MAAM-008818



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 Ω inputs and outputs.

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

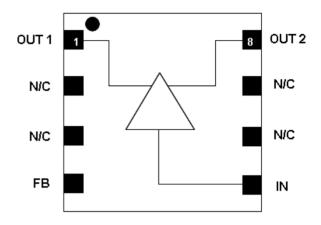
The MAAM-008818 is fabricated using M/A-COM' Technology Solutions pHEMT process to realize low noise and low distortion. The process features full passivation for robust performance and reliability.

Ordering Information 1,2

Part Number	Package		
MAAM-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

3				
Pin Name	Description			
OUT1	RF Output 1			
N/C	No Connection			
N/C	No Connection			
FB	Feedback/Bias			
IN	RF Input			
N/C	No Connection			
N/C	No Connection			
OUT2	RF Output 2			
Paddle ³	RF and DC Ground			
	OUT1 N/C N/C FB IN N/C N/C OUT2			

^{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, $T_A = 25$ °C, $V_{DD} = +5$ Volts, $Z_0 = 75$ Ω

Parameter	Test Conditions	Units	Min.	Тур.	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 Volts	mA	_	120	150

Absolute Maximum Ratings 4,5,6,7

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		

- 4. 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.
- 6. These operating conditions will ensure MTTF > 1×10^6 hours.
- 7. Junction Temperature $(T_J) = T_C + \Theta jc * ((V * I) (P_{OUT} P_{IN}))$ Typical thermal resistance $(\Theta jc) = 77^{\circ}$ C/W.

a) For $T_C = 25^{\circ}C$,

 $T_J = 71 \,^{\circ}\text{C} \ @ 5 \,^{\circ}\text{V}, 120 \,^{\circ}\text{mA}$

b) For $T_C = 85^{\circ}C$,

 $T_J = 127 \, ^{\circ}\text{C} \bigcirc 5 \, \text{V}, \, 110 \, \text{mA}$

Handling Procedures

Please observe the following precautions to avoid damage:

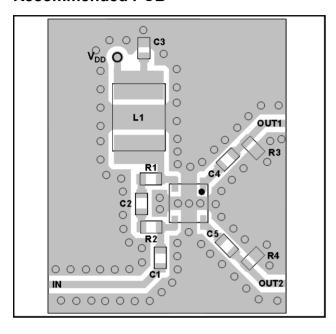
Static Sensitivity

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.

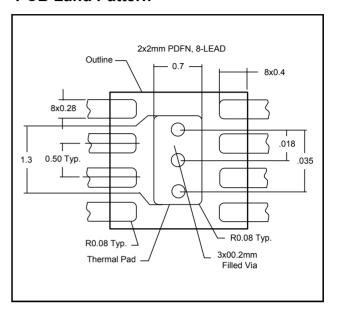


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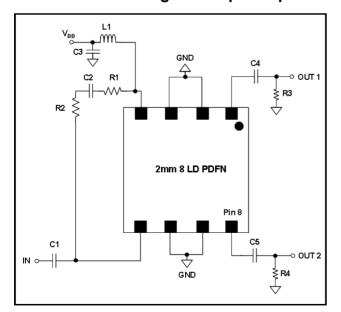
Recommended PCB



PCB Land Pattern



Schematic Including Off-Chip Components⁸



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

Off-Chip Component Values 9

Component	Value	Package
C1 - C5	0.01 μF	0402
L1 ⁹	1 μH	1210
R1, R2	180 Ω	0402
R3, R4	100 Ω	0402

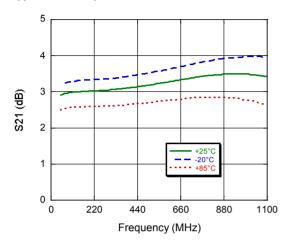
9. L1 supplied from EPCOS, part number B82422A1102K100



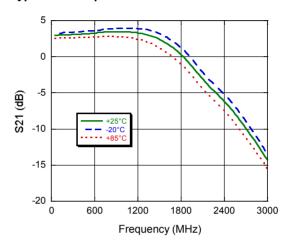
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Typical Performance Curves

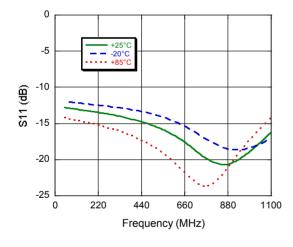
Gain to 1100 MHz Typical All Outputs



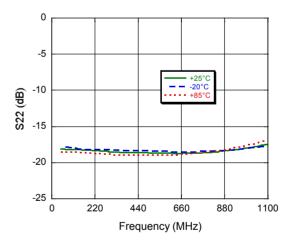
Gain to 3000 MHz Typical All Outputs



Input Return Loss



Output Return Loss Typical All Outputs

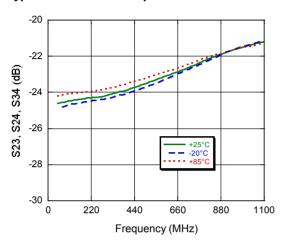




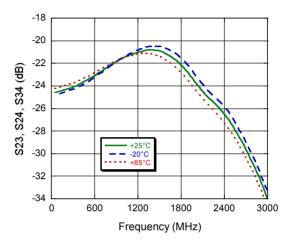
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Typical Performance Curves

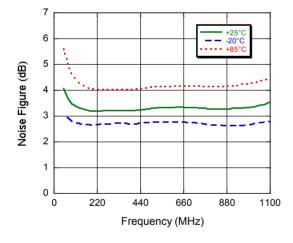
OUT-OUT Isolation to 1100 MHz Typical Between All Outputs



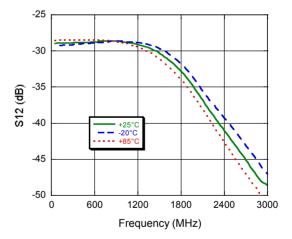
OUT-OUT Isolation to 3000 MHz Typical Between All Outputs



Noise Figure Typical All Outputs



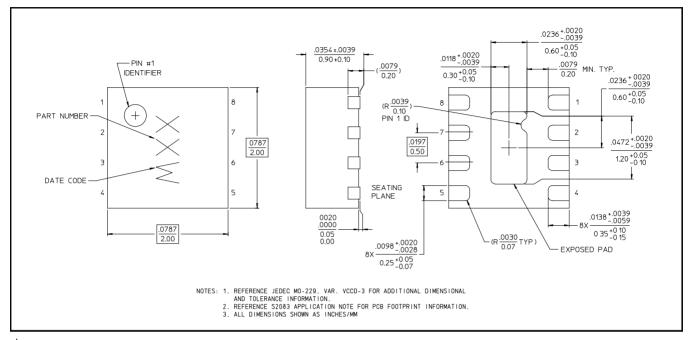
Reverse Isolation to 3000 MHz Typical From All Outputs to Input





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Lead-Free 2 mm 8-Lead PDFN[†]



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

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