Abstracts

Laser Fiber Coupling with a Hyperbolic Lens (Short Papers)

K. Kurokawa and E.E. Becker. "Laser Fiber Coupling with a Hyperbolic Lens (Short Papers)." 1975 Transactions on Microwave Theory and Techniques 23.3 (Mar. 1975 [T-MTT]): 309-311.

Substantial improvements in the coupling efficiency from injection lasers to multimode glass fibers have been obtained by spherical lenses melted on the fiber ends. However, the spherical lens has its own drawbacks. It excites high-order modes which are slow and lossy and it becomes less effective when used with graded-index fibers such as Selfoc. This paper proposes a hyperbolic lens which, in principle, is free from these drawbacks. Several samples have been made by first grinding one end of each fiber in a wedge form and then mechanically or flame-polishing the ground surface. These preliminary samples improved the coupling efficiency by a factor of 2-5 over the simple flat-end coupling depending on the difference in the refractive indices of the core and cladding. The improvement is slightly better than that achieved by spherical lenses.

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