

# 2.0 to 20.0 GHz GaAs MMIC Power Amplifier

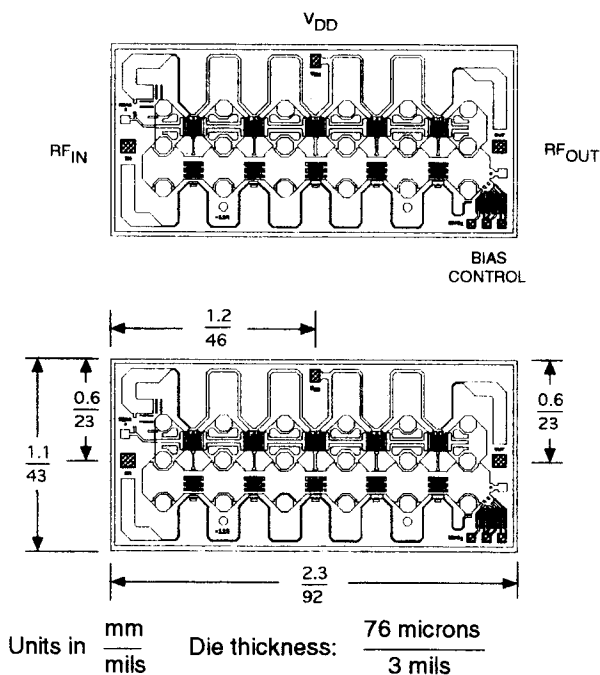
**Preliminary Product Information  
December 1991**

(1 of 2)

## Features

- Small Size: 43 x 92 mils
- High Gain
- Directly Cascadable
- Medium Power: +23 dBm
- Ion-Implanted Active Layers
- Silicon Nitride Passivation

## Chip Diagram



## Specifications ( $T_A = 25^\circ\text{C}$ , $V_{DD} = 8\text{V}$ )

Parameters	Units	Min	Typ	Max
Frequency Range	GHz	2.0		20.0
Small Signal Gain	dB	8.0	9.0	
Gain Flatness	$\pm$ dB		0.5	0.75
Input/Output VSWR	—		1.8:1	2.0:1
Power Output (@1 dB Gain Compression)	dBm	22.0	23.0	
Second Order Intercept Point	dBm		40.0	
Third Order Intercept Point	dBm		30.0	
Current	mA	225		275

## Absolute Maximum Ratings

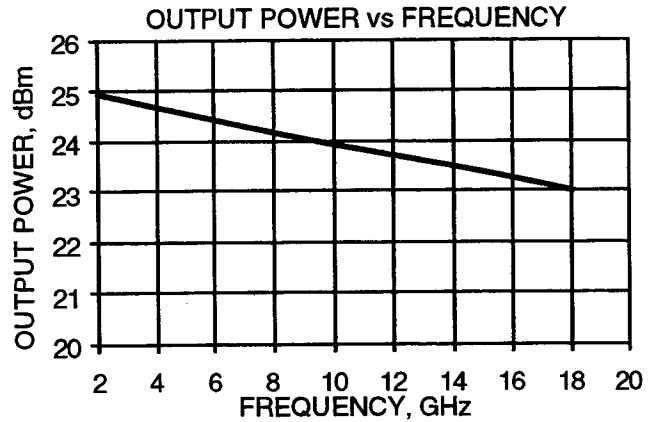
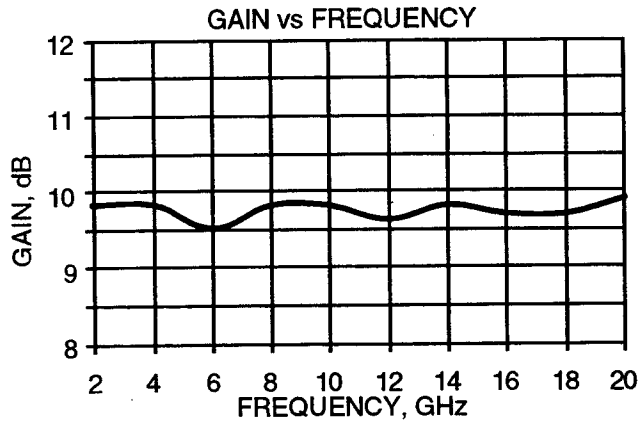
Parameter	Rating
Drain Voltage	12V
Drain Current	350 mA
Continuous Power Dissipation	3.0 W
Channel Temperature	+175°C
Storage Temperature	-65°C to +175°C
Mounting Temperature	+320°C
Input Power	+23 dBm

## Die Attach and Bonding Procedures

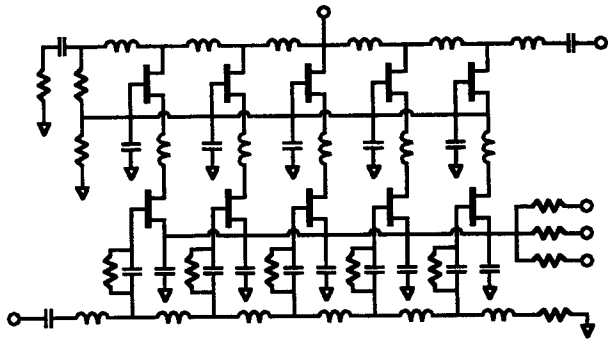
**Die Attach:** Eutectic die attach is recommended. For eutectic die attach: Preform: AuSn (80% Au, 20% Sn); Stage Temperature: 290°C,  $\pm 5^\circ\text{C}$ ; Handling Tool: Tweezers; Time: 1 min or less.

**Wire Bonding:** Wire Size: 0.7 to 1.0 mil in diameter (pre-stressed); Thermocompression bonding is preferred over thermosonic bonding. For thermocompression bonding: Stage Temperature: 250°C; Bond Tip Temperature: 150°C; Bonding Tip Pressure: 18 to 40 gms depending on size of wire.

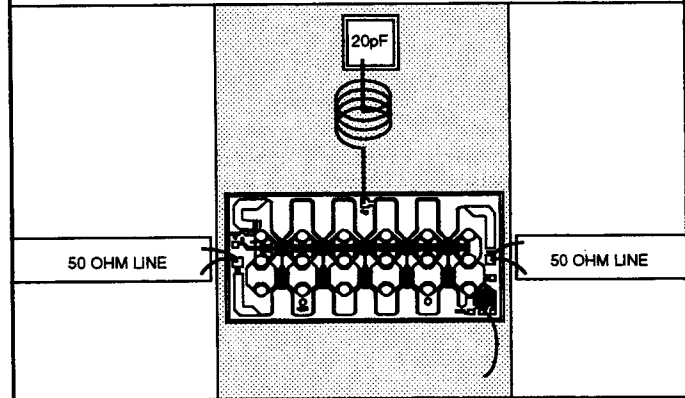
Typical Performance ( $T_A=25^\circ\text{C}$ ,  $V_{DD}=8\text{v}$ )



Schematic Diagram



Assembly Example



Typical Scattering Parameters (S-Parameters Include Bonding Wire Parasitics)

Freq. (GHz)	S11			S21			S12			S22		
	(dB)	(Mag)	(Ang)	(dB)	(Mag)	(Ang)	(dB)	(Mag)	(Ang)	(dB)	(Mag)	(Ang)
2.0	-16.5	0.149	-121	9.8	3.087	139	-51.3	0.003	-6	-14.6	0.187	141
4.0	-16.4	0.151	-179	9.8	3.093	71	-42.6	0.007	1	-18.8	0.115	89
6.0	-19.7	0.104	108	9.5	2.997	9	-38.5	0.012	-59	-24.3	0.061	61
8.0	-25.8	0.051	-67	9.8	3.088	-50	-36.1	0.016	-114	-28.4	0.038	-112
10.0	-16.9	0.143	-152	9.8	3.101	-111	-33.0	0.022	-167	-21.5	0.084	-165
12.0	-15.8	0.162	151	9.6	3.024	-171	-32.2	0.025	145	-21.9	0.080	132
14.0	-22.6	0.074	106	9.8	3.078	129	-31.3	0.027	108	-21.9	0.080	-72
16.0	-19.7	0.104	-157	9.7	3.064	66	-32.3	0.024	49	-12.1	0.247	-130
18.0	-14.9	0.179	162	9.7	3.058	4	-32.1	0.025	-23	-11.8	0.257	-163
20.0	-19.2	0.109	162	9.9	3.109	-62	-29.0	0.035	-91	-11.1	0.277	-174

Specifications subject to change.