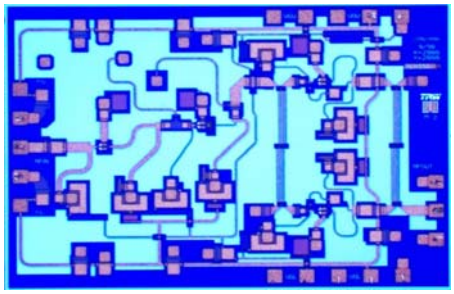
ALH430
26 – 36 GHz Low Noise Amplifier

Product Datasheet

Revision: May 2007



X=2800 µm Y=2000 µm

Product Features

- RF Frequency: 26 to 36 GHz
- Linear Gain: 23 dB typ.
- Noise Figure: 1.6 dB typ.
- Self biased from either side
- Die Size: 5.6 sq. mm.
- DC Power: 5 VDC @ 65 mA

Applications

- Point-to-Point Digital Radios
- Point-to-Multipoint Digital Radios
- VSAT
- Phased Array

Description and Application

The ALH430 monolithic HEMT amplifier is a broadband, three-stage low noise device designed for use in commercial digital radios and wireless LANs. To ensure rugged and reliable operation, HEMT devices are fully passivated. RF input and output ports are AC coupled. 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	26		36	GHz
Linear Gain	20	23		dB
Noise Figure				
26-34 GHz		1.6	2	dB
34.1-36 GHz		1.8	2.3	dB
P1 dB		11		dBm
Input Return Loss		15		dB
Output Return Loss		15		dB
Vd		5		V
Id		65		mA

Absolute Maximum Ratings (Ta = 25°C)

Parameter	Min	Max	Unit
Vd1		5.5	V
Id		120	mA
Input drive level		-4	dBm
Assy. Temperature (60 seconds)		300	deg. C

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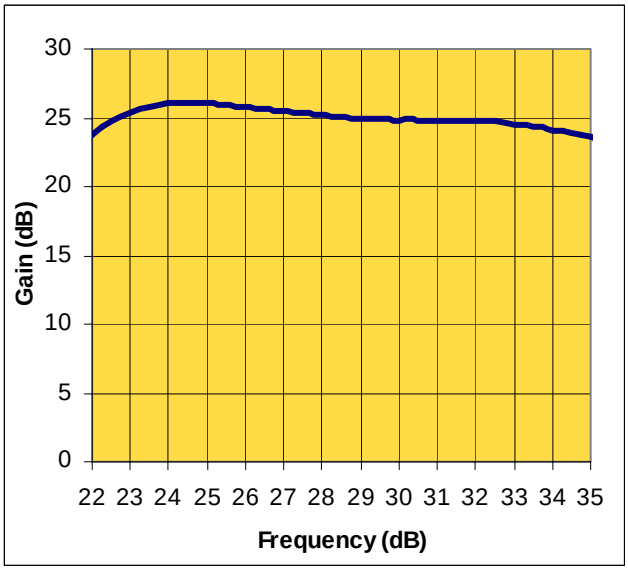
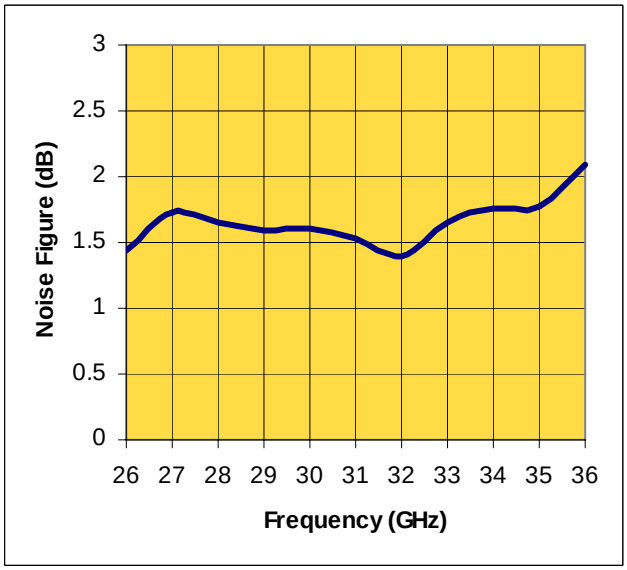
Measured performance characteristics (Typical at 25°C)
Vd= 5 V, Id= 65 mA

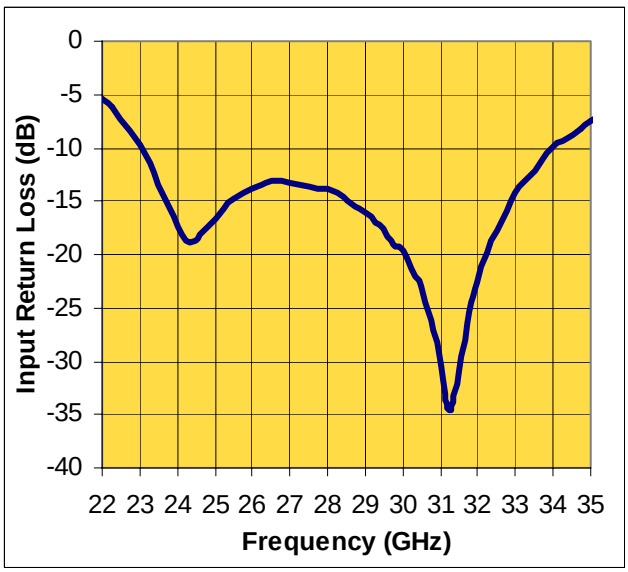
Linear Gain Versus Frequency



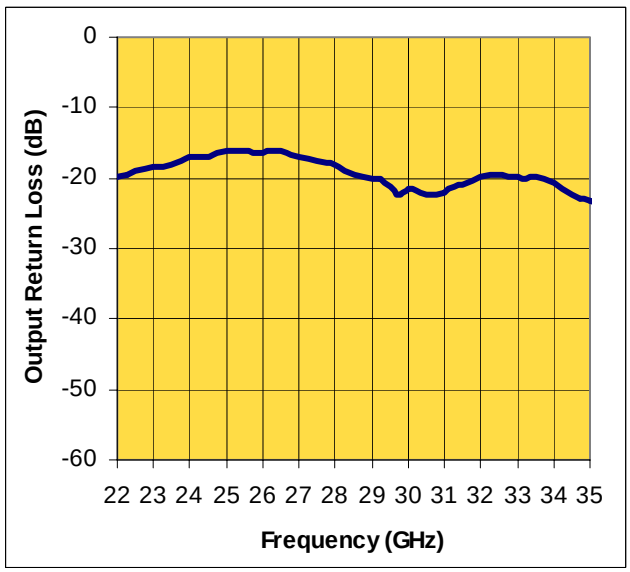
Noise Figure Versus Frequency



Input Return Loss Versus Frequency



Output Return Loss Versus Frequency



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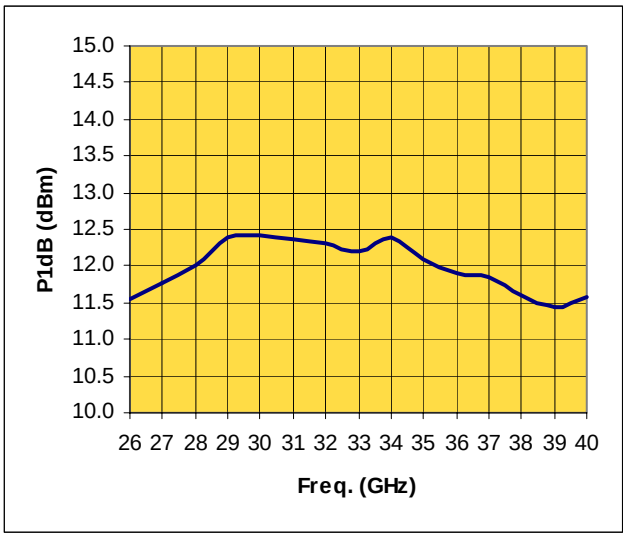
Measured performance characteristics (Typical at 25°C)
Vd= 5 V, Id= 65 mA

P1dB Versus Frequency



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Measured performance characteristics (Typical at 25°C)
Vd= 5 V, Id= 65 mA

Freq GHz	S11 Mag	S11 Ang	S21 Mag	S21 Ang	S12 Mag	S12 Ang	S22 Mag	S22 Ang
22.00	0.64	62.74	8.26	125.12	0.00	101.08	0.11	137.96
22.50	0.59	53.47	9.73	104.15	0.00	-144.94	0.12	128.66
23.00	0.54	43.31	11.20	83.54	0.00	169.75	0.12	122.41
23.50	0.47	31.82	12.93	60.86	0.00	-156.00	0.12	117.99
24.00	0.39	19.08	14.73	38.56	0.00	131.04	0.13	109.28
24.50	0.31	3.51	16.45	15.75	0.00	104.12	0.14	103.34
25.00	0.21	-12.95	17.68	-8.33	0.00	118.00	0.15	96.24
25.50	0.12	-36.77	18.59	-32.10	0.00	130.90	0.14	88.72
26.00	0.05	-93.11	19.00	-55.90	0.00	137.52	0.14	88.32
26.50	0.06	177.84	18.68	-77.69	0.00	119.04	0.15	86.18
27.00	0.10	153.61	18.33	-98.02	0.00	101.04	0.14	76.42
27.50	0.14	137.23	17.90	-117.89	0.00	104.65	0.13	68.24
28.00	0.17	126.53	17.38	-136.21	0.00	100.24	0.11	64.61
28.50	0.17	115.60	16.70	-152.60	0.00	93.91	0.10	69.16
29.00	0.17	107.76	16.39	-168.98	0.00	93.47	0.11	57.15
29.50	0.17	100.92	16.15	175.45	0.00	67.98	0.08	38.50
30.00	0.16	94.72	15.93	160.25	0.00	70.25	0.04	40.20
30.50	0.15	88.12	15.80	145.56	0.00	64.23	0.04	90.41
31.00	0.14	82.65	15.84	131.90	0.00	46.95	0.07	100.22
31.50	0.12	75.57	15.94	117.22	0.00	29.26	0.07	96.49
32.00	0.11	64.51	16.18	103.27	0.00	31.29	0.06	98.52
32.50	0.08	51.50	16.51	89.20	0.00	28.42	0.09	123.49
33.00	0.06	31.40	16.90	74.73	0.00	15.63	0.14	92.94
33.50	0.04	-9.91	17.74	60.07	0.00	7.43	0.11	85.46
34.00	0.05	-62.23	18.08	44.93	0.01	-13.41	0.14	87.28
34.50	0.09	-95.77	18.62	30.19	0.00	0.80	0.14	76.00
35.00	0.14	-112.23	19.50	13.25	0.01	-10.63	0.12	58.63
35.50	0.18	-124.47	19.84	-2.75	0.01	-18.02	0.13	63.62
36.00	0.23	-133.96	20.41	-19.41	0.01	-33.21	0.17	34.58

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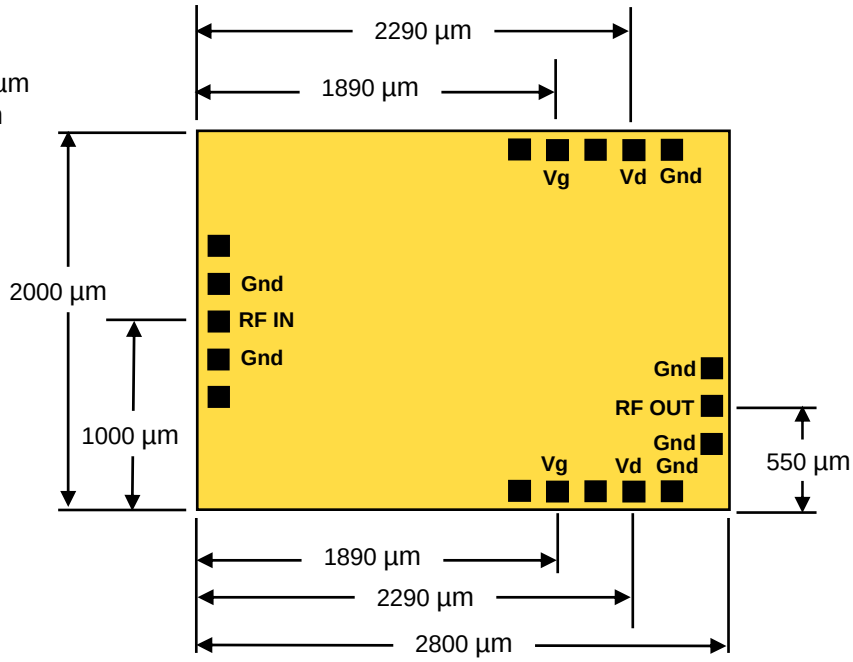
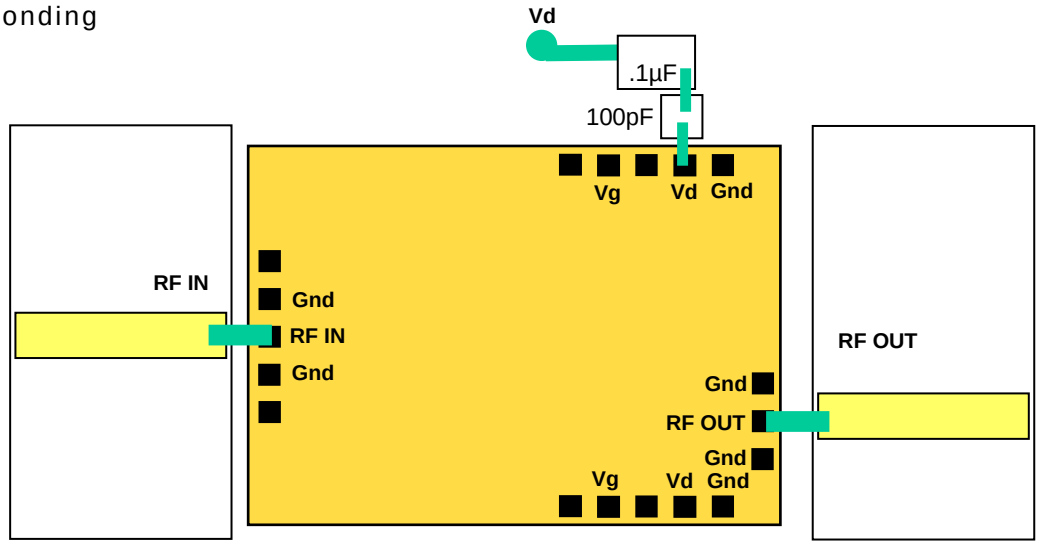
Die Size and Bond Pad Locations

X = 2800 um ± 25 µm
Y = 2000 ± 25 µm
Bond Pad = 101 x 101 ± 0.5 µm
Chip Thickness = 101 ± 5 µm



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.
3. Biasable from either side.
4. Gate overide bias pad exists on both side of MMIC.