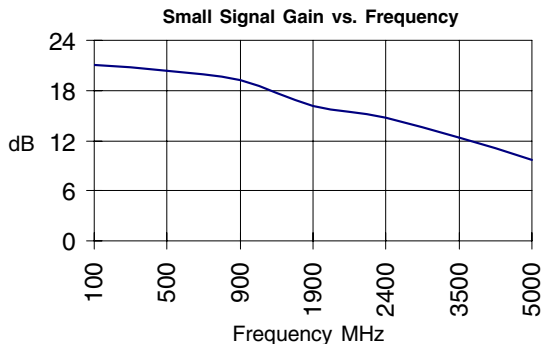


Product Description

Stanford Microdevices' SGA-6486 is a high performance cascadeable 50-ohm amplifier. This RFIC uses the latest Silicon Germanium Heterostructure Bipolar Transistor (SiGe HBT) process featuring 1 micron emitters with F_T up to 65 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-6486 requires only DC blocking and bypass capacitors for external components.



Electrical Specifications at $T_a = 25^\circ\text{C}$

Symbol	Parameters: Test Conditions: $Z_o = 50 \text{ Ohms}$, $f = \text{DC-1800 MHz}$		Units	Min.	Typ.	Max.
P_{1dB}	Output Power at 1dB Compression	$f = 850 \text{ MHz}$ $f = 1950 \text{ MHz}$	dBm dBm		21.0 18.5	
S_{21}	Small Signal Gain	$f = \text{DC-1000 MHz}$ $f = 1000\text{-}2000 \text{ MHz}$ $f = 2000\text{-}5000 \text{ MHz}$	dB dB dB	17.5	19.7 16.7 12.3	
S_{12}	Reverse Isolation	$f = \text{DC-1000 MHz}$ $f = 1000\text{-}2000 \text{ MHz}$ $f = 2000\text{-}5000 \text{ MHz}$	dB dB		23.6 22.3 17.0	
S_{11}	Input VSWR	$f = \text{DC-5000 MHz}$	-		1.50:1	
S_{22}	Output VSWR	$f = \text{DC-5000 MHz}$	-		1.50:1	
IP_3	Third Order Intercept Point	$f = 850 \text{ MHz}$ $f = 1950 \text{ MHz}$	dBm dBm		35.0 32.5	
NF	Noise Figure	$f = \text{DC-1000 MHz}$ $f = 1000\text{-}2400 \text{ MHz}$	dB dB		3.0 3.3	
T_D	Group Delay	$f = 1000 \text{ MHz}$	pS		130.6	
V_D	Device Voltage		V	4.4	5.2	5.5
I_D	Device Current		mA		75	

The information provided herein is believed to be reliable at press time. Stanford Microdevices assumes no responsibility for inaccuracies or omissions. Stanford Microdevices assumes no responsibility for the use of this information, and all such information shall be entirely at the user's own risk. Prices and specifications are subject to change without notice. No patent rights or licenses to any of the circuits described herein are implied or granted to any third party. Stanford Microdevices does not authorize or warrant any Stanford Microdevices product for use in life-support devices and/or systems.
Copyright 1999 Stanford Microdevices, Inc. All worldwide rights reserved.

SGA-6486

DC-1800 MHz Silicon Germanium HBT Cascadeable Gain Block



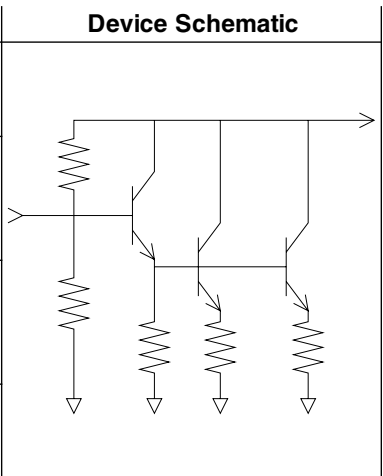
Product Features

- DC-1800 MHz Operation
- Single Voltage Supply
- High Output Intercept: +35.0 dBm typ. at 850 MHz
- High Output Power : 21.0 dBm typ. at 850 MHz
- High Gain : 19.7dB typ. at 850 MHz
- Internally Matched to 50 Ohms Input & Output

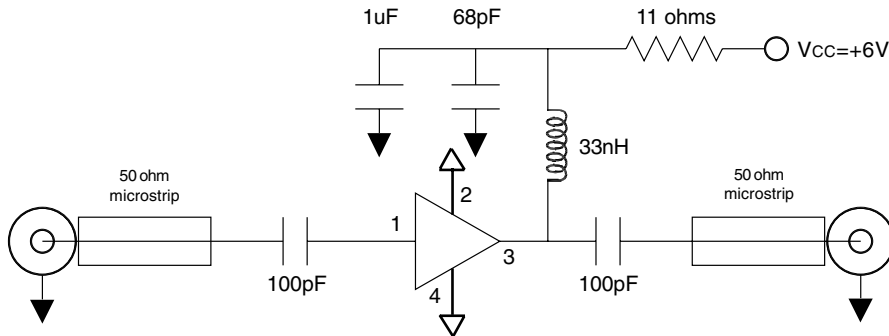
Applications

- Oscillator Amplifiers
- Final PA for Low Power Applications
- IF/ RF Buffer Amplifier
- Drivers for CATV Amplifiers

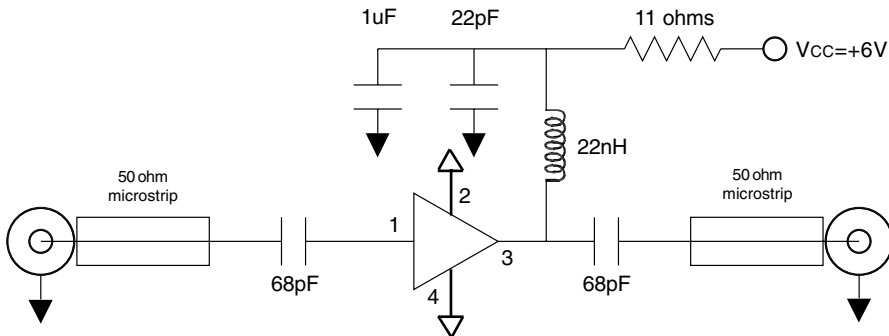
Parameter	Specification				Test Condition
	Min	Typ.	Max.	Unit	
Bandwidth Frequency Range	DC		1800	MHz	T= 25C
Device Bias Operating Voltage Operating Current		5.2 75.0		V mA	T= 25C
500 MHz Gain Noise Figure Output IP3 Output P1dB Input Return Loss Isolation		20.3 2.9 34.8 20.7 23.3 23.9		dB dB dBm dBm dB dB	T= 25C
850 MHz Gain Noise Figure Output IP3 Output P1dB Input Return Loss Isolation		19.7 3.0 35.0 21.0 22.8 23.6		dB dB dBm dBm dB dB	T= 25C
1950 MHz Gain Noise Figure Output IP3 Output P1dB Input Return Loss Isolation		16.1 3.6 32.5 18.5 21.4 21.3		dB dB dBm dBm dB dB	T= 25C
2400 MHz Gain Noise Figure Output IP3 Output P1dB Input Return Loss Isolation		14.8 3.7 31.4 17.2 17.4 19.7		dB dB dBm dBm dB dB	T= 25C

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

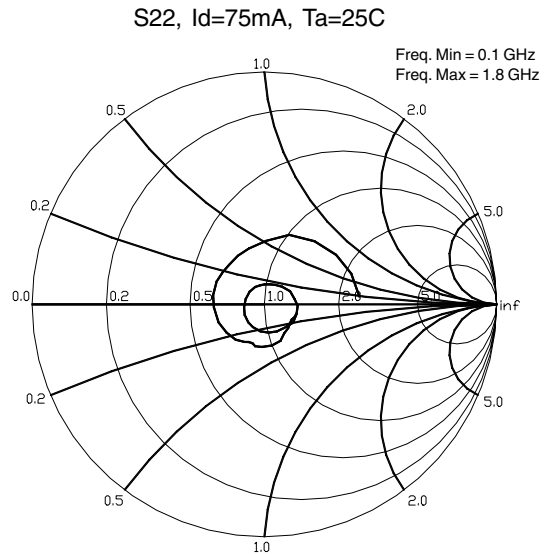
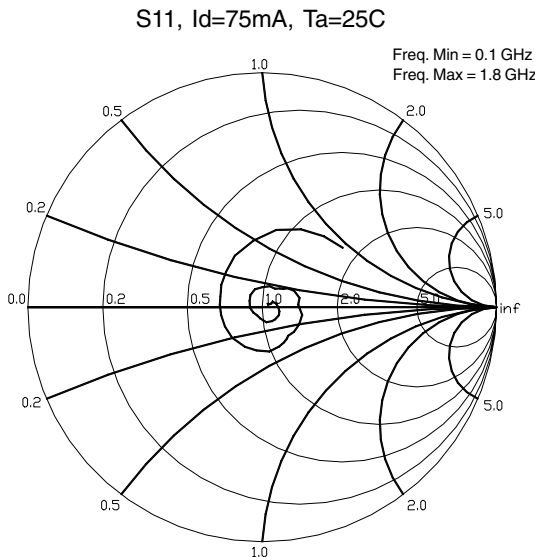
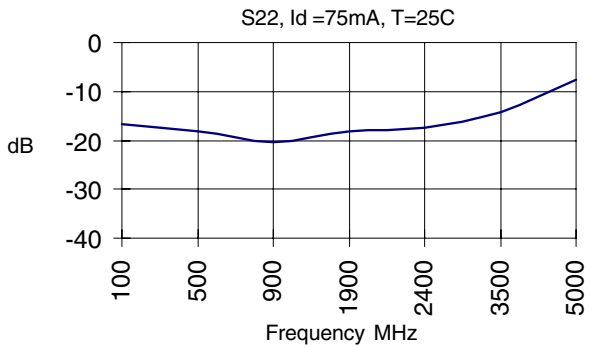
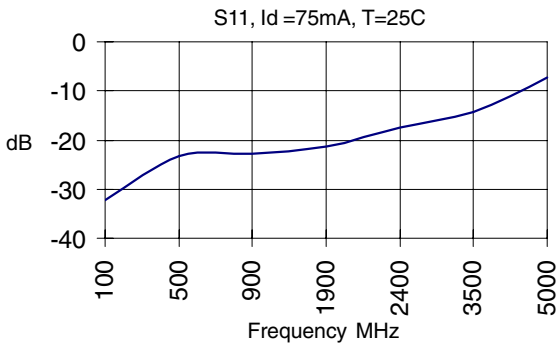
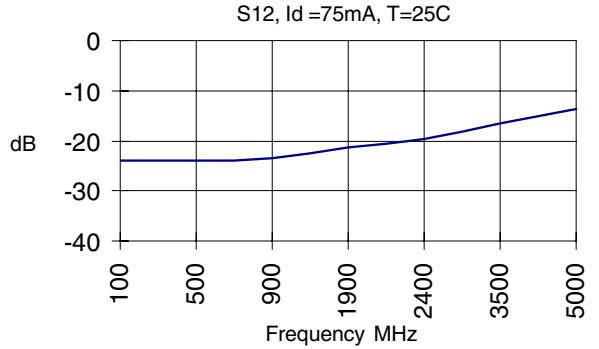
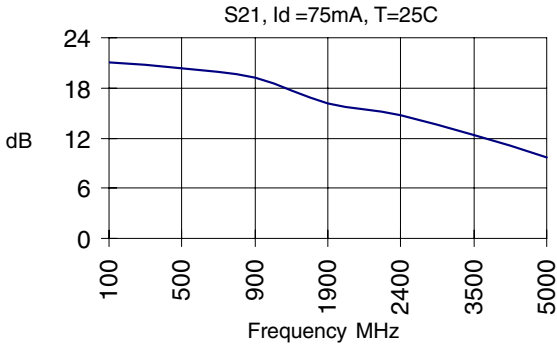
Application Schematic for +6V Operation at 900 MHz



Application Schematic for +6V Operation at 1900 MHz

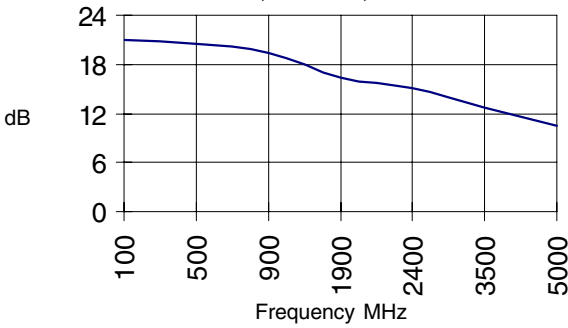


The information provided herein is believed to be reliable at press time. Stanford Microdevices assumes no responsibility for inaccuracies or omissions. Stanford Microdevices assumes no responsibility for the use of this information, and all such information shall be entirely at the user's own risk. Prices and specifications are subject to change without notice. No patent rights or licenses to any of the circuits described herein are implied or granted to any third party. Stanford Microdevices does not authorize or warrant any Stanford Microdevices product for use in life-support devices and/or systems. Copyright 1999 Stanford Microdevices, Inc. All worldwide rights reserved.

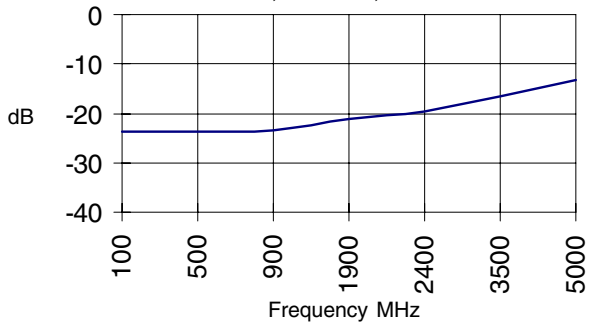


The information provided herein is believed to be reliable at press time. Stanford Microdevices assumes no responsibility for inaccuracies or omissions. Stanford Microdevices assumes no responsibility for the use of this information, and all such information shall be entirely at the user's own risk. Prices and specifications are subject to change without notice. No patent rights or licenses to any of the circuits described herein are implied or granted to any third party. Stanford Microdevices does not authorize or warrant any Stanford Microdevices product for use in life-support devices and/or systems. Copyright 1999 Stanford Microdevices, Inc. All worldwide rights reserved.

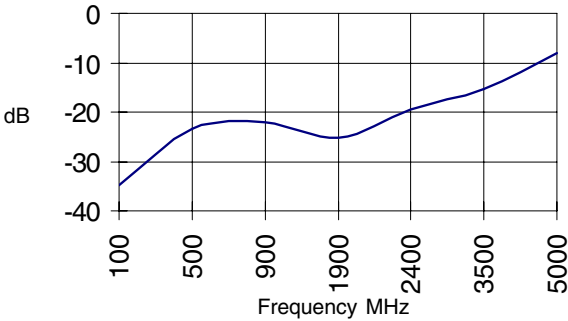
S21, Id =75mA, T=-40C



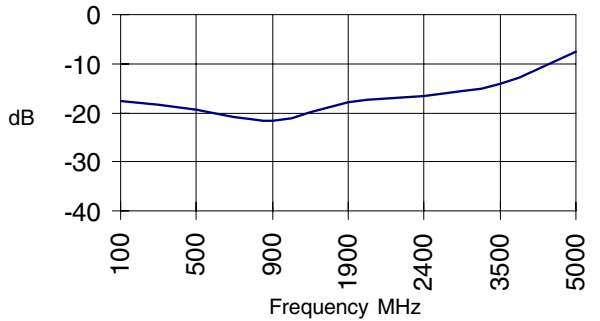
S12, Id =75mA, T=-40C



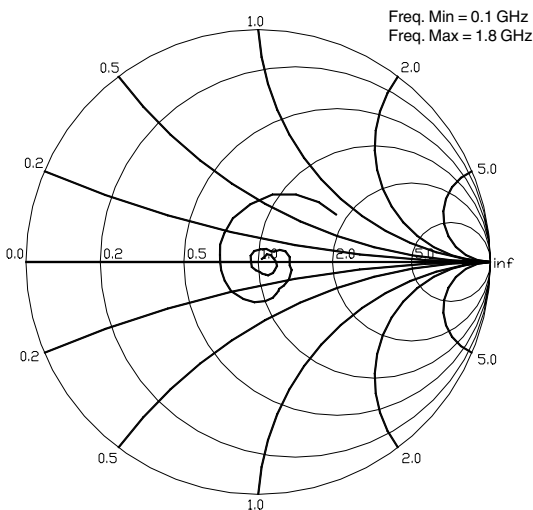
S11, Id =75mA, T=-40C



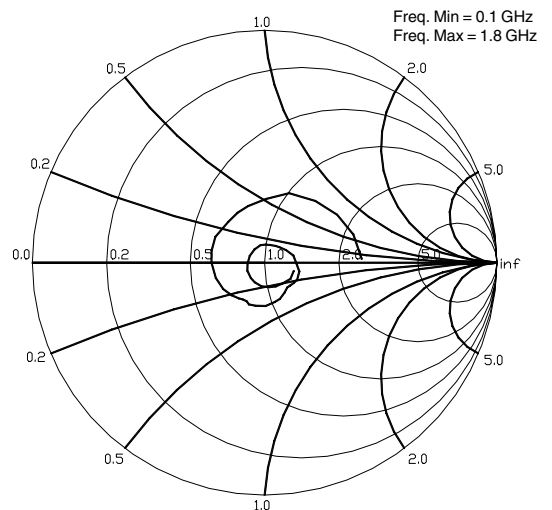
S22, Id =75mA, T=-40C



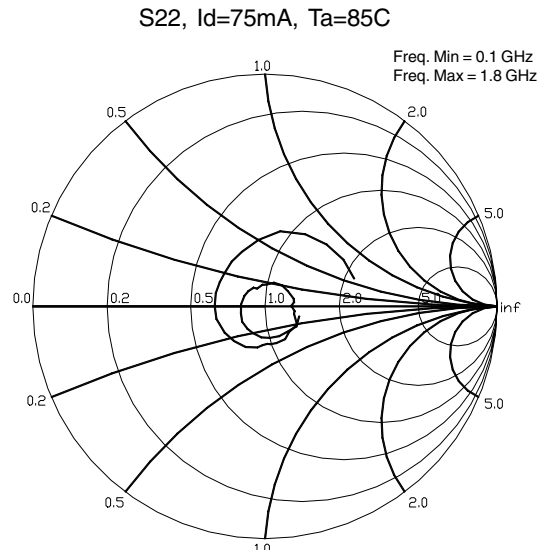
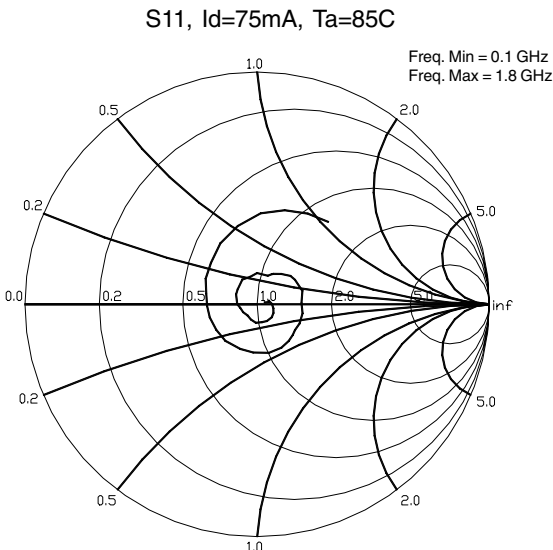
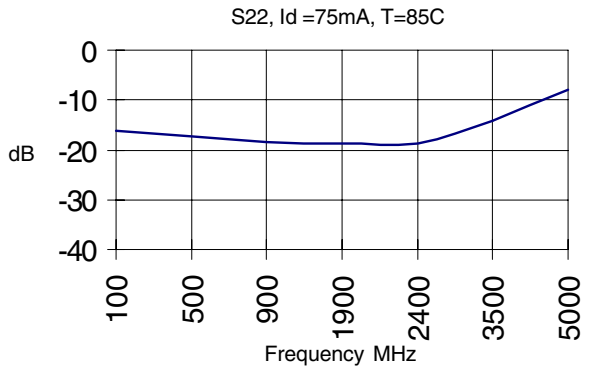
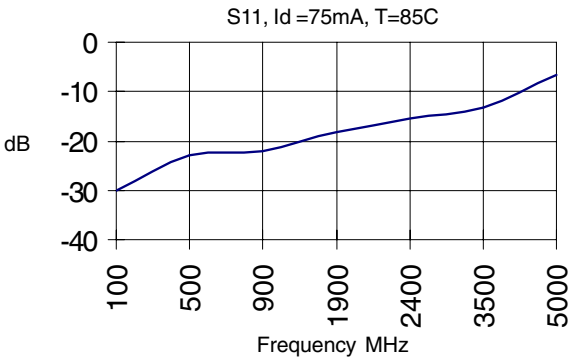
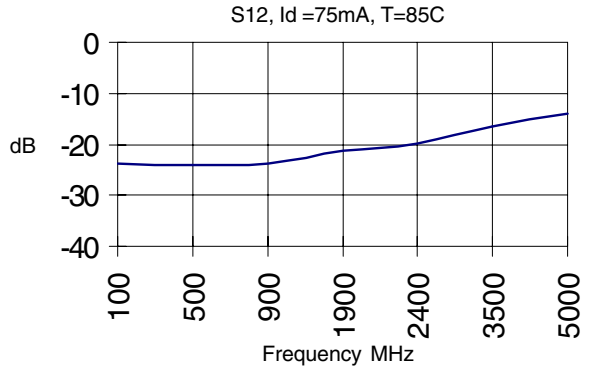
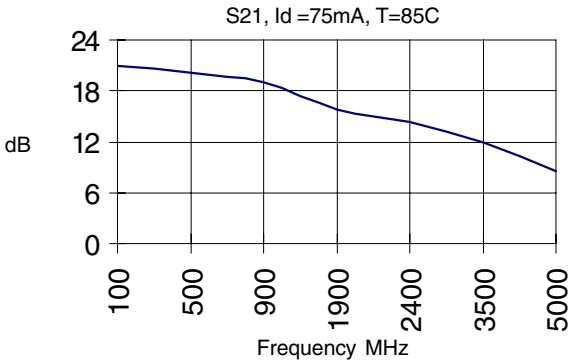
S11, Id=75mA, Ta=-40C



S22, Id=75mA, Ta=-40C



The information provided herein is believed to be reliable at press time. Stanford Microdevices assumes no responsibility for inaccuracies or omissions. Stanford Microdevices assumes no responsibility for the use of this information, and all such information shall be entirely at the user's own risk. Prices and specifications are subject to change without notice. No patent rights or licenses to any of the circuits described herein are implied or granted to any third party. Stanford Microdevices does not authorize or warrant any Stanford Microdevices product for use in life-support devices and/or systems. Copyright 1999 Stanford Microdevices, Inc. All worldwide rights reserved.



The information provided herein is believed to be reliable at press time. Stanford Microdevices assumes no responsibility for inaccuracies or omissions. Stanford Microdevices assumes no responsibility for the use of this information, and all such information shall be entirely at the user's own risk. Prices and specifications are subject to change without notice. No patent rights or licenses to any of the circuits described herein are implied or granted to any third party. Stanford Microdevices does not authorize or warrant any Stanford Microdevices product for use in life-support devices and/or systems. Copyright 1999 Stanford Microdevices, Inc. All worldwide rights reserved.

Absolute Maximum Ratings

Parameter	Value	Unit
Supply Current	160	mA
Operating Temperature	-40 to +85	C
Maximum Input Power	+10	dBm
Storage Temperature Range	-40 to +85	C
Operating Junction Temperature	+150	C

Part Number Ordering Information

Part Number	Reel Size	Devices/Reel
SGA-6486-TR1	7"	1000
SGA-6486-TR2	13"	3000

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):
97° C/W

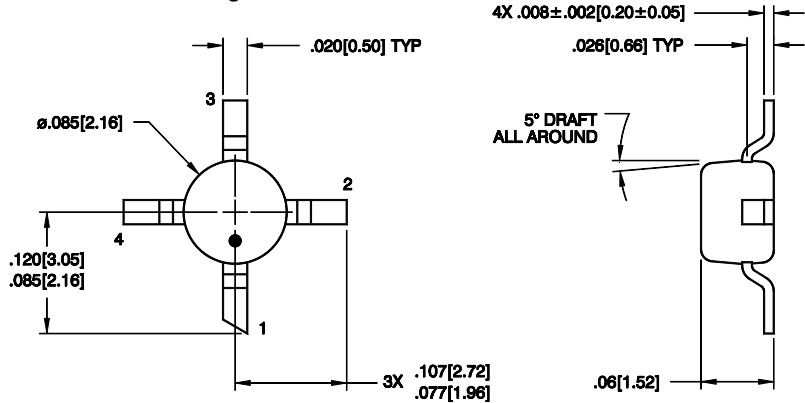
Recommended Bias Resistor Values

Supply Voltage(Vs)	6V	7.5V	9V	12V
Rbias (Ohms)	12.5	31	50	88

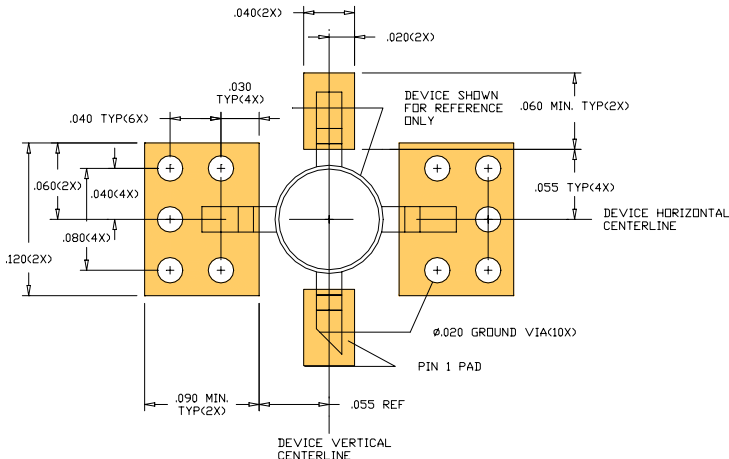
For 7.5V operation or higher, a resistor with a power handling capability of 1/2W or greater is recommended.

Package Dimensions

Pin Designation	
1	RF in
2	GND
3	RF out and Bias
4	GND



PCB Pad Layout



The information provided herein is believed to be reliable at press time. Stanford Microdevices assumes no responsibility for inaccuracies or omissions. Stanford Microdevices assumes no responsibility for the use of this information, and all such information shall be entirely at the user's own risk. Prices and specifications are subject to change without notice. No patent rights or licenses to any of the circuits described herein are implied or granted to any third party. Stanford Microdevices does not authorize or warrant any Stanford Microdevices product for use in life-support devices and/or systems. Copyright 1999 Stanford Microdevices, Inc. All worldwide rights reserved.