Abstract

Wireless Body Area Network (WBAN) enables an efficient way to continuously monitor the human body’s heart rate, blood pressure, body temperature, glucose and even brain activities through implanted/body-worn devices. Because of the infeasibility/inconvenience to replace the implanted device’s batteries, ultra-low power consumption radios are essentially needed. This research work focusses on exploiting new transceiver architectures for significantly reducing the overall power consumption of wireless radios. First, the Federal Communications Commission (FCC)'s regulation for Medical Implant Communication Service (MICS) and existing integrated circuit technologies are reviewed. Second, the improved receiver and transmitter circuit architectures are proposed to achieve fully-integrated wireless radios with less than 100uW power consumption. Based on these considerations, several energy-efficient wireless transceivers were designed and their operation demonstrated.