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## Zero Keep Out Zone Socketing Techniques: The advantages and the Limitations

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### BACKGROUND

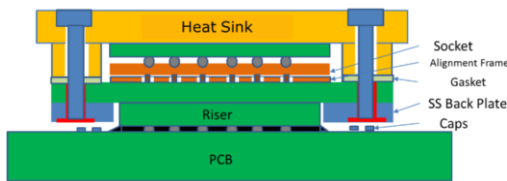
- We are seeing more demand for socketing BGA/LGA packages to OEM/ODM platforms.
- Validation is moving to be on OEM like validation platforms.
- Traditional socketing techniques require keep-out-zone on the platform.
- Most of OEMs/ODMs platforms are designed with no socketing hooks as part of the original design.
- We have worked on several technologies internally and in cooperation with industry partners to enable these type of Zero KOZ socketing solutions.

### CHALLENGES

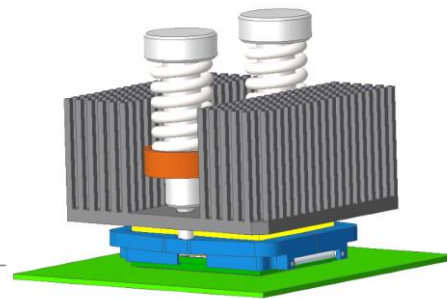
- Reliability - Validation HW are expected to sustain large number of usage cycles >300.
- Heatsink and Thermal Tools enabling
- Interposers – Zero KOZ solutions need to work with N-1, coax, Power and other types of interposers
- Usability – Validation engineers saw large number of packages over the program life cycle, time to swap packages and the ergonomics aspects of it need to be considered.
- Signal and Power Integrity: solution impact on signal and power integrity need to be as small as possible
- Cost

## SOLUTIONS

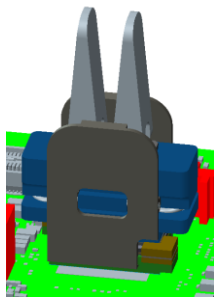
- Two major solution domains:
  - Surface Mount Technology (SMT) based



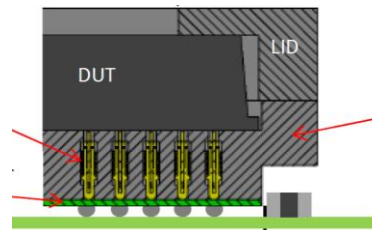
Wing Riser



Portable Wing Riser



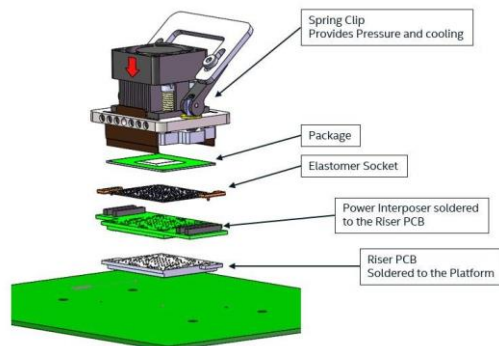
POP Spring Clip



SMT with Spring-Pin  
[HSIO Technology]



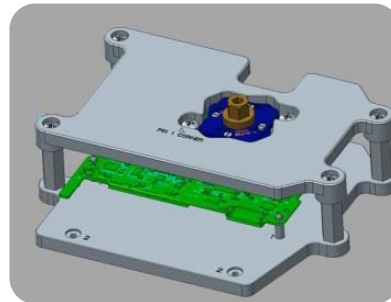
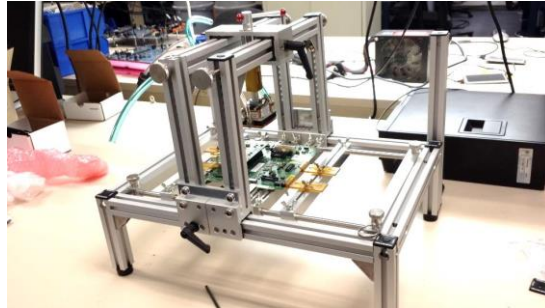
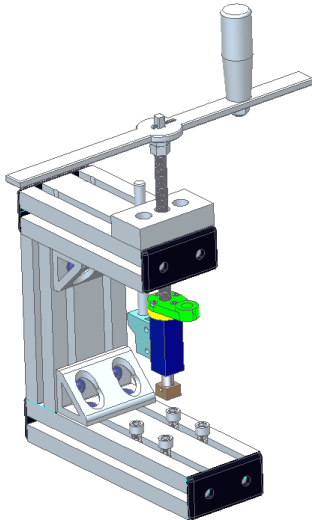
Grypper Socket  
[HSIO Technology]



Riser with Power  
Interposer

## SOLUTIONS

- Two major solution domains:
  - Chassis based



## SUMMARY

- Several ZKO technologies were explored at Intel side in the last two years. Each technology has its advantages and limitations
- One big challenge is to get the technology to work with minimum failure rate possible. This is more challenging for debug work needed on customers platforms.
- Solder joint quality and reliability is a concern for SMT type approaches
- Some SMT approaches depends on other technologies such as coax-riser. This increase the challenge as the maturity of these technology is progressing.
- Several approaches were used to aligning socket to platform for non-SMT type sockets.
- Chassis based approaches were found more reliable in getting the system to work with no issues the first time.

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