

An Efficient Digital Baseband ASIC for Wireless Biomedical Signals Monitoring

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Abstract : A digital baseband Application-Specific Integrated Circuit (ASIC) is developed for a microchip transponder to transmit signals and temperature levels from biomedical monitoring devices. The transmission protocol is adapted from the ISO/IEC 11784/85 standard. The module has a decimation filter that employs only a single adder-subtractor in its datapath. The filtered output is coded with cyclic redundancy check and transmitted through backscattering Load Shift Keying (LSK) modulation to a reader. Fabricated using the 0.18- μm CMOS technology, the module occupies 0.116 mm² in chip area (digital baseband: 0.060 mm², decimation filter: 0.056 mm²), and consumes a total of less than 0.9 μW of power (digital baseband: 0.75 μW , decimation filter: 0.14 μW).

Keywords : biomedical sensor, decimation filter, radio frequency integrated circuit (RFIC) baseband, temperature sensor

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