中国电机工程学报 2010, 30(21) 114-120 DOI: ISSN: 0258-8013 CN: 11-2107/TM

电工理论与新技术

EMI噪声分离网络在电力线噪声分析中的应用

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摘要：

研究了电力线噪声分离网络技术，包括网络拓扑优化、分离网络元器件性能改善以及利用散射参数测量进行分离网络参数提取等。结果表明，上述技术可明显提高分离网络性能，如插损提高约3 dB，噪声抑制比提高15 dB以上。此外还分别完成了基于噪声分离网络的开关电源电力线传导噪声和电力载波通信(power line communication，PLC)中的电力线辐射干扰噪声诊断抑制2个实验，验证了文中方法有效性。

关键词： 电力线噪声 传导电磁干扰 噪声分离网络 S-参数测量 开关电源噪声 电力载波通信系统辐射干扰

EMI Noise Discrimination Network Applied to Power-line EMI Noise Analysis

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Abstract:

Investigation on noise discrimination network (NDN) techniques for conducted electromagnetic interference (EMI) noise on power line is performed including optimization of network topology, performance improvement of circuit elements and the parameter extraction of NDN by using S-parameter measurement. Results show that insertion loss of NDN can be improved about 3dB and noise rejection ratio about 15dB with these techniques. Additionally, two experiments about noise diagnosis and suppression for both conductive EMI noise of SMPS and radiated noise of power line communication (PLC) system have been completed by applying the new NDN to show the efficiency of techniques.

Keywords: power line noise conducted electromagnetic interference (EMI) noise discrimination network S-parameter measurement switch mode power supply (SMPS) noise radiated EMI of power line communication (PLC)

收稿日期 2009-12-15 **修回日期** 2010-01-31 **网络版发布日期** 2010-08-04

DOI:

基金项目:

江苏省自然科学基金项目(BK2008429)；中国博士后科学基金(20080431126)。

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