

Accelerated Stress Testing

Abstract

Early product failures in the field cause warranty repair costs and affect the future buying decisions of customers. While hard-defects may be detectable in factory tests, weak products are often not detectable and are shipped to customers causing early failures. These weak products may exhibit failures or degrade only under certain stress conditions. Therefore, stress testing is needed to detect these subtle defects to ensure customers get the reliable products. Stress testing includes testing *after* stressing the incipient defects to hard defects and testing *during* stressing to show marginal defects, which are followed by root cause analysis and corrective actions. Stress testing may be used to achieve product robustness even though products are developed with new processes under short product-cycles. Such product quality improvement has proved to be a cost effective business investment. Many companies have used stress testing to improve product design, component quality and manufacturing process. While the earlier approaches were largely empirical, the fundamental principles explained in this tutorial had provided a missing foundation.

Bio

H. Anthony Chan received his PhD in physics at University of Maryland, College Park in 1982 and then continued post-doctorate research there in basic science.

After joining the former AT&T Bell Labs in 1986, his work moved to industry-oriented research in areas of interconnection, electronic packaging, reliability, and assembly in manufacturing, and then moved again to network management, network architecture and standards for both wireless and wireline networks. He had been responsible for R&D in robust product design and manufacture and for guiding various manufacturing locations in planning and conducting reliability and stress testing programs. He had designed the Wireless section of the year 2000 Network Operation Center in AT&T. He was the AT&T delegate in several standards work groups under 3GPP. He was visiting Endowed Pinson Chair Professor in Networking at San Jose State University during 2001-2003 and was professor at University of Cape Town in South Africa during 2004-2007. He is currently with Huawei Technologies in Dallas USA, where he conducts research in post 4G wireless network and contributes to international standards.

Anthony is a Fellow of IEEE. He is distinguished speaker of IEEE Reliability Society and of IEEE CPMT Society. He has numerous publications in a wide range of areas and had co-edited the Accelerated Stress Testing Handbook.