SFF TA -1034

Pluggable Multi-Purpose Module –PMM

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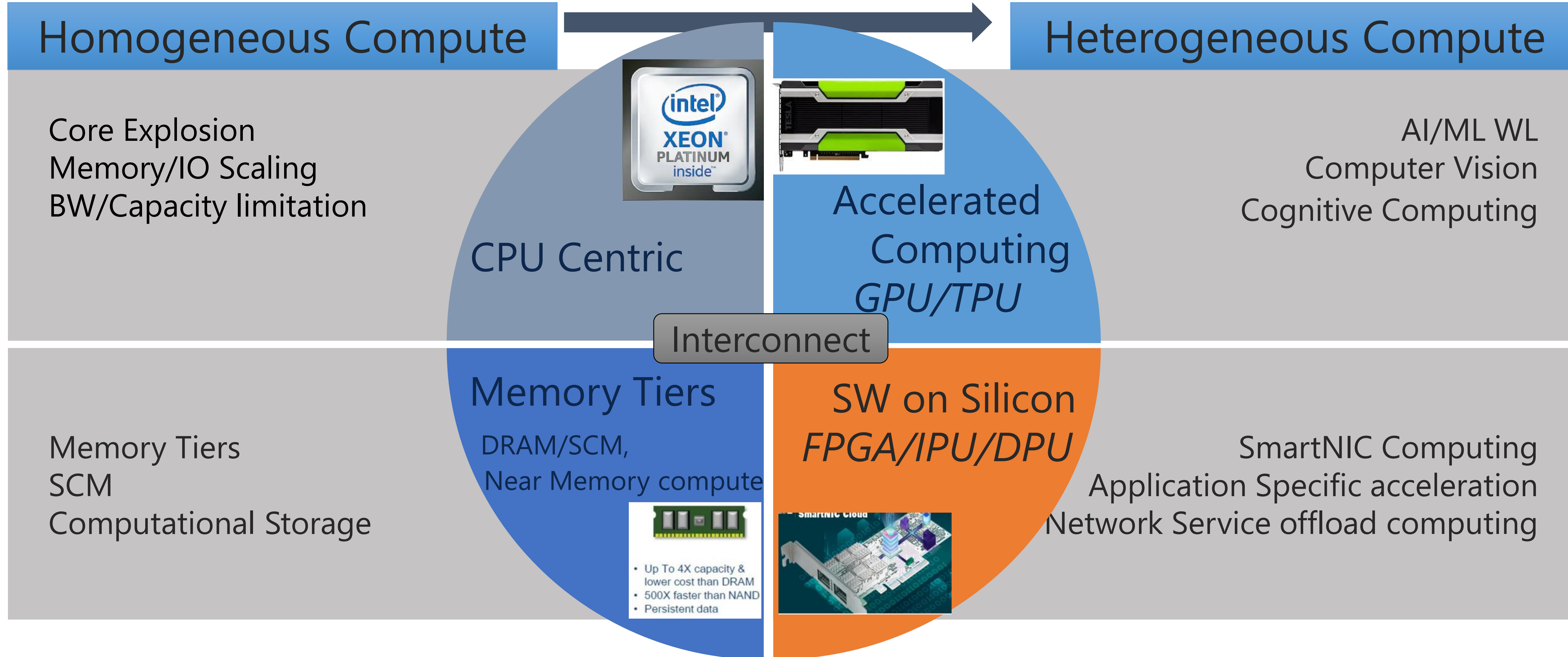
Agenda

- Preamble
  - Why new Form Factor?
- Use Cases
- Electro-Mechanical
  - Form Factor
  - Connector

Paradigm Shift in Computing

Key Drivers

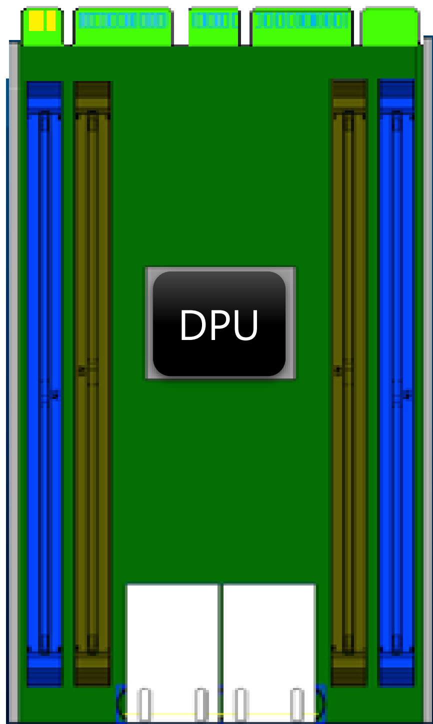
- ML/DL Workloads & disaggregation in Data Center
- Best of breed domain specific Hardware –Leading to Modular server partition

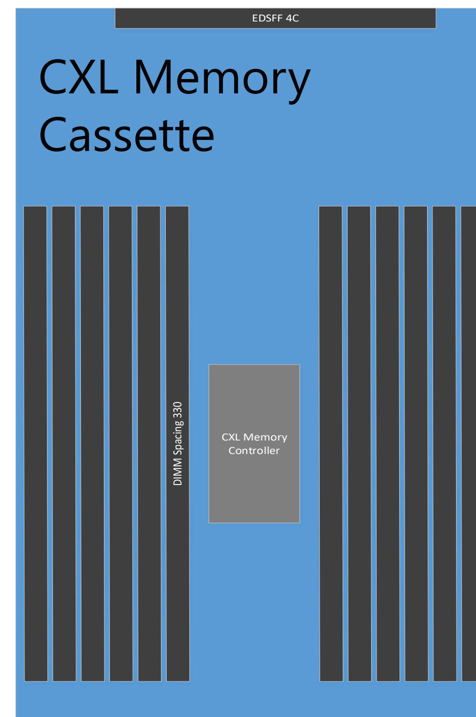


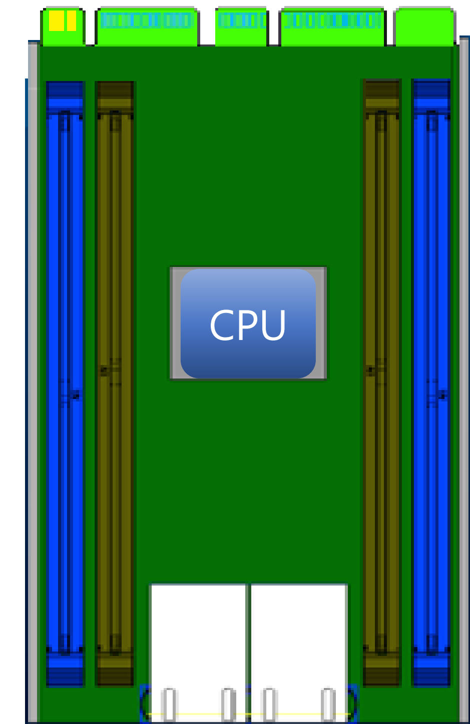
Why new Form Factor?

Use cases

1. sNIC/DPU compute/Accelerators
   - Transition from foundation NIC to high power and high-performance network services including MegaNIC applications
2. High TDP GPU's 200W-400W+
   - Serviceability and better thermal aspects
3. Memory Cassette - > Multi-TB Capacity expansion (e.g –x DIMMs with CXL controller)
   - Transition from local dram DIMMs to capacity/Bandwidth expansion Tier
4. Modular Edge compute/Multi Node (CPU +DIMM +Front IO)
   - Standardized Form factor for Edge compute /Multi node/SP market



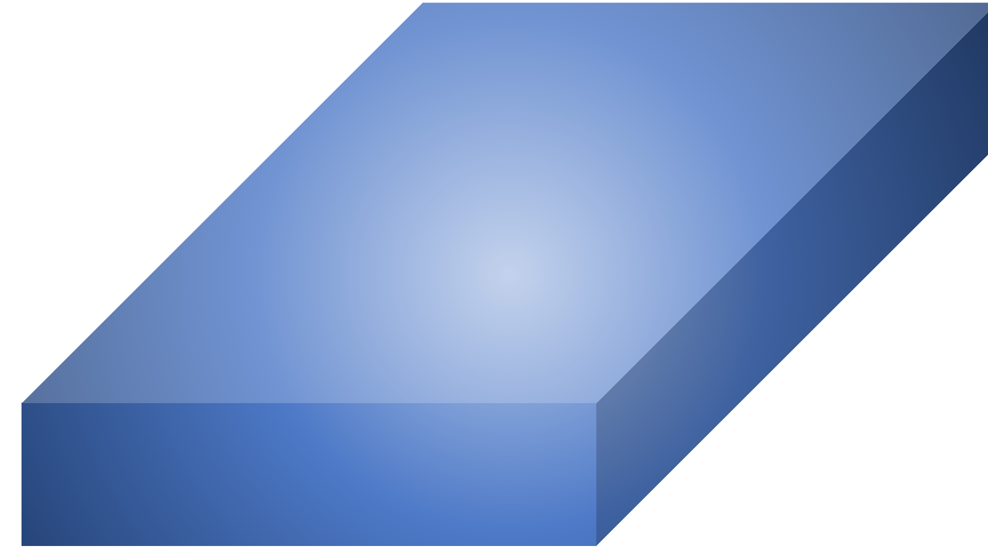




What is a PMM ?

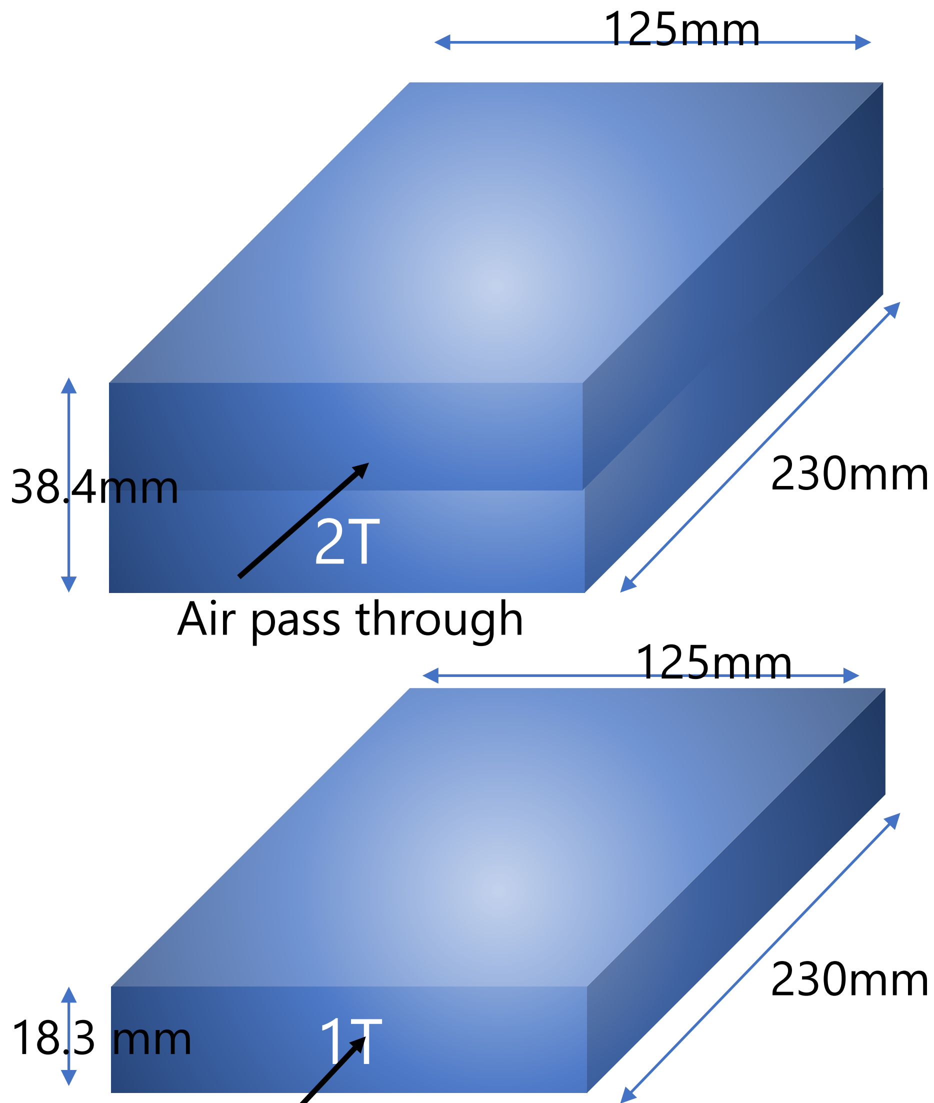
PMM aka Pluggable Multi-Purpose Module defines Electromechanical definition of Module and Host side connector enabling new use cases and as such is new Form factor.

- Working LZ:
  - SFF-TA-1002 like (PCIe/CXL @ G5/G6/G7)
  - Advanced sidebands
    - USB, KX/KR, PESTI
  - Data IO signal Pairs - 2 x 16 Lanes
  - Thermal/Power support up to 200W~600W
  - Thickness: can fit in 1U horizontal
  - Length: DIMMs + other components driven
  - Width: xPU + 8(min) DIMMs driven
  - Height : QSFP 1T , 2T DIMM driven



- Sponsors : Cisco/Intel/HPE

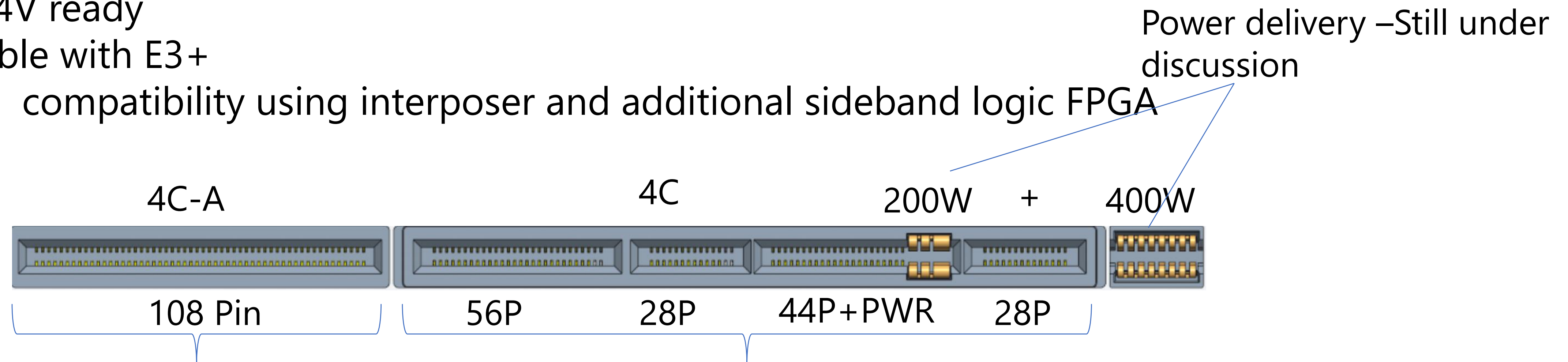
PMM Module Mechanical



- Length**: 230mm (~9") including card edge**.
  - Carrier or latch will add length (separate)
  - Would have mounting provisions
- 2T Thickness: **38.4mm**
  - 38.2 to 38.4mm still under discussion
  - If DIMMs, assumes open top (flush with top)
- 1T Thickness: **18.3mm**
- Width: **125 mm**
  - 125 mm needed to fit in Half width ORV3
- Power Envelope
  - 200W for 1T @ 12V+/- 5%
  - 200- 600W for 2T @ 12V+/-5%
- Thermal
  - Base Assumption for air cooling
    - 200W -> 20 CFM , Pressure 0.5 H20, Ta= 35C
    - 400W -> 30 CFM, Pressure = 0.75 H2O , Ta = 35C
    - 600W may necessitate liquid cooling

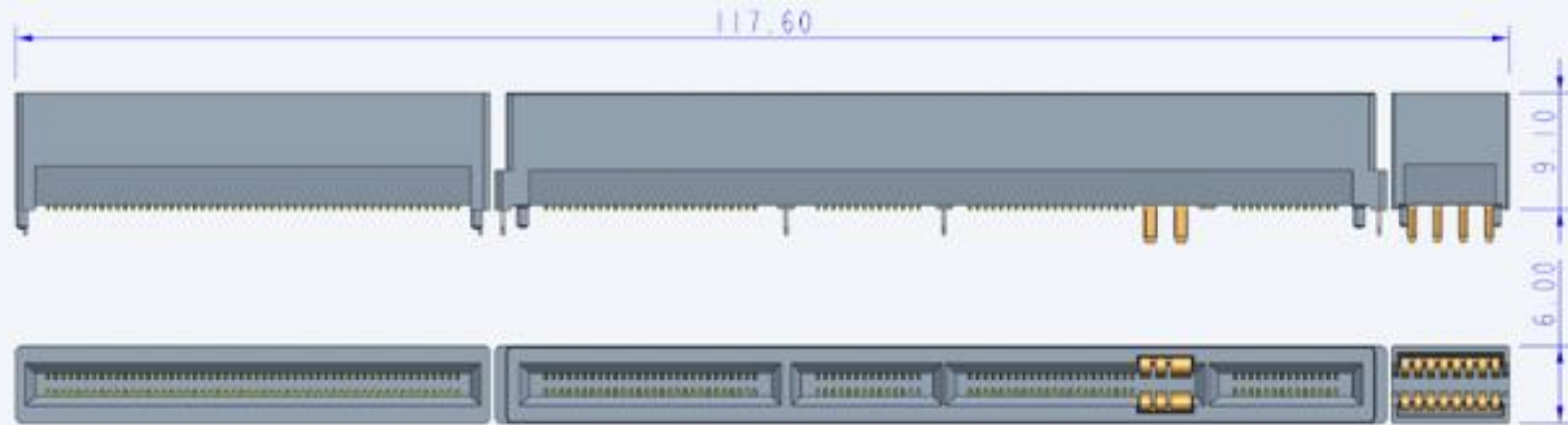
Host side Connector development and Compatibility

- Based on SFF-TA-1002 4C(2 x 4C for x32 lanes) with extra power connector
- 16/32 PCIe/CXL data lanes with advanced Side band Interface
  - 4C-A section adds additional x 16 support
- Capable of 200W - 600W delivered power after derating
- Enhancement to 4C+
  - Power increased to 200W from 80W
  - Redefined + section for advanced sidebands
- Separate 400W Power connector
- Future 54V ready
- Compatible with E3+
- OCP NIC compatibility using interposer and additional sideband logic FPGA

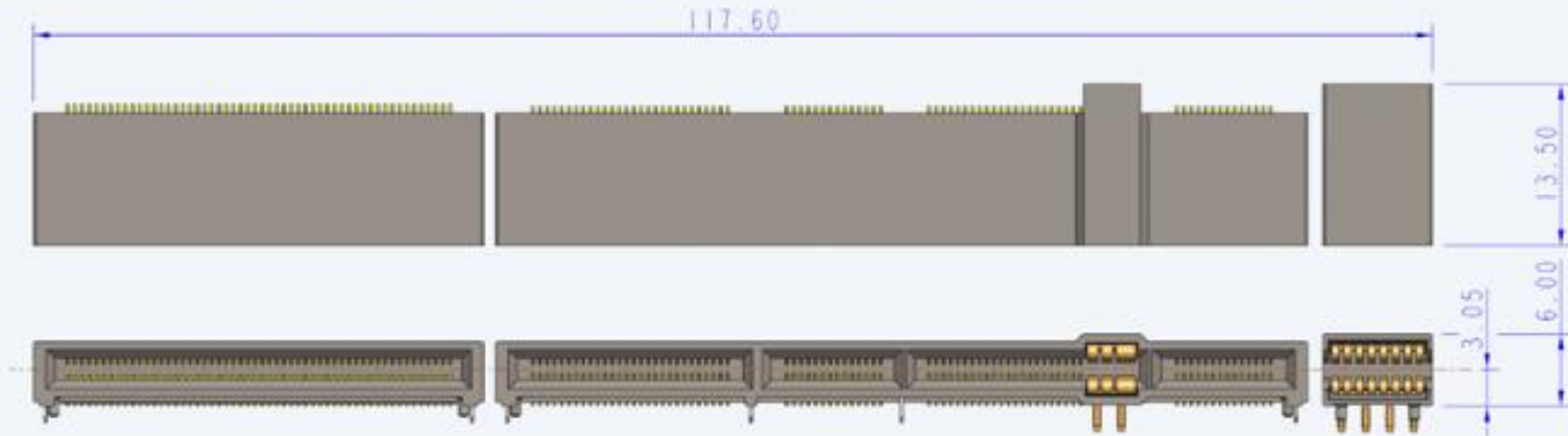


Host side Connector Outline

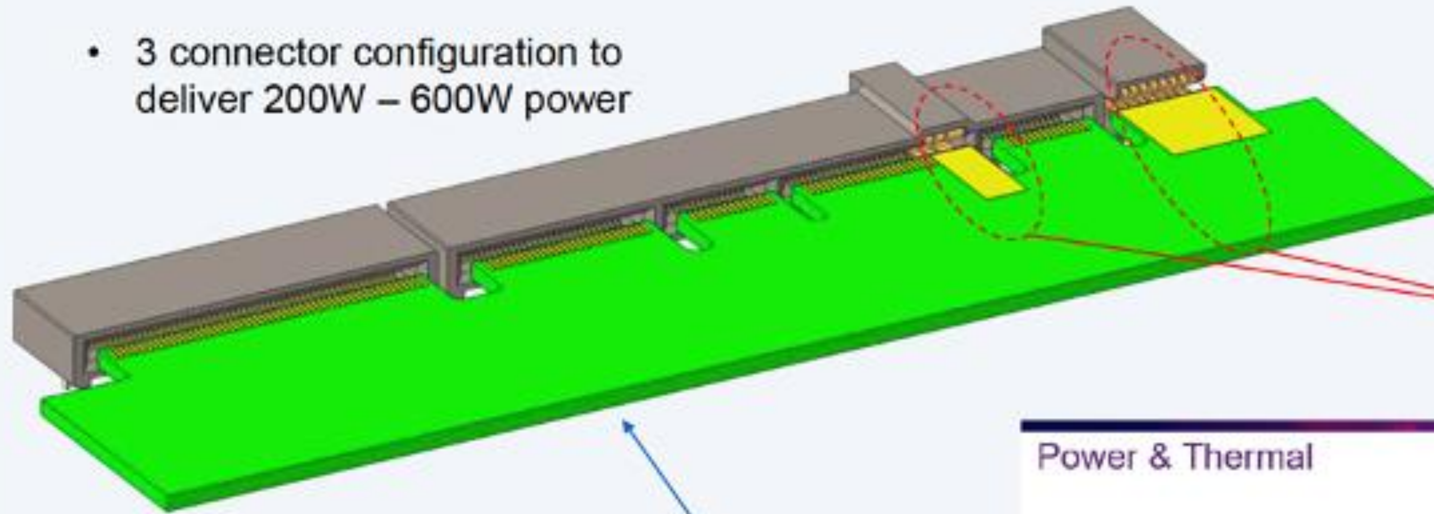
- **Vertical type**



- **Right Angle type**



Connector Mechanical



Deliver Total 600W Power

3pcs AIC card
(108P+168P+Power)

Power & Thermal

- Input Voltage 12V +/- 5%
- Power Envelope
  - 200W for 1T
  - 200-400W for 2T
- Thermal
  - Airflow passes through the enclosure(Unlike over the enclosure)
  - Base Assumption
    - 200W -> 20 CFM , Pressure 0.5 H20, Ta= 35C
    - 400W -> 30 CFM, Pressure = 0.75 H2O , Ta = 35C

SFF TA-1034 Committee Next Steps

- Connector mechanicals (will define in a separate spec to be created)
- Mechanicals
    - Module Drawings
    - System implications (e.g., insertion, extraction force, preload, EMI/ESD requirements
- Pin list/placement changes (as needed)
- Functional Details:
    - Bifurcation
    - Sideband consolidation
- Electrical Requirements
    - Power and sequencing
- Informative info on how to maintain compatibility with OCP NIC, EDSFF E3
- Clean up on all completed sections based on learnings

Please Note lot of things are in draft stage and are subject to change