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Ultra-Low Input Power Conversion Circuits based on Tunnel-FETs

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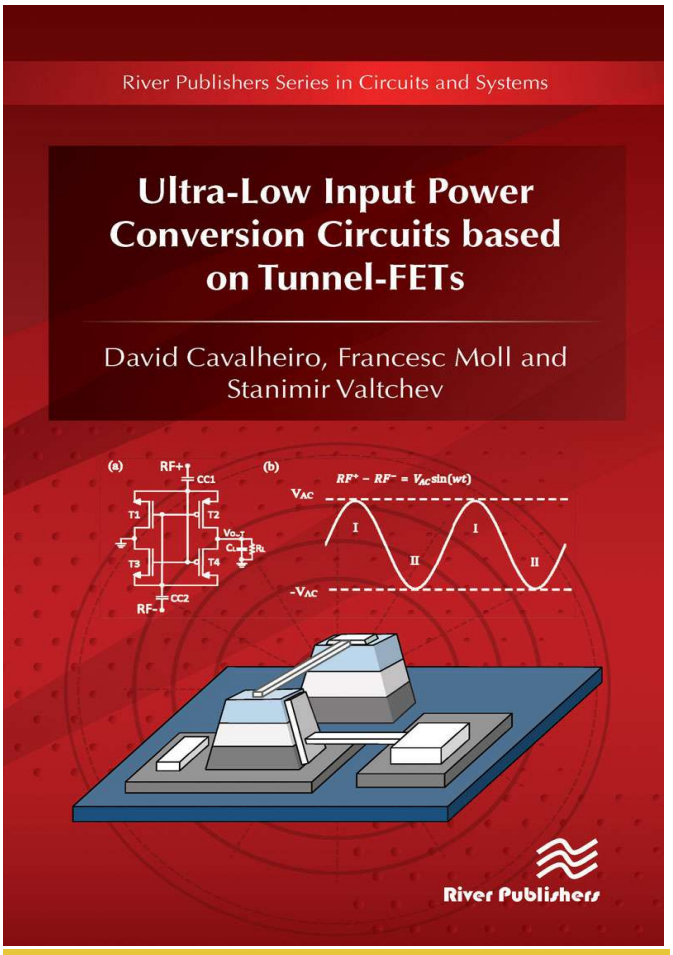
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The increasing demand in electronic portability imposes low power consumption as a key metric to analog and digital circuit design. Tunnel FET (*TFET*) devices have been explored mostly in digital circuits, showing promising results for ultra-low power and energy efficient circuit applications. The *TFET* presents a low inverse sub-threshold slope (*SS*) that allows a low leakage energy consumption, desirable in many digital circuits, especially memories.

In this book, the *TFET* is explored as an alternative technology also for ultra-low power and voltage conversion and management circuits, suitable for weak energy harvesting (*EH*) sources. The *TFET* distinct electrical characteristics under reverse bias conditions require changes in conventional circuit topologies. In this book, ultra-low input power conversion circuits based on *TFETs* are designed and analyzed, evaluating their performance as rectifiers, charge pumps and power management circuits (*PMC*) for *RF* and *DC EH* sources.



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