MSA-1110

>6V Fixed Gain, High Dynamic Range Amplifier

Description

Lead (PB) Free
RoHS 6 fully compliant

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.

MSA-1110
Cascadable Silicon Bipolar MMIC Amplifier

Data Sheet

Description

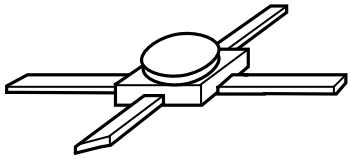
The MSA-1110 is a high performance silicon bipolar Monolithic Microwave Integrated Circuit (MMIC) housed in a hermetic high reliability package. This MMIC is designed for high dynamic range in either 50 or 75Ω systems by combining low noise figure with high IP_3. Typical applications include narrow and broadband linear amplifiers in industrial and military 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.

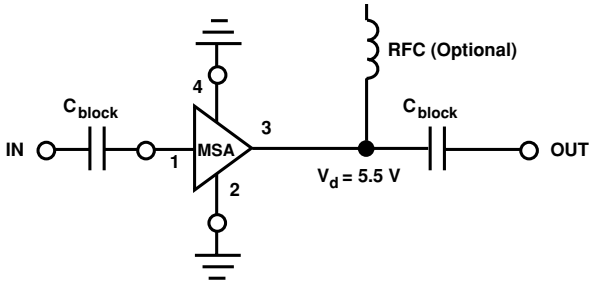
Features

- High Dynamic Range Cascadable 50Ω or 75Ω Gain Block
- 3 dB Bandwidth: 50 MHz to 1.6 GHz
- 17.5 dBm Typical $P_{1\ dB}$ at 0.5 GHz
- 12 dB Typical 50 Ω Gain at 0.5 GHz
- 3.5 dB Typical Noise Figure at 0.5 GHz
- Hermetic Gold-ceramic Microstrip Package

100 mil Package



Typical Biasing Configuration



MSA-1110 Absolute Maximum Ratings

Parameter	Absolute Maximum[1]
Device Current	90 mA
Power Dissipation[2,3]	560 mW
RF Input Power	+13 dBm
Junction Temperature	200°C
Storage Temperature	–65 to 200°C

Thermal Resistance[2, 4]:

$\theta_{jc} = 135°C/W$

Notes:
1. Permanent damage may occur if any of these limits are exceeded.
2. $T_{CASE} = 25°C$.
3. Derate at 7.4 mW/°C for $T_C > 124°C$.
4. The small spot size of this technique results in a higher, though more accurate determination of θ_{jc} than do alternate methods.

Electrical Specifications[1], $T_A = 25°C$

Symbol	Parameters and Test Conditions: $I_d = 60$ mA, $Z_0 = 50\ \Omega$		Units	Min.	Typ.	Max.
G_P	Power Gain ($\|S_{21}\|^2$)	f = 0.1 GHz	dB	11.5	12.5	13.5
ΔG_P	Gain Flatness	f = 0.1 to 1.0 GHz	dB		±0.7	±1.0
$f_{3\ dB}$	3 dB Bandwidth[2]		GHz		1.6	
VSWR	Input VSWR	f = 0.1 to 1.0 GHz			1.7:1	
	Output VSWR	f = 0.1 to 1.0 GHz			1.9:1	
NF	50 Ω Noise Figure	f = 0.5 GHz	dB		3.5	4.5
$P_{1\ dB}$	Output Power at 1 dB Gain Compression	f = 0.5 GHz	dBm	16.0	17.5	
IP_3	Third Order Intercept Point	f = 0.5 GHz	dBm		30.0	
t_D	Group Delay	f = 0.5 GHz	psec		160	
V_d	Device Voltage		V	4.5	5.5	6.5
dV/dT	Device Voltage Temperature Coefficient		mV/°C		–8.0	

Notes:
1. The recommended operating current range for this device is 40 to 75 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-1110	100	Bulk

100 mil Package Dimensions