MMIC SURFACE MOUNT

Monolithic Amplifier

MAR-8A+

50Ω DC to 1 GHz

FEATURES

- Exact Footprint Substitute for MAR-8 and MSA-0885[a,b]
  Benefits:
  - Lower Device Voltage, +3.7 V Typ.
  - Lower Power Dissipation in the MMIC
  - May Eliminate Need for Choke (RFC)
- High Gain, 31.5 dB at 0.1 GHz, Reduces Component Count
- Internally Matched to 50Ω
- High Power Output, +12.5 dBm Typ.
- Low Noise
- Improved Stability
- Protection Against Power Supply Transients
- Patent Pending
- Aqueous Washable



Generic photo used for illustration purposes only

CASE STYLE: VV105

+RoHS Compliant
The +Suffix identifies RoHS Compliance.
See our website for methodologies and qualifications

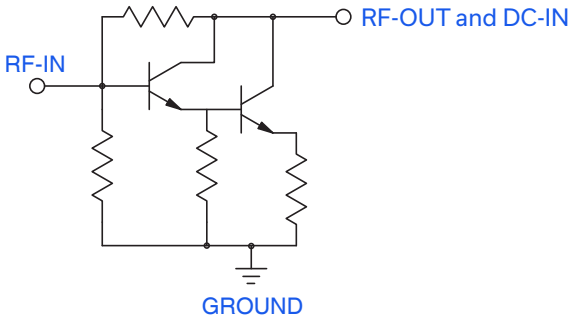
APPLICATIONS

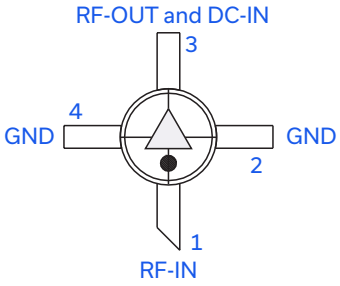
- Cellular
- PCN & Instrumentation

PRODUCT OVERVIEW

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.

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.

a. Suitability for model replacement within a particular system must be determined by and is solely the responsibility of the customer based on, among other things, electrical performance criteria, stimulus conditions, application, compatibility with other components and environmental conditions and stresses.
b. The Avago MSA-0885 part number is used for identification and comparison purposes only.

REV. E
ECO-024824
MAR-8A+
MCL NY
250311

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ELECTRICAL SPECIFICATIONS AT +25°C AND 36 mA UNLESS NOTED OTHERWISE

Parameter	Conditions (GHz)	Min.	Typ.[1]	Max.	Units
Frequency Range[2]		DC		1	GHz
Gain	0.1 1	 20[3]	31.5 25		dB
Input Return Loss	DC - 1		15.5		dB
Output Return Loss	DC - 1		11		dB
Output Power @ 1 dB Compression	1		+12.5		dBm
Output IP3	1		+25		dBm
Noise Figure	1		3.1		dB
Recommended Device Operating Current			36		mA
Device Operating Voltage		+3.2	+3.7	+4.2	V
Device Voltage Variation vs. Temperature at 36 mA			+1.2		mV/°C
Device Voltage Variation vs. Current at +25°C			11.3		mV/mA
Thermal Resistance, Junction-to-Case[4]			119		°C/W

1. Based on test data of Model MAR-8SM+ (Case Style WW107).
2. Guaranteed specification DC-1 GHz. Low frequency cut off determined by external coupling capacitors.
3. Full temperature range.
4. Case is defined as ground leads.

ABSOLUTE MAXIMUM RATINGS

Parameter	Ratings
Operating Temperature	-40°C to +85°C
Storage Temperature	-55°C to +100°C
Operating Current	65 mA
Power Dissipation	250 mW
Input Power	+13 dBm

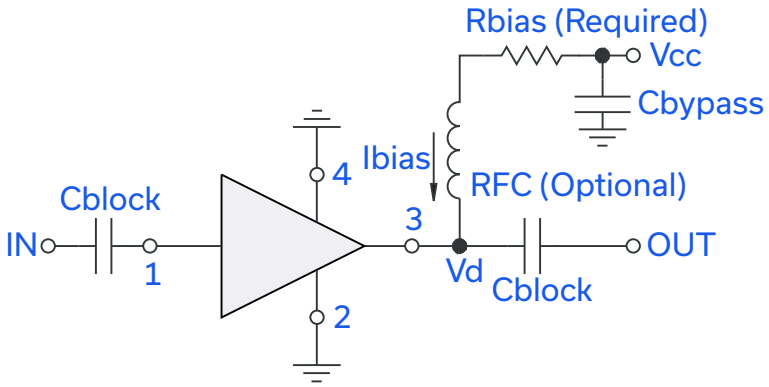
Permanent damage may occur if any of these limits are exceeded. These ratings are not intended for continuous normal operation.

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RECOMMENDED APPLICATION CIRCUIT

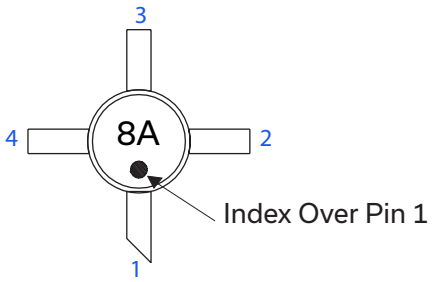


Test Board includes case, connectors, and components (in bold) soldered to PCB

R BIAS[5]	
Vcc	Bias Resistor Value[6]
7	88.7
8	118
9	143
10	174
11	200
12	226
13	255
14	280
15	309

5. When being used as a substitute for MAR-8SM or MSA-0866, the bias resistor values must be changed to the values in this table.
6. 1% Resistor values (Ohms) for optimum bias.

PRODUCT MARKING



Markings in addition to model number designation may appear for internal quality control purposes.

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ADDITIONAL DETAILED TECHNICAL INFORMATION IS AVAILABLE ON OUR DASHBOARD. CLICK HERE

Performance Data & Graphs	Data Table Swept Graphs S-Parameter Data Set (.zip file)
Case Style	VV105 Plastic micro-x package, 0.085 body diameter, Lead Finish: Matte-Tin
Tape & Reel	F4
Suggested Layout for PCB Design	PL-262
Evaluation Board	TB-432-8A+
Environmental Ratings	ENV08T3

ESD RATING

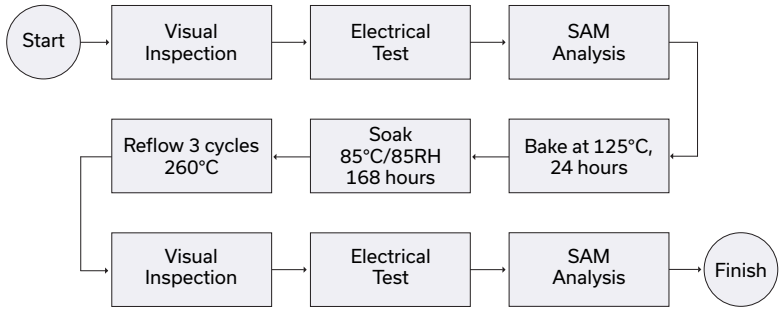
Human Body Model (HBM): Class 2 (2000 V to < 4000 V) in accordance with ANSI/ESD STM 5.1 - 2001
Charged Device Model (CDM): Class C4 (500 V to <=1000 V) in accordance with ESD STM 5.3.1 - 1999

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



NOTES

A. Performance and quality attributes and conditions not expressly stated in this specification document are intended to be excluded and do not form a part of this specification document.
B. Electrical specifications and performance data contained in this specification document are based on Mini-Circuits' applicable established test performance criteria and measurement instructions.
C. The parts covered by this specification document 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/terms/viewterm.html