Abstracts

Automated test and tuning system for microwave filters

A novel method for computerized diagnosis and automatic tuning of microwave (cavity) filters is introduced. The method is based on equivalent network theory using modified filter synthesis equations, including all characteristic filter parameters like resonant frequency, losses of individual resonators, input-/output couplings and couplings between resonators. Instead of using field simulators to extract filter parameters and associated network sensitivities, a more practical and more accurate parameter extraction process of measured S-parameter data is utilized. Thus automatic tuning becomes a two step process. In the first step the exact parameter values of an untuned filter as well as parameter sensitivities are extracted from a series of S-parameter measurements. In a second step gradient optimization is used on the so corrected model to find the tuning screw positions to give the same parameter set as obtained from the synthesis.

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