Tyco Electronics Powered 4X Mini SAS Proposal
T10/08-435r1

October 31, 2008
Our Commitment, Your Advantage

TE’s new High Density Mini-SAS proposal provides the following advantages to customers using Mini-SAS technology.

• Suitable for next generations of SAS: 6 & 12 Gbps
• PCI bracket compatible
• Pull Tab Latching capability
• Improved Insertion and Return Loss Performance
• Designed for External Fiber Cable Option
• Designed for Active Cable Assembly Option
• Heat sink compatible designs
• Single port or multi-port configurations available
• Various EMI containment options
Physical Information
## External Embedded Fiber and Copper Plug Cable Description

<table>
<thead>
<tr>
<th></th>
<th>Embedded Fiber</th>
<th>Copper</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cable Diameter</strong></td>
<td>6.2mm</td>
<td>8.2mm</td>
</tr>
<tr>
<td><strong>Cable Construction</strong></td>
<td>12 fiber</td>
<td>8 Pair</td>
</tr>
<tr>
<td><strong>Cable Bend Radius, min</strong></td>
<td>5x Dia</td>
<td>6X Cable Dia</td>
</tr>
<tr>
<td><strong>Industry Specification</strong></td>
<td>TIA-492AAAC-XBAX</td>
<td>ICEA S-83-596-2001</td>
</tr>
<tr>
<td><strong>Max Cable Length @ 12Gbps</strong></td>
<td>100 Meters</td>
<td>10 (Passive)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>30 (Active)</td>
</tr>
<tr>
<td><strong>Power (Watts)</strong></td>
<td>2.0 – 2.5 max</td>
<td>1.5 max (Active)</td>
</tr>
</tbody>
</table>
External PCI Compatible Single Port Receptacle with optional EMI Springs

- EMI gasket provide full EMI containment on bezel.
- EMI springs provide full EMI containment on cable plug.
- Accommodates a wide tolerance range between the cage and bezel.
External Single port PCI Configuration

Pull actuation of cable assembly plugs

Pull tab actuator
External Single port PCI Configuration

- New Single port powered option is smaller than existing Mini SAS single port width.
External Single port PCI Configuration

- Significant reduction in panel to cable clearance requirements
- Elimination of wasted space in plug nose and keying region.
External Single Port Comparison to MiniSAS

- Reduced overall length (receptacle + external plug details + cable radius)
- Less stress on receptacle
- All active components contained inside panel
Connector Dimensional Information

• Connector dimensional information is covered in the SFF-8634 specification (ftp://ftp.seagate.com/sff/)
• Contact and interface dimensioning not specified in SFF-8634 is covered by SFF-8086
Powered 4x External Mini SAS

- Powered 4x External Mini SAS extension (External)
  - Uses existing Mini SAS SFF-8086 contact (same P/N)
    - Limited or no additional qualification
  - Increased pin count from 26 to 32 positions
  - Receptacle improvements
    - Offer behind the bezel and through bezel options
    - Use bail style latch
    - Increased cage height allows for powered devices to be inside cabinet
  - Eliminate sidewalls on connector
    - Less chance of stubbing on through-bezel receptacle
    - Eliminate tab feature on plug (reduce expense, reduce damaged/bent plug housings)
  - Fully boxed interface
    - More robust interface.
Pinout Suggestions

• Add 6 positions to existing 26 position, external connector
  – Add EEPROM (I²C) 2 pins
  – Add Vcc₁ and Vcc₂ (3.3V and variable power supply) 2 pins
  – Add 2 additional reserved pins

  – Total of 32 positions
Powered External Proposals

• A unique interface for powered external applications makes sense because . . .
  – It prevents damage due to mismatched power pin assignments.
  – Older cables may not work at higher data rates
  – Active cables will not work in older systems
  – I2C can be used to properly set pre-emphasis and post equalization values to assure proper operation
Questions?

• For more information or if you have questions you can contact one of the following people.
• Mike Walmsley – Product Manager
  – Email: mjwalmsl@tycoelectronics.com
  – Phone: 717-985-2835
• Michael Fogg – Senior Principal Engineer, Signal Integrity and EMI
  – Email: mike.fogg@tycoelectronics.com
  – Phone: 717-986-5802
• Scott Shuey – Senior Standards Engineer
  – Email: scott.shuey@tycoelectronics.com
  – Phone: 717-592-3371
• Dan Gorenc – Product Engineer
  – Email: daniel.gorenc@tycoelectronics.com
  – Phone: 717-986-3518