CLAIMS

What is claimed is:

1. A combined radio frequency digital-to-analog converter (RFDAC) comprising:

an in-phase and quadrature- (IQ-) based DAC configured to generate a phase component of an output RF signal;

a polar-based DAC configured to generate an amplitude component of the output RF signal; and

mode circuitry configured to

operate the IQ-based DAC to generate the phase component and the amplitude component of the output RF signal in a first mode of operation, and

operate the IQ-based DAC to generate the phase component of the output RF signal and operate the polar-based DAC to generate the amplitude component of the output RF signal in a second mode of operation.

2. The combined RFDAC of claim 1, wherein the polar-based DAC is configured to utilize the phase component as a clock such that the amplitude component and the phase component are combined to generate the output RF signal.

3. The combined RFDAC of claim 1, wherein the IQ-based DAC comprises a current steering IQ RFDAC.

4. The combined RFDAC of claim 1, wherein the polar-based DAC comprises a plurality of digital power amplifiers.

5. The combined RFDAC of claim 4, wherein the plurality of digital power amplifiers comprises a plurality of switch-capacitor power amplifiers.

6. The combined RFDAC of claim 4, wherein a number of the plurality of digital power amplifiers is enabled to generate the amplitude component, wherein the number scales with a value of the amplitude component.

7. The combined RFDAC of claim 4, wherein the polar-based DAC is configured to generate the amplitude component of the output RF signal based on disabling a set of digital power amplifiers of the plurality of digital power amplifiers.

8. The combined RFDAC of claim 1, wherein, in the first mode of operation, the IQ-based DAC is configured to output the output RF signal and bypass the polar-based DAC.

9. The combined RFDAC of claim 1, wherein a frequency of the phase component comprises a carrier frequency of the output RF signal.

10. A method comprising:

generating, via a polar amplitude digital-to-analog converter (DAC) portion of an in-phase and quadrature- (IQ-) polar radio frequency (RF) DAC, a first analog amplitude component of a first output RF signal based on first digital amplitude information and the IQ-polar RFDAC operating in a first mode of operation;

generating, via an IQ RFDAC portion of the IQ-polar RFDAC, a first analog phase component of the first output RF signal based on first digital phase information and the IQ-polar RFDAC operating in the first mode of operation;

generating, via the IQ RFDAC portion of the IQ-polar RFDAC, a second analog amplitude component of a second output RF signal based on second digital amplitude information and the IQ-polar RFDAC operating in a second mode of operation; and

generating, via the IQ RFDAC portion of the IQ-polar RFDAC, a second analog phase component of the second output RF signal based on second digital phase information and the IQ-polar RFDAC operating in the second mode of operation.

11. The method of claim 10, comprising receiving an indication of the first mode or the second mode as a mode of operation for the IQ-polar RFDAC.

12. The method of claim 11, wherein the indication is based on a desired output power of the first output RF signal relative to a threshold power.

13. The method of claim 11, comprising directly generating, via the IQ RFDAC portion, the second output RF signal based on the mode of operation being the second mode.

14. The method of claim 10, wherein the IQ RFDAC portion comprises a current steering RFDAC.

15. The method of claim 10, comprising frequency modulating the generating of the first analog phase component to generate the first output RF signal by clocking the generating of the first analog amplitude component by the first analog phase component.

16. The method of claim 10, comprising generating, via digital processing circuitry, the first digital amplitude information and the first digital phase information based on a digital data indicative of the first output RF signal.

17. Radio-frequency (RF) transmission circuitry comprising:

first digital-to-analog converter (DAC) circuitry configured to generate a phase modulated signal at a carrier frequency of an RF output signal of the RF transmission circuitry based on digital data indicative of the RF output signal, the phase modulated signal comprising a consistent amplitude based on the RF transmission circuitry operating in a first mode and comprising the RF output signal based on the RF transmission circuitry operating in a second mode; and

second DAC circuitry configured to generate the RF output signal based on the digital data, the phase modulated signal, and the RF transmission circuitry operating in the first mode and be disabled based on the RF transmission circuitry operating in the second mode.

18. The RF transmission circuitry of claim 17, wherein the first DAC circuitry comprises an in-phase and quadrature (IQ) RF digital-to-analog converter (RFDAC) and the second DAC circuitry comprises one or more digital power amplifiers.

19. The RF transmission circuitry of claim 17, wherein the second mode corresponds to a higher power backoff of the RF output signal than the first mode.

20. The RF transmission circuitry of claim 17, comprising digital processing circuitry configured to generate amplitude information and phase information based on the digital data, wherein, based on the amplitude information based on the RF transmission circuitry operating in the first mode, the first DAC circuitry is configured to generate the phase modulated signal based on the phase information and the second DAC circuitry is configured to generate the RF output signal based on the amplitude information and the phase modulated signal.