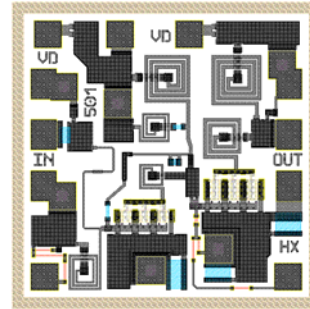


Product Features

- Frequency: 6–18GHz
- High Gain: 14 dB Typ.
- Output P_{1dB}: 20.0 dBm Typ.
- Input /Output VSWR: <2.0
- Operation from Single Supply: 5V@107mA



Chip Size: 920×920 um (36.2×36.2 mils)

Chip Thickness: 100±10 um (4±0.4 mils)

Pad Dimensions: 80×80 um

Product Description

F501 is a high efficiency two stages broadband MMIC amplifier that can work between 6GHz and 18GHz. It can provide high efficiency and flat gain by using GaAs PHEMT technics. The typical operation state is +5V from single power supply. And the front and back amplifiers are both placed in class A operation condition. It offers good linearity. In order to improve amplifier's reliability, the media is used for protecting chip. It is intend to be used in Driver for Mircowave Communication System, Buffer Amplifier, Cascadable Gain Module for ECM System, Phased Array Radar and Transmission Amplifier.

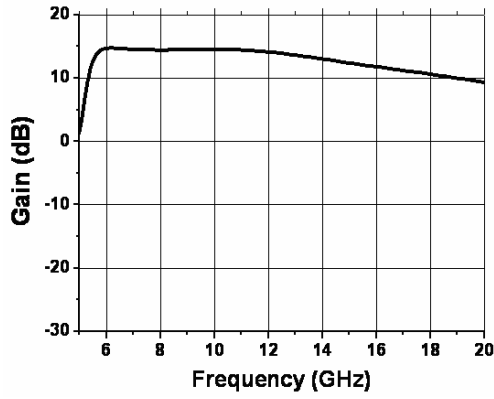
Typical Electrical Characteristic at 25°C

Symbol	Unit	Test Condition	Min.	Typ.	Max.
Gain	dB	6~18GHz	10.0	14	
Output P _{1dB}	dBm	P _{1dB} @18GHz	18.0	19.5	
Output P _{sat}	dBm	P _{sat} @18GHz	19.0	21.0	
Input VSWR	Ratio	6~18GHz		1.5	
Output VSWR	Ratio	6~18GHz		1.5	
NF	dB	NF@18GHz		5.2	6.5
S12	dB	6~18GHz		-40	-30

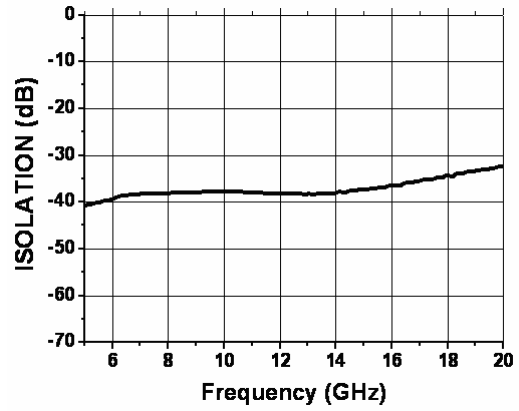
Notes: Test the small signal for the IC only. Test power and noise on the whole machine.
 (T=25°C, V_{DD}=5V, I_{DD}=107mA, Z₀=50Ω)

Typical Electrical Characteristics

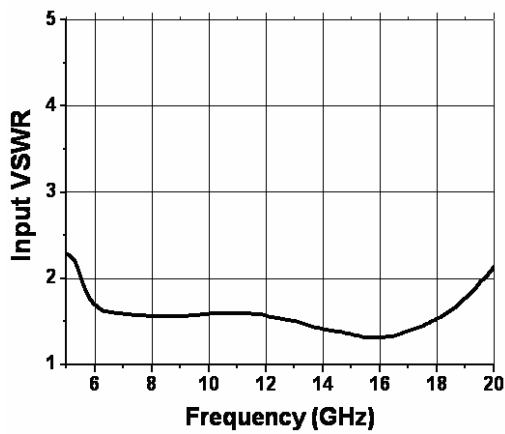
($T=25^{\circ}\text{C}$, $V_{\text{DD}}=5\text{V}$, $I_{\text{DD}}=107\text{mA}$, $Z_0=50\Omega$)



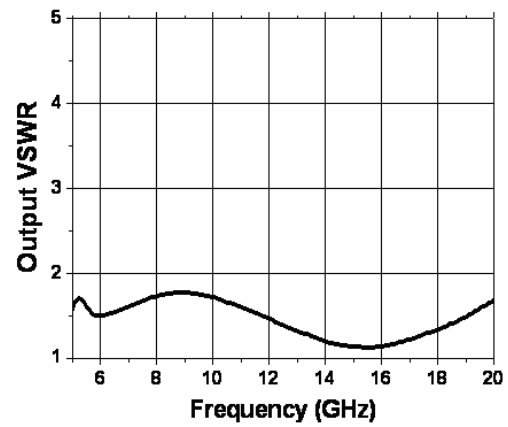
Small Signal Gain



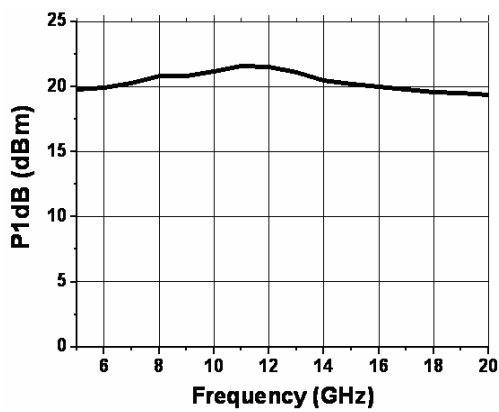
Isolation



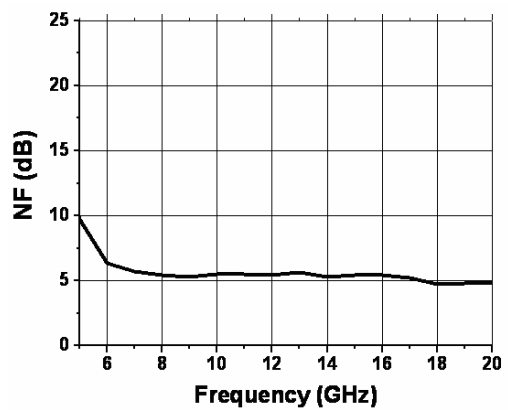
Input VSWR



Output VSWR



P1dB

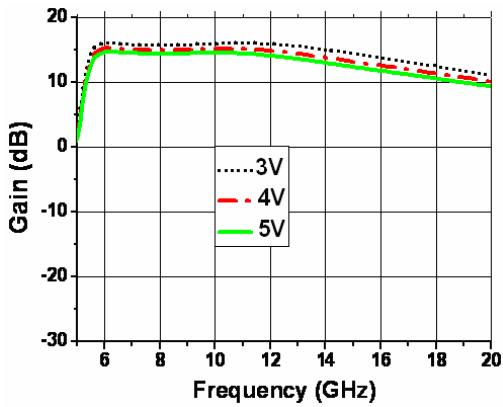


Noise Figure

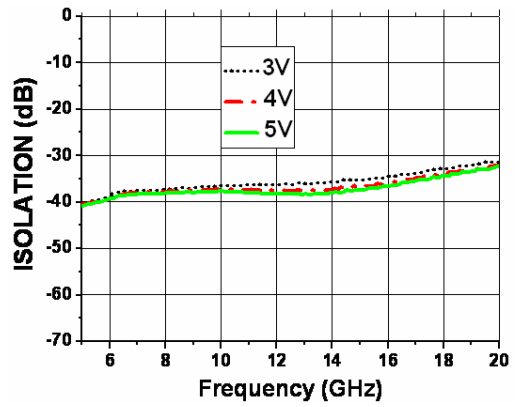
Typical Characteristics Under

Different Drive Voltage

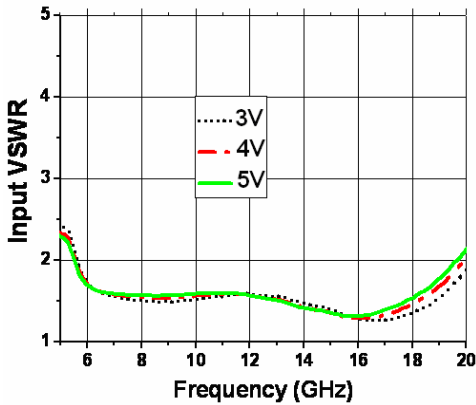
($T=25^{\circ}\text{C}$, $Z_0=50\ \Omega$)



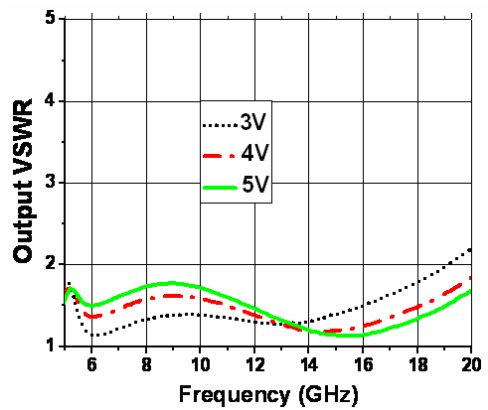
Gain vs Supply Voltage



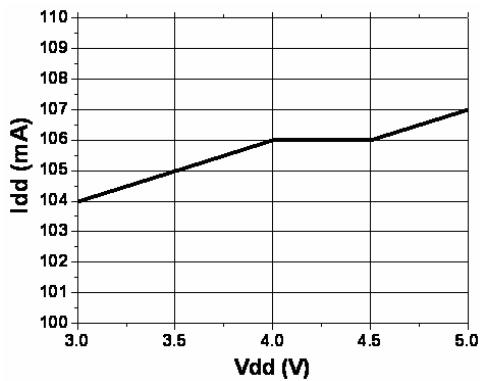
Isolation vs Supply Voltage



Input VSWR vs Supply Voltage

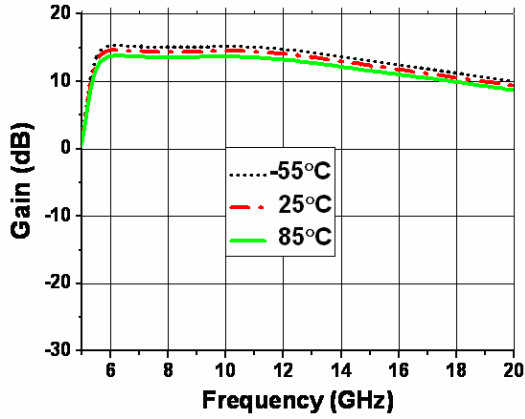


Output VSWR vs Supply Voltage

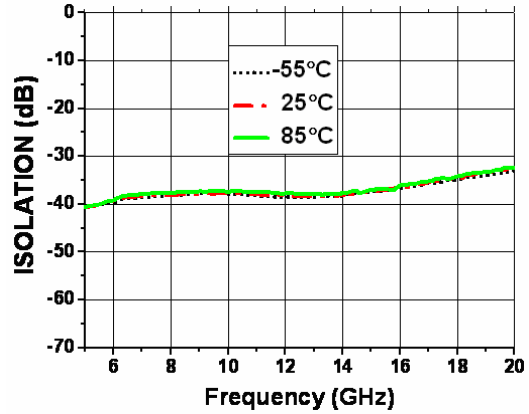


Idd vs Supply Voltage

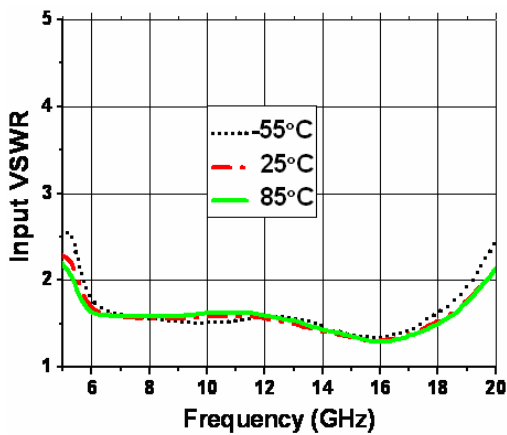
Typical Characteristics Under Different Temperature ($V_{DD}=5V, I_{DD}=107mA, Z_0=50\ \Omega$)



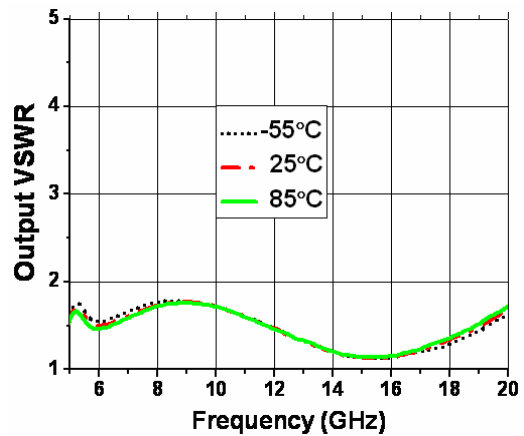
Gain vs Temp



Isolation vs Temp.



Input VSWR vs Temp

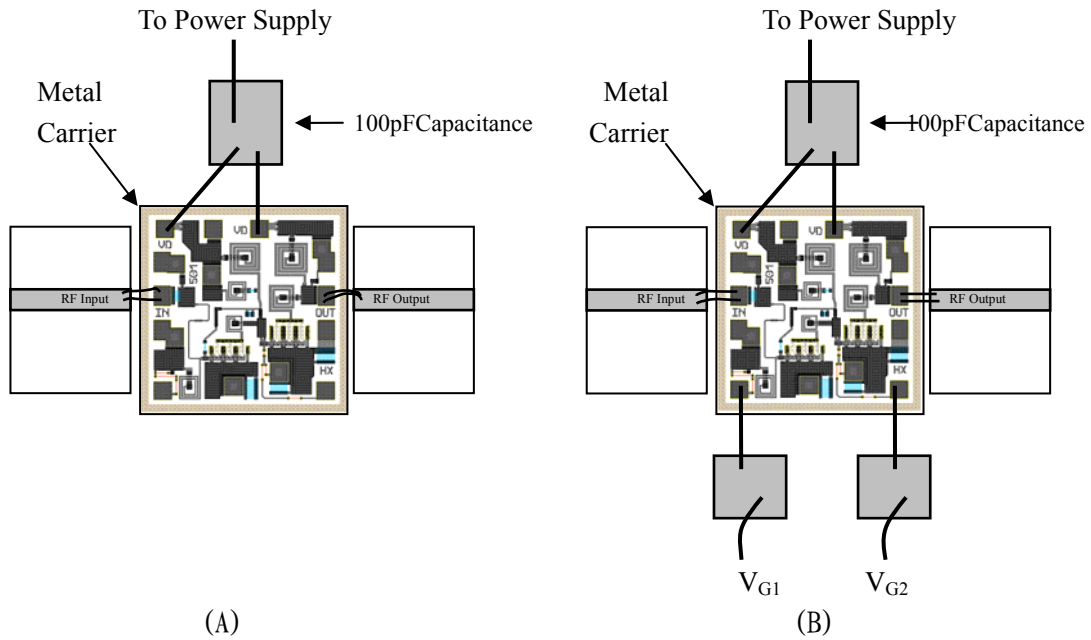


Output VSWR vs Temp

Operating Ranges

Symbol	Parameters	Unit	Min.	Max
V_{D1}, V_{D2}	Device Voltage	V		7
V_{G1}, V_{G2}	Grid Voltage	V	-5	2
I_{DD}	Device Current	mA		150
P_{in}	Input Power	dBm		20
T_{ch}	Channel Temperature	°C		+150
T_L	Operating Temp. range	°C		-55 到 +100
T_{max}	Assembling Temp.	°C		+300

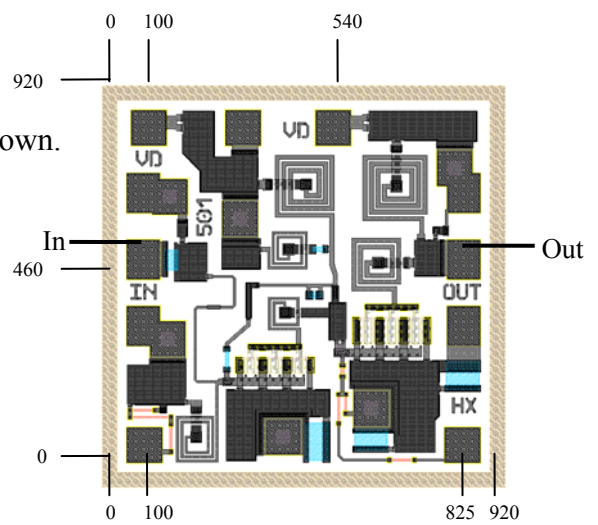
Bias and Operating Stage



F501 is adopting the bias method of connecting V_{D1} and V_{D2} as picture 16(A) shown. The recommended operating voltage is 3~5V. All the ground are through the back hole of F501. Use a large ground pad area with many plated through-holes as shown. If needed, you can adjust the gain, output power and efficiency by adjusting bias voltage V_{G1} and V_{G2} as picture 16(B) shown. If using the single leakage bias method, it does not need to connect the bias press point. The negative grid bias voltage will decrease leakage current, gain and output power. The positive grid bias voltage will increase leakage current, gain and power.

Assemble Suggestion

Use 0.7mil diameter's spun gold for input, output and power on. F501 must precaution in handling, testing and packaging!
The spun gold press point is as the right picture shown.



Pad Dimension(Unit: um)