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Prediction of Conducted EMI Noise in a Converter

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Abstract : Due to higher switching frequencies, the conducted Electromagnetic interference (EMI) noise is generated in a converter. It degrades the performance of a switching converter. Therefore, it is an essential requirement to mitigate EMI noise of high performance converter. Moreover, it includes two types of emission such as common mode (CM) and differential mode (DM) noise. CM noise is due to parasitic capacitance present in a converter and DM noise is caused by switching current. However, there is dire need to understand the main cause of EMI noise. Hence, we propose a novel method to predict conducted EMI noise of different converter topologies during early stage. This paper also presents the comparison of conducted electromagnetic interference (EMI) noise due to different SMPS topologies. We also make an attempt to develop an EMI noise model for a converter which allows detailed performance analysis. The proposed method is applied to different converter, as an example, and experimental results are verified the novel prediction technique.

Keywords : EMI, electromagnetic interference, SMPS, switch-mode power supply, common mode, CM, differential mode, DM, noise

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