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基于EMT的RF电子系统中的EMC分析

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EMC analysis based on EMT in RF electronic system

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摘要 在复杂的RF(Radio Frequency)电子系统中,采用传统的数值或实验方法,很难得到与电磁耦合相关问题的实用结果.因此,提出了采用电磁拓扑(EMT)来分析复杂电磁环境中的电磁兼容(EMC)问题.首先考虑到RF电路中有源器件的非线性特性,采用了SPICE二极管模型.然后对一个实际的功率检测电路进行了仿真分析和试验.结果表明,基于EMT的EMC分析方法是有效的,而且能够对系统的预测做出反应,可以用来分析包含有源和无源器件的RF电子系统.

关键词: BLT方程 电磁兼容 电磁拓扑 非线性 有源器件

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Abstract: It is difficult to obtain usable results for problems relating to electromagnetic coupling in complex radio frequency electronic systems by conventional numerical or experimental methods.Thus,electromagnetic topology(EMT)applied to analyze the electromagnetic compatibility(EMC)in complex electromagnetic environment is proposed in this paper.Firstly,considering the nonlinear characteristics of active components in RF circuits,a SPICE diode model is used,and then a practical power detector circuit is simulated and experimented.The results shows that EMC analysis of the electromagnetic compatibility basing on electromagnetic topology is valid and it can respond to prediction for system.This method may be used to analyze radio frequency electronic systems including passive and active components.

Key words: BLT equation   EMC   EMT   nonlinearity   active component

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