

MEOST

Multiple Environment Over Stress Testing

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ENVIRONMENTAL TESTING OF THE FUTURE



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MEOST

the Mount Everest of Stress Testing



According to Keki R. Bhote in World Class Reliability, ISBN 0-8144-0792-7



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Claims for MEOST

- Reliability levels of 10:1 to 100:1 over traditional field reliability.
- Reductions in design validation time from over 16 weeks to less than 2 days.
- Reductions in design test costs by factors of 5:1.
- Reductions in design sample sizes by factors of 10:1.



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What is MEOST?

- In MEOST testing, it is not the objective to pass a product, but to fail it.
- It is only through failures that the weak links of a design can be 'smoked out'
- Failures 'paradoxically' mean success.
- A single stress/environment is not enough to generate failures.



Challenges

- Definition of the Maximum Practical Over Stress Level (MPOSL)
- Combination of Stresses
- Finding failure modes which are representative for field failures
- Limited number of test units (3 – 10)

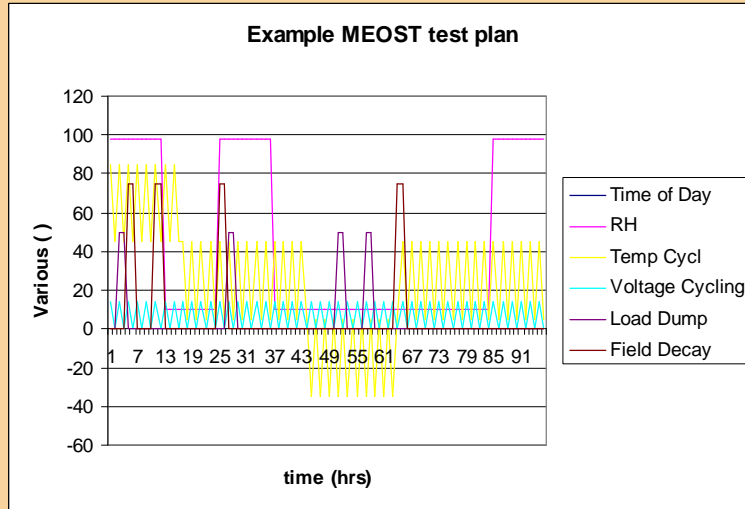


Maximum Practical Over Stress Limit

200 %	Destruct Stress
170 %	Maximum Practical Over Stress Level
130 %	Operational Stress
100 %	Design Stress
0 %	Room Ambient



Combination of Stresses



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Stages of MEOST

- Single Stress Up to the Design Limit
- Single Stress Up to the Maximum Practical Over Stress Limit (MPOSOL)
- Prototype – Full MEOST to MPSOL)
- Pilot Run
- Mini-MEOST in Outgoing Production

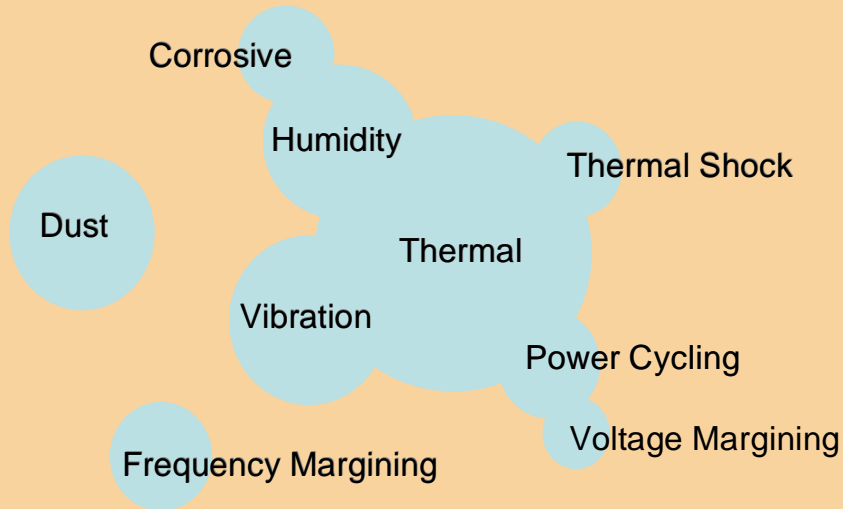


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Relative Influences of Various Stresses in Electronics



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Reasons for Solder Joint Failure

- Poor solder joint design
- Poor solder joint processing
- Solder material issues
- Excessive stresses applied to solder joints



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Practical Experience

- Accelerated Testing of Leadfree Soldered interconnects
- Traditional (Accelerated) Testing
- Definition of MPOSL for soldered interconnects



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Conclusions

- Successful Application of MEOST requires experience with the application.
- Insight in Physic of Failure is required.
- If applied correctly MEOST can reduce development time.
- MEOST is not sufficient for product qualification.

