

Communication

Theoretical Investigation of the Influence of Wavelength on the Bandwidth in Multimode W-Type Plastic Optical Fibers with Graded-Index Core Distribution

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Abstract: The bandwidth of multimode W-type plastic optical fibers (POFs) with graded-index (GI) core distribution is investigated by solving the time-dependent power flow equation. The multimode W-type GI POF is designed from a multimode single-clad (SC) GI POF fiber upon modification of the cladding layer of the latter. Results show how the bandwidth in W-type GI POFs can be enhanced by increasing the wavelength for different widths of the intermediate layer and refractive indices of the outer cladding. These fibers are characterized according to their apparent efficiency to reduce modal dispersion and increase bandwidth.

Keywords: Poly(methyl methacrylate) optical fiber; W-type plastic optical fiber; graded-index optical fiber; power flow equation; bandwidth



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