

## Broadband CATV Single Ended 3-Way Active Splitter 50 - 1100 MHz

Rev. V1

### Features

- 3-Way Splitter
- Single Ended Input and Outputs
- 2.5 dB Gain
- +15 dBmV /Channel Input
- 3.8 dB Noise Figure
- Single +5 Volt Supply
- Lead-Free 2 mm 8-Lead PDFN Package
- 100% Matte Tin Plating over Copper
- Halogen-Free "Green" Mold Compound
- RoHS\* Compliant and 260°C Reflow Compatible

### Description

M/A-COM's MAAM-008819 CATV 3-way active splitter is a GaAs MMIC which exhibits low noise figure and distortion in a lead-free 2mm 8-lead PDFN plastic package. The design features 75  $\Omega$  inputs and outputs.

The MAAM-008819 is ideally suited for multi-tuner set top boxes, home gateways, and other broadband internet based applications.

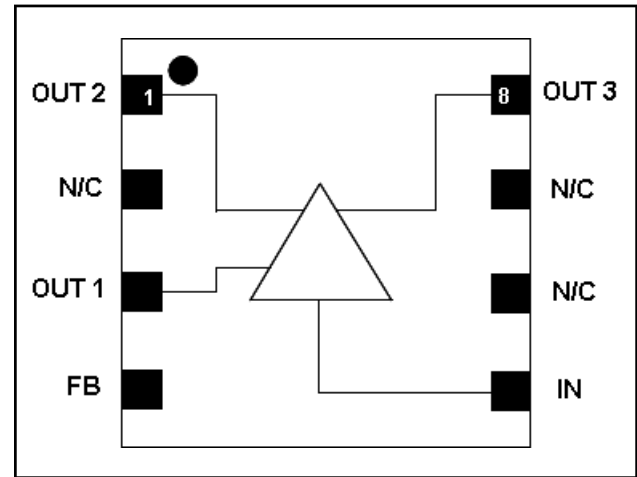
The MAAM-008819 is fabricated using M/A-COM's PHEMT process to realize low noise and low distortion. The process features full passivation for robust performance and reliability.

### Ordering Information <sup>1,2</sup>

Part Number	Package
MAAM-008819-TR1000	1000 piece reel
MAAM-008819-TR3000	3000 piece reel
MAAM-008819-001SMB	Sample Test Board

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

### Functional Schematic



### Pin Configuration

Pin No.	Pin Name	Description
1	OUT2	RF Output 2
2	N/C	No Connection
3	OUT1	RF Output 1
4	FB	Feedback/Bias
5	IN	RF Input
6	N/C	No Connection
7	N/C	No Connection
8	OUT3	RF Output 3
9	Paddle <sup>3</sup>	RF and DC Ground

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: F = 1000 MHz, T<sub>A</sub> = 25°C, V<sub>DD</sub> = +5 Volts, Z<sub>0</sub> = 75 Ω**

Parameter	Test Conditions	Units	Min.	Typ.	Max.
Gain	IN to OUT1, OUT2 & OUT3	dB	2.0	2.5	4.0
Gain Flatness	IN to OUT1, OUT2 & OUT3	dB	-	1.0	-
Noise Figure	IN to OUT1, OUT2 & OUT3	dB	-	3.8	-
Input Return Loss	IN	dB	-	12	-
Output Return Loss	OUT1, OUT2, OUT3	dB	-	9.5	-
Composite Triple Beat, CTB	132 channels, +15 dBmV/channel at the input	dBc	-	-63	-
Composite Second Order, CSO	132 channels, +15 dBmV/channel at the input	dBc	-	-60	-
Reverse Isolation	OUT1, OUT2 & OUT3 to IN	dB	-	29	-
Output to Output Isolation	Isolation between all RF outputs	dB	-	24	-
Output Power at 1dB Compression, P1dB	IN to OUT1, OUT2, OUT3	dBm	-	8.5	-
Output 3rd Order Intercept Point, OIP3	500 MHz, 2-tone, 6MHz spacing, -15 dBm Pout	dBm	-	26	-
Output 2nd Order Intercept Point, OIP2	500 MHz, 2-tone, 6MHz spacing, -15 dBm Pout	dBm	-	45	-
I <sub>DD</sub>	V <sub>DD</sub> = +5 Volts	mA	-	120	150

### Absolute Maximum Ratings <sup>4,5,6</sup>

Parameter	Absolute Maximum
Max Input Power	+12 dBm
V <sub>bias</sub>	+10.0 V
Operating Temperature	-20°C to +85°C
Junction Temperature <sup>7</sup>	150°C
Storage Temperature	-65°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.
6. These operating conditions will ensure MTTF > 1 x 10<sup>6</sup> hours.
7. Junction Temperature (T<sub>J</sub>) = T<sub>C</sub> + Θ<sub>Jc</sub> \* (V \* I)  
Typical thermal resistance (Θ<sub>Jc</sub>) = 62° C/W.
  - a) For T<sub>C</sub> = 25°C,  
T<sub>J</sub> = 62 °C @ 5 V, 120 mA
  - b) For T<sub>C</sub> = 85°C,  
T<sub>J</sub> = 119 °C @ 5 V, 110 mA

### Handling Procedures

Please observe the following precautions to avoid damage:

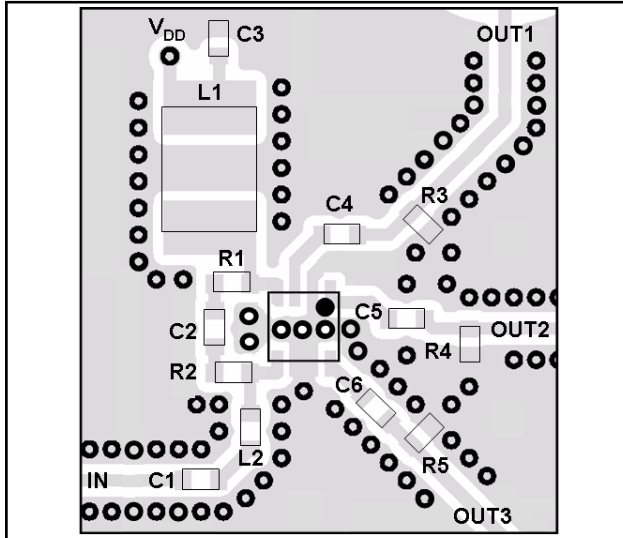
### Static Sensitivity

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.

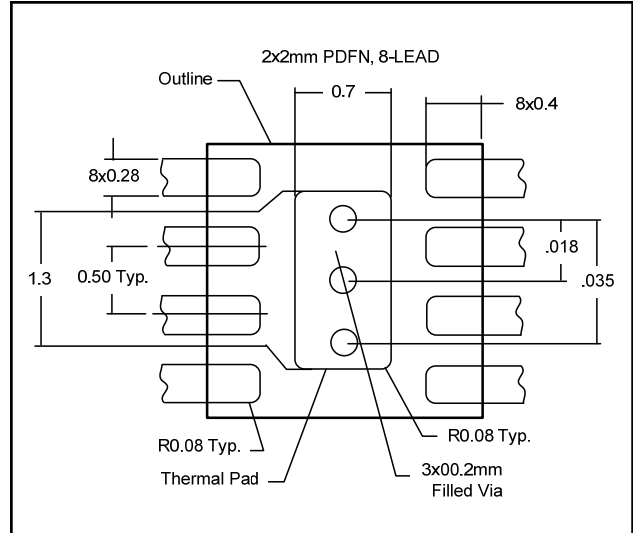
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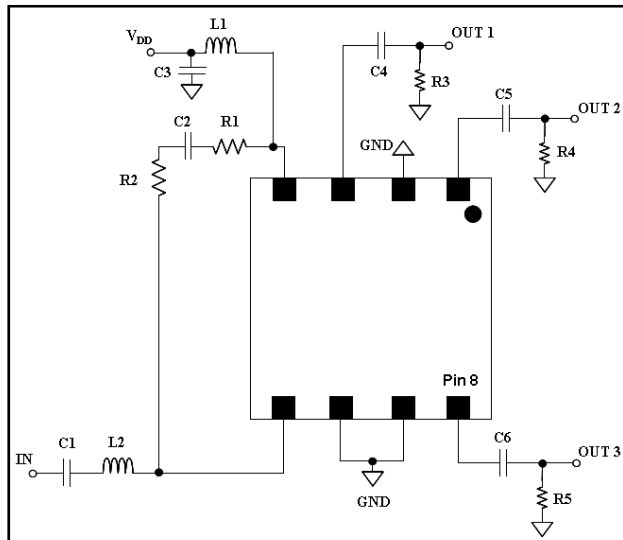
### Recommended PCB



### PCB Land Pattern



### Schematic Including Off-Chip Components<sup>8</sup>



8. The exposed pad centered on the package bottom must be connected to ground for RF, DC and thermal considerations.

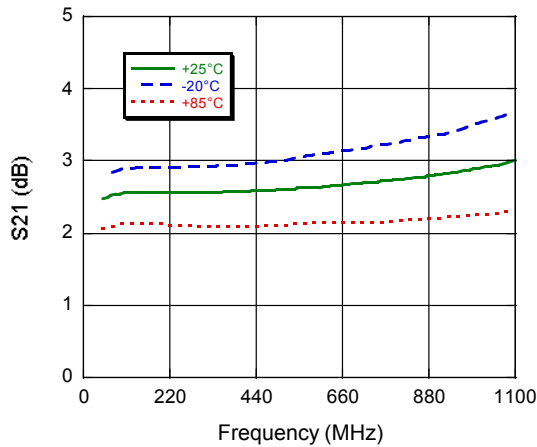
### Off-Chip Component Values

Component	Value	Package
C1 - C6	0.01 $\mu$ F	0402
L1 <sup>9</sup>	1 $\mu$ H	1210
L2	5.1 nH	0402
R1, R2	180 $\Omega$	0402
R3 - R5	390 $\Omega$	0402

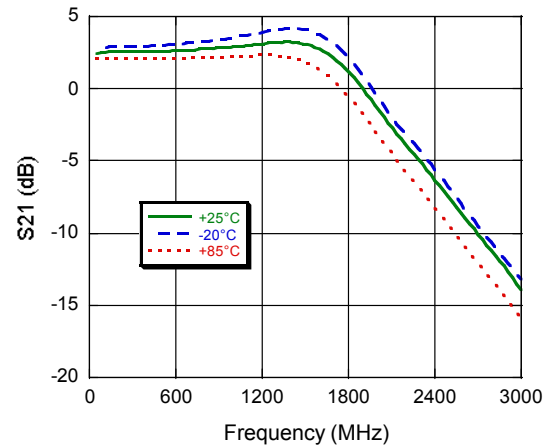
9. L1 supplied from EPCOS, part number B82422A1102K100

## Typical Performance Curves

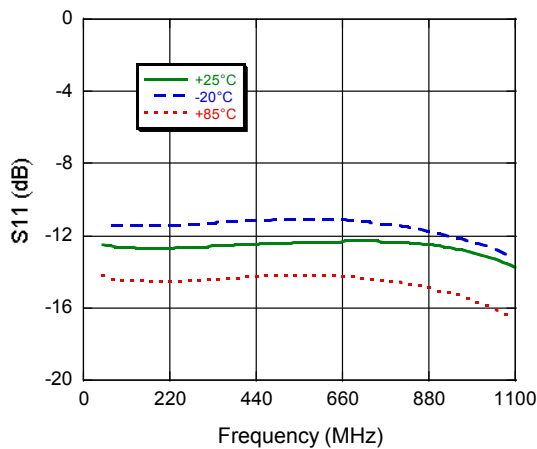
**Gain to 1100 MHz**  
*Typical All Outputs*



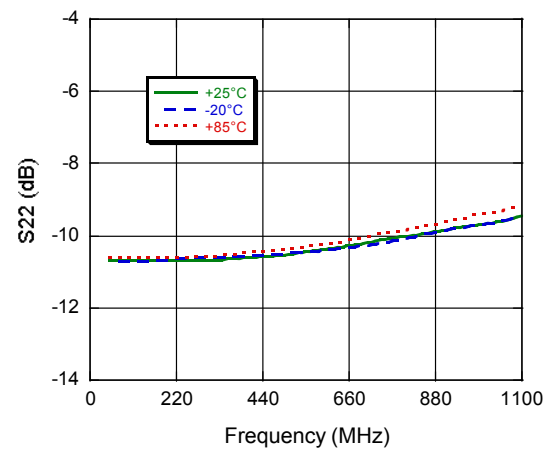
**Gain to 3000 MHz**  
*Typical All Outputs*



**Input Return Loss**

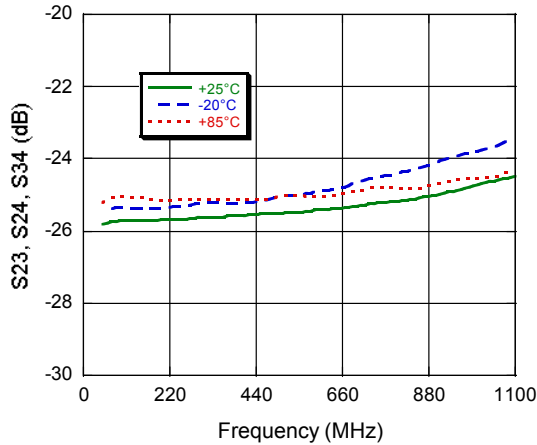


**Output Return Loss**  
*Typical All Outputs*

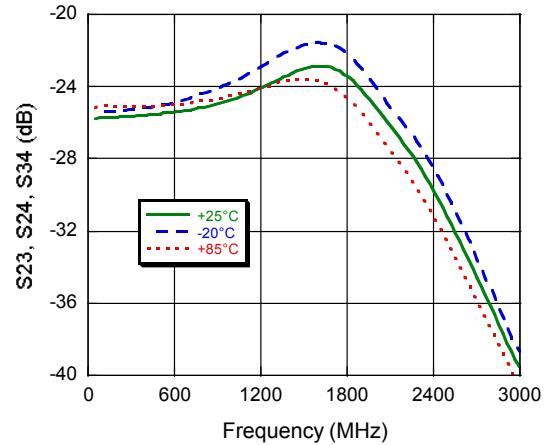


## Typical Performance Curves

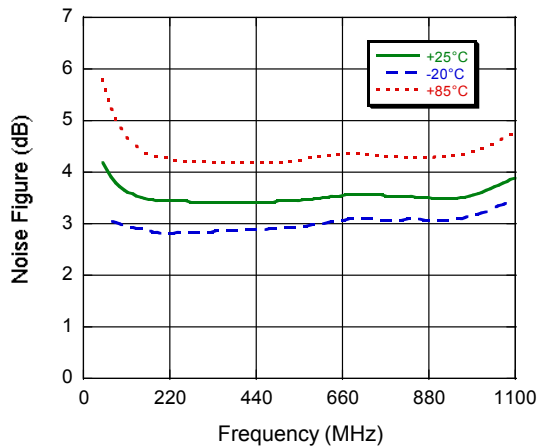
**OUT-OUT Isolation to 1100 MHz**  
Typical Between All Outputs



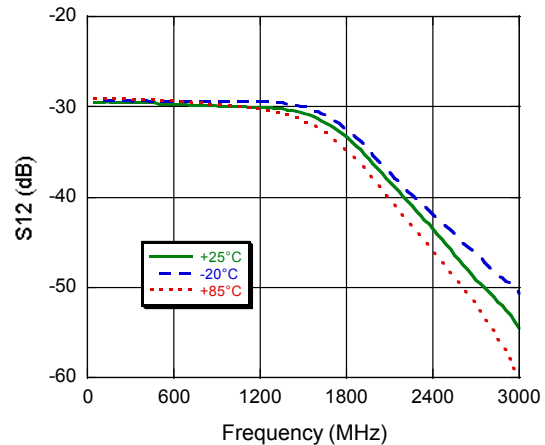
**OUT-OUT Isolation to 3000 MHz**  
Typical Between All Outputs



**Noise Figure**  
Typical All Outputs



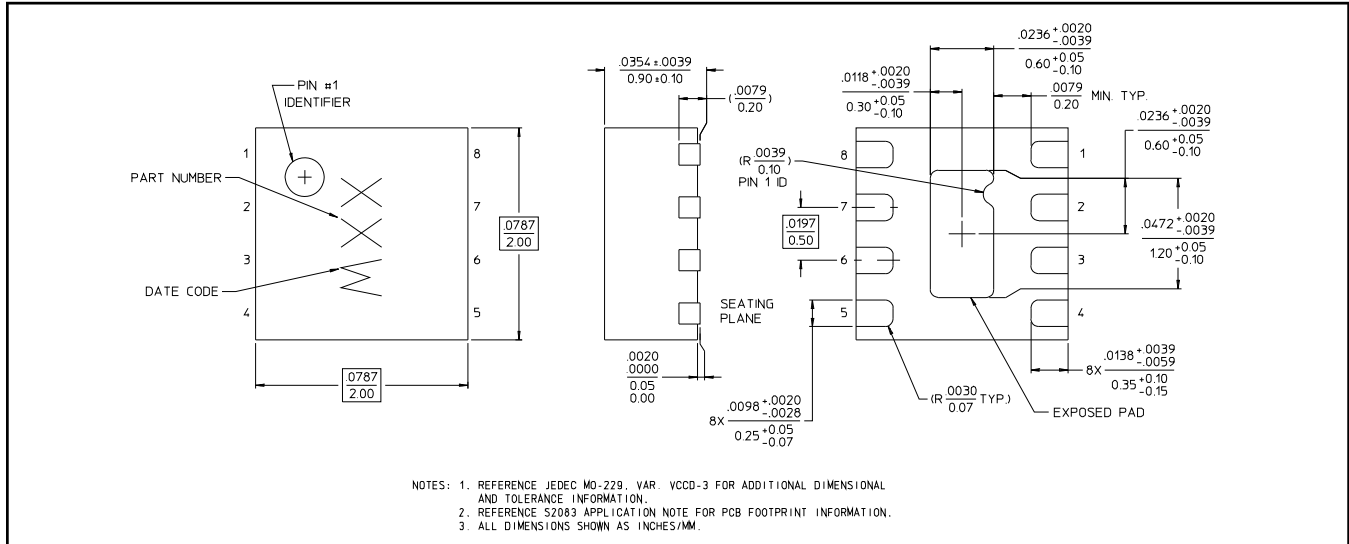
**Reverse Isolation to 3000 MHz**  
Typical From All Outputs to Input



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### Lead-Free 2 mm 8-Lead PDFN<sup>†</sup>



<sup>†</sup> Reference Application Note S2083 for lead-free solder reflow recommendations.  
Meets JEDEC moisture sensitivity level 1 requirements.