

A 2.4 GHz 0.18- μm CMOS class E single-ended power amplifier without spiral inductors

Abstract

This paper describes the design of a 2.4-GHz CMOS Class E single-ended power amplifier (PA) for wireless applications in TSMC 0.18- μm CMOS technology. The Class E PA proposed in this paper realizes all inductors with bondwires for the higher quality factor to increase PA performance and to reduce chip size. The single-ended topology is employed because most existing components designed to be driven by PAs are single-ended. The cascode topology with a self-biasing technique is used to prevent device stress and to decrease the requirement for additional bond pads. The measurement results indicate that the PA delivers 19.2 dBm output power and 27.8% power added efficiency with 3.3-V power supply into a 50 Ω load. The chip area is 0.37 mm².

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Bondwires; Class E; Output power; Power added efficiency; Power amplifier; Self biasing

Index Keywords

Bond pad; Cascode topology; Chip areas; Chip sizes; Class E; CMOS technology; Measurement results; Output power; Power supply; Power-added efficiency; Quality factors; Self biasing; Self-biasing technique; Single-ended; Spiral inductor; Wireless application

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