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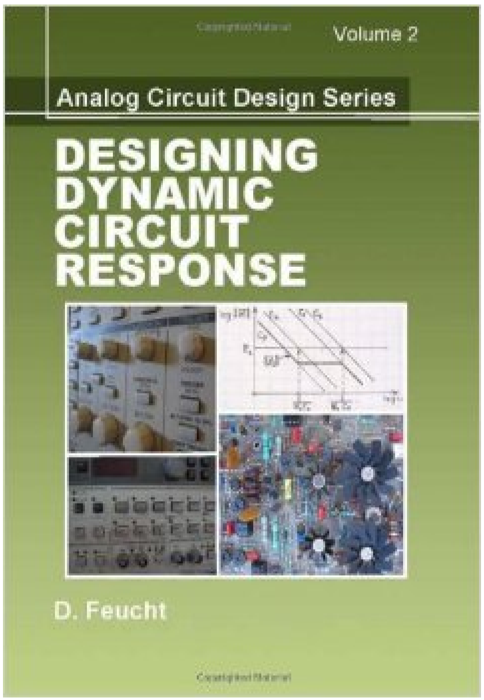
Designing Dynamic Circuit Response (Analog Circuit Design)



Synopsis

The Analog Circuit Design set reduces the concepts of analog electronics to their simplest, most obvious form which can easily be applied (even quantitatively) with minimal effort. The emphasis of the set is to help you intuitively learn through inspection how circuits work and apply the same techniques to circuits of the same class. This second volume, Designing Dynamic Circuit Response builds upon the first volume Designing Amplifier Circuits (9781891121869) by extending coverage to include reactances and their time- and frequency-related behavioral consequences. Retaining a design-oriented analysis, this volume begins with circuit fundamentals involving capacitance and inductance and lays down the approach using s-domain analysis. Additional concepts and perspectives fill in the blanks left by textbooks in regards to circuit design. It simplifies dynamic circuit analysis by using the graphical methods of reactance plots. Methods of compensating amplifiers, including feedback amplifiers, are kept as simple as possible using reactance plots and s-domain transfer functions that mainly require algebraic skill.

Book Information

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Customer Reviews

For any person wanting to learn the fine details of analog solid state design the series of books by Feucht is excellent.He is an experienced and competent engineer who handles his subject clearly and professionally.His background as a vertical amplifier designer at Tektronix gives him a solid foundation for this book on amplifier design. Here transistor modelling is covered in detail and several working circuits are given and can be checked with SPICE or by construction.Young engineers in training will benefit from the foundational approach used. Those who are accustomed mainly to using opamps as building blocks will learn the fundamentals of discrete transistor multistage amplifier design. As a seasoned analog designer myself, I recommend the book highly.

There is some merit to this series. Unfortunately it is hard to follow some of the analysis, and it will leave the inexperienced young electronics professional unable to follow....I have a fair bit of experience, and I find certain sections hard to follow.Another thing is there are examples of bad amplifier analysis or circuits that just won't work.Two examples:Botched amplifier noise analysis.ON page 95, in Volume 3, under his example of opamp input noise he has a completely botched analysis of the output noise. He doesn't give an equation (see what I mean?), but it's not too hard to figure out what he is doing.His equation (not given, but intuited from data given):eno=sqrt(eni^2 + 2(enR)^2+ (in*rin||Rfb)^2) = 61.1nV/rtHz All Wrong!The proper equation:eno=sqrt(((1+Rfb/rin)*eni)^2 + (in*Rfb)^2 + 2(enR)^2) = 70.8nV/rtHzThe only reason he ends up somewhat close to the correct answer is because the 100k resistors used in his example comprise the dominant source of noise. Its obvious if you are in an inverting gain of 1 that the amplifier itself is in a noise gain of 2, which means you have to at least get 2x the input referred voltage noise at the output.....(1+Rfb/rin)*eni or 40nV^rtHz. The resistors contribute the sqrt(2)*40.7nV/rtHz...or 57.55nV/rtHz....the current noise is only gained up to the output by the feedback resistor in*rfb = 10nV/rtHz. Rss those together you get the 70.8nV/rtHz.Another example of a circuit that will not work is the one on page 125, which has positive feedback, and would latch at one supply rail or the other depending on amplifier offset.

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