Electronic Connector Trends

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Director of Product Technology

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# Global Connector Market Size

<table>
<thead>
<tr>
<th>Rank</th>
<th>Company</th>
<th>North America</th>
<th>Europe</th>
<th>Japan</th>
<th>China</th>
<th>Asia Pacific</th>
<th>ROW</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>TE Connectivity</td>
<td>$2,131</td>
<td>$2,795</td>
<td>$547</td>
<td>$1,660</td>
<td>$902</td>
<td>$176</td>
<td>$8,211</td>
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<tr>
<td>2</td>
<td>Amphenol</td>
<td>$1,670</td>
<td>$991</td>
<td>$107</td>
<td>$1,616</td>
<td>$647</td>
<td>$208</td>
<td>$5,238</td>
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<tr>
<td>3</td>
<td>Molex Incorporated</td>
<td>$1,215</td>
<td>$574</td>
<td>$429</td>
<td>$1,279</td>
<td>$672</td>
<td>$0</td>
<td>$4,169</td>
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<tr>
<td>4</td>
<td>Delphi Connection Systems</td>
<td>$1,235</td>
<td>$757</td>
<td>$4</td>
<td>$522</td>
<td>$158</td>
<td>$61</td>
<td>$2,736</td>
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<tr>
<td>5</td>
<td>Yazaki</td>
<td>$369</td>
<td>$295</td>
<td>$541</td>
<td>$406</td>
<td>$627</td>
<td>$221</td>
<td>$2,459</td>
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<tr>
<td>6</td>
<td>Foxconn (FIT)</td>
<td>$164</td>
<td>$85</td>
<td>$24</td>
<td>$1,514</td>
<td>$509</td>
<td>$31</td>
<td>$2,328</td>
</tr>
<tr>
<td>7</td>
<td>JAE</td>
<td>$159</td>
<td>$69</td>
<td>$318</td>
<td>$737</td>
<td>$124</td>
<td>$21</td>
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<tr>
<td>8</td>
<td>JST</td>
<td>$212</td>
<td>$92</td>
<td>$460</td>
<td>$313</td>
<td>$241</td>
<td>$3</td>
<td>$1,821</td>
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<td>9</td>
<td>Luxshare</td>
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<td>$11</td>
<td>$29</td>
<td>$1,034</td>
<td>$50</td>
<td>$15</td>
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<td>10</td>
<td>Hirose</td>
<td>$62</td>
<td>$53</td>
<td>$272</td>
<td>$330</td>
<td>$289</td>
<td>$12</td>
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<tr>
<td></td>
<td>Total Top 10</td>
<td>$7,216</td>
<td>$5,721</td>
<td>$2,731</td>
<td>$9,411</td>
<td>$4,218</td>
<td>$749</td>
<td>$30,047</td>
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<tr>
<td></td>
<td>All Others</td>
<td>$4,017</td>
<td>$4,731</td>
<td>$2,029</td>
<td>$5,308</td>
<td>$4,375</td>
<td>$1,544</td>
<td>$22,003</td>
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<tr>
<td></td>
<td>Total World</td>
<td>$11,233</td>
<td>$10,453</td>
<td>$4,760</td>
<td>$14,719</td>
<td>$8,593</td>
<td>$2,292</td>
<td>$52,050</td>
</tr>
</tbody>
</table>

#ETT2017
Connector Trends

Smaller
Faster
Cheaper
Connector Trends

PCIe® Roadmap

PCIe 4.0
Scheduled to arrive in 2017

Continuous improvement with data rate as well as usage models; doubling bandwidth and improving capabilities

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Connector Trends

I/O Panel Speed / Signal Density
Connector Trends

Backplane Connectors

- Data rates to 56 Gb/s
- Limited Channel length
- NRZ to PAM4 signaling
- Reaching Practical limit of copper?
Connector Trends
Expanding Backplane options
Connector Trends
Mezzanine Connectors
Connector Trends

Mezzanine Connectors

• Addition to Multigig VPX product line
• Press-fit between parallel PCBs
• 4mm stack height
• 56 position / end stackable modules
• 100 ohm impedance
• Rated to 10 Gb/s
Connector Trends
Fine Tuning Connectors

- Controlled impedance
- Smaller compliant pins
- Backdrilled PTH stubs
- More ground pins
- Staggered footprint
- High-performance PCB materials

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Connector Trends
Power / Thermal Issues

• Improved contact design
• Higher conductivity contact alloys
• Low profile connectors
• Vented housings
• Integrated heat sinks
Connector Trends

Optical Interfaces

- Active optical cables
- Pluggable I/O
- Optical backplane
- Mid-board optical Transceivers
Connector Trends
“Flyover” Concept
Connector Trends

Connector Tech Support

- 3-D Models
- Eye diagrams
- Evaluation boards
- PCB reference footprints
- S-Parameter data
- On-Line simulation tools
- Direct engineering support
Connector Trends

Market Drivers

• IoT / IIoT
• Cloud Computing
• Automotive Electronics
• Industrial Automation
• Mobile Electronics
Connector Trends

Emerging Markets

• Autonomous transportation
• Wearable electronics
• Additive manufacturing
• Robotics
• Cloud/Fog/Mist computing
• Artificial intelligence

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Always check your facts with an expert!

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"The Business and Technology Forum for Critical Embedded Systems"

The Voodoo Behind Critical and Intelligent Embedded Systems