

## Broadband CATV Single Ended 2-Way Active Splitter 50 - 1100 MHz

Rev. V2

### Features

- 2-Way Splitter
- Single Ended Input and Outputs
- 3 dB Gain
- +15 dBmV /Channel Input
- 4 dB Noise Figure
- Single +5 Volt Supply
- Lead-Free 2 mm 8-Lead PDFN Package
- Halogen-Free “Green” Mold Compound
- RoHS\* Compliant and 260°C Reflow Compatible

### Description

The MAAM-008818 CATV 2-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-008818 is ideally suited for multi-tuner set top boxes, home gateways, and other broadband internet based appliances.

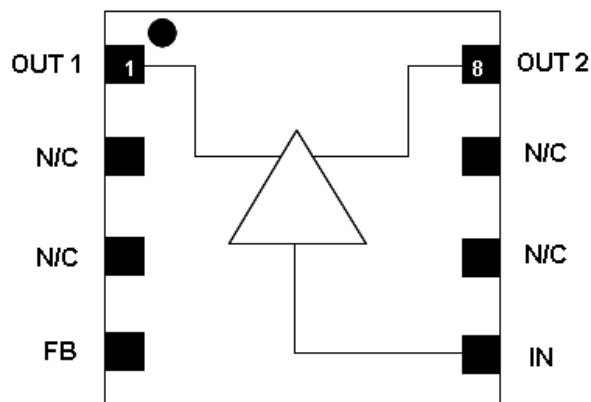
The MAAM-008818 is fabricated using M/A-COM<sup>1</sup> Technology Solutions pHEMT process to realize low noise and low distortion. The process features full passivation for robust performance and reliability.

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

Part Number	Package
MAAM-008818-TR1000	1000 piece reel
MAAM-008818-TR3000	3000 piece reel
MAAM-008818-001SMB	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	OUT1	RF Output 1
2	N/C	No Connection
3	N/C	No Connection
4	FB	Feedback/Bias
5	IN	RF Input
6	N/C	No Connection
7	N/C	No Connection
8	OUT2	RF Output 2
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: Freq. = 1000 MHz,  $T_A = 25^\circ\text{C}$ ,  $V_{DD} = +5\text{ Volts}$ ,  $Z_0 = 75\ \Omega$**

Parameter	Test Conditions	Units	Min.	Typ.	Max.
Gain	IN to OUT1, IN to OUT2	dB	2.8	3.6	4.8
Gain Flatness	IN to OUT1, IN to OUT2	dB	—	0.6	—
Noise Figure	IN to OUT1, IN to OUT2	dB	—	4	—
Input Return Loss	IN	dB	—	12	—
Output Return Loss	OUT1, OUT2	dB	—	17	—
Composite Triple Beat, CTB	132 Channels, +15 dBm V / Channel at the input	dBc	—	-63	—
Composite Second Order, CSO	132 Channels, +15 dBm V / Channel at the input	dBc	—	-60	—
Reverse Isolation	OUT1 to IN, OUT2 to IN	dB	—	28	—
Output to Output Isolation	OUT1 to OUT2	dB	—	21	—
P1dB	IN to OUT1, IN to OUT2	dBm	—	9	—
Output IP3	500 MHz, 2-tone, 6 MHz spacing, -15 dBm Pout IN to OUT1, IN to OUT2	dBm	—	25	—
Output IP2	500 MHz, 2-tone, 6 MHz spacing, -15 dBm Pout IN to OUT1, IN to OUT2	dBm	—	46	—
$I_{DD}$	$V_{DD} = +5\text{ Volts}$	mA	—	120	150

### Absolute Maximum Ratings <sup>4,5,6,7</sup>

Parameter	Absolute Maximum
Max Input Power	+12 dBm
Vbias	+10.0 V
Operating Temperature	-20°C to +85°C
Storage Temperature	-65°C to +150°C

- Exceeding any one or combination of these limits may cause permanent damage to this device.
- M/A-COM Technology Solutions does not recommend sustained operation near these survivability limits.
- These operating conditions will ensure MTTF >  $1 \times 10^6$  hours.
- Junction Temperature ( $T_J$ ) =  $T_C + \Theta_{jc} * ((V * I) - (P_{OUT} - P_{IN}))$   
Typical thermal resistance ( $\Theta_{jc}$ ) = 77° C/W.
  - For  $T_C = 25^\circ\text{C}$ ,  
 $T_J = 71^\circ\text{C}$  @ 5 V, 120 mA
  - For  $T_C = 85^\circ\text{C}$ ,  
 $T_J = 127^\circ\text{C}$  @ 5 V, 110 mA

### Handling Procedures

Please observe the following precautions to avoid damage:

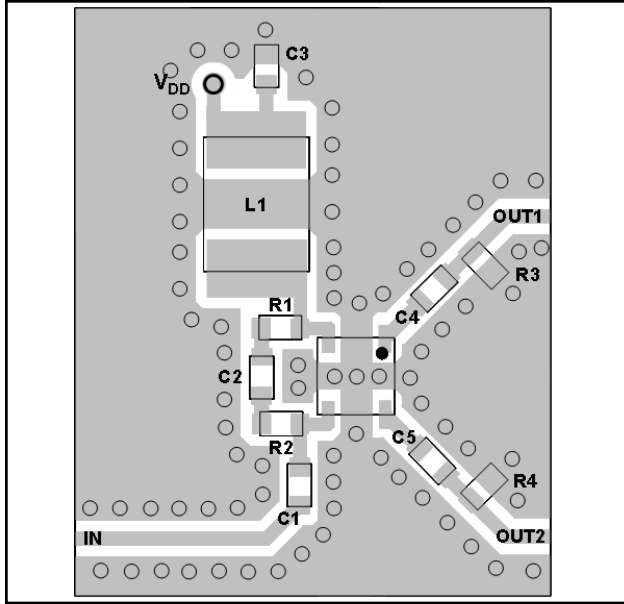
### Static Sensitivity

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.

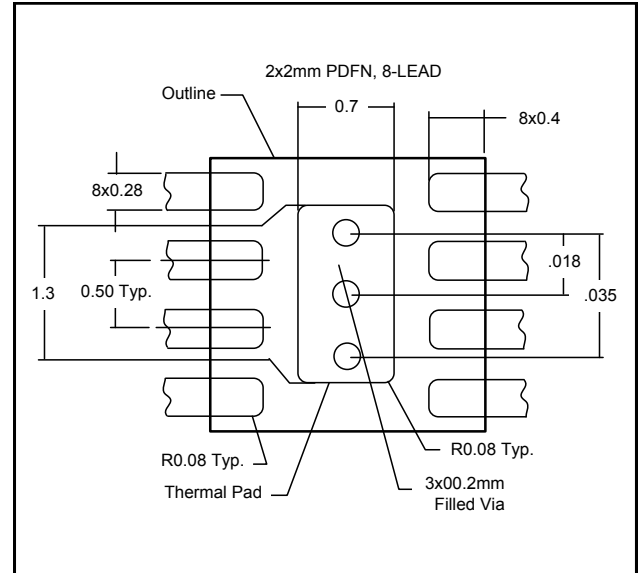
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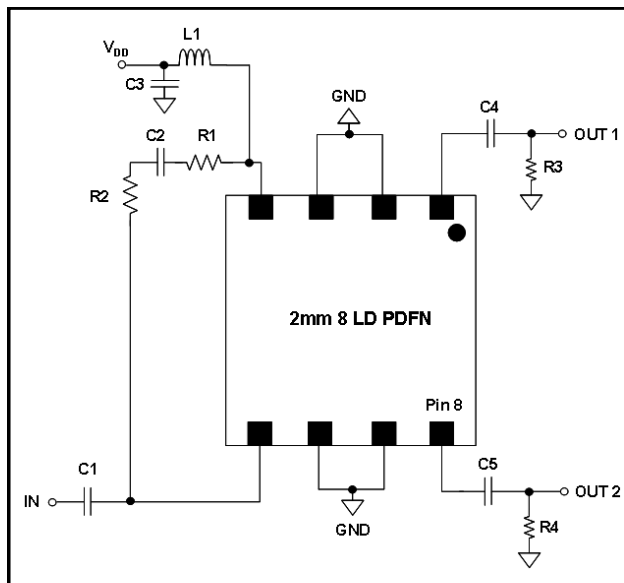
### Recommended PCB



### 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.

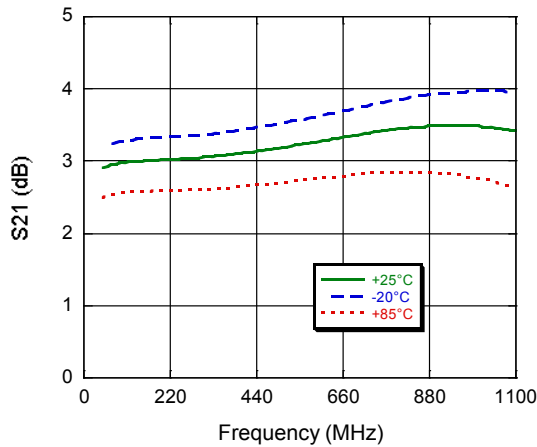
### Off-Chip Component Values<sup>9</sup>

Component	Value	Package
C1 - C5	0.01 $\mu$ F	0402
L1 <sup>9</sup>	1 $\mu$ H	1210
R1, R2	180 $\Omega$	0402
R3, R4	100 $\Omega$	0402

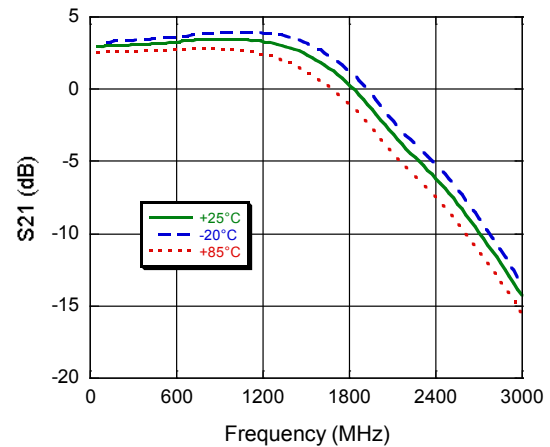
9. L1 supplied from EPCOS, part number B82422A1102K100

## Typical Performance Curves

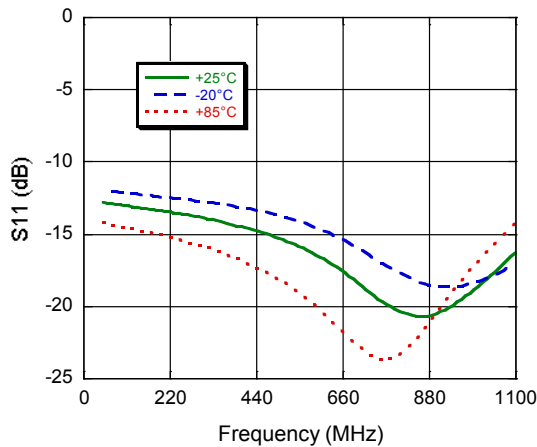
**Gain to 1100 MHz**  
**Typical All Outputs**



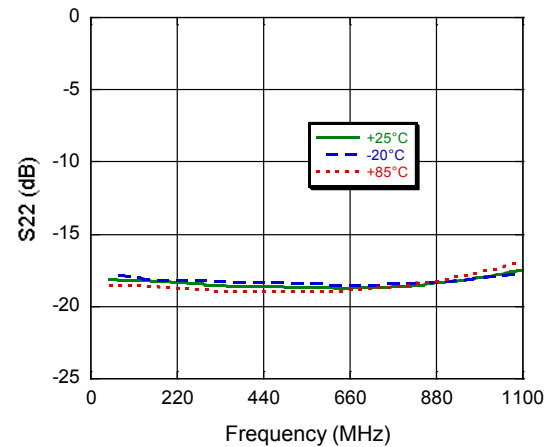
**Gain to 3000 MHz**  
**Typical All Outputs**



**Input Return Loss**

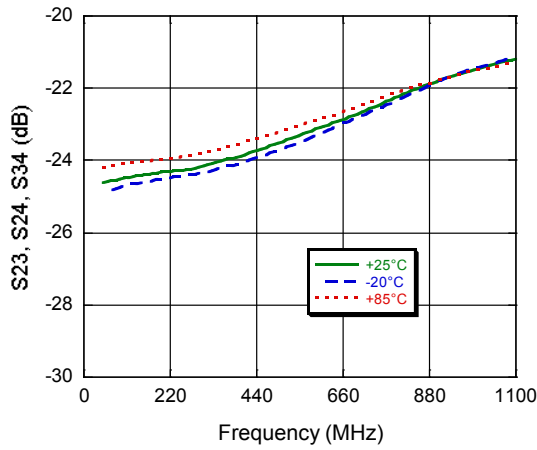


**Output Return Loss**  
**Typical All Outputs**

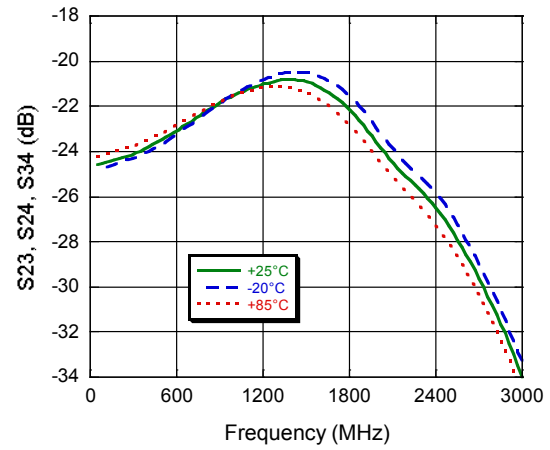


## Typical Performance Curves

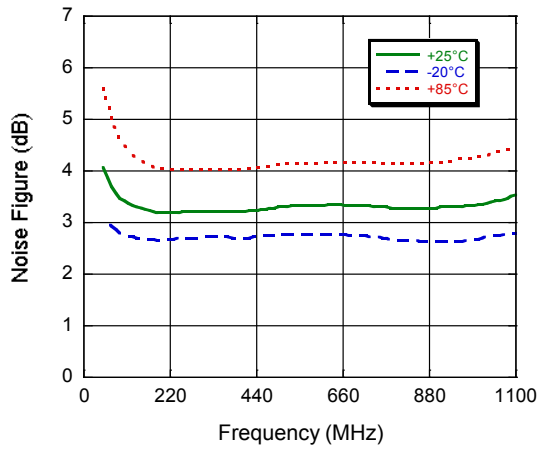
**OUT-OUT Isolation to 1100 MHz**  
 Typical Between All Outputs



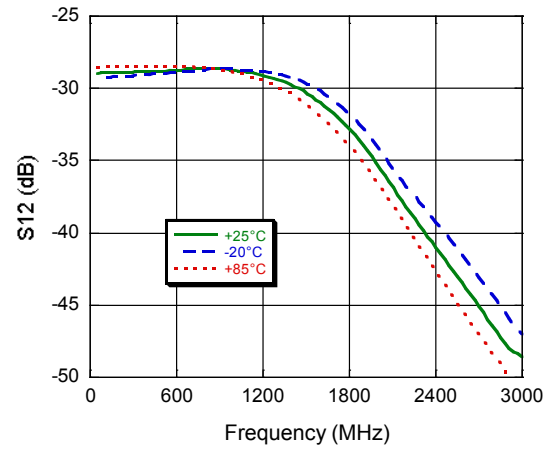
**OUT-OUT Isolation to 3000 MHz**  
 Typical Between All Outputs



**Noise Figure**  
 Typical All Outputs



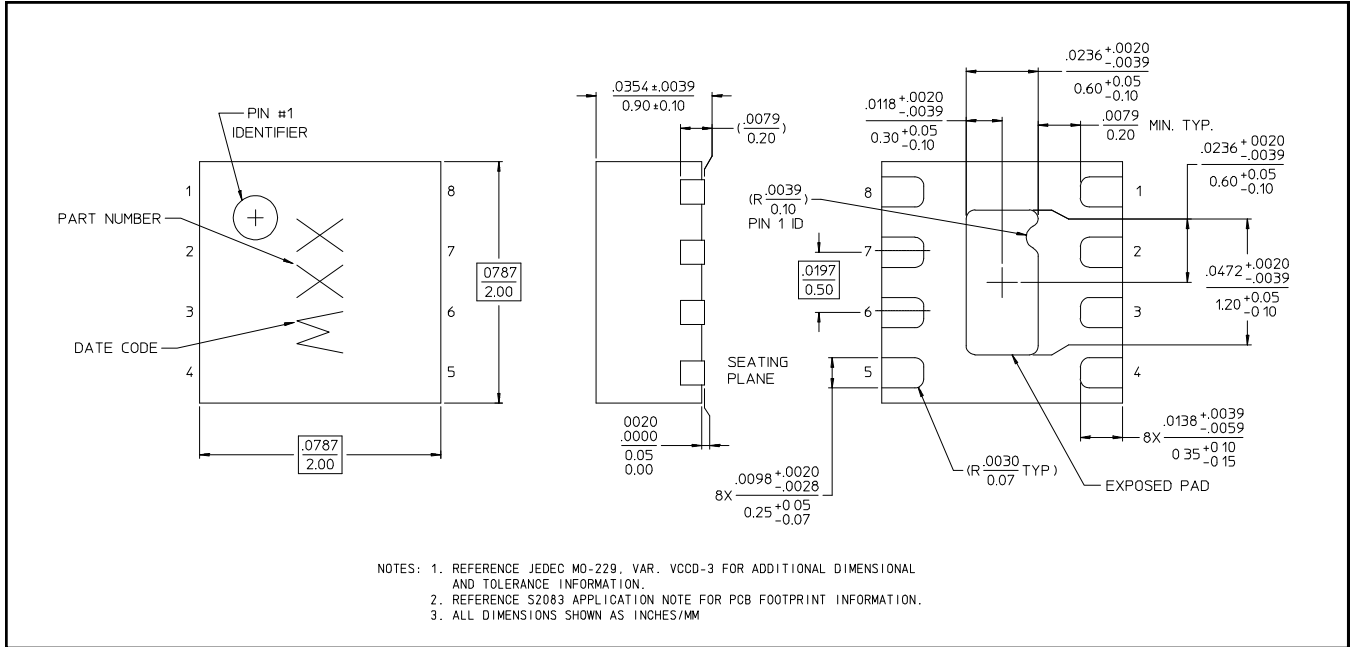
**Reverse Isolation to 3000 MHz**  
 Typical From All Outputs to Input



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



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