

Reversed Feedback Amplifier Architecture

Tech ID: 34045 / UC Case 2025-424-0

ABSTRACT

Researchers at the University of California, Davis have developed a reversed feedback amplifier design for enhanced mm-wave signal amplification.

FULL DESCRIPTION

The technology pertains to the field of mm-wave signal amplification, particularly through the use of reversed feedback amplifiers and cascaded amplifier structures. It addresses the challenges of amplifying signals in the mm-wave frequency bands, crucial for applications like wireless communications and radar systems. The technology overcomes the limitations of traditional amplifiers by employing a unique topology that includes a MOSFET (metal-oxide-semiconductor field-effect transistor) with specific passive components to achieve maximum gain operation and compensate for passive losses.

APPLICATIONS

- ▶ Wireless communication systems, including 5G and beyond.
- ▶ Data center communication circuits for high-speed data transfer.
- ▶ High-resolution imaging for medical and security applications.
- ▶ Advanced radar systems for automotive and aerospace industries.
- ▶ Any application requiring consistent, high-gain operation in mm-wave frequency bands.

FEATURES/BENEFITS

- ▶ Enhanced gain across mm-wave frequency bands, overcoming the limitations of dissipative losses.
- ▶ Improved bandwidth through stagger tuning and cascading multiple amplifier stages without the need for matching networks.
- ▶ Optimized for high-gain, broadband operation, essential for advanced communication and radar systems.
- ▶ Reduction in chip area and DC power consumption compared to traditional cascading techniques.
- ▶ Capability to overcome passive losses and achieve maximum gain (G_{max}) operation.

PATENT STATUS

Patent Pending

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OTHER INFORMATION

KEYWORDS

amplifier, bandwidth, cascaded stages, CMOS, feedback amplifier, mm-wave, MOSFET, passive losses, signal amplification, stagger tuning

CATEGORIZED AS

- ▶ **Communications**
 - ▶ Wireless
- ▶ **Engineering**
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 - ▶ Design and Fabrication

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