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论文

大功率速调管中寄生振荡问题的实验研究

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摘要
本文详细地描述了在S波段20MW大功率速调管和S波段1.5MW宽频带速调管中观察到的两种不同类型的振荡现象。实验和理论分析表明,一种类型的振荡足电子枪区的二极管振荡,另一种类型的振荡是由速调管谐振腔的高次模TM_{011}引起的π模型单腔振荡。为研制工作稳定可靠的高峰值和高平均功率速调管提供了有价值的理论和实验依据。

关键词 大功率速调管 二极管振荡 π模型单腔振荡 高次模

分类号

ON OSCILLATIONS IN HIGH POWER KLYSTRONS

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Abstract
Two different types of oscillations observed in S-band 20 MW high power klystron and S-band 1.5 MW broadband klystron are described in detail. Experiments and theoretical analysis show that one type of oscillation is diode oscillation happened in the ele-ctron gun region, and the other is π-mode monotron oscillation caused by the first high order mode TM_{011} of the klystron cavities. In order to suppress the diode oscillation, the geometry of the electron gun has been redesigned for destroying the phase condition of the oscillation. In
order to overcome the π-mode monotron oscillation, the Q_L of cavities is decreased t0 300-
400 by plasma coating the microwave attenuation material on the interior surface of cavjties. The research work on these types of oscillations provides valuable theoretical and experimental design basis for high peak and high average power klystrons with good performance, high stability and reliability.

Key words High power klystron Diode oscillation π-mode monotron oscillation High order mode

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