Your High-Reliability Interconnect Solutions Provider

In today's data driven marketplace, OEMs must maintain agility to deliver solutions faster & more efficiently than ever before

- You must have ability to scale up or down rapidly to ***Manage Space, Power & Capacity***
- You must have flexibility to meet ***Higher Data Speed*** requirements without increasing space
- You must ***Maximize Efficiency & Performance*** while ***Balancing Costs***
- You need a ***Rugged, Reliable Connector*** that is designed by a ***Trusted Industry Leader***

Higher Density & **Higher Speed** is key& the **Solution** is clear…

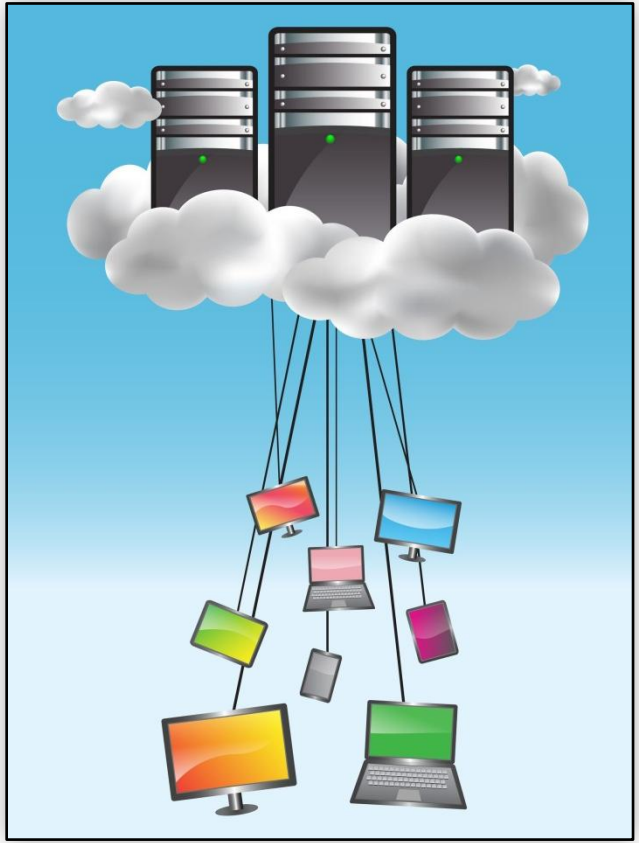
Interconnect Solution

Military-Grade Reliability for Next Generation Data Center Networking

AirBorn's HD4® Interconnect Solution empowers all **PCI Express** and other networking interconnect standards based on the PCI Express physical hardware interfaces (PHY) such as HyperTransport Technology Consortium's **HyperShare™** interconnect technology, with greater density and throughput for a variety of applications:

- **Data Centers**
- **High Performance Computing (HPC)**
- **Storage Networking**
- **Networking Equipment**
- **SSD Clusters**
- **Telecommunications**
- **Test Cquipment**

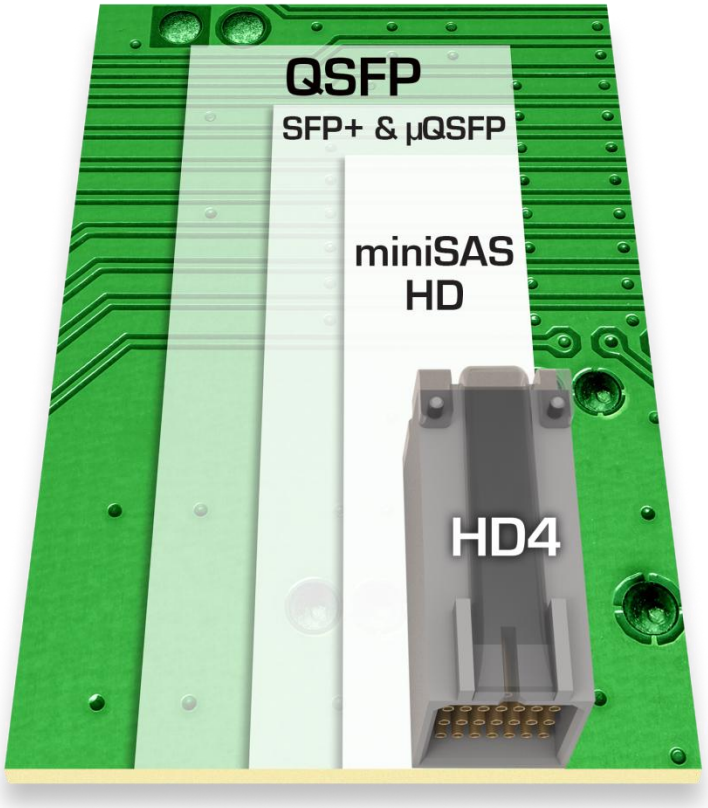
AirBorn's HD4® Interconnect Solution is the easy choice for next generation data processing and cloud computing platforms



HD4® replaces 1 Channel SFP+ links with 4 channel links within the same space requirements.

AirBorn’s HD4® Interconnect Solution holds up to 6 connectors in the same space as two (2) 4x QSFP or four (4) iPass+™ HD.

AirBorn’s HD4® Interconnect Solution



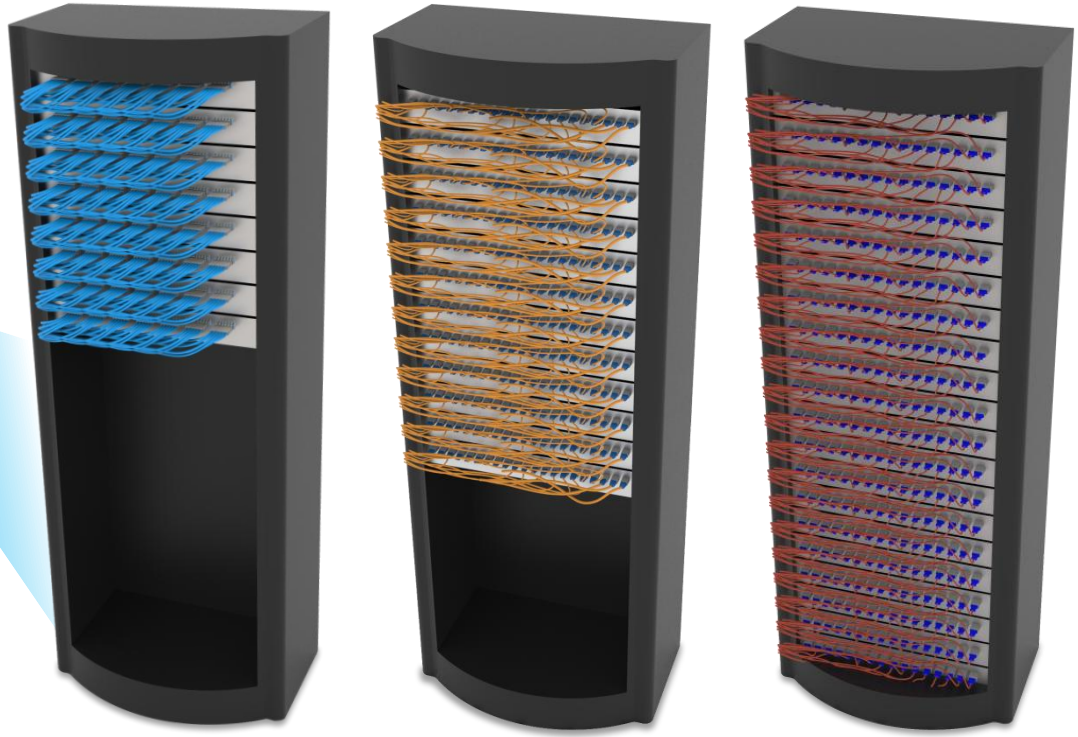
Board Space Dimensions

Product	W (mm)	L (mm)
HD4®	7.24	17.55
miniSAS HD	11.45	38
µQSFP	16.25	42.3
SFP+	16.25	42.3
QSFP	22.15	47.6

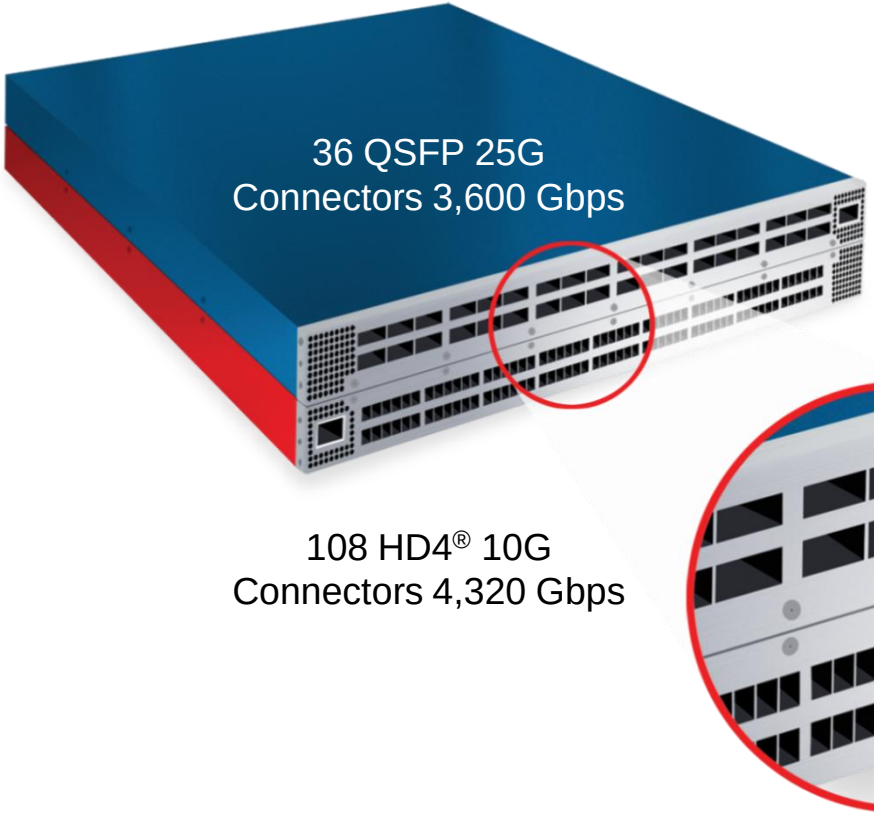
HD4® Interconnect Solution's Form Factor

- Saves approximately **66%** premium PCB & cabinet space
- Delivers the same data throughput as existing footprints in a form-factor 1.5-3X smaller
- Small form factor enables product designs which reduce expensive data center floor space, resulting in diminished energy consumption

320 Connectors



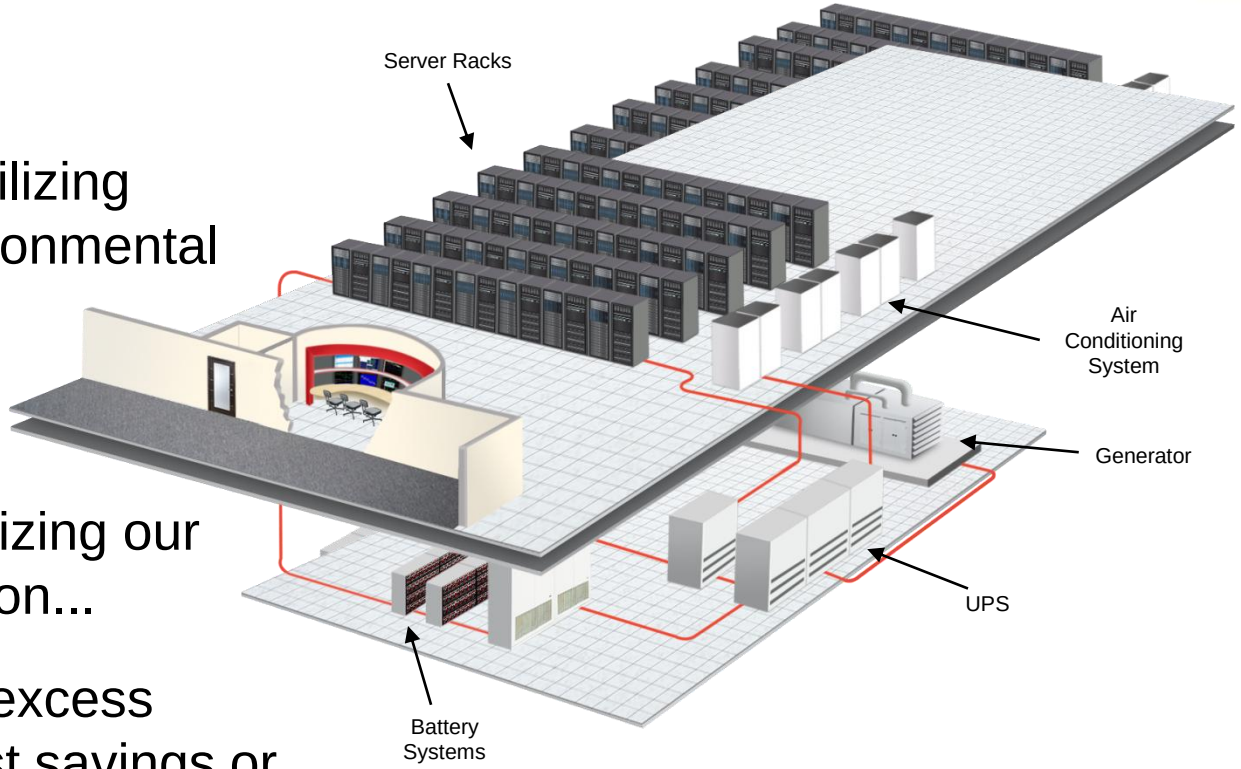
AirBorn's HD4® Cabinet | µQSFP Cabinet | QSFP Cabinet



Superior connector density means ***greater data throughput*** by utilizing ***10Gbps HD4® connectors*** vs. higher speed, ***25Gbps QSFP*** connectors in the same space

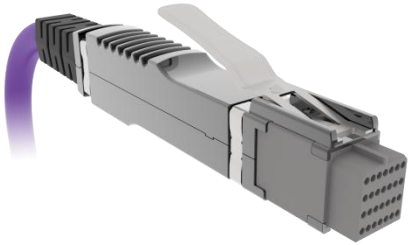
A Far More
Cost-Effective Solution

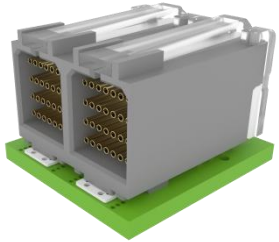
A datacenter floorplan — complete with cabinets utilizing QSFP connectors & environmental control systems.



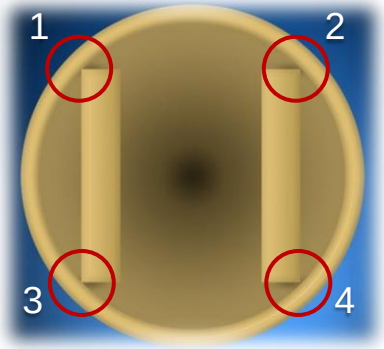
The same Datacenter utilizing our HD4® Interconnect Solution...

Eliminating the need for excess equipment, providing cost savings or opening up additional capacity.

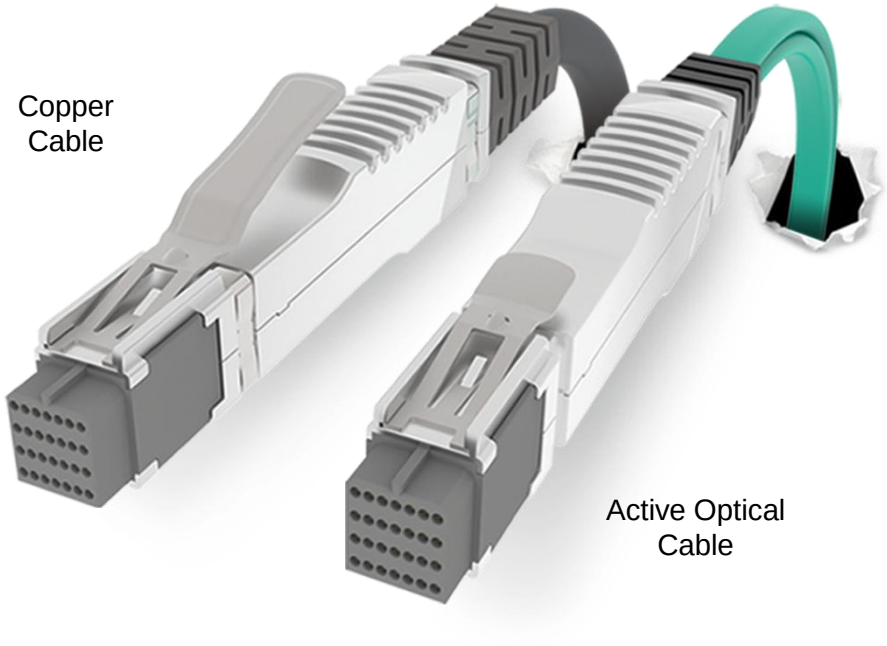




4 Contact Points

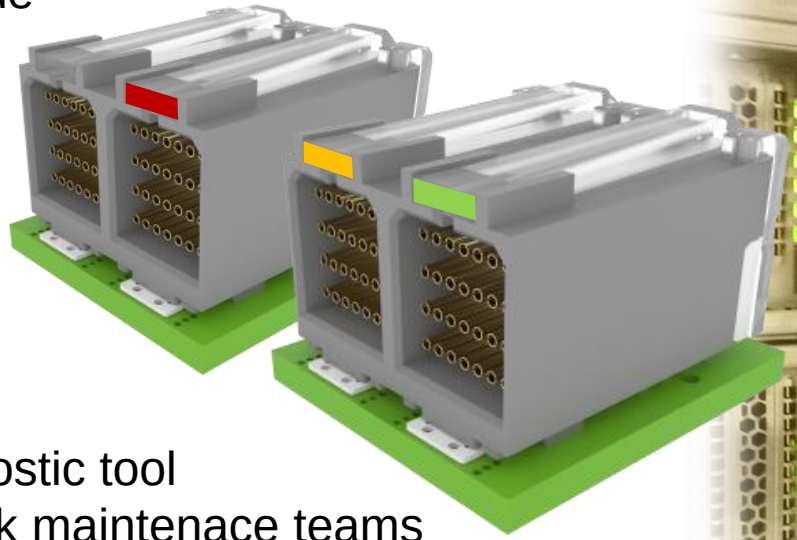


- HD4® connectors are rated up to ***250 mating cycles***
  - Design in military-grade reliability into your product
  - Vastly superior performance means peace-of-mind for network & datacenter administrators
- The HD4® contact system provides ***4 points-of-contact***
  - The best design for supreme signal integrity, dependability & performance
- Same rugged design, performance & reliability that AirBorn develops for critical applications
  - Aviation, military/defense, medical equipment & space exploration
- Contact wipe length approximately .070 (first point where electrical contact is made up to full engagement)

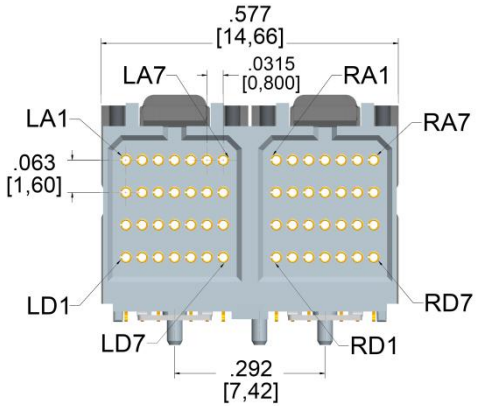


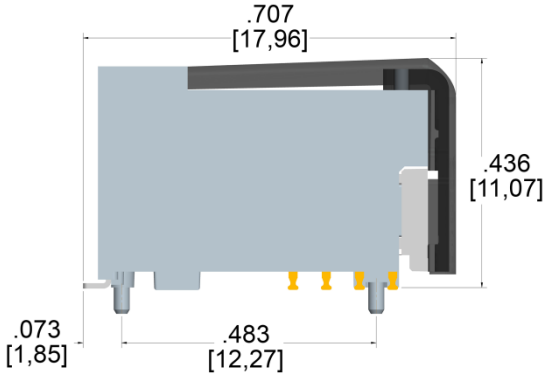
- Both Copper & Active-Optical Cable assemblies utilize the same, low-profile form factor
- Ability to plug Copper or AOC assemblies into any port
- Connect any ports between 0.5−100M distances

Despite their miniaturization,
HD4® female connectors are equipped with
an LED light guide



A powerful diagnostic tool
for IT and network maintenace teams
managing large scale data center systems


.577
[14,66]
LA7
.0315
[0,800]
RA1
LA1
RA7
.063
[1,60]
LD1
RD7
LD7
RD1
.292
[7,42]


.707
[17,96]
.436
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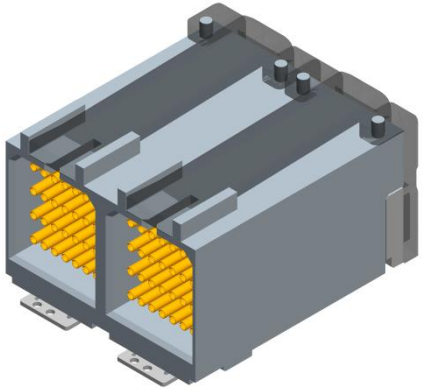
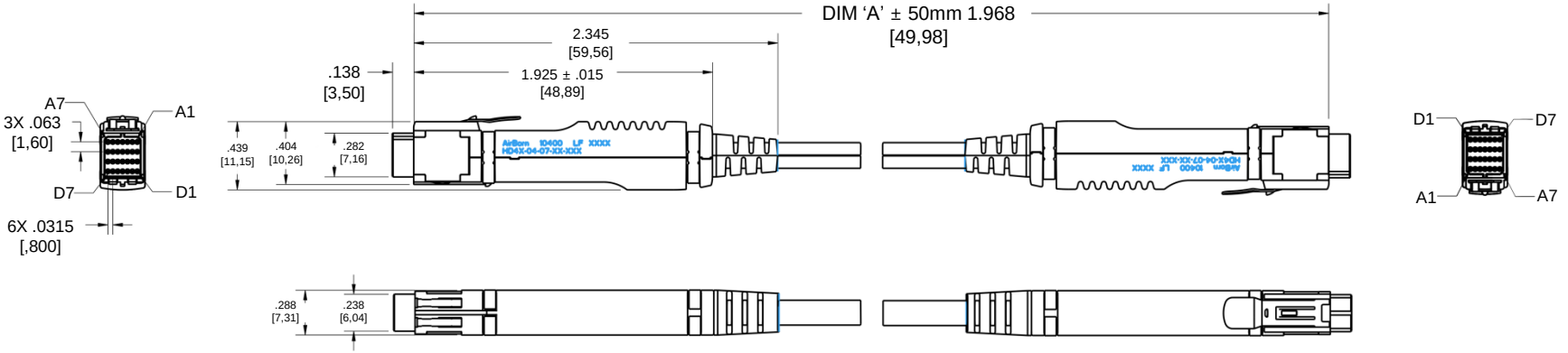
.073
[1,85]
.483
[12,27]




DIM 'A' ± 50mm 1.968
[49,98]
2.345
[59,56]
.138
[3,50]
1.925 ± .015
[48,89]
A7
3X .063
[1,60]
A1
D7
D1
6X .0315
[,800]
.439
[11,15]
.404
[10,26]
.282
[7,16]
.288
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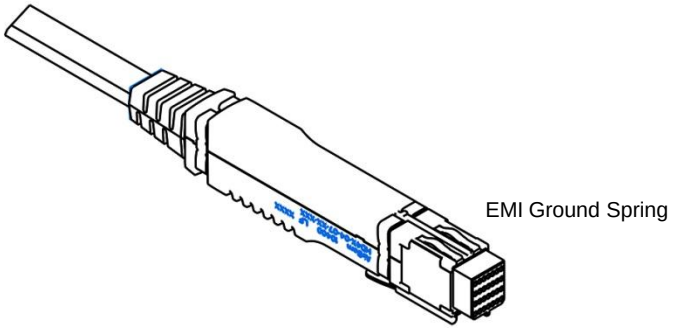
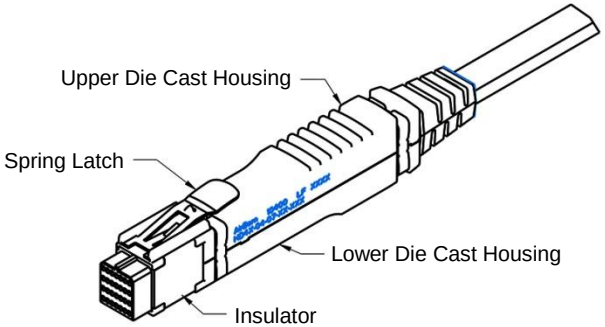
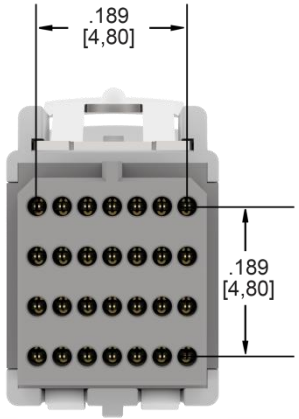
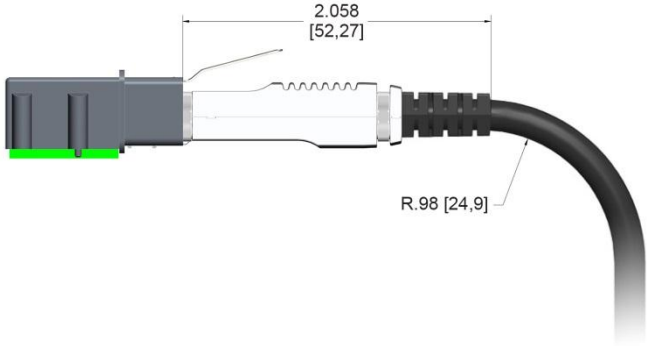
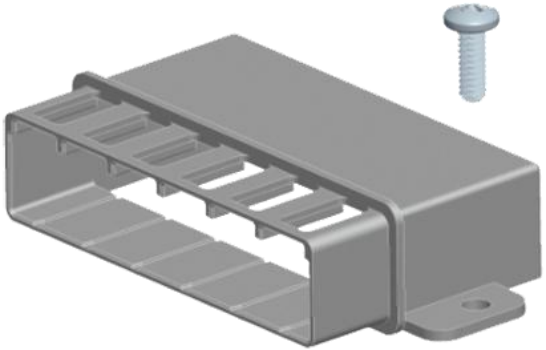
.238
[6,04]
D1
D7
A1
A7

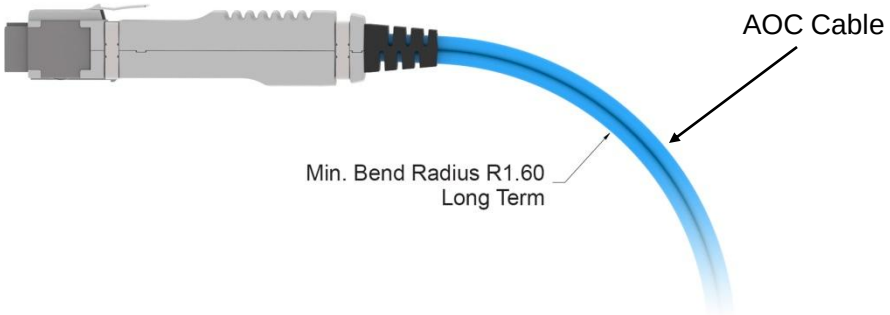

EMI Ground Spring

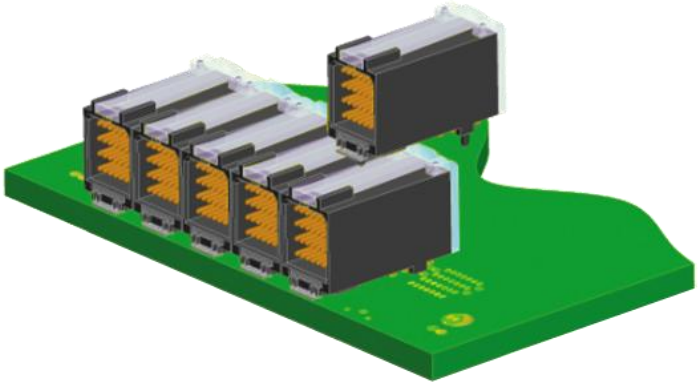

Upper Die Cast Housing
Spring Latch
Lower Die Cast Housing
Insulator

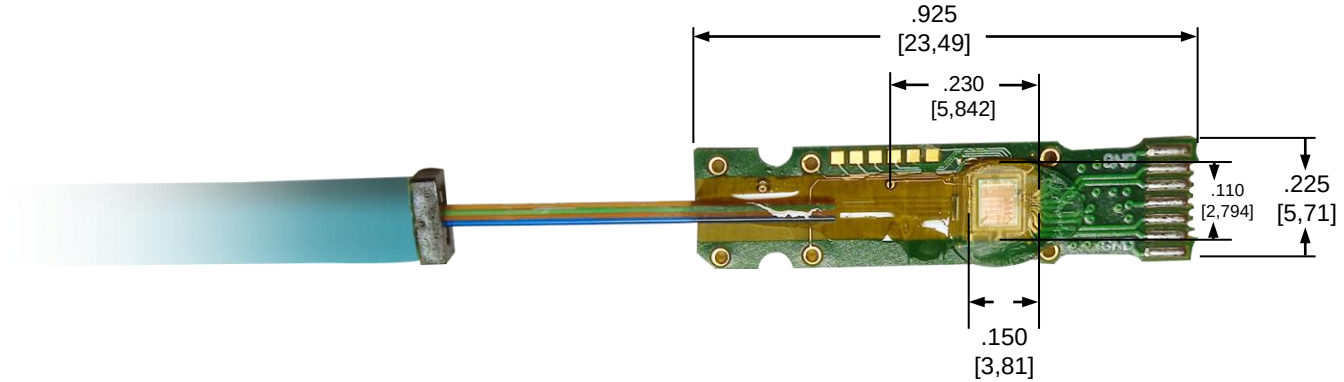

.189
[4,80]
.189
[4,80]

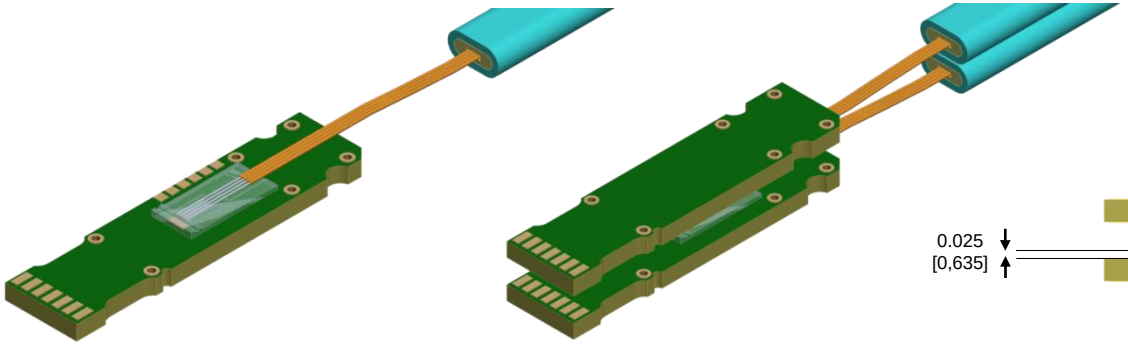

2.058
[52,27]
R.98 [24,9]



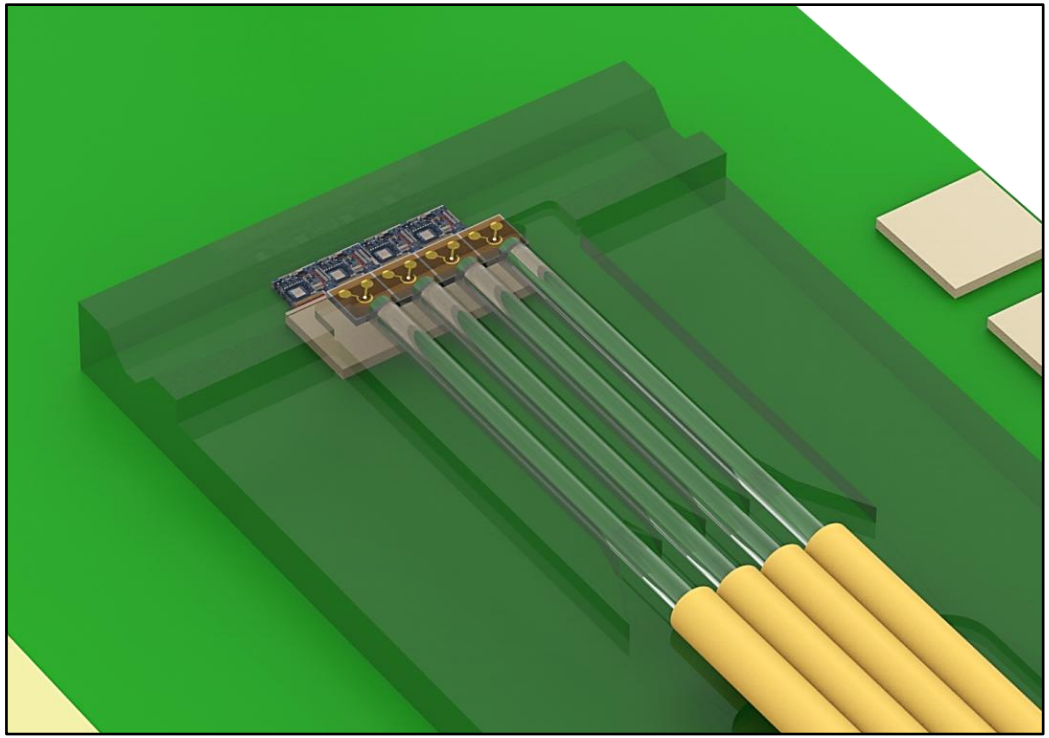

AOC Cable
Min. Bend Radius R1.60
Long Term

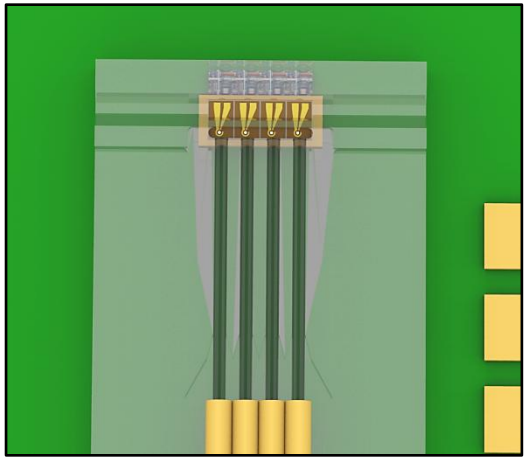


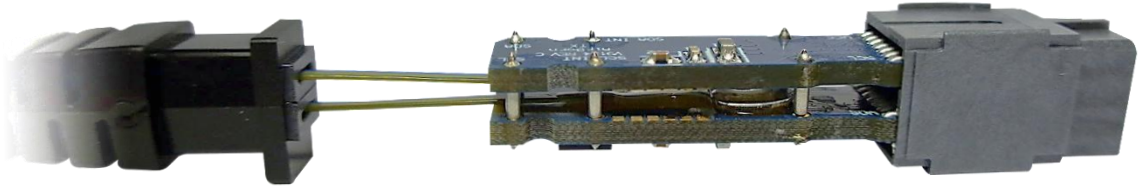

.925
[23,49]
.230
[5,842]
.110
[2,794]
.225
[5,71]
.150
[3,81]

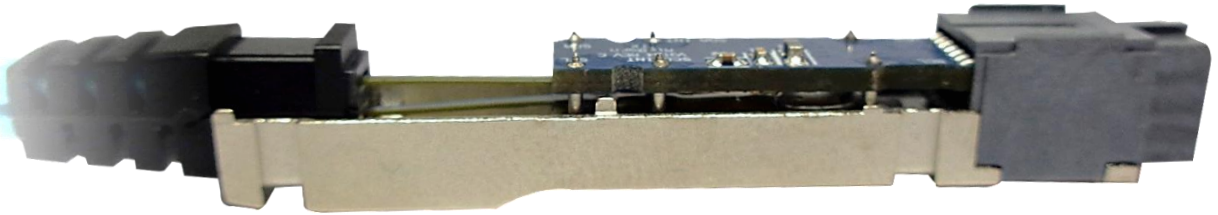



0.025
[0,635]

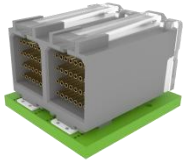








Right-Angle SI Board Connector



Materials & Finishes

Socket Contact: BeCu per UNS C17460

Contact Finish: 30µ" and 50µ" plating options for both commercial and military applications, localized gold finish per MIL-G-45204 over nickel per ASTM-B689 Type I

Molded Insulators: Glass-filled liquid crystal polymer (LCP) per ASTM-D5138

Performance

Contact Rating: 500mA

Operating Temperature: -40° to +80C° C

Contact Wipe: 1.5 mm (0.060")

Max Recommended Voltage: 30 VDC

Insulation Resistance: 1,000 megaohms @ 600 VDC

Durability: 250 connector mating cycles

Random Vibration: 3.10 grms

Shock: 30 g

Copper Cable Assembly

Materials & Finishes

Pin Contact: BeCu per ASTM-B194

Contact Finish: 30µ" and 50µ" plating options for both commercial and military applications, localized gold finish per MIL-G-45204 over nickel per ASTM-B689 Type I

Molded Insulators: Glass-filled liquid crystal polymer (LCP) per ASTM-D5138

Performance

Contact Rating: 500mA

Operating Temperature: -40° to +80° C

Contact Wipe: 1.5 mm (0.060")

Max Recommended Voltage: 3.47 V

Insulation Resistance: 1,000 megaohms @ 600 VDC

Durability: 250 connector mating cycles

Random Vibration: 3.10 grms

Shock: 30 g

Active Optical Cable Assembly

Materials & Finishes

Pin Contact: BeCu per ASTM-B194

Contact Finish: 30µ" and 50µ" plating options for both commercial and military applications, localized gold finish per MIL-G-45204 over nickel per ASTM-B689 Type I

Molded Insulators: Glass-filled liquid crystal polymer (LCP) per ASTM-D5138

Performance

Operating Temperature: 0° to 70° C

Operating Humidity: 50 to 90%, non-condensing

Storage Temperature: -40° to 85° C

Supply Voltage: 3.05 to 3.47 V (3.3, typ.)

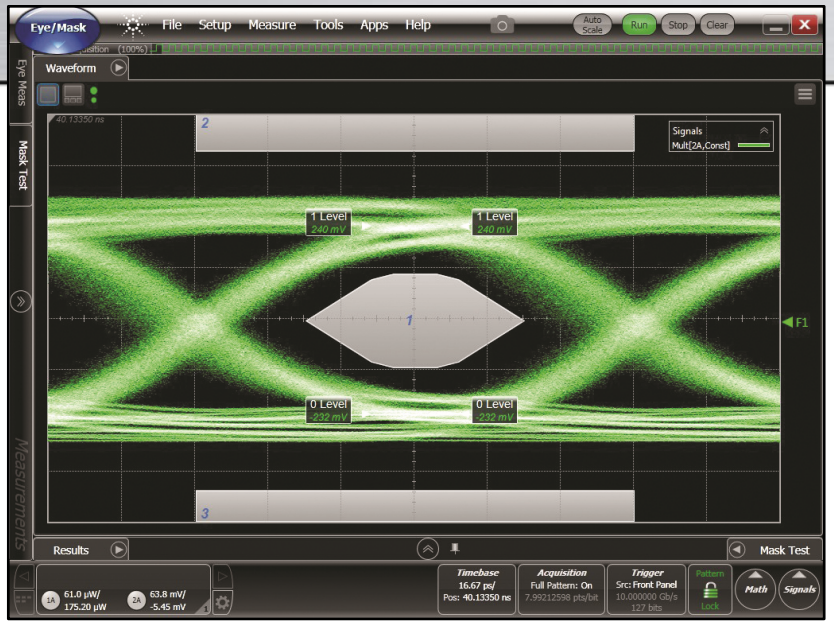
Power Consumption: 490 mW, typ. (2 x 200 mVpp)

Power Supply Current: 150 mA, typ.

Contact Wipe: 1.5 mm (0.060")

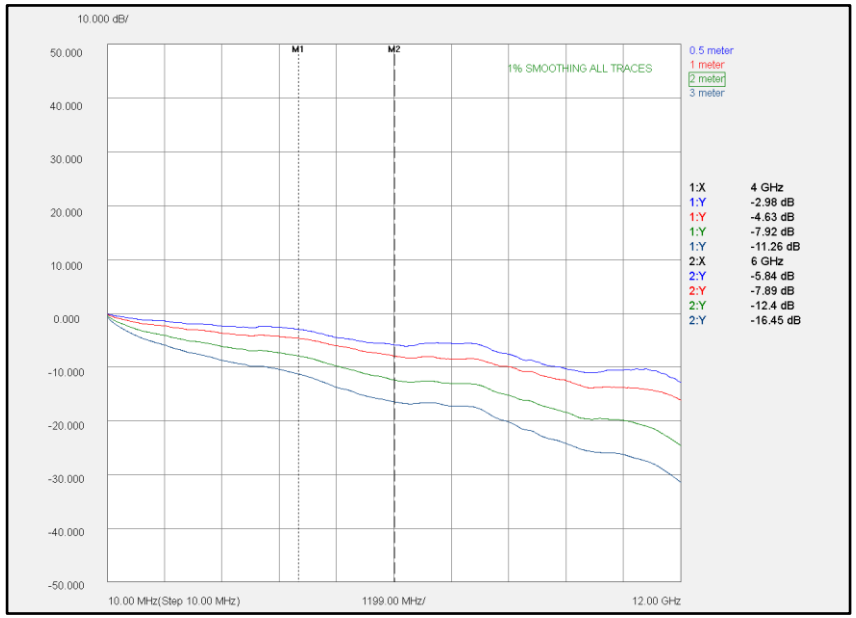
Durability: 250 connector mating cycles

NOTE: Performance values are estimates, values are subject to change without notice.

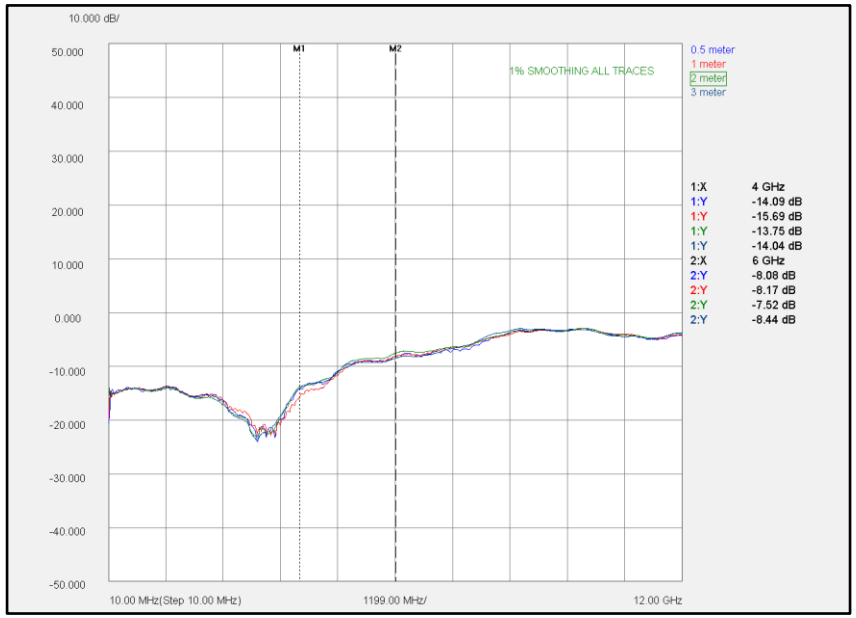


Symbol	Parameter	Maximum	Nominal	Minimum	Unit	Actual	Pass/Fail
X	Eye Mask Parameter, Time	0.36	—	—	UI	Refer to diagram	Pass
Y1, Y2	Eye Mask Parameter, Voltage	—	100, 600	—	mV	Refer to diagram	Pass
JD1	Deterministic Jitter	0.4	—	—	UI	0.23	Pass
JT1	Total Jitter	0.72	—	—	UI	0.52	Pass

NOTE: The above data was collected from the surface-mount style.



Differential Insertion Loss, SDD21



Differential Return Loss, SDD11

NOTE: The above data was collected from the surface-mount style. Results are typical and not guaranteed or Min./Max.

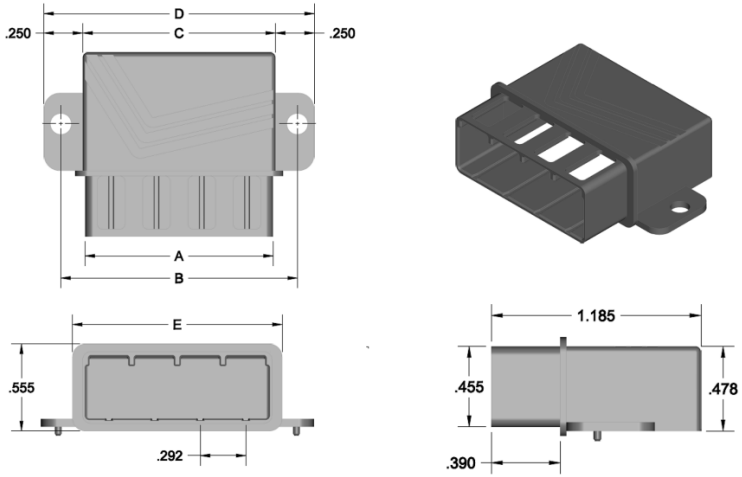
Product	2015						2016											
	Q3			Q4			Q1			Q2			Q3			Q4		
HD4™- 8-10G Cu																		
HD4™- 8-10G AOC																		
HD4™- 25G Cu**																		
HD4™- 25G AOC**																		

Cable configurations: 4x to 4x, 8x to 8x, 8x to 2-4x, 16x

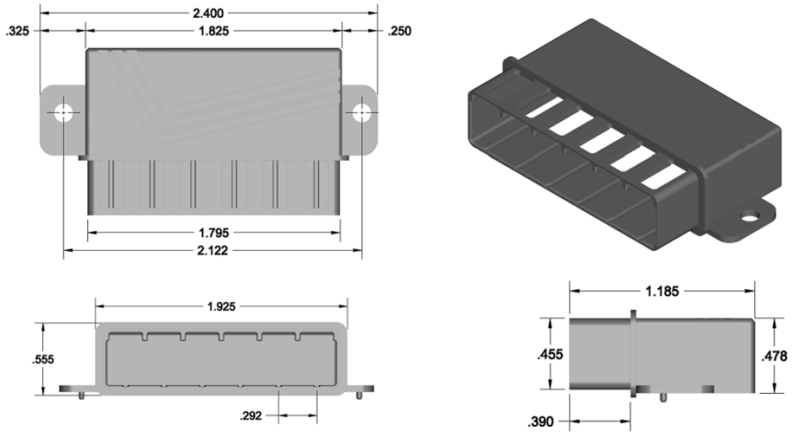
** Not a backward compatible foot print

Development
Qualification
Mass production

This Model Specifically Designed to Fit 6 HD4® Connectors (e.g. for 3D-Torus Networks) in Low Profile PCIe Add-On Cards



V4000-04 Hood



V4001-06 Hood

Part No.	Positions	A	B	C	D	E
V4000-01	1	0.335	0.648	0.365	0.865	0.465
V4000-02	2	0.627	0.94	0.657	1.157	0.757
V4000-04	4	1.211	1.524	1.241	1.741	1.341
V4001-06	6	1.795	2.122	1.825	2.400	1.925
V4000-08	8	2.379	2.692	2.409	2.909	2.509

HD4® vs. µQSFP

HD4® Features

- 33% increase in density over µQSFP (based on 72 microQSFP ports vs. 108 HD4 ports in 1U)
- 4 Channel interface like microQSFP
- 10Gbps/channel

HD4® Benefits

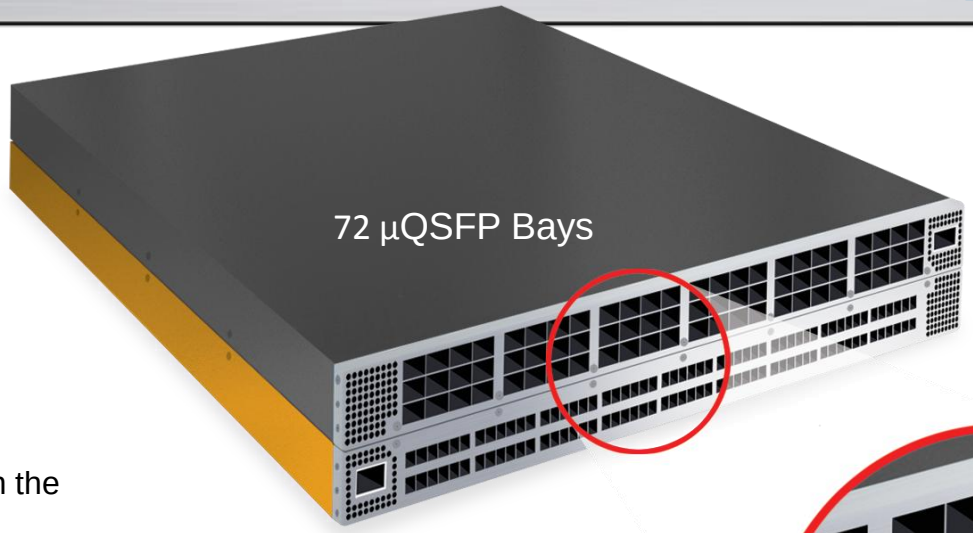
- Larger data throughput without expensive infra-structure changes to 25Gig chip sets
- Better thermal management cable interface (outside the box) for better airflow
- Supports active optical interface without changing the form factor
- Enables up to 108 ports per 1RU line card

µQSFP Features

- 33% increase in density over QSFP (based on 48 microQSFP ports vs. 36 QSFP ports in 365mm)
- Same 4 channel electrical interface as QSFP
- Same 3.5+W power capability as QSFP+
- Will support 25G and 50G (PAM4) electrical data rates

µQSFP Benefits

- Functionality of QSFP in SFP density
- Significantly improved thermal management
- Accommodates multiple electrical interface generations, while supporting a long life optical interface without changing form factor
- Enables up to 72 ports per 1RU line card



HD4® Summary

- Highest density solution in market
- Supports electrical and active optical in the same form factor
- Supports next generation data throughput with the current and established infrastructure (saving cost)

µQSFP Summary

- Enables a second generation line card with higher port density than a QSFP based line card
- Enables the same IO density as SFP with improved thermal management and increased bandwidth density

a³cube

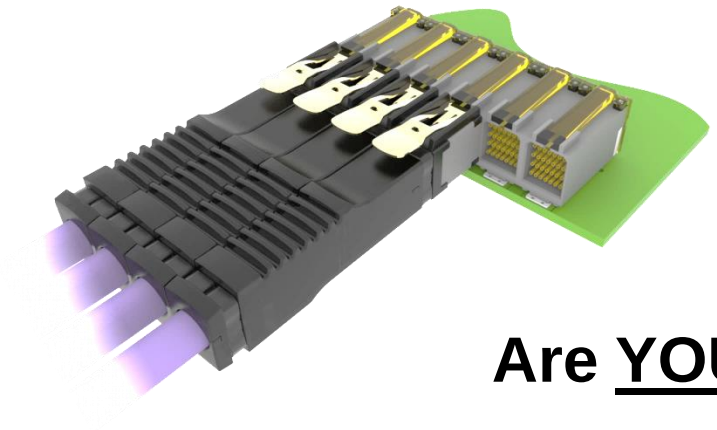
A3Cube designed their RR-IO adapter card with AirBorn's HD4®.

The HD4® connector is the only high-speed connector that allows fitting six high-speed cableconnections in a Low Profile PCIe Card. The result is a high-density, high-bandwidth, high-reliability Network Interface Controller (NIC) card ready to serve next generation of data centers

Why do so many customers choose to partner with AirBorn?

Because the Uninterrupted Flow of Information is Crucial

Data communication technology advances in unprecedented directions everyday. AirBorn's HD4® Interconnect Solution positions you on the cutting edge with increased performance, greater efficiency and unmatched durability… all within a smaller footprint.



HD4

Are YOU ready?

Mission-Critical Reliability is Our Business