

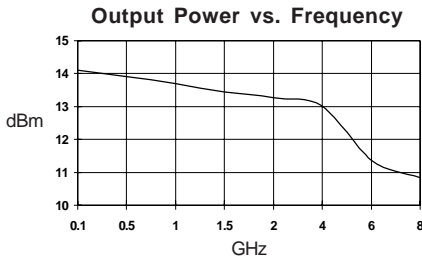
Product Description

Stanford Microdevices' SNA-186 is a GaAs monolithic broadband amplifier (MMIC) housed in a low-cost surface-mountable plastic package. This amplifier provides 12dB of gain and +13dBm of P1dB power when biased at 4V and 50mA.

The use of an external resistor allows for bias flexibility and stability. These unconditionally stable amplifiers are designed for use as general purpose 50 ohm gain blocks.

Also available in chip form (SNA-100), its small size (0.33mm x 0.33mm) and gold metallization makes it an ideal choice for use in hybrid circuits.

The SNA-186 is available in tape and reel at 1000, 3000 and 5000 devices per reel.



SNA-186

DC-8 GHz, Cascadable GaAs HBT MMIC Amplifier



Product Features

- Patented, Reliable GaAs HBT Technology
- Cascadable 50 Ohm Gain Block
- 12dB Gain, +13dBm P1dB
- 1.5:1 Input and Output VSWR
- Operates From a Single DC Supply
- Low Cost Surface Mount Plastic Package

Applications

- Narrow and Broadband Linear Amplifiers
- Commercial Communication Applications

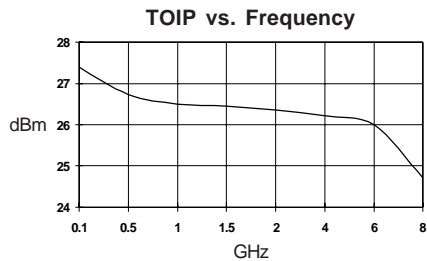
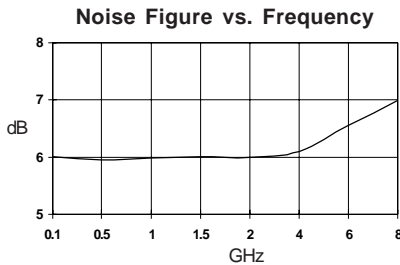
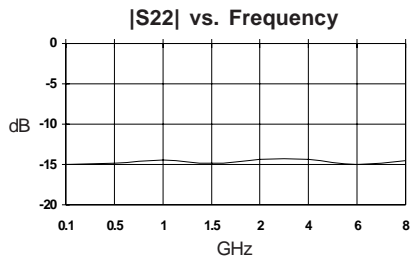
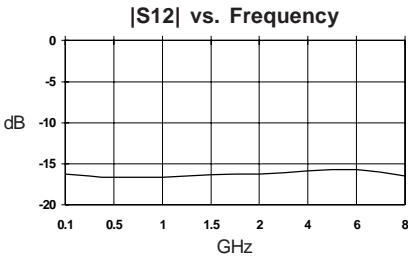
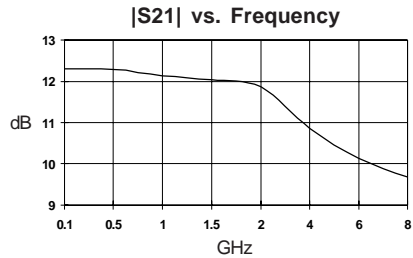
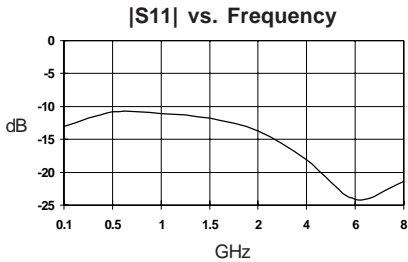
Electrical Specifications at Ta = 25C

Symbol	Parameters: Test Conditions: Id = 50 mA, Zo = 50 Ohms	Units	Min.	Typ.	Max.	
Gp	Small Signal Gain	f = 0.1-2.0 GHz f = 2.0-6.0 GHz f = 6.0-8.0 GHz	dB dB dB	10.0 9.0 8.0	12.0 11.0 10.0	
GF	Gain Flatness	f = 0.1-8.0 GHz	dB		+/-1.0	
BW3dB	3dB Bandwidth		GHz		8.0	
P1dB	Output Power at 1dB Compression	f = 0.1-6.0 GHz f = 6.0-8.0 GHz	dBm		13.0 11.0	
NF	Noise Figure	f = 0.1-6.0 GHz f = 6.0-8.0 GHz	dB		6.0 7.0	
VSWR	Input / Output	f = 0.1-8.0 GHz			1.8:1	
IP3	Third Order Intercept Point	f = 0.1-6.0 GHz f = 6.0-8.0 GHz	dBm		26 24	
Td	Group Delay	f = 2.0 GHz	psec		100	
ISOL	Reverse Isolation	f = 0.1-8.0 GHz	dB		16	
VD	Device Voltage		V	3.5	4.0	4.5
dG/dT	Device Gain Temperature Coefficient		dB/degC		-0.0015	
dV/dT	Device Voltage Temperature Coefficient		mV/degC		-4.0	

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SNA-186 DC-8 GHz Cascadable MMIC Amplifier

Typical Performance at 25° C ($V_{ds} = 4.0V$, $I_{ds} = 50mA$)



50 Ohm Gain Blocks

Typical S-Parameters $V_{ds} = 4.0V$, $I_d = 50mA$

Freq GHz	S11	S11 Ang	S21	S21 Ang	S12	S12 Ang	S22	S22 Ang
.100	0.223	-172	4.125	177	0.154	-9	0.286	131
.500	0.271	117	3.887	139	0.147	-29	0.223	114
1.00	0.309	55	3.722	98	0.145	-59	0.267	54
1.50	0.340	3	3.615	62	0.144	-87	0.300	4
2.00	0.350	-48	3.560	24	0.144	-112	0.310	-45
4.00	0.287	97	3.061	-128	0.145	127	0.345	82
6.00	0.363	92	2.147	88	0.114	6	0.419	-82
8.00	0.166	83	2.606	-53	0.129	-117	0.225	-57

(S-Parameters include the effects of two 1.0 mil diameter bond wires, each 20 mils long, connected to the gate and drain pads on the die)

Absolute Maximum Ratings

Parameter	Absolute Maximum
Device Current	75mA
Power Dissipation	330mW
RF Input Power	100mW
Junction Temperature	+200C
Operating Temperature	-45C to +85C
Storage Temperature	-65C to +150C

Notes:

1. Operation of this device above any one of these parameters may cause permanent damage.

Part Number Ordering Information

Part Number	Devices Per Reel	Reel Size
SNA-186-TR1	1000	7"
SNA-186-TR2	3000	13"
SNA-186-TR3	5000	13"

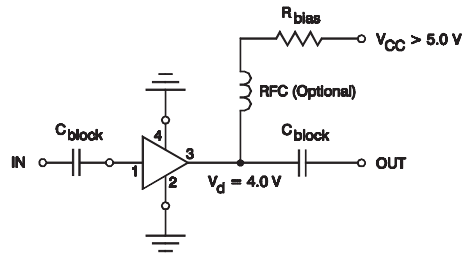
Recommended Bias Resistor Values

Supply Voltage (Vs)	5V	7.5V	9V	12V	15V	20V
Rbias (Ohms)	20	70	100	160	220	320

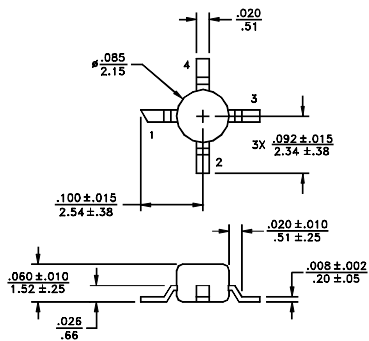
MTTF vs. Temperature @ Id = 50mA

Lead Temperature	Junction Temperature	MTTF (hrs)
+50C	+155C	1000000
+85C	+190C	100000
+115C	+220C	10000

Thermal Resistance (Lead-Junction): 531° C/W



Typical Biasing Configuration



Dimensions are in $\frac{\text{in.}}{\text{mm}}$ Tolerances: $\pm .005 \text{ in.}$
 $\pm .13 \text{ mm}$

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