



Microscale High-Frequency Vacuum Electrical Device

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The Wisconsin Alumni Research Foundation (WARF) is seeking commercial partners interested in developing a mechanically tunable, microscale vacuum electrical device with a high frequency range for wireless communications.

Overview

Only a limited number of communication frequencies are available for wireless communications. As wireless devices become more widespread, those frequencies are being used up. Additional, higher frequencies will be needed to support this increased use in the near future.

But to take advantage of the high frequencies, technologies that enable communications in this range must be developed. The use of microscale vacuum electrical devices, which allow the generation and control of extremely high frequency signals, offer one option, but their small size makes them difficult to tune and may lead to undesirable electrical interactions.

The Invention

A UW-Madison researcher has developed a mechanically tunable, microscale vacuum electrical device with a high frequency range. This device uses mechanical modulation to tune the electron beam, making it better suited for microscale fabrication by eliminating complicated tuning components and avoiding interference with the emitted electrons. In addition, using mechanical, rather than voltage, modulation may enable the device to use less power at around 50 to 100V.

Applications

- Wireless communications

Key Benefits

- Mechanical modulation offers the possibility of simplified device tuning.
- Providing an electrically isolated modulation path reduces electrical interactions among device signals and simplifies circuit design.
- Allows conventional electrical control and feedback of the vacuum electrical device
- May include a simple, solid-state actuator compatible with microscale devices and capable of operating at high frequencies

Tech Fields

- [Information Technology : Networking & telecommunications](#)

For current licensing status, please contact Jennifer Gottwald at jennifer@warf.org or 608-960-9854.
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