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## **Engineering the Reliability into Products under Harsh Environments**

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### **ABSTRACT**

In the current global competitive market, it is crucial to make highly reliable products. This, in turn, will reduce product cost by having fewer warranty claims and low repair costs. Indeed, reliability is of increasing importance for electronics systems operating in harsh environments. Some examples are electronic control units (ECUs) used for automotive engine controls (automotive) and the electronic telecommunication systems used at the subsea level (telecommunication). The ban of lead from electronic products was a major step towards a greener environment. This however brought in new challenges, especially with the reliability of lead-free solder materials. This talk will explore some research studies on the reliability of electronics packaging, with a special focus on lead-free solder joints. It is indeed very important to ensure that solder joints are reliable for the expected product lifetime as they are the weakest parts of an electronics assembly. The talk will shed some light on how various experimental and simulation research studies helped to understand, characterize and predict solder joint behaviors under severe operating conditions.