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EYEMAX® 4X HIGH-SPEED SERIAL I/O LINKS

for Infiniband®, 10G Fibre Channel, 10G Base-CX4 Ethernet (IEEE 802.3ak), and SFF-8470 Multilane SATA/SAS

DESCRIPTION

The EyeMax® 4X cable assembly, right-angle PCB receptacle, and plug kit offering from FCI enables high-speed, serial copper links for industry-standard applications. This copper solution offers a low cost alternative to fiber optics for linking servers, storage and other data networking or communication devices. The EyeMax® link solution is designed to provide a continuous flow of serial data and eliminate data traffic congestion, which can occur among hardware devices that use a parallel bus structure.

FCI's EyeMax® cable assembly technology enables high-speed data transfers that deliver aggregate bandwidth capability from a single cable assembly that ranges from 10 Gb/s to 20 Gb/s depending on the data transfer rate and the required cable length. In addition, the EyeMax® cable technology offers <4% cross-talk performance, greater bandwidth, and exceptional overall electrical performance to support switched fabric link capabilities and scalability within and between system hardware applications.

The mating interface used in EyeMax® cable and connector products has been selected as the external I/O copper link for the following industry standards: Infiniband®, 10G Fibre Channel, 10G Base-CX4 Ethernet, and SFF-8470 for Serial ATA (SATA) or Serial-Attached SCSI (SAS).
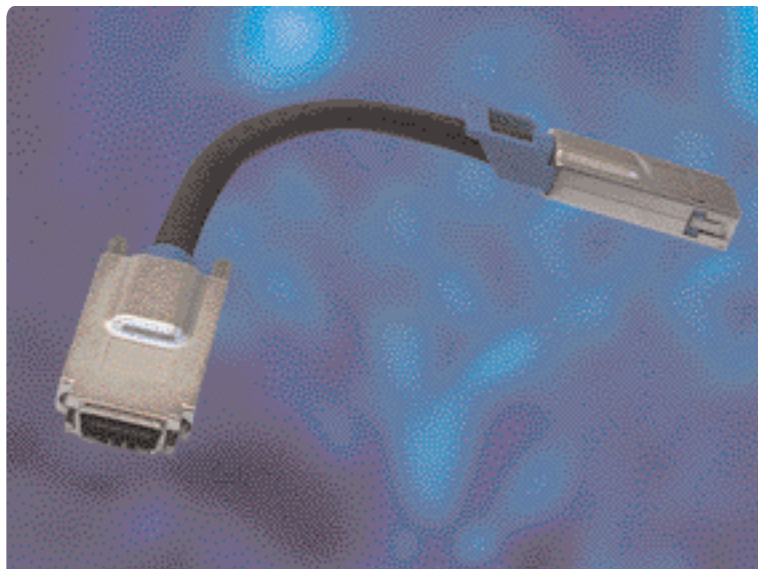

FEATURES & BENEFITS

- Robust pull-to-release latching or thumbscrew cable-lock hardware
- 4x version provides 8 differential pairs
- High-speed data rates:
  - Infiniband SDR: 2.5 Gb/s per channel
  - Infiniband DDR: 5.0 Gb/s per channel
  - Ethernet CX4: 3.125 Gb/s per channel
- Custom paddle-card design for improved crosstalk performance
- Impedance-controlled paddle card with capability to upgrade for equalization
- Die-cast shells for enhanced EMI shielding performance
- Cable assembly offering available with various high-speed raw cable options
- Right-angle, surface-mount PCB receptacles offer variety of locating post and panel-mount options
- RoHS compliant

TARGET MARKETS / APPLICATIONS

- Data
  - Servers
  - Server clusters
  - Storage systems
  - HPC and data centers
- Communications
  - Switches
  - Routers
- Industry standards
  - Infiniband (SDR, DDR)
  - 10G Fibre Channel
  - 10G Base-CX4 Ethernet (IEEE 802.3ak)
  - SFF-8470 for SATA or SAS

EYEMAX® CABLE ASSEMBLIES

FEATURES & BENEFITS

◣ Die-cast shells for enhanced EMI shielding performance
◣ Blind-mate keying features standardized
◣ Custom paddle-card design for improved crosstalk performance
◣ Standardized 24 to 30 AWG cable offering
◣ Eight fully-shielded, differential pairs
◣ Impedance-controlled paddle card with capability to upgrade for passive equalization
◣ Cable assembly offering available with various high-speed raw cable sources
◣ Competitively-priced product
◣ RoHS compliant

PART NUMBERS

Description	Base part number
4X EyeMax cable assembly, latching version	**10007290**
4X EyeMax cable assembly, thumbscrew version	**10018960**

CAPABILITY MATRIX FOR UNEQUALIZED CABLE ASSEMBLIES

Industry Standard	Wire size (AWG) for indicated cable length (in meters)												
	1m	2m	3m	4m	5m	6m	7m	8m	9m	10m	11m	12m	13m
Infiniband-SDR	30 AWG	30 AWG	30 AWG	28 AWG	26 AWG	24 AWG							
Infiniband-DDR	30 AWG	28 AWG	24 AWG										
10G Base-CX4 Ethernet (IEEE 802.3ak)	30 AWG	30 AWG	30 AWG	30 AWG	30 AWG	30 AWG	30 AWG	28 AWG	28 AWG	26 AWG	26 AWG	24 AWG	24 AWG

Additional information can be found at www.fci.com/eyemax or www.fci.com/cableassembly

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EYEMAX® 4X CABLE PLUG KITS

FEATURES & BENEFITS

- ▶ Shielded Structure for low cross-talk
- ▶ M2.5 thumbscrew option for robust attachment to threaded hex standoffs
- ▶ Robust active-latch option for easy connect and disconnect
- ▶ Die-Cast shells for enhanced EMI shielding
- ▶ Kits available with or without attached optimized paddle card
- ▶ Kits come with 3 cable exit collar sizes for various cable diameters
- ▶ No crimp tooling required for cable exit

PART NUMBERS

Description	With P1 paddlecard	With P2 paddlecard
4X plug kit - latching version, 8 signal pairs	58441-001LF	58441-101LF
4X plug kit - latching version, 8 signal pairs, passive equalization	58441-004LF	58441-104LF
4X plug kit - thumbscrew version, 8 signal pairs	10013923-001LF	10013923-101LF
4X plug kit - thumbscrew version, 8 signal pairs, passive equalization	10013923-004LF	10013923-104LF

For ease of wire management, a P1 paddlecard is recommended on one end of a cable and a P2 paddlecard in the other end.

EYEMAX® 4X BOARD-MOUNT RECEPTACLES

FEATURES & BENEFITS

- ▶ Shielded Structure for low cross-talk
- ▶ Option for threaded hex standoffs to accept M2.5 thumbscrews on cable connectors
- ▶ Clip or screw options for attaching latch-type PCB connectors to panels or brackets
- ▶ Right-angle, surface-mount connectors are compatible with conventional reflow soldering processes
- ▶ Locating pegs optional for manual or automated placement
- ▶ Soldered posts secure connector to PCB

PART NUMBERS

Description	PCB Thickness	Part Numbers
4X, latching version with mounting ears, without alignment pegs	1.6 mm	58369-111010LF
4X, latching version with mounting ears, with alignment pegs	2.4 mm	58369-112110LF
4X, latching version without mounting ears, without alignment pegs	1.6 mm	58368-111010LF
4X, latching version without mounting ears, with alignment pegs	2.4 mm	58368-112110LF
4X, thumbscrew version, without alignment pegs, with foam EMI gasket	2.4 mm	10009629-102010LF
4X, thumbscrew version, without alignment pegs, without foam EMI gasket	1.6 mm	10009629-111010LF
4X, thumbscrew version, without alignment pegs, without foam EMI gasket	2.4 mm	10009629-112010LF
4X, thumbscrew version, with alignment pegs, without foam EMI gasket	2.4 mm	10009629-112110LF
4X, thumbscrew version, with alignment pegs, without foam EMI gasket	4.0 mm	10009629-113110LF

Latching versions without mounting ears require a panel clip to attach the connector to a panel or PCI bracket. The panel clip part number is dependent upon the panel thickness and is sold separately. Reference the connector drawing for part numbers.

Additional information can be found at www.fci.com/eyemax

TECHNICAL INFORMATION

MATERIALS

▶ Cable connector and accessories
- Contacts: Copper alloy
- Contact finish:
  - Mating area: Au over Ni
  - Solder area: Sn over Ni
- Connector housing:
  High-temperature thermoplastic, UL94V-0
- Backshells: Die-cast zinc, plated Ni over Cu
- Strain relief: Thermoplastic
- Latches, thumbscrews & screws: Stainless steel
- Pull tab and cable collar: Thermoplastic
- Paddlecard: FR4

▶ Cable: Fully-shielded, 8 differential pairs

▶ Board-mount receptacles
- Contacts: Copper alloy
- Contact finish:
  - Mating area: Au over Ni
  - Solder area: Sn over Ni
- Connector housing:
  High-temperature thermoplastic, UL94V-0
- Shell: Cold rolled steel, Ni plated
- Latch plate: Cold rolled steel, plated Sn over Ni
- Panel clip: Stainless steel
- Threaded inserts: Brass, Ni plated
- Threaded hex standoff: Stainless steel

ELECTRICAL PERFORMANCE

▶ Differential impedance: $100 \pm 10\Omega$ @ 100psec

▶ Insertion loss: 10.0 dB max @ 1.25Ghz

▶ Pair-to-pair skew: 50 psec max./meter

▶ Near-end crosstalk: <4% at 100psec

▶ EMI effectiveness: 40 dB min.

▶ Jitter: 0.25 unit intervals (100 psec)

▶ Eye pattern opening: 300 psec width min. 316 mV height min. @ 2.5Gbps

MECHANICAL PERFORMANCE

▶ Durability: 250 cycles
▶ Insertion Force:
  - 30N (6.6 lbs.) max.
▶ Withdrawal Force:
  - 15N (3.3 lbs.) min.
▶ Retention Force: 75N (16.9 lbs.) min.
▶ Minimum Bend: 4 inch or less at 90° bend

ENVIRONMENTAL

▶ Temperature range: -10°C to 60°C
▶ Thermal shock: 10 cycles, -55° to 85°C
▶ Temperature life: 456 hours @ 90°C

SPECIFICATIONS

▶ Industry
- Infiniband (SDR, DDR)
- 10G Fibre Channel
- 10G Base-CX4 Ethernet (IEEE 802.3ak)
- SFF-8470 for SATA or SAS
▶ FCI
- GS-12-216 EyeMax Cable Assembly Product Specification
- GS-12-209 EyeMax Connector Product Specification
- GS-20-025 EyeMax Receptacle Application Specification

APPROVALS AND CERTIFICATIONS

▶ UL and CSA approved or approvals pending

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