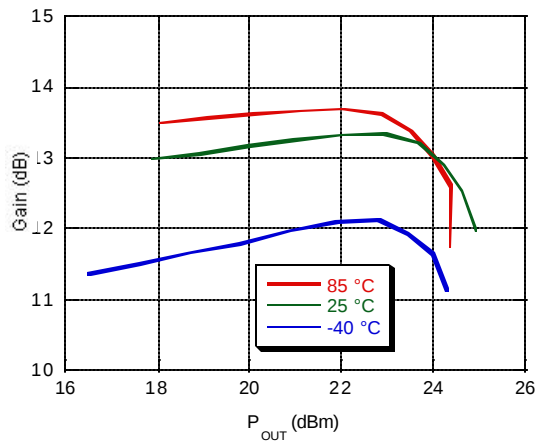
Visit www.macom.com for additional data sheets and product information.

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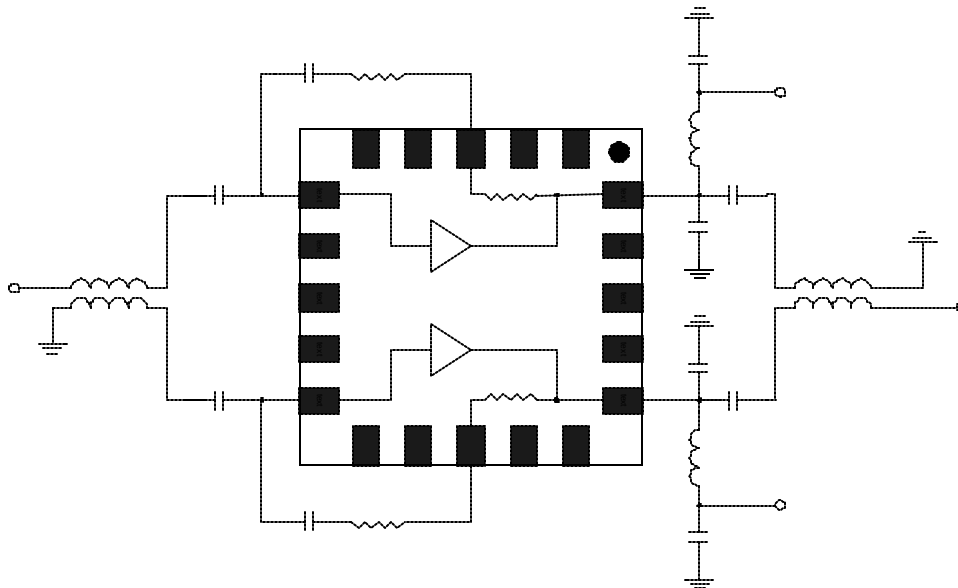
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Typical Performance Curves (continued)

Gain vs P_{OUT} at 400 MHz vs. Temperature

Test Circuit Schematic



The 1:1 baluns, T1 & T2, are M/A-COM part number ETN1-1-13TR.

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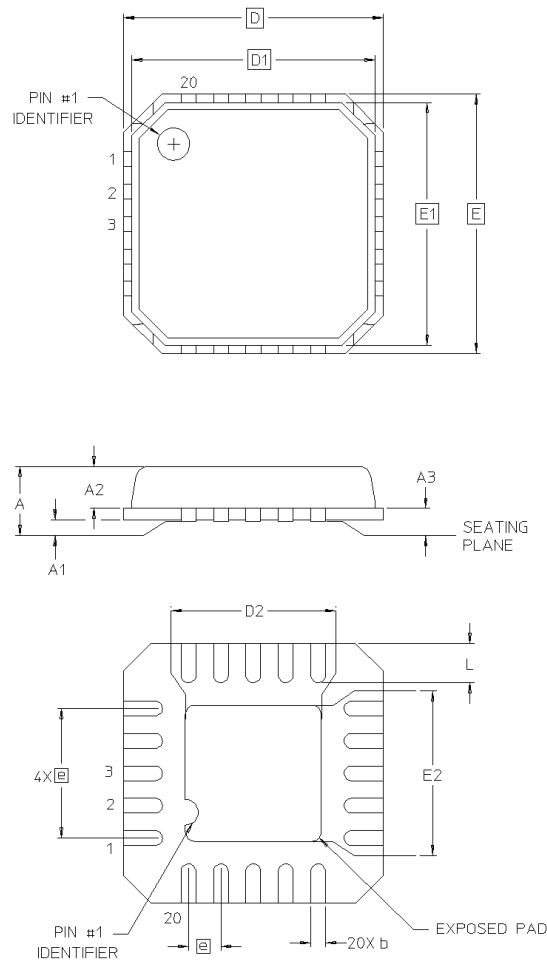
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4 mm FQFP-N 20 Lead Anvil Singulated



DIMENSION SYMBOL	MEASUREMENT (mm)		
	MIN	NOM	MAX
A	0.80	0.90	1.00
A1	0	0.02	0.05
A2	0	0.65	1.00
A3	0.25 REF		
b	0.18	0.23	0.30
D		4.00 BSC	
D1		3.75 BSC	
D2	0.75	1.70	2.25
e		0.50 BSC	
E		4.00 BSC	
E1		3.75 BSC	
E2	0.75	1.70	2.25
L	0.35	0.55	0.75

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