ExaMAX® 56GB/S HIGH SPEED ORTHOGONAL CONNECTOR SYSTEM

OVERVIEW

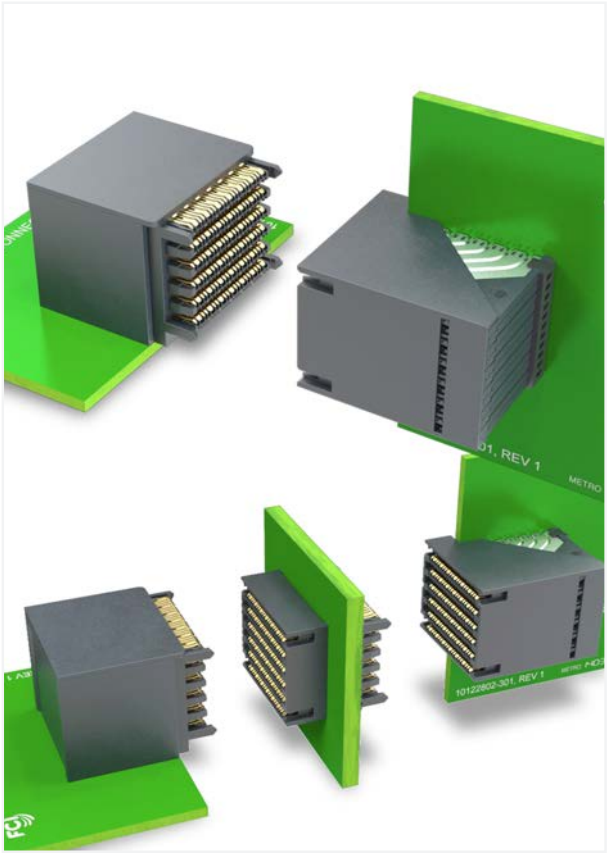
ExaMAX® high speed orthogonal connector system is designed to enable superior 25Gb/s electrical performance and provide a path to 56Gb/s in anticipation of further increases in bandwidth requirements and the data rates used for high speed signaling.

To further expand the range of applications supported by the ExaMAX® connector system, FCI 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.

FCI 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.



FEATURES	BENEFITS
• Capable of supporting data rates of 25Gb/s with scalable migration path to 56Gb/s	• Supports future system performance upgrades while eliminating costly redesign burden
• Unique beam-on-beam interface and skew equalized leadframes	• 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
• Hermaphroditic mating interface protects mating beams	• Durable, reliable mating interface design. Eliminates crushed pins
• Simple efficient 92 Ω design	• Supports both 85 and 100 Ω applications
• 2.0mm pitch delivers 76 pair per inch density	• Industry leading density performance
• Modular, 2mm hard metric connector block design	• Modular design capability supports applications requiring high and low speeds, power, and mechanical guidance at lowest industry costs
• 0.36mm PTH for signals and 0.5mm for grounds	• Friendly to PCB manufacturers, improving cost and yield
• Additional Signal Pin per IMLA	• Integrate High and low speed signals in the same connector
• Integrated guidance	• Superior mating performance

TECHNICAL INFORMATION

MATERIALS

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

ELECTRICAL PERFORMANCE

- Contact Resistance: <10 mΩ change from initial reading after environmental exposure
- Current Rating (with <30°C temperature 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 Range: -55°C to +85°C

MECHANICAL PERFORMANCE

- Long mating wipe of > 2mm
- X capture: +/-1.2mm
- Y capture: +/-1.1mm
- Mating Force: 0.36 N max. per contact
- Unmating Force: 0.10 N min. per contact
- Average press-fit insertion force: 15 N max. per contact

SPECIFICATIONS

- Product Specification: GS-12-1096
- 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

- Communications
  - Hubs, switches, routers
  - Telecom
  - Optical Transport
  - Wireless infrastructure
- Data
  - Servers
  - External storage systems
  - Super computers
- Industrial & Instrumentation
  - Test Equipment
  - Emulation Equipment

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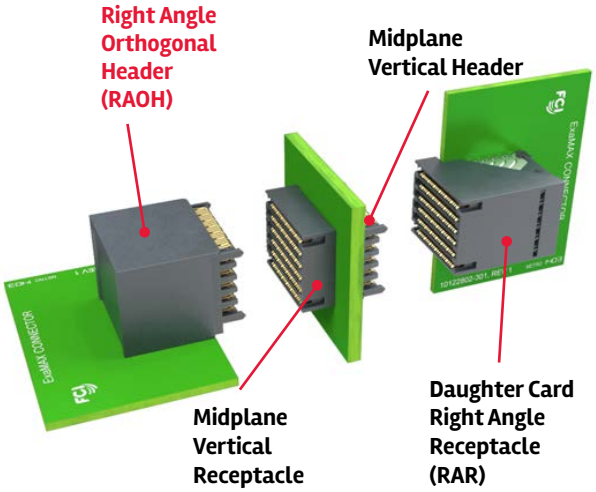
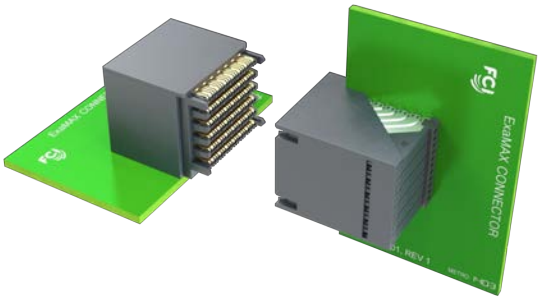
ORTHOGONAL ARCHITECTURES

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

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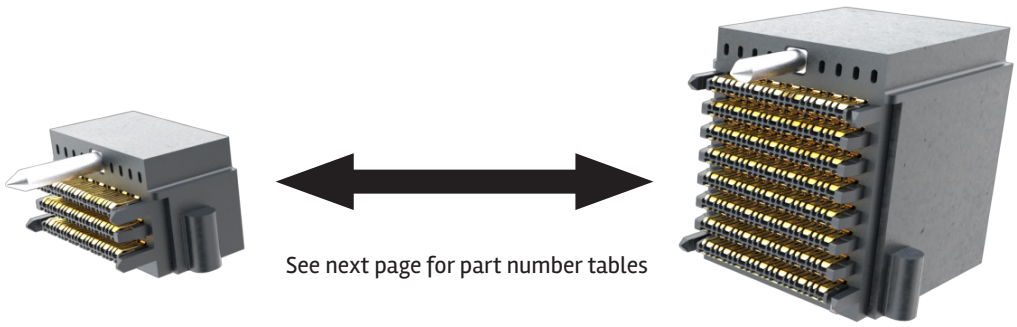
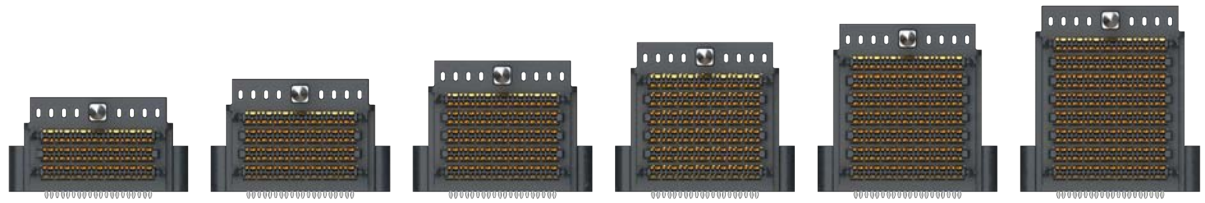
6–PAIR ORTHOGONAL VARIATIONS

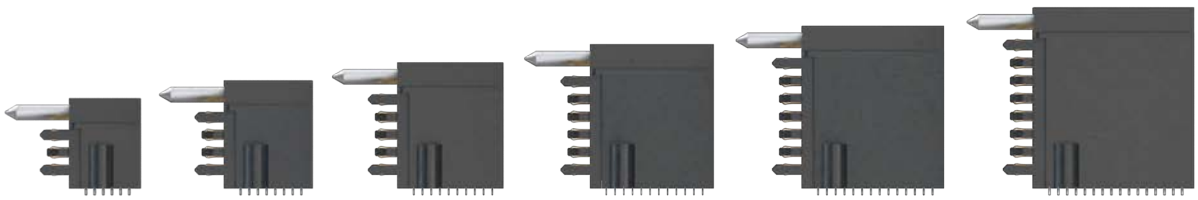


See next page for part number tables

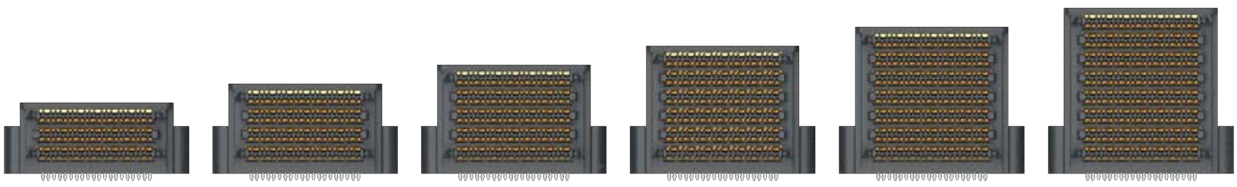
Integrated Guides*



6x6 6x8 6x10 6x12 6x14 6x16



No Guides*



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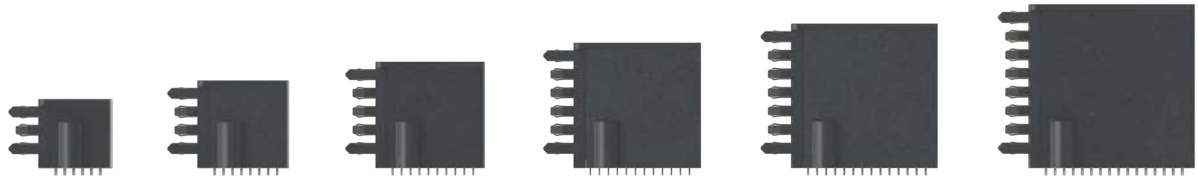

*Hold–down options are available for connectors with integrated guides and no guides

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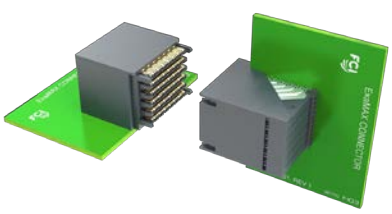
ExaMAX® DIRECT-MATE ORTHOGONAL: WITH INTEGRATED GUIDE PIN

Product Variation			Guide Pin		Mating Connector PN	
					Right Angle Receptacle (RAR)	
Pairs	Row	Differential Pairs	Right Angle Orthogonal Header (RAOH)	Screw Mount	90 degree orientation	270 degree 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		

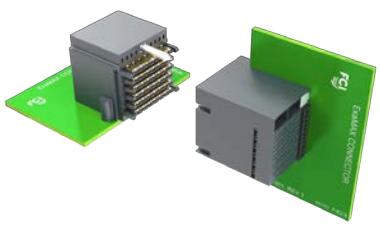
ExaMAX® DIRECT-MATE ORTHOGONAL: NO GUIDE

Product Variation			No Guide Pin		Mating Connector PN	
					Right Angle Receptacle (RAR)	
Pairs	Row	Differential Pairs	Right Angle Orthogonal Header (RAOH)	Screw Mount	90 degree orientation	270 degree 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		

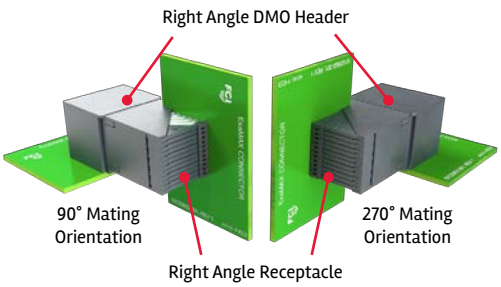
Direct-Mate Orthogonal (No Guides)



Direct-Mate Orthogonal (Guides)



Direct-Mate Orthogonal Mating Orthogonal (No Guides)



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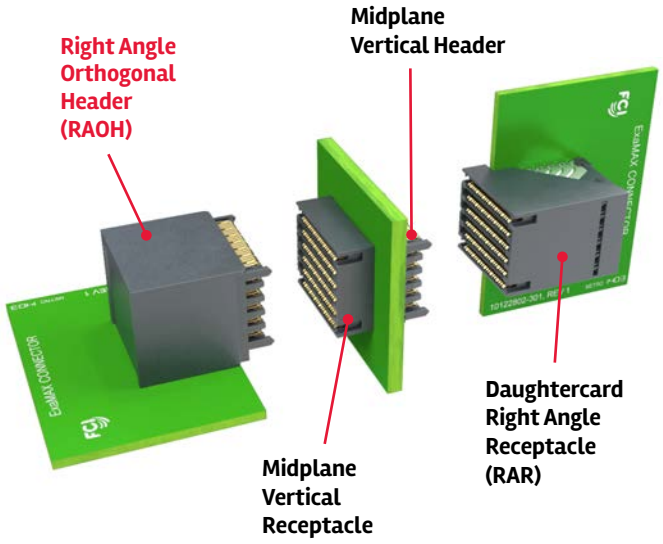
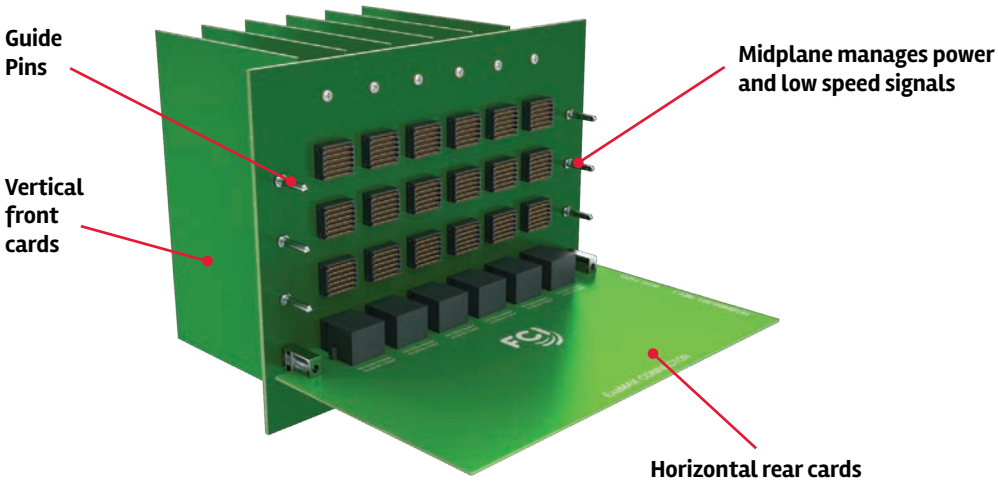
ExaMAX® MIDPLANE ORTHOGONAL

Product Variation			Mating Connector System			
			No Guide Pin			
Pairs	Row	Differential Pairs	Right Angle Orthogonal Header (RAOH)	Vertical Receptacle (VR)	Vertical Header (VH)	Right Angle Receptacle (RAR)
6	6	36	10129467-104LF	10133092-101LF	10128351-101LF	10131760-101LF
	8	48	10129470-104LF	10128467-101LF	10124752-101LF	10131762-101LF
	10	60	10130335-104LF	10132687-101LF	10127791-101LF	10131764-101LF
	12	72	10129181-104LF	10126948-101LF	10123162-101LF	10131766-101LF
	14	84	10130338-104LF	10132689-101LF	10132685-101LF	10131768-101LF
	16	96	10128316-104LF	10129736-101LF	10129738-101LF	10131770-101LF

Midplane Orthogonal



Midplane Orthogonal Application



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