TWENTIETHANNUAI

estConX

March 3 - 6, 2019

Hilton Phoenix / Mesa Hotel Mesa, Arizona

Archive

COPYRIGHT NOTICE

The presentation(s)/poster(s) in this publication comprise the proceedings of the 2019 TestConX workshop. The content reflects the opinion of the authors and their respective companies. They are reproduced here as they were presented at the 2019 TestConX workshop. This version of the presentation or poster may differ from the version that was distributed in hardcopy & softcopy form at the 2019 TestConX workshop. The inclusion of the presentations/posters in this publication does not constitute an endorsement by TestConX or the workshop's sponsors.

There is NO copyright protection claimed on the presentation/poster content by TestConX. However, each presentation/poster is the work of the authors and their respective companies: as such, it is strongly encouraged that any use reflect proper acknowledgement to the appropriate source. Any questions regarding the use of any materials presented should be directed to the author(s) or their companies.

"TestConX" and the TestConX logo are trademarks of TestConX. All rights reserved.

TestConX 2019

Wrap This Up? - Advanced Technology Packaging

High Probe Force "The Force Awakens"

Jock Sta. Maria & Kelly Daughtry Texas Instruments Incorporated





TestConX Workshop

www.testconx.org

March 3-6, 2019

TestConX 2019

Wrap This Up? - Advanced Technology Packaging



- Introduction
- Problem Statement
- Challenges
- Analysis
- Summary/Conclusion



High Probe Force "The Force Awakens"

A LEARS

TestConX Workshop

www.testconx.org

March 3-6, 2019

2

Wrap This Up? - Advanced Technology Packaging



Wrap This Up? - Advanced Technology Packaging



TestConX Workshop

TestConX 2019

Wrap This Up? - Advanced Technology Packaging



TestConX Workshop

Wrap This Up? - Advanced Technology Packaging



TestConX Workshop

TestConX 2019

Wrap This Up? - Advanced Technology Packaging

Problem

Massive Parallel Site = High Probe Force = New Challenges

If Poorly Managed, = Delays in product release = Low efficiency in production





High Probe Force "The Force Awakens"



TestConX Workshop

www.testconx.org

March 3-6, 2019

Wrap This Up? - Advanced Technology Packaging



TestConX Workshop

Wrap This Up? - Advanced Technology Packaging



TestConX Workshop

Wrap This Up? - Advanced Technology Packaging

System Analysis

Coupled Spring System



Hooke's Law:

Hooke's law - Wikipedia https://en.wikipedia.org/wiki/Hooke%27s_law ▼ Hooke's law is a law of physics that states that the force (F) needed to extend or compress a spring by some distance x scales linearly with respect to that distance. Robert Hooke · Linear elasticity · Orthotropic material

Newton's First Law:

When all the forces that act upon an object are balanced, then the object is said to be in a state of **equilibrium**. ... Thus, the net force is zero and the acceleration is 0 m/s/s. Objects at **equilibrium** must have an acceleration of 0 m/s/s. This extends from Newton's first **law** of motion.

Equilibrium and Statics - The Physics Classroom https://www.physicsclassroom.com/class/vectors/Lesson-3/Equilibrium-and-Statics

High Probe Force "The Force Awakens"

10



 $F = K(\Delta X)$

F – Force

K – Spring Constant

 ΔX – Spring Displacement

Test**ConX**®

TestConX 2019

Wrap This Up? - Advanced Technology Packaging



TestConX Workshop

www.testconx.org

March 3-6, 2019

Wrap This Up? - Advanced Technology Packaging

Key Considerations

Docking and Fixture •

- Provision of structural mounting points on both tester and handler
- Development of special measuring tools to quantify movement
- Custom solution for volume justified products



High Probe Force "The Force Awakens"



TestConX Workshop

www.testconx.org

12

Wrap This Up? - Advanced Technology Packaging



TestConX Workshop

Wrap This Up? - Advanced Technology Packaging

Summary

- Parallel site capability will continue to increase.
- High probe force is an inevitable challenge that must be faced.
- A breakthrough in contact pin force reduction is needed.

" May the solution to the Force be with you."



High Probe Force "The Force Awakens"

A CONTRACTOR

TestConX Workshop

www.testconx.org

March 3-6, 2019

14