Method to Obtain Sharp Programmable Filters Using Simple Passive Switched-Resistor Circuits

Tech ID: 24974 / UC Case 2013-518-0

SUMMARY

Researchers at UCLA have designed a method to significantly enhance the selectivity of an analog filter.

BACKGROUND

Electronic filters are analog circuits which perform signal processing functions, specifically to remove unwanted frequency components from the signal, to enhance wanted ones, or both. Active filtering solutions typically employed at baseband stages exhibit high hardware costs to settle the tradeoff between selectivity and reconfigurability. Furthermore, state-of-the-art passive filtering solutions typically employed at radio frequencies can achieve some reconfigurability and good linearity but exhibit very weak selectivity.

INNOVATION

UCLA researchers from the Department of Electrical Engineering have developed a method for producing a low-cost communications receiver that can simultaneously provide reconfigurability and highly selective filtering for both radio frequency (low-pass) and baseband (band-pass) applications. The invention modulates the impulse response of the filter to both program it and enhance its performance.

APPLICATIONS

- Analog to Digital Converters (ADC)
- Analog front ends
- Digital to Analog Converters (DAC)

ADVANTAGES

- Reduced power consumption
- Enhanced linearity
- Sharp filtering
- Programmable

STATE OF DEVELOPMENT

The technique has been analyzed mathematically and verified using computer simulations. The invention is currently at the prototype development stage where an integrated circuit is under design and fabrication.

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	9,450,566	09/20/2016	2013-518

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

- A Digital Polar and a ZVS Contour Based Hybrid Power Amplifier

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OTHER INFORMATION

KEYWORDS

Analog, Signal, Processing, Filter, Resistor, Programmable, Integrated Circuit, Switch, Baseband, Radio Frequency, Aliasing, Receiver, Reconfigure, Programmable, Linearity, ADC, DAC

CATEGORIZED AS

- **Communications**
  - Networking
  - Other
- **Engineering**
  - Other

RELATED CASES

2013-518-0

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