General Description:

90 degree hybrids are a four-port directional coupler with a 3dB coupling coefficient and are matched at all four ports where two ports are isolated from each other.

Power combiners are devices that are the inverse of a power divider. To produce a power combiner you can feed a traditional Wilkinson power divider backwards for combining low power signals and in some cases high power applications when designed expressly for high power purposes and having coherent input signals.

When non coherent signals are present the Wilkinson power divider uses an internal isolation resistors to dissipate this energy caused by the unbalanced signals. Isolation resistors are designed to balance the node voltages in a power divider to provide output port isolation when the power divider is used in the forward direction. These resistors are typically very low power for two reasons, they don’t need to dissipate any power in their normal operating condition, and secondly larger resistors add parasitic capacitance and inductance into the circuit. These factors makes it difficult to produce a combiner that is able to dissipate large amounts of power.

90 degree hybrids offer many advantages when used as a power combiner over a Wilkinson power divider/combiner. Advantages occur when non-coherent signals are being combined. A hybrid does dissipate the differential combining power as heat, instead it directs the power to the “Isolated Port” of the hybrid, where an external high power termination may be added to dissipate the unbalanced power. A hybrid is the best solution for a high power combiner requirement. Knowing the nature of the signals amplitude being combined is the key to selecting the best configuration of the power combiner for the application. Hybrids are available in many phase and amplitude variations. 90 degree hybrids are most common for high power amplifier construction for dividing and combining power modules. We offer many standard frequency bands and configurations. Custom frequencies and mechanical configurations are also available upon request.

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