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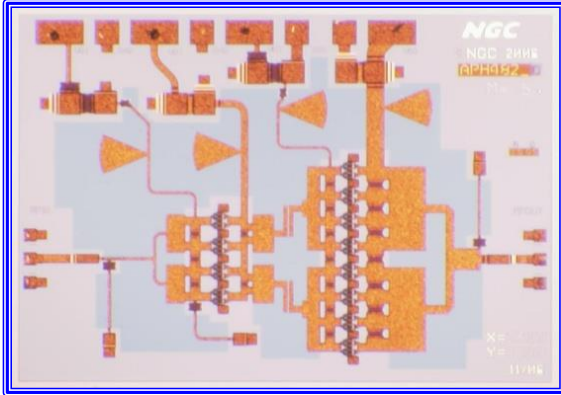
92-96 GHz

High Power Amplifier

NORTHROP GRUMMAN

Product Datasheet

Revision: January 2015



X=2300 μ m Y=1600 μ m

Product Features

- RF Frequency: 92 to 96 GHz
- Linear Gain: 7.5 dB typ.
- Psat: 25 dBm typ.
- Die Size: 3.7 sq. mm.
- 2 mil substrate
- DC Power: 4 VDC @ 480 mA

Performance Characteristics (Ta = 25°C)

Specification	Min	Typ	Max	Unit
Frequency	93		95	GHz
Linear Gain	6	7.5		dB
Input Return Loss		8		dB
Output Return Loss		10		dB
Psat		25		dBm
Vd1, Vd2		4		V
Vg1		-0.2		V
Vg2		-0.1		V
Id1		160		mA
Id2		320		mA

Applications

- Short Haul / High Capacity Links
- Sensors

Product Description

The APH482 monolithic HEMT amplifier is a broadband, two-stage power device, designed for use in commercial digital radios and wireless LANs. 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
Vd1, Vd2		4.5	V
Id1		190	mA
Id2		360	mA
Vg1, Vg2	-0.8	+0.3	V
Input drive level		22	dBm
Assy. Temperature (60 seconds)		300	deg. C

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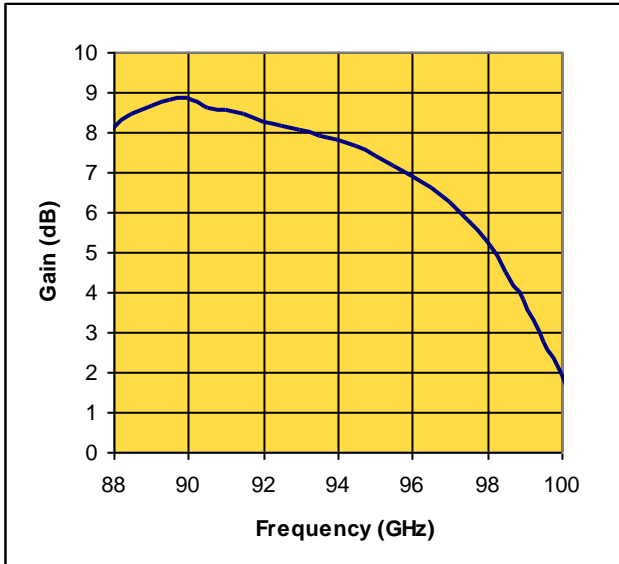
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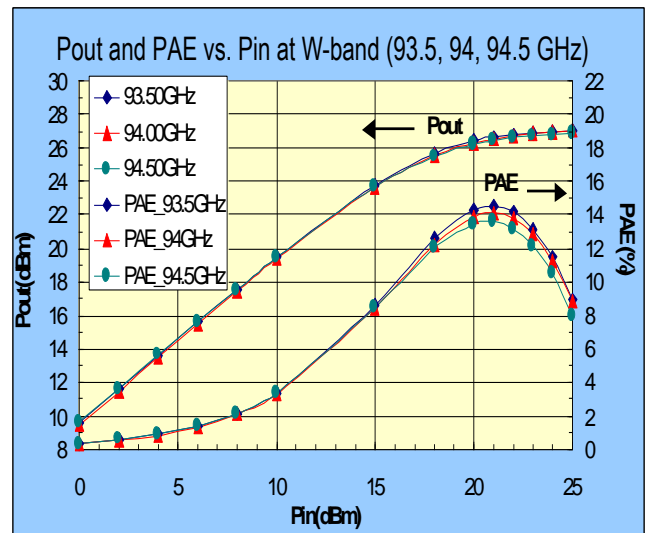
Measured Performance Characteristics (Typical Performance at 25°C)

Vd1 = Vd2 = 4V, Id1 = 160 mA, Id2 = 320 mA

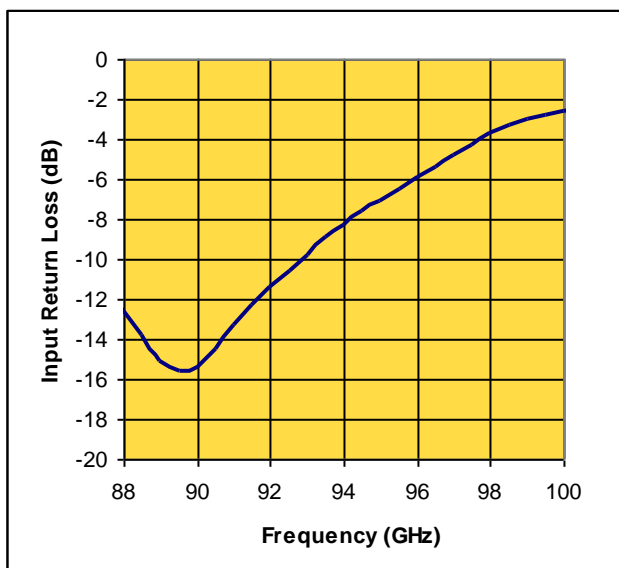
Linear Gain vs. Frequency



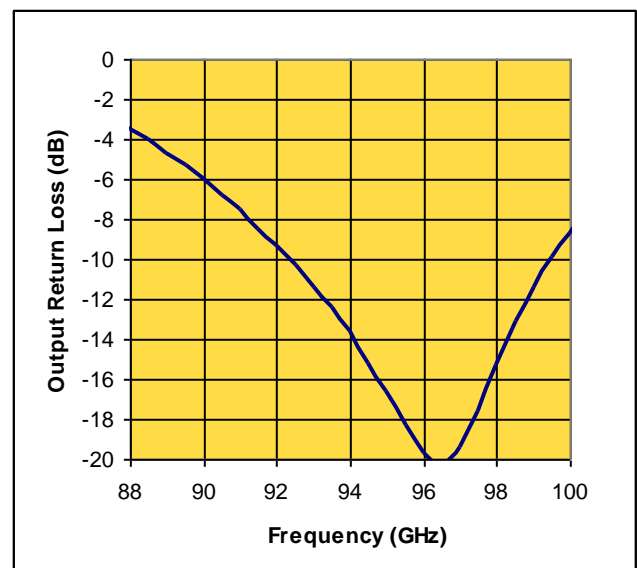
Pout Versus Pin



Input Return Loss vs. Frequency



Output Return Loss vs. Frequency

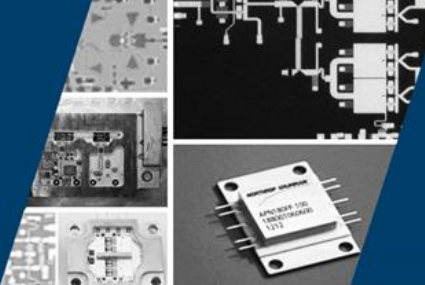


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Measured Performance Characteristics (Typical Performance at 25°C)

Vd1 = Vd2 = 4V, Id1 = 160 mA, Id2 = 320 mA

Freq GHz	S11 Mag	S11 Ang	S21 Mag	S21 Ang	S12 Mag	S12 Ang	S22 Mag	S22 Ang
88.0	0.215	116.150	2.607	-161.575	0.026	-95.482	0.669	121.886
88.5	0.191	95.661	2.691	-173.082	0.029	-103.651	0.632	116.399
89.0	0.170	74.053	2.740	-173.758	0.029	-113.847	0.583	111.529
89.5	0.172	51.640	2.780	162.165	0.031	-123.765	0.544	106.948
90.0	0.180	31.212	2.776	149.135	0.031	-134.121	0.495	102.382
90.5	0.201	14.074	2.696	137.651	0.031	-143.780	0.453	98.494
91.0	0.232	0.950	2.681	126.236	0.032	-152.169	0.415	93.928
91.5	0.262	-11.077	2.644	114.607	0.032	-164.202	0.371	89.819
92.0	0.290	-19.869	2.580	103.875	0.031	-171.160	0.336	86.664
92.5	0.319	-27.657	2.555	92.968	0.031	-176.595	0.302	82.408
93.0	0.348	-33.791	2.515	81.626	0.031	167.256	0.266	78.848
93.5	0.381	-38.934	2.481	70.741	0.030	162.343	0.236	73.219
94.0	0.410	-44.653	2.438	59.274	0.030	152.071	0.203	68.090
94.5	0.437	-49.281	2.405	47.333	0.029	141.649	0.174	60.451
95.0	0.468	-53.518	2.340	35.435	0.027	134.391	0.149	49.123
95.5	0.498	-57.343	2.266	23.814	0.026	125.204	0.125	33.604
96.0	0.531	-61.778	2.207	11.830	0.025	118.579	0.110	10.834
96.5	0.566	-65.811	2.135	-0.783	0.024	111.821	0.106	-19.451
97.0	0.603	-69.925	2.059	-13.642	0.023	101.233	0.114	-44.220
97.5	0.642	-74.389	1.958	-27.014	0.021	94.138	0.141	-63.936
98.0	0.678	-79.244	1.826	-40.222	0.020	86.305	0.179	-78.799
98.5	0.708	-84.178	1.680	-52.965	0.017	79.219	0.225	-91.195
99.0	0.736	-89.123	1.553	-65.605	0.016	72.248	0.273	-101.248
99.5	0.756	-94.212	1.380	-77.731	0.014	67.631	0.322	-110.052
100.0	0.769	-98.939	1.261	-89.420	0.012	62.807	0.369	-117.809

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Page 3

APH482

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Die Size and Bond Pad Locations (Not to Scale)

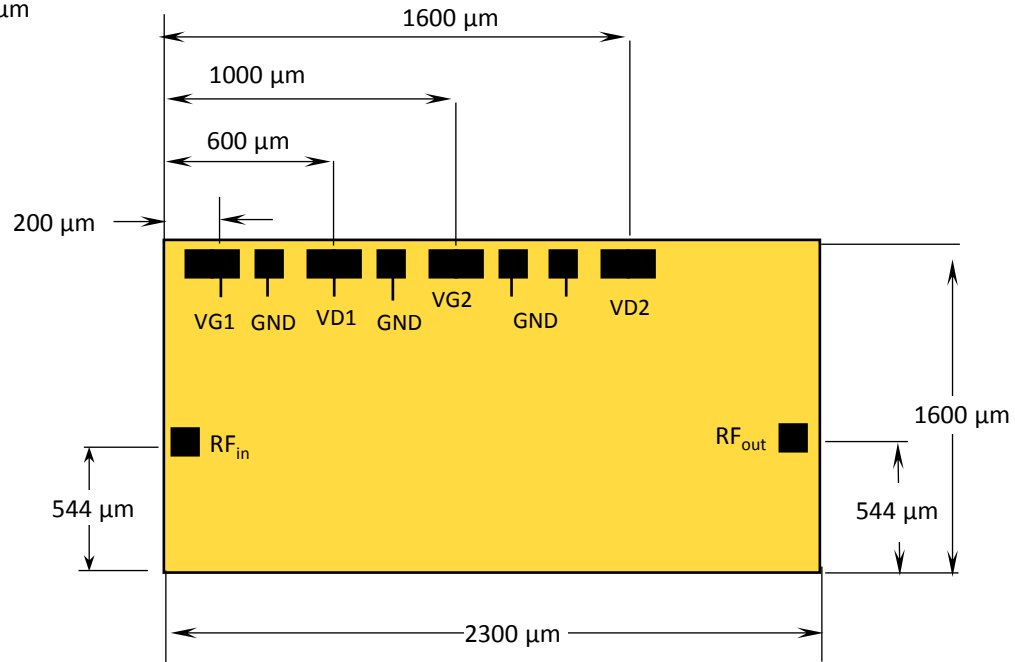
X = 2300 μm \pm 25 μm

Y = 1600 \pm 25 μm

DC Bond Pad = 201 x 101 \pm 0.5 μm

RF Bond Pad = 50 x 50 \pm 0.5 μm

Chip Thickness = 50 \pm 5 μm



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Page 4

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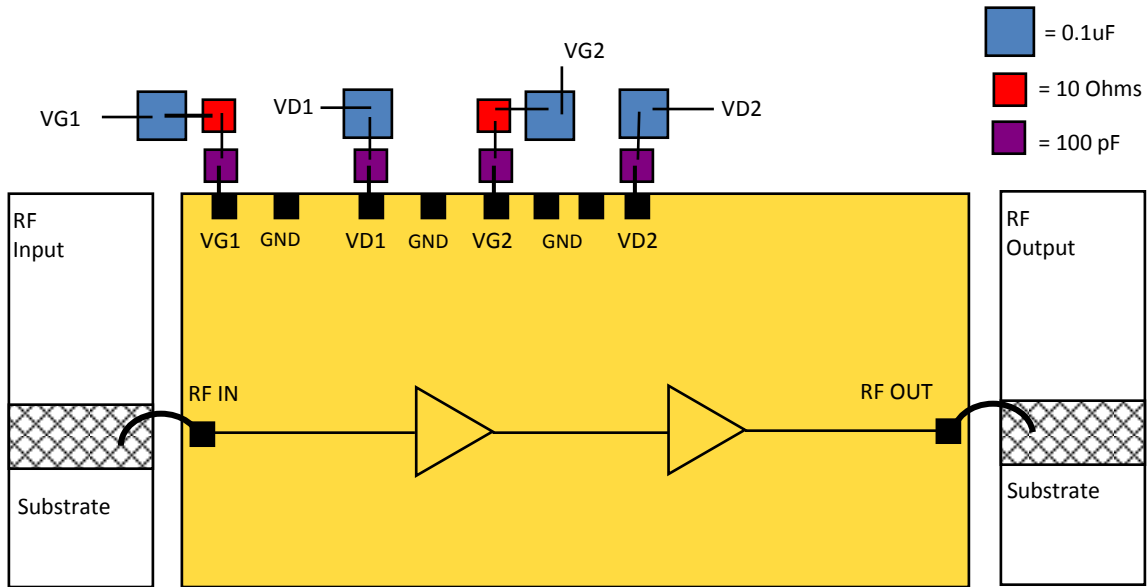
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Product Datasheet
Suggested Bonding Arrangement

Revision: January 2015



Recommended Assembly Notes

1. Bypass caps should be 100 pF ceramic (single-layer) placed no further than 30 mils from the amplifier.
2. Best performance obtained from use of <6 mil (long) by 1.5 by 0.5 mil ribbons on input and output.

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Page 5