

MSA-0686

## 5V Fixed Gain Amp, for Applications to 1 GHz

### Description



Lifecycle status: **Active**



### Features

The MSA-06 is a general purpose cascadable 50ohm low current gain block targeted for narrow and wide bandwidth IF amplifier applications. It is offered in a wide variety of plastic and ceramic packages. Bias: 5V, 16mA;  $f_{3dB} = 1\text{GHz}$ ;  $G = 19\text{dB}$ ;  $NF = 3\text{dB}$ ;  $P_{1dB} = 2\text{dBm}$ ;  $IP_{3i} = -7\text{dBm}$

# MSA-0686

## Cascadable Silicon Bipolar MMIC Amplifier



### Data Sheet

#### Description

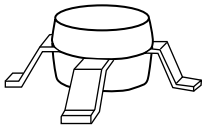
The MSA-0686 is a high performance silicon bipolar Monolithic Microwave Integrated Circuit (MMIC) housed in a low cost, surface mount plastic package. This MMIC is designed for use as a general purpose 50Ω gain block. Applications include narrow and broad band IF and RF amplifiers in commercial and industrial applications.

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.

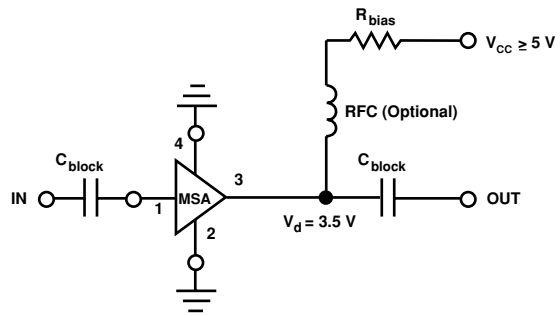
#### Features

- Cascadable 50Ω Gain Block
- Low Operating Voltage: 3.5 V Typical  $V_d$
- 3 dB Bandwidth: DC to 0.8 GHz
- High Gain: 18.5 dB Typical at 0.5 GHz
- Low Noise Figure: 3.0 dB Typical at 0.5 GHz
- Surface Mount Plastic Package
- Tape-and-Reel Packaging Available
- Lead-free Option Available

#### 86 Plastic Package



#### Typical Biasing Configuration



### MSA-0686 Absolute Maximum Ratings

Parameter	Absolute Maximum <sup>[1]</sup>
Device Current	50 mA
Power Dissipation <sup>[2,3]</sup>	200 mW
RF Input Power	+13 dBm
Junction Temperature	150°C
Storage Temperature	-65 to 150°C

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

$$\theta_{jc} = 120^{\circ}\text{C/W}$$

#### Notes:

1. Permanent damage may occur if any of these limits are exceeded.
2.  $T_{\text{CASE}} = 25^{\circ}\text{C}$ .
3. Derate at  $8.3 \text{ mW}/^{\circ}\text{C}$  for  $T_{\text{C}} > 126^{\circ}\text{C}$ .

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

Symbol	Parameters and Test Conditions: $I_{\text{d}} = 16 \text{ mA}$ , $Z_{\text{o}} = 50 \Omega$	Units	Min.	Typ.	Max.	
G <sub>P</sub>	Power Gain ( $ S_{21} ^2$ )	f = 0.1 GHz	dB	20.0		
						f = 0.5 GHz
$\Delta G_{\text{P}}$	Gain Flatness	f = 0.1 to 0.5 GHz	dB		±0.7	
f <sub>3 dB</sub>	3 dB Bandwidth		GHz	0.8		
VSWR	Input VSWR	f = 0.1 to 1.5 GHz			1.7:1	
	Output VSWR	f = 0.1 to 1.5 GHz			1.7:1	
NF	50 $\Omega$ Noise Figure	f = 0.5 GHz	dB	3.0		
P <sub>1 dB</sub>	Output Power at 1 dB Gain Compression	f = 0.5 GHz	dBm	2.0		
IP <sub>3</sub>	Third Order Intercept Point	f = 0.5 GHz	dBm	14.5		
t <sub>D</sub>	Group Delay	f = 0.5 GHz	psec	225		
V <sub>d</sub>	Device Voltage		V	2.8	3.5	4.2
dV/dT	Device Voltage Temperature Coefficient		mV/°C		-8.0	

#### Notes:

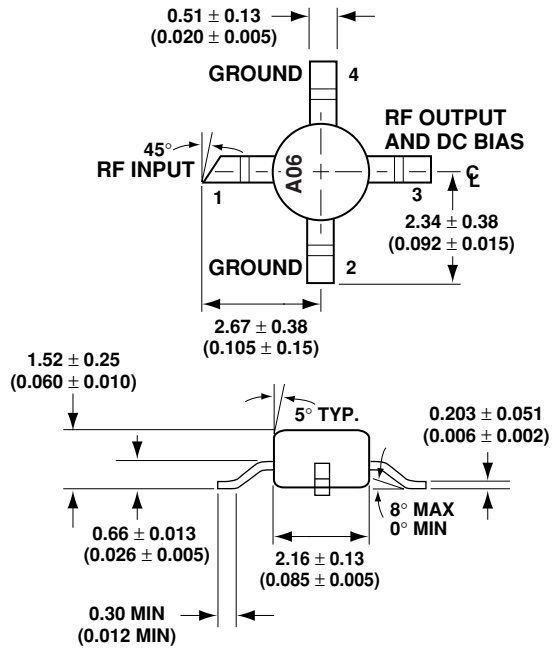
1. The recommended operating current range for this device is 12 to 20 mA. Typical performance as a function of current is on the following page.

### Ordering Information

Part Numbers	No. of Devices	Comments
MSA-0686-BLK	100	Bulk
MSA-0686-BLKG	100	Bulk
MSA-0686-TR1	1000	7" Reel
MSA-0686-TR1G	1000	7" Reel
MSA-0686-TR2	4000	13" Reel
MSA-0686-TR2G	1000	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)