Abstracts

Coupling from Multimode to Single-Mode Linear Waveguides Using Horn-Shaped Structures

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Coupling from a multimode to a single-mode linear waveguide using horn-shaped structures is investigated. The approximate coupling efficiency is found by numerical solution of coupled-mode equations that apply to the reciprocal problem, i.e., to the problem of propagation in an expanding horn. A coupling efficiency in excess of 90 percent is calculated when coupling is from the principal mode of a sample 50-µm-wide multimode waveguide to a 3-µm-wide single-mode guide (lambda = 0.63 µm). This efficiency results from a uniformly tapered horn whose length is on the order of 2 mm. The length can be decreased by using a shaped coupling region. One such region is found to result in a coupling length of approximately 1.6 mm.

❑ Return to main document.