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2.6.3 Time-Average Power Transported by TM Modes2.7 Phase and Group Velocities; Problems; References; Bibliography; 3 GRADED-INDEX THIN-FILM WAVEGUIDES; 3.1 Introduction; 3.2 Transverse Electric Modes Guided by Linearly Graded Dielectric Waveguides; 3.3 Exponentially Graded Dielectric Waveguides; 3.3.1 Transverse Electric Modes; 3.3.2 Transverse Magnetic Modes; 3.4 The WKB Method; 3.4.1 Auxiliary Function; 3.4.2 Fields in the R Zone; 3.4.3 Fields in the L Zone; 3.4.4 Fields in the Transition Zone; 3.4.5 The Constants; 3.4.6 Dispersion Relation; 3.4.7 An Example
3.5 Hocker and Burns' Numerical Method3.5.1 Transverse Electric Modes; 3.5.2 Transverse Magnetic Modes; 3.6 Step-Index Thin-Film Waveguides versus Graded-Index Dielectric Waveguides; Problems; References; 4 PROPAGATION LOSS IN THIN-FILM WAVEGUIDES; 4.1 Introduction; 4.2 Complex Relative Dielectric Constant and Complex Refractive Index; 4.3 Propagation Loss in Step-Index Waveguides; 4.3.1 Waveguides Having Weakly Absorbing Materials; 4.3.2 Metal-Clad Waveguides; 4.4 Attenuation in Thick Waveguides with Step-Index Profiles; 4.5 Loss in TM(0) Mode
4.6 Metal-Clad Waveguides with Graded-Index ProfilesProblem; References; 5 THREE-DIMENSIONAL WAVEGUIDES WITH RECTANGULAR BOUNDARIES; 5.1 Introduction; 5.2 Fields and Modes Guided by Rectangular Waveguides; 5.3 Orders of Magnitude of Fields; 5.3.1 The E (y) Modes; 5.3.2 The E(x) Modes; 5.4 Marcatili Method; 5.4.1 The E(y) Modes; 5.4.2 The E(x) Modes; 5.4.3 Discussions; 5.4.4 Generalized Guide Index; 5.5 Effective Index Method; 5.5.1 A Pseudowaveguide; 5.5.2 Alternate Pseudowaveguide; 5.5.3 Generalized Guide Index; 5.6 Comparison of Methods; Problems; References
6 OPTICAL DIRECTIONAL COUPLERS AND THEIR APPLICATIONS

Sommario/riassunto

A classroom-tested introduction to integrated and fiber optics This text offers an in-depth treatment of integrated and fiber optics, providing graduate students, engineers, and scientists with a solid foundation of the principles, capabilities, uses, and limitations of guided-wave optic devices and systems. In addition to the transmission properties of dielectric waveguides and optical fibers, this book covers the principles of directional couplers, guided-wave gratings, arrayed-waveguide gratings, and fiber optic polarization components. The material is fully classroom-tested and