Abstracts

Reflections from Rotary-Vane Precision Attenuators (Correspondence)

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Due to finite thickness of the absorbing vanes, the scattering coefficients S/sub 11/ and S/sub 22/ of a rotary-vane attenuator are not zero (as would be true of an "ideal" device) but are, in fact, functions of attenuator setting. Thus, terminal reflections cannot be eliminated by simply fixed-tuning the ports. In this correspondence we derive an equation relating S/sub 11/ (S/sub 22/) to the attenuator setting by considering the effects of small reflections from vanes of an otherwise perfect attenuator. The result is found to contain three complex constants that can be determined experimentally, with this expression one can, when necessary, take reflections into account analytically by determining the constants appropriateto the attenuator under consideration. This procedure is useful, e.g., when using a combination of an attenuator and a movable short-circuit as a variable impedance standard; or, when determining "mismatch error" in a transmission system in which the generator or load are not matched to the line.

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