Abstracts

Generation of RF pulsewidth modulated microwave signals using delta-sigma modulation

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With RF pulsewidth modulation, microwave signals are encoded in a binary signal having one pulse per period of the microwave signal, in which the pulse timing varies with the phase of the RF signal, and the pulse width varies in accordance with the signal amplitude. RF pulsewidth modulated signals are advantageous for use with high efficiency amplifiers (class D switching mode amplifiers or class C amplifiers) for the quasi-linear amplification of signals with time-varying envelope. This paper demonstrates a digital technique to generate RF pulse modulated signals for narrowband microwave signals such as those used in wireless communications. The technique makes use of delta-sigma modulation of the phase and amplitude of the signal. The generation of OQPSK signals is shown as an example. The approach is a candidate for the design of single-chip, DSP-based transmitters.

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