Abstracts

Efficient transmission-power-control scheme for Ku-band high-power amplifiers in portable user earth terminals

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A novel power-amplifier scheme is presented in this paper that realizes highly efficient transmission power control (TPC). The output power is controlled without sacrificing high power-added efficiency by combining multiple amplifiers with different power levels. Unique switching and impedance matching techniques make it possible to eliminate RF switching circuits and their associated power losses. This direct coupled architecture is called the "switchless amplifier-switching scheme." The requirements for realizing the novel power amplifiers used in this scheme are estimated, and Ku-band amplifier monolithic microwave integrated circuits (MMICs) that follow this scheme are fabricated. The capabilities of the scheme are confirmed by testing these MMICs. Finally, a novel power amplifier incorporating the developed MMICs is constructed to demonstrate its performance. Experimental results show that the amplifier can achieve a significant reduction in DC power at low output power levels under TPC.

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