GRF25XX Series Amplifiers

Industry leading noise figure (NF), gain and linearity over 4.9 to 6.0 GHz combine with internal matching to achieve superior 802.11a/n/ac low noise amplifier (LNA) performance with minimal external part count.

The LNA serves to minimize the cascaded NF of the entire receiver to best preserve the signal to noise ratio (SNR) at the receiver input. The cascaded receiver NF consists of the LNA NF plus the NF contribution of the rest of the receiver which, in turn, is minimized by the LNA gain. In the past, first or single-stage LNAs placed an emphasis on NF and gain since linearity requirements were typically moderate. Today's 802.11ac WLAN standard with its maximum 256 QAM modulation and associated low error vector magnitude (EVM) requirements place a greater linearity burden on the LNA.

Pseudo-morphic high electron mobility transistor (pHEMT) MMICs utilize the optimal process technology for this demanding application and Guerrilla RF's GRF25XX family of devices are leading the way with their dominant NF and gain. The following devices are the ideal solution for the industry's enterprise/carrier-class Wi-Fi access points designed to achieve the highest levels of RF performance:

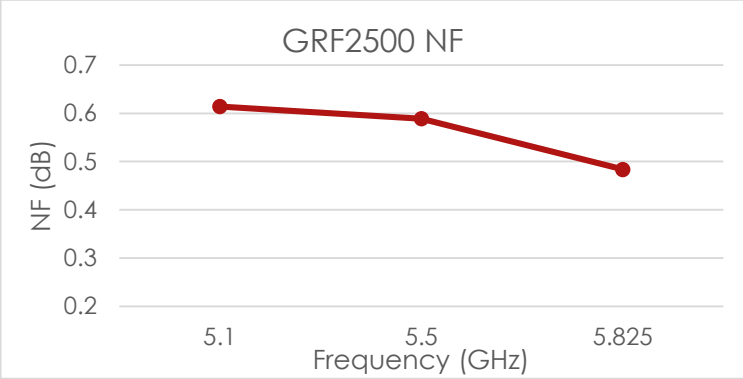
GRF2500: With an industry leading low NF of 0.6 dB balanced against 11 dB gain, this LNA is optimal for applications requiring superior cascaded NF combined with high input referenced linearity. This LNA is well suited for use with WLAN transceivers which have relatively low receiver NF and do not require high LNA gain.

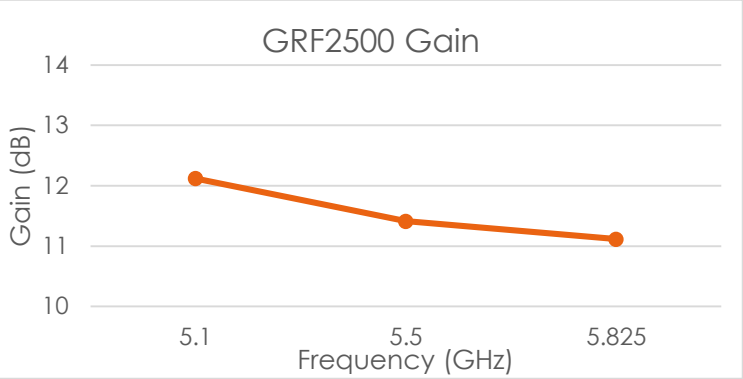
GRF2501: Exceptional 16 dB gain combined with 0.75 dB NF that is second only to the GRF2500, this device is optimal for WLAN transceivers needing high LNA gain to overtake the NF of the receive chain.

GRF2561: Along with low NF and high gain, this derivative of the GRF2501 features our patented Guerrilla Armor ™ technology which imparts high off-state isolation over a wide range of RF input powers in excess of +18 dBm. LNA is perfect for radios with high transmitter power leaking into the LNA input since it will prevent any self-biasing of the LNA under high RF input power conditions.

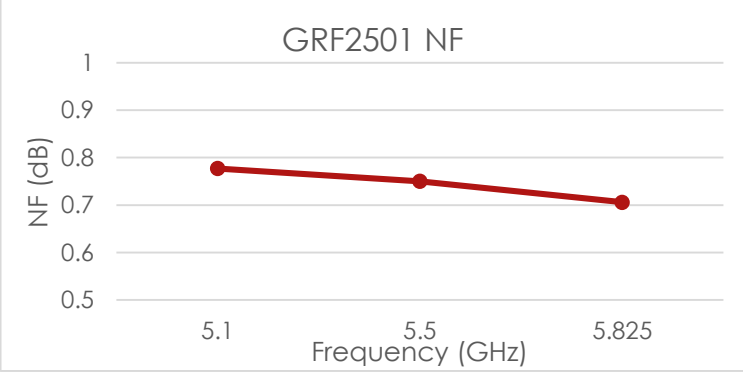
The measured evaluation board data on the following page shows typical NF and gain data for the GRF2500 and GRF2501 devices. Note the ultra-low NF and flat gain across the 5 to 6 GHz band.

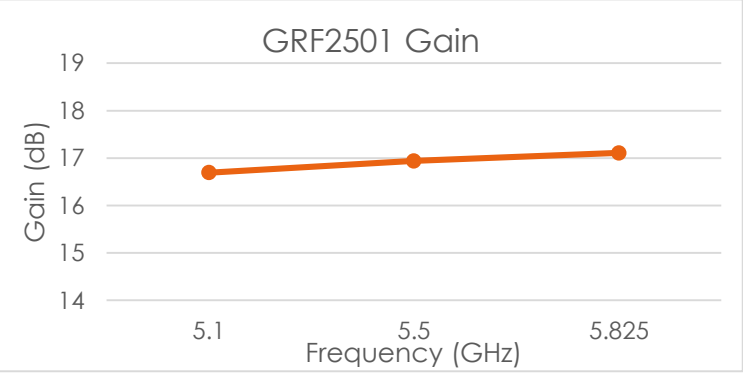
Below: GRF2500 de-embedded NF and gain:





Below: GRF2501de-embedded NF and gain:





Conclusion: These LNAs focus on providing the highest possible levels of performance (including NF that leads the industry by a wide margin) for the most demanding, performance-driven applications. All the devices offer excellent RF performance and unconditional stability over an extended operating temperature range of -40C to +105C. Internal matching results in a minimal number of external components and all three devices utilize a common 1.5 x 1.5 mm DFN package and evaluation board.

The Guerrilla RF applications engineering team is always available to provide device recommendations, tuned evaluation boards, measured device data and design assistance as needed.