

Crossbow™

20+ Gbps Orthogonal Architecture Solution

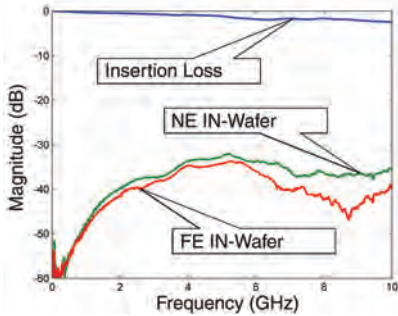


- 20+ Gbps performance
- Meets the IEEE 802.3ap v3.2 10GBASE-KR standard with margin
- XCede® technology optimized for orthogonal midplane architectures
- Demonstrated 100 Ohms ± 5% impedance across an entire link
- De-skewed differential pairs
- Less than 1.5% crosstalk at 50 picoseconds



The Crossbow™ connector system is the first differential connector truly optimized for orthogonal midplane configurations. The Crossbow connector family provides designers with superior electrical performance to 20+ Gbps for orthogonal midplane architectures.

Crossbow™ differential transmission and multi-line linear sum-of-voltage crosstalk



The Amphenol TCS Advantage

"By offering design solutions and advice related to signal integrity between the chip, the design of the PCB, and finally, the connector, Amphenol TCS has the total signal path covered. This type of system solution approach provides an advantage over connector-only manufacturers."

- Fleck Research

Version	Description/Application	Density	Minimum Slot Pitch
Crossbow (8 x 8)	8-pairs per column by 8-pairs per row on a 3.6mm pitch	64 differential pass through signal pairs in 1.62 inches ²	1.31" (33,40mm)
Crossbow (6 x 6)	6-pairs per column by 6-pairs per row on a 4mm pitch	36 differential pass through signal pairs in 1.38 inches ²	1.25" (31,75mm)
Crossbow (4 x 4)	4-pairs per column by 4-pairs per row on a 4mm pitch	16 differential pass through signal pairs in 0.74 inches ²	0.95" (24,13mm)

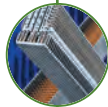
Superior Electrical Performance

Crossbow allows designers to take advantage of all the benefits associated with orthogonal midplane architectures as the differential pairs on each side of the midplane share vias creating a straight pass-through connection. This shared via approach combined with the Crossbow footprint, eliminates most electrical problems associated with the typical backplane via stub. This includes eliminating crosstalk in the footprint, reflections, and impedance mismatches — the Crossbow connector system has demonstrated a 100 Ohm ± 5% impedance across a full link.

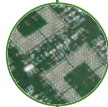
Crossbow connectors leverage optimized trace geometries, optimized footprint patterns, and an advanced 3-D shielding technique that fully surrounds and isolates the differential signals. The results are minimal transmission loss past 10 GHz, tightly matched impedance, and reduced crosstalk through the connector and the entire system.

Version	Bandwidth	Crosstalk Multi-line Time Domain	Crosstalk Single Aggressor in Frequency Domain	Crosstalk Insertion Loss to Crosstalk Ratio	Impedance
Crossbow (8 x 8)	20+ Gbps	< 1.5% at 50 picoseconds	< -35 dB for any aggressor to 10 GHz	25 dB at 10 GHz	100 ± 5%
Crossbow (6 x 6)	20+ Gbps	< 1.5% at 50 picoseconds	< -35 dB for any aggressor to 10 GHz	25 dB at 10 GHz	100 ± 5%
Crossbow (4 x 4)	20+ Gbps	< 1.5% at 50 picoseconds	< -35 dB for any aggressor to 10 GHz	25 dB at 10 GHz	100 ± 5%

Industry Leading Connectors



Printed Circuit Backplanes



Integrated Backplane Systems



Design and Applications Solutions

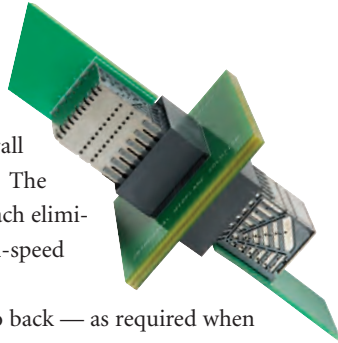


Skew Compensated

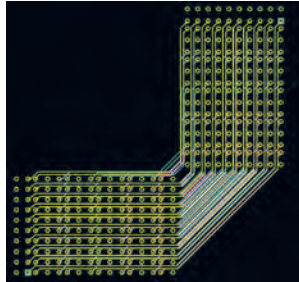
Crossbow's unique design eliminates the need for designers to compensate for skew and its negative electrical impacts with in-pair skew less than 1.5 picoseconds.

System Solution

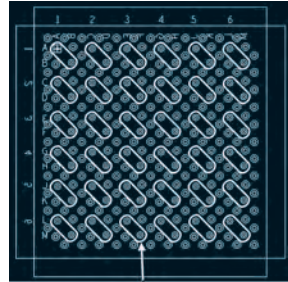
In addition to the electrical benefits, the connector provides the overall lowest cost system solution. The Crossbow shared via approach eliminates the need to route high-speed traces across the backplane to connect from the front to back — as required when standard backplane connectors are used in orthogonal midplane applications. This has the advantage of reducing PWB layers by as much as 50% and eliminates the need for backdrilling.



Traditional connector routed differentially in orthogonal midplane (GbX® 5-Pair example)



Amphenol's Crossbow™ optimized pass-through orthogonal midplane solution



Differential Signal Pair

Superior Mechanical Robustness

Crossbow meets the most rigorous mechanical requirements. The connector leverages many of Amphenol's proven technologies such as the GbX® 0.018" compliant pin and mating interface to ensure that mechanical integrity will not be an issue.

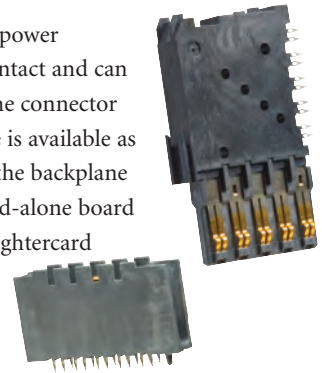
The Crossbow system includes features on the backplane connector that protect the contacts (blades) from bending during handling, reducing the chances of stubbing during mating with the daughtercard connectors. This is accomplished in the orthogonal configuration with plastic features and end walls that are higher than the signal blades effectively protecting the blades. Crossbow 2mm+ accomplishes the same protection utilizing a strip shield wall in the backplane connector which is higher than the signal blades. In addition to robust guidance, the signal blades are designed to be very rigid utilizing thicker gauges, strengthening ribs, and high performance copper alloys.

Integrated Connector Solutions

Daughtercard connector assemblies utilize a stainless steel organizer which allows signal wafers to integrate with power and guidance. The 6 x 6 Crossbow and 5-pair 2mm+ connectors were designed to fit on the same organizer allowing the designer maximum connector configuration flexibility.



Backplane and daughtercard power modules offer 6 Amps per contact and can be positioned anywhere on the connector organizer. The guide module is available as a wide guide integrated into the backplane module insulator or as a stand-alone board mounted guide pin. The daughtercard guide module includes an ESD contact feature.



Amphenol TCS

A Division of Amphenol Corporation

Amphenol TCS
200 Innovative Way, Suite 201
Nashua, New Hampshire 03062
603.879.3000

Shanghai, China +86.21.5836.5500
Dublin, Ireland +353.1.241.4000

www.amphenol-tcs.com

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