



High-Speed Digital-to-Analog Converter

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WARF: P06325US

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The Wisconsin Alumni Research Foundation (WARF) is seeking commercial partners interested in developing a digital-to-analog converter whose architecture is based on microwave circuit principles.

Overview

Digital-to-analog converters (DACs) convert digital data, encoded as bits, into analog signals, such as current or voltage. For example, in devices like MP3 players and CDs, DACs convert audio signals stored in digital form into analog signals that can be heard through speakers.

Conventionally, DACs have been based on digital circuits that typically include switches made from metal-oxide semiconductor field-effect transistors or bipolar junction transistors. The intrinsic operating characteristics of these switches are what limits the speed of conventional DACs.

The Invention

A pair of UW-Madison researchers has now created a digital-to-analog converter whose architecture is based on microwave circuit principles, rather than traditional digital circuits. The new architecture enables much faster operation: The researchers predict their design can attain processing speeds of 60 Giga-samples per second (Gs/s), while the fastest commercial DAC today operates at approximately 1.5 Gs/s. In addition, the device does not require an amplifier to achieve faster speeds, as do conventional converters.

Applications

- Direct digital synthesis
- Software-defined radio broadcasts
- Streaming media
- RADAR
- Circuit testing
- Arbitrary wave form generators

Key Benefits

- Provides a digital-to-analog converter (DAC) that can potentially operate up to 40 times faster than conventional DACs
- Manufacture is easy and cost-effective
- Design is scalable to different numbers of bits and different frequencies

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For More Information About the Inventors

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- [Daniel van der Weide](#)

Tech Fields

- [Engineering : Power electronics & control systems](#)

For current licensing status, please contact Emily Bauer at emily@warf.org or 608-960-9842

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