

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)

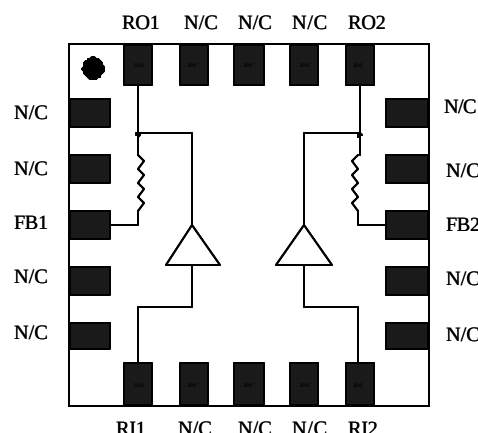
1. Reference Application Note M513 for reel size information.

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

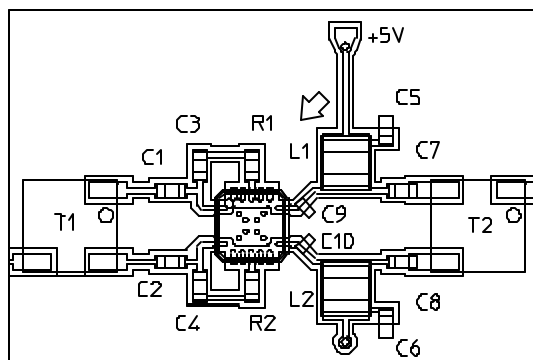
PIN No.	PIN Name	Description
1	N/C	No Connect
2	N/C	No Connect
3	FB1	Feedback 1
4	N/C	No Connect
5	N/C	No Connect
6	RI1	RF Input 1
7	N/C	No Connect
8	N/C	No Connect
9	N/C	No Connect
10	RI2	RF Input 2
11	N/C	No Connect
12	N/C	No Connect
13	FB2	Feedback 2
14	N/C	No Connect
15	N/C	No Connect
16	RO2	RF Output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

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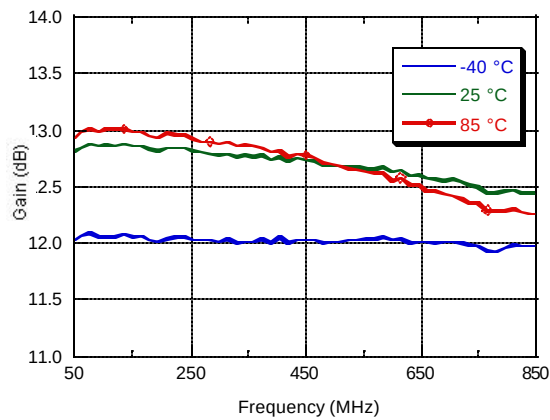
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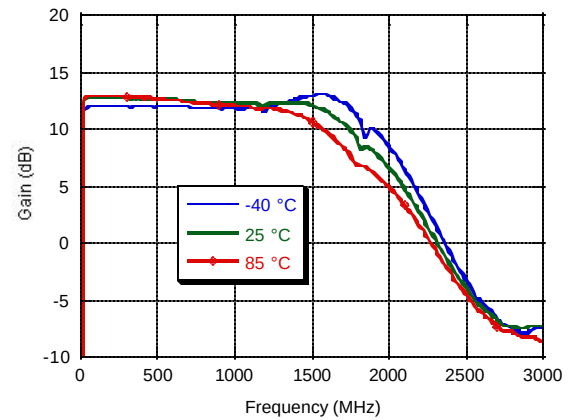
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Typical Performance Curves

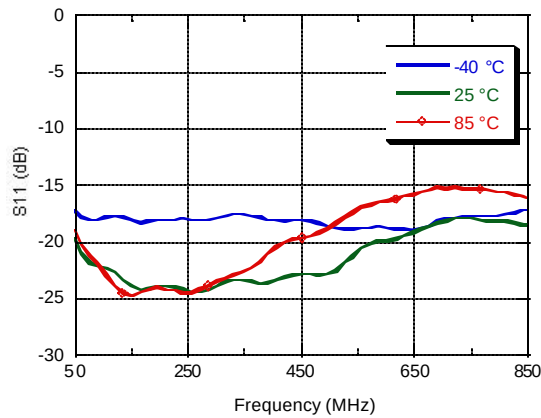
Gain vs. Frequency over Temperature



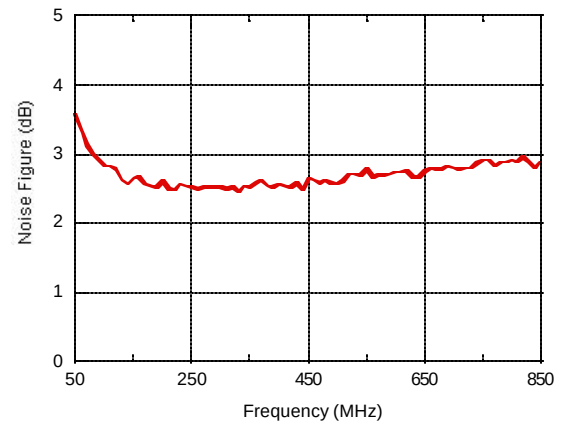
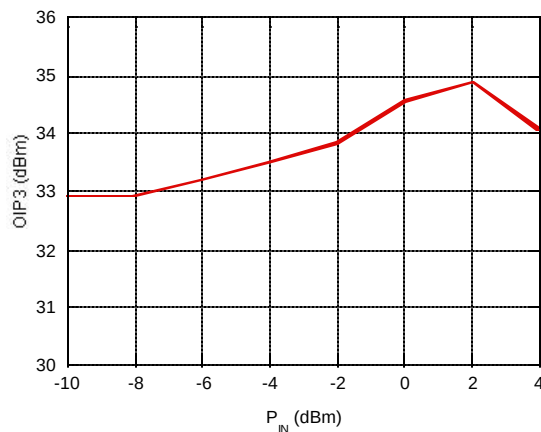
Gain vs. Frequency to 3 GHz over Temperature



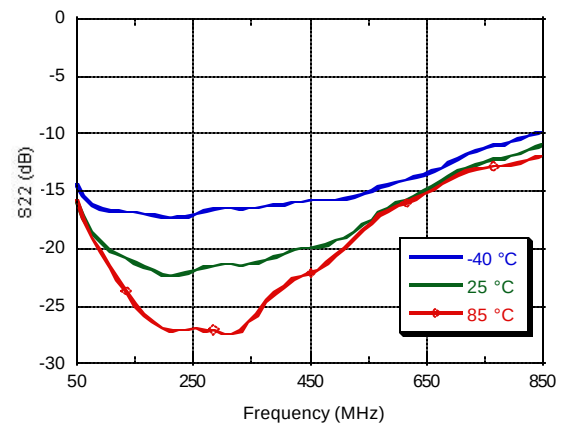
Input Return Loss vs. Frequency over Temperature



Noise Figure vs. Frequency, 25 °C

OIP3 vs. P_{IN} at 400 MHz, 25 °C

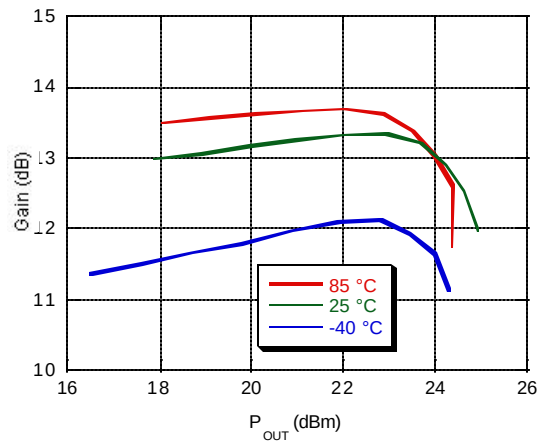
Output Return Loss vs. Frequency over Temperature



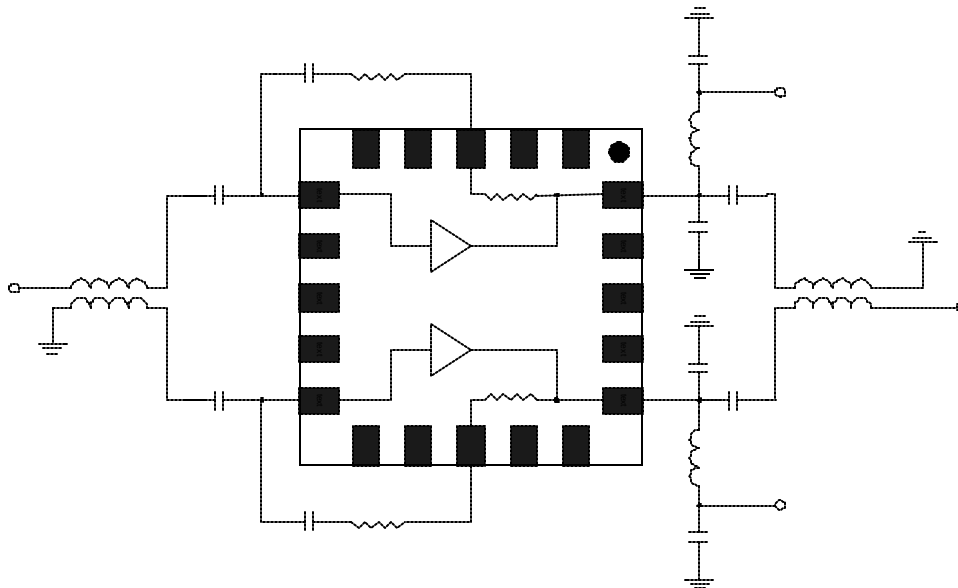
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Typical Performance Curves (continued)

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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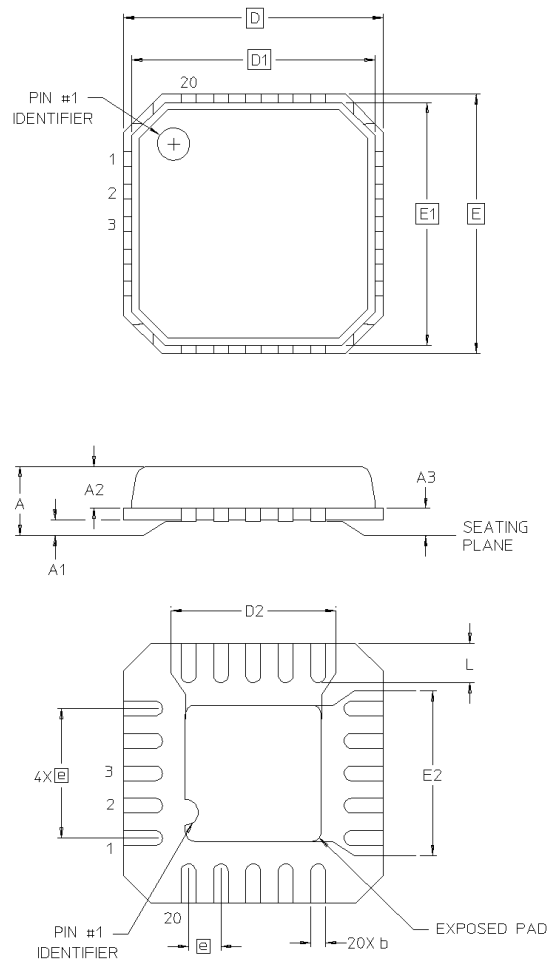
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4 mm FQFP-N 20 Lead Anvil Singulated



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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