

软件工程基于剖面映射的软硬件可靠性综合试验方法研究

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摘 要: 为真实反映产品的实际使用情况, 准确验证软硬件综合系统的可靠性, 将软件可靠性测试以及硬件可靠性试验进行了综合, 提出一种基于剖面映射的软硬件可靠性综合试验方法. 该方法首先确定软件测试剖面以及综合环境应力剖面, 然后利用剖面映射将软件测试剖面与综合环境应力剖面结合起来, 形成软硬件可靠性综合试验剖面; 该综合试验剖面真实反映了软件运行和外部环境条件变化之间的关联, 避免了软件可靠性测试和硬件可靠性试验分别进行所带来的试验风险和资源浪费, 在减少测试代价的同时实现了一次试验即验证产品的可靠性. 实验结果表明了该方法的可行性、合理性和有效性.

关键词: 综合试验; 试验方法; 软件可靠性; 硬件可靠性; 剖面映射

Software and Hardware Integrated Reliability Testing

Based on the Profile Mapping Method

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Abstract: To realistically simulate the actual usage, and accurately verify integrated hardware and software systems reliability, software and hardware integrated reliability testing based on the profile mapping method is proposed. First, the method constructs the software testing profile and comprehensive environmental stress profile, then by the profile mapping method the software testing profile and the comprehensive environmental stress profile are integrated to form a comprehensive hardware and software reliability test profile; the combined test profile can realistically reflect the association between software operation and external environment changed condition, to avoid the test risks and the waste of resources. Finally, The Integrated testing method is feasible, reasonable and effective verified through a factual Display and control system experiment.

Key words: integrated reliability testing; testing method; software reliability; hardware reliability; profile mapping method

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