Abstracts

Some Fundamental Design Principles for the Development of Precision Coaxial Standards and Components

T.E. MacKenzie and A.E. Sanderson. "Some Fundamental Design Principles for the Development of Precision Coaxial Standards and Components." 1966 Transactions on Microwave Theory and Techniques 14.1 (Jan. 1966 [T-MTT]): 29-39.

Significant advances in the performance of precision coaxial standards and components have resulted from rigid adherence to three basic design principles: 1) incremental constancy of characteristic impedance, 2) coplanar compensation of discontinuities, and 3) control of mechanical tolerance sensitivity. The advances include dielectric supports with extremely small interface discontinuities, contacting members that are insensitive to mechanical tolerances, calculable airline impedance standards of very high absolute accuracy, nearly reflectionless terminations based on a cylindrical metal-film resistor, and adaptors between line sizes based on smooth (rather than stepped) diametral transitions. Extensions of the design principles have resulted in the introduction of closely controlled reflections provided by a novel impedance-matching tuner, broadband calibrated mismatches, and resistance-standard terminations that retain their nominal dc values to very high frequencies.

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