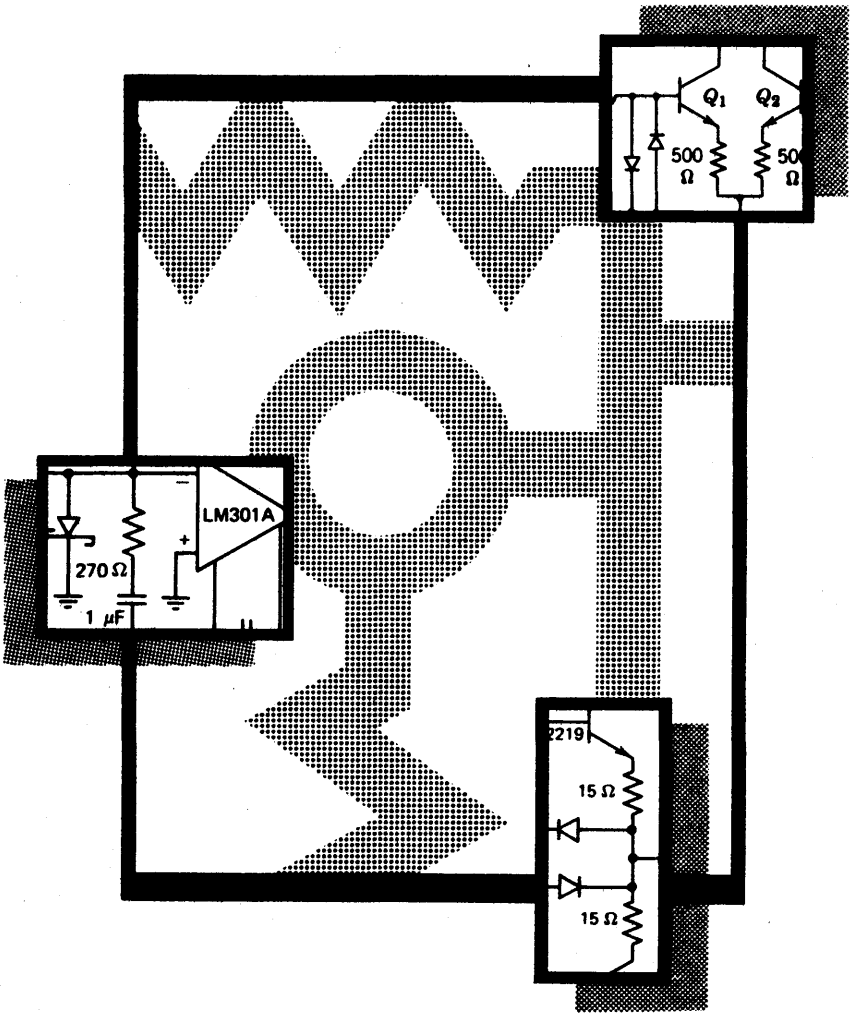
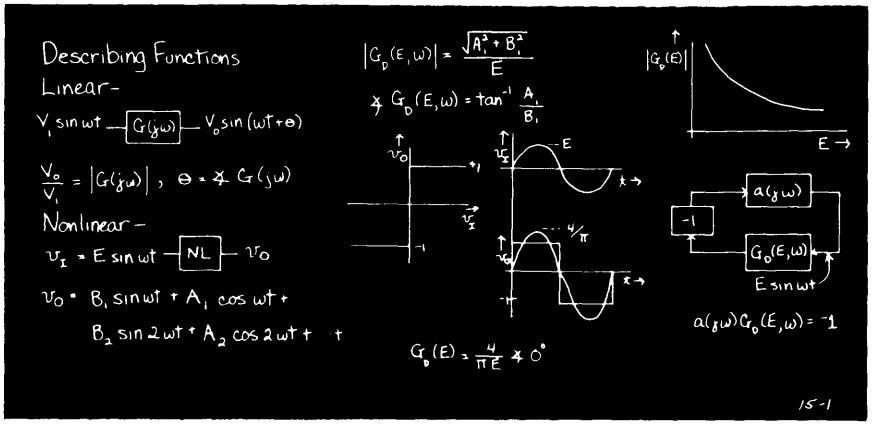
Describing Functions 15



Blackboard 15.1



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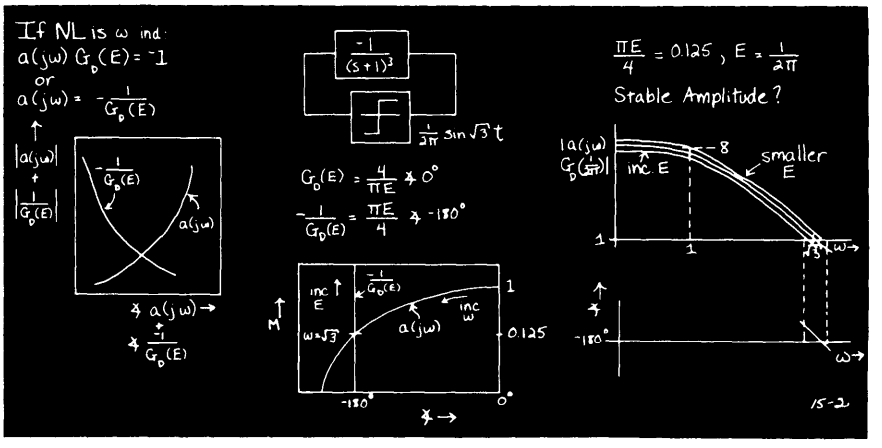
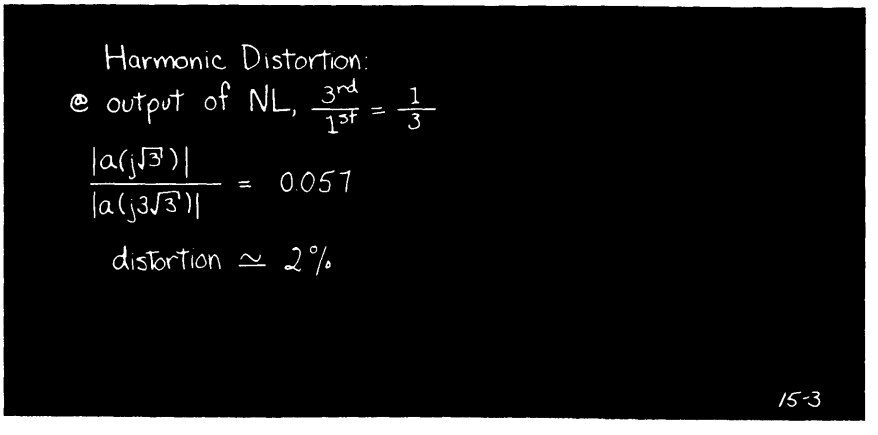


Blackboard 15.3



Comments

Describing-function analysis offers a way to apply the powerful frequency-domain methods that are so useful in linear-systems analysis to nonlinear systems. The describing function indicates the gain-and-phase shift that a nonlinear element provides to an input sinusoid, considering only the fundamental component of the output.

While describing-function analysis can be used to estimate the magnitudes of all signals in a nonlinear system that is driven with a sinusoid, the computational requirements for this type of detailed analysis are generally not justifiable. However, describing functions do provide a valuable way of estimating the amplitude, frequency, and harmonic distortion of certain kinds of oscillators.

Reading

Textbook: Sections 6.3 through 6.3.3.

Problems

Problem 15.1 (P6.6)

Problem 15.2 (P6.7)

RES.6-010 Electronic Feedback Systems

Spring 2013