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DoubleTree by Hilton San Jose
ChipletSummit.com

OCP – ODSA Project

Open Platform Development for BoW PHY Interoperability Testing

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Cisco inc

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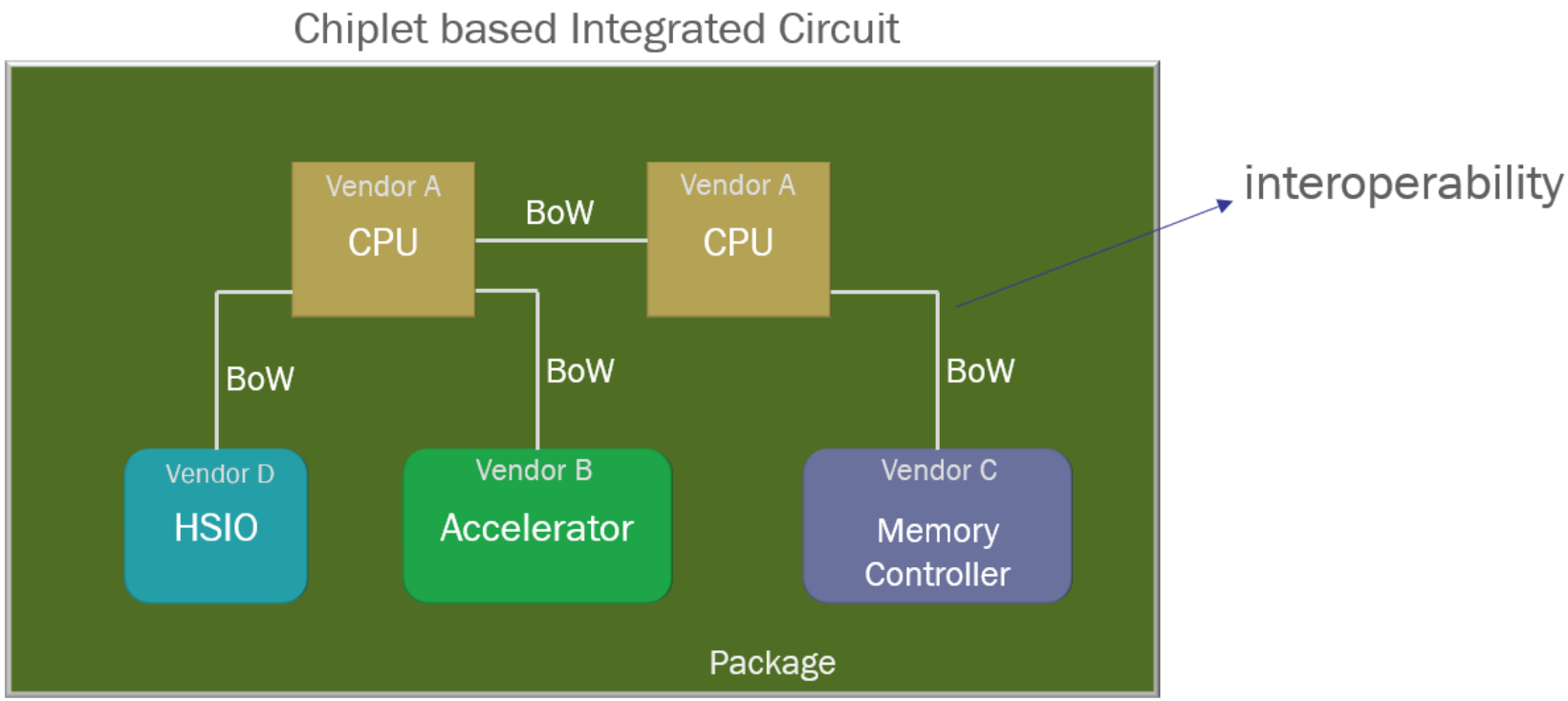
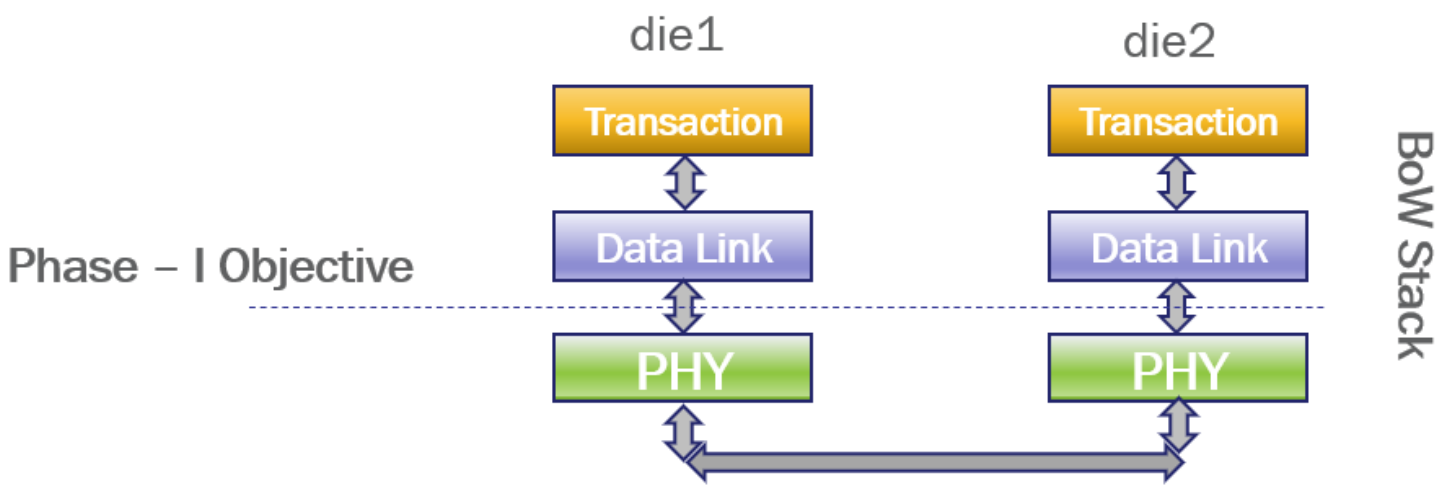
OPEN Compute Project®

Interoperability Key for Chiplet based IC Designs



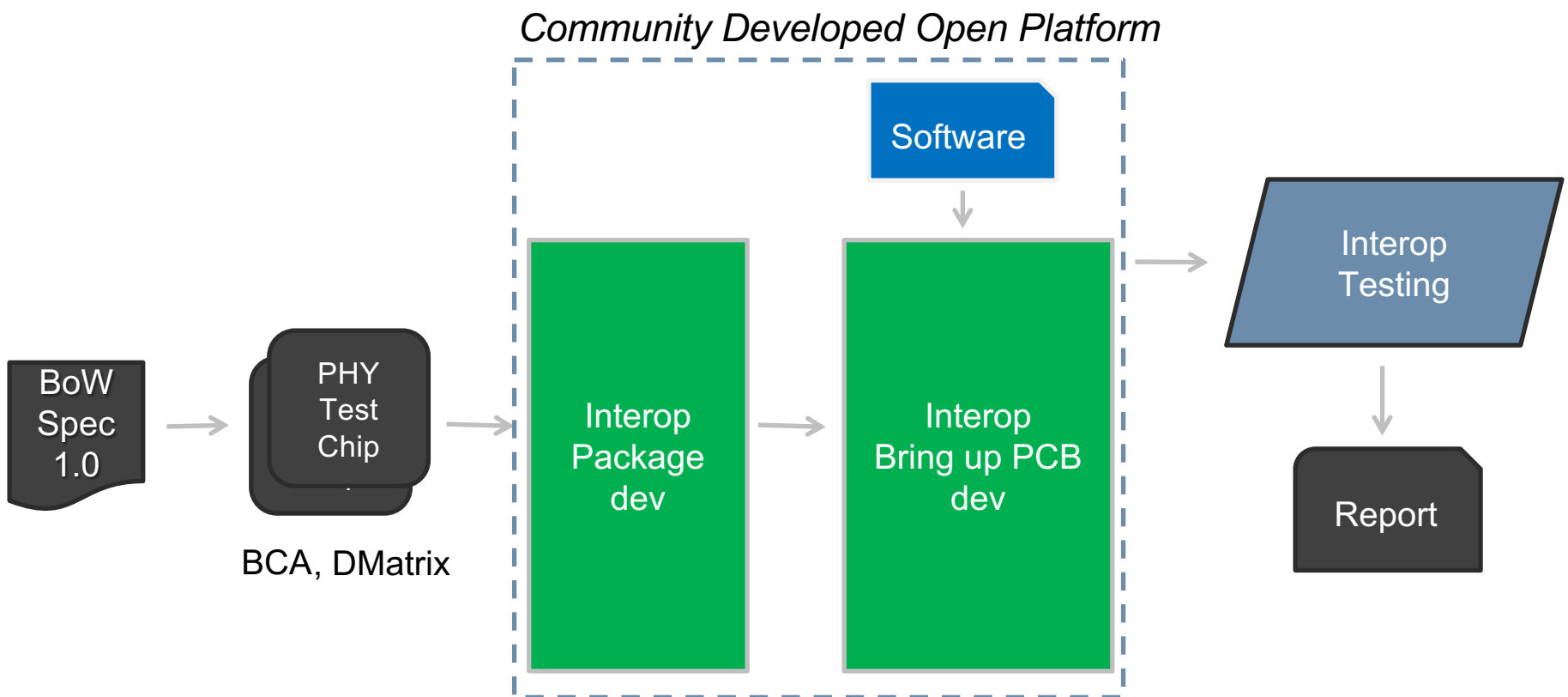
Interop Objective

- Demonstrate interoperability between two independent PHY implementations based on BoW spec 1.0



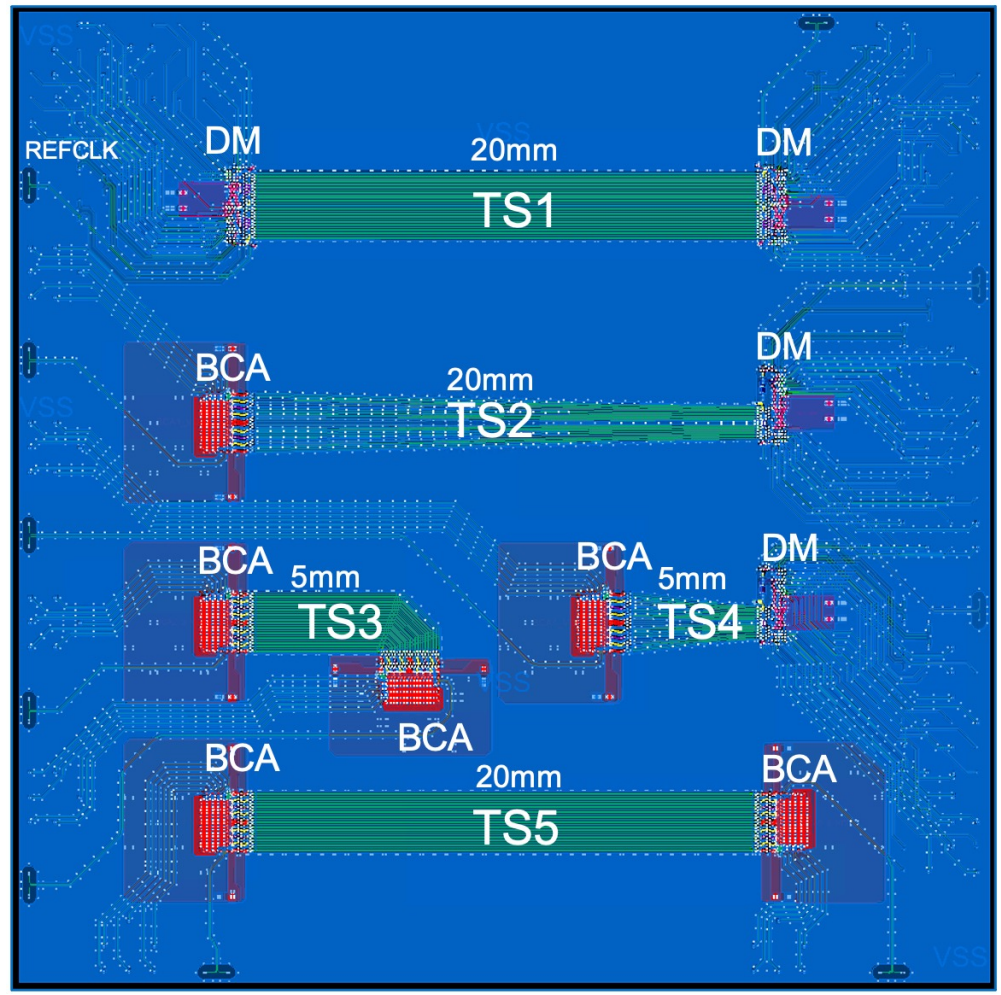
- Bring confidence to adopters

BoW Interop Platform



BoW Interop Community

BoW Interop Substrate



5 Test Structures

10 dies

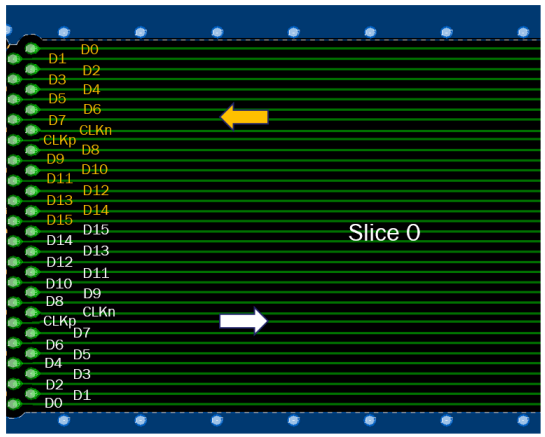
16 Gbps D2D data rate

BoW Interop Substrate

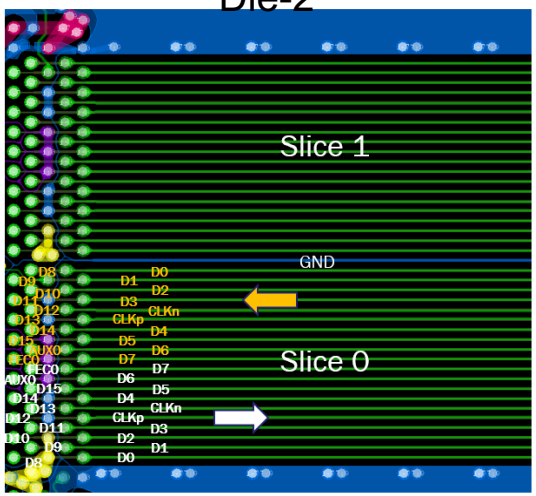
Package Design Attribute	Value
# dies per package	10 (BCA – 6, dMatrix – 4)
Package size	40 x 40 mm FCBGA
Layer count	5-2-5
Bump pitch	130 um
BGA Ball Pitch	1 mm
Package build up dielectric	GL102
# Test Sites	5 .L – 20 mm long trace .S – 5 mm short trace

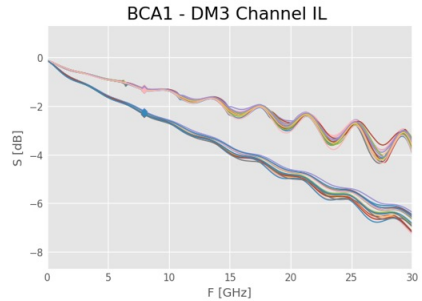
Interop PKG Layout Meets BoW SI Requirements

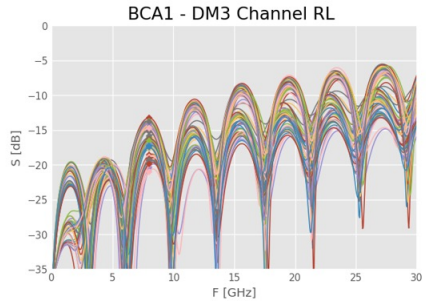
Die-1

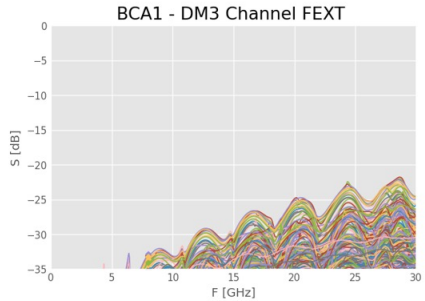


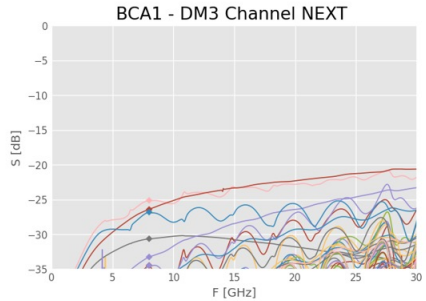
Die-2

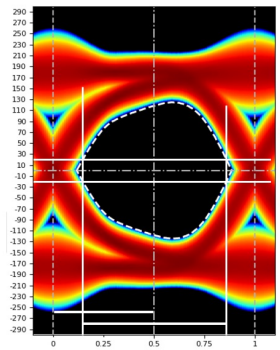






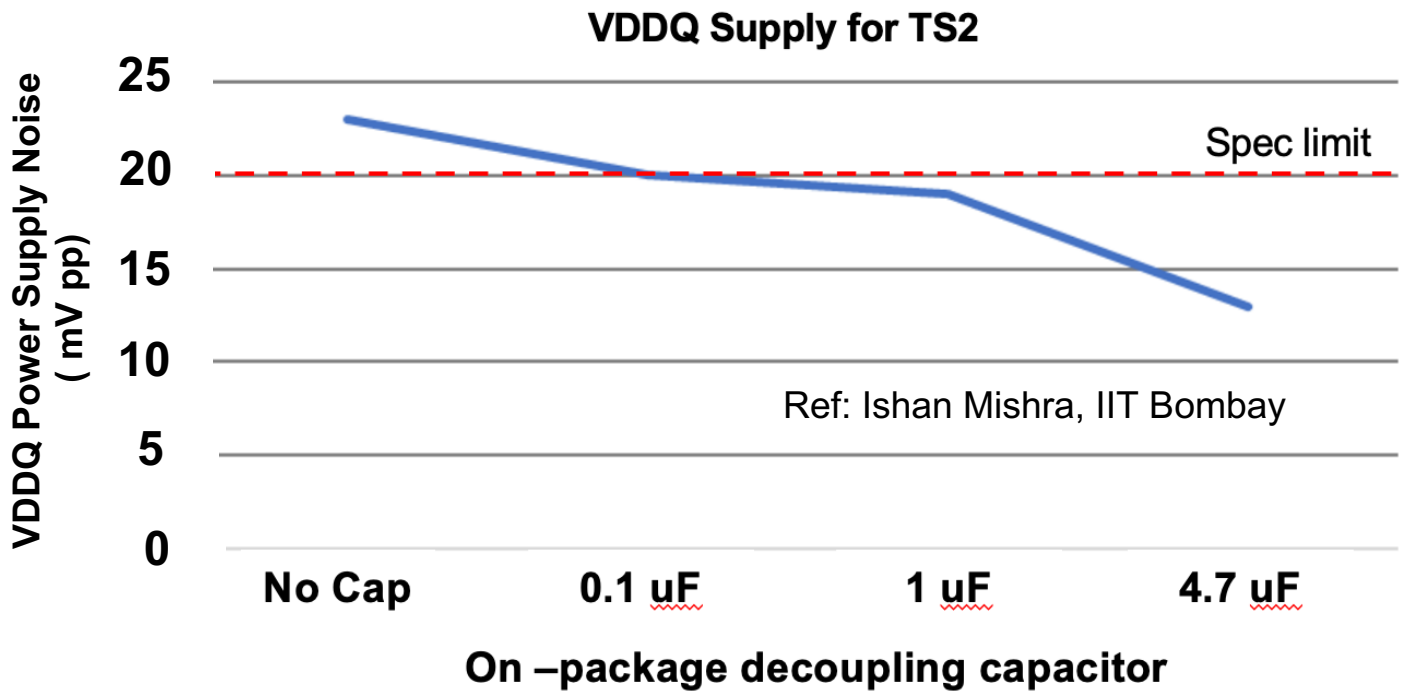






40 mV sensitivity,
EW = 72 % @ 1e-15 BER

Interop PKG meets Power Integrity Specs



Power Integrity Specs met for all power supply rails in all test structures

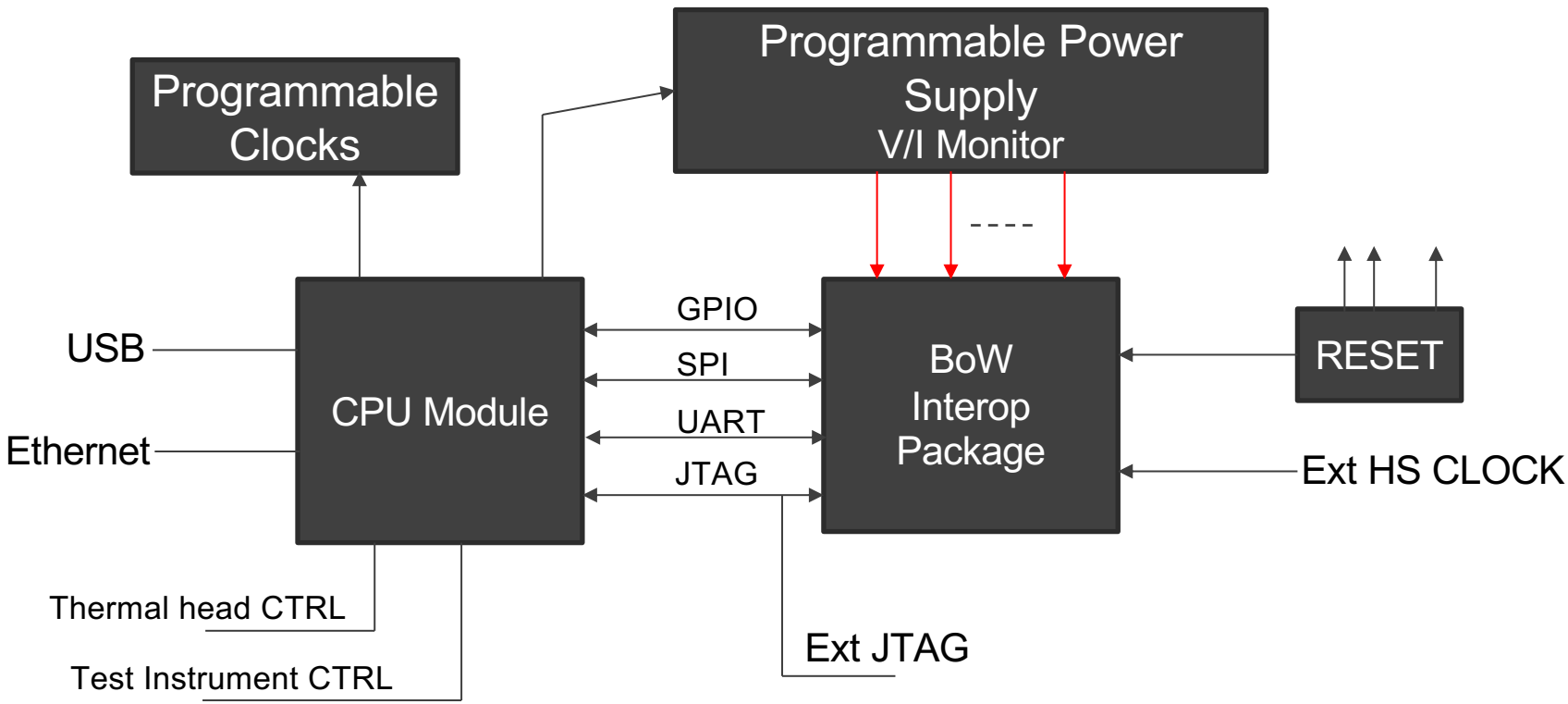
Successfully Addressed Power Integrity Challenges

- High PDN loop inductance
- S-parameter Convergence
- Noise aliasing
- Chip-Package resonance

SI Simulation Challenges

- Extending BoW to 32 Gbps data rates
- Crosstalk – a limiter for performance
- Need better simulation methodologies
  - Excessive EM simulation time for 32 Gbps data rates
  - Include Power bumps as return path in the sim

PCB Platform for Interop Testing



Future Directions

- Fabricate Interop Package and PCB
- Interop Testing and Publish results
- Establish feasibility of 32 Gbps
- New Simulation Techniques for BoW link SI Simulations

Summary

- Facilitate BoW Deployments in commercial products through Interop Testing and Validation
  - First of its kind for chiplets
- Open Interop Platform dev in Progress
- Join us and drive chiplet innovation
  - Weekly Meetings : Wed, 10 – 11 AM

Thank you !