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DIGITALLY TUNABLE COMPONENTS FOR 5G & M-MIMO

HARDWARE, CIRCUITS, & SENSORS

Technology suite for flexible efficient design and performance improvements for 5G hardware. Perfect for Massive MIMO antenna arrays.

TECHNOLOGY TYPE

Communications & Networks

STAGE OF DEVELOPMENT

Full prototype validation in a laboratory setting.

LEARN MORE

Reference Numbers: U-6603,
U-6627, U-6631

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TECHNOLOGY SUMMARY

5G telecommunications are anticipated to reach the market in 2020. As 5G emerges, so too are technologies to facilitate its implementation. Yet, the majority of technologies available increase chip area requirements and have high power consumption.

University of Utah researchers have developed a delta-sigma modulated switched capacitor transmitter, frequency tunable digital power amplifiers, and a multiphase beam steering transmitter ideal for 5G applications. This tunable modular approach allows flexible hardware configuration, such as placing components at the antenna, improving overall efficiencies.

FEATURES AND BENEFITS

Delta-sigma modulated switched capacitor transmitter:

- Hybrid-SCPA allows higher bandwidth and resolution compared to traditional Nyquist-DAC architectures.
- Enables smaller array size without resolution tradeoffs.

Frequency tunable digital power amplifier:

- Enables peak performance at digitally programmable frequencies.
- Achieves high performance with a single output network.

Multiphase beam steering transmitter:

- Beamforming synthesized from direct digital input.
- Does not require lossy phase shifters to achieve output beamsteering.
- Small overall size, high efficiency.

RECENT PUBLICATIONS

Xu, Q., Gupta, S., Azam, A., Bai, Z., & Walling, J. S. (2018). A Hybrid $\Delta\Sigma$ /Nyquist Rate Switched Capacitor Power Amplifier in 65nm CMOS. *2018 IEEE 61st International Midwest Symposium on Circuits and Systems (MWSCAS)*. doi: [10.1109/mwscas.2018.8623974](https://doi.org/10.1109/mwscas.2018.8623974)

INVENTOR PROFILE

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