



The Chinese University of Hong Kong
Non-confidential Abstract of Technology Disclosure

Title:

A Derived Physically Expressive Circuit Model for Multi-layer RF Embedded Passives

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Patent Status:

US Patent Pending

Inventor(s):

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Non-confidential abstract:

The invention, called derived physically expressive circuit model (DPECM), is for systematically derivation of an equivalent circuit model for embedded multi-layered RF passive circuits. The needs for such a physically expressive circuit model mainly comes from two aspects: (1) a co-simulation of a mixed-signal heterogeneous system that consists of digital circuits, which are modeled by a circuit simulation in the time domain, and analog passive circuits, which is simulated by electromagnetic (EM) simulation in the frequency domain; and (2) the prediction of electromagnetic interference (EMI) among the RF passive circuits. Based on the invention, the derived equivalent circuit not only consists of the main elements of the original physical layout, but also reflects the parasitic effects, which can help designers diagnose the circuits and improve the physical layout design. The derived equivalent circuit model of the RF passives also can be incorporated with other lumped element circuits to do time-domain or frequency domain simulation of whole system. The invention is applicable for various kinds of embedded passives such as LTCC technology-based passives, PCB technology-based passives as well as IC technology-based passives and so on.

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