Title:
RF Passives on Silicon--The Intended and the Unintended Burghartz, Joachim N.

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Abstract
In typical radio-frequency (RF) front-end circuits, the passive components outnumber the active devices. They occupy a major fraction of the total circuit area, and their low quality factor (Q) limits the circuit performance. Furthermore, these (intended) passive components can easily be perturbed by the interconnects feeding into them and coupled together by the (unintended) magnetic fields around those interconnects, or by (unintended) capacitive currents through the silicon substrate. One therefore needs to cope with both the optimization of the passive components, as far as Q and chip area consumption go, and the minimization of the crosstalk effects. This tutorial illustrates the design principles that lead to optimized integrated passive components on the basis of maximum Q and optimum RF isolation. Taking the well-established hybrid RF systems on printed circuit board (PCB) as a reference, the most commonly used passive components are discussed, and RF isolation techniques at chip and package level are explained.