

Surface Mount

# Monolithic Amplifier

DC-2 GHz

## Product Features

- Wideband, DC to 2 GHz
- Cascadable
- Aqueous washable
- Protected under US Patent 6,943,629



**VAM-7+**

## Typical Applications

- Cellular
- PCN
- Instrumentation
- UHF/VHF

CASE STYLE: MMM168  
PRICE: \$1.31 ea. QTY. (30)

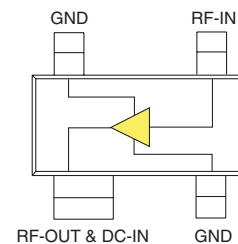
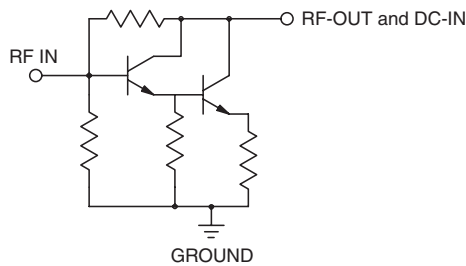
**+ RoHS compliant in accordance with EU Directive (2002/95/EC)**

The +Suffix has been added in order to identify RoHS Compliance. See our web site for RoHS Compliance methodologies and qualifications.

## General Description

VAM-7+ (RoHS compliant) is wideband amplifier offering high dynamic range. It has repeatable performance from lot to lot. It is enclosed in an SOT143 style package. It uses Darlington configuration and is fabricated using InGaP HBT technology. Expected MTBF is 800 years at 85°C case temperature.

## simplified schematic and pin description



Function	Pin Number	Description
RF IN	1	RF input pin. This pin requires the use of an external DC blocking capacitor chosen for the frequency of operation.
RF-OUT and DC-IN	3	RF output and bias pin. DC voltage is present on this pin; therefore a DC blocking capacitor is necessary for proper operation. An RF choke is needed to feed DC bias without loss of RF signal due to the bias connection, as shown in "Recommended Application Circuit".
GND	2,4	Connections to ground. Use via holes as shown in "Suggested Layout for PCB Design" to reduce ground path inductance for best performance.

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RF/MICROWAVE COMPONENTS

For detailed performance specs & shopping online see web site

Notes: 1. Performance and quality attributes and conditions not expressly stated in this specification sheet are intended to be excluded and do not form a part of this specification sheet. 2. Electrical specifications and performance data contained herein are based on Mini-Circuit's applicable established test performance criteria and measurement instructions. 3. The parts covered by this specification sheet are subject to Mini-Circuits standard limited warranty and terms and conditions (collectively, "Standard Terms"); Purchasers of this part are entitled to the rights and benefits contained therein. For a full statement of the Standard Terms and the exclusive rights and remedies thereunder, please visit Mini-Circuits' website at [www.minicircuits.com/MCLStore/terms.jsp](http://www.minicircuits.com/MCLStore/terms.jsp).

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VAM-7+  
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Electrical Specifications at 25°C and 22mA, unless noted

Parameter	Min.	Typ.	Max.	Units
Frequency Range*	DC		2	GHz
Gain				
	f=0.1 GHz	13.0		dB
	f=1 GHz	12.0		
	f=2 GHz	7.8	9.8	
Input Return Loss	f=DC to 2 GHz	14		dB
Output Return Loss	f=DC to 2 GHz	14		dB
Output Power @ 1 dB compression	f=1GHz	+5.5		dBm
Output IP3	f=1 GHz	+18		dBm
Noise Figure	f=1 GHz	5.0		dB
Recommended Device Operating Current		22		mA
Device Operating Voltage		3.8		V
Device Voltage Variation vs. Temperature at 22 mA		-2.3		mV/°C
Device Voltage Variation vs. Current at 25°C		15.1		mV/mA
Thermal Resistance, junction-to-case <sup>1</sup>		505		°C/W

\*Guaranteed specification DC-2 GHz. Low frequency cut off determined by external coupling capacitors.

Absolute Maximum Ratings

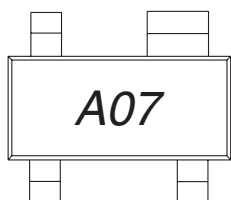
Parameter	Ratings
Operating Temperature*	-20°C to 85°C
Storage Temperature	-55°C to 100°C
Operating Current	50mA
Power Dissipation	175mW
Input Power	13dBm

Note: Permanent damage may occur if any of these limits are exceeded. These ratings are not intended for continuous normal operation.

<sup>1</sup>Case is defined as ground leads.

\*Based on typical case temperature rise 5°C above ambient.

Product Marking



Additional Detailed Technical Information

Additional information is available on our web site. To access this information enter the model number on our web site home page.

Performance data, graphs, s-parameter data set (.zip file)

Case Style: MMM168

VAM-7+: Plastic molded SOT143 style package, lead finish: tin/silver/nickel

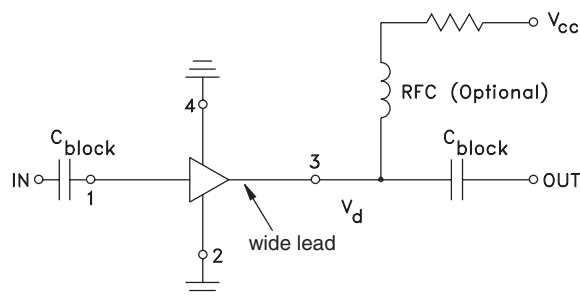
Tape & Reel: F8

Suggested Layout for PCB Design: PL-251

Evaluation Board: TB-415-7+

Environmental Ratings: ENV08

Recommended Application Circuit



R BIAS	
Vcc	"1%" Res. Values (ohms) for Optimum Biasing
7	137
8	182
9	226
10	274
11	316
12	365
13	412
14	453
15	499

**ESD Rating**

Human Body Model (HBM): Class 1B (500 v to < 1000 v) in accordance with ANSI/ESD STM 5.1 - 2001

Machine Model (MM): Class M1 (< 100 v) in accordance with ANSI/ESD STM 5.2 - 1999

**MSL Rating**

Moisture Sensitivity: MSL1 in accordance with IPC/JEDECJ-STD-020C

No.	Test Required	Condition	Standard	Quantity
1	Visual Inspection	Low Power Microscope Magnification 40x	MIP-IN-0003 (MCT spec)	45 units
2	Electrical Test	Room Temperature	SCD (MCL spec)	45 units
3	SAM Analysis	Less than 10% growth in term of delamination	J-Std-020C (Jedec Standard)	45 units
4	Moisture Sensitivity Level 1	Bake at 125°C for 24 hours Soak at 85°C/85%RH for 168 hours Reflow 3 cycles at 260°C peak	J-Std-020C (Jedec Standard)	45 units

**MSL Test Flow Chart**

