Signal Integrity at Tyco Electronics

Tyco Electronics has the broadest range of signal integrity engineers, software and tools to provide accurate simulation and analysis.

Modeling and Simulation

At Tyco Electronics the design process starts with signal integrity. Signal Integrity Engineers use sophisticated 3D tools to provide accurate simulation and analysis on the performance of each high-speed product. Tyco Electronics uses these tools to provide simulation and analysis on the performance of each high-speed product.

Test Capability

- Advanced simulation capabilities beyond 50 GHz and 60 GHz.
- Wideband models for both connector and footprint
- Detailed 3D conductivity and permittivity for accurate simulations
- Measurement and simulation of both signal and power integrity
- Footprint via pattern analysis for both connector and footprint
- Advanced calibration techniques de-embed fixture
- Frequency domain to 50 GHz
- Measurement based S-parameter connector models
- Mitchell-Liebowitz and S-parameters
- Modeling and simulation of both connector and footprint
- System level and field level analysis

Tyco Electronics has also learned the use of active silicon companies to provide active device measurements that can be invaluable to assure the success of a new product.

Customer Support and Tools

For test boards to isolation modules, Tyco Electronics provides a library of tools that help you successfully implement your system.

- Development of new products requires a thorough understanding of the electrical characteristics of the new products.
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<table>
<thead>
<tr>
<th>Speed</th>
<th>Signal Lines</th>
<th>Pitch</th>
<th>Type</th>
<th>Connectors</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0 Gbps</td>
<td>16 diff. Pairs</td>
<td>20.32 mm (0.8&quot;)</td>
<td>2.5 pair</td>
<td>MULTIGIG RT1</td>
</tr>
<tr>
<td>2.5 Gbps</td>
<td>32 diff. Pairs</td>
<td>15.25 mm (0.6&quot;)</td>
<td>4 pair</td>
<td>MULTIGIG RT2</td>
</tr>
<tr>
<td>5.0 Gbps</td>
<td>64 diff. Pairs</td>
<td>10.00 mm (0.4&quot;)</td>
<td>8 pair</td>
<td>MULTIGIG RT2</td>
</tr>
</tbody>
</table>

**Z-Pack 2 mm HM Product**

- Designed specifically for high-speed applications.
- Capable of supporting data rates up to 16 Gbps.
- Modular connector system designed as 2-pack 2 mm HM family extensions.
- Available in three and four pair versions. Width 32.00 mm (1.25") and pitch for three and four pair version 25.00 mm (1"") and 20.00 mm (0.8") respectively for the four pair version.
- Standard four right-angle bus to backplane connector specified in the JEDEC JESD48-A standard.
- Pin count: 160; pitch: 0.050" (1.27 mm) per pin board space.
- Product family includes right-angle bus to backplane, end plate backplane, co-plane backplane, mezzanine board and cable to board connectors.
- Future plans to increase product density based on similar connector design in SMT & Press-Fit: Z-PACK HM-Zd HD.
- Connector system specified in VME standards: VME 648 and 1204.

**Z-Pack 3 mm HS Product**

- High-speed connector design for both single ended and differential signals.
- Capable of supporting data rates up to 16 Gbps.
- Available in versions one pair and two pairs respectively Width: 32.00 mm (1.25") and 20.00 mm (0.8") respectively.
-如果说 for right-angle bus to backplane in plane board connections.
- In lattice feature such as integrated pulldown, keeping and ESD protection.
- Density up to 32 signal lines per pin board space, in 25.00 mm (1.0") pitch.
- Order Catalog: 1773095, “High Speed Backplane Products”.
- Website: [http://hs3.tycoelectronics.com](http://hs3.tycoelectronics.com)

**Z-Pack HM-2D Product**

- Designed specifically for high-speed differential applications.
- Capable of supporting data rates up to 16 Gbps.
- Modular connector system designed as 2 pack 2 mm HM family extensions.
- Available in two tiers, third tier in development.
- Standard four pair right-angle bus to backplane connector specified in the JEDEC JESD48-A standard.
- Pin count: 160; pitch: 0.050" (1.27 mm) per pin board space.
- Future plans to include components, active and passive, within the backplane connector.
- Connector system specified in VME standards: VME 648 and 1204.
- Website: [http://www.tycoelectronics.com/zpackmax](http://www.tycoelectronics.com/zpackmax)
High Speed Backplane Connectors

High Speed Backplane Connectors Ranked by:
• Speed Versus Signal Density
• System Slot-Pitch Versus Signal Density

Z-PACK 2 mm HM Product
- Standard 2 mm pitch in accordance to IEC 61076-4-101 and IEC 61076-4-102.
- Open pin flex connector capable of supporting data rates of 2 Gbps depending on the I/O rate.
- Modular units give flexible configurations.
- Panorama range of signal, power, coaxial and high power backboard and cable-to-board connectors.
- Available in low free space above low foot test fixtures, specifying 13.68 mm (0.540), 20.32 mm (0.800), and 25.40 mm (1.000) slot pitches.
- Four row configuration is specially designed to 0 BC-19-12-0.
- Available in any orientation for backboard and cable-to-board connections.
- Order Catalog 1773095, “Z-PACK 2 mm HM Interconnection.”
- Website: http://www.multigigrt.com

Z-PACK HS3 Product
- High speed connector designed for both single ended and differential signals.
- Capable of supporting data rates up to 5.0 Gbps.
- Available in six versions: 5.00 mm (0.200) slot-pitch.
- Suitable for four row backboard to board & in-plane board connections.
- Includes features such as integrated guarding, keying and ESD protection.
- Density up to 52 signal lines per cm board space, in 15.24 mm (0.600) slot-pitches.
- Order Catalog 1773095, “High Speed Backplane to Board Products.”
- Website: http://hs3.tycoelectronics.com

Z-PACK HM-2D Product
- Designed specifically for high speed applications.
- Capable of supporting data rates up to 15.0 Gbps.
- Modular connector system designed as 2-PACK 2 mm HM interconnection.
- Available in three, four and five pairs per cent: 25.40 mm (1.000) and pitch for two and three per version and 20.32 mm (0.800) pitch for the four pair version.
- Fixed four pin edge-card to board connector compatible to the PICMG 3.0 Advanced I/O specifications.
- Density 128 signal lines per cm board space, in 15.24 mm (0.600) slot-pitch.
- Available in standard four pair and eight pair versions.
- Future plans to include components, active and passive, within the backplane connector.
- Product features include high-speed backplane, right-angle backplane, end plane backplane, mezzanine board and cable to board connections.
- Future plans to include components, active and passive, within the backplane connector.
- Order Catalog 1773095, “High Speed Backplane to Board Products.”
- Website: http://www.tycoelectronics.com/tinman

MULTIGIG RT Product
- Four pair backplane connector capable of supporting data rates up to 20.0 Gbps.
- Available in two tiers, with 0.800 mm and 1.200 mm slot-pitches.
- Supports 100 Ohm differential, 50 Ohm single ended, open pin field and header, single column pitch (0.800 and 1.200 mm).
- Order Catalog 1773095, “High Speed Backplane to Board Products.”
- Website: http://www.multigigrt.com

Z-PACK TinMan Backplane Connector System
- Designed for high density high-speed applications.
- Capable of supporting data rates up to 15.0 Gbps.
- Compact edge-card connectors.
- Available in two versions: four and five pairs, respectively specifying 15.24 mm (0.600) and 12.70 mm (0.500) pitch per cm board space.
- Connector uses a “shieldless” construction.
- Capable of supporting data rates up to 15.0 Gbps.
- Future plans to include components, active and passive, within the backplane connector.
- Order Catalog 1773095, “Z-PACK TinMan High Speed Backplane to Board Products.”
- Website: http://www.tycoelectronics.com/tinman

Z-PACK HM-Zd Product
- High speed, 2 mm pitch backplane connector.
- Designed for high speed backplane applications.
- Capable of supporting data rates up to 12.5 Gbps.
- Future plans to extend product density based on similar connector design in SMT & Press-Fit: Z-PACK HM-Zd HD.
- Product features include high-speed backplane, right-angle backplane, end plane backplane, mezzanine board and cable to board connections.
- Website: http://hs3.tycoelectronics.com
Signal Integrity at Tyco Electronics

Tyco Electronics gives the best performance out of connectors by applying system-level signal integrity design expertise to each high-speed product. Our modeling and simulation skills are second to none with global expertise in the U.S., Europe, and Asia. Our global presence places simulation, modeling, and system level experts next to the customer.

Modeling and Simulation

Tyco Electronics is the design partner of choice with signal integrity. Signal Integrity Engineers utilize sophisticated 3D tools to provide accurate connector and footprint on pattern performance prior to production. Tyco Electronics has the tools and expertise to get the right answer.

Product Details:

- High Speed Backplane Interconnect Solutions

**High Speed Backplane Connectors (Cont'd)**

**Test Capability**

With measurement capabilities beyond 10 Gbps and 50 GHz, Tyco Electronics can characterize and provide detailed measurements for products, giving engineers a better understanding of the system behavior. Tyco Electronics has also teamed with many semiconductor companies to provide active device measurements that can be invaluable to assure the success of an application via a design.

- Advanced characterization techniques for enhanced test
- Frequency domain to 50 GHz
- Fanout driven test pattern signal greater than 5 Gbps
- Active silicon testing – multiple versions 2-5 Gbps
- Both system and connector only boards

**Customer Support and Tools**

From test boards to connector modules, Tyco Electronics provides a library of tools that help you succeed in your system. Requests can be made online through our signal integrity website.

- Measurement-based S-parameter connector modules (4-pin)
- Modeling-based S-parameter connector modules (4-pin)
- Footprint via pattern for connector and S-parameter models
- S-parameter connector models
- Characteristic evaluation test boards
- System test boards

- Time domain eye pattern/BERT to 12.5 Gbps
- Frequency domain to 50 GHz
- Measurement capabilities beyond 10 Gbps and 50 GHz
- With measurement capabilities beyond 10 Gbps and 50 GHz, Tyco Electronics can characterize and provide detailed measurements for products, giving engineers a better understanding of the system behavior.

**Supported by Technology**

The Foundation of Technology is the driving force behind Tyco Electronics’ commitment to customer success. Tyco Electronics invests in technology to ensure that we provide the most reliable and cost-effective development of high performance, high-density systems. These high performance interconnect solutions involve all aspects of the interconnect, including hardware, switching and transmission drives.

**Tyco Electronics**

As a component of the global communications, computer and consumer electronics industry, Tyco Electronics is well known for its commitment to customers. Tyco Electronics’ focus on technology and quality drives our commitment to excellence.

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Signal Integrity at Tyco Electronics

Tyco Electronics offers an extensive range of signal integrity solutions designed to help you successfully implement your system. Our team of signal integrity experts uses proprietary techniques and tools to ensure optimal results.

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Tyco Electronics provides a library of tools that help you successfully implement your system. These tools are available on the Tyco Electronics website or through a local representative.

Test Capability

For test boards to simulation models, Tyco Electronics provides a library of tools that help you successfully implement your system. Tyco Electronics has the tools and expertise to get the right answer.

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Interconnect Solutions

For test boards to simulation models, Tyco Electronics provides a library of tools that help you successfully implement your system. Tyco Electronics has the tools and expertise to get the right answer.

High Speed Backplane

Supporting the emerging need for high-speed systems, Tyco Electronics offers a complete range of high-speed backplane interconnect systems designed to meet the requirements of today's high-performance applications.

For the latest news and developments, please visit www.tycoelectronics.com/communications/high-speed-backplane.