

The Design and Fabrication of Monomode Optical Fiber

B.J. Ainslie, K.J. Beales, C.R. Day and J.D. Rush. "The Design and Fabrication of Monomode Optical Fiber." 1982 Transactions on Microwave Theory and Techniques 30.4 (Apr. 1982 [T-MTT] (Joint Special Issue on Optical Guided Wave Technology)): 360-369.

The design of monomode fibers is discussed in the context of optimizing fiber loss and dispersion simultaneously, with reference to the materials choices and limitations to preform and fiber fabrication by the MCVD technique. Two classes of monomode structure-matched cladding and depressed cladding-are considered. Ultralow attenuation has been achieved reproducibly in both classes of fiber. The control of fiber geometry and dispersion is also discussed. Matched cladding fiber suitable for systems operating at both 1.3 and 1.55 μm has been studied and mean losses of 0.45 dB/km at 1.3 μm and 0.28 dB/km at 1.55 μm have been achieved for a total of 130 km. The behavior of depressed cladding fiber is compared with predictions from the theory of propagation in W fibers. Depressed cladding fiber with stable guidance has been demonstrated with attenuation of 0.37 dB/km at 1.3 μm and 0.21 dB/km at 1.55 μm .

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