

Recent Advances and Open Challenges in RFID Antenna Applications



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Abstract Ultra-high-frequency (UHF) radio frequency identification (RFID) technology has been gaining significance with the progression of wireless communication systems and equipment having a wide variety of applications. This technology has been promoted as a low-cost, low-energy method of operation. A huge number of papers demonstrate the possibility of foreign materials or specific objects being tracked and monitored in food packaging, healthcare, agriculture, and environmental conditions. Maximum work focuses on area coverage, and significant information has been gathered to exhibit possibilities, but some open challenges and limitations have also been manifested in the previous research. Thus, further information is needed for a profound understanding of the RFID antenna method to make them dependable and applicable. From a system point of view, the challenges and state-of-the-art techniques of the UHF RFID antenna are comprehensively summarized and clearly highlighted in terms of sensing and communication. Oncoming aptitudes with recommended challenges to mitigate current limitations of RFID antenna design are also discussed.

Keywords UHF antenna · RFID · Wireless communication systems · Antenna design

1 Introduction

Radio frequency identification (RFID) is a microwave-based technology that is used for recognition using radio frequency electromagnetic waves to transfer data [1, 2]. RFID is a thriving technology throughout the world [3]. This technology is used in the identification and tracking of individual objects, including people, animals, or other

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