

Reduction of High-Frequency Planar Transformer Conduction Losses Using a Planar Litz Wire Structure

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Abstract : A new trend in power converters is to design planar transformer that aim for low profile. However, at high frequency, the planar transformer ac losses become significant due to the proximity and skin effects. In this paper, the design and implementation of a novel planar Litz conductor is presented in order to equalize the flux linkage and improving the current distribution. The developed PCB litz wire structure minimizes the losses in a similar way to the conventional multi stranded Litz wires. In order to further illustrate the eddy current effect in different arrangements, a Finite-Element Analysis (FEA) tool is used to analyze current distribution inside the conductors. Finally, the proposed planar transformer has been integrated in an electronic stage to test at high signal levels.

Keywords : planar transformer, finite-element analysis, winding losses, planar Litz wire

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