

X=1600 μm Y=1600 μm

Product Features

- ◆ RF frequency: 18 to 40 GHz
- ◆ Noise figure: 3.9 dB, typical
- ◆ Linear gain: 10 dB, typical
- ◆ P1dB: 12 dBm, typical
- ◆ Unconditionally stable
- ◆ Biasable from either side
- ◆ DC Power: 5.0 Vdc self-biased at 45 mA

Performance Characteristics (Ta = 25°C)

Specification	Min	Typ	Max	Unit
Frequency	18		28	GHz
Linear Gain	8	9		dB
Noise Figure				
18-20 GHz		4.5	5	dB
20.1-28 GHz		3.9	4.5	dB
Input Return Loss	9	10		dB
Output Return Loss		15		dB
P1dB		12		dBm
Frequency	28.1		40	GHz
Linear Gain	8	10		dB
Noise Figure		3.9	4.5	dB
Input Return Loss	9	10		dB
Output Return Loss		15		dB
P1dB		13		dBm
Vd1		5		V
Id1		45		mA

Applications

- ◆ Wideband Communication Systems
- ◆ Point-to-Point Digital Radios
- ◆ Point-to-Multipoint Digital Radios

Product Description

The ALH445 monolithic HEMT is a broadband low noise device, designed for use in commercial digital microwave radios and wideband communications systems. The LNAs balanced design provides unconditional stability as well as excellent input and output VSWR. To ensure rugged and reliable operation, HEMT devices are fully passivated. All RF ports are DC blocked. 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
Vd1		5.5	V
Id1		60	mA
Input drive level		10	dBm
Assy. Temperature (60 Seconds)		300	deg. C

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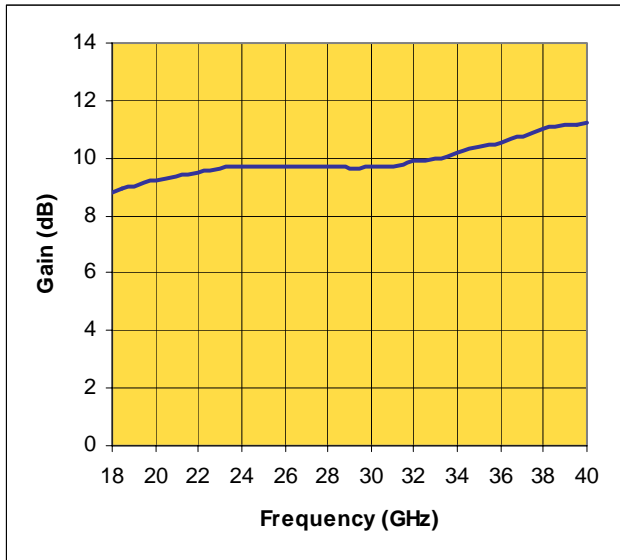


Product Datasheet

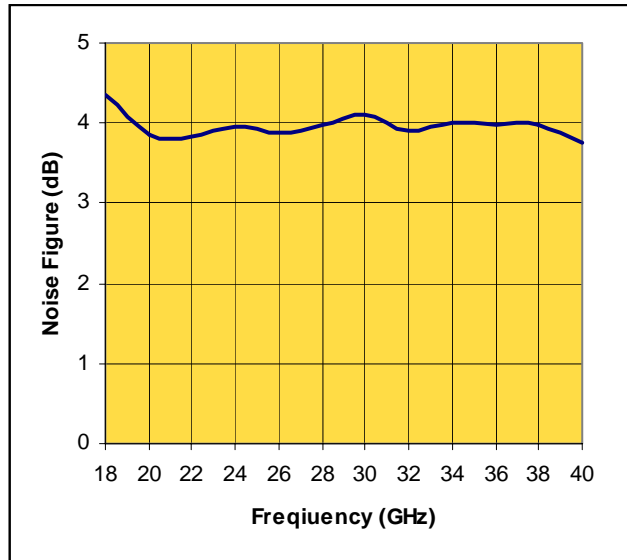
Revision: June 2007

Measured Performance Characteristics (Typical Performance at 25°C)
Vd1 = 5.0 V, Id1 = 45 mA

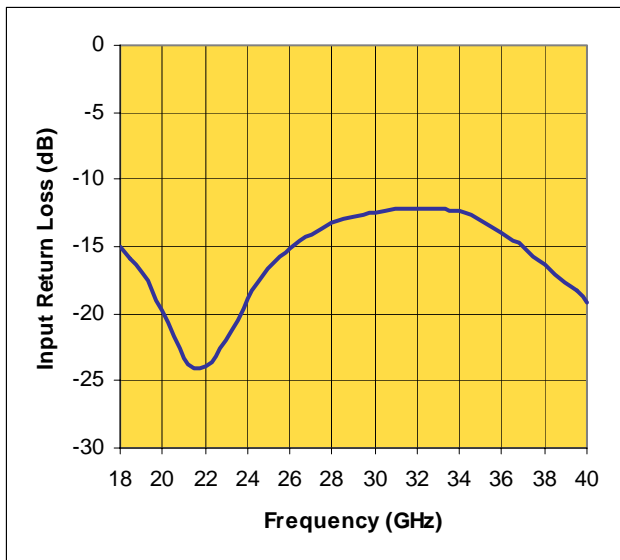
Linear Gain vs Frequency



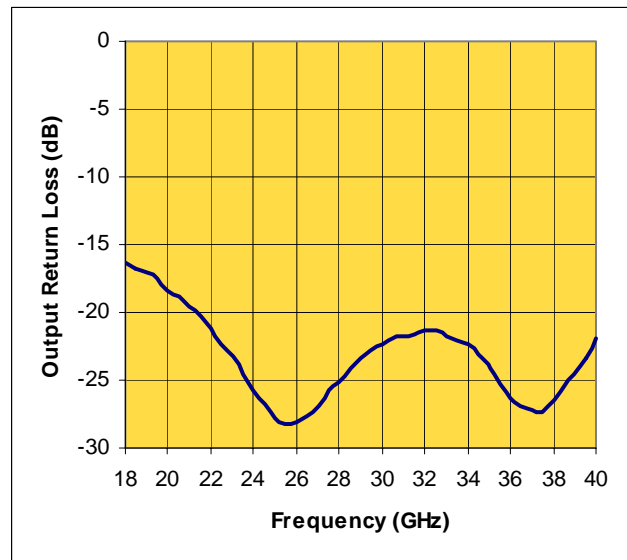
Noise Figure vs Frequency



Input Return Loss vs Frequency



Output Return Loss vs Frequency



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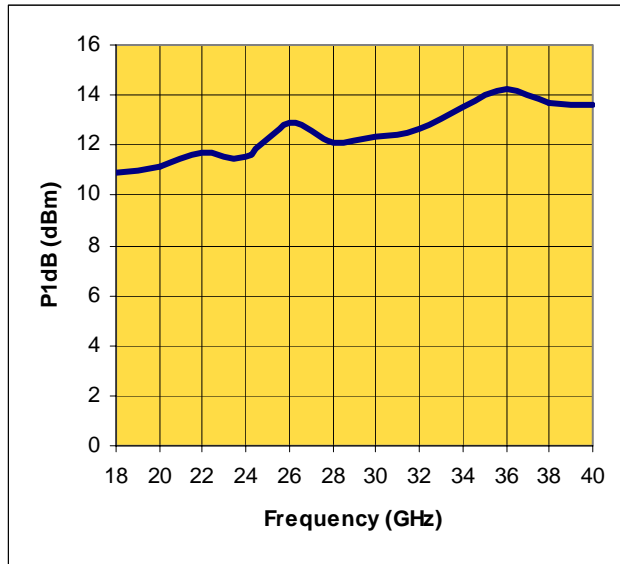


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Measured Performance Characteristics (Typical Performance at 25°C)
Vd1 = 5.0 V, Id1 = 45 mA

On-Wafer P1dB vs Frequency



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Measured Performance Characteristics (Typical Performance at 25°C)

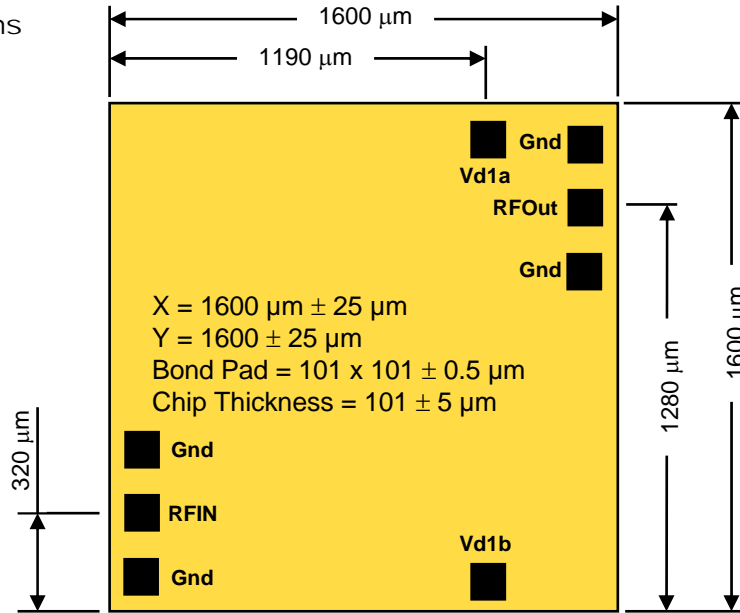
Vd1 = 5.0 V, Id1 = 45 mA

Freq GHz	S11 Mag	S11 Ang	S21 Mag	S21 Ang	S12 Mag	S12 Ang	S22 Mag	S22 Ang
18	0.21	126.40	2.54	81.72	0.07	-15.71	0.21	-164.63
19	0.15	111.89	2.64	66.95	0.07	-29.00	0.19	-177.29
20	0.09	91.89	2.71	52.20	0.08	-34.32	0.16	170.52
21	0.03	36.28	2.78	38.40	0.09	-48.51	0.13	162.78
22	0.06	-82.92	2.84	23.91	0.10	-63.53	0.10	164.21
23	0.12	-107.79	2.86	9.21	0.10	-78.14	0.07	177.20
24	0.18	-122.17	2.87	-4.54	0.11	-91.90	0.07	-161.52
25	0.23	-136.22	2.86	-18.09	0.11	-104.24	0.09	-150.60
26	0.27	-149.08	2.87	-30.66	0.11	-115.83	0.11	-151.17
27	0.31	-160.37	2.85	-43.41	0.12	-127.88	0.13	-152.28
28	0.32	-173.59	2.82	-55.76	0.12	-139.45	0.15	-158.99
29	0.34	174.08	2.81	-67.13	0.12	-149.67	0.16	-168.49
30	0.34	162.93	2.83	-78.17	0.13	-160.53	0.16	-179.06
31	0.33	149.19	2.89	-89.92	0.13	-170.89	0.16	170.27
32	0.31	136.38	2.93	-102.07	0.14	178.30	0.14	161.12
33	0.27	119.72	3.04	-114.06	0.15	166.31	0.11	149.51
34	0.24	100.26	3.15	-126.81	0.15	154.90	0.08	143.01
35	0.18	77.51	3.26	-140.16	0.17	141.44	0.04	151.72
36	0.13	40.13	3.39	-154.52	0.18	128.50	0.03	-92.49
37	0.10	-10.11	3.49	-169.98	0.18	114.04	0.09	-105.11
38	0.12	-74.64	3.52	173.97	0.19	98.49	0.15	-121.56
39	0.18	-108.14	3.46	158.25	0.19	83.44	0.20	-139.89
40	0.22	-134.57	3.46	142.79	0.19	68.89	0.23	-157.82

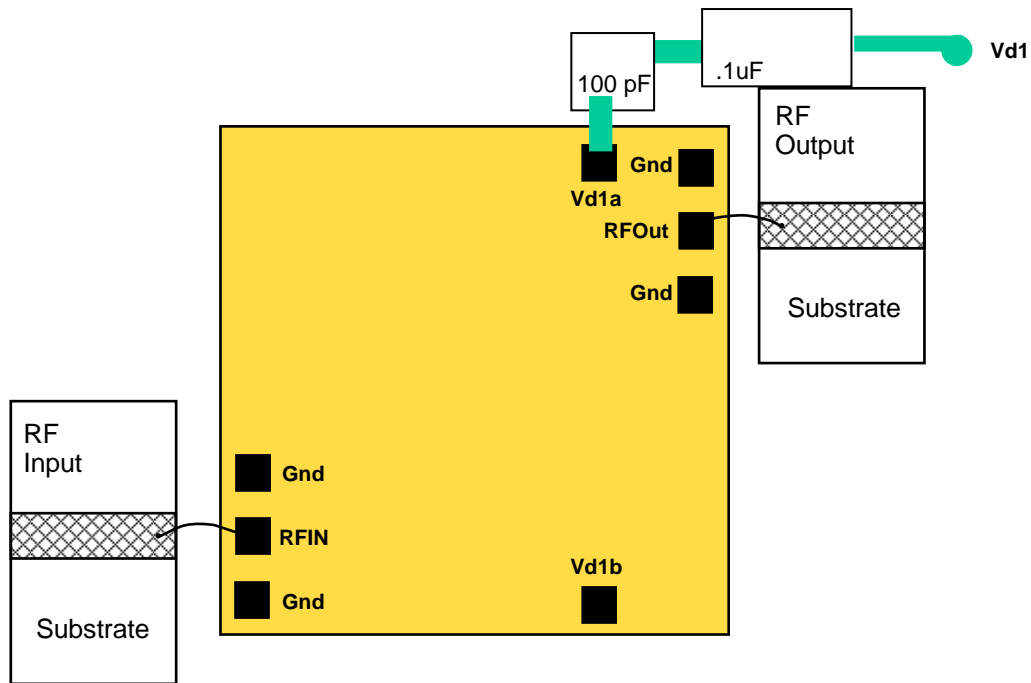
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Die Size and Bond Pad Locations



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.
3. Biasable from either side

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