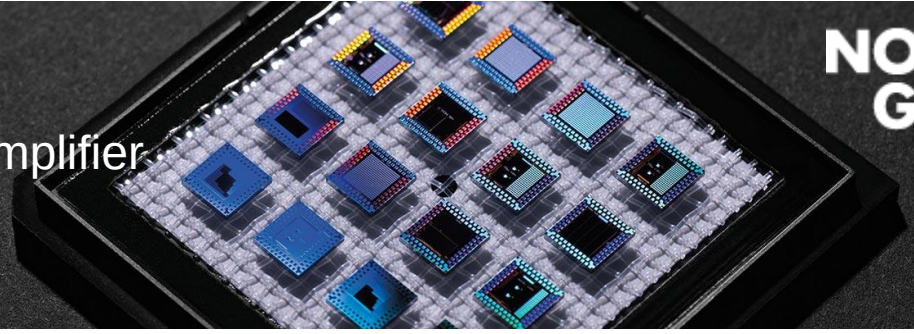
APH668
71-76 GHz
High Power Amplifier



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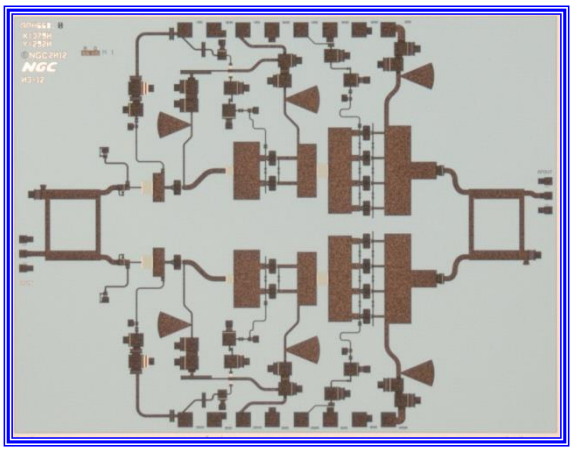

x=3.79mm; y=2.92 mm

Applications

- FCC E-band Communication Systems @ 71-76 GHz Frequency Band
- Short Haul / High Capacity Links
- Enterprise Wireless LAN
- Wireless Fiber Replacement

Product Features

- RF Frequency: 71 to 76 GHz
- Linear Gain: 19 dB typ.
- Psat: 28 dBm typ.
- PAE @Psat: 22% typ.
- Die Size: 11.07 sq. mm.
- 2 mil substrate
- DC Power: 4 VDC @ 630 mA

Product Description

The APH668 is a Gallium Arsenide-based broadband, three-stage power amplifier device, designed for use in commercial digital radios and wireless LANs. To ensure rugged and reliable operation, GaAs pHEMT 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	71		76	GHz
Linear Gain	16.5	19		dB
Input Return Loss	15	20		dB
Output Return Loss	16	19		dB
P1db (PP*)		TBD		dBm
Psat (PP*)	27	28		dBm
PAE @ Psat (PP*)		22		%
Psat (-3)	26	26.5		dBM
Vd1=Vg1a, Vd2=Vd2a		4		V
Vg1=Vg1a		-0.08		V
Vg2=Vg2a		-0.07		V
Id1+Id1a		270		mA
Id2+Id2a		360		mA

* Pulsed-Power On-Wafer unless otherwise noted

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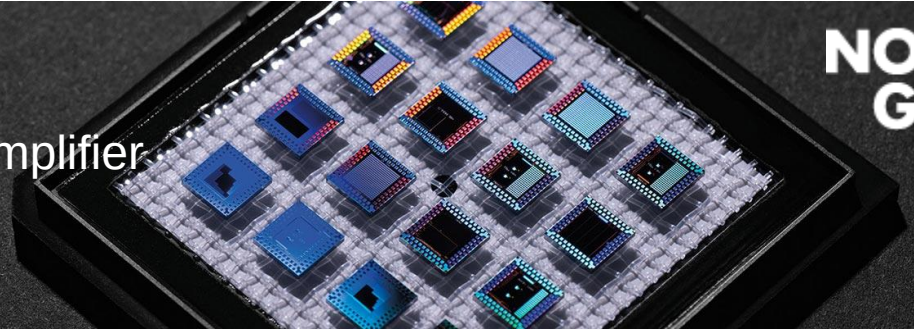

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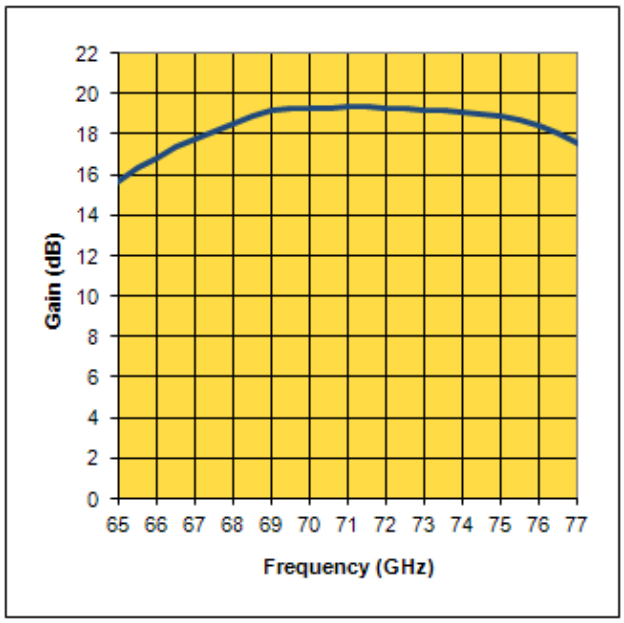
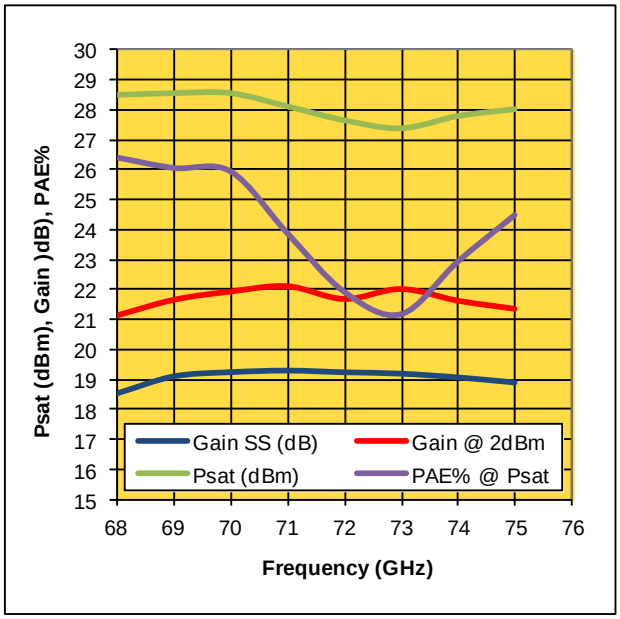
On wafer measured Performance Characteristics (Typical Performance at 25°C)
Vd = 4.0 V, Id1 + Id1a = 270 mA, Id2 + Id2a = 360 mA

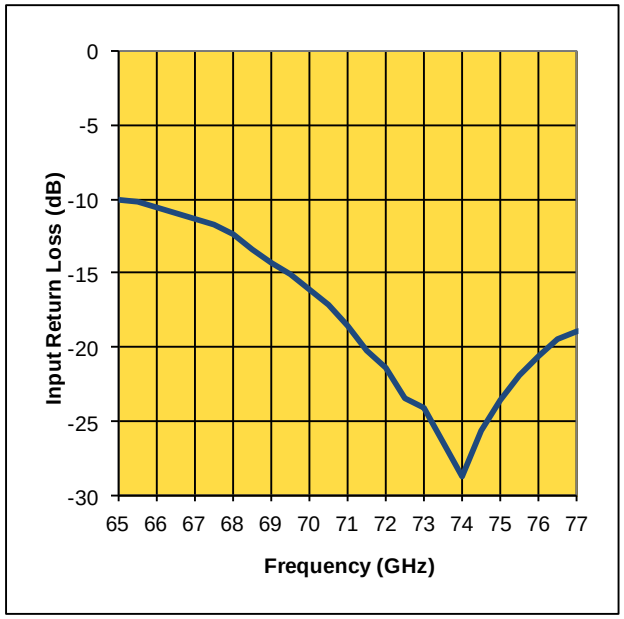
Linear Gain vs. Frequency



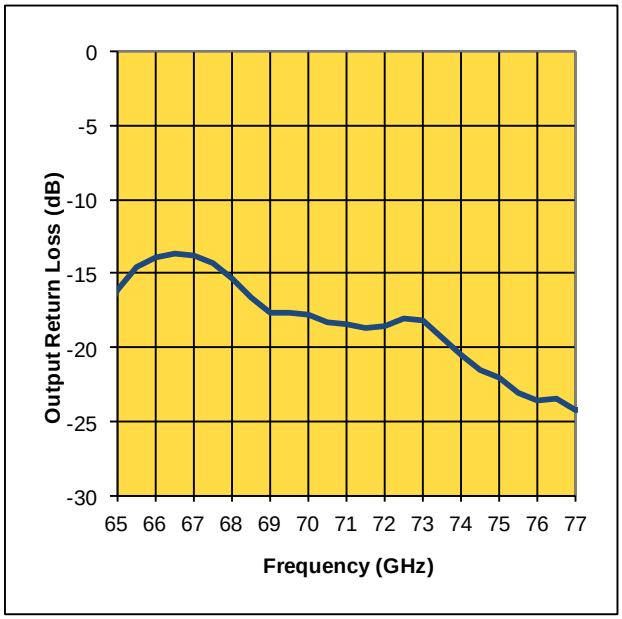
PSAT, GAIN, PAE vs. Frequency



Input Return Loss vs. Frequency



Output Return Loss vs. Frequency



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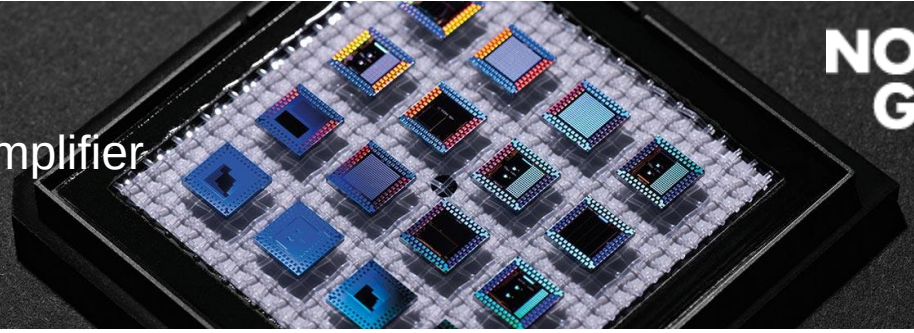

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Fixture measured Performance Characteristics (Typical Performance at 25°C)
Vd = 4 V, Id1 + Id1a = 270 mA, Id2 + Id2a = 360 mA

Freq GHz	S11 Mag	S11 Ang	S21 Mag	S21 Ang	S12 Mag	S12 Ang	S22 Mag	S22 Ang
66.0	0.301	127.400	6.324	175.200	0.002	114.100	0.223	124.700
66.5	0.286	123.800	6.736	157.200	0.002	119.100	0.227	119.800
67.0	0.279	120.000	7.123	138.900	0.001	80.930	0.220	114.500
67.5	0.263	116.100	7.488	120.600	0.001	144.700	0.204	110.900
68.0	0.246	111.600	7.863	102.500	0.001	-171.700	0.184	107.700
68.5	0.219	107.100	8.276	83.720	0.001	111.200	0.159	108.900
69.0	0.195	104.600	8.561	64.730	0.001	79.940	0.147	115.500
69.5	0.179	101.700	8.760	45.300	0.001	48.640	0.149	119.600
70.0	0.163	96.560	8.821	26.390	0.001	31.230	0.154	119.000
70.5	0.144	90.650	8.887	8.134	0.000	-29.630	0.151	118.800
71.0	0.120	85.320	8.928	-10.420	0.001	-50.240	0.147	119.500
71.5	0.094	83.080	8.954	-28.820	0.001	1.354	0.144	120.300
72.0	0.075	79.600	8.922	-47.180	0.002	-127.200	0.145	121.200
72.5	0.054	83.020	8.908	-65.490	0.001	174.400	0.150	117.300
73.0	0.052	81.570	8.811	-83.990	0.002	93.590	0.142	110.400
73.5	0.044	65.350	8.732	-102.200	0.002	48.320	0.124	101.100
74.0	0.036	35.970	8.656	-120.600	0.002	-71.500	0.108	101.600
74.5	0.043	1.162	8.584	-139.500	0.001	89.810	0.093	98.820
75.0	0.045	-26.070	8.426	-159.500	0.001	-29.830	0.085	95.120
75.5	0.058	-35.320	8.227	-179.200	0.001	-68.340	0.072	90.840
76.0	0.070	-44.620	7.927	161.100	0.001	61.650	0.062	74.730
76.5	0.083	-51.900	7.567	141.000	0.001	-19.030	0.056	57.040
77.0	0.096	-63.060	7.161	120.700	0.003	38.900	0.040	22.420
77.5	0.109	-73.180	6.647	100.200	0.004	15.660	0.034	-9.000
78.0	0.122	-84.670	6.078	79.620	0.004	-1.088	0.041	-31.560
78.5	0.125	-90.160	5.442	59.600	0.005	-43.120	0.060	-41.930
79.0	0.140	-92.650	4.829	40.550	0.005	-48.130	0.080	-59.940
79.5	0.152	-94.000	4.250	22.040	0.003	-60.000	0.098	-70.560
80.0	0.163	-94.160	3.688	3.933	0.005	-63.910	0.115	-76.800
80.5	0.177	-91.850	3.182	-13.190	0.004	-80.640	0.134	-82.190
81.0	0.199	-92.510	2.743	-29.190	0.001	-88.030	0.148	-87.400
81.5	0.214	-95.780	2.371	-45.210	0.004	-31.570	0.164	-90.170
82.0	0.227	-98.490	2.037	-60.890	0.006	-51.900	0.181	-93.150

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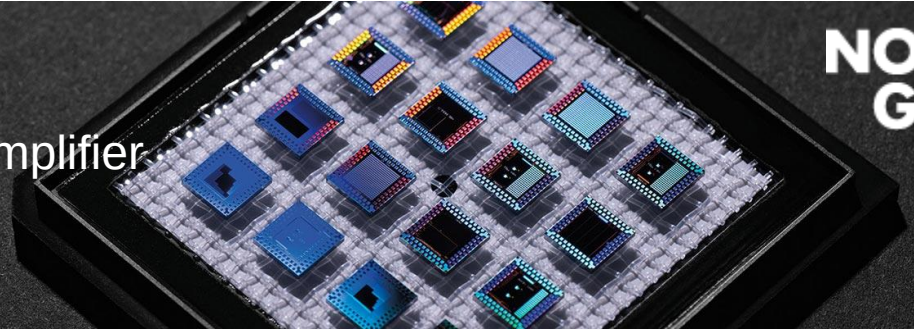

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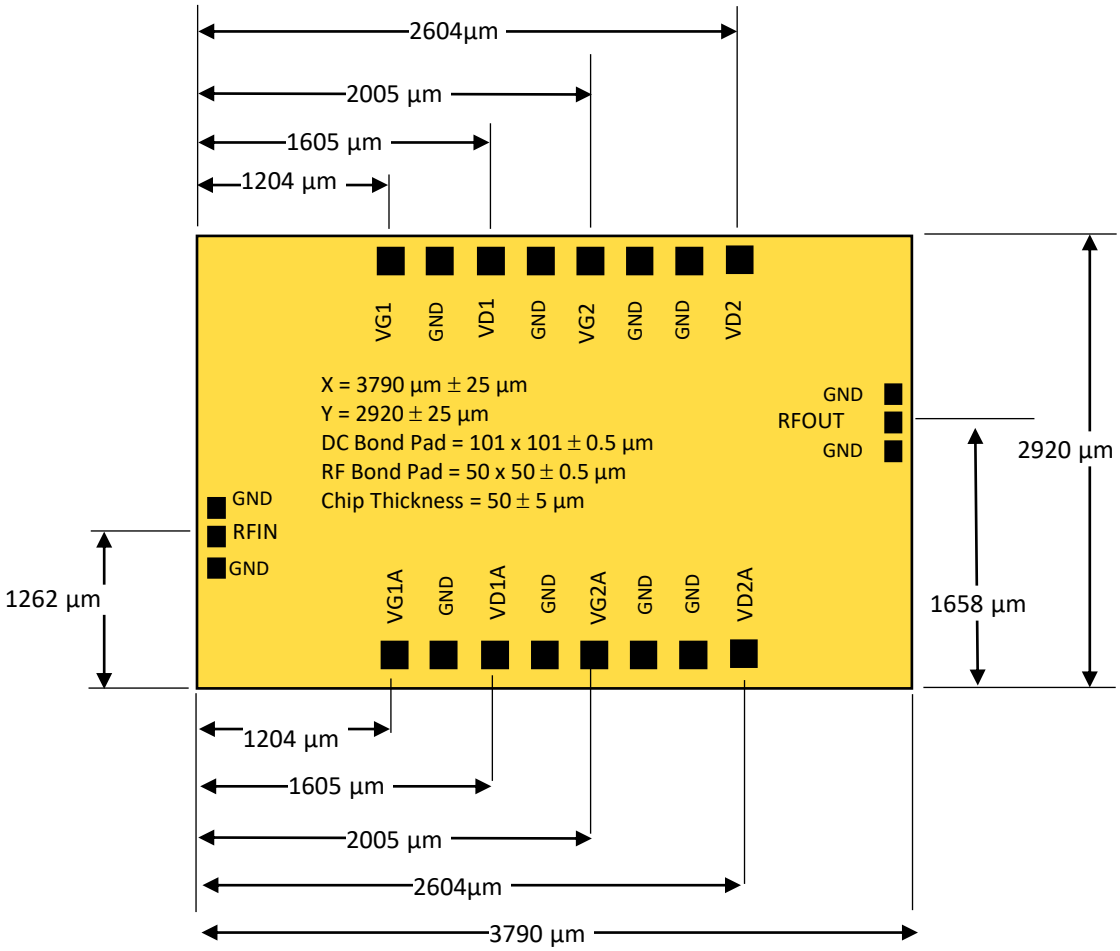
Die Size and Bond Pad Locations (Not to Scale)



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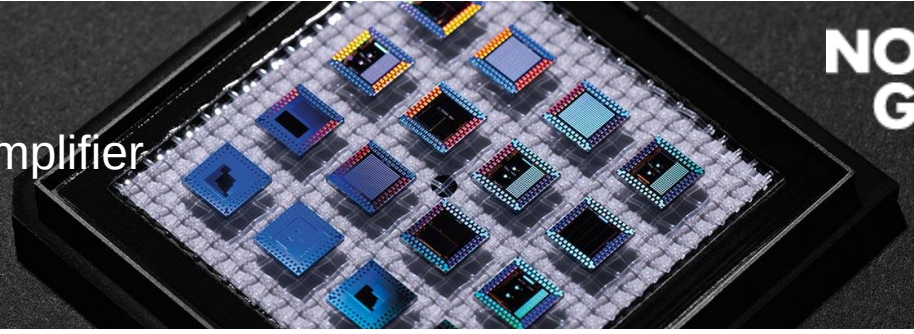

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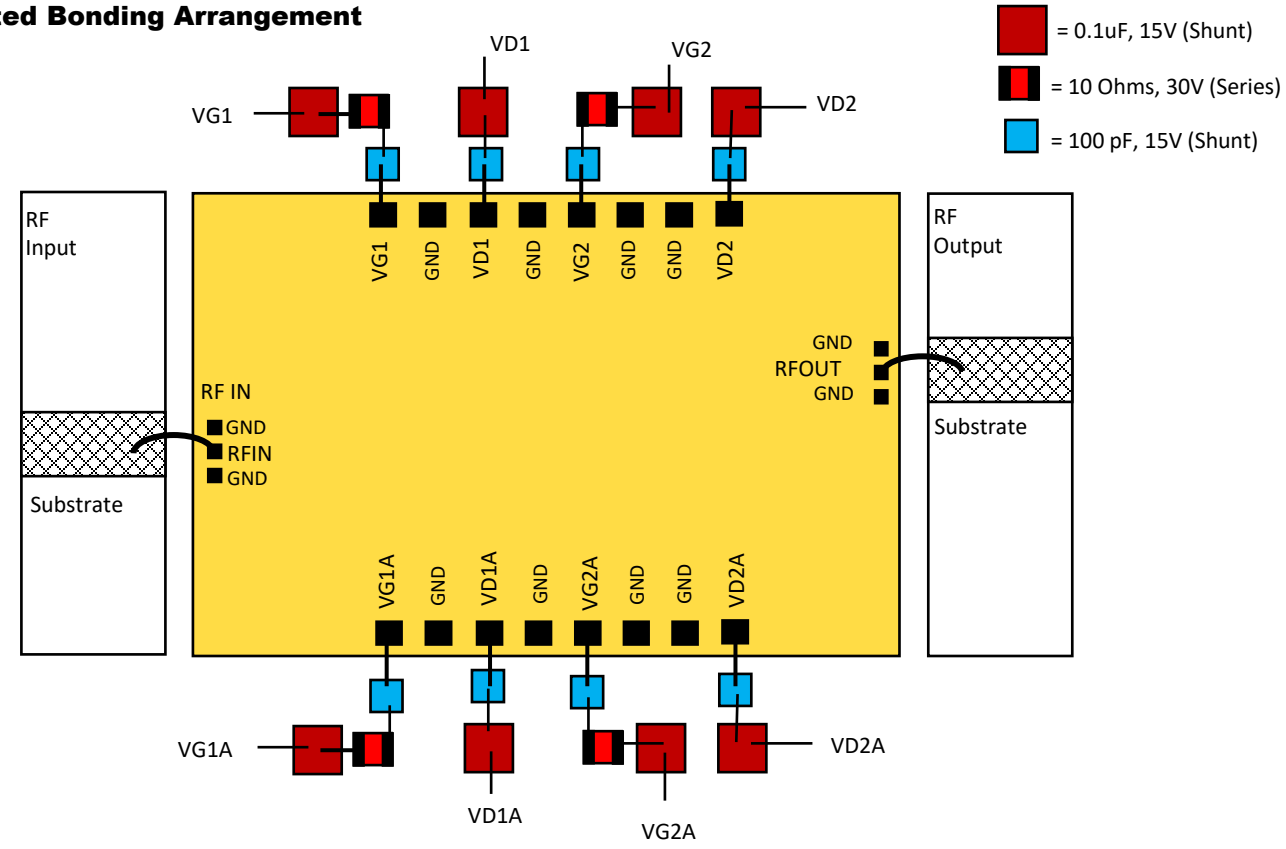
Suggested Bonding Arrangement



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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