



8W Ultra Wide Band Power Amplifier 2GHz~20GHz



Features

- Ultra Wideband Low Noise Amplifier
- Gain: 9dB Typical
- P1dB: +38dBm Typical
- Supply Voltage: +28V, -5V

Typical Applications

- Military & Defense Applications
- Wireless Infrastructure
- Test and Measurement

Electrical Specifications, TA = +25°C, Vgg = -5V, Vcc = +28V

| Parameter | Min. | Typ. | Max. | Min. | Typ. | Max. | Units |
|---|--------------------------------|------|-------------|------|------|------|-------|
| Frequency Range | 2-10 | | 10-20 | | | | GHz |
| Gain | | 9 | | | 7 | | dB |
| Gain Flatness | | ±3 | | | ±3 | | dB |
| Gain Variation Over Temperature (-45 ~ +85) | | ±3 | | | ±3 | | dB |
| Input Return Loss | | 8 | | | 8 | | dB |
| Output Return Loss | | 10 | | | 10 | | dB |
| Output 3dB Compression Point (P3dB) | | 37 | | | 34 | | dBm |
| Supply Current | | 900 | | | 900 | | mA |
| Isolation S12 | | 60 | | | 50 | | dB |
| Input Max Power (No damage) | Psat – Gain | | Psat – Gain | | | | dBm |
| Weight | | | 35 | | | | g |
| Impedance | | | 50 | | | | Ohms |
| Input / Output Connectors | SMA-Female (2.92mm - Optional) | | | | | | |
| Finish | Gold Plated | | | | | | |
| Material | Aluminum / Copper | | | | | | |

* P1dB, P3dB and Psat power test signal: 200µs pulse width with 10% duty cycle.

* For average CW power testing or increased duty cycle, a 5dB back off from Psat is required unless water/oil cooling system is applied.

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| Absolute Maximum Ratings | |
|--------------------------|-------------|
| Supply Voltage | +30 VDC |
| RF Input Power | Psat – Gain |

Note: Maximum RF input power is set to assure safety of amplifier. Input power may be increased at own risk to achieve full power of amplifier. Please reference gain and power curves.

| Biasing Up Procedure | |
|----------------------|---|
| Step 1 | Connect input and output with 50 Ohm source/load. (in band VSWR<1.9:1 or >10dB return loss) |
| Step 2 | Connect Ground Pin |
| Step 3 | Connect Vgg |
| Step 4 | Connect Vcc |
| Power OFF Procedure | |
| Step 1 | Turn Off Vcc |
| Step 2 | Turn Off Vcc |
| Step 3 | Remove RF Connection |
| Step 4 | Remove Ground |

Environmental Specifications and Test Standards

| Parameter | Standard | Description |
|----------------------------------|---------------|---|
| Operational Temperature | MIL-STD-39016 | -45°C~+55°C (Case Temperature less than 85C) |
| Storage Temperature | | -50°C~+125°C |
| Thermal Shock | | 1 Hour@ -45°C → 1 Hour @ +85°C (5 Cycles) |
| Random Vibration | | Acceleration Spectral Density 6 (m/s) Total 92.6 RMS |
| Electrical & Temperature Burn In | | Temperature +85°C for 72 Hours |
| Shock | | 1. Weight >20g, 50g half sine wave for 11ms, Speed variation 3.44m/s 2. Weight <=20g, 100g Half sine wave for 6ms, Speed variation 3.75m/s 3. Total 18 times (6 directions, 3 repetitions per direction). |
| Altitude | | Standard: 30,000 Ft (Epoxy Sealed Controlled Environment) Optional: Hermetically Sealed (60,000 ft. 1.0 PSI min) |
| Hermetically Sealed (Optional) | MIL-STD-883 | MIL-STD-883 (For Hermetically Sealed Units) |

Note: The operating temperature for the unit is specified at the package base. It is the user's responsibility to ensure the part is in an environment capable of maintaining the temperature within the specified limits



| Ordering Information | |
|----------------------|----------------------------|
| Part No. | Description |
| R02G20GSPA | 2GHz~20GHz Power Amplifier |

Amplifier Use

Ensure that the amplifier input and output ports are safely terminated into a proper 50 ohm load before turning on the power. Never operate the amplifier without a load. A proper 50 ohm load is defined as a load with impedance less than 1.9:1 or return loss larger than 10dB relative to 50 Ohm within the specified operating band width.

Power Supply Requirements

Power supply must be able to provide adequate current for the amplifier. Power supply should be able to provide 1.5 times the typical current or 1.2 times the maximum current (whichever is greater).

In most cases, RF - Lambda amplifiers will withstand severe mismatches without damage. However, operation with poor loads is discouraged. If prolonged operation with poor or unknown loads is expected, an external device such as an isolator or circulator should be used to protect the amplifier.

Ensure that the power is off when connecting or disconnecting the input or output of the amp.

Prevent overdriving the amplifier. Do not exceed the recommended input power level.

Adequate heat-sinking required for RF amplifier modules. Please inquire.

Amplifiers do not contain Thermal protection, Reverse DC polarity or Over voltage protection with the exception of a few models. Please inquire.

Proper electrostatic discharge (ESD) precautions are recommended to avoid performance degradation or loss of functionality.

What is not covered with warranty?

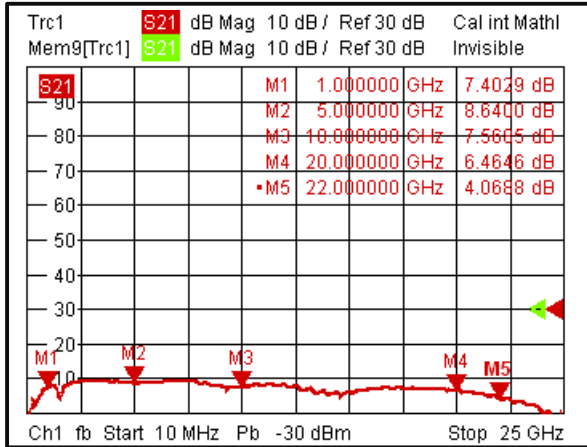
Each RF - Lambda amplifier will go through power and temperature stress testing.

Since the die, ICs or MMICs are fragile, these are not covered by warranty. Any damage to these will NOT be free to repair.

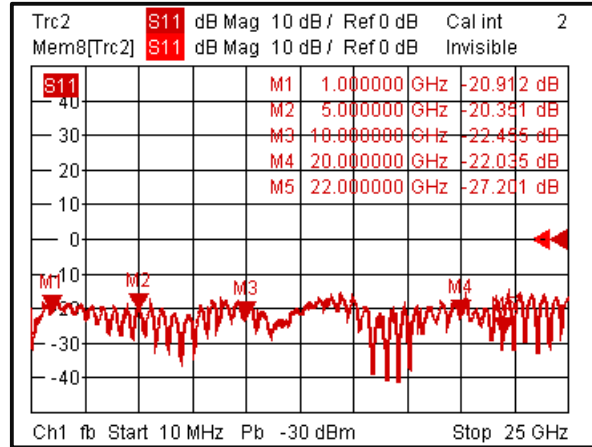
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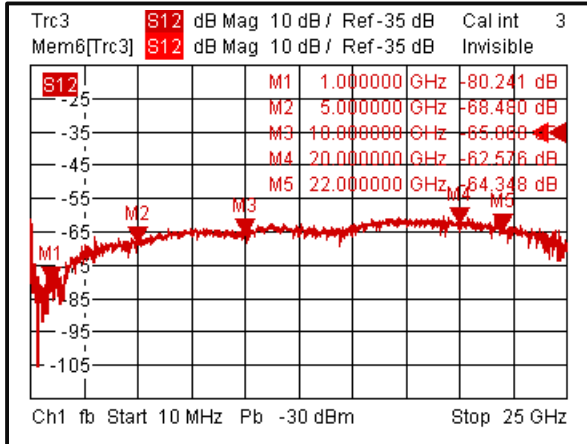
Gain vs. Frequency



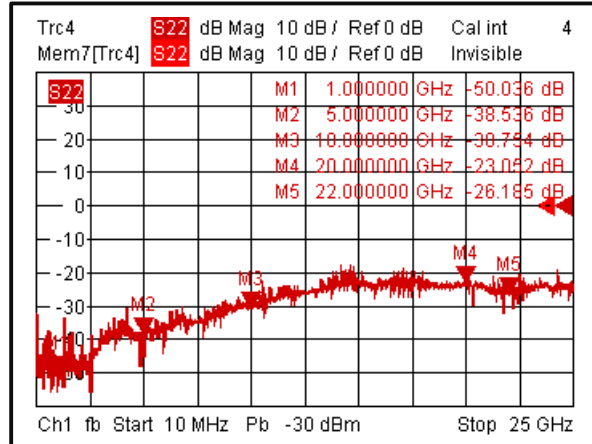
Input Return Loss



Isolation



Output Return Loss



Note: Input/output return loss measurements include attenuators to protect equipment

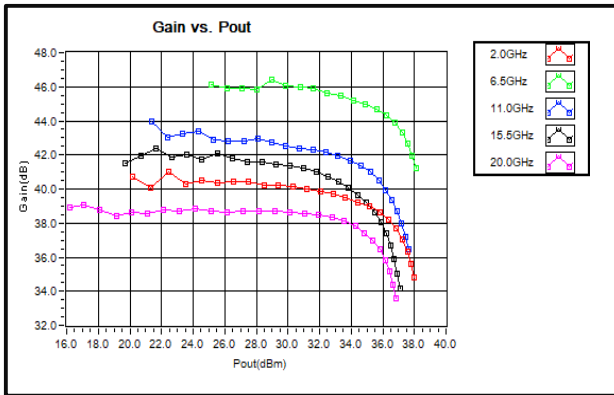


RF-LAMBDA

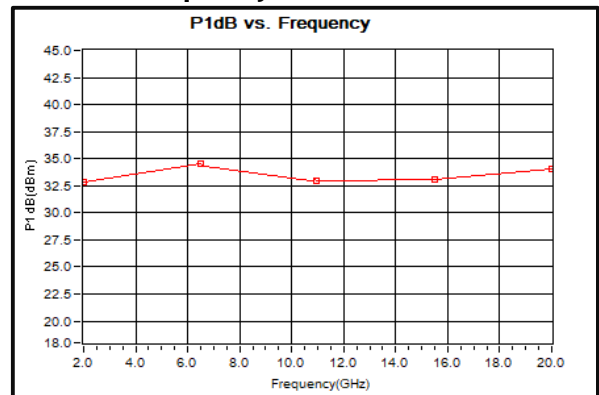
The power beyond expectations

R02G20GSPA

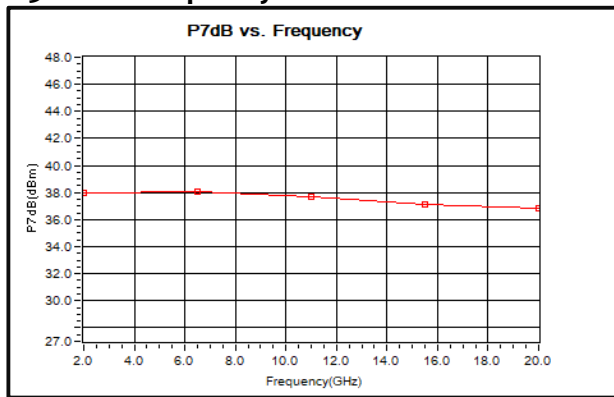
Gain vs. Pout



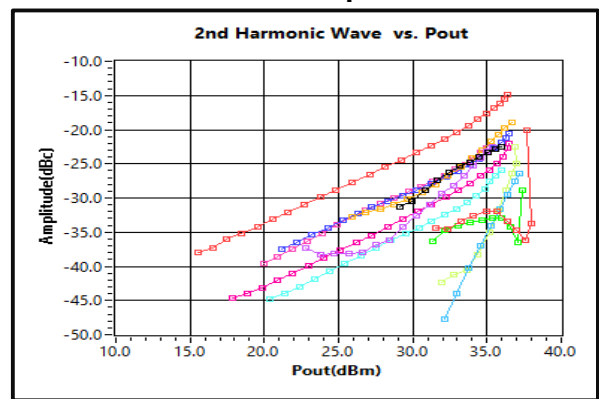
P1dB vs. Frequency



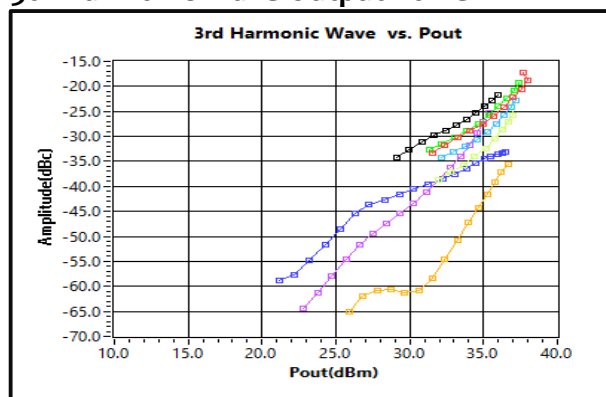
P3dB vs. Frequency



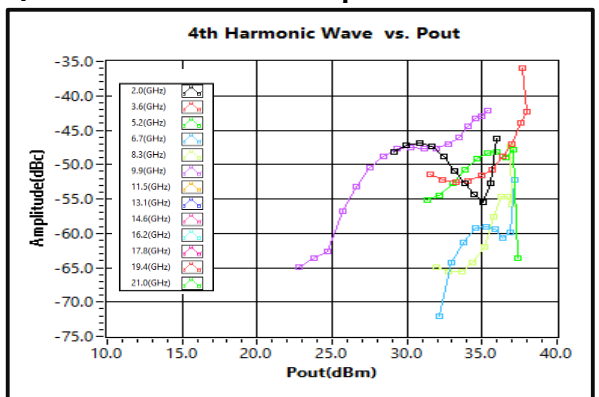
2nd Harmonic Wave Output Power



3rd Harmonic Wave Output Power



4th Harmonic Wave Output Power



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