

Abstracts

Effect of Power Reflection on the Operation of a Low-Q 8 GHz Gyrotron

P. Muggli, M.Q. Tran, H.-G. Mathews, G. Agosti, S. Alberti and A. Perrenoud. "Effect of Power Reflection on the Operation of a Low-Q 8 GHz Gyrotron." 1990 Transactions on Microwave Theory and Techniques 38.9 (Sep. 1990 [T-MTT] (Special Issue on Multifunction MMIC's and their System Applications)): 1345-1351.

The operating characteristics of a low-Q ($Q_{\text{cav}} = 225$), 8 GHz gyrotron oscillator operating in the TE_{011} mode and submitted to various mismatched loads are reported. Under matched conditions, output power up to 310 kW ($\eta = 35\%$) and maximum efficiency up to 43% have been measured. In general, power reflection from loads with different phases and amplitudes leads to an output power decrease. Excessive reflections cause mode switching (TE_{011} to TE_{012}) or even arcing inside the tube. The effect of power reflection is seen to increase rapidly with current and output power. Nevertheless, we have observed that, as predicted by calculations, the maximum output power is not reached under matched conditions but with a specific nonzero value of the complex reflection coefficient.

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