

X=2900µm Y=1600µm

Product Features

- ◆ RF Frequency: 92 to 96 GHz
- ◆ Linear Gain: 17 dB typ.
- ◆ Psat: 22 dBm typ.
- ◆ Die Size: < 4.7 sq. mm.
- ◆ 2 mil substrate
- ◆ DC Power: 4 VDC @ 280 mA

Performance Characteristics (Ta = 25°C)

Specification	Min	Typ	Max	Unit
Frequency	92		96	GHz
Linear Gain	13	14		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

Applications

- ◆ Short Haul / High Capacity Links
- ◆ Sensors

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.

Absolute Maximum Ratings (Ta = 25°C)

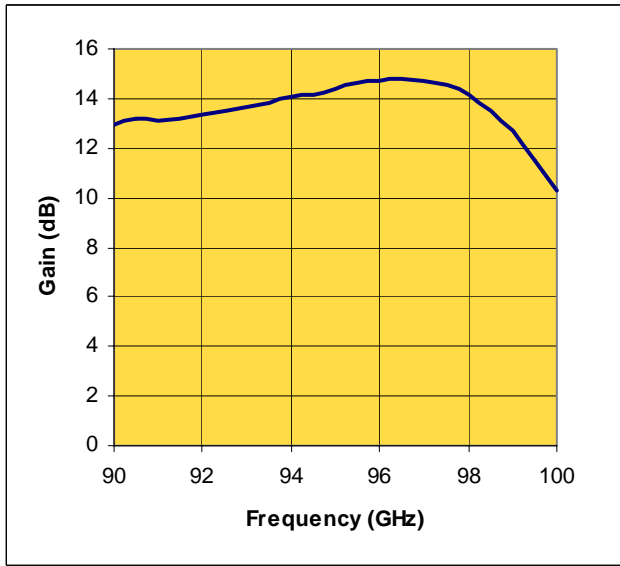
Parameter	Min	Max	Unit
Vd1, Vd2		4.5	V
Id1		160	mA
Id2		200	mA
Vg1, Vg2	-0.8	0.3	V
Input drive level		12	dBm
Assy. Temperature (60 seconds)		300	deg. C

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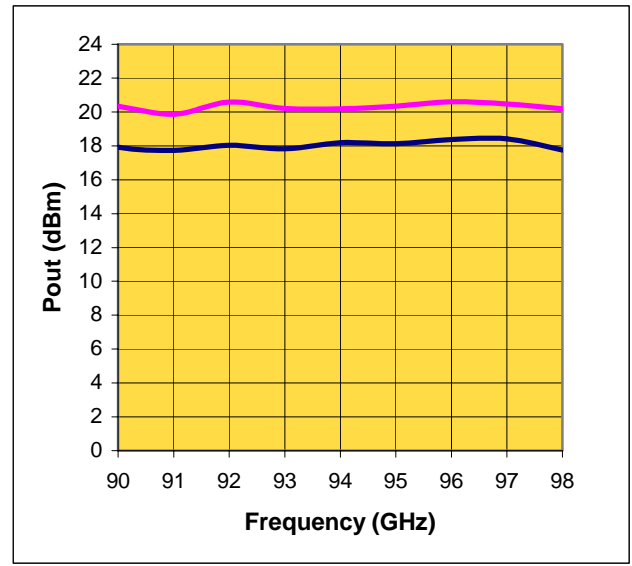


Measured Performance Characteristics (Typical Performance at 25°C)
 $V_{d1} = V_{d2} = 4V$, $I_{d1} = 120\text{ mA}$, $I_{d2} = 160\text{ mA}$

Linear Gain Versus Frequency

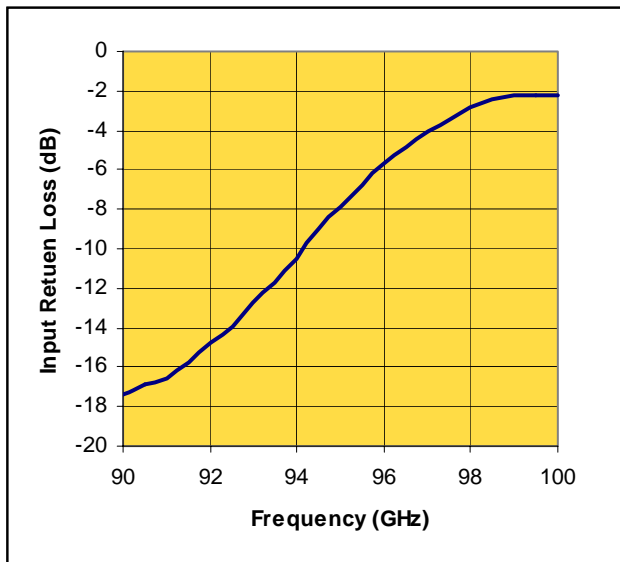


Fixtured Output Power Versus Frequency

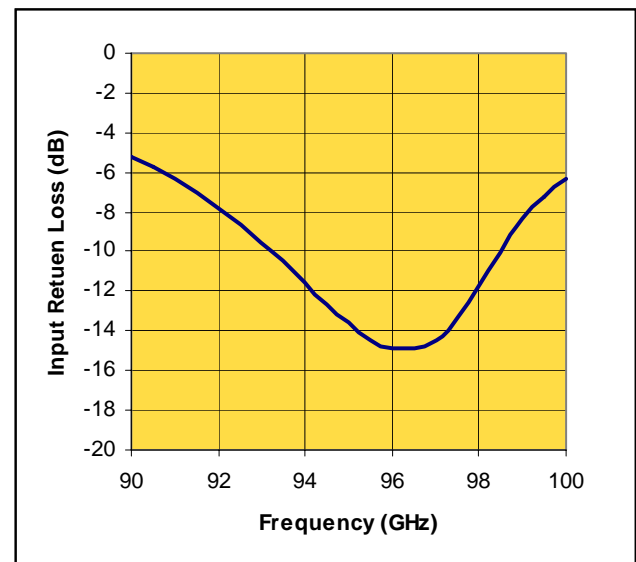


— P1dB — P2.5dB

Input Return Loss Versus Frequency



Output Return Loss Versus Frequency



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Preliminary Datasheet

Revision: May 2007

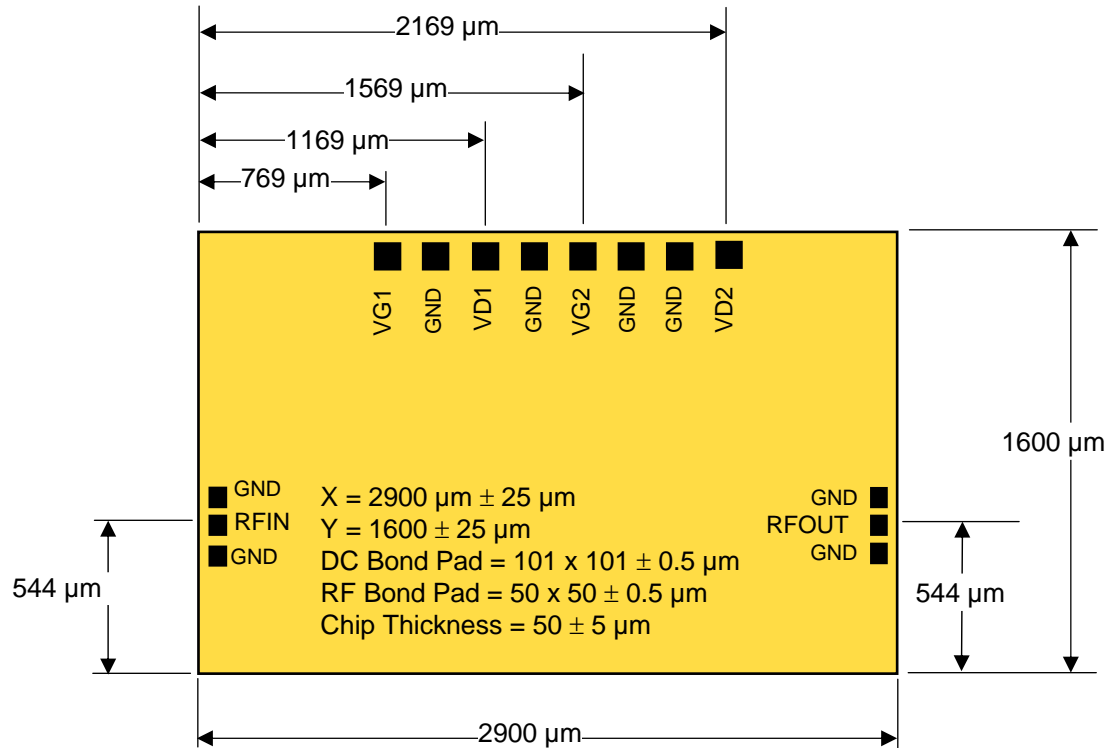
Measured Performance Characteristics (Typical Performance at 25°C)
Vd1 = Vd2 = Vd3 = 4V, Id1 = 120 mA, Id2 = 160mA

Freq GHz	S11 Mag	S11 Ang	S21 Mag	S21 Ang	S12 Mag	S12 Ang	S22 Mag	S22 Ang
88.0	0.141	92.067	4.030	121.815	0.006	-151.223	0.657	153.062
88.5	0.137	88.497	4.121	108.738	0.006	-160.776	0.635	147.986
89.0	0.138	85.752	4.181	95.479	0.005	-150.868	0.608	142.788
89.5	0.137	80.245	4.262	83.398	0.005	-106.125	0.581	138.132
90.0	0.137	72.890	4.430	70.253	0.005	102.300	0.548	133.499
90.5	0.145	62.524	4.560	56.253	0.004	159.054	0.516	128.182
91.0	0.151	53.860	4.544	42.359	0.004	158.867	0.483	122.832
91.5	0.166	43.137	4.578	29.024	0.004	143.898	0.447	117.190
92.0	0.184	31.270	4.671	15.967	0.003	131.514	0.408	112.051
92.5	0.203	20.483	4.735	2.138	0.003	126.387	0.370	106.273
93.0	0.234	10.840	4.813	-11.411	0.002	103.993	0.333	100.551
93.5	0.262	2.948	4.921	-25.087	0.002	110.981	0.301	94.671
94.0	0.298	-5.813	5.039	-39.422	0.002	101.381	0.264	88.053
94.5	0.356	-14.405	5.115	-54.081	0.002	70.275	0.233	81.054
95.0	0.404	-22.125	5.243	-68.778	0.001	37.028	0.210	72.547
95.5	0.460	-30.448	5.379	-84.854	0.001	45.619	0.191	61.863
96.0	0.522	-39.104	5.449	-101.895	0.001	3.040	0.181	49.769
96.5	0.575	-47.200	5.494	-119.085	0.001	-25.688	0.182	34.483
97.0	0.627	-55.375	5.446	-137.302	0.002	-86.247	0.193	17.896
97.5	0.677	-63.398	5.334	-156.466	0.002	-117.402	0.220	0.944
98.0	0.720	-71.256	5.092	-143.074	0.003	-118.710	0.262	-15.720
98.5	0.754	-79.083	4.732	163.016	0.004	32.797	0.318	-31.377
99.0	0.772	-86.205	4.319	144.563	0.004	141.908	0.383	-46.189
99.5	0.776	-93.267	3.769	125.309	0.004	121.688	0.435	-59.099
100.0	0.778	-99.105	3.262	107.247	0.005	105.574	0.486	-71.143

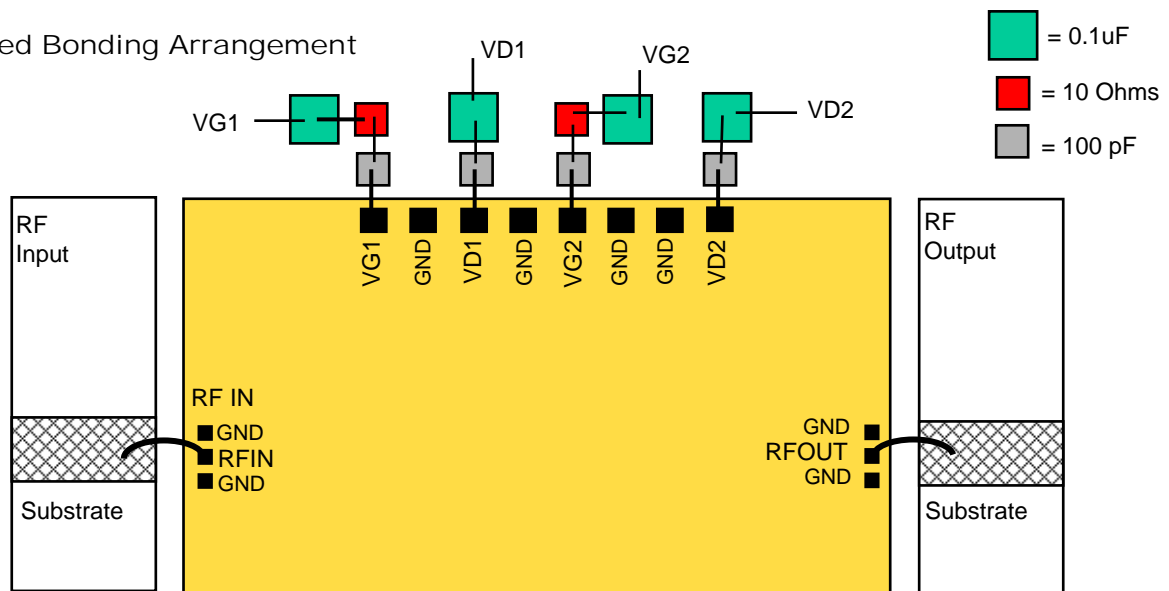
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Die Size and Bond Pad Locations



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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