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Findings from research work entitled

"Realization of immittances using modern active building blocks and their applications"

The purpose of this thesis is designing of modified active building blocks and their use in realization of immittances. The thesis covers the circuit design, synthesis, implementation and application of few active building blocks and immittances realized using it. Verification of results demonstrates the workability of each proposed circuit using SPICE simulations.

Finding 1:

MCDTA is presented as a novel active building block that is usable in the field of analog signal processing. Floating inductance simulator is realized and its functionality has been shown by designing various filter functions. All the proposed filters are electronically tunable and free from matching constraints. Other than MCDTA, only one passive element is used that is a grounded capacitor.

Finding 2:

MCDCC has been introduced as a novel functional active building block and its application is illustrated by its implementation for realizing floating inductor.

Finding 3:

Floating resistor has been realized using CIDITA, an active building block available in literature but not much exploited for the realization of immittances. This circuit enjoys advantageous feature of immittance simulation without using a single passive element.

Absence of passive elements makes this circuit versatile due to reduced chip area and power consumption.

Finding 4:

VDVTA has been used for the realization of RL circuits and employed for designing second order filter in chapter 5. Only one VDVTA and one capacitor are used for the realization of series and parallel RL circuit. VDVTA has been explored first time for the realization of RL series and parallel circuit. Finally to signify the workability of proposed circuit a second order HPF using proposed lossy grounded parallel RL circuit is implemented.

Conclusion

Hence this research mainly focuses on covering various advantages according to the state of art and deriving new immittance functions using novel and modern active building blocks. Different filter functions of high quality have been simulated illustrating the workability of proposed immittances.

All the proposed work has been described theoretically and evaluated using PSPICE simulation results.