

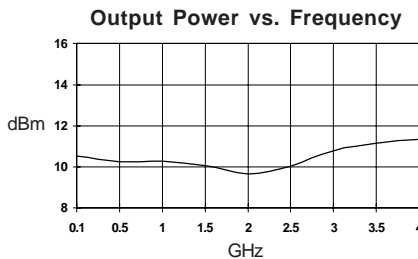
## Product Description

Stanford Microdevices' SNA-386 is a GaAs monolithic broadband amplifier (MMIC) housed in a low-cost surface-mountable plastic package. This amplifier provides 21dB gain when biased at 35mA 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-300), its small size (0.3mm x 0.3mm) and gold metallization make it an ideal choice for use in hybrid circuits.

The SNA-386 is available in tape and reel at 1000, 3000 and 5000 devices per reel.



### Electrical Specifications at Ta = 25C

Symbol	Parameters: Test Conditions: Id = 35 mA, Z <sub>o</sub> = 50 Ohms		Units	Min.	Typ.	Max.
G <sub>P</sub>	Small Signal Power Gain	f = 0.1-1.0 GHz f = 1.0-2.0 GHz f = 2.0-3.0 GHz	dB dB dB	19 18 16	21 20 18	
BW <sub>3dB</sub>	3dB Bandwidth		GHz		2.5	
P <sub>1dB</sub>	Output Power at 1dB Compression	f = 0.1-2.0 GHz f = 2.0-3.0 GHz	dBm		10 11	
NF	Noise Figure	f = 0.1-2.0 GHz f = 2.0-3.0 GHz	dB		4 4	
VSWR	Input / Output	f = 0.1-3.0 GHz	-		1.7:1	
IP <sub>3</sub>	Third Order Intercept Point	f = 2.0 GHz	dBm		23	
TD	Group Delay	f = 2.0 GHz	psec		100	
ISOL	Reverse Isolation	f = 0.1-3.0 GHz	dB		22	
VD	Device Voltage		V	3.5	4	4.5
dG/dT	Device Gain Temperature Coefficient		dB/degC		-0.003	
dV/dT	Device Voltage Temperature Coefficient		mV/degC		-4.0	

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## SNA-386

### DC-3 GHz, Cascadable GaAs MMIC Amplifier



### Product Features

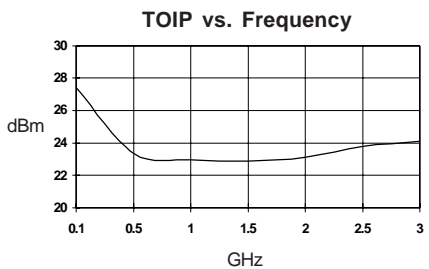
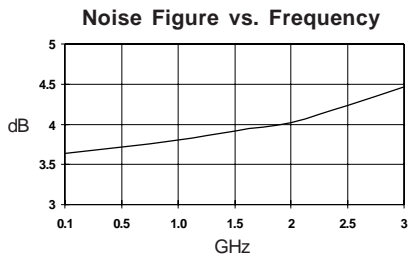
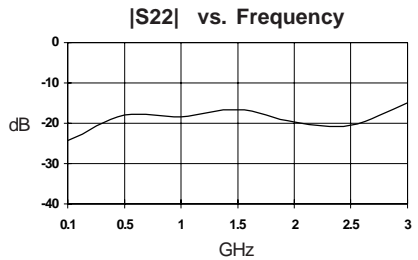
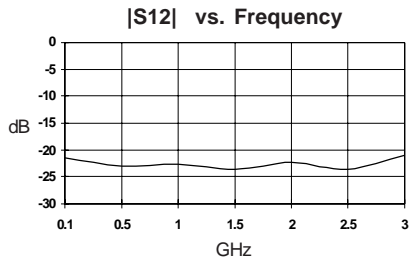
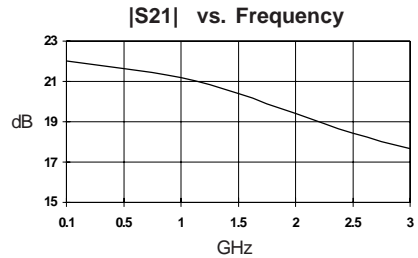
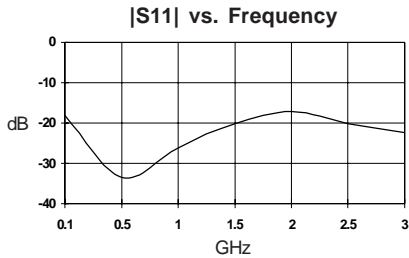
- Patented GaAs HBT Technology
- Cascadable 50 Ohm Gain Block
- 21dB Gain, +23dBm TOIP
- Operates From Single Supply
- Low Cost Surface Mount Plastic Package

### Applications

- Narrow and Broadband Linear Amplifiers
- Commercial Communication Applications

## SNA-386 DC-3 GHz Cascadable MMIC Amplifier

Typical Performance at 25° C ( $V_{ds} = 4.0V$ ,  $I_{ds} = 35mA$ )



Typical S-Parameters  $V_{ds} = 4.0V$ ,  $I_d = 35mA$

Freq GHz	S11	S11 Ang	S21	S21 Ang	S12	S12 Ang	S22	S22 Ang
.100	0.175	104	12.985	145	0.054	52	0.158	122
.250	0.193	96	12.850	136	0.059	25	0.156	105
.500	0.221	89	12.763	126	0.060	-20	0.211	96
1.00	0.229	27	11.614	85	0.065	-39	0.222	39
1.50	0.218	-40	10.280	39	0.071	-65	0.226	-24
2.00	0.191	-99	9.112	-2	0.077	-89	0.223	-78
2.50	0.157	-162	7.698	-45	0.083	-119	0.222	-136
3.00	0.130	136	6.849	-78	0.088	-146	0.221	170
3.50	0.115	70	6.423	-120	0.093	-174	0.217	114
4.00	0.113	28	5.910	-156	0.097	155	0.206	70

(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-386 DC-3 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 @ $I_d = 35\text{mA}$

Lead Temperature	Junction Temperature	MTTF (hrs)
+95C	+155C	1000000
+130C	+190C	100000
+160C	+220C	10000

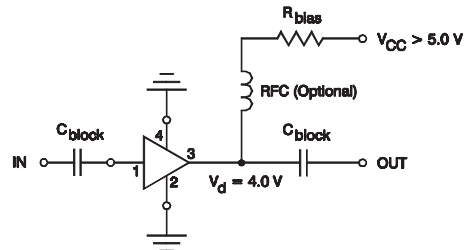
Thermal Resistance (Lead-Junction): 432° C/W

### Part Number Ordering Information

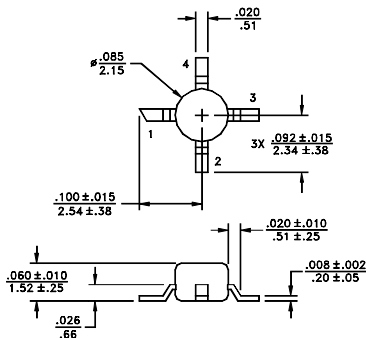
Part Number	Devices Per Reel	Reel Size
SNA-386-TR1	1000	7"
SNA-386-TR2	3000	13"
SNA-386-TR3	5000	13"

### Recommended Bias Resistor Values

Supply Voltage (Vs)	5V	7.5V	9V	12V	15V	20V
Rbias (Ohms)	29	100	143	229	314	457



Typical Biasing Configuration



Dimensions are in  $\frac{\text{in.}}{\text{mm}}$  Tolerances:  $\pm 0.005 \text{ in.}$   
 $\pm 0.13 \text{ mm}$

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