CLAIMS

What is claimed is:

1. A power amplification unit comprising:

an integral ultra-wideband (UWB) power amplifier (PA) having a RF (radio frequency) input for receiving a RF input signal, a PA output for providing an amplified output, the UWB PA operated by control and power supply voltages,

a combiner configured to receive a RF signal and an auxiliary signal and to generate therefrom, the RF input signal to the UWB PA,

a signal generator configured to generate the auxiliary signal to have a pulse-shaped component derived from the RF signal and a quiet period component, the auxiliary signal having a frequency spectrum lower than a cutoff RF frequency, and

an output matching circuit connected to the PA output and having signal filtering parameters selected to pass the amplified output above the cutoff RF frequency which is lower than a frequency of the RF signal.

2. The power amplification unit of claim 1, wherein the combiner is configured to generate the RF input signal to the UWB PA through at least one filter thereof.

3. The power amplification unit of claim 1, wherein the combiner is configured to generate the RF input signal to the UWB PA through at least two filters thereof, which correspond to frequency ranges of the RF signal and the auxiliary signal, respectively.

4. The power amplification unit of claim 1, further comprising at least one filter connected at one or more inputs of the combiner.

5. The power amplification unit of claim 1, further comprising at least two filters connected at one or more inputs of the combiner and corresponding to frequency ranges of the RF signal and the auxiliary signal, respectively.

6. The power amplification unit of claim 1, further configured to be switchable into an operation mode of direct RF input signal amplification.

7. The power amplification unit of claim 1, wherein the UWB PA is operated without changing the control and power supply voltages.

8. The power amplification unit of claim 1, wherein the pulse-shaped component is related to an envelope of the RF signal.

9. The power amplification unit of claim 1, wherein the pulse-shaped component is optimized for spectrum mask quality and Error Vector Magnitude (EVM) quality of the amplified output with respect to a PA power consumption.

10. The power amplification unit of claim 1, wherein the quiet period component of the auxiliary signal is selected to reduce a power consumption of the UWB PA with respect to a power consumption thereof when receiving a zero RF input signal.

11. The power amplification unit of claim 1 , wherein the signal generator is configured to receive digital data input and to generate therefrom the RF signal and the auxiliary signal.

12. The power amplification unit of claim 1, wherein the signal generator comprises an envelope detector configured to detect an envelope of the RF signal and generate the corresponding pulse-shaped component of the auxiliary signal therefrom.

13. The power amplification unit of claim 1, wherein the combiner comprises a duplexer having a high pass filter and a low pass filter.

14. The power amplification unit of claim 1, wherein the at least two filters of the combiner comprise at least one band pass filter.

15. The power amplification unit of claim 1, wherein the output matching circuit comprises a band-stop filter configured to attenuate the auxiliary signal in the amplified output signal.

16. The power amplification unit of claim 1, wherein the cutoff RF frequency is set between 300MHz and 3GHz.

17. A method comprising:

combining an RF signal with an auxiliary signal to provide an RF input signal to an integral UWB PA, wherein the auxiliary signal is generated to have a pulse-shaped component derived from the RF signal and a quiet period component, and

delivering an amplified output from the UWB PA through an output matching circuit having signal filtering parameters selected to pass the amplified output above a cutoff RF frequency, wherein the cutoff RF frequency is lower than a frequency of the RF signal and the auxiliary signal is configured to have a frequency spectrum lower than the cutoff RF frequency.

18. The method of claim 17, further comprising operating the UWB PA without changing control and power supply voltages thereof, with the quiet period component of the auxiliary signal selected to reduce a power consumption of the UWB PA with respect to a power consumption thereof when receiving a zero RF input signal.

19. The method of claim 17, wherein the pulse-shaped component is related to an envelope of the RF signal.

20. The power amplification unit of claim 1, further comprising optimizing the pulse-shaped component for spectrum mask quality and EVM quality of the amplified output with respect to a PA power consumption.