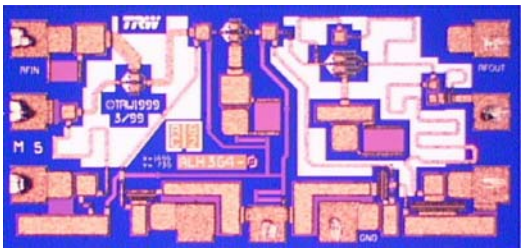
NORTHROP GRUMMAN

Velocium Products

ALH364
24 – 32 GHz Low Noise Amplifier

Product Datasheet

Revision: May 2007



X=1490 µm Y=730 µm

Applications

- Point-to-Point Digital Radios
- Point-to-Multipoint Digital Radios
- VSAT

Product Features

- RF frequency: 24 to 32 GHz
- Noise figure: 2 dB, typical
- Linear gain: 21 dB, typical
- P1dB: 7 dBm, typical
- Unconditionally stable
- Self-bias design (single supply)
- DC Power: 5 Vdc at 68 mA

Product Description

The ALH364 is a broadband, three-stage, self-biased, low noise monolithic HEMT amplifier 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.

Performance Characteristics (Ta = 25°C)

Specification	Min	Typ	Max	Unit
Frequency	24		32	GHz
Linear Gain	18	21		dB
Noise Figure		2	3	dB
Input Return Loss	10	12		dB
Output Return Loss	5	8		dB
P1dB	5	7		dBm
Vd		5		V
Id		68		mA
Thermal Resistance				C/W

Absolute Maximum Ratings (Ta = 25°C)

Parameter	Min	Max	Unit
Vd		5.5	V
Id		130	mA
Input drive level		-9	dBm
Assy. Temperature (60 seconds)		300	deg. C

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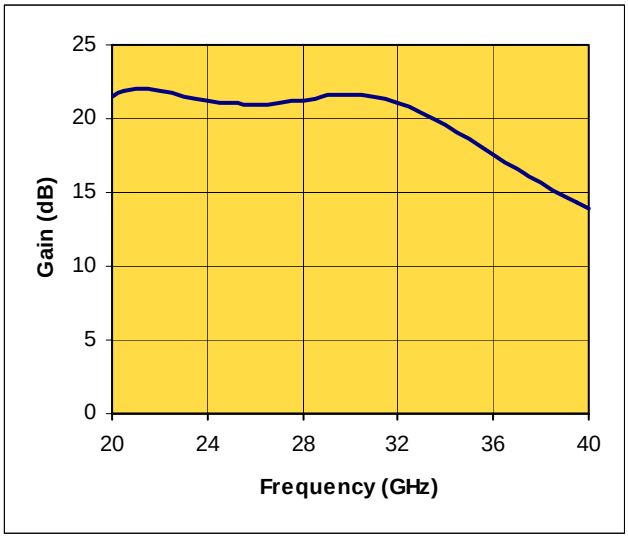
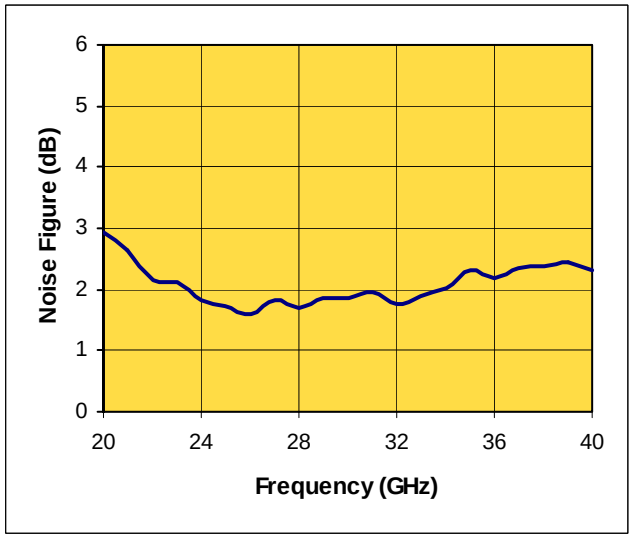
Measured Performance Characteristics (Typical Performance at 25°C)
Vd = 5.0 V, Id = 68 mA

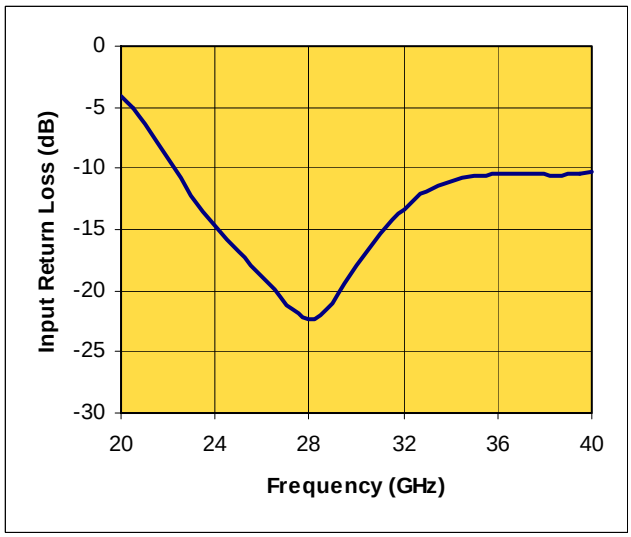
Linear Gain Versus Frequency



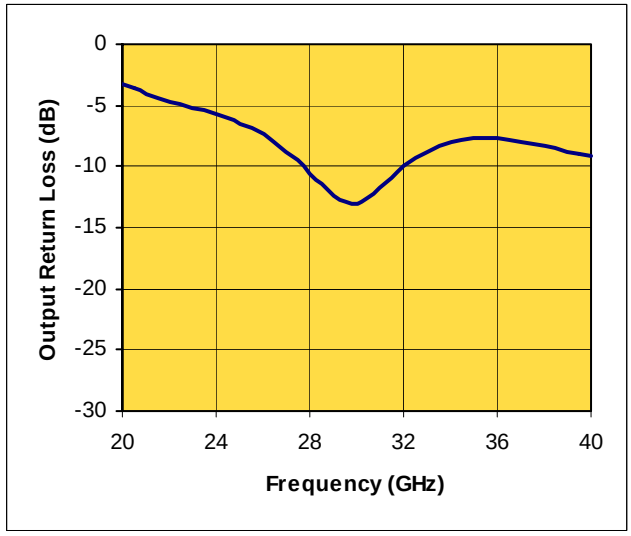
Noise Figure Versus Frequency



Input Return Loss Versus Frequency



Output Return Loss Versus Frequency



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Measured Performance Characteristics (Typical Performance at 25°C)
Vd = 5.0 V, Id = 68 mA

Freq GHz	S11 Mag	S11 Ang	S21 Mag	S21 Ang	S12 Mag	S12 Ang	S22 Mag	S22 Ang
20.00	0.63	141.97	11.81	161.72	0.00	117.15	0.69	-81.92
21.00	0.48	126.11	12.71	124.52	0.00	24.86	0.63	-86.22
22.00	0.34	116.03	12.43	92.49	0.00	-34.00	0.58	-90.64
23.00	0.25	110.95	11.85	65.83	0.00	-74.56	0.55	-96.24
24.00	0.19	108.08	11.46	42.38	0.00	-95.62	0.52	-103.97
25.00	0.14	103.25	11.28	21.23	0.00	-98.38	0.48	-113.94
26.00	0.11	94.17	11.17	1.00	0.01	-121.43	0.43	-126.97
27.00	0.09	72.24	11.27	-18.35	0.01	-128.65	0.37	-143.22
28.00	0.08	38.17	11.58	-37.91	0.01	-139.39	0.30	-167.00
29.00	0.09	1.39	11.97	-58.55	0.01	-160.80	0.24	160.05
30.00	0.13	-28.97	12.07	-80.63	0.01	-178.44	0.23	115.93
31.00	0.17	-49.40	11.85	-102.25	0.01	168.94	0.26	73.81
32.00	0.22	-66.61	11.32	-123.99	0.01	155.90	0.32	41.41
33.00	0.26	-82.25	10.49	-145.11	0.01	139.74	0.36	15.70
34.00	0.28	-94.05	9.53	-164.38	0.01	126.35	0.40	-3.86
35.00	0.29	-103.90	8.52	177.42	0.01	124.21	0.41	-19.78
36.00	0.30	-111.40	7.55	161.01	0.01	110.84	0.41	-33.87
37.00	0.30	-117.85	6.77	146.40	0.01	112.96	0.40	-45.48
38.00	0.30	-121.92	6.06	132.52	0.01	113.97	0.38	-55.47
39.00	0.30	-125.07	5.46	119.59	0.01	95.98	0.37	-65.73
40.00	0.31	-126.49	4.98	107.69	0.01	111.51	0.35	-75.01
41.00	0.31	-128.24	4.58	95.78	0.01	107.71	0.33	-83.74
42.00	0.32	-130.61	4.19	84.12	0.01	104.66	0.31	-93.36
43.00	0.33	-130.36	3.84	74.80	0.01	112.16	0.29	-101.63
44.00	0.34	-131.44	3.66	65.45	0.01	94.66	0.27	-112.94
45.00	0.37	-132.55	3.50	54.38	0.02	97.26	0.26	-123.11

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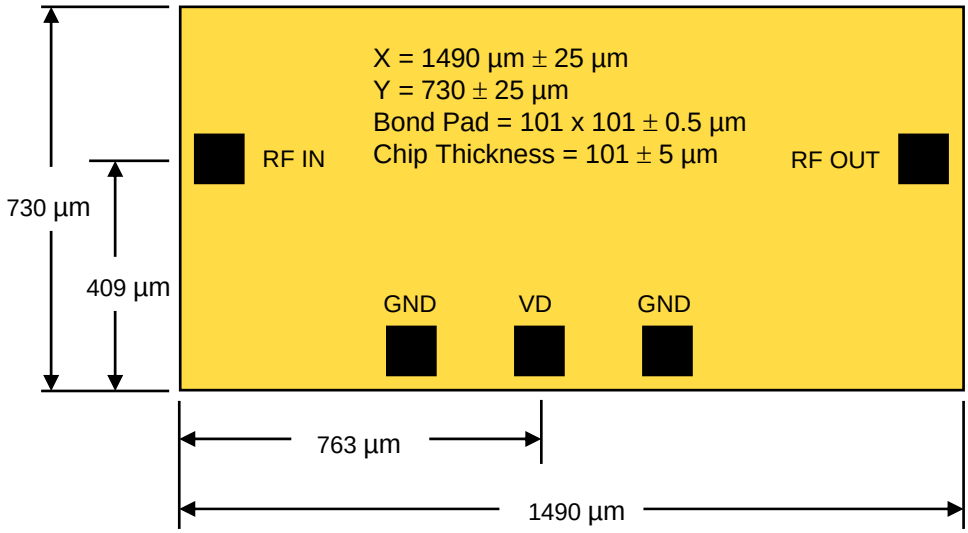
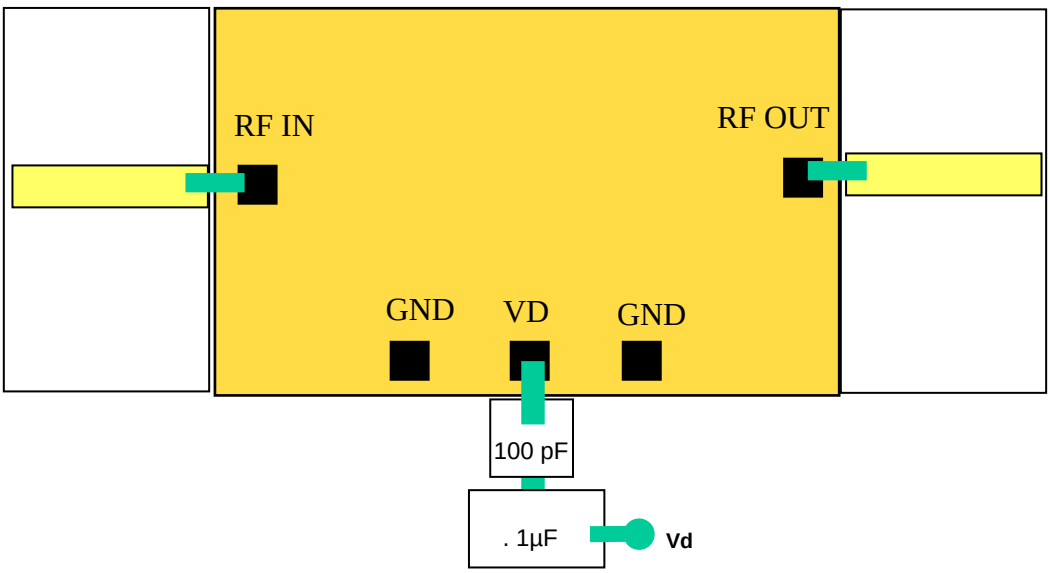
Die Size and Bond Pad Locations



Suggested Bonding



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.