



2.0 to 20.0 GHz GaAs MMIC Power Amplifier

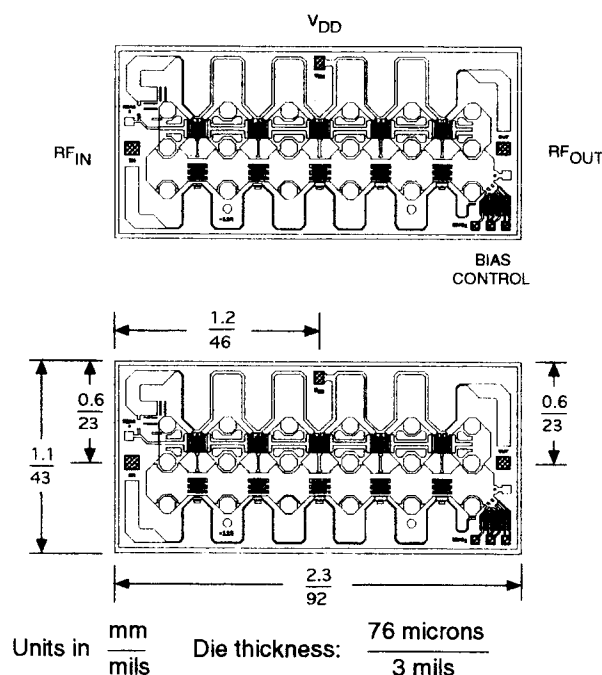
Preliminary Product Information
December 1991

(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	$\pm\text{dB}$		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

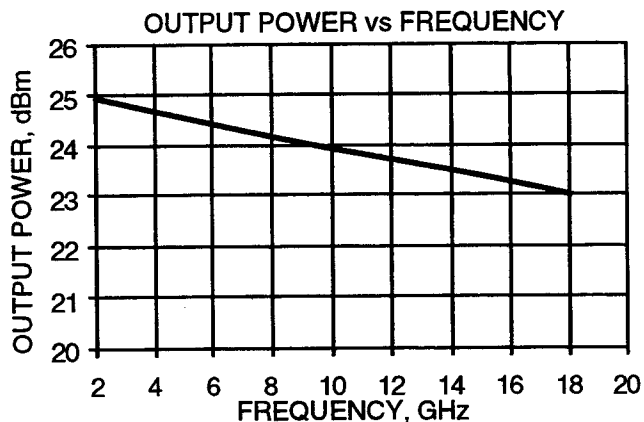
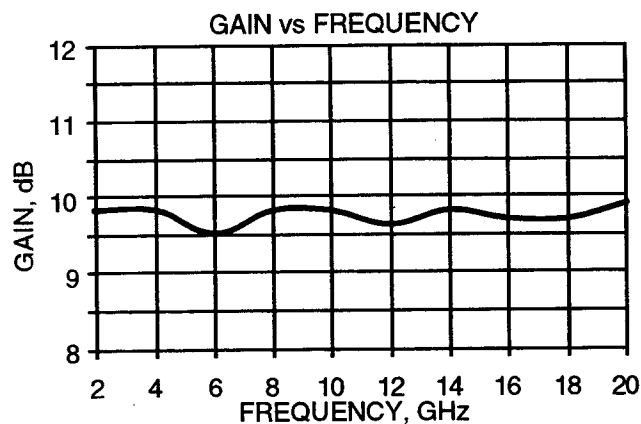
Parameter	Rating
Drain Voltage	12V
Drain Current	350 mA
Continuous Power Dissipation	3.0 W
Channel Temperature	+175°C
Storage Temperature	-65°C to +175°C
Mounting Temperature	+320°C
Input Power	+23 dBm

Die Attach and Bonding Procedures

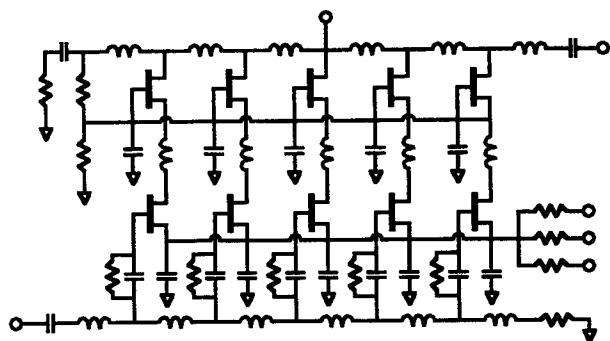
Die Attach: Eutectic die attach is recommended. For eutectic die attach: Preform: AuSn (80% Au, 20% Sn); Stage Temperature: 290°C, $\pm 5^\circ\text{C}$; Handling Tool: Tweezers; Time: 1 min or less.

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.

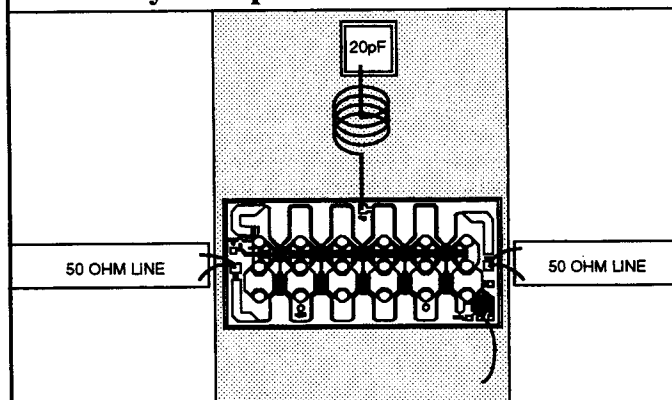
Typical Performance ($T_A = 25^\circ\text{C}$, $V_{DD} = 8\text{V}$)



Schematic Diagram



Assembly Example



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

Freq. (GHz)	S11 (dB)	S11 (Mag)	S11 (Ang)	S21 (dB)	S21 (Mag)	S21 (Ang)	S12 (dB)	S12 (Mag)	S12 (Ang)	S22 (dB)	S22 (Mag)	S22 (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.