# Abstracts

## Wide-Band, Forward-Coupling Microstrip Hybrids with High Directivity

*P.K. Ikalainen and G.L. Matthaei. "Wide-Band, Forward-Coupling Microstrip Hybrids with High Directivity." 1987 Transactions on Microwave Theory and Techniques 35.8 (Aug. 1987 [T-MTT]): 719-725.*

The common forms of microstrip hybrids are either "backward couplers" formed using parallel lines, or branch-line or rat-race hybrids. All of these tend to have degraded performance due to discontinuities, junction effects, or unequal even- and odd-mode velocities. In contrast, coupled-line microstrip forward couplers do not require any discontinuities or junctions and utilize the unequal mode velocities. As a result, forward couplers can tolerate unusually thick substrates and still achieve high directivity and very little radiation. Though they are relatively long, designs with sizable coupling gaps have reasonable lengths for many applications, particularly at millimeter-wave frequencies. A trial symmetrical design yielded a bandwidth of 15 percent for 1-dB maximum unbalance. By use of asymmetrical design, a bandwidth of 57 percent was achieved for the same tolerance. Either quadrature or "magic-T" hybrid performance can be approximated. Directivities of 37 dB or more were readily achieved.

❑ Return to main document.