

Performance Analysis of Different PSK Scheme on Receiver Sensitivity and Round Trip Distance for Chipless RFID System for UWB with Rayleigh Fading Channels in Outdoor NLOS Environment

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Abstract : In this paper, an analytic approach is presented to evaluate the Bit Error Rate (BER) and round trip distance for a UWB chipless RFID system using diversity technique at the reader receiver using different modulation technique. The analysis is carried out with multiresonator based chipless RFID tags using frequency range from 3 GHz – 6 GHz and bandwidth of 500 M Hz in outdoor non-line-of-sight (NLOS) environment. SISO configuration is used to communicate from the reader to the tag and SIMO configuration is used do vice versa. Maximal Ratio Combining (MRC) technique is used in the reader. MPSK, DQPSK, DBPSK, BPSK, QPSK and DMPSK modulation techniques are considered with coherent demodulation to evaluate the BER performance. From the numerical analysis of the results, it is found that at a given BER maximum possible round trip distance can be achieved using DMPSK modulation technique. In addition, it has been proved that, while using DMPSK modulation technique, the application of diversity has very little effect on the overall improvement in reader receiver sensitivity and achievable distance. Finally the method not only proves to be a very good way for tag detection in case of a chipless RFID system but also gives a clear insight regarding the interrelationship between BER, read range, reader received power, number of receiving antenna in outdoor NLOS environment.

Keywords : EGC, MRC, BER, read range, diversity

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