

Abstracts

A Catalog of Low Power Loss Parameters and High Power Thresholds for Partially Magnetized Ferrites

J.J. Green and F. Sandy. "A Catalog of Low Power Loss Parameters and High Power Thresholds for Partially Magnetized Ferrites." 1974 Transactions on Microwave Theory and Techniques 22.6 (Jun. 1974 [T-MTT] (Special Issue on Microwave Control Devices for Array Antenna Systems)): 645-651.

The low power loss and high power threshold properties have been measured on a number of candidate ferrite phase-shifting materials. The low power loss is characterized by $\mu_{sub 0}''$, the imaginary part of the diagonal component of the permeability tensor for the completely demagnetized state. $\mu_{sub 0}''$ was measured from 3.0 to 16.8 GHz. The high power properties are characterized by the parallel pump threshold at a bias field corresponding to $H_{sub i} / \text{Oe}$ and to $4\pi M / \text{Oe}$ and $4\pi M_{sub s} / \text{Oe}$. The threshold was measured between 3.0 and 16.8 GHz. For the purposes of computer calculation $\mu_{sub 0}''$ and $H_{sub crit}$ were fit to an equation of the form $A (\gamma_4 \pi M_{sub s}/\omega)^{1/N}$. Translating $\mu_{sub 0}''$ and $H_{sub crit}$ to $\Delta H_{sub eff}$ and $\Delta H_{sub k}$ gives the YIG plus Al as the lowest loss and lowest threshold materials followed by the Gd garnets and MgMn spinels. The Ni spinels are very lossy.

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