

ND9 Series, *ix* Industrial Ethernet Connectors

Product Specification S6168C Rev 1.5

Amphenol

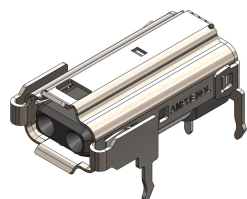
Now you're connected!

About Amphenol Commercial Products

Amphenol's commercial connector products are used in a variety of end user applications including networking, telecom, server & computer, storage & HDD, consumer electronics and entertainment, professional audio & Industrial & Military/Aerospace.

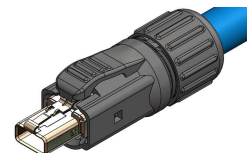
Related Products

MSPE Series for Single Pair Ethernet



MSPE-J2L0-B00

Jack, IP20, Latch-Locking,
R/A PCB Termination



MSPE-P2L0-XX0

Plug, IP20, Latch-Locking,
Termination Options



MSPE-J6S8-E00

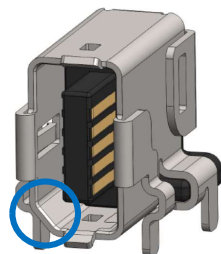
Jack, IP67, Snap-Locking,
Vertical PCB Termination



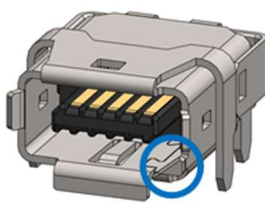
MSPE-P6S8-XX0

Plug, IP67, Snap-Locking,
Termination Options

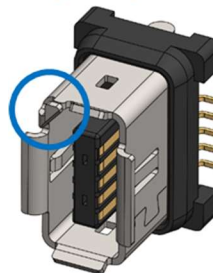
Right Angle Receptacle,
Flag-Style, Type-A Key Shown



Right Angle Receptacle,
Horizontal-Style, Type-A Key Shown



Vertical Receptacle,
Type-B Key Shown



Plug, Type-A Key Shown,
Supplied in Field-Terminable Kits,
Termination Options Available



Plug-to-Plug Cable,
Various Lengths, Colours, &
Configurations Available



Hand-Crimp Tool for
Terminating Plug Connectors



Overview

This product specification defines the general use and performance parameters for Amphenol's ND9 Series of *ix* Industrial Ethernet Connectors.

Availability:

- Type-A (CAT6A Ethernet) & *Type-B (signal & bus communication) keying for both plugs & receptacles
- Right angle & vertical SMT / PIP termination for receptacle connectors enables reflow soldering
- Field terminable kits for plug connectors with solder pad & IDC terminations for various wire gauges
- Plug-to-plug cable assemblies of various lengths & colours
- Gold flash, 0.20µm (8µ") Gold, 0.76µm (30µ") Gold, 1.27µm (50µ") Gold, or 0.76µm (30µ") Palladium Nickel with Gold flash plating options for the mating area

Please contact an Amphenol representative with any questions about availability.

*CAT6A Ethernet Capable

Usage

The ND9 Series provides a robust, miniaturized Ethernet interface (according to IEC 61076-3-124) with up to 75% space savings on the PCB compared to standard RJ45 jacks. ND9 Series connectors are future proof offering CAT6A performance for up to 10 Gb/s Ethernet communication, Support for PoE++ up to 100W as defined by IEEE 802.3bt and 360° shielding for excellent EMC immunity. ND9 Series connectors are robust, featuring an audible snap-in locking system and robust PCB anchors on the jack to endure shock and vibration (according to EN 50155) while maintaining a reliable connection. ND9 Series connectors are IP20 rated (according to IEC 60529) and can withstand up to 5000 mating cycles. ND9 Series connectors are compatible with 100BaseT, 1000BaseT, & 10GBaseT.

Application

Intended for use in a broad range of applications such as:

- Internet of Things (IoT)
- Machine to Machine (M2M)
- Building Automation
- Robotics
- Transportation
- Healthcare / Medical Equipment
- Sensors, Actuators, & Network Nodes
- Test Equipment
- Mobile Communication Systems
- Traffic Control & Monitoring Systems

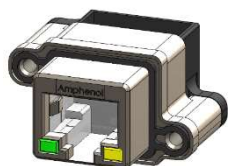
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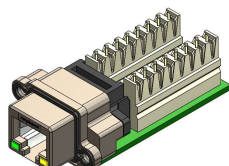
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Related Products

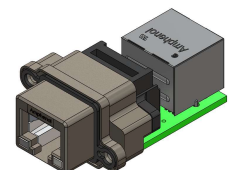
MRJR Series



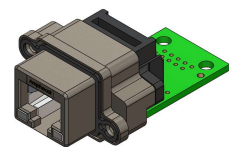
MRJR-9381-0C
CAT6A RJ45, Right Angle PCB Tail, 8 Position, LED's



MRJR-8F81-01
CAT5e RJ45 on PCB with Krone-Style IDC Contacts



MRJR-8780-01
CAT5e RJ45 on PCB with Matching RJ45



MRJR-5C80-01
Standard RJ45 on PCB For Discrete Wiring

Connector Electrical Characteristics

Current Rating:	1.5A (all pins) (1.25A if terminated to 28 AWG wire)
Voltage Rating:	50VAC max, 60VDC max
Contact Resistance:	80mΩ max, per IEC 60512-2-1, Test 2a
Shielding Resistance:	100mΩ max, per IEC 60512-2-1, Test 2a
Insulation Resistance:	500MΩ min @ 500VDC test voltage, per IEC 60512-3-1, Test 3a
Dielectric Withstanding Voltage:	500VDC, per IEC 60512-4-1, Test 4a, Method A

Connector Mechanical Characteristics

Insertion / Withdrawal Force:	25N max, per IEC 60512-13-2, Test 13b
Latch Retention Force:	80N min, per IEC 60512-13-2, Test 15f
Thermal Shock:	10 cycles between -55° and +85°C, per IEC 60512-11-4, Test 11d
Humidity:	10 cycles, 24hrs / cycle @ 93% humidity, low temperature +25°C, high temperature +65°C, cold sub-cycle -10°C, per IEC 60068-2-38, Test Z/AD
Mechanical Shock:	300m/s ² half-sine shock pulses, 11ms, per IEC 60512-6-3, Test 6c 50G max, per TP9240888 Half sine shock 5g, 30ms, per DIN EN 61373 Class 1, Cat b
Vibration, Sinusoidal:	10Hz – 500Hz, 0.35mm, 50m/s ² , per IEC 60512-6-4, Test 6d Automotive Std per TP240862
Vibration, Random:	5.72m/s ² ; No contact disturbances ≥ 1μs per DIN EN 61373 Class 1, Cat b
Mating Cycles ¹ :	5000 cycles, per IEC 60512-9-1, Test 9a
Operating Temperature ² :	-55°C to +105°C
¹ The number of mating cycles is influenced by the plating option. Please consult Amphenol with any questions.	
² The maximum operating temperature for cable assemblies is +85°C, operating temperatures can vary. Please consult Amphenol with any questions.	

Signal Characteristics

Transmission Rate:	Up to 10 Gb/s
Bandwidth:	Up to 500 MHz

Material Characteristics

ND9 Series connectors and cables are RoHS compliant per EU directive 2011/65/EU and amendments. Unless otherwise specified, the materials for each component shall be:

- Contacts: Copper alloy plated with Gold or Palladium Nickel with Gold Flash over 1.27μm (50μ") min Nickel on the mating area
- Housings / Inserts: High temperature resistant thermoplastic, UL94V-0 flammability rating
- EMI Shields: Stainless steel, Matte Tin or Nickel plated
- Wire: 26 AWG copper, metal braid / shield, PVC insulation

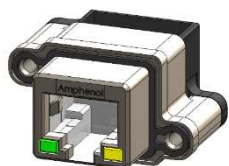
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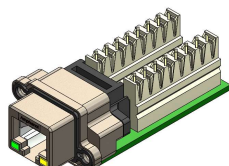
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Related Products

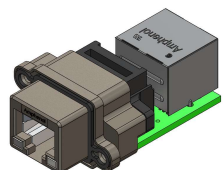
MRJR Series



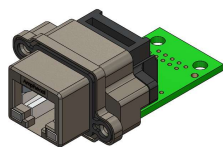
MRJR-9381-0C
CAT6A RJ45, Right Angle
PCB Tail, 8 Position, LED's



MRJR-8F81-01
CAT5e RJ45 on PCB with
Krone-Style IDC Contacts



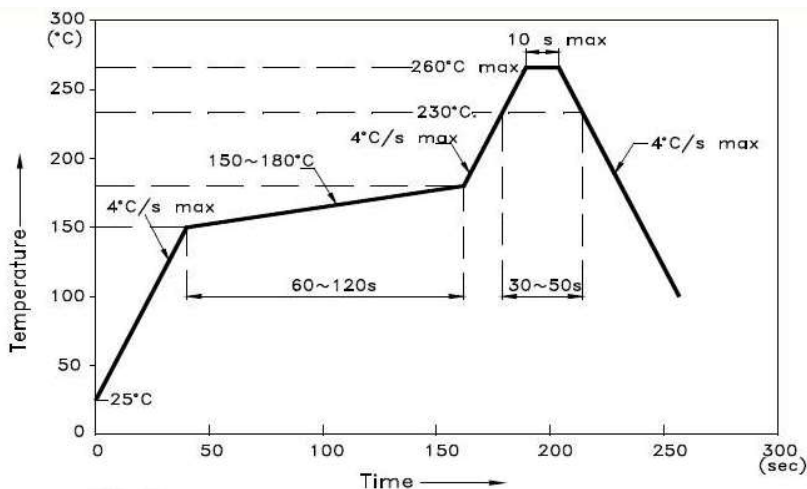
MRJR-8780-01
CAT5e RJ45 on PCB
with Matching RJ45



MRJR-5C80-01
Standard RJ45 on PCB
For Discrete Wiring

Process Characteristics

Recommended soldering process: Pin-in-paste IR reflow soldering up to 260°C for 10 seconds.
Recommended reflow profile below.



Quality Test Reports

- QTP9300760, QTR9300760
- QTR9300790, QTR9300790

Agency & Regulatory

- UL Certification: E64911
- RoHS Compliance: Per EU Directive 2011/65/EU and Amendments.

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Related Products

MRD Series



MRD-BN03-M17-000
Male Plug, 3-Socket



MRD-BG03-M17-000
Female Plug, 3-Pin



MRD-BG03-L13-000
Female Receptacle, 3-Pin

Available Documents

Receptacle Connectors

- **P-ND9-AS1X-00:** IX INDUSTRIAL RECEPTACLE, TYPE-A RIGHT ANGLE FLAG-STYLE
- **P-ND9-AS2X-00:** IX INDUSTRIAL RECEPTACLE, TYPE-A VERTICAL
- **P-ND9-AS3X-00:** IX INDUSTRIAL RECEPTACLE, TYPE-A RIGHT ANGLE HORIZONTAL-STYLE
- **P-ND9-BS1X-00:** IX INDUSTRIAL RECEPTACLE, TYPE-B RIGHT ANGLE FLAG-STYLE
- **P-ND9-BS2X-00:** IX INDUSTRIAL RECEPTACLE, TYPE-B VERTICAL
- **P-ND9-BS3X-00:** IX INDUSTRIAL RECEPTACLE, TYPE-B RIGHT ANGLE HORIZONTAL-STYLE

Plug Connectors

- **P-ND9-APXX-00XX:** IX INDUSTRIAL PLUG, TYPE-A KEY FOR ETHERNET, TERMINATION OPTIONS
- **P-ND9-BPXX-00XX:** IX INDUSTRIAL PLUG, TYPE-B KEY, TERMINATION OPTIONS

Cable Assemblies

- **P-ND9-ACAX-XXA:** IX INDUSTRIAL ETHERNET CABLE, TYPE-A PLUG ON ONE END, VARIOUS LENGTHS
- **P-ND9-ACBX-XXA:** IX INDUSTRIAL ETHERNET CABLE, TYPE-A PLUG TO PLUG, VARIOUS LENGTHS
- **P-ND9-ACCX-XXA:** IX INDUSTRIAL ETHERNET CABLE, TYPE-A PLUG TO RJ45 PLUG, VARIOUS LENGTHS
- **P-ND9-ACDX-XXC:** IX INDUSTRIAL ETHERNET CABLE, TYPE-A PLUG TO M12 MALE 4 PIN CODE D, VARIOUS LENGTHS
- **P-ND9-ACEX-XXC:** IX INDUSTRIAL ETHERNET CABLE, TYPE-A PLUG TO RIGHT ANGLE M12 MALE 4 PIN CODE D, VARIOUS LENGTHS
- **P-ND9-ACHX-XXA:** IX INDUSTRIAL ETHERNET CABLE, TYPE-A PLUG TO RIGHT ANGLE RJ45 PLUG, VARIOUS LENGTHS
- **P-ND9-BCAX-XXB:** IX INDUSTRIAL CABLE, TYPE-B PLUG ON ONE END, VARIOUS LENGTHS
- **P-ND9-BCBX-XXA:** IX INDUSTRIAL CABLE, TYPE-B PLUG TO PLUG, VARIOUS LENGTHS
- **P-ND9-BCBX-XXB:** IX INDUSTRIAL CABLE, TYPE-B PLUG TO PLUG, VARIOUS LENGTHS
- **P-ND9-BCCX-XXA:** IX INDUSTRIAL CABLE, TYPE-B PLUG TO RJ45 PLUG, VARIOUS LENGTHS
- **P-ND9-BCDX-XXC:** IX INDUSTRIAL CABLE, TYPE-B PLUG TO M12 MALE 4 PIN CODE D, VARIOUS LENGTHS
- **P-ND9-BCEX-XXC:** IX INDUSTRIAL CABLE, TYPE-B PLUG TO RIGHT ANGLE M12 MALE 4 PIN CODE D, VARIOUS LENGTHS
- **P-ND9-BCHX-XXA:** IX INDUSTRIAL CABLE, TYPE-B PLUG TO RIGHT ANGLE RJ45 PLUG, VARIOUS LENGTHS

Tools

- **P-ND9-AHT1-01:** IX INDUSTRIAL HAND CRIMP TOOL FOR PLUG CONNECTORS

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Product Numbering System for Connectors

Series

ND9 ix Industrial Series

Keying

A Type-A Key for Ethernet

B Type-B Key²

Connector Type

P Plug

S Socket (Receptacle)

Configuration

Receptacles Only

1 Receptacle, Right Angle, Flag-Style

2 Receptacle, Vertical

3 Receptacle, Right Angle, Horizontal Style

Plugs Only

5 Plug, Solder-Pad Termination

6 Plug, IDC Termination, 24-26 AWG

7 Plug, IDC Termination, 26-28 AWG

Plating for Mating Area¹

1 Gold Flash

2 0.2µm (8µ") Gold

3 0.76µm (30µ") Gold*

4 1.27µm (50µ") Gold

7 0.76µm (30µ") Palladium Nickel with Gold Flash

Unique Code

00 Standard

Packaging Style (Plugs Only)

No Digits Standard Packaging

¹ All contact terminations are matte Tin. Not every plating option is available for every connector type / configuration. Please consult Amphenol with any questions about availability.

² Can be used for Ethernet

*Not available for horizontal configuration

Now you're connected!

Product Numbering System for Cable Assemblies

Series

ND9 *ix Industrial Series*

Keying

A Type-A Key for Ethernet

B Type-B Key

Connector Type

C Cable Assembly

Configuration

A ND9 Plug on One End Only

B ND9 Plug on Both Ends

C ND9 Plug to RJ45 Plug

D ND9 Plug to M12 Plug (Male 4-Pin, Code D)

E ND9 Plug to Right Angle M12 Plug (Male 4-Pin, Code D)

Plating for Mating Area

1 Gold Flash

2 0.2µm (8µ") Gold

3 0.76µm (30µ") Gold

4 1.27µm (50µ") Gold

7 0.76µm (30µ") Palladium Nickel with Gold Flash

Cable Length

10 to 99	Length in Centimeters	G0 to G9	7 Meters + 0 to 9 Decimeters	Ordering Code Examples:
A0 to A9	1 Meter + 0 to 9 Decimeters	H0 to H9	8 Meters + 0 to 9 Decimeters	
B0 to B9	2 Meters + 0 to 9 Decimeters	J0 to J9	9 Meters + 0 to 9 Decimeters	
C0 to C9	3 Meters + 0 to 9 Decimeters	K0 to K9	10 Meters + 0 to 9 Meters	
D0 to D9	4 Meters + 0 to 9 Decimeters	L0 to L9	20 Meters + 0 to 9 Meters	
E0 to E9	5 Meters + 0 to 9 Decimeters	M0 to M9	30 Meters + 0 to 9 Decimeters	
F0 to F9	6 Meters + 0 to 9 Decimeters			

Cable Type

A 8 Wire Cable

B 10 Wire Cable

C 4 Wire Cable