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MSA-1105

## >6V Fixed Gain, High Dynamic Range Amplifier

### Description

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Lifecycle status: **Active**



### Features

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The MSA-11 is a high dynamic range 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: 8V, 60mA; f3dB = 1.6GHz; G = 12.5dB; NF = 3.5dB; P1dB = 17.5dBm; IP3i = 5dBm.

## Data Sheet

### Description

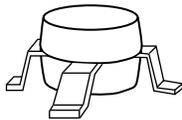
The MSA-1105 is a high performance silicon bipolar Monolithic Microwave Integrated Circuit (MMIC) housed in a low cost, surface mount plastic package. This MMIC is designed for high dynamic range in either 50  $\Omega$  or 75  $\Omega$  systems by combining low noise figure with high  $IP_3$ . Typical applications include narrow and broadband linear amplifiers in commercial and industrial systems.

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.

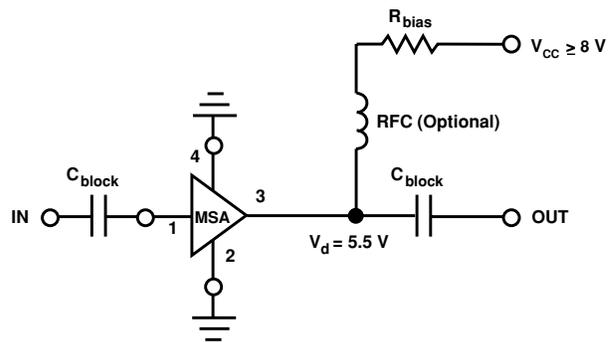
### Features

- High Dynamic Range Cascadable 50 $\Omega$  or 75 $\Omega$  Gain Block
- 3 dB Bandwidth: 50 MHz to 1.3 GHz
- 17.5 dBm Typical  $P_{1\text{ dB}}$  at 0.5 GHz
- 3.6 dB Typical Noise Figure at 0.5 GHz
- Surface Mount Plastic Package
- Tape-and-Reel Packaging Option Available
- Lead-free Option Available

### 05 Plastic Package



### Typical Biasing Configuration



## MSA-1105 Absolute Maximum Ratings

Parameter	Absolute Maximum <sup>[1]</sup>
Device Current	80 mA
Power Dissipation <sup>[2,3]</sup>	550 mW
RF Input Power	+13 dBm
Junction Temperature	150°C
Storage Temperature	-65 to 150°C

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

$$\theta_{jc} = 125^{\circ}\text{C/W}$$

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 mW/°C for  $T_{\text{C}} > 124^{\circ}\text{C}$ .

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

Symbol	Parameters and Test Conditions: $I_{\text{d}} = 60 \text{ mA}$ , $Z_0 = 50 \Omega$	Units	Min.	Typ.	Max.	
$G_{\text{p}}$	Power Gain ( $ S_{21} ^2$ )	$f = 0.05 \text{ GHz}$			12.7	
		$f = 0.5 \text{ GHz}$	dB	10.0	12.0	
		$f = 1.0 \text{ GHz}$	dB		10.5	
$\Delta G_{\text{p}}$	Gain Flatness	$f = 0.1 \text{ to } 1.0 \text{ GHz}$			$\pm 1.0$	
$f_{3 \text{ dB}}$	3 dB Bandwidth <sup>[2]</sup>				1.3	
VSWR	Input VSWR	$f = 0.1 \text{ to } 1.0 \text{ GHz}$			1.5:1	
	Output VSWR	$f = 0.1 \text{ to } 1.0 \text{ GHz}$			1.7:1	
NF	50 $\Omega$ Noise Figure	$f = 0.5 \text{ GHz}$	dB		3.6	
$P_{1 \text{ dB}}$	Output Power at 1 dB Gain Compression	$f = 0.5 \text{ GHz}$	dBm		17.5	
$IP_3$	Third Order Intercept Point	$f = 0.5 \text{ GHz}$	dBm		30.0	
$t_{\text{D}}$	Group Delay	$f = 0.5 \text{ GHz}$	psec		200	
$V_{\text{d}}$	Device Voltage		V	4.4	5.5	6.6
$dV/dT$	Device Voltage Temperature Coefficient		mV/°C		-8.0	

Notes:

1. The recommended operating current range for this device is 40 to 70 mA.  
Typical performance as a function of current is on the following page.
2. Referenced from 50 MHz gain (GP).

## Ordering Information

Part Numbers	No. of Devices	Comments
MSA-1105-STR	10	Bulk
MSA-1105-STRG	100	Bulk
MSA-1105-TR1	500	7" Reel
MSA-1105-TR1G	500	7" Reel
MSA-1105-TR2	1500	13" Reel
MSA-1105-TR2G	1500	13" Reel

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

