

## WIRELESS BACKHAUL

CELLULAR REPEATERS/SIGNAL BOOSTERS

ENTERPRISE/ CARRIER-CLASS WI-FI ACCESS POINTS

## SMALL CELLS

**BASE STATIONS/DAS** 



Guerrilla RF strives to enable universal wireless data access across the globe.

# **ABOUT GUERRILLA RF**

# WE ARE INNOVATIVE & PASSIONATE INDUSTRY VETERANS

Guerrilla RF, a start-up company headquartered in Greensboro, NC, provides high performance Monolithic Microwave Integrated Circuits (MMICs) for the wireless infrastructure market. Since our inception in 2013, we have dedicated ourselves to the development of high performance MMICs to allow the wireless infrastructure equipment manufacturers to provide greater area coverage and higher data rates. With our patent pending Guerrilla Armor<sup>™</sup> technology, our team of industry veterans, and our use of the best semiconductor process technologies, we are poised to make a big impact across multiple large markets (Enterprise & Carrier-Class Wi-Fi Access Points, Small Cells, wireless backhaul, defense, etc).

### **PRODUCT SPOTLIGHT**

**GRF4003:** With integrated RF matching, this device offers exceptional linearity and ultra-low NF over a wide bandwidth of 400 – 3800 MHz with minimal external components. It delivers outstanding performance over a range of Vdd from 1.8 to 5.0 volts and with adjustable Iddq values to achieve optimal efficiency. Whether the need is for a first stage LNA, linear driver or high performance gain block, the flexible biasing capability of this part, combined with it's outstanding broadband performance and simple implementation, enable high levels of reuse within a single design or across multiple platforms.

**GRF2501:** Designed for demanding 802.11a/n/ac applications in the 5.1 – 5.825 GHz band, this LNA delivers industry leading 16.5 dB gain and 0.8 dB NF along with high directivity. Internally matched to 50 ohms, the application schematic for this device is simple to implement with a small number of external components. GRF2501 delivers outstanding performance with Vdd ranging from 2.7 to 5.0 volts and Iddq can be adjusted to provide the ideal level of efficiency for a particular application requirement.



### **OUR APPLICATIONS**

**Wireless Backhaul:** Our low noise amplifiers, linear driver amplifiers and high frequency gain blocks offer outstanding performance from near DC to 13.5 GHz and are outstanding solutions for both IF and RF applications in NLOS, Point-to-Point and Point-to-Multipoint backhaul radio systems.

**Cellular Repeaters/Signal Boosters:** Our GRF400X series devices offer high linearity and gain along with ultra-low NF for high-performance receive and transmit lineups. Integrated RF matching provides a low external part count and a small application footprint which lead to a low cost solution. Flexible bias voltages from 1.8 to 5.0 volts combine with the broadband capability of these devices to yield a high level of reuse both within a single product as well as across platforms.

#### Enterprise/Carrier-Class Wi-Fi Access Points: Our

GRF25XX family of 802.11a/n/ac LNAs offer NF values as low as 0.5 dB and gain values as high as 16.5 dB that are far superior to their competition. This family also offers our proprietary Guerrilla Armor technology which maintains incredible off-state isolation in the presence of high RF input power levels of > +18 dBm. The RF ports of these devices are internally matched to 50 ohms over the 4.9 – 6.0 GHz band enabling a small application footprint and minimal external part count.

**Small Cells:** The devices in our GRF400X family of parts provide broadband linearity and NF performance that is suitable both as a linear PA driver and as a small cell LNA. The flexible biasing capability of this family enables such things as low voltage architectures and a high degree of component reuse. The high IP3, P1dB and excellent EVM performance of these devices make them ideal amplifiers for high PAR waveforms used in LTE and WCDMA systems.

**Base Stations and Distributed Antenna Systems (DAS):** In particular, our GRF400X devices have the gain, NF and linearity to make outstanding transmit driver and receive LNA solutions for these high performance applications. The low voltage capability of these parts enables higher efficiency architectures while maintaining outstanding levels of performance.

### **Broadband LNAs / Linear Drivers**

P/N	Frequency Range (GHz)	Reference Conditions	Gain (dB)	NF (dB)	OP1dB (dBm)	OIP3 (dBm)	Vdd Range (V)	ldd Range (mA)	Internally Matched (50 ohms)	Package (mm)
GRF4001	0.1-3.8	2600 MHz 3.3V; 65 mA	16.5	0.85	+17.5	+31.0	1.8-5.0	20-75	Yes	1.5 x 1.5 DFN-6
GRF4002	0.1-3.8	2600 MHz 4.5V; 75 mA	14.5	0.80	+22.0	+40.0	1.8-5.0	40-80	Yes	1.5 x 1.5 DFN-6
GRF4003	0.4-3.8	2600 MHz 4.5V; 95 mA	13.5	0.70	+23.5	+42.0	1.8-5.0	40-110	Yes	1.5 x 1.5 DFN-6
GRF4004	0.6 - 3.8	2600 MHz 5.0V; 140 mA	14.5	1.10	+25.5	+45.0	1.8-5.0	60-160	No	1.5 x 1.5 DFN-6
GRF3501	0.1-3.8	2600 MHz 3.3V; 65 mA	16.5	0.85	+17.5	+31.0	1.8-5.0	20-75	Yes	SOT-89
GRF3502	0.1-3.8	2600 MHz 4.5V; 75 mA	14.5	0.80	+22.0	+40.0	1.8-5.0	40-80	Yes	SOT-89
GRF3503	0.4-3.8	2600 MHz 4.5V; 95 mA	13.5	0.70	+23.5	+42.0	1.8-5.0	40-110	Yes	SOT-89
GRF3504	0.6 - 3.8	2600 MHz 5.0V; 140 mA	14.5	1.10	+25.5	+45.0	1.8-5.0	60-160	No	SOT-89

### **Narrow Band LNAs**

P/N	Frequency Range (GHz)	Reference Conditions	Gain (dB)	NF (dB)	OP1dB (dBm)	OIP3 (dBm)	Vdd Range (V)	ldd Range (mA)	Internally Matched (50 ohms)	Package (mm)
LNAs for 5-6 GHz 802.11a/n/ac										
GRF2500	4.9-6.0	5500 MHz 3.0V; 20 mA	11.0	0.5	+13.0	+26.0	1.8-5.0	8-30	Yes	1.5 x 1.5 DFN-6
GRF2501	4.9-6.0	5500 MHz 3.3V; 12 mA	16.5	0.8	+9.0	+25.0	2.7-5.0	8-30	Yes	1.5 x 1.5 DFN-6
GRF2561*	4.9-6.0	5500 MHz 3.3V; 12 mA	16.0	1.2	+9.0	+25.0	2.7-5.0	8-30	Yes	1.5 x 1.5 DFN-6

\* Guerrilla Armor

### **Broadband Gain Blocks**

P/N	Frequency Range (GHz)	Reference Conditions	Gain (dB)	NF (dB)	OP1dB (dBm)	OIP3 (dBm)	Vdd Range (V)	ldd Range (mA)	Internally Matched (50 ohms)	Package (mm)
GRF2001	0.1-12.0	1900 MHz 5V; 75 mA	16.3	2.4	+14.9	+29.4	3.0-5.0	50-90	Yes	1.5 x 1.5 DFN-6
GRF2002	0.1-10.0	1900 MHz 5V; 60 mA	16.2	1.6	+14.8	+28.9	3.0-5.0	40-80	Yes	1.5 x 1.5 DFN-6
GRF2003	0.1-8.0	1900 MHz 5V; 95 mA	18.4	1.7	+16.7	+33.3	3.0-5.0	60-110	Yes	1.5 x 1.5 DFN-6
GRF2060*	0.1-4.0	1900 MHz 5V; 40 mA	16.3	1.7	+12.8	+26.3	3.0-5.0	20-70	Yes	1.5 x 1.5 DFN-6
GRF2062*	0.1-4.0	1900 MHz 5V; 65 mA	15.4	2.2	+13.7	+27.5	3.0-5.0	40-80	Yes	1.5 x 1.5 DFN-6
GRF2710	10.0-13.5	12.0 GHz 7V; 35 mA	15.5	1.5	+15.5	+28.5	5.0-7.0	20-60	Yes	1.5 x 1.5 DFN-6

\* Guerrilla Armor



Our high performance RF and Microwave IC products enable new levels of range and coverage area in wireless systems. Aimed at various infrastructure applications, our products utilize our patent pending technologies, world class IC design talents, and cutting edge device technologies to deliver results.

# CONTACT US

