Abstracts

Transmission Characteristic Measurement of Two-Mode Optical Fiber with a Nearly Optimum Index-Profile

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Two-mode optical fibers are studied experimentally and theoretically. A fiber with a nearly optimum index profile, designed for the material dispersion-free spectral region of 1.3 µm has been fabricated. The fiber core diameter is 20 µm with a 0.26 percent of relative-index difference between the core and cladding. Group delay time differences Delta tau between LP/sub 01/ and LP/sub 11/ modes are measured in the spectral region 1.06-1.44 µm by using a fiber Raman laser. As a result, the zero-modal dispersion characteristic is confirmed to occur near 1.4 µm. It is shown that a gently sloping Delta tau characteristic against V-value is obtained when the central index dip in core index profile is eliminated. In the present test fiber, Delta tau = 230 ps/km, caused by a V-value deviation of 5 percent from the optimum V/sub 0/ at which Delta tau = 0. The theory predicts 200 ps/km with an optimum index profile.

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