NORTHROP GRUMMAN

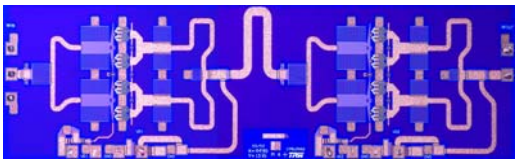
Velocium Products

APH518

21 – 24 GHz High Power Amplifier

Product Datasheet

Revision: August 2007



X=4490 µm Y=1310 µm

Applications

- Point-to-Point Digital Radios
- Point-to-Multipoint Digital Radios

Features

- RF Frequency: 21 to 24 GHz
- Linear Gain: 18 dB Typ.
- P1dB: 30 dBm typ.
- IP3: 39 dBm typ.
- Die Size: 5.9 sq. mm.
- DC Power: 5VDC @ 0.95A

Product Description

The APH518 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.

APH518 is the new Designation for the APH518_F.

Performance Characteristics (Ta = 25°C)

Specification	Min	Typ	Max	Unit
Frequency	21		24	GHz
Linear Gain	16	18		dB
P1dB	28	30		dBm
IP3	37	39		dBm
Input Return Loss	5	8		dB
Output Return Loss		8		dB
Vd1, Vd2		5		V
Vg1, Vg2		-0.5		V
Id1		350		mA
Id2		600		mA

Absolute Maximum Ratings (Ta = 25°C)

Parameter	Min	Max	Unit
Vd1, Vd2		5.5	V
Id1		600	mA
Id2		670	mA
Vg1, Vg2	-1	+0.3	V
Input drive level		15	dBm
Assy. Temperature (60 seconds)		300	deg. C

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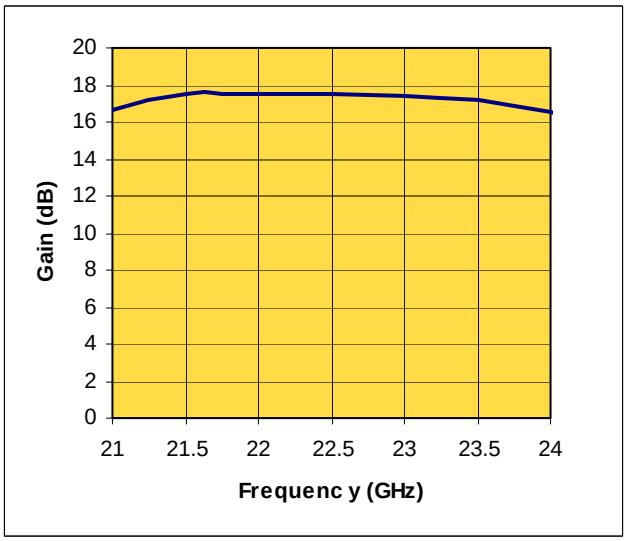
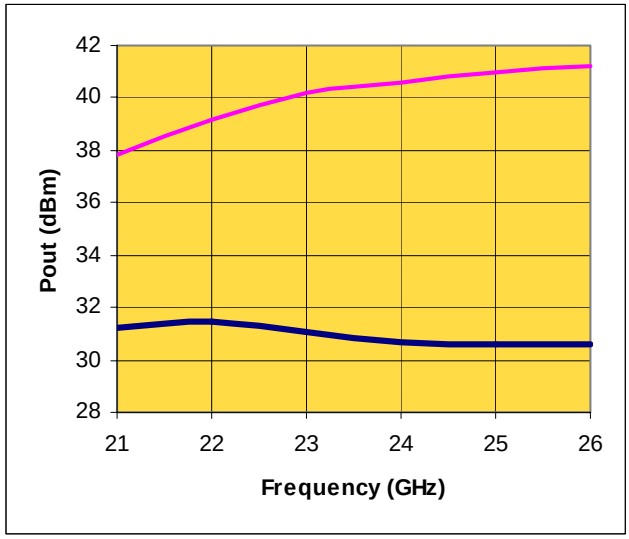
Measured Performance Characteristics (Typical Performance at 25°C)
Vd1 = Vd2 = 5.0V, Id1 = 350 mA, Id2 = 600mA

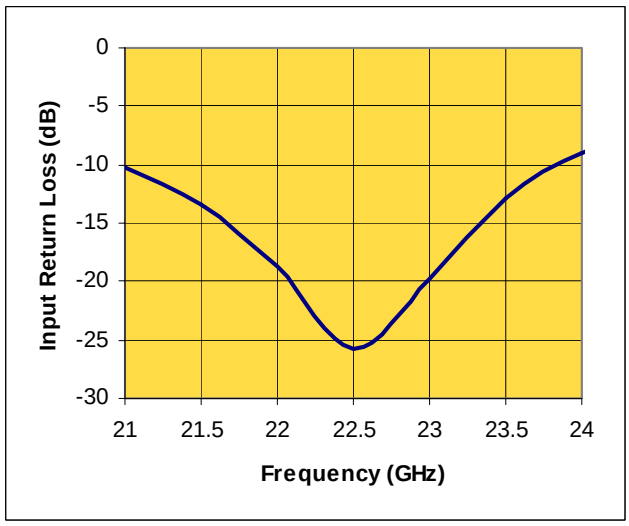
Linear Gain vs. Frequency



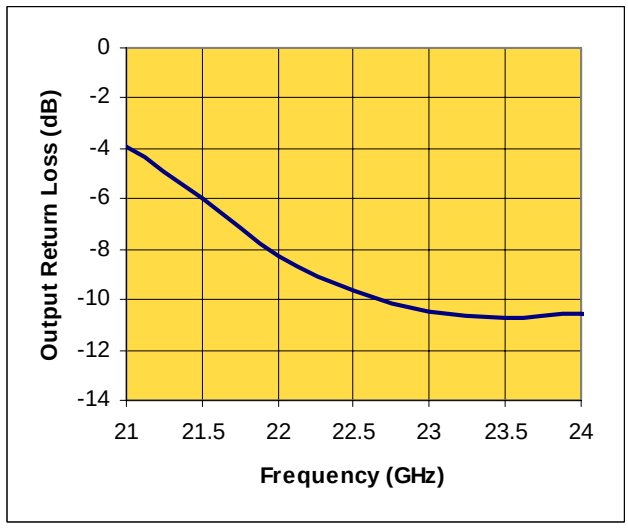
Fixtured Pout Versus Frequency



Input Return Loss vs. Frequency



Output Return Loss vs. Frequency



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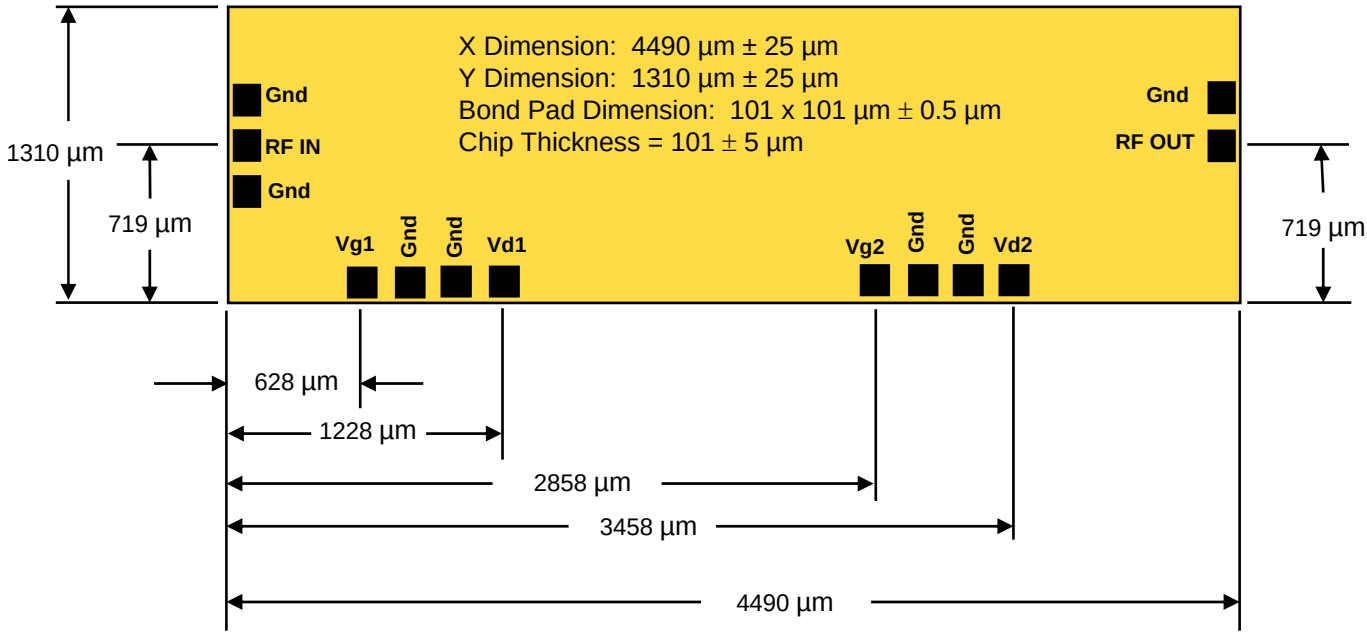
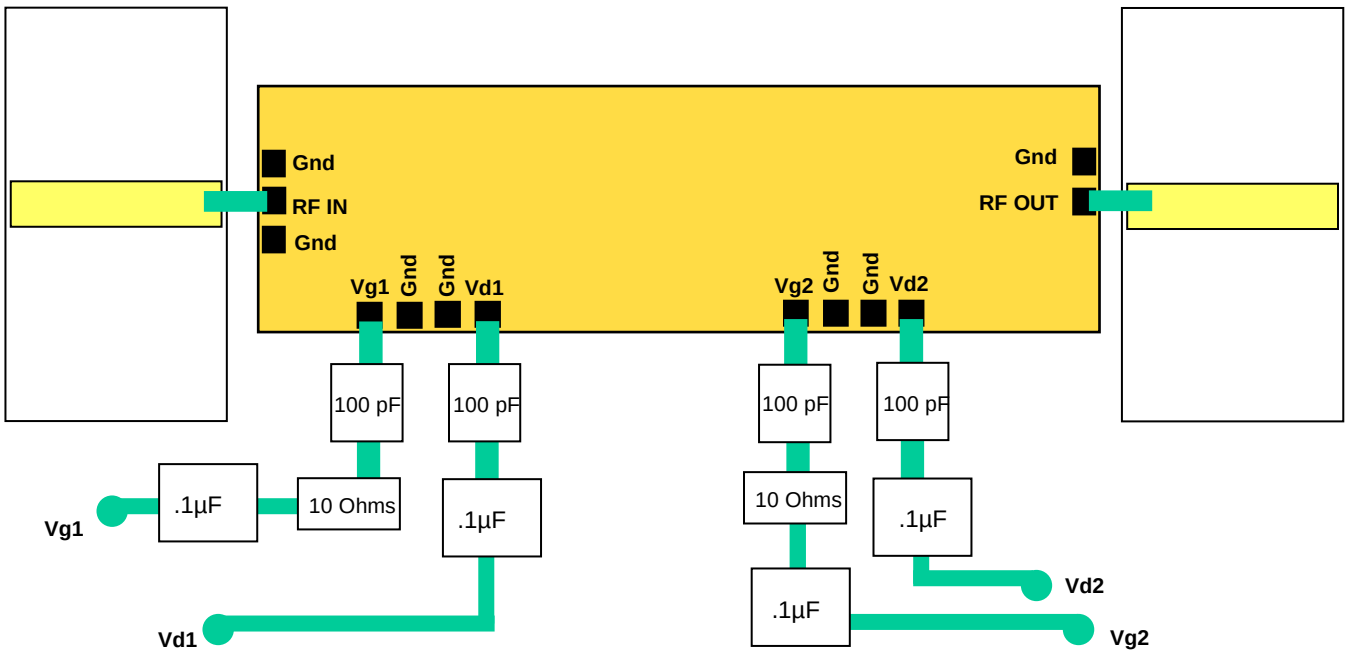
Measured Performance Characteristics (Typical Performance at 25°C)
Vd1 = Vd2 = 5.0V, Id1 = 350 mA, Id2 = 600mA

Freq. GHz	S11 Mag	S11 Ang	S21 Mag	S21 Ang	S12 Mag	S12 Ang	S22 Mag	S22 Ang
19	0.599	-142.822	2.25	165.619	0.002	105.038	0.701	102.296
19.5	0.571	-150.177	2.924	143.832	0.003	73.501	0.698	93.245
20	0.526	-159.954	3.924	118.026	0.003	38.664	0.69	81.166
20.5	0.463	-171.524	5.224	86.828	0.004	27.615	0.655	65.523
21	0.356	176.134	6.468	50.243	0.005	-7.601	0.577	46.873
21.5	0.231	167.584	7.19	11.598	0.006	-49.181	0.458	30.707
22	0.127	170.177	7.456	-25.123	0.007	-96.256	0.36	17.224
22.5	0.054	-160.347	7.484	-60.021	0.006	-138.464	0.307	4.732
23	0.077	-71.615	7.375	-94.894	0.007	-168.871	0.285	-9
23.5	0.191	-63.004	7.144	-129.382	0.009	158.318	0.291	-29.046
24	0.317	-73.057	6.67	-164.518	0.01	130.666	0.295	-53.835
24.5	0.427	-88.573	5.881	161.387	0.01	104.054	0.289	-78.991
25	0.491	-103.105	5.054	129.836	0.01	80.932	0.282	-100.647
25.5	0.529	-115.243	4.334	100.464	0.011	65.987	0.265	-119.307
26	0.535	-126.511	3.728	73.534	0.01	39.078	0.232	-134.262
26.5	0.529	-135.037	3.316	47.572	0.01	19.157	0.197	-144.647
27	0.521	-141.443	3.026	20.994	0.008	-1.784	0.17	-151.186

Die Size and Bond Pad Locations



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.