

Chipless RFID Capacity Enhancement Using the E-pulse Technique

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Abstract : With the fast increase in radio frequency identification (RFID) applications such as medical recording, library management, etc., the limitation of active tags stems from its need to external batteries as well as passive or active chips. The chipless RFID tag reduces the cost to a large extent but at the expense of utilizing the spectrum. The reduction of the cost of chipless RFID is due to the absence of the chip itself. The identification is done by utilizing the spectrum in such a way that the frequency response of the tags consists of some resonance frequencies that represent the bits. The system capacity is decided by the number of resonators within the pre-specified band. It is important to find a solution to enhance the spectrum utilization when using chipless RFID. Target identification is a process that results in a decision that a specific target is present or not. Several target identification schemes are present, but one of the most successful techniques in radar target identification in the oscillatory region is the extinction pulse technique (E-Pulse). The E-Pulse technique is used to identify targets via its characteristics (natural) modes. By introducing an innovative solution for chipless RFID reader and tag designs, the spectrum utilization goes to the optimum case. In this paper, a novel capacity enhancement scheme based on the E-pulse technique is introduced to improve the performance of the chipless RFID system.

Keywords : chipless RFID, E-pulse, natural modes, resonators

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