MAAM-007805

Tyco Electronics

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

M/A-COM Products
Rev. V1

Features

- 2-Way Splitter, 8.5 dB Gain
- Single Ended Input and Outputs
- 75 Ω Impedance
- 4.0 dB Noise Figure
- Single +5 Volt Supply
- Lead-Free 3 mm 12-Lead PQFN Package
- 100% Matte Tin Plating over Copper
- Halogen-Free "Green" Mold Compound
- RoHS* Compliant and 260°C Reflow Compatible

Description and Applications

M/A-COM's MAAM-007805 CATV 2-way active splitter is a GaAs MMIC which exhibits low noise figure and distortion in a lead-free PQFN plastic package. The MAAM-007805 employs a low noise, high linearity amplifier and power splitter functionality. The design features 75 Ω input and outputs.

The MAAM-007805 is ideally suited for multi-tuner set top boxes, home gateways, and other broadband internet based appliances.

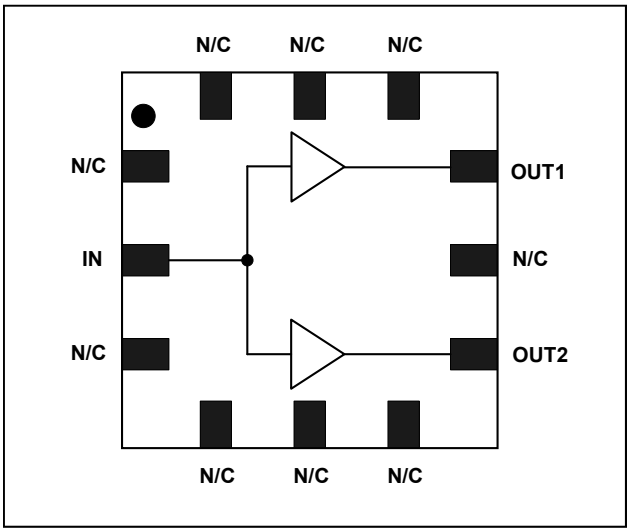
The MAAM-007805 is fabricated using M/A-COM's PHEMT process to realize low noise and low distortion. The process features full passivation for robust performance and reliability.

Ordering Information [1,2]

Part Number	Package
MAAM-007805-TR1000	1000 piece reel
MAAM-007805-TR3000	3000 piece reel
MAAM-007805-001SMB	Sample Board, 50 - 1100 MHz Tuning

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

Functional Schematic



Pin Configuration [3]

Pin No.	Function	Pin No.	Function
1	No Connection	7	RF Output 2
2	RF Input	8	No Connection
3	No Connection	9	RF Output 1
4	No Connection	10	No Connection
5	No Connection	11	No Connection
6	No Connection	12	No Connection

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

Absolute Maximum Ratings [4,5]

Parameter	Absolute Maximum
Max Input Power	+8 dBm
Vbias	+10.0 V
Operating Temperature	-40°C to +85°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.

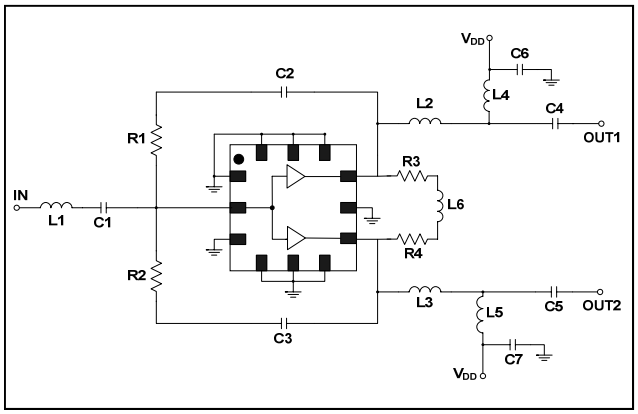
* Restrictions on Hazardous Substances, European Union Directive 2002/95/EC.

- **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
Visit www.macom.com for additional data sheets and product information.

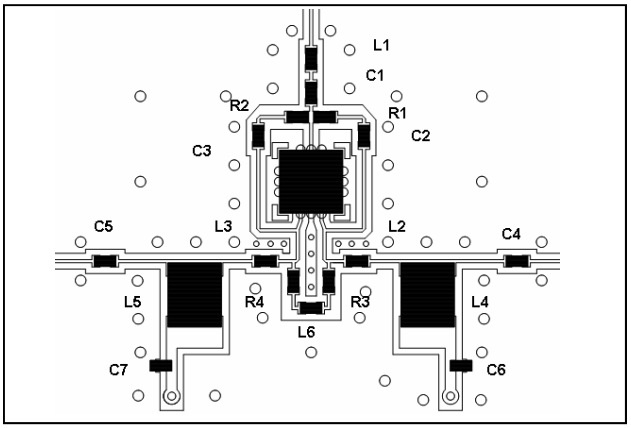
Electrical Specifications: F = 50 - 1000 MHz, T_A = 25°C, V_{DD} = +5 Volts, Z_0 = 75 Ω

Parameter	Test Conditions	Units	Min.	Typ.	Max.
Gain	In to Out1, In to Out2	dB	7.3	8.5	9.5
Gain Flatness	In to Out1, In to Out2	dB	—	0.75	1.2
Noise Figure	In to Out1, In to Out2	dB	—	4.0	4.5
Input Return Loss	Input	dB	—	19	—
Output Return Loss	Output	dB	—	18	—
Composite Triple Beat, CTB	132 channels, +15 dBmV/channel at the input.	dBc	—	-75	—
Composite Second Order, CSO	132 channels, +15 dBmV/channel at the input.	dBc	—	-60	—
Crossmodulation, XMOD	132 channels, +15 dBmV/channel at the input.	dBc	—	-60	—
Reverse Isolation	Out1 to In, Out2 to In	dB	—	20	—
Output to Output Isolation	Out1 to Out2	dB	—	25	—
P1dB	400 MHz	dBm	—	17	—
OIP3	Two tones at 1 MHz spacing, Pin at –10 dBm per tone 400 MHz	dBm	—	33	—
OIP2	Two tones at 1 MHz spacing, Pin at –10 dBm per tone 400 MHz	dBm	—	55	—
I_{DD}	V_{DD} = + 5 Volts	mA	—	100	120

Schematic PWB Layout



Recommended PCB Configuration



Off-Chip Component Values [6]

Component	Value	Package
C1- C7	0.01 µF	0402
L1	4.7 nH	0402
L2 - L3	7.5 nH	0402
L4 - L5	1.0 µH	1210
L6	18 nH	0402
R1 - R2	560 ohms	0402
R3 - R4	91 ohms	0402

6. L4 and L5 supplied from EPCOS, part number B82422A1102K100.

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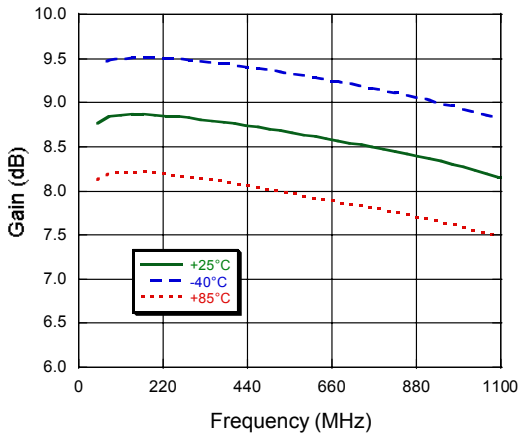
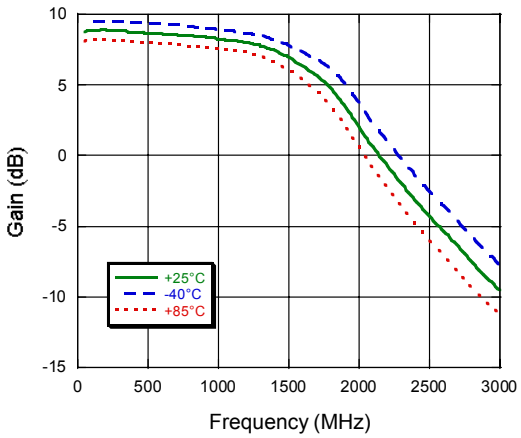
Typical Performance Curves

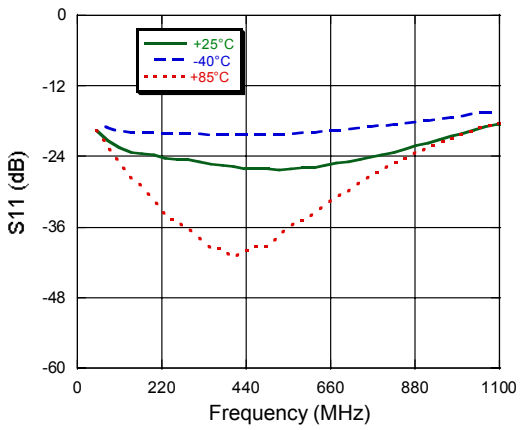
Gain vs. Frequency over Temperature



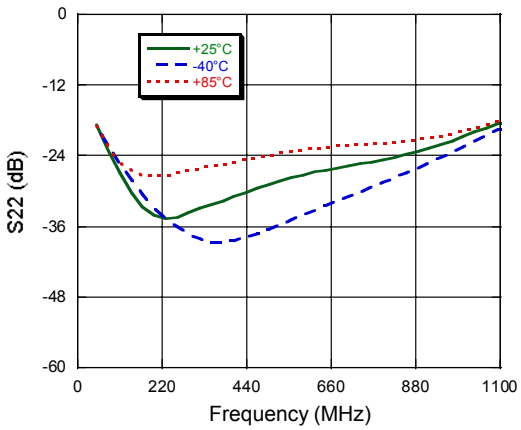
Gain vs. Frequency over Temperature to 3 GHz



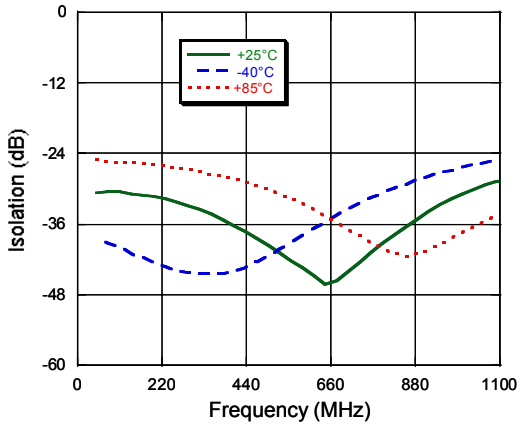
S11 vs. Frequency over Temperature



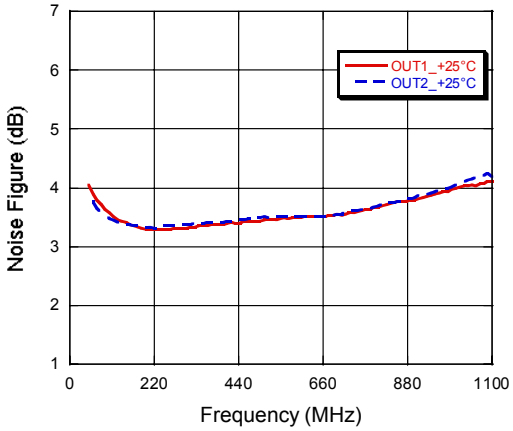
S22 vs. Frequency over Temperature



Isolation vs. Frequency over Temperature



Noise Figure



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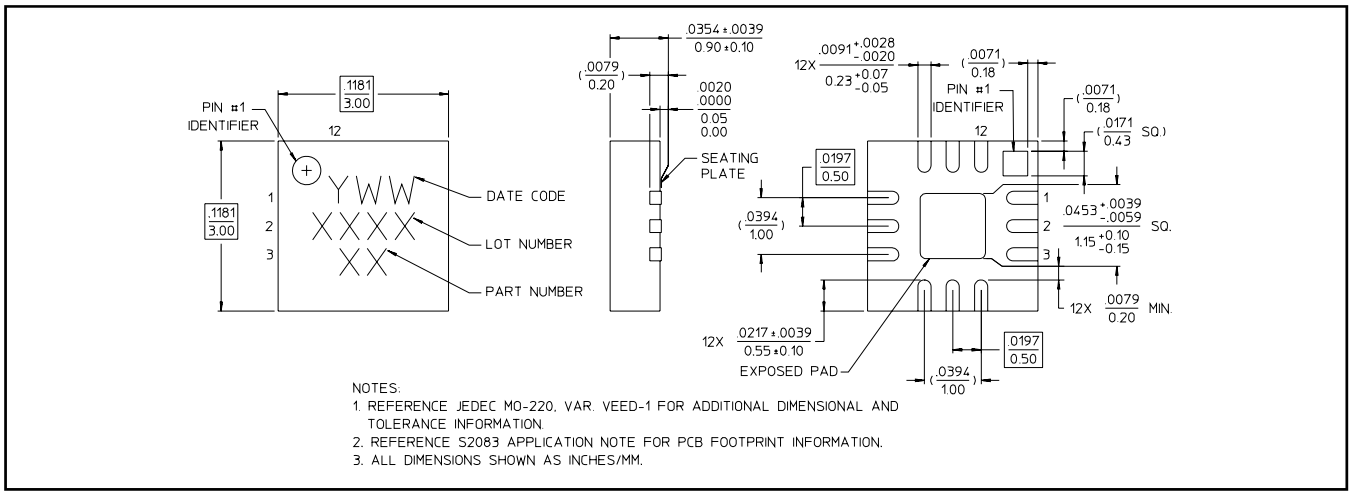
Lead-Free 3 mm 12-Lead PQFN†



† Reference Application Note M538 for lead-free solder reflow recommendations.
Meets JEDEC moisture sensitivity level 1 requirements.

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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