

X=1800µm Y=730µm

Product Features

- ◆ RF frequency: 54 to 64 GHz
- ◆ Noise figure: 7.5 dB, typical
- ◆ Linear gain: 22 dB, typical
- ◆ P1dB: 10 dBm, typical
- ◆ 1.3 sq. mm
- ◆ Single ended design
- ◆ DC Power: 4.0 Vdc at 100 mA

Performance Characteristics (Ta = 25°C)

Specification	Min	Typ	Max	Unit
Frequency	54		64	GHz
Linear Gain	20	22		dB
Noise Figure		7.5	8.5	dB
P1dB	8	10		dBm
Input Return Loss	5	8		dB
Output Return Loss	3	5		dB
Vd		4		V
Id		100		mA
Vg		-0.3		V
Thermal Resistance				
Stage 1				C/W
Stage 2				C/W
Stage 3				C/W

Applications

- ◆ Short Haul / High Capacity Links
- ◆ Wireless LANs

Description and Application

The ALH321 monolithic HEMT amplifier is a broadband, four-stage, gain block designed for use in commercial digital microwave radios and wireless LANs. The small die size allows for extremely compact packaging. To ensure rugged and reliable operation, HEMT devices are fully passivated. Both bond pad and backside metallization are Ti/Au, which is compatible with conventional die attach, thermocompression and thermosonic wire bonding assembly techniques.

Absolute Maximum Ratings (Ta = 25°C)

Parameter	Min	Max	Unit
Drain Voltage (Vds)		5.5	V
Gate Voltage (Vgs)	-1	+0.3	V
Drain-gate Voltage (Vdg)		6	V
Drain current		130	mA
Input drive level		-7	dBm
Assy. Temperature (60 seconds)		300	deg. C

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Product Datasheet **Discontinued 10/18/2006**

Revision: October 2006

Measured Performance Characteristics (Typical Performance at 25°C)
 $V_d = 4\text{ V}$, $I_d = 100\text{ mA}$

Freq GHz	S11 Mag	S11 Ang	S21 Mag	S21 Ang	S12 Mag	S12 Ang	S22 Mag	S22 Ang
40.00	0.949	111.423	1.025	56.853	0.013	145.500	0.805	136.767
41.00	0.938	99.790	1.398	20.317	0.012	-101.290	0.800	134.717
42.00	0.947	88.158	1.747	-13.249	0.016	-25.577	0.770	130.616
43.00	0.928	76.292	2.360	-47.884	0.017	-93.087	0.742	131.129
44.00	0.938	65.459	2.832	-79.295	0.007	-163.903	0.754	126.825
45.00	0.948	50.811	3.595	-111.228	0.018	178.195	0.712	123.216
46.00	0.963	39.130	4.876	-141.822	0.037	-12.422	0.677	124.214
47.00	0.980	20.327	6.077	-172.233	0.017	-8.988	0.614	122.032
48.00	1.092	4.787	8.340	151.929	0.057	174.616	0.568	101.952
49.00	1.129	-19.302	8.724	120.609	0.053	-154.888	0.402	104.698
50.00	0.877	-44.133	8.297	79.166	0.095	161.979	0.453	156.050
51.00	0.658	-54.427	12.272	48.734	0.009	162.253	0.399	123.567
52.00	0.586	-68.097	12.488	20.374	0.009	158.399	0.412	130.103
53.00	0.513	-84.859	12.940	-8.721	0.009	157.346	0.435	133.581
54.00	0.416	-103.689	12.621	-36.146	0.009	148.682	0.467	133.096
55.00	0.323	-122.844	11.950	-64.445	0.008	147.701	0.483	131.371
56.00	0.222	-144.993	11.442	-89.990	0.008	147.320	0.482	128.560
57.00	0.126	-163.704	11.482	-112.949	0.007	149.370	0.446	126.767
58.00	0.055	156.819	11.434	-134.498	0.009	153.818	0.444	126.448
59.00	0.055	55.426	12.179	-157.269	0.010	154.163	0.417	124.708
60.00	0.128	-10.983	12.570	174.185	0.012	146.111	0.353	124.838
61.00	0.181	-43.946	12.002	138.924	0.013	139.629	0.312	133.892
62.00	0.235	-72.536	10.751	102.557	0.013	134.539	0.304	146.273
63.00	0.298	-105.431	9.833	70.095	0.016	123.038	0.354	164.515
64.00	0.330	-134.987	9.429	42.069	0.017	111.585	0.464	172.093
65.00	0.376	-164.306	9.309	16.150	0.016	97.715	0.623	167.352
66.00	0.458	163.894	8.292	-13.666	0.016	88.446	0.725	164.202
67.00	0.579	135.266	7.827	-40.273	0.015	72.789	0.871	155.569
68.00	0.739	106.442	7.453	-66.243	0.013	63.462	0.912	147.503
69.00	0.982	81.432	9.569	-92.217	0.011	54.278	0.936	137.337
70.00	1.192	52.764	9.579	-127.281	0.007	50.318	0.891	131.114

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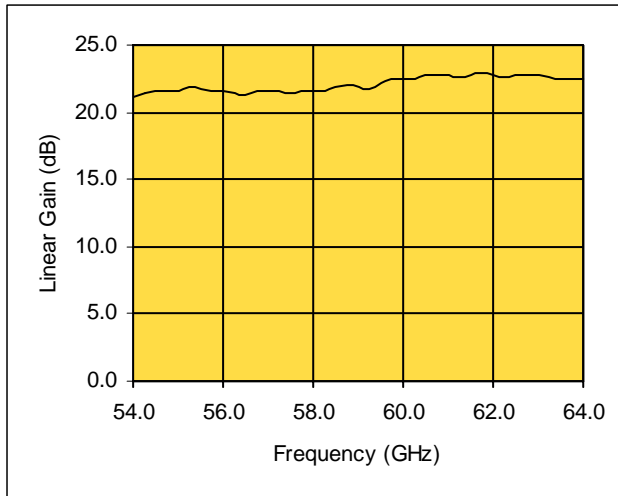


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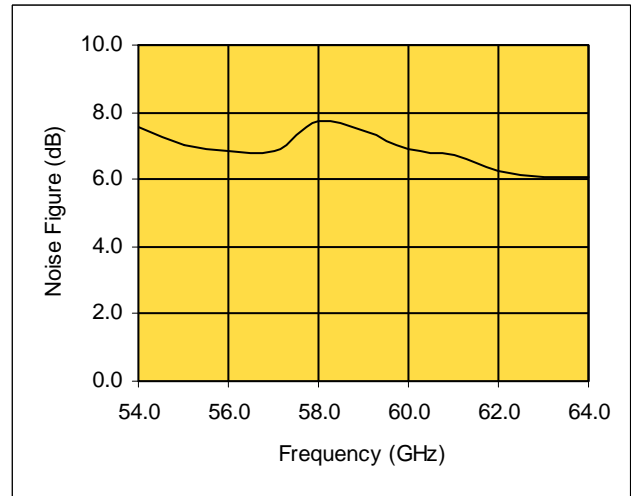
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Measured Performance Characteristics (Typical Performance at 25°C)
Vd = 4 V, Id = 100 mA

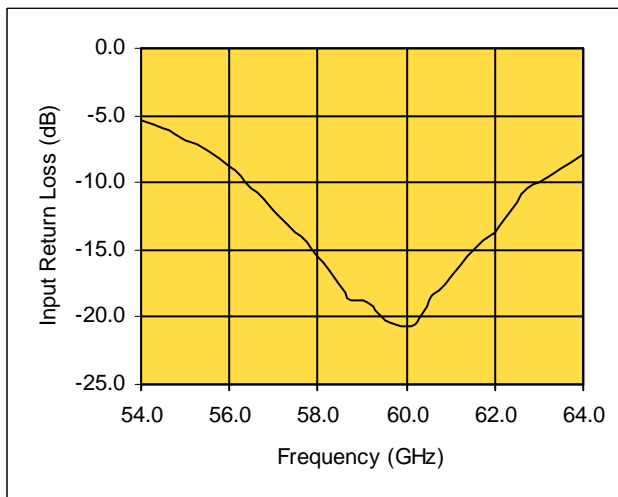
Linear Gain Versus Frequency



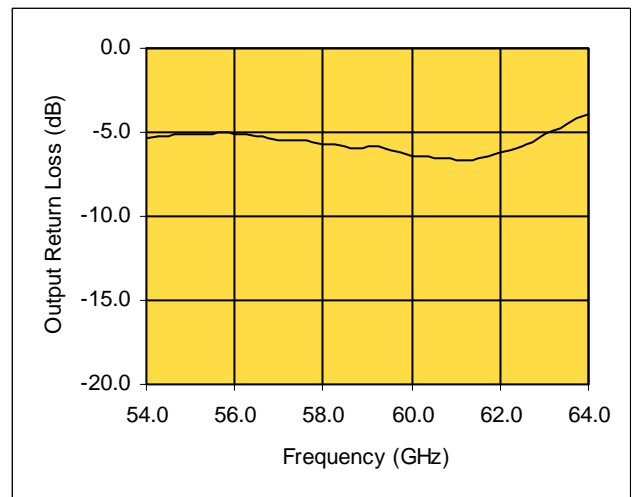
Noise Figure Versus Frequency



Input Return Loss Versus Frequency



Output Return Loss Versus Frequency



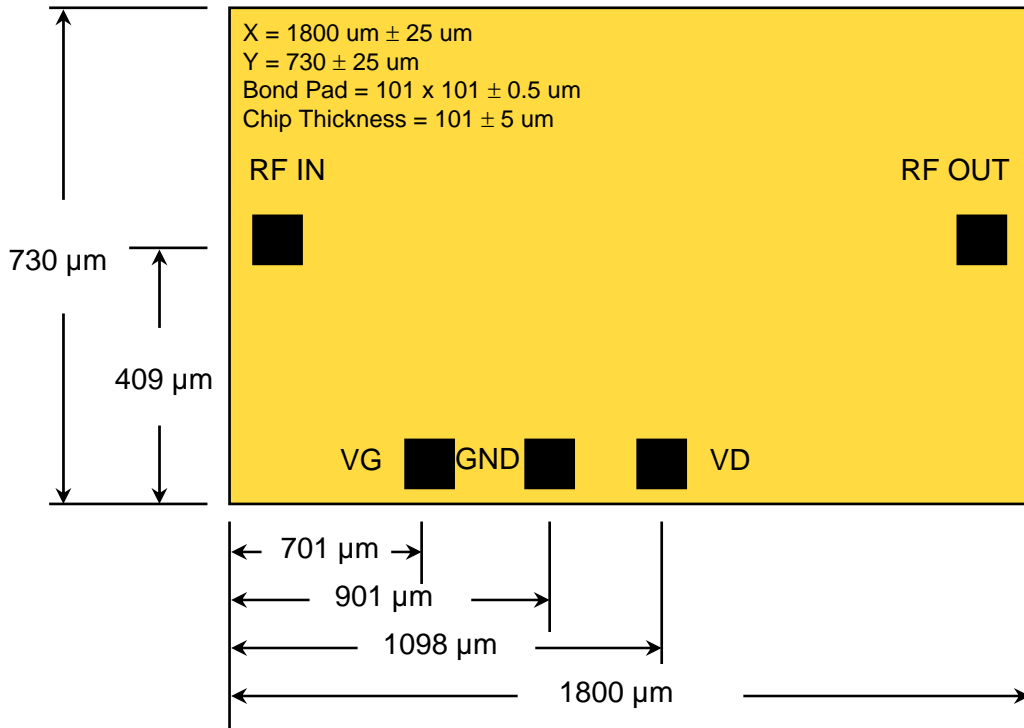
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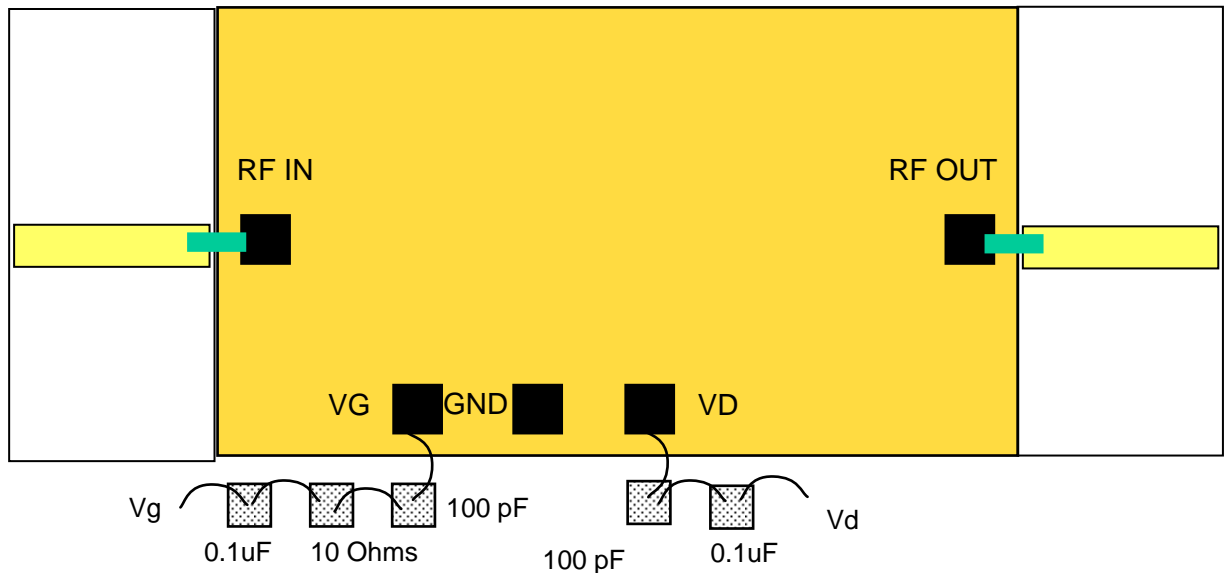
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Die Size and Bond Pad Locations



Suggested Bonding Arrangement



Recommended Assembly Notes

1. Bypass caps should be 100 pF (approximately) ceramic (single-layer) placed no farther than 30 mils from the amplifier.
2. Best performance obtained from use of <10 mil (long) by 3 by 0.5 mil ribbons on input and output.

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