

ExaMAX® 56Gb/s High Speed Orthogonal Connector System

ExaMAX® high speed orthogonal connector system is designed to enable superior 56Gb/s electrical performance for increasing bandwidth requirements and the data rates used for high speed signaling.

To further expand the range of applications supported by the ExaMAX® connector system, Amphenol has added a 6-Pair Orthogonal right angle header connector solution. The connectors enable efficient implementation of Direct-Mate orthogonal and midplane orthogonal architectures.

Orthogonal architecture solutions eliminate long, complex traces, via stub effects, simplify signal links and reduce backplane layer count.

Amphenol Direct-Mate orthogonal connector system maximizes chassis cooling and airflow while improving signal integrity performance at a reduced cost. The mechanically robust connector design supports chassis alignment in a 25mm card slot configuration. The flexible connector design also enables designers to allocate rows to high speed signal, low speed signal, or integrated power.

The ExaMAX® high speed connector system is offered in industry standard packaging options including a broad range of backplane, coplanar, mezzanine, cable-to-board, orthogonal midplane and orthogonal direct configurations.



TARGET MARKETS



FEATURES

- Capable of supporting data rates of 25Gb/s with scalable migration path to 56Gb/s
- Unique beam-on-beam interface and skew equalized leadframes
- Hermaphroditic mating interface protects mating beams
- Simple efficient 92 Ω design
- 2.0mm pitch delivers 76 pair per inch density
- Modular, 2mm hard metric connector block design
- 0.36mm PTH for signals and 0.5mm for grounds
- Additional Signal Pin per IMLA
- Integrated guidance

BENEFITS

- Supports future system performance upgrades while eliminating costly redesign burden
- Superior signal integrity performance via impedance control, low cross-talk while eliminating insertion loss resonances. Mating forces reduced by 40% compared to traditional blade and beam designs
- Durable, reliable mating interface design. Eliminates crushed pins
- Supports both 85 and 100 Ω applications
- Industry leading density performance
- Modular design capability supports applications requiring high and low speeds, power, and mechanical guidance at lowest industry costs
- Friendly to PCB manufacturers, improving cost and yield
- Integrate High and low speed signals in the same connector
- Superior mating performance

TECHNICAL INFORMATION

MATERIAL

- Contacts: High performance Copper Alloy
- Plating(s): Performance-based plating at separable interface (Telcordia GR-1217-CORE) Tin over Nickel on press-fit tails
- Housings: High temperature thermoplastic, UL 94 V-0

MECHANICAL PERFORMANCE

- Long mating wipe of > 2mm
- X capture: +/-1.2mm
- Y capture: +/-1.1mm
- Mating Force: 0.45N max. per contact
- Unmating Force: 0.10N min. per contact

ELECTRICAL PERFORMANCE

- Contact Resistance: <10 mΩ change from initial reading after environmental exposure
- Current Rating (with 30° C T-rise above ambient)
 - Signal contact: 0.5A/Contact (both signal and ground contacts can carry current)

ENVIRONMENTAL

- Telcordia GR-1217-CORE Central Office qualification completed
- Operating Temperature: -55°C to +85°C

SPECIFICATION

- Amphenol Product Specification: GS-12-1096
- Amphenol Application Specification: GS-20-0361

SIGNAL INTEGRITY PERFORMANCE

- See graphs below for Insertion Loss and power-summed crosstalk
- Impedance is tuned to 92 Ω making ExaMAX® suitable for both 85 Ω and 100 Ω systems
- Test reports are available which show the performance in both 85 Ω and 100 Ω environments
- OIF Specification: OIF-CEI-25G-LR

TARGET MARKETS/APPLICATIONS



Hubs
Optical Transport
Router
Switches
Wireless Infrastructure



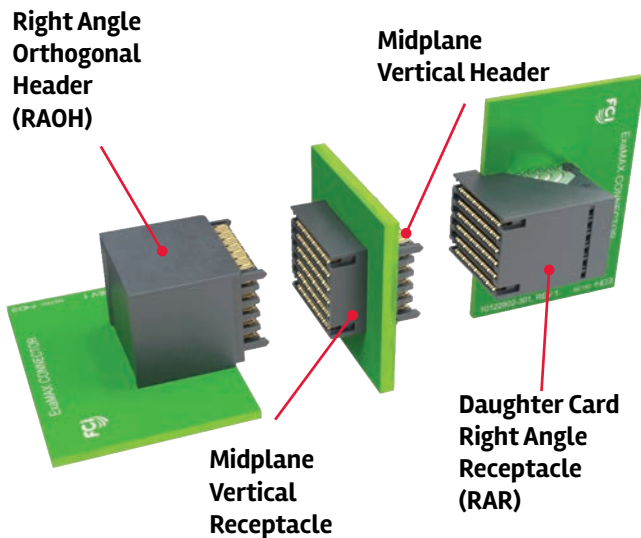
External Storage System
Server
Supercomputer



Emulation Equipment
Test Equipment

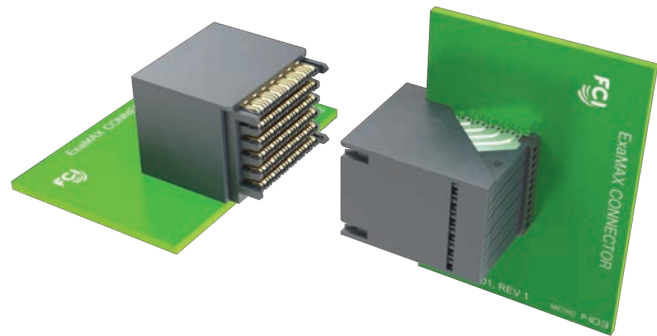
ORTHOGONAL ARCHITECTURES

MIDPLANE ORTHOGONAL



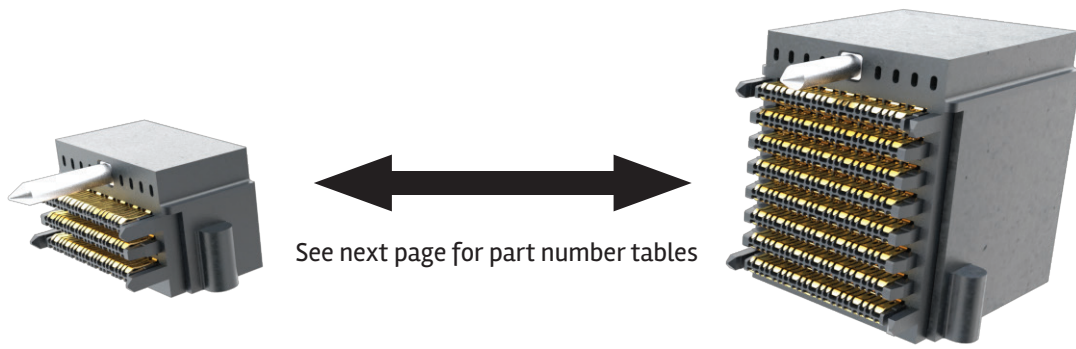
- Midplane orthogonal architecture reduces electrical length between switch chips and I/O transceivers
- Airflow Improvement: Midplane boards can block airflow needed to cool chassis
- Connector Quantity: Requires four connectors
- Connectivity: Provides connectivity through a shared via structure enabling data transfer from front to rear cards. Vertical Header (VH) and Vertical Receptacle (VR) are aligned on opposite sides of midplane and share same PC Hole
- Routing: Right Angle Orthogonal Header (RAOH) 90° rotation results in shorter channel lengths between transmitter and receiver simplifying routing; Reduces or eliminates the need for complex routing
- Board Layers: Requires fewer board layers
- Signal Loss: Orthogonal midplane via structure can result in additional signal losses due to impedance discontinuities
- Thicker PCB: May result in signal integrity degradation

DIRECT-MATE ORTHOGONAL (eliminating midplane)



- Direct-Mate orthogonal architecture improves Signal Integrity performance while reducing applied costs
- Airflow Improvement: Enables direct connections from the front to rear card via open air flow chassis design; eliminates need for special plenums to cool system and rear cards; system efficiency is improved since cooling and airflow is optimized
- Connector Quantity: Requires two connectors
- Reduces cost: Eliminates midplane board and two connectors; components, cooling system, materials and testing is eliminated or reduced
- Mechanically Robust Connector System: Minimizes alignment challenges

6-PAIR ORTHOGONAL VARIATIONS



Integrated Guides*



6x6

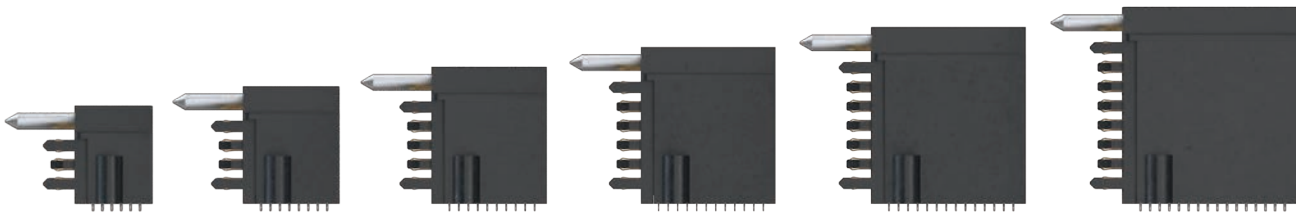
6x8

6x10

6x12

6x14

6x16



No Guides*



6x6

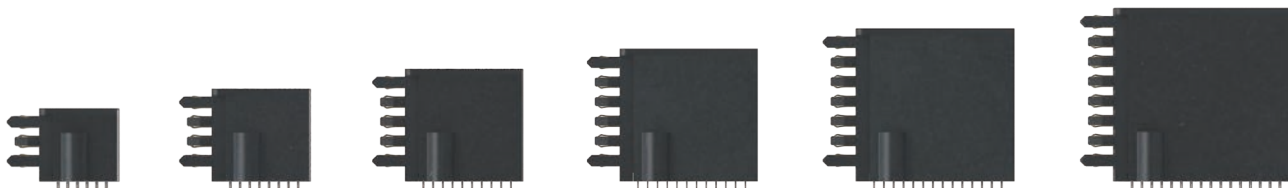
6x8

6x10

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6x16



*Hold-down options are available for connectors with integrated guides and no guides

▶ ExaMAX® 56Gb/s High Speed Orthogonal Connector System

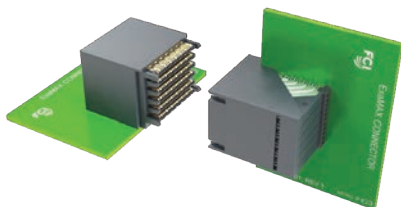
ExaMAX® DIRECT-MATE ORTHOGONAL: WITH INTEGRATED GUIDE PIN

| Product Variation | | | Guide Pin | | Mating Connector PN | |
|-------------------|---------|--------------------|--------------------------------------|-------------|------------------------------|------------------|
| Pairs | Columns | Differential Pairs | Right Angle Orthogonal Header (RAOH) | Screw Mount | Right Angle Receptacle (RAR) | |
| | | | | | 90° orientation | 270° orientation |
| 6 | 6 | 36 | 10129467-101LF | Yes | 10131760-12JLF | 10131760-11JLF |
| | | | 10129467-103LF | No | | |
| | 8 | 48 | 10129470-101LF | Yes | 10131762-12JLF | 10131762-11JLF |
| | | | 10129470-103LF | No | | |
| | 10 | 60 | 10130335-101LF | Yes | 10131764-12JLF | 10131764-11JLF |
| | | | 10130335-103LF | No | | |
| | 12 | 72 | 10129181-101LF | Yes | 10131766-12JLF | 10131766-11JLF |
| | | | 10129181-103LF | No | | |
| | 14 | 84 | 10130338-101LF | Yes | 10131768-12JLF | 10131768-11JLF |
| | | | 10130338-103LF | No | | |
| | 16 | 96 | 10128316-101LF | Yes | 10131770-12JLF | 10131770-11JLF |
| | | | 10128316-103LF | No | | |

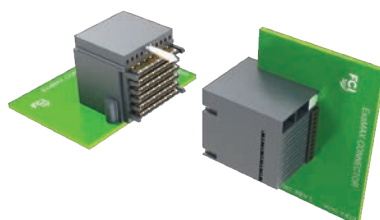
ExaMAX® DIRECT-MATE ORTHOGONAL: NO GUIDE

| Product Variation | | | No Guide Pin | | Mating Connector PN | |
|-------------------|---------|--------------------|--------------------------------------|-------------|------------------------------|------------------|
| Pairs | Columns | Differential Pairs | Right Angle Orthogonal Header (RAOH) | Screw Mount | Right Angle Receptacle (RAR) | |
| | | | | | 90° orientation | 270° orientation |
| 6 | 6 | 36 | 10129467-102LF | No | 10131760-101LF | |
| | | | 10129467-104LF | Yes | | |
| | 8 | 48 | 10129470-102LF | No | 10131762-101LF | |
| | | | 10129470-104LF | Yes | | |
| | 10 | 60 | 10130335-102LF | No | 10131764-101LF | |
| | | | 10130335-104LF | Yes | | |
| | 12 | 72 | 10129181-102LF | No | 10131766-101LF | |
| | | | 10129181-104LF | Yes | | |
| | 14 | 84 | 10130338-102LF | No | 10131768-101LF | |
| | | | 10130338-104LF | Yes | | |
| | 16 | 96 | 10128316-102LF | No | 10131770-101LF | |
| | | | 10128316-104LF | Yes | | |

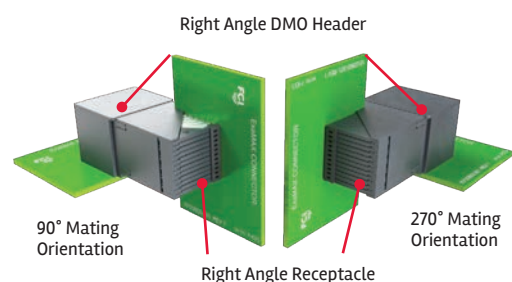
Direct-Mate Orthogonal (No Guides)



Direct-Mate Orthogonal (Guides)



Direct-Mate Orthogonal Mating Orthogonal (No Guides)

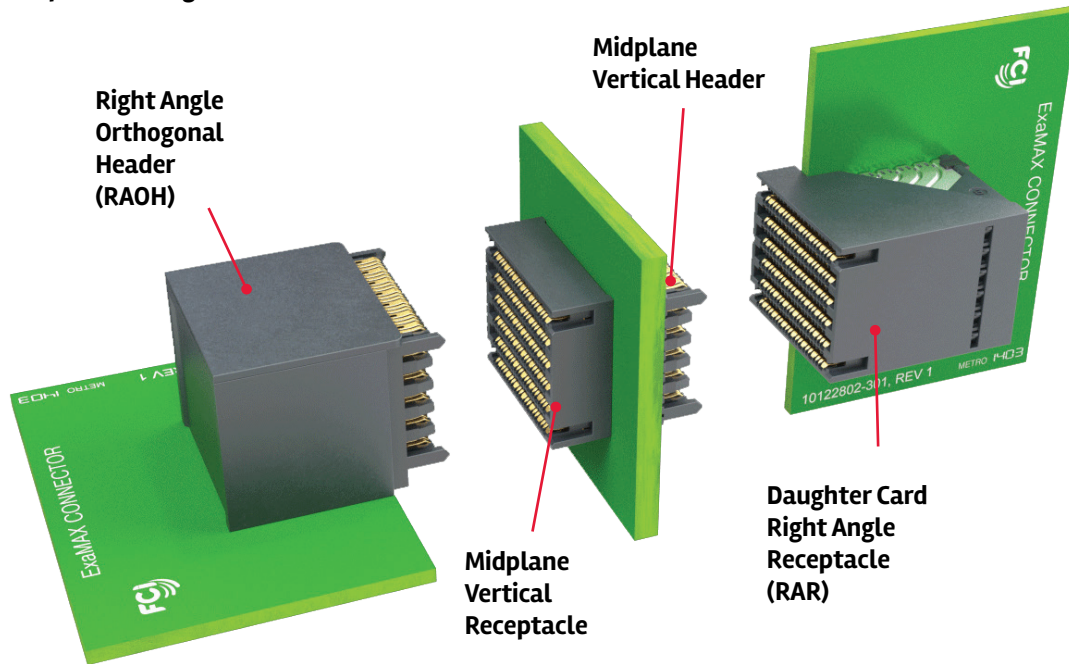


ExaMAX® 56Gb/s High Speed Orthogonal Connector System

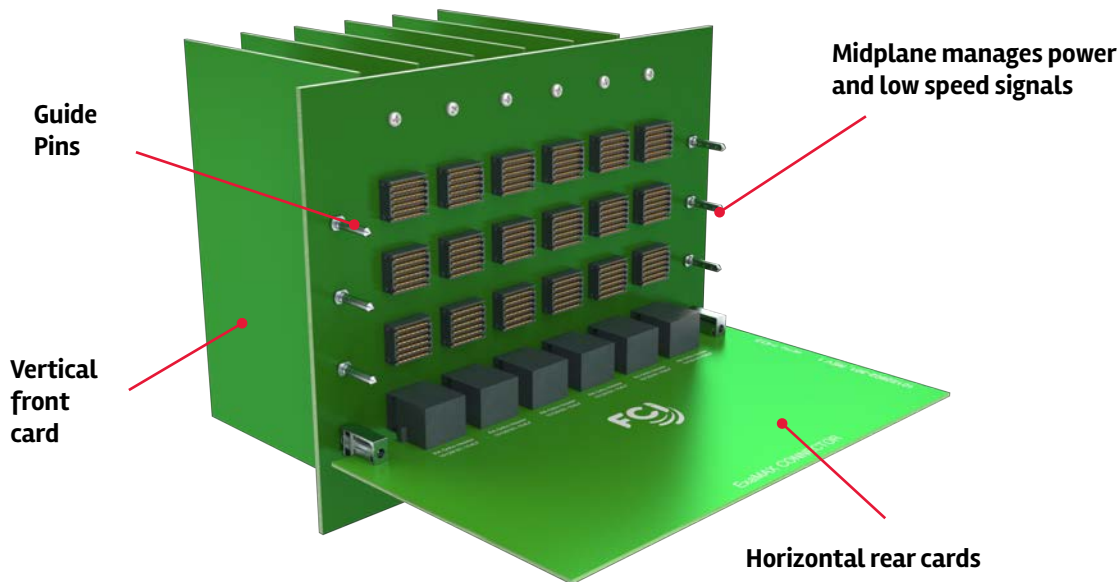
ExaMAX® MIDPLANE ORTHOGONAL

| Product Variation | | | Mating Connector System | | | |
|-------------------|---------|--------------------|--------------------------------------|--------------------------|----------------------|------------------------------|
| | | | No Guide Pin | | | |
| Pairs | Columns | Differential Pairs | Right Angle Orthogonal Header (RAOH) | Vertical Receptacle (VR) | Vertical Header (VH) | Right Angle Receptacle (RAR) |
| 6 | 6 | 36 | 10129467-102LF | 10133092-101LF | 10145395-101LF | 10131760-101LF |
| | 8 | 48 | 10129470-102LF | 10128467-101LF | 10145397-101LF | 10131762-101LF |
| | 10 | 60 | 10130335-102LF | 10132687-101LF | 10140096-101LF | 10131764-101LF |
| | 12 | 72 | 10129181-102LF | 10126948-101LF | 10140098-101LF | 10131766-101LF |
| | 14 | 84 | 10130338-102LF | 10132689-101LF | 10143710-101LF | 10131768-101LF |
| | 16 | 96 | 10128316-102LF | 10129736-101LF | 10147231-101LF | 10131770-101LF |

Midplane Orthogonal



Midplane Orthogonal Application



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