MAAM-008970

Satellite Communications Single Ended 2-Way Active Splitter
950 - 2150 MHz

Rev. V1

Features

- 2-Way Splitter
- Single Ended Input and Outputs
- 75 Ω Impedance
- 4.8 dB Gain
- Single +5 Volt Supply
- Lead-Free 3 mm 12-Lead PQFN Package
- Halogen-Free "Green" Mold Compound
- RoHS* Compliant and 260°C Reflow Compatible

Description

M/A-COM Tech's MAAM-008970 2-way active splitter is a GaAs MMIC which exhibits low noise figure and distortion in a lead-free PQFN plastic package. The MAAM-008970 employs a low noise, high linearity amplifier and power splitter functionality. The design features 75 Ω inputs and outputs.

The MAAM-008970 is ideally suited for satellite communications multi-tuner set top boxes, and other broadband based appliances.

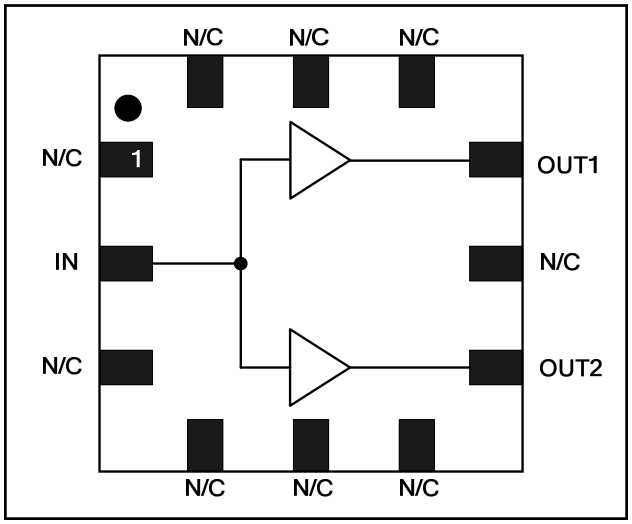
The MAAM-008970 is fabricated using M/A-COM Tech's PHEMT process to realize low noise and low distortion. The process features full passivation for robust performance and reliability.

Ordering Information[1,2]

Part Number	Package
MAAM-008970-TR1000	1000 piece reel
MAAM-008970-TR3000	3000 piece reel
MAAM-008970-001SMB	Sample Test Board

1. Reference Application Note M513 for reel size information.
2. All sample boards include 5 loose parts.

Functional Schematic



Pin Configuration[3]

Pin No.	Pin Name	Description
1	N/C	No Connection
2	IN	RF Input
3	N/C	No Connection
4	N/C	No Connection
5	N/C	No Connection
6	N/C	No Connection
7	OUT2	RF Output 2
8	N/C	No Connection
9	OUT1	RF Output 1
10	N/C	No Connection
11	N/C	No Connection
12	N/C	No Connection
13	Paddle[3]	

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

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

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Electrical Specifications: Freq: 2150 MHz, T_A = 25°C, V_{DD} = +5 Volts, Z_0 = 75 Ω

Parameter	Test Conditions	Units	Min.	Typ.	Max.
Gain	In to Out1, In to Out2	dB	4.0	4.8	5.8
Gain Flatness	In to Out1, In to Out2	dB	—	0.3	—
Noise Figure	In to Out1, In to Out2	dB	—	5.0	—
Input Return Loss	Input	dB	—	12	—
Output Return Loss	Output	dB	—	12	—
Reverse Isolation	Out1 to In, Out2 to In	dB	—	18	—
Output to Output Isolation	Out1 to Out2	dB	—	23	—
Output Power at 1 dB Compression, P1dB	1450 MHz	dBm	—	7	—
Output 3rd Order Intercept Point, OIP3	1450 MHz, P_{IN} = 0 dBm, 6 MHz Spacing	dBm	—	17	—
Output 2nd Order Intercept Point, OIP2	1450 MHz, P_{IN} = 0 dBm, 6 MHz Spacing	dBm	—	30	—
I_{DD}	V_{DD} = + 5 Volts	mA	—	60	75

Absolute Maximum Ratings [4,5,6]

Parameter	Absolute Maximum
Input Power	+12 dBm
Vbias	+10.0 V
Operating Temperature	0°C to +85°C
Junction Temperature [7]	+150°C
Storage Temperature	-65°C to +125°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.
6. These operating conditions will ensure MTTF > 1 x 10^6 hours.
7. Junction Temperature (T_J) = T_A + Θjc * (V * I)
   Typical thermal resistance (Θjc) = 148 °C/W.
   a) For T_A = 25°C,
   T_J = 69 °C @ 5.0 V, 60 mA
   b) For T_A = 85°C,
   T_J = 126 °C @ 5.0 V, 55 mA

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.

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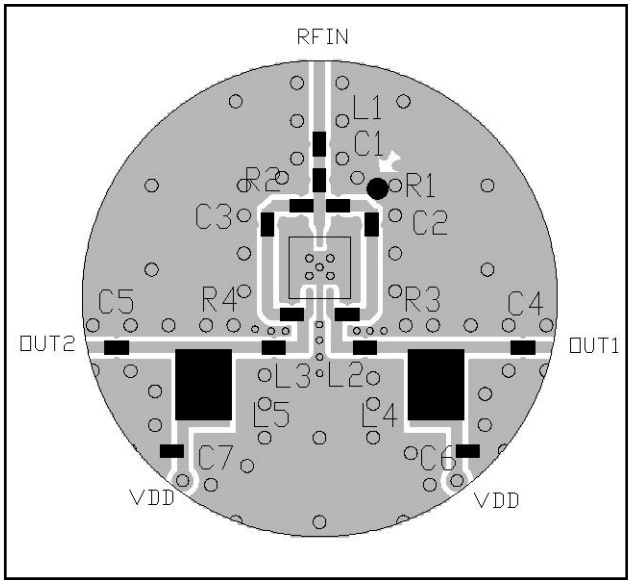
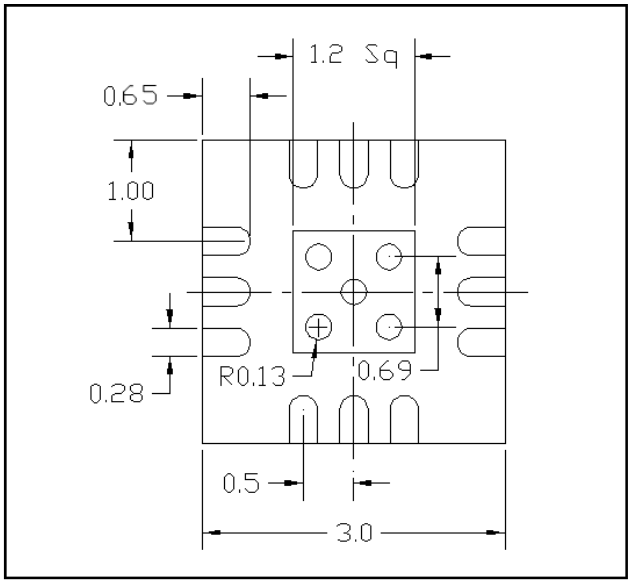
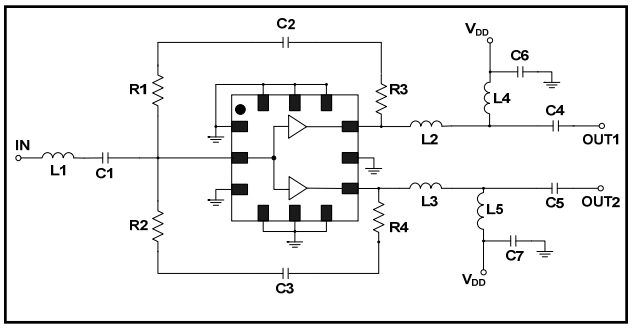
Recommended PCB



PCB Land Pattern



Schematic Including Off-Chip Components



Off-Chip Component Values

Component	Value	Package
C1 - C5	1000 pF	0402
C6 - C7	0.01 µF	0402
L1	4.7 nH	0402
L2, L3	2 nH	0402
L4, L5	100 nH	1008
R1, R2	480 Ω	0402
R3, R4	75 Ω	0402

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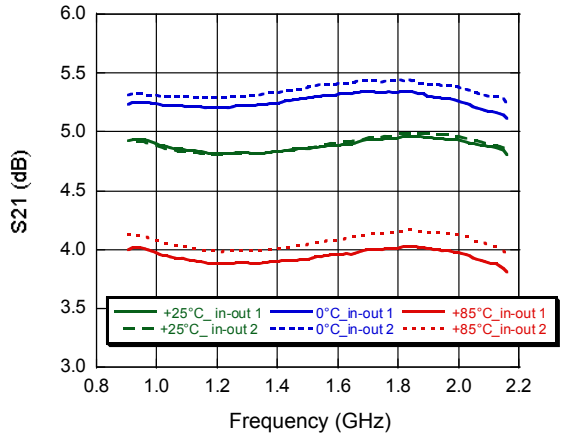
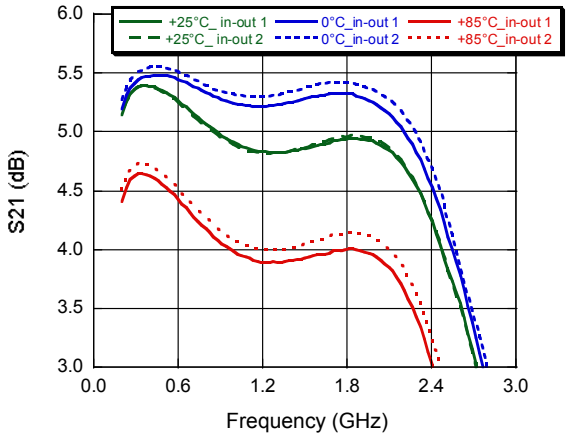
Typical Performance Curves

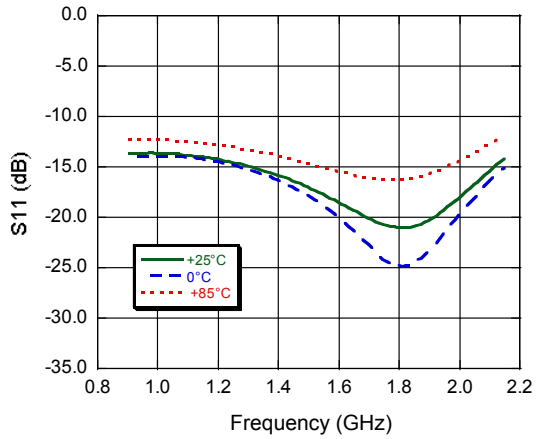
Gain__OUT1 & OUT2



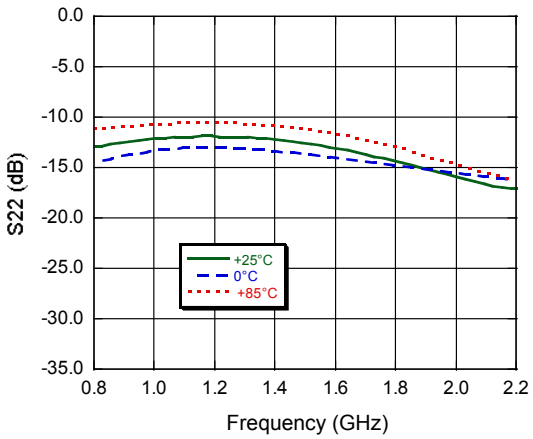
Gain__OUT1 & OUT2 to 3 GHz



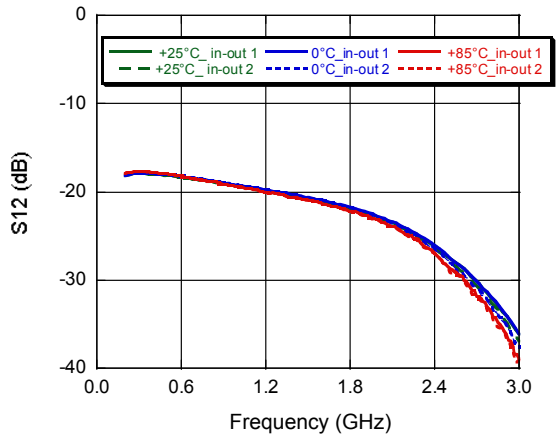
Input Return Loss



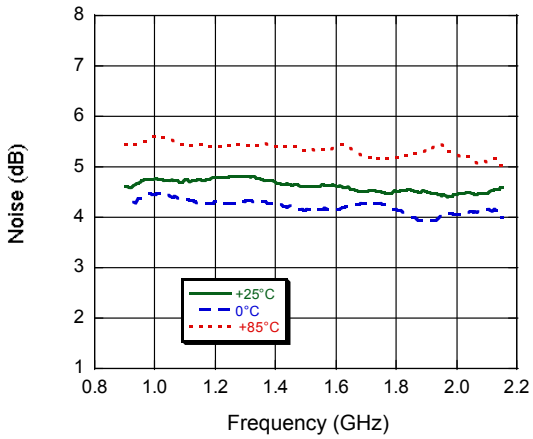
Output Return Loss (Typical both Outputs)



Reverse Isolation to 3 GHz



Noise Figure (Typical both Outputs)



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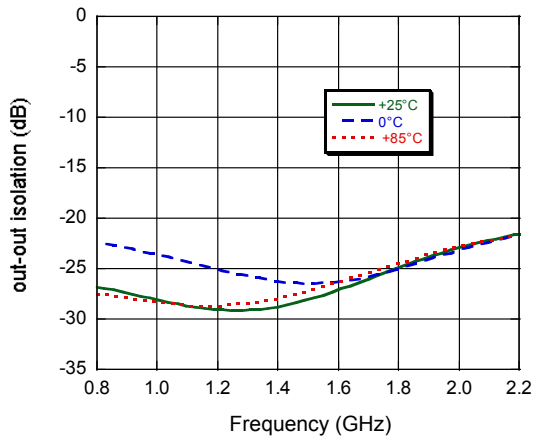
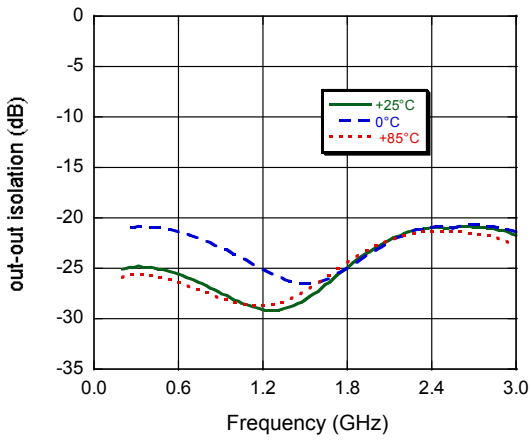
Typical Performance Curves

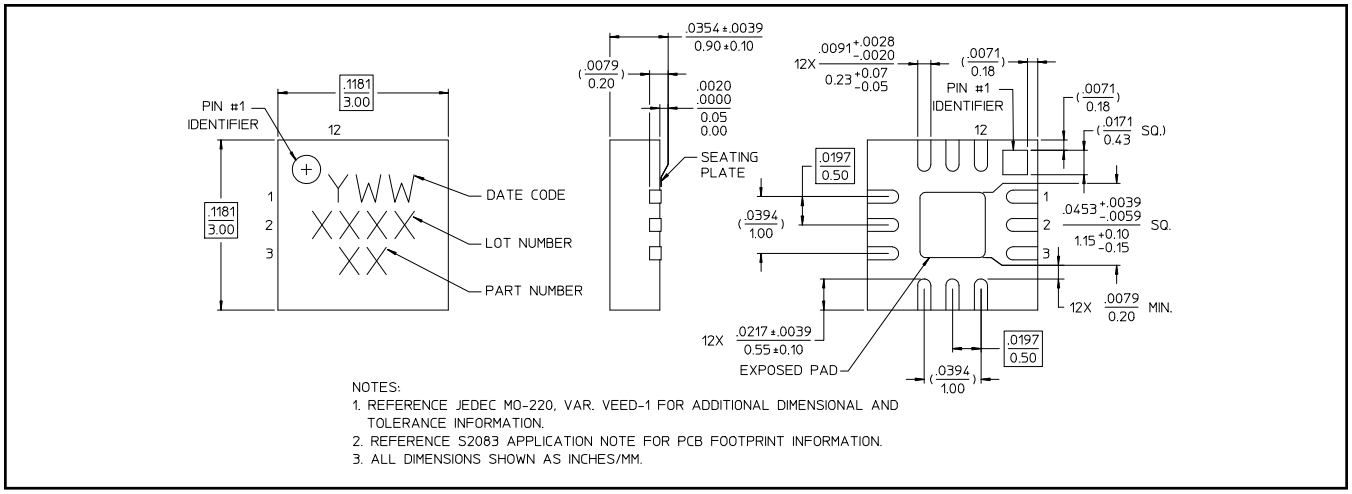
Out - Out Isolation



Out - Out Isolation to 3 GHz



Lead-Free 3 mm 12-Lead PQFN†



† Reference Application Note M538 for lead-free solder reflow recommendations.
Meets JEDEC moisture sensitivity level 1 requirements.
Plating is 100% matte tin plating over copper.

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