Abstracts

Line Width and Bandwidth of Millimeter-Wave Resonance Isolators

A theoretical derivation is made of bandwidth as a function of resonant frequency of a single crystal ferrite resonance isolator at millimeter wavelengths. The derivation takes into account the ferrite isolator as a bounded system. Using the derived relation of bandwidth and resonant frequency, and Kittel's relation between resonant frequency and applied field, equations are derived which relate line width to resonant frequency, line width to the applied magnetic field, and line width to frequency bandwidth. These resulting equations are compared with experimental data obtained with a single crystal barium ferrite isolator from 58 to 59 kMc. The theoretical relations agreed closely with the experimental data within the accuracy of the measuring equipment at these frequencies. In general, the results showed that for small frequency ranges (1 kMc) bandwidth and line width increase almost linearly with frequency, bandwidth and line width are linearly related, and line width is a fairly complicated but increasing function of applied field.

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