1. Record Nr. UNINA9910139016203321 Autore Li Changzhi <1982-> Titolo Microwave noncontact motion sensing and analysis / / Changzhi Li, Jenshan Lin Pubbl/distr/stampa Hoboken, New Jersey:,: John Wiley & Sons Inc.,, [2014] ©2014 **ISBN** 1-118-74256-7 1-118-74255-9 1-118-74279-6 Descrizione fisica 1 online resource (220 p.) Collana Wiley series in microwave and optical engineering TEC036000 Classificazione Altri autori (Persone) LinJenshan <1984-> 681/.2 Disciplina Soggetti Motion detectors Microwave detectors Motion - Measurement Radar Lingua di pubblicazione Inglese **Formato** Materiale a stampa Livello bibliografico Monografia Note generali Bibliographic Level Mode of Issuance: Monograph Nota di bibliografia Includes bibliographical references and index. Nota di contenuto Preface xi 1 Introduction 1 1.1 Background, 1 1.2 Recent Progress on Microwave Noncontact Motion Sensors, 2 1.2.1 Microwave/Millimeter-Wave Interferometer and Vibrometer, 2 1.2.2 Noncontact Vital Sign Detection, 3 1.3 About This Book, 4 2 Theory of Microwave Noncontact Motion Sensors 7 2.1 Introduction to Radar, 7 2.1.1 Antennas, 8 2.1.2 Propagation and Antenna Gain, 10 2.1.3 Radio System Link and Friis Equation, 13 2.1.4 Radar Cross Section and Radar Equation, 15 2.1.5 Radar Signal-To-Noise Ratio, 16 2.1.6 Signal-Processing Basics, 17 2.2 Mechanism of Motion Sensing Radar, 18 2.2.1 Doppler Frequency Shift, 18 2.2.2 Doppler Nonlinear Phase Modulation, 19 2.2.3 Pulse Radar, 26 2.2.4 FMCW Radar, 27 2.2.5 Comparison of Different Detection Mechanisms, 29 2.3 Key Theory and Techniques of Motion Sensing Radar, 31 2.3.1 Null and Optimal Detection Point, 31 2.3.2 Complex Signal Demodulation, 33 2.3.3 Arctangent Demodulation, 34 2.3.4 Double-Sideband Transmission, 36 2.3.5 Optimal Carrier Frequency.

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## Sommario/riassunto

"Compiling the authors? combined decades of experience, Microwave Noncontact Motion Sensing and Analysis sheds light on microwave noncontact vital sign detection from bench-top module to CMOS integrated microchip, covering a frequency range of over 30 GHz. Providing timely coverage of a technology integral to the future healthcare of the elderly, the text presents a full-bodied history of this technology, introduces current developments, and reveals future trends. Practicing engineers and researchers will discover the theory and technical details of related technologies, as well as a wide range of applications in healthcare, military, and industry"--