



Tyco Electronics proposal for new internal and external High Density Mini-SAS Connector System

*Electrical Connector and Mechanical Cage for Pluggable
Interfaces for up to 12 Gbps / Channel*

Submittal Date: March 10 2008

Our Commitment, Your Advantage

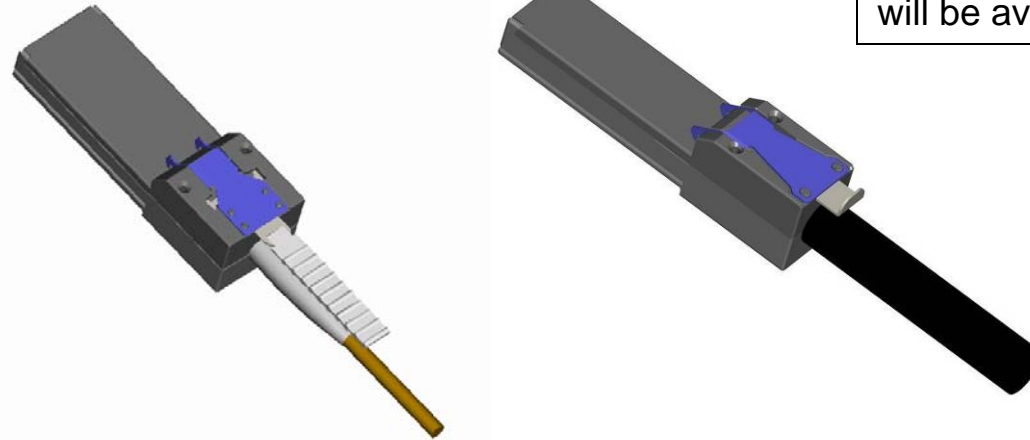
Tyco Electronics new High Density Mini-SAS proposal provides the following advantages to customers using Mini-SAS.

- Suitable for next 2 generations of SAS: 6 & 12 Gbps
- PCI bracket compatible
- External Push/Pull Latching capability
- Improved Insertion and Return Loss Performance
- External Fiber Cable Option
- External Active Cable Assembly Option
- Heat sink compatible designs for External connectors
- External Single port or multi-port configurations
- Various EMI containment options

Physical Information



External Embedded Fiber and Copper Plug Cable Description

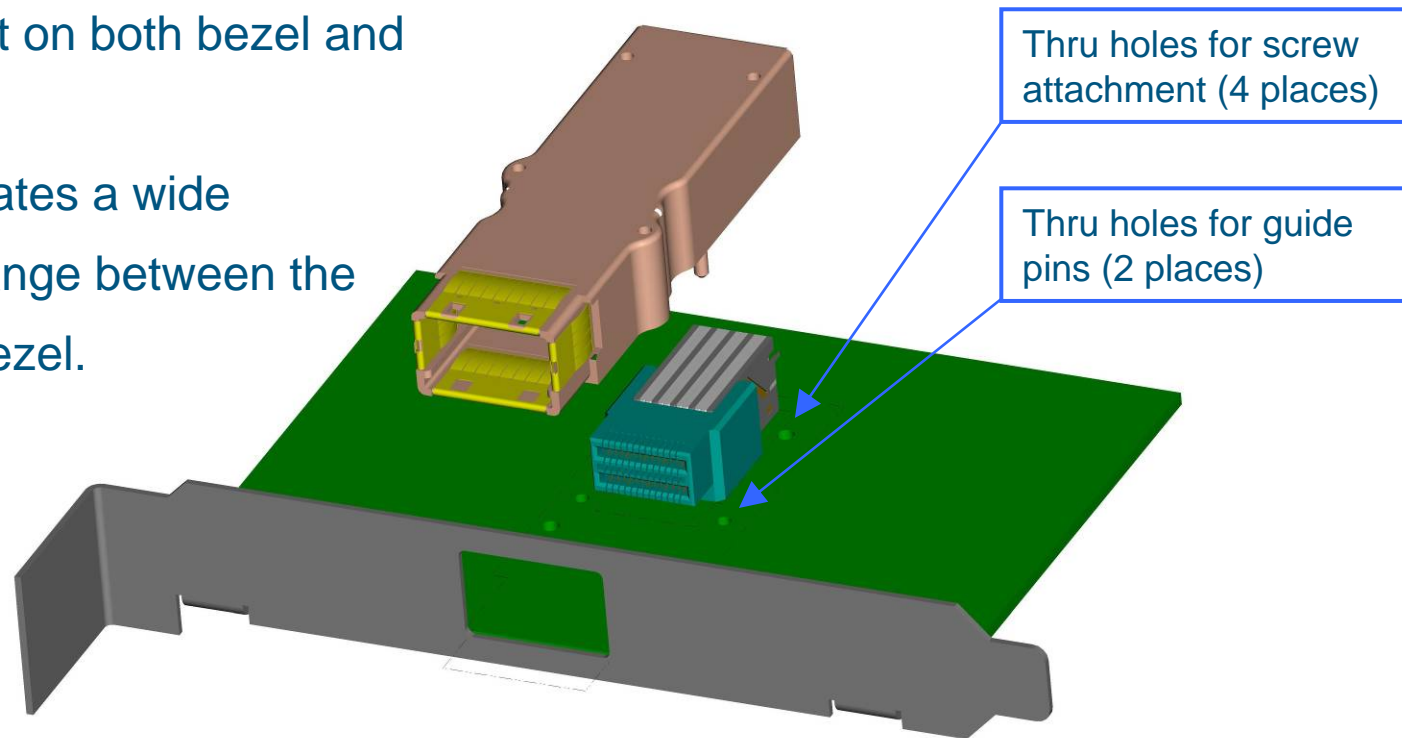


26, 28 and 30 AWG Cable will be available

	Embedded Fiber	Copper
Cable Diameter	TBD	11mm(1 cable), 8.2mm(2 Cables)
Cable Construction	16 fiber	
Cable Bend Radius, min	TBD	6X Cable Dia
Industry Specification	TIA-492AAAC-XBAX ICEA S-83-596-2001	
Max Cable Length @ 10Gbps	100 Meters	TBD (Active)
Power (Watts)	2.0 – 2.5 max	1.5 max (Active)

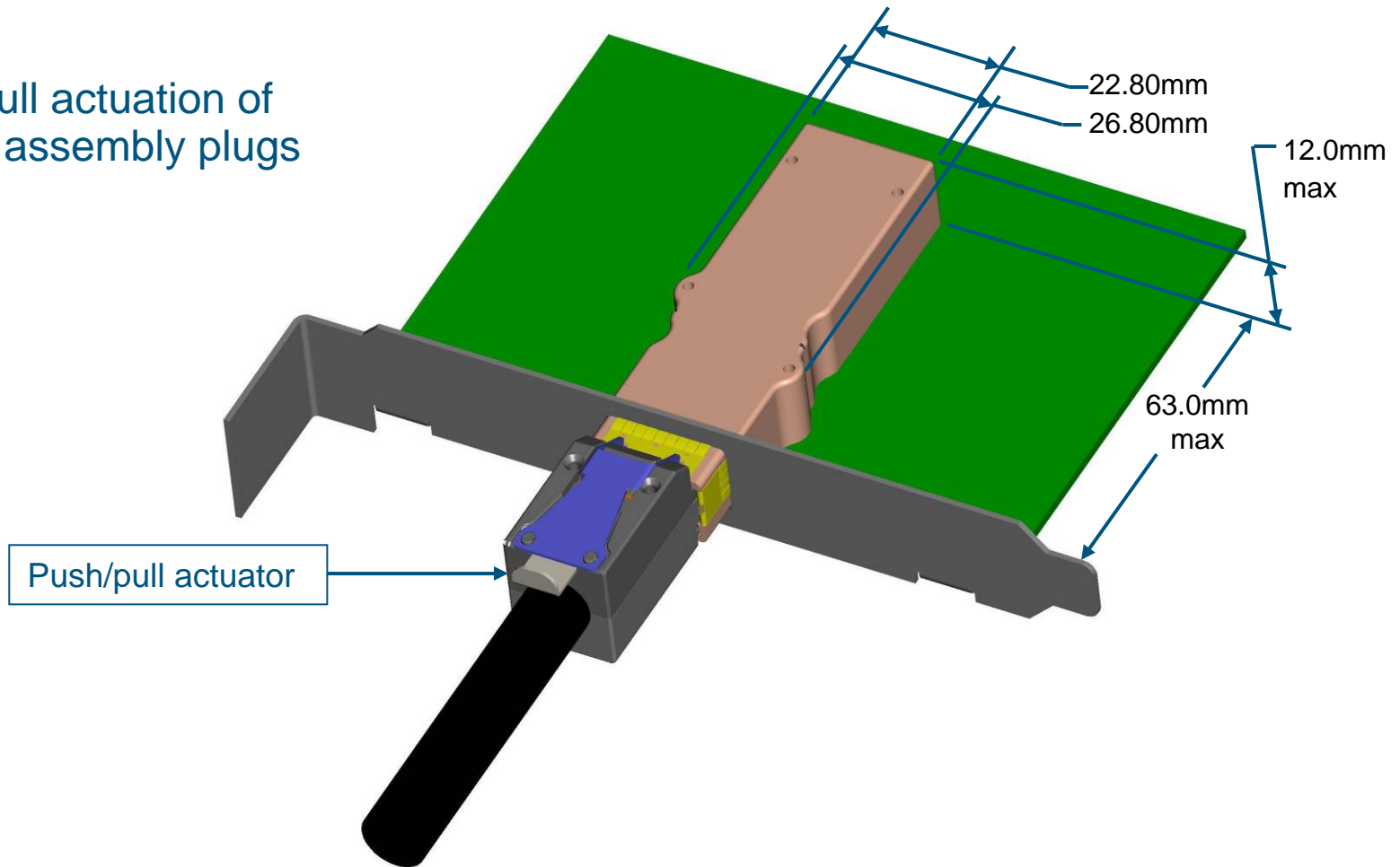
External PCI Compatible Single Port Receptacle with optional EMI Springs

- EMI Springs provide full EMI containment on both bezel and cable plug
- Accommodates a wide tolerance range between the cage and bezel.

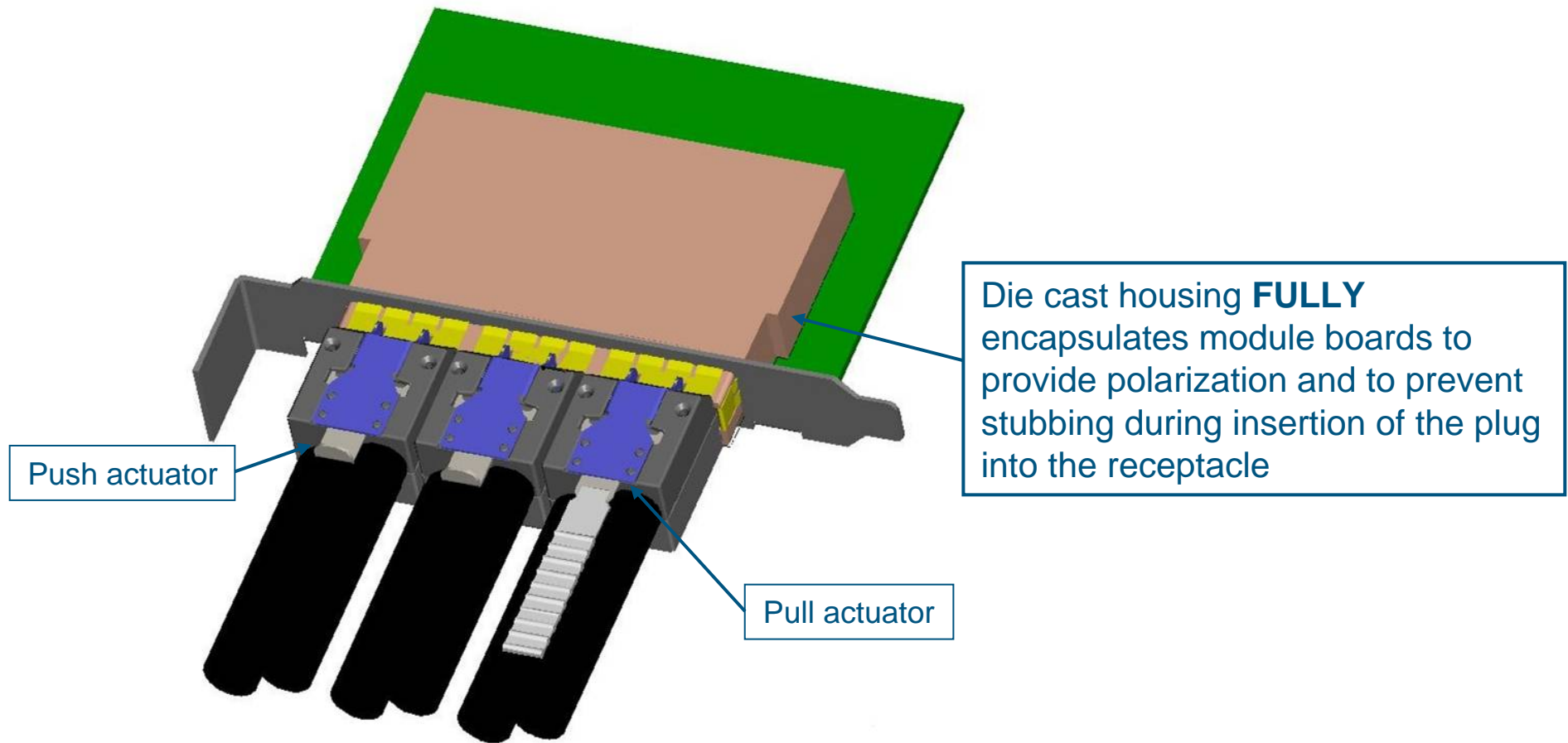


External Single port PCI Configuration

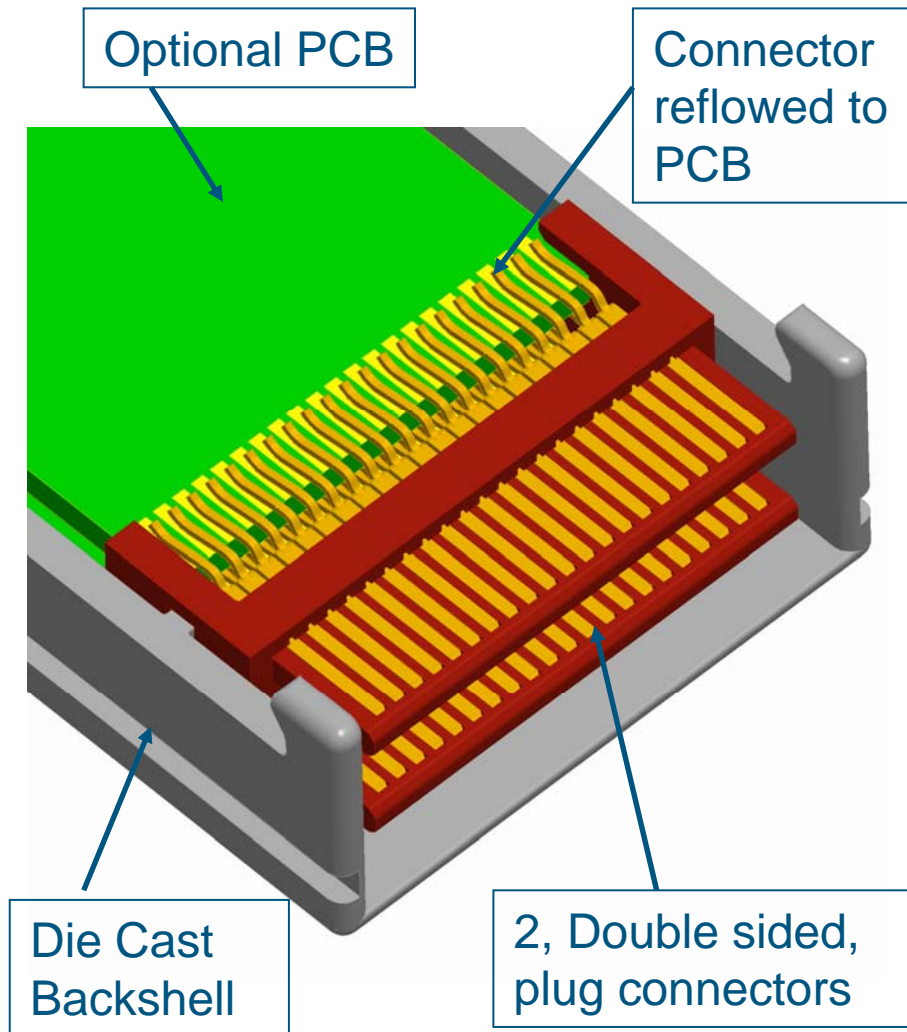
Push-pull actuation of
cable assembly plugs



External 1x3 Multi-Port PCI Configuration



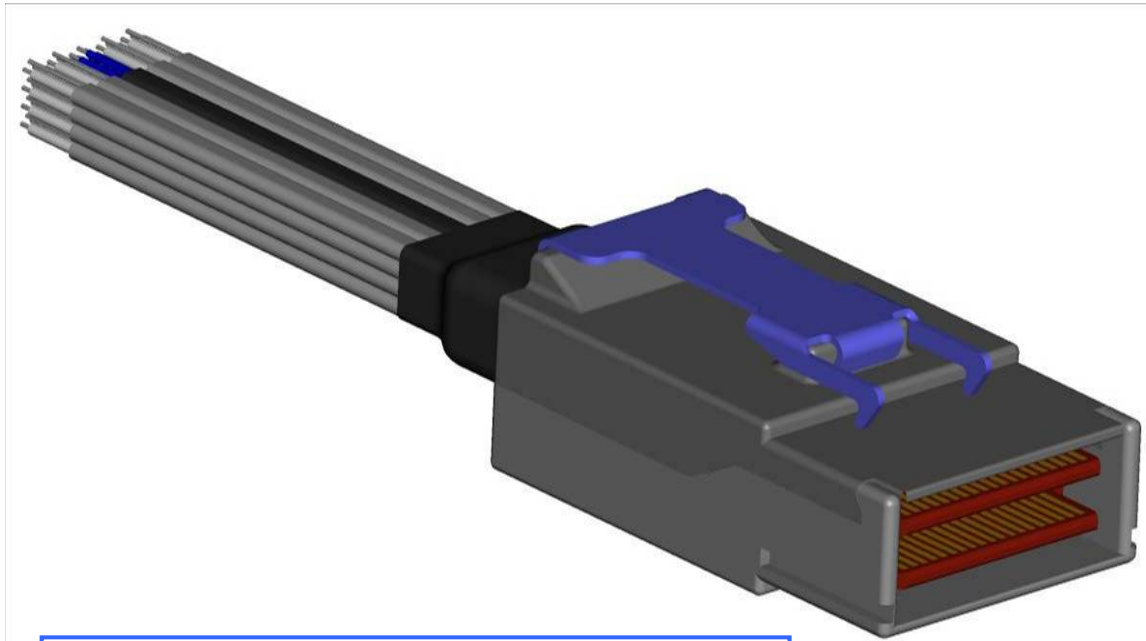
2-Piece Active Component Plug System



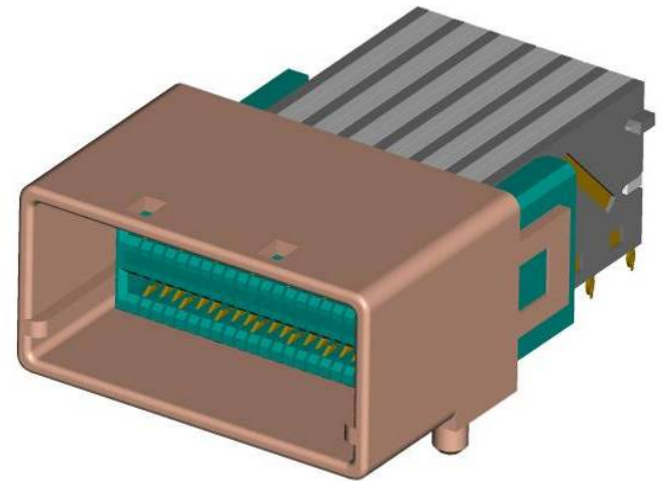
- Adding a straddle mount connector:
 - Eliminates hard gold plating on the module board
 - Permits tighter tolerances between the contact pads and exterior surfaces
 - Lowers the cost of the module pcb
 - Increases the vendor base for PCB suppliers
 - Improves durability to 500 cycles

Internal Assembly Details

Preassembled
Single Unit

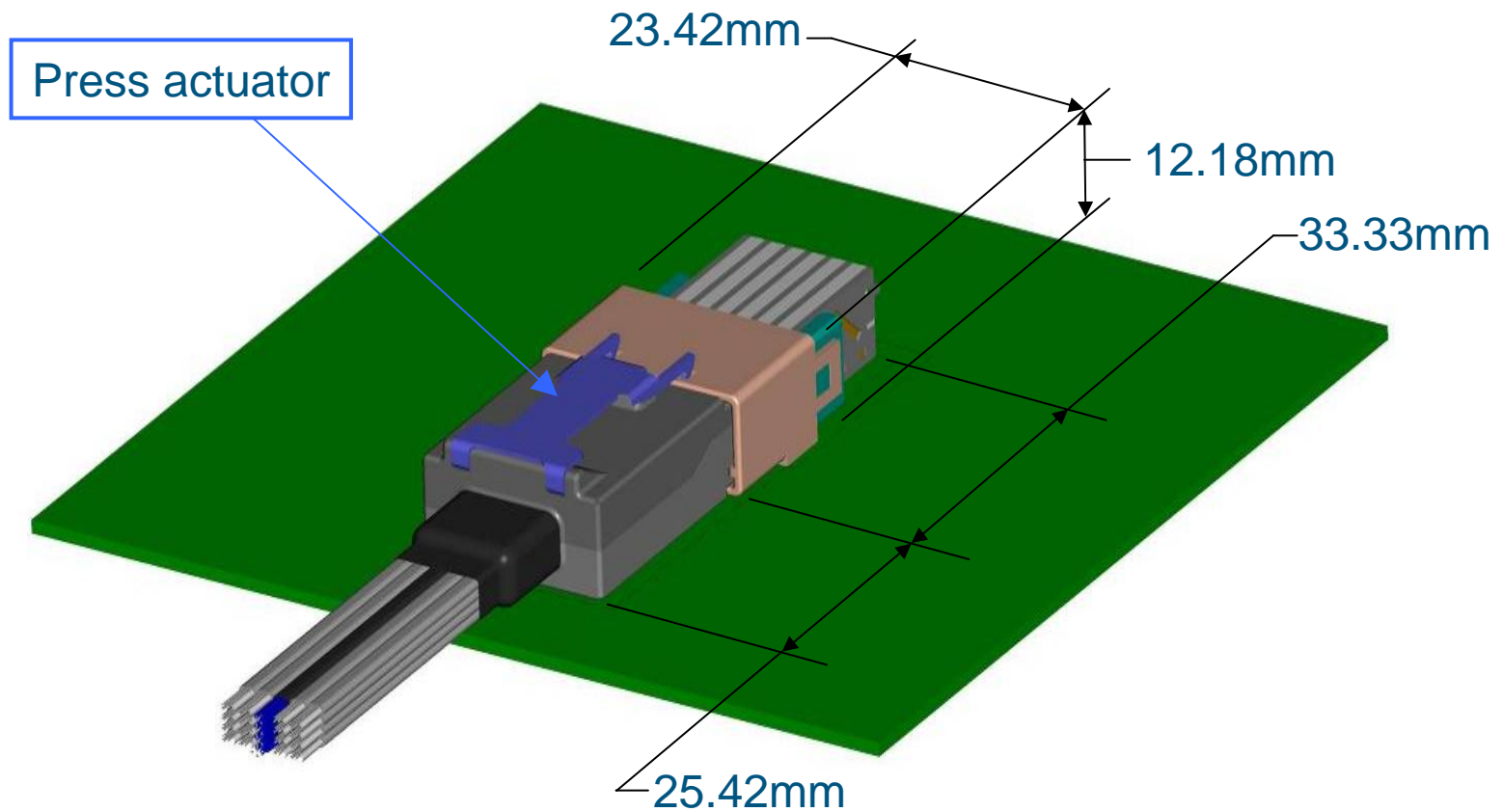


Plastic shell with guide rails to prevent stubbing during insertion of the plug into the receptacle

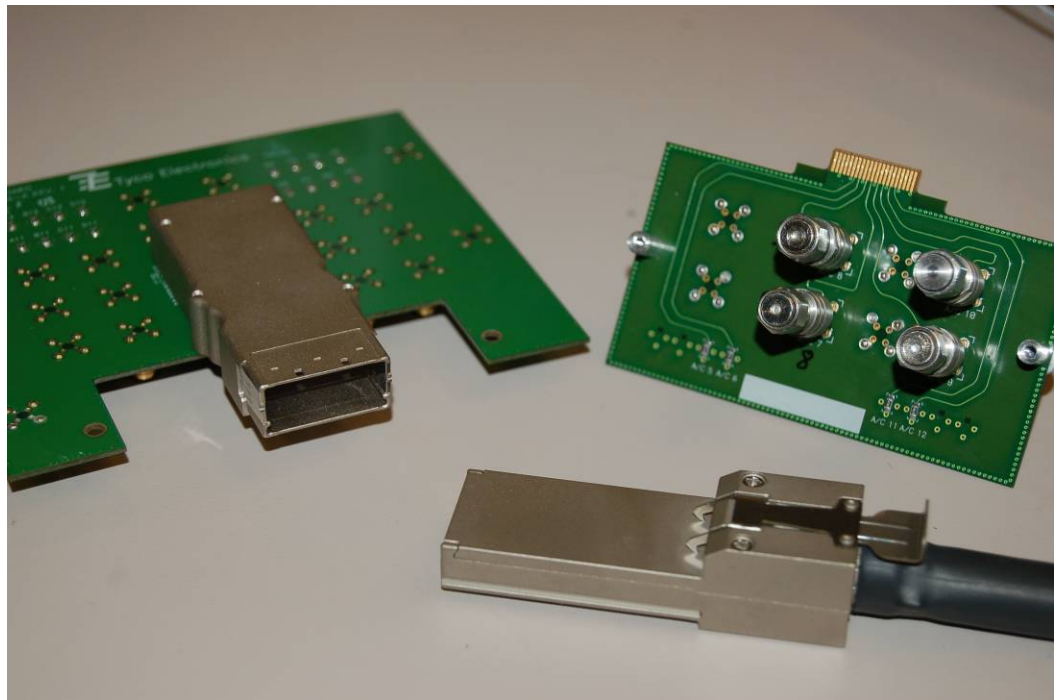


Press fit pins

Internal Single Port 38/38 Position Configuration



Electrical Performance Summary



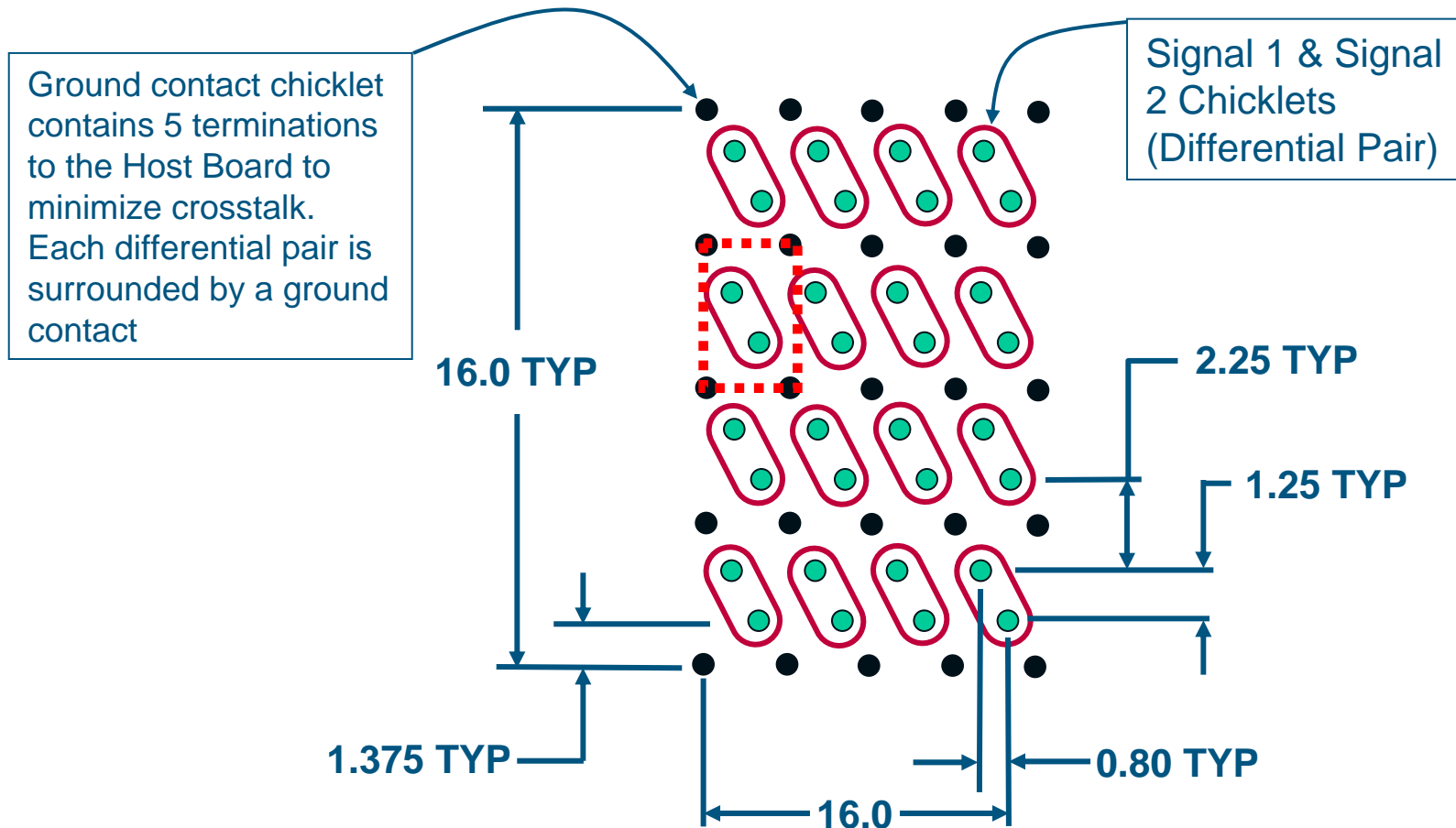
Electrical Performance Update

- Product has been fully simulated and various .s4p, .s8p, and .s16p files are available for the interface and/or cable assembly
- Production assemblies are in test, with the following data collected
 - Characteristic Impedance (Time domain)
 - *Interface (module usage) – testing complete*
 - *Two piece connector version with cable attached to contacts – testing complete*
 - Card edge with cable attach - simulation
 - NEXT and FEXT (Time domain)
 - *Interface (module usage) – testing complete*
 - *Two piece connector version with cable attached to contacts – testing complete*
 - Card edge with cable attach - simulation

Electrical Performance Update, cont'd

- Production assemblies are in test, with the following data collected
 - Insertion and Return Loss
 - *Interface (module usage) – testing complete*
 - *Two piece connector version with cable attached to contacts – testing complete*
 - Card edge with cable attach - simulation
 - NEXT and FEXT (frequency domain)
 - *Interface (module usage) – testing complete*
 - *Two piece connector version with cable attached to contacts – testing in process*
 - Card edge with cable attach - simulation

External Receptacle Host Board Layout



3 Chicklet Approach; Ground, Signal 1 & Signal 2

Optional Pinouts

- Existing external assemblies are 26 positions
- Potential to add additional contacts for power, I²C, or other user defined features



Pinout Options

- Proposed offerings for Mini-SAS applications are 26 positions for external and 38 positions for internal assemblies
 - Requests have been made by various customers for the ability to increase the density of the 38 position internal assembly
 - Additional request have been made to add power and EEPROM features to the external assembly
 - Active cable assemblies for longer distances
 - Active equalization options
 - External attach optics
 - Is it practical to make this work with the current interface?

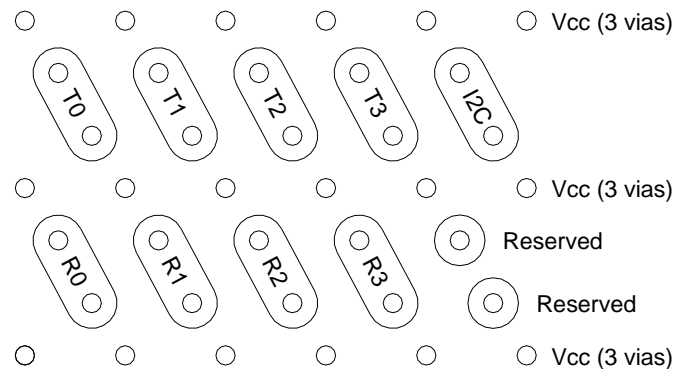
Pinout Studies, Cont'd

- Comparison of powered to non-powered options
 - There are various potential options for a stacked interface
 - What will users require?



Powered External Proposals

- Does it make sense to make a unique interface for powered external applications?
 - Powered assemblies cannot be used in older receptacles
 - Older cables may not work at higher data rates



SAS Style 2 (32pos)
Powered External

Questions?

- For more information or if you have questions you can contact one of the following people.
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