# Simulated circuit elements and their applications to RF implementations

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Simulated circuits elements attracted the interest of engineers and researchers more than four decades ago. Even from those times the idea of implementing negative resistances and minimizing the chip area occupied by inductors excited the mind of all circuit designers. The result consisted of many unique topologies proposed in literature for simulated inductors. In addition, the continuous development of the silicon technology favored an extensive research of such configurations so that the research in this field is practically completed, all possible topologies with one – three transistors being studied. This is not the same discussion when talking about their applications, ranging from amplifiers (low noise amplifiers) to active filters. In addition, the good frequency behavior favors their use in RF/microwave applications (such as power dividers). This tutorial reviews the most outstanding contributions added in literature on this research direction while emphasizing on design aspects and practical issues.