

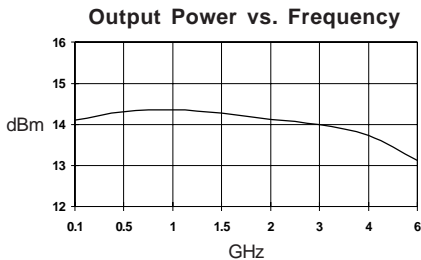
## Product Description

Stanford Microdevices SNA-286 is a GaAs monolithic broadband amplifier (MMIC) housed in a low-cost surface-mountable plastic package. This amplifier provides 15dB of gain and +14dBm of P1dB power when biased at 50mA and 4V.

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-200), its small size (0.33mm x 0.33mm) and gold metallization make it an ideal choice for use in hybrid circuits.

The SNA-286 is available in tape and reel at 1000, 3000 and 5000 devices per reel.



## Electrical Specifications at Ta = 25C

Symbol	Parameters: Test Conditions: Id = 50 mA, Zo = 50 Ohms		Units	Min.	Typ.	Max.
Gp	Small Signal Power Gain	f = 0.1-2.0 GHz	dB	13.0	15.0	
		f = 2.0-4.0 GHz	dB	11.0	13.0	
		f = 4.0-6.0 GHz	dB	10.0	12.0	
BW 3dB	3dB Bandwidth		GHz		4.5	
P1dB	Output Power at 1dB Compression:	f = 0.1-4.0 GHz	dBm		14.0	
		f = 4.0-6.0 GHz			13.0	
NF	Noise Figure	f = 0.1-2.0 GHz	dB		5.5	
		f = 4.0-6.0 GHz			6.5	
VSWR	Input / Output	f = 0.1-6.0 GHz			1.5:1	
IP3	Third Order Intercept Point	f = 0.1-4.0 GHz	dBm		27.0	
		f = 4.0-6.0 GHz			26.0	
Td	Group Delay	f = 2.0 GHz	psec		100	
ISOL	Reverse Isolation	f = 0.1-6.0 GHz	dB		20	
VD	Device Voltage		V	3.5	4.0	4.5
dG/dT	Device Gain Temperature Coefficient		mV/degC		-0.0018	
dV/dT	Device Voltage Temperature Coefficient		mV/degC		-4.0	

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522 Almanor Ave., Sunnyvale, CA 94086

Phone: (800) SMI-MMIC

<http://www.stanfordmicro.com>

## SNA-286

### DC-6.0 GHz, Cascadable GaAs MMIC Amplifier



### Product Features

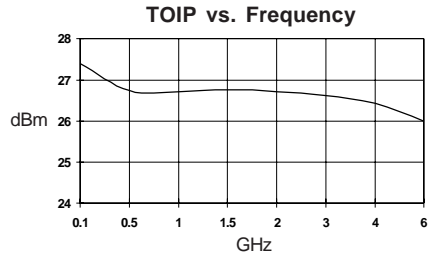
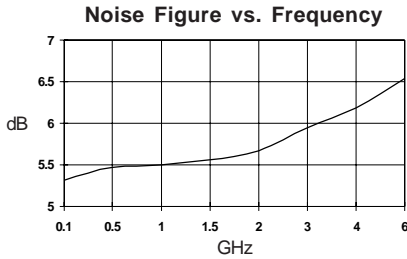
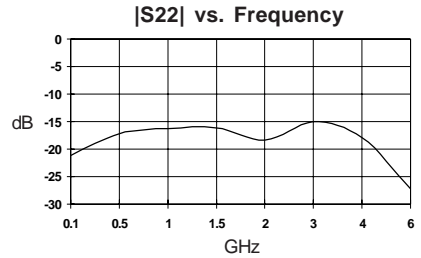
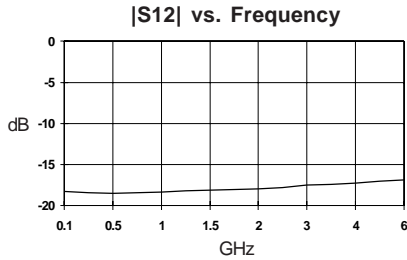
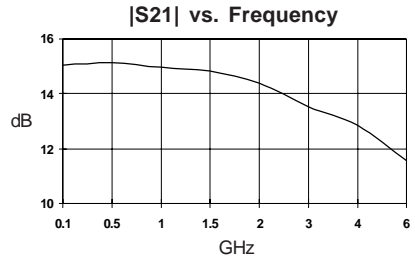
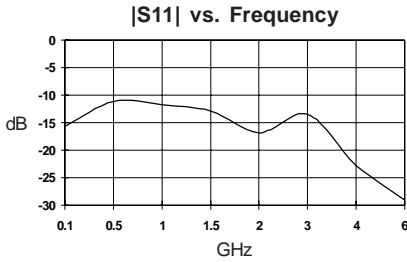
- Patented, Reliable GaAsHBT Technology
- Cascadable 50 Ohm Gain Block
- 15dB Gain, +14dBm P1dB
- 1.5:1 Input and Output VSWR
- Operates From Single Supply
- Low Cost Surface Mount Plastic Package

### Applications

- Narrow and Broadband Linear Amplifiers
- Commercial Communication Applications

## SNA-286 DC-6.0 GHz Cascadable MMIC Amplifier

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



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	0.158	-166	5.888	176	0.122	-138	0.088	-151
.250	0.197	109	5.785	171	0.121	99	0.135	92
.500	0.228	170	5.721	168	0.119	48	0.155	173
1.00	0.221	143	5.591	157	0.120	4	0.161	143
1.50	0.210	115	5.495	146	0.124	5	0.160	112
2.00	0.154	99	5.248	135	0.127	4	0.120	96
3.00	0.196	89	4.749	118	0.133	6	0.197	86
4.00	0.078	24	4.390	99	0.136	5	0.130	43
6.00	0.041	-40	3.780	68	0.144	2	0.182	-3

(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)

## SNA-286 DC-6.0 GHz Cascadable MMIC Amplifier

### 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.

### MTTF vs. Temperature @ $I_d = 50\text{mA}$

Lead Temperature	Junction Temperature	MTTF (hrs)
+50C	+155C	1 000 000
+85C	+190C	100 000
+115C	+220C	10 000

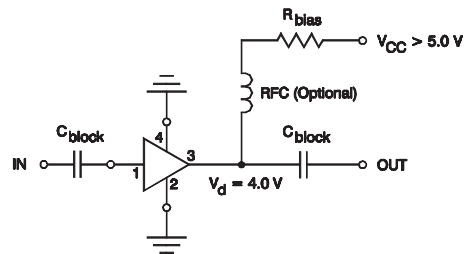
Thermal Resistance (Lead-Junction): 531° C/W

### Part Number Ordering Information

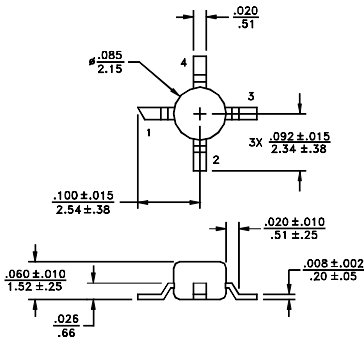
Part Number	Devices Per Reel	Reel Size
SNA-286-TR1	1000	7"
SNA-286-TR2	3000	13"
SNA-286-TR3	5000	13"

### Recommended Bias Resistor Values

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



Typical Biasing Configuration



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

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