

Abstracts

Average Output Power of an Incident Wave Randomly Coupled to a Reflected Wave

J.A. Morrison. "Average Output Power of an Incident Wave Randomly Coupled to a Reflected Wave." 1974 *Transactions on Microwave Theory and Techniques* 22.2 (Feb. 1974 [T-MTT]): 126-130.

Two waves traveling in opposite directions in a lossless waveguide, which are coupled by a random coupling function, are considered. It is assumed that no power is allowed to enter the reflected wave at the output end of the guide. The asymptotic value of the expected output power in the incident wave, when the input power is prescribed, is calculated in the limit of weak coupling and a long guide. The result is compared with that predicted by Marcuse on the basis of coupled power equations. It is found that the two results are quite close, so long as the expected output power is, greater than half the input power, but past that point Marcuse's approximation to the asymptotic value becomes increasingly poorer as the waveguide length increases. Some computer simulated results obtained by Marcuse tend to confirm the validity of the asymptotic value of the expected output power.

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