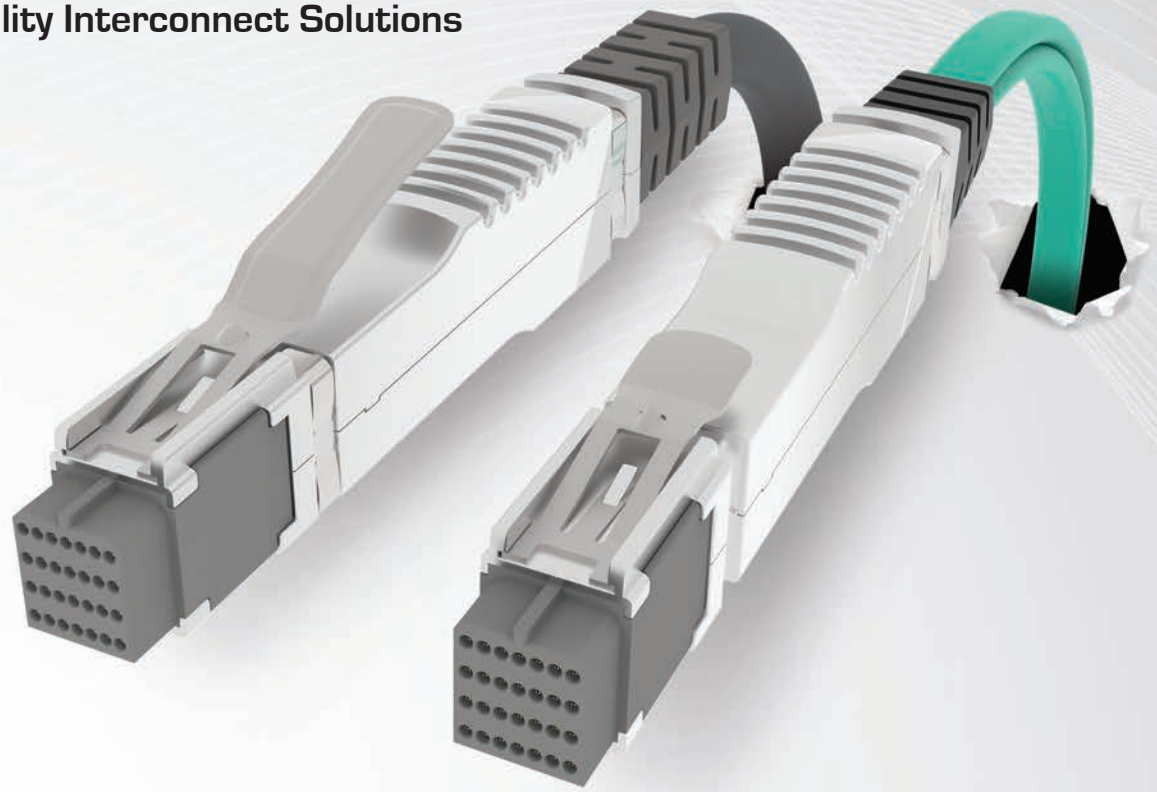
AirBorn

High-Reliability Interconnect Solutions



HD4® Interconnect Solution

AirBorn's HD4® I/O Interconnect Solution offers the highest density to performance ratio currently available for data communications applications requiring high speed, high reliability connections within the smallest footprint in the industry. HD4®'s high bandwidth, minimized signal loss and mission-critical reliability makes it uniquely suitable for the most demanding, multi-dimensional network fabrics and ultra-fast storage/SSD cluster applications. It is ideally applied in next-generation data center and cloud computing platforms.

- **Highest Density Solution**
  HD4® delivers the same data throughput as existing form factors, but in a form factor that is 1.5 to 3 times smaller, including a smaller footprint to save on premium board space.
- **Highest Performance to Density Ratio**
  In the same space as 20 QSFP 10G ports delivering 800 Gbps, the HD4® 10G solution can provide 60 ports delivering 2400 Gbps.
- **Extreme Reliability**
  The HD4® contact system provides 4-points of contact, for ultimate signal integrity and performance.
  Same rugged design, performance and reliability that AirBorn develops for critical applications like aviation, military/defense, medical equipment and space exploration.

HD4B-G

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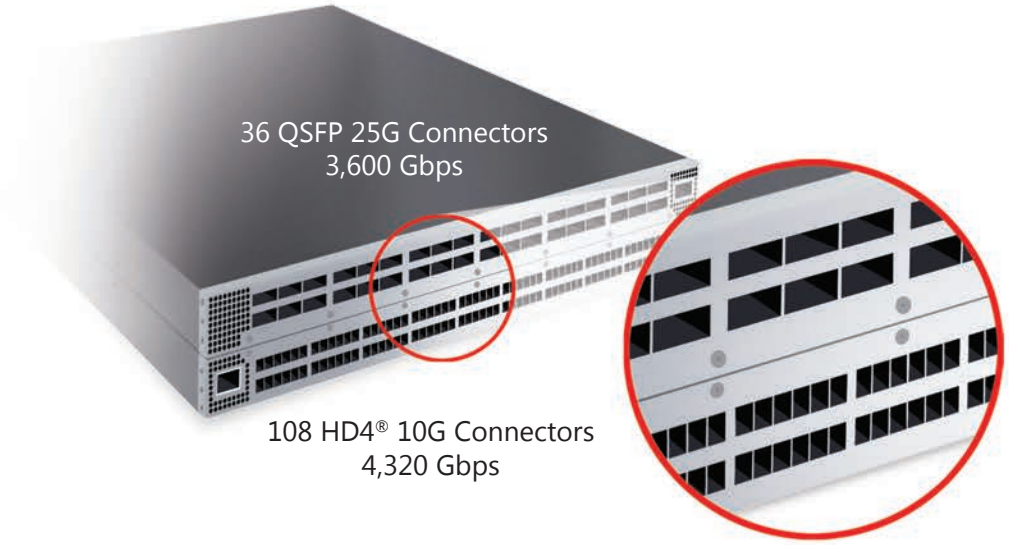


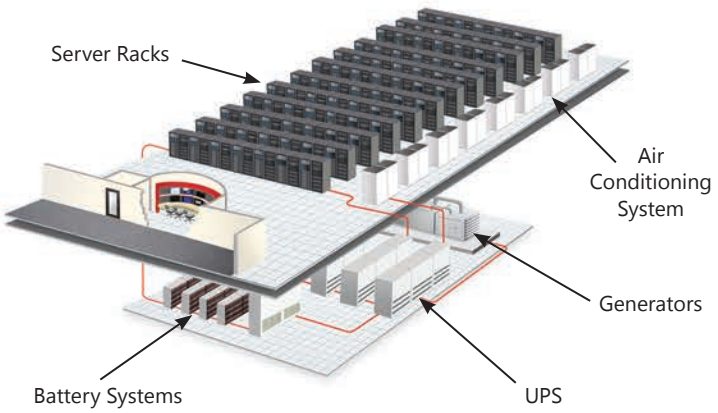
HIGHEST DENSITY SOLUTION

Superior connector density means greater data throughput utilizing 10G HD4® connectors versus 25G QSFP connectors in the same space.

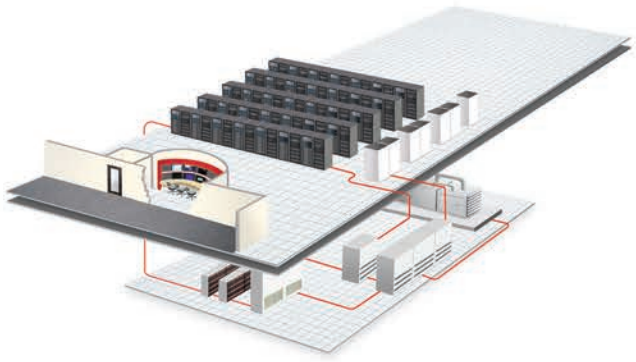
AIRBORN'S HD4® INTERCONNECT SOLUTION'S FORM FACTOR:

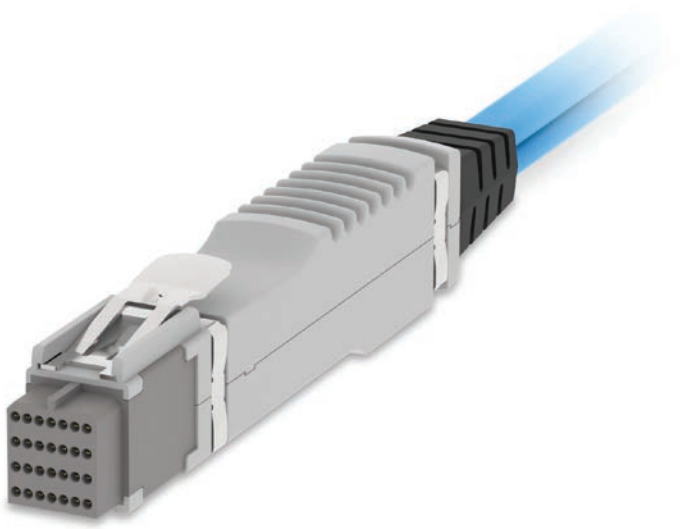
- Saves approximately 66% premium PCB & cabinet space
- Delivers the same data throughput as existing footprints in a form-factor 1.5-3x smaller
- Small form factor enables product designs which reduce expensive data center floor space, resulting in diminished energy consumption

A DATA CENTER FLOOR PLAN WITH CABINETS UTILIZING QSFP CONNECTORS



THE SAME DATA CENTER UTILIZING AIRBORN'S HD4® INTERCONNECT SOLUTION





APPLICATIONS

- High-performance computing
- Medical diagnostic equipment
- Network storage devices
- Ruggedized computing equipment
- Telecommunications hardware
- Test equipment

FEATURES

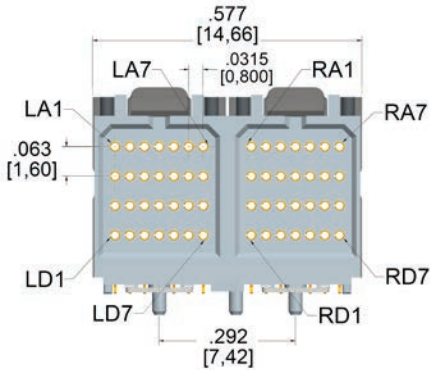
- 250 mating/demating cycles (contact AirBorn for mating cycle requirements up to 10,000 cycles)
- 4 points of contact offer superior performance and reliability
- 7.4 mm (0.292") connector-to-connector pitch enabling multiple (6) I/O ports along a low-profile PCIe
- Eight differential pair (100 Ω and 85 Ω) twinax cable construction with 4-channel full duplex capability
- I/O link targeting rack-in-cabinet-based systems that require higher bandwidth and density
- Lightpipe option available
- Robust die-cast shells for EMI shielding and termination
- SMT & paste-in-hole contact termination options available
- Up to 10 Gb/s per channel

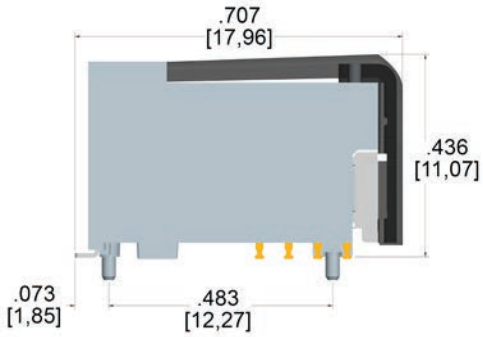
BENEFITS

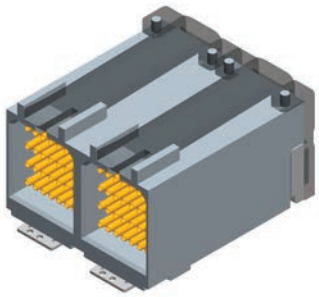
- 4 contact points — the best design for supreme signal integrity, dependability & performance
- Both copper & AOC cable assembly options available in the same form factor — no other competitor comes close
- Increased performance, greater efficiency & unmatched durability — all within a smaller footprint
- Reduced rack and floor space as well as condensed board and box content
- Same rugged performance & reliability that AirBorn develops for mission-critical applications
- Smaller cable diameters promotes greater airflow — improving cooling efficiency

STORAGE REQUIREMENTS

- Avoid prolonged exposure to UV light as it may weaken materials used in the product
- HD4® should be stored in temperatures ranging from -40° to 85° C for optimal usage
- HD4® should be used on a first in, first out basis to avoid possible storage contamination and remain in the shipping containers until ready for use
- Storage near chemicals such as Alkalies, Amines, Ammonia, Carbonates, Citrates, Nitrites, Phosphates Citrates, Sulfur Nitrites, Sulfur Compounds & Tartrates is prohibited as they may cause corrosion and cracking







HD4® RIGHT-ANGLE SI BOARD CONNECTORS

HD4® high-density, signal-integrity connectors are used in right angle, PCB-mount applications. HD4® connectors allow for six 4x interfaces in the low-profile PCIe add-on card when used with part number V4001-06. Available in dual (shown above) and single bay configurations. HD4® is RoHS compliant, UL type CL2 & CSA certified.

FEATURES

Low mating force/high-reliability contact system with four points of contact.

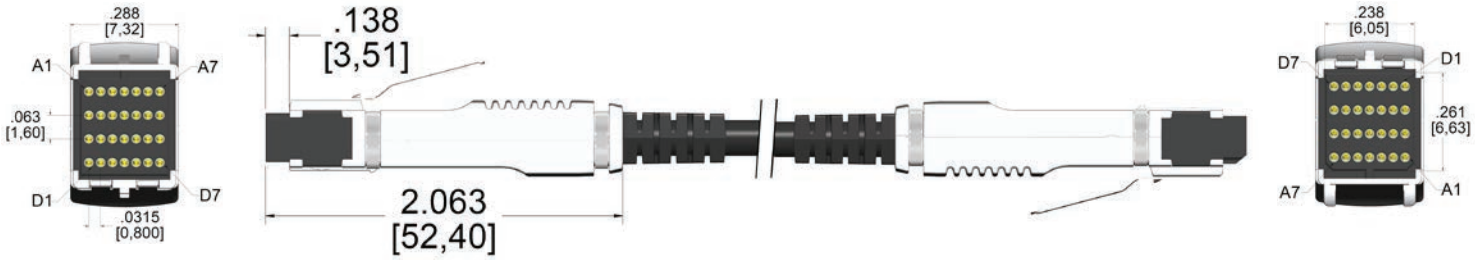
MATERIALS & FINISHES

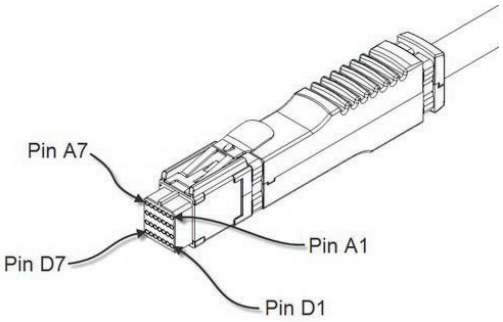
- Socket Contact: . . . . . BeCu per UNS C17460
- Contact Finish: . . . . . 30µ"and 50µ" plating options for both commercial and military applications, ... Localized gold finish per MIL-G-45204 over nickel per ASTM-B689 Type I
- Molded Insulators: . . . . . Glass-filled liquid crystal polymer (LCP) per ASTM-D5138

PERFORMANCE

- Contact Rating: 500mA
- Contact Wipe: . . . . . .1.5 mm (0.060")
- Durability: . . . . . 250 connector mating cycles
- Insulation Resistance: . . . . . 1,000 megaohms @ 600 VDC
- Max Recommended Voltage: . . . . . .30 VDC
- Operating Temperature: . . . . . .-40° to +80° C
- Random Vibration: . . . . . 3.10 grms
- Shock: . . . . . 30 g
- Storage Temperature: . . . . . -40° to 85° C

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





Row	Column 1	2	3	4	5	6	7
A	VDD	TX1p	TX1n	Gnd	TX3p	TX3n	SCL
B	Gnd	TX2p	TX2n	Gnd	TX4p	TX4n	Gnd
C	SS	Rx2p	Rx2n	Gnd	RX4p	RX4n	SDA
D	Gnd	Rx2p	Rx1n	Gnd	RX3p	RX3n	Gnd

HD4C - DIFFERENTIAL PAIR TWINAX COPPER CABLE ASSEMBLY

HD4® high-density cable assemblies are designed for differential pair, twinax applications. These cable assemblies are available in 13 standard lengths (up to 3.0 meters). HD4® is RoHS compliant, UL type CL2 & CSA certified.

FEATURES

HD4® connectors feature a low mating force/high-reliability contact system with four points of contact. HD4® cables incorporate an integrated management interface accessed over a two-wire interface to query cable details such as unique device serial number, cable length, and cable nominal impedance.

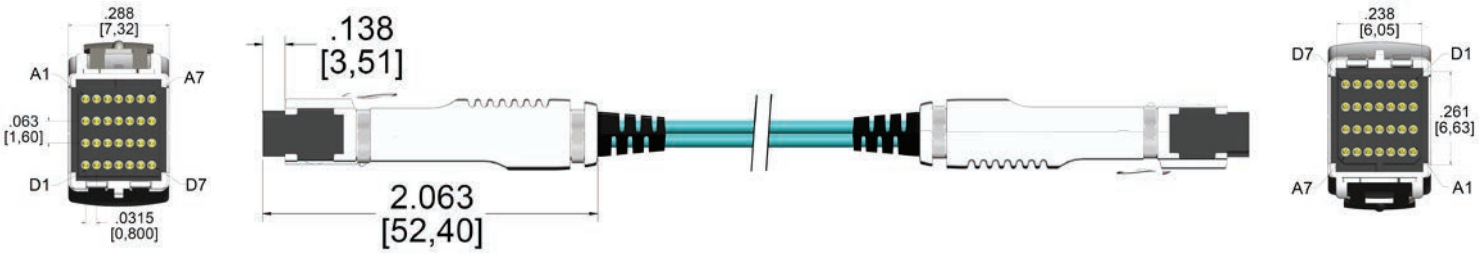
MATERIALS & FINISHES

- 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
- Contact Wipe: . . . . . 1.5 mm (0.060")
- Durability: . . . . . 250 connector mating cycles
- Insulation Resistance: . . . . . 1,000 megaohms @ 600 VDC
- Max Recommended Voltage: . . . . . 3.47 V
- Operating Temperature: . . . . . -40° to +80° C
- Random Vibration: . . . . . 3.10 grms
- Shock: . . . . . 30 g
- Storage Temperature: . . . . . -40° to 85° C

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



HD4X - ACTIVE OPTICAL CABLE ASSEMBLY

HD4® high-density, active optical cable assemblies are capable of 10 Gb/s, full duplex over four independent transmit and receive channels. The HD4X AOC is fully interchangeable with AirBorn's HD4C passive copper cable assembly having the same active electronics and management interface. The high-relibility HD4® interconnect technology is the result of the company's close cooperation with the HyperTransport Technology Consortium, of which AirBorn is a contributing member. HD4® is RoHS compliant, UL type CL2 & CSA certified.

FEATURES

HD4® connectors feature a low mating force/high-reliability contact system with four points of contact. HD4® cables incorporate an integrated management interface accessed over a two-wire interface to query cable details such as unique device serial number, cable length, and cable health. HD4X cables available in lengths up to 100 meters.

MATERIALS & FINISHES

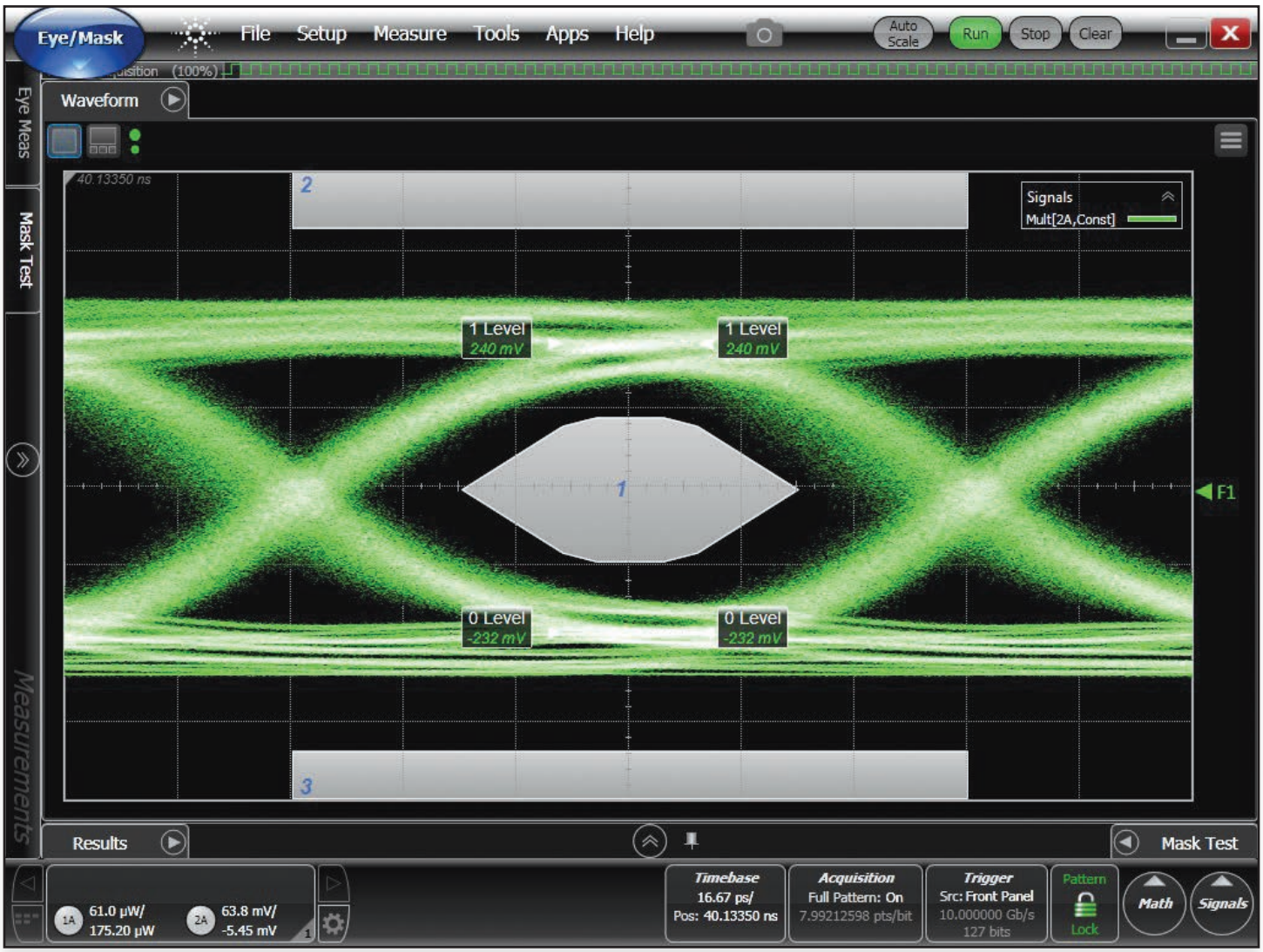
- Pin Contact: . . . . . BeCu per ASTM-B194
- Contact Finish: . . . . . 30µ"and 50µ" plating options for both commercial and military applications, ... Localized gold finish per MIL-G-45204 over nickel per ASTM-B689 Type I
- Molded Insulators: . . . . . Glass-filled liquid crystal polymer (LCP) per ASTM-D5138

PERFORMANCE

- Contact Wipe: . . . . . 1.5 mm (0.060")
- Data Bit Rate . . . . . 10 Gb/s
- Durability: . . . . . 250 connector mating cycles
- Operating Humidity: . . . . . 5% to 90%, non-condensing
- Operating Temperature: . . . . . 0° to 70° C
- 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.

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

QDR EYE DIAGRAM

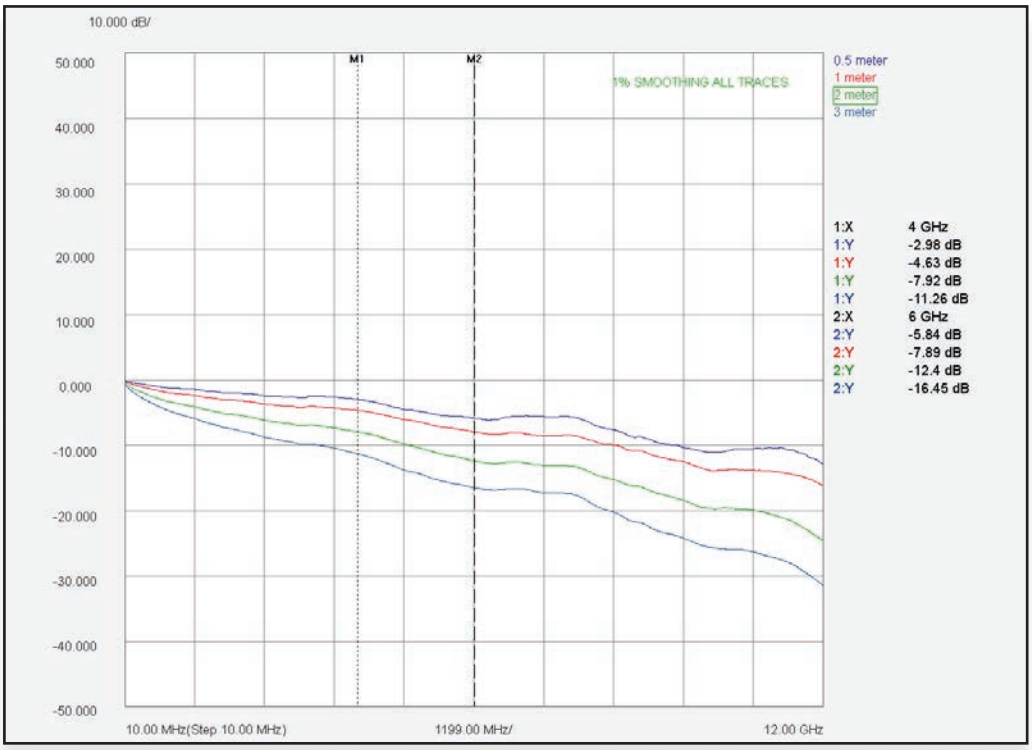


Output Characteristics for 10.0 Gb/s (infiniBand QDR)

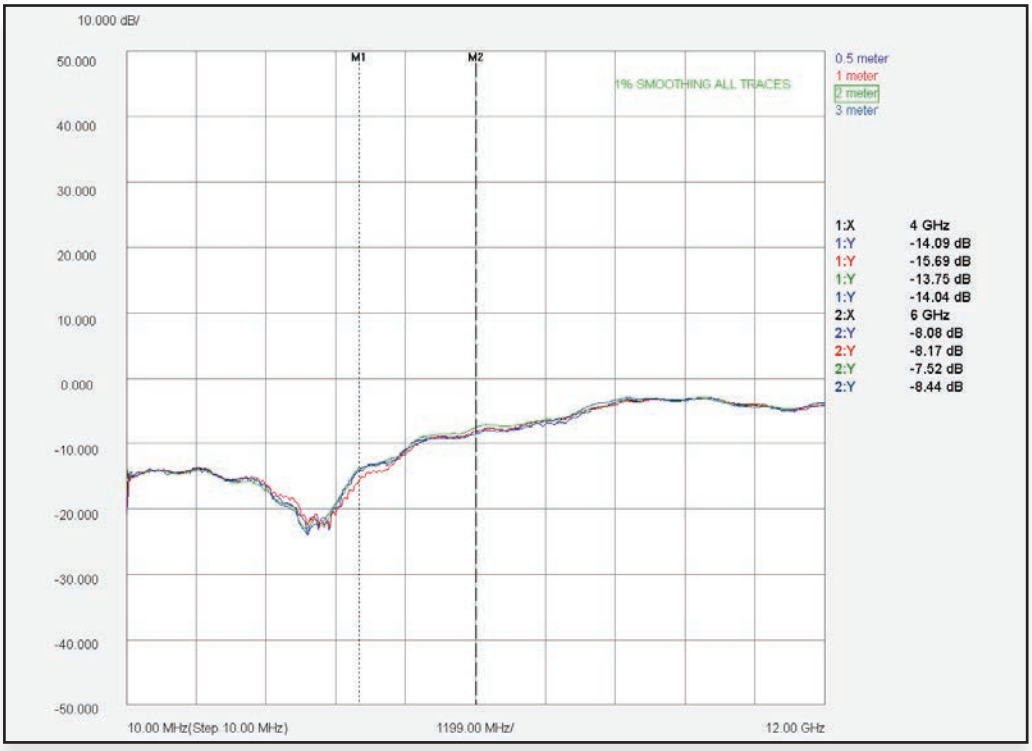
Symbol	Parameter	Maximum	Nominal	Minimum	Unit	Actual	Pass/Fail
X	Eye Mask Parameter, Time	0.36	—	—	UI	Refer to diagram above	Pass
Y1, Y2	Eye Mask Parameter, Voltage	—	100, 600	—	mV	Refer to diagram above	Pass
JD1	Deterministic Jitter	0.4	—	—	UI	0.23	Pass
JT1	Total Jitter	0.72	—	—	UI	0.52	Pass

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

DIFFERENTIAL INSERTION LOSS, SDD21

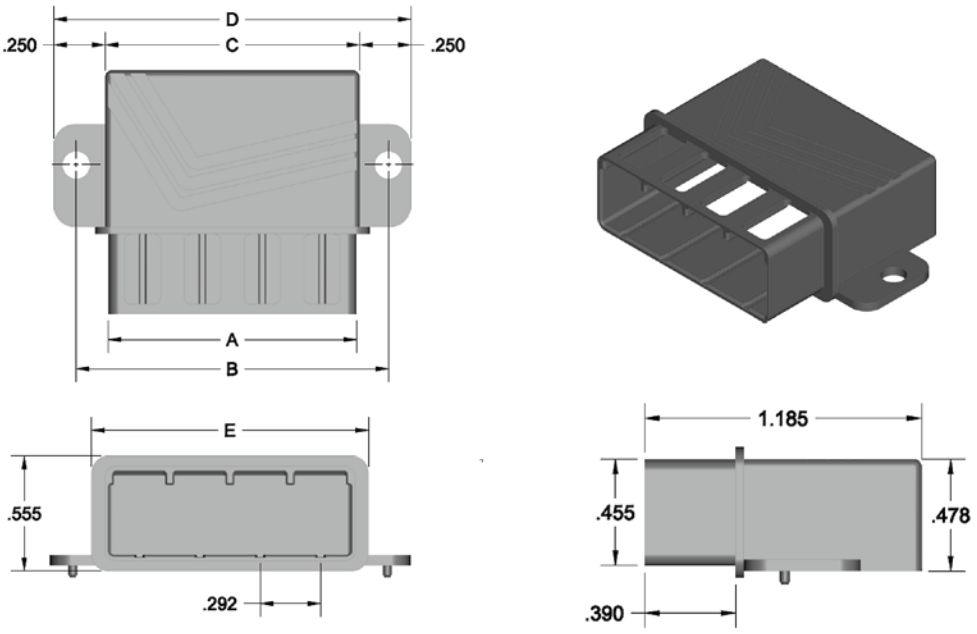


DIFFERENTIAL RETURN LOSS, SDD11



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

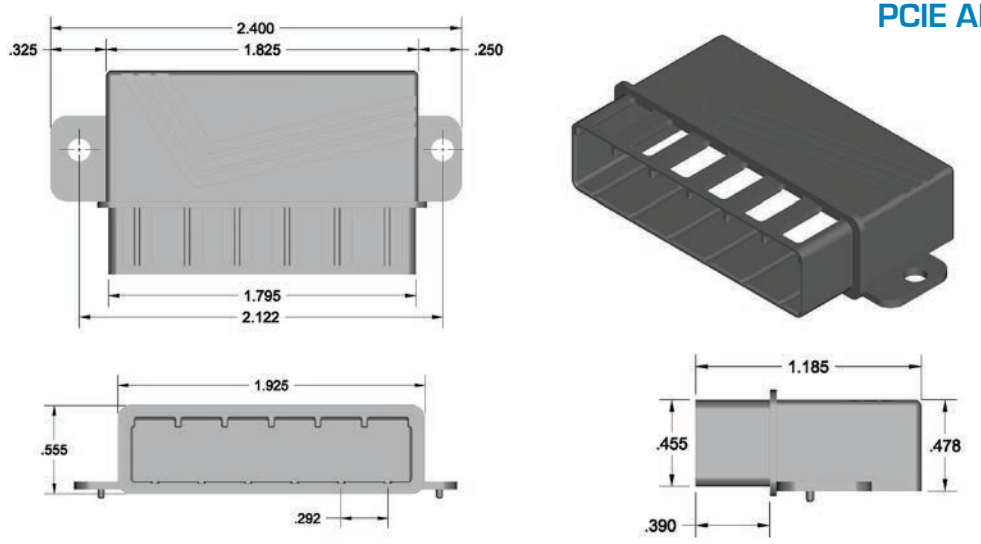
V4000-04 HOOD



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	0.940	0.657	1.157	0.757
V4000-04	4	1.211	1.524	1.241	1.741	1.341
V4000-06	6	1.795	2.122	1.825	2.400	1.925
V4000-08	8	2.379	2.692	2.409	2.909	2.509

V4001-06 HOOD

SPECIFICALLY DESIGNED FOR PCIE APPLICATIONS



MORE INFORMATION

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