NORTHROP GRUMMAN

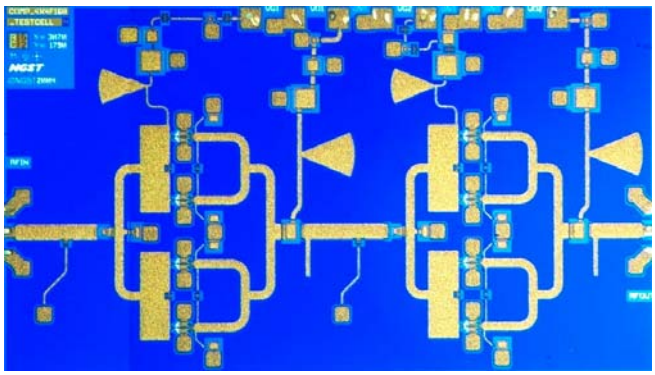
Velocium Products

APH576

81 – 86 GHz High Power Amplifier

Product Datasheet

Revision: May 2007



X=3070 µm Y=1790 µm

Applications

- New FCC E-Band Communication Systems @ 81-86 GHz Frequency Band
- Short-Haul / High Capacity Links
- Enterprise Wireless LAN
- Wireless Fiber Replacement

Product Features

- RF frequency: 81 to 86 GHz
- Linear gain: > 4.5 dB
- P1dB ~20 dBm
- Unconditionally stable
- DC Power: 4 Vdc at 320 mA
- Die Size: < 5.5 sq. mm

Product Description

The APH576 monolithic HEMT is a broadband, two- stage, power amplifier. 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	81		86	GHz
Linear Gain	4.5	5		dB
Input Return Loss	5	10		dB
Output Return Loss		2.5		dB
P1dB		20		dBm
Vd1 and Vd2		4		V
Vg		-0.2		V
Id1		160		
Id2		160		mA

Absolute Maximum Ratings (Ta = 25°C)

Parameter	Min	Max	Unit
Vd1, Vd2		4.5	V
Id1		200	mA
Id2		200	mA
Vg1, Vg2	-0.8	0.3	V
Input drive level		17	dBm
Assy. Temperature (60 seconds)		300	deg. C

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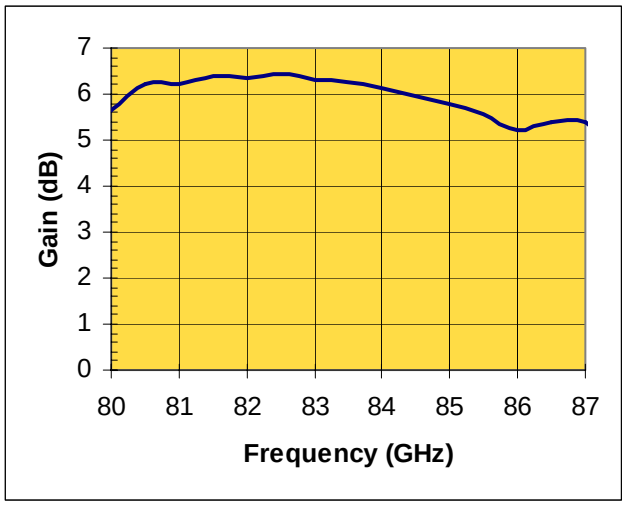
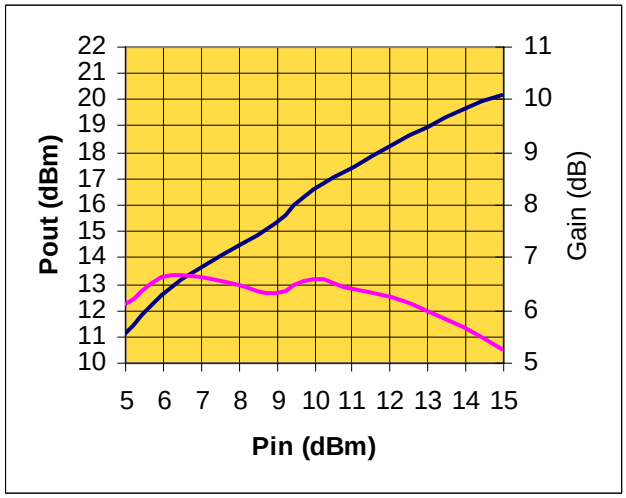
Measured Performance Characteristics (Typical Performance at 25°C)
Vd1 = Vd2 = 4V and Id1 = 160mA and Id2 = 160mA (On-Wafer)

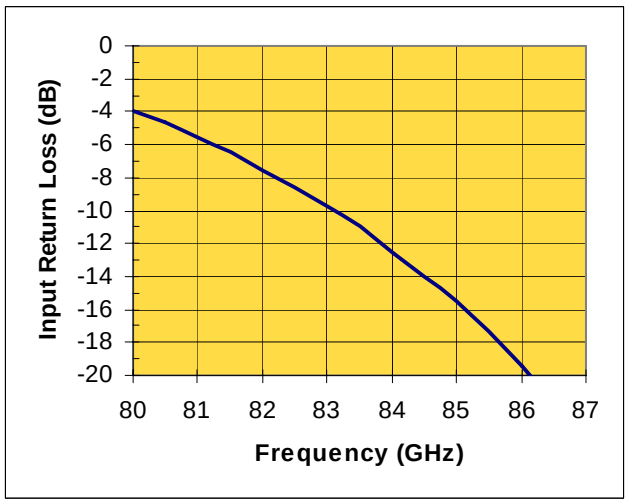
Linear Gain Versus Frequency



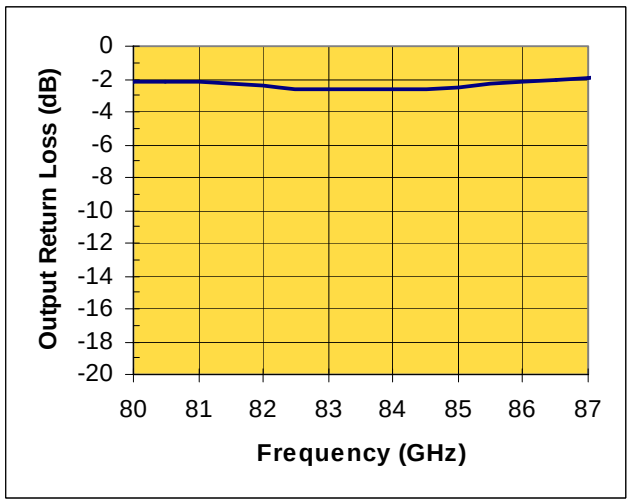
Psat Versus Power (@81 GHz)



Input Return Loss Versus Frequency

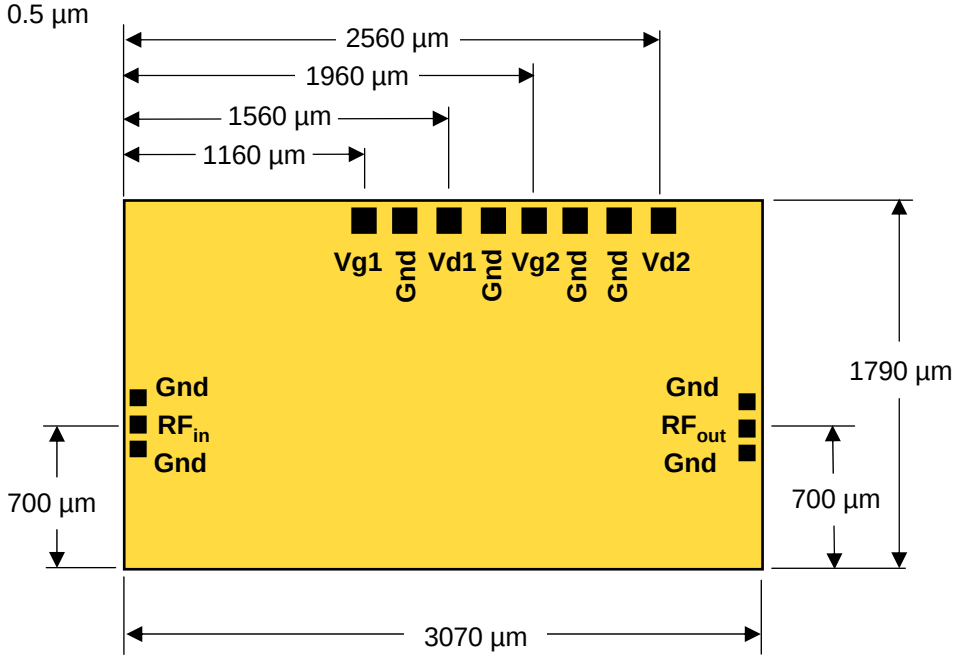


Output Return Loss Versus Frequency

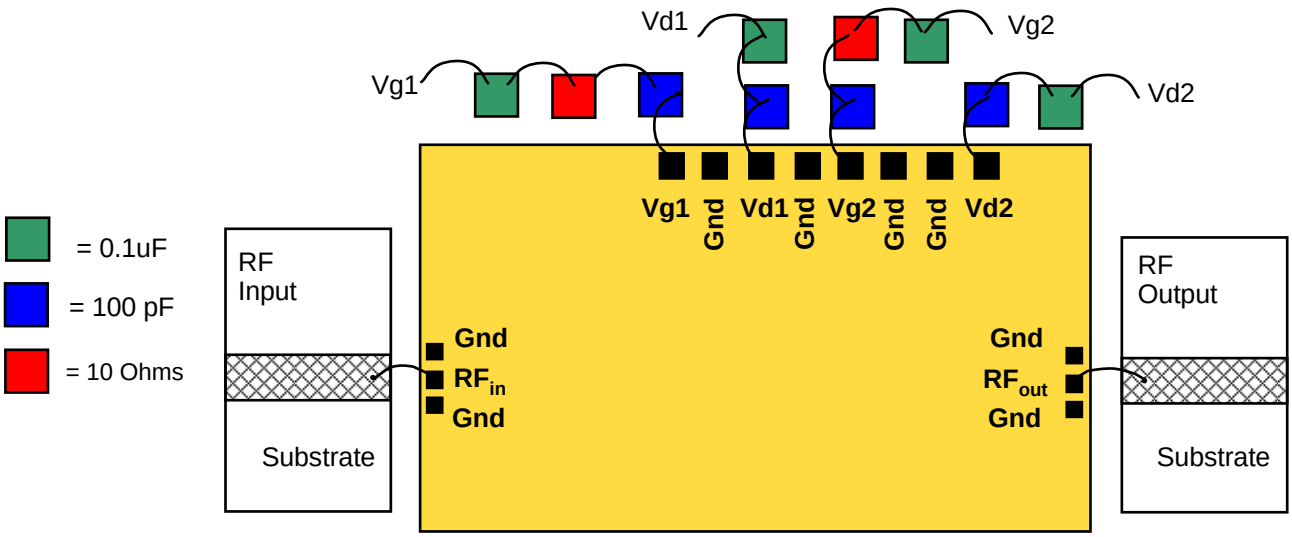


Die Size and Bond Pad Locations

X Dimension: 3070 ± 25 µm
Y Dimension: 1790 ± 25 µm
RF Bond Pad Dimension: 50 x 50 µm ± 0.5 µm
DC Bond Pad Dimension: 101 x 101 µm ± 0.5 µm
Chip Thickness = 101 ± 5 µm



Suggested Bonding Arrangement



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.