

Discover High-Speed Modular Differential Connector Systems





Amphenol Overview

Amphenol Communications Solutions (ACS), a division of Amphenol Corporation, is a world leader in interconnect solutions for Communications, Mobile Consumer Products, RF, Optics, Broadband and Commercial electronics markets.

Amphenol Corporation is one of the world's largest designers and manufacturers of electrical, electronic and fiber optic connectors and interconnect systems, antennas, sensors and sensor-based products and coaxial and high-speed specialty cable.

ACS has an expansive global presence in research and development, manufacturing, and sales. We design and manufacture a wide range of innovative connectors as well as cable assemblies for diverse applications including server, storage, data center, mobile, RF, networking, industrial, business equipment and automotive.





We place heavy emphasis on R&D for both new product and technology development, focusing on the advancement of the next generation of high-speed interconnects and power distribution solutions as well as innovative manufacturing solutions.

 Our R&D centers worldwide have registered thousands of patents and licensing agreements, developing some of the world's first innovations in connectors such as Shield-less High-Speed Connectors, Ball-Grid-Array Attachments, economical Stamped High-Power Contacts and cost effective yet reliable plating processes.

High Speed

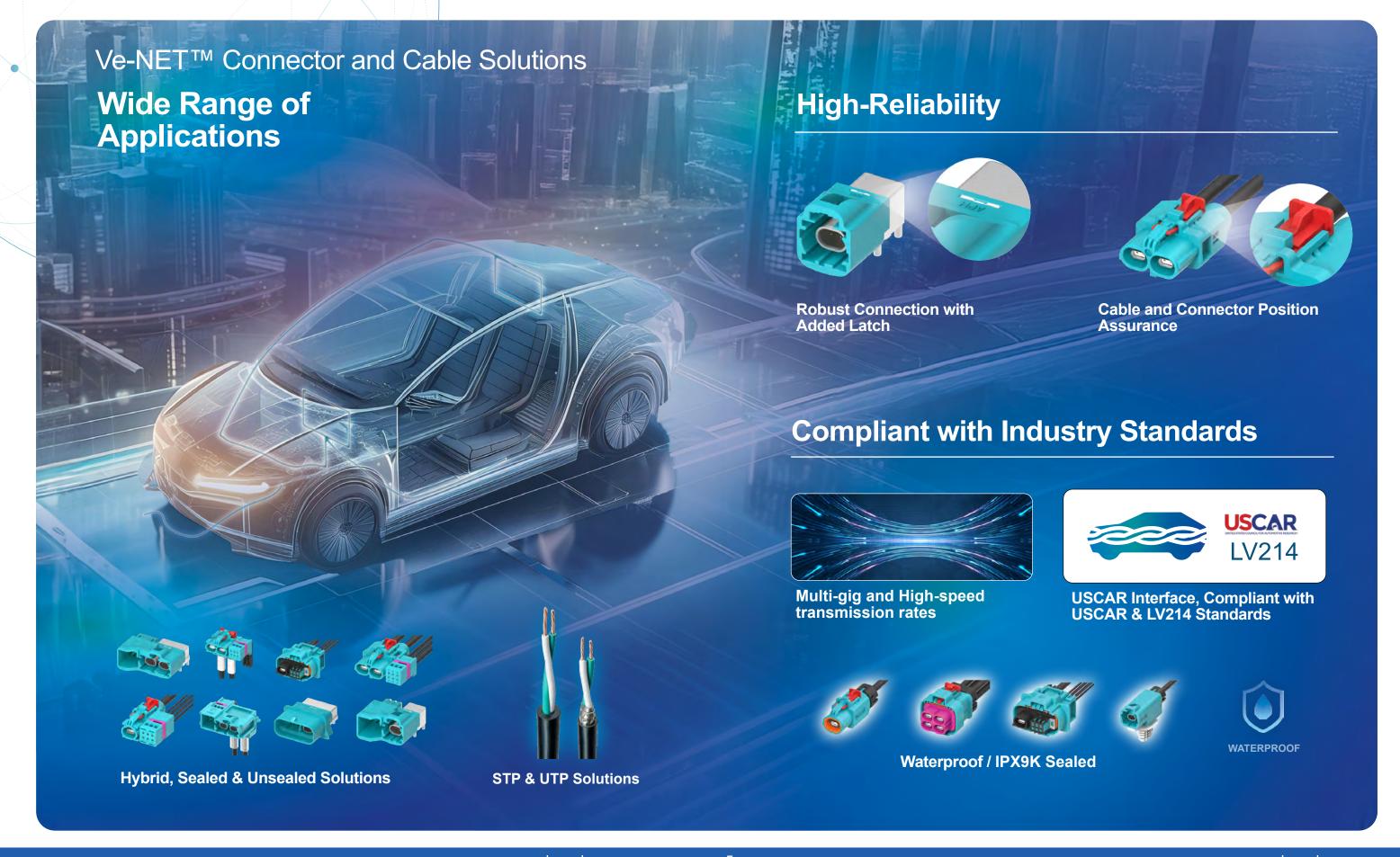
RF, Optics & Broadband

Commercia

Mobile Consume We relentlessly seek improvements of our products, increasing our solutions' overall cost effectiveness, precision and reliability. This ensures that we meet or even surpass the ever changing needs and expectations of market trends.



37,000+ Employees Worldwide



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Ve-NET™ Connectors

The Ve-NET™ connection system is meticulously engineered to comply with every electrical and mechanical requirement in the automotive industry. With its sophisticated mechanical keying, secure latching, diverse color coding options, additional locking mechanisms, it not only meets but exceeds industry standards.











Ve-NETe[™] Unshielded Connectors

Ve-NETe™ connectors are exceptionally versatile, making them ideal for a wide range of high-speed data connection applications, including unshielded Automotive Ethernet TC2 and TC9. These connectors are not only highly cost-effective but also meet the stringent demands of the automotive industry with precision. Moreover, they ensure full compatibility with standard Ve-NET™ connectors, guaranteeing seamless integration and superior performance. Elevate your data connectivity solutions with the reliability and efficiency of Ve-NET™ connectors.

Ve-NET™ Hybrid Connectors

Ve-NET™ hybrid +6 power pin connectors – now available with enhanced variants featuring additional pins specifically designed for power supply purposes. These advanced connectors provide superior performance and reliability, ensuring your power supply applications meet the highest standards.



MATERIAL

- Housing: High Temperature Thermoplastic
- Contacts: Copper Alloy
- Holder: High Temperature Thermoplastic
- LID: Zinc Alloys/Copper Alloy
- Die Cast: Zinc Alloy

MECHANICAL PERFORMANCE

- Mating Cycle: ≥ 25
- Retention force latch ≥ 110N
- Engagement Force:
- ≤ 45N (1pos)
- ≤ 75N (2/4pos)
- ≤ 90N (6pos)

ELECTRICAL PERFORMANCE

- Impedance: 100Ω
- Insulation Resistance: 100MΩ min.
- Frequency Range Depending on Cable Type: 0.01GHz to 20GHz
- Contact Current Rating: 1.5A max.
- Test Voltage: 250VAC
- Working Voltage: ≤60VDC

SPECIFICATION

- Product Specification: S-VNT-00X
- Packaging Specification: PKSVNT0XX

ENVIRONMENTAL

- Temperature Range: -40°C to +105°C
- Humidity: DIN EN 60068-2-30 @+40°C
- Vibration: SAE/USCAR-2 Rev 7 V1, LV214 S1
- Thermal Shock: SAE/USCAR-2 Rev7 and LV214, -40°C to +105°C (cable dependent)

TECHNICAL DATA TABLE

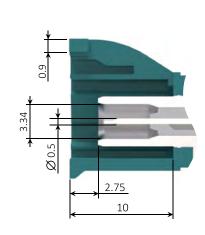
- Sealed Version IP Class (mated): IPX9K
- RoHS

COMPLIANT STANDARDS

- IEEE 802.3bp 1000BASE-T1
- IEEE 802.3ch 10GBASE-T1
- IEEE 802.3cy MULTI-GIG
- Open Alliance TC9

INTERFACE SIZE





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Amphenol specializes in developing automotive interconnect solutions to meet your needs



Mechanical Simulation

- Ansys release and Abaqus FEA
- Review of stress & strain distribution, normal force, mating & unmating force analysis
- Optimization of stress & strain distribution more evenly to prevent any permanent yield of material in product
- · Achieve the force requirement



Signal Integrity Simulation

- Frequency domain (FD)
- Time domain (TD)
- Statistical domain
- To provide S-Parameter or SPICE/HSPICE model of connector for use in high-speed electric channel



Mold Flow Simulation

- Simulate how parts are filled early in the design process to reduce molding defects, retooling, and redesign.
- Simulate the warpage of the manufactured part to help ensure the end product's fit and function.
- Advanced cooling techniques and layouts, such as conformal cooling, as well as transient heat calculations.



Rapid Prototyping

- 3D printing station
- · Dedicated mold base & tool frame
- Captive tool room for quick support on tooling
- Simulation capability with required contact pressure



Thermal Simulation

- Multi-physics for thermal dynamics simulation
- Review of thermal distribution in design
- Optimization of the design to reduce the high temperature location
- · Create current rating curve in design stage



Manufacturing IATF 16949

Put quality first by introducing IATF 16949 into your business. The international quality management standard for the automotive industry is recognized across the globe – design, manufacturing and servicing quality



Document PPAP Level 3

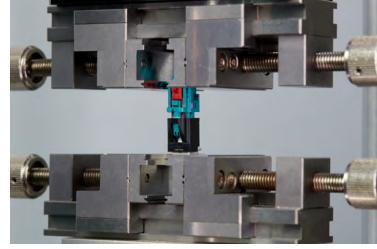
Production part approval process (PPAP) is used in the automotive supply chain for establishing confidence in component suppliers and their production processes. Actual measurements of the parts produced are taken and are used to complete the various test sheets of PPAP.



Engineering Capabilities

The United States Council for Automotive Research LLC (USCAR) pursues research and development of advanced systems for vehicles to achieve significantly increased range and performance including SAE/USCAR-21. SAE/USCAR-25 and AIAG.



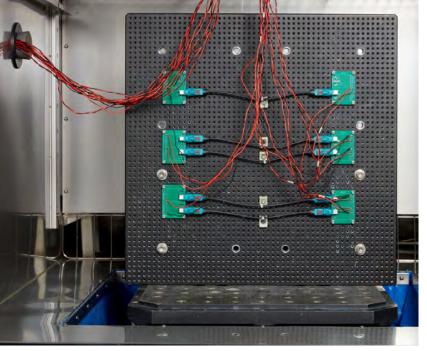




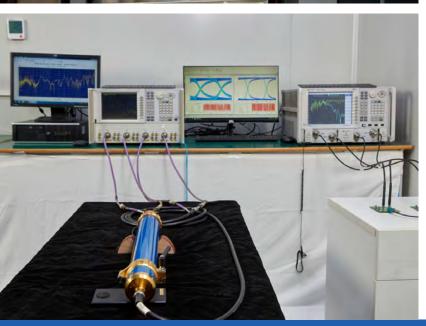
Overview of Automotive Ethernet Manufacturing and Engineering Competencies and Technologies

Amphenol Communications Solutions has cutting-edge automotive ethernet manufacturing and engineering technologies to deliver high-performance solutions such as **Ve-NET™**. Our integrated capabilities encompass advanced testing labs, precision assembly, state-of-the-art molding, and high-accuracy stamping processes. Each product undergoes rigorous testing to ensure reliability and performance, while our comprehensive product traceability system, which includes barcode laser printing, guarantees quality from production to deployment. This holistic approach ensures that our wide range of automotive ethernet products meet the stringent demands of modern automotive applications.

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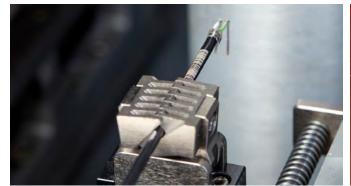
Mechanical and Electrical Testing to Automotive Standards

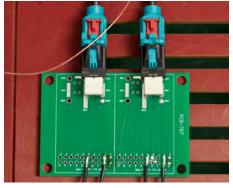
Automotive-grade products are subjected to a series of stringent mechanical and electrical tests to ensure they meet and exceed standards like **USCAR** and **LV214**. Our Signal Integrity (SI) tests verify the performance of high-speed data transmission, while mating and unmating tests ensure durability and ease of use. Vibration tests simulate real-world conditions to assess connector stability, and environmental tests, including thermal shock and humidity, confirm resilience under extreme conditions. Tests like EMI shielding tests ensure minimal noise, and electromagnetic interference, and cable bending tests validate the flexibility and longevity of our cables. These comprehensive tests guarantee that our automotive ethernet connectors deliver reliable performance in the most demanding automotive environments.

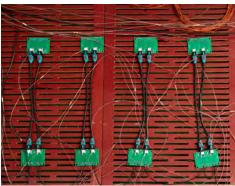
Fully Automated Connector and Cable Assembly

At Amphenol Communications Solutions manufacturing facilities, we utilize fully automated assembly processes. This ensures precision and consistency in our connector and cable production. Automation minimizes human error, enhances production efficiency, and ensures each product meets our global standards. A critical component of this automation is **Charge Coupled Device or** CCD visual inspection technology. CCD uses high-resolution image sensors to capture detailed images of the components being assembled, allowing for real-time analysis and defect detection. With the help of this advanced imaging, we can replace manual visual inspections, reducing defects and misalignments, and increasing the production speed significantly. This advanced level of automation allows Amphenol to stay ahead in the industry, producing connectors and cables essential for the high-performance demands of automotive Ethernet applications.











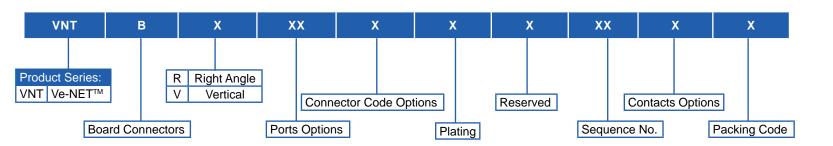
Product Traceability: Barcode Laser Printing

We employ state-of-the-art barcode laser printing technology to ensure complete product traceability. Each connector and cable are marked with a unique barcode, allowing for precise tracking throughout the manufacturing process and beyond. This system enhances quality control, facilitates efficient inventory management, and ensures accountability at every stage of production. We maintain detailed records of each product's journey from assembly to delivery and provide our customers with the highest level of transparency and reliability.

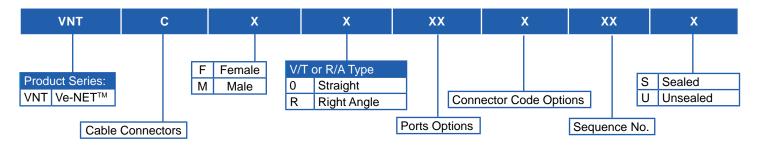
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Ve-NET™ Number Codes

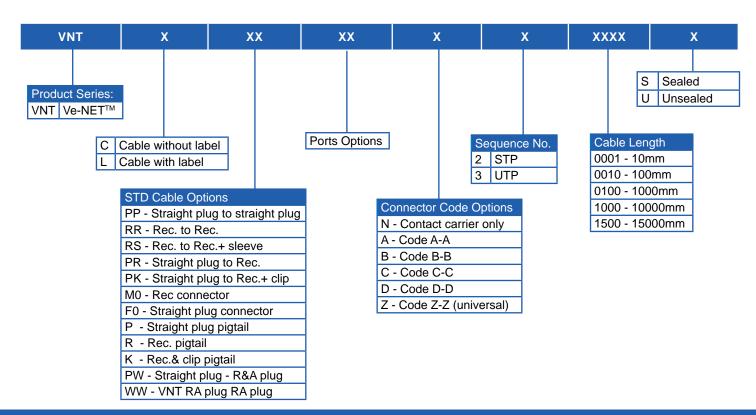
PCB Connectors



Cable Plug



Cable Harness



Ve-NET™ Connectors

PCB Connectors Unsealed

1X1 SERIES

Product type	Part Number	Orientation	Seal type	Packing type	
1x1	VNTBV11x2001SR	180°	Unsealed	Tape & Reel	
1x1	VNTBR11x2001SR	90°	Unsealed	Tape & Reel	
1x1 Inverted	VNTBR11x2003SR	90°	Unsealed	Tape & Reel	2

1X2 SERIES

Product type	Part Number	Orientation	Seal type	Packing type	
1x2	VNTBV12x2001SR	180°	Unsealed	Tape & Reel	
1x2	VNTBR12x2001SR	90°	Unsealed	Tape & Reel	Se

2Y2 SERIES

ZAZ SERIES								
Product type	Part Number	Orientation	Seal type	Packing type				
2x2	VNTBV22x2001SR	180°	Unsealed	Tape & Reel				
2x2	VNTBR22x2011SR	90°	Unsealed	Tape & Reel	900			

2X3 SERIES

Product type	Part Number	Orientation	Seal type	Packing type	
2x3	VNTBV23x2001SR	180°	Unsealed	Tape & Reel	ade
2x3	VNTBR23x2001SR	90°	Unsealed	Tape & Reel	200

*X in Part number=Option

PCB Connectors Sealed

1X1 SERIES

Product type	Part Number	Orientation	Seal type	Packing type	
1x1	VNTBR11x2002SR	90°	Sealed	Tape & Reel	

2X2 SERIES

Product type	Part Number	Orientation	Seal type	Packing type	
2x2	VNTBR22x2000SR	90°	Sealed	Tape & Reel	Cal

Cable Connectors Unsealed

1X1 SERIES

Product type	Part Number	Orientation	Seal type	Cable type	
1x1	VNTCF011X20U	180°	Unsealed	STP	
1x1 Inline	VNTCM011X20U	180°	Unsealed	STP	
1x1 Inline with cap	VNTCM011X30U	180°	Unsealed	STP	
1X1	VNTCFR11X20U	90°	Unsealed	STP	
1x1 Mini	VNTCFR11X30U	90°	Unsealed	STP	

1X2 SERIES

Product type	Part Number	Orientation	Seal type	Cable type	
1x2	VNTCF012X20U	180°	Unsealed	STP	

2X2 SERIES

Product type	Part Number	Orientation	Seal type	Cable type	
2x2	VNTCF022X20U	180°	Unsealed	STP	

2X3 SERIES

Product type	Part Number	Orientation	Seal type	Cable type	
2x3	VNTCF023X20U	180°	Unsealed	STP	200

Cable Connectors Sealed

1X1 SERIES

Product type	Part Number	Orientation	Seal type	Cable type	
1x1	VNTCF011X20S	180°	Sealed	STP	
1x1 Inline	VNTCM011X20S	180°	Sealed	STP	
1x1 Inline with cap	VNTCM011X30S	180°	Sealed	STP	

2X2 SERIES

Product type	Part Number	Orientation	Seal type	Cable type	
2x2	VNTCF022X20S	180°	Sealed	STP	

Amphenol's cable bending tests validate the flexibility and longevity of our cables



Ve-NETe[™] Unshielded Connectors

Cable Connectors Unsealed

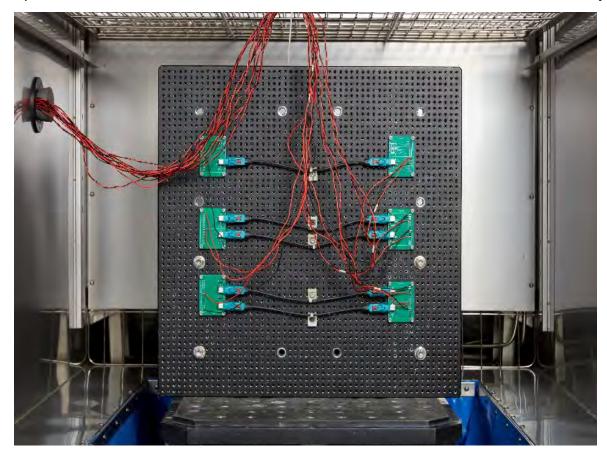
1X1 SERIES

Product type	Part Number	Orientation	Seal type	Cable type	
1x1	VNTCF011X30U	180°	Unsealed	STP	
1x1	VNTCF011X40U	180°	Unsealed	UTP	3

2X2 SERIES

EXE CERTED							
Product type	Part Number	Orientation	Seal type	Cable type			
2x2	VNTCF022X70U	180°	Unsealed	STP			
2x2	VNTCF022X40U	180°	Unsealed	UTP			

Amphenol's vibration tests simulate real-world conditions to assess connector stability



*X in Part number=Option

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Ve-NET™ Hybrid Connectors

PCB Connectors Unsealed

1X1+6 SERIES

P	roduct type	Part Number	Orientation	Seal type	Packing type	
1)	<1+6	VNTBRA6X2601SR	90°	Unsealed	Tape & Reel	

1X2+6 SERIES

Produ	ıct type	Part Number	Orientation	Seal type	Packing type	
1x2+6	5	VNTBRB6x2601SR	90°	Unsealed	Tape & Reel	

PCB Connectors Sealed

1X1+6 SERIES

TXTTO GERTES							
Product type	Part Number	Orientation	Seal type	Packing type			
1x1+6	VNTBVA6A2624SR	180°	Sealed	Tape & Reel	WI Mili		
1x1+6	VNTBRA6X2602SR	90°	Sealed	Tape & Reel			

Cable Connectors Unsealed

1X1+6 SERIES

Product type	Part Number	Orientation	Seal type	Cable type	
1x1+6	VNTCF0A6X21U	180°	Unsealed	STP	
1x1+6	VNTCF0A6X40U	180°	Unsealed	UTP	

1X2+6 SERIES

TAZTO SERIES								
Product type	Part Number	Orientation	Seal type	Cable type				
1x2+6	VNTCF0C6X20U	180°	Unsealed	STP				
1x2+6	VNTCF0C6X40U	180°	Unsealed	UTP				
1x2+6	VNTCFRC6X20U	90°	Unsealed	STP				
1x2+6 Inline	VNTCMRC6X20U	90°	Unsealed	STP				

Cable Connectors Sealed

1X1+6 SERIES

Product type	Part Number	Orientation	Seal type	Cable Type	
1x1+6	VNTCF0A6X01S	180°	Sealed	STP	

*X in Part number=Option

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Ve-NET™ Cable Harness

UNSEALED SERIES

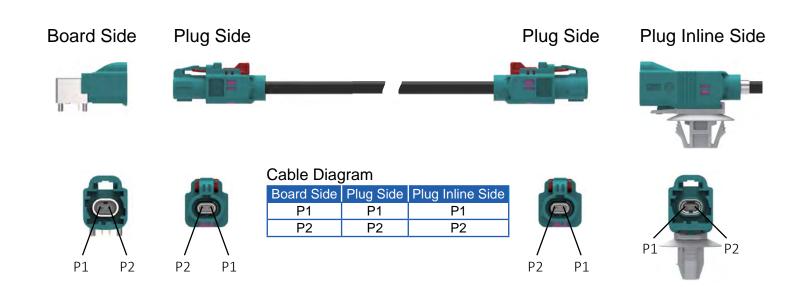
Product type	Part Number	Orientation	Seal type	Cable Type	
1x1	VNTCPR11XXXXXXU	180°	Unsealed	STP	
1x1	VNTCPP11XXXXXXU	180°	Unsealed	STP	
1X1	VNTCRR11XXXXXXU	180°	Unsealed	STP	

SEALED SERIES

Product type	Part Number	Orientation	Seal type	Cable Type	
1x1	VNTCPR1XXXXXXXS	180°	Sealed	STP	
1x1	VNTCPP1XXXXXXXS	180°	Sealed	STP	
1x1	VNTCRR1XXXXXXXS	180°	Sealed	STP	

Ve-NET™ Pin Alignment

Ve-NET™ 1x1 Series Unsealed

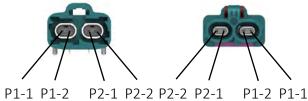


Ve-NET™ 1x2 Series Unsealed



Cable Diagram

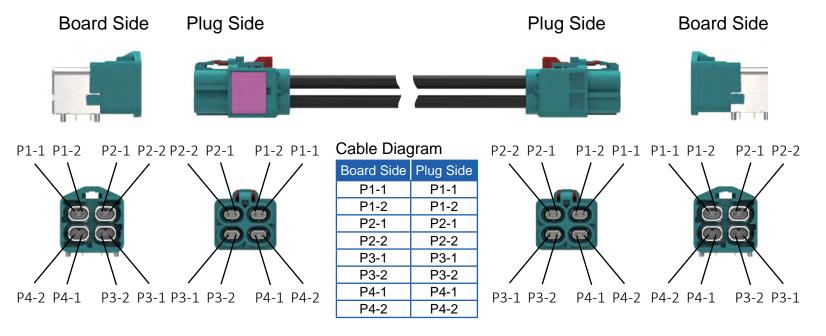
Board Side	Plug Side	Plug Inline Side
P1	P1	P1
P2	P2	P2



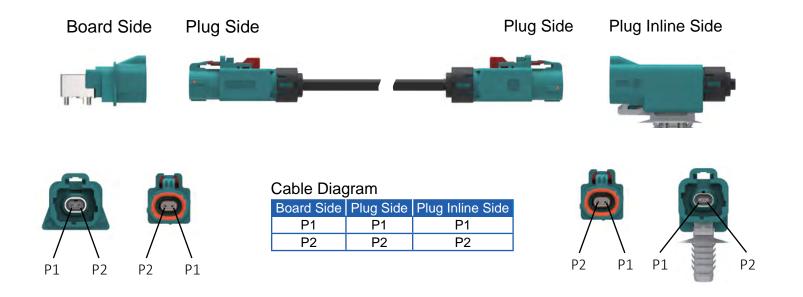




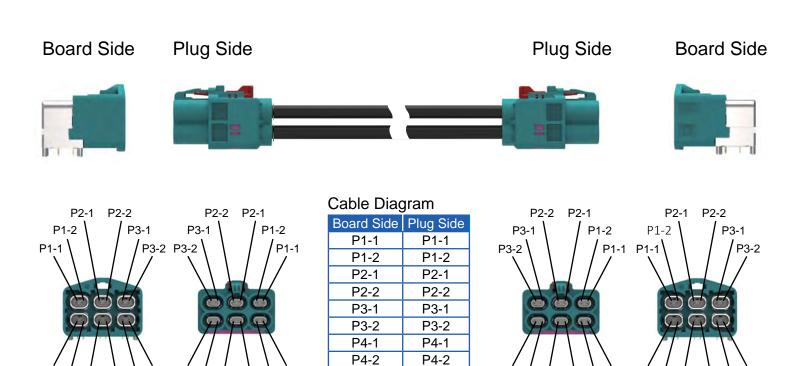
Ve-NET™ 2x2 Series Unsealed



Ve-NET™ 1x1 Series Sealed



Ve-NET™ 2x3 Series Unsealed



P5-1

P5-2

P6-1 P6-2 P4-2

P5-1 P5-2

P5-1

P5-2

P6-1

P6-1

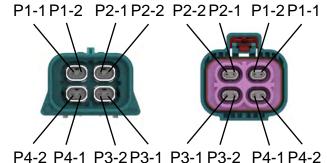
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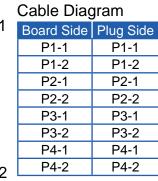
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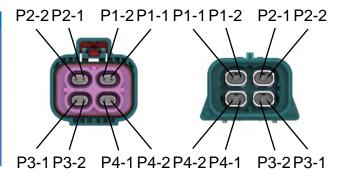
P5-2 P5-1

Ve-NET™ 2x2 Series Sealed









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P4-2

P5-1

P5-2

\P6-2 P6-2

P6-1

Ve-NET™ Coding

1x1 Series Unsealed

Coding	Male	Female	Color	RAL
Α			BLACK	SIM. 9005
В			WHITE	SIM. 9010
С			LIGHT BLUE	SIM. 5012
D			CLARET VIOLET	SIM. 4004
Е			MAY GREEN	SIM. 6017
F			NUT BROWN	SIM. 8011
G			PLATINUM GREY	SIM. 7036
Н			LIGHT PINK	SIM. 3015
J			BEIGE	SIM. 1001
К			CURRY	SIM. 1027
L			YELLOW GREEN	SIM. 6018
М			PASTEL OR- ANGE	SIM. 2003
0			LIGHT GREEN	SIM. 6027
Z			WATER BLUE	SIM. 5021

1x2 Series Unsealed

1x2 Series Unsealed					
Coding	Male	Female	Color	RAL	
А			BLACK	SIM. 9005	
В			WHITE	SIM. 9010	
С			LIGHT BLUE	SIM. 5012	
D			CLARET VIOLET	SIM. 4004	
Е			MAY GREEN	SIM. 6017	
F			NUT BROWN	SIM. 8011	
G			PLATINUM GREY	SIM. 7036	
Н			LIGHT PINK	SIM. 3015	
J			BEIGE	SIM. 1001	
К			CURRY	SIM. 1027	
L			YELLOW GREEN	SIM. 6018	
М			PASTEL OR- ANGE	SIM. 2003	
0			LIGHT GREEN	SIM. 6027	
Z			WATER BLUE	SIM. 5021	

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2x2 Series Unsealed

Coding	Male	Female	Color	RAL
А			BLACK	SIM. 9005
В			WHITE	SIM. 9010
С			LIGHT BLUE	SIM. 5012
D			CLARET VIOLET	SIM. 4004
E			MAY GREEN	SIM. 6017
F			NUT BROWN	SIM. 8011
G			PLATINUM GREY	SIM. 7036
Н			LIGHT PINK	SIM. 3015
J			BEIGE	SIM. 1001
K			CURRY	SIM. 1027
L			YELLOW GREEN	SIM. 6018
M			PASTEL OR- ANGE	SIM. 2003
0			LIGHT GREEN	SIM. 6027
Z			WATER BLUE	SIM. 5021

2x3 Series Sealed

Coding	Male	Female	Color	RAL
A			BLACK	SIM. 9005
В			WHITE	SIM. 9010
С			LIGHT BLUE	SIM. 5012
D			CLARET VIOLET	SIM. 4004
Е			MAY GREEN	SIM. 6017
F			NUT BROWN	SIM. 8011
G			PLATINUM GREY	SIM. 7036
Н			LIGHT PINK	SIM. 3015
J			BEIGE	SIM. 1001
К	000		CURRY	SIM. 1027
L	000		YELLOW GREEN	SIM. 6018
М	000		PASTEL OR- ANGE	SIM. 2003
О			LIGHT GREEN	SIM. 6027
Z			WATER BLUE	SIM. 5021

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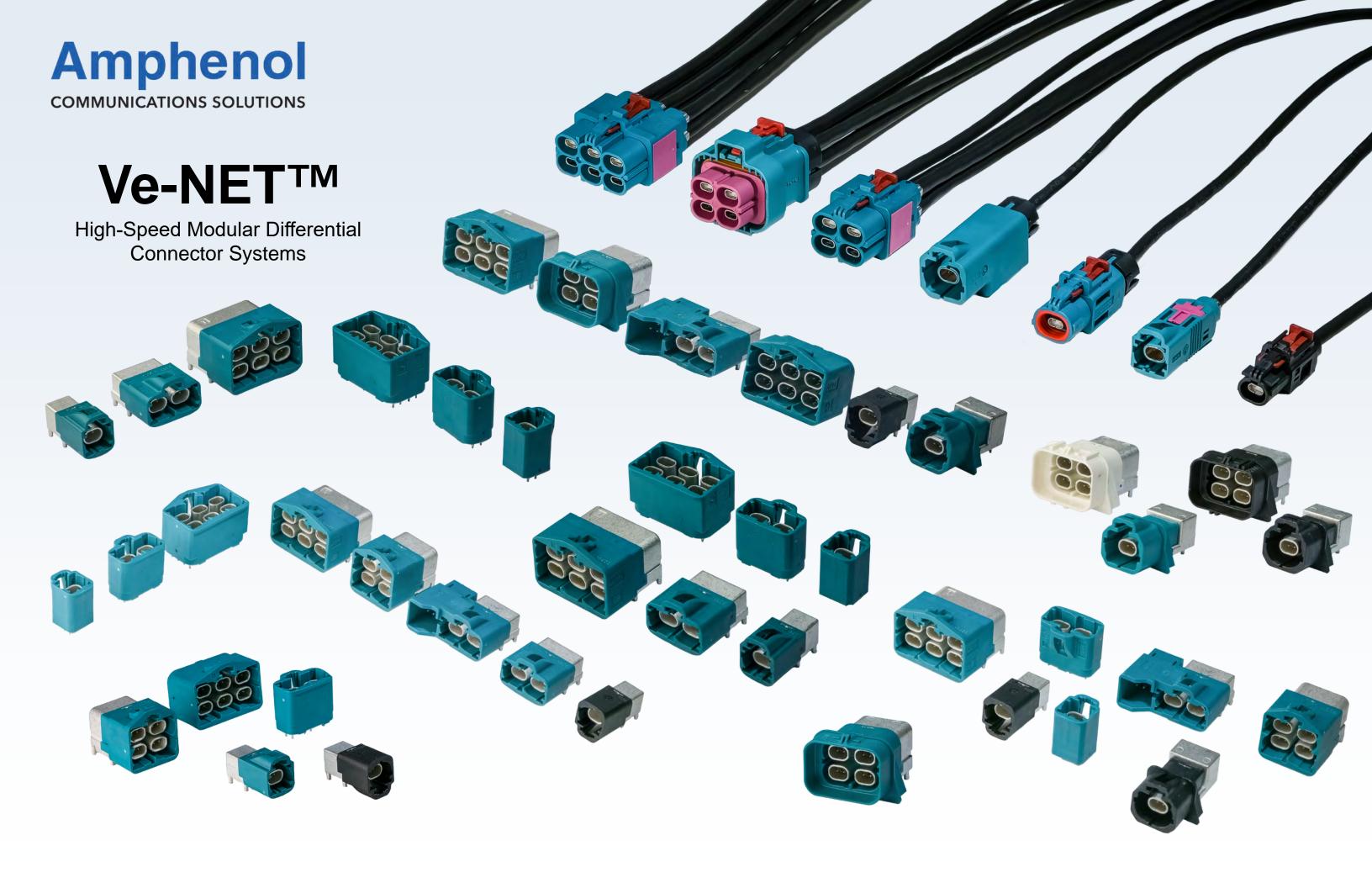
1x1 Series Sealed

TXT Series Sealed					
Coding	Male	Female	Color	RAL	
Α			BLACK	SIM. 9005	
В			WHITE	SIM. 9010	
С			LIGHT BLUE	SIM. 5012	
D			CLARET VIOLET	SIM. 4004	
E			MAY GREEN	SIM. 6017	
F			NUT BROWN	SIM. 8011	
G			PLATINUM GREY	SIM. 7036	
Н			LIGHT PINK	SIM. 3015	
J			BEIGE	SIM. 1001	
K			CURRY	SIM. 1027	
L			YELLOW GREEN	SIM. 6018	
М			PASTEL OR- ANGE	SIM. 2003	
0			LIGHT GREEN	SIM. 6027	
Z			WATER BLUE	SIM. 5021	

2x2 Series Sealed

Coding	Male	Female	Color	RAL
А			BLACK	SIM. 9005
В			WHITE	SIM. 9010
С			LIGHT BLUE	SIM. 5012
D			CLARET VIOLET	SIM. 4004
Е			MAY GREEN	SIM. 6017
F			NUT BROWN	SIM. 8011
G			PLATINUM GREY	SIM. 7036
Н			LIGHT PINK	SIM. 3015
J			BEIGE	SIM. 1001
К			CURRY	SIM. 1027
L			YELLOW GREEN	SIM. 6018
М			PASTEL OR- ANGE	SIM. 2003
Z			WATER BLUE	SIM. 5021

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Amphenol COMMUNICATIONS SOLUTIONS

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