

Drop-In

# Monolithic Amplifier

## DC-1 GHz

### Features

- Exact foot print substitute\*\* MAR-8 and MSA-0885
- High gain, 31.5 dB at 0.1 GHz, reduces component count
- High power output, +12.5 dBm typ.
- Low noise
- Improved stability
- Protection against power supply transients
- Patent pending
- Aqueous washable

### Applications

- Cellular
- PCN & instrumentation

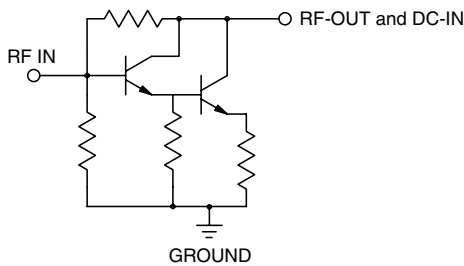
\*\* See resistor table; resistor values are higher than MAR-8/MSA-0885  
 how to replace: increase bias resistor (Rbias) by 110 ohms.

- Benefits:
- lower device voltage, 3.7 typ.
  - lower power dissipation in the MMIC
  - may eliminate need for choke (RFC)

### General Description

MAR-8A+ (RoHS compliant) is a wideband amplifier offering high dynamic range. It has repeatable performance from lot to lot. It is enclosed in a Micro-X package. MAR-8A+ uses Darlington configuration and is fabricated using InGaP HBT technology. Expected MTBF is 18,000 years at 85°C case temperature.

### simplified schematic and pin description

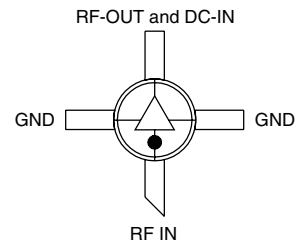


## MAR-8A+

CASE STYLE: VV105  
 PRICE: \$1.32 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.*



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.



P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661 For detailed performance specs & shopping online see Mini-Circuits web site



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RF/IF MICROWAVE COMPONENTS

REV. A  
 M108520  
 MAR-8A+  
 070122  
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Electrical Specifications at 25°C and 36mA, unless noted

Parameter	Min.	Typ. <sup>3</sup>	Max.	Units
Frequency Range	DC		1	GHz
Gain	f=0.1 GHz f=1 GHz	31.5 25		dB
Input Return Loss	f=DC to 1 GHz		15.5	dB
Output Return Loss	f=DC to 1 GHz		11	dB
Output Power @ 1 dB compression	f=1 GHz		+12.5	dBm
Output IP3	f=1 GHz		+25	dBm
Noise Figure	f=1 GHz		3.1	dB
Recommended Device Operating Current			36	mA
Device Operating Voltage	3.2	3.7	4.2	V
Thermal Resistance, junction-to-case <sup>1</sup>			119	°C/W

Absolute Maximum Ratings

Parameter	Ratings
Operating Temperature	-40°C to 85°C
Storage Temperature	-55°C to 100°C
Operating Current	65mA
Power Dissipation	250mW
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.

<sup>2</sup>Full temperature range.

<sup>3</sup>Based on test data of Model MAR-8ASM+ (Case Style WW107).



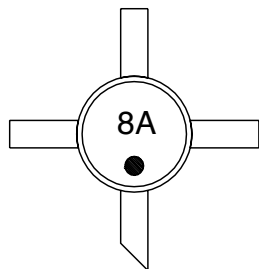
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Product Marking



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: VV105

Plastic micro-x, .085 body diameter, lead finish: tin/silver/nickel

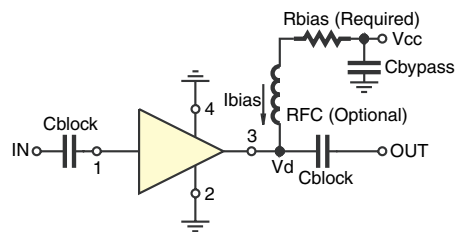
Tape & Reel: F20

Suggested Layout for PCB Design: PL-262

Evaluation Board: TB-432-8A+

Environmental Ratings: ENV08T3

Recommended Application Circuit



Test Board includes case, connectors, and components (in bold) soldered to PCB

R BIAS	
Vcc	"1%" Res. Values (ohms) for Optimum Biasing
7	88.7
8	118
9	143
10	174
11	200
12	226
13	255
14	280
15	309

**ESD Rating**

Human Body Model (HBM): Class 2 (2000v to < 4000v) in accordance with ANSI/ESD STM 5.1 - 2001

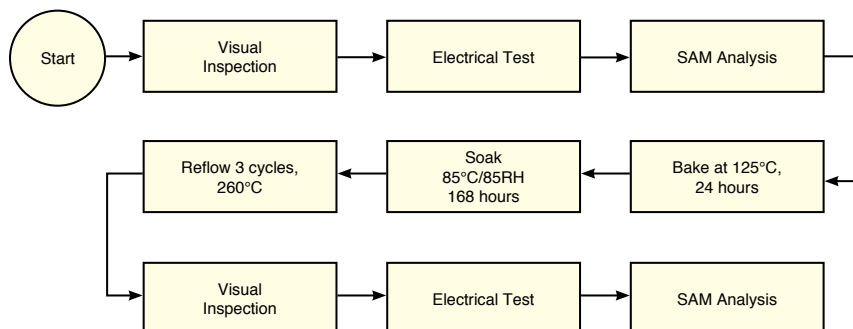
Charged Device Model (CDM): Class C4 ( 500v to 1000v) in accordance with ESD STM 5.3.1 - 1999

**MSL Rating**

Moisture Sensitivity: MSL1 in accordance with IPC/JEDEC J-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**



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