

Damage Metrics-Based Reliability Models

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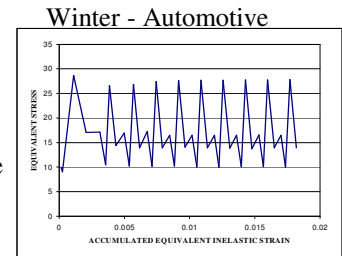
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OBJECTIVES:

- Develop damage metric-based mapping of failure modes during product- or system-specific end-use conditions
- Using an integrated process and reliability virtual qualification methodology, develop qualification guidelines for Microsystems packages used in implantable medical devices, automotive devices, computer and portable devices and for packages used in harsh environments.
- Understand different failure modes and their interaction at the system level.
- Develop standards for application-specific qualification and reduce the time required for qualification.
- Develop qualification regimes for Microsystems packages under combined vibration and/or thermal filed-use conditions.

APPROACH

- Develop physics-based models using appropriate damage metric for individual failure modes
- Incorporate multiple failure modes and their interaction at the system level
- Use damage metrics to develop system or product-specific qualification guidelines
- Employ Monte Carlo simulation to understand the effect of random variations in processes, and material properties
- Develop GUI to assess quickly system-level reliability



ACCOMPLISHMENTS:

- Developed a damage metric-based mapping methodology to predict qualification cycles based on filed-use conditions
- Developed qualification guidelines for packages under implantable medical devices, automotive, computer and handheld devices, and military avionics harsh filed-use conditions.
- Developing a GUI-based tool to predict multiple failure modes and their interactions at the system level .

