

## Broadband Overlaid Inset Dielectric Guide Coupler with Very Flat Coupling

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In this paper overlaid parallel coupled inset dielectric guides are proposed for broadband applications to directional couplers. This structure provides much flatter and higher coupling than the conventional one without an overlay. The propagation and coupling characteristics of the coupled guides are obtained by using the integral equation formulation and Galerkin's procedure. Numerical results for two limiting cases are compared with available measured data, showing good agreement. Effects of thickness and dielectric constant of the overlay are examined on coupling and bandwidth. It is found that by suitable choice of these parameters very flat coupling can be achieved for a wide frequency range which is still within the fundamental-mode bandwidth. Examples of couplers with the bandwidth exceeding 45% for the coupling of  $3 \pm 0.25$  dB are presented.

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