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Research Background

Wireless LAN, Bluetooth, etc. IF Receiver

Gm-C filters are needed.

Center frequency & Q-value adjustment is a challenge.

Proposed Digitally-Controllable Filter

Proposed Switched Gm-C Integrator

Conventional approach

Proposed method

Analog adjustment of Gm using low voltage

Digital adjustment of Gm by switch

Difficult for fine CMOS with low voltage

low voltage control

Suitable for advanced VLSI with Low Supply Voltage

Proposed Center Frequency Tuning

Circuit Design

Simulation Results

Proposed Q-Value Tuning

Circuit and Algorithm

Simulation Results

Proposed Center Frequency Tuning

Circuit Design

Simulation Results

Proposed Q-Value Tuning

Circuit and Algorithm

Simulation Results

Circuit Design

Whole Tuning Scheme

Conclusion

Summary

References

* Propose a digitally-controlled Gm-C band-pass filter using switched Gm arrays
  - Advanced VLSI Low voltage
  - Digital tuning schemes
  - Center Frequency Phase property
  - Gain property
  - Q-value
  - Determined by Gm3, Gm4
* Verification with SPICE simulation results