Abstracts

A Broad-Band Printed Circuit Hybrid Ring Power Divider

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A power divider in the form of a hybrid ring that provides substantially improved amplitude and phase characteristics over a broad frequency range compared to that of a conventional hybrid ring coupler is described. The improvement in bandwidth is obtained by the addition of a fifth port to the conventional four-port design. The new design is applicable to both equal and unequal power divisions and uses the same design equations as the conventional hybrid ring design to obtain the desired degree of coupling. The new design provides substantially improved coupling and phase characteristics over a very broad frequency range; the usable bandwidth is limited primarily by the degradation in the other parameters such as input VSWR and isolation between coupled ports. The bandwidth is approximately twice that of a conventional hybrid ring coupler. A theoretical comparison of the performance characteristics of the improved and the conventional design was accomplished using a CAD program. Experimental verification of the improved design was earned out in a stripline configuration for both equal and unequal power divisions at Ku-band and a bandwidth of approximately 45 percent was achieved.

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