Abstracts

Hybrid Inductor Modeling for Successful Filter Design (Short Papers)

W.R. Gaiewski, L.P. Dunleavy and L.A. Geis. "Hybrid Inductor Modeling for Successful Filter Design (Short Papers)." 1994 Transactions on Microwave Theory and Techniques 42.7 (Jul. 1994, Part II [T-MTT] (Special Issue on Filters and Multiplexers)): 1426-1429.

A method for deriving accurate L-band inductor models using 1-port fixtured S-parameter measurements is presented, along with examples of successful filter designs using the models. Models were developed for a number of surface-mount and leaded devices with values ranging from 4.7 nH to 470 nH. The devices were measured in a coaxial test fixture on an HP8510B network analyzer, with fixture de-embedding performed using CAD software. The models are seen to fit measured data over a broadband, from low RF through resonance. To further validate the models, several filter circuits were developed and fabricated. The results of 5th- and 9th-order lowpass filter designs are presented here. The 9th-order filter was optimized for the desired performance using the parasitic inductor models. Measurements confirm that the use of the models led to a successful design on the "first pass." Finally, simulations show that this success would not have been achieved without the developed inductor models.

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