



Connector Considerations

**100Gb/s Ethernet Electrical Backplane and Twinaxial Copper Cable Assemblies
Study Group**

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Overview



- **Connectors are a critical component in HS differential links.**
- **Implemented channels use various geometries to achieve overall interconnectivity needs.**
- **This flexibility is essential in achieving broad market acceptance of new interfaces.**
- **Single port vs. ganged/stacked ports.**
- **Connectors play an important role in overall technical and economic feasibility of next generation 100 GbE links**
- **Approach used to incorporate performance of various connector styles into channel definition forms part of the scope of the specification**



Overview



- **Historically, standards have considered a very limited set of potential applications for detailed definition, usually the first and simplest.**
- **SFP+ is a good example, SFF documents define channel performance with the SFP+ 20 pin SMT connector**
- **The majority of ports are implemented in OEM equipment on Stacked/Ganged connectors that are much more complex electrically**



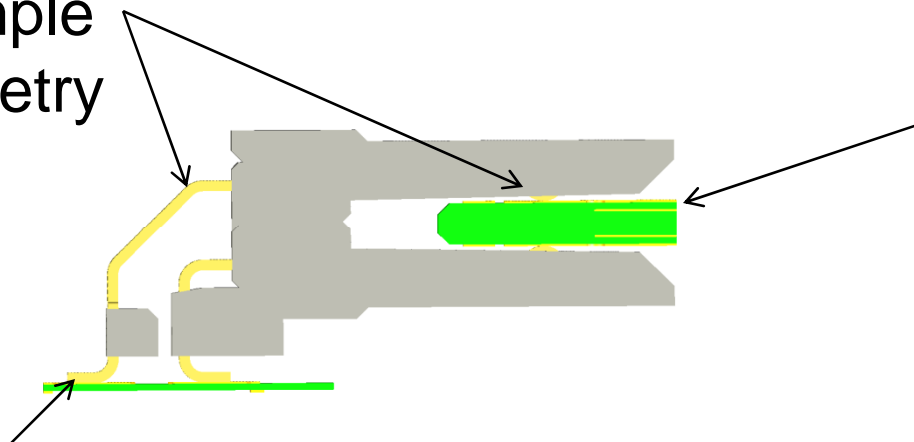
Typical Single Port Connector



Relatively simple
contact geometry

Mating module
PCB

SMT host interface



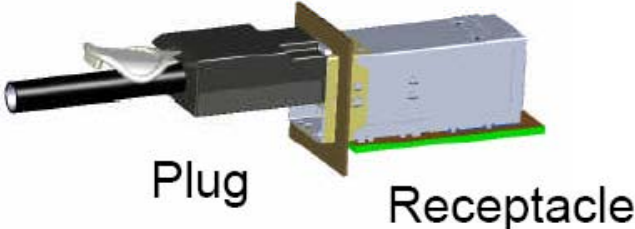
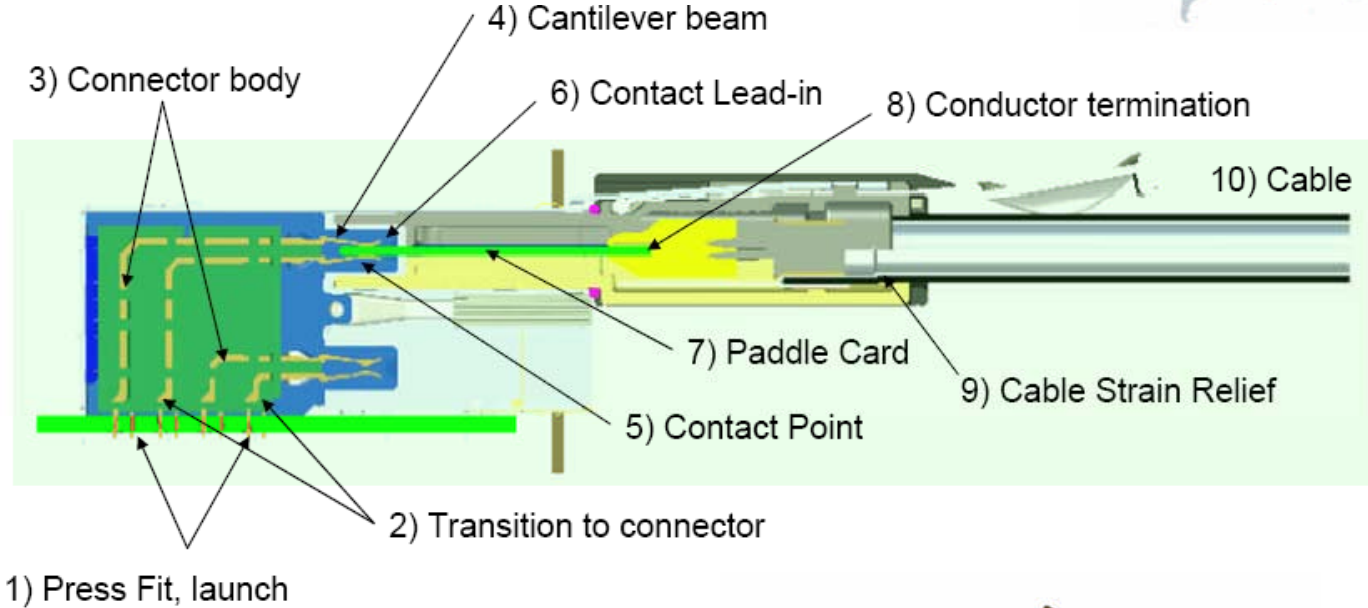
zQSFP+ Connector
4 lane, 100 GbE interface

Short “electrical” length



Typical Stacked Connector

High Speed I/O – Critical Zones

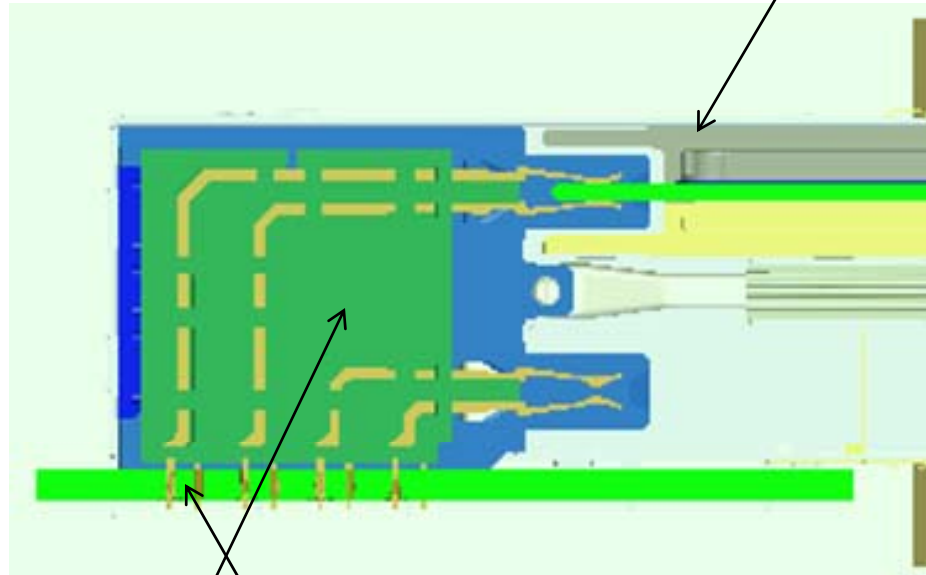


Stacked Connector Details



Long “Electrical” length

Typical Module



zQSFP+ SMT
Approx scale

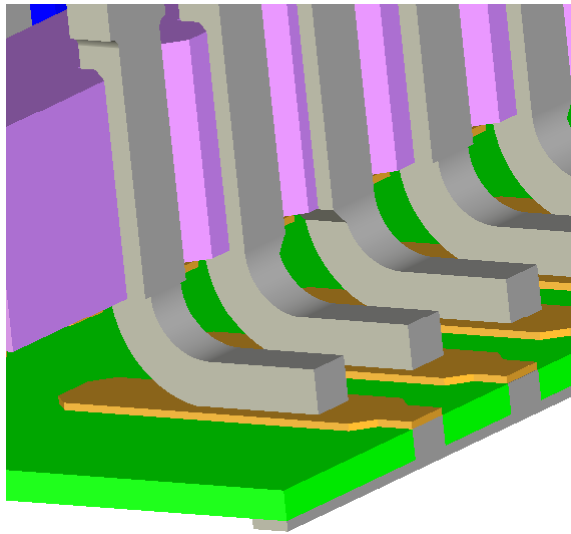
Wafer based construction

Press fit termination,
Complex pin field, routing

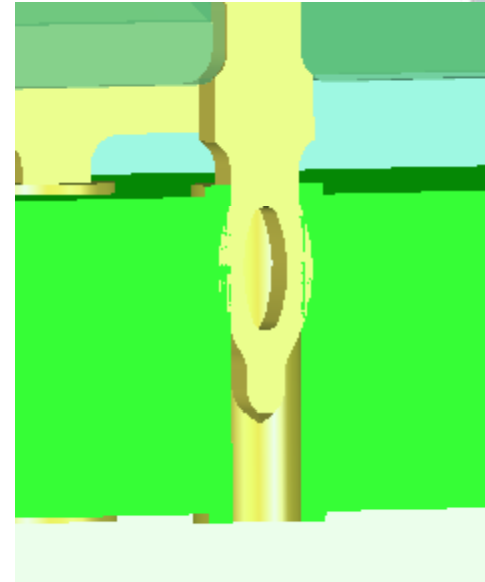
Panel



SMT vs. Press Fit



- Reflow solder connection
- Some stub affects
- Dual Row products, stringent coplanarity
- Less robust to external mechanical stresses
- Simpler overall geometry
- Very difficult to implement for multi slot connector – coplanarity across multiple rows



- Press fit mechanical connection
- Stub affects mitigated by back drilling
- Very robust mechanical structure, immune to external stresses, to a large degree
- Readily implemented for complex multi slot connector structures

Conclusion



- OEM's implement Standards Channels in many ways.
- There is greater complexity, mechanical and electrical, in the stacked styles of connectors that represent the majority of the actual applications.
- To successfully develop and deploy 25 Gb/s interfaces, all types of end product applications need to be considered in developing standards and compliance requirements.
- These issues are a significant problem with today's 10 Gb/s interfaces, and problems will be greatly increased at 25 Gb/s.



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