Abstracts

Accurate modeling of high-Q spiral inductors in thin-film multilayer technology for wireless telecommunication applications

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In the current trend toward portable applications, high-Q integrated inductors are gaining a lot of importance. Using thin-film multilayer or multichip-module-deposition technology, high-Q circular inductors for RF and microwave applications may be integrated efficiently. Their quality factors may go up to over 100. In this paper, an accurate analytical model for such multiturn circular spiral inductors embedded in a thin-film multilayer topology is presented. Starting from the geometrical parameters, the model provides an accurate prediction of the inductance value, Q factor and frequency behavior of the inductor. This allows a "first-time-right?" realization of the integrated component and provides opportunities for fast optimization of the inductors. Finally, the presented high-Q inductors have been used in various integrated RF and microwave subsystems for wireless applications, of which a number are discussed at the end of this paper.

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