

MSA-0986

## >6V Fixed Gain Amplifier, Wideband for Use to 4 GHz

### Description



Lifecycle status: **Active**



### Features

The MSA-09 is a wideband 50ohm gain block targeted for narrow and wide bandwidth IF amplifier applications up to 4GHz. It is offered in a wide variety of plastic and ceramic packages. Bias: 10V, 35mA; f3dB = 6GHz; G = 8dB; NF = 6dB; P1dB = 11.5dBm; IP3i = 13.5dBm.

# MSA-0986

## Cascadable Silicon Bipolar MMIC Amplifier



### Data Sheet

#### Description

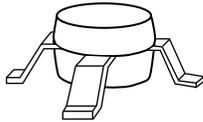
The MSA-0986 is a high performance silicon bipolar Monolithic Microwave Integrated Circuit (MMIC) housed in a low cost, surface mount plastic package. This MMIC is designed for very wide bandwidth industrial and commercial applications that require flat gain and low VSWR.

The MSA-series is fabricated using Avago's 10 GHz  $f_T$ , 25 GHz  $f_{MAX}$ , silicon bipolar MMIC process which uses nitride self-alignment, ion implantation, and gold metallization to achieve excellent performance, uniformity and reliability. The use of an external bias resistor for temperature and current stability also allows bias flexibility.

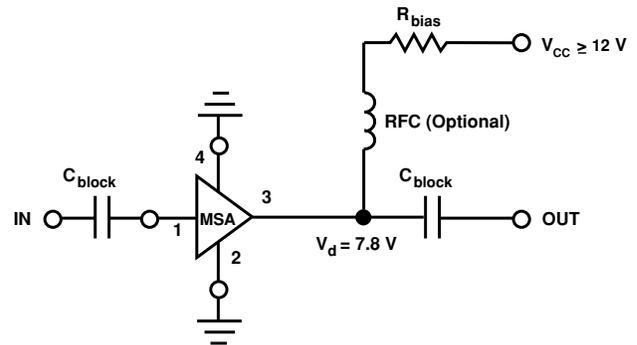
#### Features

- Broadband, Minimum Ripple Cascadable 50Ω Gain Block
- $7.2 \pm 0.5$  dB Typical Gain Flatness from 0.1 to 3.0 GHz
- 3 dB Bandwidth: 0.1 to 5.5 GHz
- 10.5 dBm Typical  $P_{1dB}$  at 2.0 GHz
- Surface Mount Plastic Package
- Tape-and-Reel Packaging Option Available
- Lead-free Option Available

#### 86 Plastic Package



#### Typical Biasing Configuration



### MSA-0986 Absolute Maximum Ratings

Parameter	Absolute Maximum <sup>[1]</sup>
Device Current	65 mA
Power Dissipation <sup>[2,3]</sup>	500 mW
RF Input Power	+13 dBm
Junction Temperature	150°C
Storage Temperature	-65 to +150°C

### Thermal Resistance<sup>[2]:</sup>

$$\theta_{jc} = 140^{\circ}\text{C}/\text{W}$$

#### Notes:

1. Permanent damage may occur if any of these limits are exceeded.
2.  $T_{\text{CASE}} = 25^{\circ}\text{C}$ .
3. Derate at 7.1 mW/°C for  $T_{\text{C}} > 80^{\circ}\text{C}$ .

### Electrical Specifications<sup>[1]</sup>, $T_{\text{A}} = 25^{\circ}\text{C}$

Symbol	Parameters and Test Conditions: $I_{\text{d}} = 35 \text{ mA}$ , $Z_{\text{o}} = 50 \Omega$	Units	Min.	Typ.	Max.
$G_{\text{P}}$	Power Gain ( $ S_{21} ^2$ ) $f = 2.0 \text{ GHz}$	dB	6.0	7.2	
$\Delta G_{\text{P}}$	Gain Flatness $f = 0.1 \text{ to } 3.0 \text{ GHz}$	dB		$\pm 0.5$	
$f_{3 \text{ dB}}$	3 dB Bandwidth <sup>[2]</sup>	GHz		5.5	
VSWR	Input VSWR $f = 1.0 \text{ to } 3.0 \text{ GHz}$			1.6:1	
	Output VSWR $f = 1.0 \text{ to } 3.0 \text{ GHz}$			1.8:1	
NF	50 $\Omega$ Noise Figure $f = 2.0 \text{ GHz}$	dB		6.2	
$P_{1 \text{ dB}}$	Output Power at 1 dB Gain Compression $f = 2.0 \text{ GHz}$	dBm		10.5	
$\text{IP}_3$	Third Order Intercept Point $f = 2.0 \text{ GHz}$	dBm		23.0	
$t_{\text{D}}$	Group Delay $f = 2.0 \text{ GHz}$	psec		95	
$V_{\text{d}}$	Device Voltage	V	6.2	7.8	9.4
dV/dT	Device Voltage Temperature Coefficient	mV/°C		-16.0	

#### Notes:

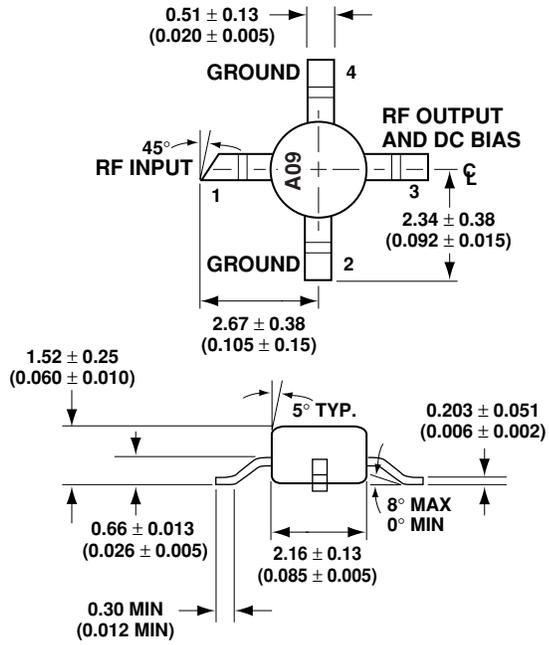
1. The recommended operating current range for this device is 25 to 45 mA. Typical performance as a function of current is on the following page.
2. Referenced from 0.1 GHz gain ( $G_{\text{P}}$ ).

### Ordering Information

Part Numbers	No. of Devices	Comments
MSA-0986-BLK	100	Bulk
MSA-0986-BLKG	100	Bulk
MSA-0986-TR1	1000	7" Reel
MSA-0986-TR1G	1000	7" Reel
MSA-0986-TR2	4000	13" Reel
MSA-0986-TR2G	4000	13" Reel

**Note:** Order part number with a "G" suffix if lead-free option is desired.

## 86 Plastic Package Dimensions



DIMENSIONS ARE IN MILLIMETERS (INCHES)