Abstracts

Average Power Capacity of Rotary-Field Ferrite Phase Shifiers

W.E. Hord. "Average Power Capacity of Rotary-Field Ferrite Phase Shifiers." 1992 Transactions on Microwave Theory and Techniques 40.12 (Dec. 1992 [T-MTT] (1992 Symposium Issue)): 2387-2391.

The rotary-field ferrite phase shifter inherently achieves excellent phase accuracy which has led to application in many single-axis phase scanned antennas. The limitation on power capacity of this device is generally dictated by average power rather than peak power. This paper analyzes the average power capacity of the phase shifter as determined by the increase in rod temperature and the maximum thermal gradient. An equivalent circuit model for thermal analysis is developed, and its parameters are determined by r-f and temperature measurements. An alternative geometry is described which results in significantly improved average power capacity without noticeable degradation of r-f performance. An experimental phase shifter using the alternative technique was built and tested. Comparison with a conventional rotary-field phase shifter demonstrates the improvement achieved.

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