Estimating the Permittivity of Rogers 4003C Substrate at Low Frequencies for Application in a Superdirective First-Order Probe for SNF Measurements

The bulk permittivity of Rogers 4003C substrate is estimated in the lower UHF frequency band by comparing the simulated and measured return loss for a bandpass filter based on a coplanar waveguide and a capacitively loaded loop. The obtained value, which deviates from that specified by Rogers at 10 GHz, is subsequently utilized for accurate design of a new light-weight superdirective first-order probe for spherical near-field (SNF) antenna measurements at low frequencies.

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