

1. Record Nr.	UNINA9910825011803321
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Titolo	Special design topics in digital wideband receivers // James Tsui
Pubbl/distr/stampa	Boston, Massachusetts ; , : Artech House, , 2010 [Piscataqay, New Jersey] : , : IEEE Xplore, , [2009]
ISBN	1-60807-031-X
Descrizione fisica	1 online resource (439 p.)
Collana	Artech House radar series
Disciplina	621.38215
Soggetti	Broadband communication systems - Design Computer network architectures Signal processing - Digital techniques Wireless communication systems - Design
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Special Design Topics in Digital Wideband Receivers; Contents; Preface; Chapter 1 Introduction; 1.1 Introduction; 1.2 Purpose of This Book; 1.3 Predicated Requirements on Receiver Performance; 1.4 Overall EW Receiver System Operation; 1.5 Encoder Designs; 1.6 Approaches and References; 1.7 Criterion of the Software Approaches; 1.8 Organization of the Book; References; Chapter 2 Amplification Required in Front of the ADC; 2.1 Introduction; 2.2 Basic Design Criterion; 2.3 Inputs to the Computer Program; 2.3.1 The Inputs Related to the RF Amplifier; 2.3.2 The Inputs Related to the ADC 2.3.3 The Inputs Related to the FFT Operator 2.4 Constants Generation; 2.5 Equations Derived; 2.6 Modification from the Previous Program; 2.7 An Example; 2.8 Nominal Sensitivity and Single Signal Dynamic Range; 2.9 Generate Nominal Values for ADC with Different Numbers of Bits; 2.10 Noise Floor and the Number of Bits; 2.11 Another Example; 2.12 Discussions of Results; References; Chapter 3 Dynamic Range Study Through Eigenvalue and MUSIC Methods; 3.1 Introduction; 3.2 Basic Definitions of Dynamic Range; 3.3 Prerequisite for Dynamic Range Measurements 3.4 Single Signal Receiver Dynamic Range (SDR) 3.5 Dynamic Range for Receiver with Multiple Signal Capability; 3.5.1 Single-Signal Dynamic

Range; 3.5.2 Two-Signal Third-Order Intermodulation Spur Free Dynamic Range; 3.5.3 The Two-Signal Instantaneous Dynamic Range (IDR); 3.6 A Brief Discussion on the Eigenvalue Decomposition and MUSIC Methods; 3.7 Define the Processing Procedure; 3.8 Eigenvalues Generated with Noise and Noise Plus Signals; 3.9 IDR Determination Through Eigenvalues; 3.10 MUSIC Method; 3.11 IDR Determined by Frequency Identification
3.12 Amplification Required in Front of the ADC
3.13 Digitization Effect on Sensitivity as a Function of a Number of Bits; 3.14 Digitization Effect in the Instantaneous Dynamic Range Calculation; 3.15 Curve Fitting for the Instantaneous Dynamic Range; 3.16 IDR Calculated with 128 Data Points and Digitization; 3.17 Generating Very High IDR Using Long Data Length; 3.18 Conclusion; References; Chapter 4 Dynamic Range Study Through Fast Fourier Transform (FFT); 4.1 Introduction; 4.2 Using Simulation Approach to Find the IDR; 4.3 Local Peaks; 4.4 Simulation Procedure; 4.5 Threshold Determination
4.6 Windows and Input Frequencies
4.7 IDR Results; 4.8 IDR with a Rectangular Window; 4.9 IDR with a Rectangular Window and Close Spaced Frequencies; 4.10 IDR with Hamming Window; 4.11 IDR with Blackman Window; 4.12 IDR with a Chebyshev Window; 4.13 IDR with a Park-McClellan Window; 4.14 Data Length and IDR; 4.15 Receiver Design Considerations; 4.16 Conclusion; 4.17 Remarks; References; Chapter 5 In-Phase and Quadrature Phase (IQ) Study; 5.1 Introduction; 5.2 Approach to Find the IQ Imbalance; 5.3 FFT Output Imbalance Measurement Procedure; 5.4 Results from Measuring FFT

Sommario/riassunto

Offering engineers a thorough examination of special, more advanced aspects of digital wideband receiver design, this practical book builds on fundamental resources on the topic, helping professionals gain a more comprehensive understanding of the subject. This in-depth volume presents a detailed look at a complete receiver design, including the encoder. Moreover, it discusses the detection of exotic signals and provides authoritative guidance on designing receivers used in electronic warfare. From frequency modulation and biphase shifting keys, to parameter encoders in electronic warfare receivers and the use of the simulation and probability density function to predict the false alarm parameter, this book focuses on critical topics and techniques that help engineers design digital wideband receivers for top performance. The authoritative reference is supported with over 310 illustrations and more than 180 equations.
