Abstracts

A Precision Compact Rotary Vane Attenuator

T.Y. Otoshi and C.T. Stelzried. "A Precision Compact Rotary Vane Attenuator." 1971 Transactions on Microwave Theory and Techniques 19.11 (Nov. 1971 [T-MTT]): 843-854.

The accurate attenuation range of many precision rotary vane attenuators is limited to about 40 dB because of a transmission error term that is not accounted for in the familiar $\cos^2$ Theta attenuation law. This paper presents a modified law that makes it possible to extend the useful dynamic attenuation range. The same modified law also makes it practical to reduce the length of the rotor section and, therefore, to develop compact rotary vane attenuators that are accurate over reduced dynamic attenuation ranges. The modified law requires the additional calibrations of the incremental attenuation and incremental phase change at the 90° vane angle setting. To verify the modified law, a precision compact WR 112 rotary vane attenuator was fabricated and tested. The attenuator has a total dynamic attenuation range of about 30 dB and a rotor section length approximately one-third that of a conventional WR 112 attenuator. Application of the modified law resulted in good agreement between theoretical and measured incremental attenuations over the total dynamic attenuation range.

❑ Return to main document.