MAAM-008819

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 Ω inputs and outputs.

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

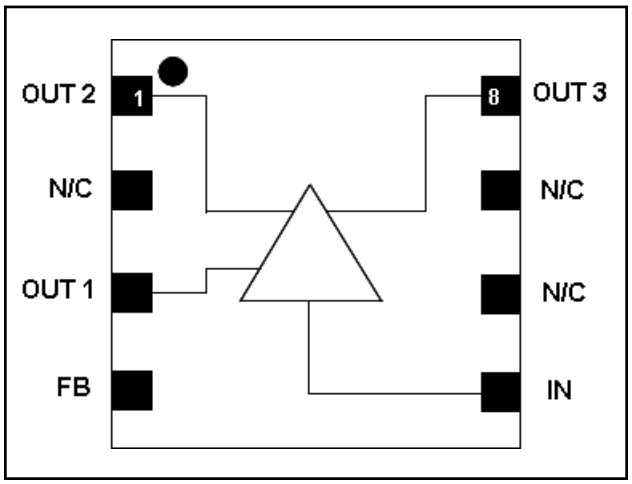
The MAAM-008819 is fabricated using M/A-COM's PHEMT process to realize low noise and low distortion. The process features full passivation for robust performance and reliability.

Ordering Information [1,2]

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[3]	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.

- **North America** Tel: 800.366.2266 / Fax: 978.366.2266
- **Europe** Tel: 44.1908.574.200 / Fax: 44.1908.574.300
- **Asia/Pacific** Tel: 81.44.844.8296 / Fax: 81.44.844.8298

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Electrical Specifications: F = 1000 MHz, T_A = 25℃, V_{DD} = +5 Volts, Z_0 = 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_{DD}	V_{DD}= +5 Volts	mA	-	120	150

Absolute Maximum Ratings [4,5,6]

Parameter	Absolute Maximum
Max Input Power	+12 dBm
Vbias	+10.0 V
Operating Temperature	-20°C to +85°C
Junction Temperature[7]	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 10^6 hours.
7. Junction Temperature (T_J) = T_C + Θjc * (V * I)
   Typical thermal resistance (Θjc) = 62° C/W.
   a) For T_C = 25°C,
   T_J = 62 °C @ 5 V, 120 mA
   b) For T_C = 85°C,
   T_J = 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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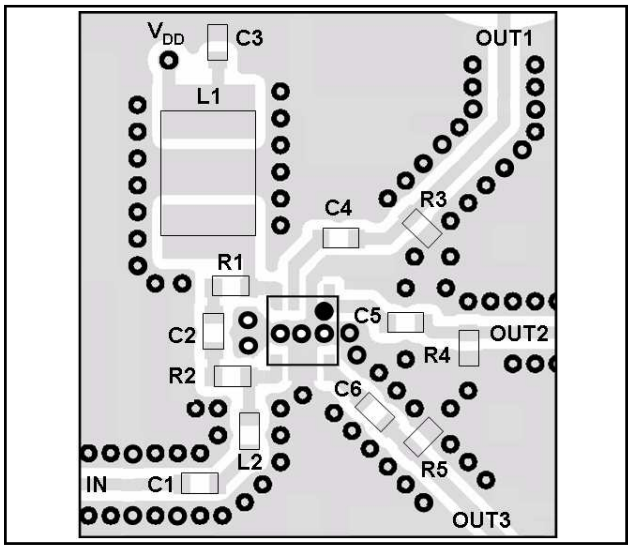
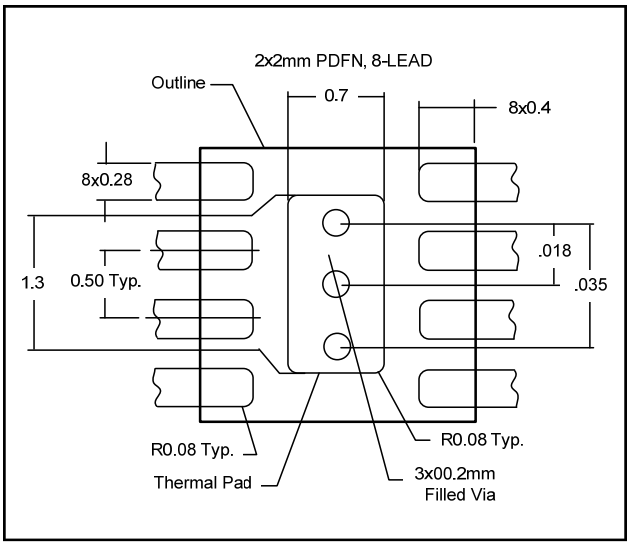
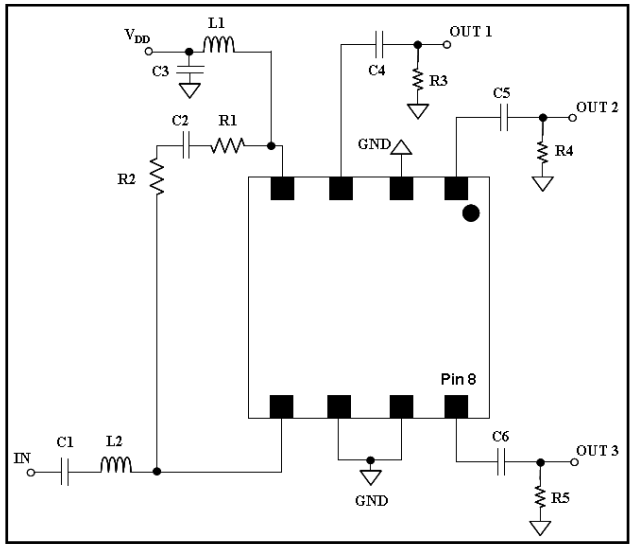
Recommended PCB



PCB Land Pattern



Schematic Including Off-Chip Components[8]



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 µF	0402
L1[9]	1 µH	1210
L2	5.1 nH	0402
R1, R2	180 Ω	0402
R3 - R5	390 Ω	0402

9. L1 supplied from EPCOS, part number B82422A1102K100

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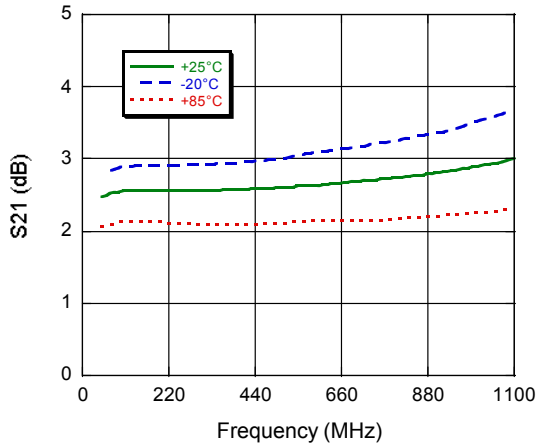
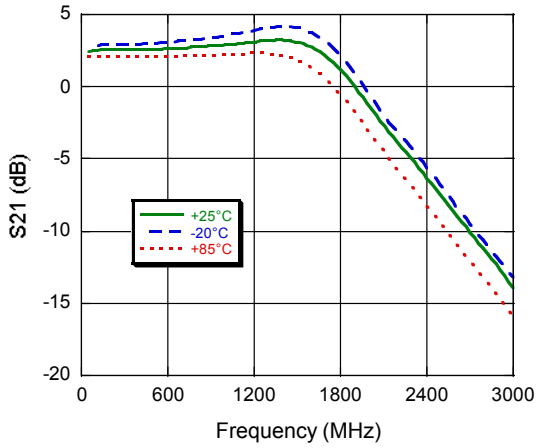
Typical Performance Curves

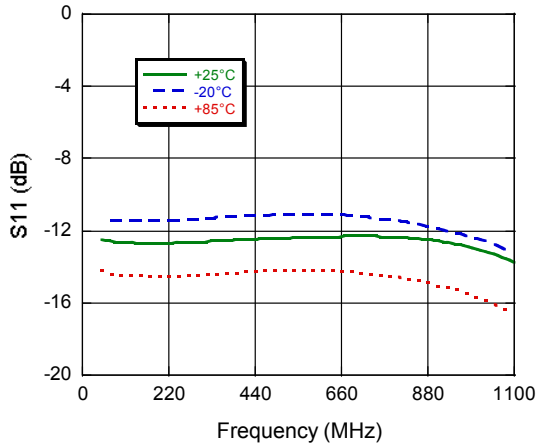
Gain to 1100 MHz
Typical All Outputs



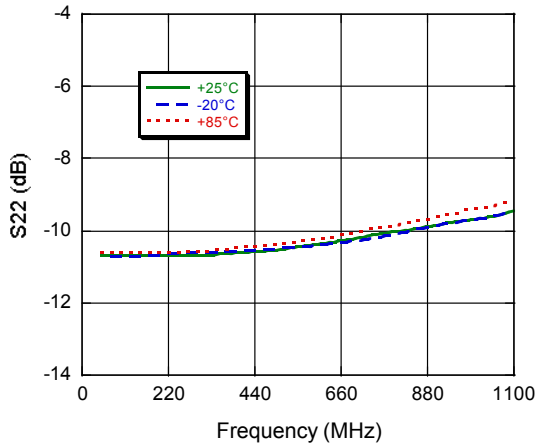
Gain to 3000 MHz
Typical All Outputs



Input Return Loss



Output Return Loss
Typical All Outputs



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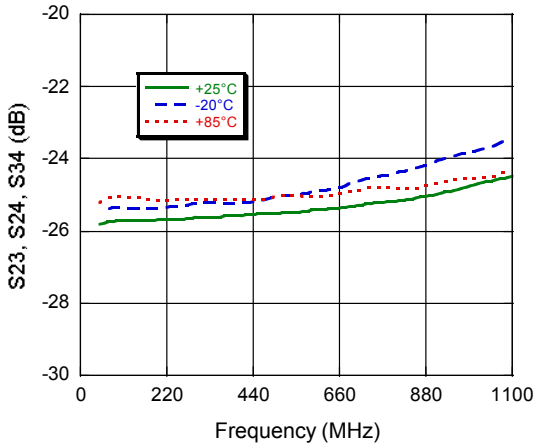
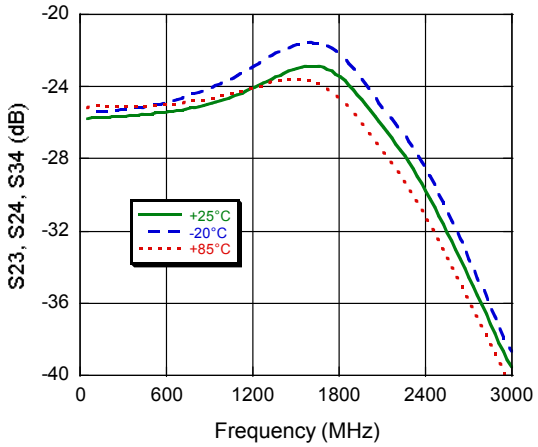
Typical Performance Curves

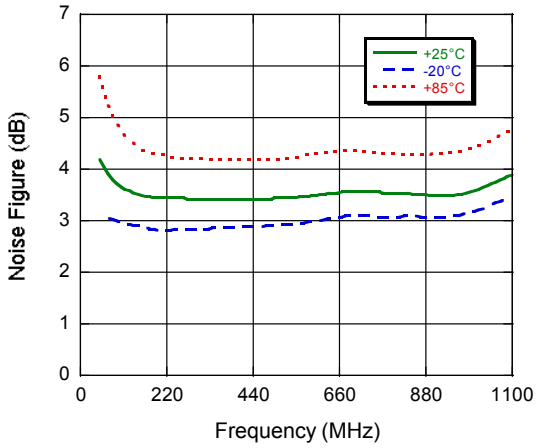
OUT-OUT Isolation to 1100 MHz
Typical Between All Outputs



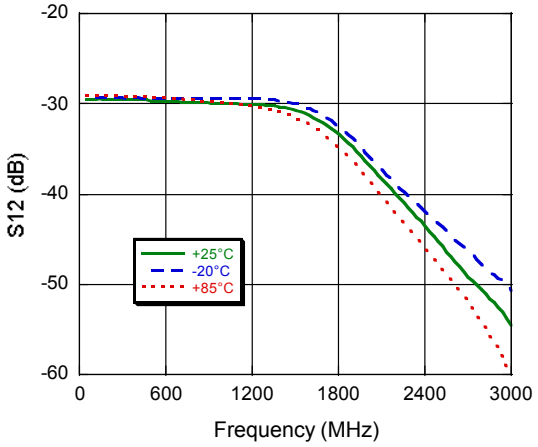
OUT-OUT Isolation to 3000 MHz
Typical Between All Outputs



Noise Figure
Typical All Outputs



Reverse Isolation to 3000 MHz
Typical From All Outputs to Input



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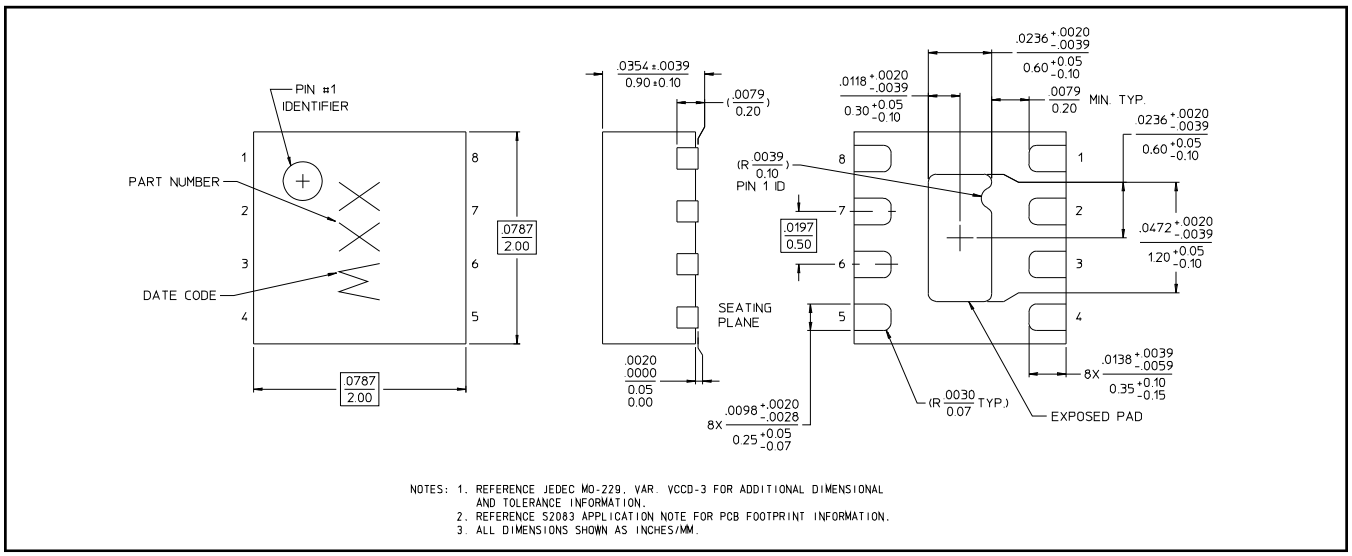

† Reference Application Note S2083 for lead-free solder reflow recommendations.
Meets JEDEC moisture sensitivity level 1 requirements.

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