

# Embedded Power Amplifier

Tech ID: 32100 / UC Case 2020-041-0

## ABSTRACT

Researchers at the University of California, Davis have developed an amplifier technology that boosts power output in order to improve data transmission speeds for high-frequency communications.

## FULL DESCRIPTION

CMOS-based technologies are widespread, providing a low-cost solution for many applications. However, several factors limit the effectiveness of these technologies in some high power or high frequency applications. Thus, an amplifier that can increase power output without reducing desired increases in gain would provide significant benefits when compared to existing communication technologies.

Researchers at the University of California, Davis have developed an amplifier that offers multiple techniques for boosting power and gain simultaneously. This combination of attributes also allows the amplifier to avoid common issues associated with impedance matching. These attributes are achieved in part by feeding a small fraction of the output power back to the input port using an embedded network. This technology also applies gain-boosting to reduce power stress and improves receiver signal-to noise ratios. The amplifier enables communications at very high frequencies, thus also offering opportunities for much higher data-rate transmissions than current networks can provide. This technology offers significant improvements for applications ranging from radar to imaging.

## APPLICATIONS

- ▶ All types of communications desiring/requiring higher signal-to-noise ratios
- ▶ Security imaging and sensing and radar for autonomous vehicles or military applications
- ▶ Systems that would benefit from operating at higher frequencies and data rate transmission speeds than current technologies can offer

## FEATURES/BENEFITS

- ▶ Boosts power output of amplifiers while simultaneously increasing gain
- ▶ Reduces power stress on processing blocks in transmitter chain
- ▶ Improves signal-to-noise ratio at receiver

## PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Published Application	<a href="#">20220014158</a>	01/13/2022	2020-041

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## INVENTORS

- ▶ Bameri, Hadi
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## OTHER INFORMATION

### KEYWORDS

Power amplifier, Gain boosting, Transmitter, Output power, Imaging, Sensing, Radar

### CATEGORIZED AS

- ▶ **Communications**
  - ▶ Other
  - ▶ Wireless
- ▶ **Computer**
  - ▶ Hardware
  - ▶ Other
- ▶ **Imaging**
  - ▶ Other
  - ▶ Security
- ▶ **Security and Defense**
  - ▶ Other
  - ▶ Screening/Imaging

▶ **Sensors &**

**Instrumentation**

▶ Other

▶ Physical

Measurement

▶ Position sensors

▶ **Transportation**

▶ Automotive

▶ Other

▶ **Engineering**

▶ Other

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