

# 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

## CONTACT

Andrew M. Van Court  
[amvancourt@ucdavis.edu](mailto:amvancourt@ucdavis.edu)  
 tel: .



## INVENTORS

- ▶ Alizadeh, Amirreza
- ▶ Hassanzadehyamchi, Saleh
- ▶ Momeni, Omeed
- ▶ Niknejad, Ali

## OTHER INFORMATION

### KEYWORDS

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

### CATEGORIZED AS

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

## RELATED CASES

2025-424-0

## ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

- ▶ [Ultra-High Range Resolution Doppler Radar Front End With Quadrature-Less Coherent Demodulation](#)
- ▶ [Field Effect Bipolar Transistor](#)
- ▶ [Low Energy and Noise Sub-Sampling Phase-Locked Loop](#)
- ▶ [High-Frequency Imaging and Data Transmission Using a Re-configurable Array Source with Directive Beam Steering](#)
- ▶ [Hybrid Electromechanical Metamaterials for Optical and Electrical Devices](#)
- ▶ [Phased-Locked Loop Coupled Array for Phased Array Applications](#)
- ▶ [Scalable Phased Array Standing Wave Architecture](#)
- ▶ [Embedded Power Amplifier](#)
- ▶ [Reducing Electrical Current Variations in Phase-Locked Loop Systems](#)

**University of California, Davis**

**Technology Transfer Office**

1 Shields Avenue, Mrak Hall 4th Floor,

Davis, CA 95616

Tel:

530.754.8649

[techtransfer@ucdavis.edu](mailto:techtransfer@ucdavis.edu)

<https://research.ucdavis.edu/technology-transfer/>

Fax:

530.754.7620

© 2025, The Regents of the University of California

[Terms of use](#)

[Privacy Notice](#)