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Study on Non-isolated Power Electronics Converters using State Space Analysis

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In this paper, different issues related to modelling and stability of non-isolated power electronics converter are tried to address by the authors. The stability of different power electronics converters like Buck Converter, Boost Converter and Buck Boost Converter are analysed by using state space analysis in order to obtain the linear model for continuous mode of operation. The transfer function of the converters for both ideal and non-ideal converters are obtained. The circuit parameters of the converters are observed from the simulation. Responses of the converters are observed with the change in the internal resistance of the inductor. In addition, simulation is performed and the plots thus obtained shows stability of the DC-DC converters. Rise time, peak time, setting time and maximum overshoot of these solid state converters are identified from the simulation.

Biography

Dr. Nitai Pal received his B.Tech. and M.Tech. from University of Calcutta, Calcutta, India in 1998 and 2000 respectively. He completed his Ph.D. (Engineering) from Jadavpur University, Kolkata, India in the year 2007. He is currently working as an Associate Professor in the Department of Electrical Engineering, Indian School of Mines (Under MHRD, Govt. of India), Dhanbad, Jharkhand, India. He has total experience of approximate fifteen years in teaching. He has total 40 nos. of research publications in various International and National Journals of repute. He has also presented several papers in International & National conferences. He is the peer reviewer of various International Journals like IEEE, IJCEE, IJCTE etc. He is the member of various professional International and National bodies. His specialization is Electrical Machines & Power Systems. His current areas of interest are power electronics applications, application of high frequency converter, renewable energy and its application, energy efficient devices, energy efficient drives, computer aided power system analysis.

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