



Evolving High-Speed Mezzanine Connectors

3 to 20+ Gb/s

Bishop and Associates, Inc. has just released a new 12-chapter, 214 page research report providing a complete analysis of evolving high-speed mezzanine connectors. Current connector market values and forecasts are provided by bandwidth, region of the world, and end user market for the years 2007, 2008, 2009, and 2013.

Mezzanine architecture offers significant packaging advantages. System density has become a critical issue for circuit designers and can be increased by utilizing the space between daughtercards. Products can be effectively partitioned to provide pluggable modules simplifying repair, customization and upgrading. Printed circuit board routing issues can be simplified and layer count reduced by spreading functions over larger board surface areas.

Industry demand for faster processing speeds have resulted in the transition from single ended to high-speed serial differential signaling. This conversion has required the upgrading of every element in the channel including connectors. New mezzanine connectors have been introduced that are designed to support differential signaling at speeds of up to 20 Gb/s. This report reviews the leading high-speed mezzanine connectors now available on the market, and provides detailed mechanical and electrical characteristics of each product.



A variety of factors associated with high-speed channels have a major influence on their behavior. Chapters are devoted to reviewing related system elements including driver and receiver technology, printed circuit board materials, as well as channel modeling, and performance measurement systems.

A new chapter focused on innovation provides examples of creative approaches to addressing some of the challenges associated with interconnection and packaging of next generation electronic equipment.

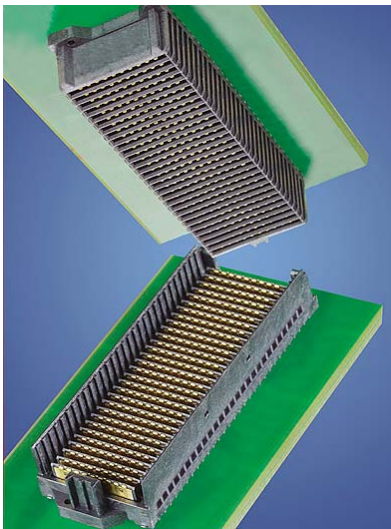
This market research report also includes several tutorial chapters on connector and high-speed design issues that enable a non-technical reader to gain from the information provided.

Technology

The level of technical support necessary to participate in the multi-gigabit mezzanine connector market is exceptional and has become nearly as important in the interface selection process as the performance of the interface itself. The equipment and experience necessary to accurately document their performance, as well as creating verified simulation models require experienced expertise that takes years to develop.

Electronic systems are consuming more power resulting in the need to develop elaborate thermal management schemes. Mezzanine connectors can either increase the challenge or contribute to the solution. Several mezzanine connectors have incorporated features that aid in transferring heat out of the system. At least one new mezzanine connector family includes optional power contacts.

Leading connector manufacturers have implemented a series of incremental improvements that have boosted the published performance of their leading backplane and mezzanine connectors. These advances together with significant improvements in signal conditioning including equalization and pre-emphasis have enabled connector bandwidth to keep pace with system demands.



Connector manufacturers who have developed expertise in the design and manufacturer of high-speed connectors as well as established extensive engineering support service departments have resulted in a stratified market of industry leaders and those who may not be able to replicate these advanced interfaces.

Designing 6+ Gb/s channels is not a trivial issue, causing many engineers to rely on their chosen connector vendor to provide extensive product selection and design support 24/7 on a global basis. Many of these new interfaces are benefiting from better understanding of the behavior of high-speed signals resulting in the refinement of the connector and its PCB launch.

Time domain test methods are being supplemented with frequency domain S-parameter data to quantify the signal integrity of a channel.

The need for increased system packaging density has become a critical design objective. Connector manufacturers are finding ways to design new mezzanine connectors with contact pitch as close as 0.4mm with the ability to conduct multi-gigabit signals.

Connector Market

Design engineers often prefer to utilize one interconnect system throughout the product. Connector manufacturers have responded with complete interconnect families that often include backplane, mezzanine and related cables. Designers are able to understand the quirks of one connector type and develop a close working relationship with a single supplier.

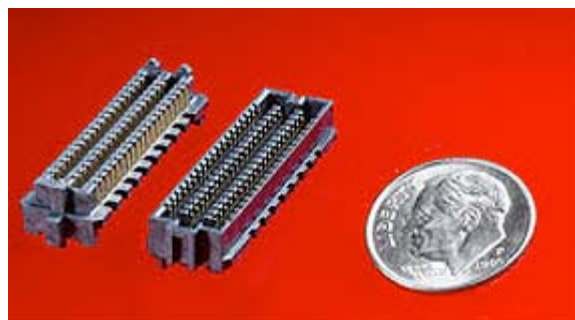
Commitment to a single interconnect family can present problems in insuring adequate supply and market prices. Manufacturers of backplane connectors have been establishing cross-licensing agreements to address this concern. Sole sourcing has traditionally been less of a concern for mezzanine connectors, but recent agreements on dual sourcing of the Samtec SeaRay, Hirose IT-3, and Tyco Electronics STRADA Mesa connectors may portend a new direction.

The market has stratified with a select group of highly competitive connector suppliers offering a full range of state-of-the-art interconnects. A secondary tier of connector manufacturers are focused on supporting individual segments of the market that requires less technical resources and / or may offer a quicker return on investment.

Formal standards organizations as well as special interest groups are developing a large number of specifications that define specific mezzanine connectors. Many of these new standards have been introduced to support high-speed serial signaling. There are advantages and challenges associated with proliferation of overlapping specifications.

Mezzanine connectors tend to introduce less high-speed signal distortion than backplane connectors making their design somewhat easier for second tier connector suppliers to enter the market.

The current global economic recession has raised some serious questions about the adoption rate of new high-speed mezzanine connectors. Leading connector manufacturers are actively designing and introducing new mezzanine connectors in anticipation of future market growth as well as well as achieving recognition of industry leadership.



This market research report is the fourth in a continuing series of investigations of this highly dynamic product segment. The advancement of this technology together with experience gained in designing these unique interfaces may set the stage for the evolution of all types of next generation electronic connectors. Those suppliers who have consistently made the necessary investment in resources to develop this expertise may emerge as the only viable suppliers capable of supporting future application requirements.

The preceding topics are just a sampling of the information and detailed data provided in this new report.

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Advanced Interconnections Corp. / Emulation Technology Inc.
Amphenol TCS – VHDM Stacker, XCede Stacker, NexLev
ERNI Components – MicroSpeed, MicroSpeed Blindmate,
MicroSpeed Power modules, ERmet Zd Stacker, Right-Angle PCI
Express connector
FCI – MEG-Array, GIG-Array, AirMax VS Stacker, TwinMezz
Fujitsu – FCN-260 BTB Series
HARTING – Micro Card Edge Connector
Hirose – IT-1, IT-2, IT-3
Molex – Plateau HS Mezz, HD Mezz, SEARAY, VHDM Stacker

Samtec – Q-Series, EdgeRate, DP Array, IsoRate, SEARAY,
RAZOR Beam, RU8 Series

Tyco Electronics – Mictor, Step-Z, Multi-Gig RT Stacker
STRADA-Mesa
Yamaichi Electronics USA – CNO99Series
AMC Connectors

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Introduction
Amphenol TCS – NexLev
ERNI – MicroSpeed
FCI – Meg-Array
FCI – Gig-Array
Fujitsu – FCN260
HARTING – Micro-Card Edge Mezzanine
Hirose – IT-2 Series
Hirose – IT-3 Series
Molex – Plateau H.S. Mezz
Molex – HD Mezz
Samtec – Q Series

Samtec – EdgeRate
Samtec – SEARAY
Samtec – RU-8.
Samtec – RAZOR Beam (SS4/ST4)
Samtec – RAZOR Beam (LSS)
Tyco Electronics –Mictor
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Techniz G-Flex
Verdant Electronics
TPL Group
Silicon Pipe
CHE-YU LI & Company
Paricon Technologies

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