

1. Record Nr.	UNINA9910825095803321
Autore	Vincent John David
Titolo	Fundamentals of infrared and visible detector operation and testing // .John David Vincent, Steven E. Hodges, John Vampola, Mark Stegall, Greg Pierce
Pubbl/distr/stampa	Hoboken, New Jersey : , : Wiley, , [2016] [Piscataway, New Jersey] : , : IEEE Xplore, , [2015]
ISBN	1-5231-1026-0 1-119-01188-4 1-119-01189-2 1-119-01187-6
Edizione	[Second edition.]
Descrizione fisica	1 online resource (646 pages) : illustrations (some color), tables, photographs
Collana	Wiley series in pure and applied optics
Disciplina	621.362
Soggetti	Infrared detectors Optical detectors Infrared detectors - Testing
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Includes index.
Nota di bibliografia	Includes bibliographical references at the end of each chapters and index.
Nota di contenuto	Foreword ix -- Preface xiii -- About the Companion Website xv -- UNIT I DETECTOR BASICS 1 -- 1 Introduction and Overview 3 -- 2 Radiometry 25 -- 3 Thermal Detectors: Mechanisms, Operation, and Performance 85 -- 4 Classical Photon Detectors: Simple Photoconductor and Photovoltaics 105 -- 5 Modern Photon Detectors 149 -- UNIT II DETECTOR ASSEMBLIES 171 -- 6 Single Detector Assemblies and Small Arrays 173 -- 7 Readout Integrated Circuits 191 -- 8 Electronics for FPA Operation 237 -- UNIT III TESTING 257 -- 9 Test Equipment 259 -- 10 Detector Testing 315 -- UNIT IV RELATED SKILLS 379 -- 11 Measurements and Uncertainty 381 -- 12 Cryogenics 407 -- 13 Vacuum 441 -- 14 Optics and Optical Materials 469 -- 15 Fourier Analysis of Detector Problems 507 -- Appendix A / Symbols, Abbreviations, and Acronyms 549 -- Index 553
Sommario/riassunto	This book presents a comprehensive introduction to the selection,

operation, and testing of infrared devices, including a description of modern detector assemblies and their operation. This book discusses how to use and test infrared and visible detectors. The book provides a convenient reference for those entering the field of IR detector design, test or use, those who work in the peripheral areas, and those who teach and train others in the field. Chapter 1 contains introductory material. Radiometry is covered in Chapter 2. The author examines Thermal detectors in Chapter 3; the "Classical" photon detectors / simple photoconductors and photovoltaics in Chapter 4; and "Modern Photon Detectors" in Chapter 5. Chapters 6 through 8 consider respectively individual elements and small arrays of elements the "readouts" (ROICs) used with large imaging arrays; and Electronics for FPA Operation and Testing. The Test Set and The Testing Process are analyzed in Chapters 9 and 10, with emphasis on uncertainty and trouble shooting. Chapters 11 through 15 discuss related skills, such as Uncertainty, Cryogenics, Vacuum, Optics, and the use of Fourier Transforms in the detector business. Some highlights of this new edition are that it * Discusses radiometric nomenclature and calculations, detector mechanisms, the associated electronics, how these devices are tested, and real-life effects and problems * Examines new tools in Infrared detector operations, specifically: selection and use of ROICs, electronics for FPA operation, operation of single element and very small FPAs, microbolometers, and multi-color FPAs * Contains five chapters with frequently sought-after information on related subjects, such as uncertainty, optics, cryogenics, vacuum, and the use of Fourier mathematics for detector analyses

Fundamentals of Infrared and Visible Detector Operation and Testing, Second Edition, provides the background and vocabulary necessary to help readers understand the selection, operation, and testing of modern infrared devices. John David Vincent: Consultant after 50 years as an IR test engineer and system engineer (SBRC, Amber Engineering, Raytheon Infrared Operations, FLIR-Indigo). His interests include uncertainty analysis, radiometrics, data analysis and presentation. Steve Hodges (Principal Senior Scientist, Alion Science and Technology) has developed fire detection and suppression systems for 30 years. John Vampola (Principal Engineering Fellow, Raytheon Vision Systems) has specialized in ROIC and FPA design and applications for 35 years. Mark Stegall and Greg Pierce. (Founder and CEO respectively SE-IR Corporation, Goleta, CA) have designed and produced test electronics for FPA evaluation and imaging demonstrations for over 25 years.
