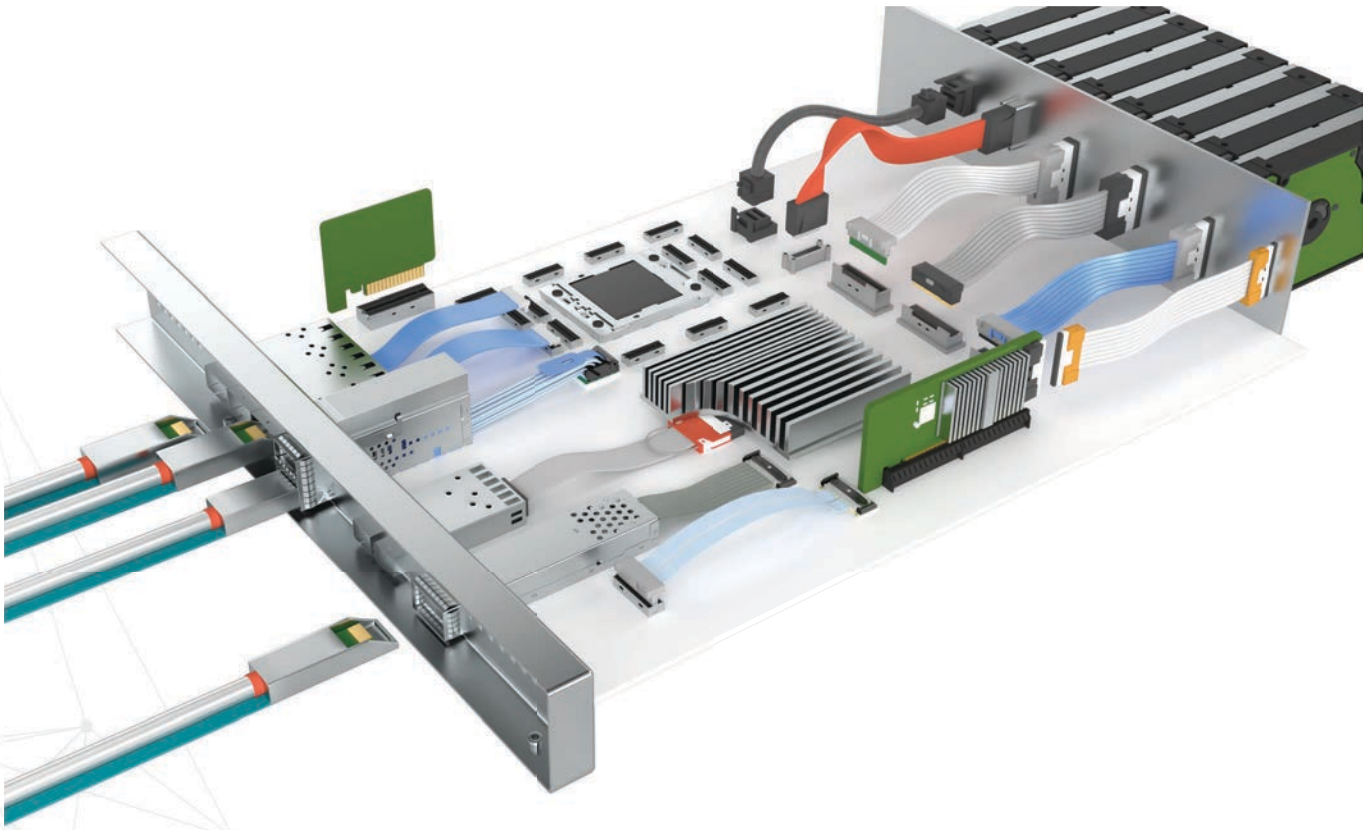
OverPass™

Amphenol

Amphenol's OverPass™ cable system offers a broad range of capabilities that allow our customers to efficiently transmit high speed signals from near an ASIC to anywhere in their system.

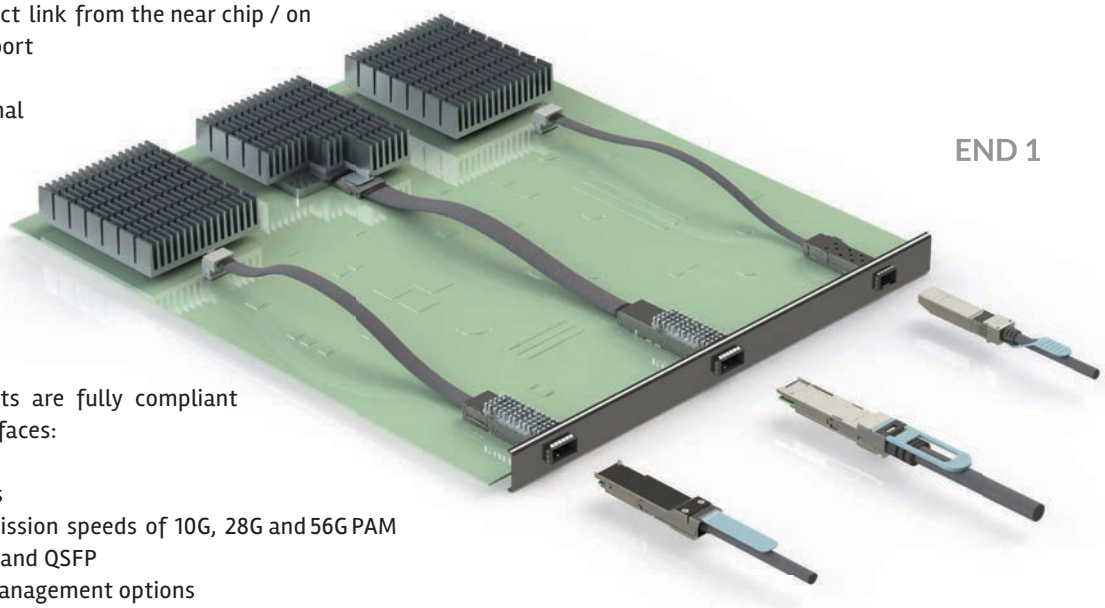


EXTERNAL IO

Use of the OverPass product in HSIO applications allow system designers to:

- have a direct high speed interconnect link from the near chip / on chip site directly to the external IO port
- reduce overall link signal loss
- eliminate the need for expensive signal re-timers and avoid increased heat generation
- reduce cost from high performance laminates in PCB construction
- optimize airflow and system heat management efficiency

END 2



END 1

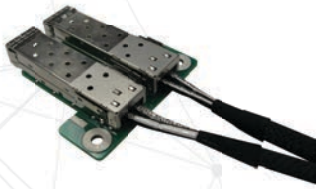
The HSIO OverPass portfolio products are fully compliant to established industry standard interfaces:

- SFP, QSFP, QSFP DD, OSFP and others
- all interfaces support signal transmission speeds of 10G, 28G and 56G PAM and 112G versions for OSFP, QSFP DD and QSFP
- press fit or cabled sideband signal management options

The portfolio also includes cage configurations & layouts (stacked & ganged, belly-to-belly) that can maximize the linear board port density available to the designer.

OverPass solutions allow for applications in elevated operating temperature environments (85C+) and all cage configurations include standard and custom heat sink offerings and light pipe options.

END 1



SFP

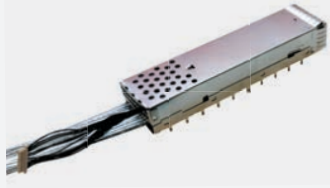
- 1 lane per port – 28G and 56G per lane capability
- Multiple port cabled solutions
- Sideband and power signal management

QSFP

- 4 lanes per port – 28G and 56G per lane capability, 112G in development
- Product configuration and cable routing flexibility
- Support cable lengths up to 1 meter

QSFP DD

- 8 lanes per port – 28G, 56G, and 112G per lane capability
- Press fit or cabled sidebands
- Multiple cage configurations (ganged, stacked)



OSFP

- 8 lanes per port – 28G, 56G, and 112G per lane capability
- Press fit or cabled sidebands
- Fully supports 25+ watt module usage
- Stacked and ganged cage configurations

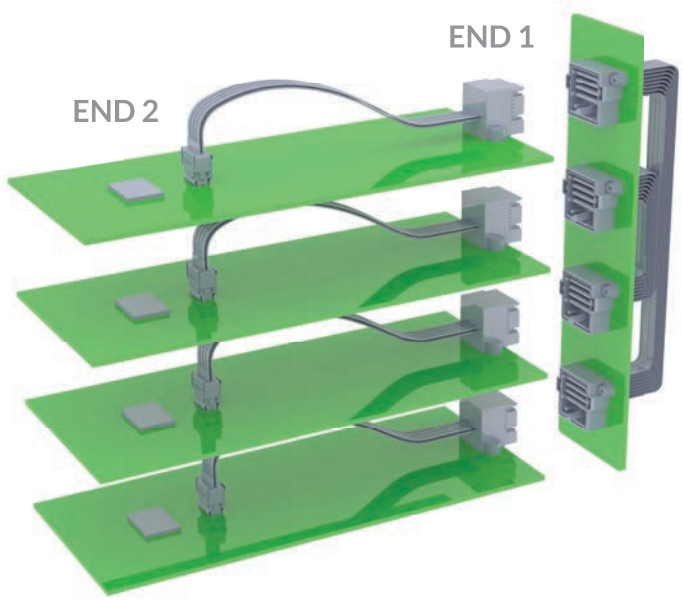
END 2

See page 4

CABLED BACKPLANE

OverPass backplane cable solutions extend the reach of passive copper for next generation system designs. 56G and 112G PAM4 performance is optimized by utilizing our low loss twinax cable with Paladin® and ExaMAX® backplane connector families. OverPass is complementary with traditional PCB routing and compatible with existing backplane connector systems.

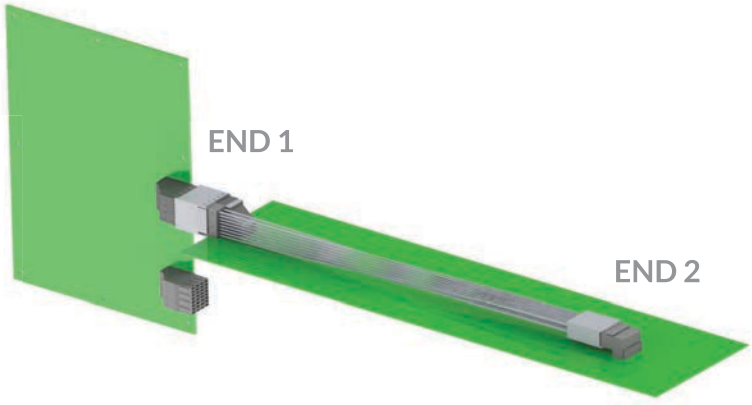
While providing enhanced performance, OverPass can lower system costs. This is done by reducing or eliminating the need for expensive active devices like retimers, and high performance board materials. The proven reliability of passive twinax copper, coupled with advanced wire attachment and 100% high speed test coverage provides peace of mind reliability.



ORTHOGONAL

Using OverPass product in Orthogonal applications allow system designers to have a direct high speed interconnect link from the chip site to the Orthogonal connector. Hybrid applications can mix cable and board differential pairs into the same connector. Allowing select routing of low speed/low reach links through the board and high speed/high reach links cabled directly to the chip site.

Multiple options for chip site connector, dependent on customer requirements (Paladin extended RAF shown).



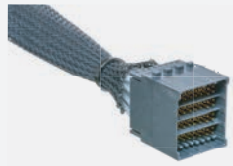
END 1

ExaMAX2®

- The innovative beam-on-beam mating interface provides improved SI performance and exceptionally low mating forces
- 100% backward mating compatible to previous ExaMAX products
- Industry leading RL and reflections performance
- No resonances before 60GHz
- Available in both a 90Ω version and 85Ω version

ExaMAX®

- Cost optimized with scalable performance beyond 56G PAM4
- Innovative design supports low insertion/extraction forces along with reduced crosstalk and low insertion loss
- Flexible connector architecture supports cable mating with a backplane cable, press fit headers, right angle and orthogonal configurations



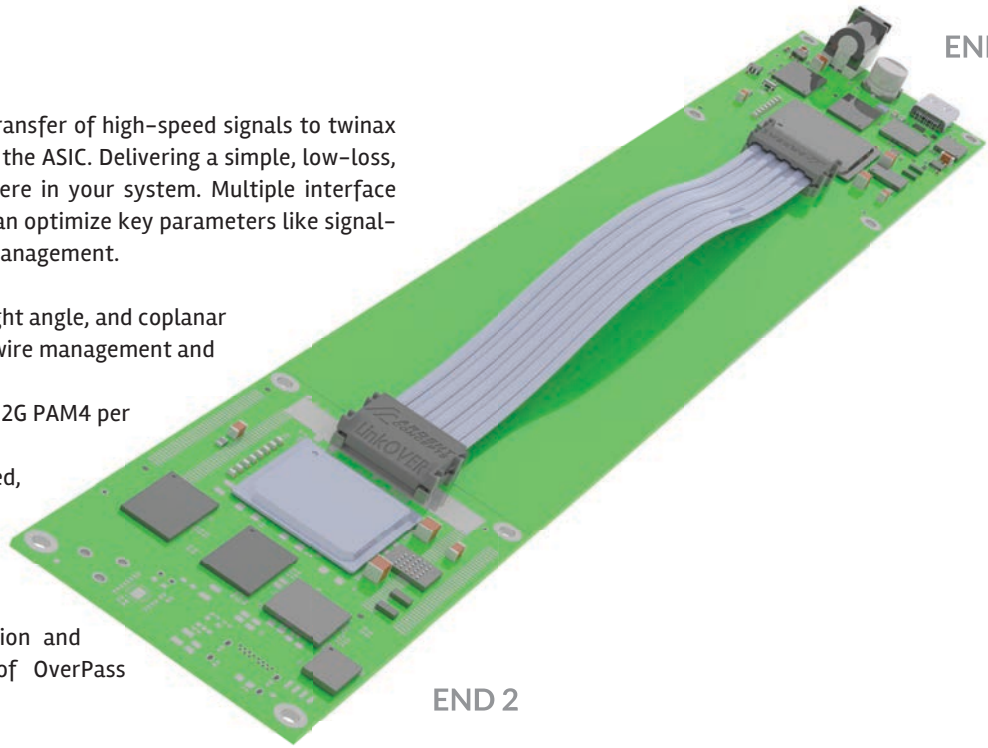
Paladin®

- Supports data rates beyond 112G PAM4; industry leading signal to noise performance
- Consistent signal integrity performance over the entire mating range
- Flexible connector architecture supports cable mating with press fit headers, right angle and orthogonal configurations

END 2

See page 4

INTERNAL

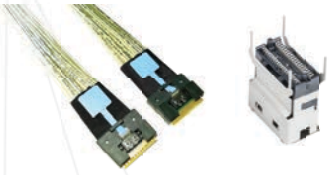


The OverPass cable system allows for the transfer of high-speed signals to twinax cables shortly after they are launched from the ASIC. Delivering a simple, low-loss, direct link to pluggable modules or anywhere in your system. Multiple interface choices are available, so system designers can optimize key parameters like signaling speed, signal density, and system heat management.

- multiple cable exit options like straight, right angle, and coplanar
- high-speed, low-loss twinax cable aids in wire management and routing
- solutions are available in 10G, 25G, 56G & 112G PAM4 per lane signaling speeds
- construction options including double ended, Y, and breakout cables
- multiple cages configurations like single, ganged and stacked

Allow us to help identify the ideal solution and optimized cost from our broad range of OverPass connector options.

END 1

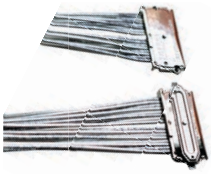


UltraPort SlimSAS®

- SFF-8654 Form Factor
- Industrial Standard of:
  - Intel UPI (11.2G)
  - NVIDIA NVLink (25G)
  - SAS-4
  - OpenCAPI
- PCIe 4.0/5.0 supported

Low Profile SlimSAS®

- X4/6/8/12/16/20 Lanes
- Industrial Standard of:
  - Intel UPI (11.2G)
  - NVIDIA NVLink (25G)
- PCIe 4.0/5.0 supported



micro-LinkOVER™

- Bypass lossy board traces when transmitting signals in next generation board-to-board, system-to-system, or chip-to-chip applications requiring high bandwidths
- Supports data rates up to 112Gb/s+ with low resonance and VSWR

DensiLink®

- Highest density (diff pair /mm2) near chip / on chip interface in market
- 28G, 56G and 112G per lane capability
- 16 and 24 diff pair configurations, 32 diff pair in development

Mini Cool Edge IO

- Up to PAM4 56G
- Server/Storage/Switch application supported:
  - PCIe 4.0/5.0
  - SAS-4/5
  - SFP/SFP+/SFP28
- X4/6/8/12/16/20/24 lanes

ExtremePort™ Z-Link

- SFF-TA-1002 Form Factor
- Industrial Standard of:
  - OCP NIC 3.0
  - EDSFF
  - GenZ
- PCIe 4.0/5.0 supported

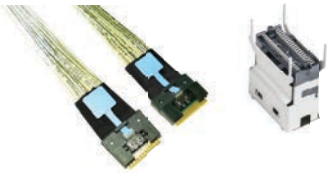
ExtremePort™ Flash

- Extreme mechanical condition application
- Server/Storage/Switch application supported:
  - PCIe 4.0/5.0
  - SAS-4/5
  - SFP/SFP+/SFP28
- Up to PAM4 56G

ExtremePort™ Swift

- Meets PCIe Gen 5 NRZ 32G specification
- Server/Storage/Switch application supported:
  - PCIe Gen5
  - UPI 2.0
  - SAS 4
- 0.6mm low profile contact pitch

END 2



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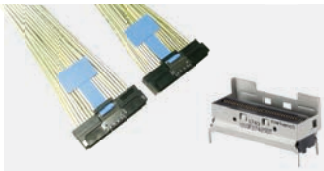

Low Profile SlimSAS®

- X4/6/8/12/16/20 Lanes
- Industrial Standard of:
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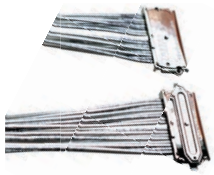
- PCIe 4.0/5.0 supported



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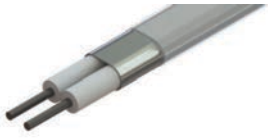
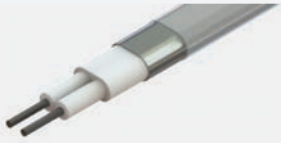
HIGH SPEED BULK CABLES



SkewClear® EXD™ Gen 1

Two insulated cores, shielded longitudinally

- Proven production model
- OverPass compatible today
- Available for immediate OverPass link / concept evaluation



SkewClear® EXD™ Gen 2 (2 extrusion)

Two insulated cores encapsulated in a secondary insulation, shielded longitudinally

- Closely coupled conductors reduce wire mode conversion
- Foam insulated cores possible to extend reach / density
- OverPass in development
- Longest reach links away from high heat sources (<85°C)

SkewClear® EXD™ Gen 2 (1 extrusion)

Two conductors encapsulated in a single insulation, shielded longitudinally

- Closely coupled conductors reduce wire mode conversion
- Customizable profiles possible
- OverPass in development
- High performance near chip applications

COMPATIBILITY ROADMAP

112G	• Currently compatible with ExaMAX2, Paladin, micro-LinkOVER, DensiLink, QSFP DD, and OSFP	• Planned compatibility with ExaMAX2 and Paladin on longest reaches	• Planned compatibility with micro-LinkOVER, Paladin, QSFP DD, OSFP, and DensiLink
224G	• No planned support	• Planned compatibility (in development) with ExaMAX2 and Paladin on longest reaches	• Planned compatibility (in development) with micro-LinkOVER, DensiLink, ExaMAX2, Paladin, and OSFP

Amphenol

www.amphenol-cs.com