

Abstract

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Maximum Allowable Data Throughput and Error Performance of On-Body Medical Body Area Networks (MBANs)

Medical Body Area Network (MBAN) is a narrowband body area network (NB-BAN), with 2360 – 2400 MHz allocated band. This paper studies the bit-error-rate (BER) performance and maximum allowable data throughput in the on-body scenario of the 2360 – 2390 MHz band, allocated for indoor applications, for different node positions and different activities including standing, walking and running. Numerical results show that the achieved bit energy to noise energy ratio ranges from 11 – 38.5 dB for the wrist to chest on-body link (first scenario) depending on the activity, and from 12.2 – 16.9 dB for the back to chest link (second scenario). The achieved data throughput is 0.097- 218.29 Mbps for the first scenario, and 44.57- 165.59 Mbps for the second scenario, also assuming different activities. The back to chest link achieves a better BER performance and data throughput as compared to the wrist to chest link in the walking and running activities due to the high movement of the transmit node in the latter case, which results in a highly dense environment.