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Band-Reconfigurable and Power-Adaptive Cellular Handset Power Amplifier

A new high-efficiency, tunable class-E power amplifier offers broadband performance, reducing system complexity, size, and cost while extending battery life in mobile and wireless communication systems.

The rise in popularity of mobile devices has simultaneously created a greater demand for high-efficiency wireless systems to connect these devices to the world. Reducing the power needed by these systems and simplifying their design increases the battery life and allows for smaller mobile devices. The most significant part of power consumption in wireless communication systems is the power amplifier used to boost the signals, making it a key area to improve.

Researchers at Purdue University have designed a new class-E power amplifier that combines high-efficiency and tenability to improve its performance in mobile devices. The uniqueness of this design is its tunable output circuit that allows it to provide various loads over 10 dB of power range within a 1 to 2 GHz frequency range. This broadband performance allows one of these amplifiers to replace the multiple amplifiers typically found in a mobile device. In addition to reducing system's complexity, cost, and size, this technology can also improve battery life because it can be reconfigured to operate efficiently at different power levels. At the high power of 2W, an efficiency of 60 to 70 percent is achieved over the entire octave bandwidth, making it ideal for next-generation wireless communication systems.

Advantages:

-High efficiency

-Continuously tunable over an octave of bandwidth

Potential Applications:

-Cell phones

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Category
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