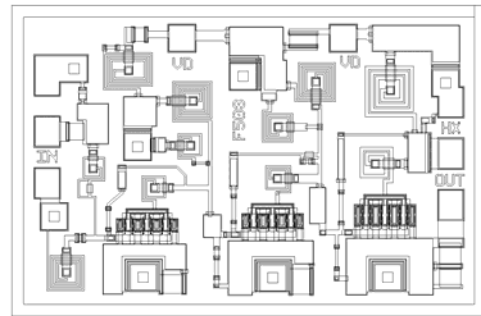


Product Features

- Frequency: 6—18GHz
- High Gain: 20.0 dB Typ.
- Output P_{1dB} : 19.0 dBm Typ.
- Input /Output VSWR: <2.0
- Operation from Single Supply: 5V@100mA

Product Description

F503 is a high efficiency three 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. The output and input are matching in 50Ω system. In order to improve amplifier's reliability, the media is



Chip Size: 920×1400 um (36.2×55.1 mils)

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

Pad Dimensions: 80×80 um

used for protecting chip. It is intended to be used in Driver for Microwave Communication System, Buffer Amplifier, Cascadable Gain Module for ECM System, Phased Array Radar and Transmission Amplifier.

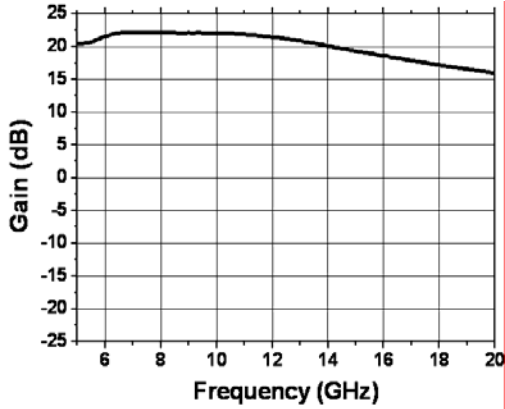
Typical Electrical Characteristic at 25°C

| Symbol | Unit | Test Condition | Min. | Typ. | Max. |
|------------------|-------|-----------------|------|------|------|
| Gain | dB | 6~18GHz | 17.0 | 20.0 | |
| Output P_{1dB} | dBm | $P_{1dB}@18GHz$ | 18.0 | 19.0 | |
| Output P_{sat} | dBm | $P_{sat}@18GHz$ | 18.5 | 20.0 | |
| Input VSWR | Ratio | 6~18GHz | | 1.5 | |
| Output VSWR | Ratio | 6~18GHz | | 1.5 | |
| NF | dB | NF@18GHz | | 6 | 7.5 |
| S12 | dB | 6~18GHz | | -60 | -50 |

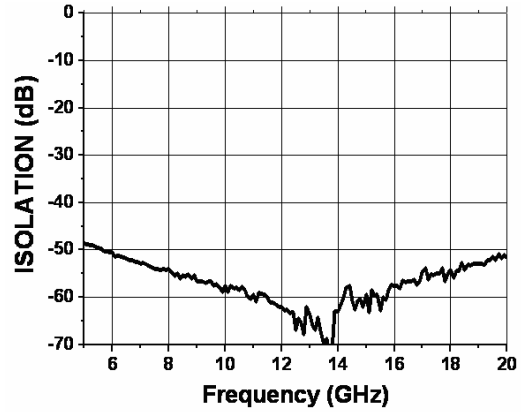
Notes: Test the small signal for the IC only. Test power and noise on the whole machine.

($T=25^{\circ}C$, $V_{DD}=5V$, $I_{DD}=100mA$, $Z_0=50\Omega$)

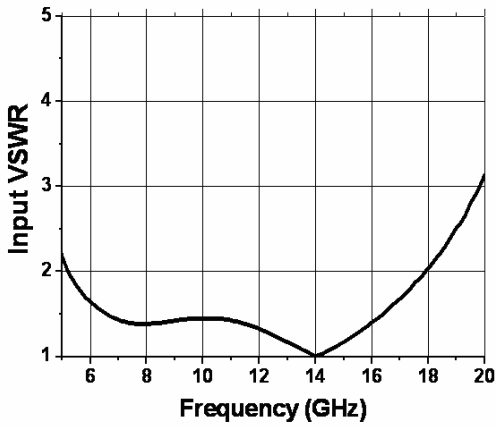
Typical Electrical Characteristics (T=25°C, VDD=5V, IDD=100mA, Z0=50Ω)



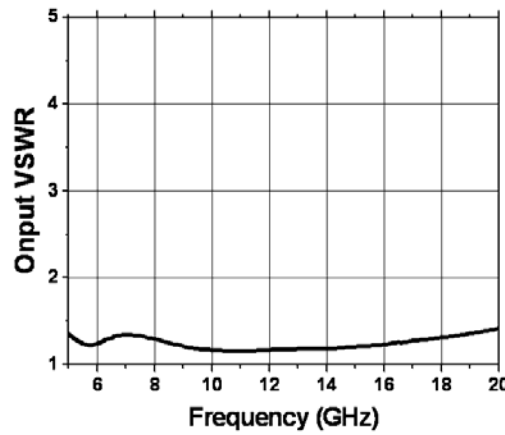
Small Signal Gain



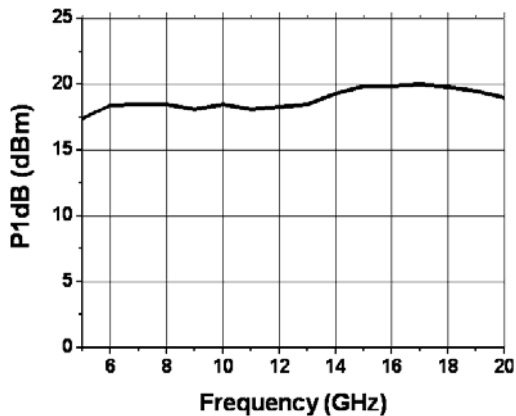
Isolation



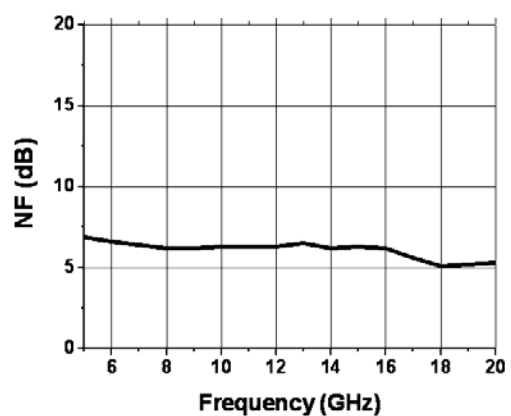
Input VSWR



Output VSWR

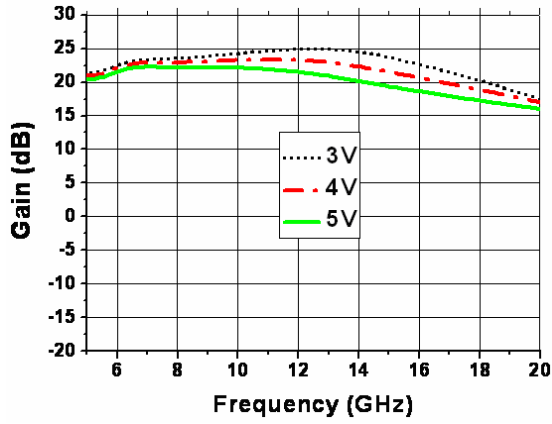


P1dB

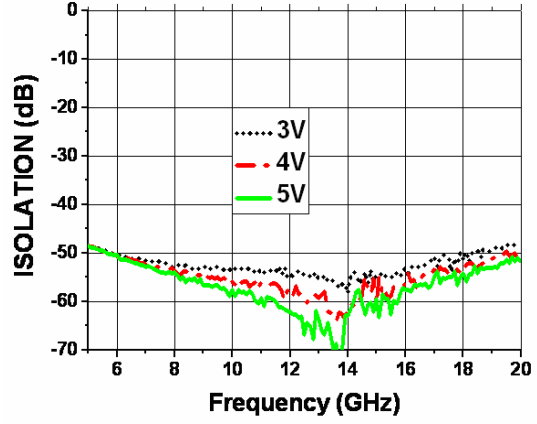


Noise Figure

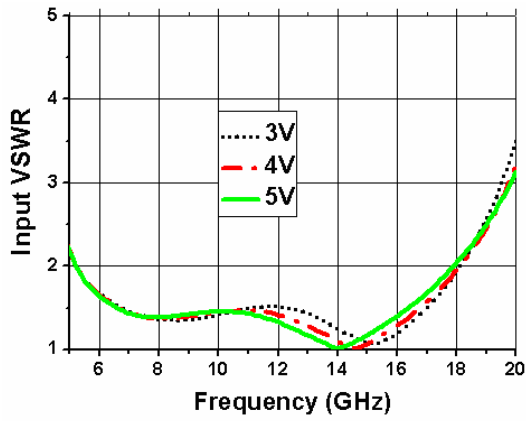
Typical Characteristics Under Different Drive Voltage (T=25°C,Z0=50Ω)



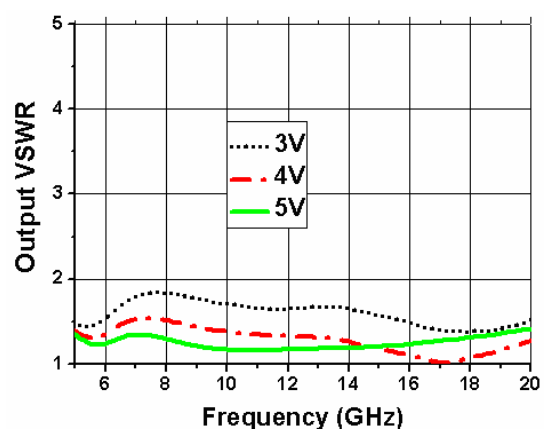
Gain vs Supply Voltage



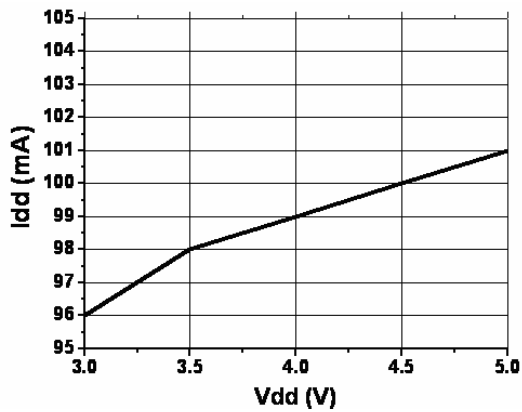
Isolation vs Supply Voltage



Input VSWR vs Supply Voltage



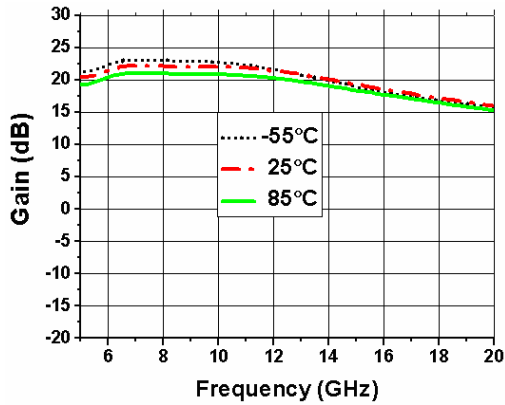
Output VSWR vs Supply Voltage



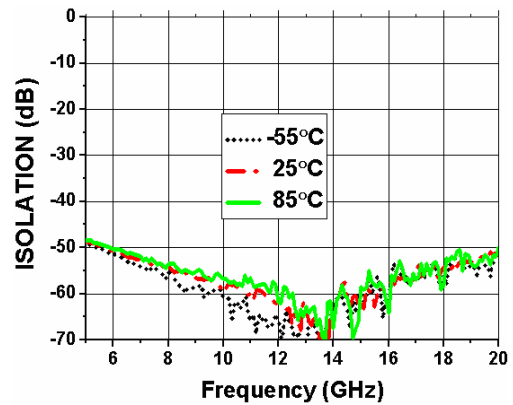
Idd vs Supply Voltage

Typical Characteristics Under Different Temperature

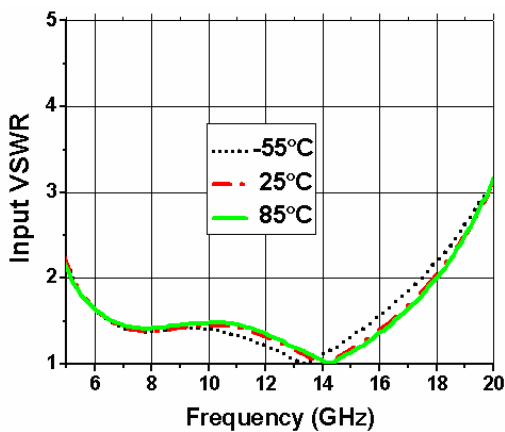
(VDD=5V,IDD=100mA,Z0=50Ω)



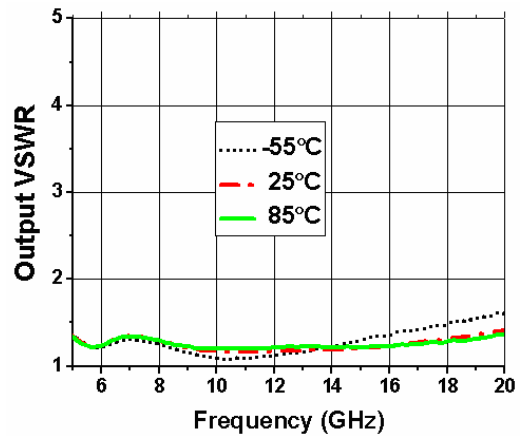
Gain vs Temp.



Isolation vs Temp.



Input VSWR vs Temp.

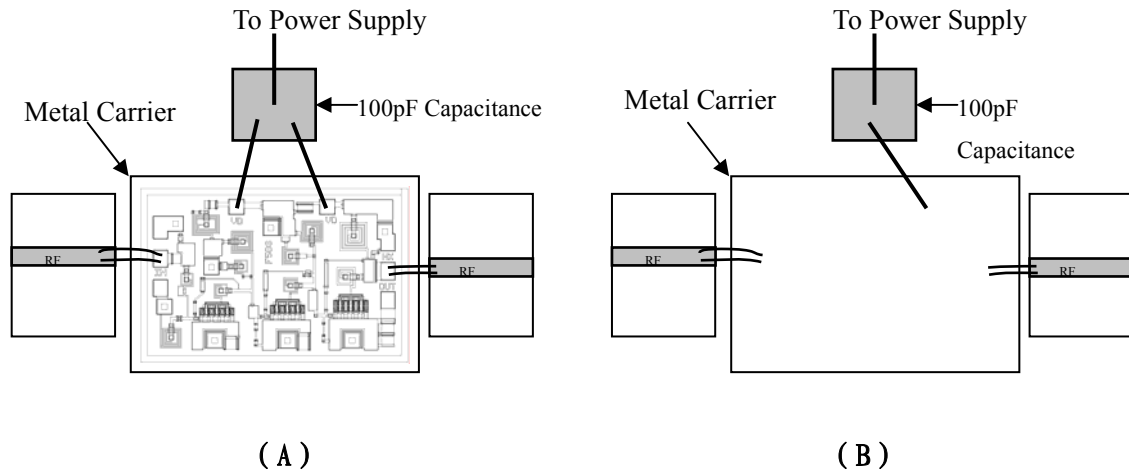


Output VSWR vs Temp.

Operating Ranges

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

Bias and Operating Stage



F503 has two kinds of uses. One is adopting the bias method of connecting V_{D1} and V_{D2} as picture (A) shown. The recommended operating voltage is 3~5V. The other is connecting V_{D2} as picture (B) shown. All the ground are through the back hole of F503.

Assemble Suggestion

Use 0.7mil diameter's spun gold for input, output and power on. F503 must precaution in handing, testing and packaging!

The spun gold press point is as the below picture shown.



Pad Dimension(Unit: um)