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Secure Identification; 4.6 Bending Effect on Tag Performance; 4.7 Conclusion; References; Chapter 5 System Technical Aspects; 5.1 Introduction; 5.2 The mm-Band of 60 GHz  
5.3 Reader Antenna5.4 Conclusions; References; Chapter 6 SAR-Based Signal Processing; 6.1 Introduction; 6.2 SAR Modes of Operation; 6.3 SAR Block Diagram; 6.4 SAR-Based Signal Processing; 6.5 Tag Imaging Results; 6.6 System Downsides; 6.7 Conclusions; References; Chapter 7 Fast Imaging Through MIMO-SAR; 7.1 Introduction; 7.2 Conventional Phased Array Antenna; 7.3 MIMO-SAR Systems; 7.4 Optimization; 7.5 MIMO-SAR Results; 7.6 Conclusion; References; Part II Advanced Tag Detection Techniques for Chipless RFID Systems; Chapter 8 Introduction; 8.1 RFID Systems  
8.2 Review of Chipless RFID Tag Detection Techniques8.3 Maximum Likelihood Detection Techniques; 8.4 Conclusions; References; Chapter 9 Chipless RFID Tag Design; 9.1 Introduction; 9.2 SISO Tag Design; 9.3 MIMO Tag Design; 9.4 Conclusions; References; Chapter 10 ML Detection Techniques for SISO Chipless RFID Tags; 10.1 Introduction; 10.2 System Models-Time Domain; 10.3 System Models-Frequency Domain; 10.4 Simulations; 10.5 Experimental Setup; 10.6 Results; 10.7 Conclusion; References; Chapter 11 Computationally Feasible Tag Detection Techniques; 11.1 Introduction  
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## Sommario/riassunto

Introduces advanced high-capacity data encoding and throughput improvement techniques for fully printable multi-bit Chipless RFID tags and reader systems The book proposes new approaches to chipless RFID tag encoding and tag detection that supersede their predecessors in signal processing, tag design, and reader architectures. The text is divided into two main sections: the first section introduces the fundamentals of electromagnetic (EM) imaging at mm-wave band to enhance the content capacity of Chipless RFID systems. The EM Imaging through Synthetic Aperture Radar (SAR) technique is used for data extraction. The second section presents a few smart tag detection techniques for existing chipless RFID systems. A Multiple-Input and Multiple-Output (MIMO) based tag detection technique improves the spectral efficiency and increases data bit capacity. The book concludes with a discussion of how the MIMO approach can be combined with the image based technique to introduce a complete solution with a fast imaging approach to chipless RFID systems. The book has the following salient features: Discusses new approaches to chipless RFID tags such as EM imaging, high capacity data encoding, and robust tag detection techniques Presents techniques to enhance data content capacity of tags and reliable tag detection for the readers at unlicensed microwave and mm-wave 2.45, 24 and 60 GHz instrumentation, scientific and medical (ISM) frequency bands Includes case studies of real-world applications

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