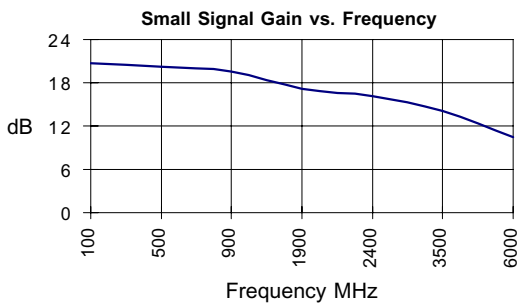


Product Description

Stanford Microdevices' SGA-2463 is a high performance cascadeable 50-ohm amplifier designed for operation at voltages as low as 2.6V. This RFIC uses the latest Silicon Germanium Heterostructure Bipolar Transistor (SiGe HBT) process featuring 1 micron emitters with F_T up to 50 GHz.

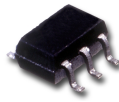
This circuit uses a darlington pair topology with resistive feedback for broadband performance as well as stability over its entire temperature range. Internally matched to 50 ohm impedance, the SGA-2463 requires only DC blocking and bypass capacitors for external components.



Preliminary

SGA-2463

DC-2000 MHz Silicon Germanium HBT Cascadeable Gain Block



Product Features

- DC-2000 MHz Operation
- Single Voltage Supply
- Low Current Draw: 20mA at 2.6V typ.
- High Output Intercept: +19.5dBm typ. at 1950 MHz
- Low Noise Figure: 2.6dB typ. at 850 MHz

Applications

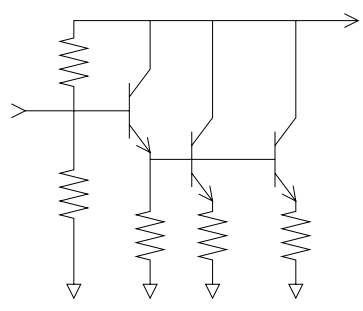
- Oscillator Amplifiers
- Cordless Phones
- IF/ RF Buffer Amplifier
- Drivers for CATV Amplifiers

Symbol	Parameters: Test Conditions: $Z_0 = 50 \text{ Ohms}$, $I_d = 20 \text{ mA}$, $T = 25^\circ\text{C}$		Units	Min.	Typ.	Max.
P_{1dB}	Output Power at 1dB Compression	$f = 850 \text{ MHz}$ $f = 1950 \text{ MHz}$	dBm dBm		9.2 6.6	
S_{21}	Small Signal Gain	$f = \text{DC} - 1000 \text{ MHz}$ $f = 1000 - 2000 \text{ MHz}$	dB dB	18.2	20.2 18.1	
S_{12}	Reverse Isolation	$f = \text{DC} - 1000 \text{ MHz}$ $f = 1000 - 2000 \text{ MHz}$	dB dB		23.2 23.1	
S_{11}	Input VSWR	$f = \text{DC} - 2000 \text{ MHz}$	-		1.6	
S_{22}	Output VSWR	$f = \text{DC} - 2000 \text{ MHz}$	-		1.3	
IP_3	Third Order Intercept Point Power out per Tone = -10 dBm	$f = 850 \text{ MHz}$ $f = 1950 \text{ MHz}$	dBm dBm		20.1 19.5	
NF	Noise Figure	$f = \text{DC} - 1000 \text{ MHz}$ $f = 1000 - 2000 \text{ MHz}$	dB dB		2.6 3.1	
T_D	Group Delay	$f = 1000 \text{ MHz}$	pS		111	
V_D	Device Voltage		V	2.3	2.6	2.9

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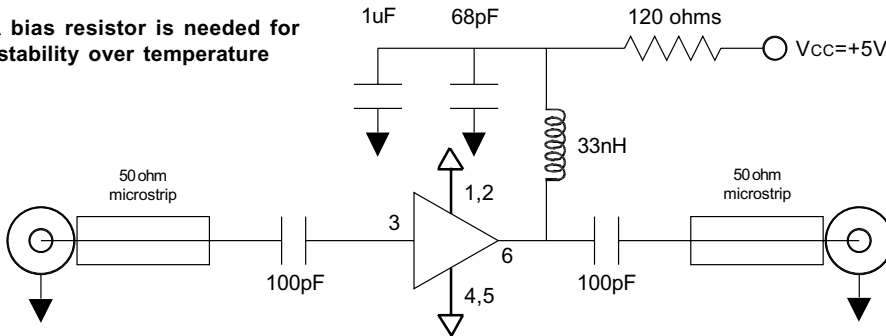
Parameter	Specification				Test
	Min	Typ.	Max.	Unit	Condition
Bandwidth Frequency Range	DC		5000	MHz	T= 25C
Device Bias Operating Voltage Operating Current		2.6 20		V mA	T= 25C
500 MHz Gain Noise Figure Output IP3 Output P1dB Input Return Loss Isolation		20.3 2.7 19.7 8.1 14.5 22.9		dB dB dBm dBm dB dB	T= 25C
850 MHz Gain Noise Figure Output IP3 Output P1dB Input Return Loss Isolation		19.6 2.6 20.1 9.2 13.2 22.9		dB dB dBm dBm dB dB	T= 25C
1950 MHz Gain Noise Figure Output IP3 Output P1dB Input Return Loss Isolation		17.1 3.1 19.5 6.6 11.2 22.8		dB dB dBm dBm dB dB	T= 25C

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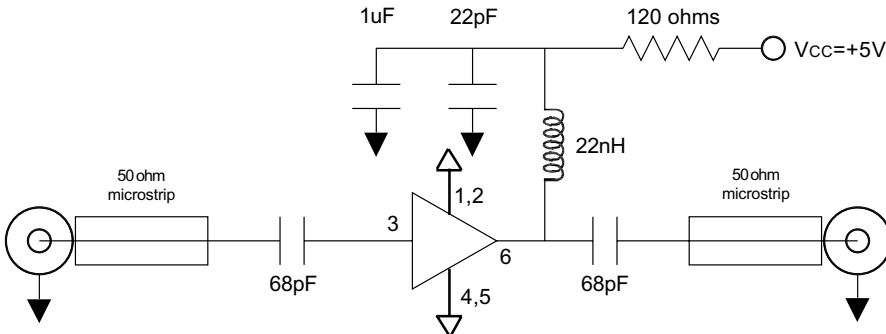
Pin #	Function	Description	Device Schematic
1	GND	Connection to ground. Use via holes for best performance to reduce lead inductance as close to ground leads as possible.	
2	GND	Sames as Pin 1	
3	RF IN	RF input pin. This pin requires the use of an external DC blocking capacitor chosen for the frequency of operation.	
4	GND	Sames as Pin 1	
5	GND	Sames as Pin 1	
6	RF OUT	RF output and bias pin. DC voltage is present on this pin, therefore a DC blocking capacitor is necessary for proper operation.	

Application Schematic for +5V Operation at 900 MHz

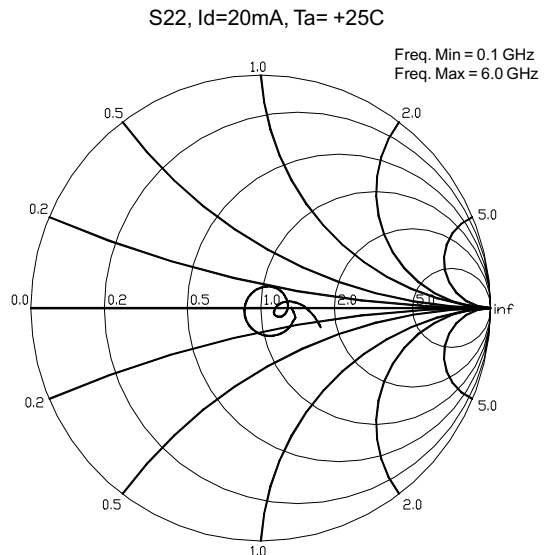
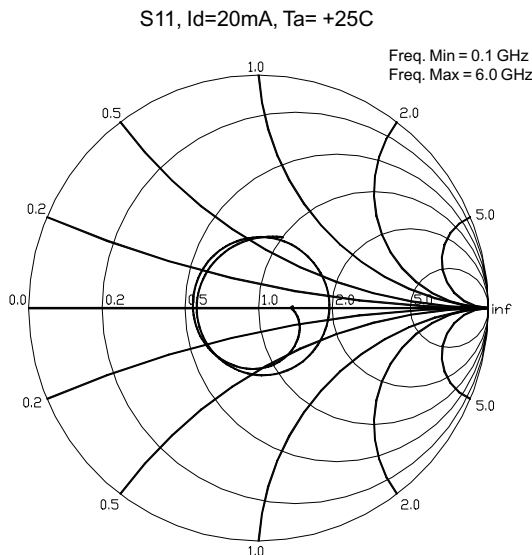
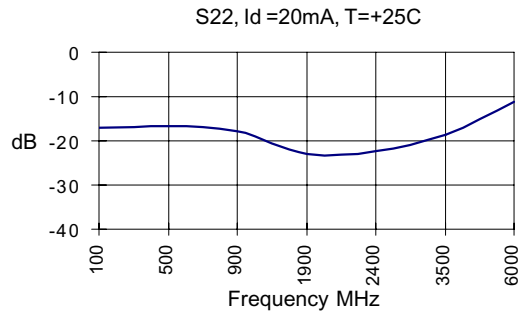
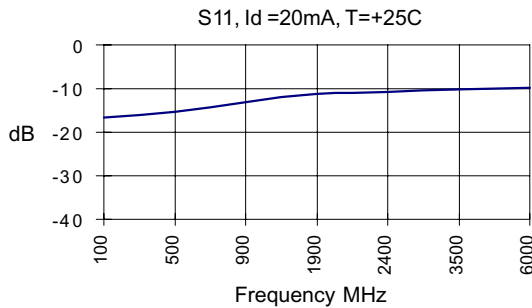
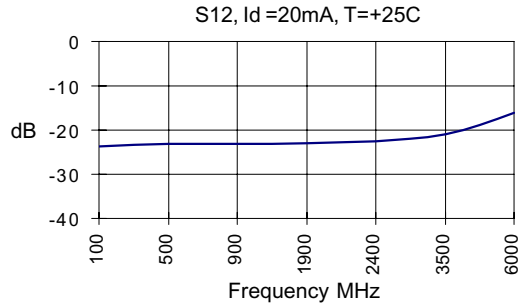
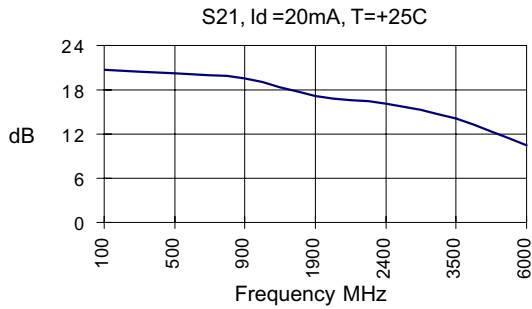
Note: A bias resistor is needed for stability over temperature



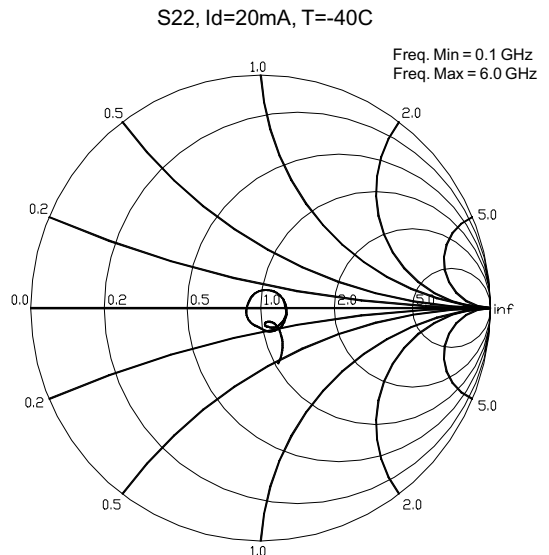
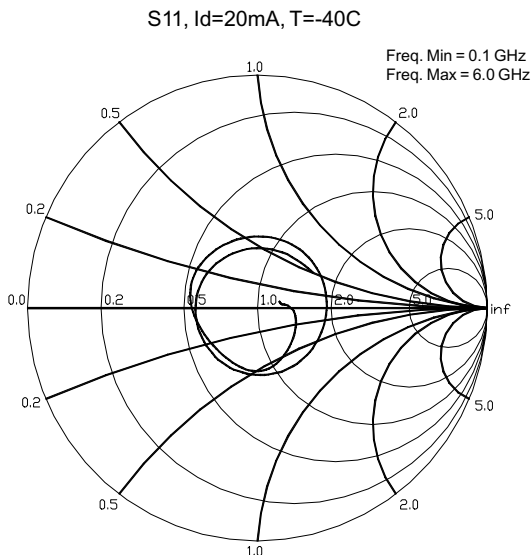
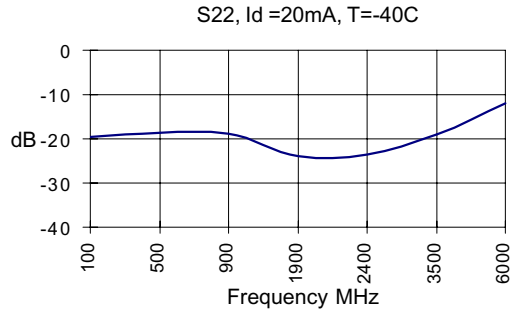
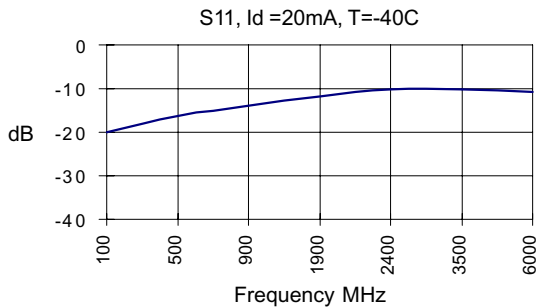
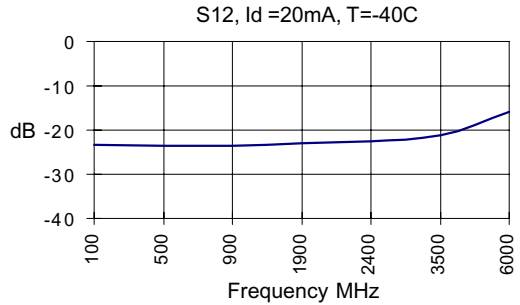
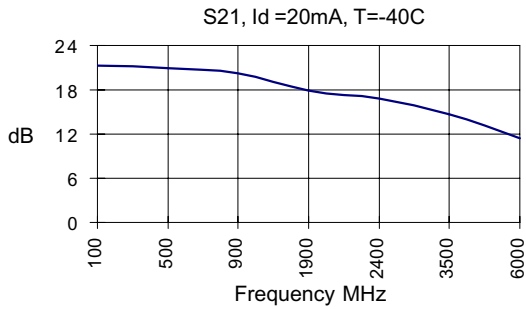
Application Schematic for +5V Operation at 1900 MHz



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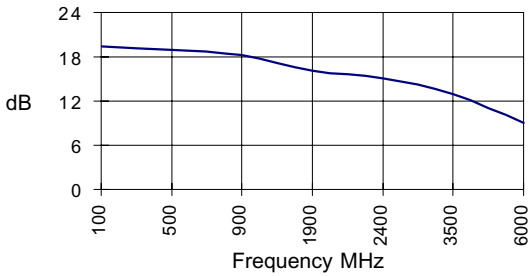


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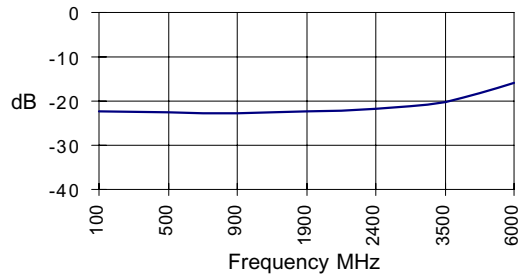


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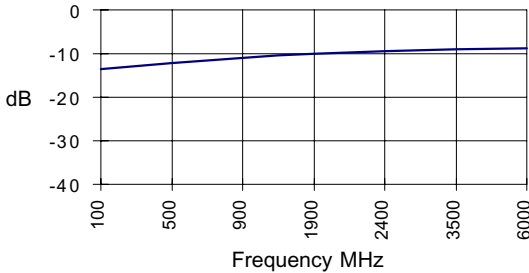
S21, Id =20mA, T=+85C



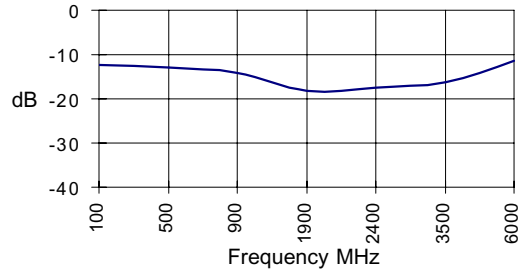
S12, Id =20mA, T=+85C



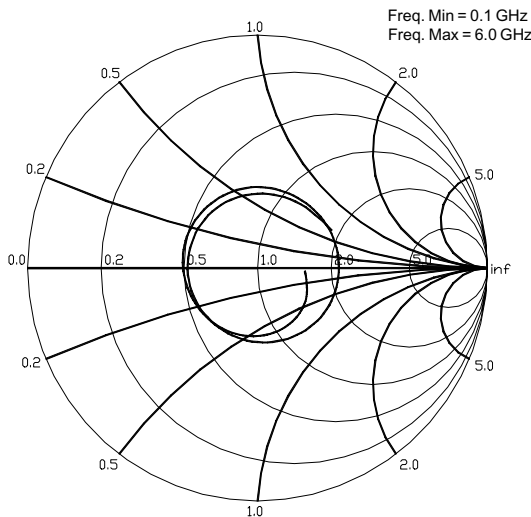
S11, Id =20mA, T=+85C



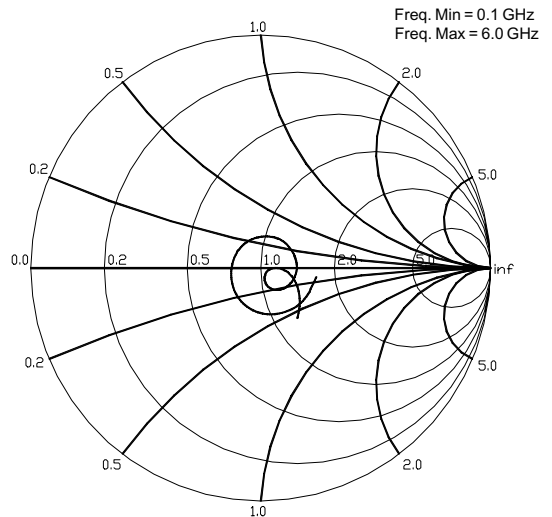
S22, Id =20mA, T=+85C



S11, Id=20mA, T=+85C



S22, Id=20mA, T=+85C



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Absolute Maximum Ratings

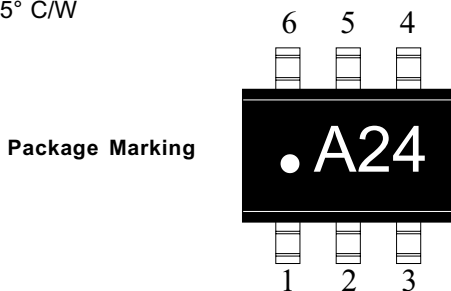
Parameter	Value	Unit
Supply Current	40	mA
Operating Temperature	-40 to +85	C
Maximum Input Power	+4	dBm
Storage Temperature Range	-40 to +85	C
Operating Junction Temperature	+125	C

Caution:



Operation of this device above any one of these parameters may cause permanent damage. Appropriate precautions in handling, packaging and testing devices must be observed.

Thermal Resistance (Lead-Junction):
255° C/W



Part Number Ordering Information

Part Number	Reel Size	Devices/Reel
SGA-2463-TR1	7"	3000

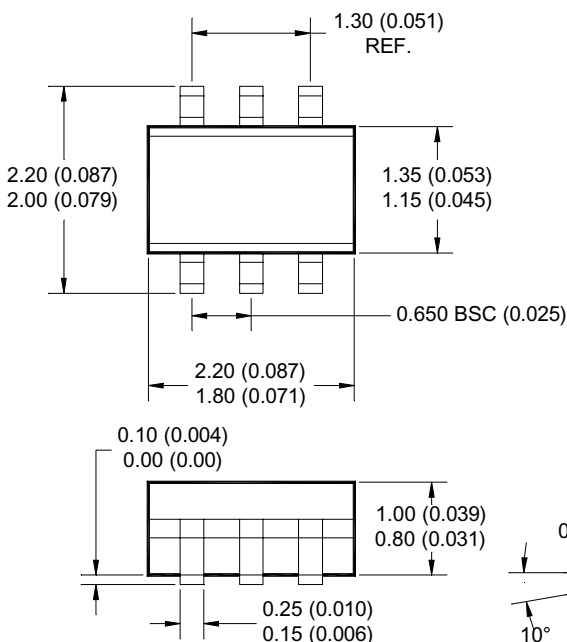
Recommended Bias Resistor Values

Supply Voltage(Vs)	3V	5V	7.5V	9V	12V
Rbias (Ohms)	20	120	245	320	470

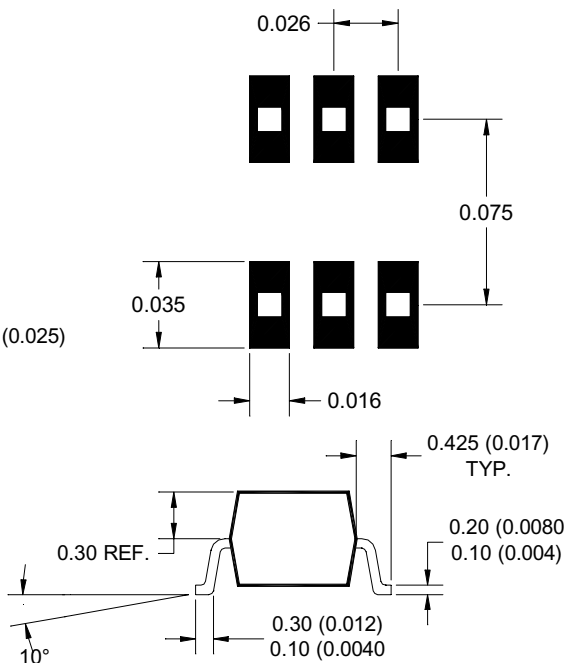
Pin Designation	
1	GND
2	GND
3	RF in
4	GND
5	GND
6	RF out

Note: Pin 1 is on lower left when you can read package marking

Package Dimensions



Pad Layout



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