A Multi-Mode Reconfigurable Analog Baseband with I/Q Calibration for GNSS Receivers

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Architecture

- Complex band-pass filter (C-BPF)
- PGA and AGC Loop
- I/Q calibration
Complex band-pass filter

- Reconfigurable C-BPF
  - Low-IF/zero-IF
  - 5th order bandpass/3rd order lowpass filter
  - Power-scalable

![Diagram of complex band-pass filter](image)

Intermediate frequency (bandwidth):
- $3.996(2.2)$
- $7.161(4.2)$
- $10.324(4.2)$
- $13.29(6)$
- $16(10)$
PGA and AGC Loop

- PGA&AGC
  - 5-50dB/ 1dB step
  - auto gain-control
I/Q calibration

- 5-50dB/ 1dB step
- auto gain-control
I/Q calibration

- Improve IRR of Complex-BPF
- auto I/Q calibration

START

input 1-bit ADC ‘MAG’

wait

accumulate

Adjust Gain error

Compare with last cycle

(only in the first cycle)

The same trend?

YES

Adjust in the same direction

NO

Save the control word

Start phase self calibration loop

finish