

ABSTRACT

Ultra Low Power IEEE 802.15.4/ZIGBEE Compliant Transceiver

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Low power wireless communications is the most demanding request among all wireless users. A battery life that can survive for years without being replaced, makes it realistic to implement many applications where the battery is unreachable (e.g. concrete walls) or expensive to change (e.g. underground applications). IEEE 802.15.4/ZIGBEE standard is published to cover low power low cost applications, where the battery life can last for years, because of the 1% duty cycle of operation. A fully integrated 2.4GHz IEEE802.15.4 Compliant transceiver suitable for low power, low cost ZIGBEE applications is implemented. Direct conversion architecture is used in both Receiver and Transmitter, to achieve the minimum possible power and area. The chip is fabricated in a standard 0.18um CMOS technology. In the transmit mode, the transmitter chain (Modulator to PA) consumes 25mW, while in the receive mode, the iv receiver chain (LNA to Demodulator) consumes 5mW. The Integer-N Frequency Synthesizer consumes 8.5mW. Other Low power circuits are reported; A 13.56 Passive RFID tag and a low power ADC suitable for Built-In-Testing applications.