Abstracts

Rigorous Modeling of Parasitic Effects in Complex SAW RF Filters

G. Fischerauer, D. Gogl, R. Weigel and P. Russer. "Rigorous Modeling of Parasitic Effects in Complex SAW RF Filters." 1994 MTT-S International Microwave Symposium Digest 94.2 (1994 Vol. II [MWSYM]): 1209-1212.

This work presents an easy-to-implement and fast lumped-element circuit model for the parasitics of complex low-loss surface acoustic wave (SAW) devices such as interdigitated interdigital transducer (IIDT) and image impedance connected (IIC) filters. The model parameters can be derived from a knowledge of the device geometry without recourse to optimization methods. We investigated the influence of the measurement setup, the package and the layout itself. It is shown how the model parameters are determined by either experiment or analysis. The greatly enhanced predictive power of the extended simulation model is demonstrated by applying it to a 15-transducer IIDT filter and a 22-transducer IIC filter at 900 MHz. It was found, for instance, that parasitic capacitances strongly influence the input impedance in the passband while the stopband level is easily explained by the inductive coupling between bond wires.

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