

P69 Digital Auto-Tuning for Center Frequency and Q-Factor of Analog Band-Pass Filter

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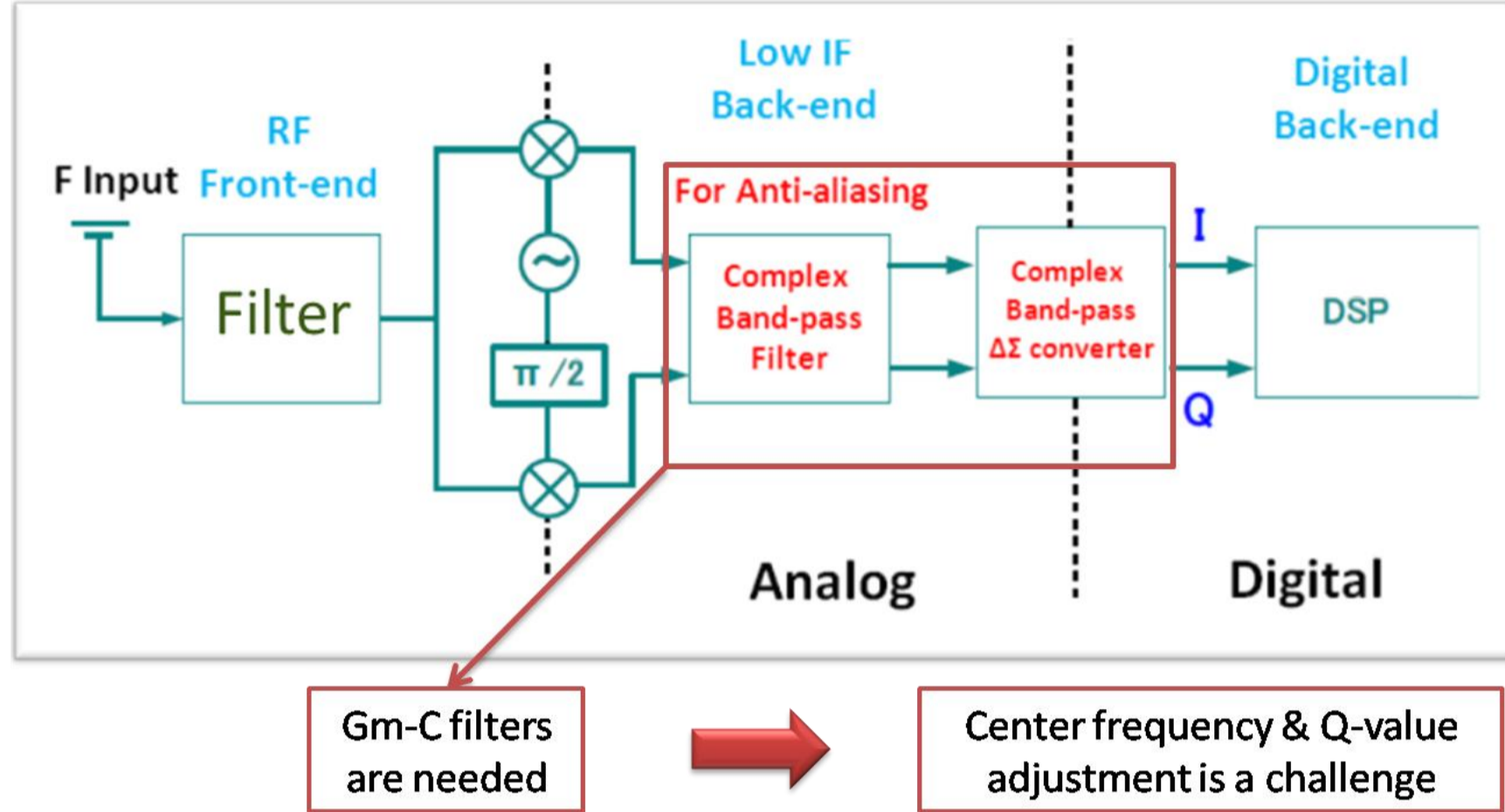
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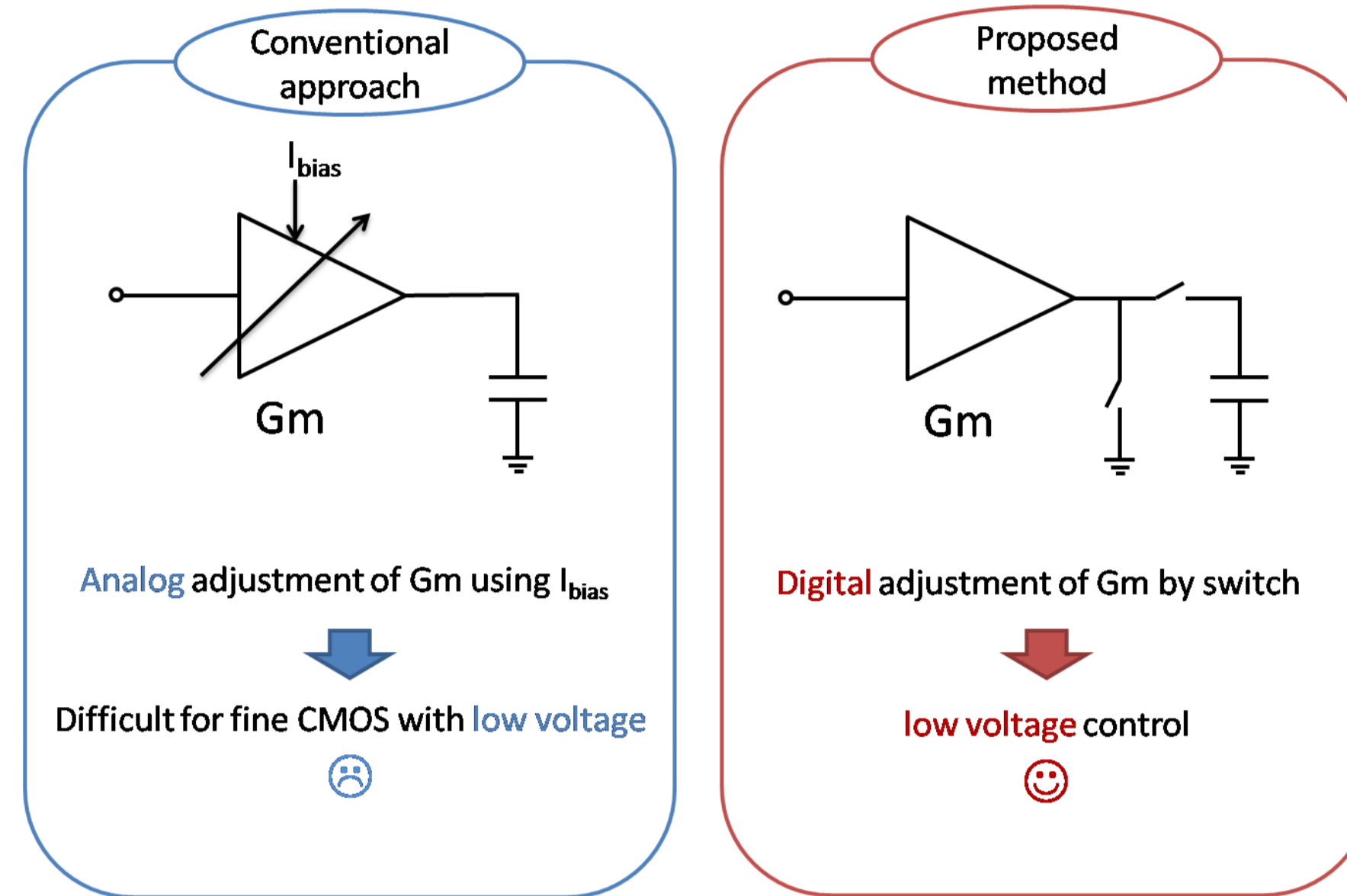
Research Background

Wireless LAN, Bluetooth, etc.
IF Receiver

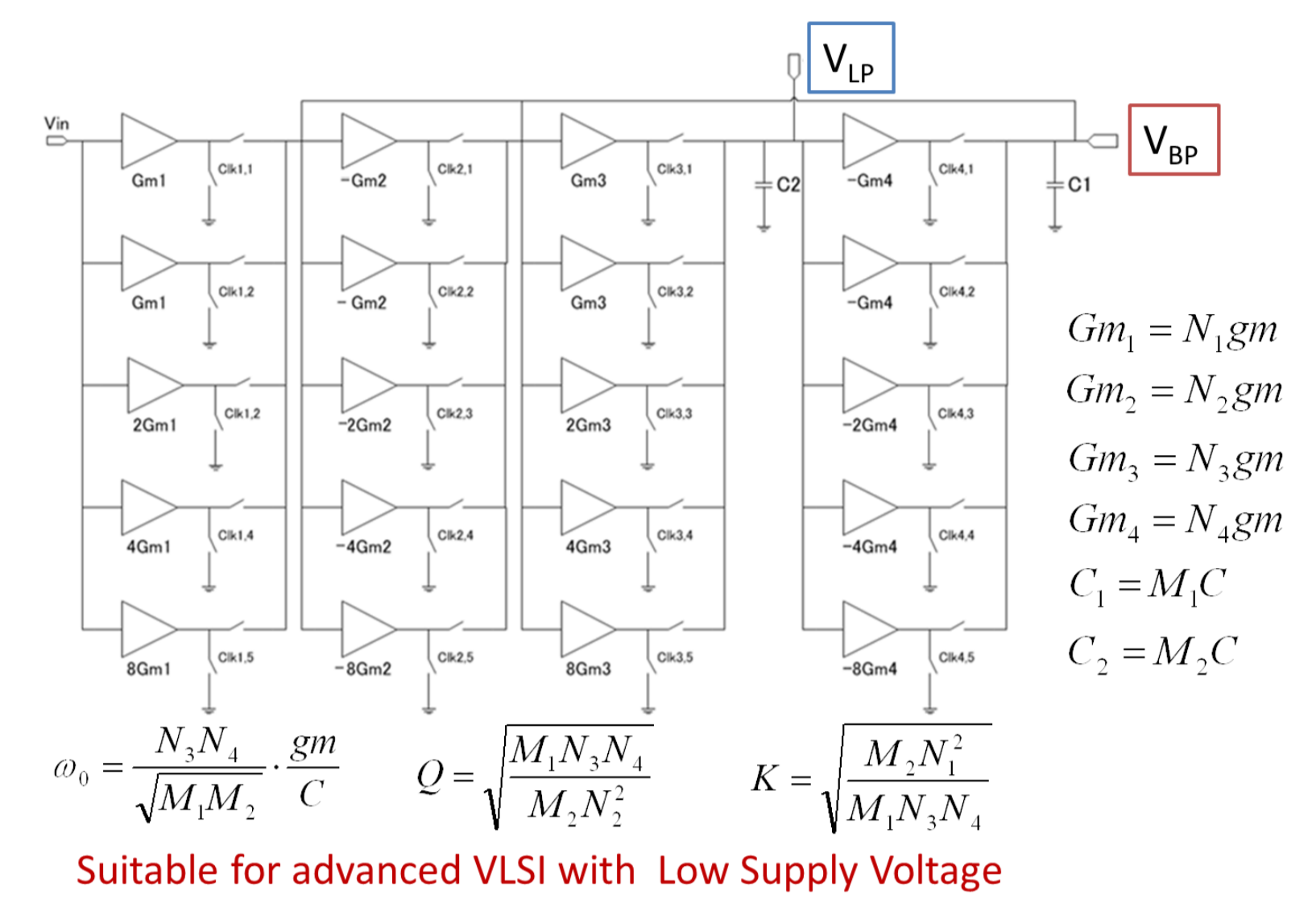


Proposed Digitally-Controllable Filter

Proposed Switched Gm-C Integrator



Digitally-Controllable BPF and LPF



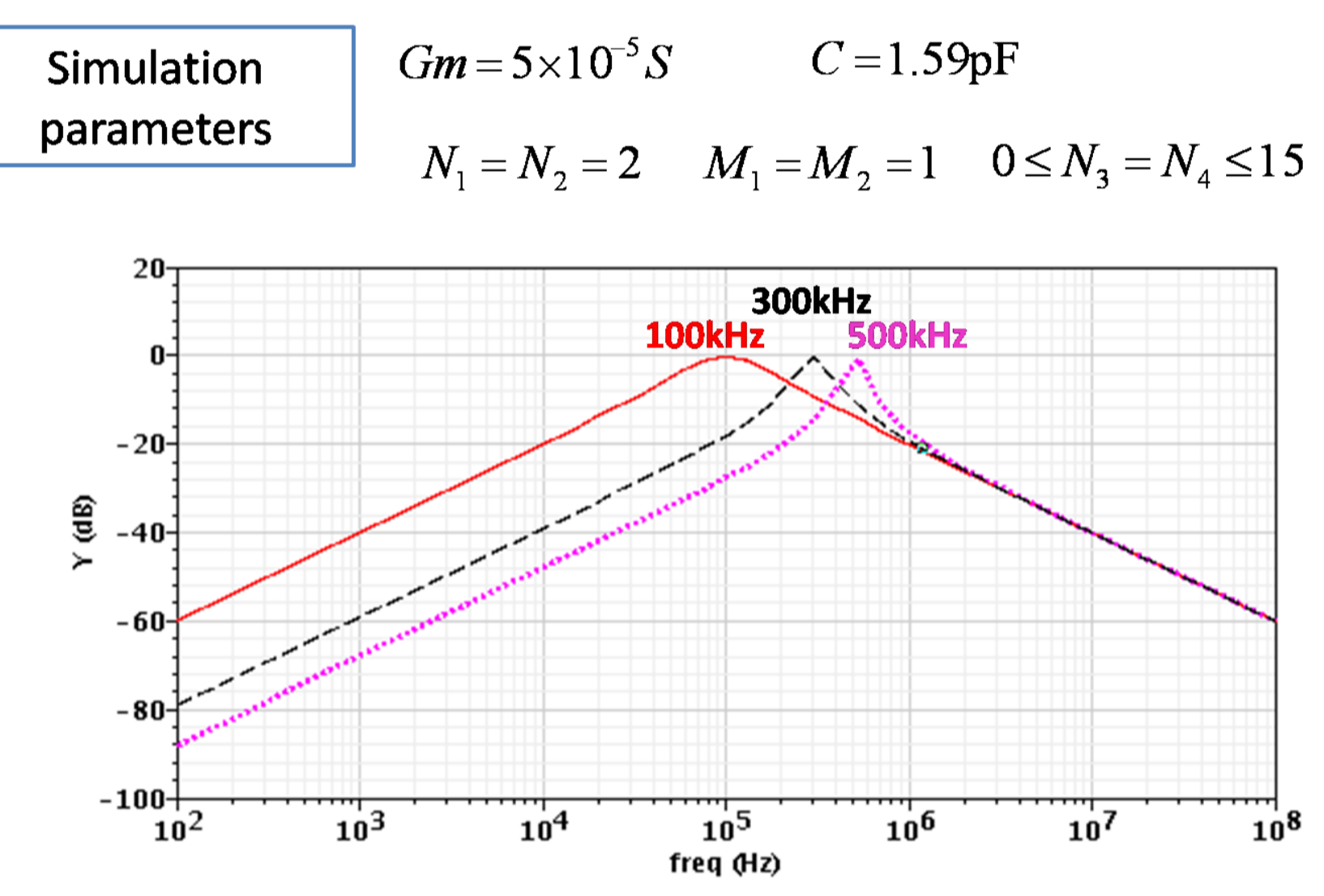
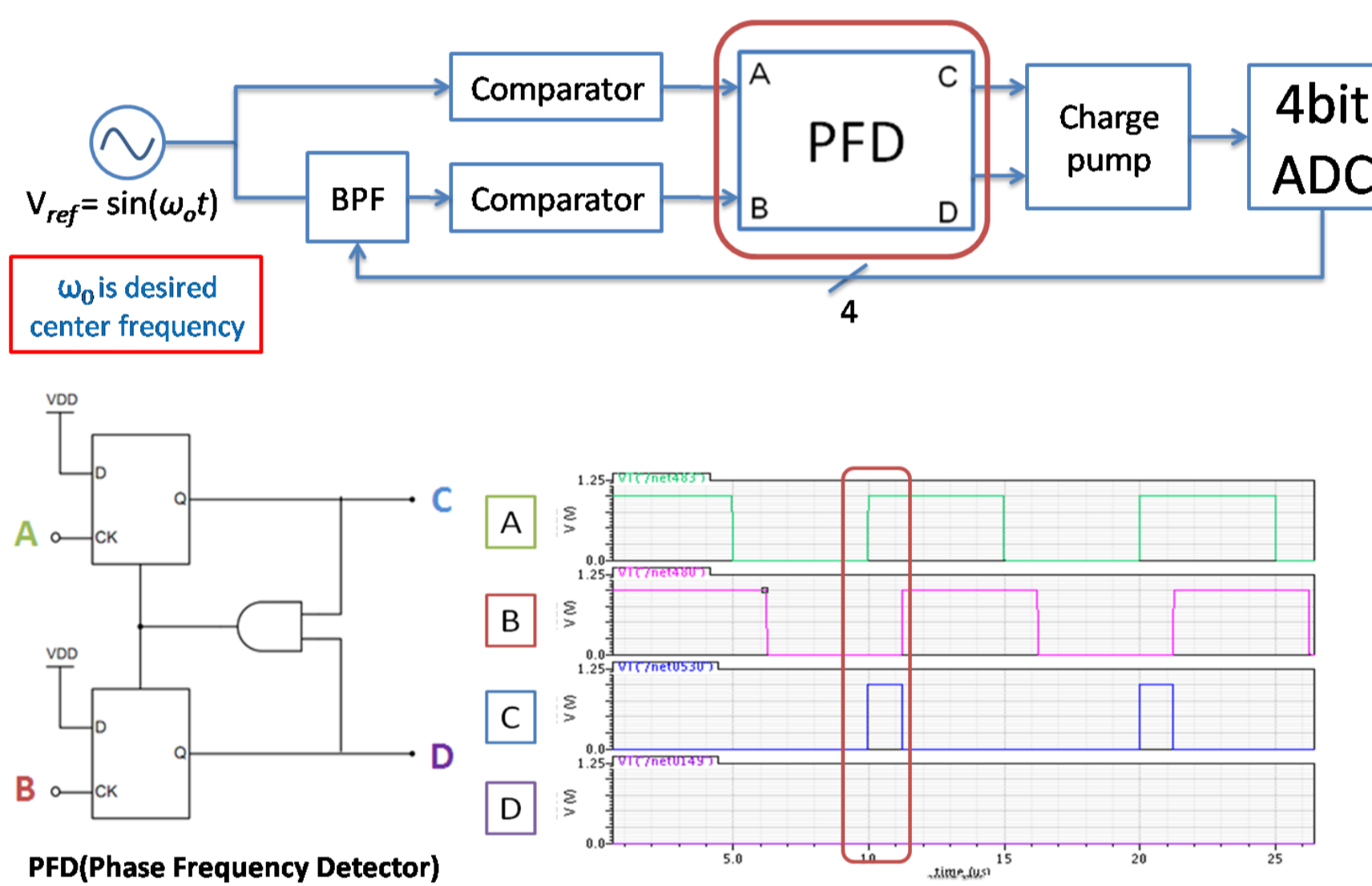
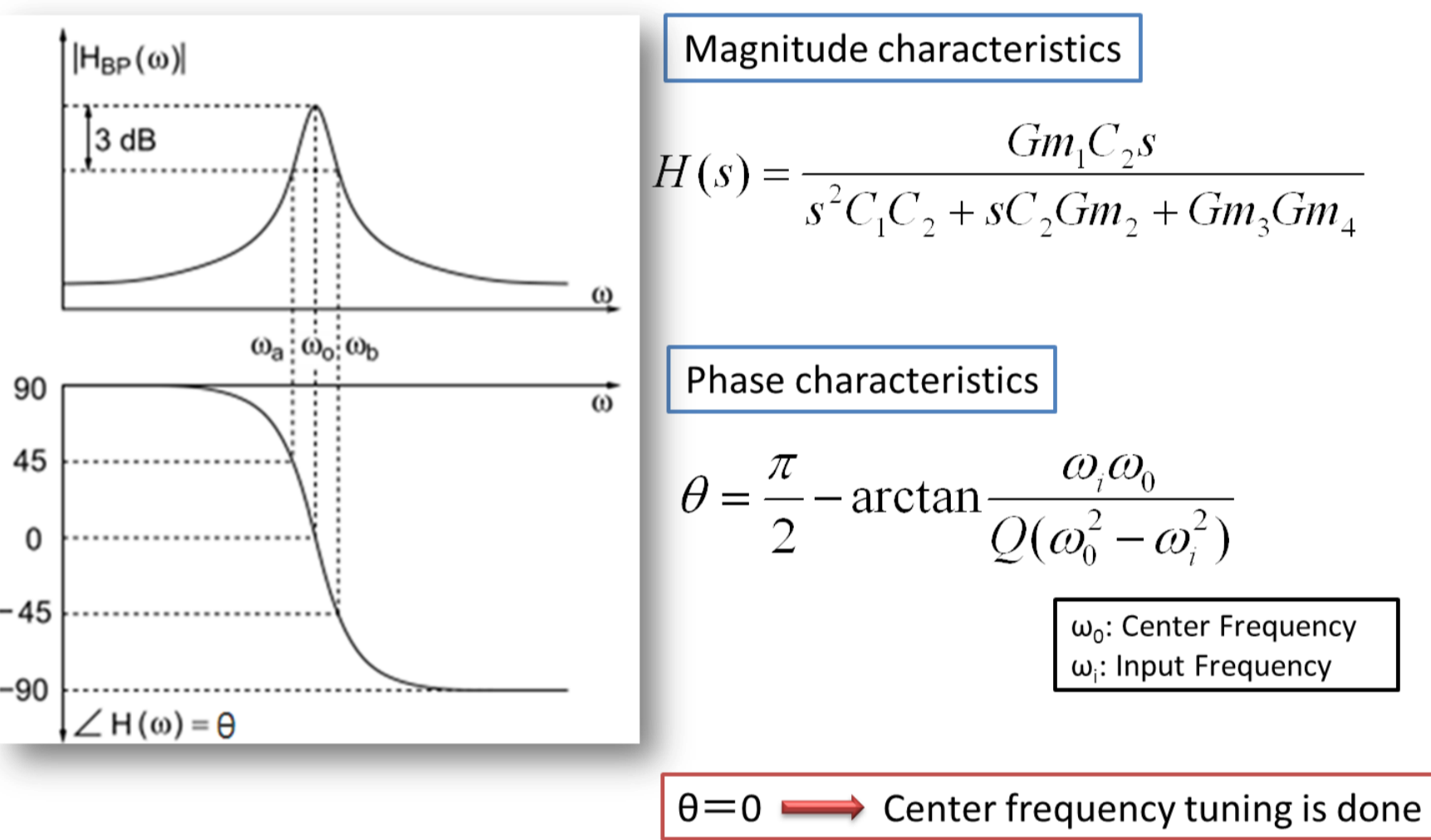
Proposed Center Frequency Tuning

Proposed Center Frequency Tuning

Circuit Design

Simulation Results

Used " $\theta = 0$ at center frequency"



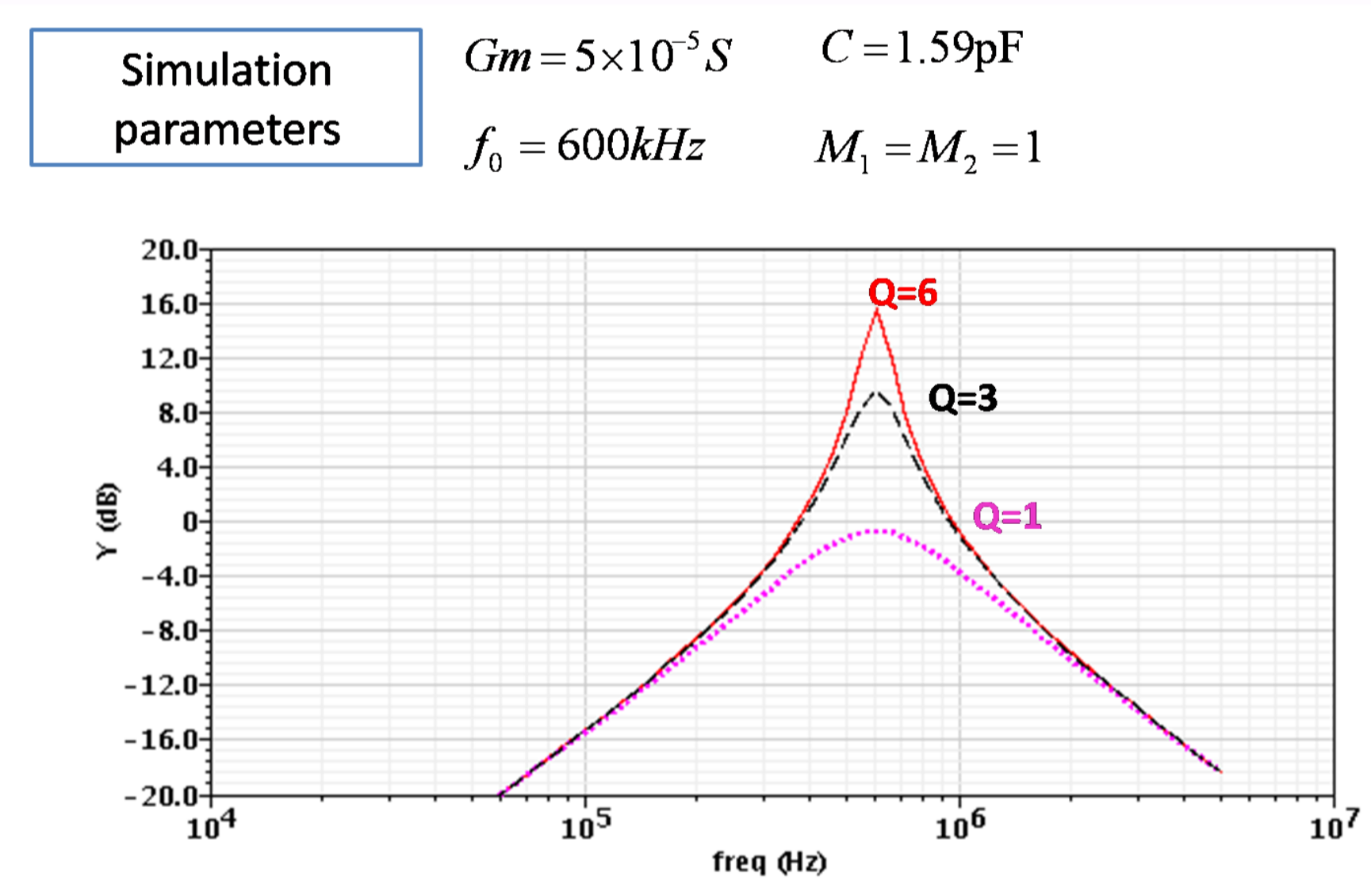
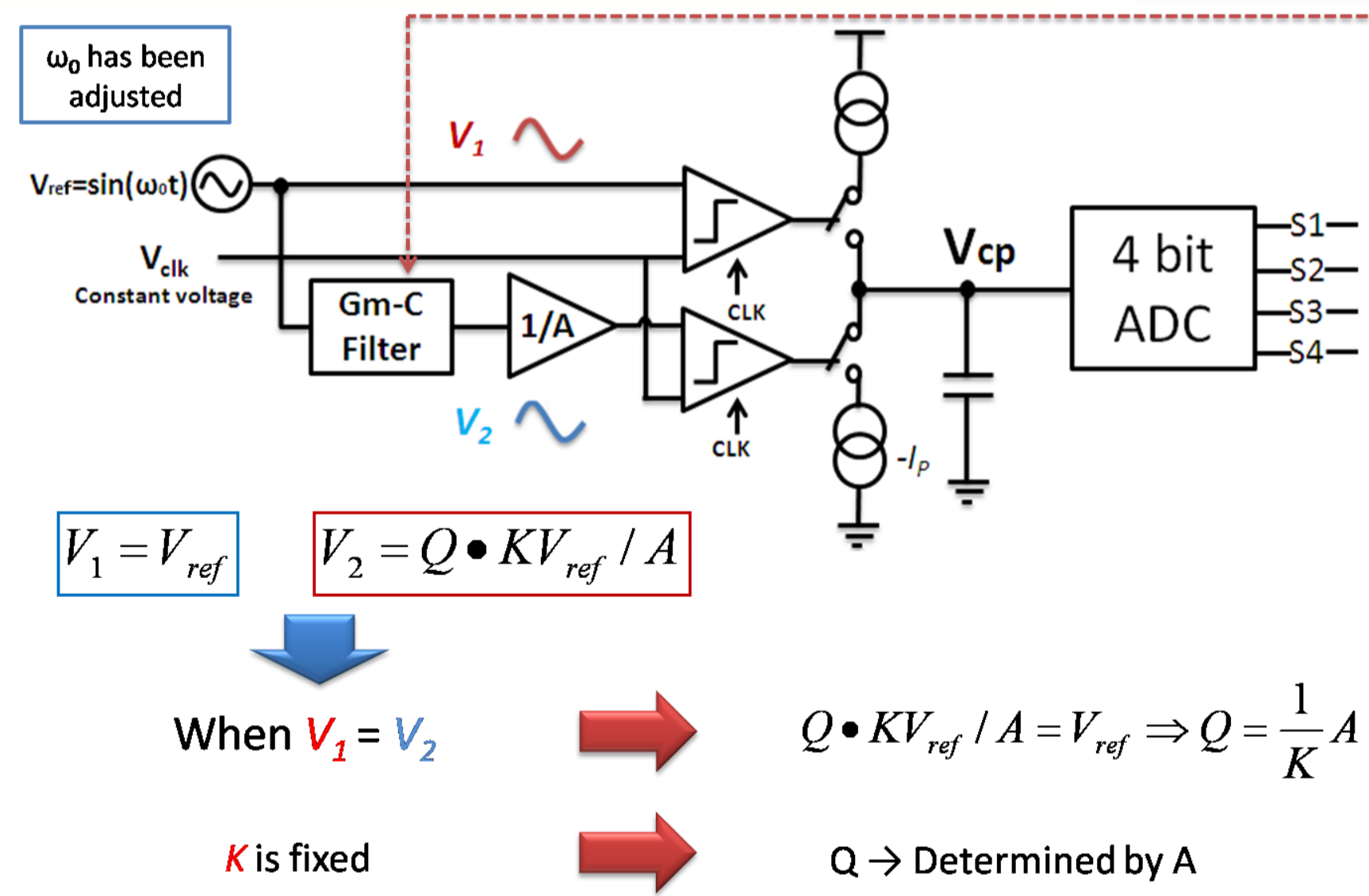
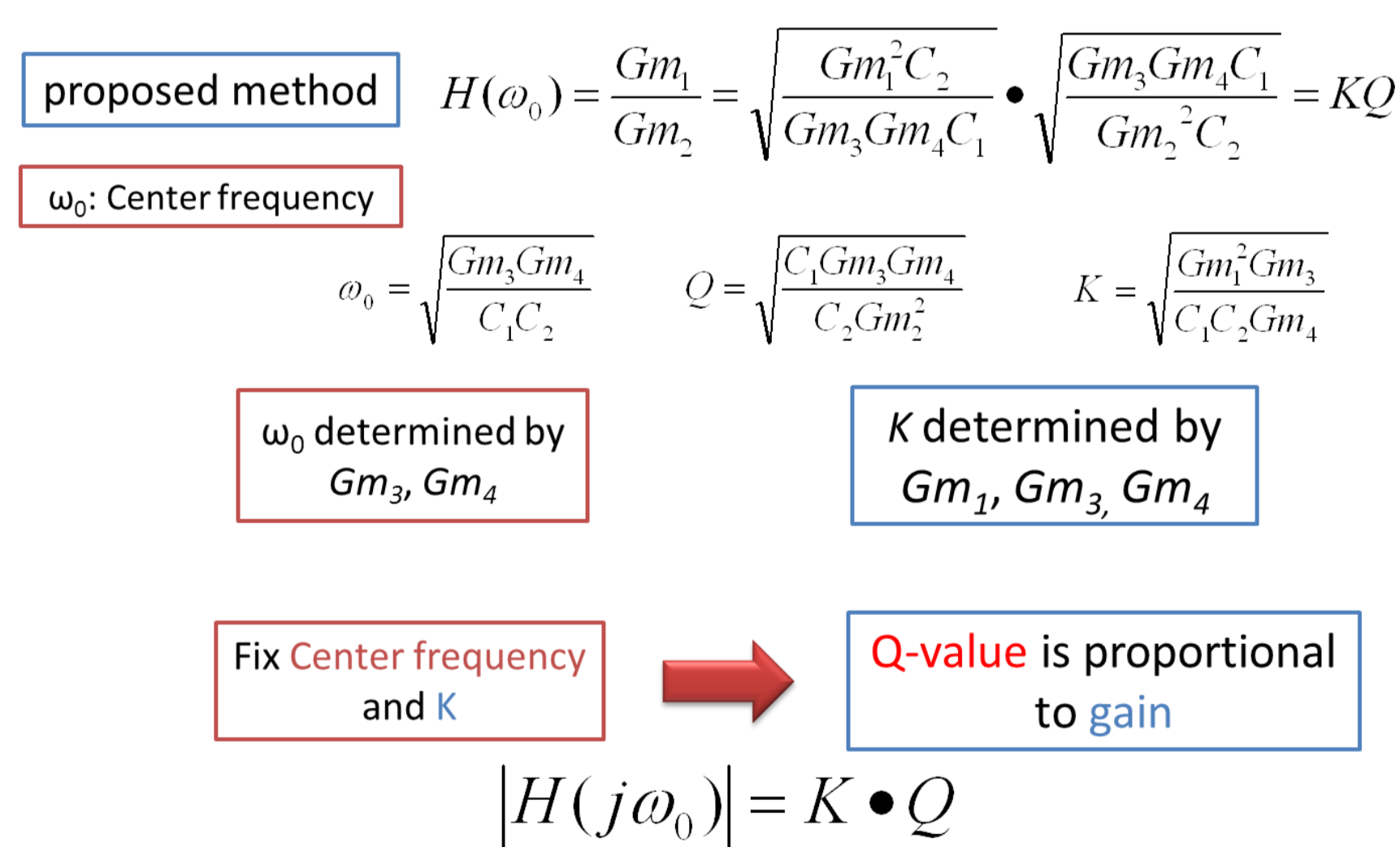
Proposed Q-Value Tuning

Proposed Q-value Tuning

Circuit and Algorithm

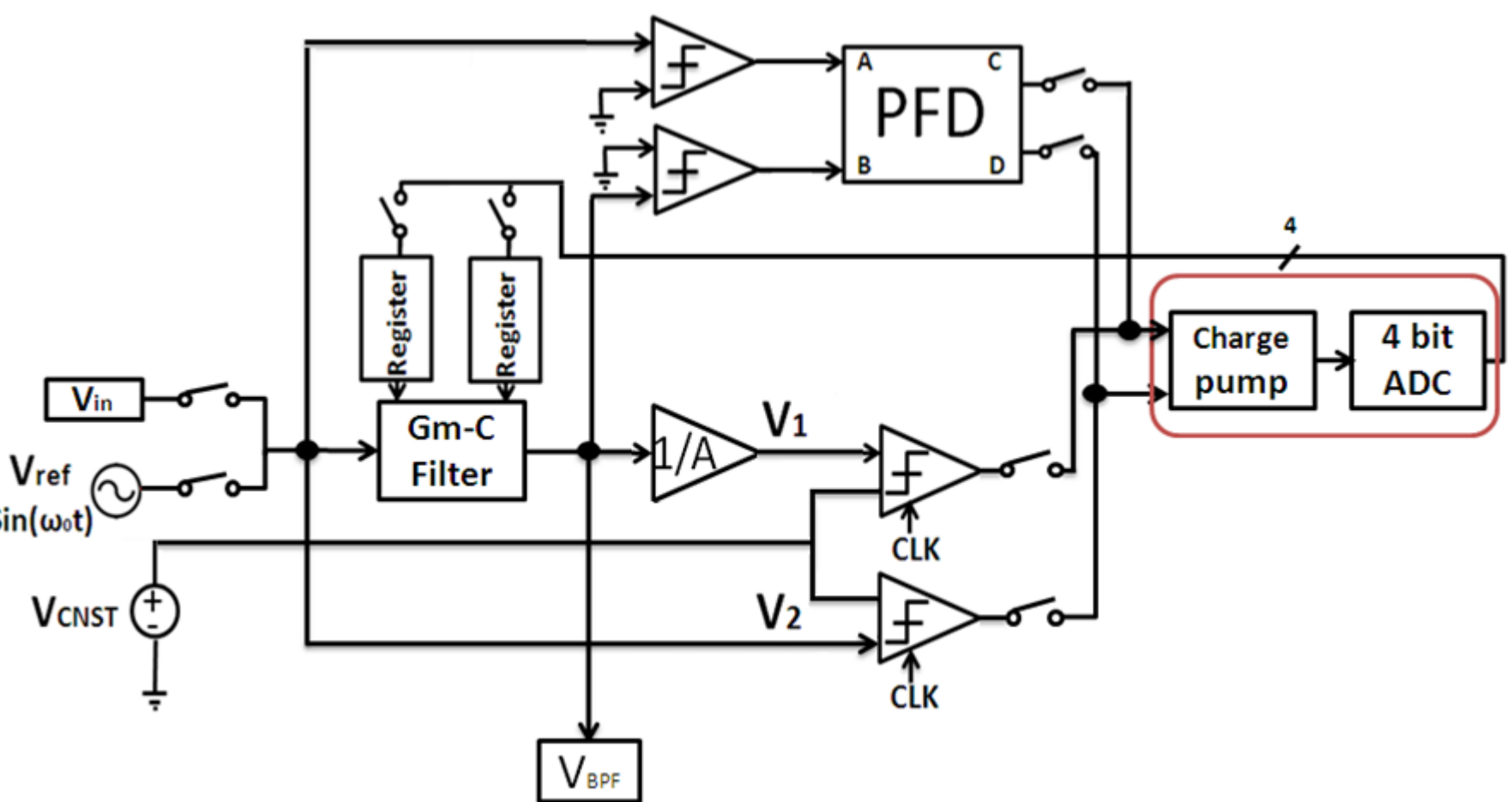
Simulation Result

Used "Gain \propto Q at center frequency"



Circuit Design

Whole Tuning Scheme



Summary

Conclusion

References

- Propose a digitally-controlled Gm-C band-pass filter using switched Gm arrays
 - Advanced VLSI \rightarrow Low voltage
- Digital tuning schemes
 - Center Frequency \rightarrow Phase property
 - Orthogonal
 - Determined by Gm_3, Gm_4
 - Q-value \rightarrow Gain property
 - Determined by Gm_2
- Verification with SPICE simulation results

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