



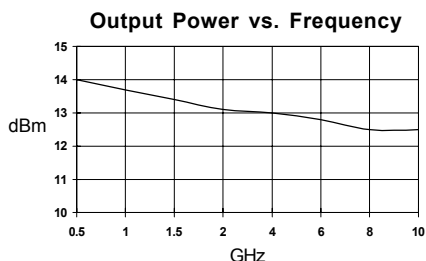
Product Description

Sirenza Microdevices' SNA-100 is a GaAs monolithic broadband amplifier (MMIC) in die form. This amplifier provides 12dB of gain at 1950 MHz when biased at 50mA.

These unconditionally stable amplifiers are designed for use as general purpose 50 ohm gain blocks. Its small size (0.33mm x 0.33mm) and gold metallization make it an ideal choice for use in hybrid circuits.

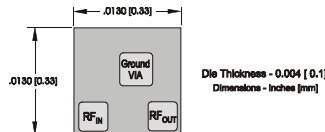
External DC decoupling capacitors determine low frequency response. The use of an external resistor allows for bias flexibility and stability.

The SNA-100 is supplied in gel paks at 100 devices per pak. Also available in packaged form (SNA-176 & SNA-186)



SNA-100

DC-10 GHz, Cascadable GaAs MMIC Amplifier



Not Recommended for New Designs, use SNA-100S

Product Features

- Cascadable 50 Ohm Gain Block
- 12dB Gain, +13dBm P1dB
- 1.5:1 Input and Output VSWR
- Operates From Single Supply
- Chip Back is Ground

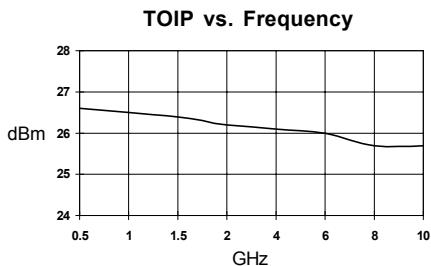
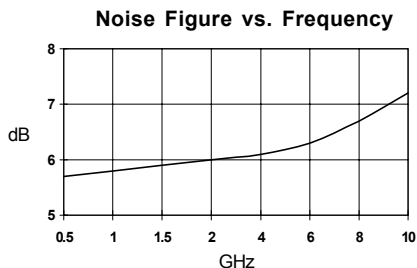
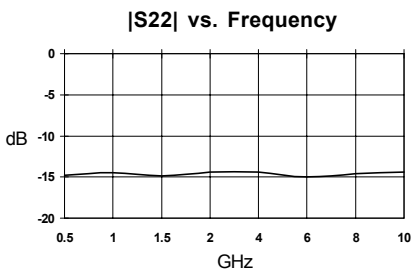
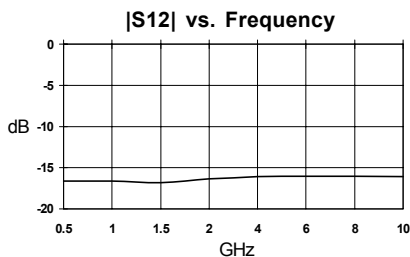
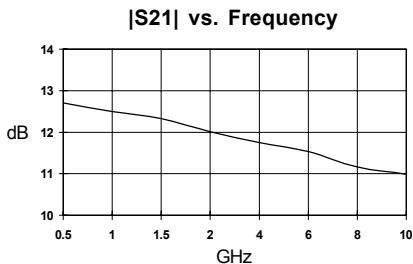
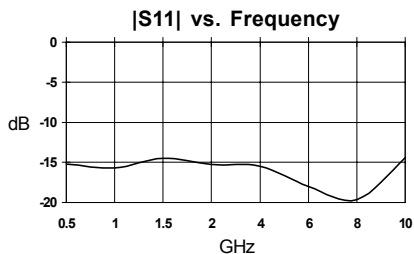
Symbol	Parameter	Units	Frequency	Min.	Typ.	Max.
G_p	Small Signal Power Gain	dB	850 MHz		12.5	
		dB	1950 MHz		12.0	
		dB	2400 MHz		11.8	
G_F	Gain Flatness	dB	0.1-8 GHz		+/- 0.5	
BW3dB	3dB Bandwidth	GHz			10.0	
P_{1dB}	Output Power at 1dB Compression	dBm	1950 MHz		13.0	
OIP_3	Output Third Order Intercept Point	dBm	1950 MHz		26.0	
NF	Noise Figure	dB	1950 MHz		5.0	
VSWR	Input / Output	-	0.1-10 GHz		1.5:1	
ISOL	Reverse Isolation	dB	0.1-10 GHz		16	
V_D	Device Operating Voltage	V		3.3	3.8	4.3
I_D	Device Operating Current	mA		45	50	55
dG/dT	Device Gain Temperature Coefficient	dB/°C			-0.0015	
R_{TH} j-b	Thermal Resistance (junction to backside)	°C/W			280	

Test Conditions: $V_S = 8\text{ V}$ $I_D = 50\text{ mA Typ.}$ OIP_3 Tone Spacing = 1 MHz, Pout per tone = 0 dBm
 $R_{BIAS} = 82\text{ Ohms}$ $T_L = 25^\circ\text{C}$ $Z_S = Z_L = 50\text{ Ohms}$

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Typical Performance at 25°C (V_{ds} = 3.8V, I_{ds} = 50mA)

(data includes bond wires)



Absolute Maximum Ratings

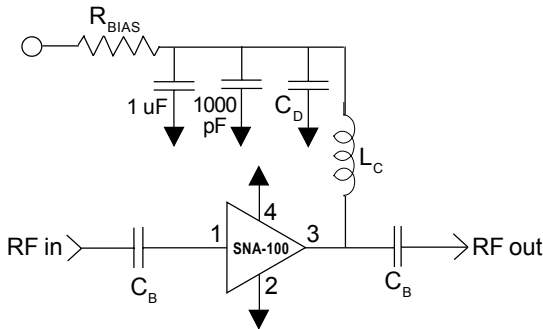
Parameter	Absolute Limit
Max. Device Current (I _D)	90 mA
Max. Device Voltage (V _D)	6 V
Max. RF Input Power	+10 dBm
Max. Junction Temp. (T _J)	+200°C
Operating Temp. Range (T _J)	-40°C to +85°C
Max. Storage Temp.	+150°C

Operation of this device beyond any one of these limits may cause permanent damage. For reliable continuous operation, the device voltage and current must not exceed the maximum operating values specified in the table on page one.

Bias Conditions should also satisfy the following expression:

$$I_D V_D < (T_J - T_L) / R_{TH} \text{ j-I}$$

Typical Application Circuit



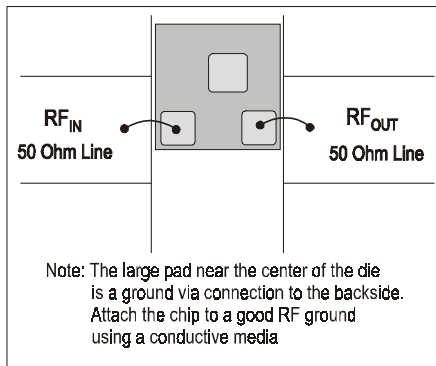
Application Circuit Element Values

Reference Designator	Frequency (Mhz)				
	500	850	1950	2400	3500
C_B	220 pF	100 pF	68 pF	56 pF	39 pF
C_D	100 pF	68 pF	22 pF	22 pF	15 pF
L_C	68 nH	33 nH	22 nH	18 nH	15 nH

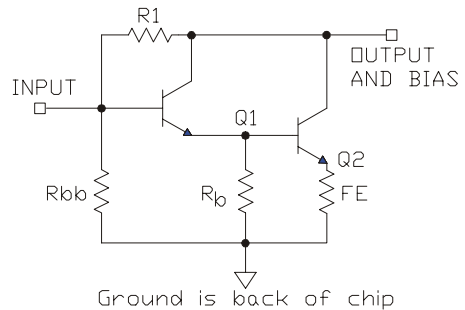
Recommended Bias Resistor Values for $I_b=50mA$

Supply Voltage (V_s)	6 V	8 V	10 V	12 V
R_{BIAS}	43 Ω	82 Ω	120 Ω	160 Ω

Note: R_{BIAS} provides DC bias stability over temperature.



Suggested Bonding Arrangement
(above configuration used for S-parameter data)



Simplified Schematic of MMIC

For recommended handling, die attach, and bonding methods, see the following application note at www.sirenza.com.

AN-041 (PDF) Handling of Unpackaged Die



Caution: ESD sensitive

Appropriate precautions in handling, packaging and testing devices must be observed.

Part Number Ordering Information

Part Number	Gel Pack
SNA-100	100 pcs. per pack

Die are shipped per Sirenza application note AN-039 Visual Criteria For Unpackaged Die