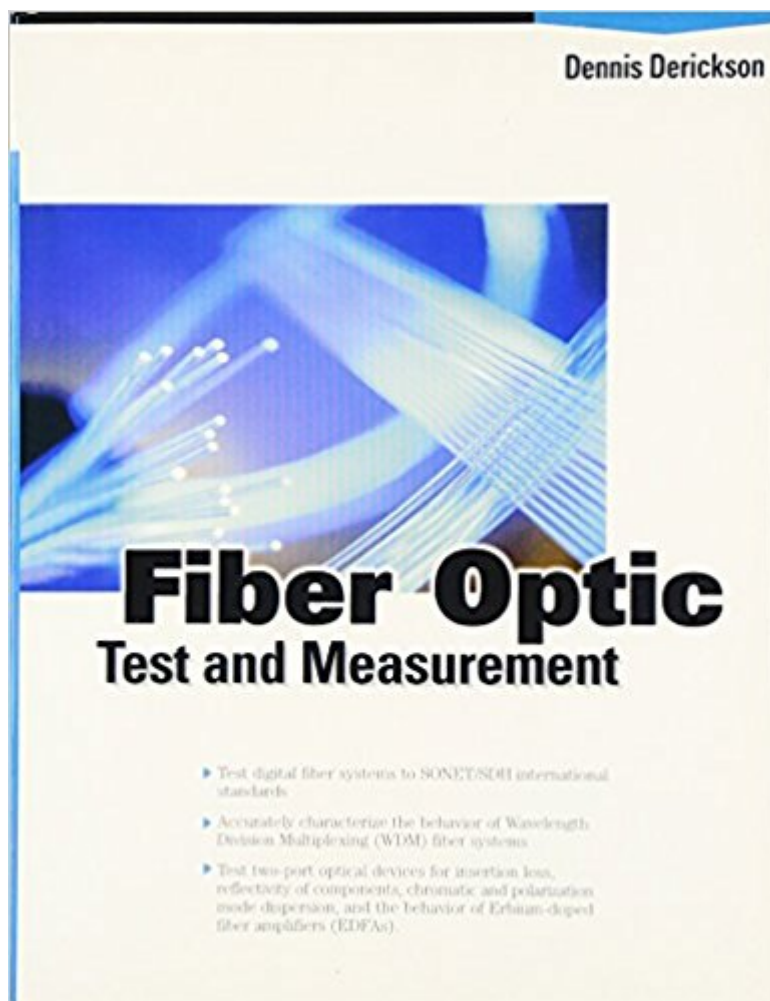**The book was found**

Fiber Optic Test And Measurement

Synopsis

This is the most authoritative, complete source of test and measurement information for engineers who design and maintain fiber optic networks. This book presents measurement principles for characterizing all three basic components of a fiber optic communication system: the optical transmitter, fiber medium and optical receiver. It also covers system level measurements, and discusses the principles and limitations of current fiber optic testing equipment. It discusses testing to SONET/SDH international standards, and helps engineers choose the best approach to testing today's new erbium doped fiber amplifiers. The book provides detailed recommendations for understanding polarization states, and presents new methods for accurately characterizing the behavior of Wavelength Division Multiplexing (WDM) fiber systems. It includes detailed coverage of testing fiber in the local loop, using optical power meters and optical time domain reflectometers. It also reviews the latest state-of-the-art 10 Gb/s systems, and even faster systems on the horizon. The coverage is practical, helping professionals accurately measure and test fiber optic systems without becoming experts in theory. All fiber optic engineers working with communications applications.

Book Information

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Customer Reviews

53433-9 The complete, practical guide to testing fiber optic communication components and systems.   Fiber optic networks are evolving rapidlyâ "and so is the technology used to design, measure, and test them. Fiber Optic Test and Measurement is the first authoritative, complete guide

to measuring both current optical networks and those on the horizon. It reflects the collective experience of Hewlett-Packard's world-class lightwave test and measurement organization, and presents extensive information that has had limited circulation to date. Learn how to characterize all three basic components of a fiber optic communication system: the optical transmitter, fiber medium, and optical receiver. Review each fundamental area of fiber optic measurement, including: Optical power measurements using several types of photodetectors Spectral measurements using diffraction gratings, Michelson interferometers and both heterodyne and homodyne spectrum analysis Polarization measurementsâ"increasingly important in high data rate networks that utilize optical amplifiers Modulation measurements via frequency and time domain analyses The book's unprecedented coverage of advanced fiber technology will be invaluable to professionals implementing or maintaining new optical networks. Learn how to: Test digital fiber systems to SONET/SDH international standards Accurately characterize the behavior of Wavelength Division Multiplexing (WDM) fiber systems Test two-port optical devices for insertion loss, reflectivity of components, chromatic and polarization mode dispersion, and the behavior of Erbium-doped fiber amplifiers (EDFAs). This practical guide will help technicians, engineers, and scientists accurately measure and test fiber optic systems, without becoming experts in fiber optic theory. It will be equally useful for experienced fiber optic professionals and those new to the field.

Hewlett-Packard engineers and scientists at three different locations in California and Germany collaborated to produce this work. DENNIS DERICKSON (editor) was one of the founding members of Hewlett-Packard's fiber optic test and measurement group in Santa Rosa, CA.

This books stands heads and shoulders above anything else written so far on the test and measurement of fiber optic systems and components. The other reviewers have given details about the books content, so I'll say why I liked the book.Two main reasons: 1) The authors go into detail regarding how different instruments work from physical principles. Such an understanding is useful in understanding a device's (and measurement's) accuracy and validity.2) The practical tips and explanations on how to make measurement alone make this an essential reference. This book neatly compliments theoretical books and papers by explaining how the typical measurements you may read about in a journal article are made and the underlying issues that contribute/take away from a measurement's efficacy/accuracy.Some of my colleagues say that because this book was written by HP people and the examples shown involve HP instruments, this book loses some value.

If so, this loss is miniscule.Most photonic test instruments, HP or not, work on more or less the same principles. Whether or not you own HP instruments, you will find this book an invaluable reference.

Extremely useful book for working in fiber optics labs

Great book.

This is probably the most complete, accurate, and authoritative book I've seen that is devoted specifically to the science of testing fiber-optic systems and components.The book begins by reviewing basic fiber-optic communications systems. It summarizes basic ideas in communications theory, characteristics of optical fiber, optical amplifiers, optical repeaters, O/E converters, and wavelength-division multiplexing. The first chapter also contains some useful background information about bit-error rates and waveform analysis. There are simple descriptions of multimode fiber, and basic explanations of things like numerical aperture, chromatic dispersion, and polarization characteristics of optical fiber. There is also some review material on active components such as Fabry-Perot lasers, distributed-feedback lasers, vertical cavity surface-emitting lasers, electrooptic modulators, and LEDs. The first chapter ends with a review of time and frequency measurements in photonic networks.The material in the first chapter is pretty broad, and some of it is rather shallow. It's not really a good place to go for a primer on photonic networks, but the first chapter does help the reader review key concepts and ideas that are important in the book's later developments.With the review completed, the book launches into detailed discussions about different types of measurements made in fiber-optic networks and on fiber-optic components. Generally, each chapter deals with a separate topic, and is written by a different author.Chapter two discusses the nuances of making optical power measurements. While some may think that such measurements are trivial, Christian Hentschel (the author of chapter 2) does an excellent job of illustrating the precise engineering needed to make the most accurate measurements of optical power. Topics covered include temperature effects, spatial effects, noise, reflectivity, and compatibility with various fiber and connector types.Chapter three is of special interest to anyone working in the field of wavelength-division multiplexing, as it's subject matter deals with optical spectrum analysis. A common theme throughout this book is to describe many of the different ways in which measurements can be performed. True to that theme, Joachim Vobis and Dennis Derickson (the authors of chapter 3) review the various ways in which spectral analysis can be

performed. These include tunable filters like the Fabry-Perot interferometers as well as diffraction-based OSAs. The authors clearly prefer the grating OSA, and most of the chapter deals with specific nuances that must be considered in making such and instrument perform properly.

Chapter four is similar to chapter three - it deals also with optical spectrum analysis. Chapter four, though, is devoted exclusively to the subject of wavelength meters that make spectral measurements using a Michelson interferometer and stabilized internal light source.Chapter five covers high-resolution optical frequency analysis. Chapter 6 deals with polarization measurements, including a review of the Jones calculus and a nice explanation and description of the Stokes parameters and Poincare sphere. Chapter 7 describes intensity modulation and noise characterization of optical signals. Chapter 8 covers analysis of digital modulation on optical carriers, including some nice material on bit-error rates, eye-diagram analysis, mask measurements, and jitter analysis. Chapter 9 has some good information on insertion-loss measurements (another of those underestimated problems). Chapter 10 has a good review of optical time-domain reflectometers (OTDRs) used in testing components, while chapter 11 explains the use of OTDRs in making measurements on optical fiber. Chapter 12 covers dispersion measurements, including both chromatic dispersion and polarization-mode dispersion. The last chapter explains the tests used to characterize erbium-doped optical fibers (EDFAs). This last chapter, especially, is well worth reading, though I found some of the test descriptions a little hard to follow.The book ends with three very useful appendices. Appendix A is devoted to noise sources in optical measurements, appendix B to nonlinear limits for optical measurements (a must for anyone working with DWDM systems) and appendix C has some practical information regarding the care of optical connectors.The book covers a tremendous amount of information. Its 642 pages are jam packed with just about everything you ever wanted to know about photonic test and measurement. And what it does not cover is usually described in excruciating detail in the complete list of references at the end of each chapter.There are plenty of equations, but not much mathematical derivation. If you are up on your algebra and calculus you will have no difficulty following anything in this book. Its aim is practicality, and I'd say it hit a bull's eye.The illustrations are done nicely; the explanations are (for the most part) clean, crisp, and concise. This is an excellent book that I highly recommend. I've marked it with yellow pen, dog-eared the corners of the pages, scribbled in the margins, spilt my drink on it at least once, broken the spine, and basically beat it to pieces. That's what you do with the really useful tools - the rest of them just sit on the shelf looking pretty and collecting dust.If you make your living testing photonic systems, you really owe it to yourself to get and read this book.Duwayne Anderson, February 28, 2000

This text is essential for anyone who wishes to test or measure optical sub-components, components, systems, or devices. Dennis lays out the fundamentals of each measurement in an easy to understand format. This is especially useful because this field is growing tremendously and often utilizes people from other fields who lack familiarity with these measurements. This book provides as easy to understand tutorial for people who need to learn these techniques. If you can't measure what you have very well, you don't know what you sent to your customer; and if they can't measure what you sent them, they don't know what they have.

I have known the test and measuring work performed by HP people since 1989, specially the written work from Dr. Christian Hentschel (one of the authors of the book) on lightwave standards and test procedures. After working all these years in the fiber optic and optoelectronics field, I have found this precisious book, and I highly recommend it to every one who needs to work on fiber optic communications. For sure, this book will easly be a first reference on the field.

I am an engineer in fiber telecommunication. I found this book is the best one for everyone in fiber optics industry. Not just theory, it gives you lots of real view how they test in HP. If you want to read this book, logon HP websit as a reference. If you are in optical industry, email me. I want to make more friends in this field.

I wish I had a book like this when I started working in the fiber optic industry.

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