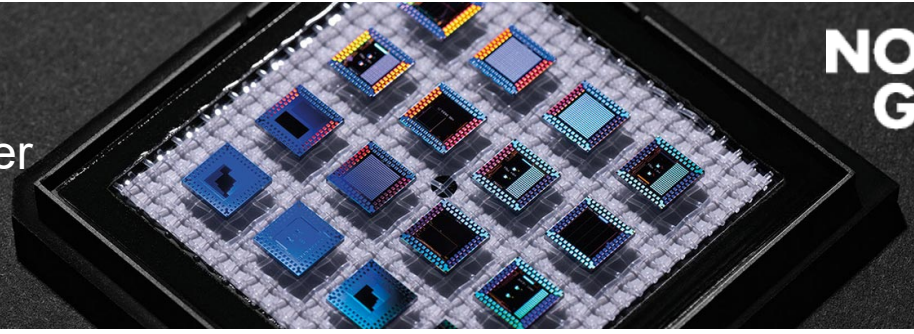
APH635
92-96 GHz
Power Amplifier



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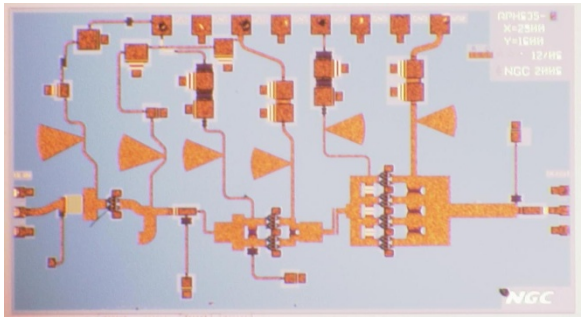

x=2.90 mm; y=1.60 mm

Product Features

- RF Frequency: 92 to 96 GHz
- Linear Gain: 15 dB typ.
- Psat: 22 dBm typ.
- Die Size: < 4.7 sq. mm.
- 2 mil substrate
- DC Power: 4 VDC @ 280 mA

Applications

- Short Haul / High Capacity Links
- Sensors
- Radar

Product Description

The APH635 monolithic HEMT amplifier is a broadband, three-stage power device, designed for use in Short Haul / High Capacity Links 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.

Performance Characteristics (Ta = 25°C)

Specification *	Min	Typ	Max	Unit
Frequency	92		96	GHz
Linear Gain	13	15		dB
Input Return Loss		7		dB
Output Return Loss		9		dB
Psat		22		dBm
Vd1, Vd2		4		V
Vg1		-0.2		V
Vg2		-0.2		V
Id1		120		mA
Id2		160		mA

* Pulsed-Power On-Wafer unless otherwise noted

Export Information
ECCN: **3A001.b.2.c**
HTS (Schedule B) code: **8542.33.0000**

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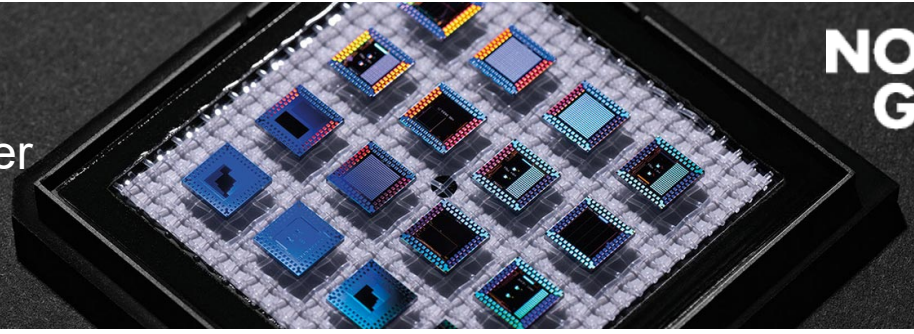

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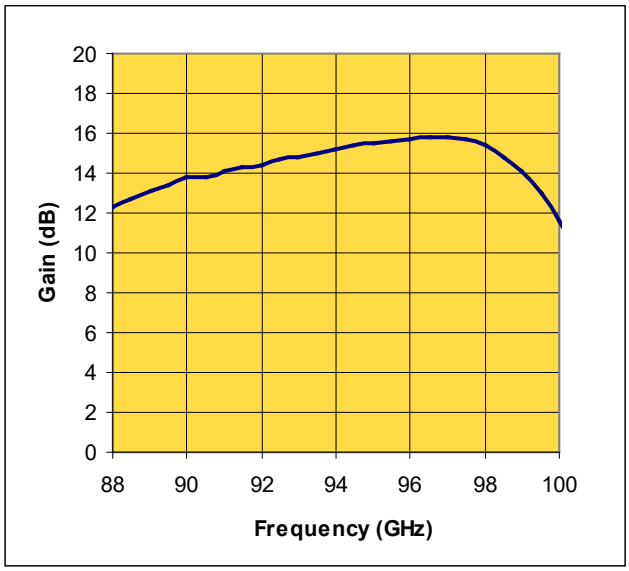
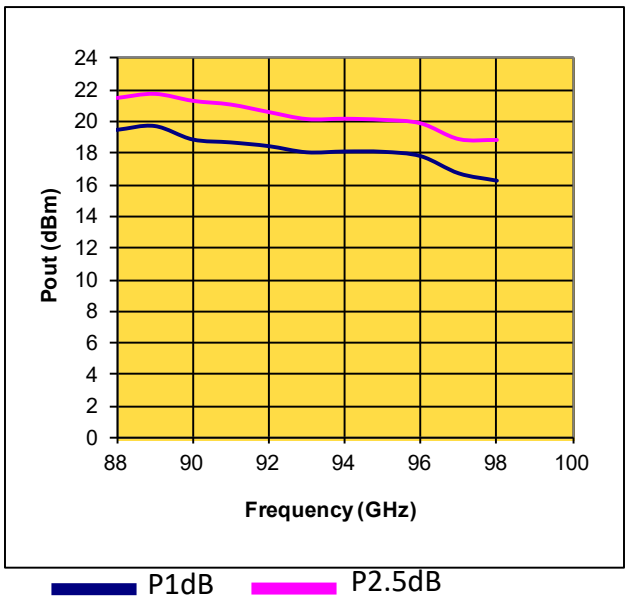
On wafer measured Performance Characteristics (Typical Performance at 25°C)
Vd1=Vd2 = 4.0 V, Id1 = 120 mA, Id2 = 160 mA

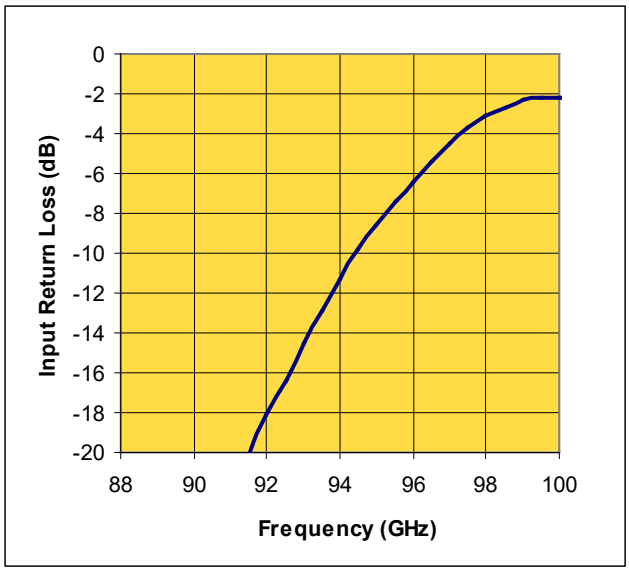
Linear Gain vs. Frequency



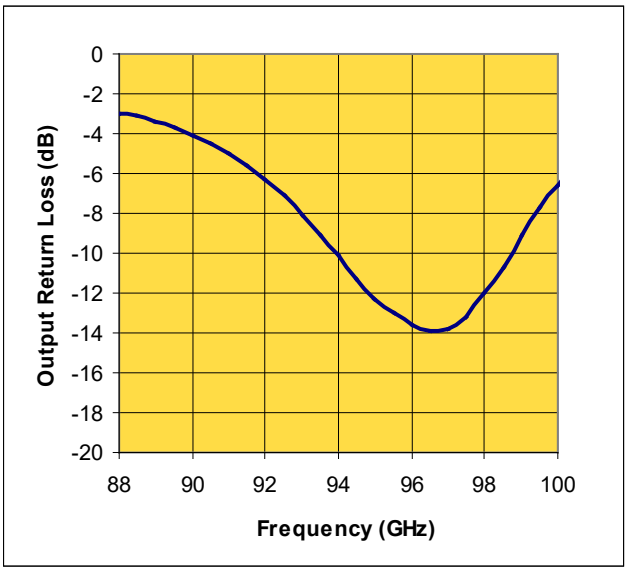
Fixtured Output Power vs. Frequency



Input Return Loss vs. Frequency



Output Return Loss vs. Frequency



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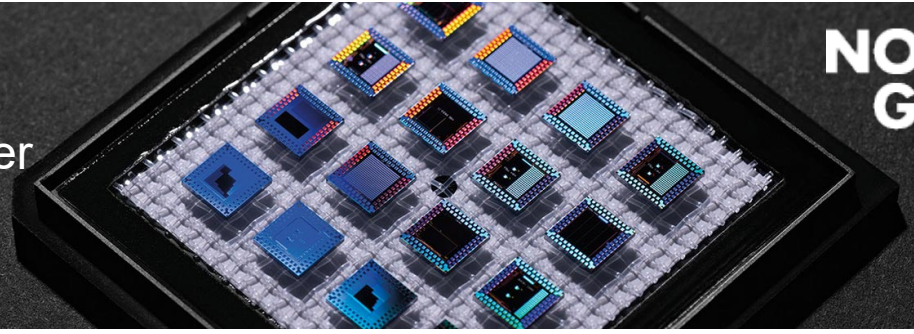

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On wafer measured Performance Characteristics (Typical Performance at 25°C)
Vd1=Vd2 = 4.0 V, Id1 = 120 mA, Id34 = 160 mA

Freq GHz	S11 Mag	S11 Ang	S21 Mag	S21 Ang	S12 Mag	S12 Ang	S22 Mag	S22 Ang
88.0	0.092	43.908	4.285	123.508	0.006	-134.727	0.716	158.137
88.5	0.073	37.535	4.447	110.909	0.007	-143.286	0.702	152.385
89.0	0.066	34.244	4.668	97.890	0.006	-150.719	0.681	146.189
89.5	0.059	25.321	4.829	84.217	0.007	-158.365	0.661	140.133
90.0	0.063	25.460	5.010	69.864	0.006	-168.894	0.631	133.690
90.5	0.070	18.410	5.023	56.119	0.006	-171.667	0.598	127.656
91.0	0.083	15.798	5.192	42.729	0.006	-170.219	0.567	120.663
91.5	0.105	11.477	5.325	28.843	0.006	147.030	0.529	113.396
92.0	0.134	2.595	5.371	15.658	0.005	138.274	0.491	106.345
92.5	0.163	-4.210	5.532	1.665	0.005	122.194	0.448	98.133
93.0	0.204	-10.633	5.650	-12.629	0.004	108.182	0.403	90.579
93.5	0.245	-18.019	5.777	-26.733	0.004	99.612	0.362	82.565
94.0	0.297	-23.575	5.921	-41.463	0.004	78.228	0.323	73.819
94.5	0.352	-30.372	6.042	-57.055	0.004	58.554	0.284	65.231
95.0	0.402	-37.539	6.113	-72.432	0.004	41.675	0.256	55.637
95.5	0.463	-44.197	6.185	-88.330	0.003	22.703	0.232	47.109
96.0	0.515	-51.361	6.265	-104.837	0.003	-1.120	0.216	37.189
96.5	0.576	-57.321	6.301	-122.365	0.003	-11.975	0.207	27.254
97.0	0.638	-64.260	6.290	-140.563	0.003	-28.604	0.207	17.790
97.5	0.695	-71.167	6.180	-159.376	0.003	-56.878	0.225	8.379
98.0	0.746	-78.266	5.969	-175.987	0.002	-83.572	0.257	-2.709
98.5	0.785	-85.243	5.614	159.925	0.002	-121.817	0.302	-14.886
99.0	0.811	-91.901	5.136	139.520	0.001	-128.897	0.359	-28.732
99.5	0.823	-97.922	4.527	118.704	0.001	-110.506	0.421	-42.004
100.0	0.822	-103.479	3.912	99.493	0.001	45.211	0.479	-54.423

2/8/2021

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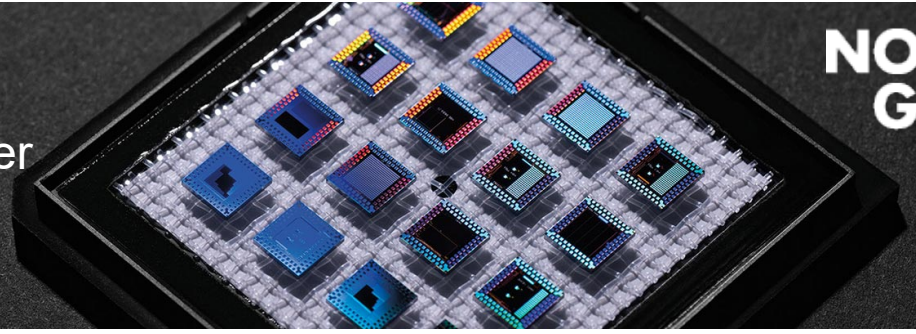

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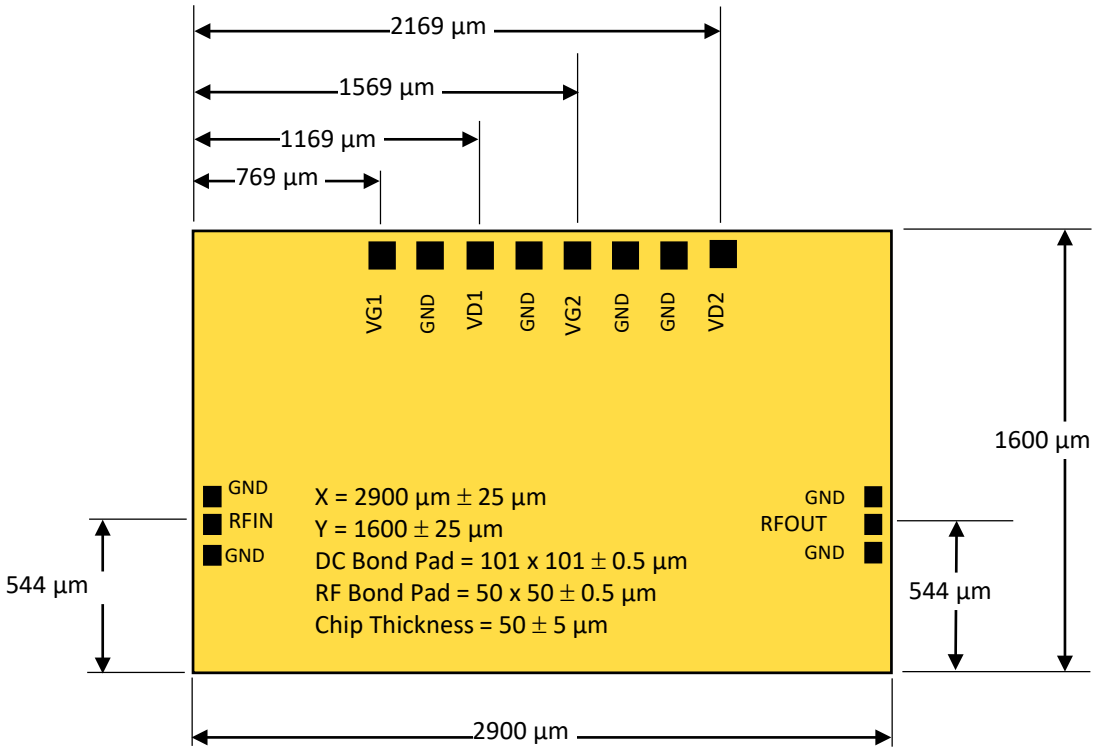
Die Size and Bond Pad Locations (Not to Scale)



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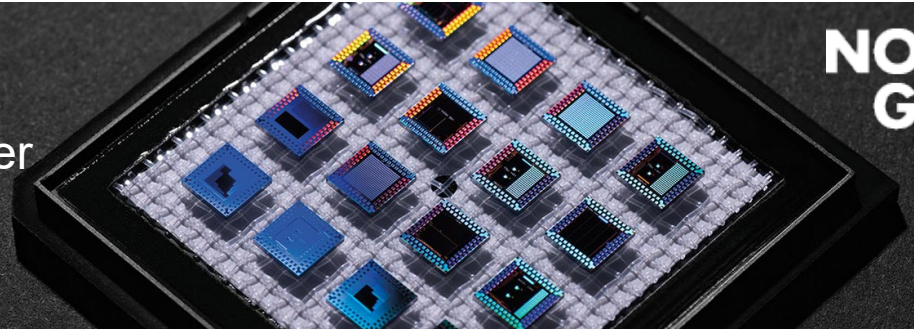
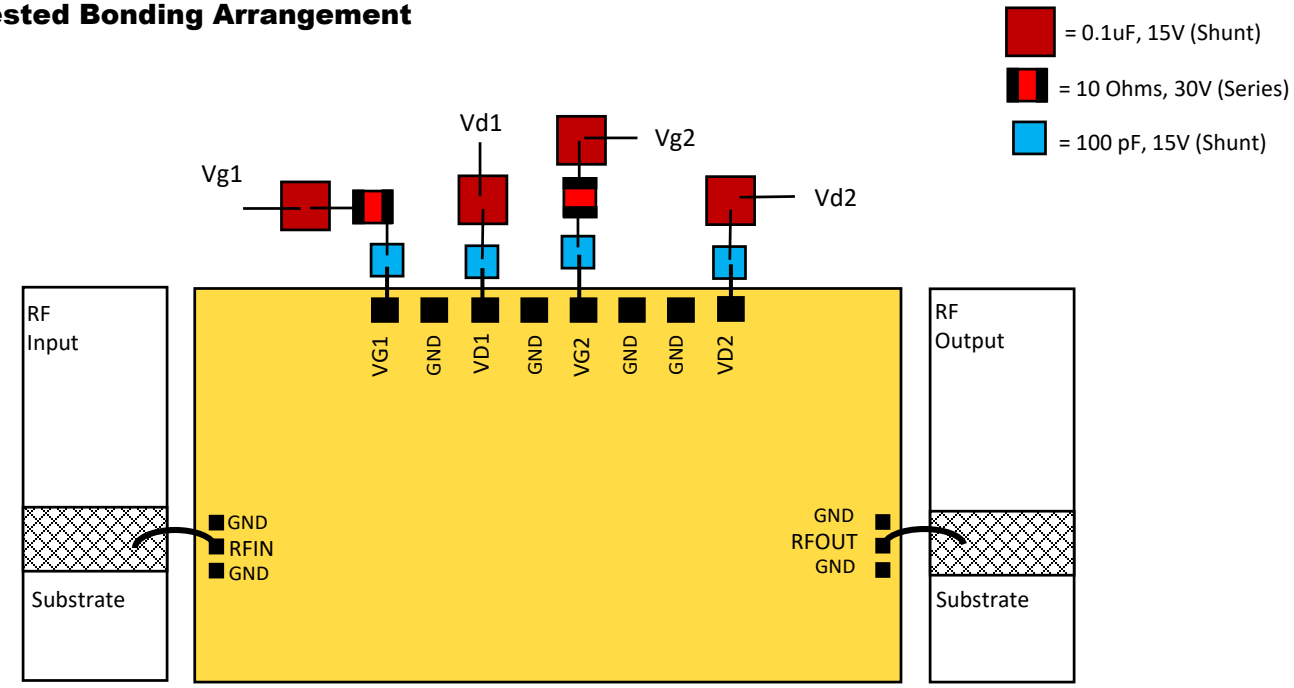


Suggested Bonding Arrangement



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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