

Design of an Arbitrary Signal Generator Based on Time-Domain Superposition

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Abstract : This paper introduces the design principles and methods of a time-domain signal generator. It explores the spectral characteristics of pulse signals and proposes a signal synthesis method based on the superposition of Gaussian signals. By adjusting the amplitude parameters of the Gaussian functions, the synthesis of arbitrary spectral signals can be achieved. The synthesis method considers the calculation of synthesis coefficients for signals with known frequency domain functions. Finally, simulation experiments verify the time-domain and frequency-domain characteristics of the synthesized signals and discuss the degree of fit between the synthesized and original signals in both domains. This paper provides valuable insights for understanding the design principles and implementation methods of time-domain signal generators.

Keywords : time-domain signal generator, pulse signal, arbitrary signal generator, signal synthesis

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