NORTHROP GRUMMAN

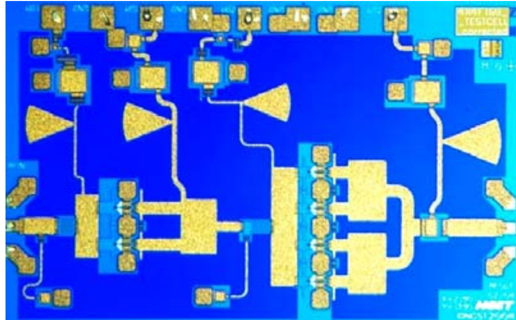
Velocium Products

APH578

83 – 86 GHz Power Amplifier

Preliminary Datasheet **Discontinued May 2007**

Revision: May 2007



X=2190µm Y=1390µm

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: 83 to 86 GHz
- ♦ Linear gain: > 7 dB
- ♦ Psat: > 21 dBm
- ♦ Unconditionally stable
- ♦ DC Power: 4 Vdc at 240 mA
- ♦ Die Size: < 3.1 sq. mm

Product Description

The APH578 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	83		86	GHz
Linear Gain	6	7		dB
Input Return Loss		4		dB
Output Return Loss		7		dB
Psat		21		dBm
Vd1 and Vd2		4		V
Vg		-0.2		V
Id1		80		
Id2		160		mA

Absolute Maximum Ratings (Ta = 25°C)

Parameter	Min	Max	Unit
Vd1, Vd2		4.5	V
Id1		100	mA
Id2		200	mA
Vg1, Vg2	-0.8	0.3	V
Input drive level		16	dBm
Assy. Temperature (60 seconds)		300	deg. C

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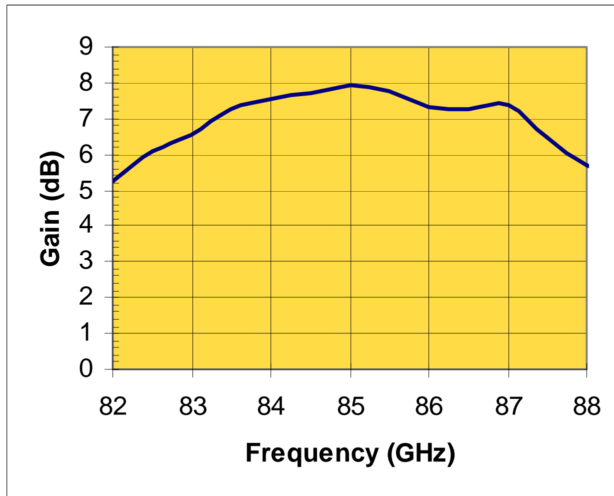
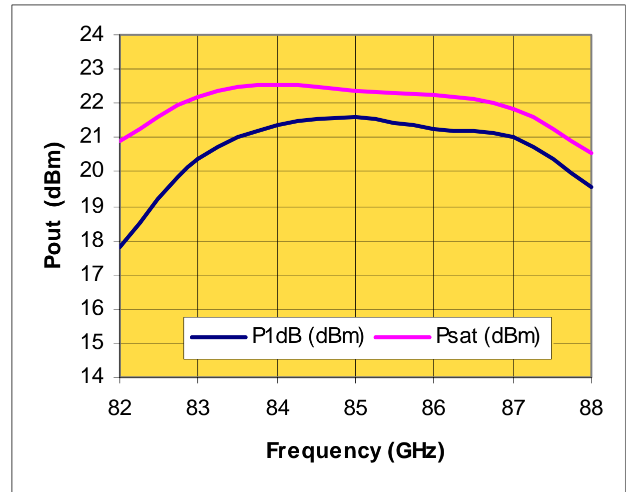
Measured Performance Characteristics (Typical Performance at 25°C)
Vd1 = Vd2 = 4V and Id1 = 80mA and Id2 = 160mA

Linear Gain Versus Frequency

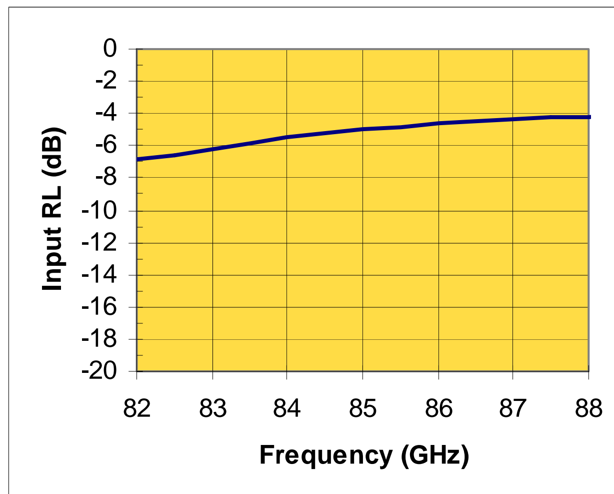


Psat Versus Frequency (Fixtured)

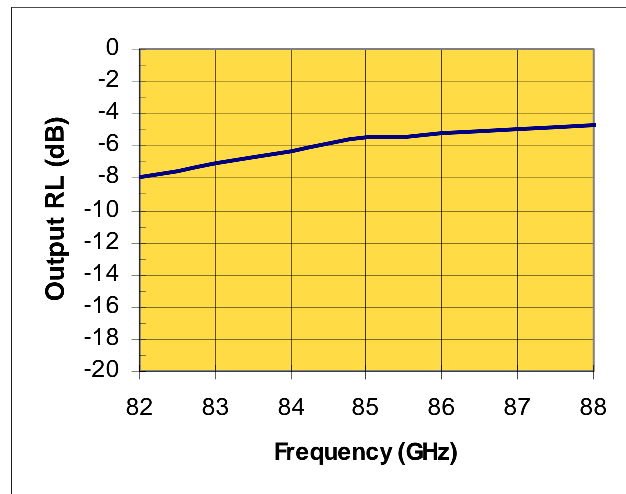


Vd=3.94V, Id1=82 mA, Id2=164 mA

Input Return Loss Versus Frequency



Output Return Loss Versus Frequency



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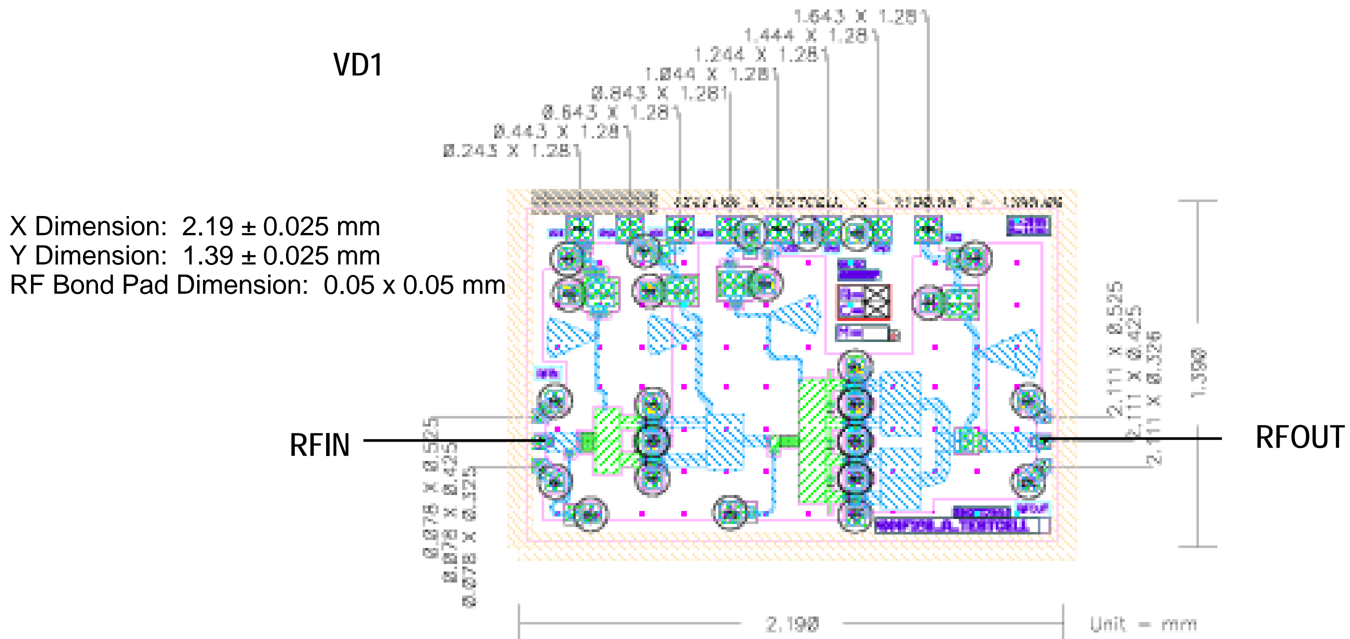
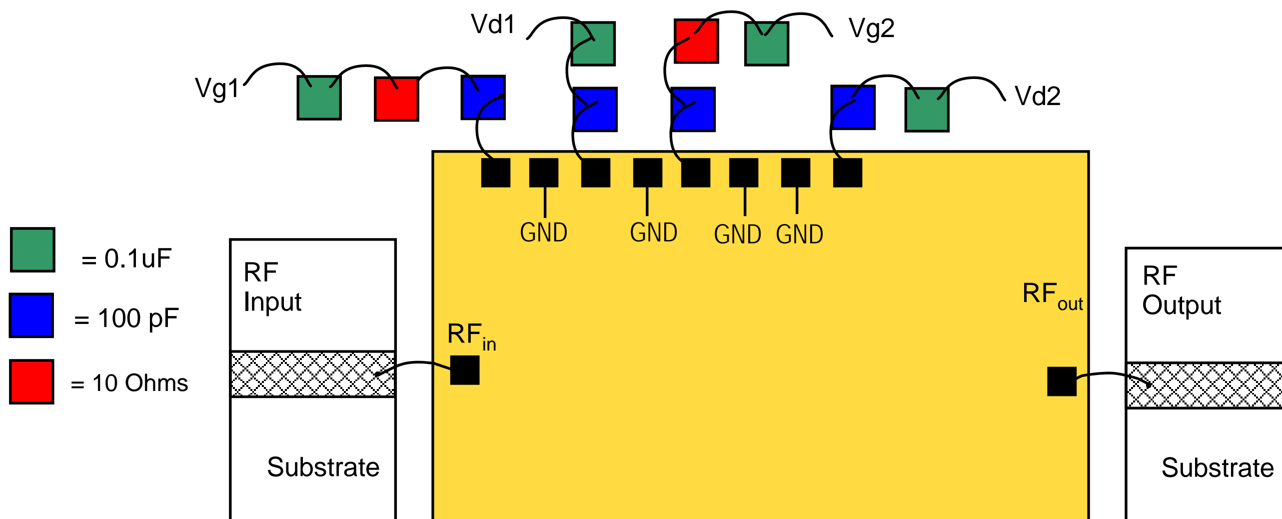
Die Size and Bond Pad Locations



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.

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