Abstracts

High-Q LTCC-based passive library for wireless system-on-package (SOP) module development

A. Sutono, D. Heo, Y.-J. Emery Chen and J. Laskar. "High-Q LTCC-based passive library for wireless system-on-package (SOP) module development." 2001 Transactions on Microwave Theory and Techniques 49.10 (Oct. 2001, Part I [T-MTT] (Mini-Special Issue on Electrical Performance of Electronic Packaging (EPEP))): 1715-1724.

In this paper, we present the development and full characterization and modeling of a multilayer ceramic-based system-on-package component library. Compact high-Q three-dimensional inductor and capacitor topologies have been chosen and incorporated. A measured inductor Q factor as high as 100 and self-resonant frequency as high as 8 GHz have been demonstrated. The new vertically interdigitated capacitor topology occupies nearly an order of magnitude less of real estate while demonstrating comparable performance to the conventional topology. The low-temperature co-fired ceramic (LTCC) library has been incorporated into a 1.9-GHz CMOS power-amplifier design exhibiting a measured 17-dB gain, 26-dBm output power, and 48% power added efficiency. This power-amplifier module with fully integrated LTCC passives demonstrates a superior performance to those with full and partial on-chip passive integration.

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