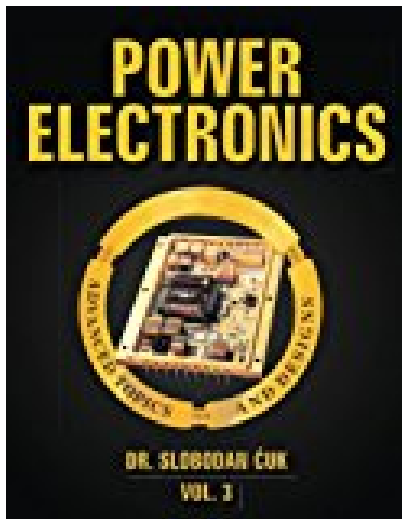


Power Electronics Advanced Topics and Designs NEW Volume 3



BOOK DETAILS

- Author : Slobodan Cuk
- Pages : 360 Pages
- Publisher : CreateSpace Independent Publishing Platform
- Language : English
- ISBN : 1519520298

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BOOK SYNOPSIS

This new Volume 4 brings together in one place the exposition of State-space Averaging Method and the Cuk converter as described in December 1976 doctorate thesis of Prof. Cuk. The Cuk converter, invented on April 1, 1975, was a prime motivator for development of this general analysis and synthesis method. Professor Middlebrook lamented in 1981: "... If the models for all such converters are the same, it should be possible to derive this unique model without having to specify in advance any particular converter. This problem was solved in a very elegant manner by Slobodan Cuk. In his 1976 PhD thesis he introduced the analysis method of State-Space Averaging, which in a single stroke eliminates the switching process from consideration and exposes the desired dynamic response. From this model came the same unique small signal equivalent circuit model, which is now called the canonical model. Again with the clarity of insight, the form of the model becomes "obvious": it contains the three essential properties of any DC to DC converter, namely DC conversion, low pass filter and conversion ratio adjustment by a control signal." Also included in this new volume 4 are three key US patents describing not only basic Cuk converter and its Isolated Cuk converter extensions, but also new general magnetics concepts: Coupled-Inductor and Integrated Magnetics. They are now proven to be equally beneficial for new switching methods and novel topologies invented recently by Dr. Cuk. After 40 years since its development, the enclosed description still remains as the most authoritative description. Subsequent Circuit Averaging modifications failed to justify the claim of "better insight" into converter models and Switch Averaged models failed to confirm the ease of use claim. Both "methods" are not even capable to model simple extensions such as addition of a voltage clamp let alone more complex topologies such as fundamentally new topologies with three switches only, invented by Dr. Cuk recently. The application of the State-space Averaging method also speeds-up naturally thousand times switching converter simulations and eliminates the inherent convergence and accuracy problems of all present simulation methods.

POWER ELECTRONICS ADVANCED TOPICS AND DESIGNS NEW VOLUME 3

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