

Semiconductor | Technology Offer

HiVP-CMOS (High Voltage-High Power-CMOS) Power Amplifier in CMOS

State of Current Technology and Market Situation

It is currently not possible to build power amplifiers using the low-cost MOS technology because of the low breakthrough voltage. Most often, the substantially more expensive GaAs technology is being used. Furthermore, the integration of GaAs and CMOS technologies increases cost and also requires additional chip area.

Making use of a cascading design, it is possible to distribute the voltage across several transistors. However, it is difficult to ensure an even distribution across all transistors. As a consequence, the HF voltage across the gate and drain of some transistors frequently exceeds the allowable breakthrough voltage.

Ensure Technology Leadership by adopting this Innovative Breakthrough

Researchers at the University of Stuttgart, developed a novel arrangement, namely cascading with "resistive diode boosting". This arrangement makes it possible to increase the output voltage of MOS power amplifiers.

This novel approach consists of a high frequency power amplifier having several parallel branches as well as serially connected semiconductor switches, with a controlling pathway, limiting the drain-gate voltage of each individual semi-conductor switch.

Patent Situation

Patent applications in Germany and in Europe
EP 1 815 593 A1

US-Patent 7,551,036

Innovation

The invention limits the break down voltage by means of a limiting path between gate and drain. This path has an exactly defined resistance and it can be switched on or off. Additionally, it is possible to adopt a parallel configuration for high current applications.

Your Advantages at a Glance:

- Use of low cost CMOS technology in power amplifiers
- Monolithic integration of power amplifiers in CMOS
- Also suitable for use in HF applications
- MOS amplifier makes the monolithic integration of digital circuits possible by using the same technology
- This leads to optimal efficiency of the MOS amplifier, particularly when using adaptive control involving the switching on and off of parallel gate fingers of multi-finger transistors
- It overcomes the need of integrating different semiconductor technologies
- Reduction in the number of transistors, leading to reduced surface requirements
- No more damage to semiconductor switches of the entire power amplifier, due to excessive drain-gate voltages.

Technology Transfer

The Technologie-Lizenz-Büro GmbH has been charged with the commercialisation and now offers companies the opportunity of obtaining a licence to exploit this new and promising technology.

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