Abstracts

Approximate analytical modeling of current crowding effects in multi-turn spiral inductors (2000 Vol. I [MWSYM])

W.B. Kuhn and N.M. Ibrahim. "Approximate analytical modeling of current crowding effects in multi-turn spiral inductors (2000 Vol. I [MWSYM])." 2000 MTT-S International Microwave Symposium Digest 00.1 (2000 Vol. I [MWSYM]): 405-408.

The effective series resistance of a multi-turn spiral inductor operating at high frequencies is known to increase dramatically above its DC value due to proximity-effect or current crowding. This phenomenon is difficult to analyze precisely and has generally required electromagnetic simulation for quantitative assessment. Current crowding is studied in this work through approximate analytical modeling and first order expressions are derived for predicting resistance as a function of frequency. The results are validated through electromagnetic simulation and with measured data taken from a spiral inductor implemented in a silicon-on-sapphire process.

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