Surface Mount

Monolithic Amplifier DC-2 GHz

Product Features

- Wideband, DC to 2 GHz
- Cascadable ceramic package
- Internally Matched to 50 Ohms
- Low noise figure, 1.9 dB typ.
- Excellent repeatability
- Aqueous washable

Replacement for RAM-6+ & MSA-0636[a,b,c,d]
AN-60-062

RAM-6A+

CASE STYLE: AF190
PRICE: $4.60 ea. QTY. (20)

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

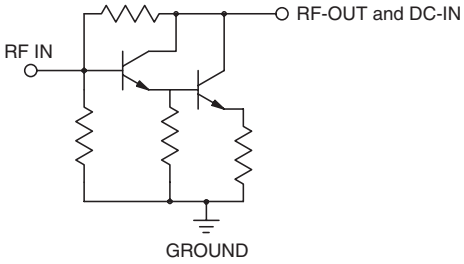
Typical Applications

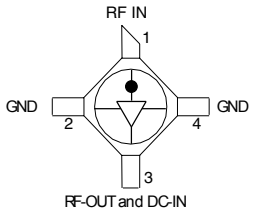
- Cellular
- UHF/VHF
- Communication system
- Transmition receivers

General Description

RAM-6A+ (RoHS compliant) is a wideband amplifier offering high dynamic range. It has repeatable performance from lot to lot. It is enclosed in a ceramic surface-mount package. RAM-6A+ uses Darlington configuration and is fabricated using GaAs 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. The RAM-6A+part number is a potential replacement for the MSA-0636 part number based on a comparison of data and characterization information available for the MSA-0636 versus similar data and the measured performance of RAM-6A+; the final determination of whether this RAM-6A+ part number is suitable 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 MSA-0636 part number is used for identification and comparison purposes only.

c. Avago Technologies is a registered trademark of Avago Technologies and is in no way affiliated with Mini-Circuits.

d. Data in Table for the MSA-0636 was taken from Avago Technologies published datasheet April 12, 2007and is used solely for informational purposes to identify MSA-0636

Electrical Specifications at 25°C and 16mA, unless noted

Parameter		Min.	Typ.	Max.	Units
Frequency Range*		DC		2	GHz
Gain	f=0.1 GHz f=1 GHz f=2 GHz	— — 15.4[2]	21.3 19.7 17.1		dB
Input Return Loss[3]	f=DC to 2 GHz		20		dB
Output Return Loss[3]	f=DC to 2 GHz		20		dB
Output Power @ 1 dB compression	f=0.5 GHz		+3.2		dBm
Output IP3	f=0.5 GHz		+17.3		dBm
Noise Figure	f=0.5 GHz		2.3		dB
Recommended Device Operating Current			16		mA
Device Operating Voltage			3.5		V
Device Voltage Variation vs. Temperature at 16 mA			-2.8		mV/°C
Device Voltage Variation vs. Current at 25°C			4.4		mV/mA
Thermal Resistance, junction-to-case[1]			100		°C/W

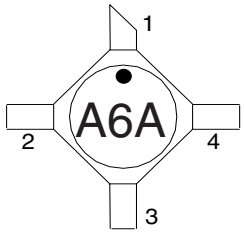
*Guaranteed specification DC-2 GHz. Low frequency cut off determined by external coupling capacitors.

Absolute Maximum Ratings

Parameter	Ratings
Operating Temperature	-54°C to 100°C
Storage Temperature	-65°C to 150°C
Operating Current	50mA
Power Dissipation	200mW
Input Power	13dBm

Note: Permanent damage may occur if any of these limits are exceeded.
These ratings are not intended for continuous normal operation.
[1]Case is defined as ground leads.
[2]Full temperature range.
[3]RAM-6A+ conditionally stable, source and load VSWR<5:1 required.
Potentially unstable with very high VSWR terminations.

Product Marking



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

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: AF190

Ceramic surface-mount, .083 body diameter, lead finish: tin-silver over nickel

Tape & Reel: F14

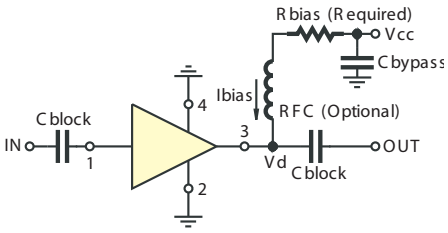
7" inch reels with 20, 50, 100, 200, 500, 1000 devices.

Suggested Layout for PCB Design: PL-254

Evaluation Board: TB-414-6A+

Environmental Ratings: ENV08T6

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**
6	154
7	215
8	280
9	340
10	402
11	464
12	536
13	590
14	665

ESD Rating

Human Body Model (HBM): Class 1C (1000 to <2000V) in accordance with ANSI/ESD STM 5.1 - 2001
Machine Model (MM): Class M2 (100V to <200V) in accordance with ANSI/ESD STM 5.2 - 1999