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MSA-1105

>6V Fixed Gain, High Dynamic Range Amplifier

Description



Lifecycle status: **Active**



Features

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.

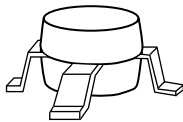
Data Sheet

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 or 75 Ω 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.

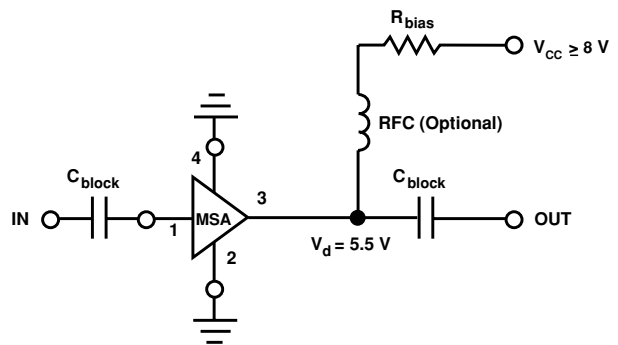
05 Plastic Package



Features

- High Dynamic Range Cascadable 50 Ω or 75 Ω 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

Typical Biasing Configuration



MSA-1105 Absolute Maximum Ratings

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

Thermal Resistance^[2]:

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

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^[1], $T_{\text{A}} = 25^{\circ}\text{C}$

Symbol	Parameters and Test Conditions: $I_{\text{d}} = 60 \text{ mA}$, $Z_0 = 50 \Omega$	Units	Min.	Typ.	Max.	
G_{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	
ΔG_{p}	Gain Flatness	$f = 0.1 \text{ to } 1.0 \text{ GHz}$			± 1.0	
$f_{3 \text{ dB}}$	3 dB Bandwidth ^[2]		GHz		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 Ω 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_{D}	Group Delay	$f = 0.5 \text{ GHz}$	psec		200	
V_{d}	Device Voltage		V	4.4	5.5	6.6
dV/dT	Device Voltage Temperature Coefficient		mV/°C		-8.0	

Notes:

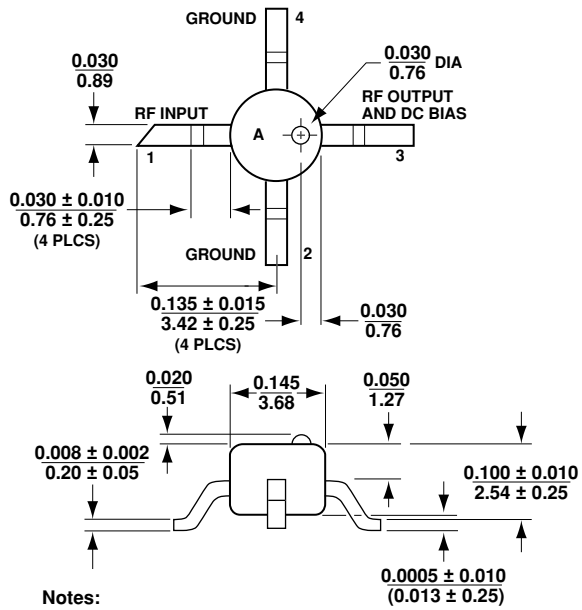
1. The recommended operating current range for this device is 40 to 70 mA.
Typical performance as a function of current is on the following page.
2. Referenced from 50 MHz gain (GP).

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.

05 Plastic Package Dimensions



Notes:

(unless otherwise specified)

1. Dimensions are $\frac{\text{in}}{\text{mm}}$
2. Tolerances
in .xxx = 0.005
mm .xx = 0.13