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## **ANALYSIS AND IMPROVEMENT TECHNIQUES FOR THE TRANSFER FUNCTION OF A PLANAR LOW – PASS FILTER**

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### **Abstract**

In this paper new techniques for the analysis and improvement of the transfer function of a low-pass filter made in planar electromagnetic technology are proposed. The low pass filter is a fundamental element of the filter used for conduction electromagnetic interferences suppression. For this purpose, in order to determine the filter's transfer function, 3D electromagnetic CAE (Computer Aided Engineering) are coupled with simulation software programs which use equivalent electric circuits in order to directly obtain the frequency response. In the filter construction process the performance improvement techniques, proposed by the authors, are taken into account. These improvement techniques address two major directions of action, namely parasitic effects minimization for the component elements and attenuation increase at high frequency by analyzing the HF losses for the entire filter structure. Following the obtained results it can be concluded that the efficiency was increased for the *Optimal planar low-pass filter* with 1.2 dB in comparison to the *Filter based on the initial structure*.

*Key words:* electromagnetic planar technology, EMI filter, optimal design, structural parasitic capacitance, transfer gain

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